#### FUNCTIONAL SERVICING & STORMWATER MANAGEMENT REPORT

#### 91 & 131 EGLINTON AVENUE EAST AND 5055 HURONTARIO STREET

CITY OF MISSISSAUGA REGION OF PEEL

#### PREPARED FOR:

#### **91 EGLINTON LTD. PARTNERSHIP**

#### **PREPARED BY:**

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### 1.0 Introduction

C.F. Crozier & Associates Inc. (Crozier) was retained by 91 Eglinton Ltd. Partnership (the Owner) to prepare a Functional Servicing and Stormwater Management Report. The report will support the applications for an official plan amendment, rezoning, and draft plan of subdivision required to permit the residential development at 91 & 131 Eglinton Avenue East and 5055 Hurontario Street in the City of Mississauga, Region of Peel (the Site).

The purpose of this report is to demonstrate that the proposed development can be implemented in accordance with the Region of Peel's servicing guidelines and the City of Mississauga's stormwater management (SWM) guidelines.

The report was previously submitted in May 2019 and has since been revised to address comments on the Planning Application Status Report (File 21T-M 18 5) printed September 24, 2019.

The following reports and design standards were referenced during the preparation of this report:

- Region of Peel 2013 Water and Wastewater Master Plan for the Lake-Based Systems, dated March 31, 2014 (Master Plan, March 2014)
- Region of Peel Public Works Design, Specifications & Procedures Manual Sanitary Design Criteria, dated March 2017 (Sanitary Design Criteria, March 2017)
- Region of Peel Public Works Design, Specifications & Procedures Manual Watermain Design Criteria, dated June 2010 (Watermain Design Criteria, June 2010)
- City of Mississauga Development Requirements Manual, dated September 2016 (Development Requirements Manual, September 2016)
- Analysis in Support of the Growth-Related Water and Wastewater Servicing Plan for 91 Eglinton Avenue East prepared by the Region of Peel, dated June 11, 2018 (Servicing Analysis, June 2018)
- Master Plan for 91 Eglinton Avenue East prepared by Dialog, dated February 10, 2020 (Master Plan, February 2020)
- Storm Area Drainage Plan and Storm Sewer Design Sheet prepared by Urbantech, dated February 2014 and July 2014 respectively

#### 2.0 General Site Description

The subject site covers an area of approximately 4.4 ha and is located in a primarily residential area in the City of Mississauga. The property, currently occupied by a greenfield, is bounded by the future extension of Armdale Road to the north, existing townhouses to the east, Eglinton Avenue East to the south, and a low-rise commercial complex to the west.

The proposed development includes six high-rise-residential towers complete with underground parking (Master Plan, February 2020). The development is proposed to be constructed in three phases.

- Phase 1 (1.04 ha): A 25-storey residential tower and 3-storey townhomes.
- **Phase 2** (0.75 ha): A 24-storey residential tower with a podium varying in height from 3-storeys to 8-storeys, and underground parking.
- **Phase 3** (1.56 ha): Four residential towers, one level of retail space and underground parking. Tower 1 is 37 storeys, Towers 2 and 4 are 35 storeys and Tower 5 is 19 storeys, all connected by a 6-storey podium.

The Site also includes two public parks, one to the east of Phase 2 (3,286 m<sup>2</sup>) and one to the north of Phase 1 (1,297 m<sup>2</sup>) and two municipal road extensions. The road extensions include:

- Extending the existing 22.0 m right-of-way known as Armdale Road west to intersect with the proposed extension of Thornwood Drive (this will form the north border of the site)
- Extending the existing Thornwood Drive south, with right-of-way widths ranging from 24.0 m to 27.50 m, to intersect with Eglinton Avenue East. The proposed Thornwood Drive extension cuts through the site between Phase 1 and Phase 3

This report will consider the proposed development in its entirety to ensure adequate sizing and locations of the required civil services (i.e. storm, water and sanitary) for the complete build-out.

#### 3.0 Water Servicing

The Region of Peel is responsible for the operation and maintenance of the public water and treatment system in the City of Mississauga, and any local system will have to connect to this public system. The existing and proposed water servicing is discussed in the following sections.

#### 3.1 Existing Water Servicing

The development falls within water pressure Zone 4. The pressure zone changes to Zone 3 directly south of the Site on Eglinton Avenue East, and east of Forum Drive. A review as-constructed drawings from the City and the Region the following watermains in proximity to the Site and within the same pressure zone (Zone 4):

- Existing 300 mm and 400 mm diameter parallel watermains on Hurontario Street that loop through the local road network. Stubs for the proposed development are provided from the existing 300 mm diameter watermain at the intersections of Future Armdale Road extension & Kencourt Drive and Future Armdale Road Extension & Thornwood Drive.
- Existing 300 mm diameter watermain on the north side of Eglinton Avenue East. This watermain is stubbed at the Future Thornwood Drive extension entrance and extends east. The watermain is constructed but not currently in use.

Multiple hydrants are located near the site for fire protection:

- One on the east side of Preston Meadow Avenue near Armdale Road.
- One on the east side of Kencourt Drive near Future Armdale Road.
- One on the north side of Armdale Road midway between Hurontario Street and Preston Meadow Avenue.
- One in front of the Site on Eglinton Avenue East, between Future Thornwood Drive and Forum Drive.

#### 3.2 Design Water Demand

The Region of Peel Linear Infrastructure Sanitary Sewer Manual (March 2017) and an email with unit specific PPU's provided by Alex Sepe (Region Staff) was used to determine the equivalent population estimate for each Site. In conformance with Meeting Minutes from a meeting with Region Staff on May 23, 2019, Table 1 used the provided PPU's to determine the equivalent population for each Phase. The detailed calculations are provided in Appendix A.

Phase	Number of Units	Amenity Area m <sup>2</sup>	Total Persons
1	578	2896	1186
2	479	2400	961
3	1743	8732	3497
Site Total	2800	14028	5644

Table	1:	Equiva	lent P	opulation	Estimate

Considering the unit breakdown for each site, provided on Page 2 of the Site Statistics (Dialog, January 28, 2020), the equivalent population is scaled to 2800 units to maximize the allowable zoning unit count to allow for flexibility during the design process. The Region's Analysis in Support of the Growth-Related Water and Wastewater Servicing Plan for 91 Eglinton Avenue East, dated June 11, 2018, considered 2800 units total.

Based on the PPU distribution the total population for a maximum of 2800 units is 5644 persons.

The Region of Peel Linear Infrastructure Watermain Design Criteria (June 2010) was used to determine the maximum domestic water demand generated by the proposed development based on the equivalent population estimate for each phase. An average daily water demand of 280 L/cap/day was used. Table 2 summarizes the estimated design water demand. Appendix A contains detailed water demand calculations.

Standard	Phase	Average Daily Demand (L/s)	Maximum Daily Demand (L/s)	Peak Hourly Demand (L/s)
Region of Peel Public Works	1	3.84	7.69	11.53
Design, Specification &	2	3.11	6.23	9.34
Infrastructure Watermain	3	11.33	22.66	33.99
Design Criteria (June 2010)	Site Total	18.29	36.58	54.87

#### Table 2: Estimated Design Water Demand

For this application, the domestic water service for each phase will be designed to convey a water demand equivalent to the peak hourly demand shown in Table 2.

#### 3.3 Fire Flow Demand

The Fire Underwriters Survey method was used to estimate the fire flow demand for the proposed development. This calculation is used to estimate the size of incoming fire lines and does not provide a recommendation for fire protection. According to the letter received from Dialog Architects dated July 5, 2018, the towers have non-combustible construction and therefore, a construction coefficient of 0.8 was applied to the fire flow calculations (Water Supply for Public Fire Protection by Fire Underwriters Survey, 1999). The proposed residential buildings will be equipped with automatic sprinkler systems which reduces the initial fire flow demand of each building by up to 50%. Each automated sprinkler system is to be designed by the Mechanical Engineer; therefore, the detailed design of the system is not included in this report. Table 3 summarizes the required fire flow demand and duration of flow required for each phase.

Standard	Phase	Phase Floor Area <sup>1</sup>		Demand Flow		
Sidiidald	rnase	(m²)	(L/s)	(USGPM)	Doralion (n)	
Water Supply for Public	1	3,752	133.3	2,113	2.0	
Fire Protection by Fire	2	4,218	150.0	2,378	2.0	
(1999)	3	7,992	200.0	3,170	2.5	

#### **Table 3: Estimated Fire Demand Flows**

Note: 1. Floor area was determined by the largest floor plus 25% of each of the two immediately adjoining floors

The proposed fire service for each phase is required to accommodate fire flows according to the calculated demand flows and for durations as indicated above. Appendix A contains the Fire Underwriters Survey calculations.

#### 3.4 Proposed Water Servicing

Municipal watermains are required to support the proposed development. A 300 mm diameter watermain is proposed on Armdale Road extending west from the existing watermain on Armdale Road, to a proposed 300 mm diameter watermain, located on the east side of Future Thornwood Drive. The existing stubs from Kencourt and Beblin Street will connect to the proposed watermain on Armdale Road to create a loop. The proposed watermain on Future Thornwood Drive will connect to the existing 300 mm diameter watermain on Eglinton Avenue East.

The proposed residential towers are higher than 84 m high and therefore, require at least two sources of water from a public water system (OBC 3.2.9.7.4). The required water services are proposed as follows:

- **Phase 1** is proposed to connect to the proposed 300 mm watermain on the Thornwood Drive, near Eglinton Avenue East.
- **Phase 2** is proposed to connect to the proposed 300 mm watermain on Armdale Road, near Belbin Street.
- **Phase 3** is proposed to connect to the proposed 300 mm watermain on Thornwood Drive, near Eglinton Avenue East.

A 100mm diameter PVC domestic water service and a 200mm diameter PVC fire line is proposed for each phase. The Mechanical Engineer will design the internal private water system including the internal sprinkler system within the building and underground parking structure. The proposed municipal watermains and water services are shown on Figure 1.

Based on the Analysis in Support of the Growth-Related Water and Wastewater Servicing Plan for 91 Eglinton Avenue East, dated June 11, 2018, the Region concluded that the existing water infrastructure is sufficient to service the proposed development with 2800 units and no upgrades are required. They indicate that "Treatment, pumping and transmission are assumed to be sufficient to service the proposed development infrastructure". Based on the Region's analysis no further water system analyses are required for this development (such as hydrant flow tests).

#### 4.0 Sanitary Servicing

The Region of Peel is responsible for the operation and maintenance of the sanitary sewer network in the City of Mississauga. The area is serviced by the East Trunk (Etobicoke Creek West) system and the G.E. Booth Wastewater Treatment Facility (Servicing Analysis, June 2018). The existing and proposed sanitary servicing is outlined in the following sections.

#### 4.1 Existing Sanitary Servicing

According to the Water and Wastewater Analysis Report prepared by the Region, the following infrastructure exists in proximity to the site:

- Existing 450 mm diameter sanitary sewer on Eglinton Avenue East conveys flows east from a stub in front of the property. It connects to the existing 525 mm diameter sewer on Tailfeather Crescent. The sewer on Tailfeather Crescent runs south along the creek and conveys flow to the Central Park Way trunk sewer.
- Existing 250 mm diameter sanitary sewer along Sorrento Drive, directly south of the site, conveys flows to the 300/375 mm diameter sewer on Ella Avenue. The sewer on Ella Avenue conveys flows west, across Hurontario Street, and into the Upper Cooksville Creek Trunk sewer.

#### 4.2 Design Sanitary Flow

The sanitary design flow for the subject property was calculated using the Region of Peel Public Works Design, Specifications & Procedures Manual – Linear Infrastructure Sanitary Sewer Manual (March 2017) and the equivalent population estimate described in Section 3.2. A unit sewage flow of 302.8 L/cap/d was used, and infiltration flow and a peaking factor were applied to the unit sewage flow to obtain the total estimated design sewage flow.

A summary of the results is presented in Table 4 and detailed calculations are provided in Appendix B.

Standard	Phase	Average Daily Flow (L/s)	Peaking Factor	Infiltration Flow (L/s)	Total Flow (L/s)
Region of Peel Public Works Design Specification	1	4.16	3.75	0.21	15.80
& Procedures Manual – Linear Infrastructure	2	3.37	3.81	0.15	12.99
Sanitary Sewer Manual (March 2017)	3	12.25	3.39	0.31	41.79
				Site Total	70.58

#### Table 4: Estimated Sanitary Design Flows

The proposed sanitary services must convey a total design sanitary demand for each phase according to the total flows indicated in Table 4.

#### 4.3 Proposed Sanitary Servicing

Municipal sanitary sewers are required to support the proposed development. A series of 300 mm and 375 mm diameter sanitary sewers are proposed on the extension of Armdale Road and Thornwood Drive respectively. The required sizing for the sewers and the minimum sloping was specified by the Region in an email dated July 9, 2018 (Appendix B). The proposed sanitary sewers will extend from the existing 450 mm diameter sanitary sewer on Eglinton Avenue East and stub at the intersection of Armdale Road and Belbin Street.

The proposed sanitary laterals are 200 mm diameter PVC pipes. The pipe capacity for 200 mm diameter laterals sloping at 2% is 46 L/s, which is greater than the total sanitary design flow for each phase. Each phase will have an individual connection to the proposed sanitary sewers. The *Preliminary Overall Servicing Plan:* Figure 1, illustrates the location of the sanitary sewers and all connections. The internal sanitary system of the buildings will be designed according to the Mechanical Engineer's details and specifications.

#### 4.4 Downstream Sanitary Capacity

The Region of Peel Public Works completed the Analysis in Support of the Growth-Related Water and Wastewater Servicing Plan for 91 Eglinton Avenue East, dated June 11, 2018. Based on the analysis, which included sanitary demand calculations, the Region concluded the treatment capacity of the existing G.E. Booth Wastewater Treatment Facility is sufficient to support the new development. A subsequent meeting with the Region held May 23, 2019 confirmed that there is sufficient downstream capacity for all phases of the project to proceed. Refer to Appendix D for details.

### 5.0 Drainage Conditions

#### 5.1 Existing Drainage Conditions

According to the topographic survey that was completed by Schaeffer Dzaldov Bennett Ltd. (June 21, 2018), existing topography conveys stormwater drainage overland to Eglinton Avenue East. The east portion of the site drains from the north-east corner to roughly the middle of the site where it is then conveyed south to the municipal right-of-way. A berm with a contour of 173 m, on the west portion of the site, splits drainage between the middle outlet and a low point in the south-west corner. The far west portion of the site demonstrates imperfect drainage. A portion of the stormwater drainage in this area is conveyed overland to the municipal right-of-way through the south-west corner and a portion is conveyed overland to the adjacent property across the west property line.

There is no existing internal storm system on the site.

Three existing storm sewers are located near the subject property:

- A 900 mm diameter storm sewer conveys stormwater flow west on Eglinton Avenue East.
- A 375 mm diameter storm sewer conveys stormwater flow south on Hurontario Street, connecting into the 900 mm storm sewer on Eglinton Avenue East.
- A series of 575/600/675 mm diameter storm sewers convey stormwater flow through an easement in the center of the commercial property directly west of the Site, from existing MH7 on Armdale Road to existing MH6 on Eglinton Avenue East.

#### 5.2 Proposed Drainage Conditions

The proposed development consists of six residential towers with podiums and townhouse units. The development includes underground parking, two public parks, and two road extensions.

The subject property has been divided into three phases, each of them analyzed separately to form the stormwater catchment areas. A storm sewer network internal to the Site will convey minor system flows generated within each phase towards the existing 900 mm diameter storm sewer on Eglinton Avenue East. The drainage will be controlled from the 100-year post-development storm event to the 2-year pre-development storm event using underground storage tanks complete with orifice controls. Drainage in each of the phases will be overcontrolled to meet the target flow rate and facilitate uncontrolled catchments in each phase.

The proposed grading, demonstrated in Figure 2, will convey the major system flows overland towards the municipal right-of-way. Major system flows from Phase 1 internal road will be conveyed to Thornwood Drive right-of-way. The rest of Phase 1 overland flow will be conveyed to existing Eglinton Avenue East right-of-way.

Overland flow from Phase 2 is conveyed through an internal road to the future Thornwood Drive right-of-way. Phase 3 will be conveyed to the existing Eglinton Avenue East right-of-way and future Thornwood Drive right-of-way.

The public parks and road extensions are not included within the phases and are not subject to stormwater quantity or quality controls. This was confirmed in a meeting with City Staff on June 11, 2018. These areas will ultimately drain to the existing storm sewer on Eglinton Avenue East. The proposed storm sewers along Future Armdale Road and Future Thornwood Drive will collect and convey runoff from the road extensions and the public parks.

#### 6.0 Stormwater Management

Stormwater management design criteria were established using the City of Mississauga standards. The stormwater management criteria include:

#### Water Quantity Control

Provide control for the private storm system to control the post-development peak flow for the 100year storm event to the pre-development peak flow for the 2-year storm event, according to City requirements for developments within the Cooksville Creek watershed. No quantity control is required for the municipal park or roads within the development limit.

#### Water Quality Control

Private stormwater discharging from the proposed development must achieve Ontario Ministry of the Environment, Conservation and Parks (MOECP) Enhanced Level of protection (80% total suspended solids (TSS) removal) for water quality control prior to discharging to the City's storm sewer network. The water quality criteria must be achieved for each phase. No quality control is required for the municipal parks or roads within the development limit.

#### <u>Water Balance</u>

Retention of the first 5 mm of rainfall for private development areas is required by the City of Mississauga Development Requirements Manual (September 2016) to achieve the water balance criteria. The retained water may be reused as grey water throughout the development or for irrigation purposes as discussed in the meeting with City Staff on June 11, 2018.

#### Minor System Design

For less than 100 ha of land, the minor storm sewer system shall be designed to accommodate a 10year design storm according to the City of Mississauga Development Requirements Manual (September 2016).

#### 6.1 Stormwater Quantity Control

The Modified Rational Method was used to determine the pre-development and post-development flow rates for each phase using the City of Mississauga standard IDF rainfall curve. The peak flow rates were then used to determine any stormwater quantity control required for the proposed development.

As discussed during a meeting with the City on June 11, 2018, areas such as the parks and the road extensions, which are not included in any of the private development phases, will discharge stormwater uncontrolled to the municipal right-of-way. No quantity control will be provided for these areas.

The frontage of each phase will discharge stormwater uncontrolled to the municipal right-of-way to reduce the number of area drains required and facilitate a smooth transition from the right-of-way to the developments. These areas are accounted for by over controlling the rest of the phase. Figure 7 and Figure 8 show the delineation of catchment areas of the pre- and post-development, respectively. Appendix C contains detailed stormwater management calculations.

Stormwater from the Site will outlet into the municipal storm system. On-site storage, including underground storage, will be used to control the peak flow from the 100-year post-development storm to the allowable stormwater peak flow which is based on the 2-year storm event under predevelopment conditions. A runoff coefficient of 0.25 was assumed for existing conditions.

A summary of the peak flow rates and storage volumes for each phase are presented in Table 5. Detailed calculations are in Appendix C.

				Pog			
Critoria	Photo	Catchment	Pro	Post-D	evelopment		Keq.
Chiefia	rnuse	Area	Development (2-year)	<b>Uncontrolled</b> (100-year)	<b>Controlled</b> (100-year)	Total (100- year)	(m <sup>3</sup> )
Cooksville	1	201, UC13, UC14, UC15	43.4	24.4	18.7	43.1	611.4
Creek: 100- year post- to	2	202, UC16	31.3	7.3	23.4	30.7	395.7
2-year pre- development	3	203, UC17, UC18	65.0	24.4	25.6	50.0	989.60
		Total:	139.7			123.8	

#### Table 5: Summary of Peak Flow Rates and Storage Volumes

As shown in Table 5, each phase requires a particular volume of on-site storage to meet quantity control criteria. To achieve the quantity control requirement, each phase will have an orifice tube downstream of an underground tank. A 75 mm diameter orifice tube will be used in Phases 2 and 3, and a 100 mm diameter orifice tube used in Phase 1 to restrict the peak flows to achieve the post-to-pre-development control. Underground storage tanks, built into the underground parking structure, will be sized to hold the required storage volume. Appendix C contains the orifice sizing calculations.

The total post-development stormwater flows leaving all phases is less than the pre-development target (i.e. 123.8 L/s < 139.7 L/s) and therefore the overall impact on the stormwater network is negligible.

#### 6.2 Stormwater Quality Control

Stormwater quality controls for the site must incorporate measures to provide an Enhanced Level of Protection (Level 1) according to the MOECP (March 2003) guidelines. Enhanced water quality protection involved the removal of at least 80% of TSS from 90% of the annual runoff volume. Water quality control will be provided for each phase separately through oil/grit separator (OGS).

A Stormceptor EF6 will be provided downstream of the underground tank and orifice tube, to provide quality control for Phases 1 to 2 prior to discharging to the City's storm sewer network. A Stormceptor EF8 will be provided to meet the water quality objective for Phase 3.

The new Stormceptor EF/EFO model's sized for 60% removal of the ETV PSD is comparable to sizing for 80% removal of the Stormceptor Fine PSD. The sizing results in Appendix C reflects this qualification. A technical bulletin explaining the equivalency is included in Appendix C.

#### 6.3 Water Balance

As stated by the City of Mississauga Development Requirements Manual (September 2016), the minimum requirement to promote water balance is retention of the 5 mm rainfall event. The water balance retention volume was calculated for each phase considering initial abstraction of runoff based on impervious areas. Table 6 describes the dead storage volume required below the invert of each underground tank to satisfy the water balance criteria.

	Table 6: water balance storage kequirement						
Standard	Criteria	Phase	<b>Impervious</b> Area (ha)	Storage Required (m³)			
City of Mississauga		1	0.78	39			
Development	Retention of first	2	0.56	28			
(September 2016)	Smm	3	1.17	59			

#### - . .

Once the final plan area of each underground tank has been established during detailed design, a depth will be indicated to achieve the required volume. Water in dead storage can be reused throughout the development as grey water or for irrigation purposes. On-site LID's illustrated in the Site Plan and Landscape Plan can also be used for water balance and will be detailed in the detailed design stage.

#### 6.4 **Minor System Design**

A storm sewer design sheet was prepared for the proposed municipal storm sewers surrounding the proposed development. The design sheet accounts for the controlled flow leaving each phase, and the uncontrolled flow from the phases, the municipal parks and the municipal roads. Using a 10-year design flow the velocity in the storm sewers ranges from 0.97 m/s - 1.59 m/s which is within the acceptable range of 0.75 m/s – 4.0 m/s according to the City of Mississauga Development Requirements Manual, Section 2.01.01.02. Appendix C contains the Storm Sewer Design Sheet.

An approved Storm Sewer Design Sheet for this area was prepared by Urbantech and dated July 28, 2014. We compared flows from our design sheet to the Urbantech design sheet at key nodes. The total peak flow from the Site at Existing MH1 on Eglinton Avenue East is 240 L/s (approx. 0.24 m<sup>3</sup>/s), which is less than the Urbantech design peak flow at that node (PR. MH 7) of approximately 592 L/s (0.592 m<sup>3</sup>/s). Similarly, the total peak flow from the Site at Existing MH8 on Armdale Road is 59 L/s (0.059 m<sup>3</sup>/s), which is less than the Urbantech design peak flow of approximately 76 L/s (0.076 m<sup>3</sup>/s) at that location. Therefore, the quantity controls provided control the peak flow to below acceptable design flows for this system. The peak flow at key points match the approved Urbantech Storm Sewer Design (July 28, 2014) as agreed upon at a meeting with City Staff on June 11, 2018.

#### 6.5 Storm Sewer Construction Phasing

The storm sewers and stormwater management will be constructed in such a way that all phases have interim and ultimate drainage paths. The construction sequencing is as follows:

- 1. Install municipal storm sewers along Armdale Road and Thornwood Drive
- 2. Rough grading of Armdale Road and Thornwood Drive
  - a. Note: The roads will act as drainage conveyance for all phases in interim and ultimate conditions
- 3. Construct phase 1 and connect storm servicing to Thornwood Drive
  - a. Phase 2 and 3 will maintain existing drainage patterns, using Thornwood Drive and Armdale Road as conveyance routes as required
- 4. Construct phase 2 and connect storm servicing to Armdale Road
- 5. Construct phase 3 and connect storm servicing to Thornwood Drive

Construction of the municipal storm servicing and right-of-ways on Armdale Road and Thornwood Drive is required to facilitate the interim and ultimate drainage conditions of all phases.

#### 6.6 Sustainable Stormwater Management

Low Impact Development (LID) strategies will be considered for use throughout the proposed development during the detailed design stage for each phase. The following LID strategies may be applicable for this site:

- **Rainwater Harvesting**: With minimal pretreatment, the captured rainwater within the underground storage tanks can be used for outdoor non-potable water uses such as irrigation, or in the buildings as gray water.
- **Green Roofs**: This method is beneficial due to its water quality, water balance, and peak flow control benefits. In addition to water resource management, green roofs improve energy efficiency, reduce urban heat island effects, and create greenspace for passive recreation.
- Enhanced Grass Swale and Bioretention: Enhanced grass swales are designed to convey, treat and attenuate stormwater runoff. This feature slows the water to allow sedimentation, filtration through the soil matrix, evapotranspiration, and infiltration into the underlying native soil. Bioretention methods, such as rain gardens and stormwater planters, allow to temporarily store, treat and infiltrate runoff. It is typically designed to capture small storm events. Where underground parking facilities exists, infiltration is not a feasible option.
- **Permeable Pavement**: Porous asphalt, pervious concrete, permeable paver and plastic grid filled with gravel can be used for driveways and walkways to reduce the amount of impervious area throughout the site. This approach encourages infiltration and reduces runoff volumes. Again, where underground parking facilities exists, infiltration is not an option.
- **Enhanced Topsoil**: Enhanced topsoil provides water quality benefits in addition to water balance storage which will reduce the infrastructure required to store the required water balance volume.

LID strategies and an overall treatment train approach, where possible, will be specified during detailed design for each phase.

#### 7.0 Conclusions and Recommendations

The proposed development can be serviced for water, sanitary, and stormwater in accordance with the City of Mississauga and Region of Peel requirements and standards. Our conclusions and recommendations include:

- 1. The development will be constructed over three phases with a maximum of 2800 units.
- 2. The development includes two municipal parks and two municipal road extensions: Armdale Road and Thornwood Drive.
- 3. Water demand for the proposed development will be provided using two 200 mm diameter fire lines and 100 mm diameter domestic lines for each phase. Each phase with a tower requires two fire line connections to the municipal watermain. Each phase will be serviced individually.
- 4. Based on the Analysis in Support of the Growth-Related Water and Wastewater Servicing Plan for 91 Eglinton Avenue East, dated June 11, 2018, the Region concluded that the existing water infrastructure is sufficient to service the proposed development for 2800 units and no upgrades are required.
- 5. Municipal watermains are required to support the development. A series of 300 mm diameter watermains are proposed along the proposed municipal street extensions.
- 6. Sanitary servicing for each phase of the proposed development will be provided using 200 mm diameter sanitary laterals extending from the proposed municipal sanitary sewer.
- 7. Municipal sanitary sewers are required to support the development. A series of 300 mm and 375 mm diameter sanitary sewers are proposed on the extension of Armdale Road and Thornwood Drive respectively. The proposed sanitary sewers will extend from the existing 450 mm diameter sanitary sewer on Eglinton Avenue East and stub at the intersection of Armdale Road and Belbin Street.
- 8. Based on the Analysis in Support of the Growth-Related Water and Wastewater Servicing Plan for 91 Eglinton Avenue East, dated June 11, 2018, the Region concluded the treatment capacity of the existing G.E. Booth Wastewater Treatment Facility is sufficient to support the new development for 2800 units.
- 9. A meeting held with Region staff of May 23, 2019 confirmed that there is sufficient downstream capacity in the sanitary sewer network to support 2800 units across the phases.
- 10. Stormwater for the Site is ultimately conveyed to the existing 900 mm diameter storm sewer on Eglinton Avenue East.
- 11. Stormwater runoff from the municipal road extensions and the public parks is not subject to stormwater quantity or quality controls. The total peak flow leaving the site is below the design flow on the approved Urbantech Storm Sewer Design Sheet. During a preconsultation meeting with the City, it was confirmed that the existing municipal storm sewers have enough capacity to facilitate construction of the proposed development.

- 12. Quantity control has been provided for each phase using an orifice tube downstream of an underground storage tank. The post-development controlled and uncontrolled flow will meet the 2-year pre-development flow.
- 13. An oil/grit separator (OGS) Stormceptor Model EF6 (Phases 1 to 2) and EF8 (Phase 3) or approved equivalent was sized for each phase to provide an enhanced level of protection (80% TSS removal) for stormwater quality control.
- 14. Water balance for the Site will be provided through the retention of the 5 mm rainfall event as dead storage below the invert in each stormwater tank.

Based on the above conclusions, we recommend the approval of the development application for the site from the perspective of functional servicing and stormwater management.

Respectfully submitted,

#### C.F. CROZIER & ASSOCIATES INC.

Nicole Segal, M.M.Sc., E.I.T. Land Development

#### C.F. CROZIER & ASSOCIATES INC.

Nick Mocan / M.Sc., P.Eng. Interim President

I:\1500\1525-91 Eglinton Ltd Partnership\4876-91 Eglinton Ave E\Reports\2020.02.07 4876\_FSRSWM.docx

#### C.F. CROZIER & ASSOCIATES INC.

Nick Constantin, P.Eng. Senior Project Manager

# APPENDIX A

Water Demand Calculations

### **Connection Demand Table**

#### WATER CONNECTION

Connection point <sup>3)</sup>				
Pressure zone of connection poin	nt	4		
Total equivalent population to be	serviced 1)	5644 persons		
Total lands to be serviced 3.35 ha				
Hydrant flow test				
Hydrant flow test location				
	Pressure (kPa)	Flow (in l/s)	Time	
Minimum water pressure				
Maximum water pressure				

No	Water demands – Phase 1					
NO.	Demand type	Demand	Units			
1	Average day flow	3.84	l/s			
2	Maximum day flow	7.69	l/s			
3	Peak hour flow	11.53	l/s			
4	Fire flow <sup>2)</sup>	133.33	l/s			
Anal	Analysis					
5	Maximum day plus fire flow	141.02	l/s			

No	Water demands – Phase 2					
NO.	Demand type	Demand	Units			
1	Average day flow	3.11	l/s			
2	Maximum day flow	6.23	l/s			
3	Peak hour flow	9.34	l/s			
4	Fire flow <sup>2)</sup>	150.00	l/s			
Anal	Analysis					
5	Maximum day plus fire flow	156.23	l/s			

No	Water demands – Phase 3						
NO.	Demand type	Demand	Units				
1	Average day flow	11.33	l/s				
2	Maximum day flow	22.66	l/s				
3	Peak hour flow	33.99	l/s				
4	Fire flow <sup>2)</sup>	200.00	l/s				
Analysis							
5	Maximum day plus fire flow	222.66	l/s				

#### WASTEWATER CONNECTION

Phase 1

Conr	nection point <sup>4)</sup>	
Total	equivalent population to be serviced	1186 persons
Total	lands to be serviced	1.04 ha
6	Wastewater sewer effluent (in I/s)	15.80

Phase 2

Conr	nection point <sup>4)</sup>	
Total	equivalent population to be serviced	961 persons
Total	lands to be serviced	0.75 ha
6	Wastewater sewer effluent (in I/s)	12.99

Phase	3	
Conr	nection point <sup>4)</sup>	
Total	equivalent population to be serviced	3497 persons
Total	lands to be serviced	1.56 ha
6	Wastewater sewer effluent (in I/s)	41.79

Please refer to design criteria for population equivocates
 Please reference the Fire Underwriters Survey Document

<sup>3)</sup> Please specify the connection point ID

<sup>4)</sup> Please specify the connection point (wastewater line or manhole ID) Also, the "total equivalent population to be serviced" and the "total lands to be serviced" should reference the connection point. (the FSR should contain one copy of Site Servicing Plan)

Please include the graphs associated with the hydrant flow test information table Please provide Professional Engineer's signature and stamp on the demand table All required calculations must be submitted with the demand table submission.



Project: 91 Eglinton Ave Project No.: 1525-4876 Prepared By: AR Checked By: NRS Date: 2020-02-05

### Site Statistics 91 Eglinton Avenue, Mississauga

#### SUMMARY OF UNIT BREAKDOWN

Site	Single	Semi	Row	Apartment 2+	Apartment 1+	Total Units	Amenity Area
Phase 1 (Lot A)	0	0	17.00	197.00	364.00	578.00	2895.78
Phase 2 (Lot B)	0	0	0.00	168.00	311.00	479.00	2399.79
Phase 3 (Lot C)	0	0	0.00	610.00	1133.00	1743.00	8732.43
Total	0.00	0.00	17.00	975.00	1808.00	2800.00	14028.00

#### SUMMARY OF POPULATION

Site	Single	Semi	Row	Apartment 2+	Apartment 1+	Amenity Area	Total Persons
Phase 1 (Lot A)	0	0	59.50	500.38	611.52	14.48	1185.88
Phase 2 (Lot B)	0	0	0.00	426.72	522.48	12.00	961.20
Phase 3 (Lot C)	0	0	0.00	1549.40	1903.44	43.66	3496.50
Total	0	0	60	2477	3037	70	5644
lote: Based on the fo	ollowing PPU Sinale	rates provid 4 1.5	ed by Alex Se	epe @ Region of F	'eel (email da	ted Septemb	ber 9, 2019)
lote: Based on the f	ollowing PPU Single Semi	rates provid 4.15 4.15	ed by Alex S	epe @ Region of F	eel (email da	ited Septemb	oer 9, 2019)
Note: Based on the fo	ollowing PPU Single Semi Row	rates provid 4.15 4.15 3.5	ed by Alex S	epe @ Region of F	eel (email da	ited Septemb	ber 9, 2019)
Note: Based on the fo	ollowing PPU Single Semi Row partment 2+	rates provid 4.15 4.15 3.5 2.54	ed by Alex S	epe @ Region of F	'eel (email da	ted Septemb	ber 9, 2019)

Manual - Linear Infrastructure - Sanitary Sewer Design Criteria (March, 2017) Section 2.1



Project: 91 Eglinton Ave E Project No.: 1525-4876 Prepared By: AR Checked By: NRS Date: 2020-02-05 Revised: 2020.02.13

#### WATER DEMAND CALCULATIONS 91 Eglinton Ave E. Proposed Residential Development

		References
<u>Phase 1</u>		
Average Consumption	280 L/cap * day	Region of Peel Public Works Design, Specifications &
Equivalent Population	1186 persons	Design Criteria (June, 2010) - 2.3 Table #1
Area	1.04 ha	
Average Daily Demand	332046.09 L/day	
	3.84 L/s	
Maximum Day Factor	2.0	
Peak Hour Factor	3.0	
Maximum Daily Flow	664092.18 L/day	
	7.69 L/s	
Peak Hour Flow	996138.28 L/day	
	11.53 L/s	
Phase 2		Pagion of Paol Public Works Design Spacifications &
Average Consumption	280 L (cap * day	Procedures Manual - Linear Infrastructure - Watermain
		Design Criteria (June, 2010) - 2.3 Table #1
Aroa	0.75 ba	
Ared	0.75 hd	
Average Daily Demand	269135.71 L/day	
	3.11 L/s	
Maximum Day Factor	2.0	
Peak Hour Factor	3.0	
Maximum Daily Flow	538271.41 L/day	
	6.23 L/s	
Peak Hour Flow	807407.12 L/day	
	9.34 L/s	
Phase 3		Region of Peel Public Works Design, Specifications & Procedures Manual - Linear Infrastructure - Watermain
		Design Criteria (June, 2010) - 2.3 Table #1
Equivalent Population	3497 persons	
Area	1.56 ha	
Average Daily Demand	979020.6 L/day	
	11.33 L/s	
Maximum Day Factor	2.0	

Maximum Day Factor	2.0
Peak Hour Factor	3.0
Maximum Daily Flow	1958041.2 L/day
	22.66 L/s
Peak Hour Flow	2937061.8 L/day
	33.99 L/s



Project: 91 Eglinton Ave Project No.: 1525-4876 Prepared By: AR Checked By: NRS Date: 2020-02-05 Revised: 2020.02.13

### SANITARY CALCULATIONS 91 Eglinton Avenue Proposed Residential Development - Total

#### SUMMARY OF WATER DEMAND

Phase	Number of Units	Population	Average Daily Demand (L/s)	Maximum Daily Demand (L/s)	Peak Hour Demand (L/s)
1	578	1186	3.84	7.69	11.53
2	479	961	3.11	6.23	9.34
3	1743	3497	11.33	22.66	33.99
Total	2800	5644	18.29	36.58	54.87



Date: 2020-02-05 Designed By: NRS Checked By: NC Updated: 2020.02.7

later Supply f	or Public Fire Protection
ire Underwrite	ers Survey
	Part II - Guide for Determination of Required Fire Flow
1. An estimate	of fire flow required for a given area may be determined by the formula:
	E = 220 * C * sart A
where	
	F = the required fire flow in litres per minute
	C = coefficient related to the type of construction:
	= 1.5 for wood frame construction (structure essentially all combustible)
	= 1.0 for ordinary construction (brick or other masonry walls, combustible floor and interior)
	= 0.8 for non-combustible construction (unprotected metal structural components)
	= 0.6 for fire-resistive construction (fully protected frame, floors, roof)
	A = The total floor area in square metres (including all storeys, but excluding basements at least
	50 percent below grade) in the building considered.
Proposed B	uildings
hoposed b	
A = 3	752.1 sq.m. 2503.1 sq.m area of largest floor
C =	0.8 ordinary construction 1248.97 sq.m 25% of each of the two immediately adjoining floc
Therefor	
Inerefor	er = 10,781 L/min
Fi	re flow determined above shall not exceed:
	30,000 L/min for wood frame construction
	30,000 L/min for ordinary construction
	25,000 L/min for non-compustible construction 25,000 L/min for fire-resistive construction
2. Values oblo	aned in No. T may be reduced by as much as 25% for occupancies naving low contents fire hazard of may ad by up to 25% surcharae for occupancies having a high fire hazard.
Non-Combu	stible -25% Free Burning 15%
Imited Combu	stible -15% Rapid Burning 25%
Combu	stible U% (No Change)
Combustibl	e 0%
	U L/min reduction 10 781 L/min
Note: Flow (	determined shall not be less than 2,000 L/min

3. Sprinklers - The value obtained in No. 2 above maybe reduced by up to 50% for complete automatic sprinkler protection. The credit for the system will be a maximum of 30% for an adequately designed system conforming to NFPA 13 and other NFPA sprinkler standards. 10% may be granted if the water supply is standard for both the system and fire departement hose lines required. Additional credit of up to 10% may be given for a fully supervised system.

 Building will have automatic sprinklers

 5,390 L/min reduction

Page 2

### Water Supply for Public Fire Protection Fire Underwriters Survey

#### Part II - Guide for Determination of Required Fire Flow

4. Exposure - To the value obtained in No. 2, a percentage should be added for structures exposed within 45 metres by the fire area under consideration. The percentage shall depend upon the height, area, and construction of the building(s) being exposed, the separation, openings in the exposed building(s), the length and height of exposure, the provision of automatic sprinklers and/or outside sprinklers in the building(s) exposed, the occupancy of the exposed building(s) and the effect of hillside locations on the possible spread of fire.

Separation	Charge	Separation	Charge
0 to 3 m	25%	20.1 to 30 m	10%
3.1 to 10 m	20%	30.1 to 45 m	5%
10.1 to 20 m	15%		

#### Exposed buildings

Name	Distance			
North	Adjacent Dwelling >45	0%	0.00	
South	Adjacent Dwelling >45	0%	0.00	
West	Adjacent Commer 30.1 to 4	515%	539.04	
East	Adjacent Commer(10.1 to 2	0115%	1617.11	
			2,156 L/min Surch	arge

Determine Required Fire Flow		
No.1	10,781	
No. 2	0 reduction	
No. 3	-5,390 reduction	
No. 4	<u>2,156</u> surcharge	
<b>Required Flow:</b>	7,547 L/min	
Rounded to nearest 1000 L/min:	8,000 L/min or	133.3 L/s
		2,113 USGPM
Required Volume		
8,000 L/	min	
x <u>120 m</u>	in	
960,000 L		

<u> </u>		
Required Duration	of Fire Flow	
Flow Required		Duration
L/min		(hours)
2,000 or less		1.0
	3,000	1.25
	4,000	1.5
	5,000	1.75
	6,000	2.0
	8,000	2.0
	10,000	2.0
	12,000	2.5
	14,000	3.0
	16,000	3.5
	18,000	4.0
	20,000	4.5
	22,000	5.0
	24.000	5.5
	26,000	6.0
	28.000	6.5
	30,000	7.0
	32,000	7.5
	34,000	8.0
	54,000	0.0

		36,000	8.5
		38,000	9.0
	40,000 and over		9.5



Date: 2020-02-05 Designed By: NRS Checked By: NC Updated: 2020.02.7

ater Supply	for Public Fire F	Protection			
ire Underwri	ers Survey F	Part II - Guide for D	etermination of Req	uired Fire Flow	,
1. An estimat	e of fire flow requ	ired for a given are	a may be determin	ed by the form	nula:
where		F = 220 * C * sqrt A	A		
WHOIC	F = the require	ed fire flow in litres p	er minute		
	C = coefficien	t related to the type = 1.5 for woo = 1.0 for ordi = 0.8 for non = 0.6 for fire-	e of construction: od frame construction inary construction (bri i-combustible constru resistive construction	n (structure esse ick or other mas iction (unprotec (fully protected	entially all combustible) onry walls, combustible floor and interior) ted metal structural components) frame, floors, roof)
	A = The total fl 50 percen	oor area in square i t below grade) in th	metres (including al ne building consider	l storeys, but ex ed.	xcluding basements at least
Proposed E	suildings				
A = C =	4218 sq.m. 0.8	ordinary construc	tion	2812.18 sq.m 1406 sq.m	area of largest floor 25% of each of the two immediately adjoining floc
Therefo	re F = 11,43	1 L/min			
F	ire flow determin 30,00 30,00 25,00 25,00	ed above shall not 0 L/min for wood fro 0 L/min for ordinary 0 L/min for non-con 0 L/min for fire-resist	exceed: ame construction construction nbustible construction ive construction	on	
2. Values obt be increas	ained in No. 1 ma ed by up to 25% s	ay be reduced by c surcharge for occup	as much as 25% for a pancies having a hi	occupancies h gh fire hazard.	aving low contents fire hazard or may
Non-Combi imited Combi Combi	ustible -259 ustible -159 ustible 09	% % % (No Change)	Free Burning Rapid Burning	15% 25%	
Combustib	le		0%		
	11,43	0 L/min reduction 1 L/min			
Note: Flow	determined shall	not be less than 20	001/min		

3. Sprinklers - The value obtained in No. 2 above maybe reduced by up to 50% for complete automatic sprinkler protection. The credit for the system will be a maximum of 30% for an adequately designed system conforming to NFPA 13 and other NFPA sprinkler standards. 10% may be granted if the water supply is standard for both the system and fire departement hose lines required. Additional credit of up to 10% may be given for a fully supervised system.

 Building will have automatic sprinklers

 5,715 L/min reduction

Page 2

### Water Supply for Public Fire Protection Fire Underwriters Survey

#### Part II - Guide for Determination of Required Fire Flow

4. Exposure - To the value obtained in No. 2, a percentage should be added for structures exposed within 45 metres by the fire area under consideration. The percentage shall depend upon the height, area, and construction of the building(s) being exposed, the separation, openings in the exposed building(s), the length and height of exposure, the provision of automatic sprinklers and/or outside sprinklers in the building(s) exposed, the occupancy of the exposed building(s) and the effect of hillside locations on the possible spread of fire.

Separation	Charge	Separation	Charge
0 to 3 m	25%	20.1 to 30 m	10%
3.1 to 10 m	20%	30.1 to 45 m	5%
10.1 to 20 m	15%		

#### **Exposed buildings**

Name	Distance		
North	Adjacent Dwelling 30.1 to 45	5%	571.54
East	Adjacent Dwelling >45	0%	0.00
South	Adjacent Dwelling 10.1 to 20 ı	15%	1714.63
West	Adjacent Commer(30.1 to 45	5%	571.54
			2,858 L/min Surcharge

Determine Required Fire Flow		
No.1 No.2	11,431 0 reduction	
No. 4	<u>2,858</u> surcharge	
Required Flow: Rounded to nearest 1000 L/min:	8,573 L/min 9,000 L/min or	150.0 L/s 2,378 USGPM
Required Flow: Rounded to nearest 1000 L/min:	8,573 L/min 9,000 L/min or	150.0 L/s 2,378 USGPN
Required Volume		
9,000 L/	ímin	

Paguirad Duration of Fire Flow				
Flow Required	Duration			
L/min	(hours)			
2,000 or less	1.0			
3,000	1.25			
4,000	1.5			
5,000	1.75			
6,000	2.0			
8,000	2.0			
10,00	2.0			
12,00	2.5			
14,00	3.0			
16,00	3.5			
18,00	4.0			
20,00	4.5			
22,00	5.0			
24,00	5.5			
26,00	6.0			
28,00	6.5			
30,00	7.0			
32.00	7.5			
34,00	8.0			

		36,000	8.5
		38,000	9.0
	40,000 and over		9.5



Date: 2020-02-05 Designed By: NRS Checked By: NC Updated: 2020.02.7

Water Supply for Public Fire Protection Fire Underwriters Survey Part II - Guide for Determination of Required Fire Flow 1. An estimate of fire flow required for a given area may be determined by the formula: F = 220 \* C \* sqrt A where F = the required fire flow in litres per minute C = coefficient related to the type of construction: 1.5 for wood frame construction (structure essentially all combustible) = = 1.0 for ordinary construction (brick or other masonry walls, combustible floor and interior) = 0.8 for non-combustible construction (unprotected metal structural components) = 0.6 for fire-resistive construction (fully protected frame, floors, roof) A = The total floor area in square metres (including all storeys, but excluding basements at least 50 percent below grade) in the building considered. **Proposed Buildings** A = 7992 sq.m. 5407.78 sq.m area of largest floor C = 0.8 ordinary construction 2584 sq.m 25% of each of the two immediately adjoining floors Therefore F = 15,734 L/min Fire flow determined above shall not exceed: 30,000 L/min for wood frame construction 30,000 L/min for ordinary construction 25,000 L/min for non-combustible construction 25,000 L/min for fire-resistive construction 2. Values obtained in No. 1 may be reduced by as much as 25% for occupancies having low contents fire hazard or may be increased by up to 25% surcharge for occupancies having a high fire hazard. Non-Combustible -25% Free Burning 15% Limited Combustible -15% 25% Rapid Burning 0% (No Change) Combustible Combustible 0% 0 L/min reduction 15,734 L/min Note: Flow determined shall not be less than 2,000 L/min

3. Sprinklers - The value obtained in No. 2 above maybe reduced by up to 50% for complete automatic sprinkler protection. The credit for the system will be a maximum of 30% for an adequately designed system conforming to NFPA 13 and other NFPA sprinkler standards. 10% may be granted if the water supply is standard for both the system and fire departement hose lines required. Additional credit of up to 10% may be given for a fully supervised system. Building will have automatic sprinklers 7,867 L/min reduction

Page 2

### Water Supply for Public Fire Protection Fire Underwriters Survey

### Part II - Guide for Determination of Required Fire Flow

4. Exposure - To the value obtained in No. 2, a percentage should be added for structures exposed within 45 metres by the fire area under consideration. The percentage shall depend upon the height, area, and construction of the building(s) being exposed, the separation, openings in the exposed building(s), the length and height of exposure, the provision of automatic sprinklers and/or outside sprinklers in the building(s) exposed, the occupancy of the exposed building(s) and the effect of hillside locations on the possible spread of fire.

Separation	Charge	Separation	Charge
0 to 3 m	25%	20.1 to 30 m	10%
3.1 to 10 m	20%	30.1 to 45 m	5%
10.1 to 20 m	15%		

#### **Exposed buildings**

Name	Distance	
North	Adjacent Dwelling 10.1 to 20115%	2360.13
South	Adjacent Dwelling >45 0%	0.00
West	Adjacent Commer 30.1 to 4515%	786.71
East	Adjacent Commer 30.1 to 4515%	786.71
		3,934 L/min Surcharge

Determine Required Fire Flow		
No.1	15,734	
No. 2	0 reduction	
No. 3	-7,867 reduction	
No. 4	<u>3,934</u> surcharge	
<b>Required Flow:</b>	11,801 L/min	
Rounded to nearest 1000 L/min:	12,000 L/min or	200.0 L/s
		3,170 USGPM
Required Volume		
12,000 L/	'min	
× 120 m	nin	
1,440,000 L		

Required Duration	of Fire Flow	
Flow Required		Duration
L/min		(hours)
2,000 or less		1.0
	3,000	1.25
	4,000	1.5
	5,000	1.75
	6,000	2.0
	8,000	2.0
	10,000	2.0
	12,000	2.5
	14,000	3.0
	16,000	3.5
	18,000	4.0
	20,000	4.5
	22,000	5.0
	24,000	5.5
	26,000	6.0
	28,000	6.5
	30,000	7.0
	32,000	7.5
	34,000	8.0

			36,000	8.5
			38,000	9.0
		40,000 and over		9.5
	-			



Date: 2018.02.07

Designed By: NRS Checked By: NC Updated: 2020.02.13

### Water Supply for Public Fire Protection Fire Underwriters Survey Results Summary

-

Phase	Number of	Floor Area	Demo	Duration	
	Units	(m³)	(L/s)	(USGPM)	Duralion
1	578	3752	133.3	2113	2.00
2	479	4218	150.0	2378	2.00
3	1743	7992	200.0	3170	2.50
	2800				

1000 - 2 Bloor Street East Toronto, Ontario, M4W 1A8 TEL **416.966.0220** 

10154 - 108 Street Edmonton, Alberta T5J 1L3 TEL **780.429.1580** 

300 – 134 11th Avenue SE Calgary, Alberta, T2G OX5 TEL 403.245.5501 406 - 611 Alexander Street Vancouver, BC, V6A 1E1 TEL 604.255.1169

July 05, 2018

DIALOG

Mr. Nick Constantin, P. Eng. Crosier and Associates Consulting Engineers 2800 High Point Drive, Suite 100 Milton, ON L9T 6P4 (905) 875-0026 Project No. 11153T

Re: Proposed Residential Development - 91 Eglinton Avenue E, Mississauga ON

Dear Nick:

This Letter serves to confirm that all buildings within this proposed development will be of noncombustible construction and sprinklered. All floor assemblies and vertical openings will have a minimum fire-resistance rating of 2 hours as per Ontario Building Code 3.2.2.42.

We trust that this letter is sufficient to address Development Engineering's request to confirm the type of building construction.

Sincerely,

minon Do

Simon Ko Principal

# APPENDIX B

Sanitary Sewer Demand Calculations



Project: 91 Eglinton Ave Project No.: 1525-4876 Prepared By: NRS Checked By: NC Date: 2020-02-05

#### Site Statistics 91 Eglinton Avenue, Mississauga

#### SUMMARY OF UNIT BREAKDOWN

Site	Single	Semi	Row	Apartment 2+	Apartment 1+	Total Units	Amenity Area
Phase 1	0	0	17.00	197.00	364.00	578.00	2895.78
Phase 2	0	0	0.00	168.00	311.00	479.00	2399.79
Phase 3	0	0	0.00	610.00	1133.00	1743.00	8732.43
Total	0.00	0.00	17.00	975.00	1808.00	2800.00	14028.00

#### SUMMARY OF POPULATION

Site	Single	Semi	Row	Apartment 2+	Apartment 1+	Amenity Area	Total Persons
Phase 1	0	0	59.50	500.38	611.52	14.48	1185.88
Phase 2	0	0	0.00	426.72	522.48	12.00	961.20
Phase 3	0	0	0.00	1549.40	1903.44	43.66	3496.50
Total	0	0	60	2477	3037	70	5644
Note: Based on the	e following PPL	J rates provid	ded by Alex Se	epe @ Region of	Peel (email de	ated Septen	nber 9, 2019)
	Single	4.15					
	Semi	4.15					

Row	3.5
Apartment 2+	2.54
Apartment 1+	1.68

Amenity area population based on 50 persons/ha per Region of Peel Public Works Design, Specifications & Procedures Manual - Linear Infrastructure - Sanitary Sewer Design Criteria (March, 2017) Section 2.1



Project: 91 Eglinton Ave Project No.: 1525-4876 Prepared By: AR Checked By: NRS Date: 2020-02-05

SANITARY CALCULA 91 Eglinton Avenue, Mis	[IONS ssissauga	
1185 88 porcons		
1.04 hg		
302.8 L/person * day		Region of Peel Public Works Design,
		Specifications & Procedures Manual - Linear Infrastructure - Sanitary Sewer
3.75		Design Criteria (March, 2017)
359084.13 L/day		
4.16 L/s		
1244020 40 L/day		
1540939.09 L/ddy		
10.07 2/3		Region of Peel Public Works Design,
0.0002 cms/ha		Specifications & Procedures Manual - Linear Infrastructure - Sanitary Sewer
0.00021 cms		Design Criteria (March, 2017) - 2.3
0.21 L/s		
15.80 L/s		
961 20 persons		
0.75 ha		
302.8 L/person * day		Region of Peel Public Works Design, Specifications & Procedures Manual -
3.81		Linear Infrastructure - Sanitary Sewer Design Criteria (March, 2017)
291051.04 L/day		
3.37 L/s		
1109199.9 L/day		
12.84 L/s		
0.0002 ametha		Region of Peel Public Works Design, Specifications & Procedures Manual -
0.0002 cms/nd		Linear Infrastructure - Sanitary Sewer
0.15 L/s		
	SANITARY CALCULAT 91 Eglinton Avenue, Mis           1185.88 persons 1.04 ha           302.8 L/person * day           3.75           359084.13 L/day           4.16 L/s           1346939.69 L/day           1.59 L/s           0.0002 cms/ha           0.0002 cms/ha           0.0002 cms/ha           0.0002 cms/ha           0.0002 cms/ha           0.21 L/s           15.80 L/s           961.20 persons           0.75 ha           302.8 L/person * day           3.81           291051.04 L/day           3.37 L/s           1109199.9 L/day           12.84 L/s           0.0002 cms/ha           0.0002 cms/ha	SANITARY CALCULATIONS 91 Eglinton Avenue, Mississauga         1185.88 persons 1.04 ha         302.8 L/person * day         3.75         359084.13 L/day         4.16 L/s         1346939.69 L/day         15.59 L/s         0.0002 cms/ha         0.0002 cms/ha         0.0002 cms/ha         0.0002 cms/ha         0.0002 cms/ha         0.21 L/s         15.80 L/s         961.20 persons         0.75 ha         302.8 L/person * day         3.81         291051.04 L/day         3.37 L/s         1109199.9 L/day         12.84 L/s         0.0002 cms/ha         0.0002 cms/ha         0.00015 cms

<u>Phase 3</u>	
Population	3496.50 persons
Area	1.56 ha
Average daily demand	302.8 L/person * day
Harmon Peaking Factor (M) M = 1+(14/(4+p^0.5))	3.39
Average Daily Flow	1058740.85 L/day
	12.25 L/s
Peak Flow	3583892.56 L/day
	41.48 L/s
Infiltration	0.0002 cms/ha 0.00031 cms <b>0.31 L/s</b>
Total Sanitary Flow	41.79 L/s
· · · · · · · · · · · · · · · · · · ·	



Project: 91 Eglinton Ave Project No.: 1525-4876 Prepared By: AR Checked By: NRS Date: 2020-02-05 Revised: 2020.02.13

### SANITARY CALCULATIONS 91 Eglinton Avenue Proposed Residential Development - Total

#### SUMMARY OF SANITARY DESIGN FLOWS

Phase	Number of Units	Population	Harmon Peaking Factor	Average Daily Flow (L/s)	Peak Flow (L/s)	Infiltration (L/s)	Total Sanitary Flow (L/s)
1	578	1186	3.75	4.16	15.59	0.21	15.80
2	479	961	3.81	3.37	12.84	0.15	12.99
3	1743	3497	3.39	12.25	41.48	0.31	41.79
Total	2800	5644		19.78	69.91	0.67	70.58
## **Nicole Segal**

From:	Mitra, Soyuz <soyuz.mitra@peelregion.ca></soyuz.mitra@peelregion.ca>
Sent:	Monday, July 9, 2018 2:54 PM
То:	Nicole Segal
Cc:	Miriam Polga; Nick Constantin
Subject:	FW: 91 Eglinton Ave E Internal Sanitary Upsizing (CFCA#1525-4876)
Follow Up Flag:	Follow up
Flag Status:	Completed

Hi Nicole,

Please see below the response from the wastewater team about your question. Let me know if you have any further questions.

Thanks

**Soyuz Mitra** P.Eng Project Manager, EA and Studies, Program Planning & Compliance

#### **The Region of Peel**

10 Peel Centre Drive, Suite A, 4<sup>th</sup> Floor, Brampton, L6T4B9 Tel. 905-791-7800 X 4550 Mob. 416-844-7543 Fax 905-791-1442 <u>Soyuz.mitra@peelregion.ca</u>



From: Motamedi, Kolsoom
Sent: July 9, 2018 2:35 PM
To: Mitra, Soyuz
Cc: Zhu, Hong; Polga, Miriam
Subject: RE: 91 Eglinton Ave E Internal Sanitary Upsizing (CFCA#1525-4876)

Hi,

The proposed sewers on the future Thornwood Drive from manhole number MH4 to MH5 and MH6 (below sketch) is 375 mm with a minimum slope of 0.5%.

The proposed sewer from the manhole number MH6 to the existing manhole on Eglinton Ave. East is 375 mm with 0.8 % slope.

Thanks and Regards,

Kolsoom Motamedi,



**From:** Nicole Segal [mailto:nsegal@cfcrozier.ca] **Sent:** July 6, 2018 12:06 PM **To:** Polga, Miriam

## **Cc:** Nick Constantin **Subject:** 91 Eglinton Ave E Internal Sanitary Upsizing (CFCA#1525-4876)

Good morning Miriam,

Nick Constantin and Nick Mocan from our office met with yourself and other Region staff on June 11, 2018 to discuss the water and wastewater servicing for 91 Eglinton Avenue East, Mississauga. During that meeting the Region indicated that upsizing of the proposed sanitary sewers on Thornwood Drive will be required to accommodate Summitview flows (Block 46).

Based on the attached Urban Tech schematic design can you please confirm the sewers which require upsizing, the required size, and confirm if the existing slopes shown are adequate?

Thank you, we appreciate your time! Regards,

| NICOLE SEGAL M.M.Sc., E.I.T. | C.F. CROZIER & ASSOCIATES | 2800 High Point Drive, Suite 100 | Milton, ON L9T 6P4 | <u>cfcrozier.ca</u> | <u>nsegal@cfcrozier.ca</u> | tel 905 875 0026



Land development engineering, from the ground up. Water Resources-Transportation-Structural-Mechanical-Electrical-Building Science

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## APPENDIX C

Stormwater Management Calculations



## Modified Rational Method - Summary

Туре	<b>Area</b> (ha)	Pre-Development RC	Post-Development Rc	Storage Required (m³)	Required Water Balance Storage (m <sup>3</sup> )
Phase 1	1.04			611	39
Phase 2	0.75	0.25	0.9	396	28
Phase 3	1.56			990	59
	3.35				



Project: 91 Eglinton Avenue East Project No.: 1525-4876 Date: 2020-02-05 Designed By: NRS/AR Checked By: NRS

	Modifie	d Rational A	Aethod - Inp	out Data	
Storm Data: City of Mississauga					References
Time of Concentration:		15	min =	= 0.25 hours = 900 sec	
Return Period	Α	В	С	i	City of Mississauga
				mm/hr	Manual (2.01.01.01)-
2 yr	610	4.6	0.78	59.89	September 2016
5 yr	820	4.6	0.78	80.51	
10 yr	1010	4.6	0.78	99.17	
25 yr	1160	4.6	0.78	113.89	
50 yr	1300	4.7	0.78	127.13	
100 yr	1450	4.9	0.78	140.69	
Pre-Developm	ent				
	Area	Area		Runoff in 100-	1
Land Use	(ha)	(m <sup>2</sup> )	С	year storm	
Phase 1	1.04	10432	0.25	0.31	Assume entire area is grass
Phase 2	0.75	7518	0.25	0.31	
Phase 3	1.56	15617	0.25	0.31	
Total Site	3.35	33567			
Post- Developm	nent				
Land Use	Area	Area		Runoff in 100-	Runoff coefficient based on
	(ha)	(m <sup>2</sup> )	C	year storm	from City of Mississauga
Phase 1: Catchment 201	0.94	9400	0.9	1.00	Development Requirements
Catchment UC13	0.05	500	0.5	0.63	Manual (2.01.01.01) -
	0.03	300	0.5	0.63	September 2016
Phase 1 Total	1.04	200	0.5	0.63	-1
Phase 2. Catchment 202	0.72	7200	0.9	1 00	4
Catchment IIC14	0.72	300	0.5	0.63	-
Phase 2 Total	0.75	7.500			4
Phase 3: Catchment 203	1.46	14600	0.9	1.00	-1
Catchment UC17	0.05	500	0.5	0.63	1
Catchment UC18	0.05	500	0.5	0.63	1
Phase 3 Total	1.56	15600			1
Total Site	3.35	33500			1
Note: For city of Mississauga appl	y adjusmer	nt tactor to F	C as follows	S	
	iu-year	1.0			
	∠o-year	1.1			
	100 year	1.2			
	roo-year	1.25			I



Project: Project No.: 91 Eglinton Avenue East 1525-4876

Revised: 2020-02-06

## MODIFIED RATIONAL METHOD - Phase 1 Release rate

#### MUNICIPALITY: City of Mississauga

Target Control Rate:	0.02	m3/s
	10.70	L/ J
Orifice Type:	Tube	
Invert Elevation:	169.15	m
Diameter of Orifice:	100	mm
Area of Orifice (A):	0.0079	sq.m
Orifice Coefficient (Cd):	0.850	
Calculation of Head		
Centroid Elevation:	169.20	m
Water Elevation:	169.60	m
Upstream Head*, (h):	0.40	m
Qa:	(Cd)(A)(2ab)0.5	
Actual Controlled Discharge Qa:	0.0187	cms
, cital comolea Discharge, qu	18.70	L/s

\*Head is based upon orifice area @ orifice face not Vena Contracta



A (ha)

Date: 2020-02-05 Designed By: NRS/AR Checked By: NRS

## MODIFIED RATIONAL METHOD - 100-year post to 2-year pre - PHASE 1

MUNICIPALITY: City of Mississauga

	Target Flow	v Rate				
	С	i (mm/hr)	A (ha)	Q (m3/s)	Q (L/s)	
Phase 1	0.25	59.89	1.04	0.043	43.42	2-year pre-development peak flow
Catchment UC13	0.63	140.69	0.05	0.012	12.22	100-year post-development uncontrolled
Catchment UC14	0.63	140.69	0.03	0.007	7.33	100-year post-development uncontrolled
Catchment UC15	0.63	140.69	0.02	0.005	4.89	100-year post-development uncontrolled
	Target Control Rate for Catchment 201			0.019	18.98	
	Actual Control Rate (Orifice)				18.70	-

Q (m3/s)

Qpost(L/s)

## 100-yr Post-Development Peak Flow

i (mm/hr)

С

Catchment 201 1.00

1.00	140.69	0.94	0.37	367.65
	Storag	ge Volume Dete	ermination	
T <sub>d</sub>	i	T <sub>d</sub>	Q	S <sub>d</sub>
min	mm/hr	sec	m <sup>3</sup> /s	m³
10	176.31	600	0.46	262.42
25	102.41	1500	0.27	378.99
40	74.58	2400	0.19	436.88
55	59.56	3300	0.16	474.37
70	50.03	4200	0.13	501.46
85	43.39	5100	0.11	522.23
100	38.47	6000	0.10	538.71
115	34.66	6900	0.09	552.11
130	31.62	7800	0.08	563.15
145	29.12	8700	0.08	572.35
160	27.04	9600	0.07	580.05
175	25.26	10500	0.07	586.51
190	23.73	11400	0.06	591.94
205	22.40	12300	0.06	596.47
220	21.22	13200	0.06	600.24
235	20.18	14100	0.05	603.33
250	19.25	15000	0.05	605.83
265	18.41	15900	0.05	607.79
280	17.65	16800	0.05	609.29
295	16.96	17700	0.04	610.35
310	16.32	18600	0.04	611.03
325	15.74	19500	0.04	611.36
340	15.20	20400	0.04	611.36
355	14.71	21300	0.04	611.06
370	14.25	22200	0.04	610.49
385	13.82	23100	0.04	609.66
400	13.42	24000	0.04	608.60
415	13.04	24900	0.03	607.31
430	12.69	25800	0.03	605.82
445	12.36	26700	0.03	604.14
	RE	QUIRED STORAG	GE VOLUME:	611.36

EQUATIONS:

**Intensity** 

Peak Flow  $Q_{pre} = 0.00278 \bullet C_{pre} \bullet i_{(Td)} \bullet A$ 

<u>Storage</u>  $S_d = Q_{post} \bullet T_d - Q_{pre} (T_d + T_c) / 2$ 

## WATER BALANCE

Infiltrate based on 5mm across impervious area Impervious Area: 0.78 ha Storage Required:

39 m3



Project: Project No.: 91 Eglinton Avenue East 1525-4876

Revised: 2020-02-06

## MODIFIED RATIONAL METHOD - Phase 2 Release rate

#### MUNICIPALITY: City of Mississauga

Target Control Rate:	0.02 23.96	m3/s L/s
Orifice Type: Invert Elevation:	Tube 169.92	m
Area of Orifice (A): Orifice Coefficient (Cd):	75 0.0044 0.850	mm sq.m
Calculation of Head	169.96	m
Water Elevation: Upstream Head*, (h):	171.94 1.98	m m
Qa: Actual Controlled Discharge, Qa:	(Cd)(A)(2gh)^0.5 0.0234	cms

\*Head is based upon orifice area @ orifice face not Vena Contracta

23.42

L/s



## MODIFIED RATIONAL METHOD - 100-year post to 2-year pre - PHASE 2

## MUNICIPALITY: City of Mississauga

	Target Flov	w Rate				
	С	i (mm/hr)	A (ha)	Q (m3/s)	Q (L/s)	
Phase 2	0.25	59.89	0.75	0.031	31.29	2-year pre-development peak flow
Catchment UC16	0.63	140.69	0.03	0.007	7.33	100-year post-development uncontrolled
	Target Control Rate for Catchment 202			0.024	23.96	
		Actual Co	ntrol Rate (Orifice)	0.023	23.42	-

## 100-yr Post-Development Peak Flow

	С	i (mm/hr)	A (ha)	Q (m3/s)	Qpost(L/s)
Catchment 202	1.00	140.69	0.72	0.28	282.31

	Storage Volume Determination					
T <sub>d</sub>	i	T <sub>d</sub>	Q	S <sub>d</sub>		
min	mm/hr	sec	m <sup>3</sup> /s	m³		
10	176.31	600	0.35	194.71		
25	102.41	1500	0.21	279.49		
40	74.58	2400	0.15	319.63		
55	59.56	3300	0.12	344.10		
70	50.03	4200	0.10	360.58		
85	43.39	5100	0.09	372.21		
100	38.47	6000	0.08	380.55		
115	34.66	6900	0.07	386.51		
130	31.62	7800	0.06	390.67		
145	29.12	8700	0.06	393.41		
160	27.04	9600	0.05	395.01		
175	25.26	10500	0.05	395.65		
190	23.73	11400	0.05	395.50		
205	22.40	12300	0.04	394.66		
220	21.22	13200	0.04	393.23		
235	20.18	14100	0.04	391.28		
250	19.25	15000	0.04	388.88		
265	18.41	15900	0.04	386.07		
280	17.65	16800	0.04	382.90		
295	16.96	17700	0.03	379.40		
	REQUIRED STORAGE VOLUME: 395.65					

EQUATIONS:

<u>Intensity</u> I = A/(tc+B)^C  $\frac{\text{Peak Flow}}{\text{Q}_{\text{pre}}} = 0.00278 \bullet \text{C}_{\text{pre}} \bullet \text{i}_{(\text{Td})} \bullet \text{A}$ 

<u>Storage</u>  $S_d = Q_{nost} \bullet T_d - Q_{nre} (T_d + T_c) / 2$ 

## WATER BALANCE

Infiltrate based on 5mm across impervious area Impervious Area: 0.56 ha Storage Required: 28 m3



Project: Project No.: 91 Eglinton Avenue East 1525-4876

Revised: 2020-02-06

## MODIFIED RATIONAL METHOD - Phase 3 Release rate

#### MUNICIPALITY: City of Mississauga

Target Control Rate:	0.04	m3/s
	40.36	L/S
Orifice Type:	Tube	
Invert Elevation:	169.19	m
Diameter of Orifice:	75	mm
Area of Orifice (A):	0.0044	sq.m
Orifice Coefficient (Cd):	0.850	
Calculation of Head		
Centroid Elevation:	169.23	m
Water Elevation:	171.60	m
Upstream Head*, (h):	2.37	m
Qa:	(Cd)(A)(2gh)^0.5	
Actual Controlled Discharge, Qa:	0.0256	cms
	25.62	L/s

\*Head is based upon orifice area @ orifice face not Vena Contracta



Project: 91 Eglinton Avenue East Project No.: 1525-4876 Date: 2020-02-05 Designed By: NRS/AR Checked By: NRS

## MODIFIED RATIONAL METHOD - 100-year post to 2-year pre - PHASE 3

## MUNICIPALITY: City of Mississauga

	Target Flov	w Rate				
	С	i (mm/hr)	A (ha)	Q (m3/s)	Q (L/s)	
Phase 3	0.25	59.89	1.56	0.065	65.01	2-year pre-development peak flow
Catchment UC17	0.63	140.69	0.05	0.012	12.22	100-year post-development uncontrolled
Catchment UC18	0.63	140.69	0.05	0.012	12.22	100-year post-development uncontrolled
	Target Control Rate for Catchment 203			0.041	40.56	
		Actual Co	ntrol Rate (Orifice)	0.026	25.62	-

## 100-yr Post-Development Peak Flow

	-	-			
	С	i (mm/hr)	A (ha)	Q (m3/s)	Qpost(L/s)
Catchment 203	1.00	140.69	1.46	0.57	571.70

Storage Volume Determination								
T <sub>d</sub>	i	T <sub>d</sub>	Q	S <sub>d</sub>				
min	mm/hr	sec	m <sup>3</sup> /s	m³				
10	176.31	600	0.72	410.65				
25	102.41	1500	0.42	593.48				
40	74.58	2400	0.30	685.05				
55	59.56	3300	0.24	744.91				
70	50.03	4200	0.20	788.60				
85	43.39	5100	0.18	822.45				
100	38.47	6000	0.16	849.64				
115	34.66	6900	0.14	872.02				
130	31.62	7800	0.13	890.76				
145	29.12	8700	0.12	906.61				
160	27.04	9600	0.11	920.15				
175	25.26	10500	0.10	931.76				
190	23.73	11400	0.10	941.75				
205	22.40	12300	0.09	950.36				
220	21.22	13200	0.09	957.77				
235	20.18	14100	0.08	964.14				
250	19.25	15000	0.08	969.58				
265	18.41	15900	0.07	974.20				
280	17.65	16800	0.07	978.08				
295	16.96	17700	0.07	981.29				
310	16.32	18600	0.07	983.90				
325	15.74	19500	0.06	985.96				
340	15.20	20400	0.06	987.52				
355	14.71	21300	0.06	988.62				
370	14.25	22200	0.06	989.28				
385	13.82	23100	0.06	989.56				
400	13.42	24000	0.05	989.46				
415	13.04	24900	0.05	989.02				
430	12.69	25800	0.05	988.26				
445	12.36	26700	0.05	987.20				
460	12.05	27600	0.05	985.86				
475	11.75	28500	0.05	984.26				
490	11.47	29400	0.05	982.40				
505	11.21	30300	0.05	980.31				
520	10.96	31200	0.04	978.00				
535	10.72	32100	0.04	975.47				
550	10.49	33000	0.04	972.75				
565	10.28	33900	0.04	969.83				
580	10.07	34800	0.04	966.73				
595	9.87	35700	0.04	963.46				
610	9.69	36600	0.04	960.02				
625	9.50	37500	0.04	956.43				
640	9.33	38400	0.04	952.68				
	RE	EQUIRED STORA	ge volume:	989.56				

EQUATIONS:







## WATER BALANCE

Infiltrate based on 5mm across impervious area

Impervious Area:1.17haStorage Required:59m3

I:\1500\1525-91 Eglinton Ltd Partnership\4876-91 Eglinton Ave E\Design\Civil\_Water\2020.02.05 New Site Plan and Stats\4876\_ Updated MRM

## **Nicole Segal**

From:	Kent S Campbell <kent.campbell@forterrabp.com></kent.campbell@forterrabp.com>
Sent:	Friday, July 20, 2018 9:43 AM
То:	Nicole Segal
Cc:	Isabelle Cleroux; Brandon O'Leary
Subject:	RE: 1525-4876 Stormceptor Sizing
Attachments:	Stormceptor Technical Bulletin - Comparative Sizing for ETV & Stormceptor Fine PSDs
	4-23-18.pdf; ISO-14034-Verification-StatementStormceptor_2017-11-10.pdf

Hello Ladies,

It was great talking to you this morning Nicole. I appreciate your patience with my "long winded" Canadian ETV OGS protocol – 60% TSS efficiency vs 80% efficiency for coarser PSD – explanation for Stormceptor EF/EFO sizing. I have attached the Imbrium Tech bulletin I mentioned as well as the Stormceptor EF/EFO ISO verification statement for the Canadian ETV testing program. Thanks too for getting me up to date on your new offices in Bradford and downtown. Please don't hesitate to get back to me if you need the sizing report format we discussed and good luck with your submission.

Have a great weekend,



For the newest version of PCSWMM please visit the Imbrium website at www.imbriumsystems.com

Kent Campbell Stormwater Specialist Cambridge Plant Phone 888-888-3222 **Cell 519 588-7473** kent.campbell@forterrabp.com **Stormceptor Protecting the water for future generations** 

From: Isabelle Cleroux [mailto:icleroux@cfcrozier.ca]
Sent: Thursday, July 19, 2018 1:59 PM
To: Kent S Campbell
Cc: Nicole Segal
Subject: 1525-4876 Stormceptor Sizing

Good afternoon Kent,

I am in the process of sizing a Stormceptor for a project but I am having trouble determining which particle size distribution I should be using. The site is in the City of Mississauga and we are looking at a minimum TSS removal of 80%. When trying to use CA ETV as the particle size distribution, the tool does not allow us to use a removal rate of 80%. Would you be able to guide me towards the particle size distribution I need for this site?

Thank you in advance for your help,

## | **ISABELLE CLEROUX** | ENGINEERING ASSISTANT | C.F. CROZIER & ASSOCIATES

| 2800 High Point Drive, Suite 100 | Milton, ON L9T 6P4

| cfcrozier.ca | icleroux@cfcrozier.ca | tel 905 875 0026



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## **TECHNICAL BULLETIN**

## Sizing Stormceptor<sup>®</sup> EF/EFO for Removal of Canadian ETV and Stormceptor Fine Particle Size Distributions

(Issued April 23, 2018)

The Canadian ETV Particle Size Distribution ("ETV PSD", shown in Table 1 below) is reasonably representative of the PSD of particulates found in typical urban stormwater runoff, and was used in sediment removal and scour performance testing of Stormceptor<sup>®</sup> EF/EFO in compliance with the provisions of the Canadian ETV protocol titled *Procedure for Laboratory Testing of Oil-Grit Separators*. Municipalities across Canada are increasingly adopting the sediment removal target of 60% removal of the ETV PSD when sizing an oil-grit separator for pretreatment of stormwater runoff, replacing former sediment removal targets that were based on removal of coarser particle size distributions.

Imbrium Systems supports and recommends adoption of 60% removal of the ETV PSD as a Canada-wide standard for sizing of Stormceptor® EF/EFO. However, it is recognized that in some areas there may continue to be sediment removal targets that are based on removal of coarser particle size distributions. Imbrium engineers have performed extensive sizing analyses to determine the estimated removal efficiency of various coarser PSDs as compared to 60% removal of the ETV PSD. Removal efficiencies were calculated for a wide range of influent flow rates, utilizing Stokes' Law for particle settling and the dimensions and hydraulic capacities of each Stormceptor model size.

Based on these analyses, sizing Stormceptor<sup>®</sup> EF/EFO for 60% removal of the ETV PSD is comparable to sizing for 80% removal of the Stormceptor Fine PSD.



Particle	Percent Less	Particle Size	Dorcont
Size (µm)	Than	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

Table 1:	Particle Size	Distribution o	f Test Sediment
TUDIC I.	i un croic bize	Distribution	i i cococonticite

The particle size distribution shown in Table 1 above is the Canadian ETV Particle Size Distribution ("ETV PSD") specified in the Canadian ETV protocol titled *Procedure for Laboratory Testing of Oil-Grit Separators*.

## Stormceptor\*



## **Project Summary Report: 91 Eglinton Stormceptor Sizing**

	Project Information	& Location	
Project Name	91 Eglinton	Project Number	1525-4876
City	Mississauga	State/ Province	Ontario
Country	Canada	Date	2/6/2020
<b>Designer Information</b>		EOR Information (o	ptional)
Name	Nicole Segal	Name	
Company	C.F. Crozier & Associates	Company	
Phone #	905-875-0026	Phone #	
Email	nsegal2@live.com	Email	

#### **Stormwater Treatment Recommendation**

The recommended Stormceptor Model(s) which achieve or exceed the user defined water quality objective for each site within the project are listed in the below Sizing Summary table.

Project Summary										
Site Name	Drainage Area (ha)	Imperviousness %	PSD	Target TSS Removal (%)	TSS Removal (%) Provided	Recommended Model				
91 Eglinton - Phase 2	0.75	75.00		60	63	EF6				
91 Eglinton - Phase 1	1.04	75.00		60	61	EF6				
91 Eglinton - Phase 3	1.56	75.00		60	63	EF8				
Notes										

• Stormceptor performance estimates are based on simulations using PCSWMM for Stormceptor, which uses the EPA Rainfall and Runoff modules.

• Design estimates listed are only representative of specific project requirements based on total suspended solids (TSS) removal defined by the selected PSD, and based on stable site conditions only, after construction is completed.

• For submerged applications or sites specific to spill control, please contact your local Stormceptor representative for further design assistance.



ST	ORM SEWE	R DESIG	N SHEE	т				P	ROJECT DET/	AILS			DESIGN CRITERIA							
SUM	10 Year St IMIT EGLIN City of	orm (Ultim NTON INC Mississauga	ate) C., T-90(	04			Pr Des Cho	oject No: Date: Igned by: ecked by:	12-029W 28-Jul-14 ZS AH					Min. Diameter = Mannings 'n'= Starting Tc =	n. Diameter = 300 mm Rainfall Intensity = <u>A</u> Mannings 'n'= 0.013 $(Tc+B)^{c}$ Starting Tc = 15 min A = 1010 B = 4.6 C= 0.78 NOMINAL PIPE SIZE				- SIZE USED	
STREET	FROM MH	то мн	AREA (ha)	RUNOFF COEFFICIENT "R"	'AR'	ACCUM. 'AR'	RAINFALL INTENSITY (mm/hr)	FLOW (m3/s)	CONSTANT CONTROLLED 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 (mîn)	TIME OF CONCENTRATION (min)	ACC. TIME OF CONCENTRATION (min)	PERCENT FULL (%)
				<u> </u>	r	I	-						[							
Preston Meadow Ave	5	4	0.20	0.60	0.12	0.12	99.2	0.033			0.033	30.0	0.50	375	0.124	1.12	15.00	0.45	15.45	27%
Preston Meadow Ave	4	3	0.53	0.45	0.24	0.36	97.4	0.097			0.097	91.8	0.50	525	0.304	1.40	15.45	1.09	16.53	32%
Kanaaut Duine			0.11	0.00	0.10	0.10	00.2	0.007			0.027	24.1	1.00	200	0.007	1.27	15.00	0.20	15 30	790/-
Block 45	o Plua	12	0.11	0.90	0.10	0.10	99.2	0.027	0.023	0.023	0.027	24.1	1.00	300	0.097	1.37	15.00	0.29	15.10	20%
Diden 15	1109		0.55	0.00	s .		33.2		0.025	0.025	0.025	0.3	1.00	300	0.057		15100	0110	10120	
Kencourt Drive	12	3				0.10	98.0	0.026		0.023	0.049	36.0	1.00	300	0.097	1.37	15.29	0.44	15.73	51%
Preston Meadow Ave	3	2	0.47	0.45	0.21	0.67	93.5	0.173		0.023	0.196	87.6	0.50	600	0.434	1.54	16.53	0.95	17.49	45%
	2	1	0.23	0.45	0.10	0.77	90.3	0.193		0.023	0.216	33.3	1.80	600	0.824	2.91	17.49	0.19	17.68	26%
Block 44	Plug	1	0.76	0.60			99.2		0.031	0.031	0.031	12.0	1.00	375	0.175	1.59	15.00	0.13	15.13	18%
																	17.00	0.35	47.00	2.40/
Preston Meadow Ave	1	EX. 2	0.25	0.60	0.15	0.92	89.7	0.230		0.054	0.284	43.3	1.80	600	0.824	2.91	17.68	0.25	17.92	34%
Thronwood/Block 48	EX. 1	EX. 2	0.20	0.90	0.18	0.18	99.2	0.051			0.051	17.7	1.19	675	0.917	2.56	15.00	0.12	15.12	6%
Forum Drive	EX. 2	EX. 3	0.13	0.90	0.11	1.22	89.0	0.301		0.054	0.355	40.5	0.99	675	0.836	2.34	<i>17.9</i> 2	0.29	18.21	42%
Armdale Road	10	7	0.22	0.90	0.20	0.20	99.2	0.054			0.054	67.0	0.50	300	0.068	0.97	15.00	1.15	16.15	79%
Block 46	TEMP. DICB1	7	1.22	0.75			99.2		0.051	0.051	0.051	19.5	1.00	450	0.285	1.79	15.00	0.18	15.18	18%
Armdale Road	9	8	0.31	0.90	0.27	0.27	99.2	0.076			0.076	3.0	1.00	300	0.097	1.37	15.00	0.04	15.04	78%
Belbin St./Armdale Road	8	7	0.25	0.90	0.23	0.50	99.0	0.137	İ		0.137	46.5	0.50	450	0.202	1.27	15.04	0.61	15.65	68%
Existing Plaza	7	11				0.70	94.8	0.183		0.051	0.234	11.5	1.25	525	0.481	2.22	16.15	0.09	16.24	49%
Existing Plaza	- 11	EX. 9	0.23	0.75	0,17	0.87	94.5	0.227		0.051	0.278	40.8	1.50	525	0.527	2.43	16.24	0.28	16.52	53%
Existing Plaza	EX. 9	EX. 8		0.75	0.74	0.87	93.6	0.225		0.051	0.276	22.8	0.57	525	0.325	1.50	16.52	0.25	16.77	85%
Existing Plaza	EX. 8	EX. /	0.46	0.75	0.34	2.24	92.7	0.311		0.051	0.362	48.8	0.74	600	0.528	1.8/	10.//	0.44	17.21	00%
LAISUNY FIOLO	1.7	24.0	1.51	0.75	1.15	4.57	71.2	0.332			0.045	07.2	0.75	015	0.710	2,01	17.41	0.72	17.75	5010
Fut Armdale Road	FUT. 2	FUT. 1	0.18	0.90	0.16	0.16	99.2	0.045			0.045	58.9	1.00	300	0.097	1.37	15.00	0.72	15.72	46%
Fut Armdale Road	FUT. 1	8	0.12	0.90	0.11	0.27	99.2	0.076	··· —		0.076	61.1	1.00	300	0.097	1.37	15.00	0.74	15.74	78%
H			0.50	0.70	0.07						0.050					4.37	45.00	0.54	46.54	710/
Fut, Armdale Road		FUI.3 FIT 4	0.50	0.50	0.25	0.25	99.2	0.069			0.069	44.1	1.00	300	0.097	1.37	15.00	0.54	15.54	71%
Fut. Armdale Road	FUT. 4	FUT. 5	0.38	0.66	0.25	0.50	95.1	0.133			0.133	18.1	0.50	450	0.202	1.27	16.09	0.24	16.33	66%
Fut. Thronwood Drive	FUT. 5	FUT. 6	0.26	0.90	0.23	0.74	94.2	0.192	··· ·		0.192	88.5	0.20	600	0.275	0.97	16.33	1.52	17.85	70%
Fut. Thronwood Drive	<u> </u>	FUT. 6	2.00	0.50	1.00	1.00	307.2	0.853			0.853			.						
Fut, Infonwood Drive			0.83	0.45	0.37	0.37	 207.2	0.319			0.319	86.1	0.20	875	0.647	120	17.85	1.19	19.04	97%
		101.7	0.51	0.50	0.20	2.37	09.2	U.J72			V.J72	00.1	0.20	023	0.072	1.20		4.17	17.01	<i>72 1</i> 0
Exsitng Eglinton Ave. E	<u> </u>	EX. 17	0.80	0.75	0.60	2.99	85.7	0.711			0.711	97.7	1.00	900	1.810	2.85	19.04	0.57	19.62	39%
Exsitng Eglinton Ave. E	EX. 17	EX. 18		0.75		2.99	84.1	0.698		]	0.698	85.0	1.00	900	1.810	2.85	19.62	0.50	20.11	39%
Exsiting Eglinton Ave. E	EX. 18	EX. 6	0.55	0.75	0.41	3.40	82.8	0,782		0.051	0.782	56.3	1.00	900	1,810	2.85	20.11	0.33	20.44	43% 75%
Essary Lyminon Ares L	2/11/0	271.17		L 1.0		5.77		1.500		0.001	1,337		1.00	,,,,,	1.010	2,00				
Note: Runoff from Blocks	44 45 and 46 wi	ill he controlled	to 2 vear	nra.devalonme	ont loval														-	

Urbantech Consulting, A Division of Leighton-Zec Ltd. 25 Royal Crest Court, Suite 201 Markham, Ontario L3R 9X4 TEL: 905.946.9461 FAX: 905.946.9595 www.urbantech.com

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				91 Eg Storm	linton Avenue East SEWER DESIGN SHE	ET							I	PROJECT: PROJECT No.: FILE: DATE:	91 Eglinton Av 1525-4876 Storm Sewer E February 6, 20	enue East Design 20
				10 YEAR DESIGN	I STORM - CITY OF MISS	ISSAUGA <sup>1</sup>								Revised:	February 6, 20	20
Α	1010	В	4.6	C	0.78									Design:	NRS	-
										-				Updated By:	AR	
		ATION ( )	15.00										I	Reviewed By:	NRS	
al IIME Of		AIION (min)	15.00						MAI	NNINGS "n	0.013					
A v C				0		ACCUM.			SLOPE	PIPE	VEL.	INITIAL		ACC. TIME		% Capacity
AXC	AXC	min	ı mm/hr	m3/sec	m3/s	m3/s	G m3/s	m	3LOFE	DIA. mm	m/sec	min	min	or conc.	m3/s	
				110,500	110/0	110/5	110/5		/0		111/3000					
0.65		15.00	99.2		0.023	0.023	0.023									
0.02	0.02	15.00	99.2	0.004			0.004									
0.06	0.08	15.00	99.2	0.022		0.023	0.045	58.9	1 00	300	1.37	15.00	0.72	1.5 72	0.097	46%
0.05	0.13	15.72	96.4	0.035		0.023	0.059	60.8	1.00	300	1.37	15.72	0.74	16.46	0.097	61%
							0.059									
0.05	0.05	15.00	99.2	0.012			0.012	44.1	1.00	300	1.37	15.00	0.54	15.54	0.097	13%
0.01	0.01	15.00	99.2	0.003			0.003									
0.09	0.15	15.54	97.1	0.039			0.039	45.4	1.00	375	1.59	15.54	0.48	16.01	0.175	22%
0.02	0.02	15.00	99.2	0.004			0.004									
0.07	0.07	15.00	99.2	0.018			0.018									
0.09	0.17	15.00	99.2	0.047			0.047	39.6	0.50	300	0.97	15.00	0.68	15.68	0.068	69%
0.04	0.04	16.01	95.3	0.010			0.010	15.5	0.50	300	0.97	16.01	0.27	16.28	0.068	14%
0.01	0.01	15.00	99.2	0.003			0.003									
0.17	0.17	15.00	99.2	0.045			0.045									
0.21	0.59	16.28	94.4	0.154			0.154	93.0	0.20	600	0.97	15.68	1.60	17.28	0.275	56%
0.03	0.03	15.00	99.2	0.007			0.007									
0.03	0.03	15.00	99.2	0.007			0.007									
1.31		15.00	99.2		0.026	0.026	0.026									
0.85		15.00	99.2		0.019	0.044	0.044									
0.16	0.80	17.28	91.0	0.202		0.044	0.247	68.0	0.20	825	1.20	17.28	0.94	18.22	0.642	38%
	0.80	18.22	88.1	0.196		0.044	0.240	13.0	0.20	825	1.20	18.22	0.18	18.40	0.642	37%
							0 240									

	<b>CROZIER</b> ASSOCIATES onsulting Engineers			INIITI			B	<b>4.6</b>	91 Eg STORM 10 YEAR DESIGN C	glinton Avenue Eas SEWER DESIGN SHI N STORM - CITY OF MISS 0.78	t EET SISSAUGA <sup>1</sup>					" 0.013		I	PROJECT: 9 'ROJECT No.: FILE: 9 DATE: Revised: Design: Updated By: Reviewed By:	91 Eglinton Av 1525-4876 Storm Sewer E February 6, 20 February 6, 20 NRS AR NRS	venue East Design 020 020
	EDOM	TO		PUN	AL IIME OF	CUMPENIK		15.00		CONSTANT		τοται		MAN	DIDE	0.013		TIAAE			
STREET	MH	мн	AREA (A)	OFF	AxC		CONC.	I.	Q	CONTROLLED Q	CONSTANT Q	Q	LENGTH	SLOPE	DIA.	VEL.	Tc		OF CONC.	CAPACITY	% Capacity
			На	COEFF			min	mm/hr	m3/sec	m3/s	m3/s	m3/s	m	%	mm	m/sec	min	min	min	m3/s	/• • • • • • • • • • • • • • • • • • •
Fut. Armdale Road	202	PR. MH8	0.72	0.90	0.65		15.00	99.2		0.023	0.023	0.023									
Fut. Armdale Road	UC16	PR. MH8	0.03	0.50	0.02	0.02	15.00	99.2	0.004			0.004									
Fut. Armdale Road	PR. MH7 (UC2)	PR. MH8	0.07	0.90	0.06	0.08	15.00	99.2	0.022		0.023	0.045	58.9	1.00	300	1.37	15.00	0.72	15.72	0.097	46%
Fut. Armdale Road	PR. MH8 (UC1)	EX. MH8	0.06	0.90	0.05	0.13	15.72	96.4	0.035		0.023	0.059	60.8	1.00	300	1.37	15.72	0.74	16.46	0.097	61%
	Total Flow to E	xisting MH 8	6									0.059									
Fut. Armdale Road	PR. MH7 (UC3)	PR. MH6	0.05	0.90	0.05	0.05	15.00	99.2	0.012			0.012	44.1	1.00	300	1.37	15.00	0.54	15.54	0.097	13%
Fut. Armdale Road	UC5	PR. MH5	0.02	0.50	0.01	0.01	15.00	99.2	0.003			0.003									
Fut. Armdale Road	PR. MH6 (UC4)	PR. MH5	0.10	0.90	0.09	0.15	15.54	97.1	0.039			0.039	45.4	1.00	375	1.59	15.54	0.48	16.01	0.175	22%
Fut. Armdale Road	UC6	PR. MH4	0.03	0.50	0.02	0.02	15.00	99.2	0.004			0.004									
Fut. Armdale Road	Park (UC12)	PR. MH4	0.13	0.50	0.07	0.07	15.00	99.2	0.018			0.018									
Fut. Armdale Road	PR. MH4A (UC7)	PR. MH4	0.10	0.90	0.09	0.17	15.00	99.2	0.047			0.047	39.6	0.50	300	0.97	15.00	0.68	15.68	0.068	69%
Fut. Armdale Road	PR. MH5 (UC8)	PR. MH4	0.04	0.90	0.04	0.04	16.01	95.3	0.010			0.010	15.5	0.50	300	0.97	16.01	0.27	16.28	0.068	14%
Fut. Thornwood Drive	UC15	PR. MH3	0.02	0.50	0.01	0.01	15.00	99.2	0.003			0.003									
Fut. Thornwood Drive	Park (UC11)	PR.MH3	0.33	0.50	0.17	0.17	15.00	99.2	0.045			0.045									
Fut. Thornwood Drive	PR. MH4 (UC9)	PR. MH3	0.23	0.90	0.21	0.59	16.28	94.4	0.154			0.154	93.0	0.20	600	0.97	15.68	1.60	17.28	0.275	56%
Fut. Thornwood Drive	UC18	PR.MH2	0.05	0.50	0.03	0.03	15.00	99.2	0.007			0.007									
Fut. Thornwood Drive	UC13	PR. MH2	0.05	0.50	0.03	0.03	15.00	99.2	0.007			0.007									
Fut. Thornwood Drive	203.00	PR. MH2	1.46	0.90	1.31		15.00	99.2		0.026	0.026	0.026									
Fut. Thornwood Drive	201.00	PR. MH2	0.94	0.90	0.85		15.00	99.2		0.019	0.044	0.044									
Fut. Thornwood Drive	PR. MH3 (UC10)	PR. MH2	0.18	0.90	0.16	0.80	17.28	91.0	0.202		0.044	0.247	68.0	0.20	825	1.20	17.28	0.94	18.22	0.642	38%
Fut. Thornwood Drive	PR. MH2	PR. MH1				0.80	18.22	88.1	0.196		0.044	0.240	13.0	0.20	825	1.20	18.22	0.18	18.40	0.642	37%
	Total Flow	/ to PR. MH 1										0.240									

Notes: 1. A, B, and C coefficients as per City of Mississauga Design Requirements

## APPENDIX D

Region's Water and Wastewater Analysis

PUBLIC WORKS Water and Wastewater Program Planning

## 91 Eglinton Avenue East – City of Mississauga

# Analysis in support of the growth-related water and wastewater servicing plan



## 91 Eglinton Avenue East – City of Mississauga

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## **Executive Summary**

The City of Mississauga is proposing to develop the 91 Eglinton Avenue East Block, located on the northeast corner of Eglinton Avenue East and Hurontario Street. A water and wastewater servicing study is required to evaluate the servicing alternatives and develop a servicing strategy which will align with the Region's current Water and Wastewater Master Servicing Plan.

The proposed development is located within the City of Mississauga and is one block south of Nahani Way, one block east of Hurontario Street, west of Forum Drive, and is north of Eglinton Avenue East. The total site area is about 11 acres. The proposed land use within the proposed development area is entirely comprised of residential land use as per the data provided by the developers at the time of this report.

Planning	Water Servicing	Wastewater Servicing	
Key Concepts	Key Concepts	Key Concepts	
<ul> <li>The proposed development is contained completely within a single SGU (M1347).</li> <li>Residential population projections for the proposed development are beyond the Region's future 2041 projections (SGU Scenario 15).</li> <li>Development is proposed in an area where potential intensification can occur around the area.</li> <li>The proposed development consists of 7 residential towers.</li> </ul>	<ul> <li>Water servicing to the development will be provided entirely by Pressure Zone 4.</li> <li>Beckett Sproule, Hanlan, Streetsville and Meadowvale pumping stations provide local Zone 4 water service.</li> <li>Storage to the area will be provided by the Tullamore and West and East Brampton reservoirs.</li> <li>Treatment, pumping and transmission are assumed to be sufficient to service the proposed development based on the total population.</li> <li>Connections to the existing system should be made on future Armdale Rd, future Thornwood Drive and Eglinton Avenue East.</li> <li>No new vertical water infrastructure projects were identified to service the proposed development.</li> </ul>	<ul> <li>Wastewater flows from the area drain south by gravity via the East Trunk System to the G.E. Booth wastewater treatment facility.</li> <li>Treatment is assumed to be sufficient to service the proposed development based on future planned infrastructure.</li> <li>Connections to the existing system should be to the Eglinton Avenue East sewer.</li> <li>No triggers to any pumping stations were identified, as the proposed development is serviceable entirely by gravity.</li> <li>However, there are conveyance capacity limitations to infrastructure downstream of the proposed development and further downstream in the East Trunk Sewer system.</li> </ul>	
Next Steps	Next Steps	Next Steps	
Program Planning will be informed of any changes to the projections.	Final connection points and fire flow requirements will be discussed.	Final connections and sanitary sewer upgrades will be discussed.	

## 1 Introduction and Background

## 1.1 Background

The 91 Eglinton Block is located on the northeast corner of Eglinton Avenue East and Hurontario Street in the City of Mississauga. A development application has been made to the City of Mississauga for a total of seven (7) towers of varying number of stories.

The total number of units as provided by the developer is 2800. At the time of this report the entire development is assumed to be residential based on the information provided by the developer.

## **1.2 Objectives**

The purpose of this report is to demonstrate the adequacy of the existing water and wastewater infrastructure as well as the proposed water and wastewater infrastructure to satisfy the servicing needs of the proposed development. The intent is also to present the detailed servicing analysis of the proposed development undertaken as part of this study including:

- Establishing water and wastewater servicing requirements.
- Identifying servicing alternatives, if applicable.
- Evaluating the water and wastewater servicing alternatives, if applicable.
- Recommending a preferred water and wastewater servicing strategy for the development.

Details of the analysis are based on the proposed land use, development size and location and the relationship with any other relevant studies that have been completed within the proposed development area.

## 2 Planning Context

This proposed development lies within the City of Mississauga, just north of Mississauga City Centre and east of the Hurontario Street corridor. The proposed development is assumed to be completely residential. Details of the proposed development are summarized below.

Building No.	Planning Estimates	Number of	Residential	Employment	Total
5	Ŭ	Units	Population	Population	Population
1	Tower 1 and Tower 2 Combined	765	2066	0	2066
2	Tower 3 and Tower 4 Combined	512	1382	0	1382
3	Tower 5 and Tower 6 Combined	600	1620	0	1620
4	Tower 7 and Future	923	2492	0	2492
	Proposed Development Total	2800	7560	0	7560
	SGU Estimate (2031)		1790	410	2200
	SGU Estimate (2041)		2860	500	3360
	SGU Estimate (Ultimate)		6551	1030	7581
	Note: SGU's Reference Scenario 15 and Scenario 0 respectively				

### TABLE 1 PROPOSED DEVELOPMENT RESIDENTIAL AND EMPLOYMENT FORECASTS

Population and employment forecasts from SGU M1347 were considered in the analysis for comparison purposes. It was assumed that 100% of the proposed development will occupy and occur within the entire SGU M1347, as shown in Figure 1.

## 91 Eglinton Avenue East – City of Mississauga



## FIGURE 1 PROPOSED DEVELOPMENT SGU BOUNDARY

The City's planning forecasts for this area are greater than the Region's planned 2041 and Ultimate growth forecasts (SGU Scenario 15 and Scenario 0 respectively), as shown in Table 2. It is important to keep in mind that the SGU contains the developing Summitview sites and well as developed areas in addition to this proposed development.

#### TABLE 2 POPULATION GROWTH FORECAST COMPARISON

Scenario / Year	PopulationEmploymentGrowthGrowth		Total Growth
2031	1790	410	2200
2041	2860	500	3360
Ultimate	6551	1030	7581
Proposed Development Only	7560	0	7560
Note: Ultimate growth numbers reference Scenario 0 and 2031-41 numbers reference SGU Scenario 15.			

## 3 Water Servicing

There is water infrastructure surrounding the proposed development which service existing land uses in the area. The development falls within the service boundary of water pressure Zone 4.

## 3.1 Existing Infrastructure

The major feed to the area is a 600 mm sub-transmission main on Bristol Road connecting to 400 mm and 300 mm watermains on Hurontario Street. Internal servicing is provided through smaller 300 mm distribution mains on Nahani Way, Preston Meadow Ave and Forum Drive. There is a constructed, but not in use, 300 mm watermain on Eglinton Avenue East from Forum Drive up to the proposed site which is intended to be looped through the future Thornwood Drive extension. The pressure zone changes to Zone 3 south of Eglinton Avenue East and west of Forum Drive.





## 3.2 Planned Water Infrastructure

Based on the Region's latest population and employment growth projections, the existing trunk infrastructure in the area is sufficient to service 2041 demands and there is allowance for growth beyond the 2041 time frame.

There are no new local infrastructures planned in the vicinity of the proposed development for the near future.

## 3.3 Water Design Criteria and Service Levels

Demands for the proposed development were calculated using the Region's latest water design criteria. The design criteria are summarized as follows:

- 265 Lpcd for average day water consumption.
- A maximum day peaking factor of 1.8 for residential and 1.4 for employment growth.
- A peak hour factor of 3.0.

Establishing hydraulic performance criteria is required in determining the project requirements to service new growth. Assessing the impact of growth on the existing water distribution system was undertaken following the 2013 Water and Wastewater Master Servicing Plan approach.

A linear water project is triggered or flagged for further analysis if it meets one or more of the following criteria:

- Under maximum day demand scenario pipe velocity exceeds 1.5 m/s;
- Under maximum day demand scenario pressure in the system drops below 40 psi or drops by more than 10 psi, reducing the level of service for existing users;
- Pressure in the system drops below 20 psi under a maximum day plus fire scenario.

The trigger for a pumping station upgrade is based on exceeding the firm capacity of the station feeding the area. Firm capacity of a pumping station is defined as the sum of the all the pump capacities minus the largest pump capacity. The station's firm capacity should be able to handle peak hour demands when distributing flow into the local system.

Water storage requirements for the 91 Eglinton Avenue East Block are calculated in accordance with MOECC Guidelines as follows:

Total Storage Requirements = A + B + C where,

- A = Equalization Storage (25% of maximum day demand of zone)
- B = Fire storage in accordance with the standard of Municipal Fire Protection of the Canada Underwriter's Association (modified from the MOECC criteria)
- C = Emergency Storage (25% of A + B)

## 3.4 Water Servicing Analysis

The objective of the hydraulic water servicing analysis is to identify alternatives for servicing the development and select a servicing strategy that considers the following key impacts:

- Existing level of service
- Water quality
- Security of supply and system redundancy
- Flexibility of servicing
- Complexity and cost of infrastructure
- Opportunity to support long term servicing of other growth areas

The 91 Eglinton Avenue East Block is situated within the serviceable range of Pressure Zone 4. The pressure zone boundary runs through the south side of Eglinton Avenue East in the vicinity of the development but no boundary change expected in the near future. The area will be serviced from the existing Zone 4 pumping stations with the easterly stations (Beckett Sproule and Hanlan) more influential than the westerly stations (Streetsville and Meadowvale). Tullamore, East Brampton and West Brampton reservoirs will provide the floating storage.

Treatment, pumping and transmission are assumed to be sufficient to service the proposed development based on future planned infrastructure.

## 3.4.1 Water Demand Requirements

Using the design criteria outlined in Section 3.3, the average day, maximum day and peak hour demands for the proposed development were calculated. These demands are summarized in Table 3.

Demand Scenario	Proposed Development	SGU Estimate (2041)	SGU Estimate (Ultimate)
Average Day (m3/d)	2003.4	890.4	2009.0
Maximum Day (m3/d)	3606.1	1549.7	3616.1
Peak Hour (m3/d)	6010.2	2671.2	6026.9

## TABLE 3 WATER DEMANDS FOR THE 91 EGLINTON AVENUE EAST BLOCK

The proposed development is only a part of the overall SGU and contributes towards total water demand requirements that are beyond even the ultimate demand requirements for the entire SGU, as per the Region's growth forecasts outlined in Table 2.

## 3.4.2 Storage Requirements

As stated earlier, storage will be provided from Tullamore and East and West Brampton pumping stations. All storage facilities have sufficient available storage capacity to 2031 and beyond. Table 4 shows the required storage for the proposed development. The fireflow of the proposed development was assumed to be 83 L/s (residential only) due to lack of actual fireflow data from the proponent.

It was confirmed that the existing storage in the system is sufficient to meet the additional requirement and no new storage upgrades are required.

## TABLE 4 STORAGE CALCULATION FOR THE 91 EGLINTON AVENUE EAST BLOCK

Requirement in m3/d	Proposed Development	SGU Estimate (Ultimate)	
Equalization: A (25% MDD)	901.5	904.0	
Fire Flow: B	7171.2	7171.2	
Emergency: C (25% (A+B)	2018.2	2018.8	
Total Storage Requirement	10090.9	10094.0	

## 3.4.3 Servicing Alternatives

Typically, a number of alternative servicing strategies are identified and further evaluated to select the most preferred servicing option. In this case, the area is surrounded by existing and planned future infrastructure. Therefore, only one servicing alternative was identified, as shown in Figure 3. Connections to watermains on Armdale Road, Thornwood Drive (future) and Eglinton Avenue East will provide service to the buildings.





Hydraulic modeling was performed to identify impacts to the existing water distribution system and to assess future infrastructure and potential water service connection points.

It was determined that assumed fire flow for the development can be supported by the existing and proposed watermains in the area.

## 3.5 Preferred Servicing Strategy

The preferred servicing strategy for the 91 Eglinton Avenue East development will be as follows:

- Tower 1 and Tower 2 (combined 765 units) will be serviced via a single connection from the future 300 mm on Thornwood Drive as there are no watermains fronting Eglinton Avenue East, west of Thornwood Drive.
- Tower 3 and Tower 4 (combined 512 units) will be serviced via a single connection from the future 300 mm on Thornwood Drive.
- Tower 5 and Tower 6 (combined 600 units) will be serviced via a single connection from the 300 mm on Armdale Road.
- Tower 7 and future builds (923 units) will be serviced via connections from the 300 mm on Eglinton Avenue East.

The connection sizes, including fire connections, in all cases should be smaller than the watermain size. Region's internal modeling showed that there is no requirement to extend the existing Eglinton Avenue East 300 mm main west Thornwood Drive to connect with the Zone 4 main on Hurontario Street. However, it is required that the future Thornwood main connects to the existing 300 mm Eglinton Avenue East main to complete looping. Also, the internal looping of watermains by connecting Armdale Road main to Thornwood Drive main is required for the purpose of servicing this new development.

The blue circles in Figure 4 show the recommended connection points along the watermains.

91 Eglinton Avenue East – City of Mississauga



## FIGURE 4 PREFERRED WATER SERVICING STRATEGY

## 4 Wastewater Servicing

There is existing wastewater infrastructure surrounding the proposed development, which services the existing land uses in the area. The area is serviced via the East Trunk (Etobicoke Creek West) system, where flows are ultimately treated at the G.E. Booth wastewater treatment facility.

## 4.1 Existing Infrastructure

The existing sanitary sewers outlet adjacent to subject site are as follows:

An existing 450 mm sanitary sewer, north of Eglinton Avenue East, heading towards the east is connected to an existing 525 mm diameter sanitary sewer on Tailfeather Crescent which in turn heads south along a creek and conveys flow to the Central Park Way Trunk sewer.

An existing 250 mm sanitary sewer along Sorrento Drive, south of Eglinton Avenue East, conveys flow to the 300 / 375 mm sewer on Ella Avenue. Ella Avenue sewer heads west, crosses Hurontario Street, and drains flows to Upper Cooksville Creek Trunk sewer.

Existing wastewater infrastructure in the vicinity of the proposed development is shown in Figure 5.



### FIGURE 5 EXISTING WASTEWATER INFRASTRUCTURE IN THE VICINITY OF PROPOSED DEVELOPMENT

## 4.2 Planned Wastewater Infrastructure

There are no major planned projects around the development area. A new 450 mm sanitary sewer along Eglinton Avenue East from Sorrento Drive to Tailfeather Crescent was built in 2016. The main purpose of this sewer is to service the future development area north of Eglinton Avenue East.

Based on the Region's latest population and employment projections, the existing and planned infrastructure is sufficient to service 2041 wastewater flows and there is some allowance for growth beyond the 2041 time frame.

## 4.3 Wastewater Design Criteria and Service Levels

Wastewater flows for the proposed development were calculated using the Region's latest revised wastewater design criteria. The wastewater design criteria are summarized as follows:

- 285 Lpcd for average day wastewater generation rate.
- Peaking factor is based on the Harmon formula.
- Inflow and infiltration allowance is based on 0.26 L/s/ha.

Establishing hydraulic performance criteria is required in determining the project requirements to service new growth. Assessing the impact of growth on the existing wastewater collection system was undertaken following the 2013 Water and Wastewater Servicing Master Plan approach.

A linear wastewater project is triggered or flagged for further analysis if it meets the following criteria:

- Pipe is surcharged and,
- Maximum water level is within 1.8 meters of ground level, indicating the potential for basement flooding,
- Under a 1 in 5 year design storm, Soil Conservation Service (SCS) Type II.

The trigger for a pumping station upgrade is based on exceeding the firm capacity of the station servicing the area. Firm capacity of a pumping station is defined as the sum of all the pump capacities minus the largest pump. The station's firm capacity should be able to handle peak wet weather flows.

## 4.4 Wastewater Servicing Analysis

The objective of the hydraulic wastewater servicing analysis is to identify alternatives for servicing the development and select a servicing strategy that considers the following key impacts:

- Existing level of service
- System capacity
- Complexity and cost of infrastructure
- Opportunity to support long term servicing of other growth areas

The 91 Eglinton Avenue East development will be serviced by the East Trunk sewer system. The area drains by gravity via the East Trunk system to the G.E. Booth wastewater treatment facility. It was confirmed that treatment capacity is sufficient to service the 91 Eglinton Avenue East development. However, hydraulic modelling shows conveyance capacity limitations to infrastructure adjacent to the proposed development and further downstream in the East Trunk Sewer System.

## 4.4.1 Wastewater Flow Requirement

The theoretical average dry weather flow, peak dry weather flow and peak wet weather flows were calculated using the design criteria described in Section 4.3. The estimated wastewater flows for this development (91 Eglinton Avenue East) are presented in Table 5.

#### TABLE 5 WASTEWATER FLOWS FOR THE 91 EGLINTON AVENUE EAST DEVELOPMENT

Flow Scenario	Proposed Development	SGU Estimate (2041)	SGU Estimate (Ultimate)
Average Dry Flow (L/s)	25	3.8	8.7
Peak Dry Flow (L/s)	76.7	14.5	30.4
Peak Wet Weather (L/s)	78	15.5	30.6

Table 6 shows the population split for the new 91 Eglinton Avenue East development by lot.

	Unit	Area-ha	Population	Peak wet weather Flow
Lot 1- Tower A & B	765	0.8	2066	24.6
Lot 2- Tower C & D	512	0.7	1382	17.1
Lot 3- Tower E & F	600	0.8	1620	19.7
Lot 4- Tower G & future	923	0.8	2492	29.1

#### TABLE 6 WASTEWATER FLOWS FOR THE 91 EGLINTON AVENUE EAST DEVELOPMENT BY LOTS

The proposed development is only a part of the overall SGU (M1347). Hydraulic modeling was performed to determine if the existing collection system has sufficient capacity to convey the higher wastewater flows generated by the additional population.

## 4.4.2 Capacity of the Existing Sewers adjacent to 91 Eglinton Avenue East development

## 4.4.2.1 Eglinton Ave. Sewer (450mm)

The existing sanitary sewer, north of Eglinton Avenue East from Sorrento Drive to Tailfeather Crescent is a 450 mm sanitary sewer. This sewer is connected to an existing 525 / 600 mm diameter sanitary sewer on Tailfeather Crescent which is headed south along the creek and conveys flows to the Central Parkway Trunk sewer.

Overall, the minimum slope of the 450 mm diameter sanitary sewer is 0.99%, providing a maximum capacity of approximately 284 L/s. The two sections of 525 mm sewer have minimum slopes of 0.39% and 0.276%, providing a maximum capacity of approximately 269 & 226 L/s respectively. The minimum slope of the 600 mm diameter sanitary sewer is 0.4%, providing a maximum capacity of 390 L/s. Figure 6 and 7 show a plan and profile of the existing 450 mm, 525 mm & 600 mm sewers.

A modelling analysis of the existing wastewater system and 2041 condition was undertaken to determine if there is sufficient conveyance capacity in the existing 450 mm, 525 mm & 600 mm sanitary sewers.
Based on the results of the analysis, the existing 450 mm sewer has enough capacity but linear conveyance upgrades of the 525 mm and 600 mm sanitary sewers will be required to accommodate the proposed development.



#### FIGURE 6 EXISTING CAPACITY OF 450 MM EGLINTON AVE. EAST SEWER





#### 4.4.2.2 Sorrento Drive Sanitary Sewer (250 / 300 mm)

The existing 250 mm sanitary sewer along Sorrento Drive, south of Eglinton Avenue East conveys flow to the 300 / 375 mm sewer on Ella Avenue. Ella Avenue sewer is headed west, crossing Hurontario Street, and drains to the 825 / 750 mm Upper Cooksville Creek Trunk sewer.

The minimum slope of the 250 mm diameter sanitary sewer is 0.72%, having a maximum capacity of 51 L/s. Some sections of the existing 375 mm sewer between have very low slope (0.183% and 0.242%)

providing a capacity of only 75 L/s. Figure 8 shows a plan and profile of the existing 250 / 300 / 375 mm diameter sanitary sewer on Sorrento Drive and Ella Avenue.

A modelling analysis of the existing wastewater system and 2041 condition was undertaken to determine if there is sufficient conveyance capacity in the existing 250 / 300 / 375 mm sanitary sewer to service the proposed growth.

Based on the results of the analysis, the existing sanitary sewer on Sorrento Drive does not have enough capacity. Also, an upgrade of the 750 / 825 mm Upper Cooksville Creek Trunk sewer will be required for the proposed development.



#### FIGURE 8 EXISTING CAPACITIES OF 250 / 300 / 375 MM SEWERS

#### 4.4.3 Servicing Alternatives

The sanitary flows from subject site should be conveyed through the proposed 300 mm / 375 mm sewers along Armdale Road and the future Thornwood Drive. The proposed sewers will also provide the possibility of servicing Block 46 (Summitview Eglinton Development), located adjacent to the subject site. Multiple connections are proposed to the Armdale Road and future Thornwood Drive sewers to convey the wastewater flows generated by the proposed development. Figure 9 shows the conceptual wastewater servicing layout for the proposed development.



The approach for wastewater servicing is based on utilizing existing sanitary infrastructure in the vicinity of the proposed development site. Three wastewater servicing alternatives were identified and further evaluated to select the most preferred servicing option.

- Drain the sanitary flows from the proposed development to the existing 450 mm sewer along the north side of Eglinton Avenue East.
- Drain the sanitary flows from the proposed development to the existing 250 mm sewer along Sorrento Drive.
- Split the sanitary flows from the proposed development between the 450 mm Eglinton Avenue sewer and 250 mm Sorrento Drive sewer.

#### 4.4.3.1 Wastewater Servicing Alternative A

The first alternative wastewater servicing concept is shown in Figure 10 and is based on conveying the generated flow to the existing 450 mm sewer on Eglinton Avenue East. The flows would drain to the existing 525 / 600 mm sanitary sewer on Tailfeather Crescent which is headed south along the creek and conveys flows to Central Park Way Trunk sewer, and they will eventually be discharged by gravity via the East Trunk sanitary sewer to the G.E. Booth wastewater treatment facility.

Sanitary Model analysis revealed that the existing 525 mm / 600 mm sewers do not have enough capacity to convey additional flow from this development so, two options can be considered:

- Upsizing approximately 900 m of the existing 525 mm / 600 mm sewer to 675mm. Or,
- Twinning the existing 525 mm / 600 mm sewer by constructing a new 450 mm sewer.

#### 4.4.3.2 Wastewater Servicing Alternative B

The second alternative wastewater servicing concept is shown in Figure 11 and is based on conveying the generated flows through the existing 250 mm sanitary sewer along Sorrento Drive, south of Eglinton Avenue East to the 300 / 375 mm sewer on Ella Avenue. Ella Avenue sewer heads west, crossing Hurontario Street, and drains to the 825 / 750 mm Upper Cooksville Creek Trunk sewer.

Sanitary Model analysis revealed that the existing 250 / 300 /375 mm sewer along Sorrento Drive and Ella Avenue do not have enough capacity to convey additional flow from this development, two options can be considered:

- Upsizing the existing 250 mm / 300 mm / 375 mm sewer on Sorrento Drive and Ella Avenue to 675mm. Or,
- Twinning the existing 250 mm / 300 mm / 375 mm sewer on Sorrento Drive and Ella Avenue by constructing a new 450 mm sewer.

In both options, the sanitary sewers will cross Hurontario Street and convey flows to the existing 825 mm Upper Cooksville Creek trunk sewer. The sanitary model results revealed capacity constraints in some sections of the existing 750 mm / 825 mm Upper Cooksville Trunk sewer, downstream of the possible connection manhole. Therefore, these sections of the Upper Cooksville Creek trunk sewer will require upsizing to 900 mm sewer.

#### 4.4.3.3 Wastewater Servicing Alternative C

This wastewater servicing alternative is based on splitting the generated flow between the existing 450 mm sewer on Eglinton Avenue and 250 mm Sorrento Drive. However, this will mean upsizing the 525 / 600 mm and the 250 / 300 / 375 mm sewers on Tailfeather Crescent and Sorrento Drive respectively. This alternative was not evaluated further due to the amount of upgrades required.

## 91 Eglinton Avenue East – City of Mississauga





WASTEWATER SERVICING ALTERNATIVE A



FIGURE 11 WASTEWATER SERVICING ALTERNATIVE B

#### 4.4.4 Preferred Alternative Analysis

The preferred wastewater servicing alternative is Alternative A. This alternative utilizes the existing 450 mm sewer on Eglinton Avenue East that will convey flows generated by the new development to the existing 525 mm sewer on Tailfeather Crescent.

However, it is important to note that sanitary model analysis revealed capacity constraints at 525mm / 600 mm sewers, so upsizing the existing sewers or constructing a new sewer is required.

Four options can be considered:

- A1 Upsizing approximately 900 m of the existing 525mm / 600 mm sewer to 675 mm along the Creek and Central Parkway East from manhole number 1795966 to manhole number 1793012. Refer figure 12 for details.
- A2 Constructing a new 450 mm sewer for approximately 900 m along the Creek and Central Parkway East from manhole number 1795966 to manhole number 1793012. Refer figure 13 for details.
- A3 Constructing a new 450 mm sewer for approximately 1300 m along Eglinton Avenue East and Central Parkway East From manhole number 6564041 to manhole number 1793012. Refer figure 13 for details.
- A4 Constructing a new 450 mm sewer for approximately 950 m along Huron Heights Drive, crossing the existing Huron Heights Park through a proposed easement towards Central Parkway to be connected to manhole number 1793012. Refer figure 13 for details.



FIGURE 12 WASTE

WASTEWATER SERVICING ALTERNATIVE A1

## 91 Eglinton Avenue East – City of Mississauga



FIGURE 13 WASTEWATER SERVICING ALTERNATIVE A2, A3 AND A4

### 4.5 Preferred Servicing Strategy

The various options listed in Section 4.4.4 were evaluated using following criteria to determine the preferred servicing strategy.

- Technical feasibility and operational suitability
- Constructability
- Construction cost
- Environmental impact
- Community impact

Comparative assessments of the options were conducted by the Region of Peel wastewater team and alternative A4 was considered as the preferred wastewater servicing strategy.

It is important to note that this preferred strategy would require a dedicated easement along the existing municipal Huron Heights Park. The preferred wastewater servicing strategy is shown in figure 16.

The preferred wastewater servicing strategy can be summarized as follows:

- Install a new 300 mm sewer (approximately 240 m length) along Armdale Road from manhole number 1 to manhole number 3.
- Install a new 375 mm sewer (approximately 180 m length) along the future Thornwood Drive from manhole number 3 to the existing 450 mm sewer.
- Install a new 450 mm sewer (approximately 950 m length) along Huron Heights Drive, crossing an existing park through a proposed easement toward Central Parkway to be connected to manhole number 1793012.





**PREFERRED WASTEWATER SERVICING STRATEGY** 

## 5 Conclusion

The proposed development is located within the City of Mississauga and is one block south of Nahani Way, one block east of Hurontario Street, west of Forum Drive, and is north of Eglinton Avenue. The total site area is about 11 acres. The development plan includes seven (7) towers contained within one SGU (M1347). Based on the residential and employment population projections proposed by the City, they are beyond the Region's forecasted 2041 (SGU Scenario 15 and Scenario 0) population.

The proposed development has an equivalent population of 7560 from 2800 units. The Region's 2041 forecast for this SGU includes 2860 residents and 500 employees, for a total population of 3360.

The Region's Ultimate (or Buildout) forecast for this SGU is closer to the proposed development projections and includes 6551 residents and 1030 employees, for a total population of 7581.

Hydraulic modeling was performed to determine if the existing water distribution and wastewater collection system have sufficient capacity to distribute and collect the additional water demands and wastewater flows, respectively, generated by the proposed development.

#### **Recommended Water Servicing**

Water servicing to the proposed 91 Eglinton Avenue East development will be provided entirely by Pressure Zone 4 in Mississauga. Zone 4 is serviced by Beckett Sproule and Hanlan pumping stations from the east and Streetsville and Meadowvale pumping stations from the west. The proposed development however is mostly influenced by the easterly pumping stations. Storage to the area will be provided by the existing Tullamore and West and East Brampton reservoirs. The major feed to the area is a 600 mm sub-transmission main on Bristol Road connecting to 400 mm and 300 mm watermains on Hurontario Street.

Four (4) buildings are proposed to be serviced from the future 300 mm on Thornwood Drive, two (2) buildings are proposed to be serviced from the 300 mm on Armdale Road and one (1) building from the existing but not yet in service 300 mm on Eglinton Avenue East.

To provide water service to the proposed development, the following water servicing components are recommended:

- A new future watermain on Thornwood Drive should be a 300mm main which connects at either end to the future 300mm on Armdale Road and existing 300mm on Eglinton Avenue East.
- There is no requirement to extend the existing watermain on Eglinton Avenue East to connect to the 400 mm main on Hurontario Street.
- The service connections should be smaller than the watermain size at all locations to maintain the integrity of the Regional water system.

#### **Recommended Wastewater Servicing**

Currently there is existing infrastructure in the area that will collect flows from the 91 Eglinton Avenue East development. However, there are some limitations in downstream conveyance capacity that will need to be addressed to support the proposed development.

The recommended wastewater servicing strategy utilizes the existing 450 mm sewer on Eglinton Avenue East to convey flows generated by the new development to the existing 525 mm sewer on Tailfeather Crescent. The proposed seven (7) residential towers could connect at various locations to the future sewers on Armdale Road and Thornwood Drive to carry the sanitary flows to the 450 mm Eglinton Avenue East sewer.

To provide wastewater service to the proposed development, the following wastewater servicing components are recommended:

- Install a new 300 mm sewer (approximately 240 m length) along Armdale Road from manhole number 1 to manhole number 3.
- Install a new 375 mm sewer (approximately 180 m length) along the future Thornwood Drive from manhole number 3 to the existing 450 mm sewer.
- Install a new 450 mm sewer (approximately 950 m length) along Huron Heights Drive, crossing an existing park through a proposed easement toward Central Parkway to be connected to manhole number 1793012.

# FIGURES









SECTION B SCALE H 1:100 V 1:50



SECTION D SCALE H 1:100 V 1:50 15 175.0 PROPOSED STREET LIGHT 174.50 PROPOSED TREE-174.00 R EXISTING PL FUTURE PROPOSED 173.50 173.00 EGLINTON AVENUE EAST PROPOSED PRECAST-CONCRETE PAVING 172.50 EXISTING ASPHALT SURFACE PROPOSED 0.75m CONCRETE SPLASH PAD 172.03 -172.00 171.63 — 8 171.50 EXISTING CONCRETE CURB ЩШ PROPOSED 3.50m WIDE MULTI-USE TRAIL PER CITY STD. 2240.080 ĺ 171.00 CATCHBASIN LOCATION LO PROPOSED 3.0m PROPOSED UTILITY 170.50 EX. HYDRO CABLES APPROX. LOCATION (TO BE RELOCATED PROPOSED UTILITY CORRIDOR) -0.50m 170.00 -LIMIT OF EXISTING SIDEWALK TO BE REMOVED 169.50 4.50m FUTURE ROAD WIDENING 3.00m 169.00 168.50 1.52m - 3.50m )<del>-</del>|-EXISTING 900mmø STORM SEWER 0.50m \_ \_ \_ 0.75m 168.00 い 167.50 167.00

NOTE: . EXISTING HYDRO CABLE ALONG EGLINTON AVENUE EAST TO BE RELOCATED INTO PROPOSED UTILITY CORRIDOR AS PER DETAILED DESIGN BY ALECTRA (IN PROGRESS)

NOTES: . SEE LANDSCAPE DESIGN DRAWINGS, DETAILS AND SPECIFICATIONS FOR STREETSCAPE INSTALLATION. (ie. TREES, SIDEWALK ETC.)

. CANOPY CLEARANCES SHOULD CONFORM WITH MISSISSAUGA STREETSCAPE FEASIBILITY TERMS OF REFERENCE, FIGURE 1. 5. STREET TREES TO BE SPACED AT 8.0m ON CENTER AND 10.0m ON CENTER WHERE UTILITIES OCCUR.

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-PROPOSED LIMIT OF	T''	ជ	SOR	RENTO DRIVE					
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	170.00		BEA	RINGS SHOWN HEREON ARE	GRID BEARING	GS DERIVED FRO	M GPS OB	SERVATIONS OF	
	169.50		AND MER	ARE REFERRED TO THE 6 IDIAN 81'00' WEST LONGITU	AND B', USH UTM CO-ORE DE. (NAD83 ((	NG THE LEICA SH DINATE SYSTEM, CSRS) (2010))	ZONE 17,	CENTRAL	
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			SITE	PLAN NOTES:					
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	168.00		DR/	WING NOTES:					
	167.50		THIS	CE IS STRICTLY PROVIDENTS	VE PROPERTY ART OF IT WITH	OF C.F. CROZIER HOUT PRIOR WRI	& ASSOC	STATES INC. AND SENT OF THIS	
	167.00		THE	CONTRACTOR SHALL VERIF	Y ALL DIMENS	IONS, LEVELS, A	ND DATUM	S ON SITE AND	
	30 30		THIS	DRAWING IS TO BE READ	AND UNDERST	OOD IN CONJUN	CTION WITH	ALL OTHER	
			ALL	EXISTING UNDERGROUND U	TILITIES TO BE	VERIFIED IN TH	E FIELD B	Y THE	
			CON						-
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		<u> </u>	Check	S.C.	N.C.	<sup>cale</sup> H 1:500 V 1:50	Uwg.	<u>FIG 3</u>	



			SECTION E SCALE H 1:100 V 1:50				
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1 ISSUE 7 FOR 1-4. SUBMISSION 2019/MAP/18   0 ISSUE / REVISION 2019/MAP/18   No. ISSUE / REVISION YYYY/MAM/00   ELEVATION NOTE: ELEVATION NOTE: ELEVATION NOTE:   SUBVEY COMPLETE DP VREMME SER OF CLAINON ACTING AND ARE RELATED TO THE CLYMON OF VI7.21 THE VREMME CLAIN OF VI7.21 THE VREMME SER OF CLAINON ACTING AND ALL SCHOOL OF VIEW CLAIN OF VI7.21 THE VREMME SER OF CLAINON ACTING AND ALL SCHOOL OF VIEW CLAIN ACTING AND ALL SCHOOL OR			2	ISSUED FOR 3rd. SUBMISSION	2020/FEB/07
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			ELF	VATION NOTE:	
SURVEY NOTES   SURVEY CONNECTED BY KREAME SURVEYORS LID. (AULY, 22, 2017)   PRAVING NAME: 17-15/81010   PRAVING NAME: 17-15/81010   PRAVING NAME: 17-15/81010   DESCRIPTION OF OUTPOINTS AND THE OWNER TOW OF OBSERVATIONS OF SPECIFIED CONTROL POINTS 4' AND B', USING TERME ON THE UEGA SUBJECTION OF THE OWNER, AND ARE REFERENCE ON MADE CARE EXCIDENTED TO GRID BY MULTIPLYING BY THE CONSENSE ON MASTER FLAM BY DIALGE DESCRIPTION OF 05 (2020/JMV/28)   DESCRIPTION OF DESCRIPTION OF OF CROTER & ASSOCIATES INC. AND DESCRIPTION OF CROERED & DESCRIPTION OF CROTER & ASSOCIATES INC. AND DESCRIPTION OF CROERED & DESCRIPTION OF THE DESCRIPTION OF DESCRIPTION			ELEV CITY METE TRAF	ATTONS SHOWN HEREON ARE MISSISSAUGA DATUM AND ARE REL OF MISSISSAUGA BENCH MARK No. 1073, HAVING AN ELEVATIO ESE ERUCHMARK SET HORIZONTALLY AT THE BASE OF A 750mm DENTO DRIVE	ATED TO THE V OF 171.721 n CONCRETE OSITE TO
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	ELEVATION NOTE:	
	LEVATIONS SHOWN HEREON ARE MISSISSAUGA DATUM AND ARE REL GITY OF MISSISSAUGA BENCH MARK NO. 1073, HANNG AN ELEVATION METRES. BENCHMARK SET HORIZONTALLY AT THE DASE OF A 750nm TRAFFIC POLE ON THE NORTH SIDE OF EGLINTON AVENUE EAST OPP SORRENTO DRIVE	ATED TO THE I OF 171.721 n CONCRETE OSITE TO
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	AND ARE REFERRED TO THE 6" UTM CO-ORDINATE SYSTEM, ZONE 17 MERIDIAN 81'00' WEST LONGITUDE. (NAD83 (CSRS) (2010))	, CENTRAL
	DISTANCES ARE GROUND AND CAN BE CONVERTED TO GRID BY MULT COMBINED SCALE FACTOR OF 0.999759	IPLYING BY THE
	SITE PLAN NOTES:	
	DESIGN ELEMENTS ARE BASED ON MASTER PLAN BY DIALOG DRAWING No.: RZ-01b (2020/JAN/28) PROJECT No.: N/A	
	DRAWING NOTES:	
	THIS DRAWING IS THE EXCLUSIVE PROPERTY OF C.F. CROZIER & ASS THE REPRODUCTION OF ANY PART OF IT WITHOUT PRIOR WRITTEN CC OFFICE IS STRICTLY PROHIBITED.	OCIATES INC. AND INSENT OF THIS
	THE CONTRACTOR SHALL VERIFY ALL DIMENSIONS, LEVELS, AND DATE REPORT ANY DISCREPANCIES OR OMISSIONS TO THIS OFFICE PRIOR T	JMS ON SITE AND
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WCE OF ON NCE OF ON	Check S.C. Check N.C. Scale H 1:500 Dwg.	FIG 6
I	¥ 1:50	

NOTE:	
SEE LANDSCAPE DESIGN DRAWINGS, DETAILS AND SPECIFIC FOR STREETSCAPE INSTALLATION, (ie. TREES, SIDEWALK E	CATIONS











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		KEY PLAN SCALE: N.T.S.
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		2 ISSUED FOR 3rd. SUBMISSION 2020/FEB/01
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·		ELEVATION NOTE: ELEVATIONS SHOWN HEREON ARE MISSISSAUGA DATUM AND ARE RELATED TO THE GITY OF MISSISSAUGA BENCH MARK No. 1073, HAVING AN ELEVATION OF 171,721 METRES. BENCHWARK SET HORIZONTALLY AT THE BASE OF A 750mm CONCRETE TRAFFIC POLE ON THE NORTH SIDE OF EGUITON AVENUE FAST OPPOSITE TO
	     	SORRENTO DRIVE SURVEY NOTES: SURVEY COMPLETED BY KRCMAR SURVEYORS LTD. (JULY, 22, 2017)
		DRAWING HOME. (F-1030 UT BEARINGS SHOWN HEREON ARE GRID BEARINGS DERIVED FROM GPS OBSERVATIONS OF SPECIFIED CONTROL POINTS 'A' AND 'B', USING THE LEICA SMARTNET RTN NETWORK, AND ARE REFERENED TO THE 'UTM CO-COMUNITE SYSTEM, ZONE 17, CENTRAL MERIDIAN 81'00' WEST LONGITUDE. (NAD83 (CSRS) (2010))
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		DRAWING NO: RZ-OID (2020/JAN/28) PROJECT NO: N/A DRAWING NOTES: THIS DRAWING IS THE EXCLUSIVE PROPERTY OF C.F. CROZIFR & ASSOCIATES INC. AMI
		THE REPRODUCTION OF ANY PART OF IT WITHOUT PRIOR WRITE ACOUSENT OF THIS OFFICE IS STRICTLY PROHIBITED. THE CONTRACTOR SHALL VERTY ALL DIMENSIONS, LEVELS, AND DATUMS ON SITE AND REPORT ANY DISCREPANCIES OR OMISSIONS TO THIS OFFICE PRIOR TO CONSTRUCTION THIS DRAWING, IS THE FEED AND IMPREMENTION OF CONTRACTORY WITH ALL OFFICE PRIOR IS TO BE FEED AND IMPREMENTION OF CONTRACTORY WITH ALL OFFICE
- <u>-</u>		PLANS AND DOCUMENTS APPLICABLE TO THIS PROJECT, DO NOT SCALE THIS DRAWING ALL EXISTING UNDERGROUND UTILITIES TO BE VERIFIED IN THE FIELD BY THE CONTRACTOR PRIOR TO CONSTRUCTION.
LWAY.		Mississauga
T. No. R0988602)		Project PROPOSED HIGH-RISE DEVELOPMENT 91 & 131 EGLINTON AVE. E. AND 5055 HURONTARIO ST.
EX. STM MH19		POST-DEVELOPMENT DRAINAGE PLAN
	Stamp	
OPROFESSIONAL	PROFESSIONAL	
N. MOCAN 100061476	PROFESSIONAL CRIME WILL CONSTANTIN 100005703636	CROZIER CONSULTING ENGINEERS 2800 HIGH POINT DRIVE SUITE 100 MILTON ON LST 6P4 9058754015 F WWW.CFCR0ZIER.CA