

**ORGANIZED SEWAGE COLLECTION SYSTEM PLAN  
FOR  
OAK RUN VILLAGE APARTMENTS**

PREPARED FOR  
Texas Commission on Environmental Quality  
Region 13 – San Antonio  
14250 Judson Road  
San Antonio, Texas 78233  
210-490-3096 (office)  
210-545-4329 (fax)

PREPARED BY



F-13351

James Ingalls, P.E.  
2021 SH 46W, Ste. 105  
New Braunfels, TX 78132

Prepared  
April 18, 2023



# Texas Commission on Environmental Quality

## Edwards Aquifer Application Cover Page

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### Our Review of Your Application

**The Edwards Aquifer Program staff conducts an administrative and technical review of all applications. The turnaround time for administrative review can be up to 30 days as outlined in 30 TAC 213.4(e). Generally administrative completeness is determined during the intake meeting or within a few days of receipt. The turnaround time for technical review of an administratively complete Edwards Aquifer application is 90 days as outlined in 30 TAC 213.4(e). Please know that the review and approval time is directly impacted by the quality and completeness of the initial application that is received. In order to conduct a timely review, it is imperative that the information provided in an Edwards Aquifer application include final plans, be accurate, complete, and in compliance with [30 TAC 213](#).**

### Administrative Review

1. [Edwards Aquifer applications](#) must be deemed administratively complete before a technical review can begin. To be considered administratively complete, the application must contain completed forms and attachments, provide the requested information, and meet all the site plan requirements. The submitted application and plan sheets should be final plans. Please submit one full-size set of plan sheets with the original application, and half-size sets with the additional copies.

To ensure that all applicable documents are included in the application, the program has developed tools to guide you and web pages to provide all forms, checklists, and guidance. Please visit the below website for assistance: <http://www.tceq.texas.gov/field/eapp>.

2. This Edwards Aquifer Application Cover Page form (certified by the applicant or agent) must be included in the application and brought to the administrative review meeting.
3. Administrative reviews are scheduled with program staff who will conduct the review. Applicants or their authorized agent should call the appropriate regional office, according to the county in which the project is located, to schedule a review. The average meeting time is one hour.
4. In the meeting, the application is examined for administrative completeness. Deficiencies will be noted by staff and emailed or faxed to the applicant and authorized agent at the end of the meeting, or shortly after. Administrative deficiencies will cause the application to be deemed incomplete and returned.

An appointment should be made to resubmit the application. The application is re-examined to ensure all deficiencies are resolved. The application will only be deemed administratively complete when all administrative deficiencies are addressed.

5. If an application is received by mail, courier service, or otherwise submitted without a review meeting, the administrative review will be conducted within 30 days. The applicant and agent will be contacted with the results of the administrative review. If the application is found to be administratively incomplete, it can be retrieved from the regional office or returned by regular mail. If returned by mail, the regional office may require arrangements for return shipping.
6. If the geologic assessment was completed before October 1, 2004 and the site contains “possibly sensitive” features, the assessment must be updated in accordance with the *Instructions to Geologists* (TCEQ-0585 Instructions).

### Technical Review

1. When an application is deemed administratively complete, the technical review period begins. The regional office will distribute copies of the application to the identified affected city, county, and groundwater conservation district whose jurisdiction includes the subject site. These entities and the public have 30 days to provide comments on the application to the regional office. All comments received are reviewed by TCEQ.
2. A site assessment is usually conducted as part of the technical review, to evaluate the geologic assessment and observe existing site conditions. The site must be accessible to our staff. The site boundaries should be

clearly marked, features identified in the geologic assessment should be flagged, roadways marked and the alignment of the Sewage Collection System and manholes should be staked at the time the application is submitted. If the site is not marked the application may be returned.

3. We evaluate the application for technical completeness and contact the applicant and agent via Notice of Deficiency (NOD) to request additional information and identify technical deficiencies. There are two deficiency response periods available to the applicant. There are 14 days to resolve deficiencies noted in the first NOD. If a second NOD is issued, there is an additional 14 days to resolve deficiencies. If the response to the second notice is not received, is incomplete or inadequate, or provides new information that is incomplete or inadequate, the application must be withdrawn or will be denied. Please note that because the technical review is underway, whether the application is withdrawn or denied **the application fee will be forfeited**.
4. The program has 90 calendar days to complete the technical review of the application. If the application is technically adequate, such that it complies with the Edwards Aquifer rules, and is protective of the Edwards Aquifer during and after construction, an approval letter will be issued. Construction or other regulated activity may not begin until an approval is issued.

**Mid-Review Modifications**

It is important to have final site plans prior to beginning the permitting process with TCEQ to avoid delays.

Occasionally, circumstances arise where you may have significant design and/or site plan changes after your Edwards Aquifer application has been deemed administratively complete by TCEQ. This is considered a “Mid-Review Modification”. Mid-Review Modifications may require redistribution of an application that includes the proposed modifications for public comment.

If you are proposing a Mid-Review Modification, two options are available:

- If the technical review has begun your application can be denied/withdrawn, your fees will be forfeited, and the plan will have to be resubmitted.
- TCEQ can continue the technical review of the application as it was submitted, and a modification application can be submitted at a later time.

If the application is denied/withdrawn, the resubmitted application will be subject to the administrative and technical review processes and will be treated as a new application. The application will be redistributed to the affected jurisdictions.

Please contact the regional office if you have questions. If your project is located in Williamson, Travis, or Hays County, contact TCEQ’s Austin Regional Office at 512-339-2929. If your project is in Comal, Bexar, Medina, Uvalde, or Kinney County, contact TCEQ’s San Antonio Regional Office at 210-490-3096

Please fill out all required fields below and submit with your application.

<b>1. Regulated Entity Name:</b> Oak Run Village Apartments				<b>2. Regulated Entity No.:</b>					
<b>3. Customer Name:</b> PARCHAUS NEW BRAUNFELS LP				<b>4. Customer No.:</b>					
<b>5. Project Type:</b> (Please circle/check one)	<input checked="" type="radio"/> New	Modification		Extension	Exception				
<b>6. Plan Type:</b> (Please circle/check one)	WPAP	CZP	<input checked="" type="radio"/> SCS	UST	AST	EXP	EXT	Technical Clarification	Optional Enhanced Measures
<b>7. Land Use:</b> (Please circle/check one)	Residential		<input checked="" type="radio"/> Non-residential		<b>8. Site (acres):</b>		17.532		
<b>9. Application Fee:</b>	\$655.50		<b>10. Permanent BMP(s):</b>			N/A			
<b>11. SCS (Linear Ft.):</b>	1311		<b>12. AST/UST (No. Tanks):</b>			N/A			
<b>13. County:</b>	Comal		<b>14. Watershed:</b>			Comal/Guadalupe River			

# Application Distribution

Instructions: Use the table below to determine the number of applications required. One original and one copy of the application, plus additional copies (as needed) for each affected incorporated city, county, and groundwater conservation district are required. Linear projects or large projects, which cross into multiple jurisdictions, can require additional copies. Refer to the “Texas Groundwater Conservation Districts within the EAPP Boundaries” map found at:

[http://www.tceq.texas.gov/assets/public/compliance/field\\_ops/eapp/EAPP%20GWCD%20map.pdf](http://www.tceq.texas.gov/assets/public/compliance/field_ops/eapp/EAPP%20GWCD%20map.pdf)

For more detailed boundaries, please contact the conservation district directly.

<b>Austin Region</b>			
<b>County:</b>	<b>Hays</b>	<b>Travis</b>	<b>Williamson</b>
Original (1 req.)	—	—	—
Region (1 req.)	—	—	—
County(ies)	—	—	—
Groundwater Conservation District(s)	<input type="checkbox"/> Edwards Aquifer Authority <input type="checkbox"/> Barton Springs/ Edwards Aquifer <input type="checkbox"/> Hays Trinity <input type="checkbox"/> Plum Creek	<input type="checkbox"/> Barton Springs/ Edwards Aquifer	NA
City(ies) Jurisdiction	<input type="checkbox"/> Austin <input type="checkbox"/> Buda <input type="checkbox"/> Dripping Springs <input type="checkbox"/> Kyle <input type="checkbox"/> Mountain City <input type="checkbox"/> San Marcos <input type="checkbox"/> Wimberley <input type="checkbox"/> Woodcreek	<input type="checkbox"/> Austin <input type="checkbox"/> Bee Cave <input type="checkbox"/> Pflugerville <input type="checkbox"/> Rollingwood <input type="checkbox"/> Round Rock <input type="checkbox"/> Sunset Valley <input type="checkbox"/> West Lake Hills	<input type="checkbox"/> Austin <input type="checkbox"/> Cedar Park <input type="checkbox"/> Florence <input type="checkbox"/> Georgetown <input type="checkbox"/> Jerrell <input type="checkbox"/> Leander <input type="checkbox"/> Liberty Hill <input type="checkbox"/> Pflugerville <input type="checkbox"/> Round Rock

<b>San Antonio Region</b>					
<b>County:</b>	<b>Bexar</b>	<b>Comal</b>	<b>Kinney</b>	<b>Medina</b>	<b>Uvalde</b>
Original (1 req.)	—	✓	—	—	—
Region (1 req.)	—	✓	—	—	—
County(ies)	—	✓	—	—	—
Groundwater Conservation District(s)	<input type="checkbox"/> Edwards Aquifer Authority <input type="checkbox"/> Trinity-Glen Rose	<input checked="" type="checkbox"/> Edwards Aquifer Authority	<input type="checkbox"/> Kinney	<input type="checkbox"/> EAA <input type="checkbox"/> Medina	<input type="checkbox"/> EAA <input type="checkbox"/> Uvalde
City(ies) Jurisdiction	<input type="checkbox"/> Castle Hills <input type="checkbox"/> Fair Oaks Ranch <input type="checkbox"/> Helotes <input type="checkbox"/> Hill Country Village <input type="checkbox"/> Hollywood Park <input type="checkbox"/> San Antonio (SAWS) <input type="checkbox"/> Shavano Park	<input type="checkbox"/> Bulverde <input type="checkbox"/> Fair Oaks Ranch <input type="checkbox"/> Garden Ridge <input checked="" type="checkbox"/> New Braunfels <input type="checkbox"/> Schertz	NA	<input type="checkbox"/> San Antonio ETJ (SAWS)	NA

I certify that to the best of my knowledge, that the application is complete and accurate. This application is hereby submitted to TCEQ for administrative review and technical review.

James Ingalls, P.E.

Print Name of Customer/Authorized Agent

*James Ingalls*

*4-18-23*

Signature of Customer/Authorized Agent

Date

**\*\*FOR TCEQ INTERNAL USE ONLY\*\***

Date(s) Reviewed:		Date Administratively Complete:	
Received From:		Correct Number of Copies:	
Received By:		Distribution Date:	
EAPP File Number:		Complex:	
Admin. Review(s) (No.):		No. AR Rounds:	
Delinquent Fees (Y/N):		Review Time Spent:	
Lat./Long. Verified:		SOS Customer Verification:	
Agent Authorization Complete/Notarized (Y/N):		Fee Check:	Payable to TCEQ (Y/N):
Core Data Form Complete (Y/N):			Signed (Y/N):
Core Data Form Incomplete Nos.:			Less than 90 days old (Y/N):

# General Information Form

## Texas Commission on Environmental Quality

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

*To ensure that the application is administratively complete, confirm that all fields in the form are complete, verify that all requested information is provided, consistently reference the same site and contact person in all forms in the application, and ensure forms are signed by the appropriate party.*

*Note: Including all the information requested in the form and attachments contributes to more streamlined technical reviews.*

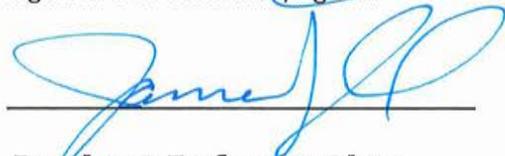
## Signature

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:

Print Name of Customer/Agent: James Ingalls, P.E.

Date: 4-18-23

Signature of Customer/Agent:



## Project Information

1. Regulated Entity Name: Oak Run Village Apartments
2. County: Comal
3. Stream Basin: Comal/Guadalupe River
4. Groundwater Conservation District (If applicable): \_\_\_\_\_
5. Edwards Aquifer Zone:
  - Recharge Zone
  - Transition Zone
6. Plan Type:
  - WPAP
  - SCS
  - Modification
  - AST
  - UST
  - Exception Request

7. Customer (Applicant):

Contact Person: Basil Koutsogeorgas  
Entity: PARCHAUS NEW BRAUNFELS LP  
Mailing Address: 8350 N Central Expy, Ste. 1500  
City, State: Dallas, TX Zip: 75206  
Telephone: 972-385-4130 FAX: \_\_\_\_\_  
Email Address: BasilK@providentrealty.net

8. Agent/Representative (If any):

Contact Person: James Ingalls, P.E.  
Entity: INK Civil  
Mailing Address: 2021 W SH46, Suite 105  
City, State: New Braunfels, TX Zip: 78132  
Telephone: 830-358-7127 FAX: \_\_\_\_\_  
Email Address: jamesingalls@ink-civil.com

9. Project Location:

- The project site is located inside the city limits of \_\_\_\_\_.
- The project site is located outside the city limits but inside the ETJ (extra-territorial jurisdiction) of New Braunfels
- The project site is not located within any city's limits or ETJ.

10.  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.

Subject property is located behind the Starbucks on Loop 337 and Oak Run Pkwy at 2850 Loop 337, New Braunfels, TX 78130

11.  **Attachment A – Road Map.** A road map showing directions to and the location of the project site is attached. The project location and site boundaries are clearly shown on the map.
12.  **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. The map(s) clearly show:
- Project site boundaries.
  - USGS Quadrangle Name(s).
  - Boundaries of the Recharge Zone (and Transition Zone, if applicable).
  - Drainage path from the project site to the boundary of the Recharge Zone.
13.  **The TCEQ must be able to inspect the project site or the application will be returned.** 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.
- Survey staking will be completed by this date: 5/29/2023

14.  **Attachment C – Project Description.** Attached at the end of this form is a detailed narrative description of the proposed project. The project description is consistent throughout the application and contains, at a minimum, the following details:

- Area of the site
- Offsite areas
- Impervious cover
- Permanent BMP(s)
- Proposed site use
- Site history
- Previous development
- Area(s) to be demolished

15. Existing project site conditions are noted below:

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

### ***Prohibited Activities***

16.  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).
- (6) New municipal and industrial wastewater discharges into or adjacent to water in the state that would create additional pollutant loading.

17.  I am aware that the following activities are prohibited on the Transition Zone and are not proposed for this project:

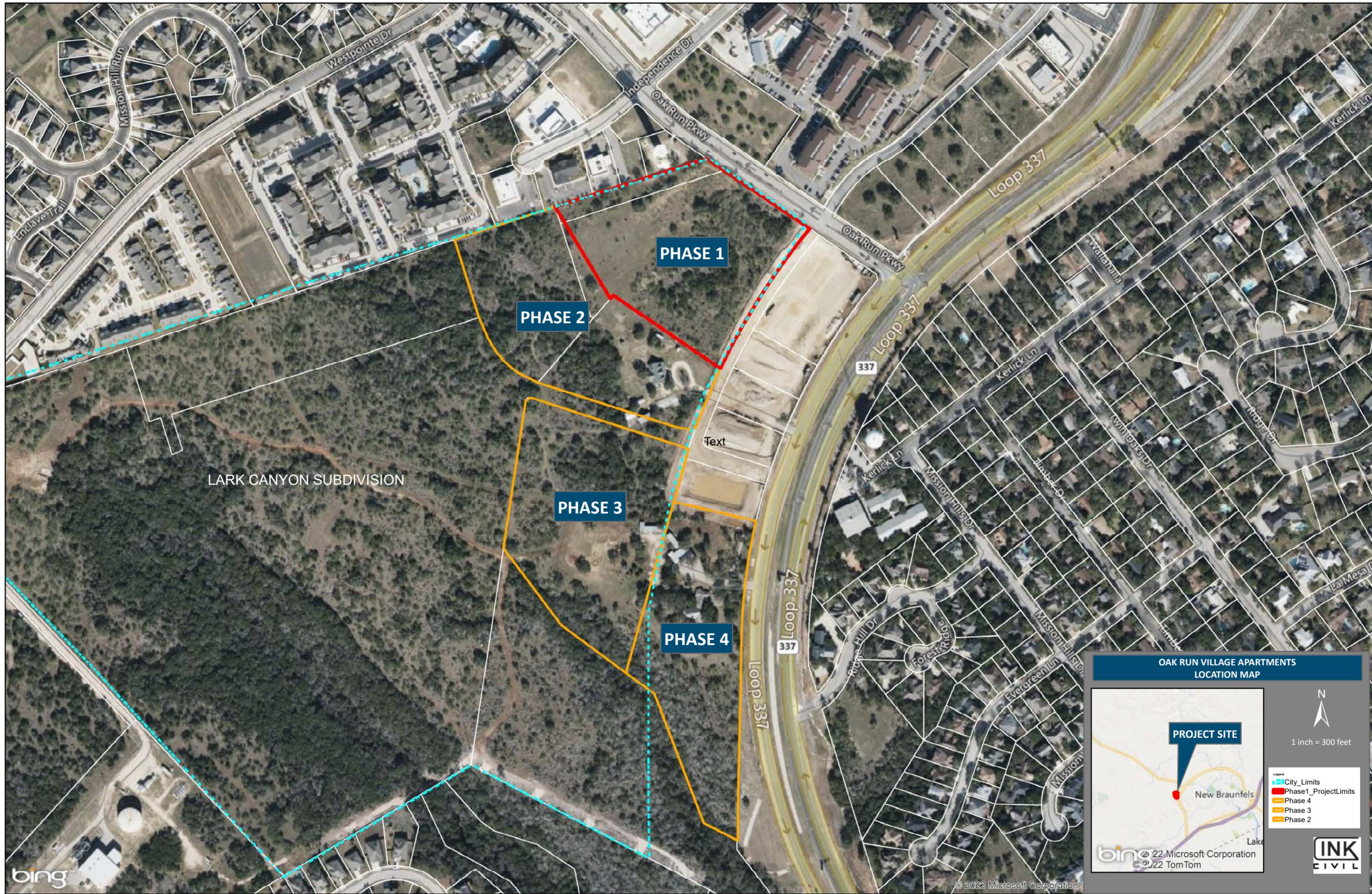
- (1) Waste disposal wells regulated under 30 TAC Chapter 331 (relating to Underground Injection Control);
- (2) Land disposal of Class I wastes, as defined in 30 TAC §335.1; and

- (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***

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

- For a Water Pollution Abatement Plan or Modification, the total acreage of the site where regulated activities will occur.
  - For an Organized Sewage Collection System Plan or Modification, the total linear footage of all collection system lines.
  - For a UST Facility Plan or Modification or an AST Facility Plan or Modification, the total number of tanks or piping systems.
  - 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.
19.  Application fees are due and payable at the time the application is filed. If the correct fee is not submitted, the TCEQ is not required to consider the application until the correct fee is submitted. Both the fee and the Edwards Aquifer Fee Form have been sent to the Commission's:
- TCEQ cashier
  - Austin Regional Office (for projects in Hays, Travis, and Williamson Counties)
  - San Antonio Regional Office (for projects in Bexar, Comal, Kinney, Medina, and Uvalde Counties) [Online ePay](#)
20.  Submit one (1) original and one (1) copy of the application, plus additional copies as needed for each affected incorporated city, groundwater conservation district, and county in which the project will be located. The TCEQ will distribute the additional copies to these jurisdictions. The copies must be submitted to the appropriate regional office.
21.  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.



PHASE 1

PHASE 2

PHASE 3

PHASE 4

LARK CANYON SUBDIVISION

Text

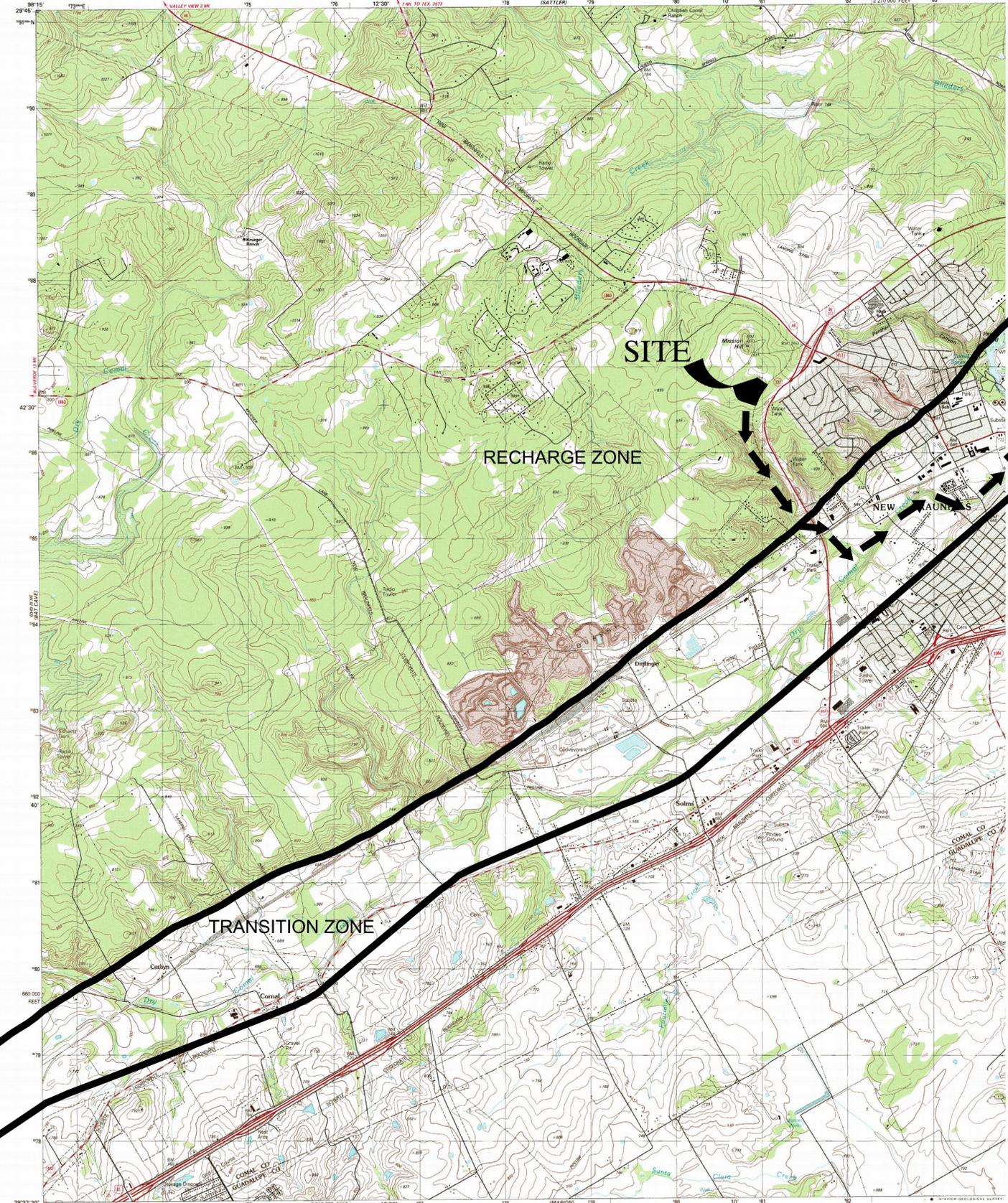
OAK RUN VILLAGE APARTMENTS  
LOCATION MAP



1 inch = 300 feet

- City Limits
- Phase 1 Project Limits
- Phase 4
- Phase 3
- Phase 2



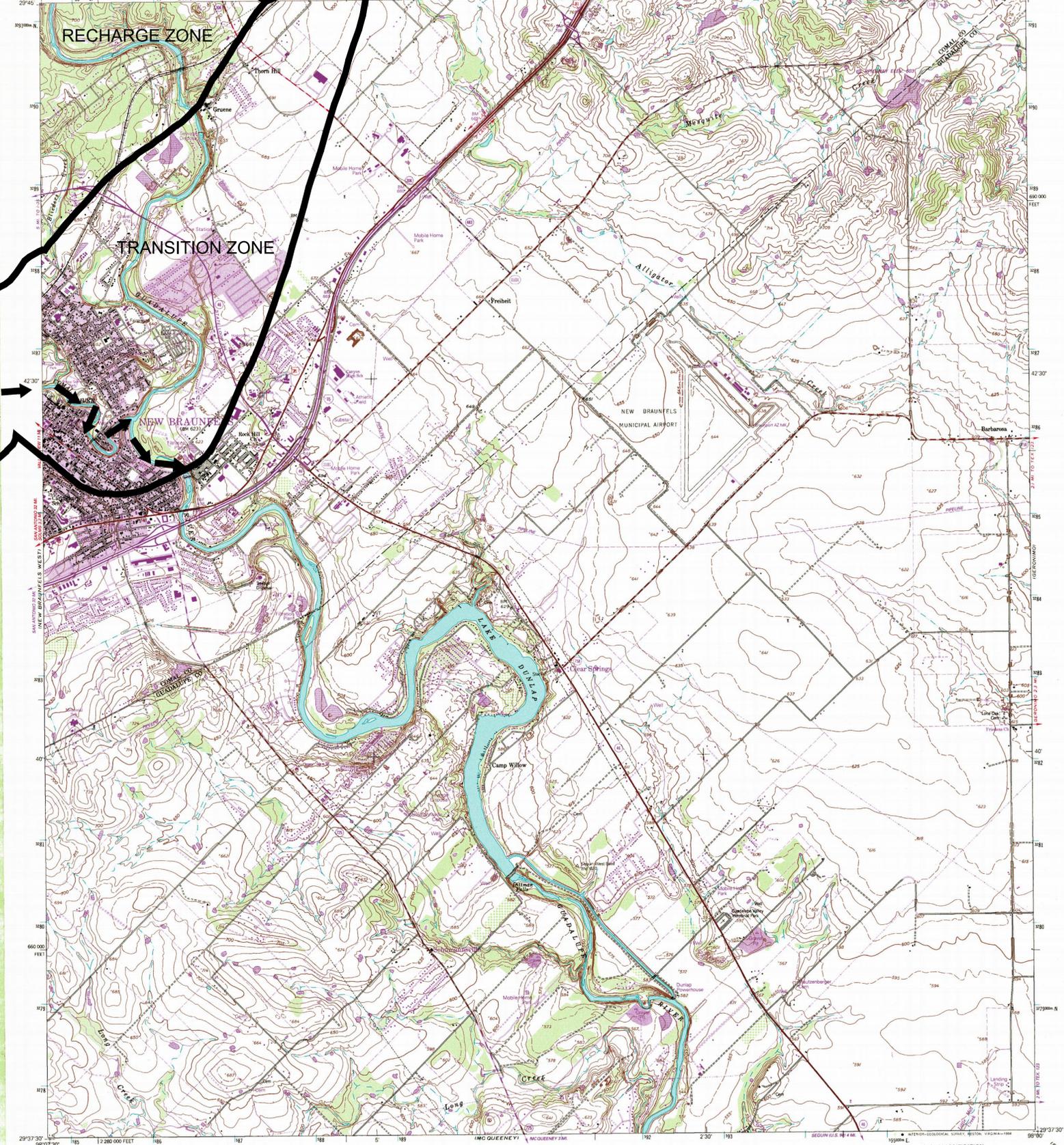


Produced by the United States Geological Survey in cooperation with the Texas Water Development Board. Revised in cooperation with the Texas Water Development Board. Control by USGS, NOS/NOAA, and USCE. Compiled by the Army Map Service by photogrammetric methods from aerial photographs taken 1956. Field checked 1958. Revised from aerial photographs taken 1956. 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. Blue and dashed lines indicate selected fence and field lines generally visible on aerial photographs. This information is unclassified.

SCALE 1:24,000  
 CONTOUR INTERVAL 10 FEET  
 NATIONAL GEODETIC VERTICAL DATUM OF 1929

ROAD CLASSIFICATION  
 Primary highway, Light hard surface  
 Secondary highway, Imperv hard surface  
 Interstate Route, U. S. R  
 U. S. R

NEW BRAUNFELS TEXAS 2998-413



Produced by the United States Geological Survey in cooperation with the Defense Mapping Agency. Control by USGS and MCGONAGAL and USCE. Compiled from aerial photographs taken 1956. Revisions in purple and woodland compiled from aerial photographs taken 1986 and other sources and not been field checked. Map edited 1984. Conflicts may exist between some updated features and previously mapped contours. North American Datum of 1927 (NAD 27). Projection and 10,000-foot ticks: Texas Coordinate System, south central zone (Lambert Conformal Conic). Blue 1000-meter Universal Transverse Mercator ticks, zone 14 North American Datum of 1983 (NAD 83) is shown by dashed corner ticks. The values of each tick between NAD 27 and NAD 83 for 7.5-minute intersections are obtainable from National Geospatial Survey NADCON software.

SCALE 1:24,000  
 CONTOUR INTERVAL 10 FEET  
 SUPPLEMENTARY CONTOUR INTERVALS 5 FEET  
 NATIONAL GEODETIC VERTICAL DATUM OF 1929

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

NEW BRAUNFELS EAST, TEX. 2998-414

**ATTACHMENT “C”**  
**Project Description**

The proposed Oak Run Village Apartments is located at 2850 Loop 337, New Braunfels, Texas 78130 in Comal County. The site consists of a 17.53-acre tract, mostly undeveloped land with a single residential homestead. This property is outside of the City of New Braunfels City Limits and is located within the Extra Territorial Jurisdiction (ETJ) of the City of New Braunfels. This property was included as part of the Lark Canyon Subdivision Master Plan and was anticipated for multi-family use. According to the Flood Insurance Rate Map No. 48091C0435F, there is no existing floodplain located within the property. The stream basin for stormwater runoff is the Dry Comal Creek.

The proposed land use will consist of the following:

The development will be constructed in four phases. The scope of this SCS application will include all utility infrastructure associated with Phase 1 and 2 of the development, comprising of the entire 17.53-acre tract. Phase 3 and 4 of the development is located across Paladora Drive on a separate 15.57-acre tract of land and will be submitted with a separate SCS application. Please see attached Location Map (Attachment A) for a breakout of the proposed phasing.

The proposed construction will include grading for the building pads, parking, drainage, and utility service lines. The subdivision infrastructure will include a water system, sewer, electricity, telephone, cable television, apartment buildings with 330 units, and an offsite detention pond that will accommodate all phases of the developments stormwater runoff. Phase 2 will include the demolition of the existing residential house (built around 2002) and construction of apartment buildings with an additional 330 units. Future planning is required of Phase 3 and 4 to determine final buildout conditions.

The SCS will connect to existing NBU infrastructure. The SCS on this project will be owned and maintained by New Braunfels Utilities (NBU) upon the acceptance of the constructed facilities.



## **GEOLOGIC ASSESSMENT**

For

**PARC HAUS TRACT  
LOOP 337  
NEW BRAUNFELS, COMAL COUNTY, TEXAS**

Prepared for  
**INK CIVIL  
2021 SH 46W, SUITE 105  
NEW BRAUNFELS, TEXAS 78132**

Prepared by  
**Professional Service Industries, Inc.  
3 Burwood Lane  
San Antonio, Texas 78216  
Telephone (210) 342-9377**

**PSI PROJECT NO.: 0435-5166**

**November 15, 2021**





Professional Service Industries, Inc.  
3 Burwood Lane, San Antonio, TX 78216  
Phone: (210) 342-9377  
Fax: (210) 342-9401

November 15, 2021

Ink Civil  
2021 SH 46W, Suite 105  
New Braunfels, TX 78132

Attn: Mr. Shane A. Klar, PE, Principal  
Email: [shane.klar@ink-civil.com](mailto:shane.klar@ink-civil.com)

RE: Geologic Assessment  
Parc Haus Tract  
Loop 337  
New Braunfels, Comal County, Texas  
PSI Project No. 435-5166

Dear Mr. Klar:

Professional Service Industries, Inc. (PSI) has completed a geologic recharge assessment for the above referenced project in compliance with the Texas Commission on Environmental Quality (TCEQ) requirements for regulated developments located on the Edwards Aquifer Recharge Zone (EARZ). The purpose of this report is to describe surficial geologic units and identify the locations and extent of significant recharge features present in the development area.

#### **AUTHORIZATION**

Authorization to perform this assessment was given via a signed copy of PSI Proposal No. 356254 on October 20, 2021.

#### **PROJECT DESCRIPTION**

The property consists of the Parc Haus tract located on the west side of Loop 337, south of Oak Run Parkway in New Braunfels, Comal County, Texas. The subject property is approximately 30-acres in size, and composed of three tracts: the North Tract, South Tract and Loop Tract. The site is located on the Edwards Aquifer Recharge Zone (EARZ), and therefore subject to special rules promulgated by the Texas Commission on Environmental Quality (TCEQ) designed to protect environmentally sensitive areas. The site is predominantly undeveloped, with site vegetation consisting of live oak, ashe-juniper trees, huisache, mountain laurel, prickly pear, agarita, and grasses.

#### **REGIONAL GEOLOGY**

##### **Physiography**

From northwest to southeast, the three physiographic provinces in Comal County are: the Edwards Plateau, the Blackland Prairie, and the West Gulf Coastal Plain. The Edwards Plateau terrain is rugged and hilly, with elevations ranging from 1,100 feet to 1,900 feet above sea level. This area is underlain by beds of limestone that dip gently to the southeast. South of the Edwards Plateau is the Balcones Fault Zone, which is also the northernmost limit of the Blackland Prairie. The Balcones Fault Zone extends northeast-southwest across Bexar County and is composed of fault blocks of limestone, chalk,

shale, and marl. The undulating, hilly topography of the Blackland Prairie ranges in elevation from about 700 feet to 1,100 feet above sea level. The faults are predominantly normal, down-to-the Gulf Coast, with near vertical throws. The West Gulf Coastal Plain lies southeast of the Blackland Prairie and is composed of relatively flat-lying beds of marl, clay, and sandy clay. According to topographic maps, elevations at the subject site range from approximately 925 feet above sea level in the northern portion of the north tract, to about 780 feet MSL in the southern portion of the Loop tract, in a drainage, with a slope to the south-southeast.

### **Stratigraphy and Structure**

The northern portion of the site is mapped as the Cretaceous Del Rio clay (Kdr). The site is overlain with a thin veneer of grass covered soil. Rock outcrops were minimal. According to the Geologic Atlas of Texas, the Del Rio Clay is calcareous and gypsiferous, with pyrite common, with a blocky structure that weathers to light gray or yellowish gray. The characteristic marine megafossil, *Ilmatogyra arietina* (formerly *exogyra arietina*) is widespread throughout the formation. The thickness ranges from 40-70 feet. A band across the north-central portion of the site is mapped as the Georgetown formation (Kgt) which is composed of limestone and marl; mostly limestone, fine grained, argillaceous, nodular, moderately indurated, light gray; some limestone, hard, brittle, thick bedded, white: some shale, marl, soft, light gray to yellowish gray; marine mega fossils include *Kingena wacoensis* and *Gryphaea washitaensis*; thickness 30 – 80 feet, thins southward.

Rocks underlying the southern portion of the site consist of the Lower Cretaceous Edwards Person Formation. Notable rock outcrops were limited to the drainage feature bordering the southwest portion of the South Tract, and the Loop Tract. According to “The Geologic Framework and Hydrogeologic Characteristics of the Edwards Aquifer Outcrop, Comal County Texas” written by the USGS, the Person Formation ranges in thickness from 180 to 224 feet and forms the upper formation of the Edwards Group. The Person Formation and the underlying Kainer Formation comprises the Edwards Aquifer, a federally designated sole source aquifer for the region.

The rocks on the southern portion of the site are mapped as the cyclic and marine member of the Person Formation. The lithology consists of a chert-bearing mudstone to packstone and miliolid grainstone. It weathers to massive, light-tan outcrops with scattered toucasia (bivalve or clam) fossils present. This member is one of the most hydrologically productive due to the large number of subsurface caverns associated with incipient karstification. It is very permeable with laterally extensive, fabric and non-fabric selective porosity.

### **SITE INVESTIGATION**

The site investigation was performed by systematically traversing the subject tract, and mapping fractured or vuggy rock outcrops, closed depressions, sinkholes, caves, or indications of fault/fracture zones. The purpose of the site investigation was to delineate features with recharge potential that may warrant special protection or consideration. The results of the site investigation are included in the



attached TCEQ report format. Feature S-1 was a zone of vuggy fractured rock with solution-enlarged fractures in a drainage near the southwest property line of the South Tract. Features S-2 and S-3 were small solution cavities on uplands in the western portions of the South Tract and North Tract, respectively.

**SUMMARY**

A solution-enlarged fractured rock outcrop zone (S-1) near the southwestern property line was the only sensitive feature noted on the subject tract. It is possible that clearing/construction activities will reveal the presence of features currently hidden by thick vegetation and/or soil cover. If caves, sinkholes, or solution cavities are encountered during future clearing/construction activities, please contact our office for additional assistance.

We appreciate this opportunity to be of service to you. If you have any questions, please do not hesitate to contact our office.

Respectfully submitted,  
**PROFESSIONAL SERVICE INDUSTRIES, INC.**



John Langan, P.G.  
Environmental Department Manager



## **WARRANTY**

The field observations and research reported herein are considered enough in detail and scope to form a reasonable basis for a general geological recharge assessment of this site. PSI warrants that the findings and conclusions contained herein have been promulgated in accordance with generally accepted geologic methods, only for the site described in this report. These methods have been developed to provide the client with information regarding apparent indications of existing or potential conditions relating to the subject site and are necessarily limited to the conditions observed at the time of the site visit and research. This report is also limited to the information available at the time it was prepared. In the event additional information is provided to PSI following the report, it will be forwarded to the client in the form received for evaluation by the client. There is a possibility that conditions may exist which could not be identified within the scope of the assessment or which were not apparent during the site visit. PSI believes that the information obtained from others during the review of public information is reliable; however, PSI cannot warrant or guarantee that the information provided by others is complete or accurate.

This report has been prepared for the exclusive use of Ink Civil for the site discussed herein. Reproductions of this report cannot be made without the expressed approval of Ink Civil. The general terms and conditions under which this assessment was prepared apply solely to Ink Civil. No other warranties are implied or expressed.



# Geologic Assessment

## Texas Commission on Environmental Quality

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

**To ensure that the application is administratively complete, confirm that all fields in the form are complete, verify that all requested information is provided, consistently reference the same site and contact person in all forms in the application, and ensure forms are signed by the appropriate party.**

**Note: Including all the information requested in the form and attachments contributes to more streamlined technical reviews.**

## Signature

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.

Print Name of Geologist: John Langan

Telephone: 210/342-9377

Date: 11/15/21

Fax: 210/342-9401

Representing: PSI TBPG No. 50128 (Name of Company and TBPG or TBPE registration number)

Signature of Geologist:



Regulated Entity Name: Parc Haus



## Project Information

1. Date(s) Geologic Assessment was performed: 10/26-27/21

2. Type of Project:

WPAP

AST

SCS

UST

3. Location of Project:

Recharge Zone

Transition Zone

Contributing Zone within the Transition Zone

4.  **Attachment A - Geologic Assessment Table.** Completed Geologic Assessment Table (Form TCEQ-0585-Table) is attached.
5.  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.

Table 1 - Soil Units, Infiltration Characteristics and Thickness

Soil Name	Group*	Thickness(feet)
Rumple Comfort Association	B	1-2
Medlin Eckrant Association	B	2-3
Eckrant-rock outcrop	B	1-2

Soil Name	Group*	Thickness(feet)

*\* 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.

6.  **Attachment B – Stratigraphic Column.** A stratigraphic column showing formations, members, and thicknesses is attached. The outcropping unit, if present, should be at the top of the stratigraphic column. Otherwise, the uppermost unit should be at the top of the stratigraphic column.
7.  **Attachment C – Site Geology.** A narrative description of the site specific geology including any features identified in the Geologic Assessment Table, a discussion of the potential for fluid movement to the Edwards Aquifer, stratigraphy, structure(s), and karst characteristics is attached.
8.  **Attachment D – Site Geologic Map(s).** 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" = 150'  
 Site Geologic Map Scale: 1" = 150'  
 Site Soils Map Scale (if more than 1 soil type): 1" = 358'
9. Method of collecting positional data:
  - Global Positioning System (GPS) technology.
  - Other method(s). Please describe method of data collection: \_\_\_\_\_
10.  The project site and boundaries are clearly shown and labeled on the Site Geologic Map.

11.  Surface geologic units are shown and labeled on the Site Geologic Map.
12.  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.
13.  The Recharge Zone boundary is shown and labeled, if appropriate.
14. All known wells (test holes, water, oil, unplugged, capped and/or abandoned, etc.): If applicable, the information must agree with Item No. 20 of the WPAP Application Section.
- There are 0 (#) wells present on the project site and the locations are shown and labeled. (Check all of the following that apply.)
- The wells are not in use and have been properly abandoned.
- The wells are not in use and will be properly abandoned.
- The wells are in use and comply with 16 TAC Chapter 76.
- There are no wells or test holes of any kind known to exist on the project site.

### *Administrative Information*

15.  Submit one (1) original and one (1) copy of the application, plus additional copies as needed for each affected incorporated city, groundwater conservation district, and county in which the project will be located. The TCEQ will distribute the additional copies to these jurisdictions. The copies must be submitted to the appropriate regional office.

**STRATIGRAPHIC COLUMN**  
**Parc Haus Tract**  
**Loop 337**  
**New Braunfels, Comal County, Texas**

FORMATION	THICKNESS	LITHOLOGIC DESCRIPTION
Del Rio Clay	40-70	Calcareous and gypsiferous, with pyrite common, with a blocky structure that weathers to light gray or yellowish gray. The characteristic marine megafossil, <i>Ilmatogyra arietina</i> (formerly <i>exogyra arietina</i> ) is widespread throughout the formation.
Georgetown Formation	10-40'	Light tan limestone identified by proximity to Del Rio clay and diagnostic marker fossil: <i>waconella wacoensis</i> brachiopod; low porosity and permeability development.
Person Formation	180-224'	Limestones and dolomites, extensive porosity development in "honeycomb sections, interbedded with massive recrystallized limestones with more limited permeabilities (especially Regional Dense Member separating the Person and Kainer Formations.
Kainer Formation	260-310'	Hard, miliolid limestones, overlying calcified dolomites and dolomite. Leached evaporitic "Kirschberg" zone of very porous and permeable collapse breccia formed by the dissolution of gypsum. Overlies the basal nodular (Walnut) bed.
Glen Rose Limestone (upper)	350-500	Yellowish-tan thinly bedded limestone and marl. Alternating beds of varying hardness erodes to "stairstep" topography. Marine fossils common.



## SOILS NARRATIVE

According to the Soil Survey of Comal County, published by the United States Department of Agriculture, Soil Conservation Service, in cooperation with the Texas Agricultural Extension Service, reissued in 1984, the soils beneath the subject property have been classified as Rumble-Comfort association, undulating (RUD) and Medlin Eckrant Association (MED) and Eckrant-Rock outcrop complex, steep (ErG).

Rumble-Comfort association soils are shallow to moderately deep soils on uplands in the Edwards Plateau. The surface layer is a dark reddish-brown cherty clay loam about 10 inches thick and overlies a subsoil of reddish-brown cherty clay with abundant limestone fragments to a depth of 28 inches. The underlying parent material is an indurated limestone. The soil is well drained, with medium surface runoff, moderately slow permeability, and very low available water capacity. The soil is not suited for cropland, or cultivation, but is used as range land and habitat for wildlife.

Medlin-Eckrant soils are nearly level to gently sloping soils on broad ridges and shallow valleys in uplands that develop over limestone. Due to the large amount of rock fragments and shallowness, these soils are not suited to crops or pasturelands, but are used as rangeland. The soil is well drained, with moderately slow permeability, very low water capacity and rapid surface runoff. The shallow depth to limestone is suitable for home sites, as the rock offers stable footings for foundations, but considerable cutting and blasting is required for underground utility lines.

Eckrant-Rock outcrop complex, steep is similar in profile, but are found on long, narrow slopes on high hills and ridges and along escarpments. The surface layer of Eckrant soil is very dark gray extremely stony clay about 10 inches thick. The lower portion of the surface layer is up to 75% stones and cobbles and overlies the fractured limestone parent material.



## SITE GEOLOGIC NARRATIVE

### Physiography

From northwest to southeast, the three physiographic provinces in Comal County are: the Edwards Plateau, the Blackland Prairie, and the West Gulf Coastal Plain. The Edwards Plateau terrain is rugged and hilly, with elevations ranging from 1,100 feet to 1,900 feet above sea level. This area is underlain by beds of limestone that dip gently to the southeast. South of the Edwards Plateau is the Balcones Fault Zone, which is also the northernmost limit of the Blackland Prairie. The Balcones Fault Zone extends northeast-southwest across Bexar County and is composed of fault blocks of limestone, chalk, shale, and marl. The undulating, hilly topography of the Blackland Prairie ranges in elevation from about 700 feet to 1,100 feet above sea level. The faults are predominantly normal, down-to-the Gulf Coast, with near vertical throws. The West Gulf Coastal Plain lies southeast of the Blackland Prairie and is composed of relatively flat-lying beds of marl, clay, and sandy clay. According to topographic maps, elevations at the subject site range from approximately 925 feet above sea level in the northern portion of the north tract, to about 780 feet MSL in the southern portion of the Loop tract, in a drainage, with a slope to the south-southeast.

### Stratigraphy and Structure

The northern portion of the site is mapped as the Cretaceous Del Rio clay (Kdr). The site is overlain with a thin veneer of grass covered soil. Rock outcrops were minimal. According to the Geologic Atlas of Texas, the Del Rio Clay is calcareous and gypsiferous, with pyrite common, with a blocky structure that weathers to light gray or yellowish gray. The characteristic marine megafossil, *Ilmatogyra arietina* (formerly *exogyra arietina*) is widespread throughout the formation. The thickness ranges from 40-70 feet. A band across the north-central portion of the site is mapped as the Georgetown formation (Kgt) which is composed of limestone and marl; mostly limestone, fine grained, argillaceous, nodular, moderately indurated, light gray; some limestone, hard, brittle, thick bedded, white; some shale, marl, soft, light gray to yellowish gray; marine mega fossils include *Kingena wacoensis* and *Gryphaea washitaensis*; thickness 30 – 80 feet, thins southward.

Rocks underlying the southern portion of the site consist of the Lower Cretaceous Edwards Person Formation. Notable rock outcrops were limited to the drainage feature bordering the southwest portion of the South Tract, and the Loop Tract. According to “The Geologic Framework and Hydrogeologic Characteristics of the Edwards Aquifer Outcrop, Comal County Texas” written by the USGS, the Person Formation ranges in thickness from 180 to 224 feet and forms the upper formation of the Edwards Group. The Person Formation and the underlying Kainer Formation comprises the Edwards Aquifer, a federally designated sole source aquifer for the region.

The rocks on the southern portion of the site are mapped as the cyclic and marine member of the Person Formation. The lithology consists of a chert-bearing mudstone to packstone and miliolid grainstone. It weathers to massive, light-tan outcrops with scattered *toucasia* (bivalve or clam) fossils



present. This member is one of the most hydrologically productive due to the large number of subsurface caverns associated with incipient karstification. It is very permeable with laterally extensive, fabric and non-fabric selective porosity.

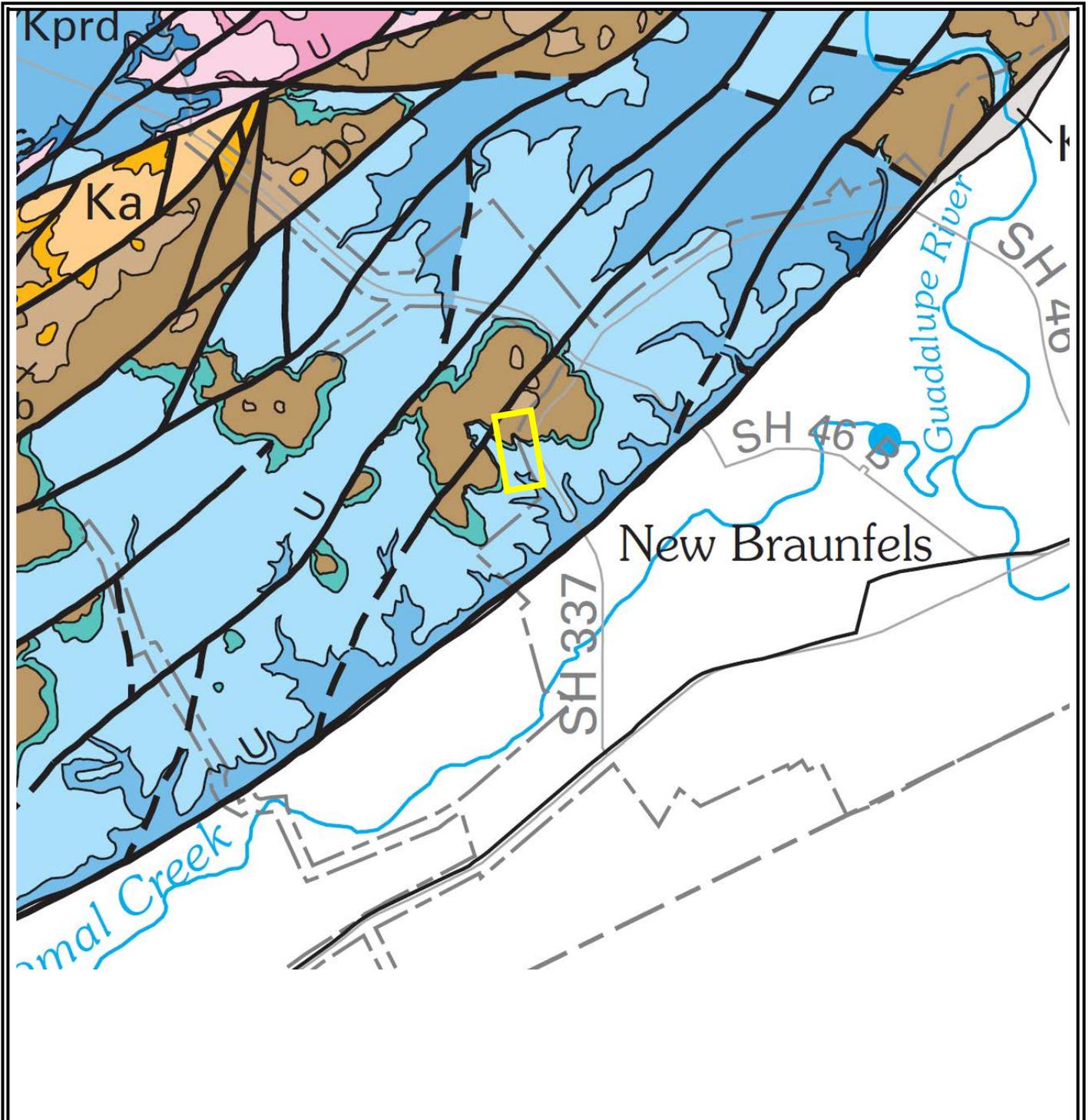
#### **SITE INVESTIGATION**

The site investigation was performed by systematically traversing the subject tract, and mapping fractured or vuggy rock outcrops, closed depressions, sinkholes, caves, or indications of fault/fracture zones. The purpose of the site investigation was to delineate features with recharge potential that may warrant special protection or consideration. The results of the site investigation are included in the attached TCEQ report format. Feature S-1 was a zone of vuggy fractured rock with solution-enlarged fractures in a drainage near the southwest property line of the South Tract. Features S-2 and S-3 were small solution cavities on uplands in the western portions of the South Tract and North Tract, respectively.

#### **SUMMARY**

A solution-enlarged fractured rock outcrop zone (S-1) near the southwestern property line was the only sensitive feature noted on the subject tract. It is possible that clearing/construction activities will reveal the presence of features currently hidden by thick vegetation and/or soil cover. If caves, sinkholes, or solution cavities are encountered during future clearing/construction activities, please contact our office for additional assistance.





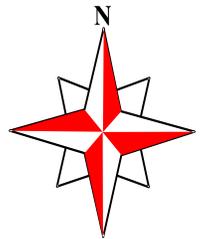
**intertek**  
**psi**  
 PSI, Inc.  
 3 Burwood Lane  
 San Antonio, Texas 78216

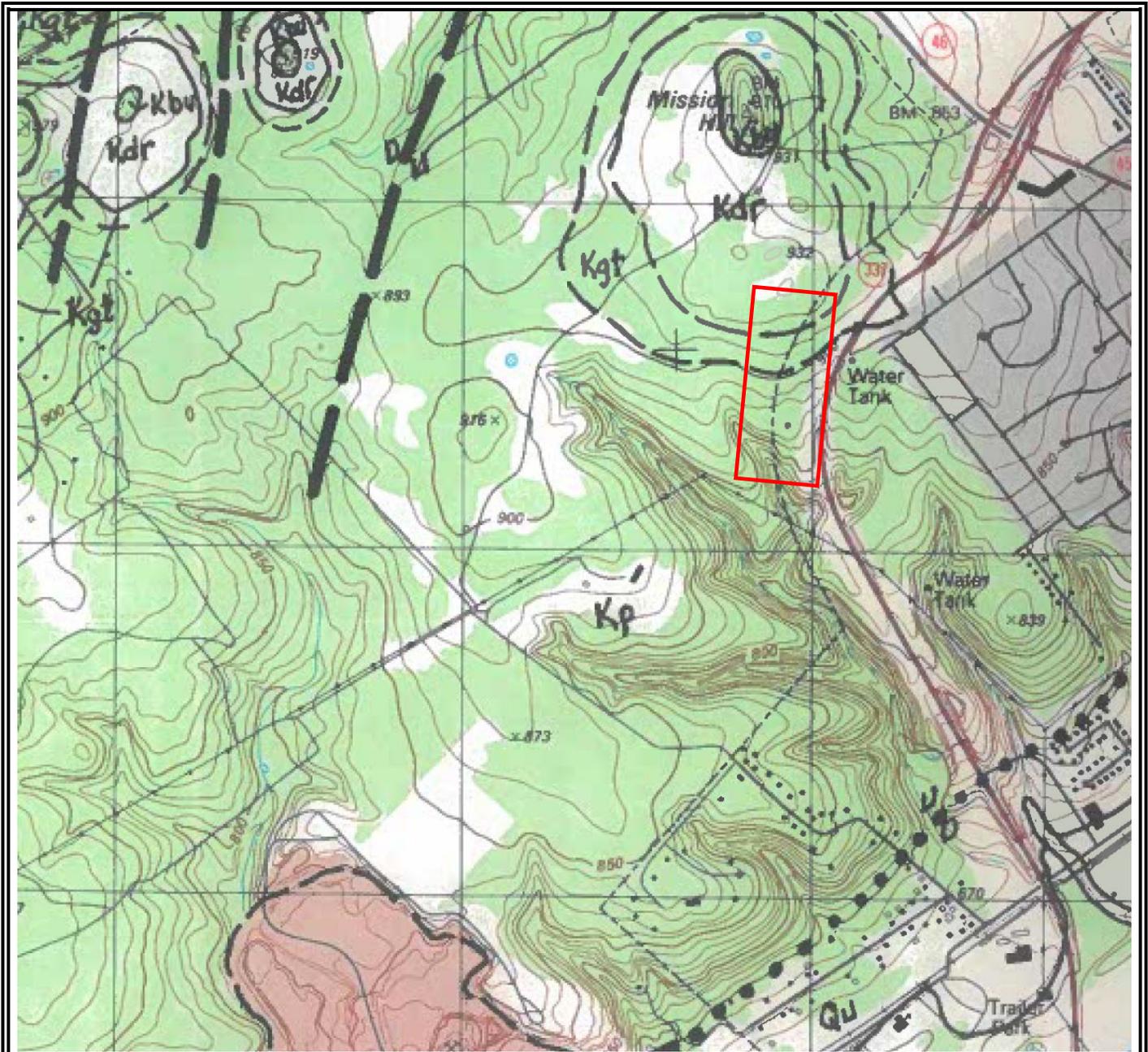
**PROJECT NAME:**

Parc Haus Tract  
 Loop 337  
 New Braunfels, TX

PROJECT NO.:435-5166

**Geologic Map of Edwards  
 Aquifer Recharge Zone,  
 South-Central Texas**  
 (USGS, 2005)





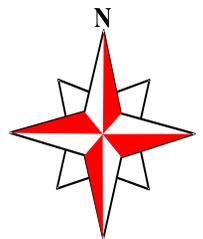
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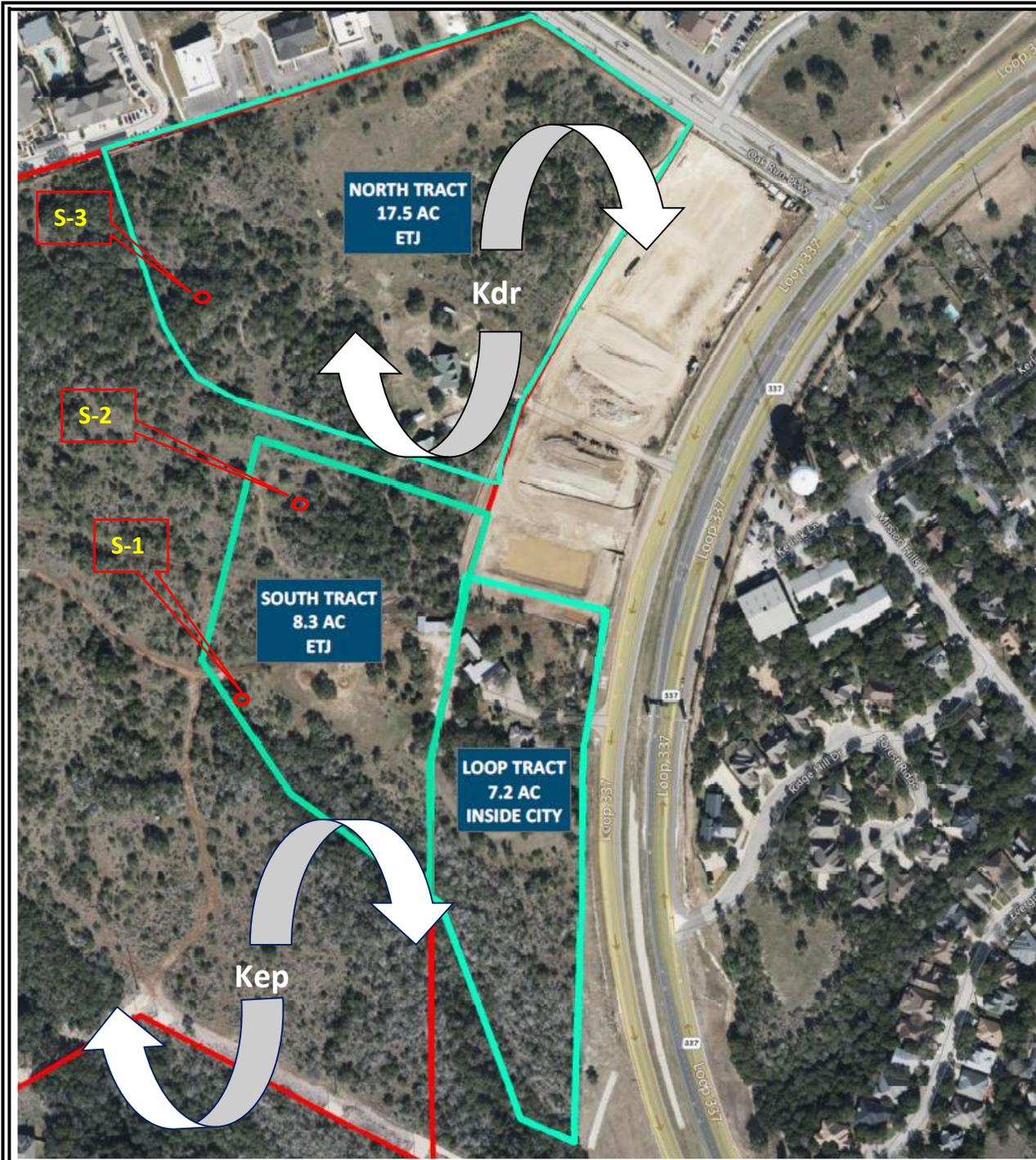
PSI, Inc.  
3 Burwood Lane  
San Antonio, Texas 78216

**PROJECT NAME:**  
Parc Haus Tract  
Loop 337  
New Braunfels, Texas  
PROJECT NO.:435-5166

**Geologic Map of the New  
Braunfels West, Texas  
Quadrangle**

Bureau of Economic Geology,  
UT-Austin (Collins 1993)  
Geology from Abbot (1973) and  
King (1957)





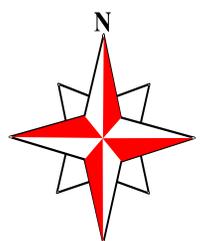
**intertek**  
**psi**  
PSI, Inc.  
3 Burwood Lane  
San Antonio, Texas 78216

**PROJECT NAME:**  
Parc Haus Tract  
Loop 337  
New Braunfels, Texas  
PROJECT NO.:435-5166



**Geologic Feature Map**

**Key**  
Kdr- Cretaceous Del Rio Clay  
Kep-Cretaceous Edwards  
Person Formation  
S-1 Feature Location







1. View of vuggy fractured rock zone feature S-1, located at 29-42-24.7; 98-9-54.5 on the southwestern property line of the South Tract, west of Loop 337 in New Braunfels, Texas.



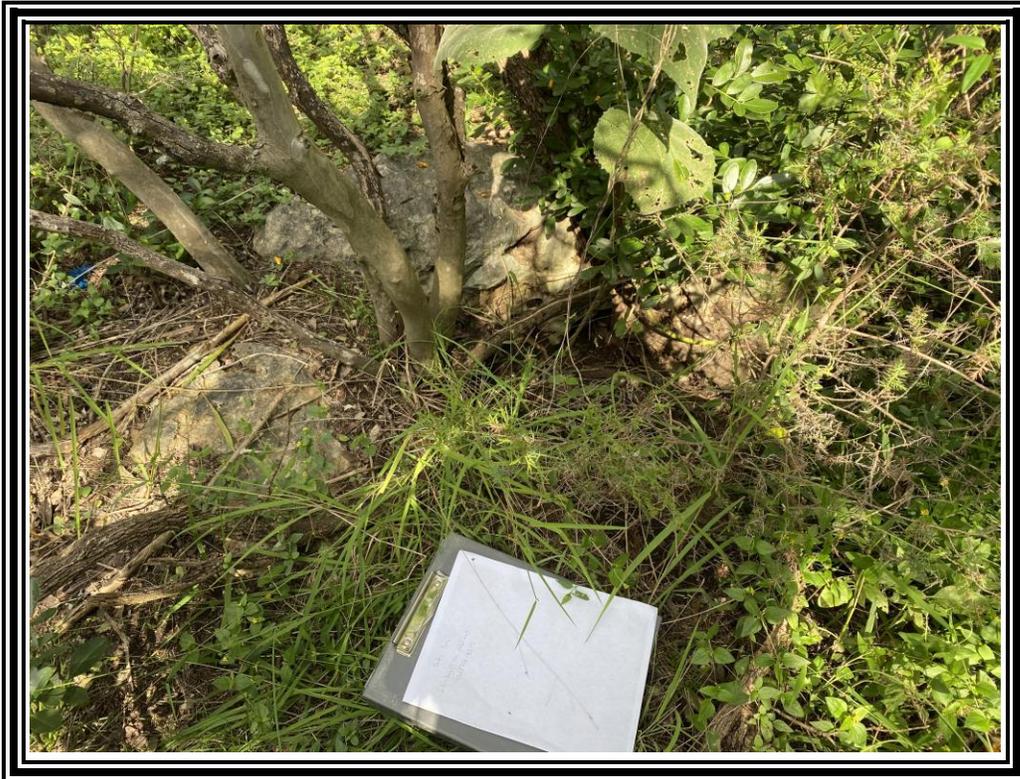
2. View of fractured rock and cavities in S-1.



3. View of southern bank of S-1.



4. Close-up view of vuggy rock on the left, with fractured rock underlying and exposed to the right.



5. View of solution cavity feature S-2, located at 29-42-29.3 98-9-53.9, in the uplands on the South Tract, near the northwest corner.



6. View of solution cavity feature S-3, located at 29-42-33.8 98-9-56.6, in the uplands on the North Tract, in the southwest portion.



7. View north along the eastern property line from the Loop Tract.

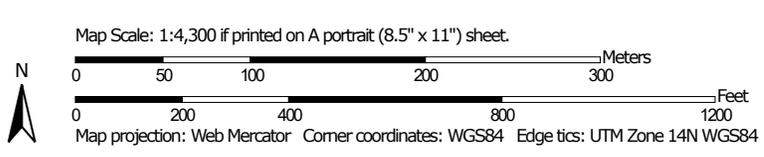


8. View of thick vegetation in the North Tract.

Soil Map—Comal and Hays Counties, Texas



Soil Map may not be valid at this scale.



## MAP LEGEND

### Area of Interest (AOI)

 Area of Interest (AOI)

### Soils

 Soil Map Unit Polygons

 Soil Map Unit Lines

 Soil Map Unit Points

### Special Point Features



Blowout



Borrow Pit



Clay Spot



Closed Depression



Gravel Pit



Gravelly Spot



Landfill



Lava Flow



Marsh or swamp



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

### Water Features



Streams and Canals

### Transportation



Rails



Interstate Highways



US Routes



Major Roads



Local Roads

### Background



Aerial Photography

## MAP INFORMATION

The soil surveys that comprise your AOI were mapped at 1:20,000.

**Warning:** Soil Map may not be valid at this scale.

Enlargement of maps beyond the scale of mapping can cause misunderstanding of the detail of mapping and accuracy of soil line placement. The maps do not show the small areas of contrasting soils that could have been shown at a more detailed scale.

Please rely on the bar scale on each map sheet for map measurements.

Source of Map: Natural Resources Conservation Service

Web Soil Survey URL:

Coordinate System: Web Mercator (EPSG:3857)

Maps from the Web Soil Survey are based on the Web Mercator projection, which preserves direction and shape but distorts distance and area. A projection that preserves area, such as the Albers equal-area conic projection, should be used if more accurate calculations of distance or area are required.

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 18, Sep 10, 2021

Soil map units are labeled (as space allows) for map scales 1:50,000 or larger.

Date(s) aerial images were photographed: Dec 17, 2020—Jan 15, 2021

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

Map Unit Symbol	Map Unit Name	Acres in AOI	Percent of AOI
ErG	Eckrant-Rock outcrop association, 8 to 30 percent slopes	3.7	10.8%
MEC	Medlin, warm-Eckrant association, 1 to 8 percent slopes	5.6	16.4%
RUD	Rumple-Comfort, rubbly association, 1 to 8 percent slopes	24.7	72.8%
<b>Totals for Area of Interest</b>		<b>34.0</b>	<b>100.0%</b>

# Organized Sewage Collection System Application

## Texas Commission on Environmental Quality

For Regulated Activities on the Edwards Aquifer Recharge Zone and Relating to 30 TAC §213.5(c), Effective June 1, 1999

**To ensure that the application is administratively complete, confirm that all fields in the form are complete, verify that all requested information is provided, consistently reference the same site and contact person in all forms in the application, and ensure forms are signed by the appropriate party.**

**Note: Including all the information requested in the form and attachments contributes to more streamlined technical reviews.**

**Regulated Entity Name:** Oak Run Village Apartments

1.  **Attachment A – SCS Engineering Design Report.** This Engineering Design Report is provided to fulfill the requirements of 30 TAC Chapter 217, including 217.10 of Subchapter A, §§217.51 – 217.70 of Subchapter C, and Subchapter D as applicable, and is required to be submitted with this SCS Application Form.

## Customer Information

2. 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: Basil Koutsogeorgas

Entity: PARCHAUS NEW BRAUNFELS LP

Mailing Address: 8350 N. CENTRAL EXPRESSWAY, STE 1500

City, State: DALLAS, TX

Zip: 75206

Telephone: 972-385-4130

Fax: \_\_\_\_\_

Email Address: BasilK@providentrealty.net

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

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

Contact Person: James Ingalls, P.E.

Texas Licensed Professional Engineer's Number: 107416

Entity: INK Civil

Mailing Address: 2021 W SH46, Suite 105

City, State: New Braunfels, TX

Zip: 78132

Telephone: 930-358-7127

Fax: \_\_\_\_\_

Email Address: jamesingalls@ink-civil.com

## Project Information

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

- Residential: Number of single-family lots: \_\_\_\_\_  
 Multi-family: Number of residential units: 660  
 Commercial  
 Industrial  
 Off-site system (not associated with any development)  
 Other: \_\_\_\_\_

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

100 % Domestic 71,820 (Average Dry Flow)  
 \_\_\_\_\_% Industrial 293,280 gallons/day (Peak Wet Weather Flow)  
 \_\_\_\_\_% Commingled \_\_\_\_\_gallons/day  
 \_\_\_\_\_gallons/day  
 Total gallons/day: 293,280

6. Existing and anticipated infiltration/inflow is 13,148 gallons/day. This will be addressed by:

Installation of watertight resilient connectors at the pipe penetration 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). Also, the newly installed pipe capacity exceeds the capacity required for the development.

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

- The WPAP application for this development was approved by letter dated \_\_\_\_\_. A copy of the approval letter is attached.  
 The WPAP application for this development was submitted to the TCEQ on 3/01/2023 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.

8. Pipe description:

Table 1 - Pipe Description

<b>Pipe Diameter(Inches)</b>	<b>Linear Feet (1)</b>	<b>Pipe Material (2)</b>	<b>Specifications (3)</b>
8"	1,291	PVC SDR-26	ASTM D-3034, D-3212, F-477
8"	20	C-900 DR 18	AWWA C-900, ASTM D 3139

**Total Linear Feet:** 1,311

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

9. The sewage collection system will convey the wastewater to the \_\_\_\_\_ (name) Treatment Plant. The treatment facility is:

- Existing
- Proposed

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

- The City of **New Braunfels** standard specifications.
- Other. Specifications are attached.

11.  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** form (TCEQ-0624) is included with this application.

**Alignment**

12.  There are no deviations from uniform grade in this sewage collection system without manholes and with open cut construction.
13.  There are no deviations from straight alignment in this sewage collection system without manholes.
- Attachment B - Justification and Calculations for Deviation in Straight Alignment without Manholes.** A justification for deviations from straight alignment in this sewage collection system without manholes with documentation from pipe manufacturer allowing pipe curvature is attached.
- For curved sewer lines, all curved sewer line notes (TCEQ-0596) are included on the construction plans for the wastewater collection system.

**Manholes and Cleanouts**

14.  Manholes or clean-outs exist at the end of each sewer line(s). These locations are listed below: (Please attach additional sheet if necessary)

Table 2 - Manholes and Cleanouts

<i>Line</i>	<i>Shown on Sheet</i>	<i>Station</i>	<i>Manhole or Clean-out?</i>
Line A	26 Of 28	10+00	Existing Manhole
Line A	26 Of 28	10+56.26	MH-A1
Line A	26 Of 28	12+77.37	MH-A2
Line A	26 Of 28	13+35.56	MH-A3 (vented)
Line A	26 Of 28	14+86.28	MH-A4
Line A	26 Of 28	15+55.21	MH-A5
Line A / Lateral Dog Wash	26 Of 28	0+74.17	Clean out

<b>Line</b>	<b>Shown on Sheet</b>	<b>Station</b>	<b>Manohole/Cleanout</b>
Line A	26 of 28	17+12.14	MH-A6 (vented)
Line A / Lateral 3	26 of 28	0+48.76	Cleanout
Line A / Lateral 3	26 of 28	0+89.69	Cleanout
Line A	26 of 28	18+13.79	MH-A7
Line A / Lateral S1A	26 of 28	0+48.42	Cleanout
Line A	26 of 28	19+59.20	MH-A8
Line A / Lateral S2	26 of 28	0+26.64	Cleanout
Line A	26 of 28	20+35.85	MH-A9 (vented)
Line A / Lateral S1B	26 of 28	0+51.70	Cleanout
Line A / Lateral S1B	26 of 28	0+86.37	Cleanout
Line A / Lateral S1B	26 of 28	1+08.98	Cleanout
Line A / Lateral S1B	26 of 28	1+24.17	Cleanout
Line C	1 of 1	10+90.50	MH-C1
Line C	1 of 1	12+74.29	MH-C2

<i>Line</i>	<i>Shown on Sheet</i>	<i>Station</i>	<i>Manhole or Clean-out?</i>
	Of		
	Of		
	Of		

15.  Manholes are installed at all Points of Curvature and Points of Termination of a sewer line.
16.  The maximum spacing between manholes on this project for each pipe diameter is no greater than:

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

- Attachment C – Justification for Variance from Maximum Manhole Spacing.** The maximum spacing between manholes on this project (for each pipe diameter used) is greater than listed in the table above. A justification for any variance from the maximum spacing is attached, and 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.
- The use of pre-cast manholes is requested for this project. The manufacturer's specifications and construction drawings, showing the method of sealing the joints, are attached.

## ***Site Plan Requirements***

***Items 18 - 25 must be included on the Site Plan.***

18.  The Site Plan must have a minimum scale of 1" = 400'.  
Site Plan Scale: 1" = 150'.
19.  The Site Plan must include the sewage collection system general layout, including manholes with station numbers, and sewer pipe stub outs (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:
- 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:

- 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:

- 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.)

Table 3 - 100-Year Floodplain

<i>Line</i>	<i>Sheet</i>	<i>Station</i>
	of	to

23. 5-year floodplain:

- 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.)

Table 4 - 5-Year Floodplain

<i>Line</i>	<i>Sheet</i>	<i>Station</i>
	of	to

24.  Legal boundaries of the site are shown.

25.  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.

**Items 26 - 33 must be included on the Plan and Profile sheets.**

26.  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.

Table 5 - Water Line Crossings

<i>Line</i>	<i>Station or Closest Point</i>	<i>Crossing or Parallel</i>	<i>Horizontal Separation Distance</i>	<i>Vertical Separation Distance</i>
Line A	13+76.62	Crossing	0	3.5'

27. Vented Manholes:

- No part** of this sewer line is within the 100-year floodplain and vented manholes are not required by 30 TAC Chapter 217.
- 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 within. No vented manholes will be used.

Table 6 - Vented Manholes

<i>Line</i>	<i>Manhole</i>	<i>Station</i>	<i>Sheet</i>
Line A	MH-A3	13+35.56	26 of 28
Line A	MH-A6	17+12.14	26 of 28
Line A	MH-A9	20+35.85	26 of 28

<i>Line</i>	<i>Manhole</i>	<i>Station</i>	<i>Sheet</i>

28. Drop manholes:

- There are no drop manholes associated with this project.
- Sewer lines which enter new or existing manholes or "manhole structures" higher than 24 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 §217.55(l)(2)(H).

Table 7 - Drop Manholes

<i>Line</i>	<i>Manhole</i>	<i>Station</i>	<i>Sheet</i>

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

- 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.

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

- 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.

31. Minimum flow velocity (From Appendix A)

- 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.

32. Maximum flow velocity/slopes (From Appendix A)

- 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 D – Calculations for 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. Calculations are attached.

Table 8 - Flows Greater Than 10 Feet per Second

<i>Line</i>	<i>Profile Sheet</i>	<i>Station to Station</i>	<i>FPS</i>	<i>% Slope</i>	<i>Erosion/Shock Protection</i>

33. Assuming pipes are flowing full, where flows are  $\geq 10$  feet per second, the provisions noted below have been made to protect against pipe displacement by erosion and/or shock under 30 TAC §217.53(l)(2)(B).

- 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.
- N/A

### **Administrative Information**

- 34.  The final plans and technical specifications are submitted for TCEQ 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.
- 35.  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:

Table 9 - Standard Details

<b>Standard Details</b>	<b>Shown on Sheet</b>
Lateral stub-out marking <b>[Required]</b>	27 of 28
Manhole, showing inverts comply with 30 TAC §217.55(l)(2) <b>[Required]</b>	27 of 28
Alternate method of joining lateral to existing SCS line for potential future connections <b>[Required]</b>	N/A of
Typical trench cross-sections <b>[Required]</b>	28 of 28
Bolted manholes <b>[Required]</b>	N/A of
Sewer Service lateral standard details <b>[Required]</b>	27 of 28
Clean-out at end of line <b>[Required, if used]</b>	28 of 28
Baffles or concrete encasement for shock/erosion protection <b>[Required, if flow velocity of any section of pipe &gt;10 fps]</b>	N/A of
Detail showing Wastewater Line/Water Line Crossing <b>[Required, if crossings are proposed]</b>	28 of 28
Mandrel detail or specifications showing compliance with 30 TAC §217.57(b) and (c) <b>[Required, if Flexible Pipe is used]</b>	28 of 28

Standard Details	Shown on Sheet
Drop manholes [Required, if a pipe entering a manhole is more than 24 inches above manhole invert]	N/A of

- 36.  All organized sewage collection system general construction notes (TCEQ-0596) are included on the construction plans for this sewage collection system.
- 37.  All proposed sewer lines will be sufficiently surveyed/staked to allow an assessment prior to TCEQ executive director approval. If the alignments of the proposed sewer lines are not walkable on that date, the application will be deemed incomplete and returned.
  - Survey staking was completed on this date: 5/29/2023
- 38.  Submit one (1) original and one (1) copy of the application, plus additional copies as needed for each affected incorporated city, groundwater conservation district, and county in which the project will be located. The TCEQ will distribute the additional copies to these jurisdictions. The copies must be submitted to the appropriate regional office.
- 39.  Any modification of this SCS application will require TCEQ approval, prior to construction, and may require submission of a revised application, with appropriate fees.

### Signature

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 **Organized 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 §217 and prepared by:

Print Name of Licensed Professional Engineer: James Ingalls, P.E.

Date: 4-18-23

Place engineer's seal here:



Signature of Licensed Professional Engineer:

---

## 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.

Table 10 - Slope Velocity

<b>Pipe Diameter(Inches)</b>	<b>% Slope required for minimum flow velocity of 2.0 fps</b>	<b>% Slope which produces flow velocity of 10.0 fps</b>
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.*

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

Figure 1 - Manning's Formula

Where:

*v* = velocity (ft/sec)  
*n* = Manning's roughness coefficient (0.013)  
*R<sub>h</sub>* = hydraulic radius (ft)  
*S* = slope (ft/ft)



2023

# Oak Run Village Apartments - Sanitary Sewer Engineering Design Report



INK Civil  
2021 SH 46W, Ste 105  
New Braunfels, TX 78132  
TBPE Firm # F-13351

Prepared for :  
Parchaus New Braunfels LP  
c/o Basil Koutsogorgas  
4/18/2023

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## PROJECT DESCRIPTION

The proposed Oak Run Village Apartments is located at 2850 Loop 337, New Braunfels, Texas 78130 in Comal County. The site consists of a 17.53-acre tract mostly undeveloped land with a single existing residential homestead. This property is outside of the City of New Braunfels City Limits and is located with the Extra Territorial Jurisdiction (ETJ) of the City of New Braunfels. This property was included as part of the Lark Canyon Subdivision Master Plan and was anticipated for multi-family use. According to the Flood Insurance Rate Map No. 48091C0435F, there is no existing floodplain located within the property. The stream basin for stormwater runoff is the Dry Comal Creek.

The proposed land use will consist of the following:

The development will be constructed in four phases. The scope of this SCS application will include all sanitary sewer infrastructure associated with Phase 1 and 2 of the development, comprising of the entire 17.53-acre tract. Phase 3 and 4 of the development is located across Paladora Drive on a separate 15.57-acre tract of land and will be submitted with a separate SCS application. Please see attached Location Map (Attachment A) for a breakout of the proposed phasing. The proposed sanitary sewer system will tie into an existing offsite manhole currently part of New Braunfels Utilities system that is sized to accept ultimate developed flows.

The potable 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. The project includes approximately 1311 linear feet of 8” sanitary sewer gravity main. The proposed SCS will connect to an existing NBU sewer line along Paladora Drive.

Table 1 below has a breakdown of the sewer main lengths by line.

Sanitary Sewer Line	Length (ft)
SSL A	1036
SSL C	275

## **SYSTEM SERVICE AREA**

The current proposed development is for a multi-family residential development. Coordination done with NBU showed that the proposed SCS with connection to the existing sanitary sewer main has an adequate capacity for the proposed Oak Run Village Apartments development.

## **DESIGN SUMMARY**

### **Inflow/Infiltration**

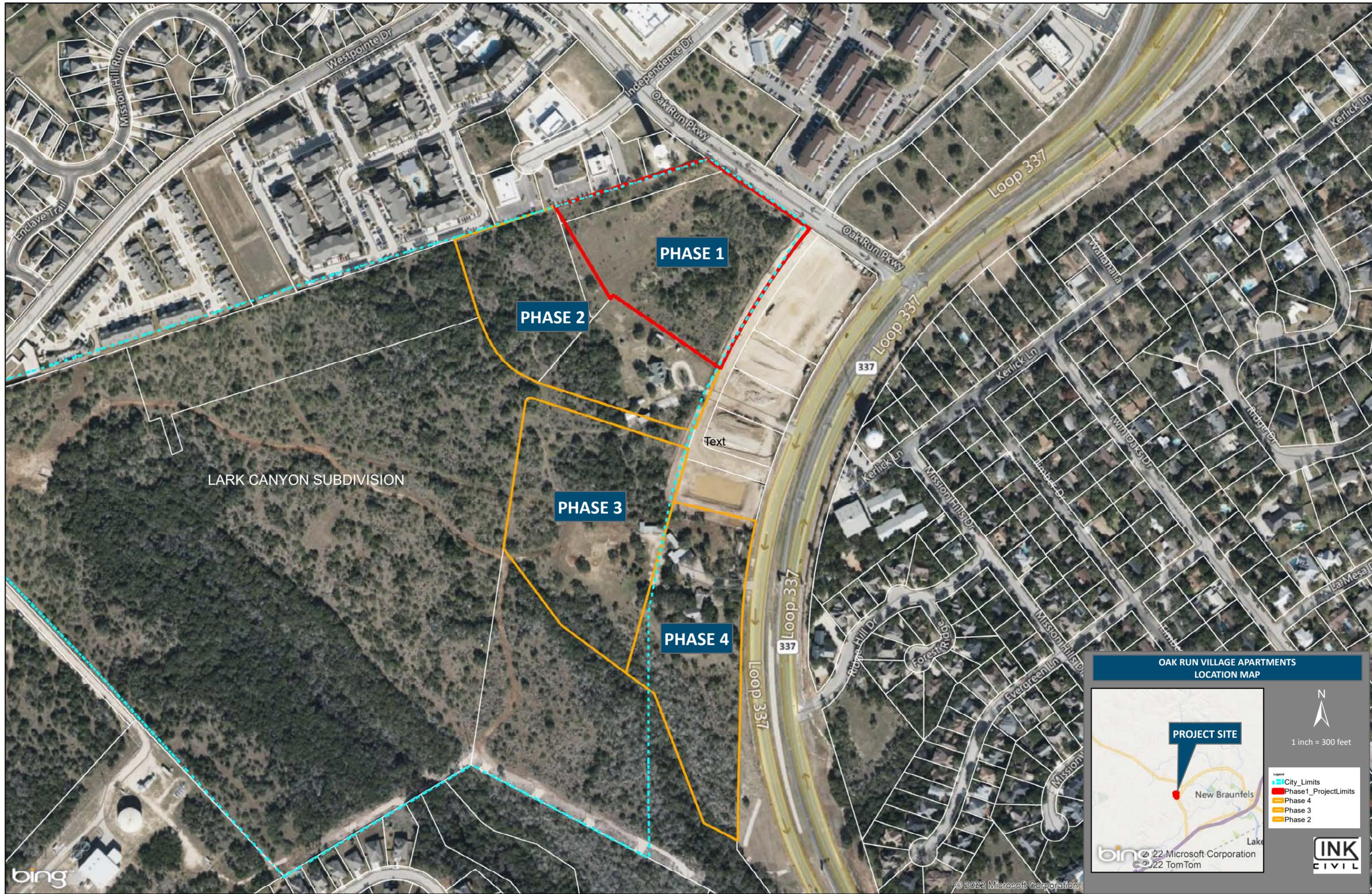
Existing and anticipated infiltration/inflow is 13,148 gallons/day. This will be addressed by the installation of watertight resilient connectors at the pipe penetrations to the manholes. In addition, the newly installed pipe shall be tested via low pressure air test or exfiltration test for leakage per TCEQ 317.2.(4). Also, the newly installed pipe capacity exceeds the capacity required for the development.

### **Wastewater/Water System Crossings**

The proposed wastewater collection system pipe crosses a water distribution system pipe at one locations. The first crossing occurs at Station 13+76.62 in the Sanitary Sewer Line A at a vertical distance of 3.5' below the water distribution line. To meet the design criteria set by TCEQ, the sanitary sewer pipes which cross below the water supply line at a distance less than nine feet vertically will be constructed with green color C-900 DR 18 PVC pipe that conforms to AWWA C-900 specifications for a length of nine feet both ways of the crossing.

**ATTACHMENT A    LOCATION MAP**





PHASE 1

PHASE 2

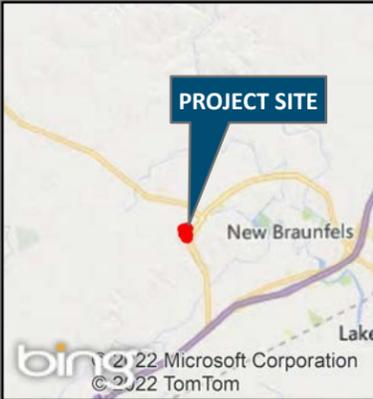
PHASE 3

PHASE 4

LARK CANYON SUBDIVISION

Text

OAK RUN VILLAGE APARTMENTS  
LOCATION MAP



1 inch = 300 feet

- City Limits
- Phase 1 Project Limits
- Phase 4
- Phase 3
- Phase 2



**ATTACHMENT B    OVERALL SERVICE AREA MAP**

CONTRACTOR SHALL NOTIFY THE FOLLOWING UTILITY COMPANIES 48 HOURS PRIOR TO EXCAVATION:

New Braunfels Utilities 830-629-8400  
 Spectrum Cable 830-625-3408  
 Centergrip Gas 830-643-5434  
 Robert Sanders 830-643-6903  
 Damaged Line 888-876-5786  
 AT&T Telephone 830-303-1333  
 Erick White PM 210-283-1706  
 Scott McBrearty (Construction) 210-656-4886  
 Texas One Call 830-545-6000

**C.P.E. LOCATOR**

CALL CENTER POINT ENERGY LOCATOR AT 1-800-545-6005, 48HRS BEFORE BEGINNING ANY EXCAVATION. 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 ANY GAS VALVES THAT ARE IN THE PROJECT AREA.

**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 THE TELEPHONE COMPANY CABLE LOCATOR 48HRS PRIOR TO EXCAVATION AT 1-800-545-6005. CONTRACTOR HAS THE RESPONSIBILITY TO PROTECT AND SUPPORT TELEPHONE COMPANY PIPING 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 SITES 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 EXCAVATIONS.

THE LOCATION OF ALL EXISTING UNDERGROUND UTILITIES ARE SHOWN IN AN APPROXIMATE LOCATIONS ONLY. THE CONTRACTOR SHALL DETERMINE THE EXACT LOCATION OF ALL EXISTING UTILITIES BEFORE COMMENCING WORK. THE CONTRACTOR WILL AGREE TO BE FULLY RESPONSIBLE FOR ANY AND ALL DAMAGES WHICH MIGHT BE INCURRED BY THEIR FAILURE TO EXACTLY LOCATE AND PRESERVE ANY AND ALL UNDERGROUND UTILITIES, STRUCTURES OR FACILITIES. CONTRACTOR SHALL NOTIFY THE ENGINEER OF ANY DISCREPANCIES 24-HOURS PRIOR TO COMMENCING CONSTRUCTION.

**CONSTRUCTION NOTES:**

- WHERE WATER LINES AND NEW SEWER LINES 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 §217.53(D) (PIPE DESIGN) AND 30 TAC §290.44(E) (WATER DISTRIBUTION).
- WHERE A NEW POTABLE WATERLINE CROSSES AN EXISTING, PRESSURE RATED WASTEWATER MAIN OR LATERAL, ONE SEGMENT OF THE WATERLINE PIPE SHALL BE CENTERED OVER THE WASTEWATER MAIN OR LATERAL SUCH THAT THE JOINTS OF THE WATERLINE PIPE ARE EQUIDISTANT AND AT LEAST NINE FEET HORIZONTALLY FROM THE CENTERLINE OF THE WASTEWATER MAIN OR LATERAL. THE POTABLE WATERLINE SHALL BE AT LEAST SIX INCHES ABOVE THE WASTEWATER MAIN OR LATERAL. WHEN POSSIBLE, THE CROSSING SHALL BE CENTERED BETWEEN THE JOINTS OF THE WASTEWATER MAIN OR LATERAL. IF THE EXISTING WASTEWATER MAIN OR LATERAL SHOWS SIGNS OF LEAKING, IT SHALL BE REPLACED FOR AT LEAST NINE FEET IN BOTH DIRECTIONS (18 FEET TOTAL) WITH AT LEAST 150 PSI PRESSURE RATED PIPE.
- ALL PRIVATE SERVICE LATERALS MUST BE INSPECTED AND CERTIFIED IN ACCORDANCE WITH 30 TAC §13.5(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.
- UTILITY SERVICES TO HAVE A MINIMUM A 3" COVER UNLESS OTHERWISE NOTED OR REQUIRED BY THE UTILITY COMPANY.
- FIRE HYDRANTS SHALL NOT BE INSTALLED WITHIN NINE FEET VERTICALLY OR HORIZONTALLY OF ANY WASTEWATER MAIN, WASTEWATER LATERAL, OR WASTEWATER SERVICE LINE REGARDLESS OF CONSTRUCTION.
- ENSURE ALL DRIVEWAY APPROACHES ARE BUILT IN GENERAL ACCORDANCE WITH A.D.A SPECIFICATIONS.
- NO VALVES, HYDRANTS, ETC. SHALL BE CONSTRUCTED WITHIN CURBS, SIDEWALKS, OR DRIVEWAYS.
- CONTRACTOR TO PROTECT INSTALLED PIPE FROM BEING CONTAMINATED OR DAMAGED PRIOR TO PLACING INTO SERVICE. ANY PIPE NBU INSPECTIONS DETERMINES IS CONTAMINATED, DIRTY, OR DAMAGED, SHALL BE REPLACED. (NSP)
- REFERENCE TO "CAP" ON THE DESIGN PLANS MEANS CAP OR PLUG. CAPS SHALL BE USED ON ALL SPOUT ENDS AND PLUGS ON ALL BELL ENDS PER NBU SPECIFICATIONS.
- INITIAL BACKFILL OF WATER LINES SHALL BE 3/4" TO DUST OR PEA GRAVEL AS PER NBU SPECIFICATIONS.
- THE LOCATIONS AND DEPTHS OF EXISTING UTILITIES, INCLUDING SERVICE LATERALS, AND DRAINAGE STRUCTURES SHOWN ON THE PLANS ARE APPROXIMATE ONLY. THE CONTRACTOR SHALL VERIFY THE EXACT LOCATION AND DEPTHS OF UNDERGROUND UTILITIES AT LEAST 48 HOURS PRIOR TO CONSTRUCTION WHETHER SHOWN ON PLANS OR NOT, AND TO PROTECT THE SAME DURING CONSTRUCTION.
- CONTRACTOR TO PRE-DIG TO VERIFY SIZE, TYPE AND LOCATION OF EXISTING UTILITIES PRIOR TO CONSTRUCTION. ALL EXISTING UTILITIES MUST BE MAINTAINED UNTIL FINAL ACCEPTANCE OF NEW SYSTEM AND SWITCH OVER OCCURS (NSP)
- CONTRACTOR TO UTILIZE WATER LINE STOPPERS TO MINIMIZE OUTAGES. USE OF LINE STOPPERS, INSTEAD OF EXISTING VALVES, MUST BE APPROVED BY NBU INSPECTIONS PRIOR TO INSTALLATION.
- SIZES ON SIZE WATER TAPS ARE ACCEPTABLE ONLY IF SOLID TAPS ARE USED.
- CONTRACTOR WILL KEEP THE AREA ON TOP OF AND AROUND THE WATER METER BOX FREE OF ALL OBJECTS AND DEBRIS.
- NO METER BOXES TO BE SET IN DRIVEWAYS. ANY METER BOXES SET IN DRIVEWAYS WILL BE RELOCATED AT CONTRACTOR'S AND/OR DEVELOPER'S EXPENSE.
- METER BOXES MUST BE SET AT PROPOSED GRADE. ANY METER BOXES THAT ARE NOT SET AT THE FINAL GRADE WILL BE ADJUSTED AT CONTRACTOR'S AND/OR DEVELOPER'S EXPENSE.
- EXISTING PIPE MATERIALS ARE UNKNOWN. CONTRACTOR WILL BE REQUIRED TO THE PROPOSED WATER MAINS TO EXISTING WATER MAINS PER NBU SPECIFICATIONS. ADDITIONAL PIPE NEEDED TO MAKE THE TIE IN WILL BE PAID FOR UNDER THE UNIT BID PRICE OF WATER PIPE OF THE SIZE INSTALLED. FITTINGS NEEDED TO MAKE THE CONNECTION TO THE EXISTING PIPE WILL BE PAID AS PART OF ITEM 510, PIPE. NO SEPARATE PAYMENT WILL BE MADE FOR THESE FITTINGS.
- DOMESTIC SERVICE BACKFLOW PREVENTER TO BE SPECIFIED AS: WAITS SERIES 909MTQT (REDUCED PRESSURE ZONE ASSEMBLY) OR ENGINEER APPROVED EQUAL.
- ALL UTILITIES TO BE CONSTRUCTED PRIOR TO STREETS.
- ALL UTILITY TRENCH COMPACTION TESTS WITHIN THE STREET PAVEMENT/SIDEWALK SECTION SHALL BE THE RESPONSIBILITY OF THE DEVELOPER'S GEOTECHNICAL ENGINEER. FILL MATERIAL SHALL BE PLACED IN UNIFORM LAYERS NOT TO EXCEED TWELVE INCHES (12") LOOSE. DETERMINE THE MAXIMUM LIFT THICKNESS BASED ON THE ABILITY OF THE COMPACTING OPERATION AND EQUIPMENT USED TO MEET THE REQUIRED DENSITY. EACH LAYER OF MATERIAL SHALL BE COMPACTED TO A MINIMUM 95% DENSITY AND TESTED FOR DENSITY AND MOISTURE IN ACCORDANCE WITH TEST METHODS TEX-113-E, TEX-114-E, TEX-115-E. THE NUMBER AND LOCATION OF REQUIRED TESTS SHALL BE DETERMINED BY THE GEOTECHNICAL ENGINEER AND APPROVED BY THE CITY OF NEW BRAUNFELS STREET INSPECTOR. AT A MINIMUM TESTS SHALL BE TAKEN EVERY 200 LF FOR EACH LIFT AND EVERY OTHER SERVICE LINE. 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. ADDITIONAL DENSITY TESTS MAY BE REQUESTED BY THE CITY OF NEW BRAUNFELS INSPECTOR.
- REFER TO ARCHITECTURAL PLANS FOR COORDINATION OF BUILDING, APPURTANANCES, DIMENSIONS, AND UTILITY ENTRANCE LOCATIONS.
- CONTRACTOR TO COORDINATE SANITARY SEWER AND WATER CONNECTIONS TO BUILDING WITH M.E.P. PLANS.
- CONTRACTOR TO COORDINATE ELECTRIC, TELEPHONE, AND GAS SERVICES WITH UTILITY PROVIDERS AND M.E.P. PLANS.
- THE GAS AND TELECOMMUNICATIONS SERVICES SHOWN ARE PRELIMINARY. REFERENCE THE M.E.P. PLANS FOR EXACT LOCATIONS OF ELECTRICAL, GAS, AND TELECOMMUNICATIONS SERVICES ARE NOT PART OF THE CIVIL DESIGN PLANS.

POINT OF DELIVERY FOR AN NBU WATER SYSTEM IS THE MAIN SIDE OF THE SERVICE LATERAL/LEAD FROM THE CUSTOMER'S METER/BACKFLOW/EASEMENT EDGE AND THAT THE POINT OF DELIVERY FOR AN NBU WASTE WATER SYSTEM IS THE MAIN SIDE OF THE SERVICE LATERAL FROM THE CUSTOMER'S CLEAN OUT PROPERTY LINE OR EASEMENT WHICHEVER IS NEARER. THE CUSTOMER IS RESPONSIBLE FOR DESIGN, CONSTRUCTION, OPERATION AND MAINTENANCE BEYOND THE POINT OF DELIVERY AND HAS SOLE CONTROL AND SUPERVISION OVER THE CUSTOMER'S INSTALLATION INCLUDING REVIEW, PERMITTING AND COMPLIANCE WITH ALL CITY PLUMBING CODES OR OTHER APPLICABLE CODES.

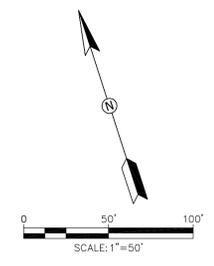
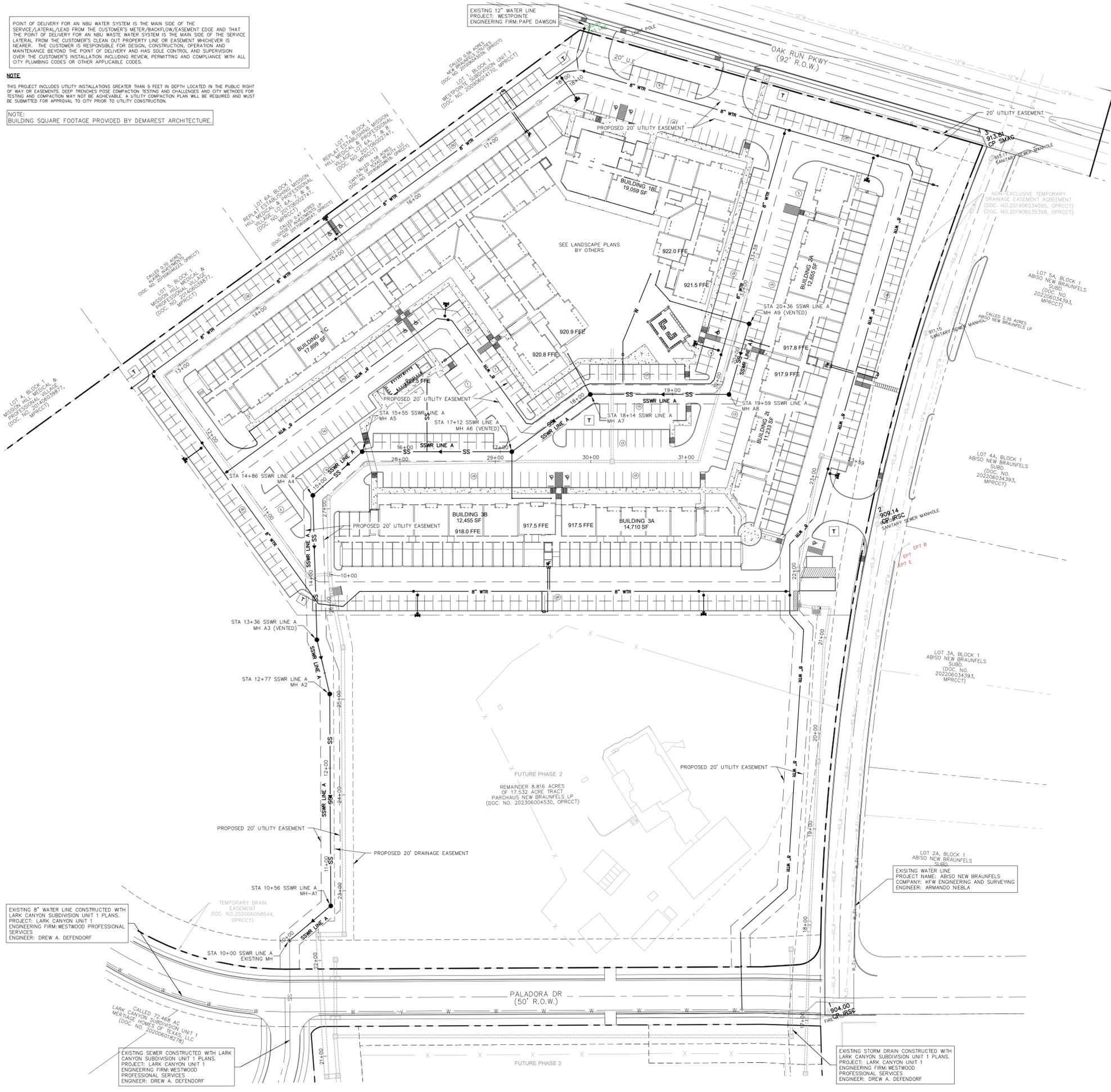
**NOTE:**

THIS PROJECT INCLUDES UTILITY INSTALLATIONS GREATER THAN 5 FEET IN DEPTH LOCATED IN THE PUBLIC RIGHT OF WAY OR EASEMENTS. DEEP TRENCHES POSE COMPACTION TESTING AND CHALLENGES AND CITY METHODS FOR TESTING AND COMPACTION MAY NOT BE ACHIEVABLE. A UTILITY COMPACTION PLAN WILL BE REQUIRED AND MUST BE SUBMITTED FOR APPROVAL TO CITY PRIOR TO UTILITY CONSTRUCTION.

**NOTE:**

BUILDING SQUARE FOOTAGE PROVIDED BY DEMAREST ARCHITECTURE.

Drawing Name: R:\Projects\PAR0001\_Parc\_Haz\_Development\Civil\Development\Civil\Overall\UTILITY\_PLAN.dwg User: Brittanysalant Apr 11, 2023 12:22PM



**LEGEND**

- BOUNDARY LINE
- EXISTING GUY WIRE
- EXISTING UTILITY POLE
- EXISTING LIGHT POLE
- EXISTING ELECTRIC METER
- EXISTING STORM DRAIN MANHOLE
- EXISTING SIGN
- EXISTING CATV PEDESTAL
- EXISTING WATER VALVE
- EXISTING FIRE HYDRANT
- EXISTING SANITARY SEWER MANHOLE
- EXISTING GAS LINE
- EXISTING 8" SANITARY SEWER LINE
- EXISTING 12" WATER LINE
- PROPOSED 8" SANITARY SEWER
- PROPOSED 8" WATER
- PROPOSED WATER VALVE
- PROPOSED FIRE HYDRANT
- PROPOSED SANITARY SEWER MANHOLE
- PROPOSED JUNCTION BOX



**PROVIDENT REALTY ADVISORS**  
 10210 N. CENTRAL EXPRESSWAY, SUITE 300  
 DALLAS, TX 75231

**OAK RUN VILLAGE APARTMENTS - PUBLIC INFRASTRUCTURE**

**OVERALL UTILITY PLAN**

SHEET **18** OF **28**

NO	DATE	ISSUES AND REVISIONS



2021 W SH46, STE 105  
 NEW BRAUNFELS, TX. 78132  
 PH: 830-358-7127 ink-civil.com  
 TBPE FIRM F-13351

**ATTACHMENT C    FEMA FIRM Map No. 48091C0435F**

**NOTES TO USERS**

This map is for use in administering the National Flood Insurance Program. It does not necessarily identify all areas subject to flooding, particularly from local drainage sources of small size. The community map repository should be consulted for possible updated or additional flood hazard information.

To obtain more detailed information in areas where Base Flood Elevations (BFEs) and/or floodways have been determined, users are encouraged to consult the Flood Profiles and Floodway Data and/or Summary of Stillwater Elevations tables contained within the Flood Insurance Study (FIS) report that accompanies this FIRM. Users should be aware that BFEs shown on the FIRM represent rounded whole-foot elevations. These BFEs are intended for flood insurance rating purposes only and should not be used as the sole source of flood elevation information. Accordingly, flood elevation data presented in the FIS report should be utilized in conjunction with the FIRM for purposes of construction and/or floodplain management.

Coastal Base Flood Elevations shown on this map apply only landward of 0.0' North American Vertical Datum of 1988 (NAVD 88). Users of this FIRM should be aware that coastal flood elevations are also provided in the Summary of Stillwater Elevations table in the Flood Insurance Study report for this jurisdiction. Elevations shown in the Summary of Stillwater Elevations table should be used for construction and/or floodplain management purposes when they are higher than the elevations shown on this FIRM.

Boundaries of the floodways were computed at cross sections and interpolated between cross sections. The floodways were based on hydraulic considerations with regard to requirements of the National Flood Insurance Program. Floodway widths and other pertinent floodway data are provided in the Flood Insurance Study report for this jurisdiction.

Certain areas not in Special Flood Hazard Areas may be protected by flood control structures. Refer to Section 2.4 "Flood Protection Measures" of the Flood Insurance Study report for information on flood control structures for this jurisdiction.

The projection used in the preparation of this map was Texas State Plane south central zone (FIPSZONE 4204). The horizontal datum was NAD83, GRS1980 spheroid. Differences in datum, spheroid, projection or State Plane zones used in the production of FIRMs for adjacent jurisdictions may result in slight positional differences in map features across jurisdiction boundaries. These differences do not affect the accuracy of the FIRM.

Flood elevations on this map are referenced to the North American Vertical Datum of 1988. These flood elevations must be compared to structure and ground elevations referenced to the same vertical datum. For information regarding conversion between the National Geodetic Vertical Datum of 1929 and the North American Vertical Datum of 1988, visit the National Geodetic Survey website at <http://www.ngs.noaa.gov/> or contact the National Geodetic Survey at the following address:

NGS Information Services  
NOAA, NINGS12  
National Geodetic Survey  
SSMC-3, #9202  
1315 East-West Highway  
Silver Spring, MD 20910-3282

To obtain current elevation, description, and/or location information for bench marks shown on this map, please contact the Information Services Branch of the National Geodetic Survey at (301) 713-3242, or visit its website at <http://www.ngs.noaa.gov/>.

Base map information shown on this FIRM was provided in digital format by Bexar Metro 911. This information was photogrammetrically compiled at a scale of at least 1:24,000 from aerial photography dated September 2004.

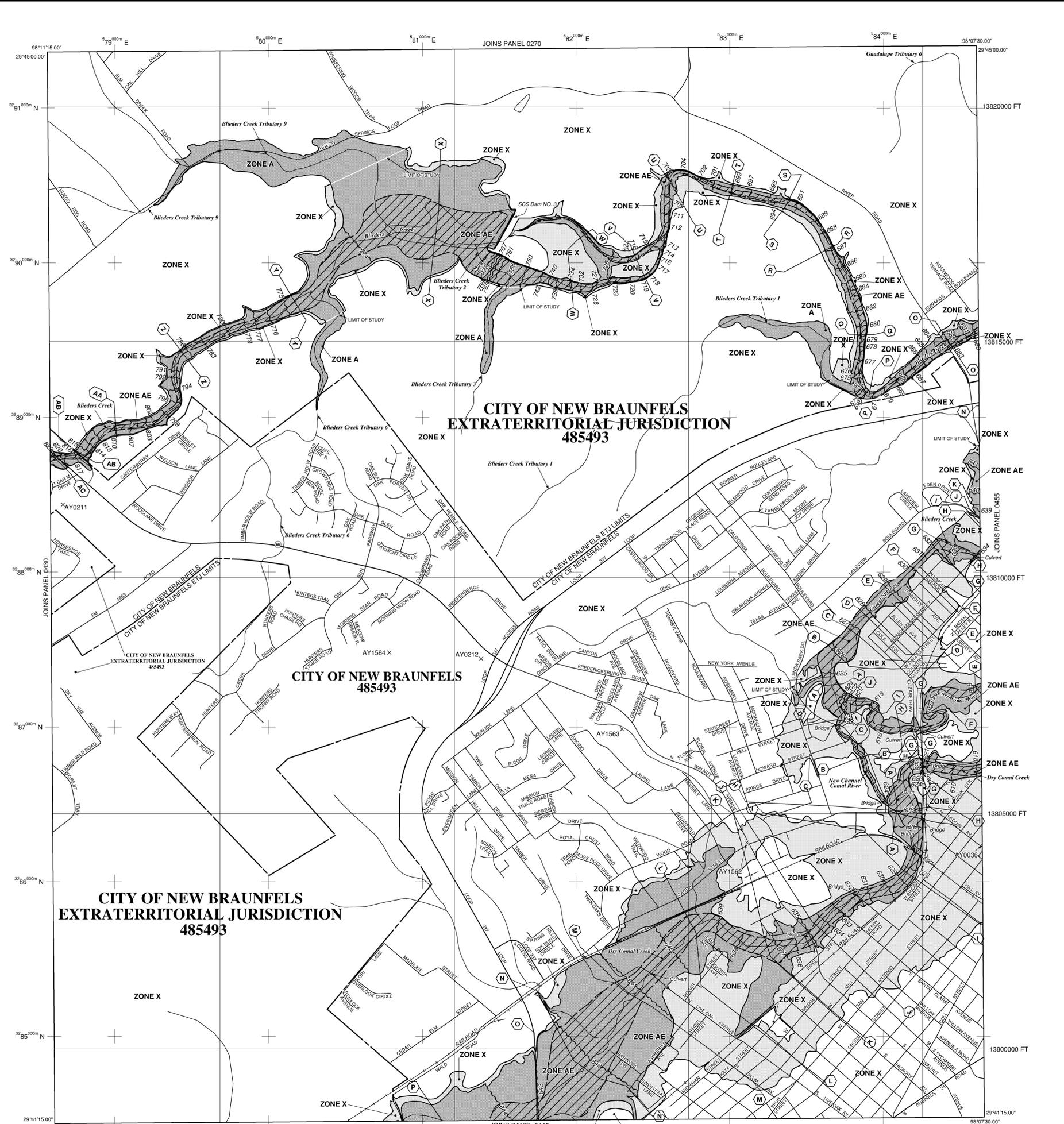
This map reflects more detailed and up-to-date stream channel configurations than those shown on the previous FIRM for this jurisdiction. The floodplains and floodways that were transferred from the previous FIRM may have been adjusted to conform to these new stream channel configurations. As a result, the Flood Profiles and Floodway Data tables in the Flood Insurance Study report (which contains authoritative hydraulic data) may reflect stream channel distances that differ from what is shown on this map.

Corporate limits shown on this map are based on the best data available at the time of publication. Because changes due to annexations or de-annexations may have occurred after this map was published, map users should contact appropriate community officials to verify current corporate limit locations.

Please refer to the separately printed Map Index for an overview map of the county showing the layout of map panels; community map repository addresses; and a Listing of Communities table containing National Flood Insurance Program dates for each community as well as a listing of the panels on which each community is located.

Contact the FEMA Map Service Center at 1-800-358-9616 for information on available products associated with this FIRM. Available products may include previously issued Letters of Map Change, a Flood Insurance Study report, and/or digital versions of this map. The FEMA Map Service Center may also be reached by Fax at 1-800-358-9620 and its website at <http://www.msc.fema.gov/>.

If you have questions about this map or questions concerning the National Flood Insurance Program in general, please call 1-877-FEMA MAP(1-877-336-2627) or visit the FEMA website at <http://www.fema.gov/>.



**LEGEND**

**SPECIAL FLOOD HAZARD AREAS (SFHAs) SUBJECT TO INUNDATION BY THE 1% ANNUAL CHANCE FLOOD**

The 1% annual chance flood (100-year flood), also known as the base flood, is the flood that has a 1% chance of being equaled or exceeded in any given year. The Special Flood Hazard Area is the area subject to flooding by the 1% annual chance flood. Areas of Special Flood Hazard include Zones A, AE, AH, AO, AR, A99, V and VE. The Base Flood Elevation is the water-surface elevation of the 1% annual chance flood.

**ZONE A** No Base Flood Elevations determined.

**ZONE AE** Base Flood Elevations determined.

**ZONE AH** Flood depths of 1 to 3 feet (usually areas of ponding); Base Flood Elevations determined.

**ZONE AO** Flood depths of 1 to 3 feet (usually sheet flow on sloping terrain); average depths determined. For areas of alluvial fan flooding, velocities also determined.

**ZONE AR** Special Flood Hazard Area formerly protected from the 1% annual chance flood by a flood control system that was subsequently decertified. Zone AR indicates that the former flood control system is being restored to provide protection from the 1% annual chance or greater flood.

**ZONE A99** Area to be protected from 1% annual chance flood by a Federal flood protection system under construction; no Base Flood Elevations determined.

**ZONE V** Coastal flood zone with velocity hazard (wave action); no Base Flood Elevations determined.

**ZONE VE** Coastal flood zone with velocity hazard (wave action); Base Flood Elevations determined.

**FLOODWAY AREAS IN ZONE AE**

The floodway is the channel of a stream plus any adjacent floodplain areas that must be kept free of encroachment so that the 1% annual chance flood can be carried without substantial increases in flood heights.

**OTHER FLOOD AREAS**

**ZONE X** Areas of 0.2% annual chance flood; areas of 1% annual chance flood with average depths of less than 1 foot or with drainage areas less than 1 square mile; and areas protected by levees from 1% annual chance flood.

**ZONE D** Areas determined to be outside the 0.2% annual chance floodplain. Areas in which flood hazards are undetermined, but possible.

**COASTAL BARRIER RESOURCES SYSTEM (CBRS) AREAS**

**OTHERWISE PROTECTED AREAS (OPAs)**

CBRS areas and OPAs are normally located within or adjacent to Special Flood Hazard Areas.

Floodplain boundary  
Floodway boundary  
Zone D boundary  
CBRS and OPA boundary  
Boundary dividing Special Flood Hazard Areas of different Base Flood Elevations, flood depths or flood velocities  
Base Flood Elevation line and value; elevation in feet\*  
Base Flood Elevation value where uniform within zone; elevation in feet  
\* Referenced to the North American Vertical Datum of 1988 (NAVD 88)

○ A ○ A Cross section line  
A-----A Transverse line  
97°07'30" 32°22'30" Geographic coordinates referenced to the North American Datum of 1983 (NAD 83)  
42°25'00"N 1000-meter Universal Transverse Mercator grid ticks, zone 14  
6000000 FT 5000-foot grid values; Texas State Plane coordinate system, south central zone (FIPSZONE 4204), Lambert Conformal Conic  
DX5510 x Bench mark (see explanation in Notes to Users section of this FIRM panel)  
● M1.5 River Mile

**MAP REPOSITORIES**  
Refer to Map Repositories list on Map Index

**EFFECTIVE DATE OF COUNTYWIDE FLOOD INSURANCE RATE MAP**  
September 2, 2009  
EFFECTIVE DATE(S) OF REVISION(S) TO THIS PANEL

For community map revision history prior to countywide mapping, refer to the Community Map History table located in the Flood Insurance Study report for this jurisdiction.

To determine if flood insurance is available in this community, contact your insurance agent or call the National Flood Insurance Program at 1-800-638-6620.

**MAP SCALE 1" = 1000'**  
0 1000 2000 FEET  
300 0 300 600 METERS

**NATIONAL FLOOD INSURANCE PROGRAM**

**PANEL 0435F**

**FIRM FLOOD INSURANCE RATE MAP**

**COMAL COUNTY, TEXAS AND INCORPORATED AREAS**

**PANEL 435 OF 505**  
(SEE MAP INDEX FOR FIRM PANEL LAYOUT)

**CONTAINS:**

COMMUNITY	NUMBER	PANEL	SUFFIX
NEW BRAUNFELS, CITY OF	485493	0435	F

Notice to User: The Map Number shown below should be used when placing map orders; the Community Number shown above should be used on insurance applications for the subject community.

**MAP NUMBER 48091C0435F**

**EFFECTIVE DATE SEPTEMBER 2, 2009**

Federal Emergency Management Agency

## **ATTACHMENT D    PIPE CALCULATIONS AND DESIGN INFORMATION**

## Specific Pipe Information

<b>Oak Run Village Apartments Gravity Sewer</b>						
Sanitary Sewer Line	Diameter (in)	Length (ft)	Slope <sub>min</sub> (%)	Slope <sub>max</sub> (%)	Velocity <sub>min</sub> (ft/s)	Velocity <sub>max</sub> (ft/s)
SSL A	8	1036	0.40	2.72	1.79	3.81
SSL C	8	275	2.48	2.50	2.37	2.50

\* All pipe to be SDR 26 PVC pipe conforming to ASTM D 3034 and ASTM D 3212

<b>Oak Run Village Apartments Sewer Pipe Stiffness &amp; Buckling Summary</b>						
Diameter (in)	Material	Length (ft)	Stiffness (psi)	Depth <sub>min</sub> (ft)	Depth <sub>max</sub> (ft)	Deflection <sub>max</sub> (%)
8	SDR 26	1,291	115	9.6	14.8	< 5%
8	C-900 DR 18	20	235	14.8	14.8	< 5%

### Pipe Stiffness

Pipe stiffness labeled in the table below came from the “Handbook of PVC Pipe” Table 7.1 below.

**TABLE 7.1  
MINIMUM PVC PIPE STIFFNESS (psi)**

<b>DR or SDR</b>	<b>Min. E = 400,000 psi</b>	<b>Min. E = 440,000 psi</b>	<b>Min. E = 500,000 psi</b>
64	7	8	9
51	14	16	18
42	26	29	32
41	28	31	35
35	46	50	57
33.5	52	57	65
32.5	57	63	71
28	91	100	114
26	115	126	144
25	129	142	161
23.5	157	173	196
21	224	246	279
18	364	400	455
17	437	480	546
14	815	895	1,019
13.5	916	1,007	1,145

## **Pipe Deflection**

Pipe deflection was determined using the attached Table 7.4 for buried pipe from the “Handbook of PVC Pipe”. The load case for this project is H20 due to the presence of a live load with an embedment material modulus of  $E' = 1000 \text{ psi}$ .  $E'$  was selected from a Table 6-4 of values published by the Plastics Pipe Institute that matched NBU Specification Item 510 for Bedding Material. NBU Specification Item 510 mentions a gradation that closely matches the gradation of Type 1-A bedding identified in the ASTM 2321. As outlined in the specifications, Bedding Material is dumped into the trench and shaped to the proper thickness without any compaction. This corresponds to the "Dumped" Class 1-A ASTM 2321 soil in the table with an associated modulus of 1,000 psi. See attached Table 6-4 and NBU 510 specification. Due to the varying depths, a deflection for both the minimum and maximum cover was identified with a red box in the attached Table 7.4 to show both extremes for each pipe.

## **Pipe Strain**

Strain failure is not a controlling factor in the design of this system. Performance of PVC pipe is rarely controlled by strain forces according to the Uni-Bell “Handbook of PVC Pipe”. Because deflection is not to exceed 5%, strain related failure is not expected.

## Critical Buckling Pressure SDR 26

The equations below are from Chapter 7 of the "Handbook of PVC Pipe"

$$P_{cr} = \frac{2E}{(1 - \nu^2)(DR - 1)^3}$$

E = Modulus of Elasticity, lbs/in<sup>2</sup>  
 ν = Poisson's Ratio, 0.38 for PVC p  
 DR = Dimension Ratio

E = 400,000  
 ν = 0.38  
 DR = 26

**P<sub>cr</sub> = Critical Buckling Pressure, lbs/in<sup>2</sup>**

<b>P<sub>cr</sub> = 59.84 lbs/in<sup>2</sup></b>
--

$$P_b = 1.15 \sqrt{P_{cr} E'}$$

E' = Modulus of Soil Reaction, lbs/in<sup>2</sup>

E' = 1,000

**P<sub>b</sub> = Buckling Pressure in a Given Soil, lbs/in<sup>2</sup>**

**P<sub>b</sub> = 281.32 lbs/in<sup>2</sup>**  
**= 40,509.78 lbs/ft<sup>2</sup>**

$$D_{max} = P_b / w_{sat}$$

w<sub>sat</sub> = Saturated Soil Weight, lbs/ft<sup>3</sup>

w<sub>sat</sub> = 120

**D<sub>max</sub> = Maximum Trench Depth, ft**

**D<sub>max</sub> = 337.58 ft**

*\*The limiting factor for buckling pressure is not depth but rather deflection. In this case deflection is not to exceed 5% which works out to a maximum depth of 42.62 ft shown below.*

$$P_e = \frac{\Delta(.149 PS + .061E')}{K}$$

PS = Pipe Stiffness, lbs/in<sup>2</sup>

PS = 115

K = Bedding Constant

K = 0.11

Δ = Specific Deflection, %

Δ = 5%

**P<sub>e</sub> = Buckling Pressure at specific deflection, lbs/in<sup>2</sup>**

**P<sub>b</sub> = 35.52 lbs/in<sup>2</sup>**  
**= 5,114.29 lbs/ft<sup>2</sup>**

$$D_{\%} = P_e / w_{sat}$$

**D<sub>%</sub> = Depth of Pipe Limited by Deflection, ft**

<b>D<sub>%</sub> = 42.62 ft</b>
---------------------------------

*\* Maximum depth of pipe is controlled by a maximum deflection of 5% (D<sub>%</sub>).*

## Critical Buckling Pressure C-900 DR 18

The equations below are from Chapter 7 of the "Handbook of PVC Pipe"

$$P_{cr} = \frac{2E}{(1 - \nu^2)(DR - 1)^3}$$

E = Modulus of Elasticity, lbs/in<sup>2</sup>  
 ν = Poisson's Ratio, 0.38 for PVC p  
 DR = Dimension Ratio

E = 400,000  
 ν = 0.38  
 DR = 18

**P<sub>cr</sub> = Critical Buckling Pressure, lbs/in<sup>2</sup>**

<b>P<sub>cr</sub> = 190.31 lbs/in<sup>2</sup></b>
---

$$P_b = 1.15 \sqrt{P_{cr} E'}$$

E' = Modulus of Soil Reaction, lbs/in<sup>2</sup>

E' = 1,000 (Dumped) Table 6-4

**P<sub>b</sub> = Buckling Pressure in a Given Soil, lbs/in<sup>2</sup>**

**P<sub>b</sub> = 501.69 lbs/in<sup>2</sup>**  
**= 72,243.13 lbs/ft<sup>2</sup>**

$$D_{max} = P_b / w_{sat}$$

w<sub>sat</sub> = Saturated Soil Weight, lbs/ft<sup>3</sup>

w<sub>sat</sub> = 120

**D<sub>max</sub> = Maximum Trench Depth, ft**

**D<sub>max</sub> = 602.03 ft**

*\*The limiting factor for buckling pressure is not depth but rather deflection. In this case deflection is not to exceed 5% which works out to a maximum depth of 62.86 ft shown below.*

$$P_e = \frac{\Delta(.149 PS + .061E')}{K}$$

PS = Pipe Stiffness, lbs/in<sup>2</sup>

PS = 364

K = Bedding Constant

K = 0.11

Δ = Specific Deflection, %

Δ = 5%

**P<sub>e</sub> = Buckling Pressure at specific deflection, lbs/in<sup>2</sup>**

**P<sub>b</sub> = 52.38 lbs/in<sup>2</sup>**  
**= 7,542.72 lbs/ft<sup>2</sup>**

$$D_{\%} = P_e / w_{sat}$$

**D<sub>%</sub> = Depth of Pipe Limited by Deflection, ft**

<b>D<sub>%</sub> = 62.86 ft</b>
---------------------------------

*\* Maximum depth of pipe is controlled by a maximum deflection of 5% (D<sub>%</sub>).*

**Table 7.4 (cont.)**  
**CALCULATED DEFLECTIONS OF BURIED PVC PRESSURE PIPE**  
**DEFLECTION (PERCENT) FOR PRISM, HIGHWAY H20, OR RAILWAY E80 LOADS**

Height of Cover Live Load E' Value	2'			4'			6'			8'			10'		
	Prism	H20	E80	Prism	H20	E80	Prism	H20	E80	Prism	H20	E80	Prism	H20	E80
	<b>DR 26</b>														
50	0.83	3.59	13.95	1.66	3.04	10.80	2.49	3.18	10.26	3.31	3.66	8.84	4.14	4.14	7.94
200	0.57	2.47	9.59	1.14	2.09	7.43	1.71	2.18	7.05	2.28	2.51	6.07	2.85	2.85	5.46
400	0.40	1.74	6.77	0.80	1.47	5.24	1.21	1.54	4.98	1.61	1.77	4.29	2.01	2.01	3.85
1000	0.21	0.93	3.59	0.43	0.78	2.78	0.64	0.82	2.64	0.85	0.94	2.28	1.07	1.07	2.05
2000	0.12	0.52	2.02	0.24	0.44	1.56	0.36	0.46	1.48	0.48	0.53	1.28	0.60	0.60	1.15
E' Value	<b>DR 32.5</b>														
50	1.44	6.24	24.22	2.88	5.28	18.77	4.32	5.52	17.81	5.76	6.35	15.35	7.20	7.20	13.79
200	0.80	3.49	13.53	1.61	2.95	10.48	2.41	3.08	9.95	3.22	3.55	8.57	4.02	4.02	7.70
400	0.51	2.19	8.52	1.01	1.86	6.60	1.52	1.94	6.26	2.02	2.23	5.40	2.53	2.53	4.85
1000	0.24	1.04	4.04	0.48	0.88	3.13	0.72	0.92	2.97	0.96	1.06	2.56	1.20	1.20	2.30
2000	0.13	0.55	2.15	0.26	0.47	1.66	0.38	0.49	1.58	0.51	0.56	1.36	0.64	0.64	1.22
E' Value	<b>DR 41</b>														
50	2.31	10.01	38.88	4.62	8.47	30.12	6.93	8.85	28.59	9.24	10.19	24.63	11.55	11.55	22.13
200	1.02	4.42	17.14	2.04	3.74	13.28	3.05	3.90	12.60	4.07	4.49	10.86	5.09	5.09	9.76
400	0.58	2.53	9.82	1.17	2.14	7.61	1.75	2.24	7.22	2.33	2.58	6.22	2.92	2.92	5.59
1000	0.26	1.11	4.31	0.51	0.94	3.34	0.77	0.98	3.17	1.02	1.13	2.73	1.28	1.28	2.45
2000	0.13	0.57	2.22	0.26	0.48	1.72	0.40	0.51	1.64	0.53	0.58	1.41	0.66	0.66	1.27
E' Value	<b>DR 51</b>														
50	3.22	13.94	54.13	6.43	11.79	41.93	9.65	12.33	39.80	12.86	14.19	34.30	16.08	16.08	30.82
200	1.16	5.04	19.57	2.33	4.27	15.16	3.49	4.46	14.39	4.65	5.13	12.40	5.81	5.81	11.14
400	0.63	2.72	10.57	1.26	2.30	8.19	1.88	2.41	7.78	2.51	2.77	6.70	3.14	3.14	6.02
1000	0.26	1.14	4.44	0.53	0.97	3.44	0.79	1.01	3.27	1.06	1.17	2.82	1.32	1.32	2.53
2000	0.13	0.58	2.26	0.27	0.49	1.75	0.40	0.51	1.66	0.54	0.59	1.43	0.67	0.67	1.29

**Table 7.4** Calculated deflections of buried PVC pressure pipe; deflection (%) for prism, highway H20, and railway E80 loads (*continued*)

Height of cover, ft	12			14			16			18			20		
Load type	Prism	H20	E80	Prism	H20	E80	Prism	H20	E80	Prism	H20	E80	Prism	H20	E80
E', psi	<b>DR 14</b>														
50	0.80	0.80	1.25	0.94	0.94	1.27	1.07	1.07	1.35	1.21	1.21	1.43	1.34	1.34	1.51
200	0.75	0.75	1.16	0.87	0.87	1.19	1.00	1.00	1.26	1.12	1.12	1.33	1.25	1.25	1.40
400	0.69	0.69	1.07	0.80	0.80	1.09	0.91	0.91	1.15	1.03	1.03	1.22	1.14	1.14	1.29
1000	0.55	0.55	0.85	0.64	0.64	0.87	0.73	0.73	0.92	0.82	0.82	0.97	0.91	0.91	1.03
2000	0.41	0.41	0.64	0.48	0.48	0.65	0.55	0.55	0.69	0.62	0.62	0.73	0.68	0.68	0.77
E', psi	<b>DR 18</b>														
50	1.74	1.74	2.71	2.04	2.04	2.76	2.33	2.33	2.93	2.62	2.62	3.10	2.91	2.91	3.27
200	1.50	1.50	2.34	1.75	1.75	2.38	2.01	2.01	2.53	2.26	2.26	2.67	2.51	2.51	2.82
400	1.27	1.27	1.98	1.48	1.48	2.01	1.69	1.69	2.14	1.91	1.91	2.26	2.12	2.12	2.38
1000	0.87	0.87	1.35	1.01	1.01	1.37	1.16	1.16	1.46	1.30	1.30	1.54	1.45	1.45	1.63
2000	0.57	0.57	0.88	0.66	0.66	0.90	0.76	0.76	0.95	0.85	0.85	1.01	0.95	0.95	1.06
E', psi	<b>DR 21</b>														
50	2.75	2.75	4.28	3.21	3.21	4.35	3.66	3.66	4.62	4.12	4.12	4.89	4.58	4.58	5.15
200	2.20	2.20	3.42	2.56	2.56	3.48	2.93	2.93	3.59	3.29	3.29	3.90	3.66	3.66	4.12
400	1.73	1.73	2.70	2.02	2.02	2.74	2.31	2.31	2.91	2.60	2.60	3.08	2.89	2.89	3.25
1000	1.06	1.06	1.65	1.24	1.24	1.68	1.41	1.41	1.78	1.59	1.59	1.88	1.77	1.77	1.99
2000	0.64	0.64	1.00	0.75	0.75	1.02	0.86	0.86	1.08	0.97	0.97	1.14	1.07	1.07	1.21
E', psi	<b>DR 25</b>														
50	4.48	4.48	6.97	5.22	5.22	7.09	5.97	5.97	7.52	6.71	6.71	7.96	7.46	7.46	8.39
200	3.18	3.18	4.94	3.70	3.70	5.03	4.23	4.23	5.34	4.76	4.76	5.65	5.29	5.29	5.95
400	2.29	2.29	3.56	2.67	2.67	3.62	3.05	3.05	3.85	3.43	3.43	4.07	3.81	3.81	4.29
1000	1.25	1.25	1.94	1.45	1.45	1.97	1.66	1.66	2.09	1.87	1.87	2.21	2.08	2.08	2.33
2000	0.71	0.71	1.10	0.83	0.83	1.12	0.94	0.94	1.19	1.06	1.06	1.26	1.18	1.18	1.33

**Table 7.4** Calculated deflections of buried PVC pressure pipe; deflection (%) for prism, highway H20, and railway E80 loads (*continued*)

Height of cover, ft	12			14			16			18			20		
Load type	Prism	H20	E80	Prism	H20	E80	Prism	H20	E80	Prism	H20	E80	Prism	H20	E80
E', psi	<b>DR 26</b>														
50	4.97	4.97	7.73	5.80	5.80	7.87	6.63	6.63	8.35	7.46	7.46	8.84	8.29	8.29	9.32
200	3.42	3.42	5.32	3.99	3.99	5.41	4.56	4.56	5.74	5.13	5.13	6.08	5.69	5.69	6.41
400	2.41	2.41	3.75	2.81	2.81	3.82	3.22	3.22	4.05	3.62	3.62	4.29	4.02	4.02	4.52
1000	1.28	1.28	1.99	1.49	1.49	2.03	1.71	1.71	2.15	1.92	1.92	2.28	2.13	2.13	2.40
2000	0.72	0.72	1.12	0.84	0.84	1.14	0.96	0.96	1.21	1.08	1.08	1.28	1.20	1.20	1.35
E', psi	<b>DR 32.5</b>														
50	8.63	8.63	13.43	10.07	10.07	13.67	11.51	11.51	14.51	12.95	12.95	15.35	14.39	14.39	16.19
200	4.82	4.82	7.51	5.63	5.63	7.64	6.43	6.43	8.11	7.24	7.24	8.58	8.04	8.04	9.04
400	3.04	3.04	4.72	3.54	3.54	4.81	4.05	4.05	5.10	4.55	4.55	5.40	5.06	5.06	5.69
1000	1.44	1.44	2.24	1.68	1.68	2.28	1.92	1.92	2.42	2.16	2.16	2.56	2.40	2.40	2.70
2000	0.77	0.77	1.19	0.89	0.89	1.21	1.02	1.02	1.29	1.15	1.15	1.36	1.28	1.28	1.44
E', psi	<b>DR 41</b>														
50	13.86	13.86	21.56	16.17	16.17	21.94	18.48	18.48	23.28	20.79	20.79	24.64	23.09	23.09	25.98
200	6.11	6.11	9.5	7.13	7.13	9.68	8.15	8.15	10.27	9.16	9.16	10.86	10.18	10.18	11.45
400	3.50	3.50	5.45	4.08	4.08	5.54	4.67	4.67	5.88	5.25	5.25	6.22	5.83	5.83	6.56
1000	1.53	1.53	2.39	1.79	1.79	2.43	2.05	2.05	2.58	2.30	2.30	2.73	2.56	2.56	2.88
2000	0.79	0.79	1.23	0.92	0.92	1.26	1.06	1.06	1.33	1.19	1.19	1.41	1.32	1.32	1.49
E', psi	<b>DR 51</b>														
50	19.29	19.29	30.02	22.51	22.51	30.55	25.72	25.72	32.42	28.94	28.94	34.30	32.15	32.15	36.17
200	6.98	6.98	10.86	8.14	8.14	11.05	9.30	9.30	11.72	10.47	10.47	12.40	11.63	11.63	13.08
400	3.77	3.77	5.86	4.40	4.40	5.97	5.03	5.03	6.33	5.65	5.65	6.70	6.28	6.28	7.07
1000	1.58	1.58	2.46	1.85	1.85	2.51	2.11	2.11	2.66	2.38	2.38	2.82	2.64	2.64	2.97
2000	0.81	0.81	1.25	0.94	0.94	1.28	1.07	1.07	1.35	1.21	1.21	1.43	1.34	1.34	1.51

TABLE 7.5

MEASURED LONG-TERM DEFLECTIONS OF SDR 35 PVC  
(MINIMUM PIPE STIFFNESS 46 PSI) PIPE (PERCENT)

ASTM Embedment Material Classification		Density (Proctor) AASHTO T-99	Height of Cover (feet)													
			3	5	8	10	12	14	16	18	20	22	24	26	28	30
Manufactured Granular Angular	CLASS I		0.2	0.3	0.4	0.5	0.6	0.7	0.9	1.0	1.1	1.2	1.3	1.4	1.5	1.6
Clean Sand & Gravel	CLASS II	90%	0.2	0.3	0.5	0.7	0.8	0.9	1.1	1.2	1.3	1.4	1.6	1.7	1.8	2.0
		80%	0.9	1.4	2.3	3.2	3.6	4.1	5.0	5.5	6.0	6.4	7.3	7.7	8.2	9.1
Sand & Gravel with Fines	CLASS III	90%	0.2	0.4	0.6	0.8	0.9	1.1	1.2	1.4	1.6	1.7	1.9	2.1	2.2	2.3
		85%	0.7	0.9	1.7	2.2	2.6	3.0	3.5	3.9	4.3	4.8	5.2	5.6	6.0	6.5
		75%	1.1	1.8	2.9	3.8	4.5	5.5	6.8	8.5	9.9	11.3	12.7	14.1	15.5	16.8
		65%	1.3	2.4	3.6	4.7	5.5	6.8	8.5	9.6	11.4	13.0	14.5	16.0	17.3	18.0
Silt & Clay	CLASS IV	85%	0.7	0.9	1.7	2.2	2.6	3.0	3.5	3.9	4.3	4.8	5.2	5.6	6.0	6.5
		75%	1.3	2.3	3.3	4.3	5.0	6.5	7.8	9.5	10.6	12.2	13.5	15.0	16.3	17.0
		65%	1.3	2.4	3.6	4.7	5.5	8.0	10.5	12.5	15.0	17.6	20.0	22.0	24.0	26.0

1. Test data indicates no length of pipe installed under conditions specified will deflect more than is indicated; the pipe will deflect less than the amount indicated if specified density is obtained.
2. Embedment material classifications are as per ASTM D 2321, "Underground Installation of Flexible Thermoplastic Sewer Pipe."
3. Listed deflections are those caused by soil loading only and do not include initial out-of-roundness, etc.
4. Data obtained from Utah State University report.

**Table 6-4**

**Backfill Class and Quality**

Pipe Embedment Material					E', psi (kPa) for Degree of Embedment Compaction					
ASTM D 2321*		ASTM D 2487		AASHTO M43 Notation	Min. Std. Proctor Density (%)	Lift Placement Depth	Dumped	Slightly < 85%	Moderate 85% - 95%	High > 95%
Class	Description	Notation	Description							
IA	Open-graded, clean manu-factured aggregates	N/A	Angular crushed stone or rock, crushed gravel, crushed slag; large voids with little or no fines	5 56	Dumped	18" (0.45 m)	1000 (6,900)	3000 (20,700)	3000 (20,700)	3000 (20,700)
	IB	Dense-graded, clean manu-factured, processed aggregates	N/A							
II	Clean, coarse-grained soils	GW	Well-graded gravel, gravel/sand mixtures; little or no fines	57 6 67	85%	12" (0.30 m)	N/R	1000 (6,900)	2000 (13,800)	3000 (20,700)
		GP	Poorly graded gravel, gravel/sand mixtures; little or no fines							
		SW	Well-graded sands, gravelly sands; little or no fines							
		SP	Poorly graded sands, gravelly sands; little or no fines							
III	Coarse-grained soils with fines	GM	Silty gravels, gravel/sand/silt mixtures	Gravel and sand with <10% fines	90%	9" (0.20 m)	N/R	N/R	1000 (6,900)	2000 (13,800)
		GC	Clayey gravels, gravel/sand/clay mixtures							
		SM	Silty sands, sand/silt mixtures							
		SC	Clayey sands, sand/clay mixtures							
IVA**	Inorganic fine-grained soils	ML	Inorganic silts and very fine sands, rock flour, silty or clayey fine sands, silts with slight plasticity				N/R	N/R	N/R	1000 (6,900)
		CL	Inorganic clays of low to medium plasticity; gravelly, sandy or silty clays; lean clays							
IVB	Inorganic fine-grained soils	MH	Inorganic silts, macaceous or diamaceous fine sandy or silty soils, elastic soils				N/R	N/R	N/R	N/R
		CH	Inorganic clays of high plasticity, fat clays							
V	Organic or highly organic soils	OL	Organic silts and organic silty clays of low plasticity				N/R	N/R	N/R	N/R
		OH	Organic clays of medium to high plasticity, organic silts							
		PT	Peat and other high organic soils							

N/R: Use not recommended by ASTM D 2321 for part of the backfill envelope.  
 \*Refer to ASTM D 2321 for more complete soil descriptions.  
 \*\*Use under the direction of a soils expert.

**ATTACHMENT E MATERIAL SPECIFICATIONS**

SUBMITTALS

CHARLOTTE'S CONCRETE, INC.  
4950 LANE DRIVE  
SAN ANTONIO, TX 78263

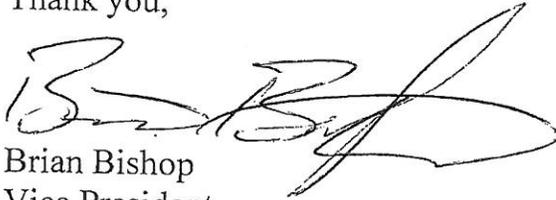
(210) 648-4774 PH.  
(210) 648-0556 FAX

Charlotte's Concrete, Inc.  
4950 Lane Drive  
San Antonio, TX 78263

CERTIFICATE OF COMPLIANCE

Portland Cement from Capitol Cement Company meets ASTM C-150 specifications. All precast manhole sections manufactured with Capitol Cement Company meet ASTM C-478 and/or C-913-07A specifications.

Thank you,

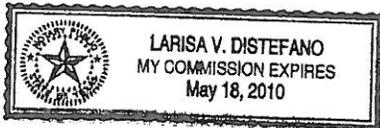


Brian Bishop  
Vice President

STATE OF TEXAS  
COUNTY OF BEXAR

SWORN AND SUBSCRIBED TO BEFORE ME THIS 4<sup>th</sup> DAY  
OF March, 2008.

My commission expires: May 18, 2010



Larisa V. Distefano  
Notary Public

Charlotte's Concrete, Inc.  
4950 Lane Drive  
San Antonio, TX 78263  
Ph-210-648-4774 Fx-210-648-0556

All precast manhole manufactured by Charlotte's Concrete Inc. will be manufactured in accordance with plans and specifications. Base sections with inverts shall have a standard yield of 2.17 or will vary due to pipe size and influent elevation. Riser sections are manufactured 12", 18", 24", 36", 48", and 60" standard heights. Flattops are used only when shown on plans or in a flood plain area and are to have a ring and cover cast in.

Cement shall be Portland cement conforming to ASTM C 150 Type I or Type III, and shall be properly vibrated and inspected to assure quality. All reinforcing steel meets or exceeds ASTM specifications.

Bases in 4' diameter range from 16" to 54" yield from flow line out to top of base with 7" of floor below pipe. Bases in 5' or 6' diameter range from 24" to 54" yield in 5' type or compression type connections will be used depending on design specifications to insure no leakage. Size of connections are determined by pipe sizes and types. All connections meet or exceed ASTM-923 specifications.

Precast riser sections and base sections have a single offset type joint or 7R type joint at spigot end if each section to accommodate a profile type gasket or o-ring type gasket. Both gaskets meet or exceed ASTM C-443-85A, ASTM C-443 and ASTM C-316A.

All invert channels are constructed secondary to the base section per plan and specifications to insure a smooth and uniform flow. All invert benches are constructed on a standard  $\frac{1}{2}$ " per foot slope or to plan specifications.

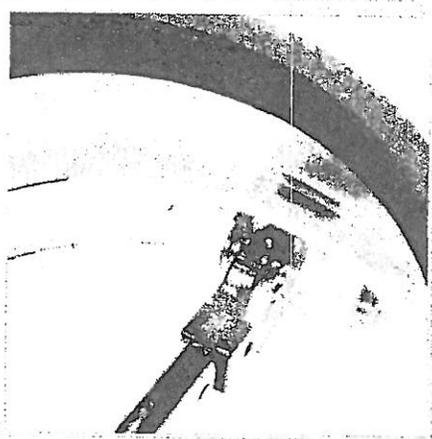
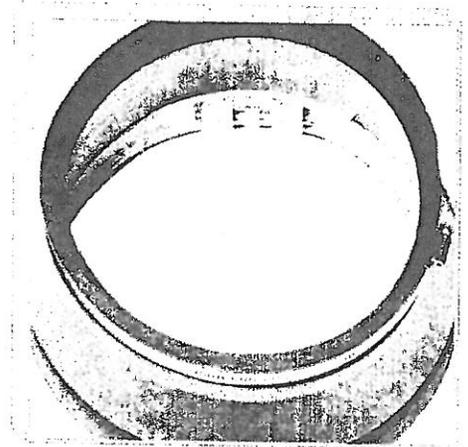
Cone sections vary from 18" to 32" in height and can be produced with concentric or eccentric openings with either 24" openings or 34  $\frac{1}{2}$ " openings. Flattops yield 9" to 12" and can be produced with the above mentioned openings. All cone sections and flattop sections meet or exceed ASTM C-478 specifications.

All riser sections, base sections, cone sections, and flattops are produced with the lift inserts for safe handling and installation.



# PSX: DIRECT DRIVE

PSX has always set the standard for watertight pipe-to-structure connections. **PSX: Direct Drive™** offers all of the sealing and durability advantages of PSX, combined with easy installation and adjustability. Using all stainless-steel components and polyisoprene rubber, PSX: Direct Drive is stronger than ever, and the unique adjusting mechanism makes installation simple.

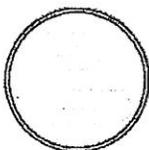


## The PSX: Direct Drive Difference

PSX: Direct Drive uses a simple all stainless steel adjuster. From outside the manhole, a small, pre-set torque wrench ratchets around the adjuster nut, opening both sides of the sleeve quickly and evenly. The breakover design wrench signals when the proper torque is reached, fully compressing the rubber against the manhole opening. Both cored and cast holes can now have the benefit of PSX sealing with the ease of wrench adjustability; the best of both worlds.

## PSX: Direct Drive Advantages:

- \* Installs quickly and easily from outside the manhole
- \* Requires no retightening or adjustment before shipment/installation
- \* All stainless-steel components - No plastic wedges to crack or break
- \* Easily accommodates hole size variation



PRESS-SEAL GASKET CORPORATION

P.O. Box 10482, Fort Wayne, Indiana 46852

Phone: (260) 436-0521 (800) 348-7325 Fax: (260) 436-1908 E-mail: sales@press-seal.com Web: www.press-seal.com

## PRODUCT SPECIFICATIONS

PSX: Direct Drive meets and/or exceeds all requirements of ASTM C-923, including physical properties of materials and performance testing. Performance testing includes:

- \* 13 psi in straight alignment
- \* 10 psi at minimum 7° angle
- \* 10 psi under shear load of 150 lbs/in. pipe diameter

PSX: Direct Drive meets and/or exceeds the following specifications:

- \* ASTM C-923 Standard Specification for Resilient Connectors Between Reinforced Concrete Manhole Structures, Pipes, and Laterals.
- \* ASTM C-1478 Standard Specification for Storm Drain Resilient Connectors Between Reinforced Concrete Storm Sewer Structures, Pipes and Laterals.
- \* ASTM C-1244 Standard Test Method for Concrete Sewer Manholes by the Negative Air Pressure (Vacuum) Test.

## APPLICATIONS

- \* Sanitary sewers
- \* Storm sewers
- \* Septic tanks
- \* Valve vaults
- \* Lift and pump stations
- \* Commercial vaults
- \* Circular or straight-wall structures

## PIPE INSTALLATION

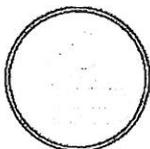
1. Clean pipe and boot to ensure no dirt or foreign materials are present.
2. Clamping surface on pipe must be clean and smooth.
3. Center pipe in opening and insert until pipe breaks the inside plane of manhole.
4. Attach take-up clamp(s) and stagger screw(s) of clamp(s) around the groove of the gasket so that take-up pressure will be equalized. Make sure each clamp is completely in the correct groove.
5. Using a torque ratchet or torque wrench, gradually tighten all screw(s) of clamp(s) in an alternating pattern to 60 lbs/in. torque.
6. After reaching 60 lbs/in. torque on final screw, check all screws again to ensure compression of all clamps.
7. Vacuum testing shall be conducted in accordance with ASTM C-1244-02.
8. Adjust pipe to line and grade. Use proper bedding, backfill materials, and techniques so that pipe deflection and deformation are minimized.
9. Any pipe stubs installed in the manhole must be positively restrained from movement per ASTM-C923. Press-Seal Gasket is not responsible for failure due to unrestrained pipe stubs for future connections.

## Why Specify PSX: Direct Drive

**PSX: Direct Drive** is the pipe-to-structure connector that finally satisfies all critical design and performance requirements: rugged construction of the adjuster and band; superior strength and toughness of polyisoprene rubber; and the proven sealing performance of PSX. It's the one adjustable connector that doesn't make you compromise sealing for convenience or price: **PSX: Direct Drive**.

U.S. Patent No. 6805359  
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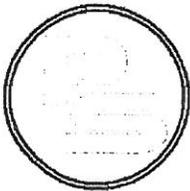
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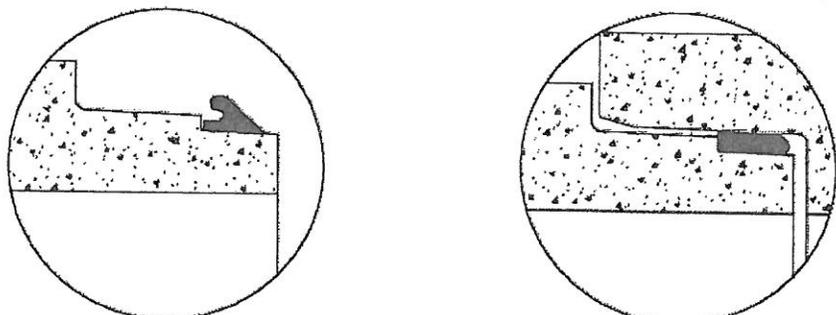
P.O. Box 10482, Fort Wayne, Indiana 46852

Phone: (260) 436-0521 (800) 348-7325 Fax: (260) 436-1908 E-mail: sales@press-seal.com Web: www.press-seal.com



# TYPE 4G & 4F PROFILE GASKETS

## PROFILE GASKETS SINGLE STEP JOINTS



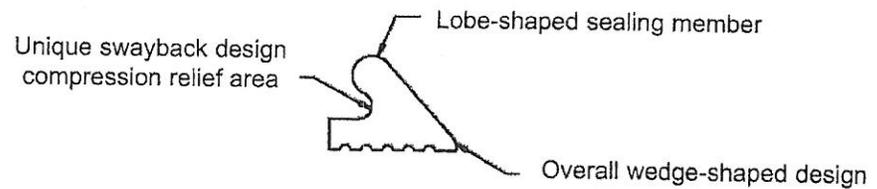
**The Type 4G & 4F Profiles Employ Special Cross Section Features For The Single Step Concrete Joint Design.**

Press-Seal Gasket has always been a pioneer in the development of pipe joining solutions, and our 4G and 4F Profile Gaskets are the latest in a series of design breakthroughs.

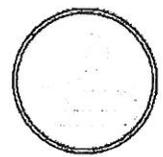
Single Step joints make concrete pipe and manhole production easier and more profitable, and the 4G and 4F make sealing of single step joints for concrete pipe and manholes reliable and economical. Press-Seal Gasket offers the Type 4G and 4F profiles in a wide variety of sizes and compounds for virtually any single step joint application. These gaskets represent years of successful use under the most demanding conditions. Our engineering department can easily determine which 4G and 4F is right for your sanitary, storm, manhole, and box culvert needs. We also offer complete joint design service for those producers interested in converting equipment to the single step design. Re-tooling to make the single step joint design makes sense for progressive producers, whether converting existing O-Ring joint equipment or purchasing new.

All Type 4G & 4F designs meet and/or exceed the Physical Property Requirements of **ASTM C-443 & ASTM C-361**.

Contact your Territory Manager or our Customer Service Department for more information.



**THESE SPECIAL DESIGN FEATURES COMBINED WITH THE HIGHEST QUALITY RUBBER COMPOUNDS PROVIDE THE PRECASTER, CONTRACTOR, AND ENGINEER WITH A WATERTIGHT JOINT EVERY TIME.**



# PRESS-SEAL GASKET CORPORATION

P.O. Box 10482, Fort Wayne, Indiana 46852  
Phone: (260) 436-0521 (800) 348-7325 Fax: (260) 436-1908 E-mail: sales@press-seal.com Web: www.press-seal.com

Type 4G and 4F gaskets are used to solve inherent problems with pre-lubricated gaskets as well as both rolling and confined O-Ring Joint Designs.

**Available for Concrete Pipe, Manholes and Box Culverts.**

## TYPE 4G AND 4F ADVANTAGES

### Easier Installation

- \* Less homing force required due to wedge shaped design.
- \* Self centering during joining allows for easier alignment.
- \* Swayback compression relief prevents joint "pushback" effect.
- \* Easier to lubricate, install, and equalize.
- \* Less likely to roll, pinch, or break bells.

### Superior Design and Performance

- \* More gasket surface contact area against joint surfaces.
- \* Single step joint much easier and less expensive to produce than the confined O-Ring joint.



155-4G



158-4G



190-4G



200-4G



260-4F



207-4G



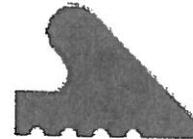
210-4G



288-4G



290-4F/PS-23



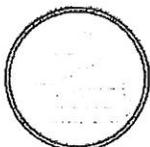
1016-4G

Type 4G & 4F gaskets meet and/or exceed the physical property requirement of ASTM C-443 & ASTM C-361

Type 4G & 4F gaskets are available in regular and oil resistant compounds.

Gasket Type	Gasket Base	Gasket Height	Annular Space
155-4G	.885	.618	.326
158-4G	.749	.622	.326
190-4G	.951	.624	.384
200-4G	.962	.700	.398
260-4G	.950	.775	.422
207-4G	1.125	.818	.450
210-4G	.880	.826	.452
288-4G	1.301	.908	.500
290-4F/PS-23	1.23	.927	.500
1016-4G	1.500	1.063	.600

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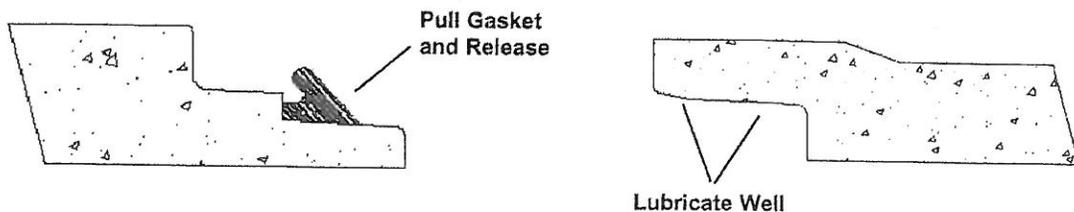
# TYPE 4G & 4F

## INSTALLATION INSTRUCTIONS

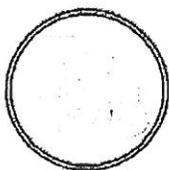
### Guidelines for Assembling 4G and 4F

Type 4G and 4F gaskets manufactured by Press-Seal Gasket Corporation have proved to be one of the most reliable gasket systems ever developed for concrete pipe. It is easy to ensure the best performance of the 4G and 4F gaskets by following these simple installation steps.

1. The pipe should be handled with extreme caution to avoid chipping of the spigots or bell grooves.
2. Clean spigot-end, including the seat of gasket.
3. Stretch the gasket over the spigot end of the pipe and move it back until it is seated against the step for the spigot. Always place squared area of gasket against pipe and step.
4. Equalize the stretch on the gasket by pulling the sealing lobe away from the spigot at least one inch and then releasing the gasket. Repeat this every three or four inches around the circumference of the pipe. Equalization of stretch makes sure that the gasket has the same stretch cross-section and tension throughout.
5. Remove all dirt and other foreign matter from the inside surface of the bell. Using a Press-Seal lubricant formulated especially for concrete pipe lubricate the entire bell area only of the joint. Be sure to coat the entrance slop of the bell thoroughly with lubricant. Do not place any lubricant on the gasket of the spigot. It is important that the gasket grips the spigot during installation, so that it is not displaced from the step.



6. Carefully align pipe sections and bring home slowly, making sure to seat pipe sections fully.
7. Complete installation by following pipe manufacturer's recommended bedding and backfilling practices.



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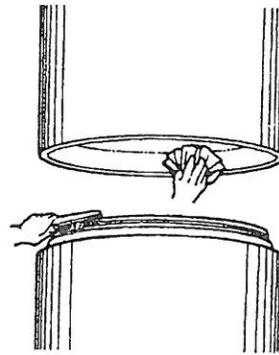
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# O-RING GASKET INSTALLATION

## ON MANHOLE RISERS

①

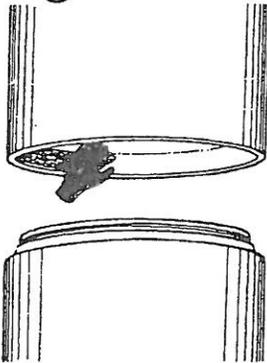


Carefully clean all dirt and foreign objects from the jointing surface of the bell or groove end of pipe

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.

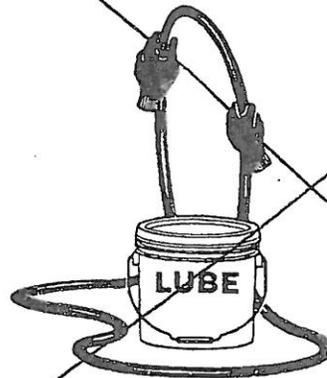
②



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

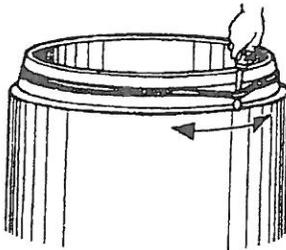


Lubricate the gasket thoroughly before it is placed on the spigot or tongue.

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.

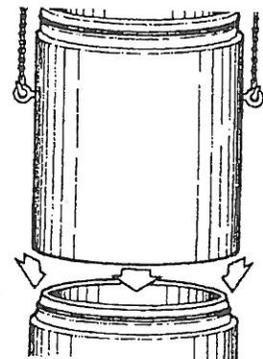


Unequal stretch could cause bunching of the gasket and may cause leaks in the joint or crack the bell.

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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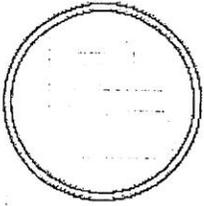


**PRESS-SEAL GASKET CORPORATION**

6935 LINCOLN PARKWAY - FORT WAYNE, INDIANA 46804

Phone (219) 436-0521 or (800) 348-7325

FAX (219) 436-1908



# PRESS-SEAL GASKET CORPORATION

Phone (260) 436-0521 Fax (260) 436-1906

September 8, 2004

This letter addresses Press-Seal Gasket's policy towards vacuum testing procedures for pipe-to-structure connectors. ASTM C 1244-02 Standard Test Method for Concrete Sewer Manholes by Negative Air Pressure (Vacuum) Test Prior to Backfill states in section 1.2, "This test method is intended to be used as a preliminary test to enable the installer to demonstrate the condition of the concrete manholes prior to backfill". This is our policy also.

In an earlier version, ASTM C 1244-93 stated "It may also be used to test manholes after backfilling; however, testing should be correlated with the connector supplier". Our policy when testing backfilled is to install a standpipe next to the structure to determine the amount of hydrostatic head that exists. The test vacuum is then reduced one inch of mercury per foot of hydrostatic head as measured to the centerline of the lowest connector until zero. Our policy was developed to address this previous standard. The above statement was eliminated from the 2002 revision because Prior to Backfill was inserted into the title. Even with this additional clarification, there are those that test after backfill; therefore, we still use the above policy to address these instances.

The standard test time for most 4' manholes is 10 inches for one minute with an allowable drop of one inch for the test to be considered successful. Ten inches of mercury is equivalent to 5 PSI or approximately 12 feet of hydrostatic head. If there exists more than 11 feet of water in the stand pipe, then the vacuum test isn't required. The purpose of this reduction method is to balance the vacuum test with hydrostatic loads at the structure; therefore, giving specifiers the confidence that they are receiving an equivalent tested product. Not reducing vacuum pressures to compensate for existing hydrostatic head increases the intended effects of the vacuum test along with possibly damaging the structure and its component/accessory products.

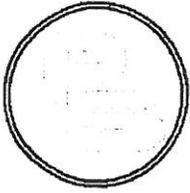
We believe the reduction method described above for backfill tested structures is the only way to give specifiers and system owners a tested product while protecting structure manufacturers, contractors and component/accessory product manufacturers like ourselves.

Please contact us if you have any questions or require a visit from a Territory Manager.

Mail to: P.O. Box 10462  
Fort Wayne, IN 46852

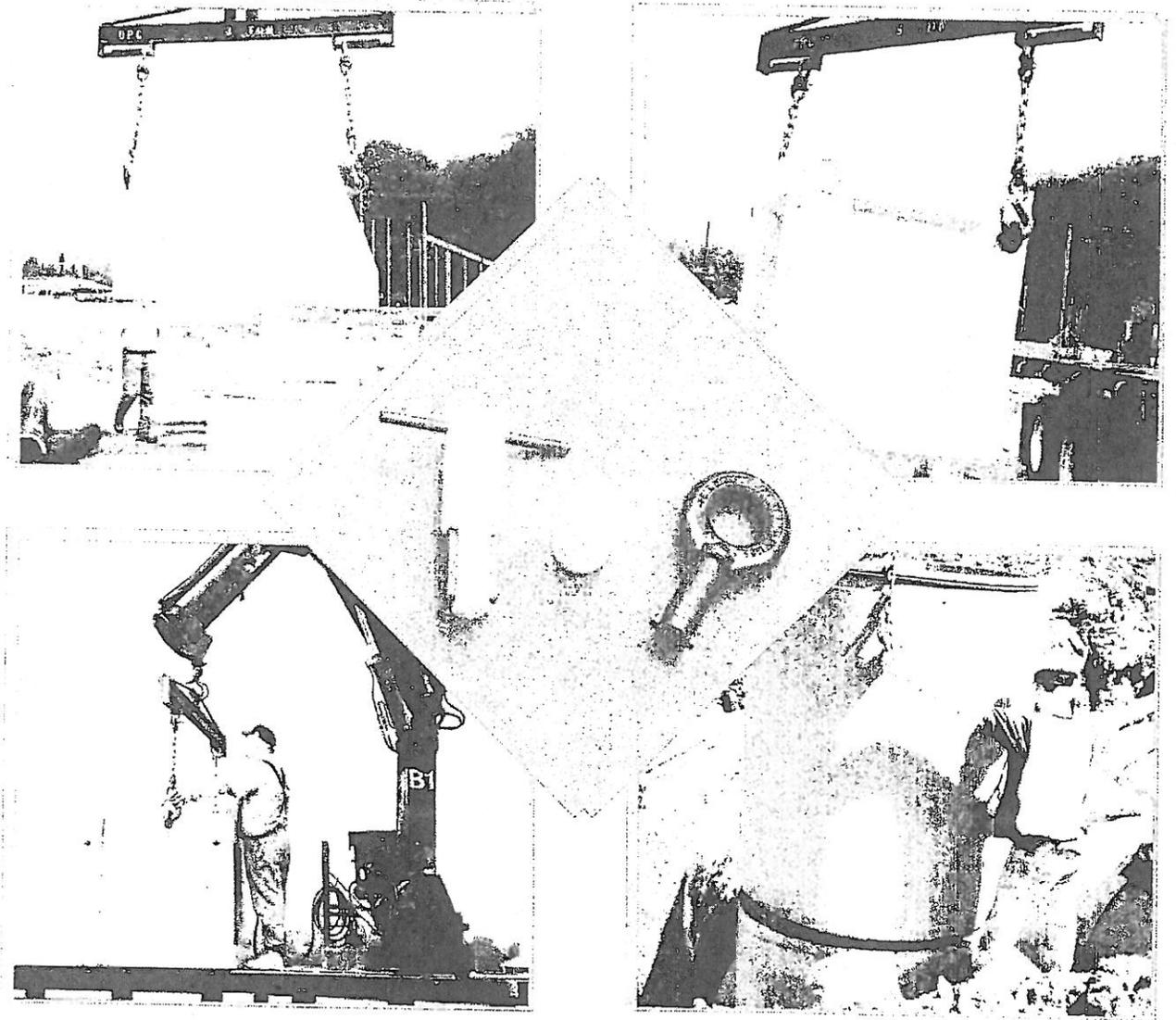
Ship to: 6932 Gettysburg Pike  
Fort Wayne, IN 46804

Web Site: [www.press-seal.com](http://www.press-seal.com)  
E-Mail: [sales@press-seal.com](mailto:sales@press-seal.com)



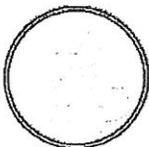
# WANT TO BE LIFE SUPPORTED

**SIMPLE \* SAFE \* QUICK \* INEXPENSIVE**



**An easy method of placing precast concrete manhole components in the field.**

**Over 18 years of Proven Performance.**

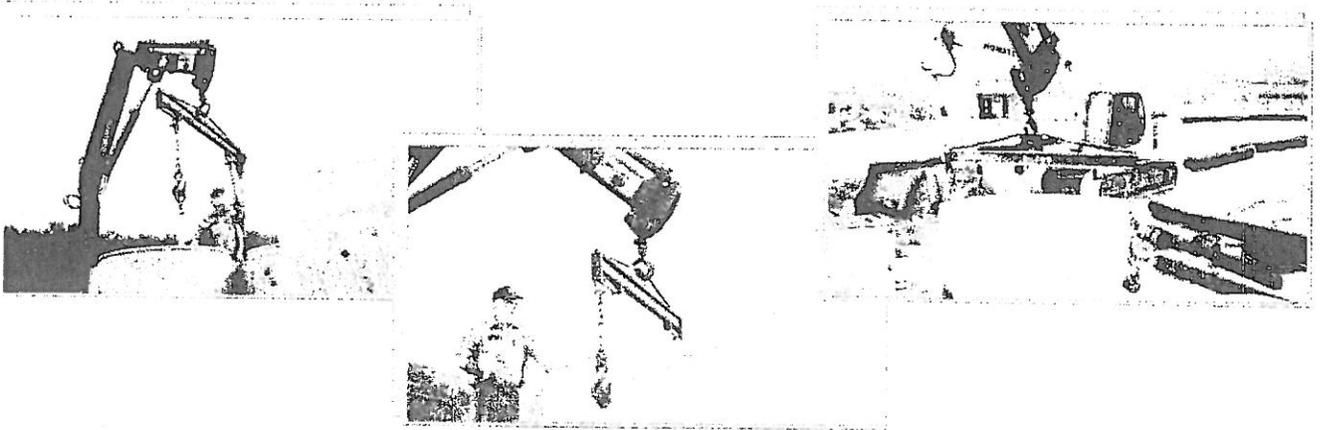


## PRESS-SEAL GASKET CORPORATION

P.O. Box 10482, Fort Wayne, Indiana 46852  
Phone: (260) 436-0521 (800) 348-7325 Fax: (260) 436-1908 E-mail: [sales@press-seal.com](mailto:sales@press-seal.com) Web: [www.press-seal.com](http://www.press-seal.com)

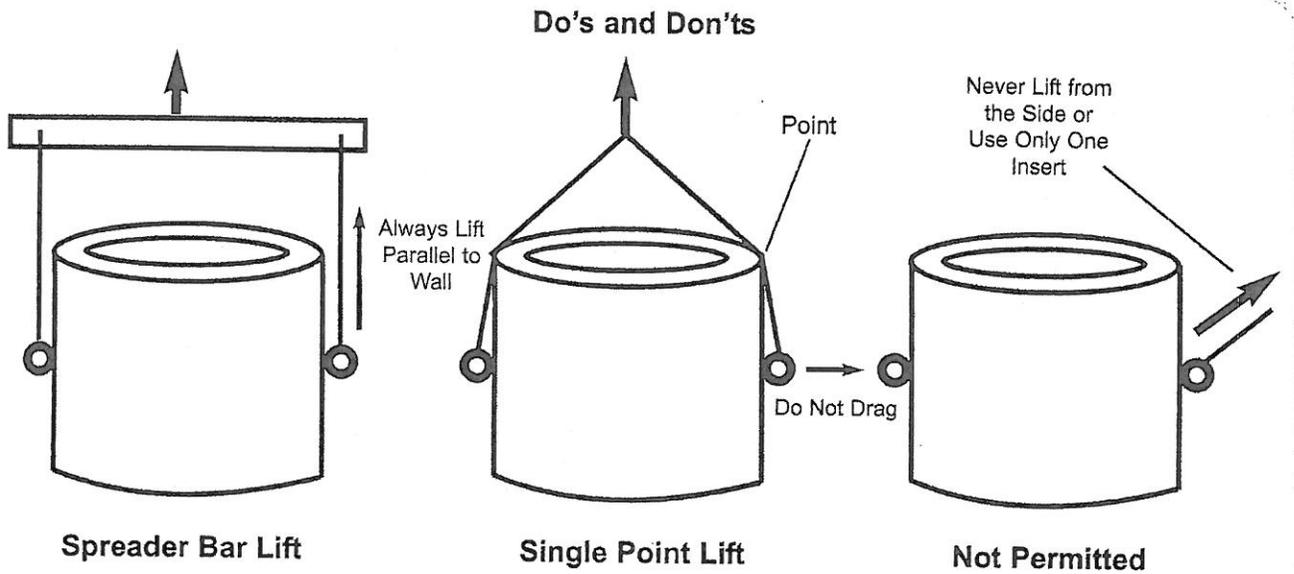
# INSTALLATION

Manhole components are delivered to the field with all inserts installed and positioned for quick lifting and installation.



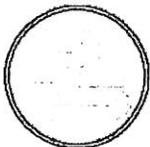
## FROM THE TRUCK TO THE DITCH

- \* Insert a lift eye into each insert.
- \* Turn the lift eye 90 degrees to the vertical position to lock it in place.
- \* Place hooks in lift eyes and lift.



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Press-Seal believes all information is accurate as of its publication date. Information, specifications, and prices are all subject to change without notice. Press-Seal is not responsible for any inadvertent errors.



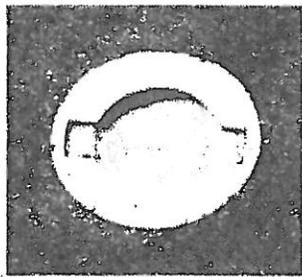
**PRESS-SEAL GASKET CORPORATION**

P.O. Box 10482, Fort Wayne, Indiana 46852

Phone: (260) 436-0521 (800) 348-7325 Fax: (260) 436-1908 E-mail: sales@press-seal.com Web: www.press-seal.com

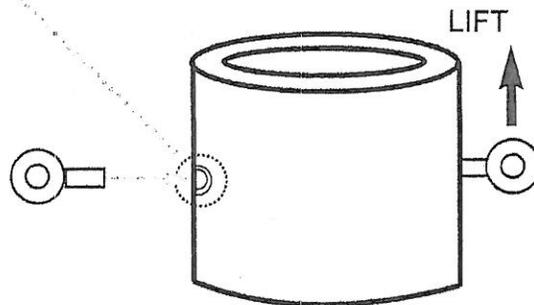
## DESIGN CRITERIA

Press-Seal Gasket provides customized design guidelines to each precaster for the use of the lift system with their particular product line and designed for its theoretical load capacity for both tensile and shear forces.



The lift inserts are designed in accordance with ASTM C-890 for four times the maximum load.

Each lift eye is designed, rated and tested to a lift capacity of 3,600 pounds with a factor of safety of five.



The maximum weight of a product for a two-lift eye system is 7,200 pounds.

The lift system works best when inserts are placed perpendicular to the wall with the lift parallel to the wall. This method insures a safe lift and does not damage the product. Special designs can be provided for product made with more than two lift inserts.

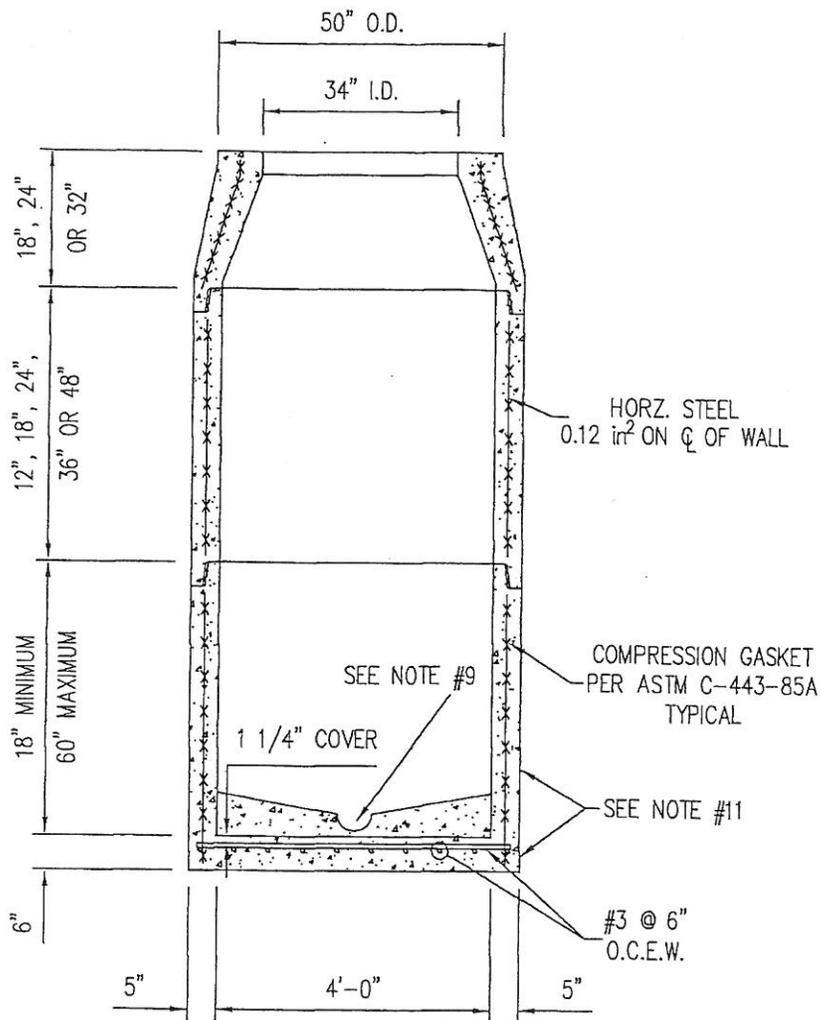
As a service to its customers, Press-Seal Gasket will determine recommended lift insert locations and maximum lift capacity for the system based on the product's geometric configuration and material properties. When requested and supplied, these designs will incorporate appropriate safety factors for lifting devices, but obtaining critical manufacturing strengths and tolerances is outside of Press-Seal Gasket's capability and responsibility. The precaster is advised that a four thousand psi minimum design concrete compressive strength is required and lift insert positioning are critical for the safe and successful performance of this system.



PRESS-SEAL GASKET CORPORATION

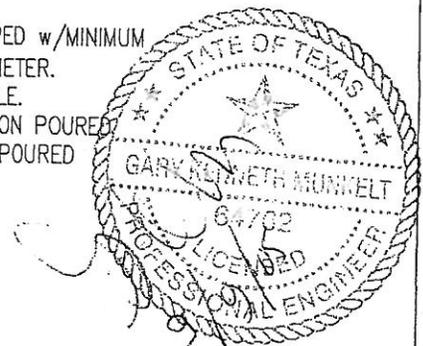
P.O. Box 10482, Fort Wayne, Indiana 46852

Phone: (260) 436-0521 (800) 348-7325 Fax: (260) 436-1908 E-mail: sales@press-seal.com Web: www.press-seal.com



**NOTES:**

1. PIPE TO MANHOLE CONNECTIONS PER ASTM C-923 MECHANICAL TYPE OR COMPRESSION.
2. CONE AVAILABLE WITH 24" CLEAR OPENING.
3. CONCRETE STRENGTH  $f'_c = 4,000$  psi.
4. REBAR STRENGTH  $f_y = 60,000$  psi.
5. WELDED WIRE FABRIC STRENGTH  $f_y = 65,000$  psi.
6. LIVE LOAD - AASHTO HS-20.
7. (2) #4 BARS AT CORNERS OF OPENINGS TOP & BOTTOM OF SLABS.
8. 30'-0" MAXIMUM COVER TO TOP OF BOTTOM SLAB
9. INVERTS TO BE "U" SHAPED w/MINIMUM 3/4 DEPTH OF PIPE DIAMETER.
10. EXTENDED BASE AVAILABLE.
11. WALL AND BOTTOM SECTION POURED MONOLITHICALLY. INVERT POURED SECONDARY.



<small>PROPRIETARY AND CONFIDENTIAL THE INFORMATION CONTAINED IN THIS DRAWING IS THE SOLE PROPERTY OF CHARLOTTE'S CONCRETE INC. ANY REPRODUCTION IN PART OR AS WHOLE WITHOUT THE WRITTEN PERMISSION OF CHARLOTTE'S CONCRETE INC. IS PROHIBITED.</small>			<h2>CHARLOTTE'S CONCRETE INC.</h2>		
DESIGNER	JHP	MEETS STANDARDS	<h3>48" DIA. MANHOLE VARIABLE STACK</h3>	DRAWING #	GKM DWG #
ENGINEER	GKM	ASTM-C-478		AA	10
REVISION					

## **ATTACHMENT F      DESIGN FLOW & PIPE CAPACITY**

## Rating Table for 8" Sewer Main

Project Description							
Friction Method	Manning Formula						
Solve For	Normal Depth						
Input Data							
Roughness Coefficient	0.013						
Channel Slope	0.400 %						
Diameter	8.0 in						
Discharge	287,280.00 gpd <span style="color: red;">Peak Dry Weather Flow</span>						
Channel Slope (%)	Normal Depth (in)	Velocity (ft/s)	Flow Area (ft <sup>2</sup> )	Wetted Perimeter (ft)	Top Width (ft)		
0.400	4.4	2.27	0.2	1.1	0.66		
0.500	4.1	2.47	0.2	1.1	0.67		
0.600	3.9	2.65	0.2	1.0	0.67		
0.700	3.7	2.80	0.2	1.0	0.66		
0.800	3.6	2.95	0.2	1.0	0.66		
0.900	3.5	3.08	0.1	1.0	0.66		
1.000	3.4	3.20	0.1	0.9	0.66		
1.100	3.3	3.31	0.1	0.9	0.66		
1.200	3.2	3.41	0.1	0.9	0.65		
1.300	3.1	3.52	0.1	0.9	0.65		
1.400	3.1	3.62	0.1	0.9	0.65		
1.500	3.0	3.70	0.1	0.9	0.65		
1.600	3.0	3.80	0.1	0.9	0.64		
1.700	2.9	3.87	0.1	0.9	0.64		
1.800	2.9	3.96	0.1	0.9	0.64		
1.900	2.8	4.04	0.1	0.8	0.64		
2.000	2.8	4.11	0.1	0.8	0.64		
2.100	2.8	4.18	0.1	0.8	0.63		
2.200	2.7	4.25	0.1	0.8	0.63		
2.300	2.7	4.33	0.1	0.8	0.63		
2.400	2.7	4.40	0.1	0.8	0.63		
2.500	2.6	4.46	0.1	0.8	0.63		
2.600	2.6	4.53	0.1	0.8	0.62		
2.700	2.6	4.59	0.1	0.8	0.62		
2.800	2.6	4.64	0.1	0.8	0.62		

## Rating Table for 8" Sewer Main

Project Description							
Friction Method	Manning Formula						
Solve For	Normal Depth						
Input Data							
Roughness Coefficient	0.013						
Channel Slope	0.400 %						
Diameter	8.0 in						
Discharge	300,428.00 gpd <span style="color: red;">Peak Wet Weather Flow</span>						
Channel Slope (%)	Normal Depth (in)	Velocity (ft/s)	Flow Area (ft <sup>2</sup> )	Wetted Perimeter (ft)	Top Width (ft)		
0.400	4.5	2.30	0.2	1.1	0.66		
0.500	4.2	2.50	0.2	1.1	0.67		
0.600	4.0	2.68	0.2	1.0	0.67		
0.700	3.8	2.84	0.2	1.0	0.67		
0.800	3.7	2.98	0.2	1.0	0.66		
0.900	3.5	3.11	0.1	1.0	0.66		
1.000	3.4	3.24	0.1	1.0	0.66		
1.100	3.4	3.35	0.1	0.9	0.66		
1.200	3.3	3.46	0.1	0.9	0.66		
1.300	3.2	3.56	0.1	0.9	0.65		
1.400	3.1	3.66	0.1	0.9	0.65		
1.500	3.1	3.76	0.1	0.9	0.65		
1.600	3.0	3.84	0.1	0.9	0.65		
1.700	3.0	3.93	0.1	0.9	0.64		
1.800	2.9	4.01	0.1	0.9	0.64		
1.900	2.9	4.08	0.1	0.9	0.64		
2.000	2.9	4.16	0.1	0.9	0.64		
2.100	2.8	4.24	0.1	0.8	0.64		
2.200	2.8	4.31	0.1	0.8	0.63		
2.300	2.7	4.38	0.1	0.8	0.63		
2.400	2.7	4.44	0.1	0.8	0.63		
2.500	2.7	4.52	0.1	0.8	0.63		
2.600	2.7	4.58	0.1	0.8	0.63		
2.700	2.6	4.64	0.1	0.8	0.63		
2.800	2.6	4.71	0.1	0.8	0.62		

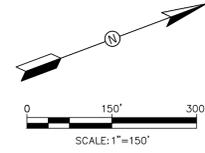
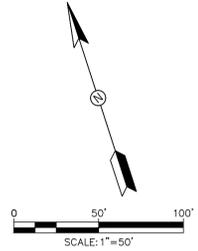
CONSTRUCTION NOTES:

1. ALL CONSTRUCTION ACTIVITIES MUST MEET THE REQUIREMENTS OF THE TCEQ APPROVED WATER POLLUTION ABATEMENT PLAN, EDWARDS AQUIFER PROTECTION PROGRAM ID NO. XXXX, INVESTIGATION NO. XXXX, REGULATED ENTITY NO. XXXX, APPROVAL LETTER DATED XXXX.
2. WHERE WATER LINES AND NEW SEWER LINES 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 §217.53(D) (PIPE DESIGN) AND 30 TAC §290.44(E) (WATER DISTRIBUTION).
3. WHERE A 9' (NINE FOOT) SEPARATION FROM WATER AND SEWER LINES CROSSING CANNOT BE MAINTAINED, THE NEW WATER LINE SHALL BE ABOVE THE SEWER LINE AS SHOWN ON THE WATER/SEWER LINE CROSSING DETAIL. AT NO TIME SHALL A WATER LINE OR WATER SERVICE BE PLACED UNDER A SEWER LINE OR SEWER SERVICE.
4. WHERE A NEW POTABLE WATERLINE CROSSES AN EXISTING, PRESSURE RATED WASTEWATER MAIN OR LATERAL, ONE SEGMENT OF THE WATERLINE PIPE SHALL BE CENTERED OVER THE WASTEWATER MAIN OR LATERAL SUCH THAT THE JOINTS OF THE WATERLINE PIPE ARE EQUIDISTANT AND AT LEAST NINE FEET HORIZONTALLY FROM THE CENTERLINE OF THE WASTEWATER MAIN OR LATERAL. THE POTABLE WATERLINE SHALL BE AT LEAST SIX INCHES ABOVE THE WASTEWATER MAIN OR LATERAL. WHENEVER POSSIBLE, THE CROSSING SHALL BE CENTERED BETWEEN THE JOINTS OF THE WASTEWATER MAIN OR LATERAL. IF THE EXISTING WASTEWATER MAIN OR LATERAL SHOWS SIGNS OF LEAKING, IT SHALL BE REPLACED FOR AT LEAST NINE FEET IN BOTH DIRECTIONS (18 FEET TOTAL) WITH AT LEAST 150 PSI PRESSURE RATED PIPE.
5. 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.
6. FIRE HYDRANTS SHALL NOT BE INSTALLED WITHIN NINE FEET VERTICALLY OR HORIZONTALLY OF ANY WASTEWATER MAIN, WASTEWATER LATERAL, OR WASTEWATER SERVICE LINE REGARDLESS OF CONSTRUCTION.
7. METER BOXES MUST BE SET AT PROPOSED FINISHED GRADE. ANY METER BOXES THAT ARE NOT SET AT THE FINAL GRADE WILL BE ADJUSTED BY THE CONTRACTOR AT NO ADDITIONAL COSTS.
8. CONTRACTOR TO COORDINATE WITH NBU IF EXISTING WATER MAINS WILL BE REMOVED FROM SERVICE AT ANY TIME.
9. ALL UTILITIES SHALL BE CONSTRUCTED PRIOR TO STREETS.
10. ENSURE ALL DRIVEWAY APPROACHES ARE BUILT IN GENERAL ACCORDANCE WITH A.D.A. SPECIFICATIONS.
11. NO VALVES, FIRE HYDRANTS, ETC. SHALL BE CONSTRUCTED WITHIN CURBS, SIDEWALKS OR DRIVEWAYS.

12. ALL UTILITY TRENCH COMPACTION TESTS WITHIN THE STREET PAVEMENT SECTION SHALL BE THE RESPONSIBILITY OF THE DEVELOPER'S GEO-TECHNICAL ENGINEER. FILL MATERIAL SHALL BE PLACED IN UNIFORM LAYERS NOT TO EXCEED TWELVE INCHES (12") THICK. EACH LAYER OF MATERIAL SHALL BE COMPACTED TO A MINIMUM 95% DENSITY AND TESTED FOR DENSITY AND MOISTURE IN ACCORDANCE WITH TEST METHODS: TEX-113-E, TEX-114-E, TEX-115-E. THE NUMBER AND LOCATION OF REQUIRED TESTS SHALL BE DETERMINED BY THE GEO-TECHNICAL ENGINEER AND APPROVED BY THE CITY OF NEW BRAUNFELS STREET INSPECTOR. AT A MINIMUM, TESTS SHALL BE TAKEN EVERY 100LF FOR EACH LIFT. UPON COMPLETION OF TESTING THE GEO-TECHNICAL 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.
13. THIS PROJECT INCLUDES UTILITY INSTALLATIONS GREATER THAN 5- FEET IN DEPTH LOCATED IN PUBLIC RIGHT-OF-WAY OR EASEMENTS. DEEP TRENCHES POSE COMPACTION TESTING AND CONSTRUCTION CHALLENGES AND CITY METHODS FOR TESTING AND COMPACTION MAY NOT BE ACHIEVABLE. A UTILITY COMPACTION PLAN WILL BE REQUIRED AND MUST BE SUBMITTED FOR APPROVAL TO CITY PRIOR TO UTILITY INSTALLATION.
14. THE ENGINEER OF RECORD ACKNOWLEDGES THAT THE POINT OF DELIVERY FOR AN NBU WASTE WATER SYSTEM IS THE MAIN SIDE OF THE SERVICE LATERAL FROM THE CUSTOMER'S CLEAN OUT OR PROPERTY LINE WHICH EVER IS NEARER. THE CUSTOMER IS RESPONSIBLE FOR DESIGN, CONSTRUCTION, OPERATION AND MAINTENANCE BEYOND THE POINT OF DELIVERY AND HAS SOLE CONTROL AND SUPERVISION OVER THE CUSTOMER'S INSTALLATION INCLUDING REVIEW, PERMITTING AND COMPLIANCE WITH ALL CITY PLUMBING CODES AND OTHER CODES AS APPLICABLE.
15. POINT OF DELIVERY FOR AN NBU WATER SYSTEM IS THE MAIN SIDE OF THE SERVICE LATERAL/LEAD FROM THE CUSTOMER'S METER/BACKFLOW/EASEMENT EDGE AND THAT THE POINT OF DELIVERY FOR AN NBU WASTE WATER SYSTEM IS THE MAIN SIDE OF THE SERVICE LATERAL FROM THE CUSTOMER'S CLEAN OUT OR PROPERTY LINE, OR EASEMENT, WHICHEVER IS NEARER. THE CUSTOMER IS RESPONSIBLE FOR DESIGN, CONSTRUCTION, OPERATION AND MAINTENANCE BEYOND THE POINT OF DELIVERY AND HAS SOLE CONTROL AND SUPERVISION OVER THE CUSTOMER'S INSTALLATION INCLUDING REVIEW, PERMITTING, AND COMPLIANCE WITH ALL CITY PLUMBING CODES OR OTHER APPLICABLE CODES.

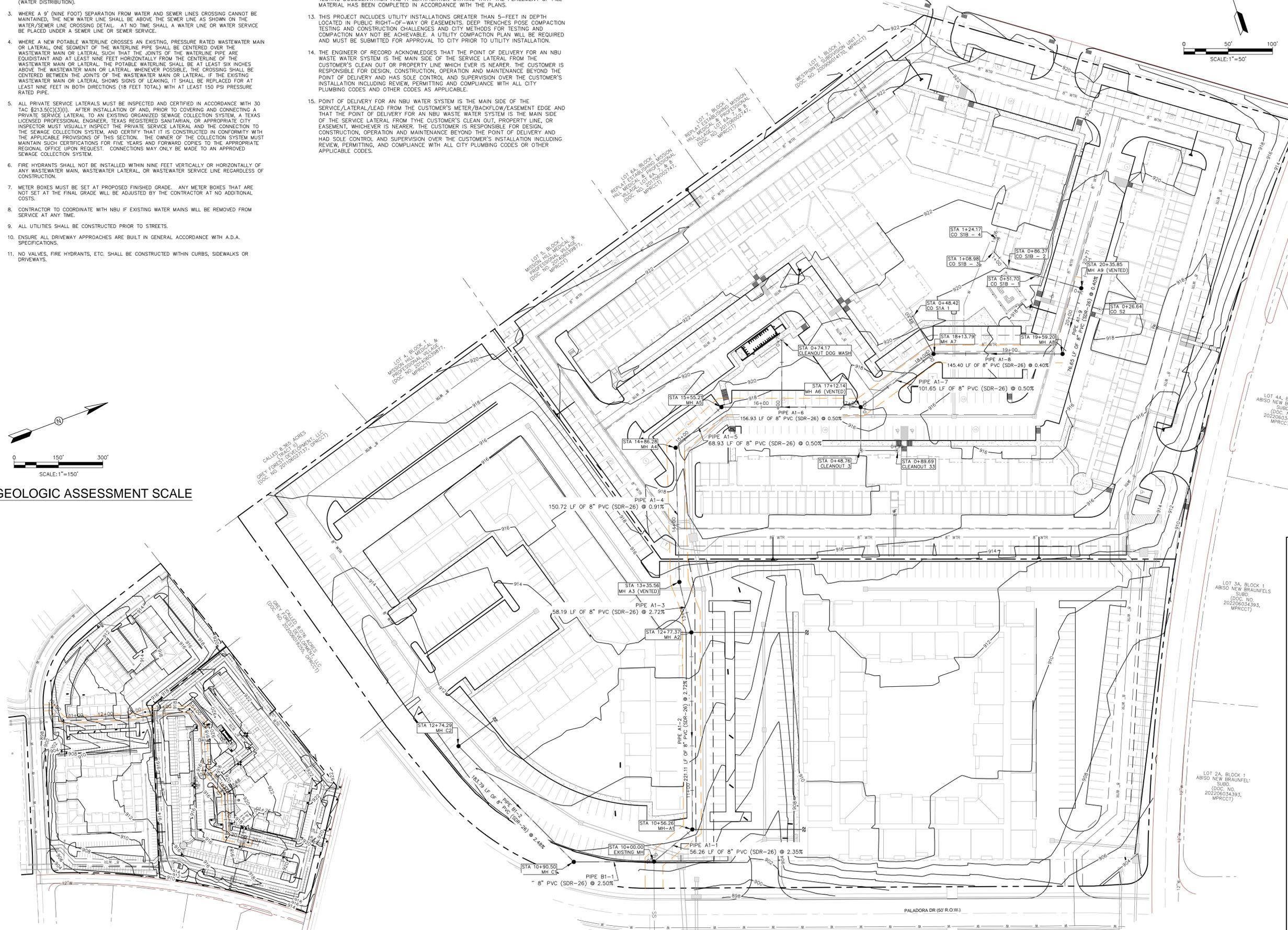
LEGEND

- W — W — EXISTING 8" WATER LINE
- SS — EXISTING SANITARY SEWER LINE
- — — — — BOUNDARY LINE
- ⊙ EXISTING SANITARY SEWER MANHOLE
- ⊙ EXISTING STORM DRAIN MANHOLE
- ⊙ EXISTING WATER VALVE
- ⊙ EXISTING FIRE HYDRANT
- 8" — PROPOSED 8" SANITARY SEWER
- ⊙ PROPOSED SANITARY SEWER MANHOLE
- 8" — PROPOSED WATER LINE
- ⊙ PROPOSED FIRE HYDRANT
- ⊙ PROPOSED GRATE INLET
- ⊙ PROPOSED JUNCTION BOX



GEOLOGIC ASSESSMENT SCALE

Drawing Name: R:\Projects\BAC001\_Proc\_Haz\_Development\Engineering\Reports\SCS\CAD\_Dwg\SCS\_Site\_Plan.dwg User: chadfrassimon Apr 26, 2023 - 8:27am



PROVIDENT REALTY ADVISORS  
10120 N. CENTRAL EXPRESSWAY,  
SUITE 300, DALLAS, TX 75231

OAK RUN VILLAGE APARTMENTS  
(PHASE 1 & 2)

SCS SITE PLAN

SHEET  
1 OF 1

NO	DATE	ISSUES AND REVISIONS



2021 W SH46, STE 105  
NEW BRAUNFELS, TX. 78132  
PH: 830-358-7127 ink-civil.com  
TBPE FIRM F-13351

# OAK RUN VILLAGE APARTMENTS - PUBLIC INFRASTRUCTURE

## NEW BRAUNFELS, TEXAS DRAINAGE, WATER AND SANITARY SEWER IMPROVEMENT PROJECT

BEING 17.532 ACRE TRACT OF LAND SITUATED IN THE WILLIAM MOOKFORD SURVEY, ABSTRACT NO. 393 AND JUAN MARTIN DE VERAMENDI SURVEY, ABSTRACT NO. 2, IN COMAL COUNTY, TEXAS; THE OFFICIAL PUBLIC RECORDS OF COMAL COUNTY TEXAS.

OWNER/DEVELOPER:  
PROVIDENT REALTY ADVISORS  
ATTN: BASIL KOUTSOGEORGAS  
1021 N. CENTRAL EXPRESSWAY, SUITE 300  
DALLAS, TX 75231  
972-385-4130

ENGINEER/SURVEYOR:  
INK CIVIL  
JAMES INGALLS, P.E. - ENGINEER  
2021 SH 46 W. STE 105  
NEW BRAUNFELS, TX. 78130  
(830) 358-7127

D.A. MAWYER LAND SURVEYING, INC.  
DREW MAWYER, R.P.L.S. - SURVEYOR  
5151 W. SH46  
NEW BRAUNFELS, TEXAS 78132  
(210) 325-0858

Point #	Raw Description	Elevation	Northing	Easting
1	CP IRSC	904.00	13805974.9840	2233949.0560
2	CP IRSC	909.14	13806450.5620	2234158.0770
3	CP SMAG	913.81	13806790.0600	2234385.9100

### PERMITS OR APPROVALS:

CITY OF NEW BRAUNFELS (PI2022-0082)	PENDING
NEW BRAUNFELS UTILITIES	PENDING
COMAL COUNTY FIRE MARSHALL	APPROVED
TCEQ	PENDING
TxDOT	N/A
UNION PACIFIC RAILROAD	N/A
CENTERPOINT ENERGY	N/A

### NBU NOTES:

- ALL RESPONSIBILITY FOR THE ADEQUACY OF THESE PLANS REMAINS WITH THE ENGINEER OF RECORD. IN ACCEPTING THESE PLANS, NEW BRAUNFELS UTILITIES MUST RELY UPON THE ADEQUACY OF THE WORK OF THE ENGINEER OF RECORD.
- THE ENGINEER OF RECORD ACKNOWLEDGES THAT ALL PROPOSED WATER AND WASTEWATER IMPROVEMENTS MUST COMPLY WITH THE TEXAS COMMISSION ON ENVIRONMENTAL QUALITY (TCEQ), CITY OF NEW BRAUNFELS WATER & WASTEWATER DESIGN CRITERIA, SOUND ENGINEERING JUDGMENT AND ANY OTHER GOVERNING ENTITY ORDINANCES OR CODES.
- ENGINEER OF RECORD ACKNOWLEDGES THAT THE POINT OF DELIVERY FOR THE NBU WATER SYSTEM IS THE MAIN SIDE OF THE SERVICE LATERAL LEAD FROM THE CUSTOMER'S METER/BACKFLOW PREVENTER/EASEMENT EDGE. THE CUSTOMER IS RESPONSIBLE FOR DESIGN, CONSTRUCTION, OPERATION AND MAINTENANCE BEYOND THE POINT OF DELIVERY AND HAS SOLE CONTROL AND SUPERVISION OVER THE CUSTOMER'S INSTALLATION INCLUDING REVIEW, PERMITTING AND COMPLIANCE WITH ALL CITY PLUMBING CODES OR OTHER APPLICABLE CODES.
- ENGINEER OF RECORD ACKNOWLEDGES THAT THE POINT OF DELIVERY FOR AN NBU WASTEWATER SYSTEM IS THE MAIN SIDE OF THE SERVICE LATERAL FROM THE CUSTOMER'S CLEAN OUT OR PROPERTY LINE, WHICHEVER IS NEARER. THE CUSTOMER IS RESPONSIBLE FOR DESIGN, CONSTRUCTION, OPERATION AND MAINTENANCE BEYOND THE POINT OF DELIVERY AND HAS SOLE CONTROL AND SUPERVISION OVER THE CUSTOMER'S INSTALLATION INCLUDING REVIEW, PERMITTING AND COMPLIANCE WITH ALL CITY PLUMBING CODES AND OTHER CODES AS APPLICABLE.
- WATER IS A PRECIOUS COMMODITY IN THE STATE OF TEXAS AND NEW BRAUNFELS UTILITIES (NBU) IS PASSIONATE ABOUT PROTECTING THE LOCAL RESOURCE. NBU'S CONTRACTOR SHALL BE FULLY RESPONSIBLE FOR ACQUIRING A FIRE HYDRANT METER SO THAT ALL WATER USED FOR CONSTRUCTION OR TESTING PURPOSES IS PROPERLY ACCOUNTED FOR. NBU WILL NOT TOLERATE ANY WATER THEFT, REGARDLESS OF THE AMOUNT. IF WATER THEFT IS DISCOVERED, THE CONTRACTOR SHALL BE SUBJECT TO MONETARY PENALTIES, CRIMINAL CHARGES, AND STOPPAGE OF ALL CONSTRUCTION ACTIVITIES RELATED TO THE PROJECT. COSTS ASSOCIATED WITH ANY WORK STOPPAGE RESULTING FROM WATER THEFT SHALL BE AT THE FULL EXPENSE OF THE CONTRACTOR.

PLEASE NOTE: NBU REQUIRES GPS POINTS FOR CERTAIN ELECTRIC, WATER AND WASTEWATER ATTRIBUTES, SOME OF WHICH MUST BE TAKEN PRIOR TO BACKFILL DURING CONSTRUCTION.

GPS POINTS ARE REQUIRED FROM THE DEVELOPER'S CONTRACTOR OR ENGINEER. A MINIMUM OF THREE (3) COORDINATE POINTS FOR GEOREFERENCING ARE REQUIRED. THE WATER AND WASTEWATER GPS POINTS SHALL BE TO SURVEY GRADE AND ELECTRIC GPS POINTS SHALL BE MEASURED TO MAP GRADE. PLEASE REFERENCE NBU'S WATER CONNECTION POLICY FOR ADDITIONAL CAD DELIVERABLE REQUIREMENTS.

**WATER**  
VERTICAL BENDS AND EDGES OF STEEL CASING (IF APPLICABLE) PRIOR TO BACKFILL  
HORIZONTAL BENDS PRIOR TO BACKFILL  
TEES PRIOR TO BACKFILL  
FITTINGS (REDUCERS AND COUPLINGS) PRIOR TO BACKFILL  
FIRE HYDRANTS (TOP OF FLANGE)  
VALVES  
METERS (TOP CENTER OF BOX)  
BLOW OFF ASSEMBLY  
CORNER SLAB OF WATER TANKS & THE ISOLATION GATE VALVE ON THE WATER TANK

**WASTEWATER**  
MANHOLES  
CLEANOUTS  
CORNER SLAB OF LIFT ALL STATIONS

**ELECTRIC**  
POLES  
TRANSFORMERS, BOTH ABOVE AND UNDERGROUND (FRONT LOCK)  
PULL BOXES  
STREET LIGHTS

COORDINATE GPS REQUIREMENTS WITH NBU INSPECTOR

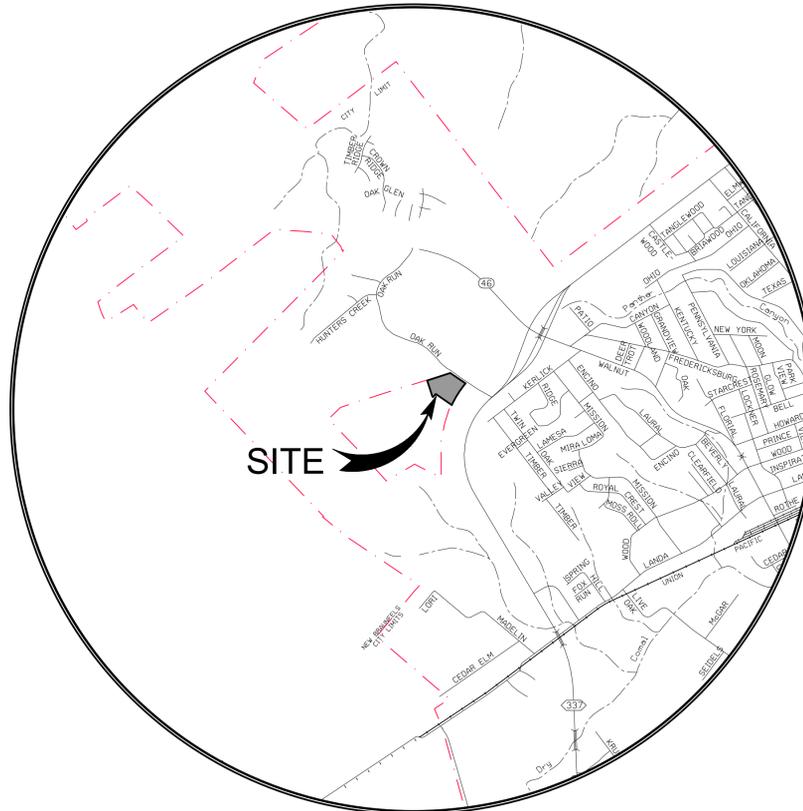
### GENERAL NOTES:

- IF CONSTRUCTION HAS NOT COMMENCED WITHIN ONE-YEAR OF CITY OF NEW BRAUNFELS AND NEW BRAUNFELS UTILITIES (NBU) APPROVAL FOR CONSTRUCTION INSPECTION, THAT APPROVAL IS NO LONGER VALID.
- ALL RESPONSIBILITY FOR THE ADEQUACY OF THESE PLANS REMAINS WITH THE ENGINEER OF RECORD. IN ACCEPTING THESE PLANS, THE CITY OF NEW BRAUNFELS MUST RELY UPON THE ADEQUACY OF THE WORK OF THE ENGINEER OF RECORD.
- NO PORTION OF THE PROJECT IS LOCATED WITHIN THE EXISTING SPECIAL FLOOD HAZARD ZONE A, 100-YEAR FLOOD BOUNDARY, AS DEFINED BY THE COMAL COUNTY, TEXAS MAP NUMBER 48091C0435F, AS PREPARED BY THE FEDERAL EMERGENCY MANAGEMENT AGENCY, EFFECTIVE DATE SEPTEMBER 2, 2009.
- THIS PROJECT IS LOCATED WITHIN THE EAA JURISDICTIONAL BOUNDARY AND IS LOCATED WITHIN A EDWARDS AQUIFER RECHARGE ZONE.
- THIS PROJECT IS A MULTI FAMILY, DEVELOPMENT TYPE 3.
- PRIOR TO THE START OF CONSTRUCTION, CONTRACTOR SHALL CONTACT THE CITY OF NEW BRAUNFELS (CONB) AND NEW BRAUNFELS UTILITIES (NBU) TO SET A PRE-CONSTRUCTION MEETING. A 48-HOUR ADVANCED NOTIFICATION IS REQUIRED.
  - ALL CONB INSPECTIONS ARE TO BE CALLED IN AT 830-221-4068 (PHONE)
  - FAKED IN AT 830-608-2117 (FAX)
  - EMAILED AT inspections@btexas.com (EMAIL)
  - NBU INSPECTIONS ARE TO BE CALLED AT 830-608-8971
- THE MOST CURRENT EDITIONS OF THE CITY OF SAN ANTONIO STANDARD SPECIFICATIONS AND THE TEXAS DEPARTMENT OF TRANSPORTATION STANDARD SPECIFICATIONS FOR CONSTRUCTION OF HIGHWAYS, STREETS AND BRIDGES SHALL FOLLOWED FOR ALL CONSTRUCTION EXCEPT AS AMENDED BY THE CITY OF NEW BRAUNFELS STANDARD DETAILS.
- GAS UTILITIES ARE NOT INCLUDED IN THE CIVIL CONSTRUCTION PLANS. FINAL GAS UTILITY DESIGN SHALL BE APPROVED BY THE CITY FOR ANY WORK WITHIN PUBLIC RIGHT-OF-WAY.

### NOTE TO CONTRACTOR:

BY THE ACT OF SUBMITTING A BID FOR THIS PROPOSED CONTRACT, THE BIDDER WARRANTS THAT THE BIDDER, AND ALL SUBCONTRACTORS AND MATERIAL SUPPLIERS HE INTENDS TO USE HAVE CAREFULLY AND THOROUGHLY REVIEWED THE DRAWINGS, SPECIFICATIONS AND ALL OTHER CONTRACT DOCUMENTS AND HAVE FOUND THEM COMPLETE AND FREE FROM ANY AMBIGUITIES AND SUFFICIENT FOR THE PURPOSE INTENDED. THE BIDDER FURTHER WARRANTS THAT TO THE BEST OF HIS OR HIS SUBCONTRACTORS' AND MATERIAL SUPPLIERS' KNOWLEDGE, ALL MATERIALS AND PRODUCTS SPECIFIED OR INDICATED HEREIN ARE ACCEPTABLE FOR ALL APPLICABLE CODES AND AUTHORITIES.

THE LOCATION OF ALL EXISTING UTILITIES SHOWN ON THESE PLANS HAS BEEN BASED UPON RECORD INFORMATION ONLY AND MAY NOT MATCH LOCATIONS AND/OR DEPTHS AS CONSTRUCTED. THE CONTRACTOR SHALL CONTACT EACH OF THE INDIVIDUAL UTILITIES FOR ASSISTANCE IN DETERMINING EXISTING UTILITY LOCATIONS AND DEPTHS PRIOR TO BEGINNING ANY CONSTRUCTION. CONTRACTOR SHALL FIELD VERIFY LOCATIONS OF ALL UTILITY CROSSINGS PRIOR TO BEGINNING ANY CONSTRUCTION.



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6	EXISTING DRAINAGE AREA MAP
7	PROPOSED DRAINAGE SCS AREA MAP
8	PROPOSED DRAINAGE RATIONAL AREA MAP
9	DETENTION POND PLAN & NOTES
10	DETENTION POND CROSS-SECTIONS
11	STORM DRAIN LINE A STA 18+00 TO 23+00
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13	WPAP SITE PLAN I
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PREPARED BY:

**INK**  
CIVIL

2021 W SH46, STE 105  
NEW BRAUNFELS, TX. 78132  
PH: 830-358-7127 ink-civil.com  
TBPE FIRM F-13351

SUBMITTED BY:

JAMES INGALLS, P.E. #107416  
INK CIVIL  
TBPE FIRM #F-13351  
2021 W SH46, STE 105  
NEW BRAUNFELS, TX 78132



SUBMITTAL DATE: 4-6-2023

NO	DATE	ISSUES AND REVISIONS

OAK RUN VILLAGE APARTMENTS - PUBLIC INFRASTRUCTURE PERMIT SET

CITY OF NEW BRAUNFELS — CONSTRUCTION NOTES — REV 3-2020

- 1. IF CONSTRUCTION HAS NOT COMMENCED WITHIN ONE-YEAR OF CITY APPROVAL FOR CONSTRUCTION INSPECTION, THAT APPROVAL IS NO LONGER VALID.
2. THE MOST CURRENT EDITIONS OF THE CITY OF SAN ANTONIO STANDARD SPECIFICATIONS AND THE TEXAS DEPARTMENT OF TRANSPORTATION STANDARD SPECIFICATIONS FOR CONSTRUCTION OF HIGHWAYS, STREETS AND BRIDGES SHALL BE FOLLOWED FOR ALL CONSTRUCTION EXCEPT AS AMENDED BY THE CITY OF NEW BRAUNFELS STANDARD DETAILS.
3. ALL RESPONSIBILITY FOR THE ADEQUACY OF THESE PLANS REMAINS WITH THE ENGINEER OF RECORD. IN ACCEPTING THESE PLANS, THE CITY OF NEW BRAUNFELS MUST RELY UPON THE ADEQUACY OF THE WORK OF THE ENGINEER OF RECORD.
4. PRIOR TO THE START OF CONSTRUCTION, THE CONTRACTOR SHALL CONTACT THE CITY OF NEW BRAUNFELS TO SCHEDULE A PRECONSTRUCTION MEETING.
4.1. FOR PUBLIC INFRASTRUCTURE PERMIT OR GRADING PERMIT PROJECTS: FOR INSPECTIONS, YOU MUST CALL BEFORE 12:00 P.M., 48 HOURS PRIOR TO YOUR INSPECTION REQUEST.
4.2. EACH INSPECTION WILL BE ALLOTTED 1 HOUR UNLESS YOU REQUEST FOR MORE TIME.
4.3. ONCE YOUR REQUEST HAS BEEN ACCEPTED, YOU WILL RECEIVE A CALL FROM THE CITY OF NEW BRAUNFELS INSPECTOR.
4.4. FOR COMMERCIAL PERMIT (CP) PROJECTS:
4.5. ALL INSPECTIONS ARE TO BE CALLED IN AT 830-221-4068 OR,
4.6. FAXED IN AT 830-608-2117 OR,
4.7. E-MAILED AT INSPECTIONS@NBUTEXAS.ORG.
5. IT IS THE CONTRACTOR'S RESPONSIBILITY TO SEE THAT ALL TEMPORARY AND PERMANENT TRAFFIC CONTROL DEVICES ARE PROPERLY INSTALLED AND MAINTAINED IN ACCORDANCE WITH THE PLANS AND LATEST EDITION OF THE TEXAS MANUAL ON UNIFORM TRAFFIC CONTROL DEVICES, IF, IN THE OPINION OF THE ENGINEERING REPRESENTATIVE AND THE CONSTRUCTION INSPECTOR, THE BARRICADES AND SIGNS DO NOT CONFORM TO ESTABLISHED STANDARDS OR ARE INCORRECTLY PLACED OR ARE INSUFFICIENT IN QUANTITY TO PROTECT THE GENERAL PUBLIC. THE CONSTRUCTION INSPECTOR SHALL STOP WORK IMMEDIATELY IF ANY VIOLATIONS ARE NOT CORRECTED AT THE TIME AS THE CONDITIONS ARE CORRECTED. IF THE NEED ARISES, ADDITIONAL TEMPORARY TRAFFIC CONTROL DEVICES MAY BE ORDERED BY THE ENGINEERING REPRESENTATIVE AT THE CONTRACTOR'S EXPENSE.
6. A TxDOT TYPE II B-B BLUE REFLECTIVE RAISED PAVEMENT MARKER SHALL BE INSTALLED IN THE CENTER OF THE ROADWAY ADJACENT TO ALL FIRE HYDRANTS IN LOCATIONS WHERE HYDRANTS ARE SITUATED ON CORNERS. BLUE REFLECTIVE RAISED PAVEMENT MARKERS SHALL BE INSTALLED ON BOTH APPROACHES WHICH FRONT THE HYDRANT. THE RAISED PAVEMENT MARKER SHALL MEET TxDOT MATERIAL, EPOXY AND ADHESIVE SPECIFICATIONS.

GROUNDWATER

- 7. IT SHALL BE THE RESPONSIBILITY OF THE DEVELOPER, CONTRACTOR, SUBCONTRACTORS, BUILDERS, GEO-TECHNICAL ENGINEER, AND PROJECT ENGINEER TO IMMEDIATELY NOTIFY THE OFFICE OF THE CITY ENGINEER AND PROJECT ENGINEER IF THE PRESENCE OF GROUNDWATER WITHIN THE SITE IS EVIDENT. UPON NOTIFICATION THE PROJECT ENGINEER SHALL RESPOND WITH PLAN REVISIONS FOR THE MITIGATION OF THE GROUNDWATER ISSUE. THE CITY ENGINEER SHALL RESPOND WITHIN TWO (2) BUSINESS DAYS UPON RECEIPT OF THE MITIGATION PLAN. ALL CONSTRUCTION ACTIVITY IMPACTED BY THE DISCOVERY OF GROUNDWATER, SHALL BE SUSPENDED UNTIL THE CITY ENGINEER GRANTS A WRITTEN APPROVAL OF THE GROUNDWATER MITIGATION PLAN.

RECORD DRAWINGS

- 8. AS PER PLATTING ORDINANCE SECTION 118-38M: WHEN ALL OF THE IMPROVEMENTS ARE FOUND TO BE CONSTRUCTED AND COMPLETED IN ACCORDANCE WITH THE SPECIFICATIONS AND STANDARDS WITH THE CITY'S STANDARDS, AND UPON RECEIPT OF ONE SET OF RECORD DRAWING PLANS, AND A DIGITAL COPY OF ALL PLANS (PDF COPY) THE CITY ENGINEER SHALL ACCEPT SUCH IMPROVEMENTS FOR THE CITY OF NEW BRAUNFELS, SUBJECT TO THE GUARANTEE OF MATERIAL AND WORKMANSHIP PROVISIONS IN THIS SECTION.

CONSTRUCTION NOTE

- 9. ENGINEER OF RECORD IS RESPONSIBLE TO ENSURE THAT EROSION CONTROL MEASURES AND STORMWATER CONTROL SUFFICIENT TO MITIGATE OFF SITE IMPACTS ARE IN PLACE AT ALL STAGES OF CONSTRUCTION.

DRAINAGE NOTE

- 10. DRAINAGE IMPROVEMENTS SUFFICIENT TO MITIGATE THE IMPACT OF CONSTRUCTION SHALL BE INSTALLED PRIOR TO ADDING IMPERVIOUS COVER.

FINISHED FLOOR ELEVATIONS

- 11. THE ELEVATION OF THE FLOOR SHALL BE AT LEAST 10 INCHES ABOVE THE FINISHED GRADE OF THE SURROUNDING GROUND, WHICH SHALL BE SLOPED IN A FASHION SO AS TO DIRECT STORMWATER AWAY FROM THE STRUCTURE. FINISHED FLOOR ELEVATIONS SHALL BE SLOPED TO MAINTAIN A MINIMUM FLOOR SLAB ELEVATION OR BOTTOM OF FLOOR JOISTS A MINIMUM OF ONE FOOT ABOVE THE 100-YEAR WATER FLOW ELEVATION IN THE STRUCTURE. DRIVEWAYS SERVING HOUSES ON THE DOWNHILL SIDE OF THE STREET SHALL HAVE A PROPERLY SIZED CROSS-SLOPE PREVENTING RUNOFF FROM ENTERING THE GARAGE.

SOILS TESTING

- 12. PROCTORS SHALL BE SAMPLED FROM ON-SITE MATERIAL (ON-SITE IS DEFINED AS LIMITS OF CONSTRUCTION FOR THIS PLAN) AND A COPY OF THE PROCTOR TEST RESULTS SHALL BE DELIVERED TO THE CITY OF NEW BRAUNFELS STREET INSPECTOR PRIOR TO ANY DENSITY TESTS.

ROADWAY

- 13. ALL ROADWAY COMPACTON TESTS SHALL BE THE RESPONSIBILITY OF THE DEVELOPER'S GEOTECHNICAL ENGINEER. FLEXIBLE BASE OR FILL/EMBANKMENT MATERIAL SHALL BE PLACED IN UNIFORM LAYERS NOT TO EXCEED EIGHT INCHES (8") LOOSE. THE REQUIRED DENSITY FOR THE FILL/EMBANKMENT MATERIAL SHALL MEET THE REQUIREMENTS OF TxDOT'S SPECIFICATION ITEM 132. THE REQUIRED DENSITY FOR THE FLEXIBLE BASE MATERIAL SHALL MEET THE REQUIREMENTS OF TxDOT'S SPECIFICATION ITEM 247. EACH LAYER OF MATERIAL, INCLUDING OF SUBGRADE, SHALL BE COMPACTED AND TESTED FOR DENSITY AND MOISTURE IN ACCORDANCE WITH TEST METHODS TEX-113-E, TEX-114-E, TEX-115-E. THE NUMBER AND LOCATION OF REQUIRED TESTS SHALL BE DETERMINED BY THE GEOTECHNICAL ENGINEER AND APPROVED BY THE CITY OF NEW BRAUNFELS STREET INSPECTOR. AT A MINIMUM, TESTS SHALL BE TAKEN EVERY 200 LF FOR EACH LIFT. UPON COMPLETION OF TESTING, THE GEOTECHNICAL ENGINEER WILL PROVIDE THE CITY OF NEW BRAUNFELS STREET INSPECTOR WITH ALL TESTING DOCUMENTATION AND A CERTIFICATION STATING THAT THE PLACEMENT OF FLEXIBLE BASE, AND FILL MATERIAL, AND SUBGRADE, HAS BEEN COMPLETED IN ACCORDANCE WITH THE PLANS. ADDITIONAL DENSITY TESTS MAY BE REQUESTED BY THE CITY OF NEW BRAUNFELS INSPECTOR.

ITEM 340

- 14. ASPHALTIC CONCRETE PAVEMENT SHALL BE THE TYPE OF HOT MIX ASPHALT AS DEFINED IN TxDOT'S STANDARD SPECIFICATIONS FOR CURRENT TxDOT STANDARD SPECIFICATIONS FOR CONSTRUCTION OF HIGHWAYS, STREET AND BRIDGES.

- 15. THE CITY OF NEW BRAUNFELS WILL NOT ACCEPT THE USE OF RECYCLED ASPHALT PAVEMENT (RAP) OR RECYCLED ASPHALT SHINGLES (RAS) IN ASPHALT MIXTURES FOR NEW ROADWAYS, ANY DEBRIS INCLUSIONS WITHIN NEW ASPHALT PAVEMENTS WILL BE REMOVED AND REPLACEMENT FROM CURB TO CURB FOR LIMITS TO BE DETERMINED BY THE CITY OF NEW BRAUNFELS.

- 16. THE ASPHALTIC CONCRETE PAVEMENT SURFACE COURSE SHALL BE PLANT MIXED, HOT LAID TYPE "B" MEETING THE SPECIFICATION REQUIREMENTS OF TxDOT ITEM 340. THE ASPHALTIC CONCRETE PAVEMENT SUB-SURFACE COURSES SHALL BE PLANT MIXED, HOT LAID TYPE "B" MEETING THE SPECIFICATION REQUIREMENTS OF TxDOT ITEM 340. THE MIXTURE SHALL BE MIXED PER THE DESIGN REQUIREMENTS SPECIFIED IN TxDOT ITEM 340 AND SHALL BE COMPACTED TO BETWEEN 91 AND 95 PERCENT OF THE MAXIMUM THEORETICAL DENSITY AS DETERMINED BY TxDOT TEST METHOD TEX-227-F. PLACE THE MIXTURE WHEN THE ROADWAY SURFACE TEMPERATURE IS AT OR ABOVE 60°F. COMPLETE ALL CONSTRUCTION OPERATIONS BEFORE THE PAVEMENT TEMPERATURE DROPS BELOW 160°F. THE ASPHALT CEMENT CONTENT BY PERCENT OF TOTAL MIXTURE WEIGHT SHALL FALL WITHIN A TOLERANCE OF +0.5 PERCENT FROM A SPECIFIC MIX DESIGN.

UTILITY TRENCH COMPACTON (ADDED TO THE CONSTRUCTION PLANS ON ALL UTILITY PLAN SHEETS).

- 17. ALL UTILITY TRENCH COMPACTON TESTS WITHIN THE STREET PAVEMENT/SIDEWALK SECTION SHALL BE THE RESPONSIBILITY OF THE DEVELOPER'S GEOTECHNICAL ENGINEER. FILL MATERIAL SHALL BE PLACED IN UNIFORM LAYERS NOT TO EXCEED TWELVE INCHES (12") LOOSE. DETERMINE THE MAXIMUM LIFT THICKNESS BASED ON THE ABILITY OF THE COMPACTING OPERATION AND EQUIPMENT USED TO MEET THE REQUIRED DENSITY. EACH LAYER OF MATERIAL SHALL BE COMPACTED TO A MINIMUM 95% DENSITY AND TESTED FOR DENSITY AND MOISTURE IN ACCORDANCE WITH TEST METHODS TEX-113-E, TEX-114-E, TEX-115-E. THE NUMBER AND LOCATION OF REQUIRED TESTS SHALL BE DETERMINED BY THE GEOTECHNICAL ENGINEER AND APPROVED BY THE CITY OF NEW BRAUNFELS STREET INSPECTOR. AT A MINIMUM, TESTS SHALL BE TAKEN EVERY 200 LF FOR EACH LIFT AND EVERY OTHER SERVICE LINE. 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. ADDITIONAL DENSITY TESTS MAY BE REQUESTED BY THE CITY OF NEW BRAUNFELS INSPECTOR.

CURB CUT DUE TO CONSTRUCTION OF NEW RIGHT-OF-WAY CONSTRUCTION

- 18. (INDICATE THE 2 OPTIONS ON THE CONSTRUCTION PLANS).
18.1. SAWCUT EXISTING STREET AND MATCH TO NEW CONSTRUCTION.
18.2. SAWCUT EXISTING CURB TO THE INTO EXISTING CONSTRUCTION.

CONSTRUCTION STABILIZED ENTRANCE

- 19. SAWCUT CURB FOR CONSTRUCTION ENTRANCE.

- 20. STABILIZED CONSTRUCTION AREA SHALL BE CONSTRUCTED OF 3X5'S SHOULD BE PLACED A MINIMUM LENGTH OF 25-FT. AND MAINTAINED SO THAT CONSTRUCTION DEBRIS DOES NOT FALL WITHIN THE CITY RIGHT-OF-WAY. RIGHT-OF-WAY MUST BE CLEARED FROM MUD, ROCKS, ETC. AT ALL TIMES.

NOTES TO BE PLACED ON ALL HW PLAN & DETAIL SHEETS

- 21. ENSURE ALL DRIVEWAY APPROACHES ARE BUILT IN GENERAL ACCORDANCE WITH A.D.A. SPECIFICATIONS.
22. NO VALVES, HYDRANTS, ETC. SHALL BE CONSTRUCTED WITHIN CURBS, SIDEWALKS, OR DRIVEWAYS.

SIGNING AND PAVEMENT MARKING PLAN NOTES

- 23. THE CONTRACTOR SHALL FURNISH AND INSTALL ALL REGULATORY AND WARNING SIGNS, STREETS NAME SIGNS AND SIGN MOUNTS IN ACCORDANCE WITH APPROVED ENGINEERING PLANS. THE CITY WILL INSPECT ALL SIGNS AT FINAL INSPECTION.

- 24. THE CONTRACTOR SHALL INSTALL ALL PAVEMENT MARKINGS IN ACCORDANCE WITH APPROVED ENGINEERING PLANS. THE CONTRACTOR SHALL NOTIFY THE CITY OF NEW BRAUNFELS STREET INSPECTOR PRIOR TO THE INSTALLATION OF ALL SEALER AND FINAL MARKINGS. THE CITY WILL INSPECT ALL MARKINGS AT FINAL APPLICATION.

SEEDING AND ESTABLISHMENT OF VEGETATION WITHIN EARTHEN CHANNELS, STORMWATER BASINS AND DISTURBED AREAS

- 25. SEEDING FOR THE PURPOSE OF ESTABLISHING VEGETATION WITHIN CONSTRUCTED EARTHEN CHANNELS, BASINS AND DISTURBED AREAS SHALL BE CONDUCTED IN ACCORDANCE WITH ITEM 164 (SEEDING FOR EROSION CONTROL OF TxDOT'S STANDARD SPECIFICATIONS FOR CONSTRUCTION AND MAINTENANCE OF HIGHWAYS, STREETS AND BRIDGES MANUAL) UNLESS SEED TYPES AND MIXES SPECIFIED FOR THE SAN ANTONIO DISTRICT (DISTRICT 15 IN TABLES 1 AND 2 UNDER ITEM 164 SHALL BE UTILIZED. DURING THE COOL SEASON (SEPT 1-NOV 30, CEREAL RYE AND SEED SPECIES SPECIFIED FOR THE SAN ANTONIO DISTRICT IN TABLE 3 MAY BE USED FOR COOL SEASON SEEDING APPLICATION). COOL SEASON SEEDING APPLICATIONS IN CONJUNCTION WITH SEED MIXES FOR THE SAN ANTONIO DISTRICT AS SPECIFIED IN TABLE 1 AND 2 UNDER ITEM 164.

- 26. IT MAY BE DEEMED NECESSARY TO INCORPORATE TOPSOIL AND SOIL AMENDMENTS (I.E. COMPOST/ FERTILIZER INTO EXISTING SOIL IN ORDER TO FACILITATE VEGETATION GROWTH. TOPSOIL COMPOST AND FERTILIZER ADDITIONS SHALL BE CONDUCTED ACCORDING TO ITEMS 160, 161 AND 166 OF TxDOT'S STANDARD SPECIFICATIONS MANUAL, RESPECTIVELY.

- 27. AREAS REQUIRING PERMANENT VEGETATION (EARTHEN CHANNELS, PONDS, ETC.) ARE REQUIRED TO MEET TxDOT SPECIFICATIONS FOR ITEM 160 TOPSOIL. TESTING PER TEX-128-E WILL BE REQUIRED AT THE CITY'S REQUEST.

- 28. WATERING MAY ALSO BE NECESSARY TO FACILITATE AND EXPEDITE THE SPROUTING AND GROWTH OF VEGETATION. ITEM 168 OF TxDOT'S STANDARD SPECIFICATIONS MANUAL SHALL BE ADHERED TO FOR VEGETATION WATERING.

- 29. IF EXTENDED DROUGHT CONDITIONS EXIST THAT HINDER OR PROHIBIT THE GROWTH AND ESTABLISHMENT OF VEGETATION, THE CONTRACTOR/ DEVELOPER SHALL PROVIDE A PLAN TO THE CITY OF NEW BRAUNFELS DESCRIBING THE MEASURES THAT WILL BE TAKEN TO STABILIZE EXISTING VEGETATION UNTIL A TIME WHEN GROWING CONDITIONS BECOME MORE FAVORABLE. NOTIONS BECOME MORE FAVORABLE.

NEW BRAUNFELS UTILITIES — GENERAL NOTES — REV 4-2020

- 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 SYSTEMS CONNECTION/CONSTRUCTION POLICY.

- 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 NBW WATER SYSTEMS ENGINEERING AT 830-608-8971 WITH AT LEAST TWO (2) WORKING DAYS (48 HOURS) NOTICE WORK COMPLETED. THE CONTRACTOR, WHICH HAS NOT RECEIVED A NOTICE TO PROCEED FROM 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 CONTRACTOR AND ACCEPTANCE BY THE NEW BRAUNFELS UTILITIES WATER SYSTEM. NBW WILL OWN AND MAINTAIN SAID WATER / WASTEWATER MAINS WHICH ARE LOCATED WITHIN PLATTED UTILITY EASEMENTS OR PUBLIC ROW OF PROPOSED DEVELOPMENTS. (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 OBTAIN, 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 TO CONTACT ENGINEER OF RECORD (EOR) FOR ANY FIELD CHANGES, ANY REVISIONS OR CHANGES TO THE APPROVED CONSTRUCTION PLANS WILL REQUIRE ADDITIONAL APPROVAL BY NBW IN WRITING.

- 6. 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.

- 7. 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.

- 8. 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.

- 9. 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.

- 10. 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.

- 11. CONTRACTOR IS RESPONSIBLE FOR REMOVAL OF ALL WASTE MATERIALS UPON PROJECT COMPLETION. THE CONTRACTOR SHALL NOT PERMANENTLY PLACE ANY WASTE MATERIAL IN THE 100-YEAR FLOOD PLAIN WITHOUT FIRST OBTAIN AN APPROVED FLOOD PLAN DEVELOPMENT PERMIT.

- 12. THE CONTRACTOR SHALL NOT PLACE ANY MATERIALS ON THE RECHARGE ZONE OF THE EDWARDS AQUIFER WITHOUT AN APPROVED WATER POLLUTION ABATEMENT PLAN FROM THE TCEI 31.314 AND 31.314.31.9.

- 13. 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 TRAFFIC FLOW AT ALL TIMES DURING CONSTRUCTION. THE CONTRACTOR IS RESPONSIBLE FOR MAINTAINING ALL DEVICES DURING CONSTRUCTION.

- 14. CONTRACTOR IS REQUIRED TO VERIFY PROJECT ELEVATIONS. THE TERM "MATCH EXISTING" SHALL BE UNDERSTOOD TO SIGNIFY BOTH HORIZONTAL AND VERTICAL ALIGNMENT.

- 15. 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.

- 16. 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 WHAETEVAR ADJUSTMENTS NECESSARY TO ENSURE THE SAFETY OF THOSE WORKMEN.

- 17. IT SHALL BE THE CONTRACTOR'S RESPONSIBILITY TO LOCATE UTILITY SERVICE LINES AS REQUIRED FOR CONSTRUCTION. UTILITY COMPANIES ARE ALSO PREVIOUSLY MENTIONED IN "UTILITY COMPACTON NOTIFICATION".

- 18. DUE TO FEDERAL REGULATIONS TITLE 49, PART 192 (B), 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.

- 19. THE CONTRACTOR IS FULLY RESPONSIBLE FOR THE TRAFFIC CONTROL AND WILL BE RESPONSIBLE FOR FURNISHING ALL TRAFFIC CONTROL DEVICES, AND FLAGGERS. THE CONSTRUCTION METHODS 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.

- 20. 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:
20.1. WATER MAINS AND SERVICES
20.2. SEWER MAINS AND SERVICES

- 21. THRUST BLOCKS WILL NOT BE ALLOWED ON THE SYSTEM WITHOUT SPECIAL APPROVAL BY NBW AND RESTRAINT LENGTH SHALL BE SUBMITTED TO NBW AT THE TIME OF PLAN SUBMITTAL.

- 22. WATER JETTING THE BACKFILL WITHIN A STREET WILL NOT BE PERMITTED. WASTEWATER TRENCHES SUBJECT TO TRAFFIC SHALL CONFORM TO NBW CONNECTION AND CONSTRUCTION POLICY MANUAL.

- 23. WHERE THE MINIMUM 9 FOOT SEPARATION DISTANCE BETWEEN WASTEWATER LINES AND WATER LINES / MAINS CANNOT BE MAINTAINED, THE INSTALLATION OF SEWER LINES SHALL BE IN STRICT ACCORDANCE WITH TCEQ.

- 24. 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 A MINIMUM OF THE FOLLOWING:
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.

- 25. UTILITY TRENCH COMPACTON WITH STREET R.O.W.
1. ALL UTILITY TRENCH COMPACTON TEST WITHIN THE STREET PAVEMENT SECTION SHALL BE THE RESPONSIBILITY OF THE DEVELOPER'S GEO-TECHNICAL ENGINEER.
2. FILL MATERIAL SHALL BE PLACED IN UNIFORM LAYERS NOT TO EXCEED TWELVE INCHES (12") LOOSE.
3. 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.

- 4. THE NUMBER AND LOCATION OF REQUIRED TESTS SHALL BE DETERMINED BY THE GEOTECHNICAL ENGINEER AND APPROVED BY THE CITY OF NEW BRAUNFELS STREET INSPECTOR.

- 5. UPON COMPLETION OF TESTING THE GEO-TECHNICAL ENGINEER SHALL PROVIDE THE CITY OF NEW BRAUNFELS STREET INSPECTOR WITH ALL TESTING DOCUMENTATION AND A CERTIFICATION STATING THAT THE POINT OF TEST MATERIAL HAS BEEN COMPLETED IN ACCORDANCE WITH THE PLANS.

NBW WATER NOTES — REV 5-2019

- 1. ALL WATER MAINS SHALL BE AWWA C900 (CLASS 150 OR GREATER).
2. WATER SERVICES SHALL BE SINGLE 1" COPPER TUBING.

- 3. WATER LINE IS TO BE CONSTRUCTED IN ACCORDANCE WITH THE NBW SYSTEMS CONNECTION & CONSTRUCTION POLICY.

- 4. WATER MAIN SHALL HAVE A MINIMUM OF 42 INCHES OF COVER, OTHERWISE CONCRETE ENCASMENT WILL BE REQUIRED.

- 5. EACH UNIT IN A DUPLEX, TRIPLEX, FOURPLEX, OR CONDOMINIUM SHALL BE PROVIDED WITH AN INDIVIDUAL WATER METER. A MASTER METER CAN BE CONSIDERED FOR SEPARATE BUILDINGS. HOWEVER, THOSE BUILDINGS MUST BE PLUMBED TO ALLOW SEPARATE METERS FOR FUTURE CONSIDERATION.

- 6. CONTRACTOR WILL KEEP THE AREA ON TOP OF AND AROUND THE WATER METER BOX FREE OF ALL OBJECTS AND DEBRIS.

- 7. INITIAL BACKFILL OF WATER LINES SHALL BE MANUFACTURED SAND OR PEA GRAVEL AS PER NBW SYSTEMS CONNECTION & CONSTRUCTION POLICY.

- 8. SECONDARY BACKFILL OF WATER LINES SHALL GENERALLY CONSIST OF MATERIAL REMOVED FROM THE TRENCH AND SHALL BE FREE FROM BRUSH, DEBRIS AND TRASH OR STONES HAVING ANY DIMENSION LARGER THAN 6" INCHES AT THE LARGEST DIMENSION.

- 9. HYDROSTATIC TESTING IS DONE FROM VALVE TO VALVE.

- 10. NO METER BOXES TO BE SET IN DRIVEWAYS OR SIDEWALKS. ANY METER BOXES SET IN DRIVEWAYS OR SIDEWALKS WILL BE RELOCATED AT CONTRACTOR'S AND/OR DEVELOPER'S EXPENSE.

- 11. METER BOXES MUST BE SET AT THE PROPOSED GRADE. ANY METER BOXES THAT ARE NOT SET AT THE FINAL GRADE MUST BE ADJUSTED AT CONTRACTOR'S AND/OR DEVELOPER'S EXPENSE.

- 12. ACCEPTABLE METER BOXES ARE D13-BAMR AND D15-BAMR. NEW RESIDENTIAL LOTS ARE REQUIRED TO USE THE D15-BAMR METER BOXES (DOUBLE AMR). COMMERCIAL LOTS SHOULD CHOICE WHICH BOX APPLIES TO THE DOMESTIC AND/OR IRRIGATION WATER LAYOUT.

- 13. THRUST-BLOCKS WILL NOT BE ALLOWED ON THE SYSTEM WITHOUT SPECIAL APPROVAL. JOINTS WILL BE RESTRAINED WITH RESTRAINING SYSTEMS APPROVED BY NBW AND RESTRAINT LENGTH SHALL BE SUBMITTED TO NBW AT THE TIME OF PLAN SUBMITTAL.

- 14. CONTRACTOR SHALL PLACE TRACER WIRE ON TOP OF THE WATER MAINS. TRACER WIRE SHOULD RUN FROM VALVE TO VALVE AND EXIT AT THE VALVE BOX. THE TRACER WIRE SHOULD BE ATTACHED TO THE TOP OF THE PIPE USING TAPE. EXCESS WIRE SHOULD BE LEFT WITHIN VALVE BOXES TO BE PLACED WITHIN LID OF COVER.

- 15. WATER QUALITY SHALL BE PROTECTED WITH APPROPRIATE BACKFLOW PREVENTION ASSEMBLIES INSTALLED ON ALL IRRIGATION SYSTEMS, FIRE SUPPRESSION SYSTEMS AND MULTI-UNIT COMPLEXES ALONG WITH MULTI-LEVEL PROPERTIES ON DOMESTIC WATER CONTAINMENT. NBW CAN ASSIST WITH THE DESIGN ON APPROPRIATE BACKFLOW PREVENTION ASSEMBLIES ON A CASE BY CASE BASIS. CONTACT NBW BACKFLOW PREVENTION SPECIALIST FOR MORE DETAILS. EMAIL QUESTIONS TO CROSSCONNECTION@NBUTEXAS.COM.

- 16. ALL BACKFLOW PREVENTION ASSEMBLIES SHALL BE TESTED UPON INSTALLATION AND REPORT SENT TO NBW VIA THE ONLINE TRACKING SYSTEM. CONTACT NBW BACKFLOW PREVENTION SPECIALIST FOR MORE DETAILS. EMAIL QUESTIONS TO CROSSCONNECTION@NBUTEXAS.COM.

- 17. ALL RESIDENTIAL AND COMMERCIAL PROPERTIES SHALL HAVE A CUSTOMER SERVICE INSPECTION CERTIFICATE (CSI INSPECTION ) COMPLETED UPON COMPLETION OF THE BUILDING OR HOME STRUCTURE. CONTACT NBW BACKFLOW PREVENTION SPECIALIST FOR MORE DETAILS. EMAIL QUESTIONS TO CROSSCONNECTION@NBUTEXAS.COM.

NBW WASTEWATER NOTES

- 1. THE CONTRACTOR SHALL MAINTAIN SERVICE TO EXISTING WASTEWATER SYSTEM AT ALL TIMES DURING CONSTRUCTION.

- 2. A MINIMUM OF 8" WASTEWATER PIPE AND FITTINGS (P.V.C. SDR-26, ASTM, D- 3034, D-3212, F-477) ARE REQUIRED ON NEW INSTALLATIONS.

- 3. ALL RESIDENTIAL WASTEWATER SERVICE LATERALS SHALL BE EXTENDED TO THE PROPERTY LINE AND A CLEANOUT SHALL BE INSTALLED AT THE PROPERTY LINE. SERVICES TO LOTS WILL EXTEND FOUR (4) FEET PAST THE UNDERGROUND ELECTRIC CONDUIT IN THE FRONT EASEMENT. ALL SEWER CLEANOUTS THAT LEAD TO NBW MAINS SHALL BE INSTALLED WITH A PROTECTIVE UTILITY SHROUD AND PIVOTING MARKER POLE DURING TIME OF CONSTRUCTION.

- 4. PIPE BEDDING OF WASTEWATER LINES SHALL BE MANUFACTURED SAND OR PEA GRAVEL AS PER NBW SPECIFICATIONS.

- 5. SECONDARY BACKFILL OF WASTEWATER 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.

- 6. ALL WASTEWATER PIPES SHALL HAVE COMPRESSION OR MECHANICAL JOINTS AS PER 30 TAC 8217.53 (C) (2).

- 7. FOR WASTEWATER 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.

- 8. ALL MANHOLES MUST BE WATER TIGHT, EITHER MONOLITHIC, CAST-IN-PLACE CONCRETE STRUCTURES OR PRECAST/PREFABRICATED MANHOLES SPECIFICALLY APPROVED BY NBW. THE MANHOLES SHALL HAVE WATER-TIGHT RINGS AND COVERS. WHEREVER THEY ARE WITHIN THE 100 YEAR FLOODPLAIN, THE MANHOLE COVERS SHALL BE BOLTED. EVERY THIRD MANHOLE BY SEQUENCE SHALL HAVE AN ALTERNATE MEANS OF VENTING. 30 TAC 8213.5 (C) (3) (A) AND 30 TAC 8217.55 (O).

- 9. ALL MANHOLES SHALL BE CONSTRUCTED SO THAT THE TOP OF THE RING IS TWO INCHES (2") ABOVE SURROUNDING GROUND EXCEPT WHEN LOCATED IN PAVED AREA. IN PAVED AREAS, THE MANHOLE RING SHALL BE FLUSH WITH PAVEMENT.

- 10. ALL NEW MANHOLES, UNLESS APPROVED BY NBW ENGINEERING, ARE TO HAVE COVERS WITH 32" OPENINGS.

- 11. WASTEWATER PIPE CONNECTIONS TO PRE-CAST MANHOLES WILL BE COMPRESSION JOINTS OR MECHANICAL "BOOT TYPE" JOINT AS APPROVED BY NBW.

- 12. WASTEWATER LINES SHALL BE TESTED FROM MANHOLE TO MANHOLE.

- 13. IN AREAS WHERE A NEW WASTEWATER MANHOLE IS TO BE CONSTRUCTED OVER AN EXISTING WASTEWATER SYSTEM, IT SHALL BE THE CONTRACTOR'S RESPONSIBILITY TO TEST THE EXISTING MANHOLES BEFORE CONSTRUCTION. AFTER THE PROPOSED MANHOLE(S) HAS BEEN BUILT, THE CONTRACTOR SHALL RE-TEST THE EXISTING SYSTEM TO THE SATISFACTION OF THE CONSTRUCTION INSPECTOR. (NO SEPARATE PAY ITEM).

- 14. WHERE THE MINIMUM 9 FOOT SEPARATION DISTANCE BETWEEN WASTEWATER LINES AND WATER LINES / MAINS CANNOT BE MAINTAINED, THE INSTALLATION OF WASTEWATER LINES SHALL BE IN STRICT ACCORDANCE WITH TCEQ. WHERE THE WASTEWATER LINE SHALL BE CONSTRUCTED OVER A WATER LINE OR P.V.C MEETING THE ASTM SPECIFICATION FOR BOTH PIPES AND JOINTS OF 150 PSI AND SHALL BE IN ACCORDANCE WITH 30 TAC 8217.53 (D) (3) (A) (i).

- 15. NO TESTING WILL BE PERFORMED PRIOR TO 30 DAYS FROM COMPLETE INSTALLATION OF THE WASTEWATER LINES. THE FOLLOWING SEQUENCE WILL BE STRICTLY ADHERED TO:
a. PULL MANDREL
b. PERFORM AIR TEST
c. CLEANING OF ANY DEBRIS
d. FLUSHING OF SYSTEM
e. TV INSPECTION (WITHIN 72 HOURS OF FLUSHING)

- 16. A MINIMUM OF 3 FEET OF COVER IS TO BE MAINTAINED OVER THE WASTEWATER MAIN AND LATERALS AT SUBGRADE, OTHERWISE CONCRETE ENCASMENT WILL BE REQUIRED.

- 17. WASTEWATER MAIN CONNECTIONS MADE DIRECTLY TO EXISTING MANHOLES WILL REQUIRE SUCCESSFUL TESTING OF THE MANHOLE IN ACCORDANCE WITH NBW CONNECTION & CONSTRUCTION POLICY MANUAL.

- 18. TCEQ AND EPA REQUIRE EROSION AND SEDIMENTATION CONTROL FOR CONSTRUCTION OF WASTEWATER COLLECTION SYSTEMS. DEVELOPER OR AUTHORIZED REPRESENTATIVE SHALL PROVIDE EROSION AND SEDIMENTATION CONTROL AS NOTES ON THE PROJECTS PLAN AND PROFILE SHEETS. TEMPORARY EROSION AND SEDIMENTATION CONTROLS SHALL BE REMOVED BY THE CONTRACTOR AT FINAL ACCEPTANCE OF THE PROJECT BY NBW WATER SYSTEMS.

- 19. ALL MANHOLES NOT WITHIN PAVED STREETS SHALL HAVE LOCKING CONCRETE COLLAR TO SECURE RING AND COVER TO MANHOLE CONE PER NBW DETAIL DRAWING #229 #331.

- 20. ALL MANHOLES OVER THE EDWARDS AQUIFER RECHARGE ZONE SHALL HAVE LOCKING CONCRETE COLLAR TO SECURE RING AND COVER TO MANHOLE CONE PER NBW DETAIL DRAWING #229 #331.

EROSION / SEDIMENTATION CONTROL:

- 1. AT A MINIMUM, THESE CONTROLS SHALL CONSIST OF ROCK BERMS AND/OR SILT FENCES CONSTRUCTED PARALLEL TO AND DOWN GRADIENT FROM THE TRENCHES. THE ROCK BERM OR SILT FENCES SHALL BE INSTALLED IN A MANNER SUCH THAT ANY RAINFALL RUNOFF SHALL BE FILTERED. HAY BALES SHALL NOT BE USED FOR TEMPORARY EROSION AND SEDIMENTATION CONTROL.

- 2. ALL TEMPORARY EROSION AND SEDIMENTATION CONTROLS MUST BE INSTALLED PRIOR TO CONSTRUCTION AND SHALL BE MAINTAINED DURING CONSTRUCTION BY THE CONTRACTOR. THE CONTRACTOR SHALL REMOVE THE EROSION CONTROLS WHEN VEGETATION IS ESTABLISHED AND THE STRUCTURE IS STABILIZED. ADDITIONAL PROTECTION MAY BE REQUIRED IF EXCESSIVE SOLIDS ARE BEING DISCHARGED FROM THE SITE.

- 3. ALL TEMPORARY EROSION AND SEDIMENTATION CONTROLS SHALL BE REMOVED BY THE CONTRACTOR AT FINAL ACCEPTANCE OF THE PROJECT BY THE OWNER/ENGINEER.

- 4. PLACEMENT OF TEMPORARY EROSION AND SEDIMENTATION CONTROLS SHALL BE IN ACCORDANCE WITH THE CONSTRUCTION PLANS. ACTUAL LOCATIONS MAY VARY SLIGHTLY FROM THE PLANS. THE CONTRACTOR SHALL INSPECT THE CONTROLS AT WEEKLY INTERVALS AND AFTER EACH STORM EVENT. RAINFALL TO INSURE DIST

**TEXAS COMMISSION ON ENVIRONMENTAL QUALITY  
COLLECTION SYSTEM – CONSTRUCTION NOTES – REV 7-15-2015**

- THIS ORGANIZED SEWAGE COLLECTION SYSTEM (OSCS) MUST BE CONSTRUCTED IN ACCORDANCE WITH 30 TEXAS ADMINISTRATIVE CODE (TAC) §213.5(C), THE TEXAS COMMISSION ON ENVIRONMENTAL QUALITY'S (TCEQ) EDWARDS AQUIFER RULES AND ANY LOCAL GOVERNMENT STANDARD SPECIFICATIONS.
- ALL CONTRACTORS CONDUCTING REGULATED ACTIVITIES ASSOCIATED WITH THIS PROPOSED REGULATED PROJECT MUST BE PROVIDED WITH COPIES OF THE SCS 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.
- A WRITTEN NOTICE OF CONSTRUCTION MUST BE SUBMITTED TO THE PRESIDING TCEQ REGIONAL OFFICE AT LEAST 48 HOURS PRIOR TO THE START OF ANY REGULATED ACTIVITIES. THIS NOTICE MUST INCLUDE:
  - THE NAME OF THE APPROVED PROJECT;
  - THE ACTIVITY START DATE; AND
  - THE CONTACT INFORMATION OF THE PRIME CONTRACTOR.
- 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.
- PRIOR TO BEGINNING ANY CONSTRUCTION ACTIVITY, ALL TEMPORARY EROSION AND SEDIMENTATION (E&S) CONTROL MEASURES MUST BE PROPERLY INSTALLED AND MAINTAINED IN ACCORDANCE WITH THE MANUFACTURERS SPECIFICATIONS. THESE CONTROLS MUST REMAIN IN PLACE UNTIL THE DISTURBED AREAS HAVE BEEN PERMANENTLY STABILIZED.
- IF ANY SENSITIVE FEATURES ARE DISCOVERED DURING THE WASTEWATER LINE TRENCHING ACTIVITIES, ALL REGULATED ACTIVITIES NEAR THE SENSITIVE FEATURE MUST BE SUSPENDED IMMEDIATELY. THE APPLICANT MUST IMMEDIATELY NOTIFY THE APPROPRIATE REGIONAL OFFICE OF THE TCEQ OF THE FEATURE DISCOVERED. A GEOLOGIST'S ASSESSMENT OF THE LOCATION AND EXTENT OF THE FEATURE DISCOVERED MUST BE REPORTED TO THAT REGIONAL OFFICE IN WRITING AND 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.
- SEWER LINES LOCATED WITHIN OR CROSSING THE 5-YEAR FLOODPLAIN OF A DRAINAGE WAY 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 6 INCHES.
- 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.
- 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 ACCEPTED CONSTRUCTION MATERIAL FOR ANY PORTION OF THE MANHOLE.  
  
THE DIAMETER OF THE MANHOLES MUST BE A MINIMUM OF FOUR FEET AND THE MANHOLE FOR ENTRY MUST HAVE A MINIMUM CLEAR OPENING DIAMETER OF 30 INCHES. THESE DIMENSIONS AND OTHER DETAILS SHOWING COMPLIANCE WITH THE COMMISSION'S RULES FOR CONSTRUCTION OF MANHOLES AND SEWER LINE/MANHOLE INVERTS DESCRIBED IN 30 TAC §217.55 ARE INCLUDED ON PLAN SHEETS 32, 33, 34 OF 38.  
  
IT IS SUGGESTED THAT ENTRANCE INTO MANHOLES IN EXCESS OF FOUR FEET DEEP BE ACCOMPLISHED BY MEANS OF A PORTABLE LADDER. THE INCLUSION OF STEPS IN A MANHOLE IS PROHIBITED.
- 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 §217.53(D) (PIPE DESIGN) AND 30 TAC §217.55(A)(E) (WATER DISTRIBUTION).
- 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:
  - IF PIPE FLEXURE IS PROPOSED, THE FOLLOWING METHOD OF PREVENTING DEFLECTION OF THE JOINT MUST BE USED:

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 §217.54.

- 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 THEIR LOCATION 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 END OF THE STREET PAVEMENT. ALL STUB-OUTS MUST BE SEALED WITH A MANUFACTURED CAP TO PREVENT LEAKAGE. EXTENSIONS THAT WERE NOT ANTICIPATED AT THE TIME OF ORIGINAL CONSTRUCTION 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 \_\_\_ OF \_\_\_ (FOR POTENTIAL FUTURE LATERALS).
- THE PRIVATE SERVICE LATERAL STUB-OUTS MUST BE INSTALLED AS SHOWN ON THE PLAN AND PROFILE SHEETS ON PLAN SHEET 28, 29, 32 OF 38 AND MARKED AFTER BACKFILLING AS SHOWN IN THE DETAIL ON PLAN SHEET 32 OF 38.
- TRENCHING, BEDDING AND BACKFILL MUST CONFORM WITH 30 TAC §217.54. 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.
- 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 CLEAN-OUT UNLESS IT CAN BE CERTIFIED AS CONFORMING WITH THE PROVISIONS OF 30 TAC §213.5(C)(3)(E).
- ALL SEWER LINES MUST BE TESTED IN ACCORDANCE WITH 30 TAC §217.57. 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) FOR A COLLECTION SYSTEM PIPE THAT WILL TRANSPORT WASTEWATER BY GRAVITY FLOW, THE DESIGN MUST SPECIFY AN INFILTRATION AND EXFILTRATION TEST OR A LOW-PRESSURE AIR TEST. A TEST MUST CONFORM TO THE FOLLOWING REQUIREMENTS:
    - (i) LOW PRESSURE AIR TEST.
      - (A) LOW PRESSURE AIR TEST MUST FOLLOW THE PROCEDURES DESCRIBED IN AMERICAN SOCIETY FOR TESTING AND MATERIALS (ASTM) C-826, ASTM C924, OR ASTM F-1417 OR OTHER PROCEDURE APPROVED BY THE EXECUTIVE DIRECTOR, EXCEPT AS TO TESTING TIMES AS REQUIRED IN TABLE C.3 IN SUBPARAGRAPH (C) OF THIS PARAGRAPH OR EQUATION C.3 IN SUBPARAGRAPH (B)(1) OF THIS PARAGRAPH.
      - (B) FOR SECTIONS OF COLLECTION SYSTEM PIPE LESS THAN 36 INCH AVERAGE INSIDE DIAMETER, THE FOLLOWING PROCEDURE MUST APPLY, UNLESS A PIPE IS TO BE TESTED AS REQUIRED BY PARAGRAPH (2) OF THIS SUBSECTION.
        - (i) A PIPE MUST BE PRESSURIZED TO 3.5 POUNDS PER SQUARE INCH (PSI) GREATER THAN THE PRESSURE EXERTED BY GROUNDWATER ABOVE THE PIPE.
        - (ii) ONCE THE PRESSURE IS STABILIZED, THE MINIMUM TIME ALLOWABLE FOR THE PRESSURE TO DROP FROM 3.5 PSI GAUGE TO 2.5 PSI GAUGE IS COMPUTED FROM THE FOLLOWING EQUATION:
 
$$T = \frac{0.085 \times D \times L}{Q}$$
      - (C) SINCE A K VALUE OF LESS THAN 1.0 MAY NOT BE USED, THE MINIMUM TESTING TIME FOR EACH PIPE DIAMETER IS SHOWN IN THE FOLLOWING TABLE C.3:
 

PIPE DIAMETER (INCHES)	MINIMUM TIME (SECONDS)	MAXIMUM LENGTH FOR MINIMUM TIME (FEET)	TIME FOR LONGER LENGTH (SECONDS/FOOT)
6	340	398	0.855
8	454	298	1.520
10	567	239	2.374
12	680	199	3.419
15	850	159	5.342
18	1020	133	7.693
21	1190	114	10.471
24	1360	100	13.676
27	1530	88	17.300
30	1700	80	21.369
33	1870	72	25.856

- ALL MANHOLES MUST BE TESTED TO MEET OR EXCEED THE REQUIREMENTS OF 30 TAC §217.58.
  - (a) ALL MANHOLES MUST PASS A LEAKAGE TEST.
  - (b) AN OWNER SHALL TEST EACH MANHOLE (AFTER ASSEMBLY AND BACKFILLING) FOR LEAKAGE, SEPARATE AND INDEPENDENT OF THE COLLECTION SYSTEM PIPES, BY HYDROSTATIC EXFILTRATION TESTING, VACUUM TESTING, OR OTHER METHOD APPROVED BY THE EXECUTIVE DIRECTOR.
    - (i) HYDROSTATIC TESTING.
      - (A) THE MAXIMUM LEAKAGE FOR HYDROSTATIC TESTING OR ANY ALTERNATIVE TEST METHODS IS 0.025 GALLONS PER FOOT DIAMETER PER FOOT OF MANHOLE DEPTH PER HOUR.
      - (B) TO PERFORM A HYDROSTATIC EXFILTRATION TEST, AN OWNER SHALL SEAL ALL WASTEWATER PIPES COMING INTO A MANHOLE WITH AN INTERNAL PIPE PLUG, FILL THE MANHOLE WITH WATER, AND MAINTAIN THE TEST FOR AT LEAST ONE HOUR.
      - (C) A TEST FOR CONCRETE MANHOLES MAY USE A 24-HOUR WETTING PERIOD BEFORE TESTING TO ALLOW SATURATION OF THE CONCRETE.
    - (ii) VACUUM TESTING.
      - (A) TO PERFORM A VACUUM TEST, AN OWNER SHALL PLUG ALL LIFT HOLES AND EXTERIOR JOINTS WITH A NON-SHRINK GROUT AND PLUG ALL PIPES ENTERING A MANHOLE.
      - (B) NO GROUT MUST BE PLACED IN HORIZONTAL JOINTS BEFORE TESTING.
      - (C) STUB-OUTS, MANHOLE BOOTHS, AND PIPE PLUGS MUST BE SECURED TO PREVENT MOVEMENT WHILE A VACUUM IS DRAWN.
      - (D) AN OWNER SHALL USE A MINIMUM 60 INCH/LB TORQUE WRENCH TO TIGHTEN THE EXTERNAL CLAMPS THAT SECURE A TEST COVER TO THE TOP OF A MANHOLE.
      - (E) A TEST HEAD MUST BE PLACED AT THE INSIDE OF THE TOP OF A CONE SECTION, AND THE SEAL INFLATED IN ACCORDANCE WITH THE MANUFACTURER'S RECOMMENDATIONS.
      - (F) THERE MUST BE A VACUUM OF 10 INCHES OF MERCURY INSIDE A MANHOLE TO PERFORM A VALID TEST.
      - (G) A TEST DOES NOT BEGIN UNTIL AFTER THE VACUUM PUMP IS OFF.
      - (H) A MANHOLE PASSES THE TEST IF AFTER 2.0 MINUTES AND WITH ALL VALVES CLOSED, THE VACUUM IS AT LEAST 9.0 INCHES OF MERCURY.

- 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.
 

AUSTIN REGIONAL OFFICE 12100 PARK 35 CIRCLE, BUILDING A AUSTIN, TEXAS 78753-1808 PHONE (512) 339-2929 FAX (512) 339-3795	SAN ANTONIO REGIONAL OFFICE 14250 JUDSON ROAD SAN ANTONIO, TEXAS 78233-4480 PHONE (210) 490-3096 FAX (210) 545-4329
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PIPE DIAMETER (INCHES)	MINIMUM TIME (SECONDS)	MAXIMUM LENGTH FOR MINIMUM TIME (FEET)	TIME FOR LONGER LENGTH (SECONDS/FOOT)
6	340	398	0.855
8	454	298	1.520
10	567	239	2.374
12	680	199	3.419
15	850	159	5.342
18	1020	133	7.693
21	1190	114	10.471
24	1360	100	13.676
27	1530	88	17.300
30	1700	80	21.369
33	1870	72	25.856

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

- 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.
- 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.
- 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.
- NO TEMPORARY ABOVEGROUND HYDROCARBON AND HAZARDOUS SUBSTANCE STORAGE TANK SYSTEMS INSTALLED WITHIN 150 FEET OF A DOMESTIC, INDUSTRIAL, IRRIGATION, OR PUBLIC WATER SUPPLY WELL, OR OTHER SENSITIVE FEATURE.
- 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.
- IF SEDIMENT ESCAPES THE CONSTRUCTION SITE, OFF-SITE ACCUMULATIONS OF SEDIMENT MUST BE REMOVED AT A FREQUENCY SUFFICIENT TO MINIMIZE OFF-SITE IMPACTS TO WATER QUALITY (E.G., FUGITIVE SEDIMENT IN STREET BEING WASHED INTO SURFACE STREAMS OR SENSITIVE FEATURES BY THE NEXT RAIN).
- 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.
- 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).
- 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.
- STABILIZATION MEASURES SHALL BE INITIATED AS SOON AS PRACTICABLE IN PORTIONS OF THE SITE WHERE CONSTRUCTION ACTIVITIES HAVE TEMPORARILY OR PERMANENTLY CEASED, BUT IN NO CASE MORE THAN 14 DAYS AFTER THE CONSTRUCTION ACTIVITY IN THAT PORTION OF THE SITE HAS TEMPORARILY OR PERMANENTLY CEASED. WHERE THE INITIATION OF STABILIZATION MEASURES BY THE 14TH DAY AFTER CONSTRUCTION ACTIVITY TEMPORARILY OR PERMANENTLY CEASES IS PRECLUDED BY WEATHER CONDITIONS, STABILIZATION MEASURES SHALL BE INITIATED AS SOON AS PRACTICABLE. WHERE CONSTRUCTION ACTIVITY ON A PORTION OF THE SITE IS TEMPORARILY CEASED, AND EARTH DISTURBING ACTIVITIES WILL BE RESUMED WITHIN 21 DAYS, TEMPORARY STABILIZATION MEASURES DO NOT HAVE TO BE INITIATED ON THAT PORTION OF 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.
- 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 PORTION OF THE SITE; AND THE DATES WHEN STABILIZATION MEASURES ARE INITIATED.
- THE HOLDER OF ANY APPROVED EDWARDS AQUIFER PROTECTION PLAN MUST NOTIFY THE APPROPRIATE REGIONAL OFFICE IN WRITING AND OBTAIN APPROVAL FROM THE EXECUTIVE DIRECTOR PRIOR TO INITIATING ANY OF THE FOLLOWING:
  - A. ANY PHYSICAL OR OPERATIONAL MODIFICATION OF ANY WATER POLLUTION ABATEMENT STRUCTURE(S), INCLUDING BUT NOT LIMITED TO TRENCHES, DAMS, BERMS, SEWAGE TREATMENT PLANTS, AND DIVERSIONARY STRUCTURES;
  - B. ANY CHANGE IN THE NATURE OR CHARACTER OF THE REGULATED ACTIVITY FROM THAT WHICH WAS ORIGINALLY APPROVED OR A CHANGE WHICH WOULD SIGNIFICANTLY IMPACT THE ABILITY OF THE PLAN TO PREVENT POLLUTION OF THE EDWARDS AQUIFER;
  - C. ANY DEVELOPMENT OF LAND PREVIOUSLY IDENTIFIED AS UNDEVELOPED IN THE ORIGINAL WATER POLLUTION ABATEMENT PLAN.

AUSTIN REGIONAL OFFICE 2800 S. IH 35, SUITE 100 AUSTIN, TEXAS 78704-5712 PHONE (512) 339-2929 FAX (512) 339-3795	SAN ANTONIO REGIONAL OFFICE 14250 JUDSON ROAD SAN ANTONIO, TEXAS 78233-4480 PHONE (210) 490-3096 PHONE (210) 545-4329
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DALLAS, TX 75231

**OAK RUN VILLAGE APARTMENTS -  
PUBLIC INFRASTRUCTURE**

**GENERAL NOTES II**

SHEET **2** OF **28**

NO	DATE	ISSUES AND REVISIONS
△		

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CONTRACTOR SHALL NOTIFY THE FOLLOWING UTILITY COMPANIES 48 HOURS PRIOR TO EXCAVATION:

New Braunfels Utilities 830-629-8400  
 Spectrum Cable 830-625-3408  
 Centergrip Gas 830-645-6434  
 Robert Sanders 830-643-6903  
 Damaged Line 888-876-9786  
 AT&T Telephone 830-303-1333  
 Erick White PM 210-283-1706  
 Scott McBrearty (Construction) 210-656-4886  
 Texas One Call 830-545-6000

**C.P.E. LOCATOR**  
 CALL CENTER POINT ENERGY LOCATOR AT 1-800-545-6005, 48HRS BEFORE BEGINNING ANY EXCAVATION. 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 ANY GAS VALVES THAT ARE IN THE PROJECT AREA.

**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 THE TELEPHONE COMPANY CABLE LOCATOR 48HRS PRIOR TO EXCAVATION AT 1-800-545-6005. CONTRACTOR HAS THE RESPONSIBILITY TO PROTECT AND SUPPORT TELEPHONE COMPANY PIPING 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 SITES 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 EXCAVATIONS.

THE LOCATION OF ALL EXISTING UNDERGROUND UTILITIES ARE SHOWN IN AN APPROXIMATE LOCATIONS ONLY. THE CONTRACTOR SHALL DETERMINE THE EXACT LOCATION OF ALL EXISTING UTILITIES BEFORE COMMENCING WORK. THE CONTRACTOR WILL AGREE TO BE FULLY RESPONSIBLE FOR ANY AND ALL DAMAGES WHICH MIGHT BE INCURRED BY THEIR FAILURE TO EXACTLY LOCATE AND PRESERVE ANY AND ALL UNDERGROUND UTILITIES, STRUCTURES OR FACILITIES. CONTRACTOR SHALL NOTIFY ENGINEER OF ANY DISCREPANCIES 24-HOURS PRIOR TO COMMENCING CONSTRUCTION.

**CONSTRUCTION NOTES:**

- WHERE WATER LINES AND NEW SEWER LINES ARE INSTALLED WITH A SEPARATION DISTANCE CLOSER THAN NINE FEET (I.E., WATER LINES CROSSING AN EXISTING PRESSURE RATED WASTEWATER MAIN OR LATERAL, ONE SEGMENT OF THE WATERLINE PIPE SHALL BE CENTERED OVER THE WASTEWATER MAIN OR LATERAL SUCH THAT THE JOINTS OF THE WATERLINE PIPE ARE EQUIDISTANT AND AT LEAST NINE FEET HORIZONTALLY FROM THE CENTERLINE OF THE WASTEWATER MAIN OR LATERAL. THE POTABLE WATERLINE SHALL BE AT LEAST SIX INCHES ABOVE THE MAIN OR LATERAL, WHEN POSSIBLE, THE CROSSING SHALL BE CENTERED BETWEEN THE JOINTS OF THE WASTEWATER MAIN OR LATERAL. IF THE EXISTING WASTEWATER MAIN OR LATERAL SHOWS SIGNS OF LEAKING, IT SHALL BE REPLACED FOR AT LEAST NINE FEET IN BOTH DIRECTIONS (18 FEET TOTAL) WITH AT LEAST 150 PSI PRESSURE RATED PIPE.
- ALL PRIVATE SERVICE LATERALS MUST BE INSPECTED AND CERTIFIED IN ACCORDANCE WITH 30 TAC §13.5(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 EXACT LOCATION AND DEPTHS OF UNDERGROUND UTILITIES 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.
- UTILITY SERVICES TO HAVE A MINIMUM A 3" COVER UNLESS OTHERWISE NOTED OR REQUIRED BY THE UTILITY COMPANY.
- FIRE HYDRANTS SHALL NOT BE INSTALLED WITHIN NINE FEET VERTICALLY OR HORIZONTALLY OF ANY WASTEWATER MAIN, WASTEWATER LATERAL, OR WASTEWATER SERVICE LINE REGARDLESS OF CONSTRUCTION.
- ENSURE ALL DRIVEWAY APPROACHES ARE BUILT IN GENERAL ACCORDANCE WITH A.D.A SPECIFICATIONS.
- NO VALVES, HYDRANTS, ETC. SHALL BE CONSTRUCTED WITHIN CURBS, SIDEWALKS, OR DRIVEWAYS.
- CONTRACTOR TO PROTECT INSTALLED PIPE FROM BEING CONTAMINATED OR DAMAGED PRIOR TO PLACING INTO SERVICE. ANY PIPE NBU INSPECTIONS DETERMINES IS CONTAMINATED, DIRTY, OR DAMAGED, SHALL BE REPLACED. (NSP)
- REFERENCE TO CAP ON THE DESIGN PLANS MEANS CAP OR PLUG. CAPS SHALL BE USED ON ALL SPOUT ENDS AND PLUGS ON ALL BELL ENDS PER NBU SPECIFICATIONS.
- INITIAL BACKFILL OF WATER LINES SHALL BE 3/4" TO DUST OR PEA GRAVEL AS PER NBU SPECIFICATIONS.
- THE LOCATIONS AND DEPTHS OF EXISTING UTILITIES, INCLUDING SERVICE LATERALS, AND DRAINAGE STRUCTURES SHOWN ON THE PLANS ARE APPROXIMATE ONLY. THE CONTRACTOR SHALL VERIFY THE EXACT LOCATION AND DEPTHS OF UNDERGROUND UTILITIES AT LEAST 48 HOURS PRIOR TO CONSTRUCTION WHETHER SHOWN ON PLANS OR NOT, AND TO PROTECT THE SAME DURING CONSTRUCTION.
- CONTRACTOR TO PRE-DO TO VERIFY SIZE, TYPE AND LOCATION OF EXISTING UTILITIES PRIOR TO CONSTRUCTION. ALL EXISTING UTILITIES MUST BE MAINTAINED UNTIL FINAL ACCEPTANCE OF NEW SYSTEM AND SWITCH OVER OCCURS (NSP)
- CONTRACTOR TO UTILIZE WATER LINE STOPPERS TO MINIMIZE OUTAGES. USE OF LINE STOPPERS, INSTEAD OF EXISTING VALVES, MUST BE APPROVED BY NBU INSPECTIONS PRIOR TO INSTALLATION.
- SIZES ON SIZE WATER TAPS ARE ACCEPTABLE ONLY IF SOLID TAPS ARE USED.
- CONTRACTOR WILL KEEP THE AREA ON TOP OF AND AROUND THE WATER METER BOX FREE OF ALL OBJECTS AND DEBRIS.
- NO METER BOXES TO BE SET IN DRIVEWAYS. ANY METER BOXES SET IN DRIVEWAYS WILL BE RELOCATED AT CONTRACTOR'S AND/OR DEVELOPER'S EXPENSE.
- METER BOXES MUST BE SET AT PROPOSED GRADE. ANY METER BOXES THAT ARE NOT SET AT THE FINAL GRADE WILL BE ADJUSTED AT CONTRACTOR'S AND/OR DEVELOPER'S EXPENSE.
- EXISTING PIPE MATERIALS ARE UNKNOWN. CONTRACTOR WILL BE REQUIRED TO THE PROPOSED WATER MAINS TO EXISTING WATER MAINS PER NBU SPECIFICATIONS. ADDITIONAL PIPE NEEDED TO MAKE THE TIE IN WILL BE PAID FOR UNDER THE UNIT BID PRICE OF WATER PIPE OF THE SIZE INSTALLED. FITTINGS NEEDED TO MAKE THE CONNECTION TO THE EXISTING PIPE WILL BE PAID AS PART OF ITEM 510, PIPE. NO SEPARATE PAYMENT WILL BE MADE FOR THESE FITTINGS.
- DOMESTIC SERVICE BACKFLOW PREVENTER TO BE SPECIFIED AS: WATTS SERIES 909M/TQ (REDUCED PRESSURE ZONE ASSEMBLY) OR ENGINEER APPROVED EQUAL.
- ALL UTILITIES TO BE CONSTRUCTED PRIOR TO STREETS.
- ALL UTILITY TRENCH COMPACTION TESTS WITHIN THE STREET PAVEMENT/SIDEWALK SECTION SHALL BE THE RESPONSIBILITY OF THE DEVELOPER'S GEOTECHNICAL ENGINEER. FILL MATERIAL SHALL BE PLACED IN UNIFORM LAYERS NOT TO EXCEED TWELVE INCHES (12") LOOSE. DETERMINE THE MAXIMUM LIFT THICKNESS BASED ON THE ABILITY OF THE COMPACTING OPERATION AND EQUIPMENT USED TO MEET THE REQUIRED DENSITY. EACH LAYER OF MATERIAL SHALL BE COMPACTED TO A MINIMUM 95% DENSITY AND TESTED FOR DENSITY AND MOISTURE IN ACCORDANCE WITH TEST METHODS TEX-113-E, TEX-114-E, TEX-115-E. THE NUMBER AND LOCATION OF REQUIRED TESTS SHALL BE DETERMINED BY THE GEOTECHNICAL ENGINEER AND APPROVED BY THE CITY OF NEW BRAUNFELS STREET INSPECTOR. AT A MINIMUM TESTS SHALL BE TAKEN EVERY 200 LF FOR EACH LIFT AND EVERY OTHER SERVICE LINE. 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. ADDITIONAL DENSITY TESTS MAY BE REQUESTED BY THE CITY OF NEW BRAUNFELS INSPECTOR.
- REFER TO ARCHITECTURAL PLANS FOR COORDINATION OF BUILDING, APPURTANANCES, DIMENSIONS, AND UTILITY ENTRANCE LOCATIONS.
- CONTRACTOR TO COORDINATE SANITARY SEWER AND WATER CONNECTIONS TO BUILDING WITH M.E.P. PLANS.
- CONTRACTOR TO COORDINATE ELECTRIC, TELEPHONE, AND GAS SERVICES WITH UTILITY PROVIDERS AND M.E.P. PLANS.
- THE GAS AND TELECOMMUNICATIONS SERVICES SHOWN ARE PRELIMINARY. REFERENCE THE M.E.P. PLANS FOR EXACT LOCATIONS OF ELECTRICAL, GAS, AND TELECOMMUNICATIONS SERVICES ARE NOT PART OF THE CIVIL DESIGN PLANS.

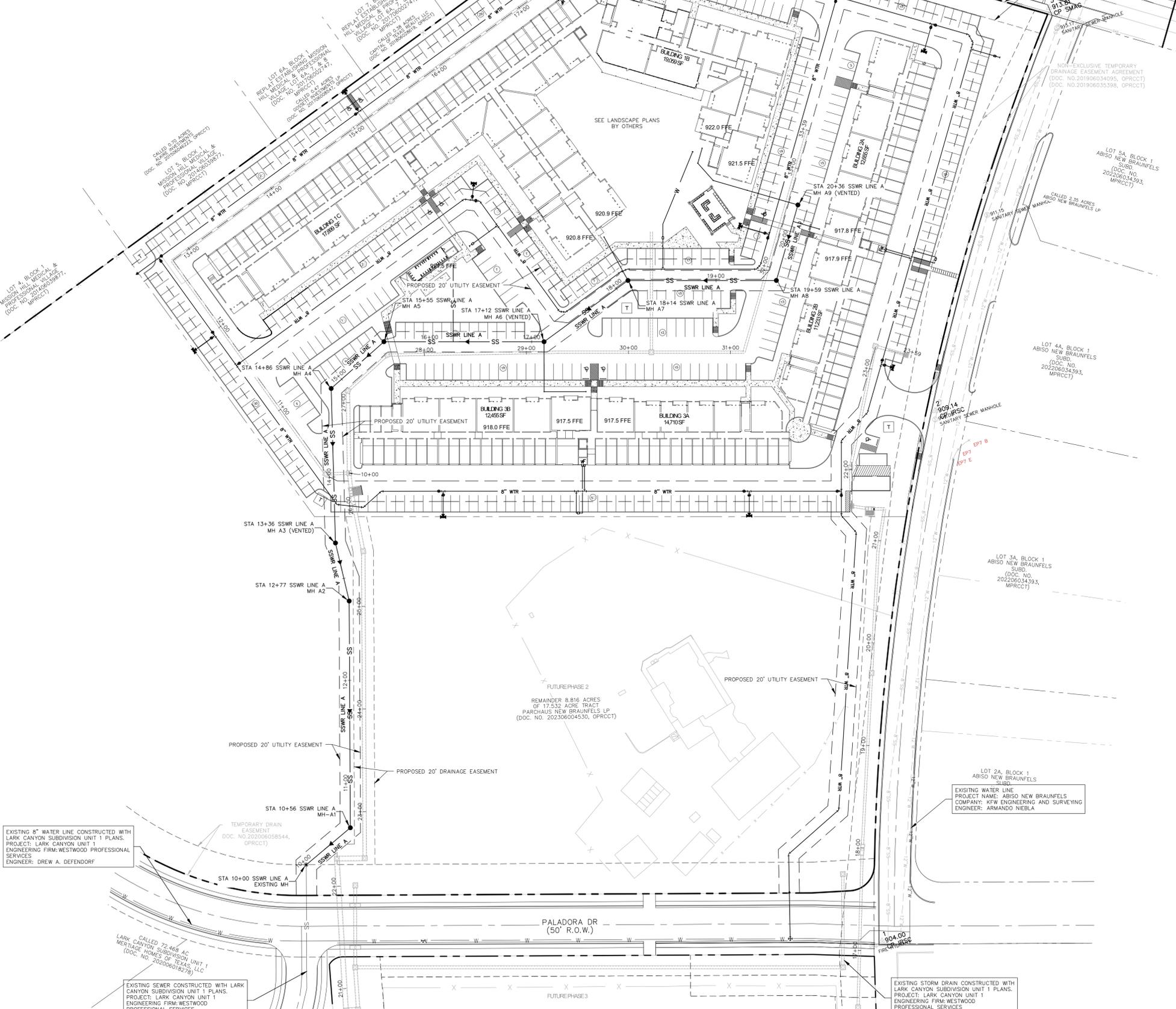
POINT OF DELIVERY FOR AN NBU WATER SYSTEM IS THE MAIN SIDE OF THE SERVICE/LATERAL/LEAD FROM THE CUSTOMER'S METER/BACKFLOW/EASEMENT EDGE AND THAT THE POINT OF DELIVERY FOR AN NBU WASTE WATER SYSTEM IS THE MAIN SIDE OF THE SERVICE LATERAL FROM THE CUSTOMER'S CLEAN OUT PROPERTY LINE OR EASEMENT WHICHEVER IS NEARER. THE CUSTOMER IS RESPONSIBLE FOR DESIGN, CONSTRUCTION, OPERATION AND MAINTENANCE BEYOND THE POINT OF DELIVERY AND HAS SOLE CONTROL AND SUPERVISION OVER THE CUSTOMER'S INSTALLATION INCLUDING REVIEW, PERMITTING AND COMPLIANCE WITH ALL CITY PLUMBING CODES OR OTHER APPLICABLE CODES.

**NOTE:**

THIS PROJECT INCLUDES UTILITY INSTALLATIONS GREATER THAN 5 FEET IN DEPTH LOCATED IN THE PUBLIC RIGHT OF WAY OR EASEMENTS. DEEP TRENCHES POSE COMPACTION TESTING AND CHALLENGES AND CITY METHODS FOR TESTING AND COMPACTION MAY NOT BE ACHIEVABLE. A UTILITY CONSTRUCTION PLAN WILL BE REQUIRED AND MUST BE SUBMITTED FOR APPROVAL TO CITY PRIOR TO UTILITY CONSTRUCTION.

**NOTE:**

BUILDING SQUARE FOOTAGE PROVIDED BY DEMAREST ARCHITECTURE.



**LEGEND**

—	BOUNDARY LINE
—	EXISTING GUY WIRE
—	EXISTING UTILITY POLE
—	EXISTING LIGHT POLE
—	EXISTING ELECTRIC METER
—	EXISTING STORM DRAIN MANHOLE
—	EXISTING SIGN PEDESTAL
—	EXISTING WATER VALVE
—	EXISTING FIRE HYDRANT
—	EXISTING SANITARY SEWER MANHOLE
—	EXISTING GAS LINE
—	EXISTING 8" SANITARY SEWER LINE
—	EXISTING 12" WATER LINE
—	PROPOSED 8" SANITARY SEWER
—	PROPOSED 8" WATER
—	PROPOSED WATER VALVE
—	PROPOSED FIRE HYDRANT
—	PROPOSED SANITARY SEWER MANHOLE
—	PROPOSED JUNCTION BOX



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**OAK RUN VILLAGE APARTMENTS - PUBLIC INFRASTRUCTURE**

**OVERALL UTILITY PLAN**

SHEET **18** OF **28**

NO	DATE	ISSUES AND REVISIONS

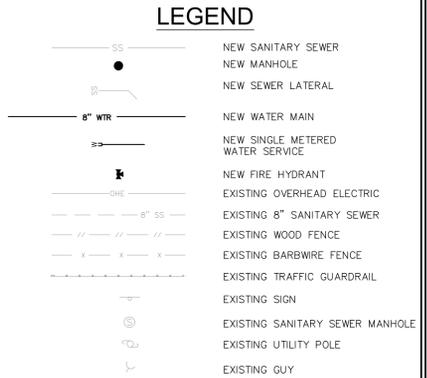
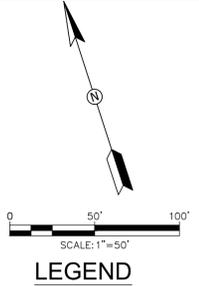


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OAK RUN VILLAGE APARTMENTS	
ITEM	QTY.
WATER MAIN (8" PVC C-900)	3878 LF
5/8" WATER METERS	2 EA.
1.5" WATER METERS	1 EA.
4" WATER METERS	2 EA.
6" WATER METERS	1 EA.
6" GATE VALVE	9 EA.
8" GATE VALVE	19 EA.
1.0" IRRIGATION METER	2 EA.
1" X 1.5" IRRIGATION METER	1 EA.
FIRE HYDRANTS	9 EA.
FIRE LINES	216 LF

PIPE INSIDE DIA.	RESTRAINED LENGTH FOR PVC PIPE								DEAD END/ INLINE VALVES		
	HORIZONTAL BENDS				VERTICAL BENDS						
	90°	45°	22.5°	11.25°	UPPER		LOWER				
8"	19	8	4	2	25	12	6	7	4	2	60
12"	27	12	6	3	36	17	9	9	5	3	85

NOTES:  
 LENGTHS SHOWN ABOVE WERE COMPUTED BASED ON THE FOLLOWING VALUES:  
 a. SAFETY FACTOR = 1.5 TO 1  
 b. TEST PRESSURE = 200 PSI  
 c. SOIL DESIGNATION = WELL GRADED GRAVELS AND GRAVEL-SAND MIXTURES, LITTLE OR NO FINES (SEA GRAVEL)  
 d. DEPTH OF COVER = 4 FEET (TYPICAL AND UPPER BEND)  
 e. DEPTH OF COVER = 5 FEET (LOWER BEND)



POINT OF DELIVERY FOR AN NBU WATER SYSTEM IS THE MAIN SIDE OF THE SERVICE LATERAL LEAD FROM THE CUSTOMER'S METER/BACKFLOW/EASEMENT EDGE AND THAT THE POINT OF DELIVERY FOR AN NBU WASTE WATER SYSTEM IS THE MAIN SIDE OF THE SERVICE LATERAL FROM THE CUSTOMER'S CLEAN OUT PROPERTY LINE OR EASEMENT WHICHEVER IS NEARER. THE CUSTOMER IS RESPONSIBLE FOR DESIGN, CONSTRUCTION, OPERATION AND MAINTENANCE BEYOND THE POINT OF DELIVERY AND HAS SOLE CONTROL AND SUPERVISION OVER THE CUSTOMER'S INSTALLATION INCLUDING REVIEW, PERMITTING AND COMPLIANCE WITH ALL CITY PLUMBING CODES OR OTHER APPLICABLE CODES.

NOTE:  
 THIS PROJECT INCLUDES UTILITY INSTALLATIONS GREATER THAN 5 FEET IN DEPTH LOCATED IN THE PUBLIC RIGHT OF WAY OR EASEMENTS. DEEP TRENCH ROSE COMPACTION TESTING AND CHALLENGES AND CITY METHODS FOR TESTING AND COMPACTION MAY NOT BE ACHIEVABLE. A UTILITY COMPACTION PLAN WILL BE REQUIRED AND MUST BE SUBMITTED FOR APPROVAL TO CITY PRIOR TO UTILITY CONSTRUCTION.

- NOTES:
- STATIONING FOR 8" WATER MAINS ARE BASED ON WATERLINE ALIGNMENTS.
  - GATE VALVES ON FIRE HYDRANT LEADS SHALL BE RESTRAINED AT THE TEE. SEE THIS SHEET FOR CALLOUTS FOR ANCHOR TEES FOR FIRE HYDRANTS.
  - THE MAIN SUPPLY LINE THAT SUPPLIES ALL DOMESTIC METERS WITHIN THIS PROJECT SHALL REQUIRE AN RP BACKFLOW PREVENTION.
  - ALL IRRIGATION METERS SHALL HAVE AN RP BACKFLOW PREVENTION.
  - THE ENTIRE HYDRANT ASSEMBLY FROM THE MAIN TO THE HYDRANT IS TO BE RESTRAINED.
  - WATER MAIN SHALL HAVE A MINIMUM OF 42 INCHES OF COVER, OTHERWISE CONCRETE ENCASUREMENT WILL BE REQUIRED.



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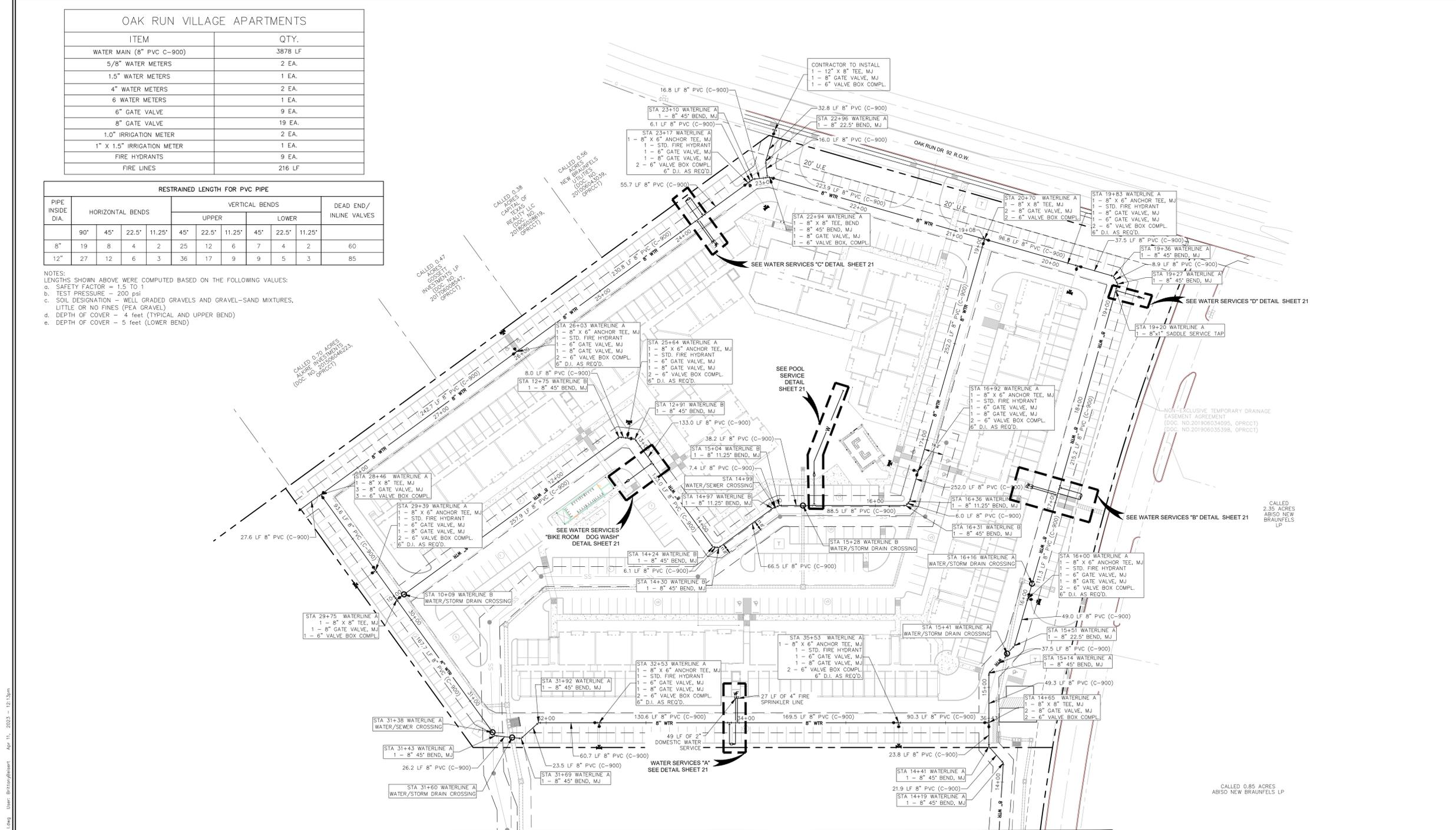
**OAK RUN VILLAGE APARTMENTS - PUBLIC INFRASTRUCTURE**

**WATER DISTRIBUTION PLAN I**

SHEET **19** OF **28**

NO	DATE	ISSUES AND REVISIONS

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CONTRACTOR SHALL NOTIFY THE FOLLOWING UTILITY COMPANIES 48 HOURS PRIOR TO EXCAVATION:

New Braunfels Utilities	830-629-8400
Spectrum Cable	830-625-3408
Centerpoint Gas	830-643-6434
Robert Sanders	830-643-6903
Hammages Line	868-876-5786
AT&T Telephone	830-303-1333
Erick White PM	210-283-1706
Scott McBrearty (Construction)	210-658-4886
Texas One Call	830-545-6005

**C.P.E. LOCATOR**  
 CALL CENTER POINT ENERGY LOCATOR AT 1-800-545-6005, 48HRS BEFORE BEGINNING ANY EXCAVATION. 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 ANY GAS VALVES THAT ARE IN THE PROJECT AREA.

**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 THE TELEPHONE COMPANY CABLE LOCATOR 48HRS PRIOR TO EXCAVATION AT 1-800-545-6005. CONTRACTOR HAS THE RESPONSIBILITY TO PROTECT AND SUPPORT TELEPHONE COMPANY 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 SHALL IMPLEMENT A TRENCH SAFETY PROGRAM IN ACCORDANCE WITH OSHA STANDARDS GOVERNING THE PRESENCE AND ACTIVITIES OF INDIVIDUALS WORKING IN AND AROUND TRENCH EXCAVATIONS.

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- CONSTRUCTION NOTES:
- WHERE WATER LINES AND NEW SEWER LINES 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 §217.53(0) (PIPE DESIGN) AND 30 TAC §290.44(2) (WATER DISTRIBUTION).
  - WHERE A NEW POTABLE WATERLINE CROSSES AN EXISTING, PRESSURE RATED WASTEWATER MAIN OR LATERAL, ONE SEGMENT OF THE WATERLINE PIPE SHALL BE CENTERED OVER THE WASTEWATER MAIN OR LATERAL SUCH THAT THE JOINTS OF THE WATERLINE PIPE ARE EQUIDISTANT AND AT LEAST NINE FEET HORIZONTALLY FROM THE CENTERLINE OF THE WASTEWATER MAIN OR LATERAL. THE POTABLE WATERLINE SHALL BE AT LEAST SIX INCHES ABOVE THE WASTEWATER MAIN OR LATERAL, WHENEVER POSSIBLE, THE CROSSING SHALL BE CENTERED BETWEEN THE JOINTS OF THE WASTEWATER MAIN OR LATERAL. IF THE EXISTING WASTEWATER MAIN OR LATERAL SHOWS SIGNS OF LEAKING, IT SHALL BE REPLACED FOR AT LEAST NINE FEET IN BOTH DIRECTIONS (18 FEET TOTAL) WITH AT LEAST 150 PSI PRESSURE RATED PIPE.
  - 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.
  - UTILITY SERVICES TO HAVE A MINIMUM A 3' COVER UNLESS OTHERWISE NOTED OR REQUIRED BY THE UTILITY COMPANY.
  - FIRE HYDRANTS SHALL NOT BE INSTALLED WITHIN NINE FEET VERTICALLY OR HORIZONTALLY OF ANY WASTEWATER MAIN, WASTEWATER LATERAL, OR WASTEWATER SERVICE LINE REGARDLESS OF CONSTRUCTION.
  - ENSURE ALL DRIVEWAY APPROACHES ARE BUILT IN GENERAL ACCORDANCE WITH A.D.A. SPECIFICATIONS.
  - NO VALVES, HYDRANTS, ETC. SHALL BE CONSTRUCTED WITHIN CURBS, SIDEWALKS, OR DRIVEWAYS.
  - CONTRACTOR TO PROTECT INSTALLED PIPE FROM BEING CONTAMINATED OR DAMAGED

- PRIOR TO PLACING INTO SERVICE, ANY PIPE NBU INSPECTIONS DETERMINES IS CONTAMINATED, DIRTY, OR DAMAGED, SHALL BE REPLACED. (NSP)
- REFERENCE TO "CAP" ON THE DESIGN PLANS MEANS CAP OR PLUG. CAPS SHALL BE USED ON ALL SPIGOT ENDS AND PLUGS ON ALL BELL ENDS PER NBU SPECIFICATIONS.
  - INITIAL BACKFILL OF WATER LINES SHALL BE 3/4" TO DUST OR PEA GRAVEL AS PER NBU SPECIFICATIONS.
  - THE LOCATIONS AND DEPTHS OF EXISTING UTILITIES, INCLUDING SERVICE LATERALS, AND DRAINAGE STRUCTURES SHOWN ON THE PLANS ARE APPROXIMATE ONLY. THE CONTRACTOR SHALL VERIFY THE EXACT LOCATION AND DEPTHS OF UNDERGROUND UTILITIES AT LEAST 48 HOURS PRIOR TO CONSTRUCTION, WHETHER SHOWN ON PLANS OR NOT, AND TO PROTECT THE SAME DURING CONSTRUCTION.
  - CONTRACTOR TO PRE-DIG TO VERIFY SIZE, TYPE AND LOCATION OF EXISTING UTILITIES PRIOR TO CONSTRUCTION. ALL EXISTING UTILITIES MUST BE MAINTAINED UNTIL FINAL ACCEPTANCE OF NEW SYSTEM AND SWITCH OVER OCCURS (NSP).
  - CONTRACTOR TO UTILIZE WATER LINE STOPPERS TO MINIMIZE OUBAGES. USE OF LINE STOPPERS, INSTEAD OF EXISTING VALVES, MUST BE APPROVED BY NBU INSPECTIONS PRIOR TO INSTALLATION.
  - SIZES ON WATER TAPS ARE ACCEPTABLE ONLY IF SOLID TAPS ARE USED.
  - CONTRACTOR WILL KEEP THE AREA ON TOP OF AND AROUND THE WATER METER BOX FREE OF ALL OBJECTS AND DEBRIS.
  - NO METER BOXES TO BE SET IN DRIVEWAYS. ANY METER BOXES SET IN DRIVEWAYS WILL BE RELOCATED TO CONTRACTOR'S AND/OR DEVELOPER'S EXPENSE.
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- DOMESTIC SERVICE BACKFLOW PREVENTER TO BE SPECIFIED AS: WATTS SERIES 909MOT (REDUCED PRESSURE ZONE ASSEMBLY) OR ENGINEER APPROVED EQUAL.
- ALL UTILITIES TO BE CONSTRUCTED PRIOR TO STREETS.
- ALL UTILITY TRENCH COMPACTION TESTS WITHIN THE STREET PAVEMENT/SIDEWALK SECTION SHALL BE THE RESPONSIBILITY OF THE DEVELOPER'S GEOTECHNICAL ENGINEER. FILL MATERIAL SHALL BE PLACED IN UNIFORM LAYERS NOT TO EXCEED TWELVE INCHES (12") LOOSE. DETERMINE THE MAXIMUM LIFT THICKNESS BASED ON THE ABILITY OF THE COMPACTION OPERATION AND EQUIPMENT USED TO MEET THE REQUIRED DENSITY. EACH LAYER OF MATERIAL SHALL BE COMPACTED TO A MINIMUM 95% DENSITY AND TESTED FOR DENSITY AND MOISTURE IN ACCORDANCE WITH TEST METHODS TEX-113-E, TEX-114-E, TEX-115-E. THE NUMBER AND LOCATION OF REQUIRED TESTS SHALL BE DETERMINED BY THE GEOTECHNICAL ENGINEER AND APPROVED BY THE CITY OF NEW BRAUNFELS STREET INSPECTOR. AT A MINIMUM TESTS SHALL BE TAKEN EVERY 200 LF FOR EACH LIFT AND EVERY OTHER SERVICE LINE 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. ADDITIONAL DENSITY TESTS MAY BE REQUESTED BY THE CITY OF NEW BRAUNFELS INSPECTOR.
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- MINIMUM DEPTH OF COVER OVER THE UPPERMOST PROJECTION OF THE WATER PIPE AND ALL APPURTENANCES SHALL BE 42 INCHES. IF COVER IS LESS 42 INCHES ADD A CONCRETE CAP OR ENCASUREMENT.

MATCHLINE "A" SEE SHEET 20

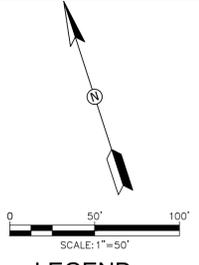
Drawing Name: R:\Projects\KAR0001\_Proc\_Haz\_Dev\Development\Con\Construction\Drawings\Public\SET\19 WATER DISTRIBUTION PLAN.dwg User: Brittan@ink.com Apr 11, 2023 - 12:13pm

**CONSTRUCTION NOTES:**

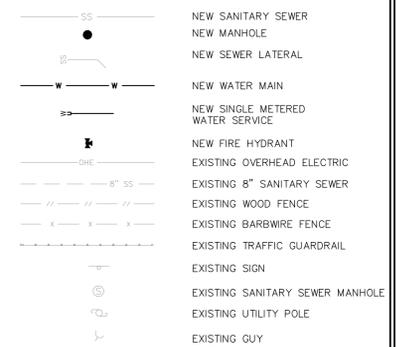
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**LEGEND**



POINT OF DELIVERY FOR AN NBU WATER SYSTEM IS THE MAIN SIDE OF THE SERVICE LATERAL/LEAD FROM THE CUSTOMER'S METER/BACKFLOW/EASEMENT EDGE AND THAT THE POINT OF DELIVERY FOR AN NBU WASTE WATER SYSTEM IS THE MAIN SIDE OF THE SERVICE LATERAL FROM THE CUSTOMER'S CLEAN OUT PROPERTY LINE OR EASEMENT WHICHEVER IS NEARER. THE CUSTOMER IS RESPONSIBLE FOR DESIGN, CONSTRUCTION, OPERATION AND MAINTENANCE BEYOND THE POINT OF DELIVERY AND HAS SOLE CONTROL AND SUPERVISION OVER THE CUSTOMER'S INSTALLATION INCLUDING REVIEW, PERMITTING AND COMPLIANCE WITH ALL CITY PLUMBING CODES OR OTHER APPLICABLE CODES.

**NOTE**

THIS PROJECT INCLUDES UTILITY INSTALLATIONS GREATER THAN 5 FEET IN DEPTH LOCATED IN THE PUBLIC RIGHT OF WAY OR EASEMENTS. DEEP TRENCHES POSE COMPACTION TESTING AND CHALLENGES AND CITY METHODS FOR TESTING AND COMPACTION MAY NOT BE ACHIEVABLE. A UTILITY COMPACTION PLAN WILL BE REQUIRED AND MUST BE SUBMITTED FOR APPROVAL TO CITY PRIOR TO UTILITY CONSTRUCTION.

- NOTES:**
- STATIONING FOR 8" WATER MAINS ARE BASED ON WATERLINE ALIGNMENTS.
  - GATE VALVES ON FIRE HYDRANT LEADS SHALL BE RESTRAINED AT THE TEE. SEE THIS SHEET FOR CALLOUTS FOR ANCHOR TEES FOR FIRE HYDRANTS.
  - THE MAIN SUPPLY LINE THAT SUPPLIES ALL DOMESTIC METERS WITHIN THIS PROJECT SHALL REQUIRE AN RP BACKFLOW PREVENTION.
  - ALL IRRIGATION METERS SHALL HAVE AN RP BACKFLOW PREVENTION.
  - THE ENTIRE HYDRANT ASSEMBLY FROM THE MAIN TO THE HYDRANT IS TO BE RESTRAINED



**PROVIDENT REALTY ADVISORS**  
10210 N. CENTRAL EXPRESSWAY, SUITE 300  
DALLAS, TX 75231

**OAK RUN VILLAGE APARTMENTS - PUBLIC INFRASTRUCTURE**

**WATER DISTRIBUTION PLAN II**

SHEET **20** OF **28**

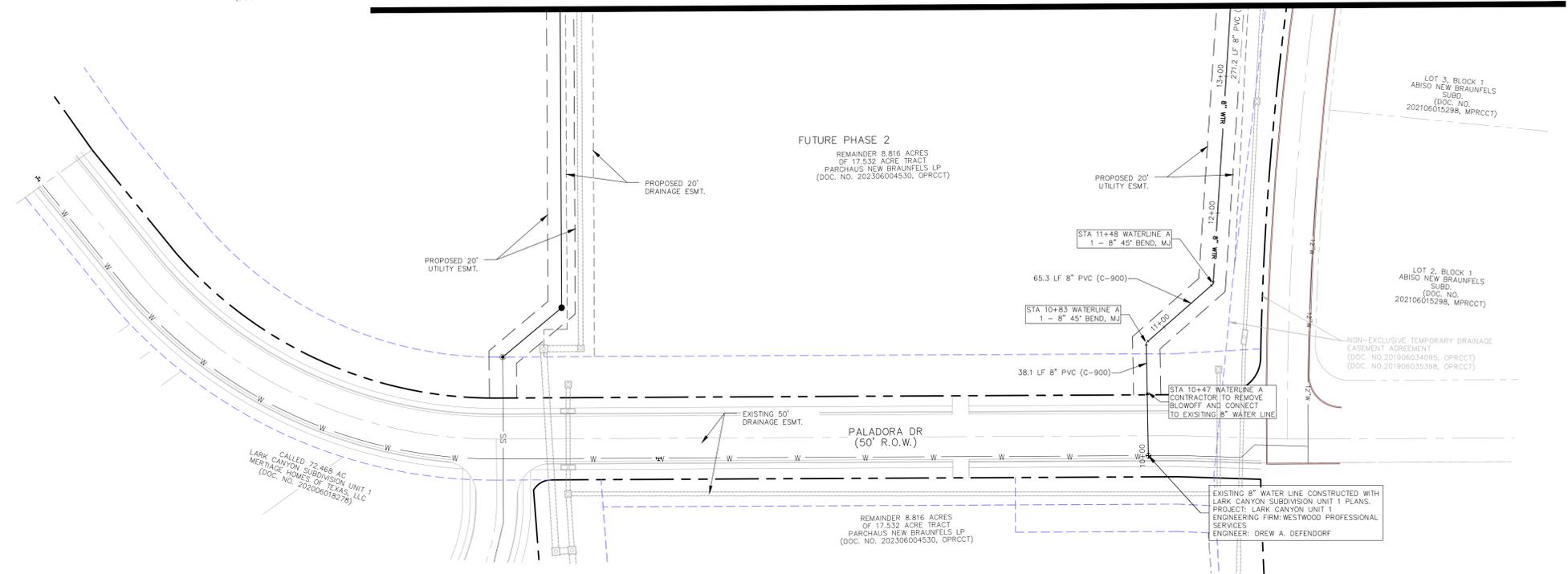
NO	DATE	ISSUES AND REVISIONS



2021 W SH46, STE 105  
NEW BRAUNFELS, TX. 78132  
PH: 830-358-7127 ink-civil.com  
TBPE FIRM F-13351

**FUTURE PHASE 2**  
REMAINDER 8.816 ACRES  
OF 17.532 ACRE TRACT  
PARCHAUS NEW BRAUNFELS LP  
(DOC. NO. 202306004530, OPRCCT)

**MATCHLINE "A" SEE SHEET 19**



- CONTRACTOR SHALL NOTIFY THE FOLLOWING UTILITY COMPANIES 48 HOURS PRIOR TO EXCAVATION:
- New Braunfels Utilities 830-629-8400
  - Spectrum Cable 830-625-3408
  - Centerpoint Gas 830-643-6434
  - Robert Sanders 830-643-6903
  - Damaged Line 868-876-5786
  - AT&T Telephone 830-303-1333
  - Erick White PM 210-283-1706
  - Scott McBrearty (Construction) 210-658-4886
  - Texas One Call 830-545-6005

**C.P.E. LOCATOR**  
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**TRENCH EXCAVATION SAFETY PROTECTION**  
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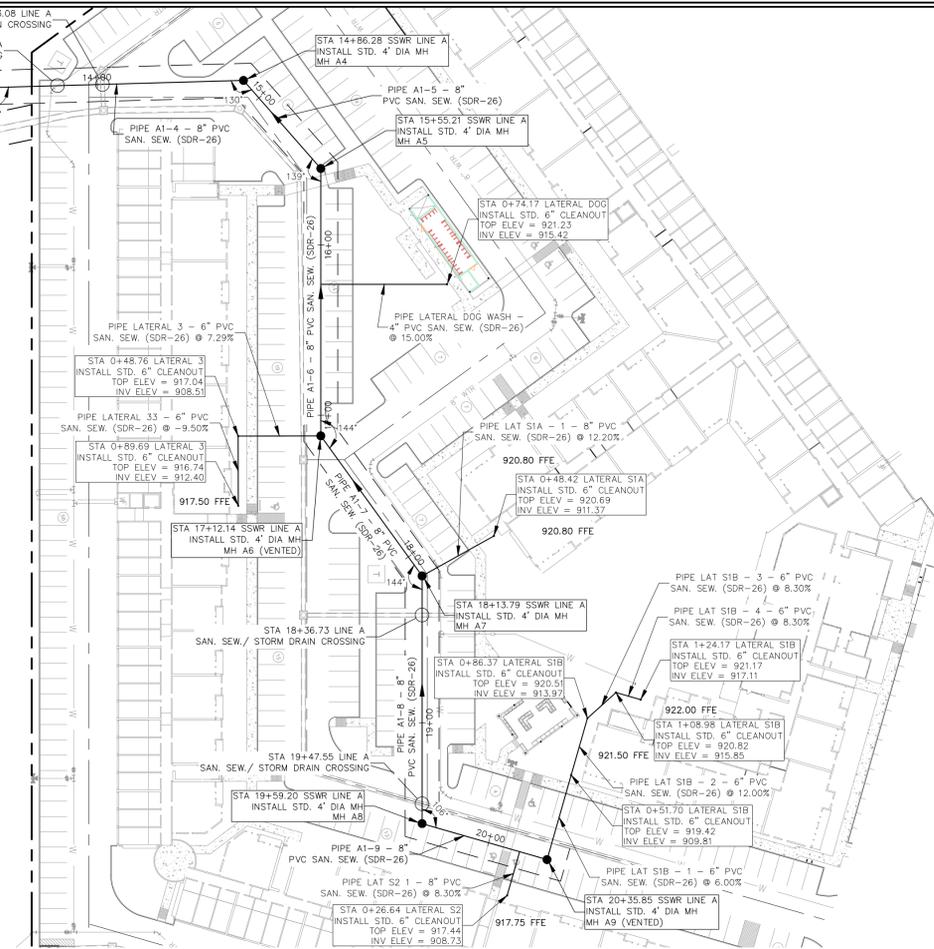
OAK RUN VILLAGE APARTMENTS		
ITEM	QTY.	
1.5" WATER METERS	3878 LF	
5/8" WATER METERS	2 EA.	
4" WATER METERS	2 EA.	
6 WATER METERS	1 EA.	
1.0" IRRIGATION METER	2 EA.	
FIRE HYDRANTS	9 EA.	
FIRE LINES	216 LF	

PIPE INSIDE DIA.	RESTRAINED LENGTH FOR PVC PIPE										DEAD END/ INLINE VALVES
	HORIZONTAL BENDS					VERTICAL BENDS					
	90°	45°	22.5°	11.25°	45°	22.5°	11.25°	45°	22.5°	11.25°	
8"	19	8	4	2	25	12	6	7	4	2	60
12"	27	12	6	3	36	17	9	9	5	3	85

**NOTES:**  
LENGTHS SHOWN ABOVE WERE COMPUTED BASED ON THE FOLLOWING VALUES:  
a. SAFETY FACTOR = 1.5 TO 1  
b. TEST PRESSURE = 200 psi  
c. SOIL DESIGNATION = WELL GRADED GRAVELS AND GRAVEL-SAND MIXTURES, LITTLE OR NO FINES (PEA GRAVEL)  
d. DEPTH OF COVER = 4 feet (TYPICAL AND UPPER BEND)  
e. DEPTH OF COVER = 5 feet (LOWER BEND)

	Flow (gpd)	Velocity (ft/s)
8" Capacity (min)	493,932	2.19
8" Capacity (max)	1,485,906	6.58
8" Average Dry Flow	35,910	0.16
8" Peak Dry Flow	143,640	0.64
8" Peak Wet Flow	149,640	0.66

Oak Run Village Apartments Phase 1 - Gravity Sewer									
Sanitary Sewer Line	Diameter (in)	Length (ft)	Slope (%)	PDW Flow (gpd)	Velocity	Capacity %	PWW Flow (gpd)	Velocity	Capacity %
PIPE A1	8	56.3	2.35%	143,640	3.58	23%	149,640	3.63	24%
PIPE A2	8	221.1	2.72%	143,640	3.77	23%	149,640	3.81	23%
PIPE A3	8	58.2	2.72%	143,640	3.77	23%	149,640	3.81	23%
PIPE A4	8	150.7	0.90%	143,640	2.54	30%	149,640	2.57	31%
PIPE A5	8	68.9	0.50%	143,640	2.06	35%	149,640	2.08	36%
PIPE A6	8	156.9	0.50%	143,640	2.06	35%	149,640	2.08	36%
PIPE A7	8	101.7	0.50%	143,640	2.06	35%	149,640	2.08	36%
PIPE A8	8	145.4	0.40%	143,640	1.79	39%	149,640	1.81	40%
PIPE A9	8	76.7	0.40%	143,640	1.79	39%	149,640	1.81	40%
Total =		1035.8							



SSWR LINE A

OAK RUN VILLAGE APARTMENTS		
ITEM		QTY.
SANITARY SEWER MAIN (8" PVC SDR-26)		1016 LF.
SANITARY SEWER MAIN (8" C-900 DR-18)		20 LF.
6" SANITARY SEWER LATERAL		214 LF.
8" SANITARY SEWER LATERAL		75 LF.
6" SANITARY SEWER CLEANOUT		8 EA.
STANDARD MANHOLE		9 EA.

CONTRACTOR SHALL NOTIFY THE FOLLOWING UTILITY COMPANIES 48 HOURS PRIOR TO EXCAVATION:

New Braunfels Utilities	830-629-8400
Spectrum Cable	830-625-3458
Centerpoint Gas	830-643-6434
Robert Sanders	830-643-6930
Damaged Line	888-676-5796
AT&T Telephone	830-303-1333
Erick White PM	210-283-1706
Scott McBrearty (Construction)	210-658-4886
Texas One Call	830-545-6005

C.P.E. LOCATOR

CALL CENTER POINT ENERGY LOCATOR AT 1-800-545-6005, 48HRS BEFORE BEGINNING ANY EXCAVATION. 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 ANY GAS VALVES THAT ARE IN THE PROJECT AREA.

TELEPHONE LOCATOR

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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 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 EXCAVATIONS.

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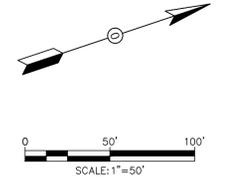
POINT OF DELIVERY FOR AN NSU WATER SYSTEM IS THE MAIN SIDE OF THE SERVICE LATERAL/LEAD FROM THE CUSTOMER'S METER/BACKFLOW/EASEMENT EDGE AND THAT THE POINT OF DELIVERY FOR AN NSU WASTE WATER SYSTEM IS THE MAIN SIDE OF THE SERVICE LATERAL FROM THE CUSTOMER'S CLEAN OUT PROPERTY LINE OR EASEMENT WHICHEVER IS NEARER. THE CUSTOMER IS RESPONSIBLE FOR DESIGN, CONSTRUCTION, OPERATION AND MAINTENANCE BEYOND THE POINT OF DELIVERY AND HAS SOLE CONTROL AND SUPERVISION OVER THE CUSTOMER'S INSTALLATION INCLUDING REVIEW, PERMITTING AND COMPLIANCE WITH ALL CITY PLUMBING CODES OR OTHER APPLICABLE CODES.

NOTE:

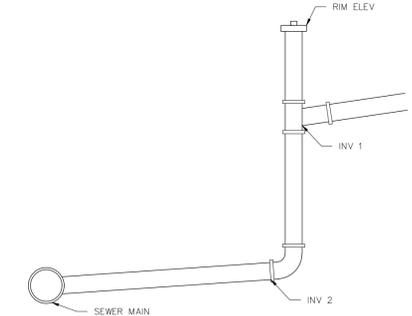
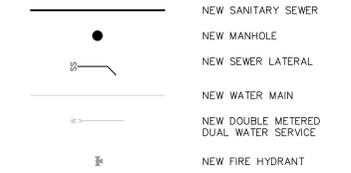
THIS PROJECT INCLUDES UTILITY INSTALLATIONS GREATER THAN 5 FEET IN DEPTH LOCATED IN THE PUBLIC RIGHT OF WAY OR EASEMENTS. DEEP TRENCHES POSE COMPACTION TESTING AND CHALLENGES AND CITY METHODS FOR TESTING AND COMPACTION MAY NOT BE ADEQUATE. A UTILITY COMPACTION PLAN WILL BE REQUIRED AND MUST BE SUBMITTED FOR APPROVAL TO CITY PRIOR TO UTILITY CONSTRUCTION.

NOTE:

BUILDING SQUARE FOOTAGE PROVIDED BY DEMAREST ARCHITECTURE.

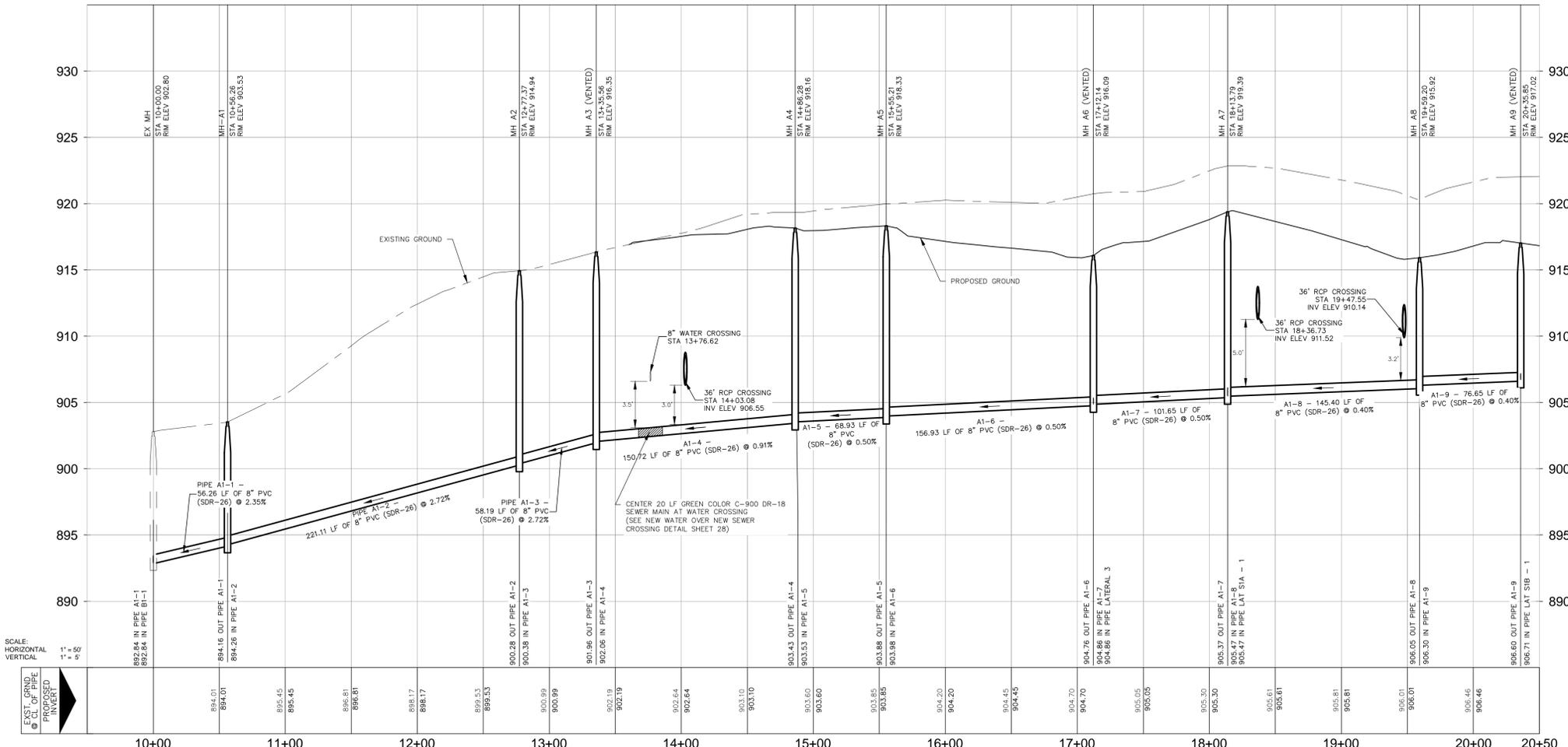


LEGEND



RISER CONNECTION DETAIL  
NOT TO SCALE

- NOTE:
- MINIMUM GRADE ALLOWED FOR SERVICE LATERALS IS 2%.
  - SERVICES WILL HAVE A MINIMUM OF THIRTY-SIX (36) INCHES OF COVER.
  - NEW MANHOLES MUST BE CONSTRUCTED OF OR LINED WITH A CORROSION RESISTANT MATERIAL. WHERE NEW CONSTRUCTION CONNECTS TO AN EXISTING MANHOLE THAT IS NOT CONSTRUCTED OF A CORROSION RESISTANT MATERIAL, THE EXISTING MANHOLES MUST BE LINED WITH OR REPLACED WITH A CORROSION RESISTANT MATERIAL.



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DALLAS, TX 75231

OAK RUN VILLAGE APARTMENTS -  
PUBLIC INFRASTRUCTURE

SANITARY SEWER LINE A

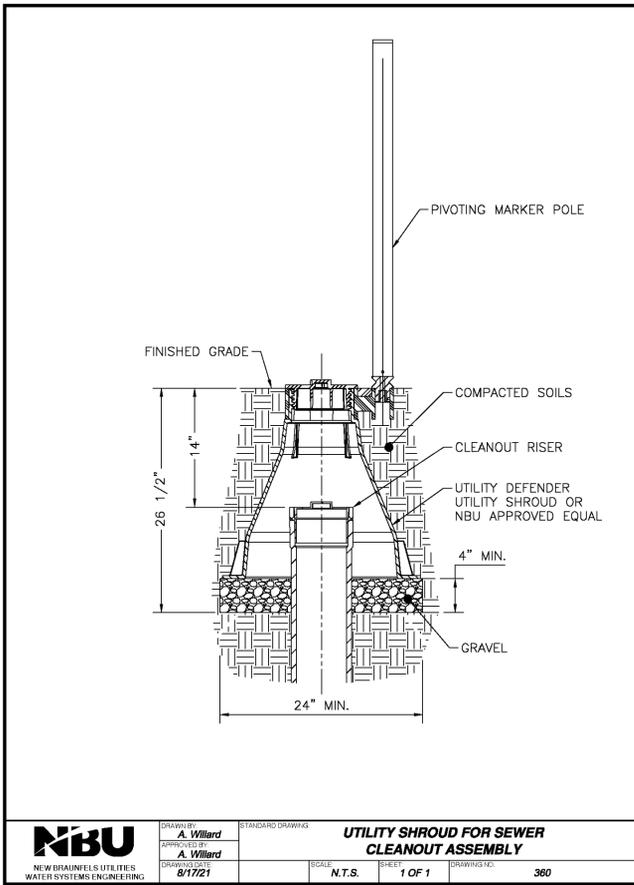
SHEET 26 OF 28

NO	DATE	ISSUES AND REVISIONS

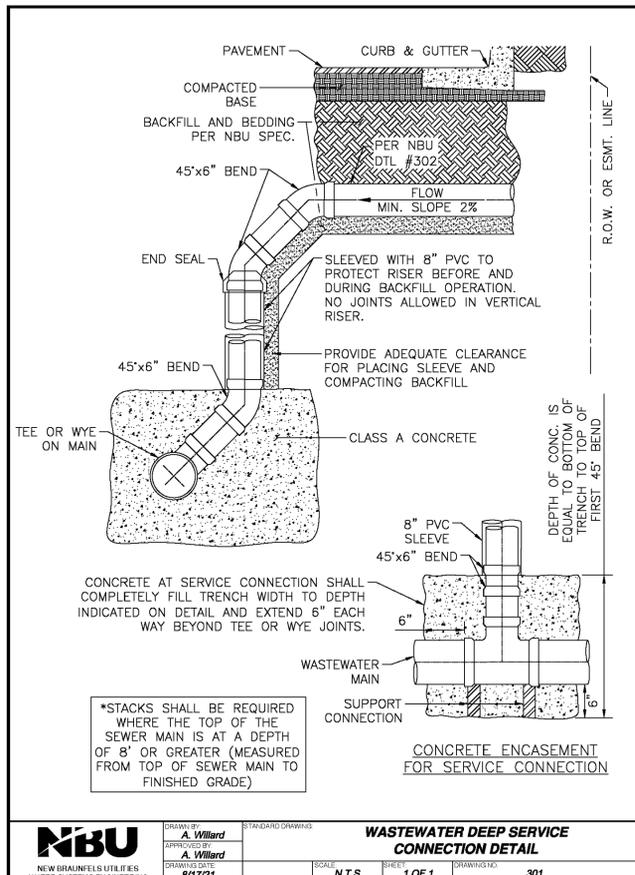


2021 W SH46, STE 105  
NEW BRAUNFELS, TX. 78132  
PH: 830-358-7127 ink-civil.com  
TBPE FIRM F-13351

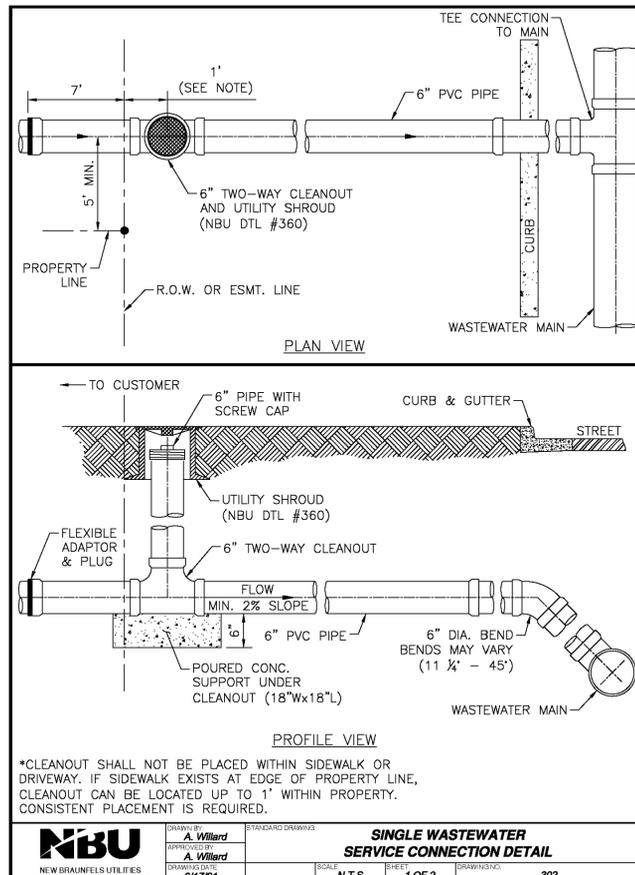
Drawing Name: R:\Projects\KARCO01\_Porc Hous Development\Con\Construction\Drawings\Public\SET\26 SANITARY SEWER LINE A.dwg User: choffhessman Apr 19, 2023 - 1:45pm



<b>NBU</b> NEW BRAUNFELS UTILITIES WATER SYSTEMS ENGINEERING	DRAWN BY A. Willard	STANDARD DRAWING	<b>UTILITY SHROUD FOR SEWER CLEANOUT ASSEMBLY</b>	
	APPROVED BY A. Willard	SCALE N.T.S.	SHEET 1 OF 1	DRAWING NO. 360



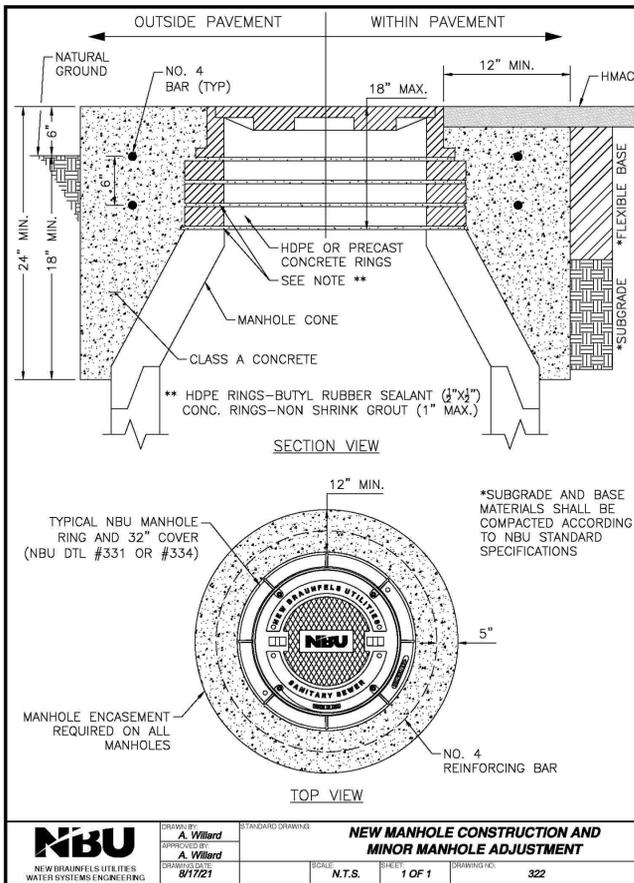
<b>NBU</b> NEW BRAUNFELS UTILITIES WATER SYSTEMS ENGINEERING	DRAWN BY A. Willard	STANDARD DRAWING	<b>WASTEWATER DEEP SERVICE CONNECTION DETAIL</b>	
	APPROVED BY A. Willard	SCALE N.T.S.	SHEET 1 OF 1	DRAWING NO. 301



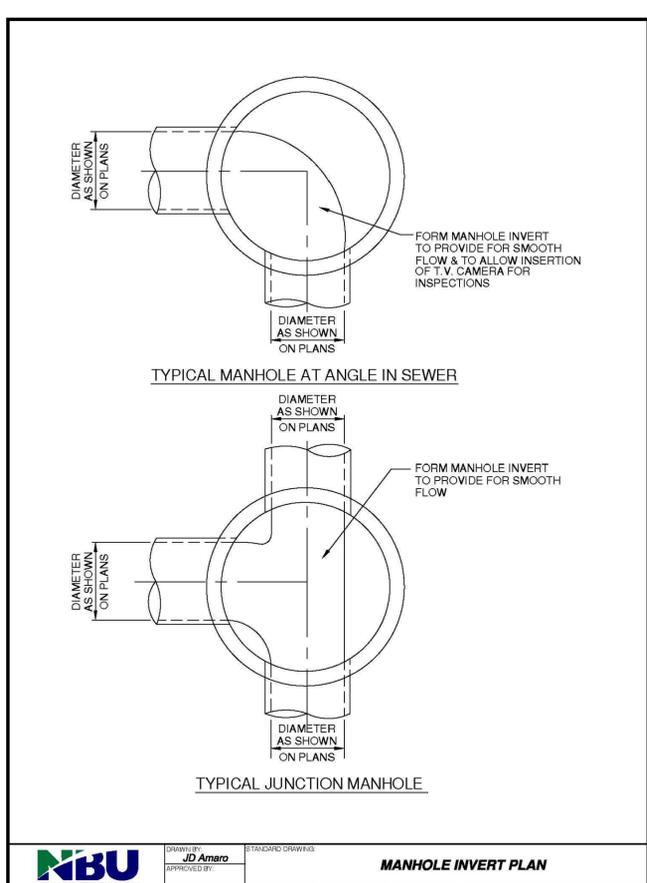
<b>NBU</b> NEW BRAUNFELS UTILITIES WATER SYSTEMS ENGINEERING	DRAWN BY A. Willard	STANDARD DRAWING	<b>SINGLE WASTEWATER SERVICE CONNECTION DETAIL</b>	
	APPROVED BY A. Willard	SCALE N.T.S.	SHEET 1 OF 2	DRAWING NO. 302

- NOTES:**
- UTILITY CONTRACTOR, DURING SUBDIVISION CONSTRUCTION, SHALL INSTALL WASTEWATER CONNECTION TO MAIN, 6" STUB WITH 6" SERVICE BRANCH WITH 2-WAY CLEANOUT, CONCRETE SUPPORT (MIN. 18"x18"x6"H), RISER FOR CLEAN OUT (CAPPED), UTILITY SHROUD, 7' EXTENSION, AND PLUG. ALL WASTEWATER PIPING SHALL HAVE ELASTOMERIC GASKET TYPE JOINTS AND SHALL SLOPE DOWNWARD TO MAIN 2%, 1/4" PER FOOT, MINIMUM TO 45' MAXIMUM. DEPTH OF SERVICE STUB AT PROPERTY LINE WILL BE SHOWN ON PLANS BY ENGINEER OR DESIGNATED REPRESENTATIVE IF GREATER THAN 4'; OTHERWISE, THE INSTALLED DEPTH WILL TYPICALLY BE 4' TO 6'. IF WASTEWATER SERVICE LINE TO MAIN REQUIRES DEFLECTION EXCEEDING 45', REFER TO DETAIL DRAWING 301. ALL INSTALLATIONS SHALL BE MADE IN ACCORDANCE WITH INFORMATION SHOWN ON APPLICABLE STANDARD DRAWINGS AND WILL BE INSPECTED BY NBU CONSTRUCTION INSPECTION PERSONNEL.
  - CUSTOMER SHALL REMOVE PLUG, INSTALL 4" WASTEWATER LINE [EXTEND 4" PIPE 6" MINIMUM INTO 6" PIPE AND JOINT WITH FLEXIBLE ADAPTOR]. IF WASTEWATER WILL NOT SATISFACTORILY FLOW BY GRAVITY TO SEWER MAIN ADJACENT TO PROPERTY, PUMP EQUIPMENT MUST BE PROVIDED BY THE CUSTOMER AS PART OF CUSTOMER'S WASTEWATER SYSTEM.
  - CUSTOMER IS RESPONSIBLE FOR PIPING SYSTEM UNTIL WASTEWATER IS CONNECTED. ANY MISSING OR DAMAGED PARTS SHALL BE REINSTALLED BY CUSTOMER WHO SHALL GUARANTEE, FOR A PERIOD OF TWO (2) YEARS FROM DATE OF FINAL ACCEPTANCE, THAT CONNECTIONS TO NBU SYSTEMS ARE FREE FROM DEFECTS IN WORKMANSHIP OR MATERIALS. CUSTOMER ALSO HAS THE RESPONSIBILITY TO ASSURE THAT 2-WAY CLEANOUTS REMAIN CLEAR OF SIDEWALKS AND OTHER OBSTRUCTIONS.
  - NBU ACTIVITY IS LIMITED TO INSPECTION OF CONNECTIONS TO NBU'S WASTEWATER SYSTEM. FOR MAINTENANCE PURPOSES, NBU'S RESPONSIBILITY ENDS AT THE CUSTOMER'S WASTEWATER CONNECTION TO THE 2-WAY CLEANOUT OR THE PROPERTY LINE, WHICHEVER IS CLOSER TO WASTEWATER MAIN.
  - PIPING IN STREET RIGHT-OF-WAY AND IN EASEMENT AREA SHALL BE BEDDED IN GRANULAR MATERIALS AS REQUIRED BY NBU STANDARD SPECIFICATION; MATERIALS SHALL BE AS SPECIFIED; BACKFILL ABOVE THE GRANULAR BEDDING. SERVICE LINES IN THESE AREAS SHALL HAVE A MINIMUM COVER BELOW FINAL STREET GRADE OF 42"; ANY EXCEPTION MUST BE SPECIFICALLY APPROVED BY THE ENGINEER.

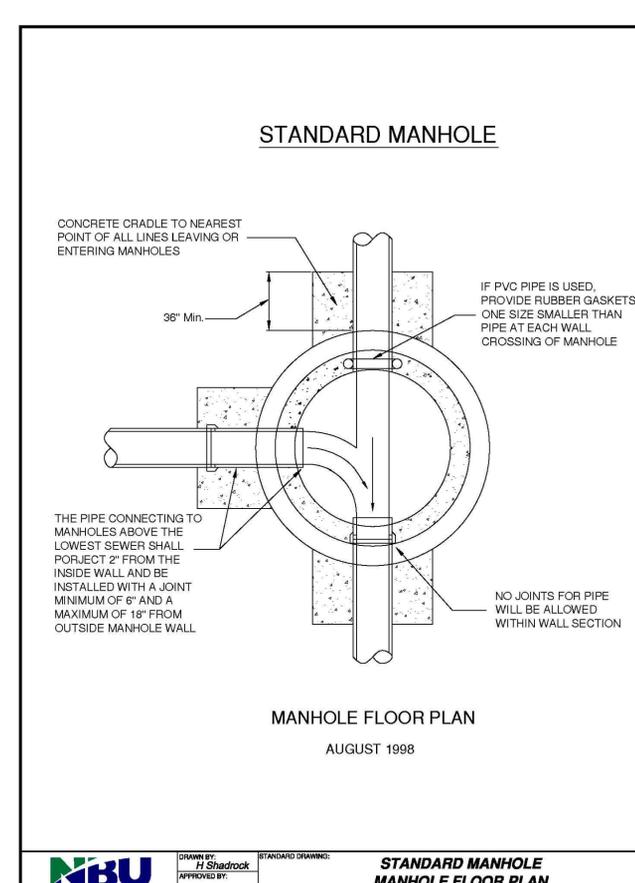
<b>NBU</b> NEW BRAUNFELS UTILITIES WATER SYSTEMS ENGINEERING	DRAWN BY A. Willard	STANDARD DRAWING	<b>SINGLE WASTEWATER SERVICE CONNECTION DETAIL</b>	
	APPROVED BY A. Willard	SCALE N.T.S.	SHEET 2 OF 2	DRAWING NO. 302



<b>NBU</b> NEW BRAUNFELS UTILITIES WATER SYSTEMS ENGINEERING	DRAWN BY A. Willard	STANDARD DRAWING	<b>NEW MANHOLE CONSTRUCTION AND MINOR MANHOLE ADJUSTMENT</b>	
	APPROVED BY A. Willard	SCALE N.T.S.	SHEET 1 OF 1	DRAWING NO. 322



<b>NBU</b> NEW BRAUNFELS UTILITIES WATER SYSTEMS ENGINEERING	DRAWN BY J.D. Amaro	STANDARD DRAWING	<b>MANHOLE INVERT PLAN</b>	
	APPROVED BY	SCALE N.T.S.	SHEET 1 OF 2	DRAWING NO. 320



<b>NBU</b> NEW BRAUNFELS UTILITIES WATER SYSTEMS ENGINEERING	DRAWN BY H. Shadrock	STANDARD DRAWING	<b>STANDARD MANHOLE MANHOLE FLOOR PLAN</b>	
	APPROVED BY	SCALE N.T.S.	SHEET 2 OF 2	DRAWING NO. 320



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10210 N. CENTRAL EXPRESSWAY, SUITE 300  
DALLAS, TX 75231

**OAK RUN VILLAGE APARTMENTS - PUBLIC INFRASTRUCTURE**

**SANITARY SEWER DETAILS I**

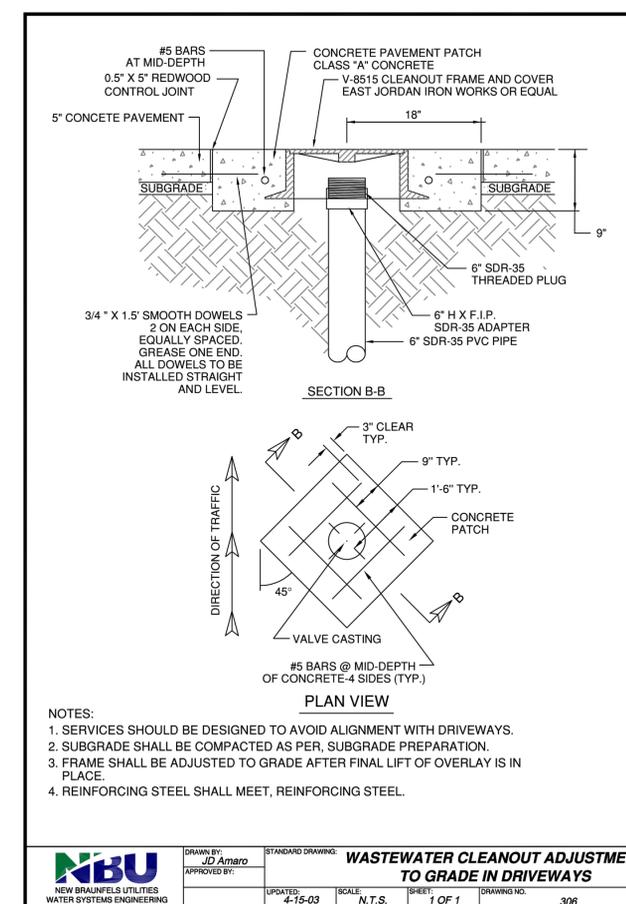
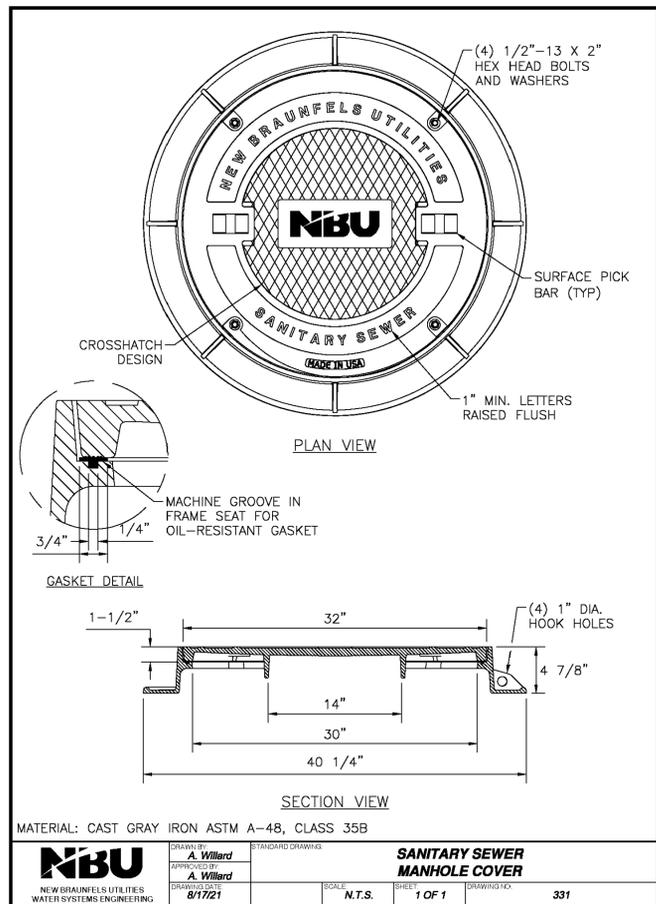
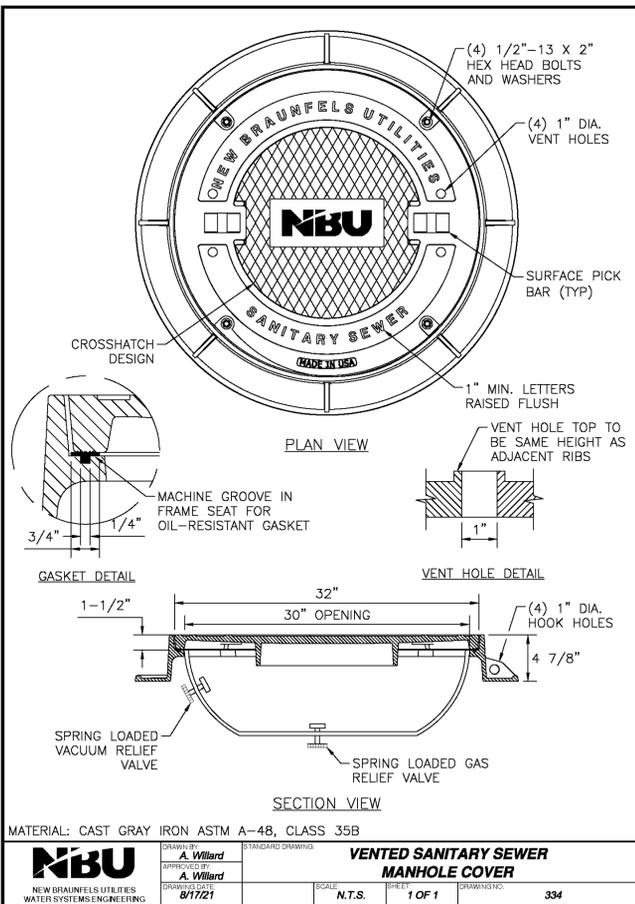
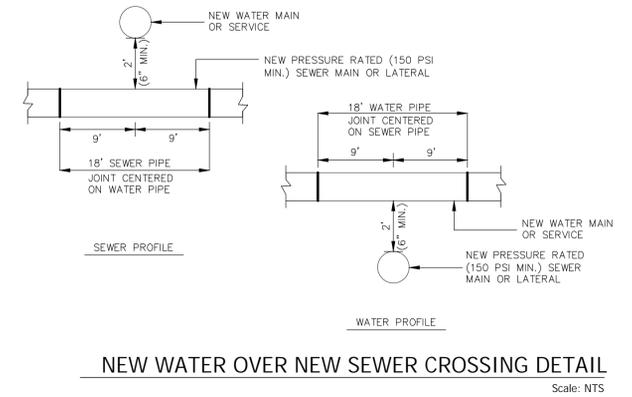
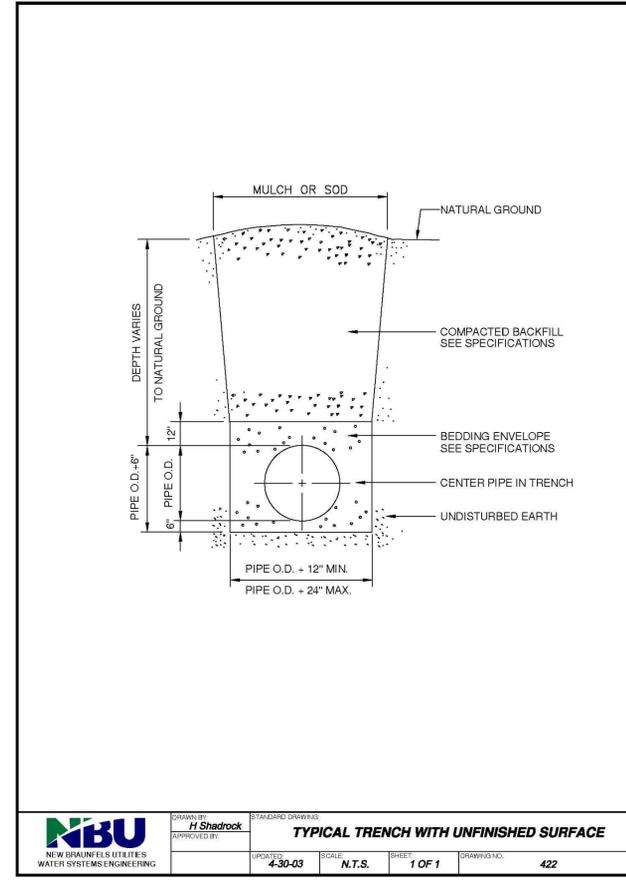
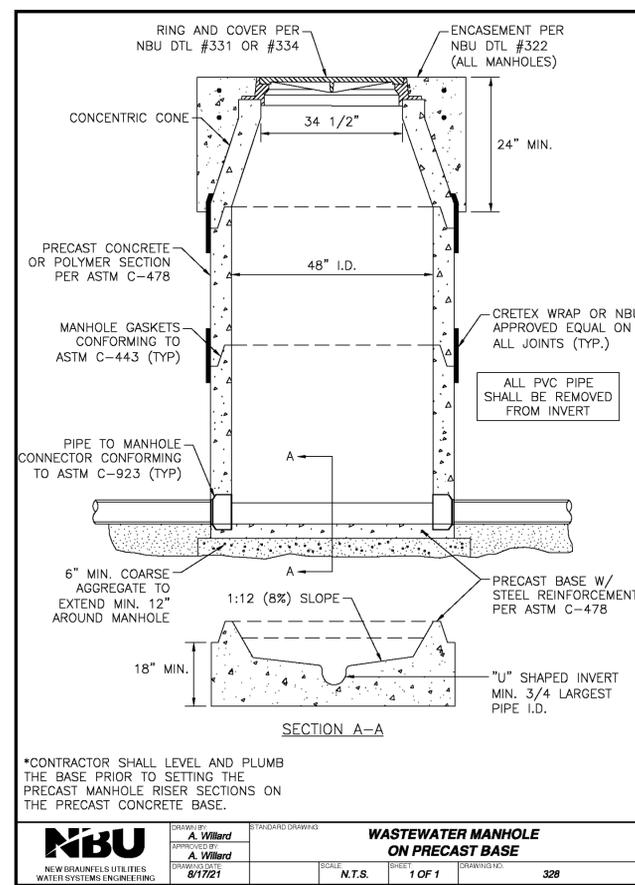
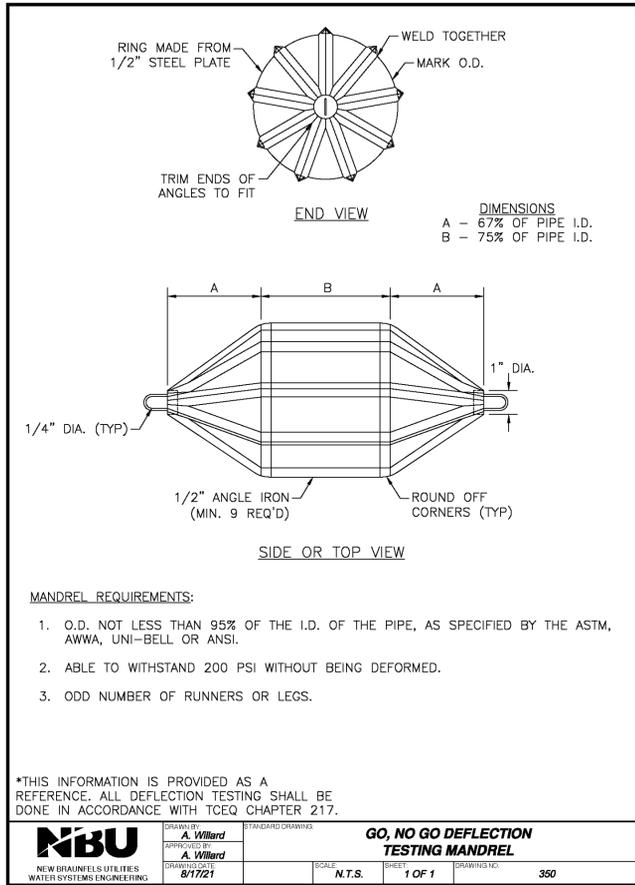
SHEET **27** OF **28**

NO	DATE	ISSUES AND REVISIONS



2021 W SH46, STE 105  
NEW BRAUNFELS, TX. 78132  
PH: 830-358-7127 ink-civil.com  
TBPE FIRM F-13351

Drawing Name: R:\Projects\KAR001\_Proc\_Hazr\_Development\Civil\Construction\Drawings\Public\SET28\_SANITARY\_SEWER\_DETAILS.rvt User: chadfraser Date: Apr 18, 2023 4:56pm



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10210 N. CENTRAL EXPRESSWAY, SUITE 300  
DALLAS, TX 75231

**OAK RUN VILLAGE APARTMENTS - PUBLIC INFRASTRUCTURE**

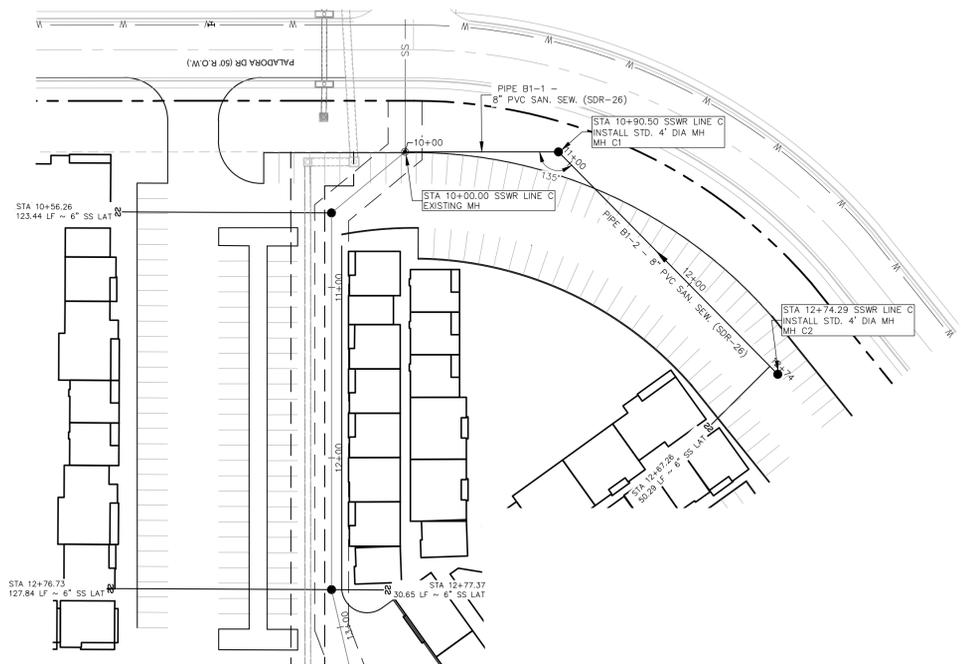
**SANITARY SEWER DETAILS II**

SHEET **28** OF **28**

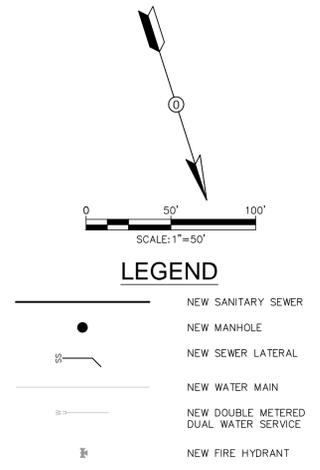
NO	DATE	ISSUES AND REVISIONS

2021 W SH46, STE 105  
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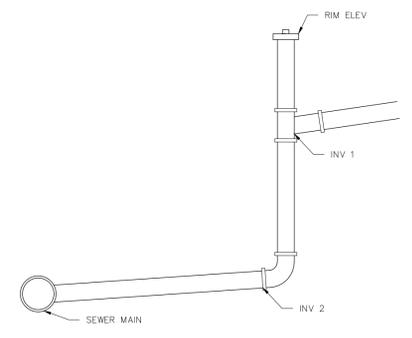
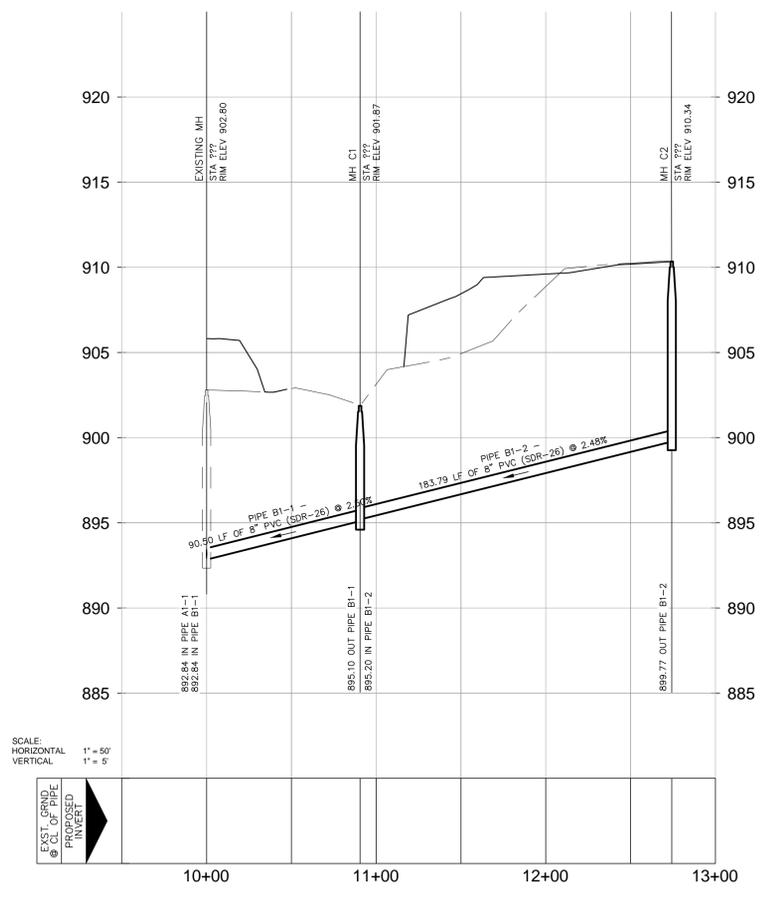


OAK RUN VILLAGE APARTMENTS	
ITEM	QTY.
SANITARY SEWER MAIN (8" PVC SDR-26)	275 LF.
6" SANITARY SEWER LATERAL	333 LF.
6" SANITARY SEWER CLEANOUT	3 EA.
STANDARD MANHOLE	2 EA.



Oak Run Village Phase 2 - Gravity Sewer									
Sanitary Sewer Line	Diameter (in.)	Length (ft)	Slope (%)	PDW Flow (gpd)	Velocity (ft/s)	Capacity %	PWW Flow (gpd)	Velocity (ft/s)	Capacity %
PIPE A1-1	8	56.26	2.35	252,840	4.21	31.2	258,840	4.23	31.6
PIPE A1-2	8	221.11	2.72	244,440	4.39	29.5	250,440	4.42	29.9
PIPE B1-1	8	90.50	2.50	33,600	2.38	11.4	39,600	2.5	12.3
PIPE B1-2	8	183.79	2.48	33,600	2.37	11.4	39,600	2.5	12.3

**SSWR LINE C**



- NOTE:**
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- |                                |              |
|--------------------------------|--------------|
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| Spectrum Cable                 | 830-625-3408 |
| Centerpoint Gas                | 830-643-6434 |
| Robert Sanders                 | 830-643-6903 |
| Damaged Line                   | 888-876-5786 |
| AT&T Telephone                 | 830-303-1333 |
| Erick White PM                 | 210-263-1706 |
| Scott McBrearty (Construction) | 210-658-4886 |
| Texas One Call                 | 830-545-6005 |

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**PROVIDENT REALTY ADVISORS**  
10120 N. CENTRAL EXPRESSWAY,  
SUITE 300, DALLAS, TX 75231

**OAK RUN VILLAGE APARTMENTS**  
(PHASE 1 & 2)

**SANITARY SEWER LINE C**

SHEET **1** OF **1**

NO	DATE	ISSUES AND REVISIONS



2021 W SH46, STE 105  
NEW BRAUNFELS, TX. 78132  
PH: 830-358-7127 ink-civil.com  
TBPE FIRM F-13351

# Temporary Stormwater Section

## Texas Commission on Environmental Quality

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

*To ensure that the application is administratively complete, confirm that all fields in the form are complete, verify that all requested information is provided, consistently reference the same site and contact person in all forms in the application, and ensure forms are signed by the appropriate party.*

*Note: Including all the information requested in the form and attachments contributes to more streamlined technical reviews.*

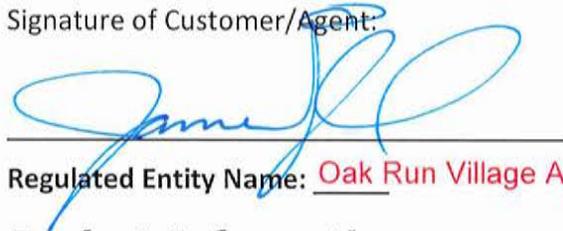
## Signature

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:

Print Name of Customer/Agent: James Ingalls, P.E.

Date: 4-18-23

Signature of Customer/Agent:



Regulated Entity Name: Oak Run Village Apartments

## Project Information

### 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:

The following fuels and/or hazardous substances will be stored on the site: \_\_\_\_\_

These fuels and/or hazardous substances will be stored in:

- Aboveground storage tanks with a cumulative storage capacity of less than 250 gallons will be stored on the site for less than one (1) year.

- Aboveground storage tanks with a cumulative storage capacity between 250 gallons and 499 gallons will be stored on the site for less than one (1) year.
- Aboveground storage tanks with a cumulative storage capacity of 500 gallons or more will be stored on the site. An Aboveground Storage Tank Facility Plan application must be submitted to the appropriate regional office of the TCEQ prior to moving the tanks onto the project.
- Fuels and hazardous substances will not be stored on the site.
- 2.  **Attachment A - Spill Response Actions.** A site specific description of the measures to be taken to contain any spill of hydrocarbons or hazardous substances is attached.
- 3.  Temporary aboveground storage tank systems of 250 gallons or more cumulative storage capacity must be located a minimum horizontal distance of 150 feet from any domestic, industrial, irrigation, or public water supply well, or other sensitive feature.
- 4.  **Attachment B - Potential Sources of Contamination.** A description of any activities or processes which may be a potential source of contamination affecting surface water quality is attached.

### ***Sequence of Construction***

- 5.  **Attachment C - Sequence of Major Activities.** A description of the sequence of major activities which will disturb soils for major portions of the site (grubbing, excavation, grading, utilities, and infrastructure installation) is attached.
  - For each activity described, an estimate (in acres) of the total area of the site to be disturbed by each activity is given.
  - For each activity described, include a description of appropriate temporary control measures and the general timing (or sequence) during the construction process that the measures will be implemented.
- 6.  Name the receiving water(s) at or near the site which will be disturbed or which will receive discharges from disturbed areas of the project: Comal/Guadalupe River

### ***Temporary Best Management Practices (TBMPs)***

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

- 7.  **Attachment D – Temporary Best Management Practices and Measures.** 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 is attached:

- 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.
  - 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.
  - A description of how BMPs and measures will prevent pollutants from entering surface streams, sensitive features, or the aquifer.
  - 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 attached. The request includes justification as to why no reasonable and practicable alternative exists for each feature.
  - There will be no temporary sealing of naturally-occurring sensitive features on the site.
9.  **Attachment F - Structural Practices.** A description of 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 is attached. Placement of structural practices in floodplains has been avoided.
10.  **Attachment G - Drainage Area Map.** A drainage area map supporting the following requirements is attached:
- For areas that will have more than 10 acres within a common drainage area disturbed at one time, a sediment basin will be provided.
  - For areas that will have more than 10 acres within a common drainage area disturbed at one time, a smaller sediment basin and/or sediment trap(s) will be used.
  - For areas that will have more than 10 acres within a common drainage area disturbed at one time, a sediment basin or other equivalent controls are not attainable, but other TBMPs and measures will be used in combination to protect down slope and side slope boundaries of the construction area.
  - There are no areas greater than 10 acres within a common drainage area that will be disturbed at one time. A smaller sediment basin and/or sediment trap(s) will be used in combination with other erosion and sediment controls within each disturbed drainage area.

- There are no areas greater than 10 acres within a common drainage area that will be disturbed at one time. Erosion and sediment controls other than sediment basins or sediment traps within each disturbed drainage area will be used.
11.  **Attachment H - Temporary Sediment Pond(s) Plans and Calculations.** Temporary sediment pond or basin construction plans and design calculations for a proposed temporary BMP or measure have 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 attached.
- N/A
12.  **Attachment I - Inspection and Maintenance for BMPs.** A plan for the inspection of each temporary BMP(s) and measure(s) and for their timely maintenance, repairs, and, if necessary, retrofit is attached. A description of the documentation procedures, recordkeeping practices, and inspection frequency are included in the plan and are specific to the site and/or BMP.
13.  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.  If sediment escapes the construction site, off-site accumulations of sediment must be removed at a frequency sufficient to minimize offsite impacts to water quality (e.g., fugitive sediment in street being washed into surface streams or sensitive features by the next rain).
15.  Sediment must be removed from sediment traps or sedimentation ponds not later than when design capacity has been reduced by 50%. A permanent stake will be provided that can indicate when the sediment occupies 50% of the basin volume.
16.  Litter, construction debris, and construction chemicals exposed to stormwater shall be prevented from becoming a pollutant source for stormwater discharges (e.g., screening outfalls, picked up daily).

### ***Soil Stabilization Practices***

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

17.  **Attachment J - Schedule of Interim and Permanent Soil Stabilization Practices.** A schedule of the interim and permanent soil stabilization practices for the site is attached.

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

### ***Administrative Information***

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

**ATTACHMENT “A”**  
**Spill Response Actions**

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 spills 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, and substances listed under 40 CFR parts 110,117, and 302, and sanitary and septic wastes should be contained and cleaned up immediately.
- (2) Store hazardous materials and wastes in covered containers and protect from vandalism.
- (3) Place a stockpile of spill cleanup materials where it will be readily accessible.
- (4) Train employees in spill prevention and cleanup.
- (5) Designate responsible individuals to oversee and enforce control measures.

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

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

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

(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 BMP's 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](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 runoff 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 runoff 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, port-o-lets, and the total suspended solids (TSS) due to the construction activities on-site. There are no other anticipated potential sources of contamination.

**ATTACHMENT “C”**  
**Sequence of Major Activities**

Stages of Construction:

1. Installation of temporary BMP's.
2. Minor site grading: This includes the removal of organic material and other debris within the proposed parking and building site.  
Approximate total disturbed area = 8.71-acres (Phase 1)  
Approximate total disturbed area = 8.82-acres (Phase 2)
3. Grading: Cutting and filling of the proposed site to prepare the site for parking and foundation construction.  
Approximate total disturbed area = 7.0-acres (Phase 1)  
Approximate total disturbed area = 7.0-acres (Phase 2)
4. Utility installation: All primary utility mains have already been installed and are available at the site. Sewer, water, gas, and electrical services will be installed at this time.
5. Finished grading: Final landscaping, Parking and building infrastructure are installed.  
Approximate total disturbed area = 6.98-acres (Phase 1)  
Approximate total disturbed area = 6.97-acres (Phase 2)

**ATTACHMENT “D”**  
**Temporary BMP's and Measures**

The following sequence will be followed for installing temporary BMP's:

1. Silt fence will be constructed on the downgradient side of proposed site.
2. A stabilized construction exit will be installed prior to any site work.

A. Silt Fence will be installed on the most downgradient side of the site and will reduce potential pollution from any stormwater that originates onsite or offsite. A stabilized construction exit will be constructed at the entrance of the site; this will reduce the amount of contaminants leaving the site.

B. Silt fence will be placed on the downgradient side of each proposed improvement to contain pollutants generated from onsite runoff. 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 and stabilized construction entrance to prevent pollution of water originating onsite and/or flowing offsite.

C. The proposed silt fences, and stabilized construction entrance constructed upgradient of the existing streams will prevent pollutants from entering them, as well as the aquifer. According to the Geologic Assessment, there is one sensitive feature that will be requested to be permanently sealed prior to site work.

**ATTACHMENT “E”**  
**Request to Temporarily Seal a Feature**

There will be no request to temporarily seal a feature.

**ATTACHMENT “F”**  
**Structural Practices**

Stabilized Construction Entrance/Exit, rock gabions, and silt fence will be used to protect disturbed soils and to prevent contamination from leaving the project site.

**ATTACHMENT “G”**  
**Drainage Area Map**

See Drainage Area Map at the end of this section.

**ATTACHMENT “H”**  
**Temporary Sediment Pond Plans and Calculations**

There will not be more than 10 acres of disturbed soil in one common drainage area that will occur at one time. Silt fence will be used for small drainage areas. No sediment ponds will be constructed due to the minimal amount of soil disturbance.

**ATTACHMENT “I”**  
**Inspection and Maintenance for BMP’s**

**Inspection and Maintenance Plan**

The contractor is required to inspect the control and fences at weekly intervals and after any rainfall events to ensure that they are functioning properly. The contractor is required to document any changes on the Site Plan, documentation must include person performing task, task performed, and date. The contractor must also document if proper inspection measures have been taken while making changes. The person(s) responsible for maintenance controls and fences shall immediately make any necessary repairs to damaged areas.

Temporary Construction Entrance/Exit: 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. All sediment spilled, dropped, washed or tracked onto public rights-of-way should be removed immediately by contractor. When necessary, wheels should be cleaned to remove sediment prior to entrance onto public right-of-way. 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. All sediment should be prevented from entering any storm drain, ditch or water course by using approved methods.

Silt Fence: Remove sediment when buildup reaches 6 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 provide equal protection, but will not obstruct vehicles. A triangular filter dike may be preferable to a silt fence at common vehicle access points. 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.

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.

Documentation: All scheduled inspection and maintenance measures made to the temporary BMPs must be documented clearly on the WPAP Site Plan showing inspection/maintenance measures performed, date, and person responsible for inspection and maintenance. 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 TCEQ and the Design Engineer. Documentation shall clearly show changes made, date, person responsible for the change, and the reason for the change.

**Owner's Information:**

Owner: PARCHAUS NEW BRAUNFELS LLC  
Contact: Basil Koutsogeorgas  
Address: 8350 N. Central Expressway, Ste. 1500  
Dallas, TX 75206

**Design Engineer:**

Company: INK Civil  
Contact: James Ingalls, P.E.  
Phone: (830) 358-7127  
Address: 2021 SH 46W, Ste. 105  
New Braunfels, Texas 78132

**Person or Firm Responsible for Erosion/Sedimentation Control Maintenance:**

Company: \_\_\_\_\_

Contact: \_\_\_\_\_

Phone: \_\_\_\_\_

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**

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 property line will also be hydro 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 Mulches: Wood fiber mulch can be applied alone or as a component of hydraulic matrices. Wood fiber applied alone is typically applied at the rate of 2,000 to 4,000 lb/acre. Wood fiber mulch is manufactured from wood or wood waste from lumber mills or from urban sources.

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. BFMs 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 BFMs should not be applied immediately before, during or immediately after rainfall if the soil is saturated. Depending on the product, BFMs typically require 12 to 24 hours to dry and become effective.

Seed Mixtures:

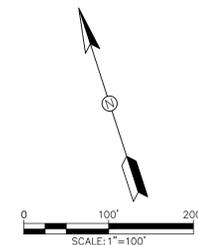
<b>Dates</b>	<b>Climate</b>	<b>Species</b>	<b>(lb/ac.)</b>
Sept. 1 to Nov. 30	Temporary Cool Season	Tall Fescue	4.0
		Oats	21.0
		Wheats	30.0
		<b>Total</b>	<b>55.0</b>
Sept. 1 to Nov. 30	Cool Season Legume	Hairy Vetch	8.0
May 1 to Aug. 31	Temporary Warm Season	Foxtail Millet	30.0

Fertilizer: Fertilizer should be applied at the rate of 40 pounds of nitrogen and 40 pounds of phosphorus per acre, which is equivalent to about 1.0 pounds of nitrogen and phosphorus per 1000 square feet.

**Installation:**

- (1) 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.
- (2) To be effective, hydraulic matrices require 24 hours to dry before rainfall occurs.
- (3) Avoid mulch over spray onto roads, sidewalks, drainage channels, existing vegetation, etc.

Oak Run Village Apt Ultimate Development - Existing Hydrology SCS								
Point	Area (ac)	CN	T <sub>c</sub> (min)	Q <sub>2</sub> (cfs)	Q <sub>10</sub> (cfs)	Q <sub>25</sub> (cfs)	Q <sub>50</sub> (cfs)	Q <sub>100</sub> (cfs)
EX-A	30.95	80.7	24	48.02	101.73	143.46	180.49	222.54



**LEGEND**

- LIMITS OF DRAINAGE AREA
- TC TIME OF CONCENTRATION
- 900- EXISTING CONTOURS
- FLOW ARROWS
- A  
9.0 DRAINAGE BASIN LABEL  
BASIN AREA (AC)
- A1  
2.0 SUB-DRAINAGE AREA LABEL  
SUB-DRAINAGE AREA (AC)
- A1 INLET LABEL
- A1 ANALYSIS POINT LABEL



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DALLAS, TX 75231

**OAK RUN VILLAGE APARTMENTS -  
PUBLIC INFRASTRUCTURE**

**EXISTING DRAINAGE  
AREA MAP**

SHEET  
**6** OF **28**

NO	DATE	ISSUES AND REVISIONS



2021 W SH46, STE 105  
NEW BRAUNFELS, TX. 78132  
PH: 830-358-7127 ink-civil.com  
TBPE FIRM F-13351

Drawing Name: R:\Projects\KARCOO1\_Proc\_Hazr\_Development\Con\Construction\Drawings\Public\SETV\EXISTING DRAINAGE AREA MAP.dwg User: Britton\jballant Apr 11, 2023 12:09pm

CONTRACTOR SHALL NOTIFY THE FOLLOWING UTILITY COMPANIES 48 HOURS PRIOR TO EXCAVATION:

New Braunfels Utilities	830-629-8400
Spectrum Cable	830-625-3408
Centerpoint Gas	830-643-6434
Robert Sanders	830-643-6903
Damaged Line	868-876-5786
AT&T Telephone	830-303-1333
Erick White PM	210-283-1706
Scott McBrearty (Construction)	210-658-4066
Texas One Call	830-545-6005

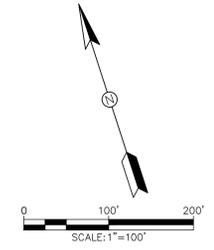
**C.P.E. LOCATOR**  
CALL CENTER POINT ENERGY LOCATOR AT 1-800-545-6005, 48HRS BEFORE BEGINNING ANY EXCAVATION. DUE TO FEDERAL REGULATIONS TITLE 49, PART 192.181, CENTER POINT ENERGY MUST MAINTAIN ACCESS TO GAS VALVES AT ALL TIMES. THE CONTRACTOR MUST PROTECT AND WORK AROUND ANY GAS VALVES THAT ARE IN THE PROJECT AREA.

**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 THE TELEPHONE COMPANY CABLE LOCATOR 48HRS PRIOR TO EXCAVATION AT 1-800-545-6005. CONTRACTOR HAS THE RESPONSIBILITY TO PROTECT AND SUPPORT TELEPHONE COMPANY 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 SHALL IMPLEMENT A TRENCH SAFETY PROGRAM IN ACCORDANCE WITH OSHA STANDARDS GOVERNING THE PRESENCE AND ACTIVITIES OF INDIVIDUALS WORKING IN AND AROUND TRENCH EXCAVATIONS.

THE LOCATION OF ALL EXISTING UNDERGROUND UTILITIES ARE SHOWN IN AN APPROXIMATE LOCATIONS ONLY. THE CONTRACTOR SHALL DETERMINE THE EXACT LOCATION OF ALL EXISTING UTILITIES BEFORE COMMENCING WORK. THE CONTRACTOR WILL AGREE TO BE FULLY RESPONSIBLE FOR ANY AND ALL DAMAGES WHICH MIGHT BE INCURRED BY THEIR FAILURE TO EXACTLY LOCATE AND PRESERVE ANY AND ALL UNDERGROUND UTILITIES, STRUCTURES OR FACILITIES. CONTRACTOR SHALL NOTIFY ENGINEER OF ANY DISCREPANCIES 24-HOURS PRIOR TO COMMENCING CONSTRUCTION.

Oak Run Village Apt Ultimate Development - Proposed Hydrology SCS								
Point	Area (ac)	CN	T <sub>c</sub> (min)	Q <sub>2</sub> (cfs)	Q <sub>10</sub> (cfs)	Q <sub>25</sub> (cfs)	Q <sub>50</sub> (cfs)	Q <sub>100</sub> (cfs)
A1	30.16	90.4	17	73.01	133.21	178.47	218.20	263.30
DET POND				43.67	89.17	127.97	161.66	200.74
A2	4.91	81.2	12	10.53	22.04	30.91	38.74	47.61
Ult				47.64	97.84	140.30	177.97	220.79



**LEGEND**

- LIMITS OF DRAINAGE AREA
- TIME OF CONCENTRATION
- EXISTING CONTOURS
- PROPOSED CONTOURS
- FLOW ARROWS
- DRAINAGE BASIN LABEL  
BASIN AREA (AC)
- SUB-DRAINAGE AREA LABEL  
SUB-DRAINAGE AREA (AC)
- INLET LABEL
- ANALYSIS POINT LABEL



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**OAK RUN VILLAGE APARTMENTS -  
PUBLIC INFRASTRUCTURE**

**PROPOSED DRAINAGE  
SCS AREA MAP**

SHEET **7** OF **28**

NO	DATE	ISSUES AND REVISIONS



2021 W SH46, STE 105  
NEW BRAUNFELS, TX. 78132  
PH: 830-358-7127 ink-civil.com  
TBPE FIRM F-13351

CONTRACTOR SHALL NOTIFY THE FOLLOWING UTILITY COMPANIES 48 HOURS PRIOR TO EXCAVATION:

New Braunfels Utilities	830-629-8400
Spectrum Cable	830-625-3408
Centerpoint Gas	830-643-6434
Robert Sanders	830-643-6903
Damaged Line	868-876-5786
AT&T Telephone	830-303-1333
Erick White PM	210-283-1706
Scott McBrearty (Construction)	210-658-4066
Texas One Call	830-545-6005

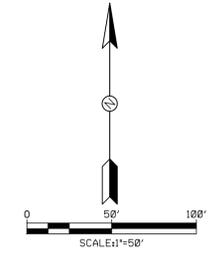
**C.P.E. LOCATOR**  
CALL CENTER POINT ENERGY LOCATOR AT 1-800-545-6005, 48HRS BEFORE BEGINNING ANY EXCAVATION. DUE TO FEDERAL REGULATIONS TITLE 49, PART 192.181, CENTER POINT ENERGY MUST MAINTAIN ACCESS TO GAS VALVES AT ALL TIMES. THE CONTRACTOR MUST PROTECT AND WORK AROUND ANY GAS VALVES THAT ARE IN THE PROJECT AREA.

**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 THE TELEPHONE COMPANY CABLE LOCATOR 48HRS PRIOR TO EXCAVATION AT 1-800-545-6005. CONTRACTOR HAS THE RESPONSIBILITY TO PROTECT AND SUPPORT TELEPHONE COMPANY 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 SHALL IMPLEMENT A TRENCH SAFETY PROGRAM IN ACCORDANCE WITH OSHA STANDARDS GOVERNING THE PRESENCE AND ACTIVITIES OF INDIVIDUALS WORKING IN AND AROUND TRENCH EXCAVATIONS.

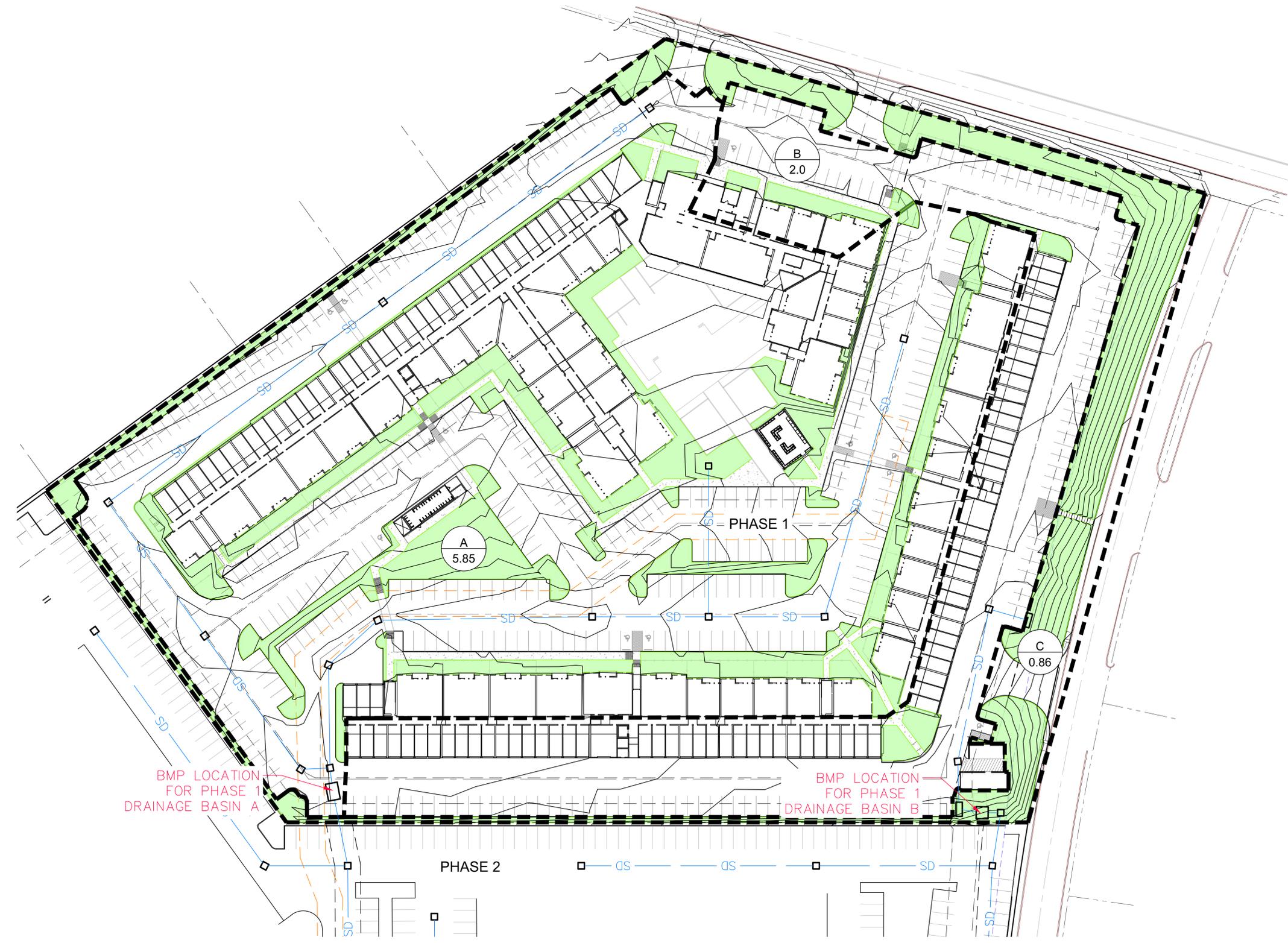
THE LOCATION OF ALL EXISTING UNDERGROUND UTILITIES ARE SHOWN IN AN APPROXIMATE LOCATIONS ONLY. THE CONTRACTOR SHALL DETERMINE THE EXACT LOCATION OF ALL EXISTING UTILITIES BEFORE COMMENCING WORK. THE CONTRACTOR WILL AGREE TO BE FULLY RESPONSIBLE FOR ANY AND ALL DAMAGES WHICH MIGHT BE INCURRED BY THEIR FAILURE TO EXACTLY LOCATE AND PRESERVE ANY AND ALL UNDERGROUND UTILITIES, STRUCTURES OR FACILITIES. CONTRACTOR SHALL NOTIFY ENGINEER OF ANY DISCREPANCIES 24-HOURS PRIOR TO COMMENCING CONSTRUCTION.

Drawing Name: R:\Projects\KARCOO1\_Proc\_Hazr\_Development\Con\Construction\Drawings\Public\SET7\_PROPOSED DRAINAGE SCS AREA MAP.dwg User: Britton\jblairlert Apr 11, 2023 12:10pm



**LEGEND**

- PROPOSED DRAINAGE AREA BOUNDARY
- SD PROPOSED STORM DRAIN
- A DRAINAGE BASIN LABEL
- 9.0 BASIN AREA (AC)



PROVIDENT REALTY ADVISORS  
10120 N. CENTRAL EXPRESSWAY,  
SUITE 300, DALLAS, TX 75231

OAK RUN VILLAGE APARTMENTS  
(PHASE 1)

WPAP DRAINAGE MAP

SHEET **1** OF **1**

NO	DATE	ISSUES AND REVISIONS



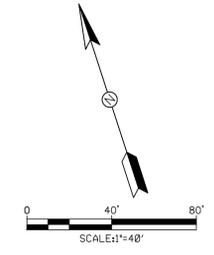
2021 W SH46, STE 105  
NEW BRAUNFELS, TX. 78132  
PH: 830-358-7127 ink-civil.com  
TBPE FIRM F-13351

Oak Run Village Apartments Phase 1 - TSS Calculations 11/14/2022

TCEQ Load Removal Calculations Summary					
Drainage Basin/Outfall Area	Total Drainage Basin Area (Ac)	Predevelopment Impervious Cover (Ac)	Post Development Impervious Cover (Ac)	Required TSS Removal (lbs)	Design TSS Removal (lbs)
A	5.85	0	4.96	4452	4457
B	2.00	0	1.92	1723	1768
C	0.86	0	0.10	90	-
<b>Total</b>	<b>8.71</b>	<b>0</b>	<b>6.98</b>	<b>6265</b>	<b>6265</b>

Summary:  
There will be two storm drain lines consisting of Drainage Area A & B. Area C TSS load will be accounted for as "overtreatment" in Drainage Basin A & B

Drawing Name: R:\Projects\WAC001\_Proc\_Haz\_Development\Reports\WPAP\_CAD\_Dwg\DWG - Phase 1 - WPAP Drainage Map.dwg User: chad@esentech.com Feb 28, 2023 - 10:59am



**LEGEND**

- PROPOSED DRAINAGE AREA BOUNDARY
- PROPOSED STORM DRAIN
- A DRAINAGE BASIN LABEL
- 9.0 BASIN AREA (AC)



PROVIDENT REALTY ADVISORS  
10120 N. CENTRAL EXPRESSWAY,  
SUITE 300, DALLAS, TX 75231

OAK RUN VILLAGE APARTMENTS  
(PHASE 2)

WPAP DRAINAGE MAP

SHEET **1** OF **1**

NO	DATE	ISSUES AND REVISIONS



2021 W SH46, STE 105  
NEW BRAUNFELS, TX. 78132  
PH: 830-358-7127 ink-civil.com  
TBPE FIRM F-13351

Oak Run Village Apartments Phase 2 - TSS Calculations 12/27/2022

Drainage Basin/Outfall Area	Total Drainage Basin Area (Ac)	TCEQ Load Removal Calculations Summary		Required TSS Removal (lbs)	Design TSS Removal (lbs)
		Predevelopment Impervious Cover (Ac)	Post Development Impervious Cover (Ac)		
A	4.68	0	4.21	3779	3629
B	3.00	0	2.75	2466	2472
C	1.14	0	0.06	54	54
<b>Total</b>	<b>8.82</b>	<b>0</b>	<b>7.02</b>	<b>6301</b>	<b>6301</b>

Summary:  
There will be two storm drain lines consisting of Drainage Area A & B. Area C TSS load will be accounted for as "overtreatment" in both DA A & B

Drawing Name: R:\Projects\VA0001\_Proc\_Haz\_Development\Engineering Reports\WPAP\_CAD\_Dwg\DWG - Phase 2 - WPAP Drainage Map.dwg User: chad@espenhahn.com Mar 01, 2023 - 3:21pm

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

I \_\_\_\_\_ Basil Koutsogeorgas \_\_\_\_\_  
Print Name  
\_\_\_\_\_ Managing Member \_\_\_\_\_  
Title - Owner/President/Other  
of \_\_\_\_\_ PARCHAUS NEW BRAUNFELS LLC LP \_\_\_\_\_  
Corporation/Partnership/Entity Name  
have authorized \_\_\_\_\_ James Ingalls, P.E. \_\_\_\_\_  
Print Name of Agent/Engineer  
of \_\_\_\_\_ INK Civil \_\_\_\_\_  
Print Name of Firm

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

I also understand that:

1. The applicant is responsible for compliance with 30 Texas Administrative Code Chapter 213 and any condition of the TCEQ's approval letter. The TCEQ is authorized to assess administrative penalties of up to \$10,000 per day per violation.
2. For those submitting an application who are not the property owner, but who have the right to control and possess the property, additional authorization is required from the owner.
3. Application fees are due and payable at the time the application is submitted. The application fee must be sent to the TCEQ cashier or to the appropriate regional office. The application will not be considered until the correct fee is received by the commission.
4. A notarized copy of the Agent Authorization Form must be provided for the person preparing the application, and this form must accompany the completed application.
5. No person shall commence any regulated activity on the Edwards Aquifer Recharge Zone, Contributing Zone or Transition Zone until the appropriate application for the activity has been filed with and approved by the Executive Director.

SIGNATURE PAGE:

[Signature]  
Applicant's Signature

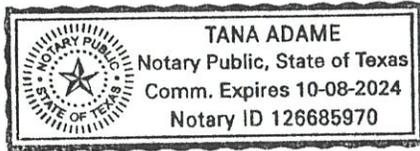
1/5/2023  
Date

THE STATE OF TEXAS §

County of DALLAS §

BEFORE ME, the undersigned authority, on this day personally appeared BASIL KOUTSOGEORGAS 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 5 day of JANUARY, 2023.



Tana Adame  
NOTARY PUBLIC

TANA ADAME  
Typed or Printed Name of Notary

MY COMMISSION EXPIRES: 10-8-24

# Application Fee Form

**Texas Commission on Environmental Quality**

Name of Proposed Regulated Entity: Oak Run Village Apartments

Regulated Entity Location: 2850 Loop 337 New Braunfels, TX 78130

Name of Customer: PARCHAUS NEW BRAUNFELS LP

Contact Person: Basil Koutsogeorgas Phone: 972-385-4130

Customer Reference Number (if issued):CN \_\_\_\_\_

Regulated Entity Reference Number (if issued):RN \_\_\_\_\_

**Austin Regional Office (3373)**

- Hays  Travis  Williamson

**San Antonio Regional Office (3362)**

- Bexar  Medina  Uvalde  
 Comal  Kinney

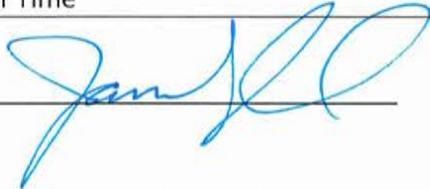
Application fees must be paid by check, certified check, or money order, payable to the **Texas Commission on Environmental Quality**. Your canceled check will serve as your receipt. **This form must be submitted with your fee payment.** This payment is being submitted to:

- Austin Regional Office  San Antonio Regional Office **Online ePay**  
 Mailed to: TCEQ - Cashier  Overnight Delivery to: TCEQ - Cashier  
 Revenues Section 12100 Park 35 Circle  
 Mail Code 214 Building A, 3rd Floor  
 P.O. Box 13088 Austin, TX 78753  
 Austin, TX 78711-3088 (512)239-0357

**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	1311 L.F.	\$ 655.50
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: 

Date: 4-18-23

# Application Fee Schedule

## Texas Commission on Environmental Quality

Edwards Aquifer Protection Program 30 TAC Chapter 213 (effective 05/01/2008)

### ***Water Pollution Abatement Plans and Modifications***

#### ***Contributing Zone Plans and Modifications***

<b><i>Project</i></b>	<b><i>Project Area in Acres</i></b>	<b><i>Fee</i></b>
One Single Family Residential Dwelling	< 5	\$650
Multiple Single Family Residential and Parks	< 5	\$1,500
	5 < 10	\$3,000
	10 < 40	\$4,000
	40 < 100	\$6,500
	100 < 500	\$8,000
	≥ 500	\$10,000
Non-residential (Commercial, industrial, institutional, multi-family residential, schools, and other sites where regulated activities will occur)	< 1	\$3,000
	1 < 5	\$4,000
	5 < 10	\$5,000
	10 < 40	\$6,500
	40 < 100	\$8,000
	≥ 100	\$10,000

#### ***Organized Sewage Collection Systems and Modifications***

<b><i>Project</i></b>	<b><i>Cost per Linear Foot</i></b>	<b><i>Minimum Fee- Maximum Fee</i></b>
Sewage Collection Systems	\$0.50	\$650 - \$6,500

#### ***Underground and Aboveground Storage Tank System Facility Plans and Modifications***

<b><i>Project</i></b>	<b><i>Cost per Tank or Piping System</i></b>	<b><i>Minimum Fee- Maximum Fee</i></b>
Underground and Aboveground Storage Tank Facility	\$650	\$650 - \$6,500

#### ***Exception Requests***

<b><i>Project</i></b>	<b><i>Fee</i></b>
Exception Request	\$500

#### ***Extension of Time Requests***

<b><i>Project</i></b>	<b><i>Fee</i></b>
Extension of Time Request	\$150



TCEQ Use Only

# TCEQ Core Data Form

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

## SECTION I: General Information

<b>1. Reason for Submission</b> (If other is checked please describe in space provided.)		
<input checked="" type="checkbox"/> New Permit, Registration or Authorization (Core Data Form should be submitted with the program application.)		
<input type="checkbox"/> Renewal (Core Data Form should be submitted with the renewal form)	<input type="checkbox"/> Other	
<b>2. Customer Reference Number (if issued)</b>	<a href="#">Follow this link to search for CN or RN numbers in Central Registry**</a>	<b>3. Regulated Entity Reference Number (if issued)</b>
CN 606112530		RN 111686432

## SECTION II: Customer Information

<b>4. General Customer Information</b>		<b>5. Effective Date for Customer Information Updates</b> (mm/dd/yyyy)	
<input type="checkbox"/> New Customer		<input type="checkbox"/> Update to Customer Information	
<input type="checkbox"/> Change in Legal Name (Verifiable with the Texas Secretary of State or Texas Comptroller of Public Accounts)		<input type="checkbox"/> Change in Regulated Entity Ownership	
<b>The Customer Name submitted here may be updated automatically based on what is current and active with the Texas Secretary of State (SOS) or Texas Comptroller of Public Accounts (CPA).</b>			
<b>6. Customer Legal Name</b> (If an individual, print last name first: eg: Doe, John)		If new Customer, enter previous Customer below:	
PARCHAUS NEW BRAUNFELS LP			
<b>7. TX SOS/CPA Filing Number</b>	<b>8. TX State Tax ID</b> (11 digits)	<b>9. Federal Tax ID</b> (9 digits)	<b>10. DUNS Number</b> (if applicable)
0804319773	32081954235		
<b>11. Type of Customer:</b>	<input type="checkbox"/> Corporation	<input type="checkbox"/> Individual	Partnership: <input type="checkbox"/> General <input checked="" type="checkbox"/> Limited
Government: <input type="checkbox"/> City <input type="checkbox"/> County <input type="checkbox"/> Federal <input type="checkbox"/> State <input type="checkbox"/> Other	<input type="checkbox"/> Sole Proprietorship	<input type="checkbox"/> Other:	
<b>12. Number of Employees</b>		<b>13. Independently Owned and Operated?</b>	
<input type="checkbox"/> 0-20 <input checked="" type="checkbox"/> 21-100 <input type="checkbox"/> 101-250 <input type="checkbox"/> 251-500 <input type="checkbox"/> 501 and higher		<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No	
<b>14. Customer Role</b> (Proposed or Actual) – as it relates to the Regulated Entity listed on this form. Please check one of the following			
<input type="checkbox"/> Owner		<input type="checkbox"/> Operator	
<input type="checkbox"/> Occupational Licensee		<input checked="" type="checkbox"/> Owner & Operator	
<input type="checkbox"/> Responsible Party		<input type="checkbox"/> Voluntary Cleanup Applicant	
<input type="checkbox"/> Other:			
<b>15. Mailing Address:</b>	8350 N. CENTRAL EXPRESSWAY SUITE 1500		
	City	DALLAS	State TX ZIP 75206 ZIP + 4
<b>16. Country Mailing Information</b> (if outside USA)		<b>17. E-Mail Address</b> (if applicable)	
		BasilK@providentrealty.net	
<b>18. Telephone Number</b>	<b>19. Extension or Code</b>	<b>20. Fax Number</b> (if applicable)	
( 972 ) 385-4130		( ) -	

## SECTION III: Regulated Entity Information

<b>21. General Regulated Entity Information</b> (If 'New Regulated Entity' is selected below this form should be accompanied by a permit application)	
<input type="checkbox"/> New Regulated Entity <input type="checkbox"/> Update to Regulated Entity Name <input checked="" type="checkbox"/> Update to Regulated Entity Information	
<b>The Regulated Entity Name submitted may be updated in order to meet TCEQ Agency Data Standards (removal of organizational endings such as Inc, LP, or LLC).</b>	
<b>22. Regulated Entity Name</b> (Enter name of the site where the regulated action is taking place.)	
Oak Run Village Apartments	

23. Street Address of the Regulated Entity: <i>(No PO Boxes)</i>	2850 Loop 337						
	City	N.Braunfels	State	TX	ZIP	78130	ZIP + 4
24. County							

Enter Physical Location Description if no street address is provided.

25. Description to Physical Location:	APPROX 0.15 MILES NORTHWEST OF LOOP 337 AND OAK RUN PKWY INTERSECTION						
26. Nearest City	New Braunfels			State	TX	Nearest ZIP Code	78130
27. Latitude (N) In Decimal:	29.710173		28. Longitude (W) In Decimal:	-98.163815			
Degrees	Minutes	Seconds	Degrees	Minutes	Seconds		
29	42	36.6228	-98	9	49.734		
29. Primary SIC Code (4 digits)	30. Secondary SIC Code (4 digits)	31. Primary NAICS Code (5 or 6 digits)	32. Secondary NAICS Code (5 or 6 digits)				
6552	6719	531210	531120				
33. What is the Primary Business of this entity? <i>(Do not repeat the SIC or NAICS description.)</i>							
Real estate investors; Multi-Family residential development							
34. Mailing Address:	8350 N. CENTRAL EXPRESSWAY SUITE 1500						
	City	Dallas	State	TX	ZIP	75206	ZIP + 4
35. E-Mail Address:	BasilK@providentrealty.net						
36. Telephone Number	37. Extension or Code		38. Fax Number <i>(if applicable)</i>				
( 972 ) 385-4130			( ) -				

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. See the Core Data Form instructions for additional guidance.

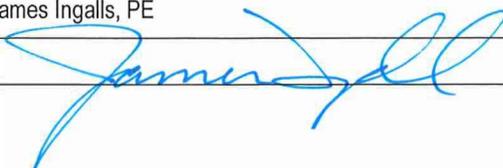
<input type="checkbox"/> Dam Safety	<input type="checkbox"/> Districts	<input checked="" type="checkbox"/> Edwards Aquifer	<input type="checkbox"/> Emissions Inventory Air	<input type="checkbox"/> Industrial Hazardous Waste
<input type="checkbox"/> Municipal Solid Waste	<input type="checkbox"/> New Source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

### SECTION IV: Preparer Information

40. Name:	Chad Friesenhahn	41. Title:	EIT
42. Telephone Number	43. Ext./Code	44. Fax Number	45. E-Mail Address
( 830 ) 358-7127		( ) -	chadfriesenhahn@ink-civil.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 6 and/or as required for the updates to the ID numbers identified in field 39.

Company:	INK Civil	Job Title:	Principal
Name <i>(In Print)</i> :	James Ingalls, PE	Phone:	( 830 ) 358- 7127
Signature:		Date:	2-21-23