CITY OF SCOTTSDALE

Water and Wastewater Study
Combined

Hanella Estates

12481 E SHEA BLVD.

SCOTTSDALE, AZ 85259

Sewer Basis of Design Report

March 1, 2021

EPS Job #16-345

Owner/Developer

ROSS AND JOY STUART
12481 E SHEA BLVD.
SCOTTSDALE, AZ 85259

CONSULTANT

EPS GROUP, I.N.C.
125 S. AVONDALE BLVD., STE 115
AVONDALE, AZ 85323
CONTACT: BRIAN NICHOLLS
TEL. 480-313-4490

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 rsacks **DATE** 3/4/2021

A. Introduction

The proposed Hanella Estates consists of 4 single-family residential units covering 4.5 acres of vacant desert land located in Scottsdale, Arizona. The Hanella Estates development has a gross density of 0.9 du/ac. The site location is on the northwest corner of N.125th Street and E. Cochise Drive. The site is within section 26, Township 3 North, Range 5 East of the Gila and Salt River base and meridian, City of Scottsdale, Maricopa County, Arizona. (Refer to the Vicinity Map in Appendix A for the project location.

B. Design Documentation

The infrastructure sewer lines and unit daily demands requirements for this project follow the City of Scottsdale Design Standards & Policies Manual (DS&PM).

C. Existing Conditions

The site is currently zoned R-43 with the intent to be rezoned to R-43 PRD. The Hanella Estates development location is within the City of Scottsdale Wastewater Service Area, a Sub-Regional Operating Group (SROG) member. The site is currently vacant. The site is located within an Environmental Sensitive Land overlay (E.S.L.) and will remain as such. Single-family residences and local roadways bound the site.

The proposed development design is compatible with the existing surrounding developments:

North: Wash and Shea Blvd.
South: E. Cochise Drive
East: Vacant (R1-43)
West: Residential (R1-43)

E. Cochise Drive will provide ingress and egress to the site. The existing infrastructure has provided adequate sewer capacity for the surrounding development; This design assumes that the existing infrastructure is sufficient for this development.

D. Proposed Conditions

Each lot is equipped with a sewer pump and connects to an individual sewer force main. These individual sewer force mains connect to a proposed manhole in Shea Boulevard. From the proposed manhole, a proposed 8” gravity sewer main connects into an existing manhole on Shea Boulevard. Wastewater then flows east via existing 15” V.C.P gravity line also located along Shea Boulevard. Velocities for the connection into the City of Scottsdale Wastewater System remains under 10 fps. The proposed sewer system will not have interior drops.

E. Computations

According to the City of Scottsdale DS&PM, Residential Demand per dwelling unit based on capita per day assumes 100 gpcpd and 2.5 persons per dwelling unit. The City of Scottsdale requires sewer line design to account for Average Day (A.D.D.) and Peak Demand (P.D.) demands. Please see the table below for wastewater demand calculations.

** Per City of Scottsdale DS&PM 7-1.403: The peaking factors are four times the average day for peak demand.*

Development	Dwelling Units (du)	Average Day Demand (A.D.D.) 4 du x 2.5 ppdu x 100 gpcpd (gpd)	Peak Demand (P.D) A.D.D. X 4 (gpd)
Hanella Estates	4	1,000	4,000

F. Summary

- Single 8” sewer connection into an existing manhole on Shea Boulevard.
- Average Day Demand of 1,000 gpd
- Peak Demand = 4,000 gpd
- Individual sewer force mains and on-lot sewer pump on each lot.
- Velocity into an existing manhole on Shea Boulevard remains below 10 fps.
- Sewer system will not have interior drops.

G. References

- City of Scottsdale Design Standards & Policies Manual (DS&PM).
- City of Scottsdale Geographic Information Systems Quarter Section Maps 28-58
- City of Scottsdale Geographic Information Systems Zoning Map 4
- City of Scottsdale Wastewater Service Areas Map (pg 502, C.O.S DS&PM)
- City of Scottsdale 2008 Integrated Wastewater Master Plan

H. Appendices

Appendix ‘A’ – Vicinity Map & Site Plan

Appendix ‘B’ – Hanella Estates Utility Site Map

Appendix ‘C’ – City of Scottsdale Wastewater Service Areas Map
(pg 502, C.O.S DS&PM)

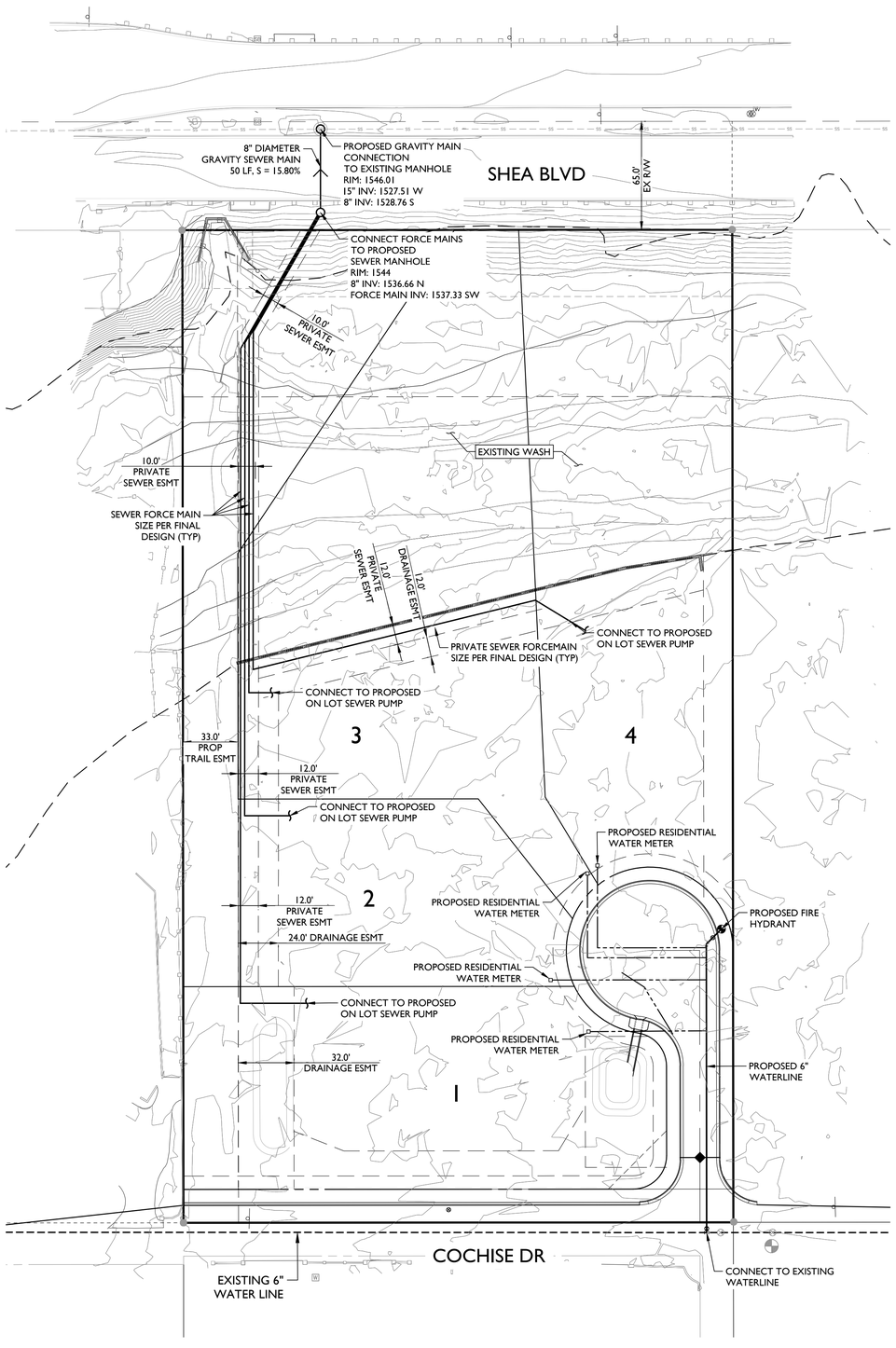
Appendix ‘D’ – Preliminary Wastewater Demand Calculations

Appendix A - Vicinity Map

Appendix B - Hanella Estates Utility Site Map

(See attached)

16-345 - HANELLA ESTATES



EPS GROUP
2045 S. Vineyard Ave, Suite 101
Mesa, AZ 85210
T:480.503.2250 | F:480.503.2258
w w w . e p s g r o u p i n c . c o m

Hanella Estates
Scottsdale, Arizona

Project:

Utility Plan

Revisions:

Call at least two full working days before you begin excavation.
ARIZONA811
Arizona Blue Stake, Inc.
Dial 8-1-1 or 1-800-STAKE-IT (782-5348)
In Maricopa County: (602)263-1100

Designer: JPF
Drawn by: JPF

Preliminary
Not For
Construction
Or
Recording

Job No.
16-345

UT01

Sheet No.
1
of 1

Jun 14, 2021 8:32am S:\Projects\2016\16-345\Civil_Prelim_Prelim G&D\16-345 - PP - Utility Plan.dwg
yesquivel

Appendix C- City of Scottsdale Wastewater Service Areas Map (pg 502, C.O.S DS&PM)

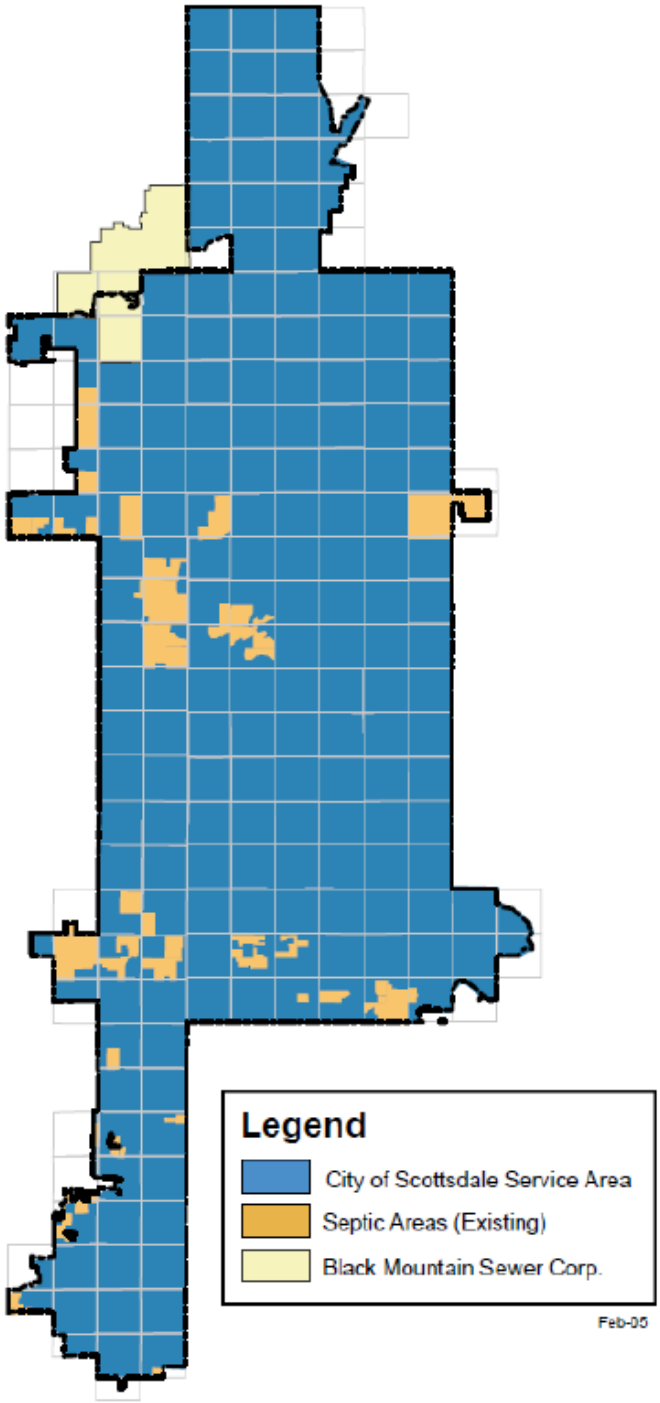
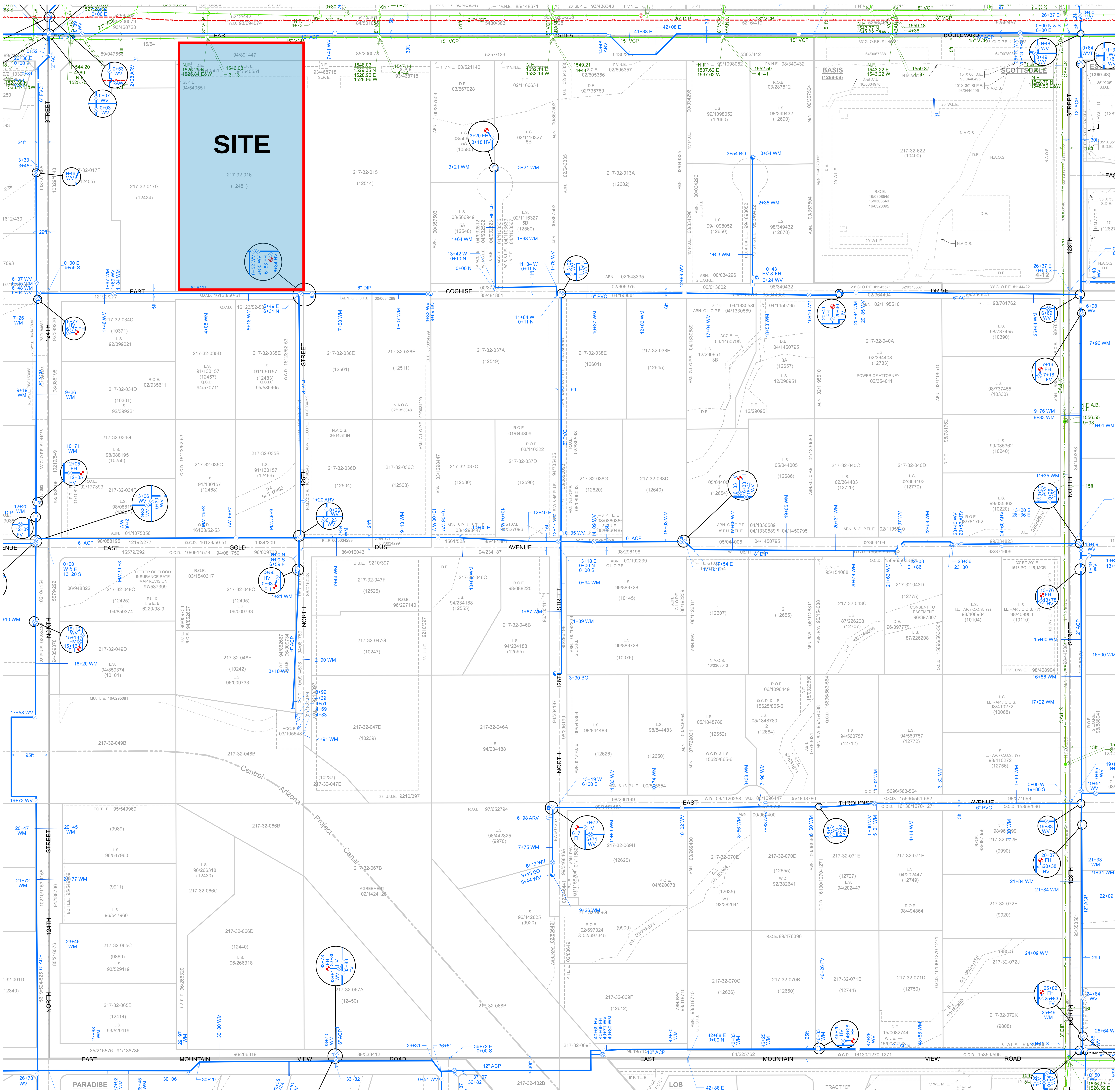


FIGURE 7-1.1 WASTEWATER SERVICE AREAS

29-58



28-57

28-59

27-58

GENERAL NOTES:

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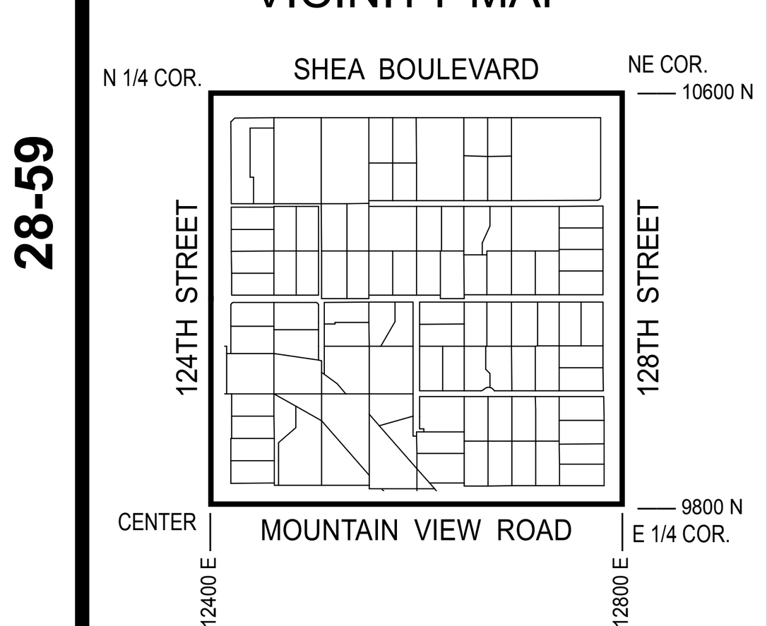
LEGEND:

Water Valve
Non-potable Water Valve
Fire Hydrant
Water Blowoff
Water Main Reducer
Water Sample Station
Water Air Release Valve
Non-potable Water Air Release Valve
Water Pressure Reducing Valve
Water Vault
Water Manhole
Non-Potable Water Manhole
Water Pump
Water Main
Non-Potable Water Main
Fire Line
Water Service
Non-Scottsdale Water Main
Sewer Manhole
Sewer Cleanout
Sewer Lift Station
Sewer Treatment Plant
Sewer Main - Gravity
Sewer Main - Force
Non-Scottsdale Sewer Main
Sewer Service

VICINITY MAP



NORTH

SCALE: 1" = 100'

0 50 100 200

The map scale of 1" = 100' is based on a full size print of 30" x 36"

WATER & SEWER

QUARTER SECTION MAP

28-58

NE 1/4 SEC. 26 T3N R5E

CITY OF SCOTTSDALE

SCOTTSDALE GEOGRAPHIC INFORMATION SYSTEMS
3629 North Drinkwater Boulevard
Scottsdale, Arizona 85251

27-NOV-16

Appendix D- Preliminary Wastewater Calculations

(See attached)

Average Daily Sewer Flows and Pipe Capacity Using Manning's Equation

Project: 16-345 - Hanella Estates - Preliminary

Prepared by: Yancy Esquivel **Date:** 3/2/2021

Calculations Assume 100 GPD/capita
Calculations Assume 2.5 Persons/D.U.

Sewer Pipe Information					Additional Flow Information					Peak Demand Information						Full Flow Check		Non-Pressurized Flow Calculations					
Sewer Reach	Length (ft)	Pipe Diameter (in)	Slope (ft/ft)	Manning's Roughness	Description	Additional Contributing Lots	Other Additional Contributing Flow (GPD)		Additional Upstream Flow (GPD)	Cumulative Daily Flow (GPD)	Equivalent Population	Peaking Factor	Peak Demand (GPD)	Peak Demand (MGD)	Peak Demand (cfs)	Full Flow Capacity (cfs)	Pressurized Flow?	Theta of flow (rad)	Depth of Flow (ft)	Percent Full (d/D)	Area of Flow (ft2)	Wetted Perimeter of flow (ft)	Velocity of Flow (fps)
MH-1 TO X-MH	32	8	0.0040	0.013		4				1,000	10	4.00	4,000	0.00400	0.006	0.77	NO	1.00	0.04	6%	0.0087	0.332	0.71

Notes:

Hanella Estates

12481 E SHEA BLVD.

SCOTTSDALE, AZ 85259

Water Basis of Design Report

August 28, 2019

EPS Job #16-345

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BY rsacks DATE 9/4/2019

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CONSULTANT

EPS GROUP, INC.
25 S. AVONDALE BLVD., STE 115
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A. Introduction

The proposed Hanella Estates consists of 4 single-family residential units covering 4.5 acres of vacant desert land located in Scottsdale, Arizona. The Hanella Estates development has a gross density of 0.9 du/ac the site is located on the northwest corner of N.125th Street and E. Cochise Drive. The site is within section 26, Township 3 North, Range 5 East of the Gila and Salt River base and meridian, City of Scottsdale, Maricopa County, Arizona. (Refer to the Vicinity Map in Appendix A for the project location.

B. Design Documentation

The infrastructure water lines and unit daily demands requirements for this project have been determined using the City of Scottsdale Design Standards & Policies Manual (DS&PM).

C. Existing Conditions

The site is currently zoned R-43 with the intent to be rezone to R-43 PRD. The Hanella Estates development is located within the City of Scottsdale Zone 4 water pressure zone. (See Appendix C - City of Scottsdale Pressure Zone Map) The site is currently vacant. The site is located within an Environmental Sensitive Land overlay (ESL) and will remain as such. The site is bounded by single family residences and local roadways.

The proposed development has been designed to be compatible with the existing surrounding developments:

North: Wash and Shea Blvd.
South: E. Cochise Drive
East: Vacant (R1-43)
West: Residential (R1-43)

E. Cochise Drive will provide ingress and egress to the site. The existing infrastructure has provided adequate domestic water and fire protection for the surrounding development, it is assumed that the existing infrastructure will be adequate for this development.

D. Proposed Conditions

A 6” water main will serve potable water to the 4 proposed lots. The lots will have individual water meters. The site will have a single water line connection onto an existing 6” ACP line located along E. Cochise Drive. The proposed 6” water line will dead end inside the development with a fire hydrant in the cul-de-sac. The water line is approximately 368 linear feet from the point of connection.

Fire Hydrant Locations

Two existing fire hydrants are located near the property at the intersections of 124th Street and 125th Street at E. Cochise Drive. A proposed fire hydrant will be provided at the end of the proposed cul-de-sac. The existing and proposed hydrants will provide fire protection for the Hanella Estates development. The existing fire hydrants and the proposed development are within the allowed 700 feet spacing of fire hydrants as defined in section 6-1.502 of the City of Scottsdale DS&PM. See Appendix ‘B’ – Hanella Estates Utility Site Map for further detail

E. Computations

According to the City of Scottsdale DS&PM, Residential Demand per dwelling units based on dwelling units per acres (Hanella Estates 0.9 DU/ac) assume 485.6 gpd per lot. The City of Scottsdale requires water lines to be designed to account for Average Day (ADD), Max Day (MDD) and Peak hour (PH) demands. Please see the table below for water demand calculations.

** Per City of Scottsdale DS&PM 6-1.404: The peaking factors are 2 times the average day for maximum day, and 3 1/2 times the average day for peak hour*

Development	Dwelling Units (du)	Average Day Demand (ADD) 485.6 gpd X 4 du (gpd)	Max Day Demand ADD X 2 (gpd)	Peak Hour Demand ADD X 3.5 (gpd)
Hanella Estates	4	1,942.4	3,884.8	6,798.4

F. Summary

- Single water line Connection onto E. Cochise Drive (6" x 6" T.S.&V.)
- Approx. 368 LF of 6" DIP water line located within C.O.S. Right of Way
- Individual water meter and service line connections to each lot
- 1 new fire hydrant located at the cul-de-sac. Existing Fire hydrant within 700' of the proposed development at the intersections of 125th, 124th street at Cochise.

G. References

- City of Scottsdale Design Standards & Policies Manual (DS&PM).
- City of Scottsdale Geographic Information Systems Quarter Section Maps 28-58
- City of Scottsdale Geographic Information Systems Zoning Map 4
- C.O.S. Water Pressure Zone Map / Water Service Area Map

H. Appendices

Appendix 'A' – Vicinity Map & Site Plan

Appendix 'B' – Hanella Estates Utility Site Map

Appendix 'C' – C.O.S. Water Pressure Zone Map / Water Service Area Map

Appendix A - Vicinity Map

Appendix B - Hanella Estates Utility Site Map

(See attached)

Appendix C- C.O.S. Water Pressure Zone Map / Water Service Area Map

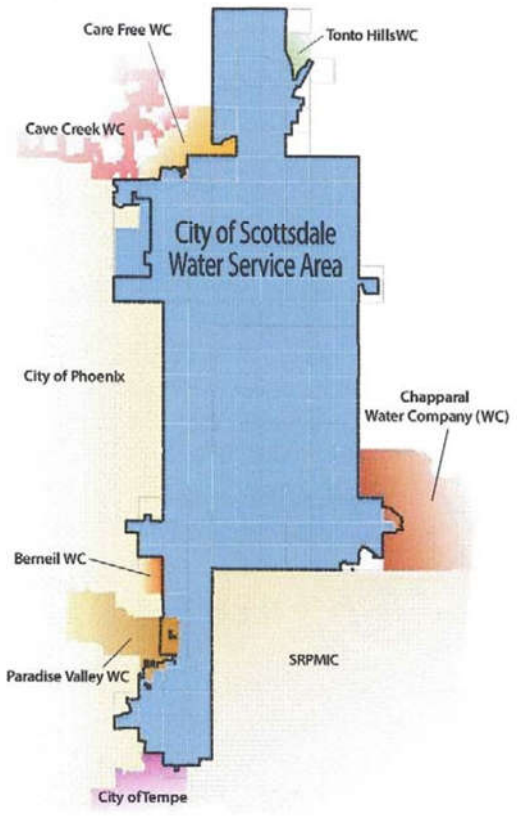
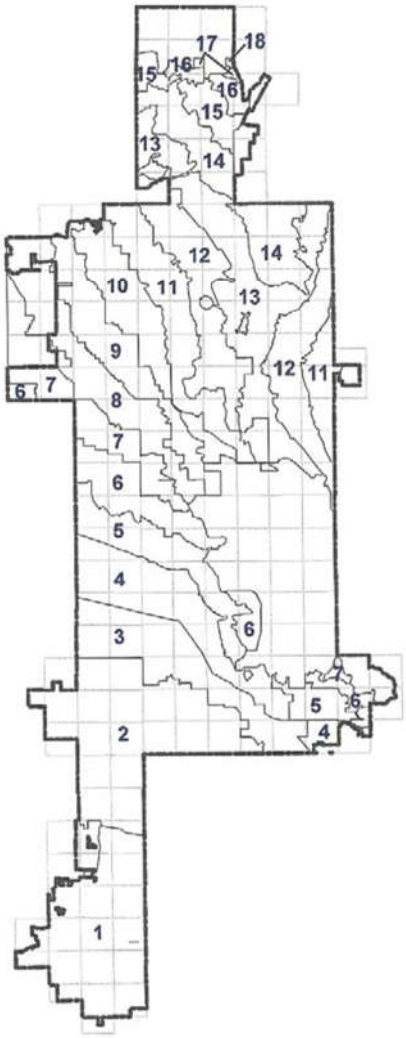


FIGURE 6.1-1 WATER SERVICE AREAS



Zone	Ground Elevation Range (Ft.)
1	1180-1280
1A	1250-1330
2A	1280-1330
2	1330-1440
3	1440-1550
4	1510-1650
4E	1550-1650
5	1650-1790
5E	1650-1750
6	1790-1920
6E	1750-1934
7	1920-2050
7E	1934-2065
8	2050-2180
8E	2065-2200
9	2180-2310
10	2310-2440
11,11E	2440-2570
12,12E	2570-2700
13	2700-2830
14	2830-2960
15	2960-3090

FIGURE 6.1-3 PRESSURE ZONE MAP

29-58

28-57

28-59

27-58

27-NOV-16

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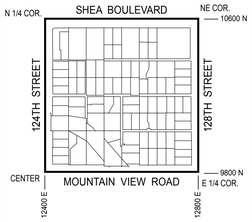
- Fire Hydrant
- Water Blowoff
- Water Main Reducer
- Water Sample Station
- Water Air Release Valve
- Non-potable Water Air Release Valve
- Water Pressure Reducing Valve
- Water Vault
- Water Manhole
- Non-Potable Water Manhole
- Water Pump
- Water Main
- Non-Potable Water Main
- Fire Line
- Water Service
- Non-Scottsdale Water Main
- Sewer Manhole
- Sewer Cleanout
- Sewer Lift Station
- Sewer Treatment Plant
- Sewer Main - Gravity
- Sewer Main - Force
- Non-Scottsdale Sewer Main
- Sewer Service

VICINITY MAP



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WATER & SEWER

QUARTER SECTION MAP

28-58

NE 1/4 SEC. 26 T3N R5E

SCOTTSDALE GEOGRAPHIC INFORMATION SYSTEMS
3629 North Drinkwater Boulevard
Scottsdale, Arizona 85251

3-PP-2018
8/28/2019

Flow Test Summary

Project Name:	EJFT 19145
Project Address:	12481 E Shea Blvd, Scottsdale, AZ 85259
Date of Flow Test:	2019-07-08
Time of Flow Test:	7:30 AM
Data Reliable Until:	2020-01-08
Conducted By:	Eder Cueva & Denise Ramirez (EJ Flow Tests) 602.999.7637
Witnessed By:	Jared Berry (City of Scottsdale) 602.541.4942
City Forces Contacted:	City of Scottsdale (602.228.2187)
Permit Number:	C58712

Note Scottsdale requires a max static pressure of 72 psi for safety factor

Raw Flow Test Data

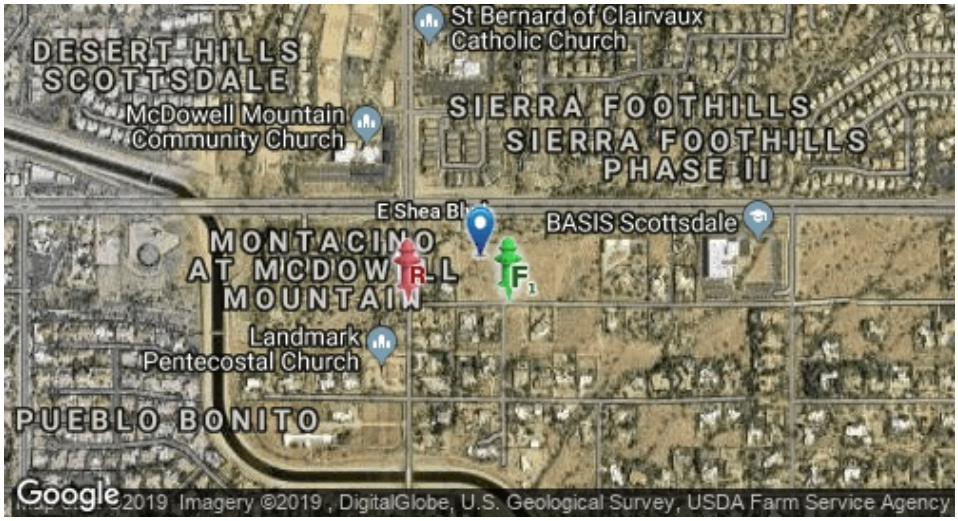
Static Pressure:	88.0 PSI
Residual Pressure:	62.0 PSI
Flowing GPM:	1,233
GPM @ 20 PSI:	2,073

Data with a 16 PSI Safety Factor

Static Pressure:	72.0 PSI
Residual Pressure:	46.0 PSI
Flowing GPM:	1,233
GPM @ 20 PSI:	1,793

Hydrant F_1

Pitot Pressure (1):	13	PSI
Coefficient of Discharge (1):	0.9	
Hydrant Orifice Diameter (1):	2.5	inches
Pitot Pressure (2):	14	PSI
Coefficient of Discharge (2):	0.9	
Hydrant Orifice Diameter (2):	2.5	inches



Project Site

Static-Residual Hydrant

Flow Hydrant

Distance Between F_1 and R
694 ft (measured linearly)

Static-Residual Elevation
1526 ft (above sea level)

Flow Hydrant (F_1) Elevation
1537 ft (above sea level)

Elevation & distance values are approximate

Flow Test Summary

Static-Residual Hydrant

Flow Hydrant (only hydrant F1 shown for clarity)

Approximate Project Site

Water Supply Curve $N^{1.85}$ Graph