Functional Servicing Report

Trent Meadows Phase 1
HBNG (Norwood) Development Inc.
67 Mill Street Norwood, ON.
Township of Asphodel-Norwood
Engage Project No. 23104

Engage Engineering Ltd.
March 2024

Issued for Rezoning and
Draft Plan Application

Revision Summary

Revision No.	Revision Title	Date	Revision Summary
1	**Issued for Draft Plan Application**	**March 15, 2024**	**Final**

Land Acknowledgement

Engage Engineering would like to acknowledge that our concern is in the traditional territory of the Michi Saagiig Anishinaabe and is part of the land and people encompassed within Treaty #20 and the Williams Treaty. We believe it is important to acknowledge these treaties, as our projects and designs often have a lasting impact on the lands, waters, wildlife, and people of this territory. We thank our local First Nations and communities for their ongoing stewardship of these lands and waters and strive to centre their voices in our work and honor our treaty obligations. May we dedicate ourselves as treaty people to moving forward in the spirit of reconciliation and enduring collaboration.

Accessibility for Ontarians with Disabilities (AODA)

This report was prepared and formatted to comply with AODA guidelines. Engage is committed to taking all reasonable steps to ensure that anyone who accesses our services will be able to do so in a way that respects their needs. As such, if you require any assistance with the access or interpretation of this report, please do not hesitate to reach out and we will be pleased to accommodate you.

Rights and Distribution

Table of Contents

1.0 Introduction 1

1.1 Purpose 1

1.2 Site Description 2

2.0 Water Servicing 4

2.1 Existing Conditions 4

2.2 Proposed Conditions 4

2.3 Design Criteria 5

2.4 Design Flow Rates 6

2.5 Distribution System Pressures 7

3.0 Sanitary Servicing 10

3.1 Existing Conditions 10

3.2 Proposed Conditions 11

3.3 Design Criteria 13

3.4 Sewage Flow Rates & Wastewater Treatment Plant Capacity 13

3.5 Lion's Park Sanitary Pumping Station 15

3.6 Downstream Sanitary Sewer 15

4.0 Summary 18

List of Figures

Figure 1 - Location Plan

Figure 2 – Site Plan

Figure 3 – Preliminary Overall Servicing Plan

Figure 4 – Existing Sanitary Drainage Areas

Figure 5 - Proposed Sanitary Drainage Areas

Figure 6 – Water Distribution Plan

Figures 10-13 - Mill Street Plan and Profile Details

List of Tables

Table 1 – Water Demand 6
Table 2 – Norwood Drinking Water System Capacity 7
Table 3 – Flow and Pressure Test Results 9
Table 4 – Flows and Pressures 10
Table 5 – Proposed Sewage Flows 14
Table 6 – Wastewater Treatment Plant Capacity 14
Table 7 – Peak Pumping Station Capacity 15
Table 8 – Legion Street Sanitary Sewer (MH86 to MH88) 17
Table 9 – Cedar Street Sanitary Sewer (MH88 to MH90) 18

List of Appendices

Appendix A: Water Design Sheets
Appendix B: Sanitary Design Sheets
Appendix C: Standpipe Background Information

1.0 Introduction

1.1 Purpose

Engage Engineering Limited (Engage) has been retained by HBNG (Norwood) Developments Inc. to prepare a Functional Servicing Report in support of the Draft Plan of Subdivision and Zoning By-Law Amendment applications for the Trent Meadows Phase 1 development. The proposed development is located at the municipal address of 67 Mill Street in the Township of Asphodel-Norwood (Township), County of Peterborough. The proposed development consists of 152 single family homes, 12 townhomes, various municipal roads, sidewalks, and stormwater management features. This report is being prepared to confirm the following:

- Water servicing capacity and configuration
- Sanitary servicing capacity and configuration

Recommendations made in this report are in accordance with the Ontario Ministry of the Environment, Conservation and Parks, and Township of Asphodel-Norwood requirements, in addition to current best practices.

This report is to be read in conjunction with the **Infrastructure Assessment for Growth Plan** (IA Report), prepared by Engage Engineering (2020), which analyzes the existing sanitary and water infrastructure in the Township. This report is an update to the **Functional Servicing Addendum Report**, prepared by Engage Engineering (March 2019). The **Functional Servicing Addendum Report** was completed to support the rezoning submission of the site previously known as the Crowley Farms Development. A Plan of Condominium was previously approved for this site, however some changes have been made to the current Draft Plan of Subdivision and the development has been segmented into four phases. This report has been updated to reflect the most current version of the Draft plan. The methodology from the previously approved submission was followed for this analysis.

It should be noted that there have been significant discussions with Township staff on the revised servicing routes for Sanitary and Watermain related to this development. The outcome of these discussions are highlighted in this report.

1.2 Site Description

The Trent Meadows development is **51.8** ha and has been divided into four phases. The location of the subject property and four phases are identified on the Location Plan attached as **Figure 1**.

Phase 1 of the development is the subject area for this report. It is situated on the south side of Mill Street approximately 400m east of Highway 7. The municipal address for this phase is 67 Mill Street, Norwood. This area consists of 10.9 ha of vacant agricultural land. Norwood District Public School is south of the Phase 1 area and residential homes are along the western boundary. East of Phase 1 is the Phase 3 area of the development currently an agricultural field. The area north of Phase 1 consists of rural lots with plans for future development.

Phase 2 of the development is located on the north side of Mill Street, west of Asphodel 10th Line. The municipal address for this phase is 112 Mill Street, Norwood. This area consists of 9.2 ha of vacant agricultural land. Phase 2 is bounded by agricultural land to the north and east. South of Phase 2 is the Phase 3 area, currently agricultural land. West of Phase 2 are rural lots with plans for future development.

Phase 3 of the development is located west of Asphodel 10th Line. The municipal address for this phase is 2250 Asphodel 10th Line, Norwood. This phase consists of 18.1 ha of agricultural land. The area is bounded by agricultural lands from all directions. Phases 1, 2 and 4 are west, north, and south of Phase 3 respectively.

Phase 4 of the development is located west of Asphodel 10th Line and North of County Road 42. The 13.6 ha area is agricultural land with a single house and various agricultural buildings. This phase is south of Phase 3 and is surrounded by agricultural lands. The agricultural field to the west of the Phase 4 area is scheduled for future development not associated with this project.

A segment of the property along the southeast boundary of the Phase 1 area is planned to be swapped for a portion of land within the Phase 3 area. The area that will be swapped out was included in the previous Zoning By-law Amendment reports. For this report, the region designated to be swapped is not included within the subject site area. The segment of land included in the land swap can be identified on the Draft Plan included as **Figure 2**.

Figure 1 - Location Plan

2.0 Water Servicing

2.1 Existing Conditions

The existing water distribution system that services the Village of Norwood is owned and operated by the Township of Asphodel-Norwood. The municipal drinking water system is comprised of the following infrastructure:

- Four municipal wells, with low lift pumping stations and treatment systems
- One municipal water tower (standpipe) with a capacity of 1,264 m³
- Approximately 13 km of watermain piping ranging in size (from 32 mm to 250mm) and material type (black iron, ductile iron, asbestos cement, and PVC)

The IA Report prepared by Engage investigated the remaining capacity in the drinking water treatment system and the treated water storage in the Village. As stated in the report, the existing water treatment plant has residual capacity for some additional development although it does not have remaining capacity to service all future developments. The Township is in the process of upgrading the water treatment system to service the expected growth in the Village. The IA report also identified existing capacity issues within the existing water standpipe in the Village. The existing standpipe is just adequate for the existing population with essentially no reserve capacity for any future development areas. The Township is currently in the final phases of the construction of a new standpipe set for completion in 2024. This facility will increase the total capacity to approximately 3200 m³.

There is an existing 150mm diameter watermain within the Mill Street Right-of-way and a 200mm diameter watermain that extend to the intersection of King Street and Mill Street. The existing water distribution system can be found on **Figure 6**.

2.2 Proposed Conditions

A looping system is proposed to service the proposed development. The existing water main at the intersection of King Street and Mill Street will need to be extended approximately 760 metres east on Mill Street to Street ‘C’. The extension will replace and upgrade the existing 150mm watermain on Mill St. The on-site domestic watermain for the development will connect to the 200mm diameter watermain extension on Mill St.

The watermain design for the proposed development includes a second connection to the watermain along Street 'A'. A new 200mm watermain is proposed through a 5m wide easement within the Norwood Agricultural Society to the existing 200mm diameter watermain on Elm Street. The Norwood Agricultural Society has agreed to accept the watermain and easement through their lands. The location of the proposed easement is shown on the **Draft Plan of Subdivision**. During preliminary discussions between the Township and OCWA, the proposed loop was thought to be favourable as it would reduce dead ends within both existing and proposed areas of the drinking water system. The water distribution plan can be seen on the **Overall Plan** which is included as **Figure 3**. The watermain can be found on the Mill Street Plan and Profile Details included as **Figures 10-13.**

Fire hydrants will be provided at a spacing of 150m maximum between hydrants. Water valves will be proposed at each leg of the intersections to ensure sections of the watermain can be shut down for maintenance and repair in the future. The exact location of the fire hydrants and water valves will be determined during the detailed design stage.

2.3 Design Criteria

The design criteria used in this report is outlined below:

- Future Residential water demand of 350 L/person/day.
- Single detached residential lots to have capacity of 3.0 persons/unit
- Townhomes to have capacity of 2.4 persons/unit
- Development unit count: 152 single detached homes and 12 townhomes
- Maximum day factor of 2.25 (based on population of 2,223)
- Peak hour factor of 3.38 (based on population of 2,223)
- Minimum fire flow of 2000 L/min
- The minimum pressure of the system shall meet or exceed 40 psi (275 kPa) during normal operating conditions.
- The minimum pressure of the system shall meet or exceed 20 psi (138 kPa) during maximum day plus fire flow conditions.

It is our understanding the Township is considering higher single detached and townhome occupancy based on the proposed PPS and OP updates. Watson & Associates Economists Ltd. completed a Development Charges Background Study for

the Township of Asphodel-Norwood dated October 13, 2023. Included in the report is a growth forecast that calculated the 20 year average occupancy for low density (single family) to be 2.697 and 2.044 for medium density (Townhomes). The calculated occupancies suggest a smaller persons per unit rate may be more appropriate than an increased rate.

2.4 Design Flow Rates

Based on a Statistics Canada Census Profile from 2021 for the Village of Norwood has a population of 1,585. An additional population of 638 from the proposed development has been included when determining the peak hour factor for the water demand calculations. The calculations for the domestic water demand and fire demand for the proposed development were determined based on the design criteria listed above. Detailed calculations have been provided in **Appendix A** and have been summarized in **Table 1** below.

Table 1 – Water Demand

Flow Type	Flow (L/min)
Average Day Flow	117.8
Maximum Day Flow	265.1
Peak Hour Flow	398.3
Minimum Fire Flow	2000.0
Maximum Day + Fire Flow	2265.1

Using the information presented in Section 3.3 of the IA Report, the capacity of the existing Norwood drinking water system was analyzed to determine if the system can accommodate the additional flows required to service the proposed development. The average maximum daily flow measured over the last nine years plus the maximum daily flow of the Norwood Park Phase 4 was used for the existing condition as requested by the Township. The analysis is summarized in **Table 2**. Additional information on the Norwood Park Phase 4 developments water demand can be found in the Functional Servicing Report for that development prepared by Engage Engineering Inc. dated January 2022.

Table 2 – Norwood Drinking Water System Capacity

Flow Type	Maximum Daily Flow (m^3/day)	Rated Capacity of Drinking Water System (m^3/day)	Drinking Water System Capacity (%)
Existing Flows	1236	1965	63
Existing Flows + Proposed Flows	1618	1965	82

As shown in **Table 2** the existing Drinking Water System in Norwood has adequate capacity to service all additional demand required for the first phase of the Trent Meadows Development. A lack of drinking water system capacity for future developments including the other phases of the Trent Meadows development has been identified in the IA Report. The system capacity will need to be increased prior to the full build out of this development. The Township has current plans to upgrade the wells and water treatment capacity for Norwood. They are not able to provide a future water treatment capacity at this time, they predict this information will be available by late 2025. The proposed system capacity should be reviewed once the upgraded values are available.

Engage has reviewed the drinking water capacity under the proposed higher intensification scenario. Based on preliminary calculations, there is sufficient capacity for the Trent Meadows Phase 1 development. Additional capacity will be required prior to full buildout of future Trent Meadows Phases and neighbouring developments.

2.5 Distribution System Pressures

System pressures were reviewed to ensure the addition of 164 residential and townhome units in the proposed development fall within the guidelines, as outlined below:

- Normal Operating Pressure from 350 to 480 kPa (50 to 70 psi)
- Minimum Operating Pressure >275 kPa (40 psi)
- Maximum Operating Pressure <700 kPa (100 psi)
- Maximum day demand plus fire flow >140kPa (20 psi)

To review system pressures and ensure adequate flow is available for the development, the hydrant flow testing results from the Township were used. There are three existing hydrants located in the vicinity of the subject property: the southwest corner of King Street and Mill Street, the north side of Mill Street opposite house number 67, and the north side of Mill Street at house number 106. Data form hydrant #56, located at 106 Mill Street was utilized as it is the closest to the proposed development.

According to the MOE Design Guidelines for Drinking-Water Systems 2008, the minimum operating water pressure for a residential development is 40 psi which is equal to 28 metres of head, excluding other losses. Based on as-built drawings for the existing water storage tank, the low-pressure elevation is approximately 242m. The proposed ground elevations for the development range from 207m to 212m, indicating that maintaining pressure at these elevations may just be achievable. This conclusion is also supported by the hydrant flow test results for hydrant #56. This hydrant has an approximate elevation of 209.65 m, located 2.35m lower than the highest proposed ground surface elevation. Converting the corresponding head elevation difference to psi results in an additional 3.3 psi required to maintain minimum pressures.

The pressure requirements should be revisited during detailed design when the elevations for the proposed development are confirmed. The impact of the new standpipe on system pressures should be available during the detailed design phase. Additional analysis will be conducted to determine the pressures through the proposed system. It is anticipated the standpipe and looping of the system will assist with pressures throughout the development. Through correspondence with the Township, it was found that preliminary models of the additional standpipe resulted in a hydraulic grade raise of 8 m, or an 11.4 psi increase in distribution system pressures. To account for the future increase in pressures, 11.4 psi was added to the pressures obtained from the hydrant flow test. This increase can be considered conservative as it was noted that the final design would aim for closer to a hydraulic grade raise of 10 m. The standpipe info acquired from the Town is available in **Appendix C**. The standpipe is expected to be online prior to the construction associated with Trent Meadows Phase 1.

The hydrant flow testing results were obtained from the Township to analyze the system pressures and flows. The results from the flow and pressure testing for the hydrants located in the vicinity of the Development were conducted in 2016 and are included in **Appendix A**. Flow and pressure test results for the hydrant #56 located at 106 Mill Street are summarized in **Table 3**.

Table 3 – Flow and Pressure Test Results

Hydrant	Field Test Flow (gpm)	Field Test Pressure (psi)	Future Pressure* (psi)
Residual (Flow 1 port)	712	18	29.4
Residual (Static)	n/a	50	61.4
Residual at 20 PSI	818*	20	-

* 11.4 psi added to future pressures corresponding to post-standpipe construction modeling results

To confirm the available flow at a pressure of 40 psi the Hazen-Williams formula was employed, and a flow of 1979 L/min was calculated at the Flow Hydrant under a 1 port future pressure scenario. For detailed calculations refer to **Appendix A**. Given the results of the flow and pressure test we can confirm that the domestic water demand and minimum fire flow can be accommodated for the proposed development under expected future conditions.

Preliminary fire flow calculations were completed in accordance with the Fire Underwriters Insurance Bureau of Canada for the Townhomes. A minimum fire flow of 2000 L/min is assumed for the single family units.

The Townhome building materials was assumed to be normal construction, and separation charges were estimated based on the worst case scenario. A fire wall was included in the Townhomes calculation separating the 12 units into single units. The preliminary results indicate the Townhomes may require 3000 L/min. The preliminary fire flow calculations should be reviewed during the detailed design stage as additional fire controls may be required if the systems future pressures do not achieve these flow rates.

Table 4 identifies flows and pressures available to meet the minimum demand requirements of the proposed development.

Table 4 – Flows and Pressures

Flow Condition	Flow Required (L/min)	Pressure Required (psi)	Flow Available (L/min)	Residual Flow Available (L/min)
Average Day Flow	118	40	1979	1672
Maximum Day Flow	265	40	1979	1553
Peak Hour Flow	398	40	1979	1455
Maximum Day + Minimum Fire Flow	2265	20	2960	695
Maximum Day + Townhome Fire Flow	3265	20	2960	0

Given the results of the flow and pressure test, the domestic water demand for average, maximum day, peak hour and maximum day plus minimum fire flow can be accommodated for the proposed development. The maximum day plus fire flows required for the townhomes is not currently available. The new standpipe, increased diameter of water main and looping of the system is anticipated to improve pressures at the proposed development. Additional hydrant flow testing will be required after the construction of the upgrades to the water distribution system and the calculations should be revisited to ensure flows are adequate for the proposed development. Additional modeling may be completed to confirm the future water pressures during the detailed design phase.

3.0 Sanitary Servicing

3.1 Existing Conditions

The existing sanitary collection system and sewage treatment plant that services the Village of Norwood is owned and operated by the Township of Asphodel-Norwood. The sewage system is comprised of the following infrastructure:

- One sewage treatment plant located on Industrial Drive.
- Three municipal pumping stations.
- Gravity collection system consisting generally of 200mm sanitary sewer with varying material types (asbestos concrete, vitrified clay, PVC)

There is an existing 200mm diameter sanitary sewer on Mill Street, west of the proposed development. This sewer connects at Queen Street running south, eventually reaching the Lions Park sanitary pumping station (SPS). There is also an existing 200mm diameter sanitary sewer at the intersection of Mill Street and King Street that runs south, towards the Lions Park SPS. The existing sanitary sewer is displayed on the **Existing Sanitary Drainage Areas** drawing, included as **Figure 4**.

The IA Report prepared by Engage investigated the remaining capacity in the wastewater treatment plant (WWTP), the Lions Park SPS and associated forcemain, and the downstream sanitary sewer system to service the proposed development. The report determined there is residual capacity in the WWTP for some additional development although it is inadequate to service all the proposed future developments. The IA report determined the Lions Park SPS is currently operating at 84% capacity and can only accommodate 94 single family homes prior to requiring upgrades. Upgrades will be required for the balance of units above 94 in the proposed development as well as other future development lands identified in the IA Report. Phasing of the occupancy for the development may be possible to use some of the available capacity in the pumping station, however consultation with the Township would be required. It is Engage's understanding that the Township is investigating and planning for the upgrade of the Lions Park SPS, and associated forcemain, which will include allocation for this development and other future development lands.

3.2 Proposed Conditions

To determine the optimal sanitary sewer flow path, various sanitary sewer routes were analyzed in conjunction with the IA Report. Through consultation with the Township the proposed sanitary sewer route along Mill Street to Legion Street was selected to service this phase of the development. A sanitary sewer design sheet was prepared to determine the available capacity in the sanitary gravity sewers under existing conditions, proposed conditions and proposed with other future developments identified in the IA report and the proposed Upper Mill Pond Development as identified by the

Township. Details on the proposed Upper Mill Pond Development can be found in the Functional Servicing Report prepared for the Upper Mill Pond Development by Jewell Engineering, dated November 28, 2023.

The proposed sanitary servicing for the development will be achieved through a route that follows Mill Street, Legion Street and Cedar Street, connecting to the 450mm sanitary sewer within the easement between Cedar Street and Elm Street. The route is identified on the **Proposed Sanitary Drainage Areas** included as **Figure 5.** The proposed sanitary sewer design sheet identifies various pipe sections along the route that will need to be replaced to achieve the required capacity for the development. The proposed 200 mm to 375 mm diameter sanitary sewer within the Mill Street ROW will replace the existing sanitary sewer and service the existing houses along Mill Street. A 375mm diameter sanitary sewer will replace the existing 200mm diameter sanitary sewer on Legion Street and Cedar Street.

Proposed sanitary servicing for the Trent Meadows Phase 1 Development will be serviced by a gravity sanitary sewer network. The proposed development will be serviced by on-site 200mm diameter (minimum) PVC sanitary sewers which will flow to the 300 mm and 375 mm diameter sanitary sewer within the Mill Street Right of Way (ROW). Sanitary flows from Trent Meadows Phase 2 will follow the same flow path as Phase 1. The current unit count for Phase 2 includes 114 single family and 12 Townhomes. A 200 mm diameter sanitary sewer has been included to service Phase 2 upstream of Phase 1. Additional details for Phase 2 will be provided during its corresponding Functional Servicing Report. The expected flows have been included in the sanitary sewer design sheet to ensure the pipes will have sufficient capacity for the future development.

The proposed sanitary sewer will be installed along the centerline of Mill Street at a depth of approximately 2.8m to provide gravity service to the basements of the proposed homes. The proposed sanitary sewer will be at least 200mm PVC DR35 sanitary sewer with a hydrostatic rating of 345 kPa (50 psi).

Sanitary maintenance holes will be provided at all intersections, change in pipe direction, and straight runs exceeding 120m. The proposed sanitary sewer configuration is displayed on the **Overall Plan** included as **Figure 3**. The pipe sizes and slopes can be found on the Mill Street Plan and Profile Details included as **Figures 10-13**. The

location of the sanitary maintenance holes will be confirmed during the detailed design stage.

3.3 Design Criteria

The design criteria to analyze the sanitary flows for the proposed development had been assembled form the MOE and Township design standards. The design criteria below have been used in three scenarios; existing, proposed and proposed with other future developments. The requirements include:

- Existing residential sewage demand of 450 L/person/day.
- Future residential sewage demand of 350 L/person/day.
- Single detached residential lots to have capacity of 3.0 persons/unit
- Townhomes to have capacity of 2.4 persons/unit
- Development unit count: 152 single detached homes, and 12 townhomes
- Harmon peaking formula to be applied to residential flows based on future population
- Infiltration rate of 0.28 L/ha/s

It is our understanding the Township is considering higher single detached and townhome per unit density based on the proposed PPS and OP updates. A density of 4.0 persons/unit for single units and 2.5 persons/unit was also analyzed to ensure the proposed pipe sizes will have capacity for the future intensification.

Watson & Associates Economists Ltd. completed a Development Charges Background Study for the Township of Asphodel-Norwood dated October 13, 2023. Included in the report is a growth forecast that calculated the 20 year average occupancy for low density (single family) to be 2.697 and 2.044 for medium density (Townhomes). The calculated occupancies suggest a smaller persons per unit rate may be more appropriate than an increased rate.

3.4 Sewage Flow Rates & Wastewater Treatment Plant Capacity

Sewage flow rates for the existing and proposed flows were analyzed based on MOE and Township guidelines. Based on the design criteria above, the sewage flows for the Trent Meadows Phase 1 have been calculated and summarized in **Table 5**. The corresponding detailed calculations are included in **Appendix B.**

Table 5 – Proposed Sewage Flows

Flow Type	Flow (m^3/day)	Flow (L/s)
Average Residential Flow	169.7	2.0
Peak Residential Flow	675.5	7.8
Infiltration Flow	271.2	3.1
Peak Design Flow	**946.7**	**10.9**

The capacity of the existing wastewater treatment plant was analyzed based upon the highest demand year to confirm the residual capacity available to accommodate other future development within Norwood. The design flows from Norwood Park Phase 4 have been added to account for the approved developments flows. Additional information on the Norwood Park Phase 4 developments design flows can be found in the Functional Servicing Report prepared for that development by Engage Engineering Inc. dated January 2022.

Table 6 – Wastewater Treatment Plant Capacity

Flow Type	Average Daily Flow (m^3/day)	Rated Capacity of Wastewater Treatment Plant (m^3/day)	Wastewater Treatment Plant Capacity (%)
Existing Flows (to date)	766	1500	51
Existing Flows + Trent Meadows Phase 1	936	1500	62

The results indicate that based upon the existing flow data, the wastewater treatment plant has residual capacity for the Trent Meadows Phase 1 development. The IA Report determined the existing wastewater treatment plant can accommodate approximately 289 residential units before requiring upgrades, assuming 3.0 persons per unit.

3.5 Lion's Park Sanitary Pumping Station

Flows from the proposed development will contribute to the Lion's Park SPS. The capacity of the Lion's Park SPS and associated forcemain was investigated in the IA Report. Using the proposed sewage flows presented in **Table 5** the capacity of the Lion's Park SPS was analyzed to determine if it has remaining capacity to service the additional units in the proposed development. The analysis is summarized in **Table 7** below.

Table 7 – Peak Pumping Station Capacity

Flow Type	Peak Flow (L/s)	Rated Capacity of Pumping Station (L/s)	Pumping Station Capacity (%)
Existing Flows (Including Norwood Park Phase 4)	46.5	55.1	106
Existing + Trent Meadows Phase 1	69.2	55.1	126

Table 7 shows the SPS does not have the residual capacity to service existing conditions or Phase 1 of the proposed development without upgrades. Upgrades will be required to service the existing demand and the additional demands of the proposed development.

The IA report recommends assessing forcemain capacity in conjunction with the SPS upgrades. It is Engage's understanding that the Township is investigating and planning for these projects to be designed to accommodate the additional flows from this proposed development as identified in the IA Report.

3.6 Downstream Sanitary Sewer

Flows from the proposed development will contribute to the Legion Street sanitary sewer and continue south to the Lions Park pumping station, and ultimately the existing WWTP. The capacity of the existing sanitary system and the ability to service the other future development has been analyzed in the IA Report. The design sheet used in the IA Report has been updated to include the proposed development and the adjacent developments identified by the Township. The sections showing over capacity in the

existing design sheet are the result of the new design criteria being used and not a result of the proposed Trent Meadows Phase 1 development. This design criteria have been determined by the Township and is outlined in further detail in the IA Report.

The design sheet for the proposed include a new sanitary sewer along Mill Street and two sections of sanitary sewer that would require upgrades prior to the development of these lands. The two areas that would require upgrades are:

- Legion Street between MH SMH3 to MH 88
- Cedar Street between MH 88 to MH 90

Sanitary sewer locations and manhole ID's are included on the **Preliminary Overall Servicing Plan** included as **Figure 3**.

To support the Trent Meadows Phase 1 development, the sanitary sewer within the Legion Steet ROW will need to be upgraded. A new section will be required on the north end of the street connecting the proposed pipe to Mill Street. Additionally, the existing portion of sanitary sewer on Legion Street will need to be upgraded to accommodate all the proposed future flows. This upgrade equates to approximately 270m of new sanitary sewer required for Legion Street. The existing sewer within Legion Street is a 200mm diameter pipe. This pipe will need to be upgraded to a 300mm diameter sanitary sewer to service the existing flows and the proposed flows from only Trent Meadows Phase 1 and Phase 2 development. To service the proposed development (Phase 1 and Phase 2) plus the adjacent Upper Mill Pond Development, a 375mm diameter sanitary sewer is required. This requirement was determined used the information from the IA Report and is summarized in **Table 8**.

Additional conveyance calculations were completed to ensure the 375 mm diameter pipe will have sufficient capacity for flows under the increased unit density scenario. The results indicate the pipes will remain under the 80% capacity threshold. Supporting calculations are provided in **Appendix B**.

Table 8 – Legion Street Sanitary Sewer (MH86 to MH88)

Sanitary Flow Scenario	Size (mm)	Flow (L/s)	Percent Capacity (%)
Existing	200	1.3	6
Existing+ Trent Meadows Phase 1	200	22.43	108
Existing + Trent Meadows Phase 1	300	22.43	37
Existing + Trent Meadows + Other Developments*	375	55.26	50

* Other Developments include Upper Mill Pond development and Neighboring development

The existing 200mm diameter sanitary sewer within the Cedar Street will need to be upgraded to a 300mm diameter sanitary sewer to service the existing flows and the proposed flows from only Trent Meadows Phase 1 and Phase 2 development. To service the proposed development (Phase 1 and Phase 2) plus the adjacent Upper Mill Pond Development, a 375mm diameter sanitary sewer is required. This was determined utilizing the information from the IA Report. Supporting documentation is provided in **Appendix B** and summarized in **Table 9**.

Additional conveyance calculations were completed to ensure the 375 mm diameter pipe will have sufficient capacity for flows under the increased unit density scenario. The results indicate the pipes will remain under the 80% capacity threshold. Supporting calculations are provided in **Appendix B**.

Table 9 – Cedar Street Sanitary Sewer (MH88 to MH90)

Scenario	Size (mm)	Flow (L/s)	Percent Capacity (%)
Existing	200	1.5	7
Existing+ Trent Meadows Phase 1	200	22.62	109
Existing + Trent Meadows Phase 1	300	22.62	51
Existing + Trent Meadows + Other Developments*	375	55.45	50

* Other Developments include Upper Mill Pond development and Neighboring development

It is Engages understanding the Township is currently in the design process related to the sanitary sewer upgrades along Cedar and Legion Street up to Mill Street.

4.0 Summary

Engage was retained by HBNG (Norwood) Development Inc. to review the municipal services available for the proposed Trent Meadows Phase 1 Development. The existing municipal infrastructure was reviewed to determine if water and sanitary servicing is available for the proposed 152 single detached homes, and 12 townhomes. The Norwood water treatment plant and sewage treatment plant, including the water distribution network and wastewater collection system, and SPS were analyzed to confirm that the services could provide the required servicing to the development.

Water servicing to the proposed development is to be connected to the existing 200mm watermain within the Mill Street ROW and loop to the existing watermain on Elm Street. A review of the existing capacity in the Norwood drinking water system determined there is sufficient capacity for Phase 1. Upgrades will be required to the existing water treatment facility and water storage to provide sufficient volume and pressure to the full buildout of future phases. The Township is currently in the construction stage for a new water storage facility that will improve conditions throughout Norwood. The existing

infrastructure has sufficient capacity to provide the minimum required fire flow for the proposed structures. Additional calculations will be required during the detailed design phase after the new facility has been connected to the system.

Sanitary servicing for the proposed residential units will be serviced internally by a 200mm gravity sanitary sewer network. A review of the existing capacity in the Norwood sanitary system determined the existing wastewater treatment plant has residual capacity for the Trent Meadows Phase 1 development. The Lions Park sanitary pumping station will require upgrades to service the Phase 1 Development as it is currently at capacity. The capacity of the forcemain will also require to be reviewed in conjunction with the SPS upgrades. The proposed development will also require upgrades to the existing sanitary sewers within the Mill Street, Legion Street, and Cedar Street ROW. It is Engages understanding the Township is currently in the design process related to the sanitary sewer upgrades along Cedar and Legion Street up to Mill Street.

Prepared by:

Logan Mattern,
Engineering Intern

Reviewed by:

Brad Parsons, P.Eng
Water Resources Manager

Figure 2 – Site Plan

Draft Plan of Subdivision

Notes

ALL DIMENSIONS ARE IN METRES UNLESS OTHERWISE SHOWN. TOPOGRAPHIC INFORMATION BY KRCMAR SURVEYORS, September 18, 2023.

Legal Description

Part Lot J Plan 6 Norwood And Part Lots 17 & 18 Concession 9 Asphodel Part 2, 45r17405
TOWNSHIP OF ASPHODEL-NORWOOD,
COUNTY OF PETERBOROUGH

Owner's Certificate

I HEREBY AUTHORIZE MACNAUGHTON HERMSEN BRITTON CLARKSON PLANNING LIMITED TO SUBMIT THIS PLAN FOR APPROVAL.

DATE: _____

HBNG (Norwood) Developments Inc.

Surveyor's Certificate

I HEREBY CERTIFY THAT THE BOUNDARIES OF THE LAND TO BE SUBDIVIDED ON THIS PLAN AND THEIR RELATIONSHIP TO THE ADJACENT LANDS ARE ACCURATELY AND CORRECTLY SHOWN.

DATE: _____

XXX- O.L.S.
XXXX

Key Plan

Notes:

Townhouses are 6.0m deep except at the end and middle of rows where an additional setback of 1.2m has been applied.

Sight triangles are 5m by 5m at local intersections.

Street lengths are as follows:
Street A = 558.19m, Street B = 321.08m, Street C = 132.34m, Street D = 234.92m, Street E = 111.99m

Revision No.	Date	Issued / Revision	By
		Additional Information Required Under Section 51(17) of the Planning Act R.S.O. 1990, c.P.13 as Amended	
A. As Shown		B. As Shown	C. As Shown
D. Residential, Retirement Residence, Park, Stormwater Management, Open Space			
E. As Shown		F. As Shown	
G. As Shown		H. Municipal Water Supply	I. Bondhead Sandy Loam
J. As Shown		K. All Services As Required	L. As Shown

LAND USE SCHEDULE

LAND USE	LOT/BLOCK	AREA (ha)	UNITS
7.6m SINGLES	BLOCKS 122-126	0.765	31
11.0m SINGLES □	LOTS 2-17, 57-69,76-79 84-85, 90-93, 95-101,103-104, 106-115, 121	2.072	59
12.2m SINGLES △	LOTS 1, 54-55, 80-83 86-89,116-120	0.598	16
15.24m SINGLES ○	LOTS 18-53,70-75, 94,102, 105	2.370	45
SPECIAL LOT	LOT 56	0.075	1
6.0m TOWNS	BLOCKS 127, 128	0.230	12
LAND SWAP	BLOCK 129	2.895	-
WALKWAY	BLOCKS 130, 131	0.028	-
ROAD WIDENING	BLOCKS 132, 133	0.179	-
DRAINAGE	BLOCKS 134, 135, 136	0.117	-
0.3m RESERVES	BLOCKS 137, 138	0.001	-
SWM	BLOCK 139	1.778	-
ROADS	A-E	2.774	-
TOTAL	-	13.88	164

25' (7.6m) Singles
36' (11.0m) Singles
40' (12.2m) Singles
50' (15.2m) Singles
6.0m Towns

MHBC | PLANNING URBAN DESIGN & LANDSCAPE ARCHITECTURE

Stamp	Date: February 13, 2024
	File No.: 1604D
	Plan Scale: 1:1000 (Arch D)
	Drawn By: P.B., Y.Y.
	Checked By: D.M.
	Other
Project: Trent Meadows Phase 1	
File Name: Draft Plan of Subdivision	Dwg No.: 1 of 1

Scale Bar: 0 10 25 50 100 200m

MEASUREMENTS SHOWN ON THIS PLAN ARE IN METRES AND CAN BE CONVERTED TO FEET BY DIVIDING BY 0.3048

N:\1604\D - Crowley Farms, Norwood\6 - Tech Production\CAD

Figure 3 – Overall Plan

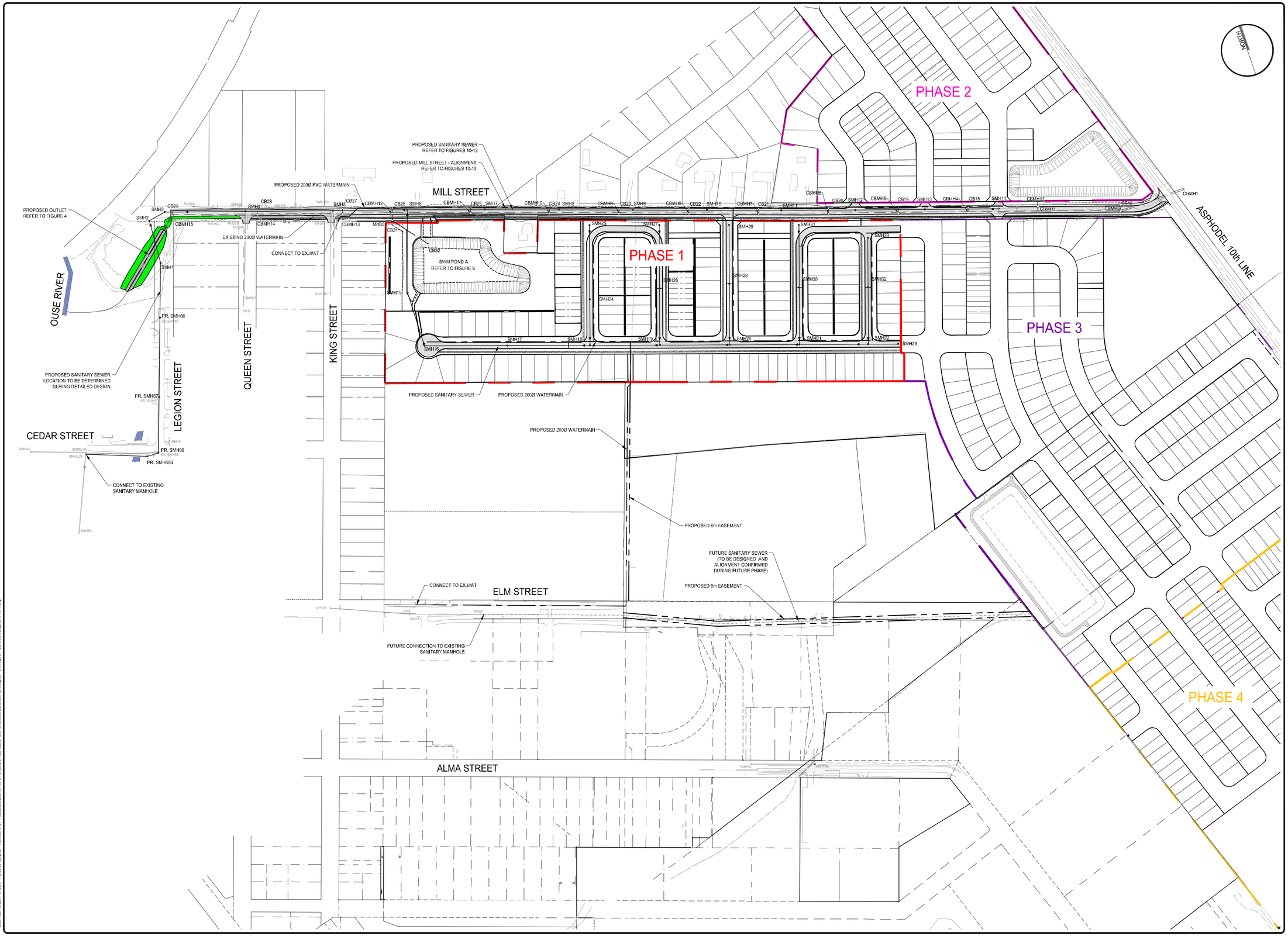

NORTH
PHASE 1
PHASE 2
PHASE 3
PHASE 4
MILL STREET
ELM STREET
ALMA STREET
CEDAR STREET
QUEEN STREET
KING STREET
LEGION STREET
OUSE RIVER
ASPHODEL 10th LINE
PROPOSED OUTLET
REFER TO FIGURE 4
PROPOSED SANITARY SEWER
REFER TO FIGURES 10-13
PROPOSED MILL STREET - ALIGNMENT
REFER TO FIGURES 10-13
PROPOSED 200Ø PVC WATERMAIN
EXISTING 200Ø WATERMAIN
CONNECT TO EX.WAT
SWM POND A
REFER TO FIGURE 8
PROPOSED SANITARY SEWER
LOCATION TO BE DETERMINED
DURING DETAILED DESIGN
PROPOSED SANITARY SEWER
PROPOSED 200Ø WATERMAIN
PROPOSED 200Ø WATERMAIN
PROPOSED 6m EASEMENT
FUTURE SANITARY SEWER
(TO BE DESIGNED AND
ALIGNMENT CONFIRMED
DURING FUTURE PHASE)
PROPOSED 6m EASEMENT
CONNECT TO EX.WAT
FUTURE CONNECTION TO EXISTING
SANITARY MANHOLE
CONNECT TO EXISTING
SANITARY MANHOLE
PR. SMH86
PR. SMH87
PR. SMH88
PR. SMH88B
SMH1
SMH2
SMH3
SMH4
SMH5
SMH6
SMH7
SMH8
SMH9
SMH10
SMH11
SMH12
SMH13
SMH14
SMH15
SMH16
SMH17
SMH18
SMH19
SMH20
SMH21
SMH22
SMH23
SMH24
SMH25
SMH26
SMH27
SMH28
SMH29
SMH30
SMH31
SMH32
SMH33
SMH74
SMH75
SMH76
SMH77
SMH78
SMH79
SMH80

Figure 4 – Existing Sanitary Drainage Areas

MILL POND

BELMONT PUMPING STATION

LION'S PARK PUMPING STATION

MAPLE AVE PUMPING STATION

WASTEWATER TREATMENT PLANT

OUSE RIVER

COUNTY ROAD 45

COUNTY RD 42

ALBINE ST

MILLPOND LN

HELEN ST

MARGARET AVE

WELLINGTON ST

CEDAR ST

LEGION ST

QUEEN ST

KING ST

ELM ST

ALMA ST

FLORA ST

MILL ST

BRIDGE ST

SPRINGS ST

PINE ST

ROBERT RD

MURRAY ST

RIDGE ST

OAK ST

INDUSTRIAL DR

VICTORIA ST

BAKER ST

BIRCH ST

SPRUCE DR

MAPLE AVE

INFILTRATION AREA: 21.45ha
SCHOOL POPULATION: 300
FAIR FLOWS: 10,000 PEOPLE @25L/PERSON/DAY

LEGEND

- VILLAGE BOUNDARY
- EXISTING SANITARY SEWER (AS-BUILTS NEEDED)
- EXISTING SANITARY SEWER
- NEW SANITARY SEWER
- SANITARY FORCE MAIN

COMMERCIAL AREA (ha): 2 (No. OF RESIDENTIAL UNITS) / 1 | 1.50 (INFILTRATION AREA (ha))

INDUSTRIAL AREA (ha): 2 (No. OF RESIDENTIAL UNITS) / 1= | 1.50 (INFILTRATION AREA (ha))

TOWNHOUSE UNITS: 2 (No. OF RESIDENTIAL UNITS) / 1* | 1.50 (INFILTRATION AREA (ha))

RETIREMENT HOME UNITS: 2 (No. OF RESIDENTIAL UNITS) / 1* | 1.50 (INFILTRATION AREA (ha))

SCHOOL POPULATION: 2 (No. OF RESIDENTIAL UNITS) / 1' | 1.50 (INFILTRATION AREA (ha))

- EXISTING SCHOOL AREA
- EXISTING COMMERCIAL AREA
- EXISTING RETIREMENT HOME AREA

ENGAGE ENGINEERING
www.engageeng.ca • 171 King Street, Suite 120, Peterborough, ON • Phone: (705) 755-0427

TRENT MEADOWS PHASE 1 SUBDIVISION

FIGURE 3 - EXISTING SANITARY DRAINAGE AREA PLAN

DRAWN:	APPROVED:	SCALE:	DATE:	PROJECT No.:
S.DINGMAN	B.PARSONS	1:5000	2020-02-04	23104

S:\01 - Projects\2200022038 - Mill Street Norwood Subdivision\02 Design\01 - Drawings\01 - Current Drawings\22038 - Ex SAN.dwg PRINTED: Feb 20, 2024

Figure 5 - Proposed Sanitary Drainage Areas

UPPER MILL POND DEVELOPMENT
INFILTRATION AREA: 35.5ha
SINGLE RESIDENTIAL UNITS: 196
TOWNHOUSE UNITS: 344
APARTMENTS: 100

INFILTRATION AREA: 21.45ha
SCHOOL POPULATION: 300
FAIR FLOWS: 10,000 PEOPLE @25L/PERSON/DAY

MILL POND
BELMONT PUMPING STATION
LION'S PARK PUMPING STATION
MAPLE AVE PUMPING STATION
WASTEWATER TREATMENT PLANT
OUSE RIVER
COUNTY RD 42
COUNTY ROAD 45
ALBINE ST
MILLPOND LN
HELEN ST
MARGARET AVE
WELLINGTON ST
MILL ST
CEDAR ST
QUEEN ST
KING ST
ELM ST
RIDGE ST
PINE ST
SPRING ST
ALMA ST
FLORA ST
OAK ST
INDUSTRIAL DR
VICTORIA ST
BAKER ST
SPRUCE DR
MAPLE AVE
BIRCH ST
MURRAY CT
ROBERT RD
OTHER FUTURE DEVELOPMENT
TRENT MEADOWS PHASE 1
TRENT MEADOWS PHASE 2
TRENT MEADOWS PHASE 3 & 4
SANITARY SERVICE ROUTE FOR PHASE 3 & 4

LEGEND

- VILLAGE BOUNDARY
- EXISTING SANITARY SEWER (AS-BUILTS NEEDED)
- EXISTING SANITARY SEWER
- SANITARY SEWER UPGRADES
- NEW SANITARY SEWER
- SANITARY FORCE MAIN

COMMERCIAL AREA (ha): No. OF RESIDENTIAL UNITS / INFILTRATION AREA (ha)
INDUSTRIAL AREA (ha): No. OF RESIDENTIAL UNITS / INFILTRATION AREA (ha)
TOWNHOUSE UNITS: No. OF RESIDENTIAL UNITS / INFILTRATION AREA (ha)
RETIREMENT HOME UNITS: No. OF RESIDENTIAL UNITS / INFILTRATION AREA (ha)
SCHOOL POPULATION: No. OF RESIDENTIAL UNITS / INFILTRATION AREA (ha)

- EXISTING SCHOOL AREA
- EXISTING COMMERCIAL AREA
- EXISTING RETIREMENT HOME AREA
- KNOWN PROPOSED DEVELOPMENTS
- FUTURE DEVELOPMENTS
- DISTANT FUTURE DEVELOPMENTS

ENGAGE ENGINEERING
www.engageeng.ca ● 171 King Street, Suite 120, Peterborough, ON ● Phone: (705) 755-0427

TRENT MEADOWS PHASE 1

FIGURE 5 PROPOSED SANITARY DRAINAGE AREA PLAN

DRAWN:	APPROVED:	SCALE:	DATE:	PROJECT No.:
S.DINGMAN	B.PARSONS	1:5000	2020-02-04	23104

Figure 6 – Water Distribution Plan

MILL POND

EXISTING WATER TOWER AND WATER TREATMENT PLANT

OUSE RIVER

ALBINE ST
MILLPOND LN
HELEN ST
MARGARET AVE
CHARLES ST
HELEN ST
WELLINGTON ST
LEGION ST
CEDAR ST
QUEEN ST
ELM ST
KING ST
MILL ST
ALMA ST
FLORA ST
COUNTY ROAD 45
RIDGE ST
VICTORIA ST
PINE ST
SPRING ST
ROBERT RD
MURRAY ST
BAKER ST
BIRCH ST
SPRUCE DR
MAPLE AVE
COUNTY RD 42

H10 H11 H12 H87 H86 H85 H84 H83 H82 H81 H80 H41 H43 H42 H40 H39 H79 H23 H22 H13 H90 H89 H16 H14 H15 H20 H17 H88 H24 H25 H21 H19 H18 H52 H74 H69 H68 H67 H66 H65 H64 H63 H62 H46 H45 H47 H44 H54 H53 H48 H55 H56 H78 H77 H76 H75 H50 H73 H72 H61 H60 H71 H57 H58 H59 H38 H37 H70 H49 H26 H27 H36 H35 H28 H29 H30 H31 H32 H33 H34

100mm Ø AC WM
150mm Ø PVC WM
200mm Ø PVC WM
150mm Ø P/G WM

LEGEND

- VILLAGE BOUNDARY
- EXISTING WATER MAIN
- EXISTING FIRE HYDRANT

ENGAGE ENGINEERING
www.engageeng.ca Phone: (705) 755-0427

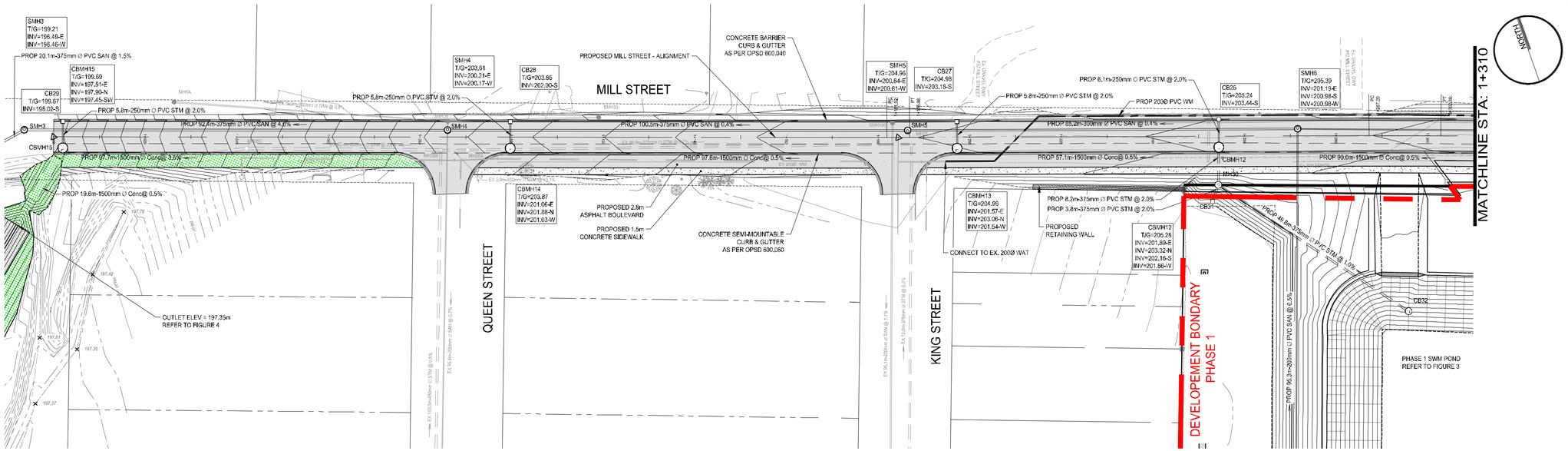
VILLAGE OF NORWOOD

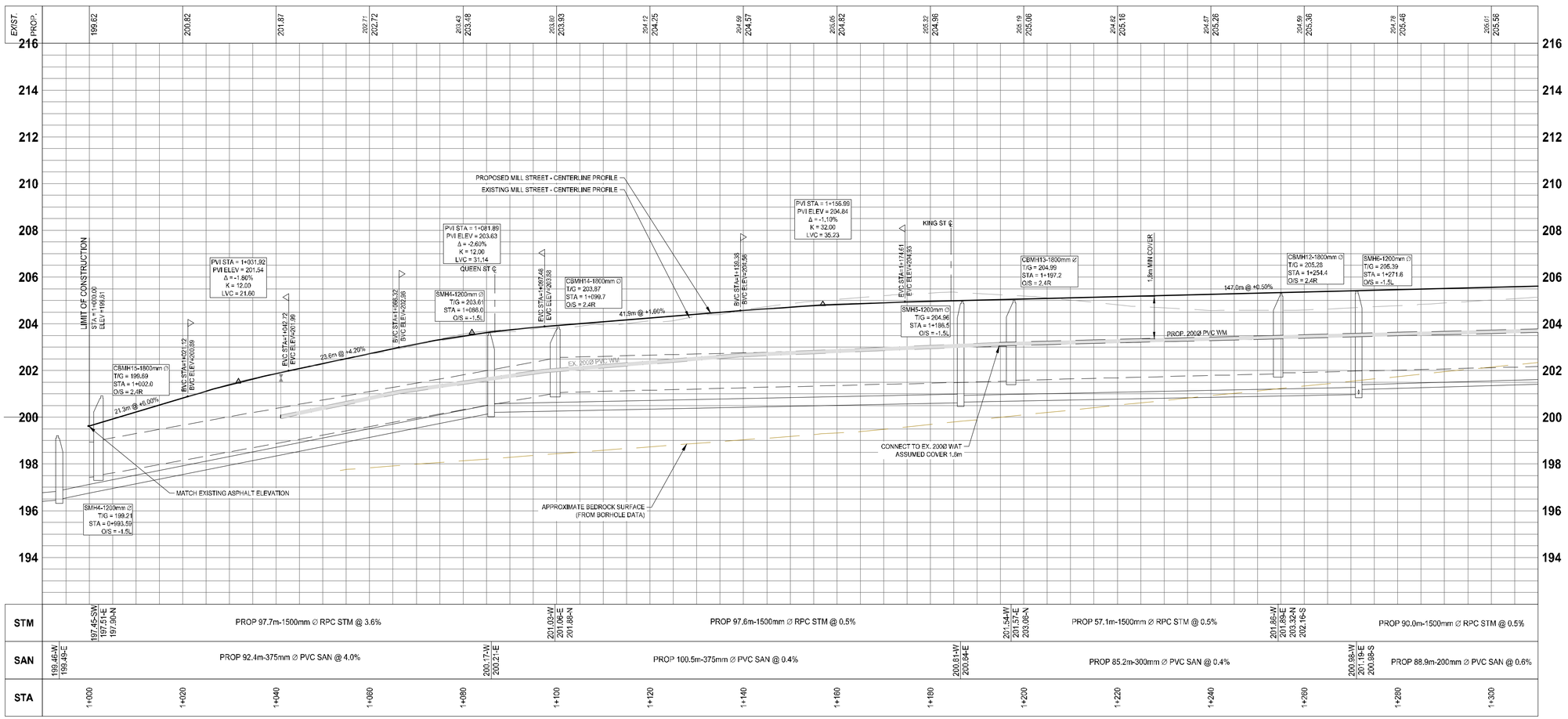
FIGURE 6 - WATER DISTRIBUTION PLAN

DRAWN:	APPROVED:	SCALE:	DATE:	PROJECT No.:
K.SHARIA	P.HURLEY	1:4500	2019-11-27	19055

S:\01 - Projects\19000\19055 - Infrastructure Assessment for Growth Plan\02 Design\01 - Drawings\Current Drawings\19055 - WAT.dwg PRINTED: Jul 21, 2020

Figures 10-13 – Mill Street Plan and Profile Details





23104-PP1

Date: Mar. 13, 2024 - 3:56 pm Plotted by: sdingman File name: S:\01 - Projects\23000\23104-57 & 112 Mill St & 1652 County Road 42 Norwood Subdivision\02 Design\01 - Current Drawings\23104-PP1.dwg

SURVEY

BENCHMARK

NOTES:

No.	REVISION	BY	DATE
1.	ISSUED FOR REZONING	SD	24/03/15

ENGAGE ENGINEERING
www.engageeng.ca ● 171 King Street, Suite 120 Peterborough, ON ● Phone (705) 755-0427

TRENT MEADOWS PHASE 1

TOWN OF NORWOOD

MILL STREET PRELIMINARY PLAN & PROFILE STA 1+000 - 1+310

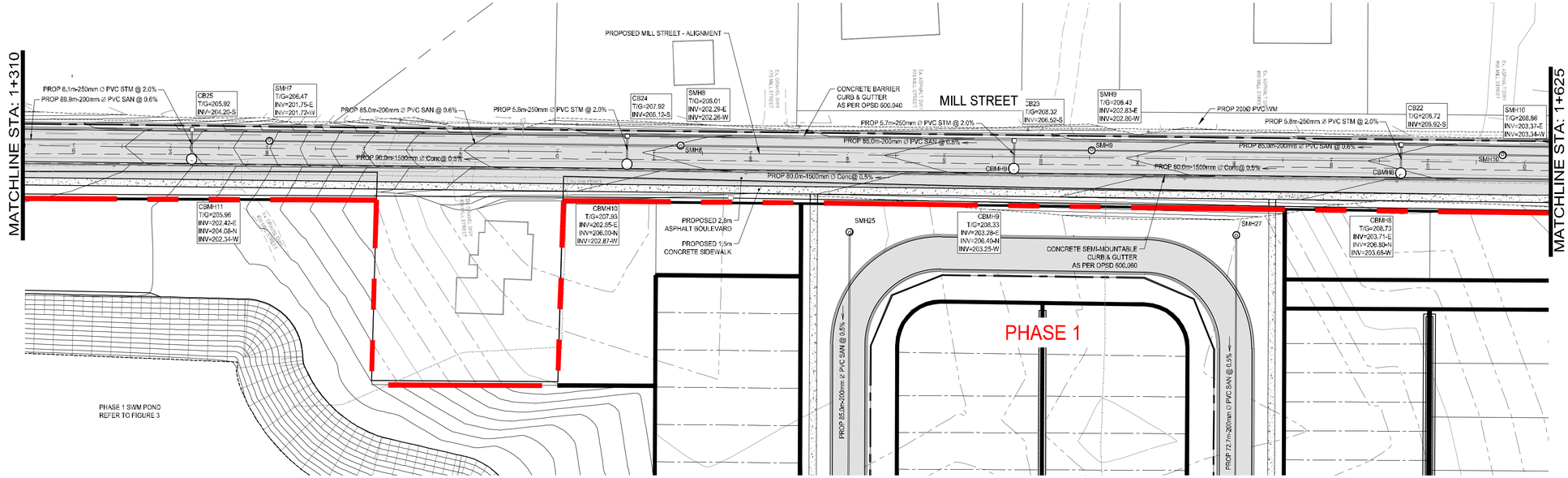
TOWN OF NORWOOD

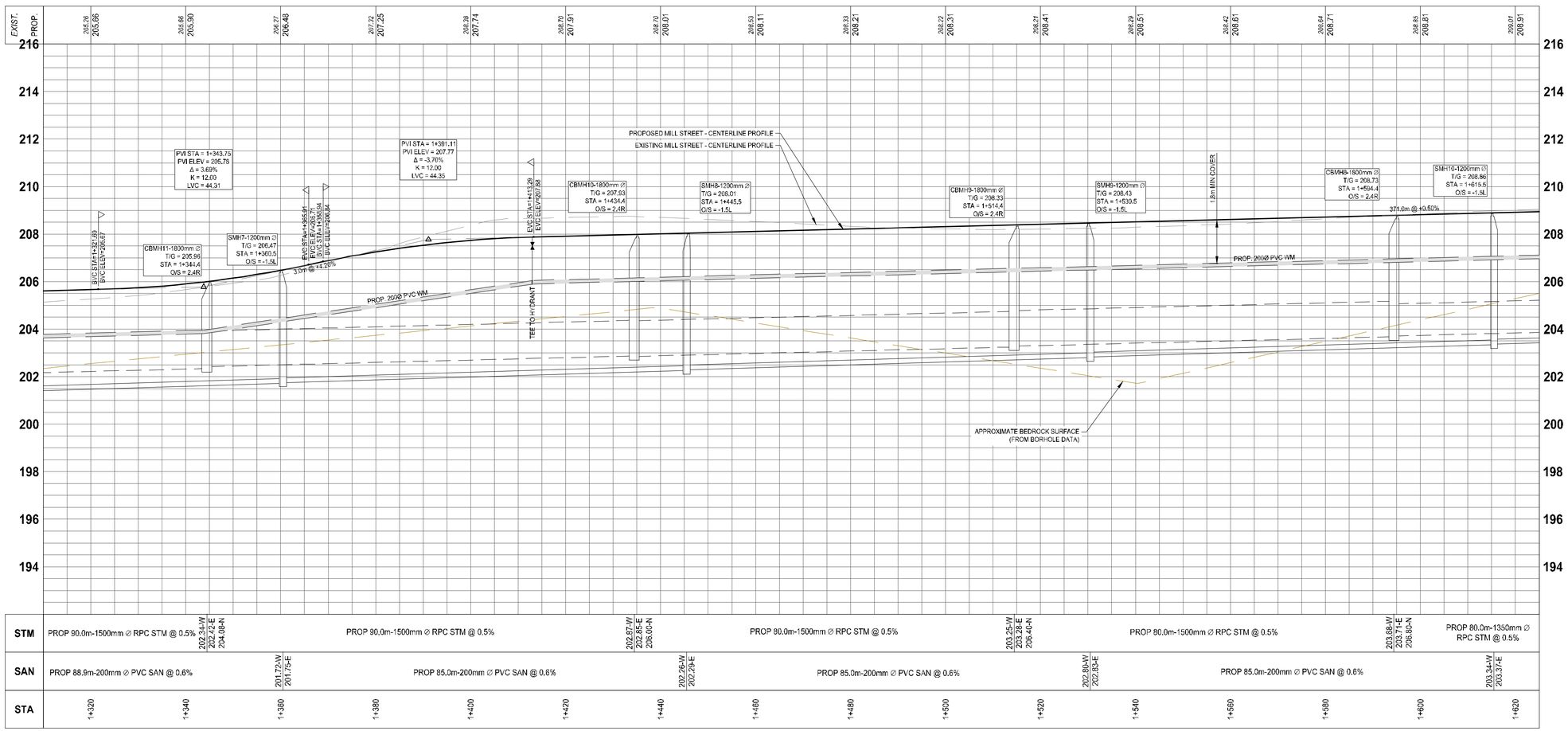
DRAWN BY:	S.DINGMAN
DESIGNED BY:	S.DINGMAN
APPROVED BY:	B.PARSONS
DATE:	2024-02-23

STAMP: LICENSED PROFESSIONAL ENGINEER — B.T.PARSONS — 100213434 — 2024-03-15 — PROVINCE OF ONTARIO

SCALE: 1:500H 1:100V

PROJECT NUMBER:	SHEET NAME:	SHEET:
23104	F10	5 of 9





23104-PP1

SURVEY

BENCHMARK

NOTES:

No.	REVISION	BY	DATE
1.	ISSUED FOR REZONING	SD	24/03/15

ENGAGE ENGINEERING
www.engageeng.ca • 171 King Street, Suite 120, Peterborough, ON • Phone: (705) 755-0427

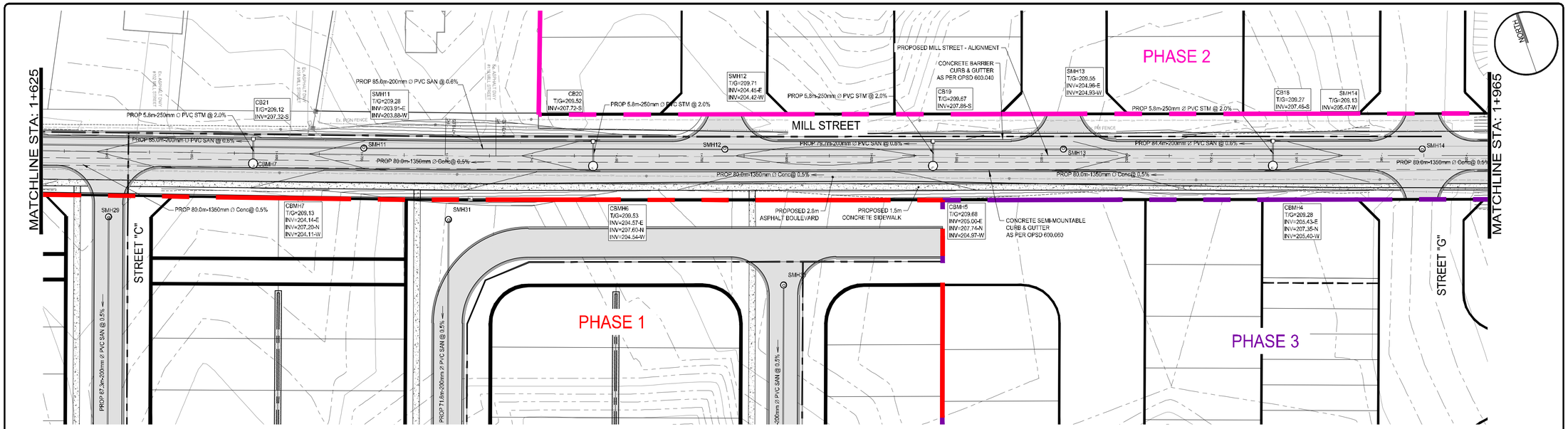
TRENT MEADOWS
PHASE 1

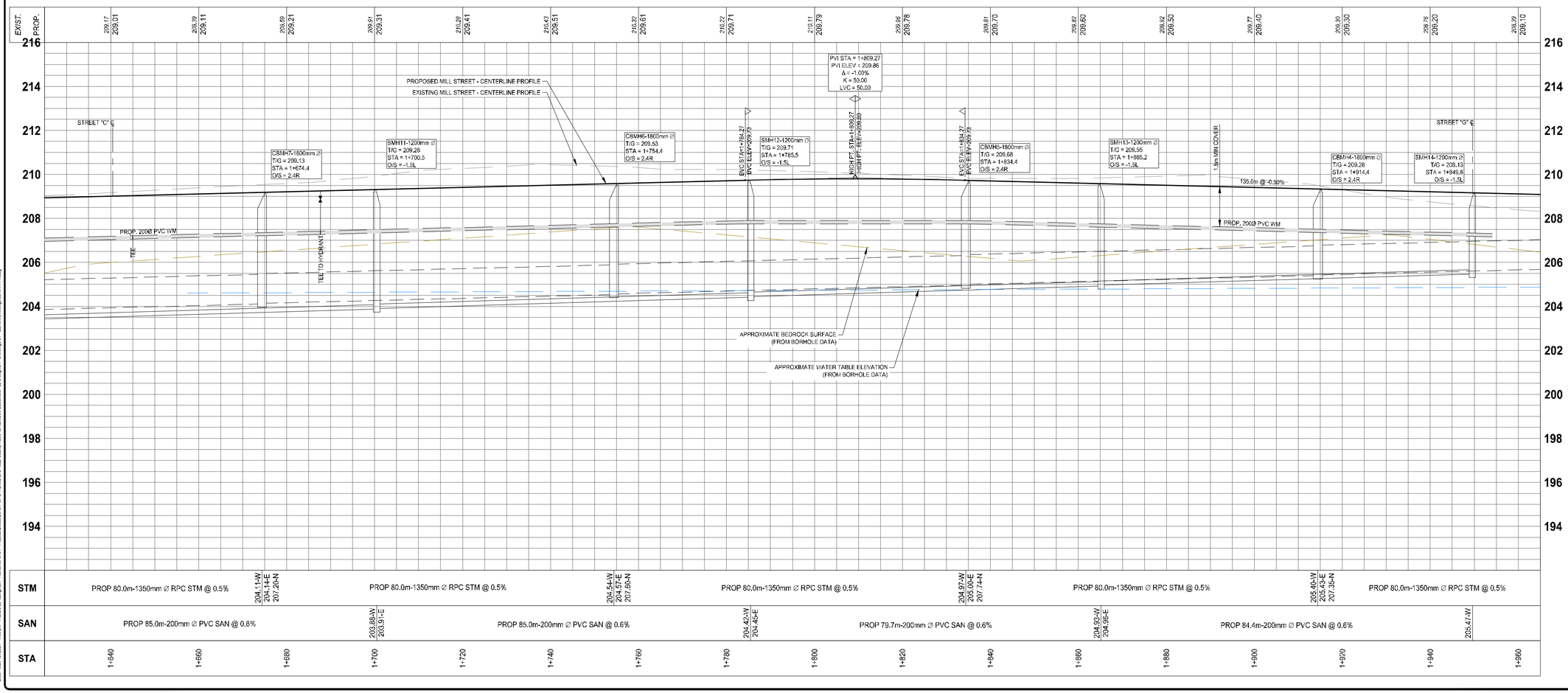
TOWN OF NORWOOD

MILL STREET PRELIMINARY PLAN & PROFILE STA 1+310 - 1+625

TOWN OF NORWOOD

DRAWN BY: S,DINGMAN
DESIGNED BY: S.DINGMAN
APPROVED BY: B.PARSONS
DATE: 2024-02-23
STAMP: B.T.PARSONS 100213434 2024-03-15 LICENSED PROFESSIONAL ENGINEER PROVINCE OF ONTARIO
SCALE: 1:500H 1:100V
PROJECT NUMBER: 23104
SHEET NAME: F11
SHEET: 6 of 9





SURVEY

BENCHMARK

NOTES:

No.	REVISION	BY	DATE
1.	ISSUED FOR REZONING	SD	24/03/15

ENGAGE ENGINEERING

www.engageeng.ca • 171 King Street, Suite 120 Peterborough, ON • Phone: (705) 755-0427

TRENT MEADOWS
PHASE 1

TOWN OF NORWOOD

MILL STREET
PRELIMINARY
PLAN & PROFILE
STA 1+625 - 1+965

TOWN OF NORWOOD

DRAWN BY: S,DINGMAN

DESIGNED BY: S.DINGMAN

APPROVED BY: B.PARSONS

DATE: 2024-02-23

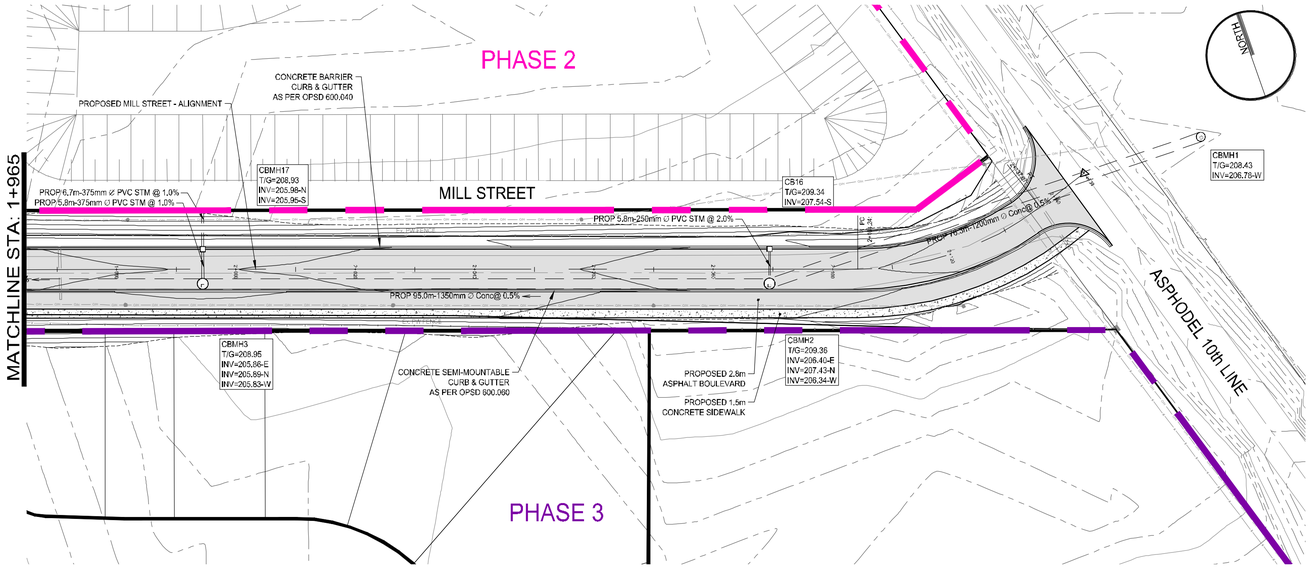
STAMP:
LICENSED PROFESSIONAL ENGINEER
B.T.PARSONS
100213434
2024-03-15
PROVINCE OF ONTARIO

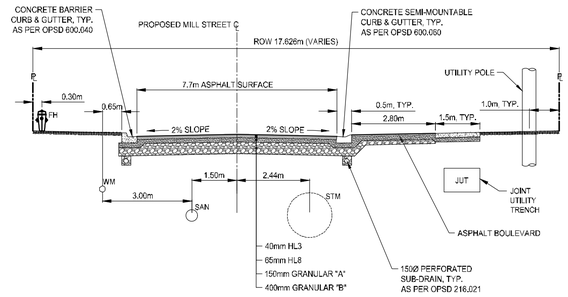
SCALE: 1:500H 1:100V

PROJECT NUMBER:	SHEET NAME:	SHEET:
23104	F12	7 of 9

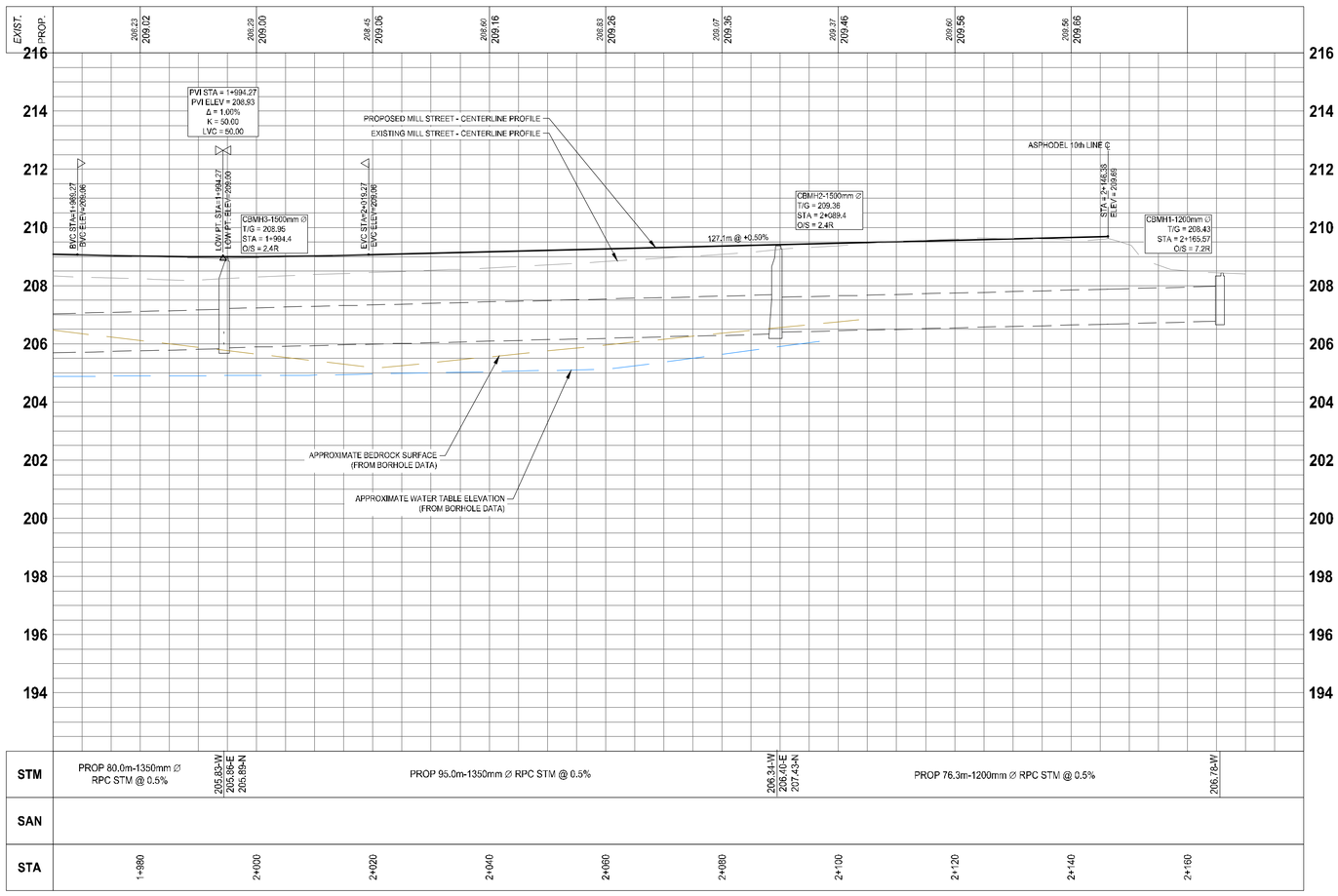
23104-PP1

Date: Mar. 13, 2024 - 4:00 pm Plotted by: sdingman Filename: S:\01 - Projects\23000\23104- 67 & 112 Mill St & 1552 County Road 42 Norwood Subdivision\02 Design\01 - Drawings\01 - Current Drawings\23104-PP1.dwg





PROPOSED MILL STREET - TYPICAL SECTION
SCALE: 1:100



SURVEY

BENCHMARK

NOTES:

No.	REVISION	BY	DATE
1.	ISSUED FOR REZONING	SD	24/03/15

ENGAGE ENGINEERING
www.engageeng.ca 171 King Street, Suite 120 Peterborough, ON Phone: (705) 755-0422

TRENT MEADOWS PHASE 1

TOWN OF NORWOOD

MILL STREET PRELIMINARY PLAN & PROFILE STA 1+965 - 2-150

TOWN OF NORWOOD

DRAWN BY:	S.DINGMAN
DESIGNED BY:	S.DINGMAN
APPROVED BY:	B.PARSONS
DATE:	2024-02-23
SCALE:	1:500H 1:100V
PROJECT NUMBER:	23104
SHEET NAME:	F13
SHEET:	8 of 9

STAMP: LICENSED PROFESSIONAL ENGINEER — B.T.PARSONS — 100213434 — 2024-03-15 — PROVINCE OF ONTARIO

23104-PP1
Date: Mar. 15, 2024 - 4:01 pm Plotted by: sdingman File source: S:\01 - Projects\23000\23104 - 67 & 112 Mill St & 1562 County Road 42 Norwood Subdivision\02 Design\01 - Drawings\01 - Current Drawings\23104-PP1.dwg

Appendix A: Water Design Sheets

Preliminary Fire Flow Calculations
Typical Townhome

Project Name: Trent Meadows Phase 1
Project No: 23104
Designed By: LM
Date: 2024-03-13

Criteria			
Water Supply for Public Fire Protection (2020)			
Fire Underwriters Survey			
F=220C√A			
F= the required fire flow in litres per minute			
C= coefficient related to the type of construction			
A= the total floor area in square metres in the building			
Calculations			
Assumptions			
	Normal construction		
C =	1	From pg. 20	
Area			
A =	130m^2	Fire walls assumed between units	
=	130.00	m^2	
Fire Flow			
F =	220C√A		
=	(220*1)√130		
=	2508	L/min	
=	3000	L/min (rounded)	
Separation Charge			
N =	0%	(Fire Break)	
E =	10%	(20m)	
S =	0%	(Fire Break)	
W =	0%	(35m)	
Total =	10%	(Max. 75%)	
Occupancy and Contents Adjustment Factor			
Group C =	-15%	(Residential Occupancies)	
Total Adjustment=	-5%		
Final Fire Flow			
F_{FINAL} =	F x Total Adjustment(%)		
=	2850	L/min	
=	**3000**	**L/min (rounded)**	

Notes:

Separation Charges to be reviewed during detailed design

C = 1.5 for wood frame construction (structure essentially all combustible)

1.0 for ordinary construction (brick or other masonry walls, combustible floor and interior)

0.8 for non-combustible construction (unprotected metal structural components, masonry or metal walls)

Water Demand

Project Name:	Trent Meadows Phase 1	**Designed By:**	LM
Project No:	23104	**Date:**	2024-03-28

Design Criteria			
Future Domestic Water Demand:	350	L/p/day	A
No. of Units (Single Family):	152		B
No. of Persons/Unit (Single Family):	3.0	p/unit	C
No. of Units (Townhouse):	12		D
No. of Persons/Unit (Townhouse):	2.4	p/unit	E
Max. Day Peak Factor (MOE):	2.25		F
Peak Hour Peak Factor (MOE):	3.38		G
Fire Flow:	2,000	L/min	H

Calculations				
Average Day Demand				
	Q_{AVG}	=	A x (B x C + D x E)	
		=	169680	L/day
		=	117.8	L/min
		=	169.7	m³/day
Maximum Day Demand				
	Q_{MDD}	=	Q_{AVG} x F	
		=	381780	L/day
		=	265.1	L/min
		=	381.8	m³/day
Peak Hour Demand				
	Q_{PHD}	=	Q_{AVG} x G	
		=	573518	L/day
		=	398.3	L/min
		=	573.5	m³/day
Total Demand (MDD + Fire Flow)				
	Q_{TD}	=	Q_{MDD} + I	
		=	3261780	L/day
		=	2265.1	L/min
		=	**3261.8**	**m³/day**

Pressure and flow calculations for the far end of the site

Required Input Used to calculate the available flow at a desired pressure at a certain elevation above a hydrant

Hydrant Pressures (Prior to Standpipe Upgrades)			**Hydrant Flows**		
Static Pressure (P_{static})	50	psi	Static Flow	0	US GPM
Test Pressure (P_{test})	18	psi	Test Flow (Q_{test})	712	US GPM
Desired Pressure ($P_{residual}$)	20	psi	Flow @ $P_{residual}$	688	US GPM
Hydrant Pressures (Assumed values after 11 psi increase to system)			**Hydrant Flows**		
Static Pressure (P_{static})	61.4	psi	Static Flow	0	US GPM
Test Pressure (P_{test})	29.4	psi	Test Flow (Q_{test})	712	US GPM
Desired Pressure ($P_{residual}$)	20	psi	Flow @ $P_{residual}$	818	US GPM

Hydrant Elevation	209.65	m
Pipe Diameter @ Hydrant	200	mm
Site Elevation	212	m
Piped Distance to Site	601	m
Connection Pipe Diameter	200	mm
Connection Pipe Material	PVC	-
Hazen Williams 'C'	150	-

Calculating Hazen Williams Head Loss Due to Friction between hydrant and site

Available Flow Rate (L/min)	Flow Rate [Q] (m^3/s)	Hazen Williams Friction Factor [C] (-)	Pipe Inside Diameter [d] (mm)	Length of Pipe [L] (m)	H-W Head Loss (m)
1978.9	0.0330	150	200	601	**2.74**
2959.8	0.0493	150	200	601	**5.77**

$$h_f = \frac{10.67Q^{1.852}}{C^{1.852}d^{4.8704}}$$

Bernoulli Equation to find the site pressure that corresponds with the Available Flow Rates, Pressure at Hydrant, and Elevations

Available Flow Rate (L/min)	Hydrant			Site			
	Pressure Head (m)	Velocity Head (m)	Elevation Head (m)	Pressure Head (m)	Velocity Head (m)	Elevation Head (m)	Friction Head Loss (m)
1978.9	30.5	0.05	209.65	**28.1**	0.05	212	0.00*
2959.8	16.4	0.08	209.65	**14.1**	0.08	212	0.00*

*Looped System Assumed to be 0

Head Loss, Pressure, and Flow Summary

Available Flow Rate (L/min)	Pressure @ Hydrant (psi)	Friction Head Loss (m)	Elevation Head Loss (m)	Total Head Loss (m)	Pressure Provided on Site (psi)	
1978.9	43.3	0.00*	2.35	2.35	**40.0**	Adjust flow rate to find the available flow at a pressure of 40 psi
2959.8	23.3	0.00*	2.35	2.35	**20.0**	Adjust flow rate to find the available flow at a pressure of 20 psi

Appendix B: Sanitary Design Sheets

Sewage Flows

Project Name:	Trent Meadows Phase 1	**Designed By:**	LM
Project No:	23104	**Date:**	2024-03-28

Design Criteria			
Residential Sewage Flows:	350	L/p/day	A
No. of Units (Single Family):	152		B
No. of Persons/Unit (Single Family):	3.0	p/unit	C
No. of Units (Townhomes):	12		D
No. of Persons/Unit (Townhomes):	2.4	p/unit	E
Drainage Area:	11.21	ha	G
Inflow and Infiltration Rate	0.28	L/s/ha	H

Calculations

Peaking Factor

K_H = 1+(14 / (4+((B*C + D*E)/1000)^1/2))

K_H = 3.98

Residential Sewage Flows

F_{RES} = (B x C + D x E +F)*A

= 169680 L/day

= 1.96 L/s

= 169.68 m³/day

Peaked Residential Sewage Flows

F_{PEAK} = F_{RES} X K_H

= 675511 L/day

= 7.82 L/s

= 675.51 m³/day

Inflow and Infiltration Rate

$F_{I\&I}$ = G x H

= 271192 L/day

= 3.14 L/s

= 271.19 m³/day

Total Proposed Sewage Flows

F_{TOT} = F_{PEAK} + $F_{I\&I}$

= 946703 L/day

= 10.96 L/s

= **946.70 m³/day**

Sanitary Sewer Design Sheet
Existing Conditions

Project Name: Trent Meadows Phase 1
Project Number: 23104

Flow Rate: 450 L/person/day
Infiltration: 0.28 L/s/ha
Max Capacity: 80 %
Location: City of Peterborough

Designed By: LM
Date: 2024-03-13

Flow	Type	Value	Unit
Single Family	Residence	3.0	person/unit
Townhomes	Residence	2.4	person/unit
Retirement Home	Residence	1.0	person/unit
Commercial	Peak Flow	0.33	L/s/ha
School	Peak Flow	0.08	L/s/100 Students
Institutional	Peak Flow	0.29	L/s/ha
Fair	Peak Flow	0.29	L/s/1000 attendees

Location			Single Family		Townhomes		Retirement Home		Commercial		School		Institutional		Fair		Area		Population		Flow							Pipe Properties					Hydraulics			
Location/Street Name	From Structure	To Structure	Number of Units	Population	Number of Units	Population	Number of Units	Population	Commercial Area(ha)	Cumulative Commercial Area (ha)	School Population	Cumulative School Population (Per 100 Students)	Institutional Area(ha)	Cumulative Institutional Area (ha)	Fair Area(ha)	Cumulative Fair Area (ha)	Catchment Area (ha)	Cumulative Catchment Area (ha)	Cumulative Population	Harmon Factor	Residential Peak Flow (L/s)	Commercial Peak Flow (L/s)	School Peak Flow (L/s)	InstitutionalPeak Flow (L/s)	FairPeak Flow (L/s)	Infiltration Flow (L/s)	Total Peak Flow (L/s)	Pipe Diameter (mm)	Pipe Slope (%)	Pipe Length (m)	Pipe Material	Mannings 'n'	Velocity in Sewer (m/s)	Pipe Capacity (L/s)	% Capacity	Actual Velocity (m/s)
Murray St	MH10	MH5	12	36	0	0	0	0	0.000	0.000	0	0	0.000	0.000	0.000	0.000	2.057	2.057	36	4.34	0.81	0.00	0.00	0.00	0.00	0.58	1.39	250	0.50	240.5	PVC	0.013	0.86	42.1	3%	0.39
Robert Rd	MH5	MH2A	21	63	0	0	0	0	0.000	0.000	0	0	0.000	0.000	0.000	0.000	3.490	5.547	99	4.25	2.19	0.00	0.00	0.00	0.00	1.55	3.74	250	0.50	262.7	PVC	0.013	0.86	42.1	9%	0.53
Pine St	MH2A	MH27	4	12	0	0	0	0	0.000	0.000	0	0	0.000	0.000	0.000	0.000	0.672	6.219	111	4.25	2.45	0.00	0.00	0.00		1.74	4.20	200	0.40	100.8	PVC	0.013	0.66	20.7	20%	0.51
Ridge St	MH25	MH27	6	18	0	0	0	0	0.000	0.000	0	0	0.000	0.000	0.000	0.000	1.493	1.493	18	4.39	0.41	0.00	0.00	0.00	0.00	0.42	0.83	200	6.30	158.0	PVC	0.013	2.62	82.3	1%	0.83
Ridge St	MH31	MH27	31	93	0	0	0	0	0.000	0.000	0	0	0.000	0.000	0.000	0.000	4.609	4.609	93	4.25	2.06	0.00	0.00	0.00	0.00	1.29	3.35	200	0.50	426.0	PVC	0.013	0.74	23.2	14%	0.52
Pine St	MH27	MH16	0	0	0	0	0	0	0.000	0.000	0	0	0.000	0.000	0.000	0.000	0.000	12.321	222	4.13	4.78	0.00	0.00	0.00	0.00	3.45	8.23	200	0.40	83.0	PVC	0.013	0.66	20.7	40%	0.62
Hwy 7	MH12	MH16	15	45	0	0	0	0	0.000	0.000	0	0	0.000	0.000	0.000	0.000	8.981	8.981	45	4.32	1.01	0.00	0.00	0.00	0.00	2.51	3.53	200	0.40	414.0	Concrete	0.013	0.66	20.7	17%	0.49
Hwy7	MH166	MH199	12	36	0	0	0	0	1.438	1.438	0	0	0.000	0.000	0.000	0.000	3.424	3.424	36	4.34	0.81	0.47	0.00	0.00	0.00	0.96	2.25	200	0.40	290.5	Concrete	0.013	0.66	20.7	11%	0.43
Pine St	MH16	MH4	6	18	0	0	0	0	0.000	0.000	0	0	0.000	0.000	0.000	0.000	0.641	21.943	285	4.09	6.07	0.00	0.00	0.00	0.00	6.14	12.21	200	1.00	143.0	Concrete	0.013	1.04	32.8	37%	0.97
Oak St/Spring St	MH2	MH4	10	30	0	0	0	0	0.000	0.000	3	3	0.000	0.000	0.000	0.000	3.914	3.914	30	4.36	0.68	0.00	0.24	0.00	0.00	1.10	2.02	200	0.40	301.0	Concrete	0.013	0.66	20.7	10%	0.42
Spring St	MH4	MH7	23	69	0	0	0	0	0.000	0.000	0	3	0.000	0.000	0.000	0.000	3.066	28.924	384	4.03	8.06	0.00	0.24	0.00	0.00	8.10	16.40	200	0.60	274.5	Concrete	0.013	0.81	25.4	65%	0.86
CR40	MH205	MH201	8	24	0	0	0	0	0.000	0.000	0	0	0.000	0.000	0.000	0.000	6.540	6.540	24	4.37	0.55	0.00	0.00	0.00	0.00	1.83	2.38	200	0.70	259.7	Concrete	0.013	0.87	27.4	9%	0.53
Albine Street	MH17A	MH201	125	375	8	19	0	0	0.000	0.000	0	0	0.000	0.000	0.000	0.000	13.970	13.970	394	4.03	8.26	0.00	0.00	0.00		3.91	12.18	200	0.40	167.0	PVC	0.013	0.66	20.7	59%	0.69
CR40	MH201	MH59	193	579	0	0	0	0	0.000	0.000	0	0	0.000	0.000	0.000	0.000	23.430	43.940	997	3.80	19.74	0.00	0.00	0.00		12.30	32.04	200	0.70	430.2	PVC	0.013	0.87	27.4	117%	0.87
Wellington		MH59	7	21	0	0	0	0	0.000	0.000	0	0	0.000	0.000	0.000	0.000	1.034	1.034	21	4.38	0.48	0.00	0.00	0.00	0.00	0.29	0.77	200	0.70	105.0	Concrete	0.013	0.87	27.4	3%	0.38
CR40 S		MH59	6	18	0	0	0	0	0.000	0.000	0	0	0.000	0.000	0.000	0.000	0.917	0.917	18	4.39	0.41	0.00	0.00	0.00	0.00	0.26	0.67	200	0.70	99.0	Concrete	0.013	0.87	27.4	2%	0.36
Wellington	MH59	MH111	9	27	0	0	0	0	0.000	0.000	0	0	0.000	0.000	0.000	0.000	1.903	47.795	1063	3.78	20.95	0.00	0.00	0.00	0.00	13.38	34.33	375	0.60	272.0	PVC	0.013	1.23	135.8	25%	1.02
Hwy 7		MH111	24	72	0	0	0	0	3.020	3.020	0	0	0.000	0.000	0.000	0.000	20.820	20.820	72	4.28	1.61	1.00	0.00	0.00	0.00	5.83	8.43	200	0.40	604.0	Concrete	0.013	0.66	20.7	41%	0.63
Hwy7	MH111	MH109	2	6	0	0	0	0	0.000	3.020	0	0	0.000	0.000	0.000	0.000	1.278	69.893	1141	3.76	22.36	1.00	0.00	0.00	0.00	19.57	42.93	375	0.50	147.0	PVC	0.013	1.12	124.0	35%	1.02
Legion St	MH86	MH88	10	30	0	0	0	0	0.000	0.000	0	0	0.000	0.000	0.000	0.000	2.277	2.277	30	4.36	0.68	0.00	0.00	0.00	0.00	0.64	1.32	200	0.40	152.0	Concrete	0.013	0.66	20.7	6%	0.37
Cedar St	MH89	MH88	1	3	0	0	0	0	0.000	0.000	0	0	0.000	0.000	0.000	0.000	0.475	0.475	3	4.45	0.07	0.00	0.00	0.00	0.00	0.13	0.20	200	0.40	40.0	Concrete	0.013	0.66	20.7	1%	0.21
Cedar St	MH88	MH90	0	0	0	0	0	0	0.000	0.000	0	0	0.000	0.000	0.000	0.000	0.000	2.751	33	4.35	0.75	0.00	0.00	0.00	0.00	0.77	1.52	200	0.40	97.0	Concrete	0.013	0.66	20.7	7%	0.38
Cedar St	MH109	MH90	0	0	0	0	0	0	0.000	3.020	0	0	0.000	0.000	0.000	0.000	0.440	70.332	1141	3.76	22.36	1.00	0.00	0.00	0.00	19.69	43.05	375	0.50	57.0	PVC	0.013	1.12	124.0	35%	1.02
Easement	MH90	MH85	2	6	0	0	0	0	0.000	3.020	0	0	0.000	0.000	0.000	0.000	2.503	75.587	1180	3.75	23.06	1.00	0.00	0.00	0.00	21.16	45.22	450	0.40	183.0	PVC	0.013	1.13	180.3	25%	0.94
Elm St	MH82	MH85	3	9	0	0	0	0	0.000	0.000	0	0	0.000	0.000	0.000	0.000	0.908	0.908	9	4.42	0.21	0.00	0.00	0.00	0.00	0.25	0.46	200	0.70	128.0	Concrete	0.013	0.87	27.4	2%	0.32
Easement	MH85	MH106	1	3	0	0	0	0	0.000	3.020	0	0	0.000	0.000	0.000	0.000	0.537	77.031	1192	3.75	23.28	1.00	0.00	0.00	0.00	21.57	45.84	450	0.30	115.0	PVC	0.013	0.98	156.2	29%	0.85
Hwy7	MH23	MH21	4	12	0	0	0	0	0.000	0.000	0	0	0.000	0.000	0.000	0.000	0.929	0.929	12	4.41	0.28	0.00	0.00	0.00	0.00	0.26	0.54	200	0.60	160.0	Concrete	0.013	0.81	25.4	2%	0.32
CR40	MH123	MH21	3	9	0	0	0	0	0.000	0.000	0	0	0.000	0.000	0.000	0.000	0.683	0.683	9	4.42	0.21	0.00	0.00	0.00	0.00	0.19	0.40	200	9.20	102.0	Concrete	0.013	3.17	99.5	0%	0.73
Hwy7	MH19	MH21	4	12	0	0	0	0	0.590	0.590	0	0	0.000	0.000	0.000	0.000	1.543	1.543	12	4.41	0.28	0.19	0.00	0.00	0.00	0.43	0.90	200	1.60	161.0	Concrete	0.013	1.32	41.5	2%	0.53
Victoria	MH21	MH106	0	0	0	0	0	0	0.000	0.590	0	0	0.000	0.000	0.000	0.000	0.250	3.405	33	4.35	0.75	0.19	0.00	0.00	0.00	0.95	1.90	200	1.60	103.0	Concrete	0.013	1.32	41.5	5%	0.67
Victoria	MH106	MH12A	4	12	0	0	0	0	0.066	3.676	0	0	0.000	0.000	0.000	0.000	2.213	82.649	1237	3.74	24.09	1.21	0.00	0.00	0.00	23.14	48.44	450	0.50	182.0	PVC	0.013	1.27	201.6	24%	1.04
Pumping Station	MH12A	PS	0	0	0	0	0	0	0.000	3.676	0	0	0.000	0.000	0.000	0.000	0.000	82.649	1237	3.74	24.09	1.21	0.00	0.00		23.14	48.44	525	0.40	6.0	PVC	0.013	1.26	272.0	18%	0.95
CR45	MH199	MH7	0	0	0	0	0	0	0.668	2.106	0	0	0.000	0.000	0.000	0.000	1.114	4.538	36	4.34	0.81	0.70	0.00	0.00	0.00	1.27	2.78	200	1.00	144.0	Concrete	0.013	1.04	32.8	8%	0.63
CR45	MH7	MH33	0	0	0	0	0	0	0.268	2.375	0	3	0.000	0.000	0.000	0.000	0.672	34.134	420	4.01	8.78	0.78	0.24	0.00	0.00	9.56	19.36	200	1.00	91.0	Concrete	0.013	1.04	32.8	59%	1.09
Pumping Station	MH33	MH124	0	0	0	0	0	0	0.000	2.375	0	3	0.000	0.000	0.000	0.000	0.000	34.134	420	4.01	8.78	0.78	0.24	0.00	0.00	9.56	19.36	250	0.80	10.5	Concrete	0.013	1.08	53.2	36%	1.00
Queen Street	MH36	MH41	52	156	0	0	0	0	0.000	0.000	0	0	0.000	0.000	0.000	0.000	7.221	7.221	156	4.19	3.40	0.00	0.00	0.00	0.00	2.02	5.42	200	0.40	565.0	Concrete	0.013	0.66	20.7	26%	0.55
King Street	MH100	MH101	9	27	0	0	0	0	0.000	0.000	0	0	0.000	0.000	0.000	0.000	1.482	1.482	27	4.36	0.61	0.00	0.00	0.00	0.00	0.41	1.03	200	1.14	95.0	Concrete	0.013	1.11	35.0	3%	0.49
King Street	MH101	MH102	10	30	0	0	0	0	0.000	0.000	0	0	0.000	0.000	0.000	0.000	0.952	2.434	57	4.30	1.28	0.00	0.00	0.00	0.00	0.68	1.96	200	0.44	89.3	Concrete	0.013	0.69	21.8	9%	0.43
King Street	MH102	MH103	8	24	0	0	0	0	0.000	0.000	0	0	0.000	0.000	0.000	0.000	0.951	3.384	81	4.27	1.80	0.00	0.00	0.00	0.00	0.95	2.75	200	1.53	85.3	Concrete	0.013	1.29	40.6	7%	0.73
King Street	MH103	MH104	9	27	0	0	0	0	0.000	0.000	0	0	0.000	0.000	0.000	0.000	0.949	4.333	108	4.23	2.38	0.00	0.00	0.00	0.00	1.21	3.59	200	0.65	92.7	Concrete	0.013	0.84	26.4	14%	0.59
King Street	MH104	MH105	6	18	0	0	0	0	0.000	0.000	0	0	0.000	0.000	0.000	0.000	0.878	5.212	126	4.22	2.77	0.00	0.00	0.00	0.00	1.46	4.23	200	0.55	92.0	Concrete	0.013	0.77	24.3	17%	0.58
Elm Street	MH80	MH105	0	0	0	0	0	0	0.000	0.000	3	3	0.000	0.000	10.000	10.000	21.451	21.451	0	4.50	0.00	0.00	0.24	0.00	2.90	6.01	9.15	200	0.50	321.0	Concrete	0.013	0.74	23.2	39%	0.69
Alma Street	MH74	MH54	22	66	0	0	61	61	0.000	0.000	0	0	0.000	0.000	0.000	0.000	6.508	6.508	127	4.21	2.79	0.00	0.00	0.00	0.00	1.82	4.61	200	0.40	484.1	Concrete	0.013	0.66	20.7	22%	0.53
King Street	MH54	MH105	10	30	0	0	0	0	0.000	0.000	0	0	0.000	0.000	0.000	0.000	1.703	8.211	157	4.19	3.42	0.00	0.00	0.00	0.00	2.30	5.72	200	0.60	179.3	Concrete	0.013	0.81	25.4	23%	0.65
Elm Street	MH105	MH41	0	0	0	0	0	0	0.000	0.000	0	3	0.000	0.000	0.000	10.000	0.180	35.054	283	4.09	6.03	0.00	0.24	0.00	2.90	9.81	18.98	200	0.50	98.2	Concrete	0.013	0.74	23.2	82%	0.82
Queen Street	MH41	MH42	10	30	0	0	0	0	0.000	0.000	0	3	0.000	0.000	0.000	10.000	1.105	43.380	469	3.99	9.74	0.00	0.24	0.00	2.90	12.15	25.03	200	0.40	86.1	Concrete	0.013	0.66	20.7	121%	0.66
Queen Street	MH42	MH43	8	24	0	0	0	0	0.000	0.000	0	3	0.000	0.000	0.000	10.000	0.912	44.292	493	3.98	10.21	0.00	0.24	0.00	2.90	12.40	25.75	200	0.40	93.3	Concrete	0.013	0.66	20.7	124%	0.66
Queen Street	MH43	MH44	6	18	0	0	0	0	0.000	0.000	0	3	0.000	0.000	0.000	10.000	0.955	45.247	511	3.97	10.56	0.00	0.24	0.00	2.90	12.67	26.37	200	0.40	83.3	Concrete	0.013	0.66	20.7	127%	0.66
Queen Street	MH44	MH45	2	6	0	0	0	0	0.000	0.000	0	3	0.000	0.000	0.000	10.000	0.357	45.604	517	3.97	10.68	0.00	0.24	0.00	2.90	12.77	26.59	200	0.40	72.2	Concrete	0.013	0.66	20.7	128%	0.66
King Street	MH55	MH56	12	36	0	0	0	0	0.000	0.000	0	0	0.000	0.000	0.000	0.000	1.522	1.522	36	4.34	0.81	0.00	0.00	0.00	0.00	0.43	1.24	200	0.60	161.0	Concrete	0.013	0.81	25.4	5%	0.42
Flora Street		MH56	12	36	0	0	0	0	0.000	0.000	3	3	0.000	0.000	0.000	0.000	3.462	3.462	36	4.34	0.81	0.00	0.26	0.00	0.00	0.97	2.04	250	0.40	235.0	Concrete	0.013	0.77	37.6	5%	0.41
Flora Street	MH56	MH45	3	9	0	0	0	0	0.000	0.000	0	3	0.000	0.000	0.000	0.000	0.408	5.392	81	4.27	1.80	0.00	0.26	0.00	0.00	1.51	3.57	200	0.40	102.0	Concrete	0.013	0.66	20.7	17%	0.49
Queen Street	MH45	MH166	0	0	0	0	0	0	0.000	0.000	0	6	0.000	0.000	0.000	10.000	0.000	50.996	598	3.93	12.25	0.00	0.50	0.00	2.90	14.28	29.93	200	0.40	14.2	Concrete	0.013	0.66	20.7	144%	0.66
Birch Street		MH97	89	267	0	0	0	0	0.000	0.000	0	0	0.000	0.000	0.000	0.000	5.545	5.545	267	4.10	5.70	0.00	0.00	0.00	0.00	1.55	7.25	200	0.40	702.5	Concrete	0.013	0.66	20.7	35%	0.60
Victoria	MH97	MH101	24	72	0	0	60	60	0.000	0.000	0	0	0.000	0.000	0.000	0.000	6.989	12.534	399	4.02	8.36	0.00	0.00	0.00	0.00	3.51	11.87	200	0.60	702.5	Concrete	0.013	0.81	25.4	47%	0.79
Victoria	MH101	MH166	16	48	0	0	0	0	0.000	0.000	0	0	0.000	0.000	0.000	0.000	5.045	19.060	474	3.99	9.84	0.00	0.00	0.00	0.00	5.34	15.18	200	0.50	348.0	Concrete	0.013	0.74	23.2	65%	0.79
Pumping Station	MH166	MH124	0	0	0	0	0	0	0.000	0.000	0	6	0.000	0.000	0.000	10.000	0.604	70.661	1072	3.78	21.11	0.00	0.50	0.00	2.90	19.78	44.29	250	1.00	112.1	Concrete	0.013	1.21	59.5	74%	1.33
	MH124	PS	0	0	0	0	0	0	0.000	2.375	0	9	0.000	0.000	0.000	10.000	0.000	104.794	1492	3.68	28.60	0.78	0.74	0.00	2.90	29.34	62.37	250	1.40	6.3	Concrete	0.013	1.43	70.4	89%	1.62

Assumed
Area of Interest

Sanitary Sewer Design Sheet
Proposed Conditions Trent Meadows Phase 1 and Phase 2

Project Name: Trent Meadows Phase 1
Project Number: 23104

Flow	Type	Value	Unit
Existing Single Family	Residence	3.0	person/unit
Existing Townhomes	Residence	2.4	person/unit
Future Single Family	Residence	3.0	person/unit
Future Townhomes	Residence	2.4	person/unit
Apartments	Residence	2	person/unit
Commercial	Peak Flow	0.33	L/s/ha
School	Peak Flow	0.08	L/s/100 Students
Fair	Peak Flow	0.29	L/s/1000 attendees

Future Flow Rate: 350 L/person/day
Existing Flow Rate: 450 L/person/day
Infiltration: 0.28 L/s/ha
Max Capacity: 80 %
Location: City of Peterborough

Designed By: LM
Date: 2024-02-09

Location			Existing Single Family		Existing Townhomes		Future Single Family		Future Townhomes		Apartments		Commercial		School		Fair		Area		Population		Flow						Pipe Properties					Hydraulics			
Location/Street Name	From Structure	To Structure	Number of Units	Population	Number of Units	Population	Number of Units	Population	Number of Units	Population	Number of Units	Population	Commercial Area(ha)	Cumulative Commercial Area (ha)	School Population	Cumulative School Population (Per 100 Students)	Fair Population	Cumulative Fair Population (Per 1000 attendees)	Catchment Area (ha)	Cumulative Catchment Area (ha)	Cumulative Population	Harmon Factor	Resedential Peak Flow (L/s)	Commercial Peak Flow (L/s)	School Peak Flow (L/s)	Fair/Peak Flow (L/s)	Infiltration Flow (L/s)	Total Peak Flow (L/s)	Pipe Diameter (mm)	Pipe Slope (%)	Pipe Length (m)	Pipe Material	Mannings 'n'	Velocity in Sewer (m/s)	Pipe Capacity (L/s)	% Capacity	Actual Velocity (m/s)
Murray St	MH10	MH5	46	138	0	0	0	0	0	0	0	0	0.000	0.000	0	0	0	0	6.080	6.080	138	4.20	3.02	0.00	0.00	0.00	1.70	4.72	250	0.50	240.5	PVC	0.013	0.86	42.1	11%	0.56
Robert Rd/Pine St	MH5	MH2A	25	75	0	0	0	0	0	0	0	0	0.000	0.000	0	0	0	0	3.490	9.570	213	4.14	4.59	0.00	0.00	0.00	2.68	7.27	250	0.50	363.5	PVC	0.013	0.86	42.1	17%	0.64
Pine St	MH2A	MH27	4	12	0	0	0	0	0	0	0	0	0.000	0.000	0	0	0	0	0.672	10.242	225	4.14	4.85	0.00	0.00	0.00	2.87	7.72	200	0.40	100.8	PVC	0.013	0.66	20.7	37%	0.61
Ridge St	MH25	MH27	6	18	0	0	0	0	0	0	0	0	0.000	0.000	0	0	0	0	1.493	1.493	18	4.39	0.41	0.00	0.00	0.00	0.42	0.83	200	6.30	158.0	PVC	0.013	2.62	82.3	1%	0.83
Ridge St	MH31	MH27	31	93	0	0	0	0	0	0	0	0	0.000	0.000	0	0	0	0	4.609	4.609	93	4.25	2.06	0.00	0.00	0.00	1.29	3.35	200	0.50	426.0	PVC	0.013	0.74	23.2	14%	0.52
Pine St	MH27	MH16	0	0	0	0	0	0	0	0	0	0	0.000	0.000	0	0	0	0	0.000	16.344	336	4.06	7.10	0.00	0.00	0.00	4.58	11.68	200	0.40	83.0	PVC	0.013	0.66	20.7	56%	0.68
Hwy 7	MH12	MH16	15	45	0	0	0	0	0	0	0	0	0.000	0.000	0	0	0	0	8.981	8.981	45	4.32	1.01	0.00	0.00	0.00	2.51	3.53	200	0.40	414.0	Concrete	0.013	0.66	20.7	17%	0.49
Hwy7	MH166	MH199	12	36	0	0	0	0	0	0	0	0	1.438	1.438	0	0	0	0	3.424	3.424	36	4.34	0.81	0.47	0.00	0.00	0.96	2.25	200	0.40	290.5	Concrete	0.013	0.66	20.7	11%	0.43
Pine St	MH16	MH4	6	18	0	0	0	0	0	0	0	0	0.000	0.000	0	0	0	0	0.641	25.966	399	4.02	8.36	0.00	0.00	0.00	7.27	15.63	200	1.00	143.0	Concrete	0.013	1.04	32.8	48%	1.03
Oak St/Spring St	MH2	MH4	10	30	0	0	0	0	0	0	0	0	0.000	0.000	0	0	0	0	3.914	3.914	30	4.36	0.68	0.00	0.00	0.00	1.10	1.78	200	0.40	301.0	Concrete	0.013	0.66	20.7	9%	0.40
Spring St	MH4	MH7	23	69	0	0	0	0	0	0	0	0	0.000	0.000	0	0	0	0	3.066	32.947	498	3.98	10.31	0.00	0.00	0.00	9.23	19.54	200	0.60	274.5	Concrete	0.013	0.81	25.4	77%	0.89
CR40	MH205	MH201	8	24	0	0	0	0	0	0	0	0	0.000	0.000	0	0	0	0	6.540	6.540	24	4.37	0.55	0.00	0.00	0.00	1.83	2.38	200	0.70	927.8	Concrete	0.013	0.87	27.4	9%	0.53
Albine Street	MH17A	MH201	125	375	8	19	0	0	0	0	0	0	0.000	0.000	0	0	0	0	13.970	13.970	394	4.03	8.26	0.00	0.00	0.00	3.91	12.18	200	0.40	126.0	PVC	0.013	0.66	20.7	59%	0.69
CR40	MH201	MH59	193	579	0	0	0	0	0	0	0	0	0.000	0.000	0	0	0	0	23.430	43.940	997	3.80	19.74	0.00	0.00	0.00	12.30	32.04	200	0.70	430.2	PVC	0.013	0.87	27.4	117%	0.87
Wellington		MH59	7	21	0	0	0	0	0	0	0	0	0.000	0.000	0	0	0	0	1.034	1.034	21	4.38	0.48	0.00	0.00	0.00	0.29	0.77	200	0.70	105.0	Concrete	0.013	0.87	27.4	3%	0.38
CR40		MH59	6	18	0	0	0	0	0	0	0	0	0.000	0.000	0	0	0	0	0.917	0.917	18	4.39	0.41	0.00	0.00	0.00	0.26	0.67	200	0.70	99.0	Concrete	0.013	0.87	27.4	2%	0.36
Wellington	MH59	MH111	9	27	0	0	0	0	0	0	0	0	0.000	0.000	0	0	0	0	1.903	47.795	1063	3.78	20.95	0.00	0.00	0.00	13.38	34.33	375	0.60	272.0	PVC	0.013	1.23	135.8	25%	1.02
Hwy 7		MH111	24	72	0	0	0	0	3	7	0	0	3.020	3.020	0	0	0	0	20.820	20.820	79	4.27	1.76	1.00	0.00	0.00	5.83	8.59	200	0.40	604.0	Concrete	0.013	0.66	20.7	41%	0.63
Hwy7	MH111	MH109	2	6	0	0	0	0	0	0	0	0	0.000	3.020	0	0	0	0	1.278	69.893	1148	3.76	22.49	1.00	0.00	0.00	19.57	43.06	375	0.50	147.0	PVC	0.013	1.12	124.0	35%	1.02
Mill St (Trent Meadows Phase 2)	SMH14	SMH11	0	0	0	0	114	342	12	29	0	0	0.000	0.000	0	0	0	0	9.440	9.440	371	4.04	6.07	0.00	0.00	0.00	2.64	8.71	200	0.60	250.0	PVC	0.013	0.81	25.4	34%	0.73
Mill St (Other)	SMH11	SMH6	10	30	0	0	0	0	0	0	0	0	0.000	0.000	0	0	0	0	2.470	11.910	401	4.02	6.53	0.00	0.00	0.00	3.33	9.86	200	0.60	430.0	PVC	0.013	0.81	25.4	39%	0.76
Mill St (Trent Meadows Phase1)	SMH6	SMH5	0	0	0	0	151	453	12	29	0	0	0.000	0.000	0	0	0	0	11.210	23.120	883	3.83	13.71	0.00	0.00	0.00	6.47	20.18	300	0.40	84.0	PVC	0.013	0.87	61.2	33%	0.78
Mill St(Upper Mill Pond)	SMH5	SMH3	0	0	0	0	0	0	0	0	0	0	0.000	0.000	0	0	0	0	0.000	23.120	883	3.83	13.71	0.00	0.00	0.00	6.47	20.18	300	0.40	195.0	PVC	0.013	0.87	61.2	33%	0.78
Legion St	SMH3	MH86	6	18	0	0	0	0	0	0	0	0	0.000	0.000	0	0	0	0	2.708	25.828	901	3.83	13.97	0.00	0.00	0.00	7.23	21.20	300	0.40	133.0	PVC	0.013	0.87	61.2	35%	0.79
Legion St	MH86	MH88	10	30	0	0	0	0	0	0	0	0	0.000	0.000	0	0	0	0	2.277	28.105	931	3.82	14.56	0.00	0.00	0.00	7.87	22.43	300	0.40	152.0	Concrete	0.013	0.87	61.2	37%	0.80
Cedar St	MH89	MH88	1	3	0	0	0	0	0	0	0	0	0.000	0.000	0	0	0	0	0.475	0.475	3	4.45	0.07	0.00	0.00	0.00	0.13	0.20	200	0.40	40.0	Concrete	0.013	0.66	20.7	1%	0.21
Cedar St	MH88	MH90	0	0	0	0	0	0	0	0	0	0	0.000	0.000	0	0	0	0	0.000	28.579	934	3.82	14.62	0.00	0.00	0.00	8.00	22.62	300	0.40	97.0	Concrete	0.013	0.87	61.2	37%	0.80
Cedar St	MH109	MH90	0	0	0	0	0	0	0	0	0	0	0.000	3.020	0	0	0	0	0.440	70.332	1148	3.76	22.49	1.00	0.00	0.00	19.69	43.18	375	0.50	57.0	PVC	0.013	1.12	124.0	35%	1.02
Easement	MH90	MH85	2	6	0	0	0	0	0	0	0	0	0.720	3.740	0	0	0	0	2.503	101.415	2088	3.57	36.05	1.23	0.00	0.00	28.40	65.68	450	0.40	183.0	PVC	0.013	1.13	180.3	36%	1.04
Elm St	MH82	MH85	3	9	0	0	0	0	0	0	0	0	0.000	0.000	0	0	0	0	0.908	0.908	9	4.42	0.21	0.00	0.00	0.00	0.25	0.46	200	0.70	128.0	Concrete	0.013	0.87	27.4	2%	0.32
Easement	MH85	MH106	1	3	0	0	0	0	0	0	0	0	0.000	3.740	0	0	0	0	0.537	102.859	2100	3.57	36.26	1.23	0.00	0.00	28.80	66.29	450	0.30	115.0	PVC	0.013	0.98	156.2	42%	0.94
Hwy7	MH23	MH21	4	12	0	0	0	0	0	0	0	0	0.000	0.000	0	0	0	0	0.929	0.929	12	4.41	0.28	0.00	0.00	0.00	0.26	0.54	200	0.60	160.0	Concrete	0.013	0.81	25.4	2%	0.32
CR40	MH123	MH21	3	9	0	0	0	0	0	0	0	0	0.000	0.000	0	0	0	0	0.683	0.683	9	4.42	0.21	0.00	0.00	0.00	0.19	0.40	200	9.20	102.0	Concrete	0.013	3.17	99.5	0%	0.73
Hwy7	MH19	MH21	4	12	0	0	0	0	0	0	0	0	0.590	0.590	0	0	0	0	1.543	1.543	12	4.41	0.28	0.19	0.00	0.00	0.43	0.90	200	1.60	161.0	Concrete	0.013	1.32	41.5	2%	0.53
Victoria	MH21	MH106	0	0	0	0	0	0	0	0	0	0	0.000	0.590	0	0	0	0	0.250	3.405	33	4.35	0.75	0.19	0.00	0.00	0.95	1.90	200	1.60	103.0	Concrete	0.013	1.32	41.5	5%	0.67
Victoria	MH106	MH12A	4	12	0	0	0	0	0	0	0	0	0.066	4.396	0	0	0	0	2.213	108.477	2145	3.56	37.05	1.45	0.00	0.00	30.37	68.88	450	0.50	182.0	PVC	0.013	1.27	201.6	34%	1.15
Pumping Station	MH12A	PS	0	0	0	0	0	0	0	0	0	0	0.000	4.396	0	0	0	0	0.000	108.477	2145	3.56	37.05	1.45	0.00	0.00	30.37	68.88	525	0.50	6.0	PVC	0.013	1.40	304.1	23%	1.13
CR45	MH199	MH7	0	0	0	0	0	0	0	0	0	0	0.668	2.106	0	0	0	0	1.114	4.538	36	4.34	0.81	0.70	0.00	0.00	1.27	2.78	200	1.00	144.0	Concrete	0.013	1.04	32.8	8%	0.63
CR45	MH7	MH33	0	0	0	0	0	0	0	0	0	0	0.268	2.375	0	0	0	0	0.672	38.157	534	3.96	11.01	0.78	0.00	0.00	10.68	22.48	200	1.00	91.0	Concrete	0.013	1.04	32.8	69%	1.12
Pumping Station	MH33	MH124	0	0	0	0	0	0	0	0	0	0	0.000	2.375	0	0	0	0	0.000	38.157	534	3.96	11.01	0.78	0.00	0.00	10.68	22.48	250	0.80	10.5	Concrete	0.013	1.08	53.2	42%	1.04
Queen Street	MH36	MH41	38	114	0	0	0	0	0	0	0	0	0.000	0.000	0	0	0	0	4.990	4.990	114	4.23	2.51	0.00	0.00	0.00	1.40	3.91	200	0.40	565.0	Concrete	0.013	0.66	20.7	19%	0.51
King Street	MH100	MH101	8	24	0	0	0	0	0	0	0	0	0.000	0.000	0	0	0	0	1.037	1.037	24	4.37	0.55	0.00	0.00	0.00	0.29	0.84	200	1.14	95.0	Concrete	0.013	1.11	35.0	2%	0.46
King Street	MH101	MH102	10	30	0	0	0	0	0	0	0	0	0.000	0.000	0	0	0	0	0.952	1.989	54	4.31	1.21	0.00	0.00	0.00	0.56	1.77	200	0.44	89.3	Concrete	0.013	0.69	21.8	8%	0.42
King Street	MH102	MH103	8	24	0	0	0	0	0	0	0	0	0.000	0.000	0	0	0	0	0.951	2.939	78	4.27	1.74	0.00	0.00	0.00	0.82	2.56	200	1.53	85.3	Concrete	0.013	1.29	40.6	6%	0.71
King Street	MH103	MH104	9	27	0	0	0	0	0	0	0	0	0.000	0.000	0	0	0	0	0.949	3.888	105	4.24	2.32	0.00	0.00	0.00	1.09	3.41	200	0.65	92.7	Concrete	0.013	0.84	26.4	13%	0.58
King Street	MH104	MH105	6	18	0	0	0	0	0	0	0	0	0.000	0.000	0	0	0	0	0.878	4.767	123	4.22	2.70	0.00	0.00	0.00	1.33	4.04	200	0.55	92.0	Concrete	0.013	0.77	24.3	17%	0.57
Elm Street	MH80	MH105	0	0	0	0	0	0	0	0	0	0	0.000	0.000	3	3	10	10	21.451	21.451	0	4.50	0.00	0.00	0.24	2.90	6.01	9.15	200	0.50	321.0	Concrete	0.013	0.74	23.2	39%	0.69
Alma Street	MH74	MH54	22	66	0	0	0	0	0	0	61	122	0.000	0.000	0	0	0	0	6.508	6.508	188	4.16	4.07	0.00	0.00	0.00	1.82	5.89	200	0.40	484.1	Concrete	0.013	0.66	20.7	28%	0.57
King Street	MH54	MH105	10	30	0	0	0	0	0	0	0	0	0.000	0.000	0	0	0	0	1.703	8.211	218	4.13	4.69	0.00	0.00	0.00	2.30	6.99	200	0.60	179.3	Concrete	0.013	0.81	25.4	28%	0.69
Elm Street	MH105	MH41	0	0	0	0	0	0	0	0	0	0	0.000	0.000	3	0	10	0.180	34.609	341	4.05	7.20	0.00	0.24	2.90	9.69	20.03	200	0.50	98.2	Concrete	0.013	0.74	23.2	86%	0.83
Queen Street	MH41	MH42	10	30	0	0	0	0	0	0	0	0	0.000	0.000	3	0	10	1.105	40.703	485	3.98	10.06	0.00	0.24	2.90	11.40	24.59	200	0.40	86.1	Concrete	0.013	0.66	20.7	119%	0.66
Queen Street	MH42	MH43	8	24	0	0	0	0	0	0	0	0	0.000	0.000	3	0	10	0.912	41.615	509	3.97	10.52	0.00	0.24	2.90	11.65	25.32	200	0.40	93.3	Concrete	0.013	0.66	20.7	122%	0.66
Queen Street	MH43	MH44	6	18	0	0	0	0	0	0	0	0	0.000	0.000	3	0	10	0.955	42.570	527	3.96	10.87	0.00	0.24	2.90	11.92	25.93	200	0.40	83.3	Concrete	0.013	0.66	20.7	125%	0.66
Queen Street	MH44	MH45	2	6	0	0	0	0	0	0	0	0	0.000	0.000	3	0	10	0.357	42.928	533	3.96	10.99	0.00	0.24	2.90	12.02	26.15	200	0.40	72.2	Concrete	0.013	0.66	20.7	126%	0.66
King Street	MH55	MH56	12	36	0	0	0	0	0	0	0	0	0.000	0.000	0	0	0	0	1.522	1.522	36	4.34	0.81	0.00	0.00	0.00	0.43	1.24	200	0.60	161.0	Concrete	0.013	0.81	25.4	5%	0.42
Flora Street		MH56	12	36	0	0	0	0	0	0	0	0	0.000	0.000	3	0	0	0	3.462	3.462	36	4.34	0.81	0.00	0.26	0.00	0.97	2.04	250	0.40	235.0	Concrete	0.013	0.77	37.6	5%	0.41
Flora Street	MH56	MH45	3	9	0	0	0	0	0	0	0	0	0.000	0.000	0	3	0	0	0.408	5.392	81	4.27	1.80	0.00	0.26	0.00	1.51	3.57	200	0.40	102.0	Concrete	0.013	0.66	20.7	17%	0.49
Flora Street	MH45	MH166	0	0	0	0	0	0	0	0	0	0	0.000	0.000	0	6	0	10	0.000	48.320	614	3.93	12.56	0.00	0.50	2.90	13.53	29.49	200	0.40	14.2	Concrete	0.013	0.66	20.7	142%	0.66
Birch Street		MH97	89	267	0	0	0	0	0	0	0	0	0.000	0.000	0	0	0	0	5.545	5.545	267	4.10	5.70	0.00	0.00	0.00	1.55	7.25	200	0.40	702.5	Concrete	0.013	0.66	20.7	35%	0.60
Victoria	MH97	MH101	24	72	0	0	0	0	0	0	60	120	0.000	0.000	0	0	0	0	6.989	12.534	459	3.99	9.55	0.00	0.00	0.00	3.51	13.06	200	0.60	702.5	Concrete	0.013	0.81	25.4	51%	0.81
Victoria	MH101	MH166	16	48	0	0	0	0	0	0	0	0	0.000	0.000	0	0	0	0	5.045	18.615	531	3.96	10.95	0.00	0.00	0.00	5.21	16.17	200	0.50	348.0	Concrete	0.013	0.74	23.2	70%	0.80
Pumping Station	MH166	MH124	0	0	0	0	0	0	0	0	0	0	0.000	0.000	0	6	0	10	0.604	67.539	1145	3.76	22.43	0.00	0.50	2.90	18.91	44.74	250	1.00	112.1	Concrete	0.013	1.21	59.5	75%	1.33
	MH124	PS	0	0	0	0	0	0	0	0	0	0	0.000	2.375	0	6	0	10	0.000	105.696	1679	3.64	31.87	0.78	0.50	2.90	29.59	65.64	250	1.40	6.6	Concrete	0.013	1.43	70.4	93%	1.63

Assumed
Proposed Development (New)
Flow Path for Development
Required Upgrades

Sanitary Sewer Design Sheet
Proposed Conditions Trent Meadows Phase 1 and 2 + Other Future Developments

Project Name: Trent Meadows Phase 1
Project Number: 23104

Flow	Type	Value	Unit
Existing Single Family	Residence	3.0	person/unit
Existing Townhomes	Residence	2.4	person/unit
Future Single Family	Residence	3.0	person/unit
Future Townhomes	Residence	2.4	person/unit
Apartments	Residence	2	person/unit
Commercial	Peak Flow	0.33	L/s/ha
School	Peak Flow	0.08	L/s/100 Students
Fair	Peak Flow	0.29	L/s/1000 attendees

Future Flow Rate: 350 L/person/day
Existing Flow Rate: 450 L/person/day
Infiltration: 0.28 L/s/ha
Max Capacity: 80 %
Location: City of Peterborough

Designed By: LM
Date: 2024-02-09

Location			Existing Single Family		Existing Townhomes		Future Single Family		Future Townhomes		Apartments		Commercial		School		Fair		Area		Population		Flow						Pipe Properties					Hydraulics			
Location/Street Name	From Structure	To Structure	Number of Units	Population	Number of Units	Population	Number of Units	Population	Number of Units	Population	Number of Units	Population	Commercial Area(ha)	Cumulative Commercial Area (ha)	School Population	Cumulative School Population (Per 100 Students)	Fair Population	Cumulative Fair Population (Per 1000 attendees)	Catchment Area (ha)	Cumulative Catchment Area (ha)	Cumulative Population	Harmon Factor	Resedential Peak Flow (L/s)	Commercial Peak Flow (L/s)	School Peak Flow (L/s)	Fair/Peak Flow (L/s)	Infiltration Flow (L/s)	Total Peak Flow (L/s)	Pipe Diameter (mm)	Pipe Slope (%)	Pipe Length (m)	Pipe Material	Mannings n'	Velocity in Sewer (m/s)	Pipe Capacity (L/s)	% Capacity	Actual Velocity (m/s)
Murray St	MH10	MH5	46	138	0	0	0	0	0	0	0	0	0.000	0.000	0	0	0	0	6.080	6.080	138	4.20	3.02	0.00	0.00	0.00	1.70	4.72	250	0.50	240.5	PVC	0.013	0.86	42.1	11%	0.56
Robert Rd/Pine St	MH5	MH2A	25	75	0	0	0	0	0	0	0	0	0.000	0.000	0	0	0	0	3.490	9.570	213	4.14	4.59	0.00	0.00	0.00	2.68	7.27	250	0.50	363.5	PVC	0.013	0.86	42.1	17%	0.64
Pine St	MH2A	MH27	4	12	0	0	0	0	0	0	0	0	0.000	0.000	0	0	0	0	0.672	10.242	225	4.14	4.85	0.00	0.00	0.00	2.87	7.72	200	0.40	100.8	PVC	0.013	0.66	20.7	37%	0.61
Ridge St	MH25	MH27	6	18	0	0	0	0	0	0	0	0	0.000	0.000	0	0	0	0	1.493	1.493	18	4.39	0.41	0.00	0.00	0.00	0.42	0.83	200	6.30	158.0	PVC	0.013	2.62	82.3	1%	0.83
Ridge St	MH31	MH27	31	93	0	0	0	0	0	0	0	0	0.000	0.000	0	0	0	0	4.609	4.609	93	4.25	2.06	0.00	0.00	0.00	1.29	3.35	200	0.50	426.0	PVC	0.013	0.74	23.2	14%	0.52
Pine St	MH27	MH16	0	0	0	0	0	0	0	0	0	0	0.000	0.000	0	0	0	0	0.000	16.344	336	4.06	7.10	0.00	0.00	0.00	4.58	11.68	200	0.40	83.0	PVC	0.013	0.66	20.7	56%	0.68
Hwy 7	MH12	MH16	15	45	0	0	0	0	0	0	0	0	0.000	0.000	0	0	0	0	8.981	8.981	45	4.32	1.01	0.00	0.00	0.00	2.51	3.53	200	0.40	414.0	Concrete	0.013	0.66	20.7	17%	0.49
Hwy7	MH166	MH199	12	36	0	0	0	0	0	0	0	0	1.438	1.438	0	0	0	0	3.424	3.424	36	4.34	0.81	0.47	0.00	0.00	0.96	2.25	200	0.40	290.5	Concrete	0.013	0.66	20.7	11%	0.43
Pine St	MH16	MH4	6	18	0	0	0	0	0	0	0	0	0.000	0.000	0	0	0	0	0.641	25.966	399	4.02	8.36	0.00	0.00	0.00	7.27	15.63	200	1.00	143.0	Concrete	0.013	1.04	32.8	48%	1.03
Oak St/Spring St	MH2	MH4	10	30	0	0	0	0	0	0	0	0	0.000	0.000	0	0	0	0	3.914	3.914	30	4.36	0.68	0.00	0.00	0.00	1.10	1.78	200	0.40	301.0	Concrete	0.013	0.66	20.7	9%	0.40
Spring St	MH4	MH7	23	69	0	0	0	0	0	0	0	0	0.000	0.000	0	0	0	0	3.066	32.947	498	3.98	10.31	0.00	0.00	0.00	9.23	19.54	200	0.60	274.5	Concrete	0.013	0.81	25.4	77%	0.89
CR40	MH205	MH201	8	24	0	0	0	0	0	0	0	0	0.000	0.000	0	0	0	0	6.540	6.540	24	4.37	0.55	0.00	0.00	0.00	1.83	2.38	200	0.70	927.8	Concrete	0.013	0.87	27.4	9%	0.53
Albine Street	MH17A	MH201	125	375	8	19	0	0	0	0	0	0	0.000	0.000	0	0	0	0	13.970	13.970	394	4.03	8.26	0.00	0.00	0.00	3.91	12.18	200	0.40	126.0	PVC	0.013	0.66	20.7	59%	0.69
CR40	MH201	MH59	193	579	0	0	0	0	0	0	0	0	0.000	0.000	0	0	0	0	23.430	43.940	997	3.80	19.74	0.00	0.00	0.00	12.30	32.04	200	0.70	430.2	PVC	0.013	0.87	27.4	117%	0.87
Wellington		MH59	7	21	0	0	0	0	0	0	0	0	0.000	0.000	0	0	0	0	1.034	1.034	21	4.38	0.48	0.00	0.00	0.00	0.29	0.77	200	0.70	105.0	Concrete	0.013	0.87	27.4	3%	0.38
CR40		MH59	6	18	0	0	0	0	0	0	0	0	0.000	0.000	0	0	0	0	0.917	0.917	18	4.39	0.41	0.00	0.00	0.00	0.26	0.67	200	0.70	99.0	Concrete	0.013	0.87	27.4	2%	0.36
Wellington	MH59	MH111	9	27	0	0	0	0	0	0	0	0	0.000	0.000	0	0	0	0	1.903	47.795	1063	3.78	20.95	0.00	0.00	0.00	13.38	34.33	375	0.60	272.0	PVC	0.013	1.23	135.8	25%	1.02
Hwy 7		MH111	24	72	0	0	0	0	3	7	0	0	3.020	3.020	0	0	0	0	20.820	20.820	79	4.27	1.76	1.00	0.00	0.00	5.83	8.59	200	0.40	604.0	Concrete	0.013	0.66	20.7	41%	0.63
Hwy7	MH111	MH109	2	6	0	0	0	0	0	0	0	0	0.000	3.020	0	0	0	0	1.278	69.893	1148	3.76	22.49	1.00	0.00	0.00	19.57	43.06	375	0.50	147.0	PVC	0.013	1.12	124.0	35%	1.02
Mill St (Trent Meadows Phase 2)	SMH14	SMH11	0	0	0	0	114	342	12	29	0	0	0.000	0.000	0	0	0	0	9.440	9.440	371	4.04	6.07	0.00	0.00	0.00	2.64	8.71	200	0.60	250.0	PVC	0.013	0.81	25.4	34%	0.73
Mill St (Other)	SMH11	SMH6	0	0	0	0	23	69	0	0	0	0	0.000	0.000	0	0	0	0	4.950	14.390	440	4.00	7.13	0.00	0.00	0.00	4.03	11.16	200	0.60	430.0	PVC	0.013	0.81	25.4	44%	0.78
Mill St (Trent Meadows Phase1)	SMH6	SMH5	0	0	0	0	151	453	12	29	0	0	0.000	0.000	0	0	0	0	11.210	25.600	922	3.82	14.27	0.00	0.00	0.00	7.17	21.44	300	0.40	84.0	PVC	0.013	0.87	61.2	35%	0.79
Mill St(Upper Mill Pond)	SMH5	SMH3	0	0	0	0	196	588	344	826	100	200	0.000	0.000	0	0	0	0	35.500	61.100	2535	3.50	35.98	0.00	0.00	0.00	17.11	53.08	375	0.40	195.0	PVC	0.013	1.00	110.9	48%	0.99
Legion St	SMH3	MH86	6	18	0	0	0	0	0	0	0	0	0.000	0.000	0	0	0	0	2.708	63.808	2553	3.50	36.21	0.00	0.00	0.00	17.87	54.08	375	0.40	133.0	PVC	0.013	1.00	110.9	49%	1.00
Legion St	MH86	MH88	10	30	0	0	0	0	0	0	0	0	0.000	0.000	0	0	0	0	2.277	66.085	2583	3.50	36.76	0.00	0.00	0.00	18.50	55.26	375	0.40	152.0	Concrete	0.013	1.00	110.9	50%	1.00
Cedar St	MH89	MH88	1	3	0	0	0	0	0	0	0	0	0.000	0.000	0	0	0	0	0.475	0.475	3	4.45	0.07	0.00	0.00	0.00	0.13	0.20	200	0.40	40.0	Concrete	0.013	0.66	20.7	1%	0.21
Cedar St	MH88	MH90	0	0	0	0	0	0	0	0	0	0	0.000	0.000	0	0	0	0	0.000	66.559	2586	3.50	36.81	0.00	0.00	0.00	18.64	55.45	375	0.40	97.0	Concrete	0.013	1.00	110.9	50%	1.00
Cedar St	MH109	MH90	0	0	0	0	0	0	0	0	0	0	0.000	3.020	0	0	0	0	0.440	70.332	1148	3.76	22.49	1.00	0.00	0.00	19.69	43.18	375	0.50	57.0	PVC	0.013	1.12	124.0	35%	1.02
Easement	MH90	MH85	2	6	0	0	0	0	0	0	0	0	0.720	3.740	0	0	0	0	2.503	139.395	3741	3.36	56.99	1.23	0.00	0.00	39.03	97.25	450	0.40	183.0	PVC	0.013	1.13	180.3	54%	1.15
Elm St	MH82	MH85	3	9	0	0	0	0	0	0	0	0	0.000	0.000	0	0	0	0	0.908	0.908	9	4.42	0.21	0.00	0.00	0.00	0.25	0.46	200	0.70	128.0	Concrete	0.013	0.87	27.4	2%	0.32
Easement	MH85	MH106	1	3	0	0	0	0	0	0	0	0	0.000	3.740	0	0	0	0	0.537	140.839	3753	3.36	57.19	1.23	0.00	0.00	39.43	97.86	450	0.30	115.0	PVC	0.013	0.98	156.2	63%	1.04
Hwy7	MH23	MH21	4	12	0	0	0	0	0	0	0	0	0.000	0.000	0	0	0	0	0.929	0.929	12	4.41	0.28	0.00	0.00	0.00	0.26	0.54	200	0.60	160.0	Concrete	0.013	0.81	25.4	2%	0.32
CR40	MH123	MH21	3	9	0	0	0	0	0	0	0	0	0.000	0.000	0	0	0	0	0.683	0.683	9	4.42	0.21	0.00	0.00	0.00	0.19	0.40	200	9.20	102.0	Concrete	0.013	3.17	99.5	0%	0.73
Hwy7	MH19	MH21	4	12	0	0	0	0	0	0	0	0	0.590	0.590	0	0	0	0	1.543	1.543	12	4.41	0.28	0.19	0.00	0.00	0.43	0.90	200	1.60	161.0	Concrete	0.013	1.32	41.5	2%	0.53
Victoria	MH21	MH106	0	0	0	0	0	0	0	0	0	0	0.000	0.590	0	0	0	0	0.250	3.405	33	4.35	0.75	0.19	0.00	0.00	0.95	1.90	200	1.60	103.0	Concrete	0.013	1.32	41.5	5%	0.67
Victoria	MH106	MH12A	4	12	0	0	0	0	0	0	0	0	0.066	4.396	0	0	0	0	2.213	146.457	3798	3.35	57.95	1.45	0.00	0.00	41.01	100.41	450	0.50	182.0	PVC	0.013	1.27	201.6	50%	1.26
Pumping Station	MH12A	PS	0	0	0	0	0	0	0	0	0	0	0.000	4.396	0	0	0	0	0.000	146.457	3798	3.35	57.95	1.45	0.00	0.00	41.01	100.41	525	0.50	6.0	PVC	0.013	1.40	304.1	33%	1.26
CR45	MH199	MH7	0	0	0	0	0	0	0	0	0	0	0.668	2.106	0	0	0	0	1.114	4.538	36	4.34	0.81	0.70	0.00	0.00	1.27	2.78	200	1.00	144.0	Concrete	0.013	1.04	32.8	8%	0.63
CR45	MH7	MH33	0	0	0	0	0	0	0	0	0	0	0.268	2.375	0	0	0	0	0.672	38.157	534	3.96	11.01	0.78	0.00	0.00	10.68	22.48	200	1.00	91.0	Concrete	0.013	1.04	32.8	69%	1.12
Pumping Station	MH33	MH124	0	0	0	0	0	0	0	0	0	0	0.000	2.375	0	0	0	0	0.000	38.157	534	3.96	11.01	0.78	0.00	0.00	10.68	22.48	250	0.80	10.5	Concrete	0.013	1.08	53.2	42%	1.04
Queen Street	MH36	MH41	38	114	0	0	0	0	0	0	0	0	0.000	0.000	0	0	0	0	4.990	4.990	114	4.23	2.51	0.00	0.00	0.00	1.40	3.91	200	0.40	565.0	Concrete	0.013	0.66	20.7	19%	0.51
King Street	MH100	MH101	8	24	0	0	0	0	0	0	0	0	0.000	0.000	0	0	0	0	1.037	1.037	24	4.37	0.55	0.00	0.00	0.00	0.29	0.84	200	1.14	95.0	Concrete	0.013	1.11	35.0	2%	0.46
King Street	MH101	MH102	10	30	0	0	0	0	0	0	0	0	0.000	0.000	0	0	0	0	0.952	1.989	54	4.31	1.21	0.00	0.00	0.00	0.56	1.77	200	0.44	89.3	Concrete	0.013	0.69	21.8	8%	0.42
King Street	MH102	MH103	8	24	0	0	0	0	0	0	0	0	0.000	0.000	0	0	0	0	0.951	2.939	78	4.27	1.74	0.00	0.00	0.00	0.82	2.56	200	1.53	85.3	Concrete	0.013	1.29	40.6	6%	0.71
King Street	MH103	MH104	9	27	0	0	0	0	0	0	0	0	0.000	0.000	0	0	0	0	0.949	3.888	105	4.24	2.32	0.00	0.00	0.00	1.09	3.41	200	0.65	92.7	Concrete	0.013	0.84	26.4	13%	0.58
King Street	MH104	MH105	6	18	0	0	0	0	0	0	0	0	0.000	0.000	0	0	0	0	0.878	4.767	123	4.22	2.70	0.00	0.00	0.00	1.33	4.04	200	0.55	92.0	Concrete	0.013	0.77	24.3	17%	0.57
Elm Street	MH80	MH105	0	0	0	0	0	0	0	0	0	0	0.000	0.000	3	3	10	10	21.451	21.451	0	4.50	0.00	0.00	0.24	2.90	6.01	9.15	200	0.50	321.0	Concrete	0.013	0.74	23.2	39%	0.69
Alma Street	MH74	MH54	22	66	0	0	0	0	0	0	61	122	0.000	0.000	0	0	0	0	6.508	6.508	188	4.16	4.07	0.00	0.00	0.00	1.82	5.89	200	0.40	484.1	Concrete	0.013	0.66	20.7	28%	0.57
King Street	MH54	MH105	10	30	0	0	0	0	0	0	0	0	0.000	0.000	0	0	0	0	1.703	8.211	218	4.13	4.69	0.00	0.00	0.00	2.30	6.99	200	0.60	179.3	Concrete	0.013	0.81	25.4	28%	0.69
Elm Street	MH105	MH41	0	0	0	0	0	0	0	0	0	0	0.000	0.000	3	0	10	0.180	0.180	34.609	341	4.05	7.20	0.00	0.24	2.90	9.69	20.03	200	0.50	98.2	Concrete	0.013	0.74	23.2	86%	0.83
Queen Street	MH41	MH42	10	30	0	0	0	0	0	0	0	0	0.000	0.000	3	0	10	1.105	40.703	485	3.98	10.06	0.00	0.24	2.90	11.40	24.59	200	0.40	86.1	Concrete	0.013	0.66	20.7	119%	0.66
Queen Street	MH42	MH43	8	24	0	0	0	0	0	0	0	0	0.000	0.000	3	0	10	0.912	41.615	509	3.97	10.52	0.00	0.24	2.90	11.65	25.32	200	0.40	93.3	Concrete	0.013	0.66	20.7	122%	0.66
Queen Street	MH43	MH44	6	18	0	0	0	0	0	0	0	0	0.000	0.000	3	0	10	0.955	42.570	527	3.96	10.87	0.00	0.24	2.90	11.92	25.93	200	0.40	83.3	Concrete	0.013	0.66	20.7	125%	0.66
Queen Street	MH44	MH45	2	6	0	0	0	0	0	0	0	0	0.000	0.000	3	0	10	0.357	42.928	533	3.96	10.99	0.00	0.24	2.90	12.02	26.15	200	0.40	72.2	Concrete	0.013	0.66	20.7	126%	0.66
King Street	MH55	MH56	12	36	0	0	0	0	0	0	0	0	0.000	0.000	0	0	0	0	1.522	1.522	36	4.34	0.81	0.00	0.00	0.00	0.43	1.24	200	0.60	161.0	Concrete	0.013	0.81	25.4	5%	0.42
Flora Street		MH56	12	36	0	0	0	0	0	0	0	0	0.000	0.000	3	0	0	0	3.462	3.462	36	4.34	0.81	0.00	0.26	0.00	0.97	2.04	250	0.40	235.0	Concrete	0.013	0.77	37.6	5%	0.41
Flora Street	MH56	MH45	3	9	0	0	0	0	0	0	0	0	0.000	0.000	0	3	0	0	0.408	5.392	81	4.27	1.80	0.00	0.26	0.00	1.51	3.57	200	0.40	102.0	Concrete	0.013	0.66	20.7	17%	0.49
Flora Street	MH45	MH166	0	0	0	0	0	0	0	0	0	0	0.000	0.000	0	6	0	10	0.000	48.320	614	3.93	12.56	0.00	0.50	2.90	13.53	29.49	200	0.40	14.2	Concrete	0.013	0.66	20.7	142%	0.66
Birch Street		MH97	89	267	0	0	0	0	0	0	0	0	0.000	0.000	0	0	0	0	5.545	5.545	267	4.10	5.70	0.00	0.00	0.00	1.55	7.25	200	0.40	702.5	Concrete	0.013	0.66	20.7	35%	0.60
Victoria	MH97	MH101	24	72	0	0	0	0	0	0	60	120	0.000	0.000	0	0	0	0	6.989	12.534	459	3.99	9.55	0.00	0.00	0.00	3.51	13.06	200	0.60	702.5	Concrete	0.013	0.81	25.4	51%	0.81
Victoria	MH101	MH166	16	48	0	0	0	0	0	0	0	0	0.000	0.000	0	0	0	0	5.045	18.615	531	3.96	10.95	0.00	0.00	0.00	5.21	16.17	200	0.50	348.0	Concrete	0.013	0.74	23.2	70%	0.80
Pumping Station	MH166	MH124	0	0	0	0	0	0	0	0	0	0	0.000	0.000	0	6	0	10	0.604	67.539	1145	3.76	22.43	0.00	0.50	2.90	18.91	44.74	250	1.00	112.1	Concrete	0.013	1.21	59.5	75%	1.33
	MH124	PS	0	0	0	0	0	0	0	0	0	0	0.000	2.375	0	6	0	10	0.000	105.696	1679	3.64	31.87	0.78	0.50	2.90	29.59	65.64	250	1.40	6.6	Concrete	0.013	1.43	70.4	93%	1.63

Assumed
Proposed Development (New)
Flow Path for Development
Required Upgrades

Sanitary Sewer Design Sheet

Proposed Future Intensification Conditions Trent Meadows Phase 1 and 2 + Other Future Developments

Project Name: Trent Meadows Phase 1
Project Number: 23104

Flow	Type	Value	Unit
Existing Single Family	Residence	3.0	person/unit
Existing Townhomes	Residence	2.4	person/unit
Future Single Family	Residence	4.0	person/unit
Future Townhomes	Residence	2.5	person/unit
Apartments	Residence	2	person/unit
Commercial	Peak Flow	0.33	L/s/ha
School	Peak Flow	0.08	L/s/100 Students
Fair	Peak Flow	0.29	L/s/1000 attendees

Future Flow Rate: 350 L/person/day
Existing Flow Rate: 450 L/person/day
Infiltration: 0.28 L/s/ha
Max Capacity: 80 %
Location: City of Peterborough

Designed By: LM
Date: 2024-02-09

Location			Existing Single Family		Existing Townhomes		Future Single Family		Future Townhomes		Apartments		Commercial		School		Fair		Area		Population		Flow						Pipe Properties					Hydraulics			
Location/Street Name	From Structure	To Structure	Number of Units	Population	Number of Units	Population	Number of Units	Population	Number of Units	Population	Number of Units	Population	Commercial Area(ha)	Cumulative Commercial Area (ha)	School Population	Cumulative School Population (Per 100 Students)	Fair Population	Cumulative Fair Population (Per 1000 attendees)	Catchment Area (ha)	Cumulative Catchment Area (ha)	Cumulative Population	Harmon Factor	Resedential Peak Flow (L/s)	Commercial Peak Flow (L/s)	School Peak Flow (L/s)	Fair/Peak Flow (L/s)	Infiltration Flow (L/s)	Total Peak Flow (L/s)	Pipe Diameter (mm)	Pipe Slope (%)	Pipe Length (m)	Pipe Material	Mannings n'	Velocity in Sewer (m/s)	Pipe Capacity (L/s)	% Capacity	Actual Velocity (m/s)
Murray St	MH10	MH5	46	138	0	0	0	0	0	0	0	0	0.000	0.000	0	0	0	0	6.080	6.080	138	4.20	3.02	0.00	0.00	0.00	1.70	4.72	250	0.50	240.5	PVC	0.013	0.86	42.1	11%	0.56
Robert Rd/Pine St	MH5	MH2A	25	75	0	0	0	0	0	0	0	0	0.000	0.000	0	0	0	0	3.490	9.570	213	4.14	4.59	0.00	0.00	0.00	2.68	7.27	250	0.50	363.5	PVC	0.013	0.86	42.1	17%	0.64
Pine St	MH2A	MH27	4	12	0	0	0	0	0	0	0	0	0.000	0.000	0	0	0	0	0.672	10.242	225	4.14	4.85	0.00	0.00	0.00	2.87	7.72	200	0.40	100.8	PVC	0.013	0.66	20.7	37%	0.61
Ridge St	MH25	MH27	6	18	0	0	0	0	0	0	0	0	0.000	0.000	0	0	0	0	1.493	1.493	18	4.39	0.41	0.00	0.00	0.00	0.42	0.83	200	6.30	158.0	PVC	0.013	2.62	82.3	1%	0.83
Ridge St	MH31	MH27	31	93	0	0	0	0	0	0	0	0	0.000	0.000	0	0	0	0	4.609	4.609	93	4.25	2.06	0.00	0.00	0.00	1.29	3.35	200	0.50	426.0	PVC	0.013	0.74	23.2	14%	0.52
Pine St	MH27	MH16	0	0	0	0	0	0	0	0	0	0	0.000	0.000	0	0	0	0	0.000	16.344	336	4.06	7.10	0.00	0.00	0.00	4.58	11.68	200	0.40	83.0	PVC	0.013	0.66	20.7	56%	0.68
Hwy 7	MH12	MH16	15	45	0	0	0	0	0	0	0	0	0.000	0.000	0	0	0	0	8.981	8.981	45	4.32	1.01	0.00	0.00	0.00	2.51	3.53	200	0.40	414.0	Concrete	0.013	0.66	20.7	17%	0.49
Hwy7	MH166	MH199	12	36	0	0	0	0	0	0	0	0	1.438	1.438	0	0	0	0	3.424	3.424	36	4.34	0.81	0.47	0.00	0.00	0.96	2.25	200	0.40	290.5	Concrete	0.013	0.66	20.7	11%	0.43
Pine St	MH16	MH4	6	18	0	0	0	0	0	0	0	0	0.000	0.000	0	0	0	0	0.641	25.966	399	4.02	8.36	0.00	0.00	0.00	7.27	15.63	200	1.00	143.0	Concrete	0.013	1.04	32.8	48%	1.03
Oak St/Spring St	MH2	MH4	10	30	0	0	0	0	0	0	0	0	0.000	0.000	0	0	0	0	3.914	3.914	30	4.36	0.68	0.00	0.00	0.00	1.10	1.78	200	0.40	301.0	Concrete	0.013	0.66	20.7	9%	0.40
Spring St	MH4	MH7	23	69	0	0	0	0	0	0	0	0	0.000	0.000	0	0	0	0	3.066	32.947	498	3.98	10.31	0.00	0.00	0.00	9.23	19.54	200	0.60	274.5	Concrete	0.013	0.81	25.4	77%	0.89
CR40	MH205	MH201	8	24	0	0	0	0	0	0	0	0	0.000	0.000	0	0	0	0	6.540	6.540	24	4.37	0.55	0.00	0.00	0.00	1.83	2.38	200	0.70	927.8	Concrete	0.013	0.87	27.4	9%	0.53
Albine Street	MH17A	MH201	125	375	8	19	0	0	0	0	0	0	0.000	0.000	0	0	0	0	13.970	13.970	394	4.03	8.26	0.00	0.00	0.00	3.91	12.18	200	0.40	126.0	PVC	0.013	0.66	20.7	59%	0.69
CR40	MH201	MH59	193	579	0	0	0	0	0	0	0	0	0.000	0.000	0	0	0	0	23.430	43.940	997	3.80	19.74	0.00	0.00	0.00	12.30	32.04	200	0.70	430.2	PVC	0.013	0.87	27.4	117%	0.87
Wellington		MH59	7	21	0	0	0	0	0	0	0	0	0.000	0.000	0	0	0	0	1.034	1.034	21	4.38	0.48	0.00	0.00	0.00	0.29	0.77	200	0.70	105.0	Concrete	0.013	0.87	27.4	3%	0.38
CR40		MH59	6	18	0	0	0	0	0	0	0	0	0.000	0.000	0	0	0	0	0.917	0.917	18	4.39	0.41	0.00	0.00	0.00	0.26	0.67	200	0.70	99.0	Concrete	0.013	0.87	27.4	2%	0.36
Wellington	MH59	MH111	9	27	0	0	0	0	0	0	0	0	0.000	0.000	0	0	0	0	1.903	47.795	1063	3.78	20.95	0.00	0.00	0.00	13.38	34.33	375	0.60	272.0	PVC	0.013	1.23	135.8	25%	1.02
Hwy 7		MH111	24	72	0	0	0	0	3	8	0	0	3.020	3.020	0	0	0	0	20.820	20.820	80	4.27	1.77	1.00	0.00	0.00	5.83	8.59	200	0.40	604.0	Concrete	0.013	0.66	20.7	41%	0.63
Hwy7	MH111	MH109	2	6	0	0	0	0	0	0	0	0	0.000	3.020	0	0	0	0	1.278	69.893	1149	3.76	22.50	1.00	0.00	0.00	19.57	43.06	375	0.50	147.0	PVC	0.013	1.12	124.0	35%	1.02
Mill St (Trent Meadows Phase 2)	SMH14	SMH11	0	0	0	0	114	456	12	30	0	0	0.000	0.000	0	0	0	0	9.440	9.440	486	3.98	7.84	0.00	0.00	0.00	2.64	10.48	200	0.60	250.0	PVC	0.013	0.81	25.4	41%	0.77
Mill St (Other)	SMH11	SMH6	0	0	0	0	23	92	0	0	0	0	0.000	0.000	0	0	0	0	4.950	14.390	578	3.94	9.23	0.00	0.00	0.00	4.03	13.26	200	0.60	430.0	PVC	0.013	0.81	25.4	52%	0.82
Mill St (Trent Meadows Phase1)	SMH6	SMH5	0	0	0	0	151	604	12	30	0	0	0.000	0.000	0	0	0	0	11.210	25.600	1212	3.75	18.39	0.00	0.00	0.00	7.17	25.55	300	0.40	84.0	PVC	0.013	0.87	61.2	42%	0.83
Mill St(Upper Mill Pond)	SMH5	SMH3	0	0	0	0	196	784	344	860	100	200	0.000	0.000	0	0	0	0	35.500	61.100	3056	3.44	42.54	0.00	0.00	0.00	17.11	59.64	375	0.40	195.0	PVC	0.013	1.00	110.9	54%	1.02
Legion St	SMH3	MH86	6	18	0	0	0	0	0	0	0	0	0.000	0.000	0	0	0	0	2.708	63.808	3074	3.43	42.75	0.00	0.00	0.00	17.87	60.62	375	0.40	133.0	PVC	0.013	1.00	110.9	55%	1.02
Legion St	MH86	MH88	10	30	0	0	0	0	0	0	0	0	0.000	0.000	0	0	0	0	2.277	66.085	3104	3.43	43.29	0.00	0.00	0.00	18.50	61.79	375	0.40	152.0	Concrete	0.013	1.00	110.9	56%	1.03
Cedar St	MH89	MH88	1	3	0	0	0	0	0	0	0	0	0.000	0.000	0	0	0	0	0.475	0.475	3	4.45	0.07	0.00	0.00	0.00	0.13	0.20	200	0.40	40.0	Concrete	0.013	0.66	20.7	1%	0.21
Cedar St	MH88	MH90	0	0	0	0	0	0	0	0	0	0	0.000	0.000	0	0	0	0	0.000	66.559	3107	3.43	43.34	0.00	0.00	0.00	18.64	61.98	375	0.40	97.0	Concrete	0.013	1.00	110.9	56%	1.03
Cedar St	MH109	MH90	0	0	0	0	0	0	0	0	0	0	0.000	3.020	0	0	0	0	0.440	70.332	1149	3.76	22.50	1.00	0.00	0.00	19.69	43.19	375	0.50	57.0	PVC	0.013	1.12	124.0	35%	1.02
Easement	MH90	MH85	2	6	0	0	0	0	0	0	0	0	0.720	3.740	0	0	0	0	2.503	139.395	4262	3.31	63.22	1.23	0.00	0.00	39.03	103.48	450	0.40	183.0	PVC	0.013	1.13	180.3	57%	1.17
Elm St	MH82	MH85	3	9	0	0	0	0	0	0	0	0	0.000	0.000	0	0	0	0	0.908	0.908	9	4.42	0.21	0.00	0.00	0.00	0.25	0.46	200	0.70	128.0	Concrete	0.013	0.87	27.4	2%	0.32
Easement	MH85	MH106	1	3	0	0	0	0	0	0	0	0	0.000	3.740	0	0	0	0	0.537	140.839	4274	3.31	63.41	1.23	0.00	0.00	39.43	104.08	450	0.30	115.0	PVC	0.013	0.98	156.2	67%	1.05
Hwy7	MH23	MH21	4	12	0	0	0	0	0	0	0	0	0.000	0.000	0	0	0	0	0.929	0.929	12	4.41	0.28	0.00	0.00	0.00	0.26	0.54	200	0.60	160.0	Concrete	0.013	0.81	25.4	2%	0.32
CR40	MH123	MH21	3	9	0	0	0	0	0	0	0	0	0.000	0.000	0	0	0	0	0.683	0.683	9	4.42	0.21	0.00	0.00	0.00	0.19	0.40	200	9.20	102.0	Concrete	0.013	3.17	99.5	0%	0.73
Hwy7	MH19	MH21	4	12	0	0	0	0	0	0	0	0	0.590	0.590	0	0	0	0	1.543	1.543	12	4.41	0.28	0.19	0.00	0.00	0.43	0.90	200	1.60	161.0	Concrete	0.013	1.32	41.5	2%	0.53
Victoria	MH21	MH106	0	0	0	0	0	0	0	0	0	0	0.000	0.590	0	0	0	0	0.250	3.405	33	4.35	0.75	0.19	0.00	0.00	0.95	1.90	200	1.60	103.0	Concrete	0.013	1.32	41.5	5%	0.67
Victoria	MH106	MH12A	4	12	0	0	0	0	0	0	0	0	0.066	4.396	0	0	0	0	2.213	146.457	4319	3.30	64.17	1.45	0.00	0.00	41.01	106.63	450	0.50	182.0	PVC	0.013	1.27	201.6	53%	1.28
Pumping Station	MH12A	PS	0	0	0	0	0	0	0	0	0	0	0.000	4.396	0	0	0	0	0.000	146.457	4319	3.30	64.17	1.45	0.00	0.00	41.01	106.63	525	0.50	6.0	PVC	0.013	1.40	304.1	35%	1.28
CR45	MH199	MH7	0	0	0	0	0	0	0	0	0	0	0.668	2.106	0	0	0	0	1.114	4.538	36	4.34	0.81	0.70	0.00	0.00	1.27	2.78	200	1.00	144.0	Concrete	0.013	1.04	32.8	8%	0.63
CR45	MH7	MH33	0	0	0	0	0	0	0	0	0	0	0.268	2.375	0	0	0	0	0.672	38.157	534	3.96	11.01	0.78	0.00	0.00	10.68	22.48	200	1.00	91.0	Concrete	0.013	1.04	32.8	69%	1.12
Pumping Station	MH33	MH124	0	0	0	0	0	0	0	0	0	0	0.000	2.375	0	0	0	0	0.000	38.157	534	3.96	11.01	0.78	0.00	0.00	10.68	22.48	250	0.80	10.5	Concrete	0.013	1.08	53.2	42%	1.04
Queen Street	MH36	MH41	38	114	0	0	0	0	0	0	0	0	0.000	0.000	0	0	0	0	4.990	4.990	114	4.23	2.51	0.00	0.00	0.00	1.40	3.91	200	0.40	565.0	Concrete	0.013	0.66	20.7	19%	0.51
King Street	MH100	MH101	8	24	0	0	0	0	0	0	0	0	0.000	0.000	0	0	0	0	1.037	1.037	24	4.37	0.55	0.00	0.00	0.00	0.29	0.84	200	1.14	95.0	Concrete	0.013	1.11	35.0	2%	0.46
King Street	MH101	MH102	10	30	0	0	0	0	0	0	0	0	0.000	0.000	0	0	0	0	0.952	1.989	54	4.31	1.21	0.00	0.00	0.00	0.56	1.77	200	0.44	89.3	Concrete	0.013	0.69	21.8	8%	0.42
King Street	MH102	MH103	8	24	0	0	0	0	0	0	0	0	0.000	0.000	0	0	0	0	0.951	2.939	78	4.27	1.74	0.00	0.00	0.00	0.82	2.56	200	1.53	85.3	Concrete	0.013	1.29	40.6	6%	0.71
King Street	MH103	MH104	9	27	0	0	0	0	0	0	0	0	0.000	0.000	0	0	0	0	0.949	3.888	105	4.24	2.32	0.00	0.00	0.00	1.09	3.41	200	0.65	92.7	Concrete	0.013	0.84	26.4	13%	0.58
King Street	MH104	MH105	6	18	0	0	0	0	0	0	0	0	0.000	0.000	0	0	0	0	0.878	4.767	123	4.22	2.70	0.00	0.00	0.00	1.33	4.04	200	0.55	92.0	Concrete	0.013	0.77	24.3	17%	0.57
Elm Street	MH80	MH105	0	0	0	0	0	0	0	0	0	0	0.000	0.000	3	3	10	10	21.451	21.451	0	4.50	0.00	0.00	0.24	2.90	6.01	9.15	200	0.50	321.0	Concrete	0.013	0.74	23.2	39%	0.69
Alma Street	MH74	MH54	22	66	0	0	0	0	0	0	61	122	0.000	0.000	0	0	0	0	6.508	6.508	188	4.16	4.07	0.00	0.00	0.00	1.82	5.89	200	0.40	484.1	Concrete	0.013	0.66	20.7	28%	0.57
King Street	MH54	MH105	10	30	0	0	0	0	0	0	0	0	0.000	0.000	0	0	0	0	1.703	8.211	218	4.13	4.69	0.00	0.00	0.00	2.30	6.99	200	0.60	179.3	Concrete	0.013	0.81	25.4	28%	0.69
Elm Street	MH105	MH41	0	0	0	0	0	0	0	0	0	0	0.000	0.000	3	0	10	0.180	34.609	341	4.05	7.20	0.00	0.24	2.90	9.69	20.03	200	0.50	98.2	Concrete	0.013	0.74	23.2	86%	0.83
Queen Street	MH41	MH42	10	30	0	0	0	0	0	0	0	0	0.000	0.000	0	3	0	10	1.105	40.703	485	3.98	10.06	0.00	0.24	2.90	11.40	24.59	200	0.40	86.1	Concrete	0.013	0.66	20.7	119%	0.66
Queen Street	MH42	MH43	8	24	0	0	0	0	0	0	0	0	0.000	0.000	0	3	0	10	0.912	41.615	509	3.97	10.52	0.00	0.24	2.90	11.65	25.32	200	0.40	93.3	Concrete	0.013	0.66	20.7	122%	0.66
Queen Street	MH43	MH44	6	18	0	0	0	0	0	0	0	0	0.000	0.000	0	3	0	10	0.955	42.570	527	3.96	10.87	0.00	0.24	2.90	11.92	25.93	200	0.40	83.3	Concrete	0.013	0.66	20.7	125%	0.66
Queen Street	MH44	MH45	2	6	0	0	0	0	0	0	0	0	0.000	0.000	0	3	0	10	0.357	42.928	533	3.96	10.99	0.00	0.24	2.90	12.02	26.15	200	0.40	72.2	Concrete	0.013	0.66	20.7	126%	0.66
King Street	MH55	MH56	12	36	0	0	0	0	0	0	0	0	0.000	0.000	0	0	0	0	1.522	1.522	36	4.34	0.81	0.00	0.00	0.00	0.43	1.24	200	0.60	161.0	Concrete	0.013	0.81	25.4	5%	0.42
Flora Street		MH56	12	36	0	0	0	0	0	0	0	0	0.000	0.000	3	3	0	0	3.462	3.462	36	4.34	0.81	0.00	0.26	0.00	0.97	2.04	250	0.40	235.0	Concrete	0.013	0.77	37.6	5%	0.41
Flora Street	MH56	MH45	3	9	0	0	0	0	0	0	0	0	0.000	0.000	0	3	0	0	0.408	5.392	81	4.27	1.80	0.00	0.26	0.00	1.51	3.57	200	0.40	102.0	Concrete	0.013	0.66	20.7	17%	0.49
Flora Street	MH45	MH166	0	0	0	0	0	0	0	0	0	0	0.000	0.000	0	6	0	10	0.000	48.320	614	3.93	12.56	0.00	0.50	2.90	13.53	29.49	200	0.40	14.2	Concrete	0.013	0.66	20.7	142%	0.66
Birch Street		MH97	89	267	0	0	0	0	0	0	0	0	0.000	0.000	0	0	0	0	5.545	5.545	267	4.10	5.70	0.00	0.00	0.00	1.55	7.25	200	0.40	702.5	Concrete	0.013	0.66	20.7	35%	0.60
Victoria	MH97	MH101	24	72	0	0	0	0	0	0	60	120	0.000	0.000	0	0	0	0	6.989	12.534	459	3.99	9.55	0.00	0.00	0.00	3.51	13.06	200	0.60	702.5	Concrete	0.013	0.81	25.4	51%	0.81
Victoria	MH101	MH166	16	48	0	0	0	0	0	0	0	0	0.000	0.000	0	0	0	0	5.045	18.615	531	3.96	10.95	0.00	0.00	0.00	5.21	16.17	200	0.50	348.0	Concrete	0.013	0.74	23.2	70%	0.80
Pumping Station	MH166	MH124	0	0	0	0	0	0	0	0	0	0	0.000	0.000	0	6	0	10	0.604	67.539	1145	3.76	22.43	0.00	0.50	2.90	18.91	44.74	250	1.00	112.1	Concrete	0.013	1.21	59.5	75%	1.33
	MH124	PS	0	0	0	0	0	0	0	0	0	0	0.000	2.375	0	6	0	10	0.000	105.696	1679	3.64	31.87	0.78	0.50	2.90	29.59	65.64	250	1.40	6.6	Concrete	0.013	1.43	70.4	93%	1.63

Assumed
Proposed Development (New)
Flow Path for Development
Required Upgrades

Appendix C: Standpipe Background Information

From: Kyle Beacock <kbeacock@antownship.ca>
Sent: March 3, 2022 1:46 PM
To: Jason Armstrong <jason@engageeng.ca>
Subject: Standpipe EA Presentation

Jason,

As discussed here is the council presentation, I believe this was based on a hydraulic grade raise of 8m which will represent about 11 psi increase in the distribution system. Final design yet to be complete and we will be shooting for closer to 10m.

I know you had mentioned about hooking on to the 200mm there but as I mentioned I believe it is a 6" (150) heading out that way, it ends right around Maybees garage.

I will find out about the Birch st. extension to see if that is ours.

Take care

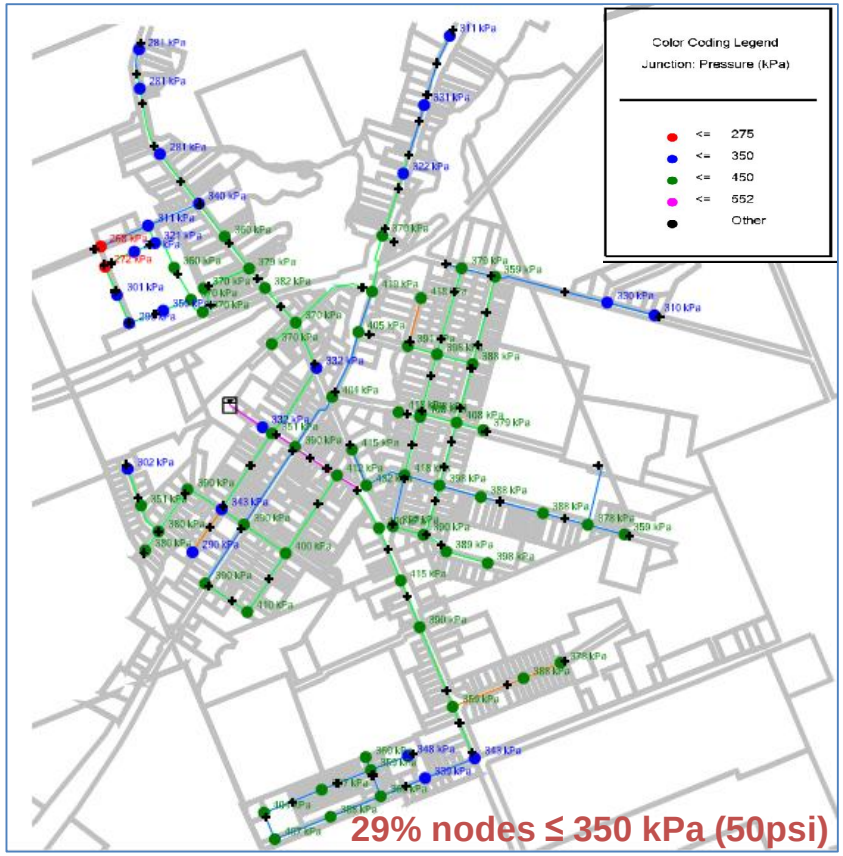
Kyle Beacock
Water and Wastewater Operations Manager
Township of Asphodel Norwood

2357 County Road 45, P.O. Box 29
Norwood, ON K0L 2V0
P: 705-639-5343 F: 705-639-1880
www.antownship.ca

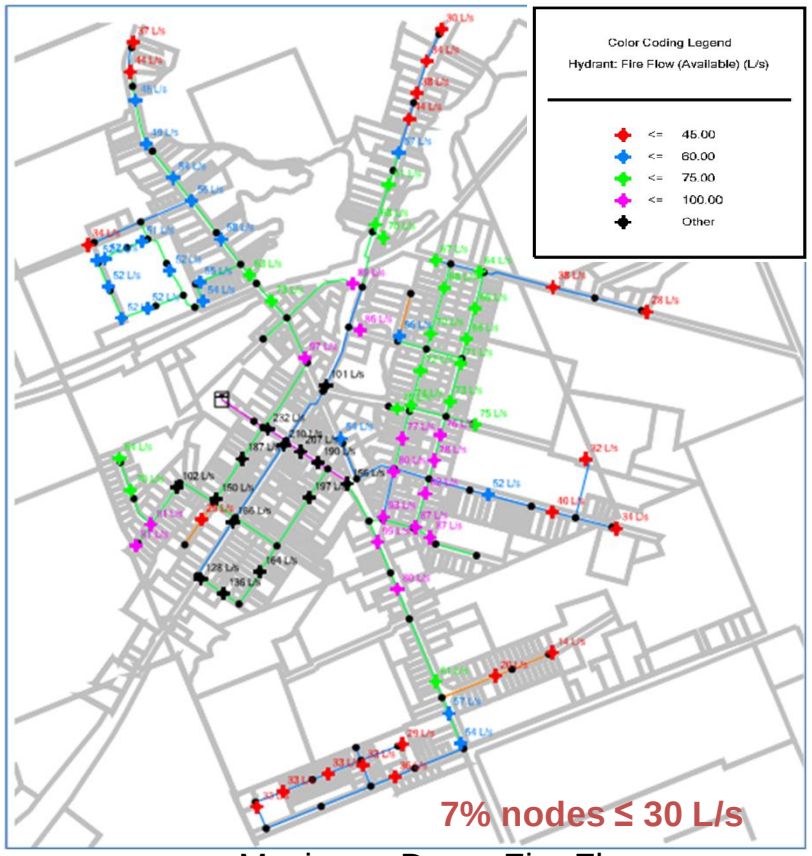
Asphodel Norwood A Growing Success

Existing Conditions

- A hydraulic water model was completed to assess the existing conditions. Overall, the existing water pressure and fire flow appears to be generally consistent with guidelines; however there are some areas (northwest corner of Village) that could be improved.



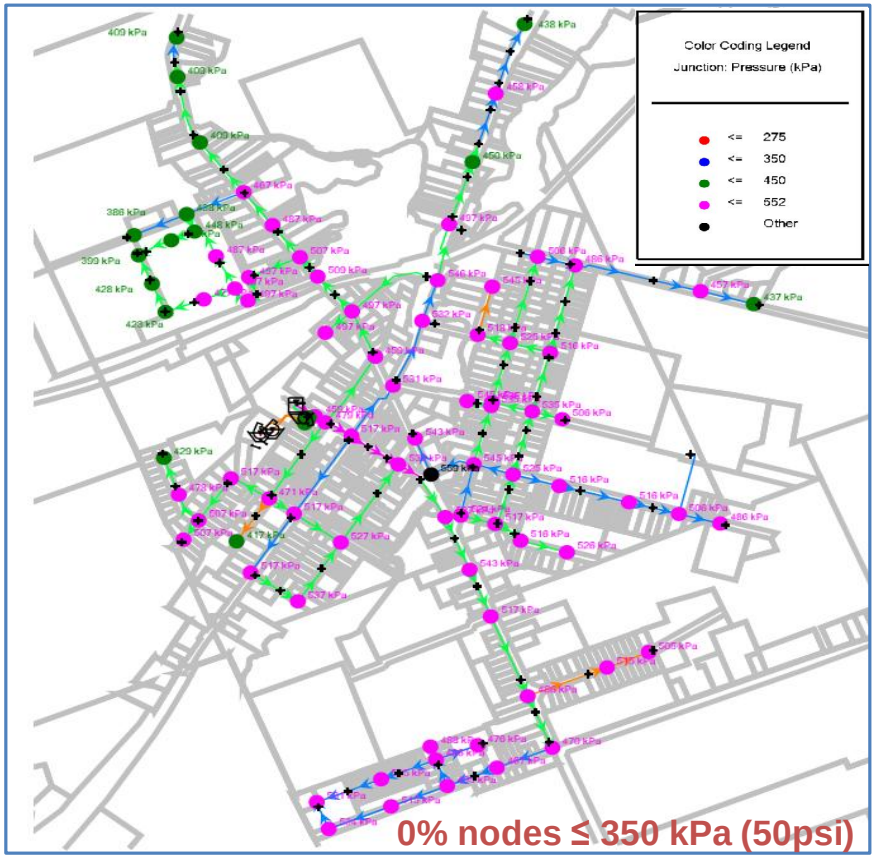
Peak Hour Flow



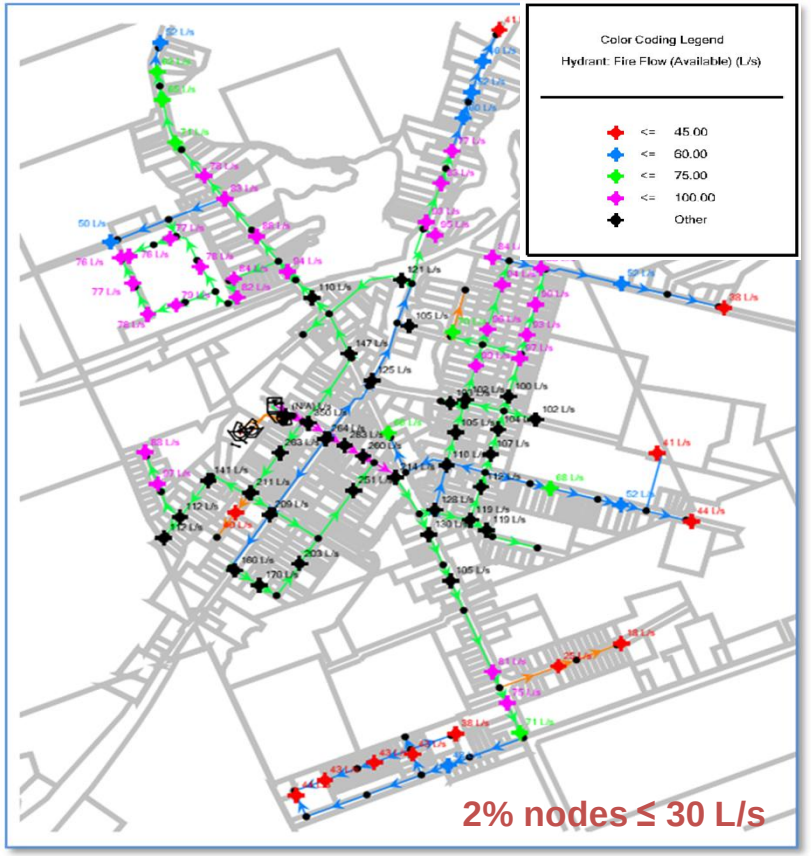
Maximum Day + Fire Flow

Preferred Solution

- Using the hydraulic water model the existing potable water system was assessed with a new water storage standpipe.



Peak Hour Flow



Maximum Day + Fire Flow