

**FUNCTIONAL SERVICING &
PRELIMINARY STORMWATER
MANAGEMENT REPORT**

2570-2590 ARGYLE ROAD

**CITY OF MISSISSAUGA
REGION OF PEEL**

PREPARED FOR:

RANEE MANAGEMENT

PREPARED BY:

**C.F. CROZIER & ASSOCIATES INC.
2800 HIGH POINT DRIVE, SUITE 100
MILTON, ON L9T 6P4**

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1.0 Introduction

C.F. Crozier & Associates Inc. (Crozier) was retained by Ranee Management to prepare a Functional Servicing & Preliminary Stormwater Management Report to support the Official Plan and Zoning By-Law Amendment applications for the proposed infill development located at 2570-2590 Argyle Road in the City of Mississauga, Regional Municipality of Peel.

The purpose of this report is to demonstrate that the proposed development can be developed in accordance with the City of Mississauga (City), Region of Peel (Region), and Credit Valley Conservation (CVC) guidelines and standards from a water, wastewater, and stormwater management perspective.

2.0 Site Description

The subject site is approximately 2.15 ha and currently consists of two (2), 12-storey residential apartment buildings (Building A and B) with associated surface parking and landscaped areas. The site is bounded by Argyle Road to the east, an existing residential apartment complex to the south, the Mary Fix Creek to the west, and a commercial building with above-ground parking structure to the north. An area of approximately 0.12 ha at the west limit of the site (within the current property boundary) is the Mary Fix Creek watercourse, which is regulated by the CVC.

The elements envisioned for the proposed development include:

- One stepped 14-storey residential tower.
- One level of underground parking.
- Four-Storey above-grade parking structure with a rooftop amenity space.
- Maintaining the two existing residential apartment buildings and a portion of the surface parking.

In addition to the construction of the new building, portions of the existing internal roadway, surface parking and associated landscaping will be modified as required to accommodate the development and improve traffic flow. The proposed residential development will have an individual municipal address.

3.0 Water Servicing

The Region of Peel is responsible for the operation and maintenance of the public water supply and treatment system in the City of Mississauga. Any local water supply system will connect to the Region's municipal water network. The existing and proposed water servicing is discussed in the following sections.

3.1 Existing Water Servicing

A review of City of Mississauga and Region of Peel as-constructed drawings indicate that there is an existing 300 mm diameter ductile iron watermain on the south side of Argyle Road (Region of Peel drawing 12661-D dated as-constructed November 13, 1992).

Review of the Subsurface Utility Plan prepared for the site (Onsite Locates, December 16, 2019) shows that existing Building A and B both have individual water connections to the 300 mm PVC watermain along Argyle Road. The plan also shows one fire hydrant located on site at the north-east corner of Building B.

3.2 Design Water Demand

The Region of Peel Linear Infrastructure Sanitary Sewer Manual (March 2017) was used to determine the equivalent population estimate for the existing and proposed buildings. Table 1 uses a unit rate occupancy density of 2.7 persons/unit to determine the equivalent population for each building. The detailed calculations are provided in Appendix A.

Table 1: Equivalent Population Estimate

Type	Building	Number of Units	Total Persons
Existing	A	127	343
	B	126	340
Proposed	C	255	689
<i>Entire Site Total</i>	--	508	1372

The total population for the proposed building is 689 persons which brings the site total to 1372 including the existing buildings.

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 and an average daily water demand of 280 L/cap/day. Table 2 summarizes the estimated design water demand. Appendix A contains detailed water demand calculations.

Table 2: Existing/ Proposed Domestic Water Demand

Standard	Building	Average Daily Demand (L/s)	Maximum Daily Demand (L/s)	Peak Hourly Demand (L/s)
Region of Peel Public Works Design, Specification & Procedures Manual – Linear Infrastructure Watermain Design Criteria (June 2010)	Existing Buildings A and B	2.21	4.43	6.64
	Proposed Building C	2.23	4.47	6.70
	<i>Entire Site Total</i>	4.45	8.89	13.34

Note: Site total domestic water demand is the sum of the existing buildings and proposed building.

As presented in Table 2, proposed Building C has a peak hour domestic water demand of 6.70 L/s.

3.3 Fire Flow Demand

The Fire Underwriters Survey was used to estimate the fire flow demand for the proposed Building C. We have assumed the tower will have ordinary construction and therefore, a construction coefficient of 1.0 was applied to the fire flow calculations (Water Supply for Public Fire Protection by Fire Underwriters Survey, 1999). We have also assumed the proposed residential building will be equipped with automatic sprinkler systems which reduces the initial fire flow demand by up to 50%.

The 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 the proposed Building C.

Table 3: Estimated Fire Flow Demand

Method	Demand Flow (L/s)	Duration (h)
Water Supply for Public Fire Protection by Fire Underwriters Survey (1999)	200	2.5

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

As shown in Table 3, proposed Building C has a fire flow demand of 200 L/s for a duration of 2.5-hours. This is based on the fire flow demand of Level 04, with a floor area of 3129.82 m² and 25% of the adjoining floors, for total area of 4709.7 m². Detailed calculations are provided in Appendix A.

A hydrant flow test was carried out by Classic Fire Protection Inc. on October 16, 2019. The minimum projected fire flow at 138 kPa (20 psi) residual pressure was determined to be 439.6 L/s (6,698 USGPM). Refer to Appendix A for detailed results of the hydrant flow test and projected fire flows.

3.4 Proposed Water Servicing

A Single water service connection is proposed to the existing 300 mm diameter PVC watermain within Argyle Road to service the proposed Building C. The service will split at the property line into an individual 100 mm diameter domestic water line and individual 200 mm diameter fire line. Both services will extend to the proposed underground parking limit for Building C. One (1) private fire hydrant is proposed to provide additional coverage for Building C. The existing buildings will continue to use their existing water connections.

The proposed water servicing plan is shown on Figure 1 – Preliminary Site Servicing. The Mechanical Engineer will design the internal private water system including the internal sprinkler system within the building and underground parking structure.

4.0 Sanitary Servicing

The Region of Peel is responsible for the operation and maintenance of the public sewage collection and treatment system in the City of Mississauga. Any local sewage system will connect to the Region's municipal sanitary sewage network.

4.1 Existing Sanitary Servicing

A review of as-constructed drawings indicates that there is an existing 250 mm diameter PVC sanitary sewer running east-west within the Argyle Road right-of-way (Region of Peel drawing 12661-D dated as-recorded November 13, 1992).

Review of the Subsurface Utility (SUE) Plan prepared by Onsite Locates and dated December 16, 2019 shows that existing Building A and B both have individual sanitary connections. Both Buildings A and B ultimately outlet to manholes on Argyle Road. The SUE did not indicate property line manholes for either building.

4.2 Design Sanitary Flow

The sanitary design flow for the proposed development 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 in Appendix B.

Table 4: Existing/ Proposed Sanitary Design Flows

Standard	Building	Average Flow (L/s)	Peaking Factor	Peak Flow (L/s)	Infiltration Flow (L/s)	Dewatering Flow (L/s)	Total Flow (L/s)
Region of Peel Public Works Design, Specification & Procedures Manual – Linear Infrastructure Sanitary Sewer Manual (March 2017)	Existing Buildings A and B	2.39	3.90	9.34	0.17	-	9.50
	Proposed Building C	2.41	3.90	9.41	0.28	0.17	9.86
	<i>Entire Site Total</i>	<i>4.81</i>	-	<i>18.75</i>	<i>0.45</i>	-	<i>19.37</i>

Note: Site total sanitary flow is the sum of the existing buildings and proposed building.

As presented in Table 4, proposed Building C has a sanitary demand of 9.86 L/s, which is required to be conveyed by the building sanitary service.

4.3 Proposed Sanitary Servicing

The development is proposed to be serviced by a 200 mm diameter sanitary sewer at a slope of 2% which has a capacity of 46 L/s and therefore is sufficient to convey the design flow. The service will connect to the existing 250 mm diameter PVC sanitary sewer within Argyle Road. A new control maintenance hole will be installed on the sewer main and at the property line. A private sanitary sewer will extend from the control maintenance hole to the proposed underground parking structure to service Building C. Existing Buildings A and B will continue to use their respective individual connections.

The proposed sanitary servicing plan is shown on Figure 1 – Preliminary Site Servicing. The internal building plumbing will be designed by the Mechanical Engineer's details and specifications.

5.0 Drainage Conditions

5.1 Existing Drainage

In general, the portion of the site fronting Argyle Road drains towards the Argyle Road R.O.W. However, the remaining majority of the site at the rear (including proposed Building C) drains to the Mary Fix Creek.

As per the Subsurface Utility Plan (Onsite Locates, December 16, 2019) a 375 mm diameter storm sewer and 450 mm diameter storm sewer convey stormwater along Argyle Road. Additionally, a 300 mm diameter storm sewer was noted on the property that outlets directly to the Mary Fix Creek along the site's southern boundary.

The Argyle Road – Dunbar Road Storm Drainage Area Plan (Plan No. unknown) provided by the City (included in Appendix C) provides more information regarding the surrounding storm network. The 375 mm diameter storm sewer conveys drainage from the initial north catchment of Argyle Road and adjacent properties. The sewer is then increased to a 450 mm diameter sewer to account for the next catchment along Argyle Road, ultimately conveying drainage to the downstream system.

Based on the topographic survey completed by Speight, Van Nostrand & Gibson Limited (Ref No. 1-E23 PEEL) the existing topography splits the stormwater flows into the following catchments:

- Catchments 101 (0.48 ha, 0.54 RC): No minor system controls. Conveys major system drainage uncontrolled to the Argyle Road and is received by the existing 375 mm diameter storm sewer. This drainage from this catchment is accounted for in the Argyle Road – Dunbar Road Storm Drainage Area Plan provided by the City.
- Catchments 102 (0.22 ha, 0.57 RC): No minor system controls. Conveys major system drainage uncontrolled to the Argyle Road and is received by the existing 450 mm diameter storm sewer. This drainage is accounted for in the Argyle Road – Dunbar Road Storm Drainage Area Plan provided by the City.
- Catchment EX1 (0.04 ha, 0.90 RC): External catchment in the northeast of the site with no minor system controls. Major system drainage is conveyed overland along Catchment 101's northwest boundary and ultimately drains to Argyle Road.
- Catchment 103 (1.11 ha, 0.86 RC): No minor system controls. Major system drainage is generally conveyed overland to a low point of 111.40 m in the south-west corner of the rear parking lot and is ultimately conveyed to Mary Fix Creek.
- Catchments 104 (0.23 ha, 0.77 RC): Minor system drainage is collected in an internal storm sewer network that consists of one catch basin and one manhole. The storm sewer network outlets to Mary Fix Creek through a 300 mm diameter sewer. Major system drainage is conveyed overland towards Catchment 103's north boundary and is ultimately conveyed to Mary Fix Creek.

It is likely that the area drains along the existing buildings' discharge to sanitary as no storm connection were located in the Subsurface Utility Plan (Onsite Locates, December 16, 2019). Roof drains for the existing buildings were observed discharging to grade.

The existing drainage conditions are illustrated on Figure 3 – Pre- Development Drainage Plan.

5.2 Proposed Drainage

The proposed drainage design generally maintains the existing drainage divide and site elevations. The main overland flow route for the site will continue to utilize Argyle Road and Mary Fix Creek.

The grading of the site results in the following catchments:

- Catchment 201 (0.44 ha, 0.54 RC): North-east portion of the site fronting Argyle Road - Maintains pre-development drainage patterns. No minor system controls proposed for this catchment. Major system drainage is conveyed overland to Argyle Road consistent with existing conditions. No additional drainage is directed to the storm sewer on Argyle Road, the 10-year post-development peak flow from Catchment 201 is less than the 10-year pre-development peak flow from Catchment 101.
- Catchment 202 (0.20 ha, 0.57 RC): South-east portion of site fronting Argyle Road – Maintains pre-development drainage patterns. No minor system controls proposed for this catchment. Major system drainage is conveyed overland to Argyle Road consistent with existing conditions. No additional drainage is directed to the storm sewer on Argyle Road, the 10-year post-development peak flow from Catchment 202 is less than the 10-year pre-development peak flow from Catchment 102.
- Catchment EXT1 (0.04 ha, 0.90 RC): External catchment in the northeast of the site with no minor system controls. Major system drainage is conveyed overland along Catchment 201's northwest boundary and ultimately drains to Argyle Road
- Catchment UC1 (0.43 ha, 0.69 RC): Landscape area at rear Building C and parking area at south-west portion of the site – Generally maintains pre-development drainage patterns. Major and minor system drainage is conveyed overland to Mary Fix Creek consistent with existing conditions. Catchments 203 and 204 will be overcontrolled to account for the uncontrolled drainage from UC1. No stormwater management controls will be applied to this Catchment as the surface conditions and drainage patterns for the area are generally consistent with the pre-development condition.
- Catchment 203 (0.65 ha, 0.85 RC): At-grade parking and driveway area central to the site - Minor system drainage is captured by proposed area drains above the proposed underground parking garage and will be conveyed to a detention pumped tank (Tank 2 - Surface) located in the underground parking structure. The controlled flow will ultimately discharge to Mary Fix Creek via the proposed 300 mm diameter storm sewer. The internal stormwater pumping and conveyance system is subject to the Mechanical Engineer's design and specifications. Major system drainage is directed to Mary Fix Creek, consistent with pre-development conditions.
- Catchment 204 (0.31 ha, 0.90 RC): Building C footprint - Minor and major system drainage is captured by Building C and conveyed to a retention & detention tank (Tank 1 - Roof). Retained portion will be pumped for re-use and detailed portion will drain by gravity. The controlled flow is ultimately discharge to Mary Fix Creek via the proposed 300 mm diameter storm sewer. Emergency and excess runoff will be discharged via external roof scuppers and an emergency overflow pipe for the retention tank. The internal stormwater system is subject to the Mechanical Engineer's design and specifications. Major system drainage is directed to Mary Fix Creek, consistent with pre-development conditions.

The proposed drainage conditions are illustrated on Figure 4 – Post-Development Drainage Plan.

6.0 Stormwater Management

Upon reviewing Credit Valley Conservation (CVC) Regulation Mapping, we found that the site is within the CVC's regulation limits. The stormwater management quantity control criteria for the Mary Fix Creek were provided by the CVC through email correspondence. The governing stormwater management criteria include:

Water Quantity Control – Mary Fix Creek

Stormwater drainage conveyed to Mary Fix Creek is required to control the 100-year post-development peak flow rate to the 100-year pre-development peak flow rate.

Water Quantity Control – Argyle Road

Based on the Argyle Road – Dunbar Road Storm Drainage Area Plan provided by the City, storm sewers along Argyle Road were sized for the 10-year storm event, therefore, drainage conveyed to Argyle Road is required to control the 10-year post development peak flow rate to the 10-year, pre-development peak flow rate.

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 or watercourse.

Water Balance & Erosion Control

Retention of the first 5 mm of rainfall on impervious areas for private development areas is required by the City of Mississauga Development Requirements Manual (September 2016) to achieve the water balance criteria and by the CVC Stormwater Management Criteria (August 2012) to achieve the erosion control criteria.

6.1 Stormwater Quantity Control

As outlined in Section 5.0, the proposed development drains to Argyle Road and Mary Fix Creek. The following sections outline the stormwater quantity control requirements for drainage to each receiving area.

6.1.1 Argyle Road

As outlined in Section 6.0, stormwater drainage conveyed to Argyle Road is required to control the 10-year post development peak flow rate to the 10-year pre-development peak flow rate. The Rational Method has been used to determine the 10-year pre-development and post-development peak flow rates generated by the site catchments draining to Argyle Road. Calculations were completed using City of Mississauga intensity-duration-frequency (IDF) data, and a maximum runoff coefficient of 0.50 for the pre-development catchments. The 10-year pre-development peak flow rates draining to Argyle Road are outlined in Table 5. Supporting calculations are provided in Appendix C.

Table 5: Summary of Pre-Development Peak Flows (Argyle Road)

Return Period	Pre-Development Catchments (L/s)			Total Peak Flow (Target Rate, L/s)
	Q _{EX01}	Q ₁₀₁	Q ₁₀₂	
10-yr	10.00	66.86	30.88	107.73

As presented in Table 5, the 10-year pre-development peak flow rate generated by the portion of the site draining to Argyle Road is 107.73 L/s. This pre-development peak flow rate has been taken as the target rate for stormwater quantity control for post-development drainage to Argyle Road.

The 10-year post-development uncontrolled peak flow rates draining to Argyle Road are outlined in Table 6. Supporting calculations are provided in Appendix C.

Table 6: Summary of Uncontrolled Post-Development Peak Flows (Argyle Road)

Return Period	Post-Development Catchments (L/s)			Total Peak Flow (L/s)
	Q _{EX01}	Q ₂₀₁	Q ₂₀₂	
10-yr	10.00	65.48	32.11	107.59

As presented in Table 6, the 10-year post development uncontrolled peak flow towards Argyle Road is 107.59 L/s, 0.14 L/s less than in pre-development conditions. Therefore, stormwater quantity controls are not required for these catchments.

6.1.2 Mary Fix Creek

As outlined in Section 6.0, stormwater drainage conveyed to Mary Fix Creek is required to control the 100-year post-development peak flow rate to the 100-year pre-development peak flow rate. The Rational Method has been used to determine the 100-year pre-development peak flow rate and post-development uncontrolled peak flow rates generated by the site catchments draining to Mary Fix Creek. Calculations were completed using City of Mississauga intensity-duration-frequency (IDF) data, and a maximum runoff coefficient of 0.50 for pre-development catchments. The 100-year pre-development peak flow rates draining to Mary Fix Creek are outlined in Table 7. Supporting calculations are provided in Appendix C.

Table 7: Summary of Pre-Development Peak Flows (Mary Fix Creek)

Return Period	Pre-Development Catchments (L/s)		Total Peak Flow (Target Rate, L/s)
	Q ₁₀₃	Q ₁₀₄	
100-yr	217.94	44.55	262.50

As presented in Table 7, the 100-year pre-development peak flow rate generated by the portion of the site draining to Mary Fix Creek is 262.50 L/s. This pre-development peak flow rate has been taken as the target rate for stormwater quantity control for drainage to Mary Fix Creek.

The 100-year post-development peak flow rate in an uncontrolled condition draining to Mary Fix Creek are outlined in Table 8. Supporting calculations are provided in Appendix C.

Table 8: Summary of Uncontrolled Post-Development Peak Flows (Mary Fix Creek)

Return Period	Post-Development Catchments			Total Peak Flow (L/s)
	Q ₂₀₃	Q ₂₀₄	Q _{UC01}	
100-yr	255.82	123.54	117.99	497.35

As presented in Table 8, the 100-year post-development uncontrolled peak flow rate generated by the portion of the site draining to Mary Fix Creek is 497.35 L/s, exceeding the target rate. Therefore, stormwater quantity controls are required for the catchments draining to Mary Fix Creek.

The Modified Rational Method was used to determine the required stormwater quantity control for the post-development catchments draining to Mary Fix Creek. As outlined in Section 5.2, stormwater runoff from Catchments 203 and 204 will be captured and controlled prior to being conveyed to the proposed storm network and discharging into Mary Fix Creek. Catchment UC01 will be uncontrolled and discharge to Mary Fix Creek, consistent with pre-development drainage patterns. Therefore, Catchments 203 and 204 will be overcontrolled to account the uncontrolled runoff from Catchment UC01. A summary of the post-development-controlled flows to Mary Fix Creek is outlined in Table 9, supporting calculations are provided in Appendix C.

Table 9: Summary of Controlled Post-Development Peak Flows (Mary Fix Creek)

Return Period	Post-Development Catchments (L/s)			Total Peak Flow (L/s)
	Q ₂₀₃	Q ₂₀₄	Q _{UC01}	
100-yr	102.00	27.49	117.99	249.49

Note: Additional 2 L/s has been added to the peak flow to account for long-term dewatering (Hydrogeological Assessment Report - Terraprobe, 2022).

As presented in Table 9, peak flows in Catchments 203 and 204 are proposed to be reduced to 102.00 L/s and 27.49 L/s, respectively, resulting in a post-development peak flow of 249.49 L/s, 13.01 L/s less than the target flow.

The attenuated flows from Catchment 203 will be contained within a proposed stormwater storage tank (Tank 2 – Surface) with a minimum storage volume of 160 m³. As outlined in Section 5.2, a pump is proposed to convey the flow from the tank to the proposed storm network at a controlled pump rate of 102.0 L/s.

The attenuated flows from Catchment 204 will be contained within a proposed stormwater storage tank (Tank 1 – Roof) with a minimum storage volume of 115 m³. As outlined in Section 5.2, the detention portion of the tank will flow by gravity and will be controlled by a 250 mm diameter orifice at a rate 27.5 L/s

Using Manning's equation, it was determined the proposed 300mm diameter outlet pipe could adequately convey the combined 100-year post-development controlled peak flow from long-term dewatering, Catchments 203 and Catchment 204 of 131.49 L/s (96% of its full flow capacity). Supporting stormwater quantity control calculations are provided in Appendix C.

Further details on the stormwater storage tanks and pump design will be determined at the detailed design stage and be designed in accordance with the Architectural, Structural and Mechanical details and specifications.

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 involves the removal of at least 80% of TSS from 90% of the annual runoff volume.

A Jellyfish Filter (JF6-5-1) is proposed to provide the requisite water quality control for Catchment 203. The Jellyfish is proposed to be installed upstream of proposed tank (Tank 2 – Surface) and will treat the stormwater runoff prior to being captured in the stormwater storage tank. As described in Section 5.2, the treated stormwater will be pumped from the tank (Tank 2 – Surface) to the proposed storm network and then discharged to Mary Fix Creek. Since Catchment 204 consists of rooftop water, it is considered clean runoff with minimal TSS. Therefore, no treatment is required for Catchment 204.

Since Catchment UC01 flows uncontrolled, treatment will not be implemented. Catchment UC01, primarily consist of re-instated pavement area which was existing in the pre-development condition. Comparing, Catchment UC01 to Catchment 103, TSS concentrations in the drainage to Mary Fix Creek will reduce in the post-development condition as Catchment UC01 has a smaller area and less impervious surfaces. Therefore, untreated runoff from Catchment UC01 will not further impact Mary Fix Creek.

Similarly, Catchment 201 and 202 consists primarily of re-instated pavement area and landscaping revisions. Consistent with the pre-development conditions, Catchments 201 and 202 will remain untreated. These catchments have reduced areas compared to the associated pre-development catchments and have maintained the same runoff coefficient through the revised landscaping design. Therefore, untreated runoff from Catchment 201 and 202 will not further impact Argyle Road and the downstream system.

6.3 Water Balance & Erosion Control

Water balance and erosion control criteria for the City of Mississauga and the CVC respectively, are both satisfied through retention of the first 5 mm of a rainfall event:

- Per the City of Mississauga Development Requirements Manual (September 2016), the minimum requirement to promote water balance is retention of the first 5 mm of a rainfall event.
- Per the Credit Valley Conservation Stormwater Management Criteria (August 2012), the minimum requirement to satisfy erosion control is detention of the first 5 mm of a rainfall event.

The City of Mississauga's water balance criteria to retain the first 5 mm of a rainfall event was taken as the governing criteria because it requires a more stringent stormwater control strategy to be implemented and simultaneously satisfies the CVC's erosion control criteria. The required water balance and erosion control retention volume was calculated considering initial abstraction of runoff based on impervious areas from Catchment 203 and 204. Table 10 depicts the volume required to be retained to satisfy the water balance and erosion control criteria.

Table 10: Water Balance and Erosion Control Storage Requirement

Standard	Criteria	Impervious Area (ha)	Volume Required (m ³)
City of Mississauga Development Requirements Manual (September 2016) to achieve water balance	Retention of first 5 mm ¹	0.88	44
Credit Valley Conservation Stormwater Management Criteria (August 2012) to achieve erosion control			

Note 1: The City of Mississauga's water balance criteria to retain the first 5 mm is the governing constraint and satisfies the CVC's erosion control criteria to only detain the first 5 mm.

A total volume of 44 m³ will be provided through intensive green roof, rainwater irrigation of the at-grade landscape and green roof, and rainwater re-use toilets in the amenity spaces (if required). The rainwater harvesting will be provided via pumping of dead storage in Catchment 204's stormwater storage tank (Tank 1 - Roof). Re-use systems and pumps are to be designed by the Mechanical Engineer and will be finalized at detailed design.

6.4 Sustainable Stormwater Management

As outlined in Section 6.3, Low Impact Development (LID) strategies will be considered for use throughout the proposed development during the detailed design stage. 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.

6.5 Long-Term Groundwater Dewatering

Based on the Hydrogeological Geological Assessment Report prepared by Terraprobe Inc. dated February 2022, the Site will require long-term dewatering. The maximum long-term groundwater discharge estimate presented by Terraprobe is 15 m³/day (0.17 L/s). A dewatering pump flow of 2 L/s was accounted for in the post-development peak flow calculations. Terraprobe indicated that the groundwater exceeds the storm water quality criteria, therefore, the groundwater will need to be treated in accordance with the City of Mississauga Storm Sewer By-Law 259-05 prior to discharge. The dewatering and groundwater treatment system will be design by a dewatering consultant and specifications will be provided at the detailed design stage. The dewatering consultant and owner are to design and maintain the system such that it will be able to provide the requisite quality treatment during the lifetime of the building.

6.6 Permanent Erosion Control Measures

Since post-development flows are now primarily controlled rather than uncontrolled and being discharge via the proposed sewer outlet along Mary Fix Creek, the flows are more concentrated in comparison to the pre-development conditions. Therefore, permanent erosion control measures should be installed at the outlet. It is proposed to install a rip-rap apron along the outfall slope of the Mary Fix Creek. Rip-rap sizing and details will be provided at detailed design.

7.0 Conclusions and Recommendations

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

1. Existing buildings A and B will maintain their existing water and sanitary servicing schemes. Drainage catchments for the existing buildings will remain unchanged.
2. Water demand for proposed Building C will be provided using a 200 mm diameter fire line and 100 mm diameter domestic line extending from the existing 300 mm diameter watermain located in the Argyle Road R.O.W.
3. Sanitary servicing for Building C will be provided with a 200 mm diameter sanitary sewer at a slope of 2% extending from the underground limit to a proposed property line manhole, ultimately connecting to the existing 250 mm sanitary sewer within Argyle Road by a proposed manhole in the R.O.W.
4. Stormwater runoff from Catchment 203 and 204 will be controlled to the 100-year pre-development flow rates and overcontrolled to account for the uncontrolled flows from Catchment UC01. Flows will be controlled and discharged to the proposed 300 mm storm outlet which outlets to Mary Fix Creek.
5. Stormwater quality control criteria can be achieved through implementation of a Jellyfish Filter JF6-5-1 or approved equivalent. The proposed strategy will provide enhanced level of protection (80% TSS removal) therefore, achieving the stormwater quality control criteria.
6. Water balance criterion for the Site will be achieved through the retention of the 5 mm rainfall event via rainwater harvesting and a green roof.

Based on the above conclusions we support the proposed development application from the perspective of water supply, sanitary servicing, and stormwater management.

Respectfully submitted,

C.F. CROZIER & ASSOCIATES INC.



Jayesh Boily, E.I.T.
Land Development

JB:

I:\1700\1788 - Ranee Management\5379 - 2570 - 2590 Argyle Rd\Reports\2023.07.25_(1788-5379)_FSR.docx

C.F. CROZIER & ASSOCIATES INC.

Rob Babic, P.Eng.
Project Manager



APPENDIX A

Water Demand Calculations

Connection Demand Table

WATER CONNECTION

Connection point ³⁾ Argyle Road – Ex. 300mm dia. DI watermain			
Pressure zone of connection point		2	
Total equivalent population to be serviced ¹⁾		689	
Total lands to be serviced		1.40 ha	
Hydrant flow test			
Hydrant flow test location		Argyle Road	
	Pressure (kPa)	Flow (in l/s)	Time
Minimum water pressure	579.16	439.6	N/A
Maximum water pressure	586.05	617	

Water demands – Phase 1			
No.	Demand type	Demand	Units
1	Average day flow	2.23	l/s
2	Maximum day flow	4.47	l/s
3	Peak hour flow	6.70	l/s
4	Fire flow ²⁾	200	l/s
Analysis			
5	Maximum day plus fire flow	204.47	l/s

WASTEWATER CONNECTION

Phase 2

Connection point ⁴⁾		
Total equivalent population to be serviced		689 persons
Total lands to be serviced		1.40 ha
6	Wastewater sewer effluent (in l/s)	9.86

¹⁾ Please refer to design criteria for population equivocates

²⁾ Please reference the Fire Underwriters Survey Document

³⁾ Please specify the connection point ID

⁴⁾ 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.



CROZIER & ASSOCIATES
Consulting Engineers

Project: 2570 - 2590 Argyle Road
Address: 2570 - 2590 Argyle Road
Project No.: 1788-5379

Date: 2020.06.08
Revised: 2022.04.01
Revised By: OS
Design: DD/JB
Check: NS/MC

Existing Population Estimate

Total Site Area

2.15 ha

	Residential (# of units)
Building A	127
Building B	126
TOTAL	253

Residential Population:

Apartment: 2.7 persons/unit
Residential Population: **683** persons

Source: Peel Region Public Works Design Criteria Manual - Sanitary Sewer, March 2017.

EXISTING POPULATION **683** persons

I:\1700\1788 - Rane Management\5379 - 2570 - 2590 Argyle Rd\Design\Civil_Water\[5379_ Ex_Prop Wtr_San Demand.xlsx]Water



CROZIER & ASSOCIATES
Consulting Engineers

Project: 2570 - 2590 Argyle Road
Address: 2570 - 2590 Argyle Road
Project No.: 1788-5379

Date: 2020.06.08
Revised: 2022.04.01
Revised By: OS
Design: DD/JB
Check: NS/MC

Proposed Population Estimate

Total Site Area

2.15 ha

	Residential (# of units)
Proposed Buildings	
Building C	255
TOTAL	255

Residential Population:

Apartment: 2.7 persons/unit
Residential Population: **689** persons

Source: Peel Region Public Works Design Criteria Manual - Sanitary Sewer, March 2017.

PROPOSED POPULATION: **689** persons

SITE TOTAL POPULATION: **1372** persons

I:\1700\1788 - Rane Management\5379 - 2570 - 2590 Argyle Rd\Design\Civil_Water\[5379_ Ex_Prop Wtr_San Demand.xlsx]Water



Project: 2570 - 2590 Argyle Road
Address: 2570 - 2590 Argyle Road
Project No.: 1788-5379

Date: 2020.06.08
Revised: 2022.04.01
Revised By: OS
Design: DD/JB
Check: NS/MC

Existing Water Demand

Population Estimate:

Residential: 683 persons
TOTAL POPULATION: 683 persons

Design Criteria:

Average Consumption Rate:	0.280 m ³ /cap.day	Source: Peel Region Public Works Watermain Design Criteria, June 2010.
Maximum Daily Demand Peaking Factor:	2.00	
Peak Hourly Demand Peaking Factor:	3.00	

Residential Demand:

Average Daily Demand:	191.24 m ³ /day
	2.21 L/s
Maximum Daily Demand:	382.48 m ³ /day
	4.43 L/s
Peak Hourly Demand:	573.72 m ³ /day
	6.64 L/s
Existing Average Day Demand:	2.21 L/s
Existing Maximum Day Demand:	4.43 L/s
Existing Peak Hourly Demand:	6.64 L/s



Project: 2570 - 2590 Argyle Road
Address: 2570 - 2590 Argyle Road
Project No.: 1788-5379

Date: 2020.06.08
Revised: 2022.04.01
Revised By: OS
Design: DD/JB
Check: NS/MC

Proposed Water Demand

Population Estimate:

Residential: 689 persons
TOTAL POPULATION: 689 persons

Design Criteria:

Average Consumption Rate: 0.280 m³/cap.day
Maximum Daily Demand Peaking Factor: 2.00
Peak Hourly Demand Peaking Factor: 3.00

Source: Peel Region Public Works
Watermain Design Criteria, June
2010.

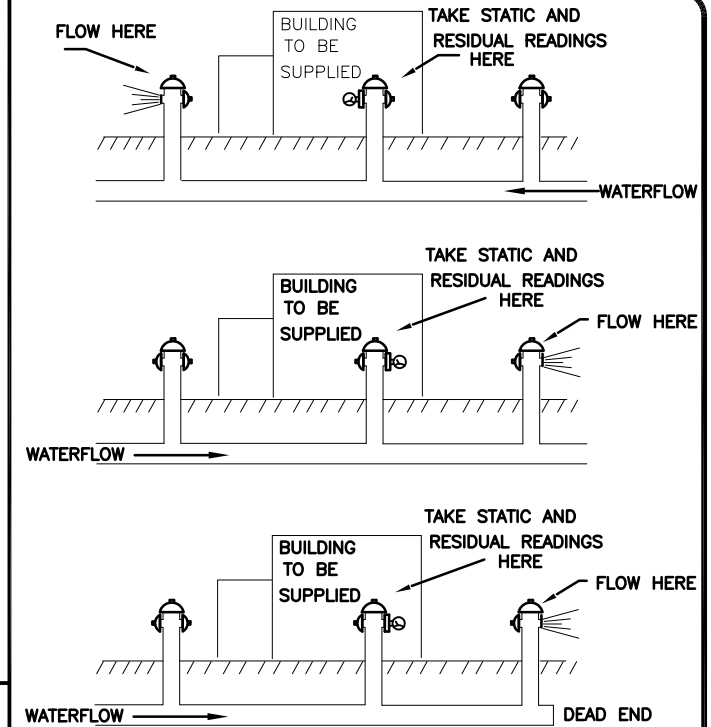
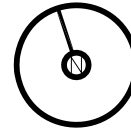
Residential Demand:

Average Daily Demand: 192.92 m³/day
2.23 L/s
Maximum Daily Demand: 385.84 m³/day
4.47 L/s
Peak Hourly Demand: 578.76 m³/day
6.70 L/s

Proposed Average Daily Demand: 2.23 L/s
Proposed Maximum Daily Demand: 4.47 L/s
Proposed Peak Hourly Demand: 6.70 L/s

Site Total Average Daily Demand: 4.45 L/s
Site Total Maximum Daily Demand: 8.89 L/s
Site Total Peak Hourly Demand: 13.34 L/s

Includes existing residential water
demand.



TEST:	PLAY PIPE	C=	STATIC(PSI)	RESIDUAL(PSI)	PITOT(PSI)	FLOW(USGPM)
	1x1 1/8					
	2x1 1/8					
	3x1 1/8					
	4x1 1/8					
	1x1 3/4					
	2x1 3/4					
	3x1 3/4					
	4x1 3/4					
HYDRANT BUTT						
1	1x2 1/2	.8	86	85	35	882.4
2	2x2 1/2	.8	86	84	12.5	1054.6
	3x2 1/2					
	4x2 1/2					
FM NOZZLE						
	1x2 1/4	.88				
	2x2 1/4	.88				
	3x2 1/4	.88				
	4x2 1/4	.88				

OUTLET TYPE

- COEF.=0.90
OUTLET SMOOTH
AND WELL ROUNDED
- COEF.=0.80
OUTLET SQUARE
AND SHARP
- COEF.=0.70
OUTLET SQUARE
AND PROJECTING
INTO BARREL
- COEF.=0.835
MODEL LPD-250A
DECHLORINATOR
DIFFUSER
PITOT TUBE

Client:
RANEE MANAGEMENT

Location:
2570-2590 ARGYLE RD
MISSISSAUGA, ON

DEDICATED SERVICE SINCE 1988

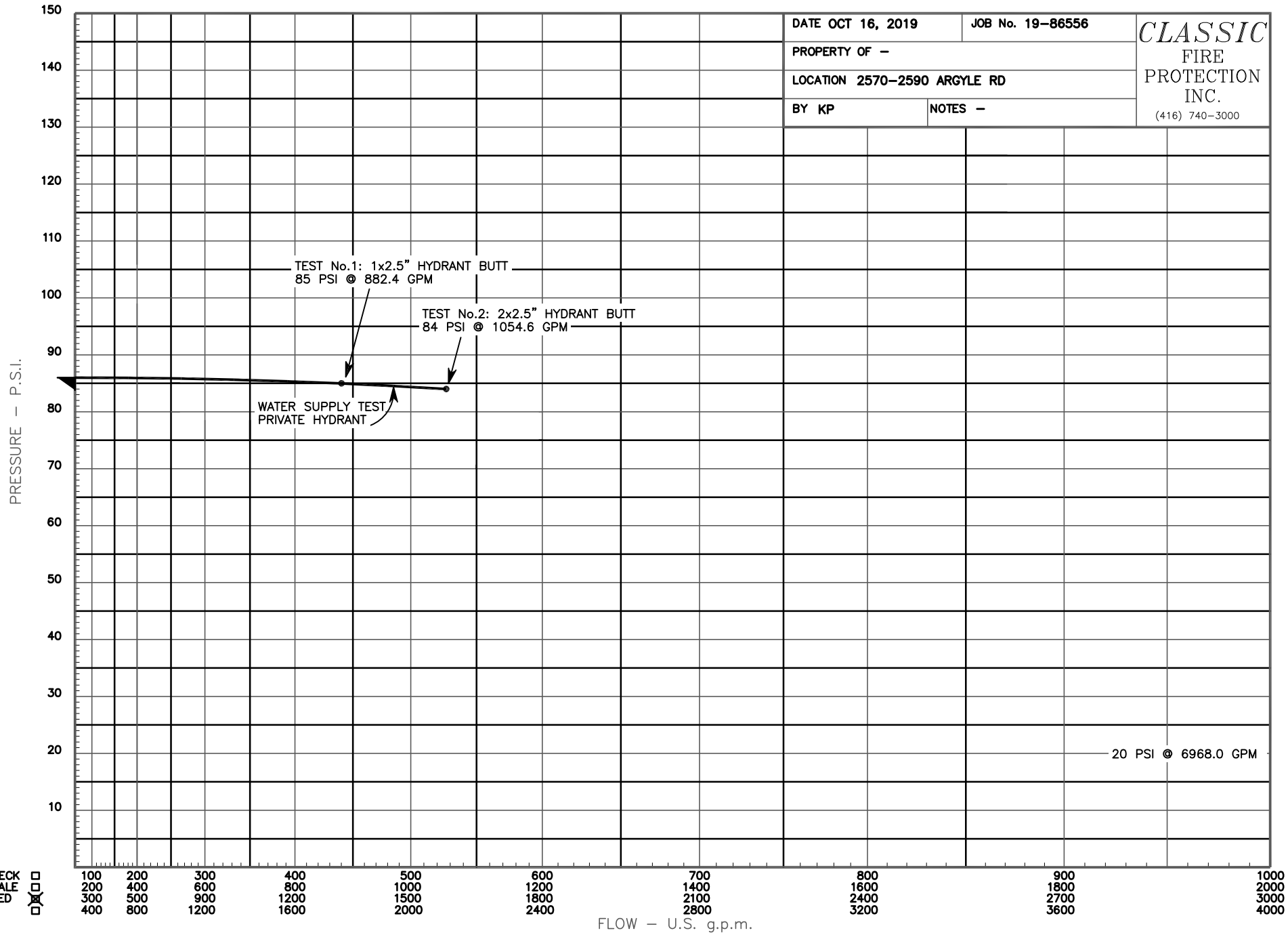
CLASSIC
FIRE PROTECTION INC.

645 GARYRAY DR.
North York, ON
M8L 1P9
(416) 740-3000

Web: www.classofire.com

WATER SUPPLY GRAPH

DATE OCT 16, 2019	JOB No. 19-86556	CLASSIC FIRE PROTECTION INC. (416) 740-3000
PROPERTY OF -		
LOCATION 2570-2590 ARGYLE RD		
BY KP	NOTES -	



CHECK
SCALE
USED

100	200	300	400	500	600	700	800	900	1000
200	400	600	800	1000	1200	1400	1600	1800	2000
300	500	900	1200	1500	1800	2100	2400	2700	3000
400	800	1200	1600	2000	2400	2800	3200	3600	4000

FLOW - U.S. g.p.m.

Building C - Fire Flow Calculations - Fire Underwriters Survey Method

Water Supply for Public Fire Protection (1999)

Fire Underwriters Survey

Notes:

- 1.) The development will use ordinary construction (C-value = 1.0).

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 Development	1.0 C-Value	Largest Floor (Plus 25% of Adjoining Floors)	3139.82 sq.m 1569.91 sq.m 4709.7 sq.m	Note: Level 04 of Tower
Therefore F =		15,100 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%	Rapid Burning	25%
Combustible	0% (No change)		
	-15% Reduction(%)		
	-2,265 L/min reduction		

Subtotal = 12,835 L/min

Note: Flow determined shall not be less than 2,000 L/min

3. Sprinklers - The value obtained in No. 2 above may be reduced by up to 50% for complete automatic sprinkler protection.

Assume complete automatic sprinkler protection (50% reduction)
-6,418 L/min reduction

Water Supply for Public Fire Protection - 1999

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%	>45 m	0%

Exposed buildings

Name	Distance (m)	Charge	Surcharge (L/min)
North	12.9	15%	1,925
East	42.5	5%	642
South	43.8	5%	642
West	10.3	15%	1,925
Total Surcharge			5,134

Determine Required Fire Flow

No. 1	15,100
No. 2	-2,265 reduction
No. 3	-6,418 reduction
No. 4	5,134 surcharge

Required Flow: 11,552 L/min
Rounded to nearest 1000 L/min: 12,000 L/min or **200.0 L/s**
3,168.0 USGPM

Note: USGPM = 0.264*(L/min)

Required Duration of Fire Flow

Flow Required (L/min)	Duration (hours)
2,000 or less	1.00
3,000	1.25
4,000	1.50
5,000	1.75
6,000	2.00
8,000	2.00
10,000	2.00
12,000	2.50
14,000	3.00
16,000	3.50
18,000	4.00
20,000	4.50
22,000	5.00
24,000	5.50
26,000	6.00
28,000	6.50
30,000	7.00
32,000	7.50
34,000	8.00
36,000	8.50
38,000	9.00
40,000 and over	9.50



PROJECT: 2570-2590 Argyle Road
 PROJECT No.: 1788-5379
 DATE: 2020.06.08

DESIGN: DD
 CHECK: NRS

Projected Fire Flows - Hydrant Flow Test dated October 16, 2019

Test	Hydrant Location / ID	Static Pressure	Residual Pressure during Test	Flow from Hydrant Test	Desired Residual Pressure	Projected Fire Flow Available at 20 psi	
		P _s	P _t	Q _t	P _r	Q _r	
		(psi)	(psi)	(USGPM)	(psi)	(USGPM)	(L/s)
			At Static Pressure				
1	Argyle Road	86	85	882.4	20	9,779	617
2			84	1054.6		6,968	439.6
EX. PRESSURE IS OKAY							

$$Q_r = Q_t \times ((P_s - P_r) / (P_s - P_t))^{0.54}$$

$$Q_r = Q_r / 15.85$$

Formula to determine available flow as per AWWA M17 (1989)

Formula to convert flows at 20 psi from USGPM to L/s

NOTE: Projected fire flows are calculated on the basis of hydrant tests carried out by Classic Fire Protection Inc. dated October 16, 2019

APPENDIX B

Sanitary Flow Calculations



CROZIER & ASSOCIATES
Consulting Engineers

Project: 2570 - 2590 Argyle Road
Address: 2570 - 2590 Argyle Road
Project No.: 1788-5379

Date: 2020.06.08
Revised: 2022.04.01
Revised By: OS
Design: DD/JB
Check: NS/MC

Existing Population Estimate

Total Site Area

2.15 ha

	Residential (# of units)
Building A	127
Building B	126
TOTAL	253

Residential Population:

Apartment: 2.7 persons/unit
Residential Population: **683** persons

Source: Peel Region Public Works Design Criteria Manual - Sanitary Sewer, March 2017.

EXISTING POPULATION **683** persons

I:\1700\1788 - Rane Management\5379 - 2570 - 2590 Argyle Rd\Design\Civil_Water\[5379_ Ex_Prop Wtr_San Demand.xlsx]Water



CROZIER & ASSOCIATES
Consulting Engineers

Project: 2570 - 2590 Argyle Road
Address: 2570 - 2590 Argyle Road
Project No.: 1788-5379

Date: 2020.06.08
Revised: 2022.04.01
Revised By: OS
Design: DD/JB
Check: NS/MC

Proposed Population Estimate

Total Site Area

2.15 ha

	Residential (# of units)
Proposed Buildings	
Building C	255
TOTAL	255

Residential Population:

Apartment: 2.7 persons/unit
Residential Population: **689** persons

Source: Peel Region Public Works Design Criteria Manual - Sanitary Sewer, March 2017.

PROPOSED POPULATION: **689** persons

SITE TOTAL POPULATION: **1372** persons

I:\1700\1788 - Rane Management\5379 - 2570 - 2590 Argyle Rd\Design\Civil_Water\[5379_ Ex_Prop Wtr_San Demand.xlsx]Water



Project: 2570 - 2590 Argyle Road
Address: 2570 - 2590 Argyle Road
Project No.: 1788-5379

Date: 2020.06.08
Revised: 2022.04.01
Revised By: OS
Design: DD/JB
Check: NS/MC

Existing Sanitary Flow

Total Site Area:

2.15 ha

Infiltration Area:

0.84 ha

Note: Sum of drainage Catchment 101 and 102 Areas

Population Estimates:

Residential: 683 persons
TOTAL POPULATION: 683 persons

Design Criteria:

Unit Sewage Flow: 0.3028 m³/cap.day

Infiltration: 0.200 L/s/ha

Peaking Factor (Commercial Land Use):

Modified Harmon Formula

$$M = 1 + \frac{14}{4 + \sqrt{Pe}}$$

Source: Peel Region Sanitary Sewer Design
Criteria, March 2017.
Standard Drawing 2-9-2

Residential Sanitary Flow:

Average Dry Weather Flow: 206.81 m³/day
2.39 L/s

Existing Dry Weather Sanitary Flow: 2.39 L/s

Peaking Factor: 3.90

Existing Peak Sanitary Flow: 9.34 L/s

Inflow/Infiltration Allowance: 0.17 L/s

Existing Design Sanitary Flow: 9.50 L/s



Project: 2570 - 2590 Argyle Road
 Address: 2570 - 2590 Argyle Road
 Project No.: 1788-5379

Date: 2020.06.08
 Revised: 2022.04.01
 Revised By: OS
 Design: DD/JB
 Check: NS/MC

Proposed Sanitary Flow

Site Area:

2.15 ha

Infiltration Area:

1.40 ha

Note: Drainage Catchments 203, 204, UC01 (Post-Development) Area

Population Estimates:

Residential: 689 persons
 TOTAL POPULATION: 689 persons

Design Criteria:

Unit Sewage Flow: 0.3028 m³/cap.day
 Infiltration: 0.200 L/s/ha

Peaking Factor (Commercial Land Use):

Source: Peel Region Sanitary Sewer Design Criteria, March 2017.
 Standard Drawing 2-9-2

Modified Harmon Formula

$$M = 1 + \frac{14}{4 + \sqrt{Pe}}$$

Residential Sanitary Flow:

Average Dry Weather Flow: 208.63 m³/day
 2.41 L/s

Proposed Dry Weather Sanitary Flow: 2.41 L/s

Peaking Factor: 3.90

Proposed Peak Sanitary Flow: 9.41 L/s

Inflow/Infiltration Allowance: 0.28 L/s

Long-Term Dewatering: 0.17 L/s

Proposed Design Sanitary Flow: 9.86 L/s

Draft Hydrogeological Assessment Report, Terraprobe Inc. dated February 23, 2022

Site Total Dry Weather Sanitary Flow: 4.81 L/s

Site Total Peak Sanitary Flow: 18.75 L/s

Site Total Design Sanitary Flow: 19.37 L/s

Includes existing residential sanitary design flows.

APPENDIX C

Stormwater Management Calculations



Catchment Areas and Runoff Coefficients

Catchment	Runoff Coefficient		Total Area (m3)	Weighted Runoff Coefficient
	0.9	0.25		
	Impervious Area (m3)	Pervious Area (m3)		
EX1	400	0	400	0.90
101	2140	2676	4816	0.54
102	1111	1113	2224	0.57
104	2140	122	2262	0.86
103	8893	2172	11065	0.77
201	1951	2416	4367	0.54
202	995	1034	2029	0.57
203	5987	507	6494	0.85
204	3136	0	3136	0.90



Project: 2570-2590 Argyle Road
 Project No.: 1788-5379
 Created By: JB
 Checked By: MC/RB
 Date: 2022.04.01
 Updated: 2023.06.15

Modified Rational Calculations - Input Parameters

Storm Data: Mississauga

Time of Concentration: $T_c = 15$ min per City of Mississauga Transportation and Works Development Requirements Manual – Section 8 Storm Drainage Design Requirements dated November 2020

Return Period	A	B	C	I (mm/hr)
2 yr	610.0	4.6	0.78	59.89
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 - Development Conditions				
Catchment ID	Area (ha)	Area (m ²)	C _{Design}	C _{Actual}
101	0.48	4816	0.50	0.54
102	0.22	2224	0.50	0.57
103	1.11	11065	0.50	0.77
104	0.23	2262	0.50	0.86
EX1	0.04	400	0.90	0.90
Total Site	2.08	20767	-	0.71

Post - Development Conditions				
Catchment	Area (ha)	Area (m ²)	Weighted C	100-Year Adjusted RC
201	0.44	4367	0.54	0.68
202	0.20	2029	0.57	0.71
203	0.65	6494	0.85	1.00
204	0.31	3136	0.90	1.00
UC01	0.43	4341	0.69	0.86
EX1	0.04	400	0.90	0.90
Total Site	2.08	20767	0.73	0.87

Equations:

$$Q_{\text{post}} = 0.0028 \cdot C_{\text{post}} \cdot i(T_d) \cdot A$$

$$i(T_d) = A / (T + B)^C$$

Note: City of Mississauga Correction Factors applied to RC for below design storms.

10-year	1.00
25-year	1.10
50-year	1.20
100-year	1.25

Modified Rational Calculations - Peak Flows Summary (Mary Fix Creek)

Pre-Development Peak Flows (L/s)

Return Period	Pre-Development Catchments		Total Peak Flow
	Q ₁₀₃	Q ₁₀₄	
100 yr	217.94	44.55	262.50

Post-Development Peak Flows (L/s) - Uncontrolled

Return Period	Post-Development Catchments			Total Peak Flow
	Q ₂₀₃	Q ₂₀₄	Q _{UC01}	
100 yr	255.82	123.54	117.99	497.35

Post-Development Peak Flows (L/s) - Controlled

Return Period	Post-Development Catchments			Total Peak Flow
	Q ₂₀₃	Q ₂₀₄	Q _{UC01}	
100 yr	102.00	27.49	117.99	249.49

Note: Additional 2 L/s has been added to the peak flow to account for long-term dewatering based on Hydrogeological Assessment Report by Terraprobe dated February 2022

300mm dia. Pipe Capacity

Q₂₀₃ + Q₂₀₄ Post Dev. = 131.49 L/S
 Q_{Pipe} = 136.76 L/S (Full Flow Capacity of Pipe)
 Percent Full = 96 %

Equations:

Peak Flow

$$Q_{\text{post}} = 0.0028 \cdot C_{\text{post}} \cdot i(T_d) \cdot A$$

Manning's Equation

$$Q_{\text{pipe}} = (1/n) \cdot A \cdot R^{2/3} \cdot S^{1/2}$$



Project: 2570-2590 Argyle Road
Project No.: 1788-5379
Created By: JB
Checked By: MC/RB
Date: 2022.04.01
Updated: 2023.06.15

Catchment 203 Storage

Modified Rational Calculations - 100-Year Storm Event

Control Criteria

100 yr: Control Post-Development Peak Flows to Pre-Development Peak Flow

100 yr: Uncontrolled Post-Development Flow:

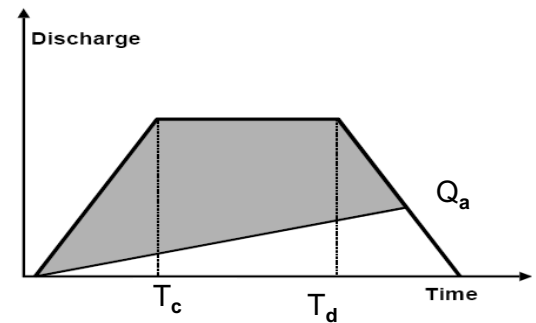
$$Q_{\text{post}} = 0.256 \text{ m}^3/\text{s}$$

100 yr: Pre-Development Flow:

$$Q_{\text{pump}} = 0.102 \text{ m}^3/\text{s} \quad \text{Pumped flow rate}$$

Storage Volume Determination

T_d (min)	i (mm/hr)	T_d (sec)	Q_{Uncont} (m^3/s)	S_d (m^3)
5	242.5	300	0.441	71.1
10	176.31	600	0.321	115.9
15	140.69	900	0.256	138.4
20	118.12	1200	0.215	150.6
25	102.41	1500	0.186	156.9
30	90.77	1800	0.165	159.4
35	81.77	2100	0.149	159.2
40	74.58	2400	0.136	157.2
45	68.68	2700	0.125	153.6
50	63.75	3000	0.116	148.9
55	59.56	3300	0.108	143.2
60	55.95	3600	0.102	136.8
65	52.81	3900	0.096	129.7
70	50.03	4200	0.091	122.0



Required Storage Volume: 159.4

Peak Flow
 $Q_{\text{post}} = 0.0028 \cdot C_{\text{post}} \cdot i(T_d) \cdot A$

Storage
 $S_d = Q_{\text{post}} \cdot T_d - Q_{\text{target}} (T_d + T_c) / 2$



Project: 2570-2590 Argyle Road
 Project No.: 1788-5379
 Created By: JB
 Checked By: MC/RB
 Date: 2022.04.01
 Updated: 2023.06.15

Catchment 204 Storage

Modified Rational Calculations - 100-Year Storm Event

Control Criteria

100 yr: Control Post-Development Peak Flows to Pre-Development Peak Flow

100 yr: Uncontrolled Post-Development Flow:

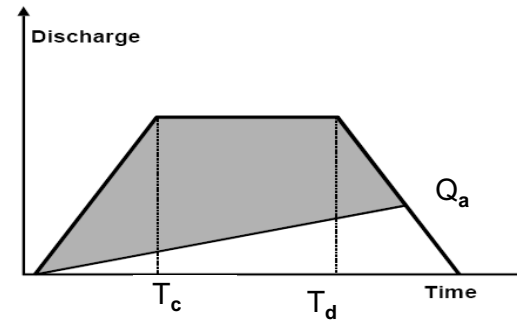
$$Q_{\text{post}} = 0.124 \text{ m}^3/\text{s}$$

100 yr: Pre-Development Flow:

$$Q_{\text{orifice}} = 0.027 \text{ m}^3/\text{s} \quad (250\text{mm Orifice})$$

Storage Volume Determination

T_d (min)	i (mm/hr)	T_d (sec)	Q_{Uncont} (m^3/s)	S_d (m^3)
5	242.53	300	0.213	47.4
10	176.31	600	0.155	72.3
15	140.69	900	0.124	86.4
20	118.12	1200	0.104	95.6
25	102.41	1500	0.090	101.9
30	90.77	1800	0.080	106.4
35	81.77	2100	0.072	109.5
40	74.58	2400	0.065	111.8
45	68.68	2700	0.060	113.3
50	63.75	3000	0.056	114.3
55	59.56	3300	0.052	114.9
60	55.95	3600	0.049	115.0
65	52.81	3900	0.046	114.9
70	50.03	4200	0.044	114.4



Required Storage Volume:

115.0

Peak Flow
 $Q_{\text{post}} = 0.0028 \cdot C_{\text{post}} \cdot i(T_d) \cdot A$

Storage
 $S_d = Q_{\text{post}} \cdot T_d - Q_{\text{target}} (T_d + T_c) / 2$



Project: 2570-2590 Argyle Road

Project No.: 1788-5379

Created By: JB

Checked By: MC/RB

Date: 2022.04.01

Updated: 2023.06.15

Modified Rational Calculations - Peak Flows Summary (Argyle Road)

Pre-Development Peak Flows (L/s)

Return Period	Pre-Development Catchments			Total Peak Flow (Target Rate)
	Q _{EX01}	Q ₁₀₁	Q ₁₀₂	
10 yr	10.00	66.86	30.88	107.73

Note: Assumed existing sewers on Argyle Road have been designed to convey the 10-year storm event

Post-Development Peak Flows (L/s) - Uncontrolled

Return Period	255.8190715			Total Peak Flow
	Q _{EX01}	Q ₂₀₁	Q ₂₀₂	
10 yr	10.00	65.48	32.11	107.59

Equations:

<p>Peak Flow</p> $Q_{\text{post}} = 0.0028 \cdot C_{\text{post}} \cdot i(T_d) \cdot A$
--



2570-2590 Argyle Road
1788-5379

Date: 2020.06.08
Created By: DD
Checked By: NS

Water Balance Volume Requirement

Site Area 2.15 ha

Water Balance criteria is 5mm across site impervious area

Impervious Area: 1.10 ha

Volume Required: 55.00 m³

Jayesh Boily

From: Hosale, Lisa <Lisa.Hosale@cvc.ca>
Sent: Friday, March 4, 2022 9:00 AM
To: Jayesh Boily
Cc: Matt Coleridge
Subject: RE: [External] RE: Floodplain Map for 2570-2590 Argyle Road, Mississauga (CFCA File No.: 1788-5379)

Hi Jayesh,
Good morning, based on CVC's current hydraulic model for Mary Fix Creek the 25 yr. W.S.El. =110.99m (110.87m+0.121 to obtain City of Miss datum) at the location of the existing outlet.

Please feel free to use this information as you prepare your resubmittal to the City, and please feel free to contact us if you have any further questions here.

Best wishes,
Lisa

I'm working remotely. The best way to reach me is by email, mobile phone or Microsoft Teams.

Lisa Hosale | M.A., M.Sc., AICP | she/her/hers
Senior Planner (Acting), Planning and Development Services | Credit Valley Conservation
905-670-1615 ext 268 | M: 437-881-1737
lisa.hosale@cvc.ca | cvc.ca



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From: Jayesh Boily <jboily@cfcrozier.ca>
Sent: Thursday, February 24, 2022 12:06 PM
To: Hosale, Lisa <Lisa.Hosale@cvc.ca>
Cc: Matt Coleridge <mcoleridge@cfcrozier.ca>
Subject: FW: [External] RE: Floodplain Map for 2570-2590 Argyle Road, Mississauga (CFCA File No.: 1788-5379)

You don't often get email from jboily@cfcrozier.ca. [Learn why this is important](#)

[CAUTION] This email originated from outside of the organization. Do not click links or open attachments unless you recognize the sender and know the content is safe. If in doubt contact help211@cvc.ca

Hi Lisa,

I got a bounce back from Maricris saying that I must contact you regarding Mississauga projects.

We are addressing first submission comments received for the 2570-2590 Argyle Road, Mississauga project and have been in contact with the CVC to address comments related to Mary Fix Creek.

We received a comment from the City's reviewer asking to confirm that the obvert of the existing outlet pipe along Mary Fix Creek is above the 25-year flood elevation. Would you be able to confirm the 25-year flood elevation for our area?

Please let me know if you need you further information or have any questions.

Thanks,
Jay

Jayesh Boily | Engineering Intern
2800 High Point Drive, Suite 100 | Milton, ON L9T 6P4
T: 905.875.0026



Crozier Connections: [f](#) [t](#) [in](#) [i](#)

Read our latest news and announcements [here](#).

From: Jayesh Boily
Sent: Thursday, February 24, 2022 11:38 AM
To: 'Marinas, Maricris' <Maricris.Marinas@cvc.ca>
Cc: Matt Coleridge <mcoleridge@cfcrozier.ca>
Subject: RE: [External] RE: Floodplain Map for 2570-2590 Argyle Road, Mississauga (CFCA File No.: 1788-5379)

Hi Maricris,

Thank you again for the updated Mary Fix Creek floodplain mapping. We are still working through comments from the first submission.

Per a comment from the City, they asked us to confirm that the obvert of the existing outlet pipe along Mary Fix Creek is above the 25-year flood elevation. Would you be able to confirm the 25-year flood elevation for our area?

Thank you,
Jay

From: Marinas, Maricris <Maricris.Marinas@cvc.ca>
Sent: Monday, July 12, 2021 4:54 PM
To: Jayesh Boily <jboily@cfcrozier.ca>
Cc: Nicole Segal <nsegal@cfcrozier.ca>; Jordan Atherton <jatherton@cfcrozier.ca>
Subject: RE: [External] RE: Floodplain Map for 2570-2590 Argyle Road, Mississauga (CFCA File No.: 1788-5379)

Hi Jayesh,

Attached is the most up to date floodplain map for Mary Fix Creek within the project area. As shown, please continue to use the previously recommended flood elevation and guidance as provided by CVC staff through comments (provided in Dec 2020) on the most recent rezoning submission (Nov 2020).

I trust this is helpful – please let me know if you have any questions.

Regards,
Maricris

I'm working remotely. The best way to reach me is by email, mobile phone or Microsoft Teams.

Maricris Marinas | M.Sc. | she/her/hers
Senior Planner, Planning and Development Services | Credit Valley Conservation
905-670-1615 ext 220 | M: 647-283-3850
maricris.marinascvc.ca | cvc.ca



[View our privacy statement](#)

From: Jayesh Boily <jboily@cfcrozier.ca>
Sent: Tuesday, June 29, 2021 10:49 AM
To: Marinas, Maricris <Maricris.Marinascvc.ca>
Cc: Nicole Segal <nsegal@cfcrozier.ca>; Jordan Atherton <jatherton@cfcrozier.ca>
Subject: [External] RE: Floodplain Map for 2570-2590 Argyle Road, Mississauga (CFCA File No.: 1788-5379)

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Hi Maricris,

I hope you're doing well. Crozier is working through the revision for the Argyle project. To address the floodplain comments, does the CVC have revised modelling for the spill area?

Thank you,

Jay

Jayesh Boily | Engineering Intern
2800 High Point Drive, Suite 100 | Milton, ON L9T 6P4
T: 905.875.0026



Crozier Connections: [f](#) [t](#) [in](#)

Read our latest news and announcements [here](#).

From: Marinas, Maricris <Maricris.Marinas@cvc.ca>
Sent: November 5, 2019 3:54 PM
To: Nicole Segal <nsegal@cfcrozier.ca>
Cc: Anindita Datta <adatta@cfcrozier.ca>; Alejandra Padron <apadron@bousfields.ca>
Subject: RE: Floodplain Map for 2570-2590 Argyle Road, Mississauga (CFCA File No.: 1788-5379)

Hi Nicole,

Based on floodplain information for Mary Fix Creek, it appears that the south west portion of the site is encroaching within the floodplain. As such, please provide a geodetic survey which shows the delineated regulatory flood elevation as follows:

- The southwest portion of the site appears to be affected by spill. For this area, please apply a regulatory flood elevation for 111.91m. Note: To obtain City of Mississauga Datum 0.121m has been added to the W.S.El. of 111.78m. For reference please see the attached figures (2D Regional Floodplain and Depth Mapping).
- Please use the attached floodplain mapping (MaryFix_Sheet 5) to delineate the floodplain along the rest of the site.

Please note that CVC is currently updating the floodplain maps for Mary Fix Creek – the model is still a work in progress and subject to change pending results from 2D analysis for spill areas.

Should you have any questions please do not hesitate to contact me.

Regards,
Maricris

Maricris Marinas, M.Sc.
Senior Planner, Planning and Development Services | Credit Valley Conservation

From: Nicole Segal <nsegal@cfcrozier.ca>
Sent: Tuesday, October 29, 2019 11:39 AM
To: Li, Annie <Annie.Li@cvc.ca>; Marinas, Maricris <Maricris.Marinas@cvc.ca>
Cc: Anindita Datta <adatta@cfcrozier.ca>
Subject: RE: Floodplain Map for 2570-2590 Argyle Road, Mississauga (CFCA File No.: 1788-5379)

Awesome, thanks Annie!

Maricris, we would appreciate if you could forward us the preliminary floodplain information and any other information that will assist us in developing a Site Plan that considers the on-site constraints.

Thanks,
Nicole

Nicole Segal M.M.Sc., EIT | Engineering Intern
C.F. Crozier & Associates Consulting Engineers
2800 High Point Drive, Suite 100 | Milton, ON L9T 6P4
cfcrozier.ca | nsegal@cfcrozier.ca
tel: 905.875.0026 ext: 329



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From: Li, Annie <Annie.Li@cvc.ca>
Sent: October 29, 2019 9:05 AM
To: Nicole Segal <nsegal@cfcrozier.ca>; Maricris Marinas <maricris.marinascvc.ca>
Cc: Anindita Datta <adatta@cfcrozier.ca>
Subject: RE: Floodplain Map for 2570-2590 Argyle Road, Mississauga (CFCA File No.: 1788-5379)

Hi Nicole,

Thanks for following up. I noticed that the email for Maricris was spelt incorrectly (sorry about my messy writing on site); Maricris is now included on the email and she will follow up with you regarding your request.

Thanks,

Annie Li
Planner, Planning and Development Services | Credit Valley Conservation
905-670-1615 ext 380 | 1-800-668-5557
annie.li@cvc.ca | cvc.ca

From: Nicole Segal <nsegal@cfcrozier.ca>
Sent: Tuesday, October 29, 2019 8:53 AM
To: Li, Annie <Annie.Li@cvc.ca>
Cc: Anindita Datta <adatta@cfcrozier.ca>; mariaris.marinascvc.ca
Subject: Floodplain Map for 2570-2590 Argyle Road, Mississauga (CFCA File No.: 1788-5379)

Hi Annie,

Nice to meet you a few weeks ago at the site walk for the Argyle project in Mississauga. Can you please forward us the preliminary revised floodplain mapping for the area that illustrated the flood elevation at 111.90?

Thank you,
Nicole

Nicole Segal M.M.Sc., EIT | Engineering Intern
C.F. Crozier & Associates Consulting Engineers
2800 High Point Drive, Suite 100 | Milton, ON L9T 6P4
cfcrozier.ca | nsegal@cfcrozier.ca
tel: 905.875.0026 ext: 329



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Daniel Doherty

From: Nathan McFadden <Nathan.McFadden@mississauga.ca>
Sent: Wednesday, March 11, 2020 7:32 AM
To: Nicole Segal
Cc: Basic, Ranka; ddoherty@cfrozier.ca; DiBerto, Dorothy
Subject: RE: 2570 Argyle Road, Mississauga - SWM Terms of Reference (CFCA File No.: 1788-5379)

Hi Nicole,

After reviewing Dorothy's email I agree with the request for more stringent storm water quantity control due to the spill/flooding occurring downstream.

Please let me know if you have any questions.

Thank you,



Nathan McFadden C.E.T.
Storm Drainage Technologist
Environmental Services
T 905-615-3200 ext.3192
nathan.mcfadden@mississauga.ca

[City of Mississauga](#) | Transportation & Works Department
Infrastructure Planning & Engineering Services

Follow us on Instagram [@saugastormwater](#)

From: DiBerto, Dorothy [mailto:Dorothy.DiBerto@cvc.ca]
Sent: Tuesday, March 10, 2020 2:54 PM
To: nsegal@cfrozier.ca
Cc: Nathan McFadden; Basic, Ranka; ddoherty@cfrozier.ca
Subject: RE: 2570 Argyle Road, Mississauga - SWM Terms of Reference (CFCA File No.: 1788-5379)

Hi Nicole,

Maricris is currently on leave so I will take this on for the moment.

To answer your questions, see my comments in **red** below:

We can further discuss if necessary,

Thanks

Dorothy Di Berto, RPP

Senior Manager, Planning | Planning and Development Services | Credit Valley Conservation
905.670.1615 ext 232 | C: 416.558.2053 | 1.800.668.5557
dorothy.diberto@cvc.ca | cvc.ca

From: Nicole Segal <nsegal@cfcrozier.ca>
Sent: Monday, March 2, 2020 5:03 PM
To: Nathan McFadden <Nathan.McFadden@mississauga.ca>; Marinas, Maricris <Maricris.Marinas@cvc.ca>
Cc: Daniel Doherty <ddoherty@cfcrozier.ca>
Subject: 2570 Argyle Road, Mississauga - SWM Terms of Reference (CFCA File No.: 1788-5379)

Hi Maricris and Nathan,

Hope you're both doing well. We are initiating the civil design of the infill project located at 2570 Argyle Road in Mississauga – see attached Site Plan. Prior to starting the design we would like to confirm the Terms of Reference for the stormwater management design. Can you please review the following criteria and advise if they are suitable for the site?:

Stormwater Quality: Achieve 80% TSS Removal – **Yes**

Stormwater Quantity: No controls required in accordance with the CVC Stormwater Management Criteria (August 2012) – refer to attached PDF named 2570 Argyle SWM Quantity Control **Based on City's Criteria (see link below), Mary Fix Creek requirement is 10 yr post-2 yr pre.**

<http://www7.mississauga.ca/Departments/Marketing/documents/tw/FINAL-Section-8-Storm-Drainage-Design-Requirements-Jan2020.pdf>

However, there is spill/flooding occurring downstream of the property and as such we recommend 100 yr post-100 yr pre development flow, if possible. Recognizing that this is more stringent than the current City criteria, but also acknowledging downstream hazard, we suggest this if City staff are in agreement.

Water Balance: Retain 5mm onsite **Yes**

We also note the Erosion Criteria: “ At a minimum retain 5 mm on site where conditions do not warrant the detailed analyses described in Section 4.3.

If a site drains to a sensitive creek, or a subwatershed study or EIR is required, then the proponent must complete a geomorphologic assessment study to determine the site appropriate erosion threshold (refer to Figure 4-1)”.

Maricris, can you please also do a high level review of the plotted floodplain elevation and advise if you see any glaring issues?

In terms of the flood hazard please provide the topographic elevation and geodetically delineate the R.F.Elevation along the property.

Also, please provide a Geotechnical Study in order to delineate the slope stability based on CVC's guide.

Thanks,
Nicole

Nicole Segal M.M.Sc., EIT | Engineering Intern
C.F. Crozier & Associates Consulting Engineers
2800 High Point Drive, Suite 100 | Milton, ON L9T 6P4

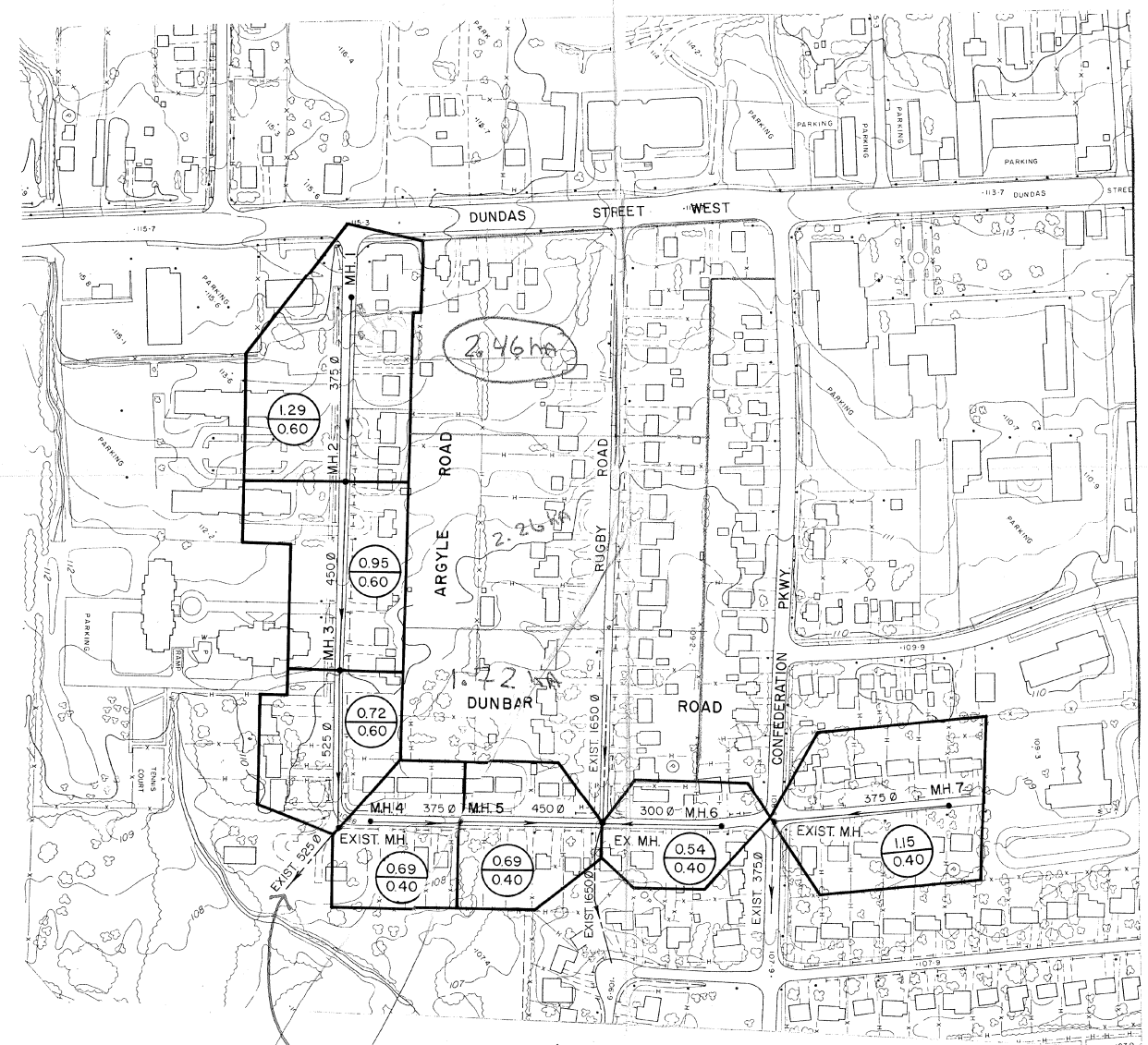
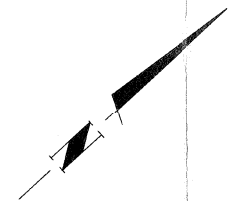


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SERVICE DATA					
SERVICE	DATE	INIT.	SERVICE	DATE	INIT.
SAN SEWERS			GAS MAINS		
STORM SEWERS			BELL U/S CABLE		
WATERMANS			HYDRO U/S CABLE		

REVISIONS		
DATE	DETAILS	INIT.



0.69 AREA - HECTARES
0.40 RUNOFF COEFFICIENT

- GENERAL NOTES**
- ALL DRIVEWAYS ASPHALT UNLESS OTHERWISE NOTED.
 - ALL SERVICE LOCATIONS ARE APPROXIMATE AND MUST BE LOCATED ACCURATELY IN FIELD.
 - ● DENOTES BUILDING - NOT LOCATED.
 - □ DENOTES BUILDING - LOCATED.
 - T.T.B.M. No. ELEV.
 - TEMP BENCH MARK ELEV. DESCRIPTION.

DESIGNED BY _____

APPROVED BY _____

CHKD

THIS EXIST. 525 ϕ - IS NOT 525mm ϕ
 BUT 450mm ϕ
 * UNDER DESIGNED FOR THIS AREA

771.2

MISSISSAUGA
Public Works Department

ARGYLE RD. — DUNBAR RD.
STORM DRAINAGE AREAS

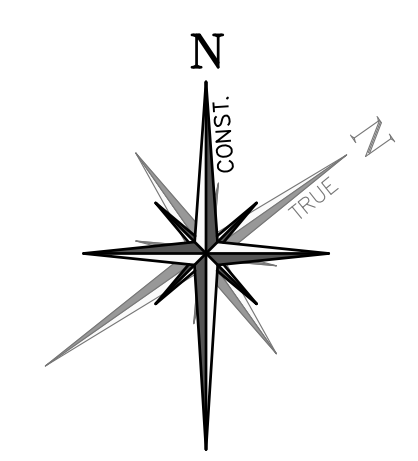
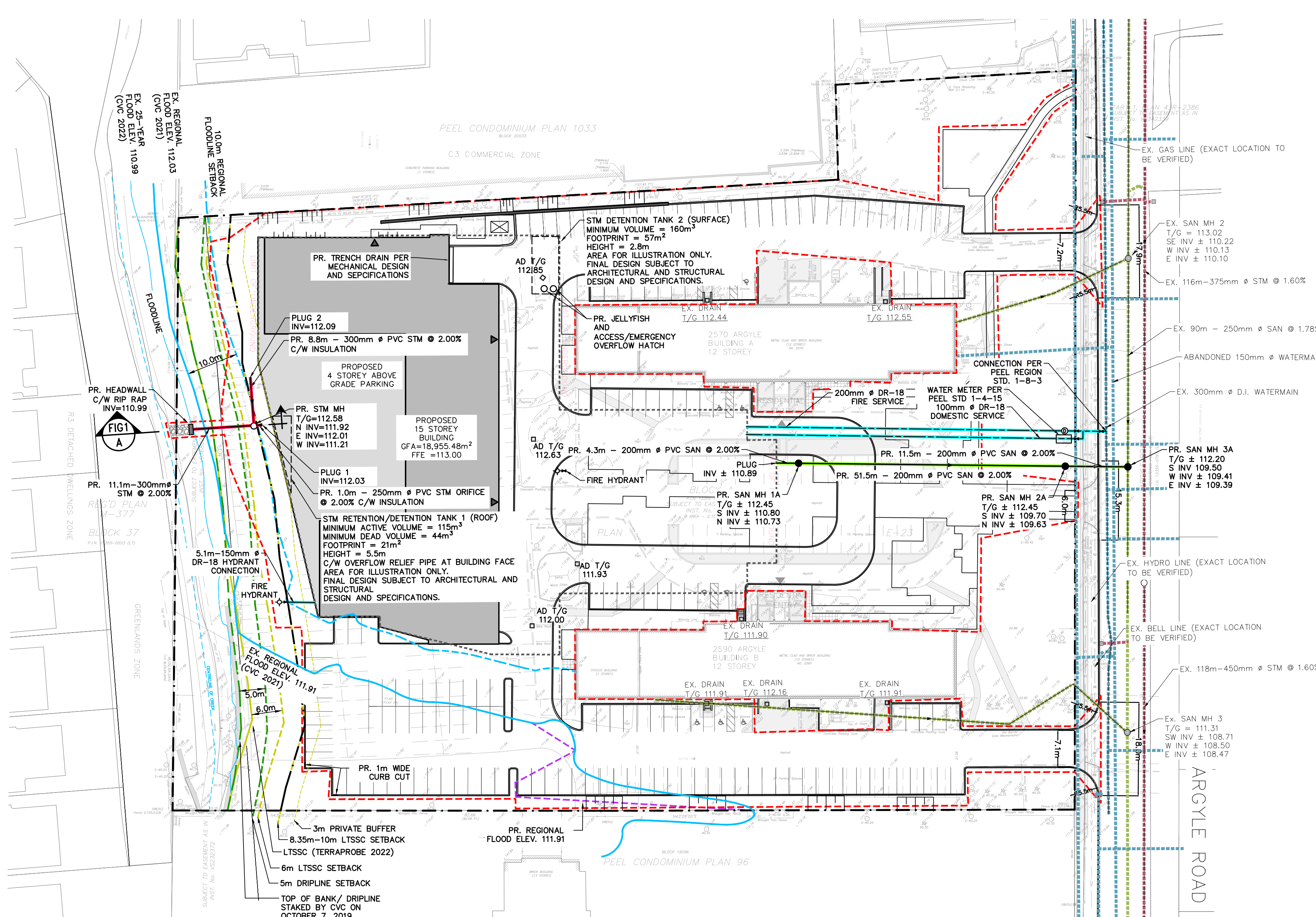
STN.	TO STN.

SCALE 1:2000	AREA Z-15	PROJECT No 90-124
DRAWN BY T.J.	CHECKED BY	PLAN No
DATE 1991 05 08	SHEET 1 OF 1	C-

177.6
15.5%

177.6

FIGURES



LEGEND

	PROPERTY LINE		PROPOSED STORM SEWER & MANHOLE
	REGIONAL FLOODLINE ELEV. (CVC 2021)		PROPOSED AREA DRAIN (PER MECHANICAL DESIGN AND SPECIFICATIONS)
	25-YEAR FLOODLINE ELEV. (CVC 2022)		PROPOSED SANITARY SEWER & MANHOLE
	10.0m REGIONAL FLOODLINE SETBACK		UNDERGROUND PARKING LIMIT
	POST-DEV. REGIONAL FLOODLINE ELEV.		LIMIT OF DISTURBANCE/DEVELOPMENT
	EXISTING WATERMAIN & GATE VALVE		TOP OF BANK/ DRILLPIPE STAKED BY CVC ON OCTOBER 7, 2019
	EXISTING STORM SEWER & MANHOLE		5.0m DRIPLINE SETBACK
	EXISTING SINGLE /DOUBLE CATCHBASIN		LONG-TERM STABLE SLOPE CREST (LTSSC) (TERRAPROBE 2022)
	EXISTING AREA DRAIN		6.0m LTSSC SETBACK
	EXISTING SANITARY SEWER & MANHOLE		8.35m-10m LTSSC SETBACK
	PROPOSED WATERMAIN & GATE VALVE		3m PRIVATE BUFFER
	PROPOSED FIRE HYDRANT & GATE VALVE		
	PROPOSED SIAMESE CONNECTION (PER MECHANICAL DESIGN AND SPECIFICATIONS)		
	PROPOSED WATER METER (PER MECHANICAL DESIGN AND SPECIFICATIONS)		
	PROPOSED DETECTOR CHECK VALVE IN CHAMBER (PER MECHANICAL DESIGN AND SPECIFICATIONS)		

NOTE: WORK WITHIN OR NEAR CREEK TO BE COMPLETED DURING JULY 1 TO MARCH 31

2	ISSUED FOR 3rd SUBMISSION	2023/JUL/25
1	ISSUED FOR COORDINATION	2022/APR/01
0	REISSUED FOR 1st SUBMISSION	2020/JUN/23
No.	ISSUE / REVISION	YYYY/MM/DD

BENCHMARK NOTE:
ELEVATIONS ARE REFERRED TO THE CITY OF MISSISSAUGA BENCHMARK No. 1059, SET HORIZONTALLY AT THE BASE OF A 750MM DIAMETER CONCRETE TRAFFIC POLE AT THE NORTH-WEST CORNER OF DUNDAS STREET WEST AND PARKHILL ROAD, HAVING A PUBLISHED ELEVATION OF 115.617M. CITY OF MISSISSAUGA DATUM: CANADIAN GEODETIC DATUM, 1928

SURVEY NOTES:
SURVEY COMPLETED BY SPEIGHT, VAN NOSTRAND & GIBSON LIMITED. (2019/MAY/21) REFERENCE No.: 1-E23-PEEL
BEARINGS SHOWN HEREON ARE ASTRONOMIC AND ARE REFERRED TO THE WESTERLY LIMIT OF ARGYLE ROAD AS SHOWN ON PLAN E-23 HAVING A BEARING OF N46°19'00"W

SITE PLAN NOTES:
DESIGN ELEMENTS ARE BASED ON SITE PLAN BY IBI GROUP. DRAWING No.: A-003 (2023/JUL/21) PROJECT No.: 120325

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ALL EXISTING UNDERGROUND UTILITIES TO BE VERIFIED IN THE FIELD BY THE CONTRACTOR PRIOR TO CONSTRUCTION.

MISSISSAUGA

Project: 2570 - 2590 ARGYLE ROAD
CITY OF MISSISSAUGA
PEEL REGION

Drawing: SITE SERVICING PLAN

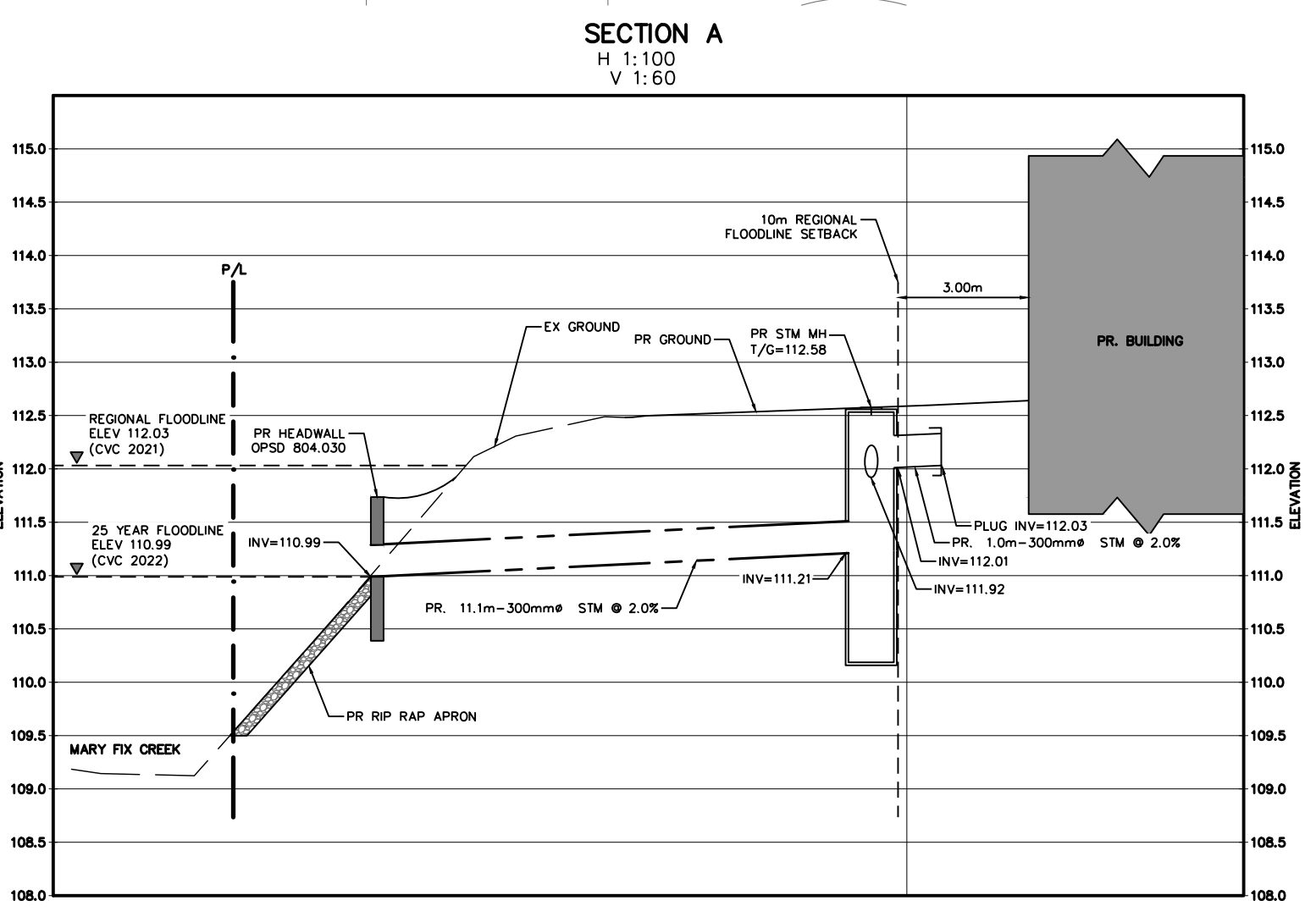
NOT FOR CONSTRUCTION

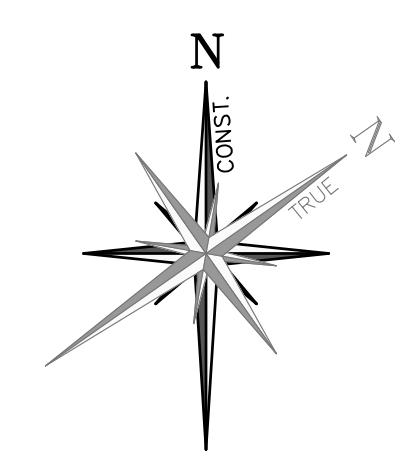
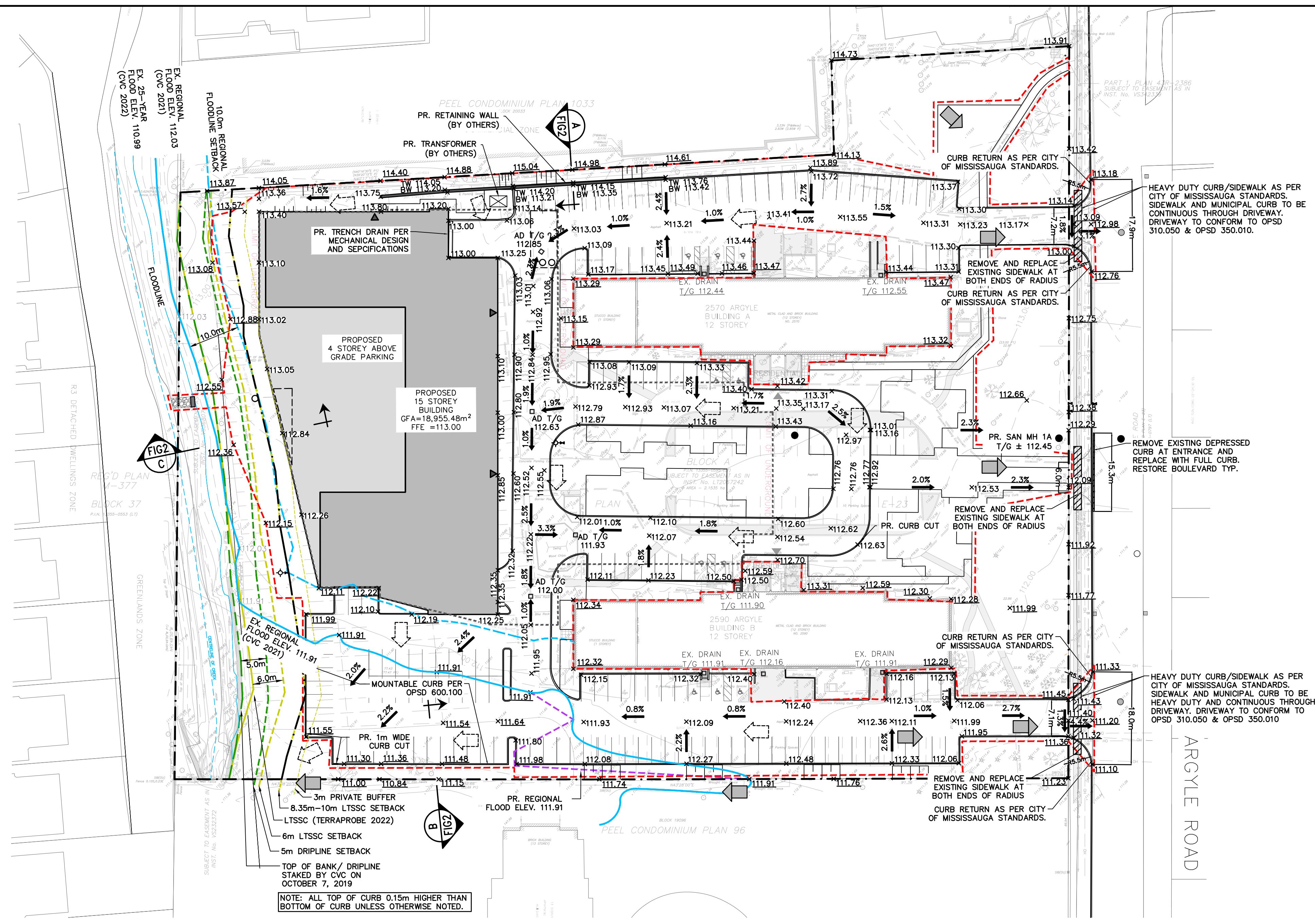
Stamp:

CROZIER CONSULTING ENGINEERS

2800 HIGH POINT DRIVE SUITE 100 MILTON, ON L9T 6P4 905-875-0026 T 905-875-4915 F WWW.CFCROZIER.CA

Drawn: J.B. Design: J.B./M.C. Project No.: 1788-5379
Check: J.B. Check: M.C./R.B. Scale: 1:500 Dwg: FIG 1





LEGEND

- PROPERTY LINE
- EXISTING CONTOUR (0.5m)
- EXISTING CONTOUR (1.0m)
- REGIONAL FLOODLINE ELEV. (CVC 2021)
- 25-YEAR FLOODLINE ELEV. (CVC 2022)
- 10.0m REGIONAL FLOODLINE SETBACK
- POST-DEV. REGIONAL FLOODLINE ELEV.
- EXISTING GRADE
- PROPOSED GRADE
- PROPOSED GRADE (TO MATCH EXISTING)
- PROPOSED RETAINING WALL
- PROPOSED MINOR FLOW DIRECTION
- MAJOR OVERLAND FLOW DIRECTION
- EXISTING OVERLAND FLOW DIRECTION
- PROPOSED SLOPE (MAX 3:1)
- LIMIT OF UNDERGROUND GARAGE
- LIMIT OF DISTURBANCE/DEVELOPMENT
- TOP OF BANK / DRIFLINE STAKED BY CVC ON OCTOBER 7, 2019
- 5.0m DRIFLINE SETBACK
- LONG TERM STABLE SLOPE CREST (LTSSC) (TERRAPROBE 2022)
- 6.0m LTSSC SETBACK
- 8.35m-10m LTSSC SETBACK
- 3m PRIVATE BUFFER

2	ISSUED FOR 3rd SUBMISSION	2023/JUL/25
1	ISSUED FOR COORDINATION	2022/APR/01
0	REISSUED FOR 1st SUBMISSION	2020/JUN/23
No.	ISSUE / REVISION	YYYY/MM/DD

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SURVEY NOTES:
SURVEY COMPLETED BY SPEIGHT, VAN NOSTRAND & GIBSON LIMITED. (2019/MAY/21)
REFERENCE No.: 1-E23-PEEL
BEARINGS SHOWN HEREON ARE ASTROMONIC AND ARE REFERRED TO THE WESTERLY LIMIT OF ARGYLE ROAD AS SHOWN ON PLAN E-23 HAVING A BEARING OF N46°19'00"W

SITE PLAN NOTES:
DESIGN ELEMENTS ARE BASED ON SITE PLAN BY IBI GROUP.
DRAWING No.: A-003 (2023/JUL/21)
PROJECT No.: 120325

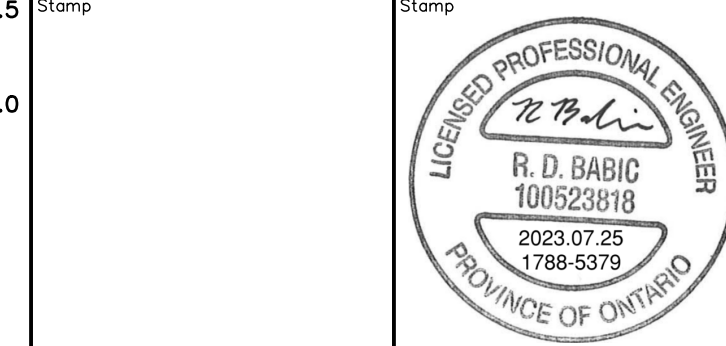
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Project
2570 - 2590 ARGYLE ROAD
CITY OF MISSISSAUGA
PEEL REGION

Drawing
SITE GRADING PLAN

NOT FOR CONSTRUCTION

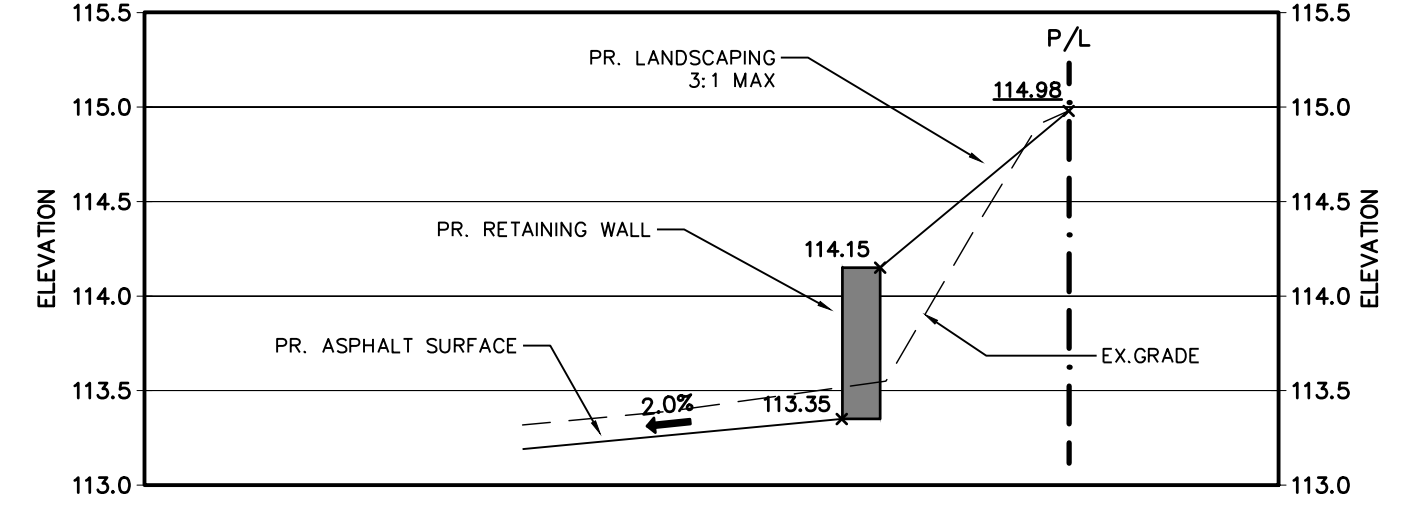


CROZIER CONSULTING ENGINEERS
2800 HIGH POINT DRIVE SUITE 100 MILTON, ON L9T 6P4 905-875-0026 T 905-875-4915 F WWW.CFCROZIER.CA

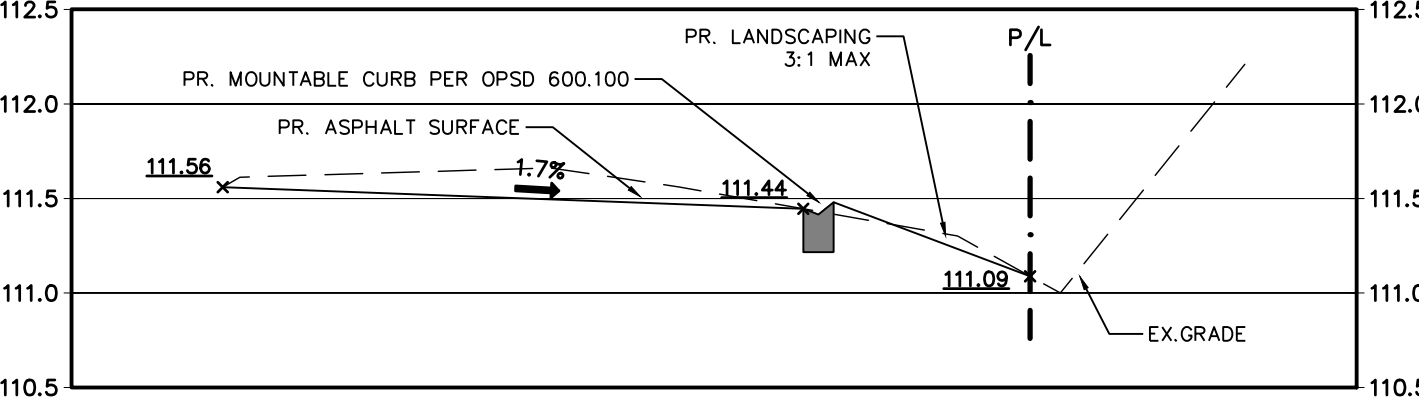
Drawn	J.B.	Design	J.B./M.C.	Project No.	1788-5379
Check	J.B.	Check	M.C./R.B.	Scale	1:500 Dwg

FIG 2

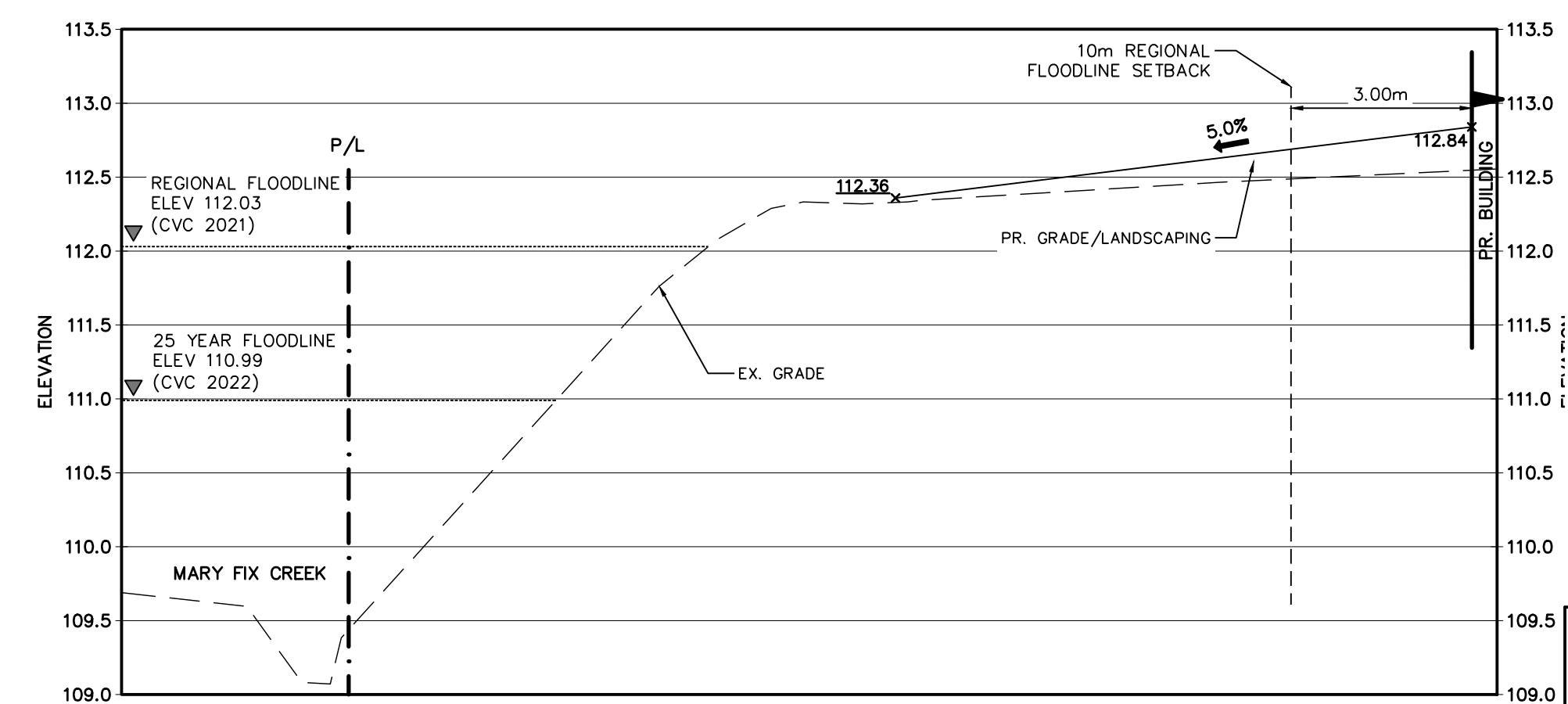
SECTION A

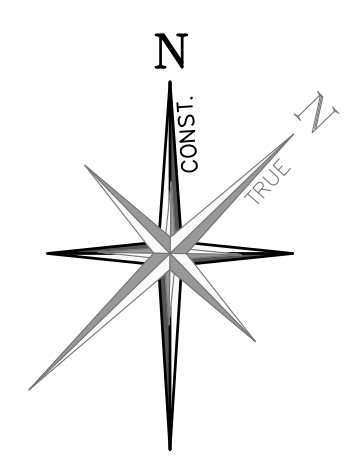
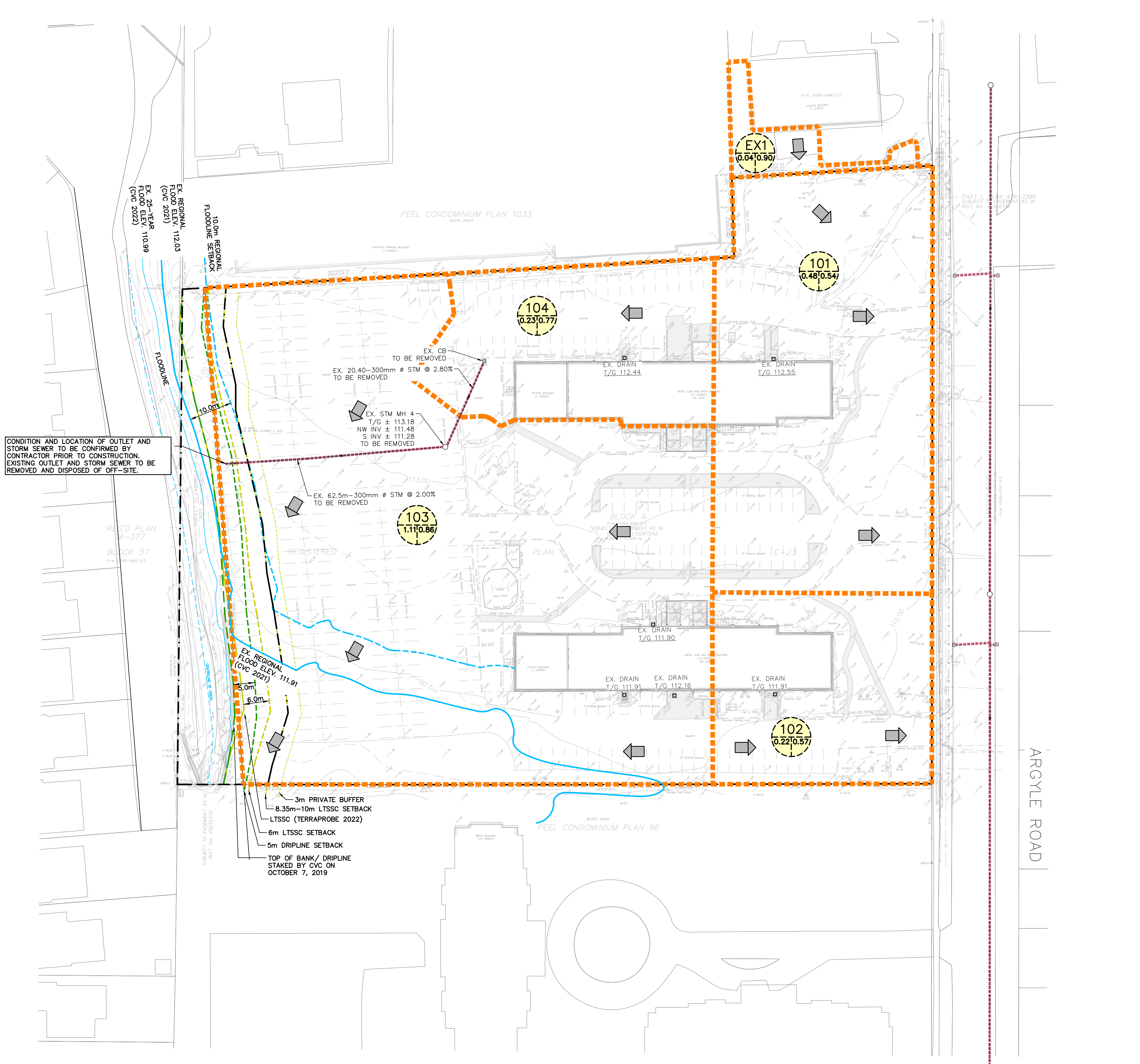


SECTION B



SECTION C





LEGEND

- PROPERTY LINE
- EXISTING CONTOUR (0.5m)
- EXISTING CONTOUR (1.0m)
- REGIONAL FLOODLINE ELEV. (CVC 2021)
- 25-YEAR FLOODLINE ELEV. (CVC 2022)
- 10.0m REGIONAL FLOODLINE SETBACK
- EXISTING GRADE
- EXISTING OVERLAND FLOW DIRECTION
- EXISTING STORM DRAINAGE CATCHMENT
- EXISTING STORM SEWER & MANHOLE
- EXISTING AREA DRAIN
- CATCHMENT I.D.
- AREA (ha) | RUNOFF COEFFICIENT
- TOP OF BANK/ DRIPLINE STAKED BY CVC ON OCTOBER 7, 2019
- 5.0m DRIPLINE SETBACK
- LONG TERM STABLE SLOPE CREST (LTSSC) (TERRAPROBE 2022)
- 6.0m LTSSC SETBACK
- 8.35m-10m LTSSC SETBACK
- 3m PRIVATE BUFFER

CONDITION AND LOCATION OF OUTLET AND STORM SEWER TO BE CONFIRMED BY CONTRACTOR PRIOR TO CONSTRUCTION. EXISTING OUTLET AND STORM SEWER TO BE REMOVED AND DISPOSED OF OFF-SITE.

NOTE: WORK WITHIN OR NEAR CREEK TO BE COMPLETED DURING JULY 1 TO MARCH 31

2	ISSUED FOR 3rd SUBMISSION	2023/JUL/25
1	ISSUED FOR COORDINATION	2022/APR/01
0	REISSUED FOR 1st SUBMISSION	2020/JUN/23
No.	ISSUE / REVISION	YYYY/MM/DD

BENCHMARK NOTE:
ELEVATIONS ARE REFERRED TO THE CITY OF MISSISSAUGA BENCHMARK No. 1059, SET HORIZONTALLY AT THE BASE OF A 75MM DIAMETER CONCRETE TRAFFIC POLE AT THE NORTH-WEST CORNER OF DUNDAS STREET WEST AND PARKHILL ROAD, HAVING A PUBLISHED ELEVATION OF 115.617M. CITY OF MISSISSAUGA DATUM: CANADIAN GEODETIC DATUM, 1928

SURVEY NOTES:
SURVEY COMPLETED BY SPEIGHT, VAN NOSTRAND & GIBSON LIMITED. (2019/MAY/21)
REFERENCE No.: 1-E23-PEEL
BEARINGS SHOWN HEREON ARE ASTRONOMIC AND ARE REFERRED TO THE WESTERLY LIMIT OF ARGYLE ROAD AS SHOWN ON PLAN E-23 HAVING A BEARING OF N46°19'00"W

SITE PLAN NOTES:
DESIGN ELEMENTS ARE BASED ON SITE PLAN BY IBI GROUP.
DRAWING No.: A-003 (2023/JUL/21)
PROJECT No.: 120325

DRAWING NOTES:
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Project
2570 - 2590 ARGYLE ROAD
CITY OF MISSISSAUGA
PEEL REGION

Drawing
PRE-DEVELOPMENT DRAINAGE PLAN

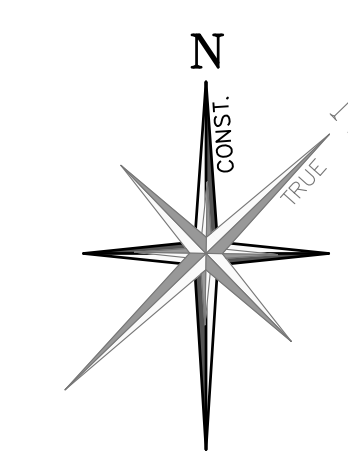
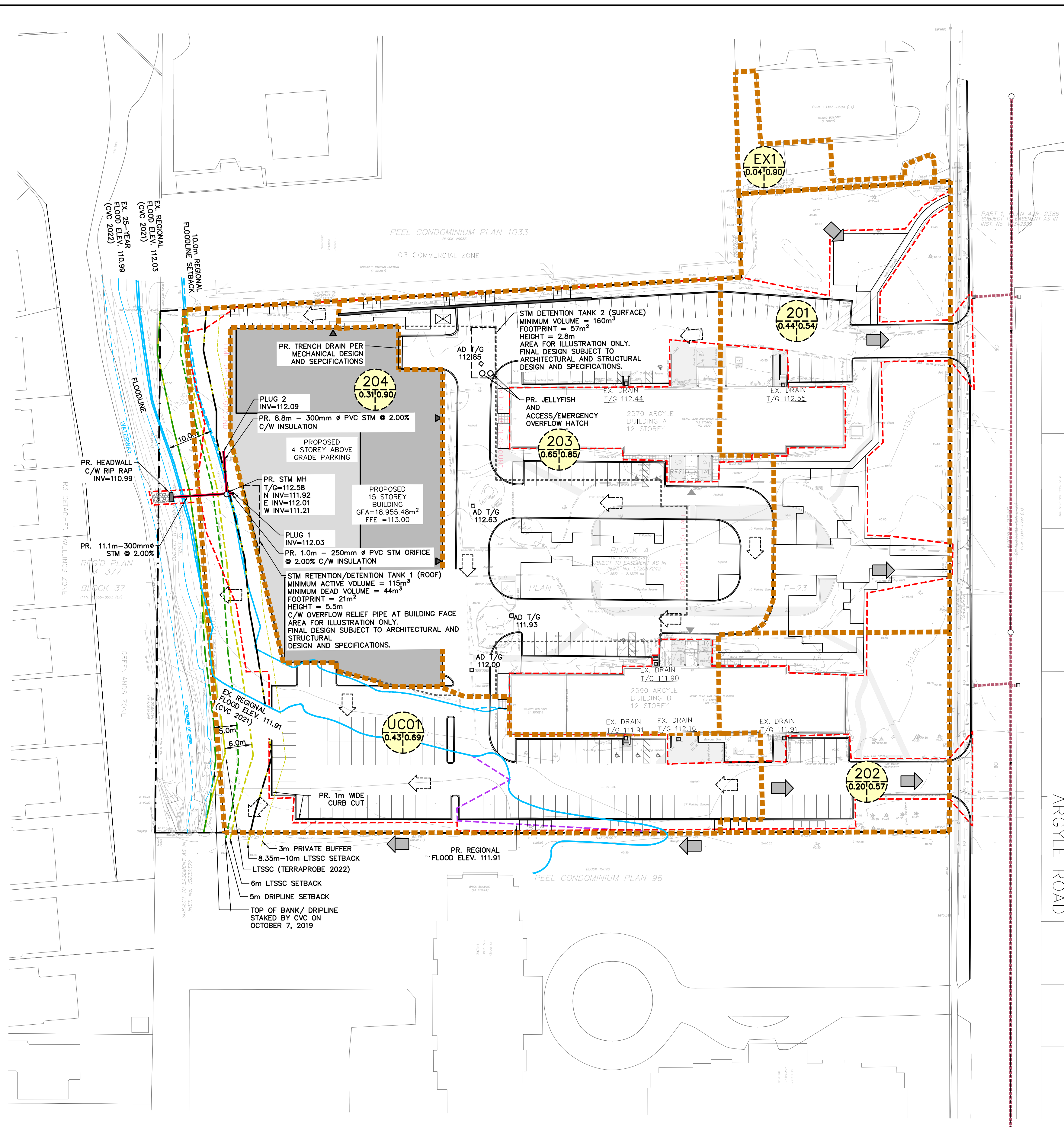
NOT FOR CONSTRUCTION

Stamp	Stamp

2800 HIGH POINT DRIVE
SUITE 100
MILTON, ON L9T 6P4
905-875-0026 T
905-875-4915 F
WWW.CFCROZIER.CA

Drawn	J.B.	Design	J.B./M.C.	Project No.	1788-5379
Check	J.B.	Check	M.C./R.B.	Scale	1:500 Dwg FIG 3





LEGEND

	PROPERTY LINE		PROPOSED STORM SEWER & MANHOLE
	EXISTING CONTOUR (0.5m)		PROPOSED AREA DRAIN
	EXISTING CONTOUR (1.0m)		CATCHMENT ID
	REGIONAL FLOODLINE ELEV. (CVC 2021)		AREA (ha) RUNOFF COEFFICIENT
	25-YEAR FLOODLINE ELEV. (CVC 2022)		LIMIT OF DISTURBANCE/DEVELOPMENT
	10.0m REGIONAL FLOODLINE SETBACK		TOP OF BANK/ DRIPLINE STAKED BY CVC ON OCTOBER 7, 2019
	POST-DEV REGIONAL FLOODLINE ELEV.		5.0m DRIPLINE SETBACK
	EXISTING GRADE		LONG TERM STABLE SLOPE CREST (LTSSC) (TERRAPROBE 2022)
	PROPOSED OVERLAND FLOW DIRECTION		6.0m LTSSC SETBACK
	EXISTING OVERLAND FLOW DIRECTION		8.35m-10m LTSSC SETBACK
	PROPOSED STORM DRAINAGE CATCHMENT		3m PRIVATE BUFFER
	EXISTING STORM SEWER & MANHOLE		
	EXISTING SINGLE /DOUBLE CATCHBASIN		
	EXISTING AREA DRAIN		

NOTE: WORK WITHIN OR NEAR CREEK TO BE COMPLETED DURING JULY 1 TO MARCH 31

2	ISSUED FOR 3rd SUBMISSION	2023/JUL/25
1	ISSUED FOR COORDINATION	2022/APR/01
0	REISSUED FOR 1st SUBMISSION	2020/JUN/23
No.	ISSUE / REVISION	YYYY/MM/DD

BENCHMARK NOTE:
ELEVATIONS ARE REFERRED TO THE CITY OF MISSISSAUGA BENCHMARK No. 1059, SET HORIZONTALLY AT THE BASE OF A 750mm DIAMETER CONCRETE TRAFFIC POLE AT THE NORTH-WEST CORNER OF DUNDAS STREET WEST AND PARKHILL ROAD, HAVING A PUBLISHED ELEVATION OF 115.617M. CITY OF MISSISSAUGA DATUM: CANADIAN GEODETIC DATUM, 1928

SURVEY NOTES:
SURVEY COMPLETED BY SPEIGHT, VAN NOSTRAND & GIBSON LIMITED. (2019/MAY/21)
REFERENCE No.: 1-E23-PEEL
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SITE PLAN NOTES:
DESIGN ELEMENTS ARE BASED ON SITE PLAN BY IBI GROUP.
DRAWING No.: A-003 (2023/JUL/21)
PROJECT No.: 120325

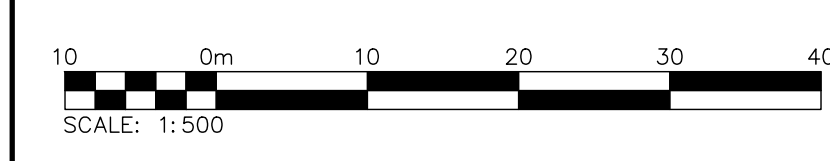
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MISSISSAUGA

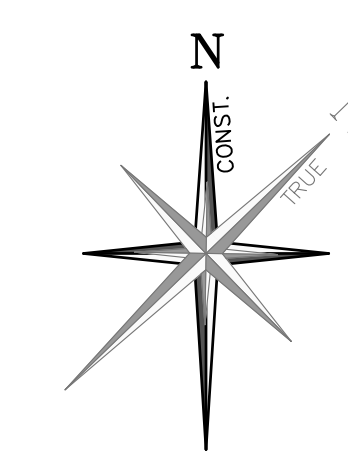
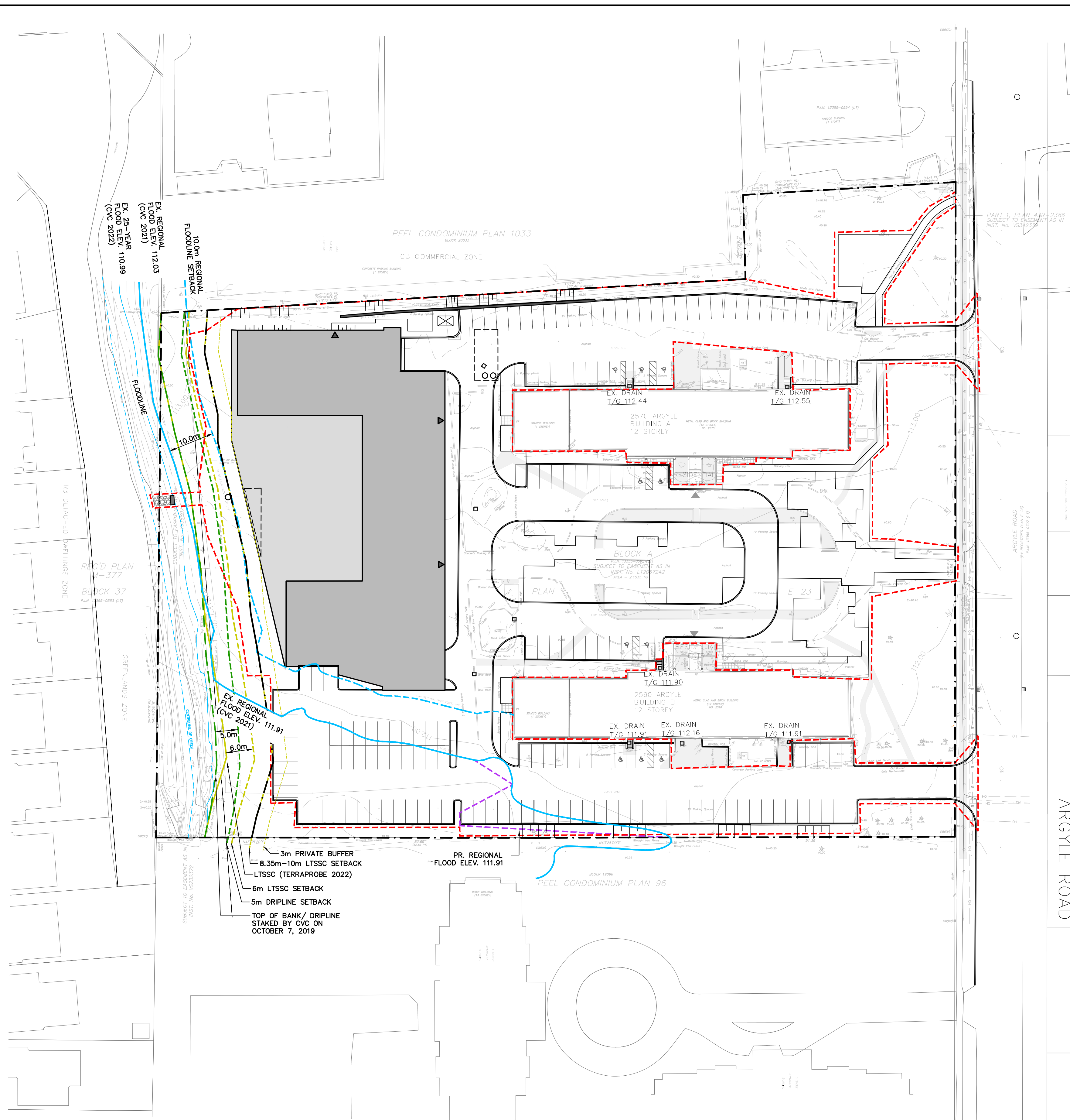
Project
2570 – 2590 ARGYLE ROAD
CITY OF MISSISSAUGA
PEEL REGION

POST-DEVELOPMENT DRAINAGE PLAN

NOT FOR CONSTRUCTION



Stamp	Stamp	Stamp	Stamp
			2800 HIGH POINT DRIVE SUITE 100 MILTON, ON L9T 6P4 905-875-0026 T 905-875-4915 F WWW.CFCROZIER.CA
Drawn	J.B.	Design	J.B./M.C.
Check	J.B.	Check	M.C./R.B.
Project No.	1788-5379		Scale
		1:500	Dwg
			FIG 4



LEGEND

- PROPERTY LINE
- EXISTING CONTOUR (0.5m)
- EXISTING CONTOUR (1.0m)
- REGIONAL FLOODLINE ELEV. (CVC 2021)
- 25-YEAR FLOODLINE ELEV. (CVC 2022)
- 10.0m REGIONAL FLOODLINE SETBACK
- POST-DEV REGIONAL FLOODLINE ELEV.
- TOP OF BANK/ DRIPLINE STAKED BY CVC ON OCTOBER 7, 2019
- 5.0m DRIPLINE SETBACK
- LONG TERM STABLE SLOPE CREST (LTSSC) (TERRAPROBE 2022)
- 6.0m LTSSC SETBACK
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- LIMIT OF DISTURBANCE/DEVELOPMENT

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CITY OF MISSISSAUGA DATUM: CANADIAN GEODETIC DATUM, 1928

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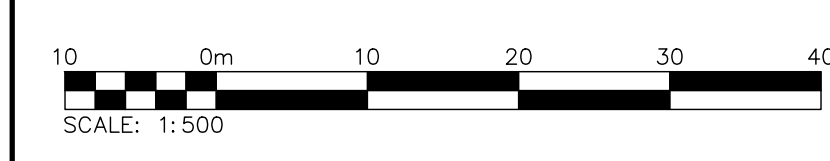
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MISSISSAUGA

Project
2570 – 2590 ARGYLE ROAD
CITY OF MISSISSAUGA
PEEL REGION

Drawing
CONSTRAINTS MAP

NOT FOR CONSTRUCTION



Stamp	Stamp			2800 HIGH POINT DRIVE SUITE 100 MILTON, ON L9T 6P4 905-875-0026 T 905-875-4915 F WWW.CFCROZIER.CA			
Drawn	J.B.			Design	J.B./M.C.	Project No.	1788-5379
Check	J.B.	Check	M.C./R.B.	Scale	1:500	Dwg	FIG 5