CITY OF SCOTTSDALE

Water and Wastewater Study
Combined

3 engineering

planning civil engineering surveying

78TH STREET & PRINCESS BOULEVARD APARTMENTS

Final Water Basis of Design Report

3 engineering Job #: 1923

August 13, 2020

FINAL Basis of Design Report

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

CITY OF SCOTTSDALE

SCOTTSDALE WATER

9379 E San Salvador Dr.
Scottsdale, AZ 85258

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 scan **DATE** 10/8/2020

To be Resolved at Plan Review:
Public waterlines require 20 feet PUE, utility plan show 14 ft. ~per DSPM 6-1.402, paragraph B.

29-DR-2020
9/18/2020

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78TH STREET & PRINCESS BOULEVARD APARTMENTS

WATER BASIS OF DESIGN REPORT

Prepared for:

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Phone: (480)281-5549

Daniel G. Mann, P.E.

August 13, 2020

Submittal to:

City of Scottsdale
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Scottsdale, AZ 85251

Prepared by:

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6370 E. Thomas Road, Suite #200
Scottsdale, Arizona 85251
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Job Number 1923

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Table of Contents

Tables

Appendices

1. Introduction

The project site, 78th Street and Princess Boulevard Apartments, is located in the northeast quarter of Section 35, Township 4 North, Range 4 East of the Gila and Salt River Meridian, Maricopa County, Arizona within the City of Scottsdale. The project is located at the northwest corner of 78th Street and Princess Boulevard, Scottsdale, Arizona 85255. The site is bounded on the north and west by vacant land, on the east by a 78th Street, and on the south by Princess Boulevard. See Appendix A for a site map.

The existing zoning is P-C. The land is undeveloped. The City of Scottsdale 2001 General Plan shows the site as a Freeway Corridor/Regional Care. The proposed zoning is P-C. The site is a proposed 180-unit apartment complex.

2. Existing Conditions

The existing zoning is P-C. The existing site is undeveloped land with adjacent roadway and a drainage channel in an easement. See Appendix A for a site map. The site is surrounded by existing vacant land.

There is an existing 12" PVC water main that transitions to a 12" DIP water main in the north half of Princess Boulevard, south of the site. There is an existing 16" DIP water main in 78th Street, east of the site. There are two 8" DIP water line stubs that extend to the site within the 78th Street right-of-way. There are no other existing water facilities on the site. See Water Plans in Appendix D for existing waterline layout.

The certified flow test can be found in Appendix B. The static pressure of the existing system was 72.0 psi and the residual pressure was 58.0 psi at 1,803 gpm with a 16.0 psi factor of safety. The test was taken at two hydrants in 78th Street, east of the site.

3. Proposed Conditions

The project consists of a 180-unit apartment complex on 10.70 acres. The proposed site has a fire flow demand of 1,062.5 gpm based on Table B105.1 of the International Fire Code. This is using the square footage of the largest building which is 24,735 s.f. and a construction type of V-B and a 75% reduction for automatic fire sprinklers. However, the minimum fire flow for multi-family structures per the City of Scottsdale DSPM is 1,500 gpm. The proposed water system is to be public and is to be maintained by the City of Scottsdale. The system will connect to the two existing 8" DIP water stubs in at the property line along 78th Street and create a loop throughout the drive aisles of the site with new 8" D.I.P. waterline. The proposed water system includes six (6) new fire hydrants, connected by the proposed 8" D.I.P. waterline. See Water Plans in Appendix D for proposed waterline layout, pipe sizes and material. Public waterlines require 20 feet PUE, utility plan show 14 ft. ~per DSPM 6-1.402, paragraph B.

4. Required Computations & Hydraulic Modeling

The purpose of this basis of design report is to verify that the existing City of Scottsdale water system is able to accommodate demands generated by the proposed project, 78th Street and Princess Boulevard Apartments. Demands were calculated using Figure 6.1-2 of the City of Scottsdale Design Standards and Policies Manual dated 2018. It is our opinion that this report is in accordance with the 2018 City of Scottsdale Design Standards and Policies Manual.

29-DR-2020
9/18/2020

The following demand criteria were used in determining the system demands for the proposed site.

1. 180 proposed units
2. 10.70 acre site (16.82 du/ac)
3. 0.33 gallons per minute per unit (per Figure 6.2 of D.S.&P.M. 2018 for Residential Demand, 12-22 DU/ac)
4. Largest Proposed Building = 24,735 s.f., Building type V-B, per Table B105.1 of the 2015 International Fire Code the fire flow = 4,250 gpm. 75% reduction based on fully sprinklered buildings is 1,062.5 gpm. The minimum fire flow is 1,500 gpm for multi-family structures per City of Scottsdale DSPM section 6-1.501. Fire Flow = 1,500 gpm.
5.
6. Max day flow = 2.0 x average day demand
7. Peak hour flow = 3.5 x average day demand

TABLE 1: ON-SITE WATER DEMANDS	
Avg. daily demand	59.4 gpm
Max day demand	118.8 gpm
Peak hour flow rate	207.9 gpm
Fire flow	1,500 gpm
Fire flow + Max Day	1,618.8 gpm

Average Daily Demand: 180-units x 0.33 gpmpu = 59.4 gpm

Max Day Demand = 2.0 x 59.4 gpm = 118.8 gpm

Peak Hour Flow rate = 3.5 x 59.4 gpm = 207.9 gpm

Bentley WaterCAD V8i was used to model the proposed water system. The WaterCAD system was modeled with a connection to the existing public water system in the 16" waterline in 78th Street using a reservoir and a pump with a curve determined from the flow test results. The Fire Flow + Max Day demand for the site is 1,618.8 gpm. At this flow, the minimum pressure in the system exceeds the City of Scottsdale Requirement of 30 psi minimum under fire flow conditions. The proposed pipes have velocities less than 10 fps. Therefore, the proposed water system is adequate to support the proposed improvements for the site. See WaterCAD Results in Appendix C.

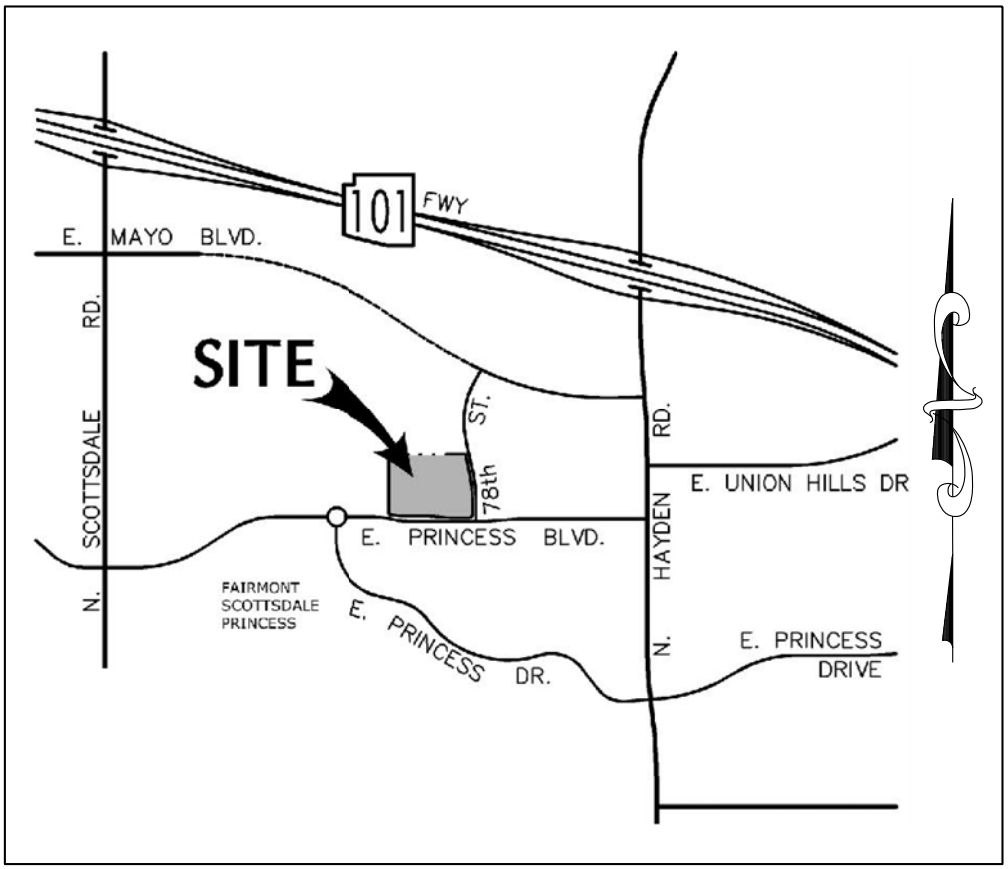
5. ***Summary***

The Peak Hourly Flow for the proposed site is 207.9 gpm.
The fire flow for the Proposed building is 1,500 gpm based on the minimum fire flow for multi-family structures per City of Scottsdale DSPM.
The system meets minimum pressure requirements at Fire Flow + Max Day demand.

29-DR-2020
9/18/2020

APPENDIX A

Vicinity Map



VICINITY MAP

N.T.S.

29-DR-2020
9/18/2020

APPENDIX B

Fire Flow Test Results

Arizona Flow Testing LLC

HYDRANT FLOW TEST REPORT

Project Name:	APN 215-07-016E
Project Address:	78th Street & Princess (NWC), Scottsdale, Arizona, 85255
Client Project No.:	19223
Arizona Flow Testing Project No.:	20235
Flow Test Permit No.:	C62468
Date and time flow test conducted:	June 25, 2020 at 10:30 AM
Data is current and reliable until:	December 25, 2020
Conducted by:	Floyd Vaughan – Az. Flow Testing, LLC (480-250-8154)
Coordinated by:	Jared Berry – City of Scottsdale-Inspector (602-541-4942)

Raw Test Data

Static Pressure: **88.0 PSI**
(Measured in pounds per square inch)

Residual Pressure: **74.0 PSI**
(Measured in pounds per square inch)

Pitot Pressure: **23.0 PSI**
(Measured in pounds per square inch)

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

Coefficient of Diffuser: 0.9

Flowing GPM: **1,803 GPM**
(Measured in gallons per minute)

GPM @ 20 PSI: **4,223 GPM**

Data with 16 PSI Safety Factor

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

Residual Pressure: **58.0 PSI**
(Measured in pounds per square inch)

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

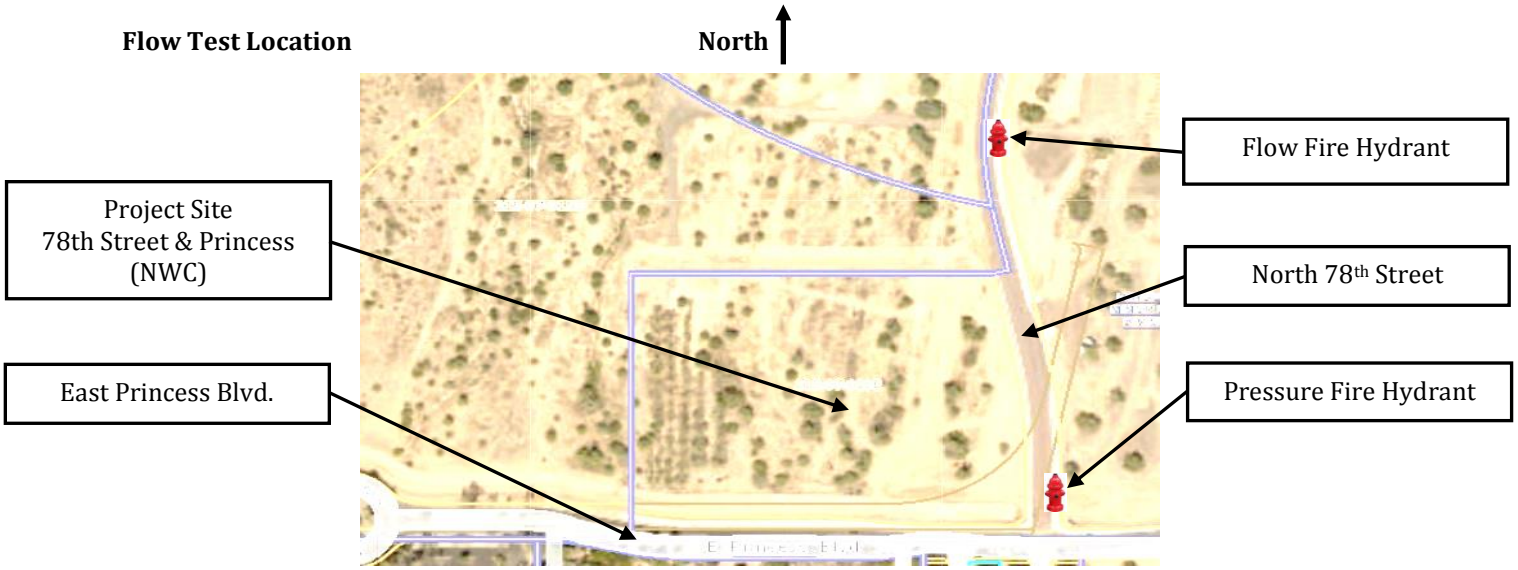
Distance between hydrants: Approx.: 770 Feet

Main size: Not Provided

Flowing GPM: **1,803 GPM**

GPM @ 20 PSI**:** **3,662 GPM**

Flow Test Location



29-DR-2020
9/18/2020

APPENDIX C

WaterCAD Results

Pump Definition Detailed Report: Flow Test 062520

Element Details

ID	61	Notes	
Label	Flow Test 062520		

Pump Definition Type

Pump Definition Type	Standard (3 Point)	Design Head	133.98 ft
Shutoff Flow	0 gpm	Maximum Operating Flow	3,662 gpm
Shutoff Head	166.32 ft	Maximum Operating Head	46.20 ft
Design Flow	1,803 gpm		

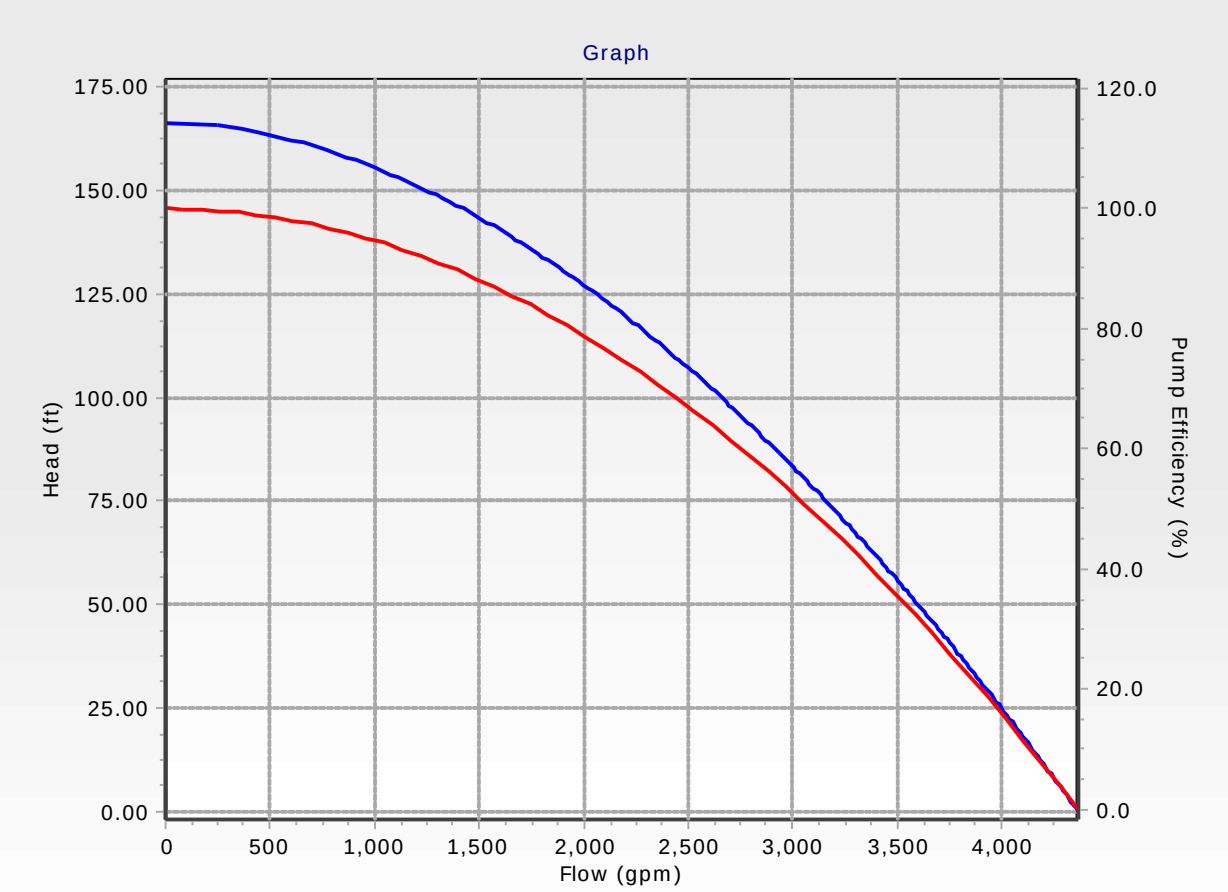
Pump Efficiency

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

Transient (Physical)

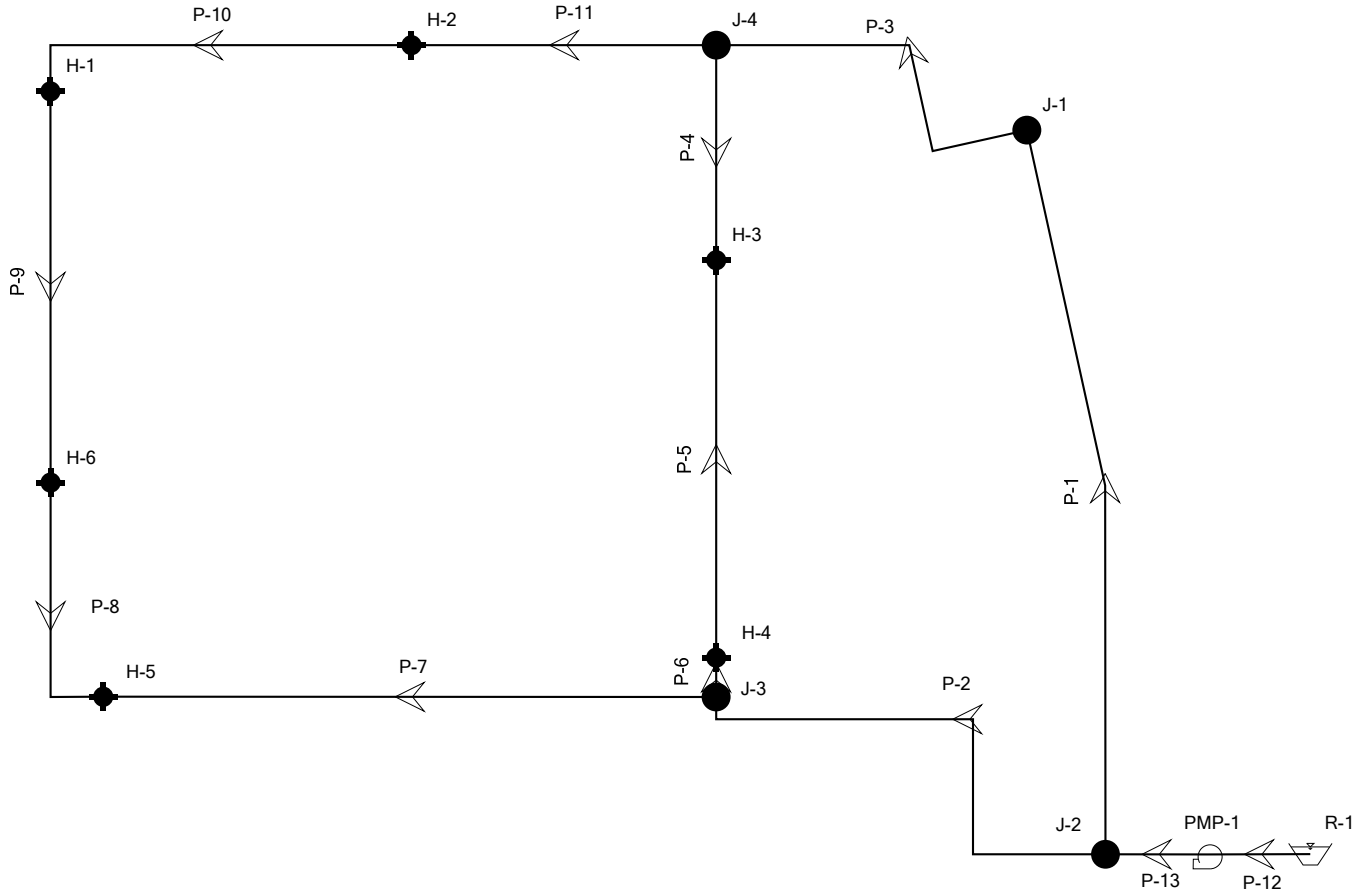
Inertia (Pump and Motor)	0.000 lb·ft²	Specific Speed	SI=25, US=1280
Speed (Full)	0 rpm	Reverse Spin Allowed?	True

Pump Definition Detailed Report: Flow Test 062520



29-DR-2020
9/18/2020

Scenario: Average Day



FlexTable: Hydrant Table (1923.wtg)

Current Time: 0.000 hours

ID	Label	Hydrant Status	Elevation (ft)	Demand (gpm)	Hydraulic Grade (ft)	Pressure (psi)
32	H-1	Closed	77.00	0	227.42	65.1
34	H-3	Closed	76.98	20	227.42	65.1
33	H-2	Closed	76.87	20	227.42	65.1
37	H-6	Closed	75.59	0	227.42	65.7
35	H-4	Closed	75.05	0	227.42	65.9
36	H-5	Closed	74.31	20	227.42	66.2

FlexTable: Junction Table (1923.wtg)

Current Time: 0.000 hours

ID	Label	Elevation (ft)	Zone	Demand (gpm)	Hydraulic Grade (ft)	Pressure (psi)
31	J-4	70.84	<None>	0	227.42	67.7
28	J-1	68.67	<None>	0	227.43	68.7
30	J-3	68.24	<None>	0	227.42	68.9
29	J-2	61.17	<None>	0	227.43	71.9

FlexTable: Pipe Table (1923.wtg)

Current Time: 0.000 hours

ID	Label	Length (ft)	Start Node	Stop Node	Diameter (in)	Material	Hazen-Williams C	Flow (gpm)	Velocity (ft/s)	Headloss Gradient (ft/ft)
52	P-13	1	PMP-1	J-2	48.0	Ductile Iron	130.0	59	0.01	0.000
51	P-12	1	R-1	PMP-1	48.0	Ductile Iron	130.0	59	0.01	0.000
47	P-8	167	H-5	H-6	8.0	Ductile Iron	130.0	-3	0.02	0.000
48	P-9	244	H-6	H-1	8.0	Ductile Iron	130.0	-3	0.02	0.000
49	P-10	254	H-1	H-2	8.0	Ductile Iron	130.0	-3	0.02	0.000
40	P-1	457	J-2	J-1	16.0	Ductile Iron	130.0	32	0.05	0.000
43	P-4	134	J-4	H-3	8.0	Ductile Iron	130.0	10	0.06	0.000
44	P-5	248	H-3	H-4	8.0	Ductile Iron	130.0	-10	0.06	0.000
45	P-6	25	H-4	J-3	8.0	Ductile Iron	130.0	-10	0.06	0.000
46	P-7	382	J-3	H-5	8.0	Ductile Iron	130.0	17	0.11	0.000
50	P-11	190	H-2	J-4	8.0	Ductile Iron	130.0	-22	0.14	0.000
41	P-2	341	J-2	J-3	8.0	Ductile Iron	130.0	27	0.17	0.000
42	P-3	248	J-1	J-4	8.0	Ductile Iron	130.0	32	0.21	0.000

FlexTable: Pump Table (1923.wtg)

Current Time: 0.000 hours

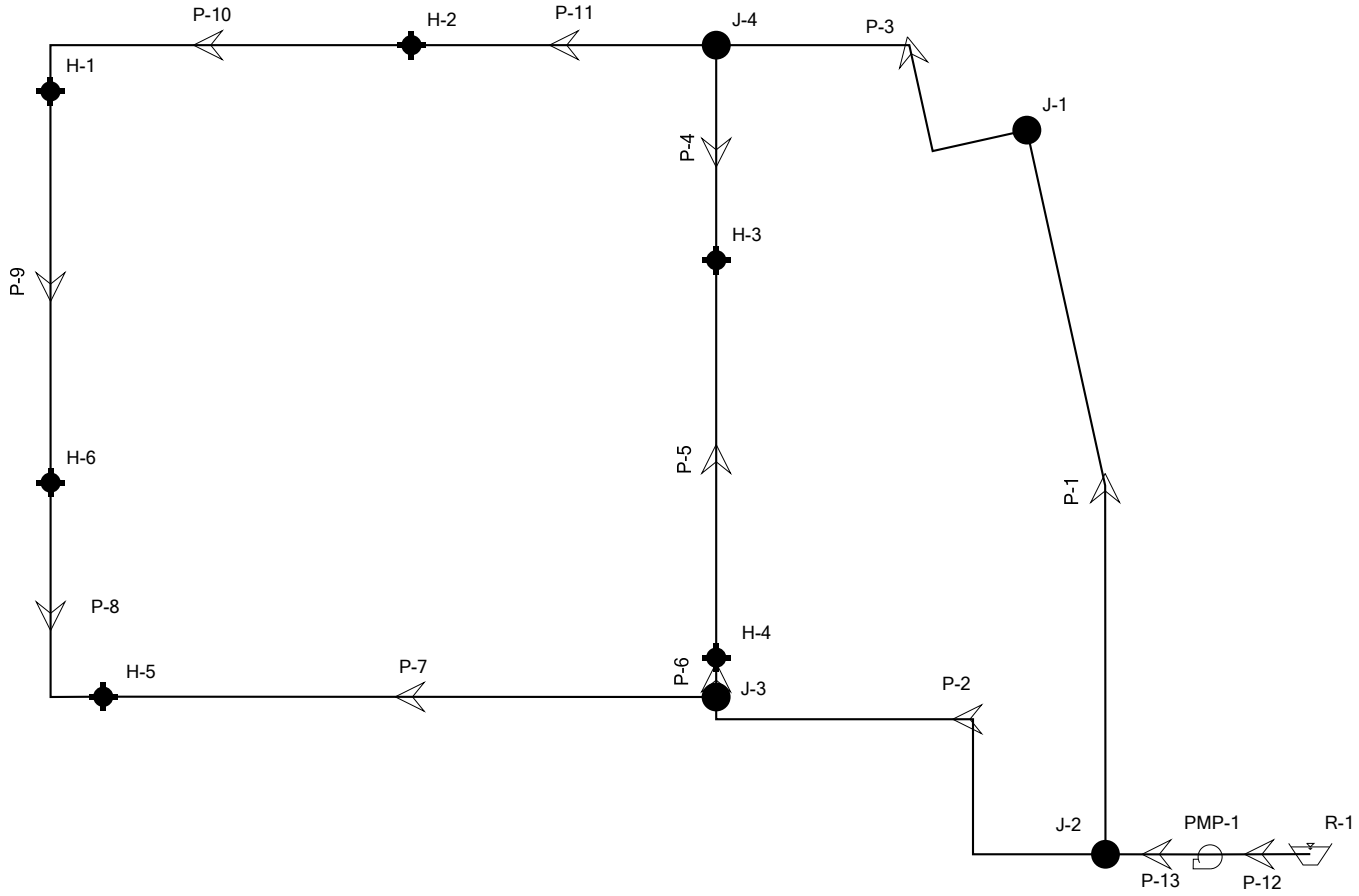
ID	Label	Elevation (ft)	Pump Definition	Status (Initial)	Hydraulic Grade (Suction) (ft)	Hydraulic Grade (Discharge) (ft)	Flow (Total) (gpm)	Pump Head (ft)
39	PMP-1	61.17	Flow Test 062520	On	61.17	227.43	59	166.26

FlexTable: Reservoir Table (1923.wtg)

Current Time: 0.000 hours

ID	Label	Elevation (ft)	Zone	Flow (Out net) (gpm)	Hydraulic Grade (ft)
38	R-1	61.17	<None>	59	61.17

Scenario: Max Day



FlexTable: Hydrant Table (1923.wtg)

Current Time: 0.000 hours

ID	Label	Hydrant Status	Elevation (ft)	Demand (gpm)	Hydraulic Grade (ft)	Pressure (psi)
32	H-1	Closed	77.00	0	227.24	65.0
34	H-3	Closed	76.98	40	227.25	65.0
33	H-2	Closed	76.87	40	227.24	65.1
37	H-6	Closed	75.59	0	227.24	65.6
35	H-4	Closed	75.05	0	227.25	65.9
36	H-5	Closed	74.31	40	227.24	66.2

FlexTable: Junction Table (1923.wtg)

Current Time: 0.000 hours

ID	Label	Elevation (ft)	Zone	Demand (gpm)	Hydraulic Grade (ft)	Pressure (psi)
31	J-4	70.84	<None>	0	227.25	67.7
28	J-1	68.67	<None>	0	227.28	68.6
30	J-3	68.24	<None>	0	227.25	68.8
29	J-2	61.17	<None>	0	227.28	71.9

FlexTable: Pipe Table (1923.wtg)

Current Time: 0.000 hours

ID	Label	Length (ft)	Start Node	Stop Node	Diameter (in)	Material	Hazen-Williams C	Flow (gpm)	Velocity (ft/s)	Headloss Gradient (ft/ft)
51	P-12	1	R-1	PMP-1	48.0	Ductile Iron	130.0	119	0.02	0.000
52	P-13	1	PMP-1	J-2	48.0	Ductile Iron	130.0	119	0.02	0.000
47	P-8	167	H-5	H-6	8.0	Ductile Iron	130.0	-5	0.03	0.000
48	P-9	244	H-6	H-1	8.0	Ductile Iron	130.0	-5	0.03	0.000
49	P-10	254	H-1	H-2	8.0	Ductile Iron	130.0	-5	0.03	0.000
40	P-1	457	J-2	J-1	16.0	Ductile Iron	130.0	65	0.10	0.000
43	P-4	134	J-4	H-3	8.0	Ductile Iron	130.0	20	0.13	0.000
44	P-5	248	H-3	H-4	8.0	Ductile Iron	130.0	-20	0.13	0.000
45	P-6	25	H-4	J-3	8.0	Ductile Iron	130.0	-20	0.13	0.000
46	P-7	382	J-3	H-5	8.0	Ductile Iron	130.0	34	0.22	0.000
50	P-11	190	H-2	J-4	8.0	Ductile Iron	130.0	-45	0.29	0.000
41	P-2	341	J-2	J-3	8.0	Ductile Iron	130.0	54	0.35	0.000
42	P-3	248	J-1	J-4	8.0	Ductile Iron	130.0	65	0.41	0.000

FlexTable: Pump Table (1923.wtg)

Current Time: 0.000 hours

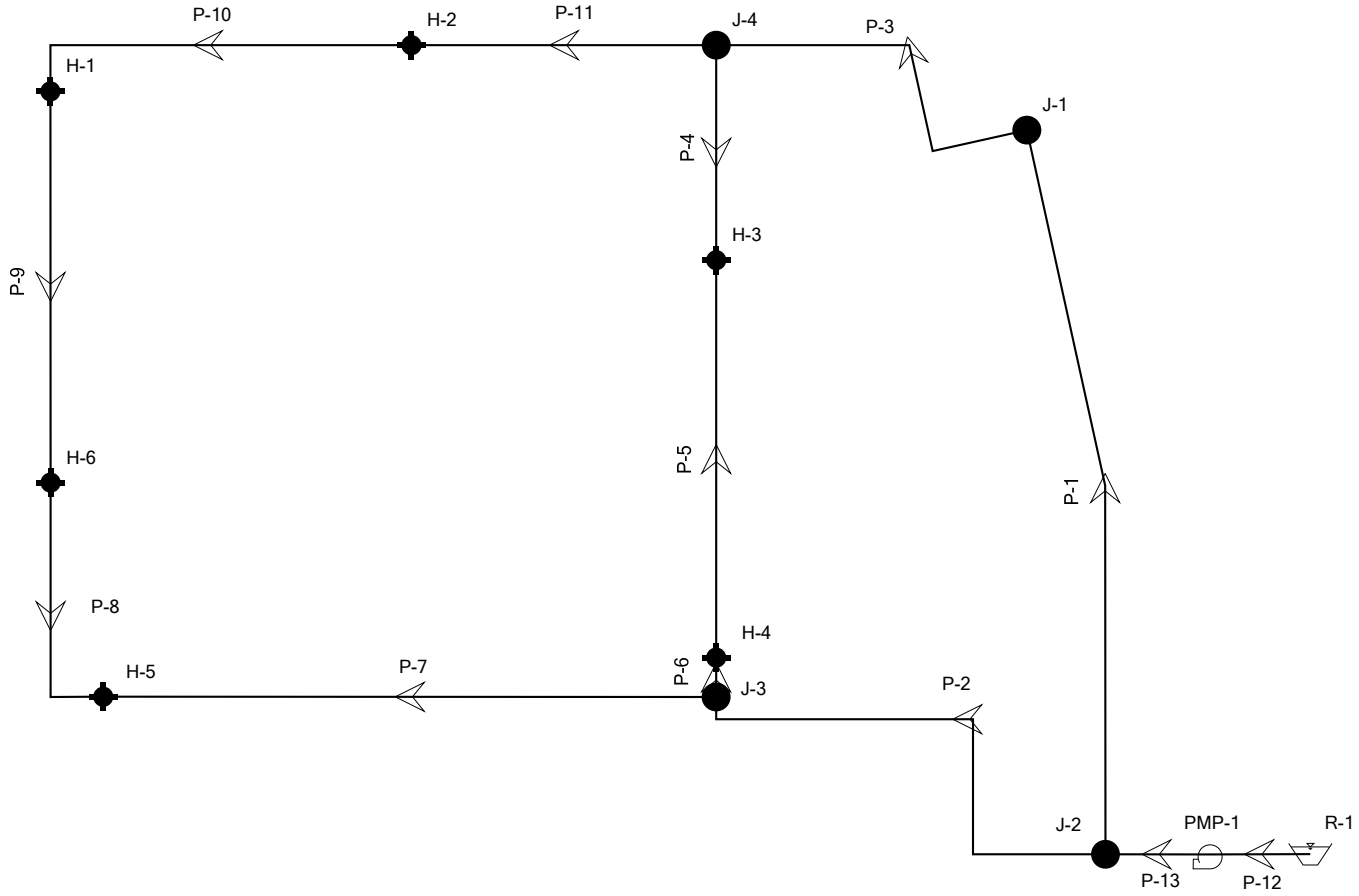
ID	Label	Elevation (ft)	Pump Definition	Status (Initial)	Hydraulic Grade (Suction) (ft)	Hydraulic Grade (Discharge) (ft)	Flow (Total) (gpm)	Pump Head (ft)
39	PMP-1	61.17	Flow Test 062520	On	61.17	227.28	119	166.11

FlexTable: Reservoir Table (1923.wtg)

Current Time: 0.000 hours

ID	Label	Elevation (ft)	Zone	Flow (Out net) (gpm)	Hydraulic Grade (ft)
38	R-1	61.17	<None>	119	61.17

Scenario: Peak Hour



FlexTable: Hydrant Table (1923.wtg)

Current Time: 0.000 hours

ID	Label	Hydrant Status	Elevation (ft)	Demand (gpm)	Hydraulic Grade (ft)	Pressure (psi)
32	H-1	Closed	77.00	0	226.78	64.8
34	H-3	Closed	76.98	69	226.81	64.8
33	H-2	Closed	76.87	69	226.78	64.9
37	H-6	Closed	75.59	0	226.78	65.4
35	H-4	Closed	75.05	0	226.82	65.7
36	H-5	Closed	74.31	69	226.78	66.0

FlexTable: Junction Table (1923.wtg)

Current Time: 0.000 hours

ID	Label	Elevation (ft)	Zone	Demand (gpm)	Hydraulic Grade (ft)	Pressure (psi)
31	J-4	70.84	<None>	0	226.81	67.5
28	J-1	68.67	<None>	0	226.89	68.5
30	J-3	68.24	<None>	0	226.82	68.6
29	J-2	61.17	<None>	0	226.90	71.7

FlexTable: Pipe Table (1923.wtg)

Current Time: 0.000 hours

ID	Label	Length (ft)	Start Node	Stop Node	Diameter (in)	Material	Hazen-Williams C	Flow (gpm)	Velocity (ft/s)	Headloss Gradient (ft/ft)
51	P-12	1	R-1	PMP-1	48.0	Ductile Iron	130.0	208	0.04	0.000
52	P-13	1	PMP-1	J-2	48.0	Ductile Iron	130.0	208	0.04	0.000
47	P-8	167	H-5	H-6	8.0	Ductile Iron	130.0	-9	0.06	0.000
48	P-9	244	H-6	H-1	8.0	Ductile Iron	130.0	-9	0.06	0.000
49	P-10	254	H-1	H-2	8.0	Ductile Iron	130.0	-9	0.06	0.000
40	P-1	457	J-2	J-1	16.0	Ductile Iron	130.0	113	0.18	0.000
43	P-4	134	J-4	H-3	8.0	Ductile Iron	130.0	34	0.22	0.000
44	P-5	248	H-3	H-4	8.0	Ductile Iron	130.0	-35	0.22	0.000
45	P-6	25	H-4	J-3	8.0	Ductile Iron	130.0	-35	0.22	0.000
46	P-7	382	J-3	H-5	8.0	Ductile Iron	130.0	60	0.38	0.000
50	P-11	190	H-2	J-4	8.0	Ductile Iron	130.0	-78	0.50	0.000
41	P-2	341	J-2	J-3	8.0	Ductile Iron	130.0	95	0.61	0.000
42	P-3	248	J-1	J-4	8.0	Ductile Iron	130.0	113	0.72	0.000

FlexTable: Pump Table (1923.wtg)

Current Time: 0.000 hours

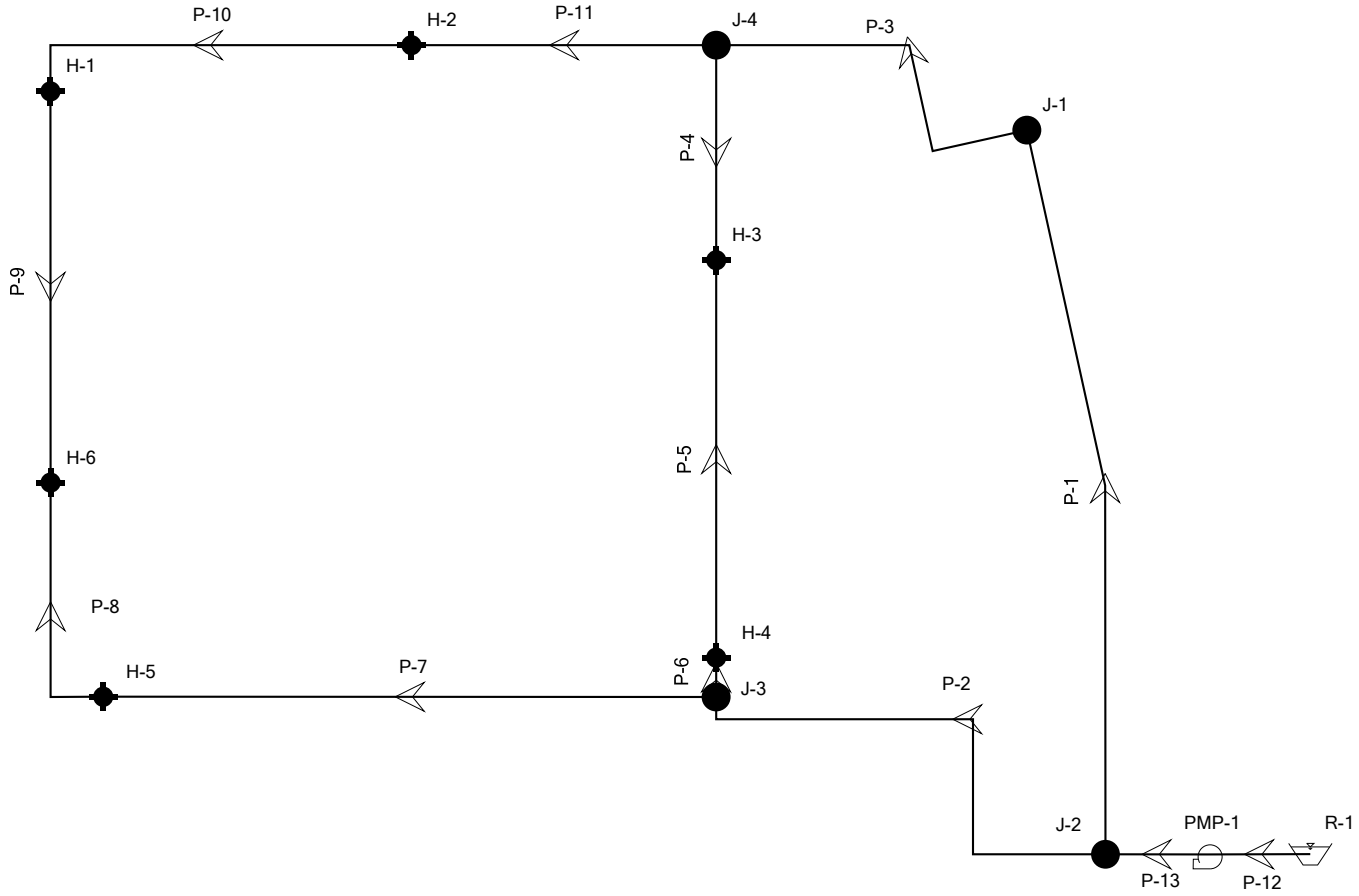
ID	Label	Elevation (ft)	Pump Definition	Status (Initial)	Hydraulic Grade (Suction) (ft)	Hydraulic Grade (Discharge) (ft)	Flow (Total) (gpm)	Pump Head (ft)
39	PMP-1	61.17	Flow Test 062520	On	61.17	226.90	208	165.73

FlexTable: Reservoir Table (1923.wtg)

Current Time: 0.000 hours

ID	Label	Elevation (ft)	Zone	Flow (Out net) (gpm)	Hydraulic Grade (ft)
38	R-1	61.17	<None>	208	61.17

Scenario: Max Day + Fire Flow



FlexTable: Hydrant Table (1923.wtg)

Current Time: 0.000 hours

ID	Label	Hydrant Status	Elevation (ft)	Demand (gpm)	Hydraulic Grade (ft)	Pressure (psi)
32	H-1	Closed	77.00	750	191.75	49.6
37	H-6	Closed	75.59	750	191.73	50.2
33	H-2	Closed	76.87	40	194.81	51.0
36	H-5	Closed	74.31	40	193.31	51.5
34	H-3	Closed	76.98	40	197.31	52.1
35	H-4	Closed	75.05	0	197.31	52.9

FlexTable: Junction Table (1923.wtg)

Current Time: 0.000 hours

ID	Label	Elevation (ft)	Zone	Demand (gpm)	Hydraulic Grade (ft)	Pressure (psi)
31	J-4	70.84	<None>	0	197.31	54.7
30	J-3	68.24	<None>	0	197.31	55.8
28	J-1	68.67	<None>	0	200.78	57.2
29	J-2	61.17	<None>	0	201.00	60.5

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

FlexTable: Pipe Table (1923.wtg)

Current Time: 0.000 hours

ID	Label	Length (ft)	Start Node	Stop Node	Diameter (in)	Material	Hazen-Williams C	Flow (gpm)	Velocity (ft/s)	Headloss Gradient (ft/ft)
44	P-5	248	H-3	H-4	8.0	Ductile Iron	130.0	-13	0.08	0.000
45	P-6	25	H-4	J-3	8.0	Ductile Iron	130.0	-13	0.08	0.000
43	P-4	134	J-4	H-3	8.0	Ductile Iron	130.0	27	0.17	0.000
51	P-12	1	R-1	PMP-1	48.0	Ductile Iron	130.0	1,619	0.29	0.000
52	P-13	1	PMP-1	J-2	48.0	Ductile Iron	130.0	1,619	0.29	0.000
48	P-9	244	H-6	H-1	8.0	Ductile Iron	130.0	-49	0.31	0.000
40	P-1	457	J-2	J-1	16.0	Ductile Iron	130.0	865	1.38	0.000
47	P-8	167	H-5	H-6	8.0	Ductile Iron	130.0	701	4.48	0.009
46	P-7	382	J-3	H-5	8.0	Ductile Iron	130.0	741	4.73	0.010
41	P-2	341	J-2	J-3	8.0	Ductile Iron	130.0	754	4.81	0.011
49	P-10	254	H-1	H-2	8.0	Ductile Iron	130.0	-799	5.10	0.012
50	P-11	190	H-2	J-4	8.0	Ductile Iron	130.0	-838	5.35	0.013
42	P-3	248	J-1	J-4	8.0	Ductile Iron	130.0	865	5.52	0.014

FlexTable: Pump Table (1923.wtg)

Current Time: 0.000 hours

ID	Label	Elevation (ft)	Pump Definition	Status (Initial)	Hydraulic Grade (Suction) (ft)	Hydraulic Grade (Discharge) (ft)	Flow (Total) (gpm)	Pump Head (ft)
39	PMP-1	61.17	Flow Test 062520	On	61.17	201.00	1,619	139.83

FlexTable: Reservoir Table (1923.wtg)

Current Time: 0.000 hours

ID	Label	Elevation (ft)	Zone	Flow (Out net) (gpm)	Hydraulic Grade (ft)
38	R-1	61.17	<None>	1,619	61.17

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

APPENDIX D

Preliminary Water Plans

A.P.N. 215-07-015C
OWNER: ARIZONA STATE LAND DEPT.
BK. 324, PG. 50, M.C.R.

A.P.N. 215-07-016F
OWNER: HAYDEN PRINCESS LLC
BK. 1447, PG. 40, M.C.R.

A.P.N. 215-07-015C
OWNER: ARIZONA STATE LAND DEPT.
BK. 324, PG. 50, M.C.R.

PROPOSED SEWER MANHOLE (TYP.)
PROPOSED 8" D.I.P. WATERLINE (PRESSURE CLASS 350)
PROPOSED 8" P.V.C. SEWERLINE (SDR-35)
PROPOSED 14' WATERLINE EASEMENT
PROPOSED 6" P.V.C. SEWERLINE (SDR-35) LATERAL (TYP.)
PROPOSED 1 1/2" WATER METER
CONNECT TO EXISTING 8" WATERLINE
PROPOSED 6" P.V.C. SEWERLINE (SDR-35) LATERAL (TYP.)
PROPOSED CLEANOUT (TYP.)
PROPOSED 14' WATERLINE EASEMENT
PROPOSED 2" WATER METER
PROPOSED BACKFLOW PREVENTER (TYP.)
PROPOSED 2" DOMESTIC WATERLINE
PROPOSED 1 1/2" DOMESTIC WATERLINE
PROPOSED 2" DOMESTIC WATERLINE
PROPOSED 2" WATER METER
PROPOSED 4" D.I.P. FIRELINE (PRESSURE CLASS 350) (TYP.)
PROPOSED FIRE HYDRANT COMPLETE (TYP.)
PROPOSED 2" DOMESTIC WATERLINE
PROPOSED 2" WATER METER
PROPOSED 14' WATERLINE EASEMENT
PROPOSED 6" P.V.C. SEWERLINE (SDR-35) LATERAL (TYP.)
PROPOSED 1" DOMESTIC WATERLINE
PROPOSED 1" WATER METER
PROPOSED BACKFLOW PREVENTER (TYP.)
PROPOSED 8" D.I.P. WATERLINE (PRESSURE CLASS 350)
PROPOSED 2" DOMESTIC WATERLINE
PROPOSED 2" WATER METER
PROPOSED 8" P.V.C. SEWERLINE (SDR-35)
PROPOSED 8" D.I.P. WATERLINE (PRESSURE CLASS 350)
PROPOSED 8" P.V.C. SEWERLINE (SDR-35)
PROPOSED 8" D.I.P. WATERLINE (PRESSURE CLASS 350)
PROPOSED 1 1/2" WATER METER
PROPOSED 8" D.I.P. WATERLINE (PRESSURE CLASS 350)
PROPOSED 2" DOMESTIC WATERLINE
PROPOSED FIRE HYDRANT COMPLETE (TYP.)
PROPOSED SEWER MANHOLE (TYP.)
PROPOSED 2" WATER METER
PROPOSED 2" WATER METER
PROPOSED 8" P.V.C. SEWERLINE (SDR-35)
PROPOSED 4" D.I.P. FIRELINE (PRESSURE CLASS 350) (TYP.)
PROPOSED 2" WATER METER
PROPOSED 2" DOMESTIC WATERLINE
PROPOSED 14' WATERLINE EASEMENT
PROPOSED 8" D.I.P. WATERLINE (PRESSURE CLASS 350)
CONNECT TO EXISTING 8" WATERLINE
PROPOSED 8" P.V.C. SEWERLINE (SDR-35)
PROPOSED 6" P.V.C. SEWERLINE (SDR-35) LATERAL (TYP.)
PROPOSED 2" DOMESTIC WATERLINE
PROPOSED 6" P.V.C. SEWERLINE (SDR-35) LATERAL (TYP.)
PROPOSED CLEANOUT (TYP.)
PROPOSED SEWER MANHOLE (TYP.)
CONNECT TO EXISTING 8" SEWER STUB
PROPOSED 8" P.V.C. SEWERLINE (SDR-35)
PROPOSED CLEANOUT (TYP.)

PRINCESS BLVD.
78TH ST.

SCALE: 1"=40'
0' 20' 40' 80'

78TH ST. & PRINCESS BLVD. APARTMENTS
NWC 78TH ST. & PRINCESS BLVD., SCOTTSDALE, AZ 85255
PRELIMINARY UTILITY PLAN

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

Registered Professional Engineer (Civil)
CERTIFICATE NO. 46857
DANIEL C. MANN
8/13/20
ARIZONA, U.S.A.

3 engineering
civil engineering
planning
surveying

DESIGNER: D. MANN
DRAWN: PAULIE S.
CHECKED: D. MANN
ENGINEER:

3 ENGINEERING, LLC
6370 E. THOMAS ROAD
SUITE # 200
SCOTTSDALE, ARIZONA 85251
PHONE: (602) 334-4387
FAX: (602) 490-3230
WWW.3ENGINEERING.COM

DATE: 08/13/20
PROJECT NO. 1923
SHEET NO. PUTL202 2 of 2
Q.S.#39-45

29-DR-2020
9/18/2020

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