URBANTECH®

FUNCTIONAL SERVICING AND STORMWATER MANAGEMENT REPORT

3064 TRAFALGAR ROAD

TOWN OF OAKVILLE

REGION OF HALTON

PREPARED FOR
DISTRIKT DEVELOPMENTS

Urbantech File No.: 18-575

OPA SUBMISSION – APRIL 2024

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1 INTRODUCTION

1.1 BACKGROUND

This report provides servicing design and stormwater management information in support of the site plan application for the proposed residential development located at 3064 Trafalgar Road, hereafter referred to as the subject property.

This study presents the recommended stormwater management and municipal servicing scheme for the development of the subject property. This report is also applicable for any future revisions to the site plan, assuming the revisions are minor and in general conformance with the concepts outlined herein.

The information presented in this report conforms to the following guidelines:

- Stormwater Management Planning and Design Manual, Ministry of Environment, March 2003 (SWMP Design Manual);
- Development Engineering Procedures & Guidelines Manual, Town of Oakville, January 2011;
- Design Criteria, Contract Specifications and Standard Drawings, Region of Halton, February 2001 (updated 2007);
- Erosion and Sediment Control Guidelines for Urban Construction, Conservation Halton et al, December 2006;
- Dundas-Trafalgar Inc./Shieldbay Developments Inc. Final Environmental Implementation Report and Functional Servicing Study, Urbantech, February 2015;
- Addendum to Dundas-Trafalgar Inc./Shieldbay Developments Inc. Final Environmental Implementation Report and Functional Servicing Study, Urbantech, February 2016;
- EIR/FSS Final Submission, Lower EM4 Subcatchment, Dundas-Trafalgar Inc. and Shieldbay Development Inc., Urbantech et. al., July 18, 2016 (*EM4 DTI/SDI EIR/FSS*);
- EIR/FSS, North Oakville Main-East Morrison Creek, Sernas Associates et.al., December 2013 (*EM1 EIR/FSS*);
- EM1 EIR/FSS Addendum, DSEL et. al., Sept. 2018 (*EM1 EIR/FSS Addendum – DSEL 2018*)
- EIR/FSS Addendum - Distrikt Development, Urbantech, September 2020

1.2 SUBJECT PROPERTY

The subject property is approximately 0.82 ha in size. The site currently consists mainly of undeveloped lands with a single-story residential building. The property is bordered on the north by the recently realigned section of the East Branch of the East Morrison Creek (MOC-2), on the west by the East Morrison Creek (MOC-4), to the south by an existing residential lot (3048 Trafalgar Road) and Trafalgar Road to the east.

The Subject Lands are located partially within the EM1 sub-catchment and partially within the EM4 subcatchment. A portion of the property falls within the Linkage Preserve Area (LPA) in the EM1 subcatchment (**Figure 1.2**). **Table 1** provides statistics for the Subject Lands and Subcatchment Area.

Table 1: Existing Subcatchment Areas in the Subject Lands

Area	Subcatchment Areas		
	East Morrison Creek East Tributary (EM4)	East Morrison Creek West Tributary (EM1)	Total
Subject Lands per subcatchment	0.38 ha	0.44 ha	0.82 ha
Percentage (%) of Subject Lands in each subcatchment	46%	54%	100%

1.3 PROPOSED DEVELOPMENT

Distrikt Developments has an approved Draft Plan of subdivision for the purpose of creating three blocks:

- Block 1 – 0.70 ha for 782 Apartment Units
- Block 2 – 0.07 ha for Natural Heritage System (Linkage Preserve Area)
- Block 3 – 0.05 ha for the Trafalgar Road widening

Block 3 area has been transferred to the city; therefore, the proposed development will be on the remaining 0.77 ha area. Within Block 1, there will be two 30-storey condominium buildings with five (5) levels of underground parking. Surface treatment will include asphalt for driveways and sod, trees and shrubs within landscaped areas. An entrance from Trafalgar Road is proposed along the southern property boundary such that the landowners to the south can share this entrance in the future in order to minimize the access points to Trafalgar Road.

The proposed site plan development will ensure that the LPA within the Subject Property is preserved. It is anticipated that fencing will be installed along the interface between the LPA and condominium lands and that the LPA will be conveyed to the Town.

2 GRADING & ROADS

The site grading design considers the following objectives and constraints:

- Conform to Town of Oakville grading criteria;
- Match existing boundary conditions and proposed widening conditions for Trafalgar Road;
- Provide suitable storm drainage;
- Provide minimum cover on proposed servicing;

The site grading is constrained by existing (and future) elevations of Trafalgar Road to the East, realigned East Morrison Creek to the North and West, and neighbouring properties to the south. The Regional Road is slated for expansion and is currently in the 60% design phase as per conversations with Regional staff. Land within the road widening extents will be conveyed to the Region, and property lines will be adjusted from existing to future as shown on the design plans.

2.1 INTERIM CONDITION

It is assumed that the development of the subject site will happen in advance of the Trafalgar Road widening by the Region of Halton. Therefore, the grading and design of the subject site shall match the existing elevations along Trafalgar Road in addition to the future, ultimate condition.

As shown on the interim grading plan **Drawing GR-2** in **Appendix A,** the site entrance matches the existing edge of pavement elevations and is graded to match the ultimate high point to the west. A 300 mm diameter culvert has been designed to match the existing ditch system along the west side of Trafalgar Road and convey drainage North. The inverts of the culvert match the ditch elevations provided on the topographic survey. Based on discussions with the Town of Oakville and Conservation Halton, an alternative Emergency Access shall be provided outside of the regional floodplain which is at an elevation of 168.97m. Since the regional floodline crosses the interim access as shown on **Drawing GR-2,** the emergency access is provided from the north and is entirely outside the floodplain. This access is provided with mountable curb on the private side, and has been designed with the appropriate width, radius, and swept path for emergency vehicles by Paradigm Transportation Solutions Ltd. An additional 300 mm diameter culvert is proposed to convey drainage north which is in conformity with the existing drainage patterns.

Certain surface features such as sidewalk connections, risers, and amenity areas will be withheld until the ultimate widening of Trafalgar Road is completed. The detailed interim design for the subject site will be provided in future submissions.

External grading is proposed at the southwest limit of the site in order to adjust the limits of the existing regional floodplain and ensure that a minimum 7.5m-buffer is provided from the extents of the regional floodplain to the proposed limits of the underground structure.

2.2 ULTIMATE CONDITIONS

The proposed grading of the subject site is designed to match the ultimate conditions for Trafalgar Road, which have been estimated from the future centreline elevations as per the design plans provided by the Region of Halton. Boulevards within the future right-of-way are graded with a 2% slope to top-of-curb elevations, and sidewalks are flat across the proposed entrance as shown on **Drawing GR-1.** The interim entrance condition as shown on **Drawing GR-2** will be regraded from the proposed high point at 169.39 to the future Trafalgar right-of-way, including lowering of area drain #1 as needed.

The entrance for the proposed development is denoted as Street A, and functions as a roundabout with an inverted crown (area drains located in the centre of the drive aisle). The grading for street A allows for accessible entrances, and safe emergency overland flow back to future Trafalgar Road.

The entrance for 3064 Trafalgar Road shall provide access to the neighbouring property to the south, which is slated for future development of its own. The elevations (bottom of curb) of the proposed design are saw-toothed, and there is a proposed retaining wall holding up the proposed development from the lower / adjacent elevations. The design of Street A is an inverted crown which sets a drainage divide and high point at the property line. It is our opinion that access to the future development to the south can be accommodated anywhere along Street A, whereby an entrance can be branched off (for example, the 7m wide entrance as shown) and sloped down to meet an appropriate FFE for this location. Utilizing this methodology, the minor and major system drainage for both properties will be separate and not cross property boundaries.

Elevations along the North property line generally match the as-built elevations of the channel realignment as per Region File DO-1026. A small portion of area to the northeast of the subject site and within the open space block will be regraded to match the proposed grading schematic and captured within onsite area drains. Elevations along the West property line match existing grades, and grading operations shall be contained within the private site within this boundary. A small portion of the eastern limit of the site (0.05ha) will drain towards Trafalgar Road in the ultimate condition. There will be no adverse impacts to the existing drainage system on Trafalgar Road as a result of the proposed grading, as the overall drainage area directed to Trafalgar Road is reduced from the pre-development condition (0.26ha).

3 STORM SERVICING AND STORMWATER MANAGEMENT

3.1 EXISTING STORM DRAINAGE

The site is within the conservation Halton's jurisdiction, within the North Oakville Creek Subwatershed. A part of eastern limit of the Linkage Preserve Area is within the site area, which will be outside of the proposed development.

The NOCSS unit rates do not apply to the Subject Lands as it was assumed in the previously approved *EM4 EIR/FSS (Urbantech 2016)* that these lands would drain uncontrolled to the East Morrison Creek (up to 70% imperviousness) due to the difficulty in providing a SWM facility with Regional storage for individual site plan areas. With respect to the Subject Lands, the target release rate is therefore based on the target of "Post-development flows based on 70% imperviousness as modelled in the *EM4 EIR/FSS".*

3.2 SUBJECT LANDS STORMWATER MANAGEMENT

The approved GAWSER modelling completed as part of the Dundas-Trafalgar Inc. and Shieldbay Inc. lands and included assumptions for the Subject Lands. The report established that the peak return period flows at Dundas Street (at MOC-4) would not be exceeded if the Subject Lands discharged uncontrolled flows with a site imperviousness of **70%.** Based on the proposed development plan, the Subject Lands has a higher imperviousness (about 76%) and some quantity control is required to ensure that the targets at Dundas Street are not exceeded.

The GAWSER model for EM-4 was updated in the Distrikt EIR/FSS Addendum to simulate the Subject Lands at higher imperviousness (90%) and to determine the storage required to control the post-development flows to the approved release rates (at 70%) to continue meeting the targets at Dundas Street. Although the post development imperviousness for the overall site is 76%, the GAWSER model was prepared conservatively assuming post-development imperviousness of 90% for the developed portion draining to the storage tank.

The approved GAWSER model did not assume any erosion control for the Subject Lands, and subsequent erosion analyses based on the approved GAWSER model flows confirmed that there were no issues related to the uncontrolled flows from the Subject Lands. To address the increased imperviousness above the approved EIR/FSS value of 70%, a 25 mm runoff control volume and flow target has been established for the Subject Lands to control the higher imperviousness to the previous 70% imperviousness from the EM-4 EIR/FSS

Quality control will be provided via oil/grit separators sized appropriately for the Subject Lands further discussed in **Section 3.8**.

The summary of the site area with the imperviousness and their outlets are provided in the table below.

Table 2: Summary of the Post-Development Storm Drainage

Outfall	Drainage Area (ha)	Imperviousness (%)
LID (ID # BIO)	0.14	0%
Storage Tank (ID # 1-9 and BDG)	0.59	100%
Uncontrolled (Ex 1 and 2)	0.05	0%
Total Developed Area	**0.78**	**76%**

3.3 STORMWATER OUTFALL TO MOC-2

A stormwater outfall is proposed from the underground storage tank to MOC-2a as shown on **Drawing STM-1** and **SP-1.** An OPSD 804.030 headwall is proposed at an invert elevation of 168.20 and the outfall has a positive slope to the creek below. Scour protection will be provided at the outlet headwall in the form of a stone core wetland (refer to **Drawing DET-1** for details). Long-term groundwater discharge from the building is proposed to be filtered to meet Town of Oakville water quality requirements, and is proposed to be directed into the stormwater management tank located in the underground parking structure. All flows from the underground storage tank will be pumped in order to drain to the adjacent watercourse within the allowable release rates.

3.4 LID MEASURES WITHIN THE LINKAGE PRESERVE AREA

As discussed with the Town, Region, and Conservation Halton at the North Oakville Agency Review Meeting on July 15, 2019, and June 21, 2021, the entirety of the developable portion of the Subject Lands will consist of the underground parking garage structure. This essentially eliminates any potential for infiltration LID measures within the proposed development envelope. There is, however, an area of land within the LPA (approximately 0.07 ha) that was considered in the 1st submission of the EIR/FSS Addendum (September 2019) for passive infiltration measures. The proposed LID is a bioswale that will receive stormwater runoff from about 0.14ha area on the west side of the plan. The location of the LID and the drainage area is shown on **Drawing STM-1** and the detail of the LID is on **Drawing DET-1.** This LID is designed to infiltrate **22mm** runoff from its drainage area within 10 hours.

Four infiltration tests were completed on August 9, 2019 within the LPA on the Subject Lands to determine the infiltration rate for the previously proposed LID measures. According to the hydrogeological investigation (BIG, August 2020), the testing in this soil resulted in hydraulic conductivities in the order of $1x10^{-4}$ cm/sec, which is considered moderately permeable. Two tests were completed in the upper layer of the silty clay till deposits (0.4m to 0.5m below ground). The testing of the silty clay resulted in hydraulic conductivity values of 1.3×10^{-5} and 4.9×10^{-7} cm/sec, which is consistent with the work completed for the *EM4 DTI/SDI EIR/FSS (Urbantech 2016)* and *EM1 EIR/FSS (Sernas 2013).* The infiltration testing results confirm *EM1 EIR/FSS (Sernas 2013)*.

The groundwater monitoring data shows the groundwater level responds to the precipitation events, which indicated the infiltration at the surface reaches the weathered bedrock aquifer and discharges in the creek.

The design calculations of the LID design are provided in **Section 3.9** of this report.

3.5 CONVEYANCE OF MINOR SYSTEM FLOWS

As shown on **Drawing STM-1**, minor system flows on the Subject Lands will be captured by area drains and conveyed through the underground parking structure and to the proposed stormwater quantity control tank (please see rating curve and allowable flows in **Table 4**). Approximately 0.59 ha will be controlled by the tank. The remaining areas are landscaped and will discharge overland to either the LPA or to Trafalgar Road.

3.6 CONVEYANCE OF MAJOR SYSTEM FLOWS

Major system flows (i.e., infrequent events) on the site plan will be captured by area drains which will be appropriately sized by the mechanical consultant based on the anticipated flows and ponding depths.

While some areas are proposed to discharge uncontrolled directly to Trafalgar Road or the LPA, it should be noted that the entire area was assumed / approved in the *EM4 EIR/FSS* to drain uncontrolled at 70% IMP. The proposed uncontrolled areas have less imperviousness than 70% as shown on **Drawing STM-1.** See **Table 4** for the required storage.

3.7 STORMWATER MANAGEMENT SYSTEM OPERATING CHARACTERISTICS

Stormwater management will be addressed by a storage tank within the underground parking garage. **Drawing STM-1** illustrates the areas captured into the area drains / underground tank (Areas 1 to 9 plus building totalling 0.59 ha), the areas discharging to Trafalgar Road uncontrolled (area EX1 at 0.03 ha), and the south uncontrolled area (area EX2 at 0.02 ha). The remaining drainage area (area BIO at 0.14 ha) is the LPA that will continue to drain overland towards MOC-4/PSW 74. Therefore, the storage tank is essentially controlling the difference between 90% and the approved 70% impervious land cover for the 0.59 ha area only. The uncontrolled areas and LPA have imperviousness less than the previously assumed 70% and therefore, have already been adequately accommodated in the EM4 modelling.

In the approved GAWSER model for the DTI/Shieldbay Inc. detailed design, the Subject Lands were included in a lumped, 2.28 ha catchment labelled as “G1 + G3” which was simulated as 70% IMP (**Figure 3b**). This catchment included all the lands between the realigned MOC-2a watercourse to Dundas Street and between Trafalgar Road to MOC-4. The blanket application of 70% imperviousness is conservative, in light of the fact that a significant portion of these lands are not developable due to the ultimate flood hazard and LPA.

To estimate the required storage volumes, the unit rates established in the Distrikt EM4 Addendum were used. **Table 3** provides the unit rates and **Table 4** provides the corresponding flow and volume requirements for the proposed drainage area as established in the Distrikt EM4 GAWSER model.

Table 3: Summary of the Post-Development Storm Drainage

Design Event	Unit Flow Rate to control G1+G3 at 90% IMP to 70% IM`P equivalent (m^3 / s / ha)	Required Unit Storage to control G1+G3 at 90% IMP to 70% IMP equivalent (m^3/ ha)
25mm	0.013	49
2-year	0.025	83
5-year	0.034	107
10-year	0.039	122
25-year	0.041	156
50-year	0.041	190
100-year	0.042	234
Regional	0.042	634

Note that these unit rates are not intended to match the NOCSS unit release rates, which are based on existing flows rather than “flows from 70% IMP areas”. However, the Regional release rate is similar to the NOCSS values for EM1/EM4 since both pervious and impervious surfaces react similarly to the Regional Storm due to antecedent moisture conditions.

Application of the unit rates in **Table 3** to the 0.59 ha portion of the Subject Lands are outlined in **Table 4**.

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Table 4: Required Storage

Design Event	Unit Flow Rate to control G1+G3 at 90% IMP to 70% IMP equivalent (m^3 / s / ha)	Target Outflow for Subject lands (0.59 ha) (m^3/s)	Required Unit Storage to control G1+G3 at 90% IMP to 70% IMP equivalent (m^3/ ha)	Target Storage for Subject lands (0.59 ha) (m^3)
25mm	0.013	0.008	49	29
2-year	0.025	0.015	83	49
5-year	0.034	0.020	107	63
10-year	0.039	0.023	122	72
25-year	0.041	0.024	156	92
50-year	0.041	0.024	190	112
100-year	0.042	0.025	234	138
Regional	0.042	0.025	634	374

The underground storage tank will be pumped in order to drain to the adjacent watercourse. This facility will be privately owned and maintained. Pumping will facilitate meeting the rather unusual rating curve above (nearly constant flow rate for 5-year to Regional Storm as shown in the preceding table). The storage tank layout has been shown on the plans. Pump details have been provided by the mechanical consultant based on coordination of the above rating curve.

It is understood that a 24 to 48 hour drawdown is preferred, but this would be difficult to achieve for a site of this size. The target release rate is approximately 8 L/s, and based on the target volume of 29m3, this would drain in approximately 1 hour. If a 24-hour drawdown time were to be provided, the release rate would have to be approximately 0.3 L/s, which is extremely low. This site was assumed to be uncontrolled in the East Morrison Creek EIR/FSS – the hydrologic analysis (GAWSER) and erosion studies always assumed that no controls were provided for this site (up to 70% imperviousness). Therefore, in this case, 24 to 48 hour drawdown is not required since the extended detention (25mm storm) flows were previously accounted for in an uncontrolled state.

As noted in section 6.3 of the hydrogeological investigation conducted by B.I.G. Consulting Inc., the long-term groundwater discharge rate of 124,500 l/day has been determined using on a safety factor of 1.5. The outlet for the groundwater is proposed to be the Morrison Creek.

Any future lands to be developed in addition to the Subject Lands can utilize the unit rates in **Table 3** to estimate the storage requirements.

3.8 WATER QUALITY CONTROL

An O/GS (oil/grit separator) has been designed to treat the stormwater from the site. The O/GS will receive the controlled flow from the storm tank and will discharge the treated flow to MH1. An EFO6 or equivalent O/GS will be used to provide 80% TSS removal from 90% of the annual runoff. The details of the O/GS design are provided in **Appendix B**. As additional quality control / scour protection, a stone core wetland is proposed at the site outlet into the adjacent East Morrison Creek tributary to the north. See **Drawing STM-1** and **DET-1** for details.

3.9 WATER BALANCE

As indicated in the Distrikt EM4 Addendum, the total developed area of the Subject Lands is approximately 0.71 ha and the LPA is 0.07ha in total 0.78ha. The total pre-development groundwater recharge volume for the Subject Lands was calculated to be approximately 1076 m^3/year with 0% imperviousness, using the water balance component values shown in the EIR/FSS addendum (Urbantech August 2020). A passive LID feature was proposed in the EM4 Addendum in an effort to mitigate the anticipated deficit in recharge due to development. However, in their comments on previous site plan design submissions, Conservation Halton has indicated that it is not necessary to match this recharge target.

The groundwater recharge rate in post-development conditions is estimated to be approximately 258 m^3/year with 76% imperviousness based on the remaining pervious area and the annual infiltration (mm/year) calculated by the hydrogeologist in the EM4 Addendum. It is acknowledged that stormwater infiltrated into the pervious area will ultimately be discharged to the storm system via foundation drains / internal building plumbing since the proposed development has a full coverage parking lot, although part of this runoff could be re-used for irrigation and / or partially infiltrated at the proposed stone core wetland at the site outlet to the channel. However, these are difficult to quantify and for the purpose of simplifying the calculations, it has been assumed that there will be essentially no recharge even with consideration of the pervious area.

To encourage some recharge, the proposed LID in the LPA has been designed to infiltrate 5mm rainfall which is equivalent to about 50% of the annual rainfall according to the Wet Weather Flow Management Guidelines by City of Toronto. Therefore, given 897 mm/year rainfall, and the evapotranspiration volume of ~20% of total rainfall (according to Section 8.5 of the EM4 Addendum which addresses post-development water balance), the available runoff volume for infiltration is 718mm/year. Since the LID can handle 5mm from the proposed drainage area, which represents 50% of the annual runoff volume, the actual runoff treated will be 718mm x 0.50 = 360mm.This results in 504 m^3/year infiltration which is about 47% decrease from the pre-development condition (1076 m^3/year). The LID details, including E&SC requirements during construction are shown on **Drawings GR-1**, **DET-1**, and **ESC-1**.

The details calculation is shown in the table below. It is assumed that infiltration in landscaped areas above the slab will be captured into the proposed cistern and can be re-used for irrigation or will be returned to the ground via the proposed stone core wetland at the storm outlet to the channel.

Table 5: Groundwater Recharge Rate

Development Scenario	Total Area (ha)	Imp%	Available area for Infiltration(ha)	Total Infiltration (mm/year) (from 897mm/yr Rainfall)	Total Infiltration (m^3/yr)	Infiltration Percentage change
Pre Development	0.78	0%	0.23	138	1076	
Post Development without LID	0.78	76%	0.19	138	258 (most likely will discharge to storm / channel)	-76%
Post Development with LID	0.78	76%	0.14 (LID drainage area)	360	504 (0.14 ha x 360mm)	-47%

The foundation drainage will be discharged into the sanitary sewer system, details are discussed in **Section 4.**

The LID has sufficient volume to contain the 5mm runoff volume, assuming no discharge via infiltration.

The maximum volume required is approximately 7.3m^3. The LID feature is approximately 140m^2 at the bottom and 150m2 at the top. The depth is 5cm. The provided volume is therefore 7.3m^3 (5mm x 0.14 ha). The level spreader is set above the estimated maximum ponding depth.

4 SANITARY SERVICING

Sanitary drainage from the proposed development will be directed to sanitary Manhole 101A provided as part of the approved servicing extension on Trafalgar Road (Trafalgar Road Works, Urbantech P# 20-650, part of DO-1029). The approved design of the sanitary sewers on Trafalgar Road has allowed for a population of 2650 persons/ha or **2041 people** for the subject site (see 20-650 Sanitary Drainage Plan and Design Sheet in **Appendix C**).

The proposed Towers will contain a combined **782 units**. Since the equivalent population of the development will be greater than 285/ha as per 2.3.2 of the Regions of Halton's Water and Wastewater Linear Design Manual, a conservative 1.833 persons per unit factor has been utilized per Table A-4 of the Region of Halton 2022 DC Background Study. The population has been estimated at **1435** people which is less than the allowable. Therefore, the approved sanitary sewer network extension on Trafalgar Road can accommodate the proposed development.

The design of the sanitary sewer network within the underground will be the responsibility of the mechanical engineer.

Refer to **Drawing SAN-1** in **Appendix A** and the **Trafalgar Road Sanitary Drainage Plan** and **Sanitary Sewer Design Sheet** in **Appendix C** for further details.

5 WATER DISTRIBUTION

The subject property is located entirely within Pressure Zone 4 of Halton Region's water distribution system. As part of the servicing extension application, a 300 mm watermain is proposed along the west side of Trafalgar Road to the existing chamber located at the corner of Wheat Boom Drive and Trafalgar Road. This work will complete the looped watermain system for the subdivision as part of file DO-1029 and will also provide 200 mm fire and 150 mm domestic service connections to Block 8 as per Region of Halton's standard RH-409.01. The location of the service connections conforms with the latest submitted materials for the service extension application.

A proposed hydrant will be located within the central island in the Street A roundabout of the private laneway for fire protection within 45 metres of the fire department ('siamese') connection.

A **Water Analysis** was prepared by Municipal Engineering Solutions ('MES'). The calculated fire flow demand for the proposed development is **133 L/s.** The analysis determined that the modelled system pressures under both 2021 and 2031 design scenarios (614 to 926 L/s and 554 to 957 L/s respectively) greatly exceed the max day + fire flow requirements at the minimum pressure of 140 kPa. The water distribution system can conclusively provide adequate flows and pressures to support the proposed development. Refer to **Appendix D** for details.

A hydrant flow test shall be completed upon installation and commissioning of the future watermain along Trafalgar Road to confirm the available pressures match the theoretical modeled values. The building mechanical design must consider both the high pressures anticipated and the future change in pressures as per the pressure-zone realignment. Refer to the **Water Pressure Analysis Memo** (dated May 18, 2023) for information regarding the impact on the development as a result of the future water pressure boundaries.

Based on the MES model results, the proposed system should satisfy the fire and domestic demands of the proposed development. Refer to **Appendix D** and drawing **SP-1** for details.

6 EROSION AND SEDIMENT CONTROLS

An Erosion and Sediment Control (ESC) strategy has been prepared in accordance with Town guidelines and the *Erosion and Sediment Control Guideline for Urban Construction (Greater Golden Horseshoe Conservation Authorities, 2006)* prior to any earthworks or grading activities on the Subject Lands. The ESC strategy will include the following:

- A temporary sediment control fence will be placed prior to grading.
- Gravel mud mat will be provided at construction vehicle access points to minimize off-site tracking of sediments.
- LID location will remain outside the limit of disturbance until construction of the LID to prevent soil compaction by heavy equipment.
- LID location will not be used as the sediment deposition site or for storing materials during construction.
- Until the drainage area is fully stabilized, stormwater runoff will be diverted away from the LID to avoid fouling / contamination of the LID soils.
- During construction, LID area will be fully protected by sit fence or construction fencing to prevent compaction by construction traffic and equipment.
- All temporary erosion and sediment control measures will be routinely inspected and repaired during construction. Temporary controls will not be removed until the areas they serve are restored and stable.
- The LID Drainage area stability will be monitored to prevent excessive sedimentation due to erosion and ongoing construction.
- LID inlets or surface drainage flow paths will be monitored to prevent obstructions in the flow path.
- Sediment depth/volume will be measured during cleaning or annually to estimate accumulation rate and optimize the frequency of maintenance.
- Double layer of sediment control fence is to be installed prior to the construction of the proposed storm sewer outlet pipe, headwall, and stone core wetland at the northeast limit of the site. Sediment control fence to remain in place until construction of the infrastructure is complete and full stabilization of the construction area have been achieved.

The details of the ESC measures are presented in **Drawing ESC-1**. A detailed Operations and Maintenance manual for the LID has been provided under separate cover.

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7 CONCLUSION

The proposed residential development at 3064 Trafalgar Road, which includes two - 30 story condominium buildings, can be adequately serviced via the proposed storm, sanitary and water distribution infrastructure and does not adversely impact any of the surrounding infrastructure or properties.

- Stormwater quantity control is provided by an underground storage tank within the underground parking space.
- Groundwater recharge is provided via a bioswale at the south-west end of the property within the LPA.
- Sanitary servicing is provided by sanitary Manhole 101A provided as part of the approved servicing extension on Trafalgar Road (DO-1029).
- Water distribution is provided by a 300 mm watermain extension along the west side of Trafalgar Road to the existing chamber located at the corner of Wheat Boom Drive and Trafalgar Road.

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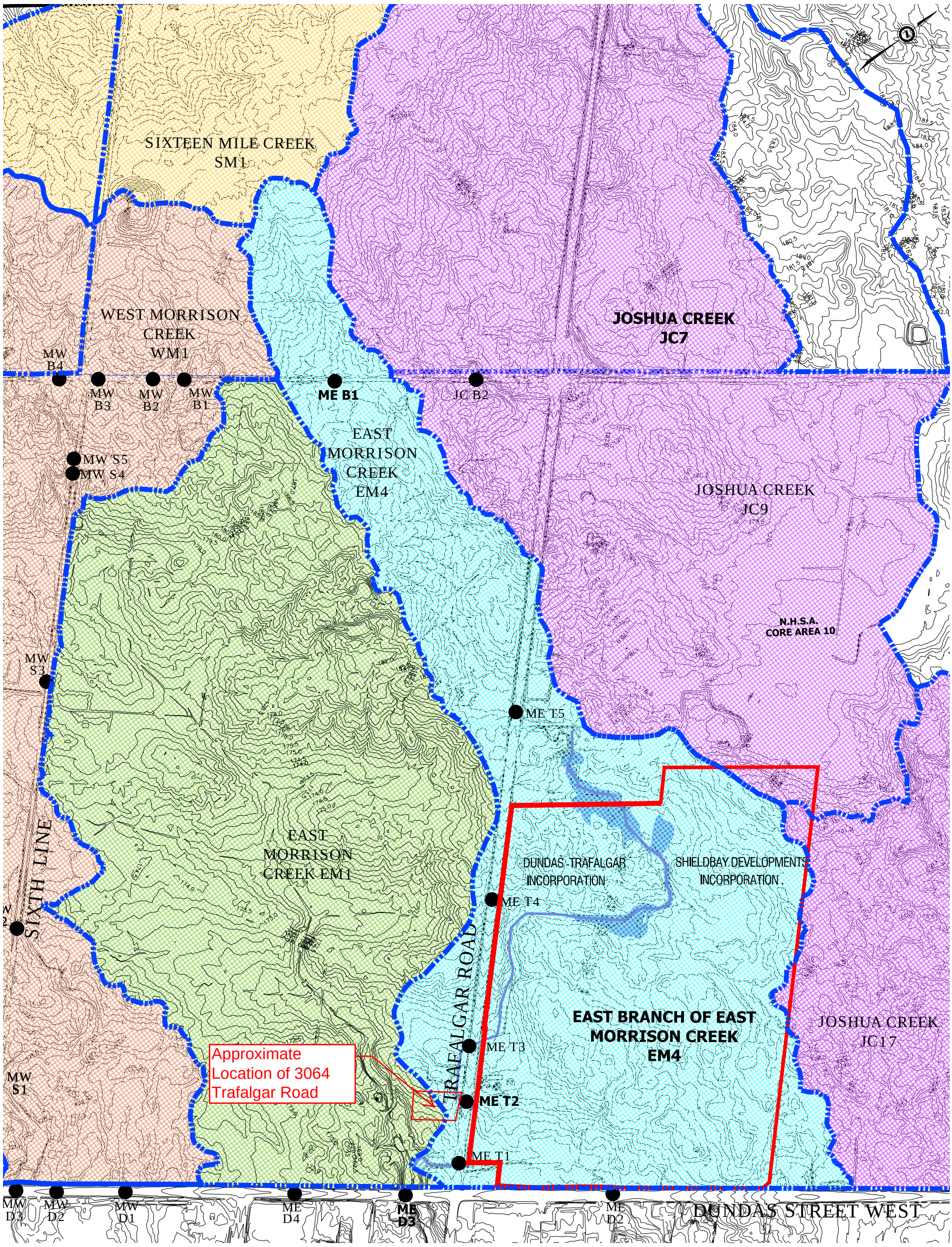
Project Manager

Andrew Fata, M.Sc. Eng., P.Eng.
Senior Associate, Water Resources

APPENDIX A

DRAWINGS and FIGURES

- Figure 1.2 – Subcatchment Boundaries Within and Adjacent to Subject Lands (EM4)
- Figure 3b – Scenario B: Post Development Drainage Area with 24.9 ha Diversion and Proposed MOC-2 Realignment
- GEN-1, General Notes Plan
- SP-1, Servicing Plan
- GR-1, Ultimate Grading Plan
- GR-2, Interim Grading Plan
- STM-1, Storm Drainage Plan
- SAN-1, Sanitary Drainage Plan
- DET-1, Details Plan
- ESC-1, Erosion and Sediment Control Plan



LEGEND:

- Subject Lands
- EIR Subcatchment Boundaries
- ME T3 — Existing Culvert
- 172.5 — Existing Contour and Elevation
- PSW 25
- Existing Watercourse

ENVIRONMENTAL IMPLEMENTATION REPORT AND FUNCTIONAL SERVICING STUDY

100m 0m 100m 200

1:10,000

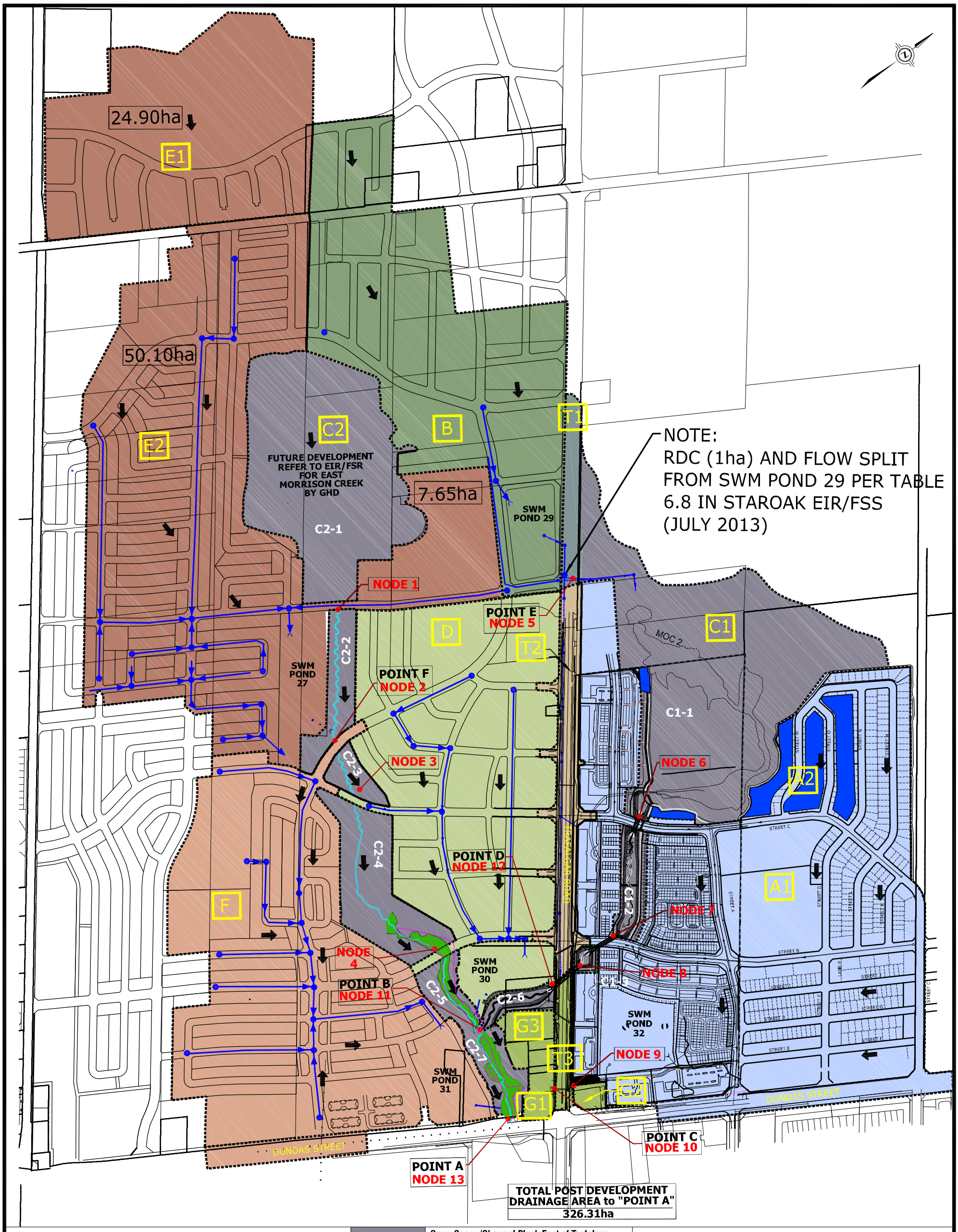
Stonybrook Consulting Inc.
Urbantech Consulting
David Schaeffer Engineering Ltd.
Bird and Hale Limited
R. J. Burnside & Associates Limited
Geomorphic Solutions

East Morrison Subcatchment EM4
Dundas-Trafalgar Inc. & Shieldbay Developments Inc.

Figure 1.2
Subcatchment Boundaries Within and Adjacent to Subject Lands

October 2014

File:P:\Projects\12-370\EIR-FSS\Final EIS-FSS\Figures\Figure 1.2 Subcatchment Boundaries.dwg Wednesday, October 22, 2014 11:36 AM



LEGEND:

- Post Development Drainage Boundary
- Proposed Minor System Flow Direction
- Overland Flow Direction
- Staked Wetland Boundary (GREEN GINGER EIR/FSS) BY GHD
- PSW Boundary (MNR STAKED, JULY 2009)

A1=62.67ha	Post Development Drainage Area Contributing to Pond 32 (NODE 9)
A2=3.9ha	Post Development Drainage Area Contributing to PSW 25/MOC-2 (NODE 6)
B=33.09ha	Post Development Drainage Area Contributing to Pond 29. Extended Detention to MOC-2/Core 10, 2-yr to Regional Flows to MOC-2 at Culvert Crossing (NODE 5)
T1=1.82ha	Post Development Trafalgar ROW Drainage Area Contributing to MOC-2/Core 10 (NODE 5)
T2=5.10ha	Post Development Trafalgar ROW Drainage Area Contributing to East Morrison Creek at Culvert Crossing Near Street B (NODE 12)
C1=25.60ha	Open Space/Channel Block East of Trafalgar Road (MOC-2) (NODE 6)
C2=28.98ha	Open Space/Channel Block West of Trafalgar Road (MOC-4 + MOC-2 extension)
D=34.55ha	Post Development Drainage Area Contributing to Pond 30 (NODE 11)
E=82.65ha	Post Development Drainage Area E1+E2 Including 24.9ha Diversion Contributing to Pond 27
F=43.45ha	Post Development Drainage Area Contributing to Pond 31 (NODE 13)
T3=1.30ha	Post Development Drainage Area Contributing directly to MOC-2A (NODE 10)
G1=0.45ha	Post Development Drainage Area (ESSO) Contributing directly to MOC-2A (NODE 9)
G2=0.45ha	Post Development Drainage Area (SHELL) Contributing directly to MOC-2A (NODE 10)
G3=1.95ha	Post Development Drainage Area (Fut. Site Plan) Contributing directly to MOC-2A (NODE 10)

ENVIRONMENTAL IMPLEMENTATION REPORT AND FUNCTIONAL SERVICING STUDY

100m 0m 100m 200

1:10,000

Stonybrook Consulting Inc.
Urbantech Consulting
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Bird and Hale Limited
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Geomorphic Solutions

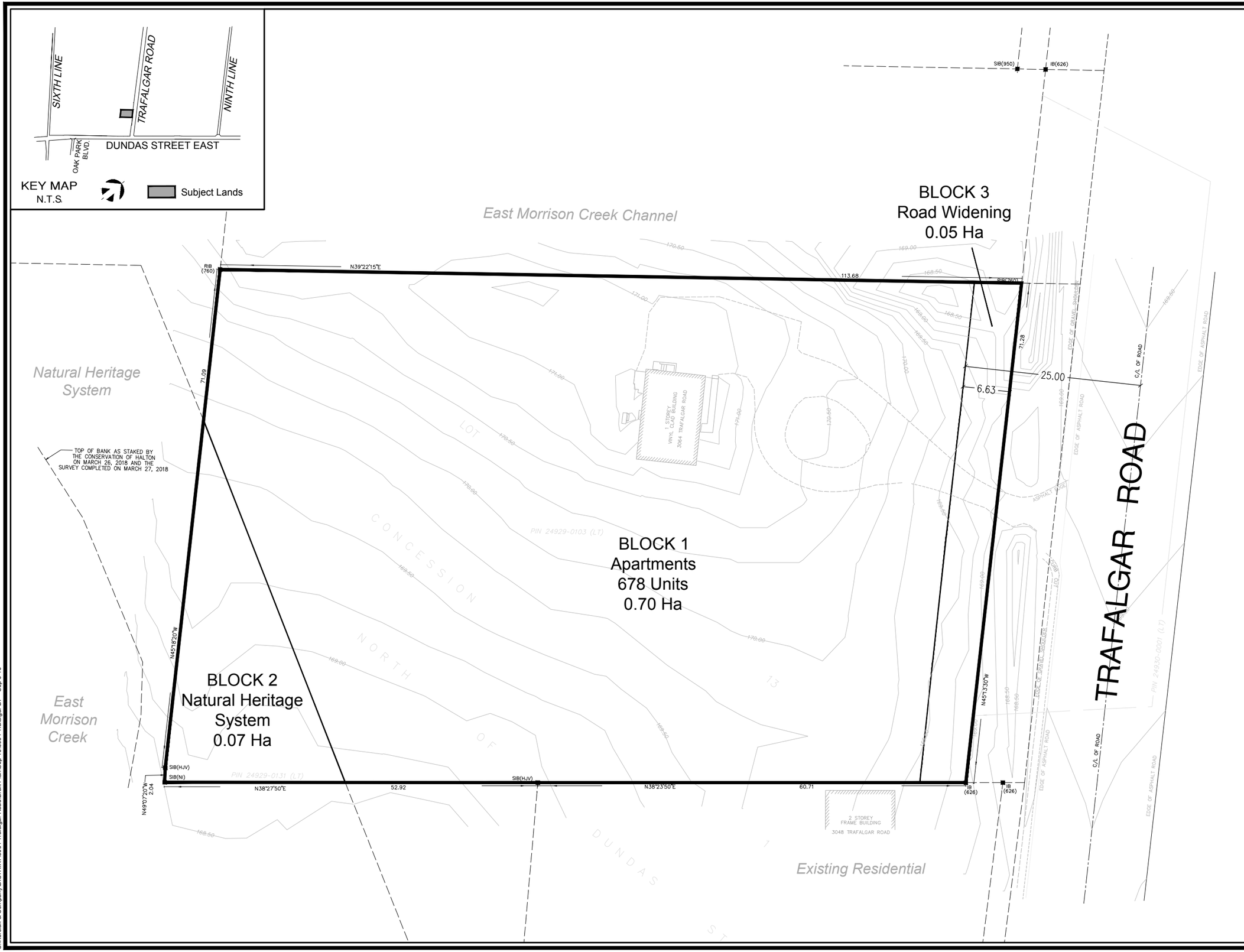
East Morrison Subcatchment EM4
Dundas-Trafalgar Inc. & Shieldbay Developments Inc.

Figure 3b
Scenario B
Post Development Drainage Area with 24.9ha Diversion and Proposed MOC-2 Realignment

October 2014

File: P:\Projects\12-370\EIR-FSS\Final EIS-FSS\Figures\Figure 3b Post Development Storm Drainage-B.dwg - Thursday, April 17, 2014

FIGURE 6.1



DRAFT PLAN OF SUBDIVISION 24T-

3064 TRAFALGAR ROAD

PART OF LOT 13
CONCESSION 1, NORTH OF DUNDAS STREET

GEOGRAPHIC TOWNSHIP OF TRAFALGAR
NOW IN THE
TOWN OF OAKVILLE
REGIONAL MUNICIPALITY OF HALTON

OWNER'S AUTHORIZATION

I HEREBY AUTHORIZE KORSIAK URBAN PLANNING TO PREPARE THIS DRAFT PLAN OF SUBDIVISION FOR APPROVAL BY THE TOWN OF OAKVILLE FOR APPROVAL.

SIGNED _____ DATE September 4, 2019
Emil Toma, A.S.O.

1-90 Wingold Avenue
Toronto, ON M6B 1P5

SURVEYOR'S CERTIFICATE

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

SIGNED _____ DATE September 6, 2019
Thomas J. Salb, Ontario Land Surveyor

J.D. BARNES LIMITED
LAND INFORMATION SPECIALISTS
SURVEYING MAPPING GIS
401 WHEELABRATOR WAY, SUITE 4, MILTON, ON L9T 3C7
T: (905) 875-9955 F: (905) 875-9956 www.jdbarnes.com

ADDITIONAL INFORMATION (UNDER SECTION 51 (17) OF THE PLANNING ACT)

A) SHOWN ON PLAN
B) SHOWN ON PLAN
C) SHOWN ON PLAN
D) SHOWN ON PLAN
E) SHOWN ON PLAN
F) SHOWN ON PLAN
G) SHOWN ON PLAN
H) MUNICIPAL AND PIPED WATER TO BE PROVIDED
I) CLAY LOAM
J) SHOWN ON PLAN
K) SANITARY AND STORM SEWERS TO BE PROVIDED
L) SHOWN ON PLAN

LAND USE SCHEDULE

Land Use	Blocks	Block Total	Area (ha)	Units
Apartments	1	1	0.70	678
NHS	2	1	0.07	
Road Widening	3	1	0.05	
Total	3	3	0.82	678

SDE CALCULATIONS

Unit Type	Blocks	Units	SDE*
Apartment	1	678	339
Total		678	339

* SDE Factors:
Apartment - 0.500

Sep. 6, 2019	Original Submission	A	KC
[D.M.Y]	REVISION	DWG	BY

NOTES:

DISTRIKT

SCALE 1:500 | September 6, 2019 | A

DRAWN BY: SE | CHECKED BY: KC

KORSIAK Urban Planning
206-277 Lakeshore Road East
Oakville, Ontario L6J 1H9
T: 905-257-0227
info@korsiak.com

GENERAL NOTES:

1. STANDARD DRAWINGS AND SPECIFICATIONS OF THE TOWN OF OAKVILLE AND THE REGION OF HALTON SHOULD BE READ IN CONJUNCTION WITH THE INFORMATION HEREIN.

2. MATERIAL SUBSTITUTIONS MUST HAVE PRIOR APPROVAL OF THE ENGINEER, TOWN OF OAKVILLE & REGION OF HALTON AND ANY OTHER REGULATORY AGENCIES HAVING JURISDICTION.

3. NO BLASTING IS REQUIRED OR ALLOWED.

4. COMPACTION OF GRANULAR BACKFILL AROUND CATCHBASINS AND MANHOLES TO BE 95% S.P.M.D.D. AND SHALL BE COMPACTED MECHANICALLY.

5. SEWER BEDDING TO BE AS PER TOWN OF OAKVILLE STANDARDS.

6. FILL AREAS GREATER THAN 0.3m WITHIN MUNICIPAL RIGHT-OF-WAY ARE SUBJECT TO COMPACTION TESTS TO ACHIEVE 100% S.P.M.D.D.

7. SET MANHOLE AND CATCHBASIN TOPS FLUSH WITH HL8 ASPHALT AND ARE TO BE ADJUSTED TO FINAL GRADE PRIOR TO PLACING FINAL LIFT OF ASPHALT.

8. TOWN OF OAKVILLE STANDARD 6-1 TO BE USED FOR CURB AND GUTTER UNLESS OTHERWISE NOTED.

9. TOWN OF OAKVILLE STANDARD 6-3 TO BE USED FOR ALL SIDEWALK. SIDEWALK DEPRESSIONS TO BE INSTALLED AT INTERSECTIONS. INTERSECTION RADII TO BE 7.50m UNLESS OTHERWISE NOTED.

10. ANY ORGANIC MATERIAL OR TOPSOIL WITHIN FUTURE ROAD ALLOWANCES SHALL BE STRIPPED PRIOR TO CONSTRUCTION.

11. ALL TRENCHES WITHIN EXISTING R.O.W. TO BE BACKFILLED WITH GRANULAR MATERIAL AND COMPACTED TO 95% S.P.M.D.D.

12. ALL TRENCHES WITHIN A REGIONAL R.O.W. TO BE BACKFILLED WITH GRANULAR MATERIAL AND COMPACTED TO 98% S.P.M.D.D.

13. SUBDRAINS TO BE INSTALLED AS PER TOWN OF OAKVILLE STD. 6-2 UNLESS OTHERWISE NOTED.

14. ALL MATERIALS SHALL MEET OR EXCEED ONTARIO PROVINCIAL STANDARD AND TOWN STANDARD SPECIFICATIONS.

15. WATERMAINS AND SANITARY SEWERS TO CONFORM TO LATEST REGIONAL MUNICIPALITY OF HALTON SPECIFICATIONS AND REQUIREMENTS.

16. CONCRETE CURBS SHALL BE OPSD 600.060.

17. REFER TO ONTARIO BUILDING CODE SECTION 7.2.4.4 REGARDING FITTINGS RESTRICTED IN USE.

18. REFER TO ONTARIO BUILDING CODE SECTION 7.2.10.5 REGARDING SADDLE HUBS.

19. REFER TO ONTARIO BUILDING CODE SECTION 7.3.5.4 REGARDING FROST PROTECTION OF SERVICES.

20. REFER TO ONTARIO BUILDING CODE SECTION 7.3.5.7 REGARDING SPATIAL SEPARATION OF SERVICES

STORM SEWERS:

1. MANHOLES TO BE AS PER O.P.S.D. 701.010 - 701.015 WITH COVER AND FRAME AS PER O.P.S.D.

2. CONCRETE PIPE TO BE CLASS 65-D AS PER CSA A257.2, PVC SDR 35 OR RIBBED PVC CONFORMING TO CSA B.182.2 (MAX PVC = 600mm DIA).

3. ALL POLYVINYL CHLORIDE (PVC.) PIPE SHALL MEET THE C.S.A. REQUIREMENTS AS NOTED WITHIN THE OPSS 1841, THE PIPE MATERIAL SHALL HAVE A CELL CLASSIFICATION OF 12454-B OR 12454-C OR ASTM STD. D-3034 AND OPSS 1841.

4. CATCHBASINS TO BE AS PER O.P.S.D. 705.01 FOR SINGLES AND 705.02 FOR DOUBLES. GRATES TO BE AS PER O.P.S.D. 400.11. CATCHBASINS LEADS TO BE 250mm DIA. FOR SINGLES AND 300mm DIA FOR DOUBLES AS PER CSA B182.2 SDR-35.

5. SILT TRAPS WITH FILTER FABRIC TO BE INSTALLED ON ALL CATCHBASINS AS PER THE REQUIREMENTS OF THE SITE ALTERATION PERMIT. TRAPS TO BE CLEANED REGULARLY BY THE CONTRACTOR. TRAPS ARE NOT TO BE REMOVED UNTIL CURBS ARE CONSTRUCTED AND BOULEVARDS ARE SODDED AND BACKYARDS ARE GRADED AND SODDED.

6. RUBBER GASKETED JOINTS ARE TO BE USED ON ALL STORM SEWER.

7. CONNECTIONS TO MAIN SEWERS SHALL BE ACHIEVED USING 'Y' FITTINGS ONLY.

8. FOR AREA DRAIN AND BUILDING INTERIOR DRAINS, REFER TO ARCHITECTURAL PLANS & SPECIFICATIONS.

SANITARY SEWERS:

1. MANHOLES AS PER O.P.S.D. 701.010 WITH FRAME AND COVER AS PER O.P.S.D. 401.01 TYPE 'B'.

2. SEWER PIPE TO BE PVC SDR 35 OR RIBBED CONFORMING TO CSA B.182.2 OPSS 1841, O.P.S.D. 806.040 AND 806.06.

3. SERVICE CONNECTIONS TO BE 125mm DIA. FOR SINGLE LOT CONNECTIONS (DUAL SANITARY CONNECTIONS ARE NOT PERMITTED, EXCEPT VERTICAL DUAL SANITARY CONNECTIONS). MINIMUM AND MAXIMUM COVER AT STREETLINE OF 2.15m & 2.75m, RESPECTIVELY, IS REQUIRED.

4. SERVICE CONNECTIONS EXCEEDING 4.50m REQUIRE RISERS AS PER REGION OF HALTON STANDARDS.

5. SAFETY PLATFORMS ARE NOT PERMITTED IN HALTON REGION.

6. CONNECTIONS TO MAIN SEWERS SHALL BE ACHIEVED USING 'Y' FITTINGS ONLY.

7. ALL SANITARY SEWER WORKS AND APPURTENANCES SHALL BE CONSTRUCTED IN ACCORDANCE WITH CURRENT REGION OF HALTON STANDARDS AND SPECIFICATIONS.

WATERMAIN:

1. 150mm DIA. TO 300mm DIA. WATERMAIN TO BE PVC CL.235 (DR-18) WITH GASKETED JOINTS PER AWWA C-900, C-905 & C-907..

2. SERVICE CONNECTIONS TO BE 25mm DIA. AND PER O.P.S.D. 1104.01. THE USE OF SADDLES IS NOT PERMITTED. PIPE FOR ALL SERVICE CONNECTIONS SHALL BE TYPE 'K' SOFT COPPER TUBING.

3. MINIMUM HORIZONTAL SEPARATION OF 2.5m BETWEEN WATERMAINS AND SEWERS. A 0.5m SEPARATION BETWEEN WATERMAINS AND SEWERS MUST BE MAINTAINED AT ALL CROSSING LOCATIONS.

4. BEDDING TO BE SUITABLE GRANULAR 'A' MATERIAL AS PER HALTON REGION STD. 1-5-1.

5. ALL WATERMAIN WILL BE SUBJECT TO PRESSURE TESTING AND FIRE FLOW TESTING AS DIRECTED BY HALTON REGION

6. SACRIFICIAL ANODES SHALL CONFORM TO ASTM B-418 TYPE II AND SHALL BE MADE OF HIGH GRADE ELECTROLYTIC ZINC, 99.99% PURE.

7. ALL METALLIC WATERMAINS, FITTING, HYDRANTS AND RESTRAINERS TO HAVE ONE ZINC ANODE PER LENGTH OF PIPE IN SIZES ACCORDING TO THE FOLLOWING TABLE AND INSTALLED IN ACCORDANCE WITH REGION OF HALTON STANDARD DRAWING RH 420.01 AND RH 420.02.

PIPE / FITTING SIZE (mm)	ZINC ANODE SIZE (KG)
150	2.7
200	5.5
300	11
400	11
450	11
HYDRANT	11

COPPER SERVICE (mm)	ZINC ANODE SIZE (KG)
20	2.7 (< 13m IN LENGTH)
	5.5 (< 26m IN LENGTH)
	11 (> 26m IN LENGTH)
25	5.5 (< 26m IN LENGTH)
	11 (> 26m IN LENGTH)
32, 38, 50	5.5

8. ANODES ARE NOT REQUIRED WITHIN VALVE-CHAMBERS, DRAIN CHAMBERS OR AIR RELEASE CHAMBER.

9. WELD CONNECTIONS TO BE COATED WITH "TC MASTIC" OR APPROVED EQUIVALENT.

10. FOR ALL ANODES CONNECTED TO NEW PIPE, FITTINGS OR TO EXISTING METALLIC WATERMAINS, A CADWELDER AND CA-15 OR EQUIVALENT CARTRIDGE SHALL BE USED. ANODE INSTALLATION SHALL BE PERFORMED IN ACCORDANCE WITH THE MANUFACTURERS INSTRUCTIONS.

11. WHERE NEW PIPE IS TO BE CONNECTED TO EXISTING DUCTILE IRON OR CAST IRON PIPE A 14.5 KG MAGNESIUM ANODE IS TO BE CONNECTED TO THE FIRST LENGTH OF EXISTING PIPE, AS PER REGION OF HALTON STANDARD DRAWING RH 420.01.

12. VALVES TO OPEN LEFT (COUNTER CLOCKWISE) AND HAVE A STANDARD 50mm SQUARE OPERATION NUT.

13. ALL PLUGS, CAPS, TEES & HYDRANTS AND BENDS WILL HAVE APPROVED MECHANICAL THRUST RESTRAINTS. CONCRETE THRUST BLOCKS SHALL ONLY BE USED IN SPECIAL CIRCUMSTANCES WITH THE APPROVAL OF THE REGION OF HALTON.

14. WATERMAIN INSTALLATION WITHIN EXISTING R.O.W. SHALL BE BACKFILLED WITH GRANULAR 'A'.

15. GATE VALVES CONFORMING TO AWWA C500 AND THE REGION OF HALTON SPECIFICATIONS SHALL BE PROVIDED ON WATERMAINS UP TO AND INCLUDING 300mm DIA.

16. WATERMAIN FITTINGS TO HAVE MECHANICAL JOINTS.

17. VERTICAL OR HORIZONTAL PIPE DEFLECTION TO BE IN ACCORDANCE WITH THE MANUFACTURES SPECIFICATIONS.

18. TRACER WIRE SHALL BE INSTALLED ON ALL NEW PVC AND POLYETHYLENE PIPE. A SOLID GAUGE TWU COPPER WIRE SHALL BE INSTALLED ALONG THE TOP OF THE PIPE STRAPPED TO THE PIPE AT 6m INTERVALS. THE WIRE SHALL BE INSTALLED BETWEEN EACH VALVE AND/OR THE END OF THE NEW PVC WATERMAIN. JOINTS IN THE WIRE ARE NOT PERMITTED. AT EACH VALVE, A LOOP OF WIRE IS TO BE BROUGHT UP INSIDE THE VALVE BOX TO THE TOP OF THE BOX AS PER HALTON STD DRAWING RH 4--4.04 OR RH 400.05

19. HYDRANTS TO BE INSTALLED SUCH THAT THE LOWER ROD STEM SHALL NOT EXCEED 1.7m MEASURED FROM THE BREAKOFF FLANGE.

20. ALL HYDRANTS AS PER O.P.S.D. 1105.010 AND RH400.02 TO HAVE STEAMER CONNECTIONS.
STORZ PUMPER CONNECTIONS
    - TWO (2) 63.5mm (2 1/2") WITH CSA STANDARD THREAD, 63.5mm I.D., 79.4mm O.D., 5 THREADS PER 25mm, 31.75mm SQUARE OPERATING NUT; AND
    - ONE (1) 100mm (4") STORZ PUMPER CONNECTION AS PER CAN/ULC #S-520, 31.75mm SQUARE OPERATING UNIT, AND STORE CAP PAINTED GLOSS BLACK.

21. MINIMUM DEPTH OF COVER OVER WATERMAIN SHALL BE 1.70m MEASURED FROM THE ROAD CENTRELINE ELEVATION.

No.	REVISIONS	DATE	BY
6.	OPA AMMENDMENT SUBMISSION	APRIL 12, 2024	AM
5.	FOURTH SPA SUBMISSION	DEC. 15, 2023	AM
4.	ISSUED FOR BUILDING PERMIT	SEPT. 29, 2023	AM
3.	THIRD SPA SUBMISSION	JULY 24, 2023	AM
2.	SECOND SPA SUBMISSION	APR. 27, 2022	JO

DISTRIKT DEVELOPMENTS
PROPOSED RESIDENTIAL
(3064 TRAFALGAR ROAD)

OAKVILLE

REGIONAL MUNICIPALITY OF HALTON
TOWN OF OAKVILLE

REGION No. ____________

MUNICIPAL PLANNING No. Z.1313.09 SITE PLAN SP.1313.006/01

MUNICIPAL

APPROVED IN PRINCIPAL SUBJECT TO DETAIL CONSTRUCTION CONFORMING TO TOWN STANDARDS AND SPECIFICATIONS.

SIGNED____________________ DATE____________

REGIONAL

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

SIGNED____________________ DATE____________
INFRASTRUCTURE PLANNING & POLICY

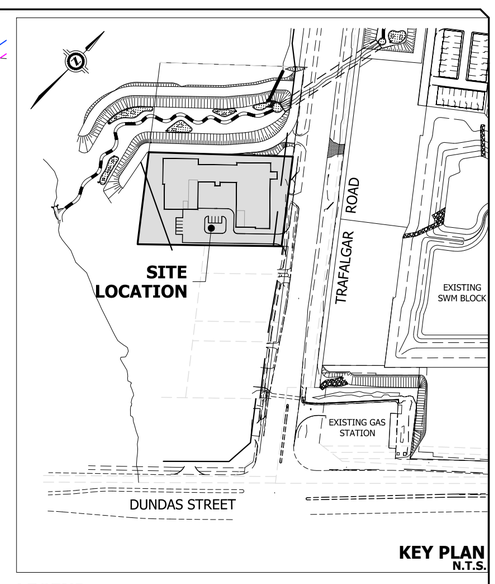
The Applicant should be aware that the approval of the water system on private property is the responsibility of the Local Municipality. Regardless, the Applicant must ensure that the Region of Halton's standards and specifications are met. (the Water and Wastewater Linear Design Manual may be obtained from the Data Management Group at 905-825-6023) Furthermore, all water quality tests must be completed to the Region of Halton's satisfaction, before the water supply can be turned on.

URBANTECH®
Urbantech® Consulting
A Division of Leighton-Zec Ltd.
3760 14th Avenue, Suite 301,
Markham, ON. L3R 3T7
TEL 905.946.9461 • urbantech.com

LICENSED PROFESSIONAL ENGINEER
A.M.R. MCLENNAN
100509390
APR 12, 2024
PROVINCE OF ONTARIO

GENERAL NOTES

DESIGNED: J.M.	CHECKED: J.O.	PROJECT No.: 18-575
DRAWN: J.M.	DATE: JUNE 2021	SHEET No.:
SCALE:		DRAWING No.: **GEN-1**



KEY PLAN
N.T.S.

LEGEND

- CONCRETE CURB, TWO-STAGE BARRIER (TOWN STD. 6-1)
- CONCRETE CURB, MOUNTABLE (OPSD 600.060)
- FUTURE CURB B.O. (REGION FILE DO-1069)
- STORM SEWER AND MANHOLE
- FUT. SANITARY SEWER AND MANHOLE B.O. (REGION FILE DO-1069)
- FUT.WATERMAIN B.O. (REGION FILE DO-1069)
- AREA DRAIN / SINGLE CATCHBASIN
- HYDRANT & VALVE
- VALVE AND BOX B.O. (REGION FILE DO-1069)
- TRANSFORMER
- EXISTING STORM MANHOLE
- EXISTING SANITARY MANHOLE
- EXISTING SINGLE CATCHBASIN
- EXISTING DOUBLE CATCHBASIN
- STREET LIGHT
- CURRENT REGIONAL FLOODLINE
- 7.5 m SETBACK FROM CURRENT REGIONAL FLOODLINE
- ULTIMATE REGIONAL FLOODLINE (APPROXIMATE/TBD)
- 7.5 m SETBACK FROM ULTIMATE REGIONAL FLOODLINE (APPROXIMATE/TBD)
- PROPOSED REGIONAL FLOODLINE
- 7.5 m SETBACK FROM PROPOSED REGIONAL FLOODLINE
- EXISTING TREE TO BE PRESERVED (REFER TO LANDSCAPING PLAN FOR DETAILS)
- PROPOSED SOD (REFER TO LANDSCAPING PLANS FOR DETAILS)
- PROPOSED SEED MIX (REFER TO LANDSCAPING PLANS FOR DETAILS)
- PROPOSED PRECAST UNIT PAVING (REFER TO LANDSCAPING PLANS FOR DETAILS)
- PROPOSED CAST IN PLACE CONCRETE (REFER TO LANDSCAPING PLANS FOR DETAILS)
- PROPOSED 1.8m HEIGHT WOOD PRIVACY FENCE (REFER TO LANDSCAPING PLANS FOR DETAILS)
- PROPOSED 1.8m HEIGHT BLACK VINYL CHAIN LINK FENCE (REFER TO LANDSCAPING PLANS FOR DETAILS)
- ROAD DELINEATOR POSTS PER OPSD 984.105 (EX. TRAFALGAR ROAD CONDITION ONLY)

NOTE:

SANITARY AND WATERMAIN WITHIN TRAFALGAR ROAD AND TO STUB LOCATIONS AS SHOWN IS BY OTHERS AS PER REGION FILE DO-1069.

BENCHMARK NOTE:

LOCAL BENCHMARK No.1 (BY J.D. BARNES LIMITED, REFERENCE NO.: 17-30-168-01, MARCH 29, 2018)

NORTHEAST CORNER OF CONCRETE DITCH HEADWALL, ELEVATION = 168.88 m

NOTES:
IT IS THE RESPONSIBILITY OF THE CONTRACTOR TO VERIFY THAT THE LOCAL BENCHMARK HAS NOT BEEN ALTERED OR DISTURBED AND THAT THE RELATIVE ELEVATION AND DESCRIPTION AGREE WITH THE INFORMATION SHOWN ON THIS SKETCH

BEFORE DIGGING, UNDERGROUND SERVICES SHOULD BE LOCATED ON SITE BY THE RESPECTIVE AGENCIES

**THIS PLAN WAS EDITED ON MARCH 29, 2018 TO SHOW TOP OF BANK AS STAKED ON MARCH 26, 2018 AND SURVEYED ON MARCH 27, 2018.

ELEVATION NOTE:
ELEVATIONS SHOWN ON THIS PLAN ARE DERIVED FROM TOWN OF OAKVILLE BENCHMARK NUMBER 276 ON TOP OF NORTH END OF CONCRETE CULVERT 1.6 KM EAST OF BURNHAMTHORPE AND TRAFALGAR ROAD.
ELEVATION = 175.722 m

No.	REVISIONS	DATE	BY
6	OPA AMENDMENT SUBMISSION	APR. 12, 2024	AM
5	FOURTH SPA SUBMISSION	DEC. 15, 2023	AM
4	ISSUED FOR BUILDING PERMIT	SEPT. 29, 2023	AM
3	THIRD SPA SUBMISSION	JULY 24, 2023	AM

DISTRIKT DEVELOPMENTS
PROPOSED RESIDENTIAL DEVELOPMENT
3064 TRAFALGAR ROAD

OAKVILLE

REGIONAL MUNICIPALITY OF HALTON
TOWN OF OAKVILLE

REGION No. SP ####

MUNICIPAL PLANNING No. Z.1313.09

SITE PLAN SP.1313.006/01

MUNICIPAL

APPROVED IN PRINCIPAL SUBJECT TO DETAIL CONSTRUCTION CONFORMING TO TOWN STANDARDS AND SPECIFICATIONS.

SIGNED_____ DATE_____

MANAGER OF DEVELOPMENT ENGINEERING

REGIONAL

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

SIGNED_____ DATE_____

INFRASTRUCTURE PLANNING & POLICY

The Applicant should be aware that the approval of the water system on private property is the responsibility of the Local Municipality. Regardless, the Applicant must ensure that the Region of Halton's standards and specifications are met. (the Water and Wastewater Linear Design Manual may be obtained from the Data Management Group at 905-825-6023). Furthermore, all water quality tests must be completed to the Region of Halton's satisfactions, before the water supply can be turned on.

URBANTECH

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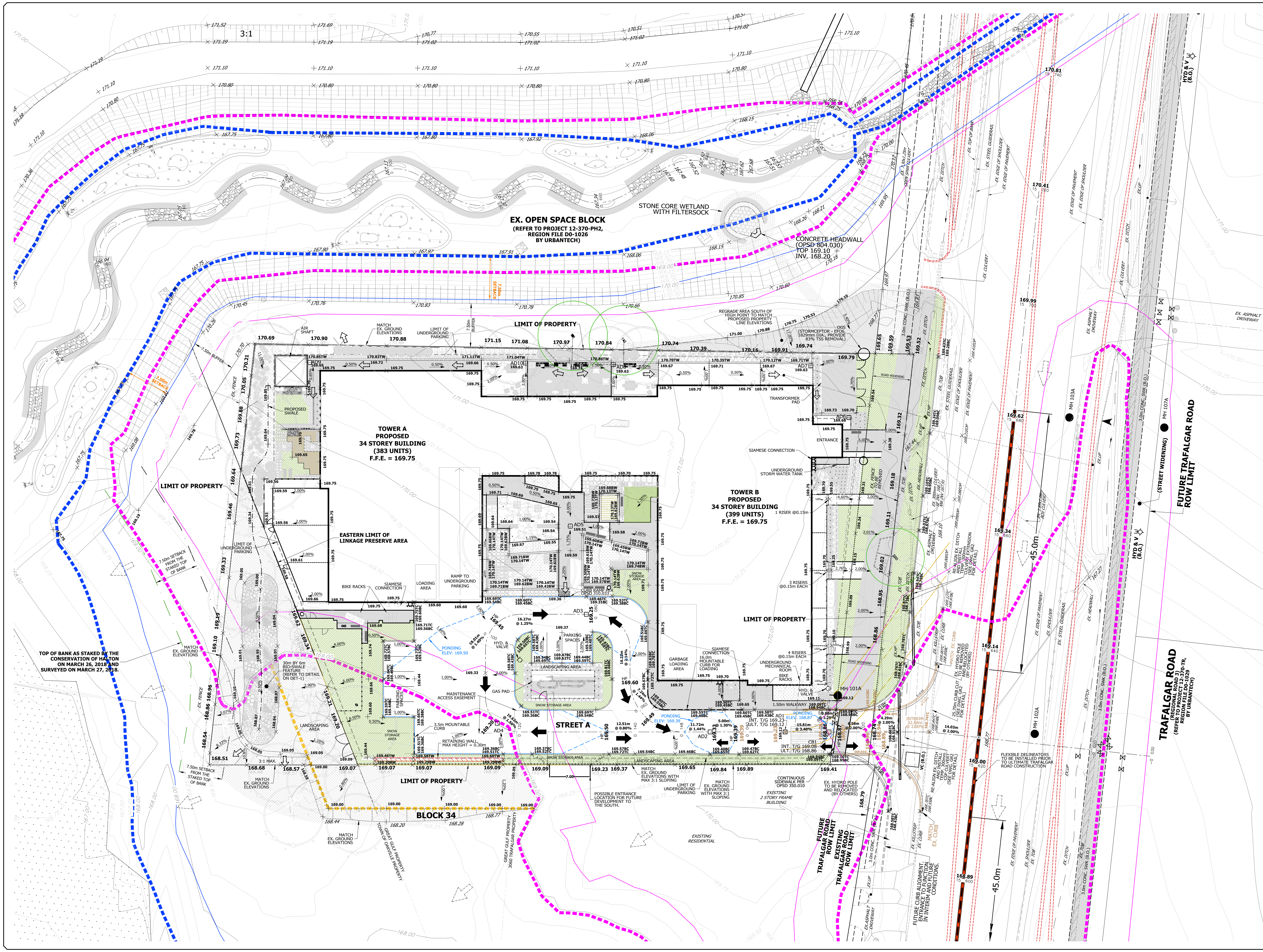
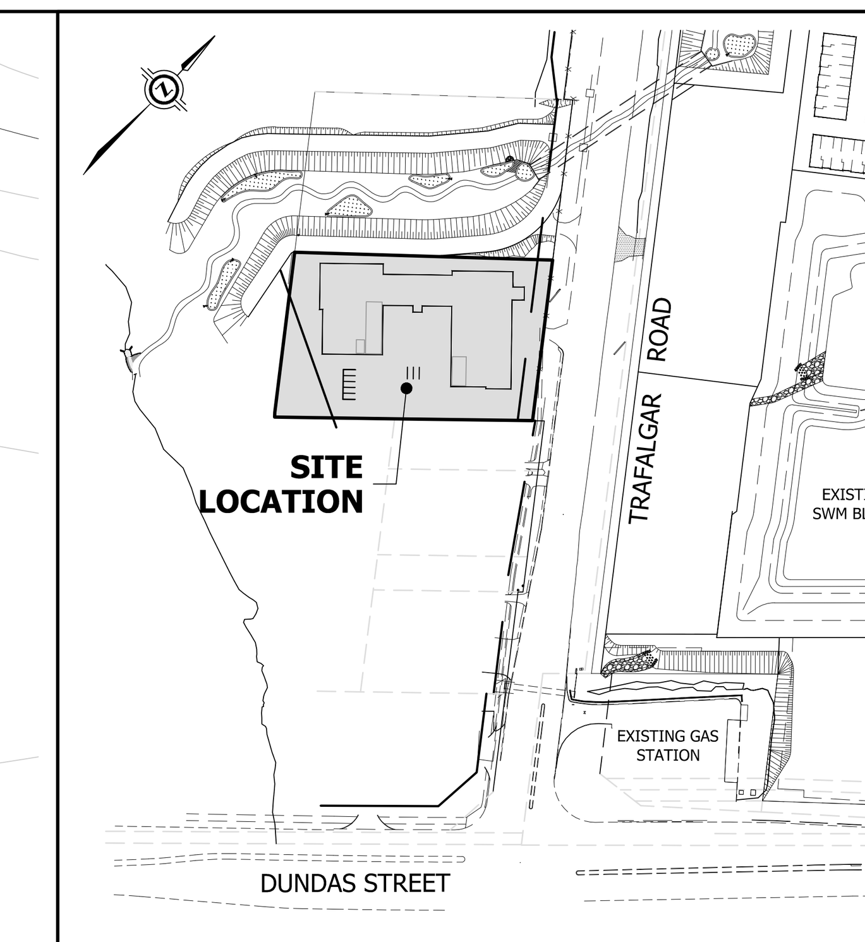
A Division of Leighton-Zec Ltd.
3760 14th Avenue, Suite 301,
Markham, ON. L3R 3T7
TEL 905.946.9461 • urbantech.com

LICENSED PROFESSIONAL ENGINEER
A.M.R. MCLENNAN
100509390
APR 12, 2024
PROVINCE OF ONTARIO

SERVICING PLAN

DESIGNED:	J.M.	CHECKED:	J.O.	PROJECT No.:	18-575
DRAWN:	J.M.	DATE:	JUNE 2021	SHEET No.:	
SCALE: 1:500 (5m 0m 5m 10m 20m)				DRAWING No.:	SP-1





KEY PLAN
N.T.S.

LEGEND

- CONCRETE CURB, TWO-STAGE BARRIER (TOWN STD. 6-1)
- CONCRETE CURB, MOUNTABLE (OPSD 600.060)
- FUTURE CURB (BY OTHERS)
- STORM MANHOLE
- SANITARY MANHOLE
- AREA DRAIN / SINGLE CATCHBASIN
- HYDRANT & VALVE
- VALVE AND BOX
- TRANSFORMER
- STREET LIGHT
- EXISTING TREE TO BE PRESERVED (REFER TO LANDSCAPING PLAN FOR DETAILS)
- TREE PROTECTION ZONE FENCE
- MAXIMUM 3:1 SLOPE
- 247.00 EXISTING CONTOUR AND ELEVATION
- +240.71 PROPOSED ELEVATION
- +240.71TC PROPOSED TOP OF CURB ELEVATION
- +240.71BC PROPOSED BOTTOM OF CURB ELEVATION
- (240.71) FUTURE ELEVATION
- 169.99 EXISTING ELEVATION
- PROP. OVERLAND FLOW DIRECTION
- PROP. EMERGENCY OVERLAND FLOW DIRECTION
- 1.8m HEIGHT WOOD PRIVACY FENCE (REFER TO LANDSCAPING PLAN FOR DETAILS)
- 1.8m HEIGHT BLACK VINYL CHAIN LINK FENCE (REFER TO LANDSCAPING PLANS FOR DETAILS)
- ULTIMATE REGIONAL FLOODLINE (APPROXIMATE/TBD)
- 7.5 m SETBACK FROM ULTIMATE REGIONAL FLOODLINE (APPROXIMATE/TBD)
- 100 YR PONDING LIMIT
- PROPOSED SOD (REFER TO LANDSCAPING PLANS FOR DETAILS)
- PROPOSED SEED MIX (REFER TO LANDSCAPING PLANS FOR DETAILS)
- PROPOSED PRECAST UNIT PAVING (REFER TO LANDSCAPING PLANS FOR DETAILS)
- PROPOSED CAST IN PLACE CONCRETE (REFER TO LANDSCAPING PLANS FOR DETAILS)
- ROAD DELINEATOR POSTS PER OPSD 984.105 (EX. TRAFALGAR ROAD CONDITION ONLY)

BENCHMARK NOTE:

LOCAL BENCHMARK No.1 (BY J.D. BARNES LIMITED, REFERENCE NO.: 17-30-168-01, MARCH 29, 2018)

NORTHEAST CORNER OF CONCRETE DITCH HEADWALL, ELEVATION = 168.88 m

NOTES:
IT IS THE RESPONSIBILITY OF THE CONTRACTOR TO VERIFY THAT THE LOCAL BENCHMARK HAS NOT BEEN ALTERED OR DISTURBED AND THAT THE RELATIVE ELEVATION AND DESCRIPTION AGREE WITH THE INFORMATION SHOWN ON THIS SKETCH

BEFORE DIGGING, UNDERGROUND SERVICES SHOULD BE LOCATED ON SITE BY THE RESPECTIVE AGENCIES

**THIS PLAN WAS EDITED ON MARCH 29, 2018 TO SHOW TOP OF BANK AS STAKED ON MARCH 26, 2018 AND SURVEYED ON MARCH 27, 2018.

ELEVATION NOTE:
ELEVATIONS SHOWN ON THIS PLAN ARE DERIVED FROM TOWN OF OAKVILLE BENCHMARK NUMBER 276 ON TOP OF NORTH END OF CONCRETE CULVERT 1.6 KM EAST OF BURNHAMTHORPE AND TRAFALGAR ROAD. ELEVATION = 175.722 m

No.	REVISION	DATE	BY
6	OPA AMMENDMENT SUBMISSION	APR. 12, 2024	AM
5	FOURTH SPA SUBMISSION	DEC. 15, 2023	AM
4	ISSUED FOR BUILDING PERMIT	SEPT. 29, 2023	AM
3	THIRD SPA SUBMISSION	JULY 24, 2023	AM

DISTRIKT DEVELOPMENTS
PROPOSED RESIDENTIAL
(3064 TRAFALGAR ROAD)

OAKVILLE
REGIONAL MUNICIPALITY OF HALTON
TOWN OF OAKVILLE

REGION NO. SP ####
MUNICIPAL PLANNING No. Z.1313.09 SITE PLAN SP.1313.006/01

MUNICIPAL
APPROVED IN PRINCIPAL SUBJECT TO DETAIL CONSTRUCTION CONFORMING TO TOWN STANDARDS AND SPECIFICATIONS.
SIGNED__________ DATE__________
MANAGER OF DEVELOPMENT ENGINEERING

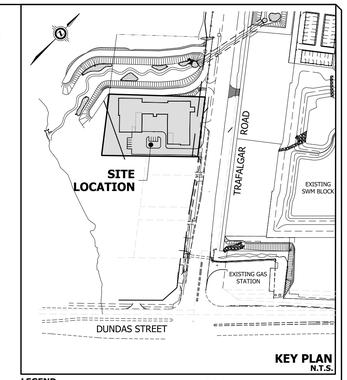
REGIONAL
DESIGN OF SANITARY AND WATER SERVICES APPROVED SUBJECT TO DETAIL CONSTRUCTION CONFORMING TO HALTON REGION STANDARDS & SPECIFICATIONS & LOCATION APPROVAL FROM AREA MUNICIPALITY.
SIGNED__________ DATE__________
LEGISLATIVE & PLANNING SERVICES DEPARTMENT

URBANTECH®
Urbantech® Consulting
A Division of Leighton-Zec Ltd.
3760 14th Avenue, Suite 301,
Markham, ON. L3R 3T7
TEL 905.946.9461 • urbantech.com

LICENSED PROFESSIONAL ENGINEER
A.M.R. MCLENNAN
100509390
APR 12, 2024
PROVINCE OF ONTARIO

ULTIMATE GRADING PLAN

DESIGNED:	J.M.	CHECKED:	J.O.	PROJECT No.:	18-575
DRAWN:	J.M.	DATE:	JUNE 2021	SHEET No.:	
SCALE: 1:300				DRAWING No.:	GR-1



KEY PLAN
N.T.S.

LEGEND

- CONCRETE CURB, TWO-STAGE BARRIER (TOWN STD. 6-1)
- CONCRETE CURB, MOUNTABLE (OPSD 600.060)
- STORM MANHOLE
- SANITARY MANHOLE
- AREA DRAIN / SINGLE CATCHBASIN
- HYDRANT & VALVE
- VALVE AND BOX
- TRANSFORMER
- STREET LIGHT
- MAXIMUM 3:1 SLOPE
- 247.00 EXISTING CONTOUR AND ELEVATION
- +240.71 PROPOSED ELEVATION
- +240.71TC PROPOSED TOP OF CURB ELEVATION
- +240.71BC PROPOSED BOTTOM OF CURB ELEVATION
- (240.71) FUTURE ELEVATION
- 169.99 EXISTING ELEVATION
- PROP. OVERLAND FLOW DIRECTION
- PROP. EMERGENCY OVERLAND FLOW DIRECTION
- CURRENT REGIONAL FLOODLINE
- 7.5 m SETBACK FROM CURRENT REGIONAL FLOODLINE
- ULTIMATE REGIONAL FLOODLINE (APPROXIMATE/TBD)
- 7.5 m SETBACK FROM ULTIMATE REGIONAL FLOODLINE (APPROXIMATE/TBD)
- PROPOSED REGIONAL FLOODLINE
- 7.5 m SETBACK FROM PROPOSED REGIONAL FLOODLINE
- ROAD DELINEATOR POSTS PER OPSD 984.105 (EX. TRAFALGAR ROAD CONDITION ONLY)

TEMP. EMERGENCY ACCESS ROAD WITH HEAVY DUTY PAVEMENT COMPONENTS:

- ASPHALTIC CONCRETE: 40mm HL-3, 60mm HL-8
- 19mm CRUSHED LIMESTONE: 150mm
- GRANULAR B SUB-BASE or 50mm CRUSHED LIMESTONE: 300mm

BENCHMARK NOTE:

LOCAL BENCHMARK No.1 (BY J.D. BARNES LIMITED, REFERENCE NO.: 17-30-168-01, MARCH 29, 2018)

NORTHEAST CORNER OF CONCRETE DITCH HEADWALL, ELEVATION = 168.88 m

NOTES:
IT IS THE RESPONSIBILITY OF THE CONTRACTOR TO VERIFY THAT THE LOCAL BENCHMARK HAS NOT BEEN ALTERED OR DISTURBED AND THAT THE RELATIVE ELEVATION AND DESCRIPTION AGREE WITH THE INFORMATION SHOWN ON THIS SKETCH

BEFORE DIGGING, UNDERGROUND SERVICES SHOULD BE LOCATED ON SITE BY THE RESPECTIVE AGENCIES

**THIS PLAN WAS EDITED ON MARCH 29, 2018 TO SHOW TOP OF BANK AS STAKED ON MARCH 26, 2018 AND SURVEYED ON MARCH 27, 2018.

ELEVATION NOTE:
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No.	REVISION	DATE	BY
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5	FOURTH SPA SUBMISSION	DEC. 15, 2023	AM
4	ISSUED FOR BUILDING PERMIT	SEPT. 29, 2023	AM
3	THIRD SPA SUBMISSION	JULY 24, 2023	AM

DISTRIKT DEVELOPMENTS
PROPOSED RESIDENTIAL
(3064 TRAFALGAR ROAD)

OAKVILLE

REGIONAL MUNICIPALITY OF HALTON
TOWN OF OAKVILLE

REGION NO. SP ####
MUNICIPAL PLANNING No. Z.1313.09
SITE PLAN SP.1313.006/01

MUNICIPAL
APPROVED IN PRINCIPAL SUBJECT TO DETAIL CONSTRUCTION CONFORMING TO TOWN STANDARDS AND SPECIFICATIONS.
SIGNED_____ DATE_____
MANAGER OF DEVELOPMENT ENGINEERING

REGIONAL
DESIGN OF SANITARY AND WATER SERVICES APPROVED SUBJECT TO DETAIL CONSTRUCTION CONFORMING TO HALTON REGION STANDARDS & SPECIFICATIONS & LOCATION APPROVAL FROM AREA MUNICIPALITY.
SIGNED_____ DATE_____
LEGISLATIVE & PLANNING SERVICES DEPARTMENT

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TEL 905.946.9461 • urbantech.com

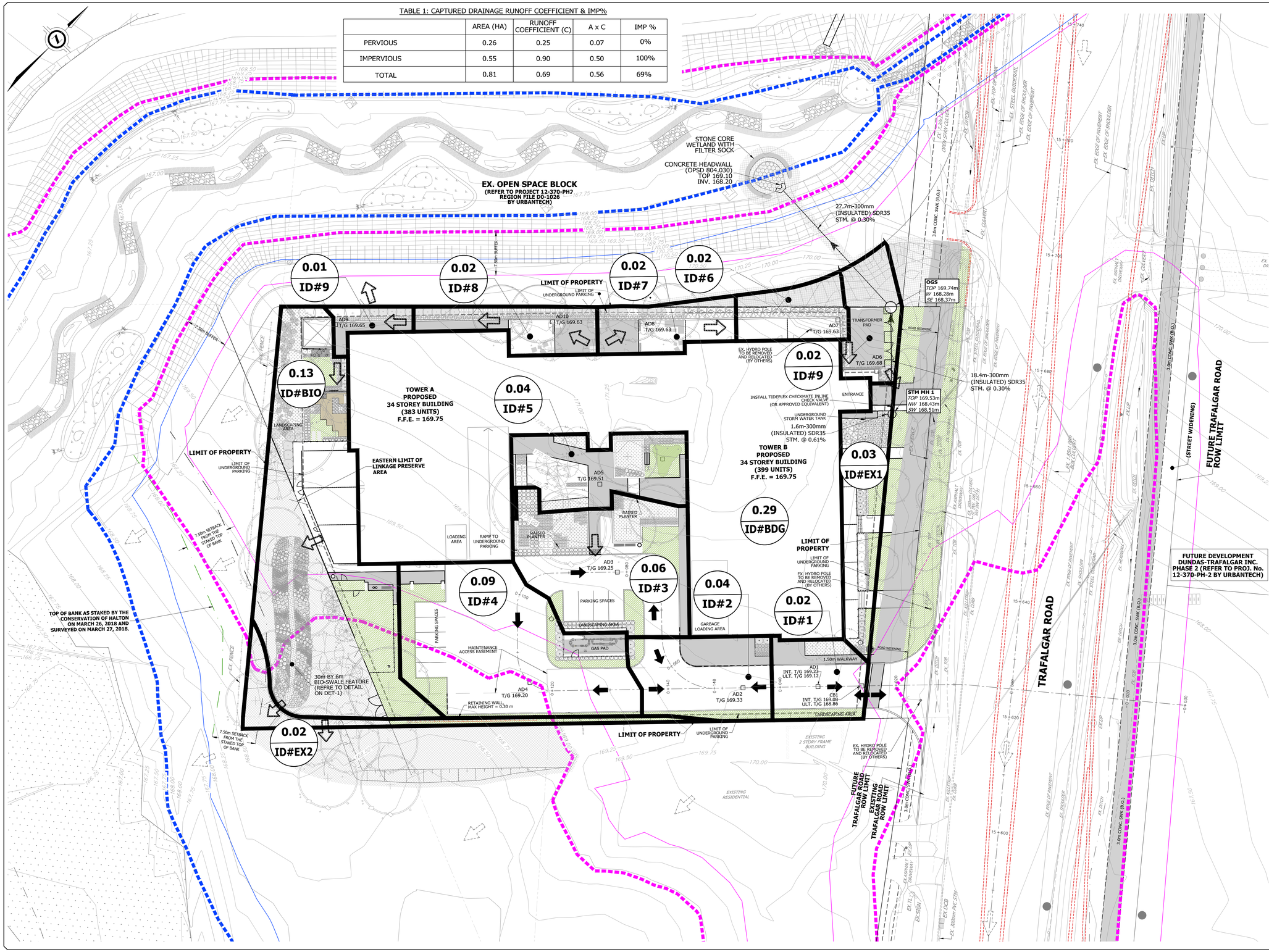
LICENCED PROFESSIONAL ENGINEER
A.M.R. MCLENNAN
100509390
APR 22, 2024
PROVINCE OF ONTARIO

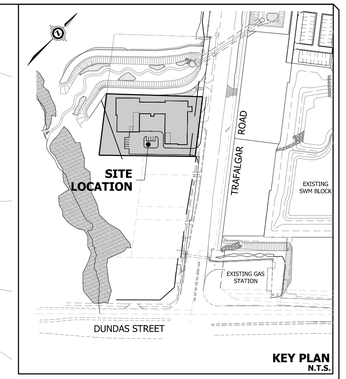
INTERIM GRADING PLAN

DESIGNED:	J.M.	CHECKED:	J.O.	PROJECT No.:	18-575
DRAWN:	J.M.	DATE:	JUNE 2021	SHEET No.:	
SCALE: 1:300				DRAWING No.:	GR-2

TABLE 1: CAPTURED DRAINAGE RUNOFF COEFFICIENT & IMP%

	AREA (HA)	RUNOFF COEFFICIENT (C)	A x C	IMP %
PERVIOUS	0.26	0.25	0.07	0%
IMPERVIOUS	0.55	0.90	0.50	100%
TOTAL	0.81	0.69	0.56	69%





LEGEND

- EXISTING GROUND CONTOUR AND ELEVATION
- PROPOSED STORM SEWER & FLOW DIRECTION
- EXISTING STORM SEWER & FLOW DIRECTION
- AREA DRAIN / SIGNLE CATCHBASIN
- 0.26. / ID#1 - DRAINAGE AREA (ha) / DRAINAGE AREA ID#
- MINOR SYSTEM DRAINAGE BOUNDARY
- PROPOSED EMERGENCY OVERLAND FLOW DIRECTION
- PROPOSED OVERLAND FLOW DIRECTION
- MAXIMUM 3:1 SLOPE
- CURRENT REGIONAL FLOODLINE
- 7.5 m SETBACK FROM CURRENT REGIONAL FLOODLINE
- ULTIMATE REGIONAL FLOODLINE (APPROXIMATE/TBD)
- 7.5 m SETBACK FROM ULTIMATE REGIONAL FLOODLINE (APPROXIMATE/TBD)

BENCHMARK NOTE:

LOCAL BENCHMARK No.1 (BY J.D. BARNES LIMITED, REFERENCE NO.: 17-30-168-01, MARCH 29, 2018)

NORTHEAST CORNER OF CONCRETE DITCH HEADWALL, ELEVATION = 168.88 m

NOTES:
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No.	REVISION	DATE	BY
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DISTRIKT DEVELOPMENTS PROPOSED RESIDENTIAL (3064 TRAFALGAR ROAD)

OAKVILLE

REGIONAL MUNICIPALITY OF HALTON
TOWN OF OAKVILLE

REGION NO. SP ####

MUNICIPAL PLANNING No. Z.1313.09

SITE PLAN SP.1313.006/01

MUNICIPAL
APPROVED IN PRINCIPAL SUBJECT TO DETAIL CONSTRUCTION CONFORMING TO TOWN STANDARDS AND SPECIFICATIONS.
SIGNED_____ DATE_____
MANAGER OF DEVELOPMENT ENGINEERING

REGIONAL
DESIGN OF SANITARY AND WATER SERVICES APPROVED SUBJECT TO DETAIL CONSTRUCTION CONFORMING TO HALTON REGION STANDARDS & SPECIFICATIONS & LOCATION APPROVAL FROM AREA MUNICIPALITY.
SIGNED_____ DATE_____
LEGISLATIVE & PLANNING SERVICES DEPARTMENT

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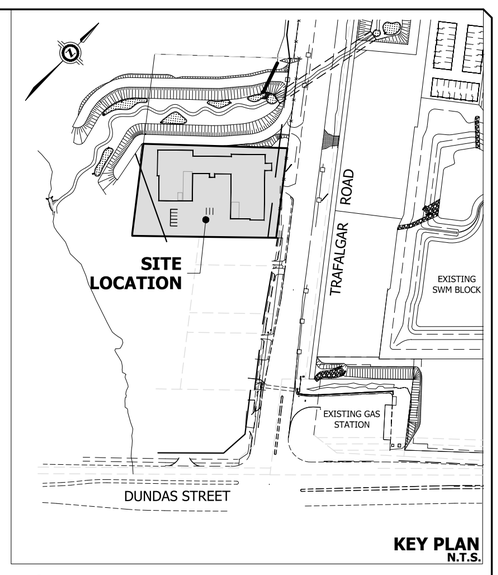
Markham, ON. L3R 3T7
TEL 905.946.9461 • urbantech.com

LICENSED PROFESSIONAL ENGINEER
A.M.R. MCLENNAN
100509390
APR 12, 2024
PROVINCE OF ONTARIO

STORM DRAINAGE PLAN

DESIGNED:	J.M.	CHECKED:	J.O.	PROJECT No.:	18-575
DRAWN:	J.M.	DATE:	JUNE 2021	SHEET No.:	
SCALE: 1:300				DRAWING No.:	STM-1



KEY PLAN
N.T.S.

LEGEND

- PROPOSED SANITARY SEWER & FLOW DIRECTION
- EXISTING SANITARY SEWER & FLOW DIRECTION
- 0.10Ha / 120 / 324 — DRAINAGE AREA (ha), POPULATION, UNITS
- SANITARY DRAINAGE AREA BOUNDARY
- CURRENT REGIONAL FLOODLINE
- 7.5 m SETBACK FROM CURRENT REGIONAL FLOODLINE
- ULTIMATE REGIONAL FLOODLINE (APPROXIMATE/TBD)
- 7.5 m SETBACK FROM ULTIMATE REGIONAL FLOODLINE (APPROXIMATE/TBD)

NOTE:

SANITARY AND WATERMAIN WITHIN TRAFALGAR ROAD AND TO STUB LOCATIONS AS SHOWN IS BY OTHERS AS PER REGION FILE DO-1069.

BENCHMARK NOTE:

LOCAL BENCHMARK No.1 (BY J.D. BARNES LIMITED, REFERENCE NO.: 17-30-168-01, MARCH 29, 2018)

NORTHEAST CORNER OF CONCRETE DITCH HEADWALL, ELEVATION = 168.88 m

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ELEVATION = 175.722 m

No.	REVISIONS	DATE	BY
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DISTRIKT DEVELOPMENTS
PROPOSED RESIDENTIAL
(3064 TRAFALGAR ROAD)

OAKVILLE

REGIONAL MUNICIPALITY OF HALTON
TOWN OF OAKVILLE

REGION No. SP ####

MUNICIPAL PLANNING No. Z.1313.09

SITE PLAN SP.1313.006/01

MUNICIPAL

APPROVED IN PRINCIPAL SUBJECT TO DETAIL CONSTRUCTION CONFORMING TO TOWN STANDARDS AND SPECIFICATIONS.

SIGNED_____ DATE_____

MANAGER OF DEVELOPMENT ENGINEERING

REGIONAL

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

SIGNED_____ DATE_____

INFRASTRUCTURE PLANNING & POLICY

The Applicant should be aware that the approval of the water system on private property is the responsibility of the Local Municipality. Regardless, the Applicant must ensure that the Region of Halton's standards and specifications are met. (the Water and Wastewater Linear Design Manual may be obtained from the Data Management Group at 905-825-6023) Furthermore, all water quality tests must be completed to the Region of Halton's satisfactions, before the water supply can be turned on.

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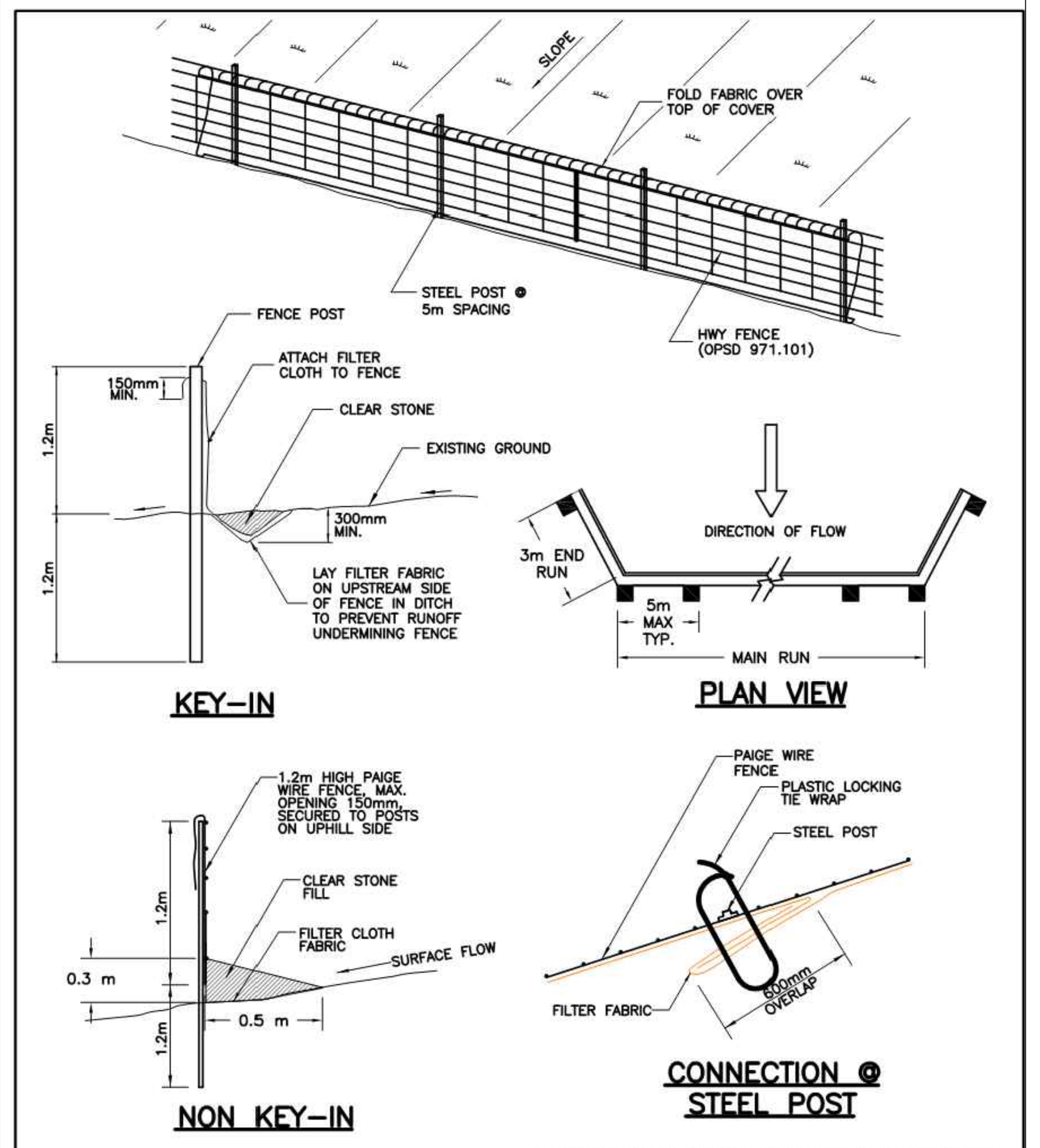
LICENSED PROFESSIONAL ENGINEER
A.M.R. MCLENNAN
100509390
APR 12, 2024
PROVINCE OF ONTARIO

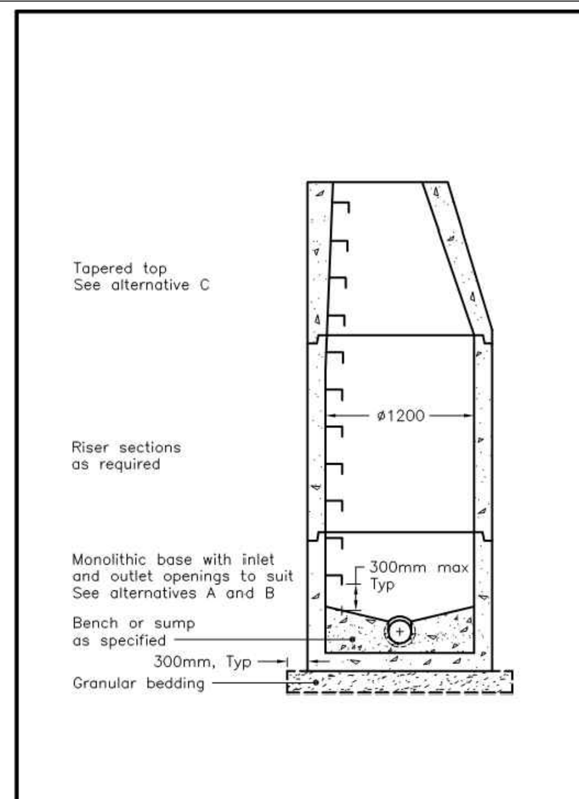
SANITARY DRAINAGE PLAN

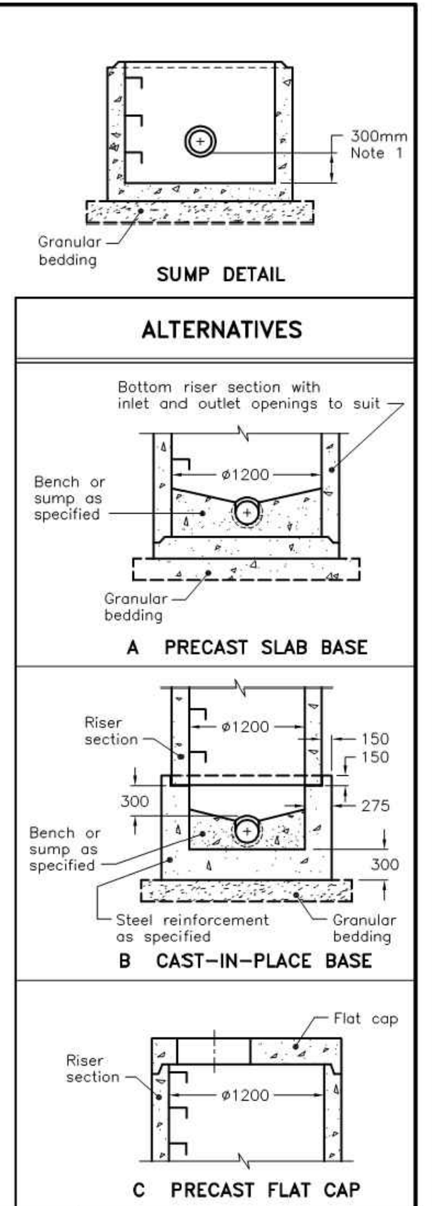
DESIGNED:	J.M.	CHECKED:	J.O.	PROJECT No.:	18-575
DRAWN:	J.M.	DATE:	JUNE 2021	SHEET No.:	
SCALE: 1:500 (5m 0m 5m 10m 20m)				DRAWING No.:	SAN-1



ALL DIMENSIONS IN MILLIMETRES UNLESS OTHERWISE NOTED

THE REGIONAL MUNICIPALITY OF HALTON PUBLIC WORKS DEPARTMENT	Date: January 2014	Rev. 0	NTS
HEAVY DUTY SILT FENCE BARRIER	REGION STANDARD		RH 200.040

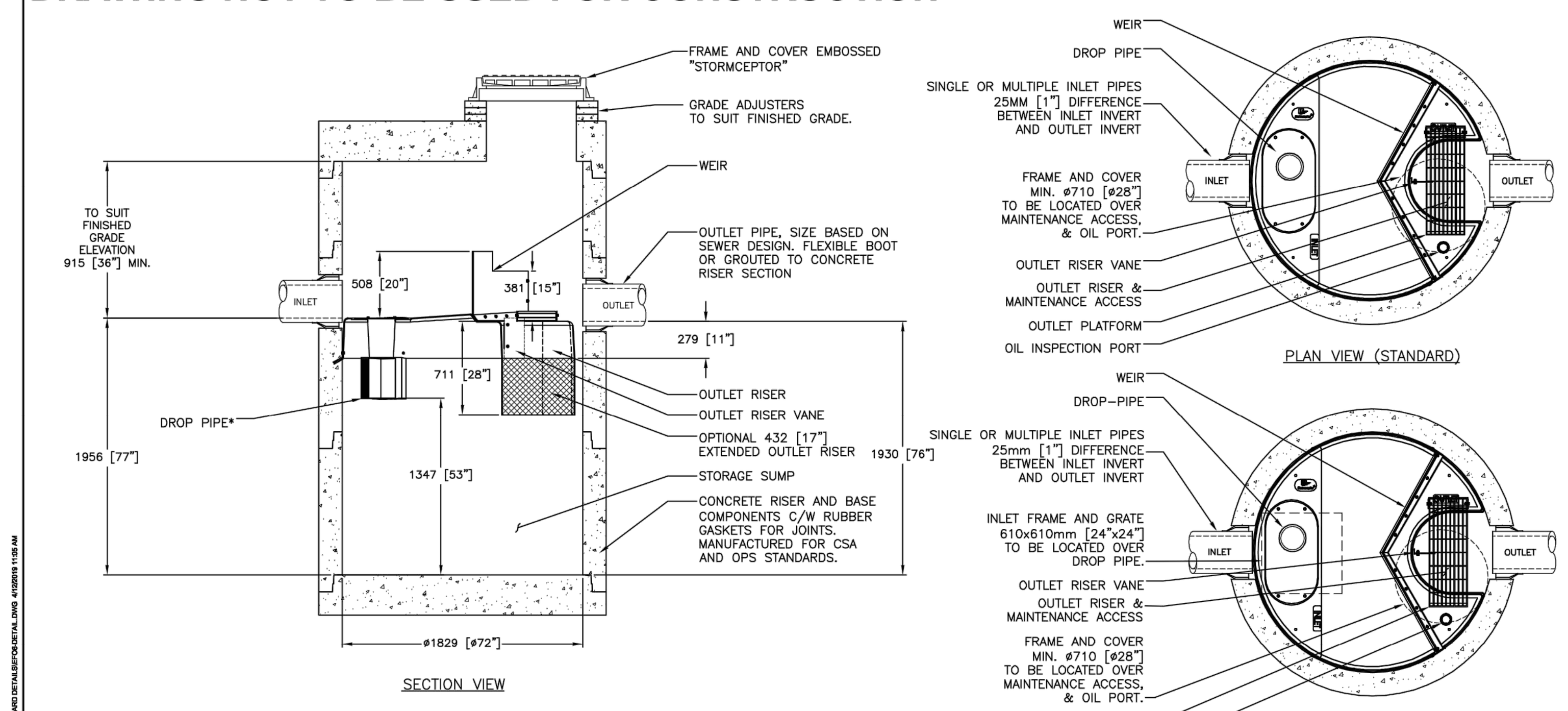




NOTES:
1 The sump is measured from the lowest invert.
A Granular backfill shall be placed to a minimum thickness of 300mm all around the maintenance hole.
B Precast concrete components shall be according to OPSD 701.030, 701.031, or 701.032.
C Structure exceeding 5.0m in depth shall include safety platform according to OPSD 404.020.
D Pipe support according to OPSD 708.020.
E For benching and pipe opening details, see OPSD 701.021.
F For adjustment unit and frame installation, see OPSD 704.010.
G All dimensions are nominal.
H All dimensions are in millimetres unless otherwise shown.

ONTARIO PROVINCIAL STANDARD DRAWING	Nov 2014	Rev 5
PRECAST CONCRETE MAINTENANCE HOLE 1200mm DIAMETER	OPSD 701.010	

DRAWING NOT TO BE USED FOR CONSTRUCTION



GENERAL NOTES:
* MAXIMUM SURFACE LOADING RATE (SLR) INTO LOWER CHAMBER THROUGH DROP PIPE IS 1135 L/min/m² (27.9 gpm/ft²) FOR STORMCEPTOR EF6 AND 535 L/min/m² (13.1 gpm/ft²) FOR STORMCEPTOR EFO6 (OIL CAPTURE CONFIGURATION).
1. ALL DIMENSIONS INDICATED ARE IN MILLIMETERS (INCHES) UNLESS OTHERWISE SPECIFIED.
2. STORMCEPTOR STRUCTURE INLET AND OUTLET PIPE SIZE AND ORIENTATION SHOWN FOR INFORMATIONAL PURPOSES ONLY.
3. UNLESS OTHERWISE NOTED, BYPASS INFRASTRUCTURE, SUCH AS ALL UPSTREAM DIVERSION STRUCTURES, CONNECTING STRUCTURES, OR PIPE CONDUITS CONNECTING TO COMPLETE THE STORMCEPTOR SYSTEM SHALL BE PROVIDED AND ADDRESSED SEPARATELY.
4. DRAWING FOR INFORMATION PURPOSES ONLY. REFER TO ENGINEER'S SITE/UTILITY PLAN FOR STRUCTURE ORIENTATION.
5. NO PRODUCT SUBSTITUTIONS SHALL BE ACCEPTED UNLESS SUBMITTED 10 DAYS PRIOR TO PROJECT BID DATE, OR AS DIRECTED BY THE ENGINEER OF RECORD.

FOR SITE SPECIFIC DRAWINGS PLEASE CONTACT YOUR LOCAL STORMCEPTOR REPRESENTATIVE. SITE SPECIFIC DRAWINGS ARE BASED ON THE BEST AVAILABLE INFORMATION AT THE TIME. SOME FIELD REVISIONS TO THE SYSTEM LOCATION OR CONNECTION PIPING MAY BE NECESSARY BASED ON AVAILABLE SPACE OR SITE CONFIGURATION REVISIONS. ELEVATIONS SHOULD BE MAINTAINED EXCEPT WHERE NOTED ON BYPASS STRUCTURE (IF REQUIRED).

INSTALLATION NOTES
A. ANY SUB-BASE, BACKFILL DEPTH, AND/OR ANTI-FLOTATION PROVISIONS ARE SITE-SPECIFIC DESIGN CONSIDERATIONS AND SHALL BE SPECIFIED BY ENGINEER OF RECORD.
B. CONTRACTOR TO PROVIDE EQUIPMENT WITH SUFFICIENT LIFTING AND REACH CAPACITY TO LIFT AND SET THE STRUCTURE (LIFTING CLUTCHES PROVIDED)
C. CONTRACTOR WILL INSTALL AND LEVEL THE STRUCTURE, SEALING THE JOINTS, LINE ENTRY AND EXIT POINTS (NON-SHRINK GROUT WITH APPROVED WATERSTOP OR FLEXIBLE BOOT)
D. CONTRACTOR TO TAKE APPROPRIATE MEASURES TO PROTECT THE DEVICE FROM CONSTRUCTION-RELATED EROSION RUNOFF.
E. DEVICE ACTIVATION, BY CONTRACTOR, SHALL OCCUR ONLY AFTER SITE HAS BEEN STABILIZED AND THE STORMCEPTOR UNIT IS CLEAN AND FREE OF DEBRIS.

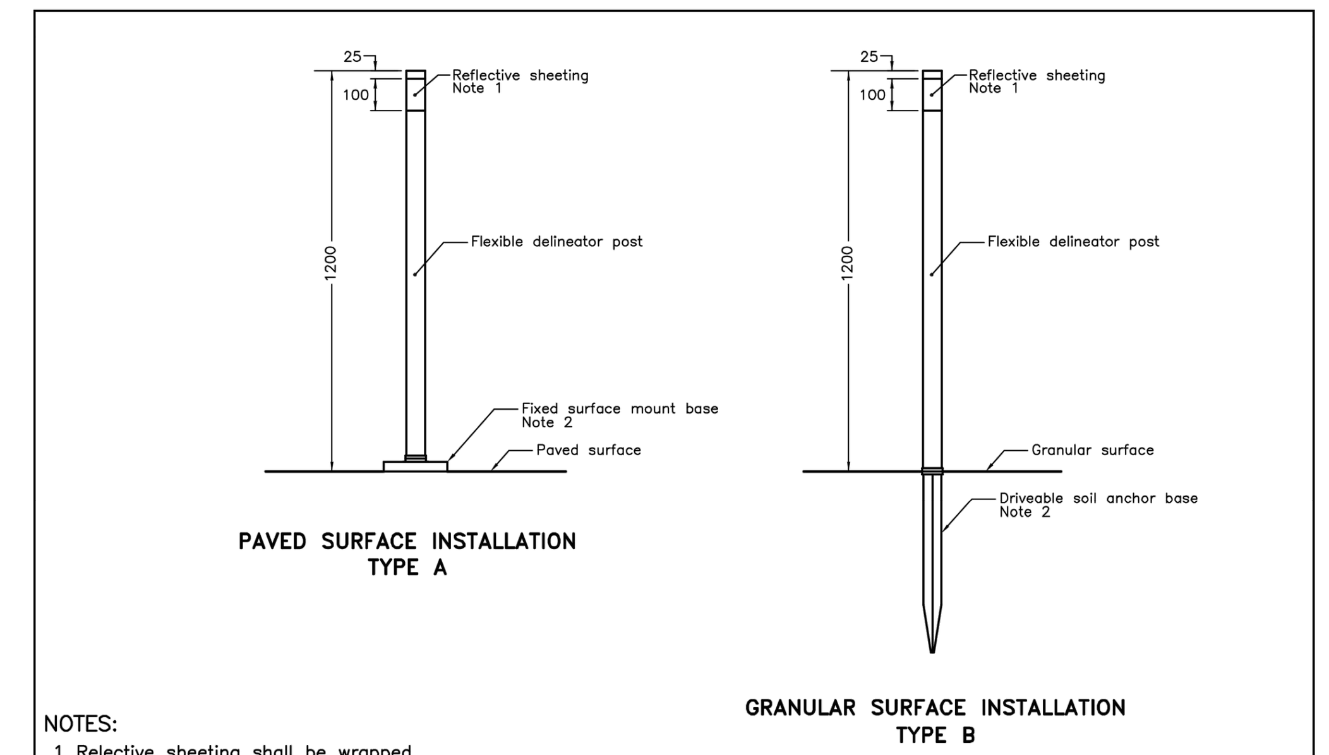
STANDARD DETAIL
NOT FOR CONSTRUCTION

SITE SPECIFIC DATA REQUIREMENTS					
STORMCEPTOR MODEL	EFO6				
STRUCTURE ID					*
HYDROCARBON STORAGE REQ'D (L)					*
WATER QUALITY FLOW RATE (L/s)					*
PEAK FLOW RATE (L/s)					*
RETURN PERIOD OF PEAK FLOW (yrs)					*
DRAINAGE AREA (HA)					*
DRAINAGE AREA IMPERVIOUSNESS (%)					*
PIPE DATA:	I.E.	MAT'L	DIA	SLOPE %	HGL
INLET #1	*	*	*	*	*
INLET #2	*	*	*	*	*
OUTLET	*	*	*	*	*
* PER ENGINEER OF RECORD					

MARK	DATE	REVISION DESCRIPTION	BY
0	05/26/17	INITIAL RELEASE	JSK
1	6/8/18	OUTLET PLATFORM	JSK
####	####	####	####
####	####		####
####	####		####

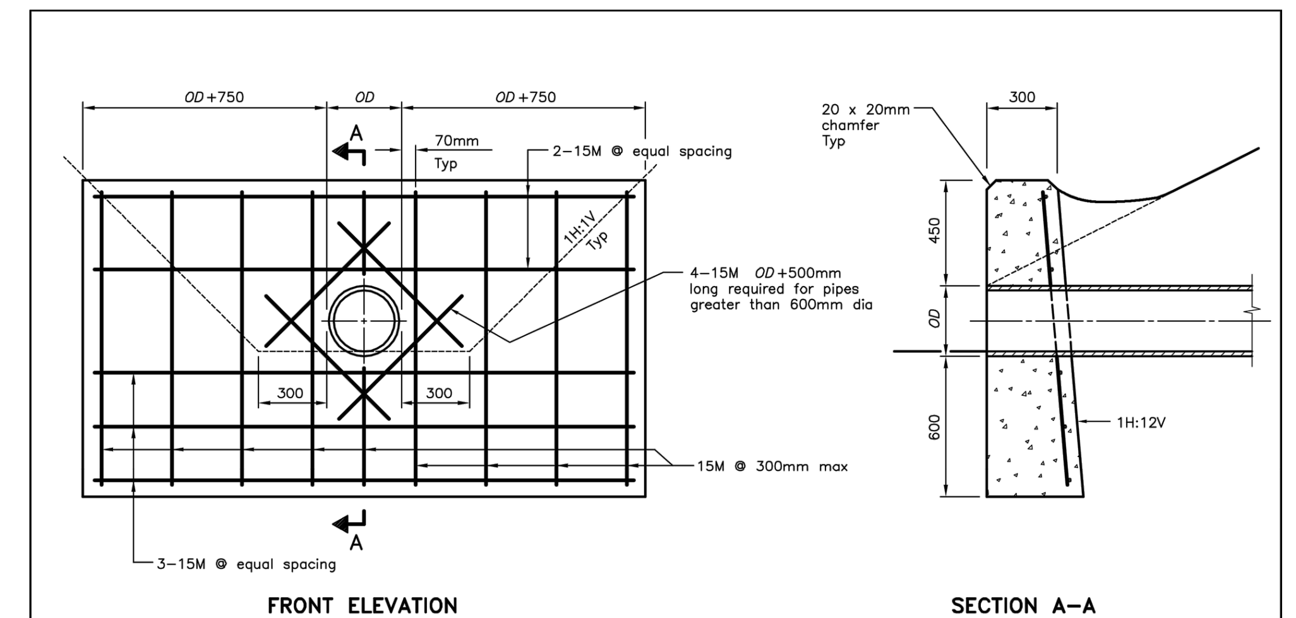
Stormceptor® EF
SCALE = NTS
imbrium

DATE: 10/13/2017	
DESIGNED: JSK	DRAWN: JSK
CHECKED: BSF	APPROVED: SP
PROJECT No.: EFO6	SEQUENCE No.: *
SHEET: 1 OF 1	



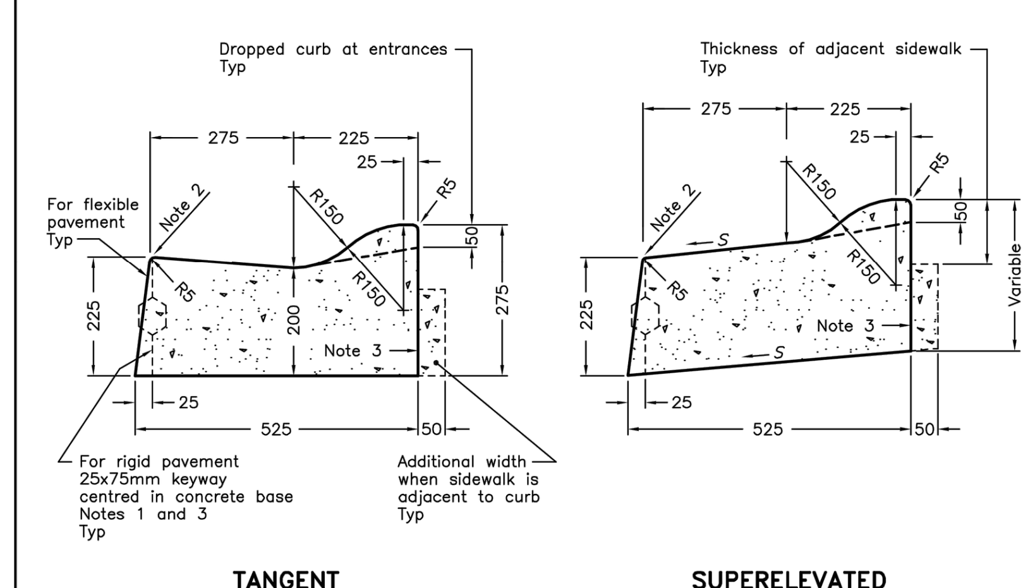
NOTES:
1 Relective sheeting shall be wrapped fully around the post.
2 Base shall be installed according to the manufacturer's specifications and installation instructions.
A All dimensions are in millimetres unless otherwise shown.

ONTARIO PROVINCIAL STANDARD DRAWING	Nov 2016	Rev 0
FLEXIBLE DELINEATOR POST INSTALLATION – TEMPORARY AND PERMANENT	OPSD 984.105	



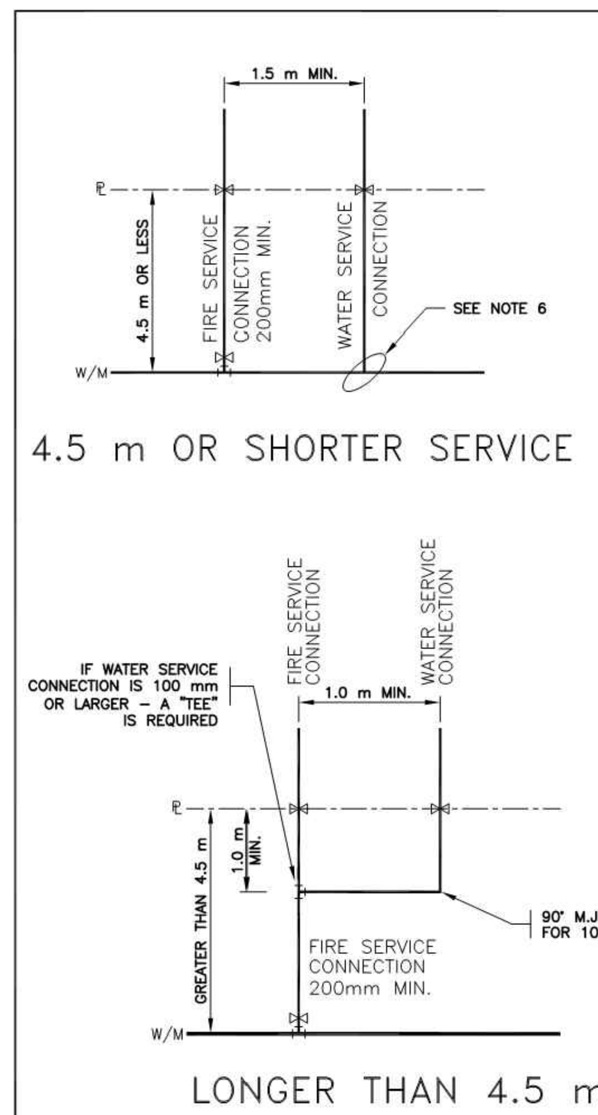
LEGEND:
OD – Outside diameter of pipe
NOTES:
A This OPSD to be read in conjunction with OPSD 3940.150.
B If a steel grate is required, refer to OPSD 804.05.
C Class of concrete: 30MPa.
D Cover to reinforcing bars 70mm ± 20mm.
E All dimensions are in millimetres unless otherwise shown.

ONTARIO PROVINCIAL STANDARD DRAWING	Nov 2017	Rev 2
CONCRETE HEADWALL FOR PIPE LESS THAN 900mm DIAMETER	OPSD 804.030	



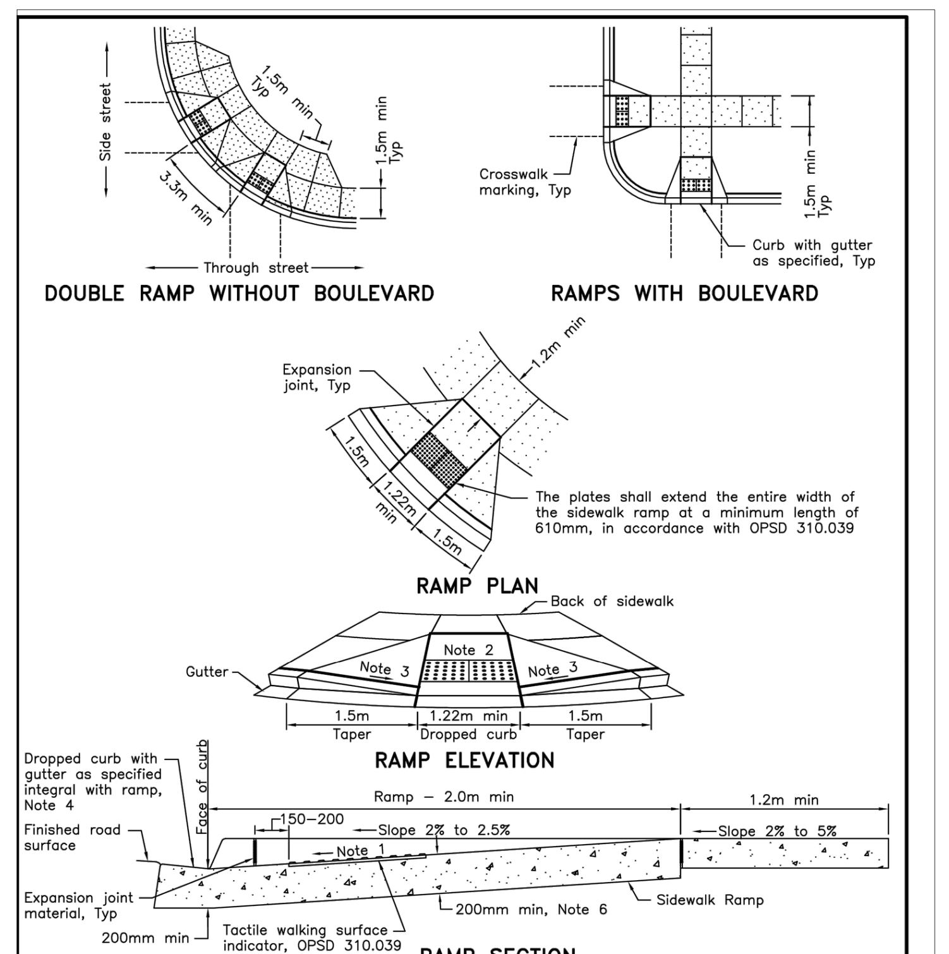
LEGEND:
S – Rate of pavement superelevation in percent, %.
NOTES:
1 When curb and gutter is adjacent to concrete pavement or base, this drawing shall be used in conjunction with OPSD 552.010 and 552.020.
2 Flexible and composite pavement shall be placed 5mm above the adjacent edge of gutter.
3 For slipforming procedure a 5% batter is acceptable.
A Treatment at entrances shall be according to OPSD 351.010.
B Outlet treatment shall be according to the OPSD 610 Series.
C The transition from one curb type to another shall be a minimum length of 3.0m, except in conjunction with guide rail where it shall be according to the OPSD 900 Series.
D All dimensions are in millimetres unless otherwise shown.

ONTARIO PROVINCIAL STANDARD DRAWING	Nov 2012	Rev 2
CONCRETE SEMI–MOUNTABLE CURB WITH STANDARD GUTTER	OPSD 600.060	



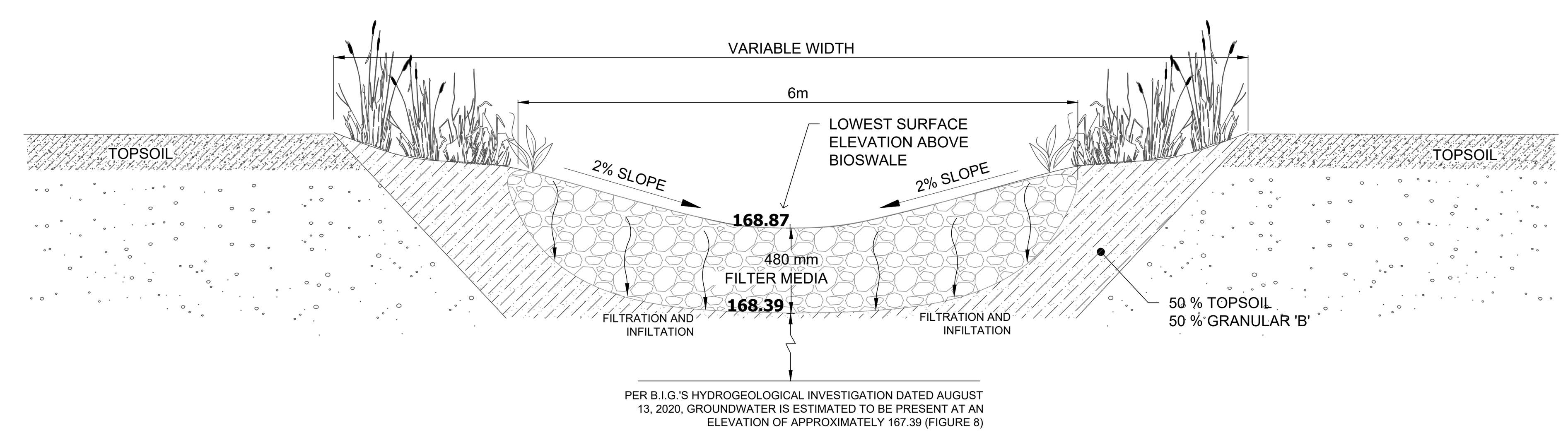
NOTES
1. COMPRESSION TYPE FITTINGS ONLY. NO SOLDERED JOINTS ARE PERMITTED BEFORE THE WATER METER.
2. WATER SERVICE CONNECTION 25, 38, 50 TO BE TYPE 'K' SOFT COPPER, 100 AND LARGER TO BE PVC OR DI.
3. FIRE SERVICE CONNECTION TO BE MIN. 200 MM.
4. IF THE WATERMAIN IS 4.5 m OR LESS FROM THE PROPERTY LINE, THEN 2 SEPARATE CONNECTIONS ARE REQUIRED.
5. TAPPING SLEEVE TO BE PRESSURE TESTED BY CONTRACTOR BEFORE MAIN IS TAPPED.
6. ALL SERVICE CONNECTIONS TO PVC PIPE REQUIRE SADDLES. ALL SERVICE CONNECTIONS 50 mm OR LESS TO HAVE A MAIN STOP, CURB STOP AND BOX. ALL SERVICES GREATER THAN 50 mm REQUIRE A TAPPING SLEEVE AND VALVE OR AN ANCHOR TEE WITH A GATE VALVE AND BOX AT THE MAIN IN ADDITION TO A PROPERTY LINE GATE VALVE AND BOX.
7. ALL GATE VALVES TO HAVE VALVE BOXES.
8. ALL DIMENSIONS IN MILLIMETRES UNLESS OTHERWISE NOTED.

THE REGIONAL MUNICIPALITY OF HALTON PUBLIC WORKS DEPARTMENT	Date: January 2014	Rev. 1	NTS
WATER SERVICE AND FIRE SERVICE CONNECTION INSTALLATIONS	REGION STANDARD		RH 409.01



NOTES:
1 Slope of ramp shall not exceed 8%.
2 Cross slope of ramp shall not exceed 2% in either direction.
3 Cross slope of flared side of ramp shall not exceed 8%.
4 Dropped curb at ramp shall be modified to eliminate 30 mm step at gutter line.
5 Minimum thickness of ramp is 200mm. Minimum thickness of sidewalk and flared sides adjacent to ramp is 150mm.
A All dimensions are in millimetres unless otherwise shown.

ONTARIO PROVINCIAL STANDARD DRAWING	Nov 2019	Rev 1
CONCRETE SIDEWALK RAMPS AT UNSIGNALIZED INTERSECTIONS	OPSD 310.033	

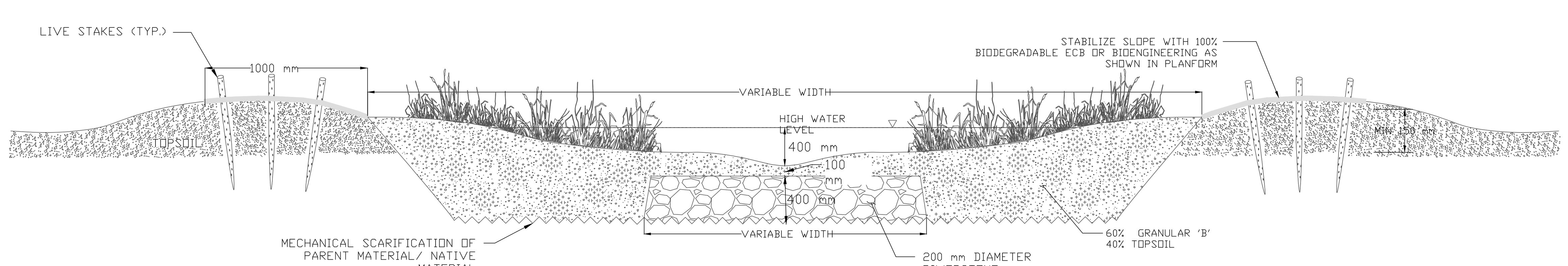


SHALLOW BIOSWALE
N.T.S

FILTER MEDIA

NOTES

APPLY 480mm BIORETENTION FILTER MEDIA ACROSS SHALLOW BIOSWALE. FILTER MEDIA TO BE "BLEND A: DRAINAGE RATE PRIORITY" PER THE LID SWM PLANNING AND SESIGN GUIDE. FILTER MEDIA ARE TO EXHIBIT THE FOLLOWING CHARACTERISTICS:
1. THOROUGHLY BLENDED AND FRIABLE, CONSISTING OF 85 to 88% SAND, 8 to 12% SILT AND CLAY;
2. A PH OF 6.5 TO 7.5;
3. 3-5% ORGANIC MATTER; AND
4. FREE FROM SUBSOIL, ROOTS, VEGETATION, DEBRIS, TOXIC MATERIALS, AND STONES OVER 50mm IN DIAMETER.



STONE CORE WETLAND
N.T.S.

No.	REVISIONS	DATE	BY
6.	OPA AMMENDMENT SUBMISSION	APRIL 12, 2024	AM
5.	FOURTH SPA SUBMISSION	DEC. 15, 2023	AM
4.	ISSUED FOR BUILDING PERMIT	SEPT. 29, 2023	AM
3.	THIRD SPA SUBMISSION	JULY 24, 2023	AM
2.	SECOND SPA SUBMISSION	APR. 27, 2022	JO

DISTRIKT DEVELOPMENTS
PROPOSED RESIDENTIAL
(3064 TRAFALGAR ROAD)

OAKVILLE
REGIONAL MUNICIPALITY OF HALTON
TOWN OF OAKVILLE

REGION No. ____________
MUNICIPAL PLANNING No. Z.1313.09 SITE PLAN SP.1313.006/01

MUNICIPAL
APPROVED IN PRINCIPAL SUBJECT TO DETAIL CONSTRUCTION CONFORMING TO TOWN STANDARDS AND SPECIFICATIONS.
SIGNED____________ DATE__________

REGIONAL
REGION DESIGN OF WATER &/OR WASTEWATER SERVICES APPROVED SUBJECT TO DETAIL CONSTRUCTION CONFORMING TO HALTON REGION STANDARDS & SPECIFICATIONS & LOCATION APPROVAL FROM AREA MUNICIPALITY.
SIGNED____________ DATE__________
INFRASTRUCTURE PLANNING & POLICY
The Applicant should be aware that the approval of the water system on private property is the responsibility of the Local Municipality. Regardless, the Applicant must ensure that the Region of Halton's standards and specifications are met. (the Water and Wastewater Linear Design Manual may be obtained from the Data Management Group at 905-825-6023) Furthermore, all water quality tests must be completed to the Region of Halton's satisfaction, before the water supply can be turned on.

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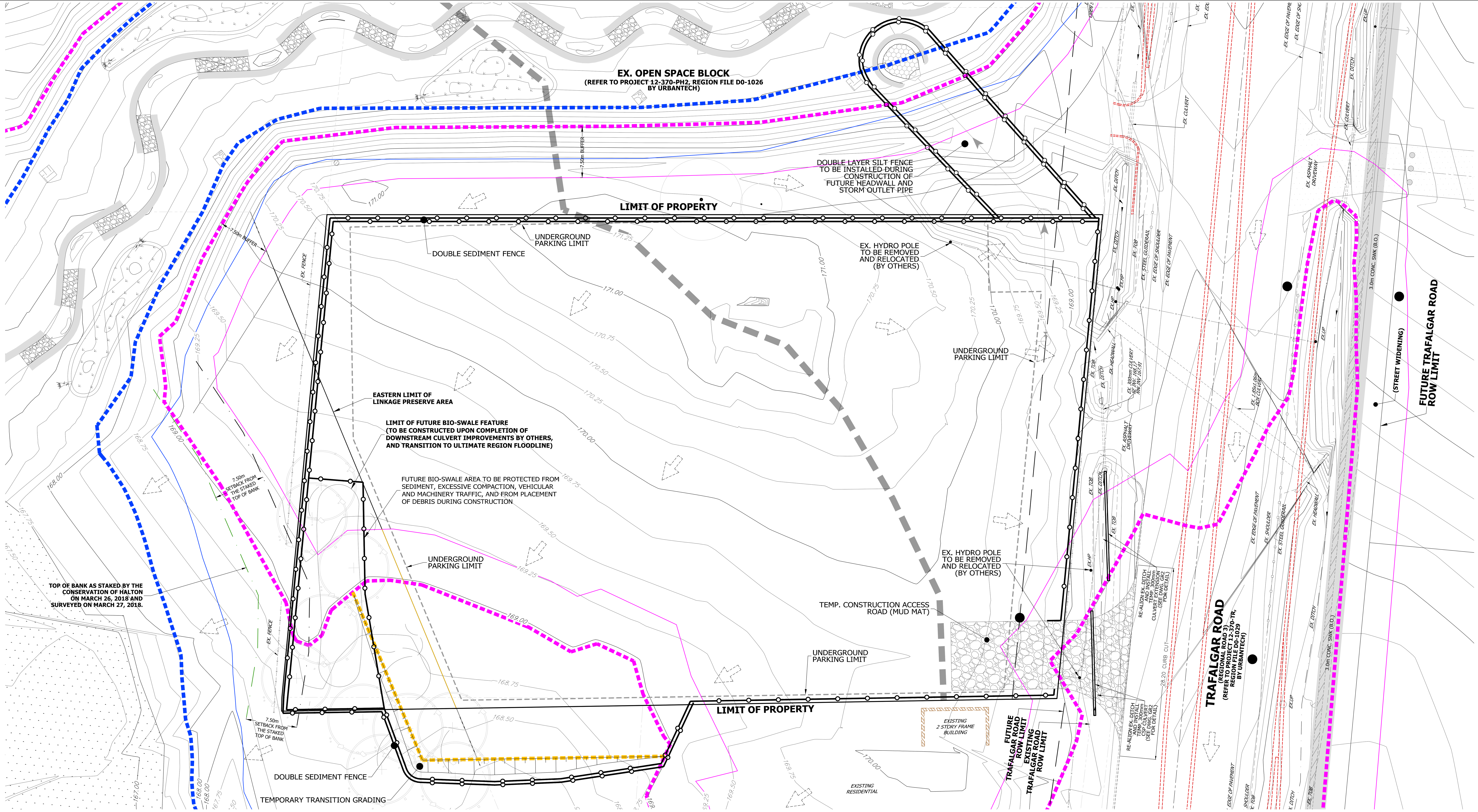
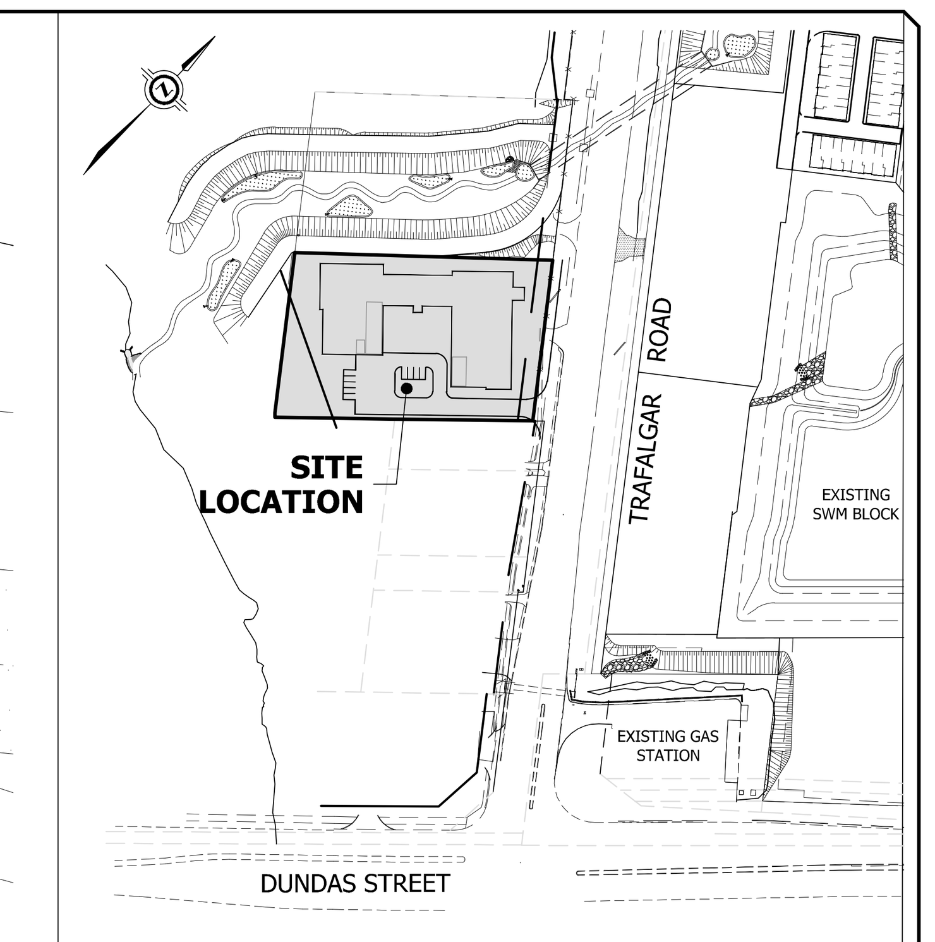
3760 14th Avenue, Suite 301,
Markham, ON. L3R 3T7
TEL 905.946.9461 • urbantech.com

LICENSED PROFESSIONAL ENGINEER
A.M.R. MCLENNAN
100509390
APR 12, 2024
PROVINCE OF ONTARIO

CONSTRUCTION DETAILS

DESIGNED: J.M.	CHECKED: J.O.	PROJECT No.: 18-575
DRAWN: J.M.	DATE: JUNE 2021	SHEET No.:
SCALE:		DRAWING No.: **DET-1**





KEY PLAN
N.T.S.

LEGEND

- PROPOSED SEDIMENT FENCE
- ROCK CHECK DAM
- EXISTING CONTOUR AND ELEVATION (177.00)
- EXISTING FLOW DIRECTION
- EXISTING DRAINAGE DIVIDE
- EXISTING REGIONAL FLOODLINE
- 7.5 m SETBACK FROM EXISTING REGIONAL FLOODLINE
- ULTIMATE REGIONAL FLOODLINE
- 7.5 m SETBACK FROM ULTIMATE REGIONAL FLOODLINE
- PROPOSED REGIONAL FLOODLINE
- 7.5 m SETBACK FROM PROPOSED REGIONAL FLOODLINE

STAGING NOTES:

STAGE 1 - TOPSOIL STRIPPING & EARTHWORKS
1. INSTALL SEDIMENT FENCE AND MUD MAT AS SHOWN.
2. UPON INSTALLATION OF ALL ESC MEASURES, TOPSOIL TO BE STRIPPED AND HAULED OFF SITE AS REQUIRED.
3. UPON COMPLETION OF TOPSOIL STRIPPING, PROCEED WITH SITE PREGRADING.

STAGE 2 - SERVICING
1. UPON COMPLETION OF PREGRADING, PROCEED WITH SITE SERVICING PER APPROVED SERVICING PLAN.
2. UPON COMPLETION OF SERVICING, IF REQUIRED, EXCESS TOPSOIL TO BE EXPORTED OFF-SITE.

STAGE 3 - BUILDING CONSTRUCTION
1. SEDIMENT FENCING AND ALL OTHER EROSION CONTROLS TO REMAIN IN PLACE UNTIL FULL BUILD-OUT.

BENCHMARK NOTE:

LOCAL BENCHMARK No.1 (BY J.D. BARNES LIMITED, REFERENCE NO.: 17-30-168-01, MARCH 29, 2018)

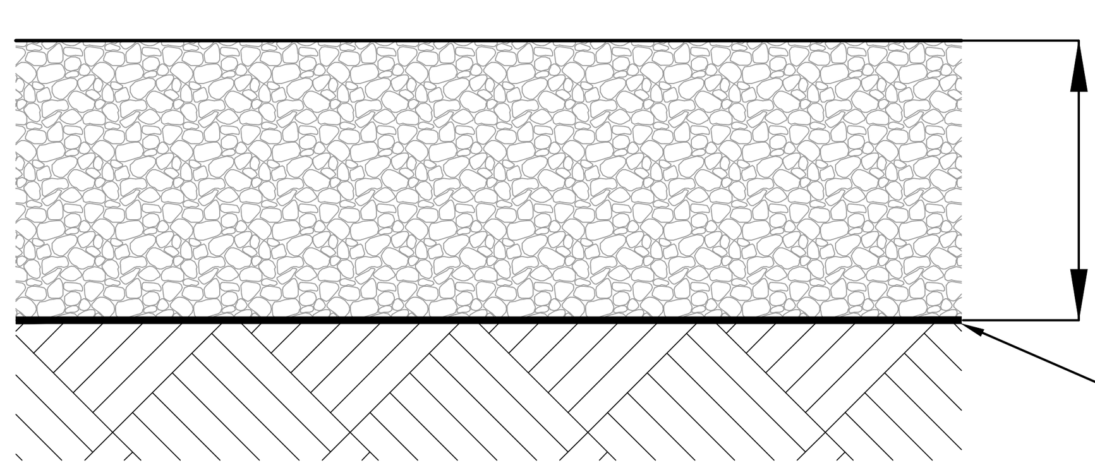
NORTHEAST CORNER OF CONCRETE DITCH HEADWALL, ELEVATION = 168.88 m

NOTES:
IT IS THE RESPONSIBILITY OF THE CONTRACTOR TO VERIFY THAT THE LOCAL BENCHMARK HAS NOT BEEN ALTERED OR DISTURBED AND THAT THE RELATIVE ELEVATION AND DESCRIPTION AGREE WITH THE INFORMATION SHOWN ON THIS SKETCH

BEFORE DIGGING, UNDERGROUND SERVICES SHOULD BE LOCATED ON SITE BY THE RESPECTIVE AGENCIES

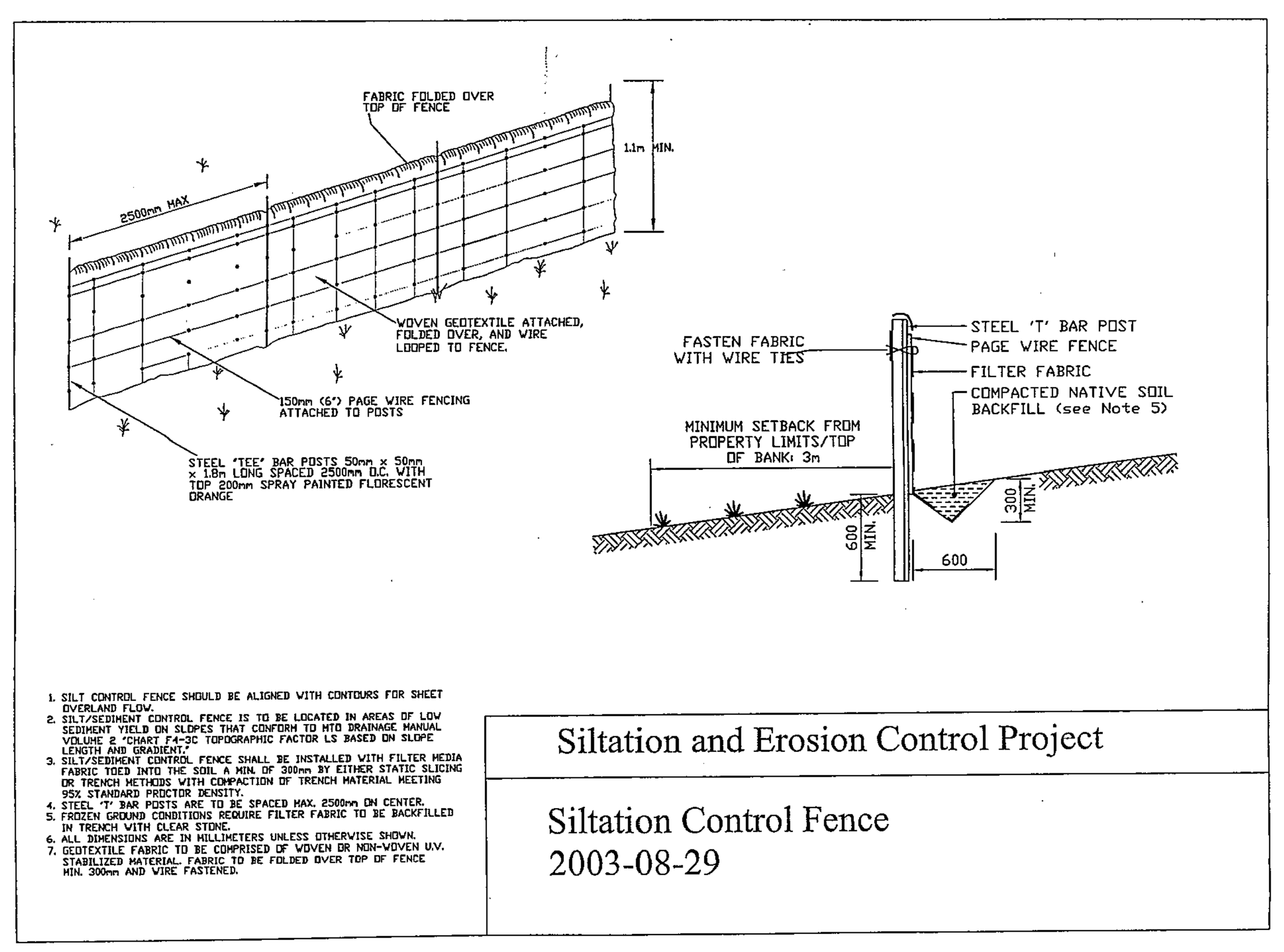
**THIS PLAN WAS EDITED ON MARCH 29, 2018 TO SHOW TOP OF BANK AS STAKED ON MARCH 26, 2018 AND SURVEYED ON MARCH 27, 2018.

ELEVATION NOTE:
ELEVATIONS SHOWN ON THIS PLAN ARE DERIVED FROM TOWN OF OAKVILLE BENCHMARK NUMBER 276 ON TOP OF NORTH END OF CONCRETE CULVERT 1.6 KM EAST OF BURNHAMTHORPE AND TRAFALGAR ROAD. ELEVATION = 175.722 m



CONTAMINATED CRUSHER-RUN LIMESTONE TO BE REMOVED AND REPLACED, AS REQUESTED BY THE ENGINEER.

TEMPORARY CONSTRUCTION ACCESS ROAD (MUD MAT)
(N.T.S.)



EROSION & SEDIMENT CONTROL NOTES

1. CONSTRUCTION ACCESS AT PRIVATE LANEWAY TO BE INSTALLED FOR SITE ACCESS. REFER TO DETAIL ON THIS DRAWING.
2. SEDIMENT FENCES TO BE INSTALLED AT LOCATION SHOWN ON THE PLAN. REFER TO DETAIL ON THIS DRAWING.
3. IN ADDITION TO THE LOCATIONS SHOWN ON THIS DRAWING, ALL PROPOSED CATCHBASINS AND AREA DRAINS ARE TO BE PROTECTED WITH FILTER CLOTH OR APPROVED EQUIVALENT. THESE ARE TO BE REGULARLY CLEANED/MAINTAINED THROUGHOUT CONSTRUCTION AND REMOVED ONLY UPON THE DIRECTION OF THE SITE ENGINEER OF RECORD.
4. THE OWNERS SHALL AGREE THAT ALL DISTURBED LANDS LEFT VACANT FOR SIX (6) MONTHS FOLLOWING COMPLETION OF OVERALL GRADING, SHALL BE COVERED WITH TOPSOIL TO A MINIMUM DEPTH OF 100mm, SEEDED, MAINTAINED AND SIGNED TO PROHIBIT DUMPING AND TRESPASSING, TO THE SATISFACTION OF THE TOWN OF OAKVILLE AND REGION OF HALTON.
5. TOPSOIL STOCKPILES THAT REMAIN UNRESTORED FOR MORE THAN 30 DAYS SHALL BE SEEDED.
6. ALL EXPOSED AREAS NOT SUBJECT TO ACTIVE CONSTRUCTION WITHIN 30 DAYS ARE TO BE RE-VEGETATED AS PER OPSS 572 IMMEDIATELY UPON COMPLETION OF AREA GRADING. ALL AREAS REGULATED BY THE GRAND RIVER CONSERVATION AUTHORITY SHOULD BE STABILIZED AS SOON AS POSSIBLE AND NO LONGER THAN SIXTY (60) DAYS AFTER DISTURBANCE.
7. VEGETATION SHALL BE COMPLETED BY THE BEGINNING OF SEPTEMBER TO ALLOW FOR SUFFICIENT TIME FOR THE VEGETATION TO TAKE ROOT. 150mm TOPSOIL DEPTH SHALL BE USED AND HYDROSEEDED WITH TYPE 1-UPLAND SEED MIX.
8. MONTHLY EROSION AND SEDIMENT CONTROL INSPECTION REPORTS (QUARTERLY DURING PERIODS OF INACTIVITY OR HOUSE CONSTRUCTION) ARE TO BE SUBMITTED TO THE AUTHORITY. THESE REPORTS ARE TO BE BASED ON FREQUENT INSPECTIONS PARTICULARLY AFTER SIGNIFICANT STORM EVENTS. THE REPORTS ARE TO BE SUBMITTED UNTIL THE SITE HAS BEEN BUILT OUT (90-100%) AND STABILIZED.
9. THE CONTRACTOR SHALL ENDEAVOR TO PREVENT MUD TRACKING ONTO EXISTING RIGHT-OF-WAYS AND SHALL PROVIDE FOR CLEAN UP AT THEIR OWN EXPENSE AS DIRECTED BY THE ENGINEER. THE CONTRACTOR SHALL ALSO BE RESPONSIBLE TO CONTROL DUST IN THE PROJECT AND HE SHALL PROVIDE, AT HIS OWN EXPENSE, CONTROLLING MEASURES AS DIRECTED BY THE ENGINEER AND THE CITY.
10. AREAS TO BE SEEDED SHALL BE MONITORED FOR SUCCESSFUL ESTABLISHMENT AND RE-SEEDED AS REQUIRED.
11. 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.
12. EROSION AND SEDIMENT CONTROLS SHALL BE INSPECTED BY THE BUILDER/DEVELOPER:
    I. WEEKLY
    II. BEFORE AND AFTER ANY PREDICTED RAINFALL EVENT
    III. FOLLOWING AN UNPREDICTED RAINFALL EVENT
    IV. DAILY, DURING EXTENDED DURATION RAINFALL EVENTS
    V. AFTER SIGNIFICANT SNOW MELT EVENTS
13. EROSION AND SEDIMENT CONTROLS SHALL BE MAINTAINED IN PROPER WORKING ORDER AT ALL TIMES. DAMAGED OR CLOGGED DEVICES SHALL BE REPAIRED WITHIN 48 HOURS.
14. 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.
15. 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 ITEMS B AND C ABOVE.
16. 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 OR OWNERS AGENT WILL ADDITIONALLY IMMEDIATELY NOTIFY THE TOWN.

No.	REVISIONS	DATE	BY
5	OPA AMENDMENT SUBMISSION	APR. 12, 2024	AM
4	FOURTH SPA SUBMISSION	DEC. 15, 2023	AM
3	THIRD SPA SUBMISSION	JULY 24, 2023	AM

DISTRIKT DEVELOPMENTS
PROPOSED RESIDENTIAL DEVELOPMENT
3064 TRAFALGAR ROAD

OAKVILLE
REGIONAL MUNICIPALITY OF HALTON
TOWN OF OAKVILLE

REGION No. SP ####
MUNICIPAL PLANNING No. Z.1313.09
SITE PLAN SP.1313.006/01

MUNICIPAL
APPROVED IN PRINCIPAL SUBJECT TO DETAIL CONSTRUCTION CONFORMING TO TOWN STANDARDS AND SPECIFICATIONS.
SIGNED______________ DATE__________
MANAGER OF DEVELOPMENT ENGINEERING

REGIONAL
REGION DESIGN OF WATER &/OR WASTEWATER SERVICES APPROVED SUBJECT TO DETAIL CONSTRUCTION CONFORMING TO HALTON REGION STANDARDS & SPECIFICATIONS & LOCATION APPROVAL FROM AREA MUNICIPALITY.
SIGNED______________ DATE__________
INFRASTRUCTURE PLANNING & POLICY
The Applicant should be aware that the approval of the water system on private property is the responsibility of the Local Municipality. Regardless, the Applicant must ensure that the Region of Halton's standards and specifications are met. (the Water and Wastewater Linear Design Manual may be obtained from the Data Management Group at 905-825-6023) Furthermore, all water quality tests must be completed to the Region of Halton's satisfaction, before the water supply can be turned on.

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A Division of Leighton-Zec Ltd.
3760 14th Avenue, Suite 301,
Markham, ON. L3R 3T7
TEL 905.946.9461 • urbantech.com

LICENSED PROFESSIONAL ENGINEER
A.M.R. MCLENNAN
100509390
APR 12, 2024
PROVINCE OF ONTARIO

EROSION AND SEDIMENT CONTROL PLAN

DESIGNED:	J.M.	CHECKED:	J.O.	PROJECT No.:	18-575
DRAWN:	J.M.	DATE:	JUNE 2021	SHEET No.:	
SCALE: 1:300	3m 0m 3m 6m 12m			DRAWING No.:	ESC-1

APPENDIX B

STORM DESIGN CALCULATIONS

- Storm Sewer Design Sheet
- EFO Sizing Report

urbantech

STORM SEWER DESIGN SHEET

100 Year Storm

Distrikt Developments-3064 Trafalgar Rd.

TOWN OF OAKVILLE

PROJECT DETAILS

Project No: 18-575
Date: 18-May-23
Designed by: AM
Checked by: JO

DESIGN CRITERIA

Min. Diameter =	300	mm	Rainfall Intensity =	A / (Tc+B)^c
Mannings 'n'=	0.013			
Starting Tc =	10	min	A =	2150
			B =	5.7
Factor of Safety =	20	%	c =	0.861

NOMINAL PIPE SIZE USED

STREET	FROM MH	TO MH	AREA (ha)	RUNOFF COEFFICIENT "R"	'AR'	ACCUM. 'AR'	RAINFALL INTENSITY (mm/hr)	FLOW (m3/s)	CONSTANT FLOW (m3/s)	ACCUM. CONSTANT FLOW (m3/s)	TOTAL FLOW (m3/s)	LENGTH (m)	SLOPE (%)	PIPE DIAMETER (mm)	FULL FLOW CAPACITY (m3/s)	FULL FLOW VELOCITY (m/s)	INITIAL Tc (min)	TIME OF CONCENTRATION (min)	ACC. TIME OF CONCENTRATION (min)	PERCENT FULL (%)
STREET A	Area Drains	Building	0.34	0.90	0.31	0.31	480.4													
Site	Roof	Building	0.25	0.90	0.23	0.23	480.4													
Site	SWM Tank	MH1					200.8		0.026	0.026	0.026	1.6	0.61	300	0.076	1.07	10.00	0.02	10.02	34%
Site	MH1	OGS					200.5			0.026	0.026	18.4	0.30	300	0.053	0.75	10.02	0.41	10.43	49%
OPEN SPACE BLOCK	OGS	HW					196.1			0.026	0.026	27.7	0.30	300	0.053	0.75	10.43	0.62	11.05	49%

Urbantech Consulting, A Division of Leighton-Zec Ltd.
3760 14th Avenue, Suite 301 Markham, Ontario L3R 3T7
TEL: 905.946.9461 FAX: 905.946.9595
www.urbantech.com

Stormceptor®

FORTERRA

Stormceptor® EF Sizing Report

STORMCEPTOR®
ESTIMATED NET ANNUAL SEDIMENT (TSS) LOAD REDUCTION

06/29/2021

Province:	Ontario
City:	Oakville
Nearest Rainfall Station:	TORONTO LESTER B. PEARSON INT'L AP
NCDC Rainfall Station Id:	8733
Years of Rainfall Data:	44

Project Name:	Distrikt
Project Number:	18-575
Designer Name:	Preetha Haque
Designer Company:	Urbantech
Designer Email:	phaque@urbantech.com
Designer Phone:	905-829-6916
EOR Name:	
EOR Company:	
EOR Email:	
EOR Phone:	

Site Name:	Distrikt OGS
Drainage Area (ha):	0.59
% Imperviousness:	100.00

Runoff Coefficient 'c': 0.90

Particle Size Distribution:	Fine
Target TSS Removal (%):	80.0

Required Water Quality Runoff Volume Capture (%):	90.00
Estimated Water Quality Flow Rate (L/s):	19.76
Oil / Fuel Spill Risk Site?	Yes
Upstream Flow Control?	Yes
Upstream Orifice Control Flow Rate to Stormceptor (L/s):	25.00
Peak Conveyance (maximum) Flow Rate (L/s):	25.00
Site Sediment Transport Rate (kg/ha/yr):	940.35
Estimated Average Annual Sediment Load (kg/yr):	499.14

Net Annual Sediment (TSS) Load Reduction Sizing Summary

Stormceptor Model	TSS Removal Provided (%)
EFO4	76
EFO6	83
EFO8	88
EFO10	90
EFO12	92

Recommended Stormceptor EFO Model: EFO6

Estimated Net Annual Sediment (TSS) Load Reduction (%): 83

Water Quality Runoff Volume Capture (%): > 90

imbrium

THIRD-PARTY TESTING AND VERIFICATION

►**Stormceptor® EF and Stormceptor® EFO** are the latest evolutions in the Stormceptor® oil-grit separator (OGS) technology series, and are designed to remove a wide variety of pollutants from stormwater and snowmelt runoff. These technologies have been third-party tested in accordance with the Canadian ETV **Procedure for Laboratory Testing of Oil-Grit Separators** and performance has been third-party verified in accordance with the **ISO 14034 Environmental Technology Verification (ETV)** protocol.

PERFORMANCE

►**Stormceptor® EF and EFO** remove stormwater pollutants through gravity separation and floatation, and feature a patent-pending design that generates positive removal of total suspended solids (TSS) throughout each storm event, including high-intensity storms. Captured pollutants include sediment, free oils, and sediment-bound pollutants such as nutrients, heavy metals, and petroleum hydrocarbons. Stormceptor is sized to remove a high level of TSS from the frequent rainfall events that contribute the vast majority of annual runoff volume and pollutant load. The technology incorporates an internal bypass to convey excessive stormwater flows from high-intensity storms through the device without resuspension and washout (scour) of previously captured pollutants. Proper routine maintenance ensures high pollutant removal performance and protection of downstream waterwavs.

PARTICLE SIZE DISTRIBUTION (PSD)

►The **Canadian ETV PSD** shown in the table below was used, or in part, for this sizing. This is the identical PSD that is referenced in the Canadian ETV ***Procedure for Laboratory Testing of Oil-Grit Separators*** for both sediment removal testing and scour testing. The Canadian ETV PSD contains a wide range of particle sizes in the sand and silt fractions, and is considered reasonably representative of the particle size fractions found in typical urban stormwater runoff.

Particle Size (µm)	Percent Less Than	Particle Size Fraction (µm)	Percent
1000	100	500-1000	5
500	95	250-500	5
250	90	150-250	15
150	75	100-150	15
100	60	75-100	10
75	50	50-75	5
50	45	20-50	10
20	35	8-20	15
8	20	5-8	10
5	10	2-5	5
2	5	<2	5

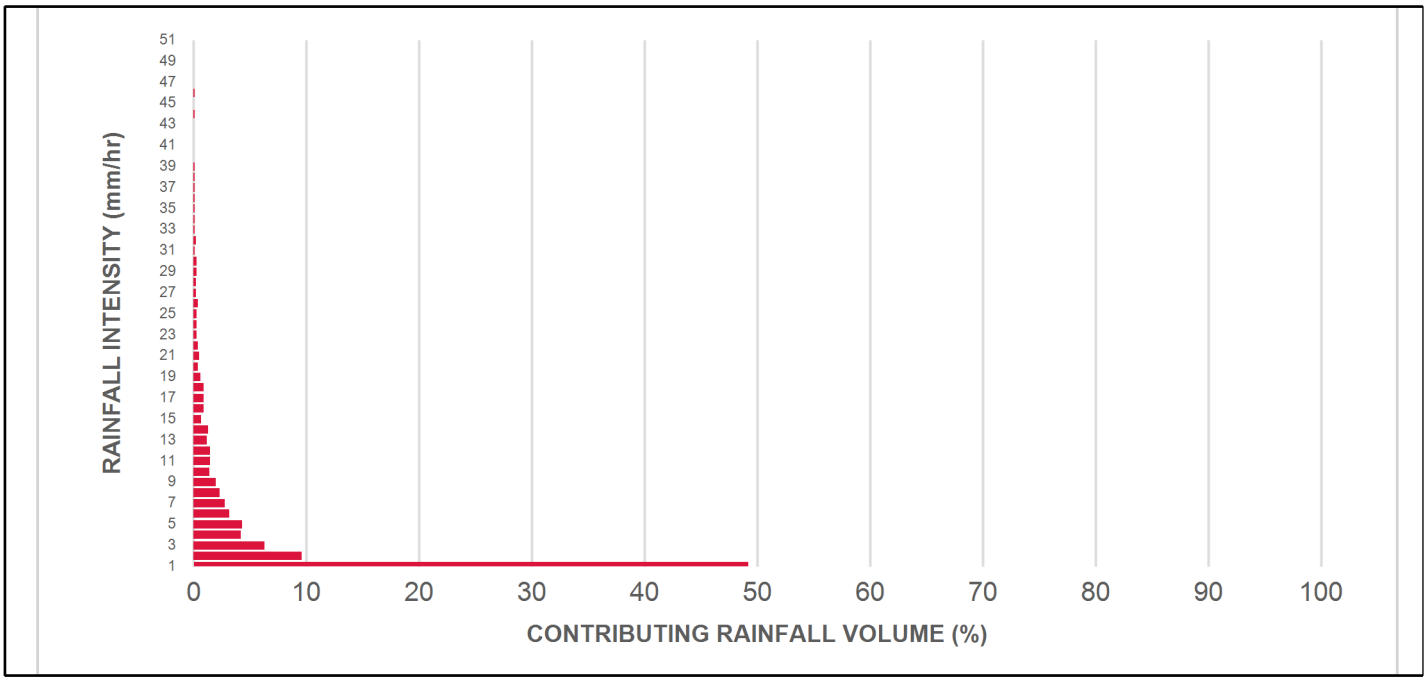
imbrium

Upstream Flow Controlled Results

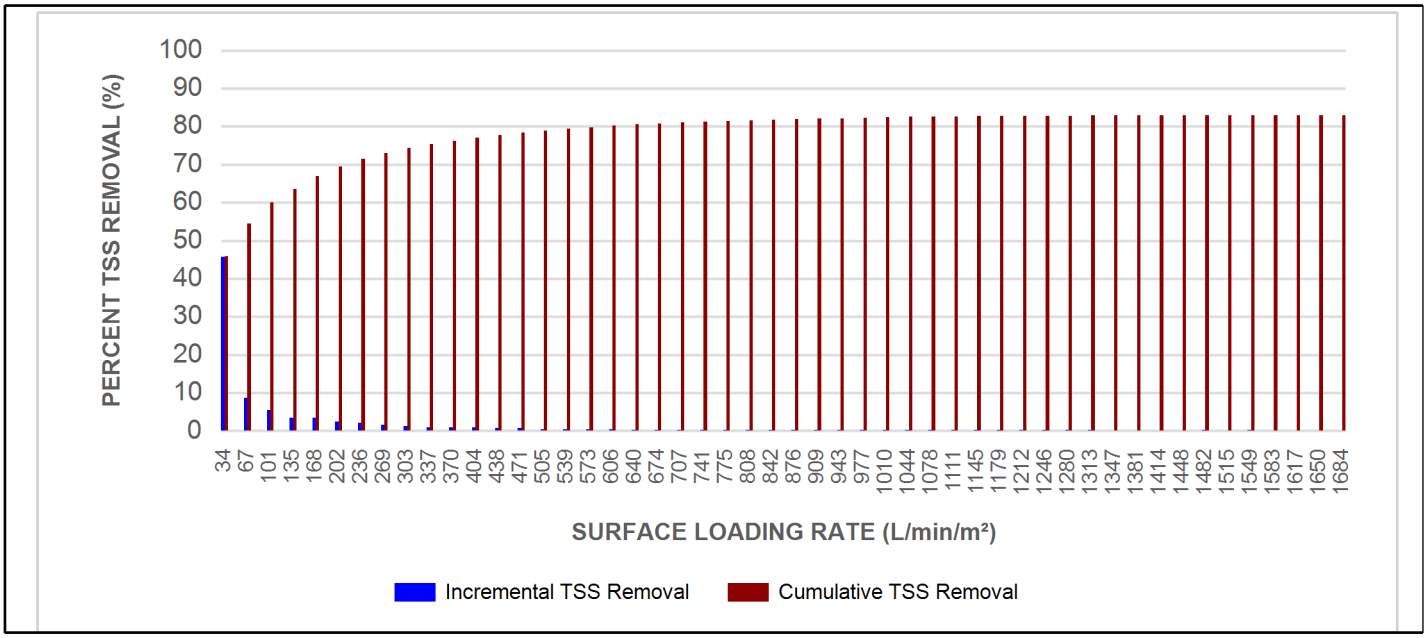
Rainfall Intensity (mm / hr)	Percent Rainfall Volume (%)	Cumulative Rainfall Volume (%)	Flow Rate (L/s)	Flow Rate (L/min)	Surface Loading Rate (L/min/m²)	Removal Efficiency (%)	Incremental Removal (%)	Cumulative Removal (%)
1	49.2	49.2	1.48	89.0	34.0	93	45.8	45.8
2	9.6	58.8	2.95	177.0	67.0	91	8.7	54.5
3	6.3	65.1	4.43	266.0	101.0	87	5.5	60.0
4	4.2	69.3	5.90	354.0	135.0	84	3.5	63.5
5	4.3	73.6	7.38	443.0	168.0	80	3.5	66.9
6	3.2	76.8	8.86	531.0	202.0	76	2.4	69.4
7	2.8	79.6	10.33	620.0	236.0	73	2.1	71.4
8	2.3	81.9	11.81	709.0	269.0	70	1.6	73.0
9	2.0	83.9	13.29	797.0	303.0	67	1.3	74.4
10	1.4	85.3	14.76	886.0	337.0	64	0.9	75.3
11	1.5	86.8	16.24	974.0	370.0	61	0.9	76.2
12	1.5	88.3	17.71	1063.0	404.0	58	0.9	77.0
13	1.2	89.5	19.19	1151.0	438.0	57	0.7	77.7
14	1.3	90.8	20.67	1240.0	471.0	56	0.7	78.4
15	0.7	91.5	22.14	1329.0	505.0	55	0.4	78.8
16	8.5	100.0	23.62	1417.0	539.0	54	4.6	83.4
17	0.0	100.0	25.00	1500.0	570.0	53	0.0	83.4
18	0.0	100.0	25.00	1500.0	570.0	53	0.0	83.4
19	0.0	100.0	25.00	1500.0	570.0	53	0.0	83.4
20	0.0	100.0	25.00	1500.0	570.0	53	0.0	83.4
21	0.0	100.0	25.00	1500.0	570.0	53	0.0	83.4
22	0.0	100.0	25.00	1500.0	570.0	53	0.0	83.4
23	0.0	100.0	25.00	1500.0	570.0	53	0.0	83.4
24	0.0	100.0	25.00	1500.0	570.0	53	0.0	83.4
25	0.0	100.0	25.00	1500.0	570.0	53	0.0	83.4

Rainfall Intensity (mm / hr)	Percent Rainfall Volume (%)	Cumulative Rainfall Volume (%)	Flow Rate (L/s)	Flow Rate (L/min)	Surface Loading Rate (L/min/m²)	Removal Efficiency (%)	Incremental Removal (%)	Cumulative Removal (%)
26	0.0	100.0	25.00	1500.0	570.0	53	0.0	83.4
27	0.0	100.0	25.00	1500.0	570.0	53	0.0	83.4
28	0.0	100.0	25.00	1500.0	570.0	53	0.0	83.4
29	0.0	100.0	25.00	1500.0	570.0	53	0.0	83.4
30	0.0	100.0	25.00	1500.0	570.0	53	0.0	83.4
31	0.0	100.0	25.00	1500.0	570.0	53	0.0	83.4
32	0.0	100.0	25.00	1500.0	570.0	53	0.0	83.4
33	0.0	100.0	25.00	1500.0	570.0	53	0.0	83.4
34	0.0	100.0	25.00	1500.0	570.0	53	0.0	83.4
35	0.0	100.0	25.00	1500.0	570.0	53	0.0	83.4
36	0.0	100.0	25.00	1500.0	570.0	53	0.0	83.4
37	0.0	100.0	25.00	1500.0	570.0	53	0.0	83.4
38	0.0	100.0	25.00	1500.0	570.0	53	0.0	83.4
39	0.0	100.0	25.00	1500.0	570.0	53	0.0	83.4
40	0.0	100.0	25.00	1500.0	570.0	53	0.0	83.4
41	0.0	100.0	25.00	1500.0	570.0	53	0.0	83.4
42	0.0	100.0	25.00	1500.0	570.0	53	0.0	83.4
43	0.0	100.0	25.00	1500.0	570.0	53	0.0	83.4
44	0.0	100.0	25.00	1500.0	570.0	53	0.0	83.4
45	0.0	100.0	25.00	1500.0	570.0	53	0.0	83.4
46	0.0	100.0	25.00	1500.0	570.0	53	0.0	83.4
47	0.0	100.0	25.00	1500.0	570.0	53	0.0	83.4
48	0.0	100.0	25.00	1500.0	570.0	53	0.0	83.4
49	0.0	100.0	25.00	1500.0	570.0	53	0.0	83.4
50	0.0	100.0	25.00	1500.0	570.0	53	0.0	83.4
Estimated Net Annual Sediment (TSS) Load Reduction =								**83 %**

RAINFALL DATA FROM TORONTO LESTER B. PEARSON INT'L AP RAINFALL STATION



INCREMENTAL AND CUMULATIVE TSS REMOVAL FOR THE RECOMMENDED STORMCEPTOR® MODEL



Maximum Pipe Diameter / Peak Conveyance

Stormceptor EF / EFO	Model Diameter		Min Angle Inlet / Outlet Pipes	Max Inlet Pipe Diameter		Max Outlet Pipe Diameter		Peak Conveyance Flow Rate	
	(m)	(ft)		(mm)	(in)	(mm)	(in)	(L/s)	(cfs)
EF4 / EFO4	1.2	4	90	609	24	609	24	425	15
EF6 / EFO6	1.8	6	90	914	36	914	36	990	35
EF8 / EFO8	2.4	8	90	1219	48	1219	48	1700	60
EF10 / EFO10	3.0	10	90	1828	72	1828	72	2830	100
EF12 / EFO12	3.6	12	90	1828	72	1828	72	2830	100

SCOUR PREVENTION AND ONLINE CONFIGURATION

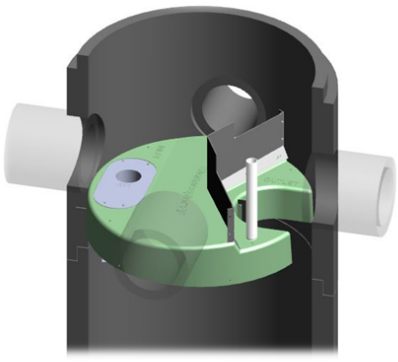
►**Stormceptor® EF and EFO** feature an internal bypass and superior scour prevention technology that have been demonstrated in third-party testing according to the scour testing provisions of the Canadian ETV **Procedure for Laboratory Testing of Oil-Grit Separators**, and the exceptional scour test performance has been third-party verified in accordance with the ISO 14034 ETV protocol. As a result, Stormceptor EF and EFO are approved for online installation, eliminating the need for costly additional bypass structures, piping, and installation expense.

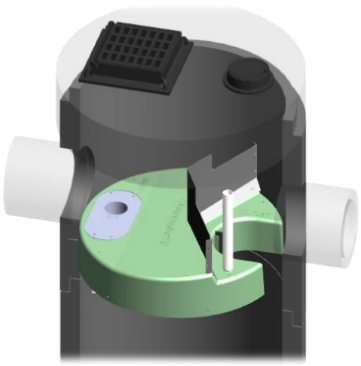
DESIGN FLEXIBILITY

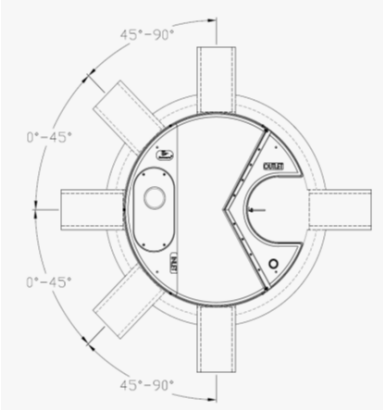
►**Stormceptor® EF** and **EFO** offers design flexibility in one simplified platform, accepting stormwater flow from a single inlet pipe or multiple inlet pipes, and/or surface runoff through an inlet grate. The device can also serve as a junction structure, accommodate a 90-degree inlet-to-outlet bend angle, and can be modified to ensure performance in submerged conditions.

OIL CAPTURE AND RETENTION

►While Stormceptor® EF will capture and retain oil from dry weather spills and low intensity runoff, **Stormceptor® EFO** has demonstrated superior oil capture and greater than 99% oil retention in third-party testing according to the light liquid re-entrainment testing provisions of the Canadian ETV **Procedure for Laboratory Testing of Oil-Grit Separators**. Stormceptor EFO is recommended for sites where oil capture and retention is a requirement.







INLET-TO-OUTLET DROP

Elevation differential between inlet and outlet pipe inverts is dictated by the angle at which the inlet pipe(s) enters the unit.

0° - 45° : The inlet pipe is 1-inch (25mm) higher than the outlet pipe.

45° - 90° : The inlet pipe is 2-inches (50mm) higher than the outlet pipe.

HEAD LOSS

The head loss through Stormceptor EF is similar to that of a 60-degree bend structure. The applicable K value for calculating minor losses through the unit is 1.1. For submerged conditions the applicable K value is 3.0.

Pollutant Capacity

Stormceptor EF / EFO	Model Diameter		Depth (Outlet Pipe Invert to Sump Floor)		Oil Volume		Recommended Sediment Maintenance Depth *		Maximum Sediment Volume *		Maximum Sediment Mass **	
	(m)	(ft)	(m)	(ft)	(L)	(Gal)	(mm)	(in)	(L)	(ft^3)	(kg)	(lb)
EF4 / EFO4	1.2	4	1.52	5.0	265	70	203	8	1190	42	1904	5250
EF6 / EFO6	1.8	6	1.93	6.3	610	160	305	12	3470	123	5552	15375
EF8 / EFO8	2.4	8	2.59	8.5	1070	280	610	24	8780	310	14048	38750
EF10 / EFO10	3.0	10	3.25	10.7	1670	440	610	24	17790	628	28464	78500
EF12 / EFO12	3.6	12	3.89	12.8	2475	655	610	24	31220	1103	49952	137875

*Increased sump depth may be added to increase sediment storage capacity

** Average density of wet packed sediment in sump = 1.6 kg/L (100 lb/ft^3)

Feature	Benefit	Feature Appeals To
Patent-pending enhanced flow treatment and scour prevention technology	Superior, verified third-party performance	Regulator, Specifying & Design Engineer
Third-party verified light liquid capture and retention for EFO version	Proven performance for fuel/oil hotspot locations	Regulator, Specifying & Design Engineer, Site Owner
Functions as bend, junction or inlet structure	Design flexibility	Specifying & Design Engineer
Minimal drop between inlet and outlet	Site installation ease	Contractor
Large diameter outlet riser for inspection and maintenance	Easy maintenance access from grade	Maintenance Contractor & Site Owner

STANDARD STORMCEPTOR EF/EFO DRAWINGS

For standard details, please visit http://www.imbriumsystems.com/stormwater-treatment-solutions/stormceptor-ef

STANDARD STORMCEPTOR EF/EFO SPECIFICATION

For specifications, please visit http://www.imbriumsystems.com/stormwater-treatment-solutions/stormceptor-ef

STANDARD PERFORMANCE SPECIFICATION FOR "OIL GRIT SEPARATOR" (OGS) STORMWATER QUALITY TREATMENT DEVICE

PART 1 – GENERAL

1.1 WORK INCLUDED

This section specifies requirements for selecting, sizing, and designing an underground Oil Grit Separator (OGS) device for stormwater quality treatment, with third-party testing results and a Statement of Verification in accordance with ISO 14034 Environmental Management – Environmental Technology Verification (ETV).

1.2 REFERENCE STANDARDS & PROCEDURES

ISO 14034:2016 Environmental management – Environmental technology verification (ETV)

Canadian Environmental Technology Verification (ETV) Program's **Procedure for Laboratory Testing of Oil-Grit Separators**

1.3 SUBMITTALS

1.3.1 All submittals, including sizing reports & shop drawings, shall be submitted upon request with each order to the contractor then forwarded to the Engineer of Record for review and acceptance. Shop drawings shall detail all OGS components, elevations, and sequence of construction.

1.3.2 Alternative devices shall have features identical to or greater than the specified device, including: treatment chamber diameter, treatment chamber wet volume, sediment storage volume, and oil storage volume.

1.3.3 Unless directed otherwise by the Engineer of Record, OGS stormwater quality treatment product substitutions or alternatives submitted within ten days prior to project bid shall not be accepted. All alternatives or substitutions submitted shall be signed and sealed by a local registered Professional Engineer, based on the exact same criteria detailed in Section 3, in entirety, subject to review and approval by the Engineer of Record.

PART 2 – PRODUCTS

2.1 OGS POLLUTANT STORAGE

The OGS device shall include a sump for sediment storage, and a protected volume for the capture and storage of petroleum hydrocarbons and buoyant gross pollutants. The minimum sediment & petroleum hydrocarbon storage capacity shall be as follows:

2.1.1	4 ft (1219 mm) Diameter OGS Units:	1.19 m^3 sediment / 265 L oil
	6 ft (1829 mm) Diameter OGS Units:	3.48 m^3 sediment / 609 L oil
	8 ft (2438 mm) Diameter OGS Units:	8.78 m^3 sediment / 1,071 L oil
	10 ft (3048 mm) Diameter OGS Units:	17.78 m^3 sediment / 1,673 L oil
	12 ft (3657 mm) Diameter OGS Units:	31.23 m^3 sediment / 2,476 L oil

PART 3 – PERFORMANCE & DESIGN

3.1 GENERAL

The OGS stormwater quality treatment device shall be verified in accordance with ISO 14034:2016 Environmental management – Environmental technology verification (ETV). The OGS stormwater quality treatment device shall

remove oil, sediment and gross pollutants from stormwater runoff during frequent wet weather events, and retain these pollutants during less frequent high flow wet weather events below the insert within the OGS for later removal during maintenance. The Manufacturer shall have at least ten (10) years of local experience, history and success in engineering design, manufacturing and production and supply of OGS stormwater quality treatment device systems, acceptable to the Engineer of Record.

3.2 SIZING METHODOLOGY

The OGS device shall be engineered, designed and sized to provide stormwater quality treatment based on treating a minimum of 90 percent of the average annual runoff volume and a minimum removal of an annual average 60% of the sediment (TSS) load based on the Particle Size Distribution (PSD) specified in the sizing report for the specified device. Sizing shall be determined using historical rainfall data and a sediment removal performance curve derived from the actual third-party verified laboratory testing data. The OGS device shall also have sufficient annual sediment storage capacity as specified and calculated in Section 2.1.

3.3 CANADIAN ETV or ISO 14034 ETV VERIFICATION OF SCOUR TESTING

The OGS device shall have Canadian ETV or ISO 14034 ETV Verification of third-party scour testing conducted in accordance with the Canadian ETV Program's **Procedure for Laboratory Testing of Oil-Grit Separators.**

3.3.1 To be acceptable for on-line installation, the OGS device must demonstrate an average scour test effluent concentration less than 10 mg/L at each surface loading rate tested, up to and including 2600 L/min/m^2.

3.4 LIGHT LIQUID RE-ENTRAINMENT SIMULATION TESTING

The OGS device shall have Canadian ETV or ISO 14034 ETV Verification of completed third-party Light Liquid Re-entrainment Simulation Testing in accordance with the Canadian ETV **Program's Procedure for Laboratory Testing of Oil-Grit Separators,** with results reported within the Canadian ETV or ISO 14034 ETV verification. This re-entrainment testing is conducted with the device pre-loaded with low density polyethylene (LDPE) plastic beads as a surrogate for light liquids such as oil and fuel. Testing is conducted on the same OGS unit tested for sediment removal to assess whether light liquids captured after a spill are effectively retained at high flow rates.

3.4.1 For an OGS device to be an acceptable stormwater treatment device on a site where vehicular traffic occurs and the potential for an oil or fuel spill exists, the OGS device must have reported verified performance results of greater than 99% cumulative retention of LDPE plastic beads for the five specified surface loading rates (ranging 200 L/min/m2 to 2600 L/min/m2) in accordance with the Light Liquid Re-entrainment Simulation Testing within the Canadian ETV Program's **Procedure for Laboratory Testing of Oil-Grit Separators.**However, an OGS device shall not be allowed if the Light Liquid Re-entrainment Simulation Testing was performed with screening components within the OGS device that are effective at retaining the LDPE plastic beads, but would not be expected to retain light liquids such as oil and fuel.

APPENDIX C

SANITARY DESIGN CALCULATIONS

- Sanitary Demand Calculations
- 20-650 - Sanitary Sewer Design Sheet
- 20-650 - 301 Sanitary Drainage Plan

URBANTECH

SANITARY DEMAND CALCULATIONS

Project Name: Distrikt Developments - 3064 Trafalgar Road
Municipality: Region of Halton
Project No.: 18-575
Date: 11-Apr-24

Existing Site

Address	3064 Trafalgar
Existing Land Use	Undeveloped
Site Area (ha)	0.7
Residential Unit Sewage Flow (L/p/s)	0.003183
Infiltration Allowance (L/ha/s)	0.286
Residential Population (ppl/unit)*	1.8
Residential Land Use Area (ha)	0.70

*All factors, densities, and caclulations are as per The Region of Halton Water and Wastewater Linear Design Manual Version 5, October 2019

**Residential population equivalency factor assumed conservatively to be 1.835 ppu as the density of the proposed development is larger than section 2.3.2. of the Linear Design Manual. This estimate is the PPU for 2 or more bedroom apartments per Table A-4 of the Region of Halton 2022 DC Background Study.*

Proposed Site

Architectural Site Stats: 10-Jan-24

Average Dry Weather Flow

Units	782
Residential Population	1435
Residential Sewage Flow (L/s)	4.57

Peaking Factor

Kav	1.00
Harmon Peaking Factor, M	3.69
Peak Residential Flow (L/s)	16.87

Proposed Infiltration

Site Area (ha)	0.7
Infiltration (L/s) (Infiltration Allowance 0.286 L/ha/s)	0.20

Total Flows

Peak Commercial Flow (L/s)	16.87
Infiltration (L/s)	0.20
Groundwater (L/s)	1.04
Total Sanitary Flow (L/s)	18.11

*B.I.G. Hydro-G Report, August 2020

urbantech

SANITARY SEWER DESIGN SHEET

DUNDAS-TRAFALGAR INC.

REGIONAL MUNICIPALITY OF HALTON

PROJECT DETAILS

Project No: 20-650
Date: 18-Dec-20
Designed by: LR
Checked by: SR/JO

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 =	0.6	m/s	Max. Peaking Factor =	4.50	
Max. Velocity =	3.0	m/s	Min. Peaking Factor=	2.00	
Factor of Safety =	15	%			

NOMINAL PIPE SIZE USED

			RESIDENTIAL							COMMERCIAL/INDUSTRIAL/INSTITUTIONAL						FLOW CALCULATIONS							PIPE DATA					
STREET	FROM MH	TO MH	AREA (ha)	ACC. AREA (ha)	UNITS (#)	DENISTY (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 (%)
TRAFALGAR RD SAN																												
TRAFALGAR		103A	1.48	1.48												0.4						0.4						
TRAFALGAR	107A	103A	0.71	0.71		2000		1420	1420							0.2	1420	3.70	16.7			16.9	1.00	375	175.3	1.6	1.0	10%
TRAFALGAR	103A	102A		2.19					1420							0.6	1420	3.70	16.7			17.3	0.35	375	103.7	0.9	0.7	17%
TRAFALGAR	101A	102A	0.77	0.77		2650		2041	2041							0.2	2041	3.58	23.2			23.5	1.00	375	175.3	1.6	1.1	13%
TRAFALGAR		102A	0.72	0.72		2000		1440	1440							0.2	1440	3.69	16.9			17.1						
TRAFALGAR	102A	104A		3.68					4901							1.1	4901	3.25	50.7			51.8	0.35	375	103.7	0.9	0.9	50%
TRAFALGAR	105A	104A	0.56	0.56		2000		1120	1120							0.2	1120	3.77	13.4			13.6	1.00	375	175.3	1.6	0.9	8%
TRAFALGAR	104A	106A		4.24					6021							1.2	6021	3.17	60.7			61.9	0.50	375	124.0	1.1	1.1	50%

Urbantech Consulting, A Division of Leighton-Zec Ltd.
3760 14th Avenue, Suite 301 Markham, Ontario L3R 3T7
TEL: 905.946.9461 FAX: 905.946.9595
www.urbantech.com

P:\Projects\20-650 -Trafalgar Rd. Servicing (DTI- Oakville)\Drawings\300 - Drainage & Design Sheet\SANITARY SEWER DESIGN SHEETS\20-650 SAN:SAN

No.	REVISIONS	DATE	BY
3			
2			
1			

DUNDAS-TRAFALGAR INC.
TRAFALGAR ROAD WORKS

OAKVILLE

REGIONAL MUNICIPALITY OF HALTON
TOWN OF OAKVILLE

TOWN FILE No. SD 603.2

REGION FILE No. DO-1069

MUNICIPAL

APPROVED IN PRINCIPAL SUBJECT TO DETAIL CONSTRUCTION CONFORMING TO TOWN STANDARDS AND SPECIFICATIONS.

SIGNED____________________ DATE____________
MANAGER OF DEVELOPMENT ENGINEERING

REGIONAL

DESIGN OF SANITARY AND WATER SERVICES APPROVED SUBJECT TO DETAIL CONSTRUCTION CONFORMING TO HALTON REGION STANDARDS & SPECIFICATIONS & LOCATION APPROVAL FROM AREA MUNICIPALITY.

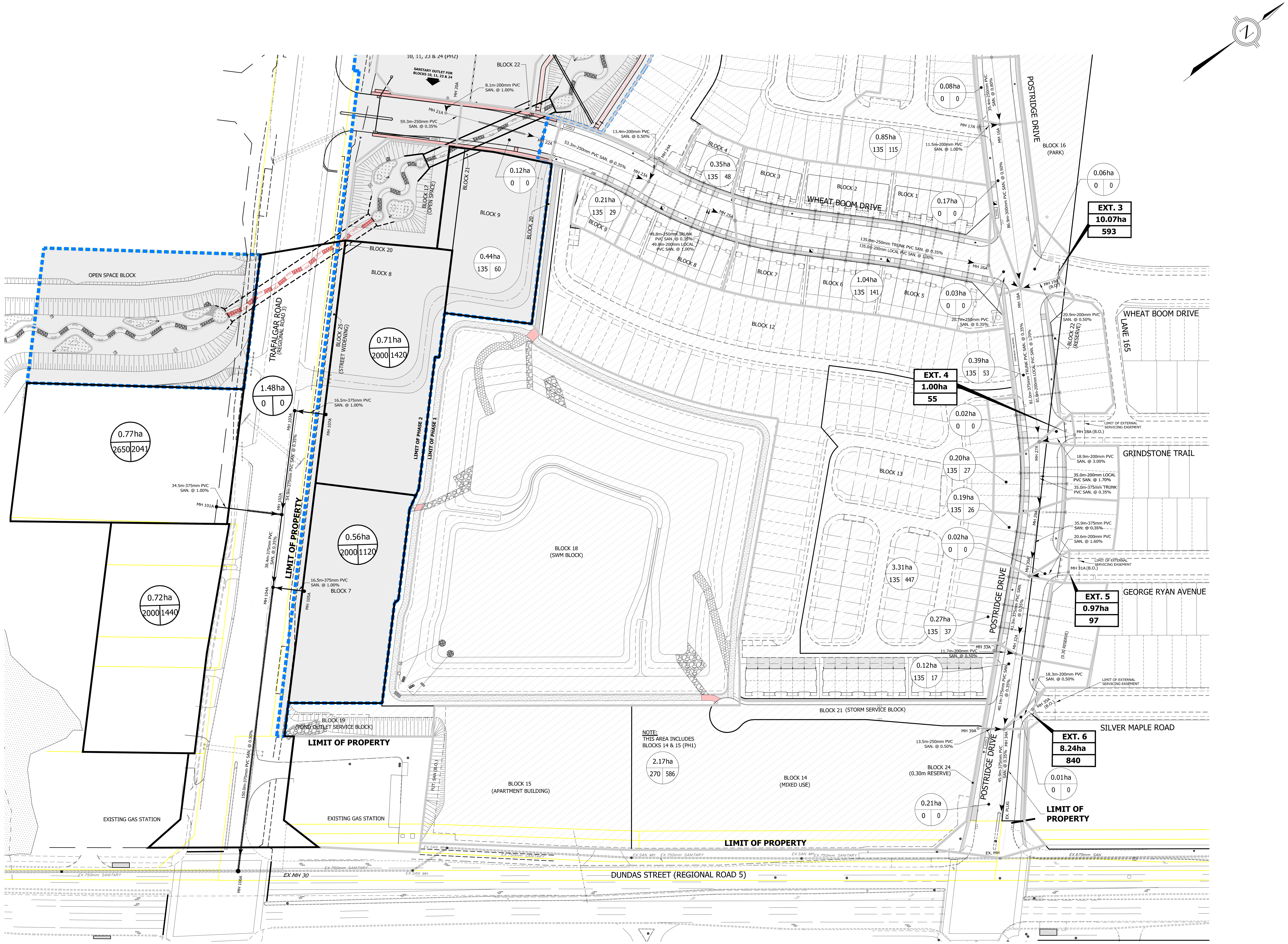
SIGNED Karthiga Mounaguru DATE 2021-10-19
LEGISLATIVE & PLANNING SERVICES DEPARTMENT

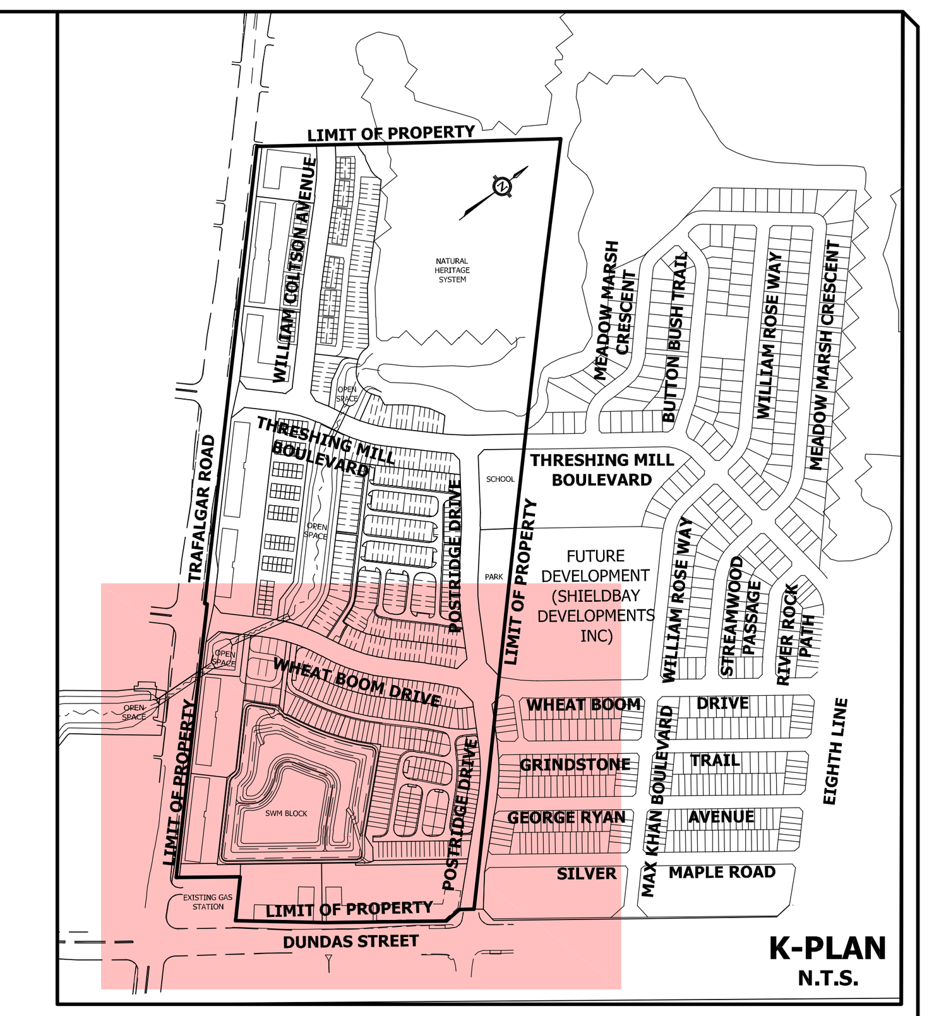
urbantech
Urbantech Consulting, A Division of Leighton-Zec Ltd.
3760 14th Avenue , Suite 301 Markham ON L3R 3T7
tel: 905.946.9461 fax: 905.946.9595
www.urbantech.com

REGISTERED PROFESSIONAL ENGINEER
B.JACKSON
100210382
JULY 16, 2021
PROVINCE OF ONTARIO

SANITARY DESIGN SHEET

DESIGNED:	L.R.	CHECKED:	B.J./J.O.	PROJECT No.:	20-650
DRAWN:	J.M.	DATE:	JULY 2021	SHEET No.:	
SCALE:	N.T.S			DRAWING No.:	**302**





LEGEND

- SANITARY MANHOLE AND FLOW DIRECTION ARROW
- EXISTING SANITARY MANHOLE AND FLOW DIRECTION ARROW
- FUTURE SANITARY MANHOLE AND FLOW DIRECTION ARROW
- SINGLE SANITARY SERVICE CONNECTION
- 0.55ha / 90 / 50: DRAINAGE AREA (ha); POPULATION; POPULATION PER Ha (P/Ha)
- 0.10Ha / 70 / 7: EXISTING DRAINAGE AREA (ha); POPULATION USED IN EXISTING SEWER DESIGN; POPULATION PER Ha (P/Ha)
- DRAINAGE AREA BOUNDARY
- EXISTING DRAINAGE AREA BOUNDARY
- PHASE 2 SUBDIVISION WORKS (REFER TO PROJECT 12-370-PH2 BY URBANTECH, REGION FILE D0-1026)
- PHASE 1 SUBDIVISION WORKS (REFER TO PROJECT 12-370 BY URBANTECH, REGION FILE D0-1026)

ELEVATIONS ARE ORTHOMETRIC AND ARE REFERRED TO THE MINISTRY OF TRANSPORTATION ONTARIO FIRST-ORDER BENCHMARK 00819818109 HAVING AN ELEVATION OF 160.216 METRES. ELEVATIONS ARE REFERENCED TO THE CANADIAN GEODETIC VERTICAL DATUM OF 1928, 1978 ADJUSTMENT (CGVD-1928:1978).
818109: CONCRETE CULVERT UNDER HWY 5, 0.8 KM WEST OF THE JCT OF HWY 5 AND NINTH LINE RD IN OAKVILLE, 62.0 M WEST OF ENTRANCE TO RED BRICK HOUSE #1350 AND 18.1 M SOUTH OF CENTRELINE OF HWY 5. TABLET IS SET VERTICALLY IN TOP OF SOUTH END OF CULVERT, 59 C MNORTH OF SOUTH END OF CULVERT AND 75 CM EAST OF WEST FACE OF CULVERT.

No.	REVISIONS	DATE	BY
3			
2			
1			

DUNDAS-TRAFALGAR INC.
TRAFALGAR ROAD WORKS

OAKVILLE
REGIONAL MUNICIPALITY OF HALTON
TOWN OF OAKVILLE

TOWN FILE No. SD 603.2
REGION FILE No. DO-1069

MUNICIPAL
APPROVED IN PRINCIPAL SUBJECT TO DETAIL CONSTRUCTION CONFORMING TO TOWN STANDARDS AND SPECIFICATIONS.
SIGNED____________ DATE________
MANAGER OF DEVELOPMENT ENGINEERING

REGIONAL
DESIGN OF SANITARY AND WATER SERVICES APPROVED SUBJECT TO DETAIL CONSTRUCTION CONFORMING TO HALTON REGION STANDARDS & SPECIFICATIONS & LOCATION APPROVAL FROM AREA MUNICIPALITY.
SIGNED Karthiga Mounaguru DATE 2021-10-19
LEGISLATIVE & PLANNING SERVICES DEPARTMENT

urbantech
Urbantech Consulting, A Division of Leighton-Zec Ltd.
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www.urbantech.com

REGISTERED PROFESSIONAL ENGINEER
B.JACKSON
100210382
JULY 16, 2021
PROVINCE OF ONTARIO

SANITARY DRAINAGE PLAN

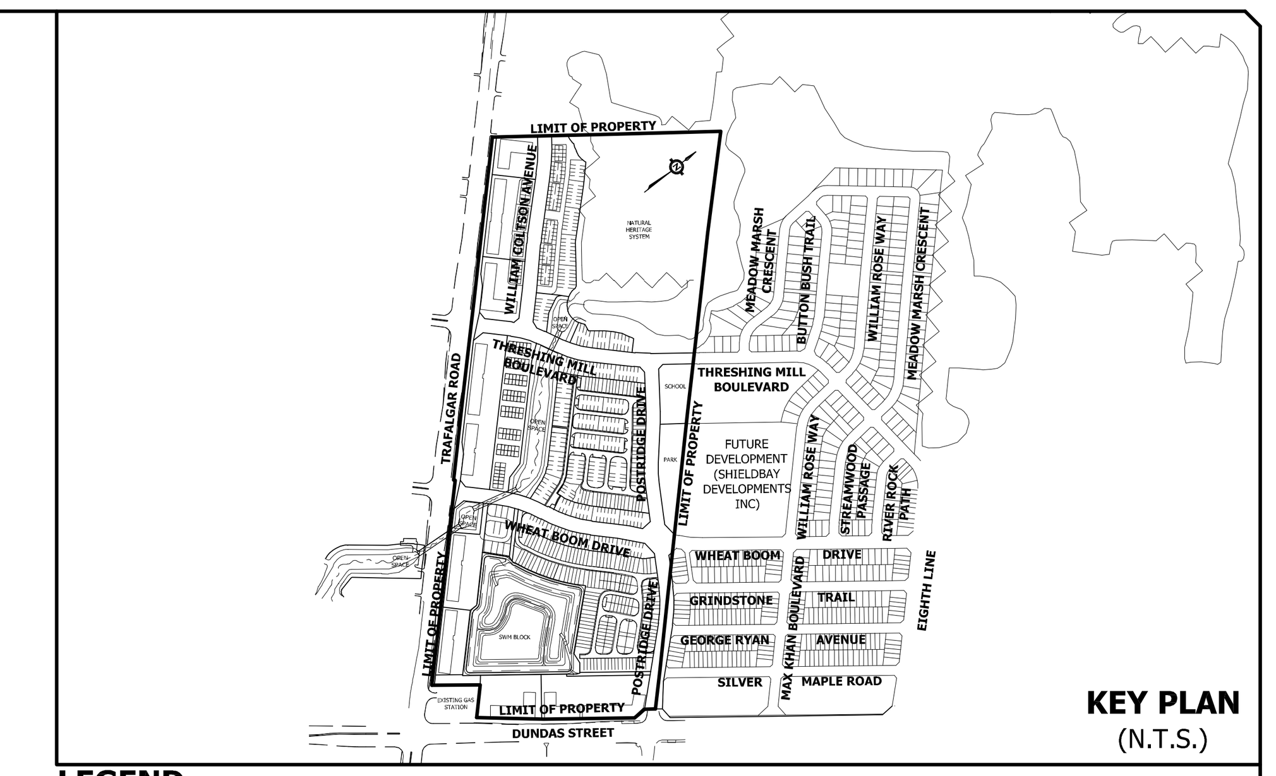
DESIGNED: L.R.	CHECKED: B.J./J.O.	PROJECT No.:	20-650
DRAWN: J.M.	DATE: JULY 2021	SHEET No.:	
SCALE: 1:1000 Meters (20 0 20 40)		DRAWING No.:	301

APPENDIX D

WATER DEMAND CALCULATIONS

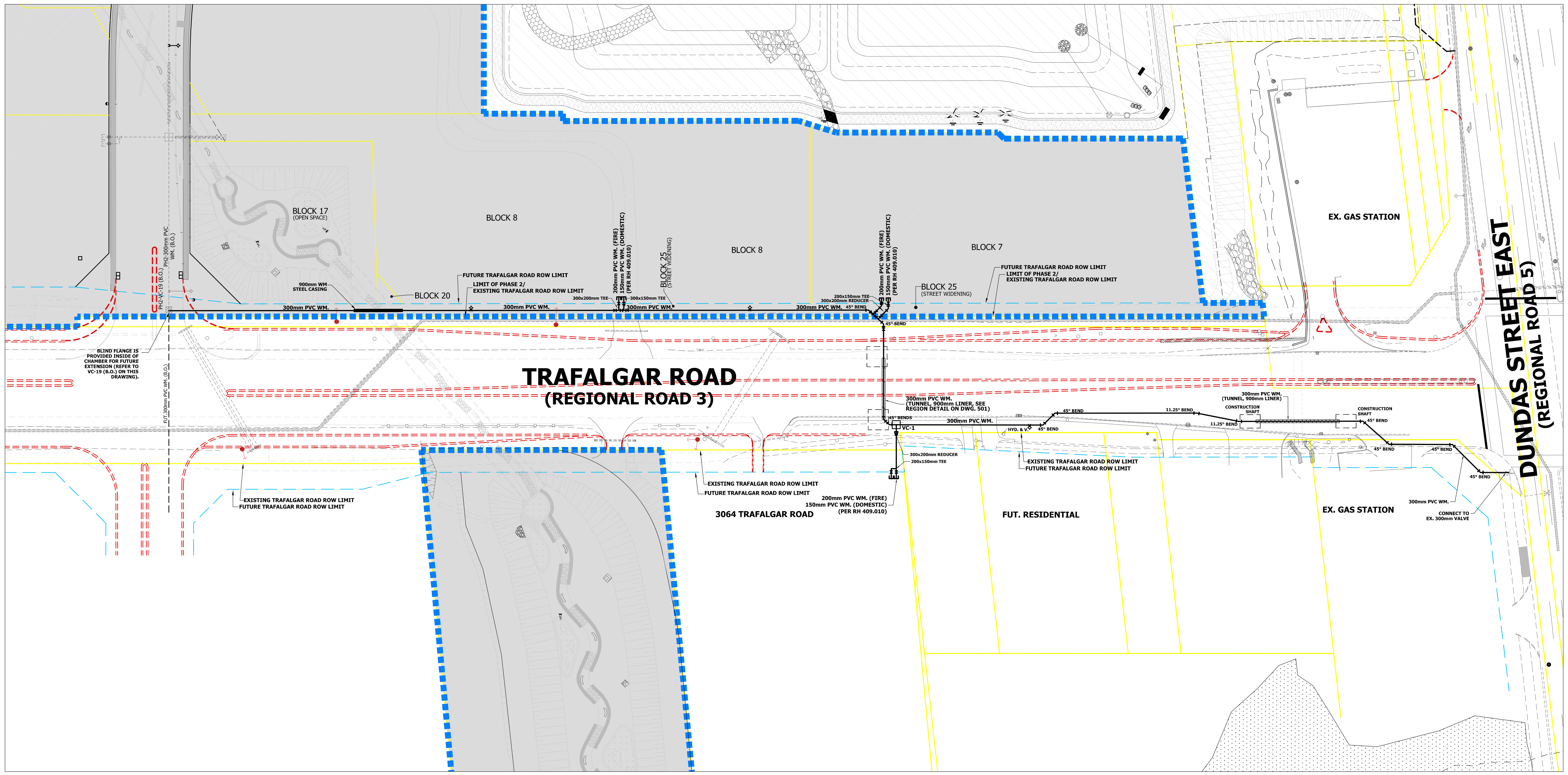
- DO-1069 - 206 Watermain Layout Plan
- Water Distribution Modeling Report by MES, dated June 30, 2021
- Water Pressure Analysis Memo (dated May 18, 2023)

KEY PLAN
(N.T.S.)



LEGEND

- EXISTING WATERMAIN
- PROPOSED WATERMAIN
- FUTURE WATERMAIN
- HYDRANT & VALVE
- VALVE AND BOX
- 2400x2400mm VALVE CHAMBER (STD RH 402.020)
- STREET LIGHT
- TRANSFORMER
- EXISTING PAVEMENT
- FUTURE CURB AS PER "ISSUED FOR 30% REVIEW" PLANS BY RVA
- PHASE 2 SUBDIVISION WORKS (REFER TO PROJECT 12-370-PH2 BY URBANTECH, REGION FILE D0-1026)
- PHASE 1 SUBDIVISION WORKS (REFER TO PROJECT 12-370 BY URBANTECH, REGION FILE D0-1026)
- EXISTING PROPERTY LINES
- FUTURE ROAD WIDENING LIMITS



GENERAL NOTES:

1. ALL EXISTING UTILITIES ARE NOT NECESSARILY SHOWN ON THE ENGINEERING DRAWINGS AND WHERE SHOWN, THE HORIZONTAL AND VERTICAL LOCATION SHOULD BE VERIFIED PRIOR TO CONSTRUCTION. THE CONTRACTOR SHALL COORDINATE WITH ALL UTILITY AGENCIES FOR LOCATES.
2. ALL AREAS DISTURBED WITHIN THE TRAFALGAR ROAD RIGHT OF WAY SHALL BE RESTORED TO ORIGINAL CONDITION OR BETTER TO THE SATISFACTION OF THE TOWN OF OAKVILLE, REGION OF HALTON, CONSERVATION HALTON AND THE ON-SITE GEOTECHNICAL ENGINEER. REFER TO DRAWING 914 FOR ADDITIONAL RESTORATION DETAILS.
3. **SHOULD UNFAVOURABLE SOIL CONDITIONS BE ENCOUNTERED DURING CONSTRUCTION, RECOMMENDATIONS FROM THE GEOTECHNICAL REPORT AND ON-SITE GEOTECHNICAL ENGINEER SHALL BE FOLLOWED.**

BENCHMARK NOTE

ELEVATIONS ARE ORTHOMETRIC AND ARE REFERRED TO THE MINISTRY OF TRANSPORTATION ONTARIO FIRST-ORDER BENCHMARK 00819818109 HAVING AN ELEVATION OF 160.216 METRES. ELEVATIONS ARE REFERENCED TO THE CANADIAN GEODETIC VERTICAL DATUM OF 1928, 1978 ADJUSTMENT (CGVD-1928:1978).
818109: CONCRETE CULVERT UNDER HWY 5, 0.8 KM WEST OF THE JCT OF HWY 5 AND NINTH LINE RD. IN OAKVILLE, 62.0 M WEST OF ENTRANCE TO RED BRICK HOUSE #1350 AND 18.1 M SOUTH OF CENTRELINE OF HWY 5. TABLET IS SET VERTICALLY IN TOP OF SOUTH END OF CULVERT, 59 C MNORTH OF SOUTH END OF CULVERT AND 75 CM EAST OF WEST FACE OF CULVERT.

No.	REVISIONS	DATE	BY
4			
3			
2			
1			

DUNDAS-TRAFALGAR INC.
TRAFALGAR ROAD WORKS

OAKVILLE
REGIONAL MUNICIPALITY OF HALTON
TOWN OF OAKVILLE

TOWN FILE No. SD 603.2

REGION FILE No. DO-0169

MUNICIPAL
APPROVED IN PRINCIPAL SUBJECT TO DETAIL CONSTRUCTION CONFORMING TO TOWN STANDARDS AND SPECIFICATIONS.
SIGNED__________ DATE__________
MANAGER OF DEVELOPMENT ENGINEERING

REGIONAL
DESIGN OF SANITARY AND WATER SERVICES APPROVED SUBJECT TO DETAIL CONSTRUCTION CONFORMING TO HALTON REGION STANDARDS & SPECIFICATIONS & LOCATION APPROVAL FROM AREA MUNICIPALITY.
SIGNED__________ DATE__________
LEGISLATIVE & PLANNING SERVICES DEPARTMENT

urbantech
Urbantech Consulting, A Division of Leighton-Zec Ltd.
3760 14th Avenue , Suite 301 Markham ON L3R 3T7
tel: 905.946.9461 fax: 905.946.9595
www.urbantech.com

REGISTERED PROFESSIONAL ENGINEER
B.JACKSON
100210382
JAN 11, 2021
PROVINCE OF ONTARIO

WATERMAIN LAYOUT PLAN

DESIGNED:	L.R.	CHECKED:	B.J./ J.O.	PROJECT No.:	20-650
DRAWN:	B.J.	DATE:	JANUARY 2021	SHEET No.:	
SCALE:	1:750	0 7.5 15 30		DRAWING No.:	206

Municipal Engineering Solutions

June 30, 2021 Project No. 17003-43

Mr. Clarence Qian
3064 Trafalgar Holdings Inc.
1-90 Wingold Avenue
Toronto, ON
M6B 1P5

Subject: Trafalgar Dundas Development
Water Distribution Modeling
Town of Oakville, Region of Halton

Dear Mr. Qian,

We are pleased to submit our report entitled "Trafalgar Dundas Development Watermain Analysis" outlining the results of our water distribution analysis for the proposed residential development in the Town of Oakville, Region of Halton.

This development was incorporated into the Region of Halton's existing Infowater water models dated June 16, 2020 and modeled utilizing the design information provided to Municipal Engineering Solutions. The findings of our analysis are summarized in the following report.

We trust you find this report satisfactory. Should you have any questions or require further clarification, please call.

Yours truly,

Municipal Engineering Solutions

John C. Bourrie

Per: John C. Bourrie, P.Eng.

/LMC

File Location: D:\Projects\2021\21-013 3064 Trafalgar Urbantech 17003-43\3.0 Report\Final report\17003-43 Trafalgar Watermain Analysis_20210630.docx

55 Gilbank Drive, Aurora, Ontario L4G 6H9

Tel: 905.726.1016 Cell: 416.434.0186 Fax: 905.726.1225

TRAFALGAR DUNDAS DEVELOPMENT

WATER ANALYSIS

PREPARED BY:

MUNICIPAL ENGINEERING SOLUTIONS

FOR:

3064 TRAFALGAR HOLDINGS INC
June 2021

Project Number: 17003-43

TABLE OF CONTENTS

APPENDICES

Section 1 – INTRODUCTION

Municipal Engineering Solutions ("MES") was retained by 3064 Trafalgar Holdings Inc to conduct a hydraulic water analysis for the proposed Trafalgar Dundas development located in the Town of Oakville in the Region of Halton. As part of this hydraulic assessment MES was requested to undertake the following:

1. Calculate/verify water demands for the proposed development using Region of Halton, provincial and industry design standards;
2. Add the subject watermains/development to the Region's existing water model;
3. Run the model to size the subject mains to achieve service criteria during Average Day, Peak Hour and fire flow during Maximum Day demand; and
4. Prepare a Report summarizing the modeling results for agency review and design purposes.

1.1 Development Background

The Trafalgar Dundas Development consists of a two tower residential building with 5 townhouse units and 693 apartment units on Trafalgar Road, north of Dundas Street East in the Town of Oakville. The proposed development is shown below on **Figure 1**. At the request of the Region and for the analysis of the watermain being constructed from Dundas Street East to Wheat Boom Drive, estimated populations for the possible future residential block to the south plus Blocks 7 and 8 were also included.

Figure 1 - Proposed Trafalgar Dundas Development

Section 2 – WATERMAIN DESIGN CRITERIA

The design criteria utilized to estimate the water demands for the hydraulic water model follows general industry standards and is calculated using the design criteria and guidelines outlined in the Region of Halton's 2019 Water and Wastewater

Linear Design Manual, the Ministry of the Environment, Conservation and Parks (MECP) Watermain Design Criteria, the Fire Underwriters Survey and as provided by Urbantech Consulting.

The following sections summarize the specific design criteria used to carry out the hydraulic watermain assessment for this development.

2.1 Equivalent Population Densities & Water Design Factors

To calculate the equivalent population and water design factors for this development MES used population densities provided by Urbantech Consulting and water demand criteria as noted in the *"Region of Halton Water and Wastewater Linear Design Manual, October 2019"*. **Table 1** summarizes the population densities and **Table 2** summarizes the average daily demand and peaking factors used for this analysis.

Table 1 – Equivalent Population Density

Type of Development	Equivalent Population (Persons/Ha)	Equivalent Population (Persons/Unit)
Townhouse	135	2.7
Apartment	285	2.7

Source: Urbantech Consulting

Table 2 - Water Design Factors

Type of Development	Average Daily Demand (m^3 per capita)	Maximum Daily Demand Peaking Factor	Peak Hourly Demand Peaking Factor
Residential	0.275	2.25	4.00
Industrial	0.275	2.25	2.25
Commercial	0.275	2.25	2.25
Community Services	0.275	2.25	2.25

Source: Region of Halton Water and Wastewater Linear Design Manual, October 2019

Section 3 –FLOW DEMANDS

Utilizing the equivalent population data from **Table 1** and the corresponding Average Day, Maximum Day and Peak Hour data from **Table 2** the water demands for this development were calculated.

3.1 Equivalent Population Flow Demands

The calculated demands for the development are summarized in **Table 3**. For additional details on the development water demands and assigned demand nodes used in the water model see **Appendix A**.

Table 3 – Water Demand for Trafalgar Dundas Development & External Blocks

	Average Day Demand (L/S)	Maximum Day Demand (L/S)	Peak Hour Demand (L/S)
Trafalgar Dundas	6.00	13.50	23.99
Block to South	4.58	10.31	18.33
Block 7	3.56	8.02	14.26
Block 8	4.52	10.17	18.08
Total	18.67	42.00	74.66

3.2 Fire Flow Demands

The fire demands for this development were calculated using the Fire Underwriters Survey ("FUS") formula outlined in the *'Water Supply For Public Fire Protection Guideline',* dated 1999. For the future residential block and Blocks 7 & 8, as those flows need to be calculated by others when the design information is known, the higher commercial fire flow from the Region's Fire Flow Certification was utilized as the default fire flow until detailed design information is available. Once the building designs/configurations are known for the proposed development the fire flows for each unit/building must be confirmed using the FUS criteria to determine the actual fire flow required. The fire flows and domestic demands for the external blocks, Blocks 7 & 8 and the future residential block to the south, must be confirmed during the detailed design stage by the engineer for that site. The fire flows used are shown in **Table 4**.

Table 4 - Fire Flow Requirements

Type of Development	Fire Flow (L/s)
Two Tower 30 Storey Buildings	133
Future Residential Block, Blocks 7 & 8	273

Source: Fire Underwriters Survey, 1999, Halton Region Fire Flow Certification Letter

As noted, the fire flow for the proposed building in **Table 4** above was calculated using the FUS formula and are based on estimated GFA the building. **Table 5** below summarizes the criteria utilized to develop the fire flow anticipated as well as the assumptions made.

Table 5 – FUS Criteria/Assumptions

	Two Tower 30 Sty Building
Type of Construction	Fire Resistive
Occupancy Type	Limited Combustible
Fire Protection (Sprinkler/Firewalls)	Sprinklers
Area Considered	Area Considered: Area Considered 12,882.2 m^2 Total GFA 52,033 m^2

Note: For Additional Information on FUS Criteria Refer to Water Supply for Public Protection Guide, Fire Underwriters Survey, 1999

3.2 External Demands

The Region of Halton InfoWater models that were provided by the Region to MES included water demands for existing and known future developments within the Region.

Section 4 – OTHER SYSTEM REQUIREMENTS

4.1 System Pressure Requirements

In addition to meeting the various flow requirements, the system must also satisfy minimum and maximum pressure requirements as outlined by the Region of Halton. The Region's pressure requirements are outlined in the Water and Wastewater Linear Design Manual and stipulate the following:

1. The water system shall be designed to maintain as close as possible to a maximum working pressure of 690 kPa (100 psi) as a best management practice.
2. The minimum system pressure shall not be less than 140 kPa (20 psi) at any point in the water system under fire flow conditions.

3. Under normal operating conditions, the water system shall have a target minimum static pressure of 345 kPa (50 psi). Under no operating conditions shall the static pressure within a distribution main fall below 275 kPa (40 psi).
4. The normal method of reduction of pressures to comply with the Ontario Building Code (reduction of pressures to 550 kPa, 80 psi) is by pressure reducing valves to be installed on individual services.

4.2 Watermain Sizing

The Region of Halton also stipulates minimum pipe sizes and requires that all watermains are adequately sized to maintain demand flows at the required pressures without causing excessive energy loss or result in water quality decay. The watermain system must therefore be designed to accommodate the greater of the following:

- Maximum day plus fire demand
- Peak hour demand

The minimum pipe size for commercial and industrial areas shall be 300 mm diameter and for residential areas the minimum pipe size shall be 150 mm diameter. For distribution systems providing fire protection the minimum pipe size shall be 150 mm diameter in accordance with Ministry of the Environment, Conservation and Parks (MECP) and NFPA requirements.

To provide appropriate fire protection, reliable supply and pressures the water distribution system should be looped wherever possible to improve supply security and water quality.

4.3 Watermain C-Factor

In designing and modeling of the pipes the Coefficient of Roughness (C-Factor) factors from the Region's design manual were utilized. The Coefficient of Roughness assigned to each pipe size in summarized in **Table 5** below.

Table 6 - Hazen-Williams Coefficient of Roughness (C-Factors)

Size of Pipe (Diameter in mm)	Pipe Material	Coefficient of Roughness (C)
50 mm	Copper	120
100 mm to 400 mm	PVC/HDPE	130
Greater Than 400 mm	Concrete Lined	110

Source: Region of Halton Water and Wastewater Linear Design Manual, October 2019

Section 5 – ANALYSIS & MODELING RESULTS

To conduct the hydraulic water analysis for the proposed development the water demands were estimated by MES using the design criteria previously discussed and incorporated the demands into the existing Region of Halton InfoWater model (June 16, 2020). The following sections discusses the model setup and results.

5.1 Model Setup

The Trafalgar Dundas development is located within pressure zone O4. The O4 service elevations range from 165.6 m to 198.7m. Elevations within the development and external areas range from 168.5 m to 173.0 m.

The Region is planning on altering the pressure districts in the northern portion of Oakville. Some areas will go directly to the ultimate future zone, but others will have an interim zone condition. The future zone names are the top water level of the zone. Trafalgar Dundas will initially be supplied by zone O4 which has a top water level of 236.0 m. In the near future, the area will be supplied by zone 236 (top water level of 236.0 m) and ultimately by zone 223.5 (top water level of 223.5 m).

The hydraulic grade line will be 12.5 m lower ultimately. The is equal to pressures being lower by approximately 18 psi (122 kPa) during some operating conditions. The model provided does not include interim condition scenarios, but both existing and interim zone supply have the same top water level and thus similar pressures.

The proposed watermain on Trafagar Road will run from Dundas Street East to Wheat Boom Drive. The watermain on Wheat Boom Drive, to the east, was considered to be constructed along with the watermain on Postridge Drive, back to Dundas Street East to complete the loop. Under 2031 conditions, the Wheat Boom watermain was assumed to be connected to the existing subdivision to the west.

New nodes were created to add the flow demands and service elevation information from the development to the Region of Halton's existing Infowater hydraulic water distribution model system and the system analysis was carried out. Friction factor for the pipes were assigned according to **Table 6**.

5.2 Watermain Sizing and System Pressures

The analysis was conducted under 2021 and 2031 servicing conditions for Average Day, Maximum Day, Peak Hour and Maximum day plus Fire demands to size the watermains and meet the pressure requirements. The pipe size and layout are shown in **Appendix B**.

This model shows the pressures will be above the OBC requirement of 80 psi (550 kPa) under the existing zone O4 and interim zone 236 conditions. Under future conditions, pressures, as noted in Section 5.1, will be lower as the top water level of the zone is lower by 12.5 m.

Pressures will be lower but still within the Region's pressure criteria. The buildings domestic and fire systems must consider the initial high pressures and the future lower pressures in the design.

The watermains were sized between 150 mm to 300 mm according to the results of average day, maximum day, maximum day plus fire, and peak hour scenarios.

Modeled service pressures for the development are summarized in **Table 7**. All pressures lie within the required operating range under average day, maximum day, maximum day plus fire flow and peak hour demands.

Detailed pipe and node tables for the various scenarios modelled are attached to this report in **Appendix B**.

Table 7 - Modeled Service Pressures

Scenario	Average Day	Maximum Day	Peak Hour	Max. Day + Fire
2021	85.6 to 92.0 psi (590 to 634 kPa)	85.6 to 92.0 psi (590 to 634kPa)	84.5 to 90.9 psi (583 to 627 kPa)	614 to 926 L/s @ 20 psi
2031	71.1 to 77.5 psi (490 to 534 kPa)	68.6 to 75.0 psi (473 to 517 kPa)	65.3 to 71.6. psi (450 to 493 kPa)	554 to 957 L/s @ 20 psi

Section 6 – CONCLUSIONS

The results are summarized below.

- The service pressures from the watermain are expected to range between 84.5 psi to 92.0 psi (583 kPa to 634 kPa) serviced by Zone O4 and between 65.3 psi to 77.5 psi (450 kPa to 534 kPa) when supplied by Zone 223.5.
- Pressures will exceed the OBC pressure criteria of 80 psi (550 kPa) under existing and interim conditions. The high pressures must be considered for the building water supply.
- The pressures will be lower under future zone supply conditions. The change of pressure must be considered in the design of the building domestic and fire supply.
- The available fire flow meets or exceeds the modeled fire flow demands at the minimum pressure of 140 kPa based on the proposed watermain configuration and assumptions made within this report.

- A hydrant test must be completed after the watermain connection is completed and before the building construction.
- The conclusions and findings of this report are applicable to 3064 Trafalgar Road only. The information included for all external blocks, Blocks 7 and 8 and the Future Residential Block south of 3064 Trafalgar Road, were included for modeling purposes only at the request of the Region of Halton. Separate individual water analysis reports must be completed for all three (3) future external blocks at the detailed design stage to confirm lateral sizes required and to confirm flows and pressures available to the site(s).
- Once the building designs/configurations are known for the proposed development the FUS fire flows summarized in Table 4 must be reviewed and confirmed by the designer(s), architect, and mechanical consultant as appropriate to ensure the fire flows used within this report are still valid prior to implementation and construction. It may also be necessary for the building construction or fire protection system to be designed to suit the available flows.
- Confirmation and/or changes to the criteria should also be provided to and reviewed with MES prior to the finalization of the detailed design drawings and construction of the watermain system. Final design parameters are to be provided to MES prior to construction for further review to confirm that the actual (final) site conditions and building design(s) reflect those modeled by MES within this report.
- This report, including all modeling assumptions used, is to be submitted to and reviewed by the water operating authority (municipality) to confirm that the modeling parameters used are acceptable to the operating authority and/or confirm if modified domestic or fire flow requirements are required or should be implemented for this particular development

Appendix A

Demands

Equivalent Population by Unit

(2017 Development Charges Update, December 2016)

Type of Development	Equivalent Population Density *(Person/Unit)*
Single Family or Semi-Detached	3.5
Townhouse	2.7
Apartment	2.7

Urbantech

Equivalent Population by Area

Type of Development	Equivalent Population Density *(Person/Hectare)*	Average Day Demands *(m3/ha/day)*
Single Family	55	15.13
Semi-detached duplex and 4-plex	100	27.50
Townhouse, Maisonette (<6 stories)	135	37.13
Apartments (>6 stories)	285	78.38
Light Commercial Areas	90	24.75
Community Services	40	11.00
Light Industrial Areas	125	34.38
Hospitals (persons/bed)	4	

Water Design Factors

Average Daily Demand (m3/capita)	0.275
Maximum Daily Demand P.F.	2.25
Maximum Hourly Demand P.F.	
Residential	*4*
I/C/I	*2.25*

Cofficient of Roughness

Size of Pipe (mm Dia.)	Material	Coefficient of Roughness (C)
50	Copper	120
100-400	PVC/HDPE	130
Over 400	Concrete Lined	110

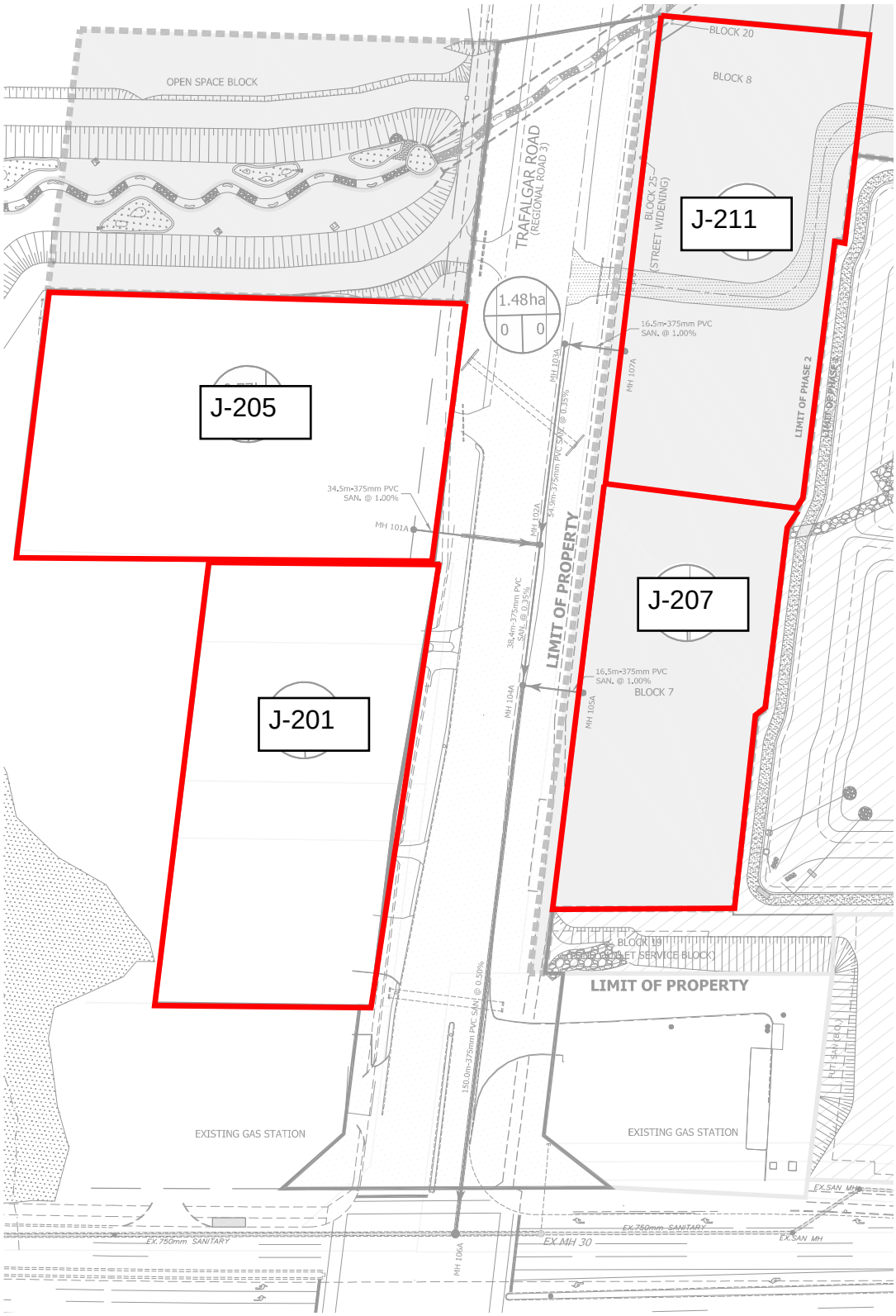
Minimum Pipe Size

Type of Development	Size of Pipe (mm Dia.)
Residential	150
Commercial/Industrial/Community	300

Working Pressures

Parameter	Pressure
Normal Condition	
Minimum Pressure	275 kPa (40 psi)
Target Pressure	350 kPa (50 psi)
Maximum (Building Code)	550 kPa (80 psi)
Maximum (Halton)	690 kPa (100 psi)
Fire Flow Conditions	
Minimum Pressure	140 kPa (20 psi)

Demand Layout



Water Demand
3064 Trafalgar, Oakville On
June 30, 2021

Node	Building	Elevation	Type of Development							Equivalent Population		Demands			Fire Flow Demands
			Single Family	Semi-Detached	Townhouse	Apartment	Commercial	Community	Industrial	Total Population	Total Population	ADD	MDD	PHD	
		(m)	*(units)*	*(units)*	*(units)*	(units)	*(ha)*	*(ha)*	*(ha)*	*(Residential)*	*(ICI)*	*(L/s)*	*(L/s)*	*(L/s)*	*(L/s)*
J-200		*170.00*								0	0	0.00	0.00	0.00	
J-201*	Hydrant	*168.50*								1440	0	4.58	10.31	18.33	273
J-202		*168.90*								0	0	0.00	0.00	0.00	
J-203		*169.80*								0	0	0.00	0.00	0.00	
J-204	Site Fire	*169.80*								0	0	0.00	0.00	0.00	133
J-205	Site Domestic	*169.80*			5	693				1884	0	6.00	13.50	23.99	
J-206		*169.80*								0	0	0.00	0.00	0.00	
J-207*	Domestic - Block 7	*169.80*								1120	0	3.56	8.02	14.26	
J-208		*169.80*								0	0	0.00	0.00	0.00	
J-209	Fire - Block 7	*169.80*								0	0	0.00	0.00	0.00	273
J-210		*172.00*								0	0	0.00	0.00	0.00	
J-211*	Domestic - Block 8	*172.00*								1420	0	4.52	10.17	18.08	
J-212		*172.00*								0	0	0.00	0.00	0.00	
J-213	Fire - Block 8	*172.00*								0	0	0.00	0.00	0.00	273
J-214	Hydrant	*172.50*								0	0	0.00	0.00	0.00	273
J-215		*173.00*								0	0	0.00	0.00	0.00	
Site Total			**0**	**0**	**5**	**693**	**0.000**	**0.000**	**0**	**1884**	**0**	**6.00**	**13.50**	**23.99**	
External Total										**3980**	**0**	**12.67**	**28.50**	**50.67**	

*population from sanitary design estimates

Calculations are based on "Water Supply for Public Fire Protection Guide" by Fire Underwriters Survey

Municipal Engineering Solutions

FUS CALCULATION

Project: 3064 Trafalgar
Project Number: 17003-43
Project Location: Halton
Date: June 23, 2021

Building Type/Block # **2-30 Storey Towers**
Firewalls/Sprinkler: **Sprinkler**
Largest Area within Firewalls

1.0 FUS Formula

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

where: F = required fire flow in litres per minute;
C = the Coefficient related to the type of construction; and
A = the total floor area in square metres (including all storeys but excluding basements at least 50% below grade)[a]

NBC Occupancy	Group C	
Type of Construction[b]	fire-resistive construction	
Foot Print Area	2331.0	sq metres
Storeys	30	
C =	0.6	
A =	12882.2	
F =	**15000**	**L/min**

2.0 Occupancy Adjustment

Type of Occupancy[c]	limited combustible	
Hazard Allowance	-0.15	
	-2250	L/min
Adjusted Fire Flow	**12750**	**L/min**

3.0 Sprinkler Adjustment

		Credit	Total
NFPA 13 sprinkler standard	YES	30%	50%
Standard Water Supply	YES	10%	
Fully Supervised system	YES	10%	

Sprinkler Credit **6375 L/min**

4.0 Exposure Adjustment

		Percent	Total*
North Side			15%
Distance to Building (m)	over 45	0%	
Length (ft) by height in storeys	over 120		
South Side			
Distance to Building (m)	10.1 to 20	15%	
Length (ft) by height in storeys	over 120		
East Side			
Distance to Building (m)	30.1 to 45	0%	
Length (ft) by height in storeys	over 120		
West Side			
Distance to Building (m)	30.1 to 45	0%	
Length (ft) by height in storeys	over 120		

*max 75%

Exposures Surcharge **1910 L/min**

Total Required Fire Flow (rounded)	**8000**	**L/min**
	133	**L/sec**

a) For fire-resistive buildings, consider the two largest adjoining floors plus 50% of each of any floors immediately above them up to 8, when vertical openings are inadequately protected. If the vertical openings and and exterior vertical communications are properly protected, consider only the area of the largest floor plus 25% of each of the two immediately adjoining floors

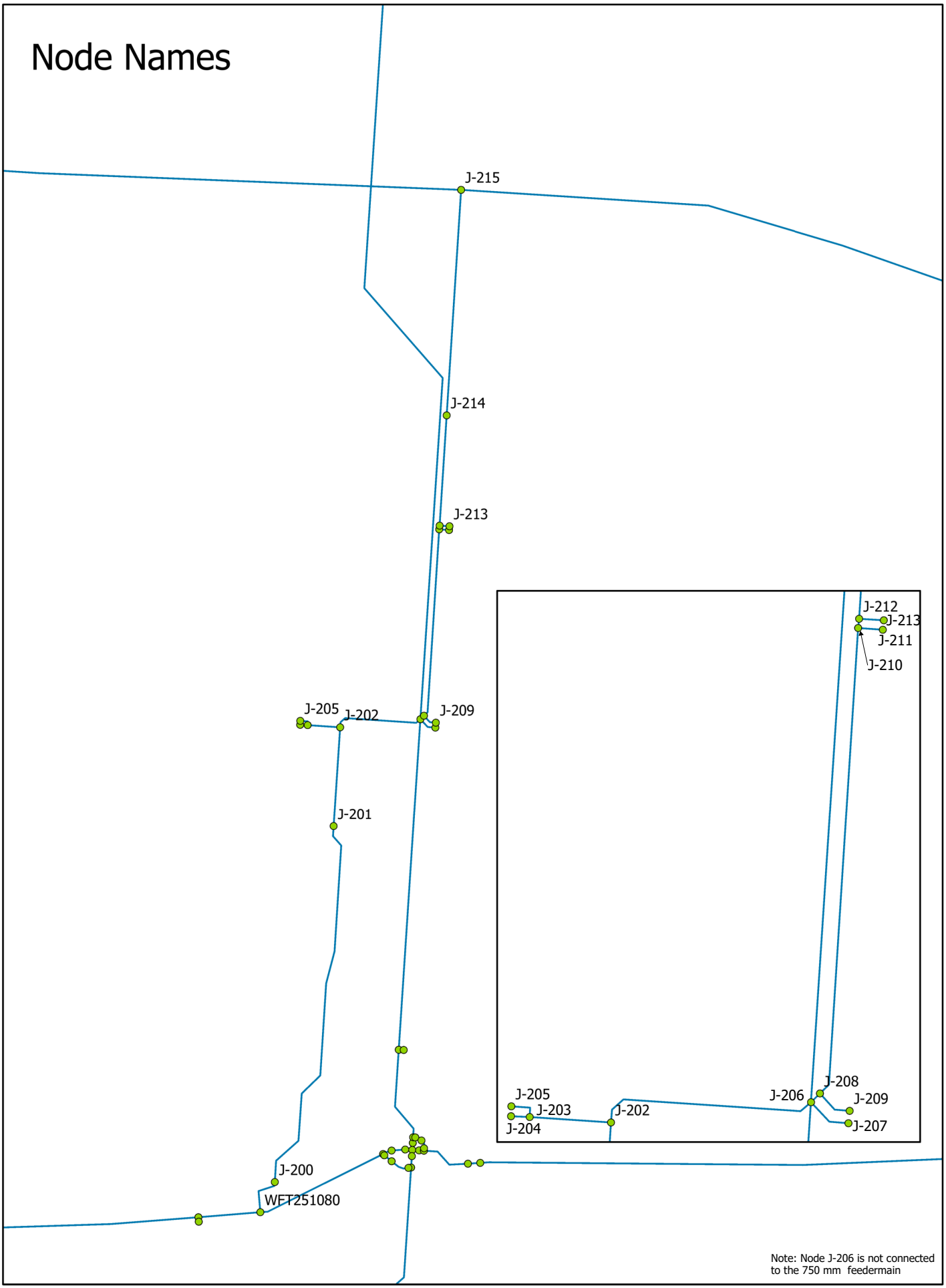
b) Wood frame=1.5, Ordinary=1.0, Non-combustible=0.8, Fire-resistive=0.6

c) Non-combustible=-25%, Limited combusitble=-15%, Combustible=0, Free burning=+15%, Rapid burning=+25%

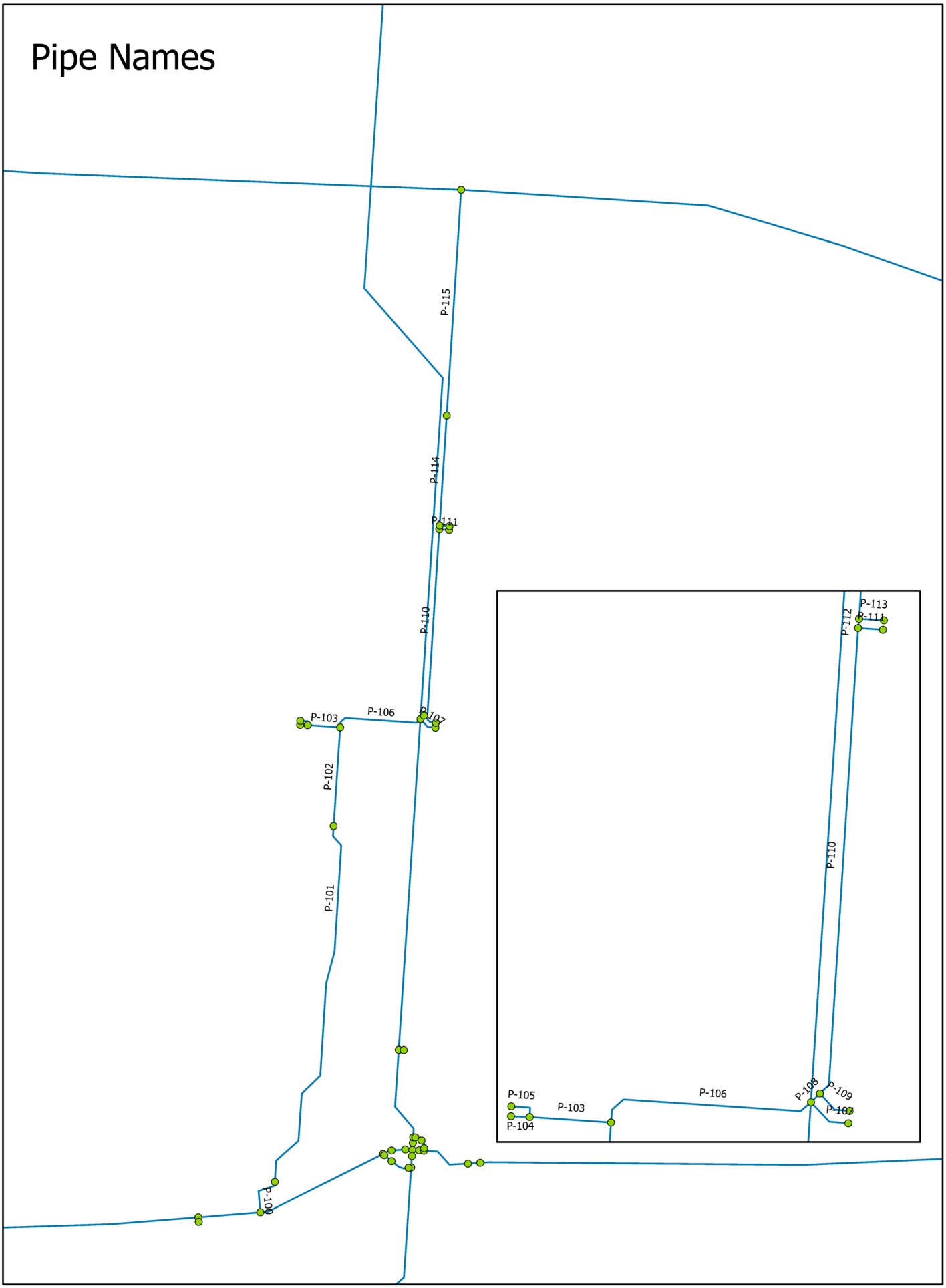
Appendix B

Model Results

Node Names


J-215
J-214
J-213
J-205
J-202
J-209
J-201
J-200
WET251080
J-212
J-213
J-211
J-210
J-205
J-203
J-204
J-202
J-206
J-208
J-209
J-207
Note: Node J-206 is not connected to the 750 mm feedermain

Pipe Names


P-115
P-114
P-111
P-110
P-103
P-106
P-102
P-101
P-100
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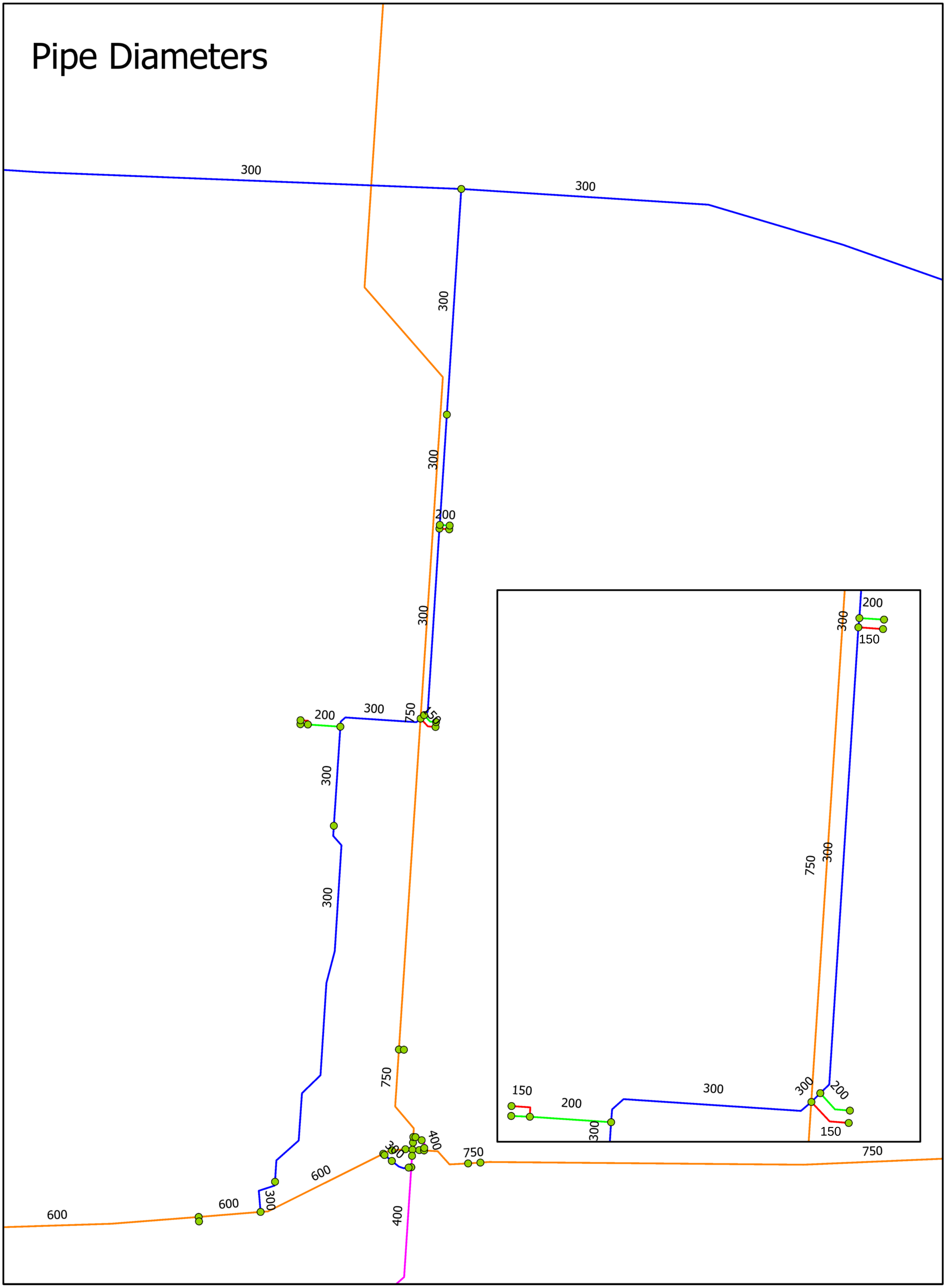
P-110
P-105
P-103
P-106
P-104
P-108
P-109
P-107

Pipe Diameters



2021 Conditions
3064 Trafalgar Developments, Oakville On
June 30, 2021

Municipal Engineering Solutions

Average Day

Node Table

ID	Demand	Elevation	Head	Pressure
	(L/s)	*(m)*	*(m)*	*(psi)*
J-200	0.00	170.00	233.19	89.84
J-201	4.58	168.50	233.17	91.94
J-202	0.00	168.90	233.17	91.37
J-203	0.00	169.80	233.17	90.08
J-204	0.00	169.80	233.17	90.08
J-205	6.00	169.80	233.16	90.08
J-206	0.00	169.80	233.17	90.09
J-207	3.56	169.80	233.17	90.09
J-208	0.00	169.80	233.17	90.09
J-209	0.00	169.80	233.17	90.09
J-210	0.00	172.00	233.17	86.96
J-211	4.52	172.00	233.17	86.96
J-212	0.00	172.00	233.17	86.96
J-213	0.00	172.00	233.17	86.96
J-214	0.00	172.50	233.17	86.25
J-215	0.00	173.00	233.18	85.55
WFT251080	0.02	170.00	233.20	89.84
MIN		**168.50**		**85.55**
MAX		**173.00**		**91.94**

Pipe Table

ID	From Node	To Node	Length	Diameter	Roughness	Flow	Velocity
			(m)	*(mm)*	*(C)*	*(ML/d)*	*(m/s)*
P-100	WFT251080	J-200	16.51	300	130	1.06	0.17
P-101	J-200	J-201	149.86	300	130	1.06	0.17
P-102	J-201	J-202	39.44	300	130	0.66	0.11
P-103	J-202	J-203	12.90	200	130	0.52	0.19
P-104	J-203	J-204	2.96	200	130	0.00	0.00
P-105	J-203	J-205	4.46	150	130	0.52	0.34
P-106	J-202	J-206	34.85	300	130	0.14	0.02
P-107	J-206	J-207	7.26	150	130	0.31	0.20
P-108	J-206	J-208	1.98	300	130	-0.16	0.03
P-109	J-208	J-209	5.83	200	130	0.00	0.00
P-110	J-208	J-210	74.54	300	130	-0.16	0.03
P-111	J-210	J-211	3.91	150	130	0.39	0.26
P-112	J-210	J-212	1.47	300	130	-0.56	0.09
P-113	J-212	J-213	3.91	200	130	0.00	0.00
P-114	J-212	J-214	43.75	300	130	-0.56	0.09
P-115	J-214	J-215	89.49	300	130	-0.56	0.09

Municipal Engineering Solutions

Maximum Day

Node Table

ID	Demand	Elevation	Head	Pressure
	(L/s)	*(m)*	*(m)*	*(psi)*
J-200	0.00	170.00	233.29	89.97
J-201	10.31	168.50	233.20	91.98
J-202	0.00	168.90	233.20	91.40
J-203	0.00	169.80	233.18	90.10
J-204	0.00	169.80	233.18	90.10
J-205	13.50	169.80	233.16	90.07
J-206	0.00	169.80	233.20	90.12
J-207	8.02	169.80	233.18	90.10
J-208	0.00	169.80	233.20	90.12
J-209	0.00	169.80	233.20	90.12
J-210	0.00	172.00	233.20	87.00
J-211	10.17	172.00	233.19	86.98
J-212	0.00	172.00	233.20	87.00
J-213	0.00	172.00	233.20	87.00
J-214	0.00	172.50	233.21	86.30
J-215	0.00	173.00	233.22	85.61
WFT251080	0.04	170.00	233.30	89.99
MIN		**168.50**		**85.61**
MAX		**173.00**		**91.98**

Pipe Table

ID	From Node	To Node	Length	Diameter	Roughness	Flow	Velocity
			(m)	*(mm)*	*(C)*	*(ML/d)*	*(m/s)*
P-100	WFT251080	J-200	16.51	300	130	2.32	0.38
P-101	J-200	J-201	149.86	300	130	2.32	0.38
P-102	J-201	J-202	39.44	300	130	1.43	0.23
P-103	J-202	J-203	12.90	200	130	1.17	0.43
P-104	J-203	J-204	2.96	200	130	0.00	0.00
P-105	J-203	J-205	4.46	150	130	1.17	0.76
P-106	J-202	J-206	34.85	300	130	0.26	0.04
P-107	J-206	J-207	7.26	150	130	0.69	0.45
P-108	J-206	J-208	1.98	300	130	-0.43	0.07
P-109	J-208	J-209	5.83	200	130	0.00	0.00
P-110	J-208	J-210	74.54	300	130	-0.43	0.07
P-111	J-210	J-211	3.91	150	130	0.88	0.58
P-112	J-210	J-212	1.47	300	130	-1.31	0.21
P-113	J-212	J-213	3.91	200	130	0.00	0.00
P-114	J-212	J-214	43.75	300	130	-1.31	0.21
P-115	J-214	J-215	89.49	300	130	-1.31	0.21

Municipal Engineering Solutions

Peak Hour

Node Table

ID	Demand	Elevation	Head	Pressure
	(L/s)	*(m)*	*(m)*	*(psi)*
J-200	0.00	170.00	232.70	89.14
J-201	18.33	168.50	232.43	90.88
J-202	0.00	168.90	232.39	90.26
J-203	0.00	169.80	232.35	88.92
J-204	0.00	169.80	232.35	88.92
J-205	23.99	169.80	232.29	88.84
J-206	0.00	169.80	232.39	88.98
J-207	14.26	169.80	232.35	88.93
J-208	0.00	169.80	232.39	88.98
J-209	0.00	169.80	232.39	88.98
J-210	0.00	172.00	232.39	85.86
J-211	18.08	172.00	232.36	85.81
J-212	0.00	172.00	232.39	85.86
J-213	0.00	172.00	232.39	85.86
J-214	0.00	172.50	232.41	85.17
J-215	0.00	173.00	232.45	84.52
WFT251080	0.06	170.00	232.73	89.18
MIN		**168.50**		**84.52**
MAX		**173.00**		**90.88**

Pipe Table

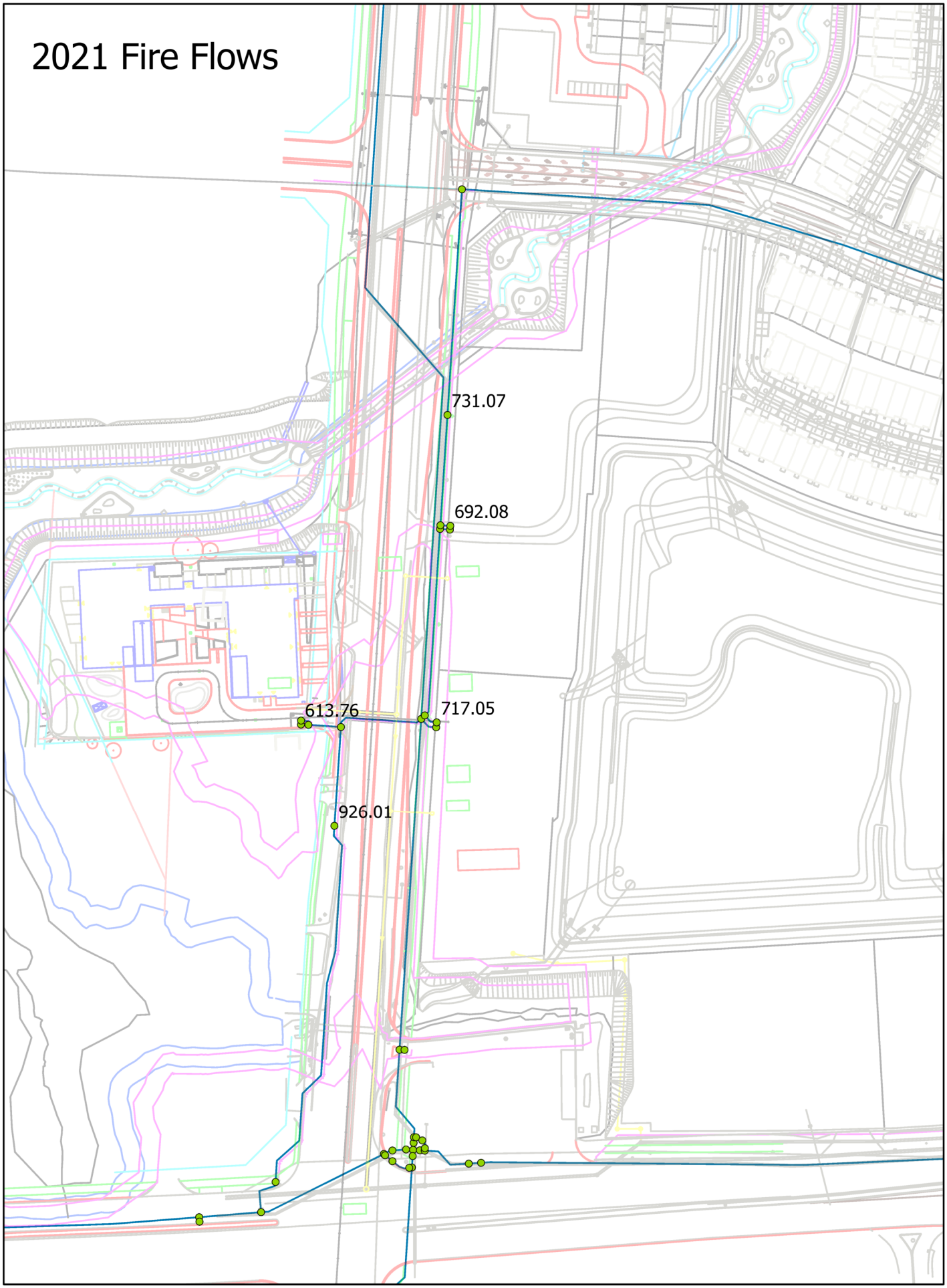
ID	From Node	To Node	Length	Diameter	Roughness	Flow	Velocity
			(m)	*(mm)*	*(C)*	*(ML/d)*	*(m/s)*
P-100	WFT251080	J-200	16.51	300	130	4.40	0.72
P-101	J-200	J-201	149.86	300	130	4.40	0.72
P-102	J-201	J-202	39.44	300	130	2.81	0.46
P-103	J-202	J-203	12.90	200	130	2.07	0.76
P-104	J-203	J-204	2.96	200	130	0.00	0.00
P-105	J-203	J-205	4.46	150	130	2.07	1.36
P-106	J-202	J-206	34.85	300	130	0.74	0.12
P-107	J-206	J-207	7.26	150	130	1.23	0.81
P-108	J-206	J-208	1.98	300	130	-0.49	0.08
P-109	J-208	J-209	5.83	200	130	0.00	0.00
P-110	J-208	J-210	74.54	300	130	-0.49	0.08
P-111	J-210	J-211	3.91	150	130	1.56	1.02
P-112	J-210	J-212	1.47	300	130	-2.05	0.34
P-113	J-212	J-213	3.91	200	130	0.00	0.00
P-114	J-212	J-214	43.75	300	130	-2.05	0.34
P-115	J-214	J-215	89.49	300	130	-2.05	0.34

2021 Conditions
3064 Trafalgar Developments, Oakville On
June 30, 2021

Municipal Engineering Solutions

Fire Flow Table			
ID	Total Demand *(L/s)*	Available Flow *(L/s)*	**Fire Flow Met?**
J-201	283.31	926.01	**TRUE**
J-204	133.00	613.76	**TRUE**
J-209	273.00	717.05	**TRUE**
J-213	273.00	692.08	**TRUE**
J-214	273.00	731.07	**TRUE**

MIN	**613.76**
MAX	**926.01**


2021 Fire Flows
731.07
692.08
613.76
717.05
926.01

2031 Conditions
3064 Trafalgar Developments, Oakville On
June 30, 2021

Municipal Engineering Solutions

Average Day

Node Table

ID	Demand	Elevation	Head	Pressure
	(L/s)	*(m)*	*(m)*	*(psi)*
J-200	0.00	170.00	223.00	75.34
J-201	4.58	168.50	222.98	77.45
J-202	0.00	168.90	222.98	76.88
J-203	0.00	169.80	222.98	75.60
J-204	0.00	169.80	222.98	75.60
J-205	6.00	169.80	222.97	75.59
J-206	0.00	169.80	222.98	75.60
J-207	3.56	169.80	222.98	75.60
J-208	0.00	169.80	222.98	75.60
J-209	0.00	169.80	222.98	75.60
J-210	0.00	172.00	222.98	72.48
J-211	4.52	172.00	222.98	72.47
J-212	0.00	172.00	222.98	72.48
J-213	0.00	172.00	222.98	72.48
J-214	0.00	172.50	222.98	71.77
J-215	0.00	173.00	222.99	71.06
WFT251080	0.03	170.00	223.00	75.35

MIN		**168.50**		**71.06**
MAX		**173.00**		**77.45**

Pipe Table

ID	From Node	To Node	Length	Diameter	Roughness	Flow	Velocity
			(m)	*(mm)*	*(C)*	*(ML/d)*	*(m/s)*
P-100	WFT251080	J-200	16.51	300	130	0.96	0.16
P-101	J-200	J-201	149.86	300	130	0.96	0.16
P-102	J-201	J-202	39.44	300	130	0.57	0.09
P-103	J-202	J-203	12.90	200	130	0.52	0.19
P-104	J-203	J-204	2.96	200	130	0.00	0.00
P-105	J-203	J-205	4.46	150	130	0.52	0.34
P-106	J-202	J-206	34.85	300	130	0.05	0.01
P-107	J-206	J-207	7.26	150	130	0.31	0.20
P-108	J-206	J-208	1.98	300	130	-0.26	0.04
P-109	J-208	J-209	5.83	200	130	0.00	0.00
P-110	J-208	J-210	74.54	300	130	-0.26	0.04
P-111	J-210	J-211	3.91	150	130	0.39	0.26
P-112	J-210	J-212	1.47	300	130	-0.65	0.11
P-113	J-212	J-213	3.91	200	130	0.00	0.00
P-114	J-212	J-214	43.75	300	130	-0.65	0.11
P-115	J-214	J-215	89.49	300	130	-0.65	0.11

Municipal Engineering Solutions

Maximum Day

Node Table

ID	Demand	Elevatio	Head	Pressure
	(L/s)	*(m)*	*(m)*	*(psi)*
J-200	0.00	170.00	221.36	73.01
J-201	10.31	168.50	221.27	75.02
J-202	0.00	168.90	221.26	74.44
J-203	0.00	169.80	221.25	73.14
J-204	0.00	169.80	221.25	73.14
J-205	13.50	169.80	221.23	73.11
J-206	0.00	169.80	221.26	73.16
J-207	8.02	169.80	221.25	73.14
J-208	0.00	169.80	221.26	73.16
J-209	0.00	169.80	221.26	73.16
J-210	0.00	172.00	221.26	70.03
J-211	10.17	172.00	221.25	70.02
J-212	0.00	172.00	221.26	70.03
J-213	0.00	172.00	221.26	70.03
J-214	0.00	172.50	221.27	69.34
J-215	0.00	173.00	221.29	68.65
WFT251080	0.05	170.00	221.37	73.03

MIN		**168.50**		**68.65**
MAX		**173.00**		**75.02**

Pipe Table

ID	From Node	To Node	Length	Diameter	Roughness	Flow	Velocity
			(m)	*(mm)*	*(C)*	*(ML/d)*	*(m/s)*
P-100	WFT251080	J-200	16.51	300	130	2.33	0.38
P-101	J-200	J-201	149.86	300	130	2.33	0.38
P-102	J-201	J-202	39.44	300	130	1.44	0.24
P-103	J-202	J-203	12.90	200	130	1.17	0.43
P-104	J-203	J-204	2.96	200	130	0.00	0.00
P-105	J-203	J-205	4.46	150	130	1.17	0.76
P-106	J-202	J-206	34.85	300	130	0.27	0.04
P-107	J-206	J-207	7.26	150	130	0.69	0.45
P-108	J-206	J-208	1.98	300	130	-0.42	0.07
P-109	J-208	J-209	5.83	200	130	0.00	0.00
P-110	J-208	J-210	74.54	300	130	-0.42	0.07
P-111	J-210	J-211	3.91	150	130	0.88	0.58
P-112	J-210	J-212	1.47	300	130	-1.30	0.21
P-113	J-212	J-213	3.91	200	130	0.00	0.00
P-114	J-212	J-214	43.75	300	130	-1.30	0.21
P-115	J-214	J-215	89.49	300	130	-1.30	0.21

Municipal Engineering Solutions

Peak Hour

Node Table

ID	Demand	Elevation	Head	Pressure
	(L/s)	*(m)*	*(m)*	*(psi)*
J-200	0.00	170.00	219.07	69.76
J-201	18.33	168.50	218.84	71.56
J-202	0.00	168.90	218.81	70.96
J-203	0.00	169.80	218.77	69.62
J-204	0.00	169.80	218.77	69.62
J-205	23.99	169.80	218.71	69.53
J-206	0.00	169.80	218.81	69.68
J-207	14.26	169.80	218.78	69.62
J-208	0.00	169.80	218.81	69.68
J-209	0.00	169.80	218.81	69.68
J-210	0.00	172.00	218.82	66.56
J-211	18.08	172.00	218.79	66.52
J-212	0.00	172.00	218.82	66.56
J-213	0.00	172.00	218.82	66.56
J-214	0.00	172.50	218.85	65.89
J-215	0.00	173.00	218.90	65.26
WFT251080	0.08	170.00	219.10	69.80

MIN		**168.50**		**65.26**
MAX		**173.00**		**71.56**

Pipe Table

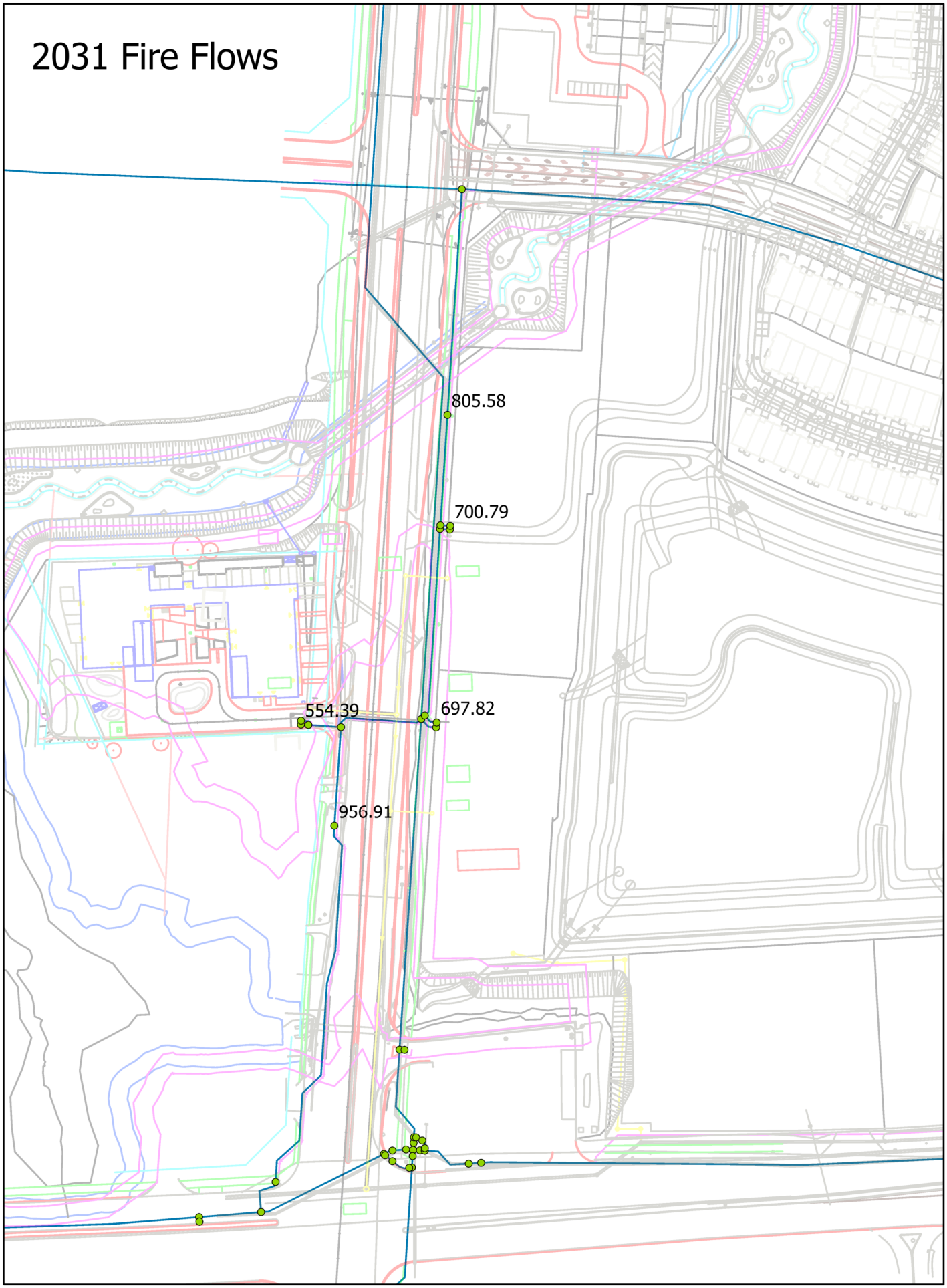
ID	From Node	To Node	Length	Diameter	Roughness	Flow	Velocity
			(m)	*(mm)*	*(C)*	*(ML/d)*	*(m/s)*
P-100	WFT251080	J-200	16.51	300	130	4.02	0.66
P-101	J-200	J-201	149.86	300	130	4.02	0.66
P-102	J-201	J-202	39.44	300	130	2.44	0.40
P-103	J-202	J-203	12.90	200	130	2.07	0.76
P-104	J-203	J-204	2.96	200	130	0.00	0.00
P-105	J-203	J-205	4.46	150	130	2.07	1.36
P-106	J-202	J-206	34.85	300	130	0.36	0.06
P-107	J-206	J-207	7.26	150	130	1.23	0.81
P-108	J-206	J-208	1.98	300	130	-0.87	0.14
P-109	J-208	J-209	5.83	200	130	0.00	0.00
P-110	J-208	J-210	74.54	300	130	-0.87	0.14
P-111	J-210	J-211	3.91	150	130	1.56	1.02
P-112	J-210	J-212	1.47	300	130	-2.43	0.40
P-113	J-212	J-213	3.91	200	130	0.00	0.00
P-114	J-212	J-214	43.75	300	130	-2.43	0.40
P-115	J-214	J-215	89.49	300	130	-2.43	0.40

2031 Conditions
3064 Trafalgar Developments, Oakville On
June 30, 2021

Municipal Engineering Solutions

Fire Flow Table			
ID	Total Demand *(L/s)*	Available Flow *(L/s)*	**Fire Flow Met?**
J-201	283.31	956.91	**TRUE**
J-204	133.00	554.39	**TRUE**
J-209	273.00	697.82	**TRUE**
J-213	273.00	700.79	**TRUE**
J-214	273.00	805.58	**TRUE**

MIN	**554.39**
MAX	**956.91**


2031 Fire Flows
805.58
700.79
554.39
697.82
956.91

URBANTECH®

Memorandum

Dear Mr. MacKenzie,

To:	**Ronald MacKenzie** Development Project Manager Planning Services	**Date:**	May 18, 2023
Cc:	**Zahir Najak**		
From:	Andrew McLennan	**Project #:**	18-575
Re:	**Distrikt Developments – 3064 Trafalgar Road** **(SP.1313.006/01)** **Town of Oakville, Regional Municipality of Halton** **Water Pressure Analysis – Region Zone Realignment**		

Please accept this memorandum pertaining to the water pressure analysis for the 3064 Trafalgar Road development by Distrikt Developments within the Town of Oakville as requested by the Region of Halton in order to determine the impact on the subject development as a result of the future changes to the pressure boundaries.

The proposed 3064 Trafalgar Road development is located within Pressure Zone O4 under the 'Interim Pressure Zones' phase as identified by the Region. This phase reflects the commissioning of the new Zone 4 (Ashgrove) reservoir where a part of Pressure Zone O4 has transferred to Top Water Level of 250m. However, the subject development is located outside of the affected area within this pressure zone and therefore has not been impacted by the interim pressure zone realignment and has remained at TWL of 236.0m. Future adjustment of the existing pressure zone boundaries will be undertaken by the Region of Halton which will place the development within the adjusted Pressure Zone O4 with a TWL of 223.5m.

The main water connection to the condominium building off of the 300mm-diameter watermain on Trafalgar Road at the west end of the subject development was considered in the calculation of static pressures under existing and future conditions. The results of the assessment are provided in Table 1 below.

	Existing/Interim Static Pressure	Future Static Pressure
TWL	236.0	223.5
Elevation (m) at connection	165.8	165.8
Elevation Difference (m)	70.2	57.7
Static Pressure (psi)	99.9	82.1

Table 1: Existing and Future Static Pressures based on Elevation

In both the interim and final pressure conditions, the static water pressure calculated will exceed the maximum pressure of 80 psi permitted by the Ontario Building Code and therefore a pressure reducing valve will be installed in order to attenuate the static pressure to acceptable levels in accordance with the OBC.

We trust that the above information is satisfactory for your review and approval. Should you have any questions or comments please contact the undersigned.

Regards,
Urbantech® Consulting

Andrew McLennan, P.Eng.
Project Manager

Encl.: Water Pressure Location Figures

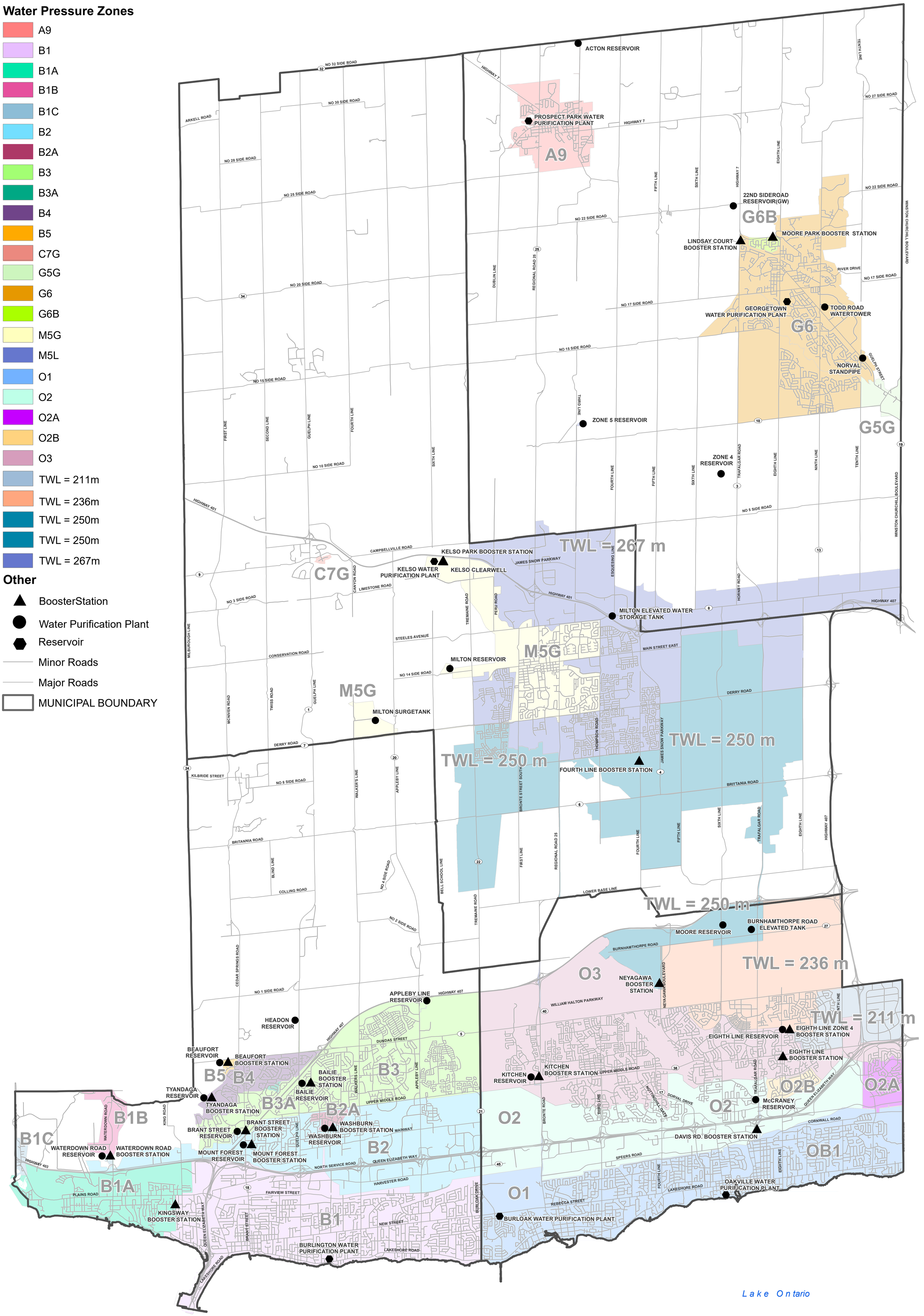
Legend

Water Pressure Zones

- A9
- B1
- B1A
- B1B
- B1C
- B2
- B2A
- B3
- B3A
- B4
- B5
- C7G
- G5G
- G6
- G6B
- M5G
- M5L
- O1
- O2
- O2A
- O2B
- O3
- TWL = 211m
- TWL = 236m
- TWL = 250m
- TWL = 250m
- TWL = 267m

Other

- BoosterStation
- Water Purification Plant
- Reservoir
- Minor Roads
- Major Roads
- MUNICIPAL BOUNDARY



GIS & Information Management
Public Works Department

HALTON REGION

Interim Water Pressure Zones

Note that the pressure zone boundaries displayed in this map are approximate and subject to change.

0 0.75 1.5 3 4.5 6 Km

Public Work, May 2020

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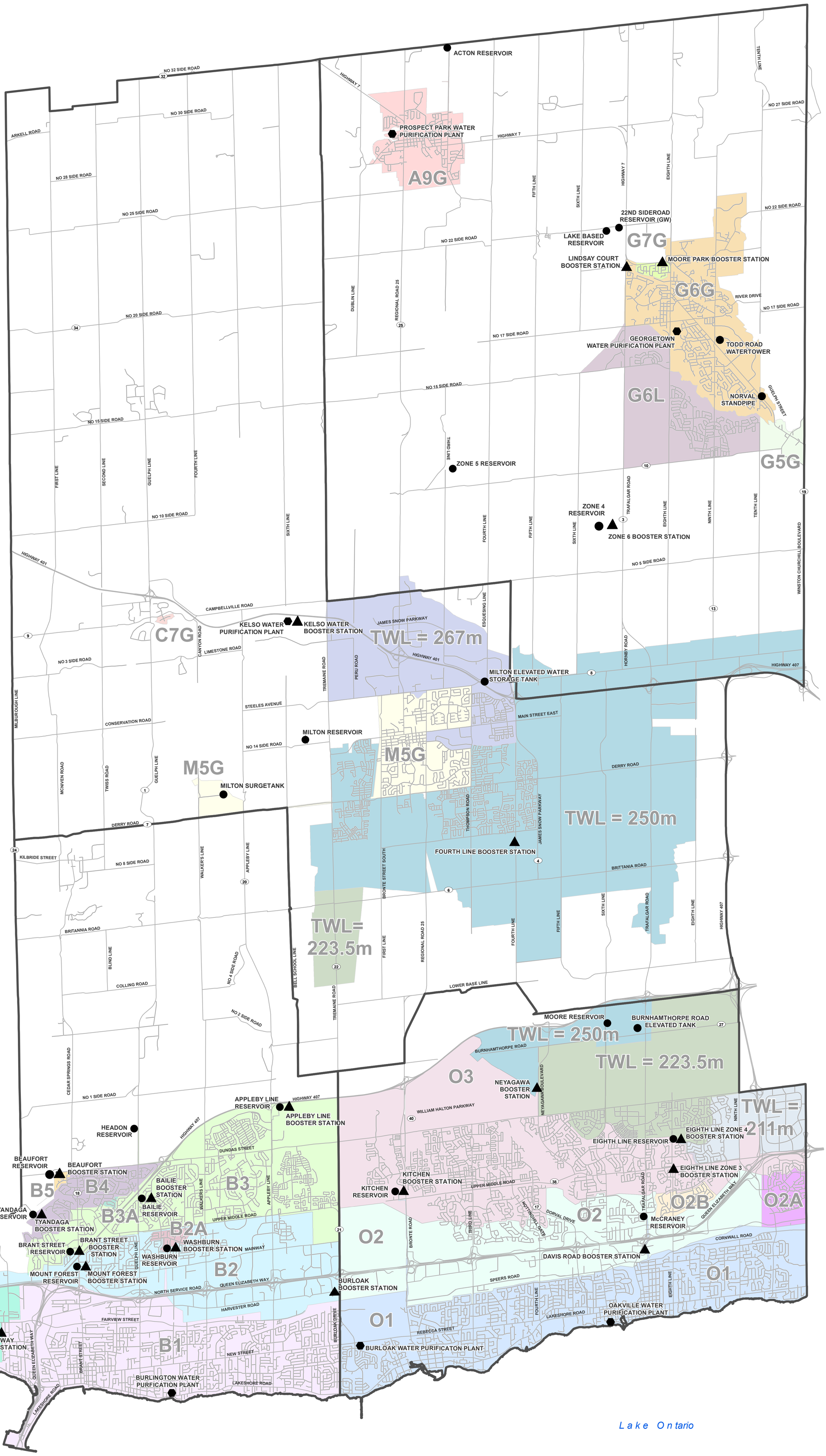
Legend

Water Pressure Zones

- A9
- B1
- B1A
- B1B
- B2
- B2A
- B3
- B3A
- B3B
- B4
- B4A
- B5
- B5A
- C7G
- G5G
- G6G
- G6L
- G7G
- M5G
- O1
- O2
- O2A
- O2B
- O3
- TWL = 211m
- TWL = 223.5m
- TWL = 250m
- TWL = 250m
- TWL = 267m

Other

- Booster Station
- Water Purification Plant
- Reservoir
- Minor Roads
- Major Roads
- MUNICIPAL BOUNDARY



GIS & Information Management
Public Works Department

HALTON REGION

Future Water Pressure Zones

Note that the pressure zone boundaries displayed in this map are approximate and subject to change.

0 0.75 1.5 3 4.5 6 Km

Public Work, May 2020

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