



FINAL WATER BASIS OF DESIGN REPORT

Scottsdale Miller Plaza Scottsdale, Arizona

Prepared for:

Toll Brothers Apartment Living
8767 E. Via de Ventura, Suite 390
Scottsdale, AZ 85258

Prepared by:

Kimley»Horn

291245002
March 2022
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FINAL Basis of Design Report

- APPROVED
- APPROVED AS NOTED
- REVISE AND RESUBMIT



Disclaimer: If approved, the approval is granted under the condition that the final construction documents submitted for city review will match the information herein. Any subsequent changes in the water or sewer design that materially impact design criteria or standards will require re-analysis, re-submittal, and approval of a revised basis of design report prior to the plan review submission.; this approval is not a guarantee of construction document acceptance. For questions or clarifications contact the Water Resources Planning and Engineering Department at 480-312-5685.

BY Idillon

DATE 3/28/2022

Address comments below and herein within the final plans:

- 1) A new meter vault proposed off of 6th Ave. Scottsdale detail 2345-1 (if final meter size dictates).
- 2) Tap onto 6th avenue and northern tap for fire line requires tapping ACP. ACP line may require replacement of ACP section with DIP. DS&PM 6-1.408 and 6-1.413
- 3) Removal of existing 4" DIP water service on 6th Ave. requires removal back to the main and replacement of the saddle/sleeve with a spool piece. DS&PM 6-1.408
- 4) Address comments on the utility plan.





Scottsdale Miller Plaza

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MARCH 2022

Prepared By:

Kimley»»Horn

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1.0 INTRODUCTION

Kimley-Horn and Associates, Inc. has prepared this Water Basis of Design Report for the proposed apartment development at the northwest corner of East 6th Avenue and North Miller Road in Scottsdale, Arizona. This report will demonstrate that the proposed project conforms to the City of Scottsdale design requirements.

Scottsdale Miller Plaza, the “project”, encompasses approximately 1.38 net acres and contains a 153,373 gross square foot five-story apartment with a 90,330 gross square foot two-level underground parking garage. The project includes 148 units with a pool amenity area. The project lies within a portion of the Southwest Quarter of Section 23, Township 2 North, Range 4 East of the Gila and Salt River Baseline and Meridian in Maricopa County, Arizona. More specifically, the project is bound by East 6th Avenue to the south, North Miller Road to the east, and existing commercial developments to the north and west. See **Appendix A** for the Vicinity Map.

2.0 DOMESTIC WATER ANALYSIS

2.1 INTENT AND SCOPE

The intent of this section is to evaluate the potable water infrastructure for the proposed development. As a result of this analysis, it will be determined if the potable water infrastructure is capable of satisfying the projected water demands for the proposed development in accordance with the City of Scottsdale Design Standards & Policies Manual (**Reference 1**) and the 2018 International Fire Code (**Reference 2**) for fire prevention.

2.2 GENERAL THEORY

The water system modeling program Water CAD, developed by Haestad Methods, is used to model the water system servicing the proposed development. The program uses the fluid mechanic head loss theory known as the Hazen-Williams method. This is the typical method used to evaluate water distribution systems.

2.3 DOMESTIC WATER SUPPLY

There is an existing 8-inch ACP water main located in East 6th Avenue south of the site and an 8-inch ACP water main within the private access drive along the western portion of the site. The existing 8-inch ACP water main in East 6th Avenue connects to an existing 8-inch DIP water main in North Miller Road east of the site. An existing 4-inch DIP water service stub enters the proposed site at the south property line and connects to the existing 8-inch ACP water main in East 6th Avenue.

The existing 4-inch DIP water service line will be removed to the existing 8-inch ACP water main in East 6th Avenue. The existing tee will be replaced with a spool of pipe to repair the 8-inch water main.

A new 6-inch DIP private fire service will connect to the existing 8-inch ACP water main East 6th Avenue along the southern portion of the site with an 8-inch by 6-inch tapping sleeve and valve. A new 3-inch copper water service line will connect to the existing 8-inch ACP water main in East 6th Avenue via a 3-inch by 8-inch saddle tap. Refer to **Appendix B** for the Preliminary Utility Plan.

Residual and static pressures were obtained from a flow test performed on two fire hydrants (one flow and one pressure) in the western driveway, by EJ Flow Tests on January 15th, 2021. The tested fire hydrants were selected due to the proximity to the proposed building. See **Appendix D** for the Fire Flow Test results.

2.4 INTERNATIONAL FIRE CODE, 2018

According to the City of Scottsdale Fire Department, the 2018 International Fire Code (IFC) with City of Scottsdale Amendments is currently the governing code with respect to fire protection requirements. The IFC evaluates the building construction type, occupancy descriptions, and square footage to set minimum fire flow requirements with regards to a particular development.

The proposed building and garage are Construction Type V-A and III-A respectively. Per Table B105.1(2) of **Reference 2**, the required fire flow is 8,000 gallons per minute. A reduction in fire-flow of 75% percent is allowed when the building is equipped with an approved fire sprinkler system. The apartment building and parking garage will be equipped with an approved fire sprinkler system. The minimum fire flow requirements per the IFC 2018 and COS DS&PM 6-1.501 for the proposed building are shown in Table 1. Table 1 also shows the required building fire flow based upon a maximum fire flow reduction of 75% allowed by the IFC 2018. The reduced fire flow shall not be less than 1,500 gpm. See **Appendix C** for IFC 2018 Appendix B.

Table 1 Required Building Fire Flows

Building	Building Construction Type	Area (sf)	Required Fire Flow per IFC 2018 (gpm)	Reduction	Required Fire Flow per IFC with Reduction (gpm)
Apartments	V-A	153,373	7,000	-	-
Garage	III-A	90,330	4,250	-	-
TOTAL	-	243,703	8,000*	75%	2,000

*Maximum required fire flow prior to automatic sprinkler system reduction per IFC 2018 Table B105.1(2) and B105.2 is 8,000 gpm.

2.5 WATER DEMANDS

According to the guidelines provided in Figure 6-1.2 of **Reference 1**, the proposed development will add the following demands to the existing water system for Average Day Demand (ADD), Maximum Day Demand (MDD), and Peak Hour Demand (PHD):

Table 2: Domestic Water Demands

Building	Building Area (sf)	# DUs	Total Demand ¹ (GPM/DU)	ADD (GPM)	MDD ² (GPM)	PHD ³ (GPM)
Building + Garage	243,703	148	0.27	39.96	79.92	139.86

From zoning dropped by 34 units and 32gpm peak, OK

Notes:

1. For high density condominium land use, average day demand is 185.3 gpd/du or 0.27 gpm/du.
2. Maximum day demand defined as 2 times the average day demand.
3. Peak hour demand defined as 3.5 times the average day demand.

Three water analyses were performed to evaluate the existing adjacent off-site water infrastructure and the proposed on-site water system:

1. Average Day Demand
2. Peak Hour Demand
3. Maximum Day Demand + Fire Flow

The system was analyzed for the worst-case scenario to ensure that the existing and proposed public water infrastructure can maintain a minimum pressure of 50 psi for the Peak Hour demand, and 30 psi for the Maximum Day plus Fire Flow demand. See **Appendix D** for water model layout to identify nodes and pipes.

See **Appendix D** for the Fire Flow Test and Water CAD Analysis and Layout. A summary of the water analysis results for the project is tabulated below:

Table 3 Domestic Water Model Result Summary

Criteria	Peak Hour Demand	Constraint	Peak Hour Pressure at Demand	Node with Minimum Pressure
Minimum Pressure	140 gpm	50 psi	71 psi	BLDG DW
Meets Criteria?	-	-	Yes*	



*The hydraulic water model was analyzed at the ground floor elevation of the proposed high-rise building. Reference plumbing calculations for any internal booster pump systems to provide adequate water pressures to the higher floors of the building.

Table 4 Max Day + Fire Flow Water Model Result Summary

Criteria	Max Day + Fire Flow Demand	Constraint	Max Day + Fire Flow Pressure at Demand	Node with Minimum Pressure
Minimum System Pressure	2,000 gpm	30 psi	39 psi	BLDG FIRE
Meets Criteria?	-	-	Yes*	



*The hydraulic water model was analyzed at the ground floor elevation of the proposed high-rise building. Reference plumbing calculations for any internal booster pump systems to provide adequate water pressures to the higher floors of the building.

Table 5 Fire Hydrant Flow Water Model Result Summary

Criteria	Fire Flow Demand	Constraint	Fire Flow Pressure at Demand	Meets Criteria?
Hydrant 1	2,000 gpm	30 psi	50 psi	YES
Hydrant 2	2,000 gpm	30 psi	41 psi	YES



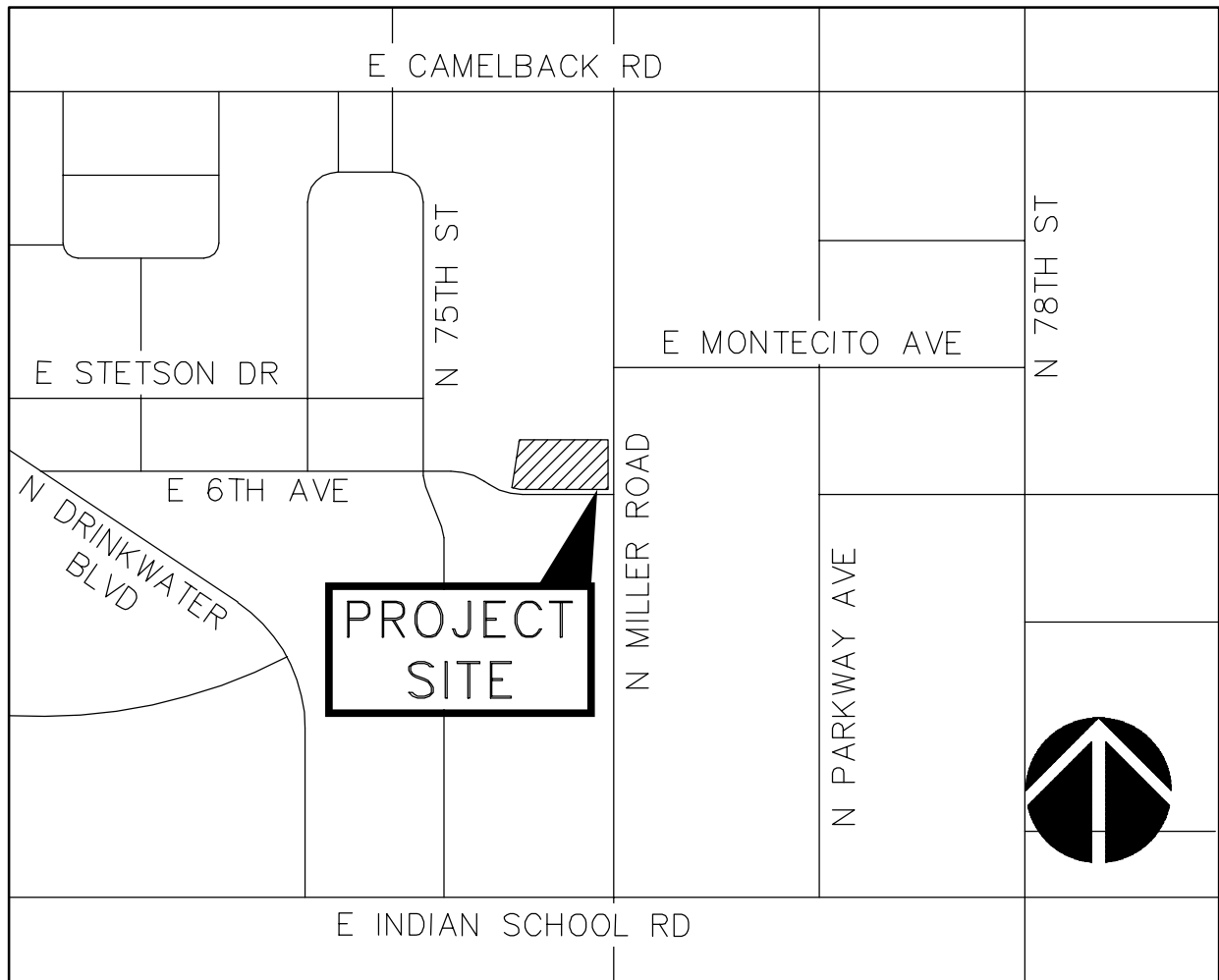
4.0 CONCLUSION

The proposed and existing on-site water system as outlined by this analysis appears adequate and sufficient to meet the required fire flow demand to the first floor of the proposed Scottsdale Miller Plaza development near the northwest corner of East 6th Avenue and North Miller Road in Scottsdale, Arizona. The proposed building may require a domestic booster system to provide adequate water pressures to the top floors of the building based on plumbing calculations.

5.0 REFERENCES

1. City of Scottsdale, *Design Standards and Policies Manual*. 2018.
2. International Code Council, *2018 International Fire Code*. December 2019.

Appendix A – Vicinity Map



VICINITY MAP

SCOTTSDALE, AZ
N.T.S.

Appendix B –Utility Plan

Appendix C – Fire Flow Requirements from 2018 IFC

APPENDIX B

FIRE-FLOW REQUIREMENTS FOR BUILDINGS

The provisions contained in this appendix are not mandatory unless specifically referenced in the adopting ordinance or legislation of the jurisdiction.

User note:

About this appendix: Appendix B provides a tool for the use of jurisdictions in establishing a policy for determining fire-flow requirements in accordance with Section 507.3. The determination of required fire flow is not an exact science, but having some level of information provides a consistent way of choosing the appropriate fire flow for buildings throughout a jurisdiction. The primary tool used in this appendix is a table that presents fire flow based on construction type and building area based on the correlation of the Insurance Services Office (ISO) method and the construction types used in the International Building Code®.

SECTION B101 GENERAL

B101.1 Scope. The procedure for determining fire-flow requirements for buildings or portions of buildings hereafter constructed shall be in accordance with this appendix. This appendix does not apply to structures other than buildings.

SECTION B102 DEFINITIONS

B102.1 Definitions. For the purpose of this appendix, certain terms are defined as follows:

FIRE FLOW. The flow rate of a water supply, measured at 20 pounds per square inch (psi) (138 kPa) residual pressure, that is available for fire fighting.

FIRE-FLOW CALCULATION AREA. The floor area, in square feet (m²), used to determine the required fire flow.

SECTION B103 MODIFICATIONS

■ **B103.1 Decreases.** The *fire code official* is authorized to reduce the *fire-flow* requirements for isolated buildings or a group of buildings in rural areas or small communities where the development of full *fire-flow* requirements is impractical.

■ **B103.2 Increases.** The *fire code official* is authorized to increase the *fire-flow* requirements where conditions indicate an unusual susceptibility to group fires or conflagrations. An increase shall be not more than twice that required for the building under consideration.

B103.3 Areas without water supply systems. For information regarding water supplies for fire-fighting purposes in rural and suburban areas in which adequate and reliable water supply systems do not exist, the *fire code official* is authorized to utilize NFPA 1142 or the *International Wildland-Urban Interface Code*.

SECTION B104 FIRE-FLOW CALCULATION AREA

B104.1 General. The *fire-flow calculation area* shall be the total floor area of all floor levels within the *exterior walls*, and under the horizontal projections of the roof of a building, except as modified in Section B104.3.

B104.2 Area separation. Portions of buildings that are separated by *fire walls* without openings, constructed in accordance with the *International Building Code*, are allowed to be considered as separate *fire-flow calculation areas*.

B104.3 Type IA and Type IB construction. The *fire-flow calculation area* of buildings constructed of Type IA and Type IB construction shall be the area of the three largest successive floors.

Exception: *Fire-flow calculation area* for open parking garages shall be determined by the area of the largest floor.

SECTION B105 FIRE-FLOW REQUIREMENTS FOR BUILDINGS

B105.1 One- and two-family dwellings, Group R-3 and R-4 buildings and townhouses. The minimum *fire-flow* and flow duration requirements for one- and two-family *dwellings*, Group R-3 and R-4 buildings and *townhouses* shall be as specified in Tables B105.1(1) and B105.1(2).

B105.2 Buildings other than one- and two-family dwellings, Group R-3 and R-4 buildings and townhouses. The minimum *fire-flow* and flow duration for buildings other than one- and two-family *dwellings*, Group R-3 and R-4 buildings and *townhouses* shall be as specified in Tables B105.2 and B105.1(2).

B105.3 Water supply for buildings equipped with an automatic sprinkler system. For buildings equipped with an *approved automatic sprinkler system*, the water supply shall be capable of providing the greater of:

1. The *automatic sprinkler system* demand, including hose stream allowance.
2. The required *fire flow*.

APPENDIX B

TABLE B105.1(1)
REQUIRED FIRE FLOW FOR ONE- AND TWO-FAMILY DWELLINGS, GROUP R-3 AND R-4 BUILDINGS AND TOWNHOUSES

FIRE-FLOW CALCULATION AREA (square feet)	AUTOMATIC SPRINKLER SYSTEM (Design Standard)	MINIMUM FIRE FLOW (gallons per minute)	FLOW DURATION (hours)
0–3,600	No automatic sprinkler system	1,000	1
3,601 and greater	No automatic sprinkler system	Value in Table B105.1(2)	Duration in Table B105.1(2) at the required fire-flow rate
0–3,600	Section 903.3.1.3 of the <i>International Fire Code</i> or Section P2904 of the <i>International Residential Code</i>	500	1/2
3,601 and greater	Section 903.3.1.3 of the <i>International Fire Code</i> or Section P2904 of the <i>International Residential Code</i>	1/2 value in Table B105.1(2)	1

For SI: 1 square foot = 0.0929 m², 1 gallon per minute = 3.785 L/m.

TABLE B105.1(2)
REFERENCE TABLE FOR TABLES B105.1(1) AND B105.2

FIRE-FLOW CALCULATION AREA (square feet)					FIRE FLOW (gallons per minute) ^b	FLOW DURATION (hours)
Type IA and IB ^a	Type IIA and IIIA ^a	Type IV and V-A ^a	Type IIB and IIIB ^a	Type V-B ^a		
0-22,700	0-12,700	0-8,200	0-5,900	0-3,600	1,500	2
22,701-30,200	12,701-17,000	8,201-10,900	5,901-7,900	3,601-4,800	1,750	
30,201-38,700	17,001-21,800	10,901-12,900	7,901-9,800	4,801-6,200	2,000	
38,701-48,300	21,801-24,200	12,901-17,400	9,801-12,600	6,201-7,700	2,250	
48,301-59,000	24,201-33,200	17,401-21,300	12,601-15,400	7,701-9,400	2,500	
59,001-70,900	33,201-39,700	21,301-25,500	15,401-18,400	9,401-11,300	2,750	3
70,901-83,700	39,701-47,100	25,501-30,100	18,401-21,800	11,301-13,400	3,000	
83,701-97,700	47,101-54,900	30,101-35,200	21,801-25,900	13,401-15,600	3,250	
97,701-112,700	54,901-63,400	35,201-40,600	25,901-29,300	15,601-18,000	3,500	
112,701-128,700	63,401-72,400	40,601-46,400	29,301-33,500	18,001-20,600	3,750	
128,701-145,900	72,401-82,100	46,401-52,500	33,501-37,900	20,601-23,300	4,000	4
145,901-164,200	82,101-92,400	52,501-59,100	37,901-42,700	23,301-26,300	4,250	
164,201-183,400	92,401-103,100	59,101-66,000	42,701-47,700	26,301-29,300	4,500	
183,401-203,700	103,101-114,600	66,001-73,300	47,701-53,000	29,301-32,600	4,750	
203,701-225,200	114,601-126,700	73,301-81,100	53,001-58,600	32,601-36,000	5,000	
225,201-247,700	126,701-139,400	81,101-89,200	58,601-65,400	36,001-39,600	5,250	
247,701-271,200	139,401-152,600	89,201-97,700	65,401-70,600	39,601-43,400	5,500	
271,201-295,900	152,601-166,500	97,701-106,500	70,601-77,000	43,401-47,400	5,750	
295,901-Greater	166,501-Greater	106,501-115,800	77,001-83,700	47,401-51,500	6,000	
—	—	115,801-125,500	83,701-90,600	51,501-55,700	6,250	
—	—	125,501-135,500	90,601-97,900	55,701-60,200	6,500	
—	—	135,501-145,800	97,901-106,800	60,201-64,800	6,750	
—	—	145,801-156,700	106,801-113,200	64,801-69,600	7,000	
—	—	156,701-167,900	113,201-121,300	69,601-74,600	7,250	
—	—	167,901-179,400	121,301-129,600	74,601-79,800	7,500	
—	—	179,401-191,400	129,601-138,300	79,801-85,100	7,750	
—	—	191,401-Greater	138,301-Greater	85,101-Greater	8,000	

For SI: 1 square foot = 0.0929 m², 1 gallon per minute = 3.785 L/m, 1 pound per square inch = 6.895 kPa.

a. Types of construction are based on the *International Building Code*.

b. Measured at 20 psi residual pressure.

**TABLE B105.2
REQUIRED FIRE FLOW FOR BUILDINGS OTHER THAN ONE- AND
TWO-FAMILY DWELLINGS, GROUP R-3 AND R-4 BUILDINGS AND TOWNHOUSES**

AUTOMATIC SPRINKLER SYSTEM (Design Standard)	MINIMUM FIRE FLOW (gallons per minute)	FLOW DURATION (hours)
No automatic sprinkler system	Value in Table B105.1(2)	Duration in Table B105.1(2)
Section 903.3.1.1 of the <i>International Fire Code</i>	25% of the value in Table B105.1(2) ^a	Duration in Table B105.1(2) at the reduced flow rate
Section 903.3.1.2 of the <i>International Fire Code</i>	25% of the value in Table B105.1(2) ^b	Duration in Table B105.1(2) at the reduced flow rate

For SI: 1 gallon per minute = 3.785 L/m.

- a. The reduced fire flow shall be not less than 1,000 gallons per minute.
b. The reduced fire flow shall be not less than 1,500 gallons per minute.

**SECTION B106
REFERENCED STANDARDS**

ICC	IBC—18	International Building Code	B104.2
ICC	IWUIC—18	International Wildland- Urban Interface Code	B103.3
ICC	IRC—18	International Residential Code	Table B105.1(1)
NFPA	1142—17	Standard on Water Supplies for Suburban and Rural Fire Fighting	B103.3

Appendix D – Fire Flow Test and Water CAD Results and Layout



Flow Test Summary

Project Name: EJFT 21024
 Project Address: E 6th Ave & N Miller Rd, Scottsdale, AZ 85251
 Date of Flow Test: 2021-01-15
 Time of Flow Test: 7:40 AM
 Data Reliable Until: 2021-07-15
 Conducted By: Eder Cueva & Steven Saethre (EJ Flow Tests) 602.999.7637
 Witnessed By: Ray Padilla (City of Scottsdale) 602.541.0586
 City Forces Contacted: City of Scottsdale (602.541.0586)
 Permit Number: C64153

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

Raw Flow Test Data

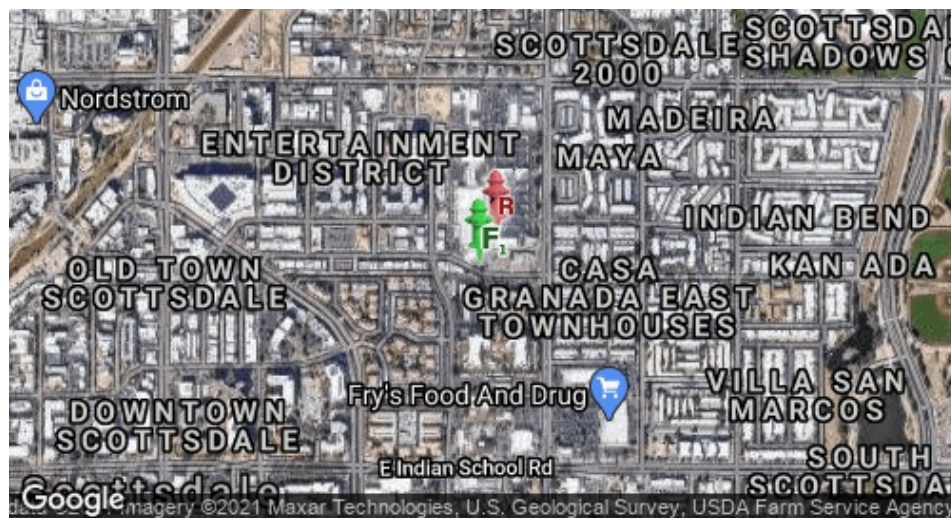
Static Pressure: 108.0 PSI
 Residual Pressure: 84.0 PSI
 Flowing GPM: 2,264
 GPM @ 20 PSI: 4,566



Data with a 36 PSI Safety Factor

Static Pressure: 72.0 PSI
 Residual Pressure: 48.0 PSI
 Flowing GPM: 2,264
 GPM @ 20 PSI: 3,437

Hydrant F₁

Pitot Pressure (1): 43 PSI
 Coefficient of Discharge (1): 0.9
 Hydrant Orifice Diameter (1): 2.5 inches
 Pitot Pressure (2): 48 PSI
 Coefficient of Discharge (2): 0.9
 Hydrant Orifice Diameter (2): 2.5 inches



 Static-Residual Hydrant
 Flow Hydrant
 Distance Between F₁ and R
 222 ft (measured linearly)
 Static-Residual Elevation
 1257 ft (above sea level)
 Flow Hydrant (F₁) Elevation
 1255 ft (above sea level)
 Elevation & distance values are approximate

Static-Residual Hydrant



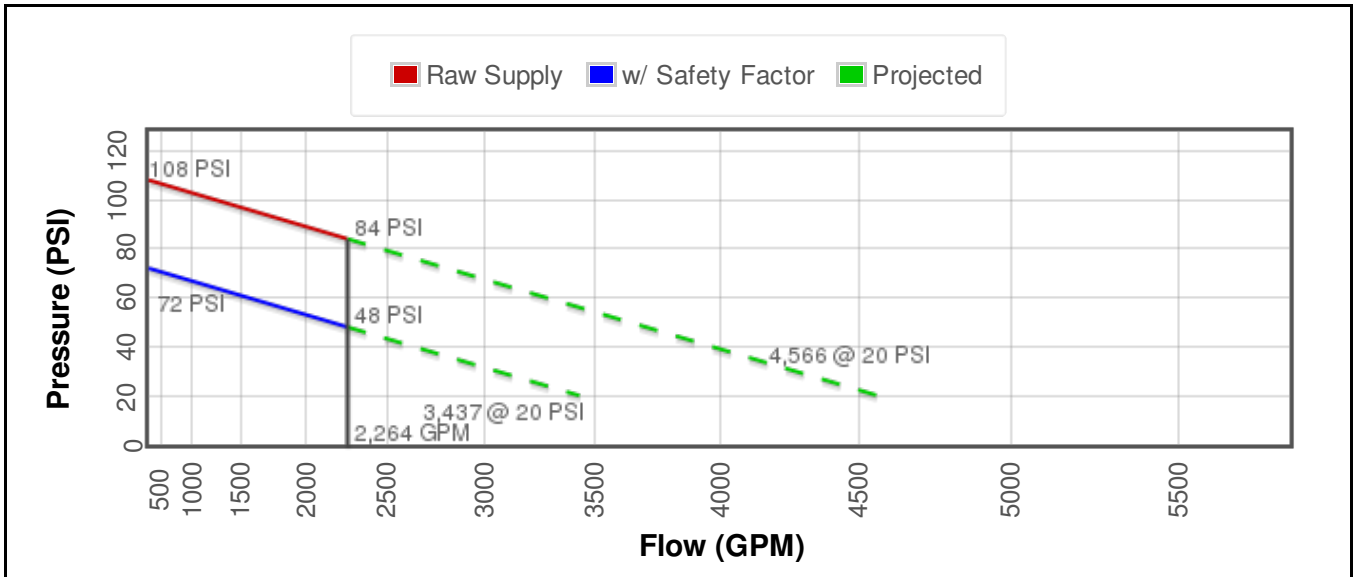
Flow Hydrant (only hydrant F1 shown for clarity)



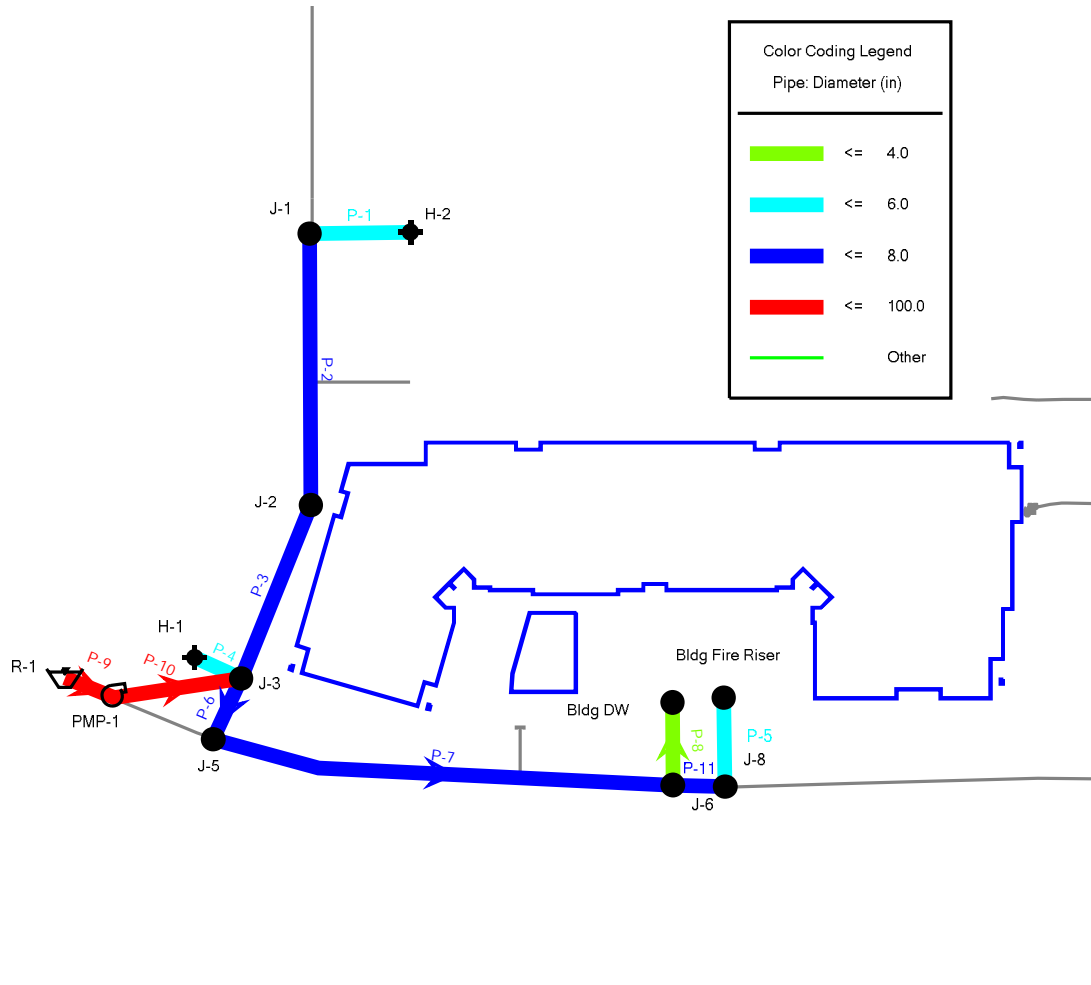
Approximate Project Site



Water Supply Curve N^{1.85} Graph



Scenario: Average Day Demand

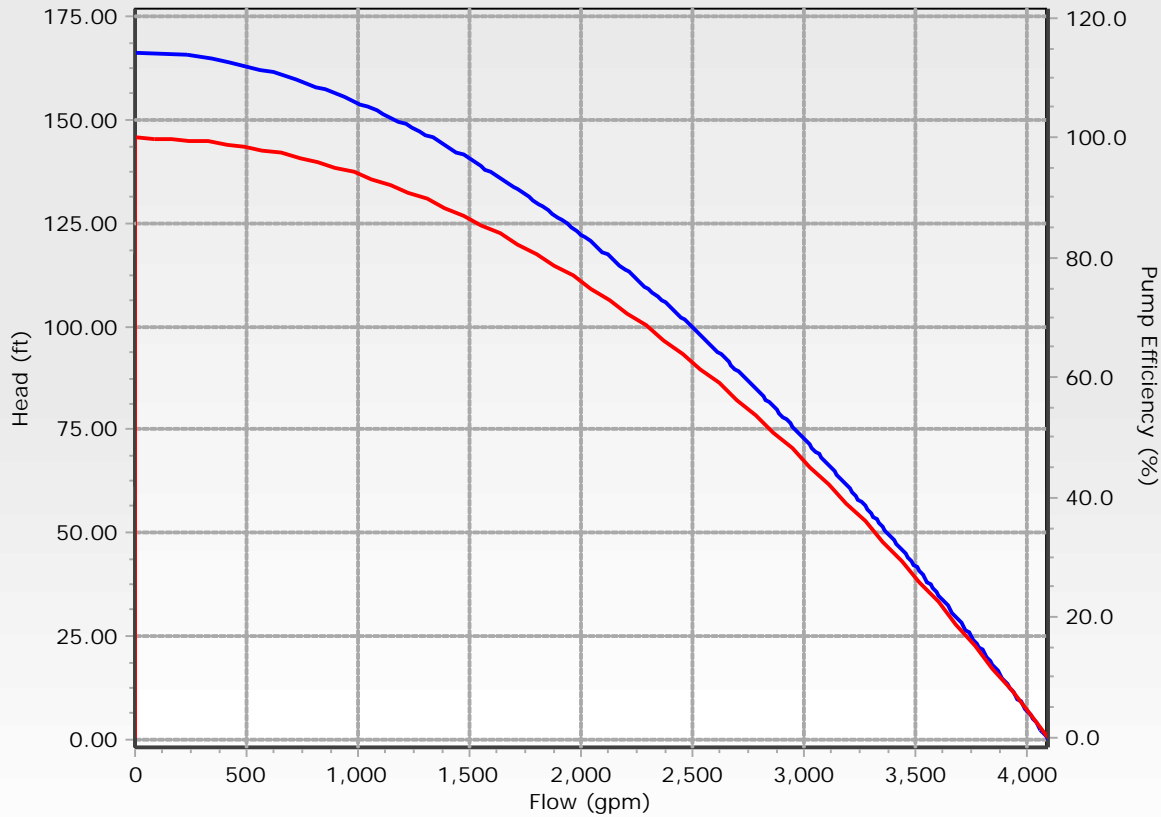


Pump Definition Detailed Report: 2021-01-15 FF Test

Element Details			
ID	54	Notes	
Label	2021-01-15 FF Test		
Pump Definition Type			
Pump Definition Type	Standard (3 Point)	Design Head	110.88 ft
Shutoff Flow	0 gpm	Maximum Operating Flow	3,437 gpm
Shutoff Head	166.32 ft	Maximum Operating Head	46.20 ft
Design Flow	2,264 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 ²	Specific Speed	SI=25, US=1280
Speed (Full)	0 rpm	Reverse Spin Allowed?	True

Pump Definition Detailed Report: 2021-01-15 FF Test

Graph



Water CAD Output Average Day Demand

Junction Table - Time: 0.00 hours

ID	Label	Is Active?	Elevation (ft)	Demand (gpm)	Hydraulic Grade (ft)	Pressure (psi)
45	Bldg DW	True	55.00	40	222.05	72
39	Bldg Fire Riser	True	55.00	0	222.28	72
32	J-1	True	57.00	0	222.29	72
34	J-2	True	57.62	0	222.29	71
36	J-3	True	55.92	0	222.29	72
41	J-5	True	55.38	0	222.29	72
43	J-6	True	54.53	0	222.28	73
69	J-8	True	54.50	0	222.28	73

Pipe Table - Time: 0.00 hours

ID	Label	Length (Scaled) (ft)	Start Node	Stop Node	Diameter (in)	Material	Hazen-Williams C	Flow (gpm)	Velocity (ft/s)	Headloss Gradient (ft/ft)
33	P-1	49	H-2	J-1	6.0	Ductile Iron	130.0	0	0.00	0.000
35	P-2	133	J-1	J-2	8.0	Asbestos Cement	140.0	0	0.00	0.000
37	P-3	91	J-2	J-3	8.0	Asbestos Cement	140.0	0	0.00	0.000
38	P-4	25	J-3	H-1	6.0	Ductile Iron	130.0	0	0.00	0.000
40	P-5	43	J-8	Bldg Fire Riser	6.0	Ductile Iron	130.0	0	0.00	0.000
42	P-6	33	J-3	J-5	8.0	Asbestos Cement	140.0	40	0.26	0.000
44	P-7	227	J-5	J-6	8.0	Asbestos Cement	140.0	40	0.26	0.000
46	P-8	40	J-6	Bldg DW	3.0	Ductile Iron	130.0	40	1.82	0.006
49	P-9	26	R-1	PMP-1	100.0	Ductile Iron	130.0	40	0.00	0.000
50	P-10	63	PMP-1	J-3	100.0	Ductile Iron	130.0	40	0.00	0.000
70	P-11	26	J-6	J-8	8.0	Ductile Iron	130.0	0	0.00	0.000

Water CAD Output Peak Hour Demand

Junction Table - Time: 0.00 hours

ID	Label	Is Active?	Elevation (ft)	Demand (gpm)	Hydraulic Grade (ft)	Pressure (psi)
45	Bldg DW	True	55.00	140	219.59	71
39	Bldg Fire Riser	True	55.00	0	221.89	72
32	J-1	True	57.00	0	222.00	71
34	J-2	True	57.62	0	222.00	71
36	J-3	True	55.92	0	222.00	72
41	J-5	True	55.38	0	221.99	72
43	J-6	True	54.53	0	221.89	72
69	J-8	True	54.50	0	221.89	72

Pipe Table - Time: 0.00 hours

ID	Label	Length (Scaled) (ft)	Start Node	Stop Node	Diameter (in)	Material	Hazen-Williams C	Flow (gpm)	Velocity (ft/s)	Headloss Gradient (ft/ft)
33	P-1	49	H-2	J-1	6.0	Ductile Iron	130.0	0	0.00	0.000
35	P-2	133	J-1	J-2	8.0	Asbestos Cement	140.0	0	0.00	0.000
37	P-3	91	J-2	J-3	8.0	Asbestos Cement	140.0	0	0.00	0.000
38	P-4	25	J-3	H-1	6.0	Ductile Iron	130.0	0	0.00	0.000
40	P-5	43	J-8	Bldg Fire Riser	6.0	Ductile Iron	130.0	0	0.00	0.000
42	P-6	33	J-3	J-5	8.0	Asbestos Cement	140.0	140	0.89	0.000
44	P-7	227	J-5	J-6	8.0	Asbestos Cement	140.0	140	0.89	0.000
46	P-8	40	J-6	Bldg DW	3.0	Ductile Iron	130.0	140	6.35	0.057
49	P-9	26	R-1	PMP-1	100.0	Ductile Iron	130.0	140	0.01	0.000
50	P-10	63	PMP-1	J-3	100.0	Ductile Iron	130.0	140	0.01	0.000
70	P-11	26	J-6	J-8	8.0	Ductile Iron	130.0	0	0.00	0.000

Water CAD Output

Maximum Day Demand + Fire Flow

Junction Table - Time: 0.00 hours

ID	Label	Is Active?	Elevation (ft)	Demand (gpm)	Hydraulic Grade (ft)	Pressure (psi)
45	Bldg DW	True	55.00	80	158.09	45
39	Bldg Fire Riser	True	55.00	2,000	145.58	39
32	J-1	True	57.00	0	174.93	51
34	J-2	True	57.62	0	174.93	51
36	J-3	True	55.92	0	174.93	51
41	J-5	True	55.38	0	172.91	51
43	J-6	True	54.53	0	158.90	45
69	J-8	True	54.50	0	157.22	44

Pipe Table - Time: 0.00 hours

ID	Label	Length (Scaled) (ft)	Start Node	Stop Node	Diameter (in)	Material	Hazen-Williams C	Flow (gpm)	Velocity (ft/s)	Headloss Gradient (ft/ft)
33	P-1	49	H-2	J-1	6.0	Ductile Iron	130.0	0	0.00	0.000
35	P-2	133	J-1	J-2	8.0	Asbestos Cement	140.0	0	0.00	0.000
37	P-3	91	J-2	J-3	8.0	Asbestos Cement	140.0	0	0.00	0.000
38	P-4	25	J-3	H-1	6.0	Ductile Iron	130.0	0	0.00	0.000
40	P-5	43	J-8	Bldg Fire Riser	6.0	Ductile Iron	130.0	2,000	22.69	0.268
42	P-6	33	J-3	J-5	8.0	Asbestos Cement	140.0	2,080	13.28	0.062
44	P-7	227	J-5	J-6	8.0	Asbestos Cement	140.0	2,080	13.28	0.062
46	P-8	40	J-6	Bldg DW	3.0	Ductile Iron	130.0	80	3.63	0.020
49	P-9	26	R-1	PMP-1	100.0	Ductile Iron	130.0	2,080	0.08	0.000
50	P-10	63	PMP-1	J-3	100.0	Ductile Iron	130.0	2,080	0.08	0.000
70	P-11	26	J-6	J-8	8.0	Ductile Iron	130.0	2,000	12.77	0.066

Water CAD Output

Hydrant 1

Hydrant Table - Time: 0.00 hours

ID	Label	Length (Hydrant Lateral) (ft)	Elevation (ft)	Demand (gpm)	Hydraulic Grade (ft)	Pressure (psi)
30	H-1	20	55.00	2,000	171.57	50
31	H-2	20	57.00	0	178.25	52

Hydrant 2

Hydrant Table - Time: 0.00 hours

ID	Label	Length (Hydrant Lateral) (ft)	Elevation (ft)	Demand (gpm)	Hydraulic Grade (ft)	Pressure (psi)
30	H-1	20	55.00	0	178.25	53
31	H-2	20	57.00	2,000	152.17	41