SERVICING REPORT

THREE SISTERS VILLAGE

JULY 2020

THREE SISTERS mountain village

QUANTUM PLACE

wsp

REVISION HISTORY

FIRST ISSUE

April, 2020	First Submission			
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SECOND ISSUE

July, 2020	Revised Submission			
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[1] Approval of this document is an administrative function indicating readiness for release and does not impart legal liability on to the Approver for any technical content contained herein. Technical accuracy and fit-for-purpose of this content is obtained through the review process. The Approver shall ensure the applicable review process has occurred prior to signing the document.

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1 INTRODUCTION

1.1 GENERAL

WSP Canada Group Limited was retained by QuantumPlace Developments Ltd on behalf of Three Sisters Mountain Village Properties Ltd. (TSMVPL - Client) to undertake the preparation of a conceptual servicing report for Three Sisters Village (TSV) development, located in the Town of Canmore. The following report outlines water and sanitary sewer servicing concepts for the development in support of the Area Structure Plan (ASP). This servicing report provides direction for the implementation of the water and sanitary sewer servicing strategy in the development and identifies the tie-in points to the Town of Canmore water and sanitary sewer networks.

1.2 SITE DESCRIPTION

TSV ASP land occupies approximately 135 ha (333 acres) in the already established community of Three Sisters Mountain Village and is located just northwest of the existing Three Sisters Creek and Ridge developments. The land is bound by the mountains to the south and by Three Sisters Parkway and Bow River to the north and east. Much of the ASP lands are located on a previously abandoned golf course. Prior to the golf course, the lands were part of an industrial mining operation and the site has been extensively logged.

For municipal water servicing, an existing 350mm PVC watermain runs through the development lands and continues to service the Three Sisters Creek and Ridge developments, and the Stewart Creek ASP area to the east. The TSV development will connect to this watermain (**Figure 2.1 in Appendix A**). For municipal sanitary sewer, a 450mm and 525mm PVC sanitary sewer trunk main flows from east to west under the Three Sisters Parkway and ultimately connects into Lift Station 8. The development can connect to this sanitary main through existing servicing stubs (**Figure 3.1 in Appendix B**). The ASP lands are located on mountainous terrain and will require thoughtful grading design to service effectively with gravity sewer.

1.3 PROJECT SCOPE

The scope of this report encompasses a review of previous studies and the preparation of a conceptual servicing report which will guide the overall development and provide a basis for design criteria and approach. This servicing report differs from the previous servicing reports as it considers updated land use concepts.

1.4 PREVIOUS STUDIES AND REPORTS

The following studies and guidelines have been reviewed and utilized in the preparation of this updated service report:

- Sanitary Sewer Servicing Study, IBI Group Ltd., May 2013
- TSMV Water Network Analysis, IBI Group Ltd., March 2013
- Cost Agreement, TSMVPL and Town of Canmore, October 2013

The previous IBI reports identify potential need for upgrades in the 450mm and 525mm gravity sanitary trunk, and for potential upgrades to the Lift Stations 8 and 10. Since then, the need for these upgrades have been reinforced in both the 2010 and 2017 Utility Master Plan (UMP) updates for the Town of Canmore. It is also noted that a private written agreement between the Town of Canmore and TSMVPL dated October 21, 2013 was reviewed in the preparation of this report.

Several Town of Canmore resources, including the following design guidelines and reports, were reviewed and utilized in the preparation of this report:

- Town of Canmore, Utilities Master Plan, Water and Sanitary, CIMA+, January 2017
- Town of Canmore, Utilities Master Plan, Water Master Plan, Epcor, December 2010
- Town of Canmore, Utilities Master Plan, Sanitary Master Plan, Stantec, June 2010
- Town of Canmore, Guidelines for Subdivision and Development in Mountainous Terrain, June 2006
- Town of Canmore, Engineering Design and Construction Guidelines, 2010
- Town of Canmore, Draft Engineering Design and Construction Guidelines, 2019

1.5 PROPOSED LAND USE

The proposed land uses for the ASP lands are a mixture of residential, mixed-use, and specialized zones. Residential zones are mostly a mixture of semi-detached, townhouse and apartments. Mixed-use zones consist of a mixture of commercial/retail at grade and tourist home (apartments) accommodations above. Industrial style zone will have retail flex spaces at-grade for creative manufacturing. Specialized zones are mostly dedicated to leisure, health and tourism.

1.6 TOWN OF CANMORE UMP POPULATION PROJECTIONS

The 2017 Town of Canmore Utility Master Plan describes population projections for future development in Section 2.3 of the report. Population projection numbers were calculated by multiplying the projected new units by 2.5 people/unit. The TSV development lands considered for this ASP are referred to as “Resort Centre” in Table 2 of the UMP.

Since the population estimates were included in the UMP, QuantumPlace Development Ltd and WSP have worked collaboratively with the Town to produce a revised land use concept for TSV. The proposed residential portion of the development is a mix of semi-detached dwellings, townhomes and low-rise apartments. With this unit mix the UMP assumption of 2.5 people/unit would provide inflated water

demand requirements. We are recommending 1.6 people/unit for apartment and hotel rooms, and 2.1 people/unit for townhomes and semi-detached dwellings as this is more representative of occupancies within this type of development and building form. No single-detached dwellings are proposed for the TSV ASP area and semi-detached dwellings are proposed to be used where absolutely necessary and sparingly on steeper slopes for the purposes of adhering to slope adaptive development principles.

In determining the residential unit occupancy rates for the development, we have analysed other communities in Western Canada with similar urban form, socio economic status, and influence from tourism. The results are shown in the table below.

Table 1.1 Household Size Comparison

	Community	City	Housing Type	Average household size
1	Victoria West	Victoria, BC	78% Apt/Town	1.9
2	Fairfield	Victoria, BC	72% Apt/Town	1.8
3	Downtown	Kelowna, BC	100% apt	1.7 (2830 apt for 4850 ppl predicted in Plan 2012) 1.0 (actual in 2006)
4	Bridgeland	Calgary, AB	66% Apt/Town	1.8
5	Hillhurst	Calgary, AB	51% Apt/Town	2
6	Mission	Calgary, AB	98% Apt/Town	1.4

References:

https://www.victoria.ca/assets/Departments/Planning~Development/Community~Planning/Local~Area~Planning/Vic~West/Vic%20West%20Profile.pdf

https://www.victoria.ca/assets/Departments/Planning~Development/Community~Planning/Local~Area~Planning/Fairfield~Gonzales/Fairfield_Profile_DRAFT_10.13.2016.pdf

https://www.kelowna.ca/sites/files/1/docs/2012-02-28_downtown_plan_report_final.pdf

https://www.kelowna.ca/sites/files/1/docs/related/ff-population_and_housing.pdf

https://www.calgary.ca/CSPS/CNS/Documents/community_social_statistics/community-profiles/bridgeland-riverside.pdf

https://www.calgary.ca/CSPS/CNS/Documents/community_social_statistics/community-profiles/hillhurst.pdf

References continued:

https://www.calgary.ca/CSPS/CNS/Documents/community_social_statistics/community-profiles/mission.pdf

wsp #1200, 10909 JASPER AVENUE EDMONTON, ALBERTA, CANADA T5J 3L9 TEL: 780.466.6555 | FAX: 780.466.8200 | www.wsp.com	PROJECT: THREE SISTERS VILLAGE SERVICING REPORT	SCALE: NA DATE: APRIL 2020
	TITLE: LOCATION PLAN	PROJECT NO: 16M-02148-02 DRAWING NO: FIGURE 1.1

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2 WATER DISTRIBUTION SYSTEM

2.1 CRITERIA AND APPROACH

This section of the report will discuss the design approach taken in modelling the water network system for the development.

2.1.1 COMPUTER MODEL

The computer software used for the analysis was Bentley WaterCAD Connect Edition. WaterCAD is a Windows based program that uses a series of nodes and pipes to predict the hydraulic behavior within a water distribution system.

2.1.2 EXISTING WATER NETWORK AND BOUNDARY CONDITIONS

The proposed water network will tie in with the existing water network at two locations on the Three Sisters Parkway and with a connection to the existing water main that runs from the Grassi Reservoir to the east.

CIMA+ has provided boundary conditions for the analysis which are provided in **Table 2.1**.

Table 2.1 Boundary Conditions

		Hydraulic Gradeline (m)	
Label	Location	Maximum Daily Demand	Maximum Daily Demand Plus Fire Flow
R-2	Existing watermain that runs from the Grassi Reservoir to the east	1453.70	1434.15
R-3	Existing watermain within the Three Sisters Parkway	1417.50	1405.80

2.1.3 WATER NETWORK DESIGN CRITERIA

Our design criteria is based on the recently approved 2020 Town of Canmore Engineering Design Guidelines. We have also reviewed the specific constraints associated with the TSV development with the Town of Canmore and discussed where variances to this guideline would be appropriate.

For our analysis, we have allowed for the following design guidelines for a water distribution system:

- Minimum system pressure of 140 kPa (20 psi) for Maximum Daily Demand (MDD) plus fire flow
- Preferred system pressure of 350 kPa (50 psi) for Maximum Daily Demand (MDD)
- Minimum system pressure of 276 kPa (40 psi) for Maximum Daily Demand (MDD), with a requirement for consideration of impacts on land usage and service sizing.
- Pressures in excess of 550 kPa (80 psi) shall be avoided within residential units either using in-line PRVs to create pressure zones or in-home PRVs to control at the houses.
- System pressures should generally not exceed 690 kPa or 100 psi. Pressures in excess of this limit will require additional considerations to ensure the system will be functional.
- Maximum velocity of 1.5 m/s for the MDD condition.
- Maximum velocity of 3.0 m/s within a loop and 6.0 m/s for a dead-end pipe for the MDD plus fire flow condition. Maximum velocities of 3.5 m/s will be considered if sufficient context is provided.
- Maximum head loss of 2 m/km for the MDD condition as a general guideline.

System water demands were based on the proposed land use types within the development and are summarized in **Table 2.2**.

Table 2.2 Water Demands

Criteria	Amount
Residential Unit Occupancy Rate	2.1 persons for each of the townhomes 2.1 persons for each of the semi-detached 1.6 persons for each of the apartment units 1.6 persons for each of the hotel rooms
Proposed Units	Analysis completed using the maximum feasible density of 4980 for all unit types.
Institutional, Commercial & Industrial (ICI) Population	55 persons per hectare
Consumption Rate (Average Daily Demand)	360 L/person/day
Residential Maximum Day Demand (MDD)	720 L/person/day
Residential Peak Hour Demand (PHD)	1440 L/person/day

The consumption rates provided in **Table 2.2** are based on the future water demand scenario provided in the 2017 UMP.

Though the network was modeled in alignment with the recommendations of the UMP, we believe the per capita water consumption is not representative of water use in a modern development. The City of Calgary is currently using 315 L/person/day and the City of Edmonton recently reduced this figure to 220 L/person/day, generally related to sustainability initiatives, low-flow fixtures, low-flow appliances, and other modern changes in various codes and regulations. It is in the best interest of the Town as it relates to longer term considerations like maintenance and operational cost to ensure infrastructure is right sized for actual demand. The design parameters should be re-visited as design development continues, and we understand the Town is taking this into consideration for future revisions of the Engineering Design Guidelines. TSMVPL has also advised that at the detailed engineering design stages that reduced water consumption rates will be discussed with the Town to ensure that right sizing of infrastructure is evaluated at that time to ensure that affordability, servicing, and long-term operating impacts are considered appropriately.

Populations, densities, and areas were determined from the Area Structure Plan. The Maximum Daily Demand and Peak Hour Demand for commercial and institutional land uses were assumed to follow the same multipliers as the residential demands listed in **Table 2.2**.

The design flow rates are summarized in **Table 2.3**.

Table 2.3 Design Flow Rates

Demand Condition	Estimated Flow (L/s)
Average Day Demand, ADD (L/s)	47
Maximum Day Demand, MDD (L/s)	94
Peak Hourly Demand, PHD (L/s)	188
Fire Flow (L/s)	200 or 300 Depending on Land Use and Building Height
Maximum Draw Rate (MDD + Fire Flow) (L/s)	394

A commonly accepted, industry guideline for fire protection flow rates is the Fire Underwriter's Survey (FUS) and this is recommended by the Town of Canmore. The fire flow criterion adopted for medium density land use is 200 L/s for a duration of 2.5 hours. A fire flow of 300 L/s for a duration of 3.5 hours is applied for land uses with high density or multiple closely spaced and/or contiguous buildings of three or more floors, regardless of the land use.

2.2 PROPOSED SYSTEM

Figure 2.1 in Appendix A shows the proposed layout of the water distribution system. The proposed water system will tie into the existing pipe loop that is connected to the Grassi Reservoir and that runs along the Three Sisters Parkway. The proposed water distribution system consists of 250 mm, 300 mm and 350 mm diameter PVC pipe. The existing water main that is located in the golf course will be relocated in a new right-of-way and the proposed water system will connect into it at various points as shown in **Figure 2.1 in Appendix A**.

It is important to note that the pressures calculated below are based upon proposed preliminary design ground contours. Future design efforts may cause these elevations to shift to suit drainage or servicing needs. This may impact the range of pressures experienced. Pressures should be revisited against Hydraulic Grade Lines during subsequent design to ensure these model results are accurate.

Pressure Reducing Valves

Two PRVs are proposed within the water system as shown in **Figure 2.2 in Appendix A**. A PRV, designated as PRV-1 on **Figure 2.2**, is proposed on the existing watermain that runs from the Grassi Reservoir to the east. A HGL setting of 1414.50 m is proposed for this PRV. A second PRV, designated as PRV-2 on **Figure 2.2**, is proposed at the northwest corner of the development where the proposed water system ties into the existing watermain that runs along the Three Sisters Parkway. A HGL setting of 1417.00 m is proposed for this PRV.

Check valves are proposed in watermains designated as WTR-302 and WTR-21 shown in **Figure 2.3 in Appendix A**. These check valves are proposed to allow water to be fed from PRV-2 to maintain pressures within acceptable limits.

2.3 MODELLING RESULTS

Modeling for the proposed servicing plan was completed for the Maximum Day demand and the Maximum Day plus Fire Flow demands. Pressure Reducing Valves (PRVs) and Check Valves are included in the modeling. **For WaterCAD model output files, please refer to Appendix C.**

Maximum Day Demand

The minimum and maximum pressures simulated within the TSV water system for the maximum day demand were 428 kPa (42 psi) and 689 kPa (100 psi). All the nodes exceeded the minimum pressure criterion of 275 kPa (40 psi). Exceedances to the design criteria are described below.

Maximum Day Demand – Pressure Exceedances in the Proposed System

Two of the nodes designated as J-262 and J-163, that are located in the northeast corner of the water system as shown on **Figure 2.3**, had simulated pressures of 765 kPa (111 psi) and 854 kPa (124 psi), respectively.

Recommendations

Nodes J-262 and J-163 are located in a low-lying area and grading in the detailed design phase may reduce these pressures slightly, but not enough for the pressures to be within working limits. This only impacts two potential development sites. It is recommended that PRVs (possibly privately owned) be implemented at this location where the high pressures have been simulated. In addition, the watermains and thrust blocks in this area would need to be designed to accommodate the higher pressures. This would be assessed in detail at the subdivision stage of the design in this area.

Maximum Day Demand – Pressure Exceedances in the Existing Water System

Two of the nodes designated as J-142A and J-162 that are located on the existing watermain that runs along the Three Sisters Parkway as shown on **Figures 2.2 and 2.3** had simulated pressures of 703 kPa (102 psi) and 916 kPa (133 psi), respectively. The pressures that were simulated at these two nodes are a result of the hydraulic grade line elevation specified at the Node designated as Reservoir R-3 in **Figure 2.2**. This elevation is a boundary condition for the analysis of the water system that was provided by CIMA+, as shown in **Table 2.1**.

Recommendations

Nodes J-142A and J-162 are located within the Town's existing water system, and the simulated pressures are based upon existing hydraulic conditions within the Town's water system. The proposed development does not impact the pressures that were simulated. Should the Town wish to lower the pressures then a PRV could be implemented on the Town's existing watermain.

Maximum Day Demand – Head Loss Exceedances in the Proposed System

The pipes designated as WTR-104, WTR-112(1) and WTR-112(2) located in the northwest corner of the water system as shown on **Figure 2.2** had simulated head loss gradients of 2.68 m/km, 2.54 m/km and 2.54 m/km, respectively that exceed the maximum recommended head loss gradient of 2.0 m/km.

Recommendations

System pressures in the lines impacted by the head loss exceedance are approximately 70 psi, which is well above minimum requirements. Also, the length of pipe in question is only 0.5 km meaning limited overall head loss from the exceedance. Given this context we recommend a higher head loss gradient be acceptable at this location and making further changes to the watermains at this location may not be necessary or operationally cost beneficial. This should be confirmed and addressed at the detail design stages of the project.

Maximum Day Demand – Head Loss Exceedance in the Town's System

The pipe designated as WTR-53(2), as shown on **Figure 2.2**, which is the existing watermain that runs along Three Sisters Parkway had a simulated head loss gradient of 3.16 m/km that exceeds the maximum head loss criterion of 2.0 m/km.

Recommendations

The head loss gradient of 3.16 m/km does not adversely impact the pressures that were simulated in the proposed development and does not adversely impact the pressures with the Town's existing water system. In addition, the head loss gradient of 3.16 m/km is not significantly larger than the recommended maximum head loss gradient of 2.0 m/km. Therefore, the head loss gradient of 3.16 m/km should be considered acceptable, and should be confirmed and addressed at the detail design stages of the project.

Maximum Day Plus 200 L/s Fire Flow

A Maximum Day Demand plus 200 L/s Fire Flow simulation was conducted at all nodes in the network. All fire flows were satisfied, and no pressures fell below the minimum allowable maximum day plus fire flow pressure of 140 kPa (20 psi). All nodes met the required 200 L/s fire flow demand.

All looped pipe velocities within the proposed water distribution system were below the maximum allowable velocity criteria of 3.0 m/s

Maximum Day Plus 200 L/s Fire Flow – Velocity Exceedances in the Existing System

The existing pipes WTR-423(1) and WTR-423(2), located in a pipe loop next to the Grassi Reservoir, as shown on **Figure 2.2**, had a velocity greater than 3.0 m/s and exceeded a velocity of 3.5 m/s. The maximum velocity that was simulated in pipe WTR-423(1) was 4.77 m/s and the maximum velocity that was simulated in pipe WTR-413(2) was 4.10 m/s

Recommendations

WSP has been involved in numerous developments where pipe velocities between 4 and 5 m/s for a short-term event such as a fire flow is a reasonable exceedance and is generally considered acceptable industry practice. Existing pipes WTR-423(1) and WTR-423(2) could be upsized or twinned to address the issue, but given this is a common and quite limited exceedance in municipal water systems we do not recommend this capital expenditure. Furthermore, a flow control valve or a surge control valve to aid with a rise in transient pressures due to higher velocities could also be considered. These pipes would need further review during detailed design.

Maximum Day Plus 300 L/s Fire Flow

A Maximum Day Demand plus 300 L/s Fire Flow simulation was conducted for land uses with high density, multiple closely spaced or contiguous buildings of three or more floors. No pressures fell below the minimum allowable maximum day plus fire pressure of 140 kPa (20 psi). All nodes met the required 300 L/s fire flow demand.

Maximum Day Plus 300 L/s Fire Flow – Velocity Exceedances in the Existing System

It is noted that existing pipes WTR-423(1) and WTR-423(2) exceeded the maximum allowable velocity criterion of 3.0 m/s and also exceeded a velocity of 3.5 m/s for the fire flow simulations. All other pipe velocities were below 3.0 m/s.

Recommendations

Pipes WTR-423(1) and WTR-423(2) are located on the existing watermain that runs from the Grassi Reservoir to the east, as shown on **Figure 2.2**. Recommendations for those pipes have been described above.

A simulated fire flow of 300 L/s at nodes J-204, J-206, J-240 generated the lowest residual pressures within the water system. Therefore, additional fire flow simulations were carried out at critical nodes J-204, J-206 and J-240.

Maximum Day And 300 L/s Fire Flow at Critical Node J-204

A simulation was completed for a 300 L/s fire flow at Node J-204 to check velocities and minimum pressures within the water distribution system.

A simulated fire flow at Node J-204 resulted in a pressure of 262 kPa (38 psi). The minimum pressure simulated within the water system was 234 kPa (34 psi) at Node J-306. This node is located at a high point at the upstream end of the water system, as shown in **Figure 2.2**, and there is no demand at this node. The simulated pressures within the water distribution system are greater than the minimum allowable maximum day plus fire flow pressure of 140 kPa (20 psi).

Maximum Day Plus 300 L/s Fire Flow – Velocity Exceedances in the Existing System

A velocity of 3.99 m/s was simulated in existing pipes WTR-423(1) and WTR-423(2) that are located next to the Grassi Reservoir, as shown in **Figure 2.2**. All other pipe velocities were below 3.0 m/s.

Recommendations

Pipes WTR-423(1) and WTR-423(2) are located on the existing watermain that runs from the Grassi Reservoir to the east, as shown on **Figure 2.2**. Recommendations for these pipes have been provided above.

Maximum Day And 300 L/s Fire Flow at Node J-206

A simulation was completed for a 300 L/s fire flow at Node J-206 to check velocities and minimum pressures within the water distribution system.

A simulated fire flow at Node J-206 resulted in a pressure of 289 kPa (42 psi) at Node J-206. The minimum pressure simulated within the water system was 234 kPa (34 psi) at Node J-306. This node is located at a high point at the upstream end of the water system, as shown in **Figure 2.2**, and there is no demand at this node. The simulated pressures within the water distribution system are greater than the minimum allowable maximum day plus fire flow pressure of 140 kPa (20 psi).

Maximum Day Plus 300 L/s Fire Flow – Velocity Exceedances in the Proposed System

A velocity of 3.07 m/s was simulated in proposed pipe WTR-15, shown in **Figures 2.2** and **2.3**. This velocity is within 10% of 3.0 m/s maximum velocity criterion and is within the tolerances of industry practice. We recommend that it be considered acceptable.

Maximum Day Plus 300 L/s Fire Flow – Velocity Exceedances in the Existing System

A velocity of 3.99 m/s was simulated in existing pipes WTR-423(1) and WTR-423(2) that are located next to the Grassi Reservoir, as shown in **Figure 2.2**. All other pipe velocities were below 3.0 m/s, except pipe WTR-15 noted above.

Recommendations

Pipes WTR-423(1) and WTR-423(2) are located on the existing watermain that runs from the Grassi Reservoir to the east, as shown on **Figure 2.2**. Recommendations for these pipes have been provided above.

Maximum Day And 300 L/s Fire Flow at Node J-240

A simulation was completed for a 300 L/s fire flow at Node J-240 to check velocities and minimum pressures within the water distribution system.

A simulated fire flow at Node J-240 resulted in a pressure of 296 kPa (43 psi) at Node J-240. A minimum pressure of 241 kPa (35 psi) was simulated at Node J-306. This node is located at a high point at the upstream end of the water system, as shown in **Figure 2.2**, and there is no demand at this node. The simulated pressures within the water distribution system are greater than the minimum allowable maximum day plus fire flow pressure of 140 kPa (20 psi).

Maximum Day Plus 300 L/s Fire Flow – Velocity Exceedances in the Proposed System

A velocity of 3.47 m/s was simulated in proposed pipe WTR-405 shown in **Figure 2.2**.

Recommendations

The velocity that was simulated in proposed pipe WTR-405 is below 3.5 m/s. The pipe could be upsized to meet the maximum velocity criterion of 3.0 m/s. However, since the simulated pressures within the proposed water system are above the minimum pressure criterion for the maximum day demand plus fire flow condition, it is recommended that the diameter of this pipe be maintained at 250 mm.

Maximum Day Plus 300 L/s Fire Flow – Velocity Exceedances in the Existing System

A velocity of 4.41 m/s was simulated in existing pipes WTR-423(1) and WTR-423(2) that are located next to the Grassi Reservoir, as shown in **Figure 2.2**. All other pipe velocities were below 3.0 m/s, except for pipe WTR-405 noted above.

Recommendations

Pipes WTR-423(1) and WTR-423(2) are located on the existing watermain that runs from the Grassi Reservoir to the east, as shown on **Figure 2.2**. Recommendations for these pipes have been provided above.

3 SANITARY SEWER SYSTEM

This section of the report will discuss the sanitary sewer network and servicing.

3.1 CATCHMENT SUMMARY

The Plan Area will be serviced with a gravity sanitary collection system. The sanitary sewer servicing is divided into three (3) sanitary catchment areas to suit the site topography. Sanitary gravity mains will connect from the Plan Area to the existing gravity mains located within the Three Sisters Parkway. The sanitary sewer system should be designed in accordance with the latest Town of Canmore Engineering Design Guidelines. **Please refer to Figure 3.1 in Appendix B, Conceptual Sanitary Network for further detail.**

3.1.1 CATCHMENT AREA 1

Catchment Area 1 is located on the east side of the Plan Area and is approximately 34 ha. Catchment land uses consist mostly of medium and high density residential developments. The proposed catchment will take advantage of the natural south to north topography and drain by gravity to an existing stub by manhole 8. **Please refer to Figure 3.1 in Appendix B, Conceptual Sanitary Network for further detail**.

3.1.2 CATCHMENT AREA 2

Catchment Area 2 is located in the centre of the Plan Area and is the largest of the three, measuring approximately 44 ha. The area is a mixture of residential, hospitality, commercial and light industrial land uses. The proposed catchment will take advantage of the natural south to north topography and drain by gravity to an existing stub by manhole A. **Please refer to Figure 3.1 in Appendix B, Conceptual Sanitary Network for further detail.**

3.1.3 CATCHMENT AREA 3

Catchment Area 3 is approximately 16ha of development lands and is of mix of residential and hospitality land uses, hotels and spas. The proposed catchment will take advantage of the natural south to north topography and drain by gravity to an existing stub by manhole 10. **Please refer to Figure 3.1 in Appendix B, Conceptual Sanitary Network for further detail.**

3.2 DESIGN CRITERIA AND APPROACH

The following design criteria in **Table 3.1**, is adopted in the Town's latest UMP by CIMA+ for sewage generation rates, along with peaking factors for different types of development.

As discussed in the section 1.6 of this report, we are assuming persons/unit numbers which more reasonably reflect the mixture of townhouse and apartment style units.

Table 3.1 Sewage Generation Rates

Land Use type	Unit rates	2017 UMP Town of Canmore values
Residential	L/c/d	360
Commercial	L/ha/d	17,000
Hotel	L/unit/d	600
Industrial	L/ha/d	17,000
Inflow/Infiltration	L/s/ha	0.28
Peaking Factor Residential	PF	Harmon Formula, 2.5 min
Peaking Factor Non-Residential (Commercial, Industrial)	PF	3.5
Peaking Factor Hotels	PF	4.0
Manning's n value	N/A	0.013

As noted in section 2.1.3, we do not believe the water consumption and sewage generation is representative of the demands of a modern development. Infiltration rates are also far too conservative when considering modern sewer infrastructure and that TSV will not have the same ground water concerns as central Canmore. Sewage generation rates should be verified by flow rates at Lift Stations 8 & 10, and the agreement dated October 21, 2013 between the Town of Canmore and TSMVPL will also have to be considered.

3.2.1 SYSTEM ANALYSIS

The gravity sanitary sewer system was analysed for flow by the use on Manning's equation. It is a widely used equation in determining design flows in pipes. The Manning's equation is as follows:

$$Q = \frac{A \times 10^3}{n} R^{2/3} S^{1/2}$$

Where:
- Q = Flow Rate (L/s)
- A = Flow Area (m2)
- n = Roughness coefficient (0.013for PVC pipes)
- S = slope (m/m)
- R = Hydraulic Radius (m)

Further, the capacity in the system was analysed on an individual pipe section basis. The calculated design flows were compared to the theoretical capacities of the pipes to provide percent full flow of each pipe section. The formula used to calculate percent full is as follows:

$$UPC = \frac{DF}{PC} \times 100$$

Where: UPC = Used Pipe Capacity (%)
PC = Pipe Capacity (%)
DF = Design Flow (L/s)

Generally, used pipe capacity below 86% is considered acceptable for sanitary sewer design. Values above 86% suggest the pipe is over capacity and may suffer from surcharging. **Please refer to the Sanitary Sewer Spreadsheet in Appendix B for further detail.**

3.3 MODELING RESULTS

Sanitary sewer modelling results are summarized in the **Table 3.2** below. The flows were separated for the three contribution areas and their discharge points identified. **Please refer to the Sanitary Sewer Spreadsheet in Appendix B for further detail.**

Table 3.2 Estimated Sewage Flows

Description	Contribution Area (Ha)	Estimated Flow (L/s)	Discharge Point
Catchment Area 1	34.08	67.75	Stub by EX MH 8
Catchment Area 2	44.13	83.22	Stub by EX MH A
Catchment Area 3	15.70	21.13	To EX MH 10
Total	**93.91**	**172.10**	

Total development flows will exceed the existing sanitary trunk capacities along the Three Sisters Parkway as identified in the 2017 Town's UMP. Sanitary trunk upsizing projects (specifically Projects 18 and 19 – Three Sisters Parkway Phase 1 and 2 are recommended in the UMP and WSP agrees that such projects are likely required based on additional sewage generation from the proposed development. However, we recommend that lift stations 8 and 10 be evaluated for infiltration issues and if found, those issues be addressed first by the Town. Also, the private agreement between TSMVPL and Town of Canmore dated October 21, 2013, be considered accordingly. Establishing actual flows to the lift stations 8 and 10 will inform the Town with respect to the potential required upgrades for the lift stations and projected timelines for the same.

A more detailed sanitary sewer analysis is recommended to be undertaken at subdivision stage to better estimate flows from the development and consider development phasing.

4 CONCLUSIONS AND RECOMMENDATIONS

4.1 WATER NETWORK ANALYSIS

The following conclusions have been drawn regarding the proposed water distribution system for the development area.

The WaterCAD model that has been developed has been used to size the proposed water system, as shown in **Figure 2.1** provided in **Appendix A**.

Two PRVs are proposed at the southwest and northwest corners of the water system as shown in **Figure 2.2**. Check valves are proposed in the watermains designated as WTR-302 and WTR-21 shown in **Figure 2.3**. These check valves are proposed to allow water to be fed from PRV-1 to maintain pressures within acceptable limits.

In summary, there are no unacceptably low pressures that were simulated for the MDD or any fire flow scenario. Pressures for the MDD were generally within the acceptable pressure range except for two nodes located at the northeast corner of the water system that is a low-lying area. The high pressures that were simulated at these nodes only impact two development lots and could be addressed by grading or additional PRVs, and designing the watermains and thrust blocks for the higher pressures. This should be assessed further at the future detail design stages.

Existing pipes WTR-423(1) and WTR-423(2) exceeded the maximum allowable velocity criterion of 3.5 m/s for all of the fire flow simulations. These pipes are located on the existing watermain that runs from the Grassi Reservoir to the east, as shown on **Figure 2.2**. Our recommendation would be to leave these pipes as they are and accept the short exceedance in velocities as it is considered a standard industry practice. Otherwise, the pipes would have to be upsized to reduce the velocities, but that may not be operationally cost beneficial. These pipes should be further reviewed during detailed design stages.

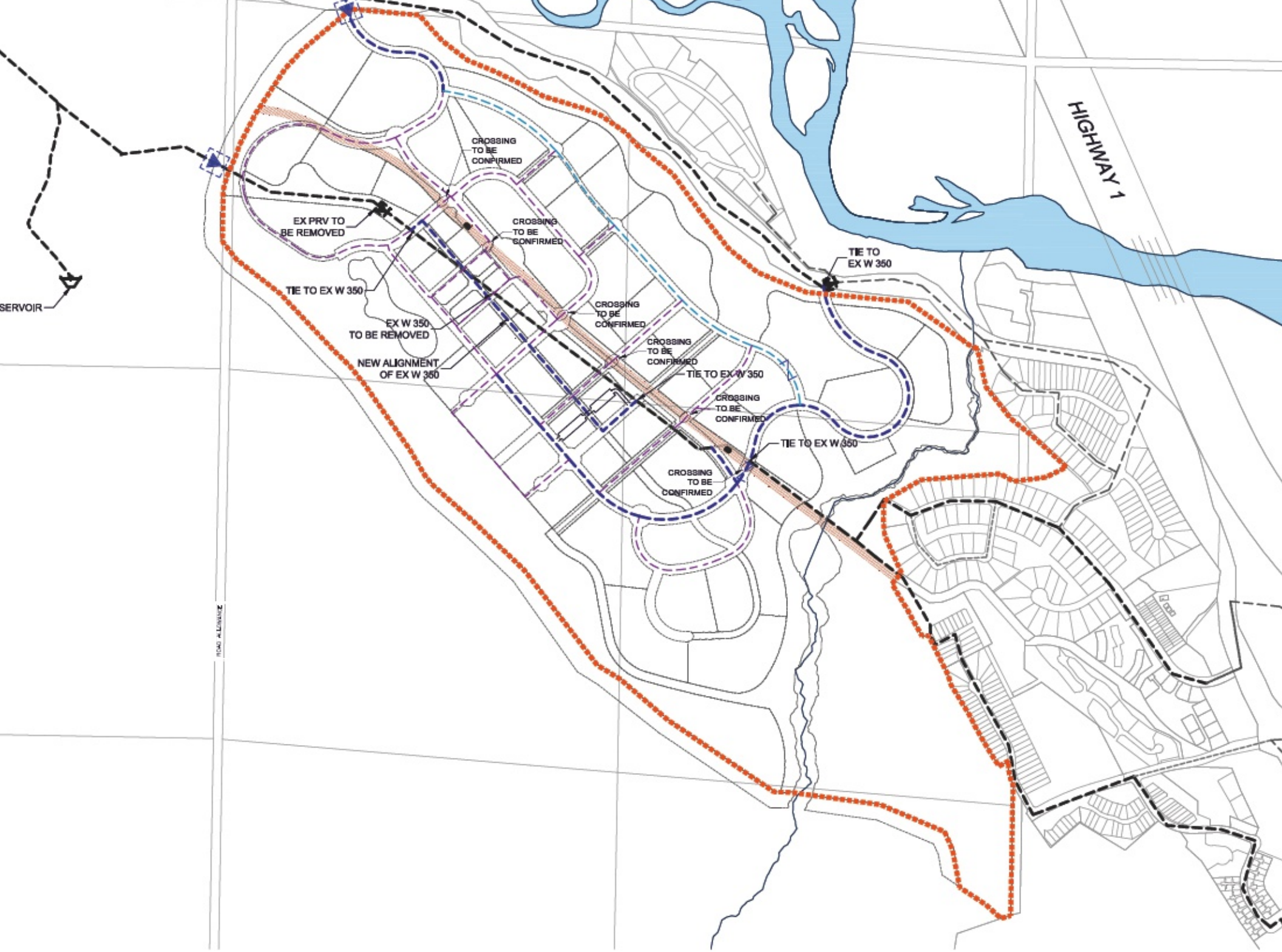
A more detailed analysis should be undertaken during future design phases to confirm the estimated water demand requirement, boundary conditions, the size and capacity of the proposed water distribution system including the location of PRVs and any potentially required upgrades to the Town's existing water supply/distribution system.

4.2 SANITARY SYSTEM ANALYSIS

The following is a summary of findings for the sanitary sewer network analysis.

The development can be serviced with a gravity sewer connecting to the existing pipe within the Three Sisters Parkway ROW. We recommend that actual flows be established prior to proceeding with offsite infrastructure upgrades. We do not foresee any upgrades beyond what has been considered in the UMP.

APPENDIX A – CONCEPTUAL WATER NETWORK



TAIN VILLAGE ASP BOUNDARY

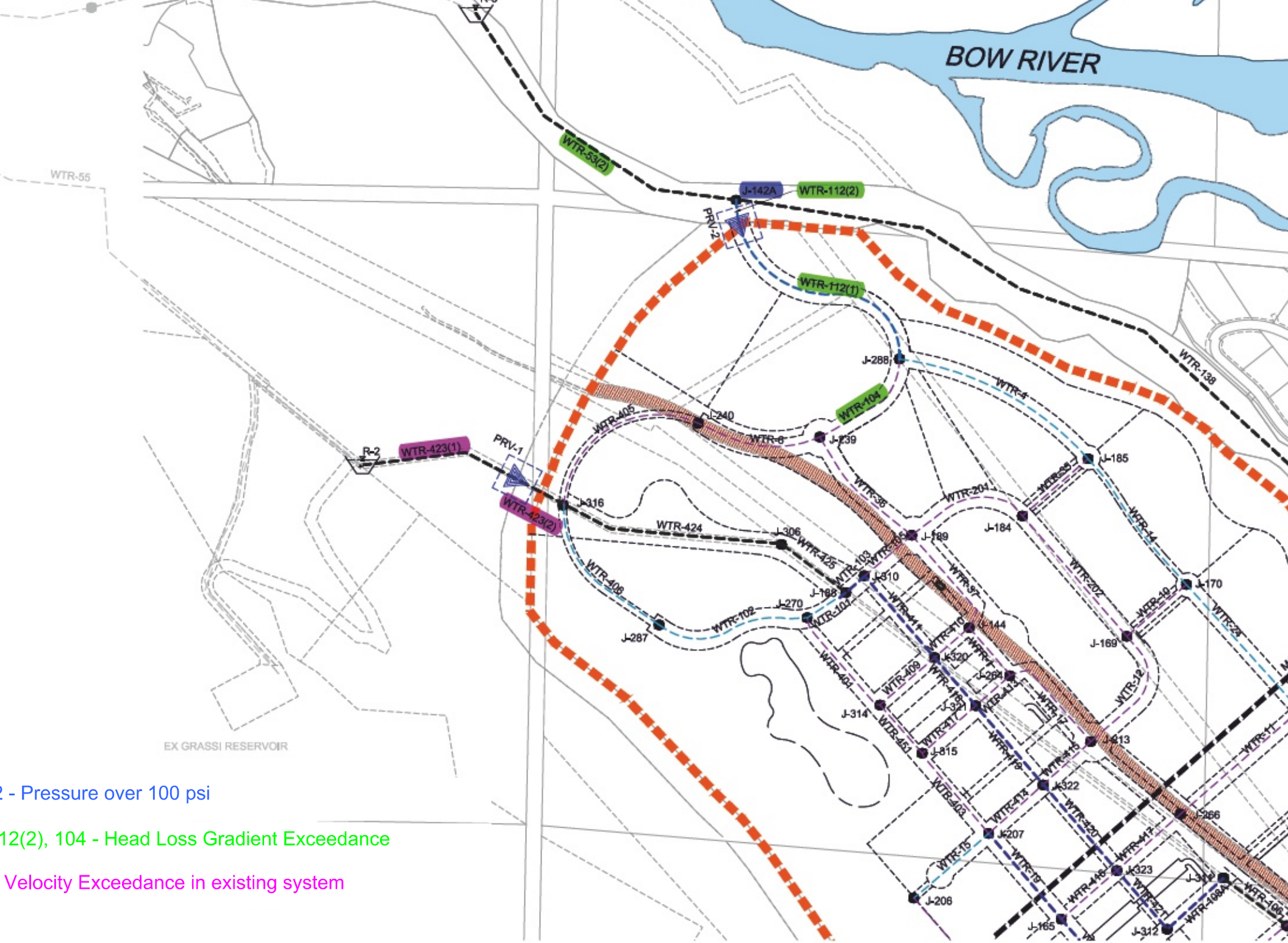
CONCEPTUAL 200 WATERMAIN

CONCEPTUAL 250 WATERMAIN

EXISTING 150 WATERMAIN

EXISTING 200 WATERMAIN

QUANTUMPLA



2 - Pressure over 100 psi

12(2), 104 - Head Loss Gradient Exceedance

Velocity Exceedance in existing system

VILLAGE ASP BOUNDARY

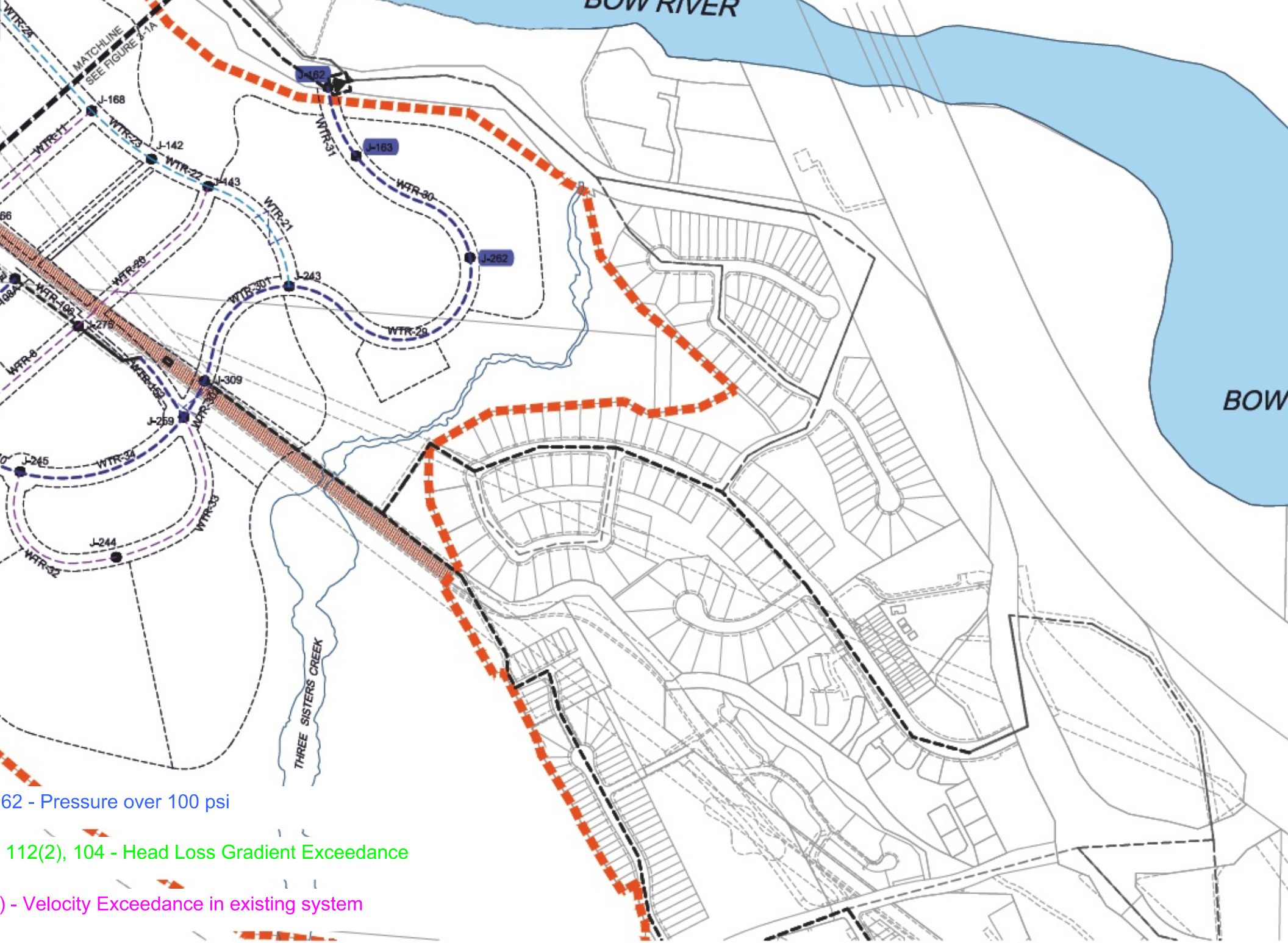
CONCEPTUAL 200 WATERMAIN

CONCEPTUAL 250 WATERMAIN

EXISTING 150 WATERMAIN

EXISTING 200 WATERMAIN

QUANTUMPLACE



62 - Pressure over 100 psi

112(2), 104 - Head Loss Gradient Exceedance

) - Velocity Exceedance in existing system

VILLAGE ASP BOUNDARY

CONCEPTUAL 200 WATERMAIN

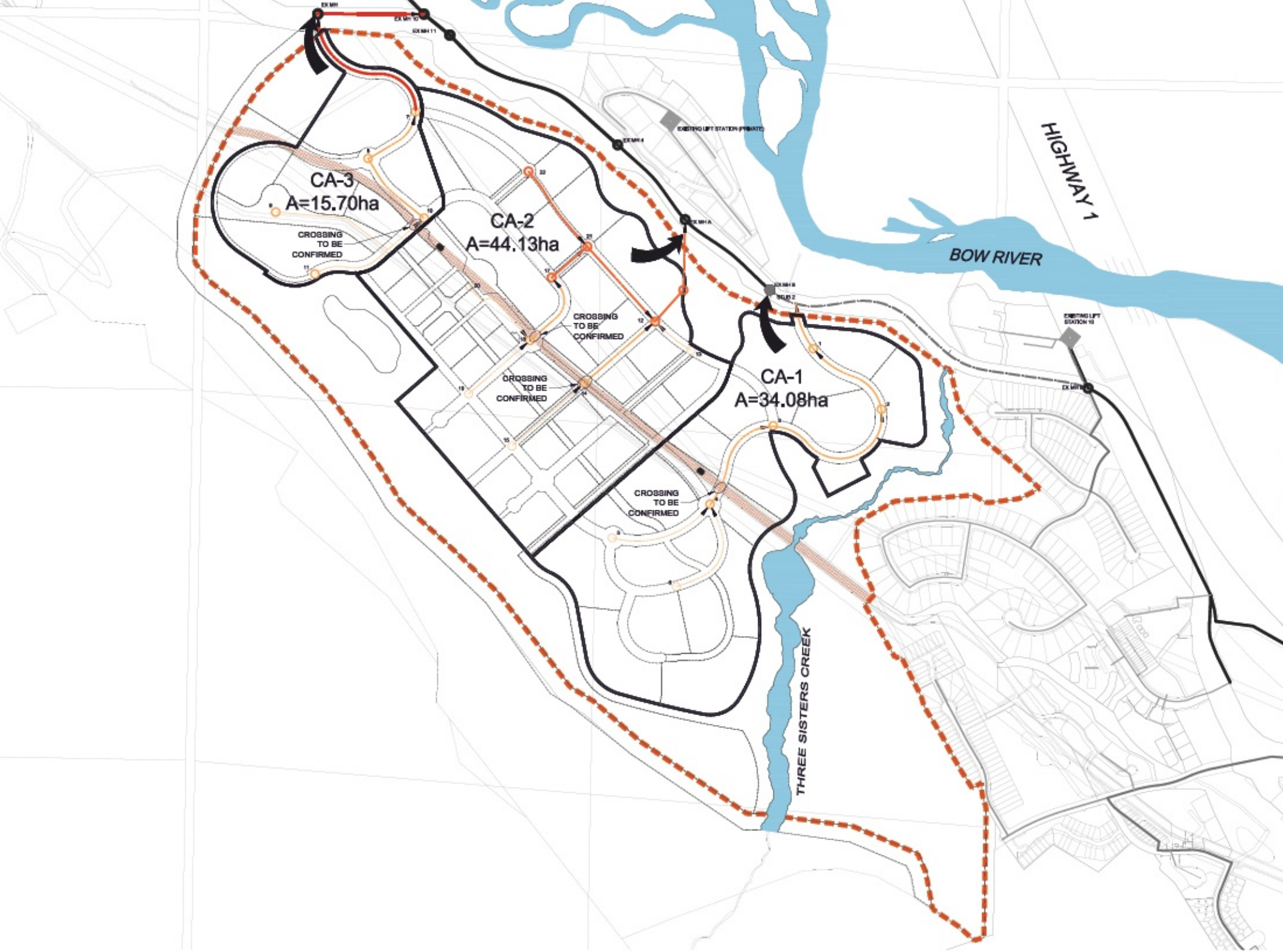
CONCEPTUAL 250 WATERMAIN

EXISTING 150 WATERMAIN

EXISTING 200 WATERMAIN

QUANTUMPLACE

APPENDIX B – CONCEPTUAL SANITARY NETWORK & SANITARY SEWER SPREADSHEET



VILLAGE ASP BOUNDARY
NDARIES

EXISTING 100mm SANITARY FORCEMAIN
EXISTING 300mm SANITARY FORCEMAIN

EXISTING 200mm SANITARY SEWER
EXISTING 250mm SANITARY SEWER

THREE SISTERS MOUNT
QUANTUMPLA

L/c/d
0 L/ha/d

L/unit/d
L/ha/d

2.5 or (1+14/(4+P^0.5); where p=populations in 1000's

THREE SISTERS VILLAGE ASP - PRELIMINARY SANITARY SEWER DESIGN CALCULATION

Residential & Retirement Areas											Non-Residential Areas												
ded Area (ha)	Tributary Area (ha)	Total Area (ha)	Added Units	Total Units Added	Persons per unit	Added Population (persons)	Total Population (persons)	Peak Factor	Ave. Dry Weather Flow (L/s)	Peak Flow (L/s) A	Retail / Commercial/ Industrial (ha)	Hotel (Units)	Added Flow (L/s)	Cumm. Flow (L/s)	Added Peak Flow (L/s)	Cummulative Peak Flow (L/s) B	Infiltration Allowance (L/s) C	Peak Dry Weather Flow (L/s) (A+B)	Total Design Flow (A+B+C) (L/s)	Pipe Slope (%)	Pipe Length (m)	Fu Ve
00		2.900	138	138	2.150	297	297	4.08	1.24	5.0	1.450		0.29	0.29	1.00	1.00	0.81	6.04	6.86	0.900		
60		7.060	269	407	2.090	562	859	3.84	3.58	13.7	0.650		0.13	0.41	0.45	1.45	1.98	15.19	17.17	1.000		
		7.060	0	407	2.100	0	859	3.84	3.58	13.7			0.00	0.41	0.00	1.45	1.98	15.19	17.17	1.000		
		7.060	0	407	2.100	0	859	3.84	3.58	13.7			0.00	0.41	0.00	1.45	1.98	15.19	17.17	1.000		
20		3.920	599	1006	1.600	958	958	3.81	3.99	15.2	3.930		0.77	0.77	2.71	2.71	1.10	17.93	19.03	0.900		
30		6.850	143	1149	2.100	300	1259	3.73	5.24	19.6	2.930		0.58	1.35	2.02	4.72	1.92	24.30	26.22	0.900		
50		7.700	0	1149	2.100	0	1259	3.73	5.24	19.6	0.910		0.18	1.53	0.63	5.35	2.16	24.93	27.09	0.500		
30		10.430	0	1149	2.100	0	1259	3.73	5.24	19.6		400.0	2.78	4.31	11.11	16.46	2.92	36.04	38.96	0.450		
10		6.610	498	1647	2.150	1071	1071	3.78	4.46	16.9			0.00	0.00	0.00	0.00	1.85	16.87	18.72	0.500		
10		12.120	443	2090	2.000	886	1957	3.59	8.15	29.3	0.810		0.16	4.47	0.56	0.56	3.39	29.85	33.25	1.500		
		29.610	0	2090	2.100	0	4074	3.33	16.98	56.5			0.00	4.47	0.00	18.47	8.29	74.93	**83.22**	3.000		
40		8.540	589	589	2.450	1443	1443	3.69	6.01	22.2			0.00	0.00	0.00	0.00	2.39	22.20	24.59	0.600		
30		12.370	279	868	2.050	572	2015	3.58	8.40	30.1			0.00	0.00	0.00	0.00	3.46	30.08	33.55	1.600		
90		14.760	164	1032	1.850	303	2318	3.54	9.66	34.1			0.00	0.00	0.00	0.00	4.13	34.15	38.28	2.600		
70		18.530	327	1359	2.050	670	2989	3.44	12.45	42.9			0.00	0.00	0.00	0.00	5.19	42.89	48.07	1.600		
40		22.570	279	1638	2.450	684	3672	3.37	15.30	51.5			0.00	0.00	0.00	0.00	6.32	51.51	57.83	3.000		
30		26.800	291	1929	2.450	713	4385	3.30	18.27	60.2			0.00	0.00	0.00	0.00	7.50	60.25	**67.75**	3.000		
30		2.430	0	0	2.100	0	0	4.50	0.00	0.0		80.0	0.56	0.56	2.22	2.22	0.68	2.22	2.90	0.800		
50		3.280	0	0	2.100	0	0	4.50	0.00	0.0		80.0	0.56	0.56	2.22	4.44	0.92	4.44	5.36	1.000		
80		5.960	0	0	2.100	0	0	4.50	0.00	0.0		90.0	0.63	0.63	2.50	6.94	1.67	6.94	8.61	0.400		
60		7.220	119	119	1.850	220	220	4.13	0.92	3.8			0.00	0.00	0.00	6.94	2.02	10.74	12.76	0.400		
40		10.060	196	315	2.450	480	700	3.89	2.92	11.4			0.00	0.00	0.00	6.94	2.82	18.31	**21.13**	0.400		
																			172.10			

APPENDIX C – WATERCAD MODEL OUTPUT

FlexTable: Reservoir Table

Active Scenario: MDD - Rev 2

ID	Label	Elevation (m)	Zone	Flow (Out net) (L/s)	Hydraulic Grade (m)
685	R-1	1,455.00	<None>	(N/A)	(N/A)
749	R-3	1,417.50	<None>	94.42	1,417.50
752	R-2	1,453.70	<None>	0.00	1,453.70

FlexTable: Junction Table

Active Scenario: MDD - Rev 2

ID	Label	Elevation (m)	Zone	Demand Collection	Demand (L/s)	Hydraulic Grade (m)	Pressure (psi)
156	J-81	1,385.33	<None>	<Collection: 0 items>	(N/A)	(N/A)	(N/A)
157	J-82	1,383.59	<None>	<Collection: 0 items>	(N/A)	(N/A)	(N/A)
263	J-142	1,344.00	<None>	<Collection: 1 items>	1.08	1,414.64	100
264	J-143	1,346.00	<None>	<Collection: 2 items>	5.80	1,414.63	97
266	J-144	1,363.00	<None>	<Collection: 2 items>	0.91	1,414.68	73
300	J-162	1,322.00	<None>	<Collection: 0 items>	0.00	1,416.04	133
301	J-163	1,329.00	<None>	<Collection: 1 items>	1.83	1,416.04	124
303	J-164	1,366.00	<None>	<Collection: 1 items>	1.08	1,414.63	69
304	J-165	1,366.00	<None>	<Collection: 1 items>	0.27	1,414.64	69
310	J-168	1,345.00	<None>	<Collection: 2 items>	2.81	1,414.65	99
313	J-169	1,361.00	<None>	<Collection: 0 items>	0.00	1,414.69	76
314	J-170	1,354.00	<None>	<Collection: 4 items>	10.12	1,414.69	86
340	J-184	1,369.00	<None>	<Collection: 1 items>	7.33	1,414.72	65
341	J-185	1,356.00	<None>	<Collection: 2 items>	2.42	1,414.79	83
346	J-188	1,372.50	<None>	<Collection: 0 items>	0.00	1,414.69	60
347	J-189	1,368.00	<None>	<Collection: 2 items>	3.28	1,414.71	66
382	J-204	1,372.84	<None>	<Collection: 2 items>	2.09	1,414.63	59
386	J-206	1,370.00	<None>	<Collection: 2 items>	2.87	1,414.64	63
387	J-207	1,366.00	<None>	<Collection: 2 items>	1.34	1,414.64	69
402	J-213	1,358.00	<None>	<Collection: 3 items>	1.71	1,414.67	80
461	J-239	1,367.00	<None>	<Collection: 1 items>	4.01	1,414.85	68
462	J-240	1,370.00	<None>	<Collection: 2 items>	1.80	1,414.78	64
469	J-243	1,351.00	<None>	<Collection: 1 items>	3.09	1,416.03	92
471	J-244	1,371.00	<None>	<Collection: 4 items>	10.14	1,414.61	62
472	J-245	1,369.00	<None>	<Collection: 1 items>	1.24	1,414.62	65
492	J-252	1,404.59	<None>	<Collection: 0 items>	(N/A)	(N/A)	(N/A)
514	J-259	1,359.00	<None>	<Collection: 2 items>	2.60	1,414.62	79
520	J-262	1,338.00	<None>	<Collection: 3 items>	5.71	1,416.03	111
525	J-264	1,362.00	<None>	<Collection: 1 items>	0.72	1,414.67	75
528	J-266	1,358.00	<None>	<Collection: 2 items>	0.97	1,414.64	80
538	J-270	1,374.00	<None>	<Collection: 1 items>	1.08	1,414.69	58

FlexTable: Junction Table

Active Scenario: MDD - Rev 2

ID	Label	Elevation (m)	Zone	Demand Collection	Demand (L/s)	Hydraulic Grade (m)	Pressure (psi)
572	J-284	1,368.50	<None>	<Collection: 2 items>	4.07	1,414.63	65
583	J-287	1,374.00	<None>	<Collection: 1 items>	1.33	1,414.69	58
589	J-288	1,361.00	<None>	<Collection: 2 items>	3.54	1,415.26	77
610	J-142A	1,344.00	<None>	<Collection: 0 items>	0.00	1,416.11	102
620	J-296	1,366.70	<None>	<Collection: 0 items>	(N/A)	(N/A)	(N/A)
658	J-309	1,357.00	<None>	<Collection: 0 items>	0.00	1,416.03	84
662	J-310	1,370.50	<None>	<Collection: 1 items>	0.62	1,414.69	63
665	J-311	1,357.00	<None>	<Collection: 0 items>	0.00	1,414.63	82
668	J-312	1,364.00	<None>	<Collection: 1 items>	0.21	1,414.64	72
687	J-314	1,370.00	<None>	<Collection: 2 items>	1.32	1,414.68	63
690	J-315	1,368.00	<None>	<Collection: 1 items>	1.06	1,414.67	66
710	J-316	1,372.14	<None>	<Collection: 0 items>	0.00	1,414.70	60
722	J-320	1,369.06	<None>	<Collection: 0 items>	0.00	1,414.68	65
725	J-321	1,364.35	<None>	<Collection: 0 items>	0.00	1,414.67	71
728	J-322	1,361.75	<None>	<Collection: 0 items>	0.00	1,414.66	75
731	J-323	1,362.28	<None>	<Collection: 0 items>	0.00	1,414.64	74
777	J-306	1,385.00	<None>	<Collection: 0 items>	0.00	1,414.69	42
796	J-275	1,356.50	<None>	<Collection: 4 items>	5.97	1,414.63	83

Active Scenario: MDD - Rev 2

	Start Node	Stop Node	Diameter (mm)	Length (m)	Material	Hazen-Williams C	Has Check Valve?	Minor Loss Coefficient (Local)	Flow (L/s)	Velocity (m/s)	Headloss Gradient (m/km)	Has User Defined Length?	Length (User Defined) (m)	Headloss (m)
57	J-81	J-82	350.0	57	PVC	120.0	False	0.000	(N/A)	(N/A)	(N/A)	False	0	(N/A)
72	J-82	J-296	350.0	372	PVC	120.0	False	0.000	(N/A)	(N/A)	(N/A)	False	0	(N/A)
73	J-252	J-81	350.0	773	PVC	120.0	False	0.000	(N/A)	(N/A)	(N/A)	False	0	(N/A)
29	R-1	J-252	350.0	429	PVC	120.0	False	0.000	(N/A)	(N/A)	(N/A)	False	0	(N/A)
20	J-296	R-3	350.0	520	PVC	120.0	False	0.000	(N/A)	(N/A)	(N/A)	False	0	(N/A)
79	J-252	R-2	350.0	179	PVC	120.0	False	0.000	(N/A)	(N/A)	(N/A)	False	0	(N/A)
79	J-143	J-243	300.0	179	PVC	120.0	True	0.000	0.00	0.00	0.000000	False	0	0.00
54	J-259	J-309	350.0	54	PVC	120.0	True	0.000	0.00	0.00	0.000000	False	0	0.00
27	R-2	PRV-1	350.0	227	PVC	120.0	False	0.000	0.00	0.00	0.000000	False	0	0.00
32	J-243	J-309	350.0	182	PVC	120.0	False	0.000	0.00	0.00	0.000000	False	0	0.00
53	PRV-1	J-316	350.0	53	PVC	120.0	False	0.000	0.00	0.00	0.000000	False	0	0.00
26	J-204	J-164	300.0	126	PVC	120.0	False	0.000	0.78	0.01	0.001181	False	0	0.00
14	J-284	J-275	250.0	214	PVC	120.0	False	0.000	-0.63	0.01	0.001393	False	0	0.00
39	J-259	J-245	350.0	239	PVC	120.0	False	0.000	-1.33	0.01	0.001245	False	0	0.00
10	J-266	J-323	250.0	110	PVC	120.0	False	0.000	0.80	0.02	0.002694	False	0	0.00
03	J-169	J-170	250.0	103	PVC	120.0	False	0.000	1.20	0.02	0.005803	False	0	0.00
26	J-262	J-243	350.0	326	PVC	120.0	False	0.000	3.09	0.03	0.005937	False	0	0.00
06	J-168	J-266	250.0	206	PVC	120.0	False	0.000	1.77	0.04	0.010110	False	0	0.00
32	J-188	J-310	350.0	32	PVC	120.0	False	0.000	3.63	0.04	0.009221	False	0	0.00
50	J-270	J-188	300.0	60	PVC	120.0	False	0.000	-2.87	0.04	0.009920	False	0	0.00
96	J-314	J-320	250.0	96	PVC	120.0	False	0.000	-2.16	0.04	0.013916	False	0	0.00
49	J-213	J-264	250.0	149	PVC	120.0	False	0.000	-2.20	0.04	0.015999	False	0	0.00
52	J-275	J-143	250.0	252	PVC	120.0	False	0.000	-2.27	0.05	0.015953	False	0	0.00
52	J-320	J-144	250.0	62	PVC	120.0	False	0.000	-2.29	0.05	0.016747	False	0	0.00
02	J-287	J-270	300.0	202	PVC	120.0	False	0.000	3.68	0.05	0.016208	False	0	0.00
95	J-321	J-315	250.0	95	PVC	120.0	False	0.000	2.66	0.05	0.022005	False	0	0.00
44	J-206	J-204	250.0	244	PVC	120.0	False	0.000	2.87	0.06	0.025046	False	0	0.01
61	J-264	J-321	250.0	61	PVC	120.0	False	0.000	2.97	0.06	0.026829	False	0	0.00
92	J-275	J-259	350.0	192	PVC	120.0	False	0.000	6.13	0.06	0.020140	False	0	0.00
92	J-316	J-306	350.0	292	PVC	120.0	False	0.000	6.50	0.07	0.021900	False	0	0.01
04	J-306	J-188	350.0	104	PVC	120.0	False	0.000	6.50	0.07	0.022808	False	0	0.00
11	J-316	J-287	300.0	211	PVC	120.0	False	0.000	5.01	0.07	0.028937	False	0	0.01
96	J-323	J-165	250.0	96	PVC	120.0	False	0.000	3.93	0.08	0.044981	False	0	0.00
29	J-206	J-207	300.0	129	PVC	120.0	False	0.000	-5.74	0.08	0.038211	False	0	0.00
02	J-245	J-284	350.0	102	PVC	120.0	False	0.000	-7.85	0.08	0.032029	False	0	0.00
46	J-165	J-207	350.0	146	PVC	120.0	False	0.000	-7.93	0.08	0.032625	False	0	0.00
06	J-163	J-262	350.0	206	PVC	120.0	False	0.000	8.80	0.09	0.038985	False	0	0.01
57	J-189	J-184	250.0	167	PVC	120.0	False	0.000	-4.53	0.09	0.058935	False	0	0.01
55	J-259	J-244	250.0	255	PVC	120.0	False	0.000	4.85	0.10	0.066616	False	0	0.02
21	J-244	J-245	250.0	221	PVC	120.0	False	0.000	-5.29	0.11	0.078046	False	0	0.02
99	J-311	J-312	350.0	99	PVC	120.0	False	0.000	-10.45	0.11	0.052690	False	0	0.01
03	J-311	J-275	350.0	103	PVC	120.0	False	0.000	10.45	0.11	0.053439	False	0	0.01
98	J-162	J-163	350.0	98	PVC	120.0	False	0.000	10.63	0.11	0.054701	False	0	0.01
57	J-142A	J-162	350.0	1,257	PVC	120.0	False	0.000	10.63	0.11	0.055406	False	0	0.07
01	J-323	J-312	350.0	101	PVC	120.0	False	0.000	10.66	0.11	0.056252	False	0	0.01
50	J-270	J-314	250.0	150	PVC	120.0	False	0.000	5.47	0.11	0.083203	False	0	0.01

Active Scenario: MDD - Rev 2

)	Start Node	Stop Node	Diameter (mm)	Length (m)	Material	Hazen-Williams C	Has Check Valve?	Minor Loss Coefficient (Local)	Flow (L/s)	Velocity (m/s)	Headloss Gradient (m/km)	Has User Defined Length?	Length (User Defined) (m)	Headloss (m)
32	J-142	J-143	300.0	82	PVC	120.0	False	0.000	8.07	0.11	0.070712	False	0	0.01
97	J-284	J-164	350.0	97	PVC	120.0	False	0.000	-11.30	0.12	0.061369	False	0	0.01
82	J-144	J-264	250.0	82	PVC	120.0	False	0.000	5.88	0.12	0.094644	False	0	0.01
98	J-164	J-165	350.0	98	PVC	120.0	False	0.000	-11.59	0.12	0.064984	False	0	0.01
83	J-314	J-315	250.0	83	PVC	120.0	False	0.000	6.31	0.13	0.109030	False	0	0.01
00	J-168	J-142	300.0	100	PVC	120.0	False	0.000	9.15	0.13	0.089058	False	0	0.01
76	J-169	J-213	250.0	176	PVC	120.0	False	0.000	6.50	0.13	0.115524	False	0	0.02
34	J-310	J-320	350.0	134	PVC	120.0	False	0.000	13.46	0.14	0.085798	False	0	0.01
96	J-320	J-321	350.0	96	PVC	120.0	False	0.000	13.60	0.14	0.086629	False	0	0.01
84	J-213	J-322	250.0	84	PVC	120.0	False	0.000	6.99	0.14	0.129741	False	0	0.01
47	J-322	J-323	350.0	147	PVC	120.0	False	0.000	13.79	0.14	0.090183	False	0	0.01
28	J-321	J-322	350.0	128	PVC	120.0	False	0.000	13.91	0.14	0.090837	False	0	0.01
95	J-322	J-207	250.0	95	PVC	120.0	False	0.000	7.11	0.14	0.135085	False	0	0.01
07	J-184	J-169	250.0	207	PVC	120.0	False	0.000	7.70	0.16	0.156660	False	0	0.03
36	J-315	J-207	250.0	136	PVC	120.0	False	0.000	7.91	0.16	0.164461	False	0	0.02
54	J-144	J-189	250.0	154	PVC	120.0	False	0.000	-9.09	0.19	0.213452	False	0	0.03
20	J-170	J-168	300.0	220	PVC	120.0	False	0.000	13.74	0.19	0.188814	False	0	0.04
81	J-310	J-189	250.0	81	PVC	120.0	False	0.000	-10.46	0.21	0.277116	False	0	0.02
41	J-240	J-316	250.0	241	PVC	120.0	False	0.000	11.51	0.23	0.330351	False	0	0.08
55	J-239	J-240	250.0	165	PVC	120.0	False	0.000	13.31	0.27	0.433052	False	0	0.07
08	J-185	J-170	300.0	208	PVC	120.0	False	0.000	22.66	0.32	0.476998	False	0	0.10
77	J-189	J-239	250.0	177	PVC	120.0	False	0.000	-18.29	0.37	0.779754	False	0	0.14
13	J-184	J-185	250.0	113	PVC	150.0	False	0.000	-19.56	0.40	0.583778	False	0	0.07
84	J-288	J-185	300.0	284	PVC	120.0	False	0.000	44.64	0.63	1.673542	False	0	0.47
54	J-239	J-288	250.0	154	PVC	120.0	False	0.000	-35.61	0.73	2.676112	False	0	0.41
41	J-142A	PRV-2	350.0	41	PVC	120.0	False	0.000	83.79	0.87	2.535266	False	0	0.10
94	PRV-2	J-288	350.0	294	PVC	120.0	False	0.000	83.79	0.87	2.534954	False	0	0.75
39	R-3	J-142A	350.0	439	PVC	120.0	False	0.000	94.42	0.98	3.162671	False	0	1.39

Active Scenario: Automated MDD +FF

Satisfies Fire Flow Constraints?	Fire Flow (Needed) (L/s)	Fire Flow (Available) (L/s)	Flow (Total Needed) (L/s)	Flow (Total Available) (L/s)	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?	Velocity o Maximum Pipe (m/s)
False	200.00	(N/A)	(N/A)	(N/A)	20	(N/A)	20	(N/A)	(N/A)	(N/A)	(N/A)	(N/A)	False	(N/A
False	200.00	(N/A)	(N/A)	(N/A)	20	(N/A)	20	(N/A)	(N/A)	(N/A)	(N/A)	(N/A)	False	(N/A
True	200.00	300.00	201.08	301.08	20	78	20	34	J-306	(N/A)	34	J-306	True	3.9
True	200.00	300.00	205.80	305.80	20	73	20	34	J-306	(N/A)	34	J-306	True	3.9
True	200.00	300.00	200.91	300.91	20	59	20	34	J-306	(N/A)	34	J-306	True	4.0
True	200.00	300.00	200.00	300.00	20	109	20	37	J-306	(N/A)	37	J-306	True	2.9
True	200.00	300.00	201.83	301.83	20	100	20	37	J-306	(N/A)	37	J-306	True	3.0
True	200.00	300.00	201.08	301.08	20	52	20	34	J-306	(N/A)	34	J-306	True	3.9
True	200.00	300.00	200.27	300.27	20	53	20	34	J-306	(N/A)	34	J-306	True	3.9
True	200.00	300.00	202.81	302.81	20	79	20	34	J-306	(N/A)	34	J-306	True	3.9
True	200.00	300.00	200.00	300.00	20	58	20	35	J-306	(N/A)	35	J-306	True	3.9
True	200.00	300.00	210.12	310.12	20	69	20	35	J-306	(N/A)	35	J-306	True	3.8
True	200.00	300.00	207.33	307.33	20	47	20	35	J-306	(N/A)	35	J-306	True	3.9
True	200.00	300.00	202.42	302.42	20	67	20	35	J-306	(N/A)	35	J-306	True	3.8
True	200.00	300.00	200.00	300.00	20	48	20	33	J-306	(N/A)	33	J-306	True	4.3
True	200.00	300.00	203.28	303.28	20	52	20	34	J-306	(N/A)	34	J-306	True	4.1
True	200.00	300.00	202.09	302.09	20	37	20	34	J-306	(N/A)	34	J-306	True	3.9
True	200.00	300.00	202.87	302.87	20	42	20	34	J-306	(N/A)	34	J-306	True	3.9
True	200.00	300.00	201.34	301.34	20	53	20	34	J-306	(N/A)	34	J-306	True	3.9
True	200.00	300.00	201.71	301.71	20	64	20	34	J-306	(N/A)	34	J-306	True	3.9
True	200.00	300.00	204.01	304.01	20	52	20	35	J-306	(N/A)	35	J-306	True	4.0
True	200.00	300.00	201.80	301.80	20	43	20	35	J-306	(N/A)	35	J-306	True	4.4
True	200.00	300.00	203.09	303.09	20	74	20	36	J-306	(N/A)	36	J-306	True	3.5
True	200.00	300.00	210.14	310.14	20	29	20	34	J-306	(N/A)	34	J-306	True	3.9
True	200.00	300.00	201.24	301.24	20	46	20	34	J-306	(N/A)	34	J-306	True	3.9
False	200.00	(N/A)	(N/A)	(N/A)	20	(N/A)	20	(N/A)	(N/A)	(N/A)	(N/A)	(N/A)	False	(N/A
True	200.00	300.00	202.60	302.60	20	59	20	34	J-306	(N/A)	34	J-306	True	3.9
True	200.00	300.00	205.71	305.71	20	89	20	37	J-306	(N/A)	37	J-306	True	3.2
True	200.00	300.00	200.72	300.72	20	60	20	34	J-306	(N/A)	34	J-306	True	4.0
True	200.00	300.00	200.97	300.97	20	57	20	34	J-306	(N/A)	34	J-306	True	3.9
True	200.00	300.00	201.08	301.08	20	46	20	33	J-306	(N/A)	33	J-306	True	4.3
True	200.00	300.00	204.07	304.07	20	48	20	34	J-306	(N/A)	34	J-306	True	3.9
True	200.00	300.00	201.33	301.33	20	46	20	34	J-306	(N/A)	34	J-306	True	4.5
True	200.00	300.00	203.54	303.54	20	61	20	36	J-306	(N/A)	36	J-306	True	3.5
True	200.00	300.00	200.00	300.00	20	81	20	39	J-306	(N/A)	39	J-306	True	2.2
False	200.00	(N/A)	(N/A)	(N/A)	20	(N/A)	20	(N/A)	(N/A)	(N/A)	(N/A)	(N/A)	False	(N/A
True	200.00	300.00	200.00	300.00	20	66	20	35	J-306	(N/A)	35	J-306	True	3.6
True	200.00	300.00	200.62	300.62	20	51	20	33	J-306	(N/A)	33	J-306	True	4.2
True	200.00	300.00	200.00	300.00	20	64	20	34	J-306	(N/A)	34	J-306	True	3.9
True	200.00	300.00	200.21	300.21	20	55	20	34	J-306	(N/A)	34	J-306	True	3.9
True	200.00	300.00	201.32	301.32	20	49	20	34	J-306	(N/A)	34	J-306	True	4.1
True	200.00	300.00	201.06	301.06	20	51	20	34	J-306	(N/A)	34	J-306	True	4.0
True	200.00	300.00	200.00	300.00	20	56	20	37	J-306	(N/A)	37	J-306	True	4.7
True	200.00	300.00	200.00	300.00	20	52	20	34	J-306	(N/A)	34	J-306	True	4.0
True	200.00	300.00	200.00	300.00	20	58	20	34	J-306	(N/A)	34	J-306	True	3.9

Active Scenario: Automated MDD +FF

Satisfies Fire Flow Constraints?	Fire Flow (Needed) (L/s)	Fire Flow (Available) (L/s)	Flow (Total Needed) (L/s)	Flow (Total Available) (L/s)	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?	Velocity o Maximum Pipe (m/s)
True	200.00	300.00	200.00	300.00	20	61	20	34	J-306	(N/A)	34	J-306	True	3.9
True	200.00	300.00	200.00	300.00	20	59	20	34	J-306	(N/A)	34	J-306	True	3.9
True	200.00	300.00	200.00	300.00	20	31	20	48	J-270	(N/A)	48	J-270	True	4.4
True	200.00	300.00	205.97	305.97	20	65	20	34	J-306	(N/A)	34	J-306	True	3.9

Active Scenario: Automated MDD + FF - 300L/s - Rev 2

Satisfies Fire Flow Constraints?	Fire Flow (Needed) (L/s)	Fire Flow (Available) (L/s)	Flow (Total Needed) (L/s)	Flow (Total Available) (L/s)	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?	Velocity o Maximum Pipe (m/s)
False	300.00	(N/A)	(N/A)	(N/A)	20	(N/A)	20	(N/A)	(N/A)	(N/A)	(N/A)	(N/A)	False	(N/A
False	300.00	(N/A)	(N/A)	(N/A)	20	(N/A)	20	(N/A)	(N/A)	(N/A)	(N/A)	(N/A)	False	(N/A
False	300.00	(N/A)	(N/A)	(N/A)	20	(N/A)	20	(N/A)	(N/A)	(N/A)	(N/A)	(N/A)	False	(N/A
False	300.00	(N/A)	(N/A)	(N/A)	20	(N/A)	20	(N/A)	(N/A)	(N/A)	(N/A)	(N/A)	False	(N/A
True	300.00	400.00	300.91	400.91	20	54	20	32	J-306	(N/A)	32	J-306	True	4.6
False	300.00	(N/A)	(N/A)	(N/A)	20	(N/A)	20	(N/A)	(N/A)	(N/A)	(N/A)	(N/A)	False	(N/A
False	300.00	(N/A)	(N/A)	(N/A)	20	(N/A)	20	(N/A)	(N/A)	(N/A)	(N/A)	(N/A)	False	(N/A
True	300.00	400.00	301.08	401.08	20	45	20	32	J-306	(N/A)	32	J-306	True	4.5
True	300.00	400.00	300.27	400.27	20	46	20	32	J-306	(N/A)	32	J-306	True	4.5
False	300.00	(N/A)	(N/A)	(N/A)	20	(N/A)	20	(N/A)	(N/A)	(N/A)	(N/A)	(N/A)	False	(N/A
True	300.00	400.00	300.00	400.00	20	51	20	33	J-306	(N/A)	33	J-306	True	4.4
False	300.00	(N/A)	(N/A)	(N/A)	20	(N/A)	20	(N/A)	(N/A)	(N/A)	(N/A)	(N/A)	False	(N/A
True	300.00	400.00	307.33	407.33	20	41	20	33	J-306	(N/A)	33	J-306	True	4.3
False	300.00	(N/A)	(N/A)	(N/A)	20	(N/A)	20	(N/A)	(N/A)	(N/A)	(N/A)	(N/A)	False	(N/A
True	300.00	400.00	300.00	400.00	20	46	20	30	J-306	(N/A)	30	J-306	True	4.8
True	300.00	400.00	303.28	403.28	20	49	20	32	J-306	(N/A)	32	J-306	True	4.5
True	300.00	400.00	302.09	402.09	20	27	20	32	J-306	(N/A)	32	J-306	True	4.5
True	300.00	400.00	302.87	402.87	20	32	20	32	J-306	(N/A)	32	J-306	True	4.5
True	300.00	400.00	301.34	401.34	20	47	20	32	J-306	(N/A)	32	J-306	True	4.5
True	300.00	400.00	301.71	401.71	20	58	20	32	J-306	(N/A)	32	J-306	True	4.5
True	300.00	400.00	304.01	404.01	20	46	20	34	J-306	(N/A)	34	J-306	True	4.4
True	300.00	400.00	301.80	401.80	20	33	20	34	J-306	(N/A)	34	J-306	True	4.9
False	300.00	(N/A)	(N/A)	(N/A)	20	(N/A)	20	(N/A)	(N/A)	(N/A)	(N/A)	(N/A)	False	(N/A
False	300.00	(N/A)	(N/A)	(N/A)	20	(N/A)	20	(N/A)	(N/A)	(N/A)	(N/A)	(N/A)	False	(N/A
False	300.00	(N/A)	(N/A)	(N/A)	20	(N/A)	20	(N/A)	(N/A)	(N/A)	(N/A)	(N/A)	False	(N/A
False	300.00	(N/A)	(N/A)	(N/A)	20	(N/A)	20	(N/A)	(N/A)	(N/A)	(N/A)	(N/A)	False	(N/A
False	300.00	(N/A)	(N/A)	(N/A)	20	(N/A)	20	(N/A)	(N/A)	(N/A)	(N/A)	(N/A)	False	(N/A
False	300.00	(N/A)	(N/A)	(N/A)	20	(N/A)	20	(N/A)	(N/A)	(N/A)	(N/A)	(N/A)	False	(N/A
True	300.00	400.00	300.72	400.72	20	54	20	32	J-306	(N/A)	32	J-306	True	4.6
False	300.00	(N/A)	(N/A)	(N/A)	20	(N/A)	20	(N/A)	(N/A)	(N/A)	(N/A)	(N/A)	False	(N/A
True	300.00	400.00	301.08	401.08	20	42	20	31	J-306	(N/A)	31	J-306	True	4.8
False	300.00	(N/A)	(N/A)	(N/A)	20	(N/A)	20	(N/A)	(N/A)	(N/A)	(N/A)	(N/A)	False	(N/A
True	300.00	400.00	301.33	401.33	20	40	20	32	J-306	(N/A)	32	J-306	True	5.2
False	300.00	(N/A)	(N/A)	(N/A)	20	(N/A)	20	(N/A)	(N/A)	(N/A)	(N/A)	(N/A)	False	(N/A
False	300.00	(N/A)	(N/A)	(N/A)	20	(N/A)	20	(N/A)	(N/A)	(N/A)	(N/A)	(N/A)	False	(N/A
False	300.00	(N/A)	(N/A)	(N/A)	20	(N/A)	20	(N/A)	(N/A)	(N/A)	(N/A)	(N/A)	False	(N/A
False	300.00	(N/A)	(N/A)	(N/A)	20	(N/A)	20	(N/A)	(N/A)	(N/A)	(N/A)	(N/A)	False	(N/A
True	300.00	400.00	300.62	400.62	20	48	20	31	J-306	(N/A)	31	J-306	True	4.7
False	300.00	(N/A)	(N/A)	(N/A)	20	(N/A)	20	(N/A)	(N/A)	(N/A)	(N/A)	(N/A)	False	(N/A
False	300.00	(N/A)	(N/A)	(N/A)	20	(N/A)	20	(N/A)	(N/A)	(N/A)	(N/A)	(N/A)	False	(N/A
True	300.00	400.00	301.32	401.32	20	43	20	31	J-306	(N/A)	31	J-306	True	4.6
True	300.00	400.00	301.06	401.06	20	45	20	32	J-306	(N/A)	32	J-306	True	4.6
True	300.00	400.00	300.00	400.00	20	54	20	35	J-306	(N/A)	35	J-306	True	5.7
True	300.00	400.00	300.00	400.00	20	48	20	32	J-306	(N/A)	32	J-306	True	4.6
True	300.00	400.00	300.00	400.00	20	54	20	32	J-306	(N/A)	32	J-306	True	4.6

Active Scenario: Automated MDD + FF - 300L/s - Rev 2

Satisfies Fire Flow Constraints?	Fire Flow (Needed) (L/s)	Fire Flow (Available) (L/s)	Flow (Total Needed) (L/s)	Flow (Total Available) (L/s)	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?	Velocity o Maximum Pipe (m/s)
True	300.00	400.00	300.00	400.00	20	56	20	32	J-306	(N/A)	32	J-306	True	4.5
True	300.00	400.00	300.00	400.00	20	53	20	32	J-306	(N/A)	32	J-306	True	4.5
False	300.00	(N/A)	(N/A)	(N/A)	20	(N/A)	20	(N/A)	(N/A)	(N/A)	(N/A)	(N/A)	False	(N/A
False	300.00	(N/A)	(N/A)	(N/A)	20	(N/A)	20	(N/A)	(N/A)	(N/A)	(N/A)	(N/A)	False	(N/A

FlexTable: Reservoir Table

Active Scenario: MDD + FF @ J-204

ID	Label	Elevation (m)	Zone	Flow (Out net) (L/s)	Hydraulic Grade (m)
685	R-1	1,435.50	<None>	(N/A)	(N/A)
749	R-3	1,405.80	<None>	10.63	1,405.80
752	R-2	1,434.15	<None>	383.55	1,434.15

FlexTable: Junction Table

Active Scenario: MDD + FF @ J-204

ID	Label	Elevation (m)	Zone	Demand Collection	Demand (L/s)	Hydraulic Grade (m)	Pressure (psi)
156	J-81	1,385.33	<None>	<Collection: 0 items>	(N/A)	(N/A)	(N/A)
157	J-82	1,383.59	<None>	<Collection: 0 items>	(N/A)	(N/A)	(N/A)
263	J-142	1,344.00	<None>	<Collection: 1 items>	1.08	1,404.50	86
264	J-143	1,346.00	<None>	<Collection: 2 items>	5.80	1,404.39	83
266	J-144	1,363.00	<None>	<Collection: 2 items>	0.91	1,406.39	62
300	J-162	1,322.00	<None>	<Collection: 0 items>	0.00	1,405.71	119
301	J-163	1,329.00	<None>	<Collection: 1 items>	1.83	1,405.70	109
303	J-164	1,366.00	<None>	<Collection: 1 items>	1.08	1,403.01	53
304	J-165	1,366.00	<None>	<Collection: 1 items>	0.27	1,403.59	53
310	J-168	1,345.00	<None>	<Collection: 2 items>	2.81	1,404.64	85
313	J-169	1,361.00	<None>	<Collection: 0 items>	0.00	1,405.47	63
314	J-170	1,354.00	<None>	<Collection: 4 items>	10.12	1,405.38	73
340	J-184	1,369.00	<None>	<Collection: 1 items>	7.33	1,405.94	52
341	J-185	1,356.00	<None>	<Collection: 2 items>	2.42	1,405.90	71
346	J-188	1,372.50	<None>	<Collection: 0 items>	0.00	1,408.02	50
347	J-189	1,368.00	<None>	<Collection: 2 items>	3.28	1,406.85	55
382	J-204	1,372.84	<None>	<Collection: 3 items>	301.85	1,399.27	38
386	J-206	1,370.00	<None>	<Collection: 2 items>	2.87	1,403.00	47
387	J-207	1,366.00	<None>	<Collection: 2 items>	1.34	1,403.85	54
402	J-213	1,358.00	<None>	<Collection: 3 items>	1.71	1,405.39	67
461	J-239	1,367.00	<None>	<Collection: 1 items>	4.01	1,407.15	57
462	J-240	1,370.00	<None>	<Collection: 2 items>	1.80	1,409.18	56
469	J-243	1,351.00	<None>	<Collection: 1 items>	3.09	1,405.69	78
471	J-244	1,371.00	<None>	<Collection: 4 items>	10.14	1,403.34	46
472	J-245	1,369.00	<None>	<Collection: 1 items>	1.24	1,403.32	49
492	J-252	1,404.59	<None>	<Collection: 0 items>	(N/A)	(N/A)	(N/A)
514	J-259	1,359.00	<None>	<Collection: 2 items>	2.60	1,403.50	63
520	J-262	1,338.00	<None>	<Collection: 3 items>	5.71	1,405.69	96
525	J-264	1,362.00	<None>	<Collection: 1 items>	0.72	1,405.86	62
528	J-266	1,358.00	<None>	<Collection: 2 items>	0.97	1,404.43	66
538	J-270	1,374.00	<None>	<Collection: 1 items>	1.08	1,408.11	48

FlexTable: Junction Table

Active Scenario: MDD + FF @ J-204

ID	Label	Elevation (m)	Zone	Demand Collection	Demand (L/s)	Hydraulic Grade (m)	Pressure (psi)
572	J-284	1,368.50	<None>	<Collection: 2 items>	4.07	1,403.23	49
583	J-287	1,374.00	<None>	<Collection: 1 items>	1.33	1,410.12	51
589	J-288	1,361.00	<None>	<Collection: 2 items>	3.54	1,406.40	64
610	J-142A	1,344.00	<None>	<Collection: 0 items>	0.00	1,405.78	88
620	J-296	1,366.70	<None>	<Collection: 0 items>	(N/A)	(N/A)	(N/A)
658	J-309	1,357.00	<None>	<Collection: 0 items>	0.00	1,405.69	69
662	J-310	1,370.50	<None>	<Collection: 1 items>	0.62	1,407.53	53
665	J-311	1,357.00	<None>	<Collection: 0 items>	0.00	1,403.97	67
668	J-312	1,364.00	<None>	<Collection: 1 items>	0.21	1,404.14	57
687	J-314	1,370.00	<None>	<Collection: 2 items>	1.32	1,406.47	52
690	J-315	1,368.00	<None>	<Collection: 1 items>	1.06	1,405.73	54
710	J-316	1,372.14	<None>	<Collection: 0 items>	0.00	1,412.27	57
722	J-320	1,369.06	<None>	<Collection: 0 items>	0.00	1,406.45	53
725	J-321	1,364.35	<None>	<Collection: 0 items>	0.00	1,405.81	59
728	J-322	1,361.75	<None>	<Collection: 0 items>	0.00	1,404.96	61
731	J-323	1,362.28	<None>	<Collection: 0 items>	0.00	1,404.32	60
777	J-306	1,385.00	<None>	<Collection: 0 items>	0.00	1,409.14	34
796	J-275	1,356.50	<None>	<Collection: 4 items>	5.97	1,403.78	67

Active Scenario: MDD + FF @ J-204

)	Start Node	Stop Node	Diameter (mm)	Length (m)	Material	Hazen-Williams C	Has Check Valve?	Minor Loss Coefficient (Local)	Flow (L/s)	Velocity (m/s)	Headloss Gradient (m/km)	Has User Defined Length?	Length (User Defined) (m)	Headloss (m)
57	J-81	J-82	350.0	57	PVC	120.0	False	0.000	(N/A)	(N/A)	(N/A)	False	0	(N/A)
72	J-82	J-296	350.0	372	PVC	120.0	False	0.000	(N/A)	(N/A)	(N/A)	False	0	(N/A)
73	J-252	J-81	350.0	773	PVC	120.0	False	0.000	(N/A)	(N/A)	(N/A)	False	0	(N/A)
29	R-1	J-252	350.0	429	PVC	120.0	False	0.000	(N/A)	(N/A)	(N/A)	False	0	(N/A)
20	J-296	R-3	350.0	520	PVC	120.0	False	0.000	(N/A)	(N/A)	(N/A)	False	0	(N/A)
79	J-252	R-2	350.0	179	PVC	120.0	False	0.000	(N/A)	(N/A)	(N/A)	False	0	(N/A)
79	J-143	J-243	300.0	179	PVC	120.0	True	0.000	0.00	0.00	0.000000	False	0	0.00
54	J-259	J-309	350.0	54	PVC	120.0	True	0.000	0.00	0.00	0.000000	False	0	0.00
82	J-243	J-309	350.0	182	PVC	120.0	False	0.000	0.00	0.00	0.000000	False	0	0.00
41	J-142A	PRV-2	350.0	41	PVC	120.0	False	0.000	0.00	0.00	0.000000	False	0	0.00
94	PRV-2	J-288	350.0	294	PVC	120.0	False	0.000	0.00	0.00	0.000000	False	0	0.00
26	J-262	J-243	350.0	326	PVC	120.0	False	0.000	3.09	0.03	0.005480	False	0	0.00
06	J-163	J-262	350.0	206	PVC	120.0	False	0.000	8.80	0.09	0.038985	False	0	0.01
98	J-162	J-163	350.0	98	PVC	120.0	False	0.000	10.63	0.11	0.056221	False	0	0.01
57	J-142A	J-162	350.0	1,257	PVC	120.0	False	0.000	10.63	0.11	0.055406	False	0	0.07
39	R-3	J-142A	350.0	439	PVC	120.0	False	0.000	10.63	0.11	0.055218	False	0	0.02
21	J-244	J-245	250.0	221	PVC	120.0	False	0.000	6.03	0.12	0.099575	False	0	0.02
96	J-314	J-320	250.0	96	PVC	120.0	False	0.000	6.68	0.14	0.120603	False	0	0.01
13	J-184	J-185	250.0	113	PVC	120.0	False	0.000	12.24	0.25	0.370778	False	0	0.04
76	J-169	J-213	250.0	176	PVC	120.0	False	0.000	13.39	0.27	0.437642	False	0	0.08
55	J-259	J-244	250.0	255	PVC	120.0	False	0.000	16.17	0.33	0.619999	False	0	0.16
61	J-264	J-321	250.0	61	PVC	120.0	False	0.000	18.28	0.37	0.778050	False	0	0.05
95	J-321	J-315	250.0	95	PVC	120.0	False	0.000	19.35	0.39	0.866038	False	0	0.08
03	J-169	J-170	250.0	103	PVC	120.0	False	0.000	19.37	0.39	0.867514	False	0	0.09
10	J-266	J-323	250.0	110	PVC	120.0	False	0.000	20.40	0.42	0.953781	False	0	0.11
52	J-320	J-144	250.0	62	PVC	120.0	False	0.000	20.92	0.43	1.000050	False	0	0.06
06	J-168	J-266	250.0	206	PVC	120.0	False	0.000	21.37	0.44	1.039204	False	0	0.21
39	J-259	J-245	350.0	239	PVC	120.0	False	0.000	43.49	0.45	0.752559	False	0	0.18
02	J-245	J-284	350.0	102	PVC	120.0	False	0.000	48.28	0.50	0.914269	False	0	0.09
82	J-142	J-143	300.0	82	PVC	120.0	False	0.000	39.57	0.56	1.339903	False	0	0.11
60	J-270	J-188	300.0	60	PVC	120.0	False	0.000	39.91	0.56	1.359096	False	0	0.08
77	J-189	J-239	250.0	177	PVC	120.0	False	0.000	-27.74	0.57	1.685681	False	0	0.30
00	J-168	J-142	300.0	100	PVC	120.0	False	0.000	40.65	0.58	1.407114	False	0	0.14
92	J-275	J-259	350.0	192	PVC	120.0	False	0.000	62.26	0.65	1.462457	False	0	0.28
84	J-288	J-185	300.0	284	PVC	120.0	False	0.000	45.76	0.65	1.751760	False	0	0.50
07	J-184	J-169	250.0	207	PVC	120.0	False	0.000	32.76	0.67	2.293133	False	0	0.47
52	J-275	J-143	250.0	252	PVC	120.0	False	0.000	-33.77	0.69	2.425974	False	0	0.61
14	J-284	J-275	250.0	214	PVC	120.0	False	0.000	-35.01	0.71	2.593921	False	0	0.55
99	J-311	J-312	350.0	99	PVC	120.0	False	0.000	-69.46	0.72	1.791460	False	0	0.18
03	J-311	J-275	350.0	103	PVC	120.0	False	0.000	69.46	0.72	1.790944	False	0	0.18
01	J-323	J-312	350.0	101	PVC	120.0	False	0.000	69.67	0.72	1.800058	False	0	0.18
46	J-165	J-207	350.0	146	PVC	120.0	False	0.000	-69.91	0.73	1.812723	False	0	0.26
54	J-144	J-189	250.0	154	PVC	120.0	False	0.000	-37.75	0.77	2.982540	False	0	0.46
08	J-185	J-170	300.0	208	PVC	120.0	False	0.000	55.58	0.79	2.511760	False	0	0.52
49	J-213	J-264	250.0	149	PVC	120.0	False	0.000	-38.77	0.79	3.132834	False	0	0.47
97	J-284	J-164	350.0	97	PVC	120.0	False	0.000	79.22	0.82	2.284472	False	0	0.22

Active Scenario: MDD + FF @ J-204

	Start Node	Stop Node	Diameter (mm)	Length (m)	Material	Hazen-Williams C	Has Check Valve?	Minor Loss Coefficient (Local)	Flow (L/s)	Velocity (m/s)	Headloss Gradient (m/km)	Has User Defined Length?	Length (User Defined) (m)	Headloss (m)
20	J-170	J-168	300.0	220	PVC	120.0	False	0.000	64.83	0.92	3.339769	False	0	0.73
54	J-239	J-288	250.0	154	PVC	120.0	False	0.000	49.30	1.00	4.888661	False	0	0.75
84	J-213	J-322	250.0	84	PVC	120.0	False	0.000	50.45	1.03	5.100786	False	0	0.43
67	J-189	J-184	250.0	167	PVC	120.0	False	0.000	52.33	1.07	5.458644	False	0	0.91
47	J-322	J-323	350.0	147	PVC	120.0	False	0.000	112.12	1.17	4.348060	False	0	0.64
82	J-144	J-264	250.0	82	PVC	120.0	False	0.000	57.77	1.18	6.555918	False	0	0.54
96	J-323	J-165	250.0	96	PVC	120.0	False	0.000	62.85	1.28	7.663840	False	0	0.74
29	J-206	J-207	300.0	129	PVC	120.0	False	0.000	-94.09	1.33	6.657935	False	0	0.86
81	J-310	J-189	250.0	81	PVC	120.0	False	0.000	65.62	1.34	8.302471	False	0	0.67
98	J-164	J-165	350.0	98	PVC	120.0	False	0.000	-132.49	1.38	5.922617	False	0	0.58
83	J-314	J-315	250.0	83	PVC	120.0	False	0.000	68.05	1.39	8.879655	False	0	0.74
28	J-321	J-322	350.0	128	PVC	120.0	False	0.000	140.68	1.46	6.619430	False	0	0.85
96	J-320	J-321	350.0	96	PVC	120.0	False	0.000	141.76	1.47	6.712214	False	0	0.65
50	J-270	J-314	250.0	150	PVC	120.0	False	0.000	76.04	1.55	10.907454	False	0	1.64
95	J-322	J-207	250.0	95	PVC	120.0	False	0.000	79.01	1.61	11.708409	False	0	1.11
34	J-310	J-320	350.0	134	PVC	120.0	False	0.000	156.01	1.62	8.015948	False	0	1.07
55	J-239	J-240	250.0	165	PVC	120.0	False	0.000	-81.05	1.65	12.276706	False	0	2.03
02	J-287	J-270	300.0	202	PVC	120.0	False	0.000	117.03	1.66	9.973377	False	0	2.01
11	J-316	J-287	300.0	211	PVC	120.0	False	0.000	118.36	1.67	10.183731	False	0	2.15
41	J-240	J-316	250.0	241	PVC	120.0	False	0.000	-82.85	1.69	12.786304	False	0	3.09
36	J-315	J-207	250.0	136	PVC	120.0	False	0.000	86.34	1.76	13.800435	False	0	1.87
44	J-206	J-204	250.0	244	PVC	120.0	False	0.000	91.22	1.86	15.280795	False	0	3.72
92	J-316	J-306	350.0	292	PVC	120.0	False	0.000	182.34	1.90	10.699470	False	0	3.13
04	J-306	J-188	350.0	104	PVC	120.0	False	0.000	182.34	1.90	10.699706	False	0	1.12
32	J-188	J-310	350.0	32	PVC	120.0	False	0.000	222.24	2.31	15.436409	False	0	0.50
26	J-204	J-164	300.0	126	PVC	120.0	False	0.000	-210.63	2.98	29.612614	False	0	3.73
27	R-2	PRV-1	350.0	227	PVC	120.0	False	0.000	383.55	3.99	42.410656	False	0	9.63
53	PRV-1	J-316	350.0	53	PVC	120.0	False	0.000	383.55	3.99	42.411472	False	0	2.24

FlexTable: Reservoir Table

Active Scenario: MDD + FF @ J-206

ID	Label	Elevation (m)	Zone	Flow (Out net) (L/s)	Hydraulic Grade (m)
685	R-1	1,435.50	<None>	(N/A)	(N/A)
749	R-3	1,405.80	<None>	10.63	1,405.80
752	R-2	1,434.15	<None>	383.79	1,434.15

FlexTable: Junction Table

Active Scenario: MDD + FF @ J-206

ID	Label	Elevation (m)	Zone	Demand Collection	Demand (L/s)	Hydraulic Grade (m)	Pressure (psi)
156	J-81	1,385.33	<None>	<Collection: 0 items>	(N/A)	(N/A)	(N/A)
157	J-82	1,383.59	<None>	<Collection: 0 items>	(N/A)	(N/A)	(N/A)
263	J-142	1,344.00	<None>	<Collection: 1 items>	1.08	1,404.67	86
264	J-143	1,346.00	<None>	<Collection: 2 items>	5.80	1,404.58	83
266	J-144	1,363.00	<None>	<Collection: 2 items>	0.91	1,406.38	62
300	J-162	1,322.00	<None>	<Collection: 0 items>	0.00	1,405.71	119
301	J-163	1,329.00	<None>	<Collection: 1 items>	1.83	1,405.70	109
303	J-164	1,366.00	<None>	<Collection: 1 items>	1.08	1,403.61	53
304	J-165	1,366.00	<None>	<Collection: 1 items>	0.27	1,403.64	53
310	J-168	1,345.00	<None>	<Collection: 2 items>	2.81	1,404.78	85
313	J-169	1,361.00	<None>	<Collection: 0 items>	0.00	1,405.51	63
314	J-170	1,354.00	<None>	<Collection: 4 items>	10.12	1,405.44	73
340	J-184	1,369.00	<None>	<Collection: 1 items>	7.33	1,405.98	52
341	J-185	1,356.00	<None>	<Collection: 2 items>	2.42	1,405.94	71
346	J-188	1,372.50	<None>	<Collection: 0 items>	0.00	1,408.01	50
347	J-189	1,368.00	<None>	<Collection: 2 items>	3.28	1,406.85	55
382	J-204	1,372.84	<None>	<Collection: 2 items>	2.09	1,402.87	43
386	J-206	1,370.00	<None>	<Collection: 3 items>	302.87	1,399.54	42
387	J-207	1,366.00	<None>	<Collection: 2 items>	1.34	1,403.56	53
402	J-213	1,358.00	<None>	<Collection: 3 items>	1.71	1,405.41	67
461	J-239	1,367.00	<None>	<Collection: 1 items>	4.01	1,407.16	57
462	J-240	1,370.00	<None>	<Collection: 2 items>	1.80	1,409.18	56
469	J-243	1,351.00	<None>	<Collection: 1 items>	3.09	1,405.69	78
471	J-244	1,371.00	<None>	<Collection: 4 items>	10.14	1,403.80	47
472	J-245	1,369.00	<None>	<Collection: 1 items>	1.24	1,403.80	49
492	J-252	1,404.59	<None>	<Collection: 0 items>	(N/A)	(N/A)	(N/A)
514	J-259	1,359.00	<None>	<Collection: 2 items>	2.60	1,403.91	64
520	J-262	1,338.00	<None>	<Collection: 3 items>	5.71	1,405.69	96
525	J-264	1,362.00	<None>	<Collection: 1 items>	0.72	1,405.84	62
528	J-266	1,358.00	<None>	<Collection: 2 items>	0.97	1,404.56	66
538	J-270	1,374.00	<None>	<Collection: 1 items>	1.08	1,408.09	48

FlexTable: Junction Table

Active Scenario: MDD + FF @ J-206

ID	Label	Elevation (m)	Zone	Demand Collection	Demand (L/s)	Hydraulic Grade (m)	Pressure (psi)
572	J-284	1,368.50	<None>	<Collection: 2 items>	4.07	1,403.74	50
583	J-287	1,374.00	<None>	<Collection: 1 items>	1.33	1,410.11	51
589	J-288	1,361.00	<None>	<Collection: 2 items>	3.54	1,406.42	64
610	J-142A	1,344.00	<None>	<Collection: 0 items>	0.00	1,405.78	88
620	J-296	1,366.70	<None>	<Collection: 0 items>	(N/A)	(N/A)	(N/A)
658	J-309	1,357.00	<None>	<Collection: 0 items>	0.00	1,405.69	69
662	J-310	1,370.50	<None>	<Collection: 1 items>	0.62	1,407.51	53
665	J-311	1,357.00	<None>	<Collection: 0 items>	0.00	1,404.22	67
668	J-312	1,364.00	<None>	<Collection: 1 items>	0.21	1,404.33	57
687	J-314	1,370.00	<None>	<Collection: 2 items>	1.32	1,406.44	52
690	J-315	1,368.00	<None>	<Collection: 1 items>	1.06	1,405.67	53
710	J-316	1,372.14	<None>	<Collection: 0 items>	0.00	1,412.26	57
722	J-320	1,369.06	<None>	<Collection: 0 items>	0.00	1,406.43	53
725	J-321	1,364.35	<None>	<Collection: 0 items>	0.00	1,405.79	59
728	J-322	1,361.75	<None>	<Collection: 0 items>	0.00	1,404.97	61
731	J-323	1,362.28	<None>	<Collection: 0 items>	0.00	1,404.45	60
777	J-306	1,385.00	<None>	<Collection: 0 items>	0.00	1,409.13	34
796	J-275	1,356.50	<None>	<Collection: 4 items>	5.97	1,404.10	68

Active Scenario: MDD + FF @ J-206

	Start Node	Stop Node	Diameter (mm)	Length (m)	Material	Hazen-Williams C	Has Check Valve?	Minor Loss Coefficient (Local)	Flow (L/s)	Velocity (m/s)	Headloss Gradient (m/km)	Has User Defined Length?	Length (User Defined) (m)	Headloss (m)
57	J-81	J-82	350.0	57	PVC	120.0	False	0.000	(N/A)	(N/A)	(N/A)	False	0	(N/A)
72	J-82	J-296	350.0	372	PVC	120.0	False	0.000	(N/A)	(N/A)	(N/A)	False	0	(N/A)
73	J-252	J-81	350.0	773	PVC	120.0	False	0.000	(N/A)	(N/A)	(N/A)	False	0	(N/A)
29	R-1	J-252	350.0	429	PVC	120.0	False	0.000	(N/A)	(N/A)	(N/A)	False	0	(N/A)
20	J-296	R-3	350.0	520	PVC	120.0	False	0.000	(N/A)	(N/A)	(N/A)	False	0	(N/A)
79	J-252	R-2	350.0	179	PVC	120.0	False	0.000	(N/A)	(N/A)	(N/A)	False	0	(N/A)
79	J-143	J-243	300.0	179	PVC	120.0	True	0.000	0.00	0.00	0.000000	False	0	0.00
54	J-259	J-309	350.0	54	PVC	120.0	True	0.000	0.00	0.00	0.000000	False	0	0.00
82	J-243	J-309	350.0	182	PVC	120.0	False	0.000	0.00	0.00	0.000000	False	0	0.00
94	PRV-2	J-288	350.0	294	PVC	120.0	False	0.000	0.00	0.00	0.000000	False	0	0.00
41	J-142A	PRV-2	350.0	41	PVC	120.0	False	0.000	0.00	0.00	0.000000	False	0	0.00
26	J-262	J-243	350.0	326	PVC	120.0	False	0.000	3.09	0.03	0.005480	False	0	0.00
21	J-244	J-245	250.0	221	PVC	120.0	False	0.000	3.16	0.06	0.030276	False	0	0.01
06	J-163	J-262	350.0	206	PVC	120.0	False	0.000	8.80	0.09	0.038985	False	0	0.01
96	J-314	J-320	250.0	96	PVC	120.0	False	0.000	5.39	0.11	0.081948	False	0	0.01
98	J-162	J-163	350.0	98	PVC	120.0	False	0.000	10.63	0.11	0.056221	False	0	0.01
57	J-142A	J-162	350.0	1,257	PVC	120.0	False	0.000	10.63	0.11	0.055406	False	0	0.07
39	R-3	J-142A	350.0	439	PVC	120.0	False	0.000	10.63	0.11	0.055218	False	0	0.02
13	J-184	J-185	250.0	113	PVC	120.0	False	0.000	11.50	0.23	0.328704	False	0	0.04
55	J-259	J-244	250.0	255	PVC	120.0	False	0.000	13.30	0.27	0.431838	False	0	0.11
98	J-164	J-165	350.0	98	PVC	120.0	False	0.000	-29.01	0.30	0.355145	False	0	0.03
76	J-169	J-213	250.0	176	PVC	120.0	False	0.000	15.61	0.32	0.580993	False	0	0.10
03	J-169	J-170	250.0	103	PVC	120.0	False	0.000	16.88	0.34	0.671671	False	0	0.07
39	J-259	J-245	350.0	239	PVC	120.0	False	0.000	34.41	0.36	0.488012	False	0	0.12
02	J-245	J-284	350.0	102	PVC	120.0	False	0.000	36.32	0.38	0.538661	False	0	0.06
46	J-165	J-207	350.0	146	PVC	120.0	False	0.000	36.74	0.38	0.550546	False	0	0.08
61	J-264	J-321	250.0	61	PVC	120.0	False	0.000	19.69	0.40	0.892684	False	0	0.05
62	J-320	J-144	250.0	62	PVC	120.0	False	0.000	20.11	0.41	0.928276	False	0	0.06
10	J-266	J-323	250.0	110	PVC	120.0	False	0.000	20.86	0.42	0.994195	False	0	0.11
06	J-168	J-266	250.0	206	PVC	120.0	False	0.000	21.83	0.44	1.081090	False	0	0.22
95	J-321	J-315	250.0	95	PVC	120.0	False	0.000	23.37	0.48	1.227542	False	0	0.12
82	J-142	J-143	300.0	82	PVC	120.0	False	0.000	35.30	0.50	1.084252	False	0	0.09
00	J-168	J-142	300.0	100	PVC	120.0	False	0.000	36.38	0.51	1.145878	False	0	0.11
92	J-275	J-259	350.0	192	PVC	120.0	False	0.000	50.30	0.52	0.985299	False	0	0.19
60	J-270	J-188	300.0	60	PVC	120.0	False	0.000	39.74	0.56	1.349176	False	0	0.08
14	J-284	J-275	250.0	214	PVC	120.0	False	0.000	-27.77	0.57	1.689357	False	0	0.36
99	J-311	J-312	350.0	99	PVC	120.0	False	0.000	-54.54	0.57	1.144126	False	0	0.11
03	J-311	J-275	350.0	103	PVC	120.0	False	0.000	54.54	0.57	1.143893	False	0	0.12
01	J-323	J-312	350.0	101	PVC	120.0	False	0.000	54.75	0.57	1.153162	False	0	0.12
77	J-189	J-239	250.0	177	PVC	120.0	False	0.000	-28.21	0.57	1.737833	False	0	0.31
52	J-275	J-143	250.0	252	PVC	120.0	False	0.000	-29.50	0.60	1.888313	False	0	0.48
97	J-284	J-164	350.0	97	PVC	120.0	False	0.000	60.02	0.62	1.367001	False	0	0.13
84	J-288	J-185	300.0	284	PVC	120.0	False	0.000	45.18	0.64	1.711338	False	0	0.49
07	J-184	J-169	250.0	207	PVC	120.0	False	0.000	32.49	0.66	2.257921	False	0	0.47
49	J-213	J-264	250.0	149	PVC	120.0	False	0.000	-37.33	0.76	2.920845	False	0	0.43
08	J-185	J-170	300.0	208	PVC	120.0	False	0.000	54.26	0.77	2.402896	False	0	0.50

Active Scenario: MDD + FF @ J-206

	Start Node	Stop Node	Diameter (mm)	Length (m)	Material	Hazen-Williams C	Has Check Valve?	Minor Loss Coefficient (Local)	Flow (L/s)	Velocity (m/s)	Headloss Gradient (m/km)	Has User Defined Length?	Length (User Defined) (m)	Headloss (m)
54	J-144	J-189	250.0	154	PVC	120.0	False	0.000	-38.54	0.79	3.098442	False	0	0.48
20	J-170	J-168	300.0	220	PVC	120.0	False	0.000	61.02	0.86	2.985151	False	0	0.66
54	J-239	J-288	250.0	154	PVC	120.0	False	0.000	48.73	0.99	4.783394	False	0	0.74
47	J-322	J-323	350.0	147	PVC	120.0	False	0.000	99.91	1.04	3.512089	False	0	0.52
84	J-213	J-322	250.0	84	PVC	120.0	False	0.000	51.23	1.04	5.250077	False	0	0.44
67	J-189	J-184	250.0	167	PVC	120.0	False	0.000	51.32	1.05	5.265765	False	0	0.88
82	J-144	J-264	250.0	82	PVC	120.0	False	0.000	57.74	1.18	6.550458	False	0	0.54
26	J-204	J-164	300.0	126	PVC	120.0	False	0.000	-87.95	1.24	5.875978	False	0	0.74
81	J-310	J-189	250.0	81	PVC	120.0	False	0.000	64.93	1.32	8.140973	False	0	0.66
96	J-323	J-165	250.0	96	PVC	120.0	False	0.000	66.02	1.34	8.395946	False	0	0.81
83	J-314	J-315	250.0	83	PVC	120.0	False	0.000	69.65	1.42	9.271090	False	0	0.77
28	J-321	J-322	350.0	128	PVC	120.0	False	0.000	138.33	1.44	6.415629	False	0	0.82
96	J-320	J-321	350.0	96	PVC	120.0	False	0.000	142.01	1.48	6.733871	False	0	0.65
50	J-270	J-314	250.0	150	PVC	120.0	False	0.000	76.36	1.56	10.990657	False	0	1.65
34	J-310	J-320	350.0	134	PVC	120.0	False	0.000	156.73	1.63	8.085032	False	0	1.08
55	J-239	J-240	250.0	165	PVC	120.0	False	0.000	-80.94	1.65	12.244295	False	0	2.02
02	J-287	J-270	300.0	202	PVC	120.0	False	0.000	117.18	1.66	9.996217	False	0	2.02
11	J-316	J-287	300.0	211	PVC	120.0	False	0.000	118.51	1.68	10.207727	False	0	2.15
41	J-240	J-316	250.0	241	PVC	120.0	False	0.000	-82.74	1.69	12.754254	False	0	3.08
44	J-206	J-204	250.0	244	PVC	120.0	False	0.000	-85.86	1.75	13.658882	False	0	3.33
95	J-322	J-207	250.0	95	PVC	120.0	False	0.000	89.65	1.83	14.794943	False	0	1.40
36	J-315	J-207	250.0	136	PVC	120.0	False	0.000	91.96	1.87	15.510825	False	0	2.11
92	J-316	J-306	350.0	292	PVC	120.0	False	0.000	182.54	1.90	10.722388	False	0	3.13
04	J-306	J-188	350.0	104	PVC	120.0	False	0.000	182.54	1.90	10.722513	False	0	1.12
32	J-188	J-310	350.0	32	PVC	120.0	False	0.000	222.28	2.31	15.441019	False	0	0.50
29	J-206	J-207	300.0	129	PVC	120.0	False	0.000	-217.01	3.07	31.295769	False	0	4.02
27	R-2	PRV-1	350.0	227	PVC	120.0	False	0.000	383.79	3.99	42.459793	False	0	9.65
53	PRV-1	J-316	350.0	53	PVC	120.0	False	0.000	383.79	3.99	42.459286	False	0	2.25

FlexTable: Reservoir Table

Active Scenario: MDD + FF @ J-240

ID	Label	Elevation (m)	Zone	Flow (Out net) (L/s)	Hydraulic Grade (m)
685	R-1	1,435.50	<None>	(N/A)	(N/A)
749	R-3	1,405.80	<None>	-29.72	1,405.80
752	R-2	1,434.15	<None>	424.15	1,434.15

FlexTable: Junction Table

Active Scenario: MDD + FF @ J-240

ID	Label	Elevation (m)	Zone	Demand Collection	Demand (L/s)	Hydraulic Grade (m)	Pressure (psi)
156	J-81	1,385.33	<None>	<Collection: 0 items>	(N/A)	(N/A)	(N/A)
157	J-82	1,383.59	<None>	<Collection: 0 items>	(N/A)	(N/A)	(N/A)
263	J-142	1,344.00	<None>	<Collection: 1 items>	1.08	1,406.87	89
264	J-143	1,346.00	<None>	<Collection: 2 items>	5.80	1,406.87	86
266	J-144	1,363.00	<None>	<Collection: 2 items>	0.91	1,407.53	63
300	J-162	1,322.00	<None>	<Collection: 0 items>	0.00	1,406.50	120
301	J-163	1,329.00	<None>	<Collection: 1 items>	1.83	1,406.55	110
303	J-164	1,366.00	<None>	<Collection: 1 items>	1.08	1,407.10	58
304	J-165	1,366.00	<None>	<Collection: 1 items>	0.27	1,407.14	58
310	J-168	1,345.00	<None>	<Collection: 2 items>	2.81	1,406.87	88
313	J-169	1,361.00	<None>	<Collection: 0 items>	0.00	1,406.93	65
314	J-170	1,354.00	<None>	<Collection: 4 items>	10.12	1,406.82	75
340	J-184	1,369.00	<None>	<Collection: 1 items>	7.33	1,406.90	54
341	J-185	1,356.00	<None>	<Collection: 2 items>	2.42	1,406.67	72
346	J-188	1,372.50	<None>	<Collection: 0 items>	0.00	1,408.70	51
347	J-189	1,368.00	<None>	<Collection: 2 items>	3.28	1,407.23	56
382	J-204	1,372.84	<None>	<Collection: 2 items>	2.09	1,407.11	49
386	J-206	1,370.00	<None>	<Collection: 2 items>	2.87	1,407.19	53
387	J-207	1,366.00	<None>	<Collection: 2 items>	1.34	1,407.21	59
402	J-213	1,358.00	<None>	<Collection: 3 items>	1.71	1,407.27	70
461	J-239	1,367.00	<None>	<Collection: 1 items>	4.01	1,405.06	54
462	J-240	1,370.00	<None>	<Collection: 3 items>	301.80	1,400.08	43
469	J-243	1,351.00	<None>	<Collection: 1 items>	3.09	1,406.85	79
471	J-244	1,371.00	<None>	<Collection: 4 items>	10.14	1,406.96	51
472	J-245	1,369.00	<None>	<Collection: 1 items>	1.24	1,407.00	54
492	J-252	1,404.59	<None>	<Collection: 0 items>	(N/A)	(N/A)	(N/A)
514	J-259	1,359.00	<None>	<Collection: 2 items>	2.60	1,406.96	68
520	J-262	1,338.00	<None>	<Collection: 3 items>	5.71	1,406.64	97
525	J-264	1,362.00	<None>	<Collection: 1 items>	0.72	1,407.50	65
528	J-266	1,358.00	<None>	<Collection: 2 items>	0.97	1,407.04	70
538	J-270	1,374.00	<None>	<Collection: 1 items>	1.08	1,408.78	49

FlexTable: Junction Table

Active Scenario: MDD + FF @ J-240

ID	Label	Elevation (m)	Zone	Demand Collection	Demand (L/s)	Hydraulic Grade (m)	Pressure (psi)
572	J-284	1,368.50	<None>	<Collection: 2 items>	4.07	1,407.04	55
583	J-287	1,374.00	<None>	<Collection: 1 items>	1.33	1,410.24	51
589	J-288	1,361.00	<None>	<Collection: 2 items>	3.54	1,405.96	64
610	J-142A	1,344.00	<None>	<Collection: 0 items>	0.00	1,405.96	88
620	J-296	1,366.70	<None>	<Collection: 0 items>	(N/A)	(N/A)	(N/A)
658	J-309	1,357.00	<None>	<Collection: 0 items>	0.00	1,406.94	71
662	J-310	1,370.50	<None>	<Collection: 1 items>	0.62	1,408.31	54
665	J-311	1,357.00	<None>	<Collection: 0 items>	0.00	1,407.05	71
668	J-312	1,364.00	<None>	<Collection: 1 items>	0.21	1,407.09	61
687	J-314	1,370.00	<None>	<Collection: 2 items>	1.32	1,407.82	54
690	J-315	1,368.00	<None>	<Collection: 1 items>	1.06	1,407.54	56
710	J-316	1,372.14	<None>	<Collection: 0 items>	0.00	1,411.81	56
722	J-320	1,369.06	<None>	<Collection: 0 items>	0.00	1,407.76	55
725	J-321	1,364.35	<None>	<Collection: 0 items>	0.00	1,407.53	61
728	J-322	1,361.75	<None>	<Collection: 0 items>	0.00	1,407.28	65
731	J-323	1,362.28	<None>	<Collection: 0 items>	0.00	1,407.14	64
777	J-306	1,385.00	<None>	<Collection: 0 items>	0.00	1,409.52	35
796	J-275	1,356.50	<None>	<Collection: 4 items>	5.97	1,407.00	72

Active Scenario: MDD + FF @ J-240

	Start Node	Stop Node	Diameter (mm)	Length (m)	Material	Hazen-Williams C	Has Check Valve?	Minor Loss Coefficient (Local)	Flow (L/s)	Velocity (m/s)	Headloss Gradient (m/km)	Has User Defined Length?	Length (User Defined) (m)	Headloss (m)
57	J-81	J-82	350.0	57	PVC	120.0	False	0.000	(N/A)	(N/A)	(N/A)	False	0	(N/A)
72	J-82	J-296	350.0	372	PVC	120.0	False	0.000	(N/A)	(N/A)	(N/A)	False	0	(N/A)
73	J-252	J-81	350.0	773	PVC	120.0	False	0.000	(N/A)	(N/A)	(N/A)	False	0	(N/A)
29	R-1	J-252	350.0	429	PVC	120.0	False	0.000	(N/A)	(N/A)	(N/A)	False	0	(N/A)
20	J-296	R-3	350.0	520	PVC	120.0	False	0.000	(N/A)	(N/A)	(N/A)	False	0	(N/A)
79	J-252	R-2	350.0	179	PVC	120.0	False	0.000	(N/A)	(N/A)	(N/A)	False	0	(N/A)
82	J-142	J-143	300.0	82	PVC	120.0	False	0.000	-0.34	0.00	0.001813	False	0	0.00
00	J-168	J-142	300.0	100	PVC	120.0	False	0.000	0.74	0.01	0.001484	False	0	0.00
41	J-142A	PRV-2	350.0	41	PVC	120.0	False	0.000	2.44	0.03	0.003643	False	0	0.00
94	PRV-2	J-288	350.0	294	PVC	120.0	False	0.000	2.44	0.03	0.003542	False	0	0.00
55	J-259	J-244	250.0	255	PVC	120.0	False	0.000	1.88	0.04	0.011687	False	0	0.00
96	J-323	J-165	250.0	96	PVC	120.0	False	0.000	-3.08	0.06	0.027919	False	0	0.00
84	J-213	J-322	250.0	84	PVC	120.0	False	0.000	-5.48	0.11	0.083532	False	0	0.01
95	J-321	J-315	250.0	95	PVC	120.0	False	0.000	-5.73	0.12	0.091162	False	0	0.01
79	J-143	J-243	300.0	179	PVC	120.0	True	0.000	8.71	0.12	0.081673	False	0	0.01
26	J-204	J-164	300.0	126	PVC	120.0	False	0.000	9.25	0.13	0.089782	False	0	0.01
07	J-184	J-169	250.0	207	PVC	120.0	False	0.000	-7.54	0.15	0.150911	False	0	0.03
14	J-284	J-275	250.0	214	PVC	120.0	False	0.000	7.97	0.16	0.167125	False	0	0.04
21	J-244	J-245	250.0	221	PVC	120.0	False	0.000	-8.26	0.17	0.178966	False	0	0.04
39	J-259	J-245	350.0	239	PVC	120.0	False	0.000	-18.42	0.19	0.153126	False	0	0.04
29	J-206	J-207	300.0	129	PVC	120.0	False	0.000	-14.21	0.20	0.201475	False	0	0.03
92	J-275	J-259	350.0	192	PVC	120.0	False	0.000	20.14	0.21	0.180483	False	0	0.03
20	J-170	J-168	300.0	220	PVC	120.0	False	0.000	-15.32	0.22	0.230772	False	0	0.05
44	J-206	J-204	250.0	244	PVC	120.0	False	0.000	11.34	0.23	0.321328	False	0	0.08
82	J-144	J-264	250.0	82	PVC	120.0	False	0.000	12.12	0.25	0.362195	False	0	0.03
02	J-245	J-284	350.0	102	PVC	120.0	False	0.000	-27.92	0.29	0.330476	False	0	0.03
61	J-264	J-321	250.0	61	PVC	120.0	False	0.000	-14.71	0.30	0.519513	False	0	0.03
52	J-275	J-143	250.0	252	PVC	120.0	False	0.000	14.85	0.30	0.529389	False	0	0.13
39	R-3	J-142A	350.0	439	PVC	120.0	False	0.000	-29.72	0.31	0.371959	False	0	0.16
96	J-314	J-320	250.0	96	PVC	120.0	False	0.000	15.58	0.32	0.578274	False	0	0.06
98	J-164	J-165	350.0	98	PVC	120.0	False	0.000	-31.79	0.33	0.420130	False	0	0.04
98	J-162	J-163	350.0	98	PVC	120.0	False	0.000	-32.16	0.33	0.430015	False	0	0.04
57	J-142A	J-162	350.0	1,257	PVC	120.0	False	0.000	-32.16	0.33	0.430227	False	0	0.54
99	J-311	J-312	350.0	99	PVC	120.0	False	0.000	-32.98	0.34	0.451629	False	0	0.04
03	J-311	J-275	350.0	103	PVC	120.0	False	0.000	32.98	0.34	0.450625	False	0	0.05
01	J-323	J-312	350.0	101	PVC	120.0	False	0.000	33.19	0.34	0.455936	False	0	0.05
95	J-322	J-207	250.0	95	PVC	120.0	False	0.000	17.23	0.35	0.697415	False	0	0.07
06	J-163	J-262	350.0	206	PVC	120.0	False	0.000	-33.99	0.35	0.476482	False	0	0.10
82	J-243	J-309	350.0	182	PVC	120.0	False	0.000	-34.08	0.35	0.479154	False	0	0.09
54	J-259	J-309	350.0	54	PVC	120.0	True	0.000	34.08	0.35	0.480244	False	0	0.03
46	J-165	J-207	350.0	146	PVC	120.0	False	0.000	-35.14	0.37	0.507726	False	0	0.07
06	J-168	J-266	250.0	206	PVC	120.0	False	0.000	-18.87	0.38	0.825441	False	0	0.17
08	J-185	J-170	300.0	208	PVC	120.0	False	0.000	-27.53	0.39	0.683984	False	0	0.14
10	J-266	J-323	250.0	110	PVC	120.0	False	0.000	-19.84	0.40	0.906630	False	0	0.10
26	J-262	J-243	350.0	326	PVC	120.0	False	0.000	-39.70	0.41	0.635680	False	0	0.21
97	J-284	J-164	350.0	97	PVC	120.0	False	0.000	-39.96	0.42	0.644378	False	0	0.06

Active Scenario: MDD + FF @ J-240

	Start Node	Stop Node	Diameter (mm)	Length (m)	Material	Hazen-Williams C	Has Check Valve?	Minor Loss Coefficient (Local)	Flow (L/s)	Velocity (m/s)	Headloss Gradient (m/km)	Has User Defined Length?	Length (User Defined) (m)	Headloss (m)
03	J-169	J-170	250.0	103	PVC	120.0	False	0.000	22.33	0.46	1.128639	False	0	0.12
47	J-322	J-323	350.0	147	PVC	120.0	False	0.000	49.96	0.52	0.972766	False	0	0.14
49	J-213	J-264	250.0	149	PVC	120.0	False	0.000	-26.10	0.53	1.505920	False	0	0.22
50	J-270	J-188	300.0	60	PVC	120.0	False	0.000	40.18	0.57	1.376457	False	0	0.08
54	J-144	J-189	250.0	154	PVC	120.0	False	0.000	29.82	0.61	1.925902	False	0	0.30
76	J-169	J-213	250.0	176	PVC	120.0	False	0.000	-29.87	0.61	1.932709	False	0	0.34
67	J-189	J-184	250.0	167	PVC	120.0	False	0.000	30.23	0.62	1.976113	False	0	0.33
13	J-184	J-185	250.0	113	PVC	120.0	False	0.000	30.44	0.62	2.002462	False	0	0.23
36	J-315	J-207	250.0	136	PVC	120.0	False	0.000	33.45	0.68	2.383582	False	0	0.32
28	J-321	J-322	350.0	128	PVC	120.0	False	0.000	72.67	0.76	1.947165	False	0	0.25
84	J-288	J-185	300.0	284	PVC	120.0	False	0.000	-55.55	0.79	2.508738	False	0	0.71
83	J-314	J-315	250.0	83	PVC	120.0	False	0.000	40.25	0.82	3.356681	False	0	0.28
96	J-320	J-321	350.0	96	PVC	120.0	False	0.000	81.64	0.85	2.416335	False	0	0.23
52	J-320	J-144	250.0	62	PVC	120.0	False	0.000	42.84	0.87	3.770524	False	0	0.23
54	J-239	J-288	250.0	154	PVC	120.0	False	0.000	-54.45	1.11	5.876630	False	0	0.91
34	J-310	J-320	350.0	134	PVC	120.0	False	0.000	108.91	1.13	4.119400	False	0	0.55
50	J-270	J-314	250.0	150	PVC	120.0	False	0.000	57.15	1.16	6.427395	False	0	0.97
02	J-287	J-270	300.0	202	PVC	120.0	False	0.000	98.41	1.39	7.234880	False	0	1.46
11	J-316	J-287	300.0	211	PVC	120.0	False	0.000	99.74	1.41	7.416359	False	0	1.56
92	J-316	J-306	350.0	292	PVC	120.0	False	0.000	154.11	1.60	7.836160	False	0	2.29
04	J-306	J-188	350.0	104	PVC	120.0	False	0.000	154.11	1.60	7.835902	False	0	0.82
77	J-189	J-239	250.0	177	PVC	120.0	False	0.000	81.07	1.65	12.280912	False	0	2.17
81	J-310	J-189	250.0	81	PVC	120.0	False	0.000	84.76	1.73	13.336441	False	0	1.08
32	J-188	J-310	350.0	32	PVC	120.0	False	0.000	194.29	2.02	12.038370	False	0	0.39
55	J-239	J-240	250.0	165	PVC	120.0	False	0.000	131.51	2.68	30.083153	False	0	4.97
41	J-240	J-316	250.0	241	PVC	120.0	False	0.000	-170.29	3.47	48.551098	False	0	11.72
53	PRV-1	J-316	350.0	53	PVC	120.0	False	0.000	424.14	4.41	51.096836	False	0	2.70
27	R-2	PRV-1	350.0	227	PVC	120.0	False	0.000	424.15	4.41	51.097580	False	0	11.61

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