CAVASSON

LOCATED NEAR THE NORTHWEST CORNER OF THE HAYDEN ROAD AND THE LOOP 101 FRONTAGE ROAD INTERSECTION

PRELIMINARY WATER REPORT – PHASE 1
BASIS OF DESIGN

March 26, 2019

Project No.: 18114-203

PREPARED FOR:

NATIONWIDE REALTY INVESTORS
375 N. FRONT STREET
COLUMBUS, OH 43215
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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 5/8/2019

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INTRODUCTION

1.1 Project Scope

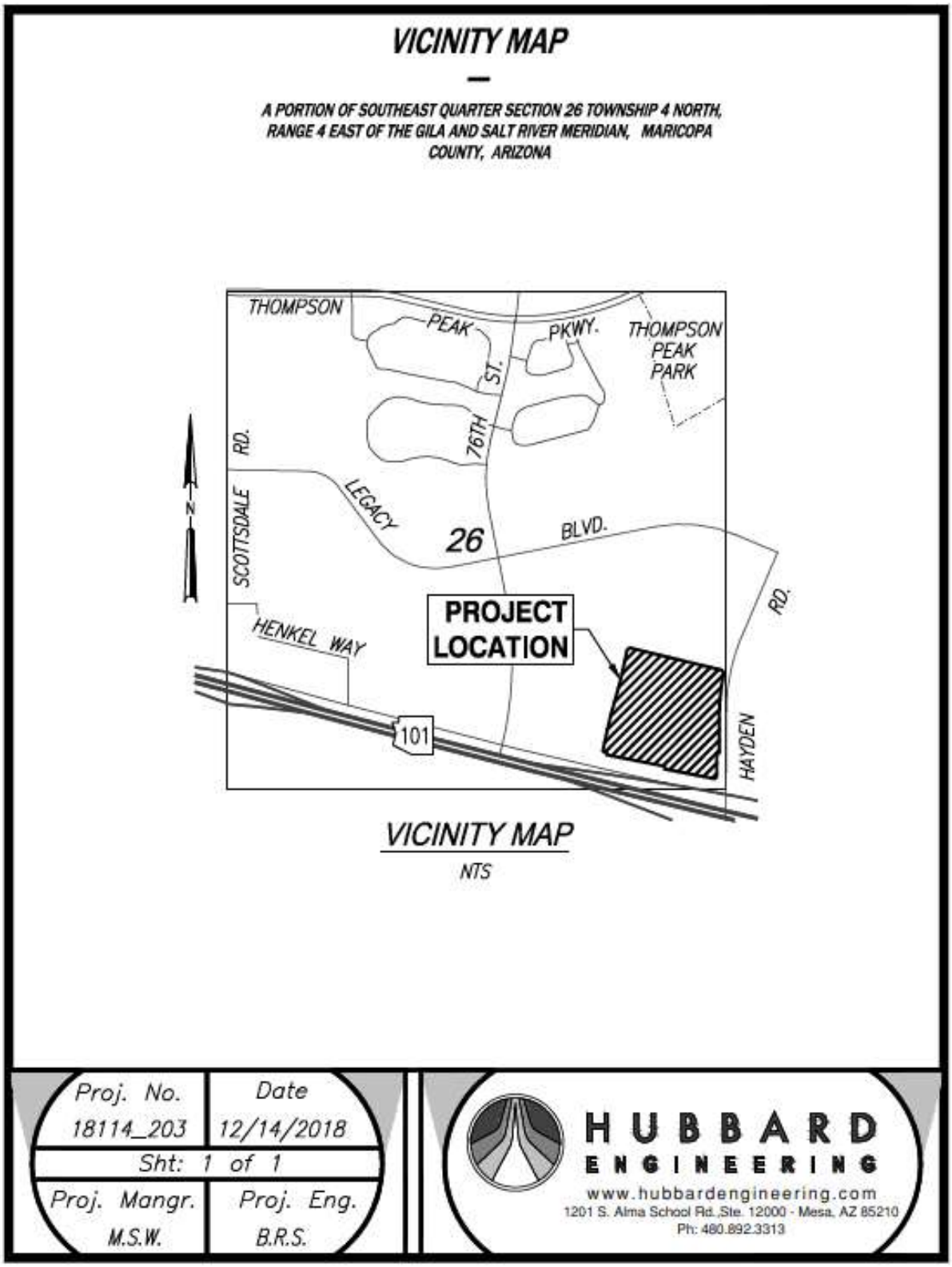
This report presents the results of a *Preliminary Water Study* conducted by Hubbard Engineering at the request of Nationwide Realty Investors ("client"), for Phase I of the Cavasson master development ("site"). The purpose of this report is to provide an evaluation of the proposed distribution system for the site. This report addresses design flows and basis of design as well as design criteria. The water analysis of this report will adhere to Hubbard Engineering's submitted and approved *Master Water Report*.

1.2 Site Description

The site is located in the southeast quarter of Section 26, Township 4N, Range 4E of the Gila and Salt River Base and Meridian, Maricopa County, Arizona. The site is currently undeveloped, and prior to Nationwide Reality Investor's acquisition, was held in trust by the Arizona State Land Department (ASLD) as a portion of the overall Crossroads East development, which encompasses approximately 883 gross acres. Phase I of the Cavasson site development is located in the southwest corner of the overall development, near the Hayden Road and Loop 101 frontage 101 intersection. The land naturally falls northeast to southwest.

Phase I of Cavasson is bounded by the Loop 101 Freeway to the south, North Hayden Road to the east, and undeveloped land to the north and west. The site location is shown in **Figure 1.1** on the *Vicinity Map*.

Figure 1.1 – Vicinity Map



1.3 Project Type

The Cavasson development is being developed by Nationwide Reality Investors as a master planned mixed use development with office, retail, hotels, and multifamily residential parcels with public and private roadways that run adjacent to and through the development. Phase I of the improvements includes construction of a new office building with a an approximately 98,800 sq. ft. footprint with five stories adding to roughly 465,000 sq. ft. and a parking garage of 3,750+/- spaces. Improvements will include surrounding access drives and utilities through the property to provide domestic water, fire, and sewer services to the proposed building and garage. The analysis for the ultimate site was conducted in Hubbard's *Master Water Report* and will be referenced as it applies to Phase I.

1.4 Regulatory Issues

The following documents were utilized in the preparation of this report:

- City of Scottsdale, *Design Standards & Policies Manual*.
- Arizona Department of Environmental Quality (ADEQ), *Aquifer Protection Permit (APP) Program*
- Maricopa Association of Governments (MAG), *Uniform Standard Specifications and Details for Public Works Construction, 2016 Edition*
- *2012 Edition of the International Fire Code*
- *2012 Edition of the International Plumbing Code*
- *Hubbard. October 22,2018. Master Water Report for Cavasson Development: Hubbard Engineering.*

2. PROJECT DESCRIPTION

2.1 Tie-In to Existing System

The proposed water system for Phase 1 of the Cavasson Development will include the existing 12-inch line along Hayden Road, 16-inch line along Claret Drive, and a proposed 8-inch loop around the garage and office buildings, providing service to nine new hydrants. The proposed line will tie into an existing 12-inch stub located in Hayden road to the east of the site as well as tie into an existing 12-inch stub located in Claret Drive to the west of the site.

See **Exhibit 1** for these tie-in locations.

2.2 Physical Features

The existing site is currently undeveloped desert and generally slopes from north to south.

2.3 Service Area

The water service provider for the existing site is the City of Scottsdale. The Cavasson development is being developed by Nationwide Reality Investors as a master planned mixed use development with office, retail, hotels, and multifamily residential parcels with public and private roadways that run adjacent and through the development. The Cavasson development is located within Zone 4 and is discussed in more detail in the submitted *Master Water Plan*.

Phase I of the improvements includes construction of a new office building with a square footage of approximately 445,000 and a parking garage of 3,750+/- spaces. Improvements will include surrounding access drives and utilities through the property to provide domestic water, fire, and sewer services to the proposed building and garage. Access to the site is provided at five locations which will allow traffic to enter and exit the site. There are two access points via Hayden Road, two access points via Claret Drive, and a future proposed access point via Cavasson Boulevard. The building construction type for the office building will be Type IIB and it will be equipped with an automatic sprinkler system (NFPA13) per the International Fire Code 2012. The building construction type for the garage will be Type IA and it will be equipped with an automatic sprinkler system (NFPA13) per the International Fire Code 2012.

2.4 Right of Way and Easements

The proposed water lines will be installed in public rights of way or exclusive water easements dedicated to the City of Scottsdale. Easements shall be a minimum of 20 feet wide for all water lines.

3. DESIGN FLOWS AND BASIS OF DESIGN

3.1 Average Daily Demands

In accordance with the *City of Scottsdale Design Standards & Policies Manual Chapter 6* Section 6-1.205 (Reference 1), the design unit water demand for an office is $8.34 * 10^{-4}$ gallons per minute per square foot.

The total service area tributary to the proposed water main consists of 465,000 sq. ft.

Thus, the total Average Daily Demand is:

$$(8.34 * 10^{-4}\ gpm/sq.ft.) \times (465{,}000\ sq.\ ft.) = \mathbf{387.81\ gpm}$$

3.2 Maximum Daily Demand and Peak Hour Flow

In accordance with the *City of Scottsdale Design Standards & Policies Manual Chapter 6* Section 6-1.404 (Reference 1), the maximum day peaking factor and peak hour peaking factor are as follows:

3.2.1 Maximum Day Demand

Max Day Demand = ADD * 2

3.2.2 Peak Hour Demand

Peak Hour Demand = ADD * 3.5

3.3 Water and Fire Demand Calculations

A summary of the water and fire demand calculations can be found in **Table 1** below.

Table 1: Water and Fire Demand Calculation Summary

Land Use	Square Footage	ADD (gpm/ft^2)	ADD (gpm)	Max Day Demand (ADD x 2) (gpm)	Peak Hour Demand (ADD x 3.5) (gpm)	Fire Flow Required (gpm)	Max Day Plus Fire Flow (gpm)
Office	450,000	$8.34*10^{-4}$	371.13	775.62	1357.335	4,000	4775.62

4. Design Criteria

4.1 Minimum Pressure

The water distribution system shall be designed and constructed to maintain the following minimum pressures:

1. Max Day Demand plus Fire Flow – minimum of 20 psi
2. Peak Hour Demand – $\geq$ 50 psi and $\leq$ 80 psi, to achieve minimum service pressure of 40 psi (Note: Uniform plumbing code requires a pressure reducing valve (PRV) on private plumbing when tap pressures exceed 80 psi)

A water model was run for the proposed system using WaterCAD. The basis of this model was developed using information from a fire hydrant flow test conducted on October 16, 2018. The results of this fire flow test are included in **Appendix A – Fire Flow Test Results**. Information regarding the definition of the pump used in the WaterCAD analysis can be found in **Appendix B – Pump Definition Report for Fire Flow Model**.

4.2 Fire Flows

Fire flow requirements are typically determined by the local fire department. The latest version of the International Fire Code (IFC), adopted by the City of Scottsdale, will serve as guidelines. A minimum Fire Flow of 8,000 gpm for 4 hours is based on a 445,000 sq. ft. building, per City of Scottsdale Fire Code, with 50% reduction Minimum Fire Flow of 4,000 gpm will be used due to NFPA 13 sprinkler system.

4.3 Minimum Pipe Sizing

There is a 12-inch proposed water main that runs from an existing water stub in Hayden road before reducing to an 8-inch proposed water main to the north of the proposed garage. This line will wrap all the way around the garage where it will tie into an existing stub in the private access road. The domestic and fire connections for the buildings will be 6-inch diameter lines.

4.4 Pipe Material

All new water main lines shall be ductile iron pipe (DIP), Class 350 per City of Scottsdale requirements.

5. Summary

- Per the City of Scottsdale Water System Pressure Zone Map, the Cavasson Development is located within Pressure Zone 4.
- The planned future Average Daily Demand for development is 387.81 gpm. This conforms to the Master Study.
- The planned future Maximum Daily Demand for the development is 775.62 gpm. This conforms to the Master Study.
- The planned future Peak Hour Demand for the development is 1357.335 gpm. This conforms to the Master Study.
- The required fire flow is 4,000 gpm.
- Based on the results of the water model, the Cavasson development system can maintain a flow of 4,020 gallons per minute at a pressure of 32 psi.
- The results from the proposed water model show there are adequate flows and pressures being provided by the existing and proposed planned infrastructure for the Cavasson development.

6. References

1. City of Scottsdale. *Design Standards & Policies Manual.* January 18, 2018.
2. Carollo Engineers. *2008 Scottsdale Integrated Water Resources Master Plan.* March 2008.
3. Coe & Van Loo Consultants, Inc. (CVL) *Arizona State Land Department- Crossroads East Water Master Plan Update,* April 13, 2008.
4. Arizona Department of Environmental Quality (ADEQ). *Engineering Bulletin 11: Minimum Requirements for Design, Submission of Plans and Specifications of Sewage Works.* May 1978.
5. Arizona Department of Environmental Quality (ADEQ). *Aquifer Protection Permit (APP) Program*.
6. Maricopa Association of Governments (MAG). *Uniform Standard Specifications and Details for Public Works Construction.* January 2016.
7. International Code Council. *2015 International Fire Code.* May 30, 2014.
8. International Code Council. *2012 Edition of the International Plumbing Code*. January 1, 2012
9. City of Scottsdale, *Ordinance No. 4346,* June 17, 2018.
10. City of Scottsdale, *Resolution No. 1147,* June 17, 2018.

Appendix A
Average Day Demand
Cavasson

Scenario: Avg Day
Current Time Step: 0.000 h
FlexTable: Junction Table

ID	Label	Elevation (ft)	Zone	Demand Collection	Demand (gpm)	Hydraulic Grade (ft)	Pressure (psi)
686	J-1	1,609.00	Zone - 4	<Collection: 0 items>	0	1,783.00	75
687	J-2	1,612.00	Zone - 4	<Collection: 0 items>	0	1,783.00	74
689	J-3	1,623.00	Zone - 4	<Collection: 0 items>	0	1,782.98	69
691	J-4	1,629.00	Zone - 4	<Collection: 0 items>	0	1,782.97	67
693	J-5	1,629.90	Zone - 4	<Collection: 0 items>	0	1,782.97	66
695	J-6	1,631.92	Zone - 4	<Collection: 0 items>	0	1,782.97	65
697	J-7	1,649.25	Zone - 4	<Collection: 0 items>	0	1,782.97	58
701	J-8	1,649.00	Zone - 4	<Collection: 0 items>	0	1,782.97	58
703	J-9	1,649.00	Zone - 4	<Collection: 0 items>	0	1,782.97	58
705	J-10	1,649.00	Zone - 4	<Collection: 0 items>	0	1,782.97	58
707	J-11	1,646.00	Zone - 4	<Collection: 0 items>	0	1,782.97	59
709	J-12	1,643.00	Zone - 4	<Collection: 0 items>	0	1,782.97	61
711	J-13	1,637.84	Zone - 4	<Collection: 0 items>	0	1,782.97	63
713	J-14	1,633.68	Zone - 4	<Collection: 0 items>	0	1,782.96	65
717	J-16	1,630.55	Zone - 4	<Collection: 0 items>	0	1,782.96	66
719	J-17	1,617.54	Zone - 4	<Collection: 0 items>	0	1,782.96	72
721	J-18	1,625.17	Zone - 4	<Collection: 0 items>	0	1,782.96	68
724	J-19	1,612.00	Zone - 4	<Collection: 0 items>	0	1,783.00	74
735	J-38	1,616.47	Zone - 4	<Collection: 0 items>	0	1,782.98	72
737	J-20	1,625.50	Zone - 4	<Collection: 0 items>	0	1,782.97	68
741	J-43	1,606.70	Zone - 4	<Collection: 0 items>	0	1,782.93	76
745	J-40	1,619.49	Zone - 4	<Collection: 0 items>	0	1,782.97	71
750	J-34	1,607.21	Zone - 4	<Collection: 0 items>	0	1,782.94	76
754	J-39	1,612.00	Zone - 4	<Collection: 0 items>	0	1,782.67	74
757	J-41	1,612.00	Zone - 4	<Collection: 0 items>	0	1,782.90	74
761	J-33	1,613.33	Zone - 4	<Collection: 0 items>	0	1,782.94	73
764	J-21	1,612.50	Zone - 4	<Collection: 0 items>	0	1,782.94	74
768	J-35	1,618.40	Zone - 4	<Collection: 0 items>	0	1,782.96	71
771	J-22	1,618.54	Zone - 4	<Collection: 0 items>	0	1,782.95	71
775	J-15	1,619.21	Zone - 4	<Collection: 0 items>	0	1,782.97	71
778	J-23	1,625.00	Zone - 4	<Collection: 0 items>	0	1,782.96	68
783	J-24	1,623.83	Zone - 4	<Collection: 0 items>	0	1,782.96	69
799	J-27	1,619.36	Zone - 4	<Collection: 0 items>	0	1,782.96	71
807	J-28	1,626.64	Zone - 4	<Collection: 0 items>	0	1,782.97	68
818	J-29	1,636.73	Zone - 4	<Collection: 0 items>	0	1,782.97	63
825	J-30	1,649.00	Zone - 4	<Collection: 0 items>	0	1,782.97	58
828	J-31	1,645.84	Zone - 4	<Collection: 0 items>	0	1,782.97	59
848	J-32	1,648.15	Zone - 4	<Collection: 0 items>	0	1,782.97	58
877	J-37	1,640.12	Zone - 4	<Collection: 0 items>	0	1,782.97	62

933	J-44	1,624.90	Zone - 4	<Collection: 0 items>	0	1,782.96	68
937	J-45	1,606.60	Zone - 4	<Collection: 0 items>	0	1,782.94	76
960	J-25	1,612.51	Zone - 4	<Collection: 1 item>	0	1,782.85	74
963	J-26	1,607.18	Zone - 4	<Collection: 0 items>	0	1,782.93	76
967	J-47	1,628.00	Zone - 4	<Collection: 0 items>	0	1,782.97	67
972	J-36	1,620.59	Zone - 4	<Collection: 0 items>	0	1,782.97	70
982	J-42	1,618.72	Zone - 4	<Collection: 0 items>	0	1,782.96	71
1017	J-46	1,614.06	Zone - 4	<Collection: 0 items>	0	1,782.94	73
1022	J-48	1,612.14	Zone - 4	<Collection: 0 items>	0	1,782.72	74
1031	J-49	1,608.94	Zone - 4	<Collection: 0 items>	0	1,782.72	75
1034	J-50	1,609.90	Zone - 4	<Collection: 0 items>	0	1,782.97	75
1057	J-51	1,610.21	Zone - 4	<Collection: 0 items>	0	1,782.62	75
1058	J-52	1,596.00	Zone - 4	<Collection: 0 items>	0	1,782.62	81
1063	J-53	1,610.06	Zone - 4	<Collection: 0 items>	0	1,782.61	75
1064	D-1A-1	1,596.00	Zone - 4	<Collection: 1 item>	388	1,781.99	80

P:\2018\18114\Design-Reports\18114-203\Water\Model\18114-WaterModel Phase 1.wtg

Scenario: Avg Day
Current Time Step: 0.000 h
FlexTable: Pipe Table

ID	Label	Length (Scaled) (ft)	Start Node	Stop Node	Diameter (in)	Material	Hazen-Williams C	Has Check Valve?	Minor Loss Coefficient (Local)	Flow (gpm)	Velocity (ft/s)	Headloss Gradient (ft/1000ft)	Has User Defined Length?	Length (User Defined) (ft)
1065	P-53	49	J-53	D-1A-1	6.0	Ductile Iron	130.0	False	0.000	388	4.40	12.835	False	0
1029	P-29	149	J-49	J-43	8.0	Ductile Iron	130.0	False	0.000	-250	1.60	1.401	False	0
1062	P-25	75	J-53	J-49	8.0	Ductile Iron	130.0	False	0.000	-250	1.60	1.399	False	0
763	P-20	86	J-33	J-41	8.0	Ductile Iron	130.0	False	0.000	138	0.88	0.466	False	0
962	P-128	98	J-25	J-41	8.0	Ductile Iron	130.0	False	0.000	-138	0.88	0.465	False	0
1024	P-127	278	J-48	J-25	8.0	Ductile Iron	130.0	False	0.000	-138	0.88	0.466	False	0
1023	P-33	107	J-39	J-48	8.0	Ductile Iron	130.0	False	0.000	-138	0.88	0.466	False	0
1055	P-18	119	J-39	J-51	8.0	Ductile Iron	130.0	False	0.000	138	0.88	0.466	False	0
1061	P-19	10	J-51	J-53	8.0	Ductile Iron	130.0	False	0.000	138	0.88	0.464	False	0
1036	P-16	279	J-50	J-19	12.0	Ductile Iron	130.0	False	0.000	-175	0.50	0.101	False	0
1035	P-15	430	J-43	J-50	12.0	Ductile Iron	130.0	False	0.000	-175	0.50	0.101	False	0
690	P-1	522	J-2	J-3	16.0	Ductile Iron	130.0	False	0.000	213	0.34	0.036	False	0
1018	P-22	260	J-35	J-46	8.0	Ductile Iron	130.0	False	0.000	52	0.33	0.076	False	0
1019	P-32	46	J-46	J-33	8.0	Ductile Iron	130.0	False	0.000	52	0.33	0.076	False	0
726	P-11	20	J-19	J-2	16.0	Ductile Iron	130.0	False	0.000	-175	0.28	0.025	False	0
772	P-23	411	J-18	J-22	16.0	Ductile Iron	130.0	False	0.000	161	0.26	0.021	False	0
773	P-24	280	J-22	J-21	16.0	Ductile Iron	130.0	False	0.000	161	0.26	0.021	False	0
767	P-21	215	J-33	J-21	12.0	Ductile Iron	130.0	False	0.000	-86	0.24	0.027	False	0
968	P-132	378	J-3	J-47	16.0	Ductile Iron	130.0	False	0.000	147	0.23	0.018	False	0
969	P-133	161	J-47	J-4	16.0	Ductile Iron	130.0	False	0.000	147	0.23	0.018	False	0
939	P-115	44	J-45	J-34	12.0	Ductile Iron	130.0	False	0.000	75	0.21	0.022	False	0
964	P-129	432	J-34	J-26	12.0	Ductile Iron	130.0	False	0.000	75	0.21	0.021	False	0
965	P-130	230	J-26	J-43	12.0	Ductile Iron	130.0	False	0.000	75	0.21	0.021	False	0
779	P-27	331	J-18	J-23	16.0	Ductile Iron	130.0	False	0.000	-117	0.19	0.012	False	0
780	P-28	276	J-23	J-20	16.0	Ductile Iron	130.0	False	0.000	-117	0.19	0.012	False	0
736	P-14	232	J-3	J-38	12.0	Ductile Iron	130.0	False	0.000	66	0.19	0.016	False	0
1010	P-107	444	J-38	J-36	12.0	Ductile Iron	130.0	False	0.000	66	0.19	0.016	False	0
974	P-136	225	J-36	J-40	12.0	Ductile Iron	130.0	False	0.000	66	0.19	0.016	False	0
808	P-41	415	J-20	J-28	16.0	Ductile Iron	130.0	False	0.000	-103	0.16	0.009	False	0
809	P-42	163	J-28	J-4	16.0	Ductile Iron	130.0	False	0.000	-103	0.16	0.009	False	0
776	P-26	70	J-40	J-15	12.0	Ductile Iron	130.0	False	0.000	52	0.15	0.011	False	0
983	P-30	32	J-35	J-42	12.0	Ductile Iron	130.0	False	0.000	-52	0.15	0.012	False	0
984	P-140	332	J-42	J-15	12.0	Ductile Iron	130.0	False	0.000	-52	0.15	0.011	False	0
938	P-114	401	J-21	J-45	16.0	Ductile Iron	130.0	False	0.000	75	0.12	0.005	False	0
694	P-2	135	J-4	J-5	16.0	Ductile Iron	130.0	False	0.000	44	0.07	0.002	False	0
696	P-3	134	J-5	J-6	16.0	Ductile Iron	130.0	False	0.000	44	0.07	0.002	False	0
702	P-4	65	J-7	J-8	16.0	Ductile Iron	130.0	False	0.000	44	0.07	0.002	False	0
704	P-5	155	J-8	J-9	16.0	Ductile Iron	130.0	False	0.000	44	0.07	0.002	False	0
710	P-6	488	J-11	J-12	16.0	Ductile Iron	130.0	False	0.000	44	0.07	0.002	False	0
714	P-7	487	J-13	J-14	16.0	Ductile Iron	130.0	False	0.000	44	0.07	0.002	False	0
785	P-31	309	J-24	J-18	16.0	Ductile Iron	130.0	False	0.000	44	0.07	0.002	False	0
800	P-35	532	J-17	J-27	16.0	Ductile Iron	130.0	False	0.000	44	0.07	0.002	False	0
801	P-36	358	J-27	J-24	16.0	Ductile Iron	130.0	False	0.000	44	0.07	0.002	False	0
819	P-46	371	J-6	J-29	16.0	Ductile Iron	130.0	False	0.000	44	0.07	0.002	False	0
826	P-48	331	J-9	J-30	16.0	Ductile Iron	130.0	False	0.000	44	0.07	0.002	False	0
827	P-49	198	J-30	J-10	16.0	Ductile Iron	130.0	False	0.000	44	0.07	0.002	False	0
829	P-50	316	J-29	J-31	16.0	Ductile Iron	130.0	False	0.000	44	0.07	0.002	False	0
830	P-51	268	J-31	J-7	16.0	Ductile Iron	130.0	False	0.000	44	0.07	0.002	False	0
849	P-60	315	J-10	J-32	16.0	Ductile Iron	130.0	False	0.000	44	0.07	0.002	False	0
850	P-61	197	J-32	J-11	16.0	Ductile Iron	130.0	False	0.000	44	0.07	0.002	False	0
878	P-75	227	J-12	J-37	16.0	Ductile Iron	130.0	False	0.000	44	0.07	0.002	False	0
879	P-76	264	J-37	J-13	16.0	Ductile Iron	130.0	False	0.000	44	0.07	0.002	False	0
934	P-111	439	J-16	J-44	16.0	Ductile Iron	130.0	False	0.000	44	0.07	0.002	False	0
935	P-112	498	J-44	J-17	16.0	Ductile Iron	130.0	False	0.000	44	0.07	0.002	False	0
1001	P-34	416	J-16	J-14	16.0	Ductile Iron	130.0	False	0.000	-44	0.07	0.002	False	0
1008	P-13	319	R-11	J-2	48.0	Ductile Iron	130.0	False	0.000	388	0.07	0.000	True	1
1066	P-453	336	J-20	J-40	12.0	Ductile Iron	130.0	False	0.000	-14	0.04	0.001	False	0
1014	P-38	14	H-5	J-35	6.0	Ductile Iron	130.0	False	0.000	0	0.00	0.000	False	0

1049	P-45	21	J-34	H-10	6.0	Ductile Iron	130.0	False	0.000	0	0.00	0.000	False	0
1012	P-37	6	H-6	J-15	6.0	Ductile Iron	130.0	False	0.000	0	0.00	0.000	False	0
1059	P-52	49	J-51	J-52	6.0	Ductile Iron	130.0	False	0.000	0	0.00	0.000	False	0
1052	P-47	17	J-26	H-11	6.0	Ductile Iron	130.0	False	0.000	0	0.00	0.000	False	0
1033	P-43	51	J-49	H-2	6.0	Ductile Iron	130.0	False	0.000	0	0.00	0.000	False	0
980	P-139	30	J-25	H-3	6.0	Ductile Iron	130.0	False	0.000	0	0.00	0.000	False	0
977	P-17	89	J-38	H-8	6.0	Ductile Iron	130.0	False	0.000	0	0.00	0.000	False	0
975	P-137	22	H-7	J-36	6.0	Ductile Iron	130.0	False	0.000	0	0.00	0.000	False	0
1021	P-39	14	J-46	H-4	6.0	Ductile Iron	130.0	False	0.000	0	0.00	0.000	False	0
1026	P-40	6	J-48	H-9	6.0	Ductile Iron	130.0	False	0.000	0	0.00	0.000	False	0
1038	P-44	7	J-50	H-1	6.0	Ductile Iron	130.0	False	0.000	0	0.00	0.000	False	0
725	P-10	181	J-1	J-19	16.0	Ductile Iron	130.0	False	0.000	0	0.00	0.000	False	0

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Appendix B
Max Day Demand
Cavasson

Scenario: Max Day
Current Time Step: 0.000 h
FlexTable: Junction Table

ID	Label	Elevation (ft)	Zone	Demand Collection	Demand (gpm)	Hydraulic Grade (ft)	Pressure (psi)
686	J-1	1,609.00	Zone - 4	<Collection: 1 item>	776	1,782.91	75
687	J-2	1,612.00	Zone - 4	<Collection: 0 items>	0	1,783.00	74
689	J-3	1,623.00	Zone - 4	<Collection: 0 items>	0	1,782.94	69
691	J-4	1,629.00	Zone - 4	<Collection: 0 items>	0	1,782.90	67
693	J-5	1,629.90	Zone - 4	<Collection: 0 items>	0	1,782.90	66
695	J-6	1,631.92	Zone - 4	<Collection: 0 items>	0	1,782.90	65
697	J-7	1,649.25	Zone - 4	<Collection: 0 items>	0	1,782.90	58
701	J-8	1,649.00	Zone - 4	<Collection: 0 items>	0	1,782.90	58
703	J-9	1,649.00	Zone - 4	<Collection: 0 items>	0	1,782.89	58
705	J-10	1,649.00	Zone - 4	<Collection: 0 items>	0	1,782.89	58
707	J-11	1,646.00	Zone - 4	<Collection: 0 items>	0	1,782.89	59
709	J-12	1,643.00	Zone - 4	<Collection: 0 items>	0	1,782.88	61
711	J-13	1,637.84	Zone - 4	<Collection: 0 items>	0	1,782.88	63
713	J-14	1,633.68	Zone - 4	<Collection: 0 items>	0	1,782.88	65
717	J-16	1,630.55	Zone - 4	<Collection: 0 items>	0	1,782.88	66
719	J-17	1,617.54	Zone - 4	<Collection: 0 items>	0	1,782.87	72
721	J-18	1,625.17	Zone - 4	<Collection: 0 items>	0	1,782.86	68
724	J-19	1,612.00	Zone - 4	<Collection: 0 items>	0	1,782.99	74
735	J-38	1,616.47	Zone - 4	<Collection: 0 items>	0	1,782.92	72
737	J-20	1,625.50	Zone - 4	<Collection: 0 items>	0	1,782.89	68
741	J-43	1,606.70	Zone - 4	<Collection: 0 items>	0	1,782.75	76
745	J-40	1,619.49	Zone - 4	<Collection: 0 items>	0	1,782.89	71
750	J-34	1,607.21	Zone - 4	<Collection: 0 items>	0	1,782.80	76
754	J-39	1,612.00	Zone - 4	<Collection: 0 items>	0	1,781.91	74
757	J-41	1,612.00	Zone - 4	<Collection: 0 items>	0	1,782.66	74
761	J-33	1,613.33	Zone - 4	<Collection: 0 items>	0	1,782.79	73
764	J-21	1,612.50	Zone - 4	<Collection: 0 items>	0	1,782.81	74
768	J-35	1,618.40	Zone - 4	<Collection: 0 items>	0	1,782.87	71
771	J-22	1,618.54	Zone - 4	<Collection: 0 items>	0	1,782.83	71
775	J-15	1,619.21	Zone - 4	<Collection: 0 items>	0	1,782.88	71
778	J-23	1,625.00	Zone - 4	<Collection: 0 items>	0	1,782.88	68
783	J-24	1,623.83	Zone - 4	<Collection: 0 items>	0	1,782.86	69
799	J-27	1,619.36	Zone - 4	<Collection: 0 items>	0	1,782.87	71
807	J-28	1,626.64	Zone - 4	<Collection: 0 items>	0	1,782.90	68
818	J-29	1,636.73	Zone - 4	<Collection: 0 items>	0	1,782.90	63
825	J-30	1,649.00	Zone - 4	<Collection: 0 items>	0	1,782.89	58
828	J-31	1,645.84	Zone - 4	<Collection: 0 items>	0	1,782.90	59
848	J-32	1,648.15	Zone - 4	<Collection: 0 items>	0	1,782.89	58
877	J-37	1,640.12	Zone - 4	<Collection: 0 items>	0	1,782.88	62

933	J-44	1,624.90	Zone - 4	<Collection: 0 items>	0	1,782.87	68
937	J-45	1,606.60	Zone - 4	<Collection: 0 items>	0	1,782.80	76
960	J-25	1,612.51	Zone - 4	<Collection: 0 items>	0	1,782.51	74
963	J-26	1,607.18	Zone - 4	<Collection: 0 items>	0	1,782.77	76
967	J-47	1,628.00	Zone - 4	<Collection: 0 items>	0	1,782.91	67
972	J-36	1,620.59	Zone - 4	<Collection: 0 items>	0	1,782.90	70
982	J-42	1,618.72	Zone - 4	<Collection: 0 items>	0	1,782.87	71
1017	J-46	1,614.06	Zone - 4	<Collection: 0 items>	0	1,782.80	73
1022	J-48	1,612.14	Zone - 4	<Collection: 0 items>	0	1,782.08	74
1031	J-49	1,608.94	Zone - 4	<Collection: 0 items>	0	1,782.06	75
1034	J-50	1,609.90	Zone - 4	<Collection: 0 items>	0	1,782.89	75
1057	J-51	1,610.21	Zone - 4	<Collection: 0 items>	0	1,781.72	74
1058	J-52	1,596.00	Zone - 4	<Collection: 0 items>	0	1,781.72	80
1063	J-53	1,610.06	Zone - 4	<Collection: 0 items>	0	1,781.71	74
1064	D-1A-1	1,596.00	Zone - 4	<Collection: 1 item>	742	1,779.62	79

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Scenario: Max Day
Current Time Step: 0.000 h
FlexTable: Pipe Table

ID	Label	Length (Scaled) (ft)	Start Node	Stop Node	Diameter (in)	Material	Hazen-Williams C	Has Check Valve?	Minor Loss Coefficient (Local)	Flow (gpm)	Velocity (ft/s)	Headloss Gradient (ft/1000ft)	Has User Defined Length?	Length (User Defined) (ft)
1065	P-53	49	J-53	D-1A-1	6.0	Ductile Iron	130.0	False	0.000	742	8.42	42.706	False	0
1029	P-29	149	J-49	J-43	8.0	Ductile Iron	130.0	False	0.000	-478	3.05	4.656	False	0
1062	P-25	75	J-53	J-49	8.0	Ductile Iron	130.0	False	0.000	-478	3.05	4.656	False	0
726	P-11	20	J-19	J-2	16.0	Ductile Iron	130.0	False	0.000	-1,106	1.77	0.753	False	0
763	P-20	86	J-33	J-41	8.0	Ductile Iron	130.0	False	0.000	264	1.69	1.553	False	0
962	P-128	98	J-25	J-41	8.0	Ductile Iron	130.0	False	0.000	-264	1.69	1.553	False	0
1023	P-33	107	J-39	J-48	8.0	Ductile Iron	130.0	False	0.000	-264	1.69	1.553	False	0
1055	P-18	119	J-39	J-51	8.0	Ductile Iron	130.0	False	0.000	264	1.69	1.554	False	0
1061	P-19	10	J-51	J-53	8.0	Ductile Iron	130.0	False	0.000	264	1.69	1.550	False	0
1024	P-127	278	J-48	J-25	8.0	Ductile Iron	130.0	False	0.000	-264	1.69	1.553	False	0
725	P-10	181	J-1	J-19	16.0	Ductile Iron	130.0	False	0.000	-776	1.24	0.390	False	0
1035	P-15	430	J-43	J-50	12.0	Ductile Iron	130.0	False	0.000	-331	0.94	0.327	False	0
1036	P-16	279	J-50	J-19	12.0	Ductile Iron	130.0	False	0.000	-331	0.94	0.327	False	0
690	P-1	522	J-2	J-3	16.0	Ductile Iron	130.0	False	0.000	411	0.66	0.120	False	0
1018	P-22	260	J-35	J-46	8.0	Ductile Iron	130.0	False	0.000	100	0.64	0.257	False	0
1019	P-32	46	J-46	J-33	8.0	Ductile Iron	130.0	False	0.000	100	0.64	0.258	False	0
772	P-23	411	J-18	J-22	16.0	Ductile Iron	130.0	False	0.000	311	0.50	0.072	False	0
773	P-24	280	J-22	J-21	16.0	Ductile Iron	130.0	False	0.000	311	0.50	0.072	False	0
767	P-21	215	J-33	J-21	12.0	Ductile Iron	130.0	False	0.000	-164	0.47	0.090	False	0
968	P-132	378	J-3	J-47	16.0	Ductile Iron	130.0	False	0.000	285	0.45	0.061	False	0
969	P-133	161	J-47	J-4	16.0	Ductile Iron	130.0	False	0.000	285	0.45	0.061	False	0
939	P-115	44	J-45	J-34	12.0	Ductile Iron	130.0	False	0.000	147	0.42	0.072	False	0
964	P-129	432	J-34	J-26	12.0	Ductile Iron	130.0	False	0.000	147	0.42	0.073	False	0
965	P-130	230	J-26	J-43	12.0	Ductile Iron	130.0	False	0.000	147	0.42	0.073	False	0
779	P-27	331	J-18	J-23	16.0	Ductile Iron	130.0	False	0.000	-226	0.36	0.040	False	0
780	P-28	276	J-23	J-20	16.0	Ductile Iron	130.0	False	0.000	-226	0.36	0.040	False	0
974	P-136	225	J-36	J-40	12.0	Ductile Iron	130.0	False	0.000	127	0.36	0.055	False	0
736	P-14	232	J-3	J-38	12.0	Ductile Iron	130.0	False	0.000	127	0.36	0.056	False	0
1010	P-107	444	J-38	J-36	12.0	Ductile Iron	130.0	False	0.000	127	0.36	0.055	False	0
808	P-41	415	J-20	J-28	16.0	Ductile Iron	130.0	False	0.000	-199	0.32	0.031	False	0
809	P-42	163	J-28	J-4	16.0	Ductile Iron	130.0	False	0.000	-199	0.32	0.032	False	0
983	P-30	32	J-35	J-42	12.0	Ductile Iron	130.0	False	0.000	-100	0.28	0.035	False	0
984	P-140	332	J-42	J-15	12.0	Ductile Iron	130.0	False	0.000	-100	0.28	0.036	False	0
776	P-26	70	J-40	J-15	12.0	Ductile Iron	130.0	False	0.000	100	0.28	0.035	False	0
1008	P-13	319	R-11	J-2	48.0	Ductile Iron	130.0	False	0.000	1,518	0.27	0.000	True	1
938	P-114	401	J-21	J-45	16.0	Ductile Iron	130.0	False	0.000	147	0.23	0.018	False	0
694	P-2	135	J-4	J-5	16.0	Ductile Iron	130.0	False	0.000	85	0.14	0.006	False	0
696	P-3	134	J-5	J-6	16.0	Ductile Iron	130.0	False	0.000	85	0.14	0.007	False	0
702	P-4	65	J-7	J-8	16.0	Ductile Iron	130.0	False	0.000	85	0.14	0.006	False	0
704	P-5	155	J-8	J-9	16.0	Ductile Iron	130.0	False	0.000	85	0.14	0.006	False	0
710	P-6	488	J-11	J-12	16.0	Ductile Iron	130.0	False	0.000	85	0.14	0.007	False	0
714	P-7	487	J-13	J-14	16.0	Ductile Iron	130.0	False	0.000	85	0.14	0.007	False	0
785	P-31	309	J-24	J-18	16.0	Ductile Iron	130.0	False	0.000	85	0.14	0.006	False	0
800	P-35	532	J-17	J-27	16.0	Ductile Iron	130.0	False	0.000	85	0.14	0.007	False	0
801	P-36	358	J-27	J-24	16.0	Ductile Iron	130.0	False	0.000	85	0.14	0.006	False	0
819	P-46	371	J-6	J-29	16.0	Ductile Iron	130.0	False	0.000	85	0.14	0.006	False	0
826	P-48	331	J-9	J-30	16.0	Ductile Iron	130.0	False	0.000	85	0.14	0.007	False	0
827	P-49	198	J-30	J-10	16.0	Ductile Iron	130.0	False	0.000	85	0.14	0.007	False	0
829	P-50	316	J-29	J-31	16.0	Ductile Iron	130.0	False	0.000	85	0.14	0.007	False	0
830	P-51	268	J-31	J-7	16.0	Ductile Iron	130.0	False	0.000	85	0.14	0.007	False	0
849	P-60	315	J-10	J-32	16.0	Ductile Iron	130.0	False	0.000	85	0.14	0.006	False	0
850	P-61	197	J-32	J-11	16.0	Ductile Iron	130.0	False	0.000	85	0.14	0.007	False	0
878	P-75	227	J-12	J-37	16.0	Ductile Iron	130.0	False	0.000	85	0.14	0.006	False	0
879	P-76	264	J-37	J-13	16.0	Ductile Iron	130.0	False	0.000	85	0.14	0.006	False	0
934	P-111	439	J-16	J-44	16.0	Ductile Iron	130.0	False	0.000	85	0.14	0.007	False	0
935	P-112	498	J-44	J-17	16.0	Ductile Iron	130.0	False	0.000	85	0.14	0.006	False	0
1001	P-34	416	J-16	J-14	16.0	Ductile Iron	130.0	False	0.000	-85	0.14	0.006	False	0
1066	P-453	336	J-20	J-40	12.0	Ductile Iron	130.0	False	0.000	-27	0.08	0.003	False	0

1026	P-40	6	J-48	H-9	6.0	Ductile Iron	130.0	False	0.000	0	0.00	0.000	False	0
1012	P-37	6	H-6	J-15	6.0	Ductile Iron	130.0	False	0.000	0	0.00	0.000	False	0
1021	P-39	14	J-46	H-4	6.0	Ductile Iron	130.0	False	0.000	0	0.00	0.000	False	0
1014	P-38	14	H-5	J-35	6.0	Ductile Iron	130.0	False	0.000	0	0.00	0.000	False	0
1038	P-44	7	J-50	H-1	6.0	Ductile Iron	130.0	False	0.000	0	0.00	0.000	False	0
1049	P-45	21	J-34	H-10	6.0	Ductile Iron	130.0	False	0.000	0	0.00	0.000	False	0
980	P-139	30	J-25	H-3	6.0	Ductile Iron	130.0	False	0.000	0	0.00	0.000	False	0
1059	P-52	49	J-51	J-52	6.0	Ductile Iron	130.0	False	0.000	0	0.00	0.000	False	0
977	P-17	89	J-38	H-8	6.0	Ductile Iron	130.0	False	0.000	0	0.00	0.000	False	0
1052	P-47	17	J-26	H-11	6.0	Ductile Iron	130.0	False	0.000	0	0.00	0.000	False	0
1033	P-43	51	J-49	H-2	6.0	Ductile Iron	130.0	False	0.000	0	0.00	0.000	False	0
975	P-137	22	H-7	J-36	6.0	Ductile Iron	130.0	False	0.000	0	0.00	0.000	False	0

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Appendix C
Peak Hour Demand
Cavasson

Scenario: Peak Hour
Current Time Step: 0.000 h
FlexTable: Junction Table

ID	Label	Elevation (ft)	Zone	Demand Collection	Demand (gpm)	Hydraulic Grade (ft)	Pressure (psi)
686	J-1	1,609.00	Zone - 4	<Collection: 0 items>	0	1,782.99	75
687	J-2	1,612.00	Zone - 4	<Collection: 0 items>	0	1,783.00	74
689	J-3	1,623.00	Zone - 4	<Collection: 0 items>	0	1,782.81	69
691	J-4	1,629.00	Zone - 4	<Collection: 0 items>	0	1,782.71	67
693	J-5	1,629.90	Zone - 4	<Collection: 0 items>	0	1,782.71	66
695	J-6	1,631.92	Zone - 4	<Collection: 0 items>	0	1,782.71	65
697	J-7	1,649.25	Zone - 4	<Collection: 0 items>	0	1,782.69	58
701	J-8	1,649.00	Zone - 4	<Collection: 0 items>	0	1,782.69	58
703	J-9	1,649.00	Zone - 4	<Collection: 0 items>	0	1,782.69	58
705	J-10	1,649.00	Zone - 4	<Collection: 0 items>	0	1,782.67	58
707	J-11	1,646.00	Zone - 4	<Collection: 0 items>	0	1,782.66	59
709	J-12	1,643.00	Zone - 4	<Collection: 0 items>	0	1,782.66	60
711	J-13	1,637.84	Zone - 4	<Collection: 0 items>	0	1,782.65	63
713	J-14	1,633.68	Zone - 4	<Collection: 0 items>	0	1,782.64	64
717	J-16	1,630.55	Zone - 4	<Collection: 0 items>	0	1,782.63	66
719	J-17	1,617.54	Zone - 4	<Collection: 0 items>	0	1,782.61	71
721	J-18	1,625.17	Zone - 4	<Collection: 0 items>	0	1,782.59	68
724	J-19	1,612.00	Zone - 4	<Collection: 0 items>	0	1,782.99	74
735	J-38	1,616.47	Zone - 4	<Collection: 0 items>	0	1,782.77	72
737	J-20	1,625.50	Zone - 4	<Collection: 0 items>	0	1,782.66	68
741	J-43	1,606.70	Zone - 4	<Collection: 0 items>	0	1,782.27	76
745	J-40	1,619.49	Zone - 4	<Collection: 0 items>	0	1,782.66	71
750	J-34	1,607.21	Zone - 4	<Collection: 0 items>	0	1,782.41	76
754	J-39	1,612.00	Zone - 4	<Collection: 0 items>	0	1,779.68	73
757	J-41	1,612.00	Zone - 4	<Collection: 0 items>	0	1,781.97	74
761	J-33	1,613.33	Zone - 4	<Collection: 0 items>	0	1,782.38	73
764	J-21	1,612.50	Zone - 4	<Collection: 0 items>	0	1,782.44	74
768	J-35	1,618.40	Zone - 4	<Collection: 0 items>	0	1,782.62	71
771	J-22	1,618.54	Zone - 4	<Collection: 0 items>	0	1,782.50	71
775	J-15	1,619.21	Zone - 4	<Collection: 0 items>	0	1,782.65	71
778	J-23	1,625.00	Zone - 4	<Collection: 0 items>	0	1,782.63	68
783	J-24	1,623.83	Zone - 4	<Collection: 0 items>	0	1,782.59	69
799	J-27	1,619.36	Zone - 4	<Collection: 0 items>	0	1,782.60	71
807	J-28	1,626.64	Zone - 4	<Collection: 0 items>	0	1,782.70	68
818	J-29	1,636.73	Zone - 4	<Collection: 0 items>	0	1,782.70	63
825	J-30	1,649.00	Zone - 4	<Collection: 0 items>	0	1,782.68	58
828	J-31	1,645.84	Zone - 4	<Collection: 0 items>	0	1,782.69	59
848	J-32	1,648.15	Zone - 4	<Collection: 0 items>	0	1,782.67	58
877	J-37	1,640.12	Zone - 4	<Collection: 0 items>	0	1,782.65	62

933	J-44	1,624.90	Zone - 4	<Collection: 0 items>	0	1,782.62	68
937	J-45	1,606.60	Zone - 4	<Collection: 0 items>	0	1,782.42	76
960	J-25	1,612.51	Zone - 4	<Collection: 0 items>	0	1,781.51	73
963	J-26	1,607.18	Zone - 4	<Collection: 0 items>	0	1,782.32	76
967	J-47	1,628.00	Zone - 4	<Collection: 0 items>	0	1,782.74	67
972	J-36	1,620.59	Zone - 4	<Collection: 0 items>	0	1,782.70	70
982	J-42	1,618.72	Zone - 4	<Collection: 0 items>	0	1,782.62	71
1017	J-46	1,614.06	Zone - 4	<Collection: 0 items>	0	1,782.41	73
1022	J-48	1,612.14	Zone - 4	<Collection: 0 items>	0	1,780.19	73
1031	J-49	1,608.94	Zone - 4	<Collection: 0 items>	0	1,780.14	74
1034	J-50	1,609.90	Zone - 4	<Collection: 0 items>	0	1,782.71	75
1057	J-51	1,610.21	Zone - 4	<Collection: 0 items>	0	1,779.12	73
1058	J-52	1,596.00	Zone - 4	<Collection: 0 items>	0	1,779.12	79
1063	J-53	1,610.06	Zone - 4	<Collection: 0 items>	0	1,779.07	73
1064	D-1A-1	1,596.00	Zone - 4	<Collection: 1 item>	1,357	1,772.69	76

Scenario: Peak Hour
Current Time Step: 0.000 h
FlexTable: Pipe Table

ID	Label	Length (Scaled) (ft)	Start Node	Stop Node	Diameter (in)	Material	Hazen-Williams C	Has Check Valve?	Minor Loss Coefficient (Local)	Flow (gpm)	Velocity (ft/s)	Headloss Gradient (ft/1000ft)	Has User Defined Length?	Length (User Defined) (ft)
1065	P-53	49	J-53	D-1A-1	6.0	Ductile Iron	130.0	False	0.000	1,357	15.40	130.604	False	0
1029	P-29	149	J-49	J-43	8.0	Ductile Iron	130.0	False	0.000	-875	5.58	14.253	False	0
1062	P-25	75	J-53	J-49	8.0	Ductile Iron	130.0	False	0.000	-875	5.58	14.253	False	0
763	P-20	86	J-33	J-41	8.0	Ductile Iron	130.0	False	0.000	483	3.08	4.740	False	0
962	P-128	98	J-25	J-41	8.0	Ductile Iron	130.0	False	0.000	-483	3.08	4.740	False	0
1023	P-33	107	J-39	J-48	8.0	Ductile Iron	130.0	False	0.000	-483	3.08	4.740	False	0
1024	P-127	278	J-48	J-25	8.0	Ductile Iron	130.0	False	0.000	-483	3.08	4.740	False	0
1055	P-18	119	J-39	J-51	8.0	Ductile Iron	130.0	False	0.000	483	3.08	4.740	False	0
1061	P-19	10	J-51	J-53	8.0	Ductile Iron	130.0	False	0.000	483	3.08	4.749	False	0
1035	P-15	430	J-43	J-50	12.0	Ductile Iron	130.0	False	0.000	-613	1.74	1.025	False	0
1036	P-16	279	J-50	J-19	12.0	Ductile Iron	130.0	False	0.000	-613	1.74	1.025	False	0
690	P-1	522	J-2	J-3	16.0	Ductile Iron	130.0	False	0.000	744	1.19	0.361	False	0
1018	P-22	260	J-35	J-46	8.0	Ductile Iron	130.0	False	0.000	181	1.16	0.773	False	0
1019	P-32	46	J-46	J-33	8.0	Ductile Iron	130.0	False	0.000	181	1.16	0.775	False	0
726	P-11	20	J-19	J-2	16.0	Ductile Iron	130.0	False	0.000	-613	0.98	0.253	False	0
772	P-23	411	J-18	J-22	16.0	Ductile Iron	130.0	False	0.000	563	0.90	0.215	False	0
773	P-24	280	J-22	J-21	16.0	Ductile Iron	130.0	False	0.000	563	0.90	0.215	False	0
767	P-21	215	J-33	J-21	12.0	Ductile Iron	130.0	False	0.000	-301	0.85	0.275	False	0
968	P-132	378	J-3	J-47	16.0	Ductile Iron	130.0	False	0.000	514	0.82	0.182	False	0
969	P-133	161	J-47	J-4	16.0	Ductile Iron	130.0	False	0.000	514	0.82	0.182	False	0
939	P-115	44	J-45	J-34	12.0	Ductile Iron	130.0	False	0.000	261	0.74	0.212	False	0
964	P-129	432	J-34	J-26	12.0	Ductile Iron	130.0	False	0.000	261	0.74	0.211	False	0
965	P-130	230	J-26	J-43	12.0	Ductile Iron	130.0	False	0.000	261	0.74	0.211	False	0
779	P-27	331	J-18	J-23	16.0	Ductile Iron	130.0	False	0.000	-409	0.65	0.119	False	0
780	P-28	276	J-23	J-20	16.0	Ductile Iron	130.0	False	0.000	-409	0.65	0.119	False	0
974	P-136	225	J-36	J-40	12.0	Ductile Iron	130.0	False	0.000	230	0.65	0.166	False	0
736	P-14	232	J-3	J-38	12.0	Ductile Iron	130.0	False	0.000	230	0.65	0.166	False	0
1010	P-107	444	J-38	J-36	12.0	Ductile Iron	130.0	False	0.000	230	0.65	0.166	False	0
808	P-41	415	J-20	J-28	16.0	Ductile Iron	130.0	False	0.000	-361	0.58	0.094	False	0
809	P-42	163	J-28	J-4	16.0	Ductile Iron	130.0	False	0.000	-361	0.58	0.095	False	0
776	P-26	70	J-40	J-15	12.0	Ductile Iron	130.0	False	0.000	181	0.51	0.107	False	0
983	P-30	32	J-35	J-42	12.0	Ductile Iron	130.0	False	0.000	-181	0.51	0.108	False	0
984	P-140	332	J-42	J-15	12.0	Ductile Iron	130.0	False	0.000	-181	0.51	0.107	False	0
938	P-114	401	J-21	J-45	16.0	Ductile Iron	130.0	False	0.000	261	0.42	0.052	False	0
694	P-2	135	J-4	J-5	16.0	Ductile Iron	130.0	False	0.000	154	0.25	0.020	False	0
696	P-3	134	J-5	J-6	16.0	Ductile Iron	130.0	False	0.000	154	0.25	0.019	False	0
702	P-4	65	J-7	J-8	16.0	Ductile Iron	130.0	False	0.000	154	0.25	0.019	False	0
704	P-5	155	J-8	J-9	16.0	Ductile Iron	130.0	False	0.000	154	0.25	0.020	False	0
710	P-6	488	J-11	J-12	16.0	Ductile Iron	130.0	False	0.000	154	0.25	0.020	False	0
714	P-7	487	J-13	J-14	16.0	Ductile Iron	130.0	False	0.000	154	0.25	0.020	False	0
785	P-31	309	J-24	J-18	16.0	Ductile Iron	130.0	False	0.000	154	0.25	0.019	False	0
800	P-35	532	J-17	J-27	16.0	Ductile Iron	130.0	False	0.000	154	0.25	0.019	False	0
801	P-36	358	J-27	J-24	16.0	Ductile Iron	130.0	False	0.000	154	0.25	0.019	False	0
819	P-46	371	J-6	J-29	16.0	Ductile Iron	130.0	False	0.000	154	0.25	0.019	False	0
826	P-48	331	J-9	J-30	16.0	Ductile Iron	130.0	False	0.000	154	0.25	0.020	False	0
827	P-49	198	J-30	J-10	16.0	Ductile Iron	130.0	False	0.000	154	0.25	0.019	False	0
829	P-50	316	J-29	J-31	16.0	Ductile Iron	130.0	False	0.000	154	0.25	0.020	False	0
830	P-51	268	J-31	J-7	16.0	Ductile Iron	130.0	False	0.000	154	0.25	0.020	False	0
849	P-60	315	J-10	J-32	16.0	Ductile Iron	130.0	False	0.000	154	0.25	0.020	False	0
850	P-61	197	J-32	J-11	16.0	Ductile Iron	130.0	False	0.000	154	0.25	0.019	False	0
878	P-75	227	J-12	J-37	16.0	Ductile Iron	130.0	False	0.000	154	0.25	0.019	False	0
879	P-76	264	J-37	J-13	16.0	Ductile Iron	130.0	False	0.000	154	0.25	0.019	False	0
934	P-111	439	J-16	J-44	16.0	Ductile Iron	130.0	False	0.000	154	0.25	0.020	False	0
935	P-112	498	J-44	J-17	16.0	Ductile Iron	130.0	False	0.000	154	0.25	0.019	False	0
1001	P-34	416	J-16	J-14	16.0	Ductile Iron	130.0	False	0.000	-154	0.25	0.019	False	0
1008	P-13	319	R-11	J-2	48.0	Ductile Iron	130.0	False	0.000	1,357	0.24	0.000	True	1
1066	P-453	336	J-20	J-40	12.0	Ductile Iron	130.0	False	0.000	-48	0.14	0.009	False	0
1049	P-45	21	J-34	H-10	6.0	Ductile Iron	130.0	False	0.000	0	0.00	0.000	False	0

725	P-10	181	J-1	J-19	16.0	Ductile Iron	130.0	False	0.000	0	0.00	0.000	False	0
1021	P-39	14	J-46	H-4	6.0	Ductile Iron	130.0	False	0.000	0	0.00	0.000	False	0
1038	P-44	7	J-50	H-1	6.0	Ductile Iron	130.0	False	0.000	0	0.00	0.000	False	0
1012	P-37	6	H-6	J-15	6.0	Ductile Iron	130.0	False	0.000	0	0.00	0.000	False	0
1026	P-40	6	J-48	H-9	6.0	Ductile Iron	130.0	False	0.000	0	0.00	0.000	False	0
975	P-137	22	H-7	J-36	6.0	Ductile Iron	130.0	False	0.000	0	0.00	0.000	False	0
1052	P-47	17	J-26	H-11	6.0	Ductile Iron	130.0	False	0.000	0	0.00	0.000	False	0
1014	P-38	14	H-5	J-35	6.0	Ductile Iron	130.0	False	0.000	0	0.00	0.000	False	0
1059	P-52	49	J-51	J-52	6.0	Ductile Iron	130.0	False	0.000	0	0.00	0.000	False	0
980	P-139	30	J-25	H-3	6.0	Ductile Iron	130.0	False	0.000	0	0.00	0.000	False	0
1033	P-43	51	J-49	H-2	6.0	Ductile Iron	130.0	False	0.000	0	0.00	0.000	False	0
977	P-17	89	J-38	H-8	6.0	Ductile Iron	130.0	False	0.000	0	0.00	0.000	False	0

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Appendix D
Max Day + Fire Flow
Cavasson

Scenario: Fire Flow
Current Time Step: 0.000 h
Fire Flow Node FlexTable: Fire Flow Report

Label	Zone	Fire Flow Iterations	Satisfies Fire Flow Constraints?	Fire Flow (Needed) (gpm)	Fire Flow (Available) (gpm)	Flow (Total Needed) (gpm)	Flow (Total Available) (gpm)	Pressure (Residual Lower Limit) (psi)	Pressure (Calculated Residual) (psi)	Pressure (Zone Lower Limit) (psi)	Pressure (Calculated Zone Lower Limit) (psi)	Junction w/ Minimum Pressure (Zone)	Pressure (System Lower Limit) (psi)	Pressure (Calculated System Lower Limit) (psi)	Junction w/ Minimum Pressure (System)	Is Fire Flow Run Balanced?
H-1	Zone - 4	2	True	4,000	4,020	4,000	4,020	20	70	20	57	J-7	20	57	J-7	True
H-2	Zone - 4	2	True	4,000	4,020	4,000	4,020	20	40	20	57	J-7	20	57	J-7	True
H-3	Zone - 4	2	True	4,000	4,020	4,000	4,020	20	49	20	56	J-7	20	56	J-7	True
H-4	Zone - 4	2	True	4,000	4,020	4,000	4,020	20	61	20	56	J-7	20	56	J-7	True
H-5	Zone - 4	2	True	4,000	4,020	4,000	4,020	20	60	20	56	J-7	20	56	J-7	True
H-6	Zone - 4	2	True	4,000	4,020	4,000	4,020	20	64	20	56	J-7	20	56	J-7	True
H-7	Zone - 4	2	True	4,000	4,020	4,000	4,020	20	57	20	56	J-7	20	56	J-7	True
H-8	Zone - 4	2	True	4,000	4,020	4,000	4,020	20	32	20	56	J-7	20	56	J-7	True
H-9	Zone - 4	2	True	4,000	4,020	4,000	4,020	20	53	20	55	J-48	20	55	J-48	True
H-10	Zone - 4	2	True	4,000	4,020	4,000	4,020	20	63	20	56	J-7	20	56	J-7	True
H-11	Zone - 4	2	True	4,000	4,020	4,000	4,020	20	64	20	57	J-7	20	57	J-7	True

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Scenario: Fire Flow
Current Time Step: 0.000 h
FlexTable: Hydrant Table

ID	Label	Hydrant Status	Include Hydrant Lateral Loss?	Emitter Coefficient (gpm/psi^n)	Length (Hydrant Lateral) (ft)	Elevation (ft)	Zone	Demand Collection	Demand (gpm)	Hydraulic Grade (ft)	Pressure (psi)
1039	H-1	Open	False	0.000	0	1,609.00	Zone - 4	<Collection: 0 items>	0	1,782.89	75
1040	H-2	Open	False	0.000	0	1,608.00	Zone - 4	<Collection: 0 items>	0	1,782.06	75
1041	H-3	Open	False	0.000	0	1,609.85	Zone - 4	<Collection: 0 items>	0	1,782.51	75
1042	H-4	Open	False	0.000	0	1,614.00	Zone - 4	<Collection: 0 items>	0	1,782.80	73
1043	H-5	Open	False	0.000	0	1,618.00	Zone - 4	<Collection: 0 items>	0	1,782.87	71
1044	H-6	Open	False	0.000	0	1,619.00	Zone - 4	<Collection: 0 items>	0	1,782.88	71
1045	H-7	Open	False	0.000	0	1,621.59	Zone - 4	<Collection: 0 items>	0	1,782.90	70
1046	H-8	Open	False	0.000	0	1,614.93	Zone - 4	<Collection: 0 items>	0	1,782.92	73
1047	H-9	Open	False	0.000	0	1,612.00	Zone - 4	<Collection: 0 items>	0	1,782.08	74
1050	H-10	Open	False	0.000	0	1,607.00	Zone - 4	<Collection: 0 items>	0	1,782.80	76
1053	H-11	Open	False	0.000	0	1,607.00	Zone - 4	<Collection: 0 items>	0	1,782.77	76

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Scenario: Fire Flow
Current Time Step: 0.000 h
FlexTable: Junction Table

ID	Label	Elevation (ft)	Zone	Demand Collection	Demand (gpm)	Hydraulic Grade (ft)	Pressure (psi)
686	J-1	1,609.00	Zone - 4	<Collection: 1 item>	776	1,782.91	75
687	J-2	1,612.00	Zone - 4	<Collection: 0 items>	0	1,783.00	74
689	J-3	1,623.00	Zone - 4	<Collection: 0 items>	0	1,782.94	69
691	J-4	1,629.00	Zone - 4	<Collection: 0 items>	0	1,782.90	67
693	J-5	1,629.90	Zone - 4	<Collection: 0 items>	0	1,782.90	66
695	J-6	1,631.92	Zone - 4	<Collection: 0 items>	0	1,782.90	65
697	J-7	1,649.25	Zone - 4	<Collection: 0 items>	0	1,782.90	58
701	J-8	1,649.00	Zone - 4	<Collection: 0 items>	0	1,782.90	58
703	J-9	1,649.00	Zone - 4	<Collection: 0 items>	0	1,782.89	58
705	J-10	1,649.00	Zone - 4	<Collection: 0 items>	0	1,782.89	58
707	J-11	1,646.00	Zone - 4	<Collection: 0 items>	0	1,782.89	59
709	J-12	1,643.00	Zone - 4	<Collection: 0 items>	0	1,782.88	61
711	J-13	1,637.84	Zone - 4	<Collection: 0 items>	0	1,782.88	63
713	J-14	1,633.68	Zone - 4	<Collection: 0 items>	0	1,782.88	65
717	J-16	1,630.55	Zone - 4	<Collection: 0 items>	0	1,782.88	66
719	J-17	1,617.54	Zone - 4	<Collection: 0 items>	0	1,782.87	72
721	J-18	1,625.17	Zone - 4	<Collection: 0 items>	0	1,782.86	68
724	J-19	1,612.00	Zone - 4	<Collection: 0 items>	0	1,782.99	74
735	J-38	1,616.47	Zone - 4	<Collection: 0 items>	0	1,782.92	72
737	J-20	1,625.50	Zone - 4	<Collection: 0 items>	0	1,782.89	68
741	J-43	1,606.70	Zone - 4	<Collection: 0 items>	0	1,782.75	76
745	J-40	1,619.49	Zone - 4	<Collection: 0 items>	0	1,782.89	71
750	J-34	1,607.21	Zone - 4	<Collection: 0 items>	0	1,782.80	76
754	J-39	1,612.00	Zone - 4	<Collection: 0 items>	0	1,781.91	74
757	J-41	1,612.00	Zone - 4	<Collection: 0 items>	0	1,782.66	74
761	J-33	1,613.33	Zone - 4	<Collection: 0 items>	0	1,782.79	73
764	J-21	1,612.50	Zone - 4	<Collection: 0 items>	0	1,782.81	74
768	J-35	1,618.40	Zone - 4	<Collection: 0 items>	0	1,782.87	71
771	J-22	1,618.54	Zone - 4	<Collection: 0 items>	0	1,782.83	71
775	J-15	1,619.21	Zone - 4	<Collection: 0 items>	0	1,782.88	71
778	J-23	1,625.00	Zone - 4	<Collection: 0 items>	0	1,782.88	68
783	J-24	1,623.83	Zone - 4	<Collection: 0 items>	0	1,782.86	69
799	J-27	1,619.36	Zone - 4	<Collection: 0 items>	0	1,782.87	71
807	J-28	1,626.64	Zone - 4	<Collection: 0 items>	0	1,782.90	68
818	J-29	1,636.73	Zone - 4	<Collection: 0 items>	0	1,782.90	63
825	J-30	1,649.00	Zone - 4	<Collection: 0 items>	0	1,782.89	58
828	J-31	1,645.84	Zone - 4	<Collection: 0 items>	0	1,782.90	59
848	J-32	1,648.15	Zone - 4	<Collection: 0 items>	0	1,782.89	58
877	J-37	1,640.12	Zone - 4	<Collection: 0 items>	0	1,782.88	62

933	J-44	1,624.90	Zone - 4	<Collection: 0 items>	0	1,782.87	68
937	J-45	1,606.60	Zone - 4	<Collection: 0 items>	0	1,782.80	76
960	J-25	1,612.51	Zone - 4	<Collection: 0 items>	0	1,782.51	74
963	J-26	1,607.18	Zone - 4	<Collection: 0 items>	0	1,782.77	76
967	J-47	1,628.00	Zone - 4	<Collection: 0 items>	0	1,782.91	67
972	J-36	1,620.59	Zone - 4	<Collection: 0 items>	0	1,782.90	70
982	J-42	1,618.72	Zone - 4	<Collection: 0 items>	0	1,782.87	71
1017	J-46	1,614.06	Zone - 4	<Collection: 0 items>	0	1,782.80	73
1022	J-48	1,612.14	Zone - 4	<Collection: 0 items>	0	1,782.08	74
1031	J-49	1,608.94	Zone - 4	<Collection: 0 items>	0	1,782.06	75
1034	J-50	1,609.90	Zone - 4	<Collection: 0 items>	0	1,782.89	75
1057	J-51	1,610.21	Zone - 4	<Collection: 0 items>	0	1,781.72	74
1058	J-52	1,596.00	Zone - 4	<Collection: 0 items>	0	1,781.72	80
1063	J-53	1,610.06	Zone - 4	<Collection: 0 items>	0	1,781.71	74
1064	D-1A-1	1,596.00	Zone - 4	<Collection: 1 item>	742	1,779.62	79

Scenario: Fire Flow
Current Time Step: 0.000 h
FlexTable: Pipe Table

ID	Label	Length (Scaled) (ft)	Start Node	Stop Node	Diameter (in)	Material	Hazen-Williams C	Has Check Valve?	Minor Loss Coefficient (Local)	Flow (gpm)	Velocity (ft/s)	Headloss Gradient (ft/1000ft)	Has User Defined Length?	Length (User Defined) (ft)
1065	P-53	49	J-53	D-1A-1	6.0	Ductile Iron	130.0	False	0.000	742	8.42	42.706	False	0
1029	P-29	149	J-49	J-43	8.0	Ductile Iron	130.0	False	0.000	-478	3.05	4.656	False	0
1062	P-25	75	J-53	J-49	8.0	Ductile Iron	130.0	False	0.000	-478	3.05	4.656	False	0
726	P-11	20	J-19	J-2	16.0	Ductile Iron	130.0	False	0.000	-1,106	1.77	0.753	False	0
763	P-20	86	J-33	J-41	8.0	Ductile Iron	130.0	False	0.000	264	1.69	1.553	False	0
962	P-128	98	J-25	J-41	8.0	Ductile Iron	130.0	False	0.000	-264	1.69	1.553	False	0
1023	P-33	107	J-39	J-48	8.0	Ductile Iron	130.0	False	0.000	-264	1.69	1.553	False	0
1055	P-18	119	J-39	J-51	8.0	Ductile Iron	130.0	False	0.000	264	1.69	1.554	False	0
1061	P-19	10	J-51	J-53	8.0	Ductile Iron	130.0	False	0.000	264	1.69	1.550	False	0
1024	P-127	278	J-48	J-25	8.0	Ductile Iron	130.0	False	0.000	-264	1.69	1.553	False	0
725	P-10	181	J-1	J-19	16.0	Ductile Iron	130.0	False	0.000	-776	1.24	0.390	False	0
1035	P-15	430	J-43	J-50	12.0	Ductile Iron	130.0	False	0.000	-331	0.94	0.327	False	0
1036	P-16	279	J-50	J-19	12.0	Ductile Iron	130.0	False	0.000	-331	0.94	0.327	False	0
690	P-1	522	J-2	J-3	16.0	Ductile Iron	130.0	False	0.000	411	0.66	0.120	False	0
1018	P-22	260	J-35	J-46	8.0	Ductile Iron	130.0	False	0.000	100	0.64	0.257	False	0
1019	P-32	46	J-46	J-33	8.0	Ductile Iron	130.0	False	0.000	100	0.64	0.258	False	0
772	P-23	411	J-18	J-22	16.0	Ductile Iron	130.0	False	0.000	311	0.50	0.072	False	0
773	P-24	280	J-22	J-21	16.0	Ductile Iron	130.0	False	0.000	311	0.50	0.072	False	0
767	P-21	215	J-33	J-21	12.0	Ductile Iron	130.0	False	0.000	-164	0.47	0.090	False	0
968	P-132	378	J-3	J-47	16.0	Ductile Iron	130.0	False	0.000	285	0.45	0.061	False	0
969	P-133	161	J-47	J-4	16.0	Ductile Iron	130.0	False	0.000	285	0.45	0.061	False	0
939	P-115	44	J-45	J-34	12.0	Ductile Iron	130.0	False	0.000	147	0.42	0.072	False	0
964	P-129	432	J-34	J-26	12.0	Ductile Iron	130.0	False	0.000	147	0.42	0.073	False	0
965	P-130	230	J-26	J-43	12.0	Ductile Iron	130.0	False	0.000	147	0.42	0.073	False	0
779	P-27	331	J-18	J-23	16.0	Ductile Iron	130.0	False	0.000	-226	0.36	0.040	False	0
780	P-28	276	J-23	J-20	16.0	Ductile Iron	130.0	False	0.000	-226	0.36	0.040	False	0
974	P-136	225	J-36	J-40	12.0	Ductile Iron	130.0	False	0.000	127	0.36	0.055	False	0
736	P-14	232	J-3	J-38	12.0	Ductile Iron	130.0	False	0.000	127	0.36	0.056	False	0
1010	P-107	444	J-38	J-36	12.0	Ductile Iron	130.0	False	0.000	127	0.36	0.055	False	0
808	P-41	415	J-20	J-28	16.0	Ductile Iron	130.0	False	0.000	-199	0.32	0.031	False	0
809	P-42	163	J-28	J-4	16.0	Ductile Iron	130.0	False	0.000	-199	0.32	0.032	False	0
983	P-30	32	J-35	J-42	12.0	Ductile Iron	130.0	False	0.000	-100	0.28	0.035	False	0
984	P-140	332	J-42	J-15	12.0	Ductile Iron	130.0	False	0.000	-100	0.28	0.036	False	0
776	P-26	70	J-40	J-15	12.0	Ductile Iron	130.0	False	0.000	100	0.28	0.035	False	0
1008	P-13	319	R-11	J-2	48.0	Ductile Iron	130.0	False	0.000	1,518	0.27	0.000	True	1
938	P-114	401	J-21	J-45	16.0	Ductile Iron	130.0	False	0.000	147	0.23	0.018	False	0
694	P-2	135	J-4	J-5	16.0	Ductile Iron	130.0	False	0.000	85	0.14	0.006	False	0
696	P-3	134	J-5	J-6	16.0	Ductile Iron	130.0	False	0.000	85	0.14	0.007	False	0
702	P-4	65	J-7	J-8	16.0	Ductile Iron	130.0	False	0.000	85	0.14	0.006	False	0
704	P-5	155	J-8	J-9	16.0	Ductile Iron	130.0	False	0.000	85	0.14	0.006	False	0
710	P-6	488	J-11	J-12	16.0	Ductile Iron	130.0	False	0.000	85	0.14	0.007	False	0
714	P-7	487	J-13	J-14	16.0	Ductile Iron	130.0	False	0.000	85	0.14	0.007	False	0
785	P-31	309	J-24	J-18	16.0	Ductile Iron	130.0	False	0.000	85	0.14	0.006	False	0
800	P-35	532	J-17	J-27	16.0	Ductile Iron	130.0	False	0.000	85	0.14	0.007	False	0
801	P-36	358	J-27	J-24	16.0	Ductile Iron	130.0	False	0.000	85	0.14	0.006	False	0
819	P-46	371	J-6	J-29	16.0	Ductile Iron	130.0	False	0.000	85	0.14	0.006	False	0
826	P-48	331	J-9	J-30	16.0	Ductile Iron	130.0	False	0.000	85	0.14	0.007	False	0
827	P-49	198	J-30	J-10	16.0	Ductile Iron	130.0	False	0.000	85	0.14	0.007	False	0
829	P-50	316	J-29	J-31	16.0	Ductile Iron	130.0	False	0.000	85	0.14	0.007	False	0
830	P-51	268	J-31	J-7	16.0	Ductile Iron	130.0	False	0.000	85	0.14	0.007	False	0
849	P-60	315	J-10	J-32	16.0	Ductile Iron	130.0	False	0.000	85	0.14	0.006	False	0
850	P-61	197	J-32	J-11	16.0	Ductile Iron	130.0	False	0.000	85	0.14	0.007	False	0
878	P-75	227	J-12	J-37	16.0	Ductile Iron	130.0	False	0.000	85	0.14	0.006	False	0
879	P-76	264	J-37	J-13	16.0	Ductile Iron	130.0	False	0.000	85	0.14	0.006	False	0
934	P-111	439	J-16	J-44	16.0	Ductile Iron	130.0	False	0.000	85	0.14	0.007	False	0
935	P-112	498	J-44	J-17	16.0	Ductile Iron	130.0	False	0.000	85	0.14	0.006	False	0
1001	P-34	416	J-16	J-14	16.0	Ductile Iron	130.0	False	0.000	-85	0.14	0.006	False	0
1066	P-453	336	J-20	J-40	12.0	Ductile Iron	130.0	False	0.000	-27	0.08	0.003	False	0

1026	P-40	6	J-48	H-9	6.0	Ductile Iron	130.0	False	0.000	0	0.00	0.000	False	0
1012	P-37	6	H-6	J-15	6.0	Ductile Iron	130.0	False	0.000	0	0.00	0.000	False	0
1021	P-39	14	J-46	H-4	6.0	Ductile Iron	130.0	False	0.000	0	0.00	0.000	False	0
1014	P-38	14	H-5	J-35	6.0	Ductile Iron	130.0	False	0.000	0	0.00	0.000	False	0
1038	P-44	7	J-50	H-1	6.0	Ductile Iron	130.0	False	0.000	0	0.00	0.000	False	0
1049	P-45	21	J-34	H-10	6.0	Ductile Iron	130.0	False	0.000	0	0.00	0.000	False	0
980	P-139	30	J-25	H-3	6.0	Ductile Iron	130.0	False	0.000	0	0.00	0.000	False	0
1059	P-52	49	J-51	J-52	6.0	Ductile Iron	130.0	False	0.000	0	0.00	0.000	False	0
977	P-17	89	J-38	H-8	6.0	Ductile Iron	130.0	False	0.000	0	0.00	0.000	False	0
1052	P-47	17	J-26	H-11	6.0	Ductile Iron	130.0	False	0.000	0	0.00	0.000	False	0
1033	P-43	51	J-49	H-2	6.0	Ductile Iron	130.0	False	0.000	0	0.00	0.000	False	0
975	P-137	22	H-7	J-36	6.0	Ductile Iron	130.0	False	0.000	0	0.00	0.000	False	0

Scenario: Fire Flow
Current Time Step: 0.000 h
FlexTable: Reservoir Table

ID	Label	Elevation (ft)	Zone	Flow (Out net) (gpm)	Hydraulic Grade (ft)
731	R-11	1,783.00	Zone - 4	1,518	1,783.00

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Appendix E
Fire Flow
Cavasson

Flow Test Summary

Project Name:	EJFT 18250-1
Project Address:	N Hayden Rd & Legacy Blvd, Scottsdale, AZ 85255
Date of Flow Test:	2018-10-16
Time of Flow Test:	7:30 AM
Data Reliable Until:	2019-04-16
Conducted By:	Cesar Reyna & Austin Gourley (EJ Flow Tests) 602.999.7637
Witnessed By:	Jared Berry (City of Scottsdale) 602.541.4942
City Forces Contacted:	City of Scottsdale (602.541.4942)
Permit Number:	C56459

Raw Flow Test Data

Static Pressure:	66.0 PSI
Residual Pressure:	59.0 PSI
Flowing GPM:	1,839
GPM @ 20 PSI:	5,082

Data with a 10 % Safety Factor

Static Pressure:	59.4 PSI
Residual Pressure:	52.4 PSI
Flowing GPM:	1,839
GPM @ 20 PSI:	4,674

Hydrant F_1

Pitot Pressure (1):	30	PSI
Coefficient of Discharge (1):	0.9	
Hydrant Orifice Diameter (1):	2.5	inches
Pitot Pressure (2):	30	PSI
Coefficient of Discharge (2):	0.9	
Hydrant Orifice Diameter (2):	2.5	inches

Static-Residual Hydrant

Flow Hydrant

Distance Between F_1 and R
1190 ft (measured linearly)

Static-Residual Elevation
1614 ft (above sea level)

Flow Hydrant (F_1) Elevation
1633 ft (above sea level)

Elevation & distance values are approximate

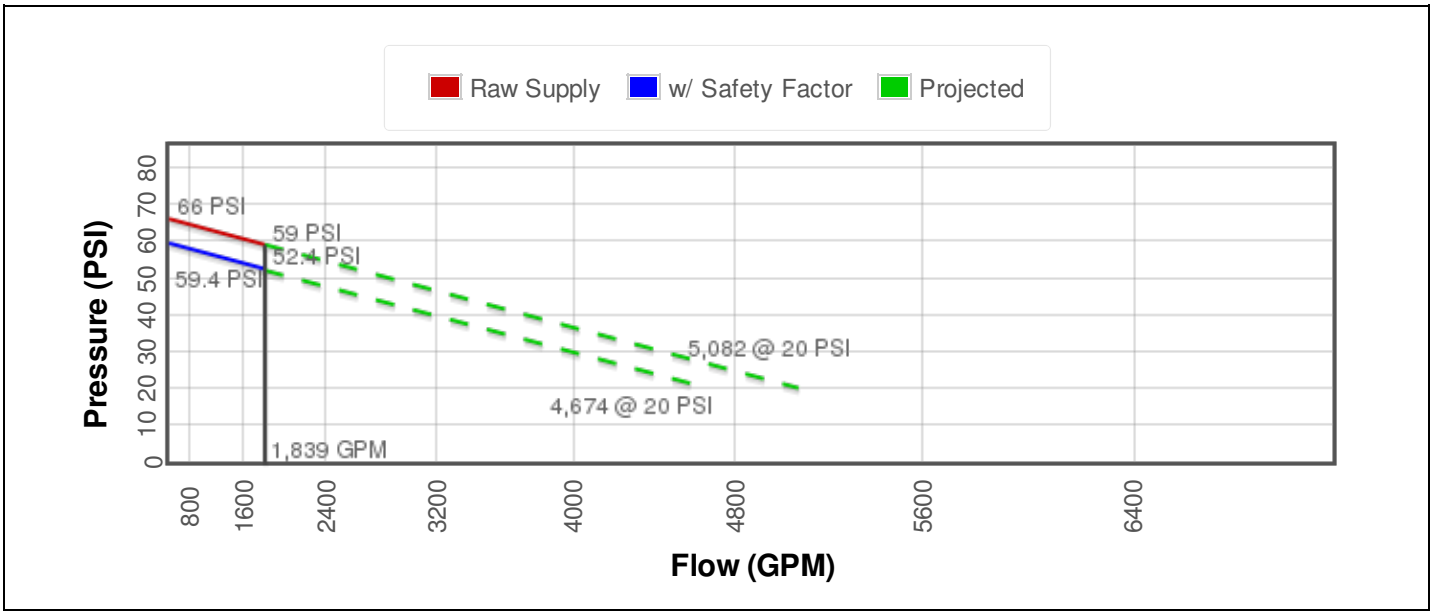
Flow Test Summary

Static-Residual Hydrant

Flow Hydrant (only hydrant F1 shown for clarity)

Approximate Project Site

Water Supply Curve $N^{1.85}$ Graph



Flow Test Summary

Project Name:	EJFT 18250-2
Project Address:	N Hayden Rd & Legacy Blvd, Scottsdale, AZ 85255
Date of Flow Test:	2018-10-16
Time of Flow Test:	7:50 AM
Data Reliable Until:	2019-04-16
Conducted By:	Cesar Reyna & Austin Gourley (EJ Flow Tests) 602.999.7637
Witnessed By:	Jared Berry (City of Scottsdale) 602.541.4942
City Forces Contacted:	City of Scottsdale (602.541.4942)
Permit Number:	C56459

Raw Flow Test Data

Static Pressure:	51.0 PSI
Residual Pressure:	44.0 PSI
Flowing GPM:	1,645
GPM @ 20 PSI:	3,673

Data with a 10 % Safety Factor

Static Pressure:	45.9 PSI
Residual Pressure:	38.9 PSI
Flowing GPM:	1,645
GPM @ 20 PSI:	3,333

Hydrant F_1

Pitot Pressure (1):	24	PSI
Coefficient of Discharge (1):	0.9	
Hydrant Orifice Diameter (1):	2.5	inches
Pitot Pressure (2):	24	PSI
Coefficient of Discharge (2):	0.9	
Hydrant Orifice Diameter (2):	2.5	inches

Static-Residual Hydrant

Flow Hydrant

Distance Between F_1 and R
489 ft (measured linearly)

Static-Residual Elevation
1650 ft (above sea level)

Flow Hydrant (F_1) Elevation
1647 ft (above sea level)

Elevation & distance values are approximate

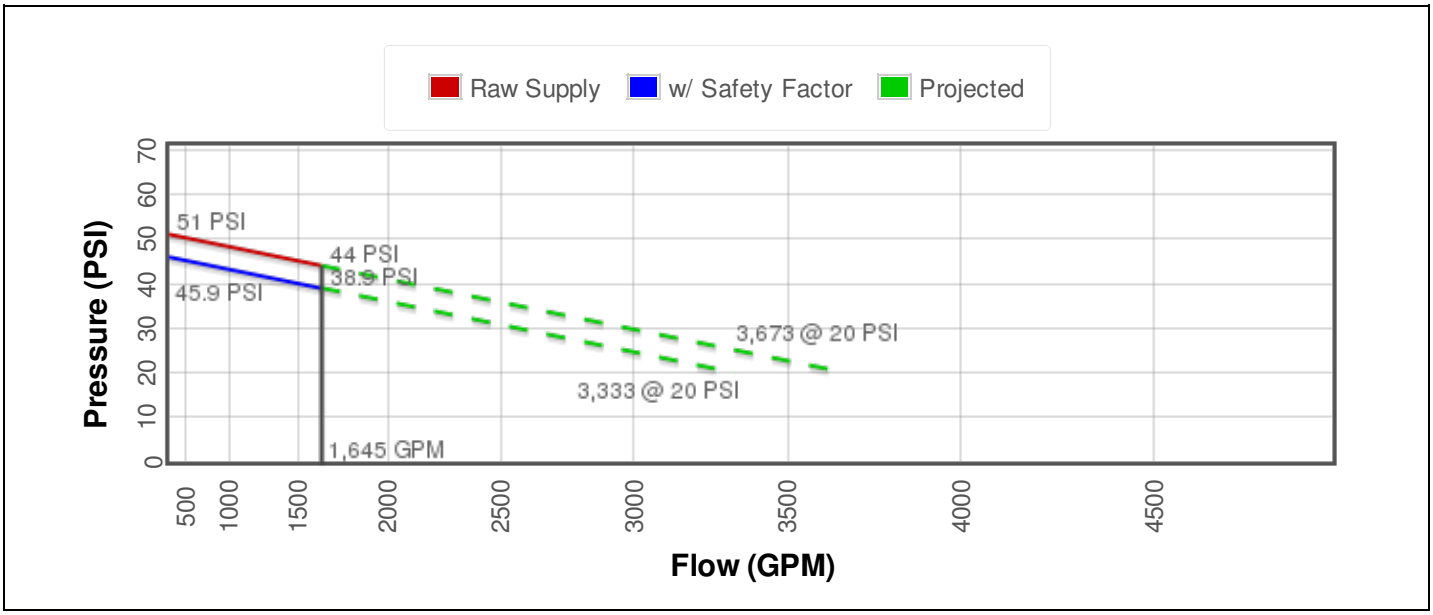
Flow Test Summary

Static-Residual Hydrant

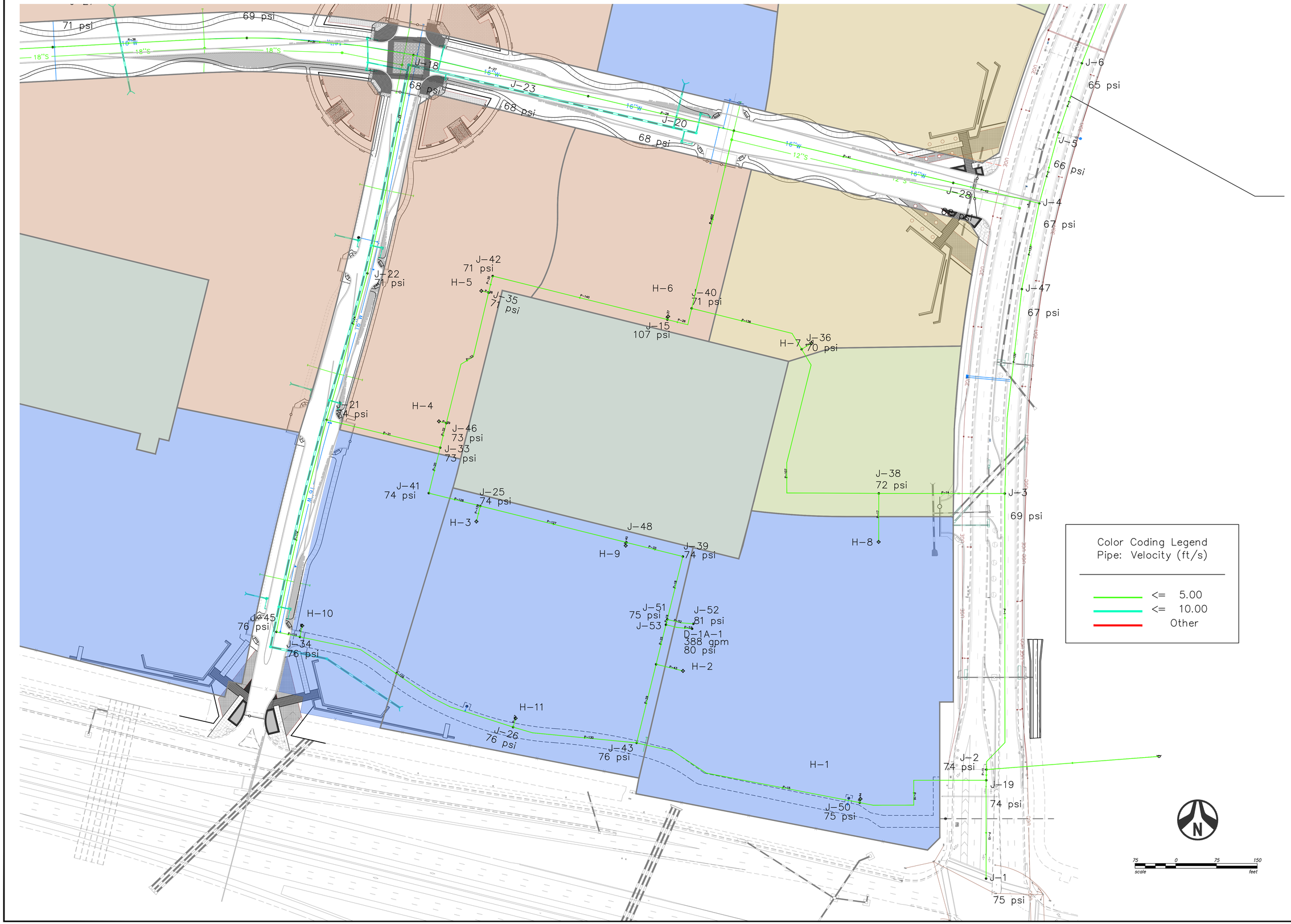
Flow Hydrant (only hydrant F1 shown for clarity)

Approximate Project Site

Water Supply Curve $N^{1.85}$ Graph



Exhibits
Cavasson



HUBBARD ENGINEERING
1201 S. Alma School Rd.
Suite 12000
Mesa, AZ 85210
PH: 480.892.3313
www.hubbardengineering.com

AVERAGE DAY DEMAND WATER SYSTEM MAP

Date	Project Eng.
10/30/2018	M. WOLF
Project No.	Project Mgr.
18114	M. WOLF

SHT: 01 OF 01

EXHIBIT 1

HUBBARD ENGINEERING
1201 S. Alma School Rd.
Suite 12000
Mesa, AZ 85210
PH: 480.892.3313
www.hubbardengineering.com

MAX DAY DEMAND WATER SYSTEM MAP

Date	Project Eng.
10/30/2018	M. WOLF
Project No.	Project Mgr.
18114	M. WOLF

SHT: 01 OF 01

EXHIBIT 2

HUBBARD ENGINEERING
1201 S. Alma School Rd.
Suite 12000
Mesa, AZ 85210
PH: 480.892.3313
www.hubbardengineering.com

PEAK HOUR DEMAND WATER SYSTEM MAP

Date	Project Eng.
10/30/2018	M. WOLF
Project No.	Project Mgr.
18114	M. WOLF

SHT: 01 OF 01

EXHIBIT 3

HUBBARD ENGINEERING
1201 S. Alma School Rd.
Suite 12000
Mesa, AZ 85210
PH: 480.892.3313
www.hubbardengineering.com

MAX DAY PLUS FIRE FLOW
WATER SYSTEM MAP

Date	Project Eng.
10/22/2018	M. WOLF
Project No.	Project Mgr.
18114	M. WOLF

SHT: 01 OF 01
EXHIBIT 4