TRAFALGAR ENGINEERING

FUNCTIONAL SERVICING & STORMWATER MANAGEMENT REPORT

Water, Sanitary, and Stormwater Management

PROPOSED MIXED USE DEVELOPMENT

217-227 CROSS AVENUE AND 571-587 ARGUS ROAD
TOWN OF OAKVILLE

OUR FILE: 1729

PREPARED FOR DISTRIKT DEVELOPMENTS INC.

OCTOBER 2024

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1.0 INTRODUCTION

1.1 Scope of Functional Servicing Report

This report has been prepared in support of the TOC Submission for Rezoning (ZBA) and Official Plan Amendment (OPA) to permit the construction of a three-tower mixed-use condominium located at 217-227 Cross Avenue, and 571-587 Argus Road, Oakville. A copy of the Site Plan and site statistics are included in Appendix 'A'. This report discusses how the proposed site can be serviced by the existing and future infrastructure for water, wastewater and storm drainage/stormwater management, site grading and erosion and sediment control. This report may be updated and refined as the project moves through the planning process to support the subdivision and Building Permit Stages.

We are aware that the Town of Oakville is currently undertaking an Official Plan review for the Midtown area. In order to prepare the servicing design, we have followed the ongoing progression of the OP review and where appropriate have reached out to Town and Regional staff to prepare this report based on the most up to date information available.

Information provided in the report is based on our general knowledge of the area as well as information/drawings obtained from the Town of Oakville and the Region of Halton. The following documents have been reviewed in support of this application:

- Water and Wastewater Area Servicing Plan for Midtown Oakville, Final Report, Blue Plan Engineering, September 28, 2017 (ASP);
- Stormwater Management Report, Oakville Part III Midtown EA, Town of Oakville, Cole Engineering, June 2014 (Midtown Oakville EA);
- Addendum to the Water and Wastewater Area Servicing Plan (ASP) for Midtown Oakville, Blue Pan Engineering, December 2020 (ASP Addendum).
- Draft Proposed Midtown Oakville OPA, released April 2, 2024 for review and discussion.

Future studies initiated by Town of Oakville staff for the Midtown Area may impact some of the assumptions in this report. This report has been prepared based on the most current information made available to us however we acknowledge that continued coordination with Town staff is required.

Trafalgar Engineering recognizes that the re-development of the Midtown node will continue beyond 2051 involving many privately owned parcels, and more importantly requires the re-development of those parcels to complete the full build-out of the Midtown road network. Trafalgar Engineering has prepared designs demonstrating that the development of the site is feasible independent to the development of adjacent parcels ("interim condition") as well as the

scenario where the full build-out of the Midtown road network is complete ("ultimate condition"). The interim roads will be privately owned and maintained whilst the ultimate roads will be public highways. The timing of the full build-out will be dependent on the re-development of the adjacent privately owned parcels and to be completed by others. The precise mechanisms for land transfers (to municipal ownership) will be determined as planning applications progress (i.e., draft plan/subdivision stages).

For the purpose of this report, north is defined as Argus Road, and South is Cross Ave.

1.2 Site Location and Description

The subject property has a gross area of 1.26 ha and consists of 5 properties located at 217-227 Cross Avenue, and 571-587 Argus Road in the Town of Oakville. The subject property is within the Oakville Midtown area and is identified as part of Block 9 in the Area Servicing Plan (ASP).

The subject property is bounded by Argus Road to the north and west, and Cross Avenue to the south. To the east of the property are private lands consisting of a 2-storey medical building at 603 Argus Road, and a car dealership (Oakland Ford) at 570 Trafalgar Road. The neighbouring properties are also within the Oakville Midtown area with future redevelopment potential. The subject property does not include 207 Cross Ave, which is the parcel of land at the North-East corner of the intersection of Argus and Cross.

The subject property is currently occupied by fast food restaurants fronting Cross Ave (Swiss Chalet, Harvey's, McDonalds), and 1- and 2-storey medical buildings. The abutting roads are typical urban roads with an array of shallow and deep underground services/utilities.

Within the property, along the south property line of 581 Argus Road and 603 Argus Road there is a 675 mm diameter municipal storm sewer approximately 3.5 m deep within a 6 m wide easement in favour of the Town. The storm sewer currently collects runoff from a portion of South Service Road, Argus Road and the adjacent properties. The sewer drains east to west and outlets to the existing 750 mm storm sewer on Argus Road. The flows then travel south to Cross Ave to a 1050 mm diameter storm sewer. The 1050 mm diameter storm sewer on Cross Ave flows west and outlets to Sixteen Mile Creek.

1.3 Proposed Development

In general, the proposed development consists of three high-rise towers with a central outdoor park space. The towers are denoted as follows:

Tower 'A'	-	46 storey residential with at grade retail
Tower 'B'	-	52 storey residential with at grade retail
Tower 'C'	-	59 storey residential with at grade retail and office space

There are seven levels of below-grade parking proposed extending over the entire site. Vehicle access to the site will be from Argus Road through Tower A, and from Street 'C' (see Section 2.3 below) through Tower C. The central publicly accessible park space is accessed through 3 sides and provides public pedestrian access through the site. Private outdoor amenity space is also provided.

As part of the proposed development the existing 675 mm diameter storm sewer through the middle of the property will be relocated to the adjacent municipal roads, and the internal easement removed.

The subject lands are impacted by adjacent road realignments, and proposed municipal roads (realignments and new roads). The resulting developable area is 0.96 ha.

2.0 MUNICIPAL ROAD NETWORK

The Midtown Oakville Class EA (approved 2014) and the Liveable Oakville Plan OPA 14 (adopted 2017) identify the local road network for the Midtown growth area. Growth Area Schedule L3 of the Liveable Oakville Plan illustrates the approximate alignments and road allowance widths of various future roads in the Midtown Oakville transportation network. Further, the 2024 Draft OP provided an updated road network configuration and widths.

We understand based on discussions with Town staff that the exact locations of the future roads are flexible and can be fixed through the planning process; however, the proposed locations must meet the intent of both the Midtown EA, OPA 14, 2024 Draft OP, and be justified from a traffic and engineering perspective.

This development is impacted by the realignment of Cross Ave at the south of the property, a new local road proposed along the east boundary of the property, and the realignment of Argus Road the north and west.

Typical road cross-sections are provided in Appendix 'A' for reference.

2.1 Argus Road

As identified in the 2024 Draft OP, Argus Road is proposed to be realigned to extend in a westerly direction through the Midtown area. The north/south leg of Argus Road will be maintained to keep a connection to Cross Ave in its current location. The horizontal alignment of Argus Road and the intersection with the north/south leg was reviewed and refined by the traffic consultant to ensure general intersection guidelines are followed. Supporting analysis and justification is provided in the Traffic Impact Study prepared by BA Group (under separate cover).

Proposed centreline of road elevations were designed in order to establish the new property line grades for the proposed development using typical urban road design. This demonstrates feasibility of the subject lands to develop in an interim condition until such time that the external roads are built. The proposed Argus Road realignment requires multiple land takings over non-participating landowners, and so the full build-out of Argus Road is recommended to be completed by the Town in the future. Interim grading, servicing, and landscape designs are provided to demonstrate the feasibility of an interim design, as well as conceptual future design.

Due do the large amount of existing municipal/regional local and trunk infrastructure within Argus Road in its current alignment, it is anticipated that the road can be realigned without the need to undertake significant infrastructure realignment. Some minor works may be required such as relocating hydrants, catchbasins, adjusting manhole covers etc.

As discussed in the Midtown Oakville EA, future development, or transportation improvements within the study area, are to meet the required stormwater management criteria. Therefore, stormwater quantity, quality and water balance requirements apply to the realignment of Argus Road. Any required stormwater management controls are be designed and constructed by the Town of Oakville as capital works projects. Stormwater management may consist of a series of Low Impact Developments (bioretention swales, infiltration galleries), OGS units, and or linear underground chambers. The location of any stormwater management features must be coordinated with the public utility providers within the right-of-way to ensure adequate clearances are met. Trafalgar Engineering understands that Town staff will initiate those conversations; we recommend that this process be initiated forthwith. The specific details will be coordinated with Town staff at the draft plan/subdivision stage.

2.2 Cross Avenue

As per the Midtown Oakville EA, Cross Avenue will be realigned north and upgraded to a larger urban road cross-section. A portion of the new alignment is within the subject property, and the required lands will be conveyed to the Town through the appropriate planning process. Along with the road realignment, all infrastructure will have to be realigned. A preliminary road alignment and profile was prepared by Cole Engineering (dated June 2014). The preliminary elevations were

used to establish property line grades for the proposed development. Refer to Section 7.0 below for further information pertaining to the grading.

The new alignment of Cross Ave does not affect the servicing or grading feasibility of the subject property. Any servicing laterals connected to infrastructure on Cross Ave in its current configuration can be reconnected to the future infrastructure in the new Cross Ave alignment. The Town and Region's consultant must consider the proposed service connections in the future design of the realignment of Cross Ave.

The detailed design and construction of Cross Ave will be completed by the Town of Oakville. Through this submission, we have demonstrated how the proposed development is feasible with the current configuration of Cross Ave. in an interim condition.

Any required stormwater management controls for the Cross Ave Road allowance will be designed and constructed by the Town of Oakville.

2.3 Street 'C' (20.0m Local Road)

The 2024 draft OP identifies a 20 m wide local road along the east boundary of the subject property, connecting Argus Road at the north end with Cross Ave at the south end. Through preliminary discussions with Town staff, it is understood that there is flexibility in the exact location of the road, but the intent of the EA and OPA must be maintained.

In coordination with BA Traffic Consultants, we have completed a preliminary design of Street 'C' per Town STD. 7-23. The ultimate centerline of the road is proposed on the existing property line. The profile of the road was constrained by matching into the existing grades on Argus Road and the proposed future grades at Cross Ave. The proposed profile also considers Cross Ave in its current configuration and demonstrates the road can tie into the existing elevations of Cross Ave on an interim condition.

The realigned 675mm storm sewer is proposed with a temporary servicing easement within the private driveway. When Street 'C' is fully built out, the interim servicing easement can be removed as the storm sewer will be within the Street 'C' right-of-way. There is no requirement for a local watermain or sanitary sewer on this local road as the adjacent development blocks can be serviced through infrastructure on adjacent roads (refer to the ASP for additional information).

The portion of the road within the subject property will be constructed to an interim condition until the full road can be built, with a modified boulevard width and curb locations. The interim road will be privately owned and maintained until the full road cross-section is built. The timing of the full road build out will be dependent on the redevelopment of the surrounding properties and are recommended to be completed by the Town of Oakville as capital works projects.

As discussed in the Midtown Oakville EA, future development, or transportation improvements within the study area, are to meet the required stormwater management criteria. Therefore, stormwater quantity, quality and water balance requirements apply to Street 'C'. Any required stormwater management controls for Street 'C' be designed and constructed by the Town of Oakville.

3.0 MUNICIPAL WATER

The subject property will be serviced for water through the local water infrastructure on the adjacent roads. The ASP notes there is sufficient water supply for the 2031 growth scenario, no major infrastructure is required to support development in this timeframe.

All proposed services must be in accordance with the Ontario Building Code, Town of Oakville, and Region of Halton standards and requirements. A copy of the Preliminary Servicing Plan is included with this submission and should be read in conjunction with this report. Existing and proposed servicing is discussed in further detail in the following sections.

3.1 Existing Municipal Water

3.1.1 Existing Linear Infrastructure

Based on record drawings from Halton Region, there are existing 300mm local watermains on Cross Ave and Argus Road, as well as a 900 mm feeder trunk watermain along Argus Road. The subject site is within the Zone 2 pressure boundary. Four existing hydrants are available along Argus Road, and one existing hydrant along Cross Ave. A flow test was undertaken (May 13, 2022). Updated flow tests may be required at the building permit stage. The results of the flow test are included in Appendix 'B' and are summarized as follows:

Table 1: Base Hydrant at 603 Argus Road

Static Pressure	89 psig
Flow 1,375 usgpm (87 L/s)	87 psig
Flow 2,176 usgpm (137 L/s)	84 psig
Theoretical Flow 8,978usgpm (566 L/s)	residual 20 psig

Table 2: Base Hydrant at 581 Argus Road

Static Pressure	89 psig
Flow 1,385 usgpm (87 L/s)	87 psig
Flow 2,201 usgpm (139 L/s)	84 psig
Theoretical Flow 9,081usgpm (573 L/s)	residual 20 psig

Table 3: Base Hydrant at 227 Cross Ave

Static Pressure	89 psig
Flow 1,483 usgpm (94 L/s)	86 psig
Flow 2,276 usgpm (144 L/s)	82 psig
Theoretical Flow 7,831usgpm (494 L/s)	residual 20 psig

The existing 581 and 587 Argus Road properties connect to the local watermain on Argus Road and the 217 and 227 Cross Avenue properties connect to the existing local main on Cross Avenue.

The watermain that currently exists along Cross Ave may be realigned to the future Cross Ave alignment.

Water infrastructure is not proposed within Street 'C' as the redevelopment of the surrounding properties can be serviced by the existing infrastructure on Argus and Cross.

3.1.2 Existing Municipal Water Demands

Using the site area and Region of Halton Linear Design Manual, the domestic water usage for the existing buildings (light commercial) was calculated and summarized below (see Appendix 'B' for supporting calculations).

Table 4: Estimated Existing Water Demands (L/min)

Average Daily Demand	22
Minimum Hourly Demand	22
Maximum Hourly Demand	49
Maximum Daily Demand	49

3.2 Proposed Municipal Water

All proposed services must be in accordance with the Ontario Building Code, Town of Oakville, and Region of Halton standards and requirements. A copy of the Preliminary Servicing Plan is included in Appendix 'E' and should be read in conjunction with this report.

3.2.1 Proposed Linear Infrastructure

Each Tower will have separate water connections for domestic and fire protection. This will allow for the development to be phased, and for each tower to be independent from the others. Towers A and B will be serviced from the existing 300 mm diameter watermain on Argus Road. Tower C will be serviced from the existing 300 mm diameter watermain on Cross Ave.

Proposed water services consist of a 200 mm diameter fire, 150 mm diameter domestic for the residential units, and 100 mm diameter domestic for the non-residential spaces for each tower. The number and sizing of connections may be subject to change through further detailed design coordination with mechanical through Site Plan and Building Permit stages. Service connections to Region of Halton infrastructure will require a service permit from the Region.

There are existing municipal hydrants within 45m of each tower. The proposed location of the fire department connection (Siamese connection) for each tower will need to be located within 45 m of a fire hydrant.

3.2.2 Proposed Municipal Water Demands

Using the unit count and type together with Table A-4 of the Region of Halton's 2022 Development Charges Background Study population density guidelines for residential dwellings (1.356 persons/unit for less than two bedrooms, and 1.831 persons/unit for 2 or more bedroom units) the residential population is estimated to be 2,995 persons. The commercial population is estimated using Page A-21 of the Region of Halton 2022 DC Study population density for commercial developments (403 ft^2/employee) resulting in a commercial population of 100 persons. The domestic water usage is estimated and summarized below (see Appendix 'B' for supporting calculations). The fire flow is estimated for demand purposes only using the Fire Underwriter's Survey methodology and should be confirmed by a sprinkler consultant at the building permit stage.

Table 5: Estimated Proposed Water Demands per Halton DC Study Criteria (L/min)

Average Daily Demand	592
Minimum Hourly Demand	592
Maximum Hourly Demand	2,334
Maximum Daily Demand	1,332
Estimated Fire Demand (FUS 1999)	7000
Maximum Daily Plus Fire Demand	8,332

4.0 MUNICIPAL WASTEWATER

The subject property will be serviced for wastewater through the local wastewater infrastructure on the adjacent roads. The ASP notes capacity concerns for the 2031 growth scenario, and potentially some required infrastructure upgrades. It is anticipated that the servicing capacity issues will be addressed in the new ASP. The planned downstream sewer upgrades would have to be constructed and in operation prior to the proposed development proceeding to the Building Permit phase for above ground works. Based on the latest conversations with Region staff, the

construction of the downstream sanitary sewer upgrades on Trafalgar Road is currently on track for construction in 2025.

In support of this application, Urbantech has completed a Downstream Sanitary Sewer Capacity Assessment (See Appendix 'C') to identify the downstream constraints and potential solutions. That study is intended to be read in conjunction with the design presented in this report and aid in discussions with Region staff on how to move forward on the downstream upgrades. Further discussions are required with respect to design, timing, and funding of these works. The study will be updated in future submissions to address changes from the 2024 Draft OP and any changes in the development proposals as further details are provided.

4.1 Existing Wastewater Infrastructure

4.1.1 Existing Linear Infrastructure

There is an existing 750 mm diameter sewer located on the east-west leg of Argus Road which drains to an existing 600mm diameter trunk sanitary sewer located on the north-south leg of Argus Road. Along Cross Ave, adjacent to the subject site, there is a 300 mm diameter local sanitary sewer and a 525 mm diameter trunk sanitary sewer. Near the eastern side of the subject lands the 525 mm diameter trunk sewer turns south and crosses through the GO Station lands to Trafalgar Road, just north of Cornwall Road. The 300 mm diameter sanitary sewer flows east and drains south via the sanitary sewer on Trafalgar Road.

The building at 581 Argus Road is connected to the sewer along the north-south leg on Argus Road and the building at 587 is connected to the sewer along the east-west leg. Presumably, the 217 and 227 Cross Ave sites are connected to the local sanitary sewer along Cross Ave. Locates must be obtained to confirm the discharge location of all sites prior to detailed design.

4.1.2 Existing Wastewater Demands

Using the development area and Region of Halton design criteria for light commercial areas (90 persons per hectare), the estimated existing sanitary discharge is determined. The table below provides a summary of the estimated wastewater flows. See Appendix 'B' for supporting calculations.

Table 6: Estimated Existing Wastewater Flow (L/s)

Average Daily Dry Weather Flow	0.36
Modified Harmon Peaking Factor	4.23
Infiltration Allowance (0.286 L/s-ha)	0.29
Peak Flow	1.83

4.2 Proposed Wastewater Infrastructure

4.2.1 Proposed Linear Infrastructure

All proposed services must be in accordance with the Ontario Building Code, Town of Oakville, and Region of Halton standards and requirements. A copy of the Preliminary Servicing Plan is included in Appendix 'E' and should be read in conjunction with this report. Existing and proposed servicing is discussed in further detail in the following sections.

Two new 300 mm dia. PVC sanitary service lateral complete with property line inspection manholes are proposed to service the development. One lateral for Towers A and B will connect to the 600 mm dia. sanitary sewer on Argus Road and drain south to Cross Ave. A separate lateral for Tower C will connect to the existing 525 mm dia. sanitary sewer on Cross Ave. The number and sizing of connections may be subject to change through further detailed design coordination with mechanical through Site Plan and Building Permit stages. Service connections to Region of Halton infrastructure will require a service permit from the Region.

The sanitary sewers that currently exist along Cross Ave may be realigned to the future Cross Ave alignment. The proposed sanitary service lateral for the Tower C may need to be adjusted and must be taken into considering for the ultimate design of Cross Ave.

No wastewater infrastructure is required within Street 'C'.

4.2.2 Proposed Wastewater Demands

Using a residential population of 2995 persons and a retail population of 100 persons (determined in Section 3.2.2) and 275 L/cap. Day the proposed sanitary discharge is estimated below (see Appendix 'B' for supporting calculations).

Table 7: Estimated Proposed Wastewater Flow (L/s)

Average Daily Dry Weather Flow	9.53
Modified Harmon Peaking Factor	3.44
Infiltration Allowance (0.286 L/s-ha)	0.27
Peak Flow	34.45

5.0 STORM DRAINAGE AND STORMWATER MANAGEMENT

5.1 Existing Drainage Condition

The existing site slopes from north to south, at an average slope of 2%. As mentioned, the site is currently occupied by restaurants and 1- and 2- storey medical buildings and paved parking lots, all of which will be removed as part of this development. The properties at 571 and 587 Argus Road collect stormwater through a series of catchbasins in their parking lot and outlet to the existing 675 mm storm sewer that runs through the middle of the property. The properties at 217-227 Cross Ave collect stormwater through a series of catchbasins in their parking lots and outlet to the storm sewer on Cross Ave. The storm sewer along Argus Road drains west and outlet to 16 Mile Creek. The storm sewer on Cross Ave drains east towards Trafalgar Road, but ultimately still outlets to 16 Mile Creek.

5.2 Stormwater Management

The Town of Oakville requirements for stormwater management are set out in the Midtown Oakville EA Study (June 2014).

The applicable criteria are as follows:

1. Stormwater Quantity Control (Peak Flow Control)

   Utilize the Midtown Oakville EA Study hydrology model to demonstrate that the target flows are met for each subwatershed. Per the Midtown EA, the proposed development is to drain to Sixteen Mile Creek (Figure DAP-2). As there are no existing flood concerns for Sixteen Mile Creek in the study area, peak runoff rates from the development are to be controlled to existing rates. In addition to meeting the flows, a minimum storage requirement is 68.2 m^3/ha.

2. Stormwater Runoff Volume Reduction (Water Balance)

   Provide retention of 25 mm over the entire area of the proposed development in accordance with the Town's Stormwater Master Plan; or,

   Retain stormwater onsite to achieve an equivalent annual volume of infiltration as per-development conditions, as per Section 3.2 of the MOE Stormwater Management Planning and Design Manual (March 2003).

3. Stormwater Quality Control

   Achieve Enhanced Level 1 Protection, as per the Ministry of Environment's Stormwater Management Planning and Design Manual (March 2003).

The development is anticipated to be completed in 2 underground phases with the potential to have 3 phase tower construction. Stormwater management was reviewed separately for each phase.

5.2.1 Stormwater Quantity Control (Peak Flow Control)

In determining the development area for stormwater management calculations, the lands for road conveyances were removed as the municipal roads will have independent stormwater controls. The resulting developable area is 0.96 ha The lands removed for road conveyances were separated from the developable area as runoff from those lands will be uncontrolled during the interim condition. In the ultimate condition, runoff will be managed within the right-of-way.

The table below provides a summary of area and pre-development runoff coefficients (refer to Figure 2).

Table 8: Pre-Development Drainage Areas

	Phase 1		Phase 2	
	Area (ha)	**RC**	**Area (ha)**	**RC**
Developable Area	0.63	0.78	0.32	0.9
Interim	0.041	0.9	0.25	0.9

Post-development flow rates are calculated using a runoff coefficient of 0.9. In the determination of the runoff coefficient, we have not accounted for any landscaping in the interior courtyard, or rooftop amenity space to remain conservative. A conservative value of post-development runoff coefficient ensures adequate sizing of the stormwater management tank. There are some minor uncontrolled areas that have been accounted for.

To control stormwater runoff from the site, an underground stormwater tank is proposed within each phase. The proposed stormwater management tank will pump stormwater to the existing storm sewer on Argus Road (Phase 1) and the existing storm sewer on Cross Ave (Phase 2).

Although we acknowledge the Town does not prefer uncontrolled discharge of groundwater to the Town's storm sewer, we propose to over control the site's storm runoff such that the total combined storm and groundwater discharge is less than or equal to the allowable storm discharge rate. The groundwater flow from the site will by-pass the stormwater tank and be directed to the property line storm manhole (after being treated). The treatment process will be detailed at the detailed design stage (by others) but must comply with Town By-Law 2009-031. The long-term sub-drain flow (groundwater flow) of 90,000 L/day (1.04 L/s) was determined in the Hydrogeological investigation prepared by B.I.G. Consulting Inc. (BIGC-ENV-349B) dated

March 2021 and discussed in further detail in Section 6.0. We have accounted for equal groundwater flow in each tank at this stage to remain conservative.

A comparison of pre- and post-development flow for each phase is provided in the table below.

Table 9: Stormwater Flows – Phase 1

Return	Pre-Dev Total (L/s)	Post-Development Uncontrolled (L/s)	Post-Development Controlled (L/s)	Groundwater Flow (L/s)	Total Release Rate to Municipal Sewer (L/s)	Storage Required (m^3)
2-yr	113	17	60	1.04	78	36
5-yr	157	23	60	1.04	84	72
10-yr	186	27	60	1.04	88	96
25-yr	246	36	60	1.04	97	149
50-yr	301	41	60	1.04	102	179
100-yr	346	45	60	1.04	105	205

Table 10: Stormwater Flows – Phase 2

Return	Pre-Dev Total (L/s)	Post-Development Uncontrolled (L/s)	Post-Development Controlled (L/s)	Groundwater Flow (L/s)	Total Release Rate to Municipal Sewer (L/s)	Storage Required (m^3)
2-yr	66	11	50	1.04	62	3
5-yr	92	16	50	1.04	67	17
10-yr	109	19	50	1.04	70	27
25-yr	144	25	50	1.04	76	49
50-yr	163	28	50	1.04	79	62
100-yr	180	31	50	1.04	82	73

Based on the analysis completed and summarized in the table above, the proposed stormwater system has been designed to demonstrate that the 100 year post development peak flow is controlled to the 2 year pre-development peak flow and the tanks sized accordingly for both phases.

The minimum storage requirement per the Midtown Oakville EA is 65.5 m^3. The post- to pre-development storage requirements yield a higher storage requirement and therefore governs.

The runoff coefficient and associated tank sizing may be refined as detailed design progresses.

Runoff from the site will be collected through the roof drains and surface drains. The runoff will be conveyed through internal plumbing and the underground parking structure (designed per OBC by others) to the stormwater tank located in the underground parking structure and must be sized

to capture and convey the 100-year event. Plumbing interior to the building and underground parking structure (designed by the mechanical engineer) will direct runoff to the stormwater tanks located in the underground parking structure and must be sized to capture the 100-year event. An emergency overland flow route is provided through the site to the adjacent municipal road. An emergency overflow from the tanks must be designed in coordination with the mechanical consultant at the detailed design stage but will likely discharge to grade in the general vicinity of the tank.

Appendix 'D' contains the detailed calculations.

5.2.2 Stormwater Runoff Volume Reduction

As outlined in the Midtown Oakville EA retention of 5 mm is required. However, in discussions with the Town, staff have recommended utilizing a retention of 25 mm (refer to correspondence in Appendix 'D').

The 25 mm retention volume is 240 m^3.

The stormwater management tanks have been sized to store this volume in addition to the volume required for peak flow control based on the catchment phases. Due to the built form of the site, there are limited opportunities for infiltration, so the re-use water will be used for onsite irrigation or other acceptable best efforts. Additional details will be provided through detailed design.

In additional to on-site irrigation, rainwater reuse may be used for items such as car wash stations within the underground parking garage, and grey water reuse (for flushing toilets) in common amenity areas or residential units. These systems will be designed at permit stage with appropriate water treatment as required.

5.2.3 Stormwater Quality Control

Runoff from the site will consist of runoff from the roof, landscape and pedestrian areas, which is generally considered clean runoff and no additional stormwater quality control is required.

5.3 Realigned Storm Sewer

The existing municipal storm sewer that runs through the middle of the street will be realigned such that it is within the Street 'C' right of way and therefore allows the cohesive development of the block. The design of Street 'C' has been done such that the centreline elevation would tie into

the future centerline of Cross Ave. These elevations are lower than existing elevations. As such, to ensure sufficient cover, an elliptical pipe is proposed.

A storm sewer design sheet was prepared to assess the existing and proposed conditions. Based on this analysis it was discovered that the existing sewer does not have sufficient capacity to convey flows through gravity flow for many of the sewer segments.

Through the design of the realigned storm sewer, all efforts were made to propose a design that increased capacity. Due to minimal cover and crossing conflicts not all pipes could be designed to flow less than 100% full. An HGL analysis was completed that demonstrates the proposed design slightly improves the existing conditions. Refer to Appendix 'D' for a preliminary analysis. As the conceptual development design of Midtown progressed, the design sheet should be updated to account for road realignments, and the outlet locations of private development sites. Further, the adjacent development project at 590 Argus to the north of the subject lands propose an alternate storm sewer alignment which would further reduce stormwater flows contributing to this sewer in the future.

Based on the commercial nature of the surrounding area, it is anticipated that there are no basement connections, to the storm system, and in surcharged conditions, water would flow overland at grade. The proposed design would be an interim condition until further detailed design of Cross Ave is completed by the Town, which should include an assessment of the stormwater sewer network.

6.0 GROUNDWATER MANAGEMENT

A Hydrogeological Investigation was performed by B.I.G. Consulting Inc. (dated March 9, 2021) assessing the short-term (construction) and long-term groundwater de-watering needs. Any construction de-watering will be addressed at the Building Permit stage and must comply with Town By-Law 2009-031. The long-term peak groundwater flow rate into the parking garage subdrains after the initial dewatering stages was estimated to be 90,000 L/day (1.04 L/s). These flows will be treated as required (to be designed by others at the detailed design stage) and will bypass the stormwater management tank system in the underground parking garage before being discharged using the proposed stormwater lateral. The groundwater discharge must be in compliance with Town By-Law 2009-031.

In the event that permanent dewatering is not permitted, the proposed building may be designed and supported by "tanked" water-proofed continuous raft foundation without permanent dewatering.

Refer to the Hydrogeological Investigation prepared by B.I.G. Consulting Inc. (BIGC-ENV-349B) dated March 2023 for details.

7.0 OVERLAND SPILL CONDITION

In 2022, the "Flood Risk Mapping and Spill Quantification - Morrison-Wedgewood Diversion Channel" (dated 2020) report was adopted formally identifying a spill condition that potentially impacts the subject lands; Trafalgar Engineering has obtained a copy of the report and associated models and is undertaking a high-level assessment of the spill condition to estimate the order-of-magnitude of flooding in the vicinity of Distrikt's lands. Our assessment will be made available in a subsequent submission. The development of the site shall not increase the flood risk on adjacent sites.

We understand that ongoing studies by others are reviewing the same. Trafalgar will review and incorporate findings of said studies at such time as they are available; however, for the purpose of this submission it is acknowledged that further review of this condition is required.

8.0 SITE GRADING

The proposed grading must ensure that drainage from the 100-year event is collected by the buildings mechanical system and conveyed to the stormwater management tank. All building openings, including air intake and exhaust shafts, must be protected from overland flow by being set a minimum of 0.2 m above the spill elevation.

The proposed property line elevations adjacent to Street 'C' have been set in conjunction with a preliminary road design prepared as part of this submission. Temporary curbs will need to be constructed in an alternate location to support the development. When the adjacent lands develop, the full road cross-section can be constructed to its ultimate condition (to be completed by the Town of Oakville). Temporary working easements will be required on the adjacent properties to facilitate the construction of the road.

The proposed property line elevations adjacent to Cross Ave have been set considering the preliminary future road centerline elevations as set out in the Midtown Oakville EA. These property line elevations provide positive drainage to the existing Cross Ave alignment if the proposed development proceeds in advance of the Cross Ave realignment.

The emergency overland flow route through the site generally flows from north to south to Cross Ave. Within the Privately Owned Public Space (POPS) runoff generally flows from north to south.

A copy of the Preliminary Grading Plan is provided and should be read in conjunction with this report.

9.0 EROSION AND SEDIMENT CONTROL

Erosion and sediment controls must be installed prior to the commencement of any construction. The erosion and sediment control devices should follow the Erosion and Sediment Control Guidelines for Urban Construction as set out by the Greater Golden Horseshoe Conservation Authority. Erosion and sediment control measures may be implemented as follows:

- Double Wrapped Catchbasins: The proposed storm sewer catchbasins and catchbasin manholes located within the subject site and adjacent municipal roads shall be double wrapped in a woven geotextile material. Woven geotextile material is to be replaced periodically when accumulated sediments interfere with drainage. The abutting streets should be monitored and if required, swept to mitigate the accumulation of tracked material on the roads on a routine basis in keeping with good construction housekeeping practices.
- Gravel Access Pad: A gravel access mat will be installed at the entrance to the construction zone to prevent mud tracking from the site to the municipal roads.
- Silt Fencing: Silt fence will be installed along the property line to intercept sheet flow.

10.0 CONCLUSION

The information presented in this Functional Servicing Report demonstrates that the proposed development can be serviced by the existing and future adjacent infrastructure for water, wastewater, stormwater in the interim and ultimate condition and can meet the Town of Oakville stormwater management criteria. The following is a summary of the report findings:

- The site is 1.26 ha with a site development area of 0.96 ha. The site is within the Midtown Oakville Growth area.
- The Town of Oakville is in the process to widen and realign Cross Ave along the south property line of the subject development. A new local road, Street ‘C’ is proposed along the east property line. Street ‘C’ will be constructed to a temporary condition, until the adjacent lands develop.
- Argus Road will be realigned in both the east-west, and north-south direction. Proposed property lines and conceptual boulevard design is shown for context and to demonstrate feasibility.
- There is existing municipal water infrastructure adjacent to the site that can readily service the site. There are no capacity constraints. The proposed average daily water demand for the site is 592 L/min and an estimated fire demand of 7,000 L/min.

- There is existing municipal wastewater infrastructure adjacent to the site. The estimated average daily wastewater flow based on Region of Halton criteria for the entire site is 9.53 L/s.
- Stormwater quantity controls will be provided by controlling post development peak flows to the pre-development rate. Storage will be provided in a stormwater tank(s) provided in the underground parking structure. Stormwater will be pumped to a maximum release rate of 60 L/s and 50 L/s to the adjacent storm sewer on Argus Road and Cross Ave respectively. The required storage volume is 205 m^3 and 73 m^3.
- The water balance criteria of 25 mm is equivalent to 240 m^3. This water will also be stored in the underground stormwater tanks and will be used for irrigation or other re-use uses.
- Grading of the site is designed to ensure runoff from the 100-year event is captured, and there is an emergency overland flow route.
- Erosion and sediment controls will be implemented during construction in accordance with the Erosion and Sediment Control Guidelines for Urban Construction as set out by the Greater Golden Horseshoe Conservation Authority.

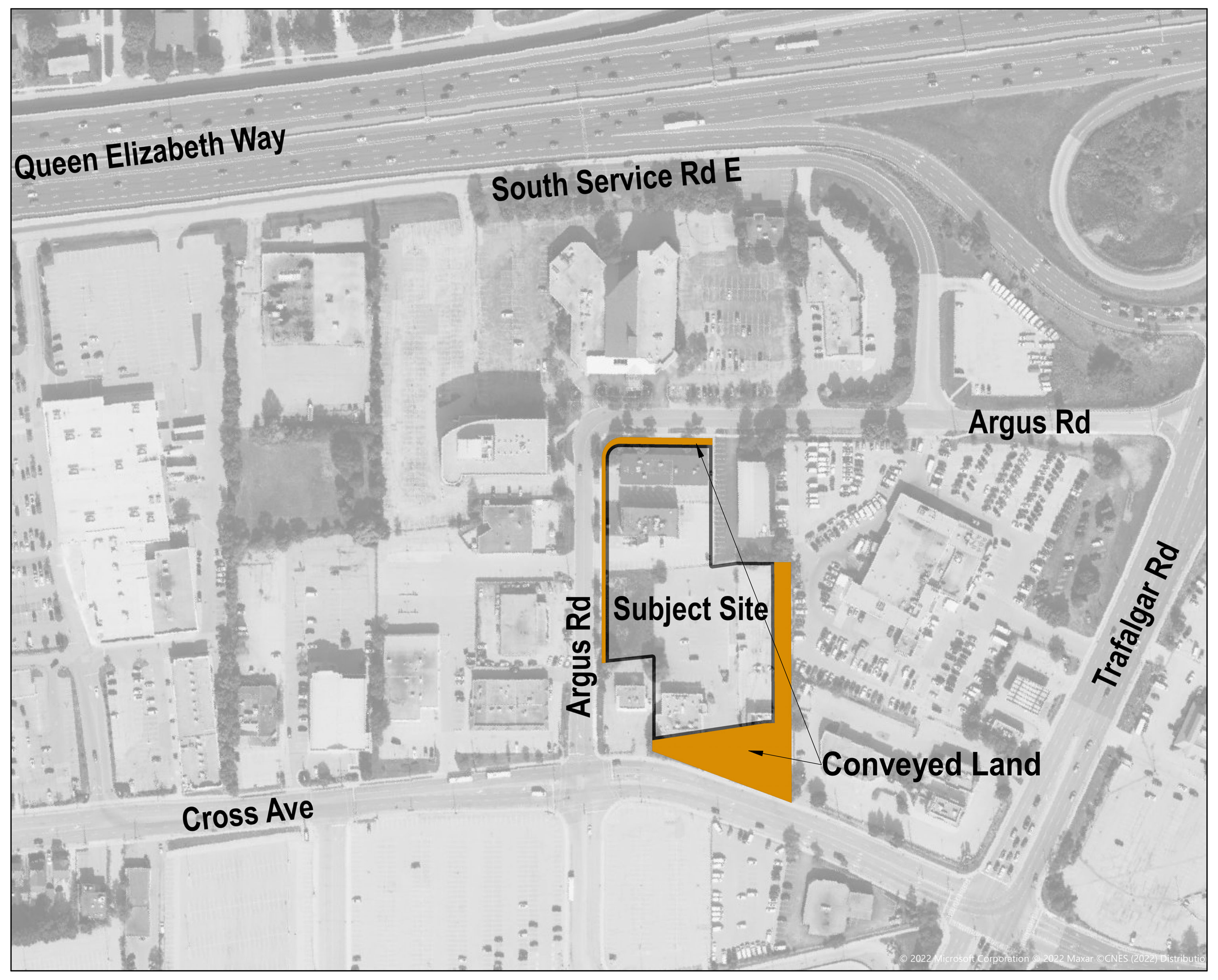
Based on the above, we support the proposed development from a civil engineering perspective for Rezoning (ZBA) and Official Plan Amendment (OPA).

PREPARED BY TRAFALGAR ENGINEERING LTD.

Digitally signed by Nicole Sylvester
Date: 2024.10.04 15:13:24 -04'00'

Nicole Sylvester, P.Eng.
Principal

APPENDIX 'A'



3 A101.S CONTEXT PLAN

2 A101.S KEY PLAN

217-227 Cross Ave and 571-587 Argus Rd | Distrikt Developments	sm	sf
Gross Lot Area:	12598	135604
Area of Road Conveyances:	2939	31638
Net Lot Area (excluding conveyances):	9659	103966
POPS Area (not conveyed):	2582	27790

BUILDING A 46 STOREY — Proposed Residential

Floor		Floor Area/Typ. Floor (sm)	No. Typ. Floors	Gross Floor Area** sm	Gross Floor Area** sf	Residential GFA (sm)	Non-Res GFA (sm) Retail (sm)	Non-Res GFA (sm) Office (sm)	Indoor Amenity GFA (sm)	Outdoor Amenity (sm)	Residential Net Saleable Area - RNSA (sm)	No. of Units
Tower A	MPH	0	1	0	0	0	0	0	0	0	0	0
	Level 9-46	850	38	32300	347677	26575	0	0	0	0	25345	455
	Level 8	850	1	850	9149	699	0	0	0	0	627	12
Podium A	Level 7	620	1	620	6676	247	0	0	245	563	241	5
	Level 3-6	1443	4	5771	62123	4525	0	0	0	0	5091	64
	Level 2	1072	1	1072	11535	0	0	0	487	427	0	0
	Mezzanine	0	0	0	0	0	0	0	0	0	0	0
	Ground	1608	1	1608	17313	1105	296	0	0	0	0	0
Building A Total				**42222**	**454473**	**33151**	**296**	**0**	**732**	**990**	**31304**	**536**
												100%

BUILDING B 52 STOREY — Proposed Residential

Floor		Floor Area/Typ. Floor (sm)	No. Typ. Floors	Gross Floor Area** sm	Gross Floor Area** sf	Residential GFA (sm)	Non-Res GFA (sm) Retail (sm)	Non-Res GFA (sm) Office (sm)	Indoor Amenity GFA (sm)	Outdoor Amenity (sm)	Residential Net Saleable Area - RNSA (sm)	No. of Units
Tower B	MPH	0	1	0	0	0	0	0	0	0	0	0
	Level 9-52	850	44	37400	402574	31117	0	0	0	0	29746	569
	Level 8	850	1	850	9149	707	0	0	0	0	679	13
Podium B	Level 7	850	1	850	9149	707	0	0	0	0	679	13
	Level 3-6	1239	4	5111	55019	4304	0	0	0	0	4169	64
	Level 2	1297	1	1297	13964	0	0	0	894	191	0	0
	Mezzanine	0	0	0	0	0	0	0	0	0	0	0
	Ground	1137	1	1137	12238	907	215	0	0	107	0	0
Building B Total				**46646**	**502093**	**37742**	**215**	**0**	**894**	**298**	**35273**	**659**
												100%

BUILDING C 59 STOREY — Proposed Residential

Floor		Floor Area/Typ. Floor (sm)	No. Typ. Floors	Gross Floor Area** sm	Gross Floor Area** sf	Residential GFA (sm)	Non-Res GFA (sm) Retail (sm)	Non-Res GFA (sm) Office (sm)	Indoor Amenity GFA (sm)	Outdoor Amenity (sm)	Residential Net Saleable Area - RNSA (sm)	No. of Units
Tower C	MPH	0	1	0	0	0	0	0	0	0	0	0
	Level 33-59	850	27	22950	247034	18936	0	0	0	0	17937	351
	Level 32	850	1	850	9149	701	0	0	0	0	525	10
	Level 9-31	850	23	19550	210436	16130	0	0	0	0	15280	299
	Level 8	972	1	972	10457	514	0	0	299	255	486	10
Podium C	Level 7	1164	1	1164	12524	0	0	0	852	951	0	0
	Level 3-6	2058	4	8231	88598	6986	0	0	0	0	6753	112
	Level 2	2694	1	2694	29002	0	0	2125	0	0	0	0
	Mezzanine	0	0	0	0	0	0	0	612	0	0	0
	Ground	2621	1	2621	28209	1777	848	0	111	32	0	0
Building C Total				**59031**	**635410**	**45045**	**848**	**2125**	**1874**	**1239**	**40981**	**782**
												100%

Total Floor Area, Gross**		**147,898 sm**		**± 1,591,976 sf**
Total Residental GFA:		**115,938 sm**		**± 1,247,956 sf**
FSI*:	Gross:	**11.74**	Net:	**15.31**
Total No. of Units		**1977**		

Parking	Min. Rate	Min. No.	Provided
Resident	0	0	974
Visitor	0	0	291
Retail	0	0	20
Office	0	0	29
TOTAL		0	1314
P1 Mezzanine			36
P1			129
P2			186
P3			192
P4			192
P5			192
P6			192
P7			195
TOTAL			1314

Bicycle Parking	Min. Rate	Min. No.	Provided
Long Term	0.75	1483	554
Short Term	0.25	494	497
Retail	1	1	2
Office	1	2	3
TOTAL		1980	1056
Mezzanine			0
P1 Mezzanine			294
P1			762
P2			0
P3			0
P4			0
P5			0
P6			0
P7			0
TOTAL			1056

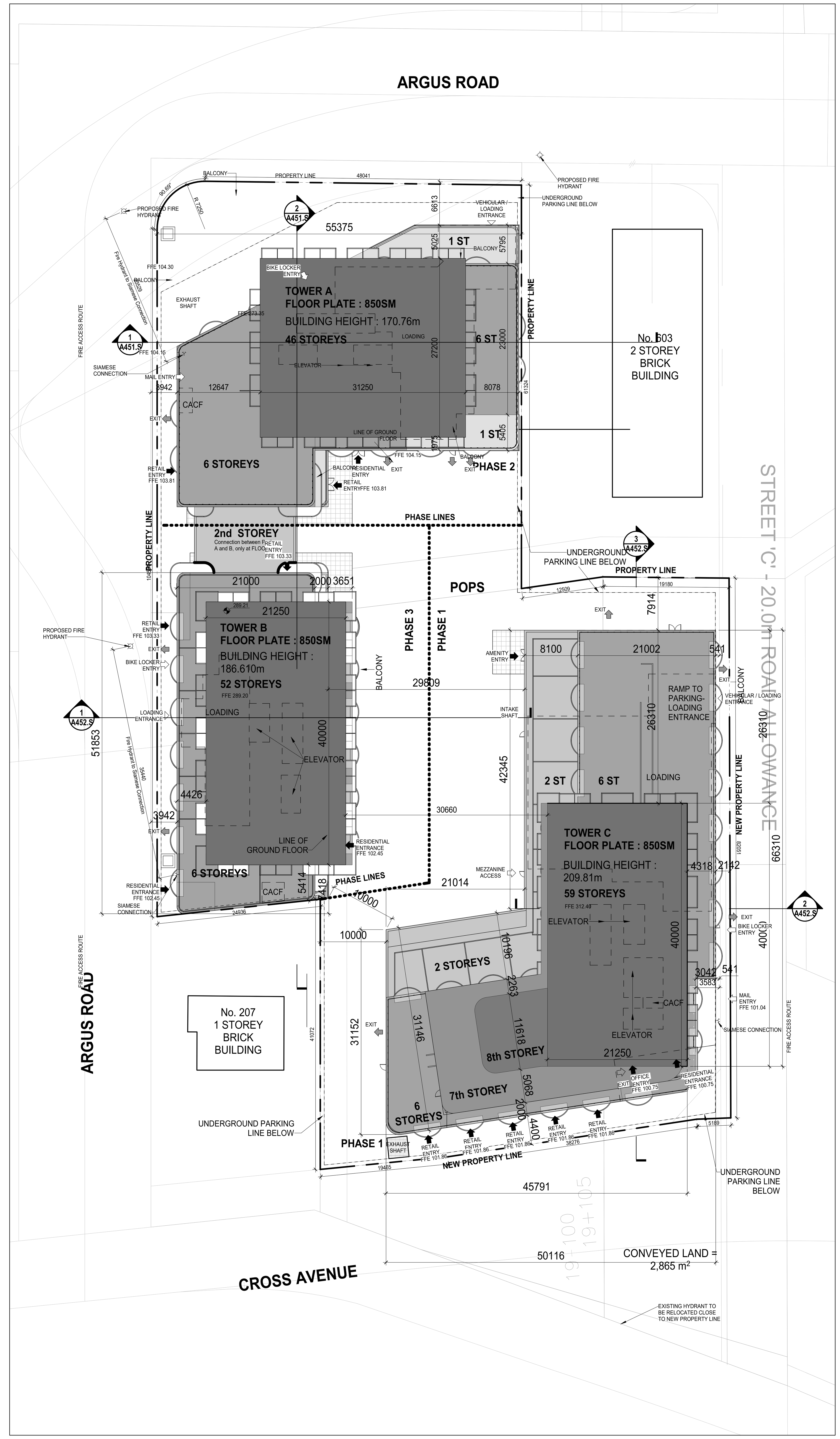
Residential Amenity	Provided	Rate
Indoor	3500	1.77
Outdoor	2526	1.28
TOTAL	6026	

Lockers	
P1 Mezzanine	0
P1	108
P2	237
P3	237
P4	237
P5	237
P6	237
P7	237
TOTAL	1530

Approx. Unit Mix			
Studios	1B	2B	3B
102	1,204	553	117
5%	61%	28%	6%

Definitions of Gross Floor Area, Net Floor Area and FSI are taken from Oakville By Law 2014-014, 2015-018 and 2023-065
*** FSI - Floor Space Index By-Law 2014-014:** means the net floor area of all buildings on a lot divided by the lot area.
Amended by 2023-065 to read: means the gross floor area of all buildings on a lot divided by the lot area.
**** Gross Floor Area Definition By-Law 2023-065:** means the total area of all of the floors in a building measured from the exterior faces of the exterior walls, but shall not include an attic, basement or mechanical penthouse.

STATISTICS



1 A101.S SITE PLAN
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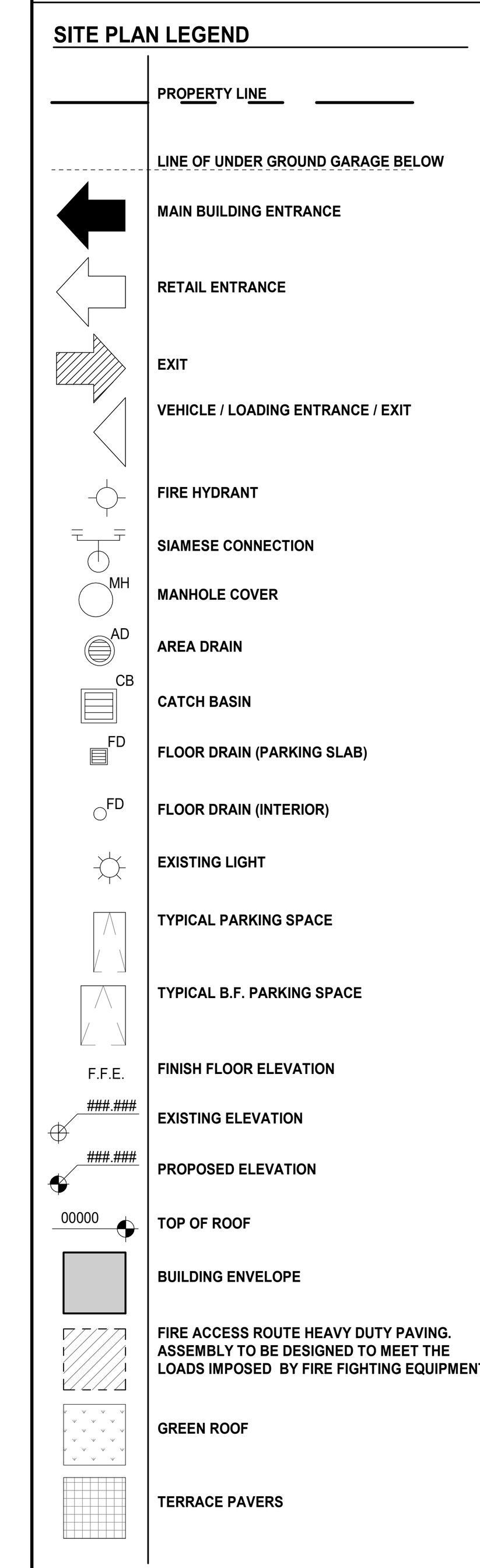

Date	No.	Description

REVISION RECORD

DRAFT

2024-09-06	Issued for Coordination
2024-03-28	Issued for ZBA, OPA rev 1 & SPA
2022-04-19	Issued for Rezoning

ISSUE RECORD

BDP. Quadrangle

Quadrangle Architects Limited
The Well, 8 Spadina Avenue, Suite 2100, Toronto, ON M5V 0S8
t 416 598 1240 www.bdpquadrangle.com

217-227 Cross Avenue and 571-587 Argus Road

for
Distrikt Developments

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PROJECT	SCALE	DRAWN	REVIEWED

Site Plan and Statistics

A101.S

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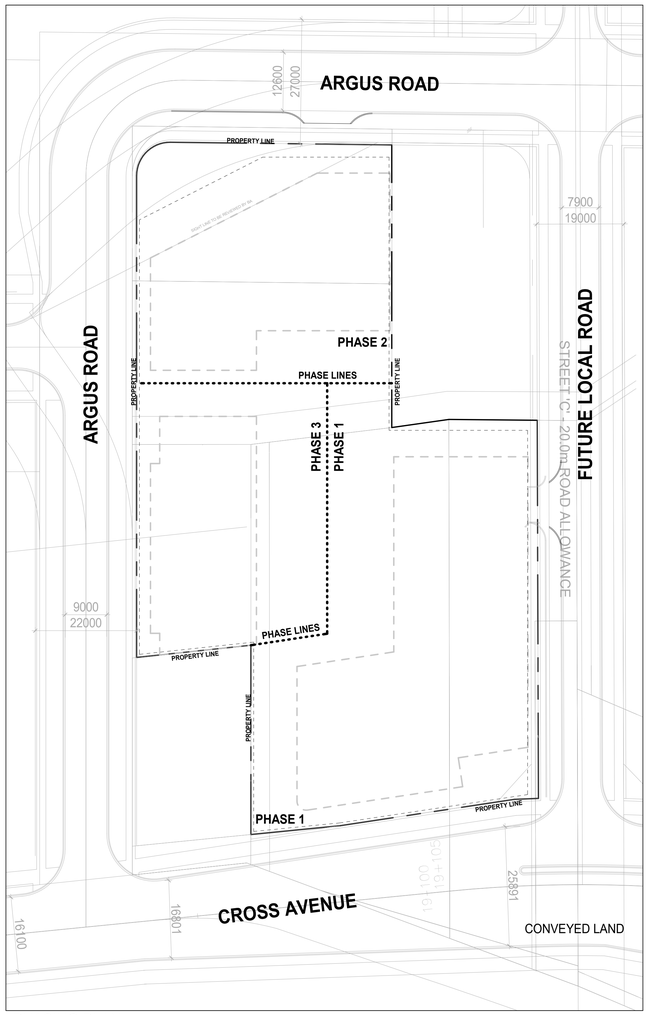
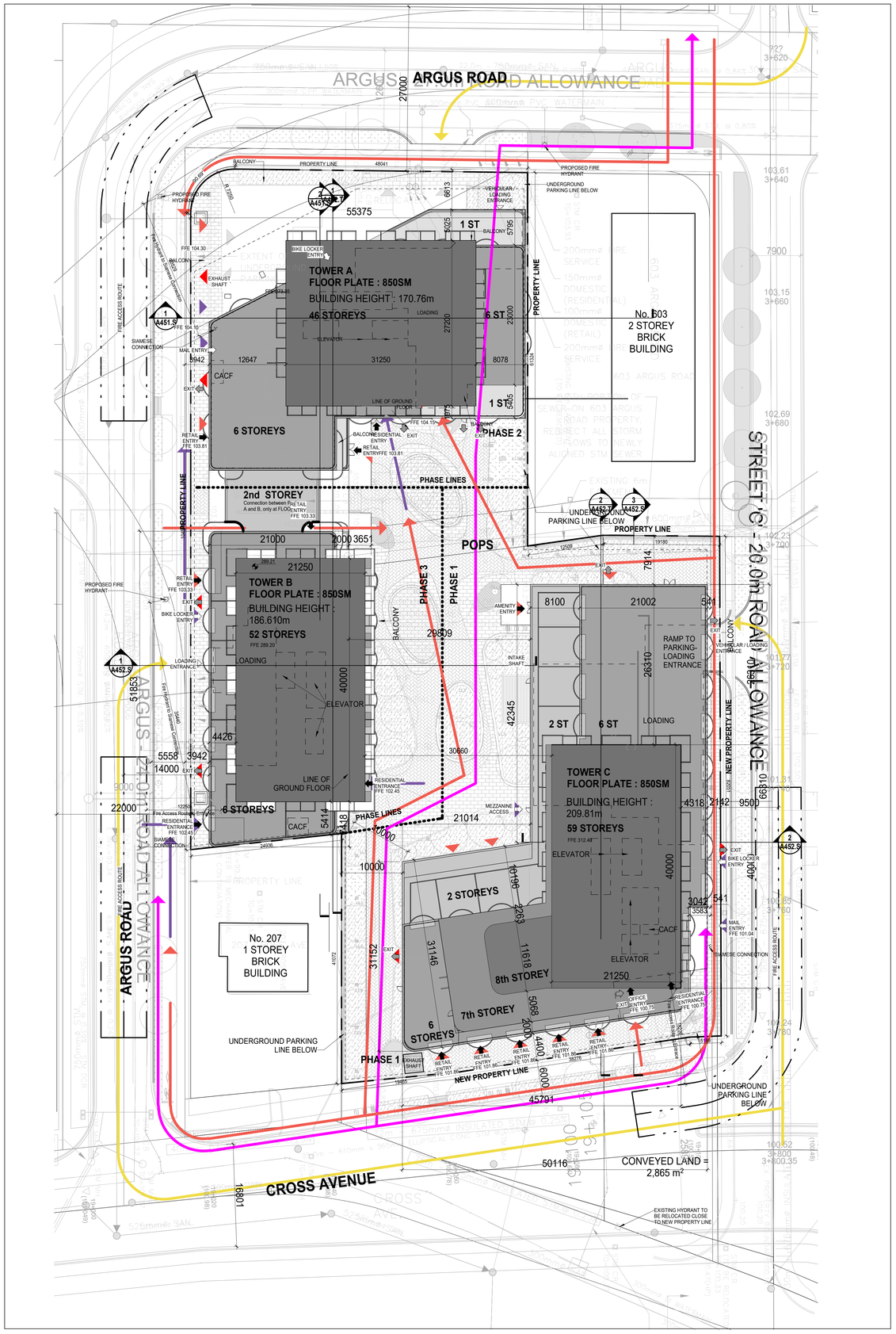


3 / A102.S PHASING PLAN



1 / A102.S SITE PLAN

CIRCULATION LEGEND

- PEDESTRIAN CONNECTION FROM GO STATION
- PEDESTRIAN PUBLIC
- PEDESTRIAN PRIVATE
- VEHICULAR CIRCULATION
- FIRE EXIT
- PRIVATE ENTRANCE
- PUBLIC ENTRANCE

Date	No.	Description
REVISION RECORD		

DRAFT

2024-09-06	Issued for Coordination
2024-03-28	Issued for ZBA, OPA rev 1 & SPA
2022-04-19	Issued for Rezoning

ISSUE RECORD

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t 416 598 1240 www.bdpquadrangle.com

217-227 Cross Avenue and
571-587 Argus Road

for
Distrikt Developments

19072	As indicated	UI	KVE
PROJECT	SCALE	DRAWN	REVIEWED

Pedestrian & Vehicular Circulation Plan and Phasing Plan

A102.S

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C:\Users\KVE\ACCDocuments\BDPQ_SITE_19072_Cross + Argus_KVE02_UI.rvt

LOT 13

LOT 14

CONCESSION 3, SOUTH OF DUNDAS STREET

ARGUS ROAD
(DEDICATED BY REGISTERED PLAN 1333)

C/L OF ROAD

LOCAL BENCHMARK No.3
ELEVATION=104.28m

PIN 24816-0074 (LT)

LOT 4

LOT 5
PIN 24816-0034 (LT)
No. 587
1 STOREY BRICK BUILDING

F.F.E.=104.64

LOT 6
PIN 24816-0035 (LT)
No. 581
3 STOREY STUCCO BUILDING

LOT 7
PIN 24816-0036 (LT)

LOT 8

No. 603
2 STOREY
BRICK BUILDING

PART 3, PLAN 20R-3864

1333 PLAN REGISTERED

0037 (LT)

SUBJECT TO AN EASEMENT AS IN INST. No. 304377

SUBJECT TO AN EASEMENT AS IN INST. No. 193642

20R-3864

24816-0009

LOT 3

LOT 2

ARGUS ROAD
(DEDICATED BY REGISTERED PLAN 1333)
PIN 24816-0074 (LT)

PIN 24816-0114 (LT)
APPROXIMATE LIMIT BETWEEN LOTS 13 AND 14, CONCESSION 3

LOT 14

LOT 13

No. 207
1 STOREY
BRICK BUILDING

No. 217
1 STOREY
STUCCO BUILDING

PIN 24816-0045 (LT)

SOUTH OF DUNDAS STREET

No. 227
1 STOREY
PRECAST CONCRETE
BUILDING

PART 4

PART 2

PART 5, PLAN 20R-3864

SUBJECT TO AN EASEMENT AS IN INST. No. 487336 AND 487707
SUBJECT TO A RIGHT-OF-WAY AS IN INST. No. 487707

24816-0042 (LT)

24816-0043 (LT)

24816-0044 (LT)

LOCAL BENCHMARK No. 1
ELEVATION=101.39

LOCAL BENCHMARK No. 2
ELEVATION=100.98

KNOWN AS CROSS AVENUE
PIN 24816-0076 (LT)

PART 1, PLAN 20R-13210
SUBJECT TO AN EASEMENT
AS IN INST. No. HB16621

PART 2, PLAN 20R-13210
SUBJECT TO AN EASEMENT
AS IN INST. No. HB16820

PART 3, PLAN 20R-13210
SUBJECT TO EASEMENTS AS IN
INST. No.'s 487336 AND HB16820
SUBJECT TO A RIGHT-OF-WAY
AS IN INST. No. 487707

PART 1, PLAN 20R-11413
DEDICATED AS PUBLIC HIGHWAY BY
BY-LAW No. 2000-015 AS IN INS1. No. HB30969
PIN 24816-0076 (LT)

LOT 13
CONCESSION 3
SOUTH OF DUNDAS STREET

J.D.BARNES LIMITED
SURVEYING MAPPING GIS
LAND INFORMATION SPECIALISTS
401 WHEELABRATOR WAY, SUITE A, MILTON, ON L9T 3C1
T: (905) 875-9955 F: (905) 875-9956 www.jdbarnes.com

DRAWN BY:	CHECKED BY:	REFERENCE NO.:
MB	RSQ	20-30-586-02-AllTopo

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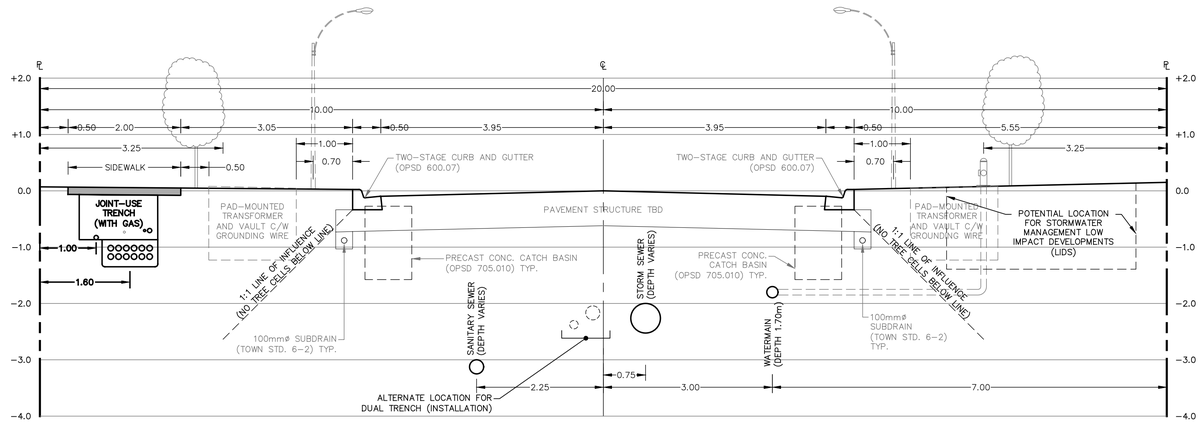
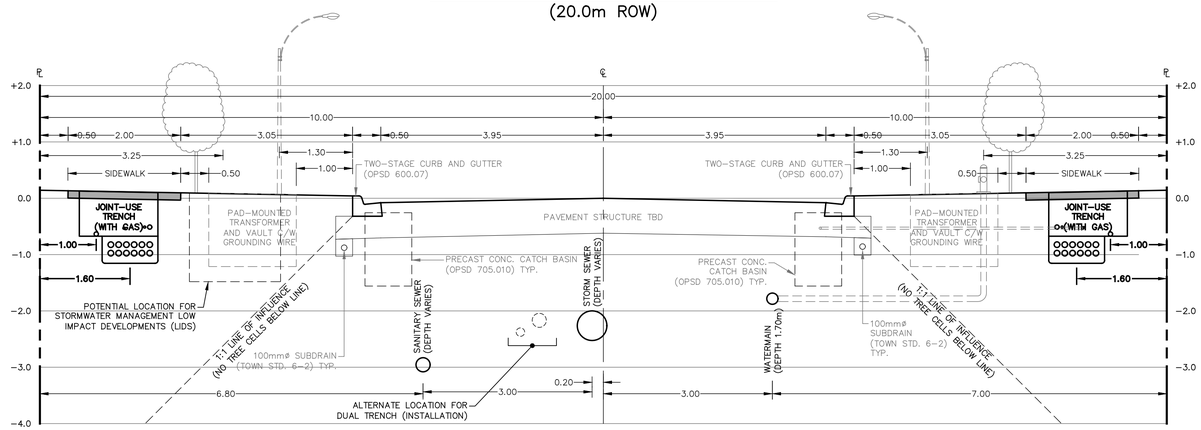
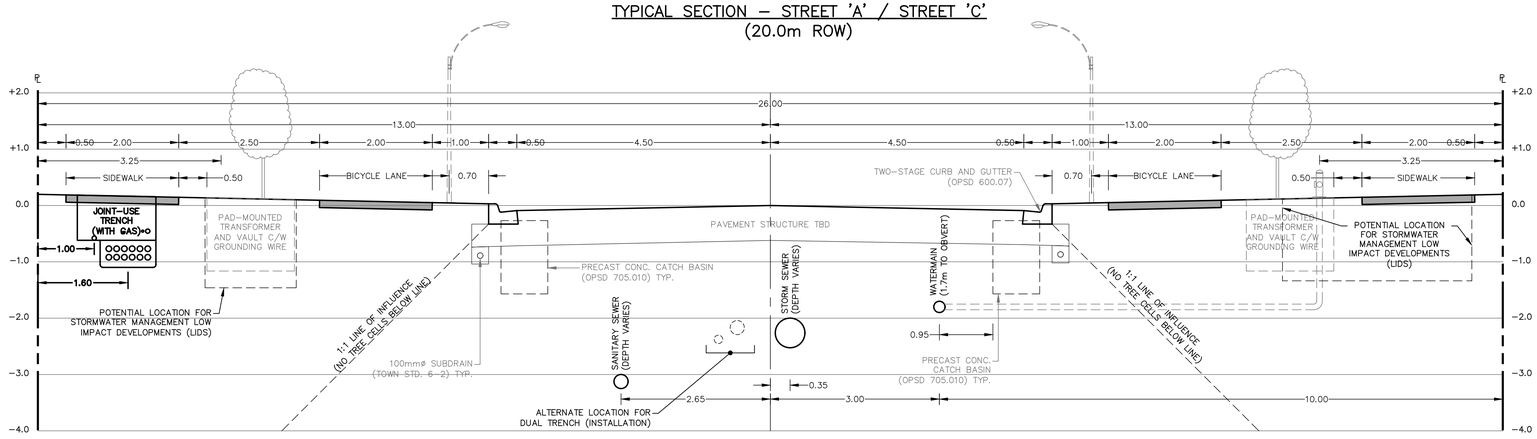


TYPICAL SECTION – SOUTH SERVICE ROAD
(20.0m ROW)



TYPICAL SECTION – STREET 'A' / STREET 'C'
(20.0m ROW)



TYPICAL SECTION – STREET 'B' / ARGUS
(26.0m ROW)

NOTE:
THESE SECTIONS ARE PRELIMINARY AND ARE SUBJECT TO COORDINATION WITH THE VARIOUS STAKEHOLDERS, INCLUDING UTILITY COMPANIES TO ENSURE ADEQUATE CLEARANCES ARE MET.

PROJECT TITLE
MIDTOWN CORE
TOWN OF OAKVILLE

DRAWING TITLE
TYPICAL ROAD CROSS−SECTIONS

TRAFALGAR ENGINEERING
#1-481 MORDEN ROAD, OAKVILLE, ON, L6K 3W6
www.trafalgareng.com

DESIGN BY	NS	SCALE	N.T.S.	DRAWING No.	FIG. 1
DRAWN BY	GL	DATE	2024/09/20		

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APPENDIX 'B'

AQUACOM CONTRACTING
81 Todd Road Suite 202 Georgetown Ont. L7G 4R8
(o) 905-467-5853 (C) 905-971-9956 (e) mark@aquacom.ca

SITE NAME	ARGUS RD AREA
TEST DATE TIME	FRIDAY MAY 13 2022 @ 10:25
SITE ADDRESS	ARGUS RD AREA, TOWN OF OAKVILLE
TECHNICIANS	MARC COULTER & JEFF DAM
COMMENTS	MUNICIPAL HYDRANTS

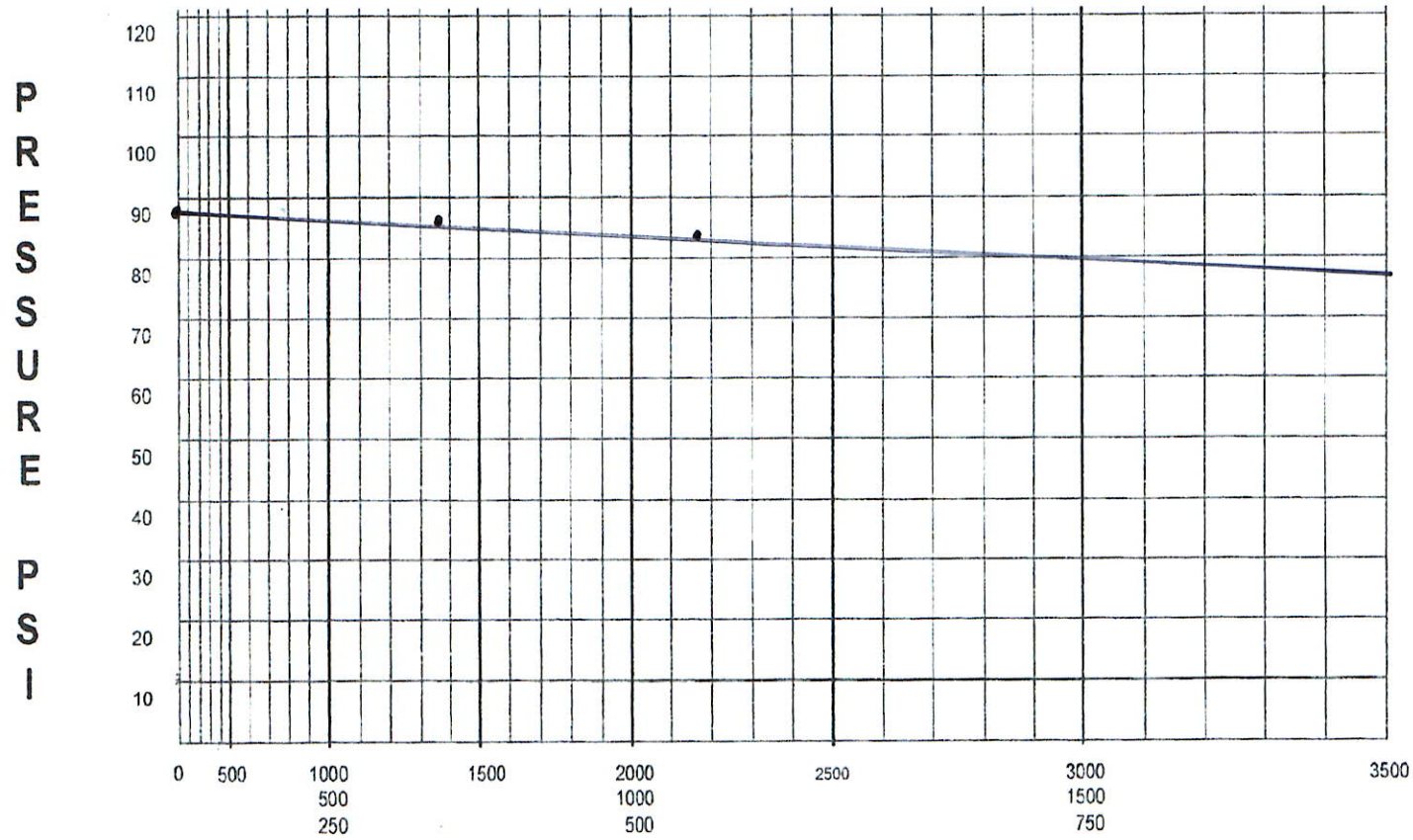
LOCATION OF FLOW HYDRANT

OPP 603 ARGUS RD

LOCATION OF RESIDUAL HYDRANT

581 ARGUS RD

# OUTLETS	SIZE INCHES	PITO PSI	FLOW USGPM	RESIDUAL PSI	STATIC PSI	PIPE DIA. MM
ONE	2.50	67	1375	87	89	300MM
TWO	2.50	42	2176	84		PVC
		THEORETICAL	8978	20	TEST #	ONE
NOZZLE COEFF.		.90				



AQUACOM CONTRACTING
81 Todd Road Suite 202 Georgetown Ont. L7G 4R8
(o) 905-467-5853 (C) 905-971-9956 (e) mark@aquacom.ca

SITE NAME ARGUS RD AREA

TEST DATE TIME FRIDAY MAY 13 2022 @ 10:55

SITE ADDRESS ARGUS RD AREA, TOWN OF OAKVILLE

TECHNICIANS MARC COULTER & JEFF DAM

COMMENTS MUNICIPAL HYDRANTS

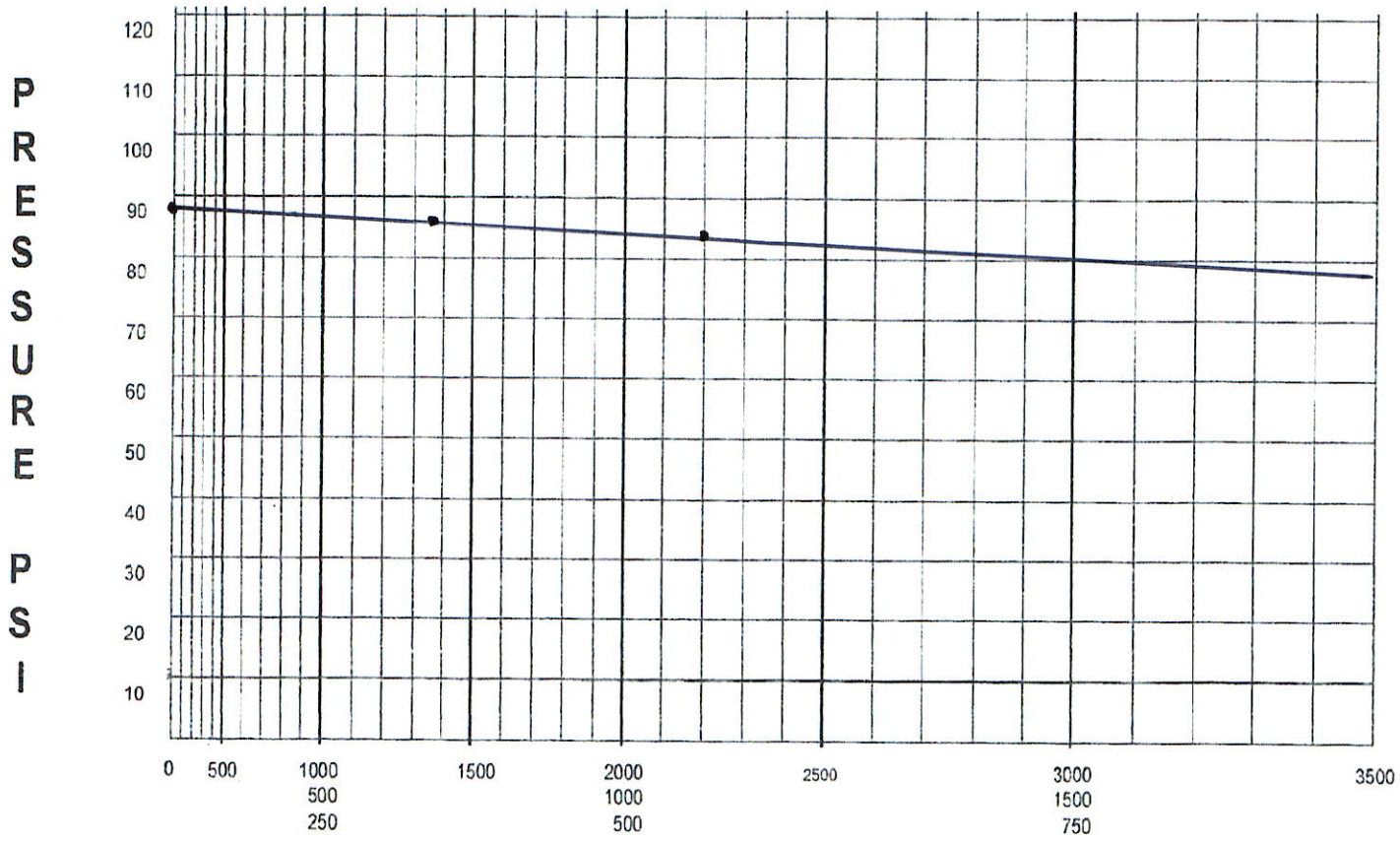
LOCATION OF FLOW HYDRANT

581 ARGUS RD

LOCATION OF RESIDUAL HYDRANT

OPP 603 ARGUS RD

# OUTLETS	SIZE INCHES	PITO PSI	FLOW USGPM	RESIDUAL PSI	STATIC PSI	PIPE DIA. MM
ONE	2.50	68	1385	87	89	300MM
TWO	2.50	43	2201	84		PVC
		THEORETICAL	9081	20	TEST #	THREE
NOZZLE COEFF.		.90				



AQUACOM CONTRACTING
81 Todd Road Suite 202 Georgetown Ont. L7G 4R8
(o) 905-467-5853 (C) 905-971-9956 (e) mark@aquacom.ca

SITE NAME ARGUS RD AREA

TEST DATE TIME FRIDAY MAY 13 2022 @ 10:40

SITE ADDRESS ARGUS RD AREA, TOWN OF OAKVILLE

TECHNICIANS MARC COULTER & JEFF DAM

COMMENTS MUNICIPAL HYDRANTS

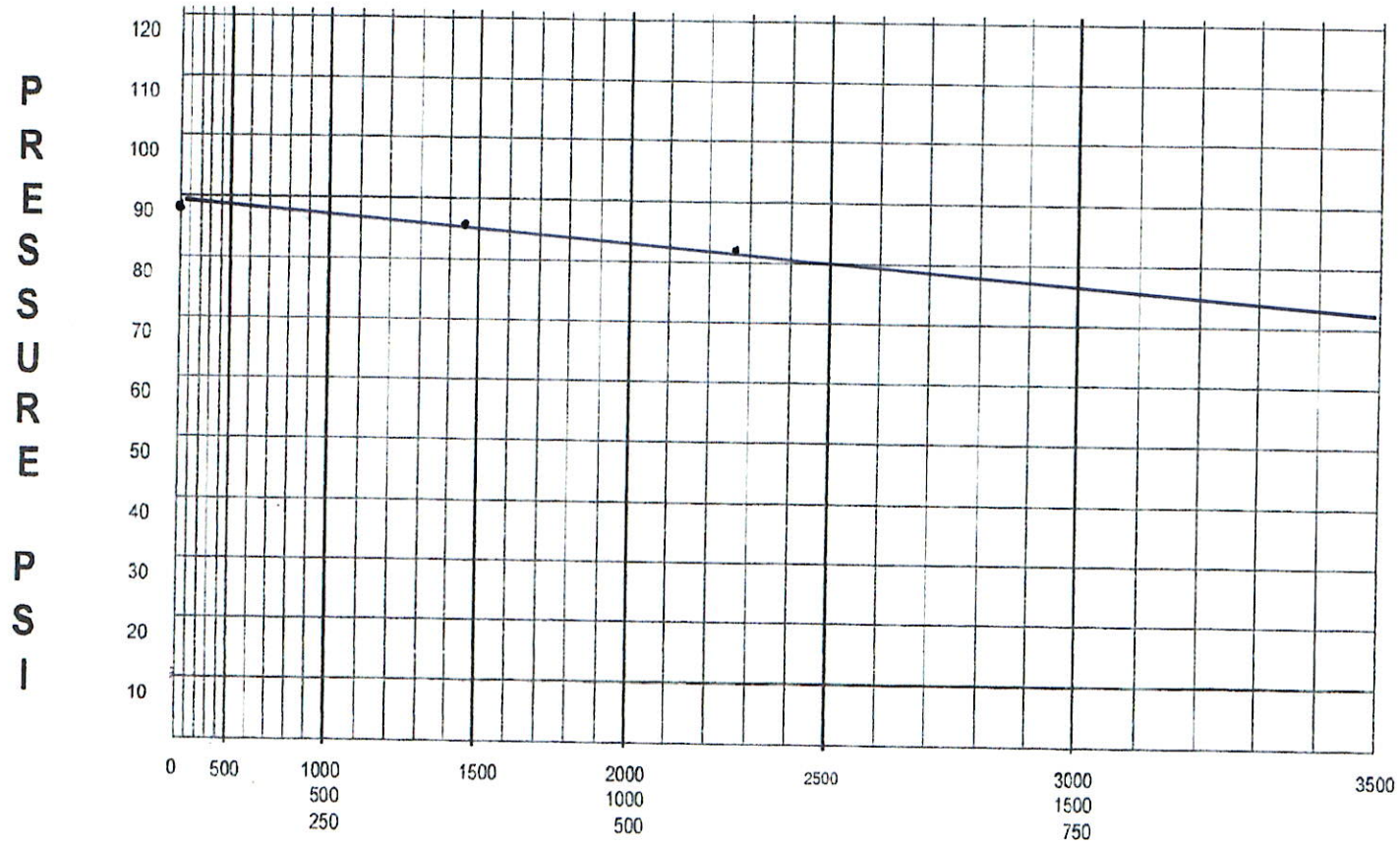
LOCATION OF FLOW HYDRANT

227 CROSS AV

LOCATION OF RESIDUAL HYDRANT

581 ARGUS RD

# OUTLETS	SIZE INCHES	PITO PSI	FLOW USGPM	RESIDUAL PSI	STATIC PSI	PIPE DIA. MM
ONE	2.50	78	1483	86	89	300MM
TWO	2.50	46	2276	82		PVC
		THEORETICAL	7831	20	TEST #	TWO
NOZZLE COEFF.		.90				



AQUACOM CONTRACTING

81 Todd Road Suite 202 Georgetown Ont. L7G 4R8

(o) 905-467-5853 (c) 905-971-9956 (e) mark@aquacom.ca

HYDRANT FLOW TEST REPORT

		HYDRANT MAKE	SEC. VALVE CONDITION	TECH.	TIME	STATIC PSI	PITO 1-2.50" PSI	FLOW 1-2.50" US GPM	RESIDUAL 1-2.50" PSI	PITO 2-2.50" PSI	FLOW 2-2.50" US GPM	RESIDUAL 2-2.50" PSI	COLOUR CODE
F1	OPP 603 ARGUS RD	CV	OK/OPEN	MC	10:25		67	1375		42	2176		BLUE
R1	581 ARGUS RD	CV	OK/OPEN	JD		89			87			84	
F2	227 CROSS AV	CV	OK/OPEN	MC	10:40		78	1483		46	2276		BLUE
R2	581 ARGUS RD	CV	OK/OPEN	JD		89			86			82	
F3	581 ARGUS RD	CV	OK/OPEN	MC	10:55		68	1385		43	2201		BLUE
R3	OPP 603 ARGUS RD	CV	OK/OPEN	JD		89			87			84	
F4													
R4													
F5													
R5													

CUSTOMER	LOCATION	CONTACTS ON SITE
TRAFALGAR ENGINEERING	ARGUS ROAD AREA	
	TOWN OF OAKVILLE	REGION OF HALTON OPERATOR

TRAFALGAR ENGINEERING LTD.

ESTIMATED EXISTING WATER DEMAND

Project: Cross and Argus
Desc: Rezoning/OPA TOC Submission

Project No.: 1729
Prepared By: NAS
Checked By: JN

	Occupancy Data					Peaking Factors			Demand Flow		
Land Use / Occupancy Type	Unit Count / GFA	Population Density (pers/ha)	Eq. Population (cap.)	Per Cap. Demand (L/cap. Day)	Average Daily Demand (L/min)	Min. Hour	Peak Hour	Max. Daily	Min. Hour Demand (L/min)	Max. Hour Demand (L/min)	Max. Daily Demand (L/min)
Light Commercial	1.26	90	113	275	22	1.00	2.25	2.25	22	49	49
TOTAL	**1**		**113**		**22**				**22**	**49**	**49**

Average Daily Demand: **22 (L/min)**
Minimum Hourly Demand: **22 (L/min)**
Maximum Hourly Demand: **49 (L/min)**
Maximum Daily Demand: **49 (L/min)**

TRAFALGAR ENGINEERING LTD.

ESTIMATED PROPOSED WATER DEMAND

Project: Cross and Argus
Desc: Rezoning/OPA TOC Submission

Project No.: 1729
Prepared By: NAS
Checked By: JN

	Occupancy Data					Peaking Factors			Demand Flow		
Land Use / Occupancy Type	Unit Count / GFA	Population Density (pers/ha)	Eq. Population (cap.)	Per Cap. Demand (L/cap. Day)	Average Daily Demand (L/min)	Min. Hour	Peak Hour	Max. Daily	Min. Hour Demand (L/min)	Max. Hour Demand (L/min)	Max. Daily Demand (L/min)
Apartments - Less than 2 Bedrooms	1306	1.356	1771	275	338	1.00	4.00	2.25	338	1353	761
Apartments - 2 or More Bedrooms	670	1.831	1227	276	235	1.00	4.00	2.25	235	941	529
Non-Residential (sq.m)	3484	37.4	93	275	18	1.00	2.25	2.25	18	40	40
TOTAL	**5460**		**3091**		**591**				**591**	**2333**	**1330**

Average Daily Demand: **591 (L/min)**
Minimum Hourly Demand: **591 (L/min)**
Maximum Hourly Demand: **2333 (L/min)**
Maximum Daily Demand: **1330 (L/min)**
Max. Daily Plus Fire: **8330 (L/min)**

Fire Flow
Using Fire Underwriters Survey Methodology:

1. **An estimate of the fire flow is given by the formula** $F = 220C\sqrt{A}$

Where:
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 (including all storeys but excluding basements at least 50% below grade)

Type of Construction: Fire-Resistive Coefficient: 0.60 Total Floor Area: 3102 (m^2)

F = 7000 (L/min)

Adequately Protected Vertical Openings: Yes

Area Note: For adequately protected vertical openings consider only the area of the largest floor plus 25% of each of the two immediately adjoining floors.

NOTE: Tower A produced the maximum Fire Flow requirement

2. **Adjust the value in No. 1 for occupancy surcharge/reduction**

Occupancy Contents: Combustible Factor: 0%

F = 7000 (L/min)

3. **Adjust the value in No. 2 for sprinkler**

NFPA 13 Sprinkler:	Yes	Reduction:	20%
Standard Water Supply:	Yes	Reduction:	10%
Fully Supervised:	Yes	Reduction:	10%
		Total Reduction:	**40%**
		Sprinkler Reduction:	**2800 (L/min)**

4. Adjust the value in No. 2 for exposure

	Separation (m)	Charge
North	23	10%
East	22	10%
South	11	15%
West	26	10%
	Total Charge:	**45%**
	Exposure Charge:	**3150 (L/min)**

5. **Estimated Fire Flow is value in No. 2 less *Sprinkler Reduction* plus *Exposure Charge* , rounded to the nearest 1000**

F = 7000 (L/min)

TRAFALGAR ENGINEERING LTD.

ESTIMATED EXISTING SANITARY FLOW

Project: Cross and Argus
Desc: Rezoning/OPA TOC Submission

Project No.: 1729
Prepared By: NAS
Checked By: JN

Residential

Land Use / Occupancy Type	Site Area (ha)	Population Density (pers/ha)	Eq. Population (cap.)	Per Cap. Demand (L/cap. Day)	Average Daily Dry Weather Flow (L/s)
			0		
TOTAL	**0.00**		**0**		**0.0**

Industrial / Commercial / Institutional

Land Use / Occupancy Type	Site Area (ha)	Population Density (pers/ha)	Eq. Population (cap.)	Unit Sewage Flow (L/Ha. Day)	Average Daily Dry Weather Flow (L/s)
Light Commerical	1.26	90.0	113	24750	0.36
TOTAL	**1.26**		**113**		**0.3609**

Residential Peaking Factor:	4.50	
ICI Peaking Factor:	4.23	
Include ICI Peaking?	Yes	
Tributary Area:	1.02	(ha)
Infiltration Allowance:	0.286	(L/s ha)
Foundation Drain Allowance:	0.00	(L/s ha)
Infilitration Avg Flow:	0.29	(L/s)
ICI Average Flow:	0.36	(L/s)
Groundwater Discharge:		(L/s)
Total Average Flow:	**0.65**	**(L/s)**
Infiltration Flow:	0.30	(L/s)
ICI Peak Flow:	1.53	(L/s)
Groundwater Discharge:		(L/s)
Total Peak Flow:	**1.83**	**(L/s)**

TRAFALGAR ENGINEERING LTD.

ESTIMATED PROPOSED SANITARY FLOW

Project: Cross and Argus
Desc: Rezoning/OPA TOC Submission

Project No.: 1729
Prepared By: NAS
Checked By: JN

Residential

Land Use / Occupancy Type	Unit Count / GFA	Population Density (pers/unit)	Eq. Population (cap.)	Per Cap. Demand (L/cap. Day)	Average Daily Dry Weather Flow (L/s)
Apartments - Less than 2 Bedrooms	1306	1.356	1771	275	5.64
Apartments - 2 or More Bedrooms	670	1.831	1227	275	3.90
TOTAL	**1976.00**		**2998**		**9.54**

Industrial / Commercial / Institutional

Land Use / Occupancy Type	Unit Count / GFA	Population Density (m^2/pers)	Eq. Population (cap.)	Per Cap. Demand (L/cap. Day)	Average Daily Dry Weather Flow (L/s)
Non-Residential / Commercial	3484	37.4	93	275	0.30
TOTAL	**3484.00**		**93**		**0.30**

Residential Peaking Factor:	3.44	
ICI Peaking Factor:	4.25	
Include ICI Peaking?	Yes	
Tributary Area:	1.02	(ha)
Infiltration Allowance:	0.286	(L/s ha)
Foundation Drain Allowance:	0.00	(L/s ha)
Residential + Infilitration Avg Flow:	9.83	(L/s)
ICI Average Flow:	0.3	(L/s)
Groundwater Discharge:		(L/s)
Total Average Flow:	**10.1**	**(L/s)**
Residential Peak Flow:	33.1	(L/s)
ICI Peak Flow:	1.3	(L/s)
Groundwater Discharge:		(L/s)
Total Peak Flow:	**34.36**	**(L/s)**

STREET 'C'
(20.0m LOCAL ROAD)

ARGUS ROAD

CROSS AVE.

EX. CB AND LEAD TO BE REMOVED

STM CB

STM CB (TO BE RELOCATED) TG=100.33

STM CB TG=100.37

SAN MH

STM CB TG=101.04

STM CB TG=102.03

TOWER A

TOWER B

TOWER C

PHASE 1

PHASE 2

PHASE 3

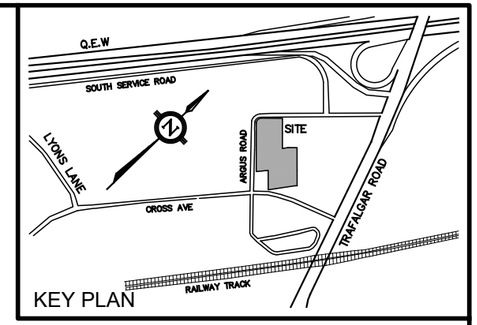
TOWER PHASE LINE

1.26
114 | 90

0.96
3091

ARGUS ROAD

KEY PLAN



LEGEND

- 0.91 / 81 — SANITARY AREA IN HECTARES; ESTIMATED POPULATION
- POST-DEVELOPMENT SANITARY DRAINAGE AREA BOUNDARY
- 0.91 / 81 | 90 — PRE-DEVELOPMENT SANITARY AREA IN HECTARES; EQUIVALENT POPULATION; POPULATION DENSITY (PP/HA)
- PRE-DEVELOPMENT SANITARY DRAINAGE AREA BOUNDARY

PROJECT TITLE
ARGUS CROSS
PROPOSED RESIDENTIAL CONDOMINIUM DEVELOPMENT
DISTRIKT DEVELOPMENTS

DRAWING TITLE
SANITARY DRAINAGE PLAN

TRAFALGAR ENGINEERING
#1-481 MORDEN ROAD, OAKVILLE, ON, L6K 3W6
www.trafalgareng.com

DESIGN BY	NAS	SCALE	1:750
DRAWN BY	ZI	DATE	2022/05/06

DRAWING No. FIG. 1

FILENAME: P:\1729 Cross and Argus\04-CAD\04-Rezoning_OPA\1729GS.dwg
PLOTDATE: Sep 20, 2024 - 9:58am

APPENDIX 'C'

Memorandum

URBANTECH®

To:	Sasha Lauzon Senior Director of Planning & Development Distrikt	**Date:**	February 26, 2024
From:	Kate Connell Senior Project Manager Urbantech Consulting	**Project #:**	**22-282W**
Re:	**Midtown Oakville Wastewater Capacity Analysis (Existing and Future Conditions)**		

This memo has been prepared by Urbantech to support on-going development applications for Distrikt properties in Midtown Oakville.

The sections that follow describe the capacity available in the Midtown wastewater pipe network, under both existing and future conditions, using a first-principles approach. The analysis was completed to:

- Confirm existing capacity constraints, prior to the Region's planned trunk sewer upgrades (on-going capital project).
- Evaluate capacity available in the future system (with trunk sewer upgrades complete), under a variety of development scenarios.
- Identify additional upgrades that may be required in the local sanitary system to support development.

Results of the analysis indicate that the future system will be able to accommodate all of the Distrikt developments (plus additional growth) with only minor upgrades to the local network.

1. Midtown Oakville Existing Wastewater System

Figure 1 shows the existing Midtown Oakville wastewater network. The main trunk sewer (West Trunk) that services Midtown Oakville (west of Trafalgar Road) also provides sanitary capacity for approximately 260 ha north of the QEW. This trunk sewer runs south along Argus Road, through the GO Station parking lot and along Trafalgar Road to Cornwall.

A second, smaller sub-trunk sewer (East Trunk) provides sanitary capacity for Midtown east of Trafalgar Road (as well as a small area west of Trafalgar Road, north of Cross Avenue). This sub-trunk runs west along Davis Road and south on Trafalgar to Cornwall.

The two trunk sewers combine south of Cornwall and drain to the Rebecca Trunk sewer, terminating at the Oakville Southwest Wastewater Treatment Plant.

The Region has noted existing capacity constraints in both the West Trunk and East Trunk. They have initiated a capital project to upgrade the sewer extents as shown in **Figure 1** (blue and orange). The Region intends to have the upgrades completed in the 2026 timeframe.

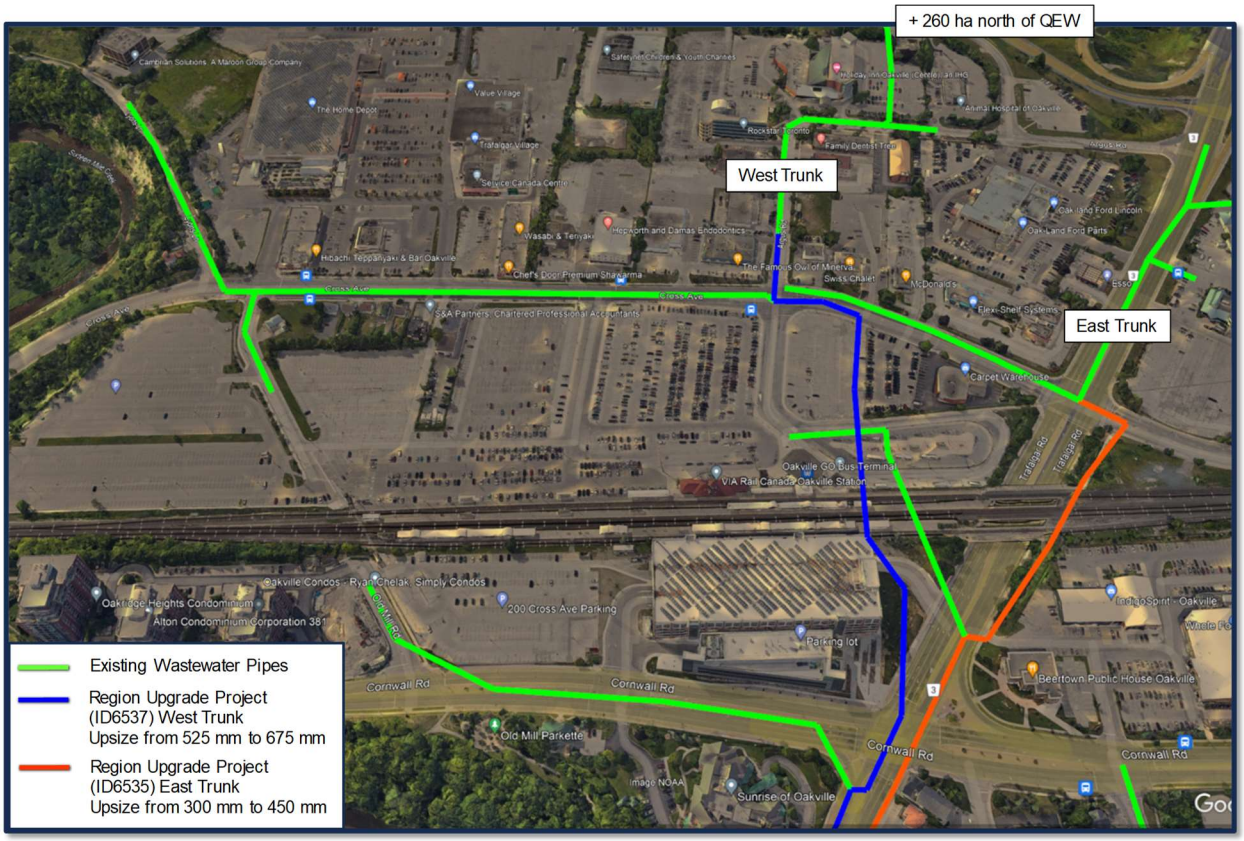


Figure 1: Midtown Oakville Wastewater Network (Existing)

2. Existing Wastewater Capacity Analysis

A first-principles wastewater analysis was undertaken to evaluate capacity in the existing sanitary network. This approach uses current land use, typical population densities and per-capita flow generation rates (in accordance with Region of Halton standards) to calculate pipe flow at the individual component level. This allows a pipe-by-pipe assessment of both trunk and local sewers.

Figure 2 shows the results of the existing conditions analysis for the Midtown sewer system. Lighter coloured pipes have more capacity and darker are more constrained. The limiting pipe segments for each trunk are identified. Results confirm an existing constraint in the West Trunk, through the GO Station parking lot. The East Trunk shows limited residual existing capacity.

Full details are available in **Attachment 1**, including associated drawings, drainage areas, key assumptions, and sanitary design sheets. It is noted that the West Trunk assessment includes calculations for the 260 ha north of the QEW which drain through Midtown. All flows are calculated using the Harmon peaking factor and inflow / infiltration in accordance with the Region's Linear Design Manual (2019).

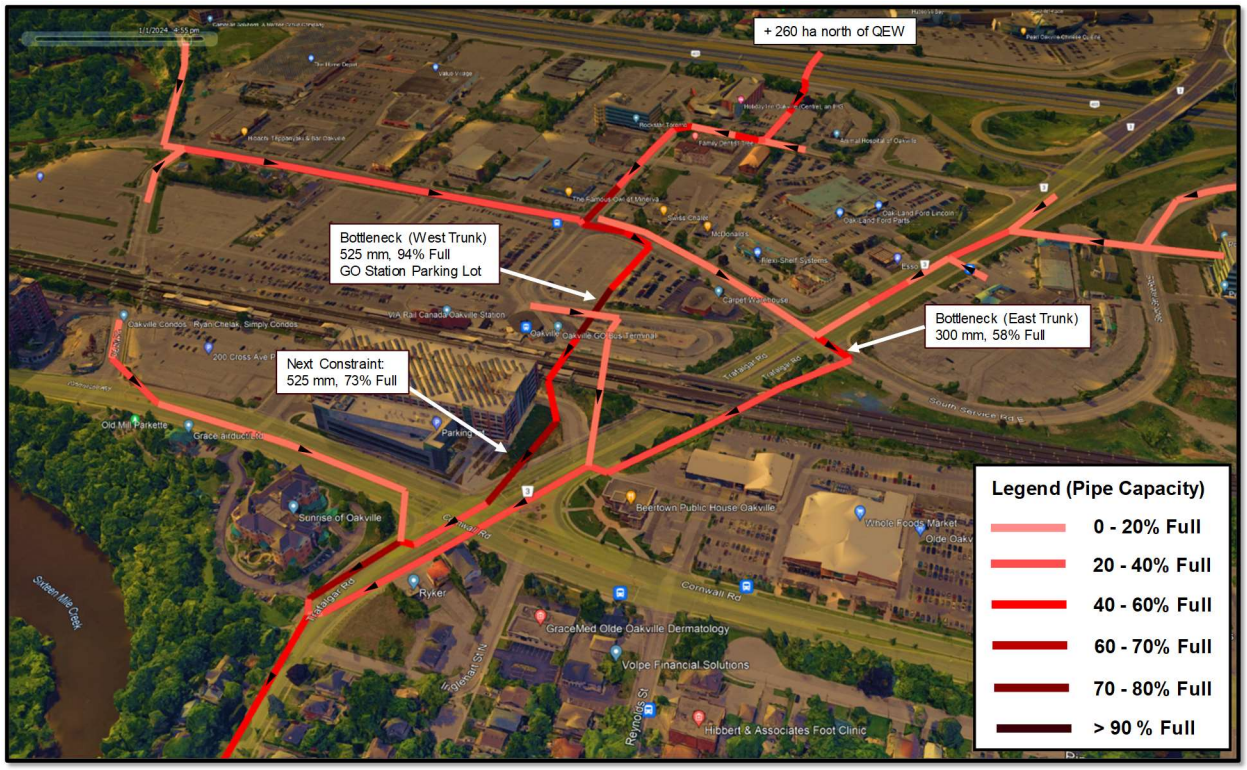


Figure 2: Midtown Oakville Existing Conditions – Pipe Capacity Analysis Results

3. Future Wastewater Capacity Analysis

The future wastewater capacity analysis for Midtown uses the same approach as outlined in Section 2 but augments the sanitary design sheet to upsize pipe components associated with the Region's upgrade project as shown in **Figure 1** (i.e., 525 mm updated to 675 mm, and 300 mm updated to 450 mm). The alignment and slopes of the existing pipe network are kept the same. These may change as the Region progresses their design, but minor changes are not anticipated to impact the results of this analysis.

Four (4) future scenarios were run to assess the impact of development on the Midtown Oakville wastewater system:

Scenario 1 (Base Case):

- Region trunk sewer upgrades complete.
- No new development added to the system (existing conditions).

Scenario 2A:

- Region trunk sewer upgrades complete.
- Population and employment projections for Distrikt planned developments added to the sewer network at appropriate nodes (all new wastewater flow directed to the West Trunk).

Scenario 2B:

- Region trunk sewer upgrades complete.
- Population and employment projections for Distrikt planned developments added to the sewer network at appropriate nodes (wastewater flow is split between the West and East Trunks)

Scenario 3:

- Region trunk sewer upgrades complete.
- Population and employment projections for all near-term development in Midtown Oakville (including Distrikt developments) added to the system at appropriate nodes. This includes 627 Lyons Lane, 349 Davis Road and 177 Cross Avenue.

Attachment 2 includes mapping, a summary of results, and detailed design sheets for the four (4) future scenarios. Population estimates for Distrikt developments are based on current engineering design (population and employment estimates) as provided by Trafalgar Engineering.

In general, results show that:

- The Region's planned trunk sewer upgrades resolve the existing capacity constraints in the Midtown system. The trunk sewer upgrades (as proposed) provide sufficient downstream capacity under all scenarios tested.
- The local 300 mm sanitary sewer on Cross Avenue (running east/west from Argus Road to Lyons Lane) has existing capacity to accommodate full build-out of Distrikt's 157/165 Cross Avenue site. Any additional development connecting to the Cross Avenue sewer will trigger an upsize from 300 mm to 450 mm diameter for a short section (approximately 140 m total, from Argus Road to 140 m west of Argus Road). The 450 mm diameter size is sufficient to support new growth under all scenarios tested (including Scenario 3 which adds 166 South Service Road, 627 Lyons Lane and 177 Cross Avenue future developments to the Cross Avenue local sewer).
- There are no other local capacity constraints in any of the future scenarios considered. Further infrastructure planning will be required to identify ultimate (i.e., 2041, 2051) servicing needs. The analysis herein, however, confirms that the system can support near-term development (currently in the pipeline) with only minor modifications.

4. Conclusions

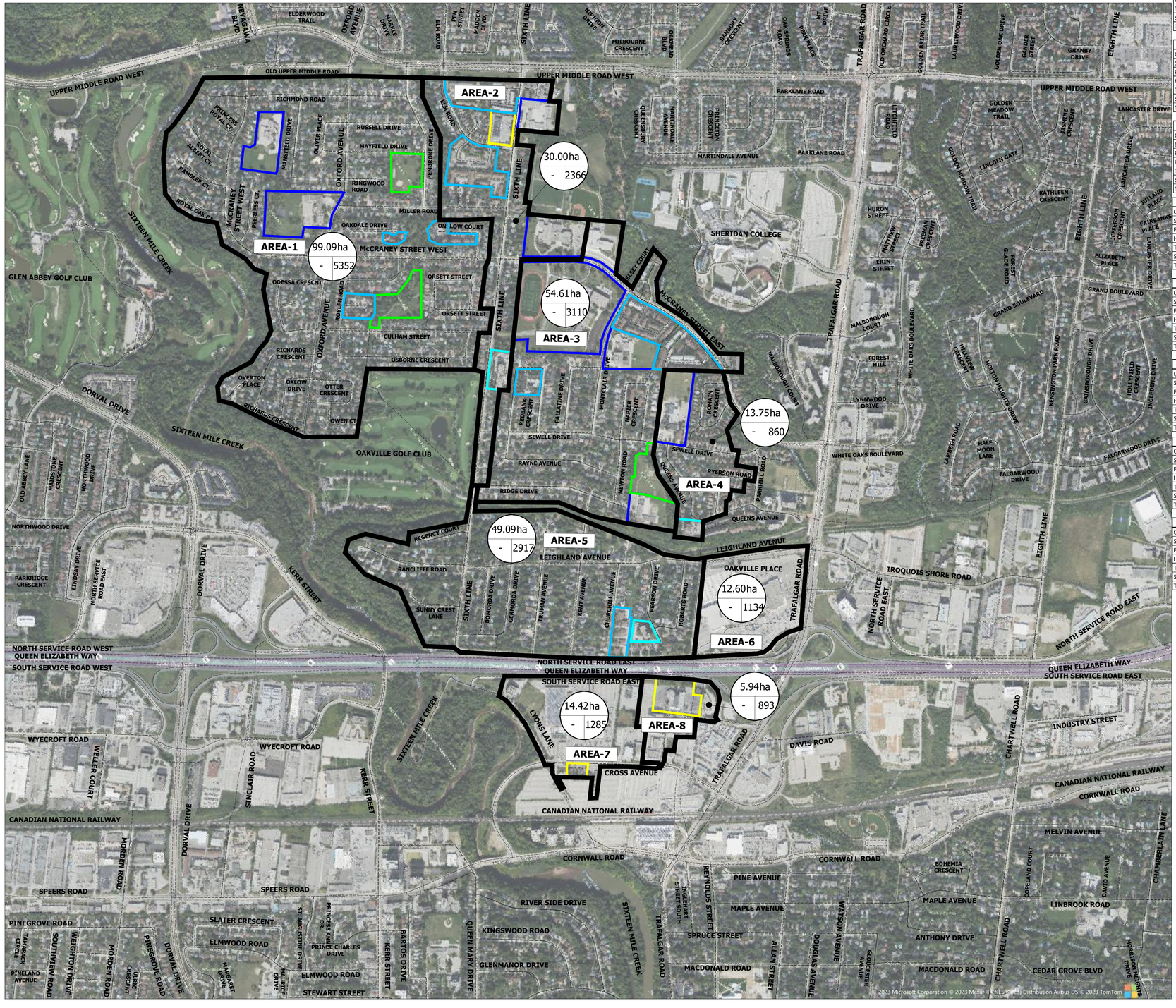
The wastewater system in Midtown Oakville provides opportunities for near-term development. The first-principles analysis of system capacity shows that:

- The Region's planned trunk sewer upgrades alleviate the existing capacity constraints in the trunk sewer system.
- Once the trunk sewers are upgraded, there is capacity in the West Trunk and East Trunk to support all development currently in the pipeline (including all Distrikt developments), with spare capacity for other landowners.
- The local sanitary system has sufficient capacity to accommodate all near-term growth, with the exception of a short (140 m) section of the existing Cross Avenue sewer (from Argus Road to 140 m west of Argus Road). This sewer can accommodate full build-out of the 157/165 Cross Avenue site but would need to be upgraded from a 300 mm diameter sewer to a 450 mm diameter sewer to facilitate additional development.

Report Prepared By:

Kate Connell, P.Eng.
Senior Project Manager
Urbantech

ATTACHMENT 1:
Existing System Capacity Analysis



AREA-1	AREA (ha)	EQUIVALENT POPULATION DENSITY (P/ha)	POPULATION
COMMERCIAL	0.00	90.00	0
SCHOOL	5.76	40.00	230
PARK	3.31	0.00	0
HIGHRISE	0.00	285.00	0
TOWNHOUSE	2.13	135.00	288
SINGLE FAMILY	87.90	55.00	4834
TOTAL	99.09		5352

AREA-2	AREA (ha)	EQUIVALENT POPULATION DENSITY (P/ha)	POPULATION
COMMERCIAL	0.93	90.00	84
SCHOOL	4.51	40.00	180
PARK	0.00	0.00	0
HIGHRISE	1.02	285.00	290
TOWNHOUSE	6.46	135.00	872
SINGLE FAMILY	17.08	55.00	940
TOTAL	30.00		2366

AREA-3	AREA (ha)	EQUIVALENT POPULATION DENSITY (P/ha)	POPULATION
COMMERCIAL	0.00	90.00	0
SCHOOL	16.02	40.00	641
PARK	1.57	0.00	0
HIGHRISE	0.00	285.00	0
TOWNHOUSE	5.41	135.00	730
SINGLE FAMILY	31.61	55.00	1739
TOTAL	54.61		3110

AREA-4	AREA (ha)	EQUIVALENT POPULATION DENSITY (P/ha)	POPULATION
COMMERCIAL	0.00	90.00	0
SCHOOL	2.75	40.00	110
PARK	0.00	0.00	0
HIGHRISE	0.63	285.00	180
TOWNHOUSE	0.00	135.00	0
SINGLE FAMILY	10.37	55.00	570
TOTAL	13.75		860

AREA-5	AREA (ha)	EQUIVALENT POPULATION DENSITY (P/ha)	POPULATION
COMMERCIAL	0.00	90.00	0
SCHOOL	0.00	40.00	0
PARK	0.00	0.00	0
HIGHRISE	0.57	285.00	162
TOWNHOUSE	1.07	135.00	144
SINGLE FAMILY	47.45	55.00	2610
TOTAL	49.09		2917

AREA-6	AREA (ha)	EQUIVALENT POPULATION DENSITY (P/ha)	POPULATION
COMMERCIAL	12.60	90.00	1134
SCHOOL	0.00	40.00	0
PARK	0.00	0.00	0
HIGHRISE	0.00	285.00	0
TOWNHOUSE	0.00	135.00	0
SINGLE FAMILY	0.00	55.00	0
TOTAL	12.60		1134

AREA-7	AREA (ha)	EQUIVALENT POPULATION DENSITY (P/ha)	POPULATION
COMMERCIAL	14.06	90.00	1265
SCHOOL	0.00	40.00	0
PARK	0.00	0.00	0
HIGHRISE	0.00	285.00	0
TOWNHOUSE	0.00	135.00	0
SINGLE FAMILY	0.36	55.00	20
TOTAL	14.42		1285

AREA-8	AREA (ha)	EQUIVALENT POPULATION DENSITY (P/ha)	POPULATION
COMMERCIAL	4.08	90.00	367
SCHOOL	0.00	40.00	0
PARK	0.00	0.00	0
HIGHRISE	1.84	285.00	524
TOWNHOUSE	0.00	135.00	0
SINGLE FAMILY	0.02	55.00	1
TOTAL	5.94		893

TOTAL POPULATION: 17916

LEGEND:

- EXISTING DRAINAGE AREA BOUNDARY
- EXISTING HIGH-RISE BUILDING
- EXISTING PARK AREA
- EXISTING COMMERCIAL AREA
- EXISTING SCHOOL AREA
- EXISTING TOWNHOUSE

0.45ha | 0 | 0

- EXISTING DRAINAGE AREA (ha)
- EXISTING POPULATION
- EXISTING DENSITY (P/ha)

No.	REVISION	DATE	BY

OAKVILLE MID-TOWN (DISTRIKT OAKVILLE)

OAKVILLE

Halton REGION

TOWN FILE No. XXXX

REGION FILE No. XXXXX

URBANTECH®

Urbantech® Consulting
A Division of Leighton-Zec West Ltd.
2030 Bristol Circle, Suite 105
Oakville, ON. L6H 0H2
TEL 905.829.8818 • urbantech.com

DESIGNED:	CHECKED: B.M.	PROJECT No.:	22-282
DRAWN: X.S.	DATE: DECEMBER 2023	SHEET No.:	
SCALE: 1:7000		DRAWING No.:	

	area(ha)	EQUIVALENT POPULATION DENSITY(P/ha)	POPULATION
COMMERCIAL	49.10	90	4419
HIGH-RISE	4.51	285	1285
SINGLE FAMILY	0.15	55	8
ROAD	1.77	-	-
TOTAL	53.76		5713

LEGEND:

- EXISTING DRAINAGE AREA BOUNDARY (COMMERCIAL)
- EXISTING DRAINAGE AREA BOUNDARY (HIGH-RISE BUILDING)
- EXISTING DRAINAGE AREA BOUNDARY (SINGLE FAMILY BUILDING)
- EXISTING DRAINAGE AREA BOUNDARY (ROAD)
- 0.45ha / 0 / 0 — EXISTING DRAINAGE AREA (ha); EXISTING POPULATION; EXISTING DENSITY (P/ha)

No.	REVISION	DATE	BY

OAKVILLE MID-TOWN (DISTRIKT OAKVILLE)

OAKVILLE

Halton REGION

TOWN FILE No. XXXX	REGION FILE No. XXXXX

URBANTECH®

Urbantech® Consulting
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2030 Bristol Circle, Suite 105
Oakville, ON. L6H 0H2
TEL 905.829.8818 • urbantech.com

DESIGNED:	CHECKED: B.M.	PROJECT No.:	22-282
DRAWN: X.S.	DATE: DECEMBER 2023	SHEET No.:	
SCALE: 1:3000 (30m 0m 30m 60m 120m)		DRAWING No.:	

URBANTECH®

SANITARY SEWER DESIGN SHEET (EXISTING)

Midtown - Existing Conditions

TOWN OF OAKVILLE

REGIONAL MUNICIPALITY OF HALTON

PROJECT DETAILS

Project No: 22-282
Date: 12-Jan-24
Designed by: J.P.O
Checked by: KC

DESIGN CRITERIA

Min Diameter = 200 mm
Mannings 'n'= 0.013
Min. Velocity = 0.60 m/s
Max. Velocity = 3.00 m/s
Avg. Domestic Flow = 275.0 l/c/d
Infiltration = 0.286 l/s/ha
Max. Peaking Factor = 4.00
Min. Peaking Factor= 2.00

NOMINAL PIPE SIZE USED

STREET	FROM MH	TO MH	LENGTH (m)	RESIDENTIAL							COMMERCIAL/INDUSTRIAL/INSTITUTIONAL						FLOW CALCULATIONS							PIPE DATA					
				AREA (ha)	ACC. AREA (ha)	UNITS (#)	DENSITY (P/ha)	DENSITY (P/Unit)	POP	ACCUM. RES. POP.	AREA (ha)	ACC. AREA (ha)	EQUIV. POP. (P/ha)	FLOW RATE (l/s/ha)	EQUIV. POP.	ACCUM. EQUIV. POP.	INFILTRATION (l/s)	TOTAL ACCUM. POP.	PEAKING FACTOR	RES. FLOW (l/s)	COMM. FLOW (l/s)	ACCUM. COMM. FLOW (l/s)	TOTAL FLOW (l/s)	SLOPE (%)	PIPE DIAMETER (mm)	FULL FLOW CAPACITY (l/s)	FULL FLOW VELOCITY (m/s)	ACTUAL VELOCITY (m/s)	PERCENT FULL (%)
Area-1	Area-1	Area-2		99.09	99.09				5352	5352							28.3	5352	3.22	54.8			83.1		200				
Area-2	Area-2	Area-3		30.00	129.09				2366	7718							36.9	7718	3.07	75.3			112.2		200				
Area-4	Area-4	Area-3		13.75	13.75				860	860							3.9	860	3.84	10.5			14.4		200				
Area-3	Area-3	MH1293		54.61	197.45				3110	11688							56.5	11688	2.89	107.4			163.9		200				
Area-5	MH1293	MH1290		49.09	246.54				2917	14605							70.5	14605	2.79	129.7			200.2	0.25	675	420.3	1.17	1.13	48%
Area-6	MH1294	MH1290		12.60	12.60				1134	1134							3.6	1134	3.76	13.6			17.2	2.35	250	91.2	1.86	1.41	19%
	MH1290	MH1288			259.14					15739							74.1	15739	2.76	138.1			212.2	0.78	600	542.3	1.92	1.73	39%
	MH1288	MH1287			259.14					15739	0.14	0.14	90		13	13	74.2	15752	2.76	138.2			212.4	0.58	600	467.6	1.65	1.59	45%
	MH1287	MH1286			259.14					15739	1.80	1.94	90		162	175	74.7	15914	2.75	139.4			214.1	0.70	600	513.7	1.82	1.69	42%
	MH1286	MH1285			259.14					15739		1.94				175	74.7	15914	2.75	139.4			214.1	0.87	600	572.7	2.03	1.82	37%
	MH1285	MH1284			259.14					15739		1.94				175	74.7	15914	2.75	139.4			214.1	0.85	600	566.1	2.00	1.80	38%
	MH1291	MH1284									1.15	1.15	90		104	104	0.3	104	4.00	1.3			1.7	1.46	300	116.8	1.65	0.51	1%
	MH1284	MH1292			259.14					15739		3.09				279	75.0	16018	2.75	140.2			215.2	0.22	750	522.2	1.18	1.10	41%
	MH1292	MH1283			259.14					15739		3.09				279	75.0	16018	2.75	140.2			215.2	1.48	750	1354.4	3.07	2.24	16%
	MH1283	MH1282			259.14					15739	1.95	5.04	90		176	455	75.6	16194	2.74	141.5			217.0	0.77	600	538.8	1.91	1.77	40%
	MH1282	MH1279			259.14					15739		5.04				455	75.6	16194	2.74	141.5			217.0	0.88	600	576.0	2.04	1.83	38%
	MH1279	MH1275			259.14					15739		5.04				455	75.6	16194	2.74	141.5			217.0	0.22	600	288.0	1.02	1.11	75%
	MH1262	MH1263									1.74	1.74	90		157	157	0.5	157	4.00	2.0			2.5	0.85	250	54.8	1.12	0.55	5%
	MH1263	MH1265										1.74				157	0.5	157	4.00	2.0			2.5	0.26	250	30.3	0.62	0.36	8%
	MH1265	MH1264									0.50	2.24	90		45	202	0.6	202	4.00	2.6			3.2	1.00	250	59.5	1.21	0.63	5%
	MH1264	MH1266										2.24				202	0.6	202	4.00	2.6			3.2	0.56	300	72.4	1.02	0.50	4%
	MH1266	MH1267										2.24				202	0.6	202	4.00	2.6			3.2	0.58	300	73.6	1.04	0.51	4%
	MH1269	MH1268									0.30	0.30	90		27	27	0.1	27	4.00	0.3			0.4	0.44	300	64.1	0.91	0.24	1%
	MH1268	MH1267										0.30				27	0.1	27	4.00	0.3			0.4	0.36	250	35.7	0.73	0.19	1%
	MH1267	MH1270									8.74	11.28	90		787	1016	3.2	1016	3.80	12.3			15.5	0.37	300	58.8	0.83	0.69	26%
	MH1270	MH1271									2.92	14.20	90		263	1279	4.1	1279	3.73	15.2			19.2	0.45	300	64.9	0.92	0.80	30%
	MH1271	MH1272									1.24	15.44	90		112	1391	4.4	1391	3.70	16.4			20.8	0.38	300	59.6	0.84	0.76	35%
	MH1272	MH1273										15.44				1391	4.4	1391	3.70	16.4			20.8	0.60	300	74.9	1.06	0.90	28%
	MH1273	MH1274										15.44				1391	4.4	1391	3.70	16.4			20.8	0.52	300	69.7	0.99	0.86	30%
	MH1274	MH1275										15.44				1391	4.4	1391	3.70	16.4			20.8	0.85	300	89.2	1.26	1.00	23%
	MH1275	MH1276			259.14					15739		20.48				1846	80.0	17585	2.71	151.6			231.6	0.66	525	349.4	1.61	1.69	66%
	MH1276	MH1277			259.14					15739		20.48				1846	80.0	17585	2.71	151.6			231.6	1.47	525	521.4	2.41	2.24	44%
	MH1277	MH1280			259.14					15739	0.66	21.14	90		60	1906	80.2	17645	2.71	152.0			232.2	1.45	525	517.9	2.39	2.30	45%
	MH1280	MH1278			259.14					15739		21.14				1906	80.2	17645	2.71	152.0			232.2	1.67	525	555.8	2.57	2.39	42%
	MH1278	MH1281			259.14					15739		21.14				1906	80.2	17645	2.71	152.0			232.2	0.33	525	247.1	1.14	1.29	94%
	MH1281	MH1247			259.14					15739		21.14				1906	80.2	17645	2.71	152.0			232.2	1.08	525	446.9	2.06	2.04	52%
	MH1247	MH1246			259.14					15739		21.14				1906	80.2	17645	2.71	152.0			232.2	0.92	525	412.5	1.91	1.92	56%
	MH1246	MH1245			259.14					15739		21.14				1906	80.2	17645	2.71	152.0			232.2	0.54	525	316.0	1.46	1.56	73%
	MH1245	MH1240			259.14					15739		21.14				1906	80.2	17645	2.71	152.0			232.2	6.53	525	1099.0	5.08	3.91	21%
	MH1240	MH1239			259.14					15739		21.14				1906	80.2	17645	2.71	152.0			232.2	0.89	525	405.7	1.87	1.89	57%
	MH1234	MH1235									1.75	1.75	90		158	158	0.5	158	4.00	2.0			2.5	2.02	200	46.6	1.48	0.77	5%
	MH1235	MH1236									2.21	3.96	90		199	357	1.1	357	4.00	4.5			5.7	0.49	200	23.0	0.73	0.59	25%
	MH1236	MH1237										3.96				357	1.1	357	4.00	4.5			5.7	0.47	250	40.8	0.83	0.58	14%
	MH1237	MH1238									0.45	4.41	90		41	398	1.3	398	4.00	5.1			6.3	0.46	300	65.6	0.93	0.59	10%
	MH1238	MH1239										4.41				398	1.3	398	4.00	5.1			6.3	1.29	300	109.8	1.55	0.84	6%
	MH1239	MH1241			259.14					15739	0.96	26.51	90		87	2391	81.7	18130	2.70	155.5			237.2	0.29	600	330.7	1.17	1.25	72%

URBANTECH®

SANITARY SEWER DESIGN SHEET (EXISTING)

Midtown - Existing Conditions

TOWN OF OAKVILLE

REGIONAL MUNICIPALITY OF HALTON

PROJECT DETAILS

Project No: 22-282
Date: 12-Jan-24
Designed by: J.P.O
Checked by: KC

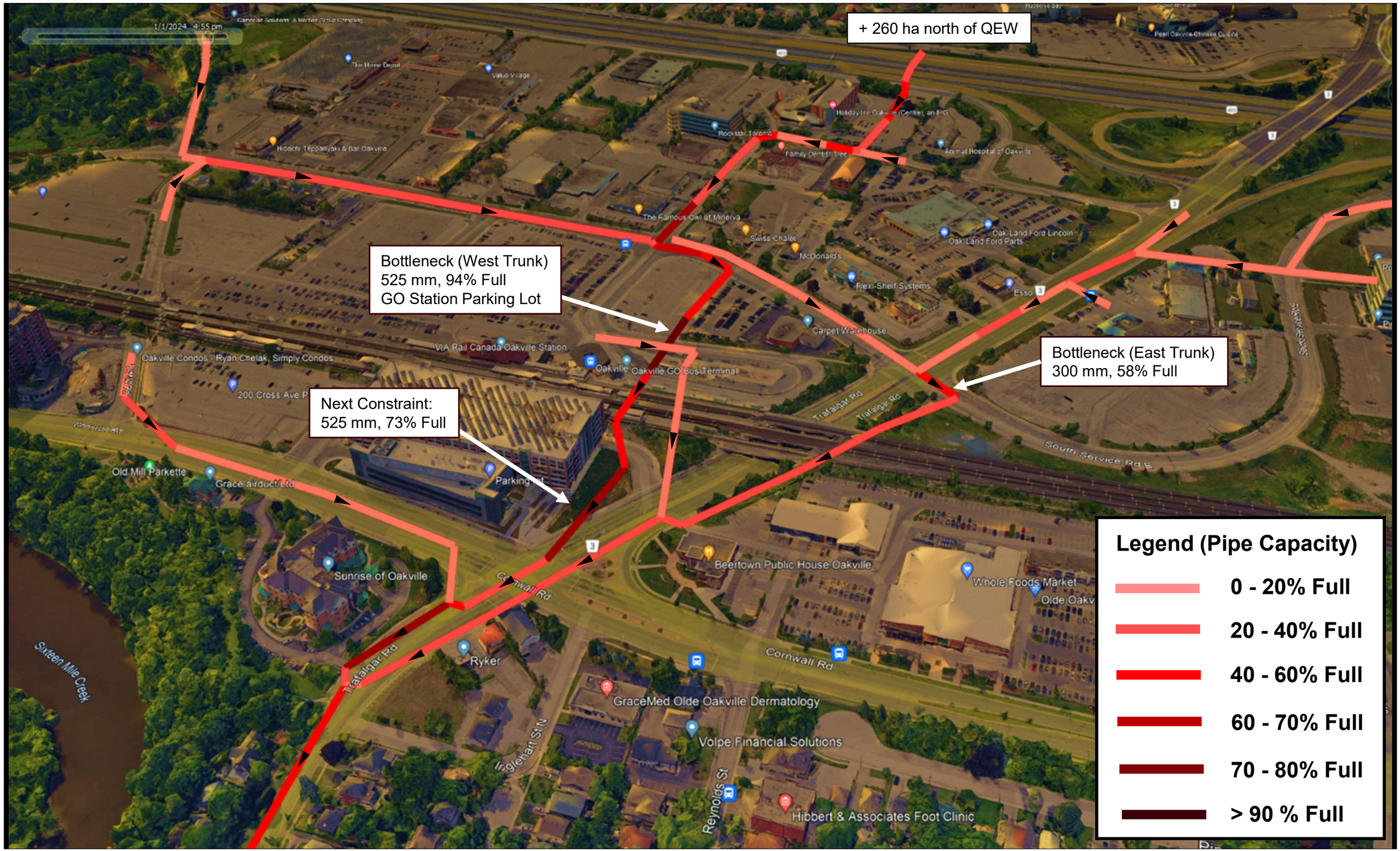
DESIGN CRITERIA

Min Diameter = 200 mm
Mannings 'n'= 0.013
Min. Velocity = 0.60 m/s
Max. Velocity = 3.00 m/s

Avg. Domestic Flow = 275.0 l/c/d
Infiltration = 0.286 l/s/ha
Max. Peaking Factor = 4.00
Min. Peaking Factor= 2.00

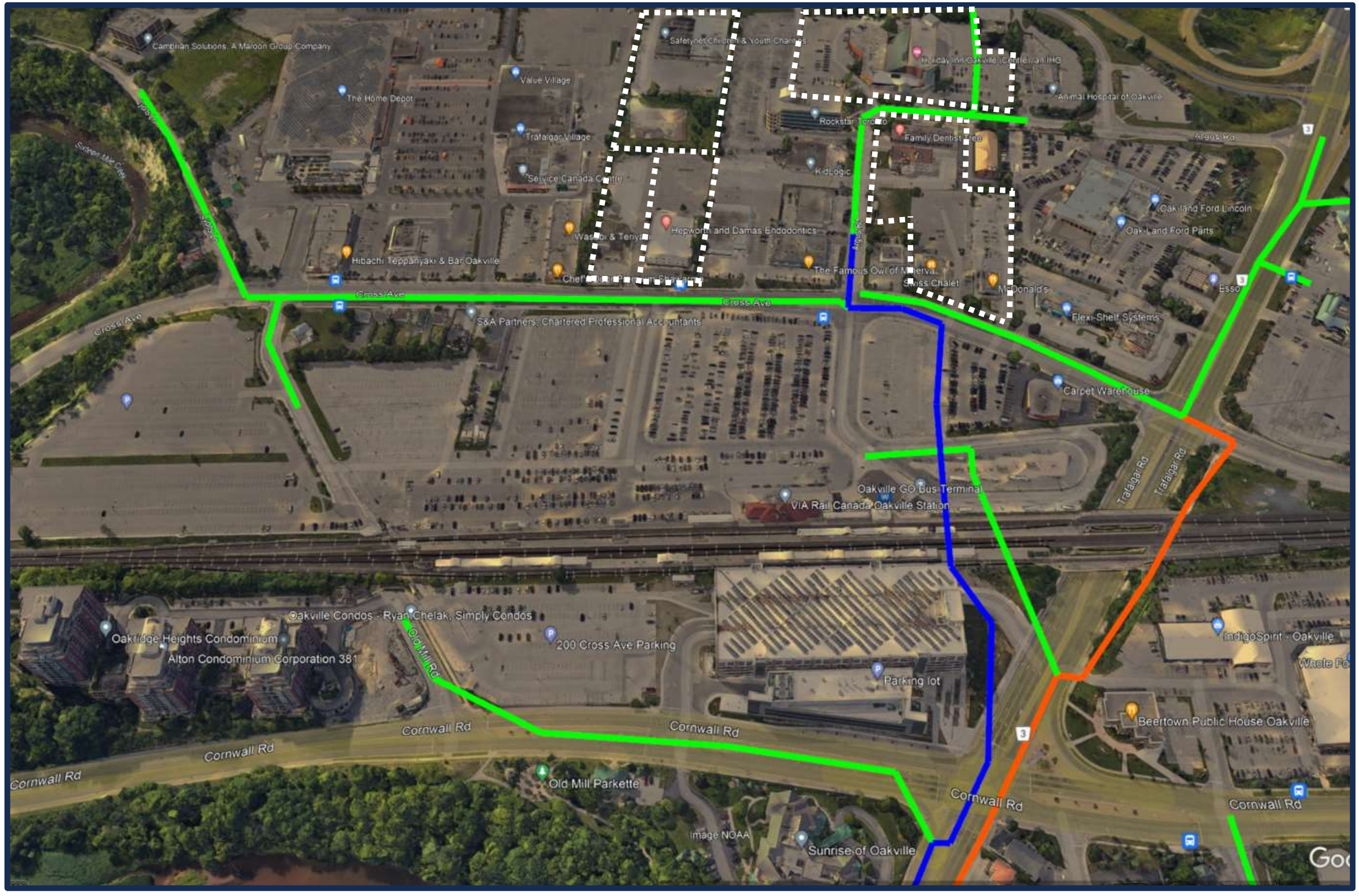
NOMINAL PIPE SIZE USED

STREET	FROM MH	TO MH	LENGTH (m)	RESIDENTIAL							COMMERCIAL/INDUSTRIAL/INSTITUTIONAL						FLOW CALCULATIONS							PIPE DATA					
				AREA (ha)	ACC. AREA (ha)	UNITS (#)	DENSITY (P/ha)	DENSITY (P/Unit)	POP	ACCUM. RES. POP.	AREA (ha)	ACC. AREA (ha)	EQUIV. POP. (P/ha)	FLOW RATE (l/s/ha)	EQUIV. POP.	ACCUM. EQUIV. POP.	INFILTRATION (l/s)	TOTAL ACCUM. POP.	PEAKING FACTOR	RES. FLOW (l/s)	COMM. FLOW (l/s)	ACCUM. COMM. FLOW (l/s)	TOTAL FLOW (l/s)	SLOPE (%)	PIPE DIAMETER (mm)	FULL FLOW CAPACITY (l/s)	FULL FLOW VELOCITY (m/s)	ACTUAL VELOCITY (m/s)	PERCENT FULL (%)
	MH1241	MH1242			259.14					15739		26.51				2391	81.7	18130	2.70	155.5			237.2	1.02	600	620.1	2.19	1.97	38%
	MH1298	MH1297									0.75	0.75	90		68	68	0.2	68	4.00	0.9			1.1	1.22	300	106.8	1.51	0.39	1%
	MH1299	MH1303									4.74	4.74	90		427	427	1.4	427	4.00	5.4			6.8	0.55	300	71.7	1.01	0.63	9%
	MH1303	MH1302										4.74				427	1.4	427	4.00	5.4			6.8	0.79	300	85.9	1.22	0.72	8%
	MH1302	MH1301									2.37	7.11	90		214	641	2.0	641	3.92	8.0			10.0	0.32	300	54.7	0.77	0.58	18%
	MH1301	MH1297									0.45	7.56	90		41	682	2.2	682	3.90	8.5			10.6	0.46	300	65.6	0.93	0.68	16%
	MH1297	MH1295										8.31				750	2.4	750	3.88	9.3			11.6	0.27	250	30.9	0.63	0.57	38%
	MH1296	MH1295									2.61	2.61	90		235	235	0.7	235	4.00	3.0			3.7	0.40	200	20.7	0.66	0.50	18%
	MH1295	MH1300									2.51	13.43	90		226	1211	3.8	1211	3.74	14.4			18.3	1.02	300	97.7	1.38	1.05	19%
	MH1300	MH1261										13.43				1211	3.8	1211	3.74	14.4			18.3	0.56	300	72.4	1.02	0.83	25%
	MH1261	MH1255										13.43				1211	3.8	1211	3.74	14.4			18.3	1.15	300	103.7	1.47	1.10	18%
	MH1258	MH1257									2.62	2.62	90		236	236	0.7	236	4.00	3.0			3.8	0.58	250	45.3	0.92	0.54	8%
	MH1257	MH1256										2.62				236	0.7	236	4.00	3.0			3.8	0.69	300	80.3	1.14	0.56	5%
	MH1256	MH1260										2.62				236	0.7	236	4.00	3.0			3.8	1.81	300	130.1	1.84	0.77	3%
	MH1260	MH1255										2.62				236	0.7	236	4.00	3.0			3.8	0.26	300	49.3	0.70	0.41	8%
	MH1255	MH1254										16.05				1447	4.6	1447	3.69	17.0			21.6	0.15	300	37.5	0.53	0.54	58%
	MH1254	MH1253									0.35	16.40	90		32	1479	4.7	1479	3.68	17.3			22.0	0.48	300	67.0	0.95	0.82	33%
	MH1253	MH1259										16.40				1479	4.7	1479	3.68	17.3			22.0	0.50	300	68.4	0.97	0.84	32%
	MH1259	MH1249									1.20	17.60	90		108	1587	5.0	1587	3.66	18.5			23.5	0.46	300	65.6	0.93	0.84	36%
	MH1249	MH1248										17.60				1587	5.0	1587	3.66	18.5			23.5	0.53	300	70.4	1.00	0.87	33%
	MH1252	MH1251									0.35	0.35	90		32	32	0.1	32	4.00	0.4			0.5	0.40	200	20.7	0.66	0.26	2%
	MH1251	MH1250									0.31	0.66	90		28	60	0.2	60	4.00	0.8			1.0	2.56	200	52.5	1.67	0.58	2%
	MH1250	MH1248										0.66				60	0.2	60	4.00	0.8			1.0	0.60	200	25.4	0.81	0.36	4%
	MH1248	MH1244										18.26				1647	5.2	1647	3.65	19.1			24.4	0.62	300	76.1	1.08	0.94	32%
	MH1244	MH1243										18.26				1647	5.2	1647	3.65	19.1			24.4	0.44	300	64.1	0.91	0.82	38%
	MH1243	MH1242										18.26				1647	5.2	1647	3.65	19.1			24.4	2.39	300	149.5	2.11	1.54	16%
	MH1242	MHX			259.14					15739		44.77				4038	86.9	19777	2.66	167.3			254.2	0.64	600	491.2	1.74	1.72	52%


+ 260 ha north of QEW
Bottleneck (West Trunk)
525 mm, 94% Full
GO Station Parking Lot
Next Constraint:
525 mm, 73% Full
Bottleneck (East Trunk)
300 mm, 58% Full
Legend (Pipe Capacity)
0 - 20% Full
20 - 40% Full
40 - 60% Full
60 - 70% Full
70 - 80% Full
> 90 % Full
Trafalgar Rd
Cornwall Rd
South Service Rd E
Sixteen Mile Creek
Reynolds St
Ingleharst St N
Oakville Condos - Ryan Chelak, Simply Condos
VIA Rail Canada Oakville Station
Oakville GO Bus Terminal
Old Mill Parkette
Sunrise of Oakville
Ryker
GraceMed Olde Oakville Dermatology
Volpe Financial Solutions
Hibbert & Associates Foot Clinic
Beertown Public House Oakville
Whole Foods Market
Carpet Warehouse
Flexi-Shelf Systems
Oak Land Ford Lincoln
Oak Land Ford Parts
Esso
McDonald's
Swiss Chalet
The Famous Owl of Minerva
Rockstar Toronto
Holiday Inn Oakville (Centre), an IHG
Animal Hospital of Oakville
Hibachi Teppanyaki & Bar Oakville
Value Village
The Home Depot

ATTACHMENT 2:
Future System Capacity Analysis

Scenario 1: Trunk Sewer Upgrades Complete, No New Development



Distrikt Developments

Existing Wastewater Pipes

Region Upgrade Project (ID6537) West Trunk
Upsize from 525 mm to 675 mm

Region Upgrade Project (ID6535) East Trunk
Upsize from 300 mm to 450 mm

Results:

Existing system bottlenecks within the Midtown Area are resolved with planned sewer upgrades.

No sewer component exceeds 55% full (this assumes existing conditions – no new development).

URBANTECH®

SANITARY SEWER DESIGN SHEET (Midtown)

SCENARIO 1

TOWN OF OAKVILLE

REGIONAL MUNICIPALITY OF HALTON

PROJECT DETAILS

Project No: 22-282
Date: 25-Feb-24
Designed by: J.P.O
Checked by: K.C

DESIGN CRITERIA

Min Diameter =	200	mm	Avg. Domestic Flow =	275.0	l/c/d
Mannings 'n'=	0.013		Infiltration =	0.286	l/s/ha
Min. Velocity =	0.60	m/s	Max. Peaking Factor =	4.00	
Max. Velocity =	3.00	m/s	Min. Peaking Factor=	2.00	

NOMINAL PIPE SIZE USED

STREET	FROM MH	TO MH	LENGTH (m)	RESIDENTIAL							COMMERCIAL/INDUSTRIAL/INSTITUTIONAL						FLOW CALCULATIONS							PIPE DATA					
				AREA (ha)	ACC. AREA (ha)	UNITS (#)	DENSITY (P/ha)	DENSITY (P/Unit)	POP	ACCUM. RES. POP.	AREA (ha)	ACC. AREA (ha)	EQUIV. POP. (P/ha)	FLOW RATE (l/s/ha)	EQUIV. POP.	ACCUM. EQUIV. POP.	INFILTRATION (l/s)	TOTAL ACCUM. POP.	PEAKING FACTOR	RES. FLOW (l/s)	COMM. FLOW (l/s)	ACCUM. COMM. FLOW (l/s)	TOTAL FLOW (l/s)	SLOPE (%)	PIPE DIAMETER (mm)	FULL FLOW CAPACITY (l/s)	FULL FLOW VELOCITY (m/s)	ACTUAL VELOCITY (m/s)	PERCENT FULL (%)
Area-1	Area-1	Area-2		99.09	99.09				5352	5352							28.3	5352	3.22	54.8			83.1		200				
Area-2	Area-2	Area-3		30.00	129.09				2366	7718							36.9	7718	3.07	75.3			112.2		200				
Area-4	Area-4	Area-3		13.75	13.75				860	860							3.9	860	3.84	10.5			14.4		200				
Area-3	Area-3	MH1293		54.61	197.45				3110	11688							56.5	11688	2.89	107.4			163.9		200				
Area-5	MH1293	MH1290		49.09	246.54				2917	14605							70.5	14605	2.79	129.7			200.2	0.25	675	420.3	1.17	1.13	48%
Area-6	MH1294	MH1290		12.60	12.60				1134	1134							3.6	1134	3.76	13.6			17.2	2.35	250	91.2	1.86	1.41	19%
	MH1290	MH1288			259.14					15739							74.1	15739	2.76	138.1			212.2	0.78	600	542.3	1.92	1.73	39%
	MH1288	MH1287			259.14					15739	0.14	0.14	90		13	13	74.2	15752	2.76	138.2			212.4	0.58	600	467.6	1.65	1.59	45%
	MH1287	MH1286			259.14					15739	1.80	1.94	90		162	175	74.7	15914	2.75	139.4			214.1	0.70	600	513.7	1.82	1.69	42%
	MH1286	MH1285			259.14					15739		1.94				175	74.7	15914	2.75	139.4			214.1	0.87	600	572.7	2.03	1.82	37%
	MH1285	MH1284			259.14					15739		1.94				175	74.7	15914	2.75	139.4			214.1	0.85	600	566.1	2.00	1.80	38%
	MH1291	MH1284									1.15	1.15	90		104	104	0.3	104	4.00	1.3			1.7	1.46	300	116.8	1.65	0.51	1%
	MH1284	MH1292			259.14					15739		3.09				279	75.0	16018	2.75	140.2			215.2	0.22	750	522.2	1.18	1.10	41%
	MH1292	MH1283			259.14					15739		3.09				279	75.0	16018	2.75	140.2			215.2	1.48	750	1354.4	3.07	2.24	16%
	MH1283	MH1282			259.14					15739	1.95	5.04	90		176	455	75.6	16194	2.74	141.5			217.0	0.77	600	538.8	1.91	1.77	40%
	MH1282	MH1279			259.14					15739		5.04				455	75.6	16194	2.74	141.5			217.0	0.88	600	576.0	2.04	1.83	38%
	MH1279	MH1275			259.14					15739		5.04				455	75.6	16194	2.74	141.5			217.0	0.22	**675**	394.3	1.10	1.11	55%
	MH1262	MH1263									1.74	1.74	90		157	157	0.5	157	4.00	2.0			2.5	0.85	250	54.8	1.12	0.55	5%
	MH1263	MH1265										1.74				157	0.5	157	4.00	2.0			2.5	0.26	250	30.3	0.62	0.36	8%
	MH1265	MH1264									0.50	2.24	90		45	202	0.6	202	4.00	2.6			3.2	1.00	250	59.5	1.21	0.63	5%
	MH1264	MH1266										2.24				202	0.6	202	4.00	2.6			3.2	0.56	300	72.4	1.02	0.50	4%
	MH1266	MH1267										2.24				202	0.6	202	4.00	2.6			3.2	0.58	300	73.6	1.04	0.51	4%
	MH1269	MH1268									0.30	0.30	90		27	27	0.1	27	4.00	0.3			0.4	0.44	300	64.1	0.91	0.24	1%
	MH1268	MH1267										0.30				27	0.1	27	4.00	0.3			0.4	0.36	250	35.7	0.73	0.19	1%
	MH1267	MH1270									8.74	11.28	90		787	1016	3.2	1016	3.80	12.3			15.5	0.37	300	58.8	0.83	0.69	26%
	MH1270	MH1271									2.92	14.20	90		263	1279	4.1	1279	3.73	15.2			19.2	0.45	300	64.9	0.92	0.80	30%
	MH1271	MH1272									1.24	15.44	90		112	1391	4.4	1391	3.70	16.4			20.8	0.38	300	59.6	0.84	0.76	35%
	MH1272	MH1273										15.44				1391	4.4	1391	3.70	16.4			20.8	0.60	300	74.9	1.06	0.90	28%
	MH1273	MH1274										15.44				1391	4.4	1391	3.70	16.4			20.8	0.52	300	69.7	0.99	0.86	30%
	MH1274	MH1275										15.44				1391	4.4	1391	3.70	16.4			20.8	0.85	300	89.2	1.26	1.00	23%
	MH1275	MH1276			259.14					15739		20.48				1846	80.0	17585	2.71	151.6			231.6	0.66	**675**	682.9	1.91	1.66	34%
	MH1276	MH1277			259.14					15739		20.48				1846	80.0	17585	2.71	151.6			231.6	1.47	**675**	1019.2	2.85	2.25	23%
	MH1277	MH1280			259.14					15739	0.66	21.14	90		60	1906	80.2	17645	2.71	152.0			232.2	1.45	**675**	1012.2	2.83	2.23	23%
	MH1280	MH1278			259.14					15739		21.14				1906	80.2	17645	2.71	152.0			232.2	1.67	**675**	1086.3	3.04	2.34	21%
	MH1278	MH1281			259.14					15739		21.14				1906	80.2	17645	2.71	152.0			232.2	0.33	**675**	482.9	1.35	1.30	48%
	MH1281	MH1247			259.14					15739		21.14				1906	80.2	17645	2.71	152.0			232.2	1.08	**675**	873.6	2.44	2.03	27%
	MH1247	MH1246			259.14					15739		21.14				1906	80.2	17645	2.71	152.0			232.2	0.92	**675**	806.3	2.25	1.92	29%
	MH1246	MH1245			259.14					15739		21.14				1906	80.2	17645	2.71	152.0			232.2	0.54	**675**	617.7	1.73	1.55	38%
	MH1245	MH1240			259.14					15739		21.14				1906	80.2	17645	2.71	152.0			232.2	6.53	**675**	2148.0	6.00	3.96	11%
	MH1240	MH1239			259.14					15739		21.14				1906	80.2	17645	2.71	152.0			232.2	0.89	**675**	793.0	2.22	1.88	29%
	MH1234	MH1235									1.75	1.75	90		158	158	0.5	158	4.00	2.0			2.5	2.02	200	46.6	1.48	0.77	5%
	MH1235	MH1236									2.21	3.96	90		199	357	1.1	357	4.00	4.5			5.7	0.49	200	23.0	0.73	0.59	25%
	MH1236	MH1237										3.96				357	1.1	357	4.00	4.5			5.7	0.47	250	40.8	0.83	0.58	14%
	MH1237	MH1238									0.45	4.41	90		41	398	1.3	398	4.00	5.1			6.3	0.46	300	65.6	0.93	0.59	10%
	MH1238	MH1239										4.41				398	1.3	398	4.00	5.1			6.3	1.29	300	109.8	1.55	0.84	6%
	MH1239	MH1241			259.14					15739	0.96	26.51	90		87	2391	81.7	18130	2.70	155.5			237.2	0.29	**675**	452.7	1.26	1.25	52%

URBANTECH®

SANITARY SEWER DESIGN SHEET (Midtown)

SCENARIO 1

TOWN OF OAKVILLE

REGIONAL MUNICIPALITY OF HALTON

PROJECT DETAILS

Project No: 22-282
Date: 25-Feb-24
Designed by: J.P.O
Checked by: K.C

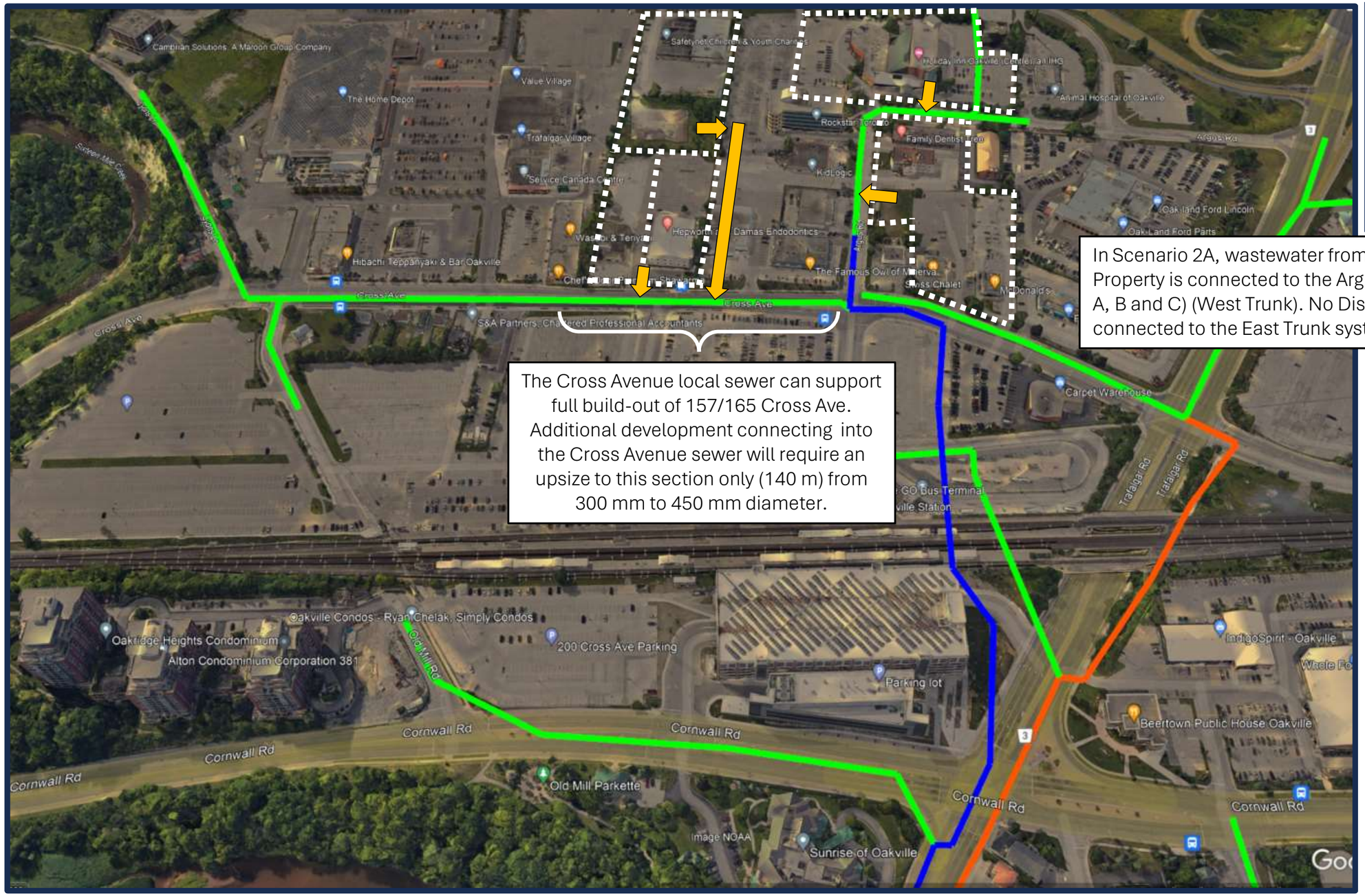
DESIGN CRITERIA

Min Diameter = 200 mm
Mannings 'n'= 0.013
Min. Velocity = 0.60 m/s
Max. Velocity = 3.00 m/s
Avg. Domestic Flow = 275.0 l/c/d
Infiltration = 0.286 l/s/ha
Max. Peaking Factor = 4.00
Min. Peaking Factor= 2.00

NOMINAL PIPE SIZE USED

STREET	FROM MH	TO MH	LENGTH (m)	RESIDENTIAL							COMMERCIAL/INDUSTRIAL/INSTITUTIONAL						FLOW CALCULATIONS							PIPE DATA					
				AREA (ha)	ACC. AREA (ha)	UNITS (#)	DENSITY (P/ha)	DENSITY (P/Unit)	POP	ACCUM. RES. POP.	AREA (ha)	ACC. AREA (ha)	EQUIV. POP. (P/ha)	FLOW RATE (l/s/ha)	EQUIV. POP.	ACCUM. EQUIV. POP.	INFILTRATION (l/s)	TOTAL ACCUM. POP.	PEAKING FACTOR	RES. FLOW (l/s)	COMM. FLOW (l/s)	ACCUM. COMM. FLOW (l/s)	TOTAL FLOW (l/s)	SLOPE (%)	PIPE DIAMETER (mm)	FULL FLOW CAPACITY (l/s)	FULL FLOW VELOCITY (m/s)	ACTUAL VELOCITY (m/s)	PERCENT FULL (%)
	MH1241	MH1242			259.14					15739		26.51				2391	81.7	18130	2.70	155.5			237.2	1.02	**675**	849.0	2.37	2.02	28%
	MH1298	MH1297									0.75	0.75	90		68	68	0.2	68	4.00	0.9			1.1	1.22	300	106.8	1.51	0.39	1%
	MH1299	MH1303									4.74	4.74	90		427	427	1.4	427	4.00	5.4			6.8	0.55	300	71.7	1.01	0.63	9%
	MH1303	MH1302										4.74				427	1.4	427	4.00	5.4			6.8	0.79	300	85.9	1.22	0.72	8%
	MH1302	MH1301									2.37	7.11	90		214	641	2.0	641	3.92	8.0			10.0	0.32	300	54.7	0.77	0.58	18%
	MH1301	MH1297									0.45	7.56	90		41	682	2.2	682	3.90	8.5			10.6	0.46	300	65.6	0.93	0.68	16%
	MH1297	MH1295										8.31				750	2.4	750	3.88	9.3			11.6	0.27	250	30.9	0.63	0.57	38%
	MH1296	MH1295									2.61	2.61	90		235	235	0.7	235	4.00	3.0			3.7	0.40	200	20.7	0.66	0.50	18%
	MH1295	MH1300									2.51	13.43	90		226	1211	3.8	1211	3.74	14.4			18.3	1.02	300	97.7	1.38	1.05	19%
	MH1300	MH1261										13.43				1211	3.8	1211	3.74	14.4			18.3	0.56	300	72.4	1.02	0.83	25%
	MH1261	MH1255										13.43				1211	3.8	1211	3.74	14.4			18.3	1.15	300	103.7	1.47	1.10	18%
	MH1258	MH1257									2.62	2.62	90		236	236	0.7	236	4.00	3.0			3.8	0.58	250	45.3	0.92	0.54	8%
	MH1257	MH1256										2.62				236	0.7	236	4.00	3.0			3.8	0.69	300	80.3	1.14	0.56	5%
	MH1256	MH1260										2.62				236	0.7	236	4.00	3.0			3.8	1.81	300	130.1	1.84	0.77	3%
	MH1260	MH1255										2.62				236	0.7	236	4.00	3.0			3.8	0.26	300	49.3	0.70	0.41	8%
	MH1255	MH1254										16.05				1447	4.6	1447	3.69	17.0			21.6	0.15	**450**	110.4	0.69	0.53	20%
	MH1254	MH1253									0.35	16.40	90		32	1479	4.7	1479	3.68	17.3			22.0	0.48	**450**	197.5	1.24	0.82	11%
	MH1253	MH1259										16.40				1479	4.7	1479	3.68	17.3			22.0	0.50	**450**	201.6	1.27	0.84	11%
	MH1259	MH1249									1.20	17.60	90		108	1587	5.0	1587	3.66	18.5			23.5	0.46	**450**	193.4	1.22	0.81	12%
	MH1249	MH1248										17.60				1587	5.0	1587	3.66	18.5			23.5	0.53	**450**	207.6	1.31	0.86	11%
	MH1252	MH1251									0.35	0.35	90		32	32	0.1	32	4.00	0.4			0.5	0.40	200	20.7	0.66	0.26	2%
	MH1251	MH1250									0.31	0.66	90		28	60	0.2	60	4.00	0.8			1.0	2.56	200	52.5	1.67	0.58	2%
	MH1250	MH1248										0.66				60	0.2	60	4.00	0.8			1.0	0.60	200	25.4	0.81	0.36	4%
	MH1248	MH1244										18.26				1647	5.2	1647	3.65	19.1			24.4	0.62	**450**	224.5	1.41	0.93	11%
	MH1244	MH1243										18.26				1647	5.2	1647	3.65	19.1			24.4	0.44	**450**	189.1	1.19	0.82	13%
	MH1243	MH1242										18.26				1647	5.2	1647	3.65	19.1			24.4	2.39	**450**	440.8	2.77	1.50	6%
	MH1242	MHX			259.14					15739		44.77				4038	86.9	19777	2.66	167.3			254.2	0.64	**675**	672.5	1.88	1.69	38%

Scenario 2A: Trunk Sewer Upgrades Complete, All Distrikt Developments Connected (Option 1)



The Cross Avenue local sewer can support full build-out of 157/165 Cross Ave. Additional development connecting into the Cross Avenue sewer will require an upsize to this section only (140 m) from 300 mm to 450 mm diameter.

Distrikt Developments

Existing Wastewater Pipes

Region Upgrade Project (ID6537) West Trunk
Upsize from 525 mm to 675 mm

Region Upgrade Project (ID6535) East Trunk
Upsize from 300 mm to 450 mm

In Scenario 2A, wastewater from the 587 Argus Property is connected to the Argus Road sewer (Tower A, B and C) (West Trunk). No Distrikt developments are connected to the East Trunk system.

Results:

In this Scenario, all Distrikt developments connect to the GO Station Trunk system (West Trunk). Once the trunk sewer is upgraded to 675 mm in diameter, there are no capacity constraints identified, except for the existing local 300 mm pipe on Cross Ave (west of Argus, as noted).

Excluding the 300 mm pipe, no sewer component exceeds 72% full.

URBANTECH®

SANITARY SEWER DESIGN SHEET (Midtown)

SCENARIO 2A

TOWN OF OAKVILLE

REGIONAL MUNICIPALITY OF HALTON

PROJECT DETAILS

Project No: 22-282
Date: 25-Feb-24
Designed by: J.P.O
Checked by: K.C

DESIGN CRITERIA

Min Diameter = 200 mm
Mannings 'n'= 0.013
Min. Velocity = 0.60 m/s
Max. Velocity = 3.00 m/s
Avg. Domestic Flow = 275.0 l/c/d
Infiltration = 0.286 l/s/ha
Max. Peaking Factor = 4.00
Min. Peaking Factor= 2.00

NOMINAL PIPE SIZE USED

STREET	FROM MH	TO MH	LENGTH (m)	RESIDENTIAL							COMMERCIAL/INDUSTRIAL/INSTITUTIONAL						FLOW CALCULATIONS							PIPE DATA					
				AREA (ha)	ACC. AREA (ha)	UNITS (#)	DENSITY (P/ha)	DENSITY (P/Unit)	POP	ACCUM. RES. POP.	AREA (ha)	ACC. AREA (ha)	EQUIV. POP. (P/ha)	FLOW RATE (l/s/ha)	EQUIV. POP.	ACCUM. EQUIV. POP.	INFILTRATION (l/s)	TOTAL ACCUM. POP.	PEAKING FACTOR	RES. FLOW (l/s)	COMM. FLOW (l/s)	ACCUM. COMM. FLOW (l/s)	TOTAL FLOW (l/s)	SLOPE (%)	PIPE DIAMETER (mm)	FULL FLOW CAPACITY (l/s)	FULL FLOW VELOCITY (m/s)	ACTUAL VELOCITY (m/s)	PERCENT FULL (%)
Area-1	Area-1	Area-2		99.09	99.09				5352	5352							28.3	5352	3.22	54.8			83.1		200				
Area-2	Area-2	Area-3		30.00	129.09				2366	7718							36.9	7718	3.07	75.3			112.2		200				
Area-4	Area-4	Area-3		13.75	13.75				860	860							3.9	860	3.84	10.5			14.4		200				
Area-3	Area-3	MH1293		54.61	197.45				3110	11688							56.5	11688	2.89	107.4			163.9		200				
Area-5	MH1293	MH1290		49.09	246.54				2917	14605							70.5	14605	2.79	129.7			200.2	0.25	675	420.3	1.17	1.13	48%
Area-6	MH1294	MH1290		12.60	12.60				1134	1134							3.6	1134	3.76	13.6			17.2	2.35	250	91.2	1.86	1.41	19%
	MH1290	MH1288			259.14					15739							74.1	15739	2.76	138.1			212.2	0.78	600	542.3	1.92	1.73	39%
	MH1288	MH1287			259.14					15739	0.14	0.14	90		13	13	74.2	15752	2.76	138.2			212.4	0.58	600	467.6	1.65	1.59	45%
	MH1287	MH1286			259.14				**3439**	19178	1.80	1.94	90		162	175	74.7	19353	2.67	164.3			238.9	0.70	600	513.7	1.82	1.74	47%
	MH1286	MH1285			259.14					19178		1.94				175	74.7	19353	2.67	164.3			238.9	0.87	600	572.7	2.03	1.88	42%
	MH1285	MH1284			259.14					19178		1.94				175	74.7	19353	2.67	164.3			238.9	0.85	600	566.1	2.00	1.86	42%
	MH1291	MH1284									1.15	1.15	90		104	104	0.3	104	4.00	1.3			1.7	1.46	300	116.8	1.65	0.51	1%
	MH1284	MH1292			259.14					19178		3.09				279	75.0	19457	2.66	165.0			240.0	0.22	750	522.2	1.18	1.13	46%
	MH1292	MH1283			259.14					19178		3.09				279	75.0	19457	2.66	165.0			240.0	1.48	750	1354.4	3.07	2.30	18%
	MH1283	MH1282			259.14				**3657**	22835	1.95	5.04	90		176	455	75.6	23290	2.59	191.7			267.3	0.77	600	538.8	1.91	1.89	50%
	MH1282	MH1279			259.14					22835		5.04				455	75.6	23290	2.59	191.7			267.3	0.88	600	576.0	2.04	1.96	46%
	MH1279	MH1275			259.14					22835		5.04				455	75.6	23290	2.59	191.7			267.3	0.22	**675**	394.3	1.10	1.16	68%
	MH1262	MH1263									1.74	1.74	90		157	157	0.5	157	4.00	2.0			2.5	0.85	250	54.8	1.12	0.55	5%
	MH1263	MH1265										1.74				157	0.5	157	4.00	2.0			2.5	0.26	250	30.3	0.62	0.36	8%
	MH1265	MH1264									0.50	2.24	90		45	202	0.6	202	4.00	2.6			3.2	1.00	250	59.5	1.21	0.63	5%
	MH1264	MH1266										2.24				202	0.6	202	4.00	2.6			3.2	0.56	300	72.4	1.02	0.50	4%
	MH1266	MH1267										2.24				202	0.6	202	4.00	2.6			3.2	0.58	300	73.6	1.04	0.51	4%
	MH1269	MH1268									0.30	0.30	90		27	27	0.1	27	4.00	0.3			0.4	0.44	300	64.1	0.91	0.24	1%
	MH1268	MH1267										0.30				27	0.1	27	4.00	0.3			0.4	0.36	250	35.7	0.73	0.19	1%
	MH1267	MH1270									8.74	11.28	90		787	1016	3.2	1016	3.80	12.3			15.5	0.37	300	58.8	0.83	0.69	26%
	MH1270	MH1271							**3540**	3540	2.92	14.20	90		263	1279	4.1	4819	3.26	50.0			54.1	0.45	300	64.9	0.92	1.01	**83%**
	MH1271	MH1272							**2716**	6256	1.24	15.44	90		112	1391	4.4	7647	3.07	74.7			79.1	0.38	300	59.6	0.84	0.96	**133%**
	MH1272	MH1273								6256		15.44				1391	4.4	7647	3.07	74.7			79.1	0.60	300	74.9	1.06	1.21	**106%**
	MH1273	MH1274								6256		15.44				1391	4.4	7647	3.07	74.7			79.1	0.52	300	69.7	0.99	1.12	**113%**
	MH1274	MH1275								6256		15.44				1391	4.4	7647	3.07	74.7			79.1	0.85	300	89.2	1.26	1.40	**89%**
	MH1275	MH1276			259.14					29091		20.48				1846	80.0	30937	2.46	242.6			322.6	0.66	**675**	682.9	1.91	1.83	47%
	MH1276	MH1277			259.14					29091		20.48				1846	80.0	30937	2.46	242.6			322.6	1.47	**675**	1019.2	2.85	2.48	32%
	MH1277	MH1280			259.14					29091	0.66	21.14	90		60	1906	80.2	30997	2.46	243.0			323.2	1.45	**675**	1012.2	2.83	2.46	32%
	MH1280	MH1278			259.14					29091		21.14				1906	80.2	30997	2.46	243.0			323.2	1.67	**675**	1086.3	3.04	2.64	30%
	MH1278	MH1281			259.14					29091		21.14				1906	80.2	30997	2.46	243.0			323.2	0.33	**675**	482.9	1.35	1.42	67%
	MH1281	MH1247			259.14					29091		21.14				1906	80.2	30997	2.46	243.0			323.2	1.08	**675**	873.6	2.44	2.20	37%
	MH1247	MH1246			259.14					29091		21.14				1906	80.2	30997	2.46	243.0			323.2	0.92	**675**	806.3	2.25	2.10	40%
	MH1246	MH1245			259.14					29091		21.14				1906	80.2	30997	2.46	243.0			323.2	0.54	**675**	617.7	1.73	1.71	52%
	MH1245	MH1240			259.14					29091		21.14				1906	80.2	30997	2.46	243.0			323.2	6.53	**675**	2148.0	6.00	4.32	15%
	MH1240	MH1239			259.14					29091		21.14				1906	80.2	30997	2.46	243.0			323.2	0.89	**675**	793.0	2.22	2.06	41%
	MH1234	MH1235									1.75	1.75	90		158	158	0.5	158	4.00	2.0			2.5	2.02	200	46.6	1.48	0.77	5%
	MH1235	MH1236									2.21	3.96	90		199	357	1.1	357	4.00	4.5			5.7	0.49	200	23.0	0.73	0.59	25%
	MH1236	MH1237										3.96				357	1.1	357	4.00	4.5			5.7	0.47	250	40.8	0.83	0.58	14%
	MH1237	MH1238									0.45	4.41	90		41	398	1.3	398	4.00	5.1			6.3	0.46	300	65.6	0.93	0.59	10%
	MH1238	MH1239										4.41				398	1.3	398	4.00	5.1			6.3	1.29	300	109.8	1.55	0.84	6%
	MH1239	MH1241			259.14					29091	0.96	26.51	90		87	2391	81.7	31482	2.46	246.2			327.9	0.29	**675**	452.7	1.26	1.35	72%

URBANTECH®

SANITARY SEWER DESIGN SHEET (Midtown)

SCENARIO 2A

TOWN OF OAKVILLE

REGIONAL MUNICIPALITY OF HALTON

PROJECT DETAILS

Project No: 22-282
Date: 25-Feb-24
Designed by: J.P.O
Checked by: K.C

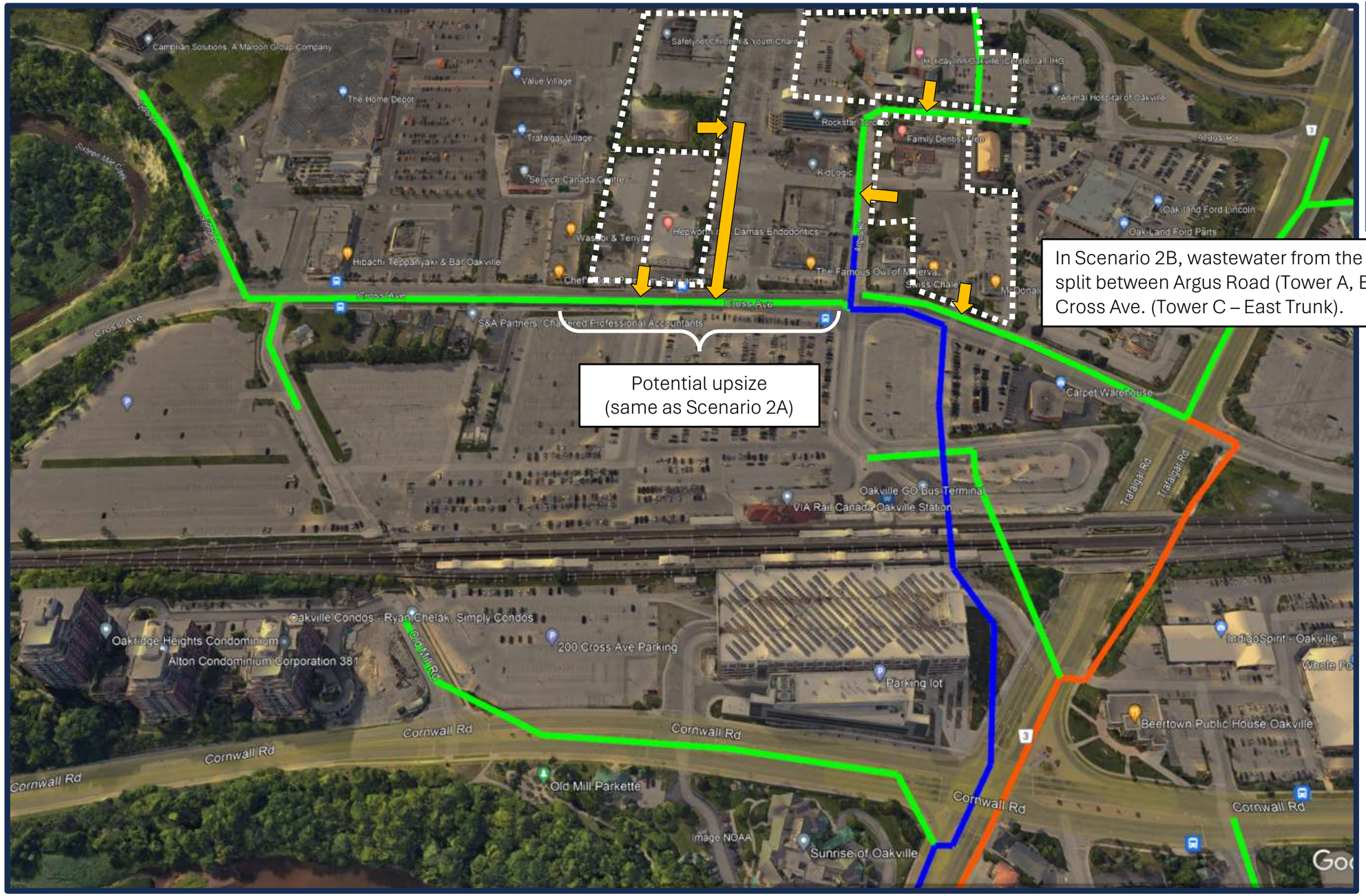
DESIGN CRITERIA

Min Diameter =	200	mm	Avg. Domestic Flow =	275.0	l/c/d
Mannings 'n'=	0.013		Infiltration =	0.286	l/s/ha
Min. Velocity =	0.60	m/s	Max. Peaking Factor =	4.00	
Max. Velocity =	3.00	m/s	Min. Peaking Factor=	2.00	

NOMINAL PIPE SIZE USED

STREET	FROM MH	TO MH	LENGTH (m)	RESIDENTIAL							COMMERCIAL/INDUSTRIAL/INSTITUTIONAL						FLOW CALCULATIONS							PIPE DATA					
				AREA (ha)	ACC. AREA (ha)	UNITS (#)	DENSITY (P/ha)	DENSITY (P/Unit)	POP	ACCUM. RES. POP.	AREA (ha)	ACC. AREA (ha)	EQUIV. POP. (P/ha)	FLOW RATE (l/s/ha)	EQUIV. POP.	ACCUM. EQUIV. POP.	INFILTRATION (l/s)	TOTAL ACCUM. POP.	PEAKING FACTOR	RES. FLOW (l/s)	COMM. FLOW (l/s)	ACCUM. COMM. FLOW (l/s)	TOTAL FLOW (l/s)	SLOPE (%)	PIPE DIAMETER (mm)	FULL FLOW CAPACITY (l/s)	FULL FLOW VELOCITY (m/s)	ACTUAL VELOCITY (m/s)	PERCENT FULL (%)
	MH1241	MH1242			259.14					29091		26.51				2391	81.7	31482	2.46	246.2			327.9	1.02	**675**	849.0	2.37	2.14	39%
	MH1298	MH1297									0.75	0.75	90		68	68	0.2	68	4.00	0.9			1.1	1.22	300	106.8	1.51	0.39	1%
	MH1299	MH1303									4.74	4.74	90		427	427	1.4	427	4.00	5.4			6.8	0.55	300	71.7	1.01	0.63	9%
	MH1303	MH1302										4.74				427	1.4	427	4.00	5.4			6.8	0.79	300	85.9	1.22	0.72	8%
	MH1302	MH1301									2.37	7.11	90		214	641	2.0	641	3.92	8.0			10.0	0.32	300	54.7	0.77	0.58	18%
	MH1301	MH1297									0.45	7.56	90		41	682	2.2	682	3.90	8.5			10.6	0.46	300	65.6	0.93	0.68	16%
	MH1297	MH1295										8.31				750	2.4	750	3.88	9.3			11.6	0.27	250	30.9	0.63	0.57	38%
	MH1296	MH1295									2.61	2.61	90		235	235	0.7	235	4.00	3.0			3.7	0.40	200	20.7	0.66	0.50	18%
	MH1295	MH1300									2.51	13.43	90		226	1211	3.8	1211	3.74	14.4			18.3	1.02	300	97.7	1.38	1.05	19%
	MH1300	MH1261										13.43				1211	3.8	1211	3.74	14.4			18.3	0.56	300	72.4	1.02	0.83	25%
	MH1261	MH1255										13.43				1211	3.8	1211	3.74	14.4			18.3	1.15	300	103.7	1.47	1.10	18%
	MH1258	MH1257									2.62	2.62	90		236	236	0.7	236	4.00	3.0			3.8	0.58	250	45.3	0.92	0.54	8%
	MH1257	MH1256										2.62				236	0.7	236	4.00	3.0			3.8	0.69	300	80.3	1.14	0.56	5%
	MH1256	MH1260										2.62				236	0.7	236	4.00	3.0			3.8	1.81	300	130.1	1.84	0.77	3%
	MH1260	MH1255										2.62				236	0.7	236	4.00	3.0			3.8	0.26	300	49.3	0.70	0.41	8%
	MH1255	MH1254										16.05				1447	4.6	1447	3.69	17.0			21.6	0.15	**450**	110.4	0.69	0.53	20%
	MH1254	MH1253									0.35	16.40	90		32	1479	4.7	1479	3.68	17.3			22.0	0.48	**450**	197.5	1.24	0.82	11%
	MH1253	MH1259										16.40				1479	4.7	1479	3.68	17.3			22.0	0.50	**450**	201.6	1.27	0.84	11%
	MH1259	MH1249									1.20	17.60	90		108	1587	5.0	1587	3.66	18.5			23.5	0.46	**450**	193.4	1.22	0.81	12%
	MH1249	MH1248										17.60				1587	5.0	1587	3.66	18.5			23.5	0.53	**450**	207.6	1.31	0.86	11%
	MH1252	MH1251									0.35	0.35	90		32	32	0.1	32	4.00	0.4			0.5	0.40	200	20.7	0.66	0.26	2%
	MH1251	MH1250									0.31	0.66	90		28	60	0.2	60	4.00	0.8			1.0	2.56	200	52.5	1.67	0.58	2%
	MH1250	MH1248										0.66				60	0.2	60	4.00	0.8			1.0	0.60	200	25.4	0.81	0.36	4%
	MH1248	MH1244										18.26				1647	5.2	1647	3.65	19.1			24.4	0.62	**450**	224.5	1.41	0.93	11%
	MH1244	MH1243										18.26				1647	5.2	1647	3.65	19.1			24.4	0.44	**450**	189.1	1.19	0.82	13%
	MH1243	MH1242										18.26				1647	5.2	1647	3.65	19.1			24.4	2.39	**450**	440.8	2.77	1.50	6%
	MH1242	MHX			259.14					29091		44.77				4038	86.9	33129	2.44	256.8			343.7	0.64	**675**	672.5	1.88	1.86	51%

Scenario 2B: Trunk Sewer Upgrades Complete, All Distrikt Developments Connected (Option 2)



Results:

In this Scenario, all Distrikt developments connect to the GO Station Trunk system (West Trunk), except for Tower C on the 587 Argus Road property, which connects into the Cross Ave sewer (east of Argus) and the Trafalgar Road trunk (East Trunk).

Similar to Scenario 2A, there are no trunk sewer capacity constraints identified.

Excluding the 300 mm pipe, no sewer component exceeds 70% full.

URBANTECH®

SANITARY SEWER DESIGN SHEET (Midtown)

SCENARIO 2B

TOWN OF OAKVILLE

REGIONAL MUNICIPALITY OF HALTON

PROJECT DETAILS

Project No: 22-282
Date: 25-Feb-24
Designed by: J.P.O
Checked by: K.C

DESIGN CRITERIA

Min Diameter = 200 mm
Mannings 'n'= 0.013
Min. Velocity = 0.60 m/s
Max. Velocity = 3.00 m/s
Avg. Domestic Flow = 275.0 l/c/d
Infiltration = 0.286 l/s/ha
Max. Peaking Factor = 4.00
Min. Peaking Factor= 2.00

NOMINAL PIPE SIZE USED

STREET	FROM MH	TO MH	LENGTH (m)	RESIDENTIAL							COMMERCIAL/INDUSTRIAL/INSTITUTIONAL						FLOW CALCULATIONS							PIPE DATA					
				AREA (ha)	ACC. AREA (ha)	UNITS (#)	DENSITY (P/ha)	DENSITY (P/Unit)	POP	ACCUM. RES. POP.	AREA (ha)	ACC. AREA (ha)	EQUIV. POP. (P/ha)	FLOW RATE (l/s/ha)	EQUIV. POP.	ACCUM. EQUIV. POP.	INFILTRATION (l/s)	TOTAL ACCUM. POP.	PEAKING FACTOR	RES. FLOW (l/s)	COMM. FLOW (l/s)	ACCUM. COMM. FLOW (l/s)	TOTAL FLOW (l/s)	SLOPE (%)	PIPE DIAMETER (mm)	FULL FLOW CAPACITY (l/s)	FULL FLOW VELOCITY (m/s)	ACTUAL VELOCITY (m/s)	PERCENT FULL (%)
Area-1	Area-1	Area-2		99.09	99.09				5352	5352							28.3	5352	3.22	54.8			83.1		200				
Area-2	Area-2	Area-3		30.00	129.09				2366	7718							36.9	7718	3.07	75.3			112.2		200				
Area-4	Area-4	Area-3		13.75	13.75				860	860							3.9	860	3.84	10.5			14.4		200				
Area-3	Area-3	MH1293		54.61	197.45				3110	11688							56.5	11688	2.89	107.4			163.9		200				
Area-5	MH1293	MH1290		49.09	246.54				2917	14605							70.5	14605	2.79	129.7			200.2	0.25	675	420.3	1.17	1.13	48%
Area-6	MH1294	MH1290		12.60	12.60				1134	1134							3.6	1134	3.76	13.6			17.2	2.35	250	91.2	1.86	1.41	19%
	MH1290	MH1288			259.14					15739							74.1	15739	2.76	138.1			212.2	0.78	600	542.3	1.92	1.73	39%
	MH1288	MH1287			259.14					15739	0.14	0.14	90		13	13	74.2	15752	2.76	138.2			212.4	0.58	600	467.6	1.65	1.59	45%
	MH1287	MH1286			259.14				**3439**	19178	1.80	1.94	90		162	175	74.7	19353	2.67	164.3			238.9	0.70	600	513.7	1.82	1.74	47%
	MH1286	MH1285			259.14					19178		1.94				175	74.7	19353	2.67	164.3			238.9	0.87	600	572.7	2.03	1.88	42%
	MH1285	MH1284			259.14					19178		1.94				175	74.7	19353	2.67	164.3			238.9	0.85	600	566.1	2.00	1.86	42%
	MH1291	MH1284									1.15	1.15	90		104	104	0.3	104	4.00	1.3			1.7	1.46	300	116.8	1.65	0.51	1%
	MH1284	MH1292			259.14					19178		3.09				279	75.0	19457	2.66	165.0			240.0	0.22	750	522.2	1.18	1.13	46%
	MH1292	MH1283			259.14					19178		3.09				279	75.0	19457	2.66	165.0			240.0	1.48	750	1354.4	3.07	2.30	18%
	MH1283	MH1282			259.14				**1989**	21167	1.95	5.04	90		176	455	75.6	21622	2.62	180.2			255.8	0.77	600	538.8	1.91	1.83	47%
	MH1282	MH1279			259.14					21167		5.04				455	75.6	21622	2.62	180.2			255.8	0.88	600	576.0	2.04	1.89	44%
	MH1279	MH1275			259.14					21167		5.04				455	75.6	21622	2.62	180.2			255.8	0.22	**675**	394.3	1.10	1.16	65%
	MH1262	MH1263									1.74	1.74	90		157	157	0.5	157	4.00	2.0			2.5	0.85	250	54.8	1.12	0.55	5%
	MH1263	MH1265										1.74				157	0.5	157	4.00	2.0			2.5	0.26	250	30.3	0.62	0.36	8%
	MH1265	MH1264									0.50	2.24	90		45	202	0.6	202	4.00	2.6			3.2	1.00	250	59.5	1.21	0.63	5%
	MH1264	MH1266										2.24				202	0.6	202	4.00	2.6			3.2	0.56	300	72.4	1.02	0.50	4%
	MH1266	MH1267										2.24				202	0.6	202	4.00	2.6			3.2	0.58	300	73.6	1.04	0.51	4%
	MH1269	MH1268									0.30	0.30	90		27	27	0.1	27	4.00	0.3			0.4	0.44	300	64.1	0.91	0.24	1%
	MH1268	MH1267										0.30				27	0.1	27	4.00	0.3			0.4	0.36	250	35.7	0.73	0.19	1%
	MH1267	MH1270									8.74	11.28	90		787	1016	3.2	1016	3.80	12.3			15.5	0.37	300	58.8	0.83	0.69	26%
	MH1270	MH1271							**3540**	3540	2.92	14.20	90		263	1279	4.1	4819	3.26	50.0			54.1	0.45	300	64.9	0.92	1.01	**83%**
	MH1271	MH1272							**2716**	6256	1.24	15.44	90		112	1391	4.4	7647	3.07	74.7			79.1	0.38	300	59.6	0.84	0.96	**133%**
	MH1272	MH1273								6256		15.44				1391	4.4	7647	3.07	74.7			79.1	0.60	300	74.9	1.06	1.21	**106%**
	MH1273	MH1274								6256		15.44				1391	4.4	7647	3.07	74.7			79.1	0.52	300	69.7	0.99	1.12	**113%**
	MH1274	MH1275								6256		15.44				1391	4.4	7647	3.07	74.7			79.1	0.85	300	89.2	1.26	1.40	**89%**
	MH1275	MH1276			259.14					27423		20.48				1846	80.0	29269	2.49	231.8			311.7	0.66	**675**	682.9	1.91	1.83	46%
	MH1276	MH1277			259.14					27423		20.48				1846	80.0	29269	2.49	231.8			311.7	1.47	**675**	1019.2	2.85	2.48	31%
	MH1277	MH1280			259.14					27423	0.66	21.14	90		60	1906	80.2	29329	2.49	232.2			312.3	1.45	**675**	1012.2	2.83	2.46	31%
	MH1280	MH1278			259.14					27423		21.14				1906	80.2	29329	2.49	232.2			312.3	1.67	**675**	1086.3	3.04	2.58	29%
	MH1278	MH1281			259.14					27423		21.14				1906	80.2	29329	2.49	232.2			312.3	0.33	**675**	482.9	1.35	1.42	65%
	MH1281	MH1247			259.14					27423		21.14				1906	80.2	29329	2.49	232.2			312.3	1.08	**675**	873.6	2.44	2.20	36%
	MH1247	MH1246			259.14					27423		21.14				1906	80.2	29329	2.49	232.2			312.3	0.92	**675**	806.3	2.25	2.03	39%
	MH1246	MH1245			259.14					27423		21.14				1906	80.2	29329	2.49	232.2			312.3	0.54	**675**	617.7	1.73	1.71	51%
	MH1245	MH1240			259.14					27423		21.14				1906	80.2	29329	2.49	232.2			312.3	6.53	**675**	2148.0	6.00	4.32	15%
	MH1240	MH1239			259.14					27423		21.14				1906	80.2	29329	2.49	232.2			312.3	0.89	**675**	793.0	2.22	1.99	39%
	MH1234	MH1235									1.75	1.75	90		158	158	0.5	158	4.00	2.0			2.5	2.02	200	46.6	1.48	0.77	5%
	MH1235	MH1236									2.21	3.96	90		199	357	1.1	357	4.00	4.5			5.7	0.49	200	23.0	0.73	0.59	25%
	MH1236	MH1237										3.96				357	1.1	357	4.00	4.5			5.7	0.47	250	40.8	0.83	0.58	14%
	MH1237	MH1238									0.45	4.41	90		41	398	1.3	398	4.00	5.1			6.3	0.46	300	65.6	0.93	0.59	10%
	MH1238	MH1239										4.41				398	1.3	398	4.00	5.1			6.3	1.29	300	109.8	1.55	0.84	6%
	MH1239	MH1241			259.14					27423	0.96	26.51	90		87	2391	81.7	29814	2.48	235.3			317.0	0.29	**675**	452.7	1.26	1.35	70%

URBANTECH®

SANITARY SEWER DESIGN SHEET (Midtown)

SCENARIO 2B

TOWN OF OAKVILLE

REGIONAL MUNICIPALITY OF HALTON

PROJECT DETAILS

Project No: 22-282
Date: 25-Feb-24
Designed by: J.P.O
Checked by: K.C

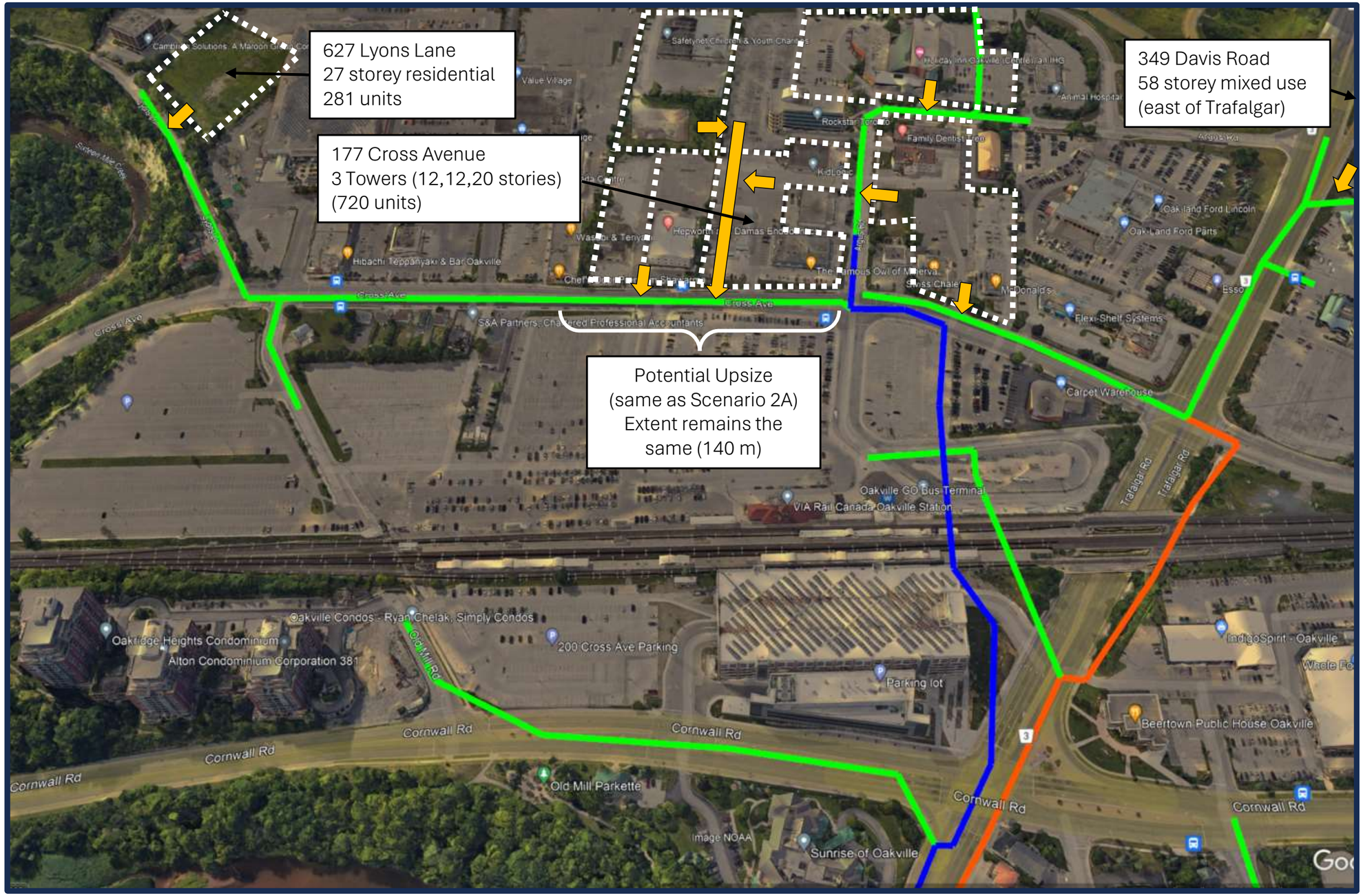
DESIGN CRITERIA

Min Diameter = 200 mm
Mannings 'n'= 0.013
Min. Velocity = 0.60 m/s
Max. Velocity = 3.00 m/s
Avg. Domestic Flow = 275.0 l/c/d
Infiltration = 0.286 l/s/ha
Max. Peaking Factor = 4.00
Min. Peaking Factor= 2.00

NOMINAL PIPE SIZE USED

STREET	FROM MH	TO MH	LENGTH (m)	RESIDENTIAL							COMMERCIAL/INDUSTRIAL/INSTITUTIONAL						FLOW CALCULATIONS							PIPE DATA					
				AREA (ha)	ACC. AREA (ha)	UNITS (#)	DENSITY (P/ha)	DENSITY (P/Unit)	POP	ACCUM. RES. POP.	AREA (ha)	ACC. AREA (ha)	EQUIV. POP. (P/ha)	FLOW RATE (l/s/ha)	EQUIV. POP.	ACCUM. EQUIV. POP.	INFILTRATION (l/s)	TOTAL ACCUM. POP.	PEAKING FACTOR	RES. FLOW (l/s)	COMM. FLOW (l/s)	ACCUM. COMM. FLOW (l/s)	TOTAL FLOW (l/s)	SLOPE (%)	PIPE DIAMETER (mm)	FULL FLOW CAPACITY (l/s)	FULL FLOW VELOCITY (m/s)	ACTUAL VELOCITY (m/s)	PERCENT FULL (%)
	MH1241	MH1242			259.14					27423		26.51				2391	81.7	29814	2.48	235.3			317.0	1.02	**675**	849.0	2.37	2.14	37%
	MH1298	MH1297									0.75	0.75	90		68	68	0.2	68	4.00	0.9			1.1	1.22	300	106.8	1.51	0.39	1%
	MH1299	MH1303									4.74	4.74	90		427	427	1.4	427	4.00	5.4			6.8	0.55	300	71.7	1.01	0.63	9%
	MH1303	MH1302										4.74				427	1.4	427	4.00	5.4			6.8	0.79	300	85.9	1.22	0.72	8%
	MH1302	MH1301									2.37	7.11	90		214	641	2.0	641	3.92	8.0			10.0	0.32	300	54.7	0.77	0.58	18%
	MH1301	MH1297									0.45	7.56	90		41	682	2.2	682	3.90	8.5			10.6	0.46	300	65.6	0.93	0.68	16%
	MH1297	MH1295										8.31				750	2.4	750	3.88	9.3			11.6	0.27	250	30.9	0.63	0.57	38%
	MH1296	MH1295									2.61	2.61	90		235	235	0.7	235	4.00	3.0			3.7	0.40	200	20.7	0.66	0.50	18%
	MH1295	MH1300									2.51	13.43	90		226	1211	3.8	1211	3.74	14.4			18.3	1.02	300	97.7	1.38	1.05	19%
	MH1300	MH1261										13.43				1211	3.8	1211	3.74	14.4			18.3	0.56	300	72.4	1.02	0.83	25%
	MH1261	MH1255										13.43				1211	3.8	1211	3.74	14.4			18.3	1.15	300	103.7	1.47	1.10	18%
	MH1258	MH1257							**1668**	1668	2.62	2.62	90		236	236	0.7	1904	3.60	21.8			22.6	0.58	250	45.3	0.92	0.91	50%
	MH1257	MH1256								1668		2.62				236	0.7	1904	3.60	21.8			22.6	0.69	300	80.3	1.14	0.97	28%
	MH1256	MH1260								1668		2.62				236	0.7	1904	3.60	21.8			22.6	1.81	300	130.1	1.84	1.36	17%
	MH1260	MH1255								1668		2.62				236	0.7	1904	3.60	21.8			22.6	0.26	300	49.3	0.70	0.67	46%
	MH1255	MH1254								1668		16.05				1447	4.6	3115	3.43	34.0			38.6	0.15	**450**	110.4	0.69	0.62	35%
	MH1254	MH1253								1668	0.35	16.40	90		32	1479	4.7	3147	3.42	34.3			39.0	0.48	**450**	197.5	1.24	0.96	20%
	MH1253	MH1259								1668		16.40				1479	4.7	3147	3.42	34.3			39.0	0.50	**450**	201.6	1.27	0.96	19%
	MH1259	MH1249								1668	1.20	17.60	90		108	1587	5.0	3255	3.41	35.3			40.4	0.46	**450**	193.4	1.22	0.94	21%
	MH1249	MH1248								1668		17.60				1587	5.0	3255	3.41	35.3			40.4	0.53	**450**	207.6	1.31	0.99	19%
	MH1252	MH1251									0.35	0.35	90		32	32	0.1	32	4.00	0.4			0.5	0.40	200	20.7	0.66	0.26	2%
	MH1251	MH1250									0.31	0.66	90		28	60	0.2	60	4.00	0.8			1.0	2.56	200	52.5	1.67	0.58	2%
	MH1250	MH1248										0.66				60	0.2	60	4.00	0.8			1.0	0.60	200	25.4	0.81	0.36	4%
	MH1248	MH1244								1668		18.26				1647	5.2	3315	3.41	35.9			41.2	0.62	**450**	224.5	1.41	1.06	18%
	MH1244	MH1243								1668		18.26				1647	5.2	3315	3.41	35.9			41.2	0.44	**450**	189.1	1.19	0.94	22%
	MH1243	MH1242								1668		18.26				1647	5.2	3315	3.41	35.9			41.2	2.39	**450**	440.8	2.77	1.72	9%
	MH1242	MHX			259.14					29091		44.77				4038	86.9	33129	2.44	256.8			343.7	0.64	**675**	672.5	1.88	1.86	51%

Scenario 3: Trunk Sewer Upgrades Complete, All Current Midtown Development Applications Connected



Results:

In this Scenario, wastewater flows from current Midtown Development Applications are added to the system.

There are no trunk sewer capacity constraints noted in the upgraded pipes. Excluding the 300 mm pipe on Cross Ave., no sewer component exceeds 73% full.

URBANTECH®

SANITARY SEWER DESIGN SHEET (Midtown)

SCENARIO 3

TOWN OF OAKVILLE

REGIONAL MUNICIPALITY OF HALTON

PROJECT DETAILS

Project No: 22-282
Date: 25-Feb-24
Designed by: J.P.O
Checked by: K.C

DESIGN CRITERIA

Min Diameter = 200 mm
Mannings 'n'= 0.013
Min. Velocity = 0.60 m/s
Max. Velocity = 3.00 m/s
Avg. Domestic Flow = 275.0 l/c/d
Infiltration = 0.286 l/s/ha
Max. Peaking Factor = 4.00
Min. Peaking Factor= 2.00

NOMINAL PIPE SIZE USED

STREET	FROM MH	TO MH	LENGTH (m)	RESIDENTIAL							COMMERCIAL/INDUSTRIAL/INSTITUTIONAL						FLOW CALCULATIONS							PIPE DATA					
				AREA (ha)	ACC. AREA (ha)	UNITS (#)	DENSITY (P/ha)	DENSITY (P/Unit)	POP	ACCUM. RES. POP.	AREA (ha)	ACC. AREA (ha)	EQUIV. POP. (P/ha)	FLOW RATE (l/s/ha)	EQUIV. POP.	ACCUM. EQUIV. POP.	INFILTRATION (l/s)	TOTAL ACCUM. POP.	PEAKING FACTOR	RES. FLOW (l/s)	COMM. FLOW (l/s)	ACCUM. COMM. FLOW (l/s)	TOTAL FLOW (l/s)	SLOPE (%)	PIPE DIAMETER (mm)	FULL FLOW CAPACITY (l/s)	FULL FLOW VELOCITY (m/s)	ACTUAL VELOCITY (m/s)	PERCENT FULL (%)
Area-1	Area-1	Area-2		99.09	99.09				5352	5352							28.3	5352	3.22	54.8			83.1		200				
Area-2	Area-2	Area-3		30.00	129.09				2366	7718							36.9	7718	3.07	75.3			112.2		200				
Area-4	Area-4	Area-3		13.75	13.75				860	860							3.9	860	3.84	10.5			14.4		200				
Area-3	Area-3	MH1293		54.61	197.45				3110	11688							56.5	11688	2.89	107.4			163.9		200				
Area-5	MH1293	MH1290		49.09	246.54				2917	14605							70.5	14605	2.79	129.7			200.2	0.25	675	420.3	1.17	1.13	48%
Area-6	MH1294	MH1290		12.60	12.60				1134	1134							3.6	1134	3.76	13.6			17.2	2.35	250	91.2	1.86	1.41	19%
	MH1290	MH1288			259.14					15739							74.1	15739	2.76	138.1			212.2	0.78	600	542.3	1.92	1.73	39%
	MH1288	MH1287			259.14					15739	0.14	0.14	90		13	13	74.2	15752	2.76	138.2			212.4	0.58	600	467.6	1.65	1.59	45%
	MH1287	MH1286			259.14				**3439**	19178	1.80	1.94	90		162	175	74.7	19353	2.67	164.3			238.9	0.70	600	513.7	1.82	1.74	47%
	MH1286	MH1285			259.14					19178		1.94				175	74.7	19353	2.67	164.3			238.9	0.87	600	572.7	2.03	1.88	42%
	MH1285	MH1284			259.14					19178		1.94				175	74.7	19353	2.67	164.3			238.9	0.85	600	566.1	2.00	1.86	42%
	MH1291	MH1284									1.15	1.15	90		104	104	0.3	104	4.00	1.3			1.7	1.46	300	116.8	1.65	0.51	1%
	MH1284	MH1292			259.14					19178		3.09				279	75.0	19457	2.66	165.0			240.0	0.22	750	522.2	1.18	1.13	46%
	MH1292	MH1283			259.14					19178		3.09				279	75.0	19457	2.66	165.0			240.0	1.48	750	1354.4	3.07	2.30	18%
	MH1283	MH1282			259.14				**1989**	21167	1.95	5.04	90		176	455	75.6	21622	2.62	180.2			255.8	0.77	600	538.8	1.91	1.83	47%
	MH1282	MH1279			259.14					21167		5.04				455	75.6	21622	2.62	180.2			255.8	0.88	600	576.0	2.04	1.89	44%
	MH1279	MH1275			259.14					21167		5.04				455	75.6	21622	2.62	180.2			255.8	0.22	**675**	394.3	1.10	1.16	65%
	MH1262	MH1263									1.74	1.74	90		157	157	0.5	157	4.00	2.0			2.5	0.85	250	54.8	1.12	0.55	5%
	MH1263	MH1265							**515**	515		1.74				157	0.5	672	3.90	8.4			8.8	0.26	250	30.3	0.62	0.53	29%
	MH1265	MH1264								515	0.50	2.24	90		45	202	0.6	717	3.89	8.9			9.5	1.00	250	59.5	1.21	0.88	16%
	MH1264	MH1266								515		2.24				202	0.6	717	3.89	8.9			9.5	0.56	300	72.4	1.02	0.71	13%
	MH1266	MH1267								515		2.24				202	0.6	717	3.89	8.9			9.5	0.58	300	73.6	1.04	0.72	13%
	MH1269	MH1268									0.30	0.30	90		27	27	0.1	27	4.00	0.3			0.4	0.44	300	64.1	0.91	0.24	1%
	MH1268	MH1267										0.30				27	0.1	27	4.00	0.3			0.4	0.36	250	35.7	0.73	0.19	1%
	MH1267	MH1270								515	8.74	11.28	90		787	1016	3.2	1531	3.67	17.9			21.1	0.37	300	58.8	0.83	0.75	36%
	MH1270	MH1271							**3540**	4055	2.92	14.20	90		263	1279	4.1	5334	3.22	54.6			58.7	0.45	300	64.9	0.92	1.04	**91%**
	MH1271	MH1272							**2716**	6771	1.24	15.44	90		112	1391	4.4	8162	3.04	79.0			83.4	0.38	300	59.6	0.84	0.96	**140%**
	MH1272	MH1273								6771		15.44				1391	4.4	8162	3.04	79.0			83.4	0.60	300	74.9	1.06	1.21	**111%**
	MH1273	MH1274							**1300**	8071		15.44				1391	4.4	9462	2.98	89.7			94.1	0.52	300	69.7	0.99	1.12	**135%**
	MH1274	MH1275								8071		15.44				1391	4.4	9462	2.98	89.7			94.1	0.85	300	89.2	1.26	1.44	**106%**
	MH1275	MH1276			259.14					29238		20.48				1846	80.0	31084	2.46	243.6			323.6	0.66	**675**	682.9	1.91	1.83	47%
	MH1276	MH1277			259.14					29238		20.48				1846	80.0	31084	2.46	243.6			323.6	1.47	**675**	1019.2	2.85	2.48	32%
	MH1277	MH1280			259.14					29238	0.66	21.14	90		60	1906	80.2	31144	2.46	244.0			324.1	1.45	**675**	1012.2	2.83	2.46	32%
	MH1280	MH1278			259.14					29238		21.14				1906	80.2	31144	2.46	244.0			324.1	1.67	**675**	1086.3	3.04	2.64	30%
	MH1278	MH1281			259.14					29238		21.14				1906	80.2	31144	2.46	244.0			324.1	0.33	**675**	482.9	1.35	1.42	67%
	MH1281	MH1247			259.14					29238		21.14				1906	80.2	31144	2.46	244.0			324.1	1.08	**675**	873.6	2.44	2.20	37%
	MH1247	MH1246			259.14					29238		21.14				1906	80.2	31144	2.46	244.0			324.1	0.92	**675**	806.3	2.25	2.10	40%
	MH1246	MH1245			259.14					29238		21.14				1906	80.2	31144	2.46	244.0			324.1	0.54	**675**	617.7	1.73	1.71	52%
	MH1245	MH1240			259.14					29238		21.14				1906	80.2	31144	2.46	244.0			324.1	6.53	**675**	2148.0	6.00	4.32	15%
	MH1240	MH1239			259.14					29238		21.14				1906	80.2	31144	2.46	244.0			324.1	0.89	**675**	793.0	2.22	2.06	41%
	MH1234	MH1235									1.75	1.75	90		158	158	0.5	158	4.00	2.0			2.5	2.02	200	46.6	1.48	0.77	5%
	MH1235	MH1236									2.21	3.96	90		199	357	1.1	357	4.00	4.5			5.7	0.49	200	23.0	0.73	0.59	25%
	MH1236	MH1237										3.96				357	1.1	357	4.00	4.5			5.7	0.47	250	40.8	0.83	0.58	14%
	MH1237	MH1238									0.45	4.41	90		41	398	1.3	398	4.00	5.1			6.3	0.46	300	65.6	0.93	0.59	10%
	MH1238	MH1239										4.41				398	1.3	398	4.00	5.1			6.3	1.29	300	109.8	1.55	0.84	6%
	MH1239	MH1241			259.14					29238	0.96	26.51	90		87	2391	81.7	31629	2.45	247.1			328.8	0.29	**675**	452.7	1.26	1.35	73%

URBANTECH®

SANITARY SEWER DESIGN SHEET (Midtown)

SCENARIO 3

TOWN OF OAKVILLE

REGIONAL MUNICIPALITY OF HALTON

PROJECT DETAILS

Project No: 22-282
Date: 25-Feb-24
Designed by: J.P.O
Checked by: K.C

DESIGN CRITERIA

Min Diameter = 200 mm
Mannings 'n'= 0.013
Min. Velocity = 0.60 m/s
Max. Velocity = 3.00 m/s

Avg. Domestic Flow = 275.0 l/c/d
Infiltration = 0.286 l/s/ha
Max. Peaking Factor = 4.00
Min. Peaking Factor= 2.00

NOMINAL PIPE SIZE USED

STREET	FROM MH	TO MH	LENGTH (m)	RESIDENTIAL							COMMERCIAL/INDUSTRIAL/INSTITUTIONAL						FLOW CALCULATIONS							PIPE DATA					
				AREA (ha)	ACC. AREA (ha)	UNITS (#)	DENSITY (P/ha)	DENSITY (P/Unit)	POP	ACCUM. RES. POP.	AREA (ha)	ACC. AREA (ha)	EQUIV. POP. (P/ha)	FLOW RATE (l/s/ha)	EQUIV. POP.	ACCUM. EQUIV. POP.	INFILTRATION (l/s)	TOTAL ACCUM. POP.	PEAKING FACTOR	RES. FLOW (l/s)	COMM. FLOW (l/s)	ACCUM. COMM. FLOW (l/s)	TOTAL FLOW (l/s)	SLOPE (%)	PIPE DIAMETER (mm)	FULL FLOW CAPACITY (l/s)	FULL FLOW VELOCITY (m/s)	ACTUAL VELOCITY (m/s)	PERCENT FULL (%)
	MH1241	MH1242			259.14					29238		26.51				2391	81.7	31629	2.45	247.1			328.8	1.02	675	849.0	2.37	2.14	39%
	MH1298	MH1297									0.75	0.75	90		68	68	0.2	68	4.00	0.9			1.1	1.22	300	106.8	1.51	0.39	1%
	MH1299	MH1303									4.74	4.74	90		427	427	1.4	427	4.00	5.4			6.8	0.55	300	71.7	1.01	0.63	9%
	MH1303	MH1302										4.74				427	1.4	427	4.00	5.4			6.8	0.79	300	85.9	1.22	0.72	8%
	MH1302	MH1301									2.37	7.11	90		214	641	2.0	641	3.92	8.0			10.0	0.32	300	54.7	0.77	0.58	18%
	MH1301	MH1297							720	720	0.45	7.56	90		41	682	2.2	1402	3.70	16.5			18.7	0.46	300	65.6	0.93	0.79	28%
	MH1297	MH1295								720		8.31				750	2.4	1470	3.69	17.2			19.6	0.27	250	30.9	0.63	0.65	64%
	MH1296	MH1295									2.61	2.61	90		235	235	0.7	235	4.00	3.0			3.7	0.40	200	20.7	0.66	0.50	18%
	MH1295	MH1300								720	2.51	13.43	90		226	1211	3.8	1931	3.60	22.1			26.0	1.02	300	97.7	1.38	1.15	27%
	MH1300	MH1261								720		13.43				1211	3.8	1931	3.60	22.1			26.0	0.56	300	72.4	1.02	0.92	36%
	MH1261	MH1255								720		13.43				1211	3.8	1931	3.60	22.1			26.0	1.15	300	103.7	1.47	1.19	25%
	MH1258	MH1257							1668	1668	2.62	2.62	90		236	236	0.7	1904	3.60	21.8			22.6	0.58	250	45.3	0.92	0.91	50%
	MH1257	MH1256								1668		2.62				236	0.7	1904	3.60	21.8			22.6	0.69	300	80.3	1.14	0.97	28%
	MH1256	MH1260								1668		2.62				236	0.7	1904	3.60	21.8			22.6	1.81	300	130.1	1.84	1.36	17%
	MH1260	MH1255								1668		2.62				236	0.7	1904	3.60	21.8			22.6	0.26	300	49.3	0.70	0.67	46%
	MH1255	MH1254								2388		16.05				1447	4.6	3835	3.35	40.9			45.5	0.15	450	110.4	0.69	0.65	41%
	MH1254	MH1253								2388	0.35	16.40	90		32	1479	4.7	3867	3.35	41.2			45.9	0.48	450	197.5	1.24	0.98	23%
	MH1253	MH1259								2388		16.40				1479	4.7	3867	3.35	41.2			45.9	0.50	450	201.6	1.27	1.00	23%
	MH1259	MH1249								2388	1.20	17.60	90		108	1587	5.0	3975	3.34	42.2			47.2	0.46	450	193.4	1.22	0.98	24%
	MH1249	MH1248								2388		17.60				1587	5.0	3975	3.34	42.2			47.2	0.53	450	207.6	1.31	1.03	23%
	MH1252	MH1251									0.35	0.35	90		32	32	0.1	32	4.00	0.4			0.5	0.40	200	20.7	0.66	0.26	2%
	MH1251	MH1250									0.31	0.66	90		28	60	0.2	60	4.00	0.8			1.0	2.56	200	52.5	1.67	0.58	2%
	MH1250	MH1248										0.66				60	0.2	60	4.00	0.8			1.0	0.60	200	25.4	0.81	0.36	4%
	MH1248	MH1244								2388		18.26				1647	5.2	4035	3.33	42.8			48.0	0.62	450	224.5	1.41	1.09	21%
	MH1244	MH1243								2388		18.26				1647	5.2	4035	3.33	42.8			48.0	0.44	450	189.1	1.19	0.96	25%
	MH1243	MH1242								2388		18.26				1647	5.2	4035	3.33	42.8			48.0	2.39	450	440.8	2.77	1.83	11%
	MH1242	MHX			259.14					31626		44.77				4038	86.9	35664	2.40	272.9			359.8	0.64	675	672.5	1.88	1.86	54%

APPENDIX 'D'

STREET 'C'
(20.0m LOCAL ROAD)

ARGUS ROAD

CROSS AVE.

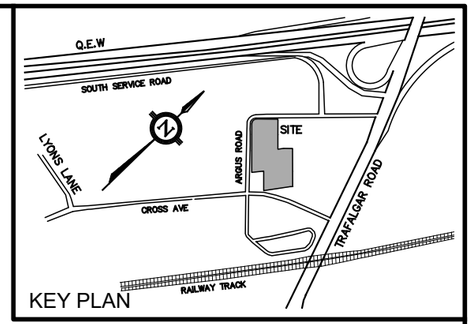
INTERIM
0.23
0.90

PHASE 2
0.32
0.90

INTERIM
0.041
0.90

PHASE 1
0.63
0.78

ARGUS ROAD



KEY PLAN

LEGEND

0.90
0.90 — AREA IN HECTARES / STORM RUN-OFF COEFFICIENT

STORM DRAINAGE AREA BOUNDARY

PROJECT TITLE
ARGUS CROSS
PROPOSED RESIDENTIAL CONDOMINIUM DEVELOPMENT
DISTRIKT DEVELOPMENTS

DRAWING TITLE
PRE-DEVELOPMENT STORM DRAINAGE PLAN

TRAFALGAR ENGINEERING
#1-481 MORDEN ROAD, OAKVILLE, ON, L6K 3W6
www.trafalgareng.com

DESIGN BY	NAS	SCALE	1:750	DRAWING No.	FIG. 2
DRAWN BY	ZI	DATE	2022/05/06		

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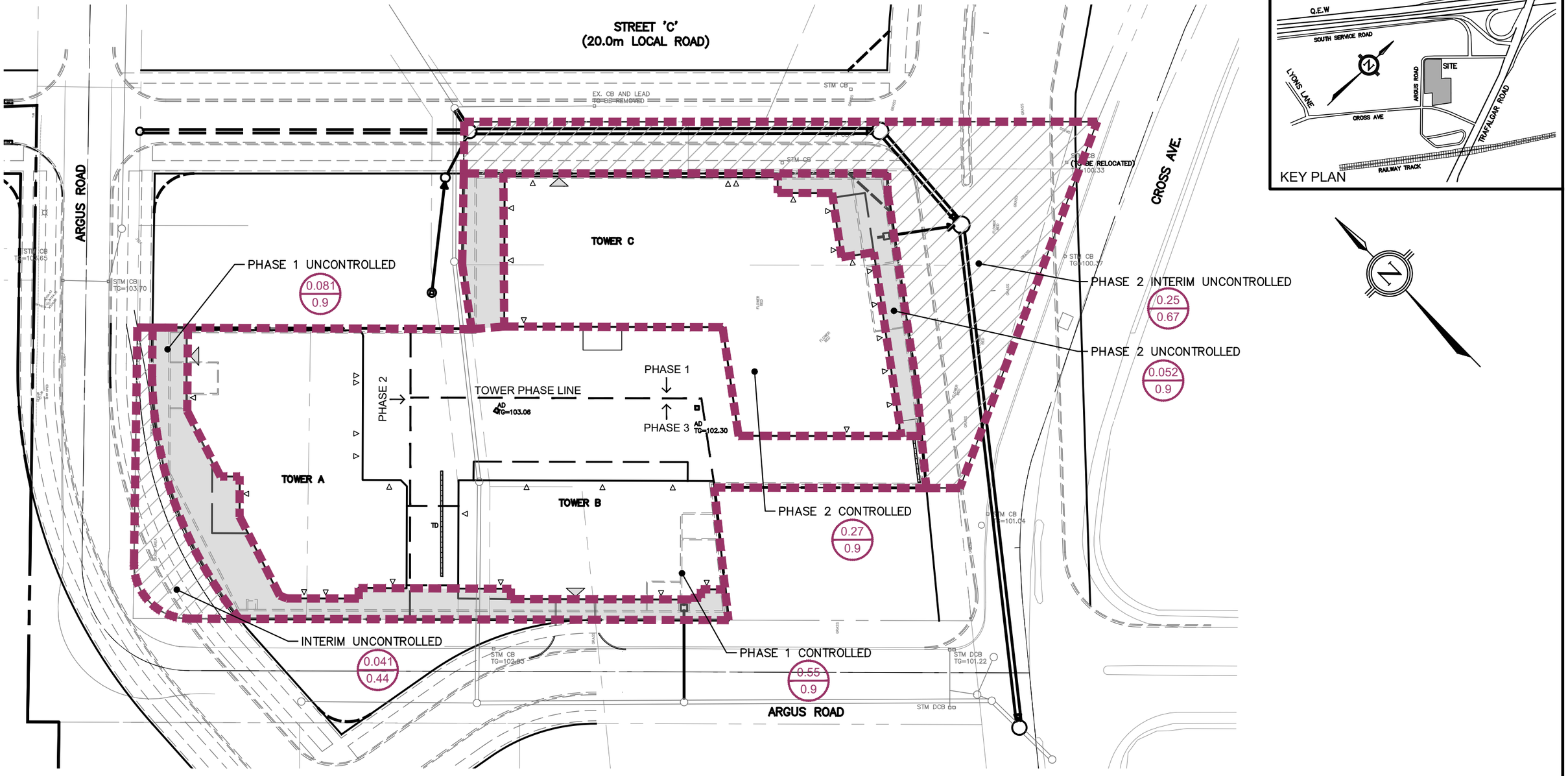
PLOTDATE: Sep 20, 2024 - 10:35am



LEGEND

0.90
0.90 — AREA IN HECTARES, STORM RUN-OFF COEFFICIENT

STORM DRAINAGE AREA BOUNDARY

PROJECT TITLE
ARGUS CROSS
PROPOSED RESIDENTIAL CONDOMINIUM DEVELOPMENT
DISTRIKT DEVELOPMENTS

DRAWING TITLE
POST-DEVELOPMENT STORM DRAINAGE PLAN

TRAFALGAR ENGINEERING
#1-481 MORDEN ROAD, OAKVILLE, ON, L6K 3W6
www.trafalgareng.com

DESIGN BY	NAS	SCALE	1:750	DRAWING No. FIG. 3
DRAWN BY	ZI	DATE	2022/05/06	

FILENAME: P:\1729 Cross and Argus\04-CAD\04-Rezoning_OPA\1729GS.dwg
PLOTDATE: Sep 20, 2024 - 9:59am

TRAFALGAR ENGINEERING LTD.

COMPOSITE RUNOFF COEFFICIENT

Project: Argus Cross - Phase 1 **Project No.:** 1729
Desc: OPA/ZBA - TOC Submission **Prepared By:** NAS
Checked By: NAS

Pre-Development Composite Runoff Coefficient

Surface	'A' (m^2)	'C'	'AC'	% Imp	'AI'
Pre-Development Impervious	5186	0.90	4667	100%	5186
Pre-Development Pervious	1156	0.25	289	0%	-
Totals	**6342**		**4956**		**5186**
		C = 'AC'/'A'= 0.78		**%I = 'AI'/'A' = 82%**	

External Drainage Area Composite Runoff Coefficient

Surface	'A' (m^2)	'C'	'AC'	% Imp	'AI'
			-		-
			-		-
			-		-
			-		-
			-		-
Totals	**-**		**-**		**-**
		C = 'AC'/'A'= -		**%I = 'AI'/'A' = -**	

Post-Development Controlled Area Composite Runoff Coefficient

Surface	'A' (m^2)	'C'	'AC'	% Imp	'AI'
Phase 1 Controlled	5532	0.90	4979	100%	5532
			-		-
			-		-
			-		-
Totals	**5532**		**4979**		**5532**
		C = 'AC'/'A'= 0.90		**%I = 'AI'/'A' = 100%**	

Post-Development Uncontrolled Area Composite Runoff Coefficient

Surface	'A' (m^2)	'C'	'AC'	% Imp	'AI'
Phase 1 Uncontrolled	810	0.90	729	100%	810
			-		-
			-		-
			-		-
			-		-
Totals	**810**		**729**		**810**
		C = 'AC'/'A'= 0.90		**%I = 'AI'/'A' = 100%**	

TRAFALGAR ENGINEERING LTD.

RATIONAL METHOD FLOWS

Based on Town of Oakville IDF Data

Project: Argus Cross - Phase 1 **Project No.:** 1729
Desc: OPA/ZBA - TOC Submission **Prepared By:** NAS
Checked By: NAS

Pre-Development Parameters

	Site	External	Total
'C'	0.782	0.000	0.782
'A' (ha)	0.634	0.000	0.634
'AC'	0.496	0.000	0.496

Pre-Development Flow

Return	Intensity (mm/hr)	Site Flow (L/s)	External Flow (L/s)	Total Flow (L/s)
2-yr	82.2	113	0	113
5-yr	114.2	157	0	157
10-yr	134.8	186	0	186
25-yr	162.2	246	0	246
50-yr	182.1	301	0	301
100-yr	200.8	346	0	346

Flows have been adjusted using 25-, 50-, and 100-yr factors of 1.1, 1.2, and 1.25 (To a maximum C of 1.0)

Post-Development Parameters

	Controlled	Uncontrolled	External	Total
'C'	0.900	0.900	0.000	0.900
'A' (ha)	0.553	0.081	0.000	0.634
'AC'	0.498	0.073	0.000	0.571

Post-Development Flow

Return	Intensity (mm/hr)	Peak Inflow (L/s)	Uncontrolled Flow (L/s)	Peak Rooftop Flow (L/s)	External Flow (L/s)	Total Flow (L/s)
2-yr	82.2	114	17	0	0	131
5-yr	114.2	158	23	0	0	181
10-yr	134.8	186	27	0	0	213
25-yr	162.2	247	36	0	0	283
50-yr	182.1	280	41	0	0	321
100-yr	200.8	309	45	0	0	354

Flows have been adjusted using 25-, 50-, and 100-yr factors of 1.1, 1.2, and 1.25 (To a maximum C of 1.0)

Post-to-Pre Comparison*

Return	Pre-Dev Total (L/s)	Post-Dev Total (L/s)	Percent Change
2-yr	113	131	16%
5-yr	157	181	15%
10-yr	186	213	15%
25-yr	246	283	15%
50-yr	301	321	7%
100-yr	346	354	2%

*Storage may be required, refer to Modified Rational Method Storage Calculation and Summary sheets if applicable

TRAFALGAR ENGINEERING LTD.

MODIFIED RATIONAL METHOD STORAGE

Based on Town of Oakville IDF Data

Project: Argus Cross - Phase 1 **Project No.:** 1729
Desc: OPA/ZBA - TOC Submission **Prepared By:** NAS
Checked By: NAS

Pre-Development

Catchment Area (ha)	0.6342
Runoff Coefficient	0.78
TC (min)	10
Control Level	2-Yr

Pre-Development Peak Intensity: 82.2 mm/hr
Pre-Development Peak Discharge: 0.113 (cms)

Post-Development Uncontrolled

Catchment Area (ha)	0.0810
Runoff Coefficient	0.90
TC (min)	10
Control Level	2-Yr

Uncontrolled Peak Discharge: 0.017 (cms)

Post-Development Controlled

Catchment Area (ha)	0.5532	
Runoff Coefficient	0.90	(1.00 Adj. Factor)
Time of Concentration	10	
Control Level	2-Yr	

Post-Development Peak Intensity: 82.2 mm/hr
Post-Development Peak Discharge: 0.114 (cms)
Allowable Release Rate: 0.06 (cms)

Storm Duration T_D (min)	Intensity $i = A \times T_D^{-C}$ (mm/hr)	Inflow Rate $Q_P = CiA/360$ (m^3/s)	Average Roof Discharge (m^3/s)	Max. Release Rate $Q_A = Ci_{2YR}A$ (m^3/s)	Inflow Volume $V_I = 60Q_PT_D$ (m^3)	Outflow Volume $V_O = 30Q_A(T_D+T_C)$ (m^3)	Storage $S = V_I - V_O$ (m^3)
10	82.18	0.114	0.000	0.060	68.2	36.0	32.2
15	64.96	0.090	0.000	0.060	80.9	45.0	35.9
20	54.15	0.075	0.000	0.060	89.9	54.0	35.9
25	46.68	0.065	0.000	0.060	96.8	63.0	33.8
30	41.19	0.057	0.000	0.060	102.5	72.0	30.5
35	36.95	0.051	0.000	0.060	107.3	81.0	26.3
40	33.58	0.046	0.000	0.060	111.5	90.0	21.5
45	30.83	0.043	0.000	0.060	115.1	99.0	16.1
50	28.54	0.039	0.000	0.060	118.4	108.0	10.4
55	26.59	0.037	0.000	0.060	121.4	117.0	4.4
60	24.92	0.034	0.000	0.060	124.1	126.0	0

TRAFALGAR ENGINEERING LTD.

MODIFIED RATIONAL METHOD STORAGE

Based on Town of Oakville IDF Data

Project: Argus Cross - Phase 1 **Project No.:** 1729
Desc: OPA/ZBA - TOC Submission **Prepared By:** NAS
Checked By: NAS

Pre-Development

Catchment Area (ha)	0.6342
Runoff Coefficient	0.78
TC (min)	10
Control Level	5-Yr

Pre-Development Peak Intensity: 114.2 mm/hr
Pre-Development Peak Discharge: 0.157 (cms)

Post-Development Uncontrolled

Catchment Area (ha)	0.0810
Runoff Coefficient	0.90
TC (min)	10
Control Level	5-Yr

Uncontrolled Peak Discharge: 0.024 (cms)

Post-Development Controlled

Catchment Area (ha)	0.5532	
Runoff Coefficient	0.90	(1.00 Adj. Factor)
Time of Concentration	10	
Control Level	5-Yr	

Post-Development Peak Intensity: 114.2 mm/hr
Post-Development Peak Discharge: 0.158 (cms)
Allowable Release Rate: 0.06 (cms)

Storm Duration T_D (min)	Intensity $i = A \times T_D^{-C}$ (mm/hr)	Inflow Rate $Q_P = CiA/360$ (m^3/s)	Average Roof Discharge (m^3/s)	Max. Release Rate $Q_A = Ci_{2YR}A$ (m^3/s)	Inflow Volume $V_I = 60Q_PT_D$ (m^3)	Outflow Volume $V_O = 30Q_A(T_D+T_C)$ (m^3)	Storage $S = V_I - V_O$ (m^3)
10	114.21	0.158	0.000	0.060	94.8	36.0	58.8
15	90.59	0.125	0.000	0.060	112.8	45.0	67.8
20	75.54	0.104	0.000	0.060	125.4	54.0	71.4
25	65.06	0.090	0.000	0.060	135.0	63.0	72.0
30	57.31	0.079	0.000	0.060	142.7	72.0	70.7
35	51.33	0.071	0.000	0.060	149.1	81.0	68.1
40	46.57	0.064	0.000	0.060	154.6	90.0	64.6
45	42.67	0.059	0.000	0.060	159.3	99.0	60.3
50	39.43	0.055	0.000	0.060	163.6	108.0	55.6
55	36.67	0.051	0.000	0.060	167.4	117.0	50.4
60	34.31	0.047	0.000	0.060	170.8	126.0	44.8
90	25.00	0.035	0.000	0.060	186.7	180.0	6.7
120	19.87	0.027	0.000	0.060	197.8	234.0	0

TRAFALGAR ENGINEERING LTD.

MODIFIED RATIONAL METHOD STORAGE

Based on Town of Oakville IDF Data

Project: Argus Cross - Phase 1 **Project No.:** 1729
Desc: OPA/ZBA - TOC Submission **Prepared By:** NAS
Checked By: NAS

Pre-Development

Catchment Area (ha)	0.6342
Runoff Coefficient	0.78
TC (min)	10
Control Level	10-Yr

Pre-Development Peak Intensity: 134.8 mm/hr
Pre-Development Peak Discharge: 0.186 (cms)

Post-Development Uncontrolled

Catchment Area (ha)	0.0810
Runoff Coefficient	0.90
TC (min)	10
Control Level	10-Yr

Uncontrolled Peak Discharge: 0.028 (cms)

Post-Development Controlled

Catchment Area (ha)	0.5532	
Runoff Coefficient	0.90	(1.00 Adj. Factor)
Time of Concentration	10	
Control Level	10-Yr	

Post-Development Peak Intensity: 134.8 mm/hr
Post-Development Peak Discharge: 0.186 (cms)
Allowable Release Rate: 0.06 (cms)

Storm Duration T_D (min)	Intensity $i = A \times T_D^{-C}$ (mm/hr)	Inflow Rate $Q_P = CiA/360$ (m^3/s)	Average Roof Discharge (m^3/s)	Max. Release Rate $Q_A = Ci_{2YR}A$ (m^3/s)	Inflow Volume $V_I = 60Q_PT_D$ (m^3)	Outflow Volume $V_O = 30Q_A(T_D+T_C)$ (m^3)	Storage $S = V_I - V_O$ (m^3)
10	134.79	0.186	0.000	0.060	111.9	36.0	75.9
15	106.76	0.148	0.000	0.060	132.9	45.0	87.9
20	88.94	0.123	0.000	0.060	147.6	54.0	93.6
25	76.53	0.106	0.000	0.060	158.8	63.0	95.8
30	67.37	0.093	0.000	0.060	167.7	72.0	95.7
35	60.30	0.083	0.000	0.060	175.1	81.0	94.1
40	54.67	0.076	0.000	0.060	181.4	90.0	91.4
45	50.07	0.069	0.000	0.060	187.0	99.0	88.0
50	46.24	0.064	0.000	0.060	191.8	108.0	83.8
55	42.99	0.059	0.000	0.060	196.2	117.0	79.2
60	40.20	0.056	0.000	0.060	200.2	126.0	74.2
90	29.24	0.040	0.000	0.060	218.3	180.0	38.3
120	23.21	0.032	0.000	0.060	231.1	234.0	0

TRAFALGAR ENGINEERING LTD.

MODIFIED RATIONAL METHOD STORAGE

Based on Town of Oakville IDF Data

Project: Argus Cross - Phase 1 **Project No.:** 1729
Desc: OPA/ZBA - TOC Submission **Prepared By:** NAS
Checked By: NAS

Pre-Development

Catchment Area (ha)	0.6342
Runoff Coefficient	0.86
TC (min)	10
Control Level	25-Yr

Pre-Development Peak Intensity: 162.2 mm/hr
Pre-Development Peak Discharge: 0.246 (cms)

Post-Development Uncontrolled

Catchment Area (ha)	0.0810
Runoff Coefficient	0.99
TC (min)	10
Control Level	25-Yr

Uncontrolled Peak Discharge: 0.037 (cms)

Post-Development Controlled

Catchment Area (ha)	0.5532	
Runoff Coefficient	0.99	(1.10 Adj. Factor)
Time of Concentration	10	
Control Level	25-Yr	

Post-Development Peak Intensity: 162.2 mm/hr
Post-Development Peak Discharge: 0.247 (cms)
Allowable Release Rate: 0.06 (cms)

Storm Duration T_D (min)	Intensity $i = A \times T_D^{-C}$ (mm/hr)	Inflow Rate $Q_P = CiA/360$ (m^3/s)	Average Roof Discharge (m^3/s)	Max. Release Rate $Q_A = Ci_{2YR}A$ (m^3/s)	Inflow Volume $V_I = 60Q_PT_D$ (m^3)	Outflow Volume $V_O = 30Q_A(T_D+T_C)$ (m^3)	Storage $S = V_I - V_O$ (m^3)
10	162.17	0.247	0.000	0.060	148.0	36.0	112.0
15	128.00	0.195	0.000	0.060	175.3	45.0	130.3
20	106.39	0.162	0.000	0.060	194.2	54.0	140.2
25	91.40	0.139	0.000	0.060	208.6	63.0	145.6
30	80.36	0.122	0.000	0.060	220.0	72.0	148.0
35	71.85	0.109	0.000	0.060	229.6	81.0	148.6
40	65.09	0.099	0.000	0.060	237.7	90.0	147.7
45	59.58	0.091	0.000	0.060	244.7	99.0	145.7
50	54.99	0.084	0.000	0.060	250.9	108.0	142.9
55	51.10	0.078	0.000	0.060	256.5	117.0	139.5
60	47.77	0.073	0.000	0.060	261.6	126.0	135.6
90	34.67	0.053	0.000	0.060	284.8	180.0	104.8
120	27.48	0.042	0.000	0.060	301.0	234.0	67.0
150	22.90	0.035	0.000	0.060	313.6	288.0	25.6
180	19.71	0.030	0.000	0.060	323.9	342.0	0

TRAFALGAR ENGINEERING LTD.

MODIFIED RATIONAL METHOD STORAGE

Based on Town of Oakville IDF Data

Project: Argus Cross - Phase 1 **Project No.:** 1729
Desc: OPA/ZBA - TOC Submission **Prepared By:** NAS
Checked By: NAS

Pre-Development

Catchment Area (ha)	0.6342
Runoff Coefficient	0.94
TC (min)	10
Control Level	50-Yr

Pre-Development Peak Intensity: 182.1 mm/hr
Pre-Development Peak Discharge: 0.301 (cms)

Post-Development Uncontrolled

Catchment Area (ha)	0.0810
Runoff Coefficient	1.00
TC (min)	10
Control Level	50-Yr

Uncontrolled Peak Discharge: 0.042 (cms)

Post-Development Controlled

Catchment Area (ha)	0.5532	
Runoff Coefficient	1.00	(1.20 Adj. Factor)
Time of Concentration	10	
Control Level	50-Yr	

Post-Development Peak Intensity: 182.1 mm/hr
Post-Development Peak Discharge: 0.28 (cms)
Allowable Release Rate: 0.06 (cms)

Storm Duration T_D (min)	Intensity $i = A \times T_D^{-C}$ (mm/hr)	Inflow Rate $Q_P = CiA/360$ (m^3/s)	Average Roof Discharge (m^3/s)	Max. Release Rate $Q_A = Ci_{2YR}A$ (m^3/s)	Inflow Volume $V_I = 60Q_PT_D$ (m^3)	Outflow Volume $V_O = 30Q_A(T_D+T_C)$ (m^3)	Storage $S = V_I - V_O$ (m^3)
10	182.06	0.280	0.000	0.060	167.9	36.0	131.9
15	143.68	0.221	0.000	0.060	198.7	45.0	153.7
20	119.36	0.183	0.000	0.060	220.1	54.0	166.1
25	102.47	0.157	0.000	0.060	236.2	63.0	173.2
30	90.02	0.138	0.000	0.060	249.0	72.0	177.0
35	80.44	0.124	0.000	0.060	259.6	81.0	178.6
40	72.82	0.112	0.000	0.060	268.6	90.0	178.6
45	66.61	0.102	0.000	0.060	276.3	99.0	177.3
50	61.43	0.094	0.000	0.060	283.2	108.0	175.2
55	57.06	0.088	0.000	0.060	289.3	117.0	172.3
60	53.30	0.082	0.000	0.060	294.9	126.0	168.9
90	38.57	0.059	0.000	0.060	320.1	180.0	140.1
120	30.51	0.047	0.000	0.060	337.6	234.0	103.6
150	25.38	0.039	0.000	0.060	351.0	288.0	63.0
180	21.81	0.034	0.000	0.060	361.9	342.0	19.9
210	19.17	0.029	0.000	0.060	371.2	396.0	0

TRAFALGAR ENGINEERING LTD.

MODIFIED RATIONAL METHOD STORAGE

Based on Town of Oakville IDF Data

Project: Argus Cross - Phase 1 **Project No.:** 1729
Desc: OPA/ZBA - TOC Submission **Prepared By:** NAS
Checked By: NAS

Pre-Development

Catchment Area (ha)	0.6342
Runoff Coefficient	0.98
TC (min)	10
Control Level	100-Yr

Pre-Development Peak Intensity: 200.8 mm/hr
Pre-Development Peak Discharge: 0.346 (cms)

Post-Development Uncontrolled

Catchment Area (ha)	0.0810
Runoff Coefficient	1.00
TC (min)	10
Control Level	100-Yr

Uncontrolled Peak Discharge: 0.046 (cms)

Post-Development Controlled

Catchment Area (ha)	0.5532	
Runoff Coefficient	1.00	(1.25 Adj. Factor)
Time of Concentration	10	
Control Level	100-Yr	

Post-Development Peak Intensity: 200.8 mm/hr
Post-Development Peak Discharge: 0.309 (cms)
Allowable Release Rate: 0.06 (cms)

Storm Duration T_D (min)	Intensity $i = A \times T_D^{-C}$ (mm/hr)	Inflow Rate $Q_P = CiA/360$ (m^3/s)	Average Roof Discharge (m^3/s)	Max. Release Rate $Q_A = Ci_{2YR}A$ (m^3/s)	Inflow Volume $V_I = 60Q_PT_D$ (m^3)	Outflow Volume $V_O = 30Q_A(T_D+T_C)$ (m^3)	Storage $S = V_I - V_O$ (m^3)
10	200.80	0.309	0.000	0.060	185.1	36.0	149.1
15	158.27	0.243	0.000	0.060	218.9	45.0	173.9
20	131.37	0.202	0.000	0.060	242.2	54.0	188.2
25	112.72	0.173	0.000	0.060	259.8	63.0	196.8
30	98.99	0.152	0.000	0.060	273.8	72.0	201.8
35	88.43	0.136	0.000	0.060	285.3	81.0	204.3
40	80.03	0.123	0.000	0.060	295.1	90.0	205.1
45	73.19	0.112	0.000	0.060	303.6	99.0	204.6
50	67.49	0.104	0.000	0.060	311.1	108.0	203.1
55	62.68	0.096	0.000	0.060	317.8	117.0	200.8
60	58.55	0.090	0.000	0.060	323.9	126.0	197.9
90	42.35	0.065	0.000	0.060	351.4	180.0	171.4
120	33.49	0.051	0.000	0.060	370.5	234.0	136.5
150	27.85	0.043	0.000	0.060	385.2	288.0	97.2
180	23.93	0.037	0.000	0.060	397.2	342.0	55.2
210	21.04	0.032	0.000	0.060	407.3	396.0	11.3
240	18.81	0.029	0.000	0.060	416.1	450.0	0

TRAFALGAR ENGINEERING LTD.

COMPOSITE RUNOFF COEFFICIENT

Project: Argus Cross - Phase 2 **Project No.:** 1729
Desc: OPA/ZBA TOC Submission **Prepared By:** NAS
Checked By: NAS

Pre-Development Composite Runoff Coefficient

Surface	'A' (m^2)	'C'	'AC'	% Imp	'AI'
Pre-Development	3225	0.90	2903	100%	3225
			-		-
			-		-
			-		-
			-		-
Totals	**3225**		**2903**		**3225**
		C = 'AC'/'A'=	**0.90**	**%I = 'AI'/'A' =**	**100%**

External Drainage Area Composite Runoff Coefficient

Surface	'A' (m^2)	'C'	'AC'	% Imp	'AI'
			-		-
			-		-
			-		-
			-		-
			-		-
Totals	**-**		**-**		**-**
		C = 'AC'/'A'=	**-**	**%I = 'AI'/'A' =**	**-**

Post-Development Controlled Area Composite Runoff Coefficient

Surface	'A' (m^2)	'C'	'AC'	% Imp	'AI'
Phase 2	2673	0.90	2406	100%	2673
			-		-
			-		-
			-		-
			-		-
Totals	**2673**		**2406**		**2673**
		C = 'AC'/'A'=	**0.90**	**%I = 'AI'/'A' =**	**100%**

Post-Development Uncontrolled Area Composite Runoff Coefficient

Surface	'A' (m^2)	'C'	'AC'	% Imp	'AI'
Phase 2 Uncontrolled	552	0.90	497	100%	552
			-		-
			-		-
			-		-
			-		-
Totals	**552**		**497**		**552**
		C = 'AC'/'A'=	**0.90**	**%I = 'AI'/'A' =**	**100%**

TRAFALGAR ENGINEERING LTD.

RATIONAL METHOD FLOWS

Based on Town of Oakville IDF Data

Project: Argus Cross - Phase 2 **Project No.:** 1729
Desc: OPA/ZBA TOC Submission **Prepared By:** NAS
Checked By: NAS

Pre-Development Parameters

	Site	External	Total
'C'	0.900	0.000	0.900
'A' (ha)	0.323	0.000	0.323
'AC'	0.290	0.000	0.290

Pre-Development Flow

Return	Intensity (mm/hr)	Site Flow (L/s)	External Flow (L/s)	Total Flow (L/s)
2-yr	82.2	66	0	66
5-yr	114.2	92	0	92
10-yr	134.8	109	0	109
25-yr	162.2	144	0	144
50-yr	182.1	163	0	163
100-yr	200.8	180	0	180

Flows have been adjusted using 25-, 50-, and 100-yr factors of 1.1, 1.2, and 1.25 (To a maximum C of 1.0)

Post-Development Parameters

	Controlled	Uncontrolled	External	Total
'C'	0.900	0.900	0.000	0.900
'A' (ha)	0.267	0.055	0.000	0.323
'AC'	0.241	0.050	0.000	0.290

Post-Development Flow

Return	Intensity (mm/hr)	Peak Inflow (L/s)	Uncontrolled Flow (L/s)	Peak Rooftop Flow (L/s)	External Flow (L/s)	Total Flow (L/s)
2-yr	82.2	55	11	0	0	66
5-yr	114.2	76	16	0	0	92
10-yr	134.8	90	19	0	0	109
25-yr	162.2	119	25	0	0	144
50-yr	182.1	135	28	0	0	163
100-yr	200.8	149	31	0	0	180

Flows have been adjusted using 25-, 50-, and 100-yr factors of 1.1, 1.2, and 1.25 (To a maximum C of 1.0)

Post-to-Pre Comparison*

Return	Pre-Dev Total (L/s)	Post-Dev Total (L/s)	Percent Change
2-yr	66	66	0%
5-yr	92	92	0%
10-yr	109	109	0%
25-yr	144	144	0%
50-yr	163	163	0%
100-yr	180	180	0%

*Storage may be required, refer to Modified Rational Method Storage Calculation and Summary sheets if applicable

TRAFALGAR ENGINEERING LTD.

MODIFIED RATIONAL METHOD STORAGE

Based on Town of Oakville IDF Data

Project: Argus Cross - Phase 2 **Project No.:** 1729
Desc: OPA/ZBA TOC Submission **Prepared By:** NAS
Checked By: NAS

Pre-Development

Catchment Area (ha)	0.3225
Runoff Coefficient	0.90
TC (min)	10
Control Level	2-Yr

Pre-Development Peak Intensity: 82.2 mm/hr
Pre-Development Peak Discharge: 0.066 (cms)

Post-Development Uncontrolled

Catchment Area (ha)	0.0552
Runoff Coefficient	0.90
TC (min)	10
Control Level	2-Yr

Uncontrolled Peak Discharge: 0.012 (cms)

Post-Development Controlled

Catchment Area (ha)	0.2673	
Runoff Coefficient	0.90	(1.00 Adj. Factor)
Time of Concentration	10	
Control Level	2-Yr	

Post-Development Peak Intensity: 82.2 mm/hr
Post-Development Peak Discharge: 0.055 (cms)
Allowable Release Rate: 0.05 (cms)

Storm Duration T_D (min)	Intensity $i = A \times T_D^{-C}$ (mm/hr)	Inflow Rate $Q_P = CiA/360$ (m^3/s)	Average Roof Discharge (m^3/s)	Max. Release Rate $Q_A = Ci_{2YR}A$ (m^3/s)	Inflow Volume $V_I = 60Q_PT_D$ (m^3)	Outflow Volume $V_O = 30Q_A(T_D+T_C)$ (m^3)	Storage $S = V_I - V_O$ (m^3)
10	82.18	0.055	0.000	0.050	33.0	30.0	3.0
15	64.96	0.043	0.000	0.050	39.1	37.5	1.6
20	54.15	0.036	0.000	0.050	43.4	45.0	0

TRAFALGAR ENGINEERING LTD.

MODIFIED RATIONAL METHOD STORAGE

Based on Town of Oakville IDF Data

Project: Argus Cross - Phase 2 **Project No.:** 1729
Desc: OPA/ZBA TOC Submission **Prepared By:** NAS
Checked By: NAS

Pre-Development

Catchment Area (ha)	0.3225
Runoff Coefficient	0.90
TC (min)	10
Control Level	5-Yr

Pre-Development Peak Intensity: 114.2 mm/hr
Pre-Development Peak Discharge: 0.092 (cms)

Post-Development Uncontrolled

Catchment Area (ha)	0.0552
Runoff Coefficient	0.90
TC (min)	10
Control Level	5-Yr

Uncontrolled Peak Discharge: 0.016 (cms)

Post-Development Controlled

Catchment Area (ha)	0.2673	
Runoff Coefficient	0.90	(1.00 Adj. Factor)
Time of Concentration	10	
Control Level	5-Yr	

Post-Development Peak Intensity: 114.2 mm/hr
Post-Development Peak Discharge: 0.076 (cms)
Allowable Release Rate: 0.05 (cms)

Storm Duration T_D (min)	Intensity $i = A \times T_D^{-C}$ (mm/hr)	Inflow Rate $Q_P = CiA/360$ (m^3/s)	Average Roof Discharge (m^3/s)	Max. Release Rate $Q_A = Ci_{2YR}A$ (m^3/s)	Inflow Volume $V_I = 60Q_PT_D$ (m^3)	Outflow Volume $V_O = 30Q_A(T_D+T_C)$ (m^3)	Storage $S = V_I - V_O$ (m^3)
10	114.21	0.076	0.000	0.050	45.8	30.0	15.8
15	90.59	0.061	0.000	0.050	54.5	37.5	17.0
20	75.54	0.050	0.000	0.050	60.6	45.0	15.6
25	65.06	0.043	0.000	0.050	65.2	52.5	12.7
30	57.31	0.038	0.000	0.050	68.9	60.0	8.9
35	51.33	0.034	0.000	0.050	72.0	67.5	4.5
40	46.57	0.031	0.000	0.050	74.7	75.0	0

TRAFALGAR ENGINEERING LTD.

MODIFIED RATIONAL METHOD STORAGE

Based on Town of Oakville IDF Data

Project: Argus Cross - Phase 2 **Project No.:** 1729
Desc: OPA/ZBA TOC Submission **Prepared By:** NAS
Checked By: NAS

Pre-Development

Catchment Area (ha)	0.3225
Runoff Coefficient	0.90
TC (min)	10
Control Level	10-Yr

Pre-Development Peak Intensity: 134.8 mm/hr
Pre-Development Peak Discharge: 0.109 (cms)

Post-Development Uncontrolled

Catchment Area (ha)	0.0552
Runoff Coefficient	0.90
TC (min)	10
Control Level	10-Yr

Uncontrolled Peak Discharge: 0.019 (cms)

Post-Development Controlled

Catchment Area (ha)	0.2673	
Runoff Coefficient	0.90	(1.00 Adj. Factor)
Time of Concentration	10	
Control Level	10-Yr	

Post-Development Peak Intensity: 134.8 mm/hr
Post-Development Peak Discharge: 0.09 (cms)
Allowable Release Rate: 0.05 (cms)

Storm Duration T_D (min)	Intensity $i = A \times T_D^{-C}$ (mm/hr)	Inflow Rate $Q_P = CiA/360$ (m^3/s)	Average Roof Discharge (m^3/s)	Max. Release Rate $Q_A = Ci_{2YR}A$ (m^3/s)	Inflow Volume $V_I = 60Q_PT_D$ (m^3)	Outflow Volume $V_O = 30Q_A(T_D+T_C)$ (m^3)	Storage $S = V_I - V_O$ (m^3)
10	134.79	0.090	0.000	0.050	54.0	30.0	24.0
15	106.76	0.071	0.000	0.050	64.2	37.5	26.7
20	88.94	0.059	0.000	0.050	71.3	45.0	26.3
25	76.53	0.051	0.000	0.050	76.7	52.5	24.2
30	67.37	0.045	0.000	0.050	81.0	60.0	21.0
35	60.30	0.040	0.000	0.050	84.6	67.5	17.1
40	54.67	0.037	0.000	0.050	87.7	75.0	12.7
45	50.07	0.033	0.000	0.050	90.3	82.5	7.8
50	46.24	0.031	0.000	0.050	92.7	90.0	2.7
55	42.99	0.029	0.000	0.050	94.8	97.5	0

TRAFALGAR ENGINEERING LTD.

MODIFIED RATIONAL METHOD STORAGE

Based on Town of Oakville IDF Data

Project: Argus Cross - Phase 2 **Project No.:** 1729
Desc: OPA/ZBA TOC Submission **Prepared By:** NAS
Checked By: NAS

Pre-Development

Catchment Area (ha)	0.3225
Runoff Coefficient	0.99
TC (min)	10
Control Level	25-Yr

Pre-Development Peak Intensity: 162.2 mm/hr
Pre-Development Peak Discharge: 0.144 (cms)

Post-Development Uncontrolled

Catchment Area (ha)	0.0552
Runoff Coefficient	0.99
TC (min)	10
Control Level	25-Yr

Uncontrolled Peak Discharge: 0.025 (cms)

Post-Development Controlled

Catchment Area (ha)	0.2673	
Runoff Coefficient	0.99	(1.10 Adj. Factor)
Time of Concentration	10	
Control Level	25-Yr	

Post-Development Peak Intensity: 162.2 mm/hr
Post-Development Peak Discharge: 0.119 (cms)
Allowable Release Rate: 0.05 (cms)

Storm Duration T_D (min)	Intensity $i = A \times T_D^{-C}$ (mm/hr)	Inflow Rate $Q_P = CiA/360$ (m^3/s)	Average Roof Discharge (m^3/s)	Max. Release Rate $Q_A = Ci_{2YR}A$ (m^3/s)	Inflow Volume $V_I = 60Q_PT_D$ (m^3)	Outflow Volume $V_O = 30Q_A(T_D+T_C)$ (m^3)	Storage $S = V_I - V_O$ (m^3)
10	162.17	0.119	0.000	0.050	71.5	30.0	41.5
15	128.00	0.094	0.000	0.050	84.7	37.5	47.2
20	106.39	0.078	0.000	0.050	93.8	45.0	48.8
25	91.40	0.067	0.000	0.050	100.8	52.5	48.3
30	80.36	0.059	0.000	0.050	106.3	60.0	46.3
35	71.85	0.053	0.000	0.050	110.9	67.5	43.4
40	65.09	0.048	0.000	0.050	114.8	75.0	39.8
45	59.58	0.044	0.000	0.050	118.2	82.5	35.7
50	54.99	0.040	0.000	0.050	121.3	90.0	31.3
55	51.10	0.038	0.000	0.050	124.0	97.5	26.5
60	47.77	0.035	0.000	0.050	126.4	105.0	21.4
90	34.67	0.025	0.000	0.050	137.6	150.0	0

TRAFALGAR ENGINEERING LTD.

MODIFIED RATIONAL METHOD STORAGE

Based on Town of Oakville IDF Data

Project: Argus Cross - Phase 2 **Project No.:** 1729
Desc: OPA/ZBA TOC Submission **Prepared By:** NAS
Checked By: NAS

Pre-Development

Catchment Area (ha)	0.3225
Runoff Coefficient	1.00
TC (min)	10
Control Level	50-Yr

Pre-Development Peak Intensity: 182.1 mm/hr
Pre-Development Peak Discharge: 0.163 (cms)

Post-Development Uncontrolled

Catchment Area (ha)	0.0552
Runoff Coefficient	1.00
TC (min)	10
Control Level	50-Yr

Uncontrolled Peak Discharge: 0.028 (cms)

Post-Development Controlled

Catchment Area (ha)	0.2673	
Runoff Coefficient	1.00	(1.20 Adj. Factor)
Time of Concentration	10	
Control Level	50-Yr	

Post-Development Peak Intensity: 182.1 mm/hr
Post-Development Peak Discharge: 0.135 (cms)
Allowable Release Rate: 0.05 (cms)

Storm Duration T_D (min)	Intensity $i = A \times T_D^{-C}$ (mm/hr)	Inflow Rate $Q_P = CiA/360$ (m^3/s)	Average Roof Discharge (m^3/s)	Max. Release Rate $Q_A = Ci_{2YR}A$ (m^3/s)	Inflow Volume $V_I = 60Q_PT_D$ (m^3)	Outflow Volume $V_O = 30Q_A(T_D+T_C)$ (m^3)	Storage $S = V_I - V_O$ (m^3)
10	182.06	0.135	0.000	0.050	81.1	30.0	51.1
15	143.68	0.107	0.000	0.050	96.0	37.5	58.5
20	119.36	0.089	0.000	0.050	106.3	45.0	61.3
25	102.47	0.076	0.000	0.050	114.1	52.5	61.6
30	90.02	0.067	0.000	0.050	120.3	60.0	60.3
35	80.44	0.060	0.000	0.050	125.4	67.5	57.9
40	72.82	0.054	0.000	0.050	129.8	75.0	54.8
45	66.61	0.049	0.000	0.050	133.5	82.5	51.0
50	61.43	0.046	0.000	0.050	136.8	90.0	46.8
55	57.06	0.042	0.000	0.050	139.8	97.5	42.3
60	53.30	0.040	0.000	0.050	142.5	105.0	37.5
90	38.57	0.029	0.000	0.050	154.7	150.0	4.7
120	30.51	0.023	0.000	0.050	163.1	195.0	0

TRAFALGAR ENGINEERING LTD.

MODIFIED RATIONAL METHOD STORAGE

Based on Town of Oakville IDF Data

Project: Argus Cross - Phase 2 **Project No.:** 1729
Desc: OPA/ZBA TOC Submission **Prepared By:** NAS
Checked By: NAS

Pre-Development

Catchment Area (ha)	0.3225
Runoff Coefficient	1.00
TC (min)	10
Control Level	100-Yr

Pre-Development Peak Intensity: 200.8 mm/hr
Pre-Development Peak Discharge: 0.18 (cms)

Post-Development Uncontrolled

Catchment Area (ha)	0.0552
Runoff Coefficient	1.00
TC (min)	10
Control Level	100-Yr

Uncontrolled Peak Discharge: 0.031 (cms)

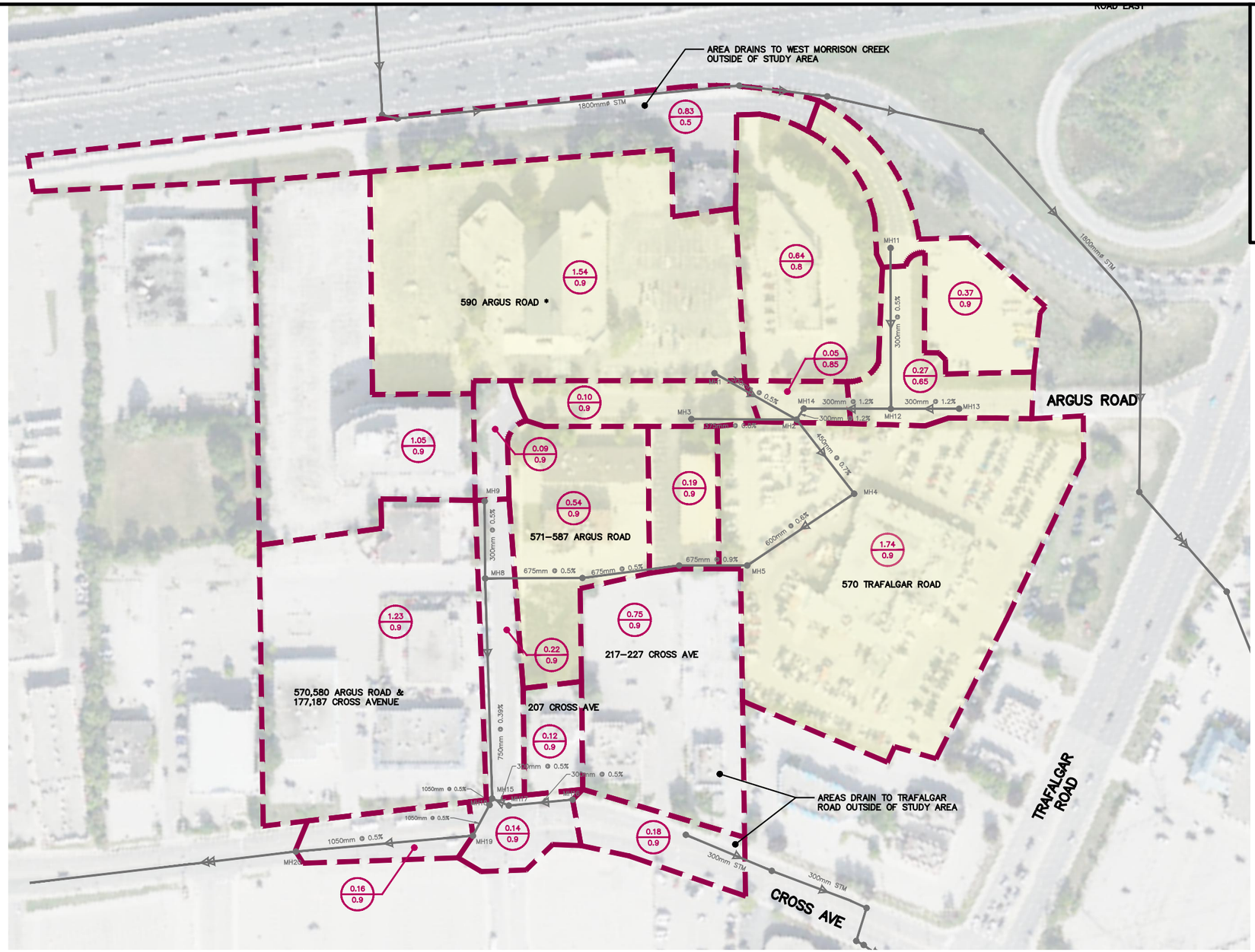
Post-Development Controlled

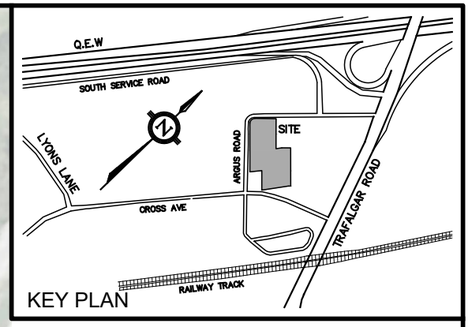
Catchment Area (ha)	0.2673	
Runoff Coefficient	1.00	(1.25 Adj. Factor)
Time of Concentration	10	
Control Level	100-Yr	

Post-Development Peak Intensity: 200.8 mm/hr
Post-Development Peak Discharge: 0.149 (cms)
Allowable Release Rate: 0.05 (cms)

Storm Duration T_D (min)	Intensity $i = A \times T_D^{-C}$ (mm/hr)	Inflow Rate $Q_P = CiA/360$ (m^3/s)	Average Roof Discharge (m^3/s)	Max. Release Rate $Q_A = Ci_{2YR}A$ (m^3/s)	Inflow Volume $V_I = 60Q_PT_D$ (m^3)	Outflow Volume $V_O = 30Q_A(T_D+T_C)$ (m^3)	Storage $S = V_I - V_O$ (m^3)
10	200.80	0.149	0.000	0.050	89.5	30.0	59.5
15	158.27	0.118	0.000	0.050	105.8	37.5	68.3
20	131.37	0.098	0.000	0.050	117.0	45.0	72.0
25	112.72	0.084	0.000	0.050	125.5	52.5	73.0
30	98.99	0.074	0.000	0.050	132.3	60.0	72.3
35	88.43	0.066	0.000	0.050	137.9	67.5	70.4
40	80.03	0.059	0.000	0.050	142.6	75.0	67.6
45	73.19	0.054	0.000	0.050	146.7	82.5	64.2
50	67.49	0.050	0.000	0.050	150.3	90.0	60.3
55	62.68	0.047	0.000	0.050	153.6	97.5	56.1
60	58.55	0.043	0.000	0.050	156.5	105.0	51.5
90	42.35	0.031	0.000	0.050	169.8	150.0	19.8
120	33.49	0.025	0.000	0.050	179.0	195.0	0

CONSTRUCTION NORTH





LEGEND

EXISTING STORM SEWER + MH

DRAINAGE AREA BOUNDARY

DRAINAGE AREA CONTRIBUTING TO 675mm ø

1.21 / 0.5 DRAINAGE AREA (ha) RUNOFF COEFFICIENT

DRAWING TITLE
EXISTING DRAINAGE PLAN FOR
675mmø SEWER REALIGNMENT

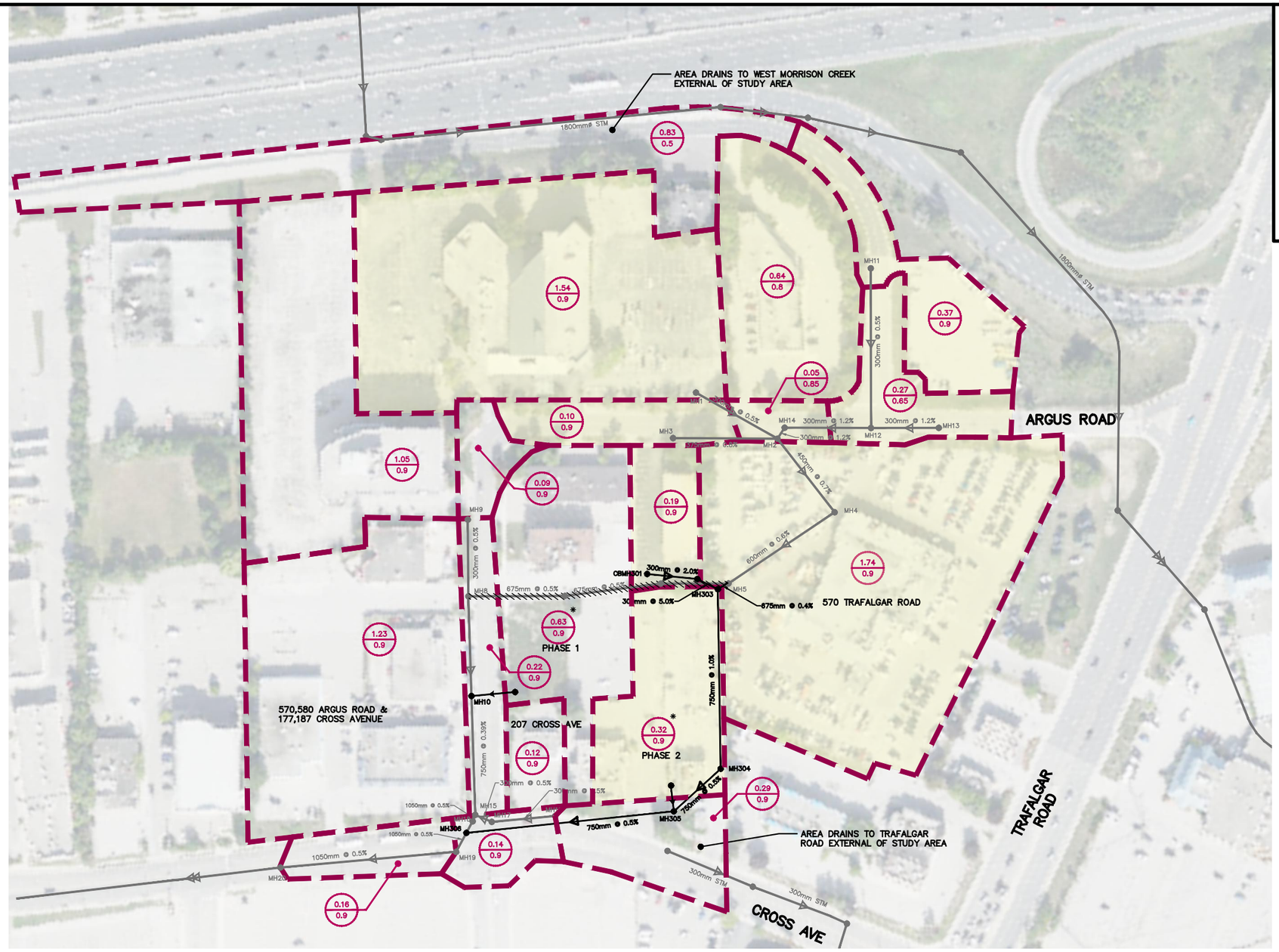
PROJECT TITLE
ARGUS CROSS

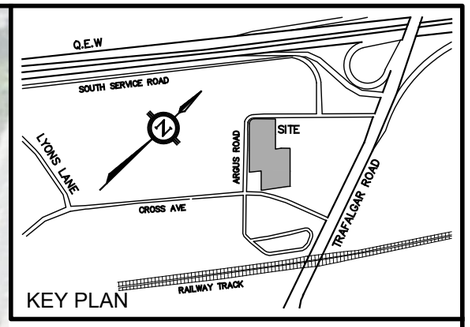
TRAFALGAR ENGINEERING
#1-481 MORDEN ROAD, OAKVILLE, ON, L6K 3W6
www.trafalgareng.com

DESIGN BY	NAS	SCALE	1:2000	DRAWING No.	FIG. 4
DRAWN BY	MW	DATE	2022/05/06		

FILENAME: P:\1798 Distrikt 590 Argus\01-Calculations\01-SWM\SSDS\1798 DRAINAGE AREA PLAN.dwg
PLOTDATE: Sep 20, 2024 - 10:35am

CONSTRUCTION NORTH





LEGEND

- PROPOSED STORM SEWER + MH
- EXISTING STORM SEWER + MH
- DRAINAGE AREA BOUNDARY
- DRAINAGE AREA CONTRIBUTING TO 675mm ø SEWER
- 1.21 / 0.5 DRAINAGE AREA (ha) RUNOFF COEFFICIENT
- * INDICATES CONTROLLED SITE RUNOFF

DRAWING TITLE
PROPOSED DRAINAGE PLAN FOR
675mmø SEWER REALIGNMENT

PROJECT TITLE
ARGUS CROSS

TRAFALGAR ENGINEERING
#1-481 MORDEN ROAD, OAKVILLE, ON, L6K 3W6
www.trafalgareng.com

DESIGN BY	NAS	SCALE	1:2000	DRAWING No.	FIG. 5
DRAWN BY	MW	DATE	2022/05/06		

FILENAME: P:\1798 Distrikt 590 Argus\01-Calculations\01-SWM\SSDS\1798 DRAINAGE AREA PLAN.dwg
PLOTDATE: Sep 20, 2024 - 12:20pm

TRAFALGAR ENGINEERING

Prepared By: NAS
Checked By: NAS
Project No. : 1729

HYDRAULIC GRADE LINE APPROXIMATION

Town of Oakville

5-Year Storm - Exisiting Conditions

Project Name : Argus Cross TOC Submission
Municipal Number: -
Date: 9/20/2024
Sheet: 1 of 1

			SEWER DESIGN				FLOW			MANHOLE LOSS					PIPE LOSS						
LOCATION	U/S MH	D/S MH	Length, L (m)	Gradient, s (%)	Pipe Dia., D (mm)	Manning's Coeff., n	Expected Flow, Q (L/s)	Friction Slope, S_f (m/m)	Velocity Head, h_v (m)	MH HGL_O (m)	Drop Across MH (m)	Bend Loss Coeff., k_b	MH Loss (m)	MH HGL_i (m)	D/S INV. (m)	Normal Depth of Flow (m)	D/S Pipe HGL (m)	Friction Loss, H_f (m)	U/S INV. (m)	U/S Pipe HGL (m)	U/S OBV. (m)
Argus Road																					
590 Argus Road	Ex.MH1	Ex.MH2	41.5	0.5	300	0.013	**439**	0.1901	1.84	113.48	0.05	0.3	0.55	114.03	101.06	0.30	114.03	7.89	101.27	121.92	101.57
234 South Service Road		MH14	41.5	0.5	300	0.013	**162**	0.0261	0.25	114.88	0.05	0.3	0.08	114.95	101.16	0.30	114.95	1.08	101.36	116.04	101.66
South Service Road	MH11	MH12	71.0	0.5	300	0.013	**107**	0.0113	0.11	116.05	0.05	0.3	0.03	116.08	101.66	0.30	116.08	0.80	102.02	116.88	102.32
East Argus	MH13	MH12	30.0	1.2	300	0.013	**56**	0.0031	0.12	116.05	0.05	0.3	0.04	116.08	101.66	0.15	116.08	0.09	102.02	116.17	102.32
East Argus	MH12	MH14	38.0	1.2	300	0.013	**170**	0.0286	0.28	114.88	0.05	0.3	0.08	114.96	101.16	0.30	114.96	1.09	101.61	116.05	101.91
East Argus	MH14	Ex.MH2	4.0	1.2	300	0.013	**321**	0.1021	0.99	113.48	0.05	1.0	0.99	114.47	101.06	0.30	114.47	0.41	101.11	114.88	101.41
West Argus Road	Ex.MH3	Ex.MH2	15.2	0.8	375	0.013	**29**	0.0002	0.06	113.48	0.05	1.0	0.06	113.54	101.06	0.11	113.54	0.00	101.18	113.54	101.56
	Ex.MH2	MH4	45.0	0.7	450	0.013	**763**	0.0659	1.10	110.18	0.05	0.3	0.33	110.51	100.69	0.46	110.51	2.97	101.01	113.48	101.46
570 Trafalgar Road	MH4	MH5	57.0	0.6	600	0.013	**1222**	0.0365	0.89	107.84	0.01	0.3	0.27	108.10	100.30	0.61	108.10	2.08	100.64	110.18	101.24
	MH5	MH6	30.0	0.9	600	0.013	**1209**	0.0357	0.87	106.50	0.01	0.3	0.26	106.77	100.04	0.61	106.77	1.07	100.29	107.84	100.89
603 Argus Rd	MH6	MH7	43.0	0.5	675	0.013	**1252**	0.0204	0.59	105.45	0.00	0.3	0.18	105.63	99.83	0.69	105.63	0.88	100.03	106.50	100.70
571-587 Argus	MH7	MH8	43.0	0.5	675	0.013	**1380**	0.0248	0.71	104.32	0.46	0.1	0.07	104.39	99.64	0.69	104.39	1.06	99.83	105.45	100.51
		MH9	5.0	0.5	300	0.013	**26**	0.0007	0.04	108.14			0.00	108.14	99.90	0.12	108.14	0.00	99.92	108.15	100.22
586 Argus	MH9	MH8	34.0	0.8	300	0.013	**324**	0.1037	1.00	104.32	0.46	0.3	0.30	104.62	99.64	0.30	104.62	3.53	99.90	108.14	100.20
580 Argus + Argus Rd ROW	MH8	MH15	100.0	0.4	750	0.013	**2036**	0.0307	1.02	100.23	0.06	1.0	1.02	101.24	98.76	0.76	101.24	3.07	99.18	104.32	99.93
207 Cross		MH15	10.0	0.5	300	0.013	**34**	0.0012	0.05	100.23	0.02	1.0	0.05	100.28	98.72	0.15	100.28	0.01	98.77	100.29	99.07
Cross Ave Trunk STM	MH15	MH19	15.0	0.8	1050	0.013	**2067**	0.0052	0.52	99.63		1.0	0.52	100.15	98.58	0.73	100.15	0.08	98.70	100.23	99.75

Notes:
1) Pipe diameter is nominal
2) Capacity and velocity are based on Imperial I.D. (Nom. Dia x 25.4/25)
3) Starting HGL is assumed to be the OBV of the pipe of the 1050 trunk sewer

Intensity, $I = A / (T_c + B)^C$ where:

A= 1170
B= 5.8
C= 0.843
t_c= Time of Concentration in minutes

TRAFALGAR ENGINEERING

Prepared By: NAS
Checked By: NAS
Project No. : 1729

HYDRAULIC GRADE LINE APPROXIMATION

Town of Oakville

5-Year Storm - Proposed Conditions

Project Name : Argus Cross TOC Submission
Municipal Number: -
Date: 10/24/2023
Sheet: 1 of 1

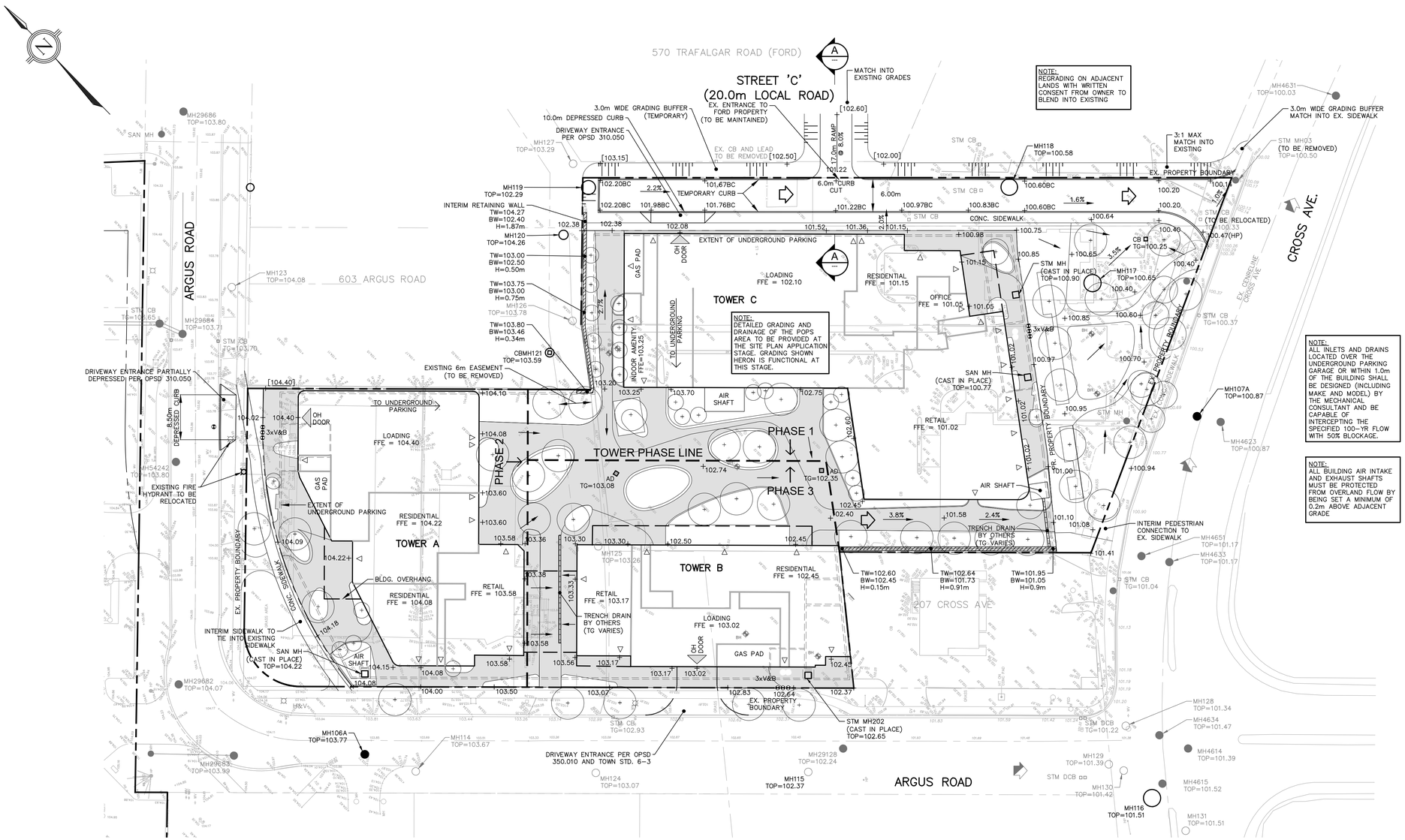
			SEWER DESIGN				FLOW			MANHOLE LOSS					PIPE LOSS						
LOCATION	U/S MH	D/S MH	Length, L (m)	Gradient, s (%)	Pipe Dia., D (mm)	Manning's Coeff., n	Expected Flow, Q (L/s)	Friction Slope, S_f (m/m)	Velocity Head, h_v (m)	MH HGL_O (m)	Drop Across MH (m)	Bend Loss Coeff., k_b	MH Loss (m)	MH HGL_i (m)	D/S INV. (m)	Normal Depth of Flow (m)	D/S Pipe HGL (m)	Friction Loss, H_f (m)	U/S INV. (m)	U/S Pipe HGL (m)	U/S OBV. (m)
Argus Road																					
590 Argus Road (Controlled)	Ex.MH1	Ex.MH2	41.5	0.5	300	0.013	**244**	0.0587	0.57	106.17	0.05	0.3	0.17	106.34	101.22	0.30	106.34	2.43	101.43	108.77	101.73
234 South Service Road		MH14	41.5	0.5	300	0.013	**162**	0.0261	0.25	107.56	0.05	0.3	0.08	107.63	101.32	0.30	107.63	1.08	101.52	108.72	101.82
South Service Road	MH11	MH12	71.0	0.5	300	0.013	**107**	0.0113	0.11	108.73	0.05	0.3	0.03	108.76	101.82	0.30	108.76	0.80	102.18	109.56	102.48
East Argus	MH13	MH12	30.0	1.2	300	0.013	**56**	0.0031	0.12	108.73	0.05	0.3	0.04	108.76	101.82	0.15	108.76	0.09	102.18	108.85	102.48
East Argus	MH12	MH14	38.0	1.2	300	0.013	**170**	0.0286	0.28	107.56	0.05	0.3	0.08	107.64	101.32	0.30	107.64	1.09	101.77	108.73	102.07
East Argus	MH14	Ex.MH2	4.0	1.2	300	0.013	**321**	0.1017	0.98	106.17	0.05	1.0	0.98	107.15	101.22	0.30	107.15	0.41	101.27	107.56	101.57
West Argus Road	Ex.MH3	Ex.MH2	15.2	0.8	375	0.013	**29**	0.0002	0.06	106.17	0.05	1.0	0.06	106.23	101.22	0.11	106.23	0.00	101.34	106.23	101.71
	Ex.MH2	MH4	45.0	0.7	450	0.013	**577**	0.0378	0.63	104.28	0.05	0.3	0.19	104.47	100.85	0.46	104.47	1.70	101.17	106.17	101.62
570 Trafalgar Road	MH4	MH5	57.0	0.6	600	0.013	**1035**	0.0261	0.64	102.60	0.05	0.3	0.19	102.79	100.46	0.61	102.79	1.49	100.80	104.28	101.40
	MH5	MH303	30.0	0.5	750	0.013	**1022**	0.0077	0.26	102.21	0.15	0.6	0.15	102.36	100.26	0.76	102.36	0.23	100.41	102.60	101.16
603 Argus Road	CBMH301	MH302	20.5	2.0	300	0.013	**54**	0.0029	0.18	102.44	0.10	0.1	0.02	102.46	101.71	0.13	102.46	0.06	102.12	102.52	102.42
	MH302	MH303	10.1	5.0	300	0.013	**54**	0.0029	0.33	102.21	0.99	0.6	0.20	102.41	101.10	0.10	102.41	0.03	101.61	102.44	101.91
Future Local Road Street 'C'	MH303	MH304	79.6	1.0	750	0.013	**1128**	0.0094	0.43	101.33	0.05	0.3	0.13	101.46	99.32	0.60	101.46	0.75	100.11	102.21	100.86
Phase 2 Controlled	MH304	MH305	24.0	0.5	750	0.013	**1154**	0.0099	0.33	100.99	0.02	0.3	0.10	101.09	99.15	0.76	101.09	0.24	99.27	101.33	100.02
	MH305	MH306	95.0	0.5	750	0.013	**1145**	0.0097	0.32	*99.75*	0.00	1.0	0.32	100.07	98.65	0.76	100.07	0.92	99.13	100.99	99.88

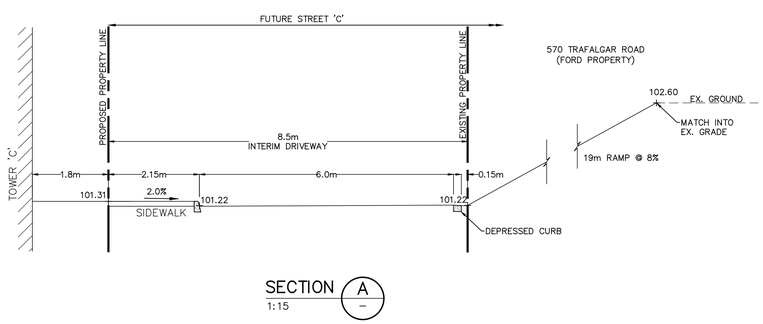
Notes:
1) Pipe diameter is nominal
2) Capacity and velocity are based on Imperial I.D. (Nom. Dia x 25.4/25)
3) Starting HGL is assumed to be the OBV of the pipe at the 1050 Trunk Sewer

Intensity, $I = A / (T_c + B)^C$ where:

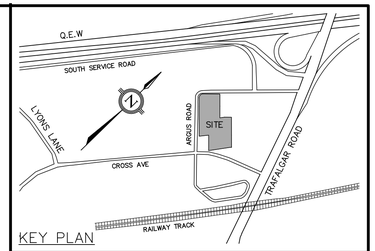
A= 1170
B= 5.8
C= 0.843
t_c= Time of Concentration in minutes

APPENDIX 'E'





SECTION A
1:15



KEY PLAN

LEGEND

- PROPOSED CATCHBASIN
- PROPOSED DOUBLE CATCHBASIN
- PROPOSED STORM MANHOLE
- PROPOSED SANITARY MANHOLE
- PROPOSED FIRE HYDRANT
- PROPOSED VALVE & BOX
- 153.78 PROPOSED FINISHED ELEVATION
- 153.46 EXISTING ELEVATION
- 153.46 EXISTING ELEVATION TO REMAIN
- EXISTING CATCHBASIN
- EXISTING STORM MH
- EXISTING SANITARY MH
- EXISTING FIRE HYDRANT
- BH1 BOREHOLE
- PROPOSED RETAINING WALL
- PROPOSED SLOPE (1:3)
- 1.0% PROPOSED SLOPE
- OVERLAND FLOW
- [153.78] INTERPOLATED EXISTING GRADE
- EXISTING OVERLAND FLOW
- OVERHEAD DOOR
- BUILDING ENTRANCE
- PROPOSED CATCHBASIN MANHOLE

NO.	MM/DD/YY	BY/DRAWN	REVISIONS
3	OCT 04, 2024	NAS/ZI	TOC DEVELOPMENT SUBMISSION
2	MAR 27, 2024	NAS/ZI	ISSUED FOR OPA/ZBA/DPS/SPA
1	MAY 11, 2022	NAS/ZI	ISSUED FOR OPA ZBA

CAD FILE: 1729GS.dwg | PLOT SCALE: 1:1 | PLOT DATE: Oct 04, 2024

ELEVATION NOTE

ELEVATIONS ARE OF GEODETIC ORIGIN (CGVD-1928:78), AND ARE DERIVED FROM GNSS OBSERVATIONS AND NATURAL RESOURCES CANADA'S GEOID MODEL HT2.0.

LOCAL BENCHMARK No. 1

CUT CROSS IN CONCRETE SIDEWALK, LOCATED AT THE NORTHERN CORNER OF THE INTERSECTION OF CROSS AVENUE AND ARGUS ROAD, AS SHOWN ON THE FACE OF PLAN
ELEVATIO=101.39m

LOCAL BENCHMARK No. 2

CUT CROSS IN CONCRETE SIDEWALK, LOCATED ON THE SOUTHEASTERN SIDE OF CROSS AVENUE ACROSS FROM NO. 217, AS SHOWN ON FACE OF PLAN
ELEVATION=100.98m

THE TOPOGRAPHIC DETAIL SHOWN HEREON WAS ACQUIRED ON JANUARY 18, 2022, BY J.D.BARNES LTD, LAND INFORMATION SPECIALISTS

LICENSED PROFESSIONAL ENGINEER N. A. SYLVESTER 100199487 OCT 04, 2024 PROVINCE OF ONTARIO

DESIGNED BY | APPROVED BY

CONSULTANT
TRAFALGAR ENGINEERING
#1-481 MORDEN ROAD, OAKVILLE, ON, L6K 3W6
www.trafalgareng.com

PROJECT TITLE
ARGUS CROSS
PROPOSED RESIDENTIAL CONDOMINIUM DEVELOPMENT
DISTRIKT DEVELOPMENTS

LOCATION
217-227 CROSS AVE & 571-587 ARGUS RD.
OAKVILLE, ONTARIO

DRAWING TITLE
PRELIMINARY GRADING PLAN (INTERIM)

0 4 8 12 16 20

SCALE	1:400	DESIGN BY	NAS
DRAWN BY	ZI	CHECKED BY	JN
DATE	2022/01/21	SHEET	1 OF 1
PROJECT No.	1729		
PLAN No.	G1		

FILENAME: P:\1729 Cross and Argus\04-CAD\04-Rezoning_OPA\1729GS.dwg
Oct 04, 2024 - 2:49pm

NOTE:
DETAILED GRADING AND DRAINAGE OF THE POPS AREA TO BE PROVIDED AT THE SITE PLAN APPLICATION STAGE. GRADING SHOWN HERON IS FUNCTIONAL AT THIS STAGE.

570 TRAFALGAR ROAD (FORD)

STREET 'C'
(20.0m LOCAL ROAD)

ARGUS ROAD

603 ARGUS ROAD

207 CROSS AVE

CROSS AVE.

TOWER A

TOWER B

TOWER C

PHASE 1

PHASE 2

PHASE 3

TOWER PHASE LINE

FUTURE ROAD ALLOWANCE

CONC. SIDEWALK (BY OTHERS)

FUTURE CURB ALIGNMENT

EX. PROPERTY BOUNDARY

SURFACE EASEMENT

DRIVEWAY ENTRANCE PER OPSD 350.010 AND TOWN STD.6-3

DRIVEWAY ENTRANCE PARTIALLY DEPRESSED PER OPSD 310.050

19.50m DEPRESSED CURB

8.50m DEPRESSED CURB

RELOCATE HYDRANT

RELOCATE HYDRANT TO BOULEDVARD (BY OTHERS)

DRIVEWAY ENTRANCE PER OPSD 350.010 AND TOWN STD. 6-3

MATCH INTO EX. GRADES

EXTENT OF UNDERGROUND PARKING

TO UNDERGROUND PARKING

LOADING
FFE = 102.10

RESIDENTIAL
FFE = 101.15

OFFICE
FFE = 101.05

INDOOR AMENITY
FFE = 103.20

RETAIL
FFE = 101.02

LOADING
FFE = 104.40

RESIDENTIAL
FFE = 104.22

RESIDENTIAL
FFE = 104.08

RETAIL
FFE = 103.58

RETAIL
FFE = 103.17

LOADING
FFE = 103.02

RESIDENTIAL
FFE = 102.45

BLDG. OVERHANG

AIR SHAFT

GAS PAD

OH DOOR

TRENCH DRAIN BY OTHERS (TG VARIES)

SAN MH (CAST IN PLACE) TOP=104.22

SAN MH (CAST IN PLACE) TOP=100.77

STM MH (CAST IN PLACE) TOP=100.90

STM MH03 TOP=100.50

STM DCB TG=101.22

STM MH202 (CAST IN PLACE) TOP=102.65

MH141 TG=103.67 (BY OTHERS)

MH29686 TOP=103.80

SAN MH TG=103.91

MH127 TOP=103.29

MH119 TOP=102.29

MH120 TOP=104.26

MH123 TOP=104.08

MH29684 TOP=103.71

STM CB TG=103.65

MH54242 TOP=103.80

MH29682 TOP=104.07

MH29683 TOP=103.99

MH126 TOP=103.78

CBMH121 TOP=103.59

MH118 TOP=100.58

MH117 TOP=100.65

MH107A TOP=100.87

MH4623 TOP=100.87

MH4631 TOP=100.03

MH4631 TOP=101.17

MH4633 TOP=101.17

MH128 TOP=101.34

MH4634 TOP=101.47

MH4614 TOP=101.39

MH4615 TOP=101.52

MH131 TOP=101.51

MH116 TOP=101.51

MH130 TOP=101.42

MH129 TOP=101.39

MH29128 TOP=102.24

MH115 TOP=102.37

MH124 TOP=103.07

MH134 TOP=103.67

MH106A TOP=103.47

100.60TC
100.45BC

100.90TC
100.75BC

101.03TC
100.88BC

TW=103.00 BW=102.50 H=0.50m

TW=103.75 BW=103.00 H=0.75m

TW=103.80 BW=103.35 H=0.45m

TW=102.60 BW=102.45 H=0.15m

TW=102.64 BW=101.73 H=0.91m

TW=101.95 BW=101.05 H=0.9m

2.15%

3.8%

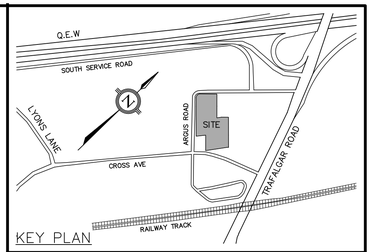
2.4%

1.0%

NOTE:
CONCEPTUAL GRADING OF CROSS AVE. REALIGNMENT SHOWN FOR CONTEXT. DESIGN IS SUBJECT TO CHANGE PENDING FINAL DESIGN FROM TOWN OF OAKVILLE

NOTE:
ALL INLETS AND DRAINS LOCATED OVER THE UNDERGROUND PARKING GARAGE OR WITHIN 1.0m OF THE BUILDING SHALL BE DESIGNED (INCLUDING MAKE AND MODEL) BY THE MECHANICAL CONSULTANT AND BE CAPABLE OF INTERCEPTING THE SPECIFIED 100-YR FLOW WITH 50% BLOCKAGE.

NOTE:
ALL BUILDING AIR INTAKE AND EXHAUST SHAFTS MUST BE PROTECTED FROM OVERLAND FLOW BY BEING SET A MINIMUM OF 0.2m ABOVE ADJACENT GRADE



KEY PLAN

LEGEND

- PROPOSED CATCHBASIN
- PROPOSED DOUBLE CATCHBASIN
- PROPOSED STORM MANHOLE
- PROPOSED SANITARY MANHOLE
- PROPOSED FIRE HYDRANT
- PROPOSED VALVE & BOX
- 153.78 PROPOSED FINISHED ELEVATION
- 153.46 EXISTING ELEVATION
- 153.46 EXISTING ELEVATION TO REMAIN
- EXISTING CATCHBASIN
- EXISTING STORM MH
- EXISTING SANITARY MH
- EXISTING FIRE HYDRANT
- BH1 BOREHOLE
- PROPOSED RETAINING WALL
- PROPOSED SLOPE (1:3)
- 1.0% PROPOSED SLOPE
- OVERLAND FLOW
- [153.78] INTERPOLATED EXISTING GRADE
- PROPOSED AREA DRAIN (300mm x 300mm)

NO.	MM/DD/YY	BY/DRAWN	REVISIONS
3	OCT 04, 2024	NAS/ZI	TOC DEVELOPMENT SUBMISSION
2	MAR 27, 2024	NAS/ZI	ISSUED FOR OPA/ZBA/DPS/SPA
1	MAY 11, 2022	NAS/ZI	ISSUED FOR OPA ZBA

CAD FILE: 1729GS.dwg | PLOT SCALE: 1:1 | PLOT DATE: Oct 04, 2024

ELEVATION NOTE

ELEVATIONS ARE OF GEODETIC ORIGIN (CGVD-1928:78), AND ARE DERIVED FROM GNSS OBSERVATIONS AND NATURAL RESOURCES CANADA'S GEOID MODEL HT2.0.

LOCAL BENCHMARK No. 1

CUT CROSS IN CONCRETE SIDEWALK, LOCATED AT THE NORTHERN CORNER OF THE INTERSECTION OF CROSS AVENUE AND ARGUS ROAD, AS SHOWN ON THE FACE OF PLAN
ELEVATIO=101.39m

LOCAL BENCHMARK No. 2

CUT CROSS IN CONCRETE SIDEWALK, LOCATED ON THE SOUTHEASTERN SIDE OF CROSS AVENUE ACROSS FROM NO. 217, AS SHOWN ON FACE OF PLAN
ELEVATION=100.98m

THE TOPOGRAPHIC DETAIL SHOWN HEREON WAS ACQUIRED ON JANUARY 18, 2022, BY J.D.BARNES LTD, LAND INFORMATION SPECIALISTS

LICENSED PROFESSIONAL ENGINEER
N. A. SYLVESTER
100199487
OCTOBER 4 2024
PROVINCE OF ONTARIO

DESIGNED BY | APPROVED BY

CONSULTANT
TRAFALGAR ENGINEERING
#1-481 MORDEN ROAD, OAKVILLE, ON, L6K 3W6
www.trafalgareng.com

PROJECT TITLE
ARGUS CROSS
PROPOSED RESIDENTIAL CONDOMINIUM DEVELOPMENT
DISTRIKT DEVELOPMENTS

LOCATION
217-227 CROSS AVE &
571-587 ARGUS RD.
OAKVILLE, ONTARIO

DRAWING TITLE
PRELIMINARY GRADING PLAN (ULTIMATE)

0 4 8 12 16 20

SCALE	1:400	DESIGN BY	NAS
DRAWN BY	ZI	CHECKED BY	JN
DATE	2022/01/21	SHEET	1 OF 1
PROJECT No.	1729		
PLAN No.	G2		

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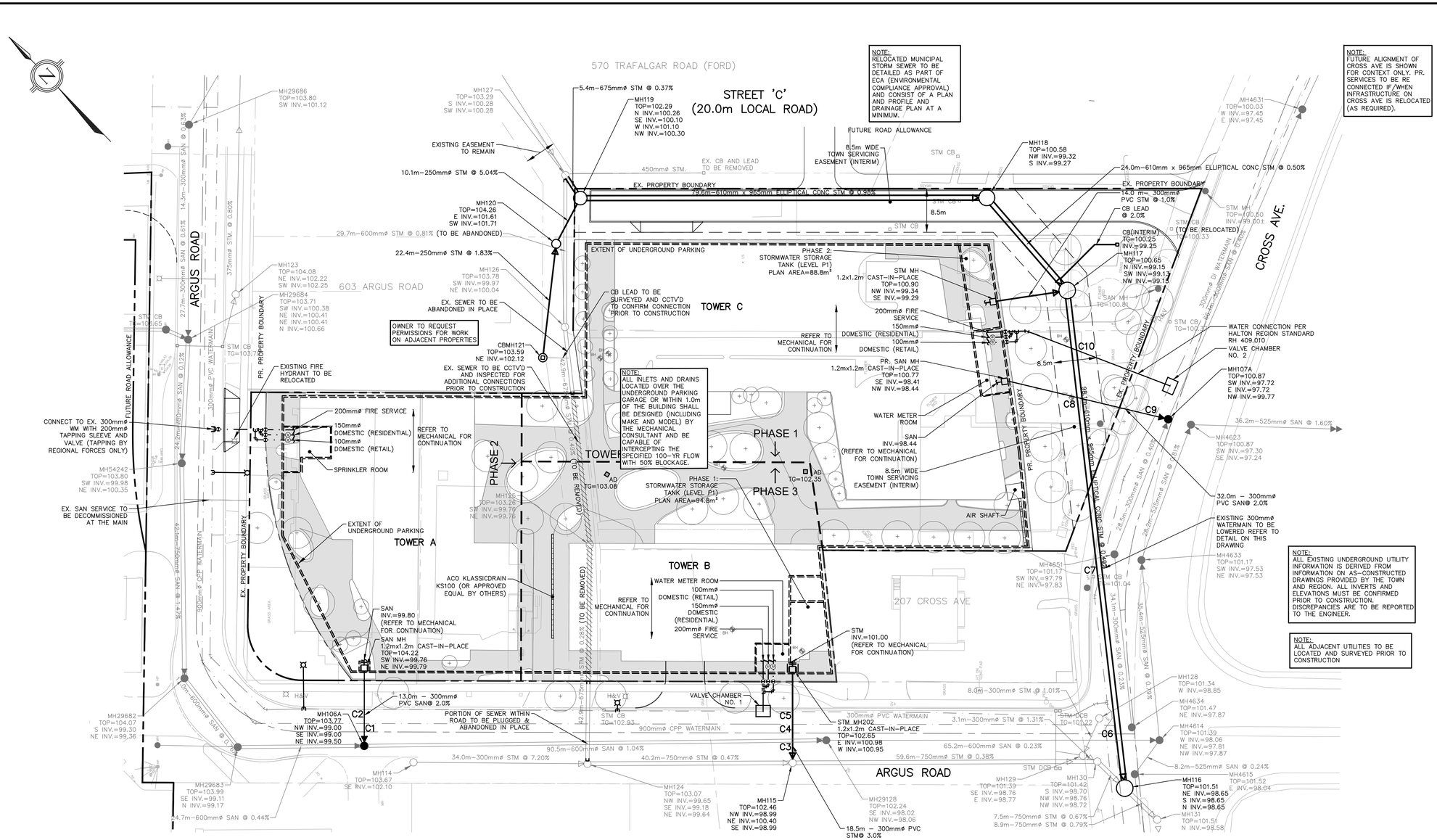
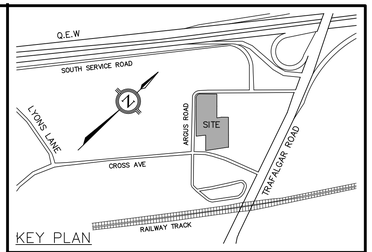
Oct 04, 2024 - 2:49pm





KEY PLAN

LEGEND

- PROPOSED STORM SEWER + MH
- EXISTING STORM SEWER + MH
- EXISTING WATERMAIN
- PROPOSED WATER SERVICE
- EXISTING SANITARY SEWER + MH
- PROPOSED SANITARY SEWER + MH
- PROPERTY LINE
- PROPOSED CATCHBASIN
- PROPOSED DOUBLE CATCHBASIN
- PROPOSED FIRE HYDRANT
- PROPOSED VALVE & BOX
- 153.78 PROPOSED FINISHED ELEVATION
- 153.46 EXISTING ELEVATION
- 153.46 EXISTING ELEVATION TO REMAIN
- EXISTING CATCHBASIN
- BH1 BOREHOLE
- EXISTING FIRE HYDRANT

NO.	MM/DD/YY	BY/DRAWN	REVISIONS
3	OCT 04, 2024	NAS/ZI	TOC DEVELOPMENT SUBMISSION
2	MAR 27, 2024	NAS/ZI	ISSUED FOR OPA/ZBA/DPS/SPA
1	MAY 11, 2022	NAS/ZI	ISSUED FOR OPA ZBA

CAD FILE: 1729GS.dwg | PLOT SCALE: 1:1 | PLOT DATE: Oct 04, 2024

ELEVATION NOTE

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LOCAL BENCHMARK No. 1

CUT CROSS IN CONCRETE SIDEWALK, LOCATED AT THE NORTHERN CORNER OF THE INTERSECTION OF CROSS AVENUE AND ARGUS ROAD, AS SHOWN ON THE FACE OF PLAN
ELEVATION=101.39m

LOCAL BENCHMARK No. 2

CUT CROSS IN CONCRETE SIDEWALK, LOCATED ON THE SOUTHEASTERN SIDE OF CROSS AVENUE ACROSS FROM NO. 217, AS SHOWN ON FACE OF PLAN
ELEVATION=100.98m

THE TOPOGRAPHIC DETAIL SHOWN HEREON WAS ACQUIRED ON JANUARY 18, 2022, BY J.D.BARNES LTD, LAND INFORMATION SPECIALISTS

NOTE: ALL EXISTING UNDERGROUND UTILITY INFORMATION IS DERIVED FROM INFORMATION ON AS-CONSTRUCTED DRAWINGS PROVIDED BY THE TOWN AND REGION. ALL INVERTS AND ELEVATIONS MUST BE CONFIRMED PRIOR TO CONSTRUCTION. DISCREPANCIES ARE TO BE REPORTED TO THE ENGINEER.

NOTE: ALL ADJACENT UTILITIES TO BE LOCATED AND SURVEYED PRIOR TO CONSTRUCTION

LICENSED PROFESSIONAL ENGINEER N. A. SYLVESTER 100199487 OCT 08 2024 PROVINCE OF ONTARIO

DESIGNED BY | APPROVED BY

CONSULTANT
TRAFALGAR ENGINEERING
#1-481 MORDEN ROAD, OAKVILLE, ON, L6K 3W6
www.trafalgareng.com

PROJECT TITLE
ARGUS CROSS
PROPOSED RESIDENTIAL CONDOMINIUM DEVELOPMENT
DISTRIKT DEVELOPMENTS

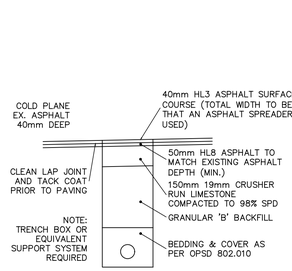
LOCATION
217–227 CROSS AVE & 571–587 ARGUS RD.
OAKVILLE, ONTARIO

DRAWING TITLE
PRELIMINARY SERVICING PLAN (INTERIM)

SCALE	1:400	DESIGN BY	NAS
DRAWN BY	ZI	CHECKED BY	JN
DATE	2022/01/21	SHEET	1 OF 1
PROJECT No.	1729	PLAN No.	S1

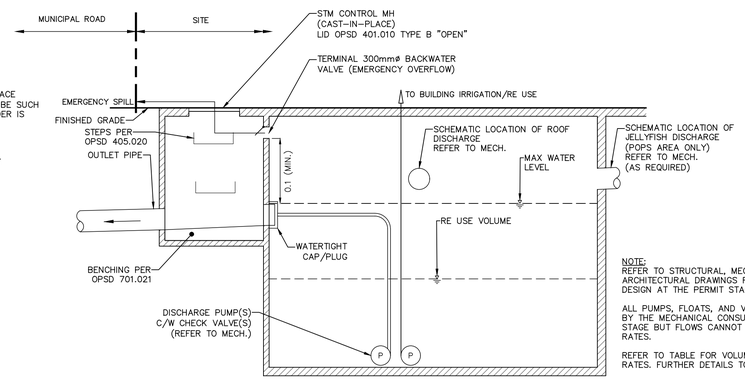
0 4 8 12 16 20

CROSSING TABLE	
C1	SAN INV. = 99.57 900mmø WM OBV .= 98.90 Δ = 0.67m
C2	300mmø WM INV. = 101.25 SAN OBV. = 99.93 Δ = 1.32m
C3	STM INV. = 100.52 SAN OBV. = 98.68 Δ = 1.84
C4	STM INV. = 100.60 900mmø WM OBV. = 98.10 Δ = 2.50
C5	STM OBV. = 100.98 300mmø WM INV. = 100.10 Δ = 0.89m
C6	STM INV. = 98.68 SAN OBV. = 98.49 Δ = 0.19m
C7	300mmø WM OBV. = 99.35 STM INV. = 98.85 Δ = 0.50m
C8	STM INV. = 99.02 SAN OBV. = 98.36 Δ = 0.66m
C9	300mmø WM INV. = 98.80 SAN OBV. = 98.10 Δ = 0.70m
C10	STM INV. = 99.07 300mmø WM OBV. = 98.33 Δ = 0.74m



TYPICAL TRENCH RESTORATION
N.T.S.

NOTE:
1. PLACE HL8 ASPHALT TO MATCH EX SURFACE.
2. IN FOLLOWING CONSTRUCTION SEASON GRIND ASPHALT 40mm DEEP AND PLACE 40mm HL3 ASPHALT.



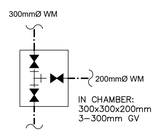
TYPICAL STORMWATER MANAGEMENT TANK SCHEMATIC
N.T.S.

NOTE:
REFER TO STRUCTURAL, MECHANICAL, AND ARCHITECTURAL DRAWINGS FOR TANK DETAIL AND DESIGN AT THE PERMIT STAGE.

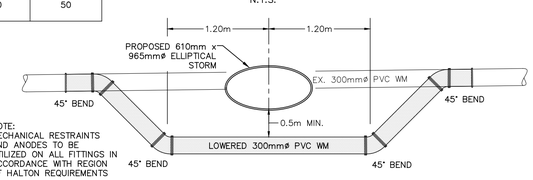
ALL PUMPS, FLOATS, AND VALVES TO BE DESIGNED BY THE MECHANICAL CONSULTANT AT THE PERMIT STAGE BUT FLOWS CANNOT EXCEED ALLOWABLE RATES.

REFER TO TABLE FOR VOLUME AND MAX PUMPING RATES. FURTHER DETAILS TO BE PROVIDED AS SPA.

STM TABLE		
	PHASE 1	PHASE 2
RE USE VOLUME (m³)	159	81
MAX QUANTITY VOLUME (m³)	205	73
TOTAL VOLUME REQUIRED (m³)	364	154
MAX PUMP RATE (L/s)	60	50



VALVE CHAMBER (TYP.)
(RH 402.080)
N.T.S.



NOTE:
MECHANICAL RESTRAINTS AND ANODES TO BE UTILIZED ON ALL FITTINGS IN ACCORDANCE WITH REGION OF HALTON REQUIREMENTS

WATERMAIN LOWERING DETAIL
N.T.S.

FILENAME: P:\1729 Cross and Argus\04-CAD\04-Rezoning_OPA\1729GS.dwg
Oct 04, 2024 - 2:39pm

GENERAL NOTES

1. CONSTRUCTION SHALL BE IN ACCORDANCE WITH THE LATEST STANDARDS OF THE REGIONAL MUNICIPALITY OF HALTON, TOWN OF OAKVILLE AND THE ONTARIO BUILDING CODE (PART 7). ONTARIO PROVINCIAL STANDARD SPECIFICATIONS AND DRAWINGS (OPSS & OPSD) SHALL BE USED IN ABSENCE OF LOCAL STANDARDS.
2. THIS DRAWING SHALL BE READ IN CONJUNCTION WITH ALL ARCHITECTURAL, MECHANICAL AND LANDSCAPE DRAWINGS.
3. ALL INFORMATION SHOWN REGARDING THE LOCATION AND SIZE OF EXISTING UTILITIES AND/OR SERVICES HAS NOT BEEN VERIFIED. THE CONTRACTOR IS RESPONSIBLE FOR VERIFYING LOCATION OF UTILITIES PRIOR TO CONSTRUCTION AND PROTECTING AND MAINTAINING DURING CONSTRUCTION.
4. THE CONTRACTOR SHALL CHECK AND VERIFY ALL GIVEN GRADES AND ELEVATIONS PRIOR TO CONSTRUCTION AND REPORT ALL DISCREPENCIES TO THE ENGINEER.
5. ALL GRADING CHANGES SHALL BE APPROVED BY THE ENGINEER AND TOWN OF OAKVILLE PRIOR TO IMPLEMENTATION.
6. CONTRACTOR TO REFER TO GEOTECHNICAL REPORT FOR PAVEMENT CONSTRUCTION AND DEWATERING DETAILS.
7. ALL DIMENSIONS AND ELEVATIONS TO BE VERIFIED PRIOR TO CONSTRUCTION AND ANY DISCREPANCIES FOUND PRIOR TO OR DURING CONSTRUCTION SHALL BE CLARIFIED WITH THE ENGINEER.

WATERMAINS

1. ALL WATERMAINS 100mm AND LARGER SHALL BE PVC, C-900, CLASS 150, SDR18 C/W MECHANICAL RESTRAINTS & TRACER WIRE PER REGION REQUIREMENTS.
2. WATER SERVICE CONNECTION LESS THAN 50mm TO BE COPPER, TYPE "K" SOFT COPPER TUBING.
3. BEDDING ON WATER SERVICE SHALL BE PER OPSD 802.010*.
4. * INDICATES O.P.S.D. CAN BE USED AS MODIFIED BY REGION OF HALTON.
5. VALVE AND BOX FOR 100mm TO 300mm WATER SERVICE PER REGION STDS.
6. COVER SHALL BE 1.7m MIN. UNLESS OTHERWISE NOTED.
7. CONNECTION TO EXISTING WATERMAIN SHALL BE PER REGION OF HALTON STD RH 409.010.
8. WATER SYSTEM SHALL BE TESTED AND DISINFECTED TO MEET REGIONAL REQUIREMENTS.
9. HYDRANTS SHALL BE MANUFACTURED IN ACCORDANCE WITH AWWA C502 AND SHALL HAVE STEAMER PORTS AS PER REGION STANDARD SPECIFICATIONS (SEE NOTE 12). ALL HYDRANTS SHALL BE INSTALLED AS PER OPSD 1105.010*. IF HYDRANT BARREL DEPTH EXCEEDS 1.7m A HYDRANT THAT CAN BE RAISED FROM THE BOTTOM WITHOUT INCREASING ROD LENGTH IS TO BE USED.
10. MINIMUM LATERAL SEPARATION FROM OTHER UTLITIES IS 2.5m.
11. WATERMAINS MUST HAVE A MINIMUM VERTICAL CLEARNACE OF 0.30m (12 INCHES) OVER, 0.50m (20 INCHES) UNDER SEWERS AND ALL OTHER UTILITIES.
12. STORZ PUMPER CONNECTION FOR HYDRANTS AS FOLLOWS:

    TWO (2) 63.5mm (2 1/2") WITH CSA STANDARD THREAD, 63.5mm I.D., 5 THREADS PER 25mm, 31.75mm SQUARE OPERATING NUT; AND STORZ CAP PAINTED GLOSS BLACK.

SANITARY SEWERS

1. ALL SANITARY SEWERS SHALL BE PVC SDR28, BEDDING PER OPSD 802.010*.
2. SANITARY MANHOLE SHALL BE AS PER OPSD 701.010* c/w COVER PER OPSD 401.010*, STEPS PER OPSD 405.010.
3. * INDICATES O.P.S.D. CAN BE USED MODIFIED BY REGION OF HALTON.
4. BENCHING IN MANHOLES SHALL BE UP TO THE OBVERT OF THE PIPE.

STORM SEWERS

1. ALL STORM SEWERS 600 mm AND SMALLER SHALL BE PVC SDR.35 WITH BEDDING PER OPSD 802.010 UNLESS OTHERWISE NOTED
2. ALL STORM SEWERS 675 mm AND LARGER SHALL BE REINFORCED CONCRETE PIPE CLASS 65-D CSA A257.2 COMPLETE WITH BEDDING PER OPSD 802.030.
3. CATCHBASIN SHALL BE PER OPSD 705.010, DOUBLE CATCHBASIN PER OPSD 705.020 C/W GRATE PER OPSD 400.020
4. CATCHBASINS IN LANDSCAPED AREAS SHALL BE SUMPLESS AND C/W BEEHIVE TOP AS PER TOWN STD.5-2
5. ALL CATCHBASINS IN LANDSCAPED AREAS SHALL BE INSTALLED WITH A SUB-DRAIN. SUB-DRAIN TO BE 100mm DIA. PERFORATED PIPE C/W FILTER SOCK SURROUNDED BY 13mm CLEAR STONE AS PER SUB-DRAIN DETAIL
6. ALL CATCHBASIN LEAD SHALL 250mm DIA. AT 2.0% MIN. UNLESS OTHERWISE NOTED.
7. ALL CATCHBASIN MANHOLES SHALL BE BENCHED.
8. ALL STORM MANHOLES SHALL BE 1200mm DIA PER OPSD 701.010 c/w COVER PER OPSD 401.010, UNLESS OTHERWISE NOTED.
9. ALL CATCHBASIN AND CATCHBASIN MANHOLES IN PAVED AREAS SHALL BE INSTALLED WITH 3.0m – 100mmø PERFORATED PIPE C/W FILTER SOCK EXTENDING OUT FROM THE CATCHBASIN AND LOCATED BELOW THE SUBGRADE SURROUNDED BY 50mm GRANULAR 'A'

GRADING NOTES

1. ALL TOPSOIL SHALL BE STRIPPED PRIOR TO GRADING.
2. ALL FILL PLACEMENT SHALL BE DONE IN ACCORDANCE WITH THE GEOTECHNICAL ENGINEERS RECOMMENDATIONS.
3. RETAINING WALLS WITH A HEIGHT GREATER THAN 0.6m ARE TO BE DESIGNED AND STAMPED BY A PROFESSIONAL ENGINEER.
4. ALL DISTURBED AREAS TO BE RESTORED WITH 200mm TOPSOIL AND SEED.
5. ALL DISTURBED AREAS WITHIN THE PUBLIC RIGHT-OF-WAY TO BE RESTORED WITH 200mm TOPSOIL AND SOD.
1. ALL WORKS WITHIN THE PUBLIC ROADWAY TO RESTORED TO THE SATISFACTION OF THE MUNICIPALITY.
6. ALL CURBING SHALL BE 150mm HIGH BARRIER CURB PER OPSD 600.110. UNLESS OTHERWISE NOTED

SERVICING NOTES

1. UNLESS NOTED OTHERWISE, ALL UTILITIES SHALL BE BACKFILLED WITH GRANULAR BACKFILL COMPACTED TO 98% S.P.M.D.D. NATIVE BACKFILL MAY BE USED WITH THE PERMISSION OF THE GEOTECHNICAL CONSULTANT. BEDDING AND COVER MATERIAL SHALL BE PER THE GEOTECHNICAL CONSULTANTS' RECOMMENDATIONS.
2. BACKFILLING AND RESTORATION WITHIN THE PUBLIC RIGHT-OF-WAY SHALL BE IN ACCORDANCE WITH THE TOWN OF OAKVILLE ROAD CUT PERMIT AND TO THE SATISFACTION OF THE ENGINEERING & CONSTRUCTION DEPARTMENT.
3. SURROUND ALL MANHOLES WITH A MINIMUM OF 1.0m COMPACTED GRANULAR 'C' BACKFILL.
4. ALL ENDS OF SERVICE CONNECTIONS SHALL BE MARKED WITH 50x100 LUMBER PLACED FROM INVERT OF SERVICE TO 1.0m ABOVE GRADE.
5. ALL SEWERS SHALL BE FLUSHED AND CCTV INSPECTED AT COMPLETION.
6. ALL REMOVED OR DAMAGED CURBS, SIDEWALK, GRANULARS, ASPHALT AND SOD RESULTING FROM SERVICE INSTALLATION SHALL BE REINSTATED BY THE CONTRACTOR TO THE SATISFACTION OF THE MUNICIPALITY.

EROSION AND SEDIMENT CONTROL NOTES

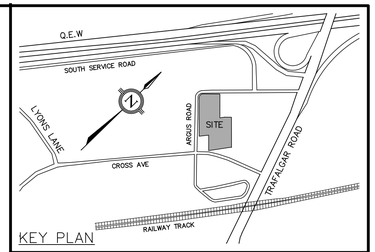
1. THE CONTRACTOR IS RESPONSIBLE TO CLEAN ALL MUD TRACKED ON TO ADJACENT ROADWAYS.
2. THE MEASURES AS PROPOSED MAY BE MODIFIED AT THE DISCRETION OF THE ENGINEER TO SUIT THE PROPOSED CONSTRUCTION PROGRAMS. THE GENERAL INTENT OF THE PROPOSED EROSION CONTROL MEASURES WILL BE MAINTAINED AT ALL TIMES.
3. ANY DISTURBED AREA NOT SCHEDULED FOR FURTHER CONSTRUCTION WITHIN 30 DAYS SHALL BE PROVIDED WITH A TEMPORARY SEED.
4. INSTALL CATCHBASIN SEDIMENT CONTROL ON EXISTING CATCHBASINS PRIOR TO START OF CONSTRUCTION.
5. INSTALL CATCHBASIN SEDIMENT CONTROL ON NEW CATCHBASINS AT TIME OF INSTALLATION.
6. ALL EROSION AND SEDIMENT CONTROLS ARE TO BE INSTALLED ACCORDING TO THE APPROVED PLANS PRIOR TO COMMENCEMENT OF ANY EARTH MOVING WORK ON THE SITE AND SHALL REMAIN IN PLACE UNTIL ALL DISTURBED AREAS ARE STABILIZED WITH THE INTENDED GROUND COVER.
7. EROSION AND SEDIMENT CONTROLS SHALL BE INSPECTED BY THE BUILDER/DEVELOPER:
   - WEEKLY
   - BEFORE AND AFTER ANY PREDICTED RAINFALL EVENT
   - FOLLOWING AN UNPREDICTED RAINFALL EVENT
   - DAILY, DURING EXTENDED DURATION RAINFALL EVENTS
   - AFTER SIGNIFICANT SNOW MELT EVENTS
8. EROSION AND SEDIMENT CONTROLS SHALL BE MAINTAINED IN PROPER WORKING ORDER AT ALL TIMES. DAMAGED OR CLOGGED DEVICES SHALL BE REPAIRED WITHIN 48 HOURS.
9. WHERE A SITE REQUIRES DEWATERING AND WHERE THE EXPELLED WATER CAN BE FREELY RELEASED TO A SUITABLE RECEIVER, THE EXPELLED WATER SHALL BE TREATED TO CAPTURE SUSPENDED PARTICLES GREATER THAN 40 MICRON IN SIZE. THE CAPTURED SEDIMENT SHALL BE DISPOSED OF PROPERLY PER MOECC GUIDELINES. THE CLEAN EXPELLED WATER SHALL FREELY RELEASE TO A SUITABLE RECEIVER THAT DOES NOT CREATE DOWNSTREAM ISSUES INCLUDING BUT NOT LIMITED TO EROSION, FLOODING – NUISANCE OR OTHERWISE, INTERFERENCE ISSUES, ETC.
10. EXISTING STORM SEWER AND DRAINAGE DITCHES ADJACENT TO THE WORKS SHALL BE PROTECTED AT ALL TIMES FROM THE ENTRY OF SEDIMENT/SILT THAT MAY MIGRATE FROM THE SITE. FOR STORM SEWERS: ALL INLETS (REAR LOT CATCHBASINS, ROAD CATCHBASINS, PIPE INLETS, ETC.) MUST BE SECURED/FITTED WITH SILTATION CONTROL MEASURES. FOR DRAINAGE DITCHES: THE INSTALLATION OF ROCK CHECK DAMS, SILTATION FENCE, SEDIMENT CONTAINMENT DEVICES MUST BE INSTALLED TO TRAP AND CONTAIN SEDIMENT. THESE SILTATION CONTROL DEVICES SHALL BE INSPECTED AND MAINTAINED PER ABOVE.
11. IN THE EVENT OF A SPILL (RELEASE OF DELETERIOUS MATERIAL) ON OR EMANATING FROM THE SITE, THE OWNER OR OWNERS AGENT SHALL IMMEDIATELY NOTIFY THE MOECC AND FOLLOW ANY PRESCRIBED CLEAN UP PROCEDURE. THE OWNER OF OWNERS AGENT WILL ADDITIONALLY IMMEDIATELY NOTIFY THE TOWN.

CONSTRUCTION NOTES

1. CONTRACTOR IS RESPONSIBLE FOR ALL TEMPORARY TRAFFIC CONTROLS, PER MTO BOOK 7.
2. CONTRACTOR IS RESPONSIBLE FOR ALL CONSTRUCTION LAYOUT, WITH CONTROL BARS PROVIDED BY THE OWNER. PROTECTION OF CONTROL BARS IS THE RESPONSIBILITY OF THE CONTRACTOR.
3. CONTRACTOR IS RESPONSIBLE TO VERIFY THE SIZE AND LOCATION OF ALL EXISTING UTILITIES PRIOR TO CONSTRUCTION, INCLUDING VAC TRUCK AND RESTORATION AS REQUIRED.
4. CONTRACTOR SHALL PROVIDE THIRD-PARTY DIGITAL AS-BUILTS IN CAD, TO INCLUDE ALL NEW SITE SERVICING INCLUDING TOPS AND INVERTS, AND FINISHED GRADES, INCLUDING PAVED AREAS, SWALES, CURBS, SIDEWALKS AND RETAINING WALLS, TO THE SATISFACTION OF THE ENGINEER.
5. CONTRACTOR SHALL FLUSH AND VIDEO ALL EXISTING SEWERS PRIOR TO AND AFTER CONNECTION, AND NEW AND DISTURBED SEWERS UPON INSTALLATION AND LATER UPON COMPLETION OF TOP WORKS AND LANDSCAPING, PER OPSS 409. VIDEOS TO BE PROVIDED TO THE ENGINEER FOR REVIEW AND APPROVAL.

TREE PROTECTION NOTES

1. TREE PROTECTION BARRIERS SHALL BE PLACED AS PER TOWN OF OAKVILLE STANDARD.
2. ADDITIONAL TREE PROTECTION LOCATIONS MAY BE REQUIRED AS DETERMINED BY THE TOWN OF OAKVILLE AND/OR THE ENGINEER.



KEY PLAN

LEGEND

NO.	MM/DD/YY	BY/DRAWN	REVISIONS
3	OCT 04, 2024	NAS/ZI	TOC DEVELOPMENT SUBMISSION
2	MAR 27, 2024	NAS/ZI	ISSUED FOR OPA/ZBA/DPS/SPA
1	MAY 11, 2022	NAS/ZI	ISSUED FOR OPA ZBA

CAD FILE: 1729GS.dwg | PLOT SCALE: 1:1 | PLOT DATE: Oct 04, 2024

ELEVATION NOTE

ELEVATIONS ARE OF GEODETIC ORIGIN (CGVD-1928:78), AND ARE DERIVED FROM GNSS OBSERVATIONS AND NATURAL RESOURCES CANADA'S GEOID MODEL HT2.0.

LOCAL BENCHMARK No. 1

CUT CROSS IN CONCRETE SIDEWALK, LOCATED AT THE NORTHERN CORNER OF THE INTERSECTION OF CROSS AVENUE AND ARGUS ROAD, AS SHOWN ON THE FACE OF PLAN
ELEVATIO=101.39m

LOCAL BENCHMARK No. 2

CUT CROSS IN CONCRETE SIDEWALK, LOCATED ON THE SOUTHEASTERN SIDE OF CROSS AVENUE ACROSS FROM NO. 217, AS SHOWN ON FACE OF PLAN
ELEVATION=100.98m

THE TOPOGRAPHIC DETAIL SHOWN HEREON WAS ACQUIRED ON JANUARY 18, 2022, BY J.D.BARNES LTD, LAND INFORMATION SPECIALISTS

LICENSED PROFESSIONAL ENGINEER
N. A. SYLVESTER
100199487
OCTOBER 4-2024
PROVINCE OF ONTARIO

DESIGNED BY | APPROVED BY

CONSULTANT

TRAFALGAR ENGINEERING
#1-481 MORDEN ROAD, OAKVILLE, ON, L6K 3W6
www.trafalgareng.com

PROJECT TITLE

ARGUS CROSS
PROPOSED RESIDENTIAL CONDOMINIUM DEVELOPMENT
DISTRIKT DEVELOPMENTS

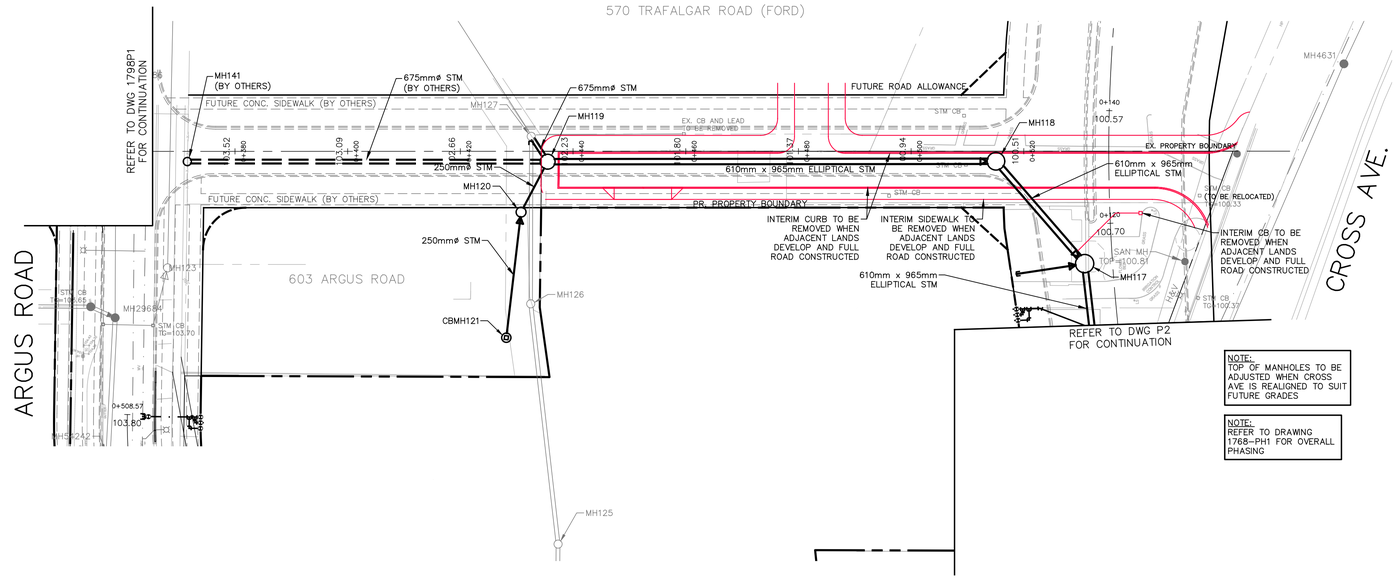
LOCATION

217-227 CROSS AVE &
571-587 ARGUS RD.
OAKVILLE, ONTARIO

DRAWING TITLE

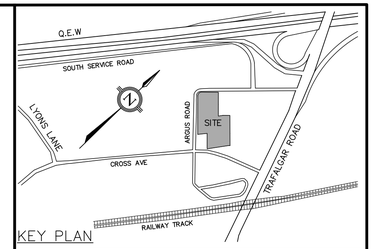
GENERAL NOTES

SCALE	1:400	DESIGN BY	NAS
DRAWN BY	ZI	CHECKED BY	JN
DATE	2022/01/21	SHEET	1 OF 1
PROJECT No.	1729		
PLAN No.	N1		



NOTE:
TOP OF MANHOLES TO BE ADJUSTED WHEN CROSS AVE IS REALIGNED TO SUIT FUTURE GRADES

NOTE:
REFER TO DRAWING 1768-PH1 FOR OVERALL PHASING



KEY PLAN

LEGEND

- PROPOSED CATCHBASIN
- PROPOSED STORM MANHOLE
- PROPOSED STORM SEWER
- PROPOSED SANITARY MANHOLE
- PROPOSED WATER SERVICE
- EX. SANITARY MANHOLE
- EX. SANITARY SEWER
- EX. STORM MANHOLE
- EX. STORM SEWER
- EX. CATCHBASIN
- EX. HYDRANT & VALVE
- EX. WATER VALVE
- EX. WATERMAIN
- EX. GASMAIN
- EX. OVERHEAD WIRE
- EX. HYDRO SERVICE
- PROPERTY LINE

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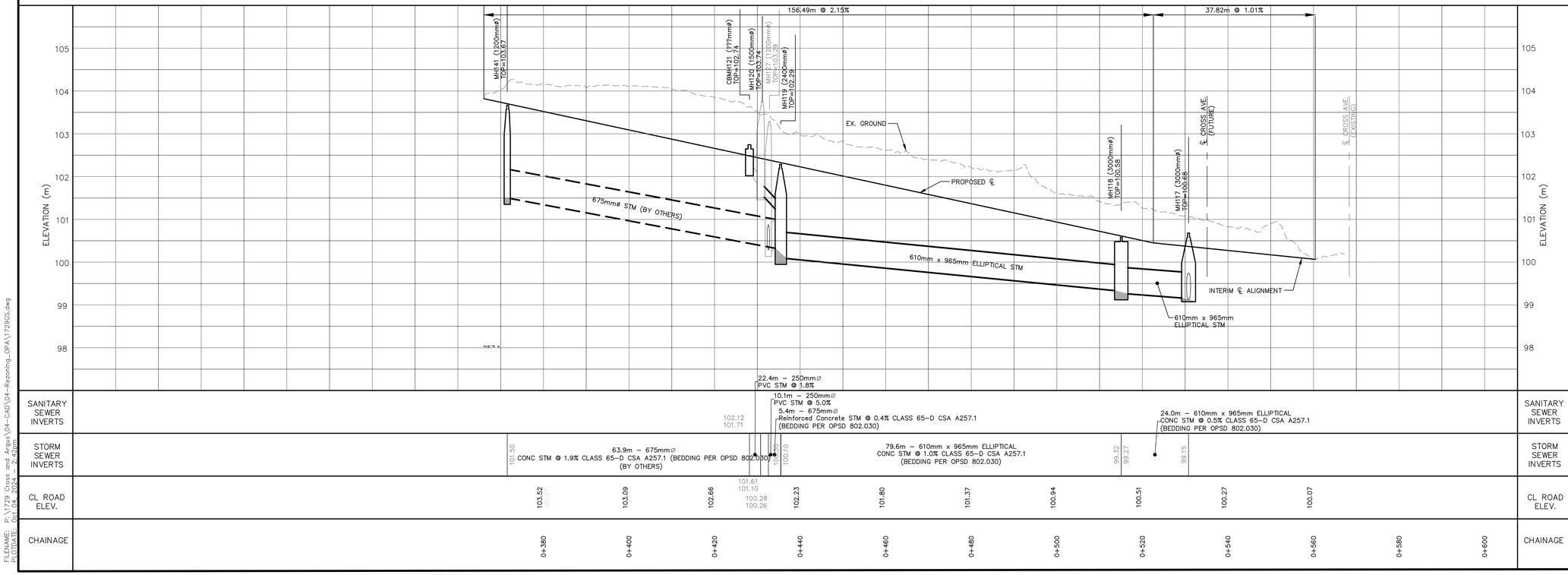
STREET 'C' (20.0m LOCAL ROAD)



No	MM/DD/YY	By/DRN	REVISIONS
2	OCT 04, 2024	NAS/ZI	TOC DEVELOPMENT SUBMISSION
1	MAR 27, 2024	NAS/ZI	ISSUED FOR OPA/ZBA/DPS/SPA

Design	NAS	Chk'd	NAS
Drawn	ZI	Chk'd	NAS
Cad File	1729GS.dwg		
Plot Date	10/04/24		

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Scale VER 0 0.5 1 1.5 2 2.5 1:50

References

Field Notes

APPROVALS

Municipal
APPROVED IN PRINCIPLE SUBJECT TO DETAIL CONSTRUCTION CONFORMING TO TOWN OF OAKVILLE STANDARDS AND SPECIFICATIONS.

Date:
Manager of Development Engineering

Regional Approval
DESIGN OF WATER &/OR WASTEWATER SERVICES APPROVED SUBJECT TO DETAIL CONSTRUCTION CONFORMING TO HALTON REGION STANDARDS & SPECIFICATIONS & LOCATION APPROVAL FROM AREA MUNICIPALITY.

SIGNED: DATE:
LEGISLATIVE AND PLANNING SERVICES DEPT.

Bell	☐	Hydro	☐
Gas	☐	Cable	☐
Traf.	☐	Water	☐

LICENSED PROFESSIONAL ENGINEER
N. A. SYLVESTER
100199487
OCTOBER 4, 2024
PROVINCE OF ONTARIO

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www.trafalgareng.com

Municipality
OAKVILLE Halton REGION

Title
ARGUS CROSS
(DISTRIKT DEVELOPMENTS)
STREET 'C'
CONCEPTUAL PLAN AND PROFILE
STA 0+570 TO 0+370

Municipal No.	Regional No.
-	-
Contract No.	Consultant No.
-	1729
	Sheet P1

20M-

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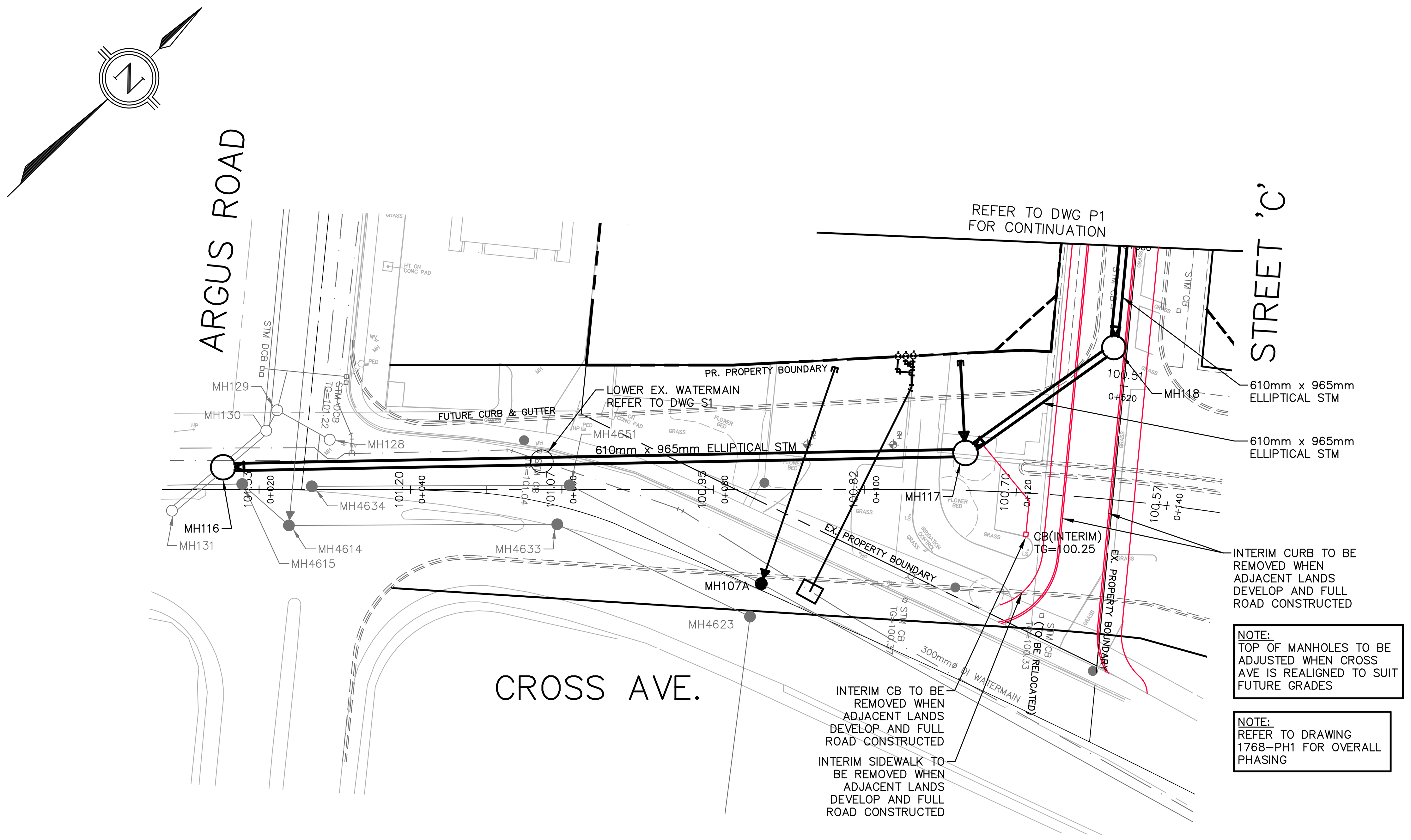

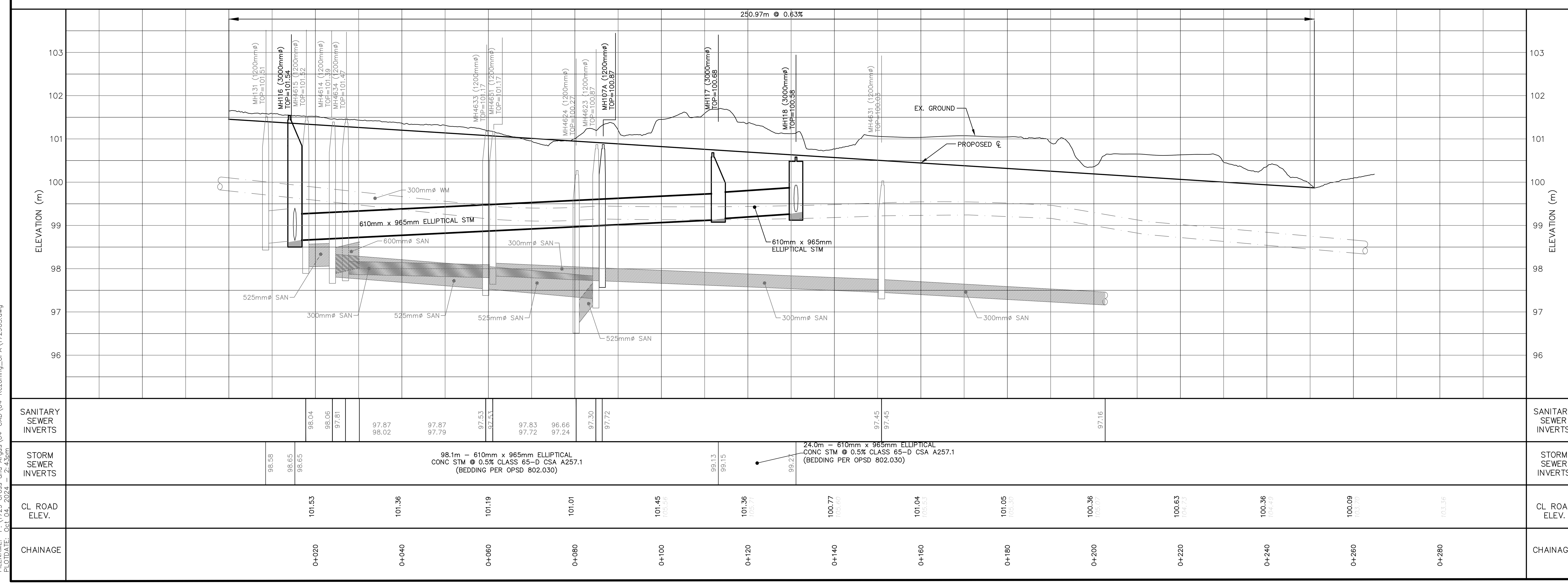

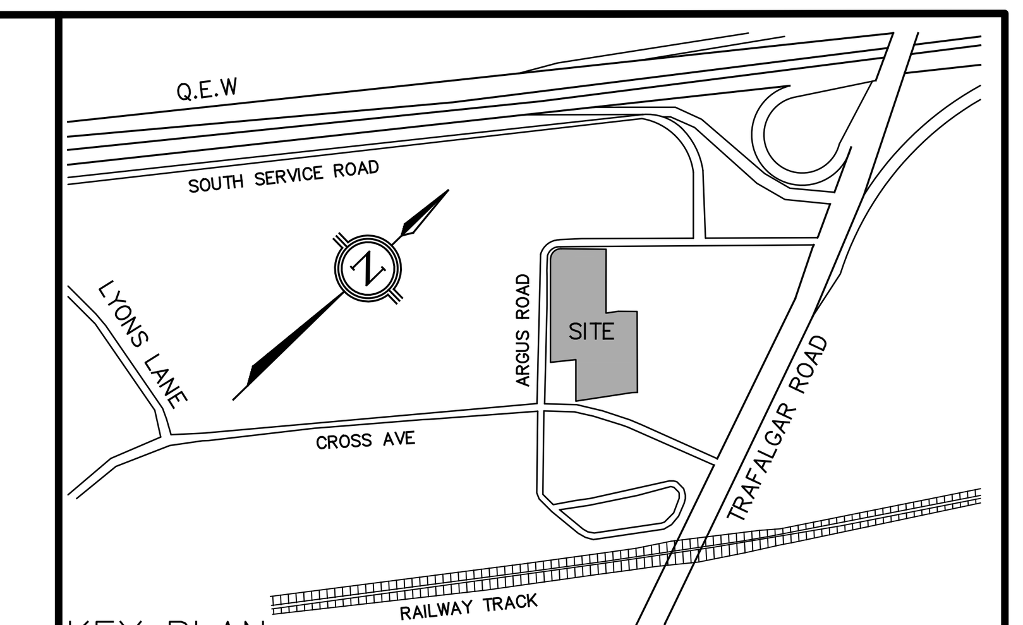

KEY PLAN

LEGEND

- PROPOSED CATCHBASIN
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Design	NAS	Chk'd	NAS	Cad File	1729GS.dwg
Drawn	ZI	Chk'd	NAS	Plot Date	10/04/24

Scale HOR 1:500 VER 1:50

References

Field Notes

APPROVALS

Municipal
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Date:
Manager of Development Engineering

Bell ☐ Hydro ☐
Gas ☐ Cable ☐
Traf. ☐ Water ☐

Regional Approval
DESIGN OF WATER &/OR WASTEWATER SERVICES APPROVED SUBJECT TO DETAIL CONSTRUCTION CONFORMING TO HALTON REGION STANDARDS & SPECIFICATIONS & LOCATION APPROVAL FROM AREA MUNICIPALITY.
SIGNED: DATE:
LEGISLATIVE AND PLANNING SERVICES DEPT.

LICENSED PROFESSIONAL ENGINEER
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Oct 04 2024
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ARGUS CROSS
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CONCEPTUAL PLAN AND PROFILE
STA 0+000 TO 0+150

Municipal No.	Regional No.
-	-
Contract No.	Consultant No.
-	1729
	Sheet P2

20M-

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