

SEWER CAPACITY REPORT
Scottsdale Heights, a Residential Development
SEC Dove Valley Road and Scottsdale Road
Scottsdale, AZ

Prepared For:



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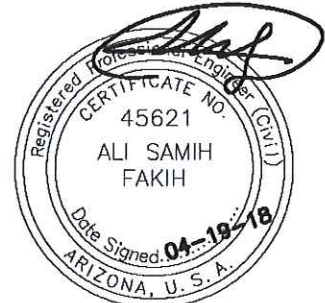
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EXPIRES 12-31-18

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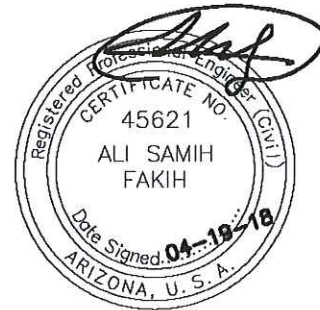


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LIST OF EXHIBITS:

- EXHIBIT "A" - Preliminary Utility Plan (sheet C4.00)

1. INTRODUCTION

1.1 SUMMARY OF PROPOSED DEVELOPMENT:

Proposed development consists of a maximum of fifty-four (54) residential duplex units fronting on a proposed internal looping 28' wide private drive. Main access is provided off Dove Valley Road and emergency access is provided from Scottsdale Road. The purpose of this sewer capacity design report is to provide preliminary analysis of the impact that this development will have on the City's sewer system.

1.2 LOCATION DESCRIPTION:

The project property consists of one (1) parcel of land located at the SEC of N Scottsdale Road and E Dove Valley Road in the NW ¼ of the NW ¼ of the NW ¼ of Section 14, Township 5 North, Range 4 East of the Gila and Salt River Base and Meridian, Maricopa County, Scottsdale, Arizona; Parcel ID number is APN: 216-51-298. Refer to **FIGURE 1 - Vicinity Map** for the project's location with respect to major cross streets

The site is bounded by E. Dove Valley Road to the north with R-4R ESL (HD) zoned residential across (Winfield), N. Scottsdale Road to the west with R1-10 ESL zoned residential across (Terravita), C-2 ESL zoned commercial (Summit at Scottsdale) to the south and south east, and R-3 ESL (Proposed Paloma) to the east.

1.3 REFERENCES:

The project site is shown in the City's General Plan Conceptual Land Use Map as commercial surrounded by Cultural/Institutional or Public, Urban Neighborhoods, Resort/Tourism, Developed Open Space (Golf Courses), and Suburban Neighborhoods.

2. DESIGN DOCUMENTATION

2.1 DESIGN COMPLIANCE:

The analysis of the proposed and existing sewer system is done in compliance with Chapter 7 – Wastewater of the City of Scottsdale 2010 update of the Design Standards & Policies Manual (DS&PM). Design flow calculations for the on-site system will be based on the recommendations in Section 7-1.403 of the DS&PM.

3. EXISTING CONDITIONS

3.1 EXISTING ZONING & LAND USE:

Land ownership, as defined by ALTA/ACSM Land Title Survey by AW Land Surveying, Inc. dated 12/18/17 includes net area of parcel 12.660+/- acres (13.313+/- acres gross area) of land designated as zone R-3 ESL with a portion south of the residential development designated as commercial C-2 ESL (Central Business District) and is undeveloped.

3.2 EXISTING TOPOGRAPHY, VEGETATION AND LANDFORM FEATURES:

The site is undeveloped natural desert with past scarring on portions of the property. The site is relatively flat, with slopes varying from about 1% to 4% from east to south-west. FIRM Map Number 04013C0895L dated October 16, 2013 indicates this site is designated as Zone "X". As such, it is defined as areas of minimal flood hazard, which are the areas outside of Special Flood Hazard Areas, and higher than the elevation of the 0.2 percent-annual-chance flood. Refer to **FIGURE 2** for an aerial of the overall project existing conditions.

3.3 EXISTING UTILITIES:

Sanitary Sewer: QS 56-45 City of Scottsdale

- A non-City of Scottsdale sanitary sewer main is present in E Dove Valley Road to the north of the site. This sewer main is owned, operated, and maintained by Black Mountain Sewer Corp. system and serves the residential development to the north east of the site.
- An 18" VCP sewer main is shown in Scottsdale Road for the full length of the sites boundary with three manholes to the west of the property. Two of the manholes are located near the north boundary of the site with one manhole located approximately 390' south of the properties northern boundary line. The COS's quarter section map indicates the sewer main is 17' east of the Scottsdale Road center line. The manhole is noted with what appears to be a rim elevation of 2243.11 and a station of 5+88. The invert elevations of the service are not shown on the quarter section map. Said ALTA survey indicates the sewer near the centerline of Scottsdale Road is approximately thirteen (13) feet deep.

Refer to **FIGURE 3** for the City quarter section map (**QS 56-45**)

4 PROPOSED CONDITIONS

4.1 SITE PLAN:

The property is proposed to be developed with a lot configuration for 54 residential duplex units. The development will include a 28' wide road system entering from Dove Valley Road. Refer to **Sheet C4.00** for proposed site layout.

4.2 PROPOSED SEWER SYSTEM:

Sanitary sewer is available in Scottsdale Road. The main in Dove Valley Road services the north and northeast. The new condominiums are proposed to be serviced from a new 8" main in the proposed private roadway out letting to Scottsdale Road near the southwest corner of the site. Refer to **Sheet C4.00** for the Preliminary Utility Plan

4.3 MAINTENANCE RESPONSIBILITIES:

The on-site sewer line for the proposed development will be public and located within right-of-way or easements to the City of Scottsdale. Therefore, the on-site and off-site sanitary sewer will be maintained by the City.

5 SANITARY SYSTEM COMPUTATIONS

5.1 SEWER FLOW DEMANDS:

DS&PM, Chapter 7 – Wastewater specifies that for residential uses, sanitary sewer lines 8 to 12 inches in diameter will be designed using 100 gallons per person per day. City staff verified demand to be based on 2.5 persons per dwelling unit. Commercial use (Club House) demand will be designed using 0.5 gpd per sq. ft.

Therefore, the average design flow is:

- Residential: 54 units x 100 gallons x 2.5 people/du = 13,500 gpd (Average)
- Commercial: 320 sf x 0.5 gallons/sf = 160 gpd (Average)
- Total Average Day Design flow = 13,500 + 160 = **13,660 gpd.**

5.2 VARIANCE FROM STATED DESIGN FLOWS:

Stated design flows for the on-site system will be used as recommended.

5.3 SEWER SYSTEM ANALYSIS (Off-Site):

The proposed sanitary sewer demands contribute a relatively small quantity toward the overall existing 18" sewer main capacity. Scottsdale Road trunk line is a master planned facility and has sufficient capacity to serve this project as determined by city staff. Refer to Figure 4 for the d/D model.

5.4 DEMAND FACTORS:

DS&PM requires a peak factor of 4 for residential and 3 for commercial. Therefore, from Section 5.1:

- Residential: 13,500 gpd x 4 = 54,000 gpd (Peak)
- Commercial: 160 gpd x 3 = 480 gpd (Peak)
- Total Peak Demand = 54,000 + 480 = **54,480 gpd**

5.5 SEWER CAPACITY CALCULATIONS

An 8" diameter sanitary sewer pipe at s=0.53% (n=0.013) has a flow capacity at ~~14%~~ ^{21%} full for the proposed peak flow of 54,480 gpd.

6. SUMMARY

6.1 SUMMARY OF PROPOSED IMPROVEMENTS:

- The proposed wastewater improvement was designed based on the current City of Scottsdale's design standards and policies.

- The existing sanitary main being tied into is capable of supporting the projected average flow for the development.

6.2 PROJECT SCHEDULE:

As a residential development the infrastructure is proposed to be constructed in a single phase to accommodate dwelling unit growth. The dwelling units may be phased based on consumer demand.

6.3 PALOMA INFRASTRUCTURE:

A 20' sewer and water easement is provided along the southern property line of this project to serve Sewer and water infrastructure for the anticipated Paloma residential subdivision directly adjacent to the east. Final design and construction of the infrastructure for the Paloma development will be by others. ✓

7 SUPPORTING MAPS

7.1 PRELIMINARY UTILITY PLAN

Refer to **Sheet C4.00** for Preliminary Utility Plan

8 REFERENCES

1. *COS QS Sewer Plan number 56-45*
2. *City of Scottsdale Design Standards & Policies Manual, 2010 (Chapter 7 – Wastewater)*

* Sewer Service Line for the Club/guard house shall be 6" per DSPM, Section 7-1.409.

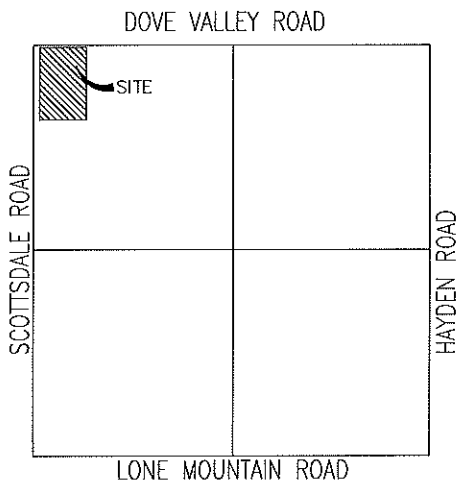


FIGURE 1
VICINITY MAP
NTS

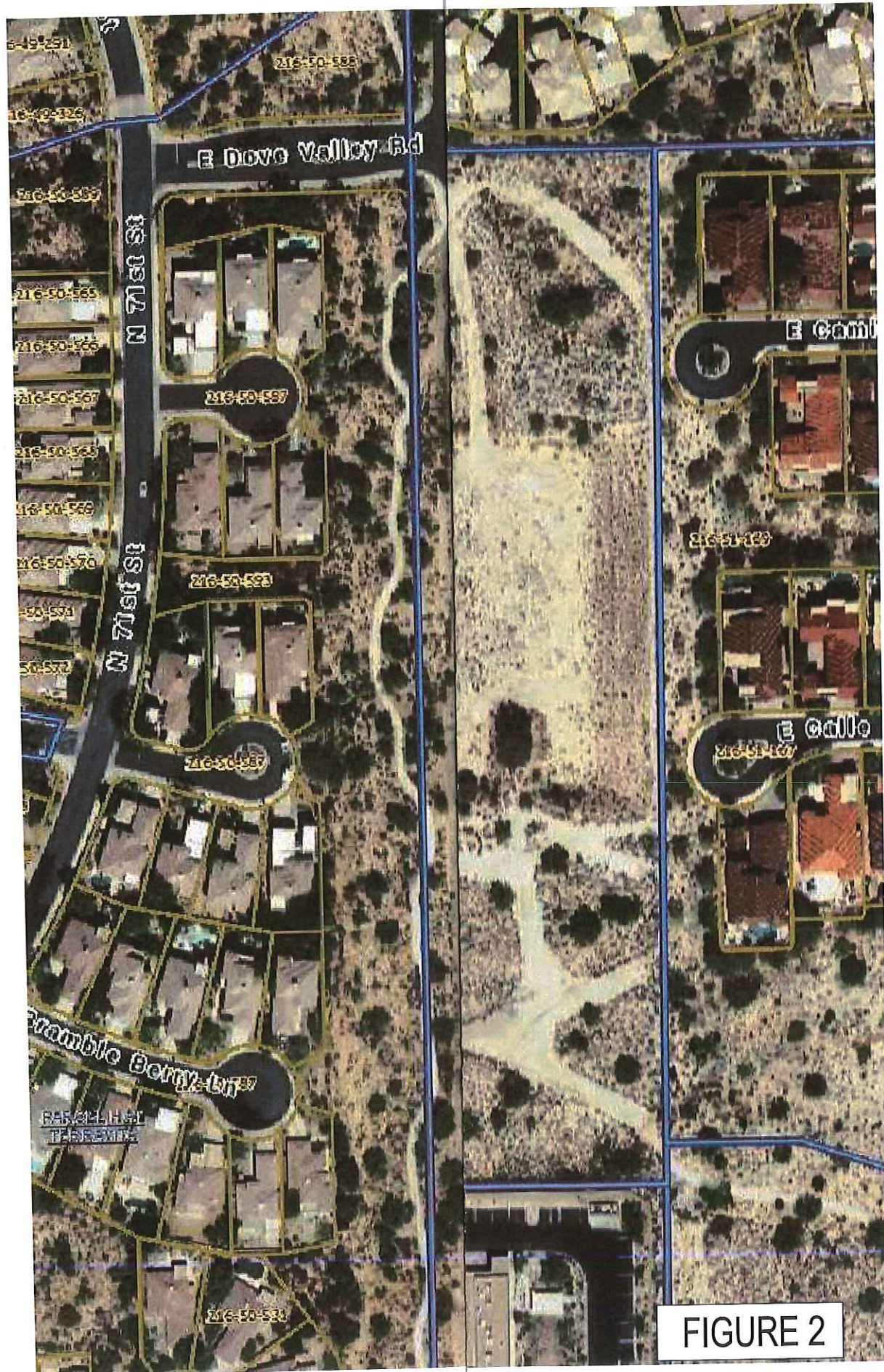
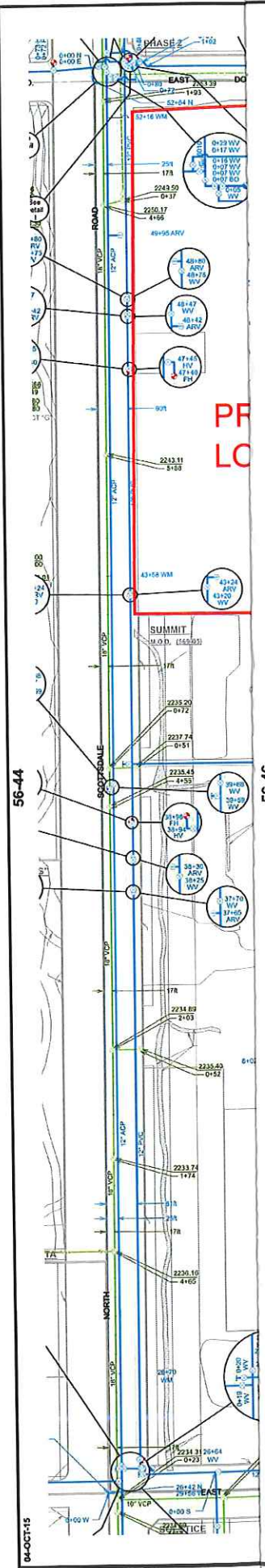


FIGURE 2

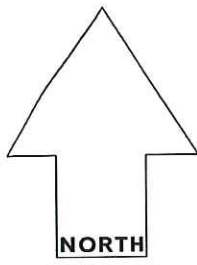
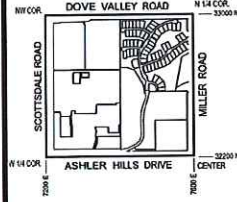


GENERAL NOTES:
 THIS IS A COMPUTER GENERATED DRAWING. FOR ANY REVISIONS PLEASE CONTACT THE CITY OF SCOTTSDALE GIS DEPARTMENT AT (480) 312-7792.
 THE SECTIONLINE BEARING AND DISTANCES ARE BASED ON THE CITY OF SCOTTSDALE GPS SURVEY OF SEPTEMBER 1991. BEARINGS ARE IN DD AND DISTANCES ARE FLATTENED TO GROUND. WHERE NO CORNER WAS FOUND THE DIMENSIONS ARE GIVEN TO CALCULATED SECTION CORNERS AND ARE NOTED AS CALCULATED ON THE MAP.

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
- Not found per improvement plans (4)
- Not found per improvement plans and/or O.S. maps (5)
- Found in field no reference (6)

VICINITY MAP



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
56-45
 NW 1/4 SEC. 14 T5N R4E

FIGURE 5

8" Pipe with Proposed Flow Conditions

Project Description

Friction Method Manning Formula
Solve For Normal Depth

Input Data

Roughness Coefficient 0.013
Channel Slope 0.00530 ft/ft
Diameter 0.67 ft
Discharge 54,480.00 gal/day

Results

Normal Depth 0.14 ft
Flow Area 0.05 ft²
Wetted Perimeter 0.63 ft
Hydraulic Radius 0.08 ft
Top Width 0.54 ft
Critical Depth 0.13 ft
Percent Full 20.7 % ✓
Critical Slope 0.00663 ft/ft
Velocity 1.59 ft/s
Velocity Head 0.04 ft
Specific Energy 0.18 ft
Froude Number 0.90
Maximum Discharge 0.96 ft³/s
Discharge Full 0.89 ft³/s
Slope Full 0.00005 ft/ft
Flow Type SubCritical

GVF Input Data

Downstream Depth 0.00 ft
Length 0.00 ft
Number Of Steps 0

GVF Output Data

Upstream Depth 0.00 ft
Profile Description
Profile Headloss 0.00 ft
Average End Depth Over Rise 0.00 %
Normal Depth Over Rise 20.68 %
Downstream Velocity Infinity ft/s

8" Pipe with Proposed Flow Conditions

GVF Output Data

Upstream Velocity	Infinity	ft/s
Normal Depth	0.14	ft
Critical Depth	0.13	ft
Channel Slope	0.00530	ft/ft
Critical Slope	0.00663	ft/ft