CITY OF SCOTTSDALE

Abbreviated Water and Sewer Needs

HUNTER
ENGINEERING

CIVIL AND SURVEY

Final Design Report
Sanitary Sewer
For
Platinum Storage
8585 E. Princess Drive
Scottsdale, Arizona

FINAL Basis of Design Report

☑ APPROVED

☐ APPROVED AS NOTED

☐ REVISE AND RESUBMIT

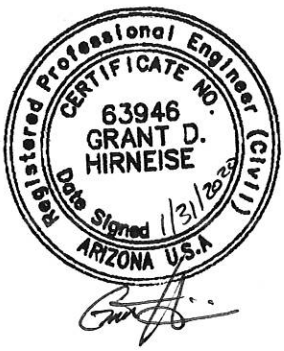
CITY OF SCOTTSDALE

SCOTTSDALE WATER

9379 E San Salvador Dr.
Scottsdale, AZ 85258

Disclaimer: If approved; the approval is granted under the condition that the final construction documents submitted for city review will match the information herein. Any subsequent changes in the water or sewer design that materially impact design criteria or standards will require re-analysis, re-submittal, and approval of a revised basis of design report prior to the plan review submission.; this approval is not a guarantee of construction document acceptance.
For questions or clarifications contact the Water Resources Planning and Engineering Department at 480-312-5685.

BY scan DATE 3/5/2020



January 2020

Prepared by:
Hunter Engineering, Inc.
10450 North 74th Street, #200
Scottsdale, AZ 85258

Final Design Report
Sanitary Sewer
For
Platinum Storage
8585 E. Princess Drive
Scottsdale, Arizona

Prepared For:

Platinum Construction
1450 TL Townsend Dr.,
Rockwall, TX 75032

Prepared By:

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Hunter Engineering, Inc.
10450 North 74th Street, #200
Scottsdale, AZ 85258
(480) 991-3985

H.E. Project No. PLAT003

TABLE OF CONTENTS

1.0 INTRODUCTION

This Final Sanitary Sewer Report has been prepared under a contract from Platinum Construction, Owner/Developer of the Platinum Storage site. The purpose of this report is to provide a sewer analysis, required by the City of Scottsdale, to support this development. Preparations of this report has been done in accordance with the procedures detailed in the City of Scottsdale *Design Standards and Policies Manual* (Reference 1).

This development is located at the southwest corner of Princess Drive and N. Pima Road. The Site is specifically located in the Southeast Quarter of Section 36, Township 4 North, Range 4 East of The Gila and Salt River Base and Meridian, Maricopa County, Arizona. Figure 1 in Appendix A illustrates the location of the project in relation to the City of Scottsdale street system.

On-site improvements include a new storage building with associated parking, utilities, drainage facilities and landscaped areas. The proposed site is bound by Princess Drive to the north, N. Pima Road to the east, and the Pima Medical Center facilities to the south and west. Access to the site will be provided by existing driveways located on Princess Drive and N. Pima Road.

2.0 EXISTING CONDITIONS

The site is located on an undeveloped parcel surrounded by multiple commercial buildings. There is an existing 8” private sewer line that runs along the west side of the project site. The private sewer line connects to an existing 8” public sewer line and manhole north of the project within Princess Drive.

3.0 PROPOSED SANITARY SEWER SYSTEM

This project will connect to the existing 8” private sewer line on the west side of the proposed building. Wastewater flows for the project were calculated in accordance with the City of Scottsdale Design Standards & Polices Manual (Reference 1). According to the calculations provided in Appendix B, the proposed building will have an estimated Average Daily Flow of 38.1 GPM and a Peak Hour Flow of 114.3 GPM. The total Peak Hour Flows for the overall development were calculated to ensure that the onsite sewer line has the capacity to the handle the flows for the existing and proposed development.

The sanitary sewer pipe and fitting material for this project will be PVC SDR-35. Trenching and bedding details for this project will be per MAG Standard Specification Section 601. Trench width above the installed pipe may be as wide as necessary to properly brace/install the work. Bedding, backfill, and compaction shall be installed per MAG Standard Specification 601.4.

4.0 CONCLUSIONS

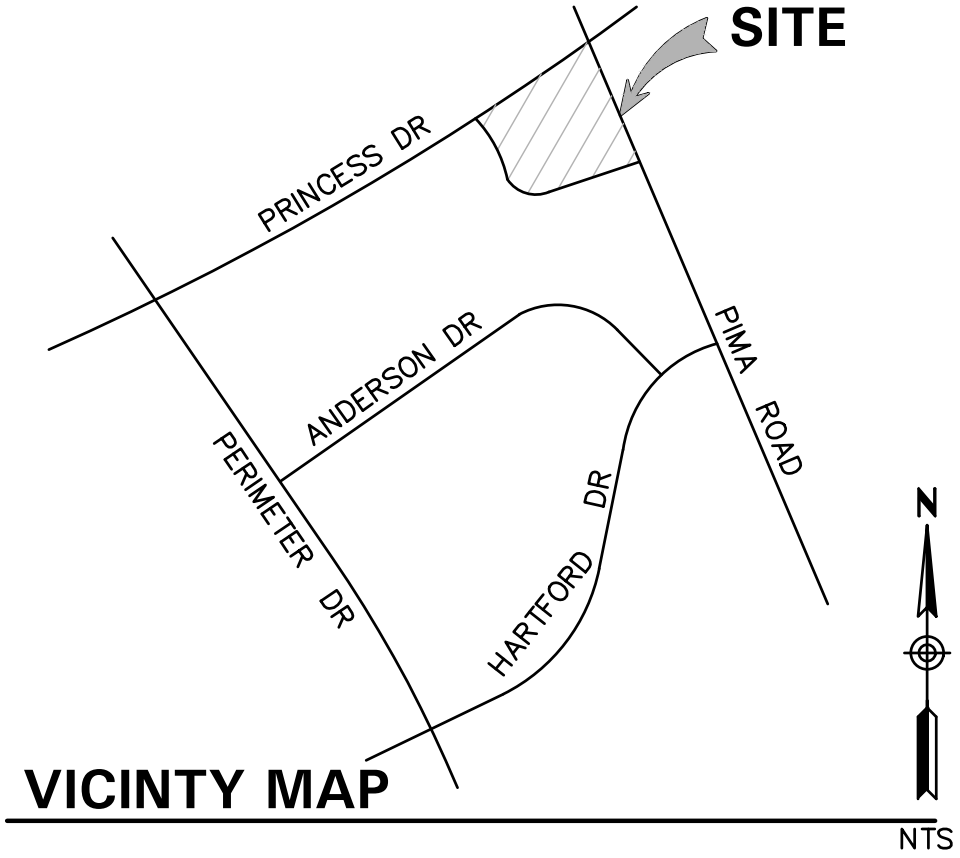
Based on the results of this study, it can be concluded that:

- The combined existing and proposed sewer system is adequate to service the development.

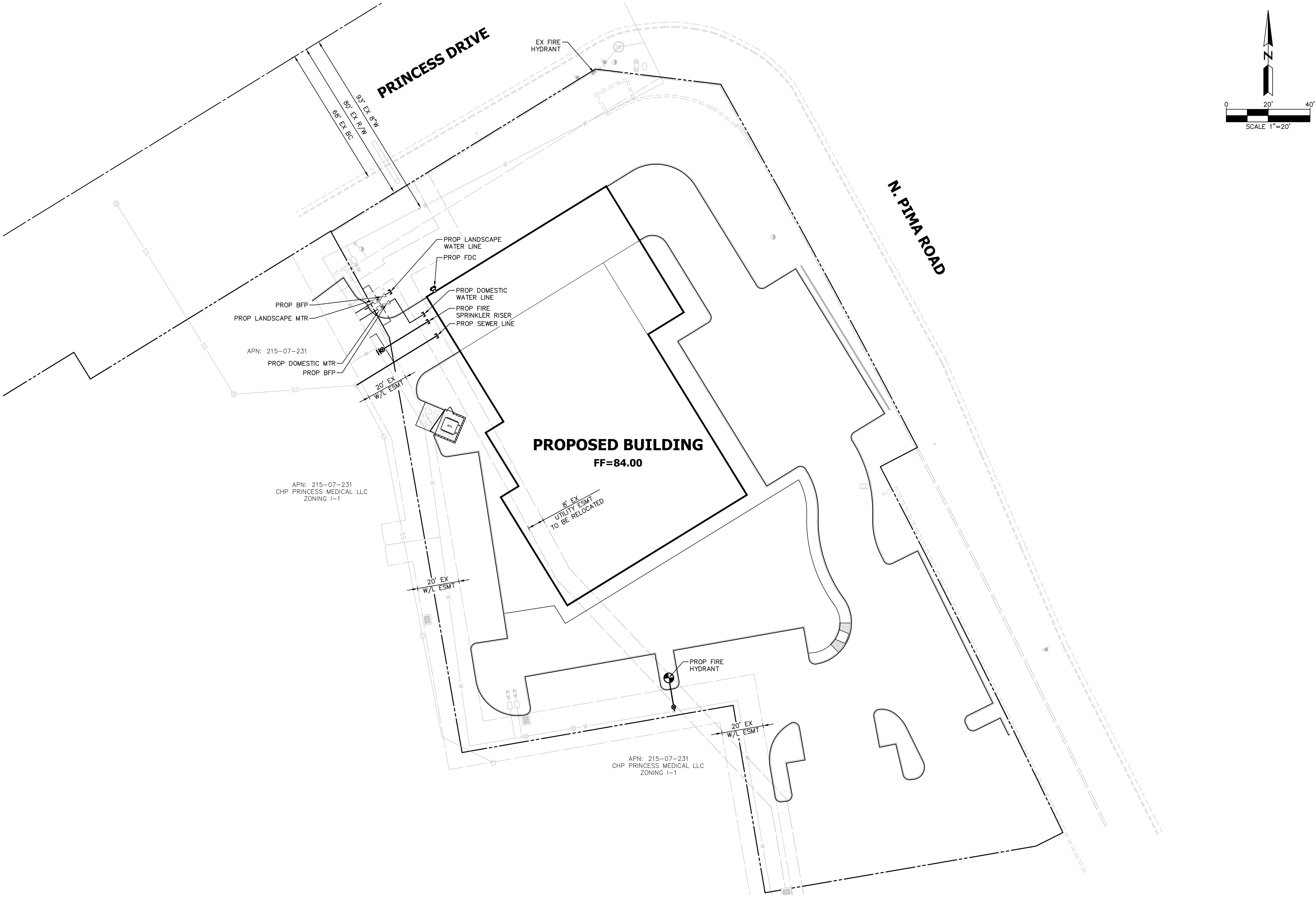
5.0 REFERENCES

1. *City of Scottsdale Design Standards & Policies Manual, January 2018.*

APPENDIX A
FIGURES



VICINITY MAP
FIGURE 1



NO.	DATE	REVISION	BY

PURPOSE:
1ST CONCEPTUAL SUBMITTAL

DESIGN BY: **AS**
DRAWN BY: **GM**
CHECKED BY: **GH**

HUNTER ENGINEERING CIVIL AND SURVEY
10450 NORTH 74TH STREET, SUITE 200
SCOTTSDALE, AZ 85258
T 480 991 3985
F 480 991 3986

Registered Professional Engineer
CERTIFICATE NO. 63946
GRANT D. HIRNEISE
Date Signed 02/04/20
ARIZONA, U.S.A.
(Civil)

CONCEPTUAL UTILITY PLAN FOR PLATINUM STORAGE 8585 E. PRINCESS DRIVE SCOTTSDALE, ARIZONA 85255

THESE PLANS ARE NOT APPROVED FOR CONSTRUCTION WITHOUT AN APPROVED SIGNATURE FROM THE GOVERNING MUNICIPALITY.

PROJECT NAME: PLATINUM STORAGE

HE NO.: PLAT003
SCALE: 1"=20'

SHEET:
C3

7-DR-2020
2/6/2020

APPENDIX B
CALCULATIONS

Project: Platinum Storage
Project No.: PLAT003
City: Scottsdale, AZ
Date: 1/31/2020

PROJECTED SANITARY SEWER LOADS

Land Use	Building Size (sf)	Average Day Sewer Demand (gpd) Figure 7-1.2		Peaking Factor Figure 7-1.2	Average Daily Flow (gpd)	Average Daily Flow (gpm)	Peak Flow (gpm)
Proposed Building	109,759	0.5	per sf	3	54,880	38.1	114.3
Existing Building [1]	71,254	0.5	per sf	3	35,627	24.7	74.2
Total							188.5

1 - Existing building size is based off the Princess Medical Center Site Plan.

6-inch Private flow
Worksheet for Circular Channel

Project Description	
Worksheet	6-inch 0.65 d/D Capa
Flow Element	Circular Channel
Method	Manning's Formula
Solve For	Discharge

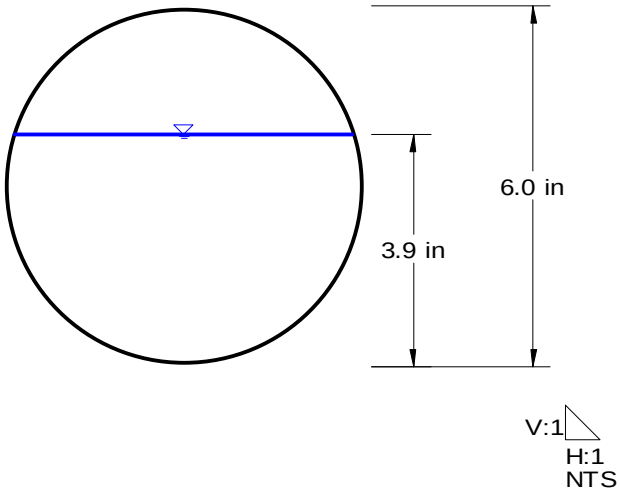
Input Data		
Mannings Coeffic	0.013	
Channel Slope	011000	ft/ft
Depth	3.9	in
Diameter	6.0	in

Results		
Discharge	200	gpm
Flow Area	0.1	ft²
Wetted Perime	0.94	ft
Top Width	0.00	ft
Critical Depth	0.34	ft
Percent Full	65.0	%
Critical Slope	0.009709	ft/ft
Velocity	3.29	ft/s
Velocity Head	0.17	ft
Specific Energy	5.9	in
Froude Numbe	1.09	
Maximum Disc	284	gpm
Discharge Full	264	gpm
Slope Full	0.006294	ft/ft
Flow Type	Supercritical	

Cross Section
Cross Section for Circular Channel

Project Description	
Worksheet	6-inch 0.65 d/D Capa
Flow Element	Circular Channel
Method	Manning's Formula
Solve For	Discharge

Section Data		
Mannings Coeffic	0.013	
Channel Slope	011000	ft/ft
Depth	3.9	in
Diameter	6.0	in
Discharge	200	gpm



6-inch Private Sewer Capacity
Worksheet for Circular Channel

Project Description	
Worksheet	6-inch Full Flow Capa
Flow Element	Circular Channel
Method	Manning's Formula
Solve For	Full Flow Capacity

Input Data		
Mannings Coeffic	0.013	
Channel Slope	011000	ft/ft
Diameter	6.0	in

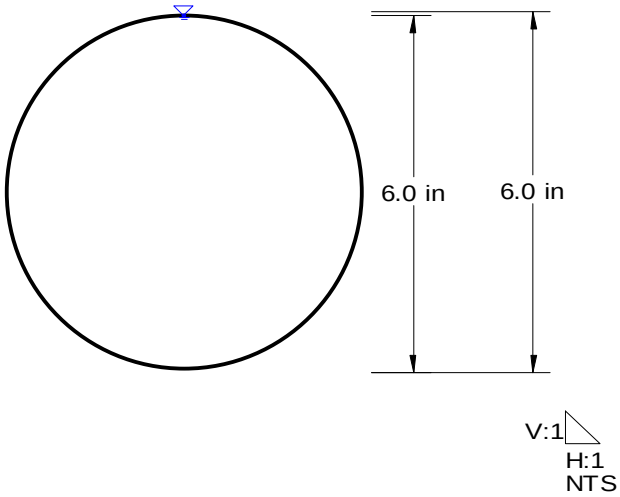
Results		
Depth	6.0	in
Discharge	264	gpm
Flow Area	0.2	ft²
Wetted Perime	1.57	ft
Top Width	0.00	ft
Critical Depth	0.39	ft
Percent Full	100.0	%
Critical Slope	012094	ft/ft
Velocity	3.00	ft/s
Velocity Head	0.14	ft
Specific Energy	7.7	in
Froude Numbe	0.00	
Maximum Disc	284	gpm
Discharge Full	264	gpm
Slope Full	011000	ft/ft
Flow Type	N/A	

Hunter
37 Brookside Road Waterbury, CT 06708 USA +1-203-755-1666

Cross Section
Cross Section for Circular Channel

Project Description	
Worksheet	6-inch Full Flow Capa
Flow Element	Circular Channel
Method	Manning's Formula
Solve For	Full Flow Capacity

Section Data		
Mannings Coeffic	0.013	
Channel Slope	011000	ft/ft
Depth	6.0	in
Diameter	6.0	in
Discharge	264	gpm



Ex 8-inch Public Flow
Worksheet for Circular Channel

Project Description	
Worksheet	8-inch 0.65 d/D Capa
Flow Element	Circular Channel
Method	Manning's Formula
Solve For	Discharge

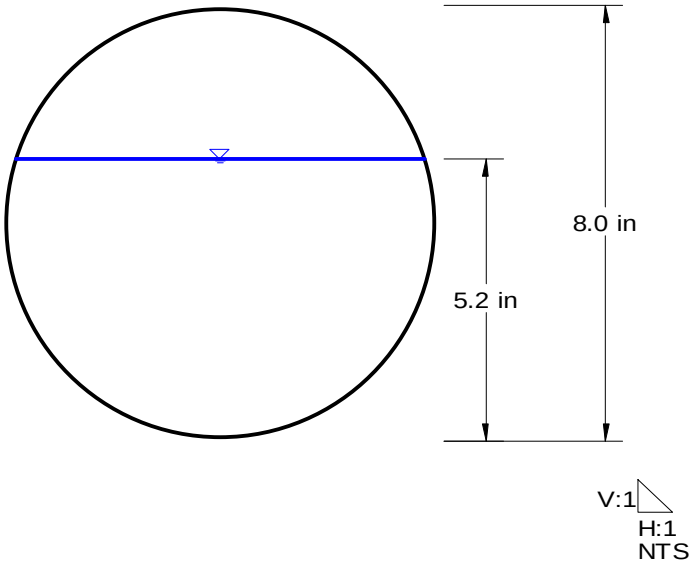
Input Data		
Mannings Coeffic	0.013	
Channel Slope	003300	ft/ft
Depth	5.2	in
Diameter	8.0	in

Results		
Discharge	236	gpm
Flow Area	0.2	ft²
Wetted Perime	1.25	ft
Top Width	0.00	ft
Critical Depth	0.34	ft
Percent Full	65.0	%
Critical Slope	0.007088	ft/ft
Velocity	2.19	ft/s
Velocity Head	0.07	ft
Specific Energy	6.1	in
Froude Numbe	0.63	
Maximum Disc	335	gpm
Discharge Full	312	gpm
Slope Full	0.001888	ft/ft
Flow Type	Subcritical	

Cross Section
Cross Section for Circular Channel

Project Description	
Worksheet	8-inch 0.65 d/D Capa
Flow Element	Circular Channel
Method	Manning's Formula
Solve For	Discharge

Section Data		
Mannings Coeffic	0.013	
Channel Slope	003300	ft/ft
Depth	5.2	in
Diameter	8.0	in
Discharge	236	gpm



Ex 8-inch Public Sewer Capacity
Worksheet for Circular Channel

Project Description	
Worksheet	8-inch Full Flow Capa
Flow Element	Circular Channel
Method	Manning's Formula
Solve For	Full Flow Capacity

Input Data		
Mannings Coeffic	0.013	
Channel Slope	003300	ft/ft
Diameter	8.0	in

Results		
Depth	8.0	in
Discharge	312	gpm
Flow Area	0.3	ft²
Wetted Perime	2.09	ft
Top Width	0.00	ft
Critical Depth	0.39	ft
Percent Full	100.0	%
Critical Slope	007718	ft/ft
Velocity	1.99	ft/s
Velocity Head	0.06	ft
Specific Energy	8.7	in
Froude Numbe	0.00	
Maximum Disc	335	gpm
Discharge Full	312	gpm
Slope Full	003300	ft/ft
Flow Type	N/A	

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Cross Section
Cross Section for Circular Channel

Project Description	
Worksheet	8-inch Full Flow Capa
Flow Element	Circular Channel
Method	Manning's Formula
Solve For	Full Flow Capacity

Section Data		
Mannings Coeffic	0.013	
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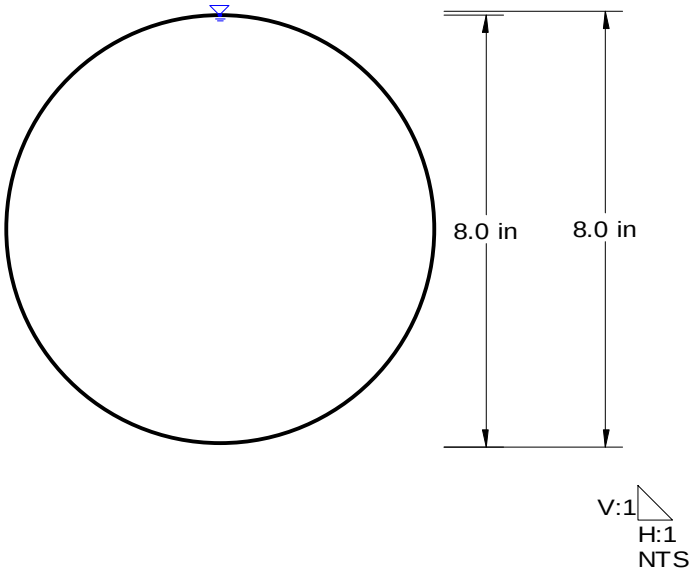

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APPENDIX C
REFERENCE INFORMATION

CITY OF SCOTTSDALE

DESIGN STANDARDS & POLICIES MANUAL

7-DR-2020
2/6/2020

Chapter 7

WASTEWATER

7

This chapter provides ordinance, policy, and standards establishing design criteria for constructing and modifying sanitary sewer (SS) systems to be owned and operated by the city, and for private systems. It provides guidance on agreements, preparation of design reports and design of sewer collection systems and final plans preparation.

LAND USE	DEMAND (gpd)	DESIGN PEAKING FACTOR
Commercial/Retail	0.5 per sq. ft.	3
Office	0.4 per sq. ft.	3
Restaurant	1.2 per sq. ft.	6
High Density Condominium (Condo)	140 per unit	4.5
Resort Hotel (includes site amenities)	380 per room.	4.5
School: without cafeteria	30 per student	6
School: with cafeteria	50 per student	6
Cultural	0.1 per sq. ft.	3
Clubhouse for Subdivision Golf Course	100 per patron x 2 patrons per du per day	4.5
Fitness Center/ Spa/ Health club	0.8 per sq. ft.	3.5

FIGURE 7-1.2 AVERAGE DAY SEWER DEMAND IN GALLONS PER DAY & PEAKING FACTORS BY LAND USE

HYDRAULIC DESIGN 7-1.404

No public SS lines will be less than 8 inches in diameter unless permission is received in writing from the Water Resources Department.

SS lines shall be designed and constructed to give mean full flow velocities equal to or greater than 2.5 fps, based upon Manning's Formula, using an "n" value of 0.013.

To prevent abrasion and erosion of the pipe material, the maximum velocity will be limited to 10 fps at estimated peak flow. Where velocities exceed this maximum figure, submit a hydraulic analysis along with construction recommendations to the Water Resources Department for consideration. In no case will velocities greater than 15 fps be allowed.

Actual velocities shall be analyzed for minimum, average day and peak day design flow conditions for each reach of pipe.

The SS system shall be designed to achieve uniform flow velocities through consistent slopes. Abrupt changes in slope shall be evaluated for hydraulic jump.

The depth to diameter ratio (d/D) for gravity SS pipes 12 inches in diameter and less shall not exceed 0.65 in the ultimate peak flow condition. This d/D ratio includes an allowance for system infiltration and inflow.

The d/D for gravity drains greater than 12 inches diameter shall not exceed 0.70 for the ultimate peak flow condition. This d/D includes an allowance for system infiltration and inflow.

Measures to mitigate hydrogen sulfide shall be analyzed at manhole drops, abrupt changes in pipe slope or direction and at changes in pipe diameter.

MANHOLES AND CLEAN OUTS 7-1.405

Manholes in city streets shall be located near the center of the inside traffic lane, rather than on or near the line separating traffic lanes. Manholes shall not be in bike trails, equestrian trails, sidewalks, crosswalks or wash crossings. Manholes are required at all