PRELIMINARY WATER BASIS OF DESIGN REPORT

Residential Healthcare Facility

90th Street and Raintree Drive
Scottsdale, AZ 85260

Prepared For:

Greystar
3200 E. Camelback Road, Suite 225
Phoenix, AZ 85018

Prepared by:

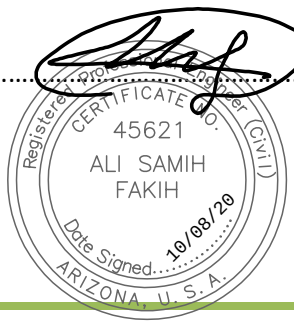
Sustainability Engineering Group
8280 E. Gelding Drive, Suite 101
Scottsdale, AZ 85260
480.588.7226 www.azSEG.com

Project Number: 200626
Submittal Date: September 24, 2020

Case No.: TBD **Plan Check No.: TBD**

16-ZN-2020
10/20/20

TABLE OF CONTENTS:



16-ZN-2020
10/20/20

LIST OF TABLES:

LIST OF FIGURES:

APPENDIX:

1. INTRODUCTION

1.1 SUMMARY OF PROPOSED DEVELOPMENT:

The report presents the service requirements for a residential healthcare facility located at the 90th Street and Raintree Drive in Scottsdale, AZ. The proposed development consists of a new 4-story residential healthcare building (179,296 sf) with a maximum of 152 units with a lobby, parking and a common area with a pool. The purpose of this report is to provide an analysis of the impact that this development will have on the city's water system.

1.2 LEGAL DESCRIPTION:

The project property consists of land located at a portion of Section 7, Township 3 North, Range 5 East of the Gila and Salt River Base and Meridian, Maricopa County, Scottsdale, Arizona. The project site consists of the following parcels:

Parcel ID: Parcel 217-15-033; SFI Raintree Scottsdale LLC, Zoning R1-35

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

1.3 EXISTING AND PROPOSED SITE ZONING AND LAND USES:

The project area includes approximately 203,311 sqft. (4.67 acres) of land designated as R1-35 zoning. The existing site consists of an undeveloped parcel. West of the proposed development is an undeveloped parcel under I-1 zoning. East of the proposed development is residential development zoned as R1-7. North of the proposed development is an office building under I-7 zoning. South of the proposed development is commercial development under I-7 zoning. The proposed project will be a Residential Healthcare Facility and therefore will be rezoned to Commercial Office (C-O).

2. DESIGN DOCUMENTATION

2.1. DESIGN COMPLIANCE:

The proposed water system is designed to meet the criteria of the City of Scottsdale ("the City") Water Resources Department, 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 design this public water infrastructure consists of modeling a network of water distribution mains to meet the City's 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 hydrant flow test results.

2.3 SOFTWARE ACKNOWLEDGEMENT:

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

3. EXISTING CONDITIONS

3.1 EXISTING TOPOGRAPHY, VEGETATION AND LANDFORM FEATURES:

Per Topographic Survey prepared by AW Land Surveying LLC, the site slopes from northwest to south east at approximately 0.5%. Elevation varies from approximately 1480.66 at the northwest corner to approximately 1476.82 at the southeast corner.

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

FIRM Map Number 04013C1760L dated October 16, 2013 indicates the site is designated as Zone "X" shaded. As such, it is defined as areas determined to an area of 0.2% annual chance flood; areas of 1% annual chance flood with average depths of less than 1 foot or with drainage areas less than 1 square mile; areas protected by levees from 1% annual chance flood.

Refer to **FIGURE 3** for the FIRM.

3.2 EXISTING WATER MAIN:

Water: City of Scottsdale (QS 34-49)

- An existing 8" DIP east of the site along the west curb of 90th Street coming from the north to approximately mid-way of the frontage, and a 12" PVC water line along the east curb of 90th Street across the full frontage.
- An 8" DIP line runs south of the site, from north to south and extends into Raintree Drive.
- An 8" DIP line with higher pressure runs north and west from the northwest property corner.
- A 20" line of unknown material runs on the east side of Pima Freeway, to the west of the site.
- Hydrants exist to the east of the site on the east curb of 90th street approximately 200 feet from the southeast corner of the property line, to the south of the site on Raintree Drive approximately 60 feet from the southeast corner of the property line.

Refer to **FIGURE 4** for COS existing QS 34-49.

3.3 CERTIFIED FLOW TEST RESULTS OF EXISTING WATER SYSTEM:

Certified fire hydrant flow testing was performed on July 16, 2020 by Arizona Flow Testing LLC at 7:00 a.m. The fire flow test recorded a static pressure of 83 psi and residual pressure of 70 psi at 1,764 gpm. The fire hydrant flow test for the west (higher pressure) system was taken from the design report for the Self-Storage Facility prepared by Helix Engineering. That flow test recorded a static pressure of 100 psi and residual pressure of 45 psi at 3,340 gpm on May 20, 2019. Flow test documentation is included in the **APPENDIX I**.

4. PROPOSED CONDITIONS

4.1 SITE PLAN:

Proposed development consists of a new residential healthcare facility with 3 and 4 story components, parking, and a common area with a pool.

4.2 PROPOSED WATER SYSTEM:

A new 8" DIP will be looped along the east side of the building tying into the existing 8" DIP dead-end at the northeast corner of the site and an existing water stub located at the southeast corner of the site. The existing 8" system at the northwest corner of the site will be tapped for a new onsite 6" fire line servicing a fire hydrant providing coverage to the west area and will not be used for domestic service. New fire hydrants are proposed to be located at the northeast, southeast and northwest corners of the building providing coverage to all areas of the structure.

4.3 WATER REQUIREMENTS:

The required fire flow was determined per the International Building Code, Fire Flow Calculation Table B105.1 (2) and Table B05.2. Per table B05.2 the minimum required fire flow for commercial buildings are 25% the value in Table 105.1(2). Considering that the total gross floor area for the building is 179,296 sf, with material type V-A, the required fire flow is 6,500 gpm. With the 75% credit for the sprinklered structures, the calculated fire flow required is the following:

Fire Flow Required= 7,500 gpm x 0.25 = 1,875 gpm.
Refer to the **Appendix IV** for IBC Reference Tables.

4.4 MAINTENANCE RESPONSIBILITIES:

The mains, meters and hydrants will be located within water easements dedicated to the City and be maintained by the City. Private backflow prevention devices will be installed on all metered devices.

5. WATER SYSTEM COMPUTATIONS

5.1 WATER DEMANDS:

The proposed development consists of residential use and a pool, with corresponding areas shown in Table 1 below. The residential area consists of 151 units. Average day water demands are described in Section 6-1.205, Figure 6.1-2 of the City of Scottsdale's Design Standards & Policies Manual ("DS&PM"). A summary of the total water demands for the site are presented below in Table 1.

Water Demand

Use	Units	Area (sq. ft.)	Unit Demand (gpm)	Avg Day (gpm)	Max Day (gpm)	Peak Hour (gpm)
High Density Residential	152	-	0.27	41	82	144
Office	-		8.34E-04	0	0	0

Note: Irrigation Demand Assumed as 5 gpm with No Peaking Factor

5.2 SOFTWARE MODELING:

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

Network analysis input parameters included the following:

1. Pipe diameters (feet)
2. Pipe lengths (feet)
3. Pipes invert elevations (feet)
4. Pressure 1 at the intersection to model the fire flow test performed
5. System demands (gpm)

6. Fire flow (gpm)
7. Model piping is ductile iron pipe using Hazen-Williams frictional losses (C = 130)

Output parameters included but were not limited to:

1. Pressure (psi)
2. Flow rates (gpm)
3. 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
    - At the highest finished floor level to be served by the system pressure during normal daily operating conditions.
  - Maximum pressure = 120 psi

- Maximum day plus coincident fire flow demand:
  - Minimum pressure = 30 psi
    - At the highest ceiling level to be served by the system pressure during normal daily operating conditions.
  - Maximum pressure = 120 psi

- Daily scenario head loss shall not exceed 10 feet per 1,000 feet length of pipe.

Refer to APPENDIX II for computer modeling results.

5.4 WATER SYSTEM ANALYSIS:

The proposed water system was analyzed under 5 scenarios: initial service design flow, average day demand, maximum day demand, peak hour demand, and fire flow demand.

The initial service design flow scenario was analyzed through the following assumptions:

- The pressure loss between meters and backflow preventers is approximately 7.5 psi.
- The highest unit fixture is located 48 feet above finish ground elevation; the resulting static loss is 20.8 psi.
- The model indicates 81 psi as peak hour pressure at the metered nodes. Provided domestic service pressure = Initial pressure – total pressure loss
  = 81 psi – (20.8 psi + 7.5 psi)
  The provided domestic pressure at the highest point of the proposed development is **52.7 psi** meeting the minimum **50 psi** requirement noted in the City's DS+PM. Internal pipe sizing and routing may require the MPE consultant to consider building pumps.

  The following table represents flow and pressure available at ground level.

Table 2 - WaterCAD® Analysis Results

Demand Scenario	Water Demand (gpm)	Pressure (PSIG)				Velocity (ft/s)	Pipe ID
		Min.	Node	Max.	Node		
Average Day (ADD)	46	81	J-10	82	J-14	0.15	P-8
Maximum Day (MDD)	87	81	J-10	82	J-14	0.29	P-8
Peak Hour (PHD)	148	81	J-10	82	J-14	0.50	P-8
FF + MDD	1962	62	J-10	65	J-14	15*	P-19

* Maximum velocity is only noted on the northwest designated fire hydrant run.

These results indicate that the proposed water system follows the City's criteria for daily water usage and fire flow events. The proposed system maintains adequate pressure throughout the proposed scenarios. The minimum provided pressure under fire flow conditions is 62 psi; which meets the minimum 30 psi requirement.

6. SUMMARY

6.1 SUMMARY OF PROPOSED WATER IMPROVEMENTS:

- The proposed water main is designed in accordance with City of Scottsdale's design standards and policies[2].
  - Minimum 50 psi @ peak hour required; 81 psi is calculated.
  - Minimum 30 psi @ fire flow required; 62 psi provided.
  - The system supports the minimum 1962 gpm fire flow requirements.
- The results shown in the modeling summary (refer to Section 5.4) indicate that the proposed water system meets the City's criteria for Daily water usage and fire flow events as described in Section 5.3.
- Pressure regulating valves will be installed on all building services and backflow prevention devices on all metered services.

6.2 PROJECT SCHEDULE:

The infrastructure and buildings are proposed to be constructed in a single phase.

7 SUPPORTING MAPS

7.1 SITE UTILITY PLAN

Refer to the Preliminary Utility Plan in **APPENDIX III.**

8 REFERENCES

1. *COS QS Water Plan number 34-49.*
2. *City of Scottsdale Design Standards & Policies Manual, 2018 (Chapter 6 – Water)*

FIGURES

FIGURE 1 – Vicinity Map

FIGURE 2 - Aerial

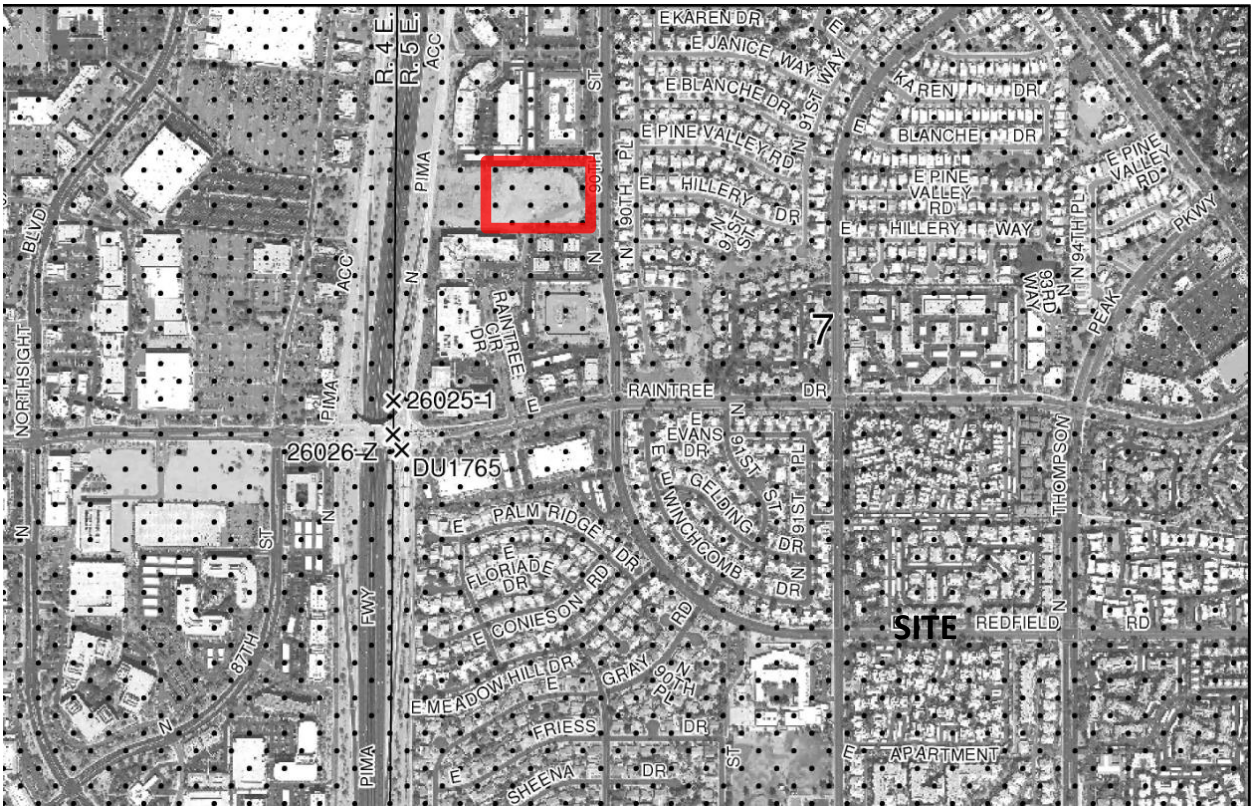


FIGURE 3 – FEMA FIRM

Excerpt from 04013C1760L

35-49

34-48

34-50

SITE

Detail D

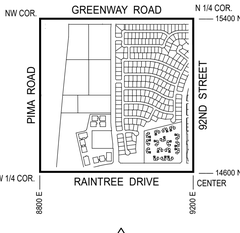
GENERAL NOTES:

- 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 (ARV)
- Non-potable Air Release Valve (NPARV)
- Blowoff (BO)
- Cap (CAP)
- Cathodic Protection (CPT)
- Fill Drain (FBD)
- Fire Hydrant (FH)
- Non-GPS Point
- Pressure Reducing Valve (PRV)
- Pump (WP)
- Reducer
- Sample Station (SS)
- Water Manhole (WMH)
- Non-Potable Manhole (NPMH)
- Well (WELL)
- Valve (V)
- Non-potable Valve (NPV)
- Vault (WVT)
- Water Main
- Non-Potable Main (NP)
- Fire / Private Main
- Non-Scottsdale Main

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

QUARTER SECTION MAP

34-49

NW 1/4 SEC. 7 T3N R5E

FIGURE 4- CITY QS MAP

05-JUL-20

CITY OF SCOTTSDALE

SCOTTSDALE GEOGRAPHIC INFORMATION SYSTEMS

3629 North Drinkwater Boulevard
Scottsdale, Arizona 85251

16 JAN 2020

10/20/20

APPENDIX I

Fire Hydrant Flow Tests

Arizona Flow Testing LLC

HYDRANT FLOW TEST REPORT

Project Name:	90th Street & Raintree
Project Address:	14900 North 90th Street, Scottsdale, Arizona 85260
Client Project No.:	Not Provided
Arizona Flow Testing Project No.:	20259
Flow Test Permit No.:	C62625
Date and time flow test conducted:	July 16, 2020 at 7:00 AM
Data is current and reliable until:	January 16, 2021
Conducted by:	Floyd Vaughan – Arizona Flow Testing, LLC (480-250-8154)
Witnessed by:	Jared Berry – City of Scottsdale-Inspector (602-541-4942)

Raw Test Data

Static Pressure: **83.0 PSI**
(Measured in pounds per square inch)

Residual Pressure: **70.0 PSI**
(Measured in pounds per square inch)

Pitot Pressure: **22.0 PSI**
(Measured in pounds per square inch)

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

Coefficient of Diffuser: .7875

Flowing GPM: **1,764 GPM**
(Measured in gallons per minute)

GPM @ 20 PSI: **4,135 GPM**

Data with 11PSI Safety Factor

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

Residual Pressure: **59.0 PSI**
(Measured in pounds per square inch)

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

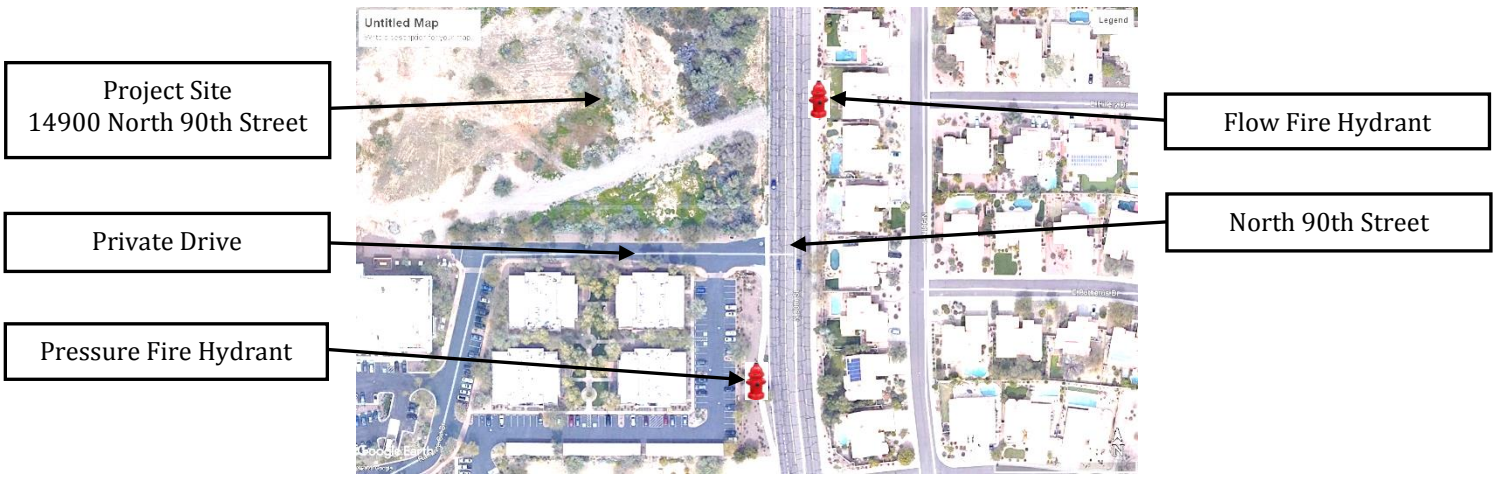
Distance between hydrants: Approx. 440 Feet

Main size: Not Provided

Flowing GPM: **1,764 GPM**

GPM @ 20 PSI**:** **3,728 GPM**

Flow Test Location **North**



E·J | Flow Test Summary

Project Name:	EJFT 19106
Project Address:	15111 N Pima Rd, Scottsdale, AZ 85260
Date of Flow Test:	2019-05-20
Time of Flow Test:	7:10 AM
Data Reliable Until:	2019-11-20
Conducted By:	Austin Gourley & Eder Cueva (EJ Flow Tests) 602.999.7637
Witnessed By:	Jared Berry (City of Scottsdale) 602.541.4942
City Forces Contacted:	City of Scottsdale (602.541.4942)
Permit Number:	C58327

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

Raw Flow Test Data

Static Pressure:	100.0 PSI
Residual Pressure:	45.0 PSI
Flowing GPM:	3,340
GPM @ 20 PSI:	4,089

Data with a 28 PSI Safety Factor

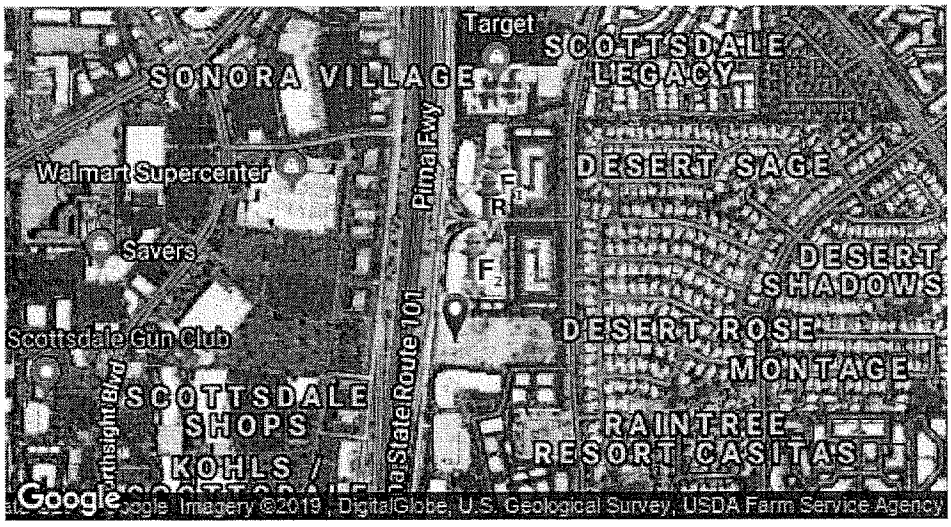
Static Pressure:	72.0 PSI
Residual Pressure:	17.0 PSI
Flowing GPM:	3,340
GPM @ 20 PSI:	3,240

Hydrant F_1

Pitot Pressure (1):	30	PSI
Coefficient of Discharge (1):	0.9	
Hydrant Orifice Diameter (1):	2.5	inches
Pitot Pressure (2):	30	PSI
Coefficient of Discharge (2):	0.9	
Hydrant Orifice Diameter (2):	2.5	inches

Hydrant F_2

Pitot Pressure (1):	20	PSI
Coefficient of Discharge (1):	0.9	
Hydrant Orifice Diameter (1):	2.5	inches
Pitot Pressure (2):	20	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
179 ft (measured linearly)

Static-Residual Elevation
1486 ft (above sea level)

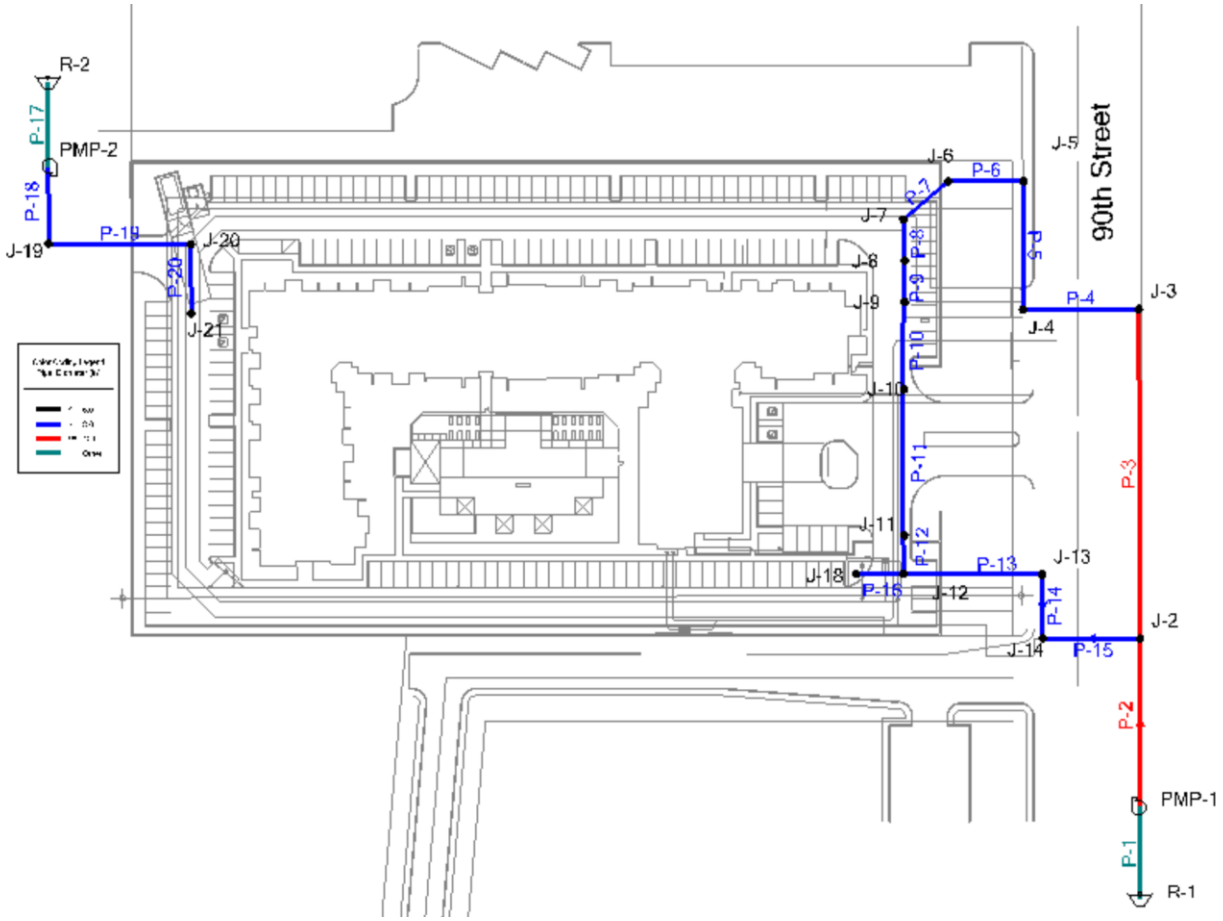
Flow Hydrant (F_1) Elevation
1489 ft (above sea level)

Elevation & distance values are approximate

35-DR-2019
16-ZN-2020
10/29/2019

APPENDIX II

WaterCAD Model Results



APPENDIX II - WATER MODEL MAP

200626-90th and Raintree.wtg

Active Scenario: Average Day Demand

FlexTable: Junction Table

Label	Elevation (ft)	Demand (gpm)	Hydraulic Grade (ft)	Pressure (psi)
J-2	1,480.30	0	1,668.94	82
J-3	1,481.50	0	1,668.94	81
J-4	1,481.90	0	1,668.94	81
J-5	1,481.70	0	1,668.94	81
J-6	1,481.00	0	1,668.94	81
J-7	1,480.70	0	1,668.94	81
J-8	1,481.80	41	1,668.94	81
J-9	1,481.80	0	1,668.94	81
J-10	1,481.40	0	1,668.94	81
J-11	1,481.80	5	1,668.94	81
J-12	1,481.20	0	1,668.94	81
J-13	1,481.30	0	1,668.94	81
J-14	1,479.00	0	1,668.94	82
J-18	1,481.80	0	1,668.94	81
J-19	1,477.00	0	1,711.70	102
J-20	1,481.40	0	1,711.70	100
J-21	1,482.30	0	1,711.70	99

200626-90th and Raintree.wtg

Active Scenario: Average Day Demand

FlexTable: Pipe Table

Label	Diameter (in)	Material	Length (Scaled) (ft)	Hazen-Williams C	Flow (gpm)	Velocity (ft/s)	Headloss (ft)
P-1	24.0	Ductile Iron	65	130.0	46	0.03	0.00
P-2	12.0	Ductile Iron	117	130.0	46	0.13	0.00
P-3	12.0	PVC	230	150.0	24	0.07	0.00
P-4	8.0	Ductile Iron	81	130.0	24	0.15	0.00
P-5	8.0	Ductile Iron	89	130.0	24	0.15	0.00
P-6	8.0	Ductile Iron	53	130.0	24	0.15	0.00
P-7	8.0	Ductile Iron	41	130.0	24	0.15	0.00
P-8	8.0	Ductile Iron	29	130.0	-24	0.15	0.00
P-9	8.0	Ductile Iron	33	130.0	17	0.11	0.00
P-10	8.0	Ductile Iron	61	130.0	17	0.11	0.00
P-11	8.0	Ductile Iron	102	130.0	17	0.11	0.00
P-12	8.0	Ductile Iron	23	130.0	22	0.14	0.00
P-13	8.0	Ductile Iron	97	130.0	22	0.14	0.00
P-14	8.0	Ductile Iron	44	130.0	22	0.14	0.00
P-15	8.0	Ductile Iron	68	130.0	22	0.14	0.00
P-16	8.0	Ductile Iron	33	130.0	0	0.00	0.00
P-17	24.0	Ductile Iron	59	130.0	0	0.00	0.00
P-18	8.0	Ductile Iron	53	130.0	0	0.00	0.00
P-19	8.0	Ductile Iron	99	130.0	0	0.00	0.00
P-20	8.0	Ductile Iron	48	130.0	0	0.00	0.00

200626-90th and Raintree.wtg

Active Scenario: Average Day Demand

FlexTable: Pump Table

Label	Elevation (ft)	Pump Status	Hydraulic Grade (Suction) (ft)	Hydraulic Grade (Discharge) (ft)	Flow (Total) (gpm)	Pump Head (ft)
PMP-1	1,476.50	On	1,477.50	1,668.94	46	191.44
PMP-2	1,480.60	On	1,480.80	1,711.70	0	230.90

200626-90th and Raintree.wtg
Active Scenario: Average Day Demand
FlexTable: Reservoir Table

Label	Elevation (ft)	Flow (Out net) (gpm)	Hydraulic Grade (ft)
R-1	1,477.50	46	1,477.50
R-2	1,480.80	0	1,480.80

Bentley Systems, Inc. Haestad Methods Solution Center
27 Siemon Company Drive Suite 200 W
Watertown, CT 06795 USA +1-203-755-1666

200626-90th and Raintree.wtg

Active Scenario: Max Day Demand

FlexTable: Junction Table

Label	Elevation (ft)	Demand (gpm)	Hydraulic Grade (ft)	Pressure (psi)
J-2	1,480.30	0	1,668.86	82
J-3	1,481.50	0	1,668.86	81
J-4	1,481.90	0	1,668.86	81
J-5	1,481.70	0	1,668.85	81
J-6	1,481.00	0	1,668.85	81
J-7	1,480.70	0	1,668.85	81
J-8	1,481.80	82	1,668.84	81
J-9	1,481.80	0	1,668.84	81
J-10	1,481.40	0	1,668.85	81
J-11	1,481.80	5	1,668.85	81
J-12	1,481.20	0	1,668.85	81
J-13	1,481.30	0	1,668.86	81
J-14	1,479.00	0	1,668.86	82
J-18	1,481.80	0	1,668.85	81
J-19	1,477.00	0	1,711.70	102
J-20	1,481.40	0	1,711.70	100
J-21	1,482.30	0	1,711.70	99

200626-90th and Raintree.wtg

Active Scenario: Max Day Demand

FlexTable: Pipe Table

Label	Diameter (in)	Material	Length (Scaled) (ft)	Hazen-Williams C	Flow (gpm)	Velocity (ft/s)	Headloss (ft)
P-1	24.0	Ductile Iron	65	130.0	87	0.06	0.00
P-2	12.0	Ductile Iron	117	130.0	87	0.25	0.00
P-3	12.0	PVC	230	150.0	46	0.13	0.00
P-4	8.0	Ductile Iron	81	130.0	46	0.29	0.00
P-5	8.0	Ductile Iron	89	130.0	46	0.29	0.01
P-6	8.0	Ductile Iron	53	130.0	46	0.29	0.00
P-7	8.0	Ductile Iron	41	130.0	46	0.29	0.00
P-8	8.0	Ductile Iron	29	130.0	-46	0.29	0.00
P-9	8.0	Ductile Iron	33	130.0	36	0.23	0.00
P-10	8.0	Ductile Iron	61	130.0	36	0.23	0.00
P-11	8.0	Ductile Iron	102	130.0	36	0.23	0.00
P-12	8.0	Ductile Iron	23	130.0	41	0.26	0.00
P-13	8.0	Ductile Iron	97	130.0	41	0.26	0.00
P-14	8.0	Ductile Iron	44	130.0	41	0.26	0.00
P-15	8.0	Ductile Iron	68	130.0	41	0.26	0.00
P-16	8.0	Ductile Iron	33	130.0	0	0.00	0.00
P-17	24.0	Ductile Iron	59	130.0	0	0.00	0.00
P-18	8.0	Ductile Iron	53	130.0	0	0.00	0.00
P-19	8.0	Ductile Iron	99	130.0	0	0.00	0.00
P-20	8.0	Ductile Iron	48	130.0	0	0.00	0.00

200626-90th and Raintree.wtg

Active Scenario: Max Day Demand

FlexTable: Pump Table

Label	Elevation (ft)	Pump Status	Hydraulic Grade (Suction) (ft)	Hydraulic Grade (Discharge) (ft)	Flow (Total) (gpm)	Pump Head (ft)
PMP-1	1,476.50	On	1,477.50	1,668.87	87	191.37
PMP-2	1,480.60	On	1,480.80	1,711.70	0	230.90

200626-90th and Raintree.wtg
Active Scenario: Max Day Demand
FlexTable: Reservoir Table

Label	Elevation (ft)	Flow (Out net) (gpm)	Hydraulic Grade (ft)
R-1	1,477.50	87	1,477.50
R-2	1,480.80	0	1,480.80

200626-90th and Raintree.wtg

Active Scenario: Peak Hour Demand

FlexTable: Junction Table

Label	Elevation (ft)	Demand (gpm)	Hydraulic Grade (ft)	Pressure (psi)
J-2	1,480.30	0	1,668.66	81
J-3	1,481.50	0	1,668.66	81
J-4	1,481.90	0	1,668.65	81
J-5	1,481.70	0	1,668.63	81
J-6	1,481.00	0	1,668.62	81
J-7	1,480.70	0	1,668.62	81
J-8	1,481.80	144	1,668.61	81
J-9	1,481.80	0	1,668.62	81
J-10	1,481.40	0	1,668.62	81
J-11	1,481.80	5	1,668.63	81
J-12	1,481.20	0	1,668.64	81
J-13	1,481.30	0	1,668.65	81
J-14	1,479.00	0	1,668.66	82
J-18	1,481.80	0	1,668.64	81
J-19	1,477.00	0	1,711.70	102
J-20	1,481.40	0	1,711.70	100
J-21	1,482.30	0	1,711.70	99

200626-90th and Raintree.wtg

Active Scenario: Peak Hour Demand

FlexTable: Pipe Table

Label	Diameter (in)	Material	Length (Scaled) (ft)	Hazen-Williams C	Flow (gpm)	Velocity (ft/s)	Headloss (ft)
P-1	24.0	Ductile Iron	65	130.0	148	0.11	0.00
P-2	12.0	Ductile Iron	117	130.0	148	0.42	0.01
P-3	12.0	PVC	230	150.0	79	0.22	0.00
P-4	8.0	Ductile Iron	81	130.0	79	0.50	0.01
P-5	8.0	Ductile Iron	89	130.0	79	0.50	0.01
P-6	8.0	Ductile Iron	53	130.0	79	0.50	0.01
P-7	8.0	Ductile Iron	41	130.0	79	0.50	0.01
P-8	8.0	Ductile Iron	29	130.0	-79	0.50	0.00
P-9	8.0	Ductile Iron	33	130.0	64	0.41	0.00
P-10	8.0	Ductile Iron	61	130.0	64	0.41	0.01
P-11	8.0	Ductile Iron	102	130.0	64	0.41	0.01
P-12	8.0	Ductile Iron	23	130.0	69	0.44	0.00
P-13	8.0	Ductile Iron	97	130.0	69	0.44	0.01
P-14	8.0	Ductile Iron	44	130.0	69	0.44	0.01
P-15	8.0	Ductile Iron	68	130.0	69	0.44	0.01
P-16	8.0	Ductile Iron	33	130.0	0	0.00	0.00
P-17	24.0	Ductile Iron	59	130.0	0	0.00	0.00
P-18	8.0	Ductile Iron	53	130.0	0	0.00	0.00
P-19	8.0	Ductile Iron	99	130.0	0	0.00	0.00
P-20	8.0	Ductile Iron	48	130.0	0	0.00	0.00

200626-90th and Raintree.wtg
Active Scenario: Peak Hour Demand
FlexTable: Pump Table

Label	Elevation (ft)	Pump Status	Hydraulic Grade (Suction) (ft)	Hydraulic Grade (Discharge) (ft)	Flow (Total) (gpm)	Pump Head (ft)
PMP-1	1,476.50	On	1,477.50	1,668.67	148	191.17
PMP-2	1,480.60	On	1,480.80	1,711.70	0	230.90

200626-90th and Raintree.wtg
Active Scenario: Peak Hour Demand
FlexTable: Reservoir Table

Label	Elevation (ft)	Flow (Out net) (gpm)	Hydraulic Grade (ft)
R-1	1,477.50	148	1,477.50
R-2	1,480.80	0	1,480.80

Bentley Systems, Inc. Haestad Methods Solution Center
27 Siemon Company Drive Suite 200 W
Watertown, CT 06795 USA +1-203-755-1666

200626-90th and Raintree.wtg

Active Scenario: Fire Flow Demand

Fire Flow Node FlexTable: Fire Flow Report

Label	Needed Fire Flow (gpm)	Calculated Pressure at Junction (psi)	Flow (Total Available) (gpm)	Junction w/ Minimum Pressure	Junction Pressure) (psi)	Pipe w/ Maximum Velocity	Pipe Velocity (ft/s)
J-2	1,875	65	2,500	J-4	54	P-2	7.34
J-3	1,875	64	2,500	J-4	53	P-2	7.34
J-4	1,875	63	2,500	J-5	52	P-4	11.85
J-5	1,875	62	2,500	J-6	51	P-5	10.43
J-6	1,875	63	2,500	J-8	50	P-5	9.74
J-7	1,875	62	2,500	J-8	50	P-7	9.25
J-8	1,875	62	2,582	J-9	50	P-7	8.91
J-9	1,875	62	2,500	J-8	50	P-7	8.54
J-10	1,875	62	2,500	J-9	50	P-13	8.66
J-11	1,875	62	2,505	J-18	50	P-13	9.88
J-12	1,875	63	2,500	J-18	50	P-13	10.17
J-13	1,875	63	2,500	J-18	52	P-14	11.66
J-14	1,875	65	2,500	J-13	52	P-15	12.59
J-18	1,875	62	2,350	J-11	53	P-16	15.00
J-19	1,875	81	2,350	J-21	69	P-18	15.00
J-20	1,875	77	2,350	J-21	65	P-19	15.00
J-21	1,875	75	2,350	J-20	65	P-20	15.00

APPENDIX III

Utility Plan

RESIDENTIAL HEALTHCARE FACILITY

90TH STREET AND RAINTREE
SCOTTSDALE, AZ 85260
PRELIMINARY UTILITY EXHIBIT

PROJECT ADDRESS
90TH STREET & RAINTREE DRIVE, SCOTTSDALE, ARIZONA 85260.

PROJECT DESCRIPTION
NEW 151-UNIT RESIDENTIAL HEALTHCARE FACILITY WITH 3 STORIES AND 4 STORIES COMPONENTS, PARKING, AND COMMON AREA.

LEGAL DESCRIPTION
A PORTION OF THE NORTHWEST QUARTER OF SECTION 7, TOWNSHIP 3 NORTH, RANGE 5 EAST OF THE GILA AND SALT RIVER BASE AND MERIDIAN, MARICOPA COUNTY, ARIZONA.

BENCHMARK:
BENCHMARK IS A BRASS FLUSH, BEING THE SOUTH QUARTER CORNER OF SECTION 7, T3N, R5E.

ELEVATION = 1447.27 (NAVD88)

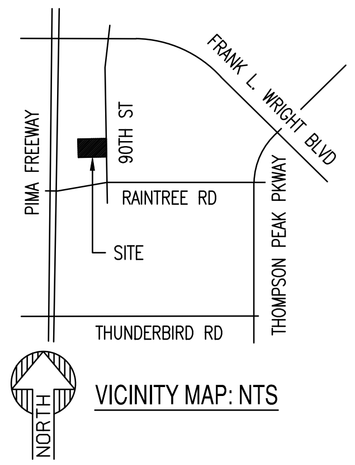
BASIS OF BEARING:
THE BASIS OF BEARING AND ALL MONUMENTATION SHOWN HEREON IS BASED ON THE MONUMENT LINE OF 90TH STREET, USING A BEARING OF SOUTH 00 DEGREES 03 MINUTES 34 SECONDS EAST, AS SHOWN ON RECORD OF SURVEY, RECORDED IN BOOK 896, PAGE 1, MARICOPA COUNTY RECORDS.

PARCEL INFORMATION:

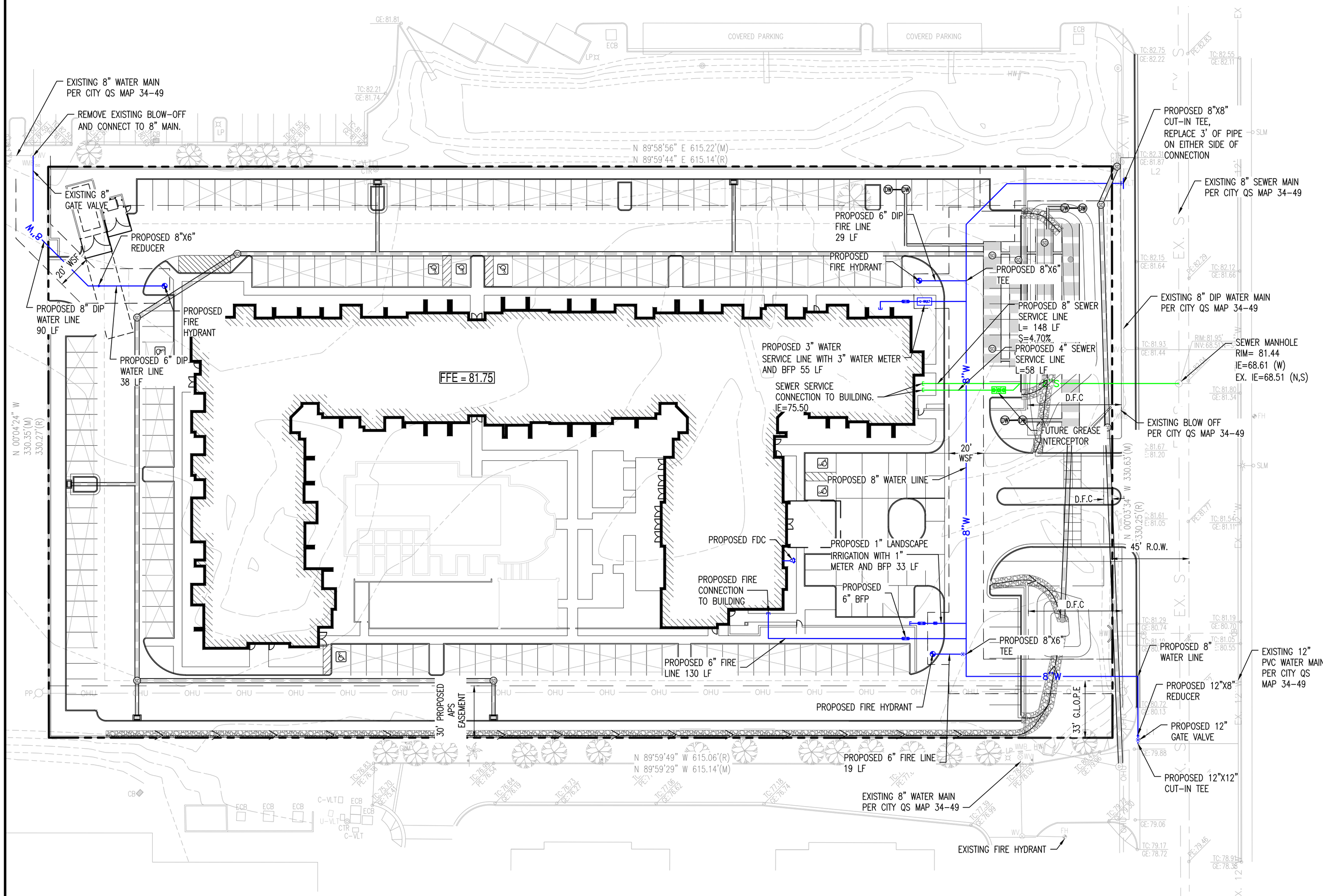
APN:	217-15-033
ZONING:	C-O
LOT SIZE:	4.66 ACRES (202,950 SF)-(NET AREA/GROSS AREA)
FLOOD ZONE:	ZONE X (0.2 % ANNUAL FLOOD HAZARD)

ARCHITECT:
TODD & ASSOCIATES, INC.
4019 N.44TH ST.
PHOENIX, AZ 85018
PHONE: 602-952-8280p

CIVIL ENGINEER:
SUSTAINABILITY ENGINEERING GROUP
8280 E GELDING DR., SUITE 101
SCOTTSDALE, AZ 85260
PHONE 480-237-2507
ATTN: ALI FAKIH
ALI@AZSEG.COM



VICINITY MAP: NTS



EXISTING LEGEND

- EX. W — EXISTING WATER LINE
- EX. S — EXISTING SEWER LINE
- PROPERTY LINE
- EXISTING EASEMENT
- EXISTING STORM LINE
- EXISTING SEWER MANHOLE
- STORM DRAIN MANHOLE
- GATE VALVE
- WATER METER BOX
- UTILITY VAULT
- FIRE HYDRANT

PROPOSED LEGEND

- PROPOSED WATER LINE
- PROPOSED SEWER LINE
- PROPOSED EASEMENT
- GATE VALVE
- WATER METER
- BACK FLOW PREVENTOR
- FIRE HYDRANT
- FDC
- MANHOLE

NORTH
0' 30' 60' 90'
SCALE: 1" = 30'

PRELIMINARY
NOT FOR
CONSTRUCTION

SEG
SUSTAINABILITY ENGINEERING GROUP
8280 E. GELDING DRIVE SUITE 101, SCOTTSDALE, ARIZONA 85260
WWW. AZSEG.COM TEL. 480.588.7226 FAX. 480.259.3534

Contact Arizona 811 at least two full working days before you begin excavation
Arizona811.com
Call 811 or click Arizona811.com

PROJECT	LOCATION
RESIDENTIAL HEALTH CARE FACILITY	N 90TH ST & RAINTREE CIRCLE DR

DRAWN	KA	9/24/2020
DESIGNED	KA	9/24/2020
QC	SC	9/22/2020
QA		
PROJ. MGR.		

DATE: 9/24/2020
ISSUED FOR: REZONING

REVISION NO.:	DATE:
1	
2	
3	
4	

JOB NO.: 200626

SHEET TITLE: PRELIMINARY UTILITY EXHIBIT

PAGE NO.:	SHEET NO.:
1 OF 1	

LOCATION: Z:\SHARED\PROJECTS\CREYSTAR\RESIDENTIAL HEALTHCARE-90TH ST & RAINTREE-SCOTTSDALE-200626\11 CAD (SEG)\11.2 ENTITLEMENT-PLANNING\PRELIMINARY UTILITY.DWGSAVED BY: KENYA.AVINA DATE: 9/24/2020

15-ZN-2020
10/2020