ACORN VALLEY SUBDIVISION

DORCHESTER
MUNICIPALITY OF THAMES CENTRE
COUNTY OF MIDDLESEX

FUNCTIONAL SERVICING REPORT

CJDL
Consulting Engineers

18010
25 June 2025

ACORN VALLEY SUBDIVISION

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TABLE OF CONTENTS

LIST OF TABLES

LIST OF FIGURES

APPENDIX 'A'

APPENDIX 'B'

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1. INTRODUCTION

The Acorn Valley Subdivision, hereafter referred to as the subject site, is approximately 44.28ha (109.4 ac.) in size and consists of two parcels separated by an untraveled road allowance (Christie Drive). The site is within the Dorchester Settlement Area in the Municipality of Thames Centre in the County of Middlesex, and is municipally known as 83 Christie Drive. Doug Tarry Developments (DTD) has proposed to develop the site as a residential subdivision consisting of low, medium and high-density built forms.

The portion of the site north of Christie Drive is 22.70ha (56.1 ac.). The portion of the development south of Christie Drive is part of a larger parcel that is 68.24ha (168.6 ac.), but only 21.58ha (53.3 ac.) of this southerly parcel is included within the Acorn Valley Subdivision. The remaining 46.66ha (115.3 ac.), hereafter referred to as the Harris Road lands, may be developed in the future, but will be required to undergo future planning applications. The servicing design within this report has consideration for the Harris Road lands being developed in the future, but does not provide a full stormwater management plan for this potential future development. A subsequent stormwater management report will be required in the future upon development of the Harris Road lands.

The northerly portion of the Acorn Valley Subdivision is legally described as Part 1 of Plan 33R-21574, Part of Lot 19 and 20, Concession A, South of the River Thames, Geographic Township of North Dorchester, Municipality of Thames Centre, County of Middlesex. The southerly portion of the site is legally described as Part 1 of Plan 33R-21717, Part of Lots 19 and 20, Concession B, South of the River Thames, Geographic Township of North Dorchester, Municipality of Thames Centre, County of Middlesex.

The entirety of the Acorn Valley Subdivision (46.2ha incl. Christie Drive ROW) is within the Dorchester Settlement Area and is designated residential in the Thames Centre Official Plan. A portion of the Harris Road lands to the south are outside of the Dorchester Settlement Area and are currently designated agricultural. The Acorn Valley lands are zoned Future Development (FD) and Environmental Protection (EP) in the Thames Centre Zoning By-Law. The subject site is also within the regulation area of the Upper Thames Conservation Authority (UTRCA).

The Acorn Valley Subdivision is bounded by a Provincially Significant Wetland to the north (Tamarack Swamp) and existing residential to the east on Wheeler Avenue. The southerly boundary of the site abuts existing agricultural, residential and an existing ravine containing a locally significant wetland. West of the site is Harris Road and existing agricultural and residential usages, as well as a locally significant wetland. Mill Pond is located approximately 350m east of the site. There is an adjacent residential development to the south/east, referred to as the Boardwalk Development, which has draft approval for 500 freehold lots and 80 medium-density units on the east and west side of Mill Road.

Construction of the Boardwalk Development is partially completed on the east side of Mill Road with approx. 160 homes built to date and additional phases proceeding to construction.

There are two municipal drains in proximity to the Acorn Valley Subdivision. The Rath-Harris Drain (1989) is approximately 300m south of the south Subdivision limit, and crosses the Harris Road lands. The Rath-Harris Drain outlets to the existing ravine abutting the southeast limit of the Subdivision, which carries flows northeast to Mill Pond. The Shaw Drain (1977) is approximately 100m west of the proposed development and outlets to an existing flow path that carries flows north to the Thames River.

The Acorn Valley Subdivision development is proposed to consist of 212 freehold lots (149 single-detached, 42 semi-detached, 21 townhome units) and 1 high-density block (393 units - 100 units/ha), for a potential 605 residential units. This Functional Servicing Report has conservatively carried a density of 150 units/ha for the high-density block, yielding 589 high-density units and a potential 801 total units in the servicing design. The proposed Draft Plan of Subdivision also provides for a future development block (30 units/ha maximum) for a potential 540 future units. One SWM pond block is proposed in the southeast corner of the site, an open space block is proposed north of Christie Drive for a proposed open-channel and multi-use trail. Additional open space blocks are proposed for natural heritage, multi-use trails and parkland usages.

The Subdivision is proposed to be developed in multiple phases, with Phase 1 including Christie Drive, Street 'B', the proposed SWM pond and open channel, high-density block 175, and abutting residential lots and parkland. Subsequent phases may be subject to change in the future but are generally shown within Figure 4 appended to this report.

The purpose of the Functional Servicing Report is to provide an overview of the proposed Acorn Valley Subdivision servicing design in support of the Draft Plan of Subdivision (DPA), Zoning By-Law Amendment (ZBA), and Official Plan Amendment (OPA) applications for the property.

2. ENVIRONMENTAL IMPACT

Vroom + Leonard have prepared an Environmental Impact Study (EIS) for the subject site. The EIS reviewed the existing natural habitat, including the adjacent locally and provincially significant wetlands, and assessed any potential impact the proposed development may have on the existing ecosystem. A 30m development setback from the existing wetland boundaries was determined to be sufficient to prevent any adverse impacts. Dripline buffers are provided around adjacent existing woodlands of significance. The only area of encroachment shown on the Draft Plan is the high-density block proposed in the southwest corner of the site. This minor encroachment will remain as part of the block with site specific zoning to restrict development of the area adjacent to the natural features. Mitigation and compensation measures are recommended in the EIS where avoidance is not possible. Please refer to the EIS for further information.

3. PARKS AND TRAILS

During the consultation stage of this project, it was discussed with the Municipality of Thames Centre that the Harry Small Trail runs east to west across the site within the existing untravelled Christie Drive ROW. The Harry Small Trail is a walking trail connecting to the Weaver Trail to the west and ultimately the Dorchester Outdoor Recreation Complex. The east end of the Harry Small Trail across the site connects to Christie Drive, and further to the east connects to the Mill Pond Trail.

Doug Tarry Developments (DTD) remains committed to implementing active-use trails and parkland that integrate with surrounding infrastructure in the neighborhood to better the community as a whole. DTL has committed to carrying the Harry Small Trail across the site as part of Phase 1 of the development. The trail will be adjusted from its current location to allow for Christie Drive to be built as a municipal

ROW, and will be relocated along the proposed open channel space directly to the north of Christie Drive. The newly relocated trail will become a multi-use feature for walking, running and/or cycling. The updated trail will maintain the easterly and westerly connection points through the Christie Drive ROW.

Through consultation with the Municipality, it was identified that an active-use parkland feature was desired. Doug Tarry Developments has reviewed the surrounding community features and trail network and has proposed a centralized parkland within the site along Christie Drive. DTL will work with Thames Centre to determine a concept plan for the parkland to ensure it is developed and remains a central component of the Acorn Valley Subdivision and the community as a whole.

A stormwater management wet pond is proposed in the southeast corner of the subdivision. The SWM pond is proposed to include a 3.0m wide maintenance access/walking trail to form a loop around the pond.

During the site investigation stage, items of archaeological significance were found within the site limits. Through consultation with local aboriginal communities, the Municipality of Thames Centre, the County of Middlesex, and the Ministry of Heritage, Sport, Tourism and Culture Industries (MHSTCI), it was determined that all significant artifacts should be kept in their current location without disturbance, to remain naturalized. Doug Tarry Developments (DTD) has worked with all parties to ensure the required open space areas remain preserved and naturalized. These areas are in the northeast corner of the site, and in the southeast, adjacent to the SWM pond block.

The relocated Harry Small Trail, parkland, and SWM pond will all be connected through a robust trail network, including a major north-south multi-use trail, to ensure all aspects of the Acorn Valley Subdivision are easily utilized by the community. The north end of the trail is proposed to connect to Mill Court through an existing municipally-owned block within the cul-de-sac.

It is further understood that the Municipality of Thames Centre has identified a potential trail connection across the existing southeasterly wooded ravine to the Boardwalk Development in the medium-term build-out of their 2015 Trails & Cycling Master Plan. The proposed trail around the SWM pond will be directly adjacent to the southeasterly ravine and allow for this future ravine boardwalk crossing to be implemented with direct connection to the Acorn Valley Subdivision, including the Harry Small Trail.

The 2015 Trails and Cycling Master Plan also identifies a north-south corridor to be implemented in the long-term build-out. This north-south corridor is being implemented with the proposed Acorn Valley Subdivision through the north-south multi-use trail. This trail will be continued southerly as subsequent build-out of adjacent land continues.

4. TRANSPORTATION

The main transportation access points for the proposed Acorn Valley Subdivision are Christie Drive to the east and Harris Road to the west. The existing Christie Drive roadway to the east becomes Mill Road and then continues south to Donnybrook Road & Dorchester Road and eventually Highway 401. The existing portion of Christe Drive to the east does have road connections to the north to Hamilton Road (County Road No. 29) through the Tiner Estates Subdivision. Harris Road to the west connects southerly to Donnybrook Drive, Dorchester Road and Highway 401 to the south, and connects to Hamilton Road (County Road No. 29) to the north. Both Christie Drive and Harris Road are local roadways as identified in the Thames Centre Official Plan.

Street 'B' & Street 'D' will be continued north into the future development block, upon build-out of that area. There are no feasible road interconnections from the Acorn Valley Subdivision to external areas north of the site, and as such the internal road network on the north end will ultimately convey all traffic towards Christie Drive.

Street 'C' & Street 'D' will continue southerly to the south limit of the Acorn Valley Subdivision site, where the road will terminate for future continuation into the Harris Road lands. It is anticipated at this time that at least one future westerly road connection to Harris Road will be provided from these southerly lands upon development, with potential for future interconnection across neighboring properties to Mill Road to the east or Donnybrook Drive further south.

Street 'C' has a block provided for a potential future interconnect to adjacent table lands southeast of the site. These lands are part of the Boardwalk Subdivision property, but are not currently proposed for development as they are separated from the remainder of the Boardwalk site by the existing ravine. If these lands are not developed and this road interconnection is not pursued in the future by the adjacent property owner, then this block may be developed as residential lot at that time.

All roadways within the Acorn Valley Subdivision are proposed as a local road classification.

Paradigm Transportation Solutions Limited has completed a Traffic Impact Assessment (TIA) for the Acorn Valley Subdivision. The TIA was scoped with the Municipality of Thames Centre and the County of Middlesex and provides an assessment of potential traffic impacts from this subdivision, with consideration for other planned development in the future. The TIA concluded the proposed development does not propose any adverse effects on the existing roadways and that all internal road networks with adequately handle estimated traffic volumes. Please refer to the Traffic Impact Assessment for further information.

5. GRADING AND GEOTECHNICAL

Existing contours for the developable portion of the site range in elevation from 254.00 – 267.00±m, with localized ravine contours extending down to 251.00±m. The site has a rolling topography which will be softened under post-development conditions, where road grades are anticipated to fall within the 0.5 – 5.0% range, with a maximum gradient of 8.0% in limited areas, if required. Road grades may be set in a saw-tooth pattern in localized areas, as required, to suit minor and major flow tributaries to the proposed SWM pond. Sawtooth gradients will be set to ensure an overall major flow gradient towards the proposed SWM pond (i.e. cascading high-points).

Lot grading will be designed to minimize the number of rear-yard catchbasins, where practical. Back-to-back lots on parallel streets will generally be designed as back-to-front drainage, where catch basins are not required for lot drainage. Where rear-yard catchbasins cannot be avoided, catchbasin leads will be designed to be as shallow as permitted by municipal standards, and are proposed to be located within a storm maintenance easement, although understood not to be required by Thames Centre Engineering Design Standards. Earth grading will raise boulevards and rear property lines to grade prior to servicing construction. Surplus fill stripped from high points will be placed in low lying areas where it can be accommodated.

Englobe Corp. was retained by the Developer (Doug Tarry Developments) to complete a geotechnical and hydrogeological site investigation for the proposed Acorn Valley Subdivision. The fieldwork completed included the drilling of fourteen boreholes to depths ranging from 4.0 – 14.0±m, with six monitoring wells and four mini-piezometers installed.

The site was determined to consist of topsoil underlain by sand & silty sand, with pockets of silt and gravel. The hydrogeological study completed by Englobe outlines detailed information regarding subsoil conditions, groundwater hydraulic gradients, groundwater recharge, dewatering for construction, and a preliminary water balance. Please refer to the applicable reports for further information.

6. WATERMAIN

6.1. Watermain Overview

The community of Dorchester obtains its water supply from eight (8) wells that are within shallow unconfined sand/gravel and deeper bedrock aquifer. The wells are located in two well fields along Dorchester Road. Water is treated by the Dorchester Water Treatment Facility (WTF) before being distributed throughout approx. 43km of municipally owned and operated watermains, including an elevated storage tank on Clara Street on the north side of the Thames River (GM BluePlan, 2019).

Easterly adjacent to the Acorn Valley site is the Tiner Estates Subdivision, which is an existing low-density residential development served by a network of 150mmø – 200mmø watermains connected to the Dorchester municipal water system. There is an existing 150mmø main on Christie Drive that abuts the future extension of the roadway across the site. There is additionally an existing 200mmø watermain at the limit of Mill Court. This 200mmø was planned for future extension and interconnection to the Acorn Valley site, and a vacant block was left at the end of Mill Court to facilitate this interconnection. This future interconnection was carried in the Municipality of Thames Centre Water and Wastewater Master Plan Update (WWMP) under capital program ID W-D-WM-13 (GM BluePlan, 2019).

Southwest of the Acorn Valley site is the Boardwalk Development, which is a low-density residential development that is draft plan approved and partially developed. The recently constructed portion of the site on the east side of Mill Road is served by a network of 50mmø – 300mmø watermains connected to the Dorchester municipal water system. There is an existing 300mmø watermain within the Boardwalk Development that is stubbed at the intersection of Mill Road & Boardwalk Way. This 300mmø stub is planned for future extension north along Mill Road and west along Christie Drive, replacing a portion of the existing 150mmø watermain on Christie Drive between Wheeler & Tiner Avenue. This future interconnection was carried in the Thames Centre WWMP under capital program ID W-D-WM-08/09/10-Alt2 (GM BluePlan, 2019). The Municipality of Thames Centre retained R.V. Anderson to complete the design of this 300mmø watermain interconnection on Mill Road from Boardwalk Way to Christie Drive, and was originally planned for construction in 2022, but the project was postponed and design is understood to currently be underway.

The Acorn Valley Subdivision is proposed to be constructed in three phases, as shown in the Phasing Figure appended to this report. Phase 1 of development will include the westerly extension of Christie Drive, including the installation of a 300mmø watermain to be stubbed at Harris Road for future extension, and the construction of Street 'B' to the south, including a 200mmø watermain. Phases 2 – 3 will include connection to the proposed 300mmø mainline on the to-be-constructed Christie Drive, with local extensions and looping to the south of the site as development occurs. 200mmø stubs will be left at Street 'B' & Street 'D' for future development to the north of the site (future development block).

Each housing unit will be provided with a 25mmø PEX water service. The high-density development block will be provided with sufficiently sized watermain stubs for future connection.

6.2. Watermain Design Criteria

Domestic water demand flows within the Acorn Valley Development were designed in accordance with Section 7.0 of the Thames Centre Engineering Design Standards (2023), and the Ministry of the Environment, Conservation and Parks (MECP) Design Guidelines for Drinking Water Systems (2008). Calculation parameters were as follows:

- Low-Density Population = 3.0 people/unit
- Medium-Density Population = 2.4 people/unit
- High-Density Population = 1.6 people/unit
- Average Per Capita Demand = 350 l/cap/day
- Min. Hour Factor = 0.50 (total pop. 3,001 – 10,000 people)
- Max. Day Factor = 2.00 (total pop. 3,001 – 10,000 people)
- Peak Hour Factor = 3.00 (total pop. 3,001 – 10,000 people)

Phases 1- 3 may consist of up to 801 residential units, with a total design population of 1,579 people. The future north development blocks may consist of up to 540 more residential units with a design population of 1,620 people. Peaking factors utilized for design of the water system were chosen based on an overall design population of 3,001 – 10,000 people to account for adjacent existing and proposed residential development included in the water model prepared for the proposed subdivision.

Based on the above design parameters, the average, peak hour and max. day demand for Phases 1 – 3 and the northerly development block are as follows;

Table 1 Domestic Water Demand Flows

Phase	Density	Residential Units	Design Population	Average Day Demand (l/s)	Peak Hour Demand (l/s)	Max Day Demand (l/s)
Phases 1 – 3	Low-Density	212	636	2.58	7.73	5.15
	High-Density	589	943	3.82	11.46	7.64
North Development Block	Low-Density	540	1,620	6.56	19.69	13.13
TOTAL		1,341	3,199	12.96	38.88	25.92

Detailed calculations are provided in Appendix ‘A’.

A minimum fire flow demand rate equal to 76 l/s was assigned to each phase of development in accordance with the minimum fire flow specified in the Thames Centre Engineering Design Standards (2023).

The Thames Centre Engineering Design Standards (2023) mandates the following pressure and flow requirements for watermain systems:

- Max day demand + fire flow must be supplied at a pressure not less than 140 kPa (20 psi) at any hydrant lateral or potential fire service connection, with flow velocities not exceeding 2.4 m/s
- Peak hour demand must be supplied at a pressure not less than 275 kPa (40 psi) in residential areas, with flow velocities not exceeding 1.5 m/s
- Average day demand must be supplied at a pressure not less than 275 kPa (40 psi) in residential areas
- Maximum residual pressure in the system should not exceed 550 kPa (80 psi) and a minimum residual pressure shall not be below 275 kPa (40 psi)
- Water shall not remain unused in the water system for more than 3 days under average day demand conditions

6.3. Water Model

In order to verify the proposed watermain infrastructure meets the requirements outlined above, an EPANET model was created to analyze the internal system, see Figures 2 & 3 enclosed to this report.

Hydrant flow testing was conducted by Classic Fire + Life Safety (Classic FLS) in October 2023 for the existing hydrant located in front of Mun. No. 109 Wheeler Avenue. The Municipality of Thames Centre was able to provide additional hydrant flow testing completed in August 2015 for existing hydrants located in front of Mun. No. 156 Wheeler Avenue and Mun. No. 155 Tiner Avenue. The as-constructed water distribution plan for the constructed portion of the Boardwalk Development was provided by the Municipality, which included as-constructed fire flows available at each installed hydrant. The Conceptual Water Distribution Analysis completed by AECOM for the proposed development at 187 Dorchester Road indicated a static hydraulic grade line of 289.2m at Dorchester Road.

The hydrant flow test conducted in October 2023 by Classic FLS was used as the most current test available for the existing watermain within the Tiner Estates Subdivision. This flow test yielded a static hydraulic grade line of 305.8m. The Water Distribution Analysis for the proposed development at 187 Dorchester Road provided a hydraulic grade line of 289.2m for the existing water system, but was dated July 2020. The more recent hydrant flow test was used as the boundary condition of 305.8m for the static hydraulic grade line available from the existing system at both the Tiner Estates and Boardwalk Development locations.

Junction elevations for the EPANET model were established using the existing and proposed finished grade elevations for the surrounding area and the Acorn Valley site. Pipe lengths and diameter were set using the proposed Watermain Servicing Plan, enclosed to this report.

A Hazen-Williams 'C' value of 100 was used 100 – 150mmø watermain, 110 for 200 – 250mmø watermain, and 120 for 300 – 600mmø watermain, in accordance with the Thames Centre Engineering Design Standards (2023).

Modelling for the average day, peak hour and max day + fire flow conditions were completed using single-period analysis. Water age analysis was completed using a continuous analysis over 14 days (336 hours). An initial age of 0.5 days (12 hours) was applied at the source within the EPANET model, which was at the intersection of Mill Road and Wheeler Court within the Tiner Estates Subdivision, or the intersection of Boardwalk Way and Harvest Lane within the Boardwalk Development. This is considered a conservative initial age based on an estimated 9.4 hour travel time using a distance of approx. 3.4km within the water system from the Dorchester Water Treatment Facility (WTF) at an average velocity of 0.1 m/s. A diurnal curve was generated to simulate varying water demand conditions throughout the day. The diurnal curve was generated based on the following demand factor distribution;

Table 2 Diurnal Curve Factors

Time (hh:mm)	Demand Type	Demand Factor
01:00	Minimum Hour	0.50
02:00	Minimum Hour	0.50
03:00	Minimum Hour	0.50
04:00	Minimum Hour	0.50
05:00	Minimum Hour	0.50
06:00	Average Day	1.00
07:00	Maximum Day	2.00
08:00	Peak Hour	3.00
09:00	Average Day	1.00
10:00	Average Day	1.00
11:00	Average Day	1.00
12:00	Average Day	1.00
13:00	Average Day	1.00
14:00	Average Day	1.00
15:00	Average Day	1.00
16:00	Average Day	1.00
17:00	Average Day	1.00
18:00	Maximum Day	2.00
19:00	Maximum Day	2.00
20:00	Average Day	1.00
21:00	Average Day	1.00
22:00	Average Day	1.00
23:00	Average Day	1.00
24:00	Minimum Hour	0.50

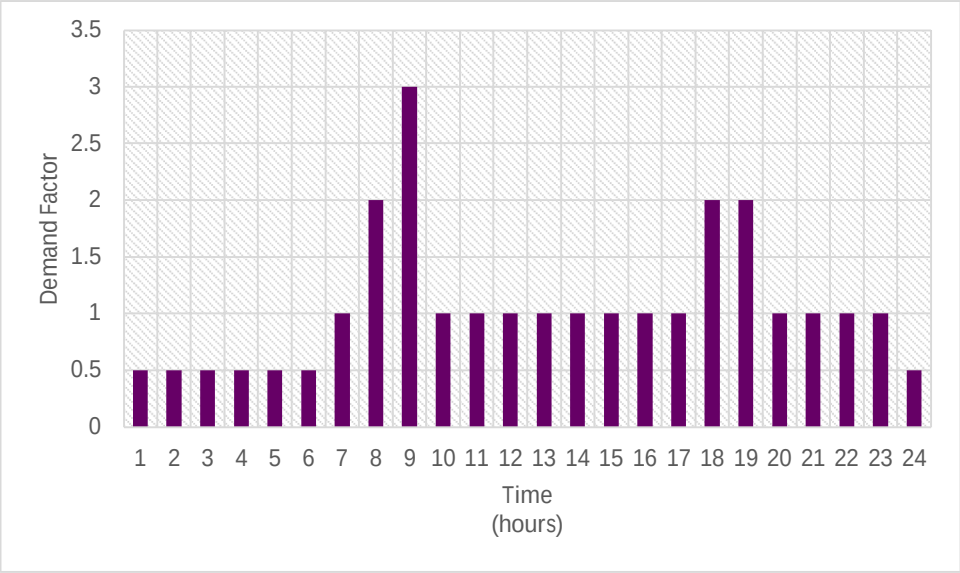


Figure 1 Diurnal Curve

6.4. Phase 1 Watermain – Domestic Flow Analysis

Phase 1 of development will include the westerly extension of Christie Drive, including the installation of a 300mmø watermain, to be stubbed at Harris Road. Street 'B' is proposed to be included with Phase 1 of development including a 200mmø watermain stubbed at the intersection with Street 'C'. Street 'B' and Street 'D' northerly road stubs will be constructed to the north limit of the open channel block, including 200mmø watermain stubs at each location, for future connection with the northern development blocks. Development within Phase 1 is proposed to consist of all low-density residential lots fronting on Christie Drive and Street 'B', as well as the high-density residential block fronting on Christie Drive.

For modelling of Phase 1 of development, the sole watermain feed will be from the existing 150mmø watermain at the east limit of Christie Drive, between Wheeler and Tiner Avenue. This is considered a conservative design assumption, as supplemental connections to the 200mmø mainline on Mill Court to the north, or the 300mmø watermain stub at the Boardwalk Development (Boardwalk Way), will only increase available flows and residual pressure.

A summary of the static, average day, peak hour and max day conditions for Phase 1 are shown below.

Table 3 Phase 1 EPANET Model Results

		Static Condition	Average Day Demand	Peak Hour Demand	Max Day Demand
Phase 1 688 units 1,240 people	Demand (l/s)	-	5.02	15.06	10.04
	Min. Residual Pressure	405.89 kPa (58.9 psi)	403.5 kPa (58.5 psi)	388.1 kPa (56.3 psi)	397.6 kPa (57.7 psi)
	Max. Flow Velocity (m/s)	-	0.2	0.7	0.4

As is shown in the table above, the proposed watermain infrastructure to be installed with Phase 1 will allow for static, average day, peak hour and max day demands to be provided with greater than 275 kPa (40 psi) and less than 550 kPa (80 psi) residual pressure in the system. Under all conditions, the minimum residual pressure was found at the 200mmø watermain stub proposed at the south end of Street 'B' for Phase 1, and the maximum velocity was within the existing 150mmø mainline on Wheeler Avenue. Detailed EPANET modelling results are provided in Appendix 'B'.

Upon completion of the water age analysis for Phase 1 of development, the only areas with a water age greater than 3 days were at the west limit of Christie Drive, and at the watermain stubs proposed at the north and south ends of Street 'D'.

For the watermain stubs proposed at the north and south end of Street 'D', there are no residences proposed to be served by these sections of mainline until future phases are constructed. It is proposed that the mainline valves to these stubs at the intersection with Christie Drive be closed after initial watermain commissioning, and that these watermain stubs be flushed and re-chlorinated in the future, upon extension for subsequent phases of development.

The westerly 180m length of 300mmø watermain on Christie Drive will not serve any demand supply until future extension on Harris Road, outside of the subdivision. With the extension of this watermain being indefinite and potentially not occurring for a number of years, this 180m length of watermain is proposed to be valved off from the remainder of the subdivision and capped at the westerly limit. Upon future extension, this watermain length will need to be flushed and re-chlorinated.

6.5. Phase 1 Watermain – Fire Flow Analysis

Under Phase 1 development conditions, the most constrained fire flow was determined for the low-density development areas (single-detached and semi-detached) and the high-density block. The critical available fire flow was determined by evaluating the greatest fire flow that could be drawn for the subdivision while all areas are under max day demand conditions, with no residual pressure being less than 140 kPa (20 psi) and no pipe flow velocity exceeding 2.4 m/s.

A summary of the maximum low-density and high-density fire flow available under each external connection scenario are shown in the table below.

Table 4 Phase 1 Fire Flow Summary

			Low-Density Fire Flow (South Limit – Street 'B')	High-Density Fire Flow (Block 175)
Phase 1 688 units 1,240 people	150mmø Christie Drive Stub ONLY	Max. Fire Flow (l/s)	50.9	61.8
		Min. Residual Pressure	140.0 kPa (20.3 psi)	143.9 kPa (20.9 psi)
		Max. Flow Velocity (m/s)	2.1	2.4
Phase 1 688 units 1,240 people	150mmø Christie Drive Stub & 200mmø Mill Court Connection	Max. Fire Flow (l/s)	61.8	61.8
		Min. Residual Pressure	168.5 kPa (24.4 psi)	273.0 kPa (39.6 psi)
		Max. Flow Velocity (m/s)	2.4	2.4
Phase 1 688 units 1,240 people	150mmø Christie Drive Stub & 300mmø Boardwalk Connection	Max. Fire Flow (l/s)	74.3	156.4
		Min. Residual Pressure	215.4 kPa (31.2 psi)	207.5 kPa (30.1 psi)
		Max. Flow Velocity (m/s)	2.4	2.4
Phase 1 688 units 1,240 people	150mmø Christie Drive Stub & 200mmø Mill Court Connection & 300mmø Boardwalk Connection	Max. Fire Flow (l/s)	74.3	156.4
		Min. Residual Pressure	224.5 kPa (32.6 psi)	239.0 kPa (34.7 psi)
		Max. Flow Velocity (m/s)	2.4	2.4

Under Phase 1 build-out, low-density built forms will consist of single-detached and semi-detached dwellings. The Ontario Building Code (OBC) fire flow required for these built forms is 45.0 l/s (detailed calculations in Appendix 'A'). The lowest fire flow available for the low-density housing product is 50.9 l/s when only the existing 150mmø watermain on Christie Drive is used for overall water supply. This lowest fire flow is slightly lower than the minimum 76.0 l/s listed in the Thames Centre Engineering Design Standards (2023), but is greater than the 45.0 l/s OBC fire flow requirement. Available fire flow in Phase 1 increases to 61.8 l/s and 74.3 l/s when an external connection is made to Mill Court and/or

Boardwalk Way, respectively. Under all of these scenarios, the minimum OBC fire flow is achieved for low-density build-out. It should be noted, a fire flow of 76.0 l/s, as specified in the Thames Centre Engineering Design Standards (2023), can be readily supplied with a maximum pipe velocity of 2.45 m/s.

Under Phase 1 build-out, with the only watermain supply point being the existing 150mmø on Christie Drive, the maximum available fire flow to the high-density block is 61.8 l/s. This remains unchanged when connecting to Mill Court due to velocity restrictions within the existing Tiner Estates development. By connecting to the existing 300mmø watermain on Boardwalk Way, the maximum available fire flow is significantly increased to 156.4 l/s. If the required fire flow for the high-density block (to be determined at the time of detailed site plan development) is within the maximum fire flow available, then the high-density block is readily able to be developed under Phase 1 build-out conditions.

6.6. Phases 1 – 3 & North Development Block Watermain – Domestic Flow Analysis

Phases 1 – 3 and the northerly development blocks (Block 192 & 193) will facilitate the completion of the entire Acorn Valley Subdivision. As indicated in Section 6.2 above, the ultimate build-out of Phases 1 – 3 and the north development blocks could yield up to 1,341 residential units with a design population of 3,199 people.

Phase 1, as described in Section 6.4 above, is proposed to consist of the westerly extension of Christie Drive across the site, the construction of Street 'B', and a portion of Street 'D', including all applicable watermain infrastructure. Phase 1 could consist of up to 99 low-density and 589 high-density units with a design population of 1,240 people. Phase 1 is shown above to be readily serviceable by connection to the existing 150mmø mainline on Christie Drive between Wheeler and Tiner Avenue, although a secondary water supply connection to either Mill Court or Boardwalk Way is recommended for redundancy and increased fire flow availability.

Phases 2 – 3 and the northerly development blocks will require a subsequent external watermain supply from either a northerly 200mmø connection through the vacant block at the end of Mill Court, or through a connection to the existing 300mmø watermain stub at Boardwalk Way within the Boardwalk Development, or a combination of the two. For the purposes of assessing the feasibility of one or both of these external connections, the EPANET modelling has evaluated each potential scenario to confirm the proposed watermain infrastructure is suited for the proposed development.

Build-out of Phases 1 – 3 and the north development blocks will allow for installation of the full watermain network proposed for the Acorn Valley Subdivision. Watermain stubs for future connection will be provided at the south limit of Street 'C' and Street 'D' (200mmø and 300mmø, respectively) for potential future extension, upon build-out of the Harris Road lands. A 300mmø watermain stub will be provided at the west limit of Christie Drive, where it intersects Harris Road, for potential future extension to the west, as described in Section 6.4 above. A 200mmø watermain stub will be provided east off of the south end of Street 'C' (Block 177). This 200mmø stub will be provided for a potential future road connection to the table lands of the adjacent property, that may be developed by others.

A summary of the static, average day, peak hour and max day conditions are shown in the table below.

Table 5 Phases 1- 3 & North Development EPANET Model Results

			Static Condition	Average Day Demand	Peak Hour Demand	Max Day Demand
Phases 1 – 3 & North Dev. 1,341 units 3,199 people	150mmø Christie Drive Stub ONLY	Demand (l/s)	-	12.96	38.88	25.92
		Min. Residual Pressure	380.4 kPa (55.2 psi)	368.5 kPa (53.5 psi)	289.8 kPa (42.0 psi)	337.7 kPa (49.0 psi)
		Max. Flow Velocity (m/s)	-	0.5	1.4	0.9
Phases 1 – 3 & North Dev. 1,341 units 3,199 people	150mmø Christie Drive Stub & 200mmø Mill Court Connection	Demand (l/s)	-	12.96	38.88	25.92
		Min. Residual Pressure	380.4 kPa (55.2 psi)	374.1 kPa (54.3 psi)	332.7 kPa (48.2 psi)	357.9 kPa (51.9 psi)
		Max. Flow Velocity (m/s)	-	0.5	1.4	0.9
Phases 1 – 3 & North Dev. 1,341 units 3,199 people	150mmø Christie Drive Stub & 300mmø Boardwalk Connection	Demand (l/s)	-	12.96	38.88	25.92
		Min. Residual Pressure	380.4 kPa (55.2 psi)	378.5 kPa (54.9 psi)	365.9 kPa (53.1 psi)	373.5 kPa (54.2 psi)
		Max. Flow Velocity (m/s)	-	0.2	0.6	0.4
Phases 1 – 3 & North Dev. 1,341 units 3,199 people	150mmø Christie Drive Stub & 200mmø Mill Court Connection & 300mmø Boardwalk Connection	Demand (l/s)	-	12.96	38.88	25.92
		Min. Residual Pressure	380.4 kPa (55.2 psi)	378.8 kPa (54.9 psi)	368.2 kPa (53.4 psi)	374.7 kPa (54.3 psi)
		Max. Flow Velocity (m/s)	-	0.2	0.7	0.5

From the table above it can be seen that Phases 1 – 3 and the north development blocks can be serviced by the proposed watermain system, through connection to Mill Court and/or Boardwalk Way, independently or combined.

Under all external connection scenarios described above, the minimum residual pressure occurs at the very south end of the proposed 300mmø watermain on Street 'D'. This 300mmø mainline is still well within minimum residual pressures and flow velocities specified, and may be extended in the future if the Harris Road lands to the south are developed. A 200mmø mainline stub is also proposed at the south limit of Street 'C' for potential future extension within the Harris Road lands, but provides a slightly higher residual pressure due to a lower ground elevation.

A water age analysis was completed for full build-out of the Acorn Valley Subdivision (Phases 1 – 3 and north development blocks) and yielded the same results under all external connections scenarios described above. The 300mmø watermain stub provided at the west limit of Christie Drive, to be installed with Phase 1 of development, will need to be valved off and not utilized until future extension to the west of the site, as further discussed in Section 6.4 above.

The 300mmø watermain stub proposed at the south limit of Street 'D' and the 200mmø stub proposed at the south limit of Street 'C' do not exceed a water age of 3 days under all external connection scenarios, therefore not requiring an automatic flushing device.

The 200mmø watermain stub proposed within Block 177 on the east side of Street 'C' does not serve any residential units and therefore does exceed a water age of 3 days under all external connection scenarios. It is proposed that the mainline valves to these stubs at the intersection with Street 'C' be closed after initial commissioning, and that this stub be flushed and re-chlorinated in the future, upon future extension.

Detailed EPANET modelling results for all external connection scenarios can be found in Appendix 'B'.

Future internal watermain looping and layout for the north development block will need to be further reviewed under detailed design when a site concept is developed.

6.7. Phases 1 – 3 & North Development Block Watermain – Fire Flow Analysis

Under Phase 1 – 3 & north development block build-out conditions, the most constrained fire flow was determined for the low-density development areas (single-detached, semi-detached & townhome) and the high-density block. The critical available fire flow was determined by evaluating the greatest fire flow that could be drawn for the subdivision while all areas are under max day demand conditions, with no residual pressure being less than 140 kPa (20 psi) and no pipe flow velocity exceeding 2.4 m/s.

A summary of the maximum low-density and high-density fire flow available under each external connection scenario are shown in the table below.

Table 6 Phases 1 - 3 & North Development Fire Flow Summary

			Low-Density Fire Flow (South Limit – Street 'D')	High-Density Fire Flow (Block 175)
Phases 1 – 3 & North Dev. 1,341 units 3,199 people	150mmø Christie Drive Stub ONLY	Max. Fire Flow (l/s)	40.7	41.7
		Min. Residual Pressure	140.0 kPa (20.3 psi)	140.0 kPa (20.3 psi)
		Max. Flow Velocity (m/s)	2.2	2.3
Phases 1 – 3 & North Dev. 1,341 units 3,199 people	150mmø Christie Drive Stub & 200mmø Mill Court Connection	Max. Fire Flow (l/s)	46.0	46.0
		Min. Residual Pressure	231.0 kPa (33.5 psi)	239.1 kPa (34.7 psi)
		Max. Flow Velocity (m/s)	2.4	2.4
Phases 1 – 3 & North Dev. 1,341 units 3,199 people	150mmø Christie Drive Stub & 300mmø Boardwalk Connection	Max. Fire Flow (l/s)	135.2	141.0
		Min. Residual Pressure	140.0 kPa (20.3 psi)	185.1 kPa (26.8 psi)
		Max. Flow Velocity (m/s)	2.3	2.4
Phases 1 – 3 & North Dev. 1,341 units 3,199 people	150mmø Christie Drive Stub & 200mmø Mill Court Connection & 300mmø Boardwalk Connection	Max. Fire Flow (l/s)	141.0	141.0
		Min. Residual Pressure	152.7 kPa (22.1 psi)	216.9 kPa (31.5 psi)
		Max. Flow Velocity (m/s)	2.4	2.4

Under Phase 1 – 3 build-out, including the northern development block, low-density built forms will consist of single-detached, semi-detached and townhome dwellings. The Ontario Building Code (OBC) fire flow required for these built forms is 45.0 l/s (singles & semis) and 60.0 l/s (townhomes) (detailed calculations in Appendix 'A'). The lowest fire flow available for the low-density housing product is 40.7 l/s when only the existing 150mmø watermain on Christie Drive is used for overall water supply. This available fire flow does not meet OBC requirements, therefore an improved water supply connection is required. By connecting to Mill Court to the north, the available fire flow is increased to 46.0 l/s, which

meets the OBC flow requirement for singles and semis, but not for townhomes. It should be noted the OBC fire flow of 60.0 l/s can be supplied with the Mill Court Connection supply, but would result in some watermains within the Tiner Estates development exceeding the Thames Centre mandated 2.4 m/s max. velocity, although still less than the MECP mandated 3.0 m/s maximum. The most robust water supply connection point is the 300mmø Boardwalk Way mainline. Connection to Boardwalk Way significantly increases the available fire flow to 135.2 l/s. This available fire flow significantly exceeds the OBC fire flow requirements, as well as the generalized 76.0 l/s requirement for low-density areas in the Thames Centre Engineering Design Standards (2023).

The Fire Underwriters Survey (FUS, 2020) fire flows required for the single-detached, semi-detached and townhome built-forms are 100.0 l/s, 116.7 l/s, and 150.0 l/s, respectively (detailed calculations in Appendix 'A'). By connecting to the Boardwalk Way 300mmø watermain, a fire flow of 150.0 l/s can be supplied, with a maximum pipe velocity of 2.48 m/s, slightly exceeding the 2.40 m/s max. in the Thames Centre Engineering Design Standards, but much less than the MECP 3.0 m/s maximum.

Under Phase 1 – 3 build-out, including the northern development block, with the watermain supply point being the 150mmø watermain on Christie Drive, the maximum fire flow available to the high-density block is 41.7 l/s. The required fire flow for the high-density block will be determined at the time of detailed development and site plan application, but it is anticipated to exceed the available 41.7 l/s. An improved watermain supply point is therefore required. Connection to Mill Court to the north will increase the available fire flow to 46.0 l/s, which may satisfy the high-density block requirements, subject to built-form and fire protection. Connecting to Boardwalk Way significantly increases the available fire flow to the high-density block to 141.0 l/s.

Providing both the Mill Court and Boardwalk Way connections maintains the same available fire flow as when solely connecting to Boardwalk Way, based on pipe velocity restrictions. It should be noted the available fire flow can increase higher under all modelling scenarios if using the MECP maximum pipe velocity of 3.0 m/s.

6.8. Watermain Development Charge Capital Projects

The 2019 Water and Wastewater Master Plan (WWMP) for the Municipality of Thames Centre provided a summary of capital projects to be captured under future Development Charges. The 300mmø watermain extension along Mill Road and Christie Drive from the Boardwalk Development was carried under Capital Program IDs W-D-WM-08/09/10 Alt1 & Alt2 (see Figure ES-2 and Table ES-1 of the 2019 WWMP included in Appendix 'A'). Alternative 1 proposed a crossing of the existing ravine in the southeast corner of the Acorn Valley Site, through the proposed Boardwalk Development on the west side of Mill Road. Alternative 2 proposed an alignment within the Mill Road and Christe Drive right-of-ways. Both alternatives carried the same 300mmø watermain and the same capital cost of $1,776,000 (excl. HST) (GM BluePlan, 2019). As discussed in Section 6.1 above, the Municipality has already retained R.V. Anderson to complete the design of the 300mmø watermain extension along Mill Road to the Tiner Estates Subdivision, which was originally planned for construction in 2022, but the project was postponed and is understood to currently be in the design stage.

The 300mmø watermain extension within the future Christie Drive roadway across the Acorn Valley Subdivision site was carried under Capital Program ID W-D-WM-11 with an estimated capital cost of $1,718,000 (excl. HST). (GM BluePlan, 2019).

The 2019 WWMP also proposed a 200mmø watermain extension from Mill Court, westerly across the Acorn Valley site, and further west across existing private property to Harris Road. This project was carried under Capital Program ID W-D-WM-13 with an estimated capital cost of $1,394,000 (excl. HST) (GM BluePlan, 2019). The 200mmø connection to Mill Court is proposed to occur with development of

the northerly blocks within the Acorn Valley Subdivision, which will be looped within the site to the 300mmø mainline proposed on Christie Drive. Due to the Municipality of Thames Centre and Middlesex County not currently possessing any property or easements along Harris Road to the west to allow for the 200mmø watermain connection west from the Acorn Valley site, a servicing block and watermain stub is not currently proposed in this area for the future interconnection further west, although this can be further assessed if the Municipality attains a servicing corridor in this area in the future.

Further discussions will need to be continued with the Municipality of Thames Centre as the development progresses regarding installation responsibility, front-ending, cost-sharing, existing watermain funding reserves and project timing.

6.9. Watermain Conclusions

The Acorn Valley Subdivision is proposed to consist of 801 residential units (Phase 1 – 3) (low, medium and high-density), with a potential of 540 additional residential units within the north development block.

The development of each phase of the Acorn Valley Subdivision will allow for extension and interconnection of the existing Dorchester municipal watermain system, with each residential unit being provided a 25mmø PEX water service, and high-density blocks being provided watermain stubs for future connection. Additional watermain stubs will be provided at the west and south limits of the site for potential future extension when the adjacent lands develop. The following is a summary of the findings from the detailed watermain modelling for the development;

- Phase 1 Build-Out
    - Phase 1 will be served by connection to the existing 150mmø watermain on Christie Drive between Wheeler and Tiner Avenue
    - Max day demand + fire flow (60.9 l/s) is able to be provided at a pressure not less than 140 kPa (20 psi) at any hydrant lateral or potential fire service connection, with flow velocities not exceeding 2.4 m/s. The maximum fire flow available of 50.9 l/s exceeds the Ontario Building Code requirement for the proposed single-detached and semi-detached dwellings (45.0 l/s). No townhome development is proposed with Phase 1.
    - At the time of development of the high-density block (site plan application stage) the required fire flow will need to be determined to be within the available fire flow that can be supplied to the block, based on external watermain supply connections at that time.
    - Peak hour demand is able to be supplied at a pressure not less than 275 kPa (40 psi), with flow velocities not exceeding 1.5 m/s
    - Average day demand is able to be supplied at a pressure not less than 275 kPa (40 psi)
    - Maximum residual pressure in the system does not exceed 550 kPa (80 psi) and minimum residual pressure is not less than 275 kPa (40 psi)
    - The westerly 180m length of 300mmø watermain on Christie Drive will be valved off and capped for extension on Harris Road in the future. Due to unforeseen extension timing, this length of watermain will need to be flushed and re-chlorinated at time of extension.
    - Watermain stubs proposed with Phase 1 of development on Street 'D' will have the mainline valves at Christie Drive closed and these sections of watermain will be flushed and re-chlorinated upon extension of the mainline for future phases.
    - All other portions of the Phase 1 water system will not have a water age greater than 3 days under average day demand conditions.

- Full Build-Out (Phases 1 – 3 & North Development Blocks)
    - Phases 1 – 3 and the northerly development blocks will be served by an interconnection to the 300mmø watermain at the Boardwalk Development, by extension along Mill Road and Christie Drive. This 300mmø mainline extension will also connect with the existing watermain within the Tiner Estates Subdivision.

- A subsequent 200mmø watermain interconnection will be provided with development of the northern blocks to the existing 200mmø mainline on Mill Court, through an existing vacant block.
- Max day demand + fire flow is able to be provided at a pressure not less than 140 kPa (20 psi) at any hydrant lateral or potential fire service connection, with flow velocities not exceeding 2.4 m/s. The maximum low-density fire flow available with just the 300mmø Boardwalk Development connection is 135.2 l/s, and with the addition of the 200mmø interconnection to Mill Court is 141.0 l/s. Both of these fire flows exceed OBC requirements and the 76.0 l/s minimum fire flow. The FUS fire flow requirements for all low-density built-forms can be readily supplied by connection to Boardwalk Way, with a slight exceedance in the 2.4 m/s max. pipe velocity under the townhome FUS flow requirement condition.
- The high-density block is able to be supplied a maximum available fire flow of 141.0 l/s by connection to Boardwalk Way. This is maintained when providing an additional connection to Mill Court. At the time of development of the high-density block (site plan application stage) the required fire flow will need to be determined to be within the available fire flow that can be supplied to the block, based on external watermain supply connection points at that time.
- Peak hour demand is able to be supplied at a pressure not less than 275 kPa (40 psi) with flow velocities not exceeding 1.5 m/s, whether solely provided by the 200mmø Mill Court connection, or the 300mmø Boardwalk Development connection
- Average day demand is able to be supplied at a pressure not less than 275 kPa (40 psi), whether solely provided by the 200mmø Mill Court connection, or the 300mmø Boardwalk Development connection
- Maximum residual pressure in the system does not exceed 550 kPa (80 psi) and minimum residual pressure is not less than 275 kPa (40 psi)
- The westerly 180m length of 300mmø watermain on Christie Drive is proposed to remain valved off and capped until flushing and re-chlorination upon future extension on Harris Road.
- The watermain stubs proposed on the east side of Street 'C' (Block 177) and at the south limits of Street 'C' and Street 'D' will have the mainline valves at the roadways closed and these sections of watermain will be flushed and re-chlorinated upon extension of the watermain for future development
- The internal watermain looping and alignment for the northern development block will be evaluated during detailed design when a concept is developed
- All other portions of the Acorn Valley water system will not have a water age greater than 3 days under average day demand conditions

7. SANITARY SEWAGE

7.1. Sanitary Overview

The Acorn Valley Subdivision is within the sanitary tributary area of Dorchester Sewage Pumping Station No. 3 (SPS No. 3) designed by Stantec Consulting Ltd. and construction in 2019. Dorchester SPS No. 3 is located south of Mill Pond, north of the Boardwalk Development, and east of the existing Boardwalk Development SWM Pond and Mill Road. The ultimate build-out area tributary to SPS No. 3 was 176.9 ha and included the Acorn Valley Subdivision lands and a portion of the Harris Road lands (Stantec, 2018).

Concurrent to the design of SPS No. 3, GM BluePlan was retained by the Municipality of Thames Centre to complete the 2019 Water and Wastewater Master Plan (WWMP). At the time of finalizing the 2019 WWMP, Dorchester SPS No. 3 was under construction. The WWMP concluded that SPS No. 3 should continue to be constructed per the original design, but that a future tributary should be planned for and future capacity upgrades be allocated under a Development Charge project for the Municipality (GM BluePlan, 2019).

The development of the Acorn Valley Subdivision will require the installation of a sanitary trunk sewer from the current SPS No. 3 location to the subject site. The sanitary trunk sewer will ultimately serve a significant area of lands outside of the Acorn Valley Subdivision and Harris Road lands, for which front-ending and cost-sharing discussions will need to be reviewed with the Municipality as the project progresses.

7.2. Dorchester Sanitary Pumping Station No. 3

Dorchester Sanitary Pumping Station No. 3 consists of a 4.7mø circular precast concrete wet well that is 13.5±m deep, currently containing 3 pumps (2 duty, 1 standby) (Stantec, 2018). The pumps convey sewage to a precast valve chamber and out to a 150mmø forcemain that crosses an existing watercourse to the northeast and outlets to an existing gravity sewer on Byron Avenue (Stantec, 2018). The 150mmø outlet forcemain was twinned during construction to allow for increased capacity to accommodate ultimate build-out conditions, while ensuring minimum flow velocities and forcemain turnover under initial build-out (Stantec, 2018). SPS No. 3 was designed for three (3) phases of build-out (Stantec, 2018);

- Initial Build-Out
  - Tributary Area = 7.9 ha
  - Tributary Population = 120 people
  - Average Sewage Flow = 1.1 l/s
  - Peak Sewage Flow = 2.2 l/s

- Medium Build-Out
  - Tributary Area = 85.1 ha
  - Tributary Population = 3,012 people
  - Average Sewage Flow = 16.0 l/s
  - Peak Sewage Flow = 34.5 l/s

- Ultimate Build-Out
  - Tributary Area = 176.9 ha
  - Tributary Population = 5,824 people
  - Average Sewage Flow = 31.5 l/s
  - Peak Sewage Flow = 65.3 l/s

The pumps currently installed in SPS No. 3 are understood to have a firm capacity of 33.0 l/s peak sewage flow, with future pump upgrades able to accommodate up to 66.0 l/s under ultimate conditions (GM BluePlan, 2019).

7.3. Sanitary Design Criteria

The Municipality of Thames Centre was able to provide the original design report for SPS No. 3, as prepared by Stantec, but the report did not include a sanitary design sheet or tributary figure for evaluating an overall breakdown of the tributary areas listed under each phase of build-out. The Municipality was able to source a separate preliminary sanitary tributary figure design sheet for SPS No. 3 as prepared by Stantec, but in general, the overall tributary areas and design flows do not match the design brief, and are lower than what was provided in the design report. The 2019 Water and Wastewater Master Plan (WWMP) completed by GM BluePlan evaluated an expanded tributary that would ultimately flow to Dorchester SPS No. 3. For the purposes of the Acorn Valley Subdivision sanitary design review, the tributary areas from the WWMP will be utilized where applicable.

The design criteria utilized for Dorchester Sanitary Pumping Station No. 3 are as follows (Stantec, 2018);

- Manning's Equation for sewer sizing;
- Low-Density
  - Unit Density of 15 units/ha (low-density);
  - Population Density of 45 ppl/ha (3.0 ppl/unit) (low-density);
- Medium-Density
  - Unit Density of 30 units/ha (medium-density);
  - Population Density of 72 ppl/ha (2.4 ppl/unit) (medium-density);
- High-Density
  - Unit Density of 150 – 300 units/ha (high-density);
  - Population Density of 240 – 480 ppl/ha (1.6 ppl/unit);
- 230 l/cap/day estimated sewage generation rate;
- 0.1 l/s/ha infiltration and inflow rate;
- Peaking factor calculated using Harmon's Peaking Factor Formula; and
- 10% uncertainty factor

The Thames Centre Engineering Design Standards (2023) specify greater low and medium-density unit rates with a sewage generation rate of 350 l/cap/day and a peaking ratio of 80% of the Harmon Peaking Factor.

The 2019 WWMP utilized the same 350 l/cap/day sewage generation rate as the Thames Centre Design Standards, but used an increased infiltration allowance of 0.2 l/s/ha for evaluating existing and proposed sewer capacity. The WWMP used 3 different methods for evaluating design population based on the Development Charge Background Study projections, or a uniform density of 50 ppl/ha (approx. 16.7 units/ha), or a combination of the two (GM BluePlan, 2019). The uniform density of 50 ppl/ha was used for the evaluation of trunk sewers in the WWMP, which generates design flows approx. 18% higher than the design criteria used for SPS No. 3. The WWMP used a different method of evaluating vertical infrastructure, such as pumping stations, involving a combination of DC Background Study population projections and the uniform density estimate, which yield peak sewage flows approx. 18% lower than the design criteria used for SPS No. 3.

For the purposes of evaluating the Acorn Valley Subdivision sanitary design, the Dorchester SPS No. 3 design criteria listed above will be used to accurately represent design inflows to SPS No.3 equivalent to the criteria used for the original pumping station design. Actual unit counts/planned densities were utilized where applicable within the development, which are generally higher than the original design densities. This approach is the most comparable to referencing the original design of SPS No. 3, and is seen as a middle-ground when comparing against the Thames Centre Engineering Design Standards (generally higher flows) and the design criteria of the 2019 WWMP (generally lower flows). The resulting design tributaries and sewage flows based on the current Thames Centre Engineering Design Standards (2023) have also been carried for clarity in the detailed sanitary design calculations included in Appendix 'A'.

7.4. Acorn Valley Subdivision

As noted in Section 1.0 above, the Acorn Valley Subdivision consists of 212 low-density units and 589 high-density units (150 units/ha) (801 units total). This results in a total design population of 1,579 people with an average sewage flow of 6.6 l/s, and a peak sewage flow of 18.9 l/s (see detailed sanitary calculations included in Appendix 'A').

These design populations and flow rates are less than the original ultimate design flow for SPS No. 3 from the sanitary tributary figure for this property (2,066 people, 10.6 l/s average flow, 26.2 l/s peak flow) (Stantec, 2018). Based on the anticipated sewage flows from the Acorn Valley Development, it is anticipated Dorchester SPS No. 3 will be under the Medium Build-Out phase when the proposed 801 residential units from this site are constructed, but will be subject to the timing of other developments tributary to the station. The initial build-out of the Acorn Valley Development is anticipated to occur in

three phases, as shown in the Phasing Plan attached, which will allow for extended monitoring of the inflows to the pumping station for pump timing adjustments and capacity evaluation.

The north development block within the proposed Draft Plan is 18.01 ha and is estimated by the Developer to yield an additional 30 units/ha, resulting in 540 units and a design population of 1,621 people with an average sewage flow of 6.6 l/s and a peak sewage flow of 19.2 l/s (see detailed sanitary calculations in Appendix 'A').

The ultimate Acorn Valley Subdivision build-out from Phases 1 – 3 and the northern development block is estimated to be 1,341 units, with a design population of 3,200 people, an average sanitary flow of 13.2 l/s and a peak sanitary flow of 35.8 l/s (see detailed sanitary calculations in Appendix 'A').

These ultimate design flows from the subject site are slightly greater than the original ultimate design flow for SPS No. 3 from this property (2,066 people, 10.6 l/s average flow, 26.2 l/s peak flow) (Stantec, 2018). The capacity of Dorchester SPS No. 3 will need to be monitored by the Municipality upon ultimate build-out of the Acorn Valley Subdivision to confirm upgrades to the station are not required. There may be additional capacity in SPS No. 3 at the time of ultimate build-out of this property, if other sites planned for development have not progressed.

All internal sanitary piping will convey sewage flows by gravity to the proposed trunk sewer and ultimately SPS No. 3. Please refer to the Sanitary Drainage System figure enclosed. Further details on sanitary pipe design will be provided with detailed engineering design. Each housing unit will be provided with a 100mmø sanitary PDC to provide basement gravity service. Sanitary sewer stubs will be provided for the proposed high-density block for future connection.

7.5. Harris Road Lands

The original design of Dorchester SPS No. 3 considered the portion of the Harris Road lands within the Dorchester Settlement Area Boundary (17.9 ha) tributary to the pumping station, but only anticipated a design population of 15 people for this area based on 5 residential lots (Stantec, 2018). Currently there are 6 existing residential lots and one agricultural commercial development in this area. The developable portion of the Harris Road lands within the settlement boundary, excluding the existing lots, is 13.35 ha. The 2019 WWMP utilized a uniform density of 50 ppl/ha for the area within the settlement boundary, which yields a design population of 668 people. If the Harris Road lands were to develop in the future the design population would likely be low-density residential development, which based on a developer-estimated 20 units/ha and 3 ppl/unit (60 ppl/ha) would yield a design population of 801 people. The Acorn Valley sanitary system is likely to be the most readily available sanitary connection point for the Harris Road lands based on current planned infrastructure. If the Harris Road lands connect to the proposed sanitary system to be installed in the Acorn Valley development, flows will ultimately be handled by Dorchester SPS No. 3, in accordance with the 2019 Water and Wastewater Master Plan (GM BluePlan, 2019). It is likely that when the Harris Road lands are considered for future development, detailed consultation will need to be conducted with the Municipality of Thames Centre to confirm if any potential upgrades will be required for SPS No. 3. It is noted the Dorchester Settlement Area Boundary will need to be amended to include the entirety of the Harris Road parcel, if all the lands were desired to be developed.

The total area of the Harris Road lands, both inside and outside of the Dorchester Settlement Area Boundary is 35.7 ha, which yields a design population of 2,142 people based on 60 ppl/ha.

7.6. External Developments

Beyond the Acorn Valley Subdivision and the Harris Road lands owned by Doug Tarry Developments, there are a number of external existing and future development lands that may connect to the sanitary trunk sewer required to be installed for the proposed subdivision. Please refer to the enclosed Sanitary Drainage Systems figure.

There are two areas of the Boardwalk Development that would ultimately be tributary to the proposed sanitary trunk sewer to be installed from Dorchester SPS No. 3. These areas are the portion of the development west of Mill Road, and the portion of the development north of the existing Boardwalk stormwater management pond. Both of these areas were accounted for in the original design of SPS No. 3 by Stantec and the 2019 WWMP by GM BluePlan. These lands are shown as EXT 1 & EXT 2 on the enclosed Sanitary Drainage Systems figure.

Further north from the Boardwalk development on Mill Road, is the existing residences of Tiner Estates (Wheeler Avenue, Tiner Avenue, Mill Road). These approx. 177 residences are currently on private sanitary systems (septic). These units were accounted for in the original design of SPS No. 3 and the 2019 WWMP by Stantec and GM BluePlan, respectively. These lands are shown as EXT 3, EXT 4 & EXT 5 on the enclosed Sanitary Drainage Systems figure.

Further to the west, beyond the Acorn Valley Subdivision and north of Christie Drive, there are two future development properties. One is an existing vacant property (agricultural usage) on the west side of Harris Road and south side of Hamilton Road (EXT 13 on enclosed sanitary figure). The other is another vacant parcel (agricultural usage) on the south side of Hamilton Road, on either side of the existing entrance to the Dorchester Outdoor Recreation Complex (EXT 14 on enclosed sanitary figure). These properties were not accounted for in the original design of SPS No. 3 (Stantec, 2018), but were planned in the 2019 Water and Wastewater Master Plan (GM BluePlan, 2019). For the purposes of the ultimate design area tributary to the sanitary trunk sewer, the 7 existing residences on the east side of Harris Road, north of Christie Drive, were considered for future connection as well (EXT 12 on enclosed sanitary figure).

The property that makes up the west half of the Boardwalk Development, on the west side of Mill Road, has a portion of the property on the table lands on the west side of the existing ravine. These lands, although part of the Boardwalk Subdivision property, were not approved for development in the original Boardwalk planning applications. If these lands were to be pursued for development in the future, it is likely they would connect to the future sanitary network within the Acorn Valley Subdivision. These lands are shown as EXT 6 on the enclosed sanitary figure with a low-density residential design population carried. This area was accounted for in the design of SPS No. 3 (Stantec, 2018) and the 2019 WWMP (GM BluePlan, 2019).

As previously mentioned in Section 7.5, there are 6 existing residential lots and one existing agricultural commercial development westerly adjacent to the Harris Road lands. These existing properties were considered as tributary to SPS No. 3 in the detailed design completed by Stantec and the 2019 WWMP completed by GM BluePlan. Under the original SPS No. 3 design, this area was just considered as 5 existing residential lots (Stantec, 2018), but within the WWMP the lands were considered as future development at 50 ppl/ha. For the purposes of evaluating the sanitary trunk sewer sizing, these lands were considered to remain under their existing usage, for future connection to the sanitary system through the Harris Road lands (EXT 7 & EXT 8 on enclosed sanitary figure).

There are vacant agricultural lands to the south, west and east of the Harris Road lands going down toward Donnybrook Drive that could be tributary to the Harris Road and Acorn Valley Subdivision sanitary system through gravity drainage, based on existing surface contours, however, these lands were not considered under the 2019 Water and Wastewater Master Plan (GM BluePlan, 2019) as being tributary to SPS No. 3 and therefore have not been carried in this sanitary assessment.

7.7. Mill Road Sanitary Trunk Sewer

The original tender for the construction of the Dorchester Sanitary Pumping Station No. 3 included a 375mmø trunk sewer from the station west to Mill Road. This trunk sewer was ultimately removed from the work constructed in 2019. Sanitary servicing for the Acorn Valley Subdivision will require the installation of this sanitary trunk sewer from SPS No. 3 west to Mill Road and ultimately northeast to the subject site.

The original design of Dorchester SPS No. 3 included two alternative alignments for the trunk sewer from the pumping station to the Acorn Valley Subdivision lands (Stantec, 2018).

- Alignment 1
  - Extend sanitary trunk sewer north on Mill Road and then west on Christie Drive to the subject site
  - Total length of sanitary trunk sewer from SPS No. 3 to the subject site is approximately 1.1 km
- Alignment 2
  - Extend sanitary trunk sewer north on Mill Road for a short distance and then west through the proposed Boardwalk Development and northwest across the existing ravine directly into the Acorn Valley Subdivision lands
  - Total length of sanitary trunk sewer from SPS No. 3 to the subject site is approximately 0.9 km

Both Alignment 1 and Alignment 2 are feasible for the servicing of the Acorn Valley Subdivision. Alignment 1 keeps all proposed sanitary infrastructure within the municipal ROW for Mill Road and Christie Drive, and can service the existing Tiner Estates lands with greater sanitary depth, but will require full road reconstruction for installation. Alignment 2 avoids the majority of the increased cost for full road reconstruction, and minimizes impact of construction on existing traffic in the area, but requires installation of the trunk sewer across the Boardwalk Development lands, of which timing for development is currently unknown, and will require a crossing of the existing ravine, which the completed EIS did consider a potentially sensitive feature. Drilling of this sewer across the ravine could be reviewed at time of detailed design to minimize impact on the existing natural environment. Both options can adequately service the full Acorn Valley Subdivision, as well as external lands to the south for potential future connection. The final sanitary trunk sewer alignment will be confirmed at the time of detailed engineering design. Although Alignment 1 is likely more costly, based on a greater length of full road reconstruction, the additional cost may be offset by completing concurrently with the planned Mill Road watermain extension by the Municipality of Thames Centre.

It is understood the Municipality of Thames Centre is preparing to tender the approx. 280m length of 375mmø sanitary trunk sewer from SPS No. 3 to Mill Road within the near future. It has been further indicated that the trunk sewer will be installed with a flatter slope than original design (0.5% versus original 1.4% slope). The sanitary assessment completed carried the updated 0.5% design slope on this sewer based on the inverts provided from the Municipality and their Engineering Design Consultant, Stantec.

A summary of the total sanitary design flows are shown in the table below. Design values are based on areas referenced above, utilizing the design criteria from the Dorchester SPS No. 3 Design Brief (Stantec, 2018) with actual/estimated densities/unit counts used for existing development, the Boardwalk Development, the Acorn Valley Subdivision, and the Harris Road lands. Please reference the sanitary design calculations and the Sanitary Drainage System figure enclosed for further details.

Table 7 Sanitary Trunk Sewer Design Flows

		Area ID (SPS No. 3 Design/ CJDL Sanitary Figure)	Tributary Area (ha)	Tributary Population (People)	Average Sanitary Design Flow (l/s)	Peak Sanitary Design Flow (l/s)
CURRENT	Original SPS No. 3 Design	Dorchester SPS No. 3 Area 18 (Excl. Mun. No. 17 & 21 Christie Drive)	45.9	2,066	10.6	26.2
	Proposed	Acorn Valley Subdivision (Excl. North Dev. Block)	19.9	1,579	6.6	18.9
		Acorn Valley Subdivision (North Dev. Block)	18.0	1,621	6.6	19.2
		TOTAL	37.9	3,200	13.2	35.8
FUTURE	Original SPS No. 3 Design	Dorchester SPS No. 3 Areas 18, 19, W, 22a, 22b (Lots Fronting on Mill Road Only)	107.0	4,025	22.5	50.0
	Proposed	Acorn Valley Subdivision	37.9	3,200	13.2	35.8
		Harris Road Lands	35.7	2,142	9.8	25.9
		External Lands (All Other Areas Shown on Enclosed Sanitary Drainage Systems Figure)	96.0	2,977	18.3	39.6
		TOTAL	169.6	8,319	41.3	90.9

As can be seen in the table above, the current south half of the Acorn Valley Subdivision (Phases 1 - 3) has a peak sanitary flow of 18.9 l/s, which is less than the original SPS No. 3 design flow from this property of 26.2 l/s, demonstrating that the current planned development is within the allocated design flows. The northerly development block will increase the overall peak sanitary flow for this site to 35.8 l/s, which is slightly higher than the original SPS No. 3 design flow (26.2 l/s). As discussed in Section 7.4, at the time of development for the north block on the current Draft Plan of Subdivision, the Municipality will need to confirm pump upsizing is not required, based on actual recorded inflows.

The total drainage area served by this sanitary trunk sewer is currently shown as 169.6 ha, with an ultimate peak sanitary flow of 90.9 l/s. The current 375mmø sanitary trunk sewer design at 0.5% slope being tendered by the Municipality can accommodate this total tributary inflow with approx. 25% additional reserve capacity. The remainder of the 375mmø trunk sewer is proposed to extend at a design slope of 0.3% to provide sufficient basement gravity service to the external limits of the tributary, while still providing approx. 5 - 15% additional reserve capacity. This 5 - 15% additional reserve capacity is still considered sufficient as there is also a 10% uncertainty factor carried on all sanitary design flows. At the intersection of Street 'B' and Christie Drive within the Acorn Valley Subdivision, the trunk sanitary sewers are proposed to split, with a 300mmø trunk extending south on Street 'B' to service lands to the south, a 250mmø trunk extending north to service the north development blocks, and a 250mmø trunk extending west to serve the high-density block and the external westerly lands. Unfortunately, the external lands on the west side of Harris Road are not readily able to be serviced by full gravity sewer extension, even when extending at the minimum slope of the 375mmø trunk sewer. Based on this, it is anticipated a small sanitary pumping station will be required on the west side of Harris Road to receive inflows from a local gravity system and convey outflows through a sanitary forcemain south on Harris Road and east on Christie Drive to the limit of the proposed 250mmø trunk sewer. Two potential locations for the Harris Road lift station are shown on the enclosed Sanitary Conveyance Figure based on existing surface contours. It is anticipated this lift station could provide design capacity for the lands included within areas EXT 12, 13 & 14, which result in a design area of 34.9ha with a design population of 1,123 (741 units), yielding an average design flow of 6.8 l/s and a peak design flow of 15.9 l/s. The 250mmø trunk sewer on Christie Drive and the ultimate 375mmø trunk sewer on Mill Road have been reviewed to confirm they will provide sufficient capacity as an outlet sewer from this potential lift station.

All sewer size and slopes are preliminary and are based upon existing ground elevations external to the subdivision lands and current proposed road elevations within the subdivision. The ultimate design of the sanitary trunk sewer to be installed within the Acorn Valley Development will be completed with detailed engineering design of the subdivision.

7.8. Sanitary Development Charge Capital Projects

The 2019 Water and Wastewater Master Plan for the Municipality of Thames Centre provided a summary of capital projects to be captured under future Development Charges. The sanitary trunk sewer to be installed from Dorchester Sanitary Pumping Station No. 3 is carried under Capital Program IDs WW-D-SS-03, WW-D-SS-05B-ALT1/2, WW-D-SS-06B-ALT1/2, and WW-D-SS-07B-ALT1/2 (see Table ES-2 and Figure ES-4 of 2019 WWMP included in Appendix 'A'). The sanitary trunk sewer was estimated to be a 375mmø size, with a combined estimated capital cost of $4,912,000 (excl. HST) (GM BluePlan, 2019). The remainder of the trunk sewer to be installed across the Acorn Valley development lands was carried under Capital Program ID WW-D-SS-11B as a 300mmø sewer with an estimated capital cost of $632,000 (excl. HST) (GM BluePlan, 2019). The WWMP noted these trunk sewers should be installed with development of the lands tributary to it, such as the Acorn Valley Subdivision.

The 2019 WWMP also carried Capital Program WW-D-SPS-07B for future upgrades to Dorchester SPS No. 3 to service additional lands outside of the original design scope. The estimated capital cost of this work was carried as $5,539,000 (excl. HST) and was indicated to be triggered when SPS No.3 is at 80% of its design capacity (GM BluePlan, 2019).

As discussed in Section 7.1 and 7.6 above, the sanitary trunk sewer that will be installed to service the Acorn Valley Subdivision will service a significant area of external lands. Further discussions will need to be continued with the Municipality of Thames Centre as the development progresses regarding installation responsibility, front-ending, cost-sharing, existing sanitary servicing reserves and project timing.

7.9. Sanitary Conclusions

The Acorn Valley Subdivision is proposed to consists of 801 residential units (low-density and high-density), with a potential 540 additional units within the northern development blocks.

The Harris Road lands to the south could contain 714 additional units (low-density) based on estimated projections (20 units/ha).

Through review of the original Dorchester Sanitary Pumping Station No. 3 design, the proposed 801 residential units proposed on the south half of Acorn Valley (Phase 1-3) are within the original design of SPS No. 3 and able to be readily serviced through the extension of a sanitary trunk sewer to the site. The northerly development blocks could increase the total tributary population for Acorn Valley slightly beyond the original SPS No. 3 design values, and the Municipality will need to monitor SPS No. 3 to confirm when pump upsizing may be required, as carried under Development Charge Capital Projects.

There are a significant number of external properties beyond the Acorn Valley Subdivision that were considered for future development in the area by the 2019 Water and Wastewater Master Plan, that will become tributary to the sanitary trunk sewer to be installed to service the proposed development. The Municipality will need to continue to monitor the capacity of SPS No. 3 as well as timing of proposed development to determine trigger points for pump upsizing and operational alterations to the existing pumping station in accordance with capital projects carried under the Water and Wastewater Master Plan.

8. STORM DRAINAGE

A separate Stormwater Management Report, prepared by CJDL Consulting Engineers, has been included with the planning applications submitted for the Acorn Valley Subdivision. The following is a summary of the findings presented in the Stormwater Management Report;

i. The Acorn Valley Subdivision lands are located within the Community of Dorchester, in the Municipality of Thames Centre, in the County of Middlesex. The subject site is within the Upper Thames Conservation Authority (UTRCA) regulation area. The area proposed for draft plan approval is 44.28ha and is located on the north and south side of the existing untraveled Christie Drive right-of-way (ROW). The area to be developed south of Christie Drive is part of a larger parcel, but only a portion is proposed with the current Draft Plan of Subdivision. The remaining lands to the south are referred to as the Harris Road lands.

ii. The Acorn Valley Subdivision lands are tributary to four pre-development stormwater outlets;
    a. Rath-Harris Municipal Drain & Southeasterly Ravine
    b. Northerly Wetland (Tamarack Swamp) – Provincially Significant
    c. Shaw Municipal Drain
    d. Westerly Wetland – Locally Significant

iii. The majority of the post-development flows from the development and the existing Christie Drive ROW will be directed towards a proposed stormwater management wet pond in the southeast corner of the site. The proposed SWM pond will discharge to the existing ravine directly adjacent to the southeast corner of the property. This ravine is ultimately tributary to Mill Pond, approx. 350m east of the subject site.

iv. Loss of groundwater recharge for the site under post-development conditions will be mitigated through the implementation of the central open channel to encourage surface contact area and subsequently infiltration, as well as the grassed rear yards of future lots at the north limit of the site that will offer direct sheet flow to the northerly wetland.

v. The stormwater management facility (SWMF) has been designed in accordance with the Stormwater Management Planning and Design Manual (MECP, 2003) and the Municipality of Thames Centre Engineering Design Standards (2023). The proposed wet pond will provide enhanced (80% TSS removal) quality control and will restrict post-development outflows to pre-development levels to the southeasterly ravine up to 100-year design storm, while safely conveying the regional (250-year) event. The proposed SWMF design will drain the 25.4mm – 4hr quality storm event over a minimum period of 24 hours.

vi. All four stormwater outlets for the site will experience equal to or less than pre-development peak outflows under post-development conditions, apart from the 25.4mm – 4hr, 2-year and 5-year storm event to the Tamarack Swamp, but consist of only grassed rear yard drainage that is considered acceptable to ensure surface water recharge to the Swamp is approximately consistent to pre-development levels for major storms.

vii. Vegetative plantings will be provided along the pond banks and surrounding areas to provide erosion and scouring protection. Native species will be selected to compliment the surrounding ecological communities, including grasses, bushes and trees in strategic locations to provide habitat enhancement within the SWMF.

Each housing unit will be provided with an individual 150mmø storm PDC, to serve as an outlet for residential sump pumps. Storm sewer stubs will be provided for high-density block for future connection. Please reference the Stormwater Management Report for further details.

9. ELECTRICAL AND UTILITIES

The Acorn Valley Subdivision lands are currently within the electrical service area of Hydro One Networks Inc. (HONI). Bell, Rogers, Execulink and Enbridge also provide utility service to this area, and it is further anticipated that there will be adequate capacity to extend services to the subject lands.

There is currently an existing overhead primary hydro line (27.6 kV) and a 2" plastic gas main in place within the untravelled Christie Drive ROW. Preliminary discussions have been initiated to confirm protection and adjustment to the existing services can be accommodated for future development of the site.

Contact with the electrical and utility providers will continue concurrently with the Municipal review of the planning applications submitted for the Acorn Valley Subdivision.

** ** **

All of which is respectfully submitted by,

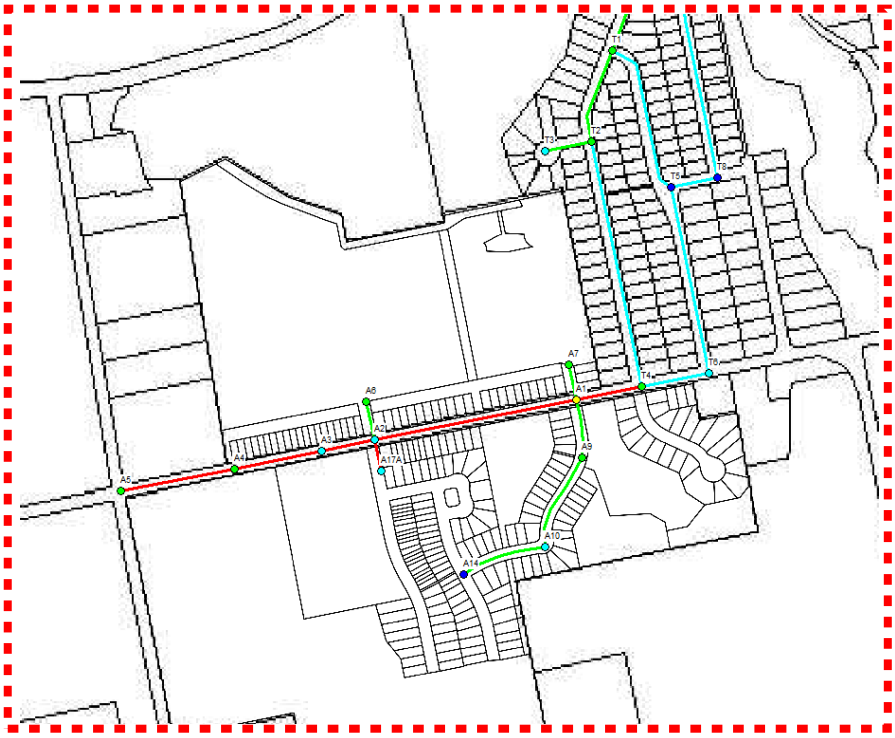
Alex Muirhead, P. Eng. Deren Lyle, P. Eng.

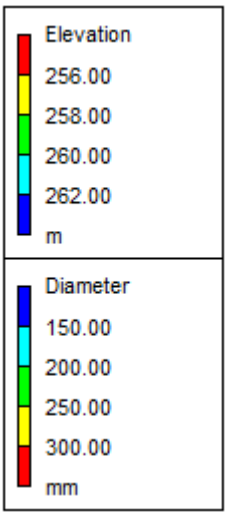
AM/kc

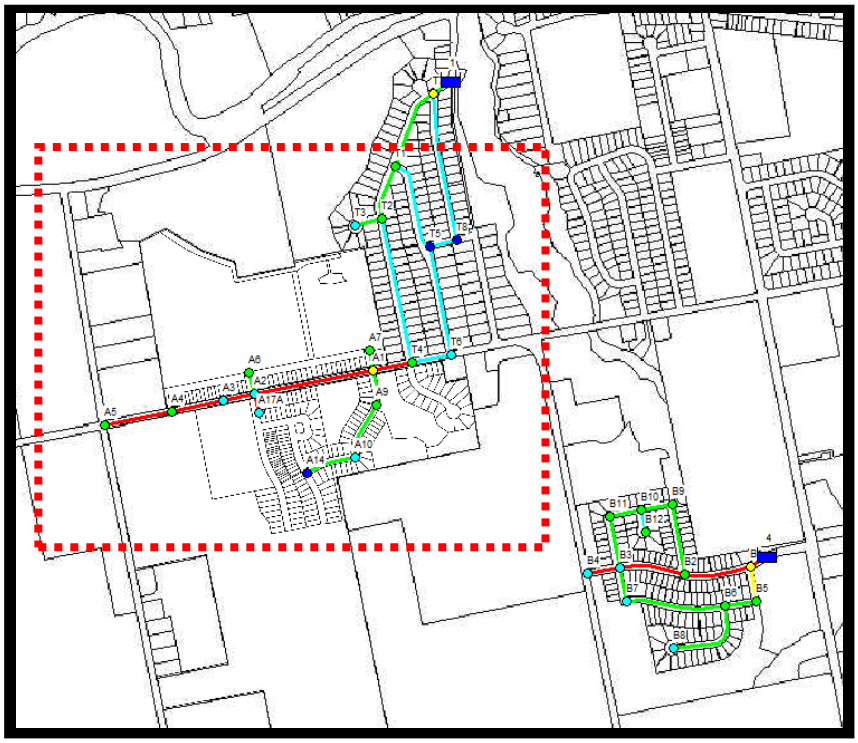
REFERENCES

1. Design Guidelines for Drinking Water Systems (Ministry of the Environment, Conservation and Parks, 2008).
2. Municipality of Thames Centre Engineering Design Standards – 2023 Edition (Municipality of Thames Centre, March 2023).
3. Scoped Environmental Impact Study (Vroom + Associates, June 2025).
4. Stage 3 Archaeological Assessment of Location 5 (AfHg-2) at 83 Christie Drive, in Part of Lot 19, Concession B South of Thames River, Geographic Township of North Dorchester, Middlesex County, Ontario (Lincoln Environmental Consulting Corporation, February 2022).
5. Stage 3 Archaeological Assessment of Location 17 (AfHg-376) at 83 Christie Drive, in Part of Lot 19, Concession B South of Thames River, Geographic Township of North Dorchester, Middlesex County, Ontario (Lincoln Environmental Consulting Corporation, February 2022).
6. Municipality of Thames Centre Trails & Cycling Master Plan (Monteith + Brown Planning Consultants, October 2015).
7. Transportation Impact Assessment (Paradigm transportation Solutions Limited, December 2023).
8. Geotechnical Engineering Report (Englobe, April 2025).
9. Hydrogeology Study Report (Englobe, April 2024).
10. Municipality of Thames Centre Water and Wastewater Master Plan Update (GM BluePlan, September 2019).
11. Conceptual Water Distribution Analysis – 187 Dorchester Road (AECOM Canada Ltd., July 2020).
12. The Boardwalk at Mill Pond Water Distribution Plan – Issued for 5th Submission Comments (MTE, June 2019).
13. City of London Standard Contract Documents for Municipal Construction Projects – 2020 Edition (City of London, 2020).
14. Design Brief for the Dorchester Sewage Pumping Station #3, Sanitary Sewer and Forcemain (Stantec, October 2018).
15. Dorchester Sewage Pumping Station #3, Sanitary Sewer and Forcemain – Issued for Tender Drawings (Stantec, August 2018).

LIST OF FIGURES







ACORN VALLEY SUBDIVISION
PHASE 1 EPANET MODEL

25 JUN 2025
JOB No. 18010

CJDL
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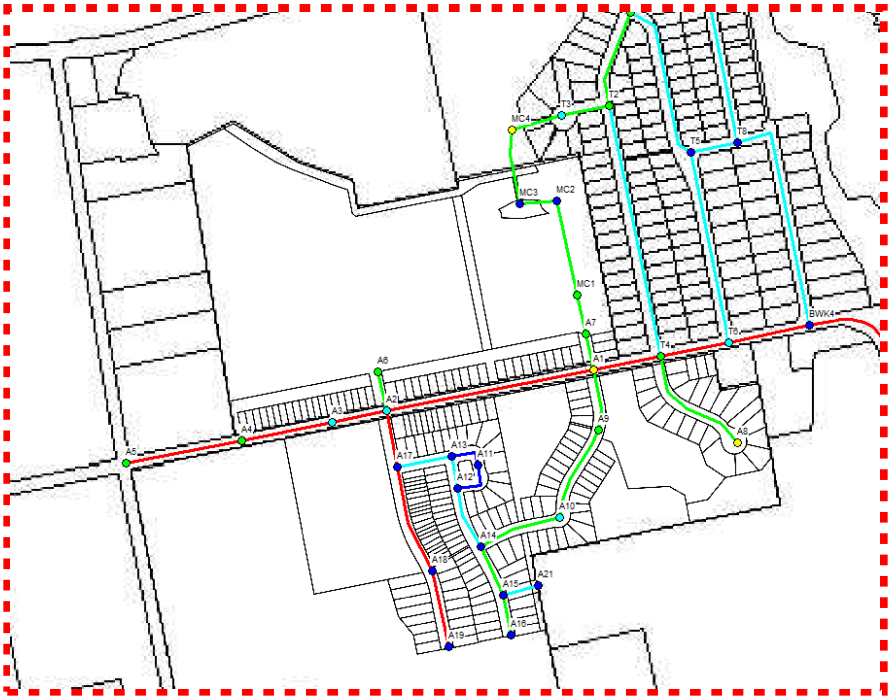

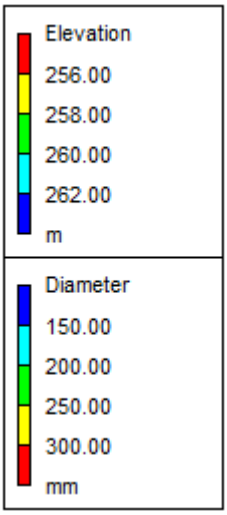

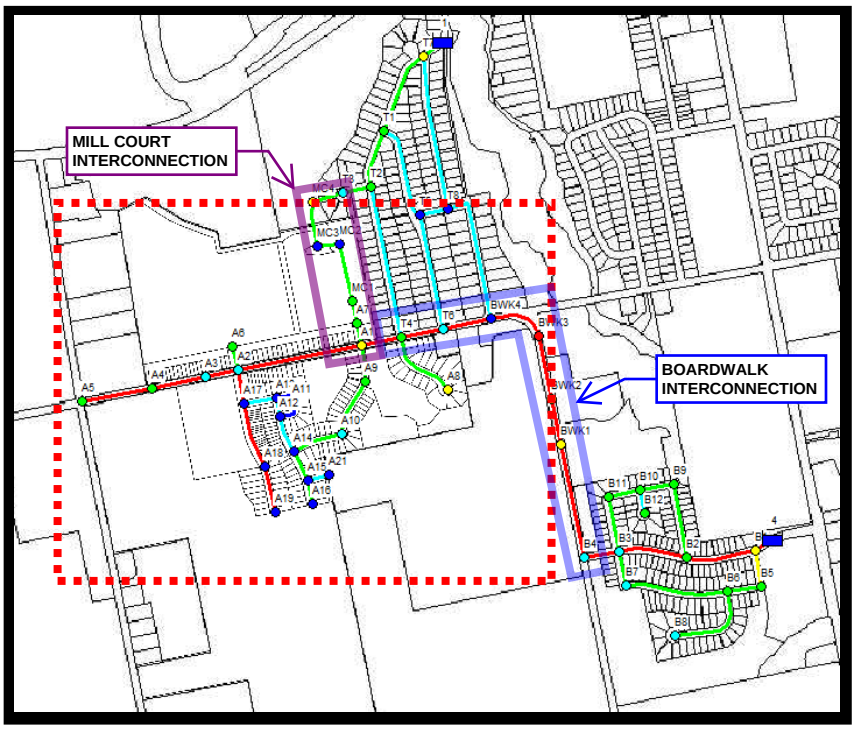

ACORN VALLEY SUBDIVISION
PHASES 1 - 3 & NORTH DEV. EPANET MODEL

25 JUN 2025
JOB No. 18010

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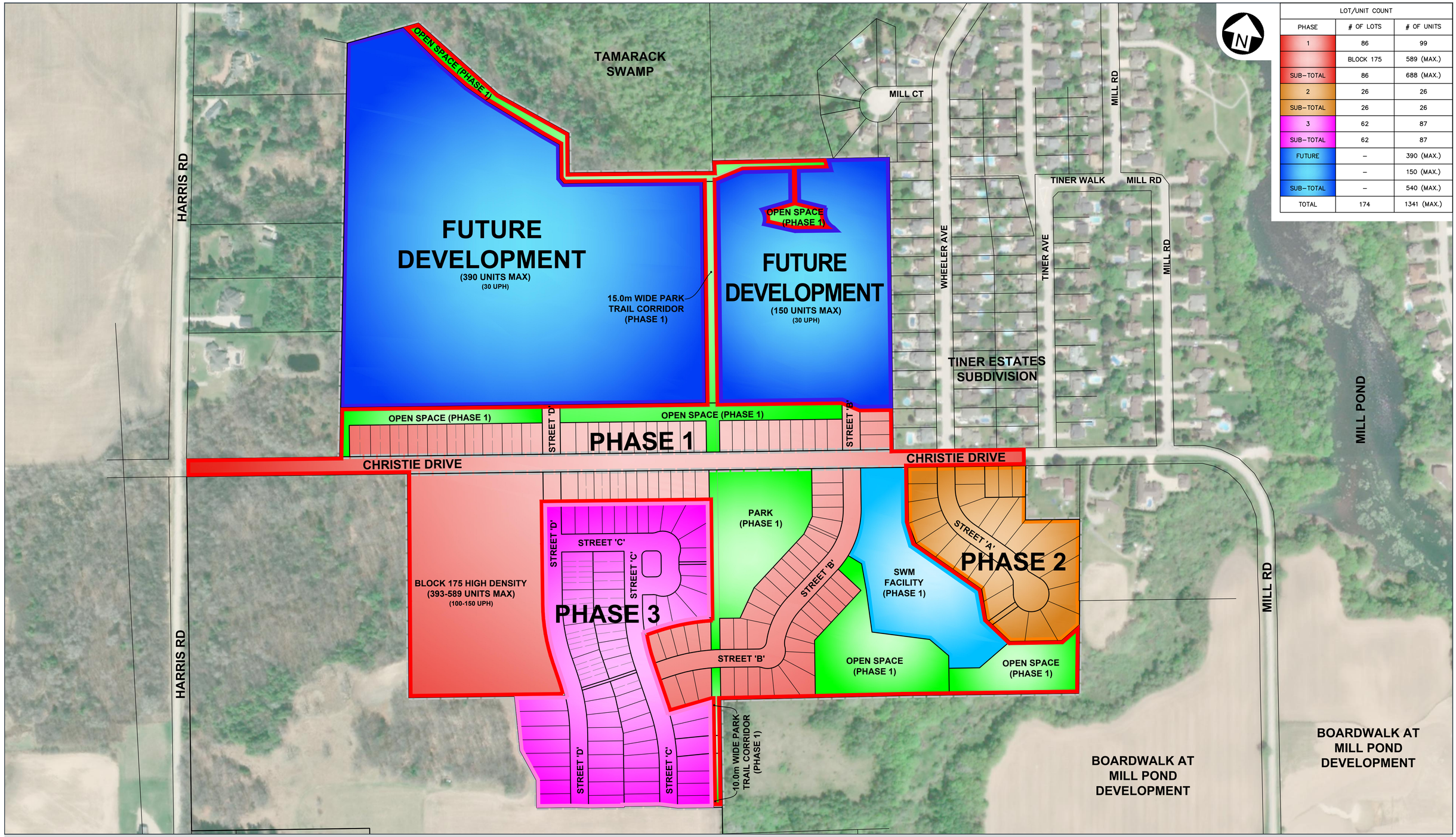

LOT/UNIT COUNT		
PHASE	# OF LOTS	# OF UNITS
1	86	99
	BLOCK 175	589 (MAX.)
SUB-TOTAL	86	688 (MAX.)
2	26	26
SUB-TOTAL	26	26
3	62	87
SUB-TOTAL	62	87
FUTURE	–	390 (MAX.)
	–	150 (MAX.)
SUB-TOTAL	–	540 (MAX.)
TOTAL	174	1341 (MAX.)

LEGEND

SITE BOUNDARY

NOTE:

- SOME PHASES MAY BE FURTHER SUBDIVIDED OR ALTERED.

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PRELIMINARY JUNE 2025

LICENSED PROFESSIONAL ENGINEER A.V. MUIRHEAD 100543499 PROVINCE OF ONTARIO

REVISION			
#	DESCRIPTION	DD/MM/YYYY	BY

PHASING PLAN

CONTRACT #:	18010	**SCALE:**	1:2000
PROJECT NAME:	ACORN VALLEY SUBDIVISION RP 11M-XXX DOUG TARRY LIMITED	**DRAWING #:**	F4

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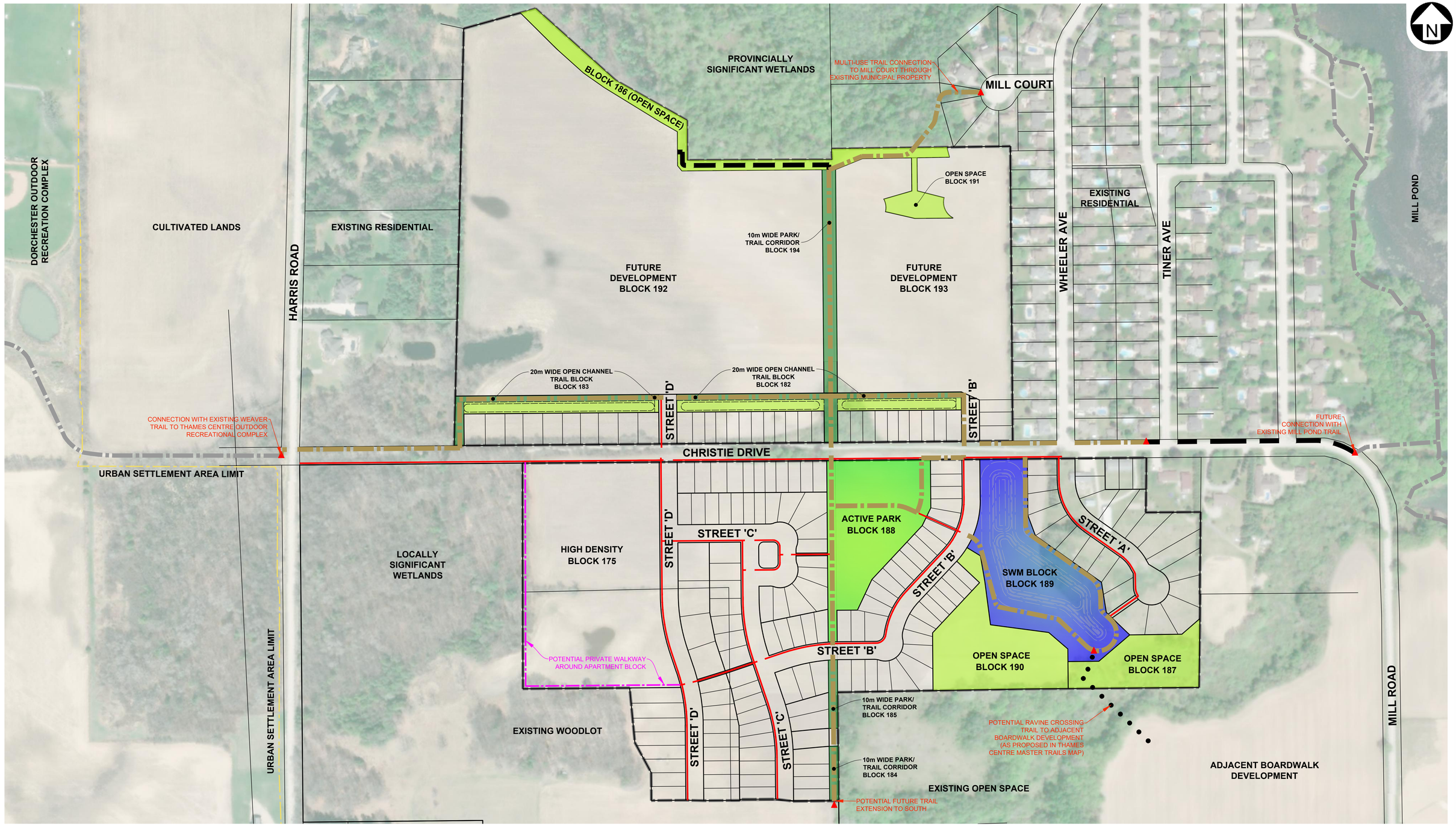

LEGEND

- FUTURE TRAIL
- PROPOSED MULTI-USE TRAIL (3.0m)
- POTENTIAL RAVINE CROSSING
- PROPOSED SIDEWALK (1.5m)
- FUTURE SIDEWALK (1.5m)
- EXISTING TRAIL
- FUTURE TRAIL CONNECTION POINTS
- SUBDIVISION LIMITS
- URBAN SETTLEMENT AREA LIMIT
- PRIVATE WALKWAY
- ACTIVE PARK
- TRAIL CORRIDOR
- OPEN SPACE/OPEN CHANNEL DRAIN
- SWM AREA

2025 EDITION

PARKLAND CALCULATION

DESCRIPTION	CONTRIBUTION AREA (ha)
BLOCK 182, 183	0.51
BLOCK 184, 185	0.14
BLOCK 188	1.47
BLOCK 194	0.37
TOTAL PARKLAND	2.49
PARKLAND PERCENTAGE (5% REQUIRED)	2.49 / 44.28 = 5.6%

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PRELIMINARY JUNE 2025

#	DESCRIPTION	DD/MM/YYYY	BY

PARKS AND TRAILS PLAN

CONTRACT #:	18010	SCALE:	1:2000
PROJECT NAME:	ACORN VALLEY SUBDIVISION RP 11M-XXX DOUG TARRY LIMITED	DRAWING #:	F5

FUTURE 200Ø CONNECTION TO MILL COURT

MILL CT

EX. 200ø WATERMAIN

200ø WATERMAIN

OPEN SPACE

BLOCK 192
FUTURE DEVELOPMENT

BLOCK 193
FUTURE DEVELOPMENT

FINAL ALIGNMENT OF FUTURE WATERMAIN TO BE DETERMINED AT TIME OF DETAILED DESIGN FOR NORTHERN DEVELOPMENT BLOCKS 192 & 193.

WHEELER AVE

TINER AVE

PARKVIEW DR

FUTURE 300Ø CONNECTION TO BOARDWALK WAY

STREET 'D'

STREET 'B'

MAINLINE VALVE TO REMAIN CLOSED UNTIL AFTER FLUSHING AND RE-CHLORINATION UPON FUT. EXTENSION

CONNECT TO EX. 150ø ON WHEELER AVE

CONNECT TO EX. 150ø ON TINER AVE

50mm AUTO-FLUSHER TO BE IN PLACE UNTIL FUT. EXTENSION ON HARRIS ROAD

300ø WATERMAIN

FUTURE 300ø UPSIZING

FUTURE 300ø CONNECTION TO BOARD WALK DEVELOPMENT

EX 150ø WATERMAIN

HARRIS RD

CHRISTIE DRIVE

STREET 'C'

PARK

STREET 'A'

BLOCK 175
HIGH DENSITY
RESIDENTIAL

150ø WATERMAIN

50ø WATERMAIN

SWMF

OPEN SPACE

POND

TH-HARRIS DRAIN

SEE EXCERPT THIS DRAWING

WHEELER AVE

TINER AVE

PARKVIEW DR

FUTURE 300ø UPSIZING

300ø WATERMAIN

1:3000

MILL POND

MILL ROAD

HARRIS DRAIN

FUTURE 300Ø CONNECTION TO BOARDWALK WAY

CONNECT TO EX. 300Ø WATERMAIN ON BOARDWALK WAY

BOARDWALK WAY

MILL POND CRESCENT

LEGEND

- PROPOSED WATERMAIN
- EXISTING WATERMAIN
- FUTURE WATERMAIN
- WATER VALVE
- WATER SERVICE CURB STOP
- HYDRANT
- SUBDIVISION LIMITS

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PROFESSIONAL ENGINEER — A.V. MUIRHEAD — 100543499 — PROVINCE OF ONTARIO
PRELIMINARY — NOT FOR CONSTRUCTION — JUNE 2025

REVISION			
#	DESCRIPTION	DD/MM/YYYY	BY

WATERMAIN SERVICING PLAN

CONTRACT #:	18010	**SCALE:**	1:2000
PROJECT NAME:	ACORN VALLEY SUBDIVISION RP 11M-XXX DOUG TARRY LIMITED	**DRAWING #:**	F6

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LEGEND

SANITARY SEWER	UNDERGROUND BELL LINE	MAINTENANCE HOLE
STORM SEWER	UNDERGROUND CABLE LINE	CLEAN OUT
WATERMAIN	DITCH/SWALE	CATCH BASIN
WATER SERVICE	TOE OF SLOPE, TOP OF BANK	WATER VALVE
NATURAL GAS LINE	FENCE	WATER SERVICE CURB STOP
UNDERGROUND POWER LINE	EDGE OF GRAVEL	HYDRANT
OVERHEAD POWER LINE	CURB, DROPPED CURB	
UNDERGROUND FIBRE OPTIC LINE	EDGE OF PAVEMENT	

GUY WIRE, UTILITY POLE	TRANSFORMER
LIGHT STANDARD	SURVEY BARS
TRAFFIC SIGNAL	CONIFEROUS, DECIDUOUS TREE
SIGN	SHRUB
GAS VALVE	EDGE OF BUSH/DRIP LINE
UTILITY PEDESTAL	GEOTECHNICAL BORE HOLE

2024 EDITION

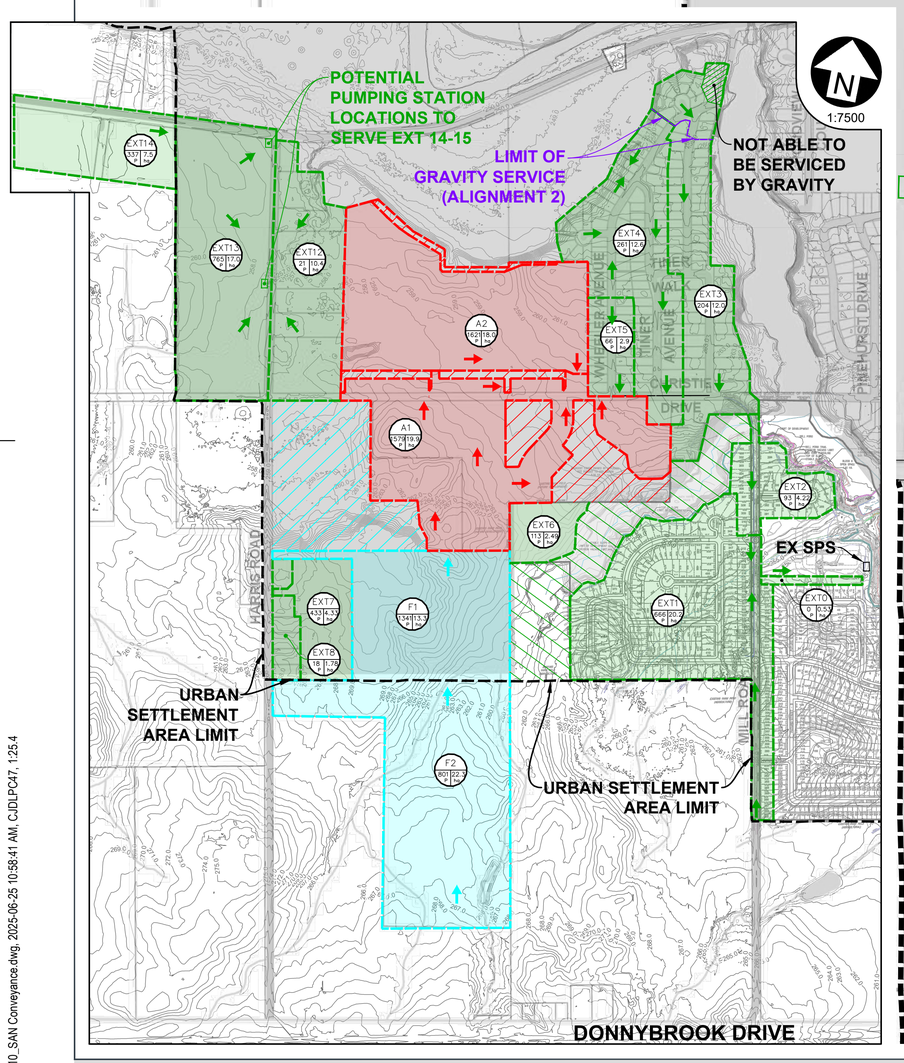
CONSULTANT:
CJDL Consulting Engineers
Cyril J. Demeyere Limited
P.O. Box 460, 261 Broadway
Tillsonburg, Ontario, N4G 4H8
Thames Centre

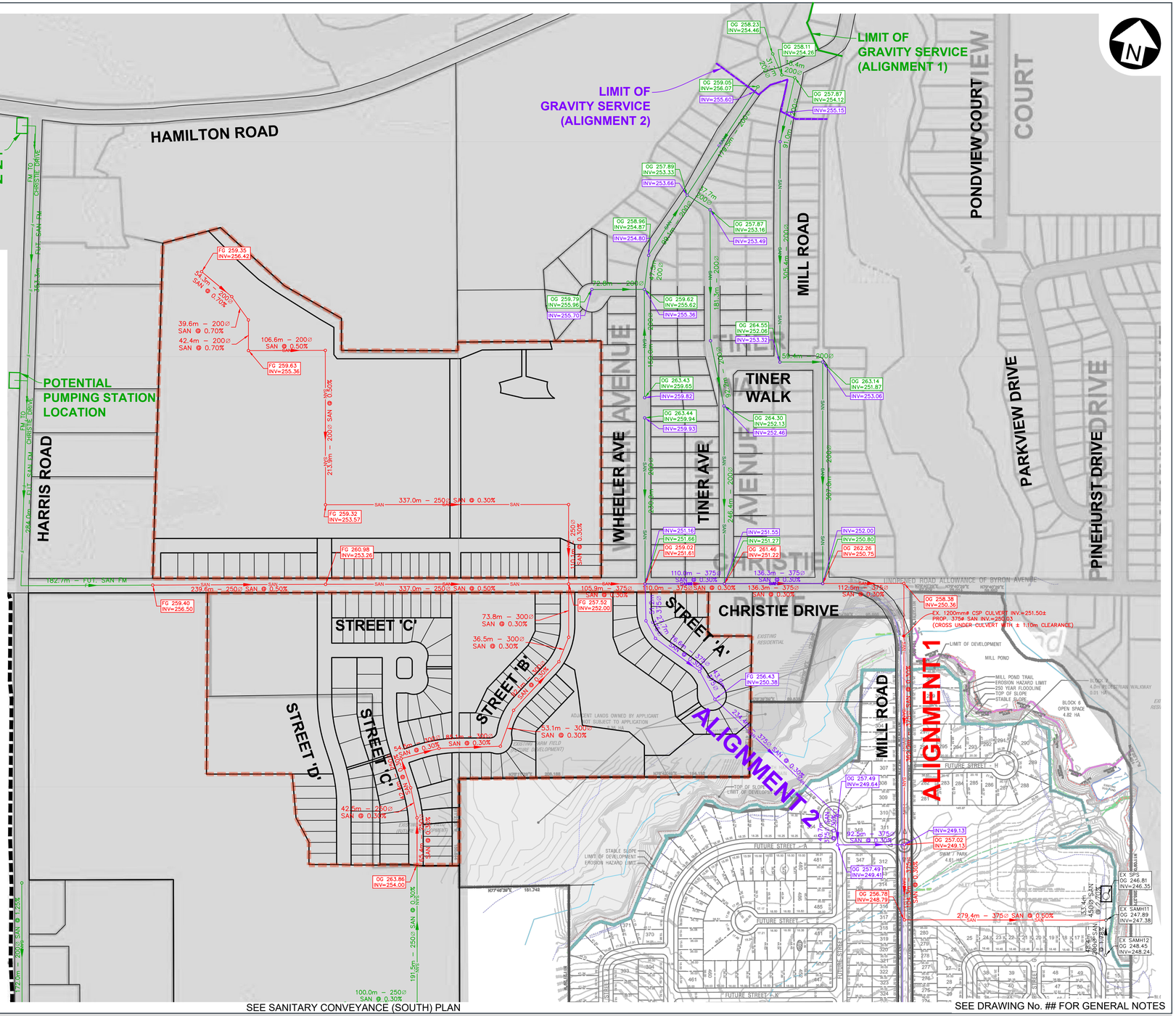
STAMP:
PRELIMINARY
25 JUN 2025

REVISION			
#	DESCRIPTION	DD/MM/YYYY	BY

MILL COURT WATERMAIN & TRAIL CONNECTION

CONTRACT #:	18010	SCALE:	1:250
PROJECT NAME:	ACORN VALLEY SUBDIVISION RP 11M-XXX DOUG TARRY LIMITED	DRAWING #:	F7





LEGEND

- PROPOSED SANITARY TRIBUTARY
- EXTERNAL SANITARY TRIBUTARY
- FUTURE SANITARY TRIBUTARY
- SETTLEMENT AREA LIMITS
- SITE LIMITS

- PROPOSED SANITARY (GRAVITY)
- ALTERNATIVE SANITARY (GRAVITY)
- EXTERNAL SANITARY (GRAVITY)
- PROPOSED MANHOLE, EXISTING/FUTURE
- FUTURE SANITARY FORCEMAIN

- AREA NUMBER
- AREA IN HECTARES
- POPULATION
- SANITARY TRIBUTARY FLOW

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LICENSED PROFESSIONAL ENGINEER A.V. MUIRHEAD 100543499 PROVINCE OF ONTARIO
PRELIMINARY JUNE 2025

REVISION			
#	DESCRIPTION	DD/MM/YYYY	BY

SANITARY CONVEYANCE (NORTH)

CONTRACT #:	18010	SCALE:	1:3000
PROJECT NAME:	ACORN VALLEY SUBDIVISION RP 11M-XXX DOUG TARRY LIMITED	DRAWING #:	F8

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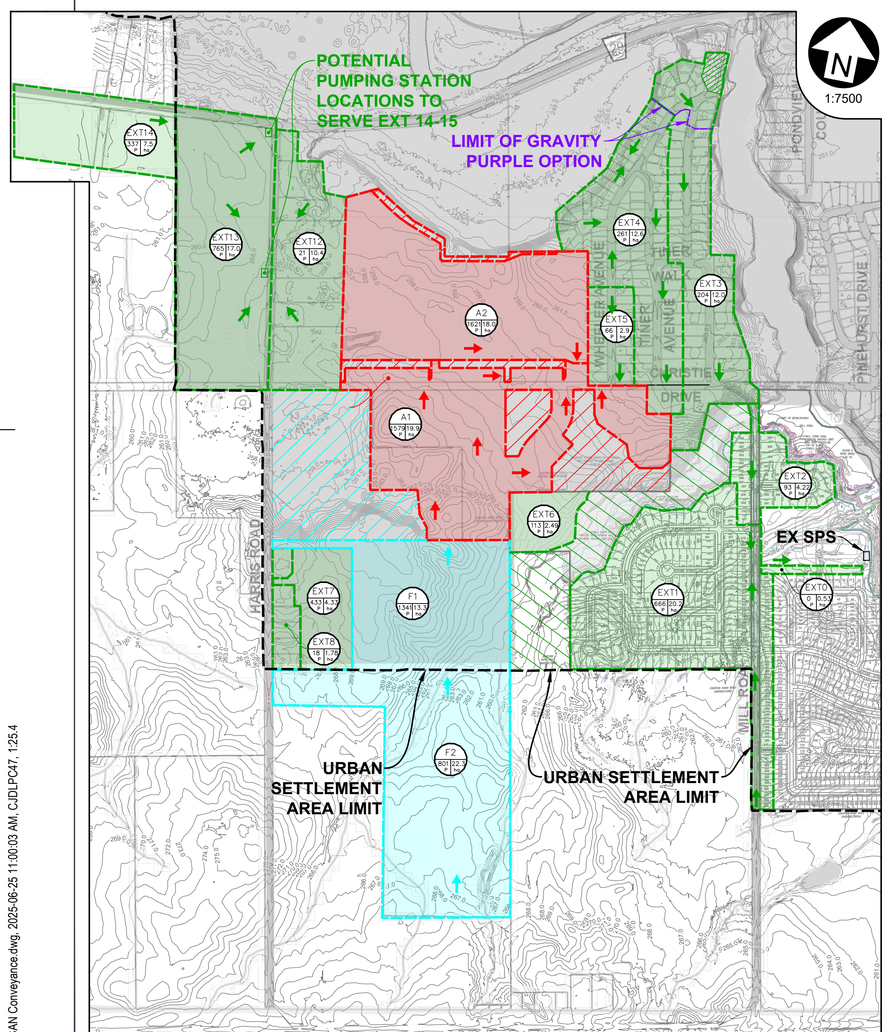
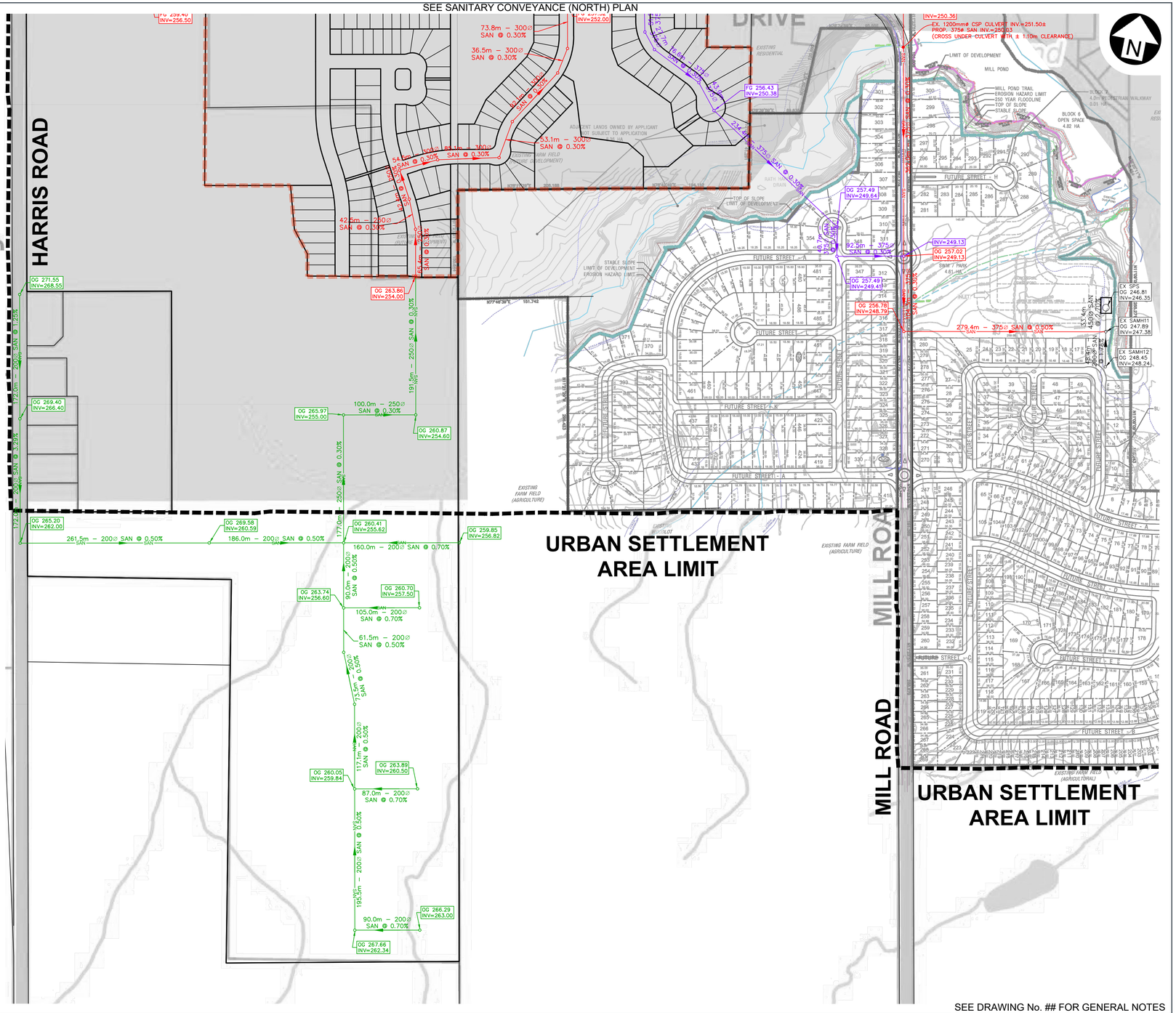
SEE SANITARY CONVEYANCE (NORTH) PLAN





SEE DRAWING No. ## FOR GENERAL NOTES

LEGEND

- PROPOSED SANITARY TRIBUTARY
- EXTERNAL SANITARY TRIBUTARY
- FUTURE SANITARY TRIBUTARY
- SETTLEMENT AREA LIMITS
- SITE LIMITS
- PROPOSED SANITARY (GRAVITY)
- ALTERNATIVE SANITARY (GRAVITY)
- EXTERNAL SANITARY (GRAVITY)
- PROPOSED MANHOLE, EXISTING/FUTURE
- FUTURE SANITARY FORCEMAIN
- AREA NUMBER
- AREA IN HECTARES
- POPULATION
- SANITARY TRIBUTARY FLOW

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D.V. MUIRHEAD 100543499 PROFESSIONAL ENGINEER PROVINCE OF ONTARIO
PRELIMINARY NOT FOR CONSTRUCTION

REVISION			
#	DESCRIPTION	DD/MM/YYYY	BY

SANITARY CONVEYANCE (SOUTH)

CONTRACT #:	18010	SCALE:	1:2000
PROJECT NAME:	ACORN VALLEY SUBDIVISION RP 11M-XXX DOUG TARRY LIMITED	DRAWING #:	F9

TRIBUTARY AREAS LEGEND

- TRIBUTARY TO RATH HARRIS DRAIN/EXISTING RAVINE + WETLAND (201.36ha MINOR, 209.22ha MAJOR)
- TRIBUTARY TO NORTHERLY WETLAND (TAMARACK SWAMP) (8.76ha)
- TRIBUTARY TO WESTERLY FLOW PATH + SHAW DRAIN (9.74ha)
- TRIBUTARY TO WESTERLY WETLAND (15.78ha)

NOTES:

1. TRIBUTARY LIMITS EXTERNAL TO SITE BASED ON MUNICIPAL. DRAIN TRIBUTARY LIMITS
2. DRAIN LENGTHS BASED ON MUNICIPAL DRAIN PLAN & PROFILES
3. INVERTS BASED ON CJDL SURVEY, IF RECORDED, OR DRAIN PLAN & PROFILES
4. TRIBUTARY LIMITS INTERNAL TO SITE BASED ON CJDL SURVEY, 2019

LEGEND

- PROPOSED STORM SEWER
- EXISTING STORM SEWER
- FUTURE STORM SEWER
- CL EXISTING WATERCOURSE
- SUBDIVISION LIMITS
- LIMIT OF DRAINAGE AREA

250.0 — METRIC CONTOUR ELEVATIONS IN METRES (BY CJDL SITE SURVEY)

MAJOR OVERLAND FLOW ROUTE

MINOR FLOW

A4 0.55 0.57 C | ha

- AREA NUMBER
- AREA IN HECTARES
- RUN-OFF COEFFICIENT

CONSULTANT:
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PRELIMINARY NOT FOR CONSTRUCTION

REVISION			
#	DESCRIPTION	DD/MM/YYYY	BY

PRE-DEVELOPMENT STORMWATER TRIBUTARIES

CONTRACT #:	18010	SCALE:	1:5000
PROJECT NAME:	ACORN VALLEY SUBDIVISION RP 11M-XXX DOUG TARRY LIMITED	DRAWING #:	F10

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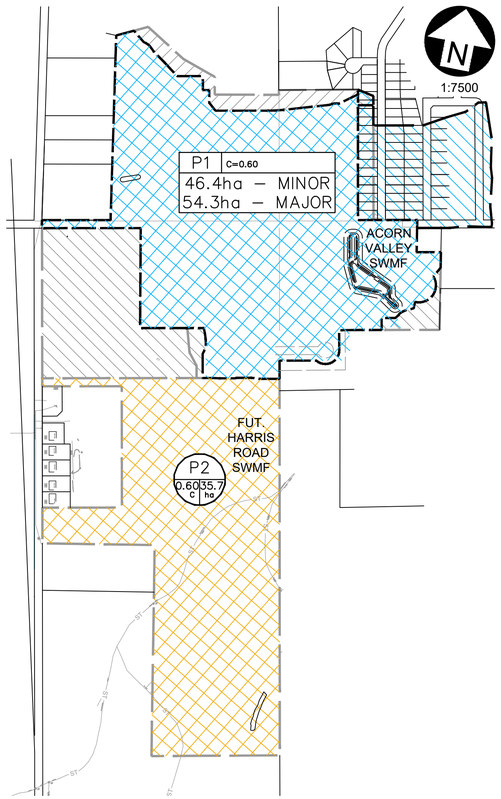

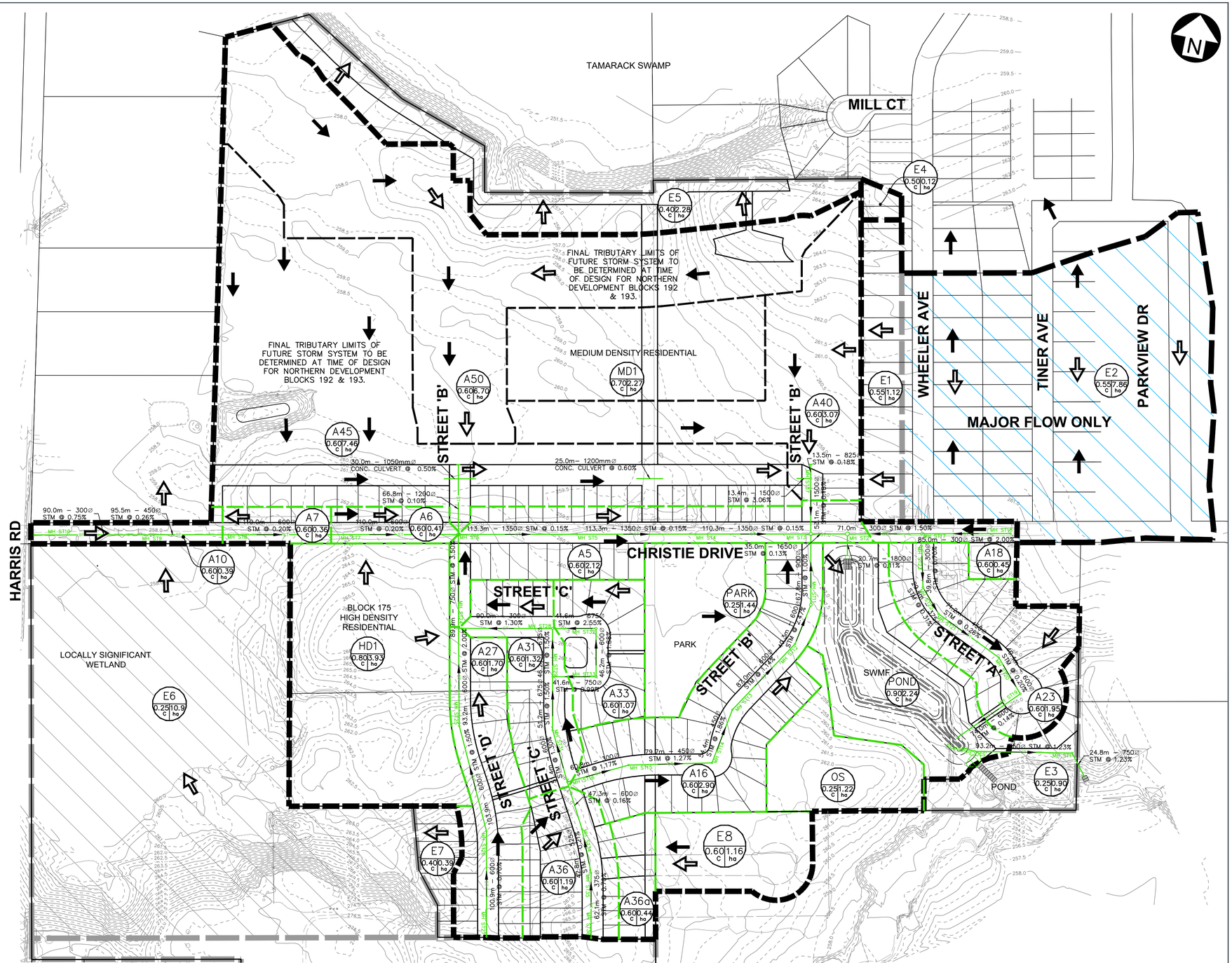

SEE DRAWING No. 20 FOR GENERAL NOTES

LEGEND

- PROPOSED STORM SEWER
- EXISTING STORM SEWER
- FUTURE STORM SEWER
- PROPOSED MANHOLE, EXISTING/FUTURE
- PROPOSED CATCHBASIN, EXISTING/FUTURE
- LIMIT OF DRAINAGE AREA

250.0 — 2.1Ac (0.85ha)

METRIC CONTOUR ELEVATIONS IN METRES (BY CJDL SITE SURVEY)

MAJOR OVERLAND FLOW ROUTE

STORM WATER DRAINAGE TO SWM FACILITY

A27 | 0.55 | 35.7 | C | ha

- AREA NUMBER
- AREA IN HECTARES
- RUN-OFF COEFFICIENT

CONSULTANT:
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PRELIMINARY JUNE 2025

REVISION			
#	DESCRIPTION	DD/MM/YYYY	BY

STORM DRAINAGE SYSTEM AND AREAS

CONTRACT #:	18010	**SCALE:**	1:2000
PROJECT NAME:	ACORN VALLEY SUBDIVISION RP 11M-XXX DOUG TARRY LIMITED	**DRAWING #:**	F11

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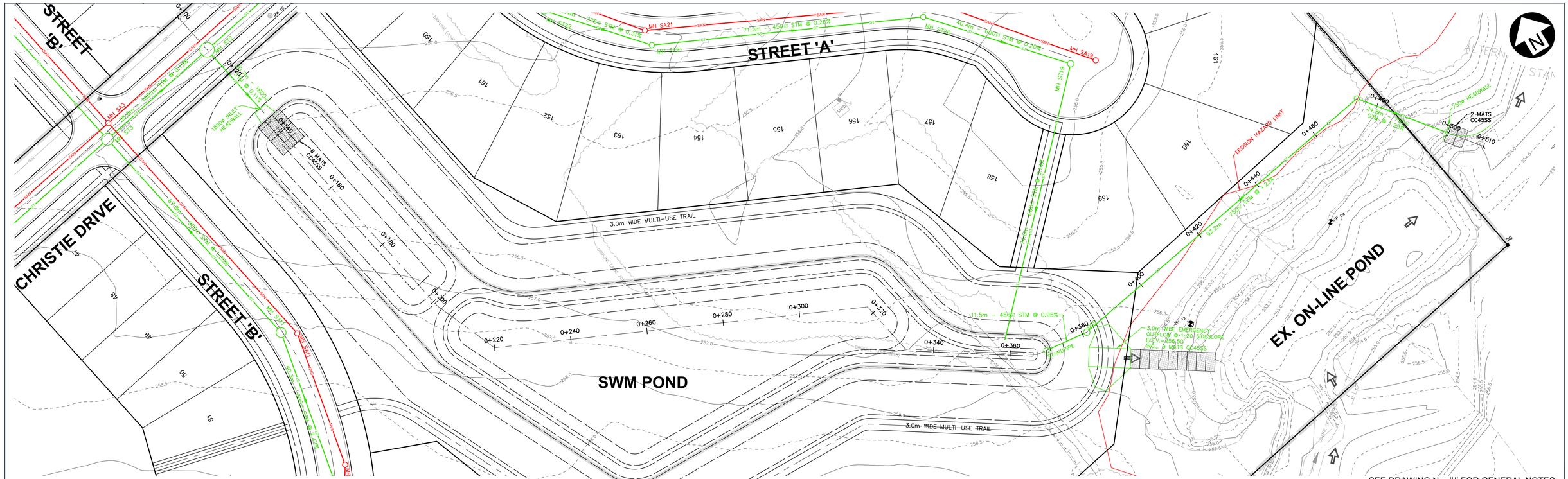

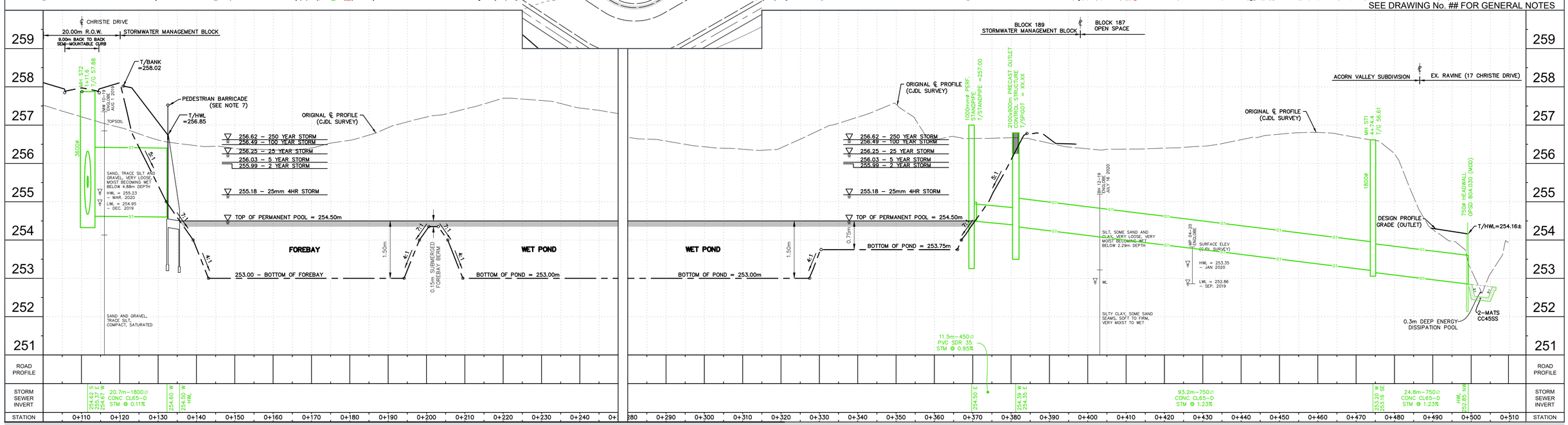

LEGEND

- SAN — SANITARY SEWER
- ST — STORM SEWER
- W — WATERMAIN
- WS — WATER SERVICE
- G — NATURAL GAS LINE
- U/H — UNDERGROUND POWER LINE
- O/H — OVERHEAD POWER LINE
- FO — UNDERGROUND FIBRE OPTIC LINE
- T — UNDERGROUND BELL LINE
- C — UNDERGROUND CABLE LINE
- DITCH/SWALE
- TOE OF SLOPE, TOP OF BANK
- FENCE
- EDGE OF GRAVEL
- CURB, DROPPED CURB
- EDGE OF PAVEMENT
- MH — MAINTENANCE HOLE
- CO — CLEAN OUT
- CB — CATCH BASIN
- WV — WATER VALVE
- WSCS — WATER SERVICE CURB STOP
- HYD — HYDRANT
- GUY WIRE, UTILITY POLE
- LIGHT STANDARD
- TL — TRAFFIC SIGNAL
- SIGN
- GV — GAS VALVE
- UTILITY PEDESTAL
- TRANSFORMER
- SURVEY BARS
- CONIFEROUS, DECIDUOUS TREE
- SHRUB
- EDGE OF BUSH/DRIP LINE
- BH — GEOTECHNICAL BORE HOLE

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100127477
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PRELIMINARY
JUNE 25 2025

REVISION			
#	DESCRIPTION	DD/MM/YYYY	BY

SWM1 - STORMWATER MANAGEMENT AREA

CONTRACT #: 18010
PROJECT NAME: ACORN VALLEY SUBDIVISION
11M-XXX
DOUG TARRY LIMITED

SCALE: HOR. 1:500
VER. 1:50
DRAWING #: F12

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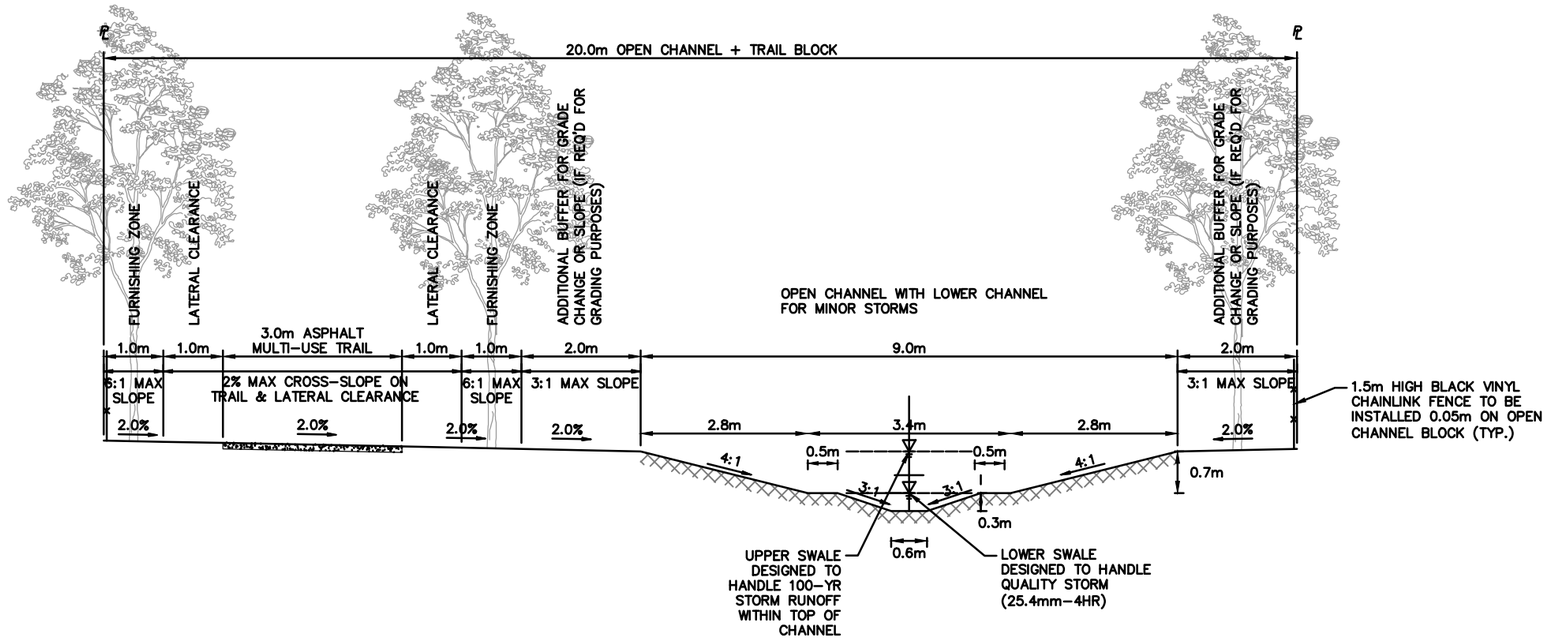
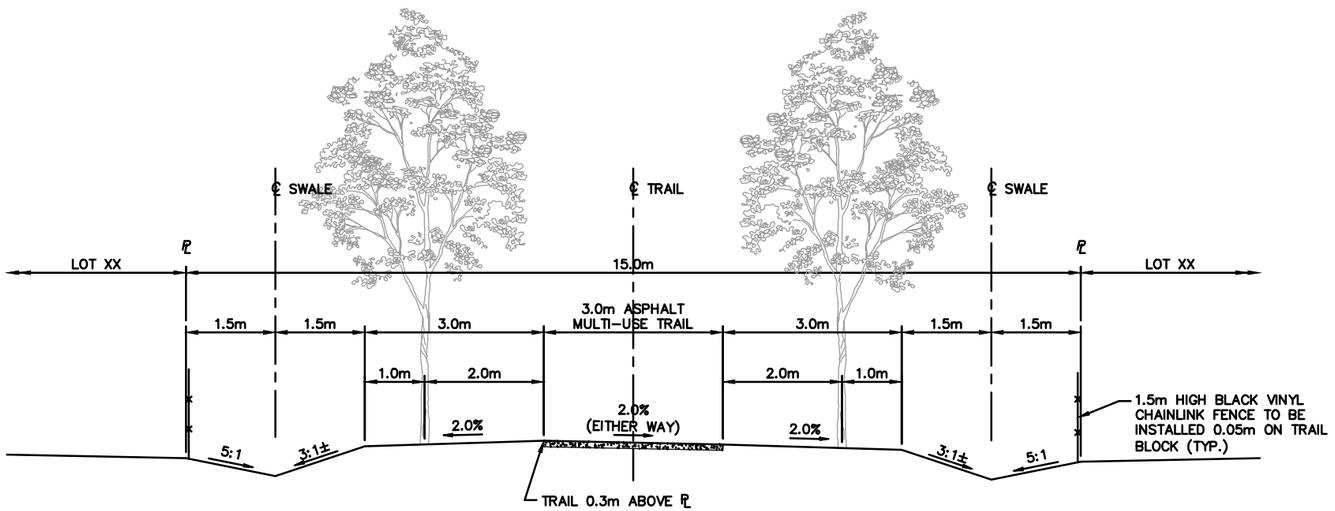


TYPICAL X-SECTION – 20m TRAIL/OPEN CHANNEL BLOCK

SCALE : 1:100



TYPICAL X-SECTION – 15m TRAIL CORRIDOR

SCALE : 1:100

83 CHRISTIE DRIVE

MUNICIPALITY OF THAMES CENTRE

TRAIL AND CHANNEL CROSS-SECTION SCHEMATIC

PLAN PREPARED BY:
CJDL Consulting Engineers
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JOB NUMBER: 18010

DATE: 25 JUNE 2025

FIGURE 13

APPENDIX 'A'

Domestic Water Demand Calculations

Ontario Building Code Fire Flow Calculations

Fire Underwriters Survey Fire Flow Calculations

Sanitary Design Calculations

Classic FLS – Hydrant Flow Test Results

2019 WWMP – Figure ES-2: Preferred Dorchester Water Servicing Strategy

2019 WWMP – Table ES-1: Water Capital Program

2019 WWMP – Figure ES-4: Preferred Dorchester Wastewater Servicing Strategy

2019 WWMP – Table ES-2: Wastewater Capital Program

ACORN VALLEY SUBDIVISION
MUNICIPALITY OF THAMES CENTRE

CJDL Consulting Engineers

PROJECT No. 18010
DATE: 25-Jun-25
DESIGN BY: AVM
CHECKED BY: DJL

DOMESTIC WATER DEMAND CALCULATIONS

ACORN VALLEY SUBDIVISION - PHASES 1-3 LOW DENSITY

Average Daily Demand Determination

No. Residential Units:	212	units
Population Per Unit:	3.0	people/unit
Design Population:	636	people
Per Capita Demand:	350.0	L/cap/d
Average Daily Demand:	2.58	L/s

Peak Hour Demand Determination:

Average Daily Demand:	2.58	L/s
Peak Hour Factor:	3.0	
Peak Hour Demand:	7.73	L/s

Max. Day Demand Determination:

Average Daily Demand:	2.58	L/s
Max. Day Factor:	2.0	
Max. Day Demand:	5.15	L/s

AVERAGE DAILY DEMAND:	2.58	L/s
PEAK HOUR DEMAND:	7.73	L/s
MAX. DAY DEMAND:	5.15	L/s

No.	REVISION	BY	DATE

ACORN VALLEY SUBDIVISION
MUNICIPALITY OF THAMES CENTRE

CJDL Consulting Engineers

PROJECT No. 18010
DATE: 25-Jun-25
DESIGN BY: AVM
CHECKED BY: DJL

DOMESTIC WATER DEMAND CALCULATIONS

ACORN VALLEY SUBDIVISION - PHASES 1-3 HIGH DENSITY

Average Daily Demand Determination

No. Residential Units:	589	units
Population Per Unit:	1.6	people/unit
Design Population:	943	people
Per Capita Demand:	350.0	L/cap/d
Average Daily Demand:	3.82	L/s

Peak Hour Demand Determination:

Average Daily Demand:	3.82	L/s
Peak Hour Factor:	3.0	
Peak Hour Demand:	11.46	L/s

Max. Day Demand Determination:

Average Daily Demand:	3.82	L/s
Max. Day Factor:	2.0	
Max. Day Demand:	7.64	L/s

AVERAGE DAILY DEMAND:	3.82	L/s
PEAK HOUR DEMAND:	11.46	L/s
MAX. DAY DEMAND:	7.64	L/s

No.	REVISION	BY	DATE

ACORN VALLEY SUBDIVISION
MUNICIPALITY OF THAMES CENTRE

CJDL Consulting Engineers

PROJECT No. 18010
DATE: 25-Jun-25
DESIGN BY: AVM
CHECKED BY: DJL

DOMESTIC WATER DEMAND CALCULATIONS

ACORN VALLEY SUBDIVISION - FUTURE NORTH DEVELOPMENT BLOCK

Average Daily Demand Determination

No. Residential Units:	540.0	units
Population Per Unit:	3.0	people/unit
Design Population:	1620	people
Per Capita Demand:	350.0	L/cap/d
Average Daily Demand:	6.56	L/s

Peak Hour Demand Determination:

Average Daily Demand:	6.56	L/s
Peak Hour Factor:	3.0	
Peak Hour Demand:	19.69	L/s

Max. Day Demand Determination:

Average Daily Demand:	6.56	L/s
Max. Day Factor:	2.0	
Max. Day Demand:	13.13	L/s

AVERAGE DAILY DEMAND:	6.56	L/s
PEAK HOUR DEMAND:	19.69	L/s
MAX. DAY DEMAND:	13.13	L/s

No.	REVISION	BY	DATE

ACORN VALLEY SUBDIVISION
MUNICIPALITY OF THAMES CENTRE

CJDL Consulting Engineers

PROJECT No. 18010
DATE: 25-Jun-25
DESIGN BY: AVM
CHECKED BY: DJL

ONTARIO BUILDING CODE FIRE DEMAND CALCULATIONS

SINGLE-DETACHED DWELLING

Building Volume Determination

Average Floor Area:	185.0	m^2	=	2000	ft^2
No. Storeys:	2.0				
Height Per Storey:	3.0	m			

Building Volume (V): 1110.0 m^3

Water Supply Coefficient Determination

Building Class: C (Per OBC Section 3.1.2.1.)

Construction Type: Building is of combustible construction with fire separations and fire-resistance ratings provided in accordance with Subsection 3.2.2. of the OBC, including loadbearing walls, columns and arches. Noncombustible construction may be used in lieu of fire-resistance rating where permitted in Subsection 3.2.2. of the OBC.

TYPE OF CONSTRUCTION	Classification by Group or Division in Accordance with Table 3.1.2.1 of the Ontario Building Code				
	A-2 B-1 B-2 B-3 C D	A-4 F-3	A-1 A-3	E F-2	F-1
Building is of noncombustible construction with fire separations and fire-resistance ratings provided in accordance with Subsection 3.2.2. of the OBC, including loadbearing walls, columns and arches.	10	12	14	17	23
Building is of noncombustible construction or of heavy timber construction conforming to Article 3.1.4.6. of the OBC. Floor assemblies are fire separations but with no fire-resistance rating. Roof assemblies, mezzanines, loadbearing walls, columns and arches do not have a fire-resistance rating.	16	19	22	27	37
Building is of combustible construction with fire separations and fire-resistance ratings provided in accordance with Subsection 3.2.2. of the OBC, including loadbearing walls, columns and arches. Noncombustible construction may be used in lieu of fire-resistance rating where permitted in Subsection 3.2.2. of the OBC.	18	22	25	31	41
Building is of combustible construction. Floor assemblies are fire separations but with no fire-resistance rating. Roof assemblies, mezzanines, loadbearing walls, columns and arches do not have a fire-resistance rating.	23	28	32	39	53
Column 1	**2**	**3**	**4**	**5**	**6**

Water Supply Coefficient (K): 18

Spatial Coefficient Determination

Front:	0.00	(Distance =	32	m (Figure 1: Spatial Separation) (OFM TG-03-1999 Section 6.3)
Rear:	0.00	(Distance =	18	m (Figure 1: Spatial Separation) (OFM TG-03-1999 Section 6.3)
Left:	0.50	(Distance =	2.4	m (Figure 1: Spatial Separation) (OFM TG-03-1999 Section 6.3)
Right:	0.50	(Distance =	2.4	m (Figure 1: Spatial Separation) (OFM TG-03-1999 Section 6.3)

Spatient Coefficient Total (S_{tot}): 2.00

Fire Flow Determination

$$Q = KVS_{Tot}$$

Water Supply Coefficient (K): 18
Building Volume (V): 1110.0 m^3
Spatial Coefficient Total (S_{tot}): 2.00

Minimum Supply of Water (Q): 39960.0 L

Building Code, Part 3 Buildings	Required Minimum Water Supply Flow Rate (L/min.)
One-storey building with building area not exceeding $600m^2$ (excluding F-1 occupancies)	1800
All other buildings	2700 (If **Q** ≤ 108,000L)(1) 3600 (If **Q** > 108,000L **and** ≤ 135,000L)(1) 4500 (If **Q** > 135,000L **and** ≤ 162,000L)(1) 5400 (If **Q** > 162,000L **and** ≤ 190,000L)(1) 6300 (If **Q** > 190,000L **and** ≤ 270,000L)(1) 9000 (If **Q** > 270,000L)(1)

Required Minimum Water Supply Flow Rate: 2700.0 L/min

Minimum Volume of Water Supply: 81000 L (Based on 30 min. minimum supply duration)

REQUIRED FIRE FLOW:	45.00	L/s

No.	REVISION	BY	DATE

ACORN VALLEY SUBDIVISION
MUNICIPALITY OF THAMES CENTRE

CJDL Consulting Engineers

PROJECT No. 18010
DATE: 25-Jun-25
DESIGN BY: AVM
CHECKED BY: DJL

ONTARIO BUILDING CODE FIRE DEMAND CALCULATIONS

SEMI-DETACHED DWELLING

Building Volume Determination

Average Floor Area:	250.0	m^2	=	2700	ft^2 (Both Units)
No. Storeys:	2.0				
Height Per Storey:	3.0	m			

Building Volume (V): 1500.0 m^3

Water Supply Coefficient Determination

Building Class: C (Per OBC Section 3.1.2.1.)

Construction Type: Building is of combustible construction with fire separations and fire-resistance ratings provided in accordance with Subsection 3.2.2. of the OBC, including loadbearing walls, columns and arches. Noncombustible construction may be used in lieu of fire-resistance rating where permitted in Subsection 3.2.2. of the OBC.

TYPE OF CONSTRUCTION	Classification by Group or Division in Accordance with Table 3.1.2.1 of the Ontario Building Code				
	A-2 B-1 B-2 B-3 C D	A-4 F-3	A-1 A-3	E F-2	F-1
Building is of noncombustible construction with fire separations and fire-resistance ratings provided in accordance with Subsection 3.2.2. of the OBC, including loadbearing walls, columns and arches.	10	12	14	17	23
Building is of noncombustible construction or of heavy timber construction conforming to Article 3.1.4.6. of the OBC. Floor assemblies are fire separations but with no fire-resistance rating. Roof assemblies, mezzanines, loadbearing walls, columns and arches do not have a fire-resistance rating.	16	19	22	27	37
Building is of combustible construction with fire separations and fire-resistance ratings provided in accordance with Subsection 3.2.2. of the OBC, including loadbearing walls, columns and arches. Noncombustible construction may be used in lieu of fire-resistance rating where permitted in Subsection 3.2.2. of the OBC.	18	22	25	31	41
Building is of combustible construction. Floor assemblies are fire separations but with no fire-resistance rating. Roof assemblies, mezzanines, loadbearing walls, columns and arches do not have a fire-resistance rating.	23	28	32	39	53
Column 1	**2**	**3**	**4**	**5**	**6**

Water Supply Coefficient (K): 18

Spatial Coefficient Determination

Front:	0.00	(Distance =	32	m (Figure 1: Spatial Separation) (OFM TG-03-1999 Section 6.3)
Rear:	0.00	(Distance =	18	m (Figure 1: Spatial Separation) (OFM TG-03-1999 Section 6.3)
Left:	0.50	(Distance =	2.4	m (Figure 1: Spatial Separation) (OFM TG-03-1999 Section 6.3)
Right:	0.50	(Distance =	2.4	m (Figure 1: Spatial Separation) (OFM TG-03-1999 Section 6.3)

Spatient Coefficient Total (S_{tot}): 2.00

Fire Flow Determination

$$Q = KVS_{Tot}$$

Water Supply Coefficient (K):	18	
Building Volume (V):	1500.0	m^3
Spatial Coefficient Total (S_{tot}):	2.00	

Minimum Supply of Water (Q): 54000.0 L

Building Code, Part 3 Buildings	Required Minimum Water Supply Flow Rate (L/min.)
One-storey building with building area not exceeding $600m^2$ (excluding F-1 occupancies)	1800
All other buildings	2700 (If **Q** ≤ 108,000L)(1) 3600 (If **Q** > 108,000L **and** ≤ 135,000L)(1) 4500 (If **Q** > 135,000L **and** ≤ 162,000L)(1) 5400 (If **Q** > 162,000L **and** ≤ 190,000L)(1) 6300 (If **Q** > 190,000L **and** ≤ 270,000L)(1) 9000 (If **Q** > 270,000L)(1)

Required Minimum Water Supply Flow Rate: 2700.0 L/min

Minimum Volume of Water Supply: 81000 L (Based on 30 min. minimum supply duration)

REQUIRED FIRE FLOW:	45.00	L/s

No.	REVISION	BY	DATE

ACORN VALLEY SUBDIVISION
MUNICIPALITY OF THAMES CENTRE

CJDL Consulting Engineers

PROJECT No. 18010
DATE: 25-Jun-25
DESIGN BY: AVM
CHECKED BY: DJL

ONTARIO BUILDING CODE FIRE DEMAND CALCULATIONS

6-UNIT TOWNHOME DWELLING

Building Volume Determination

Average Floor Area:	550.0	m^2	=	5900	ft^2 (All Units)
No. Storeys:	2.0				
Height Per Storey:	3.0	m			

Building Volume (V): 3300.0 m^3

Water Supply Coefficient Determination

Building Class: C (Per OBC Section 3.1.2.1.)

Construction Type: Building is of combustible construction with fire separations and fire-resistance ratings provided in accordance with Subsection 3.2.2. of the OBC, including loadbearing walls, columns and arches. Noncombustible construction may be used in lieu of fire-resistance rating where permitted in Subsection 3.2.2. of the OBC.

TYPE OF CONSTRUCTION	Classification by Group or Division in Accordance with Table 3.1.2.1 of the Ontario Building Code				
	A-2 B-1 B-2 B-3 C D	A-4 F-3	A-1 A-3	E F-2	F-1
Building is of noncombustible construction with fire separations and fire-resistance ratings provided in accordance with Subsection 3.2.2. of the OBC, including loadbearing walls, columns and arches.	10	12	14	17	23
Building is of noncombustible construction or of heavy timber construction conforming to Article 3.1.4.6. of the OBC. Floor assemblies are fire separations but with no fire-resistance rating. Roof assemblies, mezzanines, loadbearing walls, columns and arches do not have a fire-resistance rating.	16	19	22	27	37
Building is of combustible construction with fire separations and fire-resistance ratings provided in accordance with Subsection 3.2.2. of the OBC, including loadbearing walls, columns and arches. Noncombustible construction may be used in lieu of fire-resistance rating where permitted in Subsection 3.2.2. of the OBC.	18	22	25	31	41
Building is of combustible construction. Floor assemblies are fire separations but with no fire-resistance rating. Roof assemblies, mezzanines, loadbearing walls, columns and arches do not have a fire-resistance rating.	23	28	32	39	53
Column 1	**2**	**3**	**4**	**5**	**6**

Water Supply Coefficient (K): 18

Spatial Coefficient Determination

Front:	0.00	(Distance =	32	m (Figure 1: Spatial Separation) (OFM TG-03-1999 Section 6.3)
Rear:	0.00	(Distance =	18	m (Figure 1: Spatial Separation) (OFM TG-03-1999 Section 6.3)
Left:	0.50	(Distance =	4	m (Figure 1: Spatial Separation) (OFM TG-03-1999 Section 6.3)
Right:	0.50	(Distance =	4	m (Figure 1: Spatial Separation) (OFM TG-03-1999 Section 6.3)

Spatient Coefficient Total (S_{tot}): 2.00

Fire Flow Determination

$$Q = KVS_{Tot}$$

Water Supply Coefficient (K): 18
Building Volume (V): 3300.0 m^3
Spatial Coefficient Total (S_{tot}): 2.00

Minimum Supply of Water (Q): 118800.0 L

Building Code, Part 3 Buildings	Required Minimum Water Supply Flow Rate (L/min.)
One-storey building with building area not exceeding $600m^2$ (excluding F-1 occupancies)	1800
All other buildings	2700 (If **Q** ≤ 108,000L)(1) 3600 (If **Q** > 108,000L **and** ≤ 135,000L)(1) 4500 (If **Q** > 135,000L **and** ≤ 162,000L)(1) 5400 (If **Q** > 162,000L **and** ≤ 190,000L)(1) 6300 (If **Q** > 190,000L **and** ≤ 270,000L)(1) 9000 (If **Q** > 270,000L)(1)

Required Minimum Water Supply Flow Rate: 3600.0 L/min

Minimum Volume of Water Supply: 108000 L (Based on 30 min. minimum supply duration)

REQUIRED FIRE FLOW:	60.00	L/s

No.	REVISION	BY	DATE

ACORN VALLEY SUBDIVISION
MUNICIPALITY OF THAMES CENTRE

CJDL Consulting Engineers

PROJECT No. 18010
DATE: 25-Jun-25
DESIGN BY: AVM
CHECKED BY: DJL

FIRE UNDERWRITERS SURVEY FIRE DEMAND CALCULATIONS

SINGLE-DETACHED DWELLING

Construction Coefficient Determination

Construction Material:	Ordinary Construction	
Fire Resistance Rating:	1.0	hours

Construction Description: Exterior walls are of masonry construction (or other approved material) with a minimum 1-hour fire resistance rating, but other elements such as interior walls, arches, floors, and/or roof do not have a minimum 1-hour fire resistance rating.

Construction Type (FUS, 2020):	Type III	
Construction Coefficient (C):	1.0	

Total Floor Area Determination

Largest Floor Area:	185	m^2 (Subdivided floor area if vertical firewalls have minimum 2-hour fire rating)
Storey of Largest Floor Area:	1	
Vertical Opening Protection:	Unprotected	(Only applies for buildings with Construction Coefficient (C) less than 1.0)
Number of Storeys:	2	(Excluding basements 50% or more below grade)
Vertical Firewall Separation:	No	(Only applies if vertical firewall has a minimum 2-hour fire rating)
Vertical Firewall Protection:		(Only applies if there is vertical firewall separation)
Vertical Firewall Separation Risk:		(Indicates if there is severe risk of fire on other side of vertical firewall)

Vertical Firewall Factor:	0%	(0% if there is no vertical firewall separation)	
Total Floor Area (A):	370	m^2	100% of all floor areas

Occupancy & Contents Adjustment Factor

Building Class:	C	
Contents Hazard:	Limited Combustible Contents	
Occupancy & Contents Adjustment:	-15%	

Automatic Sprinkler Protection Adjustment

Automatic Sprinkler System:	No	(Per NFPA 13)
Standard Water Supply:		(Pressurized water supply, public or private, designed to handle Max Day +Fire Flow)
Fully Supervised System:		(Per NFPA 25)
Community Level Sprinkler Protection:		(Fully sprinklered/fire protected communities)
Automatic Sprinkler Adjustment:	0%	

Exposure Adjustment Charge

Front:	0.0%	(Distance =	32	m (FUS 2020)	(Sprinklered =	No)
Rear:	11.0%	(Distance =	18	m (FUS 2020)	(Sprinklered =	No)
Left:	21.0%	(Distance =	2.4	m (FUS 2020)	(Sprinklered =	No)
Right:	21.0%	(Distance =	2.4	m (FUS 2020)	(Sprinklered =	No)
Exposure Adjustment:	53.0%					

Fire Flow Determination

$$RFF = 220C\sqrt{A}$$

A.	Construction Coefficient (C) :	1.0	
B.	Total Effective Floor Area (A) :	370	m^2
C.	Base Fire Flow (RFF) :	4000	L/m (Rounded to nearest 1,000 L/m)
D.	Occupancy & Contents Adjustment:	-15%	
	O & C Fire Flow Adjustment:	-600	L/m
E.	Automatic Sprinkler Adjustment:	0%	
	Sprinkler Fire Flow Adjustment:	0	L/m
F.	Exposure Adjustment:	53.0%	
	Exposure Fire Flow Adjustment:	2120	L/m
G.	Required Fire Flow:	6000	L/m (Rounded to nearest 1,000 L/m)

REQUIRED FIRE FLOW:	100.00	L/s

No.	REVISION	BY	DATE

ACORN VALLEY SUBDIVISION
MUNICIPALITY OF THAMES CENTRE

CJDL Consulting Engineers

PROJECT No. 18010
DATE: 25-Jun-25
DESIGN BY: AVM
CHECKED BY: DJL

FIRE UNDERWRITERS SURVEY FIRE DEMAND CALCULATIONS

SEMI-DETACHED DWELLING

Construction Coefficient Determination

Construction Material:	Ordinary Construction	
Fire Resistance Rating:	1.0	hours
Construction Description:	Exterior walls are of masonry construction (or other approved material) with a minimum 1-hour fire resistance rating, but other elements such as interior walls, arches, floors, and/or roof do not have a minimum 1-hour fire resistance rating.	
Construction Type (FUS, 2020):	Type III	
Construction Coefficient (C):	1.0	

Total Floor Area Determination

Largest Floor Area:	250	m^2 (Subdivided floor area if vertical firewalls have minimum 2-hour fire rating)
Storey of Largest Floor Area:	1	
Vertical Opening Protection:	Unprotected	(Only applies for buildings with Construction Coefficient (C) less than 1.0)
Number of Storeys:	2	(Excluding basements 50% or more below grade)
Vertical Firewall Separation:	No	(Only applies if vertical firewall has a minimum 2-hour fire rating)
Vertical Firewall Protection:		(Only applies if there is vertical firewall separation)
Vertical Firewall Separation Risk:		(Indicates if there is severe risk of fire on other side of vertical firewall)
Vertical Firewall Factor:	0%	(0% if there is no vertical firewall separation)
Total Floor Area (A):	500	m^2 100% of all floor areas

Occupancy & Contents Adjustment Factor

Building Class:	C	
Contents Hazard:	Limited Combustible Contents	
Occupancy & Contents Adjustment:	-15%	

Automatic Sprinkler Protection Adjustment

Automatic Sprinkler System:	No	(Per NFPA 13)
Standard Water Supply:		(Pressurized water supply, public or private, designed to handle Max Day +Fire Flow)
Fully Supervised System:		(Per NFPA 25)
Community Level Sprinkler Protection:		(Fully sprinklered/fire protected communities)
Automatic Sprinkler Adjustment:	0%	

Exposure Adjustment Charge

Front:	0.0%	(Distance =	32	m (FUS 2020)	(Sprinklered =	No)
Rear:	11.0%	(Distance =	18	m (FUS 2020)	(Sprinklered =	No)
Left:	21.0%	(Distance =	2.4	m (FUS 2020)	(Sprinklered =	No)
Right:	21.0%	(Distance =	2.4	m (FUS 2020)	(Sprinklered =	No)
Exposure Adjustment:	53.0%					

Fire Flow Determination

$$RFF = 220C\sqrt{A}$$

A.	Construction Coefficient (C) :	1.0	
B.	Total Effective Floor Area (A) :	500	m^2
C.	Base Fire Flow (RFF) :	5000	L/m (Rounded to nearest 1,000 L/m)
D.	Occupancy & Contents Adjustment:	-15%	
	O & C Fire Flow Adjustment:	-750	L/m
E.	Automatic Sprinkler Adjustment:	0%	
	Sprinkler Fire Flow Adjustment:	0	L/m
F.	Exposure Adjustment:	53.0%	
	Exposure Fire Flow Adjustment:	2650	L/m
G.	Required Fire Flow:	7000	L/m (Rounded to nearest 1,000 L/m)

REQUIRED FIRE FLOW:	116.67	L/s

No.	REVISION	BY	DATE

ACORN VALLEY SUBDIVISION
MUNICIPALITY OF THAMES CENTRE

CJDL Consulting Engineers

PROJECT No. 18010
DATE: 25-Jun-25
DESIGN BY: AVM
CHECKED BY: DJL

FIRE UNDERWRITERS SURVEY FIRE DEMAND CALCULATIONS

TOWNHOME DWELLING

Construction Coefficient Determination

Construction Material:	Ordinary Construction	
Fire Resistance Rating:	1.0	hours

Construction Description: Exterior walls are of masonry construction (or other approved material) with a minimum 1-hour fire resistance rating, but other elements such as interior walls, arches, floors, and/or roof do not have a minimum 1-hour fire resistance rating.

Construction Type (FUS, 2020):	Type III	
Construction Coefficient (C):	1.0	

Total Floor Area Determination

Largest Floor Area:	550	m^2 (Subdivided floor area if vertical firewalls have minimum 2-hour fire rating)
Storey of Largest Floor Area:	1	
Vertical Opening Protection:	Unprotected	(Only applies for buildings with Construction Coefficient (C) less than 1.0)
Number of Storeys:	2	(Excluding basements 50% or more below grade)
Vertical Firewall Separation:	No	(Only applies if vertical firewall has a minimum 2-hour fire rating)
Vertical Firewall Protection:		(Only applies if there is vertical firewall separation)
Vertical Firewall Separation Risk:		(Indicates if there is severe risk of fire on other side of vertical firewall)

Vertical Firewall Factor:	0%	(0% if there is no vertical firewall separation)	
Total Floor Area (A):	1100	m^2	100% of all floor areas

Occupancy & Contents Adjustment Factor

Building Class:	C	
Contents Hazard:	Limited Combustible Contents	
Occupancy & Contents Adjustment:	-15%	

Automatic Sprinkler Protection Adjustment

Automatic Sprinkler System:	No	(Per NFPA 13)
Standard Water Supply:		(Pressurized water supply, public or private, designed to handle Max Day +Fire Flow)
Fully Supervised System:		(Per NFPA 25)
Community Level Sprinkler Protection:		(Fully sprinklered/fire protected communities)
Automatic Sprinkler Adjustment:	0%	

Exposure Adjustment Charge

Front:	0.0%	(Distance =	32	m (FUS 2020)	(Sprinklered =	No)
Rear:	11.0%	(Distance =	18	m (FUS 2020)	(Sprinklered =	No)
Left:	19.3%	(Distance =	4	m (FUS 2020)	(Sprinklered =	No)
Right:	19.3%	(Distance =	4	m (FUS 2020)	(Sprinklered =	No)
Exposure Adjustment:	49.6%					

Fire Flow Determination

$$RFF = 220C\sqrt{A}$$

A.	Construction Coefficient (C) :	1.0	
B.	Total Effective Floor Area (A) :	1100	m^2
C.	Base Fire Flow (RFF) :	7000	L/m (Rounded to nearest 1,000 L/m)
D.	Occupancy & Contents Adjustment:	-15%	
	O & C Fire Flow Adjustment:	-1050	L/m
E.	Automatic Sprinkler Adjustment:	0%	
	Sprinkler Fire Flow Adjustment:	0	L/m
F.	Exposure Adjustment:	49.6%	
	Exposure Fire Flow Adjustment:	3470	L/m
G.	Required Fire Flow:	9000	L/m (Rounded to nearest 1,000 L/m)

REQUIRED FIRE FLOW:	150.00	L/s

No.	REVISION	BY	DATE

SANITARY SEWER DESIGN SHEET

CJDL Consulting Engineers

PROJECT: ACORN VALLEY SUBDIVISION - **CURRENT**

MUNICIPALITY: THAMES CENTRE (DORCHESTER)

DATE: 25-Jun-2025
DESIGNED BY: AVM
CHECKED BY: DJL
JOB No.: 18010
SHEET: 1 of 1

NO	REVISION	DATE	BY

	2023 THAMES CENTRE DESIGN CRITERIA						DORCHESTER SPS No.3 DESIGN CRITERIA (STANTEC, 2018)					
LOW DENSITY:	90	People/ha	30	Units/ha	3	People/Unit	45	People/ha	15	Units/ha	3	People/Unit
MEDIUM DENSITY:	180	People/ha	75	Units/ha	2.4	People/Unit	72	People/ha	30	Units/ha	2.4	People/Unit
HIGH DENSITY:	240	People/ha	150	Units/ha	1.6	People/Unit	240	People/ha	150	Units/ha	1.6	People/Unit
LIGHT INDUSTRIAL:	20000	L/ha/Day					100	People/ha				
INFILTRATION:	0.100	l/s/ha					0.100	l/s/ha				
SEWAGE:	350	l/Person/Day					230	l/Person/Day				
UNCERTAINTY FACTOR:	1.1						1.1					
PEAKING FACTOR RATIO:	0.8						1.0					

$M=1+14(4+P^{0.5})^{-1}$ (l/s)
P=Population in thousands

$Cap=1000n^{-1}A*R^{0.667}s^{0.5}$ (l/s)
R=Hydraulic radius (=∅/4) (m)
A=Pipe cross-sectional area (m^2)
s=Slope of pipe

LOCATION				AREA			POPULATION								DESIGN FLOW								SEWER							UPSTREAM INVERT (m)	DOWN STREAM INVERT (m)	FALL (m)	DROP ACROSS LOWER MANHOLE (m)
							THAMES CENTRE DES. CRITERIA				SPS No.3 DES. CRITERIA				THAMES CENTRE DES. CRITERIA				SPS No.3 DES. CRITERIA																
AREA #	STREET	FROM MH	TO MH	Net or Gross	Δ Area (ha)	Total Area (ha)	PER ha.	NO. LOTS	Δ Pop	Total Pop.	PER ha.	NO. LOTS	Δ Pop	Total Pop.	Peaking Factor, M	Sewage (l/s)	Infiltration (l/s)	Design Flow (l/s)	Peaking Factor, M	Sewage (l/s)	Infiltration (l/s)	Design Flow (l/s)	Length (m)	Pipe Size (mm)	Type of Pipe	n	Min Slope (%)	Capacity (l/s)	Full Flow Velocity (m/s)					
	ORIGINAL SPS No.3 DESIGN - ACORN VALLEY LANDS																																
18	AREA 18 (Stantec 2018 Design Brief) Excl. 17 & 21 Christie Drive			GROSS	45.90	45.90	-	-	-	-	45	688	2066	2066	-	-	-	-	3.575	21.627	4.590	26.22												
				SPS No. 3 DES. AREA =		**45.90**					**SPS No.3 DES. POPULATION =**			**2066**					**SPS No. 3 DES. AVERAGE FLOW =**			**10.64**												
																			SPS No. 3 DES. PEAK FLOW =			**26.22**												
	ACORN VALLEY SUBDIVISION																																
A1	PHASES 1 - 3 (LOW-DENSITY)			GROSS	15.97	15.97	-	212	636	636	-	212	636	636	3.135	8.883	1.597	10.48	3.918	7.297	1.597	8.89												
	PHASES 1 - 3 (HIGH-DENSITY BLOCK 175)			GROSS	3.93	3.93	150	589	943	943	150	589	943	943	3.053	12.829	0.393	13.22	3.816	10.538	0.393	10.93												
	PHASES 1 - 3					19.90		801		1579		801		1579	2.931	20.620	1.990	22.61	3.663	16.938	1.990	18.93												
				PHASES 1 - 3 DES. AREA =		19.90					PHASES 1 - 3 DES. POPULATION =			1579					PHASES 1 - 3 DES. AVERAGE FLOW =			6.61												
																			PHASES 1 - 3 DES. PEAK FLOW =			18.93												
A2	NORTHERN DEVELOPMENT BLOCK			GROSS	18.01	18.01	-	540	1621	1621	-	540	1621	1621	2.924	21.120	1.801	22.92	3.655	17.349	1.801	19.15	30	Units/ha estimated by Developer										
				NORTH DEV. DES. AREA =		18.01					NORTH DEV. DES. POPULATION =			1621					NORTH DEV. DES. AVERAGE FLOW =			6.55												
																			NORTH DEV. DES. PEAK FLOW =			19.15												
	TOTAL ACORN VALLEY SUBDIVISION					37.91		1341		3200		1341		3200	2.735	38.996	3.791	42.79	3.418	32.032	3.791	35.82												
				TOTAL DES. AREA =		**37.91**					**TOTAL DES. POPULATION =**			**3200**					**TOTAL DES. AVERAGE FLOW =**			**13.16**												
																			TOTAL DES. PEAK FLOW =			**35.82**												

NOTES:

SANITARY SEWER DESIGN SHEET

CJDL Consulting Engineers

PROJECT: ACORN VALLEY SUBDIVISION - **FUTURE**

MUNICIPALITY: THAMES CENTRE (DORCHESTER)

DATE: 25-Jun-2025
DESIGNED BY: AVM
CHECKED BY: DJL
JOB No.: 18010
SHEET: 1 of 1

NO	REVISION	DATE	BY

2023 THAMES CENTRE DESIGN CRITERIA

LOW DENSITY:	90	People/ha	30	Units/ha	3	People/Unit
MEDIUM DENSITY:	180	People/ha	75	Units/ha	2.4	People/Unit
HIGH DENSITY:	240	People/ha	150	Units/ha	1.6	People/Unit
LIGHT INDUSTRIAL:	20000	L/ha/Day				
INFILTRATION:	0.100	l/s/ha				
SEWAGE:	350	l/Person/Day				
UNCERTAINTY FACTOR:	1.1					
PEAKING FACTOR RATIO:	0.8					

DORCHESTER SPS No.3 DESIGN CRITERIA (STANTEC, 2018)

45	People/ha	15	Units/ha	3	People/Unit
72	People/ha	30	Units/ha	2.4	People/Unit
240	People/ha	150	Units/ha	1.6	People/Unit
100	People/ha				
0.100	l/s/ha				
230	l/Person/Day				
1.1					
1.0					

$M=1+14(4+P^{0.5})^{-1}$ (l/s)
P=Population in thousands

$Cap=1000n^{-1}A*R^{0.667}s^{0.5}$ (l/s)
R=Hydraulic radius (=Ø/4) (m)
A=Pipe cross-sectional area (m^2)
s=Slope of pipe

LOCATION				AREA			POPULATION								DESIGN FLOW								SEWER							UPSTREAM INVERT (m)	DOWN STREAM INVERT (m)	FALL (m)	DROP ACROSS LOWER MANHOLE (m)
							THAMES CENTRE DES. CRITERIA				SPS No.3 DES. CRITERIA				THAMES CENTRE DES. CRITERIA				SPS No.3 DES. CRITERIA														
AREA #	STREET	FROM MH	TO MH	Net or Gross	Δ Area (ha)	Total Area (ha)	PER ha.	NO. LOTS	Δ Pop	Total Pop.	PER ha.	NO. LOTS	Δ Pop	Total Pop.	Peaking Factor, M	Sewage (l/s)	Infiltration (l/s)	Design Flow (l/s)	Peaking Factor, M	Sewage (l/s)	Infiltration (l/s)	Design Flow (l/s)	Length (m)	Pipe Size (mm)	Type of Pipe	n	Min Slope (%)	Capacity (l/s)	Full Flow Velocity (m/s)				
ORIGINAL SPS No.3 DESIGN - ACORN VALLEY LANDS																																
18	AREA 18 (Stantec 2018 Tributary Figure)			GROSS	47.60	47.60	-	-	-	-	45	714	2142	2142	-	-	-	-	3.562	22.345	4.760	27.10											
19	AREA 19 (Stantec 2018 Tributary Figure)			GROSS	12.50	12.50	-	-	-	-	45	187	563	563	-	-	-	-	3.947	6.507	1.250	7.76											
22a	AREA 22a (Stantec 2018 Tributary Figure)			GROSS	17.80	17.80	-	-	-	-	45	267	801	801	-	-	-	-	3.860	9.054	1.780	10.83											
W	AREA W (Stantec 2018 Tributary Figure)			GROSS	17.90	17.90	-	-	-	-	-	5	15	15	-	-	-	-	4.396	0.193	1.790	1.98											
22b	AREA 22b (Stantec 2018 Tributary Figure) Excl. SE Boardwalk Development			GROSS	11.20	11.20	-	-	-	-	45	168	504	504	-	-	-	-	3.972	5.863	1.120	6.98											
TOTAL DORCHESTER SPS No. 3 DESIGN				GROSS		107.00						1341		4025					3.331	39.259	10.700	49.96											
				SPS No. 3 DES. AREA =		**107.00**						**SPS No.3 DES. POPULATION =**		**4025**								**SPS No. 3 DES. AVERAGE FLOW =**			**22.49**								
																						SPS No. 3 DES. PEAK FLOW =			**49.96**								
ACORN VALLEY SUBDIVISION																																
A1	PHASES 1 - 3 (LOW-DENSITY)			GROSS	15.97	15.97	-	212	636	636	-	212	636	636	3.135	8.883	1.597	10.48	3.918	7.297	1.597	8.89											
	PHASES 1 - 3 (HIGH-DENSITY BLOCK 175)			GROSS	3.93	3.93	150	589	943	943	150	589	943	943	3.053	12.829	0.393	13.22	3.816	10.538	0.393	10.93											
PHASES 1 - 3						19.90		801		1579		801		1579	2.931	20.620	1.990	22.61	3.663	16.938	1.990	18.93											
				PHASES 1 - 3 DES. AREA =		**19.90**						**PHASES 1 - 3 DES. POPULATION =**		**1579**								**PHASES 1 - 3 DES. AVERAGE FLOW =**			**6.61**								
																						PHASES 1 - 3 DES. PEAK FLOW =			**18.93**								
A2	NORTHERN DEVELOPMENT BLOCK			GROSS	18.01	18.01	-	540	1621	1621	-	540	1621	1621	2.924	21.120	1.801	22.92	3.655	17.349	1.801	19.15	30	Units/ha estimated by Developer									
				NORTH DEV. DES. AREA =		**18.01**						**NORTH DEV. DES. POPULATION =**		**1621**								**NORTH DEV. DES. AVERAGE FLOW =**			**6.55**								
																						NORTH DEV. DES. PEAK FLOW =			**19.15**								
TOTAL ACORN VALLEY SUBDIVISION						37.91		1341		3200		1341		3200	2.735	38.996	3.791	42.79	3.418	32.032	3.791	35.82											
				TOTAL DES. AREA =		**37.91**						**TOTAL DES. POPULATION =**		**3200**								**TOTAL DES. AVERAGE FLOW =**			**13.16**								
																						TOTAL DES. PEAK FLOW =			**35.82**								
HARRIS ROAD LANDS																																
F2	HARRIS ROAD SOUTH			GROSS	22.35	22.35	-	447	1341	1341	-	447	1341	1341	2.971	17.756	2.235	19.99	3.714	14.585	2.235	16.82	20	Units/ha estimated by Developer									
F1	HARRIS ROAD NORTH			GROSS	13.35	13.35	-	267	801	801	-	267	801	801	3.088	11.022	1.335	12.36	3.860	9.054	1.335	10.39	20	Units/ha estimated by Developer									
TOTAL HARRIS ROAD LANDS						35.70		714		2142		714		2142	2.850	27.202	3.570	30.77	3.562	22.345	3.570	25.91											
				TOTAL DES. AREA =		**35.70**						**TOTAL DES. POPULATION =**		**2142**								**TOTAL DES. AVERAGE FLOW =**			**9.84**								
																						TOTAL DES. PEAK FLOW =			**25.91**								
EXTERNAL LANDS																																
EXT 14	HAMILTON ROAD FUTURE			GROSS	7.48	7.48	90	224	674	674	45	112	337	337	3.123	9.380	0.748	10.13	4.056	4.003	0.748	4.75											
EXT 13	HARRIS ROAD FUTURE NORTH			GROSS	17.00	17.00	90	510	1530	1530	45	255	765	765	2.939	20.035	1.700	21.73	3.872	8.674	1.700	10.37											
EXT 12	HARRIS ROAD EXISTING NORTH			GROSS	10.40	10.40	-	7	21	21	-	7	21	21	3.502	0.328	1.040	1.37	4.378	0.269	1.040	1.31											
						34.88		741		2225		374		1123	2.839	28.152	3.488	31.64	3.767	12.387	3.488	15.88											
	TOTAL - HARRIS ROAD NORTH			**TOTAL DES. AREA =**		**34.88**						**TOTAL DES. POPULATION =**		**1123**								**TOTAL DES. AVERAGE FLOW =**			**6.78**								
																						TOTAL DES. PEAK FLOW =			**15.88**								
EXT 8	HARRIS ROAD EXISTING SOUTHWEST - RESIDENTIAL			GROSS	1.78	1.78	-	6	18	18	-	6	18	18	3.509	0.281	0.178	0.46	4.386	0.231	0.178	0.41											
EXT 7	HARRIS ROAD EXISTING SOUTHWEST - INDUSTRIAL			GROSS	4.33	4.33	-	23	71	71	100	144	433	433	3.425	3.776	0.433	4.21	4.006	5.079	0.433	5.51											
						6.11		29		89		150		451	3.406	1.351	0.611	1.96	3.997	5.278	0.611	5.89											
	TOTAL - HARRIS ROAD SOUTHWEST			**TOTAL DES. AREA =**		**6.11**						**TOTAL DES. POPULATION =**		**451**								**TOTAL DES. AVERAGE FLOW =**			**1.83**								
																						TOTAL DES. PEAK FLOW =			**5.89**								
EXT 6	BOARDWALK FUTURE NORTHWEST			GROSS	2.49	2.49	90	75	225	225	45	37	113	113	3.303	3.312	0.249	3.56	4.229	1.399	0.249	1.65											
						2.49		75		225		37		113	3.303	3.312	0.249	3.56	4.229	1.399	0.249	1.65											
	TOTAL - BOARDWALK FUTURE NORTHWEST			**TOTAL DES. AREA =**		**2.49**						**TOTAL DES. POPULATION =**		**113**								**TOTAL DES. AVERAGE FLOW =**			**0.58**								
																						TOTAL DES. PEAK FLOW =			**1.65**								
EXT 5	WHEELER AVENUE EXISTING SOUTH			GROSS	2.88	2.88	-	22	66	66	-	22	66	66	3.431	1.009	0.288	1.30	4.289	0.829	0.288	1.12											
EXT 4	WHEELER AVENUE NORTH & TINER AVENUE			GROSS	12.61	12.61	-	87	261	261	-	87	261	261	3.283	3.818	1.261	5.08	4.104	3.136	1.261	4.40											
EXT 3	MILL ROAD NORTH			GROSS	12.01	12.01	-	68	204	204	-	68	204	204	3.316	3.014	1.201	4.22	4.145	2.476	1.201	3.68											
						27.50		177		531		177		531	3.169	7.497	2.750	10.25	3.961	6.158	2.750	8.91											
	TOTAL - EXISTING TINER ESTATES			**TOTAL DES. AREA =**		**27.50**						**TOTAL DES. POPULATION =**		**531**								**TOTAL DES. AVERAGE FLOW =**			**4.30**								
																						TOTAL DES. PEAK FLOW =			**8.91**								
EXT 2	MILL ROAD CENTRAL			GROSS	4.22	4.22	-	31	93	93	-	31	93	93	3.402	1.410	0.422	1.83	4.252	1.158	0.422	1.58	31	Units on Current Approved Draft Plan									
EXT 1	MILL ROAD WEST			GROSS	20.23	20.23	-	222	666	666	-	222	666	666	3.126	9.276	2.023	11.30	3.907	7.619	2.023	9.64	222	Units on Current Approved Draft Plan									
EXT 0	MILL ROAD TRUNK SEWER			GROSS	0.53	0.53	0	0	0	0	0	0	0	0	3.600	0.000	0.053	0.05	4.500	0.000	0.053	0.05											
						24.98		253		759		253		759	3.099	10.482	2.498	12.98	3.874	8.610	2.498	11.11											
	TOTAL - BOARDWALK NORTH & WEST			**TOTAL DES. AREA =**		**24.98**						**TOTAL DES. POPULATION =**		**759**								**TOTAL DES. AVERAGE FLOW =**			**4.72**								
																						TOTAL DES. PEAK FLOW =			**11.11**								
TOTAL EXTERNAL LANDS						95.96		1275		3829		991		2977	2.680	45.730	9.596	55.33	3.445	30.033	9.596	39.63											
				TOTAL DES. AREA =		**95.96**						**TOTAL DES. POPULATION =**		**2977**								**TOTAL DES. AVERAGE FLOW =**			**18.31**								
																						TOTAL DES. PEAK FLOW =			**39.63**								
SPS No.3 TRUNK SEWER (MILL ROAD TO SPS No. 3)																																
TOTAL SPS No.3 TRUNK SEWER						169.57		3330		9171		3046		8319	2.394	97.815	16.957	114.77	3.034	73.899	16.957	90.86											
				TOTAL DES. AREA =		**169.57**						**TOTAL DES. POPULATION =**		**8319**								**TOTAL DES. AVERAGE FLOW =**			**41.32**								
																						TOTAL DES. PEAK FLOW =			**90.86**		375	PVC	0.013	0.50	123.98	1.12				

NOTES:

CLASSIC FIRE + LIFE SAFETY

FLOW TEST REPORT

Form SD-003B RevDate: Nov 29, 2021

PROJECT INFORMATION			
Project Name:	Proposed Subdivision off Christie Dr	Const. Project #:	SMC-0008628
Site Address:	90 Wheeler Ave Dorchester ON	Design Project #:	2023-CFLS-607
City Contact:	Kevin Willson	Phone #:	519-871-0678
CFLS Contact:	Mike Tracey	Phone #:	519-630-4770
Technical Contact:	**Andy Coghlin**	Phone #:	**519-476-0761**

SITE INFORMATION

SITE MAP

Note: If the main is a dead end, the flowing hydrant shall be closest to the dead end

ITEMS TO LABEL ON MAP	HYDRANTS USED	MAIN SIZE
☑ Static / Residual & Flow Hydrants	☑ City Hydrant(s)	City:
☐ Flow Direction (if the main is dead end)	☐ Site Hydrant(s)	Site:

SITE NOTES

CLASSIC FIRE + LIFE SAFETY

FLOW TEST REPORT

Form SD-003B RevDate: Nov 29, 2021

TEST INFORMATION			
Minimum Required Flow:	NA	Min Ports:	2
CFLS Personnel Present:	Mike Tracey	Test Date:	2023-10-25
City / External Company:	Municipality of Thames Centre	Test Time:	8:00am

TEST EQUIPMENT	
☐ Hose Monsters with built in Pitot	Hose length used:
☐ Hand held pitot gauge	☑ Pollard diffuser elbow with built in Pitot
☐ Other:	

TEST RESULTS

Number of Ports	Outlet Size (IN)	Discharge Coefficient	Pitot Reading (PSI)				Total Flow (GPM)	Static / Residual Pressure (PSI)
0 Ports								68
1 Port	2.5	0.9	35				993	50
2 Ports	2.5	0.9	23	22			1,592	45
3 Ports	2.5	0.9					0	
4 Ports	2.5	0.9					0	
0 Ports	**STATIC RE-CHECK**							68

TEST NOTES

HYDRAULIC ADJUSTMENTS (FOR OFFICE USE ONLY)			
ADJUSTMENTS FOR HYDRAULIC GRADE LINE (HGL)			
Reservoir HGL (m):		Site Elevation (m):	
Theoretical Static Head (PSI):	0	PSI to subtract from test pressures:	68
OTHER HYDRAULIC ADJUSTMENTS			
Other adjustment as required by the City / AHJ:			

Municipality of Thames Centre

Water and Wastewater Master Plan Update

Dorchester Elevated Tank

Dorchester Water Treatment Plant

W-D-WM-16
W-D-WM-06
W-D-WM-05
W-D-WM-15
W-D-WM-14
W-D-WM-03
W-D-WM-04
W-D-WM-12
W-D-WM-13
W-D-WM-02
W-D-WM-18
W-D-WM-11
W-D-WM-10-Alt2
W-D-WM-10-Alt1
W-D-WM-09-Alt2
W-D-WM-09-Alt1
W-D-WM-08-Alt2
W-D-WM-01
W-D-WM-08-Alt1
W-D-WM-07
W-D-WM-17

SHAW RD
HAMILTON RD
BRIDGE ST
KANE ST
CATHERINE ST
ELGIN RD
DORCHESTER RD

0 1 Kilometers

Proposed Water Network

- Capital Program - Benefit to Existing System
- Capital Program - New Watermain
- Capital Program - Upgrade Watermain
- Future Local Watermain

Existing Water Network

- Elevated Tank
- Water Treatment Plant
- Existing Watermain (≤ 150 mm)
- Existing Watermain (200 - 300 mm)

General Features

- Highway
- Arterial Road
- Growth Areas
- Settlement Boundary
- Property Parcel
- Waterbody

Figure ES-2

Preferred Dorchester Water Servicing Strategy

BluePlan

September 2019
418109-G-007
NAD 1983 UTM Zone 17N

Table ES-1: Water Capital Program

Capital Program ID	Name	Description	Serviced Development Blocks	Upgrade Trigger	Upgrade Trigger (Population Growth)	Class EA Schedule	Project Type	Length (m)	Size/Capacity	Capital Program Total Component Estimated Cost (Excl. HST)
W-D-SUP-01	Maximize Dorchester WTF Supply	Maximize Well Capacity at Existing WTF	All Dorchester Developments	Existing Need	Today	A	Treatment	0 m	20 L/s	$ 1,067,000
W-D-SUP-02	New Dorchester Groundwater Supply	Includes cost of new Dorchester groundwater supply and consolidation of sources at Dorchester WTF for treatment. Includes new well houses, raw watermains, and treatment. Excludes pump capacity upgrades cost to the Dorchester WTF High Lift Pumps	All Dorchester Developments	Accumulated growth	80% Trigger of 2,800 PPJ (Persons + Jobs) = 2,200 PPJ	C	Treatment	0 m	0 L/s	$ 10,000,000
W-D-BPS-01	Dorchester HLP Upgrades	Upgrade Dorchester HLPs to supply elevated tank and distribution system from reservoirs	All Dorchester Existing + Development	Accumulated Growth or State of Good Repair (SOGR)	6,000 PPJ	A	Pumping	0 m	90 L/s	$ 1,067,000
W-D-WM-01	Dorchester Watermain - Spine Trunk Upgrade on Dorchester Rd. (South of Byron Ave.)	450m of existing 250mm DI watermain (built in 1976) to be replaced by 300mm PVC watermain	All Dorchester Developments	Accumulated Growth	North Dorchester Development	A+	Watermain	450 m	300 mm	$ 931,000
W-D-WM-02	Dorchester Watermain - Spine Trunk Upgrade on Dorchester Rd. (River Bank)	190m of existing 250mm DI watermain (built in 1976 - 1987) to be replaced by 300mm PVC watermain	All Dorchester Developments	Accumulated Growth	North Dorchester Development	A+	Watermain	190 m	300 mm	$ 403,000
W-D-WM-03	Dorchester Watermain - Spine Trunk Upgrade on Catherine St. and Minnie Rd. (North Section)	390m of existing 250mm DI and PVC watermain (built in 1990 - 1992) to be replaced by 300mm PVC watermain following Catherine St. + Minnie St. alignment	All Dorchester Developments	Accumulated Growth	North Dorchester Development	A+	Watermain	390 m	300 mm	$ 1,345,000
W-D-WM-04	Dorchester Watermain - North St. Upgrade	360m of existing 150mm CI watermain (built in 1956) on North Street and Minnie Street to be replaced by 200mm PVC watermain.	All Dorchester Developments	Dorchester Development Block 14	With new development	A+	Watermain	360 m	200 mm	$ 628,000
W-D-WM-05	Dorchester Watermain - Northeast Loop	Total of 710m of proposed PVC watermain on North Street and Village Gate Dr. to complete loop, including 590m of 200mm proposed PVC watermain on North St. and 130m of 150mm proposed PVC watermain on Village Gate Dr.	All Dorchester Developments	Dorchester Development Blocks 9, 10, 11 and 12	With new development	A	Watermain	590 m	200 mm	$ 1,023,000
W-D-WM-06	Dorchester Watermain - Marion St. Upgrade	Total of 320m of 200mm watermain on Marion Street, including 100m of existing 150mm PVC watermain to be replaced by 200mm PVC watermain and 220m of proposed 200mm PVC watermain.	All Dorchester Developments	Dorchester Development Blocks 9, 10, 11 and 12	With new development	A+	Watermain	320 m	200 mm	$ 555,000
W-D-WM-07	Dorchester Watermain - West Trunk at the Development 25	Newly proposed West Trunk - 660m of proposed 300mm PVC watermain at Development 25.	Dorchester Development Block 25	Dorchester Development Block 25	Construction proposed	A	Watermain	660 m	300 mm	$ 1,067,000
W-D-WM-08-ALT1	Dorchester Watermain - West Trunk at the Development 22	Newly proposed West Trunk - 620m of proposed 300mm PVC watermain at Development 22.	Dorchester Development Blocks 16, 17, 18, and 22	Dorchester Development Block 22	With new development	A	Watermain	620 m	300 mm	$ 1,010,000
W-D-WM-09-ALT1	Dorchester Watermain - West Trunk river crossing at Development 22.	Newly proposed West Trunk - 140m of proposed 300mm PVC watermain river crossing.	Dorchester Development Blocks 16, 17, 18, and 48	Dorchester Development Block 18 or 22	With new development	B	Watermain	140 m	300 mm	$ 356,000
W-D-WM-10-ALT1	Dorchester Watermain - West Trunk at Development 22.	Newly proposed West Trunk - 270m of proposed 300mm PVC watermain at Development 22.	Dorchester Development Blocks 16, 17, 18, and 48	Dorchester Development Block 18 or 22	With new development	A	Watermain	270 m	300 mm	$ 410,000
W-D-WM-11	Dorchester Watermain - West Trunk on Christie Dr.	Newly proposed West Trunk - Total of 980m of 300mm PVC watermain along Christie Dr. including 870m of proposed 300mm PVC watermain and 110m of existing 150mm PVC watermain to be replaced by 300mm PVC watermain	Dorchester Development Blocks 16 - 18 and 48	Dorchester Development Block 18	With new development	A	Watermain	980 m	300 mm	$ 1,718,000
W-D-WM-12	Dorchester Watermain - West Trunk on Harris Rd. and Hamilton Rd.	Newly proposed West Trunk - 1080m of proposed 300mm PVC watermain along Harris Rd. and Hamilton Rd.	Dorchester Development Blocks 16, 17 and 18	Dorchester Development Block 18	With new development	A	Watermain	910 m	300 mm	$ 1,638,000
W-D-WM-13	Dorchester Watermain - West Trunk at Mill Ct. Loop	Newly proposed West Trunk - 800m of proposed 200mm PVC watermain on Mill Ct to complete loop	Dorchester Development 18	Watermain Replacement Program	-	A+	Watermain	800 m	200 mm	$ 1,394,000
W-D-WM-14	Dorchester Watermain - Catherine St. East Section Upgrade	1020m of existing 250mm DI watermain (built in 1983) to be replaced by 300mm PVC watermain on Catherine St.	Existing Dorchester Development	Watermain Replacement Program	-	A+	Watermain	1020 m	300 mm	$ 2,089,000
W-D-WM-15	Dorchester Watermain - Catherine St. West Section Upgrade	1390m of existing 200mm PVC watermain (built in 1973 - 2013) to be replaced by 300mm PVC watermain on Catherine St.	Existing Dorchester Development	Watermain Replacement Program	-	A+	Watermain	1390 m	300 mm	$ 2,932,000
W-D-WM-16	Dorchester Watermain - Northwest Industrial Lands Upgrade	1260m of existing 200mm DI & PVC watermain (built in 1978 - 2013) to be replaced by 300mm PVC watermain	Existing Dorchester Development	Watermain Replacement Program	-	A+	Watermain	1260 m	300 mm	$ 2,283,000
W-D-WM-17	Dorchester Watermain - Hamilton Rd. Extension	350m of proposed 200mm PVC watermain along Hamilton Rd.	Dorchester Development Block 47	Dorchester Development Block 47	With new development	A+	Watermain	350 m	200 mm	$ 610,000
W-D-WM-18	Dorchester Watermain - Benefit to Existing System	370m of proposed 200mm PVC watermain along Mill Rd.	Dorchester Development Block 19	Dorchester Development Block 19	With new development	A+	Watermain	350 m	200 mm	$ 645,000
Sub-Total Dorchester Water Capital Program Projects										**$ 33,171,000**

Table ES-1: Water Capital Program

Capital Program ID	Name	Description	Serviced Development Blocks	Upgrade Trigger	Upgrade Trigger (Population Growth)	Class EA Schedule	Project Type	Length (m)	Size/Capacity	Capital Program Total Component Estimated Cost (Excl. HST)
W-D-401-ST-01	Cost Benefit Study to Service 401 Corridor Lands	Cost-benefit study to evaluate servicing options for 401 Corridor Lands, will include recommendations for service pressures and available fire flow.	401 Corridor Lands	Development Interest	-	-	Watermain	0 m	0 L/s	$ 50,000
Sub-Total 401 Corridor Water Capital Program Projects										**$ 50,000**
W-T-SUP-01	Maximize Thorndale WTF Supply	Maximize Well Capacity at Existing WTF	All Thorndale Developments	Existing Need	Today	A	Treatment	0 m	22 L/s	$ 1,020,000
W-T-SUP-02	New Thorndale Groundwater Supply	Includes cost of new Dorchester groundwater supply and consolidation of sources at Thorndale WTF for treatment. Includes new well houses, raw watermains, and treatment. Excludes pump capacity upgrades cost to the Thorndale WTF High Lift Pumps	All Thorndale Developments	Accumulated growth	80% x 2,600 PPJ = 2,000 PPJ (after planned upgrade to 22 L/s)	C	Treatment	0 m	0 L/s	$ 10,000,000
W-T-RES-01	Thorndale Reservoir Upgrade	Twinning the existing 0.451 ML reservoir and 0.363 ML reservoir	All Thorndale Developments	Accumulated growth	80% x 5,800 PPJ = 4,600 PPJ	A	Storage	0 m	0 ML	$ 753,000
W-T-BPS-01	Thorndale HLP Upgrades	Upgrade Thorndale HLP to supply elevated tank and distribution system from reservoirs	All Thorndale Developments	Existing Need	Today	A	Pumping	0 m	20 ML	$ 1,020,000
W-T-WM-01	Thorndale Watermain - Thorndale Rd. Upgrade	350m of existing PVC watermain on Thorndale Rd. (built in 1987) to be replaced by 300mm PVC watermain	All Thorndale Development Blocks	Existing Need	Today	A+	Watermain	350 m	300 mm	$ 818,000
W-T-WM-02	Thorndale Watermain - South Trunk at Monteith Lands	540m of proposed 300mm PVC watermain at Monteith Lands to complete south trunk.	Thorndale Development Blocks 1, 2, 3, 4, 8, 9 and 13	Thorndale Development Block 13	With new development	A	Watermain	540 m	300 mm	$ 898,000
W-T-WM-03	Thorndale Watermain - South Trunk Meadowbrook Ln. Upgrade	440m of existing 150mm PVC watermain on Meadowbrook Ln.(built in 1990) to be replaced by 300mm PVC watermain	Thorndale Development Blocks 1, 2, 3, 4, 8, 9 and 13	Thorndale Development Block 8, (Phase 2) or 13	With new development	A+	Watermain	440 m	300 mm	$ 794,000
W-T-WM-04	Thorndale Watermain - South Trunk at Foxborough Subdivision	280m of proposed 300mm PVC watermain at Foxborough Subdivision to complete south trunk.	Thorndale Development Blocks 1, 2, 3, 4, 8, 9 and 13	Thorndale Development Block 9	Proposed construction	A	Watermain	280 m	300 mm	$ 387,000
W-T-WM-05	Thorndale Watermain - South Trunk at Railway Crossing	410m of proposed 300mm PVC watermain at railway crossing to complete south trunk (includes directional drilling)	Thorndale Development Blocks 1, 2, 3, 4, 8, 9 and 13	Thorndale Development Block 8	With new development	A+	Watermain	410 m	300 mm	$ 1,809,000
W-T-WM-06	Thorndale Watermain - South Trunk at Rosewood Subdivision	390m of proposed 300mm PVC watermain at Rosewood Subdivision to complete south trunk.	Thorndale Development Blocks 1, 2, 3, 4, 8, 9 and 13	Thorndale Development Block 8 (Phase 2)	With new development	A	Watermain	390 m	300 mm	$ 540,000
W-T-WM-07	Thorndale Watermain - Subtrunk at Rosewood	680m of proposed 300mm PVC watermain at Rosewood Subdivision.	Thorndale Development Blocks 1, 2, 3, 4, 8, 9 and 13	Thorndale Development Block 8	Proposed construction	A	Watermain	680 m	300 mm	$ 984,000
W-T-WM-08	Thorndale Watermain Upgrade - Gerald Pkwy. Upgrade	590m of existing 200mm PVC watermain (built in 2010) on Gerald Pkwy. to be replaced by 300mm PVC watermain.	Thorndale Development Blocks 1, 2, 3, and 4	Thorndale Development Block 1, 2 or 3	With new development	A+	Watermain	590 m	300 mm	$ 1,044,000
W-T-WM-09	Thorndale Watermain Upgrade - Industrial Lands Loop	590m of 300mm watermain to connect Ideal Dr. and Gerald Pkwy. to complete loop	Thorndale Development Blocks 1, 2, 3, and 4	Thorndale Development Block 1, 2 or 3	With new development	A+	Watermain	1000 m	300 mm	$ 1,031,000
W-T-WM-10	Thorndale Watermain Upgrade - Industrial Lands Upgrade	1020m of existing 200mm PVC watermain (built in 2010) on Thorndale Rd. and Ideal Dr. to be replaced by 300mm PVC watermain.	Thorndale Development Blocks 1, 2, 3 and 4	Thorndale Development Block 1, 2 or 3	With new development	A+	Watermain	1020 m	300 mm	$ 1,798,000
Sub-Total Thorndale Water Capital Program Projects										**$ 22,896,000**
Total Municipality of Thames Centre Water Capital Program										**$ 56,117,000**

Municipality of Thames Centre

Water and Wastewater Master Plan Update

Sanitary Mains

- Existing - Local
- Existing - Trunk
- Existing - Forcemain
- Growth - Forcemains
- Growth - Development
- Upgrade
- New
- Benefits Existing

Facility Upgrades

- Pumping Station
- Wastewater Treatment Plant

Landuse

- RESIDENTIAL
- NEIGHBOURHOOD COMMERCIAL
- GENERAL COMMERCIAL
- HIGHWAY COMMERCIAL
- SETTLEMENT INDUSTRIAL
- INSTITUTIONAL
- RECREATIONAL
- PROTECTION AREA
- NATURAL AREA
- PARKS & OPEN SPACE
- ENVIRONMENTAL AREA
- CORE AREAS
- URBAN SETTLEMENT AREA BOUNDARY

WW-D-SS-13
WW-D-SS-16
WW-D-SPS-01B
WW-D-SS-01B
WW-D-SS-12
WW-D-SPS-02
WW-D-SS-15
WW-D-FM-04
WW-D-SS-02
WW-D-FM-01
WW-D-FM-05
WW-D-SS-14
WW-D-SPS-04
WW-D-SPS-03
WW-D-SS-17
WW-D-FM-02
WW-D-SS-011
WW-D-SS-05B-ALT-1
WW-D-SS-05B-ALT-2
WW-D-SS-06B-ALT-1
WW-D-FM-06
WW-D-SS-06B-ALT-2
WW-D-SS-07B-ALT-1
WW-D-FM-09
WW-D-SS-07B-ALT-2
WW-D-SS-09
WW-D-SS-03
WW-D-SS-04
WW-D-SPS-07B
WW-D-SPS-06B
WW-D-FM-08
WW-D-FM-07
WW-D-SPS-05
WW-D-TP-01B

HAMILTON RD
BRIDGE ST
JAMES ST
CATHERINE ST
ELGIN RD
DORCHESTER RD
SHAVER RD

0 1 Kilometers

Figure ES-4

Dorchester Preferred Wastewater Servicing Strategy

BluePlan Engineering

September 2019
418109
NAD 1983 UTM Zone 17N

Table ES-2: Wastewater Capital Program

Capital Program ID	Name	Description	Serviced Development Blocks and/or Existing Unserviced Areas	Upgrade Trigger	Upgrade Trigger (Population Growth)	Class EA Schedule	Project Type	Length (m)	Size/Capacity	Capital Program Total Component Estimated Cost (Excl. HST)
WW-D-TP-01B	Dorchester Treatment Plant Upgrades	Treatment plant capacity upgrades required to accommodate all development flows in Dorchester	All Dorchester Developments and Existing Areas on Private Sewage Systems (Unserviced)	Accumulated growth	80% Trigger of 1,000 PPJ (Persons + Jobs) = 800 PPJ	C	Treatment		3.2 ML	$ 14,001,000
WW-D-SPS-01B	North Dorchester New Development SPS	New SPS needed to support New Development north of railway in North Dorchester	Development 3-15 Existing Area 1	New Development North of Railway	With new development	B	Pumping		90 L/s	$ 4,732,000
WW-D-SPS-02	North Dorchester Northwest SPS	New SPS needed to support New Development and existing development south of railway and west of Dorchester Road Bridge in North Dorchester	Ex. Area 2	New Development or Municipal Servicing Replacing Private Sewage Systems	With new or existing development	B	Pumping		8 L/s	$ 568,000
WW-D-SPS-03	North Dorchester Northeast SPS	New SPS needed to support existing development south of railway and east of Dorchester Road Bridge in North Dorchester	Ex. Area 13	New Development or Municipal Servicing Replacing Private Sewage Systems	With new or existing development	B	Pumping		1 L/s	$ 121,000
WW-D-SPS-04	South Dorchester SPS	New SPS needed to support existing development south of river and north of PS3 drainage area in South Dorchester	Ex. Area 20 and North Part of Ex. Area 19	Development 19, 20 or Municipal Servicing Replacing Private Sewage Systems	With new or existing development	B	Pumping		12 L/s	$ 995,000
WW-D-SPS-05B	Southeast Dorchester SPS	New SPS needed to support Development block east of Valleyview Crescent in South Dorchester	Development 47	Development Block 47	With new development	B	Pumping		8 L/s	$ 538,000
WW-D-SPS-06B	Dorchester SPS Upgrades	Pumping station capacity upgrades required to accommodate growth flows in Dorchester	All Dorchester Development Blocks	Existing Need	Today	B	Pumping		254 L/s	$ 10,065,000
WW-D-SPS-07B	Dorchester PS3	Pumping station capacity upgrades required to accommodate growth flows in Dorchester	Development 16-19, 22-25, 29b	Southeast Development Blocks	80% Trigger of 4,500 PPJ = 3,600 PPJ	B	Pumping		102 L/s	$ 5,359,000
WW-D-FM-01	North Dorchester New Development forcemain	New forcemain needed to support new development SPS for development blocks North of CN rail in North Dorchester	Development 3-15 Ex. Area 1 - 4, 13	With WW-D-SPS-01	With new development	A+	Forcemain	475 m	300 mm	$ 1,244,000
WW-D-FM-02	Dorchester Road forcemain extension	New forcemain from Dorchester Road bridge forcemain to Dorchester road gravity sewers needed to support new development SPS for development blocks North of CN rail in North Dorchester	Development 3-15 Ex. Area 1 - 4, 13	With WW-D-SPS-01	With new development	A+	Forcemain	200 m	300 mm	$ 364,000
WW-D-FM-03	Dorchester Road forcemain extension	New forcemain from Dorchester Road bridge forcemain to Byron Ave trunk sewers needed to support new development SPS for development blocks North of CN rail in North Dorchester	Development 3-15 Ex. Area 1 - 4, 13	New Development or Municipal Servicing Replacing Private Sewage Systems	80% Trigger of 2,700 PPJ = 2,100 PPJ	A+	Forcemain	550 m	300 mm	$ 889,000
WW-D-FM-04	North Dorchester Northwest forcemain	New forcemain needed to support northwest development SPS for development blocks South of CN rail and West of Dorchester Road Bridge in North Dorchester	Ex. Area 2 and Surrounding Areas	With WW-D-SPS-02	Existing development	B	Forcemain	730 m	100 mm	$ 1,487,000
WW-D-FM-05	North Dorchester Northeast forcemain	New forcemain needed to support northeast SPS for existing development South of CN rail and East of Dorchester Road Bridge in North Dorchester	Ex. Area 13 and Surrounding Areas	With WW-D-SPS-03	With new development	B	Forcemain	500 m	100 mm	$ 1,183,000
WW-D-FM-06	South Dorchester forcemain	New forcemain needed to support south SPS for existing development South of river in South Dorchester	North part of Ex. Area 19 and Ex. Area 20	With WW-D-SPS-04	Existing development	B	Forcemain	1800 m	100 mm	$ 2,503,000
WW-D-FM-07	Southeast Dorchester forcemain	New forcemain needed to support southeast SPS for existing development East of serviced developments and North of Hamilton Road in South Dorchester	Development 47	With WW-D-SPS-05	With new development	B	Forcemain	620 m	100 mm	$ 771,000
WW-D-FM-08	Dorchester SPS forcemain	New forcemain needed to support Dorchester WWTP SPS for all existing and growth developments in Dorchester.	All Dorchester Development Blocks	With WW-D-SPS-06B (Dorchester SPS)	80% Trigger of 6,500 PPJ = 5,200 PPJ	B	Forcemain	1250 m	350 mm	$ 2,152,000
WW-D-FM-09	PS3 forcemain	Twinned forcemains needed to support PS3 for all development in Southeast Dorchester	Development 16-19, 22-25, 29b	With W-D-SPS-07B (Dorchester PS3)	80% Trigger of 4,500 PPJ = 3,600 PPJ	B	Forcemain	662 m	250 mm	$ 1,777,000
WW-D-SS-01B	New Development SPS West Sewers	New sanitary sewer required for development blocks going to new Development SPS in North Dorchester.	Development 3-7 Ex. Area 1	New Development or Municipal Servicing Replacing Private Sewage Systems	With new or existing development	A+	Sewer	420 m	300 mm	$ 490,000
WW-D-SS-02	New Development SPS East Sewers	New sanitary sewer required for development blocks going to new Development SPS in North Dorchester.	Development 8-15	New Development or Municipal Servicing Replacing Private Sewage Systems	With new or existing development	A	Sewer	480 m	250 mm	$ 712,000

Table ES-2: Wastewater Capital Program

Capital Program ID	Name	Description	Serviced Development Blocks and/or Existing Unserviced Areas	Upgrade Trigger	Upgrade Trigger (Population Growth)	Class EA Schedule	Project Type	Length (m)	Size/Capacity	Capital Program Total Component Estimated Cost (Excl. HST)
WW-D-SS-03	PS3 West Sewers	New sanitary sewer required for development blocks going to PS3 in Dorchester.	Development 17-18, 22, 25 Ex. Area 19	New Development or Municipal Servicing Replacing Private Sewage Systems	Proposed construction	A+	Sewer	265 m	375 mm	$ 1,529,000
WW-D-SS-04	PS3 West Sewers	New sanitary sewer required for development blocks going to PS3 in Dorchester.	Development 17-18, 22, 25 Ex. Area 19	New Development or Municipal Servicing Replacing Private Sewage Systems	With new or existing development	A+	Sewer	45 m	450 mm	$ 126,000
WW-D-SS-05B-ALT-1	Christie Drive and new Development sewer	New sanitary sewer required for development blocks going to PS3 in Dorchester.	Development 17-18, 22, 25 Ex. Area 19	New Development or Municipal Servicing Replacing Private Sewage Systems	With new or existing development	A+	Sewer	370 m	300 mm	$ 563,000
WW-D-SS-06B-ALT-1	Rath-Harris Municipal Drain Crossing	New sanitary sewer required for development blocks going to PS3 in Dorchester.	Development 17-18, 22, 25 Ex. Area 19	New Development or Municipal Servicing Replacing Private Sewage Systems	With new or existing development	B	Sewer	80 m	300 mm	$ 827,000
WW-D-SS-07B-ALT-1	New development sewer	New sanitary sewer required for development blocks going to PS3 in Dorchester.	Development 17-18, 22, 25 Ex. Area 19	New Development or Municipal Servicing Replacing Private Sewage Systems	With new or existing development	A+	Sewer	390 m	375 mm	$ 1,993,000
WW-D-SS-09	Sewer East of PS3	New sanitary sewer to accommodate growth flows east of PS3 in Dorchester	Development 24, 29b	New Development	With new development	A	Sewer	400 m	250 mm	$ 1,183,000
WW-D-SS-10	Sewer East of PS3	New sanitary sewer to accommodate growth flows east of PS3 in Dorchester	Development 24, 29b	New Development	With new development	A		30 m	300 mm	$ 102,000
WW-D-SS-11B	Christie Drive and new Development sewer	New sanitary sewer required for development blocks going to PS3 in Dorchester.	Development 17-18, 22, 25 Ex. Area 19	New Development	With new development	A	Sewer	505 m	300 mm	$ 632,000
WW-D-SS-12	Clara Street sewer	New sanitary sewer to accommodate growth Northeast of New development SPS in North Dorchester	Development 7 - 11 Ex. Surrounding Areas	New Development	With new development	A+	Sewer	605 m	200 mm	$ 880,000
WW-D-SS-13	Marion Street sewer	New sanitary sewer to accommodate growth Northeast of New development SPS in North Dorchester	Development 9 - 10 Ex. Surrounding Areas	New Development	With new development	A+	Sewer	210 m	200 mm	$ 342,000
WW-D-SS-14	North Street to Clara Street sewer	New sanitary sewer to accommodate growth Northeast of New development SPS in North Dorchester	Development 11-12, 14 Ex. Area 13, Surrounding Areas	New Development	With new development	A	Sewer	450 m	200 mm	$ 670,000
WW-D-SS-15	North Street Sewer	New sanitary sewer to accommodate growth Northeast of New development SPS in North Dorchester	Development 9-12, 14 Ex. Area 13, Surrounding Areas	New Development	With new development	A	Sewer	325 m	200 mm	$ 499,000
WW-D-SS-16	Richmond Street Sewer	New sanitary sewer to accommodate growth Northeast of New development SPS in North Dorchester	Development 5-7 Ex. Area 1,3-4, Surrounding Areas	New Development	With new development	A	Sewer	405 m	200 mm	$ 515,000
WW-D-SS-17	Hamilton Road to Christie Drive sewer	New sanitary sewer to accommodate growth flows east of PS3 in Dorchester	Development 16-17	New Development	With new development	A	Sewer	1250 m	200 mm	$ 1,530,000
WW-D-SS-18	Sewers for Municipal Servicing Replacing Private Sewage Systems (SPS-01B)	New sanitary sewers to benefit existing unserviced within North Dorchester (WW-D-SPS-01B catchment)	Ex. Areas in North Dorchester on Private Sewage Systems	Municipal Servicing Replacing Private Sewage Systems	With new development	A+	Sewer	7500 m	200 mm	$ 10,445,000
WW-D-SS-19	Sewers for Municipal Servicing Replacing Private Sewage Systems (SPS-02)	New sanitary sewers to benefit existing unserviced within North Dorchester (WW-D-SPS-02 catchment)	Ex. Areas in North Dorchester on Private Sewage Systems	Municipal Servicing Replacing Private Sewage Systems	With new development	A+	Sewer	5640 m	200 mm	$ 7,856,000
WW-D-SS-20	Sewers for Municipal Servicing Replacing Private Sewage Systems (SPS-03)	New sanitary sewers to benefit existing unserviced within North Dorchester (WW-D-SPS-03 catchment)	Ex. Areas in North Dorchester on Private Sewage Systems	Municipal Servicing Replacing Private Sewage Systems	With new development	A+	Sewer	1120 m	200 mm	$ 1,637,000
WW-D-SS-21	Sewers for Municipal Servicing Replacing Private Sewage Systems (SPS-04)	New sanitary sewers to benefit existing unserviced within South Dorchester (WW-D-SPS-04 catchment)	Ex. Areas in North Dorchester on Private Sewage Systems	Municipal Servicing Replacing Private Sewage Systems	With new development	A+	Sewer	5300 m	200 mm	$ 7,383,000
WW-D-SS-22	Sewers for Municipal Servicing Replacing Private Sewage Systems (SPS-06B)	New sanitary sewers to benefit existing unserviced within South Dorchester (WW-D-SPS-06B catchment)	Ex. Areas in South Dorchester on Private Sewage Systems	Municipal Servicing Replacing Private Sewage Systems	With new development	A+	Sewer	8200 m	200 mm	$ 11,420,000

Table ES-2: Wastewater Capital Program

Capital Program ID	Name	Description	Serviced Development Blocks and/or Existing Unserviced Areas	Upgrade Trigger	Upgrade Trigger (Population Growth)	Class EA Schedule	Project Type	Length (m)	Size/Capacity	Capital Program Total Component Estimated Cost (Excl. HST)
WW-D-SS-23	Sewers for Municipal Servicing Replacing Private Sewage Systems (SPS-07B)	New sanitary sewers to benefit existing unserviced within North Dorchester (WW-D-SPS-07B catchment)	Ex. Areas in South Dorchester on Private Sewage Systems	Municipal Servicing Replacing Private Sewage Systems	With new development	A+	Sewer	2250 m	200 mm	$ 3,172,000
Sub-Total Dorchester Wastewater Capital Program Projects										**$ 103,255,000**
WW-D-401-ST-01	Cost Benefit Study to Service 401 Corridor Lands	Cost-benefit study to evaluate servicing options for 401 Corridor Lands, will include recommendations for gravity, sewage pumping station or siphon options.	401 Corridor Lands	Development Interest		-	Study			$ 50,000
Sub-Total 401 Corridor Wastewater Capital Program Projects										**$ 50,000**
WW-T-TP-01B	Thorndale Treatment Plant Upgrades (includes SPS)	Treatment plant capacity upgrades required to accommodate all development flows in Thorndale (includes Thorndale SPS and forcemain)	All Thorndale Developments	Accumulated growth	1,000 PPJ	C	Treatment		1.0 ML	$ 7,192,000
WW-T-SS-01	Gerald Parkway sewer upgrades	Sewer upgrades along Gerald Parkway to accommodate growth flows in West Thorndale	Peripheral Lands Development 14 and 15	New Peripheral Lands Development	With new development	A+	Sewer	200 m	375 mm	$ 340,000
WW-T-SS-02	King Street sewer	King Street sewer from CN rail to Lions Lane to accommodate East Thorndale growth flows	Peripheral Lands Development 14 and 15	New Peripheral Lands Development	With new development	A+	Sewer	375 m	250 mm	$ 569,000
WW-T-SS-03	King Street sewer	King Street sewer from Lions Lane to Monteith Avenue to accommodate East Thorndale growth flows	Development 7-8, Ex. King St. Harrison St. Area and Peripheral Lands Development 16	Development 8-13 and 16	2,500 PPJ	A+	Sewer	485 m	250 mm	$ 719,000
WW-T-SS-04	King Street sewer	King Street sewer from Wye Creek to existing sewers to accommodate existing development flows	Development 7-8, Ex. King St. Harrison St. Area and Peripheral Lands Development 16	Development 8-13 and 17	2,500 PPJ	A+	Sewer	340 m	200 mm	$ 520,000
WW-T-SS-05	King Street sewer	King Street sewer under Wye Creek to accommodate existing development flows	Development 7-8, Ex. King St. Harrison St. Area and Peripheral Lands Development 16	Development 8-13 and 18	4,000 PPJ	B	Sewer	70 m	200 mm	$ 713,000
WW-T-SS-06	King Street sewer	King Street sewer from Harrison Street to before Wye Creek to accommodate existing development flows	Development 7-8, Ex. King St. Harrison St. Area and Peripheral Lands Development 16	Development 1, 3, 8-13 and 16	3,750 PPJ	A+	Sewer	130 m	200 mm	$ 234,000
WW-T-SS-07	Sewers for Existing Unserviced within Thorndale	New sanitary sewers to benefit existing unserviced within Thorndale	Ex. King St. Harrison St. Area	Municipal Servicing Replacing Private Sewage Systems	4,000 PPJ	A+	Sewer	806 m	200 mm	$ 1,152,000
Sub-Total Thorndale Wastewater Capital Program Projects										**$ 11,439,000**
Total Municipality of Thames Centre Wastewater Capital Program										**$ 114,744,000**

APPENDIX 'B'

EPANET Modelling Results

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*                          E P A N E T                           *
*                   Hydraulic and Water Quality                  *
*                   Analysis for Pipe Networks                   *
*                         Version 2.2                            *
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Input File: 18010_Phase 1 - ADD.net

18010_Acorn Valley - Phase 1 Average Day Demand

Link - Node Table:

Link ID	Start Node	End Node	Length m	Diameter mm
1	T1	T5	270	150
2	T5	T6	290	150
3	T6	T4	115	150
4	T1	T2	160	200
5	T2	T3	95	200
6	T2	T4	405	150
8	B3	B4	166.59	300
10	T8	T5	90	150
11	T7	T8	405	150
12	T7	T1	245	200
13	1	T7	1	200
9	T4	A1	105	300
14	A1	A2	335	300
15	A2	A3	90	300
16	A3	A4	150	300
17	A4	A5	180	300
18	A2	A6	55	200
19	A1	A7	55	200
21	A1	A9	115	200
31	A2	A17A	45	300
7	4	B1	1	300
36	B1	B2	190	300
37	B2	B3	180	300
38	B1	B5	95	250
39	B5	B6	90	200
40	B6	B8	240	200
41	B6	B7	275	200
42	B7	B3	95	200
43	B9	B2	195	200
44	B9	B10	90	200
45	B10	B11	90	200
46	B11	B3	145	200
47	B10	B12	60	150
22	A9	A10	150	200
23	A10	A14	140	200

Node Results:

Node ID	Demand LPS	Head m	Pressure m	Quality	
T2	0.33	305.73	45.93	0.00	
T3	0.07	305.73	45.73	0.00	
T1	0.27	305.74	47.74	0.00	
T5	0.24	305.71	41.21	0.00	
T6	0.22	305.60	44.10	0.00	
T4	0.22	305.57	46.57	0.00	
B3	0.22	305.80	45.60	0.00	
B4	0.00	305.80	45.60	0.00	
T7	0.28	305.80	48.30	0.00	
T8	0.21	305.73	41.23	0.00	
A1	0.12	305.56	47.86	0.00	
A2	0.35	305.56	44.56	0.00	
A5	0.00	305.55	46.70	0.00	
A6	0.00	305.56	46.16	0.00	
A7	0.04	305.56	47.26	0.00	
A9	0.17	305.56	46.56	0.00	
A17A	0.00	305.56	44.06	0.00	
A3	3.95	305.55	44.05	0.00	
A4	0.07	305.55	46.05	0.00	
B1	0.13	305.80	48.30	0.00	
B2	0.34	305.80	46.80	0.00	
B5	0.05	305.80	47.30	0.00	
B6	0.18	305.80	46.80	0.00	
B7	0.22	305.80	44.80	0.00	
B10	0.06	305.80	47.30	0.00	
B12	0.12	305.80	46.80	0.00	
B11	0.13	305.80	46.80	0.00	
B9	0.16	305.80	47.80	0.00	
B8	0.29	305.80	45.80	0.00	
A10	0.22	305.56	43.66	0.00	
A14	0.10	305.56	41.16	0.00	
1	-6.86	305.80	0.00	0.00	Reservoir
4	-1.90	305.80	0.00	0.00	Reservoir

Link Results:

Link ID	Flow LPS	Velocity m/s	Unit Headloss m/km	Status
1	1.36	0.08	0.11	Open
2	2.70	0.15	0.38	Open
3	2.48	0.14	0.33	Open
4	3.16	0.10	0.10	Open

5	0.07	0.00	0.00	Open
6	2.76	0.16	0.40	Open
8	0.00	0.00	0.00	Open
10	1.58	0.09	0.14	Open

Link Results: (continued)

Link ID	Flow LPS	Velocity m/s	Unit Headloss m/km	Status
11	1.79	0.10	0.18	Open
12	4.79	0.15	0.23	Open
13	6.86	0.22	0.43	Open
9	5.02	0.07	0.03	Open
14	4.37	0.06	0.02	Open
15	4.02	0.06	0.02	Open
16	0.07	0.00	0.00	Open
17	0.00	0.00	0.00	Open
18	0.00	0.00	0.00	Open
19	0.04	0.00	0.00	Open
21	0.49	0.02	0.00	Open
31	0.00	0.00	0.00	Open
7	1.90	0.03	0.00	Open
36	1.19	0.02	0.00	Open
37	0.59	0.01	0.00	Open
38	0.58	0.01	0.00	Open
39	0.53	0.02	0.00	Open
40	0.29	0.01	0.00	Open
41	0.06	0.00	0.00	Open
42	-0.16	0.00	0.00	Open
43	-0.26	0.01	0.00	Open
44	0.10	0.00	0.00	Open
45	-0.08	0.00	0.00	Open
46	-0.21	0.01	0.00	Open
47	0.12	0.01	0.00	Open
22	0.32	0.01	0.00	Open
23	0.10	0.00	0.00	Open

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*                          E P A N E T                              *
*                   Hydraulic and Water Quality                     *
*                   Analysis for Pipe Networks                      *
*                        Version 2.2                                *
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Input File: 18010_Phase 1 - PHD.net

18010_Acorn Valley - Phase 1 Peak Hour Demand

Link - Node Table:

Link ID	Start Node	End Node	Length m	Diameter mm
1	T1	T5	270	150
2	T5	T6	290	150
3	T6	T4	115	150
4	T1	T2	160	200
5	T2	T3	95	200
6	T2	T4	405	150
8	B3	B4	166.59	300
10	T8	T5	90	150
11	T7	T8	405	150
12	T7	T1	245	200
13	1	T7	1	200
9	T4	A1	105	300
14	A1	A2	335	300
15	A2	A3	90	300
16	A3	A4	150	300
17	A4	A5	180	300
18	A2	A6	55	200
19	A1	A7	55	200
21	A1	A9	115	200
31	A2	A17A	45	300
7	4	B1	1	300
36	B1	B2	190	300
37	B2	B3	180	300
38	B1	B5	95	250
39	B5	B6	90	200
40	B6	B8	240	200
41	B6	B7	275	200
42	B7	B3	95	200
43	B9	B2	195	200
44	B9	B10	90	200
45	B10	B11	90	200
46	B11	B3	145	200
47	B10	B12	60	150
22	A9	A10	150	200
23	A10	A14	140	200

Node Results:

Node ID	Demand LPS	Head m	Pressure m	Quality	
T2	0.99	305.24	45.44	0.00	
T3	0.21	305.24	45.24	0.00	
T1	0.81	305.37	47.37	0.00	
T5	0.72	305.15	40.65	0.00	
T6	0.66	304.30	42.80	0.00	
T4	0.66	304.02	45.02	0.00	
B3	0.66	305.80	45.60	0.00	
B4	0.00	305.80	45.60	0.00	
T7	0.84	305.80	48.30	0.00	
T8	0.63	305.25	40.75	0.00	
A1	0.36	303.99	46.29	0.00	
A2	1.05	303.94	42.94	0.00	
A5	0.00	303.92	45.07	0.00	
A6	0.00	303.94	44.54	0.00	
A7	0.12	303.99	45.69	0.00	
A9	0.51	303.99	44.99	0.00	
A17A	0.00	303.94	42.44	0.00	
A3	11.85	303.92	42.42	0.00	
A4	0.21	303.92	44.42	0.00	
B1	0.39	305.80	48.30	0.00	
B2	1.02	305.80	46.80	0.00	
B5	0.15	305.80	47.30	0.00	
B6	0.54	305.80	46.80	0.00	
B7	0.66	305.80	44.80	0.00	
B10	0.18	305.80	47.30	0.00	
B12	0.36	305.79	46.79	0.00	
B11	0.39	305.80	46.80	0.00	
B9	0.48	305.80	47.80	0.00	
B8	0.87	305.79	45.79	0.00	
A10	0.66	303.99	42.09	0.00	
A14	0.30	303.99	39.59	0.00	
1	-20.58	305.80	0.00	0.00	Reservoir
4	-5.70	305.80	0.00	0.00	Reservoir

Link Results:

Link ID	Flow LPS	Velocity m/s	Unit Headloss m/km	Status
1	4.09	0.23	0.82	Open
2	8.11	0.46	2.91	Open
3	7.45	0.42	2.49	Open
4	9.47	0.30	0.80	Open

5	0.21	0.01	0.00	Open
6	8.27	0.47	3.02	Open
8	0.00	0.00	0.00	Open
10	4.74	0.27	1.08	Open

Link Results: (continued)

Link ID	Flow LPS	Velocity m/s	Unit Headloss m/km	Status
11	5.37	0.30	1.36	Open
12	14.37	0.46	1.74	Open
13	20.58	0.66	3.37	Open
9	15.06	0.21	0.22	Open
14	13.11	0.19	0.17	Open
15	12.06	0.17	0.15	Open
16	0.21	0.00	0.00	Open
17	0.00	0.00	0.00	Open
18	0.00	0.00	0.00	Open
19	0.12	0.00	0.00	Open
21	1.47	0.05	0.03	Open
31	0.00	0.00	0.00	Open
7	5.70	0.08	0.04	Open
36	3.56	0.05	0.02	Open
37	1.76	0.02	0.00	Open
38	1.75	0.04	0.01	Open
39	1.60	0.05	0.03	Open
40	0.87	0.03	0.01	Open
41	0.19	0.01	0.00	Open
42	-0.47	0.01	0.00	Open
43	-0.77	0.02	0.01	Open
44	0.29	0.01	0.00	Open
45	-0.25	0.01	0.00	Open
46	-0.64	0.02	0.01	Open
47	0.36	0.02	0.01	Open
22	0.96	0.03	0.01	Open
23	0.30	0.01	0.00	Open

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*                          E P A N E T                           *
*                   Hydraulic and Water Quality                  *
*                   Analysis for Pipe Networks                   *
*                         Version 2.2                            *
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Input File: 18010_Phase 1 - MDD.net

18010_Acorn Valley - Phase 1 Max Day Demand

Link - Node Table:

Link ID	Start Node	End Node	Length m	Diameter mm
1	T1	T5	270	150
2	T5	T6	290	150
3	T6	T4	115	150
4	T1	T2	160	200
5	T2	T3	95	200
6	T2	T4	405	150
8	B3	B4	166.59	300
10	T8	T5	90	150
11	T7	T8	405	150
12	T7	T1	245	200
13	1	T7	1	200
9	T4	A1	105	300
14	A1	A2	335	300
15	A2	A3	90	300
16	A3	A4	150	300
17	A4	A5	180	300
18	A2	A6	55	200
19	A1	A7	55	200
21	A1	A9	115	200
31	A2	A17A	45	300
7	4	B1	1	300
36	B1	B2	190	300
37	B2	B3	180	300
38	B1	B5	95	250
39	B5	B6	90	200
40	B6	B8	240	200
41	B6	B7	275	200
42	B7	B3	95	200
43	B9	B2	195	200
44	B9	B10	90	200
45	B10	B11	90	200
46	B11	B3	145	200
47	B10	B12	60	150
22	A9	A10	150	200
23	A10	A14	140	200

Node Results:

Node ID	Demand LPS	Head m	Pressure m	Quality	
T2	0.66	305.54	45.74	0.00	
T3	0.14	305.54	45.54	0.00	
T1	0.54	305.60	47.60	0.00	
T5	0.48	305.49	40.99	0.00	
T6	0.44	305.09	43.59	0.00	
T4	0.44	304.96	45.96	0.00	
B3	0.44	305.80	45.60	0.00	
B4	0.00	305.80	45.60	0.00	
T7	0.56	305.80	48.30	0.00	
T8	0.42	305.54	41.04	0.00	
A1	0.24	304.95	47.25	0.00	
A2	0.70	304.92	43.92	0.00	
A5	0.00	304.91	46.06	0.00	
A6	0.00	304.92	45.52	0.00	
A7	0.08	304.95	46.65	0.00	
A9	0.34	304.95	45.95	0.00	
A17A	0.00	304.92	43.42	0.00	
A3	7.90	304.91	43.41	0.00	
A4	0.14	304.91	45.41	0.00	
B1	0.26	305.80	48.30	0.00	
B2	0.68	305.80	46.80	0.00	
B5	0.10	305.80	47.30	0.00	
B6	0.36	305.80	46.80	0.00	
B7	0.44	305.80	44.80	0.00	
B10	0.12	305.80	47.30	0.00	
B12	0.24	305.80	46.80	0.00	
B11	0.26	305.80	46.80	0.00	
B9	0.32	305.80	47.80	0.00	
B8	0.58	305.80	45.80	0.00	
A10	0.44	304.95	43.05	0.00	
A14	0.20	304.95	40.55	0.00	
1	-13.72	305.80	0.00	0.00	Reservoir
4	-3.80	305.80	0.00	0.00	Reservoir

Link Results:

Link ID	Flow LPS	Velocity m/s	Unit Headloss m/km	Status
1	2.73	0.15	0.39	Open
2	5.41	0.31	1.38	Open
3	4.97	0.28	1.18	Open
4	6.31	0.20	0.38	Open

5	0.14	0.00	0.00	Open
6	5.51	0.31	1.43	Open
8	0.00	0.00	0.00	Open
10	3.16	0.18	0.51	Open

Link Results: (continued)

Link ID	Flow LPS	Velocity m/s	Unit Headloss m/km	Status
11	3.58	0.20	0.64	Open
12	9.58	0.30	0.82	Open
13	13.72	0.44	1.58	Open
9	10.04	0.14	0.11	Open
14	8.74	0.12	0.08	Open
15	8.04	0.11	0.07	Open
16	0.14	0.00	0.00	Open
17	0.00	0.00	0.00	Open
18	0.00	0.00	0.00	Open
19	0.08	0.00	0.00	Open
21	0.98	0.03	0.01	Open
31	0.00	0.00	0.00	Open
7	3.80	0.05	0.02	Open
36	2.37	0.03	0.01	Open
37	1.18	0.02	0.00	Open
38	1.17	0.02	0.01	Open
39	1.07	0.03	0.01	Open
40	0.58	0.02	0.00	Open
41	0.13	0.00	0.00	Open
42	-0.31	0.01	0.00	Open
43	-0.52	0.02	0.00	Open
44	0.20	0.01	0.00	Open
45	-0.16	0.01	0.00	Open
46	-0.42	0.01	0.00	Open
47	0.24	0.01	0.00	Open
22	0.64	0.02	0.01	Open
23	0.20	0.01	0.00	Open

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*********************************************************************
*                          E P A N E T                              *
*                   Hydraulic and Water Quality                     *
*                   Analysis for Pipe Networks                      *
*                         Version 2.2                               *
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Input File: 18010_Phase 1 - MDD + FIRE.net

18010_Acorn Valley - Phase 1 Max Day Demand + Fire Flow

Link - Node Table:

Link ID	Start Node	End Node	Length m	Diameter mm
1	T1	T5	270	150
2	T5	T6	290	150
3	T6	T4	115	150
4	T1	T2	160	200
5	T2	T3	95	200
6	T2	T4	405	150
8	B3	B4	166.59	300
10	T8	T5	90	150
11	T7	T8	405	150
12	T7	T1	245	200
13	1	T7	1	200
9	T4	A1	105	300
14	A1	A2	335	300
15	A2	A3	90	300
16	A3	A4	150	300
17	A4	A5	180	300
18	A2	A6	55	200
19	A1	A7	55	200
21	A1	A9	115	200
31	A2	A17A	45	300
7	4	B1	1	300
36	B1	B2	190	300
37	B2	B3	180	300
38	B1	B5	95	250
39	B5	B6	90	200
40	B6	B8	240	200
41	B6	B7	275	200
42	B7	B3	95	200
43	B9	B2	195	200
44	B9	B10	90	200
45	B10	B11	90	200
46	B11	B3	145	200
47	B10	B12	60	150
22	A9	A10	150	200
23	A10	A14	140	200

Node Results:

Node ID	Demand LPS	Head m	Pressure m	Quality	
T2	0.66	300.77	40.97	0.00	
T3	0.14	300.77	40.77	0.00	
T1	0.54	302.01	44.01	0.00	
T5	0.48	299.87	35.37	0.00	
T6	0.44	290.08	28.58	0.00	
T4	0.44	286.30	27.30	0.00	
B3	0.44	305.80	45.60	0.00	
B4	0.00	305.80	45.60	0.00	
T7	0.56	305.77	48.27	0.00	
T8	0.42	300.90	36.40	0.00	
A1	0.24	285.98	28.28	0.00	
A2	0.70	285.96	24.96	0.00	
A5	0.00	285.95	27.10	0.00	
A6	0.00	285.96	26.56	0.00	
A7	0.08	285.98	27.68	0.00	
A9	0.34	283.83	24.83	0.00	
A17A	0.00	285.96	24.46	0.00	
A3	7.90	285.95	24.45	0.00	
A4	0.14	285.95	26.45	0.00	
B1	0.26	305.80	48.30	0.00	
B2	0.68	305.80	46.80	0.00	
B5	0.10	305.80	47.30	0.00	
B6	0.36	305.80	46.80	0.00	
B7	0.44	305.80	44.80	0.00	
B10	0.12	305.80	47.30	0.00	
B12	0.24	305.80	46.80	0.00	
B11	0.26	305.80	46.80	0.00	
B9	0.32	305.80	47.80	0.00	
B8	0.58	305.80	45.80	0.00	
A10	0.44	281.06	19.16	0.00	
A14	51.10	278.51	14.11	0.00	
1	-64.62	305.80	0.00	0.00	Reservoir
4	-3.80	305.80	0.00	0.00	Reservoir

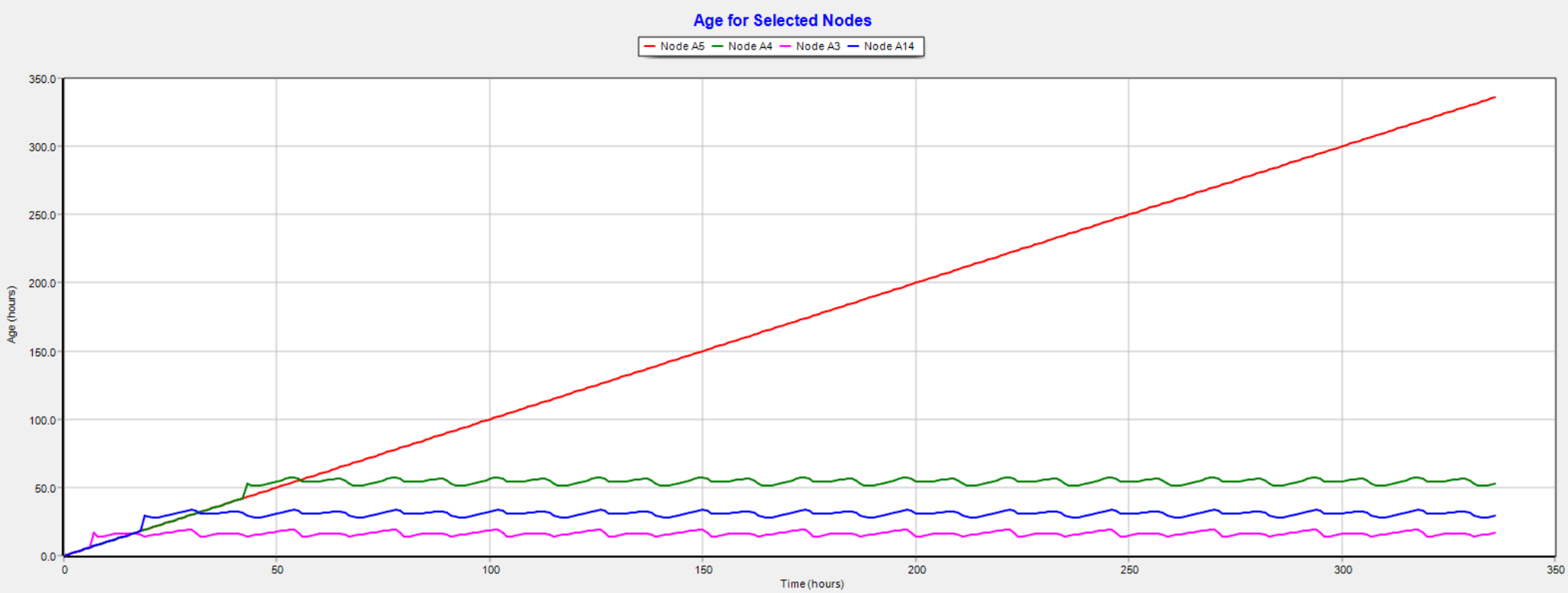
Link Results:

Link ID	Flow LPS	Velocity m/s	Unit Headloss m/km	Status
1	13.91	0.79	7.92	Open
2	30.44	1.72	33.77	Open
3	30.00	1.70	32.87	Open
4	32.18	1.02	7.73	Open

5	0.14	0.00	0.00	Open
6	31.38	1.78	35.74	Open
8	0.00	0.00	0.00	Open
10	17.01	0.96	11.49	Open

Link Results: (continued)

Link ID	Flow LPS	Velocity m/s	Unit Headloss m/km	Status
11	17.43	0.99	12.02	Open
12	46.63	1.48	15.36	Open
13	64.62	2.06	28.11	Open
9	60.94	0.86	2.98	Open
14	8.74	0.12	0.08	Open
15	8.04	0.11	0.07	Open
16	0.14	0.00	0.00	Open
17	0.00	0.00	0.00	Open
18	0.00	0.00	0.00	Open
19	0.08	0.00	0.00	Open
21	51.88	1.65	18.72	Open
31	0.00	0.00	0.00	Open
7	3.80	0.05	0.02	Open
36	2.37	0.03	0.01	Open
37	1.18	0.02	0.00	Open
38	1.17	0.02	0.01	Open
39	1.07	0.03	0.01	Open
40	0.58	0.02	0.00	Open
41	0.13	0.00	0.00	Open
42	-0.31	0.01	0.00	Open
43	-0.52	0.02	0.00	Open
44	0.20	0.01	0.00	Open
45	-0.16	0.01	0.00	Open
46	-0.42	0.01	0.00	Open
47	0.24	0.01	0.00	Open
22	51.54	1.64	18.49	Open
23	51.10	1.63	18.20	Open


Age for Selected Nodes
Node A5
Node A4
Node A3
Node A14
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300.0
250.0
200.0
150.0
100.0
50.0
0.0
Age (hours)
0
50
100
150
200
250
300
350
Time (hours)

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*********************************************************************
*                          E P A N E T                              *
*                   Hydraulic and Water Quality                     *
*                   Analysis for Pipe Networks                      *
*                        Version 2.2                                *
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Input File: 18010_Phase 1-3 + North - ADD.net

18010_Acorn Valley - Phase 1-3 + North Average Day Demand

Link - Node Table:

Link ID	Start Node	End Node	Length m	Diameter mm
1	T1	T5	270	150
2	T5	T6	290	150
3	T6	T4	115	150
4	T1	T2	160	200
5	T2	T3	95	200
6	T2	T4	405	150
8	B3	B4	166.59	300
10	T8	T5	90	150
11	T7	T8	405	150
12	T7	T1	245	200
13	1	T7	1	200
9	T4	A1	105	300
14	A1	A2	335	300
15	A2	A3	90	300
16	A3	A4	150	300
17	A4	A5	180	300
18	A2	A6	55	200
19	A1	A7	55	200
20	T4	A8	200	200
21	A1	A9	115	200
22	A9	A10	150	200
23	A10	A14	140	200
27	A13	A17	90	150
28	A13	A12	60	150
29	A14	A15	85	200
30	A15	A16	65	200
31	A2	A17	90	300
32	A17	A18	175	300
33	A18	A19	225.21	300
35	A15	A21	60	150
7	4	B1	1	300
36	B1	B2	190	300
37	B2	B3	180	300
38	B1	B5	95	250
39	B5	B6	90	200

40	B6	B8	240	200
41	B6	B7	275	200

Link - Node Table: (continued)

Link ID	Start Node	End Node	Length m	Diameter mm
42	B7	B3	95	200
43	B9	B2	195	200
44	B9	B10	90	200
45	B10	B11	90	200
46	B11	B3	145	200
47	B10	B12	60	150
24	A12	A14	100	150
25	A13	A11	70	50
26	A11	A12	70	50

Node Results:

Node ID	Demand LPS	Head m	Pressure m	Quality
T2	0.33	305.48	45.68	0.00
T3	0.07	305.48	45.48	0.00
T1	0.27	305.56	47.56	0.00
T5	0.24	305.43	40.93	0.00
T6	0.22	304.85	43.35	0.00
T4	0.22	304.64	45.64	0.00
B3	0.22	305.80	45.60	0.00
B4	0.00	305.80	45.60	0.00
T7	0.28	305.80	48.30	0.00
T8	0.21	305.49	40.99	0.00
A1	0.12	304.62	46.92	0.00
A2	0.35	304.59	43.59	0.00
A5	0.00	304.59	45.74	0.00
A6	4.74	304.58	45.18	0.00
A7	1.86	304.62	46.32	0.00
A9	0.17	304.61	45.61	0.00
A17	0.16	304.59	42.09	0.00
A13	0.07	304.60	42.40	0.00
A3	3.95	304.59	43.09	0.00
A10	0.22	304.61	42.71	0.00
A14	0.19	304.61	40.21	0.00
A19	0.13	304.59	37.59	0.00
A15	0.06	304.61	39.71	0.00
A16	0.10	304.61	39.61	0.00
A21	0.00	304.61	40.61	0.00
A8	0.28	304.64	48.14	0.00
A4	0.07	304.59	45.09	0.00

A18	0.21	304.59	38.89	0.00
B1	0.13	305.80	48.30	0.00
B2	0.34	305.80	46.80	0.00
B5	0.05	305.80	47.30	0.00
B6	0.18	305.80	46.80	0.00

Node Results: (continued)

Node ID	Demand LPS	Head m	Pressure m	Quality	
B7	0.22	305.80	44.80	0.00	
B10	0.06	305.80	47.30	0.00	
B12	0.12	305.80	46.80	0.00	
B11	0.13	305.80	46.80	0.00	
B9	0.16	305.80	47.80	0.00	
B8	0.29	305.80	45.80	0.00	
A11	0.15	304.59	42.09	0.00	
A12	0.09	304.60	41.60	0.00	
1	-14.76	305.80	0.00	0.00	Reservoir
4	-1.90	305.80	0.00	0.00	Reservoir

Link Results:

Link ID	Flow LPS	Velocity m/s	Unit Headloss m/km	Status
1	3.10	0.18	0.49	Open
2	6.59	0.37	1.98	Open
3	6.37	0.36	1.86	Open
4	7.17	0.23	0.48	Open
5	0.07	0.00	0.00	Open
6	6.77	0.38	2.09	Open
8	0.00	0.00	0.00	Open
10	3.73	0.21	0.69	Open
11	3.94	0.22	0.77	Open
12	10.54	0.34	0.98	Open
13	14.76	0.47	1.82	Open
9	12.64	0.18	0.16	Open
14	8.79	0.12	0.08	Open
15	4.02	0.06	0.02	Open
16	0.07	0.00	0.00	Open
17	0.00	0.00	0.00	Open
18	4.74	0.15	0.22	Open
19	1.86	0.06	0.04	Open
20	0.28	0.01	0.00	Open
21	1.87	0.06	0.04	Open
22	1.70	0.05	0.03	Open
23	1.48	0.05	0.03	Open
27	0.82	0.05	0.04	Open

28	-0.95	0.05	0.06	Open
29	0.16	0.01	0.00	Open
30	0.10	0.00	0.00	Open
31	-0.32	0.00	0.00	Open
32	0.34	0.00	0.00	Open
33	0.13	0.00	0.00	Open
35	0.00	0.00	0.00	Open
7	1.90	0.03	0.00	Open

Link Results: (continued)

Link ID	Flow LPS	Velocity m/s	Unit Headloss m/km	Status
36	1.19	0.02	0.00	Open
37	0.59	0.01	0.00	Open
38	0.58	0.01	0.00	Open
39	0.53	0.02	0.00	Open
40	0.29	0.01	0.00	Open
41	0.06	0.00	0.00	Open
42	-0.16	0.00	0.00	Open
43	-0.26	0.01	0.00	Open
44	0.10	0.00	0.00	Open
45	-0.08	0.00	0.00	Open
46	-0.21	0.01	0.00	Open
47	0.12	0.01	0.00	Open
24	-1.13	0.06	0.08	Open
25	0.07	0.03	0.08	Open
26	-0.08	0.04	0.13	Open

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******************************************************************
*                          E P A N E T                           *
*                   Hydraulic and Water Quality                  *
*                   Analysis for Pipe Networks                   *
*                         Version 2.2                            *
******************************************************************
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Input File: 18010_Phase 1-3 + North - PHD.net

18010_Acorn Valley - Phase 1-3 + North Peak Hour Demand

Link - Node Table:

Link ID	Start Node	End Node	Length m	Diameter mm
1	T1	T5	270	150
2	T5	T6	290	150
3	T6	T4	115	150
4	T1	T2	160	200
5	T2	T3	95	200
6	T2	T4	405	150
8	B3	B4	166.59	300
10	T8	T5	90	150
11	T7	T8	405	150
12	T7	T1	245	200
13	1	T7	1	200
9	T4	A1	105	300
14	A1	A2	335	300
15	A2	A3	90	300
16	A3	A4	150	300
17	A4	A5	180	300
18	A2	A6	55	200
19	A1	A7	55	200
20	T4	A8	200	200
21	A1	A9	115	200
22	A9	A10	150	200
23	A10	A14	140	200
27	A13	A17	90	150
28	A13	A12	60	150
29	A14	A15	85	200
30	A15	A16	65	200
31	A2	A17	90	300
32	A17	A18	175	300
33	A18	A19	225.21	300
35	A15	A21	60	150
7	4	B1	1	300
36	B1	B2	190	300
37	B2	B3	180	300
38	B1	B5	95	250
39	B5	B6	90	200

40	B6	B8	240	200
41	B6	B7	275	200

Link - Node Table: (continued)

Link ID	Start Node	End Node	Length m	Diameter mm
42	B7	B3	95	200
43	B9	B2	195	200
44	B9	B10	90	200
45	B10	B11	90	200
46	B11	B3	145	200
47	B10	B12	60	150
24	A12	A14	100	150
25	A13	A11	70	50
26	A11	A12	70	50

Node Results:

Node ID	Demand LPS	Head m	Pressure m	Quality
T2	0.99	303.37	43.57	0.00
T3	0.21	303.37	43.37	0.00
T1	0.81	303.95	45.95	0.00
T5	0.72	302.94	38.44	0.00
T6	0.66	298.54	37.04	0.00
T4	0.66	296.90	37.90	0.00
B3	0.66	305.80	45.60	0.00
B4	0.00	305.80	45.60	0.00
T7	0.84	305.79	48.29	0.00
T8	0.63	303.41	38.91	0.00
A1	0.36	296.77	39.07	0.00
A2	1.05	296.56	35.56	0.00
A5	0.00	296.54	37.69	0.00
A6	14.22	296.46	37.06	0.00
A7	5.58	296.75	38.45	0.00
A9	0.51	296.73	37.73	0.00
A17	0.48	296.56	34.06	0.00
A13	0.21	296.58	34.38	0.00
A3	11.85	296.54	35.04	0.00
A10	0.66	296.69	34.79	0.00
A14	0.57	296.67	32.27	0.00
A19	0.39	296.56	29.56	0.00
A15	0.18	296.67	31.77	0.00
A16	0.30	296.67	31.67	0.00
A21	0.00	296.67	32.67	0.00
A8	0.84	296.90	40.40	0.00
A4	0.21	296.54	37.04	0.00

A18	0.63	296.56	30.86	0.00
B1	0.39	305.80	48.30	0.00
B2	1.02	305.80	46.80	0.00
B5	0.15	305.80	47.30	0.00
B6	0.54	305.80	46.80	0.00

Node Results: (continued)

Node ID	Demand LPS	Head m	Pressure m	Quality	
B7	0.66	305.80	44.80	0.00	
B10	0.18	305.80	47.30	0.00	
B12	0.36	305.79	46.79	0.00	
B11	0.39	305.80	46.80	0.00	
B9	0.48	305.80	47.80	0.00	
B8	0.87	305.79	45.79	0.00	
A11	0.45	296.54	34.04	0.00	
A12	0.27	296.61	33.61	0.00	
1	-44.28	305.80	0.00	0.00	Reservoir
4	-5.70	305.80	0.00	0.00	Reservoir

Link Results:

Link ID	Flow LPS	Velocity m/s	Unit Headloss m/km	Status
1	9.30	0.53	3.76	Open
2	19.76	1.12	15.18	Open
3	19.10	1.08	14.25	Open
4	21.52	0.68	3.67	Open
5	0.21	0.01	0.00	Open
6	20.32	1.15	15.97	Open
8	0.00	0.00	0.00	Open
10	11.19	0.63	5.29	Open
11	11.82	0.67	5.86	Open
12	31.62	1.01	7.48	Open
13	44.28	1.41	13.95	Open
9	37.92	0.54	1.24	Open
14	26.38	0.37	0.63	Open
15	12.06	0.17	0.15	Open
16	0.21	0.00	0.00	Open
17	0.00	0.00	0.00	Open
18	14.22	0.45	1.70	Open
19	5.58	0.18	0.30	Open
20	0.84	0.03	0.01	Open
21	5.60	0.18	0.30	Open
22	5.09	0.16	0.25	Open
23	4.43	0.14	0.20	Open
27	2.45	0.14	0.32	Open

28	-2.85	0.16	0.42	Open
29	0.48	0.02	0.00	Open
30	0.30	0.01	0.00	Open
31	-0.95	0.01	0.00	Open
32	1.02	0.01	0.00	Open
33	0.39	0.01	0.00	Open
35	0.00	0.00	0.00	Open
7	5.70	0.08	0.04	Open

Link Results: (continued)

Link ID	Flow LPS	Velocity m/s	Unit Headloss m/km	Status
36	3.56	0.05	0.02	Open
37	1.76	0.02	0.00	Open
38	1.75	0.04	0.01	Open
39	1.60	0.05	0.03	Open
40	0.87	0.03	0.01	Open
41	0.19	0.01	0.00	Open
42	-0.47	0.01	0.00	Open
43	-0.77	0.02	0.01	Open
44	0.29	0.01	0.00	Open
45	-0.25	0.01	0.00	Open
46	-0.64	0.02	0.01	Open
47	0.36	0.02	0.01	Open
24	-3.38	0.19	0.58	Open
25	0.20	0.10	0.63	Open
26	-0.25	0.13	0.99	Open

```
******************************************************************
*                          E P A N E T                           *
*                   Hydraulic and Water Quality                  *
*                   Analysis for Pipe Networks                   *
*                         Version 2.2                            *
******************************************************************
```

Input File: 18010_Phase 1-3 + North - MDD.net

18010_Acorn Valley - Phase 1-3 + North Max Day Demand

Link - Node Table:

Link ID	Start Node	End Node	Length m	Diameter mm
1	T1	T5	270	150
2	T5	T6	290	150
3	T6	T4	115	150
4	T1	T2	160	200
5	T2	T3	95	200
6	T2	T4	405	150
8	B3	B4	166.59	300
10	T8	T5	90	150
11	T7	T8	405	150
12	T7	T1	245	200
13	1	T7	1	200
9	T4	A1	105	300
14	A1	A2	335	300
15	A2	A3	90	300
16	A3	A4	150	300
17	A4	A5	180	300
18	A2	A6	55	200
19	A1	A7	55	200
20	T4	A8	200	200
21	A1	A9	115	200
22	A9	A10	150	200
23	A10	A14	140	200
27	A13	A17	90	150
28	A13	A12	60	150
29	A14	A15	85	200
30	A15	A16	65	200
31	A2	A17	90	300
32	A17	A18	175	300
33	A18	A19	225.21	300
35	A15	A21	60	150
7	4	B1	1	300
36	B1	B2	190	300
37	B2	B3	180	300
38	B1	B5	95	250
39	B5	B6	90	200

40	B6	B8	240	200
41	B6	B7	275	200

Link - Node Table: (continued)

Link ID	Start Node	End Node	Length m	Diameter mm
42	B7	B3	95	200
43	B9	B2	195	200
44	B9	B10	90	200
45	B10	B11	90	200
46	B11	B3	145	200
47	B10	B12	60	150
24	A12	A14	100	150
25	A13	A11	70	50
26	A11	A12	70	50

Node Results:

Node ID	Demand LPS	Head m	Pressure m	Quality
T2	0.66	304.65	44.85	0.00
T3	0.14	304.65	44.65	0.00
T1	0.54	304.93	46.93	0.00
T5	0.48	304.45	39.95	0.00
T6	0.44	302.37	40.87	0.00
T4	0.44	301.60	42.60	0.00
B3	0.44	305.80	45.60	0.00
B4	0.00	305.80	45.60	0.00
T7	0.56	305.79	48.29	0.00
T8	0.42	304.67	40.17	0.00
A1	0.24	301.54	43.84	0.00
A2	0.70	301.44	40.44	0.00
A5	0.00	301.43	42.58	0.00
A6	9.48	301.39	41.99	0.00
A7	3.72	301.53	43.23	0.00
A9	0.34	301.52	42.52	0.00
A17	0.32	301.44	38.94	0.00
A13	0.14	301.45	39.25	0.00
A3	7.90	301.43	39.93	0.00
A10	0.44	301.50	39.60	0.00
A14	0.38	301.49	37.09	0.00
A19	0.26	301.44	34.44	0.00
A15	0.12	301.49	36.59	0.00
A16	0.20	301.49	36.49	0.00
A21	0.00	301.49	37.49	0.00
A8	0.56	301.60	45.10	0.00
A4	0.14	301.43	41.93	0.00

A18	0.42	301.44	35.74	0.00
B1	0.26	305.80	48.30	0.00
B2	0.68	305.80	46.80	0.00
B5	0.10	305.80	47.30	0.00
B6	0.36	305.80	46.80	0.00

Node Results: (continued)

Node ID	Demand LPS	Head m	Pressure m	Quality	
B7	0.44	305.80	44.80	0.00	
B10	0.12	305.80	47.30	0.00	
B12	0.24	305.80	46.80	0.00	
B11	0.26	305.80	46.80	0.00	
B9	0.32	305.80	47.80	0.00	
B8	0.58	305.80	45.80	0.00	
A11	0.30	301.43	38.93	0.00	
A12	0.18	301.46	38.46	0.00	
1	-29.52	305.80	0.00	0.00	Reservoir
4	-3.80	305.80	0.00	0.00	Reservoir

Link Results:

Link ID	Flow LPS	Velocity m/s	Unit Headloss m/km	Status
1	6.20	0.35	1.77	Open
2	13.18	0.75	7.16	Open
3	12.74	0.72	6.73	Open
4	14.34	0.46	1.73	Open
5	0.14	0.00	0.00	Open
6	13.54	0.77	7.54	Open
8	0.00	0.00	0.00	Open
10	7.46	0.42	2.50	Open
11	7.88	0.45	2.76	Open
12	21.08	0.67	3.53	Open
13	29.52	0.94	6.59	Open
9	25.28	0.36	0.58	Open
14	17.59	0.25	0.30	Open
15	8.04	0.11	0.07	Open
16	0.14	0.00	0.00	Open
17	0.00	0.00	0.00	Open
18	9.48	0.30	0.80	Open
19	3.72	0.12	0.14	Open
20	0.56	0.02	0.00	Open
21	3.73	0.12	0.14	Open
22	3.39	0.11	0.12	Open
23	2.95	0.09	0.09	Open
27	1.63	0.09	0.15	Open

28	-1.90	0.11	0.20	Open
29	0.32	0.01	0.00	Open
30	0.20	0.01	0.00	Open
31	-0.63	0.01	0.00	Open
32	0.68	0.01	0.00	Open
33	0.26	0.00	0.00	Open
35	0.00	0.00	0.00	Open
7	3.80	0.05	0.02	Open

Link Results: (continued)

Link ID	Flow LPS	Velocity m/s	Unit Headloss m/km	Status
36	2.37	0.03	0.01	Open
37	1.18	0.02	0.00	Open
38	1.17	0.02	0.01	Open
39	1.07	0.03	0.01	Open
40	0.58	0.02	0.00	Open
41	0.13	0.00	0.00	Open
42	-0.31	0.01	0.00	Open
43	-0.52	0.02	0.00	Open
44	0.20	0.01	0.00	Open
45	-0.16	0.01	0.00	Open
46	-0.42	0.01	0.00	Open
47	0.24	0.01	0.00	Open
24	-2.25	0.13	0.27	Open
25	0.13	0.07	0.30	Open
26	-0.17	0.09	0.47	Open

```
******************************************************************
*                          E P A N E T                           *
*                   Hydraulic and Water Quality                  *
*                   Analysis for Pipe Networks                   *
*                         Version 2.2                            *
******************************************************************
```

Input File: 18010_Phase 1-3 + North - MDD + FIRE.net

18010_Acorn Valley - Phase 1-3 + North Max Day Demand + Fire Flow

Link - Node Table:

Link ID	Start Node	End Node	Length m	Diameter mm
1	T1	T5	270	150
2	T5	T6	290	150
3	T6	T4	115	150
4	T1	T2	160	200
5	T2	T3	95	200
6	T2	T4	405	150
8	B3	B4	166.59	300
10	T8	T5	90	150
11	T7	T8	405	150
12	T7	T1	245	200
13	1	T7	1	200
9	T4	A1	105	300
14	A1	A2	335	300
15	A2	A3	90	300
16	A3	A4	150	300
17	A4	A5	180	300
18	A2	A6	55	200
19	A1	A7	55	200
20	T4	A8	200	200
21	A1	A9	115	200
22	A9	A10	150	200
23	A10	A14	140	200
27	A13	A17	90	150
28	A13	A12	60	150
29	A14	A15	85	200
30	A15	A16	65	200
31	A2	A17	90	300
32	A17	A18	175	300
33	A18	A19	225.21	300
35	A15	A21	60	150
7	4	B1	1	300
36	B1	B2	190	300
37	B2	B3	180	300
38	B1	B5	95	250
39	B5	B6	90	200

40	B6	B8	240	200
41	B6	B7	275	200

Link - Node Table: (continued)

Link ID	Start Node	End Node	Length m	Diameter mm
42	B7	B3	95	200
43	B9	B2	195	200
44	B9	B10	90	200
45	B10	B11	90	200
46	B11	B3	145	200
47	B10	B12	60	150
24	A12	A14	100	150
25	A13	A11	70	50
26	A11	A12	70	50

Node Results:

Node ID	Demand LPS	Head m	Pressure m	Quality
T2	0.66	299.92	40.12	0.00
T3	0.14	299.92	39.92	0.00
T1	0.54	301.37	43.37	0.00
T5	0.48	298.87	34.37	0.00
T6	0.44	287.37	25.87	0.00
T4	0.44	282.92	23.92	0.00
B3	0.44	305.80	45.60	0.00
B4	0.00	305.80	45.60	0.00
T7	0.56	305.77	48.27	0.00
T8	0.42	300.08	35.58	0.00
A1	0.24	282.56	24.86	0.00
A2	0.70	281.79	20.79	0.00
A5	0.00	281.79	22.94	0.00
A6	9.48	281.75	22.35	0.00
A7	3.72	282.55	24.25	0.00
A9	0.34	282.48	23.48	0.00
A17	0.32	281.70	19.20	0.00
A13	0.14	281.89	19.69	0.00
A3	7.90	281.79	20.29	0.00
A10	0.44	282.37	20.47	0.00
A14	0.38	282.29	17.89	0.00
A19	40.96	281.12	14.12	0.00
A15	0.12	282.29	17.39	0.00
A16	0.20	282.29	17.29	0.00
A21	0.00	282.29	18.29	0.00
A8	0.56	282.92	26.42	0.00
A4	0.14	281.79	22.29	0.00

A18	0.42	281.44	15.74	0.00
B1	0.26	305.80	48.30	0.00
B2	0.68	305.80	46.80	0.00
B5	0.10	305.80	47.30	0.00
B6	0.36	305.80	46.80	0.00

Node Results: (continued)

Node ID	Demand LPS	Head m	Pressure m	Quality	
B7	0.44	305.80	44.80	0.00	
B10	0.12	305.80	47.30	0.00	
B12	0.24	305.80	46.80	0.00	
B11	0.26	305.80	46.80	0.00	
B9	0.32	305.80	47.80	0.00	
B8	0.58	305.80	45.80	0.00	
A11	0.30	281.90	19.40	0.00	
A12	0.18	282.03	19.03	0.00	
1	-70.22	305.80	0.00	0.00	Reservoir
4	-3.80	305.80	0.00	0.00	Reservoir

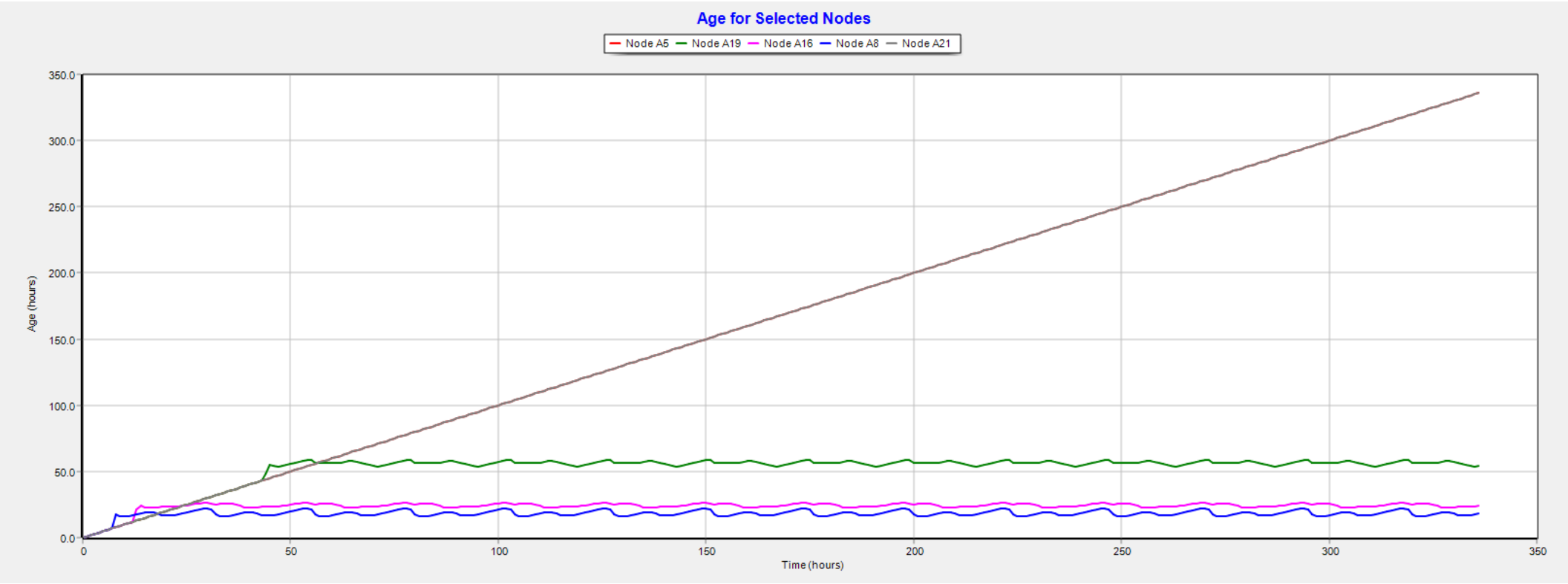
Link Results:

Link ID	Flow LPS	Velocity m/s	Unit Headloss m/km	Status
1	15.14	0.86	9.27	Open
2	33.19	1.88	39.65	Open
3	32.75	1.85	38.68	Open
4	35.03	1.12	9.04	Open
5	0.14	0.00	0.00	Open
6	34.23	1.94	41.98	Open
8	0.00	0.00	0.00	Open
10	18.53	1.05	13.47	Open
11	18.95	1.07	14.04	Open
12	50.71	1.61	17.94	Open
13	70.22	2.24	32.78	Open
9	65.98	0.93	3.45	Open
14	52.97	0.75	2.30	Open
15	8.04	0.11	0.07	Open
16	0.14	0.00	0.00	Open
17	0.00	0.00	0.00	Open
18	9.48	0.30	0.80	Open
19	3.72	0.12	0.14	Open
20	0.56	0.02	0.00	Open
21	9.05	0.29	0.74	Open
22	8.71	0.28	0.69	Open
23	8.27	0.26	0.62	Open
27	6.95	0.39	2.19	Open

28	-7.04	0.40	2.24	Open
29	0.32	0.01	0.00	Open
30	0.20	0.01	0.00	Open
31	34.75	0.49	1.05	Open
32	41.38	0.59	1.45	Open
33	40.96	0.58	1.43	Open
35	0.00	0.00	0.00	Open
7	3.80	0.05	0.02	Open

Link Results: (continued)

Link ID	Flow LPS	Velocity m/s	Unit Headloss m/km	Status
36	2.37	0.03	0.01	Open
37	1.18	0.02	0.00	Open
38	1.17	0.02	0.01	Open
39	1.07	0.03	0.01	Open
40	0.58	0.02	0.00	Open
41	0.13	0.00	0.00	Open
42	-0.31	0.01	0.00	Open
43	-0.52	0.02	0.00	Open
44	0.20	0.01	0.00	Open
45	-0.16	0.01	0.00	Open
46	-0.42	0.01	0.00	Open
47	0.24	0.01	0.00	Open
24	-7.57	0.43	2.57	Open
25	-0.05	0.03	0.06	Open
26	-0.35	0.18	1.86	Open


Age for Selected Nodes
Node A5
Node A19
Node A16
Node A8
Node A21
350.0
300.0
250.0
200.0
150.0
100.0
50.0
0.0
Age (hours)
0
50
100
150
200
250
300
350
Time (hours)

```
*********************************************************************
*                          E P A N E T                              *
*                   Hydraulic and Water Quality                     *
*                   Analysis for Pipe Networks                      *
*                        Version 2.2                                *
*********************************************************************
```

Input File: 18010_Phase 1 - MCC - ADD.net

18010_Acorn Valley - Phase 1 Average Day Demand with Mill Court Connection

Link - Node Table:

Link ID	Start Node	End Node	Length m	Diameter mm
1	T1	T5	270	150
2	T5	T6	290	150
3	T6	T4	115	150
4	T1	T2	160	200
5	T2	T3	95	200
6	T2	T4	405	150
8	B3	B4	166.59	300
10	T8	T5	90	150
11	T7	T8	405	150
12	T7	T1	245	200
13	1	T7	1	200
9	T4	A1	105	300
14	A1	A2	335	300
15	A2	A3	90	300
16	A3	A4	150	300
17	A4	A5	180	300
18	A2	A6	55	200
19	A1	A7	55	200
21	A1	A9	115	200
31	A2	A17A	45	300
7	4	B1	1	300
36	B1	B2	190	300
37	B2	B3	180	300
38	B1	B5	95	250
39	B5	B6	90	200
40	B6	B8	240	200
41	B6	B7	275	200
42	B7	B3	95	200
43	B9	B2	195	200
44	B9	B10	90	200
45	B10	B11	90	200
46	B11	B3	145	200
47	B10	B12	60	150
22	A9	A10	150	200
23	A10	A14	140	200

20	A7	MC1	60	200
24	MC1	MC2	160	200

Link - Node Table: (continued)

Link ID	Start Node	End Node	Length m	Diameter mm
25	MC2	MC3	70	200
26	MC3	MC4	120	200
27	MC4	T3	50	200

Node Results:

Node ID	Demand LPS	Head m	Pressure m	Quality
T2	0.33	305.71	45.91	0.00
T3	0.07	305.70	45.70	0.00
T1	0.27	305.74	47.74	0.00
T5	0.24	305.73	41.23	0.00
T6	0.22	305.69	44.19	0.00
T4	0.22	305.67	46.67	0.00
B3	0.22	305.80	45.60	0.00
B4	0.00	305.80	45.60	0.00
T7	0.28	305.80	48.30	0.00
T8	0.21	305.74	41.24	0.00
A1	0.12	305.67	47.97	0.00
A2	0.35	305.66	44.66	0.00
A5	0.00	305.66	46.81	0.00
A6	0.00	305.66	46.26	0.00
A7	0.04	305.67	47.37	0.00
A9	0.17	305.67	46.67	0.00
A17A	0.00	305.66	44.16	0.00
A3	3.95	305.66	44.16	0.00
A4	0.07	305.66	46.16	0.00
B1	0.13	305.80	48.30	0.00
B2	0.34	305.80	46.80	0.00
B5	0.05	305.80	47.30	0.00
B6	0.18	305.80	46.80	0.00
B7	0.22	305.80	44.80	0.00
B10	0.06	305.80	47.30	0.00
B12	0.12	305.80	46.80	0.00
B11	0.13	305.80	46.80	0.00
B9	0.16	305.80	47.80	0.00
B8	0.29	305.80	45.80	0.00
A10	0.22	305.67	43.77	0.00
A14	0.10	305.67	41.27	0.00
MC1	0.00	305.68	46.18	0.00

MC2	0.00	305.69	41.69	0.00	
MC3	0.00	305.69	41.19	0.00	
MC4	0.00	305.70	49.70	0.00	
1	-6.86	305.80	0.00	0.00	Reservoir
4	-1.90	305.80	0.00	0.00	Reservoir

Link Results:

Link ID	Flow LPS	Velocity m/s	Unit Headloss m/km	Status
1	0.58	0.03	0.02	Open
2	1.71	0.10	0.16	Open
3	1.49	0.08	0.13	Open
4	4.16	0.13	0.17	Open
5	2.53	0.08	0.07	Open
6	1.30	0.07	0.10	Open
8	0.00	0.00	0.00	Open
10	1.36	0.08	0.11	Open
11	1.57	0.09	0.14	Open
12	5.01	0.16	0.25	Open
13	6.86	0.22	0.43	Open
9	2.56	0.04	0.01	Open
14	4.37	0.06	0.02	Open
15	4.02	0.06	0.02	Open
16	0.07	0.00	0.00	Open
17	0.00	0.00	0.00	Open
18	0.00	0.00	0.00	Open
19	-2.42	0.08	0.06	Open
21	0.49	0.02	0.00	Open
31	0.00	0.00	0.00	Open
7	1.90	0.03	0.00	Open
36	1.19	0.02	0.00	Open
37	0.59	0.01	0.00	Open
38	0.58	0.01	0.00	Open
39	0.53	0.02	0.00	Open
40	0.29	0.01	0.00	Open
41	0.06	0.00	0.00	Open
42	-0.16	0.00	0.00	Open
43	-0.26	0.01	0.00	Open
44	0.10	0.00	0.00	Open
45	-0.08	0.00	0.00	Open
46	-0.21	0.01	0.00	Open
47	0.12	0.01	0.00	Open
22	0.32	0.01	0.00	Open
23	0.10	0.00	0.00	Open
20	-2.46	0.08	0.07	Open
24	-2.46	0.08	0.07	Open

25	-2.46	0.08	0.07	Open
26	-2.46	0.08	0.07	Open
27	-2.46	0.08	0.07	Open

```
******************************************************************
*                          E P A N E T                           *
*                   Hydraulic and Water Quality                  *
*                   Analysis for Pipe Networks                   *
*                         Version 2.2                            *
******************************************************************
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Input File: 18010_Phase 1 - MCC - PHD.net

18010_Acorn Valley - Phase 1 Peak Hour Demand with Mill Court Connection

Link - Node Table:

Link ID	Start Node	End Node	Length m	Diameter mm
1	T1	T5	270	150
2	T5	T6	290	150
3	T6	T4	115	150
4	T1	T2	160	200
5	T2	T3	95	200
6	T2	T4	405	150
8	B3	B4	166.59	300
10	T8	T5	90	150
11	T7	T8	405	150
12	T7	T1	245	200
13	1	T7	1	200
9	T4	A1	105	300
14	A1	A2	335	300
15	A2	A3	90	300
16	A3	A4	150	300
17	A4	A5	180	300
18	A2	A6	55	200
19	A1	A7	55	200
21	A1	A9	115	200
31	A2	A17A	45	300
7	4	B1	1	300
36	B1	B2	190	300
37	B2	B3	180	300
38	B1	B5	95	250
39	B5	B6	90	200
40	B6	B8	240	200
41	B6	B7	275	200
42	B7	B3	95	200
43	B9	B2	195	200
44	B9	B10	90	200
45	B10	B11	90	200
46	B11	B3	145	200
47	B10	B12	60	150
22	A9	A10	150	200
23	A10	A14	140	200

20	A7	MC1	60	200
24	MC1	MC2	160	200

Link - Node Table: (continued)

Link ID	Start Node	End Node	Length m	Diameter mm
25	MC2	MC3	70	200
26	MC3	MC4	120	200
27	MC4	T3	50	200

Node Results:

Node ID	Demand LPS	Head m	Pressure m	Quality
T2	0.99	305.12	45.32	0.00
T3	0.21	305.07	45.07	0.00
T1	0.81	305.33	47.33	0.00
T5	0.72	305.29	40.79	0.00
T6	0.66	304.93	43.43	0.00
T4	0.66	304.82	45.82	0.00
B3	0.66	305.80	45.60	0.00
B4	0.00	305.80	45.60	0.00
T7	0.84	305.80	48.30	0.00
T8	0.63	305.36	40.86	0.00
A1	0.36	304.81	47.11	0.00
A2	1.05	304.75	43.75	0.00
A5	0.00	304.74	45.89	0.00
A6	0.00	304.75	45.35	0.00
A7	0.12	304.84	46.54	0.00
A9	0.51	304.81	45.81	0.00
A17A	0.00	304.75	43.25	0.00
A3	11.85	304.74	43.24	0.00
A4	0.21	304.74	45.24	0.00
B1	0.39	305.80	48.30	0.00
B2	1.02	305.80	46.80	0.00
B5	0.15	305.80	47.30	0.00
B6	0.54	305.80	46.80	0.00
B7	0.66	305.80	44.80	0.00
B10	0.18	305.80	47.30	0.00
B12	0.36	305.79	46.79	0.00
B11	0.39	305.80	46.80	0.00
B9	0.48	305.80	47.80	0.00
B8	0.87	305.79	45.79	0.00
A10	0.66	304.81	42.91	0.00
A14	0.30	304.81	40.41	0.00
MC1	0.00	304.87	45.37	0.00

MC2	0.00	304.95	40.95	0.00	
MC3	0.00	304.99	40.49	0.00	
MC4	0.00	305.05	49.05	0.00	
1	-20.58	305.80	0.00	0.00	Reservoir
4	-5.70	305.80	0.00	0.00	Reservoir

Link Results:

Link ID	Flow LPS	Velocity m/s	Unit Headloss m/km	Status
1	1.74	0.10	0.17	Open
2	5.11	0.29	1.24	Open
3	4.45	0.25	0.96	Open
4	12.47	0.40	1.33	Open
5	7.59	0.24	0.53	Open
6	3.89	0.22	0.75	Open
8	0.00	0.00	0.00	Open
10	4.09	0.23	0.82	Open
11	4.72	0.27	1.07	Open
12	15.02	0.48	1.88	Open
13	20.58	0.66	3.37	Open
9	7.69	0.11	0.06	Open
14	13.11	0.19	0.17	Open
15	12.06	0.17	0.15	Open
16	0.21	0.00	0.00	Open
17	0.00	0.00	0.00	Open
18	0.00	0.00	0.00	Open
19	-7.26	0.23	0.49	Open
21	1.47	0.05	0.03	Open
31	0.00	0.00	0.00	Open
7	5.70	0.08	0.04	Open
36	3.56	0.05	0.02	Open
37	1.76	0.02	0.00	Open
38	1.75	0.04	0.01	Open
39	1.60	0.05	0.03	Open
40	0.87	0.03	0.01	Open
41	0.19	0.01	0.00	Open
42	-0.47	0.01	0.00	Open
43	-0.77	0.02	0.01	Open
44	0.29	0.01	0.00	Open
45	-0.25	0.01	0.00	Open
46	-0.64	0.02	0.01	Open
47	0.36	0.02	0.01	Open
22	0.96	0.03	0.01	Open
23	0.30	0.01	0.00	Open
20	-7.38	0.23	0.50	Open
24	-7.38	0.23	0.50	Open

25	-7.38	0.23	0.50	Open
26	-7.38	0.23	0.50	Open
27	-7.38	0.23	0.50	Open

```
******************************************************************
*                          E P A N E T                           *
*                   Hydraulic and Water Quality                  *
*                   Analysis for Pipe Networks                   *
*                        Version 2.2                             *
******************************************************************
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Input File: 18010_Phase 1 - MCC - MDD.net

18010_Acorn Valley - Phase 1 Max Day Demand with Mill Court Connection

Link - Node Table:

Link ID	Start Node	End Node	Length m	Diameter mm
1	T1	T5	270	150
2	T5	T6	290	150
3	T6	T4	115	150
4	T1	T2	160	200
5	T2	T3	95	200
6	T2	T4	405	150
8	B3	B4	166.59	300
10	T8	T5	90	150
11	T7	T8	405	150
12	T7	T1	245	200
13	1	T7	1	200
9	T4	A1	105	300
14	A1	A2	335	300
15	A2	A3	90	300
16	A3	A4	150	300
17	A4	A5	180	300
18	A2	A6	55	200
19	A1	A7	55	200
21	A1	A9	115	200
31	A2	A17A	45	300
7	4	B1	1	300
36	B1	B2	190	300
37	B2	B3	180	300
38	B1	B5	95	250
39	B5	B6	90	200
40	B6	B8	240	200
41	B6	B7	275	200
42	B7	B3	95	200
43	B9	B2	195	200
44	B9	B10	90	200
45	B10	B11	90	200
46	B11	B3	145	200
47	B10	B12	60	150
22	A9	A10	150	200
23	A10	A14	140	200

20	A7	MC1	60	200
24	MC1	MC2	160	200

Link - Node Table: (continued)

Link ID	Start Node	End Node	Length m	Diameter mm
25	MC2	MC3	70	200
26	MC3	MC4	120	200
27	MC4	T3	50	200

Node Results:

Node ID	Demand LPS	Head m	Pressure m	Quality
T2	0.66	305.48	45.68	0.00
T3	0.14	305.46	45.46	0.00
T1	0.54	305.58	47.58	0.00
T5	0.48	305.56	41.06	0.00
T6	0.44	305.39	43.89	0.00
T4	0.44	305.34	46.34	0.00
B3	0.44	305.80	45.60	0.00
B4	0.00	305.80	45.60	0.00
T7	0.56	305.80	48.30	0.00
T8	0.42	305.59	41.09	0.00
A1	0.24	305.33	47.63	0.00
A2	0.70	305.31	44.31	0.00
A5	0.00	305.30	46.45	0.00
A6	0.00	305.31	45.91	0.00
A7	0.08	305.35	47.05	0.00
A9	0.34	305.33	46.33	0.00
A17A	0.00	305.31	43.81	0.00
A3	7.90	305.30	43.80	0.00
A4	0.14	305.30	45.80	0.00
B1	0.26	305.80	48.30	0.00
B2	0.68	305.80	46.80	0.00
B5	0.10	305.80	47.30	0.00
B6	0.36	305.80	46.80	0.00
B7	0.44	305.80	44.80	0.00
B10	0.12	305.80	47.30	0.00
B12	0.24	305.80	46.80	0.00
B11	0.26	305.80	46.80	0.00
B9	0.32	305.80	47.80	0.00
B8	0.58	305.80	45.80	0.00
A10	0.44	305.33	43.43	0.00
A14	0.20	305.33	40.93	0.00
MC1	0.00	305.36	45.86	0.00
MC2	0.00	305.40	41.40	0.00

MC3	0.00	305.42	40.92	0.00	
MC4	0.00	305.44	49.44	0.00	
1	-13.72	305.80	0.00	0.00	Reservoir
4	-3.80	305.80	0.00	0.00	Reservoir

Link Results:

Link ID	Flow LPS	Velocity m/s	Unit Headloss m/km	Status
1	1.16	0.07	0.08	Open
2	3.41	0.19	0.59	Open
3	2.97	0.17	0.45	Open
4	8.31	0.26	0.63	Open
5	5.06	0.16	0.25	Open
6	2.59	0.15	0.35	Open
8	0.00	0.00	0.00	Open
10	2.73	0.15	0.39	Open
11	3.15	0.18	0.51	Open
12	10.01	0.32	0.89	Open
13	13.72	0.44	1.58	Open
9	5.12	0.07	0.03	Open
14	8.74	0.12	0.08	Open
15	8.04	0.11	0.07	Open
16	0.14	0.00	0.00	Open
17	0.00	0.00	0.00	Open
18	0.00	0.00	0.00	Open
19	-4.84	0.15	0.23	Open
21	0.98	0.03	0.01	Open
31	0.00	0.00	0.00	Open
7	3.80	0.05	0.02	Open
36	2.37	0.03	0.01	Open
37	1.18	0.02	0.00	Open
38	1.17	0.02	0.01	Open
39	1.07	0.03	0.01	Open
40	0.58	0.02	0.00	Open
41	0.13	0.00	0.00	Open
42	-0.31	0.01	0.00	Open
43	-0.52	0.02	0.00	Open
44	0.20	0.01	0.00	Open
45	-0.16	0.01	0.00	Open
46	-0.42	0.01	0.00	Open
47	0.24	0.01	0.00	Open
22	0.64	0.02	0.01	Open
23	0.20	0.01	0.00	Open
20	-4.92	0.16	0.24	Open
24	-4.92	0.16	0.24	Open
25	-4.92	0.16	0.24	Open
26	-4.92	0.16	0.24	Open

27	-4.92	0.16	0.24	Open

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*********************************************************************
*                          E P A N E T                              *
*                   Hydraulic and Water Quality                     *
*                   Analysis for Pipe Networks                      *
*                        Version 2.2                                *
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Input File: 18010_Phase 1 - MCC - MDD + FIRE.net

18010_Acorn Valley - Phase 1 Max Day Demand with Mill Court Connection

Link - Node Table:

Link ID	Start Node	End Node	Length m	Diameter mm
1	T1	T5	270	150
2	T5	T6	290	150
3	T6	T4	115	150
4	T1	T2	160	200
5	T2	T3	95	200
6	T2	T4	405	150
8	B3	B4	166.59	300
10	T8	T5	90	150
11	T7	T8	405	150
12	T7	T1	245	200
13	1	T7	1	200
9	T4	A1	105	300
14	A1	A2	335	300
15	A2	A3	90	300
16	A3	A4	150	300
17	A4	A5	180	300
18	A2	A6	55	200
19	A1	A7	55	200
21	A1	A9	115	200
31	A2	A17A	45	300
7	4	B1	1	300
36	B1	B2	190	300
37	B2	B3	180	300
38	B1	B5	95	250
39	B5	B6	90	200
40	B6	B8	240	200
41	B6	B7	275	200
42	B7	B3	95	200
43	B9	B2	195	200
44	B9	B10	90	200
45	B10	B11	90	200
46	B11	B3	145	200
47	B10	B12	60	150
22	A9	A10	150	200
23	A10	A14	140	200

20	A7	MC1	60	200
25	MC2	MC3	70	200

Link - Node Table: (continued)

Link ID	Start Node	End Node	Length m	Diameter mm
26	MC3	MC4	120	200
27	MC4	T3	50	200
32	MC1	MC2	160	200

Node Results:

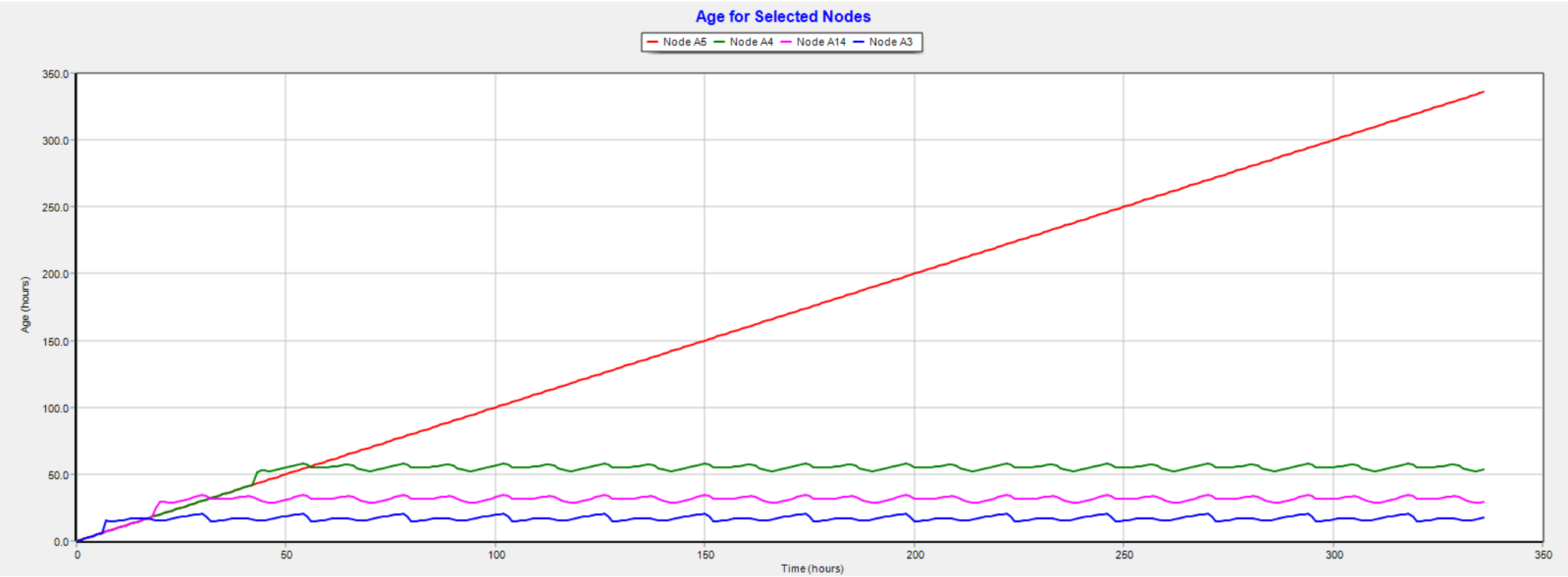
Node ID	Demand LPS	Head m	Pressure m	Quality
T2	0.66	297.26	37.46	0.00
T3	0.14	296.48	36.48	0.00
T1	0.54	300.22	42.22	0.00
T5	0.48	299.83	35.33	0.00
T6	0.44	294.45	32.95	0.00
T4	0.44	292.39	33.39	0.00
B3	0.44	305.80	45.60	0.00
B4	0.00	305.80	45.60	0.00
T7	0.56	305.76	48.26	0.00
T8	0.42	300.87	36.37	0.00
A1	0.24	292.25	34.55	0.00
A2	0.70	292.23	31.23	0.00
A5	0.00	292.22	33.37	0.00
A6	0.00	292.23	32.83	0.00
A7	0.08	292.70	34.40	0.00
A9	0.34	289.19	30.19	0.00
A17A	0.00	292.23	30.73	0.00
A3	7.90	292.22	30.72	0.00
A4	0.14	292.22	32.72	0.00
B1	0.26	305.80	48.30	0.00
B2	0.68	305.80	46.80	0.00
B5	0.10	305.80	47.30	0.00
B6	0.36	305.80	46.80	0.00
B7	0.44	305.80	44.80	0.00
B10	0.12	305.80	47.30	0.00
B12	0.24	305.80	46.80	0.00
B11	0.26	305.80	46.80	0.00
B9	0.32	305.80	47.80	0.00
B8	0.58	305.80	45.80	0.00
A10	0.44	285.23	23.33	0.00
A14	62.00	281.59	17.19	0.00
MC1	0.00	293.20	33.70	0.00
MC2	0.00	294.51	30.51	0.00

MC3	0.00	295.08	30.58	0.00	
MC4	0.00	296.07	40.07	0.00	
1	-75.52	305.80	0.00	0.00	Reservoir
4	-3.80	305.80	0.00	0.00	Reservoir

Link Results:

Link ID	Flow LPS	Velocity m/s	Unit Headloss m/km	Status
1	5.48	0.31	1.41	Open
2	22.04	1.25	18.58	Open
3	21.60	1.22	17.90	Open
4	51.48	1.64	18.45	Open
5	33.38	1.06	8.27	Open
6	17.44	0.99	12.04	Open
8	0.00	0.00	0.00	Open
10	17.04	0.96	11.54	Open
11	17.46	0.99	12.07	Open
12	57.50	1.83	22.64	Open
13	75.52	2.40	37.50	Open
9	38.60	0.55	1.28	Open
14	8.74	0.12	0.08	Open
15	8.04	0.11	0.07	Open
16	0.14	0.00	0.00	Open
17	0.00	0.00	0.00	Open
18	0.00	0.00	0.00	Open
19	-33.16	1.06	8.17	Open
21	62.78	2.00	26.65	Open
31	0.00	0.00	0.00	Open
7	3.80	0.05	0.02	Open
36	2.37	0.03	0.01	Open
37	1.18	0.02	0.00	Open
38	1.17	0.02	0.01	Open
39	1.07	0.03	0.01	Open
40	0.58	0.02	0.00	Open
41	0.13	0.00	0.00	Open
42	-0.31	0.01	0.00	Open
43	-0.52	0.02	0.00	Open
44	0.20	0.01	0.00	Open
45	-0.16	0.01	0.00	Open
46	-0.42	0.01	0.00	Open
47	0.24	0.01	0.00	Open
22	62.44	1.99	26.38	Open
23	62.00	1.97	26.04	Open
20	-33.24	1.06	8.21	Open
25	-33.24	1.06	8.21	Open
26	-33.24	1.06	8.21	Open
27	-33.24	1.06	8.21	Open

32	-33.24	1.06	8.21	Open


Age for Selected Nodes
Node A5
Node A4
Node A14
Node A3
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300.0
250.0
200.0
150.0
100.0
50.0
0.0
Age (hours)
0
50
100
150
200
250
300
350
Time (hours)

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*********************************************************************
*                          E P A N E T                              *
*                   Hydraulic and Water Quality                     *
*                   Analysis for Pipe Networks                      *
*                         Version 2.2                               *
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Input File: 18010_Phase 1-3 + North - MCC - ADD.net

18010_Acorn Valley - Phase 1-3 + North Average Day Demand with Mill Court Connection

Link - Node Table:

Link ID	Start Node	End Node	Length m	Diameter mm
1	T1	T5	270	150
2	T5	T6	290	150
3	T6	T4	115	150
4	T1	T2	160	200
5	T2	T3	95	200
6	T2	T4	405	150
8	B3	B4	166.59	300
10	T8	T5	90	150
11	T7	T8	405	150
12	T7	T1	245	200
13	1	T7	1	200
9	T4	A1	105	300
14	A1	A2	335	300
15	A2	A3	90	300
16	A3	A4	150	300
17	A4	A5	180	300
18	A2	A6	55	200
19	A1	A7	55	200
20	T4	A8	200	200
21	A1	A9	115	200
22	A9	A10	150	200
23	A10	A14	140	200
27	A13	A17	90	150
28	A13	A12	60	150
29	A14	A15	85	200
30	A15	A16	65	200
31	A2	A17	90	300
32	A17	A18	175	300
33	A18	A19	225.21	300
35	A15	A21	60	150
7	4	B1	1	300
36	B1	B2	190	300
37	B2	B3	180	300
38	B1	B5	95	250

39	B5	B6	90	200
40	B6	B8	240	200
41	B6	B7	275	200

Link - Node Table: (continued)

Link ID	Start Node	End Node	Length m	Diameter mm
42	B7	B3	95	200
43	B9	B2	195	200
44	B9	B10	90	200
45	B10	B11	90	200
46	B11	B3	145	200
47	B10	B12	60	150
24	A12	A14	100	150
25	A13	A11	70	50
26	A11	A12	70	50
34	A7	MC1	60	200
48	MC1	MC2	160	200
49	MC2	MC3	70	200
50	MC3	MC4	120	200
51	MC4	T3	50	200

Node Results:

Node ID	Demand LPS	Head m	Pressure m	Quality
T2	0.33	305.40	45.60	0.00
T3	0.07	305.37	45.37	0.00
T1	0.27	305.54	47.54	0.00
T5	0.24	305.52	41.02	0.00
T6	0.22	305.28	43.78	0.00
T4	0.22	305.20	46.20	0.00
B3	0.22	305.80	45.60	0.00
B4	0.00	305.80	45.60	0.00
T7	0.28	305.80	48.30	0.00
T8	0.21	305.56	41.06	0.00
A1	0.12	305.19	47.49	0.00
A2	0.35	305.16	44.16	0.00
A5	0.00	305.16	46.31	0.00
A6	4.74	305.15	45.75	0.00
A7	1.86	305.20	46.90	0.00
A9	0.17	305.19	46.19	0.00
A17	0.16	305.16	42.66	0.00
A13	0.07	305.17	42.97	0.00
A3	3.95	305.16	43.66	0.00
A10	0.22	305.18	43.28	0.00

A14	0.19	305.18	40.78	0.00
A19	0.13	305.16	38.16	0.00
A15	0.06	305.18	40.28	0.00
A16	0.10	305.18	40.18	0.00
A21	0.00	305.18	41.18	0.00
A8	0.28	305.20	48.70	0.00
A4	0.07	305.16	45.66	0.00

Node Results: (continued)

Node ID	Demand LPS	Head m	Pressure m	Quality	
A18	0.21	305.16	39.46	0.00	
B1	0.13	305.80	48.30	0.00	
B2	0.34	305.80	46.80	0.00	
B5	0.05	305.80	47.30	0.00	
B6	0.18	305.80	46.80	0.00	
B7	0.22	305.80	44.80	0.00	
B10	0.06	305.80	47.30	0.00	
B12	0.12	305.80	46.80	0.00	
B11	0.13	305.80	46.80	0.00	
B9	0.16	305.80	47.80	0.00	
B8	0.29	305.80	45.80	0.00	
A11	0.15	305.16	42.66	0.00	
A12	0.09	305.17	42.17	0.00	
MC1	0.00	305.22	45.72	0.00	
MC2	0.00	305.28	41.28	0.00	
MC3	0.00	305.31	40.81	0.00	
MC4	0.00	305.35	49.35	0.00	
1	-14.76	305.80	0.00	0.00	Reservoir
4	-1.90	305.80	0.00	0.00	Reservoir

Link Results:

Link ID	Flow LPS	Velocity m/s	Unit Headloss m/km	Status
1	1.11	0.06	0.07	Open
2	4.07	0.23	0.81	Open
3	3.85	0.22	0.73	Open
4	9.69	0.31	0.84	Open
5	6.21	0.20	0.37	Open
6	3.15	0.18	0.51	Open
8	0.00	0.00	0.00	Open
10	3.19	0.18	0.52	Open
11	3.40	0.19	0.58	Open
12	11.08	0.35	1.07	Open
13	14.76	0.47	1.82	Open

9	6.50	0.09	0.05	Open
14	8.79	0.12	0.08	Open
15	4.02	0.06	0.02	Open
16	0.07	0.00	0.00	Open
17	0.00	0.00	0.00	Open
18	4.74	0.15	0.22	Open
19	-4.28	0.14	0.18	Open
20	0.28	0.01	0.00	Open
21	1.87	0.06	0.04	Open
22	1.70	0.05	0.03	Open
23	1.48	0.05	0.03	Open

Link Results: (continued)

Link ID	Flow LPS	Velocity m/s	Unit Headloss m/km	Status
27	0.82	0.05	0.04	Open
28	-0.95	0.05	0.05	Open
29	0.16	0.01	0.00	Open
30	0.10	0.00	0.00	Open
31	-0.32	0.00	0.00	Open
32	0.34	0.00	0.00	Open
33	0.13	0.00	0.00	Open
35	0.00	0.00	0.00	Open
7	1.90	0.03	0.00	Open
36	1.19	0.02	0.00	Open
37	0.59	0.01	0.00	Open
38	0.58	0.01	0.00	Open
39	0.53	0.02	0.00	Open
40	0.29	0.01	0.00	Open
41	0.06	0.00	0.00	Open
42	-0.16	0.00	0.00	Open
43	-0.26	0.01	0.00	Open
44	0.10	0.00	0.00	Open
45	-0.08	0.00	0.00	Open
46	-0.21	0.01	0.00	Open
47	0.12	0.01	0.00	Open
24	-1.13	0.06	0.08	Open
25	0.07	0.03	0.08	Open
26	-0.08	0.04	0.13	Open
34	-6.14	0.20	0.36	Open
48	-6.14	0.20	0.36	Open
49	-6.14	0.20	0.36	Open
50	-6.14	0.20	0.36	Open
51	-6.14	0.20	0.36	Open

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******************************************************************
*                          E P A N E T                           *
*                   Hydraulic and Water Quality                  *
*                   Analysis for Pipe Networks                   *
*                         Version 2.2                            *
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Input File: 18010_Phase 1-3 + North - MCC - PHD.net

18010_Acorn Valley - Phase 1-3 + North Peak Hour Demand with Mill Court Connection

Link - Node Table:

Link ID	Start Node	End Node	Length m	Diameter mm
1	T1	T5	270	150
2	T5	T6	290	150
3	T6	T4	115	150
4	T1	T2	160	200
5	T2	T3	95	200
6	T2	T4	405	150
8	B3	B4	166.59	300
10	T8	T5	90	150
11	T7	T8	405	150
12	T7	T1	245	200
13	1	T7	1	200
9	T4	A1	105	300
14	A1	A2	335	300
15	A2	A3	90	300
16	A3	A4	150	300
17	A4	A5	180	300
18	A2	A6	55	200
19	A1	A7	55	200
20	T4	A8	200	200
21	A1	A9	115	200
22	A9	A10	150	200
23	A10	A14	140	200
27	A13	A17	90	150
28	A13	A12	60	150
29	A14	A15	85	200
30	A15	A16	65	200
31	A2	A17	90	300
32	A17	A18	175	300
33	A18	A19	225.21	300
35	A15	A21	60	150
7	4	B1	1	300
36	B1	B2	190	300
37	B2	B3	180	300
38	B1	B5	95	250

39	B5	B6	90	200
40	B6	B8	240	200
41	B6	B7	275	200

Link - Node Table: (continued)

Link ID	Start Node	End Node	Length m	Diameter mm
42	B7	B3	95	200
43	B9	B2	195	200
44	B9	B10	90	200
45	B10	B11	90	200
46	B11	B3	145	200
47	B10	B12	60	150
24	A12	A14	100	150
25	A13	A11	70	50
26	A11	A12	70	50
34	A7	MC1	60	200
48	MC1	MC2	160	200
49	MC2	MC3	70	200
50	MC3	MC4	120	200
51	MC4	T3	50	200

Node Results:

Node ID	Demand LPS	Head m	Pressure m	Quality
T2	0.99	302.75	42.95	0.00
T3	0.21	302.48	42.48	0.00
T1	0.81	303.78	45.78	0.00
T5	0.72	303.62	39.12	0.00
T6	0.66	301.82	40.32	0.00
T4	0.66	301.18	42.18	0.00
B3	0.66	305.80	45.60	0.00
B4	0.00	305.80	45.60	0.00
T7	0.84	305.79	48.29	0.00
T8	0.63	303.98	39.48	0.00
A1	0.36	301.14	43.44	0.00
A2	1.05	300.93	39.93	0.00
A5	0.00	300.92	42.07	0.00
A6	14.22	300.84	41.44	0.00
A7	5.58	301.22	42.92	0.00
A9	0.51	301.11	42.11	0.00
A17	0.48	300.93	38.43	0.00
A13	0.21	300.96	38.76	0.00
A3	11.85	300.92	39.42	0.00
A10	0.66	301.07	39.17	0.00

A14	0.57	301.04	36.64	0.00
A19	0.39	300.93	33.93	0.00
A15	0.18	301.04	36.14	0.00
A16	0.30	301.04	36.04	0.00
A21	0.00	301.04	37.04	0.00
A8	0.84	301.18	44.68	0.00
A4	0.21	300.92	41.42	0.00

Node Results: (continued)

Node ID	Demand LPS	Head m	Pressure m	Quality	
A18	0.63	300.93	35.23	0.00	
B1	0.39	305.80	48.30	0.00	
B2	1.02	305.80	46.80	0.00	
B5	0.15	305.80	47.30	0.00	
B6	0.54	305.80	46.80	0.00	
B7	0.66	305.80	44.80	0.00	
B10	0.18	305.80	47.30	0.00	
B12	0.36	305.79	46.79	0.00	
B11	0.39	305.80	46.80	0.00	
B9	0.48	305.80	47.80	0.00	
B8	0.87	305.79	45.79	0.00	
A11	0.45	300.91	38.41	0.00	
A12	0.27	300.98	37.98	0.00	
MC1	0.00	301.38	41.88	0.00	
MC2	0.00	301.82	37.82	0.00	
MC3	0.00	302.02	37.52	0.00	
MC4	0.00	302.35	46.35	0.00	
1	-44.28	305.80	0.00	0.00	Reservoir
4	-5.70	305.80	0.00	0.00	Reservoir

Link Results:

Link ID	Flow LPS	Velocity m/s	Unit Headloss m/km	Status
1	3.34	0.19	0.57	Open
2	12.20	0.69	6.21	Open
3	11.54	0.65	5.60	Open
4	29.08	0.93	6.41	Open
5	18.63	0.59	2.81	Open
6	9.46	0.54	3.88	Open
8	0.00	0.00	0.00	Open
10	9.57	0.54	3.96	Open
11	10.20	0.58	4.46	Open
12	33.24	1.06	8.21	Open
13	44.28	1.41	13.95	Open

9	19.50	0.28	0.36	Open
14	26.38	0.37	0.63	Open
15	12.06	0.17	0.15	Open
16	0.21	0.00	0.00	Open
17	0.00	0.00	0.00	Open
18	14.22	0.45	1.70	Open
19	-12.84	0.41	1.41	Open
20	0.84	0.03	0.01	Open
21	5.60	0.18	0.30	Open
22	5.09	0.16	0.25	Open
23	4.43	0.14	0.20	Open

Link Results: (continued)

Link ID	Flow LPS	Velocity m/s	Unit Headloss m/km	Status
27	2.45	0.14	0.32	Open
28	-2.85	0.16	0.42	Open
29	0.48	0.02	0.00	Open
30	0.30	0.01	0.00	Open
31	-0.95	0.01	0.00	Open
32	1.02	0.01	0.00	Open
33	0.39	0.01	0.00	Open
35	0.00	0.00	0.00	Open
7	5.70	0.08	0.04	Open
36	3.56	0.05	0.02	Open
37	1.76	0.02	0.00	Open
38	1.75	0.04	0.01	Open
39	1.60	0.05	0.03	Open
40	0.87	0.03	0.01	Open
41	0.19	0.01	0.00	Open
42	-0.47	0.01	0.00	Open
43	-0.77	0.02	0.01	Open
44	0.29	0.01	0.00	Open
45	-0.25	0.01	0.00	Open
46	-0.64	0.02	0.01	Open
47	0.36	0.02	0.01	Open
24	-3.38	0.19	0.58	Open
25	0.20	0.10	0.63	Open
26	-0.25	0.13	0.99	Open
34	-18.42	0.59	2.75	Open
48	-18.42	0.59	2.75	Open
49	-18.42	0.59	2.75	Open
50	-18.42	0.59	2.75	Open
51	-18.42	0.59	2.75	Open

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******************************************************************
*                          E P A N E T                           *
*                   Hydraulic and Water Quality                  *
*                   Analysis for Pipe Networks                   *
*                        Version 2.2                             *
******************************************************************
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Input File: 18010_Phase 1-3 + North - MCC - MDD.net

18010_Acorn Valley - Phase 1-3 + North Max Day Demand with Mill Court Connection

Link - Node Table:

Link ID	Start Node	End Node	Length m	Diameter mm
1	T1	T5	270	150
2	T5	T6	290	150
3	T6	T4	115	150
4	T1	T2	160	200
5	T2	T3	95	200
6	T2	T4	405	150
8	B3	B4	166.59	300
10	T8	T5	90	150
11	T7	T8	405	150
12	T7	T1	245	200
13	1	T7	1	200
9	T4	A1	105	300
14	A1	A2	335	300
15	A2	A3	90	300
16	A3	A4	150	300
17	A4	A5	180	300
18	A2	A6	55	200
19	A1	A7	55	200
20	T4	A8	200	200
21	A1	A9	115	200
22	A9	A10	150	200
23	A10	A14	140	200
27	A13	A17	90	150
28	A13	A12	60	150
29	A14	A15	85	200
30	A15	A16	65	200
31	A2	A17	90	300
32	A17	A18	175	300
33	A18	A19	225.21	300
35	A15	A21	60	150
7	4	B1	1	300
36	B1	B2	190	300
37	B2	B3	180	300
38	B1	B5	95	250
39	B5	B6	90	200

40	B6	B8	240	200
41	B6	B7	275	200

Link - Node Table: (continued)

Link ID	Start Node	End Node	Length m	Diameter mm
42	B7	B3	95	200
43	B9	B2	195	200
44	B9	B10	90	200
45	B10	B11	90	200
46	B11	B3	145	200
47	B10	B12	60	150
24	A12	A14	100	150
25	A13	A11	70	50
26	A11	A12	70	50
34	A7	MC1	60	200
48	MC1	MC2	160	200
49	MC2	MC3	70	200
50	MC3	MC4	120	200
51	MC4	T3	50	200

Node Results:

Node ID	Demand LPS	Head m	Pressure m	Quality
T2	0.66	304.36	44.56	0.00
T3	0.14	304.23	44.23	0.00
T1	0.54	304.84	46.84	0.00
T5	0.48	304.77	40.27	0.00
T6	0.44	303.92	42.42	0.00
T4	0.44	303.62	44.62	0.00
B3	0.44	305.80	45.60	0.00
B4	0.00	305.80	45.60	0.00
T7	0.56	305.79	48.29	0.00
T8	0.42	304.94	40.44	0.00
A1	0.24	303.60	45.90	0.00
A2	0.70	303.50	42.50	0.00
A5	0.00	303.49	44.64	0.00
A6	9.48	303.46	44.06	0.00
A7	3.72	303.64	45.34	0.00
A9	0.34	303.58	44.58	0.00
A17	0.32	303.50	41.00	0.00
A13	0.14	303.51	41.31	0.00
A3	7.90	303.49	41.99	0.00
A10	0.44	303.57	41.67	0.00
A14	0.38	303.55	39.15	0.00

A19	0.26	303.50	36.50	0.00
A15	0.12	303.55	38.65	0.00
A16	0.20	303.55	38.55	0.00
A21	0.00	303.55	39.55	0.00
A8	0.56	303.62	47.12	0.00
A4	0.14	303.49	43.99	0.00

Node Results: (continued)

Node ID	Demand LPS	Head m	Pressure m	Quality	
A18	0.42	303.50	37.80	0.00	
B1	0.26	305.80	48.30	0.00	
B2	0.68	305.80	46.80	0.00	
B5	0.10	305.80	47.30	0.00	
B6	0.36	305.80	46.80	0.00	
B7	0.44	305.80	44.80	0.00	
B10	0.12	305.80	47.30	0.00	
B12	0.24	305.80	46.80	0.00	
B11	0.26	305.80	46.80	0.00	
B9	0.32	305.80	47.80	0.00	
B8	0.58	305.80	45.80	0.00	
A11	0.30	303.49	40.99	0.00	
A12	0.18	303.53	40.53	0.00	
MC1	0.00	303.72	44.22	0.00	
MC2	0.00	303.92	39.92	0.00	
MC3	0.00	304.01	39.51	0.00	
MC4	0.00	304.17	48.17	0.00	
1	-29.52	305.80	0.00	0.00	Reservoir
4	-3.80	305.80	0.00	0.00	Reservoir

Link Results:

Link ID	Flow LPS	Velocity m/s	Unit Headloss m/km	Status
1	2.23	0.13	0.27	Open
2	8.13	0.46	2.93	Open
3	7.69	0.44	2.64	Open
4	19.39	0.62	3.02	Open
5	12.42	0.40	1.33	Open
6	6.31	0.36	1.83	Open
8	0.00	0.00	0.00	Open
10	6.38	0.36	1.87	Open
11	6.80	0.38	2.10	Open
12	22.16	0.71	3.87	Open
13	29.52	0.94	6.59	Open
9	13.00	0.18	0.17	Open

14	17.59	0.25	0.30	Open
15	8.04	0.11	0.07	Open
16	0.14	0.00	0.00	Open
17	0.00	0.00	0.00	Open
18	9.48	0.30	0.80	Open
19	-8.56	0.27	0.67	Open
20	0.56	0.02	0.00	Open
21	3.73	0.12	0.14	Open
22	3.39	0.11	0.12	Open
23	2.95	0.09	0.09	Open

Link Results: (continued)

Link ID	Flow LPS	Velocity m/s	Unit Headloss m/km	Status
27	1.63	0.09	0.15	Open
28	-1.90	0.11	0.20	Open
29	0.32	0.01	0.00	Open
30	0.20	0.01	0.00	Open
31	-0.63	0.01	0.00	Open
32	0.68	0.01	0.00	Open
33	0.26	0.00	0.00	Open
35	0.00	0.00	0.00	Open
7	3.80	0.05	0.02	Open
36	2.37	0.03	0.01	Open
37	1.18	0.02	0.00	Open
38	1.17	0.02	0.01	Open
39	1.07	0.03	0.01	Open
40	0.58	0.02	0.00	Open
41	0.13	0.00	0.00	Open
42	-0.31	0.01	0.00	Open
43	-0.52	0.02	0.00	Open
44	0.20	0.01	0.00	Open
45	-0.16	0.01	0.00	Open
46	-0.42	0.01	0.00	Open
47	0.24	0.01	0.00	Open
24	-2.25	0.13	0.27	Open
25	0.13	0.07	0.30	Open
26	-0.17	0.09	0.47	Open
34	-12.28	0.39	1.30	Open
48	-12.28	0.39	1.30	Open
49	-12.28	0.39	1.30	Open
50	-12.28	0.39	1.30	Open
51	-12.28	0.39	1.30	Open

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******************************************************************
*                          E P A N E T                           *
*                  Hydraulic and Water Quality                   *
*                  Analysis for Pipe Networks                    *
*                        Version 2.2                             *
******************************************************************
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Input File: 18010_Phase 1-3 + North - MCC - MDD + FIRE.net

18010_Acorn Valley - Phase 1-3 + North Max Day Demand + Fire with Mill Court Connection

Link - Node Table:

Link ID	Start Node	End Node	Length m	Diameter mm
1	T1	T5	270	150
2	T5	T6	290	150
3	T6	T4	115	150
4	T1	T2	160	200
5	T2	T3	95	200
6	T2	T4	405	150
8	B3	B4	166.59	300
10	T8	T5	90	150
11	T7	T8	405	150
12	T7	T1	245	200
13	1	T7	1	200
9	T4	A1	105	300
14	A1	A2	335	300
15	A2	A3	90	300
16	A3	A4	150	300
17	A4	A5	180	300
18	A2	A6	55	200
19	A1	A7	55	200
20	T4	A8	200	200
21	A1	A9	115	200
22	A9	A10	150	200
23	A10	A14	140	200
27	A13	A17	90	150
28	A13	A12	60	150
29	A14	A15	85	200
30	A15	A16	65	200
31	A2	A17	90	300
32	A17	A18	175	300
33	A18	A19	225.21	300
35	A15	A21	60	150
7	4	B1	1	300
36	B1	B2	190	300
37	B2	B3	180	300
38	B1	B5	95	250

39	B5	B6	90	200
40	B6	B8	240	200
41	B6	B7	275	200

Link - Node Table: (continued)

Link ID	Start Node	End Node	Length m	Diameter mm
42	B7	B3	95	200
43	B9	B2	195	200
44	B9	B10	90	200
45	B10	B11	90	200
46	B11	B3	145	200
47	B10	B12	60	150
24	A12	A14	100	150
25	A13	A11	70	50
26	A11	A12	70	50
34	A7	MC1	60	200
48	MC1	MC2	160	200
49	MC2	MC3	70	200
50	MC3	MC4	120	200
51	MC4	T3	50	200

Node Results:

Node ID	Demand LPS	Head m	Pressure m	Quality
T2	0.66	297.26	37.46	0.00
T3	0.14	296.47	36.47	0.00
T1	0.54	300.21	42.21	0.00
T5	0.48	299.84	35.34	0.00
T6	0.44	294.47	32.97	0.00
T4	0.44	292.43	33.43	0.00
B3	0.44	305.80	45.60	0.00
B4	0.00	305.80	45.60	0.00
T7	0.56	305.76	48.26	0.00
T8	0.42	300.88	36.38	0.00
A1	0.24	292.30	34.60	0.00
A2	0.70	291.40	30.40	0.00
A5	0.00	291.39	32.54	0.00
A6	9.48	291.35	31.95	0.00
A7	3.72	292.66	34.36	0.00
A9	0.34	292.20	33.20	0.00
A17	0.32	291.28	28.78	0.00
A13	0.14	291.52	29.32	0.00
A3	7.90	291.39	29.89	0.00
A10	0.44	292.08	30.18	0.00

A14	0.38	291.98	27.58	0.00
A19	46.26	290.56	23.56	0.00
A15	0.12	291.98	27.08	0.00
A16	0.20	291.98	26.98	0.00
A21	0.00	291.98	27.98	0.00
A8	0.56	292.42	35.92	0.00
A4	0.14	291.39	31.89	0.00

Node Results: (continued)

Node ID	Demand LPS	Head m	Pressure m	Quality	
A18	0.42	290.96	25.26	0.00	
B1	0.26	305.80	48.30	0.00	
B2	0.68	305.80	46.80	0.00	
B5	0.10	305.80	47.30	0.00	
B6	0.36	305.80	46.80	0.00	
B7	0.44	305.80	44.80	0.00	
B10	0.12	305.80	47.30	0.00	
B12	0.24	305.80	46.80	0.00	
B11	0.26	305.80	46.80	0.00	
B9	0.32	305.80	47.80	0.00	
B8	0.58	305.80	45.80	0.00	
A11	0.30	291.52	29.02	0.00	
A12	0.18	291.67	28.67	0.00	
MC1	0.00	293.16	33.66	0.00	
MC2	0.00	294.48	30.48	0.00	
MC3	0.00	295.06	30.56	0.00	
MC4	0.00	296.05	40.05	0.00	
1	-75.52	305.80	0.00	0.00	Reservoir
4	-3.80	305.80	0.00	0.00	Reservoir

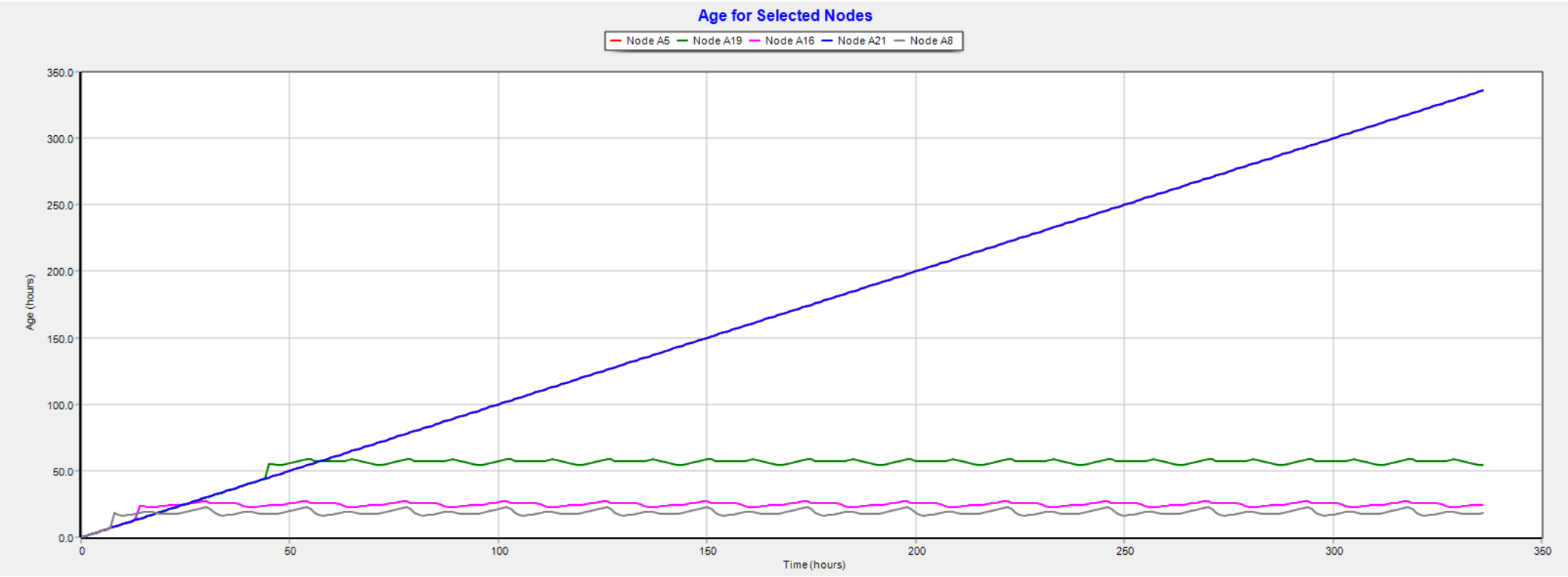
Link Results:

Link ID	Flow LPS	Velocity m/s	Unit Headloss m/km	Status
1	5.43	0.31	1.39	Open
2	21.99	1.24	18.50	Open
3	21.55	1.22	17.82	Open
4	51.53	1.64	18.48	Open
5	33.52	1.07	8.33	Open
6	17.35	0.98	11.93	Open
8	0.00	0.00	0.00	Open
10	17.04	0.96	11.53	Open
11	17.46	0.99	12.06	Open
12	57.50	1.83	22.65	Open
13	75.52	2.40	37.50	Open

9	37.90	0.54	1.24	Open
14	57.56	0.81	2.68	Open
15	8.04	0.11	0.07	Open
16	0.14	0.00	0.00	Open
17	0.00	0.00	0.00	Open
18	9.48	0.30	0.80	Open
19	-29.66	0.94	6.64	Open
20	0.56	0.02	0.00	Open
21	9.76	0.31	0.85	Open
22	9.42	0.30	0.79	Open
23	8.98	0.29	0.73	Open

Link Results: (continued)

Link ID	Flow LPS	Velocity m/s	Unit Headloss m/km	Status
27	7.66	0.43	2.62	Open
28	-7.72	0.44	2.66	Open
29	0.32	0.01	0.00	Open
30	0.20	0.01	0.00	Open
31	39.34	0.56	1.32	Open
32	46.68	0.66	1.82	Open
33	46.26	0.65	1.79	Open
35	0.00	0.00	0.00	Open
7	3.80	0.05	0.02	Open
36	2.37	0.03	0.01	Open
37	1.18	0.02	0.00	Open
38	1.17	0.02	0.01	Open
39	1.07	0.03	0.01	Open
40	0.58	0.02	0.00	Open
41	0.13	0.00	0.00	Open
42	-0.31	0.01	0.00	Open
43	-0.52	0.02	0.00	Open
44	0.20	0.01	0.00	Open
45	-0.16	0.01	0.00	Open
46	-0.42	0.01	0.00	Open
47	0.24	0.01	0.00	Open
24	-8.28	0.47	3.03	Open
25	-0.08	0.04	0.13	Open
26	-0.38	0.19	2.15	Open
34	-33.38	1.06	8.27	Open
48	-33.38	1.06	8.27	Open
49	-33.38	1.06	8.27	Open
50	-33.38	1.06	8.27	Open
51	-33.38	1.06	8.27	Open


Age for Selected Nodes
Node A5
Node A19
Node A16
Node A21
Node A8
350.0
300.0
250.0
200.0
150.0
100.0
50.0
0.0
Age (hours)
0
50
100
150
200
250
300
350
Time (hours)

```
******************************************************************
*                          E P A N E T                           *
*                   Hydraulic and Water Quality                  *
*                   Analysis for Pipe Networks                   *
*                        Version 2.2                             *
******************************************************************
```

Input File: 18010_Phase 1 - BWK - ADD.net

18010_Acorn Valley - Phase 1 Average Day Demand with Boardwalk Connection

Link - Node Table:

Link ID	Start Node	End Node	Length m	Diameter mm
1	T1	T5	270	150
2	T5	T6	290	150
3	T6	T4	115	300
4	T1	T2	160	200
5	T2	T3	95	200
6	T2	T4	405	150
8	B3	B4	166.59	300
10	T8	T5	90	150
11	T7	T8	405	150
12	T7	T1	245	200
13	1	T7	1	200
9	T4	A1	105	300
14	A1	A2	335	300
15	A2	A3	90	300
16	A3	A4	150	300
17	A4	A5	180	300
18	A2	A6	55	200
19	A1	A7	55	200
21	A1	A9	115	200
31	A2	A17A	45	300
7	4	B1	1	300
36	B1	B2	190	300
37	B2	B3	180	300
38	B1	B5	95	250
39	B5	B6	90	200
40	B6	B8	240	200
41	B6	B7	275	200
42	B7	B3	95	200
43	B9	B2	195	200
44	B9	B10	90	200
45	B10	B11	90	200
46	B11	B3	145	200
47	B10	B12	60	150
22	A9	A10	150	200
23	A10	A14	140	200

20	B4	BWK1	300	300
24	BWK1	BWK2	110	300

Link - Node Table: (continued)

Link ID	Start Node	End Node	Length m	Diameter mm
25	BWK2	BWK3	180	300
26	BWK3	BWK4	150	300
27	BWK4	T6	140	300
28	BWK4	T8	370	150

Node Results:

Node ID	Demand LPS	Head m	Pressure m	Quality
T2	0.33	305.78	45.98	0.00
T3	0.07	305.78	45.78	0.00
T1	0.27	305.78	47.78	0.00
T5	0.24	305.77	41.27	0.00
T6	0.22	305.76	44.26	0.00
T4	0.22	305.76	46.76	0.00
B3	0.22	305.79	45.59	0.00
B4	1.49	305.78	45.58	0.00
T7	0.28	305.80	48.30	0.00
T8	0.34	305.77	41.27	0.00
A1	0.12	305.76	48.06	0.00
A2	0.35	305.75	44.75	0.00
A5	0.00	305.75	46.90	0.00
A6	0.00	305.75	46.35	0.00
A7	0.04	305.76	47.46	0.00
A9	0.17	305.76	46.76	0.00
A17A	0.00	305.75	44.25	0.00
A3	3.95	305.75	44.25	0.00
A4	0.07	305.75	46.25	0.00
B1	0.13	305.80	48.30	0.00
B2	0.34	305.79	46.79	0.00
B5	0.05	305.80	47.30	0.00
B6	0.18	305.80	46.80	0.00
B7	0.22	305.79	44.79	0.00
B10	0.06	305.79	47.29	0.00
B12	0.12	305.79	46.79	0.00
B11	0.13	305.79	46.79	0.00
B9	0.16	305.79	47.79	0.00
B8	0.29	305.79	45.79	0.00
A10	0.22	305.76	43.86	0.00
A14	0.10	305.76	41.36	0.00

BWK1	1.03	305.77	48.77	0.00
BWK2	0.35	305.77	49.27	0.00
BWK3	0.00	305.77	50.27	0.00
BWK4	0.12	305.77	43.47	0.00
1	-3.73	305.80	0.00	0.00 Reservoir
4	-8.15	305.80	0.00	0.00 Reservoir

Link Results:

Link ID	Flow LPS	Velocity m/s	Unit Headloss m/km	Status
1	0.82	0.05	0.04	Open
2	0.73	0.04	0.03	Open
3	4.33	0.06	0.02	Open
4	1.31	0.04	0.02	Open
5	0.07	0.00	0.00	Open
6	0.91	0.05	0.05	Open
8	6.25	0.09	0.04	Open
10	0.15	0.01	0.00	Open
11	1.05	0.06	0.07	Open
12	2.40	0.08	0.06	Open
13	3.73	0.12	0.13	Open
9	5.02	0.07	0.03	Open
14	4.37	0.06	0.02	Open
15	4.02	0.06	0.02	Open
16	0.07	0.00	0.00	Open
17	0.00	0.00	0.00	Open
18	0.00	0.00	0.00	Open
19	0.04	0.00	0.00	Open
21	0.49	0.02	0.00	Open
31	0.00	0.00	0.00	Open
7	8.15	0.12	0.07	Open
36	6.11	0.09	0.04	Open
37	4.73	0.07	0.03	Open
38	1.91	0.04	0.01	Open
39	1.86	0.06	0.04	Open
40	0.29	0.01	0.00	Open
41	1.39	0.04	0.02	Open
42	1.17	0.04	0.02	Open
43	-1.04	0.03	0.01	Open
44	0.88	0.03	0.01	Open
45	0.70	0.02	0.01	Open
46	0.57	0.02	0.00	Open
47	0.12	0.01	0.00	Open
22	0.32	0.01	0.00	Open
23	0.10	0.00	0.00	Open
20	4.76	0.07	0.03	Open

24	3.73	0.05	0.02	Open
25	3.38	0.05	0.01	Open
26	3.38	0.05	0.01	Open
27	3.81	0.05	0.02	Open
28	-0.56	0.03	0.02	Open

```
******************************************************************
*                          E P A N E T                           *
*                   Hydraulic and Water Quality                  *
*                   Analysis for Pipe Networks                   *
*                        Version 2.2                             *
******************************************************************
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Input File: 18010_Phase 1 - BWK - PHD.net

18010_Acorn Valley - Phase 1 Peak Hour Demand with Boardwalk Connection

Link - Node Table:

Link ID	Start Node	End Node	Length m	Diameter mm
1	T1	T5	270	150
2	T5	T6	290	150
3	T6	T4	115	300
4	T1	T2	160	200
5	T2	T3	95	200
6	T2	T4	405	150
8	B3	B4	166.59	300
10	T8	T5	90	150
11	T7	T8	405	150
12	T7	T1	245	200
13	1	T7	1	200
9	T4	A1	105	300
14	A1	A2	335	300
15	A2	A3	90	300
16	A3	A4	150	300
17	A4	A5	180	300
18	A2	A6	55	200
19	A1	A7	55	200
21	A1	A9	115	200
31	A2	A17A	45	300
7	4	B1	1	300
36	B1	B2	190	300
37	B2	B3	180	300
38	B1	B5	95	250
39	B5	B6	90	200
40	B6	B8	240	200
41	B6	B7	275	200
42	B7	B3	95	200
43	B9	B2	195	200
44	B9	B10	90	200
45	B10	B11	90	200
46	B11	B3	145	200
47	B10	B12	60	150
22	A9	A10	150	200
23	A10	A14	140	200

20	B4	BWK1	300	300
24	BWK1	BWK2	110	300

Link - Node Table: (continued)

Link ID	Start Node	End Node	Length m	Diameter mm
25	BWK2	BWK3	180	300
26	BWK3	BWK4	150	300
27	BWK4	T6	140	300
28	BWK4	T8	370	150

Node Results:

Node ID	Demand LPS	Head m	Pressure m	Quality
T2	0.99	305.65	45.85	0.00
T3	0.21	305.65	45.65	0.00
T1	0.81	305.68	47.68	0.00
T5	0.72	305.59	41.09	0.00
T6	0.66	305.52	44.02	0.00
T4	0.66	305.50	46.50	0.00
B3	0.66	305.70	45.50	0.00
B4	4.47	305.65	45.45	0.00
T7	0.84	305.80	48.30	0.00
T8	1.02	305.59	41.09	0.00
A1	0.36	305.47	47.77	0.00
A2	1.05	305.42	44.42	0.00
A5	0.00	305.40	46.55	0.00
A6	0.00	305.42	46.02	0.00
A7	0.12	305.47	47.17	0.00
A9	0.51	305.47	46.47	0.00
A17A	0.00	305.42	43.92	0.00
A3	11.85	305.40	43.90	0.00
A4	0.21	305.40	45.90	0.00
B1	0.39	305.80	48.30	0.00
B2	1.02	305.74	46.74	0.00
B5	0.15	305.79	47.29	0.00
B6	0.54	305.76	46.76	0.00
B7	0.66	305.71	44.71	0.00
B10	0.18	305.71	47.21	0.00
B12	0.36	305.71	46.71	0.00
B11	0.39	305.71	46.71	0.00
B9	0.48	305.72	47.72	0.00
B8	0.87	305.76	45.76	0.00
A10	0.66	305.47	43.57	0.00
A14	0.30	305.47	41.07	0.00
BWK1	3.09	305.59	48.59	0.00

BWK2	1.05	305.57	49.07	0.00	
BWK3	0.00	305.55	50.05	0.00	
BWK4	0.36	305.54	43.24	0.00	
1	-11.20	305.80	0.00	0.00	Reservoir
4	-24.44	305.80	0.00	0.00	Reservoir

Link Results:

Link ID	Flow LPS	Velocity m/s	Unit Headloss m/km	Status
1	2.47	0.14	0.32	Open
2	2.20	0.12	0.26	Open
3	12.99	0.18	0.17	Open
4	3.93	0.13	0.16	Open
5	0.21	0.01	0.00	Open
6	2.73	0.15	0.39	Open
8	18.74	0.27	0.34	Open
10	0.45	0.03	0.01	Open
11	3.15	0.18	0.51	Open
12	7.21	0.23	0.48	Open
13	11.20	0.36	1.10	Open
9	15.06	0.21	0.22	Open
14	13.11	0.19	0.17	Open
15	12.06	0.17	0.15	Open
16	0.21	0.00	0.00	Open
17	0.00	0.00	0.00	Open
18	0.00	0.00	0.00	Open
19	0.12	0.00	0.00	Open
21	1.47	0.05	0.03	Open
31	0.00	0.00	0.00	Open
7	24.44	0.35	0.54	Open
36	18.33	0.26	0.32	Open
37	14.19	0.20	0.20	Open
38	5.72	0.12	0.11	Open
39	5.57	0.18	0.30	Open
40	0.87	0.03	0.01	Open
41	4.16	0.13	0.17	Open
42	3.50	0.11	0.13	Open
43	-3.12	0.10	0.10	Open
44	2.64	0.08	0.08	Open
45	2.10	0.07	0.05	Open
46	1.71	0.05	0.03	Open
47	0.36	0.02	0.01	Open
22	0.96	0.03	0.01	Open
23	0.30	0.01	0.00	Open
20	14.27	0.20	0.20	Open
24	11.18	0.16	0.13	Open
25	10.13	0.14	0.11	Open

26	10.13	0.14	0.11	Open
27	11.44	0.16	0.13	Open
28	-1.68	0.09	0.16	Open

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*********************************************************************
*                          E P A N E T                              *
*                   Hydraulic and Water Quality                     *
*                   Analysis for Pipe Networks                      *
*                        Version 2.2                                *
*********************************************************************
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Input File: 18010_Phase 1 - BWK - MDD.net

18010_Acorn Valley - Phase 1 Max Day Demand with Boardwalk Connection

Link - Node Table:

Link ID	Start Node	End Node	Length m	Diameter mm
1	T1	T5	270	150
2	T5	T6	290	150
3	T6	T4	115	300
4	T1	T2	160	200
5	T2	T3	95	200
6	T2	T4	405	150
8	B3	B4	166.59	300
10	T8	T5	90	150
11	T7	T8	405	150
12	T7	T1	245	200
13	1	T7	1	200
9	T4	A1	105	300
14	A1	A2	335	300
15	A2	A3	90	300
16	A3	A4	150	300
17	A4	A5	180	300
18	A2	A6	55	200
19	A1	A7	55	200
21	A1	A9	115	200
31	A2	A17A	45	300
7	4	B1	1	300
36	B1	B2	190	300
37	B2	B3	180	300
38	B1	B5	95	250
39	B5	B6	90	200
40	B6	B8	240	200
41	B6	B7	275	200
42	B7	B3	95	200
43	B9	B2	195	200
44	B9	B10	90	200
45	B10	B11	90	200
46	B11	B3	145	200
47	B10	B12	60	150
22	A9	A10	150	200
23	A10	A14	140	200

20	B4	BWK1	300	300
24	BWK1	BWK2	110	300

Link - Node Table: (continued)

Link ID	Start Node	End Node	Length m	Diameter mm
25	BWK2	BWK3	180	300
26	BWK3	BWK4	150	300
27	BWK4	T6	140	300
28	BWK4	T8	370	150

Node Results:

Node ID	Demand LPS	Head m	Pressure m	Quality
T2	0.66	305.73	45.93	0.00
T3	0.14	305.73	45.73	0.00
T1	0.54	305.74	47.74	0.00
T5	0.48	305.70	41.20	0.00
T6	0.44	305.67	44.17	0.00
T4	0.44	305.66	46.66	0.00
B3	0.44	305.75	45.55	0.00
B4	2.98	305.73	45.53	0.00
T7	0.56	305.80	48.30	0.00
T8	0.68	305.70	41.20	0.00
A1	0.24	305.65	47.95	0.00
A2	0.70	305.62	44.62	0.00
A5	0.00	305.61	46.76	0.00
A6	0.00	305.62	46.22	0.00
A7	0.08	305.65	47.35	0.00
A9	0.34	305.64	46.64	0.00
A17A	0.00	305.62	44.12	0.00
A3	7.90	305.61	44.11	0.00
A4	0.14	305.61	46.11	0.00
B1	0.26	305.80	48.30	0.00
B2	0.68	305.77	46.77	0.00
B5	0.10	305.79	47.29	0.00
B6	0.36	305.78	46.78	0.00
B7	0.44	305.76	44.76	0.00
B10	0.12	305.76	47.26	0.00
B12	0.24	305.76	46.76	0.00
B11	0.26	305.76	46.76	0.00
B9	0.32	305.76	47.76	0.00
B8	0.58	305.78	45.78	0.00
A10	0.44	305.64	43.74	0.00
A14	0.20	305.64	41.24	0.00
BWK1	2.06	305.70	48.70	0.00

BWK2	0.70	305.69	49.19	0.00	
BWK3	0.00	305.68	50.18	0.00	
BWK4	0.24	305.68	43.38	0.00	
1	-7.47	305.80	0.00	0.00	Reservoir
4	-16.29	305.80	0.00	0.00	Reservoir

Link Results:

Link ID	Flow LPS	Velocity m/s	Unit Headloss m/km	Status
1	1.65	0.09	0.15	Open
2	1.47	0.08	0.12	Open
3	8.66	0.12	0.08	Open
4	2.62	0.08	0.07	Open
5	0.14	0.00	0.00	Open
6	1.82	0.10	0.18	Open
8	12.49	0.18	0.16	Open
10	0.30	0.02	0.01	Open
11	2.10	0.12	0.24	Open
12	4.81	0.15	0.23	Open
13	7.47	0.24	0.50	Open
9	10.04	0.14	0.11	Open
14	8.74	0.12	0.08	Open
15	8.04	0.11	0.07	Open
16	0.14	0.00	0.00	Open
17	0.00	0.00	0.00	Open
18	0.00	0.00	0.00	Open
19	0.08	0.00	0.00	Open
21	0.98	0.03	0.01	Open
31	0.00	0.00	0.00	Open
7	16.29	0.23	0.26	Open
36	12.22	0.17	0.15	Open
37	9.46	0.13	0.09	Open
38	3.81	0.08	0.05	Open
39	3.71	0.12	0.14	Open
40	0.58	0.02	0.00	Open
41	2.77	0.09	0.08	Open
42	2.33	0.07	0.06	Open
43	-2.08	0.07	0.05	Open
44	1.76	0.06	0.04	Open
45	1.40	0.04	0.02	Open
46	1.14	0.04	0.02	Open
47	0.24	0.01	0.00	Open
22	0.64	0.02	0.01	Open
23	0.20	0.01	0.00	Open
20	9.51	0.13	0.10	Open
24	7.45	0.11	0.06	Open
25	6.75	0.10	0.05	Open

26	6.75	0.10	0.05	Open
27	7.63	0.11	0.06	Open
28	-1.12	0.06	0.07	Open

```
*********************************************************************
*                          E P A N E T                              *
*                   Hydraulic and Water Quality                     *
*                   Analysis for Pipe Networks                      *
*                        Version 2.2                                *
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```

Input File: 18010_Phase 1 - BWK - MDD + FIRE.net

18010_Acorn Valley - Phase 1 Max Day Demand + Fire with Boardwalk Connection

Link - Node Table:

Link ID	Start Node	End Node	Length m	Diameter mm
1	T1	T5	270	150
2	T5	T6	290	150
3	T6	T4	115	300
4	T1	T2	160	200
5	T2	T3	95	200
6	T2	T4	405	150
8	B3	B4	166.59	300
10	T8	T5	90	150
11	T7	T8	405	150
12	T7	T1	245	200
13	1	T7	1	200
9	T4	A1	105	300
14	A1	A2	335	300
15	A2	A3	90	300
16	A3	A4	150	300
17	A4	A5	180	300
18	A2	A6	55	200
19	A1	A7	55	200
21	A1	A9	115	200
31	A2	A17A	45	300
7	4	B1	1	300
36	B1	B2	190	300
37	B2	B3	180	300
38	B1	B5	95	250
39	B5	B6	90	200
40	B6	B8	240	200
41	B6	B7	275	200
42	B7	B3	95	200
43	B9	B2	195	200
44	B9	B10	90	200
45	B10	B11	90	200
46	B11	B3	145	200
47	B10	B12	60	150
22	A9	A10	150	200
23	A10	A14	140	200

20	B4	BWK1	300	300
24	BWK1	BWK2	110	300

Link - Node Table: (continued)

Link ID	Start Node	End Node	Length m	Diameter mm
25	BWK2	BWK3	180	300
26	BWK3	BWK4	150	300
27	BWK4	T6	140	300
28	BWK4	T8	370	150

Node Results:

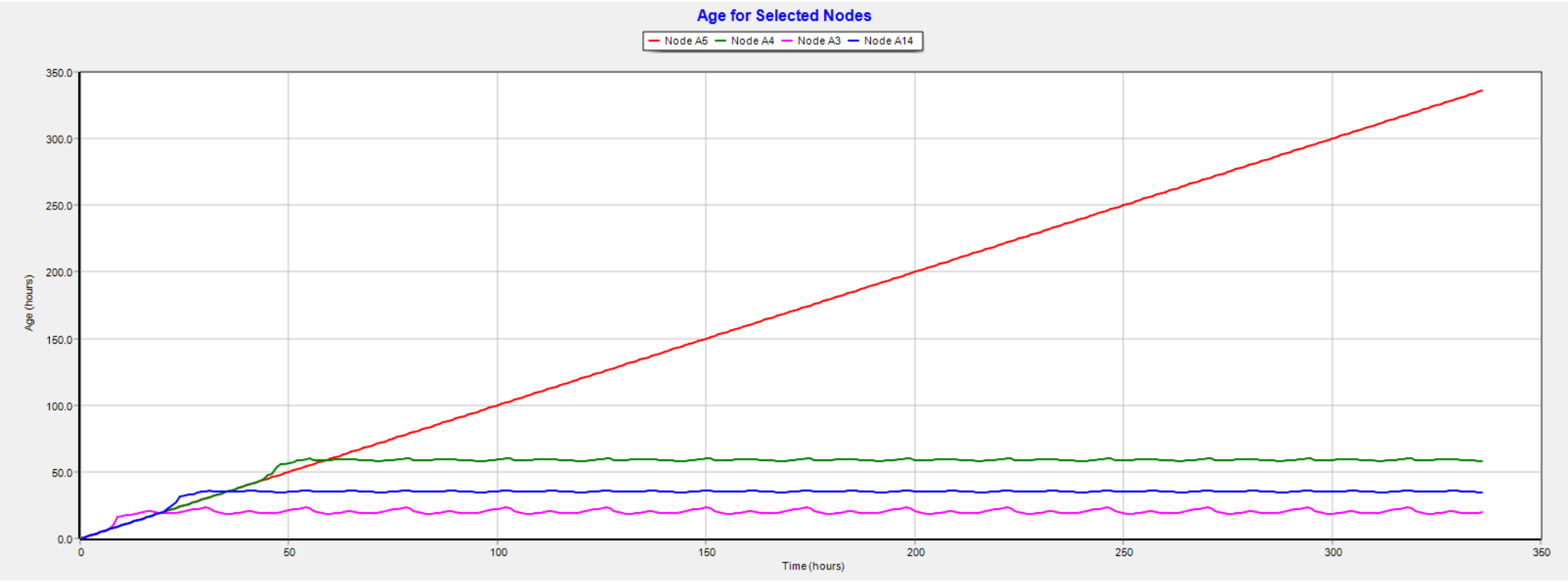
Node ID	Demand LPS	Head m	Pressure m	Quality
T2	0.66	304.54	44.74	0.00
T3	0.14	304.54	44.54	0.00
T1	0.54	304.78	46.78	0.00
T5	0.48	303.80	39.30	0.00
T6	0.44	302.37	40.87	0.00
T4	0.44	301.90	42.90	0.00
B3	0.44	305.14	44.94	0.00
B4	2.98	304.65	44.45	0.00
T7	0.56	305.79	48.29	0.00
T8	0.68	303.82	39.32	0.00
A1	0.24	301.33	43.63	0.00
A2	0.70	301.30	40.30	0.00
A5	0.00	301.29	42.44	0.00
A6	0.00	301.30	41.90	0.00
A7	0.08	301.33	43.03	0.00
A9	0.34	297.04	38.04	0.00
A17A	0.00	301.30	39.80	0.00
A3	7.90	301.29	39.79	0.00
A4	0.14	301.29	41.79	0.00
B1	0.26	305.80	48.30	0.00
B2	0.68	305.40	46.40	0.00
B5	0.10	305.75	47.25	0.00
B6	0.36	305.61	46.61	0.00
B7	0.44	305.25	44.25	0.00
B10	0.12	305.24	46.74	0.00
B12	0.24	305.24	46.24	0.00
B11	0.26	305.20	46.20	0.00
B9	0.32	305.29	47.29	0.00
B8	0.58	305.61	45.61	0.00
A10	0.44	291.49	29.59	0.00
A14	74.50	286.37	21.97	0.00

BWK1	2.06	303.86	46.86	0.00	
BWK2	0.70	303.59	47.09	0.00	
BWK3	0.00	303.16	47.66	0.00	
BWK4	0.24	302.80	40.50	0.00	
1	-34.22	305.80	0.00	0.00	Reservoir
4	-63.84	305.80	0.00	0.00	Reservoir

Link Results:

Link ID	Flow LPS	Velocity m/s	Unit Headloss m/km	Status
1	9.12	0.52	3.62	Open
2	10.77	0.61	4.93	Open
3	72.27	1.02	4.08	Open
4	13.31	0.42	1.51	Open
5	0.14	0.00	0.00	Open
6	12.51	0.71	6.51	Open
8	60.04	0.85	2.90	Open
10	2.13	0.12	0.25	Open
11	10.69	0.61	4.86	Open
12	22.97	0.73	4.14	Open
13	34.22	1.09	8.65	Open
9	84.34	1.19	5.44	Open
14	8.74	0.12	0.08	Open
15	8.04	0.11	0.07	Open
16	0.14	0.00	0.00	Open
17	0.00	0.00	0.00	Open
18	0.00	0.00	0.00	Open
19	0.08	0.00	0.00	Open
21	75.28	2.40	37.30	Open
31	0.00	0.00	0.00	Open
7	63.84	0.90	3.24	Open
36	50.20	0.71	2.08	Open
37	41.67	0.59	1.47	Open
38	13.38	0.27	0.51	Open
39	13.28	0.42	1.50	Open
40	0.58	0.02	0.00	Open
41	12.34	0.39	1.31	Open
42	11.90	0.38	1.22	Open
43	-7.84	0.25	0.57	Open
44	7.52	0.24	0.52	Open
45	7.16	0.23	0.48	Open
46	6.90	0.22	0.45	Open
47	0.24	0.01	0.00	Open
22	74.94	2.39	36.98	Open
23	74.50	2.37	36.58	Open
20	57.06	0.81	2.64	Open

24	55.00	0.78	2.46	Open
25	54.30	0.77	2.41	Open
26	54.30	0.77	2.41	Open
27	61.94	0.88	3.07	Open
28	-7.88	0.45	2.76	Open


Age for Selected Nodes
Node A5
Node A4
Node A3
Node A14
350.0
300.0
250.0
200.0
150.0
100.0
50.0
0.0
Age (hours)
0
50
100
150
200
250
300
350
Time (hours)

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******************************************************************
*                          E P A N E T                           *
*                   Hydraulic and Water Quality                  *
*                   Analysis for Pipe Networks                   *
*                         Version 2.2                            *
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Input File: 18010_Phase 1-3 + North - BWK - ADD.net

18010_Acorn Valley - Phase 1-3 + North Average Day Demand with Boardwalk Connection

Link - Node Table:

Link ID	Start Node	End Node	Length m	Diameter mm
1	T1	T5	270	150
2	T5	T6	290	150
3	T6	T4	115	300
4	T1	T2	160	200
5	T2	T3	95	200
6	T2	T4	405	150
8	B3	B4	166.59	300
10	T8	T5	90	150
11	T7	T8	405	150
12	T7	T1	245	200
13	1	T7	1	200
9	T4	A1	105	300
14	A1	A2	335	300
15	A2	A3	90	300
16	A3	A4	150	300
17	A4	A5	180	300
18	A2	A6	55	200
19	A1	A7	55	200
20	T4	A8	200	200
21	A1	A9	115	200
22	A9	A10	150	200
23	A10	A14	140	200
27	A13	A17	90	150
28	A13	A12	60	150
29	A14	A15	85	200
30	A15	A16	65	200
31	A2	A17	90	300
32	A17	A18	175	300
33	A18	A19	225.21	300
35	A15	A21	60	150
7	4	B1	1	300
36	B1	B2	190	300
37	B2	B3	180	300
38	B1	B5	95	250

39	B5	B6	90	200
40	B6	B8	240	200
41	B6	B7	275	200

Link - Node Table: (continued)

Link ID	Start Node	End Node	Length m	Diameter mm
42	B7	B3	95	200
43	B9	B2	195	200
44	B9	B10	90	200
45	B10	B11	90	200
46	B11	B3	145	200
47	B10	B12	60	150
24	A12	A14	100	150
25	A13	A11	70	50
26	A11	A12	70	50
34	B4	BWK1	300	300
48	BWK1	BWK2	110	300
49	BWK2	BWK3	180	300
50	BWK3	BWK4	150	300
51	BWK4	T6	140	300
52	BWK4	T8	370	150

Node Results:

Node ID	Demand LPS	Head m	Pressure m	Quality
T2	0.33	305.74	45.94	0.00
T3	0.07	305.74	45.74	0.00
T1	0.27	305.75	47.75	0.00
T5	0.24	305.71	41.21	0.00
T6	0.22	305.67	44.17	0.00
T4	0.22	305.65	46.65	0.00
B3	0.22	305.77	45.57	0.00
B4	1.49	305.74	45.54	0.00
T7	0.28	305.80	48.30	0.00
T8	0.34	305.71	41.21	0.00
A1	0.12	305.63	47.93	0.00
A2	0.35	305.61	44.61	0.00
A5	0.00	305.61	46.76	0.00
A6	4.74	305.59	46.19	0.00
A7	1.86	305.63	47.33	0.00
A9	0.17	305.63	46.63	0.00
A17	0.16	305.61	43.11	0.00
A13	0.07	305.61	43.41	0.00
A3	3.95	305.61	44.11	0.00

A10	0.22	305.62	43.72	0.00
A14	0.19	305.62	41.22	0.00
A19	0.13	305.61	38.61	0.00
A15	0.06	305.62	40.72	0.00
A16	0.10	305.62	40.62	0.00
A21	0.00	305.62	41.62	0.00
A8	0.28	305.65	49.15	0.00

Node Results: (continued)

Node ID	Demand LPS	Head m	Pressure m	Quality	
A4	0.07	305.61	46.11	0.00	
A18	0.21	305.61	39.91	0.00	
B1	0.13	305.80	48.30	0.00	
B2	0.34	305.78	46.78	0.00	
B5	0.05	305.80	47.30	0.00	
B6	0.18	305.79	46.79	0.00	
B7	0.22	305.77	44.77	0.00	
B10	0.06	305.77	47.27	0.00	
B12	0.12	305.77	46.77	0.00	
B11	0.13	305.77	46.77	0.00	
B9	0.16	305.77	47.77	0.00	
B8	0.29	305.79	45.79	0.00	
A11	0.15	305.60	43.10	0.00	
A12	0.09	305.61	42.61	0.00	
BWK1	1.03	305.71	48.71	0.00	
BWK2	0.35	305.70	49.20	0.00	
BWK3	0.00	305.69	50.19	0.00	
BWK4	0.12	305.68	43.38	0.00	
1	-6.56	305.80	0.00	0.00	Reservoir
4	-13.22	305.80	0.00	0.00	Reservoir

Link Results:

Link ID	Flow LPS	Velocity m/s	Unit Headloss m/km	Status
1	1.62	0.09	0.15	Open
2	1.72	0.10	0.16	Open
3	11.10	0.16	0.13	Open
4	2.44	0.08	0.07	Open
5	0.07	0.00	0.00	Open
6	2.04	0.12	0.23	Open
8	11.32	0.16	0.13	Open
10	0.34	0.02	0.01	Open
11	1.96	0.11	0.21	Open
12	4.33	0.14	0.19	Open

13	6.56	0.21	0.41	Open
9	12.64	0.18	0.16	Open
14	8.79	0.12	0.08	Open
15	4.02	0.06	0.02	Open
16	0.07	0.00	0.00	Open
17	0.00	0.00	0.00	Open
18	4.74	0.15	0.22	Open
19	1.86	0.06	0.04	Open
20	0.28	0.01	0.00	Open
21	1.87	0.06	0.04	Open
22	1.70	0.05	0.03	Open

Link Results: (continued)

Link ID	Flow LPS	Velocity m/s	Unit Headloss m/km	Status
23	1.48	0.05	0.03	Open
27	0.82	0.05	0.04	Open
28	-0.95	0.05	0.05	Open
29	0.16	0.01	0.00	Open
30	0.10	0.00	0.00	Open
31	-0.32	0.00	0.00	Open
32	0.34	0.00	0.00	Open
33	0.13	0.00	0.00	Open
35	0.00	0.00	0.00	Open
7	13.22	0.19	0.17	Open
36	10.16	0.14	0.11	Open
37	8.16	0.12	0.07	Open
38	2.93	0.06	0.03	Open
39	2.88	0.09	0.09	Open
40	0.29	0.01	0.00	Open
41	2.41	0.08	0.06	Open
42	2.19	0.07	0.05	Open
43	-1.66	0.05	0.03	Open
44	1.50	0.05	0.03	Open
45	1.32	0.04	0.02	Open
46	1.19	0.04	0.02	Open
47	0.12	0.01	0.00	Open
24	-1.13	0.06	0.08	Open
25	0.07	0.03	0.08	Open
26	-0.08	0.04	0.13	Open
34	9.83	0.14	0.10	Open
48	8.80	0.12	0.08	Open
49	8.45	0.12	0.08	Open
50	8.45	0.12	0.08	Open
51	9.60	0.14	0.10	Open
52	-1.27	0.07	0.09	Open

```
******************************************************************
*                          E P A N E T                           *
*                   Hydraulic and Water Quality                  *
*                   Analysis for Pipe Networks                   *
*                         Version 2.2                            *
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Input File: 18010_Phase 1-3 + North - BWK - PHD.net

18010_Acorn Valley - Phase 1-3 + North Peak Hour Demand with Boardwalk Connection

Link - Node Table:

Link ID	Start Node	End Node	Length m	Diameter mm
1	T1	T5	270	150
2	T5	T6	290	150
3	T6	T4	115	300
4	T1	T2	160	200
5	T2	T3	95	200
6	T2	T4	405	150
8	B3	B4	166.59	300
10	T8	T5	90	150
11	T7	T8	405	150
12	T7	T1	245	200
13	1	T7	1	200
9	T4	A1	105	300
14	A1	A2	335	300
15	A2	A3	90	300
16	A3	A4	150	300
17	A4	A5	180	300
18	A2	A6	55	200
19	A1	A7	55	200
20	T4	A8	200	200
21	A1	A9	115	200
22	A9	A10	150	200
23	A10	A14	140	200
27	A13	A17	90	150
28	A13	A12	60	150
29	A14	A15	85	200
30	A15	A16	65	200
31	A2	A17	90	300
32	A17	A18	175	300
33	A18	A19	225.21	300
35	A15	A21	60	150
7	4	B1	1	300
36	B1	B2	190	300
37	B2	B3	180	300
38	B1	B5	95	250
39	B5	B6	90	200

40	B6	B8	240	200
41	B6	B7	275	200

Link - Node Table: (continued)

Link ID	Start Node	End Node	Length m	Diameter mm
42	B7	B3	95	200
43	B9	B2	195	200
44	B9	B10	90	200
45	B10	B11	90	200
46	B11	B3	145	200
47	B10	B12	60	150
24	A12	A14	100	150
25	A13	A11	70	50
26	A11	A12	70	50
34	B4	BWK1	300	300
48	BWK1	BWK2	110	300
49	BWK2	BWK3	180	300
50	BWK3	BWK4	150	300
51	BWK4	T6	140	300
52	BWK4	T8	370	150

Node Results:

Node ID	Demand LPS	Head m	Pressure m	Quality
T2	0.99	305.36	45.56	0.00
T3	0.21	305.36	45.36	0.00
T1	0.81	305.44	47.44	0.00
T5	0.72	305.14	40.64	0.00
T6	0.66	304.78	43.28	0.00
T4	0.66	304.66	45.66	0.00
B3	0.66	305.54	45.34	0.00
B4	4.47	305.38	45.18	0.00
T7	0.84	305.80	48.30	0.00
T8	1.02	305.15	40.65	0.00
A1	0.36	304.53	46.83	0.00
A2	1.05	304.32	43.32	0.00
A5	0.00	304.31	45.46	0.00
A6	14.22	304.23	44.83	0.00
A7	5.58	304.52	46.22	0.00
A9	0.51	304.50	45.50	0.00
A17	0.48	304.32	41.82	0.00
A13	0.21	304.35	42.15	0.00
A3	11.85	304.31	42.81	0.00
A10	0.66	304.46	42.56	0.00

A14	0.57	304.43	40.03	0.00
A19	0.39	304.32	37.32	0.00
A15	0.18	304.43	39.53	0.00
A16	0.30	304.43	39.43	0.00
A21	0.00	304.43	40.43	0.00
A8	0.84	304.66	48.16	0.00

Node Results: (continued)

Node ID	Demand LPS	Head m	Pressure m	Quality	
A4	0.21	304.31	44.81	0.00	
A18	0.63	304.32	38.62	0.00	
B1	0.39	305.80	48.30	0.00	
B2	1.02	305.64	46.64	0.00	
B5	0.15	305.78	47.28	0.00	
B6	0.54	305.72	46.72	0.00	
B7	0.66	305.58	44.58	0.00	
B10	0.18	305.58	47.08	0.00	
B12	0.36	305.58	46.58	0.00	
B11	0.39	305.56	46.56	0.00	
B9	0.48	305.59	47.59	0.00	
B8	0.87	305.71	45.71	0.00	
A11	0.45	304.31	41.81	0.00	
A12	0.27	304.38	41.38	0.00	
BWK1	3.09	305.14	48.14	0.00	
BWK2	1.05	305.07	48.57	0.00	
BWK3	0.00	304.97	49.47	0.00	
BWK4	0.36	304.88	42.58	0.00	
1	-19.69	305.80	0.00	0.00	Reservoir
4	-39.65	305.80	0.00	0.00	Reservoir

Link Results:

Link ID	Flow LPS	Velocity m/s	Unit Headloss m/km	Status
1	4.85	0.27	1.12	Open
2	5.16	0.29	1.26	Open
3	33.30	0.47	0.97	Open
4	7.32	0.23	0.50	Open
5	0.21	0.01	0.00	Open
6	6.12	0.35	1.73	Open
8	33.95	0.48	1.01	Open
10	1.03	0.06	0.06	Open
11	5.87	0.33	1.60	Open
12	12.98	0.41	1.44	Open
13	19.69	0.63	3.11	Open

Link ID	Flow LPS	Velocity m/s	Unit Headloss m/km	Status
9	37.92	0.54	1.24	Open
14	26.38	0.37	0.63	Open
15	12.06	0.17	0.15	Open
16	0.21	0.00	0.00	Open
17	0.00	0.00	0.00	Open
18	14.22	0.45	1.70	Open
19	5.58	0.18	0.30	Open
20	0.84	0.03	0.01	Open
21	5.60	0.18	0.30	Open
22	5.09	0.16	0.25	Open

Link Results: (continued)

Link ID	Flow LPS	Velocity m/s	Unit Headloss m/km	Status
23	4.43	0.14	0.20	Open
27	2.45	0.14	0.32	Open
28	-2.85	0.16	0.42	Open
29	0.48	0.02	0.00	Open
30	0.30	0.01	0.00	Open
31	-0.95	0.01	0.00	Open
32	1.02	0.01	0.00	Open
33	0.39	0.01	0.00	Open
35	0.00	0.00	0.00	Open
7	39.65	0.56	1.34	Open
36	30.47	0.43	0.83	Open
37	24.48	0.35	0.55	Open
38	8.79	0.18	0.24	Open
39	8.64	0.27	0.68	Open
40	0.87	0.03	0.01	Open
41	7.23	0.23	0.49	Open
42	6.57	0.21	0.41	Open
43	-4.97	0.16	0.24	Open
44	4.49	0.14	0.20	Open
45	3.95	0.13	0.16	Open
46	3.56	0.11	0.13	Open
47	0.36	0.02	0.01	Open
24	-3.38	0.19	0.58	Open
25	0.20	0.10	0.63	Open
26	-0.25	0.13	0.99	Open
34	29.48	0.42	0.78	Open
48	26.39	0.37	0.63	Open
49	25.34	0.36	0.59	Open
50	25.34	0.36	0.59	Open
51	28.80	0.41	0.74	Open
52	-3.82	0.22	0.72	Open

```
*********************************************************************
*                          E P A N E T                              *
*                   Hydraulic and Water Quality                     *
*                   Analysis for Pipe Networks                      *
*                        Version 2.2                                *
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```

Input File: 18010_Phase 1-3 + North - BWK - MDD.net

18010_Acorn Valley - Phase 1-3 + North Max Day Demand with Boardwalk Connection

Link - Node Table:

Link ID	Start Node	End Node	Length m	Diameter mm
1	T1	T5	270	150
2	T5	T6	290	150
3	T6	T4	115	300
4	T1	T2	160	200
5	T2	T3	95	200
6	T2	T4	405	150
8	B3	B4	166.59	300
10	T8	T5	90	150
11	T7	T8	405	150
12	T7	T1	245	200
13	1	T7	1	200
9	T4	A1	105	300
14	A1	A2	335	300
15	A2	A3	90	300
16	A3	A4	150	300
17	A4	A5	180	300
18	A2	A6	55	200
19	A1	A7	55	200
20	T4	A8	200	200
21	A1	A9	115	200
22	A9	A10	150	200
23	A10	A14	140	200
27	A13	A17	90	150
28	A13	A12	60	150
29	A14	A15	85	200
30	A15	A16	65	200
31	A2	A17	90	300
32	A17	A18	175	300
33	A18	A19	225.21	300
35	A15	A21	60	150
7	4	B1	1	300
36	B1	B2	190	300
37	B2	B3	180	300
38	B1	B5	95	250
39	B5	B6	90	200

40	B6	B8	240	200
41	B6	B7	275	200

Link - Node Table: (continued)

Link ID	Start Node	End Node	Length m	Diameter mm
42	B7	B3	95	200
43	B9	B2	195	200
44	B9	B10	90	200
45	B10	B11	90	200
46	B11	B3	145	200
47	B10	B12	60	150
24	A12	A14	100	150
25	A13	A11	70	50
26	A11	A12	70	50
34	B4	BWK1	300	300
48	BWK1	BWK2	110	300
49	BWK2	BWK3	180	300
50	BWK3	BWK4	150	300
51	BWK4	T6	140	300
52	BWK4	T8	370	150

Node Results:

Node ID	Demand LPS	Head m	Pressure m	Quality
T2	0.66	305.59	45.79	0.00
T3	0.14	305.59	45.59	0.00
T1	0.54	305.63	47.63	0.00
T5	0.48	305.49	40.99	0.00
T6	0.44	305.32	43.82	0.00
T4	0.44	305.26	46.26	0.00
B3	0.44	305.68	45.48	0.00
B4	2.98	305.60	45.40	0.00
T7	0.56	305.80	48.30	0.00
T8	0.68	305.49	40.99	0.00
A1	0.24	305.20	47.50	0.00
A2	0.70	305.10	44.10	0.00
A5	0.00	305.10	46.25	0.00
A6	9.48	305.06	45.66	0.00
A7	3.72	305.19	46.89	0.00
A9	0.34	305.19	46.19	0.00
A17	0.32	305.10	42.60	0.00
A13	0.14	305.12	42.92	0.00
A3	7.90	305.10	43.60	0.00
A10	0.44	305.17	43.27	0.00

A14	0.38	305.15	40.75	0.00
A19	0.26	305.10	38.10	0.00
A15	0.12	305.15	40.25	0.00
A16	0.20	305.15	40.15	0.00
A21	0.00	305.15	41.15	0.00
A8	0.56	305.26	48.76	0.00

Node Results: (continued)

Node ID	Demand LPS	Head m	Pressure m	Quality	
A4	0.14	305.10	45.60	0.00	
A18	0.42	305.10	39.40	0.00	
B1	0.26	305.80	48.30	0.00	
B2	0.68	305.73	46.73	0.00	
B5	0.10	305.79	47.29	0.00	
B6	0.36	305.76	46.76	0.00	
B7	0.44	305.70	44.70	0.00	
B10	0.12	305.69	47.19	0.00	
B12	0.24	305.69	46.69	0.00	
B11	0.26	305.69	46.69	0.00	
B9	0.32	305.70	47.70	0.00	
B8	0.58	305.76	45.76	0.00	
A11	0.30	305.09	42.59	0.00	
A12	0.18	305.13	42.13	0.00	
BWK1	2.06	305.49	48.49	0.00	
BWK2	0.70	305.46	48.96	0.00	
BWK3	0.00	305.41	49.91	0.00	
BWK4	0.24	305.37	43.07	0.00	
1	-13.13	305.80	0.00	0.00	Reservoir
4	-26.43	305.80	0.00	0.00	Reservoir

Link Results:

Link ID	Flow LPS	Velocity m/s	Unit Headloss m/km	Status
1	3.23	0.18	0.53	Open
2	3.44	0.19	0.60	Open
3	22.20	0.31	0.46	Open
4	4.88	0.16	0.24	Open
5	0.14	0.00	0.00	Open
6	4.08	0.23	0.82	Open
8	22.63	0.32	0.48	Open
10	0.69	0.04	0.03	Open
11	3.92	0.22	0.76	Open
12	8.65	0.28	0.68	Open
13	13.13	0.42	1.47	Open

9	25.28	0.36	0.58	Open
14	17.59	0.25	0.30	Open
15	8.04	0.11	0.07	Open
16	0.14	0.00	0.00	Open
17	0.00	0.00	0.00	Open
18	9.48	0.30	0.80	Open
19	3.72	0.12	0.14	Open
20	0.56	0.02	0.00	Open
21	3.73	0.12	0.14	Open
22	3.39	0.11	0.12	Open

Link Results: (continued)

Link ID	Flow LPS	Velocity m/s	Unit Headloss m/km	Status
23	2.95	0.09	0.09	Open
27	1.63	0.09	0.15	Open
28	-1.90	0.11	0.20	Open
29	0.32	0.01	0.00	Open
30	0.20	0.01	0.00	Open
31	-0.63	0.01	0.00	Open
32	0.68	0.01	0.00	Open
33	0.26	0.00	0.00	Open
35	0.00	0.00	0.00	Open
7	26.43	0.37	0.63	Open
36	20.31	0.29	0.39	Open
37	16.32	0.23	0.26	Open
38	5.86	0.12	0.11	Open
39	5.76	0.18	0.32	Open
40	0.58	0.02	0.00	Open
41	4.82	0.15	0.23	Open
42	4.38	0.14	0.19	Open
43	-3.32	0.11	0.11	Open
44	3.00	0.10	0.10	Open
45	2.64	0.08	0.08	Open
46	2.38	0.08	0.06	Open
47	0.24	0.01	0.00	Open
24	-2.25	0.13	0.27	Open
25	0.13	0.07	0.30	Open
26	-0.17	0.09	0.47	Open
34	19.65	0.28	0.37	Open
48	17.59	0.25	0.30	Open
49	16.89	0.24	0.28	Open
50	16.89	0.24	0.28	Open
51	19.20	0.27	0.35	Open
52	-2.55	0.14	0.34	Open

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*********************************************************************
*                          E P A N E T                              *
*                   Hydraulic and Water Quality                     *
*                   Analysis for Pipe Networks                      *
*                         Version 2.2                               *
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Input File: 18010_Phase 1-3 + North - BWK - MDD + FIRE.net

18010_Acorn Valley - Phase 1-3 + North Max Day Demand + Fire with Boardwalk Connection

Link - Node Table:

Link ID	Start Node	End Node	Length m	Diameter mm
1	T1	T5	270	150
2	T5	T6	290	150
3	T6	T4	115	300
4	T1	T2	160	200
5	T2	T3	95	200
6	T2	T4	405	150
8	B3	B4	166.59	300
10	T8	T5	90	150
11	T7	T8	405	150
12	T7	T1	245	200
13	1	T7	1	200
9	T4	A1	105	300
14	A1	A2	335	300
15	A2	A3	90	300
16	A3	A4	150	300
17	A4	A5	180	300
18	A2	A6	55	200
19	A1	A7	55	200
20	T4	A8	200	200
21	A1	A9	115	200
22	A9	A10	150	200
23	A10	A14	140	200
27	A13	A17	90	150
28	A13	A12	60	150
29	A14	A15	85	200
30	A15	A16	65	200
31	A2	A17	90	300
32	A17	A18	175	300
33	A18	A19	225.21	300
35	A15	A21	60	150
7	4	B1	1	300
36	B1	B2	190	300
37	B2	B3	180	300
38	B1	B5	95	250

39	B5	B6	90	200
40	B6	B8	240	200
41	B6	B7	275	200

Link - Node Table: (continued)

Link ID	Start Node	End Node	Length m	Diameter mm
42	B7	B3	95	200
43	B9	B2	195	200
44	B9	B10	90	200
45	B10	B11	90	200
46	B11	B3	145	200
47	B10	B12	60	150
24	A12	A14	100	150
25	A13	A11	70	50
26	A11	A12	70	50
34	B4	BWK1	300	300
48	BWK1	BWK2	110	300
49	BWK2	BWK3	180	300
50	BWK3	BWK4	150	300
51	BWK4	T6	140	300
52	BWK4	T8	370	150

Node Results:

Node ID	Demand LPS	Head m	Pressure m	Quality
T2	0.66	301.97	42.17	0.00
T3	0.14	301.97	41.97	0.00
T1	0.54	302.71	44.71	0.00
T5	0.48	299.66	35.16	0.00
T6	0.44	294.99	33.49	0.00
T4	0.44	293.44	34.44	0.00
B3	0.44	303.86	43.66	0.00
B4	2.98	302.40	42.20	0.00
T7	0.56	305.77	48.27	0.00
T8	0.68	299.73	35.23	0.00
A1	0.24	291.56	33.86	0.00
A2	0.70	287.22	26.22	0.00
A5	0.00	287.21	28.36	0.00
A6	9.48	287.17	27.77	0.00
A7	3.72	291.55	33.25	0.00
A9	0.34	291.13	32.13	0.00
A17	0.32	286.32	23.82	0.00
A13	0.14	287.67	25.47	0.00
A3	7.90	287.21	25.71	0.00

A10	0.44	290.59	28.69	0.00
A14	0.38	290.11	25.71	0.00
A19	135.46	281.08	14.08	0.00
A15	0.12	290.11	25.21	0.00
A16	0.20	290.11	25.11	0.00
A21	0.00	290.11	26.11	0.00
A8	0.56	293.44	36.94	0.00

Node Results: (continued)

Node ID	Demand LPS	Head m	Pressure m	Quality	
A4	0.14	287.21	27.71	0.00	
A18	0.42	284.02	18.32	0.00	
B1	0.26	305.79	48.29	0.00	
B2	0.68	304.64	45.64	0.00	
B5	0.10	305.66	47.16	0.00	
B6	0.36	305.28	46.28	0.00	
B7	0.44	304.21	43.21	0.00	
B10	0.12	304.19	45.69	0.00	
B12	0.24	304.19	45.19	0.00	
B11	0.26	304.06	45.06	0.00	
B9	0.32	304.33	46.33	0.00	
B8	0.58	305.28	45.28	0.00	
A11	0.30	287.92	25.42	0.00	
A12	0.18	288.53	25.53	0.00	
BWK1	2.06	299.90	42.90	0.00	
BWK2	0.70	299.02	42.52	0.00	
BWK3	0.00	297.60	42.10	0.00	
BWK4	0.24	296.41	34.11	0.00	
1	-61.91	305.80	0.00	0.00	Reservoir
4	-112.85	305.80	0.00	0.00	Reservoir

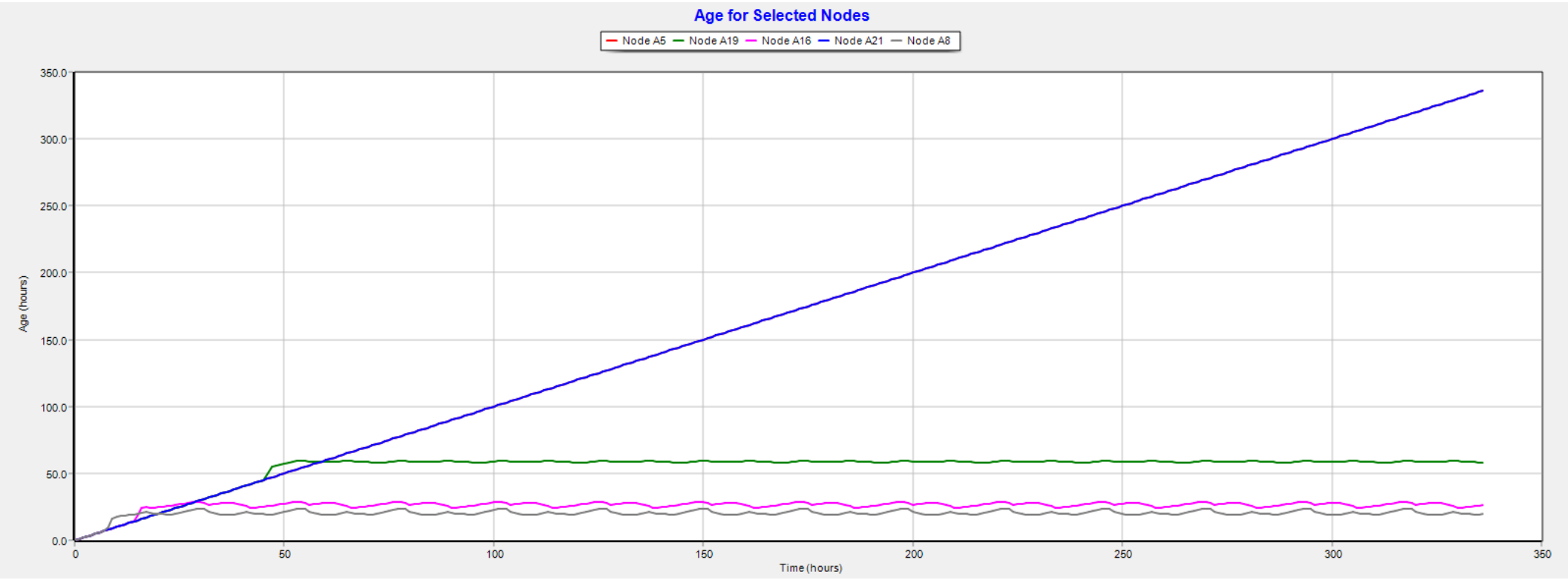
Link Results:

Link ID	Flow LPS	Velocity m/s	Unit Headloss m/km	Status
1	16.84	0.95	11.29	Open
2	20.39	1.15	16.08	Open
3	137.90	1.95	13.51	Open
4	24.38	0.78	4.62	Open
5	0.14	0.00	0.00	Open
6	23.58	1.33	21.05	Open
8	109.05	1.54	8.75	Open
10	4.03	0.23	0.80	Open
11	19.59	1.11	14.93	Open
12	41.77	1.33	12.53	Open

13	61.91	1.97	25.95	Open
9	160.48	2.27	17.90	Open
14	134.85	1.91	12.97	Open
15	8.04	0.11	0.07	Open
16	0.14	0.00	0.00	Open
17	0.00	0.00	0.00	Open
18	9.48	0.30	0.80	Open
19	3.72	0.12	0.14	Open
20	0.56	0.02	0.00	Open
21	21.67	0.69	3.71	Open
22	21.33	0.68	3.61	Open

Link Results: (continued)

Link ID	Flow LPS	Velocity m/s	Unit Headloss m/km	Status
23	20.89	0.66	3.47	Open
27	19.57	1.11	14.90	Open
28	-19.19	1.09	14.37	Open
29	0.32	0.01	0.00	Open
30	0.20	0.01	0.00	Open
31	116.63	1.65	9.91	Open
32	135.88	1.92	13.15	Open
33	135.46	1.92	13.08	Open
35	0.00	0.00	0.00	Open
7	112.85	1.60	9.32	Open
36	89.36	1.26	6.05	Open
37	74.92	1.06	4.37	Open
38	23.23	0.47	1.43	Open
39	23.13	0.74	4.19	Open
40	0.58	0.02	0.00	Open
41	22.19	0.71	3.88	Open
42	21.75	0.69	3.74	Open
43	-13.76	0.44	1.60	Open
44	13.44	0.43	1.53	Open
45	13.08	0.42	1.46	Open
46	12.82	0.41	1.41	Open
47	0.24	0.01	0.00	Open
24	-20.19	1.14	15.79	Open
25	-0.52	0.26	3.64	Open
26	-0.82	0.42	8.68	Open
34	106.07	1.50	8.31	Open
48	104.01	1.47	8.02	Open
49	103.31	1.46	7.92	Open
50	103.31	1.46	7.92	Open
51	117.95	1.67	10.12	Open
52	-14.88	0.84	8.97	Open


Age for Selected Nodes
Node A5
Node A19
Node A16
Node A21
Node A8
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300.0
250.0
200.0
150.0
100.0
50.0
0.0
Age (hours)
0
50
100
150
200
250
300
350
Time (hours)

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*********************************************************************
*                          E P A N E T                              *
*                   Hydraulic and Water Quality                     *
*                   Analysis for Pipe Networks                      *
*                        Version 2.2                                *
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Input File: 18010_Phase 1 - MCC + BWK - ADD.net

18010_Acorn Valley - Phase 1 Average Day Demand with Mill Court and Boardwalk Connection

Link - Node Table:

Link ID	Start Node	End Node	Length m	Diameter mm
1	T1	T5	270	150
2	T5	T6	290	150
3	T6	T4	115	300
4	T1	T2	160	200
5	T2	T3	95	200
6	T2	T4	405	150
8	B3	B4	166.59	300
10	T8	T5	90	150
11	T7	T8	405	150
12	T7	T1	245	200
13	1	T7	1	200
9	T4	A1	105	300
14	A1	A2	335	300
15	A2	A3	90	300
16	A3	A4	150	300
17	A4	A5	180	300
18	A2	A6	55	200
19	A1	A7	55	200
21	A1	A9	115	200
31	A2	A17A	45	300
7	4	B1	1	300
36	B1	B2	190	300
37	B2	B3	180	300
38	B1	B5	95	250
39	B5	B6	90	200
40	B6	B8	240	200
41	B6	B7	275	200
42	B7	B3	95	200
43	B9	B2	195	200
44	B9	B10	90	200
45	B10	B11	90	200
46	B11	B3	145	200
47	B10	B12	60	150
22	A9	A10	150	200

23	A10	A14	140	200
20	A7	MC1	60	200
24	MC1	MC2	160	200

Link - Node Table: (continued)

Link ID	Start Node	End Node	Length m	Diameter mm
25	MC2	MC3	70	200
26	MC3	MC4	120	200
27	MC4	T3	50	200
32	B4	BWK1	300	300
33	BWK1	BWK2	110	300
34	BWK2	BWK3	180	300
35	BWK3	BWK4	150	300
48	BWK4	T6	140	300
49	BWK4	T8	370	150

Node Results:

Node ID	Demand LPS	Head m	Pressure m	Quality
T2	0.33	305.77	45.97	0.00
T3	0.07	305.77	45.77	0.00
T1	0.27	305.78	47.78	0.00
T5	0.24	305.77	41.27	0.00
T6	0.22	305.77	44.27	0.00
T4	0.22	305.77	46.77	0.00
B3	0.22	305.79	45.59	0.00
B4	1.49	305.78	45.58	0.00
T7	0.28	305.80	48.30	0.00
T8	0.34	305.77	41.27	0.00
A1	0.12	305.76	48.06	0.00
A2	0.35	305.76	44.76	0.00
A5	0.00	305.75	46.90	0.00
A6	0.00	305.76	46.36	0.00
A7	0.04	305.76	47.46	0.00
A9	0.17	305.76	46.76	0.00
A17A	0.00	305.76	44.26	0.00
A3	3.95	305.75	44.25	0.00
A4	0.07	305.75	46.25	0.00
B1	0.13	305.80	48.30	0.00
B2	0.34	305.79	46.79	0.00
B5	0.05	305.80	47.30	0.00
B6	0.18	305.80	46.80	0.00
B7	0.22	305.79	44.79	0.00
B10	0.06	305.79	47.29	0.00

B12	0.12	305.79	46.79	0.00
B11	0.13	305.79	46.79	0.00
B9	0.16	305.79	47.79	0.00
B8	0.29	305.80	45.80	0.00
A10	0.22	305.76	43.86	0.00
A14	0.10	305.76	41.36	0.00
MC1	0.00	305.77	46.27	0.00

Node Results: (continued)

Node ID	Demand LPS	Head m	Pressure m	Quality	
MC2	0.00	305.77	41.77	0.00	
MC3	0.00	305.77	41.27	0.00	
MC4	0.00	305.77	49.77	0.00	
BWK1	1.03	305.77	48.77	0.00	
BWK2	0.35	305.77	49.27	0.00	
BWK3	0.00	305.77	50.27	0.00	
BWK4	0.12	305.77	43.47	0.00	
1	-4.09	305.80	0.00	0.00	Reservoir
4	-7.79	305.80	0.00	0.00	Reservoir

Link Results:

Link ID	Flow LPS	Velocity m/s	Unit Headloss m/km	Status
1	0.56	0.03	0.02	Open
2	0.57	0.03	0.02	Open
3	3.68	0.05	0.02	Open
4	1.96	0.06	0.04	Open
5	1.13	0.04	0.02	Open
6	0.50	0.03	0.02	Open
8	5.89	0.08	0.04	Open
10	0.25	0.01	0.00	Open
11	1.02	0.06	0.06	Open
12	2.79	0.09	0.08	Open
13	4.09	0.13	0.17	Open
9	3.96	0.06	0.02	Open
14	4.37	0.06	0.02	Open
15	4.02	0.06	0.02	Open
16	0.07	0.00	0.00	Open
17	0.00	0.00	0.00	Open
18	0.00	0.00	0.00	Open
19	-1.02	0.03	0.01	Open
21	0.49	0.02	0.00	Open
31	0.00	0.00	0.00	Open
7	7.79	0.11	0.06	Open

36	5.83	0.08	0.04	Open
37	4.49	0.06	0.02	Open
38	1.83	0.04	0.01	Open
39	1.78	0.06	0.04	Open
40	0.29	0.01	0.00	Open
41	1.31	0.04	0.02	Open
42	1.09	0.03	0.01	Open
43	-1.00	0.03	0.01	Open
44	0.84	0.03	0.01	Open
45	0.66	0.02	0.01	Open
46	0.53	0.02	0.00	Open

Link Results: (continued)

Link ID	Flow LPS	Velocity m/s	Unit Headloss m/km	Status
47	0.12	0.01	0.00	Open
22	0.32	0.01	0.00	Open
23	0.10	0.00	0.00	Open
20	-1.06	0.03	0.01	Open
24	-1.06	0.03	0.01	Open
25	-1.06	0.03	0.01	Open
26	-1.06	0.03	0.01	Open
27	-1.06	0.03	0.01	Open
32	4.40	0.06	0.02	Open
33	3.37	0.05	0.01	Open
34	3.02	0.04	0.01	Open
35	3.02	0.04	0.01	Open
48	3.33	0.05	0.01	Open
49	-0.43	0.02	0.01	Open

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*********************************************************************
*                          E P A N E T                              *
*                   Hydraulic and Water Quality                     *
*                   Analysis for Pipe Networks                      *
*                        Version 2.2                                *
*********************************************************************
```

Input File: 18010_Phase 1 - MCC + BWK - PHD.net

18010_Acorn Valley - Phase 1 Peak Hour Demand with Mill Court and Boardwalk Connection

Link - Node Table:

Link ID	Start Node	End Node	Length m	Diameter mm
1	T1	T5	270	150
2	T5	T6	290	150
3	T6	T4	115	300
4	T1	T2	160	200
5	T2	T3	95	200
6	T2	T4	405	150
8	B3	B4	166.59	300
10	T8	T5	90	150
11	T7	T8	405	150
12	T7	T1	245	200
13	1	T7	1	200
9	T4	A1	105	300
14	A1	A2	335	300
15	A2	A3	90	300
16	A3	A4	150	300
17	A4	A5	180	300
18	A2	A6	55	200
19	A1	A7	55	200
21	A1	A9	115	200
31	A2	A17A	45	300
7	4	B1	1	300
36	B1	B2	190	300
37	B2	B3	180	300
38	B1	B5	95	250
39	B5	B6	90	200
40	B6	B8	240	200
41	B6	B7	275	200
42	B7	B3	95	200
43	B9	B2	195	200
44	B9	B10	90	200
45	B10	B11	90	200
46	B11	B3	145	200
47	B10	B12	60	150
22	A9	A10	150	200

23	A10	A14	140	200
20	A7	MC1	60	200
24	MC1	MC2	160	200

Link - Node Table: (continued)

Link ID	Start Node	End Node	Length m	Diameter mm
25	MC2	MC3	70	200
26	MC3	MC4	120	200
27	MC4	T3	50	200
32	B4	BWK1	300	300
33	BWK1	BWK2	110	300
34	BWK2	BWK3	180	300
35	BWK3	BWK4	150	300
48	BWK4	T6	140	300
49	BWK4	T8	370	150

Node Results:

Node ID	Demand LPS	Head m	Pressure m	Quality
T2	0.99	305.59	45.79	0.00
T3	0.21	305.58	45.58	0.00
T1	0.81	305.64	47.64	0.00
T5	0.72	305.60	41.10	0.00
T6	0.66	305.55	44.05	0.00
T4	0.66	305.54	46.54	0.00
B3	0.66	305.71	45.51	0.00
B4	4.47	305.66	45.46	0.00
T7	0.84	305.80	48.30	0.00
T8	1.02	305.60	41.10	0.00
A1	0.36	305.52	47.82	0.00
A2	1.05	305.47	44.47	0.00
A5	0.00	305.45	46.60	0.00
A6	0.00	305.47	46.07	0.00
A7	0.12	305.53	47.23	0.00
A9	0.51	305.52	46.52	0.00
A17A	0.00	305.47	43.97	0.00
A3	11.85	305.45	43.95	0.00
A4	0.21	305.45	45.95	0.00
B1	0.39	305.80	48.30	0.00
B2	1.02	305.74	46.74	0.00
B5	0.15	305.79	47.29	0.00
B6	0.54	305.77	46.77	0.00
B7	0.66	305.72	44.72	0.00
B10	0.18	305.72	47.22	0.00

B12	0.36	305.72	46.72	0.00
B11	0.39	305.71	46.71	0.00
B9	0.48	305.73	47.73	0.00
B8	0.87	305.76	45.76	0.00
A10	0.66	305.52	43.62	0.00
A14	0.30	305.52	41.12	0.00
MC1	0.00	305.54	46.04	0.00

Node Results: (continued)

Node ID	Demand LPS	Head m	Pressure m	Quality	
MC2	0.00	305.55	41.55	0.00	
MC3	0.00	305.56	41.06	0.00	
MC4	0.00	305.57	49.57	0.00	
BWK1	3.09	305.61	48.61	0.00	
BWK2	1.05	305.60	49.10	0.00	
BWK3	0.00	305.58	50.08	0.00	
BWK4	0.36	305.57	43.27	0.00	
1	-12.27	305.80	0.00	0.00	Reservoir
4	-23.37	305.80	0.00	0.00	Reservoir

Link Results:

Link ID	Flow LPS	Velocity m/s	Unit Headloss m/km	Status
1	1.67	0.09	0.16	Open
2	1.71	0.10	0.16	Open
3	11.04	0.16	0.13	Open
4	5.88	0.19	0.33	Open
5	3.40	0.11	0.12	Open
6	1.49	0.08	0.13	Open
8	17.67	0.25	0.30	Open
10	0.76	0.04	0.04	Open
11	3.07	0.17	0.48	Open
12	8.36	0.27	0.64	Open
13	12.27	0.39	1.28	Open
9	11.87	0.17	0.14	Open
14	13.11	0.19	0.17	Open
15	12.06	0.17	0.15	Open
16	0.21	0.00	0.00	Open
17	0.00	0.00	0.00	Open
18	0.00	0.00	0.00	Open
19	-3.07	0.10	0.10	Open
21	1.47	0.05	0.03	Open
31	0.00	0.00	0.00	Open
7	23.37	0.33	0.50	Open

36	17.48	0.25	0.29	Open
37	13.47	0.19	0.18	Open
38	5.50	0.11	0.10	Open
39	5.35	0.17	0.28	Open
40	0.87	0.03	0.01	Open
41	3.94	0.13	0.16	Open
42	3.28	0.10	0.11	Open
43	-2.99	0.10	0.09	Open
44	2.51	0.08	0.07	Open
45	1.97	0.06	0.04	Open
46	1.58	0.05	0.03	Open

Link Results: (continued)

Link ID	Flow LPS	Velocity m/s	Unit Headloss m/km	Status
47	0.36	0.02	0.01	Open
22	0.96	0.03	0.01	Open
23	0.30	0.01	0.00	Open
20	-3.19	0.10	0.11	Open
24	-3.19	0.10	0.11	Open
25	-3.19	0.10	0.11	Open
26	-3.19	0.10	0.11	Open
27	-3.19	0.10	0.11	Open
32	13.20	0.19	0.18	Open
33	10.11	0.14	0.11	Open
34	9.06	0.13	0.09	Open
35	9.06	0.13	0.09	Open
48	9.99	0.14	0.10	Open
49	-1.29	0.07	0.10	Open

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******************************************************************
*                          E P A N E T                           *
*                   Hydraulic and Water Quality                  *
*                   Analysis for Pipe Networks                   *
*                         Version 2.2                            *
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Input File: 18010_Phase 1 - MCC + BWK - MDD.net

18010_Acorn Valley - Phase 1 Max Day Demand with Mill Court and Boardwalk Connection

Link - Node Table:

Link ID	Start Node	End Node	Length m	Diameter mm
1	T1	T5	270	150
2	T5	T6	290	150
3	T6	T4	115	300
4	T1	T2	160	200
5	T2	T3	95	200
6	T2	T4	405	150
8	B3	B4	166.59	300
10	T8	T5	90	150
11	T7	T8	405	150
12	T7	T1	245	200
13	1	T7	1	200
9	T4	A1	105	300
14	A1	A2	335	300
15	A2	A3	90	300
16	A3	A4	150	300
17	A4	A5	180	300
18	A2	A6	55	200
19	A1	A7	55	200
21	A1	A9	115	200
31	A2	A17A	45	300
7	4	B1	1	300
36	B1	B2	190	300
37	B2	B3	180	300
38	B1	B5	95	250
39	B5	B6	90	200
40	B6	B8	240	200
41	B6	B7	275	200
42	B7	B3	95	200
43	B9	B2	195	200
44	B9	B10	90	200
45	B10	B11	90	200
46	B11	B3	145	200
47	B10	B12	60	150
22	A9	A10	150	200

23	A10	A14	140	200
20	A7	MC1	60	200
24	MC1	MC2	160	200

Link - Node Table: (continued)

Link ID	Start Node	End Node	Length m	Diameter mm
25	MC2	MC3	70	200
26	MC3	MC4	120	200
27	MC4	T3	50	200
32	B4	BWK1	300	300
33	BWK1	BWK2	110	300
34	BWK2	BWK3	180	300
35	BWK3	BWK4	150	300
48	BWK4	T6	140	300
49	BWK4	T8	370	150

Node Results:

Node ID	Demand LPS	Head m	Pressure m	Quality
T2	0.66	305.70	45.90	0.00
T3	0.14	305.70	45.70	0.00
T1	0.54	305.73	47.73	0.00
T5	0.48	305.71	41.21	0.00
T6	0.44	305.68	44.18	0.00
T4	0.44	305.68	46.68	0.00
B3	0.44	305.76	45.56	0.00
B4	2.98	305.73	45.53	0.00
T7	0.56	305.80	48.30	0.00
T8	0.68	305.71	41.21	0.00
A1	0.24	305.67	47.97	0.00
A2	0.70	305.64	44.64	0.00
A5	0.00	305.64	46.79	0.00
A6	0.00	305.64	46.24	0.00
A7	0.08	305.67	47.37	0.00
A9	0.34	305.67	46.67	0.00
A17A	0.00	305.64	44.14	0.00
A3	7.90	305.64	44.14	0.00
A4	0.14	305.64	46.14	0.00
B1	0.26	305.80	48.30	0.00
B2	0.68	305.77	46.77	0.00
B5	0.10	305.80	47.30	0.00
B6	0.36	305.78	46.78	0.00
B7	0.44	305.76	44.76	0.00
B10	0.12	305.76	47.26	0.00

B12	0.24	305.76	46.76	0.00
B11	0.26	305.76	46.76	0.00
B9	0.32	305.76	47.76	0.00
B8	0.58	305.78	45.78	0.00
A10	0.44	305.67	43.77	0.00
A14	0.20	305.67	41.27	0.00
MC1	0.00	305.68	46.18	0.00

Node Results: (continued)

Node ID	Demand LPS	Head m	Pressure m	Quality	
MC2	0.00	305.68	41.68	0.00	
MC3	0.00	305.69	41.19	0.00	
MC4	0.00	305.69	49.69	0.00	
BWK1	2.06	305.71	48.71	0.00	
BWK2	0.70	305.70	49.20	0.00	
BWK3	0.00	305.70	50.20	0.00	
BWK4	0.24	305.69	43.39	0.00	
1	-8.18	305.80	0.00	0.00	Reservoir
4	-15.58	305.80	0.00	0.00	Reservoir

Link Results:

Link ID	Flow LPS	Velocity m/s	Unit Headloss m/km	Status
1	1.12	0.06	0.07	Open
2	1.14	0.06	0.08	Open
3	7.36	0.10	0.06	Open
4	3.92	0.12	0.16	Open
5	2.27	0.07	0.06	Open
6	0.99	0.06	0.06	Open
8	11.78	0.17	0.14	Open
10	0.50	0.03	0.02	Open
11	2.05	0.12	0.23	Open
12	5.58	0.18	0.30	Open
13	8.18	0.26	0.61	Open
9	7.91	0.11	0.07	Open
14	8.74	0.12	0.08	Open
15	8.04	0.11	0.07	Open
16	0.14	0.00	0.00	Open
17	0.00	0.00	0.00	Open
18	0.00	0.00	0.00	Open
19	-2.05	0.07	0.05	Open
21	0.98	0.03	0.01	Open
31	0.00	0.00	0.00	Open
7	15.58	0.22	0.24	Open

36	11.65	0.16	0.14	Open
37	8.98	0.13	0.09	Open
38	3.67	0.07	0.05	Open
39	3.57	0.11	0.13	Open
40	0.58	0.02	0.00	Open
41	2.63	0.08	0.07	Open
42	2.19	0.07	0.05	Open
43	-1.99	0.06	0.04	Open
44	1.67	0.05	0.03	Open
45	1.31	0.04	0.02	Open
46	1.05	0.03	0.01	Open

Link Results: (continued)

Link ID	Flow LPS	Velocity m/s	Unit Headloss m/km	Status
47	0.24	0.01	0.00	Open
22	0.64	0.02	0.01	Open
23	0.20	0.01	0.00	Open
20	-2.13	0.07	0.05	Open
24	-2.13	0.07	0.05	Open
25	-2.13	0.07	0.05	Open
26	-2.13	0.07	0.05	Open
27	-2.13	0.07	0.05	Open
32	8.80	0.12	0.08	Open
33	6.74	0.10	0.05	Open
34	6.04	0.09	0.04	Open
35	6.04	0.09	0.04	Open
48	6.66	0.09	0.05	Open
49	-0.86	0.05	0.05	Open

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*********************************************************************
*                          E P A N E T                              *
*                   Hydraulic and Water Quality                     *
*                   Analysis for Pipe Networks                      *
*                         Version 2.2                               *
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Input File: 18010_Phase 1 - MCC + BWK - MDD + FIRE.net

18010_Acorn Valley - Phase 1 Max Day Demand + Fire with Mill Court and Boardwalk Connection

Link - Node Table:

Link ID	Start Node	End Node	Length m	Diameter mm
1	T1	T5	270	150
2	T5	T6	290	150
3	T6	T4	115	300
4	T1	T2	160	200
5	T2	T3	95	200
6	T2	T4	405	150
8	B3	B4	166.59	300
10	T8	T5	90	150
11	T7	T8	405	150
12	T7	T1	245	200
13	1	T7	1	200
9	T4	A1	105	300
14	A1	A2	335	300
15	A2	A3	90	300
16	A3	A4	150	300
17	A4	A5	180	300
18	A2	A6	55	200
19	A1	A7	55	200
21	A1	A9	115	200
31	A2	A17A	45	300
7	4	B1	1	300
36	B1	B2	190	300
37	B2	B3	180	300
38	B1	B5	95	250
39	B5	B6	90	200
40	B6	B8	240	200
41	B6	B7	275	200
42	B7	B3	95	200
43	B9	B2	195	200
44	B9	B10	90	200
45	B10	B11	90	200
46	B11	B3	145	200
47	B10	B12	60	150
22	A9	A10	150	200

23	A10	A14	140	200
20	A7	MC1	60	200
24	MC1	MC2	160	200

Link - Node Table: (continued)

Link ID	Start Node	End Node	Length m	Diameter mm
25	MC2	MC3	70	200
26	MC3	MC4	120	200
27	MC4	T3	50	200
32	B4	BWK1	300	300
33	BWK1	BWK2	110	300
34	BWK2	BWK3	180	300
35	BWK3	BWK4	150	300
48	BWK4	T6	140	300
49	BWK4	T8	370	150

Node Results:

Node ID	Demand LPS	Head m	Pressure m	Quality
T2	0.66	303.52	43.72	0.00
T3	0.14	303.32	43.32	0.00
T1	0.54	304.21	46.21	0.00
T5	0.48	303.88	39.38	0.00
T6	0.44	303.00	41.50	0.00
T4	0.44	302.64	43.64	0.00
B3	0.44	305.25	45.05	0.00
B4	2.98	304.85	44.65	0.00
T7	0.56	305.79	48.29	0.00
T8	0.68	303.94	39.44	0.00
A1	0.24	302.26	44.56	0.00
A2	0.70	302.23	41.23	0.00
A5	0.00	302.22	43.37	0.00
A6	0.00	302.23	42.83	0.00
A7	0.08	302.37	44.07	0.00
A9	0.34	297.97	38.97	0.00
A17A	0.00	302.23	40.73	0.00
A3	7.90	302.22	40.72	0.00
A4	0.14	302.22	42.72	0.00
B1	0.26	305.80	48.30	0.00
B2	0.68	305.47	46.47	0.00
B5	0.10	305.76	47.26	0.00
B6	0.36	305.64	46.64	0.00
B7	0.44	305.34	44.34	0.00
B10	0.12	305.33	46.83	0.00

B12	0.24	305.33	46.33	0.00
B11	0.26	305.30	46.30	0.00
B9	0.32	305.37	47.37	0.00
B8	0.58	305.64	45.64	0.00
A10	0.44	292.42	30.52	0.00
A14	74.50	287.30	22.90	0.00
MC1	0.00	302.49	42.99	0.00

Node Results: (continued)

Node ID	Demand LPS	Head m	Pressure m	Quality	
MC2	0.00	302.82	38.82	0.00	
MC3	0.00	302.97	38.47	0.00	
MC4	0.00	303.22	47.22	0.00	
BWK1	2.06	304.20	47.20	0.00	
BWK2	0.70	303.98	47.48	0.00	
BWK3	0.00	303.63	48.13	0.00	
BWK4	0.24	303.33	41.03	0.00	
1	-40.02	305.80	0.00	0.00	Reservoir
4	-58.04	305.80	0.00	0.00	Reservoir

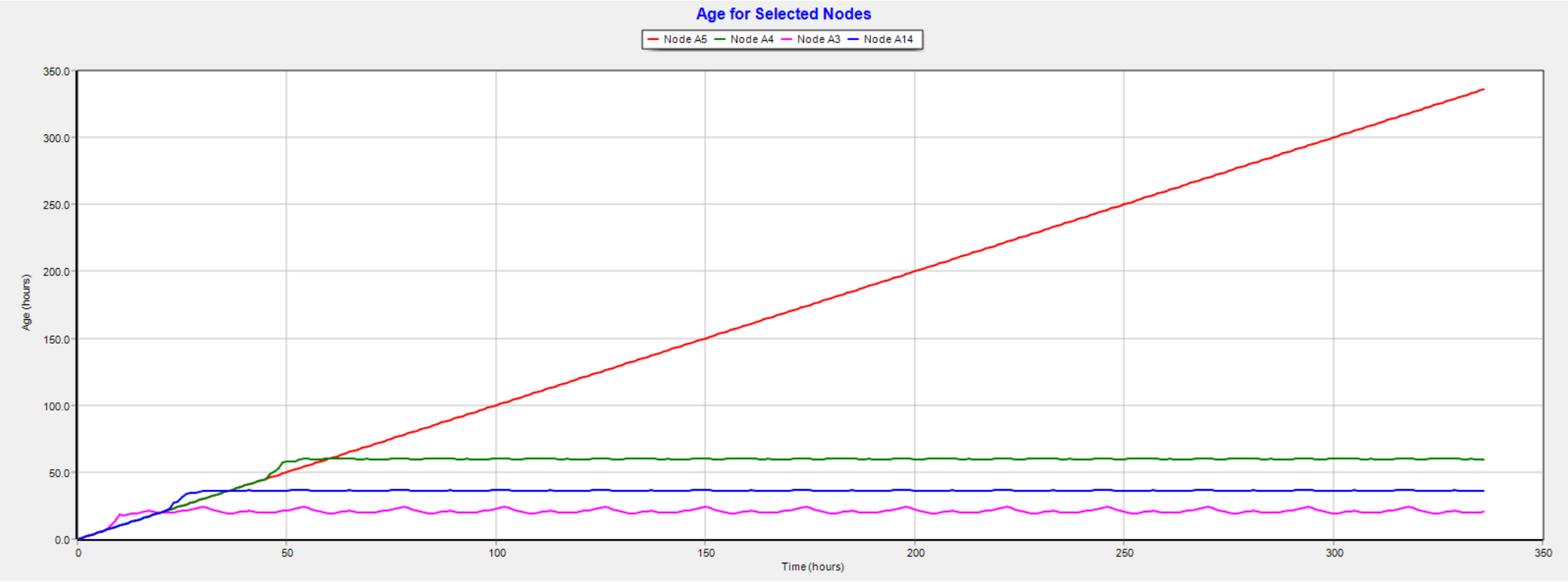
Link Results:

Link ID	Flow LPS	Velocity m/s	Unit Headloss m/km	Status
1	5.09	0.29	1.23	Open
2	8.30	0.47	3.04	Open
3	62.07	0.88	3.08	Open
4	23.51	0.75	4.32	Open
5	15.95	0.51	2.11	Open
6	6.91	0.39	2.17	Open
8	54.24	0.77	2.40	Open
10	3.69	0.21	0.68	Open
11	10.32	0.58	4.56	Open
12	29.14	0.93	6.43	Open
13	40.02	1.27	11.57	Open
9	68.53	0.97	3.70	Open
14	8.74	0.12	0.08	Open
15	8.04	0.11	0.07	Open
16	0.14	0.00	0.00	Open
17	0.00	0.00	0.00	Open
18	0.00	0.00	0.00	Open
19	-15.73	0.50	2.05	Open
21	75.28	2.40	37.30	Open
31	0.00	0.00	0.00	Open
7	58.04	0.82	2.72	Open

36	45.56	0.64	1.74	Open
37	37.74	0.53	1.23	Open
38	12.21	0.25	0.43	Open
39	12.11	0.39	1.27	Open
40	0.58	0.02	0.00	Open
41	11.17	0.36	1.09	Open
42	10.73	0.34	1.01	Open
43	-7.14	0.23	0.48	Open
44	6.82	0.22	0.44	Open
45	6.46	0.21	0.40	Open
46	6.20	0.20	0.37	Open

Link Results: (continued)

Link ID	Flow LPS	Velocity m/s	Unit Headloss m/km	Status
47	0.24	0.01	0.00	Open
22	74.94	2.39	36.98	Open
23	74.50	2.37	36.58	Open
20	-15.81	0.50	2.07	Open
24	-15.81	0.50	2.07	Open
25	-15.81	0.50	2.07	Open
26	-15.81	0.50	2.07	Open
27	-15.81	0.50	2.07	Open
32	51.26	0.73	2.16	Open
33	49.20	0.70	2.00	Open
34	48.50	0.69	1.95	Open
35	48.50	0.69	1.95	Open
48	54.21	0.77	2.40	Open
49	-5.95	0.34	1.64	Open


Age for Selected Nodes
Node A5
Node A4
Node A3
Node A14
350.0
300.0
250.0
200.0
150.0
100.0
50.0
0.0
Age (hours)
0
50
100
150
200
250
300
350
Time (hours)

```
*********************************************************************
*                          E P A N E T                              *
*                   Hydraulic and Water Quality                     *
*                   Analysis for Pipe Networks                      *
*                         Version 2.2                               *
*********************************************************************
```

Input File: 18010_Phase 1-3 + North - MCC + BWK - ADD.net

18010_Acorn Valley - Phase 1-3 + North Average Day Demand with Mill Court and Boardwalk Connection

Link - Node Table:

Link ID	Start Node	End Node	Length m	Diameter mm
1	T1	T5	270	150
2	T5	T6	290	150
3	T6	T4	115	300
4	T1	T2	160	200
5	T2	T3	95	200
6	T2	T4	405	150
8	B3	B4	166.59	300
10	T8	T5	90	150
11	T7	T8	405	150
12	T7	T1	245	200
13	1	T7	1	200
9	T4	A1	105	300
14	A1	A2	335	300
15	A2	A3	90	300
16	A3	A4	150	300
17	A4	A5	180	300
18	A2	A6	55	200
19	A1	A7	55	200
20	T4	A8	200	200
21	A1	A9	115	200
22	A9	A10	150	200
23	A10	A14	140	200
27	A13	A17	90	150
28	A13	A12	60	150
29	A14	A15	85	200
30	A15	A16	65	200
31	A2	A17	90	300
32	A17	A18	175	300
33	A18	A19	225.21	300
35	A15	A21	60	150
7	4	B1	1	300
36	B1	B2	190	300
37	B2	B3	180	300
38	B1	B5	95	250

39	B5	B6	90	200
40	B6	B8	240	200
41	B6	B7	275	200

Link - Node Table: (continued)

Link ID	Start Node	End Node	Length m	Diameter mm
42	B7	B3	95	200
43	B9	B2	195	200
44	B9	B10	90	200
45	B10	B11	90	200
46	B11	B3	145	200
47	B10	B12	60	150
24	A12	A14	100	150
25	A13	A11	70	50
26	A11	A12	70	50
34	A7	MC1	60	200
48	MC1	MC2	160	200
49	MC2	MC3	70	200
50	MC3	MC4	120	200
51	MC4	T3	50	200
55	B4	BWK1	300	300
56	BWK1	BWK2	110	300
57	BWK2	BWK3	180	300
58	BWK3	BWK4	150	300
59	BWK4	T6	140	300
60	BWK4	T8	370	150

Node Results:

Node ID	Demand LPS	Head m	Pressure m	Quality
T2	0.33	305.71	45.91	0.00
T3	0.07	305.70	45.70	0.00
T1	0.27	305.73	47.73	0.00
T5	0.24	305.72	41.22	0.00
T6	0.22	305.69	44.19	0.00
T4	0.22	305.68	46.68	0.00
B3	0.22	305.77	45.57	0.00
B4	1.49	305.75	45.55	0.00
T7	0.28	305.80	48.30	0.00
T8	0.34	305.72	41.22	0.00
A1	0.12	305.67	47.97	0.00
A2	0.35	305.64	44.64	0.00
A5	0.00	305.64	46.79	0.00
A6	4.74	305.63	46.23	0.00

A7	1.86	305.67	47.37	0.00
A9	0.17	305.66	46.66	0.00
A17	0.16	305.64	43.14	0.00
A13	0.07	305.64	43.44	0.00
A3	3.95	305.64	44.14	0.00
A10	0.22	305.66	43.76	0.00
A14	0.19	305.65	41.25	0.00

Node Results: (continued)

Node ID	Demand LPS	Head m	Pressure m	Quality	
A19	0.13	305.64	38.64	0.00	
A15	0.06	305.65	40.75	0.00	
A16	0.10	305.65	40.65	0.00	
A21	0.00	305.65	41.65	0.00	
A8	0.28	305.68	49.18	0.00	
A4	0.07	305.64	46.14	0.00	
A18	0.21	305.64	39.94	0.00	
B1	0.13	305.80	48.30	0.00	
B2	0.34	305.78	46.78	0.00	
B5	0.05	305.80	47.30	0.00	
B6	0.18	305.79	46.79	0.00	
B7	0.22	305.78	44.78	0.00	
B10	0.06	305.77	47.27	0.00	
B12	0.12	305.77	46.77	0.00	
B11	0.13	305.77	46.77	0.00	
B9	0.16	305.78	47.78	0.00	
B8	0.29	305.79	45.79	0.00	
A11	0.15	305.64	43.14	0.00	
A12	0.09	305.65	42.65	0.00	
MC1	0.00	305.67	46.17	0.00	
MC2	0.00	305.68	41.68	0.00	
MC3	0.00	305.69	41.19	0.00	
MC4	0.00	305.70	49.70	0.00	
BWK1	1.03	305.73	48.73	0.00	
BWK2	0.35	305.72	49.22	0.00	
BWK3	0.00	305.71	50.21	0.00	
BWK4	0.12	305.70	43.40	0.00	
1	-7.47	305.80	0.00	0.00	Reservoir
4	-12.31	305.80	0.00	0.00	Reservoir

Link Results:

Link ID	Flow LPS	Velocity m/s	Unit Headloss m/km	Status
1	0.97	0.05	0.06	Open

2	1.32	0.07	0.10	Open
3	9.49	0.13	0.09	Open
4	4.05	0.13	0.17	Open
5	2.63	0.08	0.07	Open
6	1.10	0.06	0.07	Open
8	10.41	0.15	0.11	Open
10	0.59	0.03	0.02	Open
11	1.90	0.11	0.20	Open
12	5.29	0.17	0.27	Open
13	7.47	0.24	0.50	Open
9	10.08	0.14	0.11	Open

Link Results: (continued)

Link ID	Flow LPS	Velocity m/s	Unit Headloss m/km	Status
14	8.79	0.12	0.08	Open
15	4.02	0.06	0.02	Open
16	0.07	0.00	0.00	Open
17	0.00	0.00	0.00	Open
18	4.74	0.15	0.22	Open
19	-0.70	0.02	0.01	Open
20	0.28	0.01	0.00	Open
21	1.87	0.06	0.04	Open
22	1.70	0.05	0.03	Open
23	1.48	0.05	0.03	Open
27	0.82	0.05	0.04	Open
28	-0.95	0.05	0.05	Open
29	0.16	0.01	0.00	Open
30	0.10	0.00	0.00	Open
31	-0.32	0.00	0.00	Open
32	0.34	0.00	0.00	Open
33	0.13	0.00	0.00	Open
35	0.00	0.00	0.00	Open
7	12.31	0.17	0.15	Open
36	9.44	0.13	0.09	Open
37	7.55	0.11	0.06	Open
38	2.75	0.06	0.03	Open
39	2.70	0.09	0.08	Open
40	0.29	0.01	0.00	Open
41	2.23	0.07	0.05	Open
42	2.01	0.06	0.05	Open
43	-1.55	0.05	0.03	Open
44	1.39	0.04	0.02	Open
45	1.21	0.04	0.02	Open
46	1.08	0.03	0.01	Open
47	0.12	0.01	0.00	Open
24	-1.13	0.06	0.08	Open

25	0.07	0.03	0.08	Open
26	-0.08	0.04	0.13	Open
34	-2.56	0.08	0.07	Open
48	-2.56	0.08	0.07	Open
49	-2.56	0.08	0.07	Open
50	-2.56	0.08	0.07	Open
51	-2.56	0.08	0.07	Open
55	8.92	0.13	0.08	Open
56	7.89	0.11	0.07	Open
57	7.54	0.11	0.06	Open
58	7.54	0.11	0.06	Open
59	8.39	0.12	0.08	Open
60	-0.96	0.05	0.06	Open

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******************************************************************
*                          E P A N E T                           *
*                   Hydraulic and Water Quality                  *
*                   Analysis for Pipe Networks                   *
*                         Version 2.2                            *
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Input File: 18010_Phase 1-3 + North - MCC + BWK - PHD.net

18010_Acorn Valley - Phase 1-3 + North Peak Hour Demand with Mill Court and Boardwalk Connection

Link - Node Table:

Link ID	Start Node	End Node	Length m	Diameter mm
1	T1	T5	270	150
2	T5	T6	290	150
3	T6	T4	115	300
4	T1	T2	160	200
5	T2	T3	95	200
6	T2	T4	405	150
8	B3	B4	166.59	300
10	T8	T5	90	150
11	T7	T8	405	150
12	T7	T1	245	200
13	1	T7	1	200
9	T4	A1	105	300
14	A1	A2	335	300
15	A2	A3	90	300
16	A3	A4	150	300
17	A4	A5	180	300
18	A2	A6	55	200
19	A1	A7	55	200
20	T4	A8	200	200
21	A1	A9	115	200
22	A9	A10	150	200
23	A10	A14	140	200
27	A13	A17	90	150
28	A13	A12	60	150
29	A14	A15	85	200
30	A15	A16	65	200
31	A2	A17	90	300
32	A17	A18	175	300
33	A18	A19	225.21	300
35	A15	A21	60	150
7	4	B1	1	300
36	B1	B2	190	300
37	B2	B3	180	300
38	B1	B5	95	250

39	B5	B6	90	200
40	B6	B8	240	200
41	B6	B7	275	200

Link - Node Table: (continued)

Link ID	Start Node	End Node	Length m	Diameter mm
42	B7	B3	95	200
43	B9	B2	195	200
44	B9	B10	90	200
45	B10	B11	90	200
46	B11	B3	145	200
47	B10	B12	60	150
24	A12	A14	100	150
25	A13	A11	70	50
26	A11	A12	70	50
34	A7	MC1	60	200
48	MC1	MC2	160	200
49	MC2	MC3	70	200
50	MC3	MC4	120	200
51	MC4	T3	50	200
55	B4	BWK1	300	300
56	BWK1	BWK2	110	300
57	BWK2	BWK3	180	300
58	BWK3	BWK4	150	300
59	BWK4	T6	140	300
60	BWK4	T8	370	150

Node Results:

Node ID	Demand LPS	Head m	Pressure m	Quality
T2	0.99	305.08	45.28	0.00
T3	0.21	305.03	45.03	0.00
T1	0.81	305.28	47.28	0.00
T5	0.72	305.17	40.67	0.00
T6	0.66	304.94	43.44	0.00
T4	0.66	304.86	45.86	0.00
B3	0.66	305.58	45.38	0.00
B4	4.47	305.43	45.23	0.00
T7	0.84	305.80	48.30	0.00
T8	1.02	305.18	40.68	0.00
A1	0.36	304.77	47.07	0.00
A2	1.05	304.56	43.56	0.00
A5	0.00	304.55	45.70	0.00
A6	14.22	304.47	45.07	0.00

A7	5.58	304.78	46.48	0.00
A9	0.51	304.74	45.74	0.00
A17	0.48	304.56	42.06	0.00
A13	0.21	304.59	42.39	0.00
A3	11.85	304.55	43.05	0.00
A10	0.66	304.70	42.80	0.00
A14	0.57	304.67	40.27	0.00

Node Results: (continued)

Node ID	Demand LPS	Head m	Pressure m	Quality	
A19	0.39	304.56	37.56	0.00	
A15	0.18	304.67	39.77	0.00	
A16	0.30	304.67	39.67	0.00	
A21	0.00	304.67	40.67	0.00	
A8	0.84	304.86	48.36	0.00	
A4	0.21	304.55	45.05	0.00	
A18	0.63	304.56	38.86	0.00	
B1	0.39	305.80	48.30	0.00	
B2	1.02	305.66	46.66	0.00	
B5	0.15	305.78	47.28	0.00	
B6	0.54	305.72	46.72	0.00	
B7	0.66	305.61	44.61	0.00	
B10	0.18	305.60	47.10	0.00	
B12	0.36	305.60	46.60	0.00	
B11	0.39	305.59	46.59	0.00	
B9	0.48	305.62	47.62	0.00	
B8	0.87	305.72	45.72	0.00	
A11	0.45	304.55	42.05	0.00	
A12	0.27	304.62	41.62	0.00	
MC1	0.00	304.81	45.31	0.00	
MC2	0.00	304.90	40.90	0.00	
MC3	0.00	304.93	40.43	0.00	
MC4	0.00	305.00	49.00	0.00	
BWK1	3.09	305.24	48.24	0.00	
BWK2	1.05	305.18	48.68	0.00	
BWK3	0.00	305.10	49.60	0.00	
BWK4	0.36	305.02	42.72	0.00	
1	-22.40	305.80	0.00	0.00	Reservoir
4	-36.94	305.80	0.00	0.00	Reservoir

Link Results:

Link ID	Flow LPS	Velocity m/s	Unit Headloss m/km	Status
1	2.90	0.16	0.43	Open

2	3.96	0.22	0.77	Open
3	28.46	0.40	0.73	Open
4	12.16	0.39	1.27	Open
5	7.88	0.25	0.57	Open
6	3.29	0.19	0.55	Open
8	31.24	0.44	0.86	Open
10	1.78	0.10	0.18	Open
11	5.69	0.32	1.51	Open
12	15.87	0.51	2.09	Open
13	22.40	0.71	3.94	Open
9	30.25	0.43	0.81	Open

Link Results: (continued)

Link ID	Flow LPS	Velocity m/s	Unit Headloss m/km	Status
14	26.38	0.37	0.63	Open
15	12.06	0.17	0.15	Open
16	0.21	0.00	0.00	Open
17	0.00	0.00	0.00	Open
18	14.22	0.45	1.70	Open
19	-2.09	0.07	0.05	Open
20	0.84	0.03	0.01	Open
21	5.60	0.18	0.30	Open
22	5.09	0.16	0.25	Open
23	4.43	0.14	0.20	Open
27	2.45	0.14	0.32	Open
28	-2.85	0.16	0.42	Open
29	0.48	0.02	0.00	Open
30	0.30	0.01	0.00	Open
31	-0.95	0.01	0.00	Open
32	1.02	0.01	0.00	Open
33	0.39	0.01	0.00	Open
35	0.00	0.00	0.00	Open
7	36.94	0.52	1.17	Open
36	28.31	0.40	0.72	Open
37	22.64	0.32	0.48	Open
38	8.24	0.17	0.21	Open
39	8.09	0.26	0.60	Open
40	0.87	0.03	0.01	Open
41	6.68	0.21	0.42	Open
42	6.02	0.19	0.35	Open
43	-4.64	0.15	0.21	Open
44	4.16	0.13	0.18	Open
45	3.62	0.12	0.14	Open
46	3.23	0.10	0.11	Open
47	0.36	0.02	0.01	Open
24	-3.38	0.19	0.58	Open

25	0.20	0.10	0.63	Open
26	-0.25	0.13	0.99	Open
34	-7.67	0.24	0.54	Open
48	-7.67	0.24	0.54	Open
49	-7.67	0.24	0.54	Open
50	-7.67	0.24	0.54	Open
51	-7.67	0.24	0.54	Open
55	26.77	0.38	0.65	Open
56	23.68	0.33	0.52	Open
57	22.63	0.32	0.48	Open
58	22.63	0.32	0.48	Open
59	25.16	0.36	0.58	Open
60	-2.89	0.16	0.43	Open

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******************************************************************
*                          E P A N E T                           *
*                   Hydraulic and Water Quality                  *
*                   Analysis for Pipe Networks                   *
*                         Version 2.2                            *
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Input File: 18010_Phase 1-3 + North - MCC + BWK - MDD.net

18010_Acorn Valley - Phase 1-3 + North Max Day Demand with Mill Court and Boardwalk Connection

Link - Node Table:

Link ID	Start Node	End Node	Length m	Diameter mm
1	T1	T5	270	150
2	T5	T6	290	150
3	T6	T4	115	300
4	T1	T2	160	200
5	T2	T3	95	200
6	T2	T4	405	150
8	B3	B4	166.59	300
10	T8	T5	90	150
11	T7	T8	405	150
12	T7	T1	245	200
13	1	T7	1	200
9	T4	A1	105	300
14	A1	A2	335	300
15	A2	A3	90	300
16	A3	A4	150	300
17	A4	A5	180	300
18	A2	A6	55	200
19	A1	A7	55	200
20	T4	A8	200	200
21	A1	A9	115	200
22	A9	A10	150	200
23	A10	A14	140	200
27	A13	A17	90	150
28	A13	A12	60	150
29	A14	A15	85	200
30	A15	A16	65	200
31	A2	A17	90	300
32	A17	A18	175	300
33	A18	A19	225.21	300
35	A15	A21	60	150
7	4	B1	1	300
36	B1	B2	190	300
37	B2	B3	180	300
38	B1	B5	95	250

39	B5	B6	90	200
40	B6	B8	240	200
41	B6	B7	275	200

Link - Node Table: (continued)

Link ID	Start Node	End Node	Length m	Diameter mm
42	B7	B3	95	200
43	B9	B2	195	200
44	B9	B10	90	200
45	B10	B11	90	200
46	B11	B3	145	200
47	B10	B12	60	150
24	A12	A14	100	150
25	A13	A11	70	50
26	A11	A12	70	50
34	A7	MC1	60	200
48	MC1	MC2	160	200
49	MC2	MC3	70	200
50	MC3	MC4	120	200
51	MC4	T3	50	200
55	B4	BWK1	300	300
56	BWK1	BWK2	110	300
57	BWK2	BWK3	180	300
58	BWK3	BWK4	150	300
59	BWK4	T6	140	300
60	BWK4	T8	370	150

Node Results:

Node ID	Demand LPS	Head m	Pressure m	Quality
T2	0.66	305.46	45.66	0.00
T3	0.14	305.43	45.43	0.00
T1	0.54	305.56	47.56	0.00
T5	0.48	305.50	41.00	0.00
T6	0.44	305.40	43.90	0.00
T4	0.44	305.36	46.36	0.00
B3	0.44	305.69	45.49	0.00
B4	2.98	305.63	45.43	0.00
T7	0.56	305.80	48.30	0.00
T8	0.68	305.51	41.01	0.00
A1	0.24	305.32	47.62	0.00
A2	0.70	305.22	44.22	0.00
A5	0.00	305.21	46.36	0.00
A6	9.48	305.17	45.77	0.00

A7	3.72	305.32	47.02	0.00
A9	0.34	305.30	46.30	0.00
A17	0.32	305.22	42.72	0.00
A13	0.14	305.23	43.03	0.00
A3	7.90	305.21	43.71	0.00
A10	0.44	305.28	43.38	0.00
A14	0.38	305.27	40.87	0.00

Node Results: (continued)

Node ID	Demand LPS	Head m	Pressure m	Quality	
A19	0.26	305.22	38.22	0.00	
A15	0.12	305.27	40.37	0.00	
A16	0.20	305.27	40.27	0.00	
A21	0.00	305.27	41.27	0.00	
A8	0.56	305.36	48.86	0.00	
A4	0.14	305.21	45.71	0.00	
A18	0.42	305.22	39.52	0.00	
B1	0.26	305.80	48.30	0.00	
B2	0.68	305.73	46.73	0.00	
B5	0.10	305.79	47.29	0.00	
B6	0.36	305.76	46.76	0.00	
B7	0.44	305.71	44.71	0.00	
B10	0.12	305.71	47.21	0.00	
B12	0.24	305.71	46.71	0.00	
B11	0.26	305.70	46.70	0.00	
B9	0.32	305.72	47.72	0.00	
B8	0.58	305.76	45.76	0.00	
A11	0.30	305.21	42.71	0.00	
A12	0.18	305.24	42.24	0.00	
MC1	0.00	305.33	45.83	0.00	
MC2	0.00	305.37	41.37	0.00	
MC3	0.00	305.39	40.89	0.00	
MC4	0.00	305.42	49.42	0.00	
BWK1	2.06	305.53	48.53	0.00	
BWK2	0.70	305.51	49.01	0.00	
BWK3	0.00	305.47	49.97	0.00	
BWK4	0.24	305.43	43.13	0.00	
1	-14.93	305.80	0.00	0.00	Reservoir
4	-24.63	305.80	0.00	0.00	Reservoir

Link Results:

Link ID	Flow LPS	Velocity m/s	Unit Headloss m/km	Status
1	1.93	0.11	0.21	Open

2	2.64	0.15	0.37	Open
3	18.97	0.27	0.34	Open
4	8.11	0.26	0.60	Open
5	5.26	0.17	0.27	Open
6	2.19	0.12	0.26	Open
8	20.83	0.29	0.41	Open
10	1.19	0.07	0.08	Open
11	3.79	0.21	0.71	Open
12	10.58	0.34	0.98	Open
13	14.93	0.48	1.86	Open
9	20.16	0.29	0.38	Open

Link Results: (continued)

Link ID	Flow LPS	Velocity m/s	Unit Headloss m/km	Status
14	17.59	0.25	0.30	Open
15	8.04	0.11	0.07	Open
16	0.14	0.00	0.00	Open
17	0.00	0.00	0.00	Open
18	9.48	0.30	0.80	Open
19	-1.40	0.04	0.02	Open
20	0.56	0.02	0.00	Open
21	3.73	0.12	0.14	Open
22	3.39	0.11	0.12	Open
23	2.95	0.09	0.09	Open
27	1.63	0.09	0.15	Open
28	-1.90	0.11	0.20	Open
29	0.32	0.01	0.00	Open
30	0.20	0.01	0.00	Open
31	-0.63	0.01	0.00	Open
32	0.68	0.01	0.00	Open
33	0.26	0.00	0.00	Open
35	0.00	0.00	0.00	Open
7	24.63	0.35	0.56	Open
36	18.87	0.27	0.34	Open
37	15.09	0.21	0.22	Open
38	5.50	0.11	0.10	Open
39	5.40	0.17	0.28	Open
40	0.58	0.02	0.00	Open
41	4.46	0.14	0.20	Open
42	4.02	0.13	0.16	Open
43	-3.10	0.10	0.10	Open
44	2.78	0.09	0.08	Open
45	2.42	0.08	0.06	Open
46	2.16	0.07	0.05	Open
47	0.24	0.01	0.00	Open
24	-2.25	0.13	0.27	Open

25	0.13	0.07	0.30	Open
26	-0.17	0.09	0.47	Open
34	-5.12	0.16	0.26	Open
48	-5.12	0.16	0.26	Open
49	-5.12	0.16	0.26	Open
50	-5.12	0.16	0.26	Open
51	-5.12	0.16	0.26	Open
55	17.85	0.25	0.31	Open
56	15.79	0.22	0.24	Open
57	15.09	0.21	0.22	Open
58	15.09	0.21	0.22	Open
59	16.77	0.24	0.27	Open
60	-1.93	0.11	0.20	Open

```
*********************************************************************
*                            E P A N E T                            *
*                     Hydraulic and Water Quality                   *
*                     Analysis for Pipe Networks                    *
*                          Version 2.2                              *
*********************************************************************
```

Input File: 18010_Phase 1-3 + North - MCC + BWK - MDD + FIRE.net

18010_Acorn Valley - Phase 1-3 + North Max Day Demand + Fire with Mill Court and Boardwalk Connection

Link - Node Table:

Link ID	Start Node	End Node	Length m	Diameter mm
1	T1	T5	270	150
2	T5	T6	290	150
3	T6	T4	115	300
4	T1	T2	160	200
5	T2	T3	95	200
6	T2	T4	405	150
8	B3	B4	166.59	300
10	T8	T5	90	150
11	T7	T8	405	150
12	T7	T1	245	200
13	1	T7	1	200
9	T4	A1	105	300
14	A1	A2	335	300
15	A2	A3	90	300
16	A3	A4	150	300
17	A4	A5	180	300
18	A2	A6	55	200
19	A1	A7	55	200
20	T4	A8	200	200
21	A1	A9	115	200
22	A9	A10	150	200
23	A10	A14	140	200
27	A13	A17	90	150
28	A13	A12	60	150
29	A14	A15	85	200
30	A15	A16	65	200
31	A2	A17	90	300
32	A17	A18	175	300
33	A18	A19	225.21	300
35	A15	A21	60	150
7	4	B1	1	300
36	B1	B2	190	300
37	B2	B3	180	300
38	B1	B5	95	250

39	B5	B6	90	200
40	B6	B8	240	200
41	B6	B7	275	200

Link - Node Table: (continued)

Link ID	Start Node	End Node	Length m	Diameter mm
42	B7	B3	95	200
43	B9	B2	195	200
44	B9	B10	90	200
45	B10	B11	90	200
46	B11	B3	145	200
47	B10	B12	60	150
24	A12	A14	100	150
25	A13	A11	70	50
26	A11	A12	70	50
34	A7	MC1	60	200
48	MC1	MC2	160	200
49	MC2	MC3	70	200
50	MC3	MC4	120	200
51	MC4	T3	50	200
55	B4	BWK1	300	300
56	BWK1	BWK2	110	300
57	BWK2	BWK3	180	300
58	BWK3	BWK4	150	300
59	BWK4	T6	140	300
60	BWK4	T8	370	150

Node Results:

Node ID	Demand LPS	Head m	Pressure m	Quality
T2	0.66	298.23	38.43	0.00
T3	0.14	297.53	37.53	0.00
T1	0.54	300.58	42.58	0.00
T5	0.48	299.53	35.03	0.00
T6	0.44	296.47	34.97	0.00
T4	0.44	295.22	36.22	0.00
B3	0.44	304.10	43.90	0.00
B4	2.98	302.83	42.63	0.00
T7	0.56	305.76	48.26	0.00
T8	0.68	299.74	35.24	0.00
A1	0.24	293.85	36.15	0.00
A2	0.70	289.21	28.21	0.00
A5	0.00	289.20	30.35	0.00
A6	9.48	289.16	29.76	0.00

A7	3.72	294.17	35.87	0.00
A9	0.34	293.40	34.40	0.00
A17	0.32	288.24	25.74	0.00
A13	0.14	289.68	27.48	0.00
A3	7.90	289.20	27.70	0.00
A10	0.44	292.82	30.92	0.00
A14	0.38	292.30	27.90	0.00

Node Results: (continued)

Node ID	Demand LPS	Head m	Pressure m	Quality	
A19	141.26	282.57	15.57	0.00	
A15	0.12	292.30	27.40	0.00	
A16	0.20	292.30	27.30	0.00	
A21	0.00	292.30	28.30	0.00	
A8	0.56	295.22	38.72	0.00	
A4	0.14	289.20	29.70	0.00	
A18	0.42	285.75	20.05	0.00	
B1	0.26	305.79	48.29	0.00	
B2	0.68	304.79	45.79	0.00	
B5	0.10	305.67	47.17	0.00	
B6	0.36	305.34	46.34	0.00	
B7	0.44	304.41	43.41	0.00	
B10	0.12	304.39	45.89	0.00	
B12	0.24	304.39	45.39	0.00	
B11	0.26	304.28	45.28	0.00	
B9	0.32	304.51	46.51	0.00	
B8	0.58	305.34	45.34	0.00	
A11	0.30	289.96	27.46	0.00	
A12	0.18	290.61	27.61	0.00	
MC1	0.00	294.61	35.11	0.00	
MC2	0.00	295.78	31.78	0.00	
MC3	0.00	296.29	31.79	0.00	
MC4	0.00	297.17	41.17	0.00	
BWK1	2.06	300.67	43.67	0.00	
BWK2	0.70	299.91	43.41	0.00	
BWK3	0.00	298.68	43.18	0.00	
BWK4	0.24	297.65	35.35	0.00	
1	-75.55	305.80	0.00	0.00	Reservoir
4	-105.01	305.80	0.00	0.00	Reservoir

Link Results:

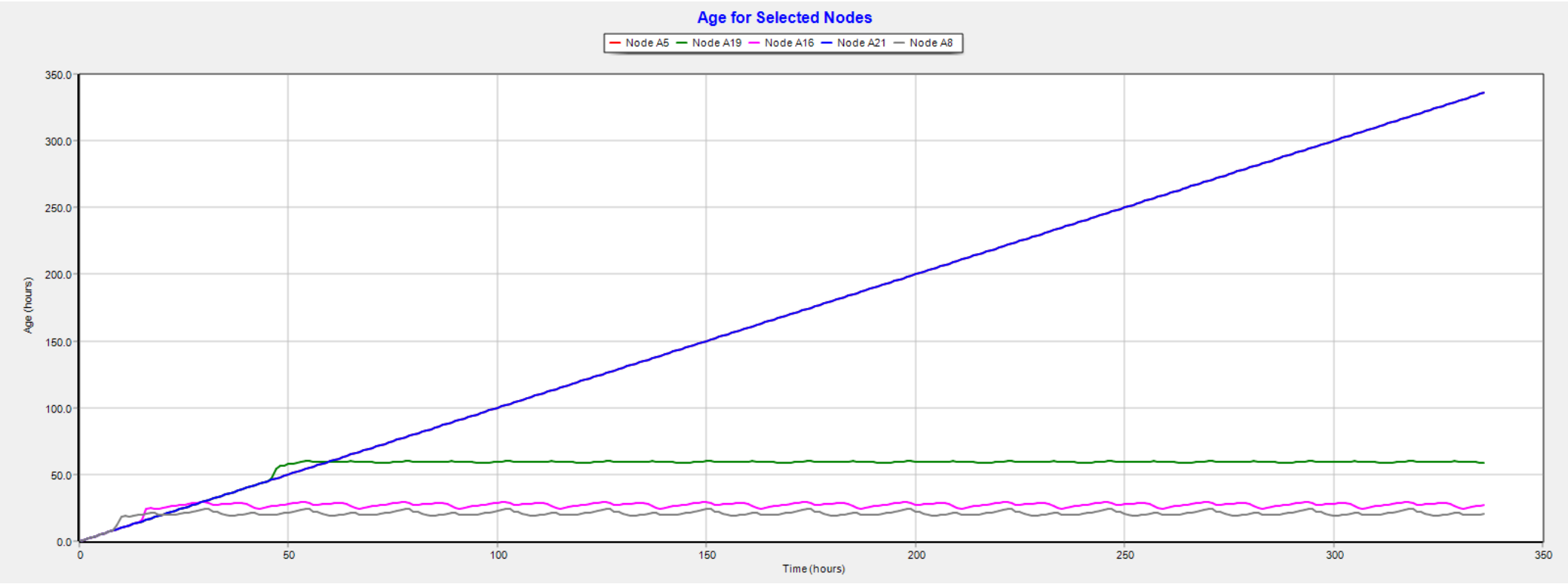
Link ID	Flow LPS	Velocity m/s	Unit Headloss m/km	Status
1	9.46	0.54	3.88	Open

2	16.24	0.92	10.55	Open
3	122.62	1.73	10.87	Open
4	45.46	1.45	14.65	Open
5	31.35	1.00	7.36	Open
6	13.44	0.76	7.44	Open
8	101.21	1.43	7.62	Open
10	7.26	0.41	2.38	Open
11	19.54	1.11	14.86	Open
12	55.45	1.77	21.17	Open
13	75.55	2.40	37.54	Open
9	135.07	1.91	13.01	Open

Link Results: (continued)

Link ID	Flow LPS	Velocity m/s	Unit Headloss m/km	Status
14	139.88	1.98	13.88	Open
15	8.04	0.11	0.07	Open
16	0.14	0.00	0.00	Open
17	0.00	0.00	0.00	Open
18	9.48	0.30	0.80	Open
19	-27.49	0.88	5.77	Open
20	0.56	0.02	0.00	Open
21	22.44	0.71	3.96	Open
22	22.10	0.70	3.85	Open
23	21.66	0.69	3.71	Open
27	20.34	1.15	16.01	Open
28	-19.93	1.13	15.42	Open
29	0.32	0.01	0.00	Open
30	0.20	0.01	0.00	Open
31	121.66	1.72	10.72	Open
32	141.68	2.00	14.21	Open
33	141.26	2.00	14.13	Open
35	0.00	0.00	0.00	Open
7	105.01	1.49	8.15	Open
36	83.09	1.18	5.29	Open
37	69.60	0.98	3.81	Open
38	21.65	0.44	1.25	Open
39	21.55	0.69	3.68	Open
40	0.58	0.02	0.00	Open
41	20.61	0.66	3.39	Open
42	20.17	0.64	3.25	Open
43	-12.82	0.41	1.40	Open
44	12.50	0.40	1.34	Open
45	12.14	0.39	1.27	Open
46	11.88	0.38	1.22	Open
47	0.24	0.01	0.00	Open
24	-20.96	1.19	16.93	Open

25	-0.55	0.28	4.00	Open
26	-0.85	0.43	9.22	Open
34	-31.21	0.99	7.30	Open
48	-31.21	0.99	7.30	Open
49	-31.21	0.99	7.30	Open
50	-31.21	0.99	7.30	Open
51	-31.21	0.99	7.30	Open
55	98.23	1.39	7.21	Open
56	96.17	1.36	6.93	Open
57	95.47	1.35	6.84	Open
58	95.47	1.35	6.84	Open
59	106.83	1.51	8.42	Open
60	-11.60	0.66	5.66	Open


Age for Selected Nodes
Node A5
Node A19
Node A16
Node A21
Node A8
350.0
300.0
250.0
200.0
150.0
100.0
50.0
0.0
Age (hours)
0
50
100
150
200
250
300
350
Time (hours)