

# FINAL WATER REPORT

for

**Magnolia on Osborn**

Scottsdale, Arizona

Prepared For:



Prepared by:



**Sustainability Engineering Group**

5240 N. 16<sup>th</sup> Street, Suite 105

Phoenix, AZ 85016

480.588.7226 [www.azSEG.com](http://www.azSEG.com)

Project Number: 220205

Submittal Date: June 1, 2023

Case No.: 914-PA-2021

Plan Check No.: TBD

## 1. Table of Contents

1. INTRODUCTION.....	1
1.1. SUMMARY OF PROPOSED DEVELOPMENT .....	1
1.2. LEGAL DESCRIPTION .....	1
2. DESIGN DOCUMENTATION .....	1
2.1. DESIGN COMPLIANCE.....	1
2.2. PROCEDURES, POLICIES AND METHODOLOGIES.....	1
2.3. SOFTWARE ACKNOWLEDGEMENT: .....	1
3. EXISTING CONDITIONS.....	1
3.1. EXISTING ZONING, LAND USE & ADJACENT PARCELS .....	1
3.2. EXISTING TOPOGRAPHY, VEGETATION AND LANDFORM FEATURES:.....	2
3.3. EXISTING WATER INFRASTRUCTURE: .....	2
3.4. CERTIFIED FLOW TEST RESULTS OF EXISTING WATER SYSTEM:.....	2
4. PROPOSED CONDITIONS.....	3
4.1. SITE PLAN:.....	3
4.2. PROPOSED WATER CONNECTION TO EXISTING SYSTEM: .....	3
4.3. SECOND SOURCE: .....	3
4.4. WATER REQUIREMENTS:.....	3
4.5. MAINTENANCE RESPONSIBILITIES:.....	3
5. WATER SYSTEM COMPUTATIONS.....	3
5.1. WATER DEMANDS .....	3
5.2. SOFTWARE MODELING: .....	4
5.3. MINIMUM PRESSURE REQUIREMENTS: .....	4
5.4. WATER SYSTEM ANALYSIS:.....	4
5.5. WATER SERVICE NEEDS: .....	5
6. SUMMARY / CONCLUSIONS.....	5
6.1. SUMMARY: .....	5
6.2. PROJECT SCHEDULE:.....	5
7. REFERENCES.....	5



**LIST OF TABLES:**

TABLE 1	-	Water Demand Calculations
TABLE 2	-	WaterCAD® Analysis Results

**LIST OF EXHIBITS:**

EXHIBIT 1	-	Vicinity Map
EXHIBIT 2	-	Aerial
EXHIBIT 3	-	Water Quarter Section Map

**APPENDIX**

APPENDIX I	-	Fire Hydrant Flow Test Report
APPENDIX II	-	Utility Plan
APPENDIX III	-	Water Model Map and Reports

## 1. INTRODUCTION

### 1.1. SUMMARY OF PROPOSED DEVELOPMENT

Magnolia on Osborn is a proposed 92-unit four-story multifamily development, with 5,800 sq.ft. of retail space located near the northeast corner of 70<sup>th</sup> Street and Osborn Road in Scottsdale, Arizona.

The purpose of this report is to provide an updated water system analysis supporting the proposed residential development. Domestic, irrigation and fire line service will be provided off the existing 12" water line along E. 6<sup>th</sup> Street.

### 1.2. LEGAL DESCRIPTION

The following parcels of subdivided land are located in the NE ¼ of Section 27, Township 2 North, Range 4 East of the Gila and Salt River Base and Meridian in Scottsdale, Arizona. Refer to **EXHIBIT 1** for a vicinity map.

- APN 130-13-064; 31,490 sq.ft. (0.73 ac) NET
- APN 130-13-062; 31,430 sq.ft. (0.72 ac) NET

The APNs are platted as Lots 16 and 18 in Orange Acres, as recorded in Book 31, Page 14 of Maricopa County Records. The total land area is 1.45 acres, more or less.

## 2. DESIGN DOCUMENTATION

### 2.1. DESIGN COMPLIANCE

The proposed water connections are designed to meet design criteria of the City of Scottsdale Water Resources Department ("the city"), the Arizona Department of Environmental Quality ("ADEQ"), and Maricopa County Environmental Services Department ("MCESD").

### 2.2. PROCEDURES, POLICIES AND METHODOLOGIES

The general methodology used to evaluate public water infrastructure consists of modeling a local network of water distribution mains to meet the city's pressure, velocity, and water demand requirements during daily demand and fire events. Connection to the water system is modeled as a reservoir and pump. The pump will simulate a pressure drop and available flow from the existing water system as depicted by the fire flow test.

### 2.3. SOFTWARE ACKNOWLEDGEMENT:

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

## 3. EXISTING CONDITIONS

### 3.1. EXISTING ZONING, LAND USE & ADJACENT PARCELS

The two existing parcels are presently zoned C-3.

70<sup>th</sup> Street Lofts northwest of the site is zoned D/DMU-2, a parcel southwest of the site is zoned C-3 and both parcels to the east are zone C-3.

### **3.2. EXISTING TOPOGRAPHY, VEGETATION AND LANDFORM FEATURES:**

The west parcel is a parking lot. The east parcel is an office building with surface parking and an enclosed storage yard. Site topography slopes from the northwest to the southeast with approximately three feet of fall. Refer to **EXHIBIT 2** for an aerial of the overall project existing conditions.

### **3.3. EXISTING WATER INFRASTRUCTURE:**

See **EXHIBIT 3** - City of Scottsdale (QS 16-44)

- An 8" ACP water main is located along the south side of Osborn Road approximately 27' south of the road centerline and provides existing metered service to the site. A fire hydrant exists mid-site.
- An 8" ACP water main is located approximately 25' north of East 6<sup>th</sup> Street centerline and provides existing metered service to the site. Another fire hydrant exists mid-site on the north side of the street.
- A 12" DIP water main exists along East 6<sup>th</sup> Street approximately 10' north of the street centerline.
- A fire hydrant exists at the southeast corner of N. 70<sup>th</sup> Street and E. 6<sup>th</sup> Street.
- A fire hydrant exists on the north side of E. Osborn Rd. at the midpoint of the south boundary of the project site.

### **3.4. CERTIFIED FLOW TEST RESULTS OF EXISTING WATER SYSTEM:**

Arizona Flow Testing LLC has performed certified tests on both the 8" and 12" systems. The 12" system tested on February 11, 2022, at 8:30 a.m. recorded a static pressure of 84 psi and residual pressure of 80 psi at 2,946 gpm. The extrapolated flow at 20 psi is 13,165 gpm. The test adjusted to 72 psi static pressure results in a residual pressure of 68 psi. The adjusted flow at 20 psi is 11,769 gpm.

The 8" system tested on October 5, 2021, at 7:00 a.m. recorded a static pressure of 90 psi and residual pressure of 82 psi at 1,842 gpm. The extrapolated flow at 20 psi is 5,942 gpm. The test adjusted to 72 psi static pressure results in a residual pressure of 64 psi. The adjusted flow at 20 psi is 5,061 gpm.

The City of Scottsdale requires the adjusted pressure parameters to be used in the hydraulic analysis. **APPENDIX I** includes the flow test documentation.

## 4. PROPOSED CONDITIONS

### 4.1. SITE PLAN:

All existing onsite structures and service lines will be removed. Existing water meter sizes and serial numbers will be inventoried for fee credit.

Refer to **Appendix II** for the Utility Plan.

### 4.2. PROPOSED WATER CONNECTION TO EXISTING SYSTEM:

Metered services for domestic and landscape water will be tapped off the 12" DIP water line in East 6<sup>th</sup> Street and be installed with backflow prevention. Fire line service will also be provided off the 12" DIP. The existing fire hydrants north and south of the site will remain and have sufficient flow to serve the proposed development. See **APPENDIX II** for a utility plan.

### 4.3. SECOND SOURCE:

The existing system has sufficient valves allowing for fire protection redundancy in the event of local service disruption.

### 4.4. WATER REQUIREMENTS:

The city's design standards govern the fire flow rates used for all buildings per Section 6-1.500 of the City of Scottsdale's Design Standards & Policies Manual ("DS&PM"), dated January 2018. The required available fire flow is 2,500 gpm for commercial and multi-family residential properties, per Section 6-1.501 of the DS&PM.

### 4.5. MAINTENANCE RESPONSIBILITIES:

Water meter and service line connections to the public main will be located within easements and/or right-of-way and be maintained by the city.

The owner will privately maintain on-site domestic and landscape service lines and backflow preventers as will the fire line.

## 5. WATER SYSTEM COMPUTATIONS

### 5.1. WATER DEMANDS

Water demands are per Figure 6.1-2 in the City's DS+PM. The fire hydrant flow test was completed with the existing commercial site occupied. Therefore, the total new demand was reduced by the existing commercial use. The new demand for a proposed project located just north of the site is added to account for the increase in the water model.

**Table 1: Onsite Water Demand Calculations**

	Bldg Area (sq.ft.)	Dwelling Units	ADD (gpm/unit)	Avg. Day Demand (gpm)	Max. Day Demand (gpm)	Peak Hour (gpm)
Residential	-	92	0.2700	24.8	49.7	86.9
Retail	5,800	-	0.0011	6.4	12.9	22.5
Ex. Office	6,195	-	-0.0008	-5.2	-10.3	-18.1
Net Demands				26.1	52.2	91.4

Peaking Factors: Max Day = 2.0, Peak Hour = 3.5

## 5.2. SOFTWARE MODELING:

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

Network analysis input parameters included the following:

- Pipe diameters (inches)
- Pipe lengths (feet)
- Pipes invert elevations (feet – MSL)
- A reservoir and a pump to model the fire flow test
- System demands (gpm)
- Fire flows (gpm)
- Model piping is ductile iron pipe using Hazen-Williams frictional losses (C = 130)

Output parameters included:

- Pressure (psi)
- Flow rates (gpm)
- Velocities (fps)

## 5.3. MINIMUM PRESSURE REQUIREMENTS:

The following system pressure requirements are in accordance with the City's design standards:

Average day, maximum day and peak hour flow demands:

- Minimum pressure = 50 psi
- Maximum pressure = 120 psi

Maximum day plus coincident fire flow demand:

- Minimum pressure = 30 psi
- Maximum pressure = 120 psi

Head loss in the public mains shall not exceed 10 feet per 1,000 feet length of pipe.

## 5.4. WATER SYSTEM ANALYSIS:

A summary of the modeling results is presented below in Table 2. Detailed WaterCAD® reports are presented in **APPENDIX III**.

A 3000 gpm plus max day demand analysis was run for the 12" system along 6<sup>th</sup> Street as this pipe will supply both domestic and fire service to the project. The 8" system along Osborn Road was analyzed for a 1500 gpm fire hydrant demand.

**Table 2: WaterCAD® Analysis Results**

Demand Scenario	Water Demand (GPM)	Pressure (PSI)				Velocity (ft/s)	Pipe ID
		Min.	Node	Max.	Node		
Peak Hour	109.5	70	J-9	73	J-3	0.3	P-3
Max. Day + Fire Flow (12" System)	2,562.0	66	J-2	69	J-1	8.7	P-3
Fire Flow (8" System)	1500	47	J-9	67	J-3	9.6	P-6

These results indicate that the proposed water system meets the City’s criteria for daily water usage and fire flow events.

**5.5. WATER SERVICE NEEDS:**

- All off of 12" DIP line on 6<sup>th</sup> Street:
- Residential demand – 2" meter
- Landscape demand – 1" meter
- Fire service demand – 6" line

**6. SUMMARY / CONCLUSIONS**

**6.1. SUMMARY:**

The proposed water connections are designed to meet criteria of the City’s Design Standards and Policies Manual, the Arizona Department of Environmental Quality (“ADEQ”), and Maricopa County Environmental Services Department (“MCESD”).

The hydraulic output indicates that the surrounding existing public water system and fire hydrants are sufficient to provide domestic, irrigation and fire service to this project.

Pressure regulating valves preset to 80 psi will be required on all water service connections to the building. Backflow prevention will be provided on all metered service connections.

**6.2. PROJECT SCHEDULE:**

As a residential apartment development, the infrastructure and buildings are proposed to be constructed in a single phase.

**7. REFERENCES**

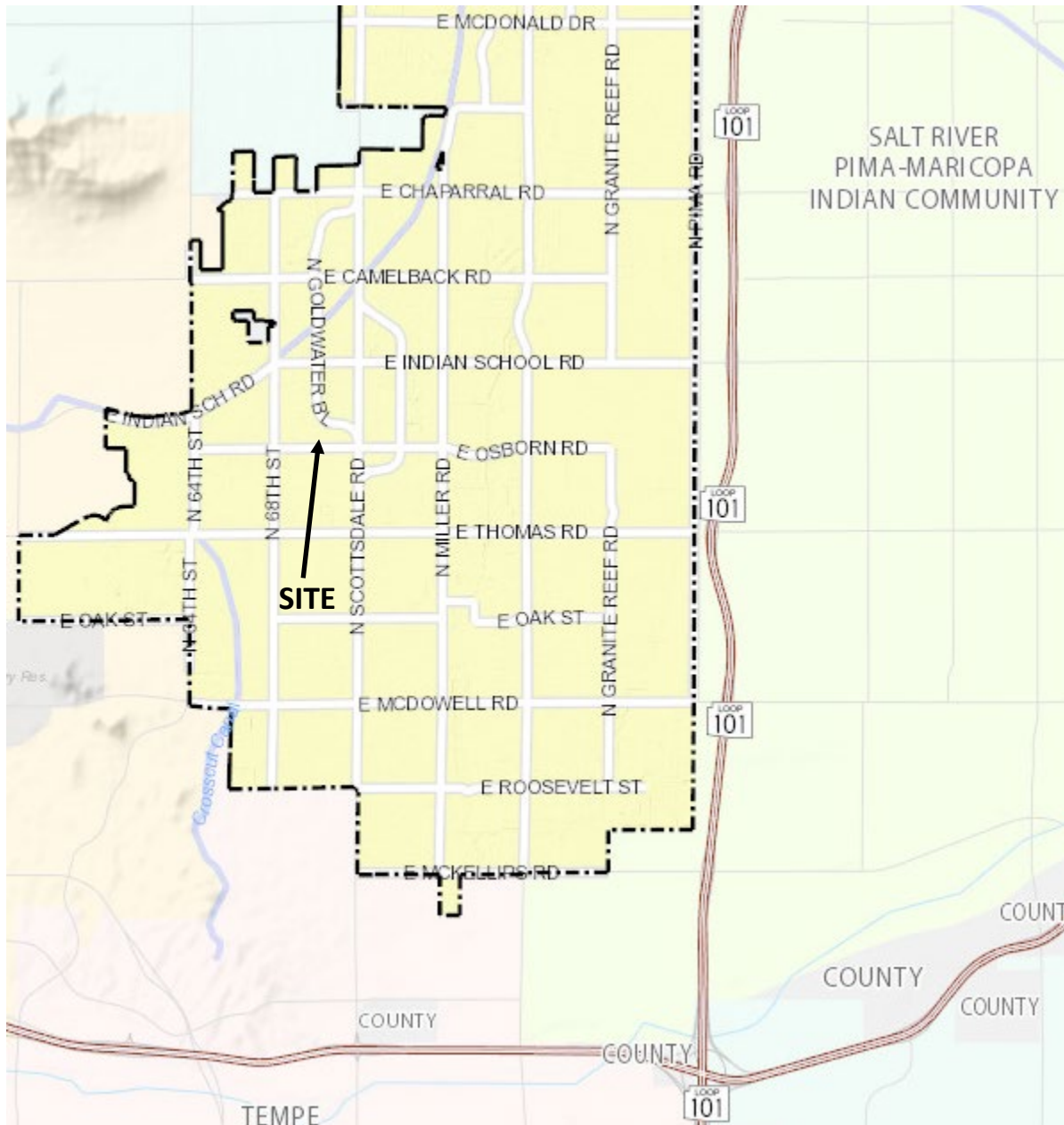
1. COS Water Q-S MAP 16-44
2. City of Scottsdale Design Standards & Policies Manual, 2018 (Chapter 6 – Water)

## *EXHIBITS*

*1. Vicinity Map*

*2. Aerial*

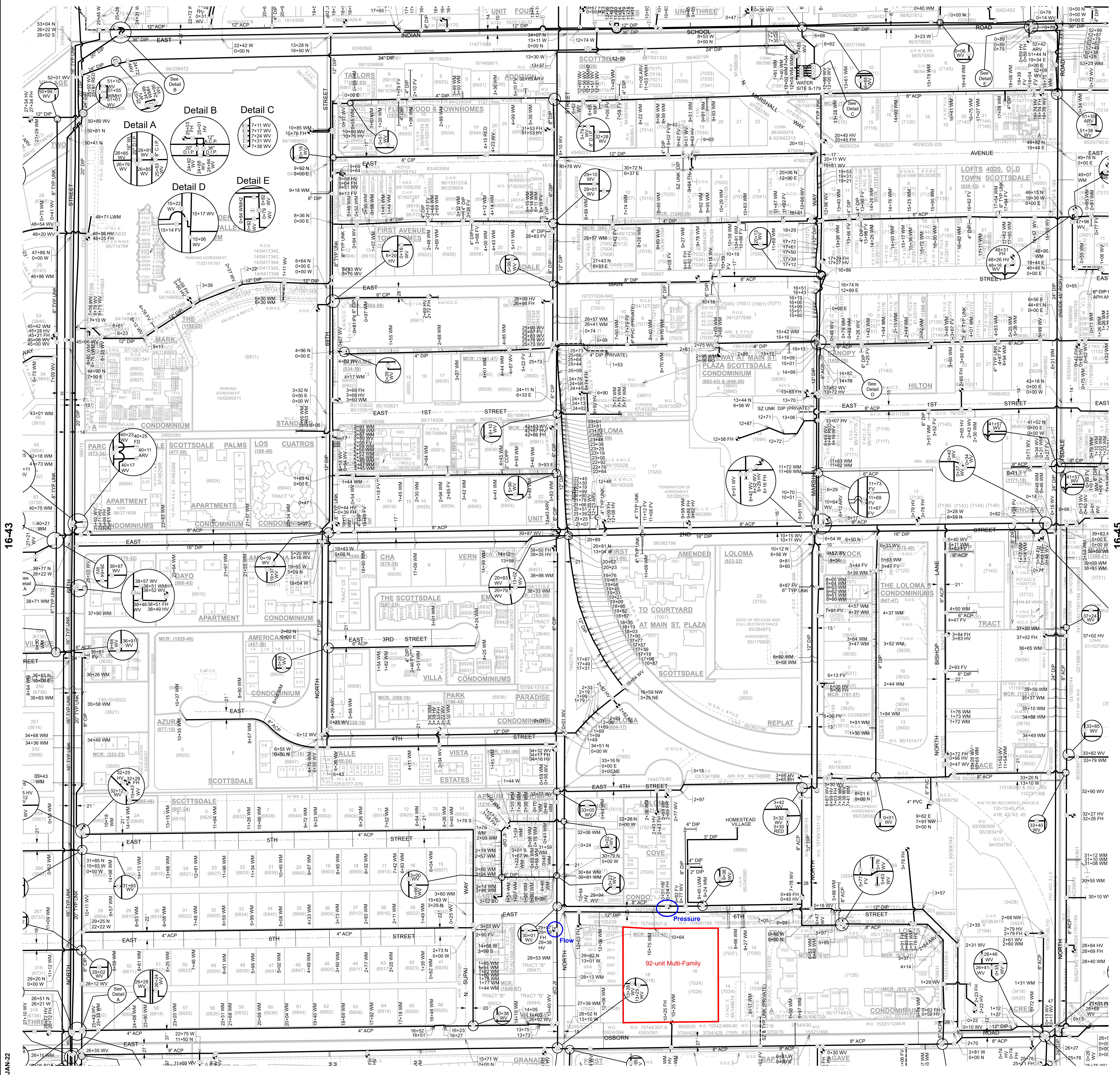
*3. Water Quarter  
Section Map*



## EXHIBIT 1 – Vicinity Map

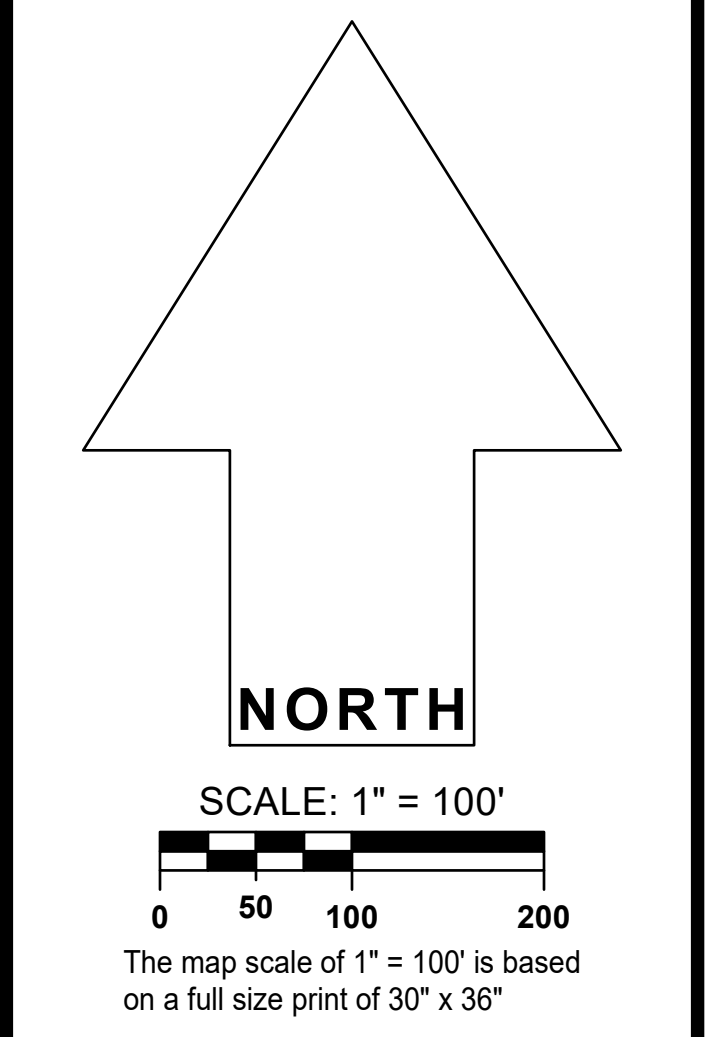
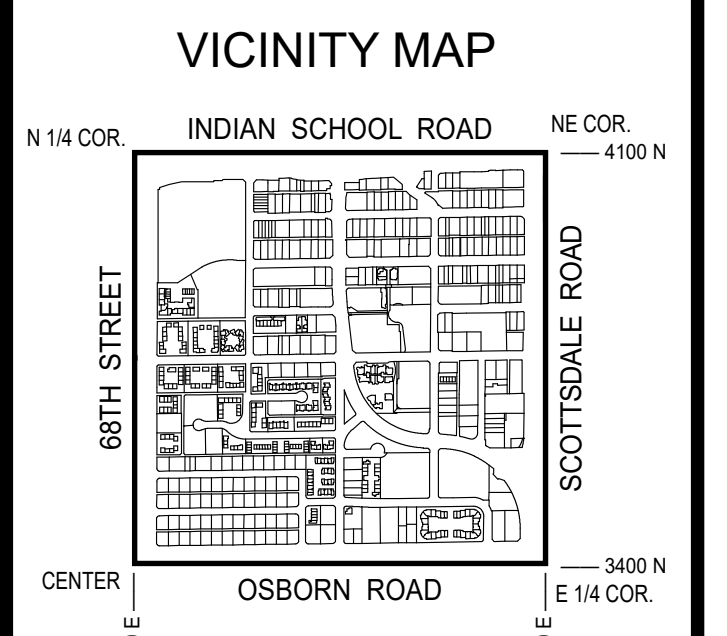
8280 E. Gelding Dr., Suite 101  
Scottsdale, AZ 85260





**GENERAL NOTES:**  
 THIS IS A COMPUTER GENERATED DRAWING. FOR ANY REVISIONS PLEASE CONTACT THE CITY OF SCOTTSDALE GIS DEPARTMENT AT (480) 312-7792.  
 THE SECTION LINE BEARING AND DISTANCES ARE BASED ON THE CITY OF SCOTTSDALE GPS SURVEY OF SEPTEMBER, 1991. BEARINGS ARE NAD 83 GRID 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:**
- 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  
**16-44**  
 NE 1/4 SEC. 27 T2N R4E  
**EXHIBIT 3**

**NOTICE**  
 THIS DOCUMENT IS PROVIDED FOR GENERAL INFORMATION PURPOSES ONLY. THE CITY OF SCOTTSDALE DOES NOT WARRANT ITS ACCURACY, COMPLETENESS OR SUITABILITY FOR ANY PARTICULAR PURPOSE. IT SHOULD NOT BE RELIED UPON WITHOUT FIELD VERIFICATION.  
 THE CITY OF SCOTTSDALE  
 30-JAN-22

# *APPENDIX I.*

## *Hydrant Flow Test Report*

# Arizona Flow Testing LLC

## HYDRANT FLOW TEST REPORT

Project Name: Olive Garden  
Project Address: Osborn Road & Scottsdale Road (SWC), Scottsdale, Arizona, 85251  
Client Project No.: Not Provided  
Arizona Flow Testing Project No.: 21528  
Flow Test Permit No.: C66438  
Date and time flow test conducted: October 5, 2021 at 7:00 AM  
Data is current and reliable until: April 5, 2022  
Conducted by: Floyd Vaughan – Arizona Flow Testing, LLC (480-250-8154)  
Witnessed by: Ray Padilla – City of Scottsdale-Inspector (602-541-0586)

### Raw Test Data

Static Pressure: **90.0 PSI**  
(Measured in pounds per square inch)

Residual Pressure: **82.0 PSI**  
(Measured in pounds per square inch)

Pitot Pressure: **24.0 PSI**  
(Measured in pounds per square inch)

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

Coefficient of Diffuser: .9

Flowing GPM: **1,842 GPM**  
(Measured in gallons per minute)

GPM @ 20 PSI: **5,942 GPM**

### Data with 18 PSI Safety Factor

Static Pressure: **72.0 PSI**  
(Measured in pounds per square inch)

Residual Pressure: **64.0 PSI**  
(Measured in pounds per square inch)

Distance between hydrants: Approx.: 330 Feet

Main size: Not Provided

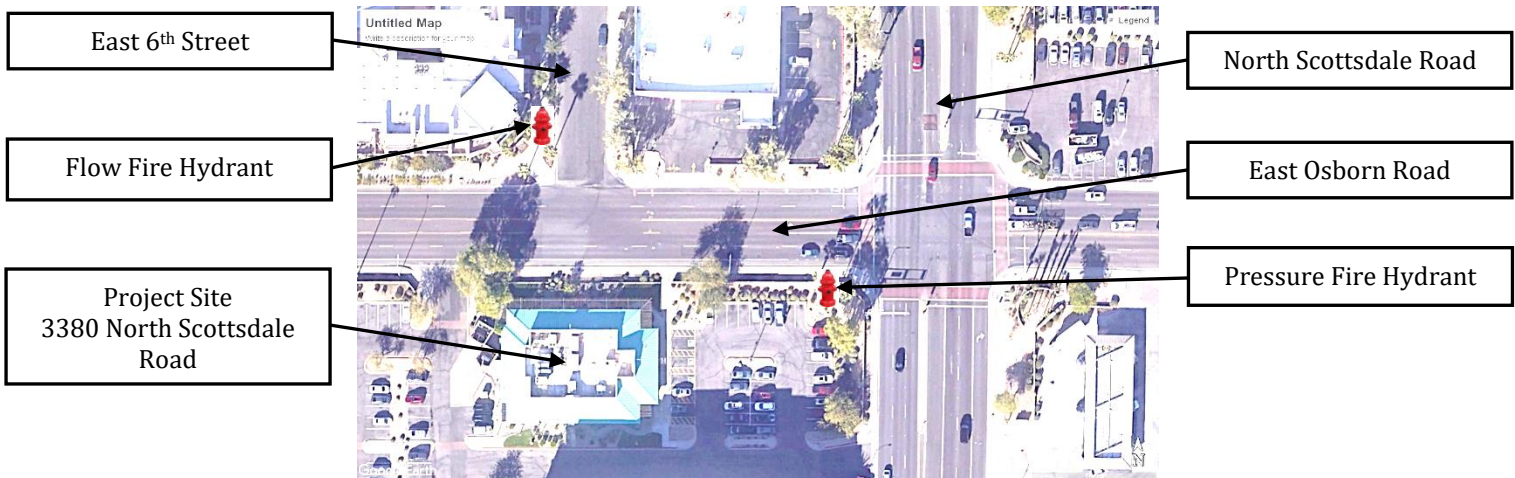
Flowing GPM: **1,842 GPM**

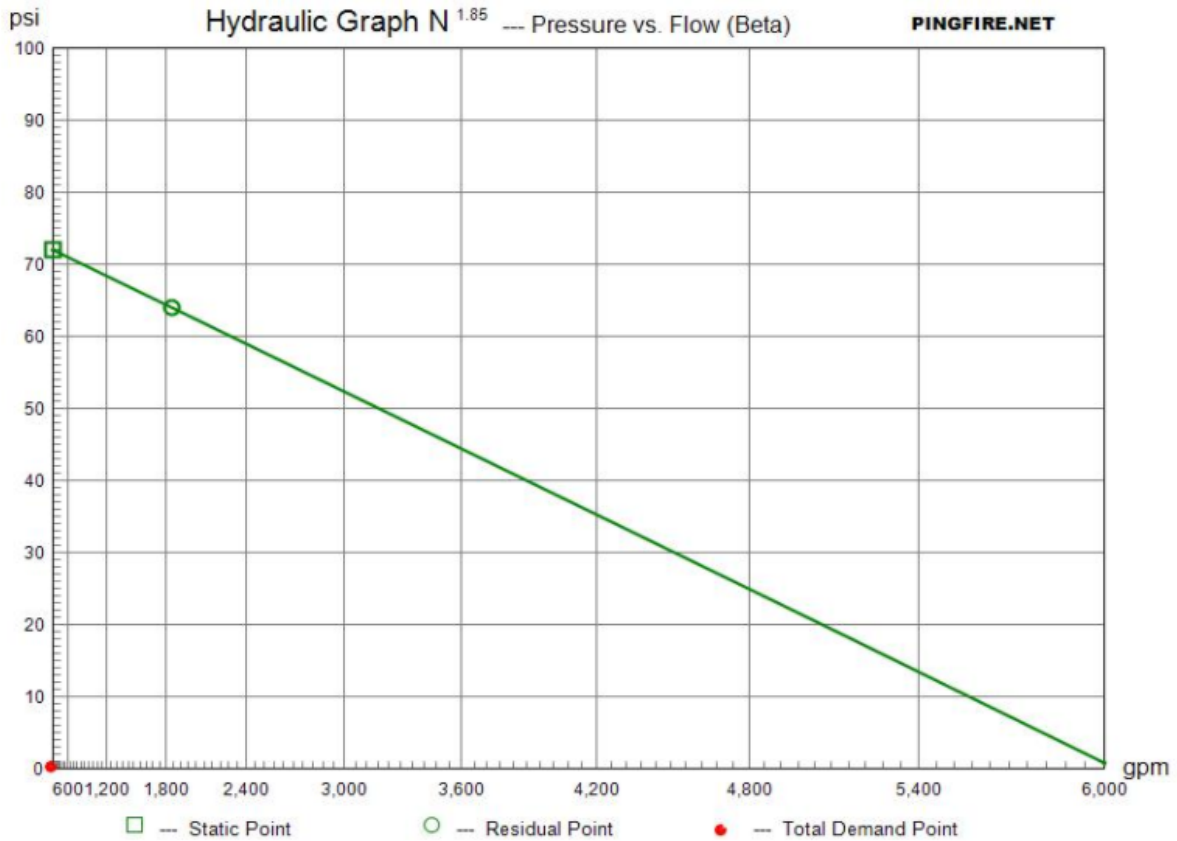
GPM @ 20 PSI: **5,061 GPM**

Scottsdale requires a maximum Static Pressure of 72 PSI for AFES Design.

### Flow Test Location

North ↑





Project Location:

Flow Test: Hydrant Elev.=  ft., Static Pressure= psi, Residual Pressure= psi, Flow= gpm

## 8" System FH Flow Test – N<sup>1.85</sup> Graph

# Arizona Flow Testing LLC

## **HYDRANT FLOW TEST REPORT**

Project Name:	Magnolia FH
Project Address:	70 <sup>th</sup> Street & Osborn Road (NEC), Scottsdale, Arizona, 85251
Client Project No.:	Not Provided
Arizona Flow Testing Project No.:	22095
Flow Test Permit No.:	C67825
Date and time flow test conducted:	February 11, 2022 at 8:30 AM
Data is current and reliable until:	August 11, 2022
Conducted by:	Floyd Vaughan – Arizona Flow Testing, LLC (480-250-8154)
Witnessed by:	Ray Padilla – City of Scottsdale-Inspector (602-541-0586)

**Raw Test Data**

Static Pressure:                   **84.0 PSI**  
(Measured in pounds per square inch)

Residual Pressure:               **80.0 PSI**  
(Measured in pounds per square inch)

Pitot Pressure:                   **47.0 PSI**  
(Measured in pounds per square inch)

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

Coefficient of Diffuser: .9

Flowing GPM:                      **2,946 GPM**  
(Measured in gallons per minute)

GPM @ 20 PSI:                   **13,165 GPM**

**Data with 12 PSI Safety Factor**

Static Pressure:                   **72.0 PSI**  
(Measured in pounds per square inch)

Residual Pressure:               **68.0 PSI**  
(Measured in pounds per square inch)

Distance between hydrants:   Approx.: 950 Feet

Main size:   12-inch DIP

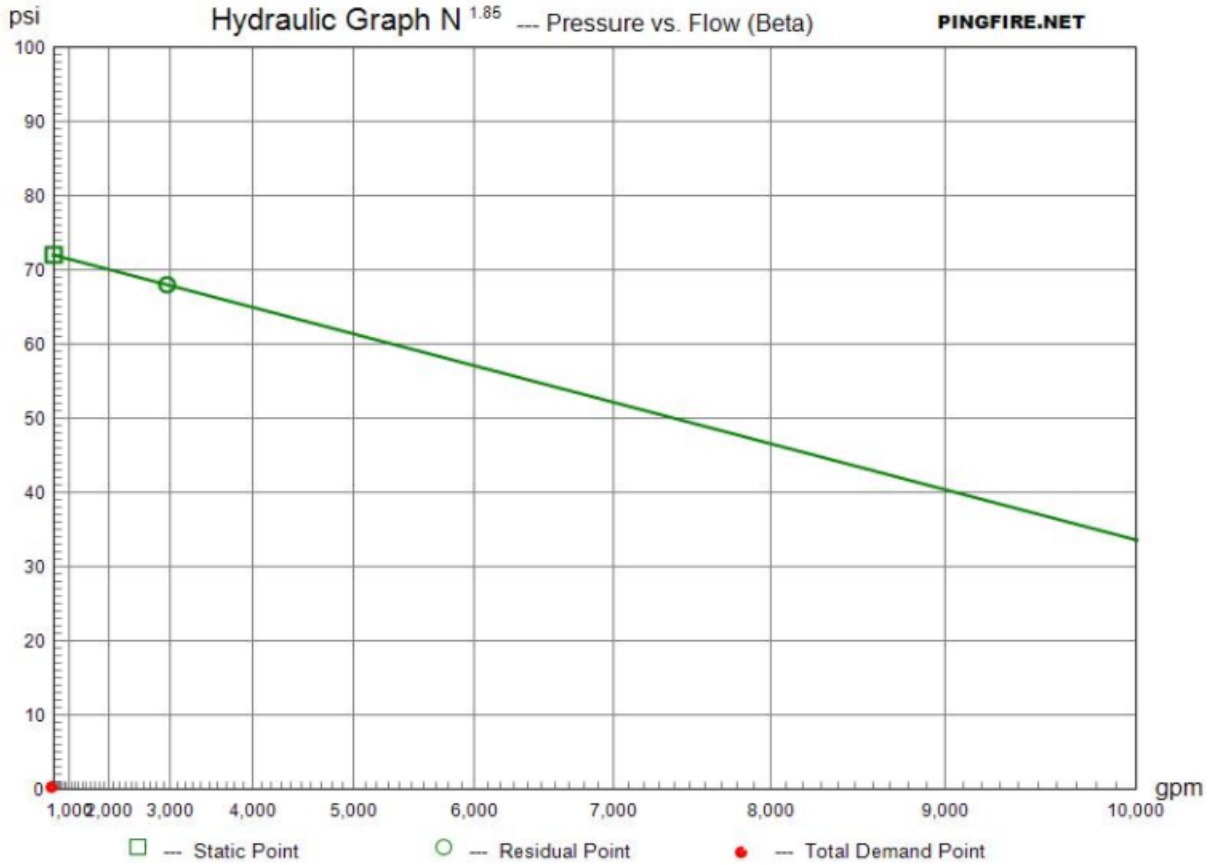
Flowing GPM:                      **2,946 GPM**

GPM @ 20 PSI:                   **11,769 GPM**

Scottsdale requires a maximum Static Pressure of 72 PSI for AFES Design.

**Flow Test Location**





Project Location:

Flow Test: Hydrant Elev.=  ft., Static Pressure= psi, Residual Pressure= psi, Flow= gpm

## 12" System FH Flow Test – N<sup>1.85</sup> Graph

## *APPENDIX II.*

### *Utility Plan*

# MAGNOLIA AT OSBORN

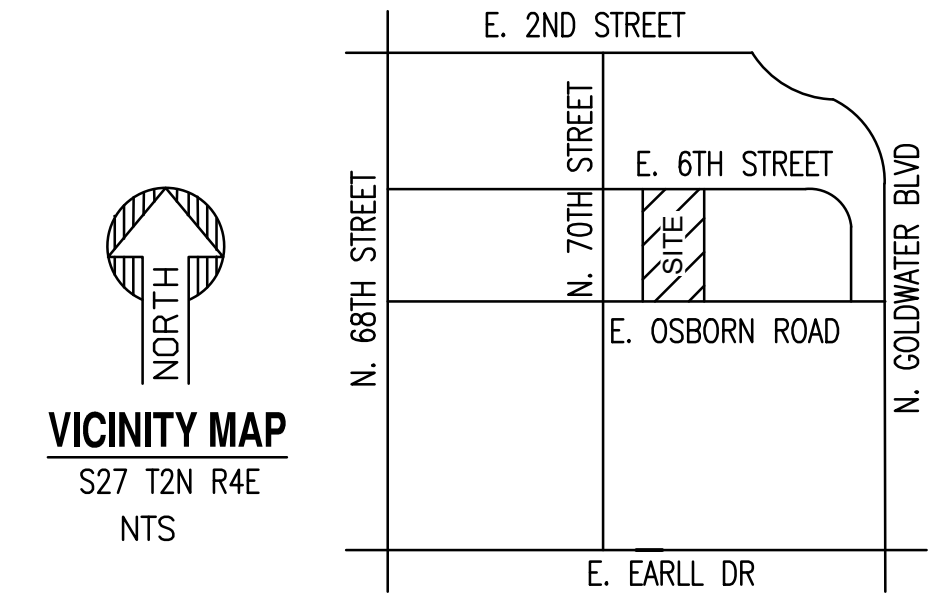
## PRELIMINARY UTILITY PLAN

NEC OF 70<sup>TH</sup> STREET & OSBORN ROAD  
 A PORTION OF THE NORTHEAST QUARTER OF SECTION 27, TOWNSHIP 2 NORTH, RANGE 4 EAST OF THE GILA AND SALT RIVER MERIDIAN, MARICOPA COUNTY, ARIZONA.

**CIVIL ENGINEER**  
 SUSTAINABILITY ENGINEERING GROUP  
 8280 E. GELDING DR., SUITE 101  
 SCOTTSDALE, ARIZONA 85260  
 PHONE: 480-588-7226  
 ATTN: ALI FAKIH  
 EMAIL: ALI@AZSEG.COM

**CLIENT:**  
 MAGNOLIA PROPERTY COMPANY  
 2435 E. SOUTHLAKE BLVD., SUITE 150  
 SOUTHLAKE, TEXAS 76092

**SURVEYOR**  
 AW LAND SURVEYING, LLC  
 P.O. BOX 2170  
 CHANDLER, ARIZONA 85244  
 PHONE: 480-244-7630  
 ATTN: DANIEL ARMIJO



PRELIMINARY  
 NOT FOR  
 CONSTRUCTION

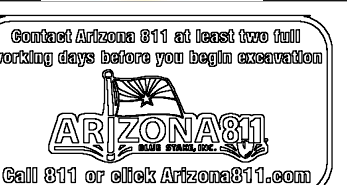
SUSTAINABILITY  
 ENGINEERING  
 GROUP

SEG



5240 N. 16TH STREET SUITE 105, PHOENIX, ARIZONA 85016  
 WWW.AZSEG.COM TEL: 480.588.7226 FAX: 480.259.3534

Magnolia  
 PROPERTY COMPANY



PROJECT: MAGNOLIA ON OSBORN  
 LOCATION: NEC OF 70<sup>TH</sup> STREET AND OSBORN ROAD

DRAWN: JC 06/01/2023  
 DESIGNED: JC 06/01/2023  
 QC: SC 03/02/2022  
 PROJ. MGR: AF 06/01/2023

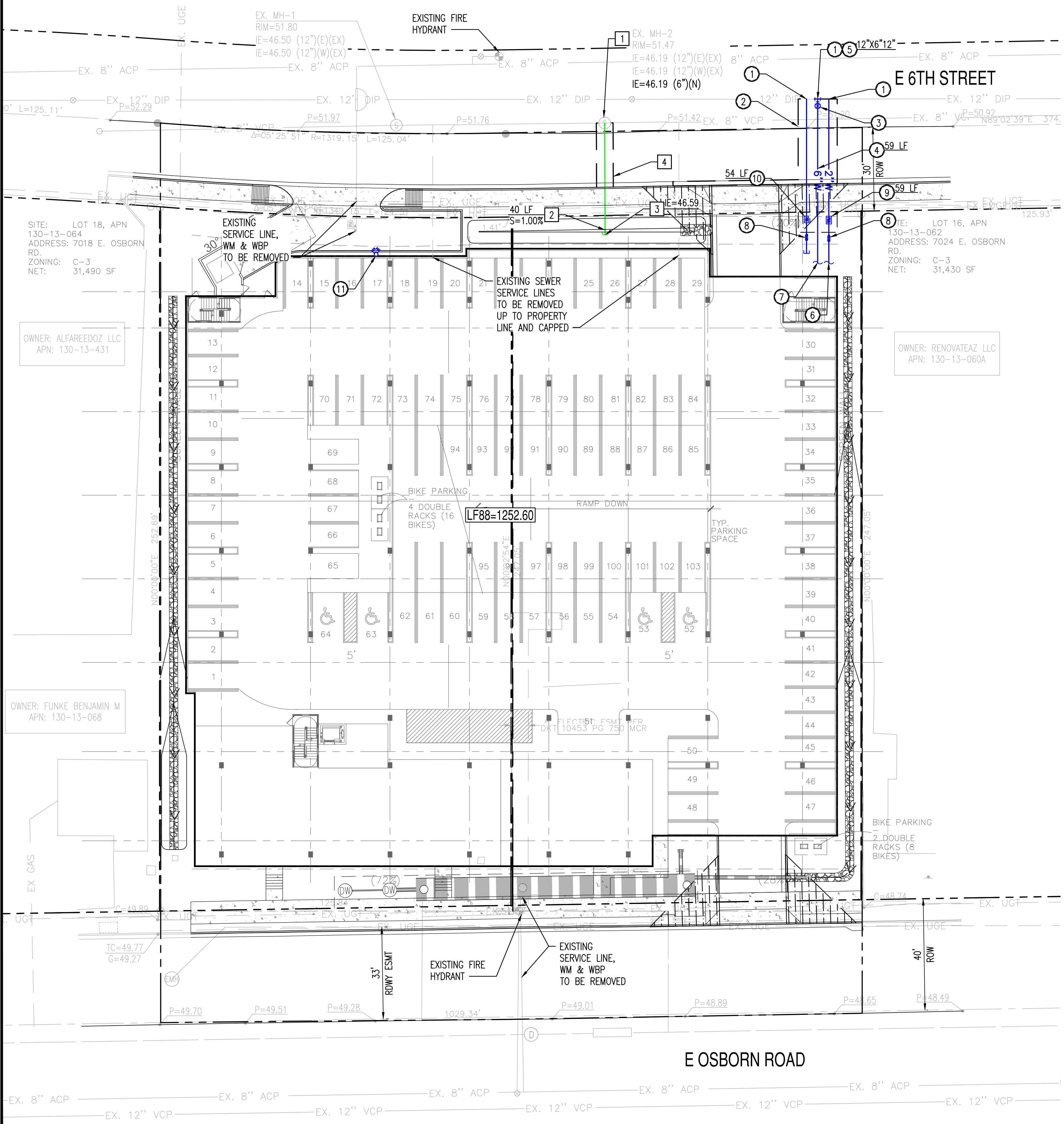
DATE: 06/01/2023  
 ISSUED FOR: REZONING

REVISION NO.	DATE

JOB NO.: 220205  
 SHEET TITLE: PRELIMINARY UTILITY PLAN

PRELIMINARY  
 UTILITY PLAN

PAGE NO.: 3 OF 3  
 SHEET NO.: C4.10



### PRELIMINARY WATER KEY NOTES

- CONTRACTOR TO VERIFY SIZE AND LOCATION OF EXISTING WATER LINE PRIOR TO CONSTRUCTION.
- SAWCUT, REMOVE AND REPLACE EXISTING PAVEMENT.
- 6" GATE VALVE WITH VALVE BOX AND COVER.
- 6" DUCTILE IRON PIPE. LENGTH PER PLAN.
- INSTALL CUT-IN TEE, SIZE PER PLAN.
- DOMESTIC CONNECTION TO BUILDING.
- FIRE CONNECTION TO BUILDING.
- BACKFLOW PREVENTION, SIZE TO MATCH WATER METER SIZE.
- INSTALL 2" TYPE "K" COPPER DOMESTIC SERVICE CONNECTION. LENGTH PER PLAN.
- INSTALL 1" TYPE "K" COPPER IRRIGATION SERVICE CONNECTION. LENGTH PER PLAN.
- INSTALL FIRE DEPARTMENT CONNECTION.

### PRELIMINARY SEWER KEY NOTES

- CONNECTION TO EXISTING SEWER MANHOLE.
- 6" PVC SEWER LINE PER MAG 440-3. LENGTH AND SLOPE PER PLAN.
- SEWER CONNECTION TO BUILDING.
- SAWCUT, REMOVE AND REPLACE EXISTING PAVEMENT.

### C.O.S. GENERAL NOTES FOR PUBLIC WORKS CONSTRUCTION

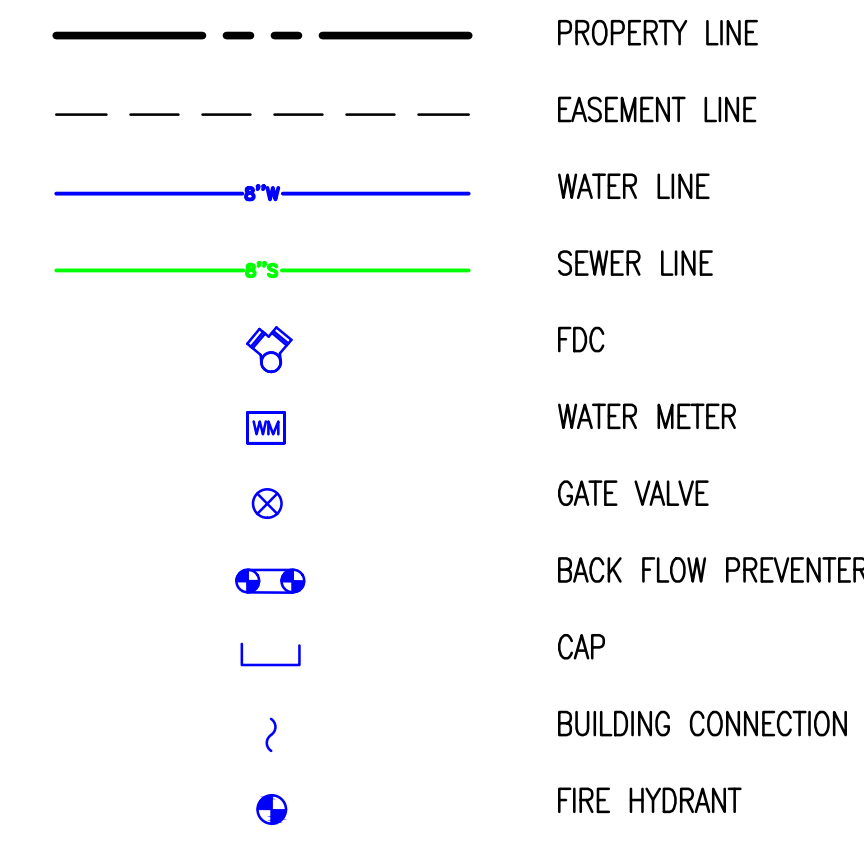
- ALL CONSTRUCTION IN THE PUBLIC RIGHTS-OF-WAY OR IN EASEMENTS GRANTED FOR PUBLIC USE MUST CONFORM TO THE LATEST MAG UNIFORM STANDARD SPECIFICATIONS AND UNIFORM STANDARD DETAILS FOR PUBLIC WORKS CONSTRUCTION AS AMENDED BY THE LATEST VERSION OF THE CITY OF SCOTTSDALE SUPPLEMENTAL STANDARD SPECIFICATIONS AND SUPPLEMENTAL STANDARD DETAILS. IF THERE IS A CONFLICT, THE CITY'S SUPPLEMENTAL STANDARD DETAILS WILL GOVERN.
- THE CITY ONLY APPROVES THE SCOPE, NOT THE DETAIL, OF ENGINEERING DESIGNS; THEREFORE, IF CONSTRUCTION QUANTITIES ARE SHOWN ON THESE PLANS, THEY ARE NOT VERIFIED BY THE CITY.
- THE APPROVAL OF PLANS IS VALID FOR SIX (6) MONTHS. IF A RIGHT-OF-WAY PERMIT FOR THE CONSTRUCTION HAS NOT BEEN ISSUED WITHIN SIX MONTHS, THE PLANS MUST BE RESUBMITTED TO THE CITY FOR REAPPROVAL.
- A PUBLIC WORKS INSPECTOR WILL INSPECT ALL WORKS WITHIN THE CITY RIGHTS-OF-WAY AND IN EASEMENTS. NOTIFY INSPECTION SERVICES 24 HOURS PRIOR TO BEGINNING CONSTRUCTION BY CALLING 480-312-5750.
- WHENEVER EXCAVATION IS NECESSARY, CALL THE BLUE STAKE CENTER, 811, TWO WORKING DAYS BEFORE EXCAVATION BEGINS. THE CENTER WILL SEE THAT THE LOCATION OF THE UNDERGROUND UTILITY LINES IS IDENTIFIED FOR THE PROJECT.
- RIGHT-OF-WAY PERMITS ARE REQUIRED FOR ALL WORK IN PUBLIC RIGHTS-OF-WAY AND EASEMENTS GRANTED FOR PUBLIC PURPOSES. A RIGHT-OF-WAY PERMIT WILL BE ISSUED BY THE CITY ONLY AFTER THE REGISTRANT HAS PAID A BASE FEE PLUS A FEE FOR INSPECTION SERVICES. COPIES OF ALL PERMITS MUST BE RETAINED ON-SITE AND BE AVAILABLE FOR INSPECTION AT ALL TIMES. FAILURE TO PRODUCE THE REQUIRED PERMITS WILL RESULT IN IMMEDIATE SUSPENSION OF ALL WORK UNTIL THE PROPER PERMIT DOCUMENTATION IS OBTAINED.
- ALL EXCAVATION AND GRADING THAT IS NOT IN THE PUBLIC RIGHTS-OF-WAY OR NOT IN EASEMENTS GRANTED FOR PUBLIC USE MUST CONFORM TO APPENDIX J, GRADING, OF THE LATEST EDITION OF THE INTERNATIONAL BUILDING CODE. A PERMIT FOR THIS GRADING MUST BE SECURED FROM THE CITY FOR A FEE ESTABLISHED BY THE CITY.

### NOTE:

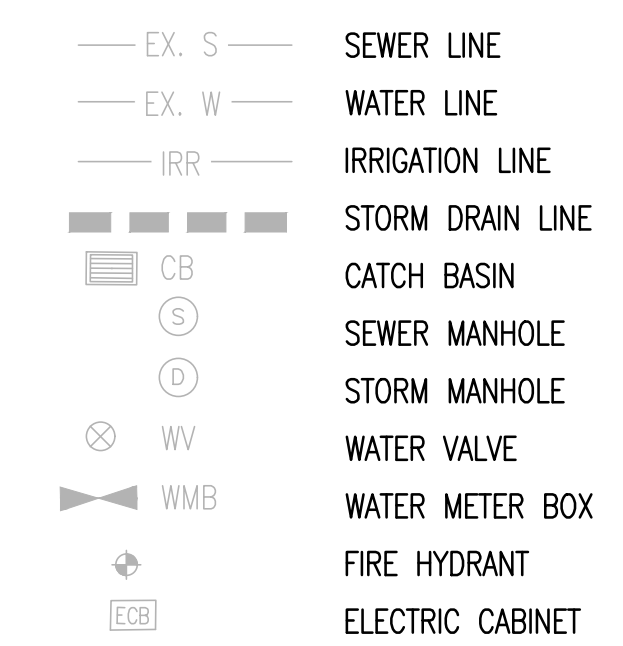
- EXISTING MANHOLES RIMS AND INVERTS HAVE BEEN SET BASED ON ALTA NO. 21-10003 BY MLC SERVICES DATED 11/02/2021. ELEVATIONS TO BE VERIFIED IN FIELD.



### PROPOSED UTILITY LEGEND:



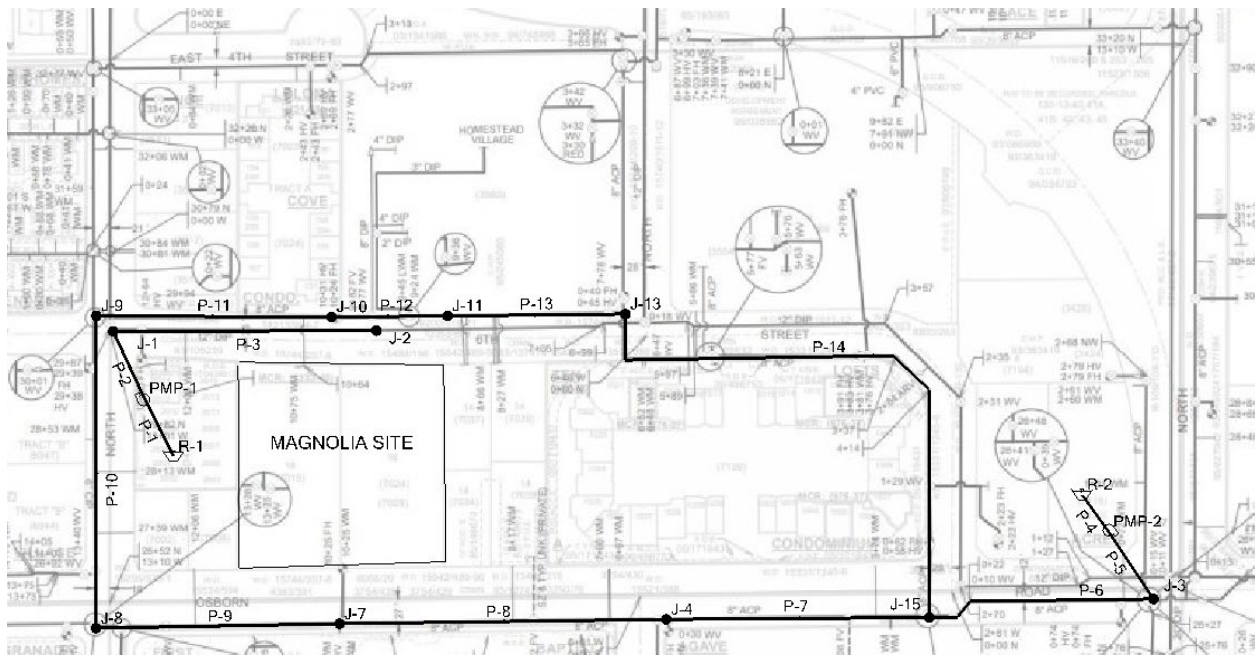
### EXISTING LEGEND



THIS DRAWING IS AN INSTRUMENT OF SERVICE AND THE PROPERTY OF SUSTAINABILITY ENGINEERING GROUP, AND SHALL REMAIN THEIR PROPERTY. THE USE OF THIS DRAWING SHALL BE RESTRICTED TO THE ORIGINAL SITE FOR WHICH IT IS PREPARED AND PUBLICATION THEREOF IS EXPRESSLY LIMITED TO SUCH USE.

## *APPENDIX III.*

# *Water Model Map and Reports*



## APPENDIX II – Water Model Map

8280 E. Gelding Dr., Suite 101  
Scottsdale, AZ 85260

**Magnolia Osborn.wtg**  
**Active Scenario: PHD**  
**FlexTable: Junction Table**

ID	Label	Elevation (ft)	Demand (gpm)	Hydraulic Grade (ft)	Pressure (psi)
34	J-1	1,250.60	0	1,417.08	72
36	J-2	1,249.90	110	1,417.06	72
40	J-3	1,245.60	0	1,413.50	73
42	J-4	1,247.40	0	1,413.50	72
49	J-7	1,248.20	0	1,413.50	72
51	J-8	1,249.30	0	1,413.50	71
53	J-9	1,250.60	0	1,413.50	70
55	J-10	1,250.30	0	1,413.50	71
57	J-11	1,249.70	0	1,413.50	71
64	J-13	1,249.40	0	1,413.50	71
68	J-15	1,245.79	0	1,413.50	73

**Magnolia Osborn.wtg**  
**Active Scenario: PHD**  
**FlexTable: Pipe Table**

Label	Diameter (in)	Material	Hazen-Williams C	Flow (gpm)	Length (ft)	Velocity (ft/s)
P-1	24.0	Ductile Iron	130.0	110	109	0.08
P-2	24.0	Ductile Iron	130.0	110	124	0.08
P-3	12.0	Ductile Iron	130.0	110	442	0.31
P-4	24.0	ACP	130.0	0	77	0.00
P-5	24.0	ACP	130.0	0	136	0.00
P-6	8.0	ACP	130.0	0	390	0.00
P-7	8.0	ACP	130.0	0	442	0.00
P-8	8.0	ACP	130.0	0	549	0.00
P-9	8.0	ACP	130.0	0	409	0.00
P-10	6.0	CIP	130.0	0	525	0.00
P-11	8.0	ACP	130.0	0	395	0.00
P-12	8.0	ACP	130.0	0	195	0.00
P-13	8.0	ACP	130.0	0	299	0.00
P-14	8.0	ACP	130.0	0	993	0.00

# 12" System

## Magnolia Osborn.wtg

### Active Scenario: MDD+FF

#### Fire Flow Node FlexTable: Fire Flow Report

Label	Flow (Total Needed) (gpm)	Pressure (Calculated Residual @ Total Flow Needed) (psi)	-	Fire Flow (Total Upper Limit) (gpm)	Junction w/ Minimum Pressure (System)	Pressure (Upper Fire Flow Limit) (psi)	Pipe w/ Maximum Velocity	Velocity of Maximum Pipe (ft/s)
J-1	2,500	69		3,000	J-2	68	P-2	2.17
J-2	2,563	66		3,063	J-1	68	P-3	8.69

**8" System**  
**Magnolia Osborn.wtg**  
**Active Scenario: MDD+FF**

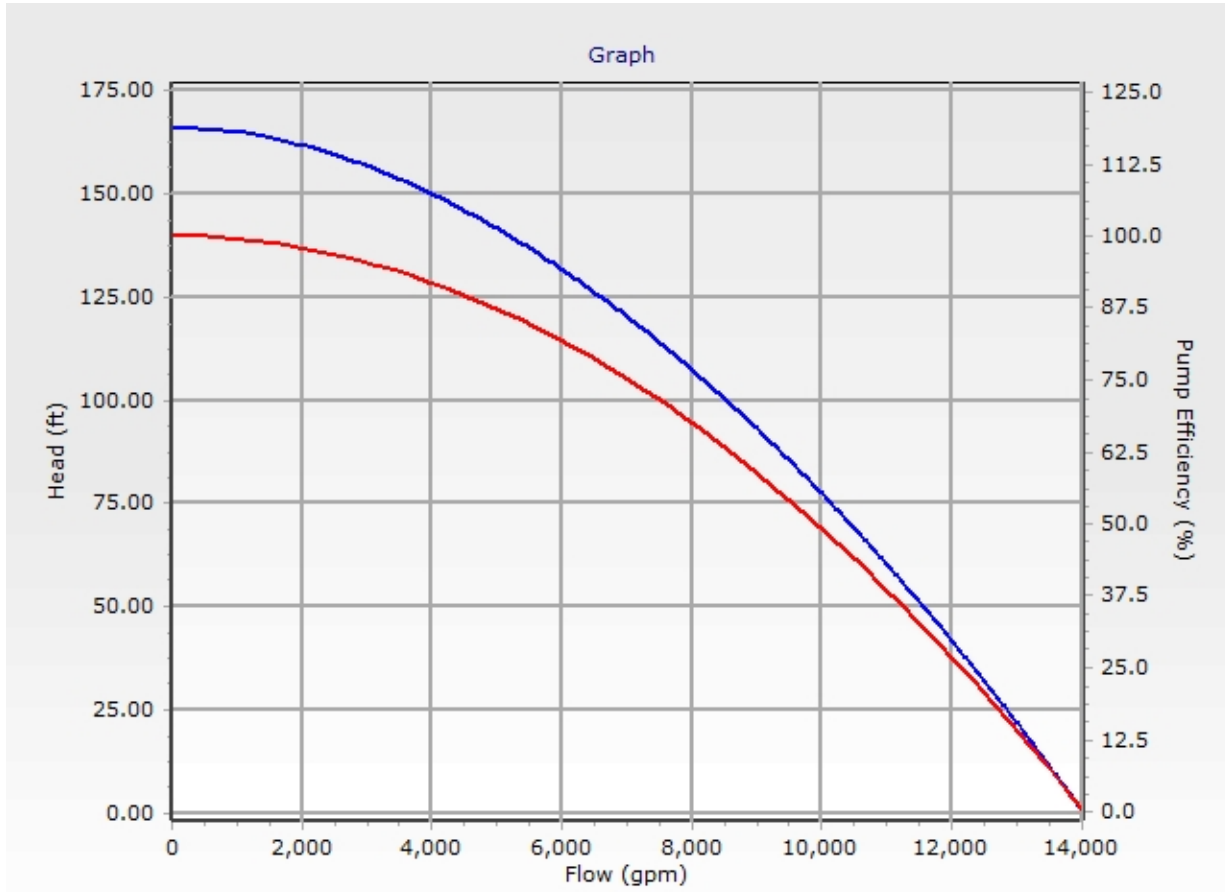
**Fire Flow Node FlexTable: Fire Flow Report**

Label	Flow (Total Needed) (gpm)	Pressure (Calculated Residual @ Total Flow Needed) (psi)	-	Fire Flow (Total Upper Limit) (gpm)	Junction w/ Minimum Pressure (System)	Pressure (Upper Fire Flow Limit) (psi)	Pipe w/ Maximum Velocity	Velocity of Maximum Pipe (ft/s)
J-1	1,500	71		1,501	J-9	70	P-2	1.11
J-2	1,563	70		1,564	J-9	70	P-3	4.44
J-3	1,500	67		1,501	J-9	65	P-5	1.06
J-4	1,500	55		1,501	J-8	55	P-6	9.58
J-7	1,500	51		1,501	J-8	51	P-6	9.58
J-8	1,500	49		1,501	J-7	52	P-6	9.58
J-9	1,500	47		1,501	J-10	49	P-6	9.58
J-10	1,500	48		1,501	J-9	49	P-6	9.58
J-11	1,500	49		1,501	J-10	49	P-6	9.58
J-13	1,500	51		1,501	J-11	51	P-6	9.58
J-15	1,500	61		1,501	J-9	58	P-6	9.58

**Magnolia Osborn.wtg**  
**Active Scenario: MDD+FF**  
**Pump Definition Detailed Report: PMP-1**

Element Details			
ID	61	Notes	
Label	PMP-1		
Pump Definition Type			
Pump Definition Type	Standard (3 Point)	Design Head	157.00 ft
Shutoff Flow	0 gpm	Maximum Operating Flow	11,769 gpm
Shutoff Head	166.30 ft	Maximum Operating Head	46.20 ft
Design Flow	2,946 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 gpm		
Transient (Physical)			
Inertia (Pump and Motor)	0.000 lb·ft <sup>2</sup>	Specific Speed	SI=25, US=1280
Speed (Full)	0 rpm	Reverse Spin Allowed?	True

**Magnolia Osborn.wtg**  
**Active Scenario: MDD+FF**  
**Pump Definition Detailed Report: PMP-1**



**Magnolia Osborn.wtg**  
**Active Scenario: MDD+FF**  
**Pump Definition Detailed Report: PMP-2**

Element Details			
ID	60	Notes	
Label	PMP-2		
Pump Definition Type			
Pump Definition Type	Standard (3 Point)	Design Head	147.80 ft
Shutoff Flow	0 gpm	Maximum Operating Flow	5,061 gpm
Shutoff Head	166.30 ft	Maximum Operating Head	46.20 ft
Design Flow	1,842 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 gpm		
Transient (Physical)			
Inertia (Pump and Motor)	0.000 lb·ft <sup>2</sup>	Specific Speed	SI=25, US=1280
Speed (Full)	0 rpm	Reverse Spin Allowed?	True

**Magnolia Osborn.wtg**  
**Active Scenario: MDD+FF**  
**Pump Definition Detailed Report: PMP-2**

