

Water Study

FINAL Basis of Design Report

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 rrahman

DATE 3/5/2019

VATER

January 10, 2019

DIAMOND MOUNTAIN ESTATES

Scottsdale, Arizona

Water Basis of Design Report

Prepared for: Diamond Creek Family Partnership 6318 E. Sage Drive

Scottsdale, Arizona 85253 Attn: C/O Robert J Campo Contact: 602.421.2047

Prepared by: Coe & Van Loo Consultants, Inc.

4550 N. 12th Street Phoenix, AZ 85014 Contact: Eric Laurin 602.264.6831

Job 1.01.0248704



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1.0 INTRODUCTION

1.1 General Description

Diamond Mountain Estates is a community encompassing approximately 10 acres, located in Scottsdale, Arizona. This development consists of 2 single family residential lots, see Figure 1 and 2, in Appendix A. The system will follow the City of Scottsdale's *Design Standards & Policies Manual*, dated January 2018.

1.2 Project Location

Diamond Mountain Estates is located in the southeast quarter of Section 33, Township 5 North, Range 5 East of the Gila and Salt River Base and Meridian, Maricopa County, Arizona.

1.3 Land Use

Diamond Mountain Estate is a planned single family residential development consisting of 2 custom dwelling units. The existing zoning is R1-190 ESL.

Land Use	Area (acres)	DU's	Density (DU/acres)
Single-Family Residential	10	2	0.2

Table 1 – Land Use and Population

1.4 Topographic Conditions

This development consists of approximately 10 acres on vacant rolling terrain residential land. There is a small mountain located to the west of the site that will not be disturbed. Careful consideration will be made to blend organically with the rolling terrain of the site and no development will occur on the hillside area and protected ridgeline at the west side of the property. The total elevation change is approximately 59 feet, dropping from 2,684 above mean sea level (MSL) at the northwest of the mountain to 2,625 MSL at the southwestern border of the site. Currently, the site consists of desert vegetation.

2.0 WATER SYSTEM DESIGN CRITERIA

2.1 Design Criteria

This Water Basis of Design Report is based on criteria from the City of Scottsdale *Design Standards and Policies Manual*, dated January 2018. The following criteria were used in developing this plan:

Land Use	Avg. Day	Max. Day	Peak Hour
	Demand ¹	Demand ²	Demand ³
	(gpd/DU)	(gpd/DU)	(gpd/DU)
Single-Family Residential (< 2 DU/ac)	993.6	1,987.2	3,477.6
Land Use	Avg. Day	Max. Day	Peak Hour
	Demand	Demand ¹	Demand ²
	(gpad)	(gpad)	(gpad)
Natural Area Open Space	0	0	0

	Table 2 –	Water	Demand	Criteria
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Note: ¹ Average day uses 0.69 gpm daily demand

 2 Maximum day peak factor is 2.0 times average day

³ Peak hour peak factor is 3.5 times average day

Additional design criteria for demand design criteria include:

- City of Scottsdale's fire flow requirements:
 - Minimum = 1,500 gpm (single-family residential)
 - Homes will be less than 6,200 SF and have sprinkler systems allowing for 75% reduction in fire flow not less than 1,500 gpm. Total fire flow needed is 1,500 gpm.

2.2 System Pressures

The water distribution system will maintain a minimum static pressure of 50 psi. The maximum static pressures in the system will not exceed 120 psi. Individual PRV's will be required for all homes. The system will be designed to maintain 30 psi minimum pressure under design fire flow requirements.

2.3 Distribution System

The distribution system will be designed using:

- Mile and half-mile alignments must be minimum of 12-inches.
- Quarter mile alignments must be minimum of 8-inches.
- Water lines located in the city's county service area must be a minimum of 8-inches unless otherwise approved by the Water Resources Department.
- The maximum length for a dead-end water distribution line, 8-inch diameter to 12-inch diameter, will be 1,200 feet in length.
- Unit friction headloss:

Maximum for transmission lines: 8 feet per 1,000 feet

Maximum for distribution lines: 10 feet per 1,000 feet

- Hazen-Williams Coefficient of 130 will be used to model the water distribution system.
- Water distribution mains 6-inches to 12-inches in diameter shall be ductile iron pipe (DIP).

3.0 **ESTIMATED DEMANDS**

Family

3.1 Demands

The Diamond Mountain Estates average day, maximum day and peak hour water demands for calculated in accordance with the demand criteria in Section 2 and are tabulated in Table 3.

Land Use	DU	Average Day Demand (gpd)	Average Day Demand (gpm)	Max Day Demand (gpm)	Peak Hourly Demand (gpm)
Single-	2	1,987.2	1.38	2.76	4.83

Table 3 – Potable Water Demands

4.0 EXISTING INFRASTRUCTURE

4.1 Existing Water Network

The project site currently is undeveloped desert land, with the exception of one single family residential home located in the west central area surrounding the mountain. This parcel is located in the North Central Service Region and is in Pressure Zones 11, and 12. The network will tie into the existing infrastructure. A 12-inch water line may be found in East Jomax Road along the project's southern limits. This line is a Zone 13 line at the eastern edge of the site, then the line passes through a zonal valve and drops to a Zone 11 waterline toward the west. Diamond Mountain Estates is located within the City of Scottsdale Water Service Area.

4.2 Existing Pressure Zones

Fire flow tests were performed in September 2018 per the City of Scottsdale *Design Standards and Policies Manual*, dated January 2018. See Appendix A for a copy of the results. Review of the City's pressure zone map indicates that the site is sandwiched between zone 13 located to the south east of the site and zone 11 found to the west of the site. A zone 12 pressure zone exists north, east and south of the site. See Appendix B for a screen shot of the City of Scottsdale's water model with pressure zones provided to CVL from the City of Scottsdale's Water Resources Department on July 22, 2014. It has been determined that service to the site in zone 12 will be provided by the existing zone 13 12-inch water main in Jomax Road. See Section 5.1 for additional discussion.

5.0 **PROPOSED WATER FACILITIES**

A minimum 20-foot easement is required for the proposed water infrastructure as well as construction of the water line along all property frontages.

5.1 Distribution System

Pressure Zone 12 will receive water from the existing water main in Jomax Road that is a Zone 13 line. A hydraulic grade line of 2,885 ft was determined from a fire flow test done in pressure Zone 13. See Appendix B for results. Current infrastructure includes an existing zonal valve approximately 200 ft west of the eastern border of our site. It is proposed that this zonal valve be kept closed resulting in water from zone 13 to pass through a PRV Vault and drop the pressure in the line to Zone 12. The PRV Vault will contain an 8-inch PRV at a setting of 2,795 feet and is required to be designed and constructed by the owner as part of this development.

In accordance will the City of Scottsdale *Design Standards and Policies Manual*, Section 6-1.403, all dead-end lines will have flushing devices per City of Scottsdale Standard Detail No. 2383.

Does not match with Model

Data. However, model data

are acceptable.

6.0 WATER SYSTEM MODELING

6.1 Network Analysis

The network analysis for the distribution system was completed using WaterCAD V8*i*. A model was created to demonstrate that the water infrastructure meets the water system design criteria. The network was analyzed for average day, maximum day, peak hour and maximum day plus fire flow demand conditions. Demands were allocated to the nodes based on the proposed lotting and overall layout. Residential fire flow (1,500 gpm) was assigned to each appropriate node independently to verify available pressure and flow for the system during a fire flow event. The fire flow test results are modeled using a static reservoir and a pump curve.

Input parameters of the water distribution system modeling include:

- Pipe Diameters (inches)
- Elevations of nodes/junctions (feet)
- System Water Demands (gpm)
- \circ Residential fire flow = 1,500 gpm
- o Hazen-Williams, C=130.

Output parameters include but are not limited to:

- o Velocities (fps)
- o Pressure (psi)
- o Head Loss (feet)
- o Flow Rates (gpm)

6.2 Modeling Results

The detailed results of the WaterCAD analysis for is presented in Appendix C. Table 4 summarizes the results for Diamond Mountain Estates.

	Flow		Pressu	ıre (psi)		Pressure at Fire	Maximum	Pino
Scenario	enario (gpm)	Minimum	Node	Maximum	Node	Hydrant (psi) Velo	Velocity (fps)	ID
Average Day	1.38	61	J-3	148	J-2	63	0.01	P-5, P-4
Maximum Day	2.76	61	J-3	148	J-2	63	0.02	P-5, P-4
Peak Hour	4.83	61	J-3	148	J-2	63	0.03	P-5, P-4
Maximum Day + Residential Fire Flow	1,002.78	55	J-3	135	J-2	63	9.60	P-4

Table 4 – Water Model Results

7.0 SUMMARY

This Water Basis of Design Report presents the water system design criteria, proposed water system design, and an overview of existing infrastructure surrounding the project site. The following summarizes CVL's analysis of the proposed water system to serve the Diamond Mountain Estates development:

- The onsite service area is located within pressure Zones 11 and 13 of the North Central Water Service Region and is in the City of Scottsdale Water Service Area.
- Demands for the project are 0.002 MGD average day demand, 0.004 MGD maximum day demand, and 0.007 MGD peak day demand.
- Distribution mains are sized to accommodate all demand requirements and will be 8-inch water lines.
- A PRV will allow water from the Zone 13 waterline within Jomax Road to serve the development as Zone 12. The PRV Vault will contain an 8-inch PRV at a setting of 2,795 feet and is required to be designed and constructed by the owner as part of this development.
- Minimum and maximum pressure and velocity requirements were met for all demand scenarios including fire flow conditions.
- Individual PRV's will be required for all homes per City of Scottsdale standards.
- Flushing devices will be placed at every dead-end of the system per City of Scottsdale Standard Detail No. 2383.
- The water system will be owned and operated by the City of Scottsdale.
- The development consists of less than 20 platted homes therefore, the development does not require a water quality sampling station per DSPM Section 6-1.418.

PRV vault shall be designed per COS Std. Dtl 2342-1.

APPENDIX A FIGURES



\\phx-cvlfile4\Engrdata\01\0248701\Environ\Two Lots\CAD\DME.dwg NicoleW November 7, 2018

		DESERT SUMMIT
	JOMAX ROAD TROON VILLAGE	
SCALE 1" = 150' 1.01.0248704 4550 North 12th Street	SITE MAP	
Phoenix, Arizona 85014 Phone 602-264-6831 http://www.cvlci.com	DIAMOND MOUNTAIN ESTATES	CELEBRATING 60 YEARS FIGURE 2

\phx-cvlfile4\Engrdata\01\0248701\Environ\Two Lots\CAD\DME.dwg NicoleW November 7, 2018



APPENDIX B FIRE FLOW TEST RESULTS



Flow Test Summary

Project Name:	EJFT 18230-1
Project Address:	11212 E Cimarron Dr, Scottsdale, AZ 85262
Date of Flow Test:	2018-09-26
Time of Flow Test:	7:35 AM
Data Reliable Until:	2019-03-26
Conducted By:	Austin Gourley & Eder Cueva (EJ Flow Tests) 602.999.7637
Witnessed By:	Phil Cipolla (City of Scottsdale) 602.828.0847
City Forces Contacted:	City of Scottsdale (602.828.0847)
Permit Number:	C56343

Raw Flow Test Data

Static Pressure:64.0 PSIResidual Pressure:52.0 PSIFlowing GPM:2,490GPM @ 20 PSI:5,022

Hydrant F₁

Pitot Pressure (1):	55	PSI
Coefficient of Discharge (1):	0.9	
Hydrant Orifice Diameter (1):	2.5	inches
Pitot Pressure (2):	55	PSI
Coefficient of Discharge (2):	0.9	
Hydrant Orifice Diameter (2):	2.5	inches

Data with a 10 % Safety Factor

Static Pressure:	57.6 PSI
Residual Pressure:	45.6 PSI
Flowing GPM:	2,490
GPM @ 20 PSI:	4,613



EJ Flow Tests, LLC 21505 North 78th Ave. | Suite 130 | Peoria, Arizona 85382 | (602) 999-7637 | www.ejengineering.com John L. Echeverri | NICET Level IV 078493 SME | C-16 FP Contractor ROC 271705 AZ | NFPA CFPS 1915 www.flowtestsummary.com Page 1

E•J Flow Test Summary

Static-Residual Hydrant



Flow Hydrant (only hydrant F1 shown for clarity)



Approximate Project Site



Water Supply Curve N^{1.85} Graph



EJ Flow Tests, LLC

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Flow Test Summary

Project Name:	EJFT 18230-2
Project Address:	11212 E Cimarron Dr, Scottsdale, AZ 85262
Date of Flow Test:	2018-09-26
Time of Flow Test:	8:00 AM
Data Reliable Until:	2019-03-26
Conducted By:	Austin Gourley & Eder Cueva (EJ Flow Tests) 602.999.7637
Witnessed By:	Phil Cipolla (City of Scottsdale) 602.828.0847
City Forces Contacted:	City of Scottsdale (602.828.0847)
Permit Number:	C56343

Note

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

Raw Flow Test Data

Static Pressure:111.0 PSIResidual Pressure:88.0 PSIFlowing GPM:2,069GPM @ 20 PSI:4,349

Hydrant F₁

Pitot Pressure (1):	38	PSI
Coefficient of Discharge (1):	0.9	
Hydrant Orifice Diameter (1):	2.5	inches
Pitot Pressure (2):	38	PSI
Coefficient of Discharge (2):	0.9	
Hydrant Orifice Diameter (2):	2.5	inches

Data with a 39 PSI Safety Factor

Static Pressure:	72.0 PSI
Residual Pressure:	49.0 PSI
Flowing GPM:	2,069
GPM @ 20 PSI:	3,215



Static-Residual Hydrant

Flow Hydrant

Distance Between F₁ and R 1135 ft (measured linearly)

Static-Residual Elevation 2678 ft (above sea level)

Flow Hydrant (F₁) Elevation 2716 ft (above sea level)

Elevation & distance values are approximate

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E•J Flow Test Summary

Static-Residual Hydrant



Approximate Project Site







Water Supply Curve N^{1.85} Graph



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APPENDIX C PRESSURE ZONE MAP

BreAnne Richter

From: Sent: To: Subject: Mann, Doug <DMANN@SCOTTSDALEAZ.GOV> Tuesday, July 22, 2014 8:06 AM BreAnne Richter RE: Diamond Mountain Estates

Hi BreAnne. This is going to be a creative exercise on your end as the line in Jomax is at zone 11 pressure west of the zone valve (in the red box) and zone 13 pressure east of the valve, but a substantial portion of the site topography suggests it should be in zone 12 (see zone map below). It will all depend on the results of the flow testing, your site layout and the results of your hydraulic analysis for average day, peak hour and max day plus fire. Doug



From: BreAnne Richter [mailto:Brichter@cvlci.com] Sent: Wednesday, July 16, 2014 1:01 PM To: Mann, Doug Subject: Diamond Mountain Estates

APPENDIX D WATERCAD RESULTS (DOMESTIC)



Diamond Estates.wtg 1/10/2019

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

Label	Start Node	Stop Node	Length (User Defined) (ft)	Length (Scaled) (ft)	Diameter (in)	Material	Hazen- Williams C	Flow (gpm)	Velocity (ft/s)	Headloss Gradient (ft/ft)
P-6	H-2	J-3	87	29	8.0	Ductile ron	130.0	0.00	0.00	0.000
P-3	J-1	J-2	0	63	12.0	Ductile Iron	130.0	1.38	0.00	0.000
P-1	R-1	PMP-1	0	40	12.0	Ductile Iron	130.0	1.38	0.00	0.000
P-2	PMP-1	J-1	0	32	12.0	Ductile Iron	130.0	1.38	0.00	0.000
P-5	PRV-1	J-3	335	102	8.0	Ductile Iron	130.0	1.38	0.01	0.000
P-4	J-2	PRV-1	119	20	8.0	Ductile Iron	130.0	1.38	0.01	0.000

FlexTable: Pipe Table

Is this fire hydrant lateral from the 8" main? The fire hydrant lateral is usually 6" per MAG Std Dtl. 360. Typ.

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Label	Elevation (ft)	Demand (gpm)	Hydraulic Grade (ft)	Pressure (psi)
J-3	2,655.00	1.38	2,795.06	61
J-1	2,716.00	0.00	2,972.41	111
J-2	2,630.00	0.00	2,972.41	148

FlexTable: Junction Table

Diamond Estates.wtg 1/10/2019 Bentley Systems, Inc. Haestad Methods Solution Center 27 Siemon Company Drive Suite 200 W Watertown, CT 06795 USA +1-203-755-1666

FlexTable: Hydrant Table

ID	ID Label		Include Lateral Loss?	Emitter Coefficient (gpm/psi^n)	Lateral Length (ft)
66	H-2	Open	False	0.000	20
Elevation (ft)	Zone	Demand Collection	Demand (gpm)	Hydraulic Grade (ft)	Pressure (psi)
2,650.00 <none></none>		<collection: 0<br="">items></collection:>	0.00	2,795.06	63

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FlexTable: PRV Table												
ID	Label	Elevation (ft)	Diameter (Valve) (in)	Minor Loss Coefficient (Local)	Hydraulic Grade Setting (Initial) (ft)							
58	PRV-1	2,640.00	8.0	0.000	2,795.00							
Pressure Setting (Initial) (psi)	Flow (gpm)	Hydraulic Grade (From) (ft)	Hydraulic Grade (To) (ft)	Headloss (ft)								
67	1.38	2,972.41	2,795.06	177.35								

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FlexTable: Reservoir Table

Label	Elevation	Flow (Out net)	Hydraulic Grade
	(ft)	(gpm)	(ft)
R-1	2,716.00	1.38	2,716.00

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						-				
Label	Start Node	Stop Node	Length (User Defined) (ft)	Length (Scaled) (ft)	Diameter (in)	Material	Hazen- Williams C	Flow (gpm)	Velocity (ft/s)	Headloss Gradient (ft/ft)
P-6	H-2	J-3	87	29	8.0	Ductile Iron	130.0	0.00	0.00	0.000
P-3	J-1	J-2	0	63	12.0	Ductile Iron	130.0	2.76	0.01	0.000
P-1	R-1	PMP-1	0	40	12.0	Ductile Iron	130.0	2.76	0.01	0.000
P-2	PMP-1	J-1	0	32	12.0	Ductile Iron	130.0	2.76	0.01	0.000
P-5	PRV-1	J-3	335	102	8.0	Ductile Iron	130.0	2.76	0.02	0.000
P-4	J-2	PRV-1	119	20	8.0	Ductile Iron	130.0	2.76	0.02	0.000

FlexTable: Pipe Table

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Label	Label Elevation (ft)		Hydraulic Grade (ft)	Pressure (psi)
J-3	2,655.00	2.76	2,795.06	61
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J-2	2,630.00	0.00	2,972.41	148

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FlexTable: Hydrant Table

ID	ID Label		Include Lateral Loss?	Emitter Coefficient (gpm/psi^n)	Lateral Length (ft)
66	H-2	Open	False	0.000	20
Elevation (ft)	Zone	Demand Collection	Demand (gpm)	Hydraulic Grade (ft)	Pressure (psi)
2,650.00	<none></none>	<collection: 0<br="">items></collection:>	0.00	2,795.06	63

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Active Scenario: Max Day FlexTable: PRV Table ID Label Elevation Diameter (Valve) Minor Loss Hydraulic Grade Setting (Initial) (ft) (in) Coefficient (Local) (ft) 2,795.00 58 PRV-1 2,640.00 8.0 0.000 Hydraulic Grade Pressure Setting Hydraulic Grade Headloss Flow (Initial) (gpm) (From) (To) (ft) (psi) (ft) (ft) 67 2,972.41 2,795.06 177.35 2.76

FlexTable: Reservoir Table

Label	Elevation	Flow (Out net)	Hydraulic Grade
	(ft)	(gpm)	(ft)
R-1	2,716.00	2.76	2,716.00

Diamond Estates.wtg 1/10/2019

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Label	Start Node	Stop Node	Length (User Defined) (ft)	Length (Scaled) (ft)	Diameter (in)	Material	Hazen- Williams C	Flow (gpm)	Velocity (ft/s)	Headloss Gradient (ft/ft)
P-6	H-2	J-3	87	29	8.0	Ductile Iron	130.0	0.00	0.00	0.000
P-3	J-1	J-2	0	63	12.0	Ductile Iron	130.0	4.83	0.01	0.000
P-1	R-1	PMP-1	0	40	12.0	Ductile Iron	130.0	4.83	0.01	0.000
P-2	PMP-1	J-1	0	32	12.0	Ductile Iron	130.0	4.83	0.01	0.000
P-5	PRV-1	J-3	335	102	8.0	Ductile Iron	130.0	4.83	0.03	0.000
P-4	J-2	PRV-1	119	20	8.0	Ductile Iron	130.0	4.83	0.03	0.000

FlexTable: Pipe Table

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Label	Elevation (ft)	Demand (gpm)	Hydraulic Grade (ft)	Pressure (psi)
J-3	2,655.00	4.83	2,795.06	61
J-1	2,716.00	0.00	2,972.41	111
J-2	2,630.00	0.00	2,972.41	148

FlexTable: Junction Table

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Elevation (ft)	Zone	Demand Collection	Demand (gpm)	Hydraulic Grade (ft)	Pressure (psi)
2,650.00	<none></none>	<collection: 0<br="">items></collection:>	0.00	2,795.06	63

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		FlexTab	ole: PRV Ta	ble	
ID	Label	Elevation (ft)	Diameter (Valve) (in)	Minor Loss Coefficient (Local)	Hydraulic Grade Setting (Initial) (ft)
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Pressure Setting (Initial) (psi)	Flow (gpm)	Hydraulic Grade (From) (ft)	Hydraulic Grade (To) (ft)	Headloss (ft)	
67	4.83	2,972.41	2,795.06	177.35	

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FlexTable: Reservoir Table

Label	Elevation	Flow (Out net)	Hydraulic Grade
	(ft)	(gpm)	(ft)
R-1	2,716.00	4.83	2,716.00

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APPENDIX E WATERCAD RESULTS (FIRE FLOW)

Active Scenario: Fire Flow

							-		
Label	Satisfies Fire Flow Constraints?	Fire Flow (Needed) (gpm)	Flow (Total Available) (gpm)	Pressure (Residual Lower Limit) (psi)	Pressure (Calculated Residual) (psi)	Pressure (Calculated System Lower Limit) (psi)	Junction w/ Minimum Pressure (System)	Pipe w/ Maximum Velocity	Velocity of Maximum Pipe (ft/s)
J-3	True	1,500.00	1,503.76	30	55	57	H-2	P-4	9.60
H-2	True	1,500.00	1,501.00	30	> 57	55	J-3	P-4	9.60
J-1	True	1,500.00	1,501.00	30	98	61	J-3	P-2	4.27
J-2	True	1,500.00	1,501.00	30	(135	61	J-3	P-3	4.27
					$\neg \heartsuit$				

Fire Flow Node FlexTable: Fire Flow Report

It appears that 111 psi of pump head has been used in this calc (Pump Table - Fire Flow). Based on flow test, 1503.76 gpm of flow is associated with ~100 psi pump head. However, with 100 psi of head, the residual pressures at fire flow appear to be >30 psi.

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Active Scenario: Fire Flow

FlexTable: Hydrant Table

ID	Label	Hydrant Status	Include Lateral Loss?	Emitter Coefficient (gpm/psi^n)	Lateral Length (ft)
66	H-2	Open	False	0.000	20
Elevation (ft)	Zone	Demand Collection	Demand (gpm)	Hydraulic Grade (ft)	Pressure (psi)
2,650.00	<none></none>	<collection: 0<br="">items></collection:>	0.00	2,795.06	63

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		Active Sce	enario: Fire	e Flow	
		FlexTal	ole: PRV Ta	ble	
ID	Label	Elevation (ft)	Diameter (Valve) (in)	Minor Loss Coefficient (Local)	Hydraulic Grade Setting (Initial) (ft)
58	PRV-1	2,640.00	8.0	0.000	2,795.00
Pressure Setting (Initial) (psi)	Flow (gpm)	Hydraulic Grade (From) (ft)	Hydraulic Grade (To) (ft)	Headloss (ft)	
67	2.76	2,972.41	2,795.06	177.35	

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Active Scenario: Fire Flow

FlexTable: Reservoir Table

Label	Elevation	Flow (Out net)	Hydraulic Grade
	(ft)	(gpm)	(ft)
R-1	2,716.00	2.76	2,716.00

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Active Scenario: Fire Flow Pump Definition Detailed Report: Raw

ID	64	Notes	
Label	Raw		
Pump Definition Type			
Pump Definition Type	Standard (3 Point)	Design Head	203.28 ft
Shutoff Flow	0.00 gpm	Maximum Operating Flow	4,349.00 gpm
Shutoff Head	256.41 ft	Maximum Operating Head	46.20 ft
Design Flow	2,069.00 gpm		
Dump Efficiency Type			
Pump Enciency Type			
Pump Efficiency Type	Constant Efficiency	Motor Efficiency	100.0 %
Pump Efficiency Type Constant Efficiency	Constant Efficiency 100.0 %	Motor Efficiency Is Variable Speed Drive?	100.0 % False
Pump Efficiency Type Constant Efficiency	Constant Efficiency 100.0 %	Motor Efficiency Is Variable Speed Drive?	100.0 % False
Pump Efficiency Type Constant Efficiency Transient (Physical)	Constant Efficiency 100.0 %	Motor Efficiency Is Variable Speed Drive?	100.0 % False
Pump Efficiency Type Constant Efficiency Transient (Physical) Inertia (Pump and Motor)	Constant Efficiency 100.0 % 0.000 lb-ft ²	Motor Efficiency Is Variable Speed Drive? Specific Speed	100.0 % False SI=25, US=1280



Active Scenario: Fire Flow Pump Definition Detailed Report: Raw

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