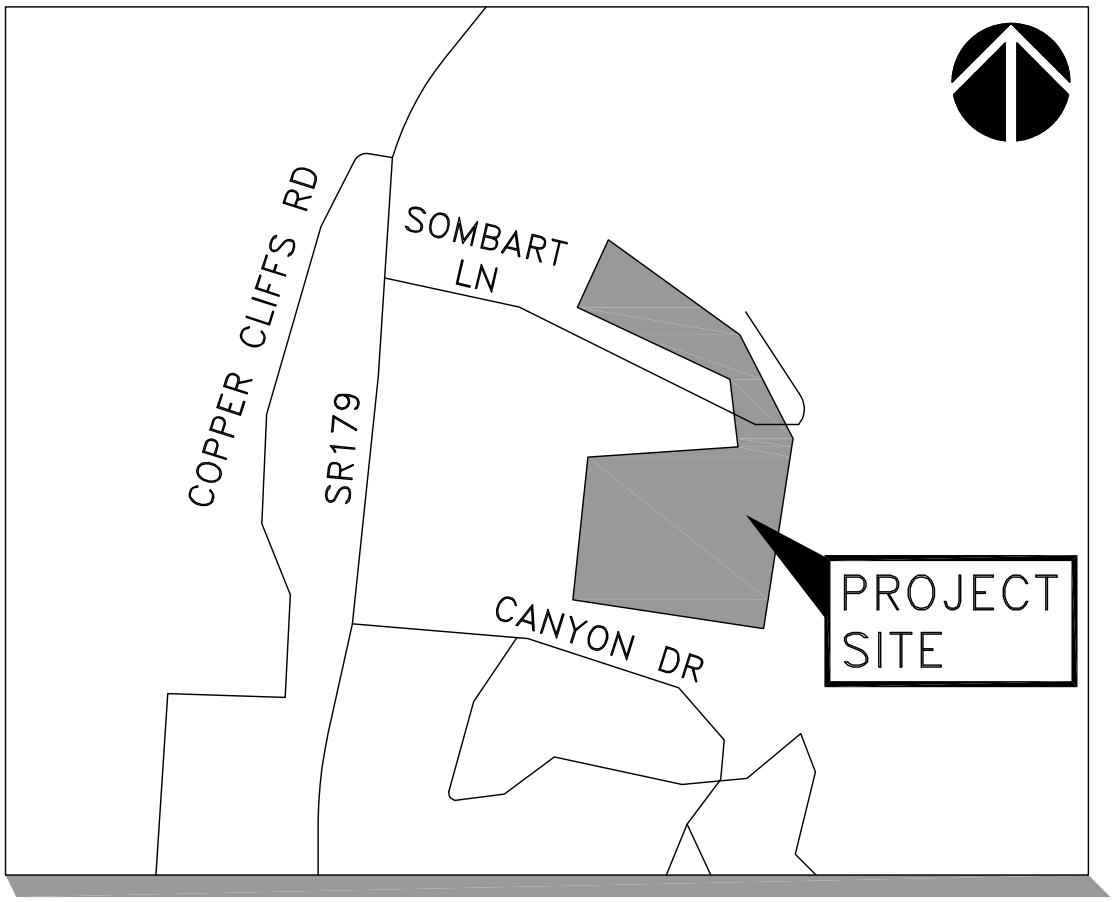


VICINITY MAP

CITY OF SEDONA
N.T.S.

PRELIMINARY WATER DESIGN MEMORANDUM

To: Erwin Architecture & Development

From: Andrew Baird, P.E.

Kimley-Horn and Associates, Inc.

Date: March 29, 2022

Subject: Arabella Spa

BACKGROUND

This Preliminary Water Design Memorandum for the Arabella Spa has been prepared to address the water system requirements outlined in the City of Sedona – Design, Review, Engineering and Administrative Manual (SDEM), Arizona Water Company (AWC) and Arizona Department of Environmental Quality (ADEQ). The main purposes of this memo are the following:

- Illustrate compliance with the SDEM and ADEQ.
- Establish water demand and fire flow criteria for design.
- Establish the feasibility of the development of the site.

The project site (Site) is located along Sombart Ln. east of State Route 179. The Site is bounded to the north by property that is zoned commercial but is currently being utilized as parking for trailheads, east by a hotel complex, south by single family residential properties, and the west by property zoned open space and Coconino National Forest. The Site is located within the City of Sedona, Section 21, Township 4 South, Range 03 East. The Site consists of parcel 401-22-034B approximately 7.0 acres. See **Appendix A** for the Location Map and Vicinity Map, respectively.

As part of this project, a new spa will be constructed, including four buildings, a walking path, and utilities to service the site. The water system design will include the future additions, and the infrastructure designed with the design accounts for the ultimate condition of the Site.

METHODOLOGY

The water system serving the Arabella Spa Site has been modeled using WaterCAD, developed using the Haestad Method. The program utilizes the fluid mechanic head loss theory known as the Hazen-Williams method. This is the generally accepted method used to evaluate water distribution systems.

EXISTING WATER SYSTEM

An existing 8-inch DIP water line is located near the northwest corner of the existing hotel building in Sombart Lane. Hydrants are located west and north of the site in Sombart Lane.

FIRE FLOW TEST

A Fire Hydrant Flow Test was conducted in order to determine capacity of the existing infrastructure to service the proposed development. Residual and static pressures were obtained from a flow test preformed on the fire hydrant near the site, west of the project site in Sombart Lane, by Arizona

Water Company (see **Appendix C** for flow text results). The residual and static pressures from the flow test are included in Table 2.

Table 1: Fire Hydrant Flow Rate Test Results

Static Pressure (psi)	Hydrant Flow Test		Calculated Maximum	
	Flow (gpm)	Residual Pressure (psi)	Flow (gpm)	Minimum Pressure (psi)
120	1060	65	1464	20

From the static and residual pressures obtained, the maximum operating flow was found to be 1,464 GPM at 20 psi. The computer model geometry was then constructed based on the existing water infrastructure using a reservoir and pump and then calibrated to the flow test. This calibration ensures that the actual infrastructure characteristics (flow, pressure) are simulated by the computer model. The proposed water infrastructure was then incorporated into the calibrated water model. This procedure was followed in order to provide the baseline hydraulics which represent actual field conditions at the time of the Fire Hydrant Flow Test.

PROPOSED WATER SYSTEM

An 8-inch DIP water main extension is proposed in Sombart Lane to provide domestic and fire service to the site. A 6" PVC domestic service line is proposed which will tie into the 8" water line near the entrance to Arabella. A proposed hydrant will be placed at the northwest corner of the site next to domestic service connection and will connect to the 8" main separately. The domestic service throughout the site will be treated as private and will not require an easement.

FIRE FLOW DEMAND

The proposed PDAB is a Construction Type I-B. The required fire flow per building was determined using the 2012 International Fire Code as adopted by City of Sedona and is based on construction type, building square footage, and provision of an approved sprinkler system. The City of Sedona allows for a maximum 75% reduction of the required fire flow for building provided that the building is equipped with an interior fire suppression sprinkler system to an absolute minimum of 1,500gpm. The minimum fire flow requirements for the proposed buildings are shown in **Table 3**. **Table 3** also shows the required building fire flow based upon a maximum fire flow reduction of 75% allowed.

Table 2: Design Criteria for Public Water Infrastructure

Building	Building Construction Type[1]	Building Area[2] (ft^2)	Required Fire Flow[3] (gpm)	Reduction[3]	Required Fire Flow[4] (gpm)
1	I-B	16859	1500		1500
2	I-B	524	1500		1500
3	I-B	1915	1500		1500
4	I-B	1304	1500		1500

[1]Construction Type based on IBC

[2]Areas based on Site Plan (Appendix A)

[3]Fire flow requirements per Sedona Fire District use of 2012 International Fire Code. Maximum reduction = 75% [4]Minimum Fire Flow Requirement of 1,500 gpm per 2006 IFC

WATER ANALYSIS AND RESULTS

The Average Daily Demand, Maximum Daily Demand, and Maximum Day Demand plus Fire Flow Demand analyses were performed, for the development, to evaluate the proposed water infrastructure. The system was analyzed to ensure that the existing and proposed public water infrastructure meets the following criteria as set forth in the DSM and EDP.

Table 3: Design Criteria for Public Water Infrastructure

Scenario	*Criteria*	*Constraint*
Max Day + Fire Flow	Minimum Pressure	20 psi
Max Day	Maximum Velocity	5 fps

The fire flow demand of 1,500 GPM was applied at the proposed fire hydrant and an assumed demand of 30 GPM was added at the Building 4 connection as a demand flow for a fire suppression system at the highest building. The minimum PSI was recorded at each node. These flows were determined based on the assumption that one building requires fire suppression at a time and the hydrant requires full flow.

As previously discussed, Maximum Day Demand plus Fire Flow Demand analyses were performed for the existing adjacent off-site water infrastructure and the proposed on-site water system. See **Appendix D** for the proposed system's Water Model Schematics and Results. A summary of the water analysis results for the public distribution main is tabulated below:

Table 4: Fire Flow and Maximum Daily Demand Water Model Result Summary

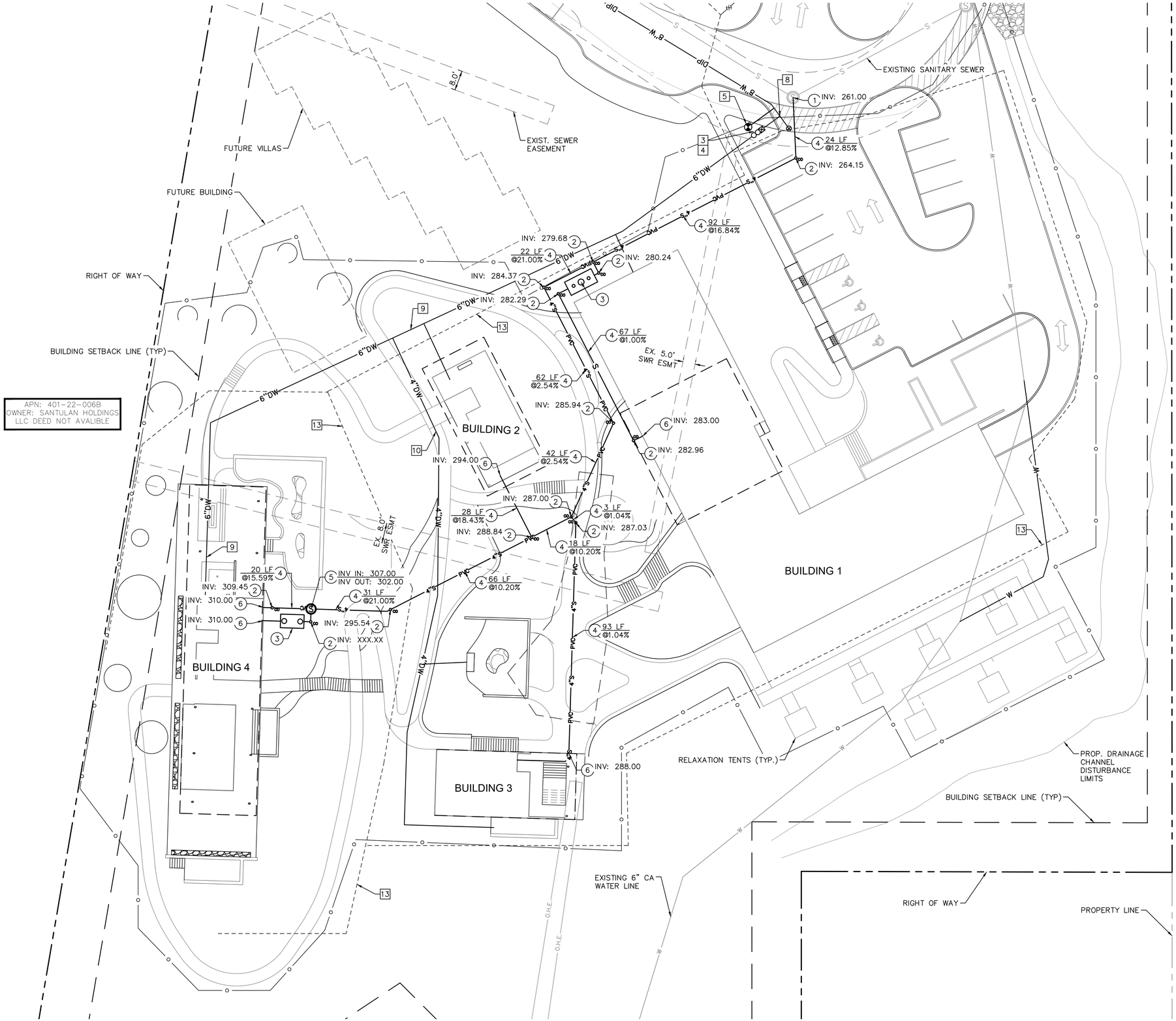
Criteria	*Constraint*	*Max Day + FF*
Minimum System Pressure	20 psi	20 psi
Maximum Velocity	5 fps	Yes*

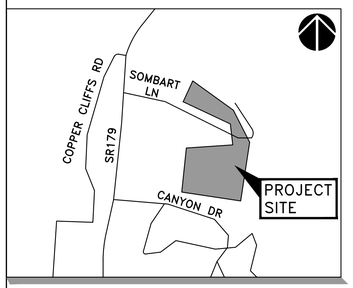
RECOMMENDATION

The proposed on-site water system and the existing, adjacent off-site public water infrastructure, as outlined by this analysis, is adequate and is sufficient to meet the required domestic water demand and fire flow demand for the proposed PD Administration Building/Public Safety Answering Point Facility project.

Appendix A – Site Location Map

Appendix B– Proposed Water System Layout





VICINITY MAP

CITY OF SEDONA
N.T.S.

WATER CONSTRUCTION NOTES

3. 6" WATER METER ASSEMBLY & VALVE
4. 6" BACKFLOW PREVENTER
5. FIRE HYDRANT ASSEMBLY
6. FIRE DEPARTMENT CONNECTION PER SEDONA FIRE DEPARTMENT STD DTL
8. TAPPING SLEEVE AND VALVE
9. 6" PVC DOMESTIC WATER LINE
10. 4" DOMESTIC WATER LINE
13. 1.5" IRRIGATION MAIN LINE, SEE ARCHITECTURAL PLANS

SEWER CONSTRUCTION NOTES

1. CONNECT TO EXISTING SEWER MANHOLE, INVERT PER PLAN
2. INSTALL 4" CLEANOUT PER MAG STD DTL 441, INVERT PER PLAN
3. INSTALL GREASE INTERCEPTOR WITH TWO-WAY CLEANOUT, SIZE PER MANUFACTURER.
4. INSTALL 4" PVC SDR 35 SEWER LINE, LENGTH AND SLOPE PER PLAN. TRENCH, BEDDING, AND BACKFILL PER MAG STD DTL 200-1.
5. 5' DIA. PRECAST CONCRETE SEWER MANHOLE PER MAG STD DTL 420-1, 426Q-1 AND 30" CAST IRON MANHOLE FRAME AND COVER PER MAG STD DTL 423-2, INVERT PER PLAN
6. CONNECT TO BUILDING, REFER TO PLUMBING PLANS

PRIVATE UTILITY NOTES

1. PRIVATE UTILITY LOCATIONS SHOWN ARE APPROXIMATE AND SHALL BE VERIFIED. PROPOSED UTILITY ROUTING ARE SHOWN FOR TRENCHING, CONDUIT, AND BACKFILL ESTIMATION. COORDINATE WITH UTILITY OWNER ON EXACT LOCATIONS AND CONSTRUCTION INFORMATION.

NORTH

GRAPHIC SCALE IN FEET
0 10 20 40

Call at least two full working days before you begin excavation.
ARIZONA 811
Arizona Blue Stake, Inc.
Dial 8-1-1 or 1-800-STAKE-IT (782-5348)
In Maricopa County: (602) 263-1100

NO.	REVISION	BY	DATE	APPR.

Kimley»Horn

201 NORTH MONTEZUMA, SUITE 206
PRESCOTT, ARIZONA 86301 (928) 458-7121

SCALE (H): 1"=20'
SCALE (V): N/A
DESIGNED BY: JWL
DRAWN BY: JTH
CHECKED BY: ACB
DATE: MAR 2022

ARABELLA SPA PRELIMINARY IMPROVEMENT PLANS
UTILITY SHEET
95 N SOMBART LANE SEDONA, AZ

PRELIMINARY
FOR REVIEW ONLY
NOT FOR CONSTRUCTION
Kimley»Horn
ENGINEER ANDREW BAIRD
PE NO. 48841 DATE 3/29

PROJECT NO.
291659000

DRAWING NAME
UT01

EXISTING SANITARY SEWER

PROPERTY LINE

APN: 401-22-035A
OWNER: SEDONA GRAND VIEW LLC

EXISTING 8" DIP WATER MAIN

7

RIGHT OF WAY

EXIST. GAS MAIN

EXISTING SEWER MANHOLE

SOMBART LANE

13

518 LF 1

EXISTING SEWER MANHOLE

EXISTING SEWER MANHOLE

EXISTING SANITARY SEWER

EXISTING SANITARY SEWER

EXISTING HOTEL BUILDINGS

EXISTING HOTEL PARKING

EXIST. GAS MAIN

SOMBART LANE

11

12

EXISTING SEWER MANHOLE

PROPERTY LINE

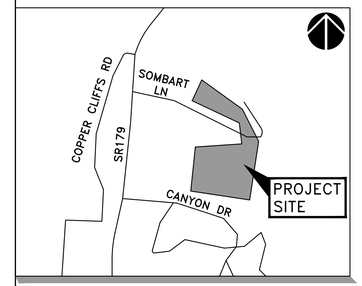
5

3
4

BUILDING SETBACK LINE (TYP)

6"DW

MATCHLINE SEE SHEET 05 FOR CONT.



VICINITY MAP

CITY OF SEDONA
N.T.S.

WATER CONSTRUCTION NOTES

1. 8" DIP WATER MAIN
3. 6" WATER METER ASSEMBLY & VALVE
4. 6" BACKFLOW PREVENTER
5. FIRE HYDRANT ASSEMBLY
6. FIRE DEPARTMENT CONNECTION PER SEDONA FIRE DEPARTMENT STD DTL
7. CONNECT TO EXISTING WATER MAIN
11. 2" IRRIGATION METER, SEE LANDSCAPE PLANS
12. 2" BACKFLOW PREVENTER, SEE LANDSCAPE PLANS
13. 1.5" IRRIGATION MAIN LINE, SEE ARCHITECTURAL PLANS

PRIVATE UTILITY NOTES

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Kimley»Horn
ENGINEER ANDREW BAIRD
PE NO. 48841 DATE 3/29

PROJECT NO.
291659000

DRAWING NAME
UT02

Appendix C– Water Demand Flows/Fire Flow Test Results

From: Casey Goff <cgoff@azwater.com>
Sent: Thursday, September 30, 2021 7:51 AM
To: Warne, James
Subject: Arabella Hydrant Flows
Attachments: Scan2021-09-30_075026.pdf

James,

Here are the hydrant flows for the surrounding fire hydrants at Arabella. These flows are somewhat old so if you need updated information, please let me know and we can schedule some flow tests. Also, see the attached portion of the ¼ section map for reference.

FH 125 Static – 110 psi
Kinetic – 65 psi
GPM – 1060

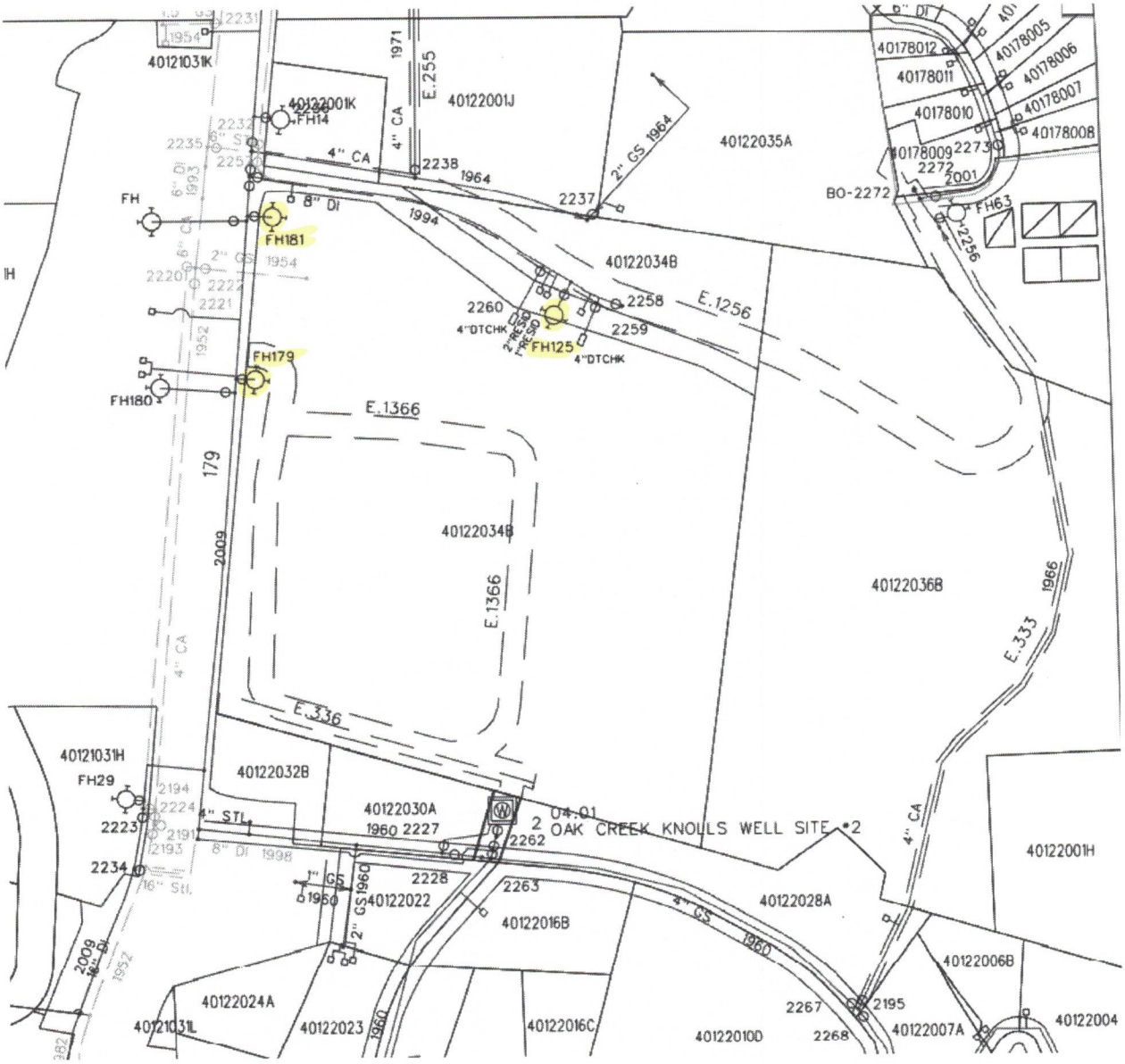
FH 179 Static – 120 psi
Kinetic – 110 psi
GPM – 1379

FH 181 Static – 120 psi
Kinetic – 108 psi
GPM – 1379

I hope this information helps.

Thanks,

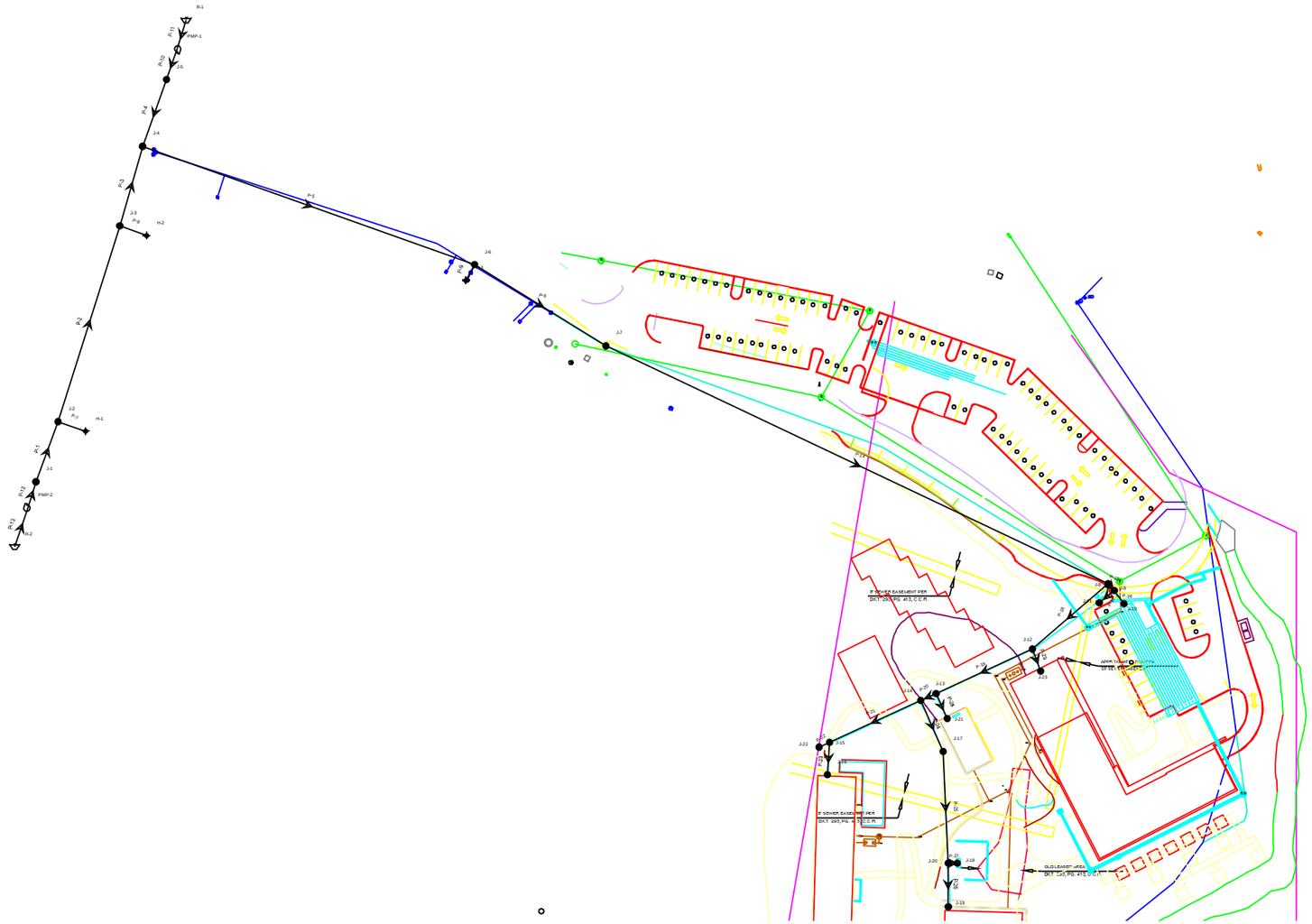
Casey Goff | Arizona Water Company
Distribution Superintendent
Verde Valley Division
65 Coffeepot Dr. Ste #7 | Sedona, AZ 86336
D: 928-282-7092 ext 4102 | cgoff@azwater.com
Visit us at www.azwater.com


40121031K
40122001K
FH14
4" CA
E.255
40122001J
40122035A
40178012
40178011
40178010
40178009
40178005
40178006
40178007
40178008
BO-2272
FH63
FH
FH181
8" DI
2" GS 1964
40122034B
E.1256
FH125
4"DTCHK
FH179
FH180
E.1366
179
2009
40122036B
E.333
1966
4" CA
E.336
40121031H
FH29
40122032B
40122030A
1960 2227
2 OAK CREEK KNOLLS WELL SITE #2
40122001H
4" STL
8" DI 1998
40122022
40122028A
40122016B
40122006B
40122024A
40121031L
40122023
40122016C
40122010D
40122007A
40122004
2195
2267
2268

Design Water Demand Calculations										
Building	***Use***	***Water Demand Rate***		***Demand Criteria***		***Water Design Flow [GPD]***	***Avg. Day Demand [GPD]***	***Avg. Day Demand [gpm]***	****Max. Day Demand [GPD]***	****Max. Day Demand [gpm]***
		gpd	***unit***	***No.***	***unit***					
Building 1	Resturant	24	EMPLOYEE	20	EMPLOYEE	480	8460	5.88	15228	10.58
		7	MEAL	200	MEAL	1400				
		2	MEAL	200	MEAL	400				
		2	MEAL	200	MEAL	400				
		1	CUSTOMER	100	CUSTOMER	100				
	Restroom	240	TOILET	10	TOILET	2400				
	Shower	200	SHOWER	14	SHOWER	2800				
	Laundry: 3 Units	50	WASH CYCLE	3	WASH CYCLE	450				
	Pool	30	PERSON	1	BAY	30				
Building 2	Pool	30	POOL	1	POOL	30	30	0.02	54	0.04
Building 3	Pool	30	POOL	1	POOL	30	690	0.48	1242	0.86
	Steam Room	60	DAY	1	DAY	60				
	Shower	200	SHOWER	3	SHOWER	600				
Building 4	Outdoor Kitchen	20	EMPLOYEE	6	EMPLOYEE	120	985	0.68	1773	1.23
	Kitchen Waste	6	MEAL	25	MEAL	150				
	Garbage Disposal	1	MEAL	25	MEAL	25				
	Kitchen Waster Disposal Service	2	MEAL	25	MEAL	50				
	Restroom	240	TOILET	2	TOILET	480				
	Pool	30	POOL	2	POOL	60				
	Outdoor Bar	2	CUSTOMER	50	CUSTOMER	100				
Pool (Next to Building 3)	Pool	30	POOL	1	POOL	30	30	0.02	54	0.04
Total							**10,195**	**7.08**	**18,351**	**12.74**

Appendix D- Water Model Results

Scenario: Base



FlexTable: Junction Table **- Average Day**

ID	Label	Elevation (ft)	Demand (gpm)	Hydraulic Grade (ft)	Pressure (psi)
30	J-1	4,225.00	0	4,509.90	123
31	J-2	4,227.00	0	4,509.90	122
33	J-3	4,230.00	0	4,509.90	121
35	J-4	4,230.00	0	4,509.90	121
37	J-5	4,231.00	0	4,509.90	121
39	J-6	4,330.00	0	4,509.89	78
41	J-7	4,337.00	0	4,509.89	75
60	J-8	4,346.00	0	4,509.89	71
62	J-9	4,346.00	0	4,509.89	71
64	J-10	4,347.00	0	4,509.89	70
66	J-11	4,365.00	0	4,509.89	63
68	J-12	4,357.80	7	4,509.89	66
70	J-13	4,369.50	0	4,509.89	61
71	J-14	4,371.30	0	4,509.89	60
72	J-15	4,385.40	0	4,509.89	54
73	J-16	4,393.90	1	4,509.88	50
74	J-17	4,373.30	0	4,509.89	59
75	J-18	4,374.00	0	4,509.89	59
76	J-19	4,374.30	0	4,509.89	59
77	J-20	4,374.10	0	4,509.89	59
78	J-21	4,377.40	0	4,509.89	57
82	J-22	4,385.40	0	4,509.89	54
90	J-23	4,360.60	7	4,509.86	65

FlexTable: Pipe Table **- Average Day**

ID	Label	Length (Scaled) (ft)	Start Node	Stop Node	Diameter (in)	Material	Hazen-Williams C	Minor Loss Coefficient (Local)	Flow (gpm)	Velocity (ft/s)	Headloss Gradient (ft/ft)
32	P-1	52	J-1	J-2	16.0	Ductile Iron	130.0	0.000	8.81	0.01	0.000
34	P-2	167	J-2	J-3	16.0	Ductile Iron	130.0	0.000	8.81	0.01	0.000
36	P-3	67	J-3	J-4	16.0	Ductile Iron	130.0	0.000	8.81	0.01	0.000
38	P-4	58	J-4	J-5	16.0	Ductile Iron	130.0	0.000	0.00	0.00	0.000
40	P-5	286	J-4	J-6	8.0	Ductile Iron	110.0	0.000	8.82	0.06	0.000
42	P-6	125	J-6	J-7	8.0	Ductile Iron	110.0	0.000	8.81	0.06	0.000
47	P-7	24	J-2	H-1	6.0	Ductile Iron	90.0	0.000	0.00	0.00	0.000
48	P-8	23	J-3	H-2	6.0	Ductile Iron	90.0	0.000	0.00	0.00	0.000
49	P-9	15	J-6	H-3	6.0	Ductile Iron	90.0	0.000	0.00	0.00	0.000
54	P-10	26	J-5	PMP-1	16.0	Ductile Iron	130.0	0.000	0.00	0.00	0.000
55	P-11	25	PMP-1	R-1	16.0	Ductile Iron	130.0	0.000	0.00	0.00	0.000
56	P-12	22	J-1	PMP-2	16.0	Ductile Iron	130.0	0.000	-8.81	0.01	0.000
57	P-13	33	PMP-2	R-2	16.0	Ductile Iron	130.0	0.000	-8.81	0.01	0.000
61	P-14	451	J-7	J-8	8.0	Ductile Iron	110.0	0.000	8.81	0.06	0.000
63	P-15	7	J-8	J-9	8.0	Ductile Iron	110.0	0.000	0.01	0.00	0.000
65	P-16	8	J-9	J-10	8.0	Ductile Iron	110.0	0.000	0.00	0.00	0.000
67	P-17	16	J-9	J-11	8.0	Ductile Iron	110.0	0.000	0.00	0.00	0.000
69	P-18	81	J-8	J-12	6.0	Ductile Iron	90.0	0.000	0.00	0.00	0.000
79	P-19	86	J-12	J-13	6.0	Ductile Iron	90.0	0.000	0.00	0.00	0.000
80	P-20	14	J-13	J-14	6.0	Ductile Iron	90.0	0.000	0.00	0.00	0.000
81	P-21	81	J-14	J-15	6.0	Ductile Iron	90.0	0.000	0.00	0.00	0.000
83	P-22	9	J-15	J-22	6.0	Ductile Iron	90.0	0.000	0.00	0.00	0.000
84	P-23	26	J-15	J-16	2.0	Ductile Iron	130.0	0.000	0.00	0.00	0.000
85	P-24	45	J-14	J-17	4.0	Ductile Iron	130.0	0.000	0.00	0.00	0.000
86	P-25	91	J-17	J-18	4.0	Ductile Iron	130.0	0.000	-8.81	0.01	0.000
87	P-26	35	J-18	J-19	4.0	Ductile Iron	130.0	0.000	-8.81	0.01	0.000
88	P-27	7	J-18	J-20	2.0	Ductile Iron	110.0	0.000	8.81	0.06	0.000
89	P-28	22	J-13	J-21	2.0	Ductile Iron	110.0	0.000	0.01	0.00	0.000
91	P-29	19	J-12	J-23	2.0	Ductile Iron	110.0	0.000	0.00	0.00	0.000

FlexTable: Pipe Table

Material	Hazen-Williams C	Minor Loss Coefficient (Local)	Flow (gpm)	Velocity (ft/s)	Headloss Gradient (ft/ft)
PVC	150.0	0.000	8.80	0.10	0.000
PVC	150.0	0.000	1.42	0.02	0.000
PVC	150.0	0.000	1.40	0.02	0.000
PVC	150.0	0.000	0.90	0.01	0.000
PVC	150.0	0.000	0.00	0.00	0.000
PVC	150.0	0.000	0.90	0.09	0.000
PVC	150.0	0.000	0.50	0.01	0.000
PVC	150.0	0.000	0.50	0.01	0.000
PVC	150.0	0.000	0.48	0.01	0.000
PVC	150.0	0.000	0.02	0.00	0.000
PVC	150.0	0.000	0.02	0.00	0.000
PVC	150.0	0.000	7.38	0.75	0.001

FlexTable: Junction Table **- Max Day**

ID	Label	Elevation (ft)	Demand (gpm)	Hydraulic Grade (ft)	Pressure (psi)
30	J-1	4,225.00	0.00	4,509.90	123
31	J-2	4,227.00	0.00	4,509.90	122
33	J-3	4,230.00	0.00	4,509.90	121
35	J-4	4,230.00	0.00	4,509.90	121
37	J-5	4,231.00	0.00	4,509.90	121
39	J-6	4,330.00	0.00	4,509.89	78
41	J-7	4,337.00	0.00	4,509.89	75
60	J-8	4,346.00	0.00	4,509.89	71
62	J-9	4,346.00	0.00	4,509.89	71
64	J-10	4,347.00	0.00	4,509.89	70
66	J-11	4,365.00	0.00	4,509.89	63
68	J-12	4,357.80	0.00	4,509.89	66
70	J-13	4,369.50	0.00	4,509.88	61
71	J-14	4,371.30	0.00	4,509.88	60
72	J-15	4,385.40	0.00	4,509.88	54
73	J-16	4,393.90	1.63	4,509.88	50
74	J-17	4,373.30	0.00	4,509.88	59
75	J-18	4,374.00	0.00	4,509.88	59
76	J-19	4,374.30	0.86	4,509.88	59
77	J-20	4,374.10	0.04	4,509.88	59
78	J-21	4,377.40	0.04	4,509.88	57
82	J-22	4,385.40	0.00	4,509.88	54
90	J-23	4,360.60	13.28	4,509.81	65

FlexTable: Pipe Table **- Max Day**

ID	Label	Length (Scaled) (ft)	Start Node	Stop Node	Diameter (in)
32	P-1	52	J-1	J-2	16.0
34	P-2	167	J-2	J-3	16.0
36	P-3	67	J-3	J-4	16.0
38	P-4	58	J-4	J-5	16.0
40	P-5	286	J-4	J-6	8.0
42	P-6	125	J-6	J-7	8.0
47	P-7	24	J-2	H-1	6.0
48	P-8	23	J-3	H-2	6.0
49	P-9	15	J-6	H-3	6.0
54	P-10	26	J-5	PMP-1	16.0
55	P-11	25	PMP-1	R-1	16.0
56	P-12	22	J-1	PMP-2	16.0
57	P-13	33	PMP-2	R-2	16.0
61	P-14	451	J-7	J-8	8.0
63	P-15	7	J-8	J-9	8.0
65	P-16	8	J-9	J-10	8.0
67	P-17	16	J-9	J-11	6.0
69	P-18	81	J-8	J-12	6.0
79	P-19	86	J-12	J-13	6.0
80	P-20	14	J-13	J-14	6.0
81	P-21	81	J-14	J-15	6.0
83	P-22	9	J-15	J-22	6.0
84	P-23	26	J-15	J-16	2.0
85	P-24	45	J-14	J-17	4.0
86	P-25	91	J-17	J-18	4.0
87	P-26	35	J-18	J-19	4.0
88	P-27	7	J-18	J-20	2.0
89	P-28	22	J-13	J-21	2.0
91	P-29	19	J-12	J-23	2.0

Material	Hazen-Williams C	Minor Loss Coefficient (Local)	Flow (gpm)	Velocity (ft/s)	Headloss Gradient (ft/ft)
Ductile Iron	130.0	0.000	15.87	0.03	0.000
Ductile Iron	130.0	0.000	15.87	0.03	0.000
Ductile Iron	130.0	0.000	15.87	0.03	0.000
Ductile Iron	130.0	0.000	0.00	0.00	0.000
Ductile Iron	110.0	0.000	15.87	0.10	0.000
Ductile Iron	110.0	0.000	15.87	0.10	0.000
Ductile Iron	90.0	0.000	0.00	0.00	0.000
Ductile Iron	90.0	0.000	0.00	0.00	0.000
Ductile Iron	90.0	0.000	0.00	0.00	0.000
Ductile Iron	130.0	0.000	0.00	0.00	0.000
Ductile Iron	130.0	0.000	0.00	0.00	0.000
Ductile Iron	130.0	0.000	-15.87	0.03	0.000
Ductile Iron	130.0	0.000	-15.87	0.03	0.000
Ductile Iron	110.0	0.000	15.87	0.10	0.000
Ductile Iron	110.0	0.000	0.01	0.00	0.000
Ductile Iron	110.0	0.000	0.00	0.00	0.000
Ductile Iron	110.0	0.000	0.00	0.00	0.000

FlexTable: Pipe Table

Material	Hazen-Williams C	Minor Loss Coefficient (Local)	Flow (gpm)	Velocity (ft/s)	Headloss Gradient (ft/ft)
PVC	150.0	0.000	15.85	0.18	0.000
PVC	150.0	0.000	2.57	0.03	0.000
PVC	150.0	0.000	2.53	0.03	0.000
PVC	150.0	0.000	1.63	0.02	0.000
PVC	150.0	0.000	0.00	0.00	0.000
PVC	150.0	0.000	1.63	0.17	0.000
PVC	150.0	0.000	0.90	0.02	0.000
PVC	150.0	0.000	0.90	0.02	0.000
PVC	150.0	0.000	0.86	0.02	0.000
PVC	150.0	0.000	0.04	0.00	0.000
PVC	150.0	0.000	0.04	0.00	0.000
PVC	150.0	0.000	13.28	1.36	0.004

FlexTable: Junction Table
Max Day Plus Fire Flow

Current Time: 0.00 hours

ID	Label	Elevation (ft)	Demand (gpm)	Hydraulic Grade (ft)	Pressure (psi)
30	J-1	4,225.00	0.00	4,487.72	114
31	J-2	4,227.00	0.00	4,487.70	113
33	J-3	4,230.00	0.00	4,487.63	111
35	J-4	4,230.00	0.00	4,487.61	111
37	J-5	4,231.00	0.00	4,487.63	111
39	J-6	4,330.00	0.00	4,471.67	61
41	J-7	4,337.00	0.00	4,464.68	55
60	J-8	4,346.00	0.00	4,439.56	40
62	J-9	4,346.00	0.00	4,439.17	40
64	J-10	4,347.00	0.00	4,439.17	40
66	J-11	4,365.00	1,500.00	4,435.80	31
68	J-12	4,357.80	0.00	4,439.54	35
70	J-13	4,369.50	0.00	4,439.53	30
71	J-14	4,371.30	0.00	4,439.53	30
72	J-15	4,385.40	0.00	4,439.52	23
73	J-16	4,393.90	31.63	4,439.00	20
74	J-17	4,373.30	0.00	4,439.53	29
75	J-18	4,374.00	0.00	4,439.53	28
76	J-19	4,374.30	0.86	4,439.53	28
77	J-20	4,374.10	0.04	4,439.53	28
78	J-21	4,377.40	0.04	4,439.53	27
82	J-22	4,385.40	0.00	4,439.52	23
90	J-23	4,360.60	13.28	4,439.47	34

Current Time: 1.00 hours

ID	Label	Elevation (ft)	Demand (gpm)	Hydraulic Grade (ft)	Pressure (psi)
30	J-1	4,225.00	0.00	4,487.72	114
31	J-2	4,227.00	0.00	4,487.70	113
33	J-3	4,230.00	0.00	4,487.63	111
35	J-4	4,230.00	0.00	4,487.61	111
37	J-5	4,231.00	0.00	4,487.63	111
39	J-6	4,330.00	0.00	4,471.67	61
41	J-7	4,337.00	0.00	4,464.68	55
60	J-8	4,346.00	0.00	4,439.56	40
62	J-9	4,346.00	0.00	4,439.17	40
64	J-10	4,347.00	0.00	4,439.17	40
66	J-11	4,365.00	1,500.00	4,435.80	31
68	J-12	4,357.80	0.00	4,439.54	35
70	J-13	4,369.50	0.00	4,439.53	30
71	J-14	4,371.30	0.00	4,439.53	30
72	J-15	4,385.40	0.00	4,439.52	23
73	J-16	4,393.90	31.63	4,439.00	20
74	J-17	4,373.30	0.00	4,439.53	29
75	J-18	4,374.00	0.00	4,439.53	28
76	J-19	4,374.30	0.86	4,439.53	28

FlexTable: Junction Table
Max Day Plus Fire Flow

Current Time: 1.00 hours

ID	Label	Elevation (ft)	Demand (gpm)	Hydraulic Grade (ft)	Pressure (psi)
77	J-20	4,374.10	0.04	4,439.53	28
78	J-21	4,377.40	0.04	4,439.53	27
82	J-22	4,385.40	0.00	4,439.52	23
90	J-23	4,360.60	13.28	4,439.46	34

Current Time: 2.00 hours

ID	Label	Elevation (ft)	Demand (gpm)	Hydraulic Grade (ft)	Pressure (psi)
30	J-1	4,225.00	0.00	4,487.72	114
31	J-2	4,227.00	0.00	4,487.70	113
33	J-3	4,230.00	0.00	4,487.63	111
35	J-4	4,230.00	0.00	4,487.61	111
37	J-5	4,231.00	0.00	4,487.63	111
39	J-6	4,330.00	0.00	4,471.67	61
41	J-7	4,337.00	0.00	4,464.68	55
60	J-8	4,346.00	0.00	4,439.56	40
62	J-9	4,346.00	0.00	4,439.17	40
64	J-10	4,347.00	0.00	4,439.17	40
66	J-11	4,365.00	1,500.00	4,435.80	31
68	J-12	4,357.80	0.00	4,439.54	35
70	J-13	4,369.50	0.00	4,439.53	30
71	J-14	4,371.30	0.00	4,439.53	30
72	J-15	4,385.40	0.00	4,439.52	23
73	J-16	4,393.90	31.63	4,439.00	20
74	J-17	4,373.30	0.00	4,439.53	29
75	J-18	4,374.00	0.00	4,439.53	28
76	J-19	4,374.30	0.86	4,439.53	28
77	J-20	4,374.10	0.04	4,439.53	28
78	J-21	4,377.40	0.04	4,439.53	27
82	J-22	4,385.40	0.00	4,439.52	23
90	J-23	4,360.60	13.28	4,439.47	34

FlexTable: Pipe Table Table
Max Day Plus Fire Flow

Current Time: 0.00 hours

ID	Label	Length (Scaled) (ft)	Start Node	Stop Node	Diameter (in)	Material	Hazen-Williams C	Minor Loss Coefficient (Local)	Flow (gpm)	Velocity (ft/s)	Headloss Gradient (ft/ft)
32	P-1	52	J-1	J-2	16.0	Ductile Iron	130.0	0.000	769.32	1.23	0.000
34	P-2	167	J-2	J-3	16.0	Ductile Iron	130.0	0.000	769.32	1.23	0.000
36	P-3	67	J-3	J-4	16.0	Ductile Iron	130.0	0.000	769.32	1.23	0.000
38	P-4	58	J-4	J-5	16.0	Ductile Iron	130.0	0.000	-776.53	1.24	0.000
40	P-5	286	J-4	J-6	8.0	Ductile Iron	110.0	0.000	1,545.85	9.87	0.056
42	P-6	125	J-6	J-7	8.0	Ductile Iron	110.0	0.000	1,545.85	9.87	0.056
47	P-7	24	J-2	H-1	6.0	Ductile Iron	90.0	0.000	0.00	0.00	0.000
48	P-8	23	J-3	H-2	6.0	Ductile Iron	90.0	0.000	0.00	0.00	0.000
49	P-9	15	J-6	H-3	6.0	Ductile Iron	90.0	0.000	0.00	0.00	0.000
54	P-10	26	J-5	PMP-1	16.0	Ductile Iron	130.0	0.000	-776.53	1.24	0.000
55	P-11	25	PMP-1	R-1	16.0	Ductile Iron	130.0	0.000	-769.32	1.23	0.000
56	P-12	22	J-1	PMP-2	16.0	Ductile Iron	130.0	0.000	-769.32	1.23	0.000
57	P-13	33	PMP-2	R-2	16.0	Ductile Iron	110.0	0.000	1,545.85	9.87	0.056
61	P-14	451	J-7	J-8	8.0	Ductile Iron	110.0	0.000	1,500.00	9.57	0.053
63	P-15	7	J-8	J-9	8.0						
65	P-16	13	J-9	J-10	8.0						
67	P-17	16	J-9	J-11	6.0						
69	P-18	81	J-8	J-12	6.0						
79	P-19	86	J-12	J-13	6.0						
80	P-20	14	J-13	J-14	6.0						
81	P-21	81	J-14	J-15	6.0						
83	P-22	9	J-15	J-22	6.0						
84	P-23	26	J-15	J-16	2.0						
85	P-24	45	J-14	J-17	4.0						
86	P-25	91	J-17	J-18	4.0						
87	P-26	35	J-18	J-19	4.0						
88	P-27	7	J-18	J-20	2.0						
89	P-28	22	J-13	J-21	2.0						
91	P-29	19	J-12	J-23	2.0						

FlexTable: Pipe Table Table
Max Day Plus Fire Flow

Current Time: 0.00 hours

Material	Hazen-Williams C	Minor Loss Coefficient (Local)	Flow (gpm)	Velocity (ft/s)	Headloss Gradient (ft/ft)
Ductile Iron	110.0	0.000	0.00	0.00	0.000
Ductile Iron	110.0	0.000	1,500.00	17.02	0.214
PVC	150.0	0.000	45.85	0.52	0.000
PVC	150.0	0.000	32.57	0.37	0.000
PVC	150.0	0.000	32.53	0.37	0.000
PVC	150.0	0.000	31.63	0.36	0.000
PVC	150.0	0.000	0.00	0.00	0.000
PVC	150.0	0.000	31.63	3.23	0.020
PVC	150.0	0.000	0.90	0.02	0.000
PVC	150.0	0.000	0.90	0.02	0.000
PVC	150.0	0.000	0.86	0.02	0.000
PVC	150.0	0.000	0.04	0.00	0.000
PVC	150.0	0.000	0.04	0.00	0.000
PVC	150.0	0.000	13.28	1.36	0.004

Current Time: 1.00 hours

ID	Label	Length (Scaled) (ft)	Start Node	Stop Node	Diameter (in)
32	P-1	52	J-1	J-2	16.0
34	P-2	167	J-2	J-3	16.0
36	P-3	67	J-3	J-4	16.0
38	P-4	58	J-4	J-5	16.0
40	P-5	286	J-4	J-6	8.0
42	P-6	125	J-6	J-7	8.0
47	P-7	24	J-2	H-1	6.0
48	P-8	23	J-3	H-2	6.0
49	P-9	15	J-6	H-3	6.0
54	P-10	26	J-5	PMP-1	16.0
55	P-11	25	PMP-1	R-1	16.0
56	P-12	22	J-1	PMP-2	16.0
57	P-13	33	PMP-2	R-2	16.0
61	P-14	451	J-7	J-8	8.0
63	P-15	7	J-8	J-9	8.0
65	P-16	13	J-9	J-10	8.0
67	P-17	16	J-9	J-11	6.0
69	P-18	81	J-8	J-12	6.0
79	P-19	86	J-12	J-13	6.0
80	P-20	14	J-13	J-14	6.0
81	P-21	81	J-14	J-15	6.0
83	P-22	9	J-15	J-22	6.0
84	P-23	26	J-15	J-16	2.0
85	P-24	45	J-14	J-17	4.0
86	P-25	91	J-17	J-18	4.0
87	P-26	35	J-18	J-19	4.0
88	P-27	7	J-18	J-20	2.0
89	P-28	22	J-13	J-21	2.0

FlexTable: Pipe Table Table
Max Day Plus Fire Flow

Current Time: 1.00 hours

ID	Label	Length (Scaled) (ft)	Start Node	Stop Node	Diameter (in)
91	P-29	19	J-12	J-23	2.0
Material	**Hazen-Williams C**	**Minor Loss Coefficient (Local)**	**Flow (gpm)**	**Velocity (ft/s)**	**Headloss Gradient (ft/ft)**
Ductile Iron	130.0	0.000	769.33	1.23	0.000
Ductile Iron	130.0	0.000	769.33	1.23	0.000
Ductile Iron	130.0	0.000	769.32	1.23	0.000
Ductile Iron	130.0	0.000	-776.54	1.24	0.000
Ductile Iron	110.0	0.000	1,545.86	9.87	0.056
Ductile Iron	110.0	0.000	1,545.86	9.87	0.056
Ductile Iron	90.0	0.000	0.00	0.00	0.000
Ductile Iron	90.0	0.000	0.00	0.00	0.000
Ductile Iron	90.0	0.000	0.00	0.00	0.000
Ductile Iron	130.0	0.000	-776.54	1.24	0.000
Ductile Iron	130.0	0.000	-776.54	1.24	0.000
Ductile Iron	130.0	0.000	-769.33	1.23	0.000
Ductile Iron	130.0	0.000	-769.33	1.23	0.000
Ductile Iron	110.0	0.000	1,545.86	9.87	0.056
Ductile Iron	110.0	0.000	1,500.00	9.57	0.053
Ductile Iron	110.0	0.000	0.00	0.00	0.000
Ductile Iron	110.0	0.000	1,500.00	17.02	0.214
PVC	150.0	0.000	45.85	0.52	0.000
PVC	150.0	0.000	32.57	0.37	0.000
PVC	150.0	0.000	32.53	0.37	0.000
PVC	150.0	0.000	31.63	0.36	0.000
PVC	150.0	0.000	0.00	0.00	0.000
PVC	150.0	0.000	31.63	3.23	0.020
PVC	150.0	0.000	0.90	0.02	0.000
PVC	150.0	0.000	0.90	0.02	0.000
PVC	150.0	0.000	0.86	0.02	0.000
PVC	150.0	0.000	0.04	0.00	0.000
PVC	150.0	0.000	0.04	0.00	0.000
PVC	150.0	0.000	13.28	1.36	0.004

Current Time: 2.00 hours

ID	Label	Length (Scaled) (ft)	Start Node	Stop Node	Diameter (in)
32	P-1	52	J-1	J-2	16.0
34	P-2	167	J-2	J-3	16.0
36	P-3	67	J-3	J-4	16.0
38	P-4	58	J-4	J-5	16.0
40	P-5	286	J-4	J-6	8.0
42	P-6	125	J-6	J-7	8.0
47	P-7	24	J-2	H-1	6.0
48	P-8	23	J-3	H-2	6.0
49	P-9	15	J-6	H-3	6.0
54	P-10	26	J-5	PMP-1	16.0

FlexTable: Pipe Table Table
Max Day Plus Fire Flow

Current Time: 2.00 hours

ID	Label	Length (Scaled) (ft)	Start Node	Stop Node	Diameter (in)	Material	Hazen-Williams C	Minor Loss Coefficient (Local)	Flow (gpm)	Velocity (ft/s)	Headloss Gradient (ft/ft)
55	P-11	25	PMP-1	R-1	16.0	Ductile Iron	130.0	0.000	769.33	1.23	0.000
56	P-12	22	J-1	PMP-2	16.0	Ductile Iron	130.0	0.000	769.32	1.23	0.000
57	P-13	33	PMP-2	R-2	16.0	Ductile Iron	130.0	0.000	769.32	1.23	0.000
61	P-14	451	J-7	J-8	8.0	Ductile Iron	130.0	0.000	-776.53	1.24	0.000
63	P-15	7	J-8	J-9	8.0	Ductile Iron	110.0	0.000	1,545.85	9.87	0.056
65	P-16	13	J-9	J-10	8.0	Ductile Iron	110.0	0.000	1,545.85	9.87	0.056
67	P-17	16	J-9	J-11	6.0	Ductile Iron	90.0	0.000	0.00	0.00	0.000
69	P-18	81	J-8	J-12	6.0	Ductile Iron	90.0	0.000	0.00	0.00	0.000
79	P-19	86	J-12	J-13	6.0	Ductile Iron	90.0	0.000	0.00	0.00	0.000
80	P-20	14	J-13	J-14	6.0	Ductile Iron	130.0	0.000	-776.53	1.24	0.000
81	P-21	81	J-14	J-15	6.0	Ductile Iron	130.0	0.000	-776.53	1.24	0.000
83	P-22	9	J-15	J-22	6.0	Ductile Iron	130.0	0.000	-769.33	1.23	0.000
84	P-23	26	J-15	J-16	2.0	Ductile Iron	130.0	0.000	-769.33	1.23	0.000
85	P-24	45	J-14	J-17	4.0	Ductile Iron	110.0	0.000	1,545.85	9.87	0.056
86	P-25	91	J-17	J-18	4.0	Ductile Iron	110.0	0.000	1,500.00	9.57	0.053
87	P-26	35	J-18	J-19	4.0	Ductile Iron	110.0	0.000	0.00	0.00	0.000
88	P-27	7	J-18	J-20	2.0	Ductile Iron	110.0	0.000	1,500.00	17.02	0.214
89	P-28	22	J-13	J-21	2.0	PVC	150.0	0.000	45.85	0.52	0.000
91	P-29	19	J-12	J-23	2.0	PVC	150.0	0.000	32.57	0.37	0.000
						PVC	150.0	0.000	32.53	0.37	0.000
						PVC	150.0	0.000	31.63	0.36	0.000
						PVC	150.0	0.000	0.00	0.00	0.000
						PVC	150.0	0.000	31.63	3.23	0.020
						PVC	150.0	0.000	0.90	0.02	0.000
						PVC	150.0	0.000	0.90	0.02	0.000

FlexTable: Pipe Table Table
Max Day Plus Fire Flow

Current Time: 2.00 hours

Material	Hazen-Williams C	Minor Loss Coefficient (Local)	Flow (gpm)	Velocity (ft/s)	Headloss Gradient (ft/ft)
PVC	150.0	0.000	0.86	0.02	0.000
PVC	150.0	0.000	0.04	0.00	0.000
PVC	150.0	0.000	0.04	0.00	0.000
PVC	150.0	0.000	13.28	1.36	0.004