

WATER CAPACITY REPORT

Silverstone Parcel "G"

Single-Family Duplex Homes & Townhomes
SWC Pinnacle Peak Rd. & Miller Road
Scottsdale, AZ

Prepared For:



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EXPIRES 9/30/2017

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1. EXECUTIVE SUMMARY

The subject project is the proposed development of sixty (60) duplex units and one-hundred twenty-four (124) townhomes with associated open space and tracts for roads/utilities at the SWC of Pinnacle Peak Road and Miller Road in Scottsdale, AZ. The parcel is currently zoned R-5 PCD.

Water service for the development is to be provided by the City of Scottsdale via new taps to an existing 12" water main in the 74th Street ROW. The project will tap the existing main at three locations and loop through the site with 8" mains. Off-site improvements are limited to new 8" main connections to the City's 12" main to provide for extension of public mains into the parcel to serve the domestic service, irrigation, and fire protection to the proposed homes. Accessible mains are also located in Miller Road but are on different zones and will not be used.

Certified fire hydrant flow testing was performed on February 22, 2017, by Arizona Flow Testing LLC at locations as shown on the provided report. The test was performed at 9:00 a.m. The fire flow test recorded a static pressure of 74 psi and residual pressure of 62 psi at 2,614 gpm. The actual flow test documentation is included in **APPENDIX I**.

2. INTRODUCTION

2.1 PLAN OBJECTIVE:

The purpose of this report is to provide discussions and calculations defining the water system concepts necessary to comply with the requirements outlined in the City of Scottsdale Design Standards & Policy Manual. Preparation of this report has been done in accordance with the requirements of the City's Design Standards & Policy Manual.

2.2 SITE LOCATION

The subject property consists of a parcel of land located at the SWC of Pinnacle Peak Road and Miller Road in Scottsdale, AZ. It is located in a portion of Section 14, Township 4 North, Range 4 East of the Gila and Salt River Base and Meridian, Maricopa County, Arizona.

- Arizona Parcel ID numbers APN: **212-03-599**
- Parcel "G" of the "Map of Dedication and Parcel Map for Silverstone at Pinnacle Peak" recorded in Book 883, page 17 per Maricopa County Recorder.
- Parcel "G" contains 23.73 net acres as shown on the ALTA/NSPS Land Title Survey prepared by Alliance Land Surveying, LLC dated March 13, 2017.

The site is further bound by 74th Street to the west and residentially developed Silverstone Parcel "H" to the south.

Refer to **FIGURE 1 - Vicinity Map** for the project's location with respect to major cross streets.

2.3 PROPOSED DEVELOPMENT

2.3.1 Existing Site Description:

Land ownership, as defined by ALTA/NSPS Land Title Survey by Alliance Land Surveying, LLC dated 03/13/2017 includes 1,033,641 Sq. Ft. (23.73 acres) of undeveloped land. City of Scottsdale zoning map designates this parcel as R-5 PCD.

The parcel is currently natural desert, sloping approximately 3% - 4% from northeast to southwest with approximately 40' of fall. There is an existing ditch within a 50' Landscape Setback and Drainage Easement along the northerly property line. This ditch captures City of Scottsdale identified greater than 50-cfs flows from the north and ultimately discharges to the Rawhide Wash just west of Silverstone Parcel "F". Approximately along the 50' setback line is an existing flood wall associated with the channel. There is an existing ditch within a 30' Landscape Setback and Drainage Easement along the easterly property line constructed with the Miller Road improvements. A Flood Wall also existing along this ditch.

There are no apparent rock outcroppings or wetlands that would pose design or construction problems. All areas of the site to be disturbed shall be revegetated to a natural condition subject to city Development Review Board approval.

Refer to **FIGURE 2** for an aerial of the overall project existing conditions.

The City of Scottsdale Water Quarter Section Map (44-45) shows water mains in adjacent roads as follows:

- A 12" DIP line runs approximately 42' south of the Pinnacle Peak Road centerline. A PRV is located at the NE corner of the site.
- Within Miller Road (76th Street alignment) are three lines running parallel. They are approximately 41' to 45' west of the centerline. From west to east are 12", 20", and 36" water lines. A 16" C-900 main is in the east side of the road.
- A 12" DIP main is located in 74th Street approximately 2' east of the centerline.
- A PRV is on this main at the NW corner of the site.

Refer to **FIGURE 3** for the COS Water Quarter Section Map (44-45).

2.3.2 Proposed Site Development:

The property is proposed to be developed with new lot configurations into sixty (60) single-family duplex units and one-hundred twenty-four (124) townhomes on 23.73 acres (7.75 units per net acre). Development will include 24' wide paved roads with rolled curbs and gated entrances from 74th Street.

The project is separated into two (2) development areas. The north half will consist of the sixty (60) duplex units and the south half will be the 124 townhomes. 8" mains are proposed to loop each site and tap the existing 12" City of Scottsdale main in 74th Street at three locations. Irrigation, fire and domestic services to the homes will be tapped off these new 8" mains. Refer to **APPENDIX III** for Preliminary Utility plans

3. DESIGN CRITERIA

3.1 UTILITY DEVELOPER GUIDE CRITERIA

This project is designed in accordance with the City of Scottsdale DS&PM. Refer to **Table 1** below for applicable "Design Criteria for Water Systems".

Table 1 - COS Design Criteria by demand type

Land Use	Average Day Demand (gal/day/unit)	Max Day Peaking Factor	Peak Hour Peaking Factor
7.75 DU/AC	248.2	2.0	3.5

The system pressures, velocities, head losses and fire flow are in accordance with the COS DS&PM as follows:

Minimum Pressures:

50 psi residual pressure at the highest delivery point and 30 psi @ max day +fire flow

Maximum Pressures:

In accordance with the DS&PM, all structures shall have an individual pressure reducing valve on the customer side of the meter.

Velocity & Head loss:

- *10 ft. headloss maximum per 1,000 linear feet of pipe for pipes less than 16 inches in diameter.*

Hazen-Williams Coefficient 130 (for new pipes)

Fire Flows:

This site is under the jurisdiction of the City of Scottsdale Fire Department. Fire flows must be in accordance with the 2015 International Fire Code which is determined as follows:

- Dwellings having a fire-flow calculation area that does not exceed 3,600 s.f. shall be 1,000 gpm for 1 hour.

These buildings will be sprinkled and may qualify for a 50% reduction; therefore, the minimum fire flow demand could be 500 gpm with City approval.

4. DEMANDS

4.1 PROJECT USE DESCRIPTION

Proposed demands for this project are based on dwelling units at a density of 7.9 DU/ac or less. Refer to **Table 2** below for the proposed water demand calculations based on the design criteria established in *Section 3.1* above

	Units	ADD (gpd/unit)	Max Day Peaking Factor	Peak Hour Peaking Factor	Avg. Day Demand (GPD)	Max. Day Demand (GPD)	Peak Hour (GPD)
Duplex Units	60	248.2	2	3.5	14,892.0	29,784.0	52,122.0
Townhome Units	124	248.2	2	3.5	30,776.8	61,553.6	107,718.8
TOTAL PROPOSED BLDG UNITS	184						
		TOTAL DEMANDS (GPD):			45,668.8	91,337.6	159,840.8
		TOTAL DEMANDS (gpm):			31.7	63.4	111.0

4.2 ZONING

Per Figure 6.1-3, this project is in pressure zone 6

4.3 PHASING OF DEMANDS

The infrastructure will be constructed in its entirety for each type of unit (duplex or townhomes) but may be phased between the types. The residential units may be phased as dictated by home demand.

4.4 SUMMARY NARRATIVE OF DEMANDS

The demand scenario that governs the design was the peak hour demand.

5. EXISTING FACILITIES / CONDITIONS

5.1 PREVIOUS MASTER PLANS

No existing master plan or water report is available from COS for this site.

6. PROPOSED FACILITIES

6.1 DISTRIBUTION SYSTEM PIPING

6.1.1 Onsite:

The proposed water supply will consist of new 8" water line main and fire hydrants. The proposed 8" pipe will be DIP in accordance with COS requirements.

Domestic service will be provided by 1" copper service connections to each lot, including meter and backflow prevention.

6.1.2 Offsite Infrastructure:

Offsite construction consists of a three new 8" mains tapping from the existing 12" main in 74th Street.

7. WATER MODEL

7.1 DESCRIPTION OF MODEL

The proposed water system is designed to meet the criteria of COS Water, the Arizona Department of Environmental Quality ("ADEQ"), and Maricopa County Environmental Services Department ("MCESD").

Bentley WaterCAD® Version 8i is the computer modeling tool used in this study.

Network analysis input parameters included the following:

1. Pipe diameters (inches)
2. Pipe lengths (feet)
3. Pipes invert elevations (feet)
4. General Purpose Valve to model Water Meter and Double Check Valve Assembly
5. A reservoir and a pump to model the fire flow test performed
6. System demands (gpm)
7. Fire flows (gpm)
8. Model piping is ductile iron pipe using Hazen-Williams frictional losses ($C = 130$)

Output parameters included but were not limited to:

1. Pressure (psig)
2. Flow rates (gpm)
3. Velocities (fps)
4. Head loss (feet)

7.2 ASSUMPTIONS

Please refer to *Section 3.1* for the design criteria.

The general methodology used to design this public water infrastructure consists of modeling a network of water distribution mains to meet COS pressure, head loss, and water demand requirements during daily demands and fire events. The connection to the water system is modeled as a reservoir and pump. The pump will simulate the pressure drop and the available flow from the existing water system as depicted by the fire flow test. Refer to **APPENDIX I** for a copy of the fire flow test results.

Irrigation, water feature, and pool filling are from a dedicated service and meter. It is assumed that these water uses occur during low peak hours and are therefore not considered in this modeling.

7.3 SUMMARY OF RESULTS

A summary of the modeling results is presented below in **Table 3**. Detailed WaterCAD® results are presented in **Appendix II**.

Table 3: WaterCAD® Analysis Results

Demand Scenario	Water Demand (GMP)	Pressure (PSIG)				Velocity (ft/s)	Pipe ID
		Min.	Node	Max.	Node		
Average Day	31.7	54.4	J-6	69.7	J-16	0.10	P-19
Maximum Day	63.4	54.4	J-6	69.6	J-16	0.21	P-19
Peak Hour	111.0	54.4	J-6	69.6	J-16	0.36	P-19
Max. + Fire Flow	1000 + Max day	31.2	J-6	N/A	N/A	N/A	N/A

These results indicate that the proposed water system meets *COS DS&PM* for daily water usage and fire flow events.

8. SUMMARY / CONCLUSIONS

8.1 CONFORMANCE TO DESIGN GOALS

- The proposed water main is designed in accordance with COS design standards and policies¹.
 - Minimum 50 psi residual @ highest delivery point required, 54.4 psi provided.
 - Minimum 30 psi @ max+ fire flow required, 31.2 psi provided.
 - 10 fps maximum velocity is not exceeded.
 - The system supports the minimum 1000 gpm fire flow requirements.
- The results shown in the modeling summary (refer to Section 7.3) indicate that the proposed water system meets the COS criteria for Daily water usage and fire flow events as described in Section 3.1.

8.2 REQUIRED FACILITIES AND PHASING

- Proposed facility improvements for this project are limited to new 8" mains, new fire hydrants, and 1" domestic service connections.
- The duplex units and townhomes may be constructed in separate phases.

REFERENCES

1. *City of Scottsdale Design Standards & Policies Manual-Chapter 6, Water*

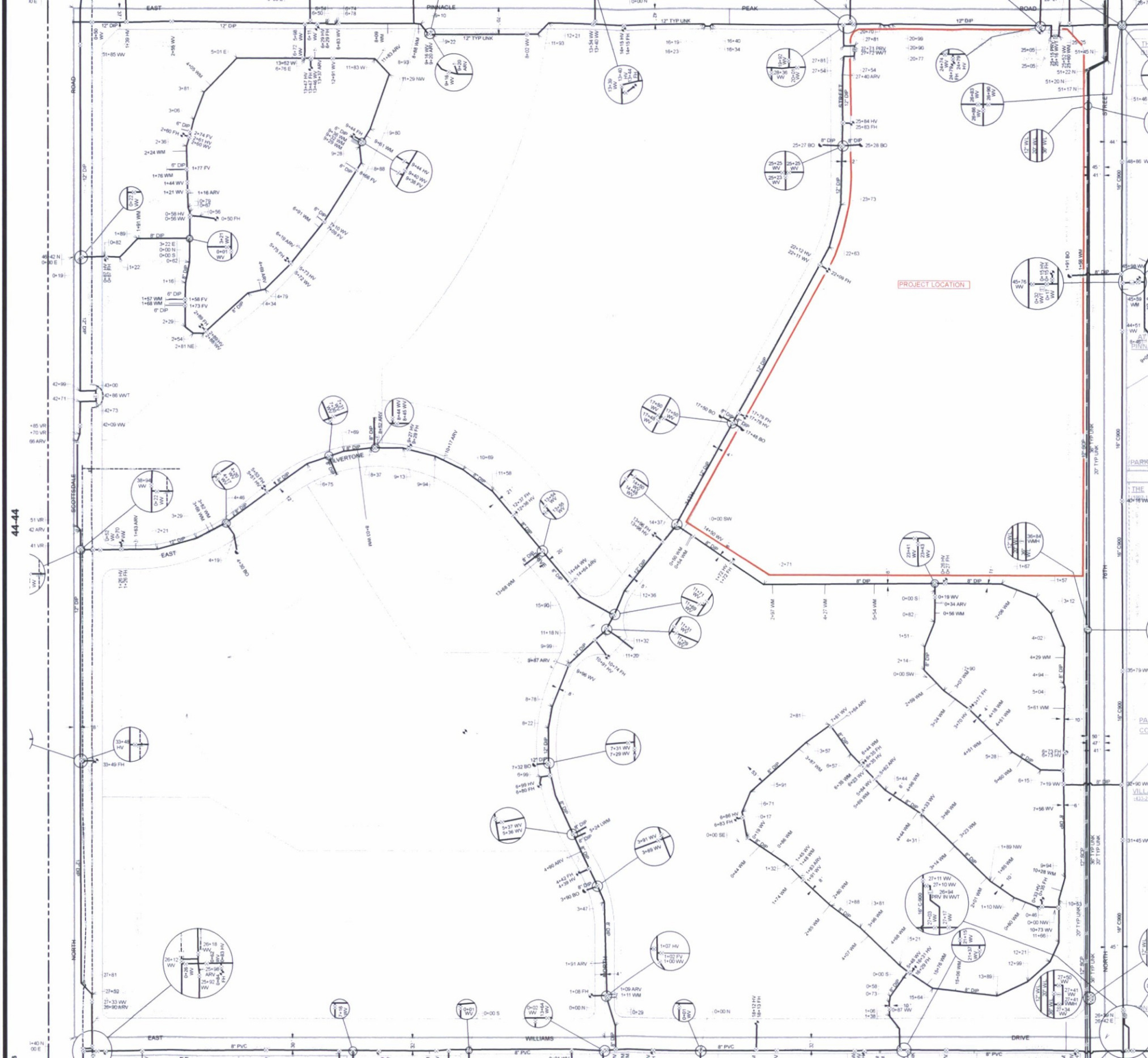
N Miller Rd & E Pinnacle Peak Rd

PROJECT LOCATION



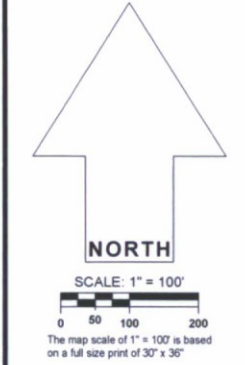
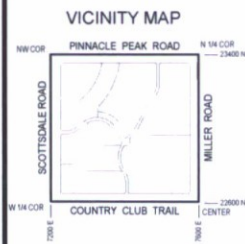
FIGURE 2
AERIAL

NOTICE
 THE CITY OF SCOTTSDALE
 IS PROVIDING THIS INFORMATION AS A SERVICE TO THE PUBLIC. THE CITY OF SCOTTSDALE IS NOT RESPONSIBLE FOR ANY ERRORS OR OMISSIONS. THE CITY OF SCOTTSDALE IS NOT PROVIDING THIS INFORMATION FOR ANY PURPOSE OTHER THAN THAT SPECIFIED. IT SHOULD NOT BE RELIED UPON WITHOUT FIELD VERIFICATION.



LEGEND:

- Air Release Valve
- Non-potable Air Release Valve
- Blowoff
- Cap
- Cathodic Protection
- Fill Drain
- Fire Hydrant
- Non-GPS Point
- Pressure Reducing Valve
- Pump
- Reducer
- Sample Station
- Water Manhole
- Non-Potable Manhole
- Well
- Valve
- Non-potable Valve
- Vault
- Water Main
- Non-Potable Main
- Fire / Private Main
- Non-Scottsdale Main



WATER
 QUARTER SECTION MAP
44-45
 NW 1/4 SEC. 14 T4N R4E

FIGURE 3



APPENDIX I

Flow Test Data

Arizona Flow Testing LLC

HYDRANT FLOW TEST REPORT

Project Name: Silverstone Parcel G
Project Address: Pinnacle Peak Road and Miller Road, Scottsdale, Arizona, 85255
Client Project No.: Not Provided
Arizona Flow Testing Project No.: 17045
Flow Test Permit No.: C52645
Date and time flow test conducted: February 22, 2017 at 9:00 AM
Data is current and reliable until: August 22, 2017
Conducted by: Floyd Vaughan – Arizona Flow Testing, LLC (480-250-8154)
Witnessed by: Larry Frandle – City of Scottsdale-Inspector (602-541-4942)

Raw Test Data

Static Pressure: **74.0 PSI**
(Measured in pounds per square inch)

Residual Pressure: **62.0 PSI**
(Measured in pounds per square inch)

Pitot Pressure: **37.0 PSI**
(Measured in pounds per square inch)

Diffuser Orifice Diameter: One (4 inch)
(Measured in inches)

Coefficient of Diffuser: .9

Flowing GPM: **2,614 GPM**
(Measured in gallons per minute)

GPM @ 20 PSI: **5,526 GPM**

Data with 10% Safety Factor

Static Pressure: **68.4 PSI**
(Measured in pounds per square inch)

Residual Pressure: **54.4 PSI**
(Measured in pounds per square inch)

Distance between hydrants: Approx. 400 Feet

Main size: Not Provided

Flowing GPM: **2,614 GPM**

GPM @ 20 PSI: **5,107 GPM**

Flow Test Location

North ↑










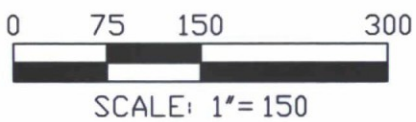
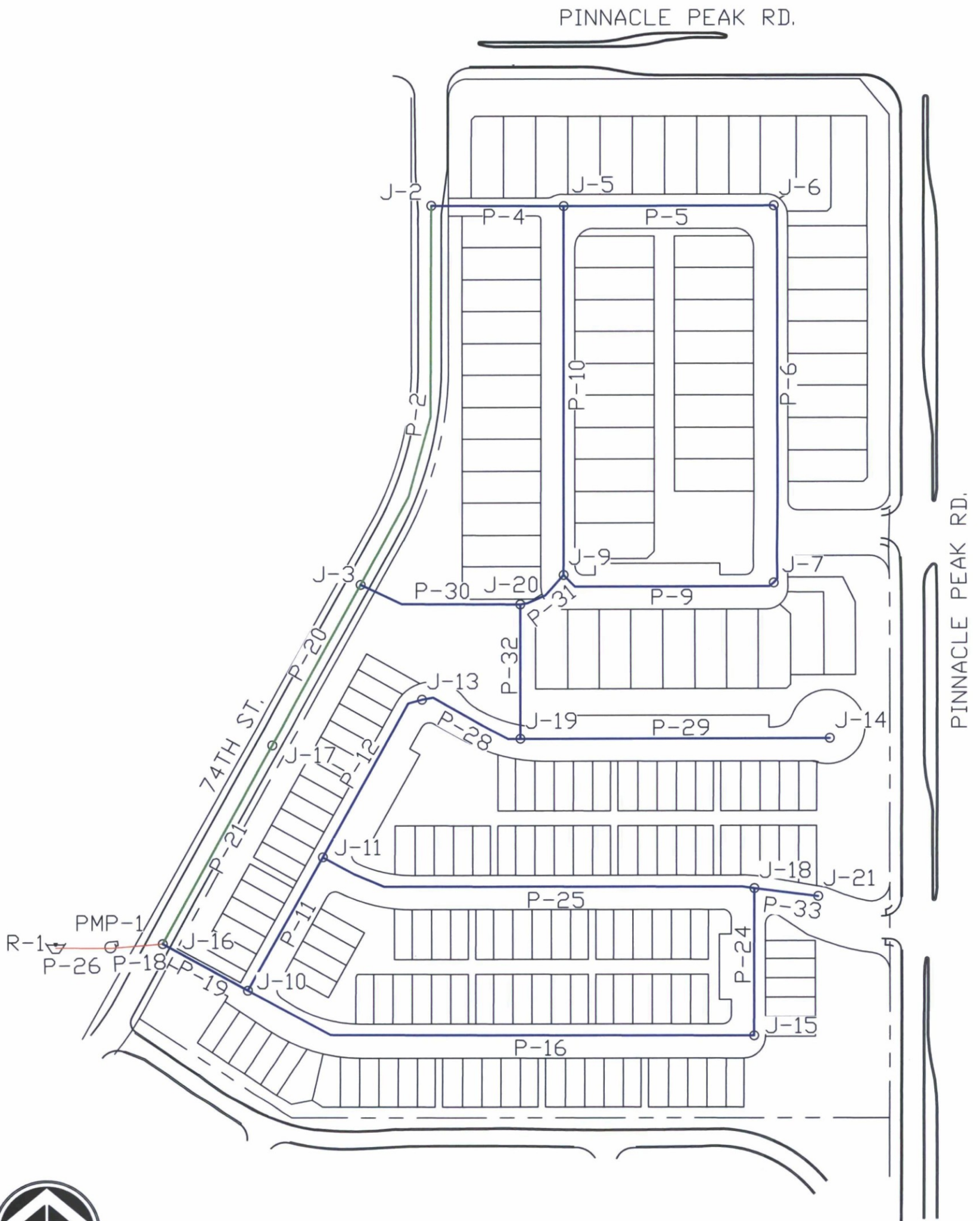
APPENDIX II

Water Model Results

SILVERSTONE PARCEL G – PHASE II PIPE AND JUNCTION MAP

LEGEND

-  8" PIPE
-  12" PIPE
-  JUNCTION
-  RESEVOIR
-  PUMP
(FLOW TEST LOCATION)



SEG

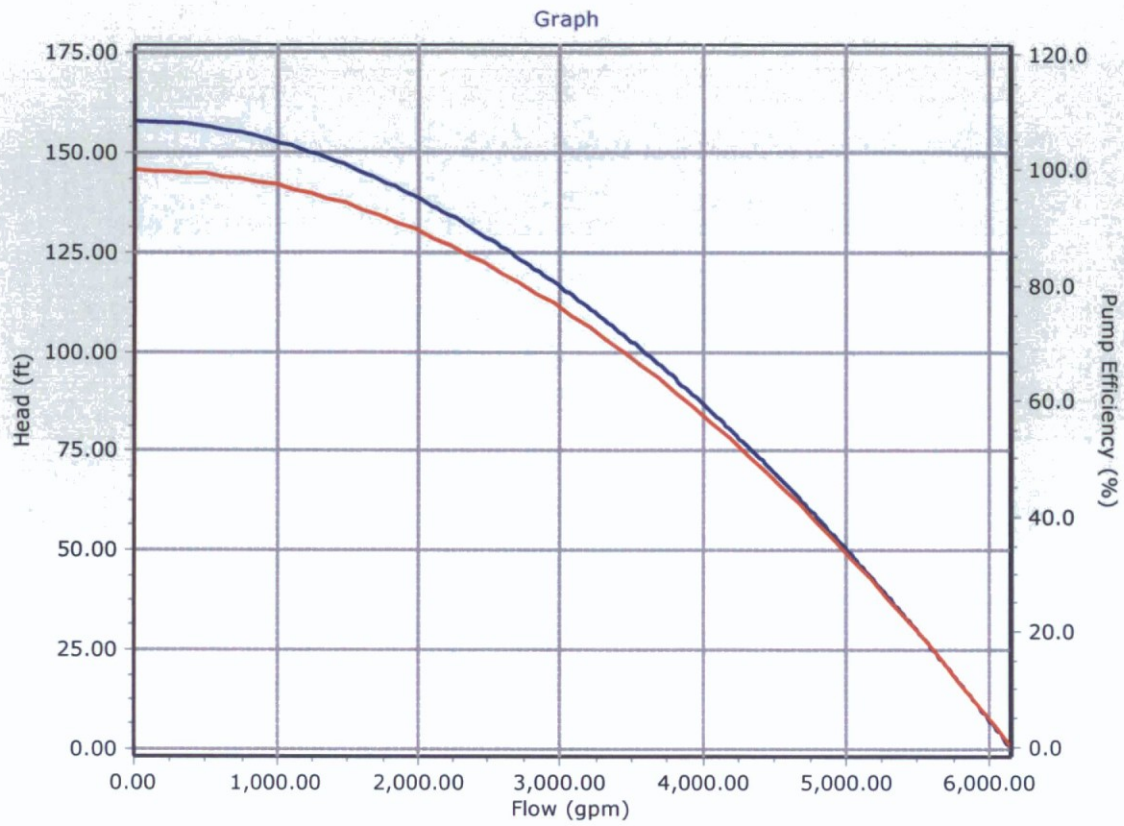
**SUSTAINABILITY
ENGINEERING
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WWW.AZSEG.COM TEL. 480.588.7226

Pump Definition Detailed Report: Hydrant Flow Test

Element Details			
ID	98	Notes	
Label	Hydrant Flow Test		
Pump Definition Type			
Pump Definition Type	Standard (3 Point)	Design Head	125.66 ft
Shutoff Flow	0.00 gpm	Maximum Operating Flow	5,107.00 gpm
Shutoff Head	158.00 ft	Maximum Operating Head	46.20 ft
Design Flow	2,614.00 gpm		
Pump Efficiency Type			
Pump Efficiency Type	Best Efficiency Point	Motor Efficiency	100.0 %
BEP Efficiency	100.0 %	Is Variable Speed Drive?	False
BEP Flow	0.00 gpm		
Transient (Physical)			
Inertia (Pump and Motor)	0.000 lb-ft ²	Specific Speed	SI=25, US=1280
Speed (Full)	0 rpm	Reverse Spin Allowed?	True

Pump Definition Detailed Report: Hydrant Flow Test



FlexTable: Junction Table
Active Scenario: Average Day

Label	Elevation (ft)	Demand (gpm)	Hydraulic Grade (ft)	Pressure (psi)
J-2	1,867.75	0.00	1,994.49	54.8
J-3	1,849.50	0.00	1,994.49	62.7
J-5	1,864.64	2.93	1,994.49	56.2
J-6	1,868.74	2.76	1,994.49	54.4
J-7	1,861.00	2.07	1,994.49	57.8
J-9	1,856.80	2.59	1,994.49	59.6
J-10	1,843.00	5.69	1,994.49	65.5
J-11	1,844.75	4.31	1,994.49	64.8
J-13	1,847.00	1.03	1,994.49	63.8
J-14	1,852.00	1.21	1,994.49	61.6
J-15	1,848.30	4.31	1,994.49	63.2
J-16	1,833.50	0.00	1,994.49	69.7
J-17	1,842.00	0.00	1,994.49	66.0
J-18	1,851.03	2.76	1,994.49	62.1
J-19	1,848.00	1.55	1,994.49	63.4
J-20	1,855.62	0.00	1,994.49	60.1
J-21	1,851.79	0.52	1,994.49	61.7

FlexTable: Pipe Table
Active Scenario: Average Day

Label	Length (Scaled) (ft)	Start Node	Stop Node	Diameter (in)	Hazen-Williams C	Flow (gpm)	Velocity (ft/s)	Headloss Gradient (ft/ft)
P-2	531	J-2	J-3	12.0	130.0	-7.40	0.02	0.000
P-4	179	J-2	J-5	8.0	130.0	7.40	0.05	0.000
P-5	284	J-5	J-6	8.0	130.0	2.92	0.02	0.000
P-6	512	J-6	J-7	8.0	130.0	0.16	0.00	0.000
P-9	292	J-9	J-7	8.0	130.0	1.91	0.01	0.000
P-10	497	J-5	J-9	8.0	130.0	1.55	0.01	0.000
P-11	206	J-10	J-11	8.0	130.0	6.07	0.04	0.000
P-12	257	J-13	J-11	8.0	130.0	1.43	0.01	0.000
P-16	699	J-15	J-10	8.0	130.0	-4.40	0.03	0.000
P-18	69	J-16	PMP-1	24.0	130.0	-31.72	0.02	0.000
P-19	130	J-10	J-16	8.0	130.0	-16.16	0.10	0.000
P-20	246	J-3	J-17	12.0	130.0	-15.57	0.04	0.000
P-21	306	J-17	J-16	12.0	130.0	-15.57	0.04	0.000
P-24	198	J-18	J-15	8.0	130.0	-0.09	0.00	0.000
P-25	592	J-11	J-18	8.0	130.0	3.19	0.02	0.000
P-26	75	R-1	PMP-1	24.0	130.0	31.72	0.02	0.000
P-28	148	J-13	J-19	8.0	130.0	-2.46	0.02	0.000
P-29	417	J-19	J-14	8.0	130.0	1.21	0.01	0.000
P-30	222	J-3	J-20	8.0	130.0	8.17	0.05	0.000
P-31	73	J-20	J-9	8.0	130.0	2.95	0.02	0.000
P-32	180	J-19	J-20	8.0	130.0	-5.22	0.03	0.000
P-33	86	J-18	J-21	8.0	130.0	0.52	0.00	0.000

FlexTable: Reservoir Table
Active Scenario: Average Day

Label	Elevation (ft)	Zone	Flow (Out net) (gpm)	Hydraulic Grade (ft)
R-1	1,836.50	<None>	31.72	1,836.50

FlexTable: Pump Table
Active Scenario: Average Day

Label	Elevation (ft)	Pump Definition	Status (Initial)	Hydraulic Grade (Suction) (ft)	Hydraulic Grade (Discharge) (ft)	Flow (Total) (gpm)	Pump Head (ft)
PMP-1	1,836.50	Hydrant Flow Test	On	1,836.50	1,994.49	31.72	157.99

FlexTable: Junction Table
Active Scenario: Max Day

Label	Elevation (ft)	Demand (gpm)	Hydraulic Grade (ft)	Pressure (psi)
J-2	1,867.75	0.00	1,994.46	54.8
J-3	1,849.50	0.00	1,994.46	62.7
J-5	1,864.64	5.86	1,994.46	56.2
J-6	1,868.74	5.52	1,994.46	54.4
J-7	1,861.00	4.14	1,994.46	57.7
J-9	1,856.80	5.17	1,994.46	59.6
J-10	1,843.00	11.38	1,994.46	65.5
J-11	1,844.75	8.62	1,994.46	64.8
J-13	1,847.00	2.07	1,994.46	63.8
J-14	1,852.00	2.41	1,994.46	61.6
J-15	1,848.30	8.62	1,994.46	63.2
J-16	1,833.50	0.00	1,994.47	69.6
J-17	1,842.00	0.00	1,994.47	66.0
J-18	1,851.03	5.52	1,994.46	62.1
J-19	1,848.00	3.10	1,994.46	63.4
J-20	1,855.62	0.00	1,994.46	60.1
J-21	1,851.79	1.03	1,994.46	61.7

FlexTable: Pipe Table
Active Scenario: Max Day

Label	Length (Scaled) (ft)	Start Node	Stop Node	Diameter (in)	Hazen-Williams C	Flow (gpm)	Velocity (ft/s)	Headloss Gradient (ft/ft)
P-2	531	J-2	J-3	12.0	130.0	-14.79	0.04	0.000
P-4	179	J-2	J-5	8.0	130.0	14.79	0.09	0.000
P-5	284	J-5	J-6	8.0	130.0	5.84	0.04	0.000
P-6	512	J-6	J-7	8.0	130.0	0.32	0.00	0.000
P-9	292	J-9	J-7	8.0	130.0	3.82	0.02	0.000
P-10	497	J-5	J-9	8.0	130.0	3.09	0.02	0.000
P-11	206	J-10	J-11	8.0	130.0	12.13	0.08	0.000
P-12	257	J-13	J-11	8.0	130.0	2.86	0.02	0.000
P-16	699	J-15	J-10	8.0	130.0	-8.80	0.06	0.000
P-18	69	J-16	PMP-1	24.0	130.0	-63.44	0.04	0.000
P-19	130	J-10	J-16	8.0	130.0	-32.31	0.21	0.000
P-20	246	J-3	J-17	12.0	130.0	-31.13	0.09	0.000
P-21	306	J-17	J-16	12.0	130.0	-31.13	0.09	0.000
P-24	198	J-18	J-15	8.0	130.0	-0.18	0.00	0.000
P-25	592	J-11	J-18	8.0	130.0	6.37	0.04	0.000
P-26	75	R-1	PMP-1	24.0	130.0	63.44	0.04	0.000
P-28	148	J-13	J-19	8.0	130.0	-4.93	0.03	0.000
P-29	417	J-19	J-14	8.0	130.0	2.41	0.02	0.000
P-30	222	J-3	J-20	8.0	130.0	16.34	0.10	0.000
P-31	73	J-20	J-9	8.0	130.0	5.90	0.04	0.000
P-32	180	J-19	J-20	8.0	130.0	-10.44	0.07	0.000
P-33	86	J-18	J-21	8.0	130.0	1.03	0.01	0.000

FlexTable: Reservoir Table

Active Scenario: Max Day

Label	Elevation (ft)	Zone	Flow (Out net) (gpm)	Hydraulic Grade (ft)
R-1	1,836.50	<None>	63.44	1,836.50

FlexTable: Pump Table
Active Scenario: Max Day

Label	Elevation (ft)	Pump Definition	Status (Initial)	Hydraulic Grade (Suction) (ft)	Hydraulic Grade (Discharge) (ft)	Flow (Total) (gpm)	Pump Head (ft)
PMP-1	1,836.50	Hydrant Flow Test	On	1,836.50	1,994.47	63.44	157.97

Fire Flow Node FlexTable: Fire Flow Report
Active Scenario: Max Day plus 1000 gpm Fire Flow

Label	Fire Flow (Needed) (gpm)	Fire Flow (Available) (gpm)	Flow (Total Needed) (gpm)	Flow (Total Available) (gpm)	Pressure (Residual Lower Limit) (psi)	Pressure (Calculated Residual) (psi)	Junction w/ Minimum Pressure (System)	Design Velocity of Maximum Pipe (ft/s)	Pipe w/ Maximum Design Velocity
J-2	1,000.00	2,500.00	1,000.00	2,500.00	30.0	37.4	J-6	5.62	P-21
J-3	1,000.00	2,500.00	1,000.00	2,500.00	30.0	47.0	J-6	5.70	P-21
J-5	1,000.00	2,500.00	1,005.86	2,505.86	30.0	37.2	J-6	8.59	P-4
J-6	1,000.00	2,500.00	1,005.52	2,505.52	30.0	31.2	J-5	9.93	P-5
J-7	1,000.00	2,480.16	1,004.14	2,484.30	30.0	35.0	J-6	10.00	P-9
J-9	1,000.00	2,427.32	1,005.17	2,432.49	30.0	42.2	J-6	10.00	P-31
J-10	1,000.00	2,089.14	1,011.38	2,100.52	30.0	53.4	J-6	10.00	P-19
J-11	1,000.00	2,383.14	1,008.62	2,391.76	30.0	47.9	J-6	10.00	P-19
J-13	1,000.00	2,500.00	1,002.07	2,502.07	30.0	44.2	J-6	8.15	P-19
J-14	1,000.00	1,564.30	1,002.41	1,566.72	30.0	45.9	J-6	10.00	P-29
J-15	1,000.00	2,174.83	1,008.62	2,183.45	30.0	43.3	J-6	10.00	P-19
J-16	1,000.00	2,500.00	1,000.00	2,500.00	30.0	56.2	J-6	1.82	P-26
J-17	1,000.00	2,500.00	1,000.00	2,500.00	30.0	51.1	J-6	6.05	P-21
J-18	1,000.00	2,202.81	1,005.52	2,208.32	30.0	41.8	J-21	10.00	P-19
J-19	1,000.00	2,500.00	1,003.10	2,503.10	30.0	44.2	J-6	9.38	P-32
J-20	1,000.00	2,500.00	1,000.00	2,500.00	30.0	42.8	J-6	6.97	P-30
J-21	1,000.00	1,565.68	1,001.03	1,566.72	30.0	49.2	J-6	10.00	P-33

FlexTable: Junction Table
Active Scenario: Max Day plus 1000 gpm Fire Flow

Label	Elevation (ft)	Demand (gpm)	Hydraulic Grade (ft)	Pressure (psi)
J-2	1,867.75	0.00	1,994.46	54.8
J-3	1,849.50	0.00	1,994.46	62.7
J-5	1,864.64	5.86	1,994.46	56.2
J-6	1,868.74	5.52	1,994.46	54.4
J-7	1,861.00	4.14	1,994.46	57.7
J-9	1,856.80	5.17	1,994.46	59.6
J-10	1,843.00	11.38	1,994.46	65.5
J-11	1,844.75	8.62	1,994.46	64.8
J-13	1,847.00	2.07	1,994.46	63.8
J-14	1,852.00	2.41	1,994.46	61.6
J-15	1,848.30	8.62	1,994.46	63.2
J-16	1,833.50	0.00	1,994.47	69.6
J-17	1,842.00	0.00	1,994.47	66.0
J-18	1,851.03	5.52	1,994.46	62.1
J-19	1,848.00	3.10	1,994.46	63.4
J-20	1,855.62	0.00	1,994.46	60.1
J-21	1,851.79	1.03	1,994.46	61.7

FlexTable: Pipe Table
Active Scenario: Max Day plus 1000 gpm Fire Flow

Label	Length (Scaled) (ft)	Start Node	Stop Node	Diameter (in)	Hazen-Williams C	Flow (gpm)	Velocity (ft/s)	Headloss Gradient (ft/ft)
P-2	531	J-2	J-3	12.0	130.0	-14.79	0.04	0.000
P-4	179	J-2	J-5	8.0	130.0	14.79	0.09	0.000
P-5	284	J-5	J-6	8.0	130.0	5.84	0.04	0.000
P-6	512	J-6	J-7	8.0	130.0	0.32	0.00	0.000
P-9	292	J-9	J-7	8.0	130.0	3.82	0.02	0.000
P-10	497	J-5	J-9	8.0	130.0	3.09	0.02	0.000
P-11	206	J-10	J-11	8.0	130.0	12.13	0.08	0.000
P-12	257	J-13	J-11	8.0	130.0	2.86	0.02	0.000
P-16	699	J-15	J-10	8.0	130.0	-8.80	0.06	0.000
P-18	69	J-16	PMP-1	24.0	130.0	-63.44	0.04	0.000
P-19	130	J-10	J-16	8.0	130.0	-32.31	0.21	0.000
P-20	246	J-3	J-17	12.0	130.0	-31.13	0.09	0.000
P-21	306	J-17	J-16	12.0	130.0	-31.13	0.09	0.000
P-24	198	J-18	J-15	8.0	130.0	-0.18	0.00	0.000
P-25	592	J-11	J-18	8.0	130.0	6.37	0.04	0.000
P-26	75	R-1	PMP-1	24.0	130.0	63.44	0.04	0.000
P-28	148	J-13	J-19	8.0	130.0	-4.93	0.03	0.000
P-29	417	J-19	J-14	8.0	130.0	2.41	0.02	0.000
P-30	222	J-3	J-20	8.0	130.0	16.34	0.10	0.000
P-31	73	J-20	J-9	8.0	130.0	5.90	0.04	0.000
P-32	180	J-19	J-20	8.0	130.0	-10.44	0.07	0.000
P-33	86	J-18	J-21	8.0	130.0	1.03	0.01	0.000

FlexTable: Reservoir Table

Active Scenario: Max Day plus 1000 gpm Fire Flow

Label	Elevation (ft)	Zone	Flow (Out net) (gpm)	Hydraulic Grade (ft)
R-1	1,836.50	<None>	63.44	1,836.50

FlexTable: Pump Table
Active Scenario: Max Day plus 1000 gpm Fire Flow

Label	Elevation (ft)	Pump Definition	Status (Initial)	Hydraulic Grade (Suction) (ft)	Hydraulic Grade (Discharge) (ft)	Flow (Total) (gpm)	Pump Head (ft)
PMP-1	1,836.50	Hydrant Flow Test	On	1,836.50	1,994.47	63.44	157.97

FlexTable: Junction Table
Active Scenario: Peak Hour

Label	Elevation (ft)	Demand (gpm)	Hydraulic Grade (ft)	Pressure (psi)
J-2	1,867.75	0.00	1,994.40	54.8
J-3	1,849.50	0.00	1,994.40	62.7
J-5	1,864.64	10.26	1,994.40	56.1
J-6	1,868.74	9.65	1,994.39	54.4
J-7	1,861.00	7.24	1,994.39	57.7
J-9	1,856.80	9.05	1,994.39	59.5
J-10	1,843.00	19.91	1,994.40	65.5
J-11	1,844.75	15.09	1,994.39	64.7
J-13	1,847.00	3.62	1,994.39	63.8
J-14	1,852.00	4.22	1,994.39	61.6
J-15	1,848.30	15.09	1,994.39	63.2
J-16	1,833.50	0.00	1,994.41	69.6
J-17	1,842.00	0.00	1,994.40	65.9
J-18	1,851.03	9.65	1,994.39	62.0
J-19	1,848.00	5.43	1,994.39	63.3
J-20	1,855.62	0.00	1,994.39	60.0
J-21	1,851.79	1.81	1,994.39	61.7

FlexTable: Pipe Table
Active Scenario: Peak Hour

Label	Length (Scaled) (ft)	Start Node	Stop Node	Diameter (in)	Hazen-Williams C	Flow (gpm)	Velocity (ft/s)	Headloss Gradient (ft/ft)
P-2	531	J-2	J-3	12.0	130.0	-25.89	0.07	0.000
P-4	179	J-2	J-5	8.0	130.0	25.89	0.17	0.000
P-5	284	J-5	J-6	8.0	130.0	10.22	0.07	0.000
P-6	512	J-6	J-7	8.0	130.0	0.56	0.00	0.000
P-9	292	J-9	J-7	8.0	130.0	6.68	0.04	0.000
P-10	497	J-5	J-9	8.0	130.0	5.41	0.03	0.000
P-11	206	J-10	J-11	8.0	130.0	21.23	0.14	0.000
P-12	257	J-13	J-11	8.0	130.0	5.00	0.03	0.000
P-16	699	J-15	J-10	8.0	130.0	-15.40	0.10	0.000
P-18	69	J-16	PMP-1	24.0	130.0	-111.03	0.08	0.000
P-19	130	J-10	J-16	8.0	130.0	-56.54	0.36	0.000
P-20	246	J-3	J-17	12.0	130.0	-54.48	0.15	0.000
P-21	306	J-17	J-16	12.0	130.0	-54.48	0.15	0.000
P-24	198	J-18	J-15	8.0	130.0	-0.31	0.00	0.000
P-25	592	J-11	J-18	8.0	130.0	11.15	0.07	0.000
P-26	75	R-1	PMP-1	24.0	130.0	111.03	0.08	0.000
P-28	148	J-13	J-19	8.0	130.0	-8.62	0.06	0.000
P-29	417	J-19	J-14	8.0	130.0	4.22	0.03	0.000
P-30	222	J-3	J-20	8.0	130.0	28.60	0.18	0.000
P-31	73	J-20	J-9	8.0	130.0	10.32	0.07	0.000
P-32	180	J-19	J-20	8.0	130.0	-18.28	0.12	0.000
P-33	86	J-18	J-21	8.0	130.0	1.81	0.01	0.000

FlexTable: Reservoir Table
Active Scenario: Peak Hour

Label	Elevation (ft)	Zone	Flow (Out net) (gpm)	Hydraulic Grade (ft)
R-1	1,836.50	<None>	111.03	1,836.50

FlexTable: Pump Table
Active Scenario: Peak Hour

Label	Elevation (ft)	Pump Definition	Status (Initial)	Hydraulic Grade (Suction) (ft)	Hydraulic Grade (Discharge) (ft)	Flow (Total) (gpm)	Pump Head (ft)
PMP-1	1,836.50	Hydrant Flow Test	On	1,836.50	1,994.41	111.03	157.91



"LEED®ing and Developing Smart Projects"

APPENDIX III

Preliminary Utility Plan



COMMENT TRACKING LOG

"LEED®ing and Developing Smart Projects"

CLIENT:	Khov	DATE:	Oct-17
PROJECT:	Silverstone Pacer G Scottsdale 170101	REFERENCE:	City of Scottsdale 2nd review

No.	Sheet No.	Reviewer	COMMENT	Responsible Party	RESPONSE
The following comments are from: Nerijus Baronas				Drainage Review	
1	Page 3 Item 6	Nerijus Baronas	It appears that some location of overflow have been identified clearly. Basins A, C, and E don't have overflow location and elevation identified, please review and add required identifiers.	SEG	Basin overflow locations have been added to all retention areas
2	Page 4 Item 7	Nerijus Baronas	Review profiles to ensure that improvement plan sheets match storm drain profiles. Profile for Basin B (UG) has number of discrepancies when compared to storm drain alignment depicted on the plan sheets. See mark-up on the C sheets.	SEG	Plan and profile coordinated. Profile flipped 180 degrees to clarify.
3	Page 6 Item 9	Nerijus Baronas	Missing HWL labels on sections B-B and C-C	SEG	HWL have been added

9-PP-2017
10/13/17



COMMENT TRACKING LOG

"LEED[®]ing and Developing Smart Projects"

8	C3.00	Nerijus Baronas	Basin B, Identify basin overflow location and elevation	SEG	Information added at retention area
9	C3.00	Nerijus Baronas	Add Note: Vertical drops greater than 24" will require hand rail installation. Bassins deeper than 3' will required guard rail from access protection.	SEG	Note added to C3.00
10	C3.10	Nerijus Baronas	How is it flowing on a side slope?	SEG	Flow line locations has been revised
11	C3.10	Nerijus Baronas	Label prop. contours	SEG	elevations added
12	C3.10	Nerijus Baronas	Add elevation at CB-3C	SEG	elevations added
13	C3.10	Nerijus Baronas	Label overflow	SEG	Information added at retention areas. Refer to C3.10 for Basin F info
14	C3.10	Nerijus Baronas	Add max slope	SEG	Side slopes are now called out
15	C3.10	Nerijus Baronas	Call out surface overflow for all back drainage	SEG	Note added
16	C3.10	Nerijus Baronas	Clarify flow path through Basin E	SEG	conflicts fixed.
17	C3.30	Nerijus Baronas	Multiple comments on structure call-out ID's	SEG	Basin B Profile flipped for clarity. Profile and plan view coordinated.
18	C3.30	Nerijus Baronas	Revise TW condition and update HGL.	SEG	UG basin is not affected by open basin HWE. Overflow is CB 3A
19	C3.30	Nerijus Baronas	Add S.D.	SEG	Profile revised, S.D added at structure.