

***SANITARY SEWER GRAVITY MAIN AND WATERLINE
TO SERVE
SARATOGA RIDGE SUBDIVISION***

DESIGN MEMORANDUM

November 2023

PRELIMINARY
NOT FOR CONSTRUCTION
FOR INFORMATION
PURPOSES ONLY
D. SCOTT JONES, P.E. 81986
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PREPARED BY:

URBAN
ENGINEERING

DCCM

2725 Swantner St. • Corpus Christi, Texas 78404
Phone: (361) 854-3101 • FAX (361) 854-6001

Job No. 43549.C2.00

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Executive Summary

The following is the Executive Summary for the plan submission for the Saratoga Ridge Subdivision Sanitary Sewer and Water Improvements. This project involves the installation of gravity sanitary sewer and manholes and water line.

There is a proposed single family residential development located approximately 3200 feet southeast of Old Brownsville Rd (See Site Location). Currently there is no gravity sanitary sewer in this area. There is a 6-inch diameter sanitary sewer force main adjacent to the proposed development. The 6-inch force main runs along Saratoga Boulevard and eventually discharges into the Greenwood Wastewater Treatment Plan. There is an existing wastewater manhole on the south side of Saratoga Boulevard at the intersection at Calle Cuernavaca and Saratoga Boulevard. The existing line is sized per the current wastewater master plan. Our intention is to continue the line per the master plan west down Saratoga Blvd to the proposed development.

The proposed development includes approximately 257 acres of single-family residential homes with approximately 965 lots to be built in phases. The estimated wastewater demand is calculated to be 1,158,000 GPD. The estimated water demand is calculated to be 833,760 GPD. See SECTION V for the design flow calculations.

The design of the gravity line will follow criteria established by TCEQ in TAC 30 Chapter 217. Material for the gravity main line will be PVC (Green, C-900, DR 26). Pipe embedment and trench backfill will conform to applicable City of Corpus Christi standards.

Future development in this area will dictate when the lift station needs to be upgraded to be able to handle the future flow. Please see Exhibit B for the overall proposed services areas (Tract 1 is the proposed development-Saratoga Ridge Subdivision) and Exhibit C for the adopted City of Corpus Christi Wastewater Collection Master Plan, Greenwood WWTP Service Area, Area 5)

The proposed gravity sanitary sewer will start at an upstream point approximately 3,200 feet southeast of Old Brownsville Road and will extend from that point east where it will tie into an existing manhole. The proposed line will be installed along the front of the property. The proposed project will include approximately 2,970 linear feet of 18-inch diameter at 0.12% slope and 4,492 linear feet of 24-inch diameter at 0.08% slope gravity sanitary sewer and 5 feet diameter manholes at required depths to be built at master plan depths (Adopted City of Corpus Christi Wastewater Collection Master Plan, Greenwood WWTP Service Area, Area 5). The proposed gravity sanitary sewer will start with an upstream point fronting the property and will extend from that point east where it will tie into an existing manhole.

Along with the sanitary sewer line, a water line needs to be installed to serve the proposed development. The proposed project would include approximately 4,150 linear feet of 12-inch waterline. It shall tie into the existing 12-inch water line with a tap and saddle along County Road 37 and tie into an existing blowoff valve on the existing 42" CSCP waterline along County Road 35. It will cross under the existing pavement by boring enclosed in a 24-inch steel casing and tie into the existing blowoff valve on the 42-inch CSCP waterline located in County Road 35. The water line design will follow criteria established by City of Corpus Christi standards. Material for the water line will be PVC (Class 150 and DR 18) and the pipe shall meet the requirements of AWWA-C900. Pipe embedment and trench backfill will conform to applicable City of Corpus Christi standards. See Exhibit E for overall Water & Sanitary Sewer Layout.

SECTION I - Introduction

A. Purpose

The purpose of this project is to construct sanitary sewer and water infrastructure improvements to serve a proposed development. The proposed sanitary sewer infrastructure includes gravity sanitary sewer line.

There is a proposed development for a tract of land, project name Saratoga Ridge Subdivision along Saratoga Boulevard. Saratoga Boulevard adjacent to the proposed development is a TXDOT right of way 120 feet wide. Currently there are no gravity sanitary sewer lines in this area. There is an existing 6-inch sanitary sewer force mains and 54 inch water line lines on the north side of Saratoga Boulevard Island and an existing gas line to the south.

There currently is an adopted Sanitary Sewer collection plan for this area (City of Corpus Christi Sanitary Sewer Collection Master Plan, Greenwood WWTP Service Area, Area 5). As part of the master plan there is a proposed gravity line. As part of the proposed improvements, a segment of the permanent gravity sanitary sewer will be constructed. The upstream end manholes will be approximately 3,200 feet southeast from Old Brownsville Road. The downstream end of the proposed segment will tie into an existing manhole which will eventually flow to the existing Greenwood Sanitary Sewer treatment plant. See exhibit E for overall water & sanitary sewer layout.

The proposed improvements as part of this project will provide sanitary sewer service to not only the proposed Saratoga Ridge Subdivision development but also the future developments to the south of Saratoga Boulevard (see attached Exhibit B for service area boundary map).

There currently is a Water Master Plan for this area (1997 B&V Master Water Plan). Please see exhibit D for the Water Master Plan). This plan shows the 54-inch water line (transmission mains) which exists but does not show a distribution water main. To serve the proposed development we have proposed 12-inch water line which shall tie into the existing 12-inch water line with a tap and saddle along County Road 37 and tie into an existing blowoff valve on the existing 42" CSCP waterline along County Road 35. It will cross under the existing pavement by boring enclosed in a 24-inch steel casing and tie into the existing blowoff valve on the 42-inch CSCP waterline located in County Road 35. Fire Hydrants will be installed on the proposed 12-inch waterline every 300 feet. See attached Exhibit E for the proposed Overall Water & Sanitary Sewer Layout Exhibit for details.

SECTION II – Proposed Improvements

A. Gravity Sanitary Sewer

1. 18-inch and 24-inch diameter PVC pipes to be installed at master plan depths.
2. Manholes
Manholes for this project will be spaced at a maximum of 500 feet apart per TCEQ Chapter 217 requirements. All the manholes 15 feet and deeper and pipe sizes greater than 18-inch to and from the manhole will be 5 feet in diameter. Manholes will be fiberglass with wall thickness and construction to conform to City of Corpus Wastewater Standard Details and Specifications.

B. Water

1. 12-inch diameter PVC
All proposed PVC water lines will be installed according to City of Corpus Christi Water Standard depths.
2. Fittings
Fittings shall be either cast iron or ductile iron and shall conform to A.N.S.I. A21.10 and A.W.W.A. C-110 and C-153, Latest Edition.

SECTION III - Gravity Sanitary Sewer and Waterline Alignment

A topographic survey will be conducted to identify existing conditions, utilities, and other possible obstructions.

Gravity Sanitary Sewer

A. Locations and Alignment for Proposed Sewer Lines

The proposed gravity sanitary sewer will start at an upstream point approximately 3,200 feet southeast of Old Brownsville Road and will extend from that point east where it will tie into an existing manhole. This line will be installed inside the right of way on the north side of Saratoga Boulevard and will be 5 feet offset from it. The proposed gravity sewer line will be located approximately 8 feet from the existing 6-inch sanitary sewer force main and approximately 17 feet from the existing 54-inch water mains. The alignment for the proposed gravity line will turn 90 degrees at the intersection of Calle Cuernavaca and Saratoga Boulevard where a new 5 feet diameter manhole will be installed. It will cross under the existing pavement by boring and tie into an existing manhole. See exhibit E for overall water & sanitary sewer layout.

B. Crossings

The future sanitary sewer gravity main will cross the following:

1. Utilities

a. Gas Utility:

A preliminary investigation indicates that there will be a crossing of an existing City gas line.

We do not anticipate the following crossings:

a. Electrical:

There are overhead electrical lines at various locations along the proposed force main route. To the best of our knowledge, all electrical lines are above ground and will not interfere with the installation of the proposed gravity main.

c. Telephone and Fiberoptics:

It does not appear that there will be any crossing of telephone or fiberoptic lines.

d. Water:

A preliminary investigation indicates that there will not be any crossing of existing water lines.

e. Sewer (Sanitary Sewer):

A preliminary investigation indicates that there will not be any crossing of existing sewer lines.

f. Petroleum and Other Petrochemical Lines:

A preliminary investigation indicates that there will not be any crossing of existing petroleum or petrochemical lines.

SECTION IV – Water Line Alignment

A. Locations and Alignment for Proposed Water Lines

The proposed 12-inch water line shall tie into the existing 12-inch water line with a tap and saddle along County Road 37 and tie into an existing blowoff valve on the existing 42" CSCP waterline along County Road 35. It will cross under the existing pavement by boring enclosed in a 24-inch steel casing and tie into the existing blowoff valve on the 42-inch CSCP waterline located in County Road 35. Fire Hydrants will be installed on the proposed 12-inch waterline every 300 feet. The water line extension between the two taps shall be installed in the 25 feet Utility Easement and be 23 feet offset from the existing 120 feet Right of Way. See exhibit E for overall water & sanitary sewer layout.

B. Crossings

We do not anticipate the following crossings:

1. Utilities

a. Electrical:

There are overhead electrical lines at various locations along the proposed force main route. To the best of our knowledge, all electrical lines are above ground and will not interfere with the installation of the proposed water main.

b. Gas Utility:

It does not appear that there will be a crossing of an existing City gas line.

c. Telephone and Fiberoptics:

It does not appear that there will be any crossing of telephone or fiberoptic lines.

d. Water:

A preliminary investigation indicates that there will not be any crossing of existing water lines.

e. Sewer (Sanitary Sewer):

A preliminary investigation indicates that there will not be any crossing of existing sewer lines.

f. Petroleum and Other Petrochemical Lines:

A preliminary investigation indicates that there will not be any crossing of existing petroleum or petrochemical lines.

SECTION V – Design Flow for Sanitary Sewer and Water

A. Design Flow for Sanitary Sewer

1. Service Area

The proposed sanitary sewer system is designed to serve approximately 257 acres of land that includes low density single family residential homes. There will be approximately 965 lots for the entire proposed development. See Exhibit A (Tract 1) for a map of the area that the proposed sanitary sewer line will serve.

2. Design Flow

The flow for this area has already been calculated in the Greenwood Wastewater Treatment Plant Master Plan. The proposed development is in accordance with the Future Land Use Plan that the Master Plan used to calculate flows. Therefore, we propose to build the extension of the collection line per the master plan size and depth required.

B. Design Flow for Water Line

1. Service Area

The proposed waterline is designed to serve approximately 257 acres of land that includes low density single family residential homes. There will be approximately 965 lots for the entire proposed development. See Exhibit A (Tract 1) for a map of the area that the proposed sanitary sewer line will serve.

2. Design Flow

The updated design flow from the proposed development was calculated by the formula below. 0.6 GPM or 864 GPD of water demand per lot was assumed.

The expected water demand is calculated as:

Total No of lots x 864 GPD = 965 lots x 864 GPD= 833,760 GPD

Therefore, the expected water demand for the proposed development is calculated to be **833,760 GPD**

SECTION VI – Work Plan

A. Surveys and Plan Preparation

1. Datum:
All work on this project (surveys, plans) will be on the Texas State Plane Coordinate System, NAD 83, South Zone (City Standard Datum).
2. Ground Surveys:
Ground elevations and validation of general land features shall be made to determine trench depths, utility locations and other obstructions. Specific areas of concern such as major channels and street crossings will require more than the normal surveys to identify topographic variations and other sub-surface structures.
3. Drawings
Drawings will be completed in accordance with the City of Corpus Christi's Standards, properly coordinated with the project specifications and other details and arranged in such a fashion as to allow the Contractor to accurately estimate the cost of the project and construct it.

All drawings will be produced electronically using a computer aided drafting design (CADD) package.

Horizontal and Vertical Scale: The scale recommended and utilized on this project shall be 1"= 40' horizontal, 1" = 4' vertical.

All pipeline plans and profile sheets will be arranged as to read from left to right with the project beginning at the proposed lift station.

Where possible, plan views will be oriented with the north to either the top or left of the sheet.

SECTION VII – Construction Requirements

A. Disposal Of Excess Site Excavation Material

All excess excavation material shall be disposed of by the Contractor. Provisions shall be provided in the Contract Documents to direct the Contractor in proper disposal of contaminated soil.

B. Restoration

Fields and ditches shall be seeded or sodded to prevent erosion. All driveways and pavements shall be repaired.

C. Storm Water Pollution Prevention Plan

A storm water pollution prevention plan shall be incorporated into the Contractor's work plan to minimize pollution entering the storm sewers along the project (including open drainage ditches). Specific emphasis shall be made near street intersections and large drainage facilities where access to and from the work area shall be critical.

D. Erosion Control

There are no specific areas where the gravity main installation shall cause erosion of property. Therefore, no specific erosion control measures are recommended beyond the City Standard Stormwater Pollution Prevention Plan.

E. Traffic Control Plan

A Traffic Control Plan will be provided in accordance with standard City specifications and latest edition of the Texas Uniform Manual on Traffic Control Devices.