ARCHITECTURE 49

CEPEO LEITRIM ELEMENTARY SCHOOL
3955 KELLY FARM DRIVE, OTTAWA, ON

SERVICING AND STORMWATER MANAGEMENT REPORT

FEBRUARY 28, 2025

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SITE PLAN APPLICATION

PROJECT NO.: CA0040067.4396
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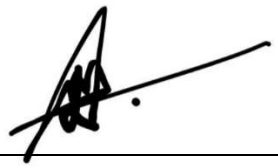

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1 GENERAL

1.1 EXECUTIVE SUMMARY

WSP has been retained by Architecture 49 on behalf of the Conseil des écoles publiques de l'est de l'Ontario (CEPEO) to deliver comprehensive servicing, grading, and stormwater management design services for a new elementary school development at 3955 Kelly Farm Drive, Ottawa. The 2.07-hectare site, currently vacant and primarily grass-covered, lies within a residential area, providing an ideal setting for community access and engagement. Entry to the site will be from both Kelly Farm Drive and Barrett Farm Drive, allowing ease of access for pedestrians and vehicles.

The site is characterized by relatively flat terrain with minor elevation variations, as detailed in a topographic survey completed by Callon Dietz Incorporated on August 15, 2024. Based on guidelines from a pre-consultation meeting held on September 13, 2024, the allowable release rate for stormwater from the site is limited to 224 L/s as per Design Brief – Barrett Lands – Phase 1 – 4660 Bank Street – Leitrim Development Area – Dated May 2018 by IBI Group, a requirement that will guide the stormwater management approach for the development.

The proposed development will feature a two-storey elementary school, outdoor baseball court, soccer field, and parking area, with additional provisions made for future portable classrooms. Additionally, space for a potential parking lot expansion has been integrated into the grading plan to accommodate future growth without requiring substantial redesign.

Stormwater servicing for the site will connect to an existing 2700mm concrete trunk sewer along Kelly Farm Drive. The controlled roof drainage system will be conveyed through an existing 675mm storm stub on Barrett Farm Drive. Sanitary servicing for the school will connect to the existing 200mm sanitary stub on Barrett Farm Drive. Although an existing watermain stub is available on Barrett Farm Drive, the position of the water entry room within the school makes it more efficient to connect via two service connections from the 300mm watermain on Kelly Farm Drive. These connections provide redundancy for a reliable water supply, meeting both domestic and fire protection requirements.

The grading design for the school site supports effective stormwater drainage, directing surface runoff toward a series of catch basins that convey water to the main trunk sewer on Kelly Farm Drive. Space for future parking lot expansion has been accounted for, with grading adjustments that will allow additional paved areas to be integrated seamlessly into the existing layout.

This detailed design provides a robust servicing, grading, and stormwater management framework for the proposed elementary school at 3955 Kelly Farm Drive, supporting regulatory compliance, efficient drainage, and community accessibility while contributing to a resilient and functional school site.

Design of a drainage and stormwater management system in this development must be prepared in accordance with the following documents:

- Sewer Design Guidelines, City of Ottawa, October 2012;
- Stormwater Management Planning and Design Manual, Ministry of the Environment, March 2003; and
- Stormwater Management Facility Design Guidelines, City of Ottawa, April 2012

This report was prepared utilizing servicing design criteria obtained from the City of Ottawa and outlines the design for water, sanitary wastewater, and stormwater facilities, including stormwater management.

The format of this report matches that of the servicing study checklist found in Section 4 of the City of Ottawa's Servicing Study Guidelines for Development Applications, November 2009.

The following municipal services are available as recorded from GeoOttawa.
Kelly Farm Drive:

- 2700mm storm trunk sewer
- 375mm sanitary sewer
- 300mm watermain

Barrett Farm Drive:

- 675mm storm sewer stub
- 200mm sanitary sewer stub
- 200mm watermain stub

It is proposed that:

- On-site stormwater management systems, employing surface storage and roof storage will be provided to attenuate flow rates leaving the site area to be redeveloped. Existing drainage patterns, previously established controlled flow rates and storm sewers will be maintained.

1.2 DATE AND REVISION NUMBER

This version of the report is the first issue, dated February 28th, 2025.

1.3 LOCATION MAP AND PLAN

The proposed institutional development is located at 3955 Kelly Farm Drive, Ottawa at the location shown in Figure 1-1 below.

Figure 1-1 Site Location

1.4 ADHERENCE TO ZONING AND RELATED REQUIREMENTS

The proposed property use will be in conformance with related requirements and is understood to be zoning-compliant

1.5 PRE-CONSULTATION MEETINGS

A pre-consultation meeting was held with the City of Ottawa on September 13, 2024. Notes from this meeting are provided in Appendix A.

1.6 HIGHER LEVEL STUDIES

The review for servicing has been undertaken in conformance with, and utilizing information from, the following documents:

- Ottawa Sewer Design Guidelines, Second Edition, Document SDG002, October 2012, City of Ottawa including:
    - Technical Bulletin ISDTB-2012-4 (20 June 2012)
    - Technical Bulletin ISDTB-2014-01 (05 February 2014)
    - Technical Bulletin PIEDTB-2016-01 (September 6, 2018)
    - Technical Bulletin ISDTB-2018-01 (21 March 2018)
    - Technical Bulletin ISDTB-2018-04 (27 June 2018)
- Ottawa Design Guidelines – Water Distribution, July 2010 (WDG001), including:

- Technical Bulletin ISDTB-2014-02 (May 27, 2014)
- Technical Bulletin ISTB-2018-02 (21 March 2018)

- Stormwater Management Planning and Design Manual, Ontario Ministry of the Environment and Climate Change, March 2003 (SMPDM).

- Design Guidelines for Drinking-Water Systems, Ontario Ministry of the Environment and Climate Change, 2008 (GDWS).

- Fire Underwriters Survey, Water Supply for Public Fire Protection (FUS), 2020.

1.7 STATEMENT OF OBJECTIVES AND SERVICING CRITERIA

The objective of the site servicing is to meet the requirements for the proposed site while adhering to the stipulations of the applicable higher-level studies and City of Ottawa servicing design guidelines. The site plan includes a new school building, a new parking area, baseball court, football/soccer field, future portable classrooms and future parking extension.

1.8 AVAILABLE EXISTING AND PROPOSED INFRASTRUCTURE

An existing 2700mm diameter concrete trunk storm sewer is located along Kelly Farm Drive on the west side of the proposed elementary school site at 3955 Kelly Farm Drive. The stormwater services for the new school will connect to this trunk sewer. Additionally, there is a 675mm storm stub and a 200mm sanitary stub along Barrett Farm Drive, which will be extended as needed to connect with the school's storm and sanitary systems. Water servicing will utilize an existing watermain stub; however, due to the location of the water entry room, two connections are planned from the 300mm watermain on Kelly Farm Drive to ensure reliable service.

The primary site access points from Kelly Farm Drive and Barrett Farm Drive will serve the school, including potential expansions and additional facilities in the future.

1.9 ENVIRONMENTALLY SIGNIFICANT AREAS, WATERCOURSES AND MUNICIPAL DRAINS

There are no watercourses, municipal drains or environmentally significant areas on the site. The proposed changes to the site will not require any additional approvals or amendments to approvals pertaining to environmentally significant areas, watercourses or municipal drains.

1.10 CONCEPT LEVEL MASTER GRADING PLAN

As the design is being submitted for site plan approval, the grading plan has been developed to the final design level. The existing and proposed grading are shown on Drawings C03. Existing grading information is based on a topographic survey of the site completed in August 2024. No changes in grading are proposed beyond the redevelopment area boundaries except the minor modification within the ROW to accommodate the proposed lay-by. The proposed grading plan confirms the feasibility of the proposed stormwater management system, drainage, soil removal and fills. The geotechnical investigation was completed in February 2025 by Cambium Inc. The grading along the study area boundary is proposed to meet the existing grade.

1.11 IMPACTS ON PRIVATE SERVICES

There are no existing domestic private services (septic system and well) located on the site. There are no neighbouring properties using private services.

1.12 DEVELOPMENT PHASING

There are no development phasing considerations for the site.

1.13 GEOTECHNICAL STUDY

A geotechnical investigation report was previously prepared by Cambium Inc. on February 07, 2025. No additional geotechnical information was required for the design of the modified site services, including paving. This geotechnical report will be included with the contract documents to be issued for construction, and the recommendations of the reports will be referenced in the construction specifications. The geotechnical study does, however, recommend a grade raise restriction of at most 1.0m.

1.14 DRAWING REQUIREMENT

The engineering plans submitted for site plan approval will be in compliance with City requirements.

2 WATER DISTRIBUTION

2.1 CONSISTENCY WITH MASTER SERVICING STUDY AND AVAILABILITY OF PUBLIC INFRASTRUCTURE

The new elementary school at 3955 Kelly Farm Drive will be serviced by the 300mm watermain on Kelly Farm Drive, utilizing two separate service connections of 200mm diameter to meet both domestic and fire protection needs. The dual 200mm diameter private water services will provide redundancy for the school building. An automatic sprinkler system will provide fire protection within the building, with the fire department connection strategically located near the main entrance. It is 45m away from the existing municipal fire hydrant on Kelly Farm Drive. No additional changes to the City's water distribution system are necessary.

2.2 SYSTEM CONSTRAINTS AND BOUNDARY CONDITIONS

A boundary service request was submitted to the City of Ottawa and boundary conditions have been received and summarized below. A fire flow of 7,000 l/min (117 l/s) was estimated for the proposed elementary school.

Table 2-1: Boundary Conditions at Connection 1

Boundary Condition Connection 1 – Barrett Farm Drive (@ 94.3m)		
SCENARIO	Hydraulic Pressure (kPa / PSI)	Head (m)
Basic Day (MAX HGL)	520.6 / 75.5	147.4
Peak Hour (MIN HGL)	506.8 / 73.5	146.0
Max Day + Fire Flow	484.7 / 70.3	143.8

2.3 CONFIRMATION OF ADEQUATE DOMESTIC SUPPLY AND PRESSURE

Water demands are based on Table 4.2 of the Ottawa Design Guidelines – Water Distribution. As previously noted, the development is considered as institutional development. A water demand calculation sheet is included in Appendix B, and the total water demands are summarized as follows:

	Proposed and Existing
Average Day	1.96 l/s
Maximum Day	2.94 l/s
Peak Hour	5.29 l/s

The 2010 City of Ottawa Water Distribution Guidelines stated that the preferred practice for design of a new distribution system is to have normal operating pressures range between 345 kPa (50 psi) and 552 kPa (80 psi) under maximum daily flow conditions. Other pressure criteria identified in the guidelines are as follows:

Minimum Pressure	Minimum system pressure under peak hour demand conditions shall not be less than 276 kPa (40 psi)

Fire Flow	During the period of maximum day demand, the system pressure shall not be less than 140 kPa (20 psi) during a fire flow event.
Maximum Pressure	Maximum pressure at any point the distribution system shall not exceed 689 kPa (100 psi). In accordance with the Ontario Building/Plumbing Code, the maximum pressure should not exceed 552 kPa (80 psi). Pressure reduction controls may be required for buildings where it is not possible/feasible to maintain the system pressure below 552 kPa.

Water pressure at municipal connections check:

Min. HGL @ Connection – Pavement elevation = 146.0m – 95.27m = 50.73m = 497.39 kPa

Water pressure at building connection (at average day) check:

Max. HGL @ Connection – Finished floor elevation = 147.4m – 96.25 = 51.15m = 501.48 kPa

Water pressure at building connection (at max. hour demand) check:

Min. HGL @ Connection – Finished floor elevation = 146.0m-96.25m = 49.75m = 487.76 kPa

Water pressure at building connection (at max. day + fire demand):

(Max Day + Fire) HGL @ Connection - Finished floor elevation = 143.8m-96.25m = 47.55m = 466.19 kPa

The minimum water pressure inside the building at the connection is determined with the minimum HGL condition, resulting in a pressure of 487.76 kPa which exceed the minimum requirement of 276 kPa per the guidelines.

2.4 CONFIRMATION OF ADEQUATE FIRE FLOW PROTECTION

The fire flow for the proposed building and portable classrooms has been calculated using the Fire Underwriters Survey (FUS) method. The method takes into account the type of building construction, the building occupancy, the use of sprinklers and the exposures to adjacent structures.

Assuming non-combustible construction and a fully supervised sprinkler system, a fire flow demand of 7,000 l/min (117 l/s) for the new school has been calculated. A copy of the FUS calculations is included in Appendix B.

The demand of 7,000 l/min for the school can be delivered through four existing fire hydrants within the Kelly Farm Drive ROW west to the site and Barret Farm Drive ROW north to the site. Both of the hydrants along Barret Farm Drive are within 45 m of the FDC. As per above, the two existing hydrants can provide up to 95 l/s with a combined total of 190 l/s which is greater than the FUS demand.

The fire flow demand of 7,000 l/min (117 l/s) has also been calculated for the portable classrooms. The portable classrooms are located close to the Kelly Farm Drive ROW. The required fire flow could also be met through the combination of two existing public hydrants on Kelly Farm Drive. The distances between the classrooms and hydrants are between 45m to 90m.

The boundary condition for Maximum Day and Fire Flow results in a pressure of 466.19 kPa at the ground floor level. In the guidelines, a minimum residual pressure of 140 kPa must be maintained in the distribution system for a fire flow and maximum day event. As a pressure of 466.19 kPa is achieved, the fire flow requirement is exceeded.

Therefore, the existing watermain system has adequate capacity to service the proposed building and the new addition.

2.5 CHECK OF HIGH PRESSURE

High pressure is not a concern. The maximum water pressure inside the building at the connection is determined with the maximum HGL condition, resulting in a pressure of 501.48 kPa which is less than the 552 kPa threshold in the guideline in which pressure control is required. Based on this result, pressure control is not required for this building.

2.6 PHASING CONSTRAINTS

Phasing constraints for development have not been detailed in this report for the site

2.7 RELIABILITY REQUIREMENTS

Shut off valves are provided for the two proposed watermain services at the property line. Existing water valve at the connection will provide reliability.

2.8 NEED FOR PRESSURE ZONE BOUNDARY MODIFICATION

A pressure zone boundary modification is not required.

2.9 CAPABILITY OF MAJOR INFRASTRUCTURE TO SUPPLY SUFFICIENT WATER

The major infrastructure is capable of supplying sufficient water.

2.10 DESCRIPTION OF PROPOSED WATER DISTRIBUTION NETWORK

The proposed watermain system consists of two 200mm dia. service connections branching off the 300mm dia. watermain located in the Kelly Farm Drive right-of-way.

2.11 OFF-SITE REQUIREMENTS

No off-site improvements to watermains, feedermains, pumping stations, or other water infrastructure are required to maintain existing conditions and service the adjacent developments.

2.12 CALCULATION OF WATER DEMANDS

Water demands were calculated as described in Sections 2.3 and 2.4 above.

3 WASTEWATER DISPOSAL

3.1 DESIGN CRITERIA

In accordance with the City of Ottawa's Sewer Design Guidelines, the following design criteria have been utilized in order to predict wastewater flows generated by the subject site and complete the sewer design:

- Minimum Velocity 0.6 m/s
- Maximum Velocity 3.0 m/s
- Manning Roughness Coefficient 0.013
- Total est. Hectares institutional use 2.07
- Average sanitary flow for institutional use 28,000 L/Ha/day
- Commercial/Institutional Peaking Factor 1.5
- Infiltration Allowance (Total) 0.33 L/Ha/s
- Minimum Sewer Slopes – 200 mm diameter 0.50%

The area of 2.07 ha represents the total area for the site. This is the sanitary collection area that is being considered to contribute to the proposed 200mm sanitary service connection to the municipal sanitary sewer.

3.2 CONSISTENCY WITH MASTER SERVICING STUDY

The sanitary connection for the new elementary school will be provided by extending into the existing 200mm sanitary stub on Barrett Farm Drive. The Ottawa Sewer Design Guidelines provide estimates of sewage flows based on institutional development.

The criteria to determine anticipated actual peak flow based on site used as described in Ottawa Sewer Design Guidelines Appendix 4-A are as follows;

- Institutional: 28000 L/Ha/day = 0.324 L/Ha/s
- Peak flow = (0.324 L/Ha/s x 2.07 ha x 1.5 peaking factor) + 0.33 l/Ha/s x 2.07 ha = 1.69 L/s

The on-site sanitary sewer network has been designed in accordance with 1.69 L/s as described above.

3.3 REVIEW OF SOIL CONDITIONS

There are no specific subsurface conditions at this site that indicate a need for an increased extraneous flow allowance. Soil conditions have been assessed by Cambium Inc., and bedding and backfill will be provided as recommended. Conventional sewer materials will be used, and dewatering will be carried out as necessary, following the geotechnical recommendations and in response to conditions encountered on-site.

As groundwater measurements taken on October 3, 2024, indicated a static level around 3 mbgs with perched water likely on overlying silts and clayey deposits, dewatering may be required for excavations extending into these layers. All dewatering activities will be conducted in line with MECP regulations and the geotechnical recommendations, maintaining the groundwater level at least 1.0m below the base of excavations.

3.4 DESCRIPTION OF EXISTING SANITARY SEWER

The proposed sanitary service for the new elementary school will extend into the existing 200mm sanitary stub on Barrett Farm Drive and connect to the existing 300mm sanitary sewer within the Barrett Farm Drive right-of-way.

3.5 VERIFICATION OF AVAILABLE CAPACITY IN DOWNSTREAM SEWER

The existing sanitary sewer within Barrett Farm Drive right-of-way is a 300 mm diameter sewer at a slope of 0.30%. This size and slope of sewer provides a capacity of 53.0 L/s.

Since the flow from the study area is only 1.69 l/s, the additional flow should have negligible impact on the capacity of the existing sewer system.

3.6 CALCULATIONS FOR NEW SANITARY SEWER

The new sanitary service from the site is a 200 mm diameter sewer at a slope of 1.0%. This size and slope of sewer provides a capacity of 32.8 L/s.

For the 2.07 ha study area, the sanitary peak flow is calculated at 1.01 l/s with an infiltration flow of 0.68 l/s (based on a peak extraneous flow of 0.33 l/s/ha) for a total flow of 1.69 l/s. Both the proposed sanitary on-site and municipal sewers have adequate capacity to convey this flow.

3.7 DESCRIPTION OF PROPOSED SEWER NETWORK

The proposed on-site sanitary sewer network will include a 200mm sanitary service line connected to a new 1200mm maintenance hole. This maintenance hole will replace the existing stub cap, providing improved access and functionality for the sanitary system.

3.8 ENVIRONMENTAL CONSTRAINTS

There are no previously identified environmental constraints that impact the sanitary servicing design in order to preserve the physical condition of watercourses, vegetation, or soil cover, or to manage water quantity or quality.

3.9 PUMPING REQUIREMENTS

The proposed development will have no impact on existing pumping stations and will not require new pumping facilities.

3.10 FORCEMAINS

There are no sanitary forcemains proposed on this site.

3.11 EMERGENCY OVERFLOWS FROM SANITARY PUMPING STATIONS

No sanitary pumping stations are proposed on this site.

3.12 SPECIAL CONSIDERATIONS

There is no known need for special considerations for sanitary sewer design related to existing site conditions.

4 SITE STORM SERVICING

4.1 EXISTING CONDITION

The subject site, located at 3955 Kelly Farm Drive, is part of Barrett Lands Subdivision development. The pre-development release rate from the 2.07 ha study area has been assigned to be 224 L/s for the 100-year event as per the IBI Design Brief 2018. The existing storm network within the Barrett Farm Drive and Kelly Farm Drive ROW consists of concrete trunk sewers, stormwater runoff from the site is conveyed via a 2700mm concrete trunk sewer along Barrett Farm Drive and Kelly Farm Drive, which ultimately discharges into the designated stormwater management pond for quantity and quality control and treatment.

4.2 ANALYSIS OF AVAILABLE CAPACITY IN PUBLIC INFRASTRUCTURE

Based on the higher-level studies and plan, the allowable release rate for the site was allocated to be 224 L/s and remains unchanged, there are no concerns related to the adequacy and available capacity of the downstream network. Capacity in the minor system is not a concern.

4.3 DRAINAGE DRAWING

Drawing C04 shows the detailed site sewer network. Drawings C03 provides proposed grading and drainage and include existing grading information. Drawing C06 and C07 provides a post-construction drainage sub-area plan, including both site and roof information. Site sub-area information is also provided on the storm sewer design sheet attached in Appendix C. An overall grading plan and Servicing plan have also been attached to Appendix C for reference.

4.4 WATER QUANTITY CONTROL OBJECTIVE

The water quantity objective for the site is to limit the flow release to 224.0 l/s. Excess flows above this limit for the school site up to those generated by the 100-year storm event from drainage on the school site are temporarily stored on site.

No provision is required on the school's site to accommodate any flow from the adjacent lands. All flows exceeding the defined minor system capacity and on-site storage capability will enter the major system, with overflow to the City right of way, on the west and south boundaries of the site.

The maximum overland runoff spill elevation for this site is 95.74, and one 175 mm dia. circular plate ICDs is proposed to be used on the outlet inside STMH109 to restrict the flow rate leaving the site to 122.54 l/s at 3.67 m head, based on the maximum spill elevation of 95.74. In theory, the runoff water will be detained on site up to the 100-yr rainfall event, and for those scenarios exceeding 100-yr rainfall event, the runoff water will be discharged offsite once all the available storage areas have reached their maximum capacities. The school site can provide a total of 233.77 m^3 of surface storage volume, but the required storage for 100-yr will be only 217.38 m^3. The ponded water will not reach the spill elevation under 100 year and lesser events. The site has more storage capacity than required because of the grading design. This will allow extra detention of water on the site during extreme events and will reduce stress on the downstream stormwater management pond. If rain falls at a rate higher than the soccer field soil can absorb, then there will be surface ponding at the designated locations shown on the drawings. If the soccer field and landscaped areas allow for infiltration, the available surface storage volume will be further increased. In theory, the use of lower runoff coefficients for landscaped surfaces already accounts for a certain degree of absorption in these areas.

4.5 WATER QUALITY CONTROL OBJECTIVE

The on-site quality control objective is to provide enhanced protection (minimum 80% TSS removal) prior to releasing flows from the site's paved areas. For this site, an OGS unit (EFO5) has been sized to meet the quality control requirements. See Appendix C for OGS details. Water quality objectives are achieved at stormwater management pond 2 as noted in the pre-consultation notes.

4.6 DESIGN CRITERIA

The stormwater system was designed following the principles of dual drainage, making accommodation for both major and minor flow.

Some of the key criteria include the following:

• Design Storm (minor system)	1:2-year return (Ottawa)
• Rational Method Sewer Sizing	
• Initial Time of Concentration	10 minutes
• Runoff Coefficients	
Landscaped Areas	C = 0.20
Asphalt/Concrete	C = 0.90
Traditional Roof	C = 0.90
• Pipe Velocities	0.80 m/s to 6.0 m/s
• Minimum Pipe Size	250 mm diameter (200 mm CB Leads and service pipes)

4.7 PROPOSED MINOR SYSTEM

The new drainage system consists of a series of manholes, catchbasins and storm sewers leading to the outlet manhole STMH109 discharging controlled flows into STMH110 (OGS Unit) at the west of the site before out letting into the existing system within the Kelly Farm Road ROW. All drainage areas on the site are collected in the site piped drainage system.

It is also customary for larger buildings to be provided with piped storm services for roof drainage. The roof drainage storm service is connected to the existing 675 mm diameter storm stub located north of the building with a new 1200 mm diameter maintenance hole, ensuring an unobstructed flow for these areas.

Using the above noted criteria, the existing on-site storm sewers were sized accordingly. A detailed storm sewer design sheet and the associated post development storm sewer drainage area plan are included in Appendix C.

4.8 STORMWATER MANAGEMENT

The study area is proposed to be limited to a total post-development release rate of 224.0 l/s (allowable release rate was determined to be 122.54 l/s), which is achieved through an inlet control device (located within STMH109) and controlled roof drains.

Flows generated that are in excess of the site's allowable release rate will be stored on site in surface storage areas or by the use of roof top storage and gradually released into the minor system so as not to exceed the site's allocation.

The maximum surface retention depth of the developed areas will be limited to maximum 350mm during a 1:100 year event. The maximum ponding elevation has been designed to be 95.74m as determined by the overland flow elevation, which is well below the building ground floor level of 96.25m.

No surface ponding will occur during a 2-year event.

Overland flow routes will be provided in the grading to permit emergency overland flow from the site. The overflow routes will eliminate any increase in ponding depth for events exceeding 100 years.

At certain locations within the study area, the opportunity to store runoff is limited due to grading constraints. These locations are located at the perimeter of the site where it is necessary to tie into existing grades, and it is not always feasible to capture or store stormwater runoff. The runoff from these areas will be uncontrolled and be released as direct runoff.

The site grading and ponding has been designed to control water generated during the 1:100-year event, with no overflow leaving the site at this control level. Please refer to the SWM Calculations in Appendix C.

4.9 INLET CONTROLS

As noted in Section 4.8, there is one inlet control device (ICD) located in STMH109. While the majority of the site is controlled by this ICD, a portion of the site consisting of catchment area A-15, A-16, A-17 and A-18 will drain directly to the existing on-site storm network uncontrolled. The rooftop of the school addition will be controlled to a release rate of 29.48 l/s, the rooftop release rate has been assumed based on 34 roof drains at ¼ exposure with maximum 0.15m ponding.

Therefore, the release from the study area that is not controlled by an ICD has been determined in the Stormwater Management Calculations, the total uncontrolled flows generated from the site are 55.30 L/s.

The ICD located in STMH109 controls the release rate from the remainder of the study area (catchment areas A-1 to A-14) to 122.54 L/s. Flow restrictions will cause the on-site catchbasin and catchbasin manholes to surcharge, generating surface ponding in the parking and landscaped areas. Ponding locations and elevations are summarized on the grading and drainage area plans. The proposed ICD dimensions are determined as:

Table 4-1: ICD Information

Structure	Head (m)	Flow Rate (l/s)	Orifice Type
STMH109	3.67	122.54	Orifice plate 175mm

Therefore, the total release rate from the study area is calculated to be 206.75 l/s and is within the limits of the maximum allowable release rate of 224.0 l/s from the site.

$$Q_{(release)} = Q_{(uncontrolled)} + Q_{(controlled)} + Q_{(roof)}$$

$$= 55.30 \text{ l/s} + 122.54 \text{ l/s} + 29.48 \text{ l/s}$$

$$= \mathbf{207.32 \text{ L/s}}$$

The controlled and uncontrolled areas can be summarized in the following table.

Table 4-2: Stormwater Management Release Rates and Storage Summary

	Catchment Area	Release Rate (l/s)	Required Ponding Volume (m^3)	Provided Ponding Volume (m^3)
Uncontrolled	A-15, A-16, A-17, A-18	55.30	N/A	N/A
Controlled	A-1 to A-14	122.54	217.38	233.77
Roof	R-1	29.48	108.30	118.88
	Total	207.32 l/s		
	Maximum allowable flow rate	224.0 l/s		

4.10 ON-SITE DETENTION

Any excess storm water up to the 100-year event is to be stored on-site to prevent surcharging of the downstream municipal storm sewer system. Detention will be provided in parking and landscape areas and building rooftops, where feasible. As previously noted, the volume of storage is dependent on the characteristics of each individual drainage area. It should be noted that greater than 0.30 m of vertical separation has been provided from all maximum ponding elevations to lowest building openings.

For the catchment areas where stormwater ponding is controlled by the ICD located in STMH109, a total of 217.38m3 of storage is required and 233.77m3 of storage is provided. The rooftop of the school addition will be controlled to a release rate of 29.48 l/s, the rooftop release rate has been assumed based on 34 roof drains at ¼ exposure with maximum 0.15m ponding. The required roof storage is calculated to be 108.30 m3, and the provided roof storage is 118.88 m3. In all instances the required storage is met via surface ponding which retain the stormwater and discharge at the restricted flow rate to the sewer system. Refer to the grading plan for storage information.

4.11 WATERCOURSES

There will be no modification to watercourses as a result of the proposed development.

4.12 PRE AND POST DEVELOPMENT PEAK FLOW RATES

The study area has an allowable release rate of 224.0 l/s. The post-development 100-year peak flow rate has been designed to be 207.32 l/s which has been achieved through roof controls and on-site surface ponding.

4.13 DIVERSION OF DRAINAGE CATCHMENT AREAS

There will be no diversion of existing drainage catchment areas arising from the proposed work described in this report.

4.14 DOWNSTREAM CAPACITY WHERE QUANTITY CONTROL IS NOT PROPOSED

This checklist item is not applicable to this development as quantity control is provided.

4.15 IMPACTS TO RECEIVING WATERCOURSES

No significant negative impact is anticipated to downstream receiving watercourses due to proposed quantity and quality control measures

4.16 MUNICIPAL DRAINS AND RELATED APPROVALS

There are no municipal drains on the site or associated with the drainage from the site.

4.17 MEANS OF CONVEYANCE AND STORAGE CAPACITY

The means of flow conveyance and storage capacity are described in Sections 4.7, 4.8, 4.9 and 4.10 above.

4.18 HYDRAULIC ANALYSIS

Hydraulic calculations for the site storm sewers are provided in the storm sewer design sheet.

4.19 IDENTIFICATION OF FLOODPLAINS

There are no designated floodplains on the site of this development.

4.20 FILL CONSTRAINTS

There are no known fill constraints applicable to this site related to any floodplain. The site is generally being graded to be within 0.5m relative to existing conditions.

5 SEDIMENT AND EROSION CONTROL

5.1 GENERAL

During construction, existing storm sewer system can be exposed to sediment loadings. A number of construction techniques designed to reduce unnecessary construction sediment loadings will be used including;

- Silt sacks will remain on open surface structures such as manholes and catchbasins until these structures are commissioned and put into use;
- Installation of silt fence, where applicable, around the perimeter of the proposed work area;
- The installation of straw bales within existing drainage features surround the site;
- Bulkhead barriers will be installed in the outlet pipes;

During construction of the services, any trench dewatering using pumps will be fitted with a “filter sock.” Thus, any pumped groundwater will be filtered prior to release to the existing surface runoff. The contractor will inspect and maintain the filter sock as needed including sediment removal and disposal.

All catchbasins, and to a lesser degree, manholes, convey surface water to sewers. Consequently, until the surrounding surface has been completed, these structures will be covered to prevent sediment from entering the minor storm sewer system. These measures will stay in place and be maintained during construction and build-out until it is appropriate to remove them.

During construction of any development both imported and native soils are placed in stockpiles. Mitigative measures and proper management to prevent these materials entering the sewer system are needed.

During construction of the deeper watermains and sewers, imported granular bedding materials are temporarily stockpiled on site. These materials are however quickly used up and generally placed before any catchbasins are installed.

Refer to the Erosion and Sedimentation Control Plan C05 provided in Appendix D.

6 APPROVAL AND PERMIT REQUIREMENTS

6.1 GENERAL

The proposed development is subject to site plan approval and building permit approval.

No approvals related to municipal drains are required.

No permits or approvals are anticipated to be required from the Ontario Ministry of Transportation, National Capital Commission, Parks Canada, Public Works and Government Services Canada, or any other provincial or federal regulatory agency.

7 CONCLUSION CHECKLIST

7.1 CONCLUSIONS AND RECOMMENDATIONS

It is concluded that the proposed development can meet all provided servicing constraints and associated requirements. It is recommended that this report be submitted to the City of Ottawa in support of the application for site plan approval.

7.2 COMMENTS RECEIVED FROM REVIEW AGENCIES

No comments yet received. This is the 1st version of the report.

APPENDIX

A

- PRE-CONSULTATION MEETING NOTES
- ARCHITECTURAL SITE PLAN
- TOPOGRAPHICAL SURVEY PLAN
- IBI GROUP DESIGN BRIEF (EXCERPTS ATTACHED)
- IBI GROUP GRADING PLAN FOR BARRETT LANDS – PHASE 1

File No.: PC2024-0354

September 13, 2024

Jill MacDonald
WSP Canada Inc.
Via email: Jill.MacDonald@wsp.com

Subject: **Pre-Consultation: Meeting Feedback**
Proposed Site Plan Control Application – 3955 Kelly Farm Drive

Please find below information regarding next steps as well as consolidated comments from the above-noted pre-consultation meeting held on September 9, 2024.

Pre-Consultation Preliminary Assessment

1 ☐	**2** ☐	**3** ☐	**4** ☒	**5** ☐

One (1) indicates that considerable major revisions are required while five (5) suggests that the proposal appears to meet the City's key land use policies and guidelines. This assessment is purely advisory and does not consider technical aspects of the proposal or in any way guarantee application approval.

Next Steps

A review of the proposal and materials submitted for the above-noted pre-consultation has been undertaken. A second pre-consultation can be submitted if the development proposal changes significantly in scope or design. When prepared, please proceed to make the formal application in accordance with direction provided online.

1. In your subsequent pre-consultation submission or formal submission, please ensure that all comments or issues detailed herein are addressed. A detailed cover letter stating how each issue has been addressed must be included with the submission materials. Please coordinate the numbering of your responses within the cover letter with the comment number(s) herein.

Supporting Information and Material Requirements

1. The attached **Study and Plan Identification List** outlines the information and material that has been identified, during this phase of pre-consultation, as either required (R) or advised (A) as part of a future complete application submission.

    a. The required plans and studies must meet the City's Terms of Reference (ToR) and/or Guidelines, as available on Ottawa.ca. These ToR and Guidelines outline

the specific requirements that must be met for each plan or study to be deemed adequate.

Consultation with Technical Agencies

1. You are encouraged to consult with technical agencies early in the development process and throughout the development of your project concept. A list of technical agencies and their contact information is enclosed.

Planning

Comments:

1. Applicant is expecting the proposal to be zoning compliant.

2. Confirmed that the school yard will be available to the public after hours.

3. Staff have concerns regarding safety and security of the site, especially after hours, in the middle area of the “L” shape of the building. Please consider other building footprints to increase visibility. Please refer to Section 10.4 in the Official Plan speaks to enhancing personal security through design.

4. Please provide a walkway that leads from Lavatera Street to the school, and ensure that there are clear sightlines from this street to the school. Landscaping along this street frontage is encouraged, but while keeping the need for clear sightlines into the site.

5. Please consider designs that better frame the intersection. There are policies supporting two+ storey schools, which might also better preserve some of the outdoor amenity area during expansion.

6. Staff have concerns regarding the driveway and parking situated next to residential, impacting a number of properties. Please consider an alternative location, perhaps along Kelly Farm. If the driveway is kept on Barrett Farm, please ensure there is a significant buffer and be cautious of lighting location.

7. Please provide turning radii for garbage trucks and other large vehicles that may enter the site.

8. Please ensure that bicycle parking is located in a visible area and is covered.

9. Please indicate on the site plan where snow storage will be located.

10. What will the school be doing to encourage students and staff to walk or bike to school to decrease the amount of private cars?

11. Please contact the local community association and Councillor Steve Desroches to make them aware of the proposal prior to formal application.

Urban Design

Comments:

12. As part of a complete application, staff require detailed architectural plans (including Building Elevations) and a Landscape Plan. An Urban Design Brief is not required.

13. If possible, increase visibility to outdoor play areas from the street(s) so that they can be used by the public after school hours and during the summer months.

14. Provide a planted landscape buffer between the surface parking areas and the adjacent residential properties.

15. Explore additional tree planting opportunities, particularly along the three public street frontages.

Engineering

Comments:

16. The Stormwater Management Criteria, for the subject site, is to be based on the following:

    a. Demonstrate the servicing strategy is consistent with higher-level studies and plans. Excerpts from relevant higher-level studies and plans will need to be discussed and provided in the Appendix of the Site Servicing and SWM report as supporting documentation to the design. Any deviations will require an update or addendum to the subdivision level MSS to support any changes at the discretion of the City. The following studies apply: **(Design Brief – Barrett Lands – Phase 1 – 4660 Bank Street – Leitrim Development Area – Dated May 2018 and Memo – Dated August 2018).**

    b. Approved drainage patterns shall be respected as part of the proposed SWM solution otherwise an update or addendum to the subdivision level MSS will be required to support the project.

    c. HGL Analysis to be completed and included as part of the Site Servicing and SWM report if basement levels are contemplated.

    d. **Water Quality Control**: provided at Pond 2.

    e. **Water Quantity Control**: Based on the, the allowable release rate for the subject site is 224 l/s. There is a minimum on-site storage requirement of

230m3. Please control post-development runoff from the subject site, for all storm events up to and including the 100-year storm event.

f. Please provide a Pre-Development Drainage Area Plan to define the pre-development drainage areas/patterns. Existing drainage patterns shall be maintained and discussed as part of the proposed SWM solution.

g. Ponding Notes:

   i. 100-year spill elevation must be 300mm lower than any building opening or ramp.

   ii. Demonstrate that the stress test spill elevation (100-year +20% event) does not spill onto any permanent structures.

   iii. The maximum permissible ponding depth for the 100-year storm event is 350mm. No spilling to adjacent sites.

   iv. Please note that as per Technical Bulletin PIEDTB-2016-01 section 8.3.11.1 (p.12 of 14) there shall be no surface ponding on private parking areas during the 2-year storm rainfall event. 100-year spill elevation must be 300mm lower than any building opening or ramp

h. Document how any foundation drainage system will be integrated into the servicing design and show the positive outlet on the plan. Foundation drainage is to be independently connected to sewer main unless being pumped with appropriate back up power, sufficient sized pump and back flow prevention. It is recommended that the foundation drainage system be drained by a sump pump connection to the storm sewer to minimize risk of basement flooding as it will provide the best protection from the uncontrolled sewer system compared to relying on the backwater valve.

i. Please note that the minimum orifice dia. for a plug style ICD is 83mm and the minimum flow rate from a vortex ICD is 6 L/s in order to reduce the likelihood of plugging.

j. If rooftop control and storage is proposed as part of the SWM solutions, sufficient details (Cl. 8.3.8.4) shall be discussed and documented in the report and on the plans. Roof drains are to be connected downstream of any incorporated ICDs within the SWM system and not to the foundation drain system. Provide a Roof Drain Plan as part of the submission.

k. Dry ponds are only to be functional for events that are greater than the 2-year storm event, a freeboard of 0.3m between the 100-year HWL elevation and the emergency overflow elevation and to be designed with a maximum depth of 1.5m with 3:1 side slopes. An emergency overland flow route to an appropriate outlet (Rideau River) from the SWM facility needs to be designed.

l. **Underground Storage**: Please note that the Modified Rational Method for storage computation in the Sewer Design Guidelines was originally intended to be used for above ground storage (i.e. parking lot) where the change in head over the orifice varied from 1.5 m to 1.2 m (assuming a 1.2 m deep CB and a max ponding depth of 0.3 m). This change in head was small and hence the release rate fluctuated little, therefore there was no need to use an average release rate.

   i. When underground storage is used, the release rate fluctuates from a maximum peak flow based on maximum head down to a release rate of zero. This difference is large and has a significant impact on storage requirements. We therefore require that an average release rate equal to 50% of the peak allowable rate shall be applied to estimate the required volume. Alternatively, the consultant may choose to use a submersible pump in the design to ensure a constant release rate. In the event that there is a disagreement from the designer regarding the required storage, The City will require that the designer demonstrate their rationale utilizing dynamic modelling, that will then be reviewed by City modelers in the Water Resources Group. Regarding all proposed UG storage, ground water levels (and in particular HGW levels) will need to be reviewed to ensure that the proposed system does not become surcharged and thereby ineffective.

   ii. Provide information on type of underground storage system including product name and model, number of chambers, chamber configuration, confirm invert of chamber system, top of chamber system, required cover over system and details, interior bottom slope (for self-cleansing), chart of storage values, length, width and height, capacity, entry ports (maintenance) etc. UG storage to provide actual 5- and 100-year event storage requirements.

17. General Servicing

a. Provide existing servicing information and the recommended location for the proposed connections. Services should ideally be grouped in a common trench to minimize the number of road cuts.

b. CCTV sewer inspection of city infrastructure is required to record pre and post construction conditions and ensure there is no damage to City Assets.

c. It is the sole responsibility of the consultant to investigate the location of existing underground utilities in the proposed servicing area and submit a request for locates to avoid conflict(s). The location of existing utilities and services shall be documented on an Existing Conditions Plan.

d. Any easements on the subject site shall be identified and respected by any development proposal and shall adhere to the conditions identified in the easement agreement. A legal survey plan shall be provided, and all easements shall be shown on the engineering plans.

e. All underground and above ground building footprints and permanent walls need to be shown on the plans to confirm that any permanent structure does not extend either above or below into the existing property lines and sight triangles.

18. Storm Sewer

a. A 675mm dia. concrete storm sewer (2019) stub is available at Nepeta Crescent off Barrett Farm Drive.

b. A storm sewer monitoring maintenance hole is required to be installed at the property line (on the private side of the property) as per City of Ottawa Sewer-Use By-Law 2003-514 (14) Monitoring Devices.

19. Sanitary Sewer

a. A 200 mm dia. PVC Sanitary sewer (2019) is available at Nepeta Crescent off Barrett Farm Drive.

b. Please provide the new Sanitary sewer discharge and we will confirm if sanitary sewer main has the capacity. The allowable sanitary release rate based on the Design Brief – Barrett Lands – Phase 1 – 4660 Bank Street – Leitrim Development Area – Dated May 2018 and Memo – Dated August 2018, is 2.38l/s.

c. Include correspondence from the Architect within the Appendix of the report confirming the number of residential units per building and a unit type breakdown for each of the buildings to support the calculated building populations.

d. Please apply the wastewater design flow parameters in Technical Bulletin PIEDTB-2018-01.

e. Sanitary sewer monitoring maintenance hole is required to be installed at the property line (on the private side of the property) as per City of Ottawa Sewer-Use By-Law 2003-514 (14) Monitoring Devices.

f. The proposed wastewater servicing design shall be consistent with higher-level studies and plans (Design Brief – Barrett Lands – Phase 1 – 4660 Bank Street – Leitrim Development Area – Dated May 2018 and Memo – Dated August 2018).

20. Water:

a. A 200 mm dia. PVC watermain (2019) is available at Nepeta Crescent off Barrett Farm Drive.

b. Water Supply Redundancy: Residential buildings with a basic day demand greater than 50m3/day (0.57 L/s) or with 50+ units are required to be connected to a minimum of two water services, with each their own meter, separated by an isolation valve to avoid a vulnerable service area.

c. Water Boundary condition requests must include the location of the service (map or plan with connection location(s) indicated) and the expected loads required by the proposed development, including calculations. Please provide the following information:

    i. Plan showing the proposed location of service(s).

    ii. Type of development and the amount of fire flow required (L/min). Note: The OBC method can be used if the fire demand for the private property is less than 9,000 L/min. If the OBC fire demand reaches 9000 L/min, then the FUS method is to be used.

    iii. Average daily demand: __L/s.

    iv. Maximum daily demand: __L/s.

    v. Maximum hourly daily demand: __L/s.

    vi. Note: Use Table 3-3 of the MOE Design Guidelines for Drinking-Water System to determine Maximum Day and Maximum Hour peaking factors for 0 to 500 persons and use Table 4.2 of the Ottawa Design Guidelines, Water Distribution for 501 to 3,000 persons.

d. Please review Technical Bulletin ISTB-2018-02, maximum fire flow hydrant capacity is provided in Section 3 Table 1 of Appendix I. A hydrant coverage figure shall be provided and demonstrate there is adequate fire protection for the proposal.

e. A Water Data Card will have to be submitted to size the water meter.

f. Any proposed emergency route is to be to the satisfaction of Fire Services.

21. Grading and Erosion

a. Post-development site grading shall match existing property line grades in order to minimize disruption to the adjacent residential properties. A topographical plan of survey shall be provided as part of the submission and a note provided on the plans.

b. Erosion and sediment control plan must be provided.

c. Any portion of the subject property which is intended to be used for permanent or temporary snow storage shall be as shown on the approved site plan and grading plan. Snow storage shall not interfere with approved grading and drainage patters or servicing. Snow storage areas shall be setback from the property lines, foundations, fencing or landscaping a minimum of 1.5m. Snow storage areas shall not occupy driveways, aisles, required parking spaces or any portion of a road allowance. If snow is to be removed from the site, please indicate this on the plan(s).

d. Street catch basins are not to be located at any proposed entrances.

e. Depressed driveways are discouraged and are not allowed in sag locations. For other locations, the builder must ensure that the maximum depth of flow on the street during the 100-year and stress test events will not spill onto the depressed driveway.

f. If Window wells are proposed, they are to be indirectly connected to the footing drains. A detail of window well with indirect connection is required, as is a note at window well location speaking to indirect connection.

22. Environmental

a. The Phase One ESA will need to be updated in a letter format (i.e. not a full report) due to the report being published more than 18 months ago. The update shall review all the information re a potential for occurrence of contamination impacting the site since the original phase one ESA was done. The phase one ESA shall be updated as per the requirements of Section 28 of the O. Reg. 153/04. Based on the recommendations of the updated Phase One ESA letter, an updated Phase Two ESA may be required.

23. Geotechnical

a. A Geotechnical Study/Investigation shall be prepared in support of this development proposal.

b. Reducing the groundwater level in this area can lead to potential damages to surrounding structures due to excessive differential settlements of the ground. The impact of groundwater lowering on adjacent properties needs to be discussed and investigated to ensure there will be no short term and long-term damages associated with lowering the groundwater in this area.

c. Geotechnical Study shall be consistent with the Geotechnical Investigation and Reporting Guidelines for Development Applications. Geotechnical Investigation and Reporting (ottawa.ca)

d. If Sensitive marine clay soils are present in this area that are susceptible to soil shrinkage that can lead to foundation and building damages. All six (6) conditions listed in the Tree Planting in Sensitive Marine Clay Soils-2017 Guidelines are required to be satisfied. Note that if the plasticity index of the soil is determined to be less than 40% a minimum separation between a street tree and the proposed building foundations of 4.5m will need to be achieved. A memorandum addressing the Tree in Clay Soil Guidelines prepared by a geotechnical engineer is required to be provided to the City. Tree Planting in Sensitive Marine Clay Soils - 2017 Guidelines (ottawa.ca)

24. Regarding Quantity Estimates

    a. Please note that external Garbage and/or bicycle storage structures are to be added to QE under Landscaping as it is subject to securities. In addition, sump pumps for Sanitary and Storm laterals and/or cisterns are to be added to QE under Hard items as it is subject to securities, even though it is internal and is spoken to under SWM and Site Servicing Report and Plan.

25. Gas pressure regulating stations: A gas pressure regulating station may be required depending on HVAC needs (typically for 12+ units). Be sure to include this on the Grading, Site Servicing, SWM and Landscape plans. This is to ensure that there are no barriers for overland flow routes (SWM) or conflicts with any proposed grading or landscape features with installed structures and has nothing to do with supply and demand of any product.

Please refer to the City of Ottawa Guide to Preparing Studies and Plans [Engineering]: Planning application submission information and materials. The guide outlines the requirement for a statement to be provided on the plan about where the property boundaries have been derived from.

As-builts can be requested through the Geoinformation Centre at the e-mail below:

geoinformation@ottawa.ca

613-580-2424 ext 44455

We recommend that you purchase the above noted studies through the Geoinformation Centre to confirm the release rates noted.

Feel free to contact Anton Chetrar, Project Manager, for follow-up questions at anton.chetrar@ottawa.ca .

Noise

Comments:

26. A road noise study is required.

Feel free to contact Mike Giampa, TPM, for follow-up questions.

Transportation

Comments:

27. Corner Sight Triangle required as per the following: Arterial/Local: 3m x 9m with the longer dimension along the arterial road.

28. TIA submission required- please proceed to scoping (TIA Step 2). The application will not be deemed complete until the submission of the draft step 2-3, including the functional draft RMA package (if applicable) and/or monitoring report (if applicable). Although a full review of the TIA Strategy report (Step 3) is not required prior to an application, it is strongly recommended.

29. Synchro files are required at Step 3.

30. Ensure that sidewalks are continuous and depressed through all private approaches.

Feel free to contact **Mike Giampa**, Transportation Project Manager, for follow-up questions.

Forestry

Comments:

31. The site was cleared through the plan of subdivision process. A tree removal permit is not required.

32. A Landscape Plan and Tree Conservation Report are submission requirements of the Site Plan Control application.

33. Trees were planted along the right of way through the plan of subdivision. Prioritize retention of existing trees over removal and replacement as directed through section 4.8.2 of the Official Plan. Consolidate infrastructure, drive isles, utilities…etc. to have minimum impact on existing trees. Where permitted by the Planning Forester, compensation for the removal of City trees will be in the form of 1:1 replacement. Transplanting options can be discussed if desired.

34. Locate the bike rack, shown on the concept plan along Kelly Farm Dr., without impacting existing trees.

35. A robust landscape plan is expected. The Official Plan has a section dedicated to trees on school sites. This is section 4.10.3 called ‘make trees an important component of a school’s outdoor space’. There are additional open areas where trees can be planted throughout the site. Please strive towards at least meeting a 40% canopy cover for this large site, in line with the City wide target.

36. Planning Forestry is happy to see trees incorporated along the parking lot. Section 4.1.4 of the Official Plan directs developments to regularly incorporate space for trees within surface parking lots. If conifers are planted along the northern property boundary, please consider the future spread of these trees and account for management needs.

37. Include a note on the Landscape Plan indicating it was prepared in conjunction with the Geotechnical Report (include date, version, and author of the plan).

38. **Tree Conservation Report requirements. The following Tree Conservation Report (TCR) requirements have been adapted from the Schedule E of the Urban Tree Protection Guidelines – for more information on these requirements please contact hayley.murray@ottawa.ca**

- A Tree Conservation Report (TCR) must be supplied for review along with the suite of other plans/reports required by the City
- Any tree 10 cm in diameter or greater and City-owned trees of any diameter requires a tree permit issued under the Tree Protection Bylaw (Bylaw 2020 – 340); the permit will be based on an approved TCR and made available at or near plan approval.
- The TCR must contain 2 separate plans/maps:
    i. Plan/Map 1 - show existing conditions with tree cover information.
    ii. Plan/Map 2 - show proposed development with tree cover information.
- The TCR must list all trees on site, as well as off-site trees if the CRZ (critical root zone) extends into the developed area, by species, diameter, and health condition. Please note that averages can be used if there are forested areas.
- Please identify trees by ownership – private onsite, private on adjoining site, city owned, co-owned (trees on a property line)
- If trees are to be removed, the TCR must clearly show where they are, and document the reason they cannot be retained.
- The removal of trees on a property line will require the permission of both property owners.
- All retained trees must be shown, and all retained trees within the area impacted by the development process must be protected as per City guidelines available at Tree Protection Specification or by searching Ottawa.ca
- The city encourages the retention of healthy trees; if possible, please seek opportunities for retention of trees that will contribute to the design/function of the site.
- Removal of a City tree is not permitted unless justified. If justified, monetary compensation for the value of the tree must be paid before a tree removal permit is issued.

39. **Landscape Plan (LP) requirements.**

- Landscape Plan Terms of Reference must be adhered to for all tree planting: Click Here. For more information on these requirements please contact hayley.murray@ottawa.ca

40. **Additional Elements for Tree Planting in the Right of Way:**

- Please ensure any retained trees are shown on the LP
- Sensitive Marine Clay - Please follow the City's 2017 Tree Planting in Sensitive Marine Clay guidelines.
- Soil Volume - Please demonstrate as per the Landscape Plan Terms of Reference that the available soil volumes for new plantings will meet or exceed the minimum soil volumes requested.
- The city requests that consideration be given to planting native species wherever there is a high probability of survival to maturity.
- Efforts shall be made to provide as much future canopy cover as possible at a site level, through tree planting and tree retention. The Landscape Plan shall show/document that the proposed tree planting and retention will contribute to the City's overall canopy cover over time. Please provide a projection of the future canopy cover for the site to 40 years

- Minimum Setbacks
    - Maintain 1.5m from sidewalk or MUP/cycle track or water service laterals.
    - Maintain 2.5m from curb
    - Coniferous species require a minimum 4.5m setback from curb, sidewalk, or MUP/cycle track/pathway.
    - Maintain 7.5m between large growing trees, and 4m between small growing trees. Park or open space planting should consider 10m spacing, except where otherwise approved in naturalization / afforestation areas.
    - Adhere to Ottawa Hydro's planting guidelines (species and setbacks) when planting around overhead primary conductors.

- Tree specifications
    - Minimum stock size: 50mm tree caliper for deciduous, 200cm height for coniferous.
    - Maximize the use of large deciduous species wherever possible to maximize future canopy coverage.
    - Tree planting on city property shall be in accordance with the City of Ottawa's Tree Planting Specification; and if possible, include watering and warranty as described in the specification.
    - No root barriers, dead-man anchor systems, or planters are permitted.

- No tree stakes unless necessary (and only 1 on the prevailing winds side of the tree)

- Hard surface planting
  - If there are hard surface plantings, a planting detail must be provided.
  - Curb style planters are highly recommended.
  - No grates are to be used and if guards are required, City of Ottawa standard (which can be provided) shall be used.

Feel free to contact Hayley Murray, Planning Forester, for follow-up questions.

Parkland

Comments:

41. The proposed site plan application is exempt from parkland dedication as per subsection 14(2)(f) of Parkland Dedication By-law No. 2022-280. This subsection exempts a school from parkland dedication where the school provides for the students' outdoor recreational needs on-site at the time of development.

Feel free to contact Burl Walker, Planner 3, for follow-up questions.

Other

42. The High Performance Development Standard (HPDS) is a collection of voluntary and required standards that raise the performance of new building projects to achieve sustainable and resilient design and will be applicable to Site Plan Control and Plan of Subdivision applications.

    a. The HPDS was passed by Council on April 13, 2022, but is not in effect at this time, as Council has referred the 2023 HPDS Update Report back to staff with the direction to bring forward an updated report to Committee at a later date. Please be advised that this is expected to occur in Q3 2024.

    b. Please refer to the HPDS information at ottawa.ca/HPDS for more information.

Submission Requirements and Fees

1. Site Plan Control Complex application.
    a. Additional information regarding fees related to planning applications can be found here.
2. The attached **Study and Plan Identification List** outlines the information and material that has been identified as either required (R) or advised (A) as part of a future complete application submission.

a. The required plans and studies must meet the City's Terms of Reference (ToR) and/or Guidelines, as available on Ottawa.ca. These ToR and Guidelines outline the specific requirements that must be met for each plan or study to be deemed adequate.

3. All of the above comments or issues should be addressed to ensure the effectiveness of the application submission review.

Should there be any questions, please do not hesitate to contact myself or the contact identified for the above areas / disciplines.

Regards,
Margot Linker

c.c. Wendy Tse
Vincent Duquette
Anton Chetrar
Mike Giampa
Hayley Murray
Nader Kadri
Matthew Steeves

SUPPLEMENTARY DEVELOPMENT INFORMATION

The following details have been compiled to provide additional information on matters for consideration throughout the application approval and development process. Please note, this document is updated from time to time and should be reviewed for each project proposed to be undertaken.

General

- Refer to Planning application submission information and materials and fees for further information on preparing for application submission. Be aware that other fees and permits may be required, outside of the development review process.
- Additional information is available related to building permits, development charges, and the Accessibility Design Standards.
- You may obtain background drawings by contacting geoinformation@ottawa.ca.
- Plans are to be standard A1 size (594 mm x 841 mm) or Arch D size (609.6 mm x 914.4 mm) sheets, dimensioned in metric and utilizing an appropriate Metric scale (1:200, 1:250, 1:300, 1:400 or 1:500).
- All PDF submitted documents are to be unlocked, flattened and not saved as a portfolio file.
- Where private roads are proposed:
    - Submit a Private Roadway Street Naming application to Building Code Services Branch for any internal private road network.
    - Applications are available at all Client Service Centres and the private roadway approval process takes three months.

Servicing and Site Works

Servicing and site works shall be in accordance with the following documents:

- Ottawa Sewer Design Guidelines (October 2012)
- Ottawa Design Guidelines – Water Distribution (2010)
- Geotechnical Investigation and Reporting Guidelines for Development Applications in the City of Ottawa (2007)
- City of Ottawa Slope Stability Guidelines for Development Applications (revised 2012)
- City of Ottawa Environmental Noise Control Guidelines (January, 2016)
- City of Ottawa Park and Pathway Development Manual (2012)
- City of Ottawa Accessibility Design Standards (2012)
- Ottawa Standard Tender Documents (latest version)
- Ontario Provincial Standards for Roads & Public Works (2013)

Exterior Site Lighting

Where proposed, requires certification by an acceptable professional engineer, licensed in the Province of Ontario, which states that the exterior site lighting has been designed to meet the following criteria:

- It uses only fixtures that meet the criteria for Full Cut-Off (Sharp cut-off) classification, as recognized by the Illuminating Engineering Society of North America (IESNA or IES), and
- It results in minimal light spillage onto adjacent properties. As a guideline, 0.5 foot-candle is normally the maximum allowable spillage.

The location of the fixtures, fixture type (make, model, part number and the mounting height) must be shown on one of the approved plans.

City Surveyor Direction

- The determination of property boundaries, minimum setbacks and other regulatory constraints are a critical component of development. An Ontario Land Surveyor (O.L.S.) needs to be consulted at the outset of a project to ensure properties are properly defined and can be used as the geospatial framework for the development.
- Topographic details may also be required for a project and should be either carried out by the O.L.S. that has provided the Legal Survey or done in consultation with the O.L.S. to ensure that the project is integrated to the appropriate control network.

  Questions regarding the above requirements can be directed to the City's Surveyor, Andre Roy, at Andre.Roy1@ottawa.ca.

Waste Management

- New multi-unit residential development, defined as containing six (6) or more units, intending to receive City waste collection services will be required, as of June 1, 2022, to participate in the City's Green Bin program in accordance with Council's approval of the multi-residential waste diversion strategy. The development must include adequate facilities for the proper storage of allocated garbage, recycling, and green bin containers and such facilities built in accordance with the approved site design. Questions regarding this change and requirements can be directed to Andre.Laplante@ottawa.ca.

- For sites containing:
  - One or more buildings with a total GFA greater than 2000 square metres;
  - Retail shopping complexes with a total GFA greater than 10,000 square metres;
  - Sites containing office buildings with total GFA greater than 10,000 square metres;
  - Hotels and motels with more than 75 units;
  - Hospitals (human);
  - Educational institutions with more than 350 students; or
  - Manufacturing establishments working more than 16,000 person-hours in a month

  A Waste Reduction Workplan Summary is required for the construction project as required by O.Reg. 102/94, being "Waste Audits and Waste Reduction Work Plans" made under the Environmental Protection Act, RSO 1990, c E.19, as amended.

Fire Routes

- Fire routes are required to be designated by By-law for Fire Services to establish them as a legal fire route. Where a development proposes to establish a fire route, an Application for Fire Route

Designation is to be made. Questions regarding the designation of fire routes and required process can be directed to fireroutes@ottawa.ca.

Dewatering Activities

- Project contractors and/or your engineers are required to contact the Sewer Use Program to arrange for the proper agreements or approvals to allow for the discharge of water from construction dewatering activities to the City's sanitary or storm sewer system. Please contact the Sewer Use Duty Officer at 613-580-2424 ext. 23326 and/or suppue@ottawa.ca.

Backflow Prevention Devices for Premise Isolation

- Buildings or facilities installing a backflow preventer for premise isolation of the drinking water system must register with the City's Backflow Prevention Program where a moderate or severe hazard may be caused in accordance with CSA B64.10 "Selection and Installation of Backflow Preventers". Please contact the Backflow Prevention Program at 613-580-2424 ext. 22299 or backflow@ottawa.ca to submit a Premise Isolation Survey.

Energy Considerations

- Are you considering harvesting thermal energy from the wastewater infrastructure or harvesting geothermal energy?
    - Additional information can be found on the City website or by contacting Melissa Jort-Conway.

Flood Plain Mapping and Climate Change

- An interactive map, for informational purposes only, showing the results of on-going flood plain mapping work completed by the Conservation Authorities in partnership with the City is now available. This mapping may be used to identify known riverine flood hazards for a property or area. The map and additional related information can be found on Ottawa.ca.

Blasting

- Where blasting may take place:
    - Blasting activities will be required to conform to the City's Standard S.P. No. F-1201 entitled Use of Explosives, as amended.
    - To avoid future delays in process, including the Municipal Consent process for shoring, ensure communication with necessary entities, including utilities, is undertaken early.
- Blasting and pile driving activities in the vicinity of Enbridge Gas Distribution and Storage (GDS) facilities require prior approval by GDS. The Blasting and Pile Driving Form, referenced in Enbridge's Third Party Requirements in the Vicinity of Natural Gas Facilities Standard, must be provided to mark-ups@enbridge.com by the Owner of the proposed work for all blasting and pile driving operations. In addition, a licensed blasting consultant's stamped validation report must be submitted to GDS for review if blasting is to occur within thirty (30) metres of GDS facilities. The request must be submitted a minimum of four weeks prior to the beginning of work to allow sufficient time for review.

Archaeological

- Archaeological Resources
    - Should potential archaeological resources be encountered during excavation activities, all Work in the area must stop immediately and the Owner shall contact a provincially licensed archaeologist.
    - If during the process of development deeply buried/undetected archaeological remains are uncovered, the Owner shall immediately notify the Archaeology Section of the Ontario Ministry of Tourism, Culture and Sport.
    - In the event that human remains are encountered during construction, the Owner shall immediately contact the police, the Ministry of Tourism, Culture and Sport and the Registrar of Cemeteries, Cemeteries Regulation Unit, Ministry of Consumer and Business Services, Consumer Protection Branch.

Trees

- The City's Tree Protection Bylaw, being By-Law No. 2020-340, as amended, requires that any trees to be removed shall be removed in accordance with an approved Tree Permit and Tree Conservation Report and that all retained trees will be protected in accordance with an approved Tree Conservation Report.

Limiting Distance and Parks

- A Limiting Distance Agreement may be required by Building Code Services before building permit(s) can be issued with respect to the proximity of the building to a park block. The City will consider entering into a Limiting Distance Agreement with the Owner with such Agreement to be confirmed through the City's Reality Initiatives & Development Branch. A Limiting Distance Agreement is at the expense of the Owner.

Development Constructability

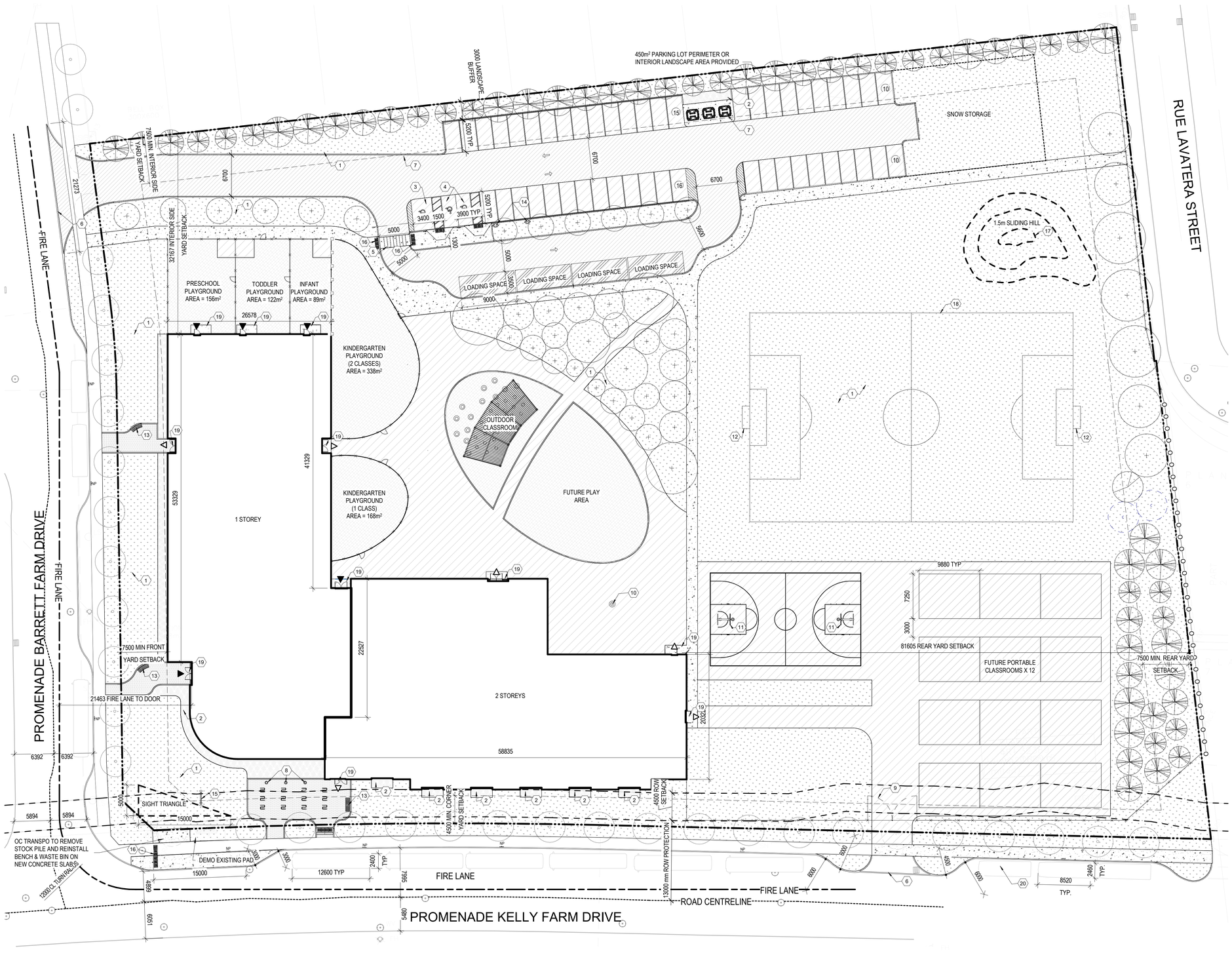
How a development is constructed, its constructability, is being looked at earlier in the development review process to raise awareness of potential impacts to the City's right of way and facilitate earlier issue resolution with stakeholders. Where a construction management plan is required as part of the site plan or subdivision application approval, conditions will be included that set out the specific parameters to be addressed for the specific project. However, please note the following construction and traffic management requirements and considerations in the development of your project.

- **Open Lane (includes all vehicular lanes, transit lanes and cycling lanes) Requirements**
    - Unless specified in the site-specific conditions to be provided by City of Ottawa Traffic Management at the time of approval, the following requirements must be adhered to and accommodated as part of any proposed encroachments and construction management plan. The standard requirements outlined in this section shall further apply to cycling facilities and Transit.
        - All lanes are to function uninterrupted at all times.
        - No interruption or blockage of traffic is permitted.
        - No loading or unloading from an open lane is permitted.
        - All vehicular travel lanes are to be a minimum of 3.5 metres in width.

- All cycling lanes are to be a minimum of 1.5 metres.

- **Pedestrian Requirements**
  - Unless specified in the site-specific conditions provided by City of Ottawa Traffic Management at the time of approval, the contractor is required to maintain a minimum width of 1.5 metres for a pedestrian facility on one side of the corridor at all times; even in instances where a pedestrian facility was not present prior to construction.
  - The facility shall include a free and unobstructed hard surface acceptable for the use of all pedestrians including those with accessibility challenges and shall maintain access to all buildings and street crossings.
  - The facility must always be maintained in a clean condition and in a good state of repair to the satisfaction of the City.
  - Any change of level which is over 13 millimetres in height is to be provided with a smooth non-tripping transition.
  - Any temporary barriers or fencing shall include a cane detectable boundary protection with edge or barrier at least 75 millimetres high above the ground surface.
  - If works overhead are required, a 2.1 metre minimum clear headroom must be provided.
  - If overhead protection is required above the pedestrian facility, it is to be offset a minimum of 600 millimetres from any travel lane.
- **Transit Requirements**
  - Travel lanes accommodating OC Transpo must be a minimum of 3.5 metres in width and have a minimum 4.5 metre vertical clearance at all times.
  - Should access to a bus stop be impacted, the developer will be required to email TOPConstructionandDetours@ottawa.ca a minimum of 20 working days prior to work commencing to coordinate any site-specific conditions as part of the work. This includes temporary relocation of transit stops, removal of bus shelters or stops and transit detour routes.
  - The contractor may be required to relocate and provide a suitable alternative to OC Transpo's bus stop to the satisfaction of OC Transpo
  - The Contractor shall provide OC Transpo with a minimum of ten (10) working days' notice to coordinate temporary relocation of bus stops. When a bus stop and/or shelter must be temporarily relocated, the contractor may be required to provide stop infrastructure (i.e. bench, bus and/or shelter pads), to the satisfaction of OC Transpo.
  - All temporary stop locations including infrastructure are to be fully accessible in accordance with City of Ottawa Accessibility Design Standards and to the satisfaction of the OC Transpo.
  - Temporary bus stops are to be constructed and ready for use prior to the start of any works that would impact the regular bus stop location(s).
- **Public Consultation**
  - May include, but not be limited to, proponent lead public meeting(s), letter notification(s) and information dissemination via print, electronic means or social media, to impacted properties above and beyond the notification requirements specified in the Road Activity By-law.
- **General Considerations for all Applications**

- A comprehensive construction management plan should include and consider the following:
    - The proposed stages of construction and the anticipated durations of each stage and any impact to existing travel lanes, pedestrian facilities, cycling facilities and/or transit facilities. Any proposed encroachment should be identified and dimensioned on the site plan for review of feasibility.
    - The proposed constructability methods being used as part of the proposed development (ie: fly forming, Peri forming etc.) and any additional traffic impacts/interruptions anticipated with proposed methods. If a crane is being placed on site, the location should be identified, and show the overhead impacts of the crane.
    - Consideration that any tie-backs and/or shoring within the City of Ottawa Right of Way are subject to Municipal Consent in advance of commencement of the project. Approval for encroachments is not guaranteed if impacts to transportation facilities cannot be addressed to the City's satisfaction.
    - Identify any truck hauling routes to and from the proposed development site and any proposed accesses. Designated heavy truck routes are to be followed at all times, however, if a deviation is required from the existing heavy truck route network, then a structural review may be required as part of an Over-dimensional Vehicle Project Permit.
    - Identify the location of any site trailers and the location. Note, if placing a site trailer above any walk-through scaffolding or on the second floor (or above), an engineering drawing must be submitted to building code services for review. More information can be found on the Building Permit Approval process.
    - Identify equipment and/or materials storage locations as required. Storage is not permitted on the road or the roadway shoulders or boulevards, unless the storage areas are identified in the traffic control plan and appropriate traffic control devices protect the equipment or materials.
- Any work as part of the development that requires a road cut, road closure or encroachment will be subject to the Road Activity By-law and potential site-specific conditions identified at site plan or subdivision approval which will be noted on the subsequent Permit(s). Information about construction in the right-of-way including applying for permits and associated fees can be found on the City's website.



1 AS101 ARCHITECTURAL SITE PLAN.

1 : 300

LEGEND

- LIGHT DUTY ASPHALT
- HEAVY DUTY ASPHALT
- CONCRETE SIDEWALKS
- UNIT PAVER
- SODDED AREA
- ENGINEERED WOOD FIBER
- PLANTING BED
- PAINTED ISLAND
- ENTRANCE
- EXIT
- EXISTING MANHOLE, REFER TO CIVIL
- EXISTING CATCH BASIN, REFER TO CIVIL
- EXISTING LS, LIGHT STANDARD, REFER TO ELECTRICAL AND STRUCTURAL
- ROAD CENTER LINE
- ROW SETBACK
- FIRE ROUTE
- PROPERTY LINE
- SETBACK LINE
- NEW 1200mm HT CHAIN LINK FENCE
- NEW 1200mm HT WOOD SCREEN FENCE
- EXISTING WOOD SCREEN FENCE
- 150mm CURB
- FIRE HYDRANT
- BASKETBALL NET
- NO PARKING - FIRE ROUTE SIGN
- BIKE RACKS

KEYNOTES

1. TOPSOIL AND SOD. REFER TO DETAIL 4/L-202
2. PLANTING BED
3. TYPE A ACCESSIBLE STALL
4. TYPE B ACCESSIBLE STALL
5. PEDESTRIAN CROSSING
6. DEPRESSED CURB. REFER TO CITY OF OTTAWA STANDARD SC7.1
7. IN-GROUND WASTE COLLECTION BIN
8. FLAGPOLE
9. VEHICULAR BARRIER GATE. REFER TO DETAIL 8/L-200
10. TRIPLE POST AND HOOP
11. BASKETBALL HOOP AND POST. REFER TO DETAIL 7/L-200
12. NEW MINI-SOCCER GOALS
13. BENCH. REFER TO DETAIL 1/L-201
14. DUAL PORT EV CHARGING UNIT C/W TWO (2) BOLLARDS.
15. SCHOOL SIGN. REFER TO DETAIL 3/L-201
16. TACTILE WARNING SURFACE INDICATOR
17. SODDED BERM. REFER TO CIVIL GRADING PLAN
18. SOCCER FIELD. LINES FOR SPACIAL LAYOUT PURPOSES ONLY, NOT TO BE PAINTED
19. CONCRETE PAD. REFER TO STRUCTURAL
20. MINIVAN DROPOFF AREA

GENERAL SITE PLAN NOTES

1. OBC 3.2.5.5.(1) LOCATION OF ACCESS ROUTES:
   ACCESS ROUTES REQUIRED BY ARTICLE 3.2.5.4 SHALL BE LOCATED SO THAT THE PRINCIPLE ENTRANCE AND EVERY ACCESS OPENING REQUIRED BY ARTICLE 3.2.5.1 AND 3.2.5.2. ARE LOCATED NOT LESS THAN 3M AND NOT MORE THAN 15M FROM THE CLOSEST PORTION OF THE ACCESS ROUTE REQUIRED FOR FIRE DEPARTMENT USE, MEASURED HORIZONTALLY FROM THE FACE OF THE BUILDING.
2. OBC 3.2.5.6.(1) ACCESS ROUTE DESIGN:
   A PORTION OF A ROADWAY OR YARD PROVIDED AS A REQUIRED ACCESS ROUTE FOR FIRE DEPARTMENT USE SHALL, (a) HAVE A CLEAR WIDTH OF NOT LESS THAN 6M, UNLESS IT CAN BE SHOWN THAT LESSER WIDTHS ARE SATISFACTORY, (b) HAVE A CENTERLINE RADIUS NOT LESS THEN 12M, (c) HAVE AN OVERHEAD CLEARANCE OF NOT LESS THAN 5M, (d) HAVE A CHANGE OF GRADIENT NOT MORE THAN 1 IN 12.5 OVER A MINIMUM DISTANCE OF 15M, (e) BE DESIGNED TO SUPPORT THE EXPECTED LOADS IMPOSED BY FIRE FIGHTING EQUIPMENT AND BE SURFACED WITH CONCRETE ASPHALT OR OTHER MATERIAL DESIGNED TO PERMIT ACCESSIBILITY UNDER ALL CLIMATIC CONDITIONS.
3. PROVIDE 75mm THK HI-40 UNDER ALL EXTERIOR CONCRETE SIDEWALK AT ALL ENTRANCES/EXITS. EXTEND RIGID INSULATION MIN 1220 PAST THE EDGE OF CONCRETE SIDEWALKS.
4. FOR CONCRETE SIDEWALK EXPANSION AND CONTRACTION JOINTS, REFER TO CIVIL DETAIL AND SPECIFICATIONS.
5. REFER TO LANDSCAPE DRAWINGS FOR LOCATIONS OF FIRE ROUTE SIGNAGE.
6. REFER TO LANDSCAPE DRAWINGS TACTILE INDICATORS
7. THIS DRAWING IS TO BE USED IN CONJUNCTION WITH CIVIL REMOVALS PLAN FOR LOCATION OF BUTTERNUT TREES.

ARCHITECTURE 49

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SEAL:

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NORTH ARROW:

DIGITAL REFERNECE:

PROJECT NO.: CA0039818.5981 CONTRACT NO.

DRAWN BY: SB CHECKED BY: SG/AH APPROVED BY: NT

KEYPLAN:

NO.	DATE	ISSUED
6	25 FEB 2025	ISSUED FOR SITE PLAN CONTROL SUBMISSION
5	14 FEB 2025	ISSUED FOR COSTING
4	10 JAN 2025	ISSUED FOR 60% REVIEW
3	20 DEC 2024	ISSUED FOR COORDINATION
2	24 SEPT 2024	ISSUED FOR CLIENT REVIEW AND COORDINATION
1	17 SEPT 2024	ISSUED FOR SCHEMATIC DESIGN APPROVAL

PROJECT

ÉCOLE ÉLÉMENTAIRE LEITRIM

DRAWING TITLE

ARCHITECTURAL SITE PLAN.

DRAWING NO. **AS101**

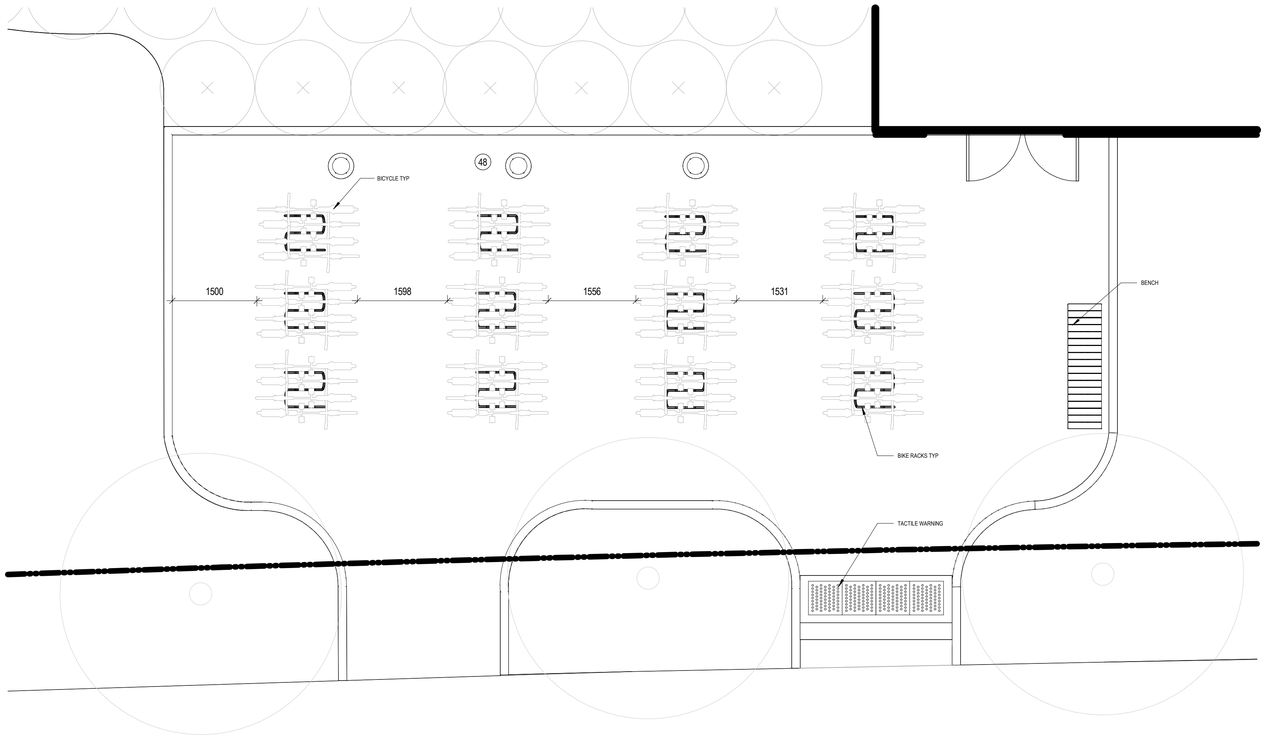
PRINT DATE: 2025-02-26 11:17:22 AM

ARCH D (24" x 36" | 610mm x 914mm)

SITE AND PARKING INFORMATION

SITE DESCRIPTION	BUILDING AREA	FIRE ACCESS REQUIREMENTS	CHILD OCCUPANCY REQUIREMENTS
TYPE OF BUILDING OR USE: SCHOOL (GROUP A-2 OCCUPANCY) LEGAL DESCRIPTION: BLOCK, REGISTERED PLAN 4M-1640 MUNICIPAL ADDRESS: 3955 KELLY FARM DRIVE PARCEL IDENTIFICATION NUMBER: 04328-4888(LT) EASEMENTS: SUBJECT TO EASEMENT IN GROSS AS IN OC2168913	FIRST FLOOR = 3,002.3 m² (EXCLUDING DAYCARE) DAYCARE = 413.2 m² TOTAL BUILDING FOOTPRINT = 3,415.5m² + SECOND FLOOR = 1,121.6 m² **TOTAL AREA** = 4,537.1 m²	FIRE TRUCK ACCESS ROUTE IS FROM MUNICIPAL COPE DRIVE AND SHALL CONFORM TO OBC 2012 - 3.2.5.4, 3.2.5.5 AND 3.2.5.6	PER ONT CHILD CARE LICENSING MANUAL REQ. OUTDOOR PLAY AREA / CHILD = 5.6m² PROVIDED OUTDOOR PLAY AREA / CHILD: - PRESCHOOL = 24 X 5.6 = 134.4m² / 156m² PROVIDED - TODDLERS = 15 X 5.6 = 84m² / 122m² PROVIDED - INFANTS = 15 X 5.6 = 84m² / 86m² PROVIDED - KINDERGARTEN = 90 X 5.6 = 504m² / 506m² PROVIDED

ZONING	REQUIREMENT (I1A)	PROPOSED	PARKING PROVISIONS	
ZONING = I1A/R3Z - MINOR INSTITUTIONAL ZONE, SUBZONE A / RESIDENTIAL THIRD DENSITY, SUBZONE Z				
MINIMUM LOT AREA: SEC. 170, TABLE 170A (b)	400m²	20, 729m²	MINIMUM REQUIRED PARKING FOR NEW ELEMENTARY SCHOOL: SEC. 101, TABLE 101, N81	15 CLASSROOMS X 1.5 = 23 2 PER 100m² OF DAYCARE GROSS FLOOR AREA (413m²) = 8 12 PORTABLES X 1.5 = 18 **PARKING REQ. = 49 / PARKING PROVIDED = 50**
MINIMUM LOT WIDTH: SEC. 170, TABLE 170A (a)	15.0m	± 113.94m	MINIMUM NUMBER OF BARRIER-FREE PARKING SPACES: BY-LAW NO. 2017-301, SECTION 111	BARRIER-FREE PARKING SPACES **REQ.** = 2 (1 TYPE 1 & 1 TYPE 2) BARRIER-FREE PARKING SPACES **PROVIDED** = 3 (1 TYPE 1 AND 2 TYPE 2) **TOTAL SITE PARKING PROVIDED = 53**
MINIMUM FRONT YARD: SEC. 170, TABLE 170A (c)	7.5m	7.5m		
MINIMUM REAR YARD: SEC. 170, TABLE 170A (d)	7.5m	± 81.605m	MINIMUM REQ. WIDTH OF A LANDSCAPED BUFFER FOR PARKING LOT: SEC. 110, TABLE 110(a)	REQ.= 3m **PROVIDED= 3m**
MINIMUM INTERIOR SIDE YARD: SEC. 170, TABLE 170A (e)	7.5m	± 32.167m		
MINIMUM CORNER SIDE YARD: SEC. 170, TABLE 170A (f)	4.5m	4.5m	MINIMUM REQUIRED PERIMETER OR INTERIOR LANDSCAPE AREA WITHIN PARKING LOT (SEC. 110)	PARKING AREA = 1248m² **REQ. =** 15% AREA OF PARKING = 187.2m² **PROVIDED = 450m²**
MINIMUM LANDSCAPED OPEN SPACE	NO REQUIREMENT	5.3% WITH PARKING LOT		
MAXIMUM LOT COVERAGE	NO REQUIREMENT	12.8% LOT COVERAGE		
PERCENTAGE OF TOTAL SITE OCCUPIED BY VEGETATION AND LANDSCAPING	NO REQUIREMENT	77% SITE OCCUPIED	MINIMUM NUMBER OF BICYCLE PARKING SPACES: SEC. 111, TABLE 111A (d)	SCHOOL: 1 PER 100m² OF GFA OFFICE: 4537 /100 = 45.4 ROUNDED TO 46 DAY CARE: 1 PER 250m² OF GFA = 360 /250 = 1.44 ROUNDED TO 2 **TOTAL: 48**
MAXIMUM BUILDING HEIGHT: SEC. 170, TABLE 170A (g)	15.0m	8.7m	BICYCLE PARKING DIMENSIONS: SEC. 111, TABLE 11B	HORIZONTAL: 0.6m by 1.8m



1 / AS102 BIKE PARKING AISLE SPACING.
1 : 50

ARCH D (24" x 36" | 610mm x 914mm)

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PROJECT

ÉCOLE ÉLÉMENTAIRE LEITRIM

DRAWING TITLE

ARCHITECTURAL SITE PLAN TABLE

DRAWING NO. **AS102**

PRINT DATE: 2025-02-26 11:20:06 AM

TOPOGRAPHIC PLAN OF SURVEY
OF
BLOCK 196
REGISTERED PLAN 4M–1640
CITY OF OTTAWA

SCALE 1:500

GEORGE N. BRACKEN
ONTARIO LAND SURVEYOR

20 15 10 5 0 10 20
(SCALE IN METRES)

LEGEND:

□	DENOTES	SURVEY MONUMENT SET
■	"	SURVEY MONUMENT FOUND
SIB	"	STANDARD IRON BAR
SSIB	"	SHORT STANDARD IRON BAR
M	"	MEASURED
S	"	SET
CP	"	CONCRETE PIN
CC	"	CUT CROSS
BOLL	"	BOLLARD
BPED	"	BELL PEDESTAL
CB	"	CATCH BASIN
FH	"	FIRE HYDRANT TOP OF SPINDLE
LS	"	LAMP STANDARD
MH	"	MANHOLE
MW	"	MONITORING WELL
SMH	"	STORM MANHOLE
SNMH	"	SANITARY MANHOLE
SN	"	MISCELLANEOUS STREET SIGN
T/G	"	TOP OF GRATE
UP	"	UTILITY POLE
WV	"	WATER VALVE
P1	"	PLAN 4M–1640
P2	"	PLAN 4R–32437
P3	"	PLAN 4R–32678
P4	"	PLAN 4R–32640
P5	"	PLAN 4R–32696
P6	"	PLAN 4R–32680
SG	"	STANTEC GEOMATICS LTD.
DEC ø60	"	DECIDUOUS TREE 0.6m. DIAMETER

NOTE

P.I.N. 04328–4888(LT) INDICATES PROPERTY IS SUBJECT TO AN EASEMENT IN GROSS AS IN OC 2168913.
BLOCK 196 IS NOT REFERRED TO.

UNDERGROUND SERVICES AS MARKED BY "PROMARK"

SITE BENCHMARK

SITE BENCHMARK 1 IS A CUT CROSS (SHOWN ON PLAN) HAVING A GEODETIC ELEVATION OF 95.593m.

SITE BENCHMARK 2 IS THE TOP SPINDLE OF A FIRE HYDRANT (SHOWN ON PLAN) ELEVATION 96.568m.

BEARING NOTE

BEARINGS ARE MTM GRID, DERIVED FROM THE EASTERLY LIMIT OF BLOCK 196 PLAN 4M–1640, HAVING A GRID BEARING OF N30°41'10"E

DISTANCES ARE GROUND AND CAN BE CONVERTED TO GRID BY MULTIPLYING BY THE COMBINED SCALE FACTOR OF 0.999946.

AREA

AREA=2.07 Ha (5.12 Acres)

ELEVATION NOTE

ELEVATIONS SHOWN HEREON ARE GEODETIC (CGVD–1928:1978) AND ARE DERIVED FROM THE CANNET VRS NETWORK STATION OTTAWA ELEVATION=95.230.

CONTOURS ARE TO 0.25 METRES

METRIC

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

SURVEYOR'S CERTIFICATE

I CERTIFY THAT:

(1) THIS SURVEY AND PLAN ARE CORRECT AND IN ACCORDANCE WITH THE SURVEYS ACT, THE SURVEYORS ACT AND THE REGULATIONS MADE UNDER THEM.

(2) THE SURVEY WAS COMPLETED ON THE 2ND DAY OF AUGUST, 2024

DATE

GEORGE N. BRACKEN
ONTARIO LAND SURVEYOR

THIS PLAN OF SURVEY RELATES TO AOLS PLAN SUBMISSION FORM NUMBER V–81965.

Callon Dietz INCORPORATED
ONTARIO LAND SURVEYORS
CARLETON PLACE LONDON NORTH BAY
requests@callondietz.com callondietz.com

ISO 9001 REGISTERED

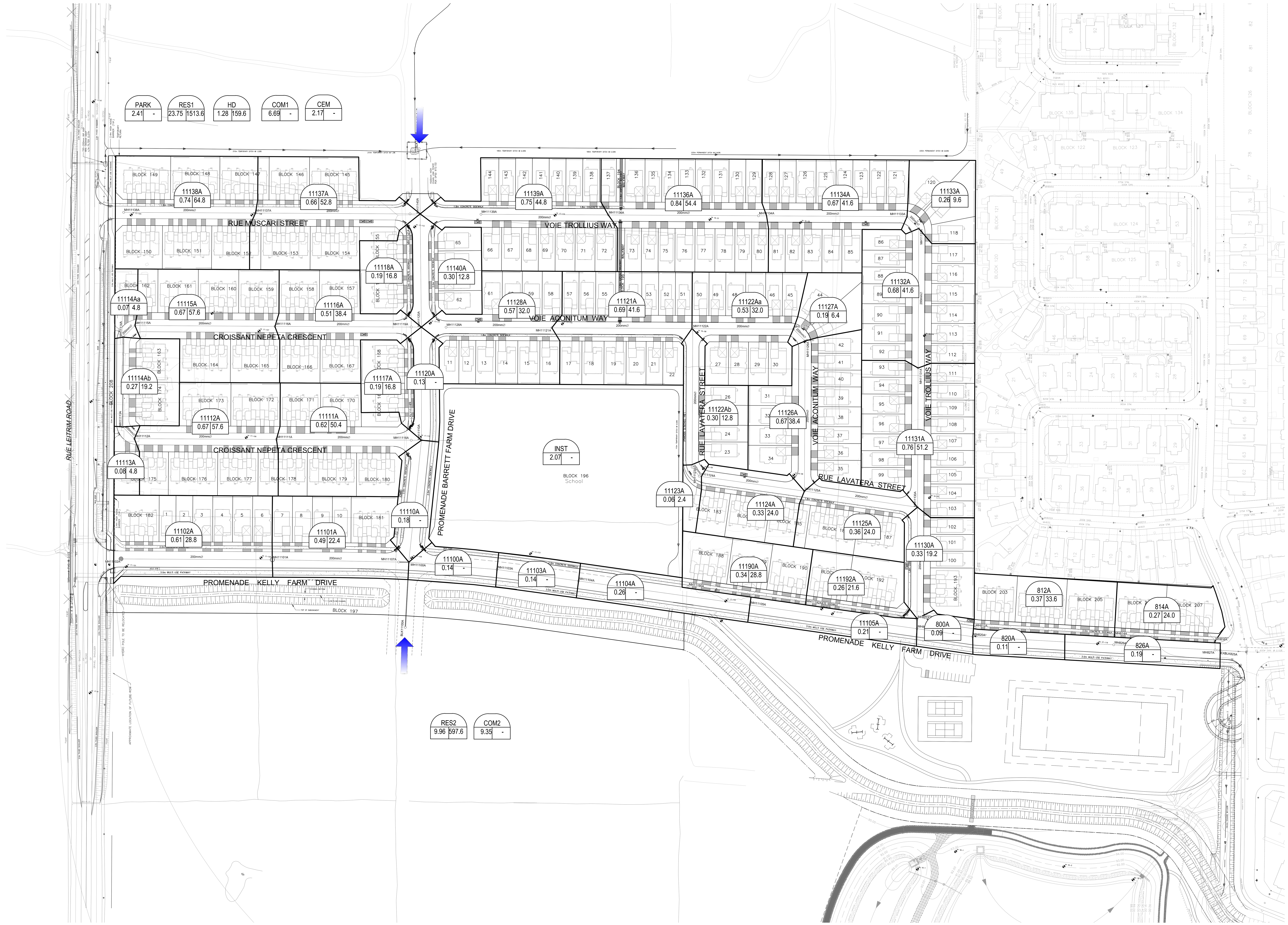
SURVEY BY: CB	DRAWN BY: DK	FILE No: 24–26499	PLAN No: X–3809

O:\Projects\2024\24-26499 CEPEO – 3 Schools\Drawings\Kelly Farm Drive\24-26499 KELLY FARM C3D TOPO.dwg September 24, 2024

Drainage Area		Downstream Segment ID	XPSWMM Node ID	IMP Ratio (%)	Segment Length (m)	Subcatchment Width (m)	Road ROW Cross Section	Max. Storage Available (m^3)	Minor System Restriction		
Segment ID	Area (ha)								2 Year Modeled Flow (l/s)*	5 Year Modeled Flow (l/s)*	ICD Flow (l/s)*
Total Flow from Street and Rear Yard Segments –Barrett Lands Phase 1 (l/s)											**4177**
External Areas to Phase 1*											
INST1	2.07	S11103B	BLK11110S	43	233	466	0	230	161	224	227
LR2	0.37	S11138	BLK11138	86	83	83	40	2	47	65	101
LR3	0.36	S11102A	BLK11102	86	81	81	40	2	52	72	98
Future External Areas†											
FCOM1	6.17	FR11D	S1155	86	694	1388	0	660	883.5	1234.9	1247
FJAVA	1.28	F11D	S1155	86	144	288	0	153	185.1	258.0	258
F11D	0.64	F11CG	S1155	71	269	269	24		19.5	27.2	60
FR11D	1.59	F11CG	S1155	71	179	358	18		54.0	78.9	140
F11CA	2.7	F11CJ	S1145	71	319	638	18		89.6	127.4	225
F11CB	1.14	F11CL	S1150	71	148	296	18		38.4	53.4	100
F11CC	0.79	F11CD	S1145	71	82	164	18		25.9	37.4	65
F11CD	0.79	F11CF	S1145	74	145	145	18		67.7	88.1	160
F11CE	0.76	F11CD	S1145	74	98	196	18		26.3	40.1	80
F11CF	0.9	F11CJ	S1145	74	106	212	18	29	266.8	379.2	758
F11CG	0.86	F11CL	S1150	73	101	202	24		56.1	66.7	100
F11CH	1.26	F11CJ	S1140	71	162	324	18		76.7	99.4	110
F11CI	1.41	F11BB	S1135	74	234	361	18	45	175.8	245.4	479
F11CJ	1.03	F11BB	S1140	74	117	234	24		125.1	146.9	200
F11CK	0.89	F11BB	S1135	74	115	230	18		31.9	45.5	85
F11CL	1.06	F11CJ	S1150	73	126	252	24		70.2	83.7	120
F11CM	0.43	F11CJ	S1140	74	55	110	18	14	54.5	75.9	146
F11BA	1.66	F11BB	S1130	74	271	465	18		63.9	87.9	150
F11BB	0.77	F11BF	S1130	74	147	147	24	25	1109.7	1626.2	1657
FP11B	2.41	F1BB	S1130	28	271	542	0	286	127.5	177.5	178
F11BC	1.33	F11BF	S1120	74	230	407	18	43	169.2	236.0	461
F11BD	0.92	F11BF	S1125	74	118	236	18		32.1	44.7	86
F11BE	1.42	F11BF	S1120	74	277	476	18		52.2	72.6	142
F11BF	1.35	PH1	S1125	74	139	278	24		92.4	110.7	297
LRE1	1.22	F11CH	S1140	79	137	275	40		22.9	32.0	310

Notes: * Barrett Lands Phase 1 modeled flow is from the DDSWMM output file 34731-PH1-3CHI2.out, 34731-PH1-3CHI5.out and 34731-PH1-3CHI100.out which are all presented on the CD in **Appendix F**.
† Future External Areas modeled flow is from the DDSWMM output file 34731-FUT-3CHI2.out, 34731-FUT-3CHI5.out and 34731-FUT-3CHI100.out which are all presented on the CD in **Appendix F**.

The assigned size of the inlet control devices (ICDs) for the subject site was optimized using DDSWMM. ICDs are incorporated into the stormwater management design to protect the minor system from surcharge during major storm events. The ICDs used for Phase 1 are provided on **Drawing 100**. It should be noted that due to the major system flow from the future areas, there were a few instances where the flow restriction into the minor system was the capacity of the CB inlet. These include DDSWMM IDs three CBs on S11140A, one CB on S11140B and one CB on S11116B (indicated in bold in **Table 6.2**). Calculations demonstrating the capacity of the CBs within a road sag is presented in **Appendix F**.



REVIEWED BY
DEVELOPMENT REVIEW SERVICES BRANCH

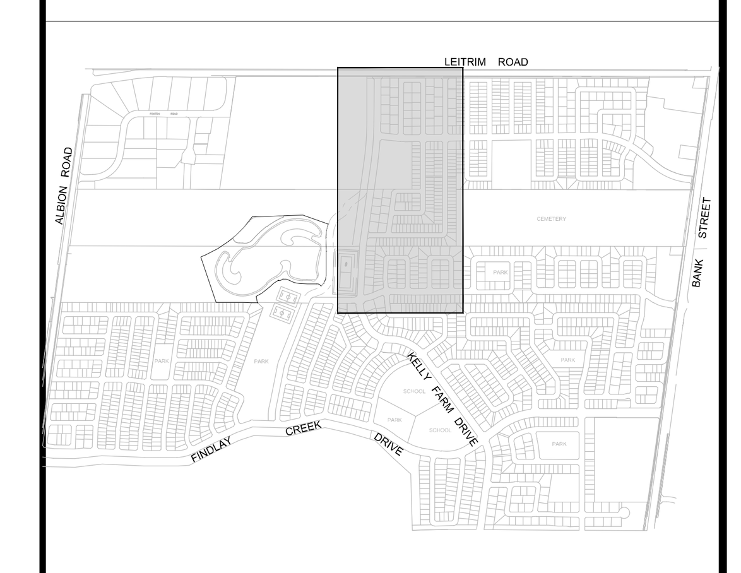
Signed ______________________

Date ______________________ 2017

Plan Number ______________________

LEGEND :

11135A — AREA NUMBER
0.43 | 30.6 — POPULATION
AREA IN HECTARES
FUTURE MINOR FLOW DIRECTION



No.	REVISIONS	By	Date
14			
13			
12			
11			
10			
9			
8			
7			
6			
5			
4	REVISED PER NEW LEGAL 2018-04-09	J.I.M.	2018:04:16
3	SUBMISSION NO. 3 FOR CITY REVIEW	J.I.M.	2018:01:17
2	SUBMISSION NO. 2 FOR CITY REVIEW	J.I.M.	2017:09:22
1	SUBMISSION NO. 1 FOR CITY REVIEW	J.I.M.	2017:04:28

BARRETT CO-TENANCY

IBI GROUP
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tel 613 225 1311 fax 613 225 9868
ibigroup.com

Project Title

BARRETT LANDS

PHASE 1

LICENSED PROFESSIONAL ENGINEER J. I. MOFFATT 2018/04/16 PROVINCE OF ONTARIO

Drawing Title

SANITARY DRAINAGE AREA PLAN

Scale
HSCALE 1:1250
VSCALE

Design	Date
K.H.	MARCH 2017
Drawn	Checked
M.M.	J.I.M.
Project No.	Drawing No.
34731	501

CITY PLAN No.

CITY FILE No. D07-16-13-0023

IBI GROUP
400-333 Preston Street
Ottawa, Ontario K1S 5N4 Canada
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ibigroup.com

SANITARY SEWER DESIGN SHEET

Barrett Lands
CITY OF OTTAWA
Tartan Land Corporation

LOCATION				RESIDENTIAL										ICI AREAS							INFILTRATION ALLOWANCE			TOTAL	PROPOSED SEWER DESIGN						
				AREA	UNIT TYPES				AREA	POPULATION		PEAK	PEAK	AREA (Ha)						PEAK	AREA (Ha)		FLOW	FLOW	CAPACITY	LENGTH	DIA	SLOPE	VELOCITY	AVAILABLE CAPACITY	
														INSTITUTIONAL		COMMERCIAL		INDUSTRIAL										(full)		
STREET	AREA ID	FROM MH	TO MH	w/ Units (Ha)	SF	SD	TH	APT	w/o Units (Ha)	IND	CUM	FACTOR	FLOW (L/s)	IND	CUM	IND	CUM	IND	CUM	FLOW (L/s)	IND	CUM	(L/s)	(L/s)	(L/s)	(m)	(mm)	(%)	(m/s)	L/s	(%)
MUSCARI STREET	11138A	MH11138A	MH11137A	0.74			27			64.8	64.8	4.00	1.05		0.00		0.00		0.00	0.00	0.74	0.74	0.21	1.26	34.22	90.85	200	1.00	1.055	32.96	96.33%
MUSCARI STREET	11137A	MH11137A	MH11142A	0.66			22			52.8	117.6	4.00	1.91		0.00		0.00		0.00	0.00	0.66	1.40	0.39	2.30	26.50	106.56	200	0.60	0.817	24.21	91.33%
MUSCARI STREET		MH11142A	MH11140A							0.0	117.6	4.00	1.91		0.00		0.00		0.00	0.00	0.00	1.40	0.39	2.30	55.26	7.00	300	0.30	0.757	52.96	95.84%
BARRETT FARM DRIVE	COM1, RES1, HD, CEM, PARK	BLK11141A	MH11140A	27.44	238		264	84		1546.4	1546.4	3.67	22.99		0.00	8.86	8.86		0.00	7.69	36.30	36.30	10.16	40.84	50.44	45.00	300	0.25	0.691	9.60	19.02%
BARRETT FARM DRIVE	11140A	MH11140A	MH11120A	0.30	4					12.8	1676.8	3.64	24.75		0.00		8.86		0.00	7.69	0.30	38.00	10.64	43.08	48.38	78.04	300	0.23	0.663	5.30	10.95%
NEPETA CRESCENT	11114Aa	MH11114A	MH11115A	0.07			2			4.8	4.8	4.00	0.08		0.00		0.00		0.00	0.00	0.07	0.07	0.02	0.10	45.26	11.39	200	1.75	1.396	45.17	99.78%
NEPETA CRESCENT	11115A	MH11115A	MH11116A	0.67			24			57.6	62.4	4.00	1.01		0.00		0.00		0.00	0.00	0.67	0.74	0.21	1.22	46.54	96.49	200	1.85	1.435	45.32	97.38%
NEPETA CRESCENT	11116A	MH11116A	MH11119A	0.51			16			38.4	100.8	4.00	1.63		0.00		0.00		0.00	0.00	0.51	1.25	0.35	1.98	20.24	93.95	200	0.35	0.624	18.26	90.20%
BARRETT FARM DRIVE	11117A	MH11117A	MH11119A	0.19			7			16.8	16.8	4.00	0.27		0.00		0.00		0.00	0.00	0.19	0.19	0.05	0.33	41.91	93.95	200	1.50	1.292	41.58	99.22%
BARRETT FARM DRIVE	11118A	MH11118A	MH11119A	0.19			7			16.8	16.8	4.00	0.27		0.00		0.00		0.00	0.00	0.19	0.19	0.05	0.33	27.59	93.95	200	0.65	0.851	27.26	98.82%
NEPETA CRESCENT		MH11119A	MH11120A							0.0	134.4	4.00	2.18		0.00		0.00		0.00	0.00	0.00	1.63	0.46	2.63	50.44	7.00	300	0.25	0.691	47.81	94.78%
BARRETT FARM DRIVE	11120A	MH11120A	MH11110A	0.13						0.0	1811.2	3.62	26.55		0.00		8.86		0.00	7.69	0.13	39.76	11.13	45.38	50.44	78.01	300	0.25	0.691	5.07	10.04%
NEPETA CRESCENT	11114Ab	MH11114A	MH11113A	0.27			8			19.2	19.2	4.00	0.31		0.00		0.00		0.00	0.00	0.27	0.27	0.08	0.39	24.19	61.85	200	0.50	0.746	23.81	98.40%
NEPETA CRESCENT	11113A	MH11113A	MH11112A	0.08			2			4.8	24.0	4.00	0.39		0.00		0.00		0.00	0.00	0.08	0.35	0.10	0.49	40.49	11.45	200	1.40	1.248	40.00	98.80%
NEPETA CRESCENT	11112A	MH11112A	MH11111A	0.67			24			57.6	81.6	4.00	1.32		0.00		0.00		0.00	0.00	0.67	1.02	0.29	1.61	40.49	97.92	200	1.40	1.248	38.88	96.03%
NEPETA CRESCENT	11111A	MH11111A	MH11118A	0.62			21			50.4	132.0	4.00	2.14		0.00		0.00		0.00	0.00	0.62	1.64	0.46	2.60	24.19	93.00	200	0.50	0.746	21.60	89.26%
NEPETA CRESCENT		MH11118A	MH11110A							0.0	132.0	4.00	2.14		0.00		0.00		0.00	0.00	0.00	1.64	0.46	2.60	55.26	7.00	300	0.30	0.757	52.66	95.30%
SCHOOL BLOCK	INST	BLK11110AS	MH11110A							0.0	0.0	4.00	0.00	2.07	2.07		0.00		0.00	1.80	2.07	2.07	0.58	2.38	24.19	19.00	200	0.50	0.746	21.82	90.18%
BARRETT FARM DRIVE	11110A	MH11110A	MH11100A	0.18						0.0	1943.2	3.60	28.30		2.07		8.86		0.00	9.49	0.18	43.65	12.22	50.01	55.26	84.55	300	0.30	0.757	5.24	9.49%
KELLY FARM DRIVE	11102A	MH11102A	MH11101A	0.61	6		4			28.8	28.8	4.00	0.47		0.00		0.00		0.00	0.00	0.61	0.61	0.17	0.64	27.59	104.28	200	0.65	0.851	26.95	97.69%
KELLY FARM DRIVE	11101A	MH11101A	MH11107A	0.49	4		4			22.4	51.2	4.00	0.83		0.00		0.00		0.00	0.00	0.49	1.10	0.31	1.14	27.59	87.12	200	0.65	0.851	26.45	95.88%
KELLY FARM DRIVE		MH11107A	MH11100A							0.0	51.2	4.00	0.83		0.00		0.00		0.00	0.00	0.00	1.10	0.31	1.14	55.26	7.00	300	0.30	0.757	54.12	97.94%
KELLY FARM DRIVE	COM2, RES2	BLK11100A	MH11100A						9.96	597.6	597.6	3.93	9.52		0.00	9.35	9.35		0.00	8.12	19.31	19.31	5.41	23.04	50.44	45.00	300	0.25	0.691	27.40	54.31%
KELLY FARM DRIVE	11100A	MH11100A	MH11103A	0.14						0.0	2592.0	3.50	36.70		2.07		18.21		0.00	17.60	0.14	64.20	17.98	72.28	77.60	61.00	375	0.18	0.681	5.32	6.85%
KELLY FARM DRIVE	11103A	MH11103A	MH11104A	0.14						0.0	2592.0	3.50	36.70		2.07		18.21		0.00	17.60	0.14	64.34	18.02	72.32	77.60	56.74	375	0.18	0.681	5.28	6.80%
KELLY FARM DRIVE	11104A	MH11104A	MH11105A	0.26						0.0	2592.0	3.50	36.70		2.07		18.21		0.00	17.60	0.26	64.60	18.09	72.40	77.60	119.35	375	0.18	0.681	5.21	6.71%
KELLY FARM DRIVE	11105A	MH11105A	MH800A	0.21						0.0	2592.0	3.50	36.70		2.07		18.21		0.00	17.60	0.21	64.81	18.15	72.45	77.60	116.30	375	0.18	0.681	5.15	6.63%
TROLLIUS WAY	11139A	MH11139A	MH11136A	0.75	14					44.8	44.8	4.00	0.73		0.00		0.00		0.00	0.00	0.75	0.75	0.21	0.94	20.24	87.77	200	0.35	0.624	19.31	95.38%
TROLLIUS WAY	11136A	MH11136A	MH11134A	0.84	17					54.4	99.2	4.00	1.61		0.00		0.00		0.00	0.00	0.84	1.59	0.45	2.05	20.24	103.59	200	0.35	0.624	18.19	89.86%
TROLLIUS WAY	11134A	MH11134A	MH11133A	0.67	13					41.6	140.8	4.00	2.28		0.00		0.00		0.00	0.00	0.67	2.26	0.63	2.91	20.24	102.36	200	0.35	0.624	17.33	85.60%
TROLLIUS WAY	11133A	MH11133A	MH11132A	0.26	3					9.6	150.4	4.00	2.44		0.00		0.00		0.00	0.00	0.26	2.52	0.71	3.14	20.24	11.51	200	0.35	0.624	17.10	84.48%
TROLLIUS WAY	11132A	MH11132A	MH11131A	0.68	13					41.6	192.0	4.00	3.11		0.00		0.00		0.00	0.00	0.68	3.20	0.90	4.01	20.24	96.21	200	0.35	0.624	16.24	80.20%
TROLLIUS WAY	11131A	MH11131A	MH11130A	0.76	16					51.2	243.2	4.00	3.94		0.00		0.00		0.00	0.00	0.76	3.96	1.11	5.05	20.24	96.00	200	0.35	0.624	15.19	75.06%
ACONITUM WAY	11128A	MH11128A	MH11121A	0.57	10					32.0	32.0	4.00	0.52		0.00		0.00		0.00	0.00	0.57	0.57	0.16	0.68	20.24	72.95	200	0.35	0.624	19.56	96.65%
ACONITUM WAY	11121A	MH11121A	MH11122A	0.69	13					41.6	73.6	4.00	1.19		0.00		0.00		0.00	0.00	0.69	1.26	0.35	1.55	20.24	97.14	200	0.35	0.624	18.70	92.37%
ACONITUM WAY	11122Aa	MH11122A	MH11127A	0.53	10					32.0	105.6	4.00	1.71		0.00		0.00		0.00	0.00	0.53	1.79	0.50	2.21	20.24	69.40	200	0.35	0.624	18.03	89.07%
ACONITUM WAY	11127A	MH11127A	MH11126A	0.19	2					6.4	112.0	4.00	1.81		0.00		0.00		0.00	0.00	0.19	1.98	0.55	2.37	20.24	11.52	200	0.35	0.624	17.87	88.30%
ACONITUM WAY	11126A	MH11126A	MH11125A	0.67	12					38.4	150.4	4.00	2.44		0.00		0.00		0.00	0.00	0.67	2.65	0.74	3.18	20.24	103.51	200	0.35	0.624	17.06	84.30%
LAVATERA STREET	11122Ab	MH11122A	MH11123A	0.30	4					12.8	86.4	4.00	1.40		0.00		0.00		0.00	0.00	0.30	0.30	0.08	1.48	20.24	95.52	200	0.35	0.624	18.76	92.67%
LAVATERA STREET	11123A	MH11123A	MH11124A	0.06			1			2.4	88.8	4.00	1.44		0.00		0.00		0.00	0.00	0.06	0.36	0.10	1.54	20.24	7.97	200	0.35	0.624	18.70	92.39%
LAVATERA STREET	11124A	MH11124A	MH11125A	0.33			10			24.0	112.8	4.00	1.83		0.00		0.00		0.00	0.00	0.33	0.69	0.19	2.02	20.24	73.24	200	0.35	0.624	18.22	90.02%
LAVATERA STREET	11125A	MH11125A	MH11130A	0.36			10			24.0	287.2	4.00	4.65		0.00		0.00		0.00	0.00	0.36	3.70	1.04	5.69	20.24	78.74	200	0.35	0.624	14.55	71.89%
TROLLIUS WAY	11130A	MH11130A	MH801A	0.33	3		4			19.2	549.6	3.95	8.80		0.00		0.00		0.00	0.00	0.33	7.99	2.24	11.04	20.24	77.22	200	0.35	0.624	9.21	45.47%
KELLY FARM DRIVE	11190A	MH11190A	MH11192A	0.34			12			28.8	28.8	4.00	0.47		0.00		0.00		0.00	0.00	0.34	0.34	0.10	0.56	27.59	81.96	200	0.65	0.851	27.02	97.96%
KELLY FARM DRIVE	11192A	MH11192A	MH801A	0.26			9			21.6	95.2	4.00	1.54		0.00		0.00		0.00	0.00	0.26	0.60	0.17	1.71	24.19	77.50	200	0.50	0.746	22.48	92.93%
KELLY FARM DRIVE		MH801A	MH800A							0.0	644.8	3.91	10.23		0.00		0.00		0.00	0.00	0.00	8.59	2.41	12.63	55.26	6.56	300	0.30	0.757	42.62	77.14%
KELLY FARM DRIVE	800A	MH800A	MH820A	0.09						0.0	3236.8	3.41	44.77		2.07		18.21		0.00	17.60	0.09	73.49	20.58	82.95	89.61	38.82	375	0.24	0.786	6.66	7.43%
KELLY FARM DRIVE	820A	MH820A	MH826A	0.11						0.0	3236.8	3.41	44.77		2.07		18.21		0.00	17.60	0.11	73.60	20.61	82.98	89.61	97.38	375	0.24	0.786	6.63	7.40%
KELLY FARM DRIVE	826A	MH826A	MH827A	0.19						0.0	3236.8	3.41	44.77		2.07		18.21		0.00	17.60	0.19	73.79	20.66	83.03	89.61	70.00	375	0.24	0.786	6.58	7.34%
KELLY FARM DRIVE	812A	MH812A	MH814A	0.37			14			33.6	33.6	4.00	0.54		0.00		0.00		0.00	0.00	0.37	0.37	0.10	0.65	27.59	96.38	200	0.65	0.851	26.94	97.65%
KELLY FARM DRIVE	814A	MH814A	MH816A	0.27			10			24.0	57.6	4.00	0.93		0.00		0.00		0.00	0.00	0.27	0.64	0.18	1.11	27.59	69.26	200	0.65	0.851	26.47	95.97%
KELLY FARM DRIVE		MH816A	MH827A							0.0	57.6	4.00	0.93		0.00		0.00		0.00	0.00	0.00	0.64	0.18	1.11	20.24	6.01	200	0.35	0.624	19.13	94.50%
KELLY FARM DRIVE		MH827A	EXBLK825A							0.0	3294.4	3.41	45.47		2.07		18.21		0.00	17.60	0.00	74.43	20.84	83.92	89.61	3.48	375	0.24	0.786	5.69	6.35%

Design Parameters:

Residential		
SF	3.2	p/p/u
TH/SD	2.4	p/p/u
APT	1.8	p/p/u
Other	60	p/p/Ha

ICI Areas			
			Peak Factor
INST	50,000	L/Ha/day	1.5
COM	50,000	L/Ha/day	1.5
IND	35,000	L/Ha/day	MOE Chart

Notes:
1. Mannings coefficient (n) = 0.013
2. Demand (per capita): 350 L/day 300 L/day
3. Infiltration allowance: 0.28 L/s/Ha
4. Residential Peaking Factor:
Harmon Formula = 1+(14/(4+P^0.5))
where P = population in thousands

Designed: K.H., W.Y.

Checked: J.I.M.

Dwg. Reference: 34731-501

No.	Revision	Date
1	City Submission No. 1	2017-04-28
2	City Submission No. 2	2017-09-22
3	City Submission No. 3	2018-01-17
4	Revised Per New Legal 2018-04-09	2018-04-16

File Reference:	Date:	Sheet No:
34731.5.7.1	2018-04-16	1 of 1

REVIEWED BY
DEVELOPMENT REVIEW SERVICES BRANCH

Signed _____

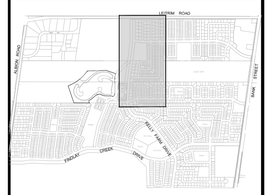
Date _____ 2017

Plan Number _____

LEGEND :

11135 | 0.43 | 0.60 — AREA NUMBER / RUN OFF COEFFICIENT / AREA IN HECTARES

FUTURE MINOR FLOW DIRECTION



No.	REVISIONS	By	Date
14			
13			
12			
11			
10			
9			
8			
7			
6			
5			
4	REVISED PER NEW LEGAL 2018-04-09	J.I.M.	2018:04:16
3	SUBMISSION NO. 3 FOR CITY REVIEW	J.I.M.	2018:01:17
2	SUBMISSION NO. 2 FOR CITY REVIEW	J.I.M.	2017:09:22
1	SUBMISSION NO. 1 FOR CITY REVIEW	J.I.M.	2017:04:28

BARRETT CO-TENANCY

IBI GROUP
400 – 333 Preston Street
Ottawa ON K1S 5N4 Canada
tel 613 225 1311 fax 613 225 9868
ibigroup.com

Project Title

BARRETT LANDS

PHASE 1

LICENSED PROFESSIONAL ENGINEER
J. I. MOFFATT
2018/04/16
PROVINCE OF ONTARIO

Drawing Title

STORM DRAINAGE AREA PLAN

Scale
HSCALE 1:1250
VSCALE

Design	Date
K.H.	MARCH 2017
Drawn	Checked
M.M.	J.I.M.
Project No.	Drawing No.
34731	500

CITY FILE No. D07-16-13-0023 CITY PLAN No.

IBI GROUP
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Ottawa, Ontario K1S 5N4 Canada
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LEGEND
Black text 2 year event curve design
Blue text 5 year event curve design (Kelly Farm Drive, Barrett Farm Drive)
Red text 10 year event curve design (Leitrim Road)
Green Text 100 year design curve

STORM SEWER DESIGN SHEET

Barrett Lands
City of Ottawa
Tartan Land Corporation

LOCATION				AREA (Ha)										RATIONAL DESIGN FLOW												SEWER DATA									
STREET	AREA ID	FROM	TO	C= 0.20	C= 0.30	C= 0.45	C= 0.50	C= 0.55	C= 0.65	C= 0.70	C= 0.75	C= 0.73	C= 0.80	IND 2.78AC	CUM 2.78AC	INLET (min)	TIME IN PIPE	TOTAL (min)	i (2) (mm/hr)	i (5) (mm/hr)	i (10) (mm/hr)	i (100) (mm/hr)	2yr PEAK FLOW (L/s)	5yr PEAK FLOW (L/s)	10yr PEAK FLOW (L/s)	100yr PEAK FLOW (L/s)	FIXED FLOW (L/s)	CUM FIXED FLOW (L/s)	DESIGN FLOW (L/s)	CAPACITY (L/s)	LENGTH (m)	PIPE SIZE (mm) DIA	PIPE SIZE (mm) W	PIPE SIZE (mm) H	SLOPE (%)	VELOCITY (m/s)	AVAIL CAP (2yr) (L/s)	AVAIL CAP (2yr) (%)
2016 UPDATED SERVICEABILITY REPORT														Time of Concentration = 10.0min + 140m/1.2m/s = 11.94																							
MUSCARI STREET		BLK11138	MH11138											0.00	0.00	11.94	0.34	12.28	70.08	94.95	111.26	162.58	0.00						91.55	115.68	21.00	375			0.40	1.015	24.13	20.86%
MUSCARI STREET	LR2	BLK11138	MH11138										0.37	0.82	0.82	11.94	0.34	12.28	70.08	94.95	111.26	162.58			91.55				91.55	115.68	21.00	375			0.40	1.015	24.13	20.86%
MUSCARI STREET	S11138, R1115	MH11138	MH11137				0.30					0.34		1.11	1.11	12.28	0.84	13.12	69.02	93.50	109.55	160.06	76.40						167.96	297.43	90.78	450			1.00	1.812	129.48	43.53%
MUSCARI STREET		MH11138	MH11137											0.00	0.82	11.94	0.84	12.78	70.08	94.95	111.26	162.58			91.55				167.96	297.43	90.78	450			1.00	1.812	129.48	43.53%
MUSCARI STREET	S11137, R11137A-B	MH11137	MH11140				0.61					0.34		1.54	2.64	13.12	1.20	14.32	66.59	90.17	105.63	154.31	176.13						264.35	347.53	112.42	525			0.60	1.555	83.18	23.93%
MUSCARI STREET		MH11137	MH11140											0.00	0.82	12.78	1.20	13.98	67.57	91.51	107.21	156.63			88.22				264.35	347.53	112.42	525			0.60	1.555	83.18	23.93%
2016 UPDATED SERVICEABILITY REPORT														Time of Concentration = 20.13min													Future Design Flow = 4049.98 L/s											
BARRETT FARM DRIVE	S11141, EXT1	BLK11141	MH11140							0.18				0.35	0.35	20.13	0.34	20.47	51.82	69.97	81.88	119.46		24.51			4,049.98	4,049.98	4,296.64	7,005.73	40.00	2100			0.15	1.959	2709.09	38.67%
BARRETT FARM DRIVE	LR1	BLK11141	MH11140										1.22	2.71	2.71	20.13	0.34	20.47	51.82	69.97	81.88	119.46			222.15				4,296.64	7,005.73	40.00	2100			0.15	1.959	2709.09	38.67%
BARRETT FARM DRIVE		MH11140	MH11120											0.00	2.64	20.47	0.74	21.21	51.29	69.24	81.02	118.20	135.65						4,551.61	8,565.43	80.96	2400			0.11	1.834	4013.82	46.86%
BARRETT FARM DRIVE	S11140A, S11140B	MH11140	MH11120							0.41				0.80	1.15	20.47	0.74	21.21	51.29	69.24	81.02	118.20		79.49				4,049.98	4,551.61	8,565.43	80.96	2400			0.11	1.834	4013.82	46.86%
BARRETT FARM DRIVE		MH11140	MH11120											0.00	3.54	20.47	0.74	21.21	51.29	69.24	81.02	118.20			286.49				4,551.61	8,565.43	80.96	2400			0.11	1.834	4013.82	46.86%
NEPETA CRESCENT		MH11114	MH11115											0.00	0.00	10.00	0.11	10.11	76.81	104.19	122.14	178.56	0.00					0.00	0.00	82.07	11.15	250			1.75	1.620	82.07	100.00%
NEPETA CRESCENT	S11115	MH11115	MH11116							0.23				0.45	0.45	10.11	0.96	11.08	76.37	103.59	121.43	177.52	34.18					0.00	34.18	82.07	93.33	250			1.75	1.620	47.89	58.35%
NEPETA CRESCENT	S11116A, R11116A-C	MH11116	MH11120				0.66			0.49				1.87	2.32	11.08	1.96	13.03	72.91	98.84	115.83	169.29	169.04					0.00	169.04	248.09	99.76	600			0.15	0.850	79.05	31.86%
BARRETT FARM DRIVE		MH11120	MH11110											0.00	4.96	21.21	0.63	21.84	50.17	67.71	79.23	115.58	249.01						4,692.46	11,726.17	74.98	2700			0.11	1.984	7033.70	59.98%
BARRETT FARM DRIVE	S11120A, S11120B	MH11120	MH11110							0.27				0.53	1.67	21.21	0.63	21.84	50.17	67.71	79.23	115.58		113.32				4,049.98	4,692.46	11,726.17	74.98	2700			0.11	1.984	7033.70	59.98%
BARRETT FARM DRIVE		MH11120	MH11110											0.00	3.54	21.21	0.63	21.84	50.17	67.71	79.23	115.58			280.16				4,692.46	11,726.17	74.98	2700			0.11	1.984	7033.70	59.98%
NEPETA CRESCENT		MH11114	MH11113											0.00	0.00	10.00	1.14	11.14	76.81	104.19	122.14	178.56	0.00					0.00	0.00	43.87	59.19	250			0.50	0.866	43.87	100.00%
NEPETA CRESCENT		MH11113	MH11112											0.00	0.00	11.14	0.13	11.27	72.69	98.54	115.48	168.77	0.00					0.00	0.00	73.41	11.21	250			1.40	1.449	73.41	100.00%
NEPETA CRESCENT	S11112A, S11112B	MH11112	MH11111							0.41				0.80	0.80	11.27	0.97	12.24	72.26	97.94	114.78	167.74	57.65					0.00	57.65	119.37	95.05	300			1.40	1.636	61.72	51.70%
NEPETA CRESCENT	S11111A, S11111B, R11111	MH11111	MH11110				0.35			0.56				1.58	2.37	12.24	1.28	13.52	69.17	93.70	109.78	160.41	164.21					0.00	164.21	210.32	98.54	450			0.50	1.281	46.11	21.92%
SCHOOL BLOCK	INST	BLK11110S	MH11110								2.07			4.32	4.32	10.00	0.19	10.19	76.81	104.19	122.14	178.56	331.49						331.49	620.09	19.00	675			0.50	1.679	288.60	46.54%
BARRETT FARM DRIVE		MH11110	MH11100											0.00	11.65	21.84	0.69	22.53	49.25	66.46	77.76	113.43	573.98						5,072.07	11,726.17	82.26	2700			0.11	1.984	6654.10	56.75%
BARRETT FARM DRIVE	S11110, R11110, INST	MH11110	MH11100				0.28		0.30					0.93	2.60	21.84	0.69	22.53	49.25	66.46	77.76	113.43		173.13				4,049.98	5,072.07	11,726.17	82.26	2700			0.11	1.984	6654.10	56.75%
BARRETT FARM DRIVE		MH11110	MH11100											0.00	3.54	21.84	0.69	22.53	49.25	66.46	77.76	113.43			274.98				5,072.07	11,726.17	82.26	2700			0.11	1.984	6654.10	56.75%
2016 UPDATED SERVICEABILITY REPORT														Time of Concentration = 10.0min + 170m/1.2m/s = 12.36min																							
KELLY FARM DRIVE		BLK11102	MH11102											0.00	0.00	12.36	0.35	12.71	68.79	93.19	109.18	159.52		0.00				0.00	87.41	162.91	21.00	450			0.30	0.992	75.50	46.34%
KELLY FARM DRIVE	LR3	BLK11102	MH11102										0.36	0.80	0.80	12.36	0.35	12.71	68.79	93.19	109.18	159.52			87.41				87.41	162.91	21.00	450			0.30	0.992	75.50	46.34%
LEITRIM RD DRAINAGE		DICB 2	STM PIPE						0.40					0.72	0.72	55.93	0.07	56.00	25.85	34.69	40.50	58.89			29.27			29.27	29.27	124.08	10.00	250			4.00	2.449	94.80	76.41%
KELLY FARM DRIVE	S11102A-B, R11102A-B	MH11102	MH11101				0.44			0.46				1.51	2.23	12.71	1.40	14.11	67.75	91.76	107.50	157.06		204.58				0.00	290.65	350.85	100.71	600			0.30	1.202	60.20	17.16%
KELLY FARM DRIVE	LR3	MH11102	MH11101											0.00	0.80	12.71	1.40	14.11	67.75	91.76	107.50	157.06			86.07				290.65	350.85	100.71	600			0.30	1.202	60.20	17.16%
KELLY FARM DRIVE	S11101	MH11101	MH11100							0.22				0.43	2.66	14.11	1.30	15.41	63.95	86.55	101.37	148.06		230.02				0.00	311.19	350.85	93.82	600			0.30	1.202	39.66	11.30%
KELLY FARM DRIVE		MH11101	MH11100											0.00	0.80	14.11	1.30	15.41	63.95	86.55	101.37	148.06			81.16				311.19	350.85	93.82	600			0.30	1.202	39.66	11.30%
2016 UPDATED SERVICEABILITY REPORT														Time of Concentration = 14.83min																							
	EXT 2	BLK11100	MH11100										15.03	33.42	33.42	14.83	0.47	15.30	62.17	84.11	98.50	143.85	2,077.74					0.00	2,077.74	4,154.07	45.00	1800			0.12	1.581	2076.33	49.98%
KELLY FARM DRIVE		MH11100	MH11104											0.00	45.07	22.53	0.96	23.49	48.29	65.15	76.22	111.17	2,176.66						6,900.07	12,247.58	119.92	2700			0.12	2.072	5347.51	43.66%
KELLY FARM DRIVE	S11100A, S11100B	MH11100	MH11104						0.28					0.51	5.26	22.53	0.96	23.49	48.29	65.15	76.22	111.17		342.87				4,049.98	6,900.07	12,247.58	119.92	2700			0.12	2.072	5347.51	43.66%
KELLY FARM DRIVE		MH11100	MH11104											0.00	4.34	22.53	0.96	23.49	48.29	65.15	76.22	111.17			330.56				6,900.07	12,247.58	119.92	2700			0.12	2.072	5347.51	43.66%
KELLY FARM DRIVE		MH11104	MH11105											0.00	45.07	23.49	0.96	24.45	47.02	63.42	74.18	108.18	2,119.21						6,860.51	12,247.58	119.60	2700			0.12	2.072	5387.07	43.98%
KELLY FARM DRIVE	S11103A, S11103B	MH11104	MH11105						0.13	0.17				0.57	5.83	23.49	0.96	24.45	47.02	63.42	74.18	108.18		369.60				4,049.98	6,860.51	12,247.58	119.60	2700			0.12	2.072	5387.07	43.98%
KELLY FARM DRIVE		MH11104	MH11105											0.00	4.34	23.49	0.96	24.45	47.02	63.42	74.18	108.18			321.71				6,860.51	12,247.58	119.60	2700			0.12	2.072	5387.07	43.98%
SCHOOL BLOCK		DI 3	STM PIPE	1.28										0.71	0.71	59.19	0.06	59.25	24.80	33.28	38.84	56.46				40.18			40.18	124.08	9.36	250			4.00	2.449	83.89	67.61%
KELLY FARM DRIVE		MH11105	MH800											0.00	45.78	24.45	0.96	25.41	45.82	61.78	72.27	105.37	2,097.79						6,900.61	12,247.58	119.60	2700			0.12	2.072	5346.98	43.66%
KELLY FARM DRIVE	S11105A-B, R11105	MH11105	MH800				0.28			0.46				1.28	7.11	24.45	0.96	25.41	45.82	61.78	72.27	105.37		439.44				4,049.98	6,900.61	12,247.58	119.60	2700			0.12	2.072	5346.98	43.66%
KELLY FARM DRIVE		MH11105	MH800											0.00	4.34	24.45	0.96	25.41	45.82	61.78	72.27	105.37			313.40				6,900.61	12,247.58	119.60	2700			0.12	2.072	5346.98	43.66%
TROLLIUS WAY	S11139, R11139A-B	MH11139	MH11136			0.36			0.35					1.08	1.08	10.00	1.62	11.62	76.81	104.19	122.14	178.56	83.17					0.00	83.17	148.72	87.93	450			0.25	0.906	65.55	44.08%
TROLLIUS WAY	S11136, R11136	MH11136	MH11134			0.22			0.39					0.98	2.06	11.62	2.04	13.66	71.11	96.36	112.92	165.01	146.67					0.00	146.67	248.09	104.08	600			0.15	0.850	101.41	40.88%
TROLLIUS WAY	S11134A-B, R11134A-B	MH11134	MH11133			0.24			0.75					1.66	3.72	13.66	1.91	15.57	65.13	88.16	103.26	150.84	242.16					0.00	242.16	339.63	105.19	675			0.15	0.919	97.48	28.70%
CEMETERY LANDS		DI 1	MH11133											0.00	0.00	50.76	0.37	51.13	27.74	37.24	43.49	63.25					390.00*	390.00	390.00	535.93	40.39	600			0.70	1.836	145.93	27.23%
TROLLIUS WAY		MH11133	MH11132											0.00	3.72	15.57	0.18	15.74	60.46	81.77	95.76	139.82	224.82					390.00	614.82	731.45	11.75	900			0.15	1.114	116.62	15.94%
TROLLIUS WAY	S11132, R11132A-B	MH11132	MH11131			0.29			0.35					1.00	4.71	15.74	1.41	17.15	60.07	81.24	95.12	138.89	283.15					390.00	673.15	905.48	99.51	975			0.15	1.175	232.34	25.66%
TROLLIUS WAY	S11131, R11131A-B	MH11131	MH11130			0.52			0.35					1.28	6.00	17.15	1.36	18.51	57.11	77.19	90.37	131.91	342.48					390.00	732.48	905.48	95.85	975			0.15	1.175	173.01	19.11%
ACONITUM WAY	S11128, R11128	MH11128	MH11121			0.22			0.36					0.93	0.93	10.00	1.52	11.52	76.81	104.19	122.14	178.56	71.10					0.00	71.10	91.46	72.95	375			0.25	0.802	20.35	22.26%
ACONITUM WAY	S11121, R11121A-B	MH11121	MH11122			0.33			0.33					1.01	1.93	11.52	1.80	13.32	71.44	96.82	113.45	165.80	138.22					0.00	138.22	200.65	97.13	525			0.20	0.898	62.42	31.11%
ACONITUM WAY	S11122A, R11122B-C	MH11122	MH11127			0.51			0.25					1.09	3.02	13.32	1.43	14.75	66.04	89.41	104.74	153.01	199.76					0.00	199.76	248.09	72.81	600			0.15	0.850	48.33	19.48%
ACONITUM WAY		MH11127	MH11126											0.00	3.02	14.75	0.23	14.97	62.37	84.39	98.83	144.32	188.66					0.00	188.66	248.09	11.52	600			0.15	0.850	59.43	23.96%
ACONITUM WAY	S11126A, S11126B	MH11126	MH11125						0.48					0.87	3.89	14.97	1.93	16.91	61.83	83.65	97.96	143.05	240.66					0.00	240.66	339.63	106.65	675			0.15	0.919	98.98	29.14%

Definitions:
Q = 2.78CiA, where:
Q = Peak Flow in Litres per Second (L/s)
A = Area in Hectares (Ha)
i = Rainfall intensity in millimeters per hour (mm/hr)
[i = 732.951 / (TC+6.199)^0.810] 2 YEAR
[i = 998.071 / (TC+6.053)^0.814] 5 YEAR
[i = 1174.184 / (TC+6.014)^0.816] 10 YEAR
[i = 1735.688 / (TC+6.014)^0.820] 100 YEAR
*Cemetery flow of 390 L/s taken from Stormwater model

Notes:
1. Mannings coefficient (n) = 0.013

Designed: K.H., W.Y.
Checked: J.I.M.
Dwg. Reference: 34731-500, 500A

No.	Revision	Date
1	City Submission No. 1	2017-04-28
2	City Submission No. 2	2017-09-22
3	City Submission No. 3	2018-10-17
4	Revised Per New Legal 2018-04-09	2018-04-16

File Reference: 34731.5.7.1
Date: 2018-04-16
Sheet No: 1 of 2

IBI GROUP
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LEGEND
Black text 2 year event curve design
Blue text 5 year event curve design (Kelly Farm Drive, Barrett Farm Drive)
Red text 10 year event curve design (Leitrim Road)
Green Text 100 year design curve

STORM SEWER DESIGN SHEET

Barrett Lands
City of Ottawa
Tartan Land Corporation

LAVATERA STREET	S11122B, R11122A	MH11122	MH11123			0.11			0.19					0.48	0.48	10.00	2.37	12.37	76.81	104.19	122.14	178.56	36.94					0.00	36.94	50.44	98.34	300			0.25	0.691	13.50	26.77%
LAVATERA STREET		MH11123	MH11124											0.00	0.48	12.37	0.19	12.56	68.76	93.14	109.13	159.45	33.07					0.00	33.07	50.44	7.91	300			0.25	0.691	17.37	34.44%
LAVATERA STREET	S11124, R11124	MH11124	MH11125			0.26				0.31				0.93	1.41	12.56	1.57	14.13	68.19	92.36	108.21	158.10	96.12					0.00	96.12	133.02	76.38	450			0.20	0.810	36.90	27.74%
LAVATERA STREET	S11125, R11125	MH11125	MH11130			0.19				0.23				0.69	5.99	16.91	1.25	18.15	57.61	77.87	91.16	133.08	344.88					0.00	344.88	579.98	78.72	825			0.15	1.051	235.10	40.54%
TROLLIUS WAY	S11130, R11130	MH11130	MH800				0.28		0.26					0.86	12.84	18.51	0.75	19.27	54.55	73.69	86.26	125.88	700.60					390.00	1,090.60	1,560.35	78.85	1050			0.30	1.746	469.75	30.11%
KELLY FARM DRIVE		MH800	MH820											0.00	58.63	25.41	0.41	25.83	44.69	60.24	70.46	102.72	2,619.80						7,836.85	12,247.58	50.98	2700			0.12	2.072	4410.73	36.01%
KELLY FARM DRIVE	S800, R800	MH800	MH820				0.15			0.26				0.71	7.83	25.41	0.41	25.83	44.69	60.24	70.46	102.72		471.52				4,439.98	7,836.85	12,247.58	50.98	2700			0.12	2.072	4410.73	36.01%
KELLY FARM DRIVE		MH800	MH820											0.00	4.34	25.41	0.41	25.83	44.69	60.24	70.46	102.72			305.55				7,836.85	12,247.58	50.98	2700			0.12	2.072	4410.73	36.01%
																31.59											2,690.00											
KELLY FARM DRIVE		EX MH827	MH826											0.00	0.00	31.59	1.35	32.94	38.67	52.07	60.86	88.67	0.00						2,743.70	3,792.13	116.86	1800			0.10	1.444	1048.43	27.65%
KELLY FARM DRIVE	S827A-C, EXT5	EX MH827	MH826							0.53				1.03	1.03	31.59	1.35	32.94	38.67	52.07	60.86	88.67		53.70			2,690.00	2,690.00	2,743.70	3,792.13	116.86	1800			0.10	1.444	1048.43	27.65%
KELLY FARM DRIVE		MH826	MH820											0.00	0.00	32.94	0.58	33.52	37.59	50.59	59.14	86.14	0.00						2,742.18	3,792.13	50.44	1800			0.10	1.444	1049.95	27.69%
KELLY FARM DRIVE		MH826	MH820											0.00	1.03	32.94	0.58	33.52	37.59	50.59	59.14	86.14		52.18				2,690.00	2,742.18	3,792.13	50.44	1800			0.10	1.444	1049.95	27.69%
POND 2		MH820	MH821											0.00	58.63	33.52	0.52	34.04	37.14	49.99	58.42	85.10	2,177.55						10,003.73	15,530.17	66.51	3000			0.11	2.128	5526.44	35.59%
POND 2		MH820	MH821											0.00	8.86	33.52	0.52	34.04	37.14	49.99	58.42	85.10		442.82				7,129.98	10,003.73	15,530.17	66.51	3000			0.11	2.128	5526.44	35.59%
POND 2		MH820	MH821											0.00	4.34	33.52	0.52	34.04	37.14	49.99	58.42	85.10			253.38				10,003.73	15,530.17	66.51	3000			0.11	2.128	5526.44	35.59%
POND 2		MH821	MH822											0.00	58.63	34.04	0.54	34.58	36.75	49.46	57.80	84.19	2,154.70						9,973.49	15,530.17	69.18	3000			0.11	2.128	5556.68	35.78%
POND 2		MH821	MH822											0.00	8.86	34.04	0.54	34.58	36.75	49.46	57.80	84.19		438.13				7,129.98	9,973.49	15,530.17	69.18	3000			0.11	2.128	5556.68	35.78%
POND 2		MH821	MH822											0.00	4.34	34.04	0.54	34.58	36.75	49.46	57.80	84.19			250.68				9,973.49	15,530.17	69.18	3000			0.11	2.128	5556.68	35.78%

Definitions:
Q = 2.78CiA, where:
Q = Peak Flow in Litres per Second (L/s)
A = Area in Hectares (Ha)
i = Rainfall intensity in millimeters per hour (mm/hr)
[i = 732.951 / (TC+6.199)^0.810] 2 YEAR
[i = 998.071 / (TC+6.053)^0.814] 5 YEAR
[i = 1174.184 / (TC+6.014)^0.816] 10 YEAR
[i = 1735.688 / (TC+6.014)^0.820] 100 YEAR

Notes:
1. Mannings coefficient (n) = 0.013

Designed: K.H., W.Y.
Checked: J.I.M.
Dwg. Reference: 34731-500, 500A

No.	Revision	Date
1	City Submission No. 1	2017-04-28
2	City Submission No. 2	2017-09-22
3	City Submission No. 3	2018-01-17
4	Revised Per New Legal 2018-04-09	2018-04-16

File Reference:	Date:	Sheet No:
34731.5.7.1	2018-04-16	2 of 2

IBI GROUP
IBI Group
400-333 Preston Street
Ottawa, Ontario
K1S 5N4

SANITARY SEWER DESIGN SHEET

PROJECT: LEITRIM DEVELOPMENT HGL
LOCATION: CITY OF OTTAWA
CLIENT:

LOCATION				RESIDENTIAL														ICI AREAS												INFILTRATION ALLOWANCE				TOTAL FLOW	Storm inflow through sani MH covers	Storm inflow through sani MH covers	Total Flow into XPSWMM Sani	Total Flow into XPSWMM Sani	PROPOSED SEWER DESIGN						
				UNIT TYPE				HARMON PEAKING FACTOR					MODIFIED PEAKING FACTOR					AREA (Ha)										PEAK FLOW (L/s)	MOD. PEAK FLOW (L/s)	AREA (Ha)			FLOW											
STREET	AREA ID	FROM MH	TO MH	Single	Semi	TH	APT	AREA (Ha)	POPULATION IND	POPULATION CUM	PEAK FACTOR	PEAK FLOW (L/s)	AREA (Ha)	POPULATION IND	POPULATION CUM	PEAK FACTOR	PEAK FLOW (L/s)	INSTITUTIONAL IND	INSTITUTIONAL CUM	INSTITUTIONAL MOD. CUM	COMMERCIAL IND	COMMERCIAL CUM	COMMERCIAL MOD. CUM	INDUSTRIAL IND	INDUSTRIAL CUM	INDUSTRIAL MOD. CUM			PARK	IND	CUM	(L/s)	(L/s)	Option 2	Option 1	Option 2	Option 1	CAPACITY (L/s)	LENGTH (m)	DIA (mm)	SLOPE (%)	VELOCITY (full) (m/s)	AVAILABLE CAPACITY L/s	(%)
		535	538						0.0	0.0	4.00	0.00	0.61	26.3	26.3	1.90	0.16										0.00	0.00		0.61	0.61	0.17	0.33			0.33	0.33	29.03	87.00	200	0.72	0.895	28.70	98.85%
		538	532						0.0	0.0	4.00	0.00	0.38	16.4	16.4	1.90	0.10										0.00	0.00		0.38	0.38	0.11	0.21			0.21	0.21	29.43	81.10	200	0.74	0.908	29.23	99.30%
		532	533						0.0	0.0	4.00	0.00	1.00	43.1	43.1	1.90	0.27										0.00	0.00		1.00	1.00	0.28	0.55			0.55	0.55	31.02	78.50	250	0.25	0.612	30.47	98.24%
		533	520						0.0	0.0	4.00	0.00	2.76	119.0	119.0	1.90	0.73										0.00	0.00		2.76	2.76	0.77	1.51			1.51	1.51	31.63	154.88	250	0.26	0.624	30.13	95.24%
		520	523						0.0	0.0	4.00	0.00	14.67	632.3	632.3	1.90	3.89										0.00	0.00	0.83	15.50	15.50	4.34	8.23			8.23	8.23	31.02	241.46	250	0.25	0.612	22.79	73.46%
		523	524						0.0	0.0	4.00	0.00	3.45	148.7	148.7	1.90	0.92										0.00	0.00		3.45	3.45	0.97	1.88			1.88	1.88	49.42	81.91	300	0.24	0.677	47.54	96.19%
		524	527						0.0	0.0	4.00	0.00	2.38	102.6	102.6	1.90	0.63										0.00	0.00		2.38	2.38	0.67	1.30			1.30	1.30	55.26	104.52	300	0.30	0.757	53.96	97.65%
		527	594						0.0	0.0	4.00	0.00	2.58	111.2	111.2	1.90	0.68										0.00	0.00	5.98	8.56	8.56	2.40	3.08			3.08	3.08	34.95	90.60	300	0.12	0.479	31.87	91.18%
		594	584						0.0	0.0	4.00	0.00	1.76	75.9	75.9	1.90	0.47										0.00	0.00		1.76	1.76	0.49	0.96	0.51	0.51	1.47	1.47	37.75	88.10	300	0.14	0.517	36.79	97.46%
		584	583						0.0	0.0	4.00	0.00	2.00	86.2	86.2	1.90	0.53										0.00	0.00		2.00	2.00	0.56	1.09			1.09	1.09	45.12	89.00	300	0.20	0.618	44.02	97.58%
		583	599						0.0	0.0	4.00	0.00	2.10	90.5	90.5	1.90	0.56										0.00	0.00		2.10	2.10	0.59	1.15			1.15	1.15	55.26	75.85	300	0.30	0.757	54.11	97.93%
		907	908					4.35	187.5	187.5	4.00	3.04		0.0	0.0	1.90	0.00										0.00	0.00	5.18	9.53	9.53	2.67	5.71	0.10	0.10	5.80	5.80	20.24	209.00	200	0.35	0.624	14.54	71.81%
		908	909					4.35	187.5	187.5	4.00	3.04		0.0	0.0	1.90	0.00										0.00	0.00		4.35	4.35	1.22	4.26			4.26	4.26	36.70	218.00	250	0.35	0.724	32.45	88.40%
		909	910					3.13	134.9	134.9	4.00	2.19		0.0	0.0	1.90	0.00										0.00	0.00		3.13	3.13	0.88	3.06			3.06	3.06	36.70	172.00	250	0.35	0.724	33.64	91.66%
		910	923					2.08	89.6	89.6	4.00	1.45		0.0	0.0	1.90	0.00				17.89	17.89					15.53	0.00		19.97	19.97	5.59	22.57	0.57	0.57	23.14	23.14	36.70	413.00	250	0.35	0.724	14.13	38.50%
		923	1270					0.29	12.5	12.5	4.00	0.20		0.0	0.0	1.90	0.00				25.41	25.41					22.06	0.00		25.70	25.70	7.20	29.46	0.35	0.35	29.81	29.81	59.68	569.00	300	0.35	0.818	30.23	50.65%
		1200	1210						0.0	0.0	4.00	0.00		0.0	0.0	1.90	0.00				3.35	3.35					2.91	0.00		3.35	3.35	0.94	3.85	0.08	0.08	3.92	3.92	20.24	181.00	200	0.35	0.624	16.40	81.00%
		1210	1220						0.0	0.0	4.00	0.00		0.0	0.0	1.90	0.00				2.92	2.92					2.53	0.00		2.92	2.92	0.82	3.35			3.35	3.35	20.24	117.00	200	0.35	0.624	16.89	83.44%
		1220	1230						0.0	0.0	4.00	0.00		0.0	0.0	1.90	0.00				6.18	6.18					5.36	0.00		6.18	6.18	1.73	7.09			7.09	7.09	20.24	257.00	200	0.35	0.624	13.15	64.95%
		1230	1250						0.0	0.0	4.00	0.00		0.0	0.0	1.90	0.00				5.18	5.18					4.50	0.00		5.18	5.18	1.45	5.95	0.18	0.18	6.13	6.13	20.24	177.00	200	0.35	0.624	14.30	70.62%
		1250	1260						0.0	0.0	4.00	0.00		0.0	0.0	1.90	0.00				1.97	1.97					1.71	0.00		1.97	1.97	0.55	2.26			2.26	2.26	20.24	91.00	200	0.35	0.624	17.98	88.83%
		1260	1270						0.0	0.0	4.00	0.00		0.0	0.0	1.90	0.00				11.64	11.64					10.10	0.00		11.64	11.64	3.26	13.36			13.36	13.36	20.24	290.00	200	0.35	0.624	6.88	33.98%
		1270	599						0.0	0.0	4.00	0.00		0.0	0.0	1.90	0.00				21.98	21.98					19.08	0.00		21.98	21.98	6.15	25.23	0.79	0.79	26.03	26.03	141.88	289.00	525	0.10	0.635	116.64	82.21%
		599	450						0.0	0.0	4.00	0.00		0.0	0.0	1.90	0.00										0.00	0.00		0.00	0.00	0.00	0.00			0.00	0.00	202.56	80.10	600	0.10	0.694	202.56	100.00%
		450	401						0.0	0.0	4.00	0.00		0.0	0.0	1.90	0.00										0.00	0.00		0.00	0.00	0.00	0.00			0.00	0.00	248.09	85.10	600	0.15	0.850	248.09	100.00%
		401	411						0.0	0.0	4.00	0.00	0.18	7.8	7.8	1.90	0.05										0.00	0.00		0.18	0.18	0.05	0.10			0.10	0.10	221.90	80.10	600	0.12	0.760	221.80	99.96%
		411	825						0.0	0.0	4.00	0.00	0.16	6.9	6.9	1.90	0.04										0.00	0.00		0.16	0.16	0.04	0.09			0.09	0.09	212.45	87.00	600	0.11	0.728	212.36	99.96%
		1145	1140					16.07	692.6	692.6	3.90	10.93		0.0	0.0	1.90	0.00				7.55	7.55					6.55	0.00		23.62	23.62	6.61	24.10	0.33	0.33	24.43	24.43	108.21	78.00	375	0.35	0.949	84.11	77.73%
		1140	1135					4.33	186.6	186.6	4.00	3.02		0.0	0.0	1.90	0.00										0.00	0.00	2.42	6.75	6.75	1.89	4.91			4.91	4.91	112.75	156.00	375	0.38	0.989	107.84	95.64%
		1135	1125					2.26	97.4	97.4	4.00	1.58		0.0	0.0	1.90	0.00										0.00	0.00		2.26	2.26	0.63	2.21			2.21	2.21	91.46	78.00	375	0.25	0.802	89.24	97.58%
		1125	1140A					2.70	116.4	116.4	4.00	1.89		0.0	0.0	1.90	0.00										0.00	0.00		2.70	2.70	0.76	2.64			2.64	2.64	91.46	78.00	375	0.25	0.802	88.81	97.11%
		1140A	1120A					3.47	149.6	149.6	4.00	2.42		0.0	0.0	1.90	0.00										0.00	0.00		3.47	3.47	0.97	3.39	0.33	0.33	3.73	3.73	100.18	78.00	375	0.30	0.879	96.79	96.61%
		1120A	1110A					2.87	123.7	123.7	4.00	2.00		0.0	0.0	1.90	0.00										0.00	0.00		2.87	2.87	0.80	2.81			2.81	2.81	100.18	78.00	375	0.30	0.879	97.38	97.20%
		1110A	1100A					1.27	54.7	54.7	4.00	0.89		0.0	0.0	1.90	0.00	2.09	2.09								1.81	0.00		3.36	3.36	0.94	3.64			3.64	3.64	153.03	85.00	375	0.70	1.342	149.39	97.62%
		1100A	1105A					2.06	88.8	88.8	4.00	1.44		0.0	0.0	1.90	0.00				19.44	19.44					16.88	0.00		21.50	21.50	6.02	24.33	0.21	0.21	24.55	24.55	81.80	193.00	375	0.20	0.717	57.47	70.25%
		1105A	820A					6.03	259.9	259.9	4.00	4.21		0.0	0.0	1.90	0.00										0.00	0.00		6.03	6.03	1.69	5.90			5.90	5.90	81.80	202.00	375	0.20	0.717	75.90	92.79%
		820A	825A					1.00	43.1	43.1	4.00	0.70		0.0	0.0	1.90	0.00										0.00	0.00		1.00	1.00	0.28	0.98			0.98	0.98	81.80	188.00	375	0.20	0.717	80.82	98.80%
		887	880						0.0	0.0	4.00	0.00	1.55	66.8	66.8	1.90	0.41				0.72		0.72				0.00	0.14		2.27	2.27	0.64	1.19			1.19	1.19	59.85	75.61	200	3.06	1.846	58.67	98.01%
		880	879						0.0	0.0	4.00	0.00	1.92	82.8	82.8	1.90	0.51										0.00	0.00		1.92	1.92	0.54	1.05			1.05	1.05	56.22	76.30	200	2.70	1.734	55.18	98.14%
		879	873						0.0	0.0	4.00	0.00	1.37	59.0	59.0	1.90	0.36										0.00	0.00		1.37	1.37	0.38	0.75			0.75	0.75	46.43	76.77	250	0.56	0.916	45.68	98.39%
		873	872						0.0	0.0	4.00	0.00	1.15	49.6	49.6	1.90	0.31										0.00	0.00		1.15	1.15	0.32	0.63			0.63	0.63	31.02	76.37	250	0.25	0.612	30.39	97.98%
		872	863						0.0	0.0	4.00	0.00	2.23	96.1	96.1	1.90	0.59										0.00	0.00		2.23	2.23	0.62	1.22	1.03	1.03	2.24	2.24	31.02	81.21	250	0.25	0.612	29.80	96.08%
		863	861						0.0	0.0	4.00	0.00	1.04	44.8	44.8	1.90	0.28										0.00	0.00		1.04	1.04	0.29	0.57			0.57	0.57	29.10	114.28	250	0.22	0.574	28.53	98.05%
		861	860						0.0	0.0	4.00	0.00	0.41	17.7	17.7	1.90	0.11										0.00	0.00		0.41	0.41	0.11	0.22			0.22	0.22	52.42	70.23	300	0.27	0.718	52.20	99.57%
		860	853						0.0	0.0	4.00	0.00	0.90	38.8	38.8	1.90	0.24										0.00	0.00	0.61	1.51	1.51	0.42	0.66	0.51	4.10	1.18	4.76	48.38	125.47	300	0.23	0.663	47.72	98.63%
		853	851						0.0	0.0	4.00	0.00	0.97	41.8	41.8	1.90	0.26										0.00	0.00		0.97	0.97	0.27	0.53			0.53	0.53	49.42	119.47	300	0.24	0.677	48.89	98.93%
		851	845						0.0	0.0	4.00	0.00	1.80	77.6	77.6	1.90	0.48										0.00	0.00		1.80	1.80	0.50	0.98			0.98	0.98	53.38	78.80	300	0.28	0.732	52.40	98.16%
		845	840						0.0	0.0	4.00	0.00	1.30	56.0	56.0	1.90	0.34										0.00	0.00		1.30	1.30	0.36	0.71			0.71	0.71	50.44	76.68	300	0.25	0.691	49.73	98.59%
		840	836						0.0	0.0	4.00	0.00	1.77	76.3	76.3	1.90	0.47										0.00	0.00		1.77	1.77	0.50	0.97			0.97	0.97	54.33	76.69	300	0.29	0.745	53.36	98.22%
		836	830						0.0	0.0	4.00	0.00	1.31	56.5	56.5	1.90	0.35										0.00	0.00		1.31	1.31	0.37	0.71			0.71	0.71	43.97	75.07	300	0.19	0.603	43.26	98.38%
		830	828						0.0	0.0	4.00	0.00	1.62	69.8	69.8	1.90	0.43										0.00	0.00		1.62	1.62	0.45	0.88	0.51	4.10	1.40	4.98	55.26	60.09	300	0.30	0.757	54.37	98.40%
		828	825A						0.0	0.0	4.00	0.00		0.0	0.0	1.90	0.00										0.00	0.00		0.00	0.00	0.00	0.00			0.00	0.00	50.44	37.50	300	0.25	0.691	50.44	100.00%
		825A	22						0.0	0.0	4.00	0.00		0.0	0.0	1.90	0.00										0.00	0.00		0.00	0.00	0.00	0.00	0.05	0.05	0.05	0.05	286.47	27.30	600	0.20	0.982	286.47	100.00%
		22	21						0.0	0.0	4.00	0.00		0.0	0.0	1.90	0.00										0.00	0.00		0.00	0.00	0.00	0.00			0.00	0.00	307.20	54.30	600	0.23	1.053	307.20	100.00%
		21	20						0.0	0.0	4.00	0.00		0.0	0.0	1.90	0.00										0.00	0.00		0.00	0.00	0.00	0.00			0.00	0.00	279.21	38.00	600	0.19	0.957	279.21	100.00%
		20	19						0.0	0.0	4.00	0.00		0.0	0.0	1.90	0.00										0.00	0.00		0.00	0.00	0.00	0.00			0.00	0.00	248.09	49.60	600	0.15	0.850	248.09	100.00%
		19	17						0.0	0.0	4.00	0.00	1.42	61.2	61.2	1.90	0.38										0.00	0.00		1.42	1.42	0.40	0.77			0.77	0.77	286.47	62.00	600	0.20	0.982	285.69	99.73%
		17	16						0.0	0.0	4.00	0.00		0.0	0.0	1.90	0.00										0.00	0.00		0.00	0.00	0.00	0.00			0.00	0.00	264.11	46.40	600	0.17	0.905	264.11	100.00%
		16	15						0.0	0.0	4.00	0.00		0.0	0.0	1.90	0.00										0.00	0.00		0.00	0.00	0.00	0.00			0.00	0.00	256.22	46.30	600	0.16	0.878	256.22	100.00%
		15	14						0.0	0.0	4.00	0.00	17.78	766.3	766.3	1.90	4.72	2.94		2.94							0.00	0.34		20.72	20.72	5.80	10.86	2.57	20.50	13.43	31.36	248.09	81.60	600	0.15	0.850	237.23	95.62%
		14	13						0.0	0.0	4.00	0.00	5.06	218.1	218.1	1.90	1.34										0.00	0.00		5.06	5.06	1.42	2.76	2.05	16.40	4.81	19.16	271.77	94.50	600	0.18	0.931	269.01	98.98%
		13	12						0.0	0.0	4.00	0.00	0.16	6.9	6.9	1.90	0.04										0.00	0.00		0.16	0.16	0.04	0.09			0.09	0.09	279.21	81.30	600	0.19	0.957	279.13	99.97%
		12	11						0.0	0.0	4.00	0.00	0.21	9.1	9.1	1.90	0.06	2.98		2.98							0.00	0.34		3.19	3.19	0.89	1.29			1.29	1.29	307.20	111.00	600	0.23	1.053	305.91	99.58%

Design Parameters:

Residential			ICI Areas				
			Average Flows (L/ha/day)			Peak Factor	
				Mod.	MOE	Mod.	MOE
SF/SD	3.2	p/p/u					
TH	2.4	p/p/u	INST	10,000	50,000	1.0	1.5
APT	1.9	p/p/u	COM	17,000	50,000	1.0	1.5
Other	43.1	p/p/Ha	IND	10,000	35,000	1.0	1.5

Notes:

1. Mannings coefficient (n) = 0.013

	MOE Criteria	Monitored Criteria
2. Average Demand (per capita):	350 (L/c/d)	280 (L/c/d)
3. Infiltration allowance:	0.28 (L/s/ha)	0.28 (L/s/ha)
4. Residential Peaking Factor: *Harmon Formula = 1+(14/(4+P^0.5)) where P = population in thousands*	Harmon	1.90

Designed: P.K.
Checked:
Dwg. Reference:

No.	Revision	Date
1.		

File Reference: 34738.5.7.1
Date: 14/08/2014
Sheet No: 1 of 3

IBI GROUP

IBI Group
400-333 Preston Street
Ottawa, Ontario
K1S 5N4

SANITARY SEWER DESIGN SHEET

PROJECT: LEITRIM DEVELOPMENT HGL
LOCATION: CITY OF OTTAWA
CLIENT:

LOCATION				RESIDENTIAL												ICI AREAS												INFILTRATION ALLOWANCE				TOTAL FLOW	Storm inflow through sani MH covers	Storm inflow through sani MH covers	Total Flow into XPSWMM Sani	Total Flow into XPSWMM Sani	PROPOSED SEWER DESIGN						
				UNIT TYPE				HARMON PEAKING FACTOR					MODIFIED PEAKING FACTOR				INSTITUTIONAL			AREA (Ha) COMMERCIAL			INDUSTRIAL			PEAK FLOW	MOD. PEAK FLOW	AREA (Ha)			FLOW											
STREET	AREA ID	FROM MH	TO MH	Single	Semi	TH	APT	AREA (Ha)	POPULATION IND	POPULATION CUM	PEAK FACTOR	PEAK FLOW (L/s)	AREA (Ha)	POPULATION IND	POPULATION CUM	PEAK FACTOR	PEAK FLOW (L/s)	IND	CUM	MOD. CUM	IND	CUM	MOD. CUM	IND	CUM	MOD. CUM	(L/s)	(L/s)	PARK	IND	CUM	(L/s)	(L/s)	Option 2	Option 1	Option 2	Option 1	CAPACITY (L/s)	LENGTH (m)	DIA (mm)	SLOPE (%)	VELOCITY (full) (m/s)	AVAILABLE CAPACITY L/s	AVAILABLE CAPACITY (%)
		603	608					5.33	229.7	229.7	4.00	3.72		0.0	0.0	1.90	0.00										0.00	0.00		5.33	5.33	1.49	5.21	0.10	0.10	*5.31*	*5.31*	39.01	124.00	200	1.30	1.203	33.80	86.63%
		608	609					4.72	203.4	203.4	4.00	3.30		0.0	0.0	1.90	0.00										0.00	0.00		4.72	4.72	1.32	4.62	0.09	0.09	*4.71*	*4.71*	20.24	126.00	200	0.35	0.624	15.62	77.19%
		609	620					13.49	581.4	581.4	3.94	9.28		0.0	0.0	1.90	0.00										0.00	0.00	2.85	16.34	16.34	4.58	13.85	0.30	0.30	*14.16*	*14.16*	78.14	91.00	300	0.60	1.071	64.29	82.27%
		620	630					2.55	109.9	109.9	4.00	1.78		0.0	0.0	1.90	0.00										0.00	0.00		2.55	2.55	0.71	2.49	0.05	0.05	*2.54*	*2.54*	45.12	82.00	300	0.20	0.618	42.62	94.47%
		630	6171					1.73	74.6	74.6	4.00	1.21		0.0	0.0	1.90	0.00										0.00	0.00		1.73	1.73	0.48	1.69	0.03	0.03	*1.72*	*1.72*	45.12	247.00	300	0.20	0.618	43.42	96.25%
		6171	6183					2.21	95.3	95.3	4.00	1.54		0.0	0.0	1.90	0.00										0.00	0.00	0.82	3.03	3.03	0.85	2.39	0.06	0.06	*2.45*	*2.45*	45.12	194.00	300	0.20	0.618	42.72	94.70%
		6183	6175A					1.85	79.7		4.00	0.00		0.0	0.0	1.90	0.00										0.00	0.00		1.85	1.85	0.52	0.52	0.03	0.03	*0.55*	*0.55*	45.12	86.00	300	0.20	0.618	44.60	98.85%
		6175A	6106					2.32	100.0		4.00	0.00		0.0	0.0	1.90	0.00										0.00	0.00		2.32	2.32	0.65	0.65	0.04	0.04	*0.69*	*0.69*	45.12	86.00	300	0.20	0.618	44.47	98.56%
		6106	647					5.18	223.3	223.3	4.00	3.62		0.0	0.0	1.90	0.00										0.00	0.00		5.18	5.18	1.45	5.07	0.10	0.10	*5.16*	*5.16*	45.12	88.00	300	0.20	0.618	40.05	88.77%
		646	647					5.74	247.4	247.4	4.00	4.01		0.0	0.0	1.90	0.00										0.00	0.00		5.74	5.74	1.61	5.62	0.11	0.11	*5.72*	*5.72*	20.24	208.00	200	0.35	0.624	14.63	72.26%
		6156	6115					1.89	81.5	81.5	4.00	1.32		0.0	0.0	1.90	0.00										0.00	0.00		1.89	1.89	0.53	1.85	0.03	0.03	*1.88*	*1.88*	36.70	88.00	250	0.35	0.724	34.85	94.96%
		6115	6101					12.58	542.2	542.2	3.96	8.69		0.0	0.0	1.90	0.00				7.13	7.13					6.19	0.00		19.71	19.71	5.52	20.40	0.36	0.36	*20.76*	*20.76*	36.70	88.00	250	0.35	0.724	16.31	44.43%
		6101	647					2.89	172.8	172.8	4.00	2.80		0.0	0.0	1.90	0.00	2.55	2.55								2.21	0.00		5.44	5.44	1.52	6.54	0.10	0.10	*6.64*	*6.64*	33.98	374.00	250	0.30	0.671	27.44	80.76%
		647	755					0.29	12.5	12.5	4.00	0.20		0.0	0.0	1.90	0.00										0.00	0.00		0.29	0.29	0.08	0.28	0.01	0.01	*0.29*	*0.29*	91.46	81.00	375	0.25	0.802	91.17	99.69%
		755	745					2.30	99.1	99.1	4.00	1.61		0.0	0.0	1.90	0.00										0.00	0.00		2.30	2.30	0.64	2.25			*2.25*	*2.25*	91.46	74.00	375	0.25	0.802	89.21	97.54%
		745	730					0.27	11.6	11.6	4.00	0.19		0.0	0.0	1.90	0.00										0.00	0.00	1.22	1.49	1.49	0.42	0.61	0.04	0.04	*0.65*	*0.65*	91.46	74.00	375	0.25	0.802	90.85	99.34%
		790	780					3.49	150.4	150.4	4.00	2.44		0.0	0.0	1.90	0.00				3.42	3.42					2.97	0.00		6.91	6.91	1.93	7.34	0.04	0.04	*7.38*	*7.38*	20.24	103.00	200	0.35	0.624	12.90	63.74%
		780	770					1.80	77.6	77.6	4.00	1.26		0.0	0.0	1.90	0.00										0.00	0.00		1.80	1.80	0.50	1.76			*1.76*	*1.76*	20.24	83.00	200	0.35	0.624	18.48	91.30%
		771	770					1.88	81.0	81.0	4.00	1.31		0.0	0.0	1.90	0.00										0.00	0.00		1.88	1.88	0.53	1.84			*1.84*	*1.84*	20.24	146.00	200	0.35	0.624	18.40	90.91%
		775	770					3.96	170.7	170.7	4.00	2.77		0.0	0.0	1.90	0.00										0.00	0.00		3.96	3.96	1.11	3.87			*3.87*	*3.87*	20.24	155.00	200	0.35	0.624	16.37	80.86%
		770	760					0.27	11.6	11.6	4.00	0.19		0.0	0.0	1.90	0.00										0.00	0.00		0.27	0.27	0.08	0.26	0.12	0.12	*0.39*	*0.39*	31.02	82.00	250	0.25	0.612	30.76	99.15%
		760	750					1.87	80.6	80.6	4.00	1.31		0.0	0.0	1.90	0.00										0.00	0.00		1.87	1.87	0.52	1.83	0.06	0.06	*1.89*	*1.89*	31.02	81.00	250	0.25	0.612	29.19	94.10%
		750	740					2.39	103.0	103.0	4.00	1.67		0.0	0.0	1.90	0.00										0.00	0.00		2.39	2.39	0.67	2.34			*2.34*	*2.34*	31.02	84.00	250	0.25	0.612	28.68	92.46%
		740	730						0.0	0.0	4.00	0.00		0.0	0.0	1.90	0.00										0.00	0.00		0.00	0.00	0.00	0.00	0.10	0.10	*0.10*	*0.10*	31.02	121.00	250	0.25	0.612	31.02	100.00%
		730	*710*					*4.10*	*176.7*	*176.7*	*4.00*	*2.86*		*0.0*	*0.0*	*1.90*	*0.00*										*0.00*	*0.00*		*4.10*	*4.10*	*1.15*	*4.01*	*0.08*	*0.08*	*4.09*	*4.09*	*101.84*	*93.26*	*375*	*0.31*	*0.893*	*97.83*	*96.06%*
		710	*700*					*2.86*	*123.3*	*123.3*	*4.00*	*2.00*		*0.0*	*0.0*	*1.90*	*0.00*										*0.00*	*0.00*		*2.86*	*2.86*	*0.80*	*2.80*	*0.05*	*0.05*	*2.84*	*2.84*	*125.40*	*77.01*	*375*	*0.47*	*1.100*	*122.60*	*97.77%*
		700	*333*					*1.80*	*77.6*	*77.6*	*4.00*	*1.26*		*0.0*	*0.0*	*1.90*	*0.00*										*0.00*	*0.00*		*1.80*	*1.80*	*0.50*	*1.76*	*0.03*	*0.03*	*1.79*	*1.79*	*115.68*	*179.20*	*375*	*0.40*	*1.015*	*113.92*	*98.48%*
		363	*362*						*0.0*	*0.0*	*4.00*	*0.00*	*1.28*	*55.2*	*55.2*	*1.90*	*0.34*									*0.00*	*0.00*		*1.28*	*1.28*	*0.36*	*0.70*			*0.70*	*0.70*	*20.24*	*89.13*	*200*	*0.35*	*0.624*	*19.54*	*96.55%*
		362	*361*						*0.0*	*0.0*	*4.00*	*0.00*	*0.39*	*16.8*	*16.8*	*1.90*	*0.10*									*0.00*	*0.00*		*0.39*	*0.39*	*0.11*	*0.21*	*0.06*	*0.06*	*0.27*	*0.27*	*20.24*	*80.00*	*200*	*0.35*	*0.624*	*20.03*	*98.95%*
		361	*355*						*0.0*	*0.0*	*4.00*	*0.00*	*1.56*	*67.2*	*67.2*	*1.90*	*0.41*									*0.00*	*0.00*		*1.56*	*1.56*	*0.44*	*0.85*			*0.85*	*0.85*	*20.24*	*167.02*	*200*	*0.35*	*0.624*	*19.39*	*95.80%*
		355	*353*						*0.0*	*0.0*	*4.00*	*0.00*	*0.80*	*34.5*	*34.5*	*1.90*	*0.21*									*0.00*	*0.00*		*0.80*	*0.80*	*0.22*	*0.44*			*0.44*	*0.44*	*20.24*	*92.48*	*200*	*0.35*	*0.624*	*19.81*	*97.84%*
		353	*350*						*0.0*	*0.0*	*4.00*	*0.00*	*0.64*	*27.6*	*27.6*	*1.90*	*0.17*									*0.00*	*0.00*		*0.64*	*0.64*	*0.18*	*0.35*			*0.35*	*0.35*	*20.24*	*106.57*	*200*	*0.35*	*0.624*	*19.89*	*98.28%*
		350	*333*						*0.0*	*0.0*	*4.00*	*0.00*	*1.92*	*82.8*	*82.8*	*1.90*	*0.51*									*0.00*	*0.00*		*1.92*	*1.92*	*0.54*	*1.05*	*0.09*	*0.09*	*1.14*	*1.14*	*55.26*	*74.93*	*300*	*0.30*	*0.757*	*54.21*	*98.10%*
		333	*11*						*0.0*	*0.0*	*4.00*	*0.00*	*2.50*	*107.8*	*107.8*	*1.90*	*0.66*									*0.00*	*0.00*		*2.50*	*2.50*	*0.70*	*1.36*	*0.01*	*0.07*	*1.37*	*1.43*	*126.72*	*157.70*	*375*	*0.48*	*1.112*	*125.36*	*98.92%*
		11	*110*						*0.0*	*0.0*	*4.00*	*0.00*		*0.0*	*0.0*	*1.90*	*0.00*									*0.00*	*0.00*		*0.00*	*0.00*	*0.00*	*0.00*			*0.00*	*0.00*	*384.34*	*6.50*	*600*	*0.36*	*1.317*	*384.34*	*100.00%*
		110	*150*						*0.0*	*0.0*	*4.00*	*0.00*	*1.48*	*63.8*	*63.8*	*1.90*	*0.39*									*0.00*	*0.00*		*1.48*	*1.48*	*0.41*	*0.81*			*0.81*	*0.81*	*373.51*	*198.60*	*600*	*0.34*	*1.280*	*372.70*	*99.78%*
		150	*130*						*0.0*	*0.0*	*4.00*	*0.00*	*9.29*	*400.4*	*400.4*	*1.90*	*2.47*									*0.00*	*0.00*	*0.83*	*10.12*	*10.12*	*2.83*	*5.30*	*1.03*	*8.20*	*6.33*	*13.50*	*373.51*	*163.00*	*600*	*0.34*	*1.280*	*368.21*	*98.58%*
		130	*120*						*0.0*	*0.0*	*4.00*	*0.00*	*15.26*	*657.7*	*657.7*	*1.90*	*4.05*									*0.00*	*0.00*	*1.40*	*16.66*	*16.66*	*4.66*	*8.71*	*4.11*	*32.80*	*12.82*	*41.51*	*466.33*	*130.90*	*600*	*0.53*	*1.598*	*457.62*	*98.13%*

Design Parameters:

Residential			ICI Areas				
			Average Flows (L/ha/day)			Peak Factor	
SF/SD	3.2	p/p/u		Mod.	MOE	Mod.	MOE
TH	2.4	p/p/u	INST	10,000	50,000	1.0	1.5
APT	1.9	p/p/u	COM	17,000	50,000	1.0	1.5
Other	43.1	p/p/Ha	IND	10,000	35,000	1.0	1.5

Notes:

1. Mannings coefficient (n) = 0.013

	MOE Criteria	Monitored Criteria
2. Average Demand (per capita):	350 (L/c/d)	280 (L/c/d)
3. Infiltration allowance:	0.28 (L/s/ha)	0.28 (L/s/ha)
4. Residential Peaking Factor: *Harmon Formula = 1+(14/(4+P^0.5)) where P = population in thousands*	Harmon	1.90

Designed: P.K.

Checked:

Dwg. Reference:

No.	Revision	Date
1.		

File Reference: 34738.5.7.1 | **Date:** 14/08/2014 | **Sheet No:** 2 of 3

IBI GROUP

IBI Group
400-333 Preston Street
Ottawa, Ontario
K1S 5N4

SANITARY SEWER DESIGN SHEET

PROJECT: LEITRIM DEVELOPMENT HGL
LOCATION: CITY OF OTTAWA
CLIENT:

LOCATION				RESIDENTIAL												ICI AREAS													INFILTRATION ALLOWANCE				TOTAL FLOW	Storm inflow through sani MH covers	Storm inflow through sani MH covers	Total Flow into XPSWMM Sani	Total Flow into XPSWMM Sani	PROPOSED SEWER DESIGN						
				UNIT TYPE				HARMON PEAKING FACTOR					MODIFIED PEAKING FACTOR																														
								AREA	POPULATION		PEAK FACTOR	PEAK FLOW	AREA	POPULATION		PEAK FACTOR	PEAK FLOW	AREA (Ha)										PEAK FLOW	MOD. PEAK FLOW	AREA (Ha)			FLOW												
																		INSTITUTIONAL			COMMERCIAL			INDUSTRIAL																		
STREET	AREA ID	FROM MH	TO MH	Single	Semi	TH	APT	(Ha)	IND	CUM		(L/s)	(Ha)	IND	CUM		(L/s)	IND	CUM	MOD. CUM	IND	CUM	MOD. CUM	IND	CUM	MOD. CUM	(L/s)	(L/s)	PARK	IND	CUM	(L/s)	(L/s)	Option 2	Option 1	Option 2	Option 1	CAPACITY (L/s)	LENGTH (m)	DIA (mm)	SLOPE (%)	VELOCITY (full) (m/s)	AVAILABLE CAPACITY L/s	(%)
		104	105						0.0	0.0	4.00	0.00	1.31	56.5	56.5	1.90	0.35	1.89		1.89	2.77		2.77				0.00	0.76		5.97	5.97	1.67	2.78	0.51	0.51	3.30	3.30	22.70	76.12	200	0.44	0.700	19.91	87.74%
		105	107						0.0	0.0	4.00	0.00	0.89	38.4	38.4	1.90	0.24										0.00	0.00		0.89	0.89	0.25	0.49			0.49	0.49	24.91	76.90	200	0.53	0.768	24.42	98.05%
		107	110A						0.0	0.0	4.00	0.00	1.83	78.9	78.9	1.90	0.49	0.60		0.60							0.00	0.07		2.43	2.43	0.68	1.24			1.24	1.24	28.63	78.07	200	0.70	0.883	27.39	95.68%
		110A	114						0.0	0.0	4.00	0.00	1.60	69.0	69.0	1.90	0.42										0.00	0.00		1.60	1.60	0.45	0.87			0.87	0.87	30.22	77.96	200	0.78	0.932	29.35	97.11%
		114	117						0.0	0.0	4.00	0.00	1.49	64.2	64.2	1.90	0.40										0.00	0.00		1.49	1.49	0.42	0.81			0.81	0.81	41.20	77.60	200	1.45	1.271	40.39	98.03%
		117	121						0.0	0.0	4.00	0.00	1.34	57.8	57.8	1.90	0.36										0.00	0.00		1.34	1.34	0.38	0.73			0.73	0.73	42.05	77.89	200	1.51	1.297	41.32	98.26%
		121	126						0.0	0.0	4.00	0.00	1.24	53.4	53.4	1.90	0.33										0.00	0.00		1.24	1.24	0.35	0.68			0.68	0.68	38.71	80.00	200	1.28	1.194	38.04	98.25%
		126	127					2.26	97.4	97.4	4.00	1.58		0.0	0.0	1.90	0.00										0.00	0.00	8.99	11.25	11.25	3.15	4.73			4.73	4.73	64.47	73.30	250	1.08	1.272	59.74	92.67%
		127	128					1.26	54.3	54.3	4.00	0.88		0.0	0.0	1.90	0.00										0.00	0.00		1.26	1.26	0.35	1.23			1.23	1.23	65.66	78.12	250	1.12	1.296	64.42	98.12%
		128	129					1.75	75.4	75.4	4.00	1.22		0.0	0.0	1.90	0.00										0.00	0.00		1.75	1.75	0.49	1.71			1.71	1.71	66.53	103.71	250	1.15	1.313	64.82	97.43%
		129	133					0.17	7.3	7.3	4.00	0.12		0.0	0.0	1.90	0.00										0.00	0.00		0.17	0.17	0.05	0.17			0.17	0.17	62.96	29.16	250	1.03	1.243	62.80	99.74%
		130A	131					6.60	284.5	284.5	4.00	4.61		0.0	0.0	1.90	0.00										0.00	0.00	1.75	8.35	8.35	2.34	6.95			6.95	6.95	37.79	77.83	200	1.22	1.165	30.85	81.62%
		131	132					1.01	43.5	43.5	4.00	0.71		0.0	0.0	1.90	0.00										0.00	0.00		1.01	1.01	0.28	0.99			0.99	0.99	36.85	42.17	200	1.16	1.136	35.86	97.32%
		132	133					0.15	6.5	6.5	4.00	0.10		0.0	0.0	1.90	0.00										0.00	0.00		0.15	0.15	0.04	0.15			0.15	0.15	37.22	32.43	250	0.36	0.735	37.08	99.61%
		133	134					0.14	6.0	6.0	4.00	0.10		0.0	0.0	1.90	0.00										0.00	0.00		0.14	0.14	0.04	0.14			0.14	0.14	105.07	27.59	375	0.33	0.922	104.94	99.87%
		134	135					0.67	28.9	28.9	4.00	0.47		0.0	0.0	1.90	0.00										0.00	0.00		0.67	0.67	0.19	0.66			0.66	0.66	89.61	109.10	375	0.24	0.786	88.95	99.27%
		135	136					3.59	154.7	154.7	4.00	2.51		0.0	0.0	1.90	0.00										0.00	0.00		3.59	3.59	1.01	3.51			3.51	3.51	75.42	59.08	375	0.17	0.661	71.90	95.34%
		136	138						0.0	0.0	4.00	0.00		0.0	0.0	1.90	0.00										0.00	0.00	0.87	0.87	0.87	0.24	0.24			0.24	0.24	96.79	179.00	375	0.28	0.849	96.54	99.75%
		138	*139*					0.54	23.3	23.3	4.00	0.38		0.0	0.0	1.90	0.00										0.00	0.00		0.54	0.54	0.15	0.53			0.53	0.53	83.82	92.60	375	0.21	0.735	83.29	99.37%
		139	*141*					2.20	94.8	94.8	4.00	1.54		0.0	0.0	1.90	0.00										0.00	0.00		2.20	2.20	0.62	2.15			2.15	2.15	89.61	169.86	375	0.24	0.786	87.46	97.60%
		141	*207*						0.0	0.0	4.00	0.00		0.0	0.0	1.90	0.00										0.00	0.00		0.00	0.00	0.00	0.00			0.00	0.00	87.72	61.40	375	0.23	0.769	87.72	100.00%
		207	*206*					25.03	1078.8	1078.8	3.78	16.51		0.0	0.0	1.90	0.00				5.08	5.08					4.41	0.00	0.40	30.51	30.51	8.54	29.47			29.47	29.47	91.46	118.68	375	0.25	0.802	61.99	67.78%
		1338	**1339**					**0.25**	**10.8**	**10.8**	**4.00**	**0.17**		**0.0**	**0.0**	**1.90**	**0.00**				**4.42**	**4.42**					**3.84**	**0.00**		**4.67**	**4.67**	**1.31**	**5.32**	**0.09**	**0.09**	*5.41*	*5.41*	**20.24**	**53.00**	**200**	**0.35**	**0.624**	**14.92**	**73.72%**
		1339	**1340**					**1.32**	**56.9**	**56.9**	**4.00**	**0.92**		**0.0**	**0.0**	**1.90**	**0.00**										**0.00**	**0.00**		**1.32**	**1.32**	**0.37**	**1.29**	**0.02**	**0.02**	*1.32*	*1.32*	**20.24**	**78.00**	**200**	**0.35**	**0.624**	**18.95**	**93.62%**
		1340	**1341**					**0.81**	**34.9**	**34.9**	**4.00**	**0.57**		**0.0**	**0.0**	**1.90**	**0.00**										**0.00**	**0.00**		**0.81**	**0.81**	**0.23**	**0.79**	**0.01**	**0.01**	*0.81*	*0.81*	**20.24**	**78.00**	**200**	**0.35**	**0.624**	**19.45**	**96.09%**
		1341	**1342**					**1.28**	**55.2**	**55.2**	**4.00**	**0.89**		**0.0**	**0.0**	**1.90**	**0.00**	**2.25**	**2.25**								**1.95**	**0.00**		**3.53**	**3.53**	**0.99**	**3.84**	**0.07**	**0.07**	*3.90*	*3.90*	**20.24**	**78.00**	**200**	**0.35**	**0.624**	**16.41**	**81.05%**
		1342	**1343**					**1.69**	**72.8**	**72.8**	**4.00**	**1.18**		**0.0**	**0.0**	**1.90**	**0.00**										**0.00**	**0.00**		**1.69**	**1.69**	**0.47**	**1.65**	**0.03**	**0.03**	*1.68*	*1.68*	**20.24**	**78.00**	**200**	**0.35**	**0.624**	**18.59**	**91.83%**
		1343	**1344**					**1.71**	**73.7**	**73.7**	**4.00**	**1.19**		**0.0**	**0.0**	**1.90**	**0.00**										**0.00**	**0.00**		**1.71**	**1.71**	**0.48**	**1.67**	**0.03**	**0.03**	*1.70*	*1.70*	**20.24**	**78.00**	**200**	**0.35**	**0.624**	**18.57**	**91.74%**
		1344	**1345**					**1.71**	**73.7**	**73.7**	**4.00**	**1.19**		**0.0**	**0.0**	**1.90**	**0.00**										**0.00**	**0.00**		**1.71**	**1.71**	**0.48**	**1.67**	**0.03**	**0.03**	*1.70*	*1.70*	**20.24**	**78.00**	**200**	**0.35**	**0.624**	**18.57**	**91.74%**
		1345	**206**					**0.33**	**14.2**	**14.2**	**4.00**	**0.23**		**0.0**	**0.0**	**1.90**	**0.00**										**0.00**	**0.00**		**0.33**	**0.33**	**0.09**	**0.32**	**0.01**	**0.01**	*0.33*	*0.33*	**36.70**	**165.00**	**250**	**0.35**	**0.724**	**36.38**	**99.12%**
		1365A	**1357**					**1.57**	**67.7**	**67.7**	**4.00**	**1.10**		**0.0**	**0.0**	**1.90**	**0.00**										**0.00**	**0.00**		**1.57**	**1.57**	**0.44**	**1.54**	**0.03**	**0.03**	*1.57*	*1.57*							
		1357	**141C**					**0.39**	**16.8**	**16.8**	**4.00**	**0.27**		**0.0**	**0.0**	**1.90**	**0.00**										**0.00**	**0.00**		**0.39**	**0.39**	**0.11**	**0.38**	**0.01**	**0.01**	*0.39*	*0.39*							
		141C	**141B**					**0.54**	**23.3**	**23.3**	**4.00**	**0.38**		**0.0**	**0.0**	**1.90**	**0.00**										**0.00**	**0.00**	**3.13**	**3.67**	**3.67**	**1.03**	**1.40**	**0.07**	**0.07**	*1.47*	*1.47*							
		141B	**1345**					**1.15**	**49.6**	**49.6**	**4.00**	**0.80**		**0.0**	**0.0**	**1.90**	**0.00**										**0.00**	**0.00**		**1.15**	**1.15**	**0.32**	**1.13**	**0.02**	**0.02**	*1.15*	*1.15*							
		1365	**1356**					**0.86**	**37.1**	**37.1**	**4.00**	**0.60**		**0.0**	**0.0**	**1.90**	**0.00**										**0.00**	**0.00**		**0.86**	**0.86**	**0.24**	**0.84**	**0.02**	**0.02**	*0.86*	*0.86*							
		1356	**1355**					**0.34**	**14.7**	**14.7**	**4.00**	**0.24**		**0.0**	**0.0**	**1.90**	**0.00**										**0.00**	**0.00**		**0.34**	**0.34**	**0.10**	**0.33**	**0.01**	**0.01**	*0.34*	*0.34*							
		1355	**1345**					**4.96**	**213.8**	**213.8**	**4.00**	**3.46**		**0.0**	**0.0**	**1.90**	**0.00**										**0.00**	**0.00**	**0.40**	**5.36**	**5.36**	**1.50**	**4.96**	**0.10**	**0.10**	*5.06*	*5.06*							
		1357A	**1356**					**1.40**	**60.3**	**60.3**	**4.00**	**0.98**		**0.0**	**0.0**	**1.90**	**0.00**										**0.00**	**0.00**		**1.40**	**1.40**	**0.39**	**1.37**	**0.03**	**0.03**	*1.40*	*1.40*							
		206	*204*					*1.96*	*84.5*	*84.5*	*4.00*	*1.37*		*0.0*	*0.0*	*1.90*	*0.00*										*0.00*	*0.00*		*1.96*	*1.96*	*0.55*	*1.92*			*1.92*	*1.92*	*83.82*	*239.46*	*375*	*0.21*	*0.735*	*81.90*	*97.71%*
		204	*202*						*0.0*	*0.0*	*4.00*	*0.00*		*0.0*	*0.0*	*1.90*	*0.00*										*0.00*	*0.00*		*0.00*	*0.00*	*0.00*	*0.00*			*0.00*	*0.00*	*91.46*	*241.53*	*375*	*0.25*	*0.802*	*91.46*	*100.00%*
		202	*201*						*0.0*	*0.0*	*4.00*	*0.00*		*0.0*	*0.0*	*1.90*	*0.00*										*0.00*	*0.00*		*0.00*	*0.00*	*0.00*	*0.00*			*0.00*	*0.00*	*77.60*	*98.08*	*375*	*0.18*	*0.681*	*77.60*	*100.00%*
		201	*200*						*0.0*	*0.0*	*4.00*	*0.00*		*0.0*	*0.0*	*1.90*	*0.00*										*0.00*	*0.00*		*0.00*	*0.00*	*0.00*	*0.00*			*0.00*	*0.00*	*87.72*	*41.60*	*375*	*0.23*	*0.769*	*87.72*	*100.00%*
		200	*100*						*0.0*	*0.0*	*4.00*	*0.00*		*0.0*	*0.0*	*1.90*	*0.00*										*0.00*	*0.00*		*0.00*	*0.00*	*0.00*	*0.00*			*0.00*	*0.00*	*158.41*	*61.60*	*375*	*0.75*	*1.389*	*158.41*	*100.00%*
		100	*110*						*0.0*	*0.0*	*4.00*	*0.00*	*0.33*	*14.2*	*14.2*	*1.90*	*0.09*										*0.00*	*0.00*		*0.33*	*0.33*	*0.09*	*0.18*			*0.18*	*0.18*	*105.07*	*95.30*	*375*	*0.33*	*0.922*	*104.89*	*99.83%*
		110	*120*						*0.0*	*0.0*	*4.00*	*0.00*	*5.81*	*250.4*	*250.4*	*1.90*	*1.54*				*11.78*		*11.78*				*0.00*	*2.32*		*17.59*	*17.59*	*4.93*	*8.78*			*8.78*	*8.78*	*129.34*	*52.50*	*375*	*0.50*	*1.134*	*120.55*	*93.21%*
		120	*P. Station*						*0.0*	*0.0*	*4.00*	*0.00*		*0.0*	*0.0*	*1.90*	*0.00*										*0.00*	*0.00*		*0.00*	*0.00*	*0.00*	*0.00*					*452.94*		*600*	*0.50*	*1.552*	*452.94*	*100.00%*

Design Parameters:

Residential			ICI Areas				
			Average Flows (L/ha/day)			Peak Factor	
SF/SD	3.2	p/p/u		Mod.	MOE	Mod.	MOE
TH	2.4	p/p/u	INST	10,000	50,000	1.0	1.5
APT	1.9	p/p/u	COM	17,000	50,000	1.0	1.5
Other	43.1	p/p/Ha	IND	10,000	35,000	1.0	1.5

Notes:

1. Mannings coefficient (n) = 0.013

	MOE Criteria	Monitored Criteria
2. Average Demand (per capita):	350 (L/c/d)	280 (L/c/d)
3. Infiltration allowance:	0.28 (L/s/ha)	0.28 (L/s/ha)
4. Residential Peaking Factor: *Harmon Formula = 1+(14/(4+P^0.5)) where P = population in thousands*	Harmon	1.90

Designed: P.K.

Checked:

Dwg. Reference:

No.	Revision	Date
1.		

File Reference: 34738.5.7.1 | **Date:** 14/08/2014 | **Sheet No:** 3 of 3

RUE LEITRIM ROAD

PROMENADE KELLY FARM DRIVE

CROISSANT NEPETA CRESCENT

RUE MUSCARI STREET

PROMENADE BARRETT FARM DRIVE

BLOCK 208

BLOCK 174

BLOCK 163

BLOCK 175

BLOCK 176

BLOCK 173

BLOCK 177

BLOCK 172

BLOCK 178

BLOCK 171

BLOCK 179

BLOCK 170

BLOCK 180

BLOCK 169

BLOCK 168

BLOCK 181

BLOCK 197

BLOCK 162

BLOCK 161

BLOCK 164

BLOCK 160

BLOCK 165

BLOCK 159

BLOCK 166

BLOCK 158

BLOCK 167

BLOCK 157

BLOCK 156

BLOCK 155

BLOCK 150

BLOCK 151

BLOCK 152

BLOCK 153

BLOCK 154

BLOCK 149

BLOCK 148

BLOCK 147

BLOCK 146

BLOCK 145

REMOVE EXISTING DRIVEWAY CULVERT AND REGRADE EXISTING DITCH AS SHOWN

REGRADE FROM EXISTING SHOULDER TO NEW DITCH AS NEEDED

GRADE TO EXISTING LEITRIM ROAD

MAX. 3:1 TERRACING

EXISTING DITCH TO BE FILLED

150–200mm RIP RAP MIN. 300mm DEEP c/w FILTER CLOTH

2.4m HIGH NOISE BARRIER (TYP.)

TEMPORARY RETURN

40.0m MULTI-USE PATHWAY

2.0m CONCRETE SIDEWALK

1.8m CONCRETE SIDEWALK

TERRACE 3:1 TO ORIGINAL GROUND

1500mm HIGH CHAIN–LINK–FENCE PER OPSD 972.132

CONT'D ON DRWG 34731-202

No.	REVISIONS	By	Date
14			
13			
12			
11			
10			
9	REVISED CMB LOCATION BLOCK 180	J.I.M.	2018:10:19
8	ISSUED FOR CITY APPROVAL	J.I.M.	2018:09:27
7	ISSUED FOR CONSTRUCTION	J.I.M.	2018:08:24
6	REVISED PER CITY COMMENTS	J.I.M.	2018:07:05
5	ISSUED FOR MOE APPROVAL	J.I.M.	2018:05:23
4	REVISED PER NEW LEGAL 2018-04-09	J.I.M.	2018:04:16
3	SUBMISSION NO. 3 FOR CITY REVIEW	J.I.M.	2018:01:17
2	SUBMISSION NO. 2 FOR CITY REVIEW	J.I.M.	2017:09:22
1	SUBMISSION NO. 1 FOR CITY REVIEW	J.I.M.	2017:04:28

BARRETT CO-TENANCY

IBI GROUP
400 – 333 Preston Street
Ottawa ON K1S 5N4 Canada
tel 613 225 1311 fax 613 225 9868
ibigroup.com

Project Title

BARRETT LANDS

PHASE 1

LICENSED PROFESSIONAL ENGINEER
J. I. MOFFATT
2018/10/19
PROVINCE OF ONTARIO

Drawing Title

GRADING PLAN

Scale

HSCALE 1:500

Design	Date
K.H.	MARCH 2017
Drawn	Checked
M.M.	J.I.M.
Project No.	Drawing No.
34731	200

CITY PLAN No. 17643

CITY FILE No. D07-16-13-0023

No.	REVISIONS	By	Date
14			
13			
12			
11			
10			
9			
8	ISSUED FOR CITY APPROVAL	J.I.M.	2018:09:27
7	ISSUED FOR CONSTRUCTION	J.I.M.	2018:08:24
6	REVISED PER CITY COMMENTS	J.I.M.	2018:07:05
5	ISSUED FOR MOE APPROVAL	J.I.M.	2018:05:23
4	REVISED PER NEW LEGAL 2018-04-09	J.I.M.	2018:04:16
3	SUBMISSION NO. 3 FOR CITY REVIEW	J.I.M.	2018:01:17
2	SUBMISSION NO. 2 FOR CITY REVIEW	J.I.M.	2017:09:22
1	SUBMISSION NO. 1 FOR CITY REVIEW	J.I.M.	2017:04:28

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PHASE 1

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Scale

HSCALE 1:500

Design	Date
K.H.	MARCH 2017
Drawn	**Checked**
M.M.	J.I.M.
Project No.	**Drawing No.**
34731	201

CITY PLAN No. 17643

CITY FILE No. D07-16-13-0023

APPENDIX

B

- FIRE UNDERWRITERS SURVEY – FIRE FLOW CALCULATION FOR BUILDING
- FIRE UNDERWRITERS SURVEY – FIRE FLOW CALCULATION FOR PORTABLE CLASSROOM
- WATER DEMAND CALCULATION
- BOUNDARY CONDITION REQUEST

Fire Flow Design Sheet (FUS)
3955 Promenade Kelly Farm, Ontario
Ottawa, Ontario
CA0040067.4396

Date: 2024-10-10
Input By: Mostafa Sayed
Reviewed By: Winston Yang

CEPEO Leitrim Elementary School
Fire Flow Requirements Based on Fire Underwriters Survey (FUS) 2020

To estimate the amount of water required to confine and control a fire, FUS uses the following base formula:

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

F = Required Fire Flow in litres per minute
C = Construction Coefficient related to the type of construction of the building
A = Total Effective Floor Area in square meters of the building

1. Construction Material

			Input	Coefficient	Value Used
C	**Type V**	Wood Frame Construction		1.5	0.8
	Type IV-A	Mass Timber Construction		0.8	
	Type IV-B	Mass Timber Construction		0.9	
	Type IV-C	Mass Timber Construction		1.0	
	Type IV-D	Mass Timber Construction		1.5	
	Type III	Ordinary Construction		1.0	
	Type II	Non-combustible Construction	Yes	0.8	
	Type I	Fire Resistive Construction		0.6	

2. Floor Area

		Input	Value Used
A	Building Footprint (m²)	3,416	3,698
	Number of Floors	2	
	Protected Openings (1-hr)	Yes	
	Total Effective Floor Area (m²) *	3,698	

* Single largest floor area + 25% of each of the two immediately adjoining floors

3. Base fire flow without adjustments

F

$F = 220 \times C \times \sqrt{A} =$ 11,000 **L/min**

4. Occupancy and Contents Adjustment Factor

		FUS Table 3	Adjustment	Value Used
(1)	Non-combustible		-25%	-15%
	Limited combustible	Yes	-15%	
	Combustible		+0%	
	Free Burning		+15%	
	Rapid Burning		+25%	

Adjustment of F due to Occupancy and Contents = 9,350 **L/min**

5. Automatic Sprinkler Protection

		FUS Table 4	Adjustment	Value Used
(2)	% of Sprinkler Coverage	100%		-40%
	Adequately Designed System (NFPA 13)	Yes	-30%	
	Standard Water Supply	Yes	-10%	
	Fully Supervised System		-10%	

Credit for Automatic Sprinkler Protection = -3,740 **L/min**

6. Exposure Surcharge

		Separation	FUS Table 5	Value Used
(3)	North Exposure (m)	25.65	+10%	+20%
	East Exposure (m)	25.1	+10%	
	South Exposure (m)	83	+0%	
	West Exposure (m)	0	+0%	

Surcharge for Exposure = +1,870 **L/min**

7. Total Required Fire Flow

F

$F = (1) + (2) + (3) =$ 7,000 **L/min**
or 117 **L/sec**
or 1,849 **GPM (US)**

Based on method described in:
"Water Supply for Public Fire Protection - A Guide to Recommended Practice", 2020
by Fire Underwriters Survey

Fire Flow Design Sheet (FUS)
3955 Promenade Kelly Farm, Ontario
Ottawa, Ontario
CA0040067.4396

Date: 2024-10-10
Input By: Mostafa Sayed
Reviewed By: Winston Yang

CEPEO Leitrim Elementary School (12 Future Portable Classrooms)
Fire Flow Requirements Based on Fire Underwriters Survey (FUS) 2020

To estimate the amount of water required to confine and control a fire, FUS uses the following base formula:

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

F = Required Fire Flow in litres per minute
C = Construction Coefficient related to the type of construction of the building
A = Total Effective Floor Area in square meters of the building

1. Construction Material

			Input	Coefficient	Value Used
C	**Type V**	Wood Frame Construction	Yes	1.5	1.5
	Type IV-A	Mass Timber Construction		0.8	
	Type IV-B	Mass Timber Construction		0.9	
	Type IV-C	Mass Timber Construction		1.0	
	Type IV-D	Mass Timber Construction		1.5	
	Type III	Ordinary Construction		1.0	
	Type II	Non-combustible Construction		0.8	
	Type I	Fire Resistive Construction		0.6	

2. Floor Area

		Input	Value Used
	Building Footprint (m²)	215	
	Number of Floors	0	
A	Protected Openings (1-hr)	Yes	215
	Total Effective Floor Area (m²) *	215	

* 100% of all Floor Areas are considered

3. Base fire flow without adjustments

F

$F = 220 \times C \times \sqrt{A}$ = **5,000 L/min**

4. Occupancy and Contents Adjustment Factor

		FUS Table 3	Adjustment	Value Used
	Non-combustible		-25%	
	Limited combustible	Yes	-15%	
(1)	Combustible		+0%	-15%
	Free Burning		+15%	
	Rapid Burning		+25%	

Adjustment of F due to Occupancy and Contents = **4,250 L/min**

5. Automatic Sprinkler Protection

		FUS Table 4	Adjustment	Value Used
	% of Sprinkler Coverage	0%		
	Adequately Designed System (NFPA 13)	No	-30%	
(2)	Standard Water Supply	No	-10%	+0%
	Fully Supervised System		-10%	

Credit for Automatic Spinkler Protection = **0 L/min**

6. Exposure Surcharge

		Separation	FUS Table 5	Value Used
	North Exposure (m)	32.98	+0%	
	East Exposure (m)	3	+25%	
(3)	South Exposure (m)	20	+15%	+65%
	West Exposure (m)	3	+25%	

Surcharge for Exposure = **+2,763 L/min**

7. Total Required Fire Flow

F

$F = (1) + (2) + (3)$ = **7,000 L/min**
or 117 **L/sec**
or 1,849 **GPM (US)**

Based on method described in:
"Water Supply for Public Fire Protection - A Guide to Recommended Practice", 2020
by Fire Underwriters Survey

Water Demand Calculation Sheet

Project:	**CEPEO Leitrim Elementary School**	**Date:**	**2024-10-03**
Location:	**3955 Promenade Kelly Farm, Ontario**	**Design:**	**MS**
WSP Project No.	**CA0040067.4396**	**Page:**	**1 of 1**

Proposed Buildings	Residential			School	Non-Residential			Avg Day			Max Day			Peak Hour			Fire
	Units			Students+Staff	Industrial	Institutional	Commercial	Demand (L/s)			Demand (L/s)			Demand (L/s)			Demand
	SF	APT	ST		(ha)	(ha)	(ha)	Res.	Non-Res.	Total	Res.	Non-Res.	Total	Res.	Non-Res.	Total	(L/min)
New School				377					0.73	0.73		1.10	1.10		1.98	1.98	
Daycare				58					0.11	0.11		0.17	0.17		0.30	0.30	7,000
Future Addition (25% of the total demand)				284					0.55	0.55		0.83	0.83		1.49	1.49	
Portables				288					0.56	0.56		0.84	0.84		1.51	1.51	7,000
Total				1007					1.96	1.96		2.94	2.94		5.29	5.29	14,000

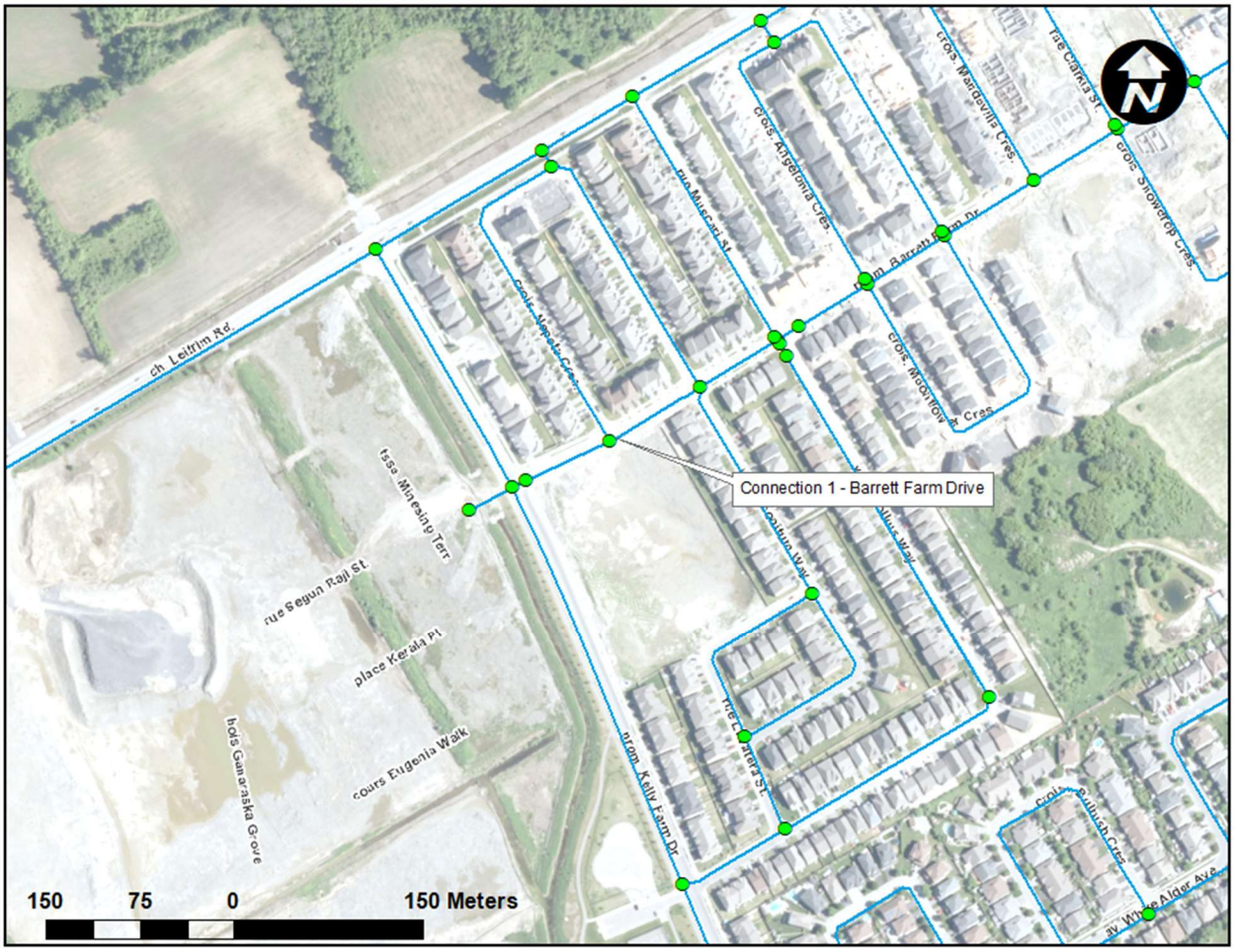
Population Densities			**Avg Day Demand**			**Max Day Demand**			**Peak Hour Demand**		
Single Family	3.4	person/unit	Residential	280	L/cap/day	Residential	2.5	x avg. day	Residential	2.2	x max. day
Semi-Detached	2.7	person/unit	Light Industrial	35000	L/ha/day	Industrial	1.5	x avg. day	Industrial	1.8	x max. day
Duplex	2.3	person/unit	Institutional	28000	L/ha/day	Institutional	1.5	x avg. day	Institutional	1.8	x max. day
Townhome (Row)	2.7	person/unit	Commercial	28000	L/ha/day	Commercial	1.5	x avg. day	Commercial	1.8	x max. day
Bachelor Apartment	1.4	person/unit									
1 Bedroom Apartment	1.4	person/unit	School	70	L/day/person	assume 10h/day					
2 Bedroom Apartment	2.1	person/unit									
3 Bedroom Apartment	3.1	person/unit	Notes:	* Existing student and staff count as per					References: Ottawa Water Distribution Design Guidelines - Section 4		
4 Bedroom Apartment	4.1	person/unit		Genivar Servicing & SWM Report 2013					2020 Fire Underwriters Survey		
Avg. Apartment	1.8	person/unit									

Boundary Conditions
3955 Kelly Farm Drive

Provided Information

Scenario	Demand	
	L/min	L/s
Average Daily Demand	106	1.76
Maximum Daily Demand	158	2.64
Peak Hour	284	4.74
Fire Flow Demand #1	7,000	116.67

Location



Results

Existing Conditions

Connection 1 – Barrett Farm Drive

Demand Scenario	Head (m)	Pressure[1] (psi)
Maximum HGL	154.7	85.8
Peak Hour	144.3	71.1
Max Day plus Fire Flow #1	131.5	52.9

[1] Ground Elevation = 94.3 m

Future SUC

Connection 1 – Barrett Farm Drive

Demand Scenario	Head (m)	Pressure[1] (psi)
Maximum HGL	147.4	75.5
Peak Hour	146.0	73.5
Max Day plus Fire Flow #1	143.8	70.3

[1] Ground Elevation = 94.3 m

Notes

1. As per the Ontario Building Code in areas that may be occupied, the static pressure at any fixture shall not exceed 552 kPa (80 psi.) Pressure control measures to be considered are as follows, in order of preference:
    a. If possible, systems to be designed to residual pressures of 345 to 552 kPa (50 to 80 psi) in all occupied areas outside of the public right-of-way without special pressure control equipment.
    b. Pressure reducing valves to be installed immediately downstream of the isolation valve in the home/ building, located downstream of the meter so it is owner maintained.

Disclaimer

The boundary condition information is based on current operation of the city water distribution system. The computer model simulation is based on the best information available at the time. The operation of the water distribution system can change on a regular basis, resulting in a variation in boundary conditions. The physical properties of watermains deteriorate over time, as such must be assumed in the absence of actual field test data. The variation in physical watermain properties can therefore alter the results of the computer model simulation. Fire Flow analysis is a reflection of available flow in the watermain; there may be additional restrictions that occur between the watermain and the hydrant that the model cannot take into account.

APPENDIX

C

- STORM SEWER DESIGN SHEET
- STORM DRAINAGE AREA PLAN C06
- ROOF DRAINAGE AREA PLAN C07
- STORMWATER MANAGEMENT CALCULATIONS
- OGS DETAILS
- DWG C03 – GRADING PLAN
- DWG C04 – SERVICING PLAN

STORM SEWER DESIGN SHEET

CEPEO Leitrim Elementary School
3955 Kelly Farm Drive, Ottawa
Project: CA0040067.4396
Date: November 2024

LOCATION				AREA (Ha)						RATIONAL DESIGN FLOW											PROPSOED SEWER DATA								
STREET	AREA ID	FROM	TO	C= 0.20	C= 0.35	C= 0.40	C= 0.70	C= 0.80	C= 0.90	IND 2.78AC	CUM 2.78 AC	INLET (min)	TOTAL (min)	i (2) (mm/hr)	i (5) (mm/hr)	i (100) (mm/hr)	2yr PEAK FLOW (L/s)	5yr PEAK FLOW (L/s)	100yr PEAK FLOW (L/s)	CONTROLLED FLOW (L/s)	DESIGN FLOW (L/s)	MATERIAL PIPE	SIZE (mm)	SLOPE (%)	LENGTH (m)	CAPACITY (l/s)	VELOCITY (m/s)	TIME IN PIPE	AVAIL CAP (5yr) (L/s)	AVAIL CAP (5yr) (%)
POST-DEVELOPMENT																														
	A-1	CB01	CBMH102	0.048					0.087	0.245	0.245	10.00	10.77	76.81	104.19	178.56	18.85				18.85	PVC DR-35	200	1.00	48.50	32.83	1.04	0.77	13.98	42.58%
	A-4	CB02	CBMH101	0.087						0.048	0.048	10.00	10.55	76.81	104.19	178.56	3.70				3.70	PVC DR-35	200	1.00	34.23	32.83	1.04	0.55	29.13	88.73%
	A-3	CBMH101	CBMH102	0.026					0.070	0.189	0.237	10.55	11.23	74.77	101.39	173.71	17.72				17.72	PVC DR-35	200	1.00	42.93	32.83	1.04	0.69	15.11	46.02%
	A-2a	CBMH102	CBMH103	0.009					0.084	0.215	0.698	11.23	11.44	72.38	98.11	168.03	50.52				50.52	PVC DR-35	300	0.70	14.60	80.99	1.14	0.21	30.47	37.63%
	A-2b	CBMH103	CBMH104	0.012					0.028	0.077	0.775	11.44	11.75	71.67	97.14	166.35	55.54				55.54	PVC DR-35	300	0.70	20.77	80.99	1.14	0.30	25.45	31.43%
	A-6	CBMH104	CBMH106	0.058					0.036	0.122	0.897	11.44	11.81	71.67	97.14	166.35	64.31				64.31	PVC DR-35	300	0.70	24.93	80.99	1.14	0.36	16.68	20.59%
	A-5	CB03	CBMH105	0.011					0.056	0.146	0.146	10.00	10.37	76.81	104.19	178.56	11.22				11.22	PVC DR-35	200	1.00	23.22	32.83	1.04	0.37	21.61	65.82%
	A-9	CBMH105	CBMH106						0.060	0.150	0.296	10.37	10.89	75.41	102.27	175.24	22.34				22.34	PVC DR-35	200	1.00	32.35	32.83	1.04	0.52	10.49	31.96%
	A-10	CBMH106	STMH108	0.015					0.081	0.212	1.406	11.81	12.49	70.50	95.53	163.57	99.10				99.10	PVC DR-35	375	0.50	45.86	124.10	1.12	0.68	25.00	20.15%
	A-13	CB05	STMH108-STMH109	0.036					0.052	0.150	0.150	10.00	10.21	76.81	104.19	178.56	11.49				11.49	PVC DR-35	200	1.00	12.97	32.83	1.04	0.21	21.34	65.00%
		STMH108	STMH109							0.000	1.555	12.49	12.99	68.41	92.66	158.62	106.40				106.40	PVC DR-35	450	0.40	33.79	180.50	1.13	0.50	74.10	41.05%
	A-7, A-8, A-11, A-12	CB04	CBMH107	0.416					0.078	0.428	0.428	10.00	10.38	76.81	104.19	178.56	32.84				32.84	PVC DR-35	250	1.00	27.79	59.53	1.21	0.38	26.68	44.83%
	A-14	CBMH107	STMH109	0.029					0.089	0.240	0.667	10.38	10.85	75.37	102.22	175.14	50.30				50.30	PVC DR-35	300	0.50	26.89	68.45	0.97	0.46	18.15	26.52%
		STMH109	STMH110 (OGS)							0.000	2.223	12.99	13.04	66.97	90.69	155.21	148.86				148.86	PVC DR-35	450	0.45	3.89	191.45	1.20	0.05	42.59	22.25%
		STMH111 (OGS)	*EX STMH 104*							0.000	2.223	13.04	13.16	66.82	90.48	154.85	148.52				148.52	PVC DR-35	450	0.45	8.80	191.45	1.20	0.12	42.93	22.42%
	ROOF	Building	STMH100	0.000					0.347	0.868	0.868	10.00	10.05	76.81	104.19	178.56	66.68				66.68	PVC DR-35	300	1.00	3.96	96.80	1.37	0.05	30.12	31.11%

Definition:
Q=2.78CiA, where:
Q = Peak Flow in Litres per Second (L/s)
A = Area in Hectares (Ha)
i = Rainfall Intensity in millimeters per hour (mm/hr)

i = 732.951/(TC+6.199)^0.810	2 Year
i = 1174.184/(TC+6.014)^0.816	5 Year
i = 1735.688/(TC+6.014)^0.820	100 Year

Notes:
1. Mannings coefficient (n) = 0.013

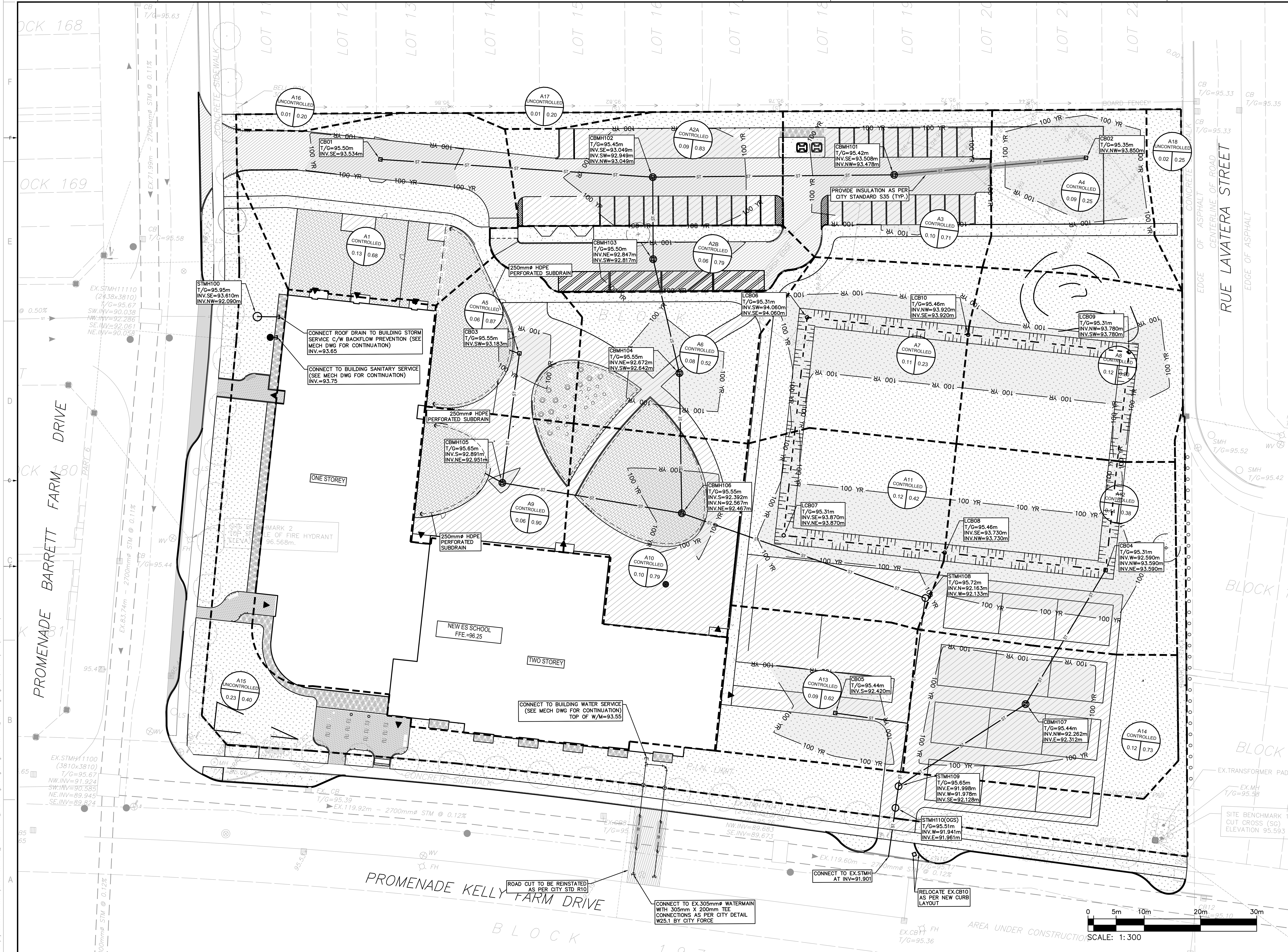
Time-of-Concentration in the Swale
FAA Equation: t (min) = 3.258 [(1.1 - C) L^0.5 / S^.33]
Where: Longest Watercourse Length, L (m). S (%)

No.	L (m)	S %	C	Tc (min)
1				#DIV/0!
2				#DIV/0!
3				#DIV/0!
4				#DIV/0!

Designed: D.M.
Checked: D.B.Y.
Dwg. Reference: C05

No.	Revision	Date
1.	City Submission No. 1	2024-11-22

File Reference:
Date: 2024-11-22
Sheet No: 1 of 1



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ARCHITECT:
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CORNWALL, ONTARIO, CANADA K6J 3E5
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SEAL:
LICENSED PROFESSIONAL ENGINEER
D. B. YANG
100230568
2025-02-27
PROVINCE OF ONTARIO

CLIENT:
Conseil des écoles publiques de l'Est de l'Ontario

PROJECT:
ÉCOLE ÉLÉMENTRIRE LEITRIM
3955 PROMENADE KELLY FARM, OTTAWA

KEY PLAN:

REV	DATE	DESCRIPTION
1	2025-02-27	ISSUED FOR SITE PLAN APPLICATION

PROJECT NO: CA0040067.4396
DATE: FEBURARY 2025
ORIGINAL SCALE: 1:300
DESIGNED BY: M.S./D.M.
DRAWN BY: J.T.
CHECKED BY: D.Y.
DISCIPLINE: CIVIL
TITLE: POST-DRAINAGE AREA DEVELOPMENT
SHEET NUMBER: C06
SHEET # 6 OF 7
ISSUE: ISSUED FOR SITE PLAN APPLICATION
REV # 1
DATE OF: 2025-02-27

D07-12-XX-XXXX

#XXXXX

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NORTH

CLIENT:
Conseil des écoles publiques de l'Est de l'Ontario
CLIENT REF. #:

PROJECT:
ÉCOLE ÉLÉMENTRIRE LEITRIM
3955 PROMENADE KELLY FARM, OTTAWA

KEY PLAN:

BEARING NOTE:
BEARINGS ARE MTM GRID, DERIVED FROM THE EASTERLY LIMIT OF BLOCK 196 PLAN 4M-1640, HAVING A GRID BEARING OF N30°41'10"E.
DISTANCES ARE GROUND AND CAN BE CONVERTED TO GRID BY MULTIPLYING BY THE COMBINED SCALE FACTOR OF 0.999946.
SITE BENCHMARK 1 IS A CUT CROSS (SHOWN ON PLAN) HAVING A GEODETIC ELEVATION OF 95.593m.
SITE BENCHMARK 2 IS THE TOP SPINDLE, THE TOP SPINDLE OF A FIRE HYDRANT (SHOWN ON PLAN) ELEVATION 96.569m.

ELEVATION NOTE:
ELEVATIONS SHOWN HEREON ARE GEODETIC (CGVD - 1928: 1978) AND ARE DERIVED FROM THE CANNET HRS NETWORK STATION OTTAWA.
ELEVATION=96.220

ISSUED FOR - REVISION:

IS	RE	DATE	DESCRIPTION
1		2025-02-27	ISSUED FOR SITE PLAN APPLICATION

PROJECT NO: CA0040067.4396
DATE: FEBURARY 2025
ORIGINAL SCALE: 1:300
DESIGNED BY: M.S./D.M.
DRAWN BY: J.T.
CHECKED BY: D.Y.
IF THIS BAR IS NOT 25mm LONG, ADJUST YOUR PLOTTING SCALE.
25mm

DISCIPLINE: CIVIL

TITLE: ROOF DRAINAGE AREA PLAN

SHEET NUMBER: C07
SHEET #: 7 OF 7

ISSUE: ISSUED FOR SITE PLAN APPLICATION
DATE OF: 2025-02-27
REV #: 1

V:\10\3 ma 2024 projects\ca0040067.4396 - ospcc leitrim ext\14.0 tech. prof services\14.05_civil\3. drawings\working drawings\CA0040067.4396_Roof Drainage.dwg Feb 27, 2025 - 2:12pm BY (CAUTI7451Z)

D07-12-XX-XXXX

#XXXXX

CEPEO Leitrim Elementary School
3955 Kelly Farm Drive, Ottawa
Project: CA0040067.4396
Date: October 2024

TABLE 2 - Uncontrolled Flow (Area A-15)

Post Dev run-off Coefficient "C"

			2 & 5 Year Event		100 Year Event	
Area	**Surface**	**Ha**	**"C"**	**C_{avg}**	**"C"+25%**	***C_{avg}**
Total	Gravel	0.000	0.70	**0.40**	0.88	**0.46**
0.225	Asphalt	0.064	0.90		1.00	
	Soft	0.161	0.20		0.25	

Runoff Coefficient Equation

$C = (A_{hard} \times 0.9 + A_{soft} \times 0.2)/A_{tot}$

$*C = (A_{hard} \times 1.0 + A_{soft} \times 0.25)/A_{tot}$

*Runoff coefficients increased by 25% up to a maximum value of 1.0 for the 100-Year event

Post Dev Free Flow

5 Year Event

Pre Dev.	**C**	**Intensity**	**Area**
5 Year	0.40	104.19	0.225

2.78CIA= 26.10

26.10 L/S

**Use a 10 minute time of concentration for 5 year

100 Year Event

Pre Dev.	**C**	**Intensity**	**Area**
100 Year	0.46	178.56	0.225

2.78CIA= 51.44

51.40 L/S

**Use a 10 minute time of concentration for 100 year

Equations:

Flow Equation

Q = 2.78 x C x I x A

Where:

C is the runoff coefficient

I is the intensity of rainfall, City of Ottawa IDF

A is the total drainage area

CEPEO Leitrim Elementary School
3955 Kelly Farm Drive, Ottawa
Project: CA0040067.4396
Date: October 2024

TABLE 2 - Uncontrolled Flow (Area A-16)

Post Dev run-off Coefficient "C"

			2 & 5 Year Event		100 Year Event	
Area	**Surface**	**Ha**	**"C"**	**C_{avg}**	**"C"+25%**	***C_{avg}**
Total	Gravel	0.000	0.70		0.88	
0.006	Asphalt	0.000	0.90	**0.20**	0.99	**0.25**
	Soft	0.006	0.20		0.25	

Runoff Coefficient Equation

$C = (A_{hard} \times 0.9 + A_{soft} \times 0.2)/A_{tot}$

$*C = (A_{hard} \times 1.0 + A_{soft} \times 0.25)/A_{tot}$

*Runoff coefficients increased by 25% up to a maximum value of 1.0 for the 100-Year event

Post Dev Free Flow

5 Year Event

Pre Dev.	**C**	**Intensity**	**Area**
5 Year	0.20	104.19	0.006
2.78CIA=	0.35		
0.40	L/S		

**Use a 10 minute time of concentration for 5 year

100 Year Event

Pre Dev.	**C**	**Intensity**	**Area**
100 Year	0.25	178.56	0.006
2.78CIA=	0.76		
0.80	L/S		

**Use a 10 minute time of concentration for 100 year

Equations:

Flow Equation

Q = 2.78 x C x I x A

Where:

C is the runoff coefficient

I is the intensity of rainfall, City of Ottawa IDF

A is the total drainage area

CEPEO Leitrim Elementary School
3955 Kelly Farm Drive, Ottawa
Project: CA0040067.4396
Date: October 2024

TABLE 2 - Uncontrolled Flow (Area A-17)

Post Dev run-off Coefficient "C"

			2 & 5 Year Event		100 Year Event	
Area	**Surface**	**Ha**	**"C"**	**C_{avg}**	**"C"+25%**	***C_{avg}**
Total	Gravel	0.000	0.70		0.88	
0.006	Asphalt	0.000	0.90	**0.20**	1.00	**0.25**
	Soft	0.006	0.20		0.25	

Runoff Coefficient Equation

$C = (A_{hard} \times 0.9 + A_{soft} \times 0.2)/A_{tot}$

$*C = (A_{hard} \times 1.0 + A_{soft} \times 0.25)/A_{tot}$

*Runoff coefficients increased by 25% up to a maximum value of 1.0 for the 100-Year event

Post Dev Free Flow

5 Year Event

Pre Dev.	**C**	**Intensity**	**Area**
5 Year	0.20	104.19	0.006
2.78CIA=	0.36		
0.40	L/S		

**Use a 10 minute time of concentration for 5 year

100 Year Event

Pre Dev.	**C**	**Intensity**	**Area**
100 Year	0.25	178.56	0.006
2.78CIA=	0.76		
0.80	L/S		

**Use a 10 minute time of concentration for 100 year

Equations:

Flow Equation

Q = 2.78 x C x I x A

Where:

C is the runoff coefficient

I is the intensity of rainfall, City of Ottawa IDF

A is the total drainage area

CEPEO Leitrim Elementary School
3955 Kelly Farm Drive, Ottawa
Project: CA0040067.4396
Date: October 2024

TABLE 2 - Uncontrolled Flow (Area A-18)

Post Dev run-off Coefficient "C"

			2 & 5 Year Event		100 Year Event	
Area	**Surface**	**Ha**	**"C"**	**C_{avg}**	**"C"+25%**	***C_{avg}**
Total	Gravel	0.000	0.70		0.88	
0.015	Asphalt	0.001	0.90	**0.25**	1.00	**0.30**
	Soft	0.014	0.20		0.25	

Runoff Coefficient Equation

$C = (A_{hard} \times 0.9 + A_{soft} \times 0.2)/A_{tot}$

$*C = (A_{hard} \times 1.0 + A_{soft} \times 0.25)/A_{tot}$

*Runoff coefficients increased by 25% up to a maximum value of 1.0 for the 100-Year event

Post Dev Free Flow

5 Year Event

Pre Dev.	**C**	**Intensity**	**Area**
5 Year	0.25	104.19	0.015
2.78CIA=	1.10		
1.10	L/S		

**Use a 10 minute time of concentration for 5 year

100 Year Event

Pre Dev.	**C**	**Intensity**	**Area**
100 Year	0.30	178.56	0.015
2.78CIA=	2.27		
2.30	L/S		

**Use a 10 minute time of concentration for 100 year

Equations:

Flow Equation

Q = 2.78 x C x I x A

Where:

C is the runoff coefficient

I is the intensity of rainfall, City of Ottawa IDF

A is the total drainage area

CEPEO Leitrim Elementary School
3955 Kelly Farm Drive, Ottawa
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TABLE 3 - Controlled Flow (Areas A-1 to A-14)

Maximum Allowable Release Rate for the Site	224.00	l/s
Roof Drains Release Rate	29.48	l/s
Uncontrolled Release Rate	55.30	l/s
Maximum Allowable Release Rate to Municipal Sewer:	139.22	l/s
Proposed release rate:	**122.54**	**l/s**

Post Dev run-off Coefficient "C"

			2 & 5 Year Event		100 Year Event	
Area	Surface	Ha	"C"	C_{avg}	"C" x 1.25	$C_{100\ avg}$
Total	Gravel	0.000	0.70		0.88	
1.469	Asphalt	0.729	0.90	**0.55**	1.00	**0.62**
	Grass	0.740	0.20		0.25	

*Areas are approximate based on Architectural site plan and Storm Drainage Area Plan

Runoff Coefficient Equation

$C = (A_{hard} \times 0.9 + A_{soft} \times 0.2)/A_{tot}$

$*C = (A_{hard} \times 1.0 + A_{soft} \times 0.25)/A_{tot}$

*Runoff coefficients increased by 25% up to a maximum value of 1.0 for the 100-Year event

QUANTITY STORAGE REQUIREMENTS - 5 Year

1.469 = Area(ha)
0.55 = C
139.2 l/s = max allowable release rate

Return Period	Time (min)	Intensity (mm/hr)	Flow Q (L/s)	Controlled Runoff (L/s)	Net Runoff To Be Stored (L/s)	Storage Req'd m^3	Storage Avail m^3
	10	**104.19**	**234.01**	**121.03**	**112.99**	**67.79**	**233.77**
	20	70.25	157.78	121.03	36.75	44.10	233.77
	30	53.93	121.12	121.03	0.09	0.17	233.77
5 YEAR	40	44.18	99.24	121.03	-21.79	-52.30	233.77
	50	37.65	84.57	121.03	-36.46	-109.38	233.77
	60	32.94	73.99	121.03	-47.04	-169.33	233.77

QUANTITY STORAGE REQUIREMENTS - 100 Year

1.469 = Area(ha)
0.62 = *C
139.2 l/s = max allowable release rate

Return Period	Time (min)	Intensity (mm/hr)	Flow Q (L/s)	Controlled Runoff (L/s)	Net Runoff To Be Stored (L/s)	Storage Req'd m^3	Storage Avail m^3
	10	178.56	452.08	122.54	329.54	197.72	233.77
	15	142.89	361.78	122.54	239.24	215.32	233.77
100 YEAR	**20**	**119.95**	**303.69**	**122.54**	**181.15**	**217.38**	**233.77**
	25	103.85	262.92	122.54	140.38	210.57	233.77
	30	91.87	232.59	122.54	110.05	198.10	233.77
	35	82.58	209.07	122.54	86.54	181.72	233.77
	40	75.15	190.25	122.54	67.72	162.52	233.77

Orifice Sizing

STMH109

Event	Flow (L/s)	Head (m)	ORIFICE AREA(m^2)	SQUARE (1-side mm)	CIRC (mmØ)
5 Year	121.03	3.58	0.024	155	175
100 Year	122.54	3.67	0.024	155	175

Orifice Control Sizing

Q = 0.6 x A x (2gh)1/2
Where:
Q is the release rate in m^3/s
A is the orifice area in m^2
g is the acceleration due to gravity, $9.81 m/s^2$
h is the head of water above the orifice centre in m
d is the diameter of the orifice in m

Orifice Invert =	91.978	m
Ponding Elevation @ 100 year=	95.740	m
Top of grate elevation	95.650	m

Equations:

Flow Equation

Q = 2.78 x C x I x A
Where:
C is the runoff coefficient
I is the intensity of rainfall, City of Ottawa IDF
A is the total drainage area

CEPEO Leitrim Elementary School
3955 Kelly Farm Drive, Ottawa
Project: CA0040067.4396
Date: October 2024

TABLE 4 - Proposed Roof Drains

Allowable Release Rate

Total Roof Area =	0.351	Ha	
Total Roof Ponding Area =	0.351	m^2	
Ponding Depth =	0.127	m	
The flow rate through each Roof Drain will be =	13.750	gpm	
	0.867	L/s	
Number of Roof Drains =	34.00		
Total flow rate =	29.48		

TABLE 1. Adjustable Accutrol Flow Rate Settings

Weir Opening Exposed	1"	2"	3"	4"	5"	6"
	Flow Rate (gallons per minute)					
Fully Exposed	5	10	15	20	25	30
3/4	5	10	13.75	17.5	21.25	25
1/2	5	10	12.5	15	17.5	20
1/4	5	10	11.25	12.5	13.75	15
Closed	5	5	5	5	5	5

Post Dev run-off Coefficient "C"

			2 & 5 Year Event		100 Year Event	
Area	Surface	Ha	"C"	C_{avg}	"C" x 1.25	$C_{100\ avg}$
Total	Asphalt		0.90		1.00	
0.351	Roof	0.351	0.90	**0.90**	1.00	**1.00**
	Grass		0.20		0.25	

*Areas are approximate based on Architectural site plan

Runoff Coefficient Equation
$C = (A_{hard} \times 0.9 + A_{soft} \times 0.2)/A_{tot}$
$*C = (A_{hard} \times 1.0 + A_{soft} \times 0.25)/A_{tot}$

*Runoff coefficients increased by 25% up to a maximum value of 1.0 for the 100-Year event

QUANTITY STORAGE REQUIREMENTS - 5 Year

0.351 = Area(ha)
0.90 = C

Return Period	Time (min)	Intensity (mm/hr)	Flow Q (L/s)	Allowable Runoff (L/s)	Net Runoff To Be Stored (L/s)	Storage Req'd (m^3)	Storage Available* (m^3)
	10	104.19	91.50	29.48	62.02	37.21	118.88
	20	**70.25**	**61.69**	**29.48**	**32.22**	**38.66**	**118.88**
5 YEAR	30	53.93	47.36	29.48	17.88	32.19	118.88
	40	44.18	38.80	29.48	9.32	22.38	118.88
	50	37.65	33.07	29.48	3.59	10.77	118.88

QUANTITY STORAGE REQUIREMENTS - 100 Year

0.351 = Area(ha)
1.00 = *C

Return Period	Time (min)	Intensity (mm/hr)	Flow Q (L/s)	Allowable Runoff (L/s)	Net Runoff To Be Stored (L/s)	Storage Req'd (m^3)	Storage Available (m^3)
	0	398.62	388.96	29.48	359.49	0.00	118.88
	10	178.56	174.23	29.48	144.76	86.85	118.88
100 YEAR	20	119.95	117.05	29.48	87.57	105.08	118.88
	30	**91.87**	**89.64**	**29.48**	**60.17**	**108.30**	**118.88**
	40	75.15	73.33	29.48	43.85	105.23	118.88
	50	63.95	62.41	29.48	32.93	98.78	118.88
	60	55.89	54.54	29.48	25.06	90.23	118.88
	70	49.79	48.58	29.48	19.11	80.24	118.88

*Storage available is calculated using roof ponding area multiplied by the maximum ponding depth, divided by 3 for a conical pond, reduced by 20% to account for roof top equipment
**Refer to roof drains area and storage volume table on DWG C08 for details

Equations:

Flow Equation
$Q = 2.78 \times C \times I \times A$
Where:
C is the runoff coefficient
I is the intensity of rainfall, City of Ottawa IDF
A is the total drainage area

Roof Drain	Roof ID	Area (m^2)	Depth (m)	Theoretical Rooftop Storage Volume (m^3)	Storage Volume (m^3)	Max Flow Rate (L/s)
1	RD1	135.18	0.127	5.7	4.6	0.87
2	RD1	135.18	0.127	5.7	4.6	0.87
3	RD2	131.96	0.127	5.6	4.5	0.87
4	RD2	131.96	0.127	5.6	4.5	0.87
5	RD3	142.08	0.127	6.0	4.8	0.87
6	RD3	142.08	0.127	6.0	4.8	0.87
7	RD4	139.69	0.127	5.9	4.7	0.87
8	RD4	139.69	0.127	5.9	4.7	0.87
9	RD5	85.10	0.127	3.6	2.9	0.87
10	RD5	85.10	0.127	3.6	2.9	0.87
11	RD6	105.47	0.127	4.5	3.6	0.87
12	RD6	105.47	0.127	4.5	3.6	0.87
13	RD7	96.74	0.127	4.1	3.3	0.87
14	RD7	96.74	0.127	4.1	3.3	0.87
15	RD8	112.83	0.127	4.8	3.8	0.87
16	RD8	112.83	0.127	4.8	3.8	0.87
17	RD9	114.39	0.127	4.8	3.9	0.87
18	RD9	114.39	0.127	4.8	3.9	0.87
19	RD10	140.16	0.127	5.9	4.7	0.87
20	RD10	140.16	0.127	5.9	4.7	0.87
21	RD11	105.31	0.127	4.5	3.6	0.87
22	RD11	105.31	0.127	4.5	3.6	0.87
23	RD12	108.48	0.127	4.6	3.7	0.87
24	RD12	108.48	0.127	4.6	3.7	0.87
25	RD13	92.40	0.127	3.9	3.1	0.87
26	RD13	92.40	0.127	3.9	3.1	0.87
27	RD14	86.44	0.127	3.7	2.9	0.87
28	RD14	86.44	0.127	3.7	2.9	0.87
29	RD15	68.08	0.127	2.9	2.3	0.87
30	RD15	68.08	0.127	2.9	2.3	0.87
31	RD16	53.30	0.127	2.3	1.8	0.87
32	RD16	53.30	0.127	2.3	1.8	0.87
33	RD17	37.55	0.127	1.6	1.3	0.87
34	RD17	37.55	0.127	1.6	1.3	0.87
Total		**3510.3**			**118.9**	**29.48**

Stormceptor® Rinker Materials

Stormceptor® EF Sizing Report

Imbrium® Systems
ESTIMATED NET ANNUAL SEDIMENT (TSS) LOAD REDUCTION

02/26/2025

Province:	Ontario
City:	Ottawa
Nearest Rainfall Station:	OTTAWA CDA RCS
Climate Station Id:	6105978
Years of Rainfall Data:	20

Site Name:	

Drainage Area (ha):	1.469
% Imperviousness:	49.60

Runoff Coefficient 'c': 0.59

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

Required Water Quality Runoff Volume Capture (%):	90.00
Estimated Water Quality Flow Rate (L/s):	28.33
Oil / Fuel Spill Risk Site?	Yes
Upstream Flow Control?	No
Peak Conveyance (maximum) Flow Rate (L/s):	
Influent TSS Concentration (mg/L):	200
Estimated Average Annual Sediment Load (kg/yr):	803
Estimated Average Annual Sediment Volume (L/yr):	653

Project Name:	CEPEO Leitrim ES
Project Number:	CA0040067.4396
Designer Name:	Devang Maratha
Designer Company:	WSP Canada
Designer Email:	devang.maratha@wsp.com
Designer Phone:	613-265-6409
EOR Name:	
EOR Company:	
EOR Email:	
EOR Phone:	

Net Annual Sediment (TSS) Load Reduction Sizing Summary

Stormceptor Model	TSS Removal Provided (%)
EFO4	74
EFO5	81
EFO6	86
EFO8	92
EFO10	95
EFO12	97

Recommended Stormceptor EFO Model: EFO5

Estimated Net Annual Sediment (TSS) Load Reduction (%): 81

Water Quality Runoff Volume Capture (%): > 90

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THIRD-PARTY TESTING AND VERIFICATION

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

PERFORMANCE

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

PARTICLE SIZE DISTRIBUTION (PSD)

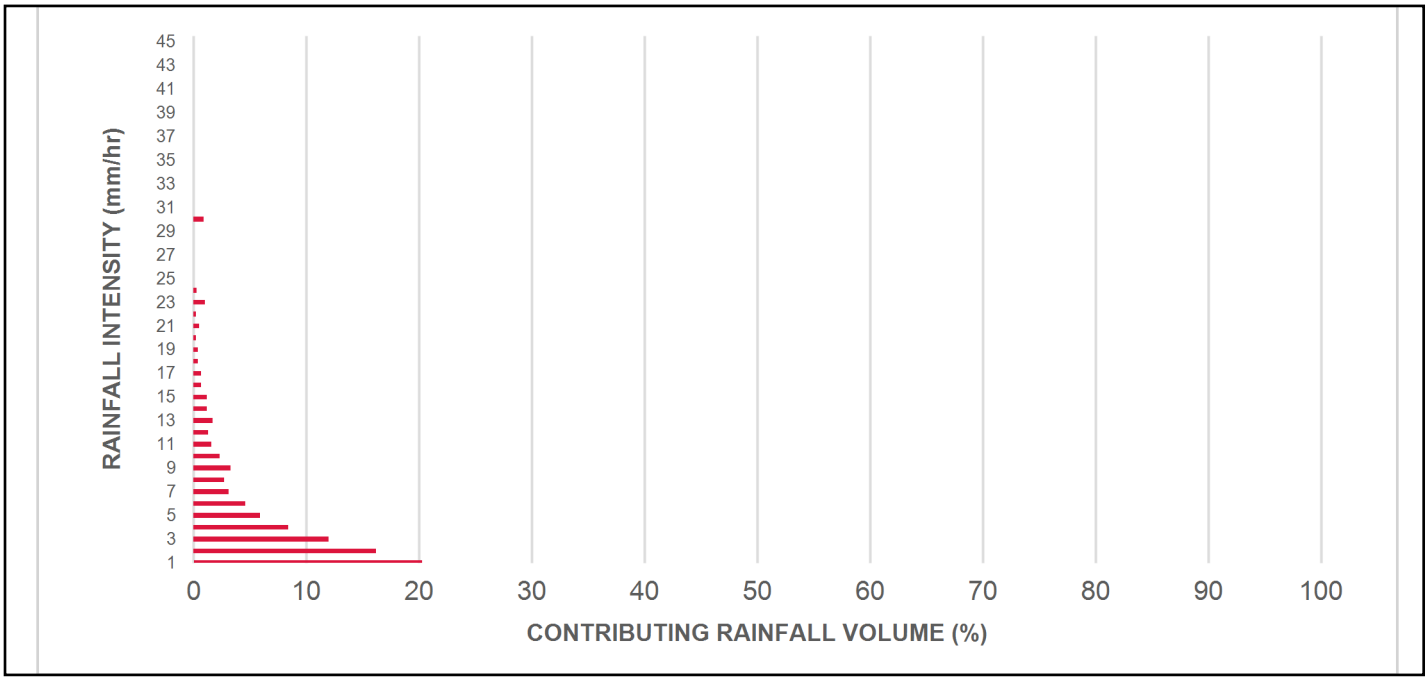
►The **Canadian ETV PSD** shown in the table below was used, or in part, for this sizing. This is the identical PSD that is referenced in the Canadian ETV ***Procedure for Laboratory Testing of Oil-Grit Separators*** for both sediment removal testing and scour testing. The Canadian ETV PSD contains a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

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

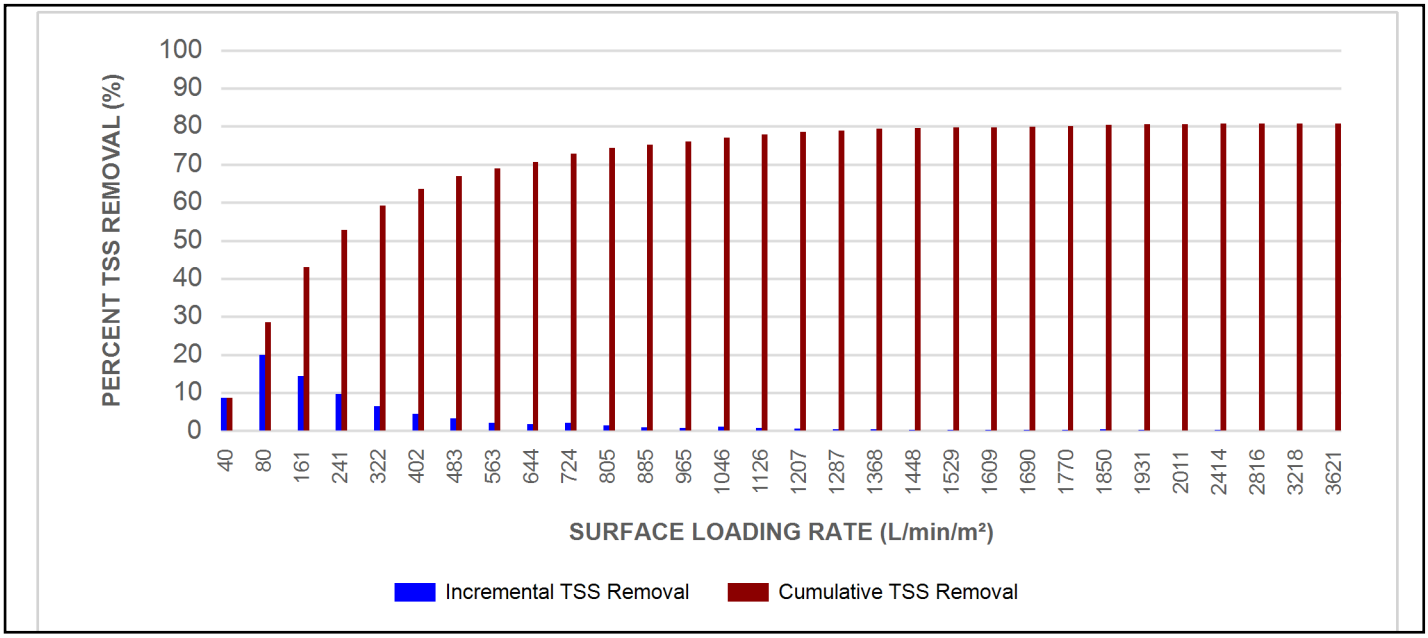
Rainfall Intensity (mm / hr)	Percent Rainfall Volume (%)	Cumulative Rainfall Volume (%)	Flow Rate (L/s)	Flow Rate (L/min)	Surface Loading Rate (L/min/m²)	Removal Efficiency (%)	Incremental Removal (%)	Cumulative Removal (%)
0.50	8.6	8.6	1.22	73.0	40.0	100	8.6	8.6
1.00	20.3	29.0	2.44	146.0	80.0	98	20.0	28.6
2.00	16.2	45.2	4.88	293.0	161.0	88	14.3	43.0
3.00	12.0	57.2	7.32	439.0	241.0	81	9.7	52.7
4.00	8.4	65.6	9.76	586.0	322.0	78	6.5	59.2
5.00	5.9	71.6	12.20	732.0	402.0	74	4.4	63.6
6.00	4.6	76.2	14.64	879.0	483.0	70	3.3	66.9
7.00	3.1	79.3	17.08	1025.0	563.0	66	2.0	68.9
8.00	2.7	82.0	19.52	1171.0	644.0	64	1.8	70.7
9.00	3.3	85.3	21.96	1318.0	724.0	64	2.1	72.8
10.00	2.3	87.6	24.40	1464.0	805.0	63	1.4	74.3
11.00	1.6	89.2	26.85	1611.0	885.0	62	1.0	75.2
12.00	1.3	90.5	29.29	1757.0	965.0	62	0.8	76.0
13.00	1.7	92.2	31.73	1904.0	1046.0	61	1.0	77.1
14.00	1.2	93.5	34.17	2050.0	1126.0	59	0.7	77.8
15.00	1.2	94.6	36.61	2196.0	1207.0	57	0.7	78.5
16.00	0.7	95.3	39.05	2343.0	1287.0	55	0.4	78.9
17.00	0.7	96.1	41.49	2489.0	1368.0	53	0.4	79.3
18.00	0.4	96.5	43.93	2636.0	1448.0	51	0.2	79.5
19.00	0.4	96.9	46.37	2782.0	1529.0	48	0.2	79.7
20.00	0.2	97.1	48.81	2929.0	1609.0	45	0.1	79.7
21.00	0.5	97.5	51.25	3075.0	1690.0	43	0.2	79.9
22.00	0.2	97.8	53.69	3221.0	1770.0	41	0.1	80.1
23.00	1.0	98.8	56.13	3368.0	1850.0	40	0.4	80.4
24.00	0.3	99.1	58.57	3514.0	1931.0	38	0.1	80.6
25.00	0.0	99.1	61.01	3661.0	2011.0	36	0.0	80.6
30.00	0.9	100.0	73.21	4393.0	2414.0	30	0.3	80.8
35.00	0.0	100.0	85.42	5125.0	2816.0	26	0.0	80.8
40.00	0.0	100.0	97.62	5857.0	3218.0	23	0.0	80.8
45.00	0.0	100.0	109.82	6589.0	3621.0	20	0.0	80.8
Estimated Net Annual Sediment (TSS) Load Reduction =								**81 %**

Climate Station ID: 6105978 *Years of Rainfall Data*: 20

RAINFALL DATA FROM OTTAWA CDA RCS RAINFALL STATION



INCREMENTAL AND CUMULATIVE TSS REMOVAL FOR THE RECOMMENDED STORMCEPTOR® MODEL



Maximum Pipe Diameter / Peak Conveyance

Stormceptor EF / EFO	Model Diameter		Min Angle Inlet / Outlet Pipes	Max Inlet Pipe Diameter		Max Outlet Pipe Diameter		Peak Conveyance Flow Rate	
	(m)	(ft)		(mm)	(in)	(mm)	(in)	(L/s)	(cfs)
EF4 / EFO4	1.2	4	90	609	24	609	24	425	15
EF5 / EFO5	1.5	5	90	762	30	762	30	710	25
EF6 / EFO6	1.8	6	90	914	36	914	36	990	35
EF8 / EFO8	2.4	8	90	1219	48	1219	48	1700	60
EF10 / EFO10	3.0	10	90	1828	72	1828	72	2830	100
EF12 / EFO12	3.6	12	90	1828	72	1828	72	2830	100

SCOUR PREVENTION AND ONLINE CONFIGURATION

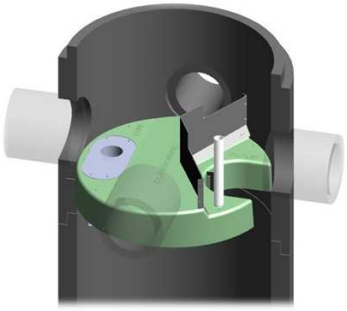
►**Stormceptor® EF and EFO** feature an internal bypass and superior scour prevention technology that have been demonstrated in third-party testing according to the scour testing provisions of the Canadian ETV **Procedure for Laboratory Testing of Oil-Grit Separators**, and the exceptional scour test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

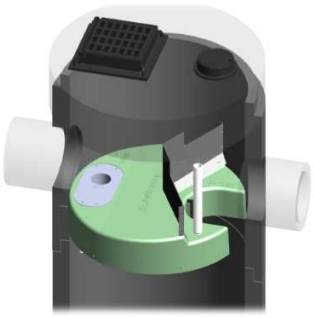
DESIGN FLEXIBILITY

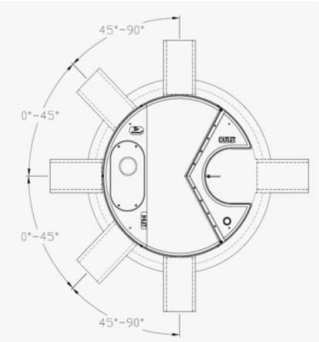
►**Stormceptor® EF** and **EFO** offers design flexibility in one simplified platform, accepting stormwater flow from a single inlet pipe or multiple inlet pipes, and/or surface runoff through an inlet grate. The device can also serve as a junction structure, accommodate a 90-degree inlet-to-outlet bend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

OIL CAPTURE AND RETENTION

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







INLET-TO-OUTLET DROP

Elevation differential between inlet and outlet pipe inverts is dictated by the angle at which the inlet pipe(s) enters the unit.
0° - 45° : The inlet pipe is 1-inch (25mm) higher than the outlet pipe.
45° - 90° : The inlet pipe is 2-inches (50mm) higher than the outlet pipe.

HEAD LOSS

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

Pollutant Capacity

Stormceptor EF / EFO	Model Diameter		Depth (Outlet Pipe Invert to Sump Floor)		Oil Volume		Recommended Sediment Maintenance Depth *		Maximum Sediment Volume *		Maximum Sediment Mass **	
	(m)	(ft)	(m)	(ft)	(L)	(Gal)	(mm)	(in)	(L)	(ft^3)	(kg)	(lb)
EF4 / EFO4	1.2	4	1.52	5.0	265	70	203	8	1190	42	1904	5250
EF5 / EFO5	1.5	5	1.62	5.3	420	111	305	10	2124	75	2612	5758
EF6 / EFO6	1.8	6	1.93	6.3	610	160	305	12	3470	123	5552	15375
EF8 / EFO8	2.4	8	2.59	8.5	1070	280	610	24	8780	310	14048	38750
EF10 / EFO10	3.0	10	3.25	10.7	1670	440	610	24	17790	628	28464	78500
EF12 / EFO12	3.6	12	3.89	12.8	2475	655	610	24	31220	1103	49952	137875

*Increased sump depth may be added to increase sediment storage capacity
** Average density of wet packed sediment in sump = 1.6 kg/L (100 lb/ft^3)

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

STANDARD STORMCEPTOR EF/EFO DRAWINGS

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

STANDARD STORMCEPTOR EF/EFO SPECIFICATION

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

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

PART 1 – GENERAL

1.1 WORK INCLUDED

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

1.2 REFERENCE STANDARDS & PROCEDURES

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

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

1.3 SUBMITTALS

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

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

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

PART 2 – PRODUCTS

2.1 OGS POLLUTANT STORAGE

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

2.1.1	4 ft (1219 mm) Diameter OGS Units:	1.19 m^3 sediment / 265 L oil
	5 ft (1524 mm) Diameter OGS Units:	1.95 m^3 sediment / 420 L oil
	6 ft (1829 mm) Diameter OGS Units:	3.48 m^3 sediment / 609 L oil
	8 ft (2438 mm) Diameter OGS Units:	8.78 m^3 sediment / 1,071 L oil
	10 ft (3048 mm) Diameter OGS Units:	17.78 m^3 sediment / 1,673 L oil
	12 ft (3657 mm) Diameter OGS Units:	31.23 m^3 sediment / 2,476 L oil

PART 3 – PERFORMANCE & DESIGN

3.1 GENERAL

The OGS stormwater quality treatment device shall be verified in accordance with ISO 14034:2016 Environmental management – Environmental technology verification (ETV). The OGS stormwater quality treatment device shall remove oil, sediment and gross pollutants from stormwater runoff during frequent wet weather events, and retain these pollutants during less frequent high flow wet weather events below the insert within the OGS for later removal during maintenance. The Manufacturer shall have at least ten (10) years of local experience, history and success in engineering design, manufacturing and production and supply of OGS stormwater quality treatment device systems, acceptable to the Engineer of Record.

3.2 SIZING METHODOLOGY

The OGS device shall be engineered, designed and sized to provide stormwater quality treatment based on treating a minimum of 90 percent of the average annual runoff volume and a minimum removal of an annual average 60% of the sediment (TSS) load based on the Particle Size Distribution (PSD) specified in the sizing report for the specified device. Sizing of the OGS shall be determined by use of a minimum ten (10) years of local historical rainfall data provided by Environment Canada. Sizing shall also be determined by use of the sediment removal performance data derived from the ISO 14034 ETV third-party verified laboratory testing data from testing conducted in accordance with the Canadian ETV protocol Procedure for Laboratory Testing of Oil-Grit Separators, as follows:

3.2.1 Sediment removal efficiency for a given surface loading rate and its associated flow rate shall be based on sediment removal efficiency demonstrated at the seven (7) tested surface loading rates specified in the protocol, ranging 40 L/min/m^2 to 1400 L/min/m^2, and as stated in the ISO 14034 ETV Verification Statement for the OGS device.

3.2.2 Sediment removal efficiency for surface loading rates between 40 L/min/m^2 and 1400 L/min/m^2 shall be based on linear interpolation of data between consecutive tested surface loading rates.

3.2.3 Sediment removal efficiency for surface loading rates less than the lowest tested surface loading rate of 40 L/min/m^2 shall be assumed to be identical to the sediment removal efficiency at 40 L/min/m^2. No extrapolation shall be allowed that results in a sediment removal efficiency that is greater than that demonstrated at 40 L/min/m^2.

3.2.4 Sediment removal efficiency for surface loading rates greater than the highest tested surface loading rate of 1400 L/min/m^2 shall assume zero sediment removal for the portion of flow that exceeds 1400 L/min/m^2, and shall be calculated using a simple proportioning formula, with 1400 L/min/m^2 in the numerator and the higher surface loading rate in the denominator, and multiplying the resulting fraction times the sediment removal efficiency at 1400 L/min/m^2.

The OGS device shall also have sufficient annual sediment storage capacity as specified and calculated in Section 2.1.

3.3 CANADIAN ETV or ISO 14034 ETV VERIFICATION OF SCOUR TESTING

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

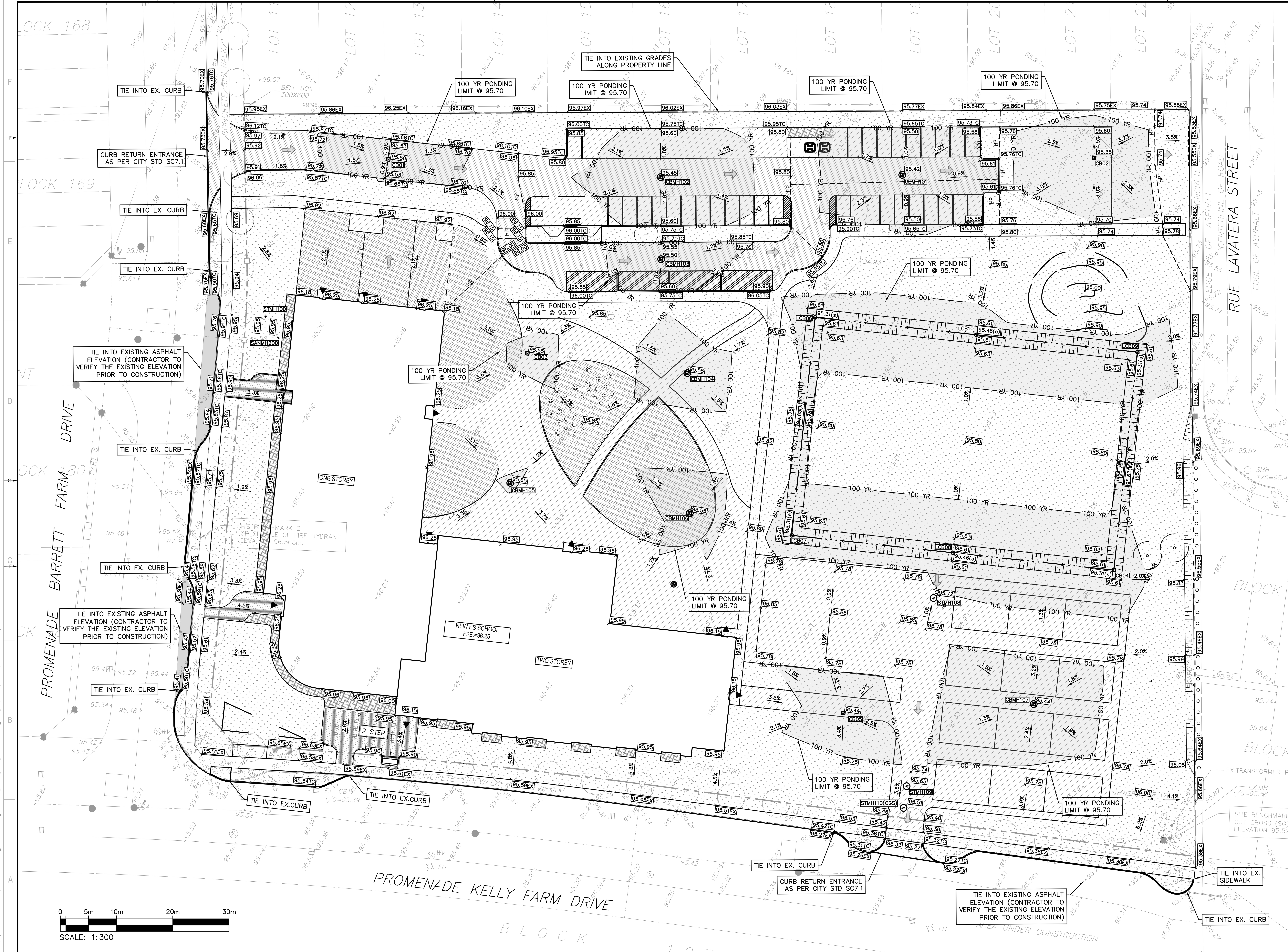
3.3.1 To be acceptable for on-line installation, the OGS device must demonstrate an average scour test effluent concentration less than 10 mg/L at each surface loading rate tested, up to and including 2600 L/min/m^2.

3.4 LIGHT LIQUID RE-ENTRAINMENT SIMULATION TESTING

The OGS device shall have Canadian ETV or ISO 14034 ETV Verification of completed third-party Light Liquid

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

3.4.1 For an OGS device to be an acceptable stormwater treatment device on a site where vehicular traffic occurs and the potential for an oil or fuel spill exists, the OGS device must have reported verified performance results of greater than 99% cumulative retention of LDPE plastic beads for the five specified surface loading rates (ranging 200 L/min/m^2 to 2600 L/min/m^2) in accordance with the Light Liquid Re-entrainment Simulation Testing within the Canadian ETV Program's **Procedure for Laboratory Testing of Oil-Grit Separators.** However, an OGS device shall not be allowed if the Light Liquid Re-entrainment Simulation Testing was performed with screening components within the OGS device that are effective at retaining the LDPE plastic beads, but would not be expected to retain light liquids such as oil and fuel.



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2025-02-27
PROVINCE OF ONTARIO

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CLIENT REF. #:

PROJECT:

ÉCOLE ÉLÉMENTRIRE LEITRIM

3955 PROMENADE KELLY FARM, OTTAWA

KEY PLAN:

BEARING NOTE

BEARINGS ARE MTM GRID, DERVIED FROM THE EASTERLY LIMIT OF BLOCK 196 PLAN 4M-1640, HAVING A GRID BEARING OF N30°41'10"E.
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ELEVATION NOTE

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ELEVATION=95.230

ISSUED FOR - REVISION:

IS	RE	DATE	DESCRIPTION
1		2025-02-27	ISSUED FOR SITE PLAN APPLICATION

PROJECT NO: CA0040067.4396
DATE: FEBURARY 2025
ORIGINAL SCALE: 1:300
IF THIS BAR IS NOT 25mm LONG, ADJUST YOUR PLOTTING SCALE.
25mm
DESIGNED BY: M.S./D.M.
DRAWN BY: J.T.
CHECKED BY: D.Y.
DISCIPLINE: CIVIL
TITLE:

GRADING PLAN

SHEET NUMBER: C03
SHEET #: 3 OF 7
ISSUE: ISSUED FOR SITE PLAN APPLICATION
REV #: 1
DATE OF: 2025-02-27

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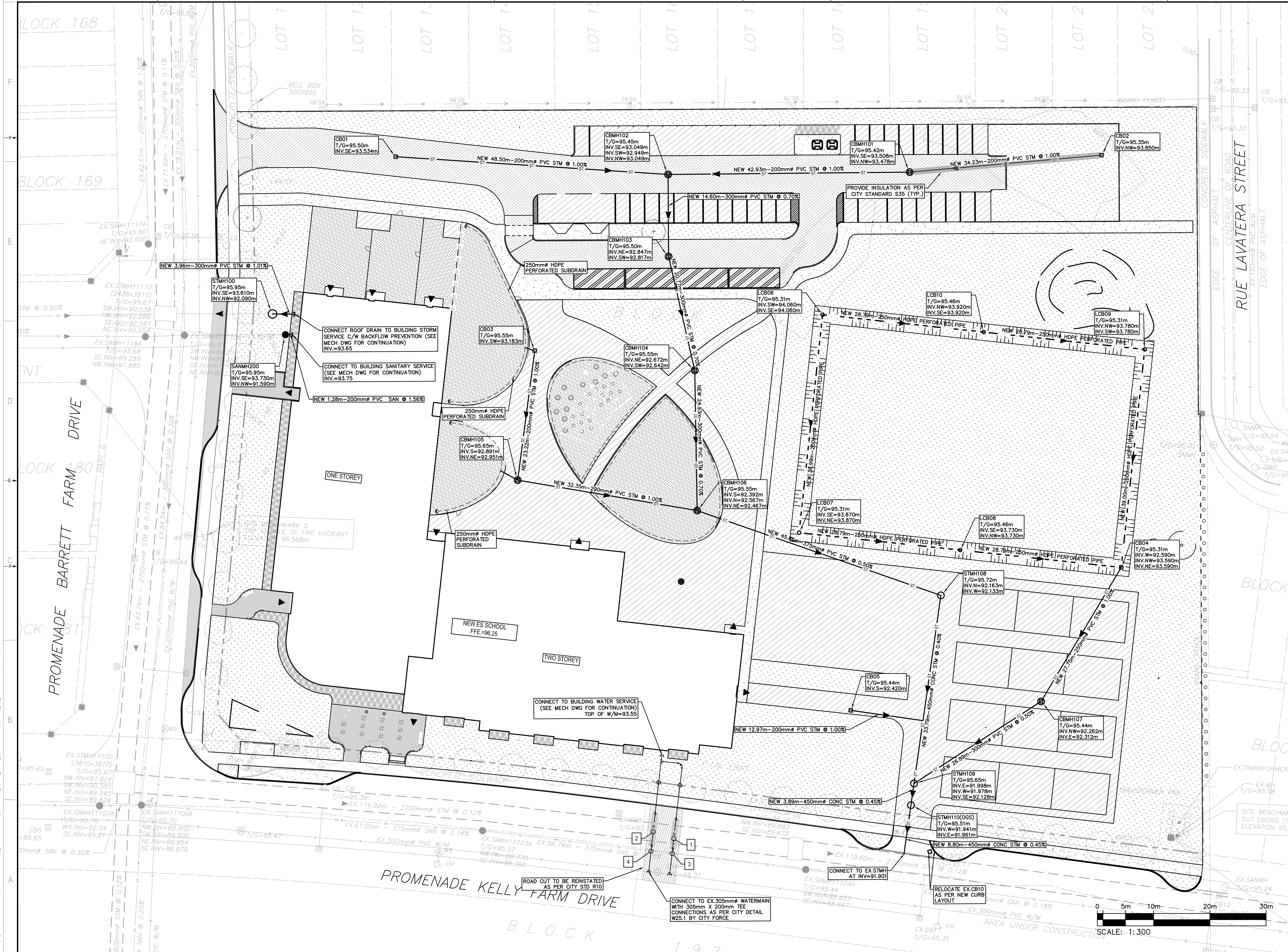
CB01
T/G=95.50m
INV.SE=93.534m
NEW 48.50m-200mmø PVC STM @ 1.00%
CBMH102
T/G=95.45m
INV.SE=93.049m
INV.SW=92.949m
INV.NW=93.049m
NEW 42.93m-200mmø PVC STM @ 1.00%
CBMH101
T/G=95.42m
INV.SE=93.508m
INV.NW=93.478m
NEW 34.23m-200mmø PVC STM @ 1.00%
CB02
T/G=95.35m
INV.NW=93.850m
PROVIDE INSULATION AS PER CITY STANDARD S35 (TYP.)
NEW 14.60m-300mmø PVC STM @ 0.70%
CBMH103
T/G=95.50m
INV.NE=92.847m
INV.SW=92.817m
250mmø HDPE PERFORATED SUBDRAIN
NEW 3.96m-300mmø PVC STM @ 1.01%
STMH100
T/G=95.95m
INV.SE=93.610m
INV.NW=92.090m
CONNECT ROOF DRAIN TO BUILDING STORM SERVICE C/W BACKFLOW PREVENTION (SEE MECH DWG FOR CONTINUATION)
INV.=93.65
CONNECT TO BUILDING SANITARY SERVICE (SEE MECH DWG FOR CONTINUATION)
INV.=93.75
SANMH200
T/G=95.95m
INV.SE=93.730m
INV.NW=91.590m
NEW 1.28m-200mmø PVC SAN @ 1.56%
CB03
T/G=95.55m
INV.SW=93.183m
CBMH104
T/G=95.55m
INV.NE=92.672m
INV.SW=92.642m
LCB06
T/G=95.31m
INV.SW=94.060m
INV.SE=94.060m
LCB10
T/G=95.46m
INV.NW=93.920m
INV.SE=93.920m
LCB09
T/G=95.31m
INV.NW=93.780m
INV.SW=93.780m
250mmø HDPE PERFORATED SUBDRAIN
CBMH105
T/G=95.65m
INV.S=92.891m
INV.NE=92.951m
NEW 32.35m-290mmø PVC STM @ 1.00%
CBMH106
T/G=95.55m
INV.S=92.392m
INV.N=92.567m
INV.NE=92.467m
LCB07
T/G=95.31m
INV.SE=93.870m
INV.NE=93.870m
LCB08
T/G=95.46m
INV.SE=93.730m
INV.NE=93.730m
CB04
T/G=95.31m
INV.W=92.590m
INV.NW=93.590m
INV.NE=93.590m
250mmø HDPE PERFORATED SUBDRAIN
ONE STOREY
NEW ES SCHOOL
FFE.=96.25
TWO STOREY
STMH108
T/G=95.72m
INV.N=92.163m
INV.W=92.133m
CB05
T/G=95.44m
INV.S=92.420m
CONNECT TO BUILDING WATER SERVICE (SEE MECH DWG FOR CONTINUATION)
TOP OF W/M=93.55
NEW 12.97m-200mmø PVC STM @ 1.00%
CBMH107
T/G=95.44m
INV.NW=92.262m
INV.E=92.312m
STMH109
T/G=95.65m
INV.E=91.998m
INV.W=91.978m
INV.SE=92.128m
NEW 3.89m-450mmø CONC STM @ 0.45%
STMH110(OGS)
T/G=95.51m
INV.W=91.941m
INV.E=91.961m
NEW 8.80m-450mmø CONC STM @ 0.45%
CONNECT TO EX.STMH AT INV=91.901
RELOCATE EX.CB10 AS PER NEW CURB LAYOUT
ROAD CUT TO BE REINSTATED AS PER CITY STD R10
CONNECT TO EX.305mmø WATERMAIN WITH 305mm X 200mm TEE CONNECTIONS AS PER CITY DETAIL W25.1 BY CITY FORCE
PROMENADE KELLY FARM DRIVE
PROMENADE BARRETT FARM DRIVE
RUE LAVATERA STREET
BLOCK 168
BLOCK 169
SCALE: 1:300
0 5m 10m 20m 30m

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2025-02-27
PROVINCE OF ONTARIO

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CLIENT REF. #:

PROJECT:

ÉCOLE ÉLÉMENTRIRE LEITRIM

3955 PROMENADE KELLY FARM, OTTAWA

KEY PLAN:

BEARING NOTE
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IS	RE	DATE	DESCRIPTION
1		2025-02-27	ISSUED FOR SITE PLAN APPLICATION

PROJECT NO: CA0040067.4396
DATE: FEBURARY 2025
ORIGINAL SCALE: 1:300
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25mm
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DRAWN BY: J.T.
CHECKED BY: D.Y.
DISCIPLINE: CIVIL
TITLE: SERVICING PLAN
SHEET NUMBER: C04
SHEET #: 4 OF 7
ISSUE: ISSUED FOR SITE PLAN APPLICATION
REV #: 1
DATE OF: 2025-02-27

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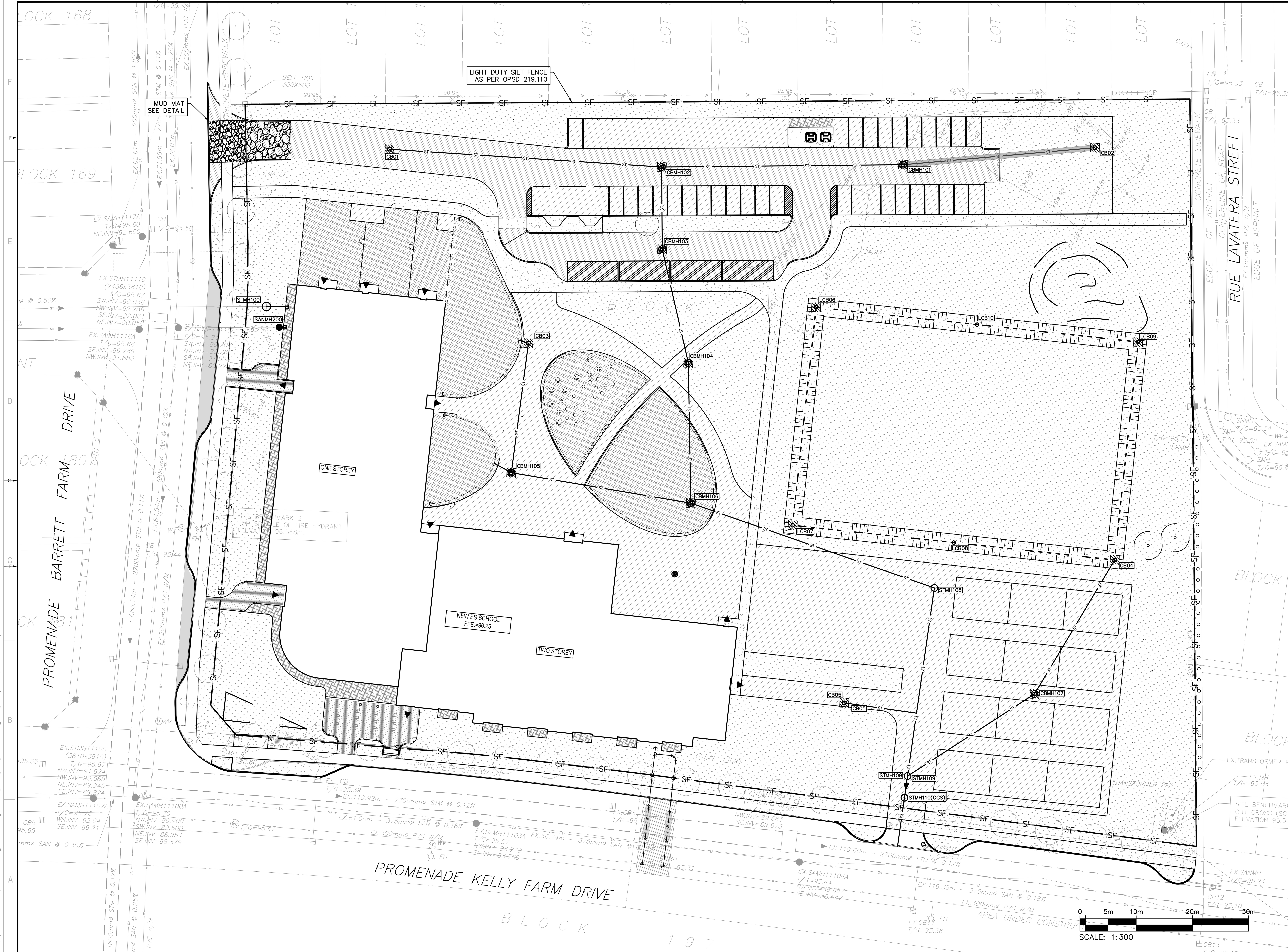
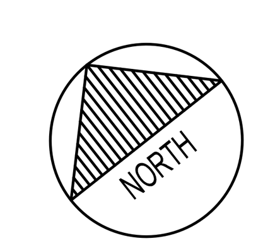
APPENDIX

D

- DWG C05 - EROSION AND SEDIMENTATION CONTROL PLAN





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CLIENT REF. #:

PROJECT:

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ORIGINAL SCALE: 1:300
IF THIS BAR IS NOT 25mm LONG, ADJUST YOUR PLOTTING SCALE. 25mm
DESIGNED BY: M.S./D.M.
DRAWN BY: J.T.
CHECKED BY: D.Y.

DISCIPLINE: CIVIL

TITLE: EROSION AND SEDIMENT CONTROL PLAN

SHEET NUMBER: C05
SHEET # 5 OF 7

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DATE OF: 2025-02-27
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APPENDIX

E

- SUBMISSION CHECK LIST

1. Accessible Parking Spaces

The terms Type A and Type B Parking Spaces have the same meaning as within O. Reg 191/11

This section applies to:

1) *Parking garages and related structures*
2) *Surface parking*
3) *On-street parking*

Standard Ref.	Requirements	Compliance	Comments
3.1.1.	**Provision:** 1 Type A accessible parking space must be provided where there are 12 or fewer spaces (see Table 3 for a complete list)	Y N N/A	
3.1.2	**Provision:** 4% of the total number of parking spaces should be accessible	Y N N/A	
3.1.2	**Provision:** if the total number of spaces is greater than 1001, provide 11 accessible parking spaces plus an addition 1% of the total number of spaces	Y N N/A	
3.1.3	**Access Aisle:** minimum of 1.5 m (see Figure 25)	Y N N/A	
3.1.3	**Location:** a maximum of 30 m from nearest accessible entrance	Y N N/A	
3.1.3	**Surface:** firm, stable and slip resistant	Y N N/A	
3.1.3	**Running slope:** maximum of 1:50 (2%)	Y N N/A	
3.1.3	**Cross slope:** maximum of 1:50 (2%)	Y N N/A	
3.1.3	**Type A spaces:** Length 5.2 m Width 3.4 m Type B spaces Length: 5.2 m Width: 2.4 m	Y N N/A	
3.1.3	**Overhead clearance:** minimum of 2.1 m	Y N N/A	
3.1.3	**Access Aisle:** minimum of 1.5 m. Must be clearly marked and adjacent to accessible parking space	Y N N/A	
3.1.4.1	**Vertical Signage:** **Width:** 0.3 m **Height:** 0.6 m (minimums)	Y N N/A	

Note – this Checklist must be read in conjunction with the City of Ottawa's Accessible Design Standards Document, 2015. All figures referenced in this document can be found in the City's Accessible Design Standards document.

	Mounted: 1.5 m to 2.0 m high at centre • Marked with International Symbol of Accessibility (see Figure 25)		
3.1.4.2	**Pavement Markings** • Marked with the International Symbol of Accessibility • 15.25 m wide by 15.25 m deep • Locate near the back of the space for 90 degree or angled parking spaces • Locate in the centre for parallel parking spaces (see Figure 27)	Y N N/A	

2. Passenger Loading Zone

Standard Ref.	Requirements	Compliance	Comments
3.2.1	**Location:** maximum of 30 m from nearest accessible entrance	Y N N/A	
3.2.1	**Side Access Aisle** **Length:** 7.4 m **Width:** 2.4 m (minimums) (see Figure 28)	Y N N/A	
3.2.1	**Vertical Clearance:** 3.6 m	Y N N/A	
3.2.1	**Path of Travel:** minimum of 1.8 m wide to nearest accessible entrance	Y N N/A	
3.2.1.1	**Vertical Signage** **Width**: 0.3 m by 0.6 m **Mount:** 1.5 m to 2.0 m high at centre (see Figure 29)	Y N N/A	

Note – this Checklist must be read in conjunction with the City of Ottawa's Accessible Design Standards Document, 2015. All figures referenced in this document can be found in the City's Accessible Design Standards document.

3. Exterior Paths of Travel

Where stairs are located on an accessible Exterior route or walkway, an alternative Accessible route is to be provided immediately adjacent to the stairs

This section applies to:

1) *Pedestrian routes that serve facility entrances*
2) *Pedestrian routes that serve as a connection between a site boundary and entrance into the site*
3) *Public Rights-of-Way*
4) *Ramps and Curb Ramps*

Standard Ref.	Requirements	Compliance	Comments
3.3.1	**Surface:** firm, stable and slip resistant	Y N N/A	
3.3.1	**Lighting**: Provide in accordance with Section 5.7 (Lighting)	Y N N/A	
3.3.2	**Path of travel:** minimum 1.8 m wide	Y N N/A	
3.3.3.1	**Running Slope:** 1:20 (5%) (maximum)	Y N N/A	
3.3.3.2	**Cross Slope:** 1:20 (2%) (maximum) where surface is concrete or asphalt. 1:10 (10%) in all other cases.	Y N N/A	
3.3.1	**Rest Area:** If width is less than 1.8 m, provided every 30 m along path of travel. Rest area to be 1.8 m by 1.8 m (minimums)	Y N N/A	
3.3.4	**Guards:** Provide when change in level is more than 0.6 m	Y N N/A	
2.1.4	**Gratings or Openings:** 13 mm (maximum) wide in direction of travel. Longest side, if rectangular, must be perpendicular with the direction of travel	Y N N/A	

4. Curb Ramps

A curb ramp provides a transition where there is a change in level between exterior path of travel and adjacent vehicular route

This section applies to:

1) *Pedestrian crossings at intersections*
2) *Parking spaces, passenger loading zones and related access aisles*
3) *Any other exterior route where there is a grade change.*

Standard Ref.	Requirements	Compliance	Comments
3.4.1	**Surface:** firm, stable and slip resistant	Y N N/A	
3.4.2	**Clear width:** 1.5 m (minimum), exclusive of flares	Y N N/A	
3.4.3	**Running Slope**: 1:12 (8.33%) (maximum)	Y N N/A	
3.4.3	**Cross Slope:** 1:50 (2%) (maximum) (see Figure 33b)	Y N N/A	
3.4.6	**Tactile Surface Walking Indicators (TWSI):** minimum depth of 610mm, at 150 mm to 200 mm from edge of curb (see 33b)	Y N N/A	
3.4.2.2	**Flared Side:** 1m wide; slope 1:15 to 1:10.	Y N N/A	

Note – this Checklist must be read in conjunction with the City of Ottawa's Accessible Design Standards Document, 2015. All figures referenced in this document can be found in the City's Accessible Design Standards document.

5. Ramps

Ramps are provided when the slope of a path of travel exceeds a gradient of 1:20 (5%)

Refer to the Ontario Building Code for all applied requirements for ramps.

For all ramp standards, see Figure 3

Standard Ref.	Requirements	Compliance	Comments
2.2.1.1	**Running Slope:** 1:15 (6.67%)	Y N N/A	
2.2.1.2	**Cross-Slope:** 1:50 (2%)	Y N N/A	
2.2.1	**Surface:** firm, stable and slip-resistant	Y N N/A	
2.2.1	**Clear Width:** 1.1 m (minimum)	Y N N/A	
2.2.1.4	**Colour Contrasting Strip:** to be provided at slope changes. 50 mm wide colour-contrasted and slip resistant strip equal to the width of the ramp	Y N N/A	
2.2.1	**Lighting:** provide in accordance with Section 5.7 (Lighting)	Y N N/A	
2.2.2	**Length:** 9 m, or less, or provide landing	Y N N/A	
2.2.2	**Landing:** to be provided at top, bottom or intermediate level, or where there is directional change. (see Figure 5)	Y N N/A	
2.2.3.1	**Handrail:** 865 to 965 mm high on both sides. **Clear width**: 1.1 m between handrails (see Figure 8)	Y N N/A	

Note – this Checklist must be read in conjunction with the City of Ottawa's Accessible Design Standards Document, 2015. All figures referenced in this document can be found in the City's Accessible Design Standards document.

6. Stairs

This section applies to stairs provided for exterior or interior environments

Refer to the Ontario Building Code for all applied requirements for stairs.

For all stair standards, see Figure 10

Standard Ref.	Requirements	Compliance	Comments
2.3	**Stairs:** where provided, an alternative accessible route is to be provided immediately adjacent, and may include a ramp or other accessible means of negotiating grade change	Y N N/A	Note which alternative to stairs is provided.
2.3.1	**Surface:** firm, stable and slip-resistant	Y N N/A	
2.3.1.1	**Tread:** 280 mm to 355 mm deep	Y N N/A	
2.3.1.1	**Riser:** 125 mm to 180 mm high	Y N N/A	
2.3.1	**Open Riser:** not permitted	Y N N/A	
2.3.1.2	**Nosing Projection:** 38 mm (maximum) (see Figure 10)	Y N N/A	
2.3.1.2	**Nosing Strip**: 50 mm deep, colour contrasted, at leading edge of tread and extending the full length of the tread	Y N N/A	
2.3.1.3	**Tactile Surface Walking Indicators (TWSI):** minimum of 610 mm deep, one tread back (see Figure 11)	Y N N/A	
2.3.1	**Lighting:** to be provided in accordance with Section 5.7	Y N N/A	
2.3.2.2	**Handrail:** 865 mm to 965 mm high on both sides. (see Figure 12)	Y N N/A	

7. Building Entrance			*This section does not apply* ☐
Standard Ref	Requirements	Compliance	Comments
4.1.1	**Provision:** at least one (1) accessible entrance 50% of the total number of building entrances (see Figure 36)	Y N N/A	
4.1.1	**Provision:** 50% of the total number of building entrances must be accessible (see Figure 36)	Y N N/A	
4.1.1	**Provision:** 30 m or less from nearest accessible parking space, or passenger loading or drop off zones	Y N N/A	

8. Benches and Seats

This section applies to
1) Rest areas and accessible routes
2) Outdoor public use eating areas
3) Waiting areas

Standard Ref	Requirements	Compliance	Comments
2.10.1	Seat height between 450 mm and 500 mm above finished floor (see Figure 23)	Y N N/A	
2.10.1	Seat depth between 330 mm and 510 mm	Y N N/A	
2.10.1	Back support extending 320 mm (minimum) above seat surface	Y N N/A	
2.10.1	Provide at least one (1) armrest at a height between 220 mm and 300 mm from the seat for additional support	Y N N/A	