Buddy Garcia, *Chairman*
Larry R. Soward, *Commissioner*
Bryan W. Shaw, Ph.D., *Commissioner*
Glenn Shankle, *Executive Director*

# TEXAS COMMISSION ON ENVIRONMENTAL QUALITY

*Protecting Texas by Reducing and Preventing Pollution*

December 28, 2007

Mr. Jeremy Fieldsend
Newcombe Development L.L.C.
325 Mission Valley Road
New Braunfels, Texas 78132

Re: Edwards Aquifer, Comal County
NAME OF PROJECT: Newcombe Tennis Ranch Residential Subdivision; Located on the east side of Mission Valley Road approximately 0.5 miles southwest of State Highway 46; New Braunfels, Texas
TYPE OF PLAN: Request for Approval of a Water Pollution Abatement Plan (WPAP); 30 Texas Administrative Code (TAC) Chapter 213 Edwards Aquifer
Edwards Aquifer Protection Program ID No. 1248.01; Investigation No. 598529; Regulated Entity No. RN102747359

Dear Mr. Fieldsend:

The Texas Commission on Environmental Quality (TCEQ) has completed its review of the WPAP application for the above-referenced project submitted to the San Antonio Regional Office by Carter & Burgess, Inc. on behalf of Newcombe Development L.L.C. on October 18, 2007. Final review of the WPAP was completed after additional material was received on December 14, 2007, and December 21, 2007. As presented to the TCEQ, the Temporary Best Management Practices (BMPs) and construction plans were prepared by a Texas Licensed Professional Engineer to be in general compliance with the requirements of 30 TAC Chapter 213. These planning materials were sealed, signed and dated by a Texas Licensed Professional Engineer. Therefore, based on the engineer's concurrence of compliance, the planning materials for construction of the proposed project and pollution abatement measures are hereby approved subject to applicable state rules and the conditions in this letter. The applicant or a person affected may file with the chief clerk a motion for reconsideration of the executive director's final action on this Edwards Aquifer Protection Plan. A motion for reconsideration must be filed no later than 23 days after the date of this approval letter. *This approval expires two (2) years from the date of this letter unless, prior to the expiration date, more than 10 percent of the construction has commenced on the project or an extension of time has been requested.*

## BACKGROUND

This application was submitted as two sites (158.84 acres and 47.0 acres) separated by an existing public road (Mission Valley Road). Under the current rule interpretation, each site requires its own WPAP, and the 47.0 acre tract was withdrawn from review by a letter dated December 14, 2007, from the project engineer. A separate application will be submitted for the 47.0 acre site.

## PROJECT DESCRIPTION

The proposed single-family residential project will have an area of approximately 158.84 acres. It will include 177 single-family residences, 16 tennis courts, a swimming pool, two bath houses, a clubhouse, 15 casitas (visitors' quarters, single bedroom buildings with kitchen) and related roads, driveways, and

sidewalks. The impervious cover will be 31.30 acres (19.7%). Project wastewater will be disposed of by conveyance to the existing Gruene Road Wastewater Treatment Plant owned by the New Braunfels Utilities.

As understood, a casita is a one bedroom guest building with kitchen facilities. The casitas are to be used for special guests (touring tennis professionals, celebrities, etc.) for long term (not daily) accommodations while they train, coach, etc. at the nearby John Newcombe Tennis Ranch Club and Conference Center. There are no plans for commercial use of the casitas (rent, sale, or lease). The applicant will own and maintain the casitas.

## PERMANENT POLLUTION ABATEMENT MEASURES

Since this single-family residential project will not have more than 20 percent impervious cover, an exemption from permanent BMPs is approved.

## GEOLOGY

According to the geologic assessment included with the application, portions of the site are located on the Edwards Person Formation, the Del Rio Clay, and the Buda Limestone. As reported, there are 16 geologic and manmade features located on the project site. Features S-4 (sinkhole) and S-5 (cave) were assessed as sensitive. The San Antonio Regional Office site assessment conducted on December 3, 2007, revealed that the features were as described, with the exception of features S-4 and S-15 (well). Based on the feature's rectangular shape, and uniform depth, the project geologist reclassified Feature S-4 from a sinkhole to a manmade excavation, and re-assessed the feature as not sensitive. Feature S-15 was assessed as a sensitive feature because the well was not properly plugged or capped. A setback consistent with the criteria of RG-348, Section 5 is proposed for Feature S-4.

During the site assessment, minor vegetation clearing was observed. According to the project engineer, a "Bobcat" with a forestry cutter attachment was used for a preliminary survey of proposed roads to identify trees to be protected. The paths were approximately 5 feet wide. No soil disturbance was observed and the shredded material did not obscure the ground.

## SPECIAL CONDITIONS

I. The holder of the approved Edwards Aquifer WPAP must comply with all provisions of 30 TAC Chapter 213 and all best management practices and measures contained in the application.

II. 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.

III. 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.

IV. Since this project will not have more than 20% impervious cover, an exemption from permanent BMPs is approved. If the percent impervious cover ever increases above 20% or the land use changes, the exemption for the whole site as described in the property boundaries required by §213.4(g), may no longer apply and the property owner must notify the appropriate regional office of these changes.

V. If any of the casitas are rented, sold or leased, or in any way converted to commercial use for any period of time, the exemption listed in Special Condition IV for the whole site as described in the property boundaries required by §213.4(g), may no longer apply and the property owner must notify the appropriate regional office of these changes.

VI. Feature S-15, and the other three wells shall be properly plugged.

## 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.

Prior to Commencement of Construction:

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

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

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

5. The applicant must provide written notification of intent to commence construction, replacement, or rehabilitation of the referenced project. Notification must be submitted to the San Antonio Regional Office no later than 48 hours prior to commencement of the regulated activity. Written notification must include the date on which the regulated activity will commence, the name of the approved plan and program ID number for the regulated activity, and the name of the prime contractor with the name and telephone number of the contact person. The executive director will use the notification to determine if the approved plan is eligible for an extension.

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

7. All borings with depths greater than or equal to 20 feet must be plugged with non-shrink grout from the bottom of the hole to within three (3) feet of the surface. The remainder of the hole

must be backfilled with cuttings from the boring. All borings less than 20 feet must be backfilled with cuttings from the boring. All borings must be backfilled or plugged within four (4) days of completion of the drilling operation. Voids may be filled with gravel.

During Construction:

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

9. If any sensitive feature (caves, solution cavities, sink holes, etc.) is discovered during construction, all regulated activities near the feature must be suspended immediately. The applicant or his agent must immediately notify the San Antonio Regional Office of the discovery of the feature. Regulated activities near the feature may not proceed until the executive director has reviewed and approved the methods proposed to protect the feature and the aquifer from potentially adverse impacts to water quality. The plan must be sealed, signed, and dated by a Texas Licensed Professional Engineer.

10. There are four wells reported to be located on this project site. All water wells, including injection, dewatering, and monitoring wells must be in compliance with the requirements of the Texas Department of Licensing and Regulation under Title 16 TAC Chapter 76 (relating to Water Well Drillers and Pump Installers) and all other locally applicable rules, as appropriate.

11. 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 of sensitive features by the next rain). Sediment must be removed from sediment traps or sedimentation ponds not later than when design capacity has been reduced by 50 percent. Litter, construction debris, and construction chemicals shall be prevented from becoming stormwater discharge pollutants.

12. 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.

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

After Completion of Construction:

14. 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. The regulated entity shall then be responsible for maintenance until

another entity assumes such obligations in writing or ownership is transferred. A copy of the transfer of responsibility must be filed with the executive director through San Antonio Regional Office within 30 days of the transfer. A copy of the transfer form (TCEQ-10263) is enclosed.

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

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

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

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

Sincerely,

Glenn Shankle
Executive Director
Texas Commission on Environmental Quality

GS/JKM/eg

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

cc: Mr. Alex Zertuche, P.E., Carter & Burgess, Inc.
Mr. Mike Etelamaki, P.E., City of New Braunfels
Mr. Tom Hornseth, P.E., Comal County
Ms. Velma Danielson, Edwards Aquifer Authority
TCEQ Central Records, Building F, MC 212

# SANITARY SEWAGE COLLECTION SYSTEM APPLICATION

RECEIVED
OCT 2 2 2008
COUNTY ENGINEER

**For**

# NEWCOMBE TENNIS RANCH SUBDIVISION

**Comal County, Texas**

**Submitted**
**June, 2008**

T 13
OCT 08 2008
SAN ANTONIO




| Submitted To: | Submitted By: |
|---|---|
| **Texas Commission on Environmental Quality**<br>Region 13 - San Antonio<br>14250 Judson Road<br>San Antonio, Texas 78233<br>210.490-3096<br>Fax 210.545-4329 | **Carter & Burgess, Inc.**<br>911 Central Parkway North, Suite 425<br>San Antonio, Texas 78232<br>210.494-0088<br>Fax 210.494-4525 |

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

REGULATED ENTITY NAME: **Newcombe Tennis Ranch Subdivision**

COUNTY: **Comal County** STREAM BASIN: **Blieders Creek, Dry Comal Creek tributary**

EDWARDS AQUIFER: X RECHARGE ZONE
__ TRANSITION ZONE

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

**CUSTOMER INFORMATION**

1. Customer (Applicant):

Contact Person: **Jeremy Fieldsend**
Entity: **Newcombe Development L.L.C.**
Mailing Address: **325 Mission Valley Road**
City, State: **New Braunfels, TX.** Zip: **78132**
Telephone: **(830)625-9105** FAX: **(830)625-2004**

Agent/Representative (If any):

Contact Person: **Alex Zertuche, P.E. or David McBeth, P.E.**
Entity: **Carter & Burgess, Inc.**
Mailing Address: **911 Central Parkway North, Suite 425**
City, State: **San Antonio, TX.** Zip: **78232**
Telephone: **(210)494-0088** FAX: **(210)494-4525**

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

3. The location of the project site is described below. The description provides sufficient detail and clarity so that the TCEQ's Regional staff can easily locate the project and site boundaries for a field investigation.
**Newcombe Tennis Ranch Subdivision is located on Mission Valley Road approximately 0.5 miles southwest of the intersection with State Highway 46.**

4. x **ATTACHMENT A - ROAD MAP**. A road map showing directions to and the location of the project site is attached at the end of this form.
5. x **ATTACHMENT B - USGS / EDWARDS RECHARGE ZONE MAP**. A copy of the official 7 ½ minute USGS Quadrangle Map (Scale: 1" = 2000') of the Edwards Recharge Zone is

attached behind this sheet. The map(s) should clearly show:

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

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

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

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

**PROHIBITED ACTIVITIES**

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

(1) waste disposal wells regulated under 30 TAC Chapter 331 of this title (relating to Underground Injection Control);
(2) new feedlot/concentrated animal feeding operations, as defined in 30 TAC §213.3;
(3) land disposal of Class I wastes, as defined in 30 TAC §335.1;
(4) the use of sewage holding tanks as parts of organized collection systems; and
(5) new municipal solid waste landfill facilities required to meet and comply with Type I standards which are defined in §330.41(b), (c), and (d) of this title (relating to Types of Municipal Solid Waste Facilities).

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

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

**ADMINISTRATIVE INFORMATION**

11. The fee for the plan(s) is based on:

__ For a Water Pollution Abatement Plan and Modifications, the total acreage of the site

where regulated activities will occur.

X For an Organized Sewage Collection System Plans and Modifications, the total linear footage of all collection system lines.

__ For a UST Facility Plan or an AST Facility Plan, the total number of tanks or piping systems.

__ A Contributing Zone Plan.

__ A request for an exception to any substantive portion of the regulations related to the protection of water quality.

__ A request for an extension to a previously approved plan.

12. Application fees are due and payable at the time the application is filed. If the correct fee is not submitted, the TCEQ is not required to consider the application until the correct fee is submitted. Both the fee and the Edwards Aquifer Fee Form have been sent to the Commission's:

__ TCEQ cashier

__ Austin Regional Office (for projects in Hays, Travis, and Williamson Counties)

X San Antonio Regional Office (for projects in Bexar, Comal, Kinney, Medina, and Uvalde Counties)

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

14. X No person shall commence any regulated activity until the Edwards Aquifer Protection Plan(s) for the activity has been filed with and approved by the executive director.

__ No person shall commence any regulated activity until the Contributing Zone Plan for the activity has been filed with the executive director.

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

**David McBeth, P.E.**

Print Name of Customer/Agent



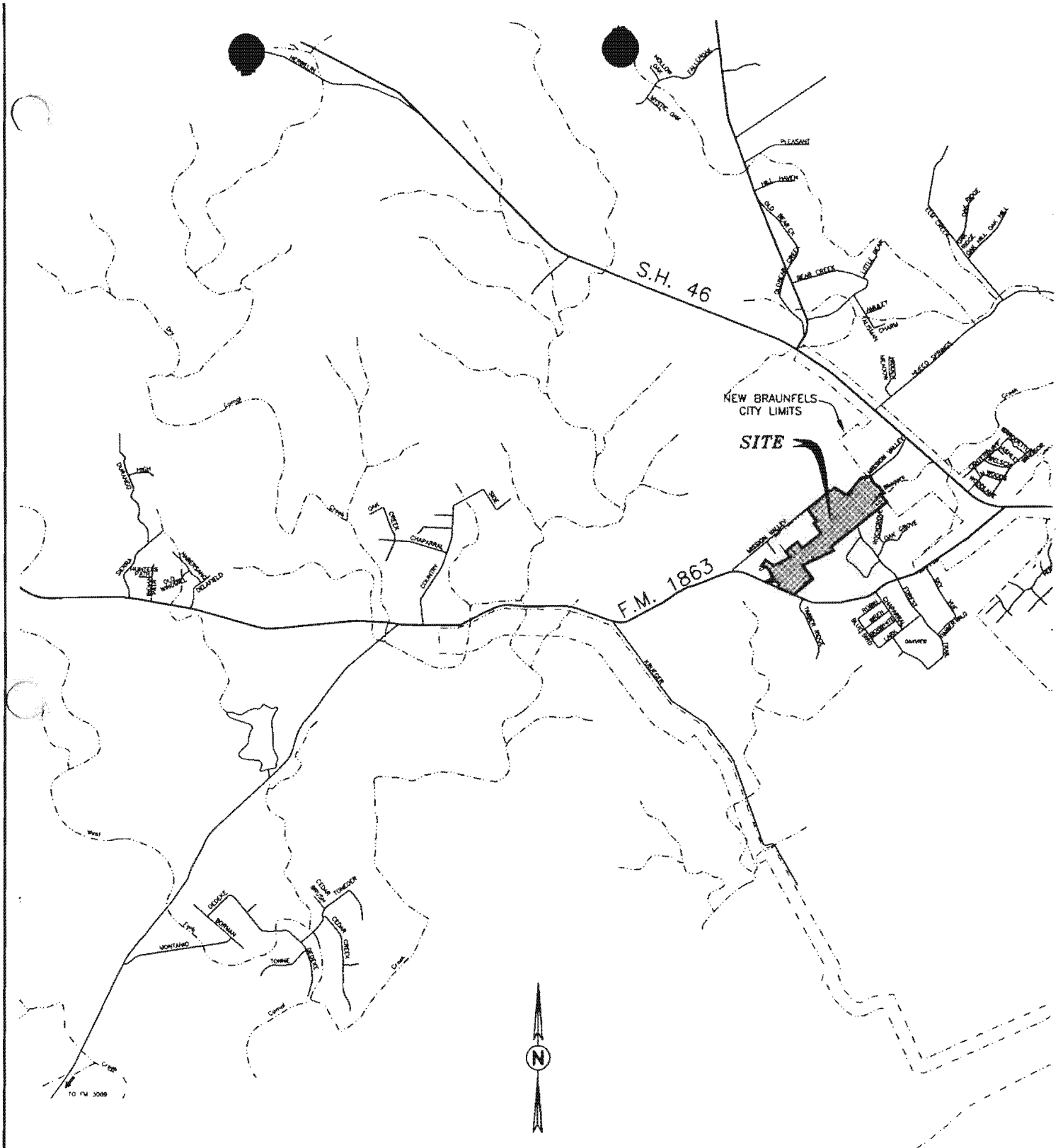
Signature of Customer/Agent

6/4/08

Date

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

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




SCALE: 1" = 1 MILE

**Carter :: Burgess**

**Consultants in Engineering, Architecture, Construction Management and Related Services**
**Carter and Burgess, Inc.**

911 Central Parkway North, Suite 425
San Antonio, Texas 78232
(210) 494-0068 Fax (210) 494-4525

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# ATTACHMENT "A"
## NEWCOMBE TENNIS RANCH SUB'D.
## 160 ACRES SOUTH OF MISSION VALLEY RD.

DRAWN BY: JR CHECKED BY: A.Z.

DATE: 12/14/07 PROJECT NO.: 310590.012

SHEET 1 OF 1

UNITED STATES
DEPARTMENT OF THE INTERIOR
GEOLOGICAL SURVEY

# NEW BRAUNFELS WEST QUADRANGLE
TEXAS
7.5 MINUTE SERIES (TOPOGRAPHIC)

SITE

RECHARGE ZONE

TRANSITION ZONE

NEW BRAUNFELS

Produced by the United States Geological Survey
Revised in cooperation with the Texas Water Development Board
Control by USGS, NOS/NOAA, and USCE

Compiled by the Army Map Service by photogrammetric methods from aerial photographs taken 1956. Field checked 1958
Revised from aerial photographs taken 1986. Field checked 1987
Map edited 1988

Projection and 10,000-foot grid ticks: Texas coordinate system, south central zone (Lambert conformal conic)
1000-meter Universal Transverse Mercator grid, zone 14
1927 North American Datum
To place on the predicted North American Datum 1983 move the projection lines 20 meters south and 28 meters east as shown by dashed corner ticks

Fine red dashed lines indicate selected fence and field lines generally visible on aerial photographs. This information is unchecked

Gray tint indicates area in which only landmark buildings are shown

UTM GRID AND 1988 MAGNETIC NORTH DECLINATION AT CENTER OF MAP
DIAGRAM IS APPROXIMATE

SCALE 1:24 000

CONTOUR INTERVAL 10 FEET
NATIONAL GEODETIC VERTICAL DATUM OF 1929

THIS MAP COMPLIES WITH NATIONAL MAP ACCURACY STANDARDS
FOR SALE BY U.S. GEOLOGICAL SURVEY, DENVER, COLORADO 80225, OR RESTON, VIRGINIA 22092
A FOLDER DESCRIBING TOPOGRAPHIC MAPS AND SYMBOLS IS AVAILABLE ON REQUEST

QUADRANGLE LOCATION

2998-413

ROAD CLASSIFICATION

Primary highway, hard surface — Light-duty road, hard or improved surface
Secondary highway, hard surface — Unimproved road
Interstate Route · U. S. Route · State Route

**NEW BRAUNFELS WEST, TEX.**
29098-F2-TF-024
**1988**
DMA 6343 II NW–SERIES V822

© INTERIOR-GEOLOGICAL SURVEY, RESTON, VIRGINIA—1988

# Official Edwards Aquifer Recharge Zone Map
## 31 Texas Administrative Code Chapter 313
## Subchapter A—San Antonio Region

UNITED STATES
DEPARTMENT OF THE INTERIOR
GEOLOGICAL SURVEY

NEW BRAUNFELS EAST QUADRANGLE
TEXAS
7.5 MINUTE SERIES (TOPOGRAPHIC)

RECHARGE ZONE

TRANSITION ZONE

NEW BRAUNFELS

NEW BRAUNFELS MUNICIPAL AIRPORT

Mapped by the Army Map Service
Published for civil use by the Geological Survey

Control by USGS, NOS/NOAA, and USCE

Topography from aerial photographs by photogrammetric methods
Aerial photographs taken 1956. Field check 1958

Polyconic projection. 1927 North American datum
10,000-foot grid based on Texas coordinate system, south central zone
1000-metre Universal Transverse Mercator grid ticks, zone 14, shown in blue

Revisions shown in purple compiled by the Geological Survey from aerial photographs taken 1973. This information not field checked

Purple tint indicates extension of urban areas

UTM GRID AND 1973 MAGNETIC NORTH DECLINATION AT CENTER OF SHEET

SCALE 1:24 000

CONTOUR INTERVAL 10 FEET
DASHED LINES REPRESENT 5-FOOT CONTOURS
NATIONAL GEODETIC VERTICAL DATUM OF 1929

THIS MAP COMPLIES WITH NATIONAL MAP ACCURACY STANDARDS
FOR SALE BY U. S. GEOLOGICAL SURVEY, DENVER, COLORADO 80225, OR RESTON, VIRGINIA 22092
A FOLDER DESCRIBING TOPOGRAPHIC MAPS AND SYMBOLS IS AVAILABLE ON REQUEST

ROAD CLASSIFICATION

Primary highway, hard surface — Light-duty road, hard or improved surface
Secondary highway, hard surface — Unimproved road
Interstate Route — U. S. Route — State Route

QUADRANGLE LOCATION

2998-414

NEW BRAUNFELS EAST, TEX.

N2937.5—W9800/7.5

1958
PHOTOREVISED 1973
AMS 6343 II NE SERIES V882

26

# ATTACHMENT "C"

## Project Description

Newcombe Tennis Ranch Subdivision – 160 Acres South of Mission Valley Rd. is located on Mission Valley Road, approximately 0.5 miles southwest of the intersection with State Highway 46. The closest major intersection is State Highway 46 and F.M 1863, approximately 0.9 miles southeast from the intersection of Mission Valley Road and State Highway 46. The subdivision consists of 158.61 acres located on the south side of Mission Valley Road. The Master Plan for this subdivision has been approved by the city of New Braunfels. This site is bound on the south by F.M. 1863, approximately 1.8 miles southwest of the intersection of State Highway 46 and FM 1863. (See location map). This site is unimproved land, primarily composed of open fields, dense brush and trees, with grass and rock outcroppings. Approximately 47 acres of the site's runoff flows west towards an unnamed tributary of Dry Comal Creek, and the remainder flows east towards Blieders Creek. According to the flood insurance rate map No. 48091C0430F provided by the Comal County Engineering Office, there is no existing floodplain located within the property.

The proposed land use will consist of the following:

72 Estate single family lots with typical lots size of 33,000 - 48,000 sq. ft.

49 Conventional single family lots with lots size of 15,000 sq. ft.

36 Cottage/Garden single family lots with lot size of 8500 sq. ft.

Tennis Amenity Facility – Approximately 12 Acres (See Section 2: Attachment "E")

Parks/Green space – Approximately 21.3 Acres

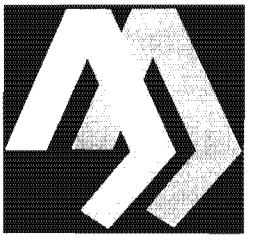
All subdivision residents will have a membership to the Tennis Amenity Facility as part of the homeowner's association requirements. The proposed tennis courts will be available to each resident, and to a very limited and exclusive small outside membership. The casitas included in the facility will be used to provide lodging for touring pros that are training or providing specialized lessons at the facility.

The subdivision infrastructure will include a water system, sewer system, electricity, telephone, cable television, and approximately 17,460 L.F. of roadway. Sewer and water service for the development will be provided by the New Braunfels Utilities. There will not be any on-site water wells or private sanitary sewer facilities. The ultimate development impervious cover for the 158.61 acres will be approximately 19.7%.

# GEOLOGIC ASSESSMENT

For:

**Water Pollution Abatement Plan**
**Newcombe Tennis Ranch Subdivision**
**160 Acres South of Mission Valley Road**
**Comal County, Texas**



ARIAS & ASSOCIATES

Geotechnical • Environmental • Testing

Prepared for:

**Mr. Jeff Moeller, P.E.**
**Carter Burgess, Inc.**
**911 Central Parkway North, Suite 425**
**San Antonio, TX 78232-5052**

**Arias Project Number 07SA-4105**
**December 2007**

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

REGULATED ENTITY NAME: **NEWCOMBE TENNIS RANCH SUBDIVISION 160 ACRES SOUTH OF MISSION VALLEY ROAD**

TYPE OF PROJECT: ___ WPAP ___ AST **X** SCS ___ UST

LOCATION OF PROJECT: **X** Recharge Zone ___ Transition Zone ___ Contributing Zone within the Transition Zone

PROJECT INFORMATION

1. **X** Geologic or manmade features are described and evaluated using the attached **GEOLOGIC ASSESSMENT TABLE**.

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

| Soil Units, Infiltration Characteristics & Thickness | | |
|---|---|---|
| Soil Name | Group* | Thickness (feet) |
| Comfort –Rock outcrop complex, 1-8% slopes (CrD) | D | 0-1.5 |
| Krum Clay, 1-3% slopes (KrB) | D | 0-2.8 |
| Medlin-Eckrant association, 1-8% slopes (MEC) | D | 0-6.0 |
| Medlin-Eckrant association, 8 to 30% slopes (MED) | D | 0-5.0 |
| Rumple-Comfort association, 1-8% slopes (RUD) | D | 0-2.0 |
| Purves clay, 1-5% slopes (PuC) | D | 0-3.75 |

* Soil Group Definitions (Abbreviated)

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

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

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

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

3. **X** A **STRATIGRAPHIC COLUMN** is attached at the end of this form that shows formations, members, and thicknesses. The outcropping unit should be at the top of the stratigraphic column.

4. **X** A **NARRATIVE DESCRIPTION OF SITE SPECIFIC GEOLOGY** is attached at the end of this form. The description must include a discussion of the potential for fluid movement to the Edwards Aquifer, stratigraphy, structure, and karst characteristics of the site.

5. **X** Appropriate **SITE GEOLOGIC MAP(S)** are attached:

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

| | |
|---|---|
| Applicant's Site Plan Scale | 1" = 100' |
| Site Geologic Map Scale | 1" = 100' |
| Site Soils Map Scale (if more than 1 soil type) | 1" = 1000' |

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

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

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

9. X Geologic or manmade features were discovered on the project site during the field investigation. They are shown and labeled on the Site Geologic Map and are described in the attached Geologic Assessment Table.
   __ Geologic or manmade features were not discovered on the project site during the field investigation.

10. X The Recharge Zone boundary is shown and labeled, if appropriate.

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

   X There are 4 (#) wells present on the project site and the locations are shown and labeled. (Check all of the following that apply.)
      __ The wells are not in use and have been properly abandoned.
      X The wells are not in use and will be properly abandoned.
      __ The wells are in use and comply with 16 TAC Chapter 76.
   __ There are no wells or test holes of any kind known to exist on the project site.

ADMINISTRATIVE INFORMATION

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

Date(s) Geologic Assessment was performed:

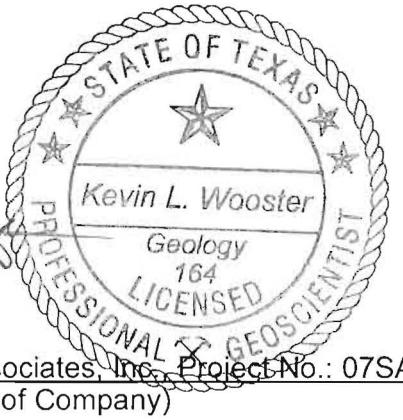
Date(s) July 23, 2007

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

Kevin L. Wooster, P.G.
Print Name of Geologist

Telephone 210-308-5884

Fax 210-308-8731




Signature of Geologist

December 10, 2007
Date

Representing: Arias & Associates, Inc. Project No.: 07SA-4105
(Name of Company)

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

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

## GEOLOGIC ASSESSMENT TABLE

**PROJECT NAME:** Newcombe Tennis Ranch Subdivision - 160 Acres South of Mission Valley Road

| LOCATION | | | | | | | FEATURE CHARACTERISTICS | | | | | | | | | | | | EVALUATION | | | PHYSICAL SETTING | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 1A | 1B * | | | 1C* | | | 2A | 2B | 3 | 4 | | | 5 | 5A | 6 | 7 | 8A | 8B | 9 | 10 | | 11 | | 12 |
| FEATURE ID | LATITUDE | | | LONGITUDE | | | FEATURE TYPE | POINTS | FORMATION | DIMENSIONS (FEET) | | | TREND (DEGREES) | DOM | DENSITY (NO/FT) | APERTURE (FEET) | INFILL | RELATIVE INFILTRATION RATE | TOTAL | SENSITIVITY | | CATCHMENT AREA (ACRES) | | TOPOGRAPHY |
| | Degrees | Minutes | Dec. secs | Degrees | Minutes | Dec. Sec. | | | | X | Y | Z | | 10 | | | | | | <40 | >40 | <1.6 | >1.6 | |
| S-1 | 29 | 43 | 25.6 | 98 | 11 | 39.2 | CD | 5 | Kep | 2.5 | 2.0 | 0.5 | | | | | O,F | 5 | 10 | X | | X | | Hillside |
| S-2 | 29 | 43 | 24.2 | 98 | 11 | 47.8 | MB | 30 | Kep | water well | | | | | | | F | 5 | 35 | X | | X | | Hillside |
| S-3 | 29 | 43 | 14.9 | 98 | 11 | 48.2 | SF | 20 | Kep | 150 | 3.5 | 2.0 | N38E | 10 | | | O, F | 9 | 39 | X | | X | | Hillside |
| S-4 | 29 | 43 | 19.4 | 98 | 11 | 50.3 | MB | 30 | Kep | 10 | 6 | 2.0 | | septic pit | | | F/C | 9 | 39 | X | | X | | Hillside |
| S-5 | 29 | 43 | 13.8 | 98 | 11 | 49.8 | C | 30 | Kep | 19 | 16 | 12 | N35E | 10 | | | N | 30 | 70 | | X | X | | Hilltop |
| | same cave, different opening | | | | | | C | | | 4.0 | 2.0 | 4.0 | | | | | N, F | | | | | | | |
| S-6 | 29 | 43 | 17.4 | 98 | 11 | 54 | CD | 5 | Kgt | 10 | 6.0 | 0.5 | | | | | O, F, C | 9 | 14 | X | | | X | Drainage |
| S-7 | 29 | 43 | 17.5 | 98 | 11 | 54.7 | CD | 5 | Kgt | 8.0 | 4.0 | 1.0 | | | | | O, F, C | 9 | 14 | X | | | X | Drainage |
| S-8 | 29 | 43 | 17.2 | 98 | 11 | 55.2 | CD | 5 | Kgt | 15 | 15 | 2.0 | | | | | O, F, C | 9 | 14 | X | | | X | Drainage |
| S-9 | 29 | 43 | 19.6 | 98 | 11 | 54.8 | CD | 5 | Kdr | 40 | 15 | 1.0 | | | | | F | 5 | 10 | X | | X | | Hillside |
| S-10 | 29 | 43 | 24.08 | 98 | 11 | 55.3 | CD | 5 | Kdr | 160 | 90 | 5.0 | | | | | F | 5 | 10 | X | | X | | Hillside |
| S-11 | 29 | 43 | 15.1 | 98 | 11 | 59.8 | CD | 5 | Kdr | 180 | 170 | 8.0 | | | | | F | 5 | 10 | X | | X | | Hillside |
| S-12A | 29 | 43 | 15.6 | 98 | 12 | 3.4 | MB | 30 | Kbu | water well | | | | | | | F | 5 | 35 | X | | X | | Hilltop |
| S-12B | 29 | 43 | 15.6 | 98 | 12 | 3.4 | MB | 30 | Kbu | abandoned water well | | | | | | | N | 10 | 40 | | X | X | | Hilltop |
| S-13 | 29 | 42 | 56.5 | 98 | 12 | 15.8 | CD | 5 | Kdr | 230 | 180 | 9.0 | | | | | F, C | 5 | 10 | X | | X | | Hillside |
| S-14 | 29 | 43 | 23.4 | 98 | 11 | 51.9 | F | 20 | Kdr/Kep | >5500 | | | N38E | 10 | | | F, C | 9 | 39 | X | | | X | Variable |
| S-15 | 29 | 42 | 54.1 | 98 | 12 | 23.1 | MB | 30 | Kdr | abandoned water well | | | | | | | N | 10 | 40 | | X | X | | Hillside |
| S-16 | 29 | 43 | 27.7 | 98 | 11 | 26.6 | MB | 30 | Kep | existing sewer manhole | | | | | | | F | 5 | 35 | X | | X | | Streambed |

* DATUM: NAD 83

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

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

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

I have read, I understood, and I have followed the Texas Commission on Environmental Quality's Instructions to Geologists. The information presented here complies with that document and is a true representation of the conditions observed in the field.

My signature certifies that I am qualified as a geologist as defined by 30 TAC Chapter 213.

Date: December 10, 2007

Sheet 1 of 1

STATE OF TEXAS
Kevin L. Wooster
Geology
164
LICENSED
PROFESSIONAL GEOSCIENTIST

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

WITHIN SCS ENVELOPE

# FEATURE GPS TABLE

Water Pollution Abatement Plan
Newcombe Tennis Ranch Subdivision
160 Acres South of Mission Valley Road
Comal County, Texas

| | Latitude | | | Longitude | | | | | |
|---|---|---|---|---|---|---|---|---|---|
| Feature No. | Deg | Min | Sec | Deg | Min | Sec | Type | Date | Measured By |
| S-1 | 29 | 43 | 25.6 | 98 | 11 | 39.2 | CD | 7/23/07 | J. Kniffen |
| S-2 | 29 | 43 | 24.2 | 98 | 11 | 47.8 | MB (well) | 7/23/07 | J. Kniffen |
| S-3 | 29 | 43 | 14.9 | 98 | 11 | 48.2 | SF | 7/23/07 | J. Martinez |
| S-4 | 29 | 43 | 19.4 | 98 | 11 | 50.3 | MB (pit) | 7/23/07 | J. Kniffen |
| S-5 | 29 | 43 | 13.8 | 98 | 11 | 49.8 | C | 7/23/07 | J.Martinez |
| | | | | same cave, different opening | | | C | 7/23/07 | J.Martinez |
| S-6 | 29 | 43 | 17.4 | 98 | 11 | 54 | CD | 7/23/07 | J.Martinez |
| S-7 | 29 | 43 | 17.5 | 98 | 11 | 54.7 | CD | 7/23/07 | K.Wooster |
| S-8 | 29 | 43 | 17.2 | 98 | 11 | 55.2 | CD | 7/23/07 | K.Wooster |
| S-9 | 29 | 43 | 19.6 | 98 | 11 | 54.8 | CD | 7/23/07 | J. Martinez |
| S-10 | 29 | 43 | 24.08 | 98 | 11 | 55.3 | CD | 7/23/07 | K.Wooster |
| S-11 | 29 | 43 | 15.1 | 98 | 11 | 59.8 | CD | 7/24/07 | K.Wooster |
| S-12A | 29 | 43 | 15.6 | 98 | 12 | 3.4 | MB (Well) | 7/24/07 | J. Kniffen |
| S-12B | 29 | 43 | 15.6 | 98 | 12 | 3.4 | MB (Well) | 7/24/07 | J. Kniffen |
| S-13 | 29 | 42 | 56.5 | 98 | 12 | 15.8 | CD | 7/24/07 | J. Kniffen |
| S-14 | 29 | 43 | 23.4 | 98 | 11 | 51.9 | F | 7/24/07 | K.Wooster |
| S-15 | 29 | 42 | 54.1 | 98 | 12 | 23.1 | MB (Well) | 12/4/07 | K.Wooster |
| S-16 | 29 | 43 | 27.7 | 98 | 11 | 26.6 | MB | 5/2/08 | K.Wooster |

# SOIL NARRATIVE

## Water Pollution Abatement Plan
## Newcombe Tennis Ranch Subdivision
## 160 Acres South of Mission Valley Road
## Comal County, Texas

In accordance with the U.S.D.A. Soil Survey of Comal and Hays Counties, Texas, dated 1984, the natural surface soils have been mapped as within six primary soil groups.

The Comfort – Rock outcrop complex, 1-8% slopes (CrD) soils are mapped to cover the north central and east portions of the property and are classified as extremely stony clay. The CrD soils are very shallow over hard limestone. These soils consist of dark gray clay grading down into brown clay, having a very slow infiltration rate when thoroughly wetted.

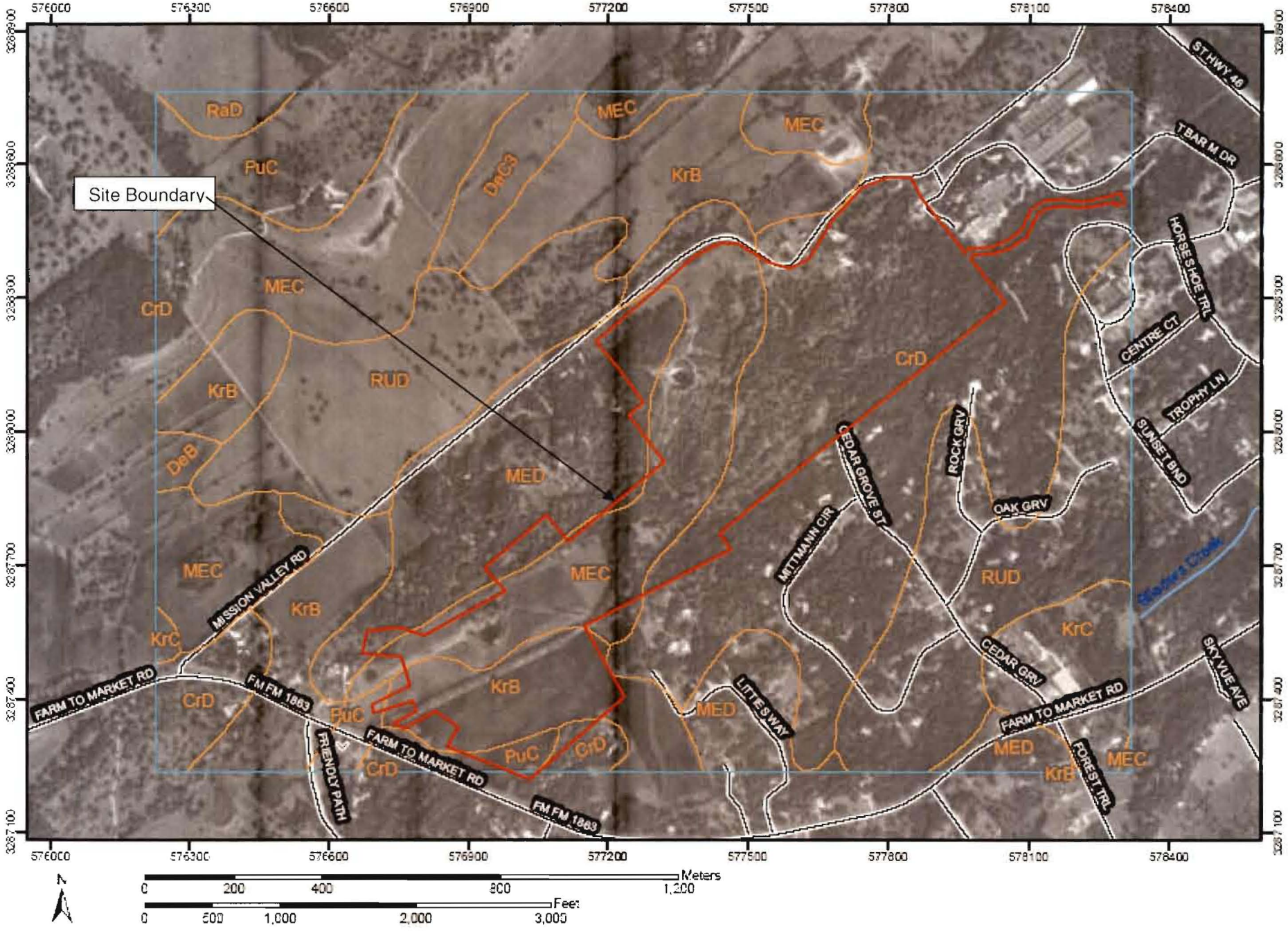
The Krum clay, 1-3% slopes (KrB) soils are mapped to cover portions of the northwestern and southwestern portions of the property and are classified as silty clay. The KrB soils are moderately deep over marine clays. These soils consist of clay grading down into silty clay, having a very slow infiltration rate when thoroughly wetted.

The Medlin – Eckrant association, 1-8% slopes (MEC) soils are mapped to cover large portions of the central and southwestern portions of the property and are classified as silty clay. The MEC soils are very shallow over hard limestone. These soils consist of clay grading down into silty clay, having a very slow infiltration rate when thoroughly wetted.

The Medlin – Eckrant association, 8-30% slopes (MED) soils are mapped to cover very small portions of the southwestern project area and are classified as silty clay. The MED soils are very shallow over hard limestone. These soils consist of clay grading down into silty clay, having a very slow infiltration rate when thoroughly wetted.

The Rumple-Comfort association, 1-8% slopes (RUD) soils are mapped in the northwest portion of the Site north of Mission Valley Road and are classified as very gravelly clay and very stony clay. These soils consist of gravelly clay grading down into stony clay, having a very slow infiltration rate when thoroughly wetted.

The Purves clay, 1-5% slopes (PuC) soils are mapped to cover a small portion of the far southwestern edge of the property and are classified as silty clay. The PuC soils are moderately deep over marine clays. These soils consist of clay grading down into silty clay, having a very slow infiltration rate when thoroughly wetted.


576000
576300
576600
576900
577200
577500
577800
578100
578400
3288900
3288600
3288300
3288000
3287700
3287400
3287100
Site Boundary
RaD
PuC
DeC3
MEC
KrB
CrD
RUD
DeB
KrC
ST HWY 46
T BAR M DR
HORSESHOE TRL
CENTRE CT
TROPHY LN
SUNSET BND
ROCK GRV
CEDAR GROVE ST
OAK GRV
MITTMANN CIR
CEDAR GRV
SKY VUE AVE
LITTLE S WAY
FOREST TRL
MISSION VALLEY RD
FARM TO MARKET RD
FM FM 1863
FRIENDLY PATH
Meters
0
200
400
800
1,200
Feet
0
600
1,000
2,000
3,000
N

## MAP LEGEND

**Area of Interest (AOI)**
- Area of Interest (AOI)

**Soils**
- Soil Map Units

**Special Point Features**
- Blowout
- Borrow Pit
- Clay Spot
- Closed Depression
- Gravel Pit
- Gravelly Spot
- Landfill
- Lava Flow
- Marsh
- Mine or Quarry
- Miscellaneous Water
- Perennial Water
- Rock Outcrop
- Saline Spot
- Sandy Spot
- Severely Eroded Spot
- Sinkhole
- Slide or Slip
- Sodic Spot
- Spoil Area
- Stony Spot
- Very Stony Spot
- Wet Spot
- Other

**Special Line Features**
- Gully
- Short Steep Slope
- Other

**Political Features**

**Municipalities**
- Cities
- Urban Areas

**Water Features**
- Oceans
- Streams and Canals

**Transportation**
- Rails

**Roads**
- Interstate Highways
- US Routes
- State Highways
- Local Roads
- Other Roads

## MAP INFORMATION

Original soil survey map sheets were prepared at publication scale. Viewing scale and printing scale, however, may vary from the original. Please rely on the bar scale on each map sheet for proper map measurements.

Source of Map: Natural Resources Conservation Service
Web Soil Survey URL: http://websoilsurvey.nrcs.usda.gov
Coordinate System: UTM Zone 14N

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

Soil Survey Area: Comal and Hays Counties, Texas
Survey Area Data: Version 5, Jan 3, 2007

Date(s) aerial images were photographed: 1995

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

# Map Unit Legend

| Comal and Hays Counties, Texas (TX604) | | | |
|---|---|---|---|
| Map Unit Symbol | Map Unit Name | Acres in AOI | Percent of AOI |
| CrD | Comfort-Rock outcrop complex, 1 to 8 percent slopes | 231.5 | 28.1% |
| DeB | Denton silty clay, 1 to 3 percent slopes | 3.4 | 0.4% |
| DeC3 | Denton silty clay, 1 to 5 percent slopes, eroded | 13.6 | 1.7% |
| KrB | Krum clay, 1 to 3 percent slopes | 116.1 | 14.1% |
| KrC | Krum clay, 3 to 5 percent slopes | 25.8 | 3.1% |
| MEC | Medlin-Eckrant association, 1 to 8 percent slopes | 156.1 | 19.0% |
| MED | Medlin-Eckrant association, 8 to 30 percent slopes | 92.7 | 11.3% |
| PuC | Purves clay, 1 to 5 percent slopes | 37.0 | 4.5% |
| RaD | Real gravelly loam, 1 to 8 percent slopes | 5.3 | 0.6% |
| RUD | Rumple-Comfort association, 1 to 8 percent slopes | 142.1 | 17.2% |
| Totals for Area of Interest (AOI) | | 823.7 | 100.0% |

# Water Pollution Abatement Plan
# Newcombe Tennis Ranch Subdivision
# 160 Acres South of Mission Valley Road
# Comal County, Texas

## STRATIGRAPHIC COLUMN

| Hydrogeologic subdivision | | | Group formation or member | | | Hydro-logic fuction | Thick-ness (feet) | Lithology | Cavern develop-ment | Porosity / permeability type |
|---|---|---|---|---|---|---|---|---|---|---|
| Quaternary | | | Terrace Deposits | | | CU | 0-30 | Gravel and sand | None | High porosity / high permeability |
| Upper Cretaceous | Upper Confining Unit | | Austin Group | | | CU | 130-150 | White to gray limestone | None | Low porosity / low permeability |
| | | | Eagle Ford Group | | | CU | 30-50 | Buff, light gray, dense mudstone | None | Low porosity / low permeability |
| | | | Buda Limestone | | | CU | 40-50 | Brown flaggy shale and argillaceous limestone | None | Low porosity / low permeability |
| | | | Del Rio Clay | | | CU | 40-50 | Blue-green to yellow-brown clay | None | None / primary upper confining unit |
| Lower Cretaceous | I | Edwards aquifer | Georgetown Formation | | | CU | 10 | Reddish-brown, gray to light tan marly limestone | None | Low porosity / low permeability |
| | II | | Edwards Group | Person Fm. | Cyclic & marine members undivided | AQ | 80-100 | Mudstone to packstone; miliolid grainstone; chert | Many sub-surface | Laterally extensive; water yielding |
| | III | | | | Leached & col-lapsed members | AQ | 80-100 | Crystalline limestone; mudstone to grainstone; chert collapsed breccia | Extensive lateral devel-opment; large rooms | Majority not fabric / one of the most permeable |
| | IV | | | | Regional dense member | CU | 20-24 | Dense, argillaceous mudstone | Very few; only vertical fracture enlargement | Not fabric / low permeability; vertical barrier |
| | V | | | Kainer Fm. | Grainstone member | AQ | 50-60 | Miliolid grainstone; mudstone to wackestone; chert | Few | Not fabric / recrystal-lization reduces permeability |
| | VI | | | | Kirschberg evaporite member | AQ | 50-60 | Highly altered crystalline limestone; chalky mudstone; chert | Probably extensive cave devel. | Majority fabric / one of the most permeable |
| | VII | | | | Dolomitic member | AQ | 110-130 | Mudstone to grainstone; crystaline limestone; chert | Caves rela-ted to struc-ture or bed-ding planes | Mostly not fabric; some bedding plane fabric / water-yielding |
| | VIII | | | | Basal nodular member | Karst AQ; not karst CU | 50-60 | Shaly, nodular limestone; mudstone and miliolid grainstone | Large lateral caves at surface | Fabric; stratigraph-ically controlled / large conduit flow at surface; no permea-bility in subsurface |
| | Lower confining unit | | Upper member of the Glen Rose Limestone | | | CU; evaporite beds AQ | 350-500 | Yellowish tan, thinly bedded limestone and marl | Some sur-face cave development | Some water product-ion at evaporite beds / relatively impermeable |

Reference: U.S.G.S. Geologic Framework and Hydrogeologic Characteristics of the Edwards Aquifer Outcrop, Comal County, Texas; Water-Resources Investigations Report 94-4117

Note: CU = Confining Unit; AQ = Aquifer

— — Indicates Upper Most Surface Bedrock Formation

# GEOLOGY NARRATIVE

Water Pollution Abatement Plan
Newcombe Tennis Ranch Subdivision
160 Acres South of Mission Valley Road
Comal County, Texas

The outcropping geologic formations mapped at the Site consist of the Cretaceous Georgetown Formation and Person Formation of the Edwards Group. These formations form the southeastern half of the central portion and eastern portion of the property. Buda Limestone caps several hilltops on the northern and western portions of the Site. The Del Rio clay outcrops over the majority of the western portion and north central portion of the Site adjacent to Mission Valley Road. The Georgetown formation appears on the central portion of the Site, and consists of a gray to reddish brown marly limestone.

The Person is observed to be the predominant outcropping recharge unit at the Site, and is composed of grainstone, crystalline limestone, mudstone and chert. The approximate locations of all features are indicated on the accompanying Site Geologic Map.

No structural features such as faults or fractures were noted in the reviewed literature sources, with the exception of one main fault crossing the central portion of the Site (Feature 14). This normal fault juxtaposes Del Rio clay to the northwest against Del Rio, Georgetown, and Person limestone to the southeast. Indications of this feature were observed on the Site through changes in lithology and vegetation. The dominant structural trend of this feature follows the general NE-SW regional trend of structure and faulting with the Balcones Fault Zone. Since faults with Del Rio Clay on the upthrown side have clay infilling along the fault, the fault scour zone of low permeability clay materials forms a barrier to downward flow, resulting in low probability of rapid infiltration. Based on the criteria shown in the Rapid Infiltration Probability flowchart of TCEQ-0585, this feature has a low infiltration rate.

One solution fracture (Feature 3) was observed in the central portion of the Site within Person limestone. The trend of this feature elongated and aligned with the regional structural trend. This feature's point value was adjusted upward with 10 points added for dominant trend. The entire length of the feature was uniformly infilled with fine grained sediment and had no openings to the subsurface. In our opinion, the overall sensitivity of the feature is low, with a low probability of rapid infiltration based on the fact that the feature is uniformly clay lined along its entire length and only has background infiltration occurring. Therefore, even with addition of 10 points for dominant trend, the infiltration point value of this feature should be adjusted downward from a 15 to a 9, to keep the feature's overall sensitivity low, due to the dominance of infilling. Based on the criteria shown in the Rapid Infiltration Probability flowchart of TCEQ-0585, the feature has a low infiltration rate.

Several karst type features were noted. One cave (Feature 5) was observed in the central portion of the Site within Person limestone. The trend of this feature elongated and aligned with the regional structural trend. The feature was open and extended to the subsurface through two openings separated by several feet. Based on the criteria shown in the Rapid Infiltration Probability flowchart of TCEQ-0585, the feature has a moderate infiltration rate with its hilltop location but is considered sensitive.

One man-made feature (Feature 4) was observed in the central portion of the Site within Person limestone. This feature was infilled at its floor with uniform fine-grained organic materials and contained some man-made debris, but was open to a depth of two feet. This feature bore some resemblance to a natural sinkhole, but, upon further investigation, appears to be a man-made excavation used historically as a septic pit. The floor of the feature, once exposed of debris and organic soil, was comprised of competent limestone with no solution features or openings at its floor. Its sidewalls appeared to be vertical and opposing sides were parallel, with squared corners, further suggesting an excavation. No trend was observed with this feature. This feature appears to have served only as a latrine, and no source of water was available, such that only small volumes of liquids were introduced. The feature had only organics and organic soils such that there is no evidence of sediments or soil from surrounding areas being transported into the feature. It does not appear capable of rapidly transmitting water into the subsurface relative to the surrounding formational materials. Based on the criteria shown in the Rapid Infiltration Probability flowchart of TCEQ-0585, the feature has a low infiltration rate.

Features 1, 6, 7, 8, and 9 are shallow closed depressions. Feature 1 is located on the base of a hillside adjacent to a drainage. Features 6, 7, 8, and 9 are located within drainages. These features are soil-floored and appear to be scour pools. No trends were observed with these features. Based on the criteria shown in the Rapid Infiltration Probability flowchart of TCEQ-0585, the features have a low infiltration rate.

Features 10, 11, and 13 are closed depressions that are dammed tanks within Del Rio Clay and have soil floors. No trends were observed with these features. Based on the criteria shown in the Rapid Infiltration Probability flowchart of TCEQ-0585, the features have a low infiltration rate.

Features S-2, S-12A, S-12B, and S-15 are man-made features, with S-2 and S-12A both existing water wells. Features S-12B and S-15 are both abandoned water wells with open casings that have above-ground stickups. No trends were observed with these features. Since S-12B and S-15 are open conduits without plugs or caps, they are considered sensitive until capped or plugged. Based on the criteria shown in the Rapid Infiltration Probability flowchart of TCEQ-0585, the two existing water wells (S-2 and S-12A) have a low infiltration rate. All four wells are to be plugged.

Feature S-16 is an existing sanitary sewer manhole along Blieders Creek, to the northeast of the site. It does not appear capable of rapidly transmitting water into the subsurface relative to the surrounding formational materials. Based on the criteria shown in the Rapid Infiltration Probability flowchart of TCEQ-0585, this feature has a low infiltration rate. No other features were indentified along the sewer alignment.

## REFERENCES


Barnes V.L. 1983, Geologic Atlas of Texas, San Antonio, Sheet, Bureau of Economic Geology, The University of Texas at Austin, Texas.

Collins, E.W., 1993. Geology of New Braunfels West Quadrangle, Comal County, Texas, Open File Map 2998-413. Bureau of Economic Geology, The University of Texas at Austin, Texas.

Small, T.A. and Hanson, J.A. 1994. Geologic Framework and Hydrogeologic Characteristics of the Edwards Aquifer Outcrop, Comal County, Texas. U.S. Geol. Survey, Water – Resources Investigations Report 94-4117. 8 pp., Plate, Fig., Table.

Texas Commission on Environmental Quality, (TCEQ), Instructions to Geologists for Geologic Assessments on the Edwards Aquifer Recharge Zone, TCEQ-0585-Instructions (Rev. 10-01-04).

United States Department of Agriculture. Soil Survey of Comal and Hays Counties, Texas. Web Soil Survey 1.1, Natural Resource Conservation Service. <http://websoilsurvey.nrcs.usda.gov/app/WebSoilSurvey.aspx> July, 2007.

United States Department of Agriculture. Urban Hydrology for Small Watersheds, Technical Release No. 55.,Appendix A. Natural Resource Conservation Service, <http://www.info.usda.gov/CED/ftp/CED/tr55.pdf > July, 1986.

United Stated Geologic Survey, 1988. New Braunfels West Quadrangle. USGS, Denver, Colorado.

# Site Geologic Map
# Newcombe Tennis Ranch Subdivision
# 160-Acres South of Mission Valley Road
# Comal County, Texas

A & A File No. 07SA-4105

ARIAS & ASSOCIATES, INC.

Sheet 2 of 2

STATE OF TEXAS
12/7/07
Kevin L. Wooster
Geology
164
LICENSED
PROFESSIONAL GEOSCIENTIST

GRAPHIC SCALE
50 0 50 100
1 inch = 100 ft.

MISSION VALLEY ROAD

S-10 CD

S-14 FAULT

U
D

Kdr

Kbu

Kep

S-9 CD

S-2 MB (WELL)

S-7 CD

S-6 CD

S-4 MB (SEPTIC PIT)

S-8 CD

S-1 CD

Kgt

S-5 CAVE

S-3 SF

S-16 MB

SEWER LINE ENVELOPE

Kep

Kep

**LEGEND:**

- Kbu = Buda Limestone
- Kdr = Del Rio Clay
- Kgt = Georgetown Formation
- Kep = Person Formation
- = Property Boundary
- CD = Closed Depression
- U/D = Fault
- SF = Solution Fracture
- SH = Sinkhole
- MB = Man Made Feature in Bedrock
- = Formation Contact

# Site Geologic Map
# Newcombe Tennis Ranch Subdivision
# 160-Acres South of Mission Valley Road
# Comal County, Texas

A & A File No. 07SA-4105

ARIAS & ASSOCIATES, INC.

Sheet 1 of 2

STATE OF TEXAS
Kevin L. Wooster
Geology
164
LICENSED
PROFESSIONAL GEOSCIENTIST
9/9/08

GRAPHIC SCALE
50 0 25 50 100
1 inch = 100 ft.

MISSION VALLEY ROAD

Kbu

Kbu

Kbu

Kdr

Kdr

Kdr

Kgt

Kep

S-15 MB (WELL)

S-13 CD

S-12B MB (WELL)

S-12A MB (WELL)

S-11X CD

SEWER LINE ENVELOPE

U
D

LEGEND:

- Kbu = Buda Limestone
- Kdr = Del Rio Clay
- Kgt = Georgetown Formation
- Kep = Person Formation
- = Property Boundary
- CD = Closed Depression
- U / D = Fault
- SF = Solution Fracture
- SH = Sinkhole
- MB = Man Made Feature in Bedrock
- = Formation Contact

**Sewage Collection System Application**
for Regulated Activities
on the Edwards Aquifer Recharge Zone
and Relating to 30 TAC §213.5(c), Effective June 1, 1999

REGULATED ENTITY NAME: **Newcombe Tennis Ranch Subdivision Unit 1**

__ **ATTACHMENT A - Sewage Collection System Submittal Application.** The Texas Commission on Environmental Quality 's (TCEQ) Sewage Collection System Submittal Application (TCEQ-10243) is provided as an aid in fulfilling the review requirements of 30 TAC Chapter 317 titled Design Criteria for Sewerage Systems, §317.1 and §317.2 is submitted with this Edwards Aquifer Sewage Collection System Application Form. Failure to complete all pertinent questions will result in the plan not being accepted or in possible delays in the review and approval of the project.

**CUSTOMER INFORMATION** (if different than customer information provided on core data form)

1. The entity and contact person responsible for providing the required engineering **certification** of testing for this sewage collection system upon completion (including private service connections) and every five years thereafter to the appropriate TCEQ region office pursuant to 30 TAC §213.5(c) is:

Contact Person: **Jeremy Fieldsend**
Entity: **Newcombe Development L.L.C.**
Mailing Address: **325 Mission Valley Road**
City, State: **New Braunfels, TX** Zip: **78132**
Telephone: **(830)625-9105** Fax: **(830)625-2004**

The appropriate regional office must be informed of any changes in this information within 30 days of the change.

2. The engineer responsible for the **design** of this sewage collection system is:

Contact Person: **David McBeth , P.E. (application) Alex Zertuche, P.E. (plans)**
Entity: **Carter & Burgess, Inc**
Mailing Address: **911 Central Parkway North, Ste 425**
City, State: **San Antonio, TX** Zip: **78232**
Telephone: **(210)494-0088** Fax: **(210)494-4525**

Texas Licensed Professional Engineer's Serial Number: **59223 & 92080**

**PROJECT DESCRIPTION**

3. Anticipated type of development to be served (estimated future population to be served, plus adequate allowance for institutional and commercial flows):

X Residential: # of single-family lots: **157**
__ Multi-family residential units: _____
__ Commercial
__ Industrial
__ Off-site system (not associated with any development)
__ Other: _____

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

| | |
|---|---|
| **100** % Domestic | **49,500** gallons/day |
| _____ % Industrial | ____ gallons/day |
| _____ % Commingled | ____ gallons/day |
| _____ Total | ____ gallons/day |

5. Existing and anticipated infiltration/inflow is 0 gallons/day. This will be addressed by No infiltration / inflow is anticipated.

6. A Water Pollution Abatement Plan (WPAP) is required for construction of any associated commercial, industrial or residential project located on the Recharge Zone.

_X_ The WPAP application for this development was approved by letter dated 12/28/07. A copy of the approval letter is attached at the end of this application.
__ The WPAP application for this development was submitted to the TCEQ on _____, but has not been approved.
__ A WPAP application is required for an associated project, but it has not been submitted.
__ There is no associated project requiring a WPAP application.

7. Pipe description:

| Pipe Diameter (Inches) | Linear Feet[1] | Pipe Material[2] | Specifications[3] |
|---|---|---|---|
| 8" | 12,265 | SDR 26 PVC | ASTM D 3034,3212 |
| 8" | 100 | SDR 26 PVC | ASTM D 2241 |
| | | | |
| | | | |
| Total Linear Feet | 12,365 | SDR 26 PVC | ASTM D 3034, 3212, 2241 |

1) Include stub-outs. Do not include private service laterals.
2) If PVC, state SDR value.
3) ASTM / ANSI / AWWA specification and class numbers should be included.

8. The following Wastewater Treatment Plant (WWTP) New Braunfels Utilities WWTP (name) will receive project wastewater for treatment and disposal. This WWTP is an **EXISTING**/PROPOSED (circle one) facility.

9. All components of this sewage collection system will comply with:

_X_ **New Braunfels Utilities** standard specifications.
__ Other. Specifications are provided directly behind this page.

10. _X_ No force main(s) and/or lift station(s) are associated with this sewage collection system.
__ A force main(s) and/or lift station(s) is associated with this sewage collection system and the Lift Station/Force Main System application is included with this application.

**CURVED SEWER LINES**

11. **ATTACHMENT B - Calculations for Minimum Radius of Curvature.** Curved sewer lines may use either JOINT DEFLECTION or PIPE FLEXURE METHOD, but not both. Indicate the method proposed. Calculations for the minimum radius of curvature are shown in **ATTACHMENT B**.

N/A__ Joint Deflection - The maximum allowable joint deflection is the lesser of the following three alternatives:

__ equal to 5°; or
__ 80% of the manufacturer's recommended maximum deflection; or
__ 80% of the appropriate ASTM, AWWA, ANSI or nationally-established standard for joint deflection.

N/A__ Pipe Flexure - The minimum radius of curvature has been computed by assuming standard lengths of straight pipe.

__ The standard length used in the calculations is the maximum length manufactured for the specific type of pipe to be installed.
__ A ___-foot length of pipe was used in the calculations. The specific type and length of the curved sections of line must be indicated on both the Plan and Profile views.
__ The curvature has been provided without rotation of the joint.

**MANHOLES AND CLEANOUTS**

12. Manholes or clean-outs exist at the end of each sewer line(s). These locations are listed below:

| Line | Shown on Sheet | Station | Manhole or Clean-out? |
|---|---|---|---|
| SSL-A | 35 Of 59 | 31+06.21 | MANHOLE |
| A service | 35 Of 59 | 2+27.15 | MANHOLE |
| SSL-B | 37 Of 59 | 15+65.37 | MANHOLE |
| SSL-C1 | 39 Of 59 | 12+94.75 | MANHOLE |
| SSL-C2 | 40 Of 59 | 12+15.45 | MANHOLE |
| SSL-D | 41 Of 59 | 9+28.78 | MANHOLE |
| SSL-E | 42 Of 59 | 5+19.84 | MANHOLE |
| SSL-F | 43 Of 59 | 7+95.10 | MANHOLE |
| SSL-G | 45 Of 59 | 16+24.67 | MANHOLE |
| SSL-H1 | 46 Of 59 | 5+26.59 | MANHOLE |
| SSL-H2 | 46 Of 59 | 5+24.62 | MANHOLE |
| SSL-J | 47 Of 59 | 3+87.75 | MANHOLE |
| SSL-K1 | 48 Of 59 | 2+89.32 | MANHOLE |
| SSL-K2 | 48 Of 59 | 5+38.61 | MANHOLE |

13. Deviations from uniform grade without manholes (e.g., grade breaks or vertical curves) will require specific approval.

_X_ There are no deviations from uniform grade in this sewage collection system without manholes.

__ **ATTACHMENT C - Justification for Deviation in Grade Without Manholes.** Justification for deviations from uniform grade in this sewage collection system without manholes is provided in **ATTACHMENT C** at the end of this form.

14. Deviations from straight alignment without manholes (i.e., horizontal curves) will require specific approval.

X__ There are no deviations from straight alignment in this sewage collection system without manholes.

__ **ATTACHMENT D - Justification for Deviation in Straight Alignment Without Manholes.** Justification for deviations from straight alignment in this sewage collection system without manholes is provided in **ATTACHMENT D** at the end of this form.

__ For curved sewer lines, all curved sewer line notes (F-0596) are included on the construction plans for the wastewater collection system.

15. _N/A_ Manholes are installed at all Points of Curve (PC) and Points of Tangent (PT) of a sewer line.

__ **ATTACHMENT E - Request for Variance from Design Criteria.** A request for a variance from this design criteria may be granted by the executive director if detailed engineering justification is provided showing that it will not result in an unreasonable risk to the Edwards Aquifer. Written justification for the variance request is provided in **ATTACHMENT E** at the end of this form. A letter of approval from the maintenance entity is acceptable as justification.

16. _X_ The maximum spacing between manholes on this project for each pipe diameter is no greater than:

| Pipe Diameter (inches) | Max. Manhole Spacing (feet) |
|---|---|
| 6 - 15 | 500 |
| 16 - 30 | 800 |
| 36 - 48 | 1000 |
| ≥54 | 2000 |

__ The maximum spacing between manholes on this project (for each pipe diameter used) is greater than listed in the table above. Justification for any variance from the maximum spacing must include a letter from the entity which will operate and maintain the system stating that it has the capability to maintain lines with manhole spacing greater than the allowed spacing.

17. __ All manholes will be monolithic, cast-in-place concrete.

_X_ The owner/developer of this project is requesting the use of pre-cast manholes. The manufacturer's specifications and construction drawing, showing the method of sealing the joints, are attached.

**SITE PLAN**

**Items 18 through 23 must be included on the Site Plan.**

18. The Site Plan must have a minimum scale of 1" = 400'.
Site Plan Scale: 1" = _100___'.

19. The Site Plan must include the sewage collection system general layout, including manholes with station numbers, and sewer pipe stubouts (if any). Site plan must be overlain by topographic contour lines, using a contour interval of not greater than ten feet and showing the area within both the five-year floodplain and the 100-year floodplain of any drainage way.

20. Lateral stub-outs:

_X_ The location of all lateral stub-outs are shown and labeled.
__ No lateral stub-outs will be installed during the construction of this sewer collection system.

21. Location of existing and proposed water lines:

_X_ The entire water distribution system for this project is shown and labeled.
__ If not shown on the Site Plan, a Utility Plan is provided showing the entire water and sewer systems.
__ There will be no water lines associated with this project.

22. 100-year floodplain:

_X_ After construction is complete, no part of this project will be in or cross a 100-year floodplain, either naturally occurring or manmade. (Do not include streets or concrete-lined channels constructed above of sewer lines.)
__ After construction is complete, all sections located within the 100-year floodplain will have water-tight manholes. These locations are listed in the table below and are shown and labeled on the Site Plan. (Do not include streets or concrete-lined channels constructed above sewer lines.)

| Line | Sheet | Station | | Station |
|---|---|---|---|---|
| | of | | to | |
| | of | | to | |
| | of | | to | |
| | of | | to | |

23. 5-year floodplain:

_X_ After construction is complete, no part of this project will be in or cross a 5-year floodplain, either naturally occurring or man-made. (Do not include streets or concrete-lined channels constructed above sewer lines.)
__ After construction is complete, all sections located within the 5-year floodplain will be encased in concrete or capped with concrete. These locations are listed in the table below and are shown and labeled on the Site Plan. (Do not include streets or concrete-lined channels constructed above sewer lines.)

| Line | Sheet | Station | | Station |
|---|---|---|---|---|
| | of | | to | |
| | of | | to | |

| | | | | |
|---|---|---|---|---|
| | of | | to | |
| | of | | to | |

**Items 24 through 31 must be included on the Plan and Profile sheets.**

24. X__ All existing or proposed water line crossings and any parallel water lines within 9 feet of sewer lines are listed in the table below. These lines must have the type of pressure rated pipe to be installed shown on the plan and profile sheets. Any request for a variance from the required pressure rated piping at crossings must include a variance approval from 30 TAC Chapter 290.

__ There will be no water line crossings.

__ There will be no water lines within 9 feet of proposed sewer lines.

| Line | Station or Closest Point | Crossing or Parallel | Horizontal Separation Distance | Vertical Separation Distance |
|---|---|---|---|---|
| SSL-C1 | 7+51 | CROSSING | | 3.13 |
| SSL-D | 1+21.01 | CROSSING | | 4.08 |
| SSL-F | 1+45.16 | CROSSING | | 3.06 |
| SSL-H1 | 1+29.36 | CROSSING | | 3.34 |
| SSL-J | 3+65.12 | CROSSING | | 8.53 |
| | | | | |
| | | | | |

25. Vented Manholes:

_X_ **No part** of this sewer line is within the 100-year floodplain and vented manholes are not required by 30 TAC Chapter 317.

__ **A portion** of this sewer line is within the 100-year floodplain and vented manholes will be provided at less than 1500 foot intervals. These water-tight manholes are listed in the table below and labeled on the appropriate profile sheets.

__ **A portion** of this sewer line is within the 100-year floodplain and an alternative means of venting shall be provided at less than 1500 feet intervals. A description of the alternative means is described on the following page.

__ **A portion** of this sewer line is within the 100-year floodplain; however, there is no interval longer than 1500 feet located in the 100-year floodplain. No vented manholes will be used.

| Line | Manhole | Station | Sheet |
|---|---|---|---|
| | | | of |
| | | | of |
| | | | of |

| | | | |
|---|---|---|---|
| | | | of |
| | | | of |
| | | | of |

26. Drop manholes:

__ There are no drop manholes associated with this project.
_X_ Sewer lines which enter new or existing manholes or "manhole structures" higher than 30 inches above the manhole invert are listed in the table below and labeled on the appropriate profile sheets. These lines meet the requirements of 30 TAC §317.2(c)(5)(E).

| Line | Manhole | Station | Sheet |
|---|---|---|---|
| SSL-B | B2 | 4+90 | 36 of 59 |
| SSL-H1 | G9 | 1+00 | 46 of 59 |
| | | | of |
| | | | of |
| | | | of |
| | | | of |

27. Sewer line stub-outs (For proposed extensions):

_x_ The placement and markings of all sewer line stub-outs are shown and labeled.
__ No sewer line stub-outs are to be installed during the construction of this sewage collection system.

28. Lateral stub-outs (For proposed private service connections):

_x_ The placement and markings of all lateral stub-outs are shown and labeled.
__ No lateral stub-outs are to be installed during the construction of this sewage collection system.

29. Minimum flow velocity (From APPENDIX A)

_x_ Assuming pipes are flowing full, all slopes are designed to produce flows equal to or greater than 2.0 feet per second for this system/line.
__ **ATTACHMENT F - Explanation of Slopes for Flows Less than 2.0 Feet Per Second.** Assuming pipes are flowing full, some slopes are designed to produce flows less than 2.0 feet per second for this system/line. An explanation is provided in **ATTACHMENT F** at the end of this form.

30. Maximum flow velocity/slopes (From APPENDIX A)

_X_ Assuming pipes are flowing full, all slopes are designed to produce maximum flows of less than or equal to 10 feet per second for this system/line.
__ **ATTACHMENT G - Explanation of Slopes for Flows Greater Than 10.0 Feet Per**

**Second.** Assuming pipes are flowing full, some slopes produce flows which are greater than 10 feet per second. These locations are listed in the table below. A variance is requested to exceed the maximum slope. Justification is provided in **ATTACHMENT G** at the end of this form.

| Line | Profile Sheet | Station | | Station | FPS | % Slope | Erosion/Shock Protection |
|---|---|---|---|---|---|---|---|
| | of | | to | | | | |
| | of | | to | | | | |
| | of | | to | | | | |
| | of | | to | | | | |

31. Assuming pipes are flowing full, where flows are ≥ 10 feet per second the provisions noted below have been made to protect against pipe displacement by erosion and/or shock. 30 TAC §317.2(c)(3)

_n/a_ Concrete encasement shown on appropriate Plan and Profile sheets for the locations listed in the table above.

__ Steel-reinforced, anchored concrete baffles/retards placed every 50 feet shown on appropriate Plan and Profile sheets for the locations listed in the table above.

__ **ATTACHMENT H - Other Protection Methods Against Erosion/Shock.** Other. An explanation is provided in **ATTACHMENT H** at the end of this form.

**ADMINISTRATIVE INFORMATION**

32. _x_ The **final plans and technical specifications** are submitted for the TCEQ's review. Each sheet of the construction plans and specifications are dated, signed, and sealed by the Texas Licensed Professional Engineer responsible for the design on each sheet.

33. Standard details are shown on the detail sheets, which are dated, signed, and sealed by the Texas Licensed Professional Engineer, as listed in the table below:

| Standard Details | Shown on Sheet |
|---|---|
| Lateral stub-out marking [**REQUIRED**] | 49 of 59 |
| Manhole, showing inverts comply with 30 TAC 317.2(c)(5)(E) [**REQUIRED**] | 49 of 59 |
| Alternate method of joining lateral to existing SCS line for potential future connections [**REQUIRED**] | 49 of 59 |
| Typical trench cross-sections [**REQUIRED**] | 49 of 59 |
| Bolted manholes [**REQUIRED**] | 49 of 59 |
| Sewer Service lateral standard details [**REQUIRED**] | 49 of 59 |
| Clean-out at end of line [**REQUIRED, if used**] | 49 of 59 |

| | |
|---|---|
| Baffles or concrete encasement for shock/erosion protection [**REQUIRED, if flow velocity of any section of pipe >10 fps**] | N/A of |
| Detail showing Wastewater Line/Water Line Crossing [**REQUIRED, if crossings are proposed**] | 31 -48 of 59 |
| Mandrel detail or specifications showing compliance with 30 TAC §317.2(a)(4)(C) [**REQUIRED, if Flexible Pipe is used**] | 49 of 59 |
| Drop manholes [**REQUIRED, if a pipe entering a manhole is more than 30 inches above manhole invert**] | 49 of 59 |

34. _X_ All organized sewage collection system general construction notes (TCEQ-0596) are included on the construction plans for this sewage collection system.

35. X__ All proposed sewer lines will be sufficiently surveyed/staked to allow an inspection prior to TCEQ executive director approval. If the alignments of the proposed sewer lines are not walkable for inspection on that date, the application will be deemed incomplete and returned.

36. _X_ One (1) original and three (3) copies of the completed application has been provided.

37. _X_ Any modification of this SCS application will require TCEQ approval, prior to construction, and may require submission of a revised application, with appropriate fees.

To the best of my knowledge, the responses to this form accurately reflect all information requested concerning the proposed regulated activities and methods to protect the Edwards Aquifer. This **SEWAGE COLLECTION SYSTEM APPLICATION** is hereby submitted for TCEQ review and executive director approval. The system was designed in accordance with the requirements of 30 TAC §213.5(c) and 30 TAC §317 and prepared by:

Place engineer's seal here:




DAVID M. McBETH, P.E.
Print Name of Licensed Professional Engineer

Signature of Licensed Professional Engineer

6/4/08
Date

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

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

## APPENDIX A
Flow Velocity Table

Flow Velocity (Flowing Full)

All gravity sewer lines on the Edwards Aquifer Recharge Zone shall be designed and constructed with hydraulic slopes sufficient to give a velocity when **flowing full** of not less than 2.0 feet per second, and not greater than 10 feet per second. The grades shown in the following table are based on Manning's formula and an n factor of 0.013 and shall be the minimum and maximum acceptable slopes unless provisions are made otherwise.

| Pipe Diameter (Inches) | % Slope required for minimum flow velocity of 2.0 fps | % Slope which produces flow velocity of 10.0 fps |
|---|---|---|
| 6 | 0.50 | 12.35 |
| 8 | 0.33 | 8.40 |
| 10 | 0.25 | 6.23 |
| 12 | 0.20 | 4.88 |
| 15 | 0.15 | 3.62 |
| 18 | 0.11 | 2.83 |
| 21 | 0.09 | 2.30 |
| 24 | 0.08 | 1.93 |
| 27 | 0.06 | 1.65 |
| 30 | 0.055 | 1.43 |
| 33 | 0.05 | 1.26 |
| 36 | 0.045 | 1.12 |
| 39 | 0.04 | 1.01 |
| >39 | * | * |

*For lines larger than 39 inches in diameter, the slope may be determined by Manning's formula (as shown below) to maintain a minimum velocity greater than 2.0 feet per second when flowing full and a maximum velocity less than 10 feet per second when flowing full.

$$v = \frac{1.49}{n} \times R_h^{0.67} \times \sqrt{S}$$

6
C

**Deed Recordation Affidavit**
Edwards Aquifer Protection Plan

THE STATE OF TEXAS §

County of Comal §

BEFORE ME, the undersigned authority, on this day personally appeared Newcombe Development, LLC.; Jeremy Fieldsend, Partner who, being duly sworn by me, deposes and says:

(1) That my name is Jeremy Fieldsend and that I own the real property described below.

(2) That said real property is subject to an EDWARDS AQUIFER PROTECTION PLAN which was required under the 30 Texas Administrative Code (TAC) Chapter 213.

(3) That the EDWARDS AQUIFER PROTECTION PLAN for said real property was approved by the Texas Commission on Environmental Quality (TCEQ) on December 28, 2007.

A copy of the letter of approval from the TCEQ is attached to this affidavit as Exhibit A and is incorporated herein by reference.

(4) The said real property is located in Comal County, Texas, and the legal description of the property is as follows:

158.84 acres of land out of the Jacob Heidrich Survey, No. 284, J. H. Hartman Survey No. 358, and the J.G. Brehmer Survey No. 524, Comal County Texas.

Jeremy Fieldsend

Newcombe Development, LLC.; Jeremy Fieldsend, Partner
LANDOWNER-AFFIANT

SWORN AND SUBSCRIBED TO before me, on this 26 day of Feb. 2008.

V. Kivlin
NOTARY PUBLIC

THE STATE OF Texas §

County of Comal §

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

GIVEN under my hand and seal of office on this 26 day of Feb 2008.

V. Kivlin
NOTARY PUBLIC

VICKIE A. KIVLIN
Notary Public, State of Texas
My Commission Expires
March 27, 2010

Vickie A. Kivlin
Typed or Printed Name of Notary

MY COMMISSION EXPIRES: March 27, 2010

Buddy Garcia, *Chairman*
Larry R. Soward, *Commissioner*
Bryan W. Shaw, Ph.D., *Commissioner*
Glenn Shankle, *Executive Director*

# TEXAS COMMISSION ON ENVIRONMENTAL QUALITY

*Protecting Texas by Reducing and Preventing Pollution*

December 28, 2007

Mr. Jeremy Fieldsend
Newcombe Development L.L.C.
325 Mission Valley Road
New Braunfels, Texas 78132

Re: Edwards Aquifer, Comal County
NAME OF PROJECT: Newcombe Tennis Ranch Residential Subdivision; Located on the east side of Mission Valley Road approximately 0.5 miles southwest of State Highway 46; New Braunfels, Texas
TYPE OF PLAN: Request for Approval of a Water Pollution Abatement Plan (WPAP); 30 Texas Administrative Code (TAC) Chapter 213 Edwards Aquifer
Edwards Aquifer Protection Program ID No. 1248.01; Investigation No. 598529; Regulated Entity No. RN102747359

Dear Mr. Fieldsend:

The Texas Commission on Environmental Quality (TCEQ) has completed its review of the WPAP application for the above-referenced project submitted to the San Antonio Regional Office by Carter & Burgess, Inc. on behalf of Newcombe Development L.L.C. on October 18, 2007. Final review of the WPAP was completed after additional material was received on December 14, 2007, and December 21, 2007. As presented to the TCEQ, the Temporary Best Management Practices (BMPs) and construction plans were prepared by a Texas Licensed Professional Engineer to be in general compliance with the requirements of 30 TAC Chapter 213. These planning materials were sealed, signed and dated by a Texas Licensed Professional Engineer. Therefore, based on the engineer's concurrence of compliance, the planning materials for construction of the proposed project and pollution abatement measures are hereby approved subject to applicable state rules and the conditions in this letter. The applicant or a person affected may file with the chief clerk a motion for reconsideration of the executive director's final action on this Edwards Aquifer Protection Plan. A motion for reconsideration must be filed no later than 23 days after the date of this approval letter. *This approval expires two (2) years from the date of this letter unless, prior to the expiration date, more than 10 percent of the construction has commenced on the project or an extension of time has been requested.*

## BACKGROUND

This application was submitted as two sites (158.84 acres and 47.0 acres) separated by an existing public road (Mission Valley Road). Under the current rule interpretation, each site requires its own WPAP, and the 47.0 acre tract was withdrawn from review by a letter dated December 14, 2007, from the project engineer. A separate application will be submitted for the 47.0 acre site.

## PROJECT DESCRIPTION

The proposed single-family residential project will have an area of approximately 158.84 acres. It will include 177 single-family residences, 16 tennis courts, a swimming pool, two bath houses, a clubhouse, 15 casitas (visitors' quarters, single bedroom buildings with kitchen) and related roads, driveways, and

sidewalks. The impervious cover will be 31.30 acres (19.7%). Project wastewater will be disposed of by conveyance to the existing Gruene Road Wastewater Treatment Plant owned by the New Braunfels Utilities.

As understood, a casita is a one bedroom guest building with kitchen facilities. The casitas are to be used for special guests (touring tennis professionals, celebrities, etc.) for long term (not daily) accommodations while they train, coach, etc. at the nearby John Newcombe Tennis Ranch Club and Conference Center. There are no plans for commercial use of the casitas (rent, sale, or lease). The applicant will own and maintain the casitas.

## PERMANENT POLLUTION ABATEMENT MEASURES

Since this single-family residential project will not have more than 20 percent impervious cover, an exemption from permanent BMPs is approved.

## GEOLOGY

According to the geologic assessment included with the application, portions of the site are located on the Edwards Person Formation, the Del Rio Clay, and the Buda Limestone. As reported, there are 16 geologic and manmade features located on the project site. Features S-4 (sinkhole) and S-5 (cave) were assessed as sensitive. The San Antonio Regional Office site assessment conducted on December 3, 2007, revealed that the features were as described, with the exception of features S-4 and S-15 (well). Based on the feature's rectangular shape, and uniform depth, the project geologist reclassified Feature S-4 from a sinkhole to a manmade excavation, and re-assessed the feature as not sensitive. Feature S-15 was assessed as a sensitive feature because the well was not properly plugged or capped. A setback consistent with the criteria of RG-348, Section 5 is proposed for Feature S-4.

During the site assessment, minor vegetation clearing was observed. According to the project engineer, a "Bobcat" with a forestry cutter attachment was used for a preliminary survey of proposed roads to identify trees to be protected. The paths were approximately 5 feet wide. No soil disturbance was observed and the shredded material did not obscure the ground.

## SPECIAL CONDITIONS

I. The holder of the approved Edwards Aquifer WPAP must comply with all provisions of 30 TAC Chapter 213 and all best management practices and measures contained in the application.

II. 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.

III. 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.

IV. Since this project will not have more than 20% impervious cover, an exemption from permanent BMPs is approved. If the percent impervious cover ever increases above 20% or the land use changes, the exemption for the whole site as described in the property boundaries required by §213.4(g), may no longer apply and the property owner must notify the appropriate regional office of these changes.

V. If any of the casitas are rented, sold or leased, or in any way converted to commercial use for any period of time, the exemption listed in Special Condition IV for the whole site as described in the property boundaries required by §213.4(g), may no longer apply and the property owner must notify the appropriate regional office of these changes.

VI. Feature S-15, and the other three wells shall be properly plugged.

## 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.

Prior to Commencement of Construction:

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

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

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

5. The applicant must provide written notification of intent to commence construction, replacement, or rehabilitation of the referenced project. Notification must be submitted to the San Antonio Regional Office no later than 48 hours prior to commencement of the regulated activity. Written notification must include the date on which the regulated activity will commence, the name of the approved plan and program ID number for the regulated activity, and the name of the prime contractor with the name and telephone number of the contact person. The executive director will use the notification to determine if the approved plan is eligible for an extension.

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

7. All borings with depths greater than or equal to 20 feet must be plugged with non-shrink grout from the bottom of the hole to within three (3) feet of the surface. The remainder of the hole

must be backfilled with cuttings from the boring. All borings less than 20 feet must be backfilled with cuttings from the boring. All borings must be backfilled or plugged within four (4) days of completion of the drilling operation. Voids may be filled with gravel.

During Construction:

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

9. If any sensitive feature (caves, solution cavities, sink holes, etc.) is discovered during construction, all regulated activities near the feature must be suspended immediately. The applicant or his agent must immediately notify the San Antonio Regional Office of the discovery of the feature. Regulated activities near the feature may not proceed until the executive director has reviewed and approved the methods proposed to protect the feature and the aquifer from potentially adverse impacts to water quality. The plan must be sealed, signed, and dated by a Texas Licensed Professional Engineer.

10. There are four wells reported to be located on this project site. All water wells, including injection, dewatering, and monitoring wells must be in compliance with the requirements of the Texas Department of Licensing and Regulation under Title 16 TAC Chapter 76 (relating to Water Well Drillers and Pump Installers) and all other locally applicable rules, as appropriate.

11. If sediment escapes the construction site, the sediment must be removed at a frequency sufficient to minimize offsite impacts to water quality (e.g., fugitive sediment in street being washed into surface streams or sensitive features by the next rain). Sediment must be removed from sediment traps or sedimentation ponds not later than when design capacity has been reduced by 50 percent. Litter, construction debris, and construction chemicals shall be prevented from becoming stormwater discharge pollutants.

12. 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.

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

After Completion of Construction:

14. 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. The regulated entity shall then be responsible for maintenance until

another entity assumes such obligations in writing or ownership is transferred. A copy of the transfer of responsibility must be filed with the executive director through San Antonio Regional Office within 30 days of the transfer. A copy of the transfer form (TCEQ-10263) is enclosed.

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

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

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

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

Sincerely,

Glenn Shankle
Executive Director
Texas Commission on Environmental Quality

GS/JKM/eg

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

cc: Mr. Alex Zertuche, P.E., Carter & Burgess, Inc.
Mr. Mike Etelamaki, P.E., City of New Braunfels
Mr. Tom Hornseth, P.E., Comal County
Ms. Velma Danielson, Edwards Aquifer Authority
TCEQ Central Records, Building F, MC 212

Filed and Recorded
Official Public Records
Joy Streater, County Clerk
Comal County, Texas
02/26/2008 11 11 46 AM
CASHONE
200806007743

Joy Streater

**Texas Commission on Environmental Quality**
# SEWAGE COLLECTION SYSTEM SUBMITTAL APPLICATION FOR PLANS AND SPECIFICATIONS REVIEW

This application is intended as an aid in fulfilling the review requirements of 30 TAC Chapter 317, titled *Design Criteria for Sewerage Systems*, sections 317.1 and 317.2. This application may be submitted in lieu of a separate engineering report. This form will only be accepted for review if all the pages of this application, including any attachments, are permanently bound together, and the application is signed, sealed and dated on the final page by a professional engineer registered in the State of Texas, or if each page of attachments and each page of this application have the signed and dated seal of a Professional Engineer registered in the State of Texas. **Use of the application form is not mandatory except for Edwards Aquifer applications.** The intent of this application is to expedite Texas Commission on Environmental Quality (TCEQ) plan review by providing a format which ensures that the information required to complete a TCEQ review of the project is included in the submittal materials, and to assist the reviewer in locating this information. Please note that the determination of whether or not the information submitted by the applicant is sufficient to obtain TCEQ approval will be made by the TCEQ reviewer and that additional information regarding the project design may be required before the TCEQ will approve construction of the project. Except as exempted in question A23 of this application, in addition to this application, each submittal must include one set of the project specifications, permanently bound, with the signed and dated seal of a Professional Engineer registered in the State of Texas on the cover of the specifications and one set of plans, with each plan sheet containing the signed and dated seal of a Professional Engineer registered in the State of Texas. The submittal of the plans, specifications and application need to be made to the following address:

TCEQ
Wastewater Permits Section
MC 148
P.O. Box 13087
Austin, Texas 78711-3087

For answers to questions relating to wastewater plan review contact:

Louis C. Herrin, III, P.E.
Phone No. (512) 239-4552

## ADMINISTRATIVE REVIEW

TCEQ review is intended to provide both a technical review and a historical record of wastewater construction projects. The following information is required for administrative review purposes.

A1) **Does the project include any potable water distribution or water treatment related construction?** YES **If yes, a separate review by the TCEQ Water Utilities Division may be required.** Please contact Joe Strouse, PE, at (512) 239-6960 for this determination.

A2) Name and mailing address of entity submitting project for review: CARTER & BURGESS, INC
911 CENTRAL PARKWAY NORTH, STE 425, SAN ANTONIO, TX 78232

A3) Name of design engineer: ALEX ZERTUCHE Phone No. : 210.494.0088

A4) County in which the project is located: COMAL

A5) Name of project (include subdivision name, contract numbers, or any other identifying information which is relevant to this project):

NEWCOMBE TENNIS RANCH UNIT 1

A6) Entity which will own and maintain the sanitary sewer collection system described in this application:
NEWCOMBE DEVELOPMENT

A7) Identify the wastewater treatment plant (WWTP) which will receive and treat flows from the project.

TCEQ Permit No. : _____ Permittee: NEW BRAUNFELS UTILITIES

Facility or plant name if different from permittee: _____

A8) If this WWTP is not under enforcement skip to A10. If this WWTP is currently under a TCEQ enforcement order, please provide the name and phone number of the TCEQ enforcement coordinator and the TCEQ Region Office wastewater inspector assigned to the enforcement case.

Name: _____ Phone No. : _____
Name: _____ Phone No. : _____

A9) Describe the nature of the enforcement case. If the WWTP which will receive flow from this project is under enforcement due to flow exceedance, the description should include the permitted average daily flow, information regarding average daily flows currently measured at the WWTP during both dry and wet weather conditions, and any other information which would help describe the flow exceedance problems:

**Use the back of this page and attachments if needed for long narrative answers or engineering calculations.**

A10) If any portion of the project is within the Edwards Aquifer Recharge Zone, **attach this form to your Edwards Aquifer protection plan**. The project must be reviewed by the appropriate TCEQ Region Office as required by 30 TAC Chapter 213. For information on the submittal requirements for projects located over the Edwards Aquifer Recharge Zone contact the appropriate Region Office for details. Are all portions of this project outside the Edwards Aquifer Recharge Zone?_____

A11) If the project is publicly funded, identify the source of funding. Please include the name and phone number of a contact person at the funding entity.

Source of Funding: N/A

Name:_____ Phone No. :_____

A12) Identify entities other than TCEQ which will review the project. Please include the name and phone number of a contact person for each entity other than the TCEQ which will review this project.

Entity: N/A Name:_____ Phone No. :_____
Entity:_____ Name:_____ Phone No. :_____
Entity:_____ Name:_____ Phone No. :_____
Entity:_____ Name:_____ Phone No. :_____

A13) If this project proposes any sewage collection system (gravity sewer pipe, lift station or force main) installation or construction which would not be considered maintenance and rehabilitation work, skip to page 7 of this application and complete the applicable portions of the technical review section of this application starting with T1 on page 7. If a project consists solely of maintenance and repair of an existing sanitary sewer collection system, a waiver of review may be granted on a case by case basis in accordance with Section 317.1(a)(7) of the Design Criteria. Section 317.1(a)(7) states, "Waiver of submittal or review requirements. When minor upgrade, rehabilitation, or maintenance work is planned for existing systems a waiver of submittal or review may be granted at the discretion of the executive director...If a waiver of submittal or review is desired, written notification to the commission...shall be made and shall include

sufficient information to describe the significance of such modifications. If a waiver of submittal or review is requested, it shall be submitted by a professional engineer registered in Texas, and shall include the signed and dated seal of the engineer submitting the waiver request. The executive director...will determine whether a submittal or review of engineering plans and specifications will be required following this initial notification of the extent of the planned modifications. Replacement of equipment, piping or materials with like equipment, piping, or materials for purposes of maintenance and repair only, will not routinely require a submittal or a technical review by the executive director, and also will not routinely require a request for a waiver of submittal or a request for a waiver of review." If this project only proposes collection system maintenance and rehabilitation work, state whether the project consists of sewage collection piping rehabilitation work, lift station rehabilitation work, or both sewage collection system piping and lift station rehabilitation work:_____

_____

If this project only consists of sewage collection piping maintenance and rehabilitation work, answer items A14 through A18.

If this project only consists of maintenance and rehabilitation work for one or more lift stations, answer items A19 through A22 and continue on with A23.

If this project proposes both sewage collection system piping rehabilitation and maintenance and rehabilitation of one or more sanitary sewer lift station, answer items A14 through A22 and continue on with A23.

A14) Detail the scope of the sewer collection pipe rehabilitation project. Include details regarding linear feet of pipe which will be rehabilitated, types of pipe rehabilitation technologies which are proposed, pipe, pipe joint and pipe bedding materials which are proposed for the maintenance and rehabilitation work and any other information which may be necessary to show that the proposed project will be accomplished utilizing standard acceptable engineering practices:

A15) Are all proposed lines to be constructed in the same trench as existing lines?_____

A16) Are all proposed lines the same diameter as existing lines?_____

A17) Are all slopes the same as or greater than existing lines?_____

A18) Will flows and connections be equal to or less than current flows and connections? _____ If no lift station rehabilitation work is planned, skip to A23.

A19) Detail the scope of the maintenance and rehabilitation work proposed for the lift station(s). Include the number of lift stations which will be rehabilitated, information regarding structural maintenance which is

to be performed on each lift station proposed for rehabilitation, the size of any pumps which are to be replaced in each lift station, the size of any pumps which currently exist in each lift station, the size of any pumps which are not proposed to be replaced and will remain in each lift station, details regarding any force main rehabilitation which is intended for the sewage system and any other information which may be necessary to show that the proposed project will be accomplished utilizing standard acceptable engineering practices:

A20) Will the operating characteristics of the rehabilitated lift station(s) be equivalent to the operating characteristics of the existing lift station(s) regarding pumping capacity versus total dynamic head?_____

A21) Will the force main piping either remain unchanged, or, be replaced at the same alignment and with the same diameter pipe as the existing force main piping? (yes or no)_____

A22) Will the lift station(s) and force main(s) include, at a minimum, an arrangement of valves and appurtenances which ensures that the lift station(s) operation will be equivalent to or superior to that of the lift station(s) and force main(s) being upgraded or replaced?_____

A23) **If you answered no to any of the items in A15, A16, A17, A18, A20, A21, or A22, skip to A24. If you answered yes to all the items in A15, A16, A17, A18, A20, A21, or A22,** which are relevant to the project, **STOP**. This project meets the criteria which must be met to allow the TCEQ to grant a

general waiver of review and to allow an exemption from the requirement to submit plans and specifications to the TCEQ. Submit pages 1 through 6 of this application, and any attachments associated with pages 1 through 6 of this application to the TCEQ for record keeping purposes. The submitted pages shall be properly bound and the final page shall include the signed and dated seal of a Professional Engineer registered in the State of Texas. The pages can be stapled or left loose if each page of the submittal has the signed and dated seal of a Professional Engineer registered in the State of Texas.

A24) **If you answered no to any of the items in A15, A16, A17, A18, A20, A21, or A22,** but believe that the project constitutes routine maintenance of an existing system, please provide engineering justification why TCEQ review should not be required. Please detail in what ways the rehabilitation project differs from the existing system with regard to the items in A15, A16, A17, A18, A20, A21 or A22. Submit all attachments and pages 1 through 6 of this application to the TCEQ for a determination of whether review is required for this project. The pages of the submittal shall be properly bound and the final page shall include the signed and dated seal of a Professional Engineer registered in the State of Texas. The pages can be stapled or left loose if each page of the submittal has the signed and dated seal of a Professional Engineer registered in the State of Texas. Please be aware that review may be required at the discretion of the Executive Director. If it is determined that the proposed maintenance and rehabilitation work will be reviewed by the TCEQ, in addition to pages 1 through 6 of this application, the applicant will need to submit one set of the project specifications, permanently bound, with the signed and dated seal of a Professional Engineer registered in the State of Texas on the cover of the specifications, an engineering report, permanently bound, with the signed and dated seal of a Professional Engineer registered in the State of Texas on the cover of the engineering report (For collection system submittals which contain no lift stations or force mains, this application form may substitute for the engineering report, provided the application is properly completed) and one set of plans, with each plan sheet containing the signed and dated seal of a Professional Engineer registered in the State of Texas.

## TECHNICAL REVIEW

T1) Please provide a brief summary of the project scope:

T2) If a conflict exists between the various submitted documents (engineering calculations, project specifications, project plans, addendums, etc.), which document takes precedent? For instance do plans govern over

specifications or do specifications govern over plans? Do special conditions govern over technical specifications or plans? etc. Where in the submitted materials is the prioritization of documents specified? Provide answers to these items below. Please be aware that the TCEQ may require any identified discrepancies between plans and specifications to be corrected or clarified:

Location in submittal: Plan sheet _____ Specifications page _____ Item No. _____

T3) This application form is intended to function as a document, which when completed properly, constitutes full compliance with Sections 317.1 and 317.2 of the TCEQ's rules. All the requirements in these Sections of Chapter 317 have been restated in this application in a format which is intended to clarify what is needed to show compliance with Sections 317.1 and 317.2. ***If during the course of completing this application it is determined that the project does not comply with specific portions of the requirements in Chapter 317, as indicated by "no" answers to the items in the application, the applicant must request a variance from the rules for these items. The specifics of what requirements must be met to obtain a variance can be found on page 35 of this application. Page 35 is also the appropriate places to provide the details needed to justify any variance requests.***

Part I of the technical review portion of this application covers gravity sewer collection piping only. Part II of this application has not yet been developed. Part II, when developed, will cover lift stations and force main piping only. If this project contains gravity collection piping complete the items in Part I, beginning with T4 on page 8 of this application. Until Part II is finalized, if this project contains lift stations and force main piping, which need a TCEQ review, a separate engineering report which shows full compliance with Section 317.3 of the TCEQ's rules titled Design Criteria for Sewerage Systems, must be submitted to the TCEQ for the lift station and force main portions of the project. Conceptually similar Chapter 317 requirements have been grouped together under their relevant citations in Part I of this application. For more detailed information on these requirements, please consult the relevant rules.

## PART I - GRAVITY SANITARY SEWER PIPING

### Capacity Design

Flow and Capacity Analysis: 30 TAC, Sections 317.2.(a)(1), 317.2.(b)(1), 317.2.(b)(2), 317.2.(b)(3), 317.4.(a)

T4) Basis for average flow used for design of collection system (**check one or more**):

Per Capita Contributions:____Service Connections:_X_Land Area and Use:____Fixture Analysis:____

T5) Peaking factor used for design:____ A peaking factor of at least 4 is required for minor lines. A peaking factor greater than 4 must be used if needed to convey peak flows. Has a peaking factor greater than or equal to 4 been used in the design?_____

T6) Provide flow/capacity analysis. The capacity analysis must derive the average and peak flows to be carried by each line. Additionally, the analysis must verify that the diameters and slopes for each reach of collection line (or for the minimum capacity reach of each line) provide a capacity adequate to carry the anticipated peak flow. The analysis must include consideration of all existing upstream flow contributions, and the impact of

the project on the downstream collection system. The stated design flow must be justified on the basis of future population to be served, and must include any anticipated industrial, commercial, or institutional flow contributions. Please note that capacities must be determined using Manning's equation for pipes flowing full with an "n" value of 0.013:

## General Structural Components

**The Design Criteria outlined in Section 317.2 of the TCEQ's rules states, "The collection system design shall provide a minimum structural life cycle of 50 years." Section 317.2 also states, "The collection system design shall provide for the minimization of anaerobic conditions." These two TCEQ requirements can be assumed to have been met for the purposes of Plans and Specifications approval provided that the items in T7 through T104, detailed below, are met:**

Materials Used and ASTM Standards Adhered To: 30 TAC 317.2(a)(2), 317.2(a)(3), 317.2(a)(5), 317.2(c)(5)(A)

T7) List all the pipe diameters proposed for this project. Specify the total linear feet of pipe proposed for each listed diameter, the pipe material proposed for each diameter, the national standard specifications (ASTM, AWWA, ANSI, etc...) which govern each proposed pipe material and the appropriate national standard specifications for joints which correspond to each of these proposed materials:

| | Linear Feet | Pipe Material | National Standard Specification for Pipe Material | National Standard for Pipe Joints |
|---|---|---|---|---|
| **Pipe Diameter 1** | 12,365 | 8"-SDR 26 | ASTM 3034 3212 | 2241 |
| **Pipe Diameter 2** | | | | |
| **Pipe Diameter 3** | | | | |
| **Pipe Diameter 4** | | | | |
| **Pipe Diameter 5** | | | | |
| **Pipe Diameter 6** | | | | |

Location in submittal: Plan sheet _____ Specifications page _____ Item No. _____

Note: Section 317.2.(c)(1) requires a minimum pipe diameter of 6 inches for all sanitary sewer collection system piping except service laterals. The TCEQ does not currently review service laterals. The design, installation and testing of service laterals is regulated by municipal and county codes. Compliance with these codes is considered sufficient to satisfy the TCEQ.

T8) Watertight, size on size resilient connectors conforming to ASTM C-923 must be specified for connecting pipe to manholes. Have such connectors been specified? _____

Location in submittal: Plan sheet _____ Specifications page _____ Item No. _____

T9) For purposes of TCEQ review, rigid pipe materials include, but are not limited to, concrete, vitrified clay or ductile iron pipe. If the design does not include rigid pipe, skip to T11. If the design includes rigid pipe, the specified bedding must comply with ASTM C-12 class A, B, or C for materials and densification. A minimum of 4 inches of bedding is required for all pipe. Will the proposed project comply with these requirements?_____

T10) Specify the bedding class proposed for each diameter of rigid pipe and each rigid pipe material:

Pipe Diameter:_____ Pipe Material:_____ Bedding Class:_____
Pipe Diameter:_____ Pipe Material:_____ Bedding Class:_____
Pipe Diameter:_____ Pipe Material:_____ Bedding Class:_____
Pipe Diameter:_____ Pipe Material:_____ Bedding Class:_____
Pipe Diameter:_____ Pipe Material:_____ Bedding Class:_____
Pipe Diameter:_____ Pipe Material:_____ Bedding Class:_____

Location in submittal: Plan sheet _____ Specifications page _____ Item No. _____

T11) For purposes of TCEQ review, flexible materials include, but are not limited to, plastics, PVC, ABS,

fiberglass, and, polyethylene. If the design does not include flexible pipe, skip to T13. If the design includes flexible pipe materials, the specified bedding must comply with ASTM D-2321 class IA, IB, II or III for materials and densification. A minimum of 4 inches of bedding is required for all pipe. Will the proposed project comply with these requirements?_____

T12) Specify the bedding class proposed for each diameter of flexible pipe and each flexible pipe material:

| | | |
|---|---|---|
| Pipe Diameter: 8" | Pipe Material: PVC | Bedding Class: D |
| Pipe Diameter:_____ | Pipe Material:_____ | Bedding Class:_____ |
| Pipe Diameter:_____ | Pipe Material:_____ | Bedding Class:_____ |
| Pipe Diameter:_____ | Pipe Material:_____ | Bedding Class:_____ |
| Pipe Diameter:_____ | Pipe Material:_____ | Bedding Class:_____ |
| Pipe Diameter:_____ | Pipe Material:_____ | Bedding Class:_____ |

Location in submittal: Plan sheet _____ Specifications page _____ Item No. _____

Note: For TCEQ review, cement stabilized bedding materials are considered to comply with ASTM D-2321 if the base material and compaction meet the minimum requirements of ASTM D-2321, class IA, IB, II or III.

T13) Brick manhole construction is not allowed. Use of brick for adjusting manhole covers to grade is also prohibited. Do the project plans and/or specifications prohibit the use of brick manholes and the use of brick to adjust manholes to grade?_____

Location in submittal: Plan sheet _____ Specifications page _____ Item No. _____

T14) Are materials specified for manhole construction limited to monolithic cast in place concrete, fiberglass, precast concrete or HDPE?_____ List all materials specified for manhole construction:

1)_____ 2)_____ 3)_____ 4)_____

Location in submittal: Plan sheet _____ Specifications page _____ Item No. _____

Minimum and Maximum Slopes: 30 TAC 317.2(c)(2), 317.2(c)(3)

T15) All pipe must be designed with a slope that will provide a velocity of at least 2 ft/s flowing full, as calculated using Manning's equation with an "n" value of 0.013. Additionally, the collection system must be designed to ensure that, with pipes flowing full, the velocities will be less than 10 feet per second. For each diameter of pipe, indicate the minimum and maximum collection line slopes which will exist in this project (see 317.2(c)(2) of the TCEQ's rules for a table of maximum and minimum slopes allowed for each diameter of pipe):

| | | |
|---|---|---|
| Pipe Diameter: ____ | Min. Slope: ____ | Max. Slope:____ |
| Pipe Diameter: ____ | Min. Slope: ____ | Max. Slope:____ |
| Pipe Diameter: ____ | Min. Slope: ____ | Max. Slope:____ |
| Pipe Diameter: ____ | Min. Slope: ____ | Max. Slope:____ |
| Pipe Diameter: ____ | Min. Slope: ____ | Max. Slope:____ |
| Pipe Diameter: ____ | Min. Slope: ____ | Max. Slope:____ |

T16) Do these proposed slopes ensure a velocity greater than or equal to 2 feet per second and less than or equal to 10 feet per second? YES

General Trenching and Backfill: 30 TAC 317.2.(a)(5), 317.2.(a)(9), 317.2.(a)(10), 317.2.(c)(3)

T17) Describe any known soil, geologic, or hydrologic conditions on the site which may pose difficulties for construction or compromise the structural integrity of the collection system. These include but are not limited to high water table; low soil strength; high plasticity index; active faults; zones of active subsidence; and, caves, solution caverns or sinkholes. If no such conditions are known to exist in the proposed project location, skip to T19. NO ADVERSE CONDITIONS HAVE BEEN IDENTIFIED

T18) Describe the measures which will be taken to provide for the structural integrity of the collection line and for construction safety where pipe must be installed in conditions described in T17:

Location in submittal: Plan sheet _____ Specifications page _____ Item No. _____

T19) **If faults, caverns, or subsidence are discovered during construction, construction should be halted to allow the features to be inspected by the design engineer or a geological or geotechnical professional.** For active faults, localized subsidence zones, or caverns, the system must be laid out to minimize the number of crossings through, and construction within, the unfavorable features. Where crossings through faults or subsidence zones are unavoidable, the design must allow for deflection due to differential settlement. Manholes should be provided on each side of such features to allow pumping in case of sewer failures. Service connections within 50 feet of such features should be avoided. These design features should be detailed in the project specifications. Will these requirements be met?_____ Please provide appropriate details:

Location in submittal: Plan sheet _____ Specifications page _____ Item No. _____

T20) The trench width must be minimized while still allowing adequate width for proper compaction of backfill, and while still ensuring that at least 4 inches of backfill exists on each side of the pipe. Will this be accomplished? YES

T21) For each diameter of pipe, indicate minimum and maximum trench width:

Pipe Diameter: _____ Min. Trench Width: _____ Max. Trench Width: _____
Pipe Diameter: _____ Min. Trench Width: _____ Max. Trench Width: _____
Pipe Diameter: _____ Min. Trench Width: _____ Max. Trench Width: _____
Pipe Diameter: _____ Min. Trench Width: _____ Max. Trench Width: _____
Pipe Diameter: _____ Min. Trench Width: _____ Max. Trench Width: _____
Pipe Diameter: _____ Min. Trench Width: _____ Max. Trench Width: _____

T22) Will the trench walls be vertical to at least one foot above the pipe? Yes

Location in submittal: Plan sheet 49 Specifications page _____ Item No. _____

T23) Will the backfill be free of stones greater than 6 inches in diameter and free of organic or any other unstable material? _____

Location in submittal: Plan sheet 49 Specifications page _____ Item No. _____

Corrosion Prevention:

T24) List any proposed collection system components (pipes, manholes, etc...) that will be susceptible to deterioration through the corrosive effects of an anaerobic sewage environment. If the collection system does not contain any components which are susceptible to deterioration through the corrosive effects of an anaerobic sewage environment, skip to T26: N/A

T25) If the proposed wastewater collection system contains components susceptible to corrosive attack, provisions to protect these components from corrosive attack, such as coatings, liners, high alkalinity concrete, etc, are needed. If steps have been taken to protect the wastewater collection system from corrosive attack, detail these corrosion prevention measures below. Indicate that these measures are sufficient to protect the gravity sanitary sewer piping from corrosive attack for a design life of 50 years and indicate where in the plans and specifications these measures are required. If the proposed wastewater collection system contains components susceptible to corrosive attack, and if corrosion prevention measures will not be taken for this project, provide an engineering analysis demonstrating that the collection system will adequately resist corrosive attack through the 50 year design life of the project. This analysis must consider the potential for anaerobic conditions both under startup conditions and at ultimate buildout. (Refer to ASCE Manual and Reports on Engineering Practice-No. 69, Sulfide in Wastewater Collection and Treatment Systems). Have these specifics been addressed?_____

Analysis:

Manholes - General: 30 TAC Section 317.2(c)

T26) Are manholes provided at all changes in size, grade or alignment of pipe? Yes

T27) Are manholes or cleanouts provided at the end of all lines? Yes

T28) The maximum manhole spacings allowed by the TCEQ are as follows:

| Pipe Diameter (in) | Maximum Manhole Spacing (ft) |
|---|---|
| 6 - 15 | 500 |
| 18 - 30 | 800 |
| 36 - 48 | 1000 |
| 54 or larger | 2000 |

Indicate what the maximum spacing in this project will be for each proposed diameter of pipe.

Pipe Diameter: 8" Max. Spacing: 372' Pipe Diameter: _____ Max. Spacing: _____
Pipe Diameter: _____ Max. Spacing: _____ Pipe Diameter: _____ Max. Spacing: _____
Pipe Diameter: _____ Max. Spacing: _____ Pipe Diameter: _____ Max. Spacing: _____

T29) Do the maximum spacings for this project comply with the TCEQ's maximum manhole spacing requirements? Yes

Manholes - Ventilation: 30 TAC 317.2.(c)(5)(C)

T30) Provide the 100-year flood plain elevation for the project area(s): N/A

T31) On what basis was the 100-year flood plain elevation determined? N/A

T32) Manhole covers which lie within a 100 year flood plain must be sealed and gasketed or otherwise provided with adequate protection against inflow. Such measures should also be provided to any manholes lying in drainageways or streets subject to carrying drainage flows. Will this requirement be met?_____

Location in submittal: Plan sheet _____ Specifications page _____ Item No. _____

T33) If this project does not contain any sections of line with more than three manholes in sequence which are bolted and gasketed, or protected against inflow in some other fashion, skip to T34. Where more than three manholes in sequence are to be bolted and gasketed, every third manhole (or a maximum of every 1,500 feet) must be vented to a point above the 100 year flood plain elevation in a way that prevents stormwater inflow. Additionally, the plans should identify the nearest known flood plain elevation and indicate any manhole covers which are required to be sealed. Will these requirements be met?_____ Does this project solely protect against inflow with bolted and gasketed manholes?_____Describe ventilation provisions:

Location in submittal: Plan sheet _____ Specifications page _____ Item No. _____

Manholes - Minimizing Turbulence: 30 TAC 317.2.(c)(5)(E)

T34) Where unequal sized pipes enter a manhole, the crowns of the pipes should be at equal elevation where feasible and the manhole channel should slope evenly between pipe inverts. If relevant, have these principles been incorporated into the design (If not relevant to this project skip to T35)? _____

T35) Drop inlets must be provided for pipes entering a manhole at an elevation greater than 30 inches above the manhole invert. This requirement is especially important where force mains or inverted siphons discharge into the gravity collection system. Any required drops should be detailed in the project plan sheets. If relevant, have these requirements been specified (If not relevant skip to T36)? _____

Location in submittal: Plan sheet _____ Specifications page _____ Item No. _____

T36) Where sewer lines enter the manhole higher than 24 inches above the manhole invert, the invert shall be filleted to prevent solids deposition. A drop pipe should be provided for a sewer entering a manhole more than 30 inches above the invert. Any required fillets should be indicated in the project plans or profile drawings. If relevant, have these features been incorporated into the design (If not relevant skip to T37)? _____

T37) A U-shaped channel must be provided through the manhole base. For pipes less than 15 inches diameter, channel depth must be at least half the pipe diameter. For pipes greater than 15 inches but

less than 24 inches diameter, channel depth must be at least 3/4 the pipe diameter. For pipes greater than 24 inches diameter, channel depth must be at least equal to the pipe diameter. Has this principle been followed in the design? _____

T38) The manhole bench (base area outside the flow channel) must be sloped at least 0.5 inches per foot. Has this principle been followed in the design? _____

Inverted Siphons: 30 TAC 317.2.(c)(6)

T39) Inverted Siphons (sag pipes) can be a major source of corrosive activity due to anaerobic conditions. If the project does not include any sag pipes skip to T40. If the project includes sag pipes, have they been designed in accordance with section 317.2.(c)(6) of the Design Criteria?_____ Provide design assumptions and calculations which justify the design of the sag pipes and show that 317.2(c)(6) of the TCEQ's rules has been complied with:

Trenchless Technology: 30 TAC 317.2(a)(2)(A)

T40) If the project propose any trenchless installation of pipe (e.g. slip-lining; boring and jacking; or, microtunneling), please provide a brief description of the type of installation, design basis, and engineering justification of why the proposed method is appropriate for this project. If the project does not propose trenchless installation of pipe skip to T41:

Vertical Curvature: 30 TAC 317.2(c)(4)

T41) Vertical curvature between manholes is not allowed in gravity collection systems. Has this project been designed without the use of vertically curved gravity collection piping between manholes?_____

Horizontal Curvature: 30 TAC 317.2(c)(4)

T42) If this project does not contain any portions which include horizontally curved gravity sanitary sewer piping, skip to T57. Chapter 317 of the TCEQ's rules states "Sewers shall be laid in straight alignment with uniform grade between manholes unless slight deviations from straight alignment and uniform grade are justified to the satisfaction of the Executive Director." To clarify what constitutes justification to the satisfaction of the Executive Director, the TCEQ developed a horizontal curvature policy. The specifics

of this horizontal curvature policy are detailed in T43 through T56. If this project includes horizontally curved gravity sanitary sewer piping, complete the relevant portions of T43 through T56, then continue with T57. Has the amount of horizontal curvature which will be used in this design been minimized?_____

T43) Horizontal curvature must be either by joint deflection or pipe flexure, but not both. Indicate the method utilized:_____If horizontal curve will be provided by joint deflection skip to T46. If horizontal curvature will be provided by pipe flexure, for each type and size of pipe to be installed using pipe flexure, calculate the minimum radius of curvature which is proposed in this project and calculate a value for 300 * $D_o$, where $D_o$ is the average outside diameter of the pipe in inches.

T44) For each type of pipe material and for each pipe diameter, report the minimum radius of curvature recommended by the manufacturer, the minimum radius of curvature recommended by a national reference standard (if available), the minimum radius of curvature calculated in T43 and the value for 300*$D_o$ calculated in T43:

| | Pipe Material | Minimum Radius of Curvature Recommended by Manufacturer | Minimum Radius of Curvature Recommended by National Reference Standard (N/A if none) | Calculated Minimum Radius of Curvature | Value for 300*$D_o$ |
|---|---|---|---|---|---|
| **Pipe Diameter 1** | | | | | |
| **Pipe Diameter 2** | | | | | |
| **Pipe Diameter 3** | | | | | |
| **Pipe Diameter 4** | | | | | |
| **Pipe Diameter 5** | | | | | |

Use the back of this page and attachments if needed for long narrative answers or engineering calculations.

| Pipe Diameter 6 | | | | | |
|---|---|---|---|---|---|

T45) If curvature will be provided by pipe flexure, all joints must be installed fully seated. The specifications must describe how installation will be performed for curved sections. The minimum radius of curvature calculated cannot be less than the minimum radius of curvature recommended by the manufacturer or the minimum radius of curvature recommended by any applicable national reference standards. The minimum radius of curvature also should not be less than $300*D_o$. Will these requirements be met?_____

Location in submittal: Plan sheet _____ Specifications page _____ Item No. _____

T46) If the horizontal curvature in this project will not be provided by joint deflection, skip to T52. If the horizontal curvature in this project will be provided by joint deflection, calculate the joint deflection proposed for each pipe diameter:

T47) Report the maximum proposed joint deflection for each pipe diameter:

Pipe Diameter:_____ Maximum Proposed Joint Deflection:_____
Pipe Diameter:_____ Maximum Proposed Joint Deflection:_____
Pipe Diameter:_____ Maximum Proposed Joint Deflection:_____
Pipe Diameter:_____ Maximum Proposed Joint Deflection:_____
Pipe Diameter:_____ Maximum Proposed Joint Deflection:_____
Pipe Diameter:_____ Maximum Proposed Joint Deflection:_____

T48) Indicate manufacturer's maximum recommended joint deflection for pipe to be used and/or indicate maximum joint deflection recommended by the appropriate national reference standard (ASTM, AWWA, ANSI etc...) for pipe to be used:

a) Manufacturer's maximum recommended joint deflection (degrees):

Pipe Diameter:_____ Deflection:_____ Pipe Diameter:_____ Joint Deflection:_____
Pipe Diameter:_____ Deflection:_____ Pipe Diameter:_____ Joint Deflection:_____
Pipe Diameter:_____ Deflection:_____ Pipe Diameter:_____ Joint Deflection:_____

b) National Reference Standard maximum recommended joint deflection (degrees):

Pipe Diameter:_____ Deflection:_____ Pipe Diameter:_____ Joint Deflection:_____
Pipe Diameter:_____ Deflection:_____ Pipe Diameter:_____ Joint Deflection:_____
Pipe Diameter:_____ Deflection:_____ Pipe Diameter:_____ Joint Deflection:_____

T49) The maximum allowable joint deflection allowed by the TCEQ's horizontal curvature policy is equal to the lesser of 5 degrees, **or** 80% of T48(a) **or** 80% of T48(b). Indicate the maximum allowable joint deflection for each pipe diameter:

Pipe Diameter:_____ Max. Allowable Joint Deflection:_____ Max. Joint Deflection for Project:_____
Pipe Diameter:_____Max. Allowable Joint Deflection:_____Max. Joint Deflection for Project:_____
Pipe Diameter:_____Max. Allowable Joint Deflection:_____Max. Joint Deflection for Project:_____
Pipe Diameter:_____Max. Allowable Joint Deflection:_____Max. Joint Deflection for Project:_____
Pipe Diameter:_____Max. Allowable Joint Deflection:_____Max. Joint Deflection for Project:_____
Pipe Diameter:_____Max. Allowable Joint Deflection:_____Max. Joint Deflection for Project:_____

T50) If the proposed joint deflection, for any individual portion of pipe, as calculated in T46 is greater than the maximum allowable joint deflection as determined in T49 for that same portion of pipe, the proposed curvature will not be approved by TCEQ. Does the proposed horizontal curvature comply with TCEQ policy as outlined in T43 through T49 above?_____

T51) Curved lines constructed using joint deflection must be tested for deflection with a mandrel sized to verify that the design maximum joint deflection is not exceeded. Has this test been specified?_____

Location in submittal: Plan sheet _____ Specifications page _____ Item No. _____

T52) For each size of pipe which will be installed with horizontal curvature, indicate the minimum slope.

Pipe Diameter:_____ Min. Slope:_____ Pipe Diameter:_____ Min. Slope:_____
Pipe Diameter:_____ Min. Slope:_____ Pipe Diameter:_____ Min. Slope:_____
Pipe Diameter:_____ Min. Slope:_____ Pipe Diameter:_____ Min. Slope:_____

T53) All curved sections of gravity line must be installed at a minimum slope at least 3% greater than the corresponding minimum slope for straight lines. Do the slopes in T52 comply with this requirement?

_____

T54) Maximum allowable manhole spacing for sections of pipe with horizontal curvature is 300 feet. Has this requirement been met in the design? _____

T55) Manholes should be provided at PC and PT of horizontal curves. Does the design include such provisions? _____

T56) Trench excavation must match the radius of curvature of the installed pipe, with the pipe laid in the center of the trench. Has this requirement been incorporated into the design and detailed in the specifications? _____

Location in submittal: Plan sheet _____ Specifications page _____ Item No. _____

Reduction of Inflow: 30 TAC 317.2(a)(8)

T57) TCEQ rules do not allow combined sewers. Has the project been designed to preclude or eliminate any connections of storm drains, roof drains, etc... to the sanitary sewer? _____

T58) If storm drainage facilities are proposed for construction in conjunction with this project, were these designed to prevent storm water from entering the sanitary sewer? _____

T59) Please indicate the design storm return period for the storm sewer, if applicable: _____

## Rigid Pipe Design

General Requirements: 30 TAC 317.2(a)(2)(B)

T60) If the project does not specify an option to use rigid pipe, skip to T61. If the project specifies an option to use rigid pipe, please provide an engineering analysis which shows that the rigid pipe design will be adequate to withstand the applied loads expected from the proposed installation. Consideration should be given to trench width, depth of cover, effect of water table elevation on the rigid pipe, etc. Please indicate the maximum burial depth or applied load for each diameter and type of pipe material and the corresponding minimum strength properties or allowable depth of installation as specified in the appropriate national reference standard, or as specified by the pipe manufacturer.

## Flexible Pipe Design

T61) If the project specifies an option to use flexible pipe materials, complete T62 through T87. If the project does not specify an option to use flexible pipe materials, skip to T89.

Live Load Analysis: 30 TAC 317.2(a)(2)(A)

T62) For the purposes of this application, the minimum depth of burial for gravity sanitary sewer pipe, from the ground surface to the crown of the pipe (H) is 2 feet. Does the submitted design comply with this minimum H? Yes

T63) If all pipe proposed for this project will be installed at a burial depth of greater than or equal to 3.0 feet and the pipe will not be subjected to live loads greater than 18 kip axle, assume that the pressure due to live load ($L_l$) = 0 and skip to T68. If a value of H greater than or equal to 2 feet and less than 3 feet is proposed for any portions of the gravity sanitary sewer pipeline or if the pipe will be subjected to live loads greater than 18 kip axle, calculations which quantify what the $L_l$ on the pipe will be must be provided:

T64) Indicate minimum H: _____

T65) Indicate maximum anticipated $L_l$ as determined in T63: _____

T66) Are all proposed flexible pipe materials capable of supporting this $L_l$?_____

T67) Indicate source of maximum $L_l$:_____

Buckling Analysis: 30 TAC 317.2(a)(2)(A)

T68) Calculate allowable and predicted buckling pressure. Predicted and allowable buckling pressures must be calculated for each size of pipe and type of flexible pipe material. For the purposes of this application form, the buckling analysis must be performed using the method outlined below. The method of calculating allowable buckling pressure provided below is only valid for lines which are installed at depths of 2 ft ≤ H ≤ 80 feet.

a) Calculate allowable bucking pressure as follows:

$$q_a = 0.4 * \sqrt[2]{32 * R_w * B' * E_b * (E * I / D^3)}$$ **Equation (1)**

$$R_w = 1 - 0.33 * (h_w / h)$$ **Equation (2)**

$$B' = \frac{1}{1 + 4 * e^{-0.065H}}$$ **Equation (3)**

$$I = (t^3/12) * (inches^4/Linch)$$ **Equation (4)**

$q_a$ = allowable buckling pressure, pounds per square inch (psi)

h = height of soil surface above top of pipe in inches (in)

$h_w$ = height of water surface above top of pipe in inches (in) (groundwater elevation)

$R_w$ = Water buoyancy factor. If $h_w = 0$, $R_w = 1$. If $0 \leq h_w \leq h$ (groundwater elevation is between the top of the pipe and the ground surface), calculate $R_w$ with Equation 2

H = Depth of burial in feet (ft) from ground surface to crown of pipe. (4')

B' = Empirical coefficient of elastic support

$E_b$ = modulus of soil reaction for the bedding material (psi)

E = modulus of elasticity of the pipe material (psi)

I = moment of inertia of the pipe wall cross section per linear inch of pipe, $inch^4$/lineal inch = $inch^3$. For solid wall pipe, I can be calculated with equation 4. If the pipe used is not solid wall pipe (for example a pipe with a ribbed cross section), the proper moment of inertia formula must be obtained from the manufacturer.

t = pipe structural wall thickness (in)

D = mean pipe diameter (in)

b) Calculate pressure applied to pipe under installed conditions:

$$q_p = \gamma_w * h_w * R_w * (W_c/D) * L_f$$ **Equation (5)**

$$W_c = \gamma_s * H * (D + t)/144$$ **Equation (6)**

$q_p$ = pressure applied to pipe under installed conditions (psi)

$\gamma_w$ = 0.0361 pounds per cubic inch (pci), specific weight of water

$\gamma_s$ = specific weight of soil in pounds per cubic foot (pcf)

$W_c$ = vertical soil load on the pipe per unit length in pounds per linear inch (lb/in)

$L_l$ = Live load as determined in T63

(SEE ATTACHED)

T69) Report $q_a$ and $q_p$ for each pipe diameter proposed and for each type of pipe material proposed:

| | | | |
|---|---|---|---|
| Pipe Diameter:_____ | Pipe Material:_____ | $q_a$:_____ | $q_p$:_____ |
| Pipe Diameter:_____ | Pipe Material:_____ | $q_a$:_____ | $q_p$:_____ |
| Pipe Diameter:_____ | Pipe Material:_____ | $q_a$:_____ | $q_p$:_____ |
| Pipe Diameter:_____ | Pipe Material:_____ | $q_a$:_____ | $q_p$:_____ |
| Pipe Diameter:_____ | Pipe Material:_____ | $q_a$:_____ | $q_p$:_____ |
| Pipe Diameter:_____ | Pipe Material:_____ | $q_a$:_____ | $q_p$_____ |

T70) If $q_a \geq q_p$, specified pipe is acceptable for the proposed installation. If $q_a \leq q_p$, the wall thickness of the pipe must be increased and/or a pipe with a larger modulus of elasticity (E) must be used. Make the appropriate modifications and repeat the buckling analysis, showing that for the upgraded pipe, $q_a \geq q_p$. Does all the pipe proposed for this project meet these requirements?_____

Wall Crushing: 30 TAC 317.2(a)(2)(A)

T71) If no concrete encased flexible pipe is proposed for the submitted project, skip to T73. If any flexible pipe will be installed in rigid encasement (e.g. concrete), calculate the maximum depth that the pipe can be buried before wall crushing (or failure by ring compression) will occur using the method outlined below. It should be noted that cement stabilized sand or soil is not considered a rigid encasement for purposes of TCEQ review:

$$H=(24*P_c*A)/(\gamma_s*D_o) \qquad \textbf{Equation (7)}$$

$D_o$ = outside pipe diameter, in.

$P_c$ = compressive stress or hydrostatic design basis (HDB). For typical PVC pipe assume 4,000 psi. For any other pipe material the HDB must be supplied by the pipe manufacturer.

A = surface area of the pipe wall, $in.^2/ft$

$\gamma_s$ = specific weight of soil in pounds per cubic foot (pcf)

H = Depth of burial in feet (ft) from ground surface to crown of pipe.

24 = conversions and coefficients

T72) Will all pipe installations proposed for this project have an H less than or equal to the maximum allowable H calculated in T71 and greater than or equal to 2 feet?_____ Report maximum allowable H, ($H_a$), and the maximum H which is proposed, ($H_p$), for each proposed pipe diameter and each type of flexible pipe material.

| | | | |
|---|---|---|---|
| Pipe Diameter:_____ | Pipe Material:_____ | $H_a$:_____ | $H_p$:_____ |
| Pipe Diameter:_____ | Pipe Material:_____ | $H_a$:_____ | $H_p$:_____ |
| Pipe Diameter:_____ | Pipe Material:_____ | $H_a$:_____ | $H_p$:_____ |
| Pipe Diameter:_____ | Pipe Material:_____ | $H_a$:_____ | $H_p$:_____ |
| Pipe Diameter:_____ | Pipe Material:_____ | $H_a$:_____ | $H_p$:_____ |
| Pipe Diameter:_____ | Pipe Material:_____ | $H_a$:_____ | $H_p$:_____ |

Installation Temperature Effects: 30 TAC 317.2(a)(2)(A)

T73) If flexible pipe will be installed under favorable ambient temperature conditions, skip to T74. If flexible pipe will be installed under very high or low ambient temperature conditions, please indicate provisions

for handling which will protect the pipe and ensure an adequate installation:

Location in submittal: Plan sheet _____ Specifications page _____ Item No. _____

Tensile Strength: 30 TAC Sections 317.2.(a)(2)(A), 317.2.(a)(5)

T74) The project specifications need to indicate minimum allowable tensile **strength** in psi for each flexible pipe material. If PVC pipe is proposed, specify cell class:

Pipe Material: PVC Tensile Strength: 7600psi Cell Class (PVC only): 12354
Pipe Material:_____ Tensile Strength:_____ Cell Class (PVC only):_____
Pipe Material:_____ Tensile Strength:_____ Cell Class (PVC only):_____
Pipe Material:_____ Tensile Strength:_____ Cell Class (PVC only):_____

Location in submittal: Plan sheet _____ Specifications page _____ Item No. _____

Strain: TAC 30 Section 317.2.(a)(2)(A)

T75) Are the conditions of this installation such that strain-related failure will not be a problem? Yes If any proposed flexible pipe material is considered to be susceptible to strain-related failure at less than 5% long-term deflection provide analysis for predicted strain due to hoop stress and bending strain. If strain-related failure will not be a problem for the pipe installation proposed in this project, skip to T76.:

Deflection Analysis: 30 TAC 317.2(a)(2)(A)

T76) Indicate $E_b$ (modulus of soil reaction for the bedding material) in psi. If $E_b$ is greater than 750 psi, justification must be provided.: 1000 psi

How was $E_b$ determined or estimated?
SAWS SPEC 804.4

T77) Indicate $E'_n$ (modulus of soil reaction for the in-situ soil) in psi: 3,000 psi

How was $E'_n$ determined or estimated?

T78) Based on T76 and T77, above, calculate the ratio of bedding modulus to soil modulus:

$E_b/E'_n$ = 0.33

If this ratio is greater than 1.25, a zeta factor must be calculated by completing T79 and T80, where zeta is a factor which corrects for the effect of in-situ soil on pipe stability. If the ratio of bedding modulus to soil modulus is less than or equal to 1.25, assume zeta = 1.0 and skip to T80.

T79) Where native soil is significantly weaker than bedding material, or where predicted deflection approaches 5%, the effect of native soil must be quantified using Leonhardt's Zeta factor. Zeta must be determined for each diameter of pipe and corresponding trench width. Zeta may be estimated graphically or calculated directly. If zeta is estimated graphically, identify the source for tables, figures, etc...(including page numbers and table numbers or figure numbers for each source) which were used to estimate zeta. To calculate zeta directly use the formulas in T79(b), below. The calculations which are done to determine the zeta factors for the different pipe diameters must be included with this submittal.

(a) Sources:

(b) Calculations:

$$zeta = \frac{1.44}{f + (1.44 - f) * (E_b / E_n')}$$ **Equation (8)**

$$f = \frac{b/d_a - 1}{1.154 + 0.444 * (b/d_a - 1)}$$ **Equation (9)**

f = pipe/trench width coefficient

b = trench width

$d_a$ = pipe diameter

$E_b$ = modulus of soil reaction for the bedding material (psi)

$E'_n$ = modulus of soil reaction for the in-situ soil (psi)

T80) For each size of pipe, report zeta factor determined in T78 or T79:

| | | | | | |
|---|---|---|---|---|---|
| Pipe Diameter: | 8" | Trench Width: | 27" | Zeta: | 1.0 |
| Pipe Diameter: | | Trench Width: | | Zeta: | |
| Pipe Diameter: | | Trench Width: | | Zeta: | |
| Pipe Diameter: | | Trench Width: | | Zeta: | |
| Pipe Diameter: | | Trench Width: | | Zeta: | |
| Pipe Diameter: | | Trench Width: | | Zeta: | |

T81) Determine pipe stiffness ($P_s$) in psi. $P_s$ can be determined either by parallel plate test at 5% deflection, based on manufacturer's data or national reference standards; or, calculated using either equation 10 or equation 11. As an example, the minimum pipe stiffness at 5% deflection for PVC pipe less than 15 inches in diameter meeting ASTM D 3034, is 46 psi for SDR-35 and 115 psi for SDR 26. If equation 11 is used, the ring stiffness constant (RSC) is provided by the pipe manufacturer. Show calculations, or provide proper references, for each size of pipe and for each flexible pipe material.

$$P_s = \frac{EI}{0.149 * r^3}$$ **Equation (10)**

or

$$P_s = 0.80 * RSC * (8.337/D)$$ **Equation (11)**

Use the back of this page and attachments if needed for long narrative answers or engineering calculations.

E = modulus of elasticity of the pipe material (psi)

I = moment of inertia of the pipe wall cross section per linear inch of pipe, $inch^4$/lineal inch = $inch^3$. For solid wall pipe, I can be calculated with equation 4. If the pipe used is not solid wall pipe (for example a pipe with a ribbed cross section), the proper moment of inertia formula must be obtained from the manufacturer.

D = mean pipe diameter (in)

r = mean radius (in)

T82) Report $P_s$ for each pipe size and each type of flexible pipe material as determined in T81.

Pipe Diameter:_____ Pipe Material:_____ $P_s$:_____
Pipe Diameter:_____ Pipe Material:_____ $P_s$:_____
Pipe Diameter:_____ Pipe Material:_____ $P_s$:_____
Pipe Diameter:_____ Pipe Material:_____ $P_s$:_____
Pipe Diameter:_____ Pipe Material:_____ $P_s$:_____
Pipe Diameter:_____ Pipe Material:_____ $P_s$:_____

T83) Because the terms in the denominator of the modified Iowa formula (Equation 13) are added, it is theoretically possible to have zero pipe stiffness ($P_s=0$) and still predict flexible pipe deflections less than 5%. In order to ensure that the stiffness being provided to the installation has a reasonable contribution from pipe stiffness, and does not rely solely on the stiffness provided by the soil stiffness factor (SSF), the ratio of $P_s$/SSF must be calculated. If $P_s$/SSF < 0.15, T81 and T82 must be repeated such that a higher stiffness pipe is chosen for each portion of the project where $P_s$/SSF < 0.15. The $P_s$/SSF ratio(s) must then be recalculated for the new higher stiffness pipe. This process must be repeated until $P_s$/SSF ≥ 0.15 exists for all proposed pipe sizes and for all types of flexible pipe materials.

$$\frac{P_s}{SSF} = \frac{P_s}{0.061 * zeta * E_b} \geq 0.15 \qquad \textbf{Equation (12)}$$

$P_s$ = Pipe stiffness (psi) [from T82]

$E_b$ = modulus of soil reaction for the bedding material (psi) [from T76]

zeta = 1.0, or a value calculated with the method in T79

SSF = soil stiffness factor ($0.061 * zeta * E_b$)

T84) Indicate the final values calculated for $P_s$/SSF for each diameter of pipe and for each pipe material:

| | | |
|---|---|---|
| Pipe Diameter:_____ | Pipe Material:_____ | $P_s$/SSF:_____ |
| Pipe Diameter:_____ | Pipe Material:_____ | $P_s$/SSF:_____ |
| Pipe Diameter:_____ | Pipe Material:_____ | $P_s$/SSF:_____ |
| Pipe Diameter:_____ | Pipe Material:_____ | $P_s$/SSF:_____ |
| Pipe Diameter:_____ | Pipe Material:_____ | $P_s$/SSF:_____ |
| Pipe Diameter:_____ | Pipe Material:_____ | $P_s$/SSF:_____ |

T85) Do all proposed pipe sizes and flexible pipe materials have a pipe stiffness to soil stiffness factor ratio of greater than or equal to 0.15?_____

T86) Calculate and report predicted deflection. Predicted deflection must be calculated for each size of pipe and type of flexible pipe material. For the purposes of this application form, predicted deflection must be calculated using the method outlined below. Show calculations and report calculated maximum deflection for each size of pipe and type of flexible pipe material. Maximum allowable deflection in installed lines is 5%, as determined by the deflection analysis and verified by a mandrel test conforming to T89. Some conservatism should be employed in determining allowable predicted deflections. This conservatism is necessary to allow for variability in the quality of installation.

$$\Delta Y/D(\%) = \frac{K * (L_p + L_l) * 100}{(0.149 * P_s) + (0.061 * zeta * E_b)}$$ **Equation (13)**

$$L_p = \frac{\gamma_s * H}{144}$$ **Equation (14)**

%ΔY/D = Predicted % vertical deflection under load.

ΔY = Change in vertical pipe diameter under load

D = Undeflected mean pipe diameter (in)

K = Bedding angle constant. Assumed to be 0.110 unless otherwise justified.

$\gamma_s$ = Unit weight of soil (pcf). $\gamma_s$ less than 120 pcf must be justified.

H = Depth of burial (ft) from ground surface to crown of pipe.

$L_p$ = Prism load (psi). If prism load is calculated using Marston's load formula, or other formulas less conservative than the one provided above, the load should be multiplied by a deflection lag factor $D_L$ = 1.5 to account for long-term deflection of the pipe as the bedding consolidates.

($P_s$ from T82; *zeta* from T80; and $E_b$ from T76)

★ If the predicted %ΔY/D for any proposed pipe size or material is over 5%, the proposed flexible pipe design cannot be approved by the TCEQ. Appropriate design modifications must be made and the analysis must be repeated until a deflection of less than or equal to 5% is predicted.

★ If a zeta value of 1.0 was assumed as a result of T78, and the predicted deflection for any size or type of pipe is determined to be between 4% and 5%, the deflection analysis must be repeated. Repeat the deflection analysis by performing all the same calculations. The difference will be that instead of using an assumed zeta factor of 1.0, the zeta factor must be calculated as outlined in T79. If the predicted deflection is determined to be above 5% after the deflection analysis is repeated, this flexible pipe design cannot be approved by the TCEQ. Appropriate design modifications must be made and the analysis must be repeated until a deflection of less than or equal to 5% is predicted.

★ If the predicted deflection, for a particular pipe, using the deflection analysis method detailed above, is less than or equal to 4%, and a zeta factor of 1.0 was assumed as a result of T78, that particular pipe is assumed to comply with the TCEQ's requirements for deflection analysis and can therefore be approved.

★ If the predicted deflection, for a particular pipe, using the deflection analysis method detailed above, is between 4% and 5%, and the zeta factor which was used in the analysis was determined using the method in T79, that particular pipe is assumed to comply with the TCEQ's requirements for deflection analysis and can therefore be approved.

T87) Report the final pipe diameters, types of pipe material proposed for each diameter, type of pipe material, pipe stiffness for each pipe material ($P_s$), zeta factors assumed or calculated for each pipe diameter, modulus of the pipe bedding material ($E_b$) and % deflection predicted for each pipe size and type of pipe material.

| | Type of Pipe Material | $P_s$ (psi) [T82] | Zeta Factor Assumed or Calculated [T80] | $E_b$ (psi) [T76] | % Deflection [T86] |
|---|---|---|---|---|---|
| **Pipe Diameter 1** | PVC | 115 | 1.0 | 1000 | 3.37 MAX |
| **Pipe Diameter 2** | | | | | |
| **Pipe Diameter 3** | | | | | |

Use the back of this page and attachments if needed for long narrative answers or engineering calculations.

| | | | | | |
|---|---|---|---|---|---|
| **Pipe Diameter 4** | | | | | |
| **Pipe Diameter 5** | | | | | |
| **Pipe Diameter 6** | | | | | |

T88) Do all pipes proposed for this project have a maximum predicted deflection of 5.0%? YES

**Miscellaneous Requirements**

Testing, Inspection, and Certification: 30 TAC Sections 317.2.(a)(1), 317.2.(a)(4)(A)&(B), 317.2(a)(4)(C), 317.2.(c)(5)(H)

T89) All gravity lines utilizing flexible pipe must be tested for deflection by pulling a rigid mandrel through the installed pipe. The test must be conducted at least 30 days after placement and compaction of final backfill. No pipe shall exceed a deflection of 5%. A rigid mandrel shall be used to measure deflection. The test must be performed without mechanical pulling devices. The mandrel's minimum outside diameter is 95% of the pipe inside diameter. The mandrel must have an odd number of runners, totaling nine or more. The barrel section of the mandrel must have a length at least 75% of the pipe inside diameter. A TV test cannot substitute for the deflection test. Will these requirements be met? YES

Location in submittal: Plan sheet _____ Specifications page _____ Item No. _____

T90) A professional engineer registered in the State of Texas must certify that the entire installation passed the required deflection test. This certification may be made in conjunction with the notice of completion required in section 317.1.(e)(1). Will these requirements be met? YES

T91) A leakage test is required for all gravity lines. For line that is not horizontally curved, a hydrostatic test and/or a low pressure air test must be performed on all proposed gravity sanitary sewer collection piping. These tests must comply with Section 317.2(a)(4) of the TCEQ's rules. All sections of horizontally curved line must be subjected to a hydrostatic leakage test conforming to the requirements of Section 317.2.(a)(4)(A) of the Design Criteria, with a maximum allowable leakage of 10 gallons/inch diameter/mile/day. Do all leakage tests proposed for this project comply with these leakage test requirements of 317.2(a)(4)? YES Which leakage test will be used? HYDROSTATIC.

Location in submittal: Plan sheet _____ Specifications page _____ Item No. _____

T92) Manholes must be tested for leakage. If manholes will be tested with a hydrostatic test, answer T93, then skip to T102. If manholes will be tested with a vacuum test, answer T94 through T101 and continue with T102. If project specifications allow either a hydrostatic test and/or a vacuum test, answer T93 through T101 and continue with T102. How will manholes be tested? HYDROSTATIC

T93) Does the hydrostatic manhole test proposed for the manholes in this project comply with the test requirements detailed in Section 317.2(c)(5)(H) of the TCEQ's rules? YES

Location in submittal: Plan sheet _____ Specifications page _____ Item No. _____

T94) Each manhole shall be tested immediately after assembly and prior to backfilling. Manholes which have been backfilled shall either be excavated to expose the entire exterior prior to vacuum testing or the manhole shall be tested for leakage by means of a hydrostatic test. Will this requirement be met?_____

Location in submittal: Plan sheet _____ Specifications page _____ Item No. _____

T95) All lift holes and exterior joints shall be plugged with an approved non-shrink grout. Will this requirement be met?_____

Location in submittal: Plan sheet _____ Specifications page _____ Item No. _____

T96) No grout shall be placed in horizontal joints before testing. Will this requirement be met?_____

Location in submittal: Plan sheet _____ Specifications page _____ Item No. _____

T97) All pipes entering the manhole shall be plugged, taking care to securely brace the plugs from being drawn into the manhole. Will this requirement be met?_____

Location in submittal: Plan sheet _____ Specifications page _____ Item No. _____

T98) Stubouts, manhole boots and pipe plugs shall be secured to prevent movement while the vacuum is drawn. Will this requirement be met?_____

Location in submittal: Plan sheet _____ Specifications page _____ Item No. _____

T99) A minimum 60-inch/lb torque wrench shall be used to tighten the external clamps that secure the test cover to the top of the manhole. Will this requirement be met?_____

Location in submittal: Plan sheet _____ Specifications page _____ Item No. _____

T100) The test head shall be placed at the inside of the top of the cone section and the seal inflated in accordance with the manufacturer's recommendation. Will this requirement be met?_____

Location in submittal: Plan sheet _____ Specifications page _____ Item No. _____

T101) A vacuum of 10 inches of mercury shall be drawn and the vacuum pump shut off. With the valves closed, the time shall be measured for the vacuum to drop to 9 inches of mercury. The manhole shall pass if the time is greater than 2 minutes. If the manhole fails the initial test, necessary repairs shall be made with a non-shrink grout while the vacuum is still being drawn. If the manhole fails a second time, repairs should again be made and the manhole shall be tested by means of a hydrostatic test which complies with Section 317.2(c)(5)(H) of the TCEQ's rules. If any manhole fails the hydrostatic test, after failing the vacuum test twice, the contractor should consider replacing that manhole. If the contractor chooses to attempt to repair that manhole, the manhole must be retested by means of the hydrostatic test outlined in Section 317.2(c)(5)(H) of the TCEQ's rules, until it passes. Will these requirements be satisfied?_____

Location in submittal: Plan sheet _____ Specifications page _____ Item No. _____

T102) Inspection must be provided during critical phases of construction by a qualified inspector under the direction of a P.E. Critical phases of construction are deemed at a minimum to include testing of pipe and manholes for leakage, and testing of flexible pipe for installed deflection. Do the project plans or specifications define the scope of inspection, and indicate who (owner, design engineer, project manager, etc...) will assume this responsibility? YES

Location in submittal: Plan sheet _____ Specifications page _____ Item No. _____

T103) TCEQ approval letters for plans and specifications review contain the requirement that once the project is completed, a P.E. registered in the state of Texas must certify that the construction was performed substantially in accordance with the approved plans and specifications. If flexible pipe was installed, a P.E. must also certify that all pipe was subjected to and passed the required deflection test. Will these requirements be met? YES

T104) Indicate who (owner, design engineer, project manager, etc...) will certify the installation:

Name: ALEX ZERTUCHE Project Relation: PROJECT MANAGER

Location in submittal: Plan sheet _____ Specifications page _____ Item No. _____

Occupational Safety, Public Health, and Environmental Protection: TAC 30 317.2.(a)(7), 317.13, 317.2.(a)(8) 317.2.(c)(5)(D), 317.2(c)(5)(E), 317.2(c)(F)

T105) The project plans and specifications must ensure that the pipe installation will adhere to the minimum separation distances allowed by 317.13, Appendix E of the TCEQ's rules. Additionally, the project plans or specifications should include language (preferably an exact reproduction of the separation distance wording detailed in Section 317.13 (Appendix E) of the Design Criteria) which ensures that the separation distance between any unknown water lines which are discovered during the installation phase of the project, and, the gravity sanitary sewer pipe which will be installed, will be sufficient to comply with the minimum separation distances allowed by 317.13, Appendix E, of the TCEQ's rules. Will the requirements of 317.13, Appendix E, been met? YES

Location in submittal: Plan sheet _____ Specifications page _____ Item No. _____

T106) Briefly describe provisions to control erosion or sedimentation due to runoff during construction of the project. Additional information may be required by the TCEQ on a case by case basis:

Location in submittal: Plan sheet _____ Specifications page _____ Item No. _____

T107) If the project site does not contain any water wells, springs, surface water sources of potable water, or potable water storage facilities, skip to T108. If the project site does contain any water wells, springs,

surface water sources of potable water, or potable water storage facilities, does the design conform to and include any applicable sections of 30 TAC Chapter 290, Rules and Regulations for Public Water Systems?_____

T108) If an air gap is required for the project, is the project designed with a minimum 18 inch air gap between the elevation of all potable water outlets and the maximum water surface elevation of any nearby sewer appurtenances? _____ If no air gap is required for this project, skip to T109.

Occupational Safety: 30 TAC Sections

T109) Are all manhole base sections at least 48 inches in diameter? YES

T110) Are all manhole covers at least 24 inches nominal diameter? YES

T111) For purposes of this application, **the use of manhole steps to access manholes for maintenance purposes will not be approved by the TCEQ!** Please indicate how manholes will be accessed if a manhole is in need of maintenance.

Location in submittal: Plan sheet _____ Specifications page _____ Item No. _____

T112) Personal gas detectors are required for wear by all personnel whose jobs require entering enclosed spaces (such as manholes and lift stations) capable of having accumulations of hydrogen sulfide or other harmful gases. Please indicate who is responsible for ensuring that these detectors are provided to the appropriate personnel.

Location in submittal: Plan sheet _____ Specifications page _____ Item No. _____

**T113) If you answered no to any of the items in this application you may need to obtain a variance from those items in accordance with Section 317.1(f) of the TCEQ's rules. Section 317.1(f) of the TCEQ's rules states, "Variance. A variance from the design criteria herein may be granted by the commission if the variance would not result in an unreasonable risk to treatment plant performance, public health or the waters in the state. Requests for variances must be submitted in writing by the design engineer and must, for each affected item, include a detailed engineering justification." List each item to which you answered no below. For each item which had a no answer, provide an engineering justification which addresses the requirements of 317.1(f). The TCEQ review engineer will determine whether or not a variance is needed. If a variance is needed, the TCEQ review engineer will determine whether or not sufficient engineering justification to comply with 317.1(f) has been provided to warrant granting a variance.**

**In order for this document to be valid, the professional engineer responsible for the completion of this application form must certify that all the information provided in this application and in the accompanying set of plans and specifications show full compliance with the requirements of Chapter 317 of the TCEQ's rules, unless a variance from Chapter 317 is being requested, and the professional engineer responsible for this application form provides the needed justification for the**

variance. Additionally, the professional engineer responsible for completing this application must certify that all portions of the application, which were relevant to the project, were filled out as completely as possible, and that all supporting calculations and engineering analyses requested in this application were performed. These calculations shall show that the proposed design complies with Chapter 317. By affixing a Texas registered professional engineer's seal to this document, below, that professional engineer certifies the compliance requirements described in this item (item T113) have been met.

Signature, Seal and Date of the Texas Professional Engineer who is certifying that item T113 has been complied with:

APPLICATION PREPARED BY:




6/4/08

FLEXABLE PIPE COMPUTATIONS

The following computations are for 8-inch diameter PVC SDR 26 pipe. This pipe will be used for gravity sewer system ranging in depth from 3 to 15 feet. The calculations follow items T62 through T87 of the Wastewater Permits Section.

Pipe Characteristics (SDR 26 Pipe)

1. Average depth of cover (6'-24')
2. Outside Pipe Diameter (8.4"= 0.70')
3. Pipe Wall Thickness (0.323"), t
4. Mean Pipe Diameter (8.077)
5. Trench Width, (2.7') approximate
6. Modulus of Elasticity, E (400,000 psi)
7. Pipe Stiffness, (115 psi)
8. Back fill weight, W (143 psi)

T62) *Minimum depth of cover for gravity sanitary sewer pipe must be greater than 2 feet.*

Depth of cover is greater than the minimum 2 feet requirement. Calculations will be performed for depths ranging from 6' to 24'.

T63) *Live Load Calculations*

Depth of cover is greater than 6 feet and proposed sewer line is located within a residential subdivision, therefore live loads shall not exceed H20. At a depth of 6 feet H20 live load is equal to 4.17 psi.

T64) *Indicate minimum H*

Minimum depth of cover (H) for calculations is 6 feet.

T65) *Indicate maximum anticipated Live Load.*

Maximum Live Load is 1.39 psi at 6 feet of cover.
(Uni-Bell Handbook of PVC Pipe)

T66) *Are all proposed flexible pipe materials capable of supporting this Live Load?*

Yes, see deflection listed in T87.

T67) *Indicate the source of maximum Live Load.*

A Truck with a H20 rating, 32 kip rear axle load.

T68) *Calculate allowable and predicted buckling pressure.*

A. Allowable buckling pressure.
Step 1. Calculate Moment of Inertia.

$I = (t^3/12)$ in units of inches$^4$/linear inch

$I = 0.323^3/12 =$ **0.002808in$^4$/in**

Step 2. Calculate B', an empirical coefficient of elastic support. The cover height of 22 feet is the worst case and will be used in the buckling calculation.

$B' = 1/(1+4*e^{-0.065(H)})$

$B' = 1/(1+4*e^{-0.065(24)}) =$ **0.5433**

Step 3. Calculate $R_w$, the water buoyancy factor. The worst case occurs when groundwater height above the pipe equals the height of cover. This is the case that is calculated.

$R_w = 1-(0.33*h_w)/h$

$R_w = 1-(0.33*288)/288 =$ **0.67**

Step 4. Calculate $q_a$, the allowable buckling pressure.

$q_a = 0.4*(32*R_w*B'*E_b*(EI/D^3))^{1/2}$

$q_a = 0.4*(32*0.67*0.5433*1000*(400{,}000*0.002808/8.077^3))^{1/2} =$ **63.03 psi**

*$E_b$ is defined in question T86

B. Calculate pressure applied to pipe under installed conditions.

Step 1. Calculate $W_c$, vertical soil load on pipe.

$W_c = \gamma_s*H*((D+t)/144)$

$W_c = 143*24*((8.077+0.323)/144) =$ **200 lb/in**

Step 2. Calculate $q_p$, pressure applied to pipe under installed conditions.

$q_p = \gamma_w * h_w + R_w * (W_c/D) + L_L$

$q_p = 0.0361 * 24 + 0.67 * (200/8.077) + 0 =$ **17.46 psi**

T69) *Report $q_a$ and $q_p$ for each pipe diameter and pipe material proposed.*

Outside Pipe Diameter = 8.4", Pipe Material = PVC SDR 26, $q_a$ = 63.03 psi, $q_p$=17.46 psi

T70) If $q_a > q_p$, specified pipe is acceptable for the proposed installation.

Since $q_a > q_p$, buckling requirements are met.

T71) If no concrete encased flexible pipe is proposed for the submitted project, skip to T73.

No concrete encasement is being considered.

T73) *If flexible pipe will be installed under favorable ambient temperature conditions, skip to T74. If a flexible pipe will be installed under very high or low ambient temperature conditions, indicate provisions for handling which will protect the pipe and ensure an adequate installation.*

The PVC pipe will be installed using recommended installation practices. Following recommended installation practices will ensure adequate installation for normal installation temperatures

T74) *The project specifications need to indicate minimum allowable tensile strength for each flexible pipe material. If PVC pipe is proposed, specify cell class.*

Pipe Material: PVC, Tensile Strength > 6,000 psi, Cell Class (PVC only) 12354

T75) *Are the conditions of this installation such that strain-related failure will not be a problem? If any flexible pipe material is considered to be susceptible to strain-related failure at less than 5% long-term deflection provide analysis for predicted strain due to hoop stress and bending strain. If strain-related failure will not be a problem for the pipe installation proposed in the project, skip to T76.*

Strain is not a design limiting criterion for PVC pipe.

T76) *Indicate $E_b$ (modulus of soil reaction for the bedding material) in psi. If $E_b$ is greater than 750 psi, justification must be provided.*

*How was $E_b$ determined or estimated?*

$E_b$ = 0 psi (for Fine-grained Soils (LL > 50)[b] Soils with medium to high plasticity CH, MH, CH-MH)

$E_b$ = 1000 psi (for crushed rock dumped) as specified in SAWS spec 804.4 for sewer pipe bedding

T77) *Indicate $E_n$ (modulus of soil reaction for the in-situ material) in psi.*

$E_n$ = 3,000 psi, This was determined by subsurface investigation. The soil is solid limestone.

T78) *Based on T76 and T77, above, calculate the ratio of bedding modulus to soil modulus:*

$E_b/E_n$ =

*If this ratio is greater than 1.25, a zeta factor must be calculated by completing T79 and T80, where zeta is a factor which corrects for the effect of the in-situ soil on pipe stability. If the ratio of bedding modulus to soil modulus is less than or equal to 1.25, assume zeta = 1.0 and skip to T80.*

$E_b/E_n$ = 1000/3,000 = .333

Since $E_b/E_n$ is less than 1.25, a zeta correction value is assumed to be 1.0. Skip to T80

T80) *For each size of pipe, report zeta factor determined in T78 or T79.*

Outside Pipe Diameter = 8.4", Trench Width = 2.7', Zeta = 1.0

T81) *Determine pipe stiffness ($P_s$) in psi.*

The pipe stiffness for PVC is determined by the parallel plate test.
(Uni-Bell Handbook of PVC Pipe, Table 7.1)

T82) *Report $P_s$ for each pipe size and for each type of flexible pipe material as determined in T81.*

Outside Pipe Diameter = 8.4", Pipe Material = PVC SDR 26 E 400,000, $P_s$ = 115 psi.

T83) *Because the terms in the denominator of the modified Iowa formula are added, it is theoretically possible to have zero pipe stiffness ($P_s = 0$) and still predict flexible pipe deflections less than 5%*

$P_s/SSF = P_s/(0.061*zeta*E_b)$ greater than or equal to 0.15

T84) *Indicate the final values calculated for $P_s/SSF$ for each diameter of pipe and each pipe material.*

$P_s/SSF = 115/(0.061*1.0*1000) = 1.86 > 0.15$ therefor, okay.

Outside Pipe Diameter = 8.4", Pipe Material = PVC, $P_s/SSF$= 4.71 psi.

T85) *Do all proposed pipe sizes and flexible pipe materials have a pipe stiffness to soil stiffness factor ratio of greater than or equal to 0.15.*

Yes.

T86) *Calculate and report predicted deflection*

$L_p = \gamma_s * H/144$

$L_p = 143 * 24/144 = 23.83$ for 24' of cover

$L_p = 143 * 6/144 = 5.96$ for 6' of cover

$E_b = 1000$ psi (crushed rock used as select back fill)

$\Delta Y/D\ (\%) = (K*(L_p+L_l)*100)/(0.149*P_s)+(.061*zeta*E_b)$

$\Delta Y/D = (0.11*(24+0)*100)/((0.149*115)+(.061*1.0*1000)) = 3.37\%$ for 22' cover

$\Delta Y/D = (0.11*(6+1.39)*100)/((0.149*115)+(.061*1.0*1000)) = 1.04\%$ for 6' cover

T87) *Report the final diameters, Type of Pipe Material, $P_s$, Zeta Factor, $E_b$, and Percent Deflection.*

Outside Pipe Diameter = 8.4"
Type of Material = PVC
$P_s = 115$ psi
Zeta Factor = 1.0
$E_b = 1000$ psi
% Deflection = 3.37 % (max)
All Pipes proposed for this project have a maximum deflection less than 5.00%

# TABLE 7.3
# AVERAGE VALUES OF MODULUS OF SOIL REACTION, E'
# (For Initial Flexible Pipe Deflection)

| Soil type-pipe bedding material (Unified Classification System[a]) (1) | E' for Degree of Compaction of Bedding, in pounds per square inch | | | |
|---|---|---|---|---|
| | Dumped (2) | Slight, < 85% Proctor, <40% relative density (3) | Moderate, 85%-95% Proctor, 40%-70% relative density (4) | High, >95% Proctor, >70% relative density (5) |
| Fine-grained Soils (LL>50)[b] Soils with medium to high plasticity, CH, MH, CH-MH | No data available; consult a competent soils engineer; Otherwise use E' = 0 | | | |
| Fine-grained Soils (LL<50) Soils with medium to no plasticity, CL, ML, ML-CL, with less than 25% coarse-grained particles | 50 | 200 | 400 | 1,000 |
| Fine-grained Soils (LL<50) Soils with medium to no plasticity, CL, ML, ML-CL, with more than 25% coarse-grained particles | 100 | 400 | 1,000 | 2,000 |
| Coarse-grained Soils with Fines GM, GC, SM, SC[c] contains more than 12% fines | | | | |
| Coarse-grained Soils with Little or no Fines GW, GP, SW, SP[c] contains less than 12% fines | 200 | 1,000 | 2,000 | 3,000 |
| Crushed Rock | 1,000 | 3,000 | 3,000 | 3,000 |
| Accuracy in Terms of Percentage Deflection[d] | ± 2 | ± 2 | ± 1 | ± 0.5 |

[a]ASTM Designation D 2487, USBR Designation E-3.
[b]LL = Liquid limit.
[c]Or any borderline soil beginning with one of these symbols (i.e. GM-GC, GC-SC).
[d]For ± 1% accuracy and predicted deflection of 3%, actual deflection would be between 2% and 4%

Note: Values applicable only for fills less than 50 ft (15 m). Table does not include any safety factor. For use in predicting initial deflections only, appropriate Deflection Lag Factor must be applied for long-term deflections. If bedding falls on the borderline between two compaction categories, select lower E' value or average the two values. Percentage Proctor based on laboratory maximum dry density from test standards using about 12,500 ft-lb/cu ft (598,000 J/m$^3$) (ASTM D 698, AASHTO T-99, USBR Designation E-11). 1 psi = 6.9 kPa.

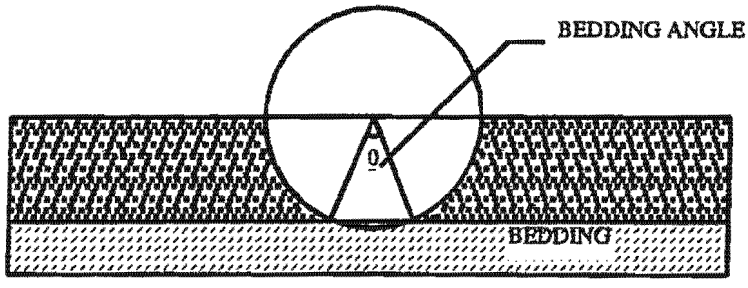
SOURCE: "Soil Reaction for Buried Flexible Pipe" by Amster K. Howard, U.S. Bureau of Reclamation, Denver, Colorado. Reprinted with permission from American Society of Civil Engineers.

## TABLE 6.6
## LIVE LOADS ON PVC PIPE

| Height of Cover (ft) | Live Load Transferred to Pipe, lb/in² | | | Height of Cover (ft) | Live Load Transferred to Pipe, lb/in² | | |
|---|---|---|---|---|---|---|---|
| | Highway H20[1] | Railway E80[2] | Airport [3] | | Highway H20[1] | Railway E80[2] | Airport [3] |
| 1 | 12.50 | | | 14 | * | 4.17 | 3.06 |
| 2 | 5.56 | 26.39 | 13.14 | 16 | * | 3.47 | 2.29 |
| 3 | 4.17 | 23.61 | 12.28 | 18 | * | 2.78 | 1.91 |
| 4 | 2.78 | 18.40 | 11.27 | 20 | * | 2.08 | 1.53 |
| 5 | 1.74 | 16.67 | 10.09 | 22 | * | 1.91 | 1.14 |
| 6 | 1.39 | 15.63 | 8.79 | 24 | * | 1.74 | 1.05 |
| 7 | 1.22 | 12.15 | 7.85 | 26 | * | 1.39 | * |
| 8 | 0.69 | 11.11 | 6.93 | 28 | * | 1.04 | * |
| 10 | * | 7.64 | 6.09 | 30 | * | 0.69 | * |
| 12 | * | 5.56 | 4.76 | 35 | * | * | * |
| | | | | 40 | * | * | * |

[1] *Simulates 20 ton truck traffic + impact*
[2] *Simulates 80,000 lb/ft railway load + impact*
[3] *180,000 lbs. dual tandem gear assembly. 26 inch spacing between tires and 66 inch center-to-center spacing between fore and aft tires under a rigid pavement 12 inches thick + impact.*
* *Negligible live load influence.*

## FIGURE 7.4
## BEDDING ANGLE




## TABLE 7.2
## VALUES OF BEDDING CONSTANT, K

| BEDDING ANGLE (DEGREES) | K |
|---|---|
| 0 | 0.110 |
| 30 | 0.108 |
| 45 | 0.105 |
| 60 | 0.102 |
| 90 | 0.096 |
| 120 | 0.090 |
| 180 | 0.083 |

# SUBMITTAL INFO.

## Charlotte's Concrete, Inc.

4950 Lane Dr.
San Antonio, Tx 78263
Ph# (210) 648-4774
Fax (210) 648-0556

Charlotte's Concrete Inc.
4950 Lane Dr.
San Antonio Tx. 78263

# CERTIFICATE OF COMPLIANCE

Portland Cement from Capitol Cement Co. meets ASTM C-150 specifications. All precast manhole sections manufactured with Capitol Cement meet ASTM C-478 specifications.

Thank you,

Brian Bishop
General Manager

STATE OF TEXAS
COUNTY OF BEXAR

SWORN AND SUBSCRIBED TO BEFORE ME THIS 26 DAY OF January, 2000.

My commission expires: 10-26-2001

Jeanette I. Burg
Notary Public

JEANETTE I. BURG
Notary Public, State of Texas
My Comm. Exp. 10/26/01

**Charlotte's Concrete, Inc.**
***W B E Firm***
**4950 Lane Drive**
**San Antonio, Texas 78263**
**210-648-4774**

Pre-cast sanitary sewer manhole will consist of a bottom, variable riser sections, and a cone or lid. Concrete used will be CLASS A, 4000 p.s.i. properly vibrated and inspected to assure quality. Reinforcing steel will meet ASTM specifications.

Inside base height is 16" to 42" inches with a 7" floor below the pipe. ***PRESS SEAL GASKETS*** will be installed with compression to insure no leakage. Size of gaskets are determined by pipe sizes. ***PRESS SEAL GASKETS*** meet or exceed ASTM C-923 specifications.

Riser sections range from 12" to 48" in height. A recess is provided on the spigot end at the joint for a ***PRESS SEAL O-RING GASKET*** to insure leak proof joints. ***PRESS SEAL O-RING GASKETS*** meet or exceed ASTM C-316A and ASTM C-443-85A specifications.

Invert channels are constructed to insure smooth uniform flow. A smooth and uniform floor is poured on a 1/2 inch per foot slope to the edge of the invert channel.

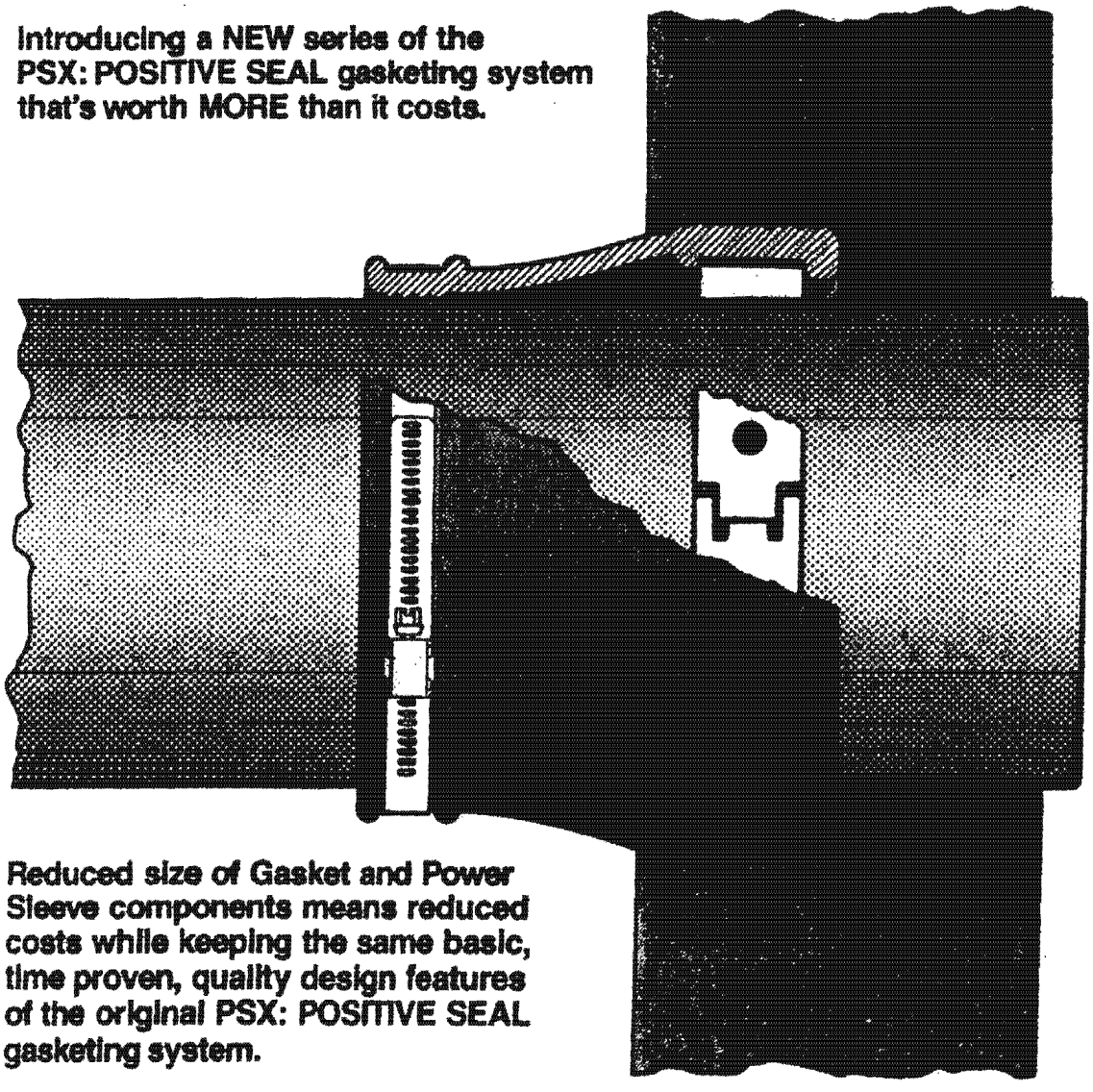
Contractor should remove all loose dirt and provide a cushion of 6" crushed stone or suitable non-cohesive bedding material placed uniformly under the base extending 6" beyond the side walls.

Cone sections are 18", 24", and 32" inches high. The bottom is 48" inside diameter and tapers to 24" inside diameter at the top to accept grade rings and frame/cover. All riser and cone sections are CLASS A concrete and steel reinforced to meet or exceed ASTM specifications.

All sections and base come equipped with lift inserts for easy installation.

# PSX : SERIES SIX

**Introducing a NEW series of the PSX: POSITIVE SEAL gasketing system that's worth MORE than it costs.**



**Reduced size of Gasket and Power Sleeve components means reduced costs while keeping the same basic, time proven, quality design features of the original PSX: POSITIVE SEAL gasketing system.**

Patent No. 4215868-4478437


## PRESS-SEAL GASKET CORPORATION

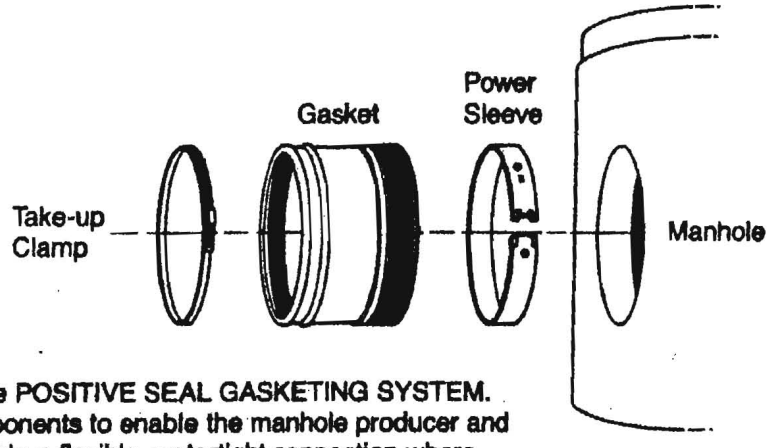
6935 LINCOLN PARKWAY - FORT WAYNE, INDIANA 46804
Phone (219) 436-0521 or (800) 348-7325
FAX (219) 436-1908

# PSX:SERIES SIX

A lower cost series of our original PSX: POSITIVE SEAL pipe to manhole flexible connector system. PSX: SERIES SIX is available for 8" through 13" holes to seal the most commonly used pipe types and sizes.

PSX: SERIES SIX Advantages:

- Lower Cost
- Lower Freight
- Same Basic Time Proven, PSX Design Features
- In Most Cases Fully Removeable
- Can Be Installed With The Same Equipment Used On Our Original PSX System
- Compatible With Our Existing Fiberglass And Urethane Hole Formers
- Compatible With Our Form & Flow Manhole Invert System
- Meets And Or Exceeds Material Specifications of ASTM C-923




PSX is the designation for the POSITIVE SEAL GASKETING SYSTEM. This system uses three components to enable the manhole producer and installation contractor to provide a flexible, watertight connection where pipe enters manhole.

The three components as shown above are: POWER SLEEVE, GASKET, and TAKE-UP CLAMP. The POWER SLEEVE is mechanically expanded to compress the GASKET against receptacle hole surface in the manhole wall. After adequate compression of the GASKET is achieved, the ends of the POWER SLEEVE interlock to insure against any loss of compression. This secures PSX in the manhole wall ready to accept desired size and type of pipe.

When the contractor is ready to install the manhole, ditch personnel need only insert pipe through PSX and tighten TAKE-UP CLAMP to compress the GASKET against outside wall of pipe entering manhole.

**NOTE: Press-Seal Gasket will continue to offer our current, full size, PSX: POSITIVE SEAL gasketing system.**

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Press-Seal Gasket Corp.

**PRESS-SEAL GASKET CORPORATION**
6935 LINCOLN PARKWAY - FORT WAYNE, INDIANA 46804
Phone (219) 436-0521 or (800) 348-7325
FAX (219) 436-1908

# PSX:SERIES SIX

## CONNECTOR CROSS-REFERENCE

| NOMINAL HOLE SIZE | PSX SIZE DESIGNATION | PSX GASKET I.D./IN. | PSX PIPE O.D./IN. ACCOMMODATION RANGE | NORTON CLAMPS STD (QTY) | NORTON CLAMPS STD PART # | APPROX. SHIP WEIGHT EACH/LB. | STANDARD PKG. QUANTITIES UPS | STANDARD PKG. QUANTITIES PALLET |
|---|---|---|---|---|---|---|---|---|
| 8" | 6-8QRS | *N/A | *1.90 TO 4.80 | (1) | 600.088 | 3 | 20 | 100/200 |
| | 08-11 | 5.64 | 4.75 TO 5.75 | (1) | 601.104 | 3 | 20 | 150/250 |
| | 08-22 | 6.45 | 5.75 TO 6.50 | (1) | 601.128 | 3.5 | 20 | 150/250 |
| 9" | 09-11 | 6.77 | 6.0 TO 7.0 | (1) | 601.128 | 3.5 | 20 | 140 |
| | 09-22 | 7.27 | 6.4 TO 7.5 | (1) | 601.128 | 3.5 | 20 | 140 |
| 10" | 10-11 | 7.33 | 6.5 TO 7.65 | (1) | 601.132 | 4 | 16 | 125 |
| | 10-22 | 8.21 | 7.4 TO 8.5 | (1) | 601.152 | 4 | 16 | 125 |
| 11" | 11-06 | 6.50 | 5.7 TO 6.9 | (1) | 601.128 | 4.75 | 10 | 50/75 |
| | 11-11 | 8.46 | 7.65 TO 8.75 | (1) | 601.156 | 4 | 16 | 100/140 |
| | 11-08 | 8.65 | 8.15 TO 9.05 | (1) | 601.156 | 4 | 16 | 100/140 |
| | 11-22 | 9.34 | 8.5 TO 9.5 | (1) | 601.168 | 4 | 16 | 85/130 |
| 12" | 12-06 | 6.50 | 5.7 TO 6.9 | (1) | 601.128 | 5.25 | 10 | 50/75 |
| | 12-08 | 8.63 | 8.0 TO 9.1 | (1) | 601.156 | 5.25 | 10 | 50/75 |
| | 12-11 | 9.46 | 8.8 TO 9.75 | (1) | 601.172 | 4.75 | 13 | 75/120 |
| | 12-22 | 10.28 | 9.4 TO 10.5 | (1) | 601.188 | 5 | 12 | 70/115 |
| 13" | 13-11 | 10.40 | 9.5 TO 10.75 | (1) | 601.188 | 5 | 12 | 70/100 |
| | 13-22 | 11.03 | 10.25 TO 11.35 | (1) | 601.188 | 5.50 | 12 | 70/100 |

*See Reverse Side For More Information

## COMPLETE SYSTEM USE CHART

| PIPE SIZE | PIPE TYPE DESCRIPTION: P.V.C. SDR35 | | C.I./D.I. AND C900 P.V.C. | | TRUSS | |
|---|---|---|---|---|---|---|
| 4" | 4.21" O.D. | 6-8QRS | 4.80" O.D. | 6-8QRS | 4.30" O.D. | 6-8QRS |
| 6" | 6.275" O.D. | 08-22<br>09-11<br>11-06<br>12-06 | 6.90" O.D. | 09-11<br>09-22<br>11-06<br>12-06 | 6.30" O.D. | 08-22<br>09-11<br>11-06<br>12-06 |
| 8" | 8.40" O.D. | 11-11<br>11-08<br>12-08 | 9.05" O.D. | 11-08<br>11-22<br>12-11 | 9.40" O.D. | 12-11<br>12-22 |
| 10" | 10.50" O.D. | 13-11<br>13-22 | 11.10" O.D. | 13-22 | 11.80" O.D. | SEE ORIGINAL PSX SYSTEM FOR LARGER PIPES |

PRESS-SEAL GASKET CORP.
FORT WAYNE, INDIANA
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(219) 436-0521

# SYSTEM SELECTION GUIDE

| PIPE O.D./IN. | PIPE DESCRIPTION | NOMINAL HOLE SIZE/IN. | PSX:POSITIVE SEAL SIZE DESIGNATION |
|---|---|---|---|
| 1.90 | 1.5" P.V.C. | 8.00 | 6-8QRS "STEP S" PSX |
| 2.38 | 2" P.V.C. | 8.00 | 6-8QRS "STEP S" PSX |
| 2.50 | 2" C.I./D.I. | 8.00 | 6-8QRS "STEP S" PSX |
| 2.75 | 2.25" C.I./D.I. | 8.00 | 6-8QRS "STEP R" PSX |
| 3.50 | 3" P.V.C. | 8.00 | 6-8QRS "STEP R" PSX |
| 3.96 | 3" C.I./D.I. | 8.00 | 6-8QRS "STEP Q" PSX |
| 4.21 | 4" P.V.C. SDR35 | 8.00 | 6-8QRS "STEP Q" PSX |
| 4.30 | 4" TRUSS | 8.00 | 6-8QRS "STEP Q" PSX |
| 4.80 | 4" C.I./D.I.<br>4" C900 P.V.C. | 8.00 | 6-8QRS "STEP Q" PSX OR 08-11 |
| 6.275 | 6" P.V.C. SDR35 | 8.00 | 08-22 |
| | | 9.00 | 09-11 |
| | | 11.00 | 11-08 |
| | | 12.00 | 12-08 |
| 6.30 | 6" TRUSS | 8.00 | 08-22 |
| | | 9.00 | 09-11 |
| | | 11.00 | 11-08 |
| | | 12.00 | 12-08 |
| 6.625 | 6" P.V.C. D2241 | 9.00 | 09-11 OR 09-22 |
| | | 10.00 | 10-11 |
| | | 11.00 | 11-08 |
| | | 12.00 | 12-08 |
| 6.90 | 6" C.I./D.I.<br>6" C900 P.V.C. | 9.00 | 09-11 OR 09-22 |
| | | 10.00 | 10-11 |
| | | 11.00 | 11-08 |
| | | 12.00 | 12-08 |
| 8.18 | 8" P.V.C. SDR41 | 10.00 | 10-22 |
| | | 11.00 | 11-11 OR 11-08 |
| | | 12.00 | 12-08 |
| 8.40 | 8" P.V.C. SDR35 | 10.00 | 10-22 |
| | | 11.00 | 11-11 OR 11-08 |
| | | 12.00 | 12-08 |

| PIPE O.D./IN. | PIPE DESCRIPTION | NOMINAL HOLE SIZE/IN. | PSX:POSITIVE SEAL SIZE DESIGNATION |
|---|---|---|---|
| 8.625 | 8" P.V.C. D2241 | 11.00 | 11-11, 11-08, OR 11-22 |
| | | 12.00 | 12-08 OR 12-11 |
| 9.05 | 8" C.I./D.I.<br>8" C900 P.V.C. | 11.00 | 11-08 OR 11-22 |
| | | 12.00 | 12-08 OR 12-11 |
| 9.40 | 8" TRUSS | 11.00 | 11-22 |
| | | 12.00 | 12-11 OR 12-22 |
| 10.20 | 10" P.V.C. SDR41 | 12.00 | 12-22 |
| | | 13.00 | 13-11 |
| 10.50 | 10" P.V.C. SDR35 | 13.00 | 13-11 OR 13-22 |
| 10.75 | 10" P.V.C. D2241 | 13.00 | 13-11 OR 13-22 |
| 11.10 | 10" C.I./D.I.<br>10" C900 P.V.C. | 13.00 | 13-22 |

See Original PSX: Positive Seal System For Larger Pipes.

## COMPARISON CHART

| PSX: SERIES SIX | PSX: POSITIVE SEAL |
|---|---|
| 6-8QRS | 8QRS |
| 08-11<br>08-22 | 8A<br>8B |
| 09-11<br>09-22 | 9A<br>9B |
| 10-11<br>10-22 | 10A<br>10B |
| 11-11<br>11-22<br>11-08<br>11-08 | 11A<br>11B<br>11Y<br>11M |
| 12-11<br>12-22<br>12-08<br>12-08 | 12A<br>12B<br>12Y<br>12M |
| 13-11<br>13-22 | 13A<br>13B |


**PRESS-SEAL GASKET CORPORATION**
**CONCRETE PRODUCTS SUPPLY COMPANY**
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MAIL TO: P.O. BOX 10482 • FORT WAYNE, INDIANA 46852
SHIP TO: 6935 LINCOLN PARKWAY • FORT WAYNE, INDIANA 46804


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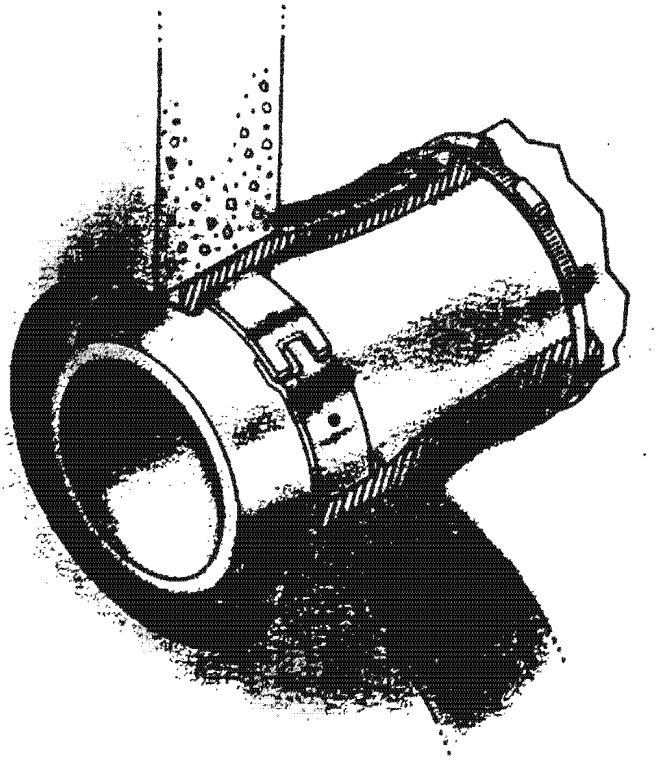
# PSX

## POSITIVE SEAL GASKET SYSTEM WITH POWER SLEEVE EXPANSION

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# PSX

Our original PSX:POSITIVE SEAL pipe to manhole flexible connector system. PSX is available for 8" and larger holes to seal the most commonly used pipe types and sizes.

**PSX Advantages:**

- In Most Cases Fully Removable
- For Use With Our Existing Fiberglass Hole Formers
- For Use With Our Form & Flow Manhole Invert System
- Meets And Or Exceeds Material Specifications of ASTM C-923

| TEST | ASTM METHOD | TEST REQUIREMENTS | TEST RESULTS |
|---|---|---|---|
| CHEMICAL RESISTANCE:<br>1N SULFURIC ACID<br>1N HYDROCHLORIC ACID | D 534, AT 22°C FOR 48 HRS. | NO WEIGHT LOSS<br>NO WEIGHT LOSS | NO WEIGHT LOSS<br>NO WEIGHT LOSS |
| TENSILE STRENGTH | D 412 | 1200 PSI, MIN. | 2800 PSI |
| ELONGATION AT BREAK | D 412 | 350%, MIN. | 675% |
| HARDNESS | D 2240 (SHORE A DUROMETER) | ±5 FROM THE MANUFACTURER'S SPECIFIED HARDNESS | 46 |
| ACCELERATED OVEN-AGING | D 573, 70+ 1°C FOR 7 DAYS. | DECREASE OF 15%, MAX, OF ORIGINAL TENSILE STRENGTH, DECREASE OF 20%, MAX, OF ELONGATION | -13% TENSILE CHANGE, -14% ELONGATION CHANGE |
| COMPRESSION TEST | D 395, METHOD B, AT 70°C FOR 22 HRS. | DECREASE OF 25%, MAX, OF ORIGINAL DEFLECTION | 13.20% |
| WATER ABSORPTION | D 471 IMMERSE 0.75 BY 2-IN. SPECIMEN IN DISTILLED WATER AT 70°C FOR 48 HRS. | INCREASE OF 10%, MAX, OF ORIGINAL BY WEIGHT | 3.30% |
| OZONE RESISTANCE | D 1171 | RATING 0 | PASS |
| LOW-TEMP. BRITTLE POINT | D 746 | NO FRACTURE AT -40° C | PASS |
| TEAR RESISTANCE | D 624, METHOD B | 200LBF/IN. (MIN.) | 318 LBF/IN. |

### GASKET INSTALLATION

1. Place PSX gasket into hole with holes in power sleeve at the 6 o'clock position.
2. Insert studs of hydraulic tool into holes of power sleeve and pump hydraulic unit until gasket stays positioned in hole without assistance.
3. Gasket must be aligned square in the hole.
4. Pump hydraulic unit to expand power sleeve while making sure sleeve ends stay aligned on top of each other.
5. After sleeve ends snap into place, face to face, check gauge to make sure minimum installation pressure has been achieved.
6. Relax power sleeve slightly to interlock the ends securely for a positive seal.

### PIPE INSTALLATION

1. After manhole has been set to grade, inspect and clean out inside of connector. Clean surface of pipe barrel to be installed.
2. Insert pipe into connector, until end of pipe breaks inside plane of manhole wall. Position pipe in center of connector. Install take-up clamp(s) in groove(s) at pipe receiving end of gasket. Check again to make sure interior of connector and pipe barrel surfaces are clean.
3. Tighten take-up clamp(s) with ratchet or torque wrench, to 60 in/lbs. torque. Adjust pipe to line and grade. Use proper bedding, backfill materials and techniques.
4. Any pipe stubs installed in the manhole must be restrained from movement.

Before using the PSX:POSITIVE SEAL system for any custom applications, contact our Customer Service Department for more information.

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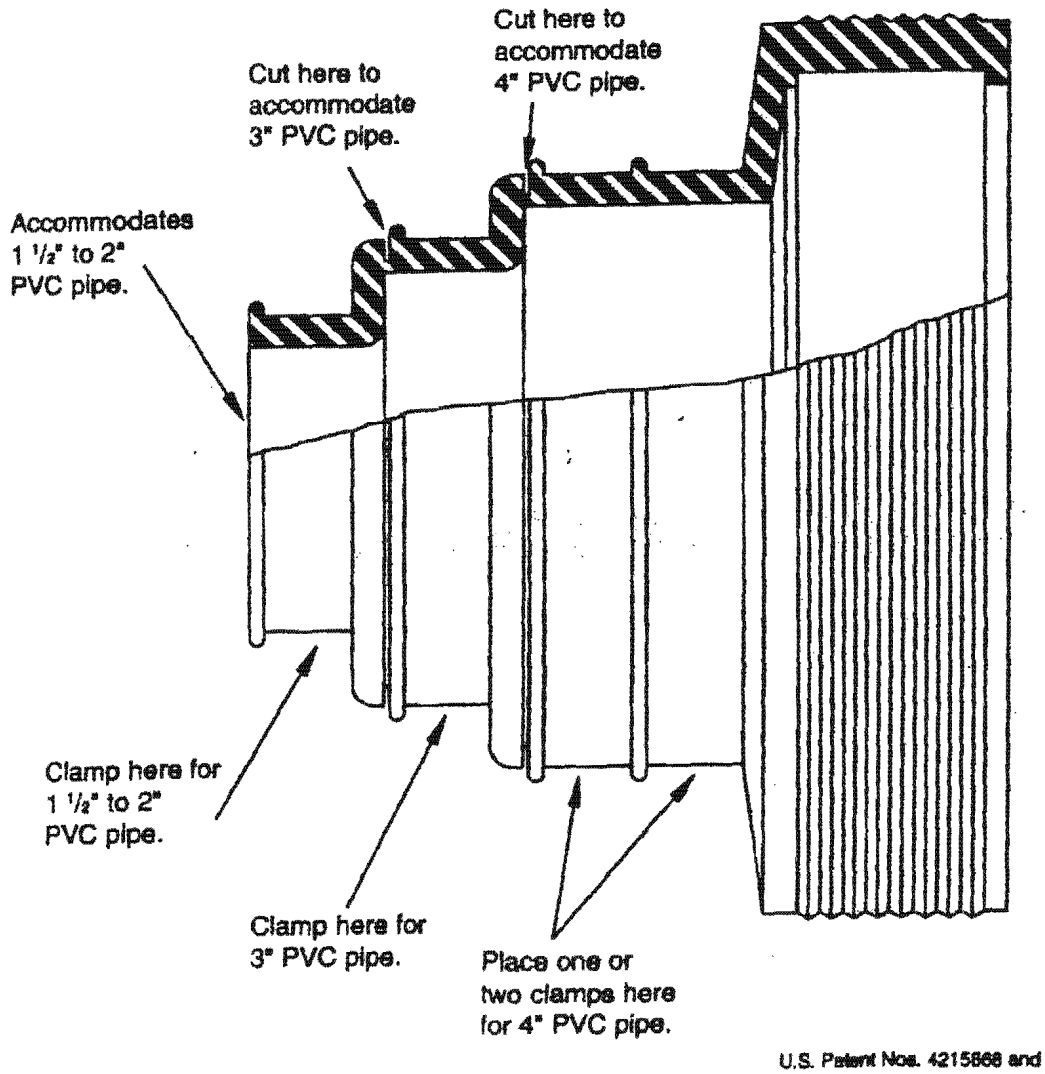
FAX (219) 436-1908

# QRS-PSX

## STEP UP TO THE FLEXIBLE CONNECTOR THAT ALLOWS THE PSX:POSITIVE SEAL TO STEP DOWN TO SMALLER DIAMETER PIPE




U.S. Patent Nos. 4215868 and 4478437

**PRESS-SEAL GASKET CORPORATION**
6935 LINCOLN PARKWAY - FORT WAYNE, INDIANA 46804
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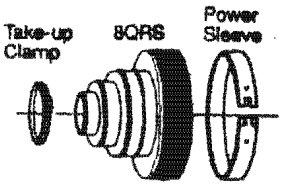
FAX (219) 436-1906

# 8QRS-PSX

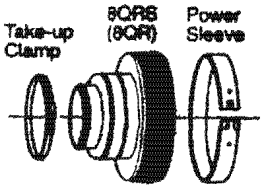
Step up to the flexible connector that allows PSX:POSITIVE SEAL to step down to smaller diameter pipe. The 8QRS-PSX is a molded gasket that has grown to be one of our most popular flexible connectors in the PSX line. The key to its success is VERSATILITY, both in its ability to accommodate varying sizes of small pipe and in its suitability to a number of different applications:

- Water Collection Systems
- Pump/Lift Stations
- Septic Tanks
- House Connections
- Meets and/or Exceeds Material Specifications of ASTM C-923

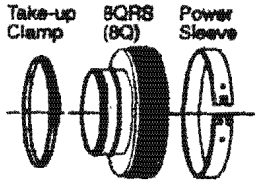
FIRST STEP
ACCOMMODATES
1.7" O.D. TO 2.5"
O.D. PVC PIPE.
PART NO. 551.8QRS




SECOND STEP
ACCOMMODATES
2.75" O.D. TO 3.75"
O.D. PVC PIPE.
PART NO. 551.8QRO




THIRD STEP
ACCOMMODATES
4.0" O.D. TO 4.8"
O.D. PVC PIPE.
PART NO. 551.8QOO




8QRS-PSX may be ordered in any of the three forms shown above: 8QRS, 8QR or 8Q.

| TEST | ASTM METHOD | TEST REQUIREMENTS | TEST RESULTS |
|---|---|---|---|
| CHEMICAL RESISTANCE:<br>1N SULFURIC ACID<br>1N HYDROCHLORIC ACID | D 534, AT 22°C FOR 48 HRS. | NO WEIGHT LOSS<br>NO WEIGHT LOSS | NO WEIGHT LOSS<br>NO WEIGHT LOSS |
| TENSILE STRENGTH | D 412 | 1200 PSI, MIN. | 2600 PSI |
| ELONGATION AT BREAK | D 412 | 350%, MIN. | 675% |
| HARDNESS | D 2240 (SHORE A DUROMETER) | ±5 FROM THE MANUFACTURER'S SPECIFIED HARDNESS | 46 |
| ACCELERATED OVEN-AGING | D 573, 70± 1°C FOR 7 DAYS | DECREASE OF 15%, MAX. OF ORIGINAL TENSILE STRENGTH. DECREASE OF 20%, MAX. OF ELONGATION | -13% TENSILE CHANGE, -14% ELONGATION CHANGE |
| COMPRESSION TEST | D 395, METHOD B, AT 70°C FOR 22 HRS. | DECREASE OF 25%, MAX. OF ORIGINAL DEFLECTION | 13.20% |
| WATER ABSORPTION | D 471 IMMERSE 0.75 BY 2-IN. SPECIMEN IN DISTILLED WATER AT 70°C FOR 48 HRS. | INCREASE OF 10%, MAX. OF ORIGINAL BY WEIGHT | 3.50% |
| OZONE RESISTANCE | D 1171 | RATING 0 | PASS |
| LOW-TEMP. BRITTLE POINT | D 746 | NO FRACTURE AT -40°C | PASS |
| TEAR RESISTANCE | D 624, METHOD B | 200LBF/IN. (MIN.) | 318 LBF/IN. |

## GASKET INSTALLATION

1. Place PSX gasket into hole with holes in power sleeve at the 6 o'clock position.
2. Insert studs of hydraulic tool into holes of power sleeve and pump hydraulic unit until gasket stays positioned in hole without assistance.
3. Gasket must be aligned square in the hole.
4. Pump hydraulic unit to expand power sleeve while making sure sleeve ends stay aligned on top of each other.
5. After sleeve ends snap into place, face to face, check gauge to make sure minimum installation pressure has been achieved.
6. Relax power sleeve slightly to interlock the ends securely for a positive seal.

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## PIPE INSTALLATION

1. After manhole has been set to grade, inspect and clean out inside of connector. Clean surface of pipe barrel to be installed.
2. If pipe O.D. is larger than 2.5", use a Wet Blade to cut 8QRS at appropriate step to accommodate pipe size.
3. Insert pipe into connector, until end of pipe breaks inside plane of manhole wall. Position pipe in center of connector. Install take-up clamp(s) in groove(s) at pipe receiving end of gasket. Check again to make sure interior of connector and pipe barrel surfaces are clean.
4. Tighten take-up clamp(s) with ratchet or torque wrench, to 60 in/lbs. torque. Adjust pipe to line and grade. Use proper bedding, backfill materials and techniques.
5. Any pipe stubs installed in the manhole must be restrained from movement.

Before using the PSX:POSITIVE SEAL system for any custom applications, contact our Customer Service Department for more information.

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6935 LINCOLN PARKWAY - FORT WAYNE, INDIANA 46804
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FAX (219) 436-1908

# PSX POSITIVE SEAL CONNECTOR CROSS-REFERENCE

EFFECTIVE JANUARY 1995

The PSX:POSITIVE SEAL Gasket System was introduced in 1981, and has grown to be a favorite of manhole producers, installation contractors, and engineers. This system is being used to provide watertight flexible connections by hundreds of manhole producers across North America.

We have made some improvements to the PSX:POSITIVE SEAL System that are reflected in the cross-reference chart on the reverse side of this page. If you have any questions about our products, please contact our Customer Service Department.

The chart on the reverse side is composed of eight columns. An explanation of each column is listed below:

Column 1: "NOMINAL HOLE SIZE": This column reflects the hole diameter to the nearest inch. This chart is based on "Even" hole sizes. Variation from the nominal or "Even" hole size may affect the maximum pipe diameter accommodated in column 5.

Column 2: "PSX SIZE DESIGNATION": Self-explanatory.

Column 3: "PSX GASKET C.L./CM.": This is the gasket component cut-length in centimeters. Each gasket is marked with this information, which should be used to identify old assemblies from new assemblies with the same designations. All molded gaskets are listed as N/A for not applicable.

Column 4: "PSX GASKET I.D./IN.": This is the inside diameter of the pipe receiving end of the gasket in inches. This column will be helpful in determining how much the installer will have to "Neck-Down" the gasket to seal any particular pipe's outside diameter.

Column 5: "PSX PIPE O.D./IN., ACCOMMODATION RANGE": This column indicates the range of pipe outside diameters each gasket will seal. Any pipe O.D. larger than the gasket I.D. (Column 4), but still within the accommodation range (Column 5); will require the infield installer to stretch the gasket slightly to insert the pipe.

Column 6: "PSX TAKE-UP CLAMP STD (QTY) PART #": This column shows our standard Take-Up Clamp quantity and part numbers included with each PSX Assembly. Each stainless steel Take-Up Clamp is imprinted with a part number.

Column 7: "APPROX. SHIP WGHT. EA./LB": This column will be helpful in estimating shipping weights and freight costs.

Column 8: "STANDARD PKG. QUANTITIES UPS PALLET": This column will be helpful ordering and planning efficient inventory and freight costs systems.

| MANHOLE I.D. | | MANHOLE STANDARD B-WALL THICKNESS | | STANDARD HOLE SIZE RANGE | | STANDARD MAXIMUM RECOMMENDED PIPE O.D. | |
|---|---|---|---|---|---|---|---|
| INCHES | MM | INCHES | MM | INCHES | MM | INCHES | MM |
| 36" | 900 | 4.0" | 100 | 8"-20" | 200-500 | 16.0" | 400 |
| 42" | 1050 | 4.5" | 113 | 8"-24" | 200-600 | 19.9" | 500 |
| 48" | 1200 | 5.0" | 125 | 8"-28" | 200-710 | 26.3" | 670 |
| 60" | 1500 | 6.0" | 150 | 8"-34" | 200-860 | 32.0" | 810 |
| 72" | 1800 | 7.0" | 175 | 8"-42" | 200-1060 | 40.0" | 1020 |

NOTE: MM Denotes millimeters (rounded to ASTM designation C 76M-86)
For other precast manhole sizes and structures, please contact our Customer Service Department.

## GASKET INSTALLATION

1. Place PSX gasket into hole with holes in power sleeve at the 6 o'clock position.
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U.S. Patent Nos. 4215868 and 4478437

## PIPE INSTALLATION

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5. Adjust pipe to line and grade. Use proper bedding, backfill materials and techniques.
6. Any pipe stubs installed in the manhole must be restrained from movement.
7. Before using the PSX:POSITIVE SEAL system for any custom applications, contact our Customer Service Depart. for more information.

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# PSX: POSITIVE SEAL CONNECTOR CROSS-REFERENCE

EFFECTIVE JANUARY 1995

| NOMINAL HOLE SIZE | PSX SIZE DESIGNATION | PSX GASKET C.L./CM. | PSX GASKET I.D./IN. | PSX PIPE O.D./IN. ACCOMMODATION RANGE | PSX TAKE-UP CLAMP (QTY) | PSX TAKE-UP CLAMP STD. PART # | APPROX. SHIP WGHT. EA./LB. | STANDARD PKG. QUANTITIES UPS | STANDARD PKG. QUANTITIES PALLET |
|---|---|---|---|---|---|---|---|---|---|
| 8 | 8QRS STEP "S" | N/A | 2.20 | 1.70" TO 2.50" | (1) | 600-88 | 3.00 | 20 | 100/200 |
| | 8QRS STEP "R" | N/A | 3.50 | 2.75" TO 3.75" | (1) | 600-88 | 3.00 | 20 | 100/200 |
| | 8QRS STEP "Q" | N/A | 4.66 | 3.75" TO 4.50" | (1) | 600-88 | 3.00 | 20 | 100/200 |
| 8 | 8A PSX | 48.8 | 5.84 | 4.75" TO 5.75" | (1) | 600-128 | 4.00 | 16 | 100/200 |
| | 8B PSX | 54.5 | 6.45 | 5.75" TO 6.30" | (1) | 600-128 | 4.50 | 16 | 100/200 |
| 9 | 9A PSX | 57.5 | 6.77 | 6.00" TO 7.09" | (1) | 600-128 | 5.00 | 12 | 100 |
| | 9B PSX | 61.9 | 7.27 | 6.40" TO 7.50" | (1) | 600-128 | 5.00 | 12 | 100 |
| 10 | 10A PSX | 61.5 | 7.39 | 6.50" TO 7.65" | (1) | 600-128 | 5.00 | 10 | 100 |
| | 10B PSX | 68.5 | 8.21 | 7.40" TO 8.50" | (1) | 600-152 | 6.00 | 10 | 100 |
| 11 | 11Y PSX | N/A | 8.59 | 5.70" TO 6.90" | (1) | 600-128 | 5.50 | 10 | 75 |
| | 11M PSX | N/A | 8.63 | 8.00" TO 9.10" | (1) | 600-152 | 6.50 | 10 | 75 |
| | 11A PSX | 70.5 | 8.46 | 7.65" TO 8.75" | (1) | 600-152 | 6.00 | 10 | 80 |
| | 11B PSX | 77.5 | 9.34 | 8.50" TO 9.50" | (1) | 600-152 | 6.00 | 10 | 80 |
| 12 | 12Y PSX | N/A | 8.50 | 5.70" TO 6.90" | (1) | 600-128 | 6.00 | 10 | 75 |
| | 12M PSX | N/A | 8.63 | 8.00" TO 9.10" | (1) | 600-152 | 6.00 | 10 | 75 |
| | 12A PSX | 78.5 | 9.46 | 8.66" TO 9.75" | (1) | 600-152 | 6.00 | 10 | 80 |
| | 12B PSX | 85.9 | 10.26 | 9.40" TO 10.50" | (1) | 600-152 | 6.50 | 9 | 80 |
| 13 | 13L PSX | 80.0 | 9.65 | 8.90" TO 9.90" | (1) | 600-152 | 6.25 | 9 | 80 |
| | 13A PSX | 86.0 | 10.49 | 9.50" TO 10.75" | (1) | 600-152 | 6.75 | 9 | 80 |
| | 13B PSX | 91.0 | 11.08 | 10.25" TO 11.35" | (1) | 600-232 | 7.10 | 9 | 80 |
| 14 | 14L PSX | 88.4 | 10.79 | 9.90" TO 11.10" | (1) | 600-152 | 7.25 | 8 | 60 |
| | 14A PSX | 91.5 | 11.19 | 10.25" TO 11.30" | (1) | 600-232 | 7.50 | 8 | 60 |
| | 14B PSX | 98.0 | 12.03 | 11.25" TO 12.25" | (1) | 600-232 | 8.00 | 8 | 60 |
| 16 | 16Y PSX | N/A | 10.75 | 10.00" TO 11.10" | (1) | 600-152 | 8.00 | 8 | 56 |
| | 16L PSX | 101.0 | 12.28 | 11.50" TO 12.50" | (1) | 600-232 | 8.00 | 7 | 50 |
| | 16A PSX | 107.5 | 13.10 | 12.20" TO 13.20" | (1) | 600-232 | 8.50 | 7 | 50 |
| | 16B PSX | 115.5 | 14.10 | 13.50" TO 14.50" | (1) | 600-296 | 9.00 | 7 | 50 |
| 18 | 18L PSX-2 | 115.5 | 14.10 | 13.20" TO 14.50" | (2) | 600-296 | 9.00 | 6 | 40 |
| | 18A PSX-2 | 123.7 | 15.13 | 14.25" TO 15.40" | (2) | 600-296 | 10.00 | 6 | 40 |
| | 18B PSX-2 | 134.6 | 16.42 | 15.50" TO 16.50" | (2) | 600-296 | 10.50 | 6 | 40 |
| 20 | 20L PSX-2 | 130.0 | 15.92 | 15.00" TO 16.25" | (2) | 600-296 | 10.50 | 5 | 30 |
| | 20A PSX-2 | 136.0 | 16.62 | 16.00" TO 17.20" | (2) | 600-296 | 11.00 | 5 | 30 |
| | 20B PSX-2 | 148.0 | 18.17 | 17.30" TO 18.50" | (2) | 600-376 | 12.00 | 5 | 30 |
| 22 | 22L PSX-2 | 145.0 | 17.80 | 17.00" TO 18.15" | (2) | 600-376 | 11.75 | 4 | 20 |
| | 22A PSX-2 | 155.5 | 19.12 | 18.20" TO 19.50" | (2) | 600-376 | 12.00 | 4 | 20 |
| | 22B PSX-2 | 163.0 | 20.05 | 19.15" TO 20.40" | (2) | 600-376 | 13.25 | 4 | 20 |
| 24 | 24L PSX-2 | 158.0 | 19.55 | 18.50" TO 19.75" | (2) | 600-376 | 13.00 | 4 | 20 |
| | 24A PSX-2 | 178.0 | 21.99 | 21.00" TO 22.10" | (2) | 600-376 | 14.25 | 4 | 20 |
| | 24B PSX-2 | 182.0 | 22.43 | 21.50" TO 22.50" | (2) | 60-376 | 14.50 | 4 | 20 |
| 26 | 26L PSX-2 | 180.0 | 22.16 | 21.30" TO 22.40" | (2) | 600-376 | 14.50 | 3 | 15 |
| | 26A PSX-2 | 187.5 | 23.12 | 22.25" TO 23.40" | (2) | 600-456 | 16.00 | 3 | 15 |
| | 26B PSX-2 | 197.0 | 24.31 | 23.40" TO 24.50" | (2) | 600-456 | 16.25 | 3 | 15 |
| 28 | 28L PSX-2 | 197.5 | 24.31 | 23.40" TO 24.60" | (2) | 600-456 | 16.25 | 3 | 15 |
| | 28A PSX-2 | 203.5 | 25.13 | 24.25" TO 25.50" | (2) | 600-456 | 16.50 | 3 | 15 |
| | 28B PSX-2 | 213.0 | 26.32 | 25.50" TO 26.50" | (2) | 600-456 | 17.00 | 3 | 15 |
| 30 | 30L PSX-2 | 213.0 | 26.32 | 25.40" TO 26.60" | (2) | 600-456 | 17.00 | 3 | 12 |
| | 30A PSX-2 | 219.4 | 27.12 | 26.25" TO 27.40" | (2) | 600-456 | 17.75 | 3 | 12 |
| | 30B PSX-2 | 229.0 | 28.32 | 27.40" TO 28.40" | (2) | 600-456 | 18.50 | 3 | 12 |
| 32 | 32L PSX-2 | 229.0 | 28.32 | 27.40" TO 28.60" | (4) | 600-296 | 18.50 | 3 | 7 |
| | 32A PSX-2 | 236.4 | 29.13 | 28.25" TO 29.40" | (4) | 600-296 | 19.00 | 3 | 7 |
| | 32B PSX-2 | 241.0 | 29.86 | 29.00" TO 30.20" | (4) | 600-296 | 19.50 | 3 | 7 |
| 34 | 34L PSX-2 | 246.0 | 30.33 | 29.50" TO 30.75" | (4) | 600-296 | 22.75 | 2 | 7 |
| | 34A PSX-2 | 255.0 | 31.56 | 30.75" TO 31.75" | (4) | 600-296 | 23.51 | 2 | 7 |
| | 34B PSX-2 | 258.0 | 32.06 | 31.25" TO 32.30" | (4) | 600-296 | 24.00 | 2 | 7 |
| 36 | 36A PSX-2 | 258.0 | 32.06 | 31.20" TO 32.40" | (4) | 600-296 | 24.00 | 2 | N/A |
| | 36B PSX-2 | 271.0 | 33.59 | 32.60" TO 33.80" | (4) | 600-296 | 25.00 | 2 | N/A |
| 38 | 38A PSX-2 | 271.5 | 33.59 | 32.70" TO 33.90" | (4) | 600-296 | 25.00 | N/A | N/A |
| | 38B PSX-2 | 283.3 | 35.15 | 34.25" TO 35.50" | (4) | 600-296 | 26.25 | N/A | N/A |
| 40 | 40L PSX-2 | 283.3 | 35.13 | 34.25" TO 35.50" | (4) | 600-376 | 26.25 | N/A | N/A |
| | 40A PSX-2 | 300.0 | 37.22 | 36.25" TO 37.50" | (4) | 600-376 | 27.75 | N/A | N/A |
| | 40B PSX-2 | 306.0 | 38.36 | 37.45" TO 38.50" | (4) | 600-376 | 28.50 | N/A | N/A |
| 42 | 42A PSX-2 | 306.0 | 38.36 | 37.45" TO 38.55" | (4) | 600-376 | 28.50 | N/A | N/A |
| | 42B PSX-2 | 325.0 | 40.36 | 39.45" TO 40.50" | (4) | 600-376 | 30.00 | N/A | N/A |

Specifications subject to change without prior notice.

# PSX:POSITIVE SEAL SYSTEM SELECTION GUIDE

EFFECTIVE JUNE, 1990

The purpose of this selection guide is to provide the manhole producer a tool to determine what hole size combination will best service his market area. The charts below list a variety of pipes commonly used to construct sanitary collection systems. For each pipe type shown, we've listed every possible PSX connector that could accommodate that given pipe's outside diameter.

The pipe dimensions listed are accurate to industry standards, however we strongly recommend that the pipe barrel's outside diameter be verified for each size and type of pipe on every project. This exercise will prevent infield installation problems. Not listed in the charts below are pipe types that are regional in useage.

| PIPE O.D./IN. | * PIPE DESCRIPTION | ** NOMINAL HOLE SIZE/IN. | *** PSX:POSITIVE SEAL SIZE DESIGNATION |
|---|---|---|---|
| 1.90 | 1.5" P.V.C. | 8.00 | 8QRS "STEP S" PSX |
| 2.38 | 2" P.V.C. | 8.00 | 8QRS "STEP S" PSX |
| 2.50 | 2" C.I./D.I. | 8.00 | 8QRS "STEP S" PSX |
| 2.75 | 2.25" C.I./D.I. | 8.00 | 8QRS "STEP R" PSX |
| 3.50 | 3" P.V.C. | 8.00 | 8QRS "STEP R" PSX |
| 3.96 | 3" C.I./D.I. | 8.00 | 8QRS "STEP Q" PSX |
| 4.21 | 4" P.V.C. D3033 OR D3034 | 8.00 | 8QRS "STEP Q" PSX |
| 4.30 | 4" TRUSS | 8.00 | 8QRS "STEP Q" PSX |
| 4.80 | 4" C.I./D.I. 4" C900 P.V.C. | 8.00 | 8QRS "STEP Q" PSX OR 8A PSX |
| 6.275 | 6" P.V.C. D3033 OR D3034 | 8.00 | 8B PSX |
| | | 9.00 | 9A PSX |
| | | 11.00 | 11Y PSX |
| | | 12.00 | 12Y PSX |
| 6.30 | 6" TRUSS | 8.00 | 8B PSX |
| | | 9.00 | 9A PSX |
| | | 11.00 | 11Y PSX |
| | | 12.00 | 12Y PSX |
| 6.625 | 6" P.V.C. D2241 | 9.00 | 9A PSX OR 9B PSX |
| | | 10.00 | 10A PSX |
| | | 11.00 | 11Y PSX |
| | | 12.00 | 12Y PSX |
| 6.90 | 6" C.I./D.I. 6" C900 P.V.C. | 9.00 | 9A PSX OR 9B PSX |
| | | 10.00 | 10A PSX |
| | | 11.00 | 11Y PSX |
| | | 12.00 | 12Y PSX |
| 8.18 | 8" P.V.C. D3033 | 10.00 | 10B PSX |
| | | 11.00 | 11M PSX OR 11A PSX |
| | | 12.00 | 12M PSX |

| PIPE O.D./IN. | * PIPE DESCRIPTION | ** NOMINAL HOLE SIZE/IN. | *** PSX:POSITIVE SEAL SIZE DESIGNATION |
|---|---|---|---|
| 8.40 | 8" P.V.C. D3034 | 10.00 | 10B PSX |
| | | 11.00 | 11M PSX OR 11A PSX |
| | | 12.00 | 12M PSX |
| 8.625 | 8" P.V.C. D2241 | 11.00 | 11M OR 11A OR 11B PSX |
| | | 12.00 | 12M PSX OR 12A PSX |
| 9.05 | 8" C.I./D.I. 8" C900 P.V.C. | 11.00 | 11M PSX OR 11B PSX |
| | | 12.00 | 12M PSX OR 12A PSX |
| | | 13.00 | 13L PSX |
| 9.40 | 8" TRUSS | 11.00 | 11B PSX |
| | | 12.00 | 12A PSX OR 12B PSX |
| | | 13.00 | 13L PSX |
| 10.20 | 10" P.V.C. D3033 | 12.00 | 12B PSX |
| | | 13.00 | 13A PSX |
| | | 14.00 | 14L PSX |
| | | 16.00 | 16Y PSX |
| 10.50 | 10" P.V.C. D3034 | 13.00 | 13A PSX OR 13B PSX |
| | | 14.00 | 14L PSX OR 14A PSX |
| | | 16.00 | 16Y PSX |
| 10.75 | 10" P.V.C. D2241 | 13.00 | 13A PSX OR 13B PSX |
| | | 14.00 | 14L PSX OR 14A PSX |
| | | 16.00 | 16Y PSX |
| 11.10 | 10" C.I./D.I. 10" C900 P.V.C. | 13.00 | 13B PSX |
| | | 14.00 | 14L PSX OR 14A PSX |
| | | 16.00 | 16Y PSX |
| 11.80 | 10" TRUSS | 14.00 | 14B PSX |
| | | 16.00 | 16L PSX |
| 12.24 | 12" P.V.C. D3033 | 14.00 | 14B PSX |
| | | 16.00 | 16L PSX OR 16A PSX |
| 12.50 | 12" P.V.C. D3034 | 16.00 | 16L PSX OR 16A PSX |
| 12.75 | 12" P.V.C. D2241 | 16.00 | 16A PSX |
| 13.20 | 12" C.I./D.I. 12" C900 P.V.C. | 16.00 | 16A PSX OR 16B PSX |
| | | 16.00 | 16L PSX-2 |

* Footnotes on reverse side.

| PIPE O.D./IN. | * PIPE DESCRIPTION | ** NOMINAL HOLE SIZE/IN. | *** PSX:POSITIVE SEAL SIZE DESIGNATION |
|---|---|---|---|
| 14.10 | 12" TRUSS | 16.00 | 16B PSX |
| | | 18.00 | 18L PSX-2 |
| 15.30 | 15" P.V.C. D3033 OR D3034<br>14" C.I./D.I. | 18.00 | 18A PSX-2 |
| | | 20.00 | 20L PSX-2 |
| 16.00 | 12" R.C.P WALL B | 18.00 | 18B PSX-2 |
| | | 20.00 | 20L PSX-2 OR 20A PSX-2 |
| 17.40 | 16" C.I./D.I. | 20.00 | 20B PSX-2 |
| | | 22.00 | 22L PSX-2 |
| 17.70 | 15" TRUSS | 20.00 | 20B PSX-2 |
| | | 22.00 | 22L PSX-2 |
| 18.701 | 18" P.V.C. F679 | 22.00 | 22A PSX-2 |
| 19.50 | 16" C.I./D.I. | 22.00 | 22A PSX-2 OR 22B PSX-2 |
| | 15" R.C.P. WALL B | 24.00 | 24L PSX-2 |
| 21.60 | 20" C.I./D.I. | 24.00 | 24A PSX-2 OR 24B PSX-2 |
| | | 26.00 | 26L PSX-2 |
| 22.047 | 21" P.V.C. F679 | 24.00 | 24A PSX-2 OR 24B PSX-2 |
| | | 26.00 | 26L PSX-2 |
| 23.00 | 18" R.C.P. WALL B | 26.00 | 26A PSX-2 |
| 24.803 | 24" P.V.C. F679 | 26.00 | 26A PSX-2 |

| PIPE O.D./IN. | * PIPE DESCRIPTION | ** NOMINAL HOLE SIZE/IN. | *** PSX:POSITIVE SEAL SIZE DESIGNATION |
|---|---|---|---|
| 25.80 | 24" C.I./D.I. | 28.00 | 28B PSX-2 |
| | | 30.00 | 30L PSX-2 |
| 26.50 | 21" R.C.P. WALL B | 30.00 | 30L PSX-2 OR 30A PSX-2 |
| 27.96 | 27" P.V.C. F679 | 30.00 | 30B PSX-2 |
| | | 32.00 | 32L PSX-2 |
| 30.00 | 24" R.C.P WALL B | 32.00 | 32B PSX-2 |
| | | 34.00 | 34L PSX-2 |
| 31.50 | 24" R.C.P. WALL C | 34.00 | 34A PSX-2 OR 34B PSX-2 |
| | | 36.00 | 36L PSX-2 |
| 32.00 | 30" C.I./D.I | 34.00 | 34B PSX-2 |
| | | 36.00 | 36A PSX-2 |
| 33.50 | 27" R.C.P. WALL B | 36.00 | 36B PSX-2 |
| | | 38.00 | 38A PSX-2 |
| 36.00 | 27" R.C.P. WALL C | 38.00 | 38B PSX-2 |
| | | 40.00 | 40L PSX-2 |
| 37.00 | 30" R.C.P. WALL B | 40.00 | 40A PSX-2 |
| 38.30 | 36" C.I./D.I. | 40.00 | 40B PSX-2 |
| | | 42.00 | 42A PSX-2 |
| 38.50 | 30" R.C.P. WALL C | 42.00 | 42A PSX-2 |

**PE TYPE DESCRIPTION KEY**

.I./D.I. = Cast Iron and Ductile Iron pipes produced to AWWA C 151 specification standards.

P.V.C. D3034 = PVC pipes produced to ASTM D 3034 specification standards up through 15" I.D. size.

P.V.C. F679 = PVC pipe produced to ASTM F 679 specification standards for pipe I.D.'s from 18" through 27".

P.V.C. D3033 = PVC pipes produced to ASTM D 3033 specification standards.

P.V.C. D 2241 = PVC pipes produced to ASTM D 2241 specification standards.

C 900 P.V.C. = Pipes produced to AWWA C 900 standard specification for Polyvinyl Chloride (PVC) pressure pipe standards.

TRUSS = Pipes produced to ASTM D 2680 specification standards.

R.C.P. = Reinforced Concrete Pipes produced to ASTM C 76 specification standards.

* PIPE TYPE/DESCRIPTION COLUMN: Pipe identification used in this chart is explained in the "key" of this selection guide. For information on sizes and types of pipes not listed, please contact our customer service department.

** NOMINAL HOLE SIZE/IN. COLUMN: These charts have been prepared based on even hole sizes. Any oversizing or undersizing of the receptacle hole will effect the maximum pipes that can be accommodated in any PSX size with a "B" size designation.

*** PSX: POSITIVE SEAL SIZE DESIGNATION COLUMN: This column shows the different PSX assemblies that will accommodate each pipe. If more than one size is listed for the same receptacle hole size, consult PSX Connector Cross-Reference to determine which size connector is best suited for each pipe size.

PSX: POSITIVE SEAL Connectors are designed to meet and/or exceed the requirements of ASTM C 923 Standard Specification for Resilient Connectors Between Reinforced Concrete Manhole Structures and pipes.

Press-Seal believes the information in this publication is accurate as of its publication date; such information is subject to change without notice. Press-Seal is not responsible for any inadvertent errors.

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# PSX POSITIVE SEAL
# COMPLETE SYSTEM USE CHART

EFFECTIVE JULY 1990

| PIPE SIZE | *PIPE TYPE DESCRIPTION | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | P.V.C. D3034 | | C.I./D.I. AND C900 P.V.C. | | TRUSS | | R.C.P.-B WALL | | R.C.P.-C WALL | | | | | |
| 4" | 4.21 O.D. | 8QRS | 4.80 O.D. | 8QRS<br>8A | 4.30 O.D. | 8QRS | | | | | | | | |
| 6" | 6.275 O.D. | 8B<br>9A<br>11Y<br>12Y | 6.90 O.D. | 9A<br>10A<br>11Y<br>12Y | 6.30 O.D. | 8B<br>9A<br>11Y<br>12Y | | | | | | | | |
| 8" | 8.40 O.D. | 10B<br>11M OR 11A<br>12M | 9.05 O.D. | 11M OR 11B<br>12M OR 12A<br>13L | 9.40 O.D. | 11B<br>12A OR 12B<br>13L | | | | | | | | |
| 10" | 10.50 O.D. | 13A OR 13B<br>14L OR 14A<br>16Y | 11.10 O.D. | 13B<br>14L OR 14A<br>16Y | 11.80 O.D. | 14B<br>16L | | | | | | | | |
| 12" | 12.50 O.D. | 16L OR 16A | 13.20 O.D. | 16A OR 16B<br>18L | 14.19 O.D. | 16B<br>18L | 16.00 O.D. | 18B<br>20L OR 20A | | | | | | |
| 14" | N/A | | 15.30 O.D. | 18A<br>20L | N/A | | | | | | | | | |
| 16" | 15.30 O.D. | 18A<br>20L | N/A | | 17.70 O.D. | 20B<br>22L | 19.50 O.D. | 22A OR 22B<br>24L | | | | | | |
| 18" | N/A | | 17.40 O.D. | 20B<br>22L | | | N/A | | | | | | | |
| 18" | 18.701 O.D. | 22A | 19.50 O.D. | 22A OR 22B<br>24L | | | 23.00 O.D. | 26A | | | | | | |
| 20" | N/A | | 21.60 O.D. | 24A OR 24B<br>26L | | | N/A | | | | | | | |
| 21" | 22.047 O.D. | 24A OR 24B<br>26L | N/A | | | | 26.50 O.D. | 30L OR 30A | | | | | | |
| 24" | 24.803 O.D. | 28A | 25.80 O.D. | 28B<br>30L | | | 30.00 O.D. | 32B<br>34L | 31.50 O.D. | 34A OR 34B<br>36L | | | | |
| 27" | 27.96 O.D. | 30B<br>30L | N/A | | | | 33.50 O.D. | 36B<br>38A | 35.00 O.D. | 38B<br>40L | | | | |
| 30" | N/A | | 32.00 O.D. | 34B<br>36A | | | 37.00 O.D. | 40A | 38.50 O.D. | 42A | | | | |
| 36" | N/A | | 38.30 O.D. | 40B<br>42A | | | | | | | | | | |
| | | | | | | | | | | | | | | |

*PIPE TYPE DESCRIPTIONS: Pipe identifications used in this chart are explained in the "key" on the reverse side of this use chart. If more than one size is listed for the same receptacle hole size, consult the PSX Connector Cross-Reference to determine which size connector is best suited for each pipe size. For information on sizes and types of pipe not listed, please contact our customer service department.


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## PIPE TYPE DESCRIPTION KEY

C.I./D.I. = Cast Iron and Ductile Iron pipes produced to AWWA C 151 specification standards.

P.V.C. D3034 = PVC pipes produced to ASTM D 3034 specification standards up through 15" I.D. size.

P.V.C. F679 = PVC pipe produced to ASTM F 679 specification standards for pipe I.D.'s from 18" through 27".

C 900 P.V.C. = Pipes produced to AWWA C 900 standard specification for Polyvinyl Chloride (PVC) pressure pipe standards.

TRUSS = Pipes produced to ASTM D 2680 specification standards.

R.C.P. = Reinforced Concrete Pipes produced to ASTM C 76 specification standards.

| MANHOLE I.D. | | MANHOLE STANDARD B-WALL THICKNESS | | STANDARD HOLE SIZE RANGE | | STANDARD MAXIMUM RECOMMENDED PIPE O.D. | |
|---|---|---|---|---|---|---|---|
| INCHES | MM | INCHES | MM | INCHES | MM | INCHES | MM |
| 36" | 900 | 4.0" | 100 | 8"-20" | 200-500 | 16.0" | 400 |
| 42" | 1050 | 4.5" | 113 | 8"-24" | 200-600 | 19.9" | 500 |
| 48" | 1200 | 5.0" | 125 | 8"-28" | 200-710 | 26.3" | 670 |
| 60" | 1500 | 6.0" | 150 | 8"-34" | 200-860 | 32.0" | 810 |
| 72" | 1800 | 7.0" | 175 | 8"-42" | 200-1060 | 40.0" | 1020 |

NOTE: MM Denotes millimeters (rounded to ASTM designation C 76M-86)
For other precast manhole sizes and structures, please contact our customer service department.

PSX: POSITIVE SEAL Connectors are designed to meet and/or exceed the requirements of ASTM C 923 Standard Specification for Resilient Connectors Between Reinforced Concrete Manhole Structures and Pipes.

## GASKET INSTALLATION

1. Place PSX gasket into hole with holes in power sleeve at the 6 o'clock position.
2. Insert studs of hydraulic tool into holes of power sleeve and pump hydraulic unit until gasket stays positioned in hole without assistance.
3. Gasket must be aligned square in the hole.
4. Pump hydraulic unit to expand power sleeve while making sure sleeve ends stay aligned on top of each other.
5. After sleeve ends snap into place, face to face, check gauge to make sure minimum installation pressure has been achieved.
6. Relax power sleeve slightly to interlock the ends securely for a positive seal.

## PIPE INSTALLATION

1. After manhole has been set to grade, inspect and clean out inside of connector. Clean surface of pipe barrel to be installed.
2. Insert pipe into connector, until end of pipe breaks inside plane of manhole wall. Position pipe in center of connector.
3. Install take-up clamp(s) in groove(s) at pipe receiving end of gasket. Check again to make sure interior of connector and pipe barrel surfaces are clean.
4. Tighten take-up clamp(s) with ratchet or torque wrench, to 60 in/lbs. torque.
5. Adjust pipe to line and grade. Use proper bedding and backfill materials and techniques.
6. Any pipe stubs installed in the manhole must be restrained from movement.
7. Before using the PSX: POSITIVE SEAL system for any custom applications, contact our Customer Service Dept., for more information.

For more specific information about PSX: Positive Seal Connectors please refer to the PSX: Positive Seal Connector Cross-Reference. For more information about PSX: Positive Seal or any other of our seals and accessories for Collection System Construction, Contact your Local Reinforced Concrete Precast Manhole Producer or our Customer Service Department.

Press-Seal believes the information in this publication is accurate as of its publication date; such information is subject to change without notice. Press-Seal is not responsible for any inadvertent errors.

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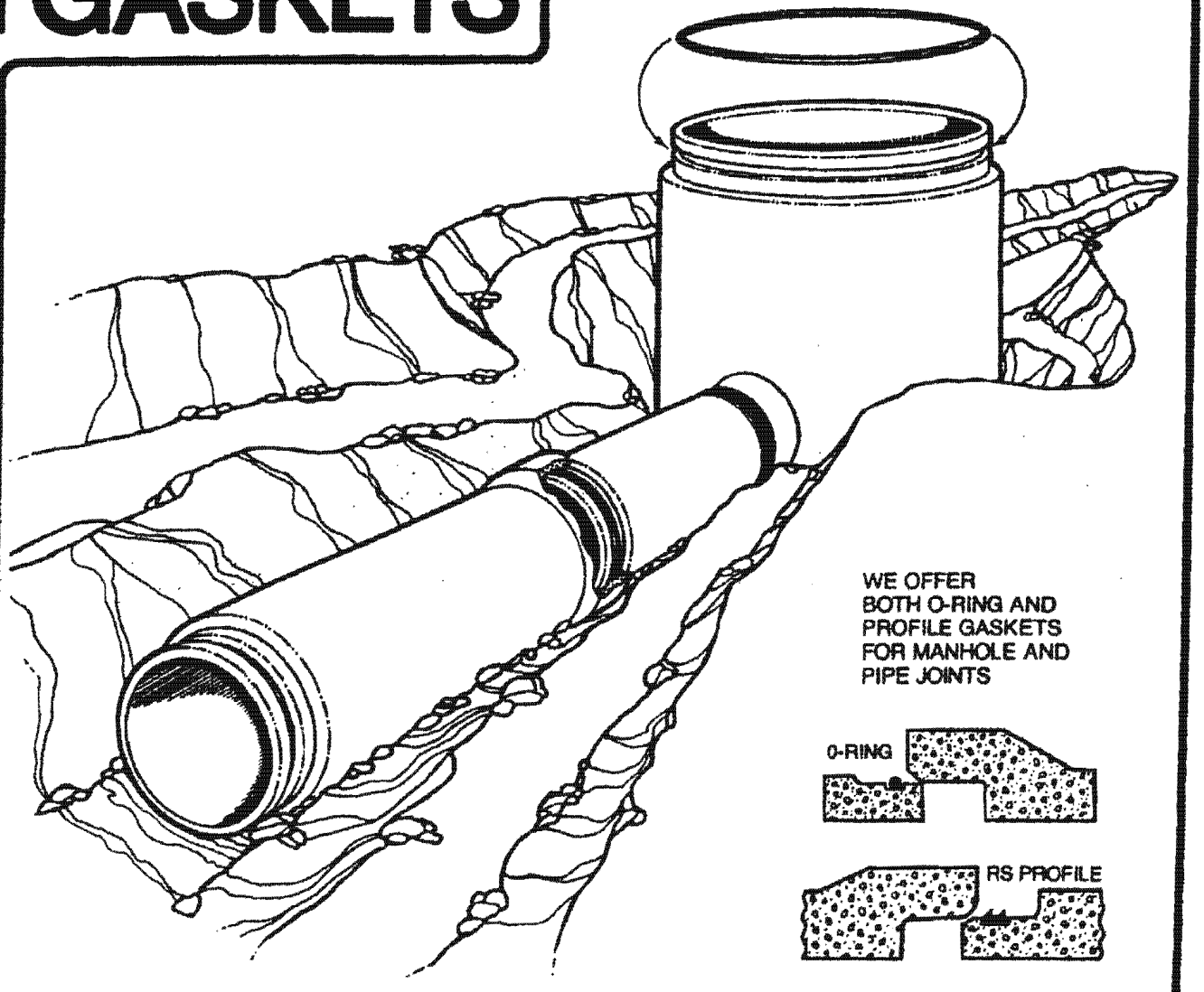
U.S. Patent Nos. 4215868 and 4478437

**PRESS-SEAL GASKET CORPORATION**
**CONCRETE PRODUCTS SUPPLY COMPANY**
1-800-348-7325 (219) 436-0521 Fax No. (219) 436-1908
MAIL TO: P.O. BOX 10482 • FORT WAYNE, INDIANA 46852
SHIP TO: 8935 LINCOLN PARKWAY • FORT WAYNE, INDIANA 46804

# O-RING GASKETS

- QUALITY RAW MATERIALS
- PRECISION EXTRUDED RUBBER
- CONSISTENT O.D., WEIGHT AND VOLUME



WE OFFER BOTH O-RING AND PROFILE GASKETS FOR MANHOLE AND PIPE JOINTS







**PRESS-SEAL GASKET CORPORATION**
6935 LINCOLN PARKWAY - FORT WAYNE, INDIANA 46804
Phone (219) 436-0521 or (800) 348-7325
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# O-RING GASKETS

O-Ring gasket designs for concrete pipe and manhole joints have proven to seal so effectively that the confined groove O-Ring gasket design has become the most commonly accepted standard joint design for concrete pipe and manhole section joints.

There are several advantages of this round cross-section and joint design:
fast and easy infield installation, the gasket cannot be installed in the spigot groove backwards, lubrication and application is easily explained and common knowledge to experienced underground contractor personnel.

---

Press-Seal gaskets are manufactured to meet or exceed the requirements of the following standards:

| | |
|---|---|
| ASTM C 361-89b<br>AWWA C 301<br>AWWA C 302 | Standard specifications for concrete pipe using O-Ring gasket designs. |
| ASTM C 443-85a | Standard specifications for concrete pipe using either O-ring or profile gasket designs. |

Press-Seal produces O-Ring gaskets to meet the requirements of either ASTM C 361-89b or C 443-85a.

| | ASTM C 361-89b Standard Gasket Physical property requirements: | ASTM C 443-85a Standard Gasket Physical property requirements: |
|---|---|---|
| Tensile strength, min. PSI | 2300 | 1200 |
| Elongation at break, min. % | 425 | 350 |
| Shore A durometer hardness +/-5 | | |
| min | 40* | 40* |
| max | 60* | 60* |
| Compression set, max % of original deflection | 20 | 25 |
| Accelerated aging, max % of original | | |
| Decrease in tensile | 15 | 15 |
| Decrease in elongation | 20 | 20 |
| Liquid immersion, max % weight increase water absorption | 5 | 10 |
| Ozone resistance | no visible cracking in accordance with test method D 1149 | no cracks in accordance with test method D 1149 |

*Allowable variation +/-5 from manufacturer specified hardness.

All the above tests are conducted in accordance with tests procedures as described in both ASTM C 361-89b and ASTM C 443-85a.

Press-Seal also manufactures profile pipe gaskets to meet the requirements of ASTM C 443-85a.

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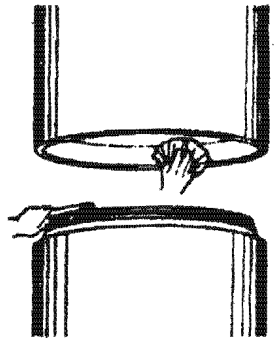
# O-RING GASKET INSTALLATION

## ON MANHOLE RISERS

①

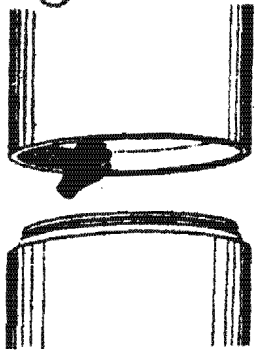


Carefully clean all dirt and foreign objects from the jointing surface of the bell or groove end of pipe

Carefully clean spigot or tongue end of pipe, including the gasket recess.

Improperly prepared bell and spigot surfaces may prevent homing of the pipe or keep the gasket from sealing.

②



Lubricate bell joint surface liberally, cover entire inside surface. Using PRESS-SEAL Pipe Gasket Lubricant.

A bell and gasket not lubricated or improperly lubricated may cause the gasket to roll and leak or possibly damage the bell.

③

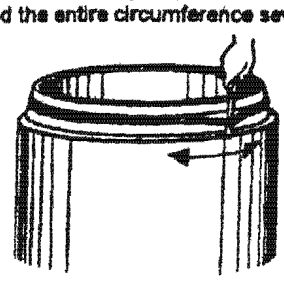



Lubricate the gasket thoroughly before it is placed on the spigot or tongue.

Excessive force will be needed to push the pipe home if the gasket is not well lubricated.

④

Fit the gasket carefully. Equalize the rubber gasket stretch by running a smooth, round object (inserted between gasket and spigot), around the entire circumference several times.

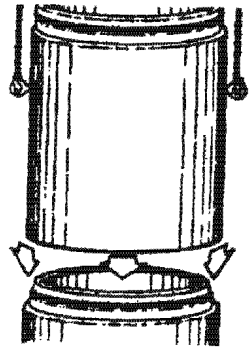


Unequal stretch could cause bunching of the gasket and may cause leaks in the joint or crack the bell.

⑤

Align the bell and spigot to be jointed. Before homing the joint check that the gasket is in contact with the bell end entrance taper around the entire circumference.

Improper alignment can dislodge gasket causing leaks or possibly breaking the bell.



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REF NO. 381.MH0883

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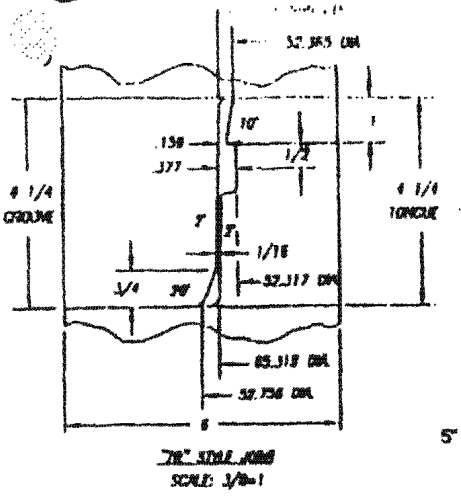
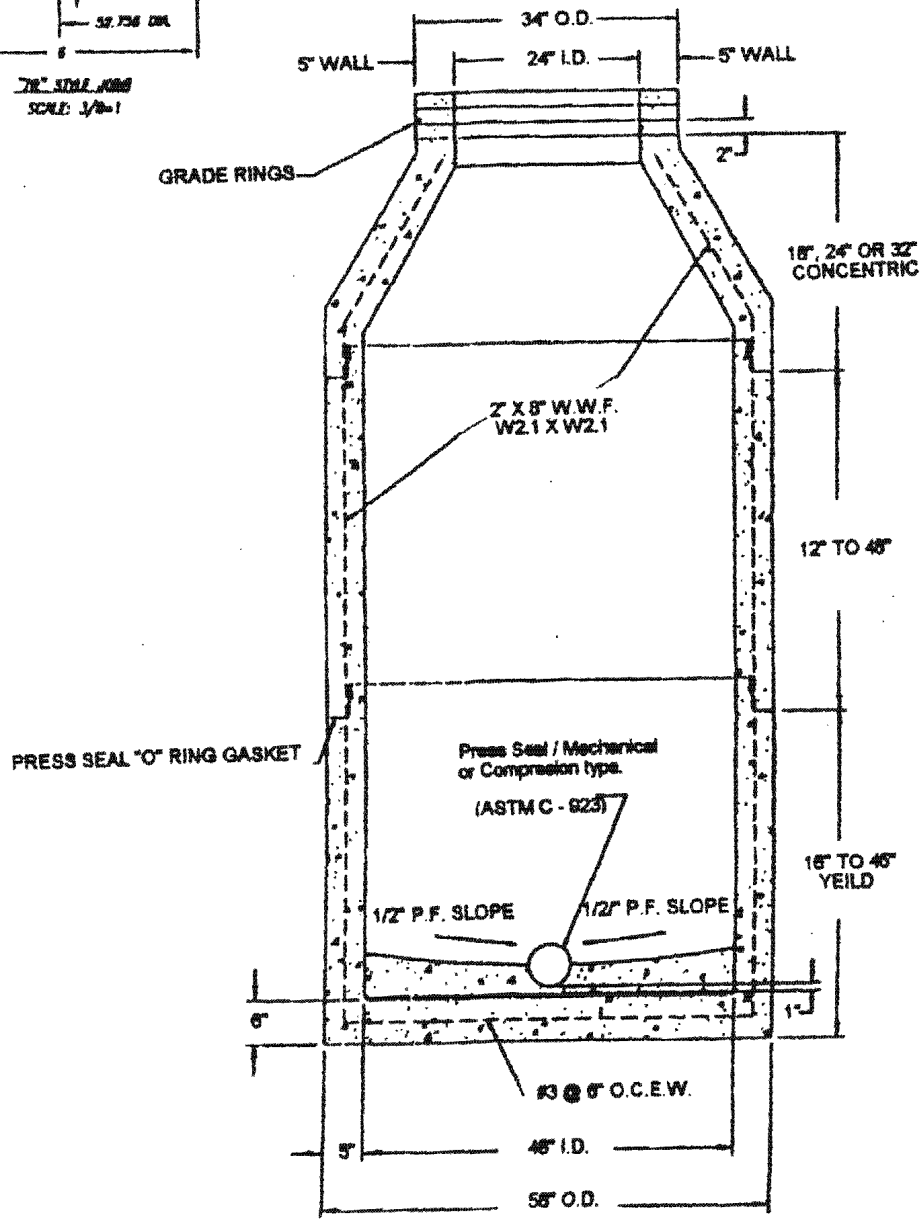
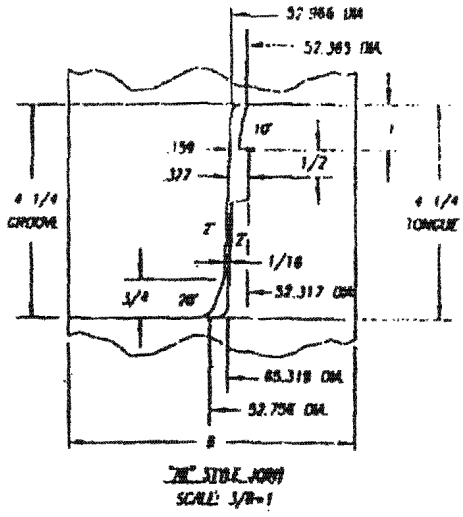


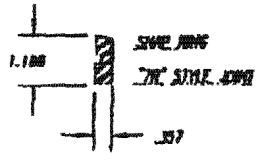


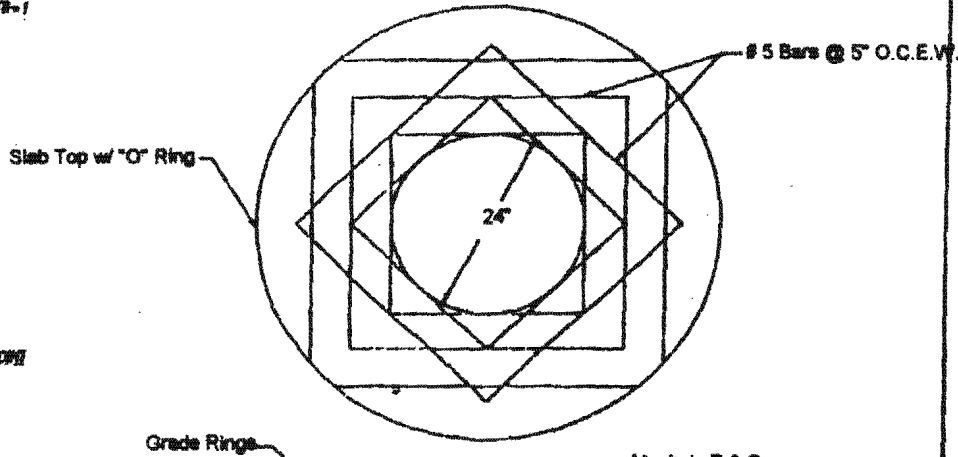

ALL MATERIALS MEET OR EXCEED ASTM C-478

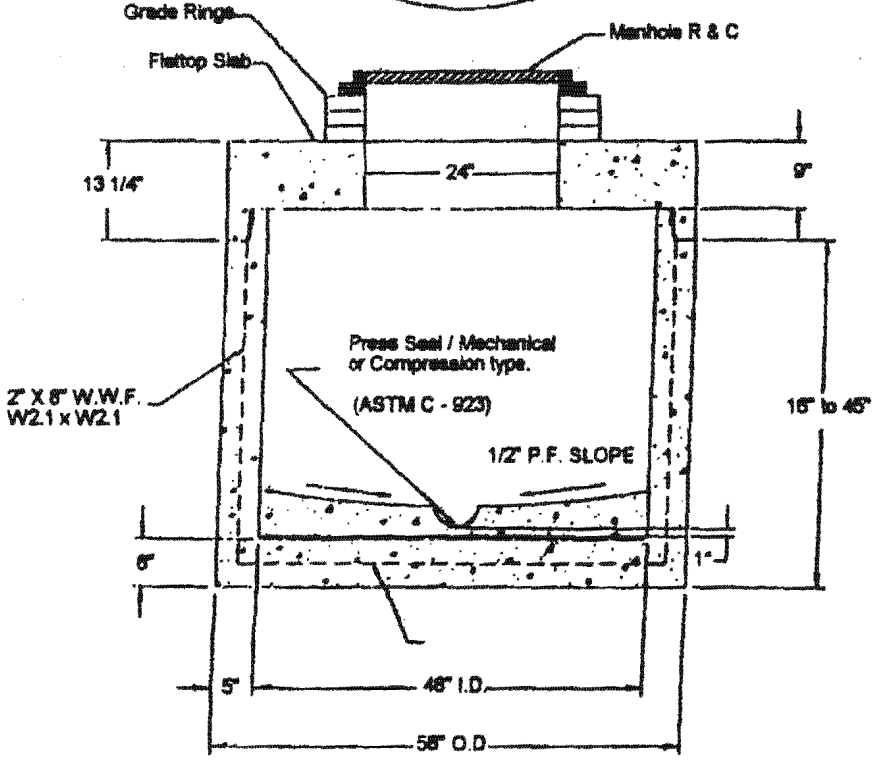
CHARLOTTES CONCRETE

CHARLOTTES




CHARLOTTES

CHARLOTTES CONCRETE

**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: **Newcombe Tennis Ranch Subdivision**

**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.

   X Fuels and hazardous substances will not be stored on-site.

2. X **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. NA 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. X **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.

   __ There are no other potential sources of contamination.

**SEQUENCE OF CONSTRUCTION**

5. X **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. X 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: **Blieders Creek, Dry Comal Creek tributary**

**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. X **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.

   X 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.

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

9. X **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. X **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.

X 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. NA **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. X **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. X 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. X 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. NA 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. X 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. X **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. X 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. X Stabilization practices must be initiated as soon as practicable where construction activities have temporarily or permanently ceased.

**ADMINISTRATIVE INFORMATION**

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

21. X 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. X 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:

**David McBeth, P.E.**
Print Name of Customer/Agent

Signature of Customer/Agent

6/4/08
Date

# ATTACHMENT "A "

## Spill Response Actions

There will be no above ground fuel storage tanks allowed on this project. Equipment will be fueled using mobile fuel trucks as needed. There is a small chance of a fuel spill occurring due to leaking construction equipment or re-fueling operations. If a spill were to occur, the following measures will be taken to contain the spill:

Minor Spills:

- 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.
- Use absorbent materials on small spills rather than hosing down or burying the spill.
- Absorbent materials shall be promptly removed and disposed of properly.
- Follow the practice below for a minor spill:
    - Contain the spread of the spill.
    - Recover spilled materials.
    - 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 shall be cleaned up immediately.

- Contain spread of the spill.
- Notify the project foreman immediately.
- 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.
- If the spill occurs in dirt areas, immediately contain the spill by constructing an earthen dike. Dig up and properly dispose of contaminated soil.
- 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, the following measures shall be taken.

- 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.
- For spills of federal reportable quantities, in conformance with the requirements in 40 CFR parts 110, 119, and 302, the contractor shall notify the National Response Center at 1-800-424-8802.
- Notification shall first be made by telephone and followed up with a written report. The written report shall provide the description of the release, the date and circumstances of the release and the steps to be taken to prevent another release.

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

## Potential Sources of Contamination

The only potential sources of contamination are construction equipment leaks, re-fueling spills and asphalt lay down operations, as well as potential from port-o-lets. There are no other anticipated potential sources of contamination.

# ATTACHMENT "C"

## Sequence of Major Activities

Stages of Construction:
The following construction sequence will occur for each unit. Final stabilization will be completed prior to the start of the next unit.

1. Clearing and Grubbing – removal of trees, stumps, brush and other debris within the proposed street right-of-way to allow for the construction of streets. Approximate disturbed area = 15 acres
2. Rough Grading – Cutting and filling of street areas to prepare the roadbed for pavement layers. Approximate disturbed area = 15 acres.
3. Culvert Installation – Culverts will be installed where needed to allow runoff under the proposed roads. Approximate disturbed area is less than 3 acres.
4. Utility Installation – There will be underground water, sanitary sewer, telephone, cable television and electric lines installed primarily within the proposed streets. There will be minimal disturbance outside of the clearing and grubbing area.
5. Finished Grading – Final landscaping and asphalt pavement layers are installed. Approximate disturbed area = 20 acres.
6. Residential Construction – Lots will be sold to individuals only, and homes built at random times. The construction is very minimal and will average 15% - 20% of disturbed area per lot. Approximate disturbed area = 21 acres.
7. Tennis Amenity Facility – The improvements at the facility will be constructed at varying times. Approximate disturbed area = 4 acres.
8. Water wells S-2 and S-12 shall be plugged in accordance with the State of Texas Rules and Regulations, Title 16, Texas Administrative Code, Chapter 76. Water well S-12 shall be plugged after rough grading for the Unit 1 streets is completed. Water well S-2 shall be plugged after the streets and drainage construction for Unit 1 is completed. Approximate disturbed area < 1 acre.

# Attachment "D"

## Temporary BMPs and Measures

Soil disturbance will be limited to a minimal distance outside of the proposed pavement and tennis amenity facility improvements. No soil disturbance will occur outside of the ROW. All of the low areas, which collect storm water runoff, will remain in a natural state acting as vegetative filter strips. Grasses will be allowed to grow between the edge of pavement and right-of-way line and will act as a filter for street runoff once established.

Silt fence will be placed on the down gradient side of the site to contain pollutants generated from on-site runoff. Rock berms will be constructed at concentrated points of discharge and just downstream of all culvert locations. Stabilized construction entrances and exits will be installed at the entrance to each unit, and the entrance to the tennis amenity facility area to help eliminate contaminants from leaving the site during construction traffic. The majority of the property will not be disturbed leaving the natural vegetation, therefore, reducing the potential of polluting streams and the aquifer.

There are 2 sensitive features identified in the Geologic Assessment. The features that were identified in the Geologic Assessment will be protected during construction by diverting concentrated runoff away from the features and or placing silt fence just upstream of the feature location. In addition, the sensitive features will also be protected during and after construction through the use of platted setbacks at each sensitive feature. Material from excavated utility trenches will be placed upstream of the trench to reduce the potential of sediment transport.

The following sequence will be followed for installing temporary BMPs:

1. Roadway centerline will be roughly cleared for surveying purposes. (No soil disturbance.)
2. Silt fence will be constructed on the downstream side of proposed roadways prior to beginning clearing and grubbing operations.
3. Silt fencing will be placed around (10-foot radius) the existing water wells prior to beginning any soil disturbing construction.
4. A stabilized construction exit will be established before clearing and grubbing equipment is delivered to the site.
5. Rock berms and rock check dams are constructed downstream of proposed culvert locations once rough grading has been completed and prior to culvert installation.
6. Prior to beginning any home construction, silt fence will be constructed on the downstream side of the lot.

# Attachment "F"

## Structural Practices

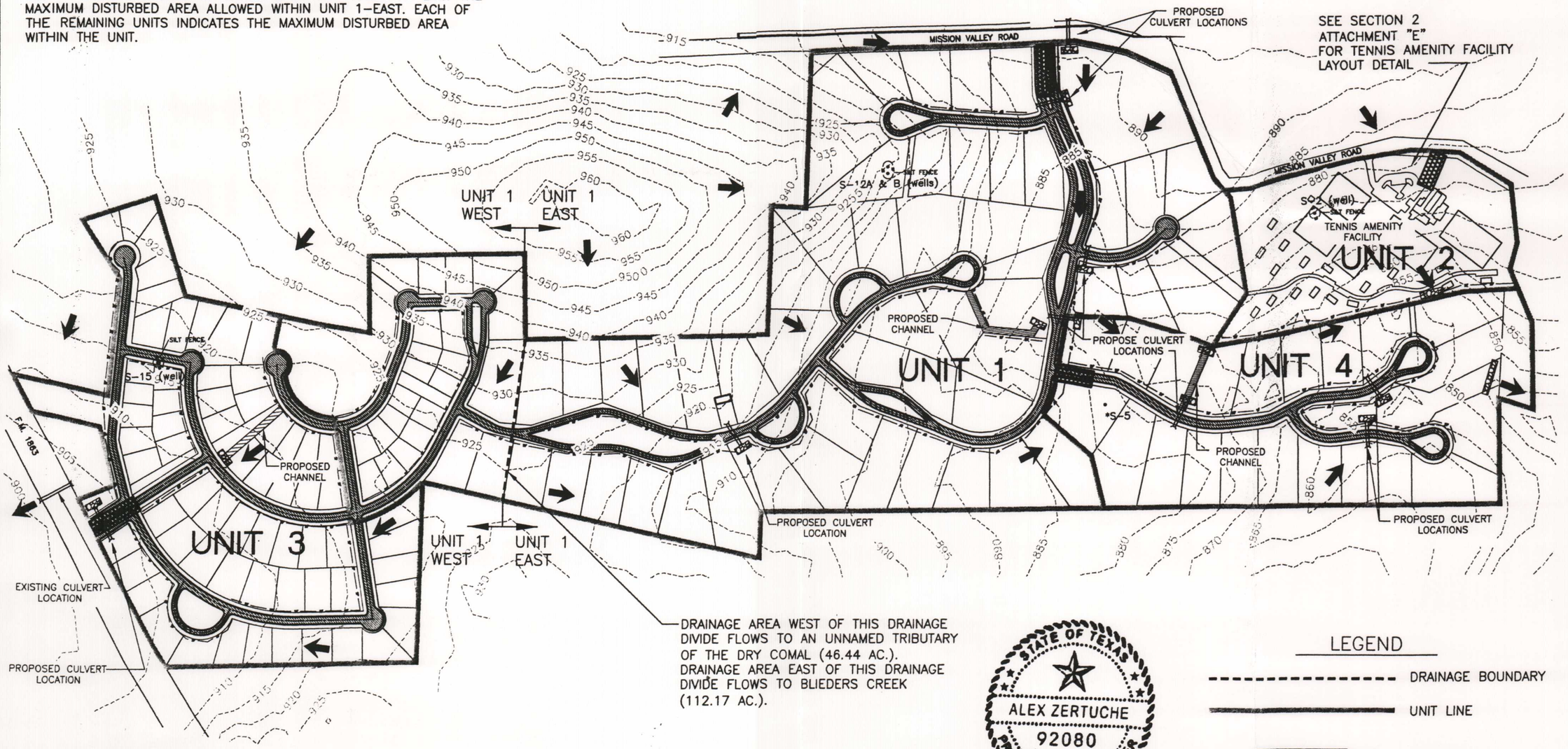
Rock berms, rock check dams and silt fence will be used to protect exposed soils and to prevent contamination from leaving the site. The majority of the site will remain in a natural condition with minimal impacts to existing drainage paths; therefore, natural filtration will be allowed to occur.

| DISTURBED AREA TABLE | | | | | | |
|---|---|---|---|---|---|---|
| | DISTURBED AREA (AC.) | | | NO. OF RESIDENTIAL LOT TYPE | | |
| UNIT NO. | STREETS** | LOTS | TOTAL | ESTATE | CONVENTIONAL | GARDEN |
| *UNIT 1 EAST (PHASE 1) | 5.13 | 4.80 | 9.93 | 37 | – | – |
| *UNIT 1 EAST (PHASE 2) | – | 1.86 | 1.86 | 13 | – | – |
| *UNIT 1 WEST | 1.72 | 1.86 | 3.58 | 3 | 8 | 13 |
| UNIT 2 | – | 3.60 | 3.60 | – | – | – |
| UNIT 3 | 3.71 | 4.87 | 8.58 | – | 41 | 23 |
| UNIT 4 | 1.64 | 2.53 | 4.17 | 19 | – | – |

* UNIT 1 IS DIVIDED INTO TWO WATERSHEDS (WEST & EAST).
** INCLUDES STREETS AND CHANNELS

TABLE NOTE:
TO MEET TCEQ REQUIREMENTS, THE DEVELOPMENT PROPOSED IN THE UNIT 1–EAST WATERSHED IS DIVIDED INTO TWO PHASES TO LIMIT THE MAXIMUM DISTURBED AREA ALLOWED WITHIN UNIT 1–EAST. EACH OF THE REMAINING UNITS INDICATES THE MAXIMUM DISTURBED AREA WITHIN THE UNIT.

SCALE: 1" = 400'




STATE OF TEXAS
ALEX ZERTUCHE
92080
LICENSED PROFESSIONAL ENGINEER
12-21-07

LEGEND

- DRAINAGE BOUNDARY
- UNIT LINE
- ROCK BERM
- SILT FENCE
- STABILIZED CONSTRUCTION ENTRANCE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# DRAINAGE AREA MAP

## ATTACHMENT "G"

**NEWCOMBE TENNIS RANCH SUBDIVISION**
**160 Acres South of Mission Valley Rd.**
**NEW BRAUNFELS, TEXAS**

| | |
|---|---|
| DATE: | 12/14/2007 |
| DRAWN BY: | JR |
| DESIGNED BY: | A.Z. |
| CHECKED BY: | A.Z. |
| REVIEWED BY: | A.Z. |
| PROJECT NUMBER: | 310690.012 |

SHEET 1

# Attachment "H"

## Temporary Sediment Pond(s) Plans and Calculations

There will not be more than 10-acres of disturbed soil in a common drainage area that will occur at one time. There will be rock berms and rock check dams installed to treat concentrated runoff from larger drainage areas (>10-acres) and silt fence used for small drainage areas and sheet flow runoff. No sediment ponds will be used on this project due to the minimal disturbance of soil.

# Attachment "I"

## Inspection and Maintenance for BMPs

## Inspection and Maintenance Plan

- The contractor is required to inspect the controls and fences at weekly intervals and after any 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.
- Temporary Construction Entrance/Exit: The entrance shall 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. All sediment spilled, dropped, washed or tracked onto public rights-of-way shall be removed immediately by contractor. When necessary, wheels shall be cleaned to remove sediment prior to entrance onto public right-of-way. When washing is required, it shall be done on an area stabilized with crushed stone that drains into an approved sediment trap. All sediment shall be prevented from entering any storm drain, ditch or water course by using approved methods.
- Silt Fence: Remove sediment when buildup reaches six inches. Replace any torn fabric or install a second line of fencing parallel to the torn section. 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 be provide equal protection, but will not obstruct vehicles. When construction is complete, the sediment shall be disposed of in a manner that will not cause additional siltation. The prior location of the silt fence shall be revegetated. The fence itself shall be disposed of in an approved landfill.
- Rock Berms: For installation in streambeds, additional daily inspections shall be made. Remove sediment and other debris when buildup reaches six inches and dispose of the accumulated silt in an approved manner that will not cause any additional siltation. Repair any loose wire sheathing. The berm shall be reshaped as needed during inspection. The berm shall be replaced when the structure ceases to function as intended due to silt accumulation among the rocks, washout, construction traffic damage, etc. The

rock berm shall be left in place until all upstream areas are stabilized and accumulated silt removed.

- TCEQ staff will be allowed full access to the property during construction of the project for inspecting controls and fences and to verify that the accepted plan is being utilized in the field. TCEQ staff has the right to speak with the contractor to verify plan changes and modifications.
- Any changes made to the location or type of controls shown on the accepted plans, due to onsite conditions, shall be documented on the site plan that is part of this Water Pollution Abatement Plan. No other changes shall be made unless approved by the TCEQ and the Design Engineer. Documentation shall clearly show changes made, date, and person responsible and reason change was made.

**Owner's Information:**

Owner: Newcombe Development L.L.C.
Contact: Jeremy Fieldsend
Phone #: (830) 625-9105
Address: 325 Mission Valley Road
New Braunfels, Texas 78132

**Owner's Engineer:**

Company: Carter & Burgess, Inc.
Contact: Alex Zertuche, P.E.
Phone #: (210) 494-0088
Address: 911 Central Pkwy North, #425
San Antonio, Texas 78232

**Person or Firm Responsible For Erosion/Sedimentation Control Maintenance:**

Company: _____ Phone #:_____
Contact: _____
Address: _____
_____

Signature of Responsible Party:_____

**This portion of the form shall be filled out and signed by the responsible party prior to construction.**

# Attachment "J"

## Schedule of Interim and Permanent Soil Stabilization Practices

There will be minimal disturbed soil due to construction operations that are not covered by pavement or buildings. The area is generally very rocky with a minimal amount of overlying soil. Areas, which are disturbed by construction staging, and storage areas will be hydro mulched with the appropriate seed mixture. Areas between the edge of pavement and right-of-way line will also be hydro mulched if a soil layer exists. Areas within islands and the entrance will be landscaped with appropriate plants and mulched. There will be no fill slopes exceeding a 3:1 slope and all fill slopes will be hydro mulched. Installation and acceptable mixtures of hydro mulch are as follows:

Materials:

Hydraulic Matrices: Hydraulic matrices include a mixture of wood fiber and acrylic polymer or other tackifier as binder. Apply as a liquid slurry using a hydraulic application machine (i.e. hydro seeder) at the following minimum rates, or as specified by the manufacturer to achieve complete coverage of the target area: 2,000 to 4,000 lb/acre wood fiber mulch, and 5 to 10% (by weight) of tackifier (acrylic copolymer, guar, psyllium, etc.)

Bonded Fiber Matrix: Bonded fiber matrix (BFM) is a hydraulically applied system of fibers and adhesives that upon drying forms an erosion resistant blanket that promotes vegetation, and prevents soil erosion. BFM's are typically applied at rates from 3,000 lb/acre to 4,000 lb/acre based on the manufacturer's recommendation. A biodegradable BFM is composed of materials that are 100% biodegradable. The binder in the BFM should also be biodegradable and should not dissolve or disperse upon re-wetting. Typically, biodegradable BFM's should not be applied immediately before, during or immediately after rainfall if the soil is saturated. Depending on the product, BFM's typically require 12 to 24 hours to dry and become effective.

Seed Mixtures:

| **Dates** | **Climate** | **Species** | **(lb/ac)** |
|---|---|---|---|
| Sept. 1 to Nov. 30 | Temporary Cool Season | Tall Fescue | 4.0 |
| | | Oats | 21.0 |
| | | Wheat | 30.0 |
| | | **Total** | **55.0** |
| Sept. 1 to Nov. 30 | Cool Season Legume | Hairy Vetch | 8.0 |
| May 1 to Aug. 31 | Temporary Warm Season | Foxtail Millet | 30.0 |

Fertilizer: Fertilizer should be applied at the rate of 40 pounds of nitrogen and 40 pounds of phosphorous per acre, which is equivalent to about 1.0 pounds of nitrogen and phosphorous per 1000 square feet.

Installation:

1. Final grading must be completed and all necessary BMPs should be in place prior to the addition of the hydro mulch mixture.
2. Prior to application, roughen embankment and fill areas by rolling with a crimping or punching type roller or by track walking. Track walking shall only be used where other methods are impractical.
3. To be effective, hydraulic matrices require 24 hours to dry before rainfall occurs.
4. Avoid mulch over spray onto roads, sidewalks, drainage channels, existing vegetation, etc.
5. Hydro mulch mixture shall be as recommended by the County Agriculture Extension Agent or as shown above for the specific time of year and whether or not irrigation will be utilized.
6. Hydro mulch rates shall be as shown above or as recommended by the County Agriculture Extension Agent, and shall be applied in a uniform manner
7. If blankets or matting are used, they shall conform to the Texas Department of Transportation specifications.

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

I **Jeremy Fieldsend**
Print Name

**Partner**
Title - Owner/President/Other

of **Newcombe Development, L.L.C.**
Corporation/Partnership/Entity Name

have authorized **Carter & Burgess, Inc.**
Print Name of Agent/Engineer

of **Carter & Burgess, Inc.**
Print Name of Firm

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

I also understand that:

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

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

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

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

Jeremy Fieldsend

Applicant's Signature Date

THE STATE OF Texas §

County of Comal §

BEFORE ME, the undersigned authority, on this day personally appeared Jeremy Fieldsend 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 9th day of October, 2008.

Florence H. Sultemeier

NOTARY PUBLIC

Typed or Printed Name of Notary

NOTARY PUBLIC STATE OF TEXAS

Florence H. Sultemeier
Notary Public
State of Texas
My Comm. Exp. 10/10/2009

MY COMMISSION EXPIRES:

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

NAME OF PROPOSED REGULATED ENTITY: **Newcombe Tennis Ranch Subdivision Unit 1**
REGULATED ENTITY LOCATION: **Along Mission Valley Road approx. 0.5 miles southwest of the intersection with SH 46 in Comal County**
NAME OF CUSTOMER: **Newcombe Development, LLC**
CONTACT PERSON: **Jeremy Fieldsend** PHONE: **(830) 625-9105**
(Please Print)

Customer Reference Number (if issued): CN 601400542 (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 | Acres | $ |
| **Sewage Collection System** | **12,365 L.F.** | **$ 6,182.50** |
| 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

21 MAY 08
Date

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

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

in their information corrected. To review such information, contact us at 512/239-3282.

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

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

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

**Organized Sewage Collection Systems and Modifications**

| PROJECT | COST PER LINEAR FOOT | MINIMUM FEE<br>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<br>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 |

Carter::Burgess

JPMorgan Chase Bank, N.A.
Dallas, TX

88-88/1113

**Date** 05/21/08 **NO.** 1048288

**PAY** **Six thousand one hundred eighty-two and 50/100 Dollars*****

$6,182.50

TO THE ORDER OF
TEXAS COMMISSION ON ENVIRONMENTAL
ATTN:
AUSTIN, TX 00000

AUTHORIZED SIGNATURE
VOID AFTER 90 DAYS

THE BACK OF THIS DOCUMENT CONTAINS A WATERMARK.

⑈1048288⑈ ⑆111300880⑆ 93200004618⑈

1048288

10713 80443 TEXAS COMMISSION ON ENVIRONMENTAL

| INVOICE NUMBER | INVOICE DATE | INVOICE AMOUNT | DISCOUNT TAKEN | AMOUNT PAID |
|---|---|---|---|---|
| 05/21/2008 | 05/21/08 | 6,182.50 | 0.00 | 6,182.50 |
| TOTALS | | 6,182.50 | 0.00 | 6,182.50 |

TCEQ

# TCEQ Core Data Form

TCEQ Use Only

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 | SCS Application |

| **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 | | 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: |

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

| **10. Mailing Address:** | 325 Mission Valley Road | | | | | | |
|---|---|---|---|---|---|---|---|
| | **City** | New Braunfels | **State** | TX | **ZIP** | 78132 | **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)* |
|---|---|---|
| ( 830 ) 625-9105 | | ( 830 ) 625-2004 |

| **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)* |
|---|---|---|---|
| 260623468 | 32033408595 | NA | NA |

| **20. Number of Employees** | | | | | **21. Independently Owned and Operated?** | |
|---|---|---|---|---|---|---|
| ☒ 0-20 | ☐ 21-100 | ☐ 101-250 | ☐ 251-500 | ☐ 501 and higher | ☐ **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)*

Newcombe Tennis Ranch Subdivision

| | | | | | | | |
|---|---|---|---|---|---|---|---|
| **24. Street Address of the Regulated Entity:** *(No P.O. Boxes)* | Entity has no street address. It is located on Mission Valley Road approximately 0.5 miles southwest of the intersection with State Highway 46. | | | | | | |
| | **City** | New Braunfels | **State** | TX | **ZIP** | 78132 | **ZIP + 4** |
| **25. Mailing Address:** | 325 Mission Valley Road | | | | | | |
| | **City** | New Braunfels | **State** | TX | **ZIP** | 78132 | **ZIP + 4** |
| **26. E-Mail Address:** | | | | | | | |

| **27. Telephone Number** | **28. Extension or Code** | **29. Fax Number** *(if applicable)* |
|---|---|---|
| ( 830 ) 625-9105 | | ( 830 ) 625-2004 |

| **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) |
|---|---|---|---|
| 1521 | NA | 236115 | NA |

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

Single-Family Houses

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

| | |
|---|---|
| **35. Description to Physical Location:** | Located on Mission Valley Road approximately 0.5 miles southwest of the intersection with State Highway 46. |

| **36. Nearest City** | **County** | **State** | **Nearest ZIP Code** |
|---|---|---|---|
| New Braunfels | Comal | TX | 78132 |

| **37. Latitude (N) In Decimal:** | 29.7208 | | **38. Longitude (W) In Decimal:** | 98.200 | |
|---|---|---|---|---|---|
| Degrees | Minutes | Seconds | Degrees | Minutes | Seconds |
| 029 | 43 | 15 | 098 | 12 | 00 |

**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 Tires |
| | | | | |
| ☐ Stormwater | ☐ Title V – Air | ☐ Used Oil | ☐ Utilities | ☐ Voluntary Cleanup |
| | | | | |
| ☐ Waste Water | ☐ Wastewater Agriculture | ☐ Water Rights | ☐ Other: | ☐ Other: |
| | | | | |

## SECTION IV: Preparer Information

| **40. Name:** | David McBeth , P.E. | **41. Title:** | Sr Project Manager |
|---|---|---|---|

| **42. Telephone Number** | **43. Ext./Code** | **44. Fax Number** | **45. E-Mail Address** |
|---|---|---|---|
| ( 210 ) 494-0088 | 6352 | ( 210 ) 494-4525 | david.mcbeth@jacobs.com |

## SECTION V: Authorized Signature

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

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

| **Company:** | Jacobs Carter Burgess | **Job Title:** | Sr Project Manager |
|---|---|---|---|
| **Name** *(In Print)* **:** | David McBeth , P.E. | **Phone:** | ( 210 ) 494-0088 |
| **Signature:** | | **Date:** | 6/4/08 |

Carter Burgess

RECEIVED
DEC 19 2008
COUNTY ENGINEER

December 16, 2008

John Barry
TCEQ San Antonio Regional Office
14250 Judson Rd.
San Antonio, TX 78233-4480

Re: Newcombe Tennis Ranch Subdivision SCS
(Edwards Aquifer Protection ID No. 1248.03; Investigation No. 706805;
Regulated Entity No. RN102747359)

Subject: Responses to SCS Comments

Mr. Barry:

Our responses to the SCS application review comments in your letter dated December 10, 2008 are addressed as follows:

**General Comments**

1. Explicitly disclose any changes to the application made in addition to those that are submitted in the response to the comments made below.

***Response:***

***Application cover sheet was revised to include design engineers seal and signature.***

***Replaced form TCEQ-0587 due to change of item 8 to undeveloped (cleared) because of current street construction work, and agent name change. Replaced Attachment "C"- Project Description due to addition of line length table.***

***Replaced Geologic Site maps to include dotted circles description in legend.***

***Replaced Application Fee Form due to correction of pipe lengths.***

***Revised form TCEQ-0582 to show correct number of lots as 209, update flows to match revised lot numbers, update I/I section to make more sense. Replaced all sheets due to increase of sheets from 10 to 11.***

***Replaced form TCEQ-10243 to fill in all sheets and change name of professional engineer. Removed previous flexible pipe computations since computations are now included within TCEQ-10243 sheets. Added "Total***

***Waste Water Flows for Development" table. Added "Wastewater Flows by Sewer Line" table. Added "Installation Guide for PVC Sewer Pipe" information. Added copy of NBU specifications detailing "Acceptance of Wastewater Manholes".***

***Replaced form TCEQ-0602 due to change in agent name and formatting change of last sheet. Revised and replaced Attachments "A, B, C, D, F, H, I and J" due to various minor changes throughout this section based on TCEQ comments.***

***Revised and replaced all construction plan sheets except sheets 1 and 6 due to TCEQ comments.***

2. Provide the entire existing and proposed water distribution system, including water service lines, on all appropriate sheets in this application.

   ***Response:*** ***All of the proposed water distribution system, including water service lines have been shown on all appropriate sheets. There is no existing water distribution system within the project limits.***

3. Apply the fault line for Feature S-14 to all plan and all plan and profile sheets where it will cross the proposed SCS lines. Special conditions on any TCEQ approval of this project on such crossings will address this matter.

   ***Response:*** ***The fault line for Feature S-14 has been shown on all sewer plan and plan & profile sheets where it will cross the proposed SCS lines.***

4. Is the use of ASTM D-2241 (SDR-26) pressure pipe as proposed for the protection of waterline/sewer line crossings approved by NBU? NBU specifications, noted as applicable to this project, all for AWWA C-900 (SDR-18) pipe for such use.

   ***Response:*** ***All references to ASTM D-2241 (SDR-26) pressure pipe have been removed and replaced with AWWA C-900 (SDR-18).***

**Sheets**

1. Sheets 31 and 32 (Site Plans): Amend as necessary.
   a. On notes 3 add "and ASTM D-2241" after "D3034".

   ***Response:*** ***On note 3 of each sheet, "and AWWA C-900 (SDR 18)" has been added to the end of the note.***

   b. Show the waterline which parallels Line SSL-B.

   ***Response:*** ***No water lines, except those shown on the plans, are currently being proposed to parallel Line SSL-B.***

2. Sheet 32 (Site Plan): Amend as necessary.
   a. This waterline crossing between Manholes (MHs) A-10 and A-11 and the waterline in its entirety is not shown.

***Response:*** ***No waterlines are currently being proposed to cross between MH's A-10 and A-11. The intent of showing the waterline crossing at this location was to provide a possible location for a waterline crossing at some future time. Since no waterlines are currently being proposed in this area, the crossing information has been removed.***

   b. Waterlines in vicinity of laterals between MHs A-15 and A-16 are not shown.

***Response:*** ***There are no waterlines proposed in the vicinity of the laterals between MH's A-15 and A-16.***

   c. Provide the NBU and EAPP job numbers for existing, connecting MH A-1 and sewer line.

***Response:*** ***The NBU and EAPP job numbers, as well as the NBU project name, have been shown on the plan view for the existing sewer main being connected into at MH A-1.***

   d. The section of Line SSL-A between MHs A-10 and A-11 appears mislabeled as 10 inch line.

***Response:*** ***This section of line SSL-A has been relabeled as an 8-inch line.***

3. Sheet 33: Amend as necessary.
   a. Provide the NBU and EAPP job numbers for the existing, connecting MH A-1 and sewer line.

***Response:*** ***The NBU and EAPP job numbers, as well as the NBU project name, have been shown on the plan view for the existing sewer main being connected into at MH A-1.***

   b. Provide the out invert elevation for the profile MH A-1.

***Response:*** ***In and Out invert elevations for MH A-1 have been shown on the profile.***

   c. MH A-2 appears to be a drop MH due to its in/out invert separation of 2.5 feet. NBU specifications require a drop MH for separations above two feet.

***Response:*** ***In and Out invert elevations at MH A-2 have been revised to avoid the use of a drop manhole.***

d. Provide an entering invert elevation for the existing lateral to be connected to MH A-2. Also, annotate removal of the old lateral to MH A-1.

***Response:*** ***The entering invert elevation for the existing lateral being connected to MH A-2 has been added. An additional note has also been added to remove the old lateral from MH A-1.***

4. Sheet 34: Amend as necessary.
   a. The water line which crosses the SCS at STA17+79.59 is not shown in the plan view.

***Response:*** ***No waterlines are currently being proposed to cross the SCS at this location. The intent of showing the waterline crossing at this location was to provide a possible location for a waterline crossing at some future time. Since no waterlines are currently being proposed in this area, the crossing information has been removed.***

b. The line segment between MHs A-12 and A-13 appears to be 113.46 feet in length, instead of 113.45.

***Response:*** ***The one-hundredth of a foot difference is due to a rounding error inherent in the design program. The length has been corrected and forced to be displayed as 113.46 feet.***

c. Label the two entering inverts shown on the MH A-12 profile.

***Response:*** ***The entering invert labels have been added to the profile for MH A-12.***

d. The invert separation for MH A-13 appears to be less than the required 0.1 foot.

***Response:*** ***The invert separation for MH A-13 has been corrected to include the required 0.1 feet.***

5. Sheet 35: Amend as necessary.
   a. Though sewer laterals are shown, no waterlines are shown on the plan view.

***Response:*** ***No water lines are proposed in the vicinity of the proposed sewer line. Sewer is being proposed along the rear of the lots,***

***and water is being proposed on the street side or front of the lots.***

b. The invert separation for MH A-14 appears to be less than the required 0.1 foot.

***Response:*** ***The invert separation for MH A-14 has been corrected to include the required 0.1 feet.***

c. The entering lateral invert is not shown on MH A-16 profile.

***Response:*** ***The entering lateral invert has been added to the profile for MH A-16.***

d. On the profile view, the Line A Service station numbering appears to begin at 0+00 for MH A-12 (not explicitly shown), resulting in different station locations for MHs A Service 1 and A Service 2.

***Response:*** ***The plan view of Line A Service has been mirrored or flipped to correspond with the stationing shown on the profile view.***

6. Sheet 36: Amend as necessary.
   a. Add STA 1+00 to MH A-9 for Line SSL-B.

***Response:*** ***The STA 1+00 label has been added to MH A-9 for line SSL-B.***

b. On the plan view show the 8 inch waterline that runs parallel to Line SSL-B.

***Response:*** ***No water lines, except those shown on the plans, are currently being proposed to parallel Line SSL-B.***

7. Sheet 37: Amend as necessary.
   a. On the plan view show the 8 inch waterline that runs parallel to Line SSL-B.

***Response:*** ***No water lines, except those shown on the plans, are currently being proposed to parallel Line SSL-B.***

b. Label MH B-8 as a drop MH.

***Response:*** ***MH B-8 has been labeled as a drop manhole.***

c. Identify and label the two entering inverts on both views.

***Response:*** ***The two entering invert elevations have been labeled on both views.***

8. Sheet 38: Amend as necessary.
   a. Label MH B-8 as a drop MH.

***Response:*** ***MH B-8 has been labeled as a drop manhole.***

   b. In the profile view, show a centered 20 foot section of ASTM D-2241 pipe on the SCS below the waterline crossing at STA 7+50.67.

***Response:*** ***A 20-foot section of AWWA C-900 sewer pipe (instead of ASTM D-2241 pipe) has been shown to be centered below the waterline crossing at STA 7+50.67.***

   c. In the waterline/sewer line detail, provide an annotation to note that the separation distance and protection requirements for potable waterlines and sewer lines are to comply with 30 TAC §§290.44(e) and 317.13.

***Response:*** ***This note has been added to the waterline/sewer line crossing detail.***

   d. On the plan view for the two sewer lateral crossings of waterlines at STA 1+23.14 and 3+66.43, provide annotations for compliance to the waterline/sewer line crossing requirements referencing the crossing detail.

***Response:*** ***This information has been added on the plan view for the two sewer laterals crossing the waterlines.***

   e. On the two views the entering invert for Line SSL-E appears lower than the exiting invert for MH C1-4.

***Response:*** ***The exiting invert elevation for MH C1-4 has been lowered to allow for a 0.1-foot invert drop from the entering invert of Line SSL-E.***

9. Sheet 39: Amend as necessary.
   a. The slope of the line segment between MHs C1-6 and C1-7 appears to be 0.39%, instead of 0.41%.

***Response:*** ***The slope has been revised to 0.40%.***

   b. Two parallel waterline crossings of the SCS at approximately STA 11+06 are not shown on the profile.

***Response:*** ***The two parallel waterlines crossing the SCS at approximately STA 11+06 have been added to the profile.***

c. See 30 TAC 213.5 (c)(3)(G)(i) with respect to a variance for the stub-out at STA 14+15.00.

***Response:*** ***The sewer line was stubbed-out on the north side of Mission Valley Road to get under the roadway pavement and provide sewer access to Unit 4 (future development of this subdivision located on the north side of Mission Valley Road). Given the current economic state of the residential market, it is difficult to anticipate when the development of Unit 4 will begin other than it will not begin for at least another year.***

10. Sheet 40: Amend as necessary.
a. Label MH B-8 as a drop MH.

***Response:*** ***MH B-8 has been labeled as a drop manhole.***

b. Add the entering invert elevation for the lateral at MH C2-2.

***Response:*** ***The entering invert elevation for the lateral at MH C2-2 has been added.***

c. The invert separations for each of the MHs C2-1 through C2-7 appear to be less the required 0.1 foot.

***Response:*** ***The invert separations for MH's C2-1 through C2-7 have been corrected to include the required 0.1 feet.***

d. Three waterline crossings of the SCS at approximately STA 2+51, 4+90, and 7+60 are not shown on the profile view.

***Response:*** ***The three water services crossing the SCS have been added to the profile view.***

e. On the plan view, for the three sewer lateral crossings of waterlines at STA 4+32.84, 7+44.85, and 10+08.85, provide annotations for compliance to the waterline/sewer line crossing requirements referencing the crossing detail.

***Response:*** ***This information has been added on the plan view for the three sewer laterals crossing the waterlines.***

11. Sheet 41: Amend as necessary.
    a. On the profile show a centered 20 foot section of ASTM D-2241 pipe on the SCS below the waterline crossing at STA 1+12.01.

***Response:*** ***A 20-foot section of AWWA C-900 sewer pipe (instead of ASTM D-2241 pipe) has been shown to be centered below the waterline crossing at STA 1+12.01.***

    b. The surface-to-surface horizontal separation distance between the 12 inch waterline and MH C1-3 appears to be less than the required nine feet.

***Response:*** ***The horizontal separation distance between the 12-inch waterline and MH C1-3 has been verified to be greater than nine feet.***

    c. The entering invert elevation for the lateral at MH D-4 is not shown in either view.

***Response:*** ***The entering invert elevation for the lateral at MH D-4 has been added.***

    d. The length and location of the lateral at MH D-4 is not specified.

***Response:*** ***The length and location of the lateral at MH D-4 (from the nearest property corner) has been shown.***

    e. The entering invert for the lateral at MH D-3 is not specified.

***Response:*** ***The entering invert elevation for the lateral at MH D-3 has been added.***

    f. The waterline crossing of the SCS at approximately STA 6+25 is not shown on the profile view.

***Response:*** ***The water service crossing the SCS have been added to the profile view.***

    g. In the waterline/sewer line detail, provide an annotation to note that the separation distance and protection requirements for potable waterlines and sewer lines are to comply with 30 TAC §§290.44(e) and 317.13.

***Response:*** ***This note has been added to the waterline/sewer line crossing detail.***

h. On the plan view, for the five sewer lateral crossings of waterlines at STA 4+10.61, 7+17.05, 7+68.23, 8+30.85, and the lateral at MH D-4, provide annotations for compliance to the waterline/sewer line crossing requirements referencing the crossing detail.

***Response:*** ***This information has been added on the plan view for the five sewer laterals crossing the waterlines.***

i. Twin 2 inch waterlines running parallel to the lateral at STA 7+68.23 appear not to meet the nine foot minimum separation requirement.

***Response:*** ***The dual water service has been revised to two (2) 1-inch individual water services with a minimum separation of 4 feet to the proposed sewer lateral. The 6-inch sewer lateral has been labeled as a 6-inch C-900 pipe to meet the minimum 4-foot separation requirements to the long 2-inch water service and the two (2) 1-inch individual water services.***

12. Sheet 42: Amend as necessary.

a. At MH C1-4 the entering invert from Line SSL-E appears to be below the MHs exiting invert elevation.

***Response:*** ***The exiting invert elevation for MH C1-4 has been lowered to allow for a 0.1-foot invert drop from the entering invert of Line SSL-E.***

b. Show and label the invert elevation for the lateral at MH E-4.

***Response:*** ***The entering invert elevation for the lateral at MH E-4 has been added.***

c. The waterline crossing of the SCS at approximately STA 3+83 is not shown on the profile view.

***Response:*** ***The water service crossing the SCS have been added to the profile view.***

d. On the plan view, for the three sewer lateral crossings of waterlines at STA 2+94.81, approximately STA 5+00, and for the lateral from MH E-4, provided annotations for compliance to the waterline/sewer line crossing requirements referencing the crossing detail.

***Response:*** ***This information has been added on the plan view for the three sewer laterals crossing the waterlines.***

13. Sheet 43: Amend as necessary.

a. On the profile show a centered 20 foot section of ASTM D-2241 pipe on the SCS below the waterline crossing at STA 1+45.16.

***Response:*** ***A 20-foot section of AWWA C-900 sewer pipe (instead of ASTM D-2241 pipe) has been shown to be centered below the waterline crossing at STA 1+45.16.***

b. Label MH F-1 as a drop MH due to its in/out invert separation of 2.43 feet. NBU specifications require a drop MH for invert elevation separations above two feet.

***Response:*** ***In and Out invert elevations at MH F-1 have been revised to avoid the use of a drop manhole.***

c. The invert separations for MHs F-2 and F-2A-13 appear to be less than the required 0.1 foot.

***Response:*** ***The invert separations for MH's F-2 and F-3 have been corrected to include the required 0.1 feet.***

d. The two waterline crossings of the SCS at approximately STA3+05 and 6+10 are not shown on the profile view.

***Response:*** ***The two water services crossing the SCS have been added to the profile view.***

e. On the plan view, for the eight sewer lateral crossings of waterlines at STA 2+58.07, 3+85.80, 5+60.96, 6+74.11, 7+87.94, the two crossings for the next unlabeled lateral, and for the unlabeled lateral from HM F-4, provide annotations for compliance to the waterline/sewer line crossing requirements referencing the crossing detail.

***Response:*** ***This information has been added on the plan view for the eight sewer laterals crossing the waterlines.***

f. Provide the entering invert elevation for the lateral at MH F-4.

***Response:*** ***The entering invert elevation for the lateral at MH F-4 has been added.***

g. In the waterline/sewer line detail, provide an annotation to not that the separation distance and protection requirements for potable waterlines and sewer lines are to comply with 30 TAC §§290.44(e) and 317.13.

***Response:*** ***This note has been added to the waterline/sewer line crossing detail.***

14. Sheet 44: Amend as necessary.
    a. None of the six MHs on the profile meet the 0.1 foot in/out invert separation requirement.

***Response:*** ***The invert separations for the six MH's have been corrected to include the required 0.1 feet.***

    b. The five waterline crossings of the SCS at approximately STA 2+42, 4+15, 6+75, 7+90, and 10+75 are not shown on the profile view.

***Response:*** ***The five water services crossing the SCS have been added to the profile view.***

    c. On the plan view, for the five sewer lateral crossings of waterlines at STA 1+56.91, 3+91.23, 6+28.43, 8+12.13, and 10+23.52, provide annotations for compliance to the waterline/sewer line crossing requirements referencing the crossing detail.

***Response:*** ***This information has been added on the plan view for the five sewer laterals crossing the waterlines.***

15. Sheet 45: Amend as necessary.
    a. MHs G-6, G-7, and G-8 on the profile do not meet the 0.1 foot in/out invert separation requirement.

***Response:*** ***The invert separations for these MH's have been corrected to include the required 0.1 feet.***

    b. One of the entering invert elevations is the same as the outgoing invert elevation on MH G-9.

***Response:*** ***The In & Out invert separations for this MH have been corrected to include the required 0.1 feet.***

    c. Identify and label the entering invert elevations for MH G-9.

***Response:*** ***The entering invert elevations for MH G-9 have been labeled.***

    d. The three waterline crossings of the SCS at approximately STA 12+25, 13+60, and 14+98 are not shown on the profile view.

***Response:*** ***The three water services crossing the SCS have been added to the profile view.***

e. On the plan view, for the three sewer lateral crossings of waterlines at STA 11+49.17, 12+80.62, and 15+09.65, provide annotations for compliance to the waterline/sewer line crossing requirements referencing the crossing detail.

***Response:*** ***This information has been added on the plan view for the three sewer laterals crossing the waterlines.***

16. Sheet 46: Amend as necessary.

a. One of the entering invert elevations is the same as the outgoing invert elevation on MH G-9 on both profiles.

***Response:*** ***The In & Out invert separations for this MH have been corrected to include the required 0.1 feet.***

b. Identify and label the entering invert elevations for MH G-9 on both profiles.

***Response:*** ***The entering invert elevations for MH G-9 have been labeled.***

c. On the profiles show a centered 20 foot section of ASTM D-2241 pipe on the SCS below the waterline crossing at STA 1+13.26 of Line SSL-H1.

***Response:*** ***A 20-foot section of AWWA C-900 sewer pipe (instead of ASTM D-2241 pipe) has been shown to be centered below the waterline crossing at STA 1+13.26 of Line SSL-H1.***

d. Provide the entering invert elevation for the lateral at MH H1-2.

***Response:*** ***The entering invert elevation for the lateral at MH H1-2 has been added.***

e. Provide the entering invert elevation for the lateral at MH H1-3 and the lateral location.

***Response:*** ***The entering invert elevation for the lateral at MH H1-3 has been added. The location of the lateral from the nearest property corner has also been shown.***

f. The waterline crossing of the SCS at approximately STA 3+75 on Line SSL-H1 is not shown on the profile view.

***Response:*** ***The water service crossing the SCS has been added to the profile view.***

g. On the plan view, for the three sewer lateral crossings of waterlines at STA 1+76.97, 2+76.27, and 3+58.52 on Line SSL-H1, provide annotations for compliance to the waterline/sewer line crossing requirements referencing the crossing detail.

***Response:*** ***This information has been added on the plan view for the three sewer laterals crossing the waterlines.***

h. In the waterline/sewer line detail, provide an annotation to note that the separation distance and protection requirements for potable waterlines and sewer lines are to comply with 30 TAC §§290.44(e) and 317.13.

***Response:*** ***This note has been added to the waterline/sewer line crossing detail.***

i. MHs H2-1 and H2-2 on the profile do not meet the 0.1 foot in/out invert separation requirement.

***Response:*** ***The invert separations for these MH's have been corrected to include the required 0.1 feet.***

j. Provide the entering invert elevation for the lateral at MH H2-3 and the lateral location.

***Response:*** ***The entering invert elevation for the lateral at MH H2-3 has been added. The location of the lateral from the nearest property corner has also been shown.***

k. On the plan view, for the five sewer lateral crossings of waterlines at STA 1+53.43, 2+49.12, 3+49.79, 4+60.25, and the unlabeled lateral at MH H2-3 on Line SSL-H2, provide annotations for compliance to the waterline/sewer line crossing requirements referencing the crossing detail.

***Response:*** ***This information has been added on the plan view for the five sewer laterals crossing the waterlines.***

17. Sheet 47: Amend as necessary.
    a. On the profile show a centered 20 foot section of ASTM D-2241 pope on the SCS below the waterline crossing at STA 3+75.18.

***Response:*** ***A 20-foot section of AWWA C-900 sewer pipe (instead of ASTM D-2241 pipe) has been shown to be centered below the waterline crossing at STA 3+75.18.***

b. One of the entering invert elevations is the same as the outgoing invert elevations on both MH G-9 and J-1.

***Response:*** ***The In & Out invert separations for these MH's have been corrected to include the required 0.1 feet.***

c. In the waterline/sewer line detail, provide an annotation to not that the separation distance and protection requirements for potable waterlines and sewer lines are to comply with 30 TAC §§290.44(e) and 317.13.

***Response:*** ***This note has been added to the waterline/sewer line crossing detail.***

18. Sheet 48: Amend as necessary.
a. MHs K1-1 and K1-2 on the profile do not meet the 0.1 foot in/out invert separation requirement.

***Response:*** ***The invert separations for these MH's have been corrected to include the required 0.1 feet.***

b. On the plan view, for the four sewer lateral crossings of waterlines at STA 1+36.44, 2+09.28, 2+55.59, and 3+13.48 on Line SSL-K1, provide annotations for compliance to the waterline/sewer line crossing requirements referencing the crossing detail.

***Response:*** ***This information has been added on the plan view for the four sewer laterals crossing the waterlines.***

c. The two waterline crossings of the SCS at approximately STA2+10 and 4+50 on Line SSL-K2 are not shown on the profile view.

***Response:*** ***The two water services crossing the SCS have been added to the profile view.***

d. On the plan view, for the three sewer lateral crossings of waterlines at STA1+70.92, 2+29.69, and 4+47.11 on Line SSL-K2, provide annotations for compliance to the waterline/sewer line crossing requirements referencing the crossing detail.

***Response:*** ***This information has been added on the plan view for the three sewer laterals crossing the waterlines.***

## General Information

1. Item 7/Attachment C, SCS Item 7, and TCEQ-10243 Items T1 and T7: Revise or provide specific description of the SCS project, including how much will be public and private SCS. Also, verify and revise the SCS footages by pipe type and the total SCS footage, as well as the ASTM for pressure pipe and joints, as necessary in the respective tables. Include applicable existing connection and ending stub-out information. Please include a separate table that designates SCS footage information by respective SCS line.

   ***Response:*** ***Attachment C has been revised to correct the length of pipe and more specifically describe the public SCS. There is no private SCS and the entity names in the application have been changed as needed to clarify this. NBU and EAPP job numbers have been indicated in the plans and in Attachment C for the existing downstream manhole. There is a table in Attachment C with the footage broken out by line.***

2. Item 8: Verify that the SCS project area is entirely undeveloped (undisturbed/uncleared).

   ***Response:*** ***The project area is entirely undeveloped, but there is currently some construction work underway in association with the roadway in Unit 1. This work is being done in accordance with the approved WPAP.***

## Geologic Assessment

1. Item 5 Geologic Map: Feature S-13 is shown with an unidentified circled marking around it which encloses parts of the SCS envelope. What does this imply? Provide explanation of the marking on the map legend.

   ***Response:*** ***The circled marking represents the rim of Feature S-13. The map legend has been revised and included with this resubmittal.***

## SCS

1. Item 1: Amend as necessary.
   a. Identify who will provide the engineering certification of testing the proposed SCS upon completion.

   ***Response:*** ***This item has been corrected to indicate New Braunfels Utilities, who will own the system after construction.***

b. Confirm that this SCS will be totally private and not be public in any part. If any part is to be public, identify that 5-year certification responsibility separately.

***Response:*** ***All of the SCS is to be public. The entity name on No. 1 in TCEQ-0582 has been corrected to reflect NBU, which will own and operate the SCS upon completion of construction.***

2. Item 2: Verify who will be responsible for the design of this project.

***Response:*** ***The design engineer has been clarified.***

3. Item 7 and TCEQ-10243 T7: Amend as necessary.
   a. Verify the SCS footage by type and totally. The total footage appears to be 12,483.66 feet, instead of 12,365 feet and 360 feet of pressure pipe may be required.

***Response:*** ***The table has been corrected to show the correct footage.***

   b. Provide the ASTM for pipe joints for each pipe type and a reference under Item T7.

***Response:*** ***The proper ASTM standard for pipe joints has been added to the table. The reference for T7 has been updated to indicate the location this is shown in the plans.***

4. Item 8: Provide the specific wastewater treatment plant (WWTP) name.

***Response:*** ***The treatment plant name and permit number have been shown.***

5. Item 12: The station numbers for ending MHs for Lines SSL-D, SSL-K1, and SSL-K2 appear incorrect. Amend.

***Response:*** ***The station numbers have been corrected.***

6. Items 20 and 28: On all sheets, including the Site Plan Sheets 31 and 32, provide all proposed laterals and properly label them.

***Response:*** ***All laterals have been shown and labeled in the plans.***

7. Item 21: On the Site Plan sheets, provide the entire existing and proposed water distribution system.

***Response:*** ***There is no existing water system within the project limits. The proposed water system has been shown.***

8. Item 24: Enter all existing and proposed waterline/sewer line crossings and parallels that do not meet the nine foot separation requirement on the table and show those crossings with protective pressure piping on the appropriate plan and profile sheets.

***Response:*** ***The table has been updated.***

9. Item 26: Add MHs A-2 and F-2 as drop MHs on the table.

***Response:*** ***The profile has been revised and these manholes are no longer drop manholes. The table has been updated to reflect the current design.***

10. Item 33: Amend as necessary.
    a. The typical pipe trench cross-section detail is not on Sheet 49.

***Response:*** ***The trench section has been added to sheet 49.***

    b. There is not clean-out detail on Sheet 49.

***Response:*** ***The table has been corrected; no clean-outs are called for on this project.***

    c. The waterline/sewer line crossing detail was found only on Sheets 38, 41, 43, 46 and 47.

***Response:*** ***The table has been updated to reflect the locations shown in the plans.***

    d. The mandrel detail consists of two parts, the drawing of the mandrel and the table of mandrel dimensions, etc. for different pipe diameters. The table is not on Sheet 49.

***Response:*** ***The table has been corrected to reflect that the mandrel detail is on sheet 49 and the specifications are found on sheet 30.***

11. Item 34 and Sheet 30 TCEQ Construction Notes (Form TCEQ-0596): Amend as necessary.
    a. Item 1 – replace "Quality" with "Quality's".

***Response:*** ***The correction has been made.***

    b. Item 3 – replace "Austin" with "San Antonio".

***Response:*** ***The correction has been made.***

c. Item 6, first paragraph – replace "detail sheets" with the specifically numbered detail sheet in the application.

***Response:*** ***The specific detail sheet has been referenced in the notes.***

d. Item 6, second paragraph – restore the original wording.

***Response:*** ***The correction has been made.***

e. Item 6, third paragraph – replace "specified in the standard specifications" with the specific ASTM or AWWA numbers for the pipe and pipe joint types for this project.

***Response:*** ***The specific references have been called out in the notes.***

f. Item 6, fourth paragraph – replace "specified in the standard specifications" with the specific pipe material, pressure classes, and SDR or DR designations for this project.

***Response:*** ***The specific references have been called out in the notes.***

g. Item 10, second paragraph – restore the original wording of this paragraph and enter the detail sheet's specific number.

***Response:*** ***The specific references have been called out in the notes.***

h. Item 10, third paragraph – add a period after the word "ladder".

***Response:*** ***A period has been added.***

i. Item 12, first paragraph – remove the extraneous underlined words "joint deflection".

***Response:*** ***The words have been removed.***

j. Item 13, second paragraph – replace the words "detail sheets" with the specifically numbered detail sheet.

***Response:*** ***The specific sheets have been called out in the notes.***

k. Item 13, third paragraph – restore the original wording of this paragraph and enter the specifically numbered plan and profile sheets showing laterals and the specifically numbered detail sheet.

***Response:*** ***The specific sheets have been called out in the notes.***

l. Item 14 – add "or" between "II" and "III".

***Response:*** ***The requested word has been added.***

m. Add the ending words for this Form TCEQ-0596 after Item 18: THESE GENERAL CONSTRUCTION NOTES MUST BE INCLUDED ON THE COSTRUCTION PLANS PROVIDED TO THE CONTRACTOR AND ALL SUBCONTRACTORS.

***Response:*** ***The requested words have been added.***

**Temporary Stormwater**

1. Item 4/Attachment B: Add potential contamination from sewer spills when connecting to the existing sewer MH or in removing and replacing the existing lateral.

***Response:*** ***The requested verbage concerning sewer spills has been added.***

2. Item 5/Attachment C: Provide a sequence of activity and quantified area of disturbance specifically for the SCS construction.

***Response:*** ***The sequence of activity has been modified to focus more on the SCS construction.***

3. Items 7/Attachment D and 9/Attachment F: Amend as necessary.
   a. Provide descriptions specific all aspects of the SCS construction.

***Response:*** ***The attachments have been updated to reflect construction of the SCS.***

b. Specify the sheets where the temporary best management practices (TBMPs) for the SCS are shown, including equipment staging and concrete truck washout pit locations.

***Response:*** ***The sheets (5 & 6) showing the TBMPs have been indicated.***

4. Item 12/Attachment I: Amend as necessary.
   a. No specific discussions of the equipment staging or concrete truck washout pit areas are noted.

   ***Response:*** ***Discussions on the staging area and washout pit have been added.***

   b. Provide a reference to the sections of the Technical Guidance Manual (2005) for inspection and maintenance of project TBMPs for contractor view.

   ***Response:*** ***A reference to Chapter One of the Edwards Aquifer Technical Guidance Manual has been added.***

   c. Attach a copy of the contractor TBMP inspection and maintenance sheet.

   ***Response:*** ***A copy of the inspection sheet has been added.***

5. Item 17/Attachment J: Amend as necessary.
   a. Revise the wording to apply to TBMPs for SCS construction only.

   ***Response:*** ***The wording was revised.***

   b. Provide information on drought contingencies.

   ***Response:*** ***Information on how to handle planting during droughts have been added.***

*Fee Form: Revise this form for the additional SCS footage and provide a supplementary fee check.

***Response:*** ***The fee form has been revised and a supplementary check has been added to the application.***

**Form TCEQ-10243**

1. General: Explicit calculations for the equations in this form may be entered directly on this form or attached to it. If attached, indicate directly on the form on what page of the attachment to find the calculations. All other responses to items should be entered in the form blanks or in its tables as appropriate.

   ***Response:*** ***Calculations have been entered in the form.***

2. Item A2: Amend with applicant, instead of engineer information.

***Response:*** ***The item has been amended.***

3. Item A3: Amend with any additional engineering firm information.

***Response:*** ***The design engineer has been clarified.***

4. Item A7: Enter the TCEQ permit number and specific name of the WWTP.

***Response:*** ***The TCEQ permit number and WWTP name have been entered.***

5. Item A12: Enter the Edwards Aquifer Authority, NBU, and the Comal County Engineer contact information.

***Response:*** ***The additional entities requested have been entered.***

6. Item T1: Provide a brief project summary or appropriately reference the same from other application sections.

***Response:*** ***A reference to Attachment C of TCEQ-0582 has been added.***

7. Item T2: Provide a response and give a reference for it in the application.

***Response:*** ***A response has been entered.***

8. Item T5: Provide responses.

***Response:*** ***Responses have been entered.***

9. Item T6: Provide the requested analysis.

***Response:*** ***The flow analysis has been completed and is attached to the application.***

10. Item T7: See SCS #3 above.

***Response:*** ***The table of pipe lengths has been corrected.***

11. Item T8, T9, and T11: Provide a response and a reference, as appropriate, for each item.

***Response:*** ***Responses have been entered.***

12. Item T12: Amend as necessary.
    a. Clarify and provide the bedding soil class(es).

    ***Response:*** ***The bedding soil class has been entered.***

    b. Provide a specific reference.

    ***Response:*** ***A reference has been entered.***

    c. Confirm that the class(es) of bedding soil chosen is (are) reconciled to the modulus of soil reaction for bedding material used in later calculations under T68, T83, and T86.

    ***Response:*** ***The bedding soil classes match the modulus of soil reaction. Refer to the attachment for T76 at the end of the form.***

13. Items T13 through T15: Provide responses and specific references as applicable.

    ***Response:*** ***Responses have been entered.***

14. Items T19: Provide a response, including details, and a specific reference.

    ***Response:*** ***A response has been entered.***

15. Item T21: Provide a response.

    ***Response:*** ***A response has been entered.***

16. Item 22: There is no such trench detail on Sheet 49. Amend.

    ***Response:*** ***A trench detail has been added to the plans.***

17. Item 23: Provide a response and correct specific reference.

    ***Response:*** ***A response has been entered.***

18. Item T28: The maximum spacing for the 8 inch line between MHs is incorrect. Amend.

    ***Response:*** ***The spacing has been corrected.***

19. Items T32 through T38: Provide responses and applicable specific references.

***Response:*** ***Responses have been entered.***

20. Item T41: Provide a response.

***Response:*** ***A response has been entered.***

21. Items T57 through T59: Provide responses.

***Response:*** ***Responses have been entered.***

22. Items T68 and T69: Amend and recalculate as necessary.
a. Provide a reference justifying the use of $Y_s$ = 143 pcf.

***Response:*** ***The soil weight was revised to 120 pcf. Calculations were modified to reflect the new number.***

b. The explicit calculation of Equation (5) appease incorrect. The input value for $h_w$ was entered as 24 feet, instead of 288 inches.

***Response:*** ***The soil depth was changed to 18 feet and the calculation rerun to use the correct value.***

c. Enter the values on the table under T69.

***Response:*** ***The table was completed.***

23. Item T70: Enter a response.

***Response:*** ***A response has been entered.***

24. Item 71 and 72: Since pipe encasement is shown on Sheets 39 and 42, provide explicit calculations of Equation (7) and enter the results on the T72 table.

***Response:*** ***Calculations for encasement have been performed.***

25. Items T76 and T77: Describe how the values were determined or estimated. Since NBU specifications apply, the SAWS reference is not applicable.

***Response:*** ***A description has been entered and the SAWS reference removed.***

26. Item T80: Is the entered value 27 inches or 2.7 feet?

***Response:*** ***The value for trench width has been removed because the zeta value was selected independent of the trench width in accordance with T78.***

27. Items T81 and T82: Enter the value in the table.

***Response:*** ***The table has been filled out.***

28. Items T83 and T84: Amend as necessary.
a. The attached calculation of Equation (12) appears incorrect.

***Response:*** ***The calculations have been revised.***

b. What is the value 4.71 psi related to?

***Response:*** ***The value has been removed from the calculations because live load is being neglected in accordance with T63.***

c. Make the corrected entries in the table.

***Response:*** ***The corrected entries have been entered in the table.***

29. Item T85: Enter the response on the form.

***Response:*** ***A response has been entered.***

30. Items T86 and T87: The explicit calculation is slightly off due to use of 24 instead of 23.83. Recalculate as necessary.

***Response:*** ***The calculations have been revised.***

31. Items T89, T91, T93, T102, and T104 through T106: Provide responses and/or specific references.

***Response:*** ***Responses have been entered.***

32. Item T111: Indicate how MHs will be accessed and provide a specific reference.

***Response:*** ***Responses have been entered.***

33. Item T112: State who is responsible and provide a specific reference.

***Response:*** ***A response has been entered.***

34. Item T113: The engineer's signature, date, and seal must be current for the engineering firm.

***Response:*** ***The engineer's seal has been updated with the design engineers.***

Should you have any comments or need additional information, please contact me at 210-494-0088.

Sincerely,

Alex Zertuche, P.E.
Jacobs Carter Burgess

Enclosures

"RECEIVED TCEQ"
SAN ANTONIO
REGION
2008 DEC 17 AM 10: 26

# SANITARY SEWER COLLECTION SYSTEM APPLICATION

**For**

# NEWCOMBE TENNIS RANCH SUBDIVISION

**New Braunfels, Comal County, Texas**

**Submitted**
**October 9, 2008**

**Resubmitted**
**December 16, 2008**




Submitted To:

**Texas Commission on Environmental Quality**
Region 13 - San Antonio
14250 Judson Road
San Antonio, Texas 78233
210.490-3096
Fax 210.545-4329

Submitted By:

**Carter & Burgess, Inc.**
911 Central Parkway North, Suite 425
San Antonio, Texas 78232
210.494-0088
Fax 210.494-4525

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

REGULATED ENTITY NAME: **Newcombe Tennis Ranch Subdivision**
COUNTY: **Comal** STREAM BASIN: **Blieders Creek, Dry Comal Creek tributary**

EDWARDS AQUIFER: X RECHARGE ZONE
__ TRANSITION ZONE

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

**CUSTOMER INFORMATION**

1. Customer (Applicant):

Contact Person: **Jeremy Fieldsend**
Entity: **Newcombe Development L.L.C.**
Mailing Address: **325 Mission Valley Road**
City, State: **New Braunfels, TX.** Zip: **78132**
Telephone: **(830)625-9105** FAX: **(830)625-2004**

Agent/Representative (If any):

Contact Person: **Alex Zertuche, PE**
Entity: **Carter & Burgess, Inc.**
Mailing Address: **911 Central Parkway North, Suite 425**
City, State: **San Antonio, TX.** Zip: **78232**
Telephone: **(210)494-0088** FAX: **(210)494-4525**

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

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

**Newcombe Tennis Ranch Subdivision is located on Mission Valley Road approximately 0.5 miles southwest of the intersection with State Highway 46.**

4. X **ATTACHMENT A - ROAD MAP**. A road map showing directions to and the location of the project site is attached at the end of this form.

5. X **ATTACHMENT B - USGS / EDWARDS RECHARGE ZONE MAP**. A copy of the official 7 ½ minute USGS Quadrangle Map (Scale: 1" = 2000') of the Edwards Recharge Zone is attached behind this sheet. The map(s) should clearly show:

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

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

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

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

**PROHIBITED ACTIVITIES**

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

   (1) waste disposal wells regulated under 30 TAC Chapter 331 of this title (relating to Underground Injection Control);
   (2) new feedlot/concentrated animal feeding operations, as defined in 30 TAC §213.3;
   (3) land disposal of Class I wastes, as defined in 30 TAC §335.1;
   (4) the use of sewage holding tanks as parts of organized collection systems; and
   (5) new municipal solid waste landfill facilities required to meet and comply with Type I standards which are defined in §330.41(b), (c), and (d) of this title (relating to Types of Municipal Solid Waste Facilities).

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

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

**ADMINISTRATIVE INFORMATION**

11. The fee for the plan(s) is based on:

   ___ For a Water Pollution Abatement Plan and Modifications, the total acreage of the site where regulated activities will occur.
   X For an Organized Sewage Collection System Plans and Modifications, the total linear

footage of all collection system lines.

__ For a UST Facility Plan or an AST Facility Plan, the total number of tanks or piping systems.

__ A Contributing Zone Plan.

__ A request for an exception to any substantive portion of the regulations related to the protection of water quality.

__ A request for an extension to a previously approved plan.

12. Application fees are due and payable at the time the application is filed. If the correct fee is not submitted, the TCEQ is not required to consider the application until the correct fee is submitted. Both the fee and the Edwards Aquifer Fee Form have been sent to the Commission's:

__ TCEQ cashier

__ Austin Regional Office (for projects in Hays, Travis, and Williamson Counties)

X San Antonio Regional Office (for projects in Bexar, Comal, Kinney, Medina, and Uvalde Counties)

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

14. X No person shall commence any regulated activity until the Edwards Aquifer Protection Plan(s) for the activity has been filed with and approved by the executive director.

__ No person shall commence any regulated activity until the Contributing Zone Plan for the activity has been filed with the executive director.

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

**Alex Zertuche, P.E.**
Print Name of Customer/Agent

Signature of Customer/Agent

12/16/08
Date

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

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

## ATTACHMENT C
## PROJECT DESCRIPTION

Newcombe Tennis Ranch Subdivision is a planned development located on the south side of Mission Valley Road, approximately 0.5 miles southwest of the intersection with State Highway 46. The closest major intersection is State Highway 46 and FM 1863, approximately 0.9 acres southeast of the intersection of Mission Valley Road and State Highway 46. The subdivision master plan contains approximately 198 acres and has been approved by the City of New Braunfels.

The site is currently undeveloped, and is primarily composed of open fields, dense brush and trees, with scattered grass and rock outcroppings. The site is located over the Edwards Aquifer Recharge Zone. Storm water runoff from the project site is split between Blieders Creek and an unnamed tributary to Dry Comal Creek. According to FEMA map panel 48091C0430F, there is no floodplain within the property.

This SCS application is for the first unit of the four planned units. The first unit (Unit 1) of the proposed development will consist of approximately 74 single family residences on various lot sizes, a tennis amenity facility, and approximately 21.3 acres of green space. The total development will contain approximately 209 single family residences. The additional units (2-4) are not included in this SCS application, but the flows for the future development have been accounted for in the design of the SCS.

The potable water distribution and sanitary sewer collection systems on this project will be owned and maintained by New Braunfels Utilities (NBU) upon their acceptance of the constructed facilities. Their will be no private utilities on site. The project includes approximately 12,484 linear feet of sanitary sewer pipe (PVC SDR-26 and PVC C-900). The proposed SCS will connect to NBU's existing facilities at manhole 'MH-A_1' shown on sheet 33 of the plans. That manhole was constructed as part of the NBU "Blieders Creek Extension" project (NBU Job No 89-0044, EAPP Job No -1102.00). All of the proposed sewer lines terminate at manholes with the exception of line 'SSL-C1'. That

line is stubbed out beyond Mission Valley Road and capped for use by the development of Newcombe Tennis Ranch Unit 4. A table with a breakdown of the sewer lengths by line is shown in Table 1 below.

| SCS Line | Length |
|---|---|
| SSL-A | 3,006.21 |
| A SERVICE | 227.15 |
| SSL-B | 1,465.37 |
| SSL-C1 | 1,315.00 |
| SSL-C2 | 1,115.45 |
| SSL-D | 827.76 |
| SSL-E | 419.84 |
| SSL-F | 695.10 |
| SSL-G | 1,524.67 |
| SSL-H1 | 426.59 |
| SSL-H2 | 424.62 |
| SSL-J | 287.75 |
| SSL-K1 | 299.81 |
| SSL-K2 | 448.34 |
| Total Length | 12,483.66 |

**Table 1 – List of Pipe Lengths Broken Out by Line**

**Sewage Collection System Application**
for Regulated Activities
on the Edwards Aquifer Recharge Zone
and Relating to 30 TAC §213.5(c), Effective June 1, 1999

REGULATED ENTITY NAME: **Newcombe Tennis Ranch Subdivision Unit 1**

X **ATTACHMENT A - Sewage Collection System Submittal Application.** The Texas Commission on Environmental Quality 's (TCEQ) Sewage Collection System Submittal Application (TCEQ-10243) is provided as an aid in fulfilling the review requirements of 30 TAC Chapter 317 titled Design Criteria for Sewerage Systems, §317.1 and §317.2 is submitted with this Edwards Aquifer Sewage Collection System Application Form. Failure to complete all pertinent questions will result in the plan not being accepted or in possible delays in the review and approval of the project.

**CUSTOMER INFORMATION** (if different than customer information provided on core data form)

1. The entity and contact person responsible for providing the required engineering **certification** of testing for this sewage collection system upon completion (including private service connections) and every five years thereafter to the appropriate TCEQ region office pursuant to 30 TAC §213.5(c) is:

Contact Person: **Wesley Hamff, P.E.**
Entity: **New Braunfels Utilities**
Mailing Address: **PO Box 310289**
City, State: **New Braunfels, TX** Zip: **78131**
Telephone: **(830)629-8400** Fax: **(830)629-8467**

The appropriate regional office must be informed of any changes in this information within 30 days of the change.

2. The engineer responsible for the **design** of this sewage collection system is:

Contact Person: **Alex Zertuche, P.E.**
Entity: **Carter & Burgess, Inc**
Mailing Address: **911 Central Parkway North, Ste 425**
City, State: **San Antonio, TX** Zip: **78232**
Telephone: **(210)494-0088** Fax: **(210)494-4525**

Texas Licensed Professional Engineer's Serial Number: **92080**

**PROJECT DESCRIPTION**

3. Anticipated type of development to be served (estimated future population to be served, plus adequate allowance for institutional and commercial flows):

X Residential: # of single-family lots: **209**
__ Multi-family residential units: _____
__ Commercial
__ Industrial
__ Off-site system (not associated with any development)
__ Other: _____

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

| | |
|---|---|
| **100** % Domestic | **51,205** gallons/day |
| _____ % Industrial | _____ gallons/day |
| _____ % Commingled | _____ gallons/day |
| _____ Total | _____ gallons/day |

5. Existing and anticipated infiltration/inflow is **147,165** gallons/day. This will be addressed by **the installation of watertight resilient connectors at the pipe penetrations to the manholes. In addition, the newly installed pipe shall be tested via low pressure air test or exfiltration test for leakage per TCEQ 317.2.(4). Lastly, the newly installed pipe capacity exceeds the capacity required for the subdivision (available capacity of 0.546 MGD versus required capacity of 0.453 MGD for peak wet weather flow).**

6. A Water Pollution Abatement Plan (WPAP) is required for construction of any associated commercial, industrial or residential project located on the Recharge Zone.

_X_ The WPAP application for this development was approved by letter dated 12/28/07. A copy of the approval letter is attached at the end of this application.
__ The WPAP application for this development was submitted to the TCEQ on _____, but has not been approved.
__ A WPAP application is required for an associated project, but it has not been submitted.
__ There is no associated project requiring a WPAP application.

7. Pipe description:

| Pipe Diameter (Inches) | Linear Feet[1] | Pipe Material[2] | Specifications[3] |
|---|---|---|---|
| 8" | 12,064 | PVC SDR 26 | ASTM D 3034, ASTM D 3212 |
| 8" | 420 | PVC C-900 DR 18 | AWWA C-900 |
| | | | |
| | | | |
| Total Linear Feet | 12,484 | | |

1) Include stub-outs. Do not include private service laterals.
2) If PVC, state SDR value.
3) ASTM / ANSI / AWWA specification and class numbers should be included.

8. The following Wastewater Treatment Plant (WWTP) Gruene WWTP (name) will receive project wastewater for treatment and disposal. This WWTP is an **EXISTING**/PROPOSED (circle one) facility.

9. All components of this sewage collection system will comply with:

_X_ **New Braunfels Utilities** standard specifications.
__ Other. Specifications are provided directly behind this page.

10. _X_ No force main(s) and/or lift station(s) are associated with this sewage collection system.
__ A force main(s) and/or lift station(s) is associated with this sewage collection system and the Lift Station/Force Main System application is included with this application.

**CURVED SEWER LINES**

11. **ATTACHMENT B - Calculations for Minimum Radius of Curvature.** Curved sewer lines may use either JOINT DEFLECTION or PIPE FLEXURE METHOD, but not both. Indicate the method proposed. Calculations for the minimum radius of curvature are shown in **ATTACHMENT B**.

N/A Joint Deflection - The maximum allowable joint deflection is the lesser of the following three alternatives:

___ equal to 5°; or

___ 80% of the manufacturer's recommended maximum deflection; or

___ 80% of the appropriate ASTM, AWWA, ANSI or nationally-established standard for joint deflection.

N/A Pipe Flexure - The minimum radius of curvature has been computed by assuming standard lengths of straight pipe.

___ The standard length used in the calculations is the maximum length manufactured for the specific type of pipe to be installed.

___ A ___-foot length of pipe was used in the calculations. The specific type and length of the curved sections of line must be indicated on both the Plan and Profile views.

___ The curvature has been provided without rotation of the joint.

## MANHOLES AND CLEANOUTS

12. Manholes or clean-outs exist at the end of each sewer line(s). These locations are listed below:

| Line | Shown on Sheet | Station | Manhole or Clean-out? |
|---|---|---|---|
| SSL-A | 35 Of 59 | 31+06.21 | MANHOLE |
| A Service | 35 Of 59 | 2+27.15 | MANHOLE |
| SSL-B | 37 Of 59 | 15+65.37 | MANHOLE |
| SSL-C1 | 39 Of 59 | 12+94.75 | MANHOLE |
| SSL-C2 | 40 Of 59 | 12+15.45 | MANHOLE |
| SSL-D | 41 Of 59 | 9+27.76 | MANHOLE |
| SSL-E | 42 Of 59 | 5+19.84 | MANHOLE |
| SSL-F | 43 Of 59 | 7+95.10 | MANHOLE |
| SSL-G | 45 Of 59 | 16+24.67 | MANHOLE |
| SSL-H1 | 46 Of 59 | 5+26.59 | MANHOLE |
| SSL-H2 | 46 Of 59 | 5+24.62 | MANHOLE |
| SSL-J | 47 Of 59 | 3+87.75 | MANHOLE |
| SSL-K1 | 48 Of 59 | 3+99.81 | MANHOLE |
| SSL-K2 | 48 Of 59 | 5+48.34 | MANHOLE |

13. Deviations from uniform grade without manholes (e.g., grade breaks or vertical curves) will require specific approval.

X There are no deviations from uniform grade in this sewage collection system without manholes.

__ **ATTACHMENT C - Justification for Deviation in Grade Without Manholes.** Justification for deviations from uniform grade in this sewage collection system without manholes is provided in **ATTACHMENT C** at the end of this form.

14. Deviations from straight alignment without manholes (i.e., horizontal curves) will require specific approval.

X There are no deviations from straight alignment in this sewage collection system without manholes.

__ **ATTACHMENT D - Justification for Deviation in Straight Alignment Without Manholes.** Justification for deviations from straight alignment in this sewage collection system without manholes is provided in **ATTACHMENT D** at the end of this form.

__ For curved sewer lines, all curved sewer line notes (F-0596) are included on the construction plans for the wastewater collection system.

15. N/A Manholes are installed at all Points of Curve (PC) and Points of Tangent (PT) of a sewer line.

__ **ATTACHMENT E - Request for Variance from Design Criteria.** A request for a variance from this design criteria may be granted by the executive director if detailed engineering justification is provided showing that it will not result in an unreasonable risk to the Edwards Aquifer. Written justification for the variance request is provided in **ATTACHMENT E** at the end of this form. A letter of approval from the maintenance entity is acceptable as justification.

16. X The maximum spacing between manholes on this project for each pipe diameter is no greater than:

| Pipe Diameter (inches) | Max. Manhole Spacing (feet) |
|---|---|
| 6 - 15 | 500 |
| 16 - 30 | 800 |
| 36 - 48 | 1000 |
| ≥54 | 2000 |

__ The maximum spacing between manholes on this project (for each pipe diameter used) is greater than listed in the table above. Justification for any variance from the maximum spacing must include a letter from the entity which will operate and maintain the system stating that it has the capability to maintain lines with manhole spacing greater than the allowed spacing.

17. __ All manholes will be monolithic, cast-in-place concrete.

X The owner/developer of this project is requesting the use of pre-cast manholes. The manufacturer's specifications and construction drawing, showing the method of sealing the joints, are attached.

**SITE PLAN**

**Items 18 through 23 must be included on the Site Plan.**

18. The Site Plan must have a minimum scale of 1" = 400'.
Site Plan Scale: 1" = 100 '.

19. The Site Plan must include the sewage collection system general layout, including manholes with station numbers, and sewer pipe stubouts (if any). Site plan must be overlain by topographic contour lines, using a contour interval of not greater than ten feet and showing the area within both the five-year floodplain and the 100-year floodplain of any drainage way.

20. Lateral stub-outs:

X The location of all lateral stub-outs are shown and labeled.
__ No lateral stub-outs will be installed during the construction of this sewer collection system.

21. Location of existing and proposed water lines:

X The entire water distribution system for this project is shown and labeled.
__ If not shown on the Site Plan, a Utility Plan is provided showing the entire water and sewer systems.
__ There will be no water lines associated with this project.

22. 100-year floodplain:

X After construction is complete, no part of this project will be in or cross a 100-year floodplain, either naturally occurring or manmade. (Do not include streets or concrete-lined channels constructed above of sewer lines.)
__ After construction is complete, all sections located within the 100-year floodplain will have water-tight manholes. These locations are listed in the table below and are shown and labeled on the Site Plan. (Do not include streets or concrete-lined channels constructed above sewer lines.)

| Line | Sheet | Station | | Station |
|---|---|---|---|---|
| | of | | to | |
| | of | | to | |
| | of | | to | |
| | of | | to | |

23. 5-year floodplain:

X After construction is complete, no part of this project will be in or cross a 5-year floodplain, either naturally occurring or man-made. (Do not include streets or concrete-lined channels constructed above sewer lines.)
__ After construction is complete, all sections located within the 5-year floodplain will be encased in concrete or capped with concrete. These locations are listed in the table below and are shown and labeled on the Site Plan. (Do not include streets or concrete-lined channels constructed above sewer lines.)

| Line | Sheet | Station | | Station |
|---|---|---|---|---|
| | of | | to | |
| | of | | to | |
| | of | | to | |
| | of | | to | |

**Items 24 through 31 must be included on the Plan and Profile sheets.**

24. X All existing or proposed water line crossings and any parallel water lines within 9 feet of sewer lines are listed in the table below. These lines must have the type of pressure rated pipe to be installed shown on the plan and profile sheets. Any request for a variance from the required pressure rated piping at crossings must include a variance approval from 30 TAC Chapter 290.

___ There will be no water line crossings.

___ There will be no water lines within 9 feet of proposed sewer lines.

| Line | Station or Closest Point | Crossing or Parallel | Horizontal Separation Distance | Vertical Separation Distance |
|---|---|---|---|---|
| SSL-C1 | 3+55 | CROSSING | | 4.07' |
| SSL-C1 | 7+51 | CROSSING | | 3.30' |
| SSL-C1 | 11+03 | CROSSING | | 5.36' |
| SSL-C2 | 2+50 | CROSSING | | 4.76' |
| SSL-C2 | 4+85 | CROSSING | | 2.25' |
| SSL-C2 | 7+57 | CROSSING | | 3.11' |
| SSL-D | 1+12 | CROSSING | | 4.08' |
| SSL-D | 6+20 | CROSSING | | 7.50' |
| SSL-E | 3+80 | CROSSING | | 3.53' |
| SSL-F | 1+45 | CROSSING | | 2.30' |
| SSL-F | 3+05 | CROSSING | | 2.26' |
| SSL-F | 6+10 | CROSSING | | 2.46' |
| SSL-G | 2+41 | CROSSING | | 2.26' |
| SSL-G | 4+17 | CROSSING | | 2.39' |
| SSL-G | 6+76 | CROSSING | | 4.04' |
| SSL-G | 7+88 | CROSSING | | 6.65' |

| | | | | |
|---|---|---|---|---|
| SSL-H1 | 1+13 | CROSSING | | 3.42' |
| SSL-H1 | 3+80 | CROSSING | | 1.83' |
| SSL-J | 3+75 | CROSSING | | 7.53' |
| SSL-K2 | 2+10 | CROSSING | | 4.45' |
| SSL-K2 | 4+50 | CROSSING | | 2.01' |

25. Vented Manholes:

X **No part** of this sewer line is within the 100-year floodplain and vented manholes are not required by 30 TAC Chapter 317.

__ **A portion** of this sewer line is within the 100-year floodplain and vented manholes will be provided at less than 1500 foot intervals. These water-tight manholes are listed in the table below and labeled on the appropriate profile sheets.

__ **A portion** of this sewer line is within the 100-year floodplain and an alternative means of venting shall be provided at less than 1500 feet intervals. A description of the alternative means is described on the following page.

__ **A portion** of this sewer line is within the 100-year floodplain; however, there is no interval longer than 1500 feet located in the 100-year floodplain. No vented manholes will be used.

| Line | Manhole | Station | Sheet |
|---|---|---|---|
| | | | of |
| | | | of |
| | | | of |
| | | | of |
| | | | of |
| | | | of |

26. Drop manholes:

__ There are no drop manholes associated with this project.

X Sewer lines which enter new or existing manholes or "manhole structures" higher than 30 inches above the manhole invert are listed in the table below and labeled on the appropriate profile sheets. These lines meet the requirements of 30 TAC §317.2(c)(5)(E).

| Line | Manhole | Station | Sheet |
|---|---|---|---|
| SSL-B | B2 | 4+90 | 36 of 59 |
| SSL-C2 | B8 | 1+00 | 40 of 59 |
| SSL-H1 | G9 | 1+00 | 46 of 59 |
| | | | of |

| | | | |
|---|---|---|---|
| | | | of |
| | | | of |

27. Sewer line stub-outs (For proposed extensions):

x The placement and markings of all sewer line stub-outs are shown and labeled.
__ No sewer line stub-outs are to be installed during the construction of this sewage collection system.

28. Lateral stub-outs (For proposed private service connections):

x The placement and markings of all lateral stub-outs are shown and labeled.
__ No lateral stub-outs are to be installed during the construction of this sewage collection system.

29. Minimum flow velocity (From APPENDIX A)

x Assuming pipes are flowing full, all slopes are designed to produce flows equal to or greater than 2.0 feet per second for this system/line.
__ **ATTACHMENT F - Explanation of Slopes for Flows Less than 2.0 Feet Per Second.** Assuming pipes are flowing full, some slopes are designed to produce flows less than 2.0 feet per second for this system/line. An explanation is provided in **ATTACHMENT F** at the end of this form.

30. Maximum flow velocity/slopes (From APPENDIX A)

X Assuming pipes are flowing full, all slopes are designed to produce maximum flows of less than or equal to 10 feet per second for this system/line.
__ **ATTACHMENT G - Explanation of Slopes for Flows Greater Than 10.0 Feet Per Second.** Assuming pipes are flowing full, some slopes produce flows which are greater than 10 feet per second. These locations are listed in the table below. A variance is requested to exceed the maximum slope. Justification is provided in **ATTACHMENT G** at the end of this form.

| Line | Profile Sheet | Station | | Station | FPS | % Slope | Erosion/Shock Protection |
|---|---|---|---|---|---|---|---|
| | of | | to | | | | |
| | of | | to | | | | |
| | of | | to | | | | |
| | of | | to | | | | |

31. Assuming pipes are flowing full, where flows are ≥ 10 feet per second the provisions noted below have been made to protect against pipe displacement by erosion and/or shock. 30 TAC §317.2(c)(3)

n/a Concrete encasement shown on appropriate Plan and Profile sheets for the locations listed in the table above.
__ Steel-reinforced, anchored concrete baffles/retards placed every 50 feet shown on

appropriate Plan and Profile sheets for the locations listed in the table above.

__ **ATTACHMENT H - Other Protection Methods Against Erosion/Shock.** Other. An explanation is provided in **ATTACHMENT H** at the end of this form.

## ADMINISTRATIVE INFORMATION

32. _x_ The **final plans and technical specifications** are submitted for the TCEQ's review. Each sheet of the construction plans and specifications are dated, signed, and sealed by the Texas Licensed Professional Engineer responsible for the design on each sheet.

33. Standard details are shown on the detail sheets, which are dated, signed, and sealed by the Texas Licensed Professional Engineer, as listed in the table below:

| Standard Details | Shown on Sheet |
|---|---|
| Lateral stub-out marking [**REQUIRED**] | 49 of 59 |
| Manhole, showing inverts comply with 30 TAC 317.2(c)(5)(E) [**REQUIRED**] | 49 of 59 |
| Alternate method of joining lateral to existing SCS line for potential future connections [**REQUIRED**] | 49 of 59 |
| Typical trench cross-sections [**REQUIRED**] | 49 of 59 |
| Bolted manholes [**REQUIRED**] | 49 of 59 |
| Sewer Service lateral standard details [**REQUIRED**] | 49 of 59 |
| Clean-out at end of line [**REQUIRED, if used**] | N/A |
| Baffles or concrete encasement for shock/erosion protection [**REQUIRED, if flow velocity of any section of pipe >10 fps**] | N/A of |
| Detail showing Wastewater Line/Water Line Crossing [**REQUIRED, if crossings are proposed**] | 38-44, 46-48 of 59 |
| Mandrel detail or specifications showing compliance with 30 TAC §317.2(a)(4)(C) [**REQUIRED, if Flexible Pipe is used**] | 30, 49 of 59 |
| Drop manholes [**REQUIRED, if a pipe entering a manhole is more than 30 inches above manhole invert**] | 49 of 59 |

34. _X_ All organized sewage collection system general construction notes (TCEQ-0596) are included on the construction plans for this sewage collection system.

35. X__ All proposed sewer lines will be sufficiently surveyed/staked to allow an inspection prior to TCEQ executive director approval. If the alignments of the proposed sewer lines are not walkable for inspection on that date, the application will be deemed incomplete and returned.

36. _X_ One (1) original and three (3) copies of the completed application has been provided.

37. X Any modification of this SCS application will require TCEQ approval, prior to construction, and may require submission of a revised application, with appropriate fees.

To the best of my knowledge, the responses to this form accurately reflect all information requested concerning the proposed regulated activities and methods to protect the Edwards Aquifer. This **SEWAGE COLLECTION SYSTEM APPLICATION** is hereby submitted for TCEQ review and executive director approval. The system was designed in accordance with the requirements of 30 TAC §213.5(c) and 30 TAC §317 and prepared by:

Place engineer's seal here:




Alex Zertuche
Print Name of Licensed Professional Engineer

Signature of Licensed Professional Engineer

12/16/08
Date

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

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

**APPENDIX A**
Flow Velocity Table

Flow Velocity (Flowing Full)

All gravity sewer lines on the Edwards Aquifer Recharge Zone shall be designed and constructed with hydraulic slopes sufficient to give a velocity when **flowing full** of not less than 2.0 feet per second, and not greater than 10 feet per second. The grades shown in the following table are based on Manning's formula and an n factor of 0.013 and shall be the minimum and maximum acceptable slopes unless provisions are made otherwise.

| Pipe Diameter (Inches) | % Slope required for minimum flow velocity of 2.0 fps | % Slope which produces flow velocity of 10.0 fps |
|---|---|---|
| 6 | 0.50 | 12.35 |
| 8 | 0.33 | 8.40 |
| 10 | 0.25 | 6.23 |
| 12 | 0.20 | 4.88 |
| 15 | 0.15 | 3.62 |
| 18 | 0.11 | 2.83 |
| 21 | 0.09 | 2.30 |
| 24 | 0.08 | 1.93 |
| 27 | 0.06 | 1.65 |
| 30 | 0.055 | 1.43 |
| 33 | 0.05 | 1.26 |
| 36 | 0.045 | 1.12 |
| 39 | 0.04 | 1.01 |
| >39 | * | * |

*For lines larger than 39 inches in diameter, the slope may be determined by Manning's formula (as shown below) to maintain a minimum velocity greater than 2.0 feet per second when flowing full and a maximum velocity less than 10 feet per second when flowing full.

$$v = \frac{1.49}{n} \times R_h^{0.67} \times \sqrt{S}$$

**Texas Commission on Environmental Quality**
**SEWAGE COLLECTION SYSTEM SUBMITTAL APPLICATION**
**FOR PLANS AND SPECIFICATIONS REVIEW**

This application is intended as an aid in fulfilling the review requirements of 30 TAC Chapter 317, titled *Design Criteria for Sewerage Systems*, sections 317.1 and 317.2. This application may be submitted in lieu of a separate engineering report. This form will only be accepted for review if all the pages of this application, including any attachments, are permanently bound together, and the application is signed, sealed and dated on the final page by a professional engineer registered in the State of Texas, or if each page of attachments and each page of this application have the signed and dated seal of a Professional Engineer registered in the State of Texas. **Use of the application form is not mandatory except for Edwards Aquifer applications.** The intent of this application is to expedite Texas Commission on Environmental Quality (TCEQ) plan review by providing a format which ensures that the information required to complete a TCEQ review of the project is included in the submittal materials, and to assist the reviewer in locating this information. Please note that the determination of whether or not the information submitted by the applicant is sufficient to obtain TCEQ approval will be made by the TCEQ reviewer and that additional information regarding the project design may be required before the TCEQ will approve construction of the project. Except as exempted in question A23 of this application, in addition to this application, each submittal must include one set of the project specifications, permanently bound, with the signed and dated seal of a Professional Engineer registered in the State of Texas on the cover of the specifications and one set of plans, with each plan sheet containing the signed and dated seal of a Professional Engineer registered in the State of Texas. The submittal of the plans, specifications and application need to be made to the following address:

TCEQ
Wastewater Permits Section
MC 148
P.O. Box 13087
Austin, Texas 78711-3087

For answers to questions relating to wastewater plan review contact:

Louis C. Herrin, III, P.E.
Phone No. (512) 239-4552

## ADMINISTRATIVE REVIEW

TCEQ review is intended to provide both a technical review and a historical record of wastewater construction projects. The following information is required for administrative review purposes.

A1) **Does the project include any potable water distribution or water treatment related construction? Yes If yes, a separate review by the TCEQ Water Utilities Division may be required.** Please contact Joe Strouse, PE, at (512) 239-6960 for this determination.

A2) Name and mailing address of entity submitting project for review: **Newcombe Development, LLC, 325 Mission Valley Road, New Braunfels, TX, 78132**

A3) Name of design engineer: **Alex Zertuche** Phone No. : **(210) 494-0088**

A4) County in which the project is located: **Comal**

A5) Name of project (include subdivision name, contract numbers, or any other identifying information which is relevant to this project):

**Newcombe Tennis Ranch Unit 1**

A6) Entity which will own and maintain the sanitary sewer collection system described in this application: **New Braunfels Utilities**

A7) Identify the wastewater treatment plant (WWTP) which will receive and treat flows from the project.

TCEQ Permit No. : **WQ0010232-0002** Permittee: **New Braunfels Utilities**

Facility or plant name if different from permittee: **Gruene WWTP**

A8) If this WWTP is not under enforcement skip to A10. If this WWTP is currently under a TCEQ enforcement order, please provide the name and phone number of the TCEQ enforcement coordinator and the TCEQ Region Office wastewater inspector assigned to the enforcement case.

Name: _____ Phone No. : _____
Name: _____ Phone No. : _____

**N/A**

A9) Describe the nature of the enforcement case. If the WWTP which will receive flow from this project is under enforcement due to flow exceedance, the description should include the permitted average daily flow, information regarding average daily flows currently measured at the WWTP during both dry and wet weather conditions, and any other information which would help describe the flow exceedance problems:

N/A

A10) If any portion of the project is within the Edwards Aquifer Recharge Zone, **attach this form to your Edwards Aquifer protection plan**. The project must be reviewed by the appropriate TCEQ Region Office as required by 30 TAC Chapter 213. For information on the submittal requirements for projects located over the Edwards Aquifer Recharge Zone contact the appropriate Region Office for details. Are all portions of this project outside the Edwards Aquifer Recharge Zone? **No**

A11) If the project is publicly funded, identify the source of funding. Please include the name and phone number of a contact person at the funding entity.

Source of Funding: **N/A**

Name: _____ Phone No. : _____

A12) Identify entities other than TCEQ which will review the project. Please include the name and phone number of a contact person for each entity other than the TCEQ which will review this project.

| | | |
|---|---|---|
| Entity: **New Braunfels Utilities** | Name: **Wesley Hamff, PE** | Phone No. : **(830) 629-8400** |
| Entity: **Edwards Aquifer Authority** | Name: **Velma Danielson** | Phone No. : **(210) 222-2204** |
| Entity: **Comal County** | Name: **Tom Hornseth, PE** | Phone No. : **(830) 608-2090** |
| Entity: _____ | Name: _____ | Phone No. : _____ |

A13) If this project proposes any sewage collection system (gravity sewer pipe, lift station or force main) installation or construction which would not be considered maintenance and rehabilitation work, skip to page 7 of this application and complete the applicable portions of the technical review section of this application starting with T1 on page 7. If a project consists solely of maintenance and repair of an existing sanitary sewer collection system, a waiver of review may be granted on a case by case basis in accordance with Section 317.1(a)(7) of the Design Criteria. Section 317.1(a)(7) states, "Waiver of submittal or review requirements. When minor upgrade, rehabilitation, or maintenance work is planned for existing systems a waiver of submittal or review may be granted at the discretion of the executive director...If a waiver of submittal or review is desired, written notification to the commission...shall be made and shall include sufficient information to describe the significance of such modifications. If a waiver of submittal

or review is requested, it shall be submitted by a professional engineer registered in Texas, and shall include the signed and dated seal of the engineer submitting the waiver request. The executive director...will determine whether a submittal or review of engineering plans and specifications will be required following this initial notification of the extent of the planned modifications. Replacement of equipment, piping or materials with like equipment, piping, or materials for purposes of maintenance and repair only, will not routinely require a submittal or a technical review by the executive director, and also will not routinely require a request for a waiver of submittal or a request for a waiver of review." If this project only proposes collection system maintenance and rehabilitation work, state whether the project consists of sewage collection piping rehabilitation work, lift station rehabilitation work, or both sewage collection system piping and lift station rehabilitation work: **N/A**

If this project only consists of sewage collection piping maintenance and rehabilitation work, answer items A14 through A18.

If this project only consists of maintenance and rehabilitation work for one or more lift stations, answer items A19 through A22 and continue on with A23.

If this project proposes both sewage collection system piping rehabilitation and maintenance and rehabilitation of one or more sanitary sewer lift station, answer items A14 through A22 and continue on with A23.

A14) Detail the scope of the sewer collection pipe rehabilitation project. Include details regarding linear feet of pipe which will be rehabilitated, types of pipe rehabilitation technologies which are proposed, pipe, pipe joint and pipe bedding materials which are proposed for the maintenance and rehabilitation work and any other information which may be necessary to show that the proposed project will be accomplished utilizing standard acceptable engineering practices:

**N/A**

A15) Are all proposed lines to be constructed in the same trench as existing lines? **N/A**

A16) Are all proposed lines the same diameter as existing lines? **N/A**

A17) Are all slopes the same as or greater than existing lines? **N/A**

A18) Will flows and connections be equal to or less than current flows and connections? _____ If no lift station rehabilitation work is planned, skip to A23. **N/A**

A19) Detail the scope of the maintenance and rehabilitation work proposed for the lift station(s). Include the number of lift stations which will be rehabilitated, information regarding structural maintenance which is to be performed on each lift station proposed for rehabilitation, the size of any pumps which are to be replaced in each lift station, the size of any pumps which currently exist in each lift station, the size of

any pumps which are not proposed to be replaced and will remain in each lift station, details regarding any force main rehabilitation which is intended for the sewage system and any other information which may be necessary to show that the proposed project will be accomplished utilizing standard acceptable engineering practices:

**N/A**

A20) Will the operating characteristics of the rehabilitated lift station(s) be equivalent to the operating characteristics of the existing lift station(s) regarding pumping capacity versus total dynamic head? **N/A**

A21) Will the force main piping either remain unchanged, or, be replaced at the same alignment and with the same diameter pipe as the existing force main piping? (yes or no) **N/A**

A22) Will the lift station(s) and force main(s) include, at a minimum, an arrangement of valves and appurtenances which ensures that the lift station(s) operation will be equivalent to or superior to that of the lift station(s) and force main(s) being upgraded or replaced? **N/A**

A23) **If you answered no to any of the items in A15, A16, A17, A18, A20, A21, or A22, skip to A24. If you answered yes to all the items in A15, A16, A17, A18, A20, A21, or A22,** which are relevant to the project, **STOP**. This project meets the criteria which must be met to allow the TCEQ to grant a general waiver of review and to allow an exemption from the requirement to submit plans and specifications to the TCEQ. Submit pages 1 through 6 of this application, and any attachments associated with pages 1

through 6 of this application to the TCEQ for record keeping purposes. The submitted pages shall be properly bound and the final page shall include the signed and dated seal of a Professional Engineer registered in the State of Texas. The pages can be stapled or left loose if each page of the submittal has the signed and dated seal of a Professional Engineer registered in the State of Texas.

A24) **If you answered no to any of the items in A15, A16, A17, A18, A20, A21, or A22,** but believe that the project constitutes routine maintenance of an existing system, please provide engineering justification why TCEQ review should not be required. Please detail in what ways the rehabilitation project differs from the existing system with regard to the items in A15, A16, A17, A18, A20, A21 or A22. Submit all attachments and pages 1 through 6 of this application to the TCEQ for a determination of whether review is required for this project. The pages of the submittal shall be properly bound and the final page shall include the signed and dated seal of a Professional Engineer registered in the State of Texas. The pages can be stapled or left loose if each page of the submittal has the signed and dated seal of a Professional Engineer registered in the State of Texas. Please be aware that review may be required at the discretion of the Executive Director. If it is determined that the proposed maintenance and rehabilitation work will be reviewed by the TCEQ, in addition to pages 1 through 6 of this application, the applicant will need to submit one set of the project specifications, permanently bound, with the signed and dated seal of a Professional Engineer registered in the State of Texas on the cover of the specifications, an engineering report, permanently bound, with the signed and dated seal of a Professional Engineer registered in the State of Texas on the cover of the engineering report (For collection system submittals which contain no lift stations or force mains, this application form may substitute for the engineering report, provided the application is properly completed) and one set of plans, with each plan sheet containing the signed and dated seal of a Professional Engineer registered in the State of Texas.

N/A

## TECHNICAL REVIEW

T1) Please provide a brief summary of the project scope:

**Please refer to Attachment C "Project Description" of TCEQ Form TCEQ-0587.**

T2) If a conflict exists between the various submitted documents (engineering calculations, project specifications, project plans, addendums, etc.), which document takes precedent? For instance do plans govern over specifications or do specifications govern over plans? Do special conditions govern over technical specifications or plans? etc. Where in the submitted materials is the prioritization of documents specified?

Provide answers to these items below. Please be aware that the TCEQ may require any identified discrepancies between plans and specifications to be corrected or clarified:

**Specifications take precedence over plans.**

Location in submittal: Plan sheet **30** Specifications page _____ Item No. **General Note No. 24**

T3) This application form is intended to function as a document, which when completed properly, constitutes full compliance with Sections 317.1 and 317.2 of the TCEQ's rules. All the requirements in these Sections of Chapter 317 have been restated in this application in a format which is intended to clarify what is needed to show compliance with Sections 317.1 and 317.2. ***If during the course of completing this application it is determined that the project does not comply with specific portions of the requirements in Chapter 317, as indicated by "no" answers to the items in the application, the applicant must request a variance from the rules for these items. The specifics of what requirements must be met to obtain a variance can be found on page 35 of this application. Page 35 is also the appropriate places to provide the details needed to justify any variance requests.***

Part I of the technical review portion of this application covers gravity sewer collection piping only. Part II of this application has not yet been developed. Part II, when developed, will cover lift stations and force main piping only. If this project contains gravity collection piping complete the items in Part I, beginning with T4 on page 8 of this application. Until Part II is finalized, if this project contains lift stations and force main piping, which need a TCEQ review, a separate engineering report which shows full compliance with Section 317.3 of the TCEQ's rules titled Design Criteria for Sewerage Systems, must be submitted to the TCEQ for the lift station and force main portions of the project. Conceptually similar Chapter 317 requirements have been grouped together under their relevant citations in Part I of this application. For more detailed information on these requirements, please consult the relevant rules.

## PART I - GRAVITY SANITARY SEWER PIPING

### Capacity Design

Flow and Capacity Analysis: 30 TAC, Sections 317.2.(a)(1), 317.2.(b)(1), 317.2.(b)(2), 317.2.(b)(3), 317.4.(a)

T4) Basis for average flow used for design of collection system (**check one or more**):

Per Capita Contributions:____ Service Connections: **X** Land Area and Use:____ Fixture Analysis:____

T5) Peaking factor used for design: **5.57** A peaking factor of at least 4 is required for minor lines. A peaking factor greater than 4 must be used if needed to convey peak flows. Has a peaking factor greater than or equal to 4 been used in the design? **YES**

T6) Provide flow/capacity analysis. The capacity analysis must derive the average and peak flows to be carried by each line. Additionally, the analysis must verify that the diameters and slopes for each reach of collection line (or for the minimum capacity reach of each line) provide a capacity adequate to carry the anticipated peak flow. The analysis must include consideration of all existing upstream flow contributions, and the impact of the project on the downstream collection system. The stated design flow must be justified on the basis of future population to be served, and must include any anticipated industrial, commercial, or

institutional flow contributions. Please note that capacities must be determined using Manning's equation for pipes flowing full with an "n" value of 0.013:

**Please refer to the attachment T6) Flow Capacity Analysis**

## General Structural Components

**The Design Criteria outlined in Section 317.2 of the TCEQ's rules states, "The collection system design shall provide a minimum structural life cycle of 50 years." Section 317.2 also states, "The collection system design shall provide for the minimization of anaerobic conditions." These two TCEQ requirements can be assumed to have been met for the purposes of Plans and Specifications approval provided that the items in T7 through T104, detailed below, are met:**

Materials Used and ASTM Standards Adhered To: 30 TAC 317.2(a)(2), 317.2(a)(3), 317.2(a)(5), 317.2(c)(5)(A)

T7) List all the pipe diameters proposed for this project. Specify the total linear feet of pipe proposed for each listed diameter, the pipe material proposed for each diameter, the national standard specifications (ASTM,

| | Linear Feet | Pipe Material | National Standard Specification for Pipe Material | National Standard for Pipe Joints |
|---|---|---|---|---|
| **Pipe Diameter 1** | 12,063.66 | 8" PVC SDR 26 | ASTM 3034 | ASTM 3212 |
| **Pipe Diameter 2** | 420 | 8" PVC DR 18 | AWWA C-900 | AWWA C-900 |
| **Pipe Diameter 3** | | | | |
| **Pipe Diameter 4** | | | | |
| **Pipe Diameter 5** | | | | |
| **Pipe Diameter 6** | | | | |

AWWA, ANSI, etc...) which govern each proposed pipe material and the appropriate national standard specifications for joints which correspond to each of these proposed materials:

Location in submittal: Plan sheet **30** Specifications page _____ Item No. _____

Note: Section 317.2.(c)(1) requires a minimum pipe diameter of 6 inches for all sanitary sewer collection system piping except service laterals. The TCEQ does not currently review service laterals. The design, installation and testing of service laterals is regulated by municipal and county codes. Compliance with these codes is considered sufficient to satisfy the TCEQ.

T8) Watertight, size on size resilient connectors conforming to ASTM C-923 must be specified for connecting pipe to manholes. Have such connectors been specified? **YES**

Location in submittal: Plan sheet **30 & 49** Specifications page _____ Item No. **TCEQ Note No 10 NBU Detail #325**

T9) For purposes of TCEQ review, rigid pipe materials include, but are not limited to, concrete, vitrified clay or ductile iron pipe. If the design does not include rigid pipe, skip to T11. If the design includes rigid pipe, the specified bedding must comply with ASTM C-12 class A, B, or C for materials and densification. A minimum of 4 inches of bedding is required for all pipe. Will the proposed project comply with these requirements? **N/A**

T10) Specify the bedding class proposed for each diameter of rigid pipe and each rigid pipe material:

| | | |
|---|---|---|
| Pipe Diameter:_____ | Pipe Material:_____ | Bedding Class:_____ |
| Pipe Diameter:_____ | Pipe Material:_____ | Bedding Class:_____ |
| Pipe Diameter:_____ | Pipe Material:_____ | Bedding Class:_____ |
| Pipe Diameter:_____ | Pipe Material:_____ | Bedding Class:_____ |
| Pipe Diameter:_____ | Pipe Material:_____ | Bedding Class:_____ |
| Pipe Diameter:_____ | Pipe Material:_____ | Bedding Class:_____ |

Location in submittal: Plan sheet _____ Specifications page _____ Item No. _____

T11) For purposes of TCEQ review, flexible materials include, but are not limited to, plastics, PVC, ABS, fiberglass, and, polyethylene. If the design does not include flexible pipe, skip to T13. If the design includes flexible pipe materials, the specified bedding must comply with ASTM D-2321 class IA, IB, II or III for materials and densification. A minimum of 4 inches of bedding is required for all pipe. Will the proposed project comply with these requirements? **YES**

T12) Specify the bedding class proposed for each diameter of flexible pipe and each flexible pipe material:

| | | |
|---|---|---|
| Pipe Diameter: **8"** | Pipe Material: **PVC SDR 26** | Bedding Class: **1A** |
| Pipe Diameter: **8"** | Pipe Material: **PVC DR 18** | Bedding Class: **1A** |
| Pipe Diameter:_____ | Pipe Material:_____ | Bedding Class:_____ |
| Pipe Diameter:_____ | Pipe Material:_____ | Bedding Class:_____ |
| Pipe Diameter:_____ | Pipe Material:_____ | Bedding Class:_____ |

Use the back of this page and attachments if needed for long narrative answers or engineering calculations.

Pipe Diameter:____ Pipe Material:_____ Bedding Class:_____

Location in submittal: Plan sheet **30** Specifications page _____ Item No. **Sewer Note No. 5**

Note: For TCEQ review, cement stabilized bedding materials are considered to comply with ASTM D-2321 if the base material and compaction meet the minimum requirements of ASTM D-2321, class IA, IB, II or III.

T13) Brick manhole construction is not allowed. Use of brick for adjusting manhole covers to grade is also prohibited. Do the project plans and/or specifications prohibit the use of brick manholes and the use of brick to adjust manholes to grade? **YES**

Location in submittal: Plan sheet **30** Specifications page _____ Item No. **Sewer Note No. 9**

T14) Are materials specified for manhole construction limited to monolithic cast in place concrete, fiberglass, precast concrete or HDPE? **YES** List all materials specified for manhole construction:

1)**Cast in Place Concrete** 2)**Precast Concrete** 3)_____ 4)_____

Location in submittal: Plan sheet **30** Specifications page _____ Item No. **Sewer Note No. 9**

Minimum and Maximum Slopes: 30 TAC 317.2(c)(2), 317.2(c)(3)

T15) All pipe must be designed with a slope that will provide a velocity of at least 2 ft/s flowing full, as calculated using Manning's equation with an "n" value of 0.013. Additionally, the collection system must be designed to ensure that, with pipes flowing full, the velocities will be less than 10 feet per second. For each diameter of pipe, indicate the minimum and maximum collection line slopes which will exist in this project (see 317.2(c)(2) of the TCEQ's rules for a table of maximum and minimum slopes allowed for each diameter of pipe):

Pipe Diameter: **8"** Min. Slope: **0.33%** Max. Slope: **7.51%**
Pipe Diameter: ____ Min. Slope: ____ Max. Slope: ____
Pipe Diameter: ____ Min. Slope: ____ Max. Slope: ____
Pipe Diameter: ____ Min. Slope: ____ Max. Slope: ____
Pipe Diameter: ____ Min. Slope: ____ Max. Slope: ____
Pipe Diameter: ____ Min. Slope: ____ Max. Slope: ____

T16) Do these proposed slopes ensure a velocity greater than or equal to 2 feet per second and less than or equal to 10 feet per second? **YES**

General Trenching and Backfill: 30 TAC 317.2.(a)(5), 317.2.(a)(9), 317.2.(a)(10), 317.2.(c)(3)

T17) Describe any known soil, geologic, or hydrologic conditions on the site which may pose difficulties for construction or compromise the structural integrity of the collection system. These include but are not limited to high water table; low soil strength; high plasticity index; active faults; zones of active subsidence; and, caves, solution caverns or sinkholes. If no such conditions are known to exist in the proposed project location, skip to T19.

**There is a fault line that crosses the proposed sewer collection system in several places. The fault line is shown in the plan and profile drawings. Please refer to the geologic assessment for additional information concerning the fault line.**

T18) Describe the measures which will be taken to provide for the structural integrity of the collection line and for construction safety where pipe must be installed in conditions described in T17:

**The manholes will be constructed with resilient connectors to allow some differential settlement to occur at the connection to the manholes without compromising the water tight connection. The PVC pipe itself is capable of up to one degree of deflection per joint (or 4") without compromising the integrity of the gasketed joint, per the manufacturer's literature (see the attachment for T18). To facilitate bypass pumping (should the need arise), manholes are located on either side of the fault.**

Location in submittal: Plan sheet **See profile sheet** Specifications page _____ Item No. _____

T19) **If faults, caverns, or subsidence are discovered during construction, construction should be halted to allow the features to be inspected by the design engineer or a geological or geotechnical professional.** For active faults, localized subsidence zones, or caverns, the system must be laid out to minimize the number of crossings through, and construction within, the unfavorable features. Where crossings through faults or subsidence zones are unavoidable, the design must allow for deflection due to differential settlement. Manholes should be provided on each side of such features to allow pumping in case of sewer failures. Service connections within 50 feet of such features should be avoided. These design features should be detailed in the project specifications. Will these requirements be met? **Yes** Please provide appropriate details:

**The TCEQ sewer notes (No. 7) require construction to stop in the area of a sensitive feature if one is discovered. Sewer Note No. 28 stipulates the requirements above concerning the design intent for faults.**

Location in submittal: Plan sheet **30** Specifications page _____ Item No. **Noted above in text**

T20) The trench width must be minimized while still allowing adequate width for proper compaction of backfill, and while still ensuring that at least 4 inches of backfill exists on each side of the pipe. Will this be accomplished? **YES**

T21) For each diameter of pipe, indicate minimum and maximum trench width:

| | | | | | |
|---|---|---|---|---|---|
| Pipe Diameter: | **8"** | Min. Trench Width: | **1.75'** | Max. Trench Width: | **2.75'** |
| Pipe Diameter: | _____ | Min. Trench Width: | _____ | Max. Trench Width: | _____ |
| Pipe Diameter: | _____ | Min. Trench Width: | _____ | Max. Trench Width: | _____ |
| Pipe Diameter: | _____ | Min. Trench Width: | _____ | Max. Trench Width: | _____ |
| Pipe Diameter: | _____ | Min. Trench Width: | _____ | Max. Trench Width: | _____ |
| Pipe Diameter: | _____ | Min. Trench Width: | _____ | Max. Trench Width: | _____ |

T22) Will the trench walls be vertical to at least one foot above the pipe? **YES**

Location in submittal: Plan sheet **49** Specifications page _____ Item No. _____

T23) Will the backfill be free of stones greater than 6 inches in diameter and free of organic or any other unstable material? **YES**

Location in submittal: Plan sheet **30** Specifications page _____ Item No. **Sewer Note No. 6**

Corrosion Prevention:

T24) List any proposed collection system components (pipes, manholes, etc...) that will be susceptible to deterioration through the corrosive effects of an anaerobic sewage environment. If the collection system does not contain any components which are susceptible to deterioration through the corrosive effects of an anaerobic sewage environment, skip to T26:

**N/A**

T25) If the proposed wastewater collection system contains components susceptible to corrosive attack, provisions to protect these components from corrosive attack, such as coatings, liners, high alkalinity concrete, etc, are needed. If steps have been taken to protect the wastewater collection system from corrosive attack, detail these corrosion prevention measures below. Indicate that these measures are sufficient to protect the gravity sanitary sewer piping from corrosive attack for a design life of 50 years and indicate where in the plans and specifications these measures are required. If the proposed wastewater collection system contains components susceptible to corrosive attack, and if corrosion prevention measures will not be taken for this project, provide an engineering analysis demonstrating that the collection system will adequately resist corrosive attack through the 50 year design life of the project. This analysis must consider the potential for anaerobic conditions both under startup conditions and at ultimate buildout. (Refer to ASCE Manual and Reports on Engineering Practice-No. 69, Sulfide in Wastewater Collection and Treatment Systems). Have these specifics been addressed?_____

Analysis:

**N/A**

Manholes - General: 30 TAC Section 317.2(c)

T26) Are manholes provided at all changes in size, grade or alignment of pipe? **YES**

T27) Are manholes or cleanouts provided at the end of all lines? **YES**

T28) The maximum manhole spacings allowed by the TCEQ are as follows:

| Pipe Diameter (in) | Maximum Manhole Spacing (ft) |
|---|---|
| 6 - 15 | 500 |
| 18 - 30 | 800 |
| 36 - 48 | 1000 |
| 54 or larger | 2000 |

Indicate what the maximum spacing in this project will be for each proposed diameter of pipe.

Pipe Diameter: **8"** Max. Spacing: **357'** Pipe Diameter: _____ Max. Spacing: _____
Pipe Diameter: _____ Max. Spacing: _____ Pipe Diameter: _____ Max. Spacing: _____
Pipe Diameter: _____ Max. Spacing: _____ Pipe Diameter: _____ Max. Spacing: _____

T29) Do the maximum spacings for this project comply with the TCEQ's maximum manhole spacing requirements? **YES**

Manholes - Ventilation: 30 TAC 317.2.(c)(5)(C)

T30) Provide the 100-year flood plain elevation for the project area(s): **N/A**

T31) On what basis was the 100-year flood plain elevation determined?

**N/A**

T32) Manhole covers which lie within a 100 year flood plain must be sealed and gasketed or otherwise provided with adequate protection against inflow. Such measures should also be provided to any manholes lying in drainageways or streets subject to carrying drainage flows. Will this requirement be met? **YES**

Location in submittal: Plan sheet **30** Specifications page _____ Item No. **Sewer Note No. 9**

T33) If this project does not contain any sections of line with more than three manholes in sequence which are bolted and gasketed, or protected against inflow in some other fashion, skip to T34. Where more than three manholes in sequence are to be bolted and gasketed, every third manhole (or a maximum of every 1,500 feet) must be vented to a point above the 100 year flood plain elevation in a way that prevents stormwater inflow. Additionally, the plans should identify the nearest known flood plain elevation and

indicate any manhole covers which are required to be sealed. Will these requirements be met?_____ Does this project solely protect against inflow with bolted and gasketed manholes?_____Describe ventilation provisions:

**N/A**

Location in submittal: Plan sheet _____ Specifications page _____ Item No. _____

Manholes - Minimizing Turbulence: 30 TAC 317.2.(c)(5)(E)

T34) Where unequal sized pipes enter a manhole, the crowns of the pipes should be at equal elevation where feasible and the manhole channel should slope evenly between pipe inverts. If relevant, have these principles been incorporated into the design (If not relevant to this project skip to T35)? **N/A**

T35) Drop inlets must be provided for pipes entering a manhole at an elevation greater than 30 inches above the manhole invert. This requirement is especially important where force mains or inverted siphons discharge into the gravity collection system. Any required drops should be detailed in the project plan sheets. If relevant, have these requirements been specified (If not relevant skip to T36)? **YES**

Location in submittal: Plan sheet **49** Specifications page _____ Item No. **NBU Detail No 325**

T36) Where sewer lines enter the manhole higher than 24 inches above the manhole invert, the invert shall be filleted to prevent solids deposition. A drop pipe should be provided for a sewer entering a manhole more than 30 inches above the invert. Any required fillets should be indicated in the project plans or profile drawings. If relevant, have these features been incorporated into the design (If not relevant skip to T37)? **YES**

T37) A U-shaped channel must be provided through the manhole base. For pipes less than 15 inches diameter, channel depth must be at least half the pipe diameter. For pipes greater than 15 inches but less than 24 inches diameter, channel depth must be at least 3/4 the pipe diameter. For pipes greater than 24 inches diameter, channel depth must be at least equal to the pipe diameter. Has this principle been followed in the design? **YES**

T38) The manhole bench (base area outside the flow channel) must be sloped at least 0.5 inches per foot. Has this principle been followed in the design? **YES**

Inverted Siphons: 30 TAC 317.2.(c)(6)

T39) Inverted Siphons (sag pipes) can be a major source of corrosive activity due to anaerobic conditions. If the project does not include any sag pipes skip to T40. If the project includes sag pipes, have they been designed in accordance with section 317.2.(c)(6) of the Design Criteria?_____ Provide design assumptions and calculations which justify the design of the sag pipes and show that 317.2(c)(6) of the TCEQ's rules has been complied with:

**N/A**

Trenchless Technology: 30 TAC 317.2(a)(2)(A)

T40) If the project propose any trenchless installation of pipe (e.g. slip-lining; boring and jacking; or, microtunneling), please provide a brief description of the type of installation, design basis, and engineering justification of why the proposed method is appropriate for this project. If the project does not propose trenchless installation of pipe skip to T41:

**N/A**

Vertical Curvature: 30 TAC 317.2(c)(4)

T41) Vertical curvature between manholes is not allowed in gravity collection systems. Has this project been designed without the use of vertically curved gravity collection piping between manholes? **YES**

Horizontal Curvature: 30 TAC 317.2(c)(4)

T42) If this project does not contain any portions which include horizontally curved gravity sanitary sewer piping, skip to T57. Chapter 317 of the TCEQ's rules states "Sewers shall be laid in straight alignment with uniform grade between manholes unless slight deviations from straight alignment and uniform grade are justified to the satisfaction of the Executive Director." To clarify what constitutes justification to the satisfaction of the Executive Director, the TCEQ developed a horizontal curvature policy. The specifics of this horizontal curvature policy are detailed in T43 through T56. If this project includes horizontally curved gravity sanitary sewer piping, complete the relevant portions of T43 through T56, then continue with T57. Has the amount of horizontal curvature which will be used in this design been minimized? **N/A**

T43) Horizontal curvature must be either by joint deflection or pipe flexure, but not both. Indicate the method utilized:_____If horizontal curve will be provided by joint deflection skip to T46. If horizontal curvature will be provided by pipe flexure, for each type and size of pipe to be installed using pipe flexure, calculate the minimum radius of curvature which is proposed in this project and calculate a value for 300 * $D_o$, where $D_o$ is the average outside diameter of the pipe in inches.

**N/A**

T44) For each type of pipe material and for each pipe diameter, report the minimum radius of curvature recommended by the manufacturer, the minimum radius of curvature recommended by a national reference standard (if available), the minimum radius of curvature calculated in T43 and the value for

300*$D_o$ calculated in T43:

| | Pipe Material | Minimum Radius of Curvature Recommended by Manufacturer | Minimum Radius of Curvature Recommended by National Reference Standard (N/A if none) | Calculated Minimum Radius of Curvature | Value for 300*$D_o$ |
|---|---|---|---|---|---|
| **Pipe Diameter 1** | | | | | |
| **Pipe Diameter 2** | | | | | |
| **Pipe Diameter 3** | | | | | |
| **Pipe Diameter 4** | | | | | |
| **Pipe Diameter 5** | | | | | |
| **Pipe Diameter 6** | | | | | |

T45) If curvature will be provided by pipe flexure, all joints must be installed fully seated. The specifications must describe how installation will be performed for curved sections. The minimum radius of curvature calculated cannot be less than the minimum radius of curvature recommended by the manufacturer or the minimum radius of curvature recommended by any applicable national reference standards. The minimum radius of curvature also should not be less than 300*$D_o$. Will these requirements be met? **N/A**

Location in submittal: Plan sheet _____ Specifications page _____ Item No. _____

T46) If the horizontal curvature in this project will not be provided by joint deflection, skip to T52. If the horizontal curvature in this project will be provided by joint deflection, calculate the joint deflection proposed for each pipe diameter:

**N/A**

T47) Report the maximum proposed joint deflection for each pipe diameter: **N/A**

Pipe Diameter:_____ Maximum Proposed Joint Deflection:_____
Pipe Diameter:_____ Maximum Proposed Joint Deflection:_____
Pipe Diameter:_____ Maximum Proposed Joint Deflection:_____
Pipe Diameter:_____ Maximum Proposed Joint Deflection:_____
Pipe Diameter:_____ Maximum Proposed Joint Deflection:_____
Pipe Diameter:_____ Maximum Proposed Joint Deflection:_____

T48) Indicate manufacturer's maximum recommended joint deflection for pipe to be used and/or indicate maximum joint deflection recommended by the appropriate national reference standard (ASTM, AWWA, ANSI etc...) for pipe to be used: **N/A**

a) Manufacturer's maximum recommended joint deflection (degrees):

Pipe Diameter:_____ Deflection:_____ Pipe Diameter:_____ Joint Deflection:_____
Pipe Diameter:_____ Deflection:_____ Pipe Diameter:_____ Joint Deflection:_____
Pipe Diameter:_____ Deflection:_____ Pipe Diameter:_____ Joint Deflection:_____

b) National Reference Standard maximum recommended joint deflection (degrees):

Pipe Diameter:_____ Deflection:_____ Pipe Diameter:_____ Joint Deflection:_____
Pipe Diameter:_____ Deflection:_____ Pipe Diameter:_____ Joint Deflection:_____
Pipe Diameter:_____ Deflection:_____ Pipe Diameter:_____ Joint Deflection:_____

T49) The maximum allowable joint deflection allowed by the TCEQ's horizontal curvature policy is equal to the lesser of 5 degrees, **or** 80% of T48(a) **or** 80% of T48(b). Indicate the maximum allowable joint deflection for each pipe diameter: **N/A**

Pipe Diameter:_____ Max. Allowable Joint Deflection:_____ Max. Joint Deflection for Project:_____
Pipe Diameter:_____ Max. Allowable Joint Deflection:_____ Max. Joint Deflection for Project:_____
Pipe Diameter:_____ Max. Allowable Joint Deflection:_____ Max. Joint Deflection for Project:_____
Pipe Diameter:_____ Max. Allowable Joint Deflection:_____ Max. Joint Deflection for Project:_____
Pipe Diameter:_____ Max. Allowable Joint Deflection:_____ Max. Joint Deflection for Project:_____
Pipe Diameter:_____ Max. Allowable Joint Deflection:_____ Max. Joint Deflection for Project:_____

T50) If the proposed joint deflection, for any individual portion of pipe, as calculated in T46 is greater than the maximum allowable joint deflection as determined in T49 for that same portion of pipe, the proposed curvature will not be approved by TCEQ. Does the proposed horizontal curvature comply with TCEQ policy as outlined in T43 through T49 above? **N/A**

T51) Curved lines constructed using joint deflection must be tested for deflection with a mandrel sized to verify that the design maximum joint deflection is not exceeded. Has this test been specified? **N/A**

Location in submittal: Plan sheet _____ Specifications page _____ Item No. _____

T52) For each size of pipe which will be installed with horizontal curvature, indicate the minimum slope.

**N/A**

| | | | |
|---|---|---|---|
| Pipe Diameter:_____ | Min. Slope:_____ | Pipe Diameter:_____ | Min. Slope:_____ |
| Pipe Diameter:_____ | Min. Slope:_____ | Pipe Diameter:_____ | Min. Slope:_____ |
| Pipe Diameter:_____ | Min. Slope:_____ | Pipe Diameter:_____ | Min. Slope:_____ |

T53) All curved sections of gravity line must be installed at a minimum slope at least 3% greater than the corresponding minimum slope for straight lines. Do the slopes in T52 comply with this requirement? **N/A**

T54) Maximum allowable manhole spacing for sections of pipe with horizontal curvature is 300 feet. Has this requirement been met in the design? **N/A**

T55) Manholes should be provided at PC and PT of horizontal curves. Does the design include such provisions? **N/A**

T56) Trench excavation must match the radius of curvature of the installed pipe, with the pipe laid in the center of the trench. Has this requirement been incorporated into the design and detailed in the specifications? **N/A**

Location in submittal: Plan sheet _____ Specifications page _____ Item No. _____

Reduction of Inflow: 30 TAC 317.2(a)(8)

T57) TCEQ rules do not allow combined sewers. Has the project been designed to preclude or eliminate any connections of storm drains, roof drains, etc... to the sanitary sewer? **YES**

T58) If storm drainage facilities are proposed for construction in conjunction with this project, were these designed to prevent storm water from entering the sanitary sewer? **YES**

T59) Please indicate the design storm return period for the storm sewer, if applicable: **25 YEAR**

## Rigid Pipe Design

General Requirements: 30 TAC 317.2(a)(2)(B)

T60) If the project does not specify an option to use rigid pipe, skip to T61. If the project specifies an option to use rigid pipe, please provide an engineering analysis which shows that the rigid pipe design will be adequate to withstand the applied loads expected from the proposed installation. Consideration should be given to trench width, depth of cover, effect of water table elevation on the rigid pipe, etc. Please indicate the maximum burial depth or applied load for each diameter and type of pipe material and the corresponding minimum strength properties or allowable depth of installation as specified in the appropriate national reference standard, or as specified by the pipe manufacturer.

**N/A**

## Flexible Pipe Design

T61) If the project specifies an option to use flexible pipe materials, complete T62 through T87. If the project does not specify an option to use flexible pipe materials, skip to T89.

Live Load Analysis: 30 TAC 317.2(a)(2)(A)

T62) For the purposes of this application, the minimum depth of burial for gravity sanitary sewer pipe, from the ground surface to the crown of the pipe (H) is 2 feet. Does the submitted design comply with this minimum H? **YES**

T63) If all pipe proposed for this project will be installed at a burial depth of greater than or equal to 3.0 feet and the pipe will not be subjected to live loads greater than 18 kip axle, assume that the pressure due to live load ($L_l$) = 0 and skip to T68. If a value of H greater than or equal to 2 feet and less than 3 feet is proposed for any portions of the gravity sanitary sewer pipeline or if the pipe will be subjected to live loads greater than 18 kip axle, calculations which quantify what the $L_l$ on the pipe will be must be provided:

**Minimum Depth of Bury is 3.0'**
**SCS is in proposed residential subdivision; live loads will be limited to H-20 loading**

T64) Indicate minimum H: **N/A**

T65) Indicate maximum anticipated $L_l$ as determined in T63: **N/A**

T66) Are all proposed flexible pipe materials capable of supporting this $L_l$? **N/A**

T67) Indicate source of maximum $L_l$: **N/A**

Buckling Analysis: 30 TAC 317.2(a)(2)(A)

T68) Calculate allowable and predicted buckling pressure. Predicted and allowable buckling pressures must be calculated for each size of pipe and type of flexible pipe material. For the purposes of this application form, the buckling analysis must be performed using the method outlined below. The method of calculating allowable buckling pressure provided below is only valid for lines which are installed at depths of 2 ft $\leq$ H $\leq$ 80 feet.

a) Calculate allowable bucking pressure as follows:

$$q_a = 0.4 * \sqrt[2]{32 * R_w * B' * E_b * (E * I / D^3)}$$

$$R_w = 1 - 0.33 * (h_w / h)$$

$$B' = \frac{1}{1 + 4 * e^{-0.065H}}$$

$$I = (t^3/12) * (inches^4/Linch)$$

$q_a$ = allowable buckling pressure, pounds per square inch (psi)

h = height of soil surface above top of pipe in inches (in)

$h_w$ = height of water surface above top of pipe in inches (in) (groundwater elevation)

$R_w$ = Water buoyancy factor. If $h_w = 0$, $R_w = 1$. If $0 \leq h_w \leq h$ (groundwater elevation is between the top of the pipe and the ground surface), calculate $R_w$ with Equation 2

H = Depth of burial in feet (ft) from ground surface to crown of pipe. **= 18 feet (max depth)**

B' = Empirical coefficient of elastic support

$E_b$ = modulus of soil reaction for the bedding material (psi) **= 1,000 psi**

E = modulus of elasticity of the pipe material (psi) **= 400,000 psi**

I = moment of inertia of the pipe wall cross section per linear inch of pipe, $inch^4$/lineal inch = $inch^3$. For solid wall pipe, I can be calculated with equation 4. If the pipe used is not solid wall pipe (for example a pipe with a ribbed cross section), the proper moment of inertia formula must be obtained from the manufacturer.

t = pipe structural wall thickness (in) **= 0.323 inches (SDR 26); 0.503 inches (C-900 DR 18)**

D = mean pipe diameter (in) **= 8.077 inches (SDR 26); 8.55 inches (C-900 DR 18)**

b) Calculate pressure applied to pipe under installed conditions:

$$q_p = \gamma_w * h_w + R_w * (W_c / D) + L_l$$

$$W_c = \gamma_s * H * (D + t)/144$$

$q_p$ = pressure applied to pipe under installed conditions (psi)

$\gamma_w$ = 0.0361 pounds per cubic inch (pci), specific weight of water

$\gamma_s$ = specific weight of soil in pounds per cubic foot (pcf) = **120 pcf**

$W_c$ = vertical soil load on the pipe per unit length in pounds per linear inch (lb/in)

$L_l$ = Live load as determined in T63 = **0 psi**

$I = (t^3/12) * (inches^4 / Linch)$

**I = $(0.323)^3/12$ = 0.002808 $in^4$/in SDR 26; I = $(0.503)^3/12$ = 0.0106 $in^4$/in C-900 DR 18**

$$B' = \frac{1}{1 + 4 * e^{-0.065H}}$$

**B' = $1/(1+4e^{(-0.065*18)})$ = 0.4461**

$$R_w = 1 - 0.33 * (h_w / h)$$

**$R_w$ = 1-0.33*(216)/216 = 0.67**

$$q_a = 0.4 * \sqrt[2]{32 * R_w * B\not{c} * E_b * (E * I / D^3)}$$

**$q_a$ = 0.4*(32*0.67*0.4461*1000*400000*0.002808/(8.077^3))^.5 = 57.11 psi SDR 26**

**$q_a$ = 0.4*(32*0.67*0.4461*1000*400000*0.0106/(8.55^3))^.5 = 101.89 psi C-900 DR 18**

$W_c = \gamma_s * H * (D + t)/144$

**$W_c$ = 120*18*(8.077+0.323)/144 = 126 lb/in SDR-26**

**$W_c$ = 120*18*(8.55+0.503)/144 = 135.80 lb/in C-900 DR 18**

$q_p = \gamma_w * h_w + R_w * (W_c / D) + L_l$

**$q_p$ = 0.0361*(18*12) + 0.067*(126/8.077) + 0 = 18.25 psi SDR-26**

**$q_p$ = 0.0361*(18*12) + 0.067*(135.80/8.55) + 0 = 18.44 psi C-900 DR 18**

T69) Report $q_a$ and $q_p$ for each pipe diameter proposed and for each type of pipe material proposed:

| | | | |
|---|---|---|---|
| Pipe Diameter: **8"** | Pipe Material: **PVC SDR 26** | $q_a$: **57.11 psi** | $q_p$: **18.25 psi** |
| Pipe Diameter: **8"** | Pipe Material: **PVC C-900 DR 18** | $q_a$: **101.89 psi** | $q_p$: **18.44 psi** |
| Pipe Diameter: | Pipe Material: | $q_a$: | $q_p$: |
| Pipe Diameter: | Pipe Material: | $q_a$: | $q_p$: |
| Pipe Diameter: | Pipe Material: | $q_a$: | $q_p$: |
| Pipe Diameter: | Pipe Material: | $q_a$: | $q_p$ |

T70) If $q_a \geq q_p$, specified pipe is acceptable for the proposed installation. If $q_a \leq q_p$, the wall thickness of the pipe must be increased and/or a pipe with a larger modulus of elasticity (E) must be used. Make the appropriate modifications and repeat the buckling analysis, showing that for the upgraded pipe, $q_a \geq q_p$. Does all the pipe proposed for this project meet these requirements? **YES**

Wall Crushing: 30 TAC 317.2(a)(2)(A)

T71) If no concrete encased flexible pipe is proposed for the submitted project, skip to T73. If any flexible pipe will be installed in rigid encasement (e.g. concrete), calculate the maximum depth that the pipe can be buried before wall crushing (or failure by ring compression) will occur using the method outlined below. It should be noted that cement stabilized sand or soil is not considered a rigid encasement for purposes of TCEQ review:

$$H = (24 * P_c * A) / (\gamma_s * D_o)$$

$D_o$ = outside pipe diameter, in.

$P_c$ = compressive stress or hydrostatic design basis (HDB). For typical PVC pipe assume 4,000 psi. For any other pipe material the HDB must be supplied by the pipe manufacturer.

A = surface area of the pipe wall, in.$^2$/ft = **3.14*D*t = 3.14*8.077*0.323 = 8.196 in$^2$/ft SDR 26**

$\gamma_s$ = specific weight of soil in pounds per cubic foot (pcf) **=120 pcf**

H = Depth of burial in feet (ft) from ground surface to crown of pipe.

24 = conversions and coefficients

**H = (24*4000*8.196)/(120*8.4) = 780.57 feet**

**Value for C-900 DR 18 pipe not calculated – no DR 18 pipe will be concrete encased**

T72) Will all pipe installations proposed for this project have an H less than or equal to the maximum allowable H calculated in T71 and greater than or equal to 2 feet? **YES** Report maximum allowable H, ($H_a$), and the maximum H which is proposed, ($H_p$), for each proposed pipe diameter and each type of flexible pipe material.

| | | | | | |
|---|---|---|---|---|---|
| Pipe Diameter: **8"** | Pipe Material: **PVC** | $H_a$: **780.57'** | $H_p$: **18'** |
| Pipe Diameter: | Pipe Material: | $H_a$: | $H_p$: |
| Pipe Diameter: | Pipe Material: | $H_a$: | $H_p$: |
| Pipe Diameter: | Pipe Material: | $H_a$: | $H_p$: |
| Pipe Diameter: | Pipe Material: | $H_a$: | $H_p$: |
| Pipe Diameter: | Pipe Material: | $H_a$: | $H_p$: |

Installation Temperature Effects: 30 TAC 317.2(a)(2)(A)

T73) If flexible pipe will be installed under favorable ambient temperature conditions, skip to T74. If flexible pipe will be installed under very high or low ambient temperature conditions, please indicate provisions for handling which will protect the pipe and ensure an adequate installation:

**N/A**

Location in submittal: Plan sheet _____ Specifications page _____ Item No. _____

Tensile Strength: 30 TAC Sections 317.2.(a)(2)(A), 317.2.(a)(5)

T74) The project specifications need to indicate minimum allowable tensile **strength** in psi for each flexible pipe material. If PVC pipe is proposed, specify cell class:

| | | | | | |
|---|---|---|---|---|---|
| Pipe Material: **PVC** | Tensile Strength: **7000 psi** | Cell Class (PVC only): **12454B** |
| Pipe Material: | Tensile Strength: | Cell Class (PVC only): |
| Pipe Material: | Tensile Strength: | Cell Class (PVC only): |
| Pipe Material: | Tensile Strength: | Cell Class (PVC only): |

Location in submittal: Plan sheet _____ Specifications page **NBU Spec 510 Page 6** Item No. _____

Strain: TAC 30 Section 317.2.(a)(2)(A)

T75) Are the conditions of this installation such that strain-related failure will not be a problem? **YES** If any proposed flexible pipe material is considered to be susceptible to strain-related failure at less than 5% long-term deflection provide analysis for predicted strain due to hoop stress and bending strain. If strain-related failure will not be a problem for the pipe installation proposed in this project, skip to T76.:

Deflection Analysis: 30 TAC 317.2(a)(2)(A)

T76) Indicate $E_b$ (modulus of soil reaction for the bedding material) in psi. If $E_b$ is greater than 750 psi, justification must be provided.: **1,000 psi**

How was $E_b$ determined or estimated? **Selected from table of values published by Uni-Bell (originally from Amster Howard of the Bureau of Reclamation) to match the specification for bedding stipulated in NBU specification Item 510. See attachment for copy of table.**

T77) Indicate $E'_n$ (modulus of soil reaction for the in-situ soil) in psi: **3,000 psi**

How was $E'_n$ determined or estimated? **Determined by subsurface investigation; native material is solid limestone**

T78) Based on T76 and T77, above, calculate the ratio of bedding modulus to soil modulus:

$E_b/E'_n =$ **0.33** .

If this ratio is greater than 1.25, a zeta factor must be calculated by completing T79 and T80, where zeta is a factor which corrects for the effect of in-situ soil on pipe stability. If the ratio of bedding modulus to soil modulus is less than or equal to 1.25, assume zeta = 1.0 and skip to T80.

T79) Where native soil is significantly weaker than bedding material, or where predicted deflection approaches 5%, the effect of native soil must be quantified using Leonhardt's Zeta factor. Zeta must be determined for each diameter of pipe and corresponding trench width. Zeta may be estimated graphically or calculated directly. If zeta is estimated graphically, identify the source for tables, figures, etc...(including page numbers and table numbers or figure numbers for each source) which were used to estimate zeta. To calculate zeta directly use the formulas in T79(b), below. The calculations which are done to determine the zeta factors for the different pipe diameters must be included with this submittal.

(a) Sources:

**N/A**

(b) Calculations:

$$zeta = \frac{1.44}{f + (1.44 - f) * (E_b / E_n')}$$

$$f = \frac{b/d_a - 1}{1.154 + 0.444 * (b/d_a - 1)}$$

f = pipe/trench width coefficient

b = trench width

$d_a$ = pipe diameter

$E_b$ = modulus of soil reaction for the bedding material (psi)

$E'_n$ = modulus of soil reaction for the in-situ soil (psi)

T80) For each size of pipe, report zeta factor determined in T78 or T79:

| | | | | | |
|---|---|---|---|---|---|
| Pipe Diameter: | **8"** | Trench Width: | **N/A** | Zeta: | **1.0** |
| Pipe Diameter: | | Trench Width: | | Zeta: | |
| Pipe Diameter: | | Trench Width: | | Zeta: | |
| Pipe Diameter: | | Trench Width: | | Zeta: | |
| Pipe Diameter: | | Trench Width: | | Zeta: | |

T81) Determine pipe stiffness ($P_s$) in psi. $P_s$ can be determined either by parallel plate test at 5% deflection, based on manufacturer's data or national reference standards; or, calculated using either equation 10 or equation 11. As an example, the minimum pipe stiffness at 5% deflection for PVC pipe less than 15 inches in diameter meeting ASTM D 3034, is 46 psi for SDR-35 and 115 psi for SDR 26. If equation 11 is used, the ring stiffness constant (RSC) is provided by the pipe manufacturer. Show calculations, or provide proper references, for each size of pipe and for each flexible pipe material.

$$P_s = \frac{EI}{0.149 * r^3}$$

or

$$P_s = 0.80 * RSC * (8.337/D)$$

E = modulus of elasticity of the pipe material (psi)

I = moment of inertia of the pipe wall cross section per linear inch of pipe, $inch^4$/lineal inch = $inch^3$. For solid wall pipe, I can be calculated with equation 4. If the pipe used is not solid wall pipe (for example a pipe with a ribbed cross section), the proper moment of inertia formula must be obtained from the manufacturer.

D = mean pipe diameter (in)

r = mean radius (in)

**$P_s$ = (400000*0.002808)/(0.149*4.0385$^3$) = 115 psi SDR 26**

**$P_s$ = (400000*0.0106)/(0.149*4.2735$^3$) = 364 psi C-900 DR 18**

T82) Report $P_s$ for each pipe size and each type of flexible pipe material as determined in T81.

| | | |
|---|---|---|
| Pipe Diameter: **8"** | Pipe Material: **PVC SDR 26** | $P_s$: **115 psi** |
| Pipe Diameter: **8"** | Pipe Material: **PVC C-900 DR 18** | $P_s$: **364 psi** |
| Pipe Diameter: | Pipe Material: | $P_s$: |
| Pipe Diameter: | Pipe Material: | $P_s$: |
| Pipe Diameter: | Pipe Material: | $P_s$: |
| Pipe Diameter: | Pipe Material: | $P_s$: |

T83) Because the terms in the denominator of the modified Iowa formula (Equation 13) are added, it is

theoretically possible to have zero pipe stiffness ($P_s$=0) and still predict flexible pipe deflections less than 5%. In order to ensure that the stiffness being provided to the installation has a reasonable contribution from pipe stiffness, and does not rely solely on the stiffness provided by the soil stiffness factor (SSF), the ratio of $P_s$/SSF must be calculated. If $P_s$/SSF < 0.15, T81 and T82 must be repeated such that a higher stiffness pipe is chosen for each portion of the project where $P_s$/SSF < 0.15. The $P_s$/SSF ratio(s) must then be recalculated for the new higher stiffness pipe. This process must be repeated until $P_s$/SSF ≥ 0.15 exists for all proposed pipe sizes and for all types of flexible pipe materials.

$$\frac{P_s}{SSF} = \frac{P_s}{0.061 * zeta * E'_b} \geq 0.15$$

$P_s$ = Pipe stiffness (psi) [from T82]

$E_b$ = modulus of soil reaction for the bedding material (psi) [from T76]

zeta = 1.0, or a value calculated with the method in T79

SSF = soil stiffness factor (0.061*zeta*$E_b$)

**SSF = 0.061*1.0*1000 = 61**

**$P_s$ = 115/61 = 1.89 (SDR 26)**

**$P_s$ = 364/61 = 5.97 (C-900 DR 18)**

T84) Indicate the final values calculated for $P_s$/SSF for each diameter of pipe and for each pipe material:

| | | |
|---|---|---|
| Pipe Diameter: **8"** | Pipe Material: **PVC SDR 26** | $P_s$/SSF: **1.89** |
| Pipe Diameter: **8"** | Pipe Material: **PVC C-900 DR 18** | $P_s$/SSF: **5.97** |
| Pipe Diameter:_____ | Pipe Material:_____ | $P_s$/SSF:_____ |
| Pipe Diameter:_____ | Pipe Material:_____ | $P_s$/SSF:_____ |
| Pipe Diameter:_____ | Pipe Material:_____ | $P_s$/SSF:_____ |
| Pipe Diameter:_____ | Pipe Material:_____ | $P_s$/SSF:_____ |

T85) Do all proposed pipe sizes and flexible pipe materials have a pipe stiffness to soil stiffness factor ratio of greater than or equal to 0.15? **YES**

T86) Calculate and report predicted deflection. Predicted deflection must be calculated for each size of pipe and type of flexible pipe material. For the purposes of this application form, predicted deflection must be calculated using the method outlined below. Show calculations and report calculated maximum deflection for each size of pipe and type of flexible pipe material. Maximum allowable deflection in installed lines is 5%, as determined by the deflection analysis and verified by a mandrel test conforming to T89. Some conservatism should be employed in determining allowable predicted deflections. This conservatism is necessary to allow for variability in the quality of installation.

$$\Delta Y/D(\%) = \frac{K*(L_p + L_l)*100}{(0.149*P_s) + (0.061*zeta*E'?b)}$$

$$L_p = \frac{\gamma_s * H}{144}$$

$\%\Delta Y/D$ = Predicted % vertical deflection under load.

$\Delta Y$ = Change in vertical pipe diameter under load

D = Undeflected mean pipe diameter (in)

K = Bedding angle constant. Assumed to be 0.110 unless otherwise justified.

$\gamma_s$ = Unit weight of soil (pcf). $\gamma_s$ less than 120 pcf must be justified.

H = Depth of burial (ft) from ground surface to crown of pipe.

$L_p$ = Prism load (psi). If prism load is calculated using Marston's load formula, or other formulas less conservative than the one provided above, the load should be multiplied by a deflection lag factor $D_L$ = 1.5 to account for long-term deflection of the pipe as the bedding consolidates.

($P_s$ from T82; *zeta* from T80; and $E_b$ from T76)

**Maximum deflection would occur at maximum depth**

**$L_p$ = 120*18/144 = 15 psi**

**$\%\Delta Y/D$ = (0.110*(15+0)*100)/((0.149*115)+(61)) = 2.11% SDR 26**

**$\%\Delta Y/D$ = (0.110*(15+0)*100)/((0.149*364)+(61)) = 1.43% C-900 DR 18**

★ If the predicted $\%\Delta Y/D$ for any proposed pipe size or material is over 5%, the proposed flexible pipe design cannot be approved by the TCEQ. Appropriate design modifications must be made and the analysis must be repeated until a deflection of less than or equal to 5% is predicted.

★ If a zeta value of 1.0 was assumed as a result of T78, and the predicted deflection for any size or type of pipe is determined to be between 4% and 5%, the deflection analysis must be repeated. Repeat the deflection analysis by performing all the same calculations. The difference will be that instead of using an assumed zeta factor of 1.0, the zeta factor must be calculated as outlined in T79. If the predicted deflection is determined to be above 5% after the deflection analysis is repeated, this

flexible pipe design cannot be approved by the TCEQ. Appropriate design modifications must be made and the analysis must be repeated until a deflection of less than or equal to 5% is predicted.

★ If the predicted deflection, for a particular pipe, using the deflection analysis method detailed above, is less than or equal to 4%, and a zeta factor of 1.0 was assumed as a result of T78, that particular pipe is assumed to comply with the TCEQ's requirements for deflection analysis and can therefore be approved.

★ If the predicted deflection, for a particular pipe, using the deflection analysis method detailed above, is between 4% and 5%, and the zeta factor which was used in the analysis was determined using the method in T79, that particular pipe is assumed to comply with the TCEQ's requirements for deflection analysis and can therefore be approved.

T87) Report the final pipe diameters, types of pipe material proposed for each diameter, type of pipe material, pipe stiffness for each pipe material ($P_s$), zeta factors assumed or calculated for each pipe diameter, modulus of the pipe bedding material ($E_b$) and % deflection predicted for each pipe size and type of pipe material.

| | Type of Pipe Material | $P_s$ (psi) [T82] | Zeta Factor Assumed or Calculated [T80] | $E_b$ (psi) [T76] | % Deflection [T86] |
|---|---|---|---|---|---|
| **Pipe Diameter 1** | PVC SDR 26 | 115 | 1.0 | 1,000 | 2.11 |
| **Pipe Diameter 2** | PVC C-900 DR 18 | 364 | 1.0 | 1,000 | 1.43 |
| **Pipe Diameter 3** | | | | | |
| **Pipe Diameter 4** | | | | | |
| **Pipe Diameter 5** | | | | | |
| **Pipe Diameter 6** | | | | | |

T88) Do all pipes proposed for this project have a maximum predicted deflection of 5.0%? **YES**

## Miscellaneous Requirements

Testing, Inspection, and Certification: 30 TAC Sections 317.2.(a)(1), 317.2.(a)(4)(A)&(B), 317.2(a)(4)(C), 317.2.(c)(5)(H)

T89) All gravity lines utilizing flexible pipe must be tested for deflection by pulling a rigid mandrel through the installed pipe. The test must be conducted at least 30 days after placement and compaction of final backfill. No pipe shall exceed a deflection of 5%. A rigid mandrel shall be used to measure deflection. The test must be performed without mechanical pulling devices. The mandrel's minimum outside diameter is 95% of the pipe inside diameter. The mandrel must have an odd number of runners, totaling nine or more. The barrel section of the mandrel must have a length at least 75% of the pipe inside

diameter. A TV test cannot substitute for the deflection test. Will these requirements be met? **YES**

Location in submittal: Plan sheet **30** Specifications page _____ Item No. **TCEQ Note 16(c)**

T90) A professional engineer registered in the State of Texas must certify that the entire installation passed the required deflection test. This certification may be made in conjunction with the notice of completion required in section 317.1.(e)(1). Will these requirements be met? **YES**

T91) A leakage test is required for all gravity lines. For line that is not horizontally curved, a hydrostatic test and/or a low pressure air test must be performed on all proposed gravity sanitary sewer collection piping. These tests must comply with Section 317.2(a)(4) of the TCEQ's rules. All sections of horizontally curved line must be subjected to a hydrostatic leakage test conforming to the requirements of Section 317.2.(a)(4)(A) of the Design Criteria, with a maximum allowable leakage of 10 gallons/inch diameter/mile/day. Do all leakage tests proposed for this project comply with these leakage test requirements of 317.2(a)(4)? **YES** Which leakage test will be used? **Low pressure air test or exfiltration, at contractor's discretion in accordance with the specifications**

Location in submittal: Plan sheet **30** Specifications page _____ Item No. **TCEQ Note 16**

T92) Manholes must be tested for leakage. If manholes will be tested with a hydrostatic test, answer T93, then skip to T102. If manholes will be tested with a vacuum test, answer T94 through T101 and continue with T102. If project specifications allow either a hydrostatic test and/or a vacuum test, answer T93 through T101 and continue with T102. How will manholes be tested? **Vacuum test or hydrostatic test**

T93) Does the hydrostatic manhole test proposed for the manholes in this project comply with the test requirements detailed in Section 317.2(c)(5)(H) of the TCEQ's rules? **YES**

Location in submittal: Plan sheet _____ Specifications page **NBU Standard Spec Item 506, Page 8-9 (see attachment)** Item No. _____

T94) Each manhole shall be tested immediately after assembly and prior to backfilling. Manholes which have been backfilled shall either be excavated to expose the entire exterior prior to vacuum testing or the manhole shall be tested for leakage by means of a hydrostatic test. Will this requirement be met? **YES**

Location in submittal: Plan sheet _____ Specifications page **NBU Standard Spec Item 506, Page 7-9 (see attachment)** Item No. _____

T95) All lift holes and exterior joints shall be plugged with an approved non-shrink grout. Will this requirement be met? **YES**

Location in submittal: Plan sheet _____ Specifications page **NBU Standard Spec Item 506, Page 7-8 (see attachment)** Item No. _____

T96) No grout shall be placed in horizontal joints before testing. Will this requirement be met? **YES**

Location in submittal: Plan sheet _____ Specifications page **NBU Standard Spec Item 506, Page 8 (see attachment)** Item No. _____

T97) All pipes entering the manhole shall be plugged, taking care to securely brace the plugs from being drawn into the manhole. Will this requirement be met? **YES**

Location in submittal: Plan sheet _____ Specifications page **NBU Standard Spec Item 506, Page 8 (see attachment)** Item No. _____
Item No. _____

T98) Stubouts, manhole boots and pipe plugs shall be secured to prevent movement while the vacuum is drawn. Will this requirement be met? **YES**

Location in submittal: Plan sheet _____ Specifications page **NBU Standard Spec Item 506, Page 8 (see attachment)** Item No. _____
Item No. _____

T99) A minimum 60-inch/lb torque wrench shall be used to tighten the external clamps that secure the test cover to the top of the manhole. Will this requirement be met? **Depends on contractor's means and methods. Plans and specifications require a passing test**

Location in submittal: Plan sheet _____ Specifications page _____ Item No. _____

T100) The test head shall be placed at the inside of the top of the cone section and the seal inflated in accordance with the manufacturer's recommendation. Will this requirement be met? **YES**

Location in submittal: Plan sheet _____ Specifications page **NBU Standard Spec Item 506, Page 8 (see attachment)** Item No. _____

T101) A vacuum of 10 inches of mercury shall be drawn and the vacuum pump shut off. With the valves closed, the time shall be measured for the vacuum to drop to 9 inches of mercury. The manhole shall pass if the time is greater than 2 minutes. If the manhole fails the initial test, necessary repairs shall be made with a non-shrink grout while the vacuum is still being drawn. If the manhole fails a second time, repairs should again be made and the manhole shall be tested by means of a hydrostatic test which complies with Section 317.2(c)(5)(H) of the TCEQ's rules. If any manhole fails the hydrostatic test, after failing the vacuum test twice, the contractor should consider replacing that manhole. If the contractor chooses to attempt to repair that manhole, the manhole must be retested by means of the hydrostatic test outlined in Section 317.2(c)(5)(H) of the TCEQ's rules, until it passes. Will these requirements be satisfied? **YES**

Location in submittal: Plan sheet _____ Specifications page **NBU Standard Spec Item 506, Page 8-9 (see attachment)** Item No. _____

T102) Inspection must be provided during critical phases of construction by a qualified inspector under the direction of a P.E. Critical phases of construction are deemed at a minimum to include testing of pipe and manholes for leakage, and testing of flexible pipe for installed deflection. Do the project plans or specifications define the scope of inspection, and indicate who (owner, design engineer, project manager, etc...) will assume this responsibility? **YES**

Location in submittal: Plan sheet _____ Specifications page **NBU Standard Spec Item 506, Page 9 (see attachment)** Item No. _____

T103) TCEQ approval letters for plans and specifications review contain the requirement that once the project is completed, a P.E. registered in the state of Texas must certify that the construction was performed substantially in accordance with the approved plans and specifications. If flexible pipe was installed, a P.E. must also certify that all pipe was subjected to and passed the required deflection test. Will these requirements be met? **YES**

T104) Indicate who (owner, design engineer, project manager, etc...) will certify the installation:

Name: **Alex Zertuche, PE** Project Relation: **Project Manager**

Location in submittal: Plan sheet **30** Specifications page _____ Item No. **Sewer Note No. 16**

Occupational Safety, Public Health, and Environmental Protection: TAC 30 317.2.(a)(7), 317.13, 317.2.(a)(8) 317.2.(c)(5)(D), 317.2(c)(5)(E), 317.2(c)(F)

T105) The project plans and specifications must ensure that the pipe installation will adhere to the minimum separation distances allowed by 317.13, Appendix E of the TCEQ's rules. Additionally, the project plans or specifications should include language (preferably an exact reproduction of the separation distance wording detailed in Section 317.13 (Appendix E) of the Design Criteria) which ensures that the separation distance between any unknown water lines which are discovered during the installation phase of the project, and, the gravity sanitary sewer pipe which will be installed, will be sufficient to comply with the minimum separation distances allowed by 317.13, Appendix E, of the TCEQ's rules. Will the requirements of 317.13, Appendix E, been met? **YES**

Location in submittal: Plan sheet **30** Specifications page _____ Item No. **TCEQ Note 11**

T106) Briefly describe provisions to control erosion or sedimentation due to runoff during construction of the project. Additional information may be required by the TCEQ on a case by case basis:
**Trench spoil will be placed on the uphill side of the trench to intercept runoff. Silt fences will be used in accordance with the developed SWPPP. Please refer to plan sheets 5-6 of 59 for details on the locations of temporary stormwater controls.**

Location in submittal: Plan sheet **5-6** Specifications page _____ Item No. _____

T107) If the project site does not contain any water wells, springs, surface water sources of potable water, or potable water storage facilities, skip to T108. If the project site does contain any water wells, springs, surface water sources of potable water, or potable water storage facilities, does the design conform to and include any applicable sections of 30 TAC Chapter 290, Rules and Regulations for Public Water Systems?**N/A**

T108) If an air gap is required for the project, is the project designed with a minimum 18 inch air gap between the elevation of all potable water outlets and the maximum water surface elevation of any nearby sewer appurtenances? N/A If no air gap is required for this project, skip to T109.

Occupational Safety: 30 TAC Sections

T109) Are all manhole base sections at least 48 inches in diameter? YES

T110) Are all manhole covers at least 24 inches nominal diameter? YES

T111) For purposes of this application, **the use of manhole steps to access manholes for maintenance purposes will not be approved by the TCEQ!** Please indicate how manholes will be accessed if a manhole is in need of maintenance. **PORTABLE LADDER**

Location in submittal: Plan sheet 30 Specifications page _____ Item No. Sewer Note 10

T112) Personal gas detectors are required for wear by all personnel whose jobs require entering enclosed spaces (such as manholes and lift stations) capable of having accumulations of hydrogen sulfide or other harmful gases. Please indicate who is responsible for ensuring that these detectors are provided to the appropriate personnel. **Selected contractor (VK Knowlton) during construction. NBU shall be responsible after acceptance of the constructed facilities**

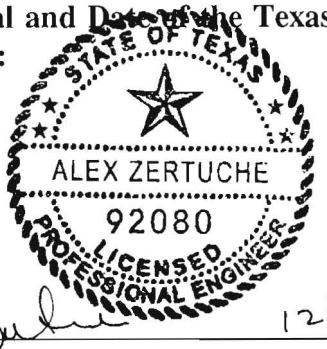
Location in submittal: Plan sheet 30 Specifications page _____ Item No. Sewer Note 29

**T113) If you answered no to any of the items in this application you may need to obtain a variance from those items in accordance with Section 317.1(f) of the TCEQ's rules. Section 317.1(f) of the TCEQ's rules states, "Variance. A variance from the design criteria herein may be granted by the commission if the variance would not result in an unreasonable risk to treatment plant performance, public health or the waters in the state. Requests for variances must be submitted in writing by the design engineer and must, for each affected item, include a detailed engineering justification." List each item to which you answered no below. For each item which had a no answer, provide an engineering justification which addresses the requirements of 317.1(f). The TCEQ review engineer will determine whether or not a variance is needed. If a variance is needed, the TCEQ review engineer will determine whether or not sufficient engineering justification to comply with 317.1(f) has been provided to warrant granting a variance.**

**In order for this document to be valid, the professional engineer responsible for the completion of this application form must certify that all the information provided in this application and in the accompanying set of plans and specifications show full compliance with the requirements of Chapter 317 of the TCEQ's rules, unless a variance from Chapter 317 is being requested, and the professional engineer responsible for this application form provides the needed justification for the variance. Additionally, the professional engineer responsible for completing this application must certify that all portions of the application, which were relevant to the project, were filled out as**

completely as possible, and that all supporting calculations and engineering analyses requested in this application were performed. These calculations shall show that the proposed design complies with Chapter 317. By affixing a Texas registered professional engineer's seal to this document, below, that professional engineer certifies the compliance requirements described in this item (item T113) have been met.

Signature, Seal and Date of the Texas Professional Engineer who is certifying that item T113 has been complied with:




12/16/08

## NEWCOMBE TENNIS RANCH
## TOTAL WASTEWATER FLOWS FOR DEVELOPMENT

| | No. of Units | Design Flow (gpd) | Wastewater Flow | |
|---|---|---|---|---|
| **Residential Connections** | | | | |
| **Unit 1 - (Current SCS Application)** | 74 | 245 | 18,130 | gpd |
| **Unit 2 - Future** | 63 | 245 | 15,435 | gpd |
| **Unit 3 - Future** | 18 | 245 | 4,410 | gpd |
| **Unit 4 - Future** | 54 | 245 | 13,230 | gpd |
| **Subtotal** | 209 | | 51,205 | gpd |
| **Number of Acres** | 196 | | | |
| **Average Dry Weather Flow** | | | 51,205 | |
| **Population Equivalent (based on 70 gal/person/day)** | | | 732 | persons |
| **F**[1] | | | 36 | gpm |
| **Calculated Peak Dry Weather Flow** | | | 285,204 | gpd |
| **Inflow & Infiltration**[2] | | | 147,165 | gpd |
| **Design Peak Wet Weather Flow** | | | 432,369 | gpd |
| **Peaking Factor for Dry Weather** | | | 5.57 | |
| **Peaking Factor for Wet Weather** | | | 8.44 | |

[1]Based on Equation 2.9.3 A.4 in NBU Design Criteria

[2]Using 750 gpd per acre served in accordance with NBU Design Criteria

## WASTEWATER FLOWS BY SEWER LINE

| | No. of Units | Average Daily Flow (gpd) | Peak Dry Weather Flow (gpd) | Peak Wet Weather Flow (gpd) | Minimum Slope (%) | Maximum Line Capacity[1] (gpd) |
|---|---|---|---|---|---|---|
| SSL-A | 209 | 51,205 | 285,204 | 432,369 | 0.48% | 546,523 |
| A SERVICE | 1 | 245 | 1,365 | 2,069 | 2.10% | 1,143,134 |
| SSL-B | 205 | 50,225 | 279,745 | 424,094 | 0.81% | 709,954 |
| SSL-C1 | 78 | 19,110 | 106,440 | 161,362 | 0.33% | 453,153 |
| SSL-C2 | 109 | 26,705 | 148,743 | 225,494 | 0.33% | 453,153 |
| SSL-D | 6 | 1,470 | 8,188 | 12,412 | 2.54% | 1,257,200 |
| SSL-E | 3 | 735 | 4,094 | 6,206 | 0.33% | 453,153 |
| SSL-F | 11 | 2,695 | 15,011 | 22,756 | 0.50% | 557,792 |
| SSL-G | 100 | 24,500 | 136,461 | 206,875 | 0.33% | 453,153 |
| SSL-H1 | 5 | 1,225 | 6,823 | 10,344 | 3.08% | 1,384,405 |
| SSL-H2 | 5 | 1,225 | 6,823 | 10,344 | 0.33% | 453,153 |
| SSL-J | 73 | 17,885 | 99,617 | 151,019 | 0.33% | 453,153 |
| SSL-K1 | 67 | 16,415 | 91,429 | 138,606 | 0.33% | 453,153 |
| SSL-K2 | 6 | 1,470 | 8,188 | 12,412 | 0.98% | 780,909 |

[1] Flowing Full

### CALCULATION OF REQUIRED PIPE SIZE

Determine if pipe at minimum slope is sufficient to convey expected peak wet weather flows. Per NBU design criteria, the pipe shall be the larger size as determined by the following: 1) Peak Dry Weather Flow shall not exceed 65% capacity of the pipe flowing full, or 2) Peak Wet Weather Flow shall not exceed 85% of the capacity of the pipe flowing full.

Capacity of 8" Pipe Flowing Full

$$Q = \frac{1.49}{n} \times A \times R_h^{0.67} \times \sqrt{S}$$

D = 0.67 feet (8 inches)
n = 0.013
$A = \pi D^2/4$
R = D/4 (for pipe flowing full)
S = 0.33% (per plans)

Q (flowing full) = 0.846 cfs
546,523 gallons per day

PDWF as % of Pipe Capacity = 52.19%

PWWF as % of Pipe Capacity = 79.11%

Diameter of 8" is adequate to convey expected flows

ATTACHMENT FOR T18

DIAMOND PLASTICS CORPORATION

# Installation Guide for PVC Sewer Pipe

**(ASTM D3034 & F679)**

## INDEX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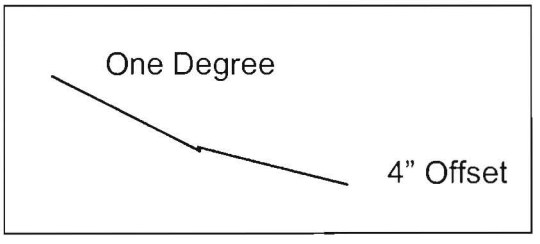
while the spigot end is pushed through the gasket. (refer to Encasements.) Push the spigot end in until the reference mark on the spigot end is flush with the end of the bell. If the spigot is inserted beyond the reference mark, laying length will be lost. Loss of laying length can be significant on projects with long footage. Also, joint flexibility is reduced when the spigot is over-inserted. Over-insertion may lead to excessive stress and joint failure. Joints may be assembled using mechanical equipment provided that the pipe is protected, properly lubed, and aligned. The end of the pipe must be protected from damage, and the joint must not be "over-belled" or inserted beyond the insert reference mark. Use a wood block or sheet of plywood to protect the end of the pipe. A come-a-long may be preferred, but a swinging stab is not recommended. Assembly will require greater effort during cold weather.

**Curvilinear Alignment** (Without Bending The Pipe.)

During construction, it may become necessary to make very slight changes of direction. When this situation is encountered, the clearance between the inside diameter of the socket and the outside diameter of the spigot may be utilized to accomplish curvilinear alignment without bending the pipe. Neither the pipe nor the joint should be axially deflected in any manner to cause stress at the joint. Diamond "Solid-Wall" PVC Sewer Pipe will accommodate a 1° change in direction per joint.



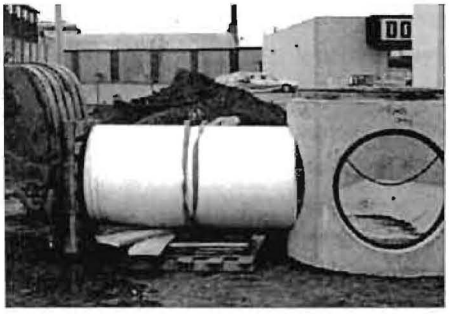

With 20' joints this is a 4" offset, and with 14' joints this is approximately 2 ¾" offset. The minimum radius of curvature for 14' joints is 800 feet, and for 20' joints the minimum curve radii is 1,146 feet. This, minimum radius of curvature, assumes the spigot is not inserted beyond the insert reference mark. Inserting the spigot beyond the insert reference mark reduces allowable joint offset.

**-Field Cutting-**

When an adaptation is needed, a joint of Diamond "Solid-Wall" PVC Sewer pipe is easily cut with a sharp bladed saw. The cut end must be beveled so it will go through a gasketed socket. The insert reference mark may be located by using a factory-marked end of the same pipe size as a guide.

**-Manhole Connections-**

Manhole construction techniques may vary from one region to another. However, the smooth surface of Diamond "Solid-Wall" PVC Sewer Pipe facilitates an easy connection. A watertight system requires a flexible seal or waterstop between the PVC pipe and the manhole structure. With precast or poured in place concrete manholes, use an elastomeric seal, or flexible boot to facilitate a seal as concrete will not



ATTACHMENT FOR 7/6

# TABLE 7.3
# AVERAGE VALUES OF MODULUS OF SOIL REACTION, E'
## (For Initial Flexible Pipe Deflection)

| Soil type-pipe bedding material (Unified Classification System[a]) (1) | E' for Degree of Compaction of Bedding, in pounds per square inch | | | |
|---|---|---|---|---|
| | Dumped (2) | Slight, < 85% Proctor, <40% relative density (3) | Moderate, 85%-95% Proctor, 40%-70% relative density (4) | High, >95% Proctor, >70% relative density (5) |
| Fine-grained Soils (LL>50)[b] Soils with medium to high plasticity, CH, MH, CH-MH | No data available; consult a competent soils engineer; Otherwise use E' = 0 | | | |
| Fine-grained Soils (LL<50) Soils with medium to no plasticity, CL, ML, ML-CL, with less than 25% coarse-grained particles | 50 | 200 | 400 | 1,000 |
| Fine-grained Soils (LL<50) Soils with medium to no plasticity, CL, ML, ML-CL, with more than 25% coarse-grained particles | 100 | 400 | 1,000 | 2,000 |
| Coarse-grained Soils with Fines GM, GC, SM, SC[c] contains more than 12% fines | | | | |
| Coarse-grained Soils with Little or no Fines GW, GP, SW, SP[c] contains less than 12% fines | 200 | 1,000 | 2,000 | 3,000 |
| Crushed Rock | 1,000 | 3,000 | 3,000 | 3,000 |
| Accuracy in Terms of Percentage Deflection[d] | ± 2 | ± 2 | ± 1 | ± 0.5 |

[a]ASTM Designation D 2487, USBR Designation E-3.
[b]LL = Liquid limit.
[c]Or any borderline soil beginning with one of these symbols (i.e. GM-GC, GC-SC).
[d]For ± 1% accuracy and predicted deflection of 3%, actual deflection would be between 2% and 4%

Note: Values applicable only for fills less than 50 ft (15 m). Table does not include any safety factor. For use in predicting initial deflections only, appropriate Deflection Lag Factor must be applied for long-term deflections. If bedding falls on the borderline between two compaction categories, select lower E' value or average the two values. Percentage Proctor based on laboratory maximum dry density from test standards using about 12,500 ft-lb/cu ft (598,000 J/m$^3$) (ASTM D 698, AASHTO T-99, USBR Designation E-11). 1 psi = 6.9 kPa.

SOURCE: "Soil Reaction for Buried Flexible Pipe" by Amster K. Howard, U.S. Bureau of Reclamation, Denver, Colorado. Reprinted with permission from American Society of Civil Engineers.

ATTACHMENT FOR T93 - T102



the foundation. Where the surrounding material can be trimmed to a smooth vertical face, outside forms may be omitted.

Backfilling for manholes shall conform to the density requirements of Special Specification Item No. 510, "Pipe". Manhole construction in roadways may be staged to facilitate base construction. Manholes constructed to interim elevations shall be covered with steel plates of sufficient thickness to support vehicular traffic. Steel plates on wastewater manholes shall be set in mortar to minimize inflow. Manholes shall be completed to finish elevation prior to placement of the roadway's finish surface. The excavation for completion of manhole construction shall be backfilled with cement stabilized sand with 2 sacks of cement per cubic yard up to the bottom of Portland Cement pavement slabs or to within 2 inches of finish elevation of asphaltic concrete pavements. The cement stabilized sand shall be a minimum of 12 inches thick.

After rings and covers are set to grade, the inside and outside of the concrete rings shall be wiped with mortar so placed as to form a durable water-tight joint smooth and even with the manhole cone section. No grouting shall be performed when the atmospheric temperature is at or below 40°F (5°C), and when necessary, because of a sudden drop in temperature, joints shall be protected against freezing for at least 24 hours.

**506.5 Acceptance Testing of Wastewater Manholes:**

Manholes shall be tested separately and independently of the wastewater lines.

A. Test by the Vacuum Method:

A vacuum test shall be performed by the Contractor prior to backfilling those manholes that fall within the right-of-way that require detouring of vehicular traffic. A second vacuum test will not be required after backfilling and compaction is complete unless there is evidence that the manhole has been damaged or disturbed subsequent to the initial vacuum test.

For manhole installations which do not require detouring of vehicular traffic, the vacuum method is recommended and may be used by the Contractor prior to backfilling the manhole to insure proper installation so that defects may be located and repaired; however, a vacuum test shall be performed after backfilling, and compaction are complete. Testing after backfill and compaction are complete will be the basis for acceptance of the manhole.

1. Equipment:

   a) The manhole vacuum tester shall be a device approved for use by the Engineer or designated representative.

   b) Pipe sealing plugs shall have a load resisting capacity equal to or greater than that required for the size of the connected pipe to be sealed.

2. Procedures - applicable to new 4'-0" diameter manholes.

   a) Manhole section interiors shall be carefully inspected; units found to have through-wall lift holes, or any penetration of the interior surface by inserts provided to facilitate handling, will not be accepted. Coating shall be applied after the testing unless coating is applied before installation or unless it is

applied at the factory. All lift holes and exterior joints shall be plugged with an acceptable non-shrink grout. No grout shall be placed in horizontal joints.

b) After cleaning the interior surfaces of the manhole, the Contractor shall place and inflate pneumatic plugs in all of the connecting pipes to isolate the manhole; sealing pressure within the plugs shall be as recommended by the plug manufacturer. Plugs and the ends of pipes connected by flexible boots-shall be blocked to prevent their movement during the vacuum test.

c). The vacuum test head shall be placed on the top of the cone section or, inside of the top of the manhole cone section, and the compression seal band inflated to the pressure recommended by its manufacturer. The vacuum pump shall be connected to the outlet port with the valve open. When a vacuum of 10 inches of mercury [(-5 psig) has been attained, the valve shall be closed and the time noted. Tampering with the test equipment will not be allowed.

d) The manhole shall have passed the test if the vacuum does not drop below 9 inches of mercury [(-4.5 psig) within three (3) minutes of the time the valve was closed. The actual vacuum shall be recorded at the end of the three (3) minutes during which the valve was closed.

e). When the standard vacuum test cannot be performed because of design or material constraints (examples: T-Type manholes, T-Lock Liners, or other reasons acceptable to the Engineer or designated representative), testing of individual joints shall be performed as directed by the Engineer or designated representative.

B. Test by the Exfiltration Method:

At the discretion of the Engineer or designated representative, the Contractor may substitute the Exfiltration Method of testing for the Vacuum test described in Section 506.5. A above. This method may only be used when ground water is not present. If ground water is present a Vacuum Test shall be used unless otherwise directed by the Engineer or designated representative. All backfilling and compaction shall be completed prior to the commencement of testing.

The procedures for the test shall include the following:

1. Manhole section interiors shall be carefully inspected; units found to have through-wall lift holes, or any penetration of the interior surface by inserts provided to facilitate handling, will not be accepted. Coating shall be applied after the testing unless coating is applied before field assembly, or at the factory. All lift holes and exterior joints shall be plugged with an acceptable non-shrink grout. No grout shall be placed in horizontal joints.

2. After cleaning the interior surface of the manhole, the Contractor shall place and inflate pneumatic plugs in all of the connecting pipes to isolate the manhole; sealing pressure within the plugs shall be as recommended by the plug manufacturer.

3. Concrete manholes shall be filled with water or otherwise thoroughly wetted for a period of 24 hours prior to testing.

4. At the start of the test, the manhole shall be filled to the top with water. The test time shall be 1 hour (60 minutes). The Construction Inspector must be present for observation during the entire time of the test. Permissible loss of water in the 1 hour test time is 0.025 gallons per diameter foot, per foot of manhole depth. For a 4 foot diameter manhole, this quantity converts to a maximum permissible drop

in the water level (from the top of the manhole cone) of 0.05 inches per foot of manhole depth or 0.5 inches for a 10 foot deep manhole.

C. Failure to Pass the Test - Records of Tests.

If the manhole fails to pass the initial test method as described in (A) Test by the Vacuum Method and, if allowed, (B) Test by the Exfiltration Method, or if visible groundwater leakage into the manhole is observed, the Contractor shall locate the leak, if necessary by disassembly of the manhole. The Contractor shall check the gaskets and replace them if necessary. The Contractor may re-lubricate the joints and re-assemble the manhole, or the Contractor may install an acceptable exterior joint sealing product on all joints and then retest the manhole. If any manhole fails the vacuum and/or exfiltration test twice, the Contractor shall consider replacing that manhole. If the Contractor chooses to attempt to repair that manhole, the manhole must be retested until it passes. In no case shall cold applied preformed plastic gaskets be used for repair. Records of all manhole testing shall be made available to the Engineer or designated representative at the close of each working day, or as otherwise directed by the Engineer or designated representative. Any damaged or visually defective products, or any products out of acceptable tolerance shall be removed from the site.

D. Inspection.

The Engineer or designated representative shall make a visual inspection of each manhole after it has passed the testing requirements and is considered to be in its final condition. The inspection shall determine the completeness of the manhole; any defects shall be corrected to the satisfaction of Engineer or designated representative.

**506.6 Measurement:**

All junction boxes and manholes of the type indicated shall be measured as units complete in place.

New manholes constructed to interim elevations to facilitate stage construction shall be measured as one unit regardless of the number of interim elevations constructed. All labor, materials and other expenses necessary for the stage construction shall be considered subsidiary to the completed unit. Abandonment of existing manholes shall be considered subsidiary to the completed unit, unless separate Pay Item is indicated on the Drawings and identified in Standard Contract Bid Form.

**506.7 Payment:**

Payment for completed junction boxes and manholes of the type indicated shall be made at the unit bid price for each. The unit bid price shall include all labor, equipment, materials, time and incidentals necessary to complete the work. When indicated in the Drawings, abandonment of existing manholes shall be made at the unit price for abandonment.

**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: **Newcombe Tennis Ranch Subdivision**

## 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.

   X Fuels and hazardous substances will not be stored on-site.

2. X **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. N/A 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. X **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.

   ___ There are no other potential sources of contamination.

## SEQUENCE OF CONSTRUCTION

5. X **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. X 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: **Blieders Creeek, Dry Comal Creek tributary**

## 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. X **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.

X 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.

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

9. X **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. X **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.

X 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. X **ATTACHMENT I - Inspection and Maintenance for BMPs.** A plan for the inspection of temporary BMPs and measures and for their timely maintenance, repairs, 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. X All control measures must be properly selected, installed, and maintained in accordance with the manufacturer's specifications and good engineering practices. If periodic inspections by the applicant or the executive director, or other information indicate a control has been used inappropriately, or incorrectly, the applicant must replace or modify the control for site situations.

14. X 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. N/A 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. X 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. X **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. X 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. X Stabilization practices must be initiated as soon as practicable where construction activities have temporarily or permanently ceased.

## ADMINISTRATIVE INFORMATION

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

21. X 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. X 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:

**Alex Zertuche, P.E.**
Print Name of Customer/Agent

Signature of Customer/Agent

12/18/08
Date

# ATTACHMENT "A "

## Spill Response Actions

There will be no above ground fuel storage tanks allowed on this project. Equipment will be fueled using mobile fuel trucks as needed. There is a small chance of a fuel spill occurring due to leaking construction equipment or re-fueling operations. The spill prevention and control measures described below, and included in Section 1.4.16 of the Edwards Aquifer Technical Guidance Manual (2005), will be followed.

Spill Prevention and Control

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

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

***Education***

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

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

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

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

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

***General Measures***

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

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

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

(4) Train employees in spill prevention and cleanup.

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

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

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

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

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

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

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

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

***Cleanup***

(1) Clean up leaks and spills immediately.

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

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

***Minor Spills***

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

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

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

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

(5) Contain the spread of the spill.

(6) Recover spilled materials.

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

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

Spills should be cleaned up immediately:

(1) Contain spread of the spill.

(2) Notify the project foreman immediately.

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

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

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

***Significant/Hazardous Spills***
For significant or hazardous spills that are in reportable quantities:

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

# ATTACHMENT "B"

## Potential Sources of Contamination

The only potential sources of contamination are construction equipment leaks, re-fueling spills and asphalt lay down operations, potential leaks from port-o-lets, and possible spills of sewage during the connection to the existing manhole "MH-A_1" or replacing the existing sanitary sewer lateral. There are no other anticipated potential sources of contamination.

# ATTACHMENT "C"

## Sequence of Major Activities

Stages of Construction:
The following construction sequence (as it pertains to the SCS) will occur for each unit.

1. Prior to construction, temporary controls to minimize erosion and loss of sediment from the site will be implemented. Please refer to plan sheets 5 & 6 for details and locations of the various BMPs.
2. Clearing and Grubbing – removal of trees, stumps, brush and other debris within the proposed sewage collection system alignment envelope (and proposed street right-of-way) to allow for the construction of the sewer system. The full right of way will be cleared to allow for the movement of construction equipment. Approximate total disturbed area = 13 acres
3. SCS Installation – The proposed sanitary sewer pipes, manholes, and laterals will be installed primarily within the proposed streets. This disturbed area will mirror the cleared area from operation two, above. SSL-A, A Service, and SSL-B are constructed outside the previously cleared street right of way. Approximate additional disturbed area for these lines = 4 acres.
4. The sewer mains and manholes will be tested in accordance with the specifications. No additional area will be disturbed with this operation.

Most infrastructure improvements, including utilities, will be constructed underneath the proposed street pavement, with the exception of lines SSL-A, SSL-B, and A-Service.

The combined disturbed area for the entire subdivision will be approximately 32 acres; however, no more than 10 acres per watershed will be disturbed at one time. As shown in the disturbed area table included in the site plan, the disturbance will be limited by dividing the subdivision's two watersheds (west and east) into construction units and phases.

Residential lots will be sold to individual lot owners, and each lot will be built by the owner's custom home builder. Based on previous experience on similar product (i.e. Rockwall Ranch Subdivision), homes will be constructed on residential lots at various times, throughout many years.

Although it's unknown when each home will be constructed, a schedule of the maximum disturbed area allowed during construction of each unit is described below.

Unit 1-East (Phase 1):
No more than 37 estate lots within the east watershed of Unit 1 will be allowed to be under construction at the same time until all of the Unit 1 streets and channels are completed. Maximum total disturbed area = 9.93 acres.

No construction within Unit 2 and Unit 4 will be allowed.

Unit 1-West:

All of the streets, channels and residential lots located within the west watershed of Unit 1 can be constructed at the same time. Maximum total disturbed area = 3.60 acres.

No construction within Unit 3 is allowed.

Unit 1-East (Phase 2):
Once the Unit 1-East (Phase 1) streets and channels are completed, the remaining 13 estate lots located within the east watershed of Unit 1 can be constructed at the same time as the Phase 1 lots. Maximum total disturbed area = 6.66 acres (assuming no lots are constructed during Phase 1).

Unit 2:
All of the streets and channels, and a minimum of 2 estate lots within Unit 1-East must be completed before all amenity center improvements can be constructed at the same time as all of the remaining 48 estate lots. Maximum total disturbed area = 9.99 acres (combined amenity center and 48 estate lot disturbed area).

No construction within Unit 4 is allowed.

It is anticipated that more than 2 estate lots will be completed prior to beginning construction of the amenity center, which will lessen the amount of area disturbed.

Unit 3:
Once the Unit 1-West streets are completed, all of the Unit 3 streets and channels can be constructed at the same time as all of the Unit 1-West lots and Unit 3 lots less 0.44 acres (equivalent to 6 conventional lots or 8 garden lots). Maximum total disturbed area = 9.96 acres.

Unit 4:
Scenerio 1- *Assuming all Unit 1-East streets and all Unit 2 (amenity center) construction is complete:* All of the Unit 4 streets and no more than 62 estate lots within Unit 1-East and Unit 4 combined can be constructed at the same time. Maximum total disturbed area = 9.90 acres.

Scenerio 2- *Assuming all Unit 1-East street construction complete and all Unit 2 (amenity center) construction in progress.* All of the Unit 4 streets and no more than 35 estate lots within Unit 1-East and Unit 4 combined can be constructed at the same time. Maximum total disturbed area = 9.90 acres.

The subdivision's homeowners association will be responsible for verifying that the maximum disturbed area in the east or west watershed does not exceed 10 acres at any one time. To do this, the homeowners association will track and limit the number of lots being constructed at the same time as other subdivision improvements (streets, amenity center, etc.) to comply with TCEQ requirements.

# Attachment "D"

## Temporary BMPs and Measures

The following sequence will be followed for installing temporary BMPs:

1. Roadway centerline will be roughly cleared for surveying purposes. (No soil disturbance.)
2. Silt fence will be constructed on the downgradient side of proposed sewer alignments prior to beginning clearing and grubbing operations. Typically, this location will also be utilized for the roadway construction. Locations for silt fences can be seen on plan sheets 5 & 6.
3. Silt fencing will be placed around (10-foot radius) the existing water wells prior to beginning any soil disturbing construction.
4. A stabilized construction entrance will be established before clearing and grubbing equipment is delivered to the site. Locations for construction entrance, concrete truck wash out pits, and contractor staging are shown on plan sheet 5.
5. Rock berms will be constructed downstream of proposed channel crossings by the sewer line to intercept potential runoff from the trenched area.

A. With the exception of the proposed subdivision entrances, the upgradient perimeter of the subdivision will remain in its natural vegetative state. As it has always done, this natural vegetation will filter pollutants originating upgradient of the site, preventing pollution of on-site runoff. Stabilized construction entrances will be constructed at each perimeter entrance to filter upgradient pollutants at these locations.

B. Silt fence will be placed on the down gradient side of each proposed improvement to contain pollutants generated from on-site runoff. Rock berms will be constructed at concentrated points of discharge and just downstream of all culvert locations. Stabilized construction entrances and exits will be installed at the entrance to each unit, and the entrance to the tennis amenity facility area to prevent pollutants from leaving the site during construction traffic. Material from excavated utility trenches will be placed upstream of the trench to reduce the potential of sediment transport.

   Soil disturbance will be limited to a minimal distance outside of the proposed pavement, residential footprint and tennis amenity facility improvements. Disturbed areas will be seeded to replace destroyed vegetation. The existing vegetation located downgradient of each proposed improvement will work in conjunction with the silt fence, rock berms and stabilized construction entrances to prevent pollution of water originating on-site and/or flowing off site.

C. The majority of the property's natural vegetation will not be disturbed. This existing natural vegetation, in addition to the silt fences, rock berms and stabilized construction entrances constructed upgradient of each stream and sensitive feature will prevent pollutants from entering them as well as the aquifer. All of the low areas, which collect storm water runoff, will remain in a natural state acting as vegetative filter strips.

D. There is one sensitive feature identified in the Geologic Assessment. This cave feature will be protected during construction by installing silt fence upstream of the feature setback. In order to maintain flow to this sensitive feature, as well as any sensitive features identified in TCEQ inspections or during construction activities, BMP's will be installed as close to the upgradient construction limits as practicable. BMP's will be maintained regularly, as described in Attachment "I", to maintain flow to the feature.

# Attachment "F"

## Structural Practices

Rock berms and silt fence will be used to protect exposed soils and to prevent contamination from leaving the site. The majority of the site will remain in a natural condition with minimal impacts to existing drainage paths; therefore, natural filtration will be allowed to occur. Locations and details of the TBMP structural devices can be seen in plan sheets 5 & 6.

# Attachment "H"

## Temporary Sediment Pond(s) Plans and Calculations

There will not be more than 10-acres of disturbed soil in a common drainage area that will occur at one time. Rock berms will be installed to treat concentrated runoff from large drainage areas, and silt fence will be used for small drainage areas and sheet flow runoff. No sediment ponds will be used on this project due to the minimal disturbance of soil.

# Attachment "I"

## Inspection and Maintenance for BMPs

### Inspection and Maintenance Plan

- The contractor is required to inspect the controls and fences at weekly intervals and after any 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. The contractor shall make himself familiar with Chapter One of the TCEQ's Technical Guidance Manual on complying with the Edwards Aquifer rules (2005 edition) concerning the purpose of and inspection for BMPs. Chapter One contains information for each of the proposed BMPs referenced in the SWPPP plans for this project.
- Temporary Construction Entrance/Exit: The entrance shall 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. All sediment spilled, dropped,

washed or tracked onto public rights-of-way shall be removed immediately by contractor. When necessary, wheels shall be cleaned to remove sediment prior to entrance onto public right-of-way. When washing is required, it shall be done on an area stabilized with crushed stone that drains into an approved sediment trap. All sediment shall be prevented from entering any storm drain, ditch or water course by using approved methods.

- Contractor Staging Area: The staging area shall be kept in an orderly manner and shall be provided with a silt fence on the downgradient side(s). No fuel or hazardous substances shall be stored in the staging area, in accordance with the terms of the WPAP. If a spill of controlled substance occurs, refer to Attachment A of this section. Pick up litter and trash on a daily basis to avoid having trash blow off site. Provide a dumpster, if needed, for trash control and empty regularly.
- Concrete Truck Washout Pit: Inspect the washout pit at weekly intervals, and daily during times of significant concrete work. Make sure that contaminated water is not leaving the site and correct any deficiencies noted. Empty the pit of dried concrete as needed to prevent overflowing of the pit during normal use.
- Silt Fence: Remove sediment when buildup reaches six inches. Replace any torn fabric or install a second line of fencing parallel to the torn section. 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 be provide equal protection, but will not obstruct vehicles. When construction is complete, the sediment shall be disposed of in a manner that will not cause additional siltation. The prior location of the silt fence shall be revegetated. The fence itself shall be disposed of in an approved landfill.
- Rock Berms: For installation in streambeds, additional daily inspections shall be made. Remove sediment and other debris when buildup reaches six inches and dispose of the accumulated silt in an approved manner that will not cause any additional siltation. Repair any loose wire sheathing. The berm shall be reshaped as needed during inspection. The berm shall be replaced when the structure ceases to function as intended due to silt accumulation among the rocks, washout, construction traffic damage, etc. The rock berm shall be left in place until all upstream areas are stabilized and accumulated silt removed.
- TCEQ staff will be allowed full access to the property during construction of the project for inspecting controls and fences and to verify that the accepted plan is being utilized in the field. TCEQ staff has the right to speak with the contractor to verify plan changes and modifications.
- Any changes made to the location or type of controls shown on the accepted plans, due to onsite conditions, shall be documented on the site plan that is part of this Water Pollution Abatement Plan. No other changes shall be made unless approved by the TCEQ and the Design Engineer. Documentation shall clearly show changes made, date, and person responsible and reason change was made.

## Inspection Reports

## Name & Qualification of Inspector: _____

Date of Inspection: _____

Inspectors shall observe the following items on each inspection:

- Disturbed areas that have not been fully stabilized
- Areas used for storage of materials that are exposed to precipitation
- Control measures outlined in the site plan
- Locations where vehicles enter/exit the site

Inspectors shall denote if any corrective actions are required and when the action was completed.

Major Observations:

Corrective Actions Required:

Corrective Actions Performed:

Signature Date

**Owner's Information:**

Owner: Newcombe Development L.L.C.
Contact: Jeremy Fieldsend
Phone #: (830) 625-9105
Address: 325 Mission Valley Road
New Braunfels, Texas 78132

**Owner's Engineer:**

Company: Jacobs Carter Burgess
Contact: Alex Zertuche, P.E.
Phone #: (210) 494-0088
Address: 911 Central Pkwy North, #425
San Antonio, Texas 78232

**Person or Firm Responsible For Erosion/Sedimentation Control Maintenance:**

Company: _____ Phone #: _____
Contact: _____
Address: _____
_____

Signature of Responsible Party: _____

**This portion of the form shall be filled out and signed by the responsible party prior to construction.**

# Attachment "J"

## Schedule of Interim and Permanent Soil Stabilization Practices

There will be minimal disturbed soil due to construction operations that are not covered by pavement or buildings. The majority of the proposed sewage collection system will be located within the proposed roadway and will not receive interim soil stabilization, as the roadway will be constructed over the sewer system once it has been constructed. Sewer lines 'SSL-A', 'SSL-B', and 'A Service' will be built outside the proposed roadway area and will require soil stabilization. This will be done as described for areas behind the curb and will be done as soon as practicable after construction is complete. The area is generally very rocky with a minimal amount of overlying soil. Areas which are disturbed by construction staging and storage areas will be hydro mulched with the appropriate seed mixture as soon as practicable. Areas between the edge of pavement and right-of-way line will also be hydro mulched if a soil layer exists. Areas within islands and the entrance will be landscaped with appropriate plants and mulched. There will be no fill slopes exceeding a 3:1 slope and all fill slopes will be hydro mulched. Installation and acceptable mixtures of hydro mulch are as follows:

Materials:

Hydraulic Matrices: Hydraulic matrices include a mixture of wood fiber and acrylic polymer or other tackifier as binder. Apply as a liquid slurry using a hydraulic application machine (i.e. hydro seeder) at the following minimum rates, or as specified by the manufacturer to achieve complete coverage of the target area: 2,000 to 4,000 lb/acre wood fiber mulch, and 5 to 10% (by weight) of tackifier (acrylic copolymer, guar, psyllium, etc.)

Bonded Fiber Matrix: Bonded fiber matrix (BFM) is a hydraulically applied system of fibers and adhesives that upon drying forms an erosion resistant blanket that promotes vegetation, and prevents soil erosion. BFM's are typically applied at rates from 3,000 lb/acre to 4,000 lb/acre based on the manufacturer's recommendation. A biodegradable BFM is composed of materials that are 100% biodegradable. The binder in the BFM should also be biodegradable and should not dissolve or disperse upon re-wetting. Typically, biodegradable BFM's should not be applied immediately before, during or immediately after rainfall if the soil is saturated. Depending on the product, BFM's typically require 12 to 24 hours to dry and become effective.

Seed Mixtures:

| **Dates** | **Climate** | **Species** | **(lb/ac)** |
|---|---|---|---|
| Sept. 1 to Nov. 30 | Temporary Cool Season | Tall Fescue | 4.0 |
| | | Oats | 21.0 |
| | | Wheat | 30.0 |
| | | **Total** | **55.0** |
| Sept. 1 to Nov. 30 | Cool Season Legume | Hairy Vetch | 8.0 |
| May 1 to Aug. 31 | Temporary Warm Season | Foxtail Millet | 30.0 |

Fertilizer: Fertilizer should be applied at the rate of 40 pounds of nitrogen and 40 pounds of phosphorous per acre, which is equivalent to about 1.0 pounds of nitrogen and phosphorous per 1000 square feet.

Installation:

1. Final grading must be completed and all necessary BMPs should be in place prior to the addition of the hydro mulch mixture.
2. Prior to application, roughen embankment and fill areas by rolling with a crimping or punching type roller or by track walking. Track walking shall only be used where other methods are impractical.
3. To be effective, hydraulic matrices require 24 hours to dry before rainfall occurs.
4. Avoid mulch over spray onto roads, sidewalks, drainage channels, existing vegetation, etc.
5. Hydro mulch mixture shall be as recommended by the County Agriculture Extension Agent or as shown above for the specific time of year and whether or not irrigation will be utilized.
6. Hydro mulch rates shall be as shown above or as recommended by the County Agriculture Extension Agent, and shall be applied in a uniform manner
7. If blankets or matting are used, they shall conform to the Texas Department of Transportation specifications.

Drought:

In areas experiencing droughts where the initiation of stabilization measures by the 14th day after construction activity has temporarily or permanently ceased is precluded by seasonal arid conditions, stabilization measures shall be initiated as soon as practicable.

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

NAME OF PROPOSED REGULATED ENTITY: **Newcombe Tennis Ranch Subdivision Unit 1**
REGULATED ENTITY LOCATION: **Along Mission Valley Road approx. 0.5 miles southwest of the intersection with SH 46 in Comal County**
NAME OF CUSTOMER: **Newcombe Development, LLC**
CONTACT PERSON: **Jeremy Fieldsend** PHONE: **(830) 625-9105**
(Please Print)

Customer Reference Number (if issued): CN **601400542** (nine digits)

Regulated Entity Reference Number (if issued): RN **102747359** (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 | Acres | $ |
| **Sewage Collection System** | **12,484 L.F.** | **$ 6,242.00** |
| 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

12/16/08
Date

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

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

in their information corrected. To review such information, contact us at 512/239-3282.

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

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

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

**Organized Sewage Collection Systems and Modifications**

| PROJECT | COST PER LINEAR FOOT | MINIMUM FEE<br>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<br>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 |

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SAN ANTONIO
REGION

2008 OCT 14 AM 11:07

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# JACOBS

BANK OF AMERICA, N.A.
ATLANTA, GEORGIA
64-1278
611

Number
6175743

13-OCT-2008

PAY
Six Thousand One Hundred Eighty-Two Dollars And 50 Cents

******6,182.50

VOID AFTER 90 DAYS
NOT VALID OVER $20,000.00
UNLESS COUNTERSIGNED

Joseph J. Jacobs

TO THE ORDER OF
TEXAS COMMISSION ON ENVIRONMENTAL
12100 PARK 35 CIRCLE
MC-214
AUSTIN, TX
78753

⑈6175743⑈ ⑆061112788⑆ 329 994 2054⑈

YVONNE O ZERTUCHE
ALEX ZERTUCHE
12900 E LOOP 1604 N APT 116
UNIVERSAL CTY, TX 78148-3171

1524

37-65/1119 1105
6197019075

12-16-08 Date

Pay to the Order of TEXAS COMMISSION ON ENVIRONMENTAL QUALITY $ 59.50

FIFTY-NINE AND 50/00 Dollars

Security Features Details on Back

WELLS FARGO Wells Fargo Bank, N.A. Texas wellsfargo.com

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For NEWCOMBE SCS FEES

MP

⑆111900659⑆ 6197019075⑈ 01524

# Site Geologic Map
# Newcombe Tennis Ranch Subdivision
# 160-Acres South of Mission Valley Road
# Comal County, Texas

A & A File No. 07SA-4105

ARIAS & ASSOCIATES, INC.

Sheet 1 of 2

GRAPHIC SCALE
50 0 25 50 100
1 Inch = 100 Ft.

STATE OF TEXAS
Kevin L. Wooster
Geology
164
LICENSED
PROFESSIONAL GEOSCIENTIST
12/16/08

MISSION VALLEY ROAD

Kbu

Kdr

Kgt

Kep

S-15 MB (WELL)

S-13 CD

S-12B MB (WELL)

S-12A MB (WELL)

S-11 CD

SEWER LINE ENVELOPE

U
D

LEGEND:

- Kbu = Buda Limestone
- Kdr = Del Rio Clay
- Kgt = Georgetown Formation
- Kep = Person Formation
- = Property Boundary
- CD = Closed Depression, dotted line indicates areal extent
- U/D = Fault
- SF = Solution Fracture
- SH = Sinkhole
- MB = Man Made Feature in Bedrock
- = Formation Contact

Site Geologic Map
Newcombe Tennis Ranch
Subdivision
160-Acres South of Mission
Valley Road
Comal County, Texas

A & A File No. 07SA-4105

ARIAS & ASSOCIATES, INC.

Sheet 2 of 2

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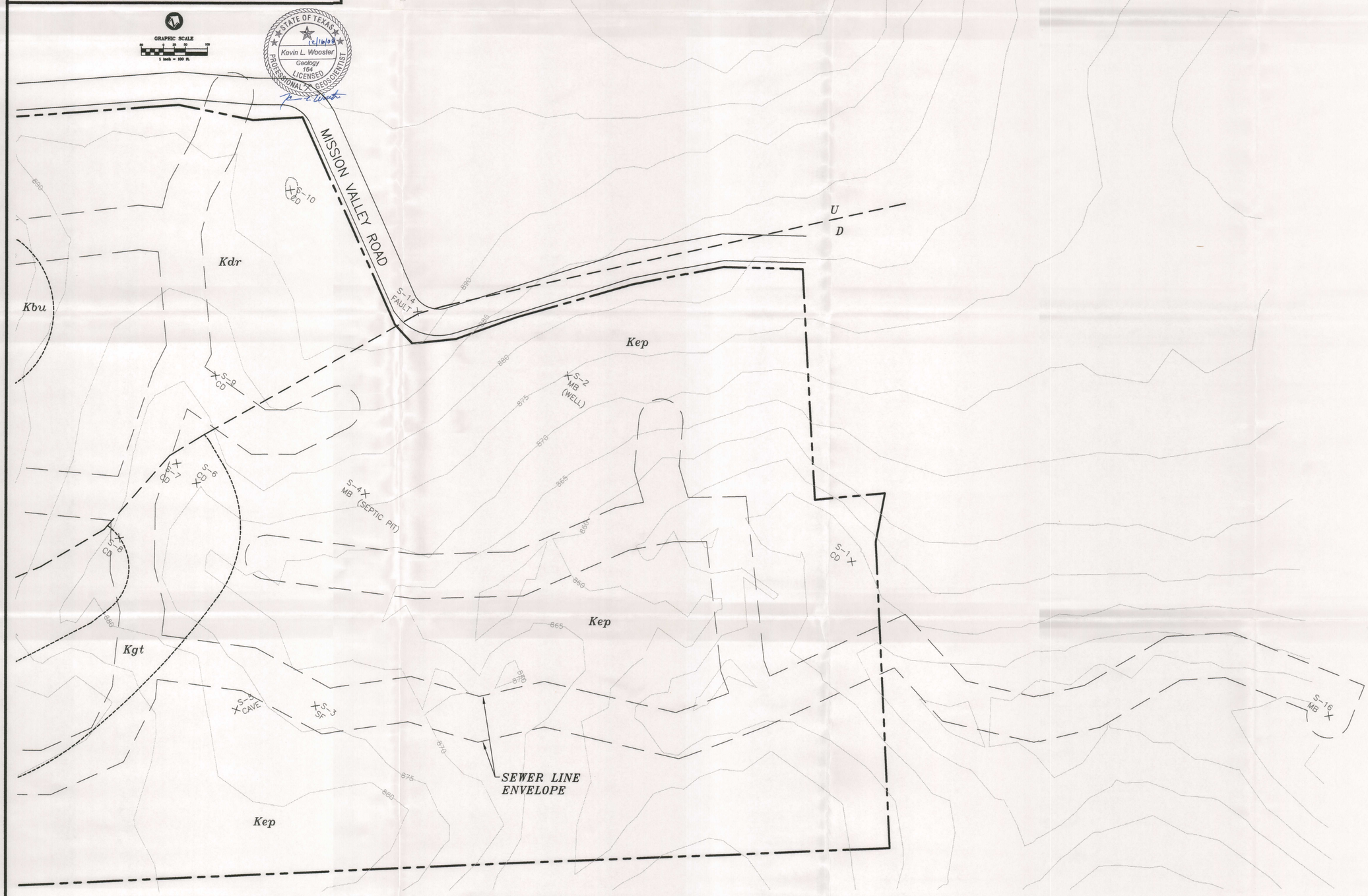


LEGEND:

Kbu = Buda Limestone
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Kep = Person Formation
= Property Boundary
CD = Closed Depression, dotted line indicates areal extent
U/D = Fault
SF = Solution Fracture
SH = Sinkhole
MB = Man Made Feature in Bedrock
= Formation Contact

# NEWCOMBE TENNIS RANCH UNIT 1

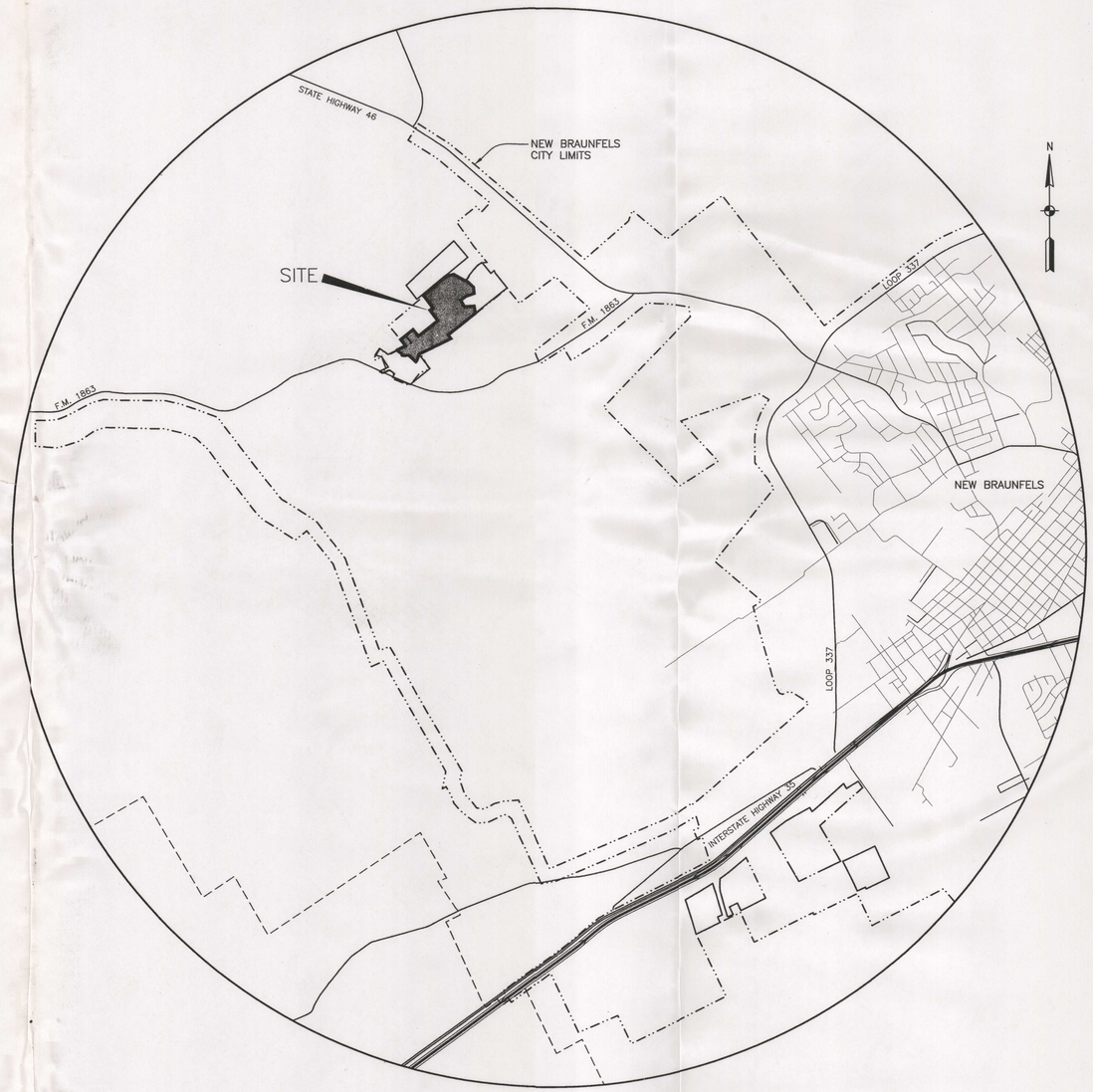
## PLANNED DEVELOPMENT
## NEW BRAUNFELS, TEXAS

RECEIVED TCEQ
SAN ANTONIO
REGION
2008 DEC 17 AM 10: 32

KNOWN ALL MEN BY THESE PRESENTS:

I THE UNDERSIGNED, ALEX ZERTUCHE, A PROFESSIONAL ENGINEER LICENSED IN THE STATE OF TEXAS, HEREBY CERTIFY THAT PROPER ENGINEERING CONSIDERATION HAS BEEN GIVEN TO THESE PLANS AND ALL ENGINEERING ASPECTS ARE IN COMPLIANCE WITH CITY AND STATE REGULATIONS AND LAWS. UNLESS A VARIANCE TO A PARTICULAR REQUIREMENT HAS BEEN GRANTED BY THE CITY AND STATE.

ALEX ZERTUCHE
LICENSED PROFESSIONAL ENGINEER NO. 92080
CARTER & BURGESS INC.
911 CENTRAL PARKWAY N. SUITE 425
SAN ANTONIO, TEXAS 78232.




VICINITY MAP
1" = 1/2 MILE

**Carter :: Burgess**

Consultants in Engineering, Architecture,
Construction Management and Related Services
Carter and Burgess, Inc.

911 Central Parkway North, Suite 425
San Antonio, Texas 78232
(210) 494-0088 Fax (210) 494-4525
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CARTER AND BURGESS PROJECT NO.: 310590.012

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| 4 | ON-SITE DRAINAGE AREA MAP |
| 5 | STORMWATER POLLUTION PREVENTION PLAN |
| 6 | STORWATER POLLUTION PREVENTION PLAN OFFISTE WATER AND SEWER |
| 7 | OVERALL STREET KEY PLAN |
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| 12 | BILLABONG ISLAND START TO END |
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| 26 | DETENTION POND LAYOUT |
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| 35 | SANITARY SEWER PLAN AND PROFILE LINE A STA 24+00 TO END<br>A SERVICE STA 0+00 TO END |
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| 38 | SANITARY SEWER PLAN AND PROFILE LINE C1 STA 0+00 TO 10+00 |
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| 40 | SANITARY SEWER PLAN AND PROFILE LINE C2 STA 0+00 TO END |
| 41 | SANITARY SEWER PLAN AND PROFILE LINE D STA 0+00 TO END |
| 42 | SANITARY SEWER PLAN AND PROFILE LINE E STA 0+00 TO END |
| 43 | SANITARY SEWER PLAN AND PROFILE LINE F STA 0+00 TO END |
| 44 | SANITARY SEWER PLAN AND PROFILE LINE G STA 0+00 TO 11+00 |
| 45 | SANITARY SEWER PLAN AND PROFILE LINE G STA 11+00 TO END |
| 46 | SANITARY SEWER PLAN AND PROFILE LINES H1 & H2 STA 0+00 TO END |
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STATE OF TEXAS
ALEX ZERTUCHE
92080
LICENSED
PROFESSIONAL ENGINEER
12-17-08

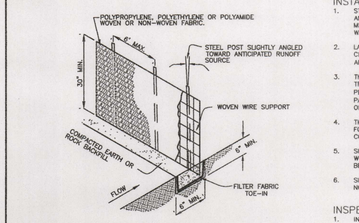
COVER SHEET

NEWCOMBE TENNIS RANCH
SUBDIVISION
UNIT 1
NEW BRAUNFELS, TEXAS

DATE: 5-16-2008
DRAWN BY: M.A.R.
DESIGNED BY: A.Z.
CHECKED BY: A.Z.
REVIEWED BY: A.Z.
PROJECT NUMBER: 310590.012

SHEET 1 OF 59

Drawing Name: P:\310590.012 Newcombe Tennis Ranch\Construction Plans\Unit 1\Construction Plans\310590_Cover.dwg Date: Jun 16, 2008 - 1:49pm User: rodrigueza




MATERIALS:

1. SILT FENCE MATERIAL SHALL 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 PER SQ. IN., ULTRAVIOLET STABILITY EXCEEDING 70%, AND MINIMUM APPARENT OPENING SIZE OF U.S. SIEVE NO. 30.
2. FENCE POSTS SHALL BE MADE OF HOT ROLLED STEEL, AT LEAST 4 FEET LONG WITH TEE OR Y-BAR CROSS SECTION, SURFACE PAINTED OR GALVANIZED, MINIMUM NOMINAL WEIGHT 1.25 LB/FT , AND BRINELL HARDNESS EXCEEDING 140.
3. WOVEN WIRE BACKING TO SUPPORT THE FABRIC SHALL BE GALVANIZED 2" X 4" WELDED WIRE, 12 GAUGE MINIMUM.

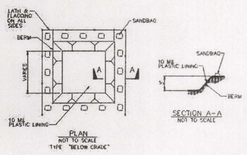
INSTALLATION:

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

INSPECTION AND MAINTENANCE GUIDELINES:

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

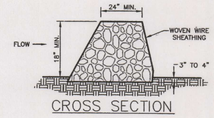
## SILT FENCE
N.T.S.



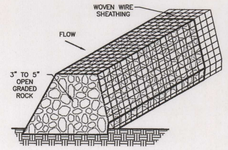

## CONCRETE TRUCK WASHOUT PIT
N.T.S.

GENERAL NOTES:

1. DETAIL ABOVE ILLUSTRATES MINIMUM DIMENSIONS. PIT CAN BE INCREASED IN SIZE DEPENDING ON EXPECTED FREQUENCY OF USE.
2. PLASTIC LINING MATERIAL SHOULD BE A MINIMUM OF 10 MIL IN POLYETHELENE SHEETING AND SHOULD BE FREE OF HOLES, TEARS, OR OTHER DEFECTS THAT COMPRIMISE THE IMPERMEABILITY OF THE MATERIAL.
3. WASHOUT PIT SHALL BE LOCATED IN AN AREA EASILY ACCESSIBLE TO CONSTRUCTION TRAFFIC.
4. WASHOUT PIT SHALL NOT BE LOCATED IN AREAS SUBJECT TO INUNDATION FROM STORM WATER RUNOFF.
5. DO NOT WASHOUT CONCRETE TRUCKS INTO STORM DRAINS, OPEN DITCHES, STREETS, OR STREAMS.




CROSS SECTION




ISOMETRIC PLAN VIEW

MATERIALS:

1. THE BERM STRUCTURE SHOULD BE SECURED WITH A WOVEN WIRE SHEATHING HAVING MAXIMUM OPENING OF 11 INCH AND A MINIMUM WIRE DIAMETER OF 20 GAUGE GALVANIZED AND SHOULD BE SECURED WITH SHOAT RINGS.
2. CLEAN, OPEN GRADED 3 – 5 INCH DIAMETER ROCK SHOULD BE USED, EXCEPT IN AREAS WHERE HIGH VELOCITIES OR LARGE VOLUMES OF FLOW ARE EXPECTED, WHERE 5 – 8 INCH DIAMETERS ROCKS MAY BE USED.

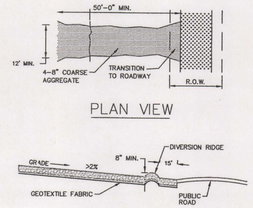
INSTALLATION:

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

INSPECTION AND MAINTENANCE GUIDELINES:

1. INSPECTION SHOULD BE MADE WEEKLY AND AFTER EACH RAINFALL. REPAIR OR REPLACEMENT SHOULD BE MADE PROMPTLY AS NEEDED BY CONTRACTOR.
2. REMOVE SEDIMENT AND OTHER DEBRIS WHEN BUILDUP REACHES 6" AND DISPOSE OF THE ACCUMULATED SILT IN AN APPROVED MANNER THAT WILL NOT CAUSE ANY ADDITIONAL SILTATION.
3. REPAIR ANY LOOSE WIRE SHEATHING.
4. THE BERM SHOULD BE RESHAPED AS NEEDED DURING INSPECTION.
5. THE BERM SHOULD BE REPLACED WHEN STRUCTURE CEASES TO FUNCTION AS INTENDED DUE TO SILT ACCUMULATION AMONG THE ROCKS, WASHOUT, CONSTRUCTION TRAFFIC DAMAGE, ETC.
6. THE ROCK BERM SHOULD BE LEFT IN PLACE UNTIL ALL UPSTREAM AREAS ARE STABILIZED AND ACCUMULATED SILT REMOVED.

## ROCK BERM
N.T.S.




MATERIALS:

1. THE AGGREGATE SHOULD CONSIST OF 4 – 8 INCHES WASHED STONE OVER A STABLE FOUNDATION AS SPECIFIED IN THE PLAN.
2. THE AGGREGATE SHOULD BE PLACED WITH A MINIMUM THICKNESS OF 8 INCHES.
3. THE GEOTEXTILE FABRIC SHOULD BE DESIGNED SPECIFICALLY FOR USE AS A SOIL FILTRATION MEDIA WITH AN APPROXIMATE WEIGHT OF 6 OZ/YD², A MULLEN BURST RATING OF 140 LB/IN², AND AN EQUIVALENT OPENING SIZE GREATER THAN A NUMBER 50 SIEVE.
4. IF A WASHING FACILITY IS REQUIRED, A LEVEL AREA WITH A MINIMUM OF 4 INCH DIAMETER WASHED STONE OR COMMERCIAL RACK SHOULD BE INCLUDED IN THE PLANS. DIVERT WASTEWATER TO A SEDIMENT TRAP OR BASIN.

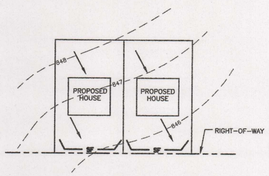
INSTALLATION:

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

INSPECTION AND MAINTENANCE GUIDELINES:

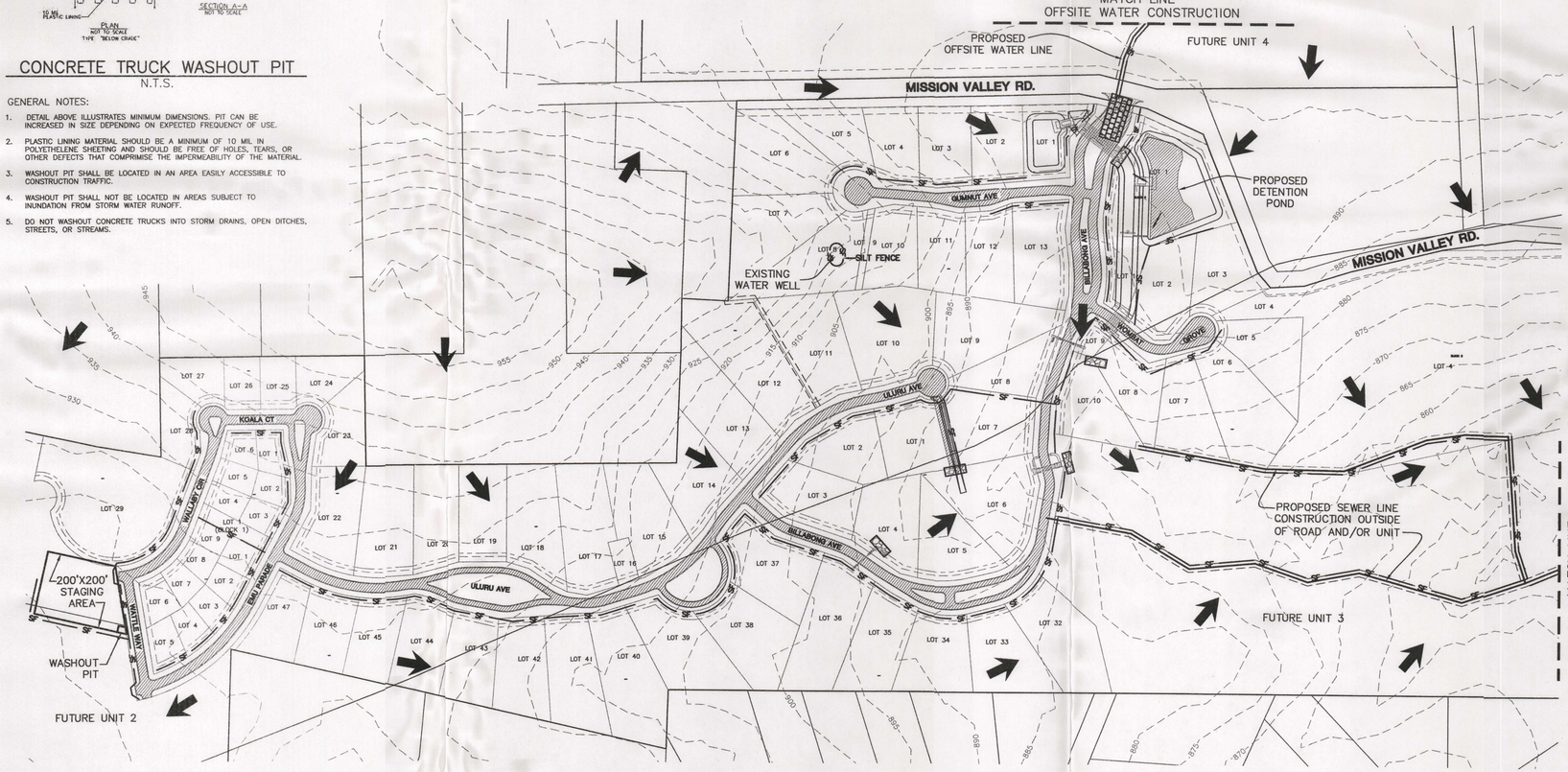
1. THE ENTRANCE SHOULD BE MAINTAINED IN A CONDITION, WHICH WILL PREVENT TRACKING OR FLOWING OF SEDIMENT ONTO PUBLIC RIGHTS-OF-WAY. THIS MAY REQUIRE PERIODIC TOP DRESSING WITH ADDITIONAL STONE AS CONDITIONS DEMAND AND REPAIR AND/OR CLEANOUT OF ANY MEASURES USED TO TRAP SEDIMENT.
2. ALL SEDIMENT SPILLED,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

## STABILIZED CONSTRUCTION ENTRANCE
N.T.S.




## TYPICAL SILT FENCE AT RESIDENTIAL LOT

NOTE:
RESIDENTIAL LOT CONSTRUCTION MUST MEET THE REQUIREMENTS OF THIS WPAP AS WELL AS WITH LOCAL, STATE, AND FEDERAL REGULATIONS. TEMPORARY BMPS MUST BE IN PLACE PRIOR TO ANY RESIDENTIAL LOTS CONSTRUCTION.




**Texas Commission on Environmental Quality**
**Water Pollution Abatement Plan**
**General Construction Notes**

1. Written construction notification must be given to the appropriate TCEQ regional office no later than 48 hours prior to commencement of the regulated activity. Information must include the date on which the regulated activity will commence, the name of the approved plan for the regulated activity, and the name of the prime contractor and the name and telephone number of the contact person.
2. All contractors conducting regulated activities associated with this project must be provided with complete copies of the approved Water Pollution Abatement Plan and the TCEQ letter indicating the specific conditions of its approval. During the course of these regulated activities, the contractors are required to keep on-site copies of the approved plan and approval letter.
3. If any sensitive feature is discovered during construction, all regulated activities near the sensitive feature must be suspended immediately. The appropriate TCEQ regional office must be immediately notified of any sensitive features encountered during construction. The regulated activities near the sensitive feature may not proceed until the TCEQ has reviewed and approved the methods proposed to protect the sensitive feature and the Edwards Aquifer from any potentially adverse impacts to water quality.
4. No temporary aboveground hydrocarbon and hazardous substance storage tank system is installed within 150 feet of a domestic, industrial, irrigation, or public water supply well, or other sensitive feature.
5. Prior to commencement of construction, all temporary erosion and sedimentation (E&S) control measures must be properly selected, installed, and maintained in accordance with the manufacturers specifications and good engineering practices. Controls specified in the temporary storm water section of the approved Edwards Aquifer Protection Plan are required during construction. If inspections indicate a control has been used inappropriately, or incorrectly, the applicant must replace or modify the control for site situations. The controls must remain in place until disturbed areas are revegetated and the areas have become permanently stabilized.
6. If sediment escapes the construction site, off site accumulations of sediment must be removed at a frequency sufficient to minimize offsite impacts to water quality (e.g., fugitive sediment in street being washed into surface streams or sensitive features by the next rain).
7. Sediment must be removed from sediment traps or sedimentation ponds not later than when design capacity has been reduced by 50%. A permanent stake must be provided that can indicate when the sediment occupies 50% of the basin volume.
8. Litter, construction debris, and construction chemicals exposed to stormwater shall be prevented from becoming a pollutant source for stormwater discharges (e.g., screening outfalls, picked up daily).
9. All spoils (excavated material) generated from the project site must be stored on-site with proper E&S controls. For storage or disposal of spoils at another site on the Edwards Aquifer Recharge Zone, the owner of the site must receive approval of a water pollution abatement plan for the placement of fill material or mass grading prior to the placement of spoils at the other site.
10. Stabilization measures shall be initiated as soon as practicable in portions of the site where construction activities have temporarily or permanently ceased, but in no case more than 14 days after the construction activity in that portion of the site has temporarily or permanently ceased. Where the initiation of stabilization measures by the 14th day after construction activity temporary or permanently cease is precluded by weather conditions, stabilization measures shall be initiated as soon as practicable. Where construction activity on a portion of the site is temporarily ceased, and earth disturbing activities will be resumed within 21 days, temporary stabilization measures do not have to be initiated on that portion of site. In areas experiencing droughts where the initiation of stabilization measures by the 14th day after construction activity has temporarily or permanently ceased is precluded by seasonal arid conditions, stabilization measures shall be initiated as soon as practicable.
11. The following records shall be maintained and made available to the TCEQ upon request: the dates when major grading activities occur; the dates when construction activities temporarily or permanently cease on a portion of the site; and the dates when stabilization measures are initiated.
12. The holder of any approved Edward Aquifer protection plan must notify the appropriate regional office in writing and obtain approval from the executive director prior to initiating any of the following:

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

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

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

Austin Regional Office
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Phone(512) 339-2929
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San Antonio, Texas 78233-4480
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Fax (210) 545-4329

LEGEND

- AREAS OF DISTURBANCE
- ROCK BERM
- STABILIZED CONSTRUCTION ENTRANCE
- SF — SF — SILT FENCE
- 850 EXISTING CONTOURS

SCALE: 1" = 200'

| NO. | DATE | REVISION | BY |
|---|---|---|---|
| 1 | 12/15/08 | REVISED PER TCEQ COMMENT LETTER DATED DECEMBER 10, 2008 | JR |


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SAN ANTONIO
ALEX ZERTUCHE
92080
LICENSED
PROFESSIONAL ENGINEER
12/16/08

# STORMWATER POLLUTION PREVENTION PLAN

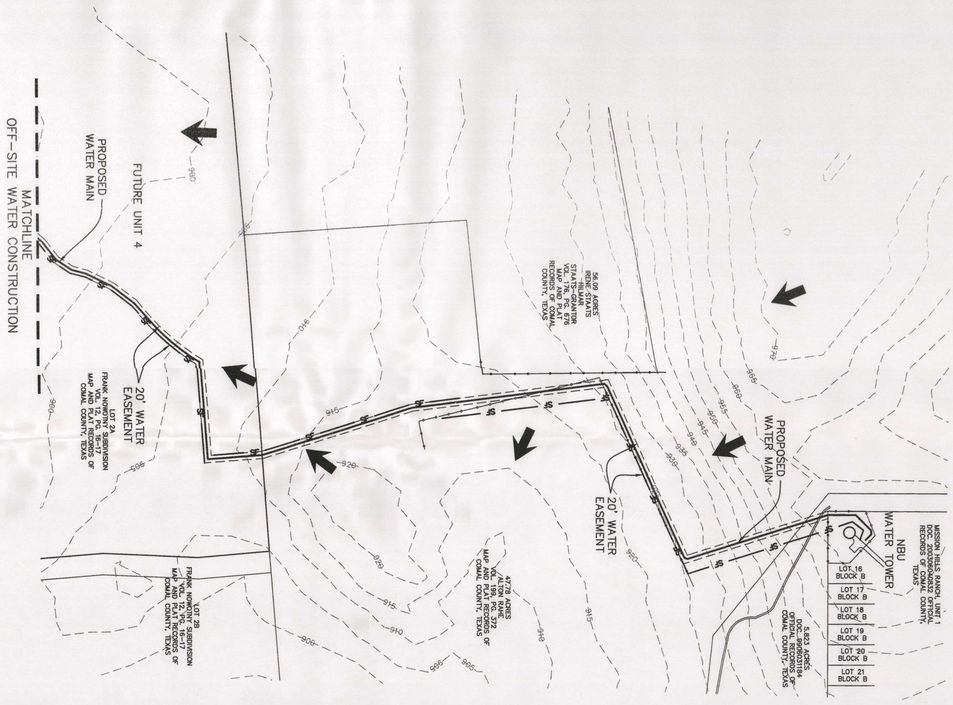
## NEWCOMBE TENNIS RANCH SUBDIVISION UNIT 1

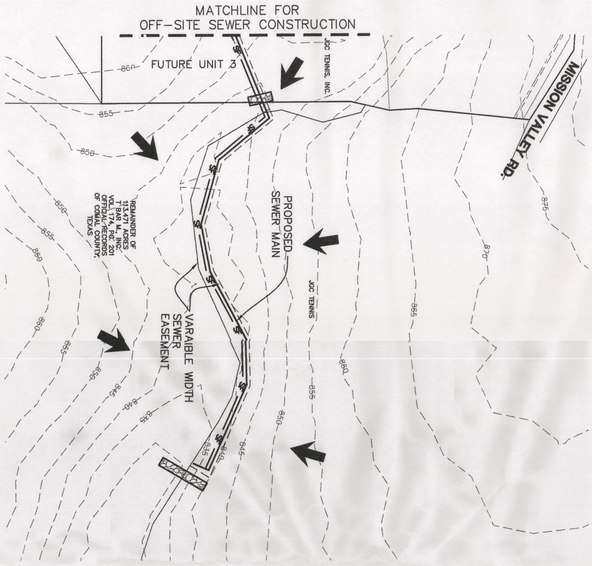
NEW BRAUNFELS, TEXAS

DATE: 5-16-2008
DRAWN BY: J.R.
DESIGNED BY: A.Z.
CHECKED BY: A.Z.
REVIEWED BY: A.Z.
PROJECT NUMBER: 310590.012

SHEET 5 OF 59

Drawing Name: P:\310590.012 Newcombe Tennis Ranch\Construction Plans\Unit 1\Construction Plans\310590-U1-SWPPP.dwg User: rodriguezjk Dec 16, 2008 - 12:06pm




NOTE:
ALL UTILITY TRENCH EXCAVATION SHALL BE PLACED ON UPSTREAM SIDE OF TRENCH.

SCALE: 1" = 200'

LEGEND

- AREAS OF DISTURBANCE
- ROCK BERM
- STABILIZED CONSTRUCTION ENTRANCE
- SF — SILT FENCE
- 850 EXISTING CONTOURS

| NO. | DATE | REVISION | BY |
|---|---|---|---|
| | | | |

SHEET 6 OF 59

| | |
|---|---|
| DATE: | 5-16-2008 |
| DRAWN BY: | J.R. |
| DESIGNED BY: | A.Z. |
| CHECKED BY: | A.Z. |
| REVIEWED BY: | A.Z. |
| PROJECT NUMBER: | 310590.012 |

# NEWCOMBE TENNIS RANCH SUBDIVISION UNIT 1

NEW BRAUNFELS, TEXAS

# STORWATER POLLUTION PREVENTION PLAN OFFISTE WATER & SEWER

STATE OF TEXAS
ALEX ZERTUCHE
92080
LICENSED PROFESSIONAL ENGINEER
6-17-08

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## GENERAL NOTES:

1. ALL MATERIALS AND CONSTRUCTION PROCEDURES WITHIN THE SCOPE OF THE PROJECT SHALL BE APPROVED BY NEW BRAUNFELS UTILITIES AND COMPLY WITH THE CURRENT "NEW BRAUNFELS UTILITIES WATER SYSTEM CONNECTION/CONSTRUCTION POLICIES WATER SYSTEM".

2. CONTRACTOR SHALL NOT PROCEED WITH ANY PIPE INSTALLATION WORK UNTIL THEY OBTAIN A COPY OF THE PLANS FROM THE CONSULTANT OR ENGINEER AND NOTIFY NBU WATER SYSTEMS ENGINEERING AT 830-629-8417 WITH AT LEAST THREE (3) WORKING DAYS (72 HOURS) NOTICE. WORK COMPLETED BY THE CONTRACTOR WHICH HAS NOT RECEIVED A NOTICE TO PROCEED WITH NEW BRAUNFELS UTILITIES WATER SYSTEMS ENGINEERING WILL BE SUBJECT TO REMOVAL AND REPLACEMENT BY AND AT THE EXPENSE OF THE CONTRACTOR.

3. THE DEVELOPER DEDICATES THE WATER / WASTEWATER MAINS UPON COMPLETION BY THE DEVELOPER AND ACCEPTANCE BY THE NEW BRAUNFELS UTILITIES WATER SYSTEM. NBU WILL OWN AND MAINTAIN SAID WATER / WASTEWATER MAINS WHICH ARE LOCATED WITHIN SAID PARTICULAR SUBDIVISION. (AS APPLICABLE).

4. CONTRACTOR AGREES TO ASSUME SOLE AND COMPLETE RESPONSIBILITY FOR JOB SITE CONDITIONS DURING THE CONSTRUCTION OF THE PROJECT, INCLUDING SAFETY OF ALL PERSONS AND PROPERTY. THIS REQUIREMENT SHALL APPLY CONTINUOUSLY AND NOT BE LIMITED TO NORMAL WORKING HOURS. THE CONTRACTOR SHALL DEFEND, INDEMNIFY AND HOLD THE OWNERS AND THE ENGINEER AND HIS EMPLOYEES, PARTNERS OFFICERS, DIRECTORS, OR CONSULTANTS HARMLESS FROM ANY AND ALL LIABILITY, REAL OR ALLEGED, IN CONNECTION WITH THE PERFORMANCE OF THE WORK ON THIS PROJECT, EXCEPTING FROM LIABILITY ARISING FROM SOLE NEGLIGENCE OF THE OWNER OR ENGINEER, ENGINEER'S DIRECTORS, OFFICERS, EMPLOYEES, OR CONSULTANTS.

5. CONTRACTOR AND/OR CONTRACTOR'S INDEPENDENTLY RETAINED EMPLOYEE OR SAFETY CONSULTANT SHALL IMPLEMENT A TRENCH SAFETY PROGRAM IN ACCORDANCE WITH OSHA STANDARDS GOVERNING THE PRESENCE AND ACTIVITIES OF INDIVIDUALS WORKING IN AND AROUND TRENCH EXCAVATION.

6. CONTRACTOR SHALL BE RESPONSIBLE FOR RESTORING TO ITS ORIGINAL OR BETTER CONDITION, ANY DAMAGES DONE TO EXISTING FENCES, CURBS, STREETS, DRIVEWAYS, LANDSCAPING AND STRUCTURES, AND EXISTING UTILITIES (NOT ADJUSTED ON PLANS). COST OF RESTORATIONS, IF ANY, SHALL BE THE CONTRACTOR'S ENTIRE EXPENSE.

7. THE CONTRACTOR SHALL AVOID CUTTING ROOTS LARGER THAN ONE INCH IN DIAMETER WHEN EXCAVATING NEAR EXISTING TREES. EXCAVATION IN VICINITY OF TREES SHALL PROCEED WITH CAUTION.

8. CONTRACTOR SHALL PROCURE ALL PERMITS AND LICENSES, PAY ALL CHARGES, FEES AND TAXES AND GIVE ALL NOTICES NECESSARY AND INCIDENTAL TO THE DUE AND LAWFUL PROSECUTION OF THE WORK.

9. NO EXTRA PAYMENT SHALL BE ALLOWED FOR WORK CALLED FOR ON THE PLANS BUT NOT INCLUDED ON THE BID SCHEDULE. THIS INCIDENTAL WORK WILL BE REQUIRED AND SHALL BE INCLUDED UNDER THE PAY ITEM TO WHICH IT RELATES.

10. CONTRACTOR IS RESPONSIBLE FOR REMOVAL OF ALL WASTE MATERIALS UPON PROJECT COMPLETION. THE CONTRACTOR SHALL NOT PERMANENTLY PLACE ANY WASTE MATERIALS IN THE 100-YEAR FLOOD PLAIN WITHOUT FIRST OBTAINING AN APPROVED FLOOD PLAIN DEVELOPMENT PERMIT.

11. THE CONTRACTOR SHALL NOT PLACE ANY MATERIALS ON THE RECHARGE ZONE OF THE EDWARDS AQUIFER WITHOUT AN APPROVED WATER POLLUTION ABATEMENT PLAN FROM THE TCEQ 31 TAC 313.4 AND 31 TAC 313.9.

12. BARRICADES AND WARNING SIGNS SHALL CONFORM TO THE "TEXAS MANUAL ON UNIFORM TRAFFIC CONTROL DEVICES" AND SHALL BE LOCATED TO PROVIDE MAXIMUM PROTECTION TO THE PUBLIC AS WELL AS CONSTRUCTION PERSONNEL AND EQUIPMENT WHILE PROVIDING CONTINUOUS TRAFFIC FLOW AT ALL TIMES DURING CONSTRUCTION. THE CONTRACTOR IS RESPONSIBLE FOR MAINTAINING ALL DEVICES DURING CONSTRUCTION.

13. CONTRACTOR IS REQUIRED TO VERIFY PROJECT ELEVATIONS. THE TERM "MATCH EXISTING" SHALL BE UNDERSTOOD TO SIGNIFY BOTH HORIZONTAL AND VERTICAL ALIGNMENT.

14. THE LOCATION OF UTILITIES, EITHER UNDERGROUND OR OVERHEAD, SHOWN WITHIN THE RIGHT OF WAY ARE APPROXIMATE AND SHALL BE VERIFIED BY THE CONTRACTOR BEFORE BEGINNING CONSTRUCTION OPERATIONS.

15. OSHA REGULATIONS PROHIBIT OPERATIONS THAT WILL BRING PERSONS OR EQUIPMENT WITHIN 10 FEET OF AN ENERGIZED LINE. WHERE WORKMEN AND/OR EQUIPMENT HAVE TO WORK CLOSE TO AN ENERGIZED ELECTRICAL LINE, THE CONTRACTOR SHALL NOTIFY THE ELECTRICAL POWER COMPANY INVOLVED AND MAKE WHATEVER ADJUSTMENTS NECESSARY TO ENSURE THE SAFETY OF THOSE WORKMEN.

16. IT SHALL BE THE CONTRACTOR'S RESPONSIBILITY TO LOCATE UTILITY SERVICE LINES AS REQUIRED FOR CONSTRUCTION. UTILITY COMPANIES ARE ALSO PREVIOUSLY MENTIONED IN "UTILITY COMPANY NOTIFICATION."

17. DUE TO FEDERAL REGULATIONS TITLE 49, PART 192 (8), GAS COMPANIES MUST MAINTAIN ACCESS TO GAS VALVES AT ALL TIMES. THE CONTRACTOR MUST PROTECT AND WORK AROUND ANY GAS VALVES THAT ARE IN THE PROJECT AREA.

18. THE CONTRACTOR IS FULLY RESPONSIBLE FOR THE TRAFFIC CONTROL AND WILL BE RESPONSIBLE FOR FURNISHING ALL TRAFFIC CONTROL DEVICES, AND FLAGGERS. THE CONSTRUCTION METHOD SHALL BE CONDUCTED TO PROVIDE THE LEAST POSSIBLE INTERFERENCE TO TRAFFIC SO AS TO PERMIT THE CONTINUOUS MOVEMENT OF THE TRAFFIC IN ONE DIRECTION AT ALL TIMES. THE CONTRACTOR SHALL CLEAN UP AND REMOVE FROM THE WORK AREA ANY LOOSE MATERIAL RESULTING FROM CONTRACT OPERATIONS AT THE END OF EACH WORKDAY.

19. PRIOR TO ORDERING MATERIALS TO BE USED IN CONSTRUCTION, CONTRACTOR SHALL PROVIDE THE ENGINEER WITH FOUR (4) COPIES OF THE SOURCE, TYPE, GRADATION, MATERIAL SPECIFICATION DATA AND/OR SHOP DRAWINGS, AS APPLICABLE, TO SATISFY THE REQUIREMENTS OF THE FOLLOWING ITEMS AND ALL MATERIAL ITEMS REFERRED TO IN THESE LISTED ITEMS:

    A. WATER MAINS AND SERVICES
    B. SEWER MAINS AND SERVICES

20. NO METER BOXES TO BE SET IN DRIVEWAYS. ANY METER BOXES SET IN DRIVEWAYS WILL BE RELOCATED AT CONTRACTOR'S AND/OR DEVELOPERS EXPENSE.

21. WHERE THE MINIMUM 9 FOOT SEPARATION DISTANCE BETWEEN SEWER LINES AND WATER LINES/MAINS CANNOT BE MAINTAINED, THE INSTALLATION OF SEWER LINES SHALL BE IN STRICT ACCORDANCE WITH TCEQ.

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

23. UTILITY TRENCH COMPACTION WITH STREET R.O.W.

    A. ALL UTILITY TRENCH COMPACTION TEST WITHIN THE STREET PAVEMENT SECTION SHALL BE THE RESPONSIBILITY OF THE DEVELOPER'S GEOTECHNICAL ENGINEER.

    B. FILL MATERIAL SHALL BE PLACE IN UNIFORM LAYERS NOT TO EXCEED TWELVE INCHES (12") LOOSE.

    C. EACH LAYER OF MATERIAL SHALL BE COMPACTED AS SPECIFIED AND TESTED FOR DENSITY AND MOISTURE IN ACCORDANCE WITH TEST METHODS TEX-113-E, TEX-114-E, TEX-115-E.

    D. THE NUMBER AND LOCATION OF REQUIRED TESTS SHALL BE DETERMINED BY THE GEOTECHNICAL ENGINEER AND APPROVED BY THE CITY OF NEW BRAUNFELS STREET INSPECTOR.

    E. UPON COMPLETION OF TESTING THE GEOTECHNICAL ENGINEER SHALL PROVIDE THE CITY OF NEW BRAUNFELS STREET INSPECTOR WITH ALL TESTING DOCUMENTATION AND A CERTIFICATION STATING THAT THE PLACEMENT OF FILL MATERIAL HAS BEEN COMPLETED IN ACCORDANCE WITH THE PLANS.

24. IN CASE OF DISCREPANCY BETWEEN THESE PLANS AND STANDARD CITY OF NEW BRAUNFELS AND NEW BRAUNFELS UTILITIES SPECIFICATIONS CALLED OUT IN NOTE #1, THE SPECIFICATIONS SHALL TAKE PRECEDENCE.

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## SEWER NOTES:

1. THE CONTRACTOR SHALL MAINTAIN SERVICE TO EXISTING SANITARY SEWERS AT ALL TIMES DURING CONSTRUCTION.

2. DUE TO FEDERAL REGULATIONS TITLE 49, PART 192,181 CENTER POINT ENERGY MUST MAINTAIN ACCESS TO GAS VALVES AT ALL TIMES. THE CONTRACTOR MUST PROTECT AND WORK AROUND GAS VALVES THAT ARE IN THE PROJECT AREAS.

3. ALL 8" GRAVITY SEWER PIPE (MAINS & LATERALS) AND FITTINGS IN THIS PROJECT ARE PVC SDR-26, ASTM D-3034, D-3212, F-477. ALL PRESSURE RATED SEWER PIPE IS PVC AWWA C-900 PIPE, COLORED GREEN.

4. ALL RESIDENTIAL SEWER SERVICE LATERALS SHALL BE EXTENDED TO THE PROPERTY LINE AND CAPPED AND SEALED.

5. INITIAL BACKFILL OF SEWER LINES SHALL BE 3/4" TO DUST OR PEA GRAVEL AS PER NBU SPECIFICATIONS.

6. SECONDARY BACKFILL OF SEWER LINES SHALL GENERALLY CONSIST OF MATERIALS REMOVED FROM THE TRENCH AND SHALL BE FREE FROM BRUSH, DEBRIS AND TRASH, NO ROCKS OR STONES HAVING ANY DIMENSION LARGER THAN 6 INCHES AT THE LARGEST DIMENSION.

7. ALL SEWER PIPES SHALL HAVE COMPRESSION OR MECHANICAL JOINTS AS PER 31 TAC 313.5 (C) (2) (II).

8. FOR SEWER LINES LESS THAN 24" IN DIAMETER, SELECT INITIAL BACKFILL MATERIAL SHALL BE PLACED IN TWO LIFTS.

    A. THE FIRST LIFT SHALL BE SPREAD UNIFORMLY AND SIMULTANEOUSLY ON EACH SIDE AND UNDER THE SHOULDERS OF THE PIPE TO THE MID POINT OR SPRING LINE OF THE PIPE.

    B. THE SECOND LIFT SHALL BE PLACED TO A DEPTH AS SHOWN ON THE PIPE BACKFILL DETAIL FOR PIPES LARGER THAN 24", 12" MAXIMUM LIFTS SHALL BE USED.

9. ALL MANHOLES MUST BE WATER TIGHT, EITHER MONOLITHIC, CAST-IN-PLACE CONCRETE STRUCTURES OR PREFABRICATED MANHOLES SPECIFICALLY APPROVED BY NBU. THE MANHOLES SHALL HAVE WATER TIGHT RINGS AND COVERS. WHEREVER THEY ARE WITHIN THE 100 YEAR FLOODPLAIN, THE MANHOLE COVERS SHALL BE BOLTED. EVERY FOURTH MANHOLE IN SEQUENCE SHALL HAVE AN ALTERNATE MEANS OF VENTING [31 TAC 313.5(C)(1) AND 31 TAC 317.2(C)(5)(F)]. THE USE OF BRICKS TO BRING MANOLE COVERS TO GRADE SHALL NOT BE ALLOWED.

10. ALL MANHOLES SHALL BE CONSTRUCTED SO THAT THE TOP OF THE RING IS ABOVE THE SURROUNDING GROUND, EXCEPT WHEN LOCATED IN PAVED AREAS. IN PAVED AREAS, THE MANHOLE RING SHALL BE FLUSH WITH PAVEMENT.

11. ALL NEW MANHOLES ARE TO HAVE COVERS WITH 32" OPENINGS.

12. SEWER PIPE CONNECTIONS TO PRE-CAST MANHOLES WILL BE COMPRESSION JOINTS OR MECHANICAL "BOOT TYPE" JOINT AS APPROVED BY NBU.

13. SEWER LINES SHALL BE TESTED FROM MANHOLE TO MANHOLE.

14. IN AREAS WHERE A NEW SANITARY SEWER MANHOLE IS TO BE CONSTRUCTED OVER AN EXISTING SANITARY SEWER SYSTEM, IT SHALL BE THE CONTRACTORS RESPONSIBILITY TO TEST THE EXISTING MANHOLES BEFORE CONSTRUCTION. AFTER PROPOSED MANHOLE HAS BEEN BUILT, THE CONTRACTOR SHALL RE-TEST THE EXISTING SYSTEM TO THE SATISFACTION OF THE CONSTRUCTION INSPECTOR. (NO SEPARATE PAY ITEM).

15. WHERE THE MINIMUM 9 FEET SEPARATION DISTANCE BETWEEN SEWER LINES AND WATER LINES/MAINS CANNOT BE MAINTAINED, THE INSTALLATION OF SEWER LINES SHALL BE IN STRICT ACCORDANCE WITH TCEQ. THE WASTEWATER LINE SHALL BE CONSTRUCTED OF CAST IRON, DUCTILE IRON OR PVC MEETING THE ASTM SPECIFICATION FOR BOTH PIPES AND JOINTS OF 150 PSI AND SHALL BE IN ACCORDANCE WITH 30 TAC 290.44(E)(5).

16. AFTER CONSTRUCTION, TESTING WILL BE DONE BY TV CAMERA BY THE CONTRACTOR AND OBSERVED BY THE INSPECTOR OR WATER SYSTEMS ENGINEERING PERSONNEL, AS THE CAMERA IS RUN THROUGH THE LINES (NSPI). ANY ABNORMALITIES FOUND IN THE LINE, SUCH AS BROKEN PIPE OR MISALIGNED JOINTS, MUST BE REPLACED BY THE CONTRACTOR AT HIS EXPENSE. CONTRACTOR TO PROVIDE TV TAPES TO CONSTRUCTION INSPECTION FOR REVIEW PRIOR TO FINAL INSPECTION OF THE PROJECT.

17. WATER JETTING THE BACKFILL WITHIN A STREET WILL NOT BE PERMITTED. SANITARY SEWER TRENCHES SUBJECT TO TRAFFIC SHALL CONFORM TO NBU CONNECTION & CONSTRUCTION POLICY MANUAL.

18. NO TESTING WILL BE PERFORMED PRIOR TO 30 DAYS FROM COMPLETE INSTALLATION OF THE SANITARY SEWER LINES. THE FOLLOWING SEQUENCE WILL BE STRICTLY ADHERED TO:

    A. PULL MANDREL.
    B. PERFORM AIR TEST.

19. WHERE REQUIRED, CONCRETE ENCASEMENT SHALL BE PLACED AS SHOWN ON THE STANDARD DETAIL SHEET.

20. A MINIMUM OF 3 FEET OF COVER IS TO BE MAINTAINED OVER THE SANITARY SEWER MAIN AND LATERALS AT SUBGRADE, OTHERWISE CONCRETE ENCASEMENT WILL BE REQUIRED.

21. SANITARY SEWER MAIN CONNECTIONS MADE DIRECTLY TO EXISTING MANHOLES WILL REQUIRE SUCCESSFUL TESTING OF THE MANHOLE IN ACCORDANCE WITH NBU CONNECTION & CONSTRUCTION POLICY MANUAL.

22. TCEQ AND EPA REQUIRE EROSION AND SEDIMENTATION CONTROL FOR CONSTRUCTION OF SEWER COLLECTION SYSTEMS. CONTRACTOR SHALL PROVIDE EROSION AND SEDIMENTATION CONTROL PER THE PROJECT PLANS. ALL TEMPORARY EROSION AND SEDIMENTATION CONTROLS SHALL BE REMOVED BY THE CONTRACTOR AT FINAL ACCEPTANCE OF THE PROJECT BY NBU WATER SYSTEMS.

23. ALL MANHOLES NOT WITHIN PAVED STREETS SHALL HAVE LOCKING CONCRETE COLLAR TO SECURE RING AND COVER TO MANHOLE CONE PER NBU DETAIL DRAWING #329. (NO SEPARATE PAY ITEM)

24. ALL MANHOLES OVER THE EDWARD'S AQUIFER RECHARGE ZONE SHALL HAVE LOCKING CONCRETE COLLAR TO SECURE RING AND COVER TO MANHOLE CONE PER NBU DETAIL DRAWING #329. (NO SEPARATE PAY ITEM)

25. ALL SEWER SERVICES SHALL HAVE CLEANOUTS INSTALLED AT PROPERTY LINE PER NBU DRAWING #302 AND #303. (NO SEPARATE PAY ITEM)

26. EACH LOT OWNER SHALL BE RESPONSIBLE FOR VERIFYING THE DEPTH OF THE SEWER SERVICE STUB OUT, AND DETERMINING THE MINIMUM SERVICEABLE FINISHED FLOOR ELEVATION. DEPENDING ON THE FINISHED FLOOR ELEVATION, SOME LOTS, IN PARTICULAR LOTS 2-6 & 10-12 OF BLOCK 2, LOT 4 OF BLOCK 4, AND LOTS 32-34 & 36-42 OF BLOCK 7 MAY REQUIRE GRINDER PUMPS TO CONVEY FLOW TO THE EDGE OF THE LOT AND INTO THE GRAVITY SEWER SERVICE LINE.

27. VERTICAL SEWER SERVICE STACKS SHALL BE REQUIRED WHERE THE TOP OF THE SEWER MAIN IS AT A DEPTH OF 8 FEET OR GREATER, UNLESS SHOWN OTHERWISE ON PLANS.

28. PORTIONS OF THIS PROJECT CONTAIN A GEOLOGIC FAULT. CROSSING OF THIS FAULT HAS BEEN MINIMIZED TO THE EXTENT POSSIBLE. WHERE CROSSINGS THROUGH FAULTS OR SUBSIDENCE ZONES ARE UNAVOIDABLE, THE DESIGN MUST ALLOW FOR DEFLECTION DUE TO DIFFERENTIAL SETTLEMENT. MANHOLES SHOULD BE PROVIDED ON EACH SIDE OF SUCH FEATURES TO ALLOW PUMPING IN CASE OF SEWER FAILURES. SERVICE CONNECTIONS WITHIN 50 FEET OF SUCH FEATURES SHOULD BE AVOIDED.

29. IN ACCORDANCE WITH OSHA REGULATIONS, PERSONAL GAS DETECTORS ARE REQUIRED TO BE WORN BY PERSONNEL ENTERING CONFINED SPACES THAT MIGHT CONTAIN HYDROGEN SULFIDE GAS. CONTRACTOR SHALL BE RESPONSIBLE FOR PROVIDING SUCH DEVICES (AS APPLICABLE FOR WORK LOCATION) FOR DURATION OF CONSTRUCTION. UTILITY OWNER SHALL PROVIDE DEVICES TO THEIR PERSONNEL ONCE SYSTEM IS ACCEPTED BY UTILITY.

TCEQ-0596 (Rev. 10/01/04)

**Texas Commission on Environmental Quality**
**Organized Sewage Collection System**
**General Construction Notes**

1. This Organized Sewage Collection System must be designed and constructed in accordance with the Texas Commission on Environmental Quality's (TCEQ) Edwards Aquifer Rules 30 Texas Administrative Code (TAC) §213.5(c), the Design Criteria for Sewerage Systems 30 TAC §317.1, 30 TAC §317.2, 30 TAC §317.3, and 30 TAC §317.13, and the City of San Antonio Standard Specifications.

2. All contractors conducting regulated activities associated with this proposed regulated project must be provided with copies of the Sewage Collection System plan and the TCEQ letter indicating the specific conditions of its approval. During the course of these regulated activities, the contractors must be required to keep on-site copies of the plan and the approval letter.

3. Prior to commencing any regulated activity, the applicant or his agent must notify the San Antonio Regional Office, in writing, of the date on which the regulated activity will begin.

4. Any modification to the activities described in the referenced SCS application following the date of approval may require the submittal of an SCS application to modify this approval, including the payment of appropriate fees and all information necessary for its review and approval.

5. The temporary erosion and sedimentation controls must be installed prior to initiating any other construction activity and maintained in accordance with the requirements of the construction plans. All temporary erosion and sedimentation controls must be removed when the construction area is stabilized.

6. The sewer line trench details showing the cross section with the dimensions, pipe placement, and backfill instructions are included on Plan Sheet 49 of 59 of these plans. All sewer pipes joints must meet the requirements in 30 TAC §317.2(a)(3).

   Gravity lines must be SDR 26 or less. Pressurized sewer systems must have pipe with a minimum working pressure rating of 150 psi and must be colored green.

   The ASTM, ANSI, or AWWA specification numbers for the pipe(s) and joints are ASTM 3034, ASTM 3212, AWWA C-900.

   The pipe material, the pressure classes, and the SDR and/or DR designations are PVC SDR 26 (gravity) and dr-18 (pressure).

7. If any sensitive features are discovered during the wastewater line trenching activities, all regulated activities near the sensitive feature must be suspended immediately. The owner must notify the appropriate regional office of the Texas Commission on Environmental Quality in writing within two working days of the feature discovered. The applicant must submit a plan for ensuring the structural integrity of the sewer line or for modifying the proposed collection system alignment around the feature. The regulated activities near the sensitive feature may not proceed until the executive director has reviewed and approved the methods proposed to protect the sensitive feature and the Edwards Aquifer from any potentially adverse impacts to water quality while maintaining the structural integrity of the line.

8. Sewer lines located within or crossing the 5-year floodplain of a drainageway will be protected from inundation and stream velocities which could cause erosion and scouring of backfill. The trench must be capped with concrete to prevent scouring of backfill, or the sewer lines must be encased in concrete. All concrete shall have a minimum thickness of six (6) inches.

9. Blasting procedures for protection of existing sewer lines and other utilities will be in accordance with the National Fire Protection Association criteria. Sand is not allowed as bedding or backfill in trenches that have been blasted. If any existing sewer lines are damaged, the lines must be repaired and retested.

10. All manholes constructed or rehabilitated on this project must have watertight size on size resilient connectors allowing for differential settlement. If manholes are constructed within the 100-year floodplain, the cover must have a gasket and be bolted to the ring. Where gasketed manhole covers are required for more than three manholes in sequence or for more than 1500 feet, alternate means of venting will be provided. Bricks are not an acceptable construction material for any portion of the manhole.

    The diameter of the manholes must be a minimum of four feet and the manhole covers must have a minimum nominal diameter of two feet. These dimensions and other details showing compliance with the commission's rules concerning manholes and sewer line/manhole inverts described in 30 TAC 317.2(c)(5)(E) are included on Plan Sheet 49 of 59.

    It is suggested that entrance into manholes in excess of four feet deep be accomplished by means of a portable ladder. Where steps are used, they shall be made of a non-corrosive material and be in accordance with applicable OSHA specifications.

11. Where water lines and new sewer line are installed with a separation distance closer than nine feet (i.e., water lines crossing wastewater lines, water lines paralleling wastewater lines, or water lines next to manholes) the installation must meet the requirements of 30 TAC §317.13 (Design of Sewerage Systems) or 30 TAC §290.44(e) (Water Distribution).

12. Where sewers lines deviate from straight alignment and uniform grade all curvature of sewer pipe must be achieved by the following procedure which is recommended by the pipe manufacturer: Not permitted on this project

    If pipe flexure is proposed, the following method of preventing deflection of the joint must be used: Not permitted on this project.

    Specific care must be taken to ensure that the joint is placed in the center of the trench and properly bedded in accordance with 30 TAC §317.2(a)(5).

13. New sewage collection system lines must be constructed with "stub outs" for the connection of anticipated extensions. The location of such "stub outs" must be marked on the ground such that the location of such "stub outs" can be easily determined at the time of connection of the extensions. Such "stub outs" must be manufactured wyes or tees that are compatible in size and material with both the sewer line and the extension. At the time of original construction, new "stub-outs" must be constructed sufficiently to extend beyond the edge(s) of any street pavement under which they will pass to the property line. All "stub-outs" must be sealed with a manufactured cap to prevent leakage. Extensions that were not anticipated at the time of original construction or that are to be connected to an existing sewer line not furnished with "stub outs" must be connected using a manufactured saddle and in accordance with accepted plumbing techniques.

    If no stub-out is present an alternate method of joining laterals is shown in the detail on Plan Sheet 49 of 59. (For potential future laterals).

    The private service lateral stub-outs must be installed as shown on the plan and profile sheets on Plan Sheet 33-48 of 59 and marked after backfilling as shown in the detail on Plan Sheet 49 of 59.

14. Trenching, bedding and backfill must conform with 30 TAC §317.2(a)(5). The bedding and backfill for flexible pipe must comply with the standards of ASTM D-2321, Classes IA, IB, II or III. Rigid pipe bedding must comply with the requirements of ASTM C 12 (ANSI A 106.2) classes A, B or C.

15. Sewer lines must be tested from manhole to manhole. When a new sewer line is connected to an existing stub or clean-out, it must be tested from existing manhole to new manhole. If a stub or clean-out is used at the end of the proposed sewer line, no private service attachments may be connected between the last manhole and the cleanout unless it can be certified as conforming with the provisions of 30 TAC §213.5(c)(3)(E).

16. All sewer lines must be tested in accordance with 30 TAC §317.2(a)(4). The engineer must retain copies of all test results which must be made available to the executive director upon request. The engineer must certify in writing that all wastewater lines have passed all required testing to the appropriate regional office within 30 days of test completion and prior to use of the new collection system. Testing method will be:

    (A) Infiltration or Exfiltration Tests. The total exfiltration as determined by a hydrostatic head test, must not exceed 50 gallons per inch diameter per mile of pipe per 24 hours at a minimum test head of two feet above the crown of the pipe at the upstream manhole. When pipes are installed below the groundwater level an infiltration test must be used in lieu of the exfiltration test. The total infiltration, as determined by a hydrostatic head test, must not exceed 50 gallons per inch diameter per mile of pipe per 24 hours at a minimum test head of two feet above the crown of the pipe at the upstream manhole, or at least two feet above existing groundwater level, whichever is greater. For construction within the 25 year flood plain, the infiltration or exfiltration must not exceed 10 gallons per inch diameter per mile of pipe per 24 hours at the same minimum test head. If the quantity of infiltration or exfiltration exceeds the maximum quantity specified, remedial action must be undertaken in order to reduce the infiltration or exfiltration to an amount within the limits specified.

    (B) Low Pressure Air Test. The procedure for the low pressure air test must conform to the procedures described in ASTM C-828, ASTM C-924, ASTM F-1417 or other appropriate procedures, except for testing times. The test times must be as outlined in this section. For sections of pipe less than 36-inch average inside diameter, the following procedure must apply unless the pipe is to be joint tested. The pipe must be pressurized to 3.5 psi greater than the pressure exerted by groundwater above the pipe. Once the pressure is stabilized, the minimum time allowable for the pressure to drop from 3.5 pounds per square inch gauge to 2.5 pounds per square inch gauge must be computed from the following equation:

    where:

    T = time for pressure to drop 1.0 pound per square inch gauge in seconds
    K = 0.000419 X D X L, but not less than 1.0
    D = average inside pipe diameter in inches
    L = length of line of same size being tested, in feet
    Q = rate of loss, 0.0015 cubic feet per minute per square foot internal surface will be used.

    Since a K value of less than 1.0 will not be used, there are minimum times for each pipe diameter as outlined below:

| Pipe Diameter (inches) | Minimum Time (seconds) | Length for Minimum (feet) | Time for Longer Length (seconds) |
|---|---|---|---|
| 6 | 340 | 398 | 0.855(L) |
| 8 | 454 | 298 | 1.520(L) |
| 10 | 567 | 239 | 2.374(L) |
| 12 | 680 | 199 | 3.419(L) |
| 15 | 850 | 159 | 5.342(L) |
| 18 | 1020 | 133 | 7.693(L) |
| 21 | 1190 | 114 | 10.471(L) |
| 24 | 1360 | 100 | 13.676(L) |
| 27 | 1530 | 88 | 17.309(L) |
| 30 | 1700 | 80 | 21.369(L) |
| 33 | 1870 | 72 | 25.856(L) |

    The test may be stopped if no pressure loss has occurred during the first 25% of the calculated testing time. If any pressure loss or leakage has occurred during the first 25% of the testing period, then the test must continue for the entire test duration as outlined above or until failure. Lines with a 27-inch average inside diameter and larger may be air tested at each joint. Pipe greater than 36 inch diameter must be tested for leakage at each joint. If the joint test is used, a visual inspection of the joint must be performed immediately after testing. The pipe is to be pressurized to 3.5 psi greater than the pressure exerted by groundwater above the pipe. Once the pressure has stabilized, the minimum time allowable for the pressure to drop from 3.5 pounds per square inch gauge to 2.5 pounds per square inch gauge must be 10 seconds.

    (C) Deflection Testing. Deflection tests must be performed on all flexible pipes. For pipelines with inside diameters less than 27 inches, a rigid mandrel must be used to measure deflection. For pipelines with an inside diameter of 27 inches and greater, a method approved by the executive director must be used to test for vertical deflections. Other methods must provide a precision of ± two tenths of one percent (0.2 %) deflection. The test must be conducted after the final backfill has been in place at least 30 days. No pipe will exceed a deflection of five percent. If a pipe should fail to pass the deflection test, the problem must be corrected and a second test must be conducted after the final backfill has been in place an additional 30 days. The tests must be performed without mechanical pulling devices. The design engineer should recognize that this is a maximum deflection criterion for all pipes and a deflection test less than five percent may be more appropriate for specific types and sizes of pipe. Upon completion of construction, the design engineer or other Texas Licensed Professional Engineer appointed by the owner must certify, to the Executive Director, that the entire installation has passed the deflection test. This certification may be made in conjunction with the notice of completion required in §317.(6)(1) of this title (relating to General Provisions). This certification must be provided for the Commission to consider the requirements of the approval to have been met.

    (i) The rigid mandrel shall have an outside diameter (O.D.) equal to 95% of the inside diameter (I.D.) of the pipe. The inside diameter of the pipe, for the purpose of determining the outside diameter of the mandrel, shall be the average outside diameter minus two minimum wall thicknesses for O.D. controlled pipe and the average inside diameter for I.D. controlled pipe, all dimensions shall be per appropriate standard. Statistical or other "tolerance packages" shall not be considered in mandrel sizing.

    (ii) The rigid mandrel shall be constructed of a metal or a rigid plastic material that can withstand 200 psi without being deformed. The mandrel shall have nine or more "runners" or "legs" as long as the total number of legs is an odd number. The barrel section of the mandrel shall have a length of at least 75% of the inside diameter of the pipe. A proving ring shall be provided and used for each size mandrel in use.

    (iii) Adjustable or flexible mandrels are prohibited. A television inspection is not a substitute for the deflection test. A deflectometer may be approved for use on a case by case basis. Mandrels with removable legs or runners may be accepted on a case by case basis.

17. All manholes must be tested to meet or exceed the requirements of 30 TAC §317.2(c)(5)(H).

18. All private service laterals must be inspected and certified in accordance with 30 TAC §213.5(c)(3)(I). After installation of and, prior to covering and connecting a private service lateral to an existing organized sewage collection system, a Texas Licensed Professional Engineer, Texas Registered Sanitarian, or appropriate city inspector must visually inspect the private service lateral and the connection to the sewage collection system, and certify that it is constructed in conformity with the applicable provisions of this section. The owner of the collection system must maintain such certifications for five years and forward copies to the appropriate regional office upon request. Connections may only be made to an approved sewage collection system.

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

**GAS LOCATOR**

CALL CENTERPOINT ENERGY AT 1-800-427-7142, 48 HOURS BEFORE BEGINNING ANY EXCAVATION. DUE TO FEDERAL REGULATIONS TITLE 49, PART 192.181, CENTERPOINT MUST MAINTAIN ACCESS TO GAS VALVES AT ALL TIMES. THE CONTRACTOR MUST PROTECT AND WORK AROUND ANY GAS VALVES THAT ARE IN THE PROJECT AREA.

**TELEPHONE LOCATOR**

NOTE: "THE EXISTENCE AND LOCATION OF UNDERGROUND CABLE INDICATED ON THE PLANS ARE TAKEN FROM THE BEST RECORDS AVAILABLE AND ARE NOT GUARANTEED TO BE ACCURATE. CONTRACTOR TO CONTACT THE TELEPHONE COMPANY CABLE LOCATOR 48 HOURS PRIOR TO EXCAVATION AT 1-800-828-5127. CONTRACTOR HAS THE RESPONSIBILITY TO PROTECT AND SUPPORT TELEPHONE COMPANY PLANT DURING CONSTRUCTION."

**TRENCH EXCAVATION SAFETY PROTECTION**

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

NOTES:

1. ALL EXCAVATED MATERIAL SHALL BE PLACED ON THE UPHILL SIDE OF THE SEWER TRENCH ALLOWING THE TRENCH TO INTERCEPT ANY SILT CONTAMINATED RUNOFF.

2. ALL LATERALS SHALL HAVE A 2.0% MINIMUM SLOPE.

3. SANITARY SEWER PIPE TO BE: – PVC ASTM TYPE PSM, D3034 SDR 26 AND AWWA C–900 (SDR 18).

CENTERPOINT ENERGY LOCATOR:
CALL LOCATOR AT 811 OR (800) 227–6477, 48 HOURS BEFORE BEGINNING ANY EXCAVATION.
DUE TO FEDERAL REGULATIONS TITLE 49, PART 192.181, CENTERPOINT ENERGY MUST MAINTAIN ACCESS TO GAS VALVES AT ALL TIMES. THE CONTRACTOR MUST PROTECT AND WORK AROUND ANY GAS VALVES THAT ARE IN THE PROJECT LIMITS.
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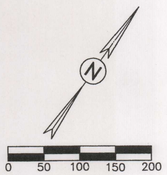
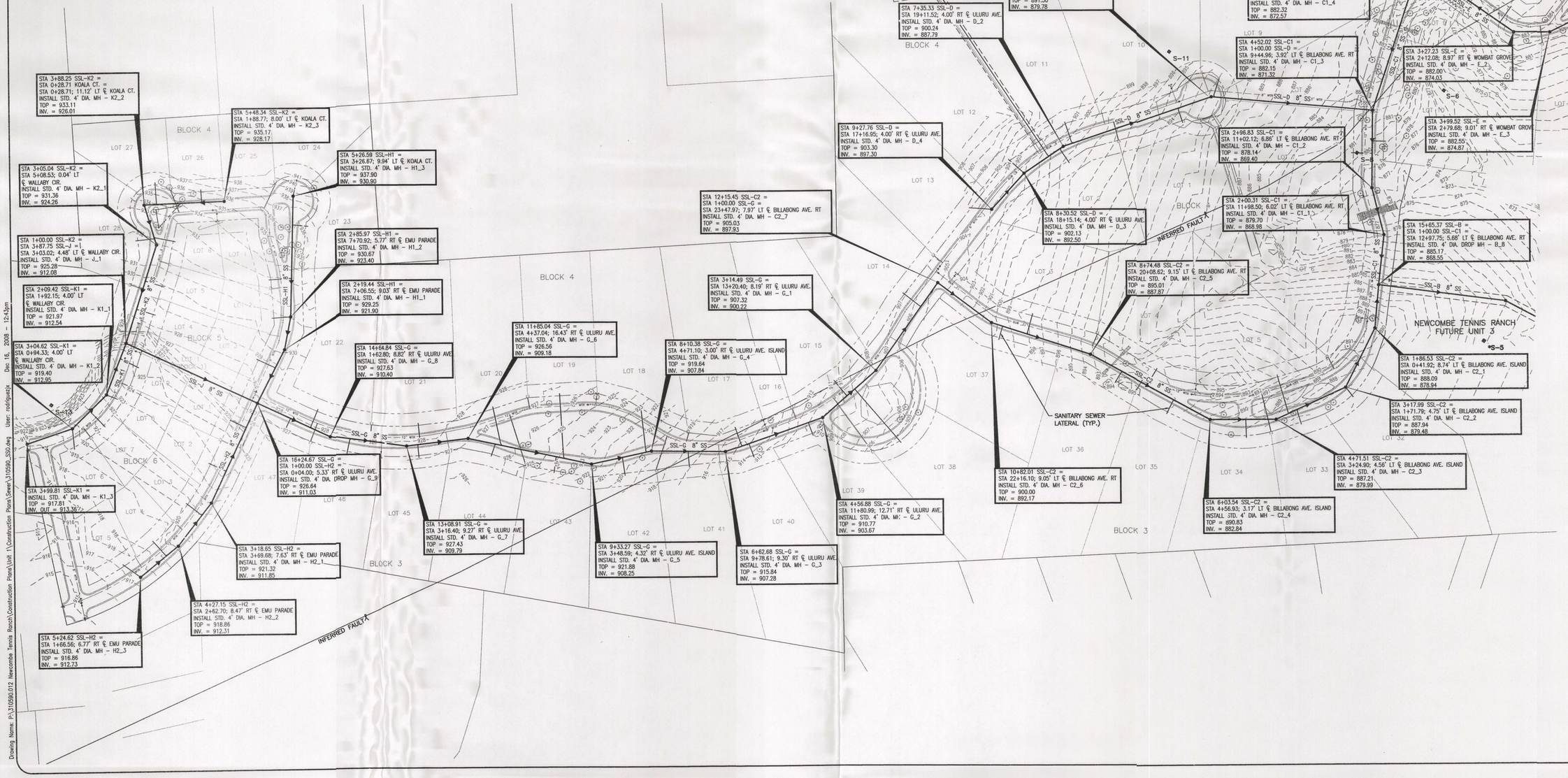



## LEGEND

| EXISTING | PROPOSED | |
|---|---|---|
| –8"W– | –8"W– | WATER MAIN |
| –8"SS– | | SANITARY SEWER |
| | | FIRE HYDRANT |
| | | WATER VALVE |
| | | WATER METER |
| | | SANITARY SEWER MH |
| | | SANITARY SEWER LATERAL |
| | | EXISTING TREE |
| ◆S–6 | | GEOLOGIC FEATURE |





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San Antonio, Texas 78232
(210) 494-0388 Fax: (210) 494-0325

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| NO. | DATE | REVISION | BY |
|---|---|---|---|
| 1 | 12/15/08 | REVISED PER TCEQ COMMENT LETTER DATED DECEMBER 10, 2008 | JR |

STATE OF TEXAS
ALEX ZERTUCHE
92080
LICENSED PROFESSIONAL ENGINEER
12-16-08

# SANITARY SEWER OVERALL PLAN WEST

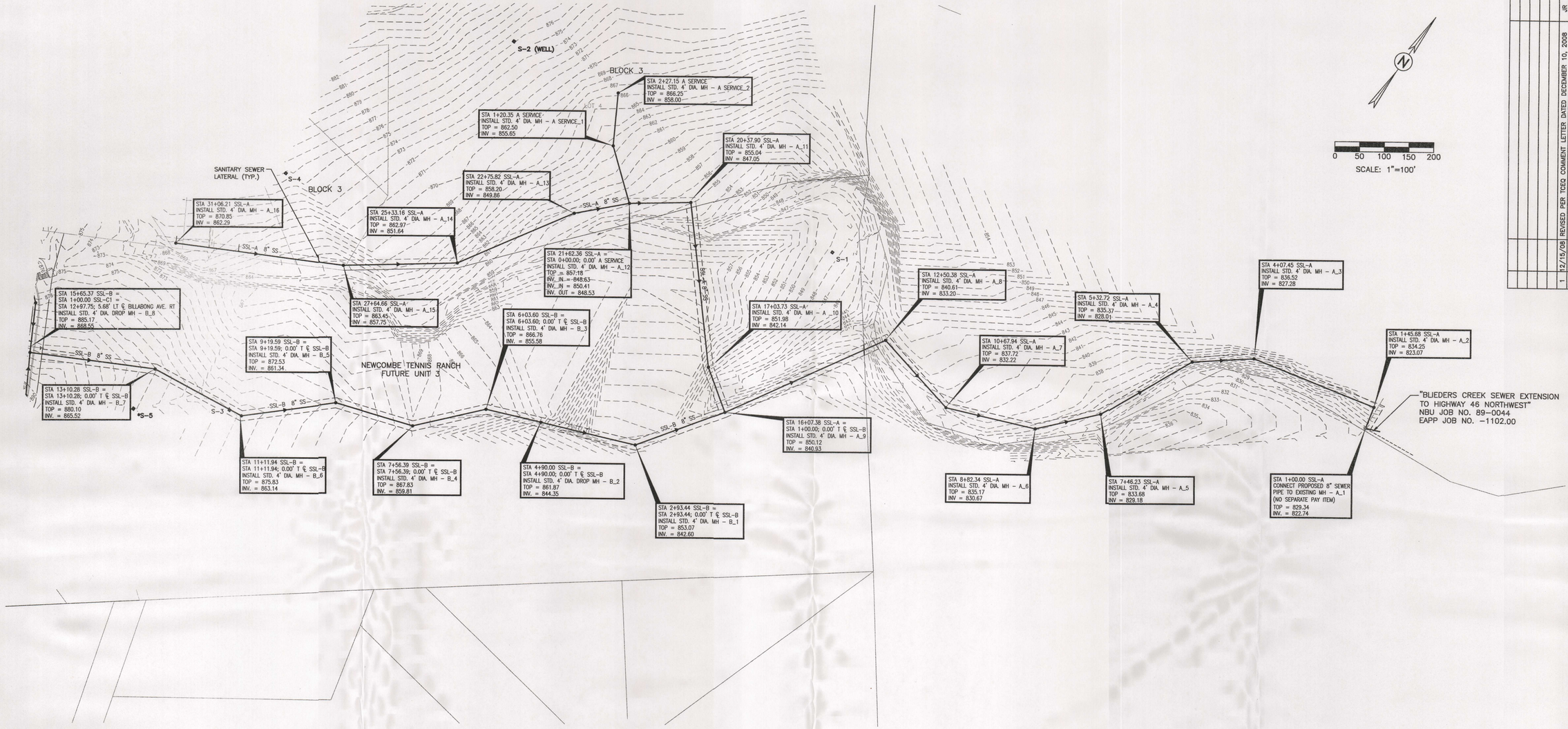
# NEWCOMBE TENNIS RANCH SUBDIVISION UNIT 1

NEW BRAUNFELS, TEXAS

DATE: 5–16–2008
DRAWN BY: B.R.
DESIGNED BY: A.Z.
CHECKED BY: A.Z.
REVIEWED BY: A.Z.
PROJECT NUMBER: 310590.012

SHEET 31 OF 59

Drawing Name: P:\310590.012 Newcombe Tennis Ranch\Construction Plans\Unit 1\Construction Plans\Sewer\310590_SS01.dwg Dec 16, 2008 – 12:43pm User: rodriguezk




## LEGEND

| EXISTING | PROPOSED | |
|---|---|---|
| —8"W— | —8"W— | WATER MAIN |
| —8"SS— | | SANITARY SEWER |
| | | FIRE HYDRANT |
| | | WATER VALVE |
| | | WATER METER |
| | | SANITARY SEWER MH |
| | | SANITARY SEWER LATERAL |
| | | EXISTING TREE |
| ◆*S-6 | | GEOLOGIC FEATURE |

NOTES:

1. ALL EXCAVATED MATERIAL SHALL BE PLACED ON THE UPHILL SIDE OF THE SEWER TRENCH ALLOWING THE TRENCH TO INTERCEPT ANY SILT CONTAMINATED RUNOFF.

2. ALL LATERALS SHALL HAVE A 2.0% MINIMUM SLOPE.

3. SANITARY SEWER PIPE TO BE: – PVC ASTM TYPE PSM, D3034 SDR 26 AND AWWA C-900 (SDR 18).

CENTERPOINT ENERGY LOCATOR:
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"THE EXISTENCE AND LOCATION OF UNDERGROUND CABLE INDICATED ON THE PLANS ARE TAKEN FROM THE BEST RECORDS AVAILABLE AND ARE NOT GUARANTEED TO BE ACCURATE. CONTRACTOR TO CONTACT TELEPHONE COMPANY CABLE LOCATOR 48 HOURS PRIOR TO EXCAVATION AT 1-800-828-5127. CONTRACTOR HAS THE RESPONSIBILITY TO PROTECT AND SUPPORT TELEPHONE COMPANY PLANT DURING CONSTRUCTION."
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CONTRACTOR AND/OR CONTRACTOR'S INDEPENDENTLY RETAINED EMPLOYEE OR STRUCTURAL DESIGN / GEOTECHNICAL / SAFETY / EQUIPMENT CONSULTANT, IF ANY, SHALL REVIEW THESE PLANS AND AVAILABLE GEOTECHNICAL INFORMATION AND THE ANTICIPATED INSTALLATION SITE(S) WITHIN THE PROJECT LIMITS IN ORDER TO IMPLEMENT CONTRACTOR'S TRENCH EXCAVATION SAFETY PROTECTION SYSTEMS, PROGRAMS, AND/OR PROCEDURES FOR THE THE PROJECT DESCRIBED IN THE CONTRACT DOCUMENTS. THE CONTRACTOR'S IMPLEMENTATION OF THESE SYSTEMS, PROGRAMS AND/OR PROCEDURES SHALL PROVIDE FOR ADEQUATE TRENCH EXCAVATION SAFETY PROTECTION THAT COMPLIES WITH, AS A MINIMUM, OSHA STANDARDS FOR TRENCH EXCAVATIONS. SPECIFICALLY, CONTRACTOR AND/OR CONTRACTOR'S INDEPENDENTLY RETAINED EMPLOYEE OR SAFETY CONSULTANT SHALL IMPLEMENT A TRENCH SAFETY PROGRAM IN ACCORDANCE WITH OSHA STANDARDS GOVERNING THE PRESENCE AND ACTIVITIES OF INDIVIDUALS WORKING IN AND AROUND TRENCH EXCAVATION.

| NO. | DATE | REVISION | BY |
|---|---|---|---|
| 1 | 12/15/08 | REVISED PER TCEQ COMMENT LETTER DATED DECEMBER 10, 2008 | JJR |


Carter :: Burgess
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STATE OF TEXAS
ALEX ZERTUCHE
92080
LICENSED
PROFESSIONAL ENGINEER
12-11-08

# SANITARY SEWER OVERALL PLAN EAST

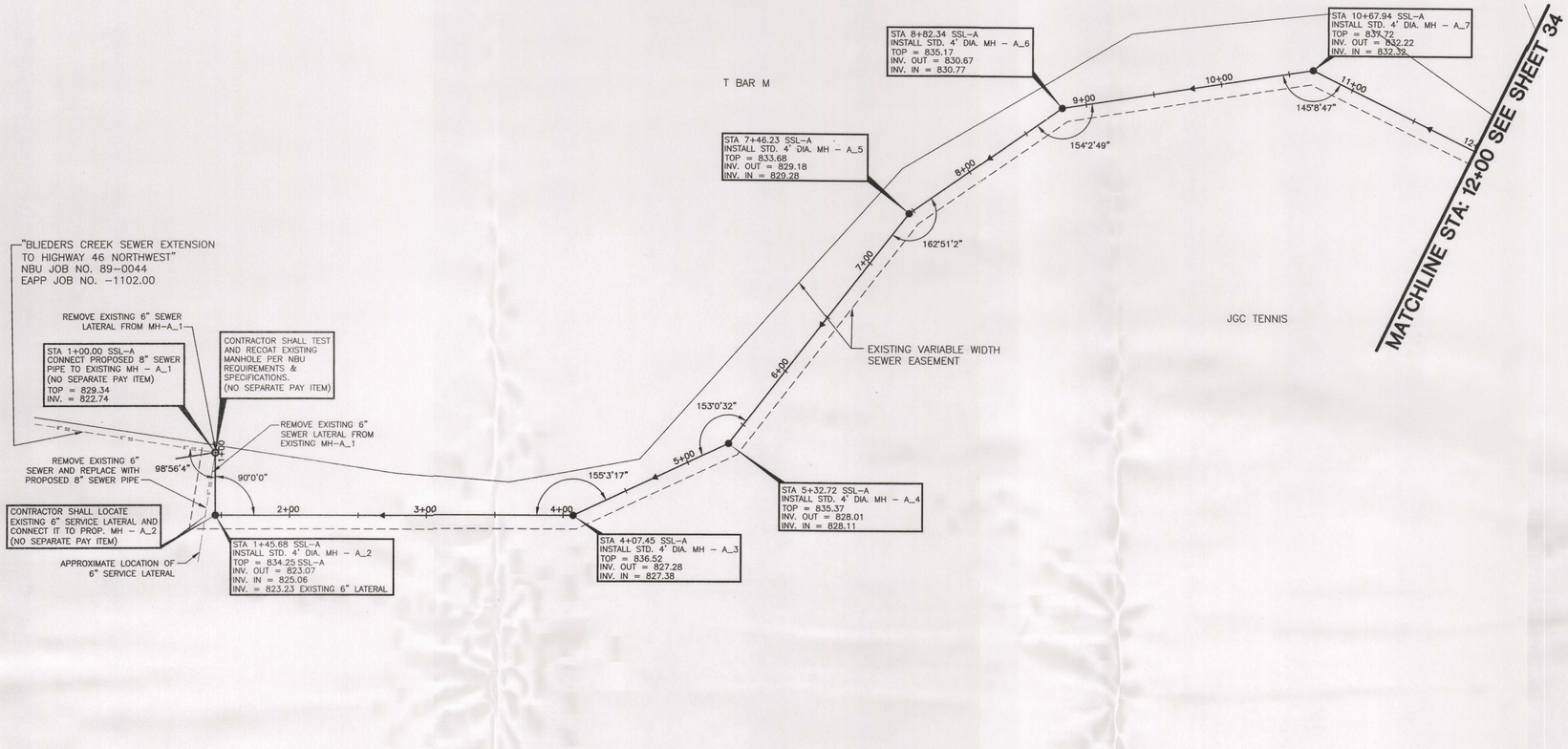
## NEWCOMBE TENNIS RANCH SUBDIVISION UNIT 1

NEW BRAUNFELS, TEXAS

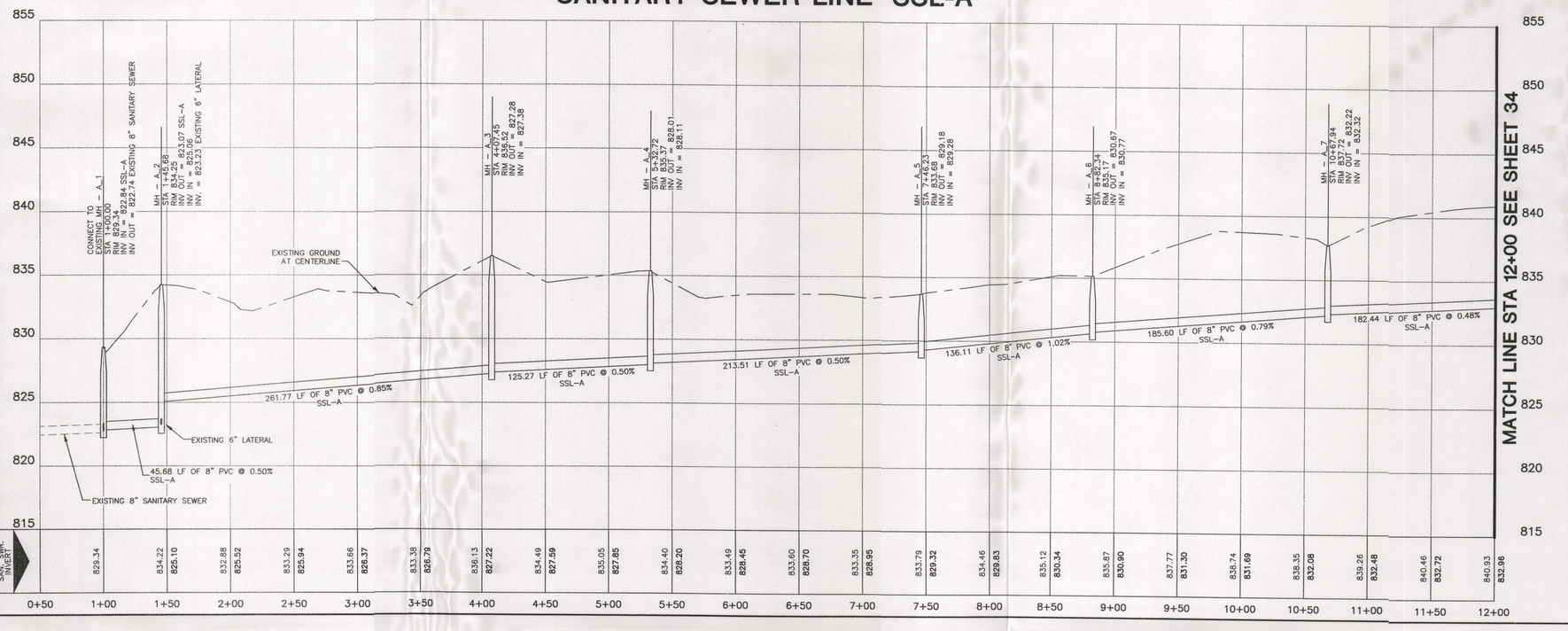
DATE: 5-16-2008
DRAWN BY: B.R.
DESIGNED BY: A.Z.
CHECKED BY: A.Z.
REVIEWED BY: A.Z.
PROJECT NUMBER: 310590.012

SHEET 32 OF 59

Drawing Name: P:\310590.012 Newcombe Tennis Ranch\Construction Plans\Unit 1\Construction Plans\Sewer\310590_SSO.dwg User: rodriguezjk Dec 16, 2008 - 12:43pm




## SANITARY SEWER LINE "SSL-A"




| NO. | DATE | REVISION | BY |
|---|---|---|---|
| 1 | 12/15/08 | REVISED PER TCEQ COMMENT LETTER DATED DECEMBER 10, 2008 | JR |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San Antonio, Texas 78232-1761
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STATE OF TEXAS
ALEX ZERTUCHE
92080
LICENSED PROFESSIONAL ENGINEER
12-16-08

0 25 50 100

SCALE
HORIZ.: 1" = 50'
VERT.: 1" = 5'

## LEGEND

| EXISTING | PROPOSED | |
|---|---|---|
| -8"W- | -8"W- | WATER MAIN |
| -8"SS- | | SANITARY SEWER |
| | | FIRE HYDRANT |
| | | WATER VALVE |
| | | WATER METER |
| | | SANITARY SEWER MH |
| | | SANITARY SEWER LATERAL |
| | | EXISTING TREE |
| ◆ *S-6 | | GEOLOGIC FEATURE |

CENTERPOINT ENERGY LOCATOR:
CALL LOCATOR AT 811 OR (800) 227-6477, 48 HOURS BEFORE BEGINNING ANY EXCAVATION.
DUE TO FEDERAL REGULATIONS TITLE 49, PART 192.181, CENTERPOINT ENERGY MUST MAINTAIN ACCESS TO GAS VALVES AT ALL TIMES. THE CONTRACTOR MUST PROTECT AND WORK AROUND ANY GAS VALVES THAT ARE IN THE PROJECT LIMITS.

TELEPHONE LOCATOR:
"THE EXISTENCE AND LOCATION OF UNDERGROUND CABLE INDICATED ON THE PLANS ARE TAKEN FROM THE BEST RECORDS AVAILABLE AND ARE NOT GUARANTEED TO BE ACCURATE. CONTRACTOR TO CONTACT TELEPHONE COMPANY CABLE LOCATOR 48 HOURS PRIOR TO EXCAVATION AT 1-800-828-5127. CONTRACTOR HAS THE RESPONSIBILITY TO PROTECT AND SUPPORT TELEPHONE COMPANY PLANT DURING CONSTRUCTION."

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

# SANITARY SEWER PLAN AND PROFILE LINE A STA 0+00 TO 12+00

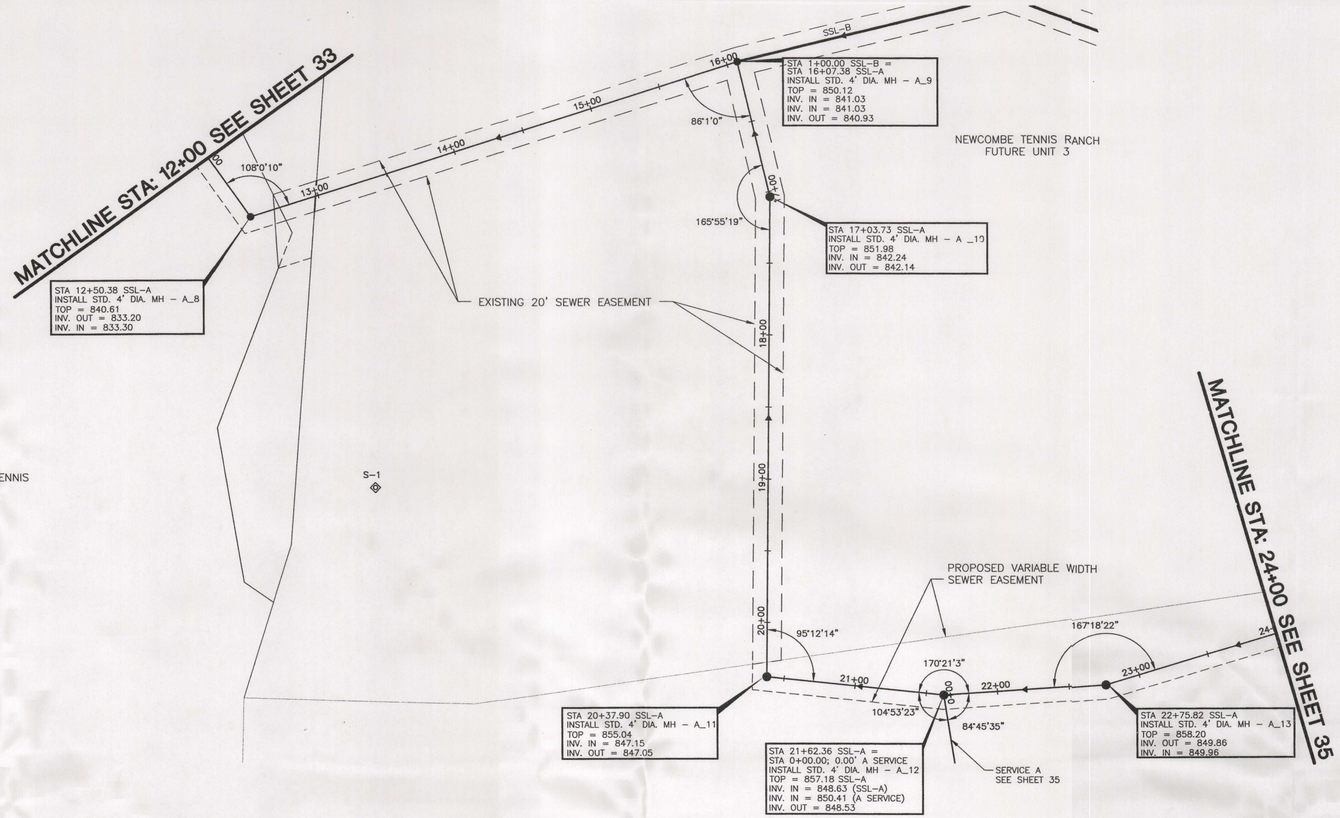
## NEWCOMBE TENNIS RANCH SUBDIVISION UNIT 1

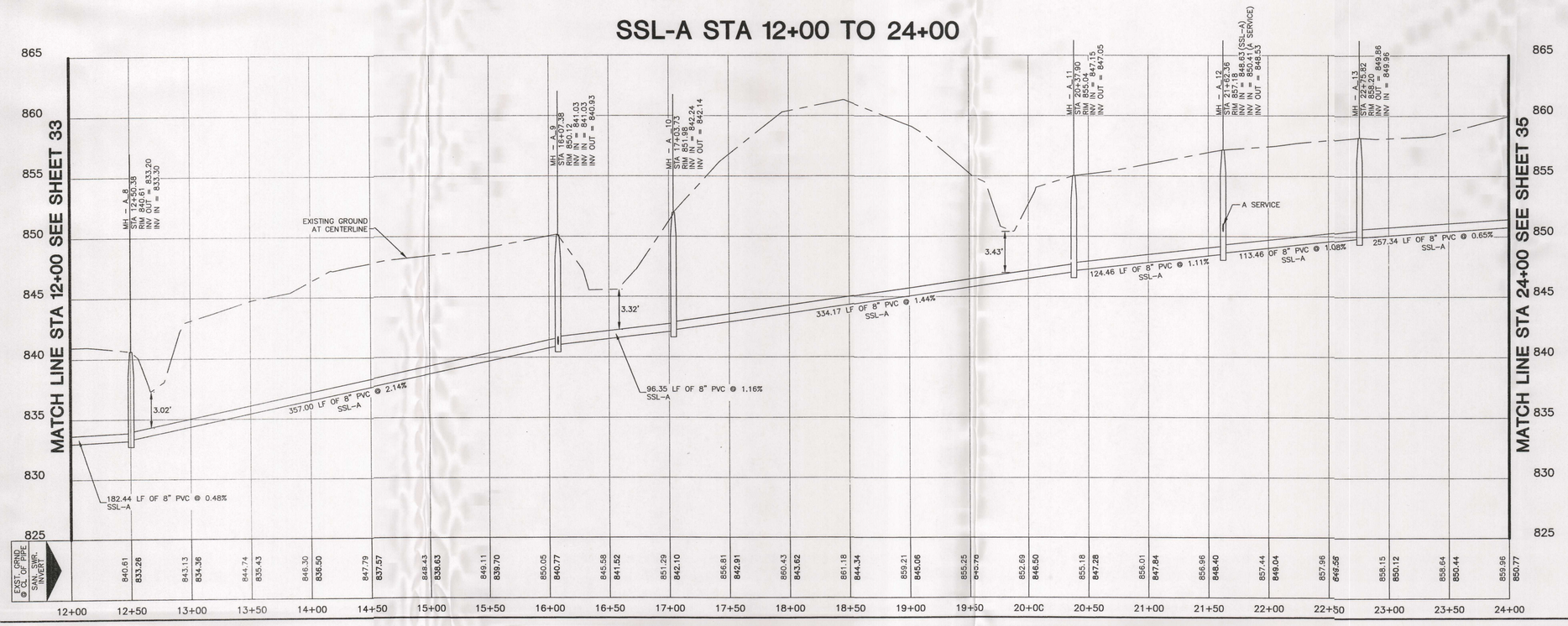
NEW BRAUNFELS, TEXAS

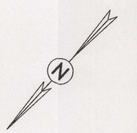
DATE: 5-16-2008
DRAWN BY: B.R.
DESIGNED BY: A.Z.
CHECKED BY: A.Z.
REVIEWED BY: A.Z.
PROJECT NUMBER: 310590.012

SHEET 33 OF 59

Drawing Name: P:\310590.012 Newcombe Tennis Ranch\Construction Plans\Unit 1\Construction Plans\Sewer\310590 Line A.dwg User: rodriguezjk Dec 16, 2008 - 1:32pm




SCALE
HORIZ.: 1" = 50'
VERT.: 1" = 5'

## LEGEND

| EXISTING | PROPOSED | |
|---|---|---|
| -8"W- | -8"W- | WATER MAIN |
| -8"SS- | | SANITARY SEWER |
| | | FIRE HYDRANT |
| | | WATER VALVE |
| | | WATER METER |
| | | SANITARY SEWER MH |
| | | SANITARY SEWER LATERAL |
| | | EXISTING TREE |
| ◆S-6 | | GEOLOGIC FEATURE |

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| NO. | DATE | REVISION | BY |
|---|---|---|---|
| 1 | 12/15/08 | REVISED PER TCEQ COMMENT LETTER DATED DECEMBER 10, 2008 | JR |


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# SANITARY SEWER PLAN AND PROFILE LINE A STA 12+00 TO 24+00

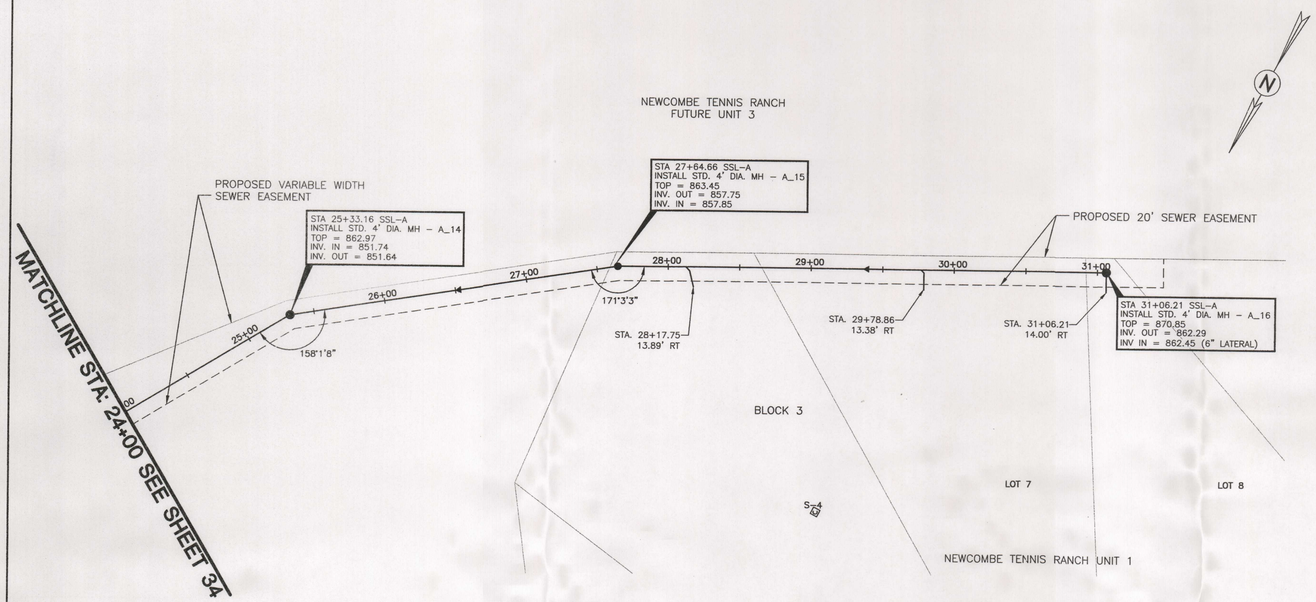
## NEWCOMBE TENNIS RANCH SUBDIVISION UNIT 1

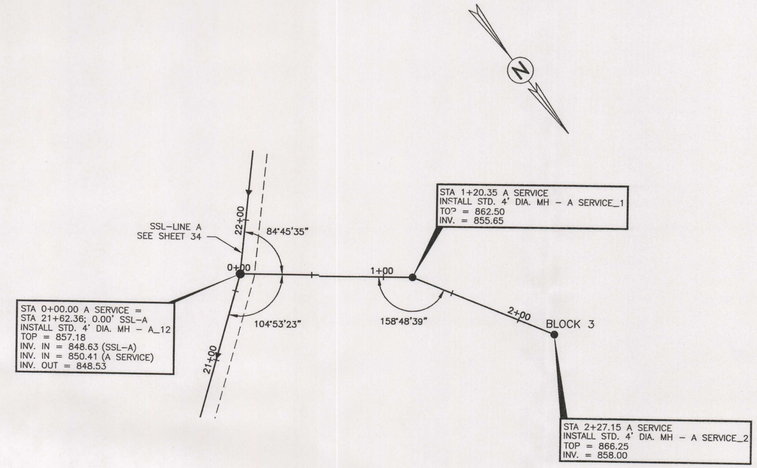
NEW BRAUNFELS, TEXAS

DATE: 5-16-2008
DRAWN BY: B.R.
DESIGNED BY: A.Z.
CHECKED BY: A.Z.
REVIEWED BY: A.Z.
PROJECT NUMBER: 310580.012

SHEET 34 OF 59

Drawing Name: P:\310580.012 Newcombe Tennis Ranch\Construction Plans\Unit 1\Construction Plans\Sewer\310580 Line A.dwg User: rodrigwa Dec 16, 2008 - 1:33pm



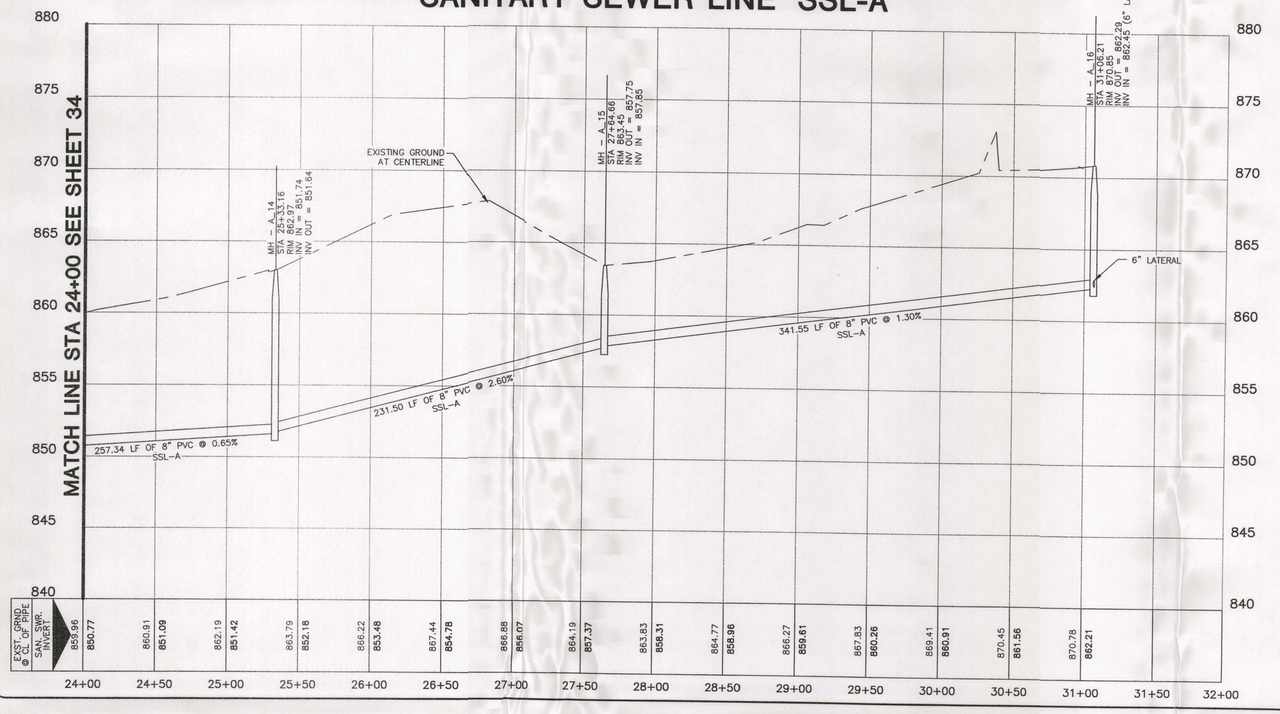

0 25 50 100

SCALE
HORIZ.: 1" = 50'
VERT.: 1" = 5'

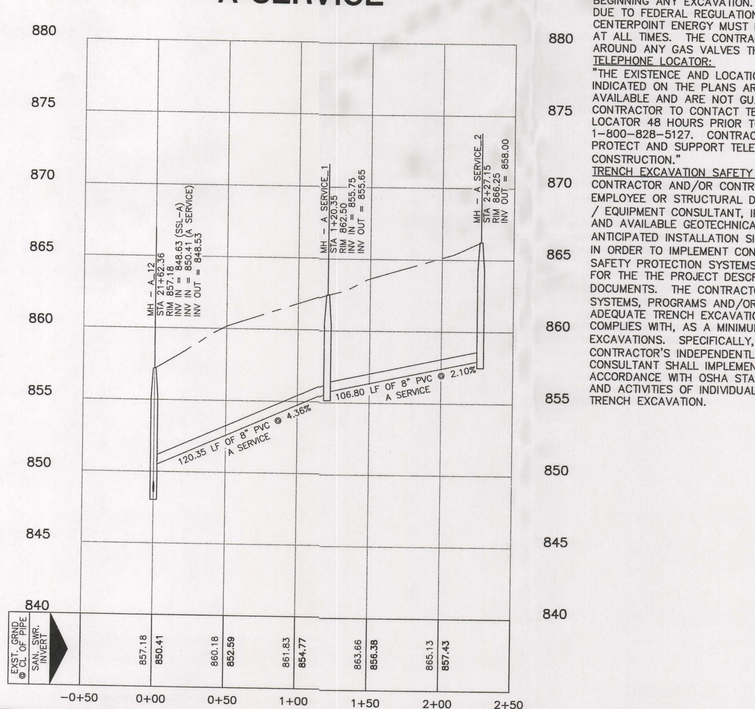
## LEGEND

| EXISTING | PROPOSED | |
|---|---|---|
| -8"W- | -8"W- | WATER MAIN |
| -8"SS- | | SANITARY SEWER |
| | | FIRE HYDRANT |
| | | WATER VALVE |
| | | WATER METER |
| | | SANITARY SEWER MH |
| | | SANITARY SEWER LATERAL |
| | | EXISTING TREE |
| *S-6 | | GEOLOGIC FEATURE |

## SANITARY SEWER LINE "SSL-A"




## SANITARY SEWER LINE "A SERVICE"




CENTERPOINT ENERGY LOCATOR:
CALL LOCATOR AT 811 OR (800) 227-6477, 48 HOURS BEFORE BEGINNING ANY EXCAVATION.
DUE TO FEDERAL REGULATIONS TITLE 49, PART 192.181, CENTERPOINT ENERGY MUST MAINTAIN ACCESS TO GAS VALVES AT ALL TIMES. THE CONTRACTOR MUST PROTECT AND WORK AROUND ANY GAS VALVES THAT ARE IN THE PROJECT LIMITS.

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| NO. | DATE | REVISION | BY |
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| 1 | 12/15/08 | REVISED PER TCEQ COMMENT LETTER DATED DECEMBER 10, 2008 | JR |


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12-15-08

# SANITARY SEWER PLAN AND PROFILE LINE A STA 24+00 TO END A SERVICE STA 0+00 TO END

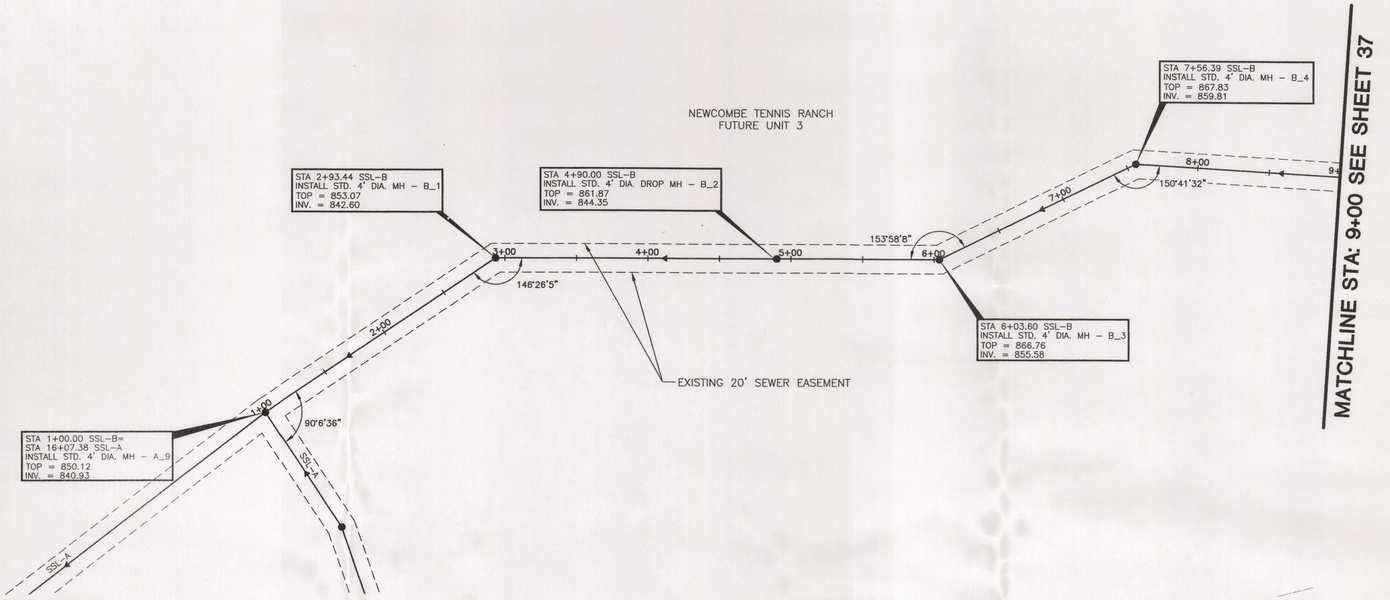
## NEWCOMBE TENNIS RANCH SUBDIVISION UNIT 1

NEW BRAUNFELS, TEXAS

DATE: 5-16-2008
DRAWN BY: B.R.
DESIGNED BY: A.Z.
CHECKED BY: A.Z.
REVIEWED BY: A.Z.
PROJECT NUMBER: 310590.012

SHEET 35 OF 59

Drawing Name: P:\310590.012 Newcombe Tennis Ranch\Construction Plans\Unit 1\Construction Plans\Sewer\310590 Line A.dwg User: rodriguezjx Dec 16, 2008 - 11:24am

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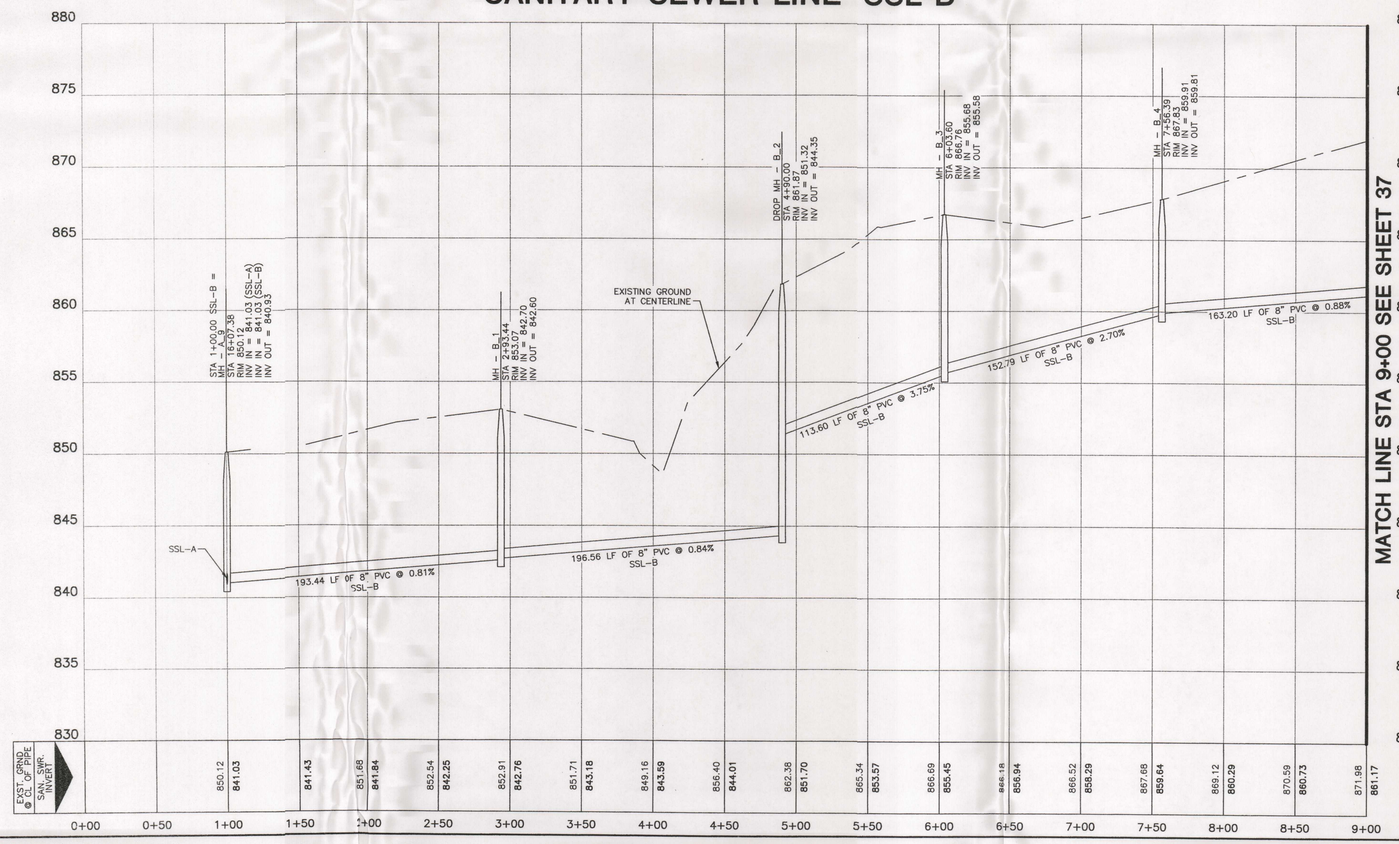


Drawing Name: P:\310560.012 Newcombe Tennis Ranch\Construction Plans\Unit 1\Construction Plans\Sewer\310560 Line B.dwg User: rodriguezjx Dec 16, 2008 - 11:25am

| NO. | DATE | REVISION | BY |
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| 1 | 12/15/08 | REVISED PER TCEQ COMMENT LETTER DATED DECEMBER 10, 2008 | JR |


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PROFESSIONAL ENGINEER
12-16-08

N

0 25 50 100

SCALE
HORIZ.: 1" = 50'
VERT.: 1" = 5'

## LEGEND

| EXISTING | PROPOSED | |
|---|---|---|
| -8"W- | -8"W- | WATER MAIN |
| -8"SS- | | SANITARY SEWER |
| | | FIRE HYDRANT |
| | | WATER VALVE |
| | | WATER METER |
| | | SANITARY SEWER MH |
| | | SANITARY SEWER LATERAL |
| | | EXISTING TREE |
| *S-6 | | GEOLOGIC FEATURE |

CENTERPOINT ENERGY LOCATOR:
CALL LOCATOR AT 811 OR (800) 227-6477, 48 HOURS BEFORE BEGINNING ANY EXCAVATION.
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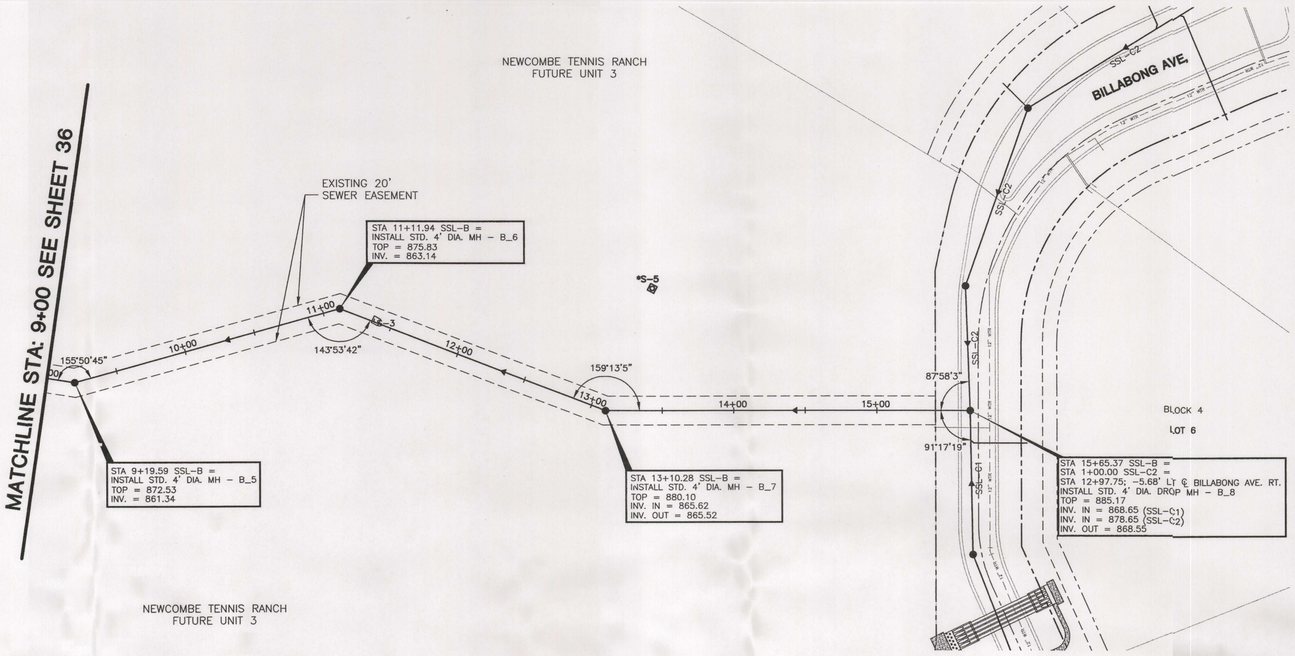
# SANITARY SEWER PLAN AND PROFILE LINE B STA 0+00 TO 9+00

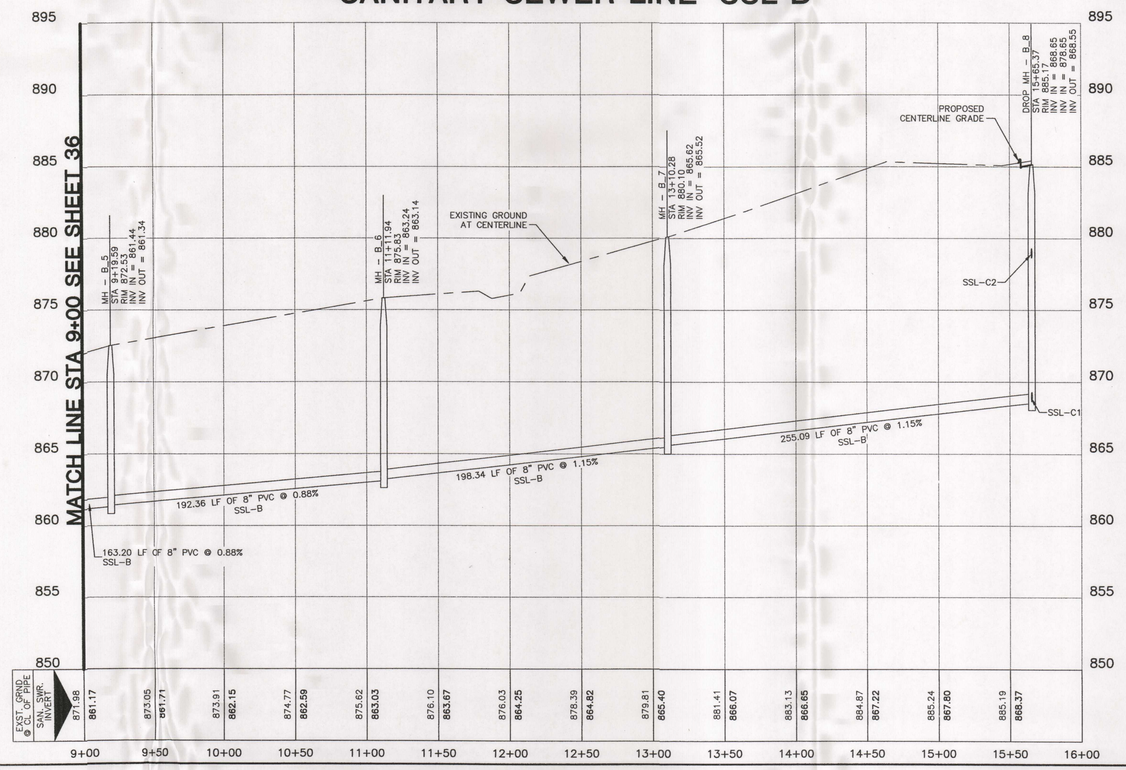
# NEWCOMBE TENNIS RANCH SUBDIVISION UNIT 1

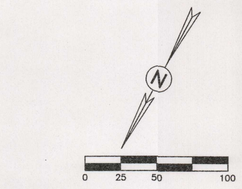
NEW BRAUNFELS, TEXAS

DATE: 5-16-2008
DRAWN BY: B.R.
DESIGNED BY: A.Z.
CHECKED BY: A.Z.
REVIEWED BY: A.Z.
PROJECT NUMBER: 310560.012

SHEET 36 OF 59




## LEGEND

| EXISTING | PROPOSED | |
|---|---|---|
| -8"W- | -8"W- | WATER MAIN |
| -8"SS- | | SANITARY SEWER |
| | | FIRE HYDRANT |
| | | WATER VALVE |
| | | WATER METER |
| | | SANITARY SEWER MH |
| | | SANITARY SEWER LATERAL |
| | | EXISTING TREE |
| S-6 | | GEOLOGIC FEATURE |

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| NO. | DATE | REVISION | BY |
|---|---|---|---|
| 1 | 12/15/08 | REVISED PER TCEQ COMMENT LETTER DATED DECEMBER 10, 2008 | JR |

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Consultants in Engineering, Architecture, Construction Management and Related Services
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92080
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12-16-08

# SANITARY SEWER PLAN AND PROFILE LINE B

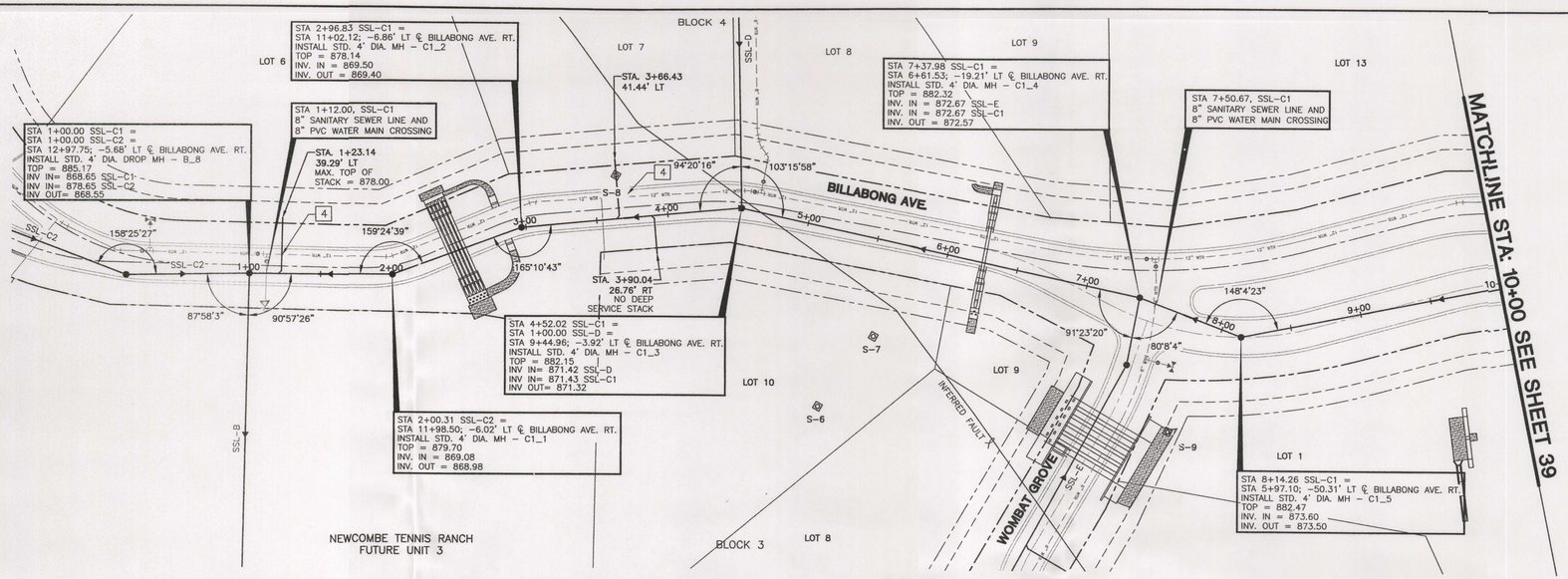
## NEWCOMBE TENNIS RANCH SUBDIVISION UNIT 1

NEW BRAUNFELS, TEXAS

DATE: 5-16-2008
DRAWN BY: B.R.
DESIGNED BY: A.Z.
CHECKED BY: A.Z.
REVIEWED BY: A.Z.
PROJECT NUMBER: 310590.012

SHEET 37 OF 59

Drawing Name: P:\310590.012 Newcombe Tennis Ranch\Construction Phase\Unit 1\Construction Phase\Sewer\310590 Line B.dwg Dec. 16, 2008 - 11:39am User: rodriguezjs




## KEY NOTES

1. PROPOSED 1" WATER SERVICE. SEE WATER LINE CROSSING DETAIL THIS SHEET.
2. PROPOSED 2-1" WATER SERVICES. SEE WATER LINE CROSSING DETAIL THIS SHEET.
3. 20 LF ~ 8" PVC C-900 CENTERED ON WATER LINE.
4. SEE WATER LINE CROSSING DETAIL THIS SHEET.

| NO. | DATE | REVISION | BY |
|---|---|---|---|
| 1 | 12/15/08 | REVISED PER TCEQ COMMENT LETTER DATED DECEMBER 10, 2008 | JR |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Consultants in Engineering, Architecture, Construction Management and Related Services
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San Antonio, Texas 78232-1762
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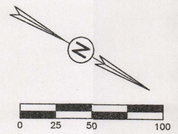
12-16-08




SCALE
HORIZ.: 1" = 50'
VERT.: 1" = 5'

## LEGEND

| EXISTING | PROPOSED | |
|---|---|---|
| -8"W- | —8"W— | WATER MAIN |
| -8"SS- | | SANITARY SEWER |
| | | FIRE HYDRANT |
| | | WATER VALVE |
| | | WATER METER |
| | | SANITARY SEWER MH |
| | | SANITARY SEWER LATERAL |
| | | EXISTING TREE |
| *S-6 | | GEOLOGIC FEATURE |

CENTERPOINT ENERGY LOCATOR:
CALL LOCATOR AT 811 OR (800) 227-6477, 48 HOURS BEFORE BEGINNING ANY EXCAVATION.
DUE TO FEDERAL REGULATIONS TITLE 49, PART 192.181, CENTERPOINT ENERGY MUST MAINTAIN ACCESS TO GAS VALVES AT ALL TIMES. THE CONTRACTOR MUST PROTECT AND WORK AROUND ANY GAS VALVES THAT ARE IN THE PROJECT LIMITS.
TELEPHONE LOCATOR:
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TRENCH EXCAVATION SAFETY PROTECTION:
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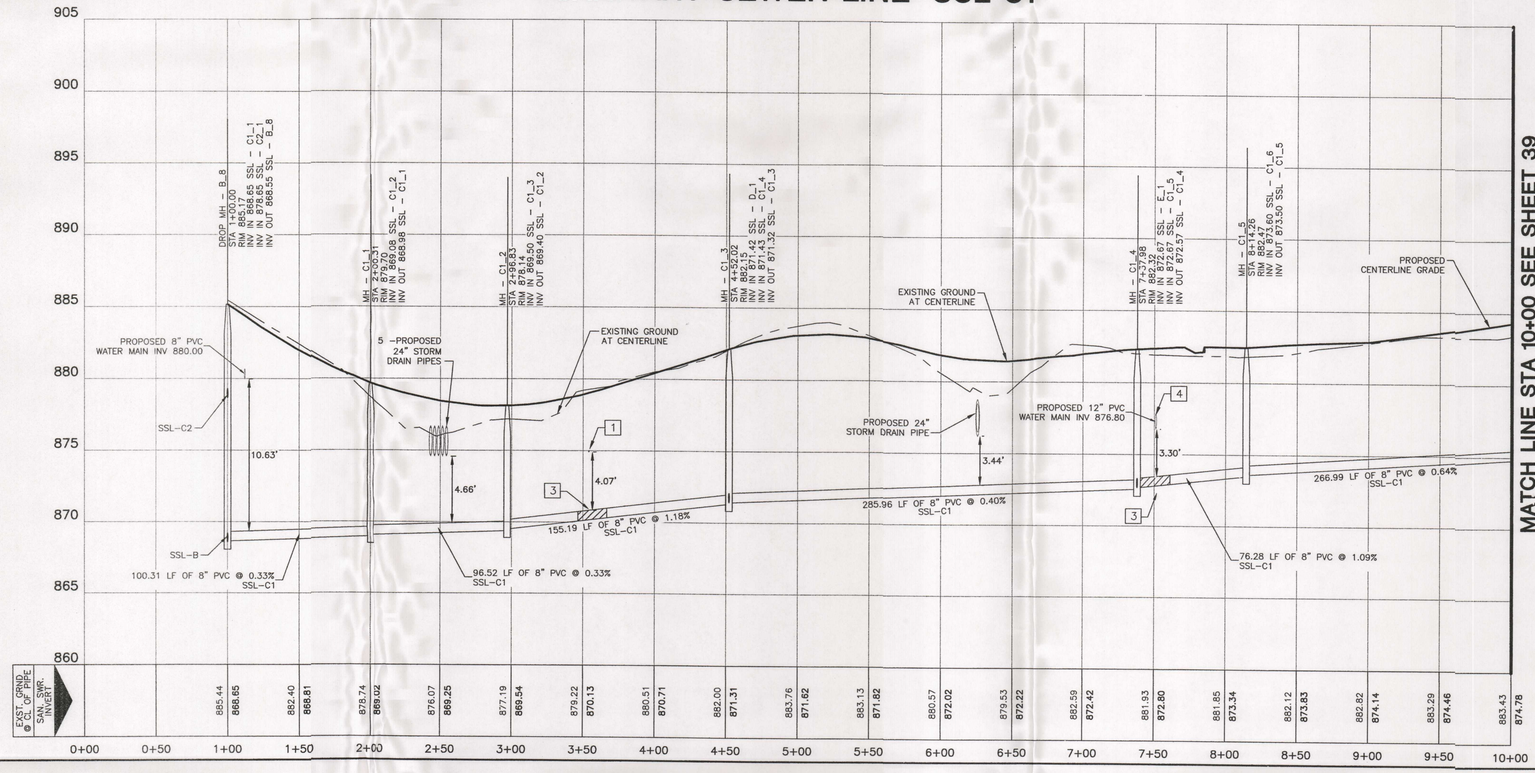
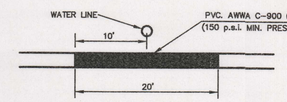
## SANITARY SEWER LINE "SSL-C1"




NOTE:
WATER/SEWER SEPARATION DISTANCE AND PROTECTION REQUIREMENTS SHALL COMPLY WITH 30 TAC 290.44(e) AND 317.13.

SAN. SEW. / WATER LINE CROSSING DETAIL
N.T.S.

# SANITARY SEWER PLAN AND PROFILE LINE C1 STA 0+00 TO 10+00

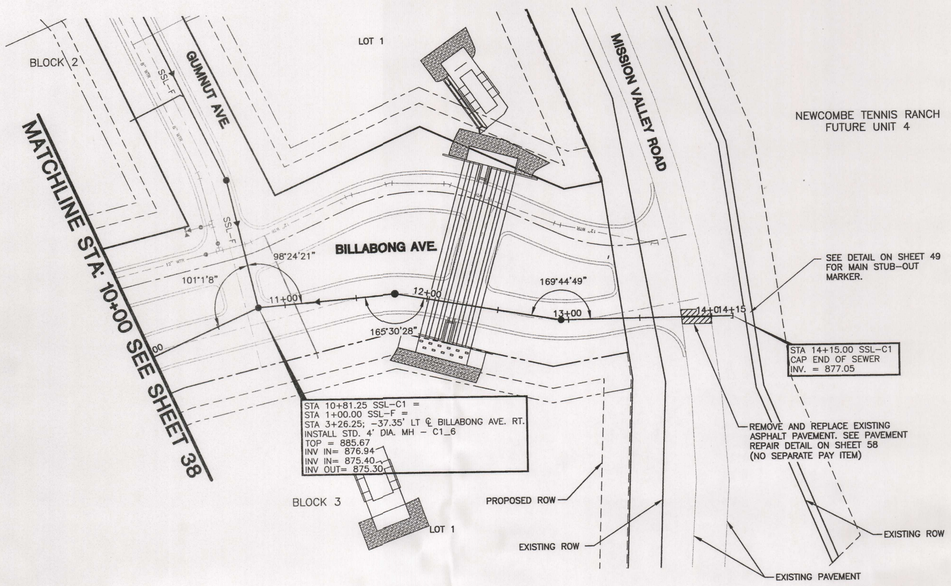
# NEWCOMBE TENNIS RANCH SUBDIVISION UNIT 1

NEW BRAUNFELS, TEXAS

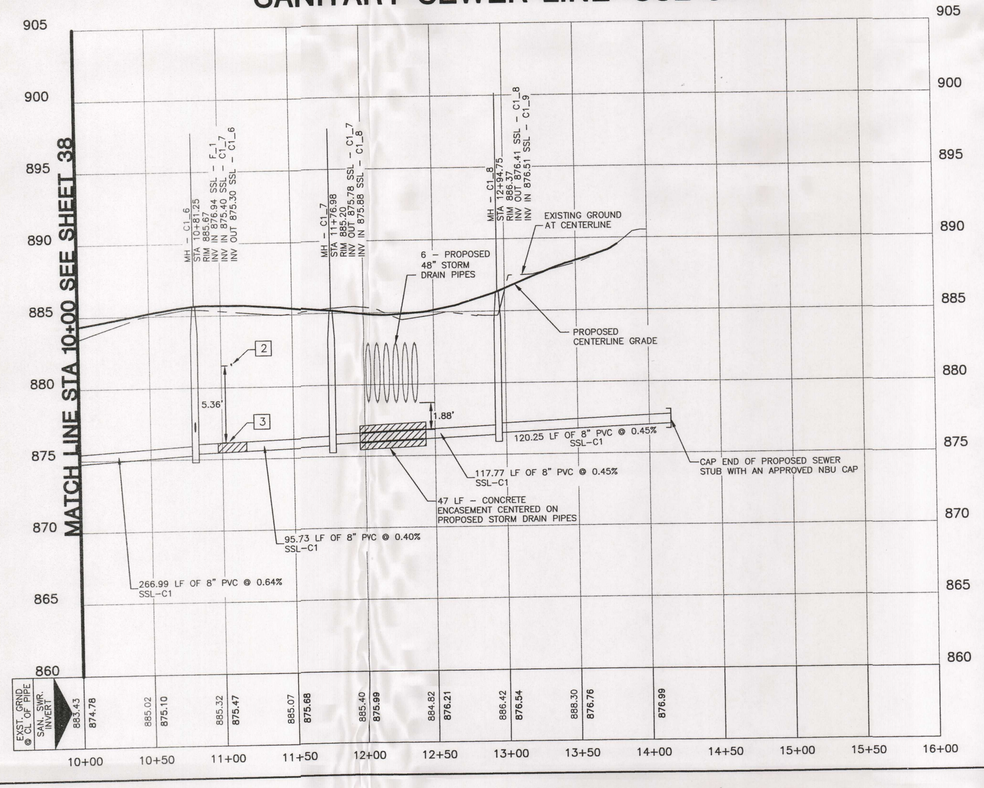
DATE: 5-16-2008
DRAWN BY: B.R.
DESIGNED BY: A.Z.
CHECKED BY: A.Z.
REVIEWED BY: A.Z.
PROJECT NUMBER: 310590.012

SHEET 38 OF 59


Drawing Name: P:\310590.012 Newcombe Tennis Ranch\Construction Plans\Unit 1\Construction Plans\Sewer\310590 Line C1.dwg User: rodriguezjx Dec 16, 2008 - 11:35am




# SANITARY SEWER LINE "SSL-C1"




# KEY NOTES

1. PROPOSED 1" WATER SERVICE. SEE WATER LINE CROSSING DETAIL THIS SHEET.
2. PPROPOSED 1" & 2" WATER SERVICES. SEE WATER LINE CROSSING DETAIL THIS SHEET.
3. 20 LF ~ 8" PVC C-900 CENTERED ON WATER LINE.
4. SEE WATER LINE CROSSING DETAIL THIS SHEET.

| NO. | DATE | REVISION | BY |
|---|---|---|---|
| 1 | 12/15/08 | REVISED PER TCEQ COMMENT LETTER DATED DECEMBER 10, 2008 | JR |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Consultants in Engineering, Architecture, Construction Management and Related Services
Carter and Burgess, Inc.
911 Central Parkway North, Suite 425
San Antonio, Texas 78232
(210) 494-0088 Fax: (210) 494-0828

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STATE OF TEXAS
ALEX ZERTUCHE
92080
LICENSED
PROFESSIONAL ENGINEER
12-16-08

N

0 25 50 100

SCALE
HORIZ.: 1" = 50'
VERT.: 1" = 5'

# LEGEND

| EXISTING | PROPOSED | |
|---|---|---|
| -8"W- | -8"W- | WATER MAIN |
| -8"SS- | | SANITARY SEWER |
| | | FIRE HYDRANT |
| | | WATER VALVE |
| | | WATER METER |
| | | SANITARY SEWER MH |
| | | SANITARY SEWER LATERAL |
| | | EXISTING TREE |
| *S-6 | | GEOLOGIC FEATURE |

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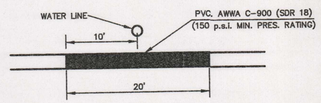



NOTE:
WATER/SEWER SEPARATION DISTANCE AND PROTECTION REQUIREMENTS SHALL COMPLY WITH 30 TAC 290.44(e) AND 317.13.

SAN. SEW. / WATER LINE CROSSING DETAIL
N.T.S.

# SANITARY SEWER PLAN AND PROFILE LINE C1

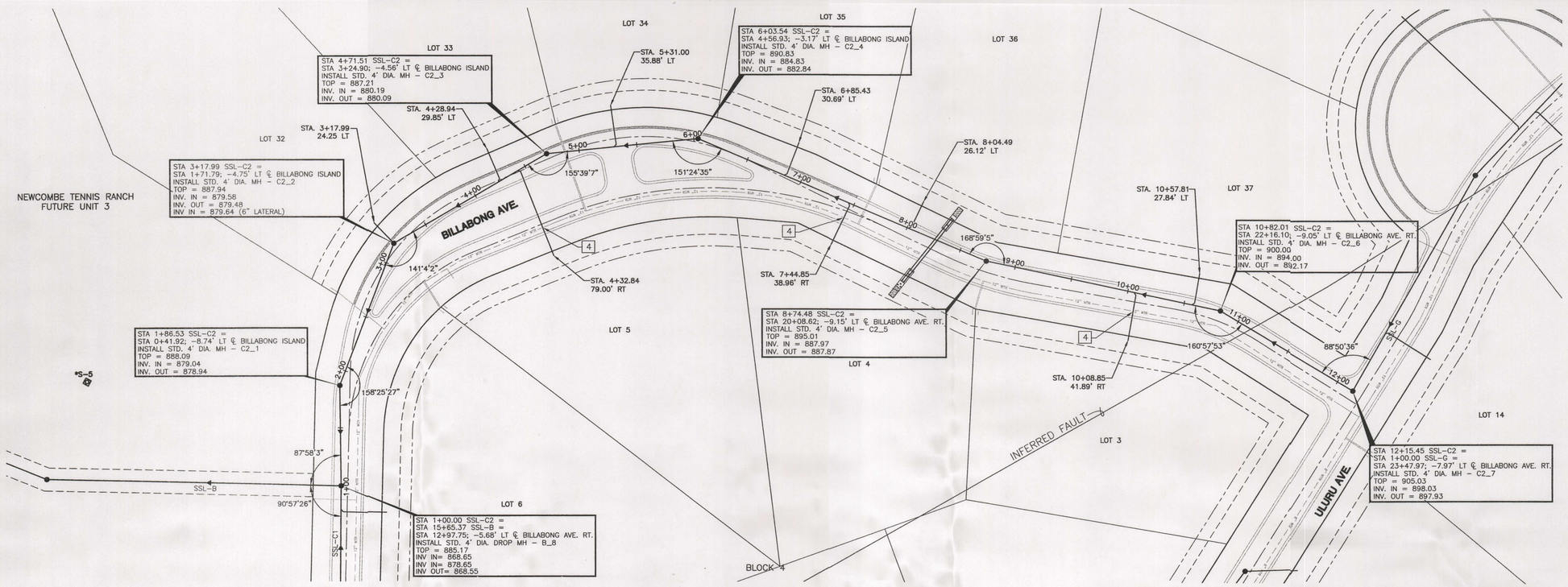
# NEWCOMBE TENNIS RANCH SUBDIVISION UNIT 1

NEW BRAUNFELS, TEXAS

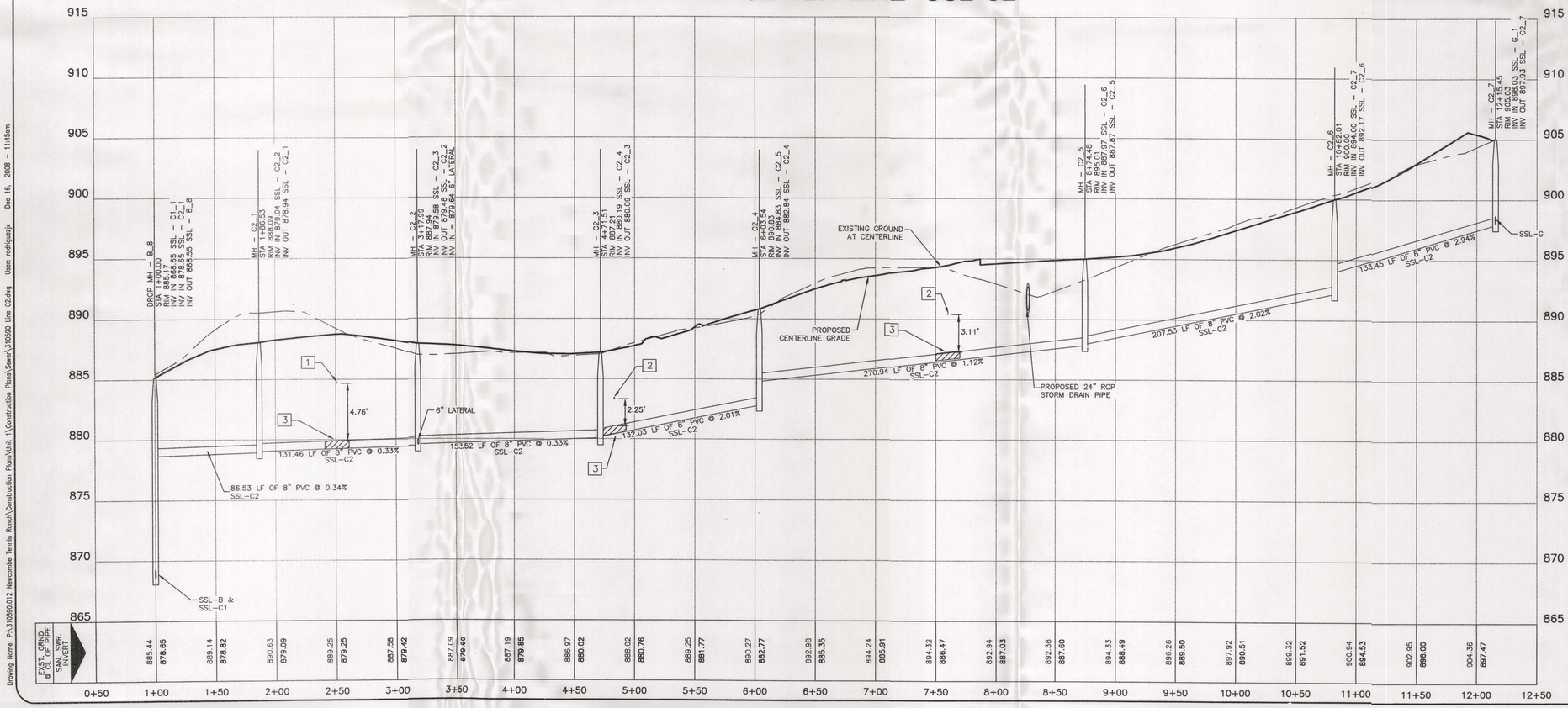
DATE: 5-16-2008
DRAWN BY: B.R.
DESIGNED BY: A.Z.
CHECKED BY: A.Z.
REVIEWED BY: A.Z.
PROJECT NUMBER: 310590.012

SHEET 39 OF 59

Drawing Name: P:\310590.012 Newcombe Tennis Ranch\Construction Plans\Unit 1\Construction Plans\Sewer\310590 Line C1.dwg User: rodriguezja Dec 16, 2008 - 11:43am




# SANITARY SEWER LINE "SSL-C2"




## LEGEND

| EXISTING | PROPOSED | |
|---|---|---|
| -8"W- | —8"W— | WATER MAIN |
| -8"SS- | ——— | SANITARY SEWER |
| | | FIRE HYDRANT |
| | | WATER VALVE |
| | | WATER METER |
| | | SANITARY SEWER MH |
| | | SANITARY SEWER LATERAL |
| | | SDR 26 |

## KEY NOTES

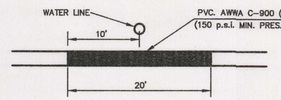
1. PROPOSED 1" WATER SERVICE. SEE WATER LINE CROSSING DETAIL THIS SHEET.
2. PROPOSED 2-1" WATER SERVICES. SEE WATER LINE CROSSING DETAIL THIS SHEET.
3. 20 LF ~ 8" PVC C-900 CENTERED ON WATER LINE.
4. SEE WATER LINE CROSSING DETAIL THIS SHEET.

UNDERGROUND UTILITY LOCATOR

CONTRACTOR TO NOTIFY UNDERGROUND UTILITY LOCATOR AT LEAST 24 HOURS PRIOR TO CONSTRUCTION. (1-800-545-6005)

TRENCH EXCAVATION SAFETY PROTECTION

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




NOTE:
WATER/SEWER SEPARATION DISTANCE AND PROTECTION REQUIREMENTS SHALL COMPLY WITH 30 TAC 290.44(e) AND 317.13.

SAN. SEW. / WATER LINE CROSSING DETAIL

N.T.S.

SCALE
HORIZ.: 1" = 50'
VERT.: 1" = 5'

| NO. | DATE | REVISION | BY |
|---|---|---|---|
| 1 | 12/15/08 | REVISED PER TCEQ COMMENT LETTER DATED DECEMBER 10, 2008 | JR |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12-16-08

# SANITARY SEWER PLAN AND PROFILE LINE C2 STA 0+00 TO END

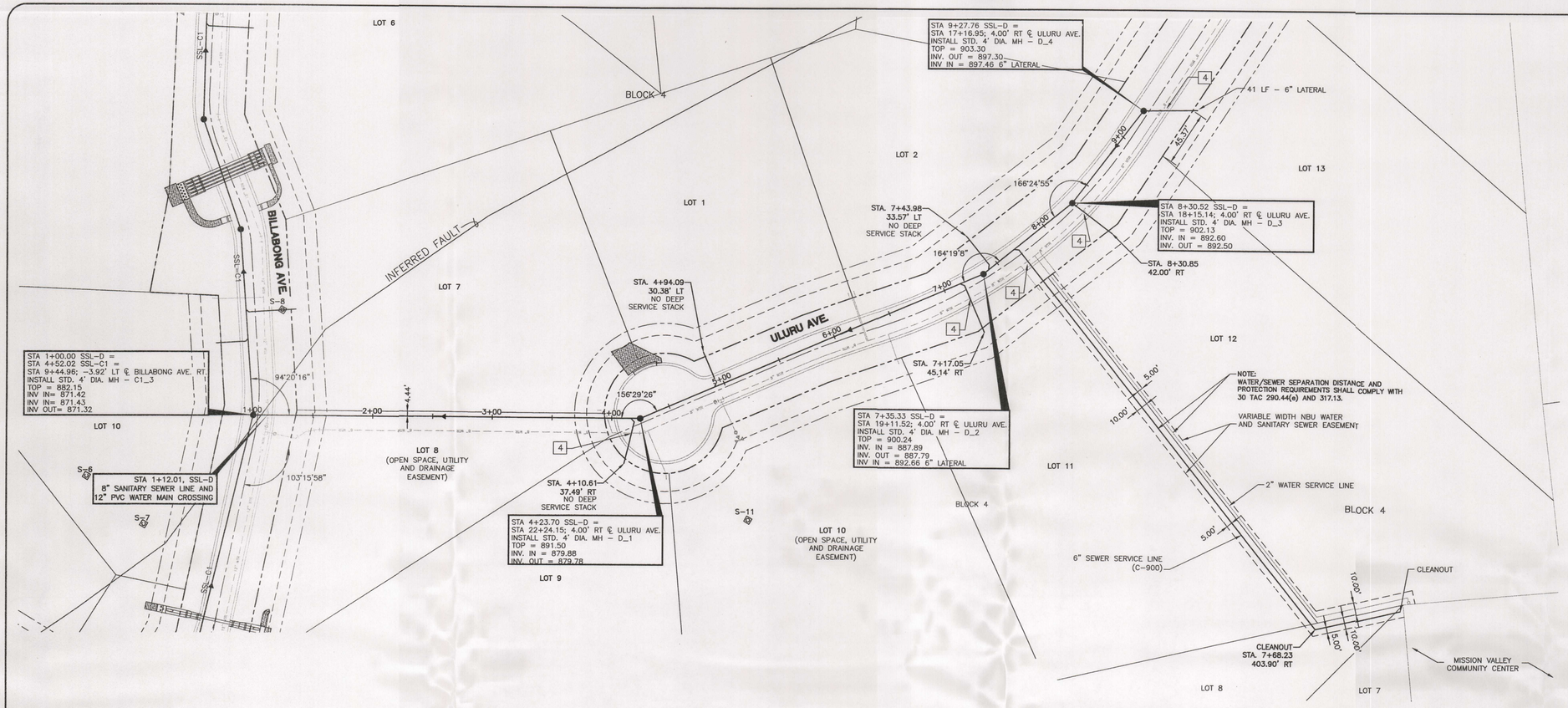
# NEWCOMBE TENNIS RANCH SUBDIVISION UNIT 1

NEW BRAUNFELS, TEXAS

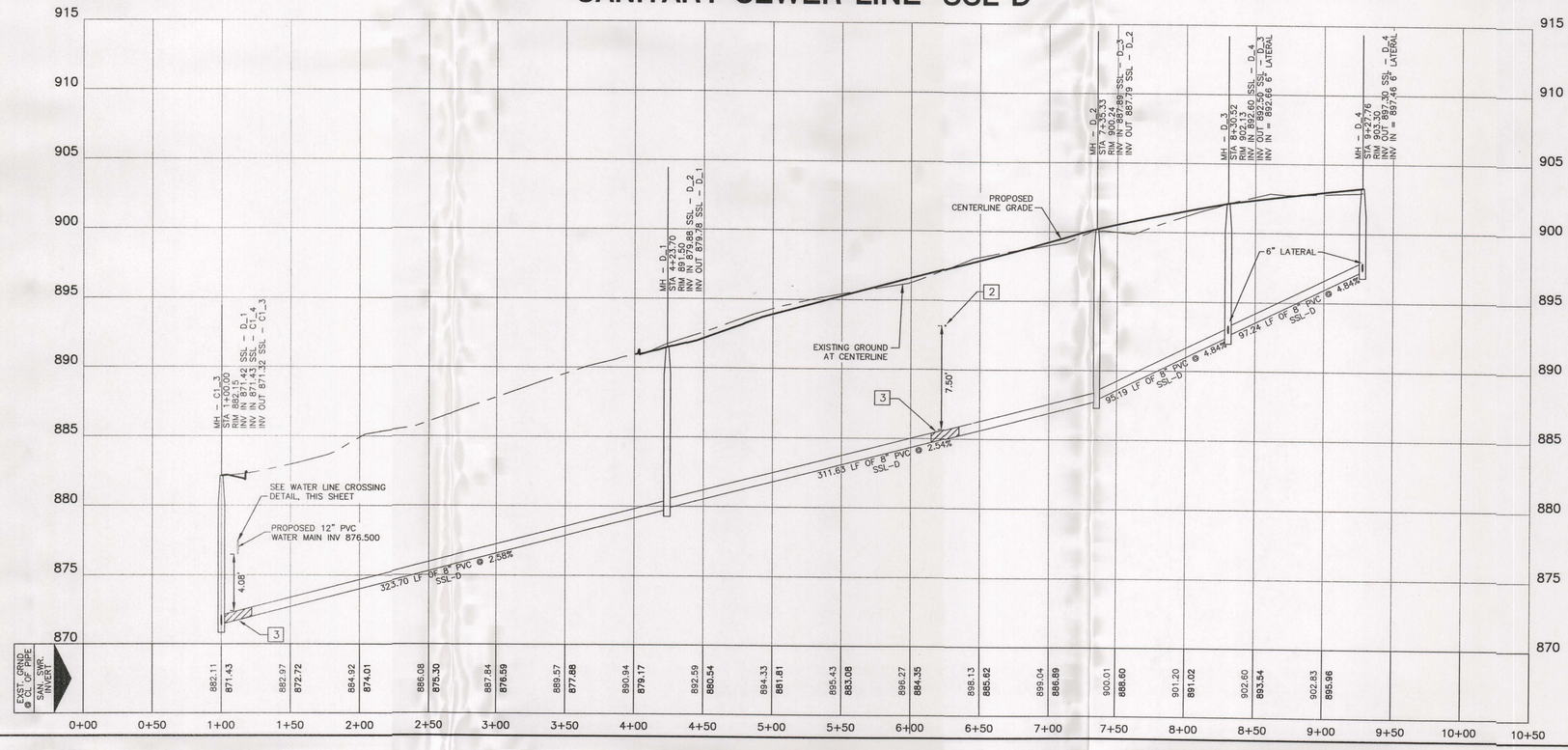
DATE: 5-16-2008
DRAWN BY: B.R.
DESIGNED BY: A.Z.
CHECKED BY: A.Z.
REVIEWED BY: A.Z.
PROJECT NUMBER: 310590.012

SHEET 40 OF 59

Drawing Name: P:\310590.012 Newcombe Tennis Ranch\Construction Plans\Unit 1\Construction Plans\Sewer\310590 Line C2.dwg User: rodriguezjx Dec 16, 2008 - 11:45am




# SANITARY SEWER LINE "SSL-D"




## KEY NOTES

1. PROPOSED 1" WATER SERVICE. SEE WATER LINE CROSSING DETAIL THIS SHEET.
2. PROPOSED 2-1" WATER SERVICES. SEE WATER LINE CROSSING DETAIL THIS SHEET.
3. 20 LF ~ 8" PVC C-900 CENTERED ON WATER LINE.
4. SEE WATER LINE CROSSING DETAIL THIS SHEET.

| NO. | DATE | REVISION | BY |
|---|---|---|---|
| 1 | 12/15/08 | REVISED PER TCEQ COMMENT LETTER DATED DECEMBER 10, 2008 | JR |

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STATE OF TEXAS
ALEX ZERTUCHE
92080
LICENSED
PROFESSIONAL ENGINEER
12-16-08

0 25 50 100
SCALE
HORIZ.: 1" = 50'
VERT.: 1" = 5'

## LEGEND

| EXISTING | PROPOSED | |
|---|---|---|
| -8"W- | -8"W- | WATER MAIN |
| -8"SS- | | SANITARY SEWER |
| | | FIRE HYDRANT |
| | | WATER VALVE |
| | | WATER METER |
| | | SANITARY SEWER MH |
| | | SANITARY SEWER LATERAL |
| | | EXISTING TREE |
| S-6 | | GEOLOGIC FEATURE |

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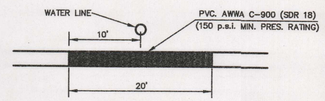



NOTE:
WATER/SEWER SEPARATION DISTANCE AND PROTECTION REQUIREMENTS SHALL COMPLY WITH 30 TAC 290.44(e) AND 317.13.

SAN. SEW. / WATER LINE CROSSING DETAIL
N.T.S.

# SANITARY SEWER PLAN AND PROFILE LINE D STA 0+00 TO END

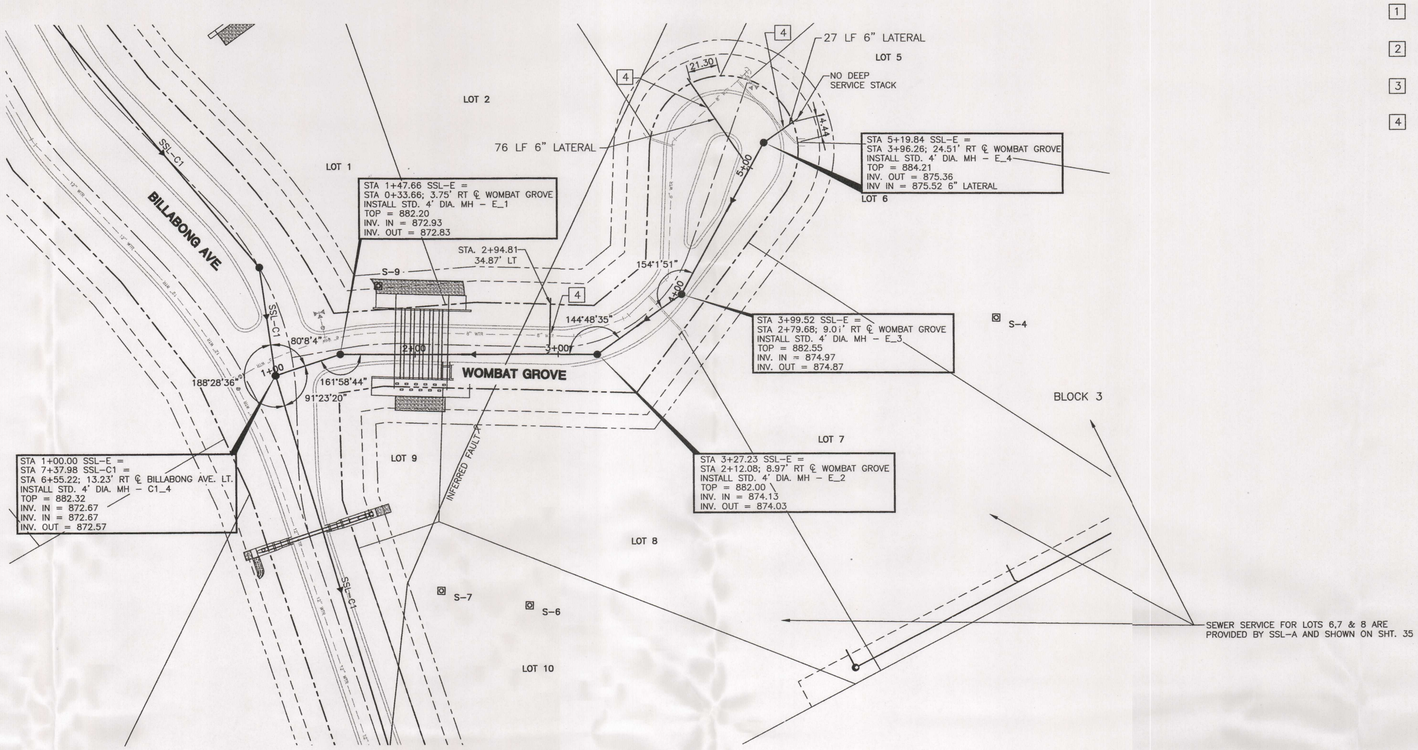
# NEWCOMBE TENNIS RANCH SUBDIVISION UNIT 1

NEW BRAUNFELS, TEXAS

DATE: 5-16-2008
DRAWN BY: B.R.
DESIGNED BY: A.Z.
CHECKED BY: A.Z.
REVIEWED BY: A.Z.
PROJECT NUMBER: 310590.012

SHEET 41 OF 59

Drawing Name: P:\310590.012 Newcombe Tennis Ranch\Construction Plans\Unit 1\Construction Plans\Sewer\310590 Line D.dwg User: rodriguezjx Dec 16, 2008 - 1:37pm




## KEY NOTES

1. PROPOSED 1" WATER SERVICE. SEE WATER LINE CROSSING DETAIL THIS SHEET.
2. PROPOSED 2-1" WATER SERVICES. SEE WATER LINE CROSSING DETAIL THIS SHEET.
3. 20 LF ~ 8" PVC C-900 CENTERED ON WATER LINE.
4. SEE WATER LINE CROSSING DETAIL THIS SHEET.

| NO. | DATE | REVISION | BY |
|---|---|---|---|
| 1 | 12/15/08 | REVISED PER TCEQ COMMENT LETTER DATED DECEMBER 10, 2008 | JR |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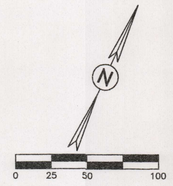
12-14-08




SCALE
HORIZ.: 1" = 50'
VERT.: 1" = 5'

## LEGEND

| EXISTING | PROPOSED | |
|---|---|---|
| -8"W- | -8"W- | WATER MAIN |
| -8"SS- | | SANITARY SEWER |
| | | FIRE HYDRANT |
| | | WATER VALVE |
| | | WATER METER |
| | | SANITARY SEWER MH |
| | | SANITARY SEWER LATERAL |
| | | EXISTING TREE |
| ◆S-6 | | GEOLOGIC FEATURE |

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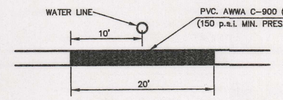
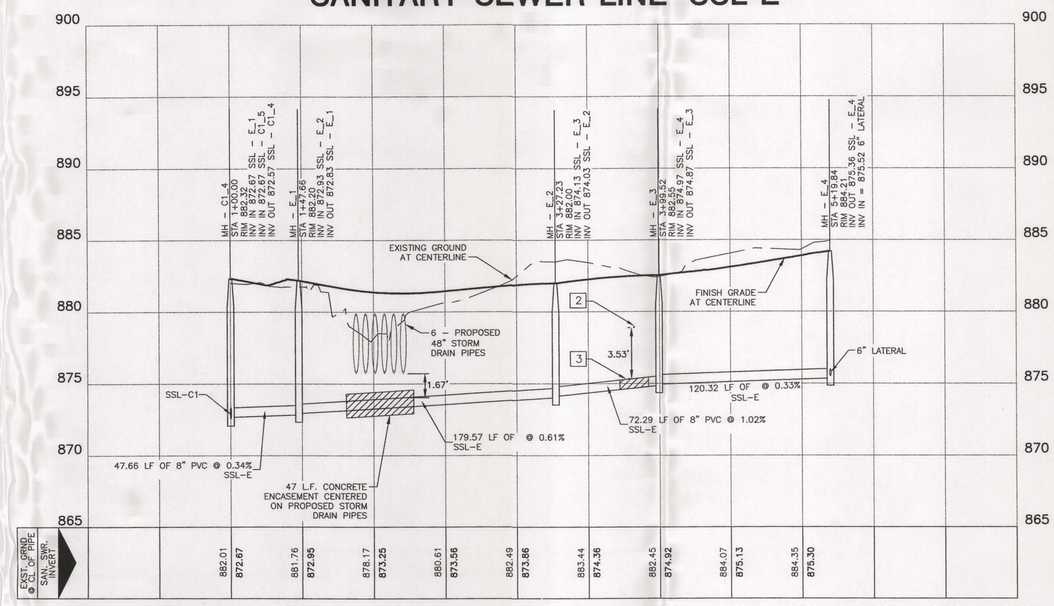



NOTE:
WATER/SEWER SEPARATION DISTANCE AND PROTECTION REQUIREMENTS SHALL COMPLY WITH 30 TAC 290.44(e) AND 317.13.

SAN. SEW. / WATER LINE CROSSING DETAIL
N.T.S.

## SANITARY SEWER LINE "SSL-E"




# SANITARY SEWER PLAN AND PROFILE LINE E STA 0+00 TO END

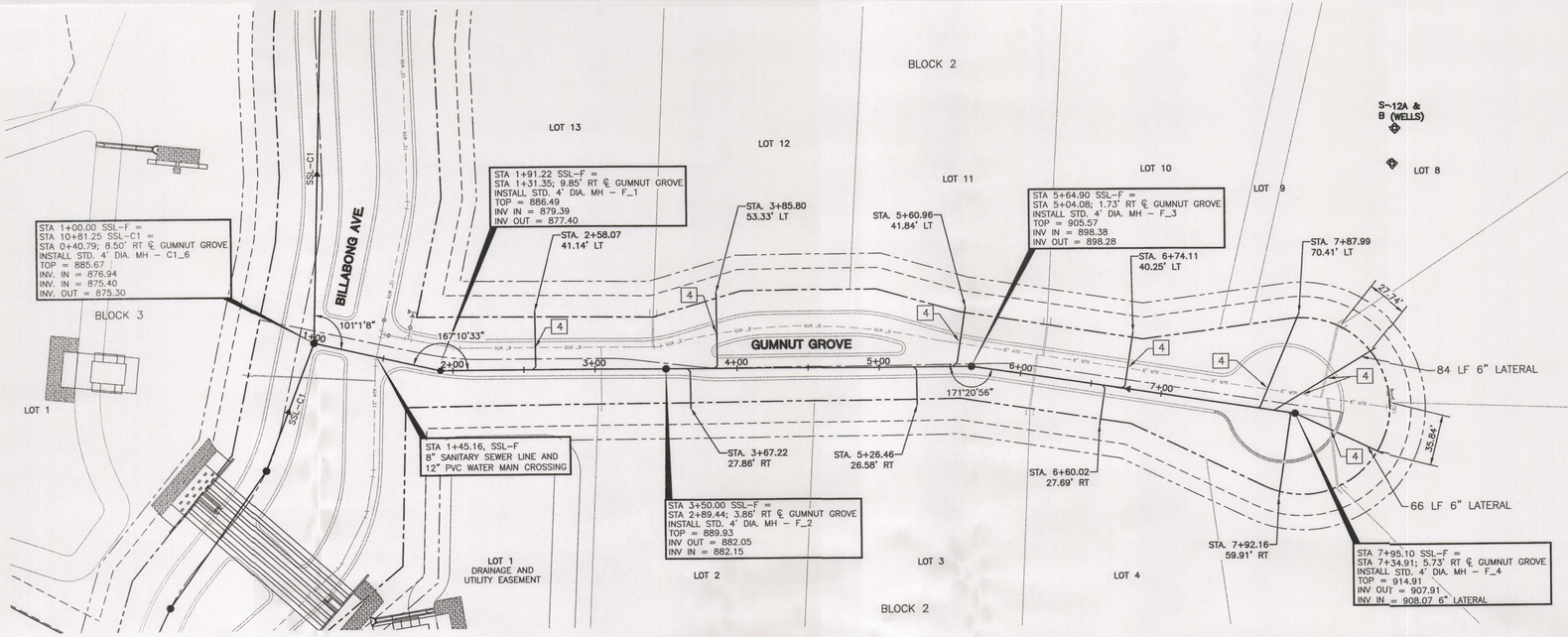
## NEWCOMBE TENNIS RANCH SUBDIVISION UNIT 1

NEW BRAUNFELS, TEXAS

DATE: 5-16-2008
DRAWN BY: B.R.
DESIGNED BY: A.Z.
CHECKED BY: A.Z.
REVIEWED BY: A.Z.
PROJECT NUMBER: 310590.012

SHEET 42 OF 59

Drawing Name: P:\310590.012 Newcombe Tennis Ranch\Construction Plans\Unit 1\Construction Plans\Sewer\310590 Line E.dwg User: rodriguezjx Dec. 16, 2008 - 11:50am




## KEY NOTES

1. PROPOSED 1" WATER SERVICE. SEE WATER LINE CROSSING DETAIL THIS SHEET.
2. PROPOSED 2-1" WATER SERVICES. SEE WATER LINE CROSSING DETAIL THIS SHEET.
3. 20 LF ~ 8" PVC C-900 CENTERED ON WATER LINE.
4. SEE WATER LINE CROSSING DETAIL THIS SHEET.

| NO. | DATE | REVISION | BY |
|---|---|---|---|
| 1 | 12/15/08 | REVISED PER TCEQ COMMENT LETTER DATED DECEMBER 10, 2008 | JR |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San Antonio, Texas 78232-1761
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STATE OF TEXAS
ALEX ZERTUCHE
92080
LICENSED
PROFESSIONAL ENGINEER
12-08

SCALE
HORIZ.: 1" = 50'
VERT.: 1" = 5'

## LEGEND

| EXISTING | PROPOSED | |
|---|---|---|
| —8"W— | —8"W— | WATER MAIN |
| —8"SS— | | SANITARY SEWER |
| | | FIRE HYDRANT |
| | | WATER VALVE |
| | | WATER METER |
| | | SANITARY SEWER MH |
| | | SANITARY SEWER LATERAL |
| | | EXISTING TREE |
| ◆S-6 | | GEOLOGIC FEATURE |

CENTERPOINT ENERGY LOCATOR:
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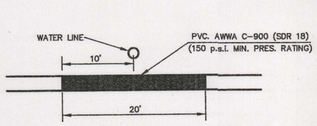
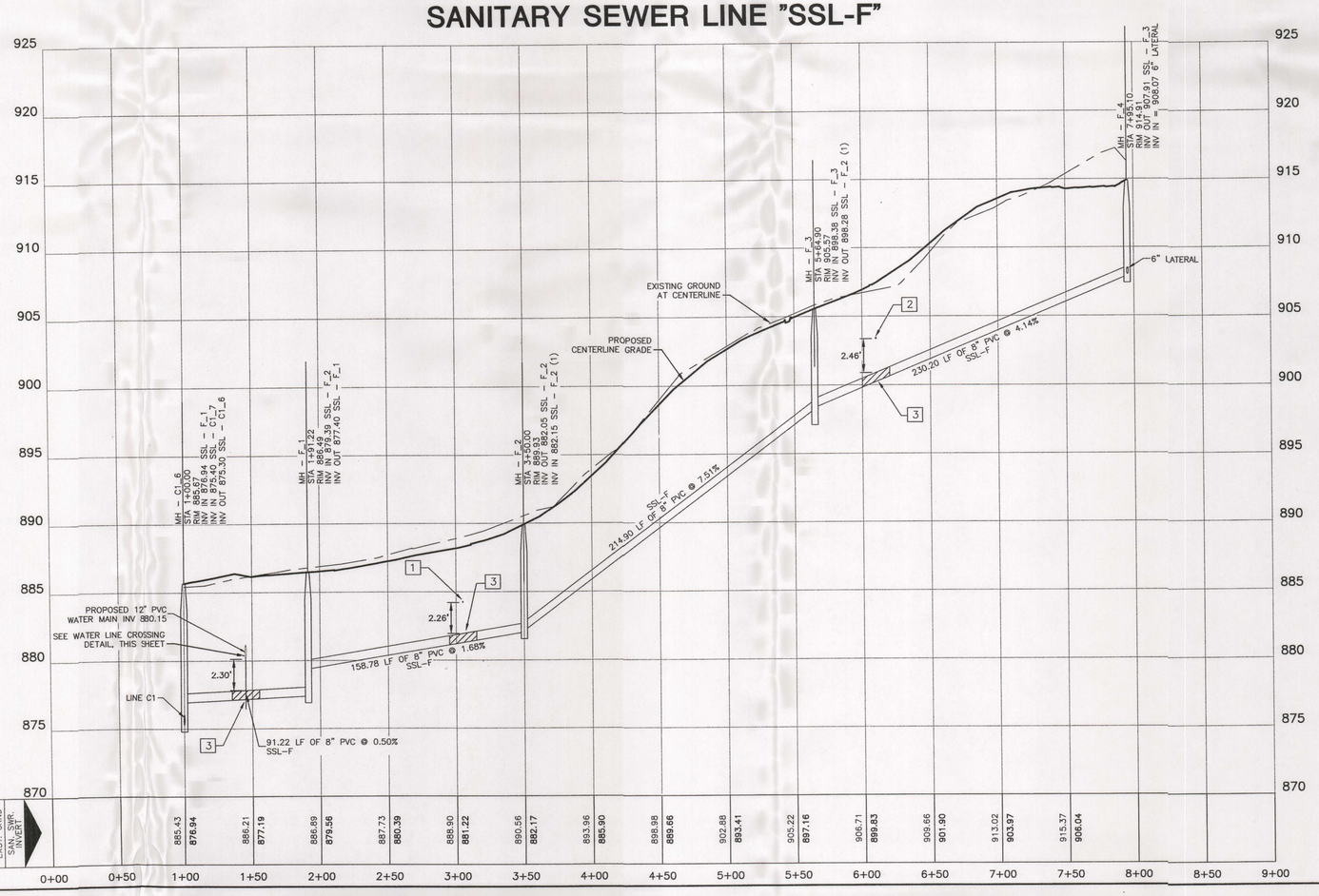



NOTE:
WATER/SEWER SEPARATION DISTANCE AND PROTECTION REQUIREMENTS SHALL COMPLY WITH 30 TAC 290.44(e) AND 317.13.

SAN. SEW. / WATER LINE CROSSING DETAIL
N.T.S.

# SANITARY SEWER LINE "SSL-F"




# SANITARY SEWER PLAN AND PROFILE LINE F STA 0+00 TO END

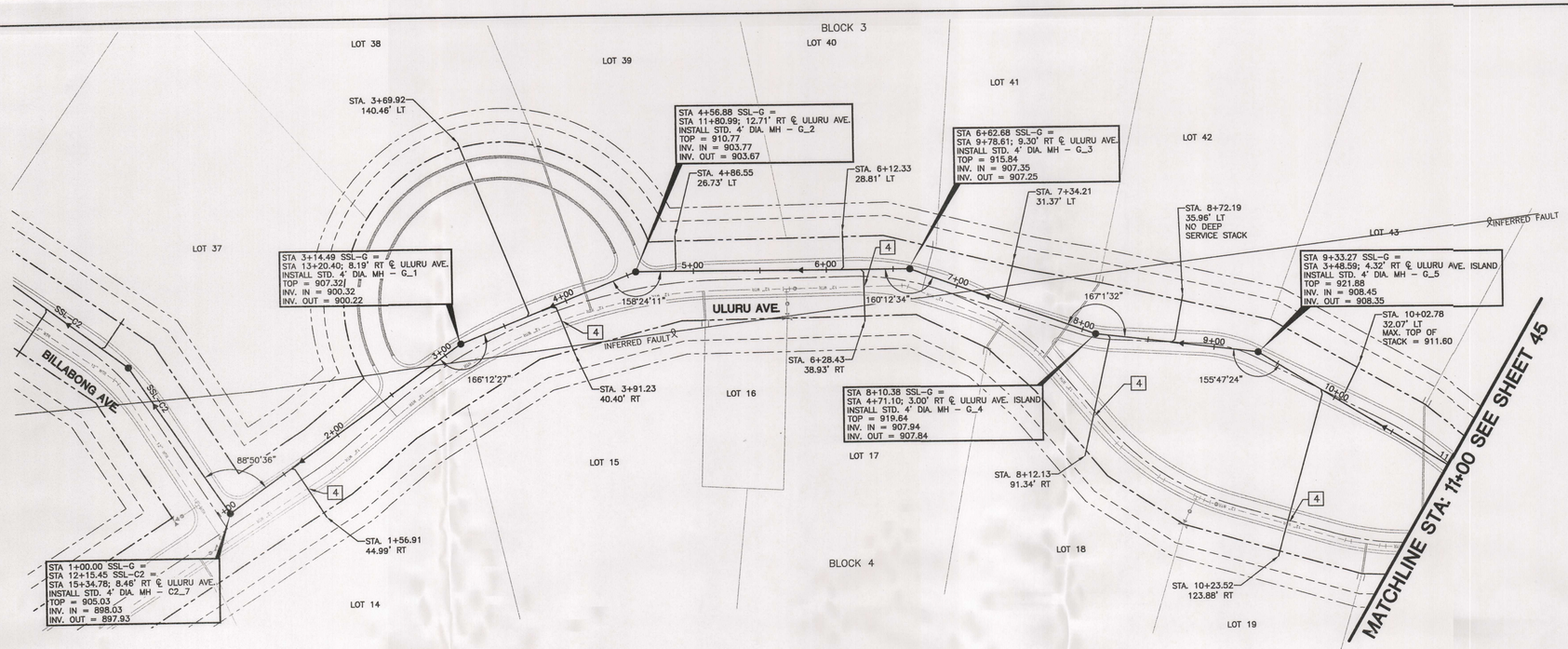
## NEWCOMBE TENNIS RANCH SUBDIVISION UNIT 1

NEW BRAUNFELS, TEXAS

DATE: 5-16-2008
DRAWN BY: B.R.
DESIGNED BY: A.Z.
CHECKED BY: A.Z.
REVIEWED BY: A.Z.
PROJECT NUMBER: 310590.012

SHEET 43 OF 59

Drawing Name: P:\310590.012 Newcombe Tennis Ranch\Construction Plans\Unit 1\Construction Plans\Sheet\310590 Line F.dwg User: rodriguezjx Dec 16, 2008 - 11:53am




## KEY NOTES

1. PROPOSED 1" WATER SERVICE. SEE WATER LINE CROSSING DETAIL THIS SHEET.
2. PROPOSED 2–1" WATER SERVICES. SEE WATER LINE CROSSING DETAIL THIS SHEET.
3. 20 LF ~ 8" PVC C–900 CENTERED ON WATER LINE.
4. SEE WATER LINE CROSSING DETAIL THIS SHEET.
5. PROPOSED 1" WATER SERVICE.
6. PROPOSED 2–1" WATER SERVICES.

| NO. | DATE | REVISION | BY |
|---|---|---|---|
| 1 | 12/15/08 | REVISED PER TCEQ COMMENT LETTER DATED DECEMBER 10, 2008 | JR |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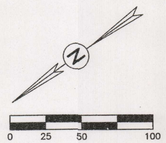
12/16/08




SCALE
HORIZ.: 1" = 50'
VERT.: 1" = 5'

## LEGEND

| EXISTING | PROPOSED | |
|---|---|---|
| –8"W– | –8"W– | WATER MAIN |
| –8"SS– | | SANITARY SEWER |
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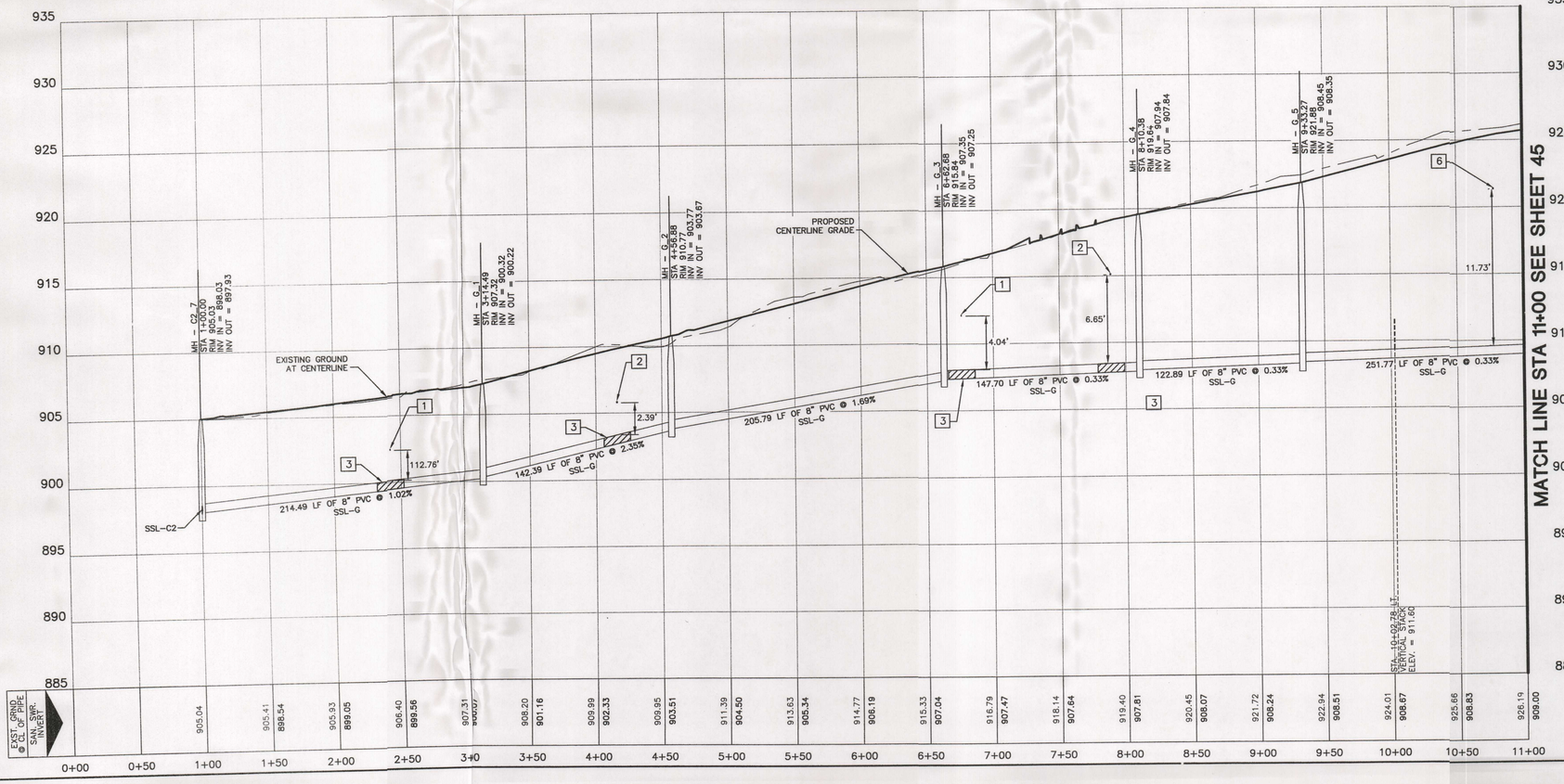
| | | WATER VALVE |
| | | WATER METER |
| | | SANITARY SEWER MH |
| | | SANITARY SEWER LATERAL |
| | | EXISTING TREE |
| *S–6 | | GEOLOGIC FEATURE |

# SANITARY SEWER PLAN AND PROFILE LINE G STA 0+00 TO 11+00

## NEWCOMBE TENNIS RANCH SUBDIVISION UNIT 1

NEW BRAUNFELS, TEXAS

## SANITARY SEWER LINE "SSL-G"

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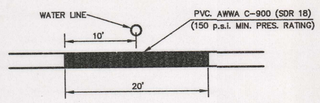


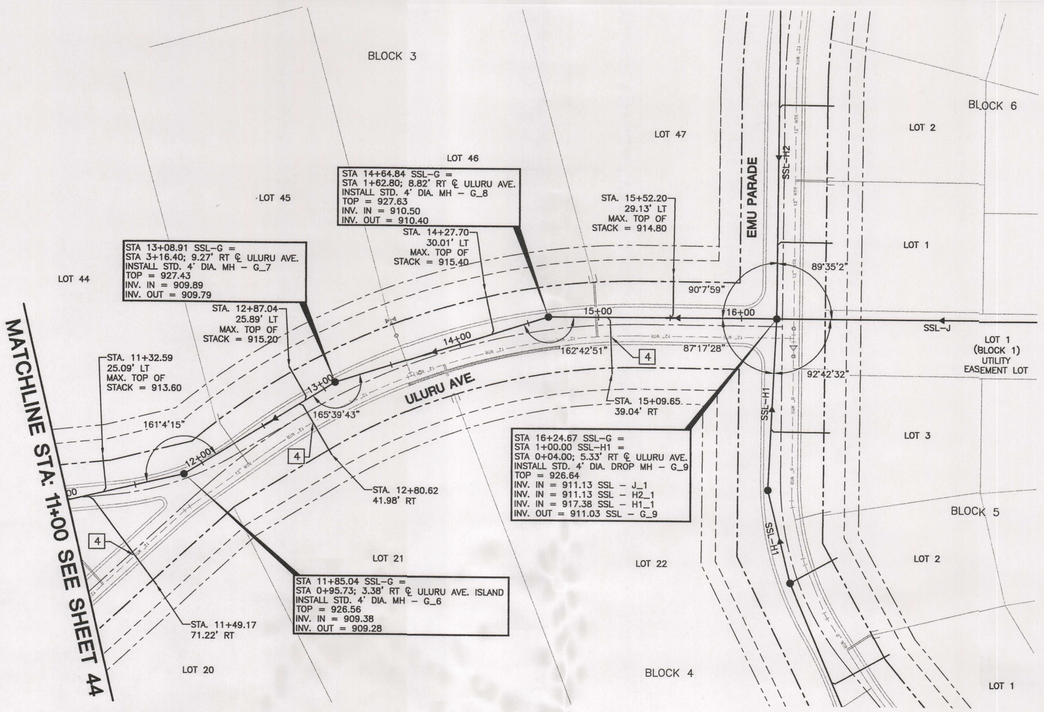

NOTE:
WATER/SEWER SEPARATION DISTANCE AND PROTECTION REQUIREMENTS SHALL COMPLY WITH 30 TAC 290.44(e) AND 317.13.

SAN. SEW. / WATER LINE CROSSING DETAIL
N.T.S.

DATE: 5-16-2008
DRAWN BY: B.R.
DESIGNED BY: A.Z.
CHECKED BY: A.Z.
REVIEWED BY: A.Z.
PROJECT NUMBER: 310590.012

SHEET 44 OF 59

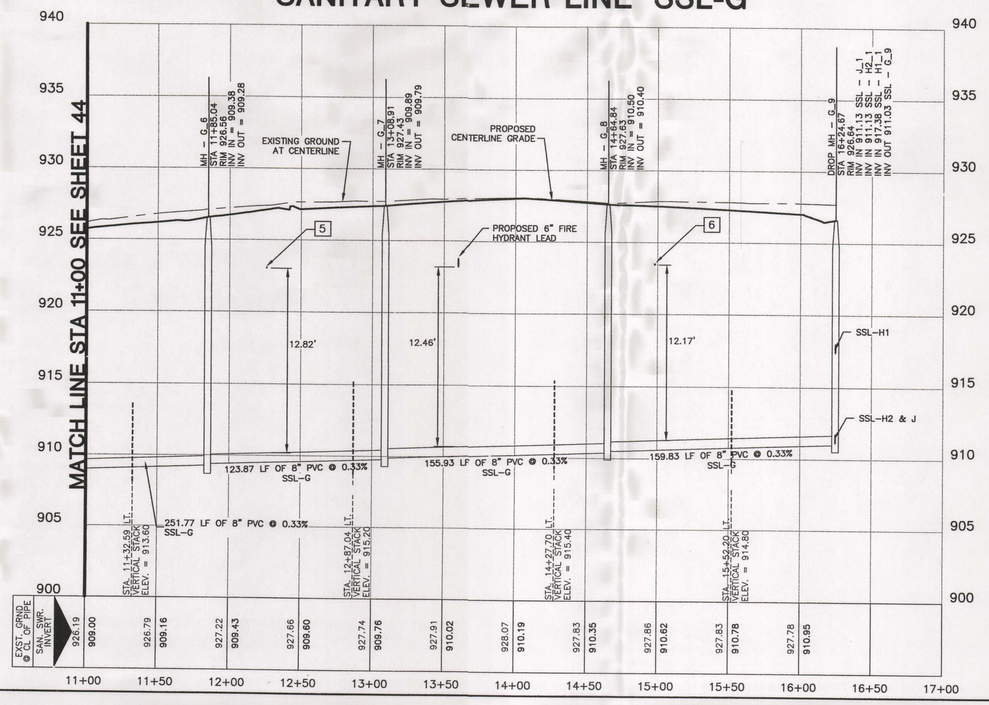

Drawing Name: P:\310590.012 Newcombe Tennis Ranch\Construction Plans\Unit 1\Construction Plans\Sewer\310590 Line G.dwg User: rodriguezjx Dec 16, 2008 - 2:28pm

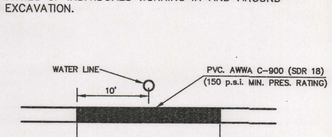



# KEY NOTES

1. PROPOSED 1" WATER SERVICE. SEE WATER LINE CROSSING DETAIL THIS SHEET.
2. PROPOSED 2-1" WATER SERVICES. SEE WATER LINE CROSSING DETAIL THIS SHEET.
3. 20 LF ~ 8" PVC C-900 CENTERED ON WATER LINE.
4. SEE WATER LINE CROSSING DETAIL THIS SHEET.
5. PROPOSED 1" WATER SERVICE.
6. PROPOSED 2-1" WATER SERVICES.

# SANITARY SEWER LINE "SSL-G"

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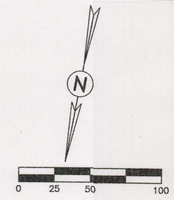
## SAN. SEW. / WATER LINE CROSSING DETAIL

N.T.S.




SCALE
HORIZ.: 1" = 50'
VERT.: 1" = 5'

# LEGEND

| EXISTING | PROPOSED | |
|---|---|---|
| -8"W- | —8"W— | WATER MAIN |
| -8"SS- | | SANITARY SEWER |
| | | FIRE HYDRANT |
| | | WATER VALVE |
| | | WATER METER |
| | | SANITARY SEWER MH |
| | | SANITARY SEWER LATERAL |
| | | EXISTING TREE |
| ◆ *S-6 | | GEOLOGIC FEATURE |

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| NO. | DATE | REVISION | BY |
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| 1 | 12/15/08 | REVISED PER TCEQ COMMENT LETTER DATED DECEMBER 10, 2008 | JR |

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PROFESSIONAL ENGINEER
12-16-08

# SANITARY SEWER PLAN AND PROFILE LINE G STA 11+00 TO END

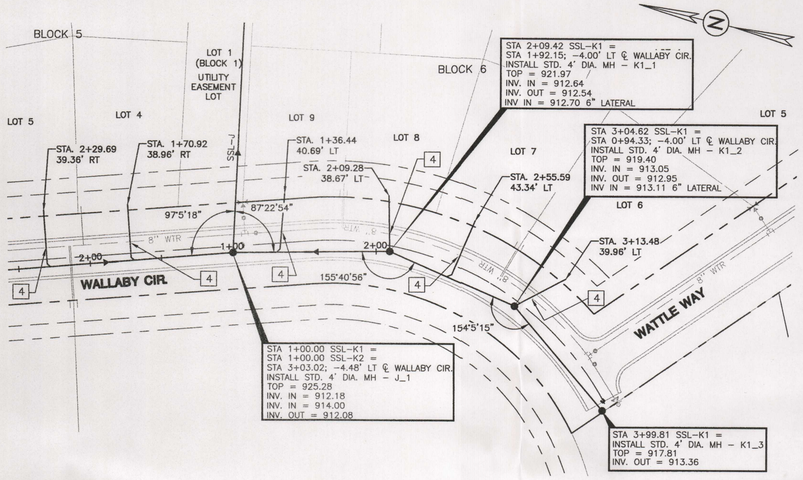
## NEWCOMBE TENNIS RANCH SUBDIVISION UNIT 1

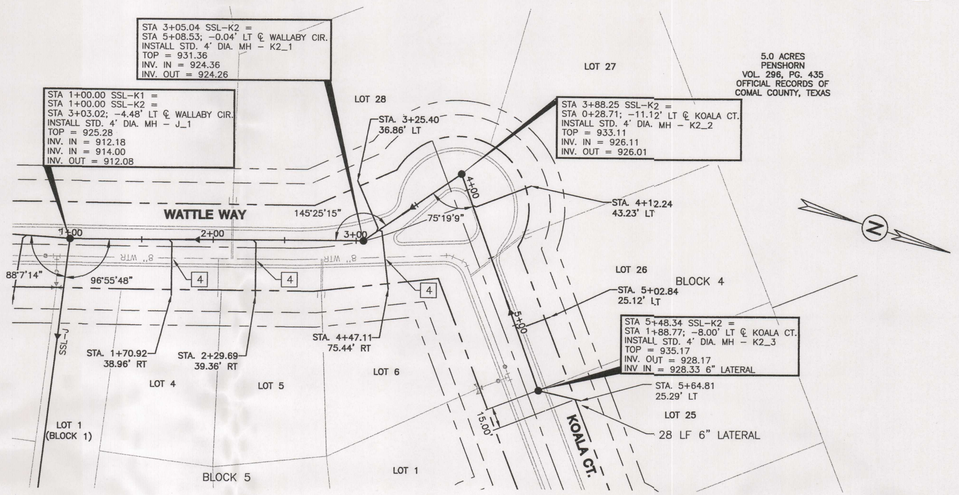
NEW BRAUNFELS, TEXAS

DATE: 5-16-2008
DRAWN BY: B.R.
DESIGNED BY: A.Z.
CHECKED BY: A.Z.
REVIEWED BY: A.Z.
PROJECT NUMBER: 310590.012

SHEET 45 OF 59

Drawing Name: P:\310590.012 Newcombe Tennis Ranch\Construction Phase\Unit 1\Construction Phase\Sewer\310590 Line G.dwg User: rodriguezjk Dec 16, 2008 - 2:29pm




## KEY NOTES

1. PROPOSED 1" WATER SERVICE. SEE WATER LINE CROSSING DETAIL THIS SHEET.
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3. 20 LF ~ 8" PVC C-900 CENTERED ON WATER LINE.
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STATE OF TEXAS
ALEX ZERTUCHE
92080
LICENSED PROFESSIONAL ENGINEER
12-16-08

0 25 50 100
SCALE
HORIZ.: 1" = 50'
VERT.: 1" = 5'

## LEGEND

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|---|---|---|
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| -8"SS- | | SANITARY SEWER |
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| | | WATER VALVE |
| | | WATER METER |
| | | SANITARY SEWER MH |
| | | SANITARY SEWER LATERAL |
| | | EXISTING TREE |
| *S-6 | | GEOLOGIC FEATURE |

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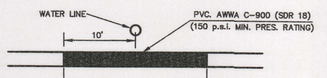


NOTE:
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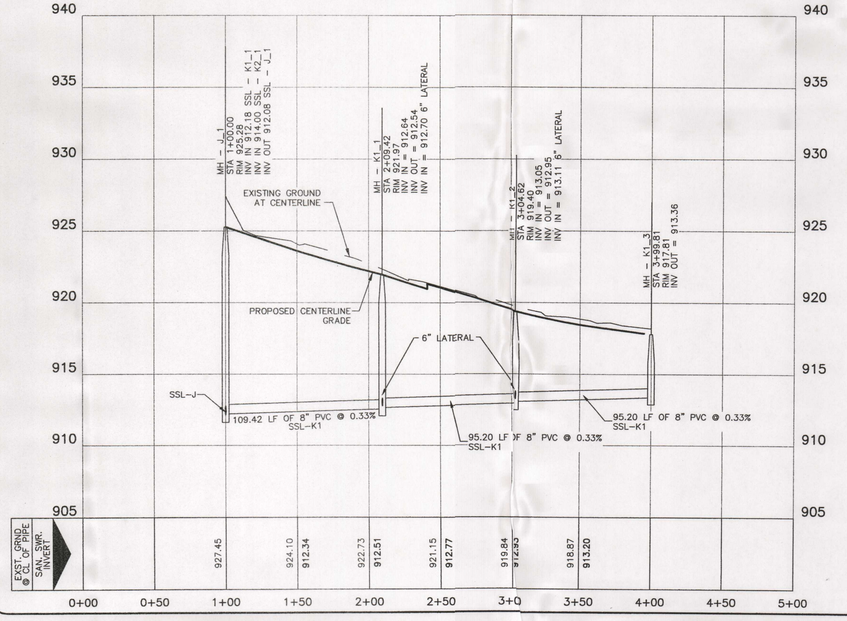
SAN. SEW. / WATER LINE CROSSING DETAIL
N.T.S.

## SANITARY SEWER LINE "SSL-K1"

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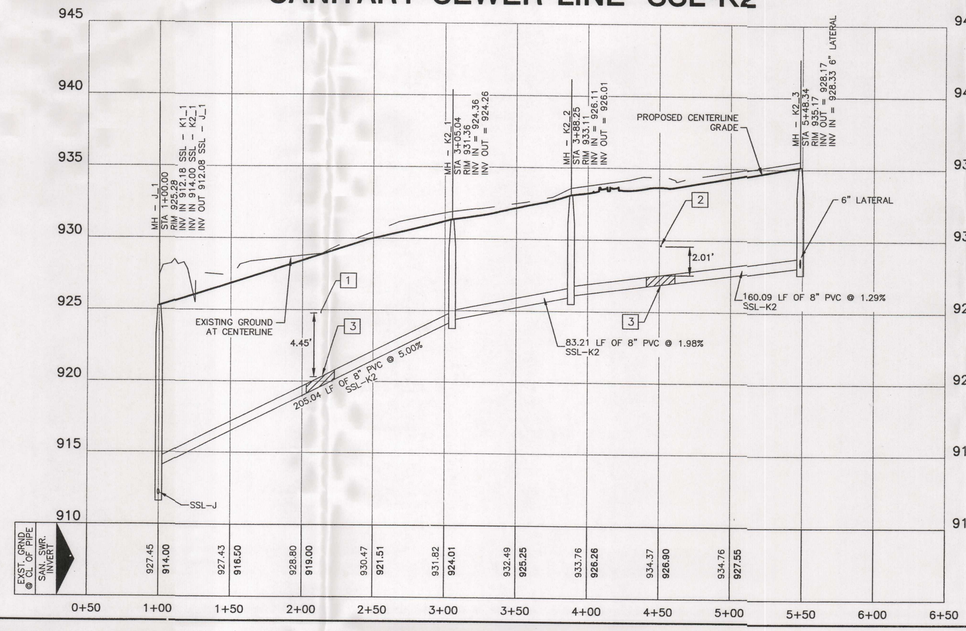



| | |
|---|---|
| DATE: | 5-16-2008 |
| DRAWN BY: | B.R. |
| DESIGNED BY: | A.Z. |
| CHECKED BY: | A.Z. |
| REVIEWED BY: | A.Z. |
| PROJECT NUMBER: | 310590.012 |

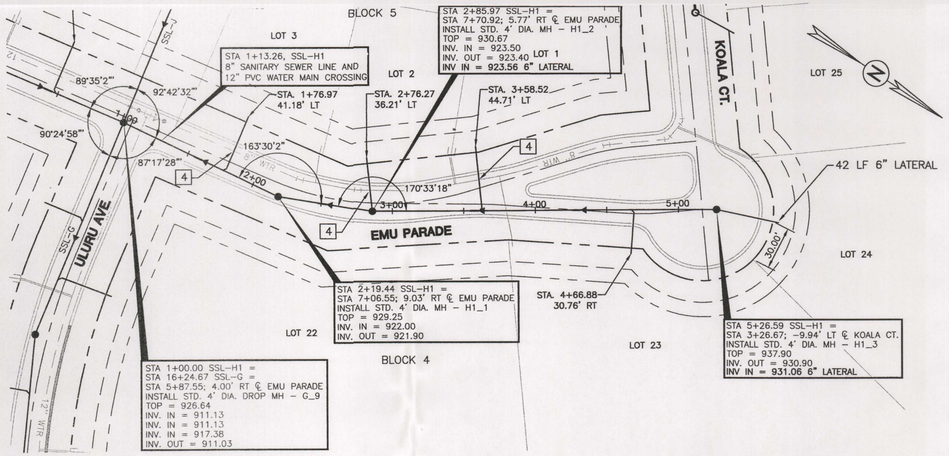
# SANITARY SEWER PLAN AND PROFILE LINES K1 & K2 STA 0+00 TO END

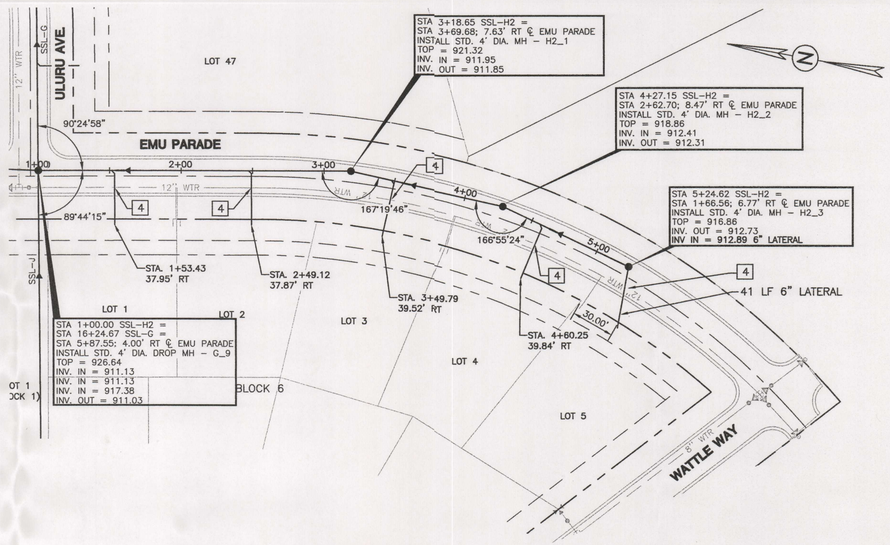
## NEWCOMBE TENNIS RANCH SUBDIVISION UNIT 1

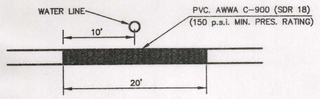
NEW BRAUNFELS, TEXAS

SHEET 48 OF 59

Drawing Name: P:\310590.012 Newcombe Tennis Ranch\Construction Plans\Unit 1\Construction Plans\Sewer\310590 Line K1_K2.dwg User: rodriguezjx Dec 16, 2008 - 12:42pm




NOTE:
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SAN. SEW. / WATER LINE CROSSING DETAIL

N.T.S.

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

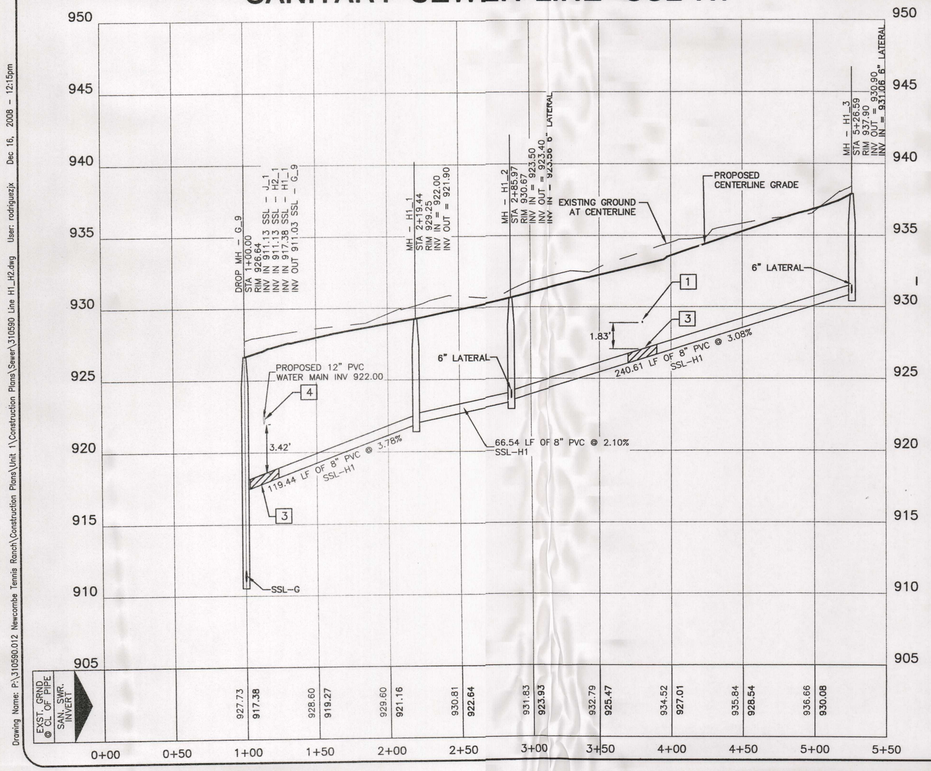
0 25 50 100

SCALE
HORIZ.: 1" = 50'
VERT.: 1" = 5'

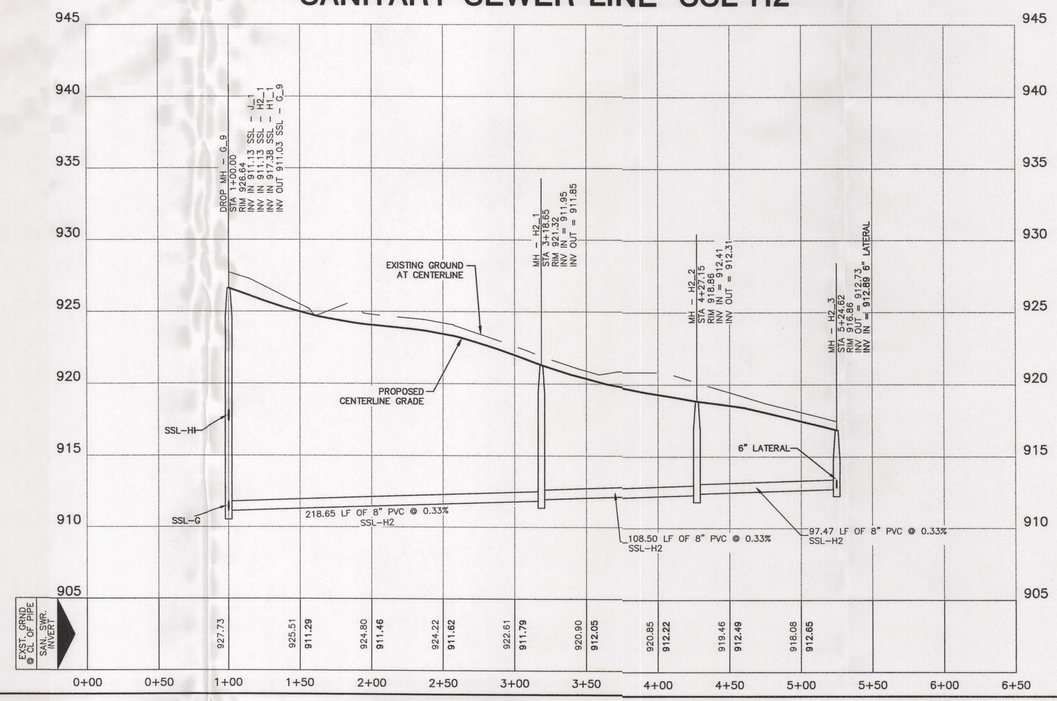
## LEGEND

| EXISTING | PROPOSED | |
|---|---|---|
| -8"W- | -8"W- | WATER MAIN |
| -8"SS- | | SANITARY SEWER |
| | | FIRE HYDRANT |
| | | WATER VALVE |
| | | WATER METER |
| | | SANITARY SEWER MH |
| | | SANITARY SEWER LATERAL |
| | | EXISTING TREE |
| ◆ *S-6 | | GEOLOGIC FEATURE |

## SANITARY SEWER LINE "SSL-H1"




## SANITARY SEWER LINE "SSL-H2"




| NO. | DATE | REVISION |
|---|---|---|
| 1 | 12/15/08 | REVISED PER TCEQ COMMENT LETTER DATED DECEMBER 10, 2008 |
| | | BY: JR |

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Consultants in Engineering, Architecture, Construction Management and Related Services
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San Antonio, Texas 78232
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STATE OF TEXAS
ALEX ZERTUCHE
92080
LICENSED PROFESSIONAL ENGINEER
12-16-08

# SANITARY SEWER PLAN AND PROFILE LINES - H1 & H2 STA 0+00 TO END

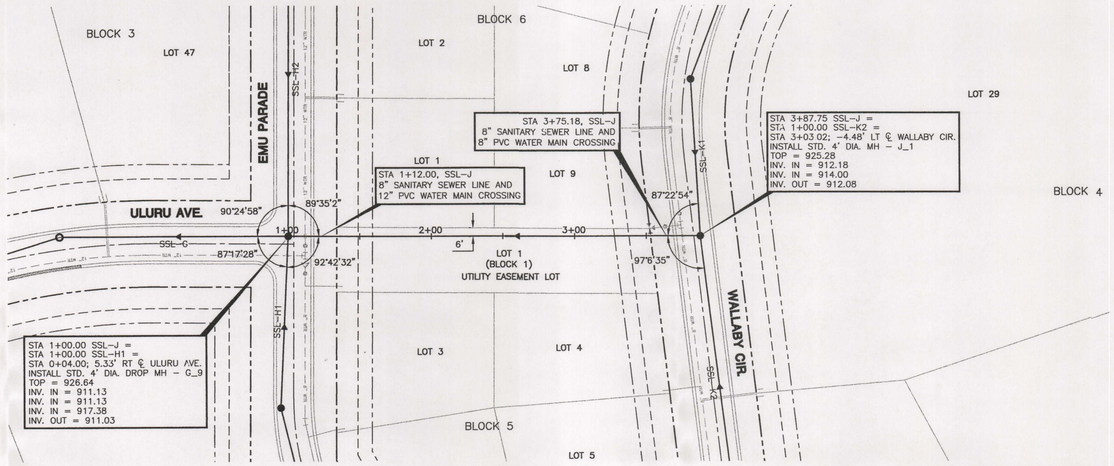
# NEWCOMBE TENNIS RANCH SUBDIVISION UNIT 1

NEW BRAUNFELS, TEXAS

DATE: 5-16-2008
DRAWN BY: B.R.
DESIGNED BY: A.Z.
CHECKED BY: A.Z.
REVIEWED BY: A.Z.
PROJECT NUMBER: 310590.012

SHEET 46 OF 59

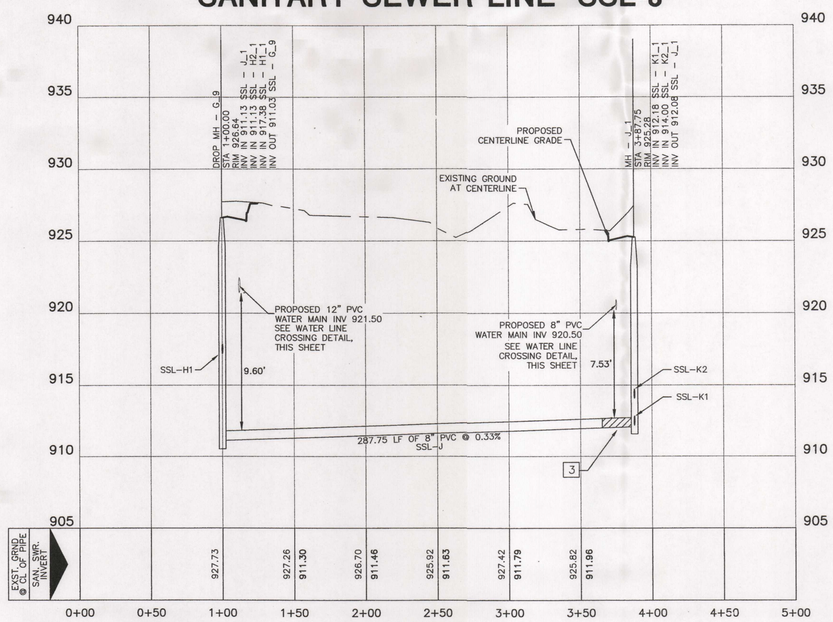
Drawing Name: P:\310590.012 Newcombe Tennis Ranch\Construction Plans\Unit 1\Construction Plans\Sewer\310590 Line H1_H2.dwg User: rodriguezjk Dec 16, 2008 - 12:15pm

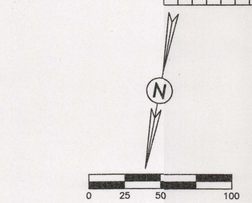



## KEY NOTES

1. PROPOSED 1" WATER SERVICE. SEE WATER LINE CROSSING DETAIL THIS SHEET.
2. PROPOSED 2-1" WATER SERVICES. SEE WATER LINE CROSSING DETAIL THIS SHEET.
3. 20 LF ~ 8" PVC C-900 CENTERED ON WATER LINE.
4. SEE WATER LINE CROSSING DETAIL THIS SHEET.

## SANITARY SEWER LINE "SSL-J"



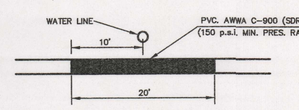




SCALE
HORIZ.: 1" = 50'
VERT.: 1" = 5'

## LEGEND

| EXISTING | PROPOSED | |
|---|---|---|
| -8"W- | -8"W- | WATER MAIN |
| -8"SS- | | SANITARY SEWER |
| | | FIRE HYDRANT |
| | | WATER VALVE |
| | | WATER METER |
| | | SANITARY SEWER MH |
| | | SANITARY SEWER LATERAL |
| | | EXISTING TREE |
| ◆"S-6 | | GEOLOGIC FEATURE |

CENTERPOINT ENERGY LOCATOR:
CALL LOCATOR AT 811 OR (800) 227-6477, 48 HOURS BEFORE BEGINNING ANY EXCAVATION.
DUE TO FEDERAL REGULATIONS TITLE 49, PART 192.181, CENTERPOINT ENERGY MUST MAINTAIN ACCESS TO GAS VALVES AT ALL TIMES. THE CONTRACTOR MUST PROTECT AND WORK AROUND ANY GAS VALVES THAT ARE IN THE PROJECT LIMITS.
TELEPHONE LOCATOR:
"THE EXISTENCE AND LOCATION OF UNDERGROUND CABLE INDICATED ON THE PLANS ARE TAKEN FROM THE BEST RECORDS AVAILABLE AND ARE NOT GUARANTEED TO BE ACCURATE. CONTRACTOR TO CONTACT TELEPHONE COMPANY CABLE LOCATOR 48 HOURS PRIOR TO EXCAVATION AT 1-800-828-5127. CONTRACTOR HAS THE RESPONSIBILITY TO PROTECT AND SUPPORT TELEPHONE COMPANY PLANT DURING CONSTRUCTION."
TRENCH EXCAVATION SAFETY PROTECTION:
CONTRACTOR AND/OR CONTRACTOR'S INDEPENDENTLY RETAINED EMPLOYEE OR STRUCTURAL DESIGN / GEOTECHNICAL / SAFETY / EQUIPMENT CONSULTANT, IF ANY, SHALL REVIEW THESE PLANS AND AVAILABLE GEOTECHNICAL INFORMATION AND THE ANTICIPATED INSTALLATION SITE(S) WITHIN THE PROJECT LIMITS IN ORDER TO IMPLEMENT CONTRACTOR'S TRENCH EXCAVATION SAFETY PROTECTION SYSTEMS, PROGRAMS, AND/OR PROCEDURES FOR THE THE PROJECT DESCRIBED IN THE CONTRACT DOCUMENTS. THE CONTRACTOR'S IMPLEMENTATION OF THESE SYSTEMS, PROGRAMS AND/OR PROCEDURES SHALL PROVIDE FOR ADEQUATE TRENCH EXCAVATION SAFETY PROTECTION THAT COMPLIES WITH, AS A MINIMUM, OSHA STANDARDS FOR TRENCH EXCAVATIONS. SPECIFICALLY, CONTRACTOR AND/OR CONTRACTOR'S INDEPENDENTLY RETAINED EMPLOYEE OR SAFETY CONSULTANT SHALL IMPLEMENT A TRENCH SAFETY PROGRAM IN ACCORDANCE WITH OSHA STANDARDS GOVERNING THE PRESENCE AND ACTIVITIES OF INDIVIDUALS WORKING IN AND AROUND TRENCH EXCAVATION.




NOTE:
WATER/SEWER SEPARATION DISTANCE AND PROTECTION REQUIREMENTS SHALL COMPLY WITH 30 TAC 290.44(e) AND 317.13.

SAN. SEW. / WATER LINE CROSSING DETAIL
N.T.S.

| NO. | DATE | REVISION | BY |
|---|---|---|---|
| 1 | 12/15/08 | REVISED PER TCEQ COMMENT LETTER DATED DECEMBER 10, 2008 | JR |

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San Antonio, Texas 78232
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STATE OF TEXAS
ALEX ZERTUCHE
92080
LICENSED
PROFESSIONAL ENGINEER
12-16-08

# SANITARY SEWER PLAN AND PROFILE LINE J STA 0+00 TO END

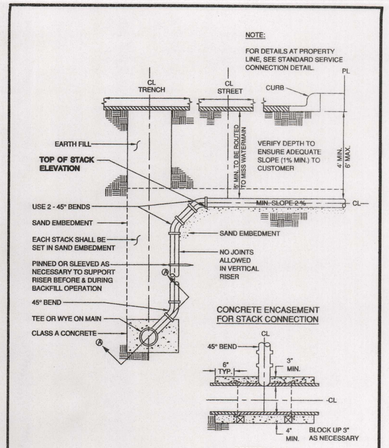
## NEWCOMBE TENNIS RANCH SUBDIVISION UNIT 1

NEW BRAUNFELS, TEXAS

DATE: 5-16-2008
DRAWN BY: B.R.
DESIGNED BY: A.Z.
CHECKED BY: A.Z.
REVIEWED BY: A.Z.
PROJECT NUMBER: 310590.012

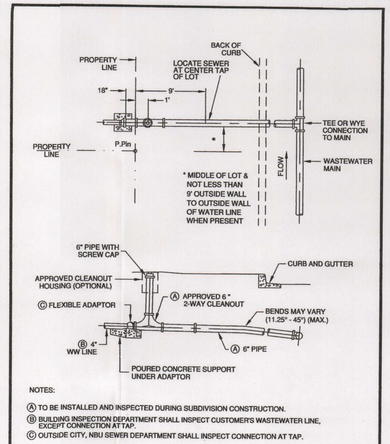
SHEET 47 OF 59

Drawing Name: P:\310590.012 Newcombe Tennis Ranch\Construction Plans\Unit 1\Construction Plans\Sanw\310590 Line J.dwg User: rodriguezjx Dec 16, 2008 - 1:40pm



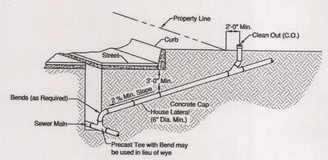

NBU — NEW BRAUNFELS UTILITIES, WATER SYSTEMS ENGINEERING — Drawn By: JD Amaro — Approved By: — Standard Drawing: WASTEWATER DEEP SERVICE CONNECTION DETAIL — Updated: 4-15-03 — Scale: N.T.S. — Sheet: 1 OF 1 — Drawing No.: 301

WASTEWATER DEEP SERVICE CONNECTION STACKS WILL BE USED WHERE THE SEWER MAIN IS DEEPER THAN 8 FEET UNLESS OTHERWISE NOTED IN PLAN SHEETS. SEE PLANS FOR MAX. TOP OF STACK ELEVATIONS.




NOTES:
Ⓐ TO BE INSTALLED AND INSPECTED DURING SUBDIVISION CONSTRUCTION.
Ⓑ BUILDING INSPECTION DEPARTMENT SHALL INSPECT CUSTOMER'S WASTEWATER LINE, EXCEPT CONNECTION AT TAP.
Ⓒ OUTSIDE CITY, NBU SEWER DEPARTMENT SHALL INSPECT CONNECTION AT TAP.

NBU — NEW BRAUNFELS UTILITIES, WATER SYSTEMS ENGINEERING — Drawn By: H Shadrock — Approved By: — Standard Drawing: SINGLE WASTEWATER SERVICE CONNECTION DETAIL — Updated: 4-28-03 — Scale: N.T.S. — Sheet: 1 OF 2 — Drawing No.: 302



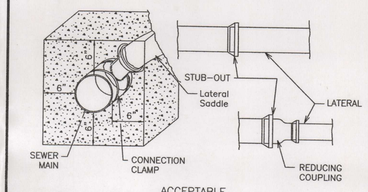

GENERAL NOTES
1. ALL CONSTRUCTION AND MATERIALS SHALL BE IN STRICT CONFORMANCE WITH APPLICABLE PROVISION OF "STANDARD SPECIFICATION FOR PUBLIC WORKS CONSTRUCTION".
2. MANHOLE RINGS AND COVERS SHALL BE TRANS-TEX A77, OR EQUAL, WHEN WATER TIGHT MANHOLE RINGS AND COVERS ARE SPECIFIED, THEY SHALL BE TRANS-77, "X" RING OR APPROVED EQUAL.
3. A. MATERIAL FOR SANITARY SEWER PIPE MUST BE THE SAME FROM MANHOLE TO MANHOLE. CHANGES IN TYPE OF PIPE MAY BE MADE ONLY AT MANHOLES, OR SPECIAL STRUCTURES, EXCEPT AS APPROVED BY THE NBU PROJECT ENGINEER.
B. ADAPTERS AND CONCRETE COLLARS SHALL BE USED AS DIRECTED BY THE ENGINEER AND AS APPROVED BY THE NBU PROJECT ENGINEER.
4. ALL SEWER PIPE WITH LESS THAN THREE FEET (3'-0") OF COVER SHALL BE CONC. ENCASED, AS PER ITEM NO. 407.
5. ALL FORCE MAINS SHALL BE PROVIDED WITH THRUST BLOCKS. WHERE CHANGES IN DIRECTION OCCUR, AT TEES, BENDS, CROSSES, CHANGES IN SIZE, STOPS (DEAD ENDS). VALVES AND /OR AS SHOWN BELOW, OR AS DIRECTED BY THE ENGINEER.
6. ALL CONCRETE USED FOR THRUST BLOCKING SHALL HAVE A MINIMUM CONCRETE STRENGTH OF 3500 PSI.
7. ALL MANDRELS MUST BE APPROVED BY NBU CONSTRUCTION INSPECTIONS AND STAMPED BEFORE USE.
8. REFER DRAWINGS TO THE "NEW BRAUNFELS WATER SYSTEMS STANDARD DRAWINGS FOR SANITARY SEWER CONSTRUCTION."

NOTES:
1. MATERIALS FOR SANITARY SEWER LATERAL SHALL CONFORM TO THE CITY OF NEW BRAUNFELS STANDARD SPECIFICATIONS FOR PRIVATE SEWAGE FACILITIES. ALL FLEXIBLE PIPE SHALL CONFORM TO A MINIMUM OF ASTM DESIGNATION D-3034 (SDR-35 OR BETTER) WITH COMPRESSION JOINTS. GASKETS OR SHALL BE SOLVENT JOINT ENGINEER, REGISTERED SANITARIAN, OR APPROPRIATE CITY INSPECTOR INSPECT AND CERTIFY THE SERVICE LATERAL PRIOR TO COVERING IN ACCORDANCE WITH 31 TAC 333.91.4 (f) (ii). ALTER OF CERTIFICATION MUST BE SENT TO THE TCEQ NEW BRAUNFELS OFFICE.
B. IF THE PROPERTY IS INSIDE NEW BRAUNFELS CITY LIMITS, A PERMIT IS REQUIRED FROM THE CITY OF NEW BRAUNFELS BUILDING AND ZONING PLUMBING SECTION (830-9000).
C. IF THE PROPERTY IS OUTSIDE NEW BRAUNFELS CITY LIMITS AND OVER THE EDWARDS RECHARGE ZONE, A PERMIT IS REQUIRED FROM THE NEW BRAUNFELS WATER SYSTEM (830-929-8417).

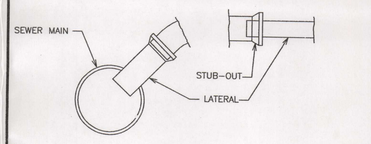
HOUSE LATERAL DETAIL
NOT TO SCALE

NBU — NEW BRAUNFELS UTILITIES, WATER SYSTEMS ENGINEERING — Drawn By: JD Amaro — Approved By: — Standard Drawing: HOUSE LATERAL DETAIL — Updated: 5-6-03 — Scale: N.T.S. — Sheet: 1 OF 1 — Drawing No.: 303

LATERAL CONNECTION TO EXISTING SEWER MAIN/STUB-OUT

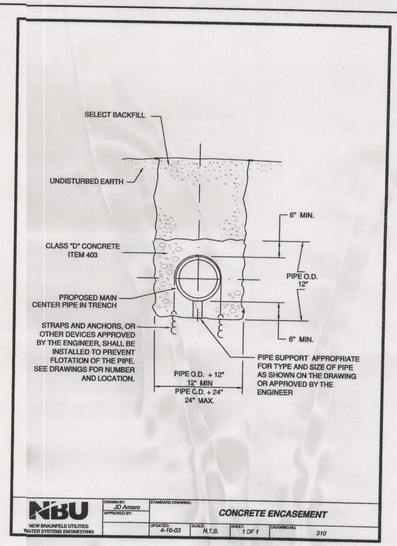



ACCEPTABLE




UNACCEPTABLE

NOTE:
THE SADDLE SHALL BE PERMANENTLY BONDED TO THE EXISTING MAIN BY THE USE OF COMPOUNDS OR OR CLAMPS AS RECOMMENDED BY THE MANUFACTURER.




NBU — NEW BRAUNFELS UTILITIES, WATER SYSTEMS ENGINEERING — Drawn By: JD Amaro — Approved By: — Standard Drawing: CONCRETE ENCASEMENT — Updated: 4-16-03 — Scale: N.T.S. — Sheet: 1 OF 1 — Drawing No.: 310

| NO. | DATE | REVISION | BY |
|---|---|---|---|
| 1 | 12/15/08 | REVISED PER TCEQ COMMENT LETTER DATED DECEMBER 10, 2008 | JR |

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STATE OF TEXAS — ALEX ZERTUCHE — 92080 — LICENSED PROFESSIONAL ENGINEER — 12-16-08

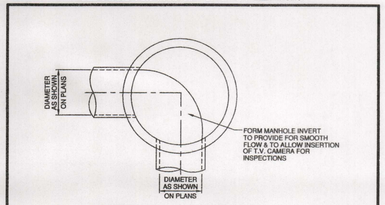
# SANITARY SEWER DETAILS

## NEWCOMBE TENNIS RANCH SUBDIVISION UNIT 1

NEW BRAUNFELS, TEXAS

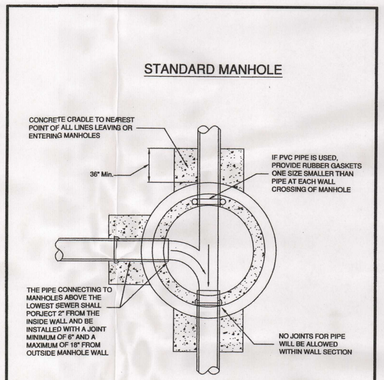
DATE: 5-26-2008
DRAWN BY: B.R.
DESIGNED BY: A.Z.
CHECKED BY: A.Z.
REVIEWED BY: A.Z.
PROJECT NUMBER: 310590.012

SHEET 49 OF 59



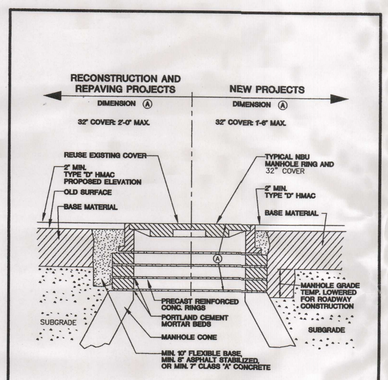

NBU — NEW BRAUNFELS UTILITIES, WATER SYSTEMS ENGINEERING — Drawn By: JD Amaro — Approved By: — Standard Drawing: MANHOLE INVERT PLAN — Updated: 4-16-03 — Scale: N.T.S. — Sheet: 1 OF 2 — Drawing No.: 320

## STANDARD MANHOLE



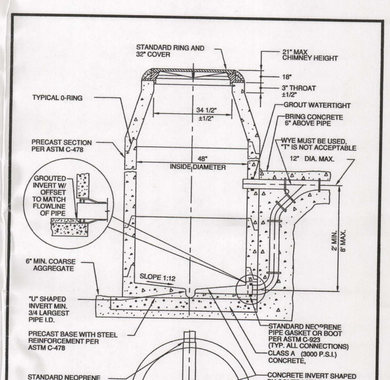

MANHOLE FLOOR PLAN
AUGUST 1998

NBU — NEW BRAUNFELS UTILITIES, WATER SYSTEMS ENGINEERING — Drawn By: H Shadrock — Approved By: — Standard Drawing: STANDARD MANHOLE MANHOLE FLOOR PLAN — Updated: 5-6-03 — Scale: N.T.S. — Sheet: 2 OF 2 — Drawing No.: 320

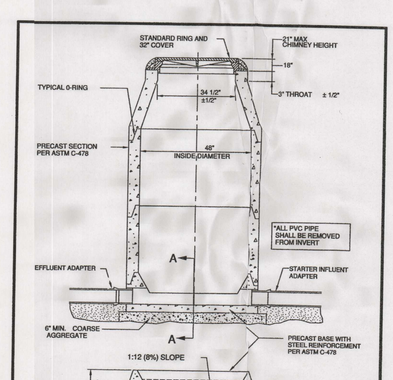



NOTES:
1. MORTAR BEDS SHALL NOT EXCEED 1".
2. SUBGRADE AND BASE MATERIALS SHALL BE COMPACTED ACCORDING TO STANDARD SPECIFICATIONS.

NBU — NEW BRAUNFELS UTILITIES, WATER SYSTEMS ENGINEERING — Drawn By: JD Amaro — Approved By: — Standard Drawing: NEW MANHOLE CONSTRUCTION AND MINOR MANHOLE ADJUSTMENT — Updated: 4-16-03 — Scale: N.T.S. — Sheet: 1 OF 1 — Drawing No.: 322



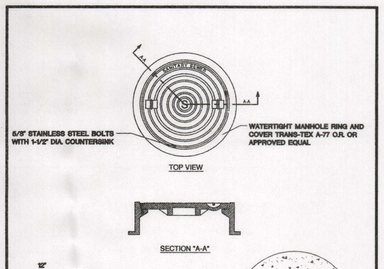

NBU — NEW BRAUNFELS UTILITIES, WATER SYSTEMS ENGINEERING — Drawn By: JD Amaro — Approved By: — Standard Drawing: PRECAST MANHOLE WITH DROP INLET ON PRECAST BASE — Updated: 4-16-03 — Scale: N.T.S. — Sheet: 1 OF 1 — Drawing No.: 325




TYPICAL PRECAST BASE

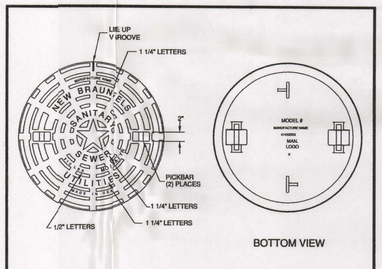
NOTE:
THE MANHOLE BASE SHALL BE BEDDED ON 6" COARSE AGGRIGATE. THE CONTRACTOR SHALL LEVEL AND PLUMB THE BASE PRIOR TO STTING THE PRECAST MANHOLE RISER SECTIONS ON THE PRECAST CONCRETE BAS.

NBU — NEW BRAUNFELS UTILITIES, WATER SYSTEMS ENGINEERING — Drawn By: H Shadrock — Approved By: — Standard Drawing: WASTEWATER MANHOLE ONPRECAST BASE — Updated: 4-24-03 — Scale: N.T.S. — Sheet: 1F 1 — Drawing No.: 328




NOTE:
MANHOLE RING ENCASEMENT IS REQUIRED ON ALL MANHOLES EXCEPT MANHOLES IN NEW OR EXISTING STREETS WHERE AS DIRECTED BY THE ENGINEER.

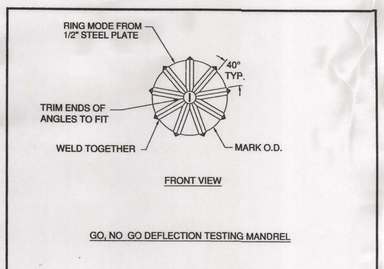
NEW MANHOLE CONSTRUCTION AND MINOR MANHOLE ADJUSTMENT



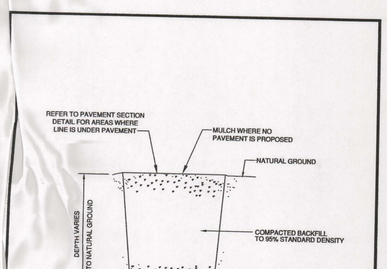

COVER SPECIFATIONS:
1. EST. WEIGHT - 210LBS
2. GRAY IRON
3. ASTM A48 CL35

√ MACHINED SURFACE

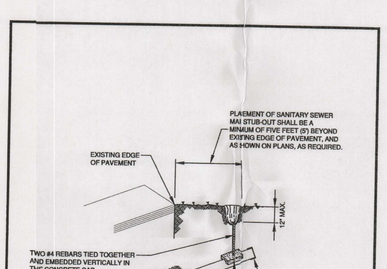
SANITARY SEWER MANHOLE - 32" COVER




NBU — NEW BRAUNFELS UTILITIES, WATER SYSTEMS ENGINEERING — Drawn By: JD Amaro — Approved By: — Standard Drawing: GO, NO GO DEFLECTION TESTING MANDREL — Updated: 5-6-03 — Scale: N.T.S. — Sheet: 1 OF 1 — Drawing No.: 350




TRENCH DETAIL




SANITARY SEWER MAIN STUBOUT MARKING DETAIL

Drawing Name: P:\310590.012 Newcombe Tennis Ranch\Construction Plans\Unit 1\Construction Plans\Sewer\Sewer Details 1.dwg User: rodriguezjx Dec 16, 2008 - 1:18pm

RECEIVED
OCT 13 2008
COUNTY ENGINEER

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

# TEXAS COMMISSION ON ENVIRONMENTAL QUALITY

*Protecting Texas by Reducing and Preventing Pollution*

October 7, 2008

Mr. Jeremy Fieldsend, Partner
Newcombe Tennis Ranch Subdivision
325 Mission Valley Road
New Braunfels, Texas 78132

Re: EDWARDS AQUIFER, Comal County
PROJECT: Newcombe Tennis Ranch Subdivision; Project number 1248.02
Regulated Entity No: RN102891918; Investigation No. 689438
TYPE: Solution Feature/Sensitive Feature; 30 Texas Administrative Code (TAC) §213.5(f)(2); Edwards Aquifer Protection Program

Dear Mr. Fieldsend:

The Texas Commission on Environmental Quality (TCEQ) received a plan which addresses protection of solution features encountered during excavation of the detention pond for the above referenced project. It was submitted on behalf of Newcombe Tennis Ranch Subdivision, by Jacobs Carter Burgess, and received by the San Antonio Regional Office on July 30, 2008. Final review of the Solution Feature submittal was completed after additional material was received on August 1, 2008, August 4, 2008, August 6, 2008, August 11, 2008, September 12, 2008, and October 7, 2008. Feature location and assessments are outlined in Table I below.

TABLE I

| Type of Solution Feature | Location | Case*/Sensitivity |
|---|---|---|
| Solution Cavity (No. 1) | 1.6'x1.6'x8.0<br>Floor of detention pond excavation in southwest corner, 12' from toe | 4/NA |

A representative of the San Antonio Region office did conduct an on site investigation on August 8, 2008. The engineered resolution submitted for this feature is in the enclosed Solution Feature {Closure Section Newcombe Tennis Ranch Detention Pond} drawing. Based on the information provided, and its certification by Mr. Alex Zertuche, P.E., your protection plan is approved with the following conditions:

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1. The location of the solution features shall be shown on the "as-built" plans.

2. Any concrete or concrete encasement shall meet or exceed San Antonio Water System specifications for minimum thickness and compression strength.

Should clarification of this letter be desired or if we may be of any other assistance, please contact Ms. Stacy Tanner of the San Antonio Regional Office at (210) 403-4078. Please reference project number 1248.02.

Sincerely,

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

LMB/SMT/eg

Enclosures: Table I (Minimum Standards for Closing Solution Features in Sewer Line Trenches)
Closure Section Newcombe Tennis Ranch Detention Pond

cc with Enclosures:
Mr. Alex Zertuche, P.E., Jacobs Carter Burgess
Mr. Jim Klein, P.E., City of New Braunfels
Mr. Tom Hornseth, P.E., Comal County
Ms. Velma Danielson, Edwards Aquifer Authority
TCEQ Central Records, Building F, MC-212

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TABLE II

EDWARDS AQUIFER PROTECTION PROGRAM - TCEQ
**Minimum Protective Standards for Sewer Line and Storm Sewer Trenches**
(from Edwards Aquifer Guidance Document 96.004, Effective 8/11/98)

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

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

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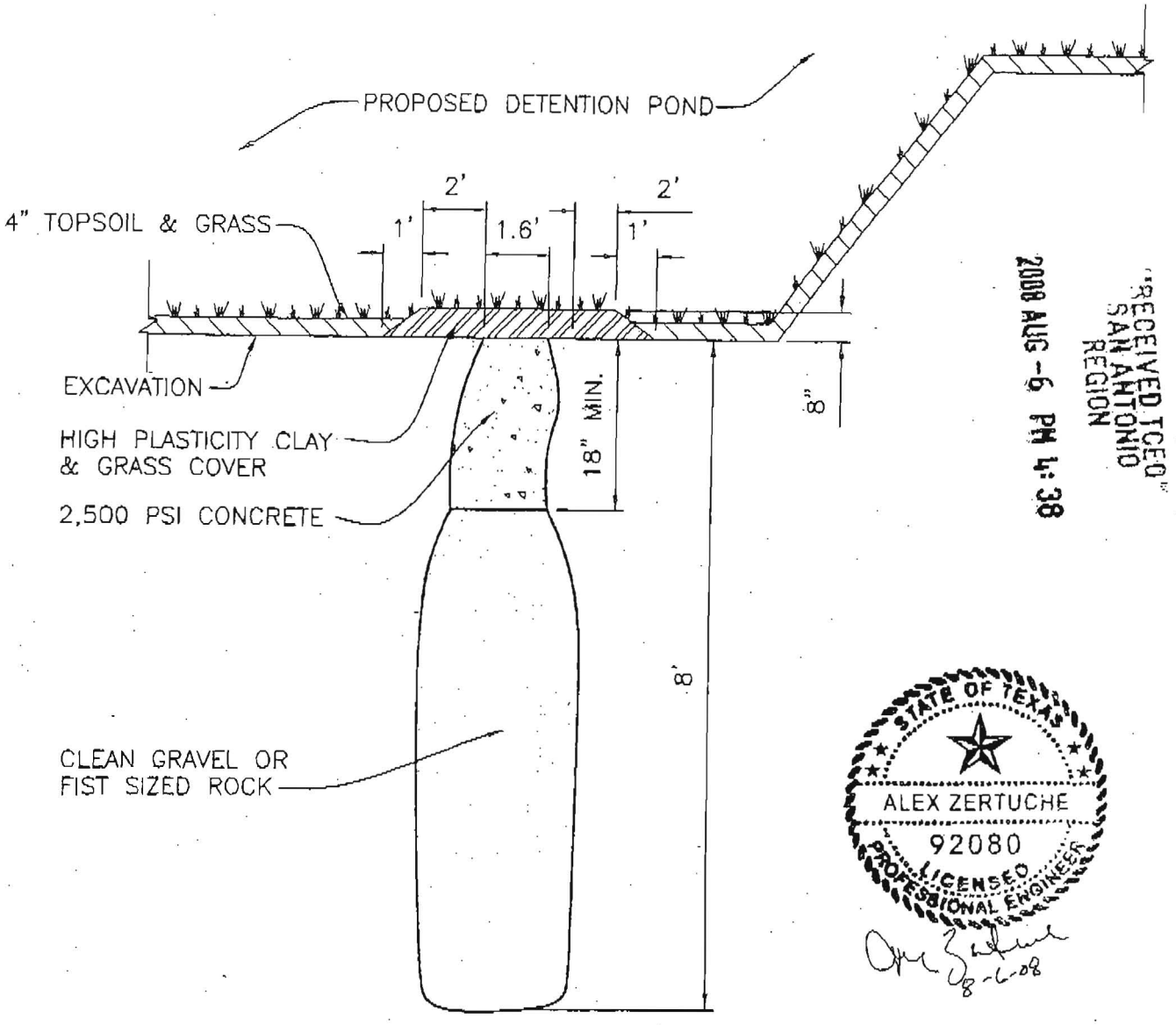


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REGION
2008 AUG -6 PM 4:38




# SOLUTION FEATURE CLOSURE SECTION
# NEWCOMBE TENNIS RANCH UNIT 1
# @ DETENTION POND

NOT TO SCALE

**Carter :: Burgess**

**Consultants in Engineering, Architecture, Construction Management and Related Services**
**Carter and Burgess, Inc.**

911 Central Parkway North, Suite 420
San Antonio, Texas 78232
(210) 494-0068 Fax (210) 494-4525

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## ATTACHMENT 3
## EAPP NO. 1248.01

DRAWN BY: JR CHECKED BY: A.Z.

DATE: 08/06/08 PROJECT NO.: 310590.012

SHEET 1 OF 1

Carter::Burgess

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July 29, 2008

Ms. Lynn Bumguardner
TCEQ – Region 13
14250 Judson Road
San Antonio, Texas 78233

RE: Solution Feature Report for Newcombe Tennis Ranch Subdivision, EAPP ID No.1248.01

Ms. Bumguardner,

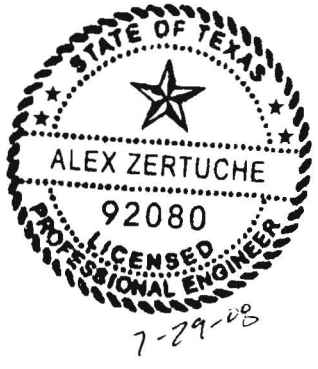
Carter Burgess was notified on Monday, July 28, 2008 that our client's contractor had exposed a possible solution cavity while excavating the floor of a proposed detention pond in Newcombe Tennis Ranch Unit 1. We instructed the contractor to suspend all work immediately and protect the area near the feature. The project's geologist, Arias & Associates, was also notified and instructed to perform a visual inspection of the feature. TCEQ was notified by email to Mr. John Mauser on July 28, 2008.

Enclosed is the Solution Feature Discovery Report prepared by Arias & Associates. Based on TCEQ's Guidance Document 96.004 and the geologist's recommendation, we propose to fill the feature with clean gravel and close it at the surface with an 18-inch thick concrete (2500 psi min.) cap. The area above the concrete cap will also have 8-inches of high plasticity clay and vegetative cover.

Please call me at 210- 403-5541 if you have any questions.

Sincerely,

Alex Zertuche, P.E
Project Manager



ARIAS & ASSOCIATES
Geotechnical • Environmental • Testing

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July 28, 2006
Arias Job No. 07-4105-02

Mr. Alex Zertuche, P.E.
Jacobs Carter Burgess
911 Central Parkway North, Suite 425
San Antonio, TX 78232-5052

Re: Solution Feature Discovery Form
Newcombe Tennis Ranch Subdivision
160 Acres South of Mission Valley Road
Comal County, Texas

Dear Mr. Zertuche:

On July 28, 2008, our firm was notified of a solution cavity that was encountered in the detention pond floor excavation near the entrance to the above-referenced site. We were at that time requested to perform a visual inspection on the feature and provide corrective recommendations.

The undersigned geologist performed a visual inspection on the afternoon of July 28, 2008. The solution cavity is located within limestone bedrock of the Georgetown Formation and consisted of a narrow vertical opening about 1.6 feet in diameter, and extended to an enlarged small cave open down to about 8 feet below the cut floor of the detention pond. Air flow was observed to be coming from the feature. No other openings were observed in the area.

Because the cavity is situated just beneath the surface under the proposed detention pond and the internal structure of the surrounding limestone is sound, the feature should be filled with gravel with an 18-inch thick concrete cap at its surface. The detention pond is designed to have a clay soil surface with vegetative cover planned.

Sincerely,

Kevin L. Wooster

Kevin L. Wooster, P.G.
Engineering Geologist

762 Wilson
Eagle Pass, Texas 78852
(830) 757-8891
(830) 757-8899 Fax

142 Chula Vista
San Antonio, Texas 78232
(210) 308-5884
(210) 308-5886 Fax

1030 Logandale
Houston, Texas 77032
(281) 227-2243
(281) 227-7088 Fax

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# Solution Feature Discovery Notification Form

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

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

| | | | |
|---|---|---|---|
| **Regulated Entity Name:** | Newcombe Tennis Ranch Subdivision | **EAPP ID #:** | 1248.01 |
| **Project Type:** | (WPAP) SCS UST AST | **Approval Date:** | December 28, 2007 |
| **Regulated Entity Location:** | Detention Pond near entrance | **Approval Dates/ID#'s of any Modifications:** | |
| **Date Feature(s) Discovered:** | July 28, 2008 | **Date TCEQ Notified:** | July 28, 2008 |
| **Holder of Approved Plan:** | Newcombe Tennis Ranch Subdivision | **Solution Feature Plan Submitted By:** | Kevin L. Wooster, P.G. |
| **Contact:** | Alex Zertuche, P.E. | **Title:** | Engineering Geologist |
| **Title:** | Project Manager | **Company:** | Arias & Associates, Inc. |
| **Mailing Address:** | JacobsCarter Burgess | **Mailing Address:** | 142 Chula Vista |
| **Phone:** | 210-403-5541 | **Phone:** | 210-308-5884 |
| **Fax:** | 210-494-4525 | **Fax:** | 210-308-8731 |

| Feature No. | Feature Dimensions | Location of Feature (Reference features related to a SCS by Line and Station) | Case*/ Sensitivity** |
|---|---|---|---|
| S-1 | 1.6' x 1.6' x 8.0 | Floor of detention pond excavation in southwest corner, 12' from toe | 2 |
| | | | |
| | | | |
| | | | |

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

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

Submitted by: Kevin L. Wooster Date: July 28, 2008

Printed name: Kevin L. Wooster, P.G.

**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.

# EAPP - Solution Cavity Form

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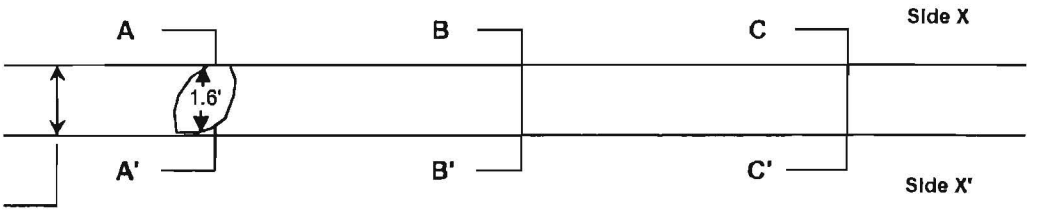
- ☐ Sewage Collection System
- ☐ Water Line
- ☒ Other

PROJECT: Newcombe Tennis Ranch Subdivision

DATE OF FIND: 7/28/2008 DATE TCEQ NOTIFIED: 7/28/2008

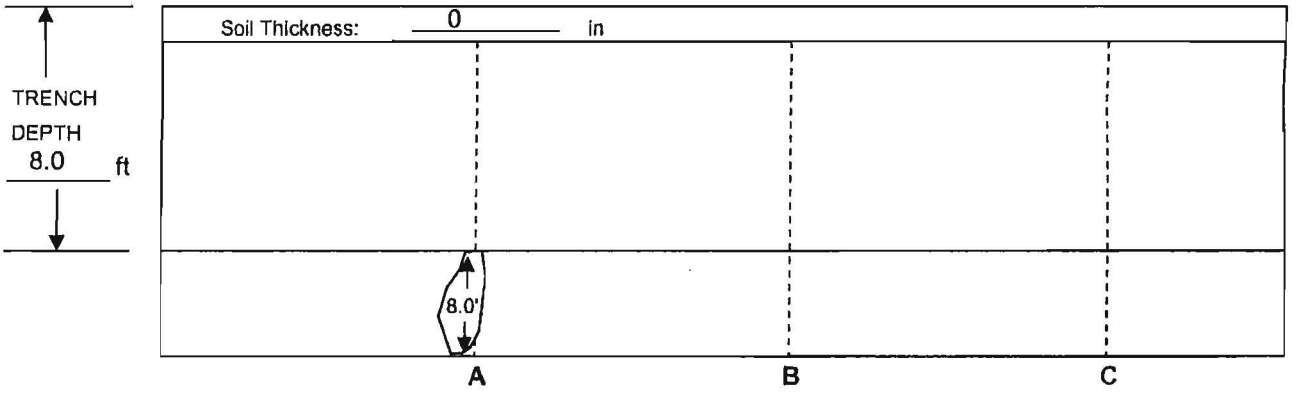
## Plan View



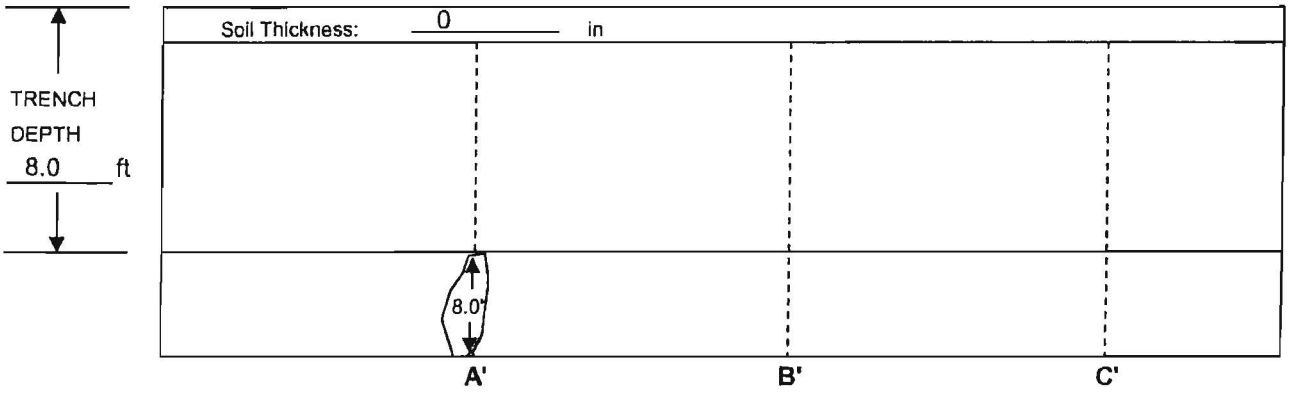

TRENCH WIDTH >100 ft ft

LINE: _____ STATION 0 + _____ _____ + _____ _____ + _____

## Profile (Side X):




## Profile (Side X'):



**Sewer Collection System**
Solution Cavity Form
TNRCC - EAPP

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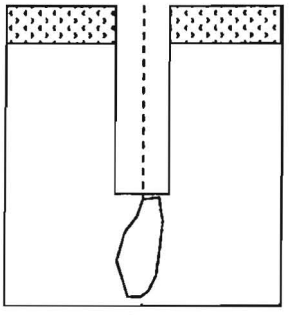
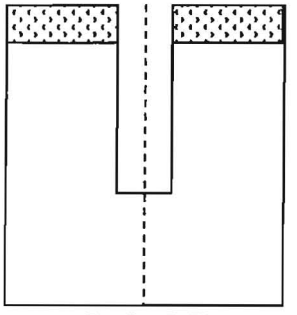
Notes:
-Include dimensioning
-Include illustrative pictures for complex features
-Attach additional pages if necessary.
-Identify case of feature (EAGD 96.004)

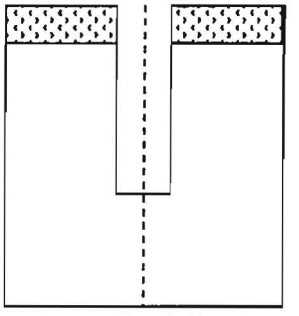
## Cross-Section View



Section A-A'



Section B-B'



Section C-C'

| Line | Station | Feature | Case | Sensitivity |
|---|---|---|---|---|
| | | Solution cavity leading to small cave | 2 | Sensitive |
| 12 feet | from toe of slope in sothwest corner of detention pond excavation. | | | |
| | | | | |
| | | | | |
| | | | | |

Notes: Feature is in floor of excavation cut into Georgetown Formation, under about 7 feet of removed Del Rio Clay. Feature is solution cavity extending downward into small cave about 8 feet deep and about 5 feet in diameter, with air flow observed to be coming out of feature.

Printed Name of Geologist

Kevin L. Wooster

Signiture of Geologist

7/28/2008

Date

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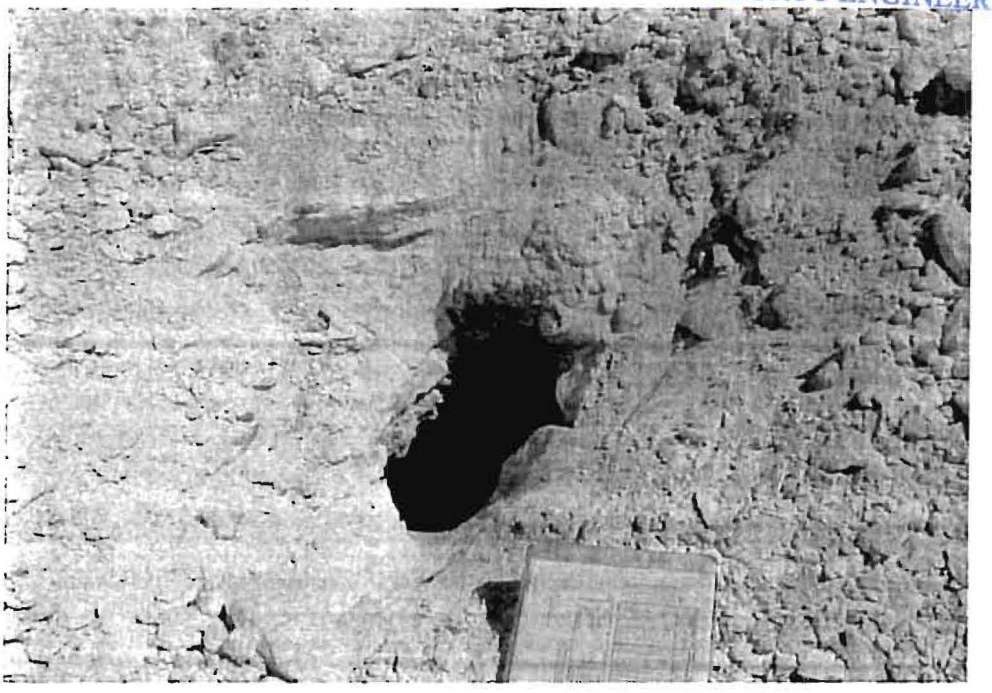
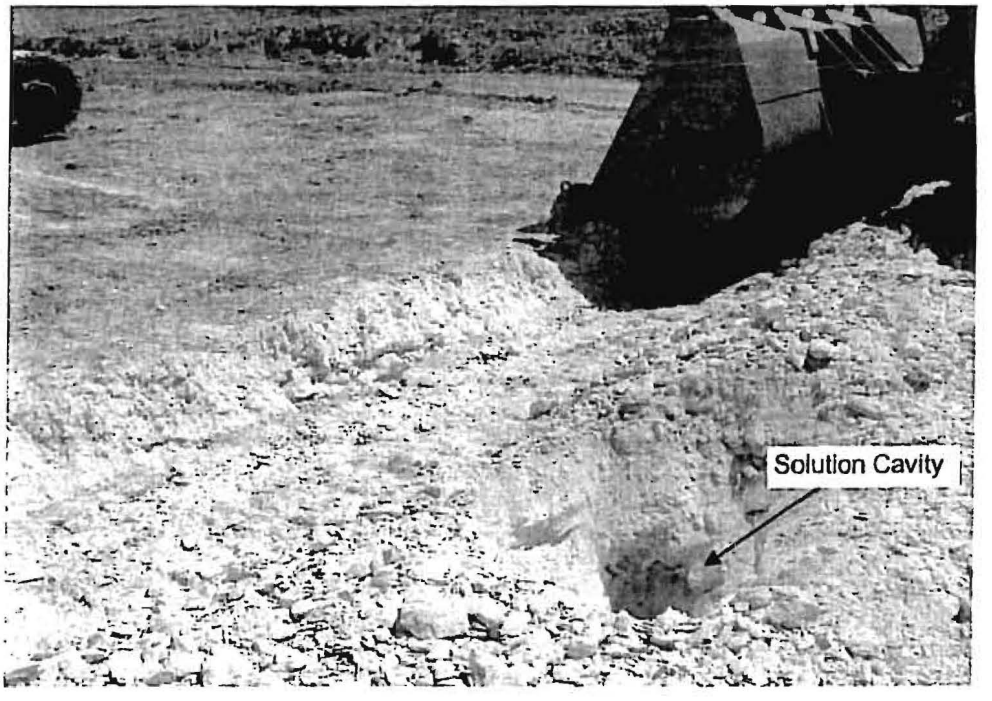
**Sewer Collection System**

Solution Cavity Form
TNRCC - EAPP

# Photographs



Photograph of Solution Cavity




Photograph of Solution Cavity relative to floor of excavation