PRELIMINARY WATER REPORT

PRELIMINARY Basis of Design Report

- ☐ ACCEPTED
- ☑ ACCEPTED AS NOTED
- ☐ REVISE AND RESUBMIT

CITY OF SCOTTSDALE
SCOTTSDALE WATER
9379 E San Salvador Dr.
Scottsdale, AZ 85258

Disclaimer: If accepted; the preliminary approval is granted under the condition that a final basis of design report will also be submitted for city review and approval (typically during the DR or PP case). The final report shall incorporate further water or sewer design and analysis requirements as defined in the city design standards and policy manual and address those items noted in the preliminary review comments (both separate and included herein). The final report shall be submitted and approved prior to the plan review submission.
For questions or clarifications contact the Water Resources Planning and Engineering Department at 480-312-5685.

BY ldillon **DATE** 11/10/2020

Conform to following stipulations and address comments below and herein in the final BOD with DR case:

1) STIPULATION: In addition to new water lines shown herein an additional 200 feet of 8-inch water main be placed along 3rd Ave to complete an 8-inch loop around the site and bring the min pressure during fire flow +MD closer to the required 30psi . If proven to be unnecessary in your final BOD this stipulation will be removed.

2) Raw hydrant flow test data shall not be used for modeling scenarios per DS&PM. Adjust static pressure to 72psi and resubmit modeling analysis with final BOD. If you are burning 76psi of head in the system adjacent to your site velocities are far too high and pipeline infrastructure is inadequately sized. DS&PM 6-1.405, B., 5

3) Maximum velocities (even under fire flow) should be 7.5fps (Note: 10fps or slightly above may be allowed under certain circumstances) DS&PM 6-1.4040, C, 3

Note: I would recommend you perform a hydrant flow test off the hydrant to the east along Indian School and feed your model from this point. For final BOD resubmittal please de-rate the static pressure accordingly per DS&PM, split fire flow reasonably to 2 hydrants available to site, and resolve modeling software calculation/setup issues.

The Triangle

7120 E. Indian School Road
Scottsdale, AZ 85251

Prepared For:

Gensler

2575 E. Camelback Rd Suite 175
Phoenix, AZ 85016
Phone: 602-523-4900

Prepared by:

SEG

Registered Professional Engineer (Civil)
CERTIFICATE NO.
45621
ALI SAMIH FAKIH
Date Signed 10/16/20
ARIZONA, U.S.A.

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

Project Number: 200504

Revision Date: October 16, 2020 (Rezoning)

Case No.: 10-ZN-2020 **Plan Check No.: TBD**

10-ZN-2020
10/22/20

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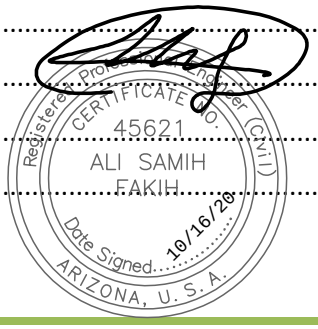


LIST OF TABLES:

LIST OF FIGURES:

APPENDIX:

1. INTRODUCTION

1.1 SUMMARY OF PROPOSED DEVELOPMENT:

The proposed development consists of a mixed residential use with commercial amenities located north of Indian School Road and south of 3rd Avenue between Marshall Way and Scottsdale Road in Scottsdale Arizona. An existing inn and several commercial buildings will be razed. The lot area is 144,173 square feet (3.31 acres) per the A.L.T.A. surveys. The proposed structures will have a maximum of seven floors and include approximately 230 residential units, 168 hotel rooms, a 4,000 square foot restaurant, 14,000 square feet of miscellaneous retail/fitness/clubhouse amenities and a pool.

1.2 REPORT INTENT:

This preliminary report is provided to support the rezoning from C-2 to D/OC-2 PBD DO-Type 2 and evaluate existing and proposed water demands compliant to the City's 2017 Design Standards and Policies Manual and the projects impact to the local area's water distribution system.

1.3 SITE AND LEGAL DESCRIPTION:

The project property consists three land parcels located in the SE ¼ of Section 22, Township 2 North, Range 4 East of the Gila and Salt River Base and Meridian, Maricopa County, with the following Assessor Parcel Numbers:

- 173-50-108A, 173-50-034 and 173-50-117B

Refer to **FIGURE 1** for a vicinity map of the project's location with respect to major cross streets.

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.

2.3 SOFTWARE ACKNOWLEDGEMENT:

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

3. EXISTING CONDITIONS

3.1 ZONING & LAND USE:

The overall project parcel is zoned C-2. Land uses consist of a motel and commercial/retail/office activities.

3.2 EXISTING TOPOGRAPHY, VEGETATION AND LANDFORM FEATURES:

The site has approximately five feet of fall from 3rd Avenue to Indian School Road in a south east direction. The site is covered with building and paved parking with only minor landscaping. Refer to **FIGURE 2** for an aerial of the overall project existing conditions.

FIRM Map Number 04013C2235L dated October 16, 2013 indicates this site is designated as Zone "X". As such, it is defined as areas outside of the 0.2% annual chance of flooding. Refer to **FIGURE 3** for an excerpt from the FIRM.

3.3 EXISTING WATER MAIN:

Water: City of Scottsdale (QS 17-45)

- The site is located within COS Water Pressure Zone 1A.
- An existing 12" ductile iron (DIP) water distribution main serving Zone 1A fronts the site under Indian School Road.
- An existing 6" asbestos cement (ACP) and 8" DIP water distribution main serving Zone 1A fronts the site under 3rd Avenue.
- An existing 8" ACP water extends north along the site's east property line from Indian School Road and dead ends just south of 3rd Avenue.
- Fire hydrants exist to the east and west of the project along Indian School Road and fronting the site along 3rd Avenue.
- Four existing water meters to the parcels are indicated on the City's quarter-section maps to the site along Indian School Road and 3rd Avenue.
- An existing 36" DIP water transmission line fronts the site under Indian School Road and serves Pressure Zone 1 to the south of Indian School Road.

raw hydrant flow test data shall not be used for modeling scenarios per DS&PM. Adjust static pressure. If you are burning 76psi of head in the system adjacent to your site velocities are far too high and infrastructure is inadequate.

Refer to **FIGURE 4** for COS Water QS Map 17-45 showing water line locations.

3.4 CERTIFIED FLOW TEST RESULTS OF EXISTING WATER SYSTEM:

Certified fire hydrant flow testing was performed on May 14, 2020 by Arizona Flow Testing LLC at 7:00 a.m. The fire flow test recorded a static pressure of 106.0 psi and residual pressure of 76.0 psi at 2,354 gpm. The actual flow test documentation is included in the **APPENDIX I**.

The water model uses the raw data as a basis for evaluating the City's water supply at the public main. The AFES data will be used by the building fire sprinkler engineer to design the automated fire sprinkler system.

4. PROPOSED CONDITIONS

4.1 SITE PLAN:

The property is proposed to be re-developed as residential apartment and hotel use with supporting commercial, office and retail facilities. Development will include new drive entrances from both Indian School Road and 3rd Avenue. A new pedestrian crossing is proposed at 3rd Avenue connecting the project to Craftsman Court.

4.2 PROPOSED WATER SYSTEM:

A new reach of 8" DIP water main is proposed along the west property line connecting the 12" DIP in Indian School Road to the 6" ACP in 3rd Avenue. This line will support fire service to the hotel and apartment buildings. The existing dead-end water line along the northeast property line is proposed to be connected into the 3rd Avenue 8" DIP and will be used for fire and domestic service to the residential buildings. Domestic, irrigation and fire line service connections for the existing commercial building is off the 12" DIP in Indian School Road.

The extensions and connections noted above will provide redundant sourcing to the site from either Indian School Road or 3rd Avenue. New fire hydrants will be provided to meet City spacing requirements.

4.3 WATER REQUIREMENTS:

The City's design standards govern the domestic and fire flow demands per Chapter 6 of the City of Scottsdale's Design Standards & Policies Manual ("DS&PM"), dated January 2017. The maximum fire flow demand used is 2,500 gpm based on the proposed high-rise building and 1,500 gpm for the low-rise residential buildings.

Building 1 Height = 90'	Building 2 Height = 90'
Building 3 Height = 40'	Building 4,5,6 Height = 32'

The required fire flow was determined to be 2,500 gpm for high-rise and 1,500 gpm for low-rise based on DS&PM.

4.4 MAINTENANCE RESPONSIBILITIES:

On-site water lines and meters for the proposed development will be public, located within easements dedicated to the City of Scottsdale. An additional easement will be proposed along the eastern boundary to provide a total width of 13'. An alleyway will be dedicated to the City along the western boundary. Refer to **FIGURE 5** – Proposed Easement Exhibit.

The existing offsite water lines are in public rights-of-ways and/or easements. All metered services will be installed with reduced pressure principle backflow preventers owned and maintained by the property owner.

5. WATER SYSTEM COMPUTATIONS

5.1 WATER DEMANDS:

The proposed development at the site consists of residential apartment units and a hotel including two swimming pools and commercial/office/retail facilities. The associated DS+PM demands along with the peaking factors are shown in Table 1 below. A summary of the total water demands for the site are presented below in Table 2.

Table 1: COS DESIGN CRITERIA BY DEMAND TYPE

Land Use	Average Day Demand (gpm)	Unit	*Peaking Factors*	
			Max Day	Peak Hour
High Density Residential	0.27	per unit	2	3.5
Hotel	0.63	per unit	2	3.5
Restaurant	1.81E-03	per sq. ft.	2	3.5
Retail amenities	1.11E-03	per sq. ft.	2	3.5

Table 2: ONSITE WATER DEMAND CALCULATIONS PER DS+PM

Land Use	Unit Count or Area (sq ft)	Unit	ADD per Unit (gpm)	Avg. Day Demand (gpm)	Max Day Demand (gpm)	Peak Hour Demand (gpm)
B-1 Hotel	168	Rooms	0.63	105.8	211.7	370.4
B-1 Restaurant	4,000	Sq. Ft.	1.81E-03	7.2	14.5	25.3
B-2/3 High Density Residentia	220	Units	0.27	59.4	118.8	207.9
B-4 Townhomes	2	Units	0.27	0.5	1.1	1.9
B-5 Townhomes	2	Units	0.27	0.5	1.1	1.9
B-6 Townhomes	6	Units	0.27	1.6	3.2	5.7
Ex - Retail amenities	14,000	Sq. Ft.	1.11E-03	15.5	31.1	54.4
			Totals	190.7	381.4	667.5

5.2 SOFTWARE MODELING:

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

Network analysis input parameters included the following:

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

Output parameters included but were not limited to:

30psi w/ MD + FF @ hydrant tee, 15psi at highest finished floor w/ MD + FF

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

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 psig
    - At the highest finished floor level to be served by the system pressure during normal daily operating conditions.
  - Maximum pressure = 120 psig
- Maximum day plus coincident fire flow demand:
  - Minimum pressure = 30 psig
    - At the highest ceiling level to be served by the system pressure during normal daily operating conditions.
  - Maximum pressure = 120 psig
- Daily scenario head loss shall not exceed 10 feet per 1,000 feet length of pipe.

Refer to **APPENDIX II** for computer modeling results.

Static pressure of 106psi needs to be derated

5.4 WATER SYSTEM ANALYSIS:

A summary of the modeling results is presented below in Table 3. Detailed WaterCAD® results are presented in **APPENDIX II**. Water pressure for domestic and fire service to the upper floors of high-rise structures may require internal pumps and will be designed by the Mechanical Engineer. The following table represents flow and pressure available at ground level.

Table 3 - WaterCAD® Analysis Results

Demand Scenario	Water Demand (GPM)	Pressure (PSIG)				Velocity (ft/s)	Pipe ID
		Min.	Node	Max.	Node		
Average Day	191	103	J-7	108	J-13	0.84	P-21
Maximum Day	381	102	J-7	107	J-13	1.68	P-21
Peak Hour	667	100	J-7	104	J-13	2.95	P-21
MD + Fire	2881	30	J-6	56	J-7	15	P-8

These results indicate that the proposed water system meets the City's criteria for daily water usage and fire flow events. The minimum 2500 gpm values shown in APPENDIX II support the fire flow demand for high-rise apartment and hotel buildings.

10-ZN-2020
10/22/20

6. SUMMARY

using 106psi static with no adjustment

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; 100 psi provided.~~
  - Minimum 30 psi @ max+ fire flow required; 30 psi provided.
  - The system supports the minimum 2500 gpm for high-rise buildings and 1500 gpm for low-rise commercial buildings plus 381 gpm at maximum day.
- ~~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.~~
- The 72 psi "Data with 34 psi Safety Factor" is to be used by the fire sprinkler design consultant in designing fire sprinkler systems for individual buildings.

6.2 PROJECT SCHEDULE:

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

And also to be used for fire flow analysis

7 SUPPORTING MAPS

7.1 SITE UTILITY PLAN

Refer to the Site Plan / Utility Plan in **APPENDIX III.**

8 REFERENCES

1. *COS QS Water Plan number 17-44*
2. *City of Scottsdale Design Standards & Policies Manual, 2017 (Chapter 6 – Water)*

10-ZN-2020
10/22/20

FIGURES

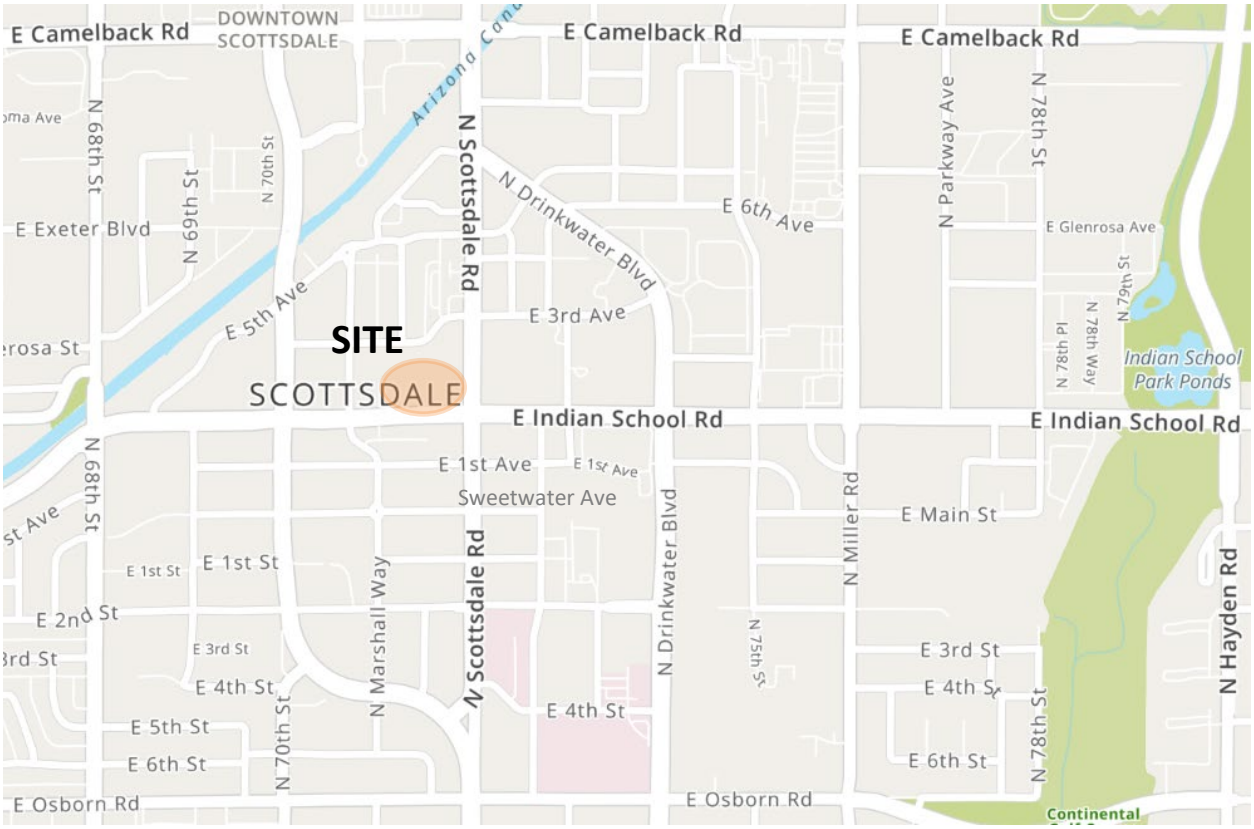


FIGURE 1 – Vicinity Map

FIGURE 2 - Aerial

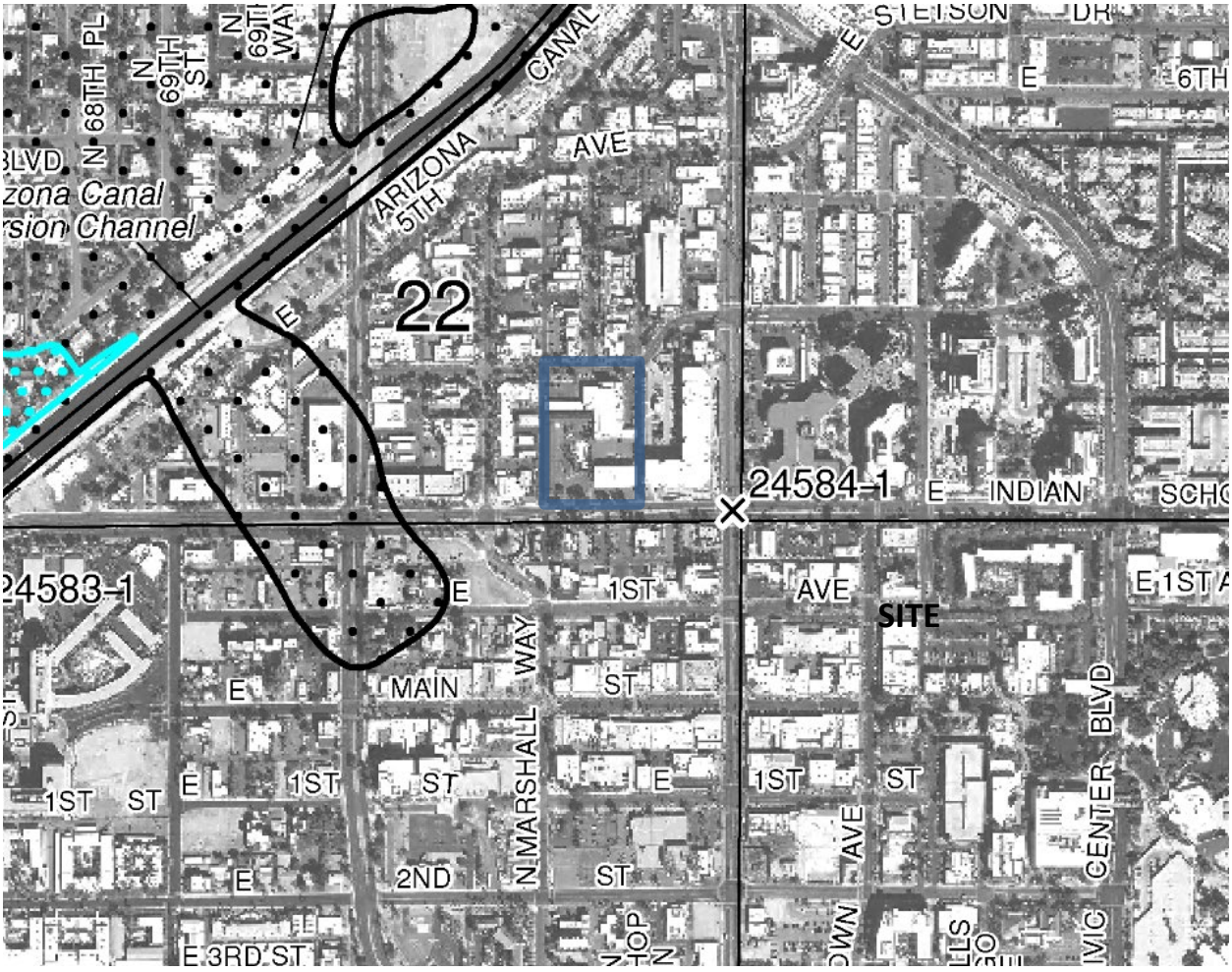


FIGURE 3 – FEMA FIRM

Excerpt from 04013C2235L

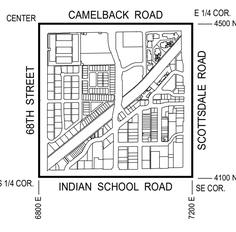
GENERAL NOTES:

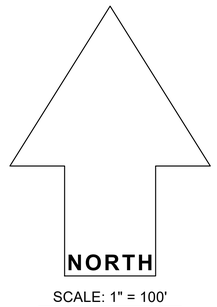
- THIS IS A COMPUTER GENERATED DRAWING. FOR ANY REVISIONS PLEASE CONTACT THE CITY OF SCOTTSDALE GIS DEPARTMENT AT (480) 312-7792.
- THE SECTION LINE BEARING AND DISTANCES ARE BASED ON THE CITY OF SCOTTSDALE GPS SURVEY OF SEPTEMBER, 1991. BEARINGS ARE NAD 83 GRID AND DISTANCES ARE FLATTENED TO GROUND. 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

VICINITY MAP





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

WATER

QUARTER SECTION MAP

17-44

SE 1/4 SEC. 22 T2N R4E

FIGURE 4

N O T I C E

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

10-NZ-2020
10/22/20

CITY OF SCOTTSDALE

SCOTTSDALE GEOGRAPHIC INFORMATION SYSTEMS

3629 North Drinkwater Boulevard
Scottsdale, Arizona 85251

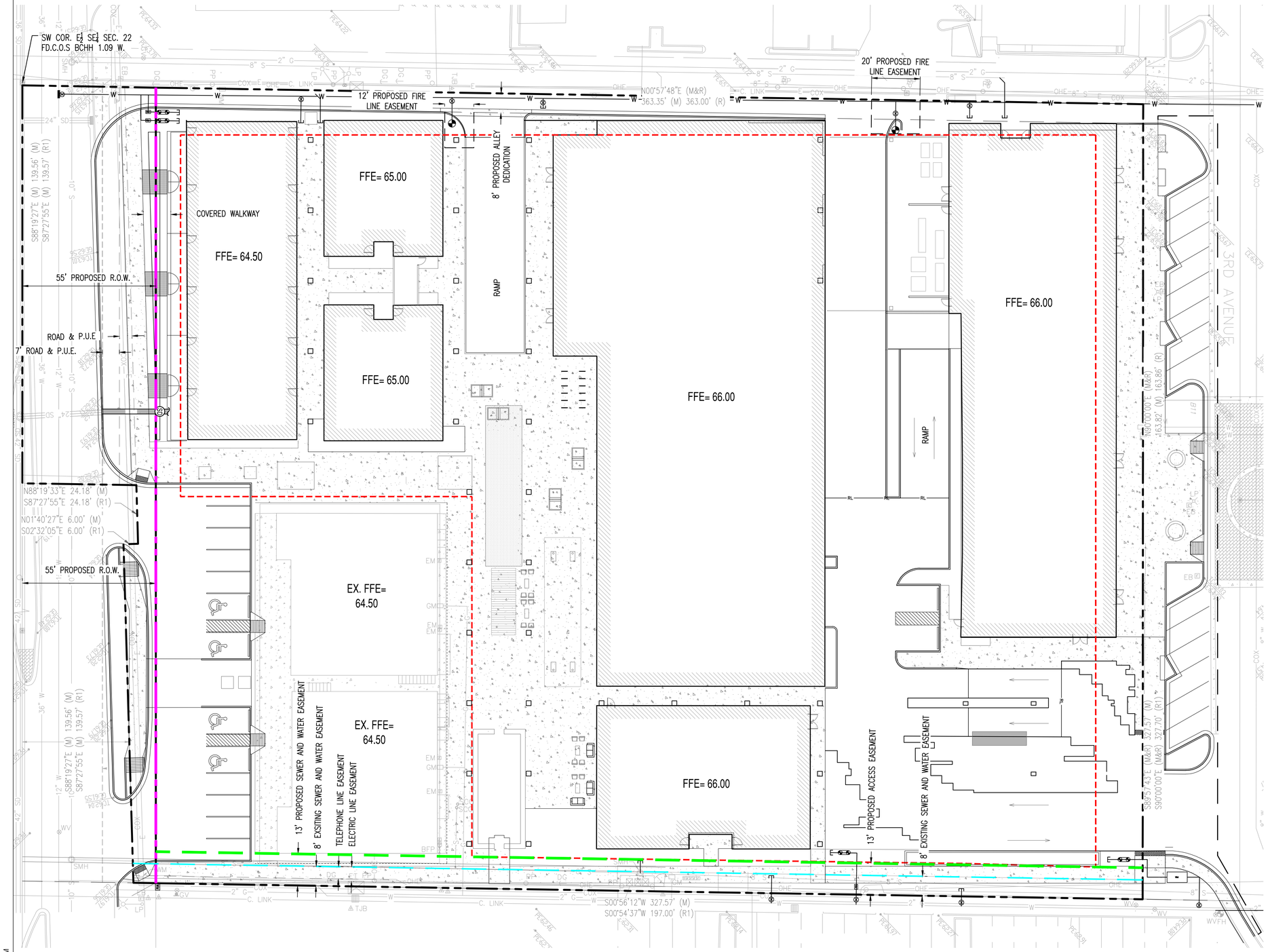
THE TRIANGLE

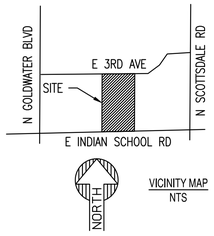
7120 E. INDIAN SCHOOL ROAD SCOTTSDALE, AZ 85251
PROPOSED EASEMENT EXHIBIT

CIVIL ENGINEER:
SEG
8280 E. GELDING DR, SUITE #101
SCOTTSDALE, AZ 85260
480-588-7226
ATTN: ALI FAKIH

CLIENT:
PEG DEVELOPMENT
180 N. UNIVERSITY AVE
SUITE 200, PROVO UT 84601
801-655-1998
ATTN: MATT KRAMBULE

ARCHITECT:
GENSLER
2575 E. CAMELBACK RD
SUITE 175, PHOENIX AZ 85016
602-253-4900
ATTN: JOHANNA COLLINS





VICINITY MAP
NTS

PROPOSED LEGEND:

- PROPERTY LINE
- PROPOSED ACCESS EASEMENT
- PROPOSED WATER AND SEWER EASEMENT
- UNDERGROUND PARKING
- EXISTING WATER EASEMENT
- PROPOSED R.O.W.

NORTH

0' 20' 40' 60'

SCALE: 1" = 20'

6/19/2020 3:38:59 PM

10-ZN-2020
10/22/20

THE TRIANGLE

7120 E INDIAN SCHOOL RD,
SCOTTSDALE, AZ 85251

- CASE PRE-APP NUMBER -
63-PA-2020

Gensler
2575 E Camelback Road
Suite 175
Phoenix, AZ 85016
United States
Tel 602.523.4900
Fax 602.523.4949

SYDNOR
4806 N 78TH Place
Scottsdale, AZ 85251
United States
Tel 480.206.4593

SEG
8280 E. GELDING DRIVE
Suite 101
Scottsdale, AZ 85260
United States
Tel 480.588.7226

△ Date	Description
10/16/20	Resubmittal

Seal / Signature

NOT FOR CONSTRUCTION

Project Name
3RD AVENUE+INDIAN SCHOOL ROAD - SCOTTSDALE, AZ

Project Number
200504 (SEG)

Description
PROPOSED EASEMENT EXHIBIT

Scale
As indicated

FIGURE 5

APPENDICIES

APPENDIX I - Flow Test

APPENDIX II - WaterCAD Modeling Analysis

APPENDIX III - Site Plan / Utility Plan

Arizona Flow Testing LLC

HYDRANT FLOW TEST REPORT

Project Name:	Arts District in Scottsdale
Project Address:	7100 East Indian School Road, Scottsdale, Arizona 85251
Client Project No.:	200504
Arizona Flow Testing Project No.:	20174
Flow Test Permit No.:	C62135
Date and time flow test conducted:	May 14, 2020 at 7:00 AM
Data is current and reliable until:	November 14, 2020
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: **106.0 PSI**
(Measured in pounds per square inch)

Residual Pressure: **76.0 PSI**
(Measured in pounds per square inch)

Pitot Pressure: **30.0 PSI**
(Measured in pounds per square inch)

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

Coefficient of Diffuser: .7875

Flowing GPM: **2,354 GPM**
(Measured in gallons per minute)

GPM @ 20 PSI: **4,156 GPM**

Data with 34 PSI Safety Factor

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

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

Residual Pressure: **42.0 PSI**
(Measured in pounds per square inch)

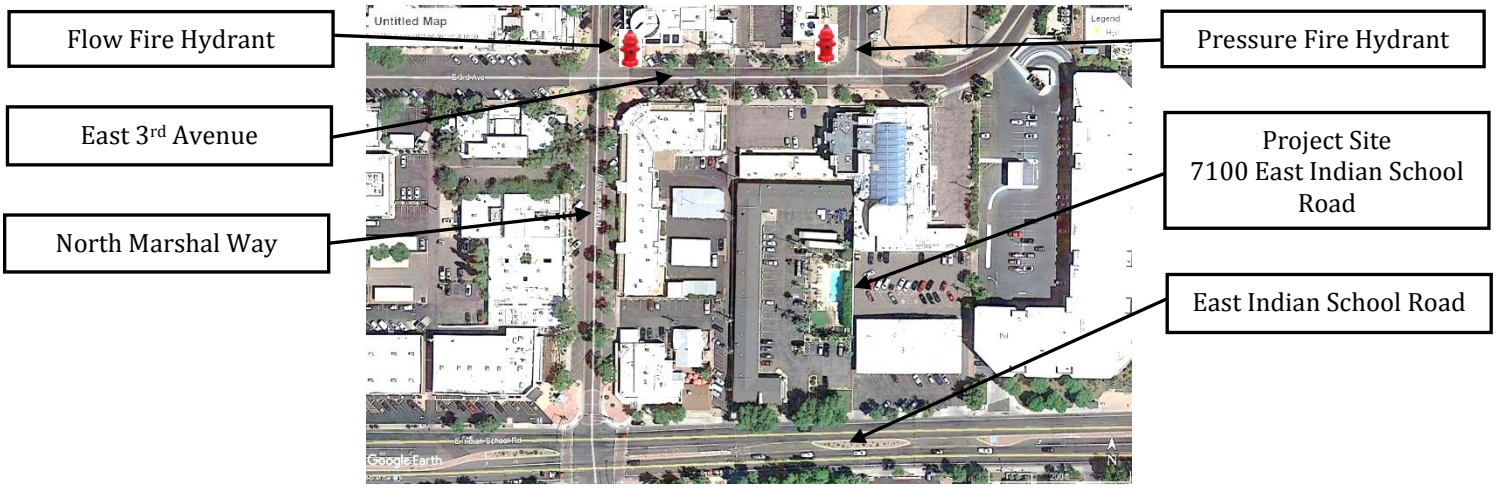
Distance between hydrants: Approx. 280 Feet

Main size: Not Provided

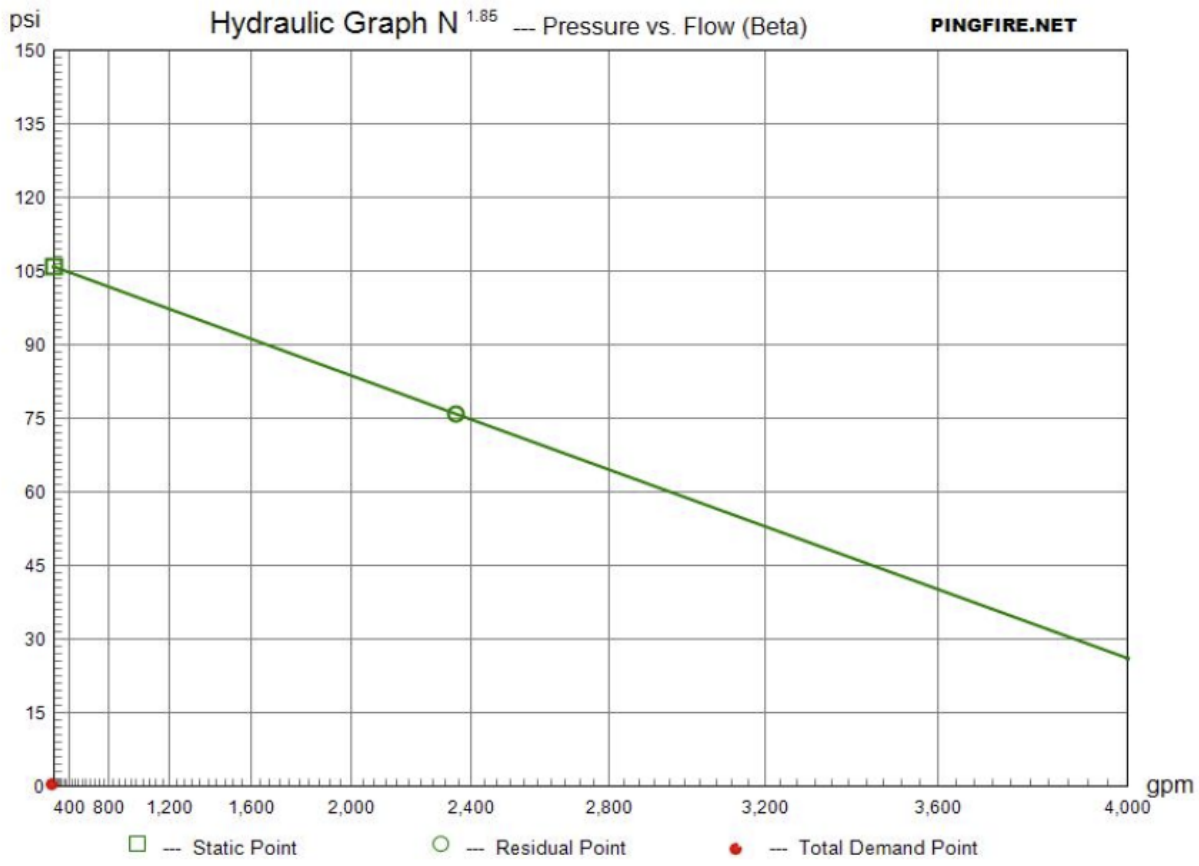
Flowing GPM: **2,354 GPM**

GPM @ 20 PSI**:** **3,168 GPM**

Flow Test Location **North**



Flow Curve With Raw Test Data:

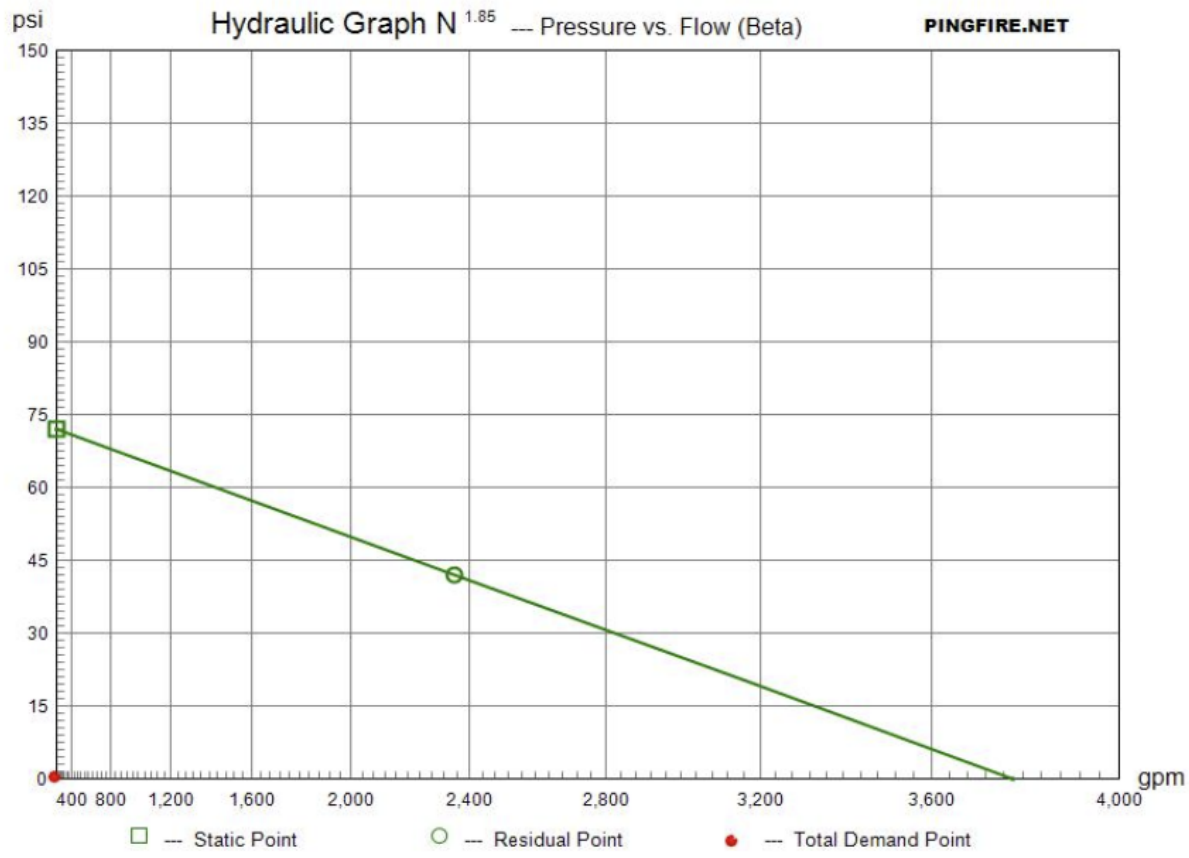


Project Location: Gensler - Triangle Building

Flow Test: Hydrant Elev.= 1265 ft., Static Pressure= 106 psi, Residual Pressure= 76 psi, Flow= 2354 gpm

APPENDIX I
FH Flow Test Data

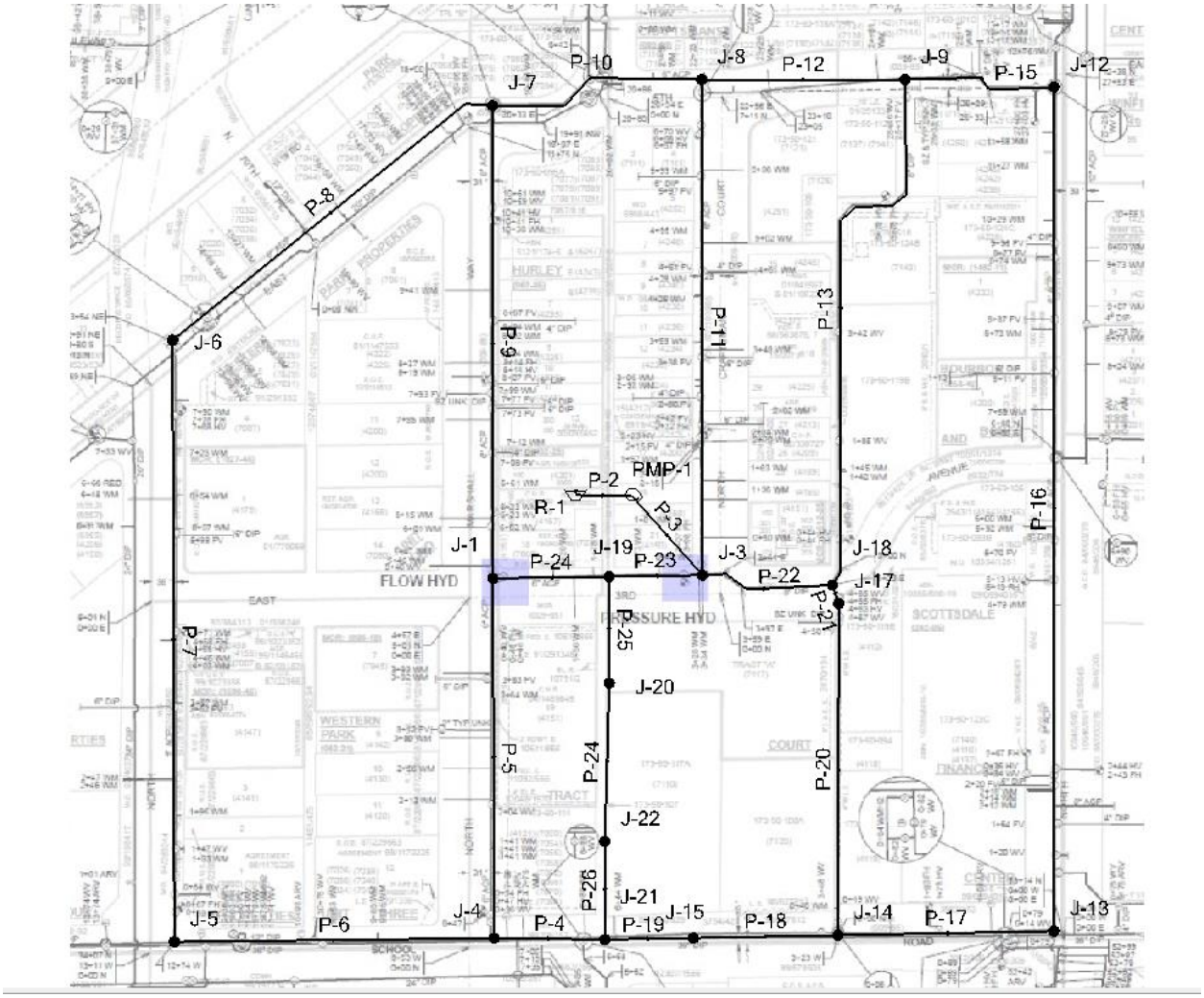
Flow Curve With 34 psi Safety Factor:



Project Location: Gensler - Triangle Building

Flow Test: Hydrant Elev.= 1265 ft., Static Pressure= 72 psi, Residual Pressure= 42 psi, Flow= 2354 gpm

APPENDIX I
FH Flow Test Data



APPENDIX II - WaterCAD Modeling Analysis

2020-08-28 Water Model.wtg

Active Scenario: AD

FlexTable: Junction Table

Label	Elevation (ft)	Demand (gpm)	Hydraulic Grade (ft)	Pressure (psi)
J-1	1,267.10	0	1,509.15	105
J-3	1,265.20	0	1,509.20	106
J-4	1,263.90	0	1,509.14	106
J-5	1,266.00	0	1,509.14	105
J-6	1,270.20	0	1,509.14	103
J-7	1,270.80	0	1,509.14	103
J-8	1,268.20	0	1,509.14	104
J-9	1,267.50	0	1,509.14	105
J-12	1,267.00	0	1,509.14	105
J-13	1,259.90	0	1,509.13	108
J-14	1,261.90	16	1,509.13	107
J-15	1,262.50	0	1,509.14	107
J-17	1,265.65	168	1,509.11	105
J-18	1,265.65	0	1,509.13	105
J-19	1,266.06	0	1,509.16	105
J-20	1,266.00	0	1,509.15	105
J-21	1,263.12	0	1,509.14	106
J-22	1,266.00	7	1,509.14	105

2020-08-28 Water Model.wtg

Active Scenario: AD

FlexTable: Pipe Table

Label	Length (Scaled) (ft)	Start Node	Stop Node	Diameter (in)	Material	Hazen-Williams C	Flow (gpm)	Velocity (ft/s)
P-2	89	R-1	PMP-1	24.0	Ductile Iron	130.0	191	0.14
P-3	167	PMP-1	J-3	24.0	Ductile Iron	130.0	191	0.14
P-5	566	J-1	J-4	6.0	Asbestos Cement	140.0	12	0.14
P-6	504	J-4	J-5	12.0	Ductile Iron	130.0	-5	0.01
P-7	947	J-5	J-6	6.0	Ductile Iron	130.0	-5	0.06
P-8	635	J-6	J-7	6.0	Ductile Iron	130.0	-5	0.06
P-9	744	J-7	J-1	6.0	Asbestos Cement	140.0	-6	0.07
P-10	349	J-7	J-8	6.0	Ductile Iron	130.0	1	0.01
P-11	780	J-8	J-3	6.0	Asbestos Cement	140.0	-25	0.28
P-12	320	J-8	J-9	8.0	Ductile Iron	130.0	26	0.16
P-15	246	J-9	J-12	8.0	Asbestos Cement	140.0	7	0.05
P-16	1,328	J-12	J-13	8.0	Asbestos Cement	140.0	7	0.05
P-17	340	J-13	J-14	12.0	Ductile Iron	130.0	7	0.02
P-18	228	J-14	J-15	12.0	Ductile Iron	130.0	-44	0.13
P-20	522	J-14	J-17	8.0	Ductile Iron	130.0	36	0.23
P-13	877	J-9	J-18	8.0	Ductile Iron	130.0	18	0.12
P-22	213	J-18	J-3	8.0	Ductile Iron	130.0	-113	0.72
P-21	31	J-17	J-18	8.0	Ductile Iron	130.0	-132	0.84
P-23	148	J-3	J-19	6.0	Asbestos Cement	140.0	53	0.60
P-24	183	J-19	J-1	6.0	Asbestos Cement	140.0	19	0.21
P-25	168	J-19	J-20	8.0	Ductile Iron	130.0	34	0.22
P-19	140	J-15	J-21	12.0	Ductile Iron	130.0	-44	0.13
P-4	174	J-21	J-4	12.0	Ductile Iron	130.0	-17	0.05
P-26	154	J-21	J-22	8.0	Ductile Iron	130.0	-27	0.17
P-24	249	J-20	J-22	8.0	Ductile Iron	130.0	34	0.22

2020-08-28 Water Model.wtg

Active Scenario: AD

FlexTable: Pump Table

Label	Elevation (ft)	Status (Initial)	Hydraulic Grade (Suction) (ft)	Hydraulic Grade (Discharge) (ft)	Flow (Total) (gpm)	Pump Head (ft)
PMP-1	1,265.00	On	1,265.20	1,509.20	191	244.00

2020-08-28 Water Model.wtg
Active Scenario: AD
FlexTable: Reservoir Table

Label	Elevation (ft)	Flow (Out net) (gpm)	Hydraulic Grade (ft)
R-1	1,265.20	191	1,265.20

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2020-08-28 Water Model.wtg

Active Scenario: MD

FlexTable: Junction Table

Label	Elevation (ft)	Demand (gpm)	Hydraulic Grade (ft)	Pressure (psi)
J-1	1,267.10	0	1,506.93	104
J-3	1,265.20	0	1,507.10	105
J-4	1,263.90	0	1,506.89	105
J-5	1,266.00	0	1,506.89	104
J-6	1,270.20	0	1,506.90	102
J-7	1,270.80	0	1,506.91	102
J-8	1,268.20	0	1,506.91	103
J-9	1,267.50	0	1,506.89	104
J-12	1,267.00	0	1,506.89	104
J-13	1,259.90	0	1,506.88	107
J-14	1,261.90	31	1,506.88	106
J-15	1,262.50	0	1,506.88	106
J-17	1,265.65	336	1,506.80	104
J-18	1,265.65	0	1,506.85	104
J-19	1,266.06	0	1,506.95	104
J-20	1,266.00	0	1,506.93	104
J-21	1,263.12	0	1,506.89	105
J-22	1,266.00	14	1,506.90	104

2020-08-28 Water Model.wtg

Active Scenario: MD

FlexTable: Pipe Table

Label	Length (Scaled) (ft)	Start Node	Stop Node	Diameter (in)	Material	Hazen-Williams C	Flow (gpm)	Velocity (ft/s)
P-2	89	R-1	PMP-1	24.0	Ductile Iron	130.0	381	0.27
P-3	167	PMP-1	J-3	24.0	Ductile Iron	130.0	381	0.27
P-5	566	J-1	J-4	6.0	Asbestos Cement	140.0	25	0.28
P-6	504	J-4	J-5	12.0	Ductile Iron	130.0	-10	0.03
P-7	947	J-5	J-6	6.0	Ductile Iron	130.0	-10	0.11
P-8	635	J-6	J-7	6.0	Ductile Iron	130.0	-10	0.11
P-9	744	J-7	J-1	6.0	Asbestos Cement	140.0	-13	0.14
P-10	349	J-7	J-8	6.0	Ductile Iron	130.0	3	0.03
P-11	780	J-8	J-3	6.0	Asbestos Cement	140.0	-49	0.56
P-12	320	J-8	J-9	8.0	Ductile Iron	130.0	52	0.33
P-15	246	J-9	J-12	8.0	Asbestos Cement	140.0	15	0.09
P-16	1,328	J-12	J-13	8.0	Asbestos Cement	140.0	15	0.09
P-17	340	J-13	J-14	12.0	Ductile Iron	130.0	15	0.04
P-18	228	J-14	J-15	12.0	Ductile Iron	130.0	-88	0.25
P-20	522	J-14	J-17	8.0	Ductile Iron	130.0	72	0.46
P-13	877	J-9	J-18	8.0	Ductile Iron	130.0	37	0.24
P-22	213	J-18	J-3	8.0	Ductile Iron	130.0	-227	1.45
P-21	31	J-17	J-18	8.0	Ductile Iron	130.0	-264	1.68
P-23	148	J-3	J-19	6.0	Asbestos Cement	140.0	105	1.20
P-24	183	J-19	J-1	6.0	Asbestos Cement	140.0	37	0.42
P-25	168	J-19	J-20	8.0	Ductile Iron	130.0	68	0.44
P-19	140	J-15	J-21	12.0	Ductile Iron	130.0	-88	0.25
P-4	174	J-21	J-4	12.0	Ductile Iron	130.0	-35	0.10
P-26	154	J-21	J-22	8.0	Ductile Iron	130.0	-54	0.34
P-24	249	J-20	J-22	8.0	Ductile Iron	130.0	68	0.44

2020-08-28 Water Model.wtg

Active Scenario: MD

FlexTable: Pump Table

Label	Elevation (ft)	Status (Initial)	Hydraulic Grade (Suction) (ft)	Hydraulic Grade (Discharge) (ft)	Flow (Total) (gpm)	Pump Head (ft)
PMP-1	1,265.00	On	1,265.20	1,507.10	381	241.90

2020-08-28 Water Model.wtg
Active Scenario: MD
FlexTable: Reservoir Table

Label	Elevation (ft)	Flow (Out net) (gpm)	Hydraulic Grade (ft)
R-1	1,265.20	381	1,265.20

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2020-08-28 Water Model.wtg

Active Scenario: PH

FlexTable: Junction Table

Label	Elevation (ft)	Demand (gpm)	Hydraulic Grade (ft)	Pressure (psi)
J-1	1,267.10	0	1,501.34	101
J-3	1,265.20	0	1,501.83	102
J-4	1,263.90	0	1,501.23	103
J-5	1,266.00	0	1,501.23	102
J-6	1,270.20	0	1,501.27	100
J-7	1,270.80	0	1,501.30	100
J-8	1,268.20	0	1,501.30	101
J-9	1,267.50	0	1,501.23	101
J-12	1,267.00	0	1,501.22	101
J-13	1,259.90	0	1,501.20	104
J-14	1,261.90	54	1,501.20	104
J-15	1,262.50	0	1,501.22	103
J-17	1,265.65	588	1,500.99	102
J-18	1,265.65	0	1,501.13	102
J-19	1,266.06	0	1,501.41	102
J-20	1,266.00	0	1,501.35	102
J-21	1,263.12	0	1,501.23	103
J-22	1,266.00	25	1,501.26	102

2020-08-28 Water Model.wtg

Active Scenario: PH

FlexTable: Pipe Table

Label	Length (Scaled) (ft)	Start Node	Stop Node	Diameter (in)	Material	Hazen-Williams C	Flow (gpm)	Velocity (ft/s)
P-2	89	R-1	PMP-1	24.0	Ductile Iron	130.0	667	0.47
P-3	167	PMP-1	J-3	24.0	Ductile Iron	130.0	667	0.47
P-5	566	J-1	J-4	6.0	Asbestos Cement	140.0	43	0.49
P-6	504	J-4	J-5	12.0	Ductile Iron	130.0	-18	0.05
P-7	947	J-5	J-6	6.0	Ductile Iron	130.0	-18	0.20
P-8	635	J-6	J-7	6.0	Ductile Iron	130.0	-18	0.20
P-9	744	J-7	J-1	6.0	Asbestos Cement	140.0	-22	0.25
P-10	349	J-7	J-8	6.0	Ductile Iron	130.0	4	0.05
P-11	780	J-8	J-3	6.0	Asbestos Cement	140.0	-86	0.97
P-12	320	J-8	J-9	8.0	Ductile Iron	130.0	90	0.58
P-15	246	J-9	J-12	8.0	Asbestos Cement	140.0	26	0.16
P-16	1,328	J-12	J-13	8.0	Asbestos Cement	140.0	26	0.16
P-17	340	J-13	J-14	12.0	Ductile Iron	130.0	26	0.07
P-18	228	J-14	J-15	12.0	Ductile Iron	130.0	-155	0.44
P-20	522	J-14	J-17	8.0	Ductile Iron	130.0	126	0.80
P-13	877	J-9	J-18	8.0	Ductile Iron	130.0	65	0.41
P-22	213	J-18	J-3	8.0	Ductile Iron	130.0	-397	2.53
P-21	31	J-17	J-18	8.0	Ductile Iron	130.0	-462	2.95
P-23	148	J-3	J-19	6.0	Asbestos Cement	140.0	184	2.09
P-24	183	J-19	J-1	6.0	Asbestos Cement	140.0	65	0.74
P-25	168	J-19	J-20	8.0	Ductile Iron	130.0	119	0.76
P-19	140	J-15	J-21	12.0	Ductile Iron	130.0	-155	0.44
P-4	174	J-21	J-4	12.0	Ductile Iron	130.0	-60	0.17
P-26	154	J-21	J-22	8.0	Ductile Iron	130.0	-94	0.60
P-24	249	J-20	J-22	8.0	Ductile Iron	130.0	119	0.76

2020-08-28 Water Model.wtg

Active Scenario: PH

FlexTable: Pump Table

Label	Elevation (ft)	Status (Initial)	Hydraulic Grade (Suction) (ft)	Hydraulic Grade (Discharge) (ft)	Flow (Total) (gpm)	Pump Head (ft)
PMP-1	1,265.00	On	1,265.20	1,501.84	667	236.64

2020-08-28 Water Model.wtg

Active Scenario: PH

FlexTable: Reservoir Table

Label	Elevation (ft)	Flow (Out net) (gpm)	Hydraulic Grade (ft)
R-1	1,265.20	667	1,265.20

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should be 2,500

without static pressure adjustment, -34

2020-10-11 Water Model.wtg

Active Scenario: MD+FF

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)	Notes	Pipe w/ Maximum Velocity	Pipe Velocity (ft/s)
J-1	1,500	80	2,709	J-7	46		P-27	15.00
J-3	1,500	86	2,881	J-7	49		P-21	1.68
J-4	1,500	83	2,881	J-5	41		P-23	13.46
J-5	1,500	82	2,881	J-6	40		P-23	13.48
J-6	1,500	65	2,484	J-7	48		P-8	15.00
J-7	1,500	75	2,878	J-6	30		P-10	15.00
J-8	1,500	80	2,881	J-7	40		P-23	10.35
J-9	1,500	81	2,881	J-12	39		P-22	10.87
J-12	1,500	80	2,881	J-9	40		P-15	11.83
J-13	1,500	85	2,881	J-6	42		P-23	12.70
J-14	1,500	85	2,912	J-6	42		P-23	12.85
J-15	1,500	84	2,881	J-6	42		P-23	13.19
J-17	1,500	83	3,111	J-7	48		P-21	15.00
J-18	1,500	84	2,881	J-17	44		P-22	13.10
J-19	1,500	83	2,486	J-7	56		P-23	15.00
J-20	1,500	82	2,720	J-22	48		P-23	15.00
J-21	1,500	84	2,881	J-6	42		P-23	13.40
J-22	1,500	82	2,896	J-6	42		P-23	14.60

10-ZN-2020
10/22/20

2020-08-28 Water Model.wtg
Active Scenario: PH
Pump Definition Detailed Report: PMP-1

Element Details

ID	67	Notes	
Label	PMP-1		

Pump Definition Type

Pump Definition Type	Standard (3 Point)	Design Head	175.50 ft
Shutoff Flow	0 gpm	Maximum Operating Flow	3,740 gpm
Shutoff Head	244.80 ft	Maximum Operating Head	46.20 ft
Design Flow	2,118 gpm		

Pump Efficiency Type

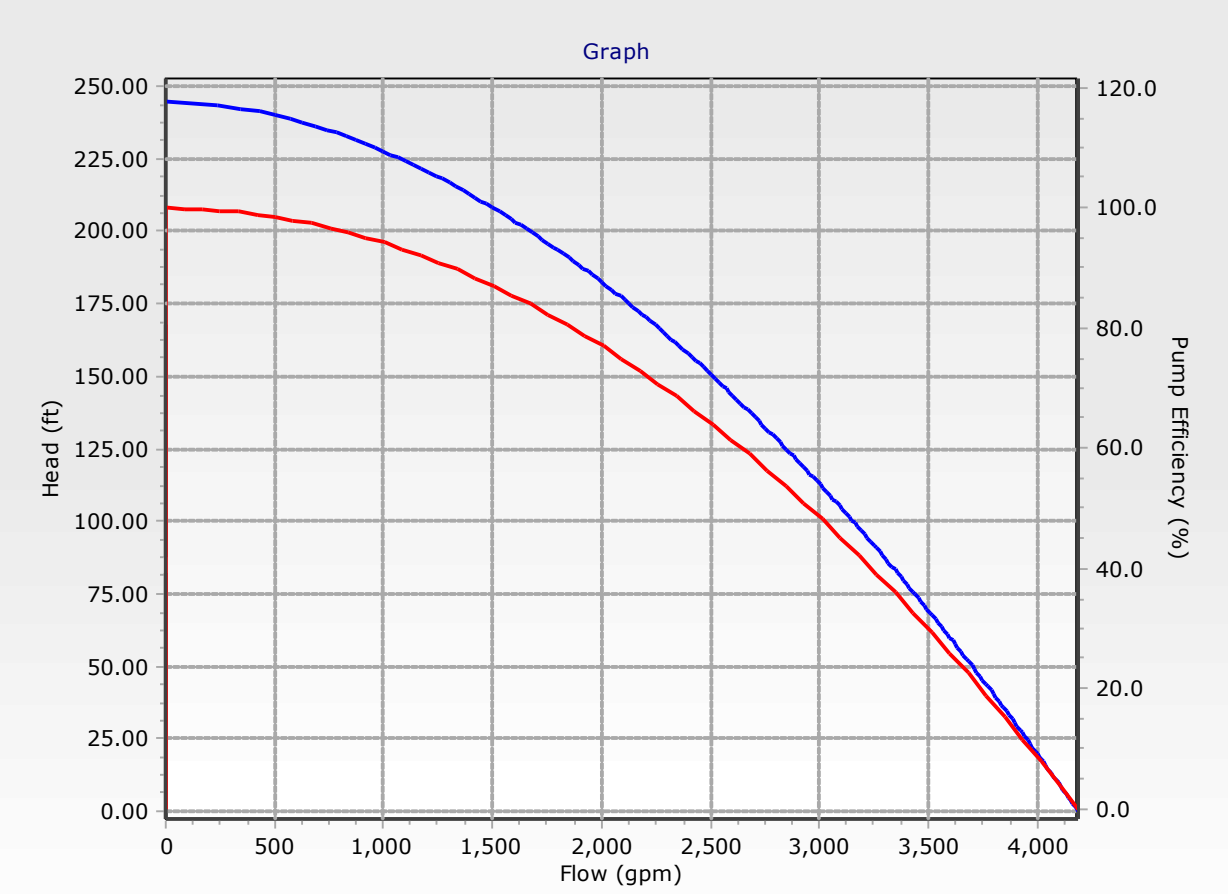
Pump Efficiency Type	Best Efficiency Point	Motor Efficiency	100.0 %
BEP Efficiency	100.0 %	Is Variable Speed Drive?	False
BEP Flow	0 gpm		

Transient (Physical)

Inertia (Pump and Motor)	0.000 lb·ft²	Specific Speed	SI=25, US=1280
Speed (Full)	0 rpm	Reverse Spin Allowed?	True

10-ZN-2020
10/22/20

2020-08-28 Water Model.wtg
Active Scenario: PH
Pump Definition Detailed Report: PMP-1



10-ZN-2020
10/22/20

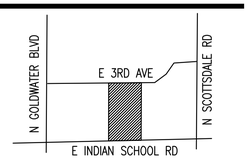
THE TRIANGLE

7120 E. INDIAN SCHOOL ROAD SCOTTSDALE, AZ 85251

CIVIL ENGINEER:
SEG
8280 E. GELDING DR, SUITE #101
SCOTTSDALE, AZ 85260
480-588-7226
ATTN: ALI FAKIH

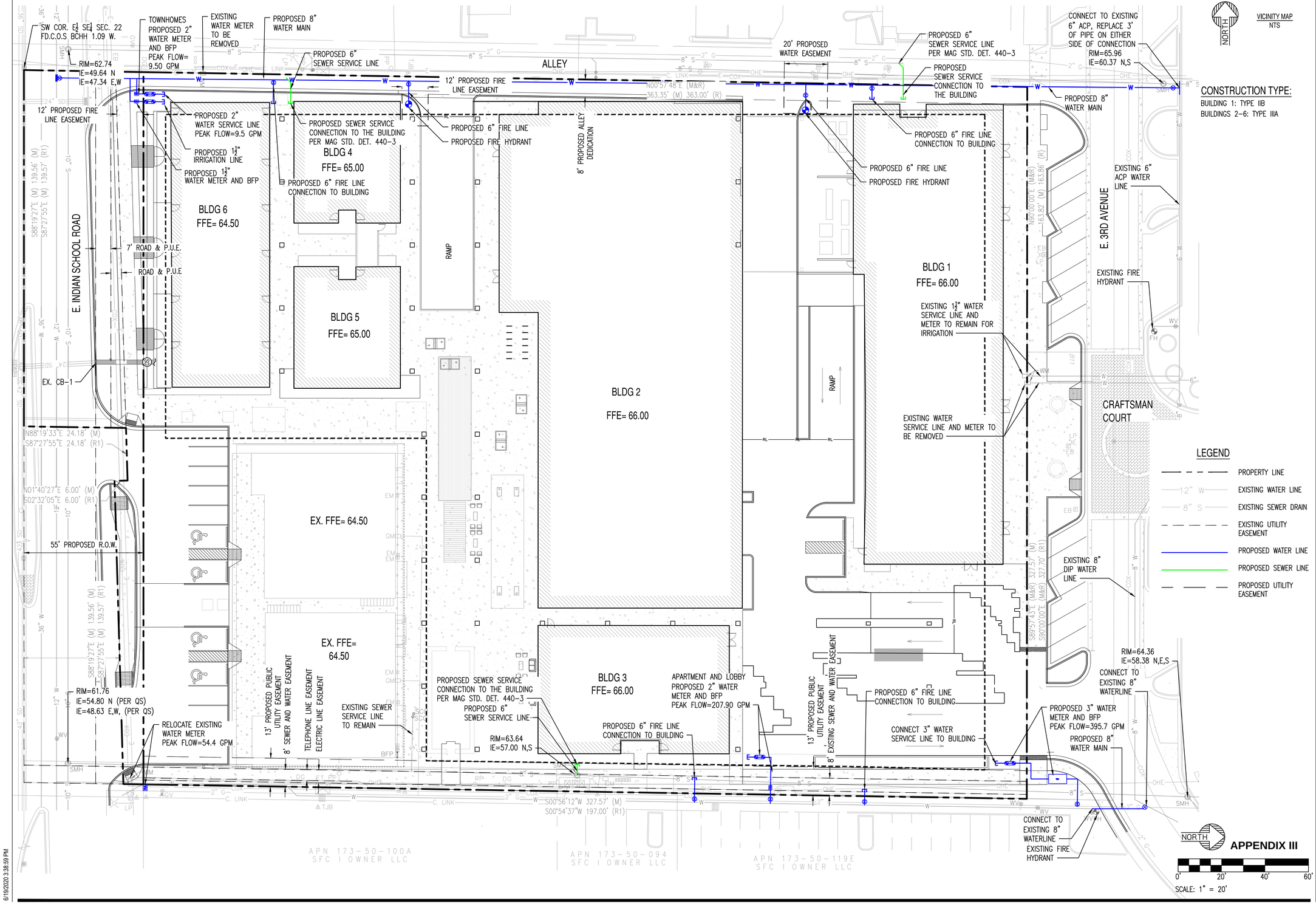
CLIENT:
PEG DEVELOPMENT
180 N. UNIVERSITY AVE
SUITE 200, PROVO UT 84601
801-655-1998
ATTN: MATT KRAMBULE

ARCHITECT:
GENSLER
2575 E. CAMELBACK RD
SUITE 175, PHOENIX AZ 85016
602-253-4900
ATTN: JOHANNA COLLINS



VICINITY MAP
NTS

CONSTRUCTION TYPE:
BUILDING 1: TYPE IIB
BUILDINGS 2-6: TYPE IIIA



APPENDIX III

LEGEND

- PROPERTY LINE
- EXISTING WATER LINE
- EXISTING SEWER DRAIN
- EXISTING UTILITY EASEMENT
- PROPOSED WATER LINE
- PROPOSED SEWER LINE
- PROPOSED UTILITY EASEMENT

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10-ZN-2020
10/22/20

THE TRIANGLE

7120 E INDIAN SCHOOL RD,
SCOTTSDALE, AZ 85251

- CASE PRE-APP NUMBER -
63-PA-2020

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Tel 480.206.4593

SEG
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Suite 101
Scottsdale, AZ 85260
United States
Tel 480.588.7226

△	Date	Description
	10/16/20	Resubmittal

Seal / Signature

NOT FOR CONSTRUCTION

Project Name
3RD AVENUE+INDIAN SCHOOL ROAD - SCOTTSDALE, AZ

Project Number
200504 (SEG)

Description
PRELIMINARY UTILITY PLAN

Scale
As indicated

C4.00