Jericho Fire District #1

Water System Asset Management Plan

Water Reservoir Building

Water Treatment Building

November 16, 2023

Revision 1 – February 21, 2024

Prepared By:

EAST ENGINEERING

CIVIL INFRASTRUCTURE

Water System Asset Management Plan

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- State of Vermont – Department of Environmental Conservation: https://dec.vermont.gov/water/drinking-water/capacity-dev/asset-management

SECTION 1.0 – WATER SYSTEM ASSET SUMMARY

1.1 Inventory Summary and Condition Assessment

The detailed asset inventory and condition assessments are included in Appendix A and the mapping of these assets are shown on plans in Appendix B. The inventories list details on each asset, including: Component ID#, Description, Make/Model, Size, Location, Year Installed, Condition (1 to 5, with 1 being new/excellent and 5 being old/poor), Probability of Failure, Consequence of Failure, Estimated Service Life, Years Remaining in Service, Estimated Replacement Year, and Estimated Replacement Cost (in 2023 dollars). Only assets that have an estimated replacement value of $1,000, or greater, were included in this inventory. The inventories were divided into three general categories, which are summarized below.

- Facilities: The facilities surveyed included, the Water Treatment Building located off of Raceway Road and the Reservoir Building located on Foothills Drive.
    - Total estimated replacement cost (2023) of all components: $680,000
- Pipes: This list includes distribution mains throughout the system ranging from 3” in diameter to 6” in diameter. Water service piping supplying to individual residences were generally not included as these are typically a responsibility of the homeowner. The summary is as follows:
    - Approximately 12,000 feet of piping
    - Total estimated replacement cost (2023): $2,400,000
    - Approximately half feet of piping is at, or near, the end of its service life.
- Valves/Blowoffs/Curb Stops (Shutoffs): This inventory includes all valves, blow-offs, and curb stops that were located in the system. Many valves and curb stops have not been located, they are commonly paved over, destroyed, buried, or otherwise non-detectable. As more are found, they can be added to the database and mapping.
    - Total estimated replacement cost (2023): $250,000
- Total Approximate Replacement Value of All Assets (2023 Cost): $3,300,000

There have been a few upgrades to the system since its original installation (including reservoir/control improvements in the 2000’s and new sand filter in 2022), however much of the original piping/valves are original (1970’s) and scored the worst in terms of condition, probability of failure, and risk to the system.

Details of the ranking system, that is noted in the inventories, for probability of failure and consequence of failure are below and reflect the Vermont Department of Environmental Conservation, Fiscal Sustainability Plan (FSP).

Probability of Failure (POF)

1 – Very Good – New or nearly new with no known or suspected issues
2 – Good – Few known or suspected issues
3 – Average – Known or suspected issues

4 – Fair – Known or suspected issues may affect performance in the next several years
5 – Poor – Known or suspected issues may affect performance within 1 to 2 years

Consequence of Failure (COF)

1 – Insignificant disruption
2 – Minor disruption
3 – Moderate disruption
4 – Major disruption
5 – Catastrophic disruption

SECTION 2.0 – HYDRAULIC ANALYSIS

A hydraulic analysis of the Jericho Fire District 1 (JFD1) Water System was completed as part of the Asset Management Plan. The hydraulic analysis is a useful tool to assist operators, engineers, and System personnel on understanding the physical limits of the system, including flows, pressures, demands, and other important factors. The JFD1 system does not have the storage or piping capacity for fire protection, so this was not included in the hydraulic analysis.

Existing water mains, blowoffs, storage tank, well, pumps, and valves were mapped into Bentley Systems, WaterCAD. Mapping was completed based on historic information, as well as GPS survey data collected in the field. WaterCAD analyzes many different user inputs including component elevations, pipe sizes/materials, pump make/model, system usage/demands, C-factors, and valving to calculate system hydraulic conditions. Details on each junction and pipe (Base Conditions) are compiled in a WaterCAD database table, located in Appendix D. The "Base Conditions" modeled were based on an estimated instantaneous peak demand (worst cast scenario).

The following are assumptions and user inputs within the model:

- Hydraulic Calculation Method: Steady-State
- Pumps
    - Make/Model: Based on field information.
    - Well Pumps: Off
    - Water Treatment Facility: Off
    - Reservoir Booster Pumps: Off
- Tank-Hydropneumatic System
    - Tank Elevation: Per previously completed plans and field data.
- Distribution Piping
    - Location, Diameter, Lengths: Based on old plans provided from previous projects and GPS information gathered.
    - C-Factors (pipe friction): Based on industry published data and hydrant flow tests. Generally, 100-120 for older AC mains and 120-130 for PVC mains.

- Demands
    - Based on State rules an approximate instantaneous peak demand of 5 gallons per minutes (gpm), per house, was distributed across the junctions and hydrants. Based on experience, this is likely very conservative for flows.
- Fire Flow Calculations/Simulations:
    - Not applicable – System designed for potable water service only, no fire protection provided due to the reservoir capacity and system piping.

For a summary of the working pressures/fire flows under estimated instantaneous peak demand conditions in the base model:

- Pressures for the majority of the area are between 40-100 psi. As suspected, the lowest pressures are seen at the homes closest (highest in elevation) to the water storage tank, but are still above the State minimum recommended pressures.

WaterCAD allows the user to adjust inputs to create "scenarios", which help identify potential improvements and to size water main replacements. Because the working pressures are adequate under instantaneous peak demands with current main sizing, and it is unlikely that a significant buildout or high-users will be added to this system, main replacements can likely be to the current size (this can be evaluated in detail during a final design phase).

Future Model Use

Similar to other aspects of the Asset Management Plan, the hydraulic model requires updating as improvements are made to the system. The model is a good tool for JFD1 planning and future design projects. JFD1 retains ownership of this digital model; however, updates need to be completed by a professional engineer who has experience/is qualified to work on public community water systems.

SECTION 3.0 – RISK ASSESSMENT & RISK REDUCTION MEASURES

One of the purposes of the Asset Management Plan is to help mitigate system risks, as well as identify overall life cycle costs of major components within the system. As shown in the Asset Inventories, each component was provided a risk score, which is the multiple of two factors: probability of failure (POF) and consequence of failure (COF). POF and COF were given a numerical value ranging from 1 to 5, which is previously described in Section 1.2.

Estimated service life values were assigned to each asset based on industry literature, field experience, and local conditions. It is not uncommon for assets to function beyond the assumed service life (or fail well before it), however, to the extent possible, assets will be rehabilitated or replaced at or near the dates indicated in the asset database. Proactive and timely rehabilitation and/or replacement of assets will be more cost effective, in the long-term, than reactive repairs or replacements.

3.1 Priority of Assets Based on Risk

Facilities

The majority of the water system facilities have had fairly recent upgrades (tank/booster system in mid 2000's and a new filter in 2022), and therefore in fair to good condition, limiting major risks. JFD1 should continue with regular maintenance of facility components as they need repaired or replaced.

Pipe

The highest rated risk on the pipe inventory were the sections of asbestos cement (AC) pipe on the original sections of the system (Foothill Drive, Ridge Road). As noted, the exact extent of the AC mains are not exactly known and should be investigated further.

Valves-Blowoffs-Curbstops

Individual hydrants and curb stops did not rise to the high-risk categories of more critical infrastructure components as noted in the pipe section, however, all of the valves that serve the asbestos cement pipe from the 1970's are grouped with the high-risk pipe sections. It is common for old AC piping systems to have the pipe in fair condition, however, all fittings/valves/components attached to the pipe are in poor/critical condition and begin to fail before the actual pipe.

3.2 Risk Reduction Measures

The focus of risk reduction measures is on the assets that are most critical and/or have the highest risk factors, which are listed below along with several measures for risk reduction measures. The JFD1 operators may also have additional risk reduction measures that are implemented during their typical maintenance practices.

1. Well and Well Pump
    a. Operational Check – Daily
    b. Visual Inspection of well casing, cap, vent – Monthly
    c. Repair/Rehabilitate/Replace: 15 years, unless flow metering shows deterioration of pump output earlier.
2. Sand Filter
    a. Operation and Maintenance per Manufacturer's recommendations.
3. Booster Pumps
    a. Operational Check – Daily. Keep additional new pump/motor on-site for future use.

Risk reduction and life cycle cost reduction measures for other system assets (less critical and/or lower risk factors) are noted in the list below with the anticipated schedule/period of maintenance.

Distribution

- Valves – Exercise Annually, Locate/Mark All Isolation Valves
- Blowoffs – Operate/Flush Annually

Facilities

- Pump Motors – Grease Bi-Annually, if required.
- Generators – Exercise Monthly
- Alarm Tests (Temperature, Level, Pressure, etc.) – Bi-Annual

Storage

- Water Storage Tank Visual Inspection (internal, external, including overflow vent screen) – Monthly
- Water Storage Tank Robotic Cleaning and Inspection – Every 3 Years

SECTION 4.0 – PRIORITY IMPROVEMENTS

Based on the hydraulic modeling results, and the risks evaluated in the asset databases, below is the priority improvement identified (beyond normal system maintenance).

1. Water Main Replacement – Replace AC distribution mains as well as the corporations, service piping and curb stops that lateral off the AC pipe to each residence.

SECTION 5.0 – FUNDING

It is expected that water system improvements will be funded responsibly in order to limit rate increases, while maintaining assets. Several funding strategies for the priority improvements are discussed below.

Vermont Municipal Bond Bank (VMBB) – Since the 1970s, VMBB has provided millions of dollars in loans to municipalities, fire districts, and school districts. VMBB loans are relatively low cost, 20-year bonds, to help finance infrastructure improvement projects. Applications are typically due in May, for review by the VMBB board, with approvals being received in June.

Self-Funded Capital Improvements – It is difficult for most utilities to completely self-fund projects of significant size and scope, however, smaller projects may be viable out of the existing and future capital improvement funds.

Drinking Water State Revolving Fund (DWSRF) – This approach utilizes Federal money and is administered through the State of Vermont, Agency of Natural Resources. DWSRF uses a “priority list” for funding applicable projects, which typically include treatment, distribution, and storage, and facilities. Once this Asset Management Plan is accepted by

the State, the JFD1 will obtain more priority points with their future applications, and therefore be more likely to get funding opportunities.

SECTION 6.0 – LEVEL OF SERVICE GOALS & PERFORMANCE MEASURES AND CAPITAL PLAN

Section 6.1 Level of Service Goals & Performance Measures

As part of the Asset Management Plan, the State requires that a level of service agreement, including at least three internal and external goals, be implemented. The goals must be specific, measurable, and achievable with assigned schedules for completion. The table below outlines the goals and performance measures. This table will be reviewed and modified (if necessary) by the Jericho Fire District 1 on an annual basis.

Level of Service	Target	Input/Data to Measure	Period Measurement	Current Level	Goal Achievement
External Goals (Directly Impacts Customers)					
Meet Federal Safe Drinking Water Act Primary Drinking Water Standards (Federal and State)	100%	Water Supply Rule and Test Results	Varies	No Violations	Meeting Goal
Maintain chlorine residual levels entering the water distribution system from the water treatment facility between 0.2 mg/L and 1.0 mg/L	100%	Test Results	Continuous	In Range	Meeting Goal
All distribution chlorine residuals taken at the time of bacteriological sampling will be between 0.2 mg/L and 1.0 mg/L	100%	Test Results	Per approved sampling plan in the distribution system	In Range	Meeting Goal
Water breaks/outages will be limited to 8 hours	90%	Repair Report	Per break or outage	No Exceedances	Meeting Goal
Internal Goals (System Operations and Performance)					
Operators receive annual training updates	20 hours	Training Certificates	Annual	In Progress	In Progress

Rates are reviewed annually and raised as needed to adequately maintain infrastructure	100%	Financial Audit, JFD1 Input	Annual	In Progress	In Progress
Increase budget allocations for asset repair/replacement	10%	User Rates	Annual	Not Yet Begun	In Progress
Department operates within budget	10% (+/-)	Financial Audit	Annual	Within Budget	Historically Has Meet
Update asset inventories	100%	GPS and Field Info	Bi-Annual	Not Yet Begun	In Progress

Section 6.2 Capital Improvement Schedule

The priority improvements noted in Section 4 (Asbestos Cement Main Replacements) should be considered in the next 5 years, unless financially unattainable or other assets fail and rise to a higher priority. Many of the typical funding sources for public water system improvements take several years to plan, design, permit and construct. Depending on the extent/lengths of the AC main identified, JFD1 could schedule the capital improvements into several phases – this would be identified during subsequent design phases.

APPENDIX A

ASSET DATABASE TABLES

-PIPE

-VALVES, BLOWOFFS, CURBSTOPS

-FACILITIES

Jericho Fire District 1
Asset Management Inventory
Pipe Inventory
Current Year: 2023

EAST ENGINEERING
CIVIL INFRASTRUCTURE

ID#	Length	Size	Material	Year	Condition (1-5)	POF (1-5)	COF (1-5)	Risk	Service Life Est.	Years Remaining Est.	Replacement Year	Replacement Cost in 2023 $
P-8	707	6	Asbestos Cement	1975	5	4	3	12	50	2	2025	$141,400
P-9	849	6	Asbestos Cement	1975	5	4	3	12	50	2	2025	$169,800
P-11	530	6	Asbestos Cement	1975	5	4	3	12	50	2	2025	$106,000
P-12	405	6	PVC	1980	3	2	3	6	75	32	2055	$81,000
P-13	894	6	Asbestos Cement	1975	5	4	3	12	50	2	2025	$178,800
P-14	341	6	PVC	1980	3	2	3	6	75	32	2055	$68,200
P-15	296	6	PVC	1980	3	2	3	6	75	32	2055	$59,200
P-16	466	6	PVC	1980	3	2	3	6	75	32	2055	$93,200
P-17	697	6	PVC	1980	3	2	3	6	75	32	2055	$139,400
P-18	451	6	PVC	1980	3	2	3	6	75	32	2055	$90,200
P-19	1,148	6	PVC	1980	3	2	3	6	75	32	2055	$229,600
P-20	188	6	PVC	1980	3	2	3	6	75	32	2055	$37,600
P-21	1,161	4	Asbestos Cement	1975	5	4	3	12	50	2	2025	$232,200
P-26	21	6	PVC	2006	2	2	5	10	75	58	2081	$4,200
P-27	169	6	PVC	1980	3	2	5	10	75	32	2055	$33,800
P-28	56	6	PVC	2006	2	2	5	10	75	58	2081	$11,200
P-29	41	6	PVC	2006	2	2	5	10	75	58	2081	$8,200
P-30	54	6	PVC	1980	3	2	3	6	75	32	2055	$10,800
P-31	394	3	PVC	2006	2	2	5	10	100	83	2106	$78,800

Jericho Fire District 1
Asset Management Inventory
Pipe Inventory
Current Year: 2023

EAST ENGINEERING
CIVIL INFRASTRUCTURE

ID#	Length	Size	Material	Year	Condition (1-5)	POF (1-5)	COF (1-5)	Risk	Service Life Est.	Years Remaining Est.	Replacement Year	Replacement Cost in 2023 $
P-32	1,813	4	Asbestos Cement	1975	5	4	5	20	50	2	2025	$362,600
P-33	304	6	Asbestos Cement	1975	5	4	3	12	50	2	2025	$60,800
P-34	364	6	Asbestos Cement	1975	5	4	3	12	50	2	2025	$72,800
P-35	469	6	Asbestos Cement	1975	5	4	3	12	50	2	2025	$93,800
P-36	442	6	PVC	1980	3	2	3	6	75	32	2055	$88,400
	12,260 FEET										TOTAL COST (2023)	$2,452,000

Jericho Fire District 1
Asset Management Inventory
Valve-Blowoff-Shutoff Inventory
Current Year: 2023

EAST ENGINEERING
CIVIL INFRASTRUCTURE

ID#	Description	Size	Northing	Easting	Year	Condition (1-5)	POF (1-5)	COF (1-5)	Risk	Service Life Est.	Est. Years Remain	Replace. Year	Replace. Cost ($2023)
WV9	Water Valve	4	736710.339	1519405.899	1975	4	4	3	12	75	27	2050	$4,000
WV8	Water Valve	4	736705.246	1519406.753	1975	4	4	3	12	75	27	2050	$4,000
WV7	Water Valve	6	736519.634	1519277.916	1975	4	4	3	12	75	27	2050	$4,000
WV6	Water Valve	6	735703.57	1519387.067	1975	4	4	3	12	75	27	2050	$4,000
WV5	Water Valve	6	735701.259	1519388.929	1975	4	4	3	12	75	27	2050	$4,000
WV4	Water Valve	6	735699.226	1519388.477	1975	4	4	3	12	75	27	2050	$4,000
WV3	Water Valve	3	735114.804	1519720.567	2006	2	2	3	6	75	58	2081	$4,000
WV2	Water Valve	3	735111.899	1519719.784	2006	2	2	3	6	75	58	2081	$4,000
WV17	Water Valve	6	735639.025	1519037.186	1975	4	4	3	12	75	27	2050	$4,000
WV16	Water Valve	6	737044.497	1517918.833	1975	4	4	3	12	75	27	2050	$4,000
WV15	Water Valve	6	737047.5	1517917.835	1975	4	4	3	12	75	27	2050	$4,000
WV14	Water Valve	6	736944.843	1518898.067	1975	4	4	3	12	75	27	2050	$4,000
WV13	Water Valve	4	736703.276	1519385.762	1975	4	4	3	12	75	27	2050	$4,000
WV12	Water Valve	4	736720.041	1519414.005	1975	4	4	3	12	75	27	2050	$4,000
WV11	Water Valve	4	736713.136	1519414.572	1975	4	4	3	12	75	27	2050	$4,000
WV10	Water Valve	4	736712.301	1519405.348	1975	4	4	3	12	75	27	2050	$4,000
WV1	Water Valve	3	735112.736	1519721.837	2006	2	2	3	6	75	58	2081	$4,000
CS-WE8	Curb Stop	Unk.	736595.788	1518687.553	1980	3	3	3	9	75	32	2055	$2,500
CS-WE7	Curb Stop	Unk.	736582.048	1518764.027	1980	3	3	3	9	75	32	2055	$2,500

Jericho Fire District 1
Asset Management Inventory
Valve-Blowoff-Shutoff Inventory
Current Year: 2023

EAST ENGINEERING
CIVIL INFRASTRUCTURE

ID#	Description	Size	Northing	Easting	Year	Condition (1-5)	POF (1-5)	COF (1-5)	Risk	Service Life Est.	Est. Years Remain	Replace. Year	Replace. Cost ($2023)
CS-WE4	Curb Stop	Unk.	736771.115	1518769.388	1980	3	3	3	9	75	32	2055	$2,500
CS-WE12	Curb Stop	Unk.	736421.384	1518622.119	1980	3	3	3	9	75	32	2055	$2,500
CS-RI9	Curb Stop	Unk.	735936.405	1519743.95	1985	3	3	3	9	75	37	2060	$2,500
CS-RI6	Curb Stop	Unk.	735812.683	1519705.175	1985	3	3	3	9	75	37	2060	$2,500
CS-RI2	Curb Stop	Unk.	735756.655	1519515.077	1985	3	3	3	9	75	37	2060	$2,500
CS-RI16	Curb Stop	Unk.	736240.805	1519834.743	1985	3	3	3	9	75	37	2060	$2,500
CS-RI15	Curb Stop	Unk.	736237.239	1519816.141	1985	3	3	3	9	75	37	2060	$2,500
CS-RI14	Curb Stop	Unk.	736074.645	1519899.575	1985	3	3	3	9	75	37	2060	$2,500
CS-RI13	Curb Stop	Unk.	736100.048	1519780.766	1985	3	3	3	9	75	37	2060	$2,500
CS-RI12	Curb Stop	Unk.	735980.662	1519880.974	1985	3	3	3	9	75	37	2060	$2,500
CS-RI10	Curb Stop	Unk.	735914.853	1519839.315	1985	3	3	3	9	75	37	2060	$2,500
CS-ME9	Curb Stop	Unk.	735426.236	1518723.955	1990	3	3	3	9	75	42	2065	$2,500
CS-ME5	Curb Stop	Unk.	735616.277	1519053.953	1990	3	3	3	9	75	42	2065	$2,500
CS-ME43	Curb Stop	Unk.	736705.271	1517925.677	1990	3	3	3	9	75	42	2065	$2,500
CS-ME39	Curb Stop	Unk.	736613.339	1518052.95	1990	3	3	3	9	75	42	2065	$2,500
CS-ME38	Curb Stop	Unk.	736696.186	1518200.007	1990	3	3	3	9	75	42	2065	$2,500
CS-ME35	Curb Stop	Unk.	Unk.	Unk.	1990	3	3	3	9	75	42	2065	$2,500
CS-ME34	Curb Stop	Unk.	736531.904	1518247.95	1990	3	3	3	9	75	42	2065	$2,500
CS-ME31	Curb Stop	Unk.	736334.617	1518342.93	1990	3	3	3	9	75	42	2065	$2,500

Jericho Fire District 1
Asset Management Inventory
Valve-Blowoff-Shutoff Inventory
Current Year: 2023

EAST ENGINEERING
CIVIL INFRASTRUCTURE

ID#	Description	Size	Northing	Easting	Year	Condition (1-5)	POF (1-5)	COF (1-5)	Risk	Service Life Est.	Est. Years Remain	Replace. Year	Replace. Cost ($2023)
CS-ME25	Curb Stop	Unk.	736148.53	1518461.267	1990	3	3	3	9	75	42	2065	$2,500
CS-ME24	Curb Stop	Unk.	736146.56	1518528.494	1990	3	3	3	9	75	42	2065	$2,500
CS-ME21	Curb Stop	Unk.	735883.698	1518501.041	1990	3	3	3	9	75	42	2065	$2,500
CS-ME20	Curb Stop	Unk.	735872.085	1518559.884	1990	3	3	3	9	75	42	2065	$2,500
CS-ME43	Curb Stop	Unk.	735872.085	1518559.884	1990	3	3	3	9	75	42	2065	$2,500
CS-ME2	Curb Stop	Unk.	Unk.	Unk.	1990	3	3	3	9	75	42	2065	$2,500
CS-ME17	Curb Stop	Unk.	735706.409	1518463.984	1990	3	3	3	9	75	42	2065	$2,500
CS-ME16	Curb Stop	Unk.	735743.188	1518537.363	1990	3	3	3	9	75	42	2065	$2,500
CS-ME15	Curb Stop	Unk.	735553.576	1518493.25	1990	3	3	3	9	75	42	2065	$2,500
CS-ME10	Curb Stop	Unk.	735539.683	1518763.425	1990	3	3	3	9	75	42	2065	$2,500
CS-LI7	Curb Stop	Unk.	736909.604	1518447.09	1990	3	3	3	9	75	42	2065	$2,500
CS-LI6	Curb Stop	Unk.	736948.682	1518385.782	1990	3	3	3	9	75	42	2065	$2,500
CS-FO84	Curb Stop	Unk.	736671.103	1517496.913	1980	3	3	3	9	75	32	2055	$2,500
CS-FO83	Curb Stop	Unk.	736598.675	1517486.919	1980	3	3	3	9	75	32	2055	$2,500
CS-FO82	Curb Stop	Unk.	Unk.	Unk.	1980	3	3	3	9	75	32	2055	$2,500
CS-FO81	Curb Stop	Unk.	736673.492	1517635.508	1980	3	3	3	9	75	32	2055	$2,500
CS-FO78	Curb Stop	Unk.	736921.626	1517785.427	1980	3	3	3	9	75	32	2055	$2,500
CS-FO74	Curb Stop	Unk.	737069.19	1517873.008	1980	3	3	3	9	75	32	2055	$2,500
CS-FO73	Curb Stop	Unk.	737099.376	1517970.873	1980	3	3	3	9	75	32	2055	$2,500

Jericho Fire District 1
Asset Management Inventory
Valve-Blowoff-Shutoff Inventory
Current Year: 2023

EAST ENGINEERING
CIVIL INFRASTRUCTURE

ID#	Description	Size	Northing	Easting	Year	Condition (1-5)	POF (1-5)	COF (1-5)	Risk	Service Life Est.	Est. Years Remain	Replace. Year	Replace. Cost ($2023)
CS-FO68	Curb Stop	Unk.	737293.007	1518029.223	1980	3	3	3	9	75	32	2055	$2,500
CS-FO67	Curb Stop	Unk.	737279.508	1518139.237	1980	3	3	3	9	75	32	2055	$2,500
CS-FO66	Curb Stop	Unk.	737413.617	1518177.489	1980	3	3	3	9	75	32	2055	$2,500
CS-FO64	Curb Stop	Unk.	737429.703	1518279.828	1980	3	3	3	9	75	32	2055	$2,500
CS-FO62	Curb Stop	Unk.	737415.83	1518330.363	1980	3	3	3	9	75	32	2055	$2,500
CS-FO58	Curb Stop	Unk.	737208.067	1518522.946	1980	3	3	3	9	75	32	2055	$2,500
CS-FO57	Curb Stop	Unk.	737071.786	1518477.381	1980	3	3	3	9	75	32	2055	$2,500
CS-FO48	Curb Stop	Unk.	736948.03	1518906.785	1980	3	3	3	9	75	32	2055	$2,500
CS-FO45	Curb Stop	Unk.	Unk.	Unk.	1980	3	3	3	9	75	32	2055	$2,500
CS-FO46	Curb Stop	Unk.	Unk.	Unk.	1980	3	3	3	9	75	32	2055	$2,500
CS-FO4	Curb Stop	Unk.	735459.846	1519435.047	1975	4	4	3	12	75	27	2050	$2,500
CS-FO38	Curb Stop	Unk.	736707.739	1519383.788	1975	4	4	3	12	75	27	2050	$2,500
CS-FO35	Curb Stop	Unk.	Unk.	Unk.	1975	4	4	3	12	75	27	2050	$2,500
CS-FO34	Curb Stop	Unk.	736468.987	1519344.442	1975	4	4	3	12	75	27	2050	$2,500
CS-FO34	Curb Stop	Unk.	737103.452	1518672.87	1975	4	4	3	12	75	27	2050	$2,500
CS-FO33	Curb Stop	Unk.	736358.03	1519334.635	1975	4	4	3	12	75	27	2050	$2,500
CS-FO32	Curb Stop	Unk.	736369.304	1519392.863	1975	4	4	3	12	75	27	2050	$2,500
CS-FO25	Curb Stop	Unk.	736113.924	1519315.635	1975	4	4	3	12	75	27	2050	$2,500
CS-FO24	Curb Stop	Unk.	735886.911	1519362.922	1975	4	4	3	12	75	27	2050	$2,500

Jericho Fire District 1
Asset Management Inventory
Valve-Blowoff-Shutoff Inventory
Current Year: 2023

EAST ENGINEERING
CIVIL INFRASTRUCTURE

ID#	Description	Size	Northing	Easting	Year	Condition (1-5)	POF (1-5)	COF (1-5)	Risk	Service Life Est.	Est. Years Remain	Replace. Year	Replace. Cost ($2023)
CS-FO23	Curb Stop	Unk.	735835.901	1519296.634	1975	4	4	3	12	75	27	2050	$2,500
CS-FO14	Curb Stop	Unk.	735489.631	1519466.304	1975	4	4	3	12	75	27	2050	$2,500
CS-AR7	Curb Stop	Unk.	736379.631	1518880.341	1980	3	3	3	9	75	32	2055	$2,500
CS-AR6	Curb Stop	Unk.	736180.506	1518867.884	1980	3	3	3	9	75	32	2055	$2,500
CS-AR4	Curb Stop	Unk.	736421.692	1518741.933	1980	3	3	3	9	75	32	2055	$2,500
CS	Curb Stop	Unk.	736516.907	1519277.955	1990	3	3	3	9	75	42	2065	$2,500
CS	Curb Stop	Unk.	736674.984	1517518.735	1990	3	3	3	9	75	42	2065	$2,500
CS	Curb Stop	Unk.	735413.755	1518689.348	1990	3	3	3	9	75	42	2065	$2,500
CS	Curb Stop	Unk.	737049.412	1517917.406	1990	3	3	3	9	75	42	2065	$2,500
CS	Curb Stop	Unk.	736434.963	1518758.353	1990	3	3	3	9	75	42	2065	$2,500
CS	Curb Stop	Unk.	736104.401	1519868.294	1990	3	3	3	9	75	42	2065	$2,500
CS	Curb Stop	Unk.	734700.748	1519574.985	1990	3	3	3	9	75	42	2065	$2,500
BLOWOFF	Blowoff	N/A	736676.339	1517518.093	1990	3	3	3	9	50	17	2040	$5,000
BLOWOFF	Blowoff	N/A	735413.03	1518688.712	1990	3	3	3	9	50	17	2040	$5,000
BLOWOFF	Blowoff	N/A	737049.367	1517915.673	1990	3	3	3	9	50	17	2040	$5,000
BLOWOFF	Blowoff	N/A	736435.817	1518755.992	1990	3	3	3	9	50	17	2040	$5,000
BLOWOFF	Blowoff	N/A	736104.986	1519873.476	1990	3	3	3	9	50	17	2040	$5,000
									0		**TOTAL COST (2023$)**		$270,500

Jericho Fire District 1
Asset Management Inventory
Facilities Inventory
Current Year: 2023

EAST ENGINEERING
CIVIL INFRASTRUCTURE

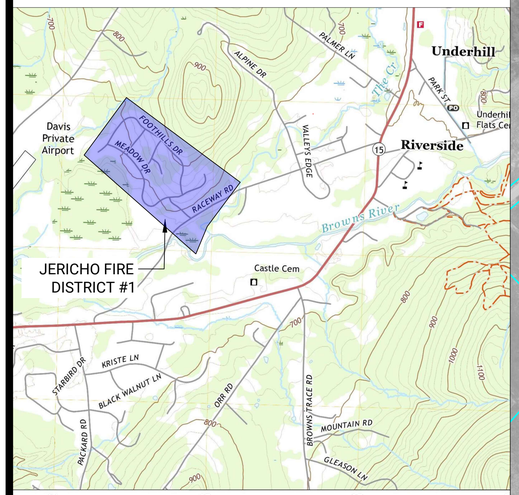
House#	St Code	ID#	Description	Make	Model	Size	Unit	Location	Year	Condition (1-5)	POF (1-5)	COF (1-5)	Risk	Service Life Est.	Years Remain	Replace Year	Replacement Cost (2023 $)
N/A	Raceway	WTF-BLDG-1	Treatment Building	N/A	N/A	N/A	N/A	Water Treatment Facility	1970	4	2	4	8	100	47	2070	$150,000
N/A	Raceway	WTF-CONT-1	Elec/Control Panel	N/a	N/A	N/A	N/A	Water Treatment Facility	1990	4	3	4	12	50	17	2040	$20,000
N/A	Raceway	WTF-CONT-2	RTU	Mission Control	110	N/A	N/A	Water Treatment Facility	2006	2	2	2	4	50	33	2056	$5,000
N/A	Raceway	WTF-WELL-2	Well #2	N/A	N/A	6	Inch	Raceway	1970	3	1	5	5	100	47	2070	$50,000
N/A	Raceway	WTF-CHEM-1	Chemical Feed Pun	Stenner	85MPH17	N/A	N/A	Water Treatment Facility	2020	2	2	2	4	10	7	2030	$2,000
N/A	Raceway	WTF-CHEM-2	Chemical Feed Pun	Stenner	45MPH10	N/A	N/A	Water Treatment Facility	2020	2	2	2	4	10	7	2030	$2,000
N/A	Raceway	WTF-TANK-1	Greensand Filter Ui	Culligan	48X60X3. PVC, BFV WIDE, 188FC	N/A	N/A	Water Treatment Facility	2022	1	1	3	3	20	19	2042	$80,000
N/A	Raceway	WTF-MISC-1	Unit Heater	Empire	DV210/DV215	N/A	N/A	Water Treatment Facility	1990	4	3	1	3	40	7	2030	$1,000
N/A	Raceway	WTF-MISC-1	Dehumidifier	Vantage	LRG2200	N/A	N/A	Water Treatment Facility	2022	1	1	1	1	10	9	2032	$3,000
N/A	Foothills	RES-BLDG-1	Reservoir Building	N/A	N/A	N/A	N/A	Reservoir Site	2006	2	3	4	12	100	83	2106	$150,000
N/A	Foothills	RES-TANK-1	Concrete Tank	Concrete	N/A	22000	Gal	Reservoir Site	2006	2	2	5	10	100	83	2106	$150,000
N/A	Foothills	RES-GEN-1	Generator + ATS	Generac	N/A	18	kW	Reservoir Site	2006	2	2	2	4	20	3	2026	$20,000
N/A	Foothills	RES-HP-1	HP Tank	Wellmate	WM35-WB	120	Gal	Reservoir Site	2006	2	2	1	2	25	8	2031	$2,500
N/A	Foothills	RES-HP-2	HP Tank	Wellmate	WM35-WB	120	Gal	Reservoir Site	2006	2	2	1	2	25	8	2031	$2,500
N/A	Foothills	RES-HP-3	HP Tank	Wellmate	WM35-WB	120	Gal	Reservoir Site	2006	2	2	1	2	25	8	2031	$2,500
N/A	Foothills	RES-HP-4	HP Tank	Wellmate	WM35-WB	120	Gal	Reservoir Site	2006	2	2	1	2	25	8	2031	$2,500
N/A	Foothills	RES-HP-5	HP Tank	Wellmate	WM35-WB	120	Gal	Reservoir Site	2006	2	2	1	2	25	8	2031	$2,500
N/A	Foothills	RES-HP-6	HP Tank	Wellmate	WM35-WB	120	Gal	Reservoir Site	2006	2	2	1	2	25	8	2031	$2,500
N/A	Foothills	RES-PUMP-1	Booster Pump 1	Berkley	LTH-3	3	HP	Reservoir Site	2006	4	4	3	12	20	3	2026	$5,000
N/A	Foothills	RES-PUMP-2	Booster Pump 2	Berkley	LTH-3	3	HP	Reservoir Site	2006	4	4	3	12	20	3	2026	$5,000
N/A	Foothills	RES-COMP-1	Compressor					Reservoir Site	2006	3	3	2	6	20	3	2026	$2,000
N/A	Foothills	RES-CONT-1	Remote Telemetry	Mission Control	110	N/A	N/A	Reservoir Site	2006	2	2	2	4	50	33	2056	$5,000
N/A	Foothills	RES-CONT-2	Control Panel	N/A	N/A	N/A	N/A	Reservoir Site	2006	2	2	2	4	50	33	2056	$10,000
N/A	Foothills	RES-CONT-3	Cl Analyzer	Rosemont	SoluCompII	N/A	N/A	Reservoir Site	2006	2	2	1	2	20	3	2026	$5,000
																Total	$680,000

APPENDIX B

WATER SYSTEM ASSET MAPPING

GENERAL/CONSTRUCTION NOTES

1. TO CLARIFY THE PLANS, ALL EXISTING SITE FEATURES ARE SHOWN IN lowercase LETTERS AND ALL PROPOSED IMPROVEMENTS ARE SHOWN IN CAPITAL LETTERS.
2. THIS PLAN SHOWS APPROXIMATE WATER SYSTEM COMPONENTS AND TAX MAP BOUNDARIES BASED ON SURVEY WORK COMPLETED BY EAST ENGINEERING IN OCTOBER 2023. THIS IS NOT A BOUNDARY SURVEY.

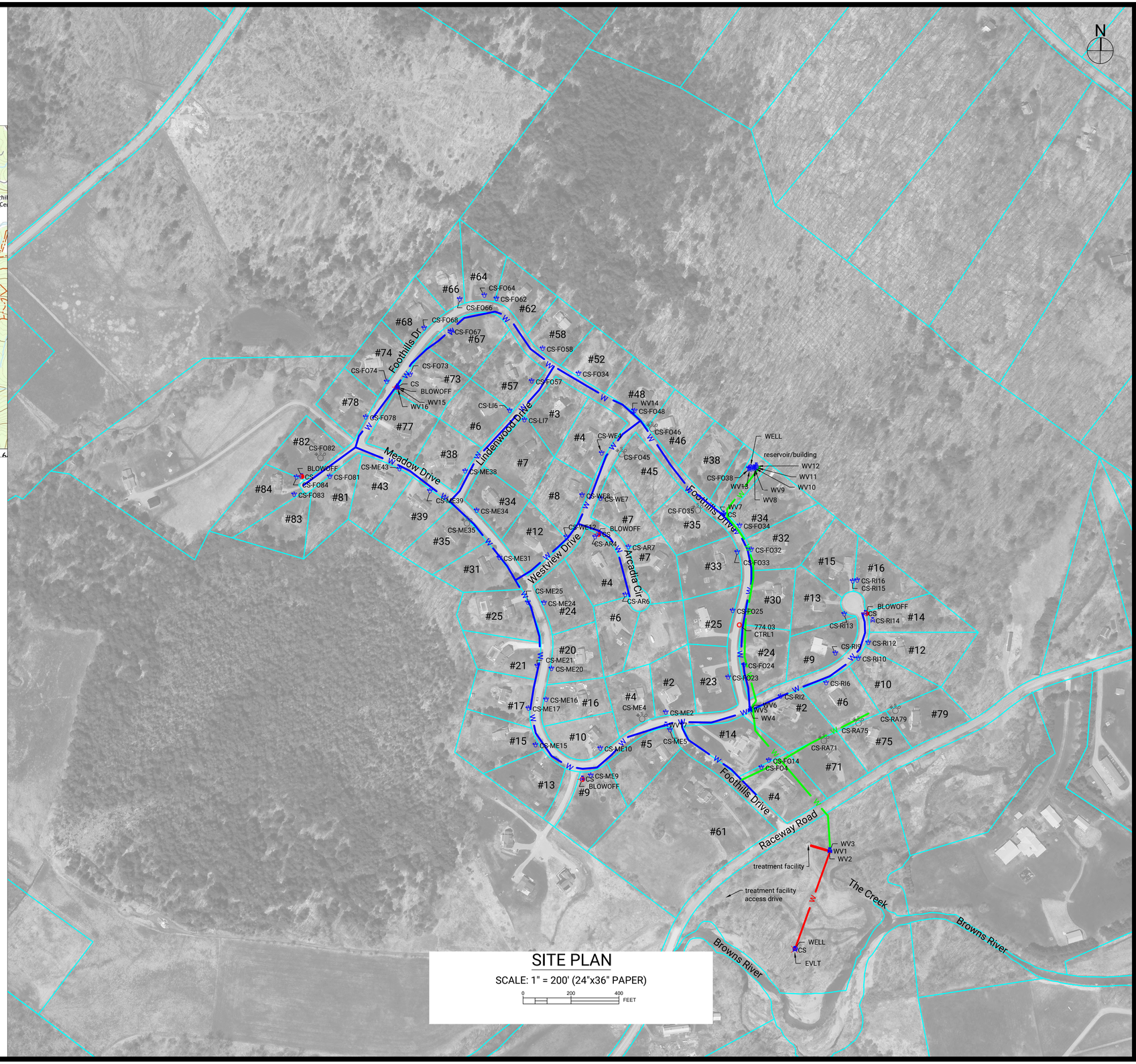


PROJECT LOCATION MAP

NOT TO SCALE

LEGEND:

- WV — VALVE
- BLOWOFF
- CURB STOP (SURVEYED)
- CURB STOP (EST. FROM OLD PLANS)
- W — WELL
- 3" MAIN
- 4" MAIN
- 6" MAIN



SITE PLAN

SCALE: 1" = 200' (24"x36" PAPER)

0 200 400 FEET

EAST ENGINEERING
CIVIL INFRASTRUCTURE

(802) 989-6686
WWW.EASTENGINEERINGPLC.COM

STATE OF VERMONT — TYLER D. BILLINGSLEY — NO. 69581 — CIVIL — LICENSED PROFESSIONAL ENGINEER

OWNER:

JERICHO FIRE DISTRICT #1

PO BOX 281
JERICHO VT 05465

PROJECT:

WATER SYSTEM ASSET MANAGEMENT

ISSUED FOR:
REVIEW

ISSUED DATE:
2023-11-16

PROJ. #: 083-02

REVISIONS

#	BY:	DATE:
1	TB	2024-02-21

WATER SYSTEM SITE PLAN

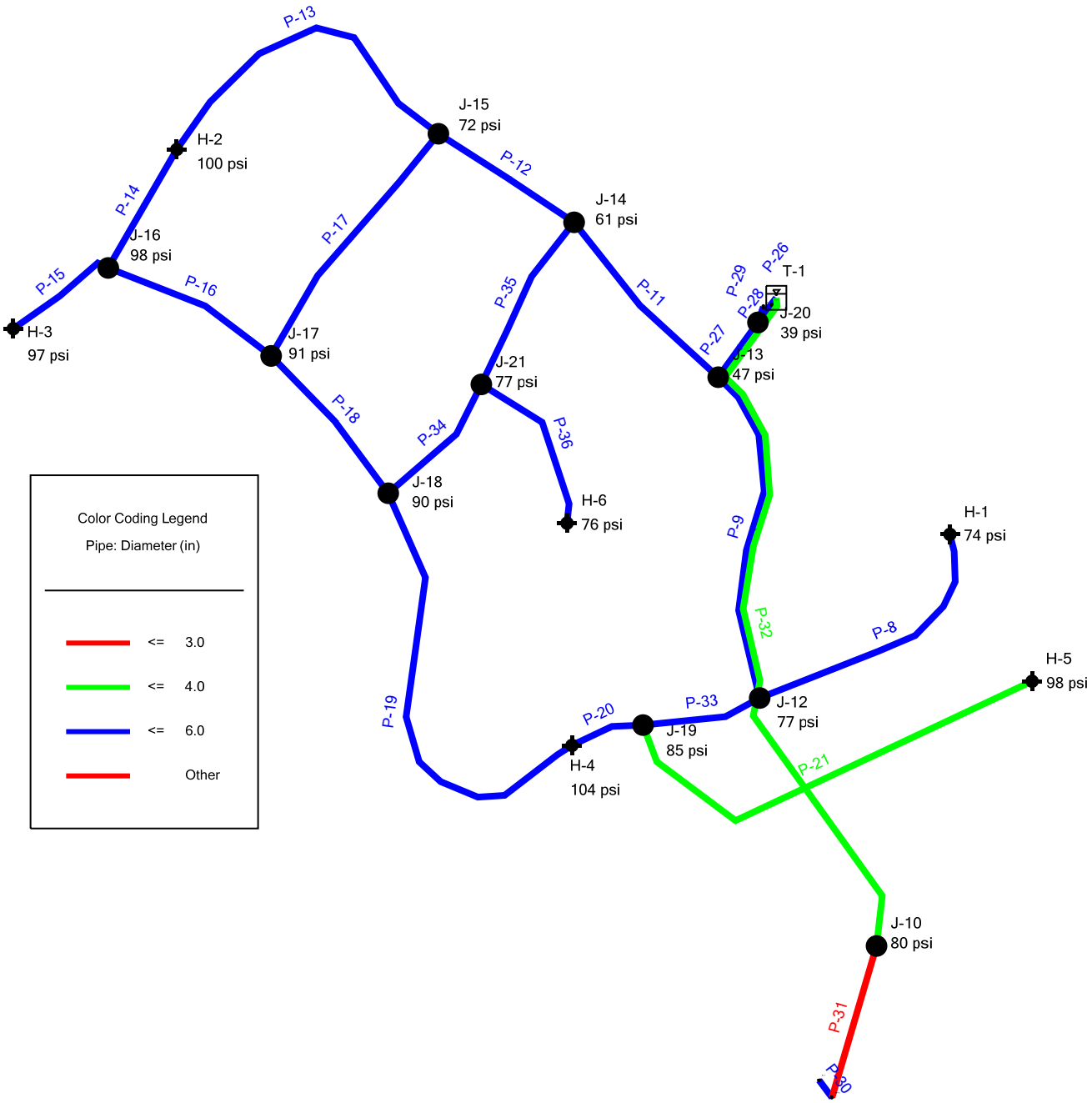
DRAWING NO:

C-1.0

APPENDIX C

HYDRAULIC MODEL (WATERCAD) PLAN

Scenario: Base



APPENDIX D

HYDRAULIC MODEL DATABASE RESULTS

FlexTable: Hydrant Table

Label	Hydrant Status	Elevation (ft)	Demand (gpm)	Pressure (psi)
H-1	Closed	744.00	45	74
H-2	Closed	683.00	0	100
H-3	Closed	691.00	0	97
H-4	Closed	674.00	40	104
H-5	Closed	688.00	20	98
H-6	Closed	739.00	25	76

FlexTable: Junction Table

Label	Elevation (ft)	Demand (gpm)	Pressure (psi)
J-10	657.00	5	80
J-12	738.00	10	77
J-13	808.00	50	47
J-14	774.00	5	61
J-15	749.00	40	72
J-16	687.00	40	98
J-17	704.00	25	91
J-18	706.00	40	90
J-19	719.00	5	85
J-20	830.00	5	39
J-21	736.00	5	77

FlexTable: Pipe Table

Label	Length (Scaled) (ft)	Start Node	Stop Node	Diameter (in)	Material	Hazen-Williams C	Flow (gpm)
P-8	707	J-12	H-1	6.0	Asbestos Cement	100.0	45
P-9	849	J-12	J-13	6.0	Asbestos Cement	100.0	-133
P-11	530	J-13	J-14	6.0	Asbestos Cement	100.0	167
P-12	405	J-14	J-15	6.0	PVC	120.0	93
P-13	894	J-15	H-2	6.0	Asbestos Cement	100.0	22
P-14	341	H-2	J-16	6.0	PVC	120.0	22
P-15	296	J-16	H-3	6.0	PVC	120.0	0
P-16	466	J-16	J-17	6.0	PVC	120.0	-18
P-17	697	J-17	J-15	6.0	PVC	120.0	-31
P-18	451	J-17	J-18	6.0	PVC	120.0	-12
P-19	1,148	J-18	H-4	6.0	PVC	120.0	-13
P-20	188	H-4	J-19	6.0	PVC	120.0	-53
P-21	1,161	J-19	H-5	4.0	Asbestos Cement	100.0	20
P-26	21	PMP-1	T-1	6.0	PVC	120.0	0
P-27	169	J-13	J-20	6.0	PVC	120.0	-350
P-28	56	J-20	PMP-1	6.0	PVC	120.0	0
P-29	41	HT-1	J-20	6.0	PVC	120.0	355
P-30	54	R-1	PMP-2	6.0	PVC	120.0	0
P-31	394	PMP-2	J-10	3.0	PVC	120.0	0
P-32	1,813	J-10	T-1	4.0	Asbestos Cement	100.0	-5
P-33	304	J-19	J-12	6.0	Asbestos Cement	100.0	-78
P-34	364	J-18	J-21	6.0	Asbestos Cement	100.0	-39
P-35	469	J-21	J-14	6.0	Asbestos Cement	100.0	-69
P-36	442	J-21	H-6	6.0	PVC	120.0	25