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1000514608 ONTARIO INC.

PROPOSED COMMERCIAL DEVELOPMENT

3075 PALLADIUM DRIVE, CITY OF OTTAWA, ON.



FUNCTIONAL SERVICING & STORMWATER MANAGEMENT REPORT

CITY SPA FILE NO. D07-12-24-0076

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1 INTRODUCTION

1.1 Scope of the SWM Report

WPE. Engineering Limited has been retained by 10005144608 Ontario Inc. to prepare Functional Servicing and Stormwater Management Report for a proposed commercial development located at 3075 Palladium Drive within the Kanata West Retail Centre (KWRC), itself part of the Kanata West Business Park (KWBP). The subject site is proposed to be developed to include four commercial buildings and associated parking lots. Detailed servicing and stormwater management designs were previously prepared (by IBI Group) and approved for the subject site as part of the overall KWRC development.

This report is prepared to:

- Demonstrate that the amended Site Plan for the subject site can be designed in line with the overarching report titled Design Brief, Kanata West Retail Centre— 3015, 3075 and 3095 Palladium Drive, prepared by IBI Group, dated September 2016 (herein referred to as the IBI Report).
- Detail the proposed means of servicing the site and provide details on how to meet the stormwater management requirements outlined in the overarching IBI Report.

Pre-consultation notes from the City of Ottawa have been provided in **Appendix A** for reference.

1.2 Site Location

The property is located southwest of Palladium Drive and Campeau Drive in the City of Ottawa. The proposed development property is bounded by Campeau Drive to the north, Kanata West Centre Drive (private) to the east, Cabela's Way (private) to the south and an unnamed private access road to the west.

The 2.57 ha subject property is zoned General Mixed Use and is currently undeveloped. Refer to **FIG. 1** for the location of the development site.

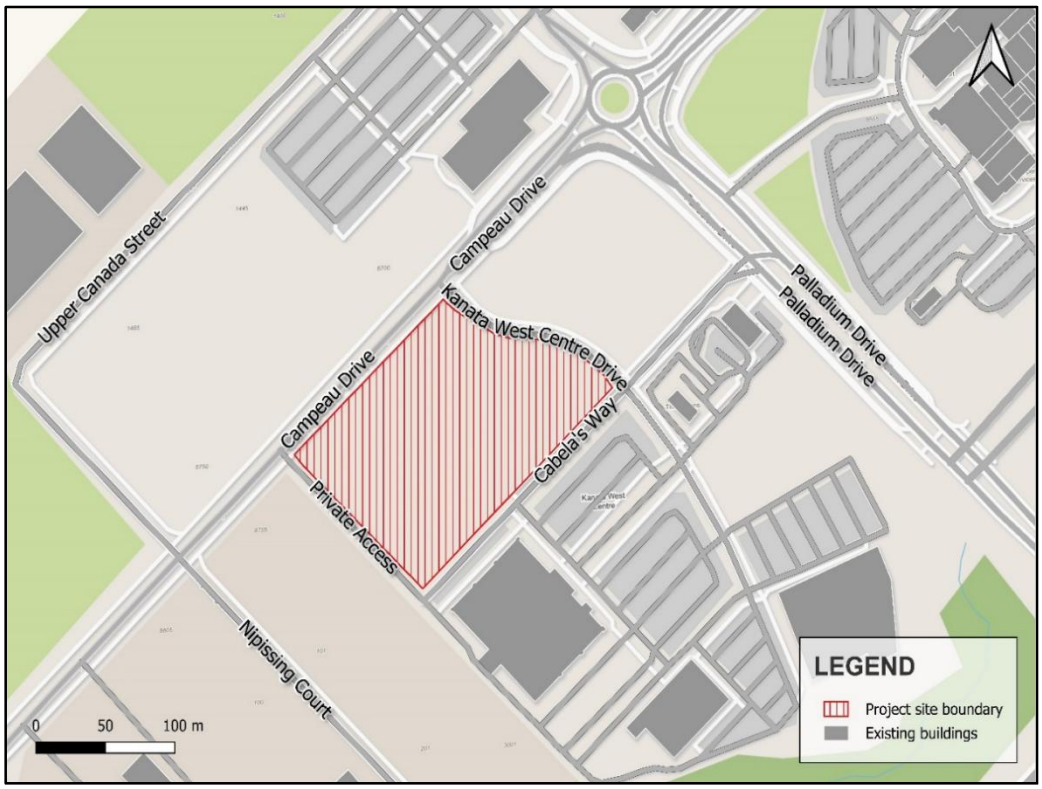


FIG. 1: Site Location

1.3 Stormwater Management Plan Objectives

The objectives of the stormwater management plan are as follows:

- Determine site specific stormwater management requirements to ensure that the development project is in conformance with the design criteria of City of Ottawa and MECP.
- Prepare a stormwater management design documenting the strategy along with the technical information necessary for sizing the proposed stormwater management practices.

1.4 SWM Design Criteria

The servicing and stormwater management designs for the subject site have been prepared in line with the following documents:

- **Sewer Design Guidelines**, City of Ottawa, Second Edition, October 2012 (herein referred to as OSDG).
    - **Technical Bulletin ISD-2010-1**, City of Ottawa, September 28,

2010.
    - **Technical Bulletin ISD-2011-2**, City of Ottawa, October 6, 2011.
    - **Technical Bulletin ISD-2012-1**, City of Ottawa, January 31, 2012.
    - **Technical Bulletin ISD-2012-4**, City of Ottawa, June 20, 2012.
    - **Technical Bulletin ISD-2012-6**, City of Ottawa, October 31, 2012.
    - **Technical Bulletin ISDTB-2014-01**, City of Ottawa, February 5, 2014.
    - **Technical Bulletin PIEDTB-2016-01**, City of Ottawa, September 6, 2016.
    - **Technical Bulletin ISTB-2018-01**, City of Ottawa, March 21, 2018.
    - **Technical Bulletin ISTB-2018-03**, City of Ottawa, March 21, 2018.
    - **Technical Bulletin ISTB-2018-04**, City of Ottawa, June 27, 2018.
    - **Technical Bulletin ISTB-2019-02**, City of Ottawa, July 08, 2019.
- **Kanata West Master Servicing Study (KWMSS), 2006**
- **Ottawa Design Guidelines, Water Distribution**, City of Ottawa, First Edition, July 2010 (herein referred to as OWDG).
    - **Technical Bulletin ISD-2010-2**, City of Ottawa, December 15, 2010.
    - **Technical Bulletin ISDTB-2014-02**, City of Ottawa, May 27, 2014.
    - **Technical Bulletin ISTB-2018-02**, City of Ottawa, March 21, 2018.
    - **Technical Bulletin ISTB-2021-03**, City of Ottawa, August 18, 2021.
- **Design Guidelines for Sewage Works**, Ministry of the Environment, 2008 (herein referred to as MECP Sewage Design Guidelines).
- **Design Guidelines for Drinking-Water Systems**, Ministry of the Environment, 2008 (herein referred to as MECP Water Design Guidelines).
- **Water Supply for Public Fire Protection**, Fire Underwriters Survey, 2020 (herein referred to as FUS Guidelines).
- **Geotechnical Investigation**, Yuri Mendes Engineering, Sept. 2024.
- **Design Brief, Kanata West Retail Centre — 3015, 3075 and 3095 Palladium Drive**, prepared by IBI Group, September 2016 (herein referred to as the IBI Report).
- **Kanata West Business Park Stormwater Management Report and Pond 6 West Design Brief**, prepared by IBI Group, dated November

2015.

- **Addendum Report: Kanata West Business Park Stormwater Management Report and Pond 6 East Design Brief**, prepared by IBI Group, dated November 2015.

Water Quantity Control:

The following stormwater management measures are to be implemented for the subject site to ensure adherence to water quantity controls as outlined in the IBI report:

- Dual Drainage System: Both minor and major drainage systems are to be designed to ensure peak runoffs are controlled to the modeled rates for the 5-year (minor system) and 100-year (major system) events, as per the approved IBI report.
- On-Site Quantity Storage: On-site quantity storage is provided to accommodate excess runoff up to and including the 100-year design event, ensuring that release rates do not exceed allowable limits.
- Emergency Overland Flow Routes: Runoff exceeding the allowable release rate for events beyond the 100-year design event is permitted to discharge off-site via designated emergency overland flow routes.

Water Quality Control:

- Water Quality control is to be managed and provided by the existing Pond 6 West Stormwater Management Facility.

Water Balance Management:

- The Carp River Watershed/Subwatershed Study (CRWS) established water balance calculations and infiltration targets for the subwatershed area based on soil characteristics from a stormwater management perspective. Building on the CRWS, the Kanata West development's infiltration targets were defined in the KWMSS, which recommended that 50 to 70 mm/year of runoff be infiltrated from the eastern portion of the KWBP site. Additionally, the KWMSS mandated that post-development infiltration rates be increased by 25% over pre-development rates to offset areas like roadway corridors that cannot facilitate infiltration. For the KWRC, the infiltration target is set at 75 mm/year, as detailed in Section 4.3.4 of the IBI Report. Consistent with the IBI design, infiltration galleries

fed by roof drains is to be installed to meet the required infiltration rates for the subject site.

2 EXISTING CONDITIONS

2.1 General

As discussed earlier, the 2.57 ha subject property is designated as General Mixed Use (GM [2167]) and is presently undeveloped. However, there are existing private infrastructure installations within the private roadways adjacent to the east and south of the site:

- A 203 mm diameter water main runs along Cabela's Way, with another of the same diameter along Kanata West Centre Drive.
- A sanitary sewer of 200 mm diameter along Cabela's Way transitions to 300 mm diameter along Kanata West Centre Drive, before discharging to Campeau Drive.
- Storm sewers range from 525-975 mm diameter along Cabela's Way and 375-450 mm diameter along Kanata West Centre Drive, connecting at the intersection and continuing south to ultimately discharge to Stormwater Management Pond 6 at the southwest corner of KWBP.
- Service stubs (200 mm diameter sanitary, 250 mm diameter storm, and 152 mm diameter water) are available from both Cabela's Way and Kanata West Centre Drive, initially installed for previous Site Plan buildings (A3 and A4).
- Additionally, a 203 mm diameter water main stub extends approximately 105 meters west from the intersection of Cabela's Way and Kanata West Centre Drive.

To the west, an unnamed access road was paved to facilitate truck access to the Cabela's building to the south, although the private infrastructure within the roadway was not installed. This will be installed as part of this development in accordance with approved IBI design. Refer to drawings, such as the General Plan of Services, As-Built General Plan of Services, and Cabela's Access Road, in the **Appendix A** for more details.

The site contains a substantial grounding grid that serves an existing transformer situated along Campeau Drive. This grid currently occupies a specific area (approximately 37.99 m x 81.85 m) under a temporary easement, which will be

replaced by a blanket easement covering the entire block to facilitate the proposed site plan. Relocation of sections of the grounding grid will be necessary as part of the electrical design process and will be coordinated accordingly.

In reviewing the topographic survey, the existing site generally drains from northwest to southeast, discharging to Feedmill Creek. Refer to **DWG. C-01** found in the **Appendix B** for more details.

2.2 Rainfall Information

The rainfall intensity (I) for the site was calculated using City of Ottawa's IDF curve equations, including:

Rainfall intensity equation for 5-year return period:

$$I_{5-yr} = \frac{998.071}{(\text{Time in min} + 6.053)^{0.814}}$$

Rainfall intensity equation for 100-year return period:

$$I_{100-yr} = \frac{1735.688}{(\text{Time in min} + 6.014)^{0.820}}$$

Where; I = rainfall intensity in mm/hr,

Time in min = time of concentration (Tc) in minutes

An initial time of concentration (Tc) of 10 minutes (or 0.167 hours) is considered.

2.3 Allowable Flow Rates

The overall stormwater management design for the KWRC was modeled by IBI Group using SWMHYMO. Table 4.2 from the IBI Report in **Appendix F** shows the modeled peak runoff and capture rates for each drainage area within the KWRC for the 5-year and 100-year design storm events. The KWRC Storm Drainage Area Plan – prepared by IBI Group – can be found in **Appendix E**.

For drainage areas R55, R12, and P55, on-site surface storage was assumed to meet the allocated capture rates. For drainage areas D21, D22, D24, D13, and D11 (which include access roads), surface storage within existing road sags was assumed to meet the allocated capture rates.

Drainage areas R55 and P55 are allocated within pipe run MH24 to MH32 on Cabela's Way. According to Table 4.2, the cumulative modeled peak runoff for

these areas is 430 L/s and 778 L/s for the 5-year and 100-year events, respectively. The cumulative capture rates are 424 L/s and 615 L/s for the same events, indicating that on-site storage is needed to avoid exceeding the capture rates.

Drainage area R12 is included within pipe run MH12 to MH13 on Kanata West Centre Drive. The report notes that the peak runoff for drainage area R12 is 29 L/s and 49 L/s for the 5-year and 100-year events, respectively, with a capture rate of 26 L/s for both events. This indicates that on-site storage is required to stay within the capture rates.

Drainage area D21, which is allocated within pipe run MH21 to MH22 on the unnamed road, has a modeled cumulative peak runoff of 124 L/s and 225 L/s for the 5-year and 100-year events, respectively. The cumulative capture rate is 120 L/s and 164 L/s for these events, indicating that runoff will be fully captured during the 5-year event, and surface storage within the road sags will be provided for the 100-year event. Therefore, the peak runoff from the site tributary to the unnamed road surface inlets for pipe run MH21 to MH22 must not exceed the modeled peak runoffs.

Drainage area L21 is allocated within pipe run MH21 to MH22 on the unnamed road. This drainage area is assumed to be uncontrolled, and the minor system design has accounted for the 100-year peak design flow.

The subject site (i.e., developable area, excluding the private access roads) forms part of drainage areas D22, D24, D13, and D11. Portions of these boundaries include off-site areas such as roadways and adjacent development blocks. To account for these off-site areas, the modeled peak runoffs must be adjusted based on the area within the site limits.

Drainage area D22, allocated within pipe run MH22 to MH23 on Cabela's Way via existing curb inlet catch basins, has a modeled peak runoff of 28 L/s and 49 L/s for the 5-year and 100-year events, respectively. The capture rate is 24 L/s for both events. This indicates that runoff will be close to fully captured during the 5-year event and that surface storage within the road sags will be provided during the 100-year event. The D22 drainage boundary has a total area of 0.20 ha, with the subject site contributing only 0.04 ha. Thus, the peak runoff from the subject site to the existing surface inlets for pipe run MH22 to MH23 must be controlled to pro-rated rates of 5.6 L/s and 9.8 L/s for the 5-year and 100-year events, respectively.

Drainage area D24, allocated within pipe run MH24 to MH32 on Cabela's Way via existing curb inlet catch basins, has a modeled peak runoff of 48 L/s and 88 L/s for the 5-year and 100-year events, respectively. The capture rate is noted as 48 L/s and 54 L/s for the 5-year and 100-year design events respectively. This indicates that runoff will be fully captured during the 5-year event and that surface storage within the road sags will be provided during the 100-year event. The D24 drainage boundary has a total area of 0.20 ha, with the subject site contributing only 0.064 ha. Thus, the peak runoff from the subject site to the existing surface inlets for pipe run MH24 to MH32 must be controlled to pro-rated rates of 15.4 L/s and 17.3 L/s for the 5-year and 100-year events, respectively.

Drainage area D13, allocated within pipe run MH13 to MH14 on Kanata West Centre Drive via existing curb inlet catch basins, has a modeled peak runoff of 28 L/s and 49 L/s for the 5-year and 100-year events, respectively. The capture rates are 26 L/s and 28 L/s for these events. This indicates that runoff will be close to fully captured during the 5-year event and that surface storage within the road sags will be provided during the 100-year event. The D13 drainage boundary has a total area of 0.10 ha, with the subject site contributing only 0.043 ha. Thus, the peak runoff from the subject site to the existing surface inlets for pipe run MH13 to MH14 must be controlled to pro-rated rates of 12.0 L/s and 21.1 L/s for the 5-year and 100-year events, respectively.

Drainage area D11, allocated within pipe run MH11 to MH12 on Kanata West Centre Drive via existing curb inlet catch basins, has a modeled peak runoff of 61 L/s and 112 L/s for the 5-year and 100-year events, respectively. The capture rates are 61 L/s and 68 L/s for these events. The D11 drainage boundary has a total area of 0.25 ha, with the subject site contributing only 0.034 ha. Thus, the peak runoff from the subject site to the existing surface inlets for pipe run MH11 to MH12 must be controlled to pro-rated rates of 8.3 L/s and 15.2 L/s for the 5-year and 100-year events, respectively.

The IBI Report for the KWRC does not discuss uncontrolled free flow areas to the Campeau Drive and Palladium Drive storm sewer systems. However, interpolation of the KWRC Storm Drainage Area Plan indicates that approximately 0.022 ha of perimeter area was designed to be uncontrolled. Using the Rational Method, the allocated free flow has been calculated to be 1.3 L/s and 2.9 L/s for the 5-year and 100-year design events, respectively.

The pro-rated allocated flows are summarized in Table F-03**,** provided in **Appendix F**. Refer also to **FIG. 6 –** Site Contribution Area Plan provided in

Appendix F.

3 POST DEVELOPMENT CONDITIONS

3.1 General

The owner proposes to develop the subject property to include four commercial buildings and associated parking lots. The 2.57 ha block includes private rights-of-way to the west and south of the development area. For this report, the "subject site" will refer to the developable area, excluding the private access roads. The four commercial buildings range from approximately 687.43 m² to 5,678.11 m² in area and will be accessed via entrances from Kanata West Centre Drive, Cabela's Way, and the unnamed road. The development is planned in two phases. Phase 1 will encompass the construction of Building A, the parking lot, and access roads. Phase 2 will involve the construction of Buildings B, C, and D along with their adjacent parking areas. Detailed information can be found in the Site Plan and Phasing Plan, included in **Appendix B.**

Developing the subject site will necessitate new water and sanitary services, as well as a new storm sewer system to manage site runoff according to the design criteria outlined in the IBI Report. All site servicing will be completed as part of Phase 1. For further details, refer to the design drawings provided in **Appendix B**.

3.2 Water Balance Management

As discussed earlier, the Carp River Watershed/Subwatershed Study (CRWS) provided comprehensive water balance calculations and established infiltration targets for the subwatershed area from stormwater management perspective and based on soil characteristics. For the KWRC, the infiltration target has been set at 75 mm/year, as detailed in section 4.3.4 of the IBI report. In alignment with the IBI design, infiltration galleries, which are supplied by building A roof drains, will be implemented to meet the specified infiltration rates for the site.

The runoff from Building A's roof will be directed to a proposed infiltration gallery located within the parking lot. Consistent with the approved IBI design, the sizing of the infiltration gallery is determined based on several factors: the roof drainage area, daily precipitation data, infiltration through the bottom and the bottom third of the side walls, and percolation rates verified by the Geotechnical Investigation. The sizing of the infiltration gallery is based on the following input parameters:

Roof Area 5,678.11 m^2 (Building A)

Percolation Rate	0.48 m/day (determined from Geotechnical Investigation)
Site Area	2.57 ha
Precipitation Data	Daily rainfall for wet year and dry year as per IBI design
Gallery Area	10 m x 19.5 m
Gallery Depth	0.60 m (effective depth below perforated pipe invert elevation)
Dry Cell Volume	44.5 m^3 (assumes void ratio of 0.38)

Using the parameters above, the average infiltration rate for the site was calculated to be 81.4 mm/year which exceeds the target infiltration rate of 75 mm/year and therefore has been designed in accordance with the IBI Report and overarching reports for the subwatershed area. Refer to infiltration gallery sizing calculations (Table F-08 to F-10) and sample sizing calculations from the IBI report in the **Appendix F**.

Infiltration-based Low Impact Development (LID) options typically require a buffer between the bottom of the facility invert and the seasonally high groundwater table for optimal performance, with a preferred separation of about 1.0 meter. Site-specific investigations are necessary to determine the presence of high groundwater conditions. According to the most recent Geotechnical Investigation (July, 2024), YME installed four monitoring wells in the area of Building A, specifically boreholes BH1, BH2, BH3, and BH4, as shown in Appendix F, to examine soil characteristics and groundwater conditions. The LATEST investigation (Sept. 24, 2024) determined that the water table is 2.3 meters below the existing surface, the groundwater elevation is approximately 102.24 meter.

While the proposed infiltration gallery has a bottom elevation ranging from 102.61m to 102.77m, which is above the groundwater table based on YME geotechnical investigation, it does not achieve the recommended 1.0-meter separation, but above the groundwater table. The storm sewer system's upstream end has minimal cover (less than 1.0 meter), making it impractical to elevate the infiltration gallery further. Similarly, reducing the gallery depth is not feasible, as the active depth below the perforated pipes is only 0.60 meters. The runoff directed to the infiltration gallery comes exclusively from the Building A roof and is thus considered free of contaminants.

It is important to note that long-term static groundwater levels often decrease post-development. While the infiltration gallery's performance may be limited during periods of high groundwater, it remains functional during the rest of the year when groundwater levels are lower. Should infiltration into the surrounding

soil be impeded due to sediment accumulation or high groundwater levels, stormwater will bypass the infiltration gallery through the perforated storm pipes and discharge into the downstream storm sewer system. In case of a blockage within the gallery, a 375 mm diameter overflow/bypass pipe has been included, designed to handle the peak flow from a 5-year design storm event from the tributary roof area.

3.3 Water Quality Control

The Pond 6 West Facility is situated at the western edge of the Kanata West Business Park (KWBP), north of Feedmill Creek. This facility manages both water quality and quantity for the development located west of Palladium Drive (see Figure 2 – Post-Development SWM Drainage Boundaries Overall Site, prepared by IBI Group, in **Appendix F**). It discharges into Feedmill Creek in compliance with the Kanata West Business Park Stormwater Management Report and the Pond 6 West Design Brief, both prepared by IBI Group. As the minor storm system feeds into the Pond 6 West Facility, no additional on-site quality control measures are necessary for this site.

3.4 Water Quantity Control

As illustrated in **FIG. 05** – Proposed Storm Drainage Area Plan in **Appendix E**, the subject site is divided into 23 drainage areas, including STM1-STM13, R1-R6, and FF1-FF5. To ensure compliance with the quantity control criteria outlined in sections 1.4 and 2.3, runoff from the main parking lot (i.e., drainage areas STM1-STM6, STM10-STM11) will be captured by surface inlet catch basins and conveyed to the on-site storm sewer system. These catch basins will be equipped with inlet control devices (ICDs) to restrict flows to the minor system during larger storm events (see Section 3.4.1).

Additionally, runoff from the Building A roof (i.e., drainage areas R1-R3) will be managed by roof drains designed by the Mechanical Engineer, with outflow restricted to a release rate of 40 L/s/ha. Runoff from the roofs of Buildings B and D (i.e., drainage areas R4 and R6) will be conveyed to the on-site storm sewer system via building storm service connections, as these buildings do not have roof storage and their roof areas are considered uncontrolled.

The perimeter of the site adjacent to Cabela's Way (i.e., drainage area FF4) will discharge uncontrolled to the private roadway, where it will be captured by existing curb inlet catch basins and conveyed to the existing storm sewer system

within pipe run MH24 to MH32. The runoff will be controlled by existing storm system controls to meet the capture rates specified by the IBI design.

The controlled and uncontrolled flows from drainage areas STM1-STM6, STM10-STM12, R1-R4, R6, and FF4 to pipe run MH24 to MH32 on Cabela's Way will be below the allocated IBI design flow rates by 98.1 L/s and 226.5 L/s during the 5-year and 100-year design events, respectively (refer to Table F-03 in **Appendix F**).

Runoff from the loading ramp area (i.e., drainage area STM9) will be captured by a surface inlet catch basin and conveyed uncontrolled to the storm sewer system on the unnamed access road. Runoff from the unnamed access road (i.e., drainage area STM13) will be captured by surface inlet catch basins and conveyed to the storm sewer system, designed by IBI but constructed as part of this development. These catch basins will have ICDs as specified in the approved IBI design drawings. The controlled and uncontrolled flows from drainage areas STM7-STM9 and STM13 to pipe run MH21 to MH22 on the unnamed access road will be below the allocated IBI design flow rates by 60.3 L/s and 138.3 L/s during the 5-year and 100-year design events, respectively (refer to Table F-03 in **Appendix F**).

Runoff from the Building C roof (drainage area R5) will be conveyed to the existing storm sewer system on Kanata West Centre Drive via an existing building storm service stub. The roof flow from Building C to pipe run MH12 to MH13 on Kanata West Centre Drive will be below the allocated IBI design flow by 7.0 L/s during the 5-year event but will exceed it by 10.2 L/s during the 100-year event (refer to Table F-03 in **Appendix F**). The existing 450 mm diameter storm sewer has 45.95 L/s of available capacity during the 5-year event (refer to KWRC Storm Sewer Design Sheet in **Appendix E**) and should accommodate the increased flows from the site.

Runoff from the perimeter of the site adjacent to Campeau Drive (i.e., drainage area FF1) will be conveyed uncontrolled to the municipal right-of-way, captured by existing curb inlet catch basins, and conveyed to the existing municipal storm sewer system. The runoff will be controlled by the existing storm system controls to meet the capture rates as specified by the overall IBI KWBP design. The uncontrolled free flow from drainage area FF1 to Campeau Drive will slightly exceed the allocated IBI design flow by 5.4 L/s and 11.6 L/s during the 5-year and 100-year design events, respectively (refer to Table F-03 in **Appendix F**). The existing 825 mm diameter storm sewer on Campeau Drive has 88.76 L/s of available capacity during the 5-year event (refer to KWRC Storm Sewer Design

Sheet in **Appendix E**) and should accommodate the slight increase in flows.

Runoff from the perimeter of the site adjacent to Kanata West Centre Drive (i.e., drainage area FF2) will be conveyed uncontrolled to the private roadway, captured by existing curb inlet catch basins, and conveyed to the existing storm sewer system within pipe run MH11 to MH12. The runoff will be managed by existing storm system controls to meet the capture rates specified by the IBI design. The uncontrolled free flow from drainage area FF2 to pipe run MH11 to MH12 on Kanata West Centre Drive will exceed the allocated IBI design flow by 6.2 L/s and 15.8 L/s during the 5-year and 100-year design events, respectively (refer to Table F-03 in **Appendix F**). The existing 375 mm diameter storm sewer has 26.28 L/s of available capacity during the 5-year event (refer to KWRC Storm Sewer Design Sheet in **Appendix E**) and should accommodate the increase in flows.

Runoff from the perimeter of the site adjacent to Kanata West Centre Drive (i.e., drainage area FF3) will be conveyed uncontrolled to the private roadway, captured by existing curb inlet catch basins, and conveyed to the existing storm sewer system within pipe run MH13 to MH14. The runoff will be managed by existing storm system controls to meet the capture rates specified by the IBI design. The uncontrolled free flow from drainage area FF3 to pipe run MH13 to MH14 on Kanata West Centre Drive will be below the allocated IBI design flow by 10.1 L/s and 17.0 L/s during the 5-year and 100-year design events, respectively (refer to Table F-03 in **Appendix F**).

Runoff from the perimeter of the site adjacent to Cabela's Way (i.e., drainage area FF5) will be conveyed uncontrolled to the private roadway, captured by existing curb inlet catch basins, and conveyed to the existing storm sewer system within pipe run MH22 to MH23. The runoff will be managed by existing storm system controls to meet the capture rates specified by the IBI design. The uncontrolled free flow from drainage area FF5 to pipe run MH22 to MH23 on Cabela's Way will exceed the allocated IBI design flow by 17.5 L/s and 39.4 L/s during the 5-year and 100-year design events, respectively (refer to Table F-03 in **Appendix F**). The existing 525 mm diameter storm sewer has 32.52 L/s of available capacity during the 5-year event (refer to KWRC Storm Sewer Design Sheet) and should accommodate the increase in flows.

Overall, the total outflows from the subject site to the existing storm sewer system do not exceed the allocated flows from the IBI design during the 5-year and 100-year design events and thus align with the overarching IBI Report. Refer

to supporting flow calculations in **Appendix F** for more details. The outflows from the subject site are summarized in Table 1 below. A more detailed summary, demonstrating the pro-rated values from the IBI design, is shown in Table F-03 in **Appendix F**.

TABLE 1: Outflow Summary

Drainage Area ID	5-YR Outflow (L/s)[*5]	100-YR Outflow (L/s)[*5]	Drainage Area Restriction
STM1	60	65.3	Controlled via ICD
STM2	40	43.2	Controlled via ICD
STM3	20	21.3	Controlled via ICD
STM4	40	42.4	Controlled via ICD
STM5	20	21.0	Controlled via ICD
STM6	40	42.7	Controlled via ICD
STM7 + STM8	48	49.0	Controlled via ICD
STM10	20	20.7	Controlled via ICD
STM11	20	20.6	Controlled via ICD
STM13	52.1	52.1	Controlled via ICD[*1]
R1	9.2	9.2	Controlled via Roof Drain
R2	7.5	7.5	Controlled via Roof Drain
R3	5.5	5.5	Controlled via Roof Drain
Sub-Total	**382.3**	**400.6**	**Controlled Flows**
STM9	4.2	7.9	Uncontrolled
STM12	2.5	5.3	Uncontrolled
R4	17.9	34.1	Uncontrolled
R5	19.0	36.2	Uncontrolled
R6	21.2	40.4	Uncontrolled
FF1	6.8	14.5	Uncontrolled[*2]
FF2	14.5	31.0	Uncontrolled[*2]
FF3	1.9	4.1	Uncontrolled[*2]
FF4	17.4	37.3	Uncontrolled[*2]
FF5	22.3	47.8	Uncontrolled[*2]
Sub-Total	**127.7**	**258.5**	**Uncontrolled Flows**
Total	**510.0[*3]**	**659.2[*3]**	
Allowable	**660.1[*4]**	**964.0[*4]**	

Notes:

1. Details for the Inlet Control Devices (ICDs) are in accordance with the approved IBI design. Please refer to the Cabela's Access Road drawing provided in **Appendix A**.
2. Drainage areas discharge freely from the site boundary but are regulated by existing ICDs within the access roads, as specified in the approved IBI design.
3. Total flow values are calculated using precise numbers. Minor discrepancies may arise

when performing manual calculations based on the table values.
4. Allowable flow rates are determined as per the approved IBI design. Refer to Table 4.2 in the KWRC Design Brief (2016).
5. For additional details, refer to **Table F-03** in **Appendix F**.

3.4.1 Inlet Control Devices (ICDs)

The catch basins within the parking areas will be fitted with inlet control devices (ICDs) to limit the flow to the minor system during significant storm events. The catch basin at the loading ramp (CB 9) and the catch basin manhole in the landscaped area (CBMH 208) will remain uncontrolled to prevent surface ponding. The ICD in CBMH 209 will manage upstream drainage areas STM7 and STM8. The ICDs have been sized using the orifice equation (OSDG Section 8.3.8.1) based on designated release rates and available heads. Detailed information about the ICDs is provided in Table 2 below.

TABLE 2: ICD Details

Structure	Controlled Drainage Area	2-YR Outflow (L/s)	5-YR Outflow (L/s)	100-YR Outflow (L/s)	Orifice Dia. (mm)
CB1	STM1	60.0	60.0	65.3	167.1
CB2	STM2	40.0	40.0	43.2	134.8
CB3	STM3	20.0	20.0	21.3	92.4
CB4	STM4	40.0	40.0	42.4	129.2
CB5	STM5	20.0	20.0	21.0	89.1
CB6	STM6	40.0	40.0	42.7	125.9
CBMH209	STM7+STM8	48.0	48.0	49.0	132.6
CB10	STM10	20.0	20.0	20.7	90.2
CB11	STM11	20.0	20.0	20.6	90.9
CICB2	STM13	13	13	13	Tempest LHF
CICB3	STM13	23.5	23.5	23.5	Tempest HF
CICB4	STM13	15.6	15.6	15.6	Tempest HF

Note:

1. Outflows and ICD details as per IBI design. Refer to Cabela's Access Road drawing in **Appendix A.**

For further details, please refer to the Table F-04: Orifice Sizing/ICD calculations provided in **Appendix F**.

3.4.2 Quantity Storage

To limit the site's runoff to the outflows specified in Section 3.4, on-site quantity

storage will be necessary. This storage will be provided as surface storage at the catch basin locations. Using the Modified Rational Method, the required storage volumes have been calculated for the controlled drainage areas. It is important to note that no surface storage is needed for the 2-year or 5-year design events. Details of the required and provided storage volumes are summarized in Table 3 below.

TABLE 3: Quantity Storage Volume Details

Drainage Area	100-YR Required Storage Volume (m^3)	100-YR Provided Storage Volume (m^3)
STM1	28.9	34.26
STM2	18.9	21.45
STM3	9.3	9.57
STM4	19.8	23.2
STM5	6.5	8.84
STM6	19.6	25.56
STM7+STM8	5.6	6.57
STM10	3.4	4.18
STM11	2.0	2.73

Notes:

1. The provided storage volumes were calculated using AutoCAD Civil 3D by Autodesk.
2. The provided storage volumes consider only available surface storage, with no underground storage included.
3. No surface storage is required for the 2-year or 5-year design events.

As shown in Table 3 above, sufficient on-site storage has been provided for all design events up to and including the 100-year event. For further details, please refer to the Table F-05, F-06 and F-07: surface storage volume calculations provided in **Appendix F**.

As mentioned in Section 3.4, the saw-tooth construction of the adjacent private roads, designed by IBI Group, is intended to provide quantity storage for their respective drainage areas, which include uncontrolled portions of the subject site.

3.4.3 Surface Ponding

Surface ponding will be required in the parking lot areas to provide quantity storage. Details of the surface ponding for the on-site catch basins are summarized in Table 4 below.

TABLE 4: Surface Ponding Details			
Structure	**2-YR Outflow (L/s)**	**5-YR Ponding Depth (m)**	**100-YR Ponding Depth (m)**
CB1	0.00	0.00	0.19
CB2	0.00	0.00	0.18
CB3	0.00	0.00	0.16
CB4	0.00	0.00	0.16
CB5	0.00	0.00	0.15
CB6	0.00	0.00	0.20
CBMH209	0.00	0.00	0.07
CB10	0.00	0.00	0.10
CB11	0.00	0.00	0.08
CBMH208	0.00	0.00	0.00
Notes: 1. Ponding depths are measured from the ponding elevation to the top of grate elevation.			

As shown in Table 4 above, no surface ponding will occur during the 2-year design event, in accordance with the current OSDG. During the 100-year event, the maximum ponding depths are less than 0.30 m, also complying with OSDG standards.

3.4.4 Major System

Cascading overland flow from the majority of the KWRC is directed from the northwest to the southeast, discharging into Feedmill Creek. For further details, refer to Figure 2 – Post-Development SWM Boundaries, prepared by IBI Group for the KWBP in **Appendix F**.

The major system flow from the parking lot east of Building A will be conveyed to Kanata West Centre Drive via the proposed entrance connection, following the approved IBI design. Similarly, the major system flow from the parking/loading area west of Building A will be directed to the unnamed access road, also following the IBI design.

Since adequate on-site storage is provided (see Section 3.4.2), no major system flows from controlled drainage areas are expected for up to and including the 100-year design event. A minimum freeboard of 0.30 meters has been maintained between spillover elevations and the finished floor elevations of adjacent buildings.

3.4.5 Hydraulic Grade Line (HGL) Analysis

As noted in Section 4.6 of the IBI Report, the hydraulic grade line (HGL) within the storm sewers of the KWBP is determined by the water levels in Feedmill Creek, as well as in the Pond 6 West and Pond 6 East facilities. Due to the permanent water levels in these ponds, some storm sewers within the KWBP will be partially submerged. A summary of the 100-year HGL analysis for the KWBP is provided in Table 4.8 of the IBI Report (refer to **Appendix F**).

An HGL analysis has been conducted for the proposed on-site storm sewer system, using a downstream 100-year HGL elevation of 103.55 m at the proposed storm connection to the existing system (HGL interpolated from IBI Table 4.8 for the 100-year 12-Hour SCS event). It is important to note that while the modelled 100-year HGL for the 100-year 3-hour Chicago storm event is lower, the more conservative 12-hour event has been used for this analysis. The HGL analysis confirms that the 100-year HGL will remain below the top of grate/cover elevations of the on-site storm manholes and catch basins, as well as below the proposed building finished floor elevations. For further details, please refer to the Table F-11: HGL calculations in **Appendix F**.

3.5 Interim Stormwater Management

The property will be developed in two phases, as planned by the Owner. Phase 1 will encompass the construction of Building A, a significant portion of the parking lot, and access roads. Phase 2 will involve the construction of Buildings B, C, and D along with their adjacent parking areas.

During the interim period, before the full completion of Phase 2, all runoff from the parking lot areas will be captured and managed in accordance with the stormwater management design outlined earlier. The boundaries of Phase 2 will remain in their current pre-development state, and therefore, no additional measures to control runoff are proposed at this time. For details, please refer to the Interim Grading Plan (**C-02**) provided in **Appendix B**.

4. SITE SERVICING

The purpose of this site servicing study is to review the site servicing requirement of the proposed addition and adequacy of existing water, sanitary and storm services.

4.1 Sanitary Servicing

4.1.1 Existing System

The KWRC lands have been designed to connect with the existing 300 mm diameter sanitary sewer on Campeau Drive at its intersection with Kanata West Centre Drive (EX MH 105A). This sewer network facilitates the conveyance of sanitary flows originating from both the KWRC and the broader KWBP area, directing them eastward through the Campeau Drive sanitary sewer system until they reach the Signature Ridge Pump Station (SRPS) situated north of Highway 417.

In terms of existing infrastructure, Cabela's Way features sanitary sewers with a diameter of 200 mm, while Kanata West Centre Drive features sanitary sewers ranging from 200 mm to 300 mm in diameter. Notably, there are discrepancies in reported diameters: the As-Built General Plan of Services (prepared by IBI Group, **Appendix A**) indicates a 300 mm diameter for existing sewers between MH12A and MH105A, whereas the KWRC Sanitary Sewer Design Sheet from the IBI Report suggests diameters ranging from 200 mm to 250 mm.

Furthermore, previous installations include two 200 mm diameter sanitary service stubs to accommodate former buildings, aligning with the Site Plan outlined in the IBI design (refer to the As-Built General Plan of Services in **Appendix A**).

Design Parameters

The KWRC is classified as an extensive employment area, as detailed in Section 3.3 of the IBI Report. In accordance with the City's requirements, the following design parameters from City's Technical Bulletin ISTB-2018-01 have been applied to the subject site:

Sanitary Demand Rate for Sewers:

- Extensive Employment Area/Commercial 28,000 L/ha/day

Peaking Factors:

- Commercial 1.5

Extraneous Flows:

- Infiltration Allowance 0.33 L/s/ha (KWRC)

Velocity:

- Minimum Velocity 0.6 m/s
- Maximum Velocity 3.0 m/s

Sanitary flows originating from the lands comprising the subject site have been allocated to existing private sanitary sewers along Kanata West Centre Drive and Cabela's Way. According to the IBI Report, drainage area A1 was initially allocated upstream of MH22A on Cabela's Way. However, updated drawings for the Cabela's Access Road (dated 2023), which supersede the IBI Report (dated 2016), indicate that flows are now allocated upstream of MH32A on Cabela's Way.

Additionally:

- Drainage area A3, including approximately 0.04 hectares from the subject site, is allocated upstream of MH32A on Cabela's Way.
- Drainage area A4, encompassing approximately 0.66 hectares from the subject site, is allocated upstream of MH14A on Cabela's Way.
- Drainage area A15, involving approximately 0.01 hectares from the subject site, is allocated upstream of MH13A on Kanata West Centre Drive.
- Drainage area A16, covering approximately 0.13 hectares from the subject site, is allocated upstream of MH12A on Kanata West Centre Drive.
- Drainage area A17, comprising approximately 0.23 hectares from the subject site, is allocated upstream of MH11A on Kanata West Centre Drive.
- Drainage area A18, including approximately 0.31 hectares from the subject site, is allocated upstream of MH10A on Kanata West Centre Drive.

For more detailed information, please refer to the KWRC Sanitary Drainage Area Plan #C-501 and KWRC Sanitary Sewer Design Sheet in **Appendix D**. The total design sanitary flow allocated for the subject site is 2.80 L/s per the KWRC Sanitary Sewer Design Sheet.

4.1.2 Proposed Sanitary Servicing

New private sanitary sewers are necessary to accommodate the needs of the subject site. A 200 mm diameter sanitary sewer extension will be constructed within the unnamed road, originating from EXMH 22A on Cabela's Way, in accordance with the approved IBI servicing design. Sanitary flows from Building A will be directed through a new 200 mm diameter service line to connect to the newly constructed 200 mm diameter private sanitary sewer located within the unnamed road.

For Buildings C and D, a new 200 mm diameter sanitary sewer connection will be established to link with the existing 200 mm diameter private sanitary sewer on Cabela's Way, upstream of EX MH14A.

Building B's sanitary flows will be conveyed via a new 200 mm diameter sanitary service line with a control manhole, connecting to the existing 300 mm diameter private sanitary sewer on Kanata West Centre Drive, upstream of MH11A.

Using the design criteria outlined in Section 1.4 and 4.1.1, the total peak sanitary design flow from the subject site (covering a tributary area of 2.43 hectares), upstream of MH11A on Kanata West Centre Drive, has been computed to be 1.98 L/s, less than the allocated flows (I.e. 2.80 L/s) from the IBI design. The KWRC Sanitary Sewer Design Sheet – in **Appendix D** – indicates that the sanitary sewers on Cabela's Way and Kanata West Centre Drive have available capacities ranging from 39.6% to 95.5% - without considering increased pipe diameters of 300 mm as discussed earlier.

All proposed sanitary sewers have been meticulously designed to accommodate the peak design flows and ensure compliance with acceptable full flow velocity ranges. For further details, please refer to the Proposed Sanitary Drainage Area Plan – **FIG. 04** and the Sanitary Sewer Design Sheet (Table D-01) in **Appendix D,** and site servicing plan – **DWG. C-03** in **Appendix B**.

4.2 Storm Servicing

4.2.1 Existing System

The existing storm sewer infrastructure along Kanata West Centre Drive ranges from 375 mm to 450 mm in diameter, while along Cabela's Way it ranges from 525 mm to 975 mm in diameter. This system conveys stormwater southward to the existing Pond 6 West Facility, ultimately discharging into Feedmill Creek.

Minor system flows from the subject site are allocated to the existing storm sewers on adjacent private roads within the KWRC. The primary drainage areas within the subject site include P55, R55, R12, D21, and L21 as outlined in the Storm Drainage Area Plan prepared by IBI Group in **Appendix E**. Additionally, parts of drainage areas D22, D24, D13, and D11 are within the site's limits, although these include off-site areas (detailed further in Section 2.3).

According to the IBI design, a 5-year peak flow of 451.00 L/s from drainage areas P55 and R55 is allocated to pipe run EXMH24 to EXMH32 on Cabela's Way

(refer to KWRC Storm Sewer Design Sheet in **Appendix E**). Consistent with this design, the majority of the minor system flow from the subject site will discharge downstream of EXMH24.

For more comprehensive information, please refer to the KWRC Storm Drainage Area Plan and KWRC Storm Sewer Design Sheet provided in **Appendix E**. The allocated minor system flows from the drainage areas entirely within the subject site are summarized in **Table 5** below.

TABLE 5: Allocated Minor Systems Flows

IBI Drainage Area ID	Area (ha)	C Value	5-YR Peak Flow (L/s)	100-YR Peak Flow (L/s)	Allocated Pipe Run
D21	0.2	0.9	52.14	--	MH21-MH22
L21	0.19	0.9	--	84.88	MH21-MH22
R55 & P55	1.73	0.9	451.00	--	MH24-MH32
R12	0.1	0.9	26.05	--	MH12-MH13

Notes:

1. Refer to KWRC Storm Drainage Area Plan and KWRC Storm Sewer Design Sheet – **Appendix E**.
2. IBI design allocated for 100-year peak flow from area L21.

Design Parameters

In line with the comprehensive IBI Report, the proposed storm sewer system has been designed using the following parameters:

- Design Level of Service — 5-Year event
- Inlet Time of Concentration — 10 minutes
- Rainfall Intensity — City of Ottawa IDF curve equations
- Manning's Roughness Coefficient — 0.013
- Minimum Full Flow Velocity — 0.80 m/s
- Maximum Full Flow Velocity — 3.0 m/s
- Minimum Pipe Diameter — 250 mm
- Runoff Coefficients — 0.90 for impervious areas (hard surfaces/ Roofs) or gravel surfaces
  0.20 for pervious areas

4.2.2 Proposed Storm Servicing

Stormwater runoff from the majority of the subject site, including the parking area east of Building A and building roofs, will be managed by a proposed storm sewer system. This system will convey runoff to a new manhole on Cabela's Way, located approximately 25 meters upstream of EXMH 32.

Additionally, a proposed storm sewer system will be installed within the unnamed road, directing runoff to EXMH22 on Cabela's Way as per the approved IBI design. This system is designed to capture and convey flows from the unnamed road and adjacent drainage areas. Runoff from the loading/parking areas west of Building A will also be directed to this proposed storm sewer system.

Roof runoff from Building A will be controlled by roof drains designed by the Mechanical Engineer, and conveyed internally through the building to proposed building storm services. Roofdrain controls shall be designed at a discharge flow rate of 40 L/s/ha. The roofdrain design and rooftop storage (Building A) are summarized in **Table 5A** below.

TABLE 5A: Roof Drains and Rooftop Stormwater Storage

Building	Ponding Area (ha)	Discharge Flow (L/s)	5-YR Storm		100-YR Storm		No. of Area Drains (Zurn Z105)
			Ponding Depth (mm)	Ponding Volume (m^3)	Ponding Depth (mm)	Ponding Volume (m^3)	
A	0.40	22.71	26.2	104.98	58.9	235.64	10

Notes:

1. Refer to roofdrain designs by JHD Engineering Inc. (Appendix A).
2. Max stormwater volume on roof is 302.9 m^3 per the emchanical design.

To accommodate the size of the roof area, three 250 mm diameter storm services will be provided to convey roof flows. The roof flows will be collected and conveyed to an infiltration gallery located within the parking lot. To prevent any potential back flow from the infiltration galleries, a backflow check valve is proposed on each storm connection. Refer to Dwg. C-03 for locations of backflow check valves. Although infiltration is expected, the storm sewer system is designed with capacity to handle the full 5-year peak flow from the roof area.

Similarly, roofs of Buildings B, C, and D will utilize trough systems designed by

the Mechanical Engineer to collect roof runoff. Each building will have a 250 mm diameter storm service to convey roof flows. Building C will utilize an existing 250 mm storm service stub. The storm sewer system has been designed to manage the full 100-year peak flow from the roof areas without causing surcharging.

According to Section 6.6 of the Geotechnical Investigation, perimeter foundation drainage is unnecessary for slab-on-grade structures as long as the floor slab level remains above the finished exterior ground surface level. Hence, no storm services are required to collect foundation drainage for the proposed buildings.

Minor system flows from the subject site, calculated using the Rational Method for the 5-year peak, are summarized in Table 6 below.

TABLE 6: Minor Systems Flows

IBI Drainage Area ID[*1]	Current Design Drainage Area ID	Area (ha)	Allocated 5-Yr Peak Flow[*3] (L/s)	Current Design Full 5-YR Peak Flow[*4] (L/s)	Tributary Pipe Run
D21, L21[*2]	STM7-STM9, TM13	0.30	137.02	68.22	MH21-MH22
R55, P55	R1-R4, R6, STM1-STM6, STM10-STM12	1.73	451.00	374.82	MH24-MH32
R12	R5	0.07	26.05	19.00	MH12-MH13

Notes:

1. Please refer to the KWRC Storm Drainage Area Plan and KWRC Storm Sewer Design Sheet for detailed information in **Appendix E**.
2. The IBI design has allocated for the 100-year peak flow from area L21.
3. Refer to Table 5 for additional details.
4. Note that the full 5-year peak flow calculation does not include controlled orifice flows. For more information, refer to the Table E-01: Storm Sewer Design Sheet in **Appendix E**.

As shown in Table 6 above, the full 5-year peak flows from the minor system are within the allocated peak flows specified in the approved IBI design. The proposed on-site storm sewers range in diameter from 250 mm to 600 mm (See **DWG. C-03** in **Appendix B** for specific details). These sewers have been

designed to accommodate the full 5-year peak design flow while maintaining acceptable full flow velocities as per the OSDG standards.

Furthermore, the capacity of the proposed storm sewer system has been evaluated for the 100-year design event, incorporating restricted flows to ensure the system will not be surcharged up to and including the 100-year event. For additional details, please refer to the Table E-01: storm sewer design sheet, Storm Drainage Area Plan **– FIG. 05**, and Table E-02: composite runoff coefficient calculations provided in **Appendix E.**

4.3 Water Servicing

4.3.1 Existing System

Existing private water mains with a diameter of 203 mm and associated private hydrants are available along Kanata West Centre Drive and Cabela's Way to provide service to the subject site. According to the IBI site plan, a 152 mm diameter water service stub was previously installed from the existing water main on Kanata West Centre Drive to service the former A4 building. Similarly, another 152 mm diameter water service stub was installed from the existing water main on Cabela's Way to service the former A3 building. Both of these existing services will need to be decommissioned in accordance with City of Ottawa standards. An existing 203 mm diameter water main stub, situated approximately 105 meters west of the intersection of Cabela's Way and Kanata West Centre Drive, will be retained for the purpose of on-site water supply.

Design Parameters

In line with the IBI Report and the current Ottawa Water Distribution Guidelines (OWDG), the following water main design criteria have been applied to the subject site:

Water Demand Rate:

- Shopping Center/Commercial Avg. Water Demand 2,500 L/1000m^2/day

Peaking Factors – Peak Hour:

- Commercial 1.8

Peaking Factors – Maximum Day:

- Commercial 1.5

Pressure:

- Min. Pressure During Peak Hour 276 kPa (40 psi)
- Min. Pressure During Maximum Day Plus Fire 140 kPa (20 psi)
- Max. Pressure in Unoccupied Areas 689 kPa (100 psi)
- Max. Pressure in Occupied Areas 552 kPa (80 psi)

Fire Flow Rate:

- Fire Flow FUS calculations (Sec. 4.4)

4.3.2 Proposed Water Servicing

The proposed buildings will receive their domestic water supply through connections to the private water mains located on Kanata West Centre Drive, Cabela's Way, and the unnamed access road.

- Building A will connect to a new 152 mm diameter service line from a new 203 mm diameter private water main to be installed within the unnamed road.
- Building B will connect via a new 152 mm diameter service line to the existing 203 mm diameter water main on Kanata West Centre Drive.
- Buildings C and D will be serviced by a new 152 mm diameter connection to the existing 203 mm diameter water main on Cabela's Way.
- For fire protection, the existing 203 mm diameter water main stub located west of Building D will be extended to provide adequate coverage.

Additionally, a new 203 mm diameter water main will be installed within the unnamed road, linking the existing stubs between Campeau Drive and Cabela's Way. In line with the approved IBI servicing design, two fire hydrants will also be installed along the unnamed road to ensure sufficient fire protection. Refer to **DWG. C-03** in **Appendix B** for specific details.

4.3.3 Boundary Conditions

The City of Ottawa has provided the boundary conditions for the subject site concerning the private connections from the KWRC to the municipal distribution system. These conditions are summarized in Table 7 below.

TABLE 7: Boundary Conditions								
Demand Scenario	**Connection #1**		**Connection #2**		**Connection #3**		**Connection #4**	
	Head (m)	**Pres. (psi)**	**Head (m)**	**Pres. (psi)**	**Head (m)**	**Pres. (psi)**	**Head (m)**	**Pres. (psi)**
Max. HGL	160.7	81.7	160.7	83.2	160.7	81.7	160.7	79.6
Peak Hour	156.5	75.7	156.5	77.2	156.5	75.7	156.5	73.6
Max. Day Plus Fire	137.5	48.7	139.5	53.1	133.8	43.4	115	14.7

Notes:

1. Connection #1 is at Campeau Drive west.
2. Connection #2 is at Campeau Drive east.
3. Connection #3 is at Palladium Drive.
4. Connection #4 is at Nipissing Court.

As the City's hydraulic model does not include private systems, the boundary conditions provided at Palladium Drive (connection 3) and Nipissing Court (connection 4) assume that the municipal system is a dead-end. However, in reality, the system is looped via the private pipe network within the KWRC. This conservative assumption results in lower outputs from the model.

Accordingly, as indicated by the City, only two boundary conditions are necessary to develop a hydraulic model. Therefore, the boundary conditions for connections 3 and 4 have been excluded from the developed model. For further information, please refer to the boundary conditions provided in **Appendix C**.

4.3.4 Water Demands

Based on the City's design criteria (OWDG) and input from the IBI report, the commercial water demand is estimated in Table C-05: Water Demand Calculation, **Appendix C** and the key estimates are summarized in the Table 8 below:

TABLE 8: Water Demands			
Junction	**Demand (L/s)**		
	Avg. Day	**Max. Daily**	**Max. Hourly**
Building A	0.158	0.238	0.428
Building B	0.020	0.029	0.053
Building C	0.021	0.031	0.056
Building D	0.023	0.034	0.062
Total	**0.222**	**0.333**	**0.599**

Refer to the Table C-05: Water Demand Calculation in **Appendix C** for more details.

4.3.5 Fire Flows

Private hydrants already exist along Kanata West Centre Drive and Cabela's Way to protect the subject site from fire. However, a new private hydrant will be necessary on-site to ensure adequate coverage. This new hydrant will be positioned within a landscaped island in the parking area, along the fire route, and within 45 meters of the proposed Siamese connection for Building A. All buildings will be steel framed, I.e. non-combustible and serviced with supervised automatic sprinkler system. Refer to the confirmation email of project team architect - TAES in **Appendix C**.

The total required fire flow for each building has been determined using the 2020 Water Supply for Public Fire Protection guidelines (FUS, 2020). The following input parameters are assumed in the FUS calculations:

Commercial Building A:

- Type of Construction: Non-Combustible Construction
- Ground Floor Area: Building footprints as per Site Plan
- Occupancy Class: Combustible
- Sprinkler Protection: Yes
- Exposure Distances: Building separations as per Site Plan

Commercial Buildings B, C, & D:

- Type of Construction: Non-Combustible Construction
- Ground Floor Area: Building footprints as per Site Plan
- Occupancy Class: Combustible
- Sprinkler Protection: Yes
- Exposure Distances: Building separations as per Site Plan

The total required fire flow for each building is summarized in Table 9 below.

TABLE 9: Total Required Fire Flow

Building	Total Required Fire Flow (L/min)
A	7,000
B	5,000
C	6,000
D	6,000

As shown in Table 9 above, the total required fire flow for the proposed buildings ranges from 5,000 to 6,000 L/min. For further details, please refer to Table C-01 to C-05 for the complete FUS calculations provided in **Appendix C**.

The fire flow estimate for Building B, C & D is based on wood frame construction, and therefore is conservative. Calculations are not required to be updated per discussion with the City on Nov. 4, 2024. Refer to **Appendix A** for discussion details.

4.3.6 Hydrant Coverage

Pressure losses due to friction in firehoses are directly proportional to the hose length. Consequently, the actual fire flow delivered by the nozzle at the end of a longer firehose will be less compared to a shorter hose connected to the same hydrant. According to OSDG ISTB-2018-02, the aggregate fire flow capacity of all contributing fire hydrants within 150 meters of a building must meet or exceed the required fire flow.

In some situations, involving dead-end watermains, standard hydrant spacing

may not suffice to achieve the necessary fire flow. The contribution to the required fire flow is based on the distance from the hydrant to the building in question. Specifically, a flow of 5,700 L/min should be assigned to hydrants located 75 meters or less from the building, while a flow of 3,800 L/min should be assigned to hydrants situated between 75 and 150 meters from the building (as per Table 1 from ISTB-2018-02 for AA-rated hydrants).

For the on-site buildings, fire flow coverage will be provided by the existing hydrant on Kanata West Centre Drive (EX. HYD-2) and the proposed on-site hydrant (Prop-HYD). Building C will also be covered by the existing hydrant on Cabela's Way (EX. HYD-1). The contributing fire flows from the adjacent hydrants are summarized in Table 5.4 below.

TABLE 10: Hydrant Coverage

Building	Prop-HYD Contribution (L/min)	EX. HYD-2 Contribution (L/min)	EX. HYD-1 Contribution (L/min)	Total Fire Flow Contribution (L/min)	Required Fire Flow (L/min)
A	5,700	3,800	-	9,500	7,000
B	5,700	5,700	-	11,400	5,000
C	3,800	5,700	5,700	15,200	6,000
D	5,700	5,700	-	11,400	6,000

As shown in Table 10 above, the contributing fire flows from the adjacent hydrants exceed the total required fire flows noted in Table 9, thus meeting the requirements of ISTB-2018-02. Refer to the Hydrant Coverage Plan – **FIG 2,** included in **Appendix C** for more details.

4.3.7 Hydraulic Model

A hydraulic model for water distribution was created using EPANET model for the subject site. This model integrated the proposed layouts of water mains, placement of hydrants, boundary conditions provided by the City of Ottawa, and typical "C" factors as per the latest OWDG guidelines. Please refer to the hydraulic model layout – **FIG. 03**, included in **Appendix C**. The results of the hydraulic model, including Peak Hour demand, and simulations for Max. Day +

Fire Flow and available fire flow at hydrants, are summarized in Table 11 below.

TABLE 11: Hydraulic Model Outputs

Model Junction	Pressure under Peak Hour (psi)	Pressure under Max. Day + Fire flow (psi)	Available Fire Flow (Lpm)
Building A	73.76	48.05	-
Building B	73.72	46.22	-
Building C	74.12	35.24	-
Building D	73.72	34.85	-
Prop_HYD			9,906.00
EX. HYD#1			11,994.00
EX. HYD#2			15,846.00

Under worst case scenario (i.e., when B, C, D buildings are considered as having not Automatic Sprinkler System) and considering the maximum daily demand (MDD) of 0.33 L/s and fire flow (FF) ranging from 116.67 to 183.33 L/s anticipated for the new buildings, the hydraulic model predicts residual pressures ranging from 25.7 psi to 53.9 psi throughout the water distribution network under MDD + FF conditions. These pressures are not less than the minimum pressure requirement of 20 psi set by the City of Ottawa Guideline.

Additionally, as shown in Table 11 above, the pressure anticipated at each building junction surpasses the minimum allowable threshold of 40 psi during the Peak Hour simulation. Furthermore, it has been verified that during the Maximum HGL simulation, the peak pressure at each building junction remains below the maximum permissible limit of 80 psi, thus obviating the need for pressure reducing valves (PRVs).

During the MDD + FF simulation, the fire flow available from the proposed on-site hydrant (Prop_HYD), calculated at a reference pressure of 20 psi, exceeds the total required fire flows for Buildings A and B as determined in Section 4.3.5. Similarly, the fire flow available from the existing hydrants (EX. HYD#1 and HYD#2) surpasses the aggregate fire flow requirements for all proposed buildings.

Therefore, the design of the proposed watermain systems adequately fulfills both

domestic demand and fire protection criteria outlined in the OWDG and IBI Report. Detailed hydraulic model layout and outputs can be found in **Appendix C** for further reference.

5. EROSION AND SEDIMENT CONTROL DURING CONSTRUCTION

Before construction begins and until vegetation is re-established in disturbed areas, erosion and sediment control (ESC) measures must be put in place to mitigate the impact on receiving watercourses and existing infrastructure. The following ESC measures have been proposed for the subject site:

- Limit Exposure: Minimize the extent of exposed soils at any given time.
- Maintenance of ESC Measures: Maintain erosion and sediment control measures until vegetation is re-established in all disturbed areas. Re-vegetate disturbed areas as soon as possible according to the approved Landscape Plan.
- Soil Stockpiles: Stockpile soil at least 15 meters away from watercourses, drainage features, and the top of steep slopes.
- Silt Sacks: Install silt sacks between the frame and cover on all proposed and existing catch basins and open cover storm manholes until construction is completed.
- Silt Fence: Install and maintain a silt fence along property boundaries.
- Mud Mats: Install mud mats at all construction entrances.
- Inspections: Conduct visual inspections weekly during active construction and after major storm events (more than 25mm of rain in a 24-hour period) and repair any damage immediately. Assess and repair ESC measures following significant snowmelt events.
- Anticipatory Inspections: Perform visual inspections in anticipation of large storm events or extended periods of rainfall and/or snowmelt that could result in significant runoff volumes.
- Protecting ESC Measures: Take care to prevent damage to ESC measures during construction operations.
- Temporary Removal: Temporarily remove barriers, if necessary, for construction operations and reinstate them immediately after the operations are completed.
- Adjustments: Adjust ESC measures during construction to adapt to site features as development progresses.
- Cleaning and Replacement: Clean accumulated sedimentation from ESC

measures as needed and replace them as necessary.

- Additional Measures: If the Engineer deems additional prevention methods necessary to control erosion and sedimentation, the Contractor must implement these measures to the Engineer's satisfaction.
- Compliance: Ensure construction and maintenance of erosion and sediment controls comply with Ontario Provincial Standard Specification (OPSS) 805.

Once vegetation is re-established within the limits of Phase 1, ESC measures may be removed. The ESC measures within the limits of Phase 2 shall remain until the works are constructed and vegetation is re-established. For more details, refer to the Erosion and Sediment Control Plan (**DWG. C-04**) provided in **Appendix B**.

6. CONCLUSIONS

This servicing and stormwater management report has been prepared to support the Site Plan Application for the development at 3075 Palladium Drive, within the KWRC. The report details the strategies to comply with stormwater management requirements, and outlines the proposed site servicing methods, as per City of Ottawa guidelines and the IBI Report for the KWRC. The proposed stormwater management designs and servicing will include the following key features:

6.1 Stormwater Management Plan

- Water Balance: An infiltration gallery located in the parking lot, receiving runoff from Building A's roof drains, will be employed to meet the site's infiltration target (i.e., 75mm/year).
- Water Quantity Control: While the quantity control to the minor system will be controlled through Inlet Control Devices (ICDs), on-site storage will be provided for major system control for all storm events up to and including 100-year design storms in accordance with IBI report.
- Water Quality Control: The water quality control will be provided by the existing Pond 6 West Facility.

6.2 Site Servicing

- Sanitary Service: The sanitary flows will be conveyed by new 200mm dia sanitary sewers to the existing private sanitary sewer systems on Kanata West Centre Drive, Cabela's Way and the unnamed access road.
- Storm Service: The proposed storm sewers ranging from 200mm to

600mm – minor storm sewer systems – will connect to the existing storm sewer system on Cabela's Way, upstream of EXMH 32. The stormwater outflows for all storm events, including those up to the 100-year design storm, will be managed in compliance with the IBI Report.

- Water Service: The domestic water supply will be provided through new 152mm watermain connections to the existing private watermains on Kanata West Centre Drive, Cabela's Way, and the unnamed access road. Fire protection water supply will be ensured by a new on-site hydrant as well as the existing private hydrants adjacent to the site.

6.3 Temporary Erosion and Sediment Control prior to Construction

- Erosion and sediment control measures will be employed prior to construction and will be maintained until disturbed areas have been re-vegetated in accordance with ESC guidelines and other requirements.

Prepared By:

WPE Engineering Ltd.



Michael Du, P.Eng.
Project Manager

Appendix A

Pre-Consultation Notes

General Plan of Services (prepared by IBI Group)

As-Built General Plan of Services (prepared by IBI Group)

Cabela’s Access Road (prepared by IBI Group)

Discussion Summary with City’s Engineer

PHASE 3 PRE- CONSULTATION: REVIEW FEEDBACK
MARCH 22, 2024

File No.: PC2024-0078

March 22, 2024

Tim Eisner
Applicant's Company
Via email: Applicant's email

Subject: Phase 3 Pre-Consultation: Review Feedback
Proposed Insert Application Type(s) – Address

Please find below information regarding next steps as well as consolidated comments from the review of the studies and plans submitted in support of the above-noted pre-consultation.

Next Steps

1. A review of the materials submitted for the above-noted pre-consultation has been undertaken and staff have identified deficiencies needing to be resolved**.** Please proceed to complete a Pre-consultation Application Form for another Phase 3 review and submit together with the necessary revised studies and/or plans to planningcirculations@ottawa.ca.

2. In your subsequent Phase 3 pre-consultation 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.

Planning

List of Studies and Plans Reviewed:

- **Site Plan**, A100, prepared by Allan Stone Architect, dated 16 Feb 2024.
- **Building A Elevations**, A-201, prepared by TAES Architects Inc., dated 2023-11-30, revision 6 dated 2024-02-16.
- **Building B – Elevation**, A200, prepared by Rossmann Architecture, dated 2023-10-11, revision 1.1 dated 2024-01-25.
- **Building C – Elevation**, A201, prepared by Rossmann Architecture, dated 2023-10-11, revision 1.1 dated 2024-01-25.
- **Building D – Elevation**, A202, prepared by Rossmann Architecture, dated 2023-10-11, revision 1.1 dated 2024-01-25.

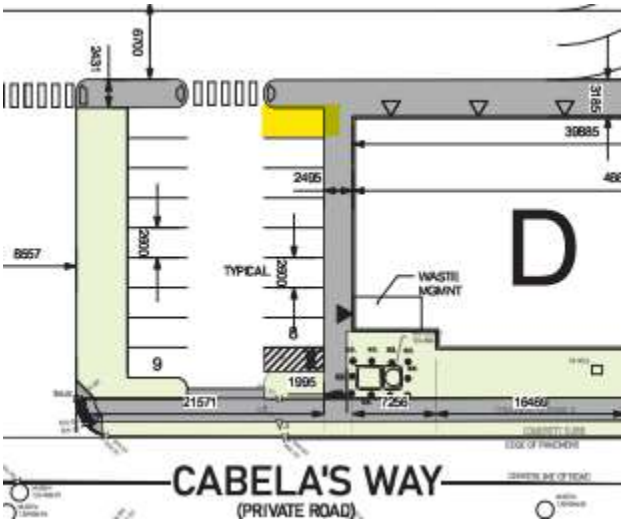
Deficiencies:

Site Plan

1. Please indicate the location of snow storage. Please note the snow storage area should not interfere with the location of any trees.

2. Please include design details for bicycle parking.

3. Is it possible to provide an accessible parking space closer to Building D?



Landscape Plan

4. Please include the agent and surveyor in the list of consultants.

5. Please include a Key Plan showing the location of the site.

6. Please include a legal description.

Elevations

7. It appears the doors on *Building A Elevation (West Side) - Rear* do not match the site plan.

Comments:

8. There is a discrepancy between the number of revisions and label on *Building A Elevation* drawing the order on the table jumps from 3 to 5, please revise.

9. Is *Part 4* as shown in the Reference Plan owned by someone else? Would that have an impact on the proposed Building B and the future severance?

10. Are there any easements on the property. If yes what is the nature of the easement?

11. Please explain why the bicycle parking rate for a shopping centre is used as opposed to retail food store and retail store.

12. Staff appreciate the efforts to improve the landscape on site, however, Staff encourages the applicant to find opportunities to provide more trees within the parking lot.

Urban Design

List of Studies and Plans Reviewed:

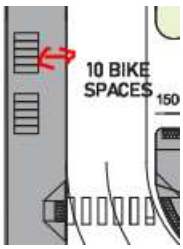
- **Site Plan**, A100, prepared by Allan Stone Architect, dated 16 Feb 2024.
- **Building A Elevations**, A-201, prepared by TAES Architects Inc., dated 2023-11-30, revision 6 dated 2024-02-16.
- **Building B – Elevation**, A200, prepared by Rossmann Architecture, dated 2023-10-11, revision 1.1 dated 2024-01-25.
- **Building C – Elevation**, A201, prepared by Rossmann Architecture, dated 2023-10-11, revision 1.1 dated 2024-01-25.
- **Building D – Elevation**, A202, prepared by Rossmann Architecture, dated 2023-10-11, revision 1.1 dated 2024-01-25.

Deficiencies:

Site Plan:

13. Please identify walkway width throughout the site.

14. Please identify the width of walkway where the bike racks are near Building A. Circled below.



15. Please identify the width of walkway where the building façade articulates outwards to the edge of drive aisle (north and south of the screenshot above).

16. Please include the Landscape Architects in the list of consultants.

Elevations:

17. The building elevations for Building C do not match door locations on the Site Plan. There is a door missing on the north-east elevation.

18. Should there not be signage signs on the west side of Building B and C?

Comments:

19. A Design Brief has not been submitted. Please provide a document will all highlighted TOR in a single package with applicable analysis/discussion.

20. Please include an additional tree on the north end of Building B, west of the utilities.

21. Understanding that the available permeable space around Build C has utilities and prevents tree planting, please include a more robust planting plan. Similarly around Building B and D include a more robust planting plan, this is in keeping with the previous KWCP.

22. Can the applicant please confirm that there is only one location for waste pickup?

23. Where is the main entrance for Sunny Foodmart? The elevations could be articulated further to emphasize the main entrance to the foodmart and then to the supplementary units on the south end of the building (include space for signage).

24. Please have the building façade of Building A relate to Building B-D. Building B-D have architectural articulation and glazing that should be consistent throughout this plaza.

Engineering

- **Geotechnical Investigation – Proposed Development – 3075 Palladium Drive**, prepared by GEMTEC, dated October 24, 2023.

- **3075 Palladium Drive – Kanata West Retail Centre – Servicing and Stormwater Management Report**, prepared by Robinson Land Development, dated February 2024.

- **Erosion and Sediment Control Plan**, Drawing No. 23027-ESC1, prepared by Robinson Land Development, revision 1, dated 02/23/24

- **Grading Plan**, Drawing No. 23027-GR1, prepared by Robinson Land Development, revision 1, dated 02/23/24

- **Interim Grading Plan**, Drawing No. 23027-GR2, prepared by Robinson Land Development, revision 1, dated 02/23/24

- **Servicing Plan**, Drawing No. 23027-S1, prepared by Robinson Land Development, revision 1, dated 02/23/24

- **Notes & Details**, Drawing No. 23027-N1, prepared by Robinson Land Development, revision 1, dated 02/23/24

- **Existing Conditions and Removals Plan**, Drawing No. 23027-R1, prepared by Robinson Land Development, revision 1, dated 02/23/24

- **Sanitary Drainage Area Plan**, Drawing No. 23027-SAN1, prepared by Robinson Land Development, revision 1, dated 02/23/24

- **Storm Drainage Area Plan**, Drawing No. 23027-STM1, prepared by Robinson Land Development, revision 1, dated 02/23/24

- **Phase I – Environmental Site Assessment – Vacant and Agricultural Property – 405-425 Huntmar Drive and 3001 Palladium Drive**, prepared by Paterson Group, dated January 8, 2014.

- **Phase I – Environmental Site Assessment Update –3075 Palladium Drive**, prepared by Paterson Group, dated May 16, 2023.

Completeness Comments (to be addressed for a complete formal submission):

Servicing and Stormwater Management Report

25. Section 5.6, page 11, please have the architect confirm that the type of construction for Building A will be – Non-combustible Construction as assumed in the fireflow calculations of the report. Pages 20, 21 of the FUS, 2020 can be used as guidance to determine the C value.

26. A 50% sprinkler credit requires confirmation from the mechanical engineer that the monitoring system to be in accordance with FUS requirements.

27. As per OSDG Section 8.3.8.4, since control flow roof drains will be used, please provide the following information: Type and number of control device proposed, maximum flow rate (at maximum head), depth and volume of flow depth.

28. Additionally, as per OSDG Section 8.3.11.3, please provide the following information on the design drawings: rooftop storage volume, depth of flow depth, location of roof drains, number of roof drains, flow per roof drain, total flow from roof.

29. Has the option of connecting the infiltration gallery to the existing stub at Building A or to existing MH23 in Cabela's Way been considered? Also consider

separating the infiltration system from the parking lot system to avoid possible cross contamination. Please review, and revise if you deem this servicing approach appropriate.

Geotechnical Report

30. Section 6.10, page 15 states that the final design details for the service installations were not available at the time of reporting. Given the infiltration gallery and the requirement for clay seals at horizontal spacings of no more than 100 meters (per Section 6.10.7), it is recommended that the Geotech be provided with the servicing and grading plans for review/comment/make recommendations.

Servicing Plan

31. Confirm existing sanitary pipe material on Kanata West Centre Dr. at Building B connection. If existing pipe is concrete, a MH will be required to make a connection to existing sewer. Provide connection invert.

32. Please revise CICB1 and CICB2 to individual connections to STMH21 due to CICB2 having inlets at less than 90 degrees apart.

33. Please revise line type of sewers in Unnamed Road to black as the sewers are not existing.

Grading Plan

34. Please provide major overland flow arrows on all roads surrounding the subject site, including the unnamed road. Ensure that the major overland flow does not spill onto adjacent properties.

Notes & Details

35. Please update Note 17 with: “Clay Seals shall be installed at a horizontal spacing of no more than 100 meters as per Geotechnical Report recommendations.”

Supportability Comments (to be addressed prior to or at the time of application submission; ideally prior to if another phase 3 pre consult submission is required):

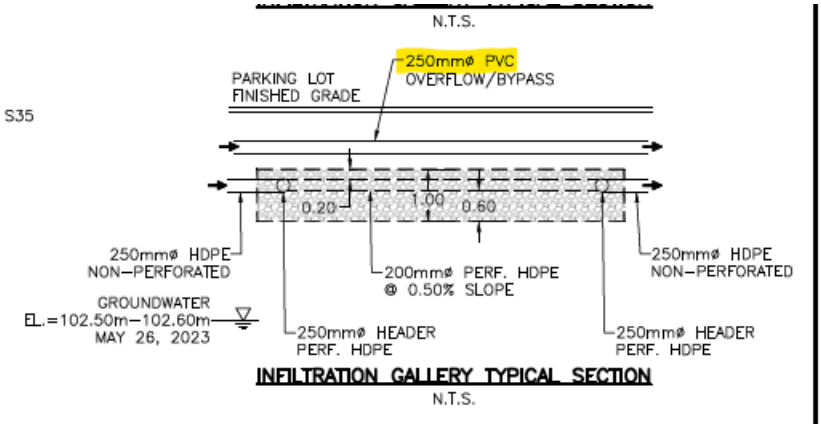
Servicing and Stormwater Management Report

36. Please update the date of the Geotechnical Investigation Report to the latest Geotechnical report available, if providing a date.

Servicing Plan

37. Infiltration gallery bypass invert is higher than storm invert at Building A. Please provide a storm backflow preventer at Building A per City spec S14. Also there is

a discrepancy on the overflow pipe size in the Infiltration Gallery Typical Section to the overflow pipe size mentioned in the report. Please review and revise.



38. Please update the drawing to show a 90-degree connection from CB3 and the storm sewer.

39. Please show the existing storm and sanitary MH inverts and T/G on Kanata West Park Drive and Cabela's Way to which the subject site's storm and sanitary sewers will connect to.

40. Please consider changing CB8 to a CBMH as it is recommended to avoid connecting catch basins in series.

Notes & Details

41. Please update Note 13 with: "Refer to Geotechnical Investigation Prepared by GEMTEC."

Feel free to contact Anton Chetrar, Infrastructure Project Manager, for follow-up questions.

Transportation

- **Site Plan**, prepared by Allan Stone Architect, dated October 2023.
- **Transportation Impact Assessment**, prepared by CGH, dated February 2024.

Comments:

Section 2.2.2 Existing Intersections:

42. "The existing signalized area key intersections within one kilometre" change wording by removing the word "signalized".

43. Please include discussion of pedestrian and cycling crossings at study area signalized intersections, wherever notable. For example, it should be noted that there is not pedestrian crossing on the south leg of the Palladium Drive and Highway 417 Westbound Ramp intersection.

44. The southbound approach of the Campeau Drive and Journeyman Street intersection is the same as the northbound approach (i.e., it consists of an auxiliary left-turn lane, a through lane, and a right-turn lane).

45. The description of the Palladium Drive at Cabela's Way intersection states that the northbound U turn is restricted. However, no signage or other evidence of this restriction is visible on Google Street View. Please confirm U-turn restriction.

46. The description of the Palladium Drive at Highway 417 Eastbound Ramp describes the westbound approach. Revise to "eastbound approach".

Section 2.3.1 Changes to the Area Transportation Network:

47. Update the statement, "The EA including the Stittsville Main Street is expected to be completed in 2023."

Section 5.2 Trip Generation:

48. Clarify if there is a supermarket planned for Building A.

Section 7.1 2027 Future Background Operations:

49. Figure 17 shows the 417 eastbound ramp is signalized in 2027. However, the text stating the assumption that this intersection will be signalized only appears in Section 7.2. The first sentence of Section 7.2 should be replicated in Section 7.1.

50. The Synchro worksheets in the appendices indicate that all future traffic analysis evaluates the intersection of Palladium Drive and the Highway 417 Eastbound Ramp with double eastbound left-turn lanes. This is inconsistent with the design provided in Appendix E. Please review and revise, if necessary.

51. The Sidra worksheets are not included in Appendices G to J. They are included in Appendix C only. Please add Sidra worksheets.

Section 7.3 2027 Future Total Operations:

52. The discussion surrounding the overcapacity westbound left-turn movement at the Campeau Drive and Journeyman Street intersection states the percentage of westbound vehicle volume associated with the proposed development. However, the deterioration in the permissive westbound left-turn movement is caused by the increase in opposing eastbound traffic (i.e., westbound left-turning traffic have a more difficult time finding gaps due to the higher eastbound volumes). Please revise discussion in Section 7.3 and Section 7.4.

Section 6.3 Other Developments:

53. Correct reference error.

Section 8.1 Design for Sustainable Modes:

54. Recommend provision of a concrete sidewalk on the west side of Kanata West Centre Drive between the Cabela's Way and Campeau Drive. Without this sidewalk there is poor pedestrian connectivity between the patios for Building B and Building C.

55. The straight path of the sidewalk on the north side of Cabela's Way (private road) is interrupted by the 18 parking stalls to the south of building A. Consider options to improve the intuitive navigability of this sidewalk.

56. Consider provision of a crossing of Cabela's Way between Building A and the front of the Cabela's store.

57. The location of a couple of the depressed curbs for accessible parking spaces could be located a better position to provide a direct connection to the access aisle:

a. The accessible parking stall closest to the northwest corner of Building B

b. The accessible parking stall closest to the 10 bicycle parking spaces in the middle of Building A.

58. Provide a description of the location of the bicycle parking spaces.

59. Pave the area around the six bicycle parking spaces at the northeast corner of Building A so that these bicycle parking spaces are more usable.

Section 10 Boundary Street Design:

60. For an enterprise area, local streets have no BLOS target (per Exhibit 22 of MMLOS Guideline). Please correct.

Section 11.1 Location and Design of Access:

61. Consider revising the west access to Campeau Drive to meet City standards by extending the concrete sidewalk on the south side of Campeau Drive across the access.

Traffic Signal Design

62. If there are any future proposed changes in the existing roadway geometry that require signalizing of an intersection or changing an existing signalized intersection, the City of Ottawa Traffic Signal Design Unit is required to complete

a traffic signal plant design and will need to be engaged in reviews during the functional design stage.

Please contact Christopher Geen: 613-227-0674 or Christopher.Geen@ottawa.ca and Diana Barrett: 613-807-3035 or Diana.Barrett@ottawa.ca to discuss traffic signal design related requirements.

63. Please ensure the files sent to us meet the following criteria:

a. Drawings to be in NAD83 coordinates

b. Drawings should not include any x-references within design

c. Drawings must be in model space

d. Drawings to be in CAD format (.dwg)

e. Drawings to be in 2D (.dwg)

f. Include: proposed geometry, proposed pavement markings and signage, AutoTURN vehicle templates, proposed and/or existing utilities (only within project limits), existing base mapping/topo (only within project limits), proposed landscape/streetscape if available.

Traffic Engineering

64. In a few of the synchro analysis at Campeau Drive & Journeyman Street intersection, make corrections to the phase numbers; the phase 2/6 mainstreet is Campeau Drive. To fill-in the grey colour on the splits and phases diagram at Palladium Drive & Highway 417 Westbound Ramp intersection, maximize the southbound phase 6 green splits to 59 seconds.

65. Please provide in-depth analysis for Kanata West Centre & Cabela's Way all-way stop control intersection. This intersection is key to the operation of the adjacent Palladium Drive & Cabela's Way intersection.

Feel free to contact Neeti Paudel, Transportation Project Manager, for follow-up questions.

Forestry

- **Landscape Plan**, L.1, prepared by James B. Lennox & Associates Inc., dated October 2023, revision 4 dated 02/15/2024.

- **Tree Conservation Report 3075 Palladium Drive City of Ottawa**, prepared by CSW Landscape Architects Limited, dated February 15, 2024.

Deficiencies:

Tree Conservation Report

66. Trees 1-3 and 19-21 are listed as in poor condition with 80% crown dieback. Please remove and replace these trees for a better chance at long term survival post-development.

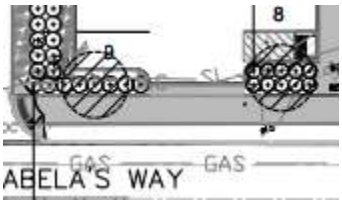
67. Please ensure the ownership of all trees is listed correctly in the table (trees 9-16 are City-owned).

68. Both the Landscape Plan and TCR must show the tree protection fencing area around all existing trees and ensure that any additional landscaping, hardscaping etc. is designed outside of the tree protection areas. For example, what appears to be entrances on the east side of building B including paving and new landscaping right to the trunks of existing trees, as well as proposed parking directly adjacent to tree 17 & 18. Please revise both plans to provide appropriate setbacks from the existing trees.

Landscape Plan

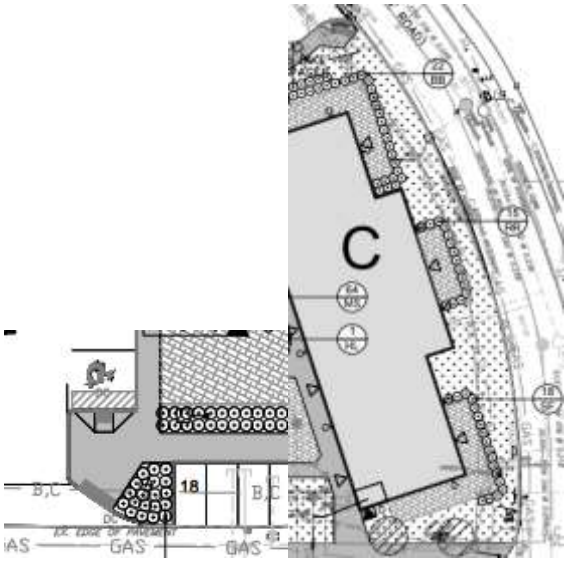
69. Please include all required items listed within the Landscape Plan Terms of Reference on the Landscape Plan. The soil volume calculations must be demonstrated on the plans to ensure that all greenspace with sufficient soil includes a tree and that all trees are provided with sufficient soil volume.

70. Confirm that the soil volume provided around the existing trees is not only sufficient for the protection through construction, but also to support their long-term growth and survival. E.g., trees 17 & 18



71. Please label the existing trees on the Landscape Plan as per the TCR for ease of reference.

72. The projected canopy cover for the site is 11%. It appears that there is space to plant additional trees east of building C, to improve both the canopy cover and streetscape in this area. In other areas, consider expanding some of the parking lot islands/boulevards or reducing the sidewalk coverage or # of parking spaces to support tree planting.



Comments:

73. As per the direction of the Official Plan, Section 4.8.2 Policy 3, it is strongly recommended to provide additional space within the site to plant trees to increase the canopy cover projection and to decrease the urban heat island effect from the large amount of parking.

74. Please consider replacing proposed vegetation with invasive tendencies (e.g. Euonymus alatus) with native or non-invasive species.

75. Updates to the Landscape Plan and Tree Conservation Report are required prior to a Site Plan Control submission.

Feel free to contact Nancy Young, Forester, for follow-up questions.

Zoning Examination

Comments:

76. As per geoOttawa it looks like this property is within the MTO boundaries. Please check with MTO to see if a permit is required.

77. The minimum parking space rate reviewed were for shopping centre rate in Area C as per Schedule 1A the required parking is based on 3.6 per 100 m2 of gross leasable floor area. As per my estimated gross floor area without having floor plans to verify all 4 buildings are roughly 77770.94 m2 as such for shopping centre a minimum of 280 spaces are required and only 244 are being provided as per the site plan. Please revise.

78. Accessible spaces required from 251-300 spaces is 8. 4 type A spaces and 4 type B spaces. Only 3 type B spaces where provided, please revise site plan to add 1 addition Type B parking space.

79. Refuse collection is located in the rear yards, please provide a detail of how it will be screened in. Outdoor refuse collection as per section 110(3) must have an opaque screen of minimum 2m in height.

80. Bicycle parking for retail food store and retail store is 1 per 250m² of GFA. With the GFA of all buildings being 7770.94m² the required amount of bicycle parking spaces is 31, at the moment only 26 spaces are showing, please revise, also please show the dimension of the spaces. Horizontal spaces must be 0.6m x 1.8m.

81. Loading spaces are required for the retail food store, because of the gross floor area 2 loading spaces are required, please identify those loading spaces and make sure they comply with all provisions of Section 113 of the zoning by-law.

Traffic management

Comments:

82. Will there be any encroachments needed on City ROW – sidewalk closures? Lane closures? Will need traffic control plans showing the limits and location of the request – as well a timeline for the duration of the closure, anything 20 days or more is subject to Councillor approval.

83. Will there need to be site servicing/road cut impacts? – this needs to also have a dimensioned site plan and TCP to show the impact.

a. Please note: No construction work will be allowed on Weekends on the roadway for Campeau Drive or Kanata West Centre Drive.

84. Please identify the truck haul route to and from site.

85. Is the proposed temporary access going to be the permanent access as well? a temporary access will need to be applied beforehand.

86. Will there be any crane swing impacts on adjacent properties including the City ROW (if any).

Conservation Authority

1. Please see a letter from the Mississippi Valley Conservation Authority attached to this email.

Feel free to contact Mercedes Liedtke, Mississippi Valley Conservation Authority, for follow-up questions.

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

Yours Truly,
Solé Soyak

CITY OF OTTAWA REVIEW FOR APPLICATION COMPLETENESS (OCT. 31, 2024) ENGINEERING COMMENTS DISCUSSION SUMMARY (NOV. 4, 2024)

File No.: D07-12-24-0076

October 31, 2024

Peter Cai
Caimion Development Inc.
Via email: pcai@petercai.ca

Subject: Review for Application Completeness
Site Plan Control (Complex) – 3075 Palladium Drive

Please find below the detailed comments from the review of the studies and plans submitted in support of the above noted site plan control application.

Planning

List of Studies and Plans Reviewed:

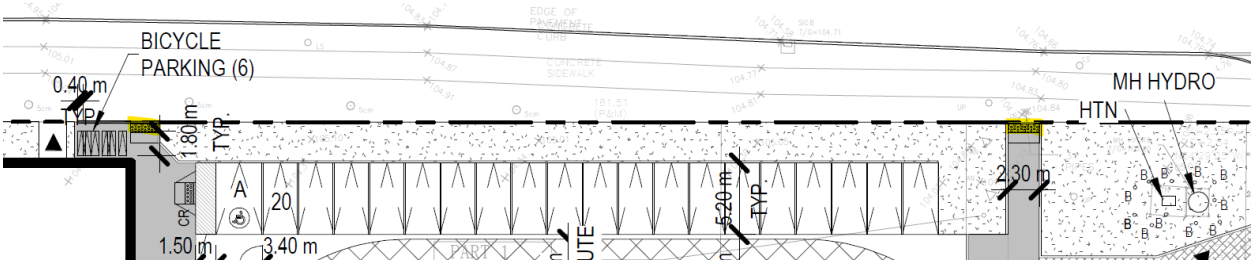
- **Site Plan**, A001, prepared by TAES Architects Inc., dated 2024-09-30.
- **Building Elevations**, A-201, prepared by TAES Architects Inc., dated 2024-07-18.
- **Building Elevations**, A-202 to A-204, prepared by TAES Architects Inc., dated 2024-07-25.
- **Landscape Plan**, L.1, prepared by James B. Lennox & Associates Inc., dated 09/25/2024.
- **Tree Conservation Report Current Vegetation**, TCR1.1, prepared by CSW, dated 18-09-24.
- **Tree Conservation Report Proposed Development**, TCR1.2, prepared by CSW, dated 18-09-24.
- **Tree Conservation Report**, TCR1.3, prepared by CSW, dated 18-09-24.
- **Planning Rationale + Design Brief**, prepared by TAES Architects inc., dated October 4th, 2024.

Deficiencies:

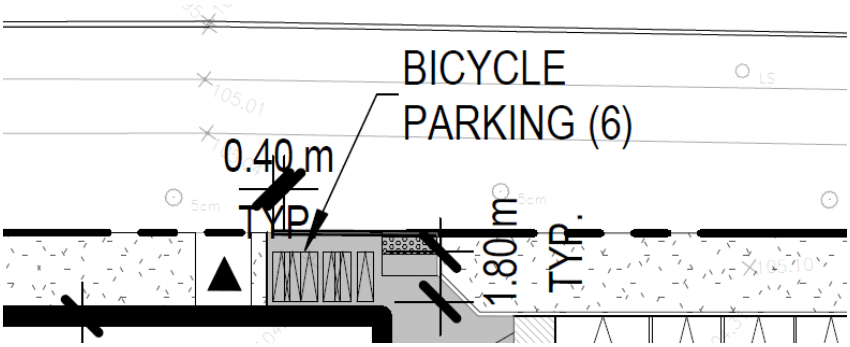
Site Plan

1. There is no Gross Leasable Floor area for buildings B, C and D. Please provide to ensure the total number of required parking spaces is met.

2. Please clarify what the highlighted markup on the drawing symbolizes, it is not included in the legend. Is it a depressed curb? If yes, it should connect to the City's sidewalks.



3. The minimum space width for a bicycle parking spaces as per Section 111, table 111B is 0.60 metres. The bicycle parking in the area below indicates the size at 0.4 metres. Please revise.



4. The zoning table indicates the number of loading spaces required is as per table 101, however, the correct table is 113. Please revise.

<u>Planning Rationale and Design Brief</u>

5. Please remove PC2024-0078 from the title page.

6. The section 3.1 Provincial Policy Statement should be updated to reflect the new Provincial Planning Statement which came into effect on October 20, 2024.

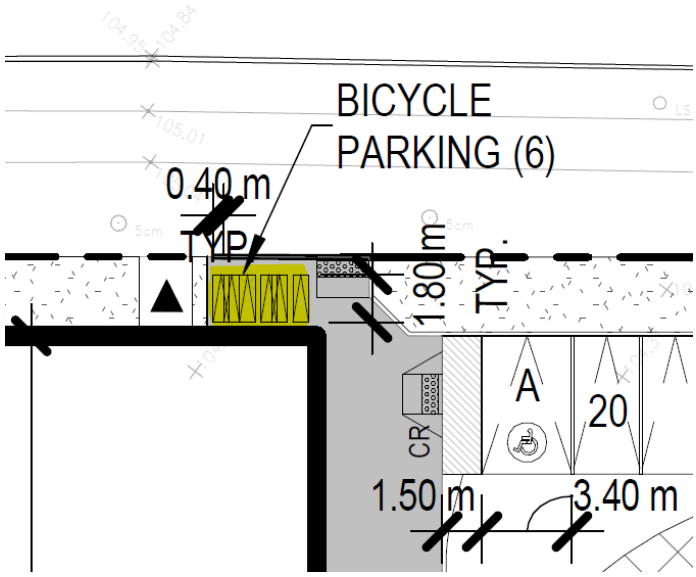
7. A zoning confirmation report has not been submitted, however, should you wish to include the report as part of Section 3. Compliance of the Planning Rationale, please ensure all the requirements as per the Term of Reference are included. For example, the current zoning compliance table is missing the corner side yard setback requirement.

Comments:

8. Please clarify the intent of the "play area" use and whether it is contemplated in the GM zone. If the use is not permitted, a Zoning By-law Amendment (major) application will be required to accommodate the use. Alternatively, please

remove the reference to “play area” from the drawings should you not wish to pursue a rezoning.

9. Please consider relocating the bicycle parking to the east façade of the grocery store to provide a clear path between the side entrance and the sidewalk.



10. Section 113 (6) states that a portion of the required loading spaces must be provided as oversize vehicle loading spaces as per Table 113 C and must comply with the space provisions as per Table 113B. It is not clear on the site plan whether that provision is met.

11. A Private Roadway Street Naming application to BCS is required for any internal private road network. The private roadway approval process is three months.

Urban Design

List of Studies and Plans Reviewed:

- **Landscape Plan**, L.1, prepared by James B. Lennox & Associates Inc., dated 09/25/2024.

Deficiencies:

12. Please tie sidewalks within the site to City sidewalks along Campeau Drive (2 connections).

Comments:

13. Please be aware that any landscape elements outside of property lines will be required to enter into a Maintenance and Liability Agreement (sidewalks, pavers, plantings, etc.) as part of the Site Plan Agreement.

Engineering

- **Subsurface Investigation Report**, prepared by Yuri Mendez Engineering, dated September 19, 2024
- **Functional Servicing & Stormwater Management Report**, preapred by WPE Engineering Ltd., dated September 30, 2024
- **Phase 1 – Environemntal Site Assessemnt Update**, preapred by Paterson Group, dated September 12, 2024
- **Site Grading Plan**, C-01, prepared by WPE Engineering Ltd., Revision 2, dated September 27, 2024
- **Interim Grading Plan**, C-02, prepared by WPE Engineering Ltd., Revision 2, dated September 27, 2024
- **Site Servicing Plan**, C-03, prepared by WPE Engineering Ltd., Revision 2, dated September 27, 2024
- **Erosion & Sediment Control Plan**, C-04, prepared by WPE Engineering Ltd., Revision 2, dated September 27, 2024
- **Existing Conditions and Removals Plan**, C-05, prepared by WPE Engineering Ltd., Revision 2, dated September 27, 2024

Comments:

Geotechnical Report

14. The report still does not provide an estimate of the amount of water expected to be pumped. Section 7 provide estimates of infiltration, permeability, and percolation rates – these parameters should be used to clearly determine if a Permit to Take Water is expected and the approximate amount of water to be pumped. Furthermore, the report should discuss the possible short term and long-term impacts with respect to groundwater lowering due to pumping to the surrounding properties.
15. Please provide a section in the report that speaks to the proposed infiltration gallery, specifically with respect to the elevation of the groundwater table and the depth of the gallery. Will the infiltration gallery still be effective given that there is less than 1.0m of separation?

Servicing and Stormwater Management Report

16. The email confirmation from the Architect must confirm that the buildings are serviced by a supervised automatic sprinkler system. This is required given that the FUS calculations indicate a 50% reduction for sprinkler protection. Furthermore, the email indicates that Buildings A,B,C and D are non-combustible with structural steel framing and precast panel claddings, while the FUS calculations shows Buildings B, C, D to be constructed by wood frame construction. Please clarify and revise accordingly.
17. Please provide the 5-year and 100-year roof ponding limits.
18. Extraneous sanitary flows should be calculated using 0.33 as per updated Sewer Design Guidelines. Please revise accordingly.
19. Storm sewer design sheet shows a value 743.71 L/s for STM12. Please review and revise if incorrect.

Servicing Plan

20. Infiltration gallery bypass invert is higher than storm invert at Building A. Is this not a risk for backups at Building A?
21. Please provide a sanitary monitoring manhole on private property for Building B.
22. Please provide the springline elevations of the mainline sewers as well the invert of the connecting service lateral. This is required to demonstrate that all connections are made above the springline elevation of the mainline sewer.

Feel free to contact Mohammed Fawzi, Infrastructure Project Manager, for follow-up questions.

Transportation

- **Proposed Commercial Development Traffic Impact Assessment**, prepared by WPE, dated July 15, 2024.

Comments:

23. Clarify whether Unnamed Road is meant to be private or public. If private, extend the sidewalk across the private approach.

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

Forestry

- **Landscape Plan**, L.1, prepared by James B. Lennox & Associates Inc., dated 09/25/2024.
- **Tree Conservation Report Current Vegetation**, TCR1.1, prepared by CSW, dated 18-09-24.
- **Tree Conservation Report Proposed Development**, TCR1.2, prepared by CSW, dated 18-09-24.
- **Tree Conservation Report**, TCR1.3, prepared by CSW, dated 18-09-24.

Comments:

Tree Conservation Report

24. All previous comments and deficiencies have been addressed. This TCR is approved.
25. A permit is not required for the removal of trees identified in the TCR, as they are on private property.
26. Tree protection fencing must be installed and approved by the Planning Forester prior to any excavation on site. Please contact Nancy.young@ottawa.ca when the fencing is installed.

Landscape Plan

27. Please confirm why no trees are proposed within the Cabela's Way or Kanata est Centre Dr, in proximity to buildings C & D. Planting of trees in locations where there is sufficient space should be prioritized, with services located to provide sufficient space.
28. 15.2% canopy cover is very low. Providing even small trees in this area would help to improve the canopy cover and user experience of the site, especially in proximity to the sidewalk.
29. Page 7 of the Landscape Plan Terms of Reference requires applicants to submit a digital, georeferenced CAD or GIS file of the final approved LP. Please follow this link to review the submission requirements: https://documents.ottawa.ca/sites/documents/files/landscape_tor_en.pdf . The file can be sent to the Planning Forester or Planning File Lead.

Feel free to contact Nancy Young, Forester, for follow-up questions.

Other

30. The Site Plan requires a note stating where property boundary & topographic information was derived from.

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

Yours Truly,
Solé Soyak

c.c. Nishant Dave, Planning Support
Mohammed Fwazi, Project Manager - Infrastructure Approvals
Mike Giampa, Project Manager - Transportation
Molly Smith, Urban Design
Nancy Young, Forester

Gmail Mike Du <mdu@wpeengineering.com>

Re: 3075 Palladium Drive - Engineering Comments

Fawzi, Mohammed <mohammed.fawzi@ottawa.ca> Mon, Nov 4, 2024 at 11:03 AM
To: mdu <mdu@wpeengineering.com>
Cc: Sherry Shen <sshen@wpeengineering.com>

Good Morning Michael,

Thank you for taking the time to discuss the comments this morning. Please find my comments in red below.

Let me know if you have any questions or concerns.

Best Regards,

Mohammed Fawzi, P.Eng.

Senior Project Manager (A), Infrastructure Approvals

Development Review – West Branch

Planning, Development and Building Services Department (PDBS)| Direction générale des services de la planification, de l'aménagement et du bâtiment (DGSPAB)

City of Ottawa | Ville d'Ottawa

110 Laurier Avenue West | 110 Avenue Laurier Ouest

Ottawa, ON K1P 1J1

613.580.2424 ext./poste 20120, Mohammed.Fawzi@ottawa.ca

From: Sherry Shen <sshen@wpeengineering.com>
Sent: Monday, October 28, 2024 12:07 AM
To: Fawzi, Mohammed <mohammed.fawzi@ottawa.ca>
Subject: Re: 3075 Palladium Drive - Engineering Comments

Sorry Mohamed for the delayed response.

I'm currently traveling overseas with 12-hr time difference, but I can call you in the morning (Ottawa) if you are available.

CAUTION: This email originated from an External Sender. Please do not click links or open attachments unless you recognize the source.

ATTENTION : Ce courriel provient d'un expéditeur externe. Ne cliquez sur aucun lien et n'ouvrez pas de pièce jointe, excepté si vous connaissez l'expéditeur.

Please see my brief response below:

On Mon, Oct 21, 2024 at 19:58 Fawzi, Mohammed <mohammed.fawzi@ottawa.ca> wrote:

> Good Morning Michael,
>
> Thanks for chatting with me on Friday. As we discussed, please find my comments below. If we can have a quick call today or perhaps with someone familiar with the file, to discuss the comments before I send them out formally to the file lead. Let me know what time works best.
>
> **Servicing and Stormwater Management Report**
>
> - The email confirmation from the Architect must confirm that the buildings are serviced by a supervised automatic sprinkler system. This is required given that the FUS calculations indicate a 50% reduction for sprinkler protection. Furthermore, the email indicates that Buildings A,B,C and D are non-combustible with structural steel framing and precast panel claddings, while the FUS calculations shows Buildings B, C, D to be constructed by wood frame construction. Please clarify and revise accordingly. WPE response:Calc for Bldg B,c and D were not revised as the previous calcs are conservative. We can update the calcs accordingly. As discussed, the Architect must confirm that the buildings are serviced by a supervised automatic sprinkler system. Updates to the calculations are not required but it should be stated in the report that the FUS calculations for Buildings B, C and D were calculated using wood frame construction to be conservative.
> -
> - Please provide the 5-year and 100-year roof ponding limits.WPE responses: ponding depths are indicated on Civil plans. Details on mechanical designs included in FSR. As discussed, the limits of ponding must be included on the stormwater management plan/roof plan. If the mechanical designs are not finalized, an accurate estimate of the limits can be done.
>
> -
> - Extraneous sanitary flows should be calculated using 0.33 as per updated Sewer Design Guidelines. Please revise accordingly. WPE response: both the extraneous flow and daily flow are based on the previous version of design criteria, and the master plan. The daily flows per the current design criteria is much lower and therefore the calculated flow is conservative. Please advise whether or not the master shall be followed? Report must show calculated flows based on the updated City guidelines as well as the design criteria based on the MSS. Report should mention that the results were evaluated on the MSS criteria to be more conservative.
> - Storm sewer design sheet shows a value 743.71 L/s for STM12. Pleased review and revise if incorrect. WPE response: reviewed and the result is correct. No further comments.
> - According to the Geotechnical Report, the GW elevation is at 102.85-103.5m elevation which corresponds to depths between 0.9m to 1.55m. Would the infiltration gallery not be sitting in a depth within groundwater? WPE response : Infiltration gallery, as the feasible LID on the site, shall function when groundwater table becomes lower. No other options seem viable. The groundwater table will likely not become lower. Given the shallow depth of the groundwater, it is more than likely that the infiltration gallery will not be as effective as intended. Please confirm that the stormwater management calculations, i.e. sizing of ICD's and storage calculations were calculated assuming no infiltration is to occur on site.

Servicing Plan

- Infiltration gallery bypass invert is higher than storm invert at Building A. Is this not a risk for backups at Building A? The backflow preventer at building A will provide protection, however, I am concerned that given the shallow depth of groundwater, backups in the infiltration system will occur often, thus increasing the wear and tear on the backflow preventer which could cause it to fail prematurely. What are your thoughts?
- Please provide a sanitary monitoring manhole on private property for Building B. Confirmed this will be shown in the next submission.
- Please provide the springline elevations of the mainline sewers as well the invert of the connecting service lateral. This is required to demonstrate that all connections are made above the springline elevation of the mainline sewer. Confirmed this will be shown in the next submission.

Thank you.

Best Regards,

Mohammed Fawzi, P.Eng.

Senior Project Manager (A), Infrastructure Approvals

Development Review – West Branch

Planning, Development and Building Services Department (PDBS)| Direction générale des services de la planification, de l'aménagement et du bâtiment (DGSPAB)

City of Ottawa | Ville d'Ottawa

110 Laurier Avenue West | 110 Avenue Laurier Ouest

Ottawa, ON K1P 1J1

613.580.2424 ext./poste 20120, Mohammed.Fawzi@ottawa.ca

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This e-mail originates from the City of Ottawa e-mail system. Any distribution, use or copying of this e-mail or the information it contains by other than the intended recipient(s) is unauthorized. Thank you.

Le présent courriel a été expédié par le système de courriels de la Ville d'Ottawa. Toute distribution, utilisation ou reproduction du courriel ou des renseignements qui s'y trouvent par une personne autre que son destinataire prévu est interdite. Je vous remercie de votre collaboration.

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[Quoted text hidden]

REVIEW FOR APPLICATION COMPLETENESS
DATED JANUARY 20, 2025

File No.: D07-12-24-0076

January 20, 2025

Peter Cai
Caimion Development Inc.
Via email: pcai@petercai.ca

Subject: Review for Application Completeness
Site Plan Control Application – 3075 Palladium Drive

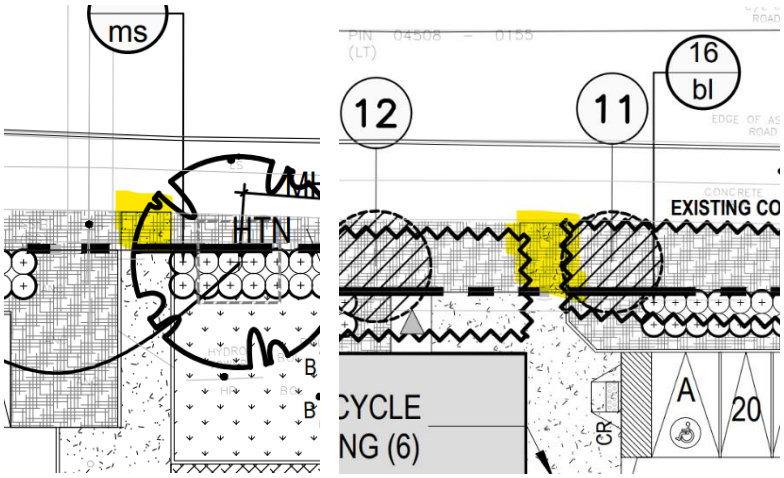
Please find below consolidated preliminary comments from the review of the studies and plans submitted in support of the above-noted Site Plan Control Application.

Planning

The following comments can be addressed after the application has been circulated:

1. Please remove the City of Ottawa logo from the cover page of the Civil Drawings. This needs to be removed prior to approval of Site Plan Control.

2. Please ensure consistency between drawings, for example the Landscape Plan shows the treatment of the walkways connecting to Campeau Drive as "composted pine mulch". This will need to be revised prior to Site Plan Control approval.



3. Section 3.1 of the Planning Rationale and Design Brief indicates the proposal complies with chapter 3 of the Provincial Planning Statement, please note the section does not apply to the proposal as per the definition of public service facility. **Public service facilities:** *means land, buildings and structures, including but not limited to schools, hospitals and community recreation facilities, for the provision of programs and services provided or subsidized by a government or other body, such as social assistance, recreation, police and fire protection, health, child care and educational programs, including elementary, secondary,*

post-secondary, long-term care services, and cultural services (page 50, Definitions). Please amend that section prior to Site Plan Control approval.

Urban Design

Comments:

4. The submission material is deemed complete from an Urban Design perspective. Comments, if any, will be provided during the circulation period.

Engineering

List of Studies and Plans Reviewed:

- **Subsurface Investigation Report**, prepared by Yuri Mendez Engineering, dated November 11, 2024
- **Functional Servicing & Stormwater Management Report**, prepared by WPE Engineering Ltd., dated December 18, 2024
- **Site Grading Plan**, C-01, prepared by WPE Engineering Ltd., Revision 3, dated December 18, 2024
- **Interim Grading Plan**, C-02, prepared by WPE Engineering Ltd., Revision 3, dated December 18, 2024
- **Site Servicing Plan**, C-03, prepared WPE Engineering Ltd., Revision 3, dated December 18, 2024

Deficiencies:

5. No deficiencies.

Comments:

6. No comments.

Feel free to contact Mohammed Fawzi Infrastructure Project Manager, for follow-up questions.

Transportation

List of Studies and Plans Reviewed:

- **Proposed Commercial Development 3075 Palladium TIA**, prepared by WPE Engineering, dated December 18, 2024.

Comments:

7. If Unnamed Road remains private, please depress and extend the sidewalk across the private approach.

8. The existing configuration at Campeau/Kanata West Centre (private road) is incorrect. If feasible, continue the Campeau sidewalk across the private approach.

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

Environment

Comments:

9. No Comments.

Forestry

Comments:

10. Please confirm where the 4.5m building setback referred to in the response table comes from. The geotechnical report does not identify this as an area of Sensitive Marine Clay or other sensitive soils. If this setback is unnecessary, trees could be planted along the street frontage in proximity to building C, to improve both the canopy cover and streetscape of the site.

11. A georeferenced version of the approved landscape plan is a requirement of the TOR. It is the applicant's responsibility to provide any necessary data or to find a consultant who can produce it.

Feel free to contact Nancy Young, Forester, for follow-up questions.

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

Yours Truly,
Solé Soyak

c.c. Nishant Dave, Planner I, Development Review West
Nader Kadri, Urban Design Planner
Mohammed Fawzi, Infrastructure Project Manager
Mike Giampa, Transportation Project Manager
Matthew Hayley, Environmental Planner
Nancy Young, Planning Forester

File Number: D07-12-24-0076

January 20, 2025

Caimion Development Inc. / TAES Architects Ltd.
234 Willowdusk Street, Ottawa, ON, K2M 0L5
Sent Via Email: pcai@petercai.ca

Dear Peter Cai:

Subject: Site Plan Control Application
3075 Palladium Drive

Pursuant to subsection 41 (3.6) of the *Planning Act*, this letter is to advise that the above-noted Site Plan Control application submission, received by the City of Ottawa on August 7, 2024, and subsequent revised submission received by the City of Ottawa on October 5, 2024 and December 20, 2024, has been reviewed and is deemed "incomplete" for the purposes of the *Planning Act* and/or the City's submission requirements. The following summarizes where the submission is deficient.

Information or Material required:

Functional Servicing & Stormwater Management Report, prepared by WPE Engineering Ltd., dated December 18, 2024.

1. Please remove the following section from the report.
   a. Appendix A – Pre-consultation Meeting Notes August 30, 2022, and Phase 2 Pre-consultation: Meeting Feedback August 29, 2023. (pages 41-58).

Proposed Commercial Development 3075 Palladium TIA, prepared by WPE Engineering, dated December 18, 2024.

2. Appendix A – Screening Form (pages 58-60). A new screening form prepared by WPE or written permission from CGH Transportation indicating that WPE is allowed to use the above-noted information is required.

This application will not be considered until the required information and materials are received. Please submit all required material to the undersigned.

If you have any questions concerning the status of this application, please contact Solé Soyak by telephone, at 613-315-1597 or by e-mail at Sole.Soyak@ottawa.ca.

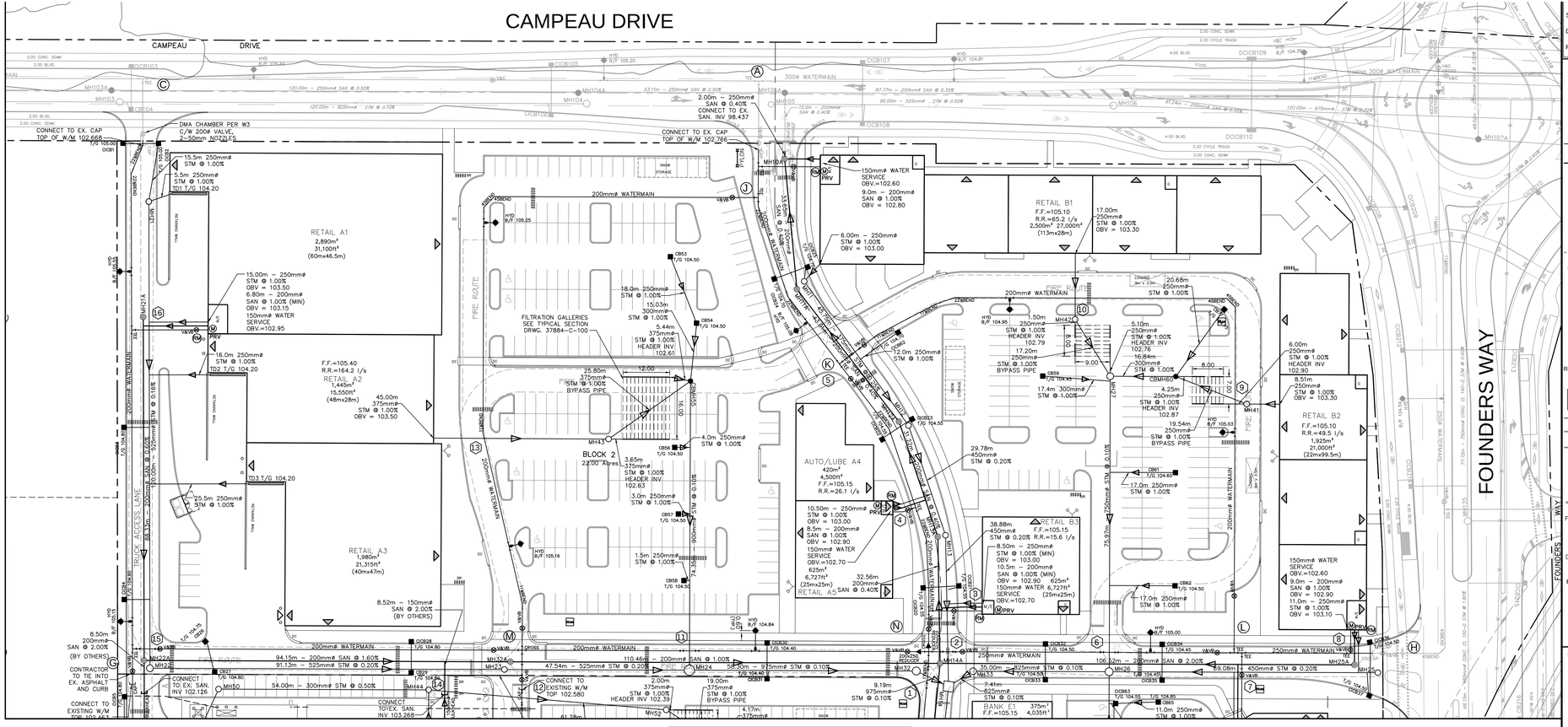
Sincerely,

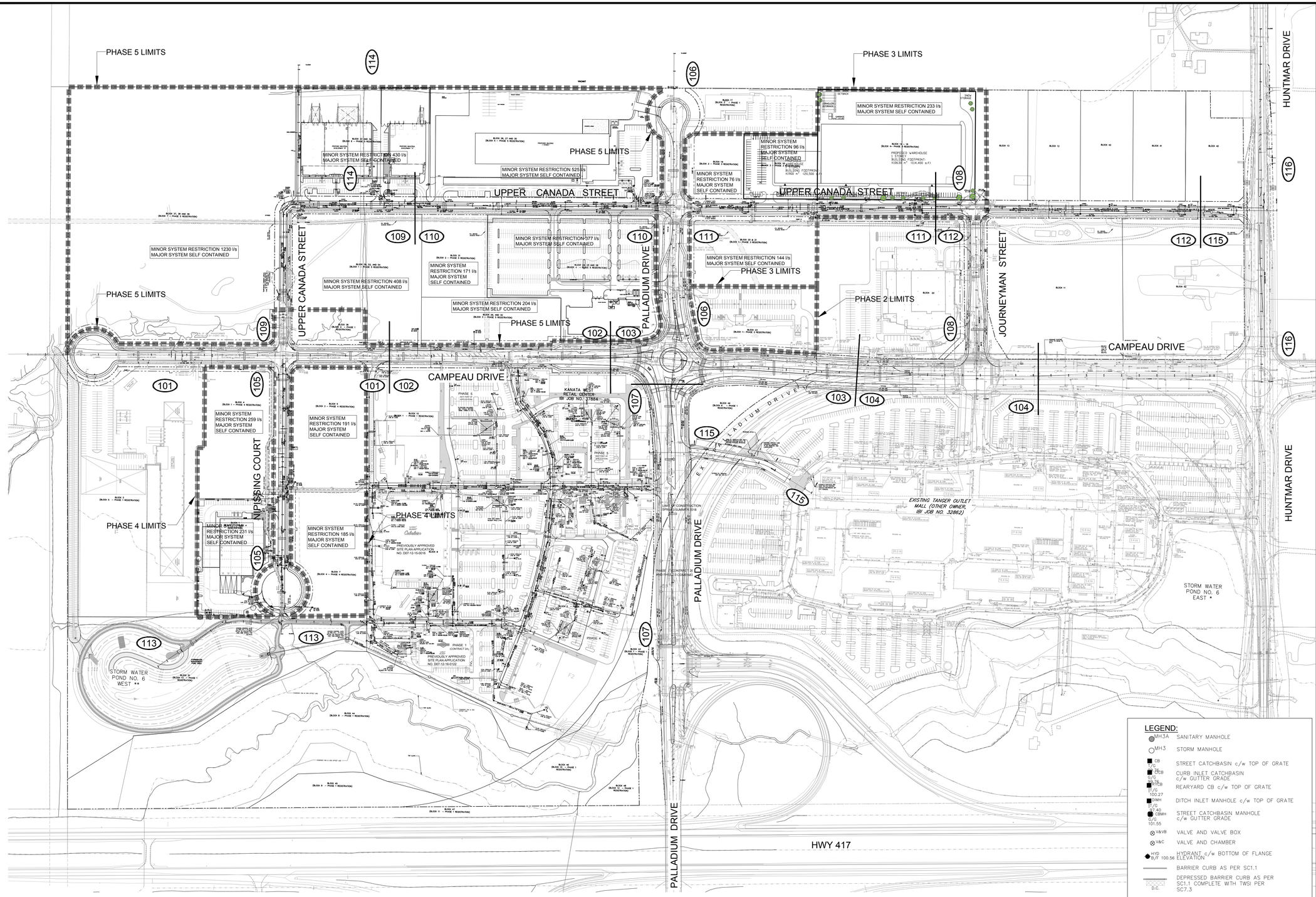
Solé Soyak
Planner II
Development Review All Wards

c.c Nishant Dave, Planner I, Development Review West
Nader Kadri, Urban Design Planner
Mohammed Fawzi, Infrastructure Approvals Project Manager
Mike Giampa, Infrastructure Approvals Project Manager
Matthew Hayley, Environmental Planner
Nancy Young, Planning Forester

KWRC GENERAL PLAN OF SERVICES (IBI)
KWBP AS-BUILT GENERAL PLAN OF SERVICES (IBI)
CABELA'S TRUCK ACCESS ROAD (PRIVATE ACCESS) (IBI)

	STATION	DESCRIPTION	RINSHED	TOP OF	AS-BUILT
A	0+017.74	EX. 2000D CAP	105.128	102.766	
	0+022.00	2000 x 1500D TEE DOMESTIC SERV ICE	105.057	102.657	
J	0+029.97	2000 x 2000D TEE	104.930	102.530	
	0+032.25	2000D – 11 1/4° BEND	104.903	102.503	
	0+040	--	104.860	102.460	
	0+056.24	2000D – 11 1/4° BEND	104.779	102.379	
	0+064.50	HY ORANT TEE	104.919	102.519	
K	0+077.98	2000 x 2000D TEE	104.940	102.085	
	0+099.07	2000D - 22 1/2° BND	104.823	102.223	
	0+120.35	2000 x 1500D TEE DOMESTIC SERV ICE	104.806	102.165	
	0+128.88	2000D – 22 1/2° BEND	104.753	102.353	
	0+147.84	2000D x 1500D TEE DOMESTIC SERV ICE	104.631	102.231	
	0+152.33	2000D V&VB	104.689	102.289	
	0+156.42	2000 x 250D REDUCER	104.784	102.384	
N	0+157.90	2500 x 2500 CROSS	104.809	102.409	
	0+161.00	2500D – 11 1/4° BEND	104.856	102.456	
	0+161.19	2500D 45° BEND V ERTICAL BEND	104.852	102.452	
	0+162.58	2500D 45° BEND V ERTICAL BEND	104.82	101.170	
	0+166.10	2500D 45° BEND V ERTICAL BEND	104.765	101.170	
	0+167.38	2500D 45° BEND V ERTICAL BEND	104.738	102.338	
	0+177.96	HY ORANT TEE	104.621	102.221	
	0+187.06	2500 x 1500D TEE DOMESTIC SERV ICE	104.549	102.149	
	0+200	--	104.508	102.108	
	0+213.41	2500D V&VB	104.621	102.221	
F	0+219.24	2500 x 200D TEE	104.675	102.275	
	0+228.56	2500D – 11 1/4° BEND	104.623	102.225	
	0+240	--	104.485	102.085	
	0+260	--	104.403	102.003	
	0+280	--	104.616	102.216	
	0+300	--	104.461	102.061	
	0+320	2500 45° BEND V ERTICAL BEND	104.614	102.214	
	0+322.42	2500 45° BEND V ERTICAL BEND	104.645	99.860	
N	0+324.97	2500 x 2500D CROSS	104.673	99.880	
	0+326.93	2000 x 250D REDUCER	104.628	99.880	
	0+329.92	2000 45° BEND V ERTICAL BEND	104.602	99.888	
	0+332.29	2000 45° BEND V ERTICAL BEND	104.576	102.175	
	0+332.74	2000D V&VB	105.569	103.169	
	0+340	--	104.537	102.137	
	0+360	--	104.515	102.115	
	0+370.80	HY ORANT TEE	104.543	102.143	
	0+373	1500 x 200D REDUCER	104.527	102.127	
	0+388.60	1500 – 45° BEND	104.548	101.480	
	0+394.97	1500 – 45° BEND	104.580	101.480	
	0+400.46	1500 CS	104.693	102.289	
B	0+406.28	BUILDING - DOMESTIC SERV ICE	104.977	102.550	
C	0+017.13	EX. 2000D CAP REPLA CE WITH 2000D– 22 1/2° BND	105.048	102.668	
	0+024.97	2000D – 22 1/2° BEND	105.124	102.724	
	0+050.14	HY ORANT TEE	105.293	102.893	
	0+065.16	2000 x 1500D TEE DOMESTIC SERV ICE	105.122	102.722	
	0+80	--	104.923	102.523	
	0+100	--	104.924	102.524	
	0+120	--	104.987	102.587	
	0+140.13	HY ORANT TEE	104.868	102.468	
G	0+147.15	2000D x 200D TEE	104.938	102.538	
	0+152.87	2000D V&VB	104.913	102.513	
	0+156.32	2000D CA P	104.863	102.463	
	0+160	--	104.859	102.459	
	0+175	2000 x 750 TEE DOMESTIC SERV ICE	105.078	102.678	
	0+176	2000 x 2000D TEE DOMESTIC SERV ICE	105.050	102.650	
	0+180	--	104.948	102.548	
	0+200	--	105.032	102.632	
	0+220	--	105.066	102.666	
	0+236.70	HY ORANT TEE	104.988	102.588	
	0+240	--	105.036	102.636	
	0+260	--	104.927	102.527	
	0+280	--	104.826	102.226	
	0+292.80	2000D CA P	104.781	102.381	
	0+298.77	2000D V&VB	104.836	102.436	
	0+300	--	104.85	102.450	
D	0+303.19	2500 x 200D TEE	104.919	102.519	
E	0+000.00	2500D CA P	105.450	103.050	
D	0+083.31	2000 x 2500D TEE	104.918	102.519	
	0+085.31	2500D V&VB	104.941	102.541	
	0+085.93	2500 45° BEND V ERTICAL BEND	104.940	102.548	
	0+86.52	2500 45° BEND V ERTICAL BEND	104.955	101.970	
	0+089.10	2500 45° BEND V ERTICAL BEND	104.965	101.970	
	0+089.71	2500 45° BEND V ERTICAL BEND	104.992	102.592	
	0+093.94	HY ORANT TEE	104.963	102.563	
	0+100	--	104.910	102.510	
	0+120	--	104.727	102.327	
	0+121.40	--	104.712	102.279	
	0+123.54	--	104.692	102.270	
	0+140	--	104.630	102.350	
	0+147.48	2500 45° BEND V ERTICAL BEND	104.694	102.264	
	0+148.17	2500 45° BEND V ERTICAL BEND	104.700	101.620	
	0+150.57	2500 45° BEND V ERTICAL BEND	104.720	101.620	
	0+151.29	2500 45° BEND V ERTICAL BEND	104.726	102.326	
	0+160.46	2500 x 150D TEE DOMESTIC SERV ICE	104.804	102.404	
	0+176	--	104.862	102.360	
	0+178	--	104.831	102.360	
	0+180	--	104.831	102.360	
I	0+182.31	2000 x 250D TEE	104.810	102.410	
	0+187.90	2500D V&VB	104.761	102.361	
	0+200	--	104.654	102.254	
	0+220	--	104.459	102.059	
	0+233.26	2500 45° BEND V ERTICAL BEND	104.348	101.948	
	0+234.21	2500 45° BEND V ERTICAL BEND	104.357	101.030	
	0+236.82	2500 – 22 1/2° BEND	104.381	101.030	
	0+237.37	2500 45° BEND V ERTICAL BEND	104.390	101.030	
	0+238.33	2500 45° BEND V ERTICAL BEND	104.400	102.006	
	0+245.71	2500D V&VB	104.524	102.124	
	0+246.27	2500 45° BEND V ERTICAL BEND	104.535	102.135	
	0+248.58	2500 45° BEND V ERTICAL BEND	104.582	99.880	
N	0+255.00	2500 x 2500D CROSS	104.673	99.880	
	0+260.55	2500 x 200D REDUCER	104.647	99.880	
	0+261.83	2000 45° BEND V ERTICAL BEND	104.645	99.880	
	0+264.02	2000 45° BEND V ERTICAL BEND	104.639	102.226	
	0+266.98	2000D V&VB	104.617	102.217	
	0+280	--	104.644	102.244	
	0+300.88	HY ORANT TEE	104.693	102.293	
	0+324.36	2000 – 45° BEND	104.707	102.307	
	0+325.90	2000 – 45° BEND	104.697	102.277	
	0+333.29	2000 – 11 1/4° BEND	104.586	102.186	
	0+340	--	104.543	102.143	
	0+360	--	104.480	102.080	
	0+371.06	HY ORANT TEE	104.585	102.185	
	0+375.08	2000 x 150D TEE DOMESTIC SERV ICE	104.615	102.215	
	0+375.25	2000 45° BEND V ERTICAL BEND	104.615	102.215	
	0+376.97	2000 45° BEND V ERTICAL BEND	104.624	100.750	
	0+380.87	2000 45° BEND V ERTICAL BEND	104.647	100.750	
	0+382.16	2000 45° BEND V ERTICAL BEND	104.676	102.276	
	0+396.20	2000D V&VB	104.706	102.306	
	0+400	--	104.703	102.303	
	0+420	--	104.703	102.303	
	0+432.27	--	104.703	102.303	
	0+435.60	--	104.706	102.200	
	0+445.01	HY ORANT TEE	104.734	102.334	
	0+447.63	2000 – 45° BEND	104.762	102.362	
	0+452.60	2000 – 11 1/4° BEND	104.802	102.402	
	0+457.82	2000 – 45° BEND	104.788	102.388	
	0+480	--	104.782	102.382	
	0+500	--	104.681	102.281	
	0+500.71	2000 – 11 1/4° BEND	104.680	102.280	
	0+511	2000D V&VB	104.723	102.323	
	0+514.04	2000 45° BEND V ERTICAL BEND	104.679	102.279	
	0+515.84	2000 45° BEND V ERTICAL BEND	104.651	100.700	
	0+519.18	2000 45° BEND V ERTICAL BEND	104.691	100.700	
	0+520.80	2000 45° BEND V ERTICAL BEND	104.731	102.331	
F	0+523.14	2500 x 200D TEE	104.675	102.275	
G	0+000.00	2000 x 200D TEE	104.939	102.539	
	0+000.72	2000 45° BEND V ERTICAL BEND	104.944	102.544	
	0+001.89	2000 45° BEND V ERTICAL BEND	104.950	101.380	
	0+005.86	2000 45° BEND V ERTICAL BEND	104.984	101.380	
	0+007.00	2000 45° BEND V ERTICAL BEND	105.000	102.600	
	0+007.11	2000D V&VB	104.999	102.599	
	0+020	--	104.850	102.450	
	0+040	--	104.994	102.594	
	0+060	--	104.928	102.528	
	0+080	--	104.929	102.529	
	0+092.86	2000D V&VB	104.964	102.564	
M	0+100.17	2000 x 200D CROSS	104.897	102.497	
	0+120	--	104.734	102.334	
	0+140	--	104.596	102.196	
	0+140.79	2000 45° BEND V ERTICAL BEND	104.59	102.190	
	0+141.64	2000 45° BEND V ERTICAL BEND	104.564	101.350	
	0+144.78	2000 45° BEND V ERTICAL BEND	104.563	101.350	
	0+145.60	2000 45° BEND V ERTICAL BEND	104.557	102.157	
	0+160.13	HY ORANT TEE	104.458	102.058	
	0+180	--	104.584	102.184	
	0+199.20	2000D V&VB	104.722	102.322	
	0+202.22	2000 x 250D REDUCER	104.775	102.375	
N	0+205.28	2500 x 2500D CROSS	104.809	102.409	
	0+207.66	2500 45° BEND V ERTICAL BEND	104.863	102.463	
	0+208.33	2500 45° BEND V ERTICAL BEND	104.848	101.770	
	0+210.89	2500 45° BEND V ERTICAL BEND	104.802	101.770	
	0+211.55	2500 45° BEND V ERTICAL BEND	104.792	102.394	
	0+213.36	2500D V&VB	104.767	102.367	
	0+220	--	104.696	102.296	
	0+240	--	104.589	102.189	
	0+248.81	2500 45° BEND V ERTICAL BEND	104.679	102.279	
	0+249.61	2500 45° BEND V ERTICAL BEND	104.687	101.490	
	0+252.37	2500 45° BEND V ERTICAL BEND	104.649	101.490	
	0+253.33	2500 45° BEND V ERTICAL BEND	104.639	102.239	
	0+261.68	HY ORANT TEE	104.527	102.127	
	0+278.85	2500 V&VB	104.658	102.258	
	0+283.18	2000 x 250D TEE	104.711	102.311	
L	0+285.18	2500 x 150D TEE DOMESTIC SERV ICE	104.734	102.334	
	0+300	--	104.734	102.334	
	0+313.14	2500 x 150D TEE DOMESTIC SERV ICE	104.593	102.115	
H	0+318.77	2500 CA P	104.557	102.157	
I	0+000.00	2000 x 250D TEE	104.810	102.410	
	0+001.52	2000 V&VB	104.766	102.386	
	0+007.35	2000 CA P	104.841	102.362	
	0+020	--	104.892	102.492	
	0+039.89	HY ORANT TEE	105.000	102.800	
	0+060	--	105.100	102.700	
	0+080	--	105.050	102.650	
	0+100	--	105.069	102.669	
	0+120	--	105.008	102.608	
	0+125.10	HY ORANT TEE	105.121	102.721	
	0+140	--	105.039	102.639	
	0+141.98	2000 45° BEND V ERTICAL BEND	104.988	102.588	
	0+142.57	2000 45° BEND V ERTICAL BEND	105.054	102.066	
	0+145.15	2000 45° BEND V ERTICAL BEND	104.997	102.066	
	0+145.68	2000 45° BEND V ERTICAL BEND	105.006	102.606	
	0+146	2000 CAP	104.960	102.560	
	0+148.50	2000 V&VB	104.900	102.500	
	0+149.12	2000 45° BEND V ERTICAL BEND	104.876	102.476	
	0+149.73	2000 45° BEND V ERTICAL BEND	104.864	101.940	
	0+152.44	2000 45° BEND V ERTICAL BEND	104.932	101.840	
	0+153.14	2000 45° BEND V ERTICAL BEND	104.949	102.549	
M	0+156.08	2000 x 200D CROSS	104.897	102.497	
	0+181.73	2000D V&VB	104.928	102.528	
	0+187.92	2000 – 11 1/4° BEND	104.910	102.510	
	0+183.15	HY ORANT TEE	105.063	102.663	
	0+200	--	104.921	102.521	
	0+213.11	2000 – 11 1/4° BEND	104.967	102.567	
	0+220	--	105.003	102.803	
	0+240	--	105.007	102.807	
	0+260	--	105.018	102.618	
	0+267.16	HY ORANT TEE	105.050	102.650	
	0+271.14	2000 – 45° BEND	105.023	102.623	
	0+274.99	2000 – 45° BEND	104.976	102.379	
	0+280	--	104.975	102.575	
	0+300	--	104.836	102.436	
	0+320	--	104.838	102.438	
	0+336.13	2000D V&VB	104.907	102.507	
J	0+342.80	2000 x 200D TEE	104.930	102.530	
K	0+000.00	2000 x 200D TEE	104.840	102.440	
	0+003.41	2000 45° BEND V ERTICAL BEND	104.885	102.485	
	0+003.86	2000 45° BEND V ERTICAL BEND	104.874	102.030	
	0+006.39	2000 45° BEND V ERTICAL BEND	104.809	102.030	
	0+006.76	2000 45° BEND V ERTICAL BEND	104.803	102.403	
	0+008.05	2000D V&VB	104.816	102.416	
	0+012.56	2000 – 11 1/4° BEND	104.793	102.393	
	0+029.31	2000 – 11 1/4° BEND	104.796	102.396	
	0+034.46	2000 - 22 1/2° BND	104.779	102.379	
	0+048.57	HY ORANT TEE	104.811	102.411	
	0+060	--	104.775	102.375	
	0+080	--	104.800	102.400	
	0+100	--	104.815	102.415	
	0+104.40	2000 – 45° BEND	104.793	102.393	
	0+107.47	2000 – 45° BEND	104.792	102.392	
	0+120	--	104.803	102.403	
	0+139.70	HY ORANT TEE	104.818	102.418	
	0+160	--	104.815	102.415	
	0+180	--	104.668	102.268	
	0+181.77	2000 V&VB	104.875	102.475	
L	0+196.37	2000 x 250D TEE	104.711	102.311	


CAMPEAU DRIVE
FOUNDERS WAY
TRUCK ACCESS LANE
FIRE ROUTE
CONNECT TO EX. CAP TOP OF W/M 102.668
DMA CHAMBER PER W3 C/W 200ø VALVE, 2-50mm NOZZLES
RETAIL A1 2,890m² 31,100ft² (60mx46.5m)
RETAIL A2 1,445m² 15,550ft² (48mx28m)
RETAIL A3 1,980m² 21,315ft² (40mx47m)
BLOCK 2 22.00 Acres
FILTRATION GALLERIES SEE TYPICAL SECTION DRWG. 37884-C-100
AUTO/LUBE A4 420m² 4,500ft² F.F.=105.15 R.R.=26.1 l/s
RETAIL A5
RETAIL B1 F.F.=105.10 R.R.=65.2 l/s 2,500m² 27,000ft² (113mx28m)
RETAIL B2 F.F.=105.10 R.R.=49.5 l/s 1,925m² 21,000ft² (22mx99.5m)
RETAIL B3 F.F.=105.15 R.R.=15.6 l/s
RANK F1 F.F.=105.15 4,035ft²
CONNECT TO EX. SAN. INV 102.126
CONNECT TO EX. SAN. INV 103.268
CONNECT TO EX. SAN. INV 98.437
CONNECT TO EX. SAN. INV 102.580
CONNECT TO EX. CAP TOP OF W/M 102.766
CONNECT TO EXISTING W/M TOP 102.443
CONTRACTOR TO TIE INTO EX. ASPHALT AND CURB
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NOTES:

* REFER TO KANATA WEST BUSINESS PARK STORMWATER MANAGEMENT REPORT AND POND 6 EAST DESIGN REPORT. 337 HUNTMAR DRIVE TANGER OUTLET CENTERS REPORT 32862.5.2.3 REVISION 4 NOVEMBER 2014.

** REFER TO KANATA WEST BUSINESS PARK STORMWATER MANAGEMENT REPORT AND POND 6 WEST DESIGN BRIEF REPORT 14289.5.2.3 SEPTEMBER 2015.

SITE BENCHMARK TO BE OBTAINED FROM LEGAL SURVEYOR STANTEC GEOMATICS

FOR EXTENT OF EXISTING CONSTRUCTION REFER TO DRAWING 14289-100A

No.	REVISIONS	By	Date
32	RECORD DRAWINGS	LME	22: 07: 27
31	ADD SERVICE CONNECTIONS FOR BLOCKS 5 AND 6	LME	20: 06: 17
30	ISSUED FOR CONSTRUCTION PHASE 4 AND 5	LME	20: 05: 27
29	ISSUED FOR TENDER PHASE 4 AND 5	LME	20: 02: 12
28	REVISED AS PER PHASE 5 COMMENTS	LME	19: 10: 25
27	ISSUED FOR PHASE 5 REGISTRATION	LME	19: 09: 10
26	ISSUED FOR PHASE 3 CONSTRUCTION	LME	19: 08: 15
25	REVISED AS PER PHASE 4 COMMENTS	LME	19: 07: 25
24	REVISED AS PER PHASE 4 COMMENTS	LME	19: 07: 22
23	REVISED AS PER PHASE 4 COMMENTS	LME	19: 06: 24
22	ISSUED FOR PHASE 4 REGISTRATION	LME	19: 04: 25
21	REVISED AS PER PHASE 3 COMMENTS	LME	19: 03: 08
20	REVISED AS PER PHASE 3 COMMENTS	LME	19: 02: 11
19	ISSUED FOR PHASE 3 TENDER	LME	19: 01: 11
18	REVISED AS PER PHASE 3 COMMENTS	LME	18: 12: 14
17	REVISED FOR PHASE 3 REGISTRATION	LME	18: 09: 14
16	ADDED CITY FILE NUMBER	LME	18: 05: 30
15	REVISED FOR PHASE 2 REGISTRATION	LME	18: 04: 20
14	REVISED DMA CHAMBER IN BLK 10 & RELOCATE HYD. BLK 35/36	LME	16: 05: 05
13	ISSUED AS PER REVISED CARPENTERS UNION	LME	16: 04: 25
12	REVISE HYDRANT ON UPPER CANADA ST. AT BLOCK 36 P/L	LME	16: 04: 20
11	REVISE ENTRANCE TO TANGER MALL FROM PALLADIUM DRIVE	LME	16: 03: 02
10	RE-ISSUED FOR CONSTRUCTION	LME	16: 02: 03
9	ISSUED FOR CONSTRUCTION	LME	16: 01: 19
8	ISSUED FOR MYLARS	LME	16: 01: 12
7	ISSUED TO TAGGART	LME	15: 12: 14
6	ISSUED TO TAGGART	LME	15: 10: 16
5	REVISED AS PER CITY COMMENTS	LME	15: 10: 15
4	REVISE WM, STM, AND SAN ON CAMPEAU AND UPPER CANADA	LME	15: 08: 19
3	REVISED AS PER NEW SITE PLAN AND CITY COMMENTS	LME	15: 06: 19
2	REVISED AS PER CITY COMMENTS	LME	15: 04: 08
1	ISSUED TO CITY FOR APPROVAL	LME	14: 11: 27

TAGGART REALTY MANAGEMENT

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

Project Title

KANATA WEST BUSINESS PARK PHASE 5

LICENSED PROFESSIONAL ENGINEER
L. M. LYNN
13379508
22/07/27
PROVINCE OF ONTARIO

LEGEND:

- MH3A — SANITARY MANHOLE
- MH3 — STORM MANHOLE
- CB T/G — STREET CATCHBASIN c/w TOP OF GRATE
- ZCB T/G 00.00 GUTTER — CURB INLET CATCHBASIN c/w GUTTER GRADE
- RYCB T/G 100.27 — REARYARD CB c/w TOP OF GRATE
- DIMH T/G 97.40 — DITCH INLET MANHOLE c/w TOP OF GRATE
- CBMH T/G 101.55 — STREET CATCHBASIN MANHOLE c/w GUTTER GRADE
- V&VB — VALVE AND VALVE BOX
- V&C — VALVE AND CHAMBER
- HYD B/F 100.56 — HYDRANT c/w BOTTOM OF FLANGE ELEVATION
- BARRIER CURB AS PER SC1.1
- D.C. — DEPRESSED BARRIER CURB AS PER SC1.1 COMPLETE WITH TWSI PER SC7.3
- MOUNTABLE CURB AS PER SC1.3
- PROPOSED CONCRETE SIDEWALK
- REQUIRED FILL BELOW ROAD SUBGRADE
- CLAY DYKES
- HGL 103.54 — HYDRAULIC GRADE LINE
- 111 — DRAWING NUMBER
- TEMPORARY 3.0m GRAVEL ACCESS ROAD

Drawing Title

GENERAL PLAN OF SERVICES

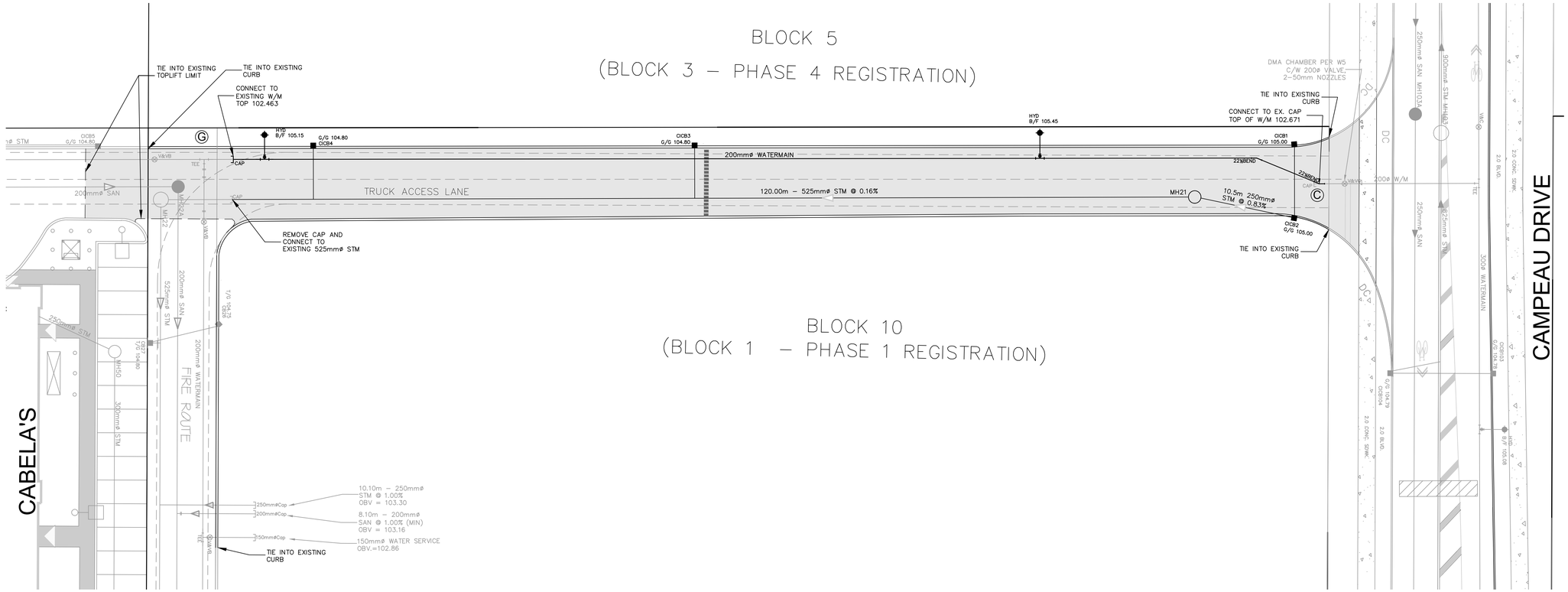
Scale 1:2000

Design	Date
LME	NOV. 2014
Drawn	Checked
DPS	TRB
Project No.	Drawing No.
14289	100

D07-16-14-0003_P5

#17661

\\14289_ferncrest\c3.0 Drawings\50cm\Layouts\100 GENERAL PLAN.dwg Layout: Name: 100 GENERAL PLAN Plot Style: IBI STANDARD - HALF.CTB Plot Scale: 1:10.0 Plotted At: 7/27/2022 3:14 PM Last Saved By: dmuma Last Saved At: Jun 16, 22



WATERMAIN SCHEDULE

	STATION	DESCRIPTION	FINISHED GRADE (m)	TOP OF WATERMAIN	AS-BUILT WATERMAIN
C	0+017.13	EX. 200Ø CAP REPLACE WITH 200Ø– 22 1/2° BEND	105.071	102.671	
	0+024.97	200Ø – 22 1/2° BEND	105.064	102.664	
	0+050.14	HYDRANT TEE	105.276	102.876	
	0+065.16	--	105.107	102.707	
	0+080	--	104.927	102.527	
	0+100	--	104.931	102.531	
	0+120	--	104.996	102.596	
	0+140.13	HYDRANT TEE	104.874	102.474	
G	0+147.15	200Ø x 200Ø TEE	104.943	102.543	102.50
	0+152.87	200Ø V&VB	104.913	102.513	102.50

KWRC–Storm STRUCTURE TABLE

NAME	RIM ELEV.	INVERT IN	INVERT IN AS–BUILT	INVERT OUT	INVERT OUT AS–BUILT	DESCRIPTION
MH21	105.16	N103.143 NW103.143		SE102.868		1200ø OPSD 701.010
MH22	104.98	~~NW102.676~~	102.660	~~NE102.619~~	102.620	1500ø OPSD 701.011

CATCH BASIN DATA TABLE

STRUCTURE ID	AREA ID	STRUCTURE	COVER	ELEVATION			OUTLET PIPE		HEAD	FLOW	ICD TYPE	ORIFICE SIZE		
				TOP OF GRATE	INVERT INLET	INVERT OUTLET	DIAMETER (mm)	TYPE				AREA	DIAMOND	CIRCULAR
CICB 1	D21	OPSD 705.010	S22 & S23	105.00		103.430	200	PVC DR-35						
CICB 2		OPSD 705.010	S22 & S23	105.00	103.330	103.230	250	PVC DR-35	1.64	13.0	Tempest LHF			
CICB 3	D21	OPSD 705.010	S22 & S23	104.80		103.230	250	PVC DR-35	1.44	23.5	Tempest HF			
CICB 4	D21	OPSD 705.010	S22 & S23	104.80		103.230	250	PVC DR-35	1.44	15.6	Tempest HF			
CICB 5	D29	OPSD 705.010	S22 & S23	104.80		103.230	200	PVC DR-35						
CICB 6		OPSD 705.010	S22 & S23	104.80	103.130	103.030	250	PVC DR-35	1.64	26.1	Tempest HF			

ROAD STRUCTURE❀

CAR ONLY PARKING AREAS:

50mm WEAR COURSE12.5mm SUPERPAVE
150mm BASE GRANULAR "A"
300mm SUBBASE GRANULAR "B"

HEAVY TRUCK AREAS AND ACCESS LANES:

40mm WEAR COURSE 12.5mm SUPERPAVE
50mm BINDER COURSE 19.0mm SUPERPAVE
150mm BASE COURSE GRANULAR "A"
400mm SUBBASE GRANULAR "B"

❀REFER TO NOTE 1.15

CLIENT

TAGGART REALTY MANAGEMENT

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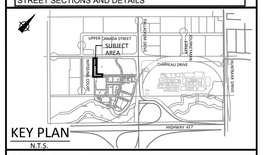
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IBI Group Professional Services (Canada) Inc.
is a member of the IBI Group of companies

ISSUES

No.	DESCRIPTION	DATE
1	ISSUED FOR COORDINATION	XXXX-XX-XX
2		
3		
4		
5		
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10		

SEE 010, 011, 012 FOR NOTES, LEGEND, CB TABLE, STREET SECTIONS AND DETAILS

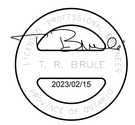


KEY PLAN
N.T.S.

CONSULTANTS

1:250 0 2.5 7.5 12.5m

SEAL



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

PROJECT

KANATA WEST RETAIL CENTRE
3015, 3075, & 3095 PALLADIUM DRIVE

PROJECT NO: 37533	
DRAWN BY: **D.P.S.**	CHECKED BY: **M.S**
PROJECT MGR: **T.R.B.**	APPROVED BY: **T.R.B.**

SHEET TITLE

CABELA'S
ACCESS ROAD

SHEET NUMBER	ISSUE
C-103	1

CITY FILE No. D07-12-17-0064

CITY PLAN No. 17253

File Location: J:\37884-KNWRetailCentre\5 0 Drawings\50civil\layouts\Access Road\C-103.dwg Last Saved: February 15, 2023 by dsiuma Plotted: Wednesday, February 15, 2023 12:10:01 PM by Don Siuma

Appendix B

Site Plan

Phasing Plan

Site Grading Plan (DWG. C-01)

Interim Grading Plan (DWG. C-02)

Site Servicing Plan (DWG. C-03)

Erosion & Sediment Control Plan (DWG. C-04)

Existing Conditions and Removals Plan (DWG. C-05)

Notes & Details (DWG. C-06)

Notes & Details (DWG. C-07)

SITE STATISTICS (By Law 2008-250)

ZONING	GM (2167)	**LOT NO.**	Concession 1 Part of Lot 3
PLAN NO.	4M-1566	**LOT AREA**	25764 sm

DESCRIPTION	EXISTING	PROPOSED	REQUIRED	SECTION
LAND USE	VACANT	RETAIL STORE	GENERAL MIXED USE - INCL. RETAIL STORE	187-188
MIN.LOT WIDTH		132.2 m	NO MINIMUM	TABLE 187
MIN. LOT AREA		25764 sm	NO MINIMUM	TABLE 187
MAX.BUILDING HEIGHT		8.2 m (27')	18 M	TABLE 187
NO. OF STORIES		2		
GFA TOTAL		**7910.24 sm**		
PHASE 1: BUILDING A		5,678.11 sm		
PHASE 2: BUILDING B		687.43 sm		
BUILDING C		729.10 sm		
BUILDING D		815.57 sm		
BUILDING AREA TOTAL		**7760.00 sm**		
PHASE 1: BUILDING A		5535.95 sm		
PHASE 2: BUILDING B		687.43 sm		
BUILDING C		729.10 sm		
BUILDING D		815.57 sm		
FSI		0.3	2	TABLE 187
GLA TOTAL		**6586 sm**		
PHASE 1: BUILDING A		4577 sm		
PHASE 2: TOTAL		2009 sm		
BUILDING B		643.44 sm		
BUILDING C		677.15 sm		
BUILDING D		688.41 sm		

SETBACK	EXISTING	PROPOSED	REQUIRED	SECTION
FRONT (EAST)		5.52 m	1.5 m	EXCEPTION 2167
SIDE (NORTH)		3.00 m	NO MINIMUM	TABLE 187
SIDE (SOUTH)		15.61 m	NO MINIMUM	EXCEPTION 2167
REAR (WEST)		12.85 m	NO MINIMUM	TABLE 187

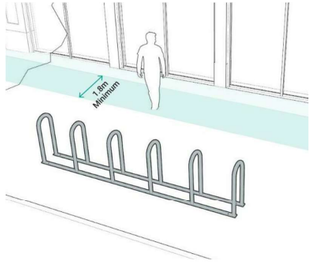
LANDSCAPED AREA	EXISTING	PROPOSED		REQUIRED	SECTION
MIN. AREA OF LANDSCAPING IN PARKING LOT:		3017 sm	25%	15 %	
MINIMUM WIDTH OF LANDSCAPED AREA		3 m		3 M (i) ABUTTING A STREET OR (ii)ABUTTING A RESIDENTIAL OR INSTITUTIONAL ZONE NO MINIMUM (iii) OTHER CASES	TABLE 187

PARKING	EXISTING	PROPOSED	REQUIRED	SECTION
TOTAL PARKING		237 SPACES	3.6 per 100 m^2 of GLA = 237	TABLE 101
INCLUDING ACCESSIBLE PARKING		7 SPACES		
BICYCLE PARKING SPACE		28 SPACES	Building A (Retail): 1 per 250 m^2 of GFA = 23 Building B, Building C, Building D (Shopping Centre): 1 per 500 m^2 of GFA = 5	TABLE 111A

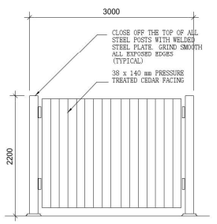
LOADING	EXISTING	PROPOSED	REQUIRED	SECTION
TOTAL NUMBER OF LOADING SPACES		2 SPACES (One Over Size Space)	2 SPACES (One Over Size Space)	TABLE 113

LEGAL DESCRIPTION

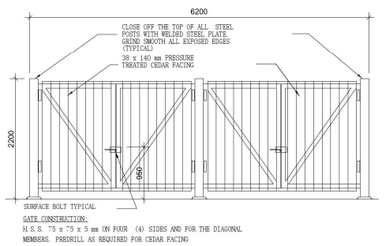
BLOCK 1, PLAN 4M1566 SUBJECT TO AN EASEMENT AS IN OC1776587 SUBJECT TO AN EASEMENT IN GROSS OVER PART 1, 4R29646 AS IN OC1808376 TOGETHER WITH AN EASEMENT OVER PART BLOCK 2 4M1566 PARTS 3,10 & 11 4R33025 AS IN OC2259230 TOGETHER WITH AN EASEMENT OVER PART BLOCK 2 4M1566,PARTS 3,6,9,10 & 11 4R33025 AS IN OC2259230 TOGETHER WITH AN EASEMENT OVER BLOCK 2 4M1566 AS IN OC2259230 SUBJECT TO AN EASEMENT OVER PARTS 4,14 & 15 4R33025 IN FAVOUR OF PART LOT 3 CONCESSION HUNTLEY PART 1 4R28887 AS IN OC2259232 SUBJECT TO AN EASEMENT OVER PARTS 4,14 & 15 4R33025 IN FAVOUR OF PART LOT 3 CONCESSION HUNTLEY,PART 1 4R28887 AS IN OC2259232 SUBJECT TO AN EASEMENT OVER PART 15 4R33025 IN FAVOUR OF PART LOT 3 CONCESSION HUNTLEY,PART 1 4R28887 AS IN OC2259232 SUBJECT TO AN EASEMENT IN FAVOUR OF PART LOT 3 CONCESSION HUNTLEY,PART 1 4R28887 AS IN OC2259232 SUBJECT TO AN EASEMENT OVER PARTS 4,14 & 15 4R33025 IN FAVOUR OF BLOCK 2 4M1566 AS IN OC2259233 SUBJECT TO AN EASEMENT IN FAVOUR OF BLOCK 2 4M1566 AS IN OC2259233 TOGETHER WITH AN EASEMENT OVER PART LOT 3 CONCESSION 1 HUNTLEY, PART 12 4R33025 AS IN OC2259234 TOGETHER WITH AN EASEMENT OVER PART LOT 3 CONCESSION 1 HUNTLEY, PART 5 4R33025 AS IN OC2259234 TOGETHER WITH AN EASEMENT OVER PART LOT 3 CONCESSION 1 HUNTLEY, PART 13 4R33025 AS IN OC2259234 TOGETHER WITH AN EASEMENT OVER PART LOT 3 CONCESSION 1 HUNTLEY PART 1 4R28887 AS IN OC2259234 TOGETHER WITH AN EASEMENT OVER PART BLOCK 14, PLAN 4M-1566, PARTS 1, 2, 6 AND 7, 4R33025 AS IN OC2603279 TOGETHER WITH AN EASEMENT OVER PART BLOCK 14, PLAN 4M-1566, PARTS 1 AND 2, 4R33025 AS IN OC2603279 TOGETHER WITH AN EASEMENT OVER BLOCK 14, 4M-1566 AS IN OC2603279 SUBJECT TO AN EASEMENT OVER PART 3 ON PLAN 4R-35309 IN FAVOUR OF PART OF BLOCK 2, PLAN 4M1566, BEING PARTS 1-4 ON PLAN 4R-33022 AS IN OC2657399 SUBJECT TO AN EASEMENT OVER PART 3 ON PLAN 4R-35309 IN FAVOUR OF PART OF BLOCK 2, PLAN 4M1566, BEING PART 1 ON PLAN 4R-34709 AS IN OC2657400 SUBJECT TO AN EASEMENT OVER PART 3 ON PLAN 4R-35309 IN FAVOUR OF BLOCK 2, PLAN 4M1566, SAVE AND EXCEPT PARTS 1-4 ON PLAN 4R-33022 AND PART 1 ON PLAN 4R-34709 AS IN OC2657401 SUBJECT TO AN EASEMENT OVER PART 3 ON PLAN 4R-35309 IN FAVOUR OF PART OF LOT 3, CONCESSION 1, HUNTLEY, BEING PART 1 ON PLAN 4R-28887 AS IN OC2657402 SUBJECT TO AN EASEMENT OVER PART 3 PLAN 4R35309 IN FAVOUR OF BLOCK 14 PLAN 4M1566 AS IN OC2657403 SUBJECT TO AN EASEMENT OVER PARTS 4, 14 AND 15 PLAN 4R33025 IN FAVOUR OF BLOCK 14 PLAN 4M1566 AS IN OC2657404 SUBJECT TO AN EASEMENT OVER BLOCK 1 PLAN 4M1566 IN FAVOUR OF BLOCK 14 PLAN 4M1566 AS IN OC2657404 TOGETHER WITH AN EASEMENT OVER PART OF BLOCK 13, 4M1566, PART 1, 4R35071 AS IN OC2665902 CITY OF OTTAWA



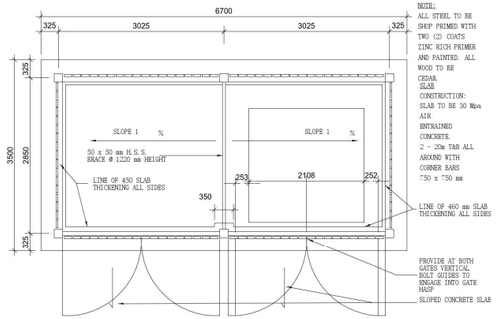
5 A001 Bicycle Parking Detail



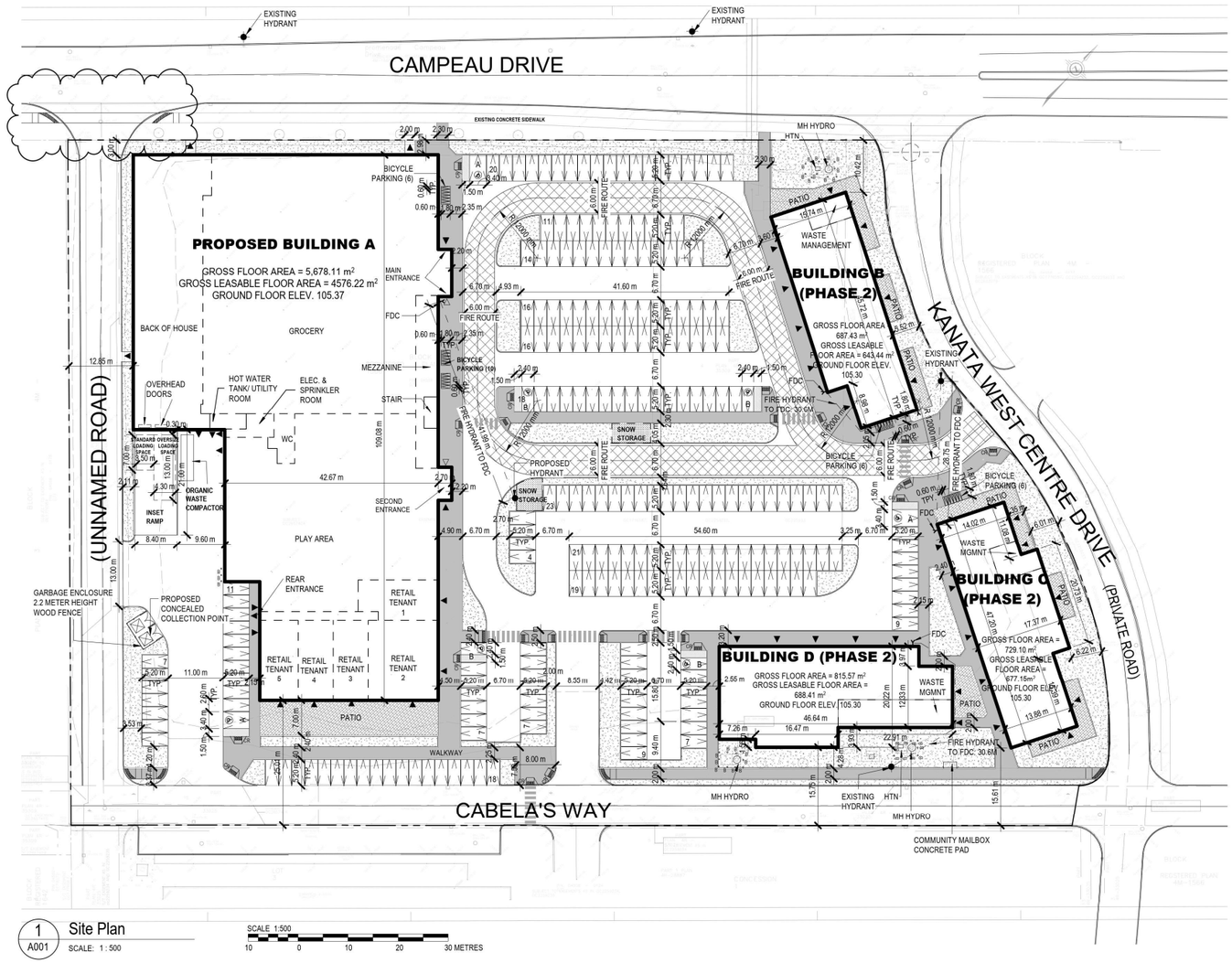
4 A001 Garbage Enclosure Side Elevation
SCALE: 1 : 50



3 A001 Garbage Enclosure Front Elevation
SCALE: 1 : 50



2 A001 Garbage Enclosure Plan
SCALE: 1 : 50



1 A001 Site Plan
SCALE: 1 : 500

SCALE 1:500
10 0 10 20 30 METRES

NOTES

1. DRAWING BASED ON PLAN OF SURVEY PREPARED BY J.D.BARNES LIMITED, ISSUED ON DECEMBER 9,2024, BLOCK 1, REGISTERED PLAN 4M-1566. CITY OF OTTAWA

2. BUILDING A, BUILDING B, BUILDING C AND BUILDING D TO BE NON-COMBUSTIBLE CONSTRUCTION.

SITE LEGENDS

- FIRE HYDRANT
- FIRE DEPARTMENT CONNECTION
- PEDESTRIAN DOORS
- BOLLARD
- CR CURB RAMP W/TWSI
- PROPERTY LINE
- OUTLINE OF BUILDING
- SOFT LANDSCAPING
- CONCRETE SIDEWALK
- FIRE ROUTE
- PATIO
- SNOW STORAGE

OWNER:
1000514608 Ontario Inc. (ie. Sunny Food Mart)
100 Duffield Dr,
Markham, ON L6G 1B5,
Tel: (905) 946-0551

APPLICANT:
Caimion Development Inc.
234 Willowdusk St,
Ottawa, ON K2M 0L5.
Tel: 613-777-9888.

ARCHITECTS:
TAES Architects Inc.
98 Scarsdale Road
Toronto, ON M3B 2R7
Tel: 416-800 3284

SURVEYOR
J.D. BARNES LIMITED
62 STEACIE DRIVE, SUITE 103,
KANATA, ON K2K 2A9
TEL: 613-713-7244

CIVIL ENGINEER:
WPE Engineering Limited
222 - 7250 Keele Street
Vaughan, On. L4K 1Z8
TEL: 416-578-8682

LANDSCAPE ARCHITECTS:
James B. Lennox & Associates Inc.
3332 Carling Ave.
Ottawa, Ontario K2H 5A8
Tel: 613-722-5168

MECHANICAL AND ELECTRICAL ENGINEERING:
JHD Engineering Inc
Unit 290, 7181 Yonge Street
Thornhill Ontario L3T 0C7
Tel: 647-632-4763

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THIS DRAWING IS NOT TO BE USED FOR CONSTRUCTION UNTIL SIGNED BY THE ARCHITECT.

No.	Issued	Date	By
1	For Site Plan Approval	2024-07-25	JW
2	Revision 1 For SPA	2024-09-30	JW
3	Revision 2 For SPA	2024-12-18	JW
4	Revision 3 For SPA	2025-01-24	JW

KEY PLAN



ONTARIO ASSOCIATION OF ARCHITECTS
SHENSHU ZHANG
LICENCE
5814

TAES Architects Inc.
98 SCARSDALE ROAD,
TORONTO, ONTARIO, M3B 2R7
T: 416 800 3284
F:416-800-3485

SUNNY FOODMART

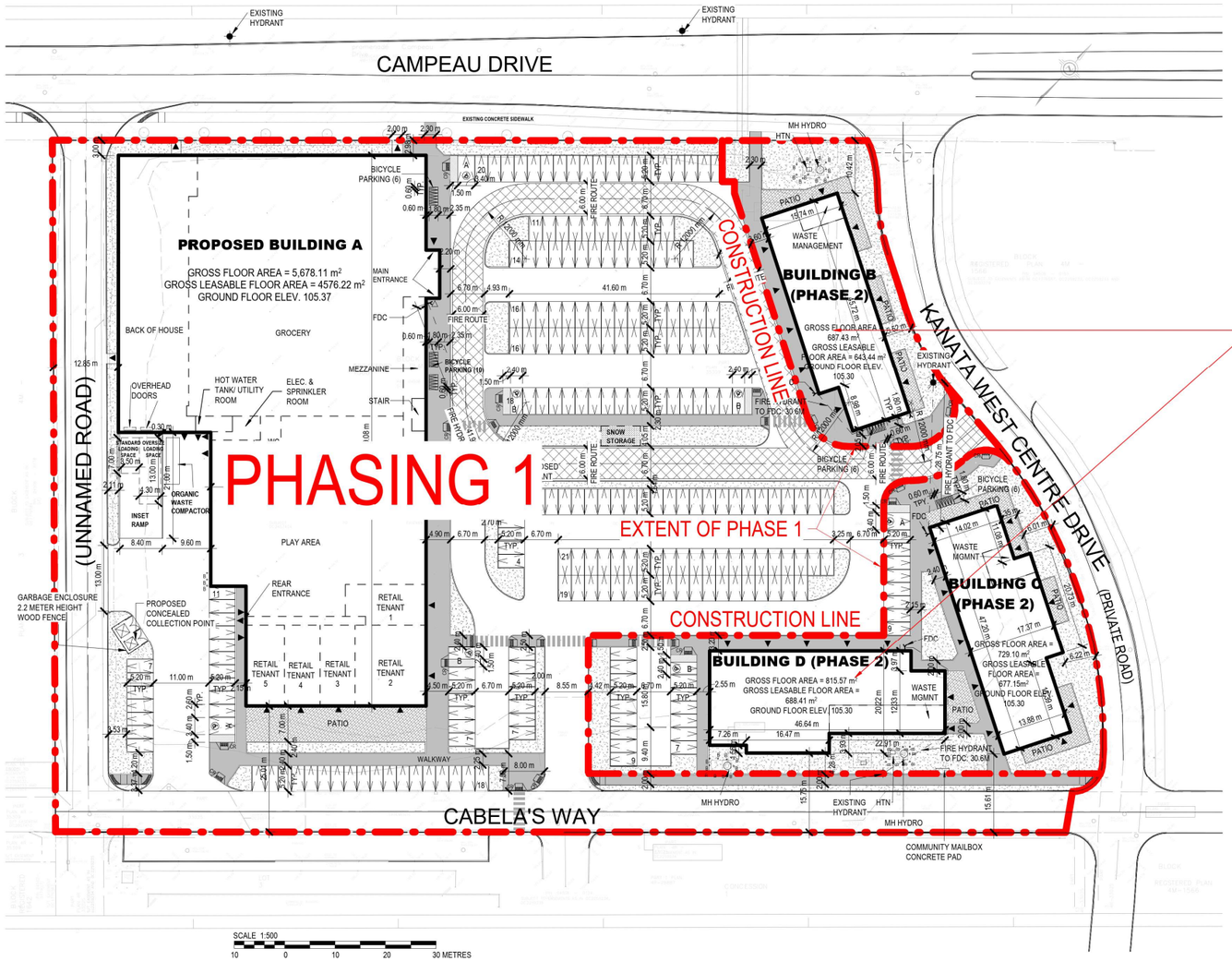
3075 PALLADIUM DRIVE, OTTAWA, ON

Project No.		T2023043
Drawn	Scale	As indicated
Checked	Date	07/25/24

SITE PLAN

Drawing No. A001

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1 A002 Site Plan - Phasing

SCALE: 1 : 500

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CONTRACTOR MUST CHECK & VERIFY ALL DIMENSIONS ON SITE.

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No.	Issued	Date	By
1	For Site Plan Approval	2024-07-25	JW
3	Revision 2 For SPA	2024-12-18	JW
4	Revision 3 For SPA	2025-01-24	JW

KEY PLAN



ONTARIO ASSOCIATION OF ARCHITECTS
SHENSHU ZHANG
LICENCE 5914

TAES Architects Inc.
98 SCARSDALE ROAD,
TORONTO, ONTARIO, M3B 2R7
T: 416 800 3284
F:416-800-3485

SUNNY FOODMART

3075 PALLADIUM DRIVE, OTTAWA, ON

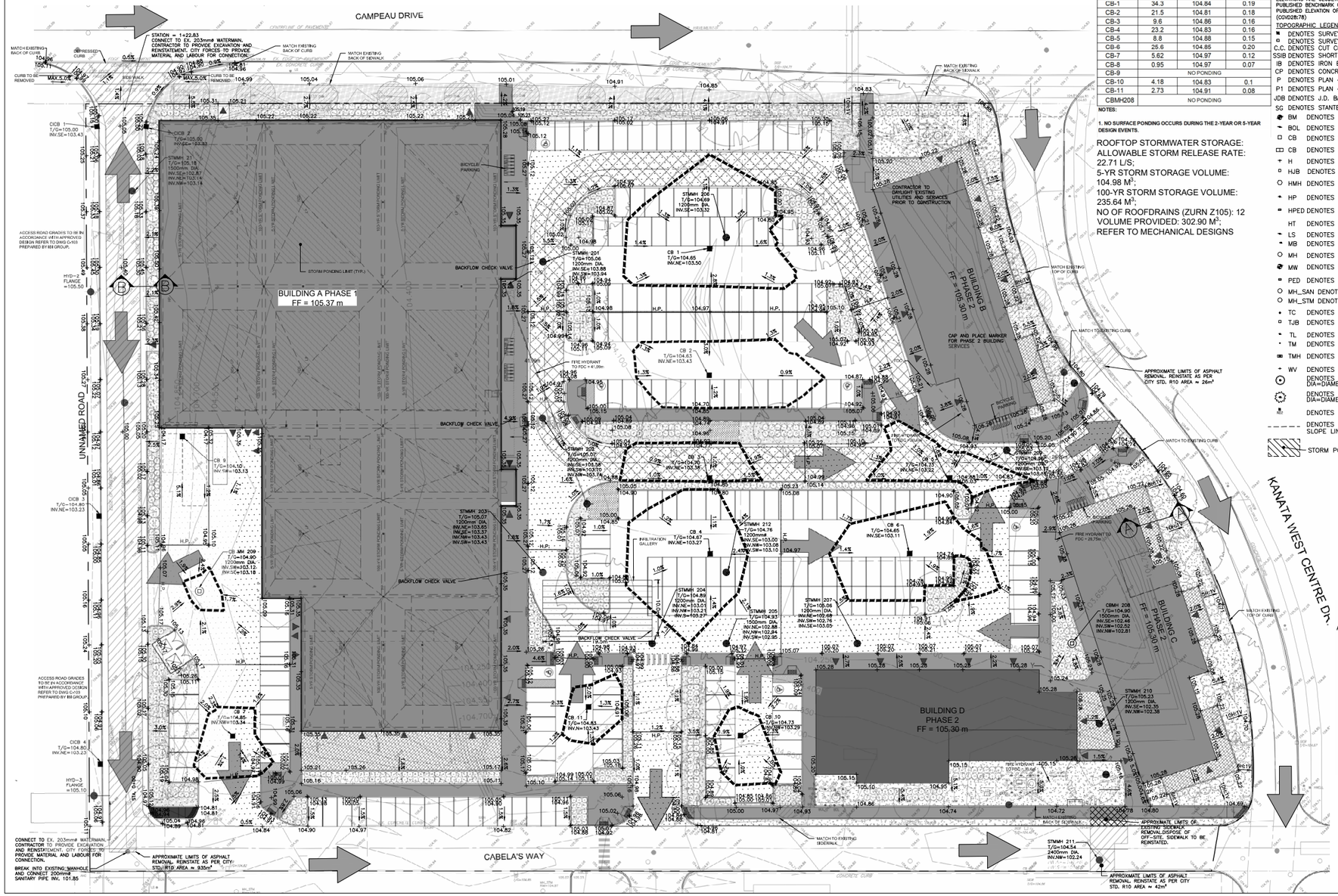
Project No.		T2023043
Drawn	Scale	As indicated
Checked	Date	07/09/24

SITE PLAN - PHASING

Drawing No. A002

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*NOTE: ALL EXACT SEWER PIPE INVERTS TO BE VERIFIED IN THE FIELD BY THE CONTRACTOR.



SURFACE PONDING TABLE			
STRUCTURE	100-YEAR		
	PROVIDED STORAGE VOLUME(M³)	PONDING ELEVATION(M)	PONDING DEPTH(M)
CB-1	34.3	104.84	0.19
CB-2	21.5	104.81	0.18
CB-3	9.6	104.86	0.16
CB-4	23.2	104.83	0.16
CB-5	8.8	104.88	0.15
CB-6	25.6	104.85	0.20
CB-7	5.62	104.97	0.12
CB-8	0.95	104.97	0.07
CB-9	NO PONDING		
CB-10	4.18	104.83	0.1
CB-11	2.73	104.91	0.08
CBMH208	NO PONDING		

NOTES:

1. NO SURFACE PONDING OCCURS DURING THE 2-YEAR OR 5-YEAR DESIGN EVENTS.

ROOFTOP STORMWATER STORAGE:
ALLOWABLE STORM RELEASE RATE: 22.71 L/S;
5-YR STORM STORAGE VOLUME: 104.98 M^3;
100-YR STORM STORAGE VOLUME: 235.64 M^3;
NO OF ROOFDRAINS (ZURN Z105): 12
VOLUME PROVIDED: 302.90 M^3;
REFER TO MECHANICAL DESIGNS

PLAN OF SURVEY SHOWING TOPOGRAPHIC DETAIL OF
BLOCK 1
REGISTERED PLAN 4M-1566
CITY OF OTTAWA

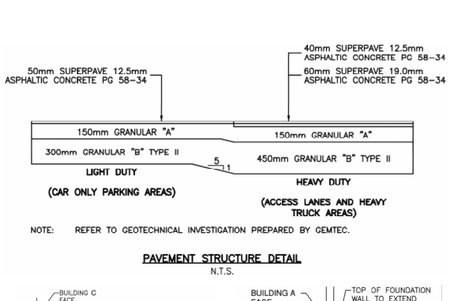
ELEVATIONS ARE GEODETIC AND ARE REFERRED TO PUBLISHED BENCHMARK 00119833001, HAVING A PUBLISHED ELEVATION OF 77.081 METRES (COVD28:78)

TOPOGRAPHIC LEGEND

- DENOTES SURVEY MONUMENT FOUND
- DENOTES SURVEY MONUMENT SET
- C.C. DENOTES CUT CROSS
- SSIB DENOTES SHORT STANDARD IRON BAR
- IB DENOTES IRON BAR
- CP DENOTES CONCRETE PIN
- P DENOTES PLAN 4R – 35309
- P1 DENOTES PLAN 4R – 33025
- JDB DENOTES J.D. BARNES LIMITED
- SG DENOTES STANTEC GEOMATICS LTD.
- BM DENOTES BENCH MARK
- BOL DENOTES BOLLARD
- CB DENOTES CATCHBASIN
- CB DENOTES DOUBLE CATCHBASIN
- H DENOTES FIRE HYDRANT
- HJB DENOTES HYDRO JUNCTION BOX
- HMH DENOTES HYDRO MANHOLE
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- DENOTES ROOF DRAIN
- DENOTES ROOF DRAIN SLOPE LINE @ 2.00%
- STORM PONDING LIMIT (TYP.)

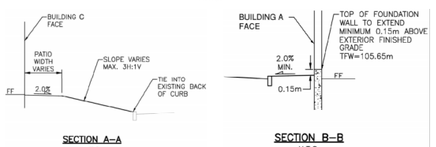
LEGEND

- PROPERTY LINE
- ENTRANCE
- DEPRESSED CURB WITH TWSI
- EXISTING HYDRANT
- EXISTING WATER VALVE
- EXISTING TREE
- 100 - YEAR PONDING LIMIT
- TERRACING (3H:1V MAX.)
- PROPOSED VALVE & BOX
- PROPOSED HYDRANT
- +105.06 PROPOSED SPOT ELEVATION
- 2.0% DRAINAGE SLOPE & DIRECTION
- PROPOSED CATCH BASIN
- PROPOSED CATCHBASIN MANHOLE
- PROPOSED STORM MANHOLE
- EMERGENCY FLOW ROUTE FOR THE STORM ABOVE THE 1:100 EVENT
- EXISTING CONTOURS
- HEAVY-DUTY ASPHALT
- ASPHALT REINSTATEMENT
- PROPOSED SODDED GRASS AREA
- PROPOSED COMPOSTED PINE MULCH OR APPROVED EQUAL
- PROPOSED PRECAST CONCRETE PAVERS
- PROPOSED SHRUBS / ORNAMENTAL GRASSES / PERENNIALS
- EXISTING TREE TO REMAIN (REFER TO TREE CONSERVATION REPORT PREPARED BY CSW LANDSCAPE ARCHITECTS LTD. FOR DETAILS)
- APPROX 40 YEAR CANOPY PROJECTION
- PROPOSED DECIDUOUS TREE
- REQUIRED SOIL VOLUME



NOTE: REFER TO GEOTECHNICAL INVESTIGATION PREPARED BY GEMTEC.

PAVEMENT STRUCTURE DETAIL
N.T.S.



SECTION A-A
N.T.S.

SECTION B-B
N.T.S.

KEY PLAN
N.T.S



No.	Issued	Date	By
4	REVISED COMMENTS	2025-06-13	MD
3	REVISED COMMENTS	2024-12-18	MD
2	REVISED COMMENTS	2024-09-27	MD
1	ISSUED FOR SPA	2024-07-15	MD

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LICENSED PROFESSIONAL ENGINEER
Z. DU
2025-06-13
PROVINCE OF ONTARIO

WPE ENGINEERING LTD.
222 - 7250 KEELE STREET
VAUGHAN, ON. L4K 1Z8
T: (416) 578 8682
DESIGN@WPEENGINEERING.COM

SCALE BAR
1:300 0 2 4 6 8 10 12m

PROP. COMMERCIAL DEVELOPMENT

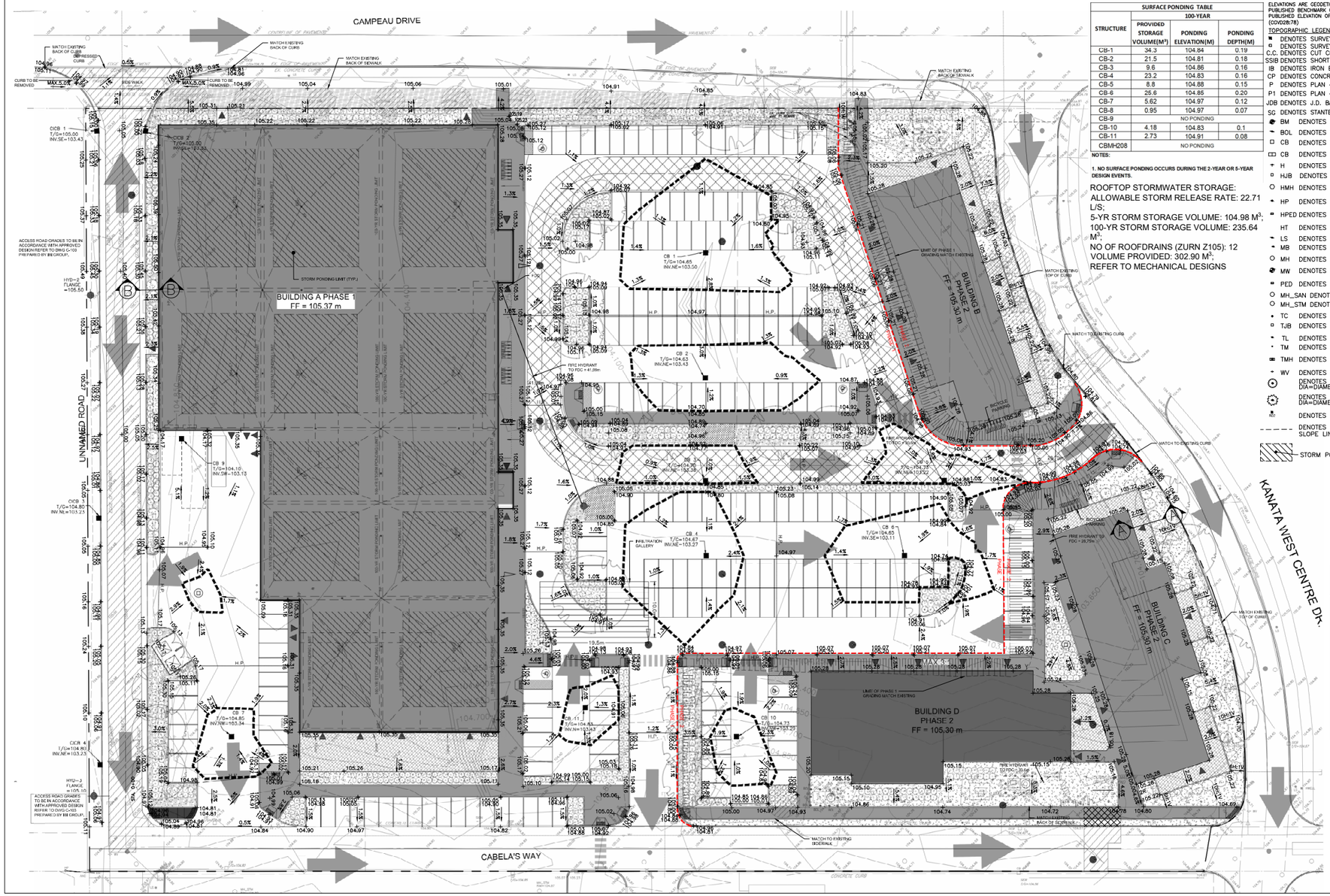
3075 PALLADIUM DRIVE
CITY OF OTTAWA

SITE GRADING PLAN

CITY FILE NO.D07-12-24-0076

Design	A.M.	Scale	1:300
Checked	Z.D	Date	2024-06-24
Project No.	2034	Drawing No.	C-01

*NOTE: ALL EXACT SEWER PIPE INVERTS TO BE VERIFIED IN THE FIELD BY THE CONTRACTOR.



SURFACE PONDING TABLE			
STRUCTURE	100-YEAR		
	PROVIDED STORAGE VOLUME(M³)	PONDING ELEVATION(M)	PONDING DEPTH(M)
CB-1	34.3	104.84	0.19
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NO OF ROOFDRAINS (ZURN Z105): 12
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REFER TO MECHANICAL DESIGNS

PLAN OF SURVEY SHOWING TOPOGRAPHIC DETAIL OF
BLOCK 1
REGISTERED PLAN 4M-1566
CITY OF OTTAWA

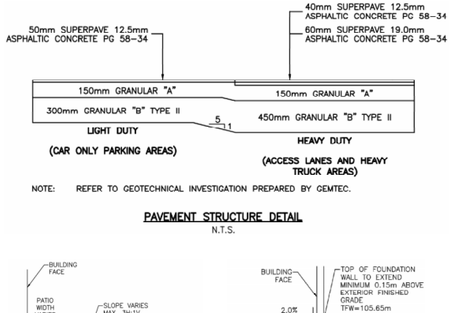
ELEVATIONS ARE GEODETIC AND ARE REFERRED TO PUBLISHED BENCHMARK 001198330D1, HAVING A PUBLISHED ELEVATION OF 77.081 METRES (COVD28:78)

TOPOGRAPHIC LEGEND

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- DENOTES SURVEY MONUMENT SET
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- STORM PONDING LIMIT (TYP.)

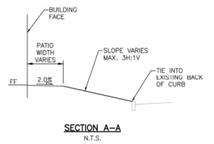
LEGEND

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- PHASING LIMITS
- ENTRANCE
- DEPRESSED CURB WITH TWSI
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- EXISTING WATER VALVE
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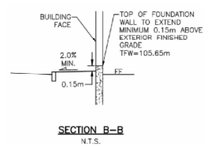


NOTE: REFER TO GEOTECHNICAL INVESTIGATION PREPARED BY GEMTEC.

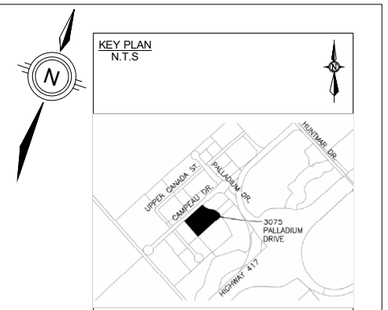
PAVEMENT STRUCTURE DETAIL
N.T.S.



SECTION A-A
N.T.S.



SECTION B-B
N.T.S.



No.	Issued	Date	By
4	REVISED COMMENTS	2025-06-13	MD
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DESIGN@WPEENGINEERING.COM

SCALE BAR
1:300 0 2 4 6 8 10 12m

PROP. COMMERCIAL DEVELOPMENT

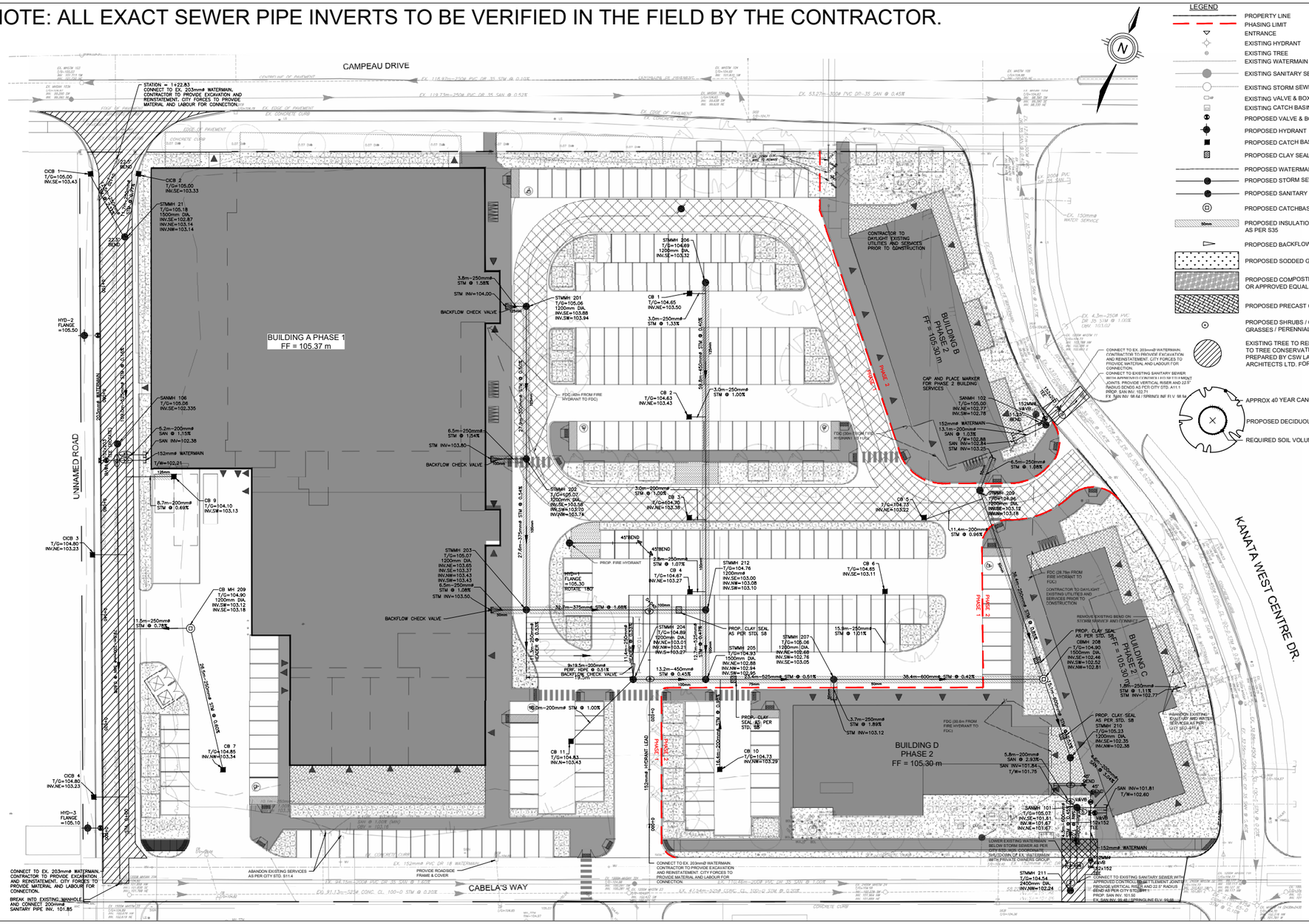
3075 PALLADIUM DRIVE
CITY OF OTTAWA

INTERIM GRADING PLAN

CITY FILE NO.D07-12-24-0076

Design	A.M.	Scale	1:300
Checked	Z.D	Date	2024-06-24
Project No.	2034	Drawing No.	C-02

*NOTE: ALL EXACT SEWER PIPE INVERTS TO BE VERIFIED IN THE FIELD BY THE CONTRACTOR.


CAMPEAU DRIVE
UNNAMED ROAD
KANATA WEST CENTRE DR.
CABELA'S WAY
BUILDING A PHASE 1
FF = 105.37 m
BUILDING B
FF = 105.30 m
BUILDING C
PHASE 2
FF = 105.30 m
BUILDING D
PHASE 2
FF = 105.30 m
PHASE 1
PHASE 2
STATION = 1+22.83
CONNECT TO EX. 203mmø WATERMAIN, CONTRACTOR TO PROVIDE EXCAVATION AND REINSTATEMENT. CITY FORCES TO PROVIDE MATERIAL AND LABOUR FOR CONNECTION.
CONTRACTOR TO DAYLIGHT EXISTING UTILITIES AND SERVICES PRIOR TO CONSTRUCTION
CAP AND PLACE MARKER FOR PHASE 2 BUILDING SERVICES
CONNECT TO EX. 203mmØ WATERMAIN. CONTRACTOR TO PROVIDE EXCAVATION AND REINSTATEMENT. CITY FORCES TO PROVIDE MATERIAL AND LABOUR FOR CONNECTION.
CONNECT TO EXISTING SANITARY SEWER WITH APPROVED CONTROLLED SETTLEMENT JOINTS. PROVIDE VERTICAL RISER AND 22.5° RADIUS BENDS AS PER CITY STD. A11.1
PROP. SAN INV. 101.71
EX. SAN INV. 98.64 / SPRING INF. F.V. 98.64
PROP. CLAY SEAL AS PER STD. S8
PROP. PRECAST CONCRETE PAVERS
PROP. PRECAST CONCRETE PAVERS AS PER LANDSCAPE ARCHITECTS
PROP. INTERLOCKING CONCRETE PAVERS AS PER LANDSCAPE ARCHITECTS
PROP. ASPHALT AS PER STD. S1
PROP. CONCRETE CURB AS PER STD. S6
PROP. CONCRETE CURB AS PER STD. S7
PROP. CONCRETE CURB AS PER STD. S8
PROP. CONCRETE CURB AS PER STD. S9
PROP. CONCRETE CURB AS PER STD. S10
PROP. CONCRETE CURB AS PER STD.

DENOTES DECIDUOUS TREE
DIA=DIAMETER OF TRUNK IN METRES

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DIA=DIAMETER OF TRUNK IN METRES

MH_SAN DENOTES SANITARY MANHOLE
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TC DENOTES TELEPHONE CHAMBER
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TL DENOTES TRAFFIC SIGNAL
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TMH DENOTES TELEPHONE MANHOLE
WV DENOTES WATER VALVE

PLAN OF SURVEY SHOWING
TOPOGRAPHIC DETAIL OF
BLOCK 1
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CITY OF OTTAWA

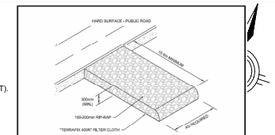
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TOPOGRAPHIC LEGEND

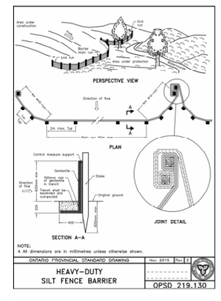
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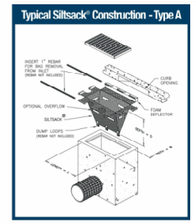
LEGEND

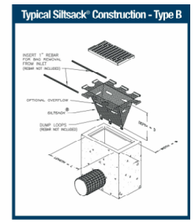
PROPERTY LINE
PHASING LIMIT
EXISTING CATCHBASIN
EXISTING STORM SEWER & MANHOLE
SILT SACK (OR APPROVED EQUIVALENT). SEE DETAILS ON DWG. 23027-N1
PROPOSED CATCH BASIN
PROPOSED SILT FENCE
PROPOSED STORM SEWER & MANHOLE
PROPOSED CATCHBASIN MANHOLE
PROPOSED HYDRANT
PROPOSED MUDMAT



TEMPORARY GRAVEL ACCESS PAD | N.T.S.



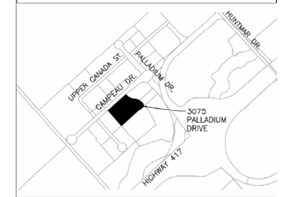




NOTES:

1. THE CONTRACTOR SHALL IMPLEMENT BEST MANAGEMENT PRACTICES TO PROVIDE FOR PROTECTION OF THE AREA DRAINAGE SYSTEM AND THE ULTIMATE RECEIVING WATERCOURSE DURING CONSTRUCTION ACTIVITIES. THE CONTRACTOR ACKNOWLEDGES THAT FAILURE TO IMPLEMENT APPROPRIATE EROSION AND SEDIMENT CONTROL MEASURES MAY BE SUBJECT TO PENALTIES IMPOSED BY ANY APPLICABLE REGULATORY AGENCY.
2. LIMIT THE EXTENT OF EXPOSED SOILS AT ANY GIVEN TIME
3. EROSION AND SEDIMENT CONTROL MEASURES SHALL BE MAINTAINED UNTIL VEGETATION HAS BEEN RE-ESTABLISHED IN ALL DISTURBED AREAS. RE-VEGETATE DISTURBED AREAS AS SOON AS POSSIBLE.
4. STOCKPILE SOIL AWAY (15 METERS OR GREATER) FROM WATERCOURSES, DRAINAGE FEATURES AND TOP OF STEEP SLOPES.
5. SILT SACKS ARE TO BE PLACED UNDERNEATH THE FRAME AND COVER OF ALL PROPOSED AND EXISTING CATCH BASIN AND OPEN COVER
6. A SILT FENCE BARRIER SHALL BE INSTALLED AS PER OPSD 219.110 WHERE INDICATED AND MAINTAINED AS REQUIRED.
7. INSTALL MUD MATS AT ALL CONSTRUCTION ENTRANCES.
8. DURING ACTIVE CONSTRUCTION PERIODS, VISUAL INSPECTIONS SHALL BE UNDERTAKEN ON A WEEKLY BASIS AND AFTER MAJOR STORM EVENTS (>25mm RAIN IN 24 HOUR PERIOD) ON SEDIMENT CONTROL BARRIERS AND ANY DAMAGE REPAIRED IMMEDIATELY.
9. EROSION AND SEDIMENT CONTROL BARRIERS SHALL ALSO BE ASSESSED (AND REPAIRED AS REQUIRED) FOLLOWING SIGNIFICANT SNOW MELT EVENTS.
10. VISUAL INSPECTIONS SHALL ALSO BE UNDERTAKEN IN ANTICIPATION OF LARGE STORM EVENTS (OR A SERIES OF RAINFALL AND/OR SNOW MELT DAYS) THAT COULD POTENTIALLY YIELD SIGNIFICANT RUNOFF VOLUMES.
11. CARE SHALL BE TAKEN TO PREVENT DAMAGE TO EROSION AND SEDIMENT CONTROLS DURING CONSTRUCTION OPERATIONS
12. IN SOME CASES,BARRIERS MAY BE REMOVED TEMPORARLY TO ACCOMMODATE THE CONSTRUCTION OPERATIONS. THE AFFECTED BARRIERS SHALL BE REINSTATED IMMEDIATELY AFTER CONSTRUCTION OPERATIONS ARE COMPLETED.
13. EROSION AND SEDIMENT CONTROL MEASURES SHALL BE ADJUSTED AS REQUIRED AS THE SITE BECOMES DEVELOPED.
14. SEDIMENT CONTROL DEVICES SHALL BE CLEANED OF ACCUMULATED SEDIMENTATION AS REQUIRED AND REPLACED AS NECESSARY.
15. DURING THE COURSE OF CONSTRUCTION, IF THE ENGINEER BELIEVES THAT ADDITIONAL PREVENTION METHODS ARE REQUIRED TO CONTROL EROSION AND SEDIMENTATION, THE CONTRACTOR SHALL IMPLEMENT ADDITIONAL MEASURES, AS REQUIRED, TO THE SATISFACTION OF THE ENGINEER.
16. CONSTRUCTION AND MAINTENANCE REQUIREMENTS FOR EROSION AND SEDIMENT CONTROLS ARE TO COMPLY WITH OPSS. 805

KEY PLAN
N.T.S



No.	Issued	Date	By
4	REVISED COMMENTS	2025-06-13	MD
3	REVISED COMMENTS	2024-12-18	MD
2	REVISED COMMENTS	2024-09-27	MD
1	ISSUED FOR SPA	2024-07-15	MD

THE LOCATION OF ALL UNDER- / ABOVE-GROUND UTILITIES AND SERVICES IS APPROXIMATE ONLY AND WHERE SHOWN ON THE DRAWING(S) THE ACCURACY OF THE UTILITIES AND SERVICES IS NOT GUARANTEED. THE OWNER AND / OR HIS REPRESENTATIVE SHALL DETERMINE THE LOCATION OF ALL UTILITIES AND SERVICES BEFORE COMMENCING ANY CONSTRUCTION ACTIVITIES.

CONTRACTOR MUST CHECK & VERIFY ALL DIMENSIONS ON SITE.

THIS DRAWING IS NOT TO BE USED FOR CONSTRUCTION.

LICENSED PROFESSIONAL ENGINEER
Z. DU
2025-06-13
PROVINCE OF ONTARIO

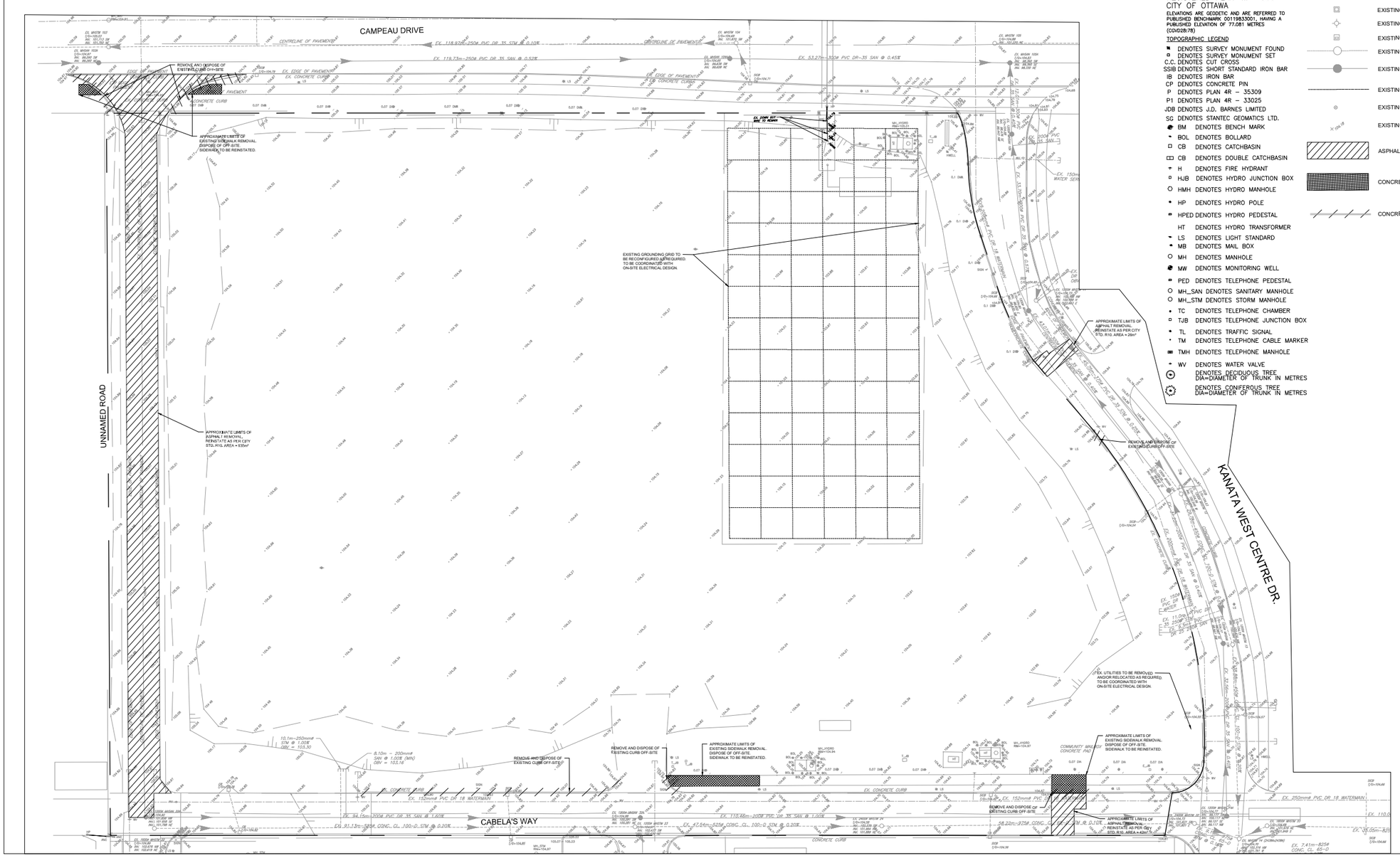
WPE ENGINEERING LTD.
222 - 7250 KEELE STREET
VAUGHAN, ON. L4K 1Z8
T: (416) 578 8682
DESIGN@WPEENGINEERING.COM

SCALE BAR
1:300 0 2 4 6 8 10 12m

PROP. COMMERCIAL DEVELOPMENT

3075 PALLADIUM DRIVE
CITY OF OTTAWA
EROSION & SEDIMENT CONTROL PLAN
CITY FILE NO.D07-12-24-0076

Design	A.M.	Scale	1:300
Checked	Z.D	Date	2024-06-24
Project No.	2034	Drawing No.	C-04


CAMPEAU DRIVE
UNNAMED ROAD
CABELA'S WAY
KANATA WEST CENTRE DR.
REMOVE AND DISPOSE OF EXISTING CURB OFF-SITE
APPROXIMATE LIMITS OF EXISTING SIDEWALK REMOVAL. DISPOSE OF OFF-SITE. SIDEWALK TO BE REINSTATED.
APPROXIMATE LIMITS OF ASPHALT REMOVAL. REINSTATE AS PER CITY STD, R10, AREA = 930m²
EXISTING GROUNDING GRID TO BE RECONFIGURED AS REQUIRED. TO BE COORDINATED WITH ON-SITE ELECTRICAL DESIGN.
EX. UTILITIES TO BE REMOVED AND/OR RELOCATED AS REQUIRED. TO BE COORDINATED WITH ON-SITE ELECTRICAL DESIGN.
APPROXIMATE LIMITS OF ASPHALT REMOVAL. REINSTATE AS PER CITY STD, R10, AREA = 28m²
APPROXIMATE LIMITS OF ASPHALT REMOVAL. REINSTATE AS PER City STD, R10, AREA = 42m²
EX. 119.73m–250ø PVC DR 35 SAN @ 0.52%
EX. 53.27m–300ø PVC DR–35 SAN @ 0.45%
EX. 114.97m–250ø PVC DR 35 STM @ 0.10%
EX. 152mmø PVC DR 18 WATERMAIN
EX. 350mmø PVC DR 18 WATERMAIN
EX. 600mmø PVC DR 35 SAN
EX. 1500mmø PVC DR 35 STM
EX. 1200mmø PVC DR 35 STM
EX. 1050mmø PVC DR 35 STM
EX. 675mmø PVC DR 35 STM
EX. 450mmø PVC DR 35 STM
EX. 375mmø PVC DR 35 STM
EX. 300mmø PVC DR 35 SAN
EX. 250mmø PVC DR 35 SAN
EX. 200mmø PVC DR 35 SAN
EX. 91.15m–525ø CONC. CL. 100–D STM @ 0.20%
EX. 47.54m–525ø CONC. CL. 100–D STM @ 0.20%
58.22m–975ø CONC. CL. 100–D STM @ 0.10%
EX. 7.41m–825ø CONC. CL. 65–D
6.10m – 200mmø SAN @ 1.00% (MIN) OBV = 103.30
10.1m–250mmø STM @ 1.00% OBV = 103.30
EX. CONCRETE CURB
EX. CONCRETE CURB & GUTTER
CONCRETE CURB
CONCRETE SIDEWALK
PAVEMENT
EX. EDGE OF PAVEMENT
CENTRELINE OF PAVEMENT
EX. POWER GUY WIRE TO HYDRO
EX. 600mmø PVC DR 35 SAN
EX. 1500mmø PVC DR 35 STM
EX. 1200mmø PVC DR 35 STM
EX. 1050mmø PVC DR 35 STM
EX. 675mmø PVC DR 35 STM
EX. 450mmø PVC DR 35 STM
EX. 375mmø PVC DR 35 STM
EX. 300mmø PVC DR 35 SAN
EX. 250mmø PVC DR 35 SAN
EX. 200mmø PVC DR 35 SAN
EX. 150mm WATER SERVICE
EX. 200mmø PVC DR 35 SAN
EX. 1500mmø PVC DR 35 STM
EX. 1200mmø PVC DR 35 STM
EX. 1050mmø PVC DR 35 STM
EX. 675mmø PVC DR 35 STM
EX. 450mmø PVC DR 35 STM
EX. 375mmø PVC DR 35 STM
EX. 300mmø PVC DR 35 SAN
EX. 250mmø PVC DR 35 SAN

GENERAL NOTES:

1. ALL WORKS AND MATERIALS SHALL CONFORM TO THE LATEST REVISIONS OF THE STANDARDS AND SPECIFICATIONS OF THE CITY OF OTTAWA AND ONTARIO PROVINCIAL STANDARD DRAWINGS (OPSD) AND SPECIFICATIONS (OPSS), AS AMENDED BY THE CITY OF OTTAWA.
2. THE CONTRACTOR SHALL CONFIRM THE LOCATION OF ALL EXISTING UTILITIES WITHIN THE SITE AND ADJACENT WORK AREAS. THE CONTRACTOR SHALL BE RESPONSIBLE FOR PROTECTING ALL EXISTING UTILITIES TO THE SATISFACTION OF THE AUTHORITY HAVING JURISDICTION.THE CONTRACTOR SHALL BE RESPONSIBLE FOR REPAIR OR REPLACEMENT OF ANY SERVICES OR UTILITIES DISTURBED DURING CONSTRUCTION,TO THE SATISFACTION OF THE AUTHORITY HAVING JURISDICTION.
3. ALL DIMENSIONS AND ELEVATION SHALL BE CHECKED AND VERIFIED IN THE FIELD BY THE CONTRACTOR PRIOR TO THE START OF CONSTRUCTION. ANY DISCREPANCIES SHALL BE REPORTED IMMEDIATELY TO THE ENGINEER.
4. DESIGN ELEVATIONS GIVEN ARE TO BE ADHERED TO WITH NO CHANGES WITHOUT PRIOR WRITTEN APPROVAL BY ROBINSON LAND DEVELOPMENT.
5. ANY AREA BEYOND THE LIMIT OF THE SITE DISTURBED DURING CONSTRUCTION SHALL BE RESTORED TO ORIGINAL CONDITION OR BETTER TO THE SATISFACTION OF THE AUTHORITY HAVING JURISDICITION AT THE CONTRACTOR'S EXPENSE.
6. RELOCATION OF EXISTING SERVICES AND/OR UTILITIES SHALL BE AS SHOWN ON THE DRAWINGS OR AS DIRECTED BY THE ENGINEER AT THE EXPENSE OF THE CONTRACTOR.
7. ALL WORK SHALL BE COMPLETED IN ACCORDANCE WITH THE "OCCUPATIONAL HEALTH AND SAFETY ACT AND REGULATION FOR CONSTRUCTION PROJECTS".THE GENERAL CONTRACTOR SHALL BE DEEMED TO BE THE CONTRACTOR AS DEFINED IN THE ACT.
8. ALL CONSTRUCTION SIGNAGE MUST BE CONFORM TO THE M.T.O MANUAL OF UNIFORM TRAFFIC CONTROL DEVICE(LATEST AMENDMENT).
9. ALL DIMENSIONS ARE IN METER UNLESS OTHERWISE SPECIFIED.
10. THE SUPPORT OF ALL UTILITIES SHALL BE IN ACCORDANCE WITH THE REQUIREMENTS OF THE AUTHORITY HAVING JURISDICTION.
11. THE CONTRACTOR WILL BE RESPONSIBLE FOR ADDITIONAL BEDDING OR ADDITIONAL STRENGTH PIPE IF THE MAXIMUM TRENCH WIDTH, AS SPECIFIED BY OPSD, IS EXCEEDED.
12. ALL NECESSARY CLEARING AND GRABBING SHALL BE COMPLETED BY THE CONTRACTOR, REVIEW WITH THE CITY OF OTTAWA PRIOR TO AND TREE CUTTING.
13. REFER TO GEOTECHNICAL INVESTIGATION PREPARED BY YURI MENDEZ ENGINEERING,DATED JUNE 2023.
14. THE CONTRACTOR IS RESPONSIBLE FOR AND SHALL PROVIDE FOR DEWATERING, SUPPORT AND PROTECTION OF EXCAVATION AND TRENCHING AS WELL AS RELEASE OF ANY PUMPED GROUNDWATER IN A CONTROLLED AND APPROVED MANNER.
15. DO NOT CONSTRUCT USING DRAWINGS THAT ARE NOT MARKED "ISSUED FOR CONSTRUCTION".
16. CONTRACTOR IS RESPONSIBLE FOR ALL LAYOUT FOR CONSTRUCTION PURPOSES.
17. CLAY SEALS SHALL BE INSTALLED AT A HORIZONTAL SPACING OF NO MORE THAN 100 METERS AS PER GEOTECHNICAL REPORT RECOMMENDATIONS.

STORM SEWERS:

1. ALL REINFORCED CONCRETE STORM SEWER PIPE SHALL BE IN ACCORDANCE WITH CSA A257.2(LATEST AMENDMENT). ALL NON-REINFORCED CONCRETE STORM SEWER PIPE SHALL BE IN ACCORDANCE WITH CSA A257.3(LATEST AMENDMENT),PIPE SHALL BE JOINTED WITH STD.RUBBER GASKETS AS PER CSA A257.3(LATEST AMENDMENT).
2. ALL STORM SEWER TRENCH AND BEDDING SHALL BE IN ACCORDANCE WITH THE CITY OF OTTAWA STD.S6 AND S7 CLASS 'B' UNLESS OTHERWISE SPECIFIED. BEDDING AND COVER MATERIAL SHALL BE SPECIFIED BY PROJECT GEOTECHNICAL ENGINEER.
3. ALL PVC STORM SEWERS ARE TO BE SDR 35 APPROVED PER C.S.A. B182.2 OR LATEST AMENDMENT,UNLESS OTHERWISE SPECIFIED.
4. STORM MANHOLE FRAME AND COVERS SHALL BE AS PER CITY OF OTTAWA STD. S24.1.
5. SUMP. FOR STORM SEWERS 900MM SHALL BE CONSTRUCTED WITH A 300MM SUMP.FOR STORM SEWER 900MM AND OVER USE BENCHING IN ACCORDANCE WITH OPSD 701.021.
6. THE STORM SEWER CLASS HAVE BEEN DESIGNED BASED ON BEDDING CONDITIONS SPECIFIED ABOVE.WHERE THE SPECIFIED TRENCH WIDTH IS EXCEEDED, THE CONTRACTOR SHALL BE REQUIRED TO PROVIDE ADDITIONAL BEDDING, A DIFFERENT TYPE OF BEDDING OR A HIGHER PIPE STRENGTH ST HIS OWN EXPENSE AND SHALL ALSO BE RESPONSIBLE FOR EXTRA TEMPORARY AND/OR PERMANENT REPAIRS MADE NECESSARY BY THE WIDENED TRENCH.
7. ALL STORM MANHOLES SHALL BE 1200MM DIAMETER AS PER OPSD 701.010 UNLESS OTHERWISE NOTED.
8. ALL CATCH BASINS SHALL BE 600MM X 600MM AS PER OPSD 705.010 UNLESS OTHERWISE NOTED.

SANITARY SEWERS:

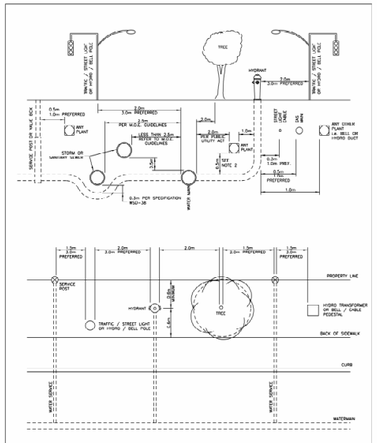
1. ALL SANITARY SEWERS SHALL BE PVC SDR 35, IN ACCORDANCE WITH CITY OF OTTAWA STANDARDS.
2. SANITARY SEWER TRENCH AND BEDDING SHALL BE AS PER CITY OF OTTAWA STD.S6 AND S7, CLASS "B" BEDDING UNLESS OTHERWISE NOTED.
3. ALL SANITARY SERVICES ARE TO BE EQUIPPED WITH APPROVED BACKWATER VALVES.
4. SANITARY MANHOLE FRAME AND COVERS SHALL BE WATERTIGHT AS PER CITY OF OTTAWA STD.S24.1
5. SANITARY SEWER MANHOLES SHALL BE BENCHED AS PER OPSD 701.021.
6. SANITARY PRE-CAST MANHOLE SHALL BE CONSTRUCTED WITH A HIGHER PERCENTAGE OF SILICA FUME IN THE CONCRETE TO MAKE IT MORE DENSE AND LESS SUSCEPTIBLE TO CORROSION OR PINHOLE LEAKS.
7. FOR SANITARY MANHOLES, DEPENDING ON THE ELEVATION OF THE GROUND WATER TABLE AND BASED ON THE RECOMMENDATION OF THE PROJECT GEOTECHNICAL CONSULTANT,CRETEX SEALS,OR A SIMILAR PRODUCT,SHALL BE INSTALLED IN THE PRE-CAST MANHOLE SECTION TO JUST BELOW THE MANHOLE FRAME TO PREVENT INFILTRATION.
9. WATERMAIN IN FILL AREAS TO CONTRACTOR SHALL PERFORM LEAKAGE TESTING, IN THE PRESENCE OF THE CONSULTANT, FOR SANITARY SEWERS IN ACCORDANCE WITH OPSS 410 AND OPSS 407.CONTRACTOR SHALL PERFORM VIDEO INSPECTION OF ALL STORM AND SANITARY SEWERS. A COPY OF THE VIDEO AND INSPECTION REPORT SHALL BE SUBMITTED TO THE ENGINEER FOR REVIEW.
10. IN ACCORDANCE WITH CITY OF OTTAWA STANDARD S11, SANITARY SERVICE CONNECTION REQUIRES APPROVED CONTROLLED SETTLEMENT JOINT.

WATER SUPPLY:

1. ALL PVC WATERMAINS SHALL BE EQUAL TO AWWA C-900 CLASS 150, SDR 18, OR APPROVED EQUAL
2. WATERMAIN TRENCH AND BEDDING AND COVER MATERIAL SHALL BE SPECIFIED BY PROJECT GEOTECHNICAL ENGINEER.
3. ALL PVC WATERMAINS SHALL BE INSTALLED WITH A 10 GAUGE STRANDED COPPER TWU OR RWU TRACER WIRE IN ACCORDANCE WITH CITY OF OTTAWA STD.W36.
4. CATHODIC PROTECTION IS REQUIRED ON ALL METALLIC FITTINGS AS PER CITY OF OTTAWA STD. W40 AND W42.
5. CONTRACTOR TO SUPPLY HYDRANT EXTENSION TO ADJUST THE LENGTH OF HYDRANT BARREL IF REQUIRED.
6. FIRE HYDRANTS SHALL BE INSTALLED AS PER CITY OF OTTAWA STD. W19, AND LOCATED AS PER CITY STD. W18.
7. VALVE IN BOXES SHALL BE INSTALLED AS PER CITY OF OTTAWA STD.W24.
8. WATERMAIN IN FILL AREAS TO BE INSTALLED WITH RESTRAINED JOINTS AS PER CITY OF OTTAWA STD.W25.5 AND W25.6.
9. TRUST BLOCKING OF WATERMAIN TO BE INSTALLED AS PER CITY OF OTTAWA STD.W25.3 ANS W25.4.
10. THE CONTRACTOR SHALL PROVIDE ALL TEMPORARY CAPS, PLUGS AND BLOW-OFFS AND NOZZLES REQUIRED FOR TESTING AND DISINFECTION OF THE WATREMAIN.
11. INSULATION FOR WATERMAIN CROSSING OVER AND BELOW SEWER SHALL BE IN ACCORDANCE WITH CITY OF OTTAWA STD.W25.2 AND W25.RESPECTIVELY.WHERE WATERMAIN COVER IS LESS THAN 2.4M.
12. AS PER CITY GUIDELINE, THE MINIMUM VERTICAL CLEARANCE BETWEEN WATERMAIN AND SEWER / UTILITY IS 0.25M FOR CROSSING OVER THE SEWER,AS PER CITY STD.W25.2. FOR CROSSING UNDER SEWER, ADEQUATE STRUCTURAL SUPPORT FOR THE SEWERS IS REQUIRED TO PREVENT EXCESSIVE DEFLECTION OF JOINTS AND SETTLINGS.THE LENGTH OF WATER PIPE SHALL BE CENTERED AT THE POINT OF CROSSING SO THAT THE JOINTS WILL BE EQUIDISTANT AND AS FAR AS POSSIBLE FROM THE SEWER AS PER CITYSTD.W25.
13. CONNECTION TO EXISTING WATERMAIN TO BE PERFORMED BY CITY FORCES. CONTRACTOR TO PROVIDE LABOUR,EQUIPMENT AND MATERIAL REQUIRED FOR EXCAVATION,BEDDING AND REINSTATEMENT.
14. SWABBING, DISINFECTION, AND HYDROSTATIC TESTING TO BE CONDUCTED AS PER CITY OF OTTAWA STANDARDS IN THE PRESENCE OF A CITY INSPECTOR AND/OR CONSULTANT.

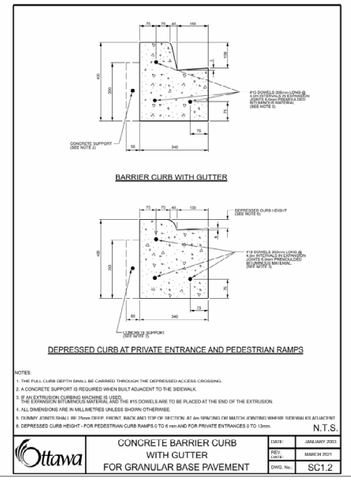
ROADWORK SPECIFICATIONS:

1. CONCRETE CURB SHALL BE IN ACCORDANCE WITH CITY OF OTTAWA STD. SC1.1 (BARRIER CURB). PROVISION SHALL BE MADE FOR CURB DEPRESSIONS AT SIDEWALKS AND DRIVEWAYS.
2. ALL BARRIER CURB TO BE 150MM ABOVE FINISHED ASPHALT GRADE UNLESS OTHERWISE NOTED.
3. CONCRETE SIDEWALK SHALL BE IN ACCORDANCE WITH THE CITY OF OTTAWA STD.SC1.4
4. TWSIS SHALL BE INSTALLED IN ACCORDANCE WITH THE CITY OF OTTAWA STD.SC7.3.
5. PAVEMENT REINSTATEMENT FOR SERVICE AND UTILITY CUTS SHALL BE IN ACCORDANCE WITH THE CITY OF OTTAWA STD.R10 AND OPSD 509.010,OPSS.310.
6. GRANULAR "A" SHALL BE PLACED TO A MINIMUM THICKNS OF 300MM AROUND ALL STRUCTURES WITHIN PAVEMENT AREA.
7. ALL GRANULAR FOR ROADS SHALL BE COMPACTED TO A MINIMUM OF 98%STANDARD PROCTOR DENSITY.
8. ASPHALT WEAR COURSES SHALL NOT BE PLACED UNTIL THE VIDEO INSPECTION OF SEWERS & NECESSARY REPAIRS HAVE BEEN CARRIED OUT TO THE SATISFACTION OF THE ENGINEER.
9. SUB-EXCAVATE SOFT AREA AND FILL WITH GRANULAR"B" COMPACTED IN MAXIMUM 300MM LIFTS.
10. PEDESTRIAN CURB RAMP WITH BOULEVARD SHALL BE ACCORDANCE WITH CITY OF OTTAWA STD.SC7
11. ALL EDGES OF DISTURBED PAVEMENT SHALL BE SAW-CUT TO FROM A NEAT AND STRAIGHT LINE PRIOR TO PLACING NEW ASPHALT.
12. PAVEMENT DESIGN AS PER GEOTECHNICAL RECOMMENDATIONS.



NOTES:
1. DIMENSIONS ILLUSTRATED ARE MINIMUM ACCEPTABLE CLEARANCES UNLESS OTHERWISE NOTED.
2. 0.5m VERTICAL SEPARATION IS REQUIRED BETWEEN WATERMAINS, AND OTHER UTILITY INSTALLATIONS, TO ALLOW FOR PROPER BEDDING OF THE WATERMAIN AND SUFFICIENT CLEARANCE TO CONDUCT REPAIRS.

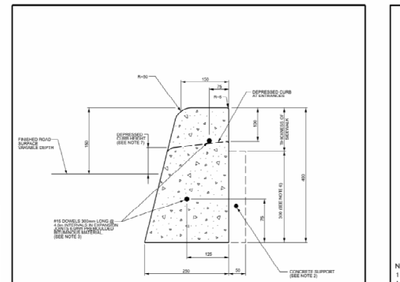
Ottawa	GENERAL WATER PLANT TO UTILITY CLEARANCE	DATE: MARCH 2009 REV: DWG. No.: R20



NOTES:
1. THE FULL CURB DEPTH SHALL BE CARRIED THROUGH THE DEPRESSED ACCESS CROSSING.
2. A CONCRETE SUPPORT IS REQUIRED WHEN BUILT ADJACENT TO THE SIDEWALK.
3. IF AN EXTRUSION CURBING MACHINE IS USED, THE EXPANSION MATERIALS MATERIAL AND THE #15 DOWELS ARE TO BE PLACED AT THE END OF THE EXTRUSION.
4. ALL DIMENSIONS ARE IN MILLIMETRES UNLESS SHOWN OTHERWISE.
5. DUMMY JOINTS SHALL BE 25mm DEEP, FRONT, BACK AND TOP OF SECTION AT 4m SPACING OR MATCH JOINTING WHERE SIDEWALK IS ADJACENT.
6. FOR DEPRESSED CURB AT ENTRANCES USE 250.
7. DEPRESSED CURB HEIGHT - FOR PEDESTRIAN CURB RAMPS 0 TO 6 mm AND FOR PRIVATE ENTRANCES 0 TO 13mm.

N.T.S.

Ottawa	CONCRETE BARRIER CURB WITH GUTTER FOR GRANULAR BASE PAVEMENT	DATE: JANUARY 2003 REV: MARCH 2021 DWG. No.: SC1.2

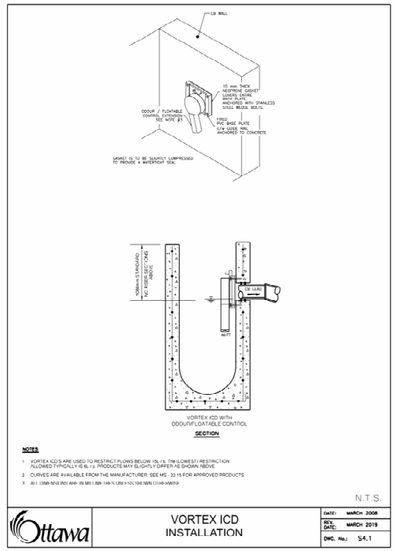


CONCRETE BARRIER CURB

NOTES:
1. THE FULL CURB DEPTH SHALL BE CARRIED THROUGH THE DEPRESSED ACCESS CROSSING.
2. A CONCRETE SUPPORT IS REQUIRED WHEN BUILT ADJACENT TO THE SIDEWALK.
3. IF AN EXTRUSION CURBING MACHINE IS USED, THE EXPANSION MATERIALS MATERIAL AND THE #15 DOWELS ARE TO BE PLACED AT THE END OF THE EXTRUSION.
4. ALL DIMENSIONS ARE IN MILLIMETRES UNLESS SHOWN OTHERWISE.
5. DUMMY JOINTS SHALL BE 25mm DEEP, FRONT, BACK AND TOP OF SECTION AT 4m SPACING OR MATCH JOINTING WHERE SIDEWALK IS ADJACENT.
6. FOR DEPRESSED CURB AT ENTRANCES USE 250.
7. DEPRESSED CURB HEIGHT - FOR PEDESTRIAN CURB RAMPS 0 TO 6 mm AND FOR PRIVATE ENTRANCES 0 TO 13mm.

N.T.S.

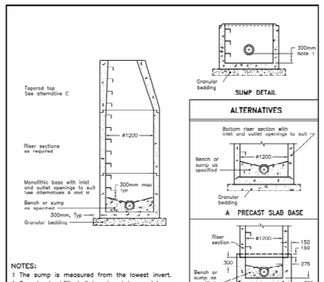
Ottawa	CONCRETE BARRIER CURB FOR GRANULAR BASE PAVEMENT (MODIFIED OPSD-600.110)	DATE: JANUARY 2003 REV: DATE: MARCH 2021 DWG. No.: SC1.1



NOTES:
1. VORTEX ICD'S ARE USED TO RESTRICT FLOWS BELOW 15L/S. THE ILOWEST RESTRICTION ALLOWED TYPICALLY IS 8L/S. PRODUCTS WITH SLIGHTLY DIFFER AS SHOWN ABOVE.
2. CURVES ARE AVAILABLE FROM THE MANUFACTURER. SEE MS - 22-15 FOR APPROVED PRODUCTS
3. AVAILABLE FROM NDS INC 888-76 NDS (888-763-6387) OR ADVANCED DRAINAGE SYSTEMS (800-821-6710)

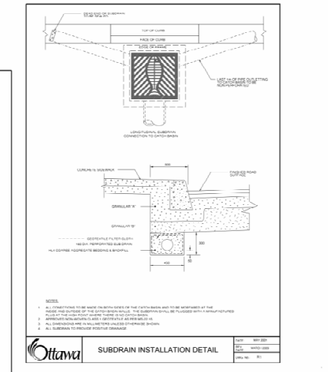
N.T.S.

Ottawa	VORTEX ICD INSTALLATION	DATE: MARCH 2008 REV: DATE: MARCH 2019 DWG. No.: S4.1



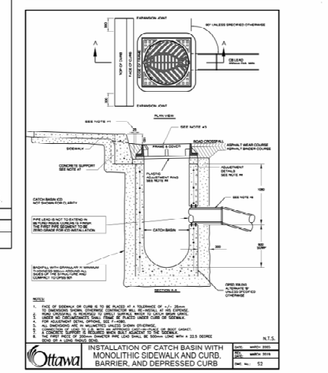
NOTES:
1. The sump is measured from the lowest invert.
A. Granular bedding shall be placed to a minimum thickness of 300mm all around the maintenance hole.
B. Precast concrete components shall be according to OPSD 701.030, 701.031, or 701.032.
C. Structure exceeding 5.0m in depth shall include safety platform according to OPSD 404.020.
D. Pipe support according to OPSD 708.030.
E. For benching and pipe opening details, see OPSD 701.021.
F. For adjustment unit and frame installation, see OPSD 704.010.
G. All dimensions are nominal.
H. All dimensions are in millimetres unless otherwise shown.

ONTARIO PROVINCIAL STANDARD DRAWING	Nov 2014	Rev: 3
PRECAST CONCRETE MAINTENANCE HOLE 1200mm DIAMETER		OPSD 701.010



NOTES:
1. ALL CONNECTIONS TO BE MADE ON BOTH SIDES OF THE CATCH BASIN AND TO BE MONTARED AT THE INSIDE AND OUTSIDE OF THE CATCH BASIN WALLS. THE SUBDRAIN SHALL BE PLUGGED WITH A PERMEABLE MATERIAL TO PREVENT BACKFILL FROM ENTERING THE SUBDRAIN.
2. APPROVED INSTALLATION AIDS (DEPTH PLY AS SHOWN ABOVE) OR AS APPROVED EQUAL
3. ALL DIMENSIONS ARE IN MILLIMETRES UNLESS OTHERWISE SHOWN.
4. ALL SUBDRAIN TO ENCAPSULATED IN FILTER CLOTH.

Ottawa	SUBDRAIN INSTALLATION DETAIL	DATE: MAR 2005 REV: DWG. No.: S11.1



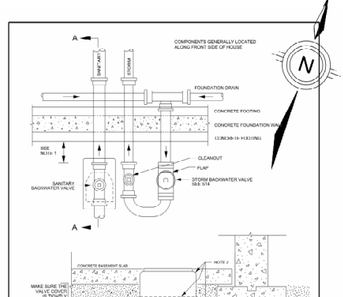
NOTES:
1. EDGE OF SIDEWALK OR CURB TO BE FLARED AT A TAPERANCE OF +/- 25mm TO DIMENSIONS SHOWN. STRAIGHT CONSTRUCTION IS ALL ACCEPTABLE OR CURVED.
2. CATCH BASIN ICD'S ARE USED TO RESTRICT FLOWS BELOW 15L/S. THE LOWEST RESTRICTION ALLOWED TYPICALLY IS 8L/S. PRODUCTS WITH SLIGHTLY DIFFER AS SHOWN ABOVE.
3. CURVES ARE AVAILABLE FROM THE MANUFACTURER. SEE MS - 22-15 FOR APPROVED PRODUCTS
4. THE FIRST PIPE SEGMENT TO BE CONCRETE SUPPORT FOR LOW SHALL BE 3000mm LONG WITH A 33.5 SKEWS

N.T.S.

Ottawa	INSTALLATION OF CATCH BASIN WITH MONOLITHIC SIDEWALK AND CURB, BARRIER, AND DEPRESSED CURB	DATE: MARCH 2008 REV: DATE: MARCH 2019 Dwg. no.: S3

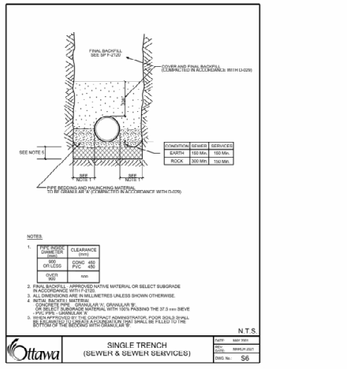
NOTES:
1. THE STANDARD ROW CROSS SECTIONS INDICATE MINIMUM DIMENSIONS THAT ARE TO BE INCORPORATED INTO THE DESIGN OF ANY NEW DEVELOPMENTS INVOLVING NEW AND EXISTING STREETS. ANY VARIATIONS TO THE STANDARD ROW CROSS SECTIONS ARE SUBJECT TO THE INTRASTRUCTURE SERVICES DEVIATION PROCESS. CONTACT THE STANDARDS UNIT AT STANDARDSSECTION@OTTAWA.CA FOR MORE INFORMATION.
2. ALL DRAWINGS SHALL BE READ IN CONJUNCTION WITH APPLICABLE CITY STANDARDS, GUIDELINES, AND POLICIES, INCLUDING COORDINATED UTILITY PLANS, GRADING PLANS AND LOCAL AREA PLANS. REFER ALSO TO UTILITY PARTNER STANDARD PLANT LOCATIONS.
3. ALL CROSS SECTIONS MAY BE SUBJECT TO SUNSHOJ ANT TRAFFIC CALMING MEASURES, TO BE DETERMINED THROUGH PLAN OF SUBDIVISION OR SEPARATE TRANSPORTATION STUDIES.
4. TYPICAL CROSS SECTION BOULEVARD WIDTH SHALL BE MAINTAINED WHEN CONSTRUCTING CUL-DE-SACS AND CORNER LOTS, REGARDLESS OF ROADWAY GEOMETRY.
5. WATERMAINS, WATER SERVICES, AND ASSOCIATED APPURTENANCES SHALL BE CONSTRUCTED PER THE WATER DESIGN GUIDELINES.
6. WATERMAIN AND HYDRANTS TO BE INSTALLED ON SOUTH AND EAST SIDE OF ROW, WHERE POSSIBLE
7. SEWERS AND SEWER SERVICES SHALL BE CONSTRUCTED PER THE SEWER DESIGN GUIDELINES.
8. IN-ROAD CATCH BASINS SHALL ONLY BE USED ON RESIDENTIAL ROADS WITHOUT BUS TRAFFIC OR AS OTHERWISE DIRECTED BY THE SEWER DESIGN GUIDELINES.
9. BARRIER CURB SHALL BE USED ON ALL RESIDENTIAL ROADS WITH SINGLE FAMILY DWELLINGS. MOUNTABLE CURB MAY ONLY BE USED FOR AREAS WITH FREQUENT CURB CUTS, SUCH AS TOWNHOME DEVELOPMENTS, WITH APPROVAL FROM THE CITY.
10. WATER AND SEWER SERVICES SHALL BE LAID AS PER CITY STANDARD DETAIL DRAWINGS. THE COORDINATED UTILITY PLAN, AND IN COORDINATION WITH ALL OTHER ELEMENTS IN THE ROW.
11. WHERE LOCATING WATER AND SEWER SERVICES UNDERNEATH LANDSCAPED AREAS WOULD CONFLICT WITH TREE PLANTING, IF SUCH A TREE, THEY MAY BE RUN UNDERNEATH THE DRIVEWAY OR OTHER HARDSCAPED AREAS.
12. MINIMUM 1.5 M CLEARANCE, AT-GRADE, TO BE MAINTAINED AROUND WATER SERVICE POST FROM TREE, TRANSFORMER, UTILITY PEDESTAL, TRAFFIC POLE, AND STREETLIGHT.
13. UTILITY TRENCHING ARE TO BE GROUPED TOGETHER WITH THE HYDRO/BELL/CABLE TRANSFORMER, OR ON THE HOUSE SIDE OF THE UTILITY TRENCH.
14. STREETLIGHT CABLE SHALL BE LOCATED IN JOINT USE TRENCH (JUT), WHERE NO JUT EXISTS, AND/OR CLEARANCES TO TREE, HYDRANTS, AND WATER SERVICE POST.
15. TRAFFIC SIGNAL CABLE SHALL BE LOCATED IN THE JUT OR AT THE SAME OFFSET AS STREETLIGHT POLES IN A SEPARATE TRENCH.
16. TRAFFIC COMMUNICATIONS CABLE SHALL BE LOCATED IN THE JUT OR IN A TRENCH LOCATED AT THE SAME OFFSET AS THE STREETLIGHT POLES.
17. THE PREFERRED LOCATION FOR TRAFFIC HANDHOLES IS IN HARD SURFACES. WHEN HANDHOLES ARE PLACED IN THE BOULEVARD, A CONCRETE COLLAR SHALL BE PROVIDED.
18. THE DRYUTILITIES SHALL SUPPLY AND INSTALL DUCTS FOR UTILITY CROSSINGS AT INTERSECTIONS.
19. TREE PLACEMENT, NUMBER, AND SPECIES SHALL BE PER CITY POLICY, THE LANDSCAPE PLAN, COORDINATED UTILITY PLAN, AND THE DEVELOPMENT AGREEMENTS.
20. THE HYDRO TRANSFORMER BASE SHALL BE LOCATED A MINIMUM OF 2.0 M FROM THE DRIVEWAY EDGE.

Ottawa	STANDARD NOTES ROAD ALLOWANCE	DATE: MAR 2009 REV: SEPT 2022 DWG No: ROW-NOTES



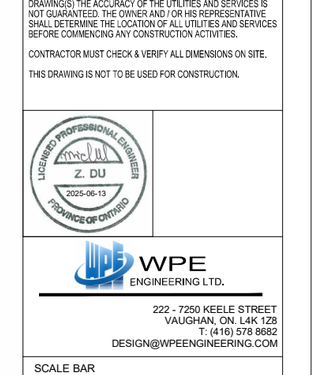
NOTES:
1. BACKSETTER VALVE (T-FAN-FLYTE AND ANY OTHER FITTINGS MUST BE INSTALLED A MINIMUM OF 100mm INSIDE OF THE BASEMENT FOOTING. THIS IS TO ENSURE THERE IS SUFFICIENT ROOM TO REPLACE THESE COMPONENTS IN THE FUTURE WITHOUT HAVING TO DAMAGE THE FOOTING/WALL DURING THE PROCESS
2. JOINTS BETWEEN THE ACCESS BOX SECTIONS AND THE ACCESS BOX AND THE BACKWATER VALVE AND THE FLOOR SEAM SHALL BE SEALED

Ottawa	SANITARY BACKWATER VALVE INSTALLATION TYPE 1	N.T.S. DATE: MARCH 2019 REV: MARCH 2011 DWG. No.: S14.1



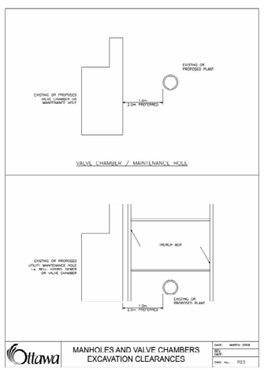
NOTES
1. DIAMETER OF SERVICE CONNECTIONS SHALL BE AS SPECIFIED IN THE DRAWINGS OF THE SUBDIVISION OF THE CUTSHEETS SEWER MAIN. DIAMETER. THE CONNECTION SHALL BE MADE USING FULL BODY SADDLES OF APPROVED MATERIAL SUITED TO SERVICE CONNECTION SHALL BE AT THE SAME MATERIAL AS THE SERVICE CONNECTION PIPE.
2. SANITARY SERVICES TO BE 150mm AND STORM SERVICES TO BE 150mm FOR NEW RESIDENTIAL UNLESS SPECIFIED OTHERWISE. SERVICE PIPE AND FASTENERS TO BE APPROVED OR EQUAL. SERVICE PRODUCTS UNLESS SPECIFIED OTHERWISE.
3. ALL SERVICES SHALL BE INSTALLED WITH A MINIMUM COVER OF 2.5m AND A MAXIMUM COVER OF 3.5m ABOVE APPROVED MATERIAL AS SPECIFIED IN THE DRAWINGS OF THE SUBDIVISION. PROVIDE APPROVED BEDDING AND BACKFILL MATERIAL TO A MINIMUM OF 1.0m ABOVE TOP OF PIPE. APPROVED MATERIAL SHALL BE PLACED IN ACCORDANCE WITH THE REQUIREMENTS OF THE MUNICIPALITY HAVING JURISDICTION. ALL EXCAVATED MATERIAL SHALL BE DISPOSED OF IN ACCORDANCE WITH THE REQUIREMENTS OF THE MUNICIPALITY HAVING JURISDICTION. NO EXCAVATED MATERIAL SHALL BE PLACED ADJACENT TO AN OPEN TRENCH UNLESS APPROVED BY THE ENGINEER. ALL EXCAVATED MATERIAL SHALL BE PLACED TO MINIMIZE NATIVE PRESSURE.
4. ALL DIMENSIONS ARE IN MILLIMETRES UNLESS OTHERWISE SHOWN.
5. PIPES BEING DRIVEN OR JACKED ARE NOT ALLOWED

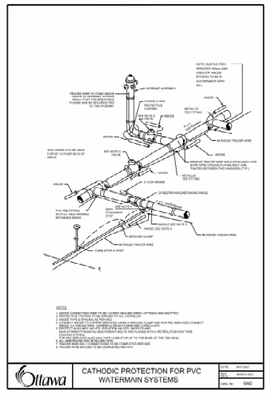
Ottawa	SEWER SERVICE CONNECTIONS FOR FLEXIBLE MAIN SEWER PIPE	DATE: MAR 2008 REV: DWG No: S11.1



NOTES:
1. PIPE SIZES (mm) | MIN. CLEARANCE (mm)
   - 200 OR LESS | 200
   - 250 TO 450 | 250
   - 525 TO 900 | 300
   - 1050 AND LARGER | MIN. 300
2. FINAL BACKFILL - APPROVED NATIVE MATERIAL OR SELECT SUBGRADE IN ACCORDANCE WITH O.P.S.S.(OPSS).
3. ALL DIMENSIONS ARE IN MILLIMETRES UNLESS SHOWN OTHERWISE.
4. BEDDING MATERIAL:
   - CONCRETE PIPE - GRANULAR 'A' OR SELECT SUBGRADE MATERIAL WITH 100% PASSING THE 37.5 mm SIEVE AND NO MORE THAN 8% PASSING
   - STEEL AND PLASTIC PIPE - GRANULAR 'A' OR SELECT SUBGRADE MATERIAL SHALL BE FILLED TO THE SPRINGLINE OF THE PIPE

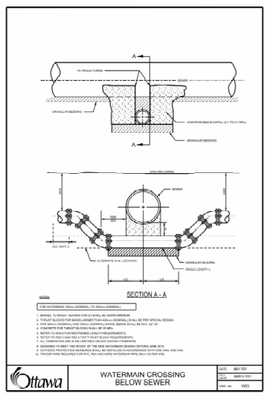
Ottawa	SINGLE TRENCH (SEWER & SEWER SERVICES)	DATE: MAY 2011 REV: MARCH 2021 DWG No: S6





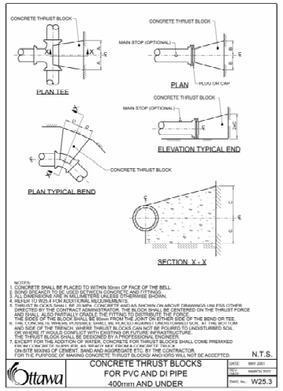
CATHODIC PROTECTION FOR PVC WATERMAIN SYSTEMS

DATE: MAY 2001
REV.
DWG No.: W40



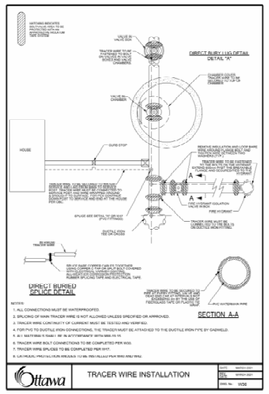
WATERMAIN CROSSING BELOW SEWER

DATE: MAR 2001
REV.
DWG No.: W43



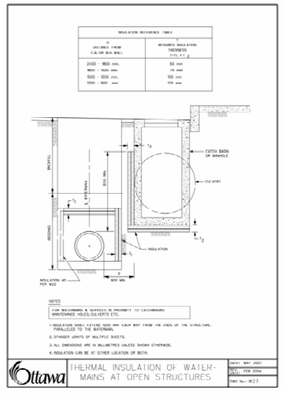
CONCRETE THRUST BLOCKS FOR PVC AND DI PIPE 400mm AND UNDER

DATE: MAY 2001
REV.
DWG No.: W25.3



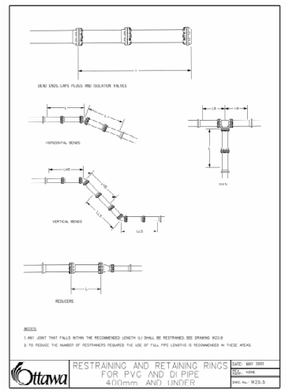
TRACER WIRE INSTALLATION

DATE: MARCH 2001
REV.
DWG No.: W24



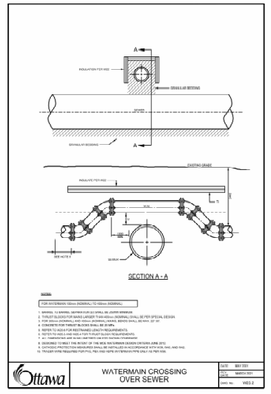
THERMAL INSULATION OF WATER-MAINS AT OPEN STRUCTURES

DATE: MAY 2001
REV.: FEB 2004
DWG No.: W23



RESTRAINING AND RETAINING RINGS FOR PVC AND DI PIPE 400mm AND UNDER

DATE: MAY 2001
REV.: JUNE
DWG No.: W23.5



WATERMAIN CROSSING OVER SEWER

DATE: MAY 2001
REV.
DWG No.: W23.2

SUPPORT DETAIL FOR EXISTING UTILITY CROSSING SLIM TRENCH OR WATERMAIN TRENCH

DATE: MAY 2001
REV.
DWG No.: S10

THERMAL INSULATION FOR WATERMAINS IN SHALLOW TRENCHES

DATE: MAY 2001
REV.
DWG No.: W22

INSULATION FOR SHALLOW SEWERS

DATE: MARCH 2003
REV.
DWG No.: S26

VALVE BOX ASSEMBLY

DATE: MAY 2001
REV.
DWG No.: S24

STANDARD CIRCULAR FRAME FOR MAINTENANCE HOLES (MODIFIED OPSD-401.020)

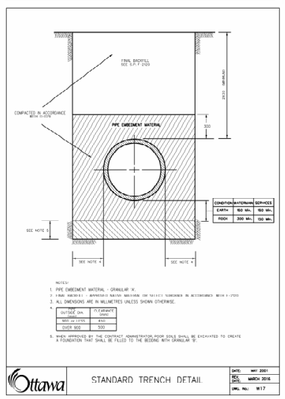
DATE: MAY 2001
REV.: MARCH 2018
DWG No.: S25

CLAY SEAL FOR PIPE TRENCHES

DATE: MAY 2001
REV.
DWG No.: S8

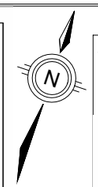
INSTALLATION OF CATCH BASIN WITH MONOLITHIC SIDEWALK AND CURB, BARRIER, AND DEPRESSED CURB

DATE: MARCH 2005
REV.: MARCH 2019
DWG No.: S2

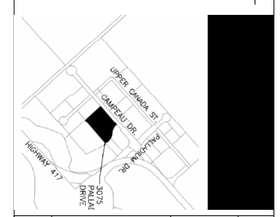


STANDARD TRENCH DETAIL

DATE: MAY 2001
REV.
DWG No.: W17



KEY PLAN
N.T.S



No.	Issued	Date	By
4	REVISED COMMENTS	2025-06-13	MD
3	REVISED COMMENTS	2024-12-18	MD
2	REVISED COMMENTS	2024-09-27	MD
1	ISSUED FOR SPA	2024-07-15	MD

THE LOCATION OF ALL UNDER-/ ABOVE-GROUND UTILITIES AND SERVICES IS APPROXIMATE ONLY AND WHERE SHOWN ON THE DRAWING(S) THE ACCURACY OF THE UTILITIES AND SERVICES IS NOT GUARANTEED. THE OWNER AND / OR HIS REPRESENTATIVE SHALL DETERMINE THE LOCATION OF ALL UTILITIES AND SERVICES BEFORE COMMENCING ANY CONSTRUCTION ACTIVITIES.

CONTRACTOR MUST CHECK & VERIFY ALL DIMENSIONS ON SITE.

THIS DRAWING IS NOT TO BE USED FOR CONSTRUCTION.

LICENSED PROFESSIONAL ENGINEER
Z. DU
2025-06-13
PROVINCE OF ONTARIO

WPE ENGINEERING LTD.
222 - 7250 KEELE STREET
VAUGHAN, ON. L4K 1Z8
T: (416) 578 8682
DESIGN@WPEENGINEERING.COM

SCALE BAR
1:000 0 2 4 6 8 10 12m

PROP. COMMERCIAL DEVELOPMENT

3075 PALLADIUM DRIVE
CITY OF OTTAWA
DETAILS

CITY FILE NO.D07-12-24-0076

Design F.T.	Scale N.T.S
Checked Z.D	Date 2024-06-24
Project No. 2034	Drawing No. C-07

Appendix C

Boundary Conditions

Fire Water Demand Calculation (Table C-01 to C-04)

Architect’s Confirmation - Non-Combustible Construction

Design Water Demand Calculation (Table C-05)

Hydrant Coverage Plan

Hydraulic Model Network (FIG. 03)

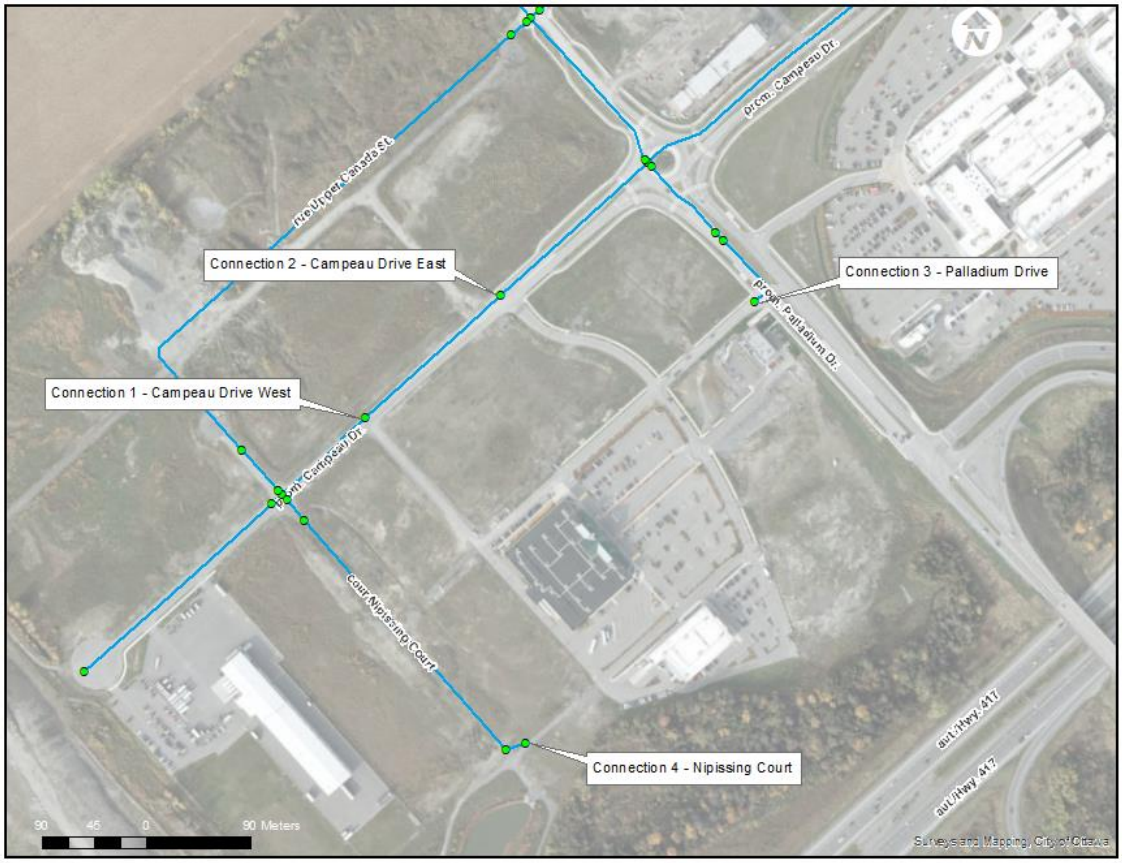
Hydraulic Model Outputs (Table C-06 to C-10)

Boundary Conditions
3075 Palladium

Provided Information

Scenario	Demand	
	L/min	L/s
Average Daily Demand	14	0.23
Maximum Daily Demand	20	0.34
Peak Hour	36	0.61
Fire Flow Demand #1	11,000	183.33
Fire Flow Demand #2	10,000	166.67

Location



Results

Connection 1 – Campeau Drive West

Demand Scenario	Head (m)	Pressure[1] (psi)
Maximum HGL	160.7	81.7
Peak Hour	156.5	75.7
Max Day plus Fire Flow #1	137.5	48.7
Max Day plus Fire Flow #2	140.7	53.2
[1] Ground Elevation =	103.3	m

Connection 2 – Campeau Drive East

Demand Scenario	Head (m)	Pressure[1] (psi)
Maximum HGL	160.7	83.2
Peak Hour	156.5	77.2
Max Day plus Fire Flow #1	139.5	53.1
Max Day plus Fire Flow #2	142.3	57.1
[1] Ground Elevation =	102.2	m

Connection 3 – Palladium Dr.

Demand Scenario	Head (m)	Pressure[1] (psi)
Maximum HGL	160.7	81.7
Peak Hour	156.5	75.7
Max Day plus Fire Flow #1	133.8	43.4
Max Day plus Fire Flow #2	137.5	48.7
[1] Ground Elevation =	103.3	m

Connection 4 – Nipissing Court

Demand Scenario	Head (m)	Pressure[1] (psi)
Maximum HGL	160.7	79.6
Peak Hour	156.5	73.6
Max Day plus Fire Flow #1	115.0	14.7
Max Day plus Fire Flow #2	121.8	24.3
[1] Ground Elevation =	104.7	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.). Connections 1, 2 and 3 for “Maximum HGL” scenarios do not respect this requirement. 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.

2. OWDG Section 4.2.2 specifies watermain pressure requirement under Maximum Daily Demand, Peak Hour Demand and Fire Flow Demand.
    a. During periods of maximum day and fire flow demand, the residual pressure at any point in the distribution system shall not be less than 20 psi. Connection 4 under “Max Day plus Fire Flow #1” does not respect this requirement.

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.

Gmail Mike Du <mdu@wpeengineering.com>

3075 Palladium Drive - Building Construction Type and Sprinkler System

Liquan Zhu <lzhu@taesarchitects.com> Thu, Nov 7, 2024 at 6:21 PM
Reply-To: lzhu@taesarchitects.com
To: Mike Du <mdu@wpeengineering.com>
Cc: pcai@caimion.com, jwu@taesarchitects.com, Shenshu Zhang <szhang@taesarchitects.com>

Hi Mike,

Hope all is well.

This email is to confirm that Building A, Building B, Building C and Building D located at 3075 Palladium Drive, Ottawa are the non-combustible constructions with structural steel framings and precast panel claddings. All four buildings are serviced by a supervised automatic sprinkler system.

Please feel free to reach out to us if you have any questions and concerns.

Thank you,

Liquan Zhu

Dipl.-Ing. Arch., M. Arch., OAA, LEED-AP/BD+C

TAES Architects Inc.

98 Scarsdale Road

Toronto, ON M3B 2R7

Canada

T: 416-800 3284 ext. 208

F: 416-800 3485

C: 416-889 0068

lzhu@taesarchitects.com

www.taesarchitects.com

WPE Engineering Ltd. Engineers, Planners and Project Managers	Table C-01: Fire Water Demand Calculation - Proposed Condition: Building A			
	Prepared:	A.R.M	Page No.	C-01
	Checked:	M.D.		
Project: Proposed Commercial Development, 3075 Palladium Drive, City of Ottawa, ON.	Proj. #	2034		
	Date:	30-May-24		

PROPOSED CONDITION

This calculation is following the "Water Supply for Public Fire Protection" by Fire Underwriters Survey (Fire Underwriters Survey, 2020).

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

where F = the required fire flow in litres per minute
C = coefficient related to the type of construction.
= 0.8 for non-combustible construction
A = the total floor area in square metres. For fire resistive buildings, consider only the area of the largest floor plus 25% of each of the two immediately adjoining floors.

Step 1: Type of Construction: Non-Combustible Construction (Type II) C= 0.8

According the building stats, Area (m^2)
Building A 5678

Therefore, F = 13000 **l/min** (Rounded to the nearest 1000)

Step 2: Occupancy reduction: Combustible Charge= **0.00**

Proposed building is industrial and no reduction is applied.
Therefore: F1 = 13000 l/min

Step 3: Reduction for sprinkler protection: Yes 0.5

Using the automatic sprinkler system, a reduction rate of 50% is used.
Therefore: F2 = 6500 l/min

Step 4: Separation charge:

Charge for the separations on each side:

Separation	Charge	
> 30 m	0%	West
> 30 m	0%	North
> 30 m	0%	East
> 30 m	0%	South

Total charge in % 0% (75% maximum)

Total charge F3 = 0 l/min

Required Fire Flow: 7000 l/min(Rounded to the nearest 1000)
or 116.67 l/s
or 1849 US GPM

WPE Engineering Ltd. Engineers, Planners and Project Managers	Table C-02: Fire Water Demand Calculation - Proposed Condition: Building B			
	Prepared:	A.R.M	Page No.	C-02
	Checked:	M.D.		
Project: Proposed Commercial Development, 3075 Palladium Drive, City of Ottawa, ON.	Proj. #	2034		
	Date:	30-May-24		

PROPOSED CONDITION

This calculation is following the "Water Supply for Public Fire Protection" by Fire Underwriters Survey (Fire Underwriters Survey, 2020).

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

where F = the required fire flow in litres per minute
C = coefficient related to the type of construction.
= 0.8 for non-combustible construction
A = the total floor area in square metres. For fire resistive buildings, consider only the area of the largest floor plus 25% of each of the two immediately adjoining floors.

Step 1: Type of Construction: Wood Frame (Type V) C= 1.5

According the building stats, Area (m^2)
Building B 687

Therefore, F = 9000 **l/min** (Rounded to the nearest 1000)

Step 2: Occupancy reduction: Combustible Charge= **0.00**

Proposed building is industrial and no reduction is applied.
Therefore: F1 = 9000 l/min

Step 3: Reduction for sprinkler protection: Yes 0.5

Using the automatic sprinkler system, a reduction rate of 50% is used.
Therefore: F2 = 4500 l/min

Step 4: Separation charge:

Charge for the separations on each side:

	Separation	Charge	
	> 30 m	0%	West
	> 30 m	0%	North
Length-height factor: 32m	= 22.2 m	2%	East
Length-height factor: 14m	= 23 m	0%	South

Total charge in % 2% (75% maximum)

Total charge F3 = 180 l/min

Required Fire Flow: 5000 l/min(Rounded to the nearest 1000)
or 83.33 l/s
or 1321 US GPM

WPE Engineering Ltd. Engineers, Planners and Project Managers	Table C-03: **Fire Water Demand Calculation - Proposed Condition: Building C**			
	Prepared:	A.R.M	Page No.	C-03
	Checked:	M.D.		
Project: Proposed Commercial Development, 3075 Palladium Drive, City of Ottawa, ON.	Proj. #	2034		
	Date:	30-May-24		

PROPOSED CONDITION

This calculation is following the "Water Supply for Public Fire Protection" by Fire Underwriters Survey (Fire Underwriters Survey, 2020).

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

where F = the required fire flow in litres per minute
C = coefficient related to the type of construction.
= 0.8 for non-combustible construction
A = the total floor area in square metres. For fire resistive buildings, consider only the area of the largest floor plus 25% of each of the two immediately adjoining floors.

Step 1: Type of Construction: Wood Frame (Type V) C= 1.5

According the building stats, Area (m^2)
Building C 729

Therefore, F = 9000 **l/min** (Rounded to the nearest 1000)

Step 2: Occupancy reduction: Combustible Charge= **0.00**

Proposed building is industrial and no reduction is applied.
Therefore: F1 = 9000 l/min

Step 3: Reduction for sprinkler protection: Yes 0.5

Using the automatic sprinkler system, a reduction rate of 50% is used.
Therefore: F2 = 4500 l/min

Step 4: Separation charge:

Charge for the separations on each side:

	Separation	Charge	
Length-height factor: 12.3m	= 9 m	15%	West
Length-height factor: 11.8m	= 23 m	0%	North
Length-height factor: 13.1m	= 26.4 m	0%	East
	> 30 m	0%	South

Total charge in % 15% (75% maximum)

Total charge F3 = 1350 l/min

Required Fire Flow: 6000 l/min(Rounded to the nearest 1000)
or 100.00 l/s
or 1585 US GPM

WPE Engineering Ltd. Engineers, Planners and Project Managers	Table C-04: Fire Water Demand Calculation - Proposed Condition: Building D			
	Prepared:	A.R.M	Page No.	C-04
	Checked:	M.D.		
Project: Proposed Commercial Development, 3075 Palladium Drive, City of Ottawa, ON.	Proj. #	2034		
	Date:	30-May-24		

PROPOSED CONDITION

This calculation is following the "Water Supply for Public Fire Protection" by Fire Underwriters Survey (Fire Underwriters Survey, 2020).

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

where F = the required fire flow in litres per minute
C = coefficient related to the type of construction.
= 0.8 for non-combustible construction
A = the total floor area in square metres. For fire resistive buildings, consider only the area of the largest floor plus 25% of each of the two immediately adjoining floors.

Step 1: Type of Construction: Wood Frame (Type V) C= 1.5

According the building stats, Area (m^2)
Building D 816

Therefore, F = 9000 **l/min** (Rounded to the nearest 1000)

Step 2: Occupancy reduction: Combustible Charge= **0.00**

Proposed building is industrial and no reduction is applied.
Therefore: F1 = 9000 l/min

Step 3: Reduction for sprinkler protection: Yes 0.5

Using the automatic sprinkler system, a reduction rate of 50% is used.
Therefore: F2 = 4500 l/min

Step 4: Separation charge:

Charge for the separations on each side:

	Separation	Charge	
	> 30 m	0%	West
	> 30 m	0%	North
Length-height factor: 47.2m	= 9 m	17%	East
	> 30 m	0%	South

Total charge in % 17% (75% maximum)

Total charge F3 = 1530 l/min

Required Fire Flow: 6000 l/min(Rounded to the nearest 1000)
or 100.00 l/s
or 1585 US GPM

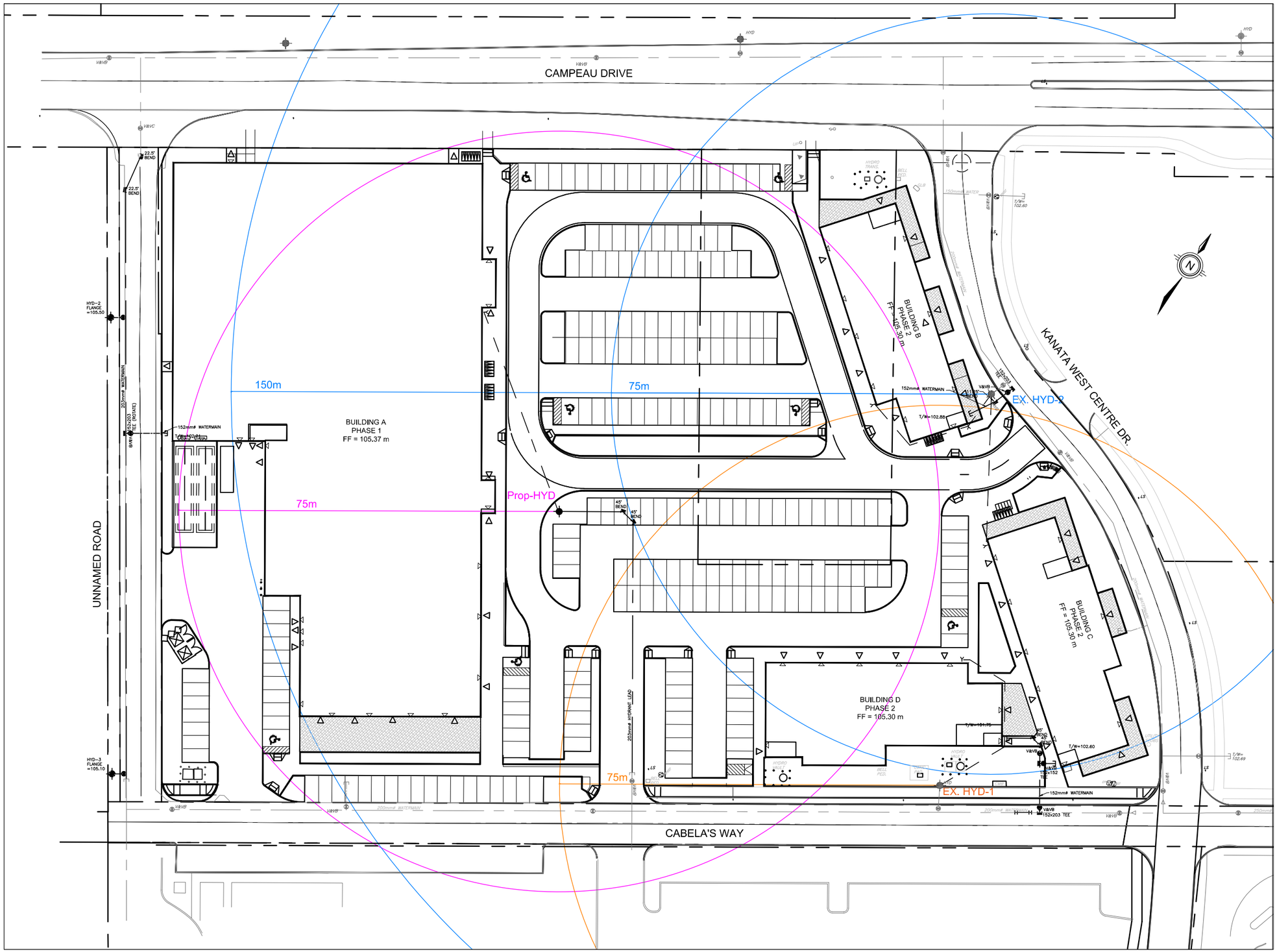
WPE Engineering Ltd. Engineers, Planners and Project Managers	Table C-05: Water Demand Calculation Proposed Condition			
	Prepared:	A.R.M	Page No.	C-05
	Checked:	M.D.		
Project: Proposed Commercial Development, 3075 Palladium Drive, City of Ottawa, ON.	Proj. #	2034		
	Date:	30-May-24		

PROPOSED CONDITION

Water Demand - Shopping Center	2500	L/1000 m^2/day - Consumption rates as per OWDG Table 4.2.

Junction	Commercial Area - GFA (m^2)	Avg. Day Demand (L/s)	Max. Daily Demand - L/s (1.5 x Avg. Day)	Max. Hourly Demand - L/s (1.8 x Max. Day)	Ave. Day Demand (m^3/day)	Remarks
Building A	5678.11	0.164	0.246	0.444	14.2	
Building B	687.43	0.020	0.030	0.054	1.7	
Building C	729.1	0.021	0.032	0.057	1.8	
Building D	815.57	0.024	0.035	0.064	2.0	
Total	**7910.21**	**0.229**	**0.343**	**0.618**	**19.8**	

Required Fire Flow (L/s)		Max. Day Demand plus Fire Flow (L/s)	Design Water Demand (L/s)	
Building A	116.67	116.91	116.91	
Building B	83.33	83.36	83.36	
Building C	100.00	100.03	100.03	
Building D	100.00	100.04	100.04	
Total	**400.00**	**400.34**	**400.34**	
		Or	**6345.44**	**US GPM**



THE LOCATION OF ALL UNDER- / ABOVE-GROUND UTILITIES AND SERVICES IS APPROXIMATE ONLY AND WHERE SHOWN ON THE DRAWING(S) THE ACCURACY OF THE UTILITIES AND SERVICES IS NOT GUARANTEED. THE OWNER AND / OR HIS REPRESENTATIVE SHALL DETERMINE THE LOCATION OF ALL UTILITIES AND SERVICES BEFORE COMMENCING ANY CONSTRUCTION ACTIVITIES.

DO NOT SCALE DRAWINGS.

CONTRACTOR MUST CHECK & VERIFY ALL DIMENSIONS ON SITE.

THIS DRAWING IS NOT TO BE USED FOR CONSTRUCTION.

No.	Issued	Date	By
1	ISSUED FOR SPA	08-07-2024	



LICENSED PROFESSIONAL ENGINEER
Z. DU
08-07-2024
PROVINCE OF ONTARIO

WPE
ENGINEERING LTD.
222 - 7250 KEELE STREET
VAUGHAN, ONTARIO
L4K 1Z8
T: 416 578 8682
MDU@WPEENGINEERING.COM

3075 PALLADIUM DRIVE OTTAWA, ONTARIO

Project Number	2034		
Drawn	A.R.M	Scale	1:350
Checked	MD	Date	2024-07-08

HYDRANT COVERAGE PLAN

Drawing No.

FIG02

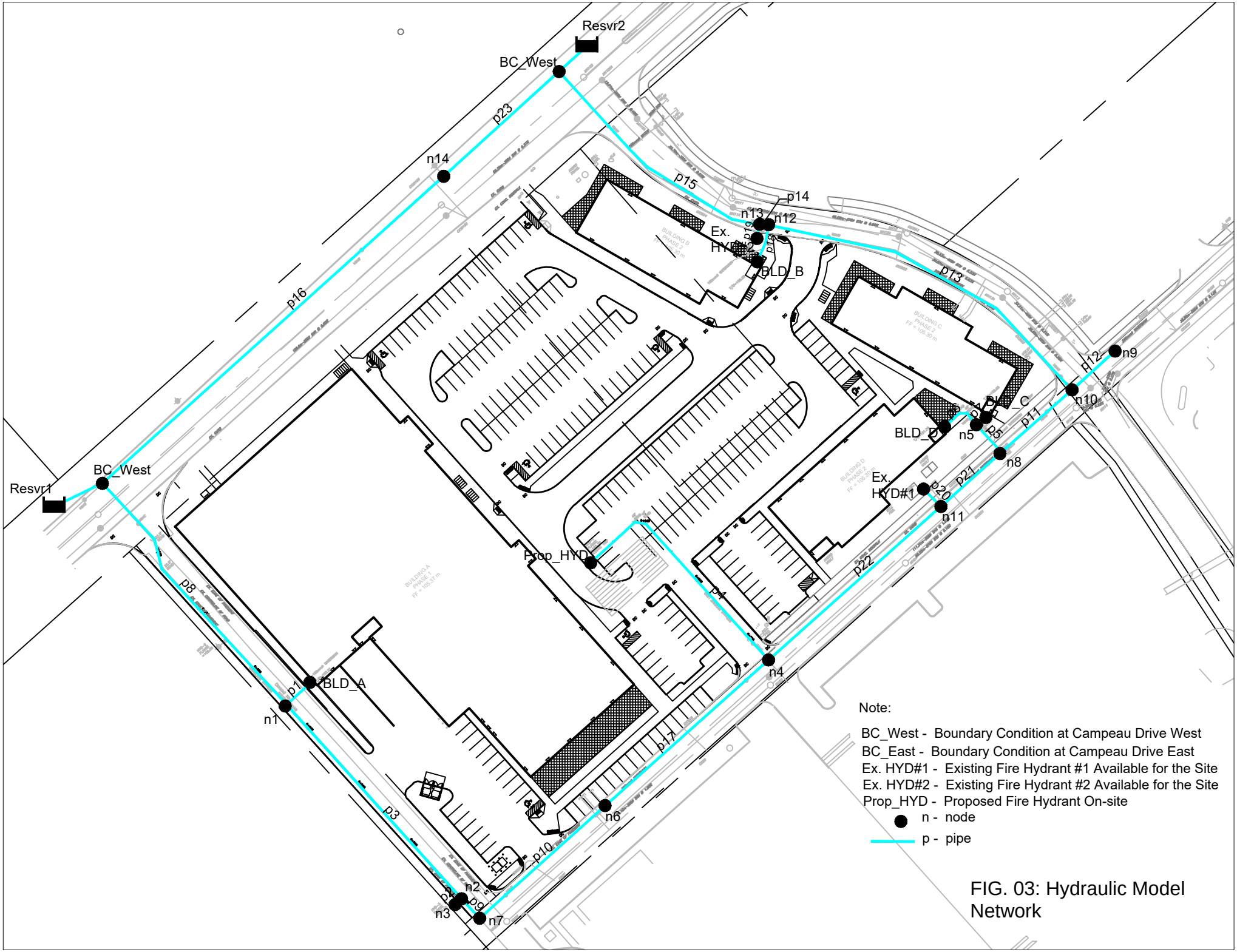


FIG. 03: Hydraulic Model Network

Table C-06: Pressures Under Peak Hour Demand:

Node ID	Elevation	Demand	Head	Pressure	Pressure
	m	LPS	m	m	psi
Junc BLD_A	105.25	0.43	157.11	51.86	73.76
Junc n1	104.97	0	157.11	52.14	74.16
Junc n2	104.91	0	157.11	52.2	74.24
Junc n3	105.1	0	157.11	52.01	73.97
Junc Prop_HYD	105.06	0	157.11	52.05	74.03
Junc n4	104.89	0	157.11	52.22	74.27
Junc BLD_D	105.28	0.06	157.11	51.83	73.72
Junc n5	105	0	157.11	52.11	74.12
Junc BLD_C	105	0.06	157.11	52.11	74.12
Junc BLD_B	105.28	0.05	157.11	51.83	73.72
Junc n6	104.96	0	157.11	52.15	74.17
Junc n7	104.91	0	157.11	52.2	74.24
Junc n8	104.5	0	157.11	52.61	74.83
Junc n9	104.66	0	157.11	52.45	74.60
Junc n10	104.69	0	157.11	52.42	74.56
Junc Ex.HYD#1	104.68	0	157.11	52.43	74.57
Junc n11	104.42	0	157.11	52.69	74.94
Junc n12	104.83	0	157.11	52.28	74.36
Junc n13	104.8	0	157.11	52.31	74.40
Junc Ex.HYD#2	104.8	0	157.11	52.31	74.40
Junc n14	104.55	0	157.11	52.56	74.76
Junc BC_West	105.01	0	157.11	52.1	74.10
Junc BC_East	104.66	0	157.11	52.45	74.60

Table C-07: Maximum Pressure Under Max Daily Demand:

Node ID	Elevation	Demand	Head	Pressure	Pressure
	m	LPS	m	m	psi
Junc BLD_A	105.25	0.24	157.66	52.41	74.54
Junc n1	104.97	0	157.66	52.69	74.94
Junc n2	104.91	0	157.66	52.75	75.03
Junc n3	105.1	0	157.66	52.56	74.76
Junc Prop_HYD	105.06	0	157.66	52.6	74.81
Junc n4	104.89	0	157.66	52.77	75.05
Junc BLD_D	105.28	0.03	157.66	52.38	74.50
Junc n5	105	0	157.66	52.66	74.90
Junc BLD_C	105	0.03	157.66	52.66	74.90
Junc BLD_B	105.28	0.03	157.66	52.38	74.50
Junc n6	104.96	0	157.66	52.7	74.96
Junc n7	104.91	0	157.66	52.75	75.03
Junc n8	104.5	0	157.66	53.16	75.61
Junc n9	104.66	0	157.66	53	75.38
Junc n10	104.69	0	157.66	52.97	75.34
Junc Ex.HYD#1	104.68	0	157.66	52.98	75.35
Junc n11	104.42	0	157.66	53.24	75.72
Junc n12	104.83	0	157.66	52.83	75.14
Junc n13	104.8	0	157.66	52.86	75.18
Junc Ex.HYD#2	104.8	0	157.66	52.86	75.18
Junc n14	104.55	0	157.66	53.11	75.54
Junc BC_West	105.01	0	157.66	52.65	74.88
Junc BC_East	104.66	0	157.66	53	75.38

Table C-08: Pressure under Fire Flow + Max Daily Demand:

Node ID	Elevation	Demand	Head	Pressure	Pressure
	m	LPS	m	m	psi
Junc BLD_A	105.25	0.24	139.03	33.78	48.05
Junc n1	104.97	0	139.03	34.06	48.44
Junc n2	104.91	0	136	31.09	44.22
Junc n3	105.1	0	136	30.9	43.95
Junc Prop_HYD	105.06	0	131.02	25.96	36.92
Junc n4	104.89	0	131.02	26.13	37.16
Junc BLD_D	105.28	0.03	129.78	24.5	34.85
Junc n5	105	0	129.78	24.78	35.24
Junc BLD_C	105	0.03	129.78	24.78	35.24
Junc BLD_B	105.28	0.03	137.78	32.5	46.22
Junc n6	104.96	0	133.58	28.62	40.71
Junc n7	104.91	0	135.58	30.67	43.62
Junc n8	104.5	0	129.78	25.28	35.96
Junc n9	104.66	0	131.56	26.9	38.26
Junc n10	104.69	0	131.56	26.87	38.22
Junc Ex.HYD#1	104.68	183.33	122.75	18.07	25.70
Junc n11	104.42	0	128.32	23.9	33.99
Junc n12	104.83	0	137.78	32.95	46.86
Junc n13	104.8	0	137.93	33.13	47.12
Junc Ex.HYD#2	104.8	0	137.93	33.13	47.12
Junc n14	104.55	0	142.44	37.89	53.89
Junc BC_West	105.01	0	142.44	37.43	53.24
Junc BC_East	104.66	0	142.44	37.78	53.73

Table C-09: Available Fire Flow for Three Hydrants:

HYD ID	Static Head m	Static Pressure psi	Fire Flow Demand LPS	Available Fire Flow LPS	Residual Pressure psi
Ex.HYD#1	53	75.4	183.33	199.9	20
Ex.HYD#2	52.8	75.1	166.67	264.1	20
Prop_HYD	52.6	74.8	116.67	165.1	20

Table C-10: Pipe Information:

Link ID	Length m	Diametrer mm	Roughness	Flow LPS	Velocity m/s	Unit Headloss m/km
Pipe p1	8.19	152	100	-0.24	0.01	0
Pipe p2	2.23	152	100	0	0	0
Pipe p3	67.15	203	110	-59.2	1.88	24.84
Pipe p4	65.54	203	110	-116.67	3.6	94.75
Pipe p5	9.7	152	100	0.06	0	0
Pipe p6	10.67	152	100	0.03	0	0
Pipe p7	3.09	152	100	0.03	0	0
Pipe p8	75.04	203	110	59.44	1.89	25.05
Pipe p9	7.02	203	110	-59.2	1.88	32.92
Pipe p10	43.37	203	110	-59.2	1.88	25.36
Pipe p11	24.37	203	110	-57.53	1.83	25.12
Pipe p12	14.82	203	110	0	0	0
Pipe p13	91.71	203	110	-57.53	1.83	23.5
Pipe p14	2.38	203	110	-57.56	1.83	22.69
Pipe p15	66.2	203	110	-57.56	1.83	23.59
Pipe p16	118.28	305	110	-5.92	0.08	0.05
Pipe P17	56.35	203	110	59.2	1.88	25.02
Pipe P18	9.7	152	100	-0.03	0	0
Pipe P19	3.64	152	100	0	0	0
Pipe p20	6.32	152	100	0	0	0
Pipe p21	20.88	203	110	-57.47	1.83	24.25
Pipe p22	59.54	203	110	-57.47	1.83	23.62
Pipe p23	40.08	305	110	-5.92	0.08	0.05

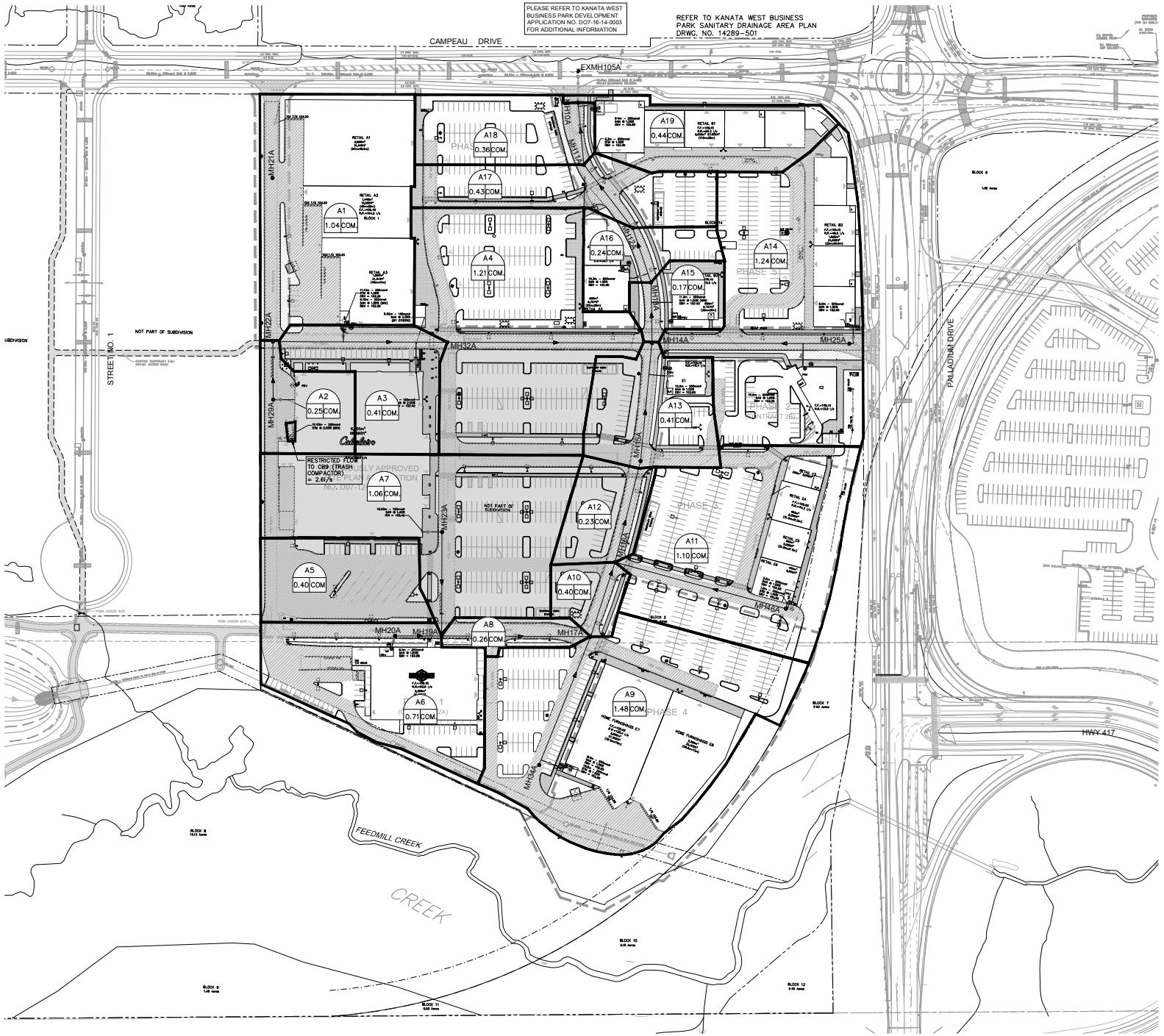
Appendix D

KWRC Sanitary Drainage Area Plan (prepared by IBI Group)

KWRC Sanitary Sewer Design Sheet (prepared by IBI Group)

Proposed Sanitary Drainage Area Plan (FIG. 04)

Sanitary Sewer Design Sheet (Table D-01)



No.	Revised	By	Date
14			
13			
12			
11			
10			
9			
8	REVISED PER CITY COMMENTS	LME	16-08-31
7	ISSUED TO CITY FOR APPROVAL PHASE 2A	LME	16-08-04
6	RE-ISSUED FOR MYLARS	LME	15-11-26
5	RE-ISSUED FOR MYLARS	LME	15-11-03
4	ISSUED FOR MYLARS	LME	15-07-20
3	REVISED PER CITY COMMENTS AND NEW SITE PLAN	LME	15-06-19
2	REVISED PER CITY COMMENTS	LME	15-04-27
1	ISSUED TO CITY FOR APPROVAL	LME	15-01-29

TAGGART REALTY MANAGEMENT

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

Project Title: KANATA WEST RETAIL CENTRE
3015, 3075, & 3095 PALLADIUM DRIVE

Drawing Title: SANITARY DRAINAGE AREA PLAN

Scale: 1:750

Design	Date
LME	JAN. 2015
Drawn	Checked
DPS	TRB
Project No.	Drawing No.
37884	C-501

APPROVED ☐ REFUSED ☐
THIS ___ DAY OF _____, 20____
DERRICK MOODIE, ACTING MANAGER
DEVELOPMENT REVIEW, SUBURBAN SERVICES

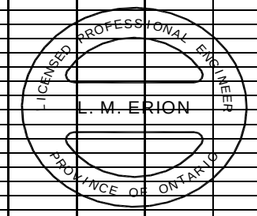
D07-12-16-0122

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

SANITARY SEWER DESIGN SHEET

Kanata West Retail Center
CITY OF OTTAWA
Taggart Realty Management

LOCATION				RESIDENTIAL										ICI AREAS								INFILTRATION ALLOWANCE			FIXED FLOW	TOTAL FLOW	PROPOSED SEWER DESIGN							
				AREA w/ Units (Ha)	UNIT TYPES				AREA w/o Units (Ha)	POPULATION		PEAK FACTOR	PEAK FLOW (L/s)	AREA (Ha)						PEAK FLOW (L/s)	AREA (Ha)		FLOW			CAPACITY	LENGTH	DIA	SLOPE	VELOCITY (full)	VELOCITY (actual)	AVAILABLE CAPACITY	
														INDUSTRIAL		COMMERCIAL		PRESTIGE BUISNESS PK															
STREET	AREA ID	FROM MH	TO MH		SF	SD	TH	APT		IND	CUM			IND	CUM	IND	CUM	IND	CUM		IND	CUM	(L/s)	(L/s)	(L/s)	(L/s)	(m)	(mm)	(%)	(m/s)	(m/s)	L/s	(%)
	A1	MH21A	MH22A							0.0	0.0	4.00	0.00			1.04	1.04			0.90	1.04	1.04	0.29	0.00	1.19	26.50	88.33	200	0.60	0.82	0.40	25.31	95.50%
	A2	MH29A	MH22A							0.0	0.0	4.00	0.00			0.25	0.25			0.22	0.25	0.25	0.07	0.00	0.29	59.26	23.00	200	3.00	1.83	0.47	58.98	99.52%
	A3	MH22A	MH32A							0.0	0.0	4.00	0.00			0.41	1.70			1.48	0.41	1.70	0.48	0.00	1.95	43.28	94.15	200	1.60	1.33	0.66	41.33	95.49%
	A4	MH32A	MH14A							0.0	0.0	4.00	0.00			1.21	2.91			2.53	1.21	2.91	0.81	0.00	3.34	34.22	110.46	200	1.00	1.06	0.65	30.88	90.24%
	A5, A6	MH20A	MH19A							0.0	0.0	4.00	0.00			1.11	1.11			0.96	1.11	1.11	0.31	0.00	1.27	48.39	25.00	200	2.00	1.49	0.64	47.12	97.37%
	A7	MH23A	MH19A							0.0	0.0	4.00	0.00			1.06	1.06			0.92	1.06	1.06	0.30	0.00	1.22	26.50	44.08	200	0.60	0.82	0.40	25.29	95.41%
	A8	MH19A	MH17A							0.0	0.0	4.00	0.00			0.26	2.43			2.11	0.26	2.43	0.68	0.00	2.79	34.22	80.49	200	1.00	1.06	0.63	31.43	91.85%
	A9	MH34A	MH17A							0.0	0.0	4.00	0.00			1.48	1.48			1.28	1.40	1.40	0.39	0.00	1.68	53.01	74.68	200	2.40	1.63	0.70	51.33	96.84%
	A10	MH17A	MH16A							0.0	0.0	4.00	0.00			0.40	4.31			3.74	0.40	4.23	1.18	0.00	4.93	34.22	42.26	200	1.00	1.06	0.74	29.29	85.60%
	A11	MH46A	MH16A							0.0	0.0	4.00	0.00			1.10	1.10			0.95	1.10	1.10	0.31	0.00	1.26	48.39	95.58	200	2.00	1.49	0.64	47.13	97.39%
	A12	MH16A	MH15A							0.0	0.0	4.00	0.00			0.23	5.64			4.90	0.23	5.56	1.56	0.00	6.45	26.50	56.34	200	0.60	0.82	0.63	20.05	75.65%
	A13	MH15A	MH14A							0.0	0.0	4.00	0.00			0.41	6.05			5.25	0.41	5.97	1.67	0.00	6.92	26.50	64.00	200	0.60	0.82	0.63	19.58	73.88%
	A14	MH25A	MH14A							0.0	0.0	4.00	0.00			1.24	1.24			1.08	1.24	1.24	0.35	0.00	1.42	48.39	106.52	200	2.00	1.49	0.64	46.97	97.06%
	A15	MH14A	MH13A							0.0	0.0	4.00	0.00			0.17	10.37			9.00	0.17	10.29	2.88	0.00	11.88	21.64	32.56	200	0.40	0.67	0.67	9.76	45.09%
	A16	MH13A	MH12A							0.0	0.0	4.00	0.00			0.24	10.61			9.21	0.24	10.53	2.95	0.00	12.16	21.64	31.22	200	0.40	0.67	0.67	9.48	43.82%
	A17	MH12A	MH11A							0.0	0.0	4.00	0.00			0.43	11.04			9.58	0.43	10.96	3.07	0.00	12.65	21.64	43.01	200	0.40	0.67	0.67	8.99	41.53%
	A18	MH11A	MH10A							0.0	0.0	4.00	0.00			0.36	11.40			9.90	0.36	11.32	3.17	0.00	13.07	21.64	33.65	200	0.40	0.67	0.69	8.58	39.62%
	A19	MH10A	MH105A							0.0	0.0	4.00	0.00			0.44	11.84			10.28	0.44	11.76	3.29	0.00	13.57	39.24	17.00	250	0.40	0.77	0.70	25.67	65.41%



Design Parameters:

Residential			ICI Areas			
						Peak Factor
SF	3.4	p/p/u				
TH/SD	2.7	p/p/u	P.B.P.	35,000	L/Ha/day	1.5
APT	1.8	p/p/u	COM	50,000	L/Ha/day	1.5
Other	60	p/p/Ha	IND	35,000	L/Ha/day	MOE Chart

Notes:
1. Mannings coefficient (n) = 0.013
2. Demand (per capita): 350 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

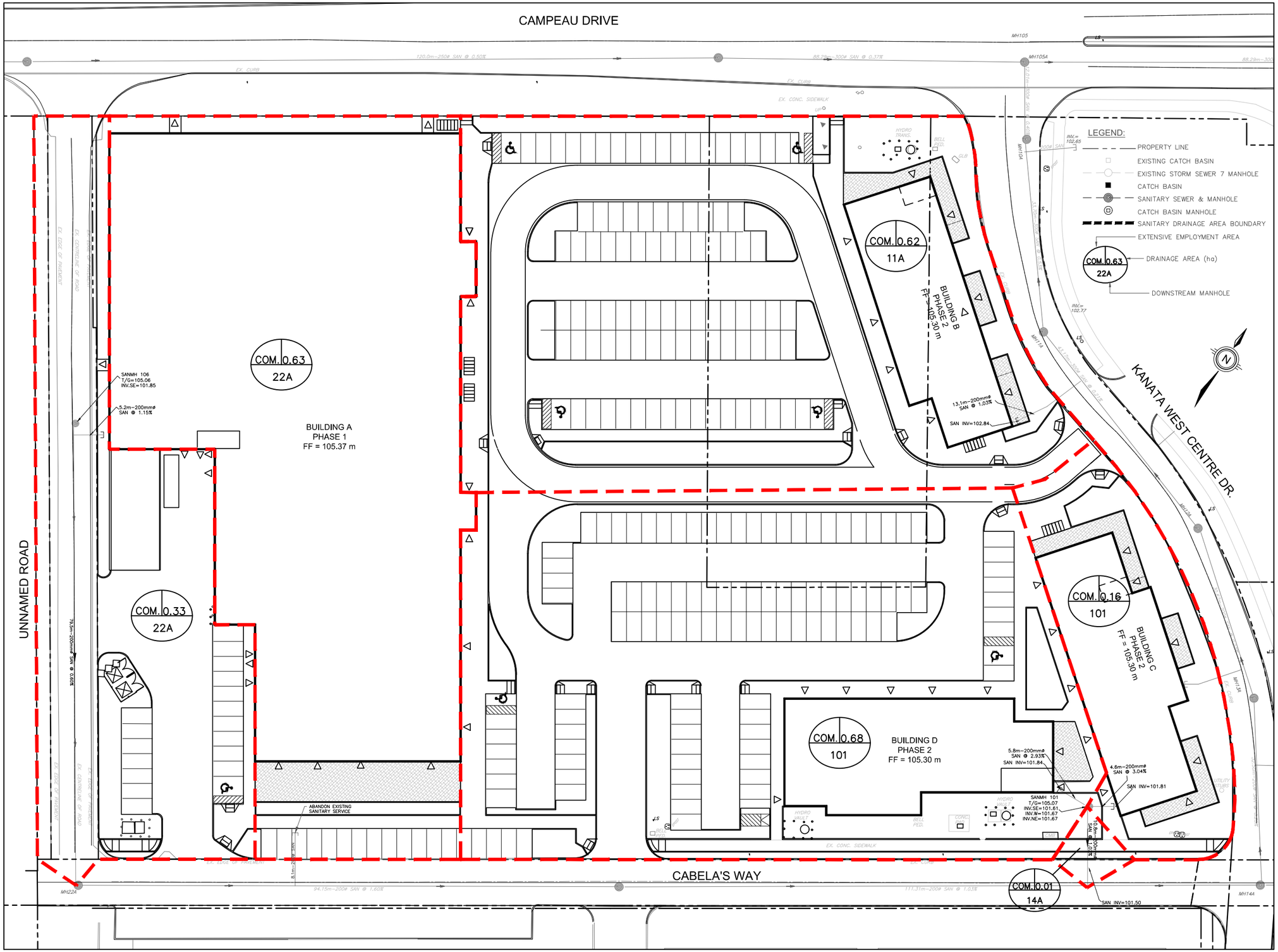
Designed: LME

Checked:

Dwg. Reference: 37884-501

No.	Revision	Date
1.	City submission No. 1	1/29/2015
2.	City submission No. 2	4/24/2015
3.	City submission No. 3	6/19/2015
4.	City submission No. 4	10/16/2015
5.	City submission No. 5	10/27/2015
6	City submission No. 6	11/27/2015
7	City submission No. 7	8/3/2016

File Reference:	Date:	Sheet No:
37884.5.7.1	8/4/2016	1 of 1



THE LOCATION OF ALL UNDER- / ABOVE-GROUND UTILITIES AND SERVICES IS APPROXIMATE ONLY AND WHERE SHOWN ON THE DRAWING(S) THE ACCURACY OF THE UTILITIES AND SERVICES IS NOT GUARANTEED. THE OWNER AND / OR HIS REPRESENTATIVE SHALL DETERMINE THE LOCATION OF ALL UTILITIES AND SERVICES BEFORE COMMENCING ANY CONSTRUCTION ACTIVITIES.

DO NOT SCALE DRAWINGS.

CONTRACTOR MUST CHECK & VERIFY ALL DIMENSIONS ON SITE.

THIS DRAWING IS NOT TO BE USED FOR CONSTRUCTION.

No.	Issued	Date	By
1	ISSUED FOR SPA	08-07-2024	



LICENSED PROFESSIONAL ENGINEER
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MDU@WPEENGINEERING.COM

3075 PALLADIUM DRIVE
OTTAWA, ONTARIO

Project Number			2034
Drawn	A.R.M	Scale	1:300
Checked	MD	Date	2024-07-08

PROPOSED SANITARY DRAINAGE AREA PLAN

Drawing No.

FIG.04

WPE Engineering Ltd.
Engineers, Planners and Project Managers

Sanitary Sewer Design Sheet
Proposed Condition

Prepared:	A.R.M	Page No.	B-01
Checked:	Z.D		
Project #:	2034		
Date:	12-Nov-24		

Project: Proposed Commercial Development, 3075 Palladium Drive, City of Ottawa, ON.

LOCATION			COMMERCIAL		DESIGN FLOW (l/s)				PROPOSED SANITARY SEWER DESIGN				
Street Name	FROM MH	TO MH	INDIVIDUAL (ha)	CUMULATIVE AREA (ha)	PF	EXTRANEOUS FLOW	COMMERCIAL FLOW	TOTAL FLOW	SIZE (mm)	GRADE (%)	CAPACITY (L/s)	FULL VELOCITY (m/s)	SPARE CAPACITY (L/s)
TO CABELA'S WAY U/S MH 22A													
UNNAMMED ROAD	BLDG A	MAIN	0.63	0.63	1.50	0.21	0.31	0.51	201.16	1.15	35.72	1.12	29.84
UNNAMMED ROAD	106	EX 22A	0.33	0.96	1.50	0.32	0.47	0.78	201.16	0.60	25.80	0.81	21.14
TO CABELA'S WAY U/S MH 14A													
CABELA'S WAY	BLDG D	101	0.68	0.68	1.50	0.22	0.33	0.55	201.16	2.93	57.01	1.79	47.90
CABELA'S WAY	BLDG C	101	0.16	0.16	1.50	0.05	0.08	0.13	201.16	3.04	58.07	1.83	49.23
CABELA'S WAY	101	EX MAIN	0.01	0.85	1.50	0.28	0.41	0.69	201.16	1.02	33.64	1.06	27.90
TO KANATA WEST CENTRE DRIVE U/S MH 11A													
KANATA WEST CENTRE DR.	BLDG B	EX MAIN	0.62	0.62	1.50	0.20	0.30	0.51	201.16	1.03	33.80	1.06	28.22
		Total Area (ha)	**2.43**		1.5		**Total Design Flow (L/s)**	**1.98**					

DESIGN PARAMETERS (ISTB-2018-01):

Extensive Employment Area:	28,000 L/ha/day
Max. Residentail Peak Factor:	4
Harmon - Correct Factor (K):	0.8
Peaking Factor (PF):	1.5
Extraneous Flow:	0.33 L/s/ha
Minimum Full Flow Velocity:	0.6 m/s
Maximum Full Flow Velocity	3.0 m/s
Manning's Coefficient (n):	0.013

Appendix E

KWRC Storm Drainage Area Plan (prepared by IBI Group)

KWRC Storm Sewer Design Sheet (prepared by IBI Group)

KWBP Storm Sewer Design Sheets (prepared by IBI Group)

Proposed Storm Drainage Area Plan (FIG. 05)

Storm Sewer Design Sheet (Table E-01)

Composite Runoff Coefficient Calculations (Table E-02)

Roof Drains Design bu JHD Engineering Inc.

PLEASE REFER TO KANATA WEST BUSINESS PARK DEVELOPMENT APPLICATION NO. D07-16-14-0003 FOR ADDITIONAL INFORMATION

REFER TO KANATA WEST BUSINESS PARK STORM DRAINAGE AREA PLAN DRAWING NO. 14289-500

UPPER CANADA STREET

NIPISSING COURT

CAMPEAU DRIVE

PALLADIUM DRIVE

NOT PART OF SUBDIVISION

PHASE 1 (CONTRACT 2A)

PHASE 2 (CONTRACT 2B)

PHASE 3

PHASE 4

PHASE 5

PREVIOUSLY APPROVED SITE PLAN APPLICATION NO. D07-12-15-0016

FEEDMILL CREEK

CREEK

BLOCK 1 45.00m MIN. OBV = 103.50

BLOCK 2 11.24 Acres

BLOCK 6 1.02 Acres

BLOCK 7 0.92 Acres

BLOCK 8 13.13 Acres

BLOCK 10 3.18 Acres

BLOCK 14

RETAIL A1 2,890m² 31,100ft² (60m×46.5m)

RETAIL A3 1,980m² 21,315ft² (40m×47m)

AUTO/LUBE A4 400m² 4,306ft²

RETAIL A5 420m² 4,521ft² (25m×25m)

RETAIL B1 F.F.=105.10 R.K.=45.2 l/s 2,600m² 27,000ft² (113m×28m)

RETAIL B2 F.F.=105.10 R.K.=49.5 l/s 1,800m² 19,400ft² (45m×40m)

RETAIL E5 900m² 9,688ft² (31.5m×28.5m)

RETAIL E6 1,000m² 10,764ft² (35m×28.5m)

HOME FURNISHINGS E7 F.F.=103.5 l/s R.K.=218.2 l/s 2,940m² 31,646ft² (49.5m×59m)

HOME FURNISHINGS E8 2,940m² 31,646ft² (49.5m×59m)

RETAIL E9 2,350m² 25,310ft²

R55	0.90	0.63	13.500m² (148m×28m) R.K.=154.2 l/s
D21	0.90	0.20	
L21	0.90	0.19	
D22	0.90	0.20	
D24	0.90	0.20	
P55	0.90	1.10	
D11	0.90	0.25	
R27A	0.90	0.25	MIN.
R12	0.90	0.10	
D13	0.90	0.10	
R13	0.90	0.06	
P27	0.90	0.71	
R27B	0.90	0.19	
D26	0.90	0.08	
D25	0.90	0.16	
R14	0.90	0.04	
R25	0.9	0.05	
P28	0.90	0.39	
D14	0.90	0.09	
D29	0.90	0.13	
R31	0.90	0.32	
L29	0.90	0.03	
R19	0.90	0.32	
P31	0.90	1.40	
D15	0.90	0.12	
R38A	0.90	0.17	
P46	0.90	0.25	
P38	0.90	1.09	
D30	0.90	0.18	
P19	0.90	0.36	
D16	0.90	0.10	
D18	0.90	0.15	
P35B	0.90	0.05	
L19	0.90	0.03	
P35A	0.90	0.11	
R35	0.90	0.24	
P34	0.90	0.58	
R38B	0.90	0.50	
L34	0.90	0.16	

APPROVED ☐ REFUSED ☐

THIS ____ DAY OF _____, 20_____

DERRICK MOODIE, ACTING MANAGER
DEVELOPMENT REVIEW, SUBURBAN SERVICES

LEGEND:

- DRAINAGE AREA LIMITS
- MH601 STORM MANHOLE & NUMBER
- STORM SEWER & FLOW DIRECTION
- R25 AREA ID
- 0.85 2.63 AREA IN HECTARES / RUNOFF COEFFICIENT
- R31 ROOF AREA
- D30 DRIVE LANES
- P31 PARKING AREA
- L34 LOADING AREA
- EMERGENCY OVERLAND FLOW ROUTE
- AREA CONSTRUCTED AS PART OF PLAN OF SUBDIVISION FILE NO. D07-16-14-0003

KEY PLAN

No.	REVISIONS	By	Date
14			
13			
12			
11			
10			
9			
8	REVISED PER CITY COMMENTS	LME	16-08-31
7	ISSUED TO CITY FOR APPROVAL PHASE 2A	LME	16-08-04
6	RE-ISSUED FOR MYLARS	LME	15-11-26
5	RE-ISSUED FOR MYLARS	LME	15-11-03
4	ISSUED FOR MYLARS	LME	15-07-20
3	REVISED PER CITY COMMENTS AND NEW SITE PLAN	LME	15-06-19
2	REVISED PER CITY COMMENTS	LME	15-04-27
1	ISSUED TO CITY FOR APPROVAL	LME	15-01-29

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ibigroup.com

Project Title

KANATA WEST RETAIL CENTRE

3015, 3075, & 3095 PALLADIUM DRIVE

2016/08/31

Drawing Title

STORM DRAINAGE AREA PLAN

Scale 1:750

Design	Date
LME	JAN. 2015
Drawn	Checked
DPS	TRB
Project No.	Drawing No.
37884	C-500

D07-12-16-0122

a:\37884-KWBRetailCentre\15.0 Drawings\30dwf\Stage\AVAMECC-500.dwg Layout Name: C-500 Plot Style: AIA STANDARD-HALF.CTB Plot Scale: 1:1.5 Plotted At: 8/31/2016 2:47 PM Last Saved By: dsiuma Last Saved At: Aug. 31, 16

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

STORM SEWER DESIGN SHEET

Kanata West Retail Center
City of Ottawa
Taggart Realty Management

LOCATION				AREA (Ha)										RATIONAL DESIGN FLOW												SEWER DATA							
STREET	AREA ID	FROM	TO	C= 0.20	C= 0.25	C= 0.40	C= 0.50	C= 0.57	C= 0.65	C= 0.69	C= 0.70	C= 0.90	C= 0.90	IND 2.78AC	CUM 2.78AC	INLET (min)	TIME IN PIPE	TOTAL (min)	i (5) (mm/hr)	i (10) (mm/hr)	i (100) (mm/hr)	5yr PEAK FLOW (L/s)	10yr PEAK FLOW (L/s)	100yr PEAK FLOW (L/s)	FIXED FLOW (L/s)	DESIGN FLOW (L/s)	CAPACITY (L/s)	LENGTH (m)	PIPE SIZE (mm) DIA	W	H	SLOPE (%)	VELOCITY (m/s)	AVAIL CAP (5yr) (L/s)	(%)
	D11	MH11	MH12									0.25		0.63	0.63	10.00	0.95	10.95	104.19	122.14	178.56	65.17				65.17	91.46	45.75	375			0.25	0.802	26.28	28.74%
	R12	MH12	MH13									0.10		0.25	0.88	10.95	0.61	11.56	99.43	116.53	170.31	87.07				87.07	133.02	29.78	450			0.20	0.810	45.95	34.54%
	D13, R13	MH13	MH14									0.16		0.40	1.28	11.56	0.80	12.36	96.60	113.20	165.43	123.27				123.27	133.02	38.88	450			0.20	0.810	9.75	7.33%
	D25, R25	MH25	MH26									0.21		0.53	0.53	10.00	1.42	11.42	104.19	122.14	178.56	54.75				54.75	133.02	69.08	450			0.20	0.810	78.27	58.84%
	P27, R27A, R27B	MH27	MH26									1.15		2.88	2.88	10.00	1.57	11.57	104.19	122.14	178.56	299.79				299.79	367.27	75.97	750			0.10	0.805	67.48	18.37%
	P28	MH28	MH26									0.39		0.98	0.98	10.00	0.88	10.88	104.19	122.14	178.56	101.67				101.67	133.02	42.76	450			0.20	0.810	31.35	23.57%
	D26	MH26	MH33									0.08		0.20	4.58	11.57	0.68	12.25	96.56	113.16	165.36	442.13				442.13	473.55	35.00	825			0.10	0.858	31.42	6.64%
		MH33	MH14											0.00	4.58	12.25	0.14	12.40	93.63	109.71	160.30	428.72				428.72	473.55	7.41	825			0.10	0.858	44.84	9.47%
	D21	MH21	MH22									0.20		0.50	0.50	10.00			104.19	122.14	178.56	52.14													
	L21												0.19	0.48	0.48	10.00	2.49	12.49	104.19	122.14	178.56			84.88		137.02	179.46	120.00	525			0.16	0.803	42.44	23.65%
	D22	MH22	MH23									0.20		0.50	1.00	12.49			92.65	108.55	158.60	92.73													
														0.00	0.48	12.49	1.69	14.18	92.65	108.55	158.60			75.40		168.12	200.65	91.13	525			0.20	0.898	32.52	16.21%
		MH23	MH24											0.00	1.00	14.18			86.30	101.07	147.62	86.37													
														0.00	0.48	14.18	0.88	15.06	86.30	101.07	147.62			70.18		156.54	200.65	47.54	525			0.20	0.898	44.10	21.98%
	P55, R55	CBMH55	MH24									1.73		4.33	4.33	10.00	1.36	11.36	104.19	122.14	178.56	451.00				451.00	597.22	74.35	900			0.10	0.909	146.23	24.48%
	D24	MH24	MH32									0.20		0.50	5.83	15.06			83.35	97.61	142.54	485.90													
														0.00	0.48	15.06	1.01	16.08	83.35	97.61	142.54			67.76		553.66	739.33	58.30	975			0.10	0.959	185.66	25.11%
		MH32	MH14											0.00	5.83	16.08			80.23	93.94	137.16	467.72													
														0.00	0.48	16.08	0.16	16.24	80.23	93.94	137.16			65.20		532.92	739.33	9.19	975			0.10	0.959	206.40	27.92%
	D14, R14	MH14	MH15									0.13		0.33	12.01	16.24			79.76	93.39	136.35	957.93													
														0.00	0.48	16.24	0.79	17.03	79.76	93.39	136.35			64.82		1,022.74	1,760.81	56.60	1350			0.10	1.192	738.07	41.92%
	D15	MH15	MH16									0.12		0.30	12.31	17.03			77.53	90.76	132.49	954.37													
														0.00	0.48	17.03	0.80	17.82	77.53	90.76	132.49			62.99		1,017.36	1,760.81	56.91	1350			0.10	1.192	743.45	42.22%
	P46	CBMH46	MH38									0.25		0.63	0.63	10.00	1.28	11.28	104.19	122.14	178.56	65.17				65.17	133.02	62.32	450			0.20	0.810	67.84	51.00%
	P38, R38A, R38B	MH38	MH16									1.76		4.40	5.03	11.28	0.85	12.13	97.88	114.70	167.63	492.22				492.22	597.22	46.30	900			0.10	0.909	105.00	17.58%
	D16	MH16	MH17									0.10		0.25	17.59	17.82			75.42	88.28	128.86	1,326.55													
														0.00	0.48	17.82	0.64	18.47	75.42	88.28	128.86			61.26		1,387.81	2,332.02	49.47	1500			0.10	1.278	944.22	40.49%
		MH17	MH18											0.00	17.59	18.47			73.80	86.38	126.07	1,298.08													
														0.00	0.48	18.47	0.30	18.77	73.80	86.38	126.07			59.93		1,358.01	2,332.02	22.78	1500			0.10	1.278	974.01	41.77%
	P31	MH31	CBMH 45									1.40		3.50	3.50	10.00			104.19	122.14	178.56	364.97													
	R31												0.32	0.80	0.80	10.00	2.14	12.14	104.19	122.14	178.56			142.96		507.93	597.22	116.78	900			0.10	0.909	89.29	14.95%
		CBMH 45	MH18											0.00	3.50	12.14			94.10	110.26	161.11	329.62													
														0.00	0.80	12.14	0.32	12.46	94.10	110.26	161.11			128.99		458.61	597.22	17.60	900			0.10	0.909	138.61	23.21%
	D18	MH18	MH18B									0.15		0.38	21.47	18.77			73.08	85.54	124.83	1,568.84													
														0.00	1.28	18.77	0.15	18.91	73.08	85.54	124.83			159.28		1,728.12	3,006.86	12.10	1650			0.10	1.362	1278.74	42.53%
		MH34	CBMH34											0.00	0.00	10.00			104.19	122.14	178.56	0.00													
	L34												0.16	0.40	0.40	10.00	0.84	10.84	104.19	122.14	178.56			71.48		71.48	148.72	45.57	450			0.25	0.906	77.24	51.93%
	P34	CBMH34	MH18B									0.58		1.45	1.45	10.84			99.96	117.16	171.24	145.06													
														0.00	0.40	10.84	1.79	12.63	99.96	117.16	171.24			68.55		213.61	367.27	86.60	750			0.10	0.805	153.66	41.84%
		MH18B	MH19											0.00	22.92	18.77			73.08	85.54	124.83	1,674.89													
														0.00	1.68	18.77	0.91	19.67	73.08	85.54	124.83			209.25		1,884.14	3,006.86	74.28	1650			0.10	1.362	1122.72	37.34%
	P19	MH19	MH20									0.36		0.90	23.82	19.67			70.97	83.06	121.19	1,690.50													
	R19												0.32	0.80	2.48	19.67	0.75	20.43	70.97	83.06	121.19			300.19		1,990.70	3,006.86	61.54	1650			0.10	1.362	1016.17	33.79%
	D29	MH29	MH30									0.13		0.33	0.33	10.00			104.19	122.14	178.56	33.89													
	L29												0.03	0.08	0.08	10.00	1.06	11.06	104.19	122.14	178.56			13.40		47.29	91.46	51.00	375			0.25	0.802	44.16	48.29%
	D30	MH30	MH20									0.18		0.45	0.78	11.06			98.91	115.92	169.42	76.72													
															0.08	11.06	0.63	11.69	98.91	115.92	169.42			12.72		89.43	188.11	43.23	450			0.40	1.146	98.68	52.46%
	R35, P35A	MH47	MH35									0.35		0.88	0.88	10.00	0.49	10.49	104.19	122.14	178.56	91.24				91.24	115.68	29.88	375			0.40	1.015	24.44	21.13%
	P35B	MH35	MH20									0.05		0.13	1.00	10.49	0.34	10.84	101.67	119.17	174.19	101.75				115.15	148.72	18.75	450			0.25	0.906	33.56	22.57%
	L19												0.03	0.08	0.08	10.00	0.55	10.55	104.19	122.14	178.56			13.40		13.40	62.04	40.50	250			1.00	1.224	48.64	78.40%
		MH20	MH123											0.00	25.60	20.43			69.33	81.12	118.36	1,774.42													
														0.00	2.63	20.43	1.32	21.75	69.33	81.12	118.36			310.93		2,085.36	3,006.86	107.79	1650			0.10	1.362	921.51	30.65%

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 = 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: LME/TRB

Checked: TRB

Dwg. Reference: 37884-500

No.	Revision	Date
1.	City submission No. 1	1/29/2015
2.	City submission No. 2	4/24/2015
3.	City submission No. 3	6/19/2015
4.	City submission No. 4	10/16/2015
5.	City submission No. 5	10/27/2015
6.	City submission No. 6	11/27/2015
7.	City Submission No. 7 (Revised for Princess Auto Block)	8/3/2016

File Reference: 37884.5.7.1
Date: 8/4/2016
Sheet No: 1 of 1

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STORM SEWER INLET DESIGN SHEET

Kanata West Retail Center
City of Ottawa
Taggart Realty Management

LOCATION					AREA (Ha)										RATIONAL DESIGN FLOW										
STREET	AREA ID	FROM	TO	STRUCTURE	C= 0.20	C= 0.25	C= 0.40	C= 0.50	C= 0.57	C= 0.65	C= 0.69	C= 0.70	C= 0.90	C= 0.90	IND 2.78AC	CUM 2.78AC	INLET (min)	TIME IN PIPE	TOTAL (min)	i (5) (mm/hr)	i (10) (mm/hr)	i (100) (mm/hr)	5yr PEAK FLOW (L/s)	10yr PEAK FLOW (L/s)	100yr PEAK FLOW (L/s)	FIXED FLOW (L/s)	DESIGN FLOW (L/s)
	D11	MH 11	MH 12	CIBC 25									0.09		0.23	0.23	10.00			104.19	122.14	178.56	23.46				23.46
	D11			CIBC 62									0.05		0.13	0.13	10.00			104.19	122.14	178.56	13.03				13.03
	D11			CIBC 23									0.11		0.28	0.28	10.00			104.19	122.14	178.56	28.68				28.68
				Sub Total																							**65.17**
	R12	MH 12	MH 13	Building A4, A5									0.10		0.25	0.25	10.00			104.19	122.14	178.56	26.07				26.07
	D13	MH 13	MH 14	CICB 21									0.10		0.25	0.25	10.00			104.19	122.14	178.56	26.07				26.07
	R13			Building B3									0.06		0.15	0.15	10.00			104.19	122.14	178.56	15.64				15.64
				Sub Total																							**41.71**
	D25	MH 25	MH 26	CICB 37									0.07		0.18	0.18	10.00			104.19	122.14	178.56	18.25				18.25
	D25			CICB 35									0.09		0.23	0.23	10.00			104.19	122.14	178.56	23.46				23.46
	R25			Building E2									0.05		0.13	0.13	10.00			104.19	122.14	178.56	13.03				13.03
				Sub Total																							**54.75**
	R27A	MH 27	MH 26	Building B1									0.25		0.63	0.63	10.00			104.19	122.14	178.56	65.17				65.17
	P27, R27B			Bldg. B2, CB 77, CBMH60									0.38		0.95	0.95	10.00			104.19	122.14	178.56	99.06				99.06
	P27			CB59									0.28		0.70	0.70	10.00			104.19	122.14	178.56	72.99				72.99
	P27			CB61									0.09		0.23	0.23	10.00			104.19	122.14	178.56	23.46				23.46
	P27			CB62									0.15		0.38	0.38	10.00			104.19	122.14	178.56	39.10				39.10
				Sub Total																							**299.79**
	P28	MH 28	MH 26	CICB 63									0.11		0.28	0.28	10.00			104.19	122.14	178.56	28.68				28.68
	P28			CB64									0.08		0.20	0.20	10.00			104.19	122.14	178.56	20.86				20.86
	P28			CB 75									0.08		0.20	0.20	10.00			104.19	122.14	178.56	20.86				20.86
	P28			CICB 76									0.12		0.30	0.30	10.00			104.19	122.14	178.56	31.28				31.28
				Sub Total																							**101.67**
	D26	MH 26	MH 14	CICB 33									0.08		0.20	0.20	10.00			104.19	122.14	178.56	20.86				20.86
	D21	MH 21	MH 22	CICB 2									0.05		0.13	0.13	10.00			104.19	122.14	178.56	13.03				13.03
	D21			CICB 3									0.09		0.23	0.23	10.00			104.19	122.14	178.56	23.46				23.46
	D21			CICB 4									0.06		0.15	0.15	10.00			104.19	122.14	178.56	15.64				15.64
	L21			TD 1										0.05	0.13	0.13	10.00			104.19	122.14	178.56			22.34		22.34
	L21			TD 2										0.07	0.18	0.18	10.00			104.19	122.14	178.56			31.27		31.27
	L21			TD 3										0.07	0.18	0.18	10.00			104.19	122.14	178.56			31.27		31.27
				Sub Total																							**137.02**
	D22	MH 22	MH 23	CICB 27									0.09		0.23	0.23	10.00			104.19	122.14	178.56	23.46				23.46
	D22			CICB 29									0.11		0.28	0.28	10.00			104.19	122.14	178.56	28.68				28.68
				Sub Total																							**52.14**
	R55, P55	CBMH 55	MH 24	Bldg. A1-3, CBMH 55									1.25		3.13	3.13	10.00			104.19	122.14	178.56	325.86				325.86
	P55			CB 56									0.16		0.40	0.40	10.00			104.19	122.14	178.56	41.71				41.71
	P55			CB 57									0.15		0.38	0.38	10.00			104.19	122.14	178.56	39.10				39.10
	P55			CB 58									0.17		0.43	0.43	10.00			104.19	122.14	178.56	44.32				44.32
				Sub Total																							**451.00**
	D24	MH 24	MH 14	CB 31									0.20		0.50	0.50	10.00			104.19	122.14	178.56	52.14				52.14
	D14	MH 14	MH 15	CICB 19									0.09		0.23	0.23	10.00			104.19	122.14	178.56	23.46				23.46
	R14			Building E1									0.04		0.10	0.10	10.00			104.19	122.14	178.56	10.43				10.43
				Sub Total																							**33.89**
	D15	MH 15	MH 16	CICB 17									0.12		0.30	0.30	10.00			104.19	122.14	178.56	31.28				31.28
	P46	CBMH 46	MH 38	CBMH 46									0.25		0.63	0.63	10.00			104.19	122.14	178.56	65.17				65.17
	P38, R38A	MH 38	MH 16	Bldg. E3-6, CBMH 39									0.33		0.83	0.83	10.00			104.19	122.14	178.56	86.03				86.03
	P38			CB 69									0.13		0.33	0.33	10.00			104.19	122.14	178.56	33.89				33.89
	P38, R38B			Bldg. E7-8, CBMH 53									0.98		2.45	2.45	10.00			104.19	122.14	178.56	255.48				255.48
	P38			CB 68									0.18		0.45	0.45	10.00			104.19	122.14	178.56	46.92				46.92
				CB 70									0.14		0.35	0.35	10.00			104.19	122.14	178.56	36.50				36.50
				Sub Total																							**458.82**
	D16	MH 16	MH 17	CICB 15									0.10		0.25	0.25	10.00			104.19	122.14	178.56	26.07				26.07
	P34	MH 34	MH 17	TD 6, 7 CB 78										0.15	0.38	0.38	10.00			104.19	122.14	178.56			67.01		
	L34			CBMH 34									0.07		0.18	0.18	10.00			104.19	122.14	178.56	18.25				85.26
	P34			CB 23									0.09		0.23	0.23	10.00			104.19	122.14	178.56	23.46				23.46
	P34			CB 24									0.07		0.18	0.18	10.00			104.19	122.14	178.56	18.25				18.25
	P34			CB 51									0.08		0.20	0.20	10.00			104.19	122.14	178.56	20.86				20.86
	P34			CB 48, CB50									0.19		0.48	0.48	10.00			104.19	122.14	178.56	49.53				49.53
				Sub Total																							**197.36**

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STORM SEWER INLET DESIGN SHEET

Kanata West Retail Center
City of Ottawa
Taggart Realty Management

LOCATION					AREA (Ha)										RATIONAL DESIGN FLOW										
STREET	AREA ID	FROM	TO	STRUCTURE	C= 0.20	C= 0.25	C= 0.40	C= 0.50	C= 0.57	C= 0.65	C= 0.69	C= 0.70	C= 0.90	C= 0.90	IND 2.78AC	CUM 2.78AC	INLET (min)	TIME IN PIPE	TOTAL (min)	i (5) (mm/hr)	i (10) (mm/hr)	i (100) (mm/hr)	5yr PEAK FLOW (L/s)	10yr PEAK FLOW (L/s)	100yr PEAK FLOW (L/s)	FIXED FLOW (L/s)	DESIGN FLOW (L/s)
	R31	MH 31	MH 45	Cabela's building										0.32	0.80	0.80	10.00			104.19	122.14	178.56			142.96		
	P31			CBMH 45									1.40		3.50	3.50	10.00			104.19	122.14	178.56	364.97				507.93
				Sub Total																							**507.93**
	D18	MH 18	MH 18A	CICB 13									0.15		0.38	0.38	10.00			104.19	122.14	178.56	39.10				39.10
	L19	MH 19	MH 20	TD 5										0.03	0.08	0.08	10.00			104.19	122.14	178.56			13.40		13.40
	R19			Cabela's building MH 45A										0.32	0.80	0.80	10.00			104.19	122.14	178.56			142.96		142.96
	P19			CB 8									0.05		0.13	0.13	10.00			104.19	122.14	178.56	13.43				13.43
	P19			CB 11									0.18		0.45	0.45	10.00			104.19	122.14	178.56	46.92				46.92
	P19			CICB 10									0.13		0.33	0.33	10.00			104.19	122.14	178.56	33.89				33.89
	L29	MH 29	MH 30	CB 10										0.03	0.08	0.08	10.00			104.19	122.14	178.56			13.40		13.40
	D29			CICB 6									0.10		0.25	0.25	10.00			104.19	122.14	178.56	26.07				26.07
				CB 9									0.01		0.01	0.01	10.00			104.19	122.14	178.56	1.49				1.49
	D29			CICB 7									0.03		0.08	0.08	10.00			104.19	122.14	178.56	7.82				7.82
				Sub Total																							**48.78**
	D30	MH 30	MH 20	CICB 8									0.18		0.45	0.45	10.00			104.19	122.14	178.56	46.92				46.92
	P35, R35	MH 35	MH 20	Bldg. AP, CBMH 47									0.41		1.03	1.03	10.00			104.19	122.14	178.56	106.88				106.88
	P35			CB 46									0.08		0.20	0.20	10.00			104.19	122.14	178.56	20.86				20.86
				Sub Total																							**127.74**

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 = 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:

LICENSED PROFESSIONAL ENGINEER
L. M. ERION
PROVINCE OF ONTARIO

Designed: LME

Checked:

Dwg. Reference: 37884-500

No.	Revision
1.	City submission No. 1
2.	City submission No. 2
3.	City submission No. 3
4.	City submission No. 4

File Reference: 37884.5.7.1
Date: 10/16/2015

IBI GROUP

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

STORM SEWER DESIGN SHEET

PROJECT: KANATA WEST BUSINESS PARK
LOCATION: 333 HUNTMAR DRIVE
CLIENT: TAGGART

LOCATION				AREA (Ha)											RATIONAL DESIGN FLOW												SEWER DATA								
STREET	AREA ID	FROM MH	TO MH	C= 0.20	C= 0.57	C= 0.57	C= 0.61	C= 0.68	C= 0.68	C= 0.70	C= 0.85	C= 0.85	C= 0.90	C= 0.90	IND 2.78AC	CUM 2.78AC	INLET (min)	TIME IN PIPE	TOTAL (min)	i (5) (mm/hr)	i (10) (mm/hr)	i (100) (mm/hr)	5yr PEAK FLOW (L/s)	10yr PEAK FLOW (L/s)	100yr PEAK FLOW (L/s)	FIXED FLOW (L/s)	DESIGN FLOW (L/s)	CAPACITY (L/s)	LENGTH (m)	PIPE SIZE (mm) DIA	W	H	SLOPE (%)	VELOCITY (m/s)	AVAIL CAP (Syr) (L/s)	(%)
KANATA WEST BUSINESS PARK - Block numbers based on overall concept plan of subdivision																																		
Journeyman St.		*MH140*	*MH141*												*0.00*	*19.28*	*16.32*			*79.51*	*93.10*	*135.92*	*1,533.17*												
						0.13				*0.32*					*0.83*	*2.96*	*16.32*	*0.95*	*17.27*	*79.51*	*93.10*	*135.92*			*402.03*		*1,935.2*	*2,784.1*	*107.00*	*1350*			*0.25*	*1.884*	*848.9*	*30.5%*
		MH141	*MH141B*												*0.00*	*19.28*	*17.27*			*76.88*	*90.00*	*131.37*	*1,482.33*												
										0.13					*0.25*	*3.21*	*17.27*	*0.54*	*17.81*	*76.88*	*90.00*	*131.37*			*421.81*		*1,904.1*	*2,156.5*	*47.35*	*1350*			*0.15*	*1.460*	*252.4*	*11.7%*
Journeyman St.		*Stub*	*MH 603*												*0.00*	*19.28*	*17.81*			*75.46*	*88.33*	*128.92*	*1,454.94*												
															0.00	*3.21*	*17.81*	*0.33*	*18.14*	*75.46*	*88.33*	*128.92*			*413.95*		*1,868.9*	*1,363.9*	*18.02*	*1350*			*0.06*	*0.923*	*-505.0*	*-37.0%*
Campeau Drive		*603*	*602*												*0.00*	*47.54*	*19.70*			*70.93*	*83.00*	*121.11*	*3,372.06*												
												0.26			*0.61*	*15.30*	*19.70*	*0.71*	*20.41*	*70.93*	*83.00*	*121.11*			*1,853.06*		*5,225.1*	*3,971.3*	*92.77*	*1500*			*0.29*	*2.177*	*-1253.8*	*-31.6%*
		602	*601*												*0.00*	*47.54*	*20.41*			*69.37*	*81.18*	*118.44*	*3,298.20*												
												0.32			*0.76*	*16.06*	*20.41*	*0.53*	*20.94*	*69.37*	*81.18*	*118.44*			*1,901.67*		*5,199.9*	*4,362.8*	*76.05*	*1500*			*0.35*	*2.392*	*-837.0*	*-19.2%*
Tanger	*Blocks 10, 11*	*601*	*9*								*4.56*				*10.78*	*58.32*	*20.94*			*68.26*	*79.87*	*116.52*	*3,980.92*												
												0.78			*1.84*	*17.90*	*20.94*	*0.87*	*21.80*	*68.26*	*79.87*	*116.52*			*2,085.72*		*6,066.6*	*5,730.3*	*96.86*	*1950*			*0.15*	*1.859*	*-336.4*	*-5.9%*
Tanger		*9*	*12*										*3.24*		*8.11*	*66.43*	*21.80*			*66.52*	*77.83*	*113.53*	*4,418.87*												
															0.00	*17.90*	*21.80*	*0.81*	*22.62*	*66.52*	*77.83*	*113.53*			*2,032.17*	*18.00*	*6,469.0*	*5,749.5*	*90.76*	*1950*			*0.15*	*1.865*	*-719.6*	*-12.5%*
Tanger		*12*	*13*										*1.81*		*4.53*	*70.95*	*22.62*			*64.99*	*76.03*	*110.89*	*4,611.14*												
															0.00	*17.90*	*22.62*	*0.22*	*22.83*	*64.99*	*76.03*	*110.89*			*1,984.84*	*18.00*	*6,614.0*	*5,749.5*	*24.54*	*1950*			*0.15*	*1.865*	*-864.5*	*-15.0%*
Tanger		*13*	*Pond 6E*										*4.11*		*10.28*	*81.24*	*22.83*			*64.59*	*75.56*	*110.20*	*5,246.78*												
														0.84	*2.10*	*20.00*	*22.83*	*0.08*	*22.92*	*64.59*	*75.56*	*110.20*			*2,204.06*	*153.00*	*7,603.8*	*7,005.7*	*9.99*	*2100*			*0.15*	*1.959*	*-598.1*	*-8.5%*
KANATA WEST BUSINESS PARK																																			
Upper Canada St.	Block31,33,34	**MH154**	**MH153**								**2.59**				**6.12**	**6.12**	**12.70**			**91.81**	**107.56**	**157.14**	**561.88**												
						0.32									**0.51**	**0.51**	**12.70**	**1.70**	**14.40**	**91.81**	**107.56**	**157.14**			**79.68**		**641.6**	**905.5**	**120.00**	**975**			**0.15**	**1.175**	**263.92**	**29.15%**
Upper Canada St.	**Blocks 35, 53, 54**	**MH153**	**MH152B**								**1.82**				**4.30**	**10.42**	**14.40**			**85.54**	**100.18**	**146.32**	**891.39**												
						0.16									**0.25**	**0.76**	**14.40**	**1.10**	**15.51**	**85.54**	**100.18**	**146.32**			**111.29**		**1002.7**	**1,103.3**	**81.80**	**1050**			**0.15**	**1.234**	**100.65**	**9.12%**
	External Drainage	**DI200**	**MH152B**	14.53											**8.08**	**8.08**	**30.00**	**2.48**	**32.48**	**53.93**	**63.05**	**91.87**	**435.66**					**435.7**	**473.6**	**127.45**	**825**			**0.10**	**0.858**	**37.89**	**8.00%**
Upper Canada St.		**MH152B**	**MH152**												**0.00**	**18.50**	**14.40**			**85.54**	**100.18**	**146.32**	**1,582.43**												
															0.00	**0.76**	**14.40**	**1.07**	**15.47**	**85.54**	**100.18**	**146.32**			**111.29**		**1693.7**	**2,332.0**	**81.80**	**1500**			**0.10**	**1.278**	**638.30**	**27.37%**
	Blocks 39	**MH152**	**MH151**												**0.00**	**18.50**	**15.47**			**82.07**	**96.11**	**140.33**	**1,518.31**												
															0.00	**0.76**	**15.47**	**0.18**	**15.65**	**82.07**	**96.11**	**140.33**			**106.74**		**1625.0**	**2,332.0**	**13.91**	**1500**			**0.10**	**1.278**	**706.98**	**30.32%**
		MH151	**MH150**												**0.00**	**18.50**	**15.65**			**81.51**	**95.45**	**139.37**	**1,507.97**												
						0.17									**0.27**	**1.03**	**15.65**	**1.35**	**17.00**	**81.51**	**95.45**	**139.37**			**143.55**		**1651.5**	**2,332.0**	**103.40**	**1500**			**0.10**	**1.278**	**680.50**	**29.18%**
		MH150	**MH120**												**0.00**	**18.50**	**17.00**			**77.61**	**90.86**	**132.64**	**1,435.79**												
						0.20									**0.32**	**1.35**	**17.00**	**0.89**	**17.89**	**77.61**	**90.86**	**132.64**			**178.65**		**1614.4**	**3,006.9**	**72.86**	**1650**			**0.10**	**1.362**	**1392.42**	**46.31%**
Campeau Drive	*Block 3*	*MH99*	*MH100*								*4.18*				*9.88*	*9.88*	*11.70*			*96.00*	*112.49*	*164.38*	*948.19*												
									0.36						*0.68*	*0.68*	*11.70*	*1.13*	*12.83*	*96.00*	*112.49*	*164.38*			*111.87*		*1060.1*	*1,560.3*	*118.50*	*1050*			*0.30*	*1.746*	*500.29*	*32.06%*
		MH100	*MH101*												*0.00*	*9.88*	*12.83*			*91.29*	*106.95*	*156.24*	*901.68*												
							0.27								*0.46*	*1.14*	*12.83*	*0.76*	*13.59*	*91.29*	*106.95*	*156.24*			*177.87*		*1079.6*	*2,073.9*	*80.84*	*1200*			*0.26*	*1.776*	*994.37*	*47.95%*
	Block 37, 38, 39	*MH101*	*MH120*								*7.03*				*16.61*	*26.49*	*15.50*			*81.98*	*95.99*	*140.17*	*2,171.48*												
															0.00	*1.14*	*15.50*	*0.14*	*15.64*	*81.98*	*95.99*	*140.17*			*159.57*		*2331.0*	*2,961.0*	*20.89*	*1200*			*0.53*	*2.536*	*630.00*	*21.28%*
Campeau Drive	*Block 32, 29*	*MH104*	*MH103*								*0.85*				*2.01*	*2.01*	*11.25*			*98.02*	*114.88*	*167.89*	*196.89*												
							0.66								*1.12*	*1.12*	*11.25*	*2.33*	*13.58*	*98.02*	*114.88*	*167.89*			*187.90*		*384.8*	*473.6*	*120.00*	*825*			*0.10*	*0.858*	*88.76*	*18.74%*
	Block 36	*MH103*	*MH102*								*0.33*				*0.78*	*2.79*	*13.58*			*88.44*	*103.60*	*151.33*	*246.61*												
															0.00	*1.12*	*13.58*	*1.52*	*15.10*	*88.44*	*103.60*	*151.33*			*169.37*		*416.0*	*597.2*	*82.99*	*900*			*0.10*	*0.909*	*181.24*	*30.35%*
		MH102	*MH120*												*0.00*	*2.79*	*15.10*			*83.23*	*97.47*	*142.33*	*232.08*												
															0.00	*1.12*	*15.10*	*0.37*	*15.47*	*83.23*	*97.47*	*142.33*			*159.30*		*391.4*	*597.2*	*20.01*	*900*			*0.10*	*0.909*	*205.85*	*34.47%*
Nipissing Court	*Blocks 4, 5*	*MH120*	*MH121*								*2.37*				*5.60*	*53.38*	*17.89*			*75.25*	*88.09*	*128.57*	*4,016.75*												
						0.26									*0.41*	*4.02*	*17.89*	*0.74*	*18.63*	*75.25*	*88.09*	*128.57*			*516.40*		*4533.2*	*6,120.8*	*88.44*	*1950*			*0.17*	*1.985*	*1587.62*	*25.94%*
		MH121	*MH122*		*0.21*										*0.33*	*53.71*	*18.63*			*73.40*	*85.92*	*125.38*	*3,942.57*												
															0.00	*4.02*	*18.63*	*0.73*	*19.36*	*73.40*	*85.92*	*125.38*			*503.61*		*4446.2*	*7,119.4*	*100.84*	*1950*			*0.23*	*2.309*	*2673.27*	*37.55%*
	Blocks 1, 7	*MH122*	*MH123*						*0.35*		*2.23*				*5.93*	*59.64*	*19.36*			*71.69*	*83.90*	*122.43*	*4,275.61*												
															0.00	*4.02*	*19.36*	*0.77*	*20.13*	*71.69*	*83.90*	*122.43*			*491.73*		*4767.3*	*6,638.9*	*99.19*	*1950*			*0.20*	*2.154*	*1871.57*	*28.19%*
Future	*Blocks 8, 9*	*MH (215)*	*MH123*								*11.78*				*27.84*	*27.84*	*20.70*	*0.24*	*20.94*	*68.75*	*80.45*	*117.37*	*1,913.77*					*1,913.8*	*3,006.9*	*20.00*	*1650*			*0.10*	*1.362*	*1093.09*	*36.35%*
West Pond Outlet		*MH123*	*Outlet*												*0.00*	*87.48*	*20.13*			*69.97*	*81.88*	*119.47*	*6,121.06*												
															0.00	*4.02*	*20.13*	*0.87*	*21.00*	*69.97*	*81.88*	*119.47*			*479.86*		*6600.9*	*10,648.2*	*119.64*	*2400*			*0.17*	*2.280*	*4047.31*	*38.01%*
Future	*Blocks X,X*	*MH XX*	*MHXX*	*Grey = Constructed*																															

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 = 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

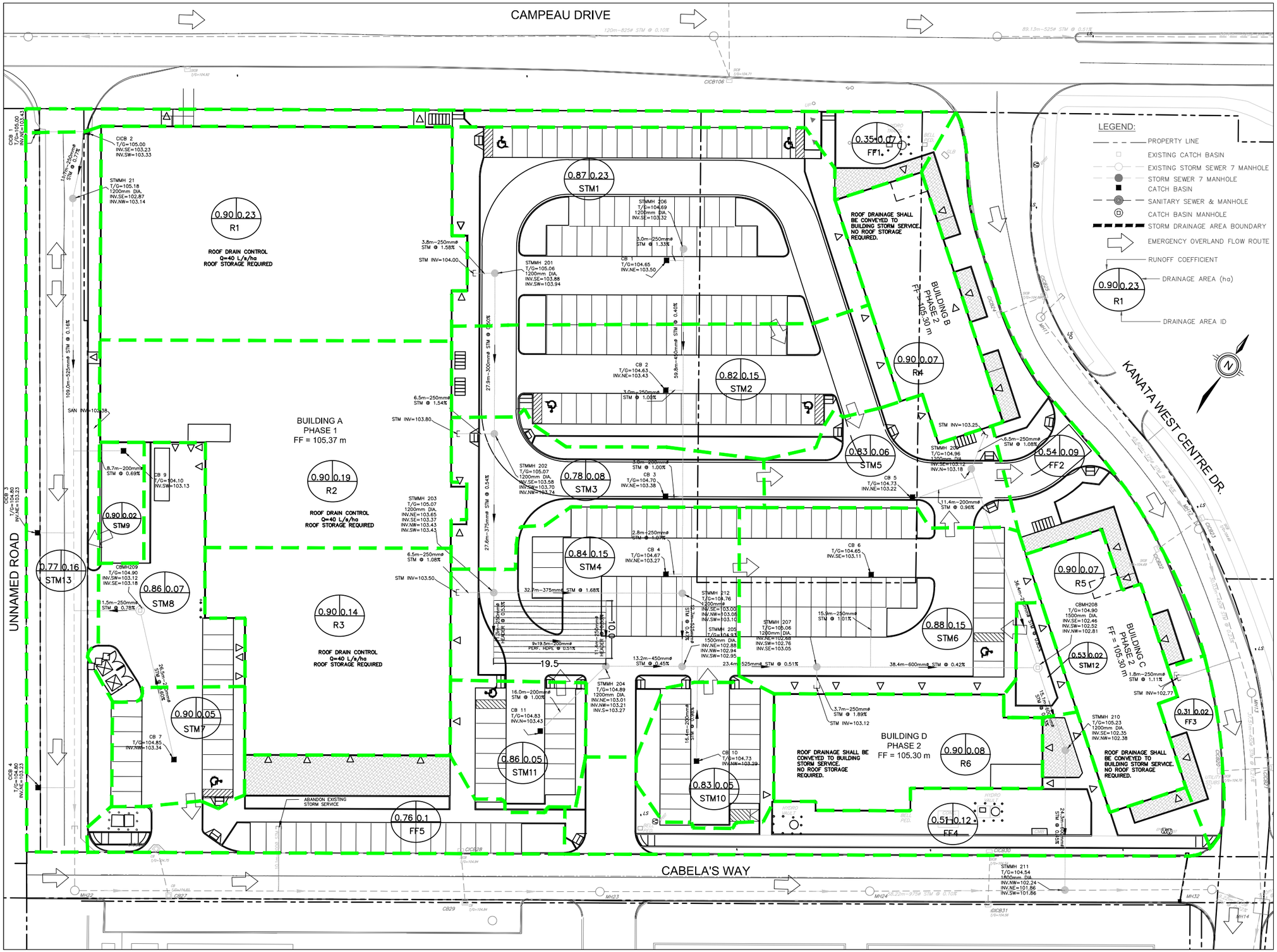
Notes:
1. Mannings coefficient (n) = 0.013

2. The Storm Sewer Design Sheet is for the rational method storm sewer design only, release rates for the individual blocks are included in Table 4.1 of the Design Brief, Kanata West Business Park, 333 Huntmar Drive, by IBI Group November 2015

Designed: LME
Checked:
Dwg. Reference: 14289-500

No.	Revision	Date
1.	City submission No. 1	2014-11-25
2.	City submission No. 2	2015-04-08
3.	City submission No. 3	2015-06-18
4.	City submission No. 4	2015-10-15
5.	City submission No. 5	2015-11-04
6.	Revised for Phase 2 Regristration	2018-04-19
7.	Revised for Phase 3 Regristration	2018-09-14
8.	Revised per City comments	2018-12-14
9.	Revised per City comments	2019-03-08
10.	Revised for Phase 4 Registration	2019-04-25
11.	Revised per comments for Phase 4 Registration	2019-06-24
12.	Revised for Phase 5 Registration	2019-09-10
13.	Revised per City comments for Phase 5 Registration	2019-10-24
14.	Revised per City comments for Phase 5 Registration	2019-11-06

File Reference: 14289.5.7.1 | **Date:** 2019-11-06 | **Sheet No:** 2 of 2



THE LOCATION OF ALL UNDER- / ABOVE-GROUND UTILITIES AND SERVICES IS APPROXIMATE ONLY AND WHERE SHOWN ON THE DRAWING(S) THE ACCURACY OF THE UTILITIES AND SERVICES IS NOT GUARANTEED. THE OWNER AND / OR HIS REPRESENTATIVE SHALL DETERMINE THE LOCATION OF ALL UTILITIES AND SERVICES BEFORE COMMENCING ANY CONSTRUCTION ACTIVITIES.

DO NOT SCALE DRAWINGS.

CONTRACTOR MUST CHECK & VERIFY ALL DIMENSIONS ON SITE.

THIS DRAWING IS NOT TO BE USED FOR CONSTRUCTION.

No.	Issued	Date	By
1	ISSUED FOR SPA	08-07-2024	





WPE
ENGINEERING LTD.
222 - 7250 KEELE STREET
VAUGHAN, ONTARIO
L4K 1Z8
T: 416 578 8682
MDU@WPEENGINEERING.COM

3075 PALLADIUM DRIVE OTTAWA, ONTARIO

Project Number			2034
Drawn	A.R.M	Scale	1:300
Checked	MD	Date	2024-07-08

PROPOSED STORM DRAINAGE AREA PLAN

Drawing No.

FIG.05

WPE Engineering Ltd.
Engineers, Planners and Project Managers

Table E-01: Storm Sewer Design Sheet
Proposed Condition

Prepared:	A.R.M	Page No.	E-01
Checked:	Z.D.		
Project #:	2034		
Date:	06-Jun-24		

Project: Proposed Commercial Development, 3075 Palladium Drive, City of Ottawa, ON.

LOCATION			AREA (ha)		RUNOFF COEFFICIENT (C)		2.78 x A x C				T_c (min)	RAINFALL INTENSITY - I (mm/hr)		PEAK FLOWS - Q_p (L/s)		RESTRICTIVE FLOWS (L/s)		PROPOSED STORM SEWER DESIGN							
DRAINAGE ID	FROM MH	TO MH	IND.	CUM.	5yr	100yr	INDIVIDUAL		CUMULATIVE			5yr	100yr	5yr	100yr	IND.	CUM.	SIZE (mm)	GRADE (%)	LENGTH (m)	SEWER CAPACITY (L/s)	FULL FLOW VELOCITY (m/s)	TIME OF FLOW (min)	5-yr PERCENT FULL (%)	100 % FULL WITH RESTRICTED CONTROLS (%)
							5yr	100yr	5yr	100yr															
TO CABELA'S WAY EX. STMMH 32																									
R1	BLDG A	201	0.23	0.23	0.90	1.00	0.57	0.64	0.57	0.64	10.00	104.19	178.56	59.72	113.72	9.16	9.16	251.46	1.58	3.80	75.92	1.53	0.04	79	12
	201	202	0.00	0.23	0.00	1.00	0.00	0.00	0.57	0.64	10.04	103.97	178.18	59.60	113.48	0.00	9.16	299.36	0.50	27.90	67.99	0.97	0.48	88	13
R2	BLDG A	202	0.19	0.19	0.90	1.00	0.47	0.52	0.47	0.52	10.00	104.19	178.56	48.97	93.24	7.51	7.51	251.46	1.54	6.50	74.95	1.51	0.07	65	10
	202	203	0.00	0.42	0.00	1.00	0.00	0.00	1.04	1.16	10.52	101.51	173.92	105.89	201.59	0.00	16.68	366.42	0.54	27.60	121.13	1.15	0.40	87	14
R3	BLDG A	203	0.14	0.14	0.90	1.00	0.34	0.38	0.34	0.38	10.00	104.19	178.56	35.72	68.01	5.48	5.48	251.46	1.08	6.50	62.77	1.26	0.09	57	9
	203	204	0.00	0.55	0.00	1.00	0.00	0.00	1.39	1.54	10.92	99.56	170.54	137.98	262.63	0.00	22.16	**FLOWS TO INFILTRATION GALLERY**							
STM11	CB 11	204	0.05	0.05	0.83	1.00	0.11	0.13	0.11	0.13	10.00	104.19	178.56	11.69	24.02	20.61	20.61	201.16	1.00	16.00	33.31	1.05	0.25	35	62
	204	205	0.00	0.60	0.00	1.00	0.00	0.00	1.50	1.67	10.92	99.56	170.54	149.16	285.57	0.00	42.77	457.00	0.45	13.20	199.29	1.21	0.18	75	21
STM1	CB 1	MAIN	0.23	0.23	0.87	1.00	0.55	0.64	0.55	0.64	10.00	104.19	178.56	57.53	113.53	65.33	65.33	251.46	1.33	3.00	69.65	1.40	0.04	83	94
STM2	CB 2	MAIN	0.15	0.15	0.82	1.00	0.34	0.42	0.34	0.42	10.00	104.19	178.56	35.89	74.70	43.22	43.22	251.46	1.00	3.00	60.40	1.22	0.04	59	72
STM3	CB 3	MAIN	0.08	0.08	0.78	0.97	0.16	0.21	0.16	0.21	10.00	104.19	178.56	17.16	36.76	21.27	21.27	201.16	1.00	3.00	33.31	1.05	0.05	52	64
STM4	CB 4	MAIN	0.15	0.15	0.84	1.00	0.35	0.42	0.35	0.42	10.00	104.19	178.56	36.98	75.48	42.44	42.44	251.46	1.07	2.80	62.48	1.26	0.04	59	68
	206	212	0.00	0.61	0.00	0.00	0.00	0.00	1.42	1.68	10.05	103.94	178.12	147.19	299.74	0.00	172.26	457.00	0.40	59.80	187.89	1.15	0.87	78	92
	212	205	0.00	0.61	0.00	0.00	0.00	0.00	1.42	1.68	10.92	99.56	170.54	140.98	286.98	0.00	172.26	533.00	0.47	12.70	306.97	1.38	0.15	46	56
STM10	CB 10	MAIN	0.05	0.05	0.83	1.00	0.12	0.15	0.12	0.15	10.00	104.19	178.56	12.72	26.33	20.73	20.73	201.16	0.98	16.40	32.97	1.04	0.26	39	63
	205	207	0.00	1.26	0.00	1.00	0.00	0.00	3.04	3.50	11.10	98.70	169.06	299.70	592.50	0.00	235.76	533.00	0.51	23.40	319.76	1.43	0.27	94	74
R6	BLDG D	207	0.08	0.08	0.90	1.00	0.20	0.23	0.20	0.23	10.00	104.19	178.56	21.22	40.40	40.48	40.48	251.46	1.89	3.70	83.03	1.67	0.04	26	49
STM6	CB 6	MAIN	0.15	0.15	0.88	1.00	0.37	0.42	0.37	0.42	10.00	104.19	178.56	38.81	75.33	42.73	42.73	251.46	1.01	15.90	60.70	1.22	0.22	64	70
	207	208	0.00	1.50	0.00	1.00	0.00	0.00	3.61	4.15	11.38	97.44	166.88	352.02	693.05	0.00	318.97	610.00	0.41	38.40	410.88	1.41	0.46	86	78
R4	BLDG B	209	0.07	0.07	0.90	1.00	0.17	0.19	0.17	0.19	10.00	104.19	178.56	17.92	34.13	34.13	34.13	251.46	1.08	6.50	62.77	1.26	0.09	29	54
STM5	CB 5	MAIN	0.06	0.06	0.83	1.00	0.15	0.18	0.15	0.18	10.00	104.19	178.56	15.42	31.85	21.04	21.04	201.16	0.96	11.40	32.64	1.03	0.19	47	64
	209	208	0.00	0.13	0.00	1.00	0.00	0.00	0.32	0.37	10.19	103.23	176.88	33.03	65.36	0.00	55.17	251.46	0.85	36.40	55.68	1.12	0.54	59	99
STM12	CBMH 208	210	0.02	0.02	0.53	0.66	0.02	0.03	3.96	4.55	11.83	95.42	163.39	377.50	743.71	5.27	379.41	610.00	0.53	15.10	467.15	1.60	0.16	81	81
	210	211	0.00	1.65	0.00	1.00	0.00	0.00	3.96	4.55	11.99	94.74	162.21	374.82	738.38	0.00	379.41	610.00	0.45	24.30	430.45	1.47	0.27	87	88
INFILTRATION GALLERY BYPASS																									
	203	212	0.00	0.00	0.00	0.00	0.00	0.00	1.39	1.54	10.92	99.56	170.54	137.98	262.63	0.00	22.16	366.42	1.68	32.70	213.65	2.03	0.27	65	10
	212	205	0.00	1.16	0.00	0.00	0.00	0.00	2.80	3.22	11.19	98.29	168.35	275.42	542.55	0.00	194.42	533.00	0.47	12.70	306.97	1.38	0.15	90	63
TO KANATA WEST CENTRE DRIVE EX STMMH 13																									
R5	BLDG C	EX MAIN	0.07	0.07	0.90	1.00	0.18	0.20	0.18	0.20	10.00	104.19	178.56	19.00	36.18	36.13	36.13	251.46	1.00	11.50	60.40	1.22	0.16	31	60
TO CABELA'S WAY EX STMMH 22																									
STM9	CB 9	MAIN	0.02	0.02	0.90	1.00	0.04	0.05	0.04	0.05	10.00	104.19	178.56	4.23	8.06	7.88	7.88	201.16	0.69	8.70	27.67	0.87	0.17	15	28
STM7	CB 7	CB 8	0.05	0.05	0.90	1.00	0.11	0.13	0.11	0.13	10.00	104.19	178.56	11.90	22.66	0.00	0.00	251.46	0.60	26.50	46.78	0.94	0.47	25	0
STM8	CBMH209	MAIN	0.07	0.12	0.86	1.00	0.17	0.20	0.29	0.33	10.47	101.78	174.38	29.17	56.98	48.00	49.00	251.46	0.78	11.50	53.34	1.07	0.18	55	92
STM13	21	EX22	0.16	0.30	0.77	0.97	0.35	0.44	0.68	0.81	10.65	100.89	172.85	68.22	139.66	52.10	107.98	533.00	0.16	109.00	179.10	0.80	2.26	38	60
DESIGN PARAMETERS																									

NOTES:

1. Rainfall intensity calculated using City of Ottawa IDF curve equations.
2. Peak flows calculated using the Rational Method.

Q = 2.78CIA, Where:
Q = Peak Flow (L/s)
A = Drainage Area (ha)
I = Rainfall Intensity (mm/hr)
C = Runoff Coefficient

3. Manning's roughness coefficient = 0.013
4. Full flow velocity: Min = 0.8m/s; Max = 3.0m/s (City of Ottawa Sewer Design Guidelines, v.2012)

Intensity Duration Frequency (IDF) Curve Equation (Rainfall Intensity - I in mm/hr):

100 year Intensity: $I_{100} = \frac{1735.688}{(\text{Time in} \quad 6.014)^{0.820}}$

50 year Intensity: $I_{50} = \frac{1569.580}{(\text{Time in mi} \quad 6.014)^{0.820}}$

25 year Intensity: $I_{25} = \frac{1402.884}{(\text{Time in min} + 6.014)^{0.819}}$

10 year Intensity: $I_{10} = \frac{1174.184}{(\text{Time in mi} \quad 6.014)^{0.816}}$

5 year Intensity: $I_5 = \frac{998.071}{(\text{Time in min} + 6.053)^{0.814}}$

2 year Intensity: $I_2 = \frac{732.951}{(\text{Time in min} + 6.199)^{0.810}}$

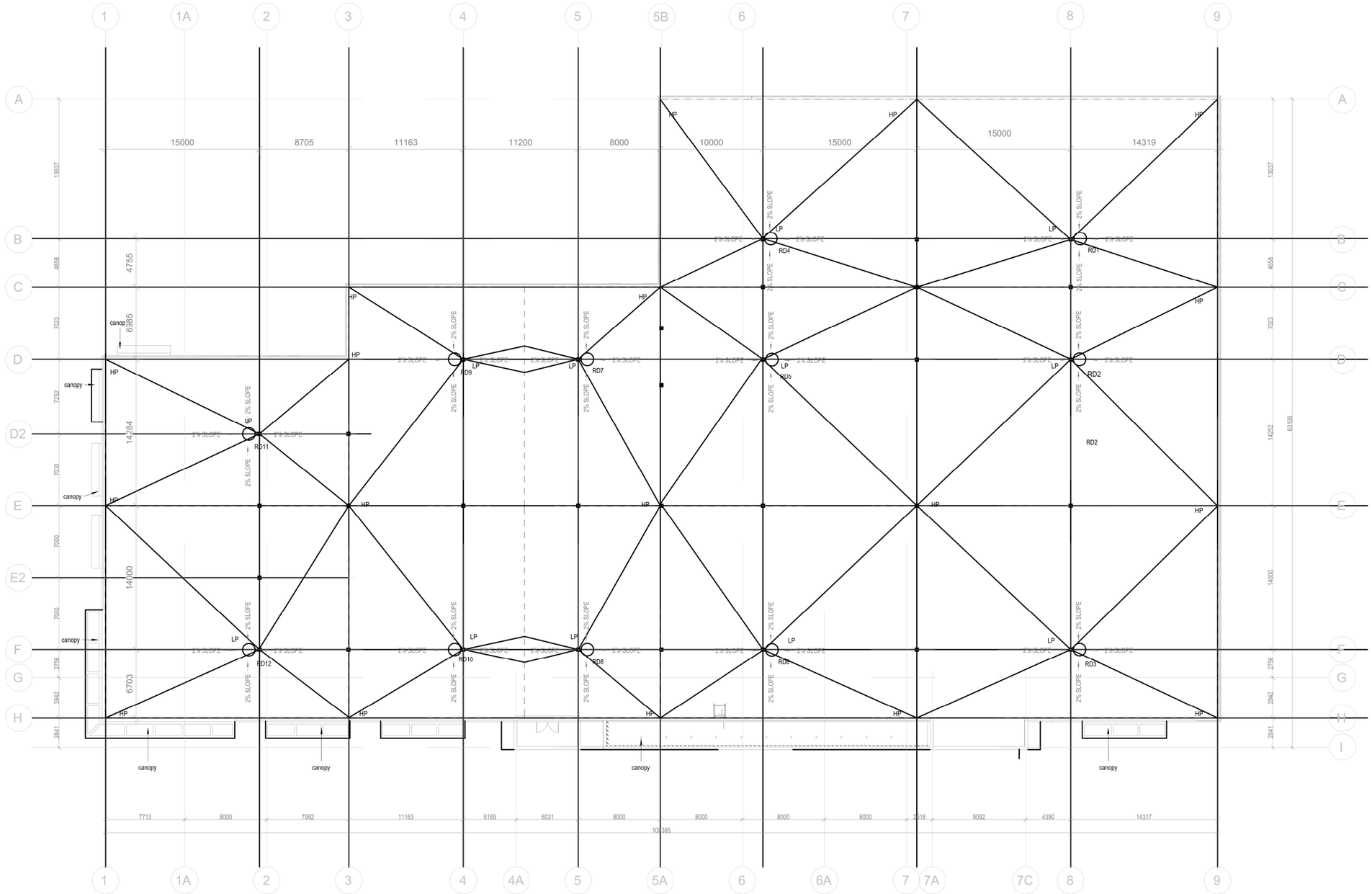
	WPE Engineering Ltd. Engineers, Planners and Project Managers	**Table E-02: Composite Runoff Coefficient Calculation Proposed Condition**			
		Prepared:	A.R.M	Page No.	E-02
		Checked:	Z.D.		
Project: Proposed Commercial Development, 3075 Palladium Drive, City of Ottawa, ON.		Proj. #	2034		
		Date:	06-Jun-24		

Composite Runoff Coefficient (C) Calculations for Storm Drainage Areas

Drainage ID	Impervious Area (ha)	Pervious Area (ha)	Gavel Area (ha)	Total Area (ha)	C - 5yr	C - 100yr	Percent Impervious (%)
R1	0.23	0.00	0.00	0.23	0.90	1.00	100.0
R2	0.19	0.00	0.00	0.19	0.90	1.00	100.0
R3	0.14	0.00	0.00	0.14	0.90	1.00	100.0
R4	0.07	0.00	0.00	0.07	0.90	1.00	100.0
R5	0.07	0.00	0.00	0.07	0.90	1.00	100.0
R6	0.08	0.00	0.00	0.08	0.90	1.00	100.0
STM1	0.22	0.01	0.00	0.23	0.87	1.00	95.5
STM2	0.13	0.02	0.00	0.15	0.82	1.00	89.0
STM3	0.06	0.0135	0.00	0.08	0.78	0.97	82.3
STM4	0.14	0.013	0.00	0.15	0.84	1.00	91.4
STM5	0.06	0.006	0.00	0.06	0.83	1.00	90.0
STM6	0.15	0.004	0.00	0.15	0.88	1.00	97.6
STM7	0.05	0.00	0.00	0.05	0.90	1.00	100.0
STM8	0.07	0.004	0.00	0.07	0.86	1.00	94.7
STM9	0.02	0.00	0.00	0.02	0.90	1.00	100.0
STM10	0.05	0.005	0.00	0.05	0.83	1.00	89.7
STM11	0.04	0.005	0.00	0.05	0.83	1.00	90.6
STM12	0.01	0.009	0.00	0.02	0.53	0.66	47.0
STM13	0.13	0.029	0.00	0.16	0.77	0.97	82.0
FF1	0.01	0.052	0.00	0.07	0.35	0.44	21.7
FF2	0.04	0.048	0.00	0.09	0.54	0.67	48.4
FF3	0.003	0.018	0.00	0.02	0.31	0.39	16.1
FF4	0.05	0.067	0.00	0.12	0.51	0.63	43.8
FF5	0.08	0.020	0.00	0.10	0.76	0.95	80.2
STM7 + STM8	0.11	0.004	0.00	0.12	0.88	1.00	96.7

Runoff Coefficients:

C impervious = 0.9
C pervious = 0.20
C gravel = 0.80
C_{100} = C * 1.25 (Max. 1.0)



No.	Revision	Date	By
3	REVISED FOR PERMIT	2024-12-08	
2	REVISED FOR PERMIT	2024-09-22	
1	ADDED PER CITY FOR PERMIT	2024-06-28	

JHD Engineering Inc.

7181 Yonge Street, Unit 290
Thornhill, ON
L3T 0C7

LICENSED PROFESSIONAL ENGINEER
J. HUANG
100063456
JUN 28, 2024
PROVINCE OF ONTARIO

SUNNY FOODMART

3075 PALLADIUM DRIVE
OTTAWA ON

Project number

Drawn	AL	Scale	1/16" =1' -0" (Arch D)
Checked	JH	Date	MAR 2024

Roof Drain Location

Drawing No.
M8.0

CONTROLLED FLOW ROOF DRAIN

Roof Drain ID	Drainage Area (SM)	Watts Roof Drain Model (Weir opening)	Controlled Flow per Drain (gpm)		Approximate Ponding Deoth (M)		Storage Volume Required (M3)		Max Storage Available (M3)
			1:5 Year	1:100 Year	1:5 Year	1:100 Year	1:5 Year	1:100 Year	
RD1	536.61	RD-100_A-ADJ (1/2 exposed)	17.50	20.00	0.108	0.141	9.92	22.27	26.83
RD2	624.05	RD-100_A-ADJ (1/2 exposed)	17.50	20.00	0.108	0.141	11.54	25.90	31.20
RD3	606.25	RD-100_A-ADJ (1/2 exposed)	17.50	20.00	0.108	0.141	11.21	25.16	30.31
RD4	457.54	RD-100_A-ADJ (1/2 exposed)	17.50	20.00	0.108	0.141	8.46	18.99	22.88
RD5	531.77	RD-100_A-ADJ (1/2 exposed)	17.50	20.00	0.108	0.141	9.83	22.07	26.59
RD6	517.57	RD-100_A-ADJ (1/2 exposed)	17.50	20.00	0.108	0.141	9.57	21.48	25.88
RD7	281.47	RD-100_A-ADJ (1/2 exposed)	17.50	20.00	0.108	0.141	5.20	11.68	14.07
RD8	273.82	RD-100_A-ADJ (1/2 exposed)	17.50	20.00	0.108	0.141	5.06	11.36	13.69
RD9	364.42	RD-100_A-ADJ (1/2 exposed)	17.50	20.00	0.108	0.141	6.74	15.12	18.22
RD10	354.58	RD-100_A-ADJ (1/2 exposed)	17.50	20.00	0.108	0.141	6.56	14.72	17.73
RD11	338.61	RD-100_A-ADJ (1/2 exposed)	17.50	20.00	0.108	0.141	6.26	14.05	16.93
RD12	490.77	RD-100_A-ADJ (1/2 exposed)	17.50	20.00	0.108	0.141	9.07	20.37	24.54
Total Roof(SM)	5,678.00			240.00			104.98	235.64	268.87

ROOFDRAIN & ASSUMPTION

ROOFDRAIN DESIGN PARAMETERS

1. ROOF AREA=5678 M2
2. STORM WATER STORAGE
   V5 YEAR = 104.98M2, 18.49mm PONDING DEPTH;
   V100 YEAR = 235.64M3, 41.50mm PONDING DEPTH
3. MAXIMUM TOTAL DISCHARGE FLOW = 22.71 L/S (360 GPM)
4. TOTAL 12 ROOF DRAIN. MAXIMUM AREA OF RD2 WILL HANDLE 6717.26 SF (624.05 SM) OF WATER.

   FOR RD2
   5 YEAR REQUIRED STORAGE IS 11.53 M3
   100 YEAR REQUIRED STORAGE IS 25.90 M3
   THE RD2 MAX AVAILABLE STORAGE IS 31.20 M3, MAX AVAILABLE PONDING DEPTH IS 150mm. IT IS SATISFIED.

CONTROL ROOFDRAIN SELECTION

1. WATTS ADJUSTABLE FLOW CONTROL ROOF DRAIN IS SELECTED. MODEL: RD-100_A-ADJ
2. WITH WEIR OPENING EXPOSED (1/2 EXPOSED), THE CONTROL ROOF DRAIN FLOW RATE IS 20 GPM AT 6" (150mm) HEAD.
3. THE 100 YEAR RAINFALL WATER STORAGE 235.64 M3 ON THE ROOF. IT IS 62,249.5 GALLON.
3. SELECTED ROOF DRAIN FLOW RATE 20 GPM, TOTAL 12 ROOF DRAINS WILL PROVIDE 12X20=240 GPM.
   THE WATER RELEASE TIME WILL BE 62,249.5/240 = 4.3 HOUR.
4. THE TOTAL 12 ROOF DRAIN FLOW RATE IS 240 GPM. THIS VALUE IS LESS THAN THE MAXIMUM ALLOWABLE FLOW RATE OF 360 GPM. IT IS SATISFIED.
5. SCUPPERS WILL BE PROVIDED ALONG PERIMETER PARAPET FOR OVERFLOW.
   THE MINIMUM 3" SCUPPER HEIGHT IS REQUIRED.

WATTS® Adjustable Accutrol Weir Adjustable Flow Control for Roof Drains

Tag:

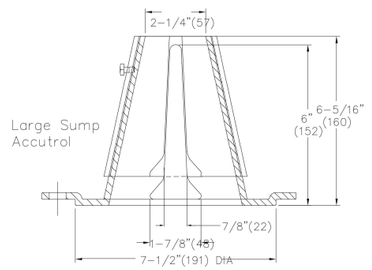
ADJUSTABLE ACCUTROL

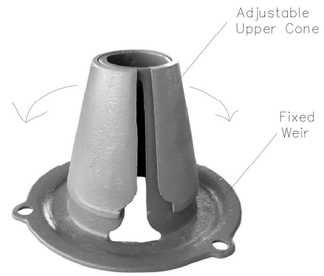
For more flexibility in controlling flow with heads deeper than 2", Watts Drainage offers the Adjustable Accutrol. The Adjustable Accutrol Weir is designed with a single parabolic opening that can be covered to restrict flow above 2" of head to less than 5 gpm per inch, up to 6" of head. To adjust the flow rate for depths over 2" of head, set the slot in the adjustable upper cone according to the flow rate required. Refer to Table 1 below.
Note: Flow rates are directly proportional to the amount of weir opening that is exposed.

EXAMPLE:

For example, if the adjustable upper cone is set to cover 1/2 of the weir opening, flow rates above 2"of head will be restricted to 2-1/2 gpm per inch of head.

Therefore, at 3"of head, the flow rate through the Accutrol Weir that has 1/2 the slot exposed will be:
[5 gpm (per inch of head) x 2 inches of head] + 2-1/2 gpm (for the third inch of head) = 12-1/2 gpm.





1/2 Weir Opening Exposed Shown Above

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

WATTS CONTROL ROOF DRAIN

No.	Revision	Date	By
3	REVISED FOR PERMIT	2024-12-08	
2	REVISED FOR PERMIT	2024-09-22	
1	ADDED PER CITY FOR PERMIT	2024-06-28	

JHD Engineering Inc.

7181 Yonge Street, Unit 290
Thornhill, ON
L3T 0C7

LICENSED PROFESSIONAL ENGINEER
J. HUANG
100004NA
JUN 28, 2024
PROVINCE OF ONTARIO

SUNNY FOODMART

3075 PALLADIUM DRIVE
OTTAWA ON

Project number

Drawn	AL	Scale	N.T.S. (Arch D)
Checked	JH	Date	MAR 2024

Roof Drain flow rate & control

Drawing No.
M8.1

Appendix F

Table 4.2 SWMHYMO Modeling Results (prepared by IBI Group)

Site Contribution STM Area Plan (FIG. 06)

Flow Calculations (Table F-01 to F-02)

Allocated Release Rates and Site Outflows (Table F-03)

Ponding and Orifice Size/ICD Calculations (Table F-04)

Surface Storage Volume Calculations (Table F-05 to 07)

Figure 2 – Post-Development SWM Boundaries (prepared by IBI Group)

Infiltration Gallery Calculations (Table F-08 to F-10)

Sample Infiltration Gallery Calculations (prepared by IBI Group)

Table 4.8 – Summary of HGL (prepared by IBI Group)

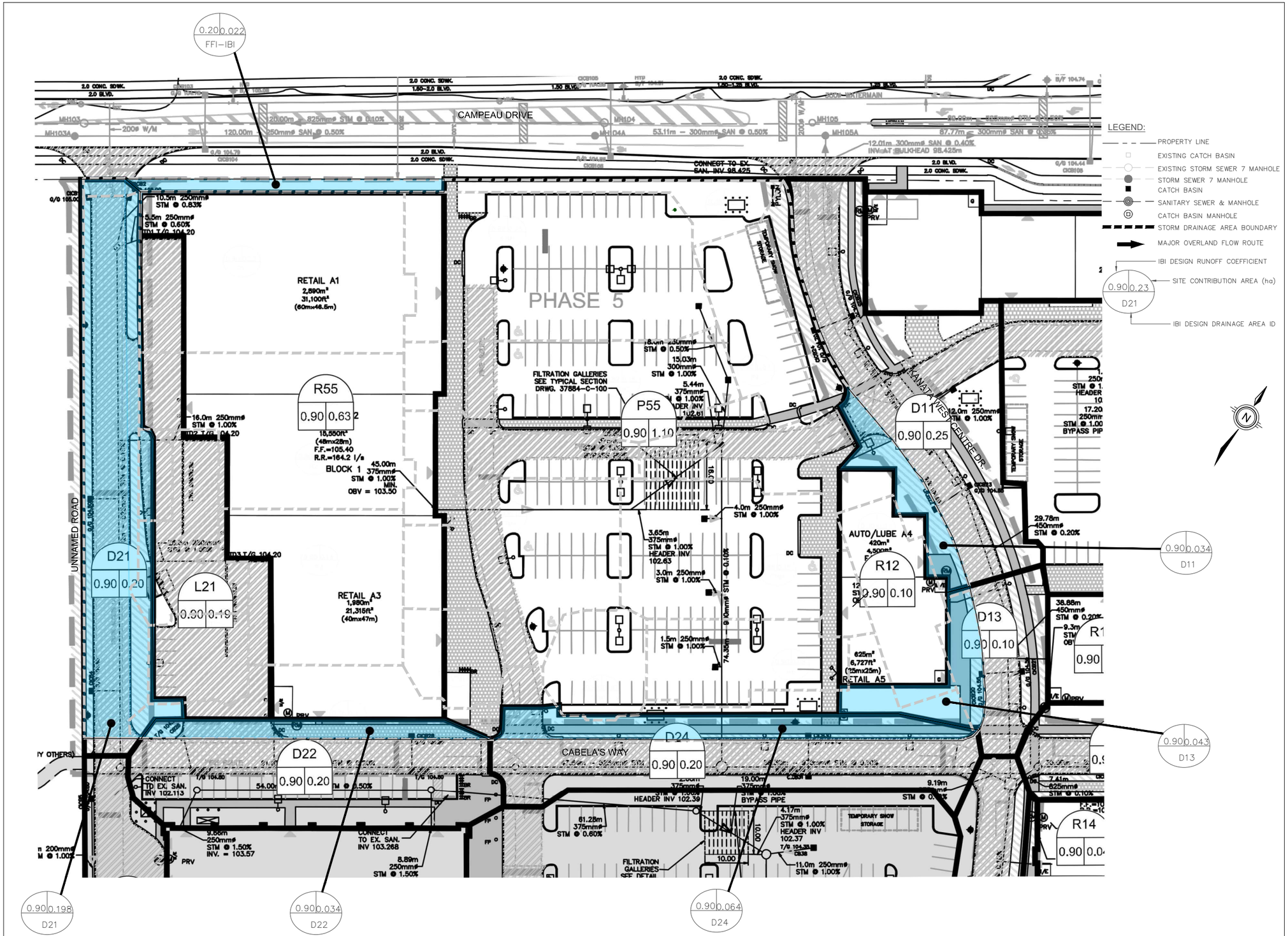
Hydraulic Grade Line Computation Form (Table F-11)

flow on the streets. The 8m wide driveway was entered into the model with the appropriate longitudinal slopes to obtain the maximum normal depth and velocity of flow, based on the maximum major flow from the SWMHYMO model results. The SWMHYMO output file is provided within **Appendix C** for reference. The results of the evaluation are presented in the below tables.

Table 4.2 SWMHYMO Modeling Results: 5 Year and 100 Year Chicago Storm Events

AREA ID	PEAK RUNOFF (L/S)		CAPTURE (L/S)	
	5 yr CHI	100 yr chi	5 yr CHI	100 yr chi
D21i	11	20	11	13
D21ii	85	156	85	127
D22i	28	49	24	24
D29/L29	36	66	36	61
D30	47	85	47	49
P35/L19	73	132	73	132
R55	170	300	164	164
R12	29	49	26	26
P55	260	478	260	451
D11	61	112	61	68
D13	28	49	26	28
D22ii	28	49	28	29
D24	48	88	48	54
R27A	70	122	65	65
R27B	54	93	50	50
R13	17	30	16	16
P27	174	318	174	238
D25ii	19	34	18	19
D25i	23	42	23	24
D26	22	39	21	22
D14	24	43	24	26
R31	89	156	89	156
R19	89	156	89	156
P31	320	593	320	510
D15	32	57	31	33
R14	11	20	10	10
R25	14	25	13	13
P28	106	187	102	105
R38A	48	83	44	44
P46	59	108	59	65
R38B	136	240	130	130
P38	278	506	278	459
P19	92	167	92	97
D18	38	70	38	40
D16	27	48	26	27
R35	67	117	63	63
P34/L34	166	301	166	204

From a major system perspective, major flow from the majority of the development cascades to Feedmill Creek. A summary of the results of the modelling for the 5 year and 100 year Chicago design storm events are presented in the below **Tables 4.3 and 4.4**:



THE LOCATION OF ALL UNDER- / ABOVE-GROUND UTILITIES AND SERVICES IS APPROXIMATE ONLY AND WHERE SHOWN ON THE DRAWING(S) THE ACCURACY OF THE UTILITIES AND SERVICES IS NOT GUARANTEED. THE OWNER AND / OR HIS REPRESENTATIVE SHALL DETERMINE THE LOCATION OF ALL UTILITIES AND SERVICES BEFORE COMMENCING ANY CONSTRUCTION ACTIVITIES.

DO NOT SCALE DRAWINGS.

CONTRACTOR MUST CHECK & VERIFY ALL DIMENSIONS ON SITE.

THIS DRAWING IS NOT TO BE USED FOR CONSTRUCTION.

No.	Issued	Date	By
1	ISSUED FOR SPA	10-06-2024	



LICENSED PROFESSIONAL ENGINEER
Z. DU
10–06–2024
PROVINCE OF ONTARIO

WPE ENGINEERING LTD.
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VAUGHAN, ONTARIO
L4K 1Z8
T: 416 578 8682
MDU@WPEENGINEERING.COM

3075 PALLADIUM DRIVE OTTAWA, ONTARIO

Project Number	2034		
Drawn	A.R.M	Scale	NTS
Checked	MD	Date	2024-06-03

SITE CONTRIBUTION STM AREA PLAN

Drawing No.

FIG. 06

WPE Engineering Ltd.
Engineers, Planners and Project Managers

Table F-01: Flow Calculations
Proposed Condition

Prepared:	A.R.M	Page No.	F-01
Checked:	Z.D		
Project #:	2034		
Date:	06-Jun-25		

Project: Proposed Commercial Development, 3075 Palladium Drive, City of Ottawa, ON.

Flow Calculations - Area R1

Area ID	R1
Area (ha)	0.2291
C	0.90
C (100yr)	1
Controlled Rate (L/s)	9.164

Design Event	Time (min)	Rainfall Intensity (mm/hr)	Flow (L/s)	Runoff (m^3)	Release Volume (m^3)	Storage (m^3)
2-yr	10	76.8	44.0	26.4	5.5	20.9
	15	61.8	35.4	31.9	8.2	23.6
	20	52.0	29.8	35.8	11.0	24.8
	25	45.2	25.9	38.8	13.7	25.1
	30	40.0	23.0	41.3	16.5	24.8
	35	36.1	20.7	43.4	19.2	24.2
5-yr	10	104.2	59.7	35.8	5.5	30.3
	15	83.6	47.9	43.1	8.2	34.9
	20	70.3	40.3	48.3	11.0	37.3
	25	60.9	34.9	52.4	13.7	38.6
	30	53.9	30.9	55.6	16.5	39.1
	35	48.5	27.8	58.4	19.2	39.2
	40	44.2	25.3	60.8	22.0	38.8
100-yr	10	178.6	113.7	68.2	5.5	62.7
	15	142.9	91.0	81.9	8.2	73.7
	20	120.0	76.4	91.7	11.0	80.7
	25	103.8	66.1	99.2	13.7	85.5
	30	91.9	58.5	105.3	16.5	88.8
	35	82.6	52.6	110.4	19.2	91.2
	40	75.1	47.9	114.9	22.0	92.9
	45	69.1	44.0	118.7	24.7	94.0
	50	64.0	40.7	122.2	27.5	94.7
	55	59.6	38.0	125.3	30.2	95.1
	60	55.9	35.6	128.2	33.0	95.2
	65	52.6	33.5	130.8	35.7	95.0

Notes:
1. Rainfall intesnity calculated using City of Ottawa IDF curve equations.
2. Flow calculated using the Rational Method. Q=2.78CiA.
3. C (100yr) = C + 25% (Max. 1.0)

Flow Calculations - Area R4

Area ID	R4
Area (ha)	0.07
C	0.90
C (100yr)	1

Design Event	Time (min)	Rainfall Intensity (mm/hr)	Flow (L/s)
2-yr	10	76.8	13.2
	15	61.8	10.6
	20	52.0	8.9
	25	45.2	7.8
	30	40.0	6.9
	35	36.1	6.2
5-yr	10	104.2	17.9
	15	83.6	14.4
	20	70.3	12.1
	25	60.9	10.5
	30	53.9	9.3
	35	48.5	8.3
	40	44.2	7.6
100-yr	10	178.6	34.1
	15	142.9	27.3
	20	120.0	22.9
	25	103.8	19.8
	30	91.9	17.6
	35	82.6	15.8
	40	75.1	14.4
	45	69.1	13.2
	50	64.0	12.2
	55	59.6	11.4
	60	55.9	10.7
	65	52.6	10.1

Notes:
1. Rainfall intesnity calculated using City of Ottawa IDF curve equations.
2. Flow calculated using the Rational Method. Q=2.78CiA.
3. C (100yr) = C + 25% (Max. 1.0)

Flow Calculations - Area R5

Area ID	R5
Area (ha)	0.07
C	0.90
C (100yr)	1

Design Event	Time (min)	Rainfall Intensity (mm/hr)	Flow (L/s)
2-yr	10	76.8	14.0
	15	61.8	11.3
	20	52.0	9.5
	25	45.2	8.2
	30	40.0	7.3
	35	36.1	6.6
5-yr	10	104.2	19.0
	15	83.6	15.2
	20	70.3	12.8
	25	60.9	11.1
	30	53.9	9.8
	35	48.5	8.8
	40	44.2	8.1
100-yr	10	178.6	36.2
	15	142.9	29.0
	20	120.0	24.3
	25	103.8	21.0
	30	91.9	18.6
	35	82.6	16.7
	40	75.1	15.2
	45	69.1	14.0
	50	64.0	13.0
	55	59.6	12.1
	60	55.9	11.3
	65	52.6	10.7

Notes:
1. Rainfall intesnity calculated using City of Ottawa IDF curve equations.
2. Flow calculated using the Rational Method. Q=2.78CiA.
3. C (100yr) = C + 25% (Max. 1.0)

Flow Calculations - Area R2

Area ID	R2
Area (ha)	0.18784
C	0.9
C (100yr)	1
Controlled Rate (L/s)	7.5136

Design Event	Time (min)	Rainfall Intensity (mm/hr)	Flow (L/s)	Runoff (m^3)	Release Volume (m^3)	Storage (m^3)
2-yr	10	76.8	36.1	21.7	4.5	17.1
	15	61.8	29.0	26.1	6.8	19.4
	20	52.0	24.5	29.3	9.0	20.3
	25	45.2	21.2	31.8	11.3	20.6
	30	40.0	18.8	33.9	13.5	20.4
	35	36.1	16.9	35.6	15.8	19.8
5-yr	10	104.2	49.0	29.4	4.5	24.9
	15	83.6	39.3	35.3	6.8	28.6
	20	70.3	33.0	39.6	9.0	30.6
	25	60.9	28.6	42.9	11.3	31.7
	30	53.9	25.3	45.6	13.5	32.1
	35	48.5	22.8	47.9	15.8	32.1
	40	44.2	20.8	49.8	18.0	31.8
100-yr	10	178.6	93.2	55.9	4.5	51.4
	15	142.9	74.6	67.2	6.8	60.4
	20	120.0	62.6	75.2	9.0	66.1
	25	103.8	54.2	81.3	11.3	70.1
	30	91.9	48.0	86.4	13.5	72.8
	35	82.6	43.1	90.6	15.8	74.8
	40	75.1	39.2	94.2	18.0	76.1
	50	64.0	33.4	100.2	22.5	77.6
	60	55.9	29.2	105.1	27.0	78.0
	70	49.8	26.0	109.2	31.6	77.6

Notes:
1. Rainfall intesnity calculated using City of Ottawa IDF curve equations.
2. Flow calculated using the Rational Method. Q=2.78CiA.
3. C (100yr) = C + 25% (Max. 1.0)

Free Flow Calculations - Area FF3 to Kanata West Centre Drive U/S

Area ID	FF3
Area (ha)	0.02
C	0.31
C (100yr)	0.39

Design Event	Time (min)	Rainfall Intensity (mm/hr)	Flow (L/s)
2-yr	10	76.8	1.4
	15	61.8	1.1
	20	52.0	1.0
	25	45.2	0.8
	30	40.0	0.7
	35	36.1	0.7
5-yr	10	104.2	1.9
	15	83.6	1.5
	20	70.3	1.3
	25	60.9	1.1
	30	53.9	1.0
	35	48.5	0.9
	40	44.2	0.8
100-yr	10	178.6	4.1
	15	142.9	3.3
	20	120.0	2.7
	25	103.8	2.4
	30	91.9	2.1
	35	82.6	1.9
	40	75.1	1.7
	50	64.0	1.5
	60	55.9	1.3
	70	49.8	1.1

Notes:
1. Rainfall intesnity calculated using City of Ottawa IDF curve equations.
2. Flow calculated using the Rational Method. Q=2.78CiA.
3. C (100yr) = C + 25% (Max. 1.0)

Flow Calculations - Area R6

Area ID	R6
Area (ha)	0.08
C	0.90
C (100yr)	1

Design Event	Time (min)	Rainfall Intensity (mm/hr)	Flow (L/s)
2-yr	10	76.8	15.6
	15	61.8	12.6
	20	52.0	10.6
	25	45.2	9.2
	30	40.0	8.2
	35	36.1	7.3
5-yr	10	104.2	21.2
	15	83.6	17.0
	20	70.3	14.3
	25	60.9	12.4
	30	53.9	11.0
	35	48.5	9.9
	40	44.2	9.0
100-yr	10	178.6	40.4
	15	142.9	32.3
	20	120.0	27.1
	25	103.8	23.5
	30	91.9	20.8
	35	82.6	18.7
	40	75.1	17.0
	50	64.0	14.5
	60	55.9	12.6
	70	49.8	11.3

Notes:
1. Rainfall intesnity calculated using City of Ottawa IDF curve equations.
2. Flow calculated using the Rational Method. Q=2.78CiA.
3. C (100yr) = C + 25% (Max. 1.0)

WPE Engineering Ltd. Engineers, Planners and Project Managers	**Table F-02: Flow Calculations** **Proposed Condition**	
	Prepared: A.R.M	Page No. F-02
	Checked: Z.D	
Project: Proposed Commercial Development, 3075 Palladium Drive, City of Ottawa, ON.	Project #: 2034	
	Date: 06-Jun-25	

Flow Calculations - Area R3

Area ID	**R3**
Area (ha)	**0.137013**
C	**0.9**
C (100yr)	**1**
Controlled Rate (L/s)	**5.48052**

Design Event	Time (min)	Rainfall Intensity (mm/hr)	Flow (L/s)	Runoff (m^3)	Release Volume (m^3)	Storage (m^3)
2-yr	**10**	**76.8**	**26.3**	**15.8**	**3.3**	**12.5**
	15	61.8	21.2	19.1	4.9	14.1
	20	52.0	17.8	21.4	6.6	14.8
	25	45.2	15.5	23.2	8.2	15.0
	30	40.0	13.7	24.7	9.9	14.8
	35	36.1	12.4	26.0	11.5	14.4
5-yr	**10**	**104.2**	**35.7**	**21.4**	**3.3**	**18.1**
	15	83.6	28.6	25.8	4.9	20.8
	20	70.3	24.1	28.9	6.6	22.3
	25	60.9	20.9	31.3	8.2	23.1
	30	53.9	18.5	33.3	9.9	23.4
	35	48.5	16.6	34.9	11.5	23.4
	40	44.2	15.1	36.4	13.2	23.2
100-yr	**10**	**178.6**	**68.0**	**40.8**	**3.3**	**37.5**
	15	142.9	54.4	49.0	4.9	44.1
	20	120.0	45.7	54.8	6.6	48.2
	25	103.8	39.6	59.3	8.2	51.1
	30	91.9	35.0	63.0	9.9	53.1
	35	82.6	31.5	66.1	11.5	54.5
	40	75.1	28.6	68.7	13.2	55.5
	50	64.0	24.4	73.1	16.4	56.6
	60	55.9	21.3	76.6	19.7	56.9
	70	49.8	19.0	79.7	23.0	56.6

Notes:
1. Rainfall intesnity calculated using City of Ottawa IDF curve equations.
2. Flow calculated using the Rational Method. Q=2.78CiA.
3. C (100yr) = C + 25% (Max. 1.0)

Free Flow Calculations - Area FF2 to Kanata West Centre Drive U/S

Area ID	**FF2**
Area (ha)	**0.09**
C	**0.54**
C (100yr)	**0.67**

Design Event	Time (min)	Rainfall Intensity (mm/hr)	Flow (L/s)
2-yr	**10**	**76.8**	**10.7**
	15	61.8	8.6
	20	52.0	7.2
	25	45.2	6.3
	30	40.0	5.6
	35	36.1	5.0
5-yr	**10**	**104.2**	**14.5**
	15	83.6	11.6
	20	70.3	9.8
	25	60.9	8.5
	30	53.9	7.5
	35	48.5	6.7
	40	44.2	6.1
100-yr	**10**	**178.6**	**31.0**
	15	142.9	24.8
	20	120.0	20.8
	25	103.8	18.0
	30	91.9	15.9
	35	82.6	14.3
	40	75.1	13.0
	50	64.0	11.1
	60	55.9	9.7
	70	49.8	8.6

Notes:
1. Rainfall intesnity calculated using City of Ottawa IDF curve equations.
2. Flow calculated using the Rational Method. Q=2.78CiA.
3. C (100yr) = C + 25% (Max. 1.0)

Free Flow Calculations - Area FF5 to Cabela's U/S MH23

Area ID	**FF5**
Area (ha)	**0.10**
C	**0.76**
C (100yr)	**0.95**

Design Event	Time (min)	Rainfall Intensity (mm/hr)	Flow (L/s)
2-yr	**10**	**76.8**	**16.4**
	15	61.8	13.2
	20	52.0	11.1
	25	45.2	9.7
	30	40.0	8.6
	35	36.1	7.7
5-yr	**10**	**104.2**	**22.3**
	15	83.6	17.9
	20	70.3	15.0
	25	60.9	13.0
	30	53.9	11.5
	35	48.5	10.4
	40	44.2	9.5
100-yr	**10**	**178.6**	**47.8**
	15	142.9	38.2
	20	120.0	32.1
	25	103.8	27.8
	30	91.9	24.6
	35	82.6	22.1
	40	75.1	20.1
	50	64.0	17.1
	60	55.9	15.0
	70	49.8	13.3

Notes:
1. Rainfall intesnity calculated using City of Ottawa IDF curve equations.
2. Flow calculated using the Rational Method. Q=2.78CiA.
3. C (100yr) = C + 25% (Max. 1.0)

Free Flow Calculations - Area FF1 to Campeau Drive

Area ID	**FF1**
Area (ha)	**0.07**
C	**0.35**
C (100yr)	**0.44**

Design Event	Time (min)	Rainfall Intensity (mm/hr)	Flow (L/s)
2-yr	**10**	**76.8**	**5.0**
	15	61.8	4.0
	20	52.0	3.4
	25	45.2	2.9
	30	40.0	2.6
	35	36.1	2.3
5-yr	**10**	**104.2**	**6.8**
	15	83.6	5.4
	20	70.3	4.6
	25	60.9	4.0
	30	53.9	3.5
	35	48.5	3.2
100-yr	**10**	**178.6**	**14.5**
	15	142.9	11.6
	20	120.0	9.7
	25	103.8	8.4
	30	91.9	7.5
	35	82.6	6.7

Notes:
1. Rainfall intesnity calculated using City of Ottawa IDF curve equations.
2. Flow calculated using the Rational Method. Q=2.78CiA.
3. C (100yr) = C + 25% (Max. 1.0)

Free Flow Calculations - Area FF4 to Cabela's Way U/S MH32

Area ID	**FF4**
Area (ha)	**0.12**
C	**0.51**
C (100yr)	**0.63**

Design Event	Time (min)	Rainfall Intensity (mm/hr)	Flow (L/s)
2-yr	**10**	**76.8**	**12.8**
	15	61.8	10.3
	20	52.0	8.7
	25	45.2	7.6
	30	40.0	6.7
	35	36.1	6.0
5-yr	**10**	**104.2**	**17.4**
	15	83.6	14.0
	20	70.3	11.8
	25	60.9	10.2
	30	53.9	9.0
	35	48.5	8.1
100-yr	**10**	**178.6**	**37.3**
	15	142.9	29.9
	20	120.0	25.1
	25	103.8	21.7
	30	91.9	19.2
	35	82.6	17.3

Notes:
1. Rainfall intesnity calculated using City of Ottawa IDF curve equations.
2. Flow calculated using the Rational Method. Q=2.78CiA.
3. C (100yr) = C + 25% (Max. 1.0)

WPE Engineering Ltd.
Engineers, Planners and Project Managers

Table F-03:Allocated Release Rates and Site Outflows

Prepared:	A.R.M	Page No.	F-03
Checked:	Z.D.		
Proj. #	2034		
Date:	06-Jun-25		

Project: Proposed Commercial Development, 3075 Palladium Drive, City of Ottawa, ON.

Allowable Release Rates							Site Outflows				Net Change	
Drainage Area	IBI Design			Site Contribution			Drainage Area	Subject Site			Peak Runoff/Controlled Flows (L/s)	
	Area (ha)	Peak Runoff/Capture Rate (L/s)		Area (ha)	Pro-rated allowable (L/s)			Area (ha)	Peak Runoff/Controlled Flows (L/s)			
		5yr	100yr		5yr	100yr			5yr	100yr	5yr	100yr
To Campeau Drive												
FF1-IBI	0.022	1.3	2.9	0.022	1.3	2.9	FF1	0.07	6.8	14.5		
Sub-Total	0.022	1.3	2.9	0.022	1.3	2.9	**Sub-Total**	0.07	6.8	14.50	-5.4	-11.6
To Kanata West Centre Drive U/S MH12												
D11	0.25	61.0	112.0	0.034	8.3	15.2	FF2	0.09	14.5	31.0		
Sub-Total	0.25	61.0	112.0	0.034	8.3	15.2	**Sub-Total**	0.09	14.5	31.0	-6.2	-15.8
To Kanata West Centre Drive U/S MH13												
R12	0.10	26.0	26.0	0.10	26.0	26.0	R5	0.07	19.0	36.2		
Sub-Total	0.10	26.0	26.0	0.10	26.0	26.0	**Sub-Total**	0.07	19.0	36.2	7.0	-10.2
To Kanata West Centre Drive U/S MH14												
D13	0.10	28.0	49.0	0.043	12.0	21.1	FF3	0.02	1.9	4.1		
Sub-Total	0.10	28.0	49.0	0.043	12.0	21.1	**Sub-Total**	0.02	1.9	4.1	10.1	17.0
To Cabela's Way U/S MH22												
D21	0.20	120.0	164.0	0.198	118.8	162.4	STM7 + STM8	0.12	48.0	49.0		
L21	0.19	49.5	84.9	0.19	49.5	84.9	STM9	0.02	7.9	7.9		
							STM13	0.16	52.1	52.1		
Sub-Total	0.39	169.50	248.90	0.39	168.30	247.26	**Sub-Total**	0.30	107.98	108.98	60.3	138.3
To Cabela's Way U/S MH23												
D22	0.20	28.0	49.0	0.034	4.8	8.3	FF5	0.10	22.3	47.8		
Sub-Total	0.20	28.0	49.0	0.034	4.8	8.3	**Sub-Total**	0.10	22.3	47.8	-17.5	-39.4
To Cabela's Way U/S MH32												
P55	1.10	260.0	451.0	1.10	260.0	451.0	R1	0.23	9.2	9.2		
R55	0.63	164.0	164.0	0.63	164.0	164.0	R2	0.19	7.5	7.5		
D24	0.20	48.0	54.0	0.064	15.4	17.3	R3	0.14	5.5	5.5		
							R4	0.07	17.9	34.1		
							R6	0.15	21.2	40.4		
							STM1	0.23	60.0	65.3		
							STM2	0.15	40.0	43.2		
							STM3	0.08	20.0	21.3		
							STM4	0.15	40.0	42.4		
							STM5	0.06	20.0	21.0		
							STM6	0.15	40.0	42.7		
							STM10	0.05	20.0	20.7		
							STM11	0.05	20.0	20.6		
							STM12	0.02	2.5	5.3		
							FF4	0.12	17.4	37.3		
Sub-Total	**1.9**	**472.0**	**669.0**	**1.8**	**439.4**	**632.3**	**Sub-Total**	**1.8**	**341.2**	**416.7**	**98.1**	**215.6**
Total	**3.0**	**785.8**	**1156.8**	**2.4**	**660.1**	**953.1**	**Total**	**2.5**	**513.6**	**659.2**	**146.4**	**293.9**

Notes:

1. IBI Design Values: The design values used are based on Table 4.2 from the KWRC Design Brief, 2016, prepared by the IBI Group.
2. Site Contribution Values: These values are prorated based on the area of the subject site within the IBI drainage area.
3. Allowable Release Rates (Areas D11, D13, D21, D22, and D24): These rates correspond to the peak runoff values specified in Table 4.2.
4. Allowable Release Rates (Areas R12, R55, and P55): These rates correspond to the capture rates listed in Table 4.2.
5. Reference Plans: For detailed information, refer to the Storm Drainage Area Plan (DWG. 23027-STM1) and the KWRC Storm Drainage Area Plan in Appendix E.

WPE Engineering Ltd.
Engineers, Planners and Project Managers

Table F-04: Ponding and Orifice Size Calculations - Proposed Condition

Prepared:	A.R.M	Page No.	F-04
Checked:	Z.D.		
Project #:	2034		
Date:	06-Jun-24		

Project: Proposed Commercial Development, 3075 Palladium Drive, City of Ottawa, ON.

Structure ID	Drainage ID	Outlet Pipe Inv. Elev. (m)	Outlet Pipe Dia. (m)	C/L Orifice Elev. (m)	T/G Elev. (m)	2-year Ponding			5-year Ponding			100-year Ponding			Outflows (L/s)			Orifice Area (m^2)	Orifice Diameter (mm)	Orifice Type
						Depth (m)	Elev. (m)	Head (m)	Depth (m)	Elev. (m)	Head (m)	Depth (m)	Elev. (m)	Head (m)	2-yr	5-yr	100-yr			
CB 1	STM1	103.50	0.251	103.63	104.65	0.00	104.65	1.02	0.00	104.65	1.02	0.19	104.84	1.21	60.0	60.0	65.3	0.022	167.1	Circular, Slide
CB 2	STM2	103.43	0.251	103.56	104.63	0.00	104.63	1.07	0.00	104.63	1.07	0.18	104.81	1.25	40.0	40.0	43.2	0.014	134.8	Circular, Slide
CB 3	STM3	103.38	0.201	103.48	104.70	0.00	104.70	1.22	0.00	104.70	1.22	0.16	104.86	1.38	20.0	20.0	21.3	0.007	92.4	Circular, Slide
CB 4	STM4	103.27	0.251	103.40	104.67	0.00	104.67	1.27	0.00	104.67	1.27	0.16	104.83	1.43	40.0	40.0	42.4	0.013	129.2	Circular, Slide
CB 5	STM5	103.22	0.201	103.32	104.73	0.00	104.73	1.41	0.00	104.73	1.41	0.15	104.88	1.56	20.0	20.0	21.0	0.006	89.1	Circular, Slide
CB 6	STM6	103.11	0.251	103.24	104.65	0.00	104.65	1.41	0.00	104.65	1.41	0.20	104.85	1.61	40.0	40.0	42.7	0.012	125.9	Circular, Slide
CBMH209	STM7 + STM8	103.12	0.251	103.25	104.90	0.00	104.90	1.65	0.00	104.90	1.65	0.07	104.97	1.72	48.0	48.0	49.0	0.014	132.6	Circular, Slide
CB 10	STM10	103.29	0.201	103.39	104.73	0.00	104.73	1.34	0.00	104.73	1.34	0.10	104.83	1.44	20.0	20.0	20.7	0.006	90.2	Circular, Slide
CB 11	STM11	103.43	0.201	103.53	104.83	0.00	104.83	1.30	0.00	104.83	1.30	0.08	104.91	1.38	20.0	20.0	20.6	0.006	90.9	Circular, Slide

Notes:

1. Ponding depths are measured from the ponding elevation to the T/G elevation.
2. Heads are measured from the ponding elevation to the centreline of orifice elevation.
3. Orifice Area = (Q/1000) / 0.61(2*9.81*H_{100})^0.5 (OSDG Section 8.3.8.1)
4. Orifice areas are calculated using 2 year head and outflow values.

WPE Engineering Ltd. Engineers, Planners and Project Managers	Table F-05: Surface Storage Volume Calculations - Proposed Condition			
	Prepared:	A.R.M	Page No.	F-05
	Checked:	Z.D.		
Project: Proposed Commercial Development, 3075 Palladium Drive, City of Ottawa, ON.	Project #:	2034		
	Date:	06-Jun-24		

Storage Volume Calculations - Area STM1 (CB 1)

Area ID	**STM1**	**2-yr Release Rate - ICD (L/s)**	60.0
Area (ha)	**0.23**	**5-yr Release Rate - ICD (L/s)**	60.0
C	**0.87**	**100-yr Release Rate - ICD (L/s)**	65.3
C (100yr)	**1**	**Storage Provided (m^3)*2**	**34.26**

Design Event	Time (min)	Rainfall Intensity (mm/hr)	Flow (L/s)	Release Rate (L/s)	Net Runoff (L/s)	Storage Required (m3)
2-yr	10	76.8	42.4	60	-17.6	-10.6
	15	61.8	34.1	60	-25.9	-23.3
	20	52.0	28.7	60	-31.3	-37.5
	25	45.2	24.9	60	-35.1	-52.6
	30	40.0	22.1	60	-37.9	-68.2
	35	36.1	19.9	60	-40.1	-84.2
5-yr	10	104.2	57.5	60	-2.5	-1.5
	15	83.6	46.1	60	-13.9	-12.5
	20	70.3	38.8	60	-21.2	-25.5
	25	60.9	33.6	60	-26.4	-39.6
	30	53.9	29.8	60	-30.2	-54.4
	35	48.5	26.8	60	-33.2	-69.7
100-yr	**10**	**178.6**	**113.5**	**65.3**	**48.2**	**28.9**
	15	142.9	90.9	65.3	25.5	23.0
	20	120.0	76.3	65.3	10.9	13.1
	25	103.8	66.0	65.3	0.7	1.0
	30	91.9	58.4	65.3	-6.9	-12.5
	35	82.6	52.5	65.3	-12.8	-26.9

Notes:
1. Rainfall intesnity calculated using City of Ottawa IDF curve equations.
2. Provided storage volumes have been calculated using AutoCAD Civil 3D.
3. Flow calculated using the Rational Method. Q=2.78CiA.
4. C (100yr) = C + 25% (Max. 1.0).

Storage Volume Calculations - Area STM3 (CB 3)

Area ID	**STM3**	**2-yr Release Rate - ICD (L/s)**	20.0
Area (ha)	**0.08**	**5-yr Release Rate - ICD (L/s)**	20.0
C	**0.78**	**100-yr Release Rate - ICD (L/s)**	21.3
C (100yr)	**0.97**	**Storage Provided (m^3)*2**	**9.6**

Design Event	Time (min)	Rainfall Intensity (mm/hr)	Flow (L/s)	Release Rate (L/s)	Net Runoff (L/s)	Storage Required (m3)
2-yr	10	76.8	12.6	20	-7.4	-4.4
	15	61.8	10.2	20	-9.8	-8.8
	20	52.0	8.6	20	-11.4	-13.7
	25	45.2	7.4	20	-12.6	-18.8
	30	40.0	6.6	20	-13.4	-24.1
	35	36.1	5.9	20	-14.1	-29.5
5-yr	10	104.2	17.2	20	-2.8	-1.7
	15	83.6	13.8	20	-6.2	-5.6
	20	70.3	11.6	20	-8.4	-10.1
	25	60.9	10.0	20	-10.0	-15.0
	30	53.9	8.9	20	-11.1	-20.0
	35	48.5	8.0	20	-12.0	-25.2
100-yr	**10**	**178.6**	**36.8**	**21.3**	**15.5**	**9.3**
	15	142.9	29.4	21.3	8.1	7.3
	20	120.0	24.7	21.3	3.4	4.1
	25	103.8	21.4	21.3	0.1	0.2
	30	91.9	18.9	21.3	-2.4	-4.2
	35	82.6	17.0	21.3	-4.3	-9.0

Notes:
1. Rainfall intesnity calculated using City of Ottawa IDF curve equations.
2. Provided storage volumes have been calculated using AutoCAD Civil 3D.
3. Flow calculated using the Rational Method. Q=2.78CiA.
4. C (100yr) = C + 25% (Max. 1.0).

Storage Volume Calculations - Area STM2 (CB 2)

Area ID	**STM2**	**2-yr Release Rate - ICD (L/s)**	40.0
Area (ha)	**0.15**	**5-yr Release Rate - ICD (L/s)**	40.0
C	**0.82**	**100-yr Release Rate - ICD (L/s)**	43.2
C (100yr)	**1**	**Storage Provided (m^3)*2**	**21.5**

Design Event	Time (min)	Rainfall Intensity (mm/hr)	Flow (L/s)	Release Rate (L/s)	Net Runoff (L/s)	Storage Required (m3)
2-yr	10	76.8	26.5	40	-13.5	-8.1
	15	61.8	21.3	40	-18.7	-16.9
	20	52.0	17.9	40	-22.1	-26.5
	25	45.2	15.6	40	-24.4	-36.7
	30	40.0	13.8	40	-26.2	-47.2
	35	36.1	12.4	40	-27.6	-57.9
5-yr	10	104.2	35.9	40	-4.1	-2.5
	15	83.6	28.8	40	-11.2	-10.1
	20	70.3	24.2	40	-15.8	-19.0
	25	60.9	21.0	40	-19.0	-28.5
	30	53.9	18.6	40	-21.4	-38.6
	35	48.5	16.7	40	-23.3	-48.9
100-yr	**10**	**178.6**	**74.7**	**43.2**	**31.5**	**18.9**
	15	142.9	59.8	43.2	16.6	14.9
	20	120.0	50.2	43.2	7.0	8.4
	25	103.8	43.4	43.2	0.2	0.3
	30	91.9	38.4	43.2	-4.8	-8.6
	35	82.6	34.5	43.2	-8.7	-18.2

Notes:
1. Rainfall intesnity calculated using City of Ottawa IDF curve equations.
2. Provided storage volumes have been calculated using AutoCAD Civil 3D.
3. Flow calculated using the Rational Method. Q=2.78CiA.
4. C (100yr) = C + 25% (Max. 1.0).

Storage Volume Calculations - Area STM4 (CB 4)

Area ID	**STM4**	**2-yr Release Rate - ICD (L/s)**	40.0
Area (ha)	**0.15**	**5-yr Release Rate - ICD (L/s)**	40.0
C	**0.84**	**100-yr Release Rate - ICD (L/s)**	42.4
C (100yr)	**1**	**Storage Provided (m^3)*2**	**23.2**

Design Event	Time (min)	Rainfall Intensity (mm/hr)	Flow (L/s)	Release Rate (L/s)	Net Runoff (L/s)	Storage Required (m3)
2-yr	10	76.8	27.3	40	-12.7	-7.6
	15	61.8	21.9	40	-18.1	-16.3
	20	52.0	18.5	40	-21.5	-25.8
	25	45.2	16.0	40	-24.0	-36.0
	30	40.0	14.2	40	-25.8	-46.4
	35	36.1	12.8	40	-27.2	-57.1
5-yr	10	104.2	37.0	40	-3.0	-1.8
	15	83.6	29.7	40	-10.3	-9.3
	20	70.3	24.9	40	-15.1	-18.1
	25	60.9	21.6	40	-18.4	-27.6
	30	53.9	19.1	40	-20.9	-37.5
	35	48.5	17.2	40	-22.8	-47.8
100-yr	**10**	**178.6**	**75.5**	**42.4**	**33.0**	**19.8**
	15	142.9	60.4	42.4	18.0	16.2
	20	120.0	50.7	42.4	8.3	9.9
	25	103.8	43.9	42.4	1.5	2.2
	30	91.9	38.8	42.4	-3.6	-6.5
	35	82.6	34.9	42.4	-7.5	-15.8

Notes:
1. Rainfall intesnity calculated using City of Ottawa IDF curve equations.
2. Provided storage volumes have been calculated using AutoCAD Civil 3D.
3. Flow calculated using the Rational Method. Q=2.78CiA.
4. C (100yr) = C + 25% (Max. 1.0).

WPE Engineering Ltd. Engineers, Planners and Project Managers	Table F-06: Surface Storage Volume Calculations - Proposed Condition			
	Prepared:	A.R.M	Page No.	F-06
	Checked:	Z.D		
Project: Proposed Commercial Development, 3075 Palladium Drive, City of Ottawa, ON.	Project #:	2034		
	Date:	12-Jun-24		

Storage Volume Calculations - Area STM5 (CB 5)

Area ID	**STM5**		**2-yr Release Rate - ICD (L/s)**		20.0
Area (ha)	**0.06**		**5-yr Release Rate - ICD (L/s)**		20.0
C	**0.83**		**100-yr Release Rate - ICD (L/s)**		21.0
C (100yr)	**1**		**Storage Provided (m^3)*2**		**8.84**

Design Event	Time (min)	Rainfall Intensity (mm/hr)	Flow (L/s)	Release Rate (L/s)	Net Runoff (L/s)	Storage Required (m3)
2-yr	10	76.8	11.4	20	-8.6	-5.2
	15	61.8	9.1	20	-10.9	-9.8
	20	52.0	7.7	20	-12.3	-14.8
	25	45.2	6.7	20	-13.3	-20.0
	30	40.0	5.9	20	-14.1	-25.3
	35	36.1	5.3	20	-14.7	-30.8
5-yr	10	104.2	15.4	20	-4.6	-2.7
	15	83.6	12.4	20	-7.6	-6.9
	20	70.3	10.4	20	-9.6	-11.5
	25	60.9	9.0	20	-11.0	-16.5
	30	53.9	8.0	20	-12.0	-21.6
	35	48.5	7.2	20	-12.8	-26.9
100-yr	**10**	**178.6**	**31.9**	**21.0**	**10.8**	**6.5**
	15	142.9	25.5	21.0	4.5	4.0
	20	120.0	21.4	21.0	0.4	0.4
	25	103.8	18.5	21.0	-2.5	-3.8
	30	91.9	16.4	21.0	-4.7	-8.4
	35	82.6	14.7	21.0	-6.3	-13.2

Notes:
1. Rainfall intesnity calculated using City of Ottawa IDF curve equations.
2. Provided storage volumes have been calculated using AutoCAD Civil 3D.
3. Flow calculated using the Rational Method. Q=2.78CiA.
4. C (100yr) = C + 25% (Max. 1.0).

Storage Volume Calculations - Area STM9 (CB 9)

Area ID	**STM9**		**2-yr Release Rate - ICD (L/s)**		Uncontrolled
Area (ha)	**0.02**		**5-yr Release Rate - ICD (L/s)**		Uncontrolled
C	**0.90**		**100-yr Release Rate - ICD (L/s)**		Uncontrolled
C (100yr)	**1**		**Storage Provided (m^3)*2**		**None**

Design Event	Time (min)	Rainfall Intensity (mm/hr)	Flow (L/s)	Release Rate (L/s)	Net Runoff (L/s)	Storage Required (m3)
2-yr	10	76.8	3.1	3.1	0.0	0.0
	15	61.8	2.5	2.5	0.0	0.0
	20	52.0	2.1	2.1	0.0	0.0
	25	45.2	1.8	1.8	0.0	0.0
	30	40.0	1.6	1.6	0.0	0.0
	35	36.1	1.5	1.5	0.0	0.0
5-yr	10	104.2	4.2	4.2	0.0	0.0
	15	83.6	3.4	3.4	0.0	0.0
	20	70.3	2.9	2.9	0.0	0.0
	25	60.9	2.5	2.5	0.0	0.0
	30	53.9	2.2	2.2	0.0	0.0
	35	48.5	2.0	2.0	0.0	0.0
100-yr	10	178.6	8.1	8.1	0.0	0.0
	15	142.9	6.5	6.5	0.0	0.0
	20	120.0	5.4	5.4	0.0	0.0
	25	103.8	4.7	4.7	0.0	0.0
	30	91.9	4.1	4.1	0.0	0.0
	35	82.6	3.7	3.7	0.0	0.0

Notes:
1. Rainfall intesnity calculated using City of Ottawa IDF curve equations.
2. Provided storage volumes have been calculated using AutoCAD Civil 3D.
3. Flow calculated using the Rational Method. Q=2.78CiA.
4. C (100yr) = C + 25% (Max. 1.0).

Storage Volume Calculations - Area STM6 (CB 6)

Area ID	**STM6**		**2-yr Release Rate - ICD (L/s)**		40.0
Area (ha)	**0.15**		**5-yr Release Rate - ICD (L/s)**		40.0
C	**0.88**		**100-yr Release Rate - ICD (L/s)**		42.7
C (100yr)	**1**		**Storage Provided (m^3)*2**		**25.56**

Design Event	Time (min)	Rainfall Intensity (mm/hr)	Flow (L/s)	Release Rate (L/s)	Net Runoff (L/s)	Storage Required (m3)
2-yr	10	76.8	28.6	40	-11.4	-6.8
	15	61.8	23.0	40	-17.0	-15.3
	20	52.0	19.4	40	-20.6	-24.7
	25	45.2	16.8	40	-23.2	-34.8
	30	40.0	14.9	40	-25.1	-45.2
	35	36.1	13.4	40	-26.6	-55.8
5-yr	10	104.2	38.8	40	-1.2	-0.7
	15	83.6	31.1	40	-8.9	-8.0
	20	70.3	26.2	40	-13.8	-16.6
	25	60.9	22.7	40	-17.3	-26.0
	30	53.9	20.1	40	-19.9	-35.8
	35	48.5	18.1	40	-21.9	-46.1
100-yr	**10**	**178.6**	**75.3**	**42.7**	**32.6**	**19.6**
	15	142.9	60.3	42.7	17.6	15.8
	20	120.0	50.6	42.7	7.9	9.4
	25	103.8	43.8	42.7	1.1	1.6
	30	91.9	38.8	42.7	-4.0	-7.2
	35	82.6	34.8	42.7	-7.9	-16.6

Notes:
1. Rainfall intesnity calculated using City of Ottawa IDF curve equations.
2. Provided storage volumes have been calculated using AutoCAD Civil 3D.
3. Flow calculated using the Rational Method. Q=2.78CiA.
4. C (100yr) = C + 25% (Max. 1.0).

Storage Volume Calculations - Area STM7 + STM8 (CB 7 & CBMH209)

Area ID	**STM7 + STM8**		**2-yr Release Rate - ICD (L/s)**		48.0
Area (ha)	**0.12**		**5-yr Release Rate - ICD (L/s)**		48.0
C	**0.88**		**100-yr Release Rate - ICD (L/s)**		49.0
C (100yr)	**1**		**Storage Provided (m^3)*2**		**6.57**

Design Event	Time (min)	Rainfall Intensity (mm/hr)	Flow (L/s)	Release Rate (L/s)	Net Runoff (L/s)	Storage Required (m3)
2-yr	10	76.8	22.0	48	-26.0	-15.6
	15	61.8	17.7	48	-30.3	-27.3
	20	52.0	14.9	48	-33.1	-39.7
	25	45.2	12.9	48	-35.1	-52.6
	30	40.0	11.5	48	-36.5	-65.7
	35	36.1	10.3	48	-37.7	-79.1
5-yr	10	104.2	29.9	48	-18.1	-10.9
	15	83.6	23.9	48	-24.1	-21.6
	20	70.3	20.1	48	-27.9	-33.4
	25	60.9	17.5	48	-30.5	-45.8
	30	53.9	15.5	48	-32.5	-58.6
	35	48.5	13.9	48	-34.1	-71.6
100-yr	**10**	**178.6**	**58.3**	**49.0**	**9.3**	**5.6**
	15	142.9	46.7	49.0	-2.3	-2.1
	20	120.0	39.2	49.0	-9.8	-11.8
	25	103.8	33.9	49.0	-15.1	-22.6
	30	91.9	30.0	49.0	-19.0	-34.2
	35	82.6	27.0	49.0	-22.0	-46.2

Notes:
1. Rainfall intesnity calculated using City of Ottawa IDF curve equations.
2. Provided storage volumes have been calculated using AutoCAD Civil 3D.
3. Flow calculated using the Rational Method. Q=2.78CiA.
4. C (100yr) = C + 25% (Max. 1.0).

WPE Engineering Ltd. Engineers, Planners and Project Managers	Table F-07: Surface Storage Volume Calculations - Proposed Condition			
	Prepared:	A.R.M	Page No.	F-07
	Checked:	Z.D		
Project: Proposed Commercial Development, 3075 Palladium Drive, City of Ottawa, ON.	Project #:	2034		
	Date:	12-Jun-24		

Storage Volume Calculations - Area STM10 (CB 10)

Area ID	**STM10**	**2-yr Release Rate - ICD (L/s)**	20.0
Area (ha)	**0.05**	**5-yr Release Rate - ICD (L/s)**	20.0
C	**0.83**	**100-yr Release Rate - ICD (L/s)**	20.7
C (100yr)	**1**	**Storage Provided (m^3)*2**	**4.18**

Design Event	Time (min)	Rainfall Intensity (mm/hr)	Flow (L/s)	Release Rate (L/s)	Net Runoff (L/s)	Storage Required (m3)
2-yr	10	76.8	9.4	20.0	-10.6	-6.4
	15	61.8	7.5	20.0	-12.5	-11.2
	20	52.0	6.4	20.0	-13.6	-16.4
	25	45.2	5.5	20.0	-14.5	-21.7
	30	40.0	4.9	20.0	-15.1	-27.2
	35	36.1	4.4	20.0	-15.6	-32.8
5-yr	10	104.2	12.7	20.0	-7.3	-4.4
	15	83.6	10.2	20.0	-9.8	-8.8
	20	70.3	8.6	20.0	-11.4	-13.7
	25	60.9	7.4	20.0	-12.6	-18.8
	30	53.9	6.6	20.0	-13.4	-24.1
	35	48.5	5.9	20.0	-14.1	-29.6
100-yr	**10**	**178.6**	**26.3**	**20.7**	**5.6**	**3.4**
	15	142.9	21.1	20.7	0.3	0.3
	20	120.0	17.7	20.7	-3.0	-3.7
	25	103.8	15.3	20.7	-5.4	-8.1
	30	91.9	13.5	20.7	-7.2	-12.9
	35	82.6	12.2	20.7	-8.6	-18.0

Notes:
1. Rainfall intesnity calculated using City of Ottawa IDF curve equations.
2. Provided storage volumes have been calculated using AutoCAD Civil 3D.
3. Flow calculated using the Rational Method. Q=2.78CiA.
4. C (100yr) = C + 25% (Max. 1.0).

Storage Volume Calculations - Area STM12 (STMMH 208)

Area ID	**STM12**	**2-yr Release Rate - ICD (L/s)**	Uncontrolled
Area (ha)	**0.02**	**5-yr Release Rate - ICD (L/s)**	Uncontrolled
C	**0.53**	**100-yr Release Rate - ICD (L/s)**	Uncontrolled
C (100yr)	**0.66**	**Storage Provided (m^3)*2**	**None**

Design Event	Time (min)	Rainfall Intensity (mm/hr)	Flow (L/s)	Release Rate (L/s)	Net Runoff (L/s)	Storage Required (m3)
2-yr	10	76.8	1.8	1.8	0.0	0.0
	15	61.8	1.5	1.5	0.0	0.0
	20	52.0	1.2	1.2	0.0	0.0
	25	45.2	1.1	1.1	0.0	0.0
	30	40.0	0.9	0.9	0.0	0.0
	35	36.1	0.9	0.9	0.0	0.0
5-yr	10	104.2	2.5	2.5	0.0	0.0
	15	83.6	2.0	2.0	0.0	0.0
	20	70.3	1.7	1.7	0.0	0.0
	25	60.9	1.4	1.4	0.0	0.0
	30	53.9	1.3	1.3	0.0	0.0
	35	48.5	1.1	1.1	0.0	0.0
100-yr	10	178.6	5.3	5.3	0.0	0.0
	15	142.9	4.2	4.2	0.0	0.0
	20	120.0	3.5	3.5	0.0	0.0
	25	103.8	3.1	3.1	0.0	0.0
	30	91.9	2.7	2.7	0.0	0.0
	35	82.6	2.4	2.4	0.0	0.0

Notes:
1. Rainfall intesnity calculated using City of Ottawa IDF curve equations.
2. Provided storage volumes have been calculated using AutoCAD Civil 3D.
3. Flow calculated using the Rational Method. Q=2.78CiA.
4. C (100yr) = C + 25% (Max. 1.0).

Storage Volume Calculations - Area STM11 (CB 11)

Area ID	**STM11**	**2-yr Release Rate - ICD (L/s)**	20.0
Area (ha)	**0.05**	**5-yr Release Rate - ICD (L/s)**	20.0
C	**0.83**	**100-yr Release Rate - ICD (L/s)**	20.6
C (100yr)	**1**	**Storage Provided (m^3)*2**	**2.73**

Design Event	Time (min)	Rainfall Intensity (mm/hr)	Flow (L/s)	Release Rate (L/s)	Net Runoff (L/s)	Storage Required (m3)
2-yr	10	76.8	8.6	20.0	-11.4	-6.8
	15	61.8	6.9	20.0	-13.1	-11.8
	20	52.0	5.8	20.0	-14.2	-17.0
	25	45.2	5.1	20.0	-14.9	-22.4
	30	40.0	4.5	20.0	-15.5	-27.9
	35	36.1	4.0	20.0	-16.0	-33.5
5-yr	10	104.2	11.7	20.0	-8.3	-5.0
	15	83.6	9.4	20.0	-10.6	-9.6
	20	70.3	7.9	20.0	-12.1	-14.5
	25	60.9	6.8	20.0	-13.2	-19.7
	30	53.9	6.1	20.0	-13.9	-25.1
	35	48.5	5.4	20.0	-14.6	-30.6
100-yr	**10**	**178.6**	**24.0**	**20.6**	**3.4**	**2.0**
	15	142.9	19.2	20.6	-1.4	-1.2
	20	120.0	16.1	20.6	-4.5	-5.4
	25	103.8	14.0	20.6	-6.6	-10.0
	30	91.9	12.4	20.6	-8.3	-14.9
	35	82.6	11.1	20.6	-9.5	-20.0

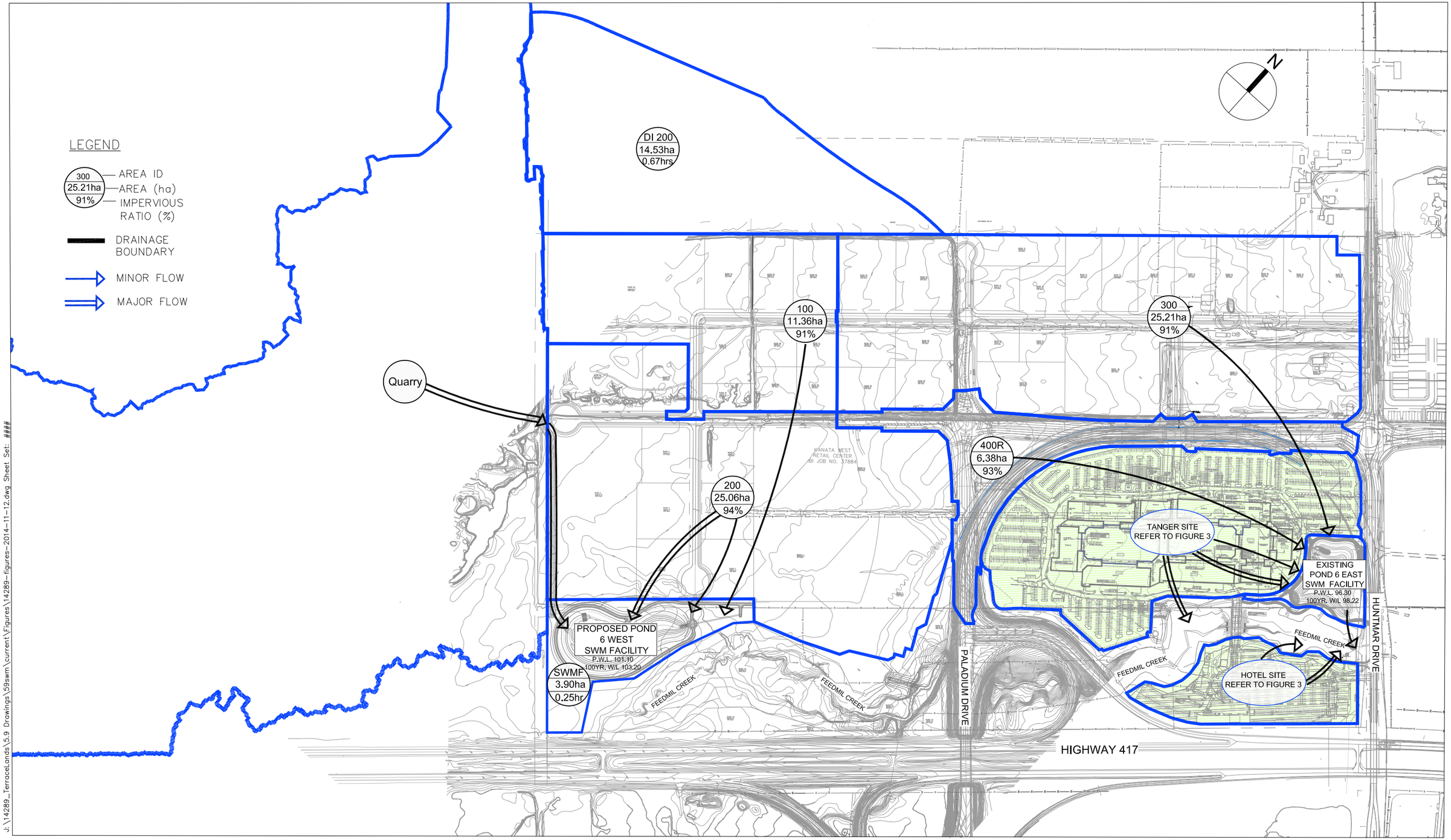
Notes:
1. Rainfall intesnity calculated using City of Ottawa IDF curve equations.
2. Provided storage volumes have been calculated using AutoCAD Civil 3D.
3. Flow calculated using the Rational Method. Q=2.78CiA.
4. C (100yr) = C + 25% (Max. 1.0).

Storage Volume Calculations - Area STM13 (UNNAMED ROAD)

Area ID	**STM13**	**2-yr Release Rate - ICD (L/s)*5**	52.1
Area (ha)	**0.16**	**5-yr Release Rate - ICD (L/s)*5**	52.1
C	**0.77**	**100-yr Release Rate - ICD (L/s)*5**	**52.1**
C (100yr)	**0.97**	**Storage Provided (m^3)*2**	**+32.93**

Design Event	Time (min)	Rainfall Intensity (mm/hr)	Flow (L/s)	Release Rate (L/s)	Net Runoff (L/s)	Storage Required (m3)
2-yr	10	76.8	26.8	52.1	-25.3	-15.2
	15	61.8	21.6	52.1	-30.5	-27.5
	20	52.0	18.2	52.1	-33.9	-40.7
	25	45.2	15.8	52.1	-36.3	-54.5
	30	40.0	14.0	52.1	-38.1	-68.6
	35	36.1	12.6	52.1	-39.5	-83.0
5-yr	10	104.2	36.4	52.1	-15.7	-9.4
	15	83.6	29.2	52.1	-22.9	-20.7
	20	70.3	24.5	52.1	-27.6	-33.1
	25	60.9	21.2	52.1	-30.9	-46.3
	30	53.9	18.8	52.1	-33.3	-59.9
	35	48.5	16.9	52.1	-35.2	-73.9
100-yr	**10**	**178.6**	**77.9**	**52.1**	**25.8**	**15.5**
	15	142.9	62.3	52.1	10.2	9.2
	20	120.0	52.3	52.1	0.2	0.3
	25	103.8	45.3	52.1	-6.8	-10.2
	30	91.9	40.1	52.1	-12.0	-21.7
	35	82.6	36.0	52.1	-16.1	-33.8

Notes:
1. Rainfall intesnity calculated using City of Ottawa IDF curve equations.
2. Provided storage volumes have been estimated by IBI Group and can be found in Ponding Plan, C-400 drawing.
3. Flow calculated using the Rational Method. Q=2.78CiA.
4. C (100yr) = C + 25% (Max. 1.0).
5. Release Rate as per IBI design for the unnamed access road.



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Plot Style: ---- Plot Scale: 1:1 Plotted At: Sep. 28, 15 10:17 AM Printed By: SLAVICA VUKIC Last Saved By: SVUKIC Last Saved At: Sep. 28, 15

IBI GROUP

Scale

N.T.S.

Project Title

TANGER OUTLETS CENTRE STORMWATER MANAGEMENT FACILITY

Drawing Title

POST-DEVELOPMENT SWM DRAINAGE BOUNDARIES OVERALL SITE

Sheet No.

FIGURE 2

	WPE Engineering Ltd. Engineers, Planners and Project Managers	**Table F-08: Summary of Infiltration Gallery Calculations** **Proposed Condition**			
		Prepared:	A.R.M	Page No.	F-08
		Checked:	Z.D.		
Project: Proposed Commercial Development, 3075 Palladium Drive, City of Ottawa, ON.		Project #:	2034		
		Date:	06-Jun-24		

Summary of Infiltration Gallery Calculations

Annual Precipitation (mm)	**920**
95% Available Runoff (mm)	**874**
Site Area (ha)	**2.57**

Building ID	Roof Area (m^2)	Available Runoff Volume (m^3)	Infiltration Gallery				Gallery Overflow (%)			Gallery Overflow Vol. (m^3)			Infiltration Volume (m^3)		
			Width (m)	Length (m)	Area (m^2)	Depth (m)	Wet Year	Dry Year	Average	Wet Year	Dry Year	Average	Wet Year	Dry Year	Average
A	5678.11	4962.66814	10	19.5	195	0.60	77.98	24.13	51.05	1891.707	424.744	1158.23	2425.815	1760.45	2093.13

Average Infiltration Rate (mm/year)	81.4
Target Infiltration Rate (mm/year)	75.0

WPE Engineering Ltd.
Engineers, Planners and Project Managers

Table F-09: Infiltration Gallery Sizing (Wet Year)
Proposed Condition

Prepared:	A.R.M	Page No.	F-09
Checked:	Z.D.		
Proj. #	2034		
Date:	06-Jun-24		

Project: Proposed Commercial Development, 3075 Palladium Drive, City of Ottawa, ON.

Infiltration Gallery Sizing Calculation
Wet Year Calculation

Runoff Area (m^2)	5678.11	
Effective Runoff (%)	95%	
Infiltration Rate (mm/hr)	50	As per Geotechnical Investigation (YME)
Infiltration Safety Factor	2.5	As per Geotechnical Investigation (GEMTIC)
Design Infiltration Rate (mm/hr)	20	
Percolation Rate (min/cm)	15	As per Geotechnical Investigation (YME)
Percolation Rate (m/day)	0.48	

Precipitation Data April 1 to October 31 (Wet year)

Total Precipitation Depth	800.4	mm
Total Precipitation Volume	4318	m^3
Total Infiltration Volume	2425.8	m^3
Development Area	2.5816	ha
Infiltration Rate	93.97	mm/yr.
Overflow Volume	1891.7	m^3/yr.
Runoff Volume Overflow	77.98	%

Infiltration Gallery Sizing

Width (m)	10	
Length (m)	19.5	
Depth (m)	0.60	
Number of Cells	1	
Void Ratio	0.38	3/4" Cleastone
Drawdown Time (hr)	30	
Total Dry Cell Volume (m^3)	44.5	

Date	Rainfall (mm)	Rainfall Intensity - Avg (mm/hr)	Rainwater Available (m^3)	Volume Inflow to Dry Cell (m^3)	Volume in Dry Cell (m^3)	Volume Passing Dry Cell (m^3)	Infiltration from Bottom (m^3)	Infiltration from Sides (Bottom 3rd)	Balance in Dry Cell (m^3)
01-Apr	0.2	0.008	1.1	1.1	1.1	0.0	1.1	0	0.0
02-Apr	0.4	0.017	2.2	2.2	2.2	0.0	2.2	0	0.0
03-Apr	0	0	0.0	0.0	0.0	0.0	0.0	0	0.0
04-Apr	0	0	0.0	0.0	0.0	0.0	0.0	0	0.0
05-Apr	0	0	0.0	0.0	0.0	0.0	0.0	0	0.0
06-Apr	7.8	0.325	42.1	42.1	42.1	0.0	42.1	0	0.0
07-Apr	3.4	0.142	18.3	18.3	18.3	0.0	18.3	0	0.0
08-Apr	4.6	0.192	24.8	24.8	24.8	0.0	24.8	0	0.0
09-Apr	4.2	0.175	22.7	22.7	22.7	0.0	22.7	0	0.0
10-Apr	0	0	0.0	0.0	0.0	0.0	0.0	0	0.0
11-Apr	0	0	0.0	0.0	0.0	0.0	0.0	0	0.0
12-Apr	0	0	0.0	0.0	0.0	0.0	0.0	0	0.0
13-Apr	0	0	0.0	0.0	0.0	0.0	0.0	0	0.0
14-Apr	0	0	0.0	0.0	0.0	0.0	0.0	0	0.0
15-Apr	0	0	0.0	0.0	0.0	0.0	0.0	0	0.0
16-Apr	0	0	0.0	0.0	0.0	0.0	0.0	0	0.0
17-Apr	0	0	0.0	0.0	0.0	0.0	0.0	0	0.0
18-Apr	0	0	0.0	0.0	0.0	0.0	0.0	0	0.0
19-Apr	0	0	0.0	0.0	0.0	0.0	0.0	0	0.0
20-Apr	8.2	0.342	44.2	44.2	44.2	0.0	44.2	0	0.0
21-Apr	2.8	0.117	15.1	15.1	15.1	0.0	15.1	0	0.0
22-Apr	0	0	0.0	0.0	0.0	0.0	0.0	0	0.0
23-Apr	0	0	0.0	0.0	0.0	0.0	0.0	0	0.0
24-Apr	0	0	0.0	0.0	0.0	0.0	0.0	0	0.0
25-Apr	0	0	0.0	0.0	0.0	0.0	0.0	0	0.0
26-Apr	0	0	0.0	0.0	0.0	0.0	0.0	0	0.0
27-Apr	0	0	0.0	0.0	0.0	0.0	0.0	0	0.0
28-Apr	0	0	0.0	0.0	0.0	0.0	0.0	0	0.0
29-Apr	0	0	0.0	0.0	0.0	0.0	0.0	0	0.0
30-Apr	0	0	0.0	0.0	0.0	0.0	0.0	0	0.0
01-May	9	0.375	48.5	44.5	44.5	4.1	44.5	0	0.0
02-May	0	0	0.0	0.0	0.0	0.0	0.0	0	0.0
03-May	0	0	0.0	0.0	0.0	0.0	0.0	0	0.0
04-May	2.4	0.1	12.9	12.9	12.9	0.0	12.9	0	0.0
05-May	8	0.333	43.2	43.2	43.2	0.0	43.2	0	0.0
06-May	1	0.042	5.4	5.4	5.4	0.0	5.4	0	0.0
07-May	1.6	0.067	8.6	8.6	8.6	0.0	8.6	0	0.0
08-May	0.8	0.033	4.3	4.3	4.3	0.0	4.3	0	0.0
09-May	0	0	0.0	0.0	0.0	0.0	0.0	0	0.0
10-May	0	0	0.0	0.0	0.0	0.0	0.0	0	0.0
11-May	0	0	0.0	0.0	0.0	0.0	0.0	0	0.0
12-May	0	0	0.0	0.0	0.0	0.0	0.0	0	0.0
13-May	0	0	0.0	0.0	0.0	0.0	0.0	0	0.0
14-May	0	0	0.0	0.0	0.0	0.0	0.0	0	0.0
15-May	1	0.042	5.4	5.4	5.4	0.0	5.4	0	0.0
16-May	17.4	0.725	93.9	44.5	44.5	49.4	44.5	0	0.0
17-May	0	0	0.0	0.0	0.0	0.0	0.0	0	0.0
18-May	11	0.458	59.3	44.5	44.5	14.9	44.5	0	0.0
19-May	30.2	1.258	162.9	44.5	44.5	118.4	44.5	0	0.0

20-May	29.4	1.225	158.6	44.5	44.5	114.1	44.5	0	0.0
21-May	5.9	0.246	31.8	31.8	31.8	0.0	31.8	0	0.0
22-May	26.9	1.121	145.1	44.5	44.5	100.6	44.5	0	0.0
23-May	11.3	0.471	61.0	44.5	44.5	16.5	44.5	0	0.0
24-May	0.4	0.017	2.2	2.2	2.2	0.0	2.2	0	0.0
25-May	0	0	0.0	0.0	0.0	0.0	0.0	0	0.0
26-May	0	0	0.0	0.0	0.0	0.0	0.0	0	0.0
27-May	7.8	0.325	42.1	42.1	42.1	0.0	42.1	0	0.0
28-May	0	0	0.0	0.0	0.0	0.0	0.0	0	0.0
29-May	0	0	0.0	0.0	0.0	0.0	0.0	0	0.0
30-May	0	0	0.0	0.0	0.0	0.0	0.0	0	0.0
31-May	0	0	0.0	0.0	0.0	0.0	0.0	0	0.0
01-Jun	10.6	0.442	57.2	44.5	44.5	12.7	44.5	0	0.0
02-Jun	0	0	0.0	0.0	0.0	0.0	0.0	0	0.0
03-Jun	0	0	0.0	0.0	0.0	0.0	0.0	0	0.0
04-Jun	0	0	0.0	0.0	0.0	0.0	0.0	0	0.0
05-Jun	1.4	0.058	7.6	7.6	7.6	0.0	7.6	0	0.0
06-Jun	0	0	0.0	0.0	0.0	0.0	0.0	0	0.0
07-Jun	5	0.208	27.0	27.0	27.0	0.0	27.0	0	0.0
08-Jun	0.2	0.008	1.1	1.1	1.1	0.0	1.1	0	0.0
09-Jun	0	0	0.0	0.0	0.0	0.0	0.0	0	0.0
10-Jun	0	0	0.0	0.0	0.0	0.0	0.0	0	0.0
11-Jun	4.8	0.2	25.9	25.9	25.9	0.0	25.9	0	0.0
12-Jun	26.2	1.092	141.3	44.5	44.5	96.9	44.5	0	0.0
13-Jun	1	0.042	5.4	5.4	5.4	0.0	5.4	0	0.0
14-Jun	0	0	0.0	0.0	0.0	0.0	0.0	0	0.0
15-Jun	0	0	0.0	0.0	0.0	0.0	0.0	0	0.0
16-Jun	5.6	0.233	30.2	30.2	30.2	0.0	30.2	0	0.0
17-Jun	0	0	0.0	0.0	0.0	0.0	0.0	0	0.0
18-Jun	0	0	0.0	0.0	0.0	0.0	0.0	0	0.0
19-Jun	4	0.167	21.6	21.6	21.6	0.0	21.6	0	0.0
20-Jun	0	0	0.0	0.0	0.0	0.0	0.0	0	0.0
21-Jun	0	0	0.0	0.0	0.0	0.0	0.0	0	0.0
22-Jun	0	0	0.0	0.0	0.0	0.0	0.0	0	0.0
23-Jun	1	0.042	5.4	5.4	5.4	0.0	5.4	0	0.0
24-Jun	27.2	1.133	146.7	44.5	44.5	102.3	44.5	0	0.0
25-Jun	0	0	0.0	0.0	0.0	0.0	0.0	0	0.0
26-Jun	0	0	0.0	0.0	0.0	0.0	0.0	0	0.0
27-Jun	29	1.208	156.4	44.5	44.5	112.0	44.5	0	0.0
28-Jun	0	0	0.0	0.0	0.0	0.0	0.0	0	0.0
29-Jun	0.2	0.008	1.1	1.1	1.1	0.0	1.1	0	0.0
30-Jun	0	0	0.0	0.0	0.0	0.0	0.0	0	0.0
01-Jul	0	0	0.0	0.0	0.0	0.0	0.0	0	0.0
02-Jul	10	0.417	53.9	44.5	44.5	9.5	44.5	0	0.0
03-Jul	14.8	0.617	79.8	44.5	44.5	35.4	44.5	0	0.0
04-Jul	7.6	0.317	41.0	41.0	41.0	0.0	41.0	0	0.0
05-Jul	14.8	0.617	79.8	44.5	44.5	35.4	44.5	0	0.0
06-Jul	0	0	0.0	0.0	0.0	0.0	0.0	0	0.0
07-Jul	0	0	0.0	0.0	0.0	0.0	0.0	0	0.0
08-Jul	0	0	0.0	0.0	0.0	0.0	0.0	0	0.0
09-Jul	0	0	0.0	0.0	0.0	0.0	0.0	0	0.0
10-Jul	0	0	0.0	0.0	0.0	0.0	0.0	0	0.0
11-Jul	0	0	0.0	0.0	0.0	0.0	0.0	0	0.0
12-Jul	0	0	0.0	0.0	0.0	0.0	0.0	0	0.0
13-Jul	10.6	0.442	57.2	44.5	44.5	12.7	44.5	0	0.0
14-Jul	0.4	0.017	2.2	2.2	2.2	0.0	2.2	0	0.0
15-Jul	0	0	0.0	0.0	0.0	0.0	0.0	0	0.0
16-Jul	0	0	0.0	0.0	0.0	0.0	0.0	0	0.0
17-Jul	0	0	0.0	0.0	0.0	0.0	0.0	0	0.0
18-Jul	0	0	0.0	0.0	0.0	0.0	0.0	0	0.0
19-Jul	0	0	0.0	0.0	0.0	0.0	0.0	0	0.0
20-Jul	6.2	0.258	33.4	33.4	33.4	0.0	33.4	0	0.0
21-Jul	0	0	0.0	0.0	0.0	0.0	0.0	0	0.0
22-Jul	0	0	0.0	0.0	0.0	0.0	0.0	0	0.0
23-Jul	0	0	0.0	0.0	0.0	0.0	0.0	0	0.0
24-Jul	0	0	0.0	0.0	0.0	0.0	0.0	0	0.0
25-Jul	3.6	0.15	19.4	19.4	19.4	0.0	19.4	0	0.0
26-Jul	31.6	1.317	170.5	44.5	44.5	126.0	44.5	0	0.0
27-Jul	0	0	0.0	0.0	0.0	0.0	0.0	0	0.0
28-Jul	0	0	0.0	0.0	0.0	0.0	0.0	0	0.0
29-Jul	42.4	1.767	228.7	44.5	44.5	184.3	44.5	0	0.0
30-Jul	2.4	0.1	12.9	12.9	12.9	0.0	12.9	0	0.0
31-Jul	0	0	0.0	0.0	0.0	0.0	0.0	0	0.0
01-Aug	0.6	0.025	3.2	3.2	3.2	0.0	3.2	0	0.0
02-Aug	10.8	0.45	58.3	44.5	44.5	13.8	44.5	0	0.0
03-Aug	0	0	0.0	0.0	0.0	0.0	0.0	0	0.0
04-Aug	0	0	0.0	0.0	0.0	0.0	0.0	0	0.0
05-Aug	0.4	0.017	2.2	2.2	2.2	0.0	2.2	0	0.0
06-Aug	4	0.167	21.6	21.6	21.6	0.0	21.6	0	0.0
07-Aug	1.2	0.05	6.5	6.5	6.5	0.0	6.5	0	0.0
08-Aug	2.8	0.117	15.1	15.1	15.1	0.0	15.1	0	0.0
09-Aug	11	0.458	59.3	44.5	44.5	14.9	44.5	0	0.0
10-Aug	0	0	0.0	0.0	0.0	0.0	0.0	0	0.0
11-Aug	0	0	0.0	0.0	0.0	0.0	0.0	0	0.0

12-Aug	0	0	0.0	0.0	0.0	0.0	0.0	0	0.0
13-Aug	0	0	0.0	0.0	0.0	0.0	0.0	0	0.0
14-Aug	0	0	0.0	0.0	0.0	0.0	0.0	0	0.0
15-Aug	2	0.083	10.8	10.8	10.8	0.0	10.8	0	0.0
16-Aug	0	0	0.0	0.0	0.0	0.0	0.0	0	0.0
17-Aug	0	0	0.0	0.0	0.0	0.0	0.0	0	0.0
18-Aug	14.2	0.592	76.6	44.5	44.5	32.1	44.5	0	0.0
19-Aug	0	0	0.0	0.0	0.0	0.0	0.0	0	0.0
20-Aug	0	0	0.0	0.0	0.0	0.0	0.0	0	0.0
21-Aug	15.6	0.65	84.1	44.5	44.5	39.7	44.5	0	0.0
22-Aug	0	0	0.0	0.0	0.0	0.0	0.0	0	0.0
23-Aug	6.6	0.275	35.6	35.6	35.6	0.0	35.6	0	0.0
24-Aug	0.8	0.033	4.3	4.3	4.3	0.0	4.3	0	0.0
25-Aug	0	0	0.0	0.0	0.0	0.0	0.0	0	0.0
26-Aug	3.8	0.158	20.5	20.5	20.5	0.0	20.5	0	0.0
27-Aug	24.2	1.008	130.5	44.5	44.5	86.1	44.5	0	0.0
28-Aug	0.8	0.033	4.3	4.3	4.3	0.0	4.3	0	0.0
29-Aug	0	0	0.0	0.0	0.0	0.0	0.0	0	0.0
30-Aug	0	0	0.0	0.0	0.0	0.0	0.0	0	0.0
31-Aug	0	0	0.0	0.0	0.0	0.0	0.0	0	0.0
01-Sep	0	0	0.0	0.0	0.0	0.0	0.0	0	0.0
02-Sep	0.4	0.017	2.2	2.2	2.2	0.0	2.2	0	0.0
03-Sep	0	0	0.0	0.0	0.0	0.0	0.0	0	0.0
04-Sep	1.9	0.079	10.2	10.2	10.2	0.0	10.2	0	0.0
05-Sep	5.8	0.242	31.3	31.3	31.3	0.0	31.3	0	0.0
06-Sep	0	0	0.0	0.0	0.0	0.0	0.0	0	0.0
07-Sep	0	0	0.0	0.0	0.0	0.0	0.0	0	0.0
08-Sep	0	0	0.0	0.0	0.0	0.0	0.0	0	0.0
09-Sep	0	0	0.0	0.0	0.0	0.0	0.0	0	0.0
10-Sep	6.4	0.267	34.5	34.5	34.5	0.0	34.5	0	0.0
11-Sep	61.8	2.575	333.4	44.5	44.5	288.9	44.5	0	0.0
12-Sep	20.6	0.858	111.1	44.5	44.5	66.7	44.5	0	0.0
13-Sep	5.8	0.242	31.3	31.3	31.3	0.0	31.3	0	0.0
14-Sep	0	0	0.0	0.0	0.0	0.0	0.0	0	0.0
15-Sep	8.1	0.338	43.7	43.7	43.7	0.0	43.7	0	0.0
16-Sep	2.3	0.096	12.4	12.4	12.4	0.0	12.4	0	0.0
17-Sep	0	0	0.0	0.0	0.0	0.0	0.0	0	0.0
18-Sep	0	0	0.0	0.0	0.0	0.0	0.0	0	0.0
19-Sep	0	0	0.0	0.0	0.0	0.0	0.0	0	0.0
20-Sep	0.8	0.033	4.3	4.3	4.3	0.0	4.3	0	0.0
21-Sep	0	0	0.0	0.0	0.0	0.0	0.0	0	0.0
22-Sep	0	0	0.0	0.0	0.0	0.0	0.0	0	0.0
23-Sep	13	0.542	70.1	44.5	44.5	25.7	44.5	0	0.0
24-Sep	0	0	0.0	0.0	0.0	0.0	0.0	0	0.0
25-Sep	0	0	0.0	0.0	0.0	0.0	0.0	0	0.0
26-Sep	0	0	0.0	0.0	0.0	0.0	0.0	0	0.0
27-Sep	0	0	0.0	0.0	0.0	0.0	0.0	0	0.0
28-Sep	1.3	0.054	7.0	7.0	7.0	0.0	7.0	0	0.0
29-Sep	14.1	0.588	76.1	44.5	44.5	31.6	44.5	0	0.0
30-Sep	25.2	1.05	135.9	44.5	44.5	91.5	44.5	0	0.0
01-Oct	0	0	0.0	0.0	0.0	0.0	0.0	0	0.0
02-Oct	0.4	0.017	2.2	2.2	2.2	0.0	2.2	0	0.0
03-Oct	7.8	0.325	42.1	42.1	42.1	0.0	42.1	0	0.0
04-Oct	7.8	0.325	42.1	42.1	42.1	0.0	42.1	0	0.0
05-Oct	6	0.25	32.4	32.4	32.4	0.0	32.4	0	0.0
06-Oct	0.4	0.017	2.2	2.2	2.2	0.0	2.2	0	0.0
07-Oct	0	0	0.0	0.0	0.0	0.0	0.0	0	0.0
08-Oct	1	0.042	5.4	5.4	5.4	0.0	5.4	0	0.0
09-Oct	1.2	0.05	6.5	6.5	6.5	0.0	6.5	0	0.0
10-Oct	0	0	0.0	0.0	0.0	0.0	0.0	0	0.0
11-Oct	0	0	0.0	0.0	0.0	0.0	0.0	0	0.0
12-Oct	0	0	0.0	0.0	0.0	0.0	0.0	0	0.0
13-Oct	10.4	0.433	56.1	44.5	44.5	11.6	44.5	0	0.0
14-Oct	9	0.375	48.5	44.5	44.5	4.1	44.5	0	0.0
15-Oct	0	0	0.0	0.0	0.0	0.0	0.0	0	0.0
16-Oct	0.2	0.008	1.1	1.1	1.1	0.0	1.1	0	0.0
17-Oct	1.6	0.067	8.6	8.6	8.6	0.0	8.6	0	0.0
18-Oct	0	0	0.0	0.0	0.0	0.0	0.0	0	0.0
19-Oct	0	0	0.0	0.0	0.0	0.0	0.0	0	0.0
20-Oct	0	0	0.0	0.0	0.0	0.0	0.0	0	0.0
21-Oct	5.8	0.242	31.3	31.3	31.3	0.0	31.3	0	0.0
22-Oct	0	0	0.0	0.0	0.0	0.0	0.0	0	0.0
23-Oct	1	0.042	5.4	5.4	5.4	0.0	5.4	0	0.0
24-Oct	0	0	0.0	0.0	0.0	0.0	0.0	0	0.0
25-Oct	0	0	0.0	0.0	0.0	0.0	0.0	0	0.0
26-Oct	1.3	0.054	7.0	7.0	7.0	0.0	7.0	0	0.0
27-Oct	10.9	0.454	58.8	44.5	44.5	14.3	44.5	0	0.0
28-Oct	0	0	0.0	0.0	0.0	0.0	0.0	0	0.0
29-Oct	13	0.542	70.1	44.5	44.5	25.7	44.5	0	0.0
30-Oct	0	0	0.0	0.0	0.0	0.0	0.0	0	0.0
31-Oct	0	0	0.0	0.0	0.0	0.0	0.0	0	0.0
Total	**800.4**	**33.4**	**4317.5**	**2425.8**	**2425.8**	**1891.7**	**2425.8**	**0.0**	**0.0**

WPE Engineering Ltd.
Engineers, Planners and Project Managers

Table F-10: Infiltration Gallery Sizing (Dry Year) Proposed Condition

Prepared:	A.R.M	Page No.	F-10
Checked:	Z.D.		
Proj. #	2034		
Date:	06-Jun-24		

Project: Proposed Commercial Development, 3075 Palladium Drive, City of Ottawa, ON.

Infiltration Gallery Sizing Calculation
Wet Year Calculation

Runoff Area (m^2)	5678.11	
Effective Runoff (%)	95%	
Infiltration Rate (mm/hr)	50	As per Geotechnical Investigation (YME)
Infiltration Safety Factor	2.5	As per Geotechnical Investigation (GEMTIC)
Design Infiltration Rate (mm/hr)	20	
Percolation Rate (min/cm)	15	As per Geotechnical Investigation (YME)
Percolation Rate (m/day)	0.48	

Precipitation Data April 1 to October 31 (Dry year)

Total Precipitation Depth	405.1	mm
Total Precipitation Volume	2185	m^3
Total Infiltration Volume	1760.4	m^3
Development Area	2.5816	ha
Infiltration Rate	68.19	mm/yr.
Overflow Volume	424.7	m^3/yr.
Runoff Volume Overflow	24.13	%

Infiltration Gallery Sizing

Width (m)	10	
Length (m)	19.5	
Depth (m)	0.60	
Number of Cells	1	
Void Ratio	0.38	3/4" Cleastone
Drawdown Time (hr)	30	
Total Dry Cell Volume (m^3)	44.5	

Date	Rainfall (mm)	Rainfall Intensity - Avg (mm/hr)	Rainwater Available (m^3)	Volume Inflow to Dry Cell (m^3)	Volume in Dry Cell (m^3)	Volume Passing Dry Cell (m^3)	Infiltration from Bottom (m^3)	Infiltration from Sides (Bottom 3rd)	Balance in Dry Cell (m^3)
01-Apr	0	0	0.0	0.0	0.0	0.0	0.0	0	0.0
02-Apr	0	0	0.0	0.0	0.0	0.0	0.0	0	0.0
03-Apr	0	0	0.0	0.0	0.0	0.0	0.0	0	0.0
04-Apr	15	0.625	80.9	44.5	44.5	36.5	44.5	0	0.0
05-Apr	0	0	0.0	0.0	0.0	0.0	0.0	0	0.0
06-Apr	0	0	0.0	0.0	0.0	0.0	0.0	0	0.0
07-Apr	0.3	0.013	1.6	1.6	1.6	0.0	1.6	0	0.0
08-Apr	0	0	0.0	0.0	0.0	0.0	0.0	0	0.0
09-Apr	0	0	0.0	0.0	0.0	0.0	0.0	0	0.0
10-Apr	0	0	0.0	0.0	0.0	0.0	0.0	0	0.0
11-Apr	0	0	0.0	0.0	0.0	0.0	0.0	0	0.0
12-Apr	1	0.042	5.4	5.4	5.4	0.0	5.4	0	0.0
13-Apr	1.6	0.067	8.6	8.6	8.6	0.0	8.6	0	0.0
14-Apr	5.9	0.246	31.8	31.8	31.8	0.0	31.8	0	0.0
15-Apr	2.3	0.096	12.4	12.4	12.4	0.0	12.4	0	0.0
16-Apr	0	0	0.0	0.0	0.0	0.0	0.0	0	0.0
17-Apr	0	0	0.0	0.0	0.0	0.0	0.0	0	0.0
18-Apr	0	0	0.0	0.0	0.0	0.0	0.0	0	0.0
19-Apr	0	0	0.0	0.0	0.0	0.0	0.0	0	0.0
20-Apr	0	0	0.0	0.0	0.0	0.0	0.0	0	0.0
21-Apr	0	0	0.0	0.0	0.0	0.0	0.0	0	0.0
22-Apr	6.9	0.288	37.2	37.2	37.2	0.0	37.2	0	0.0
23-Apr	4.8	0.2	25.9	25.9	25.9	0.0	25.9	0	0.0
24-Apr	0.3	0.013	1.6	1.6	1.6	0.0	1.6	0	0.0
25-Apr	0	0	0.0	0.0	0.0	0.0	0.0	0	0.0
26-Apr	0	0	0.0	0.0	0.0	0.0	0.0	0	0.0
27-Apr	0	0	0.0	0.0	0.0	0.0	0.0	0	0.0
28-Apr	0	0	0.0	0.0	0.0	0.0	0.0	0	0.0
29-Apr	10.8	0.45	58.3	44.5	44.5	13.8	44.5	0	0.0
30-Apr	1.6	0.067	8.6	8.6	8.6	0.0	8.6	0	0.0
01-May	3.8	0.158	20.5	20.5	20.5	0.0	20.5	0	0.0
02-May	0	0	0.0	0.0	0.0	0.0	0.0	0	0.0
03-May	11.3	0.471	61.0	44.5	44.5	16.5	44.5	0	0.0
04-May	0	0	0.0	0.0	0.0	0.0	0.0	0	0.0
05-May	0	0	0.0	0.0	0.0	0.0	0.0	0	0.0
06-May	4.1	0.171	22.1	22.1	22.1	0.0	22.1	0	0.0
07-May	3	0.125	16.2	16.2	16.2	0.0	16.2	0	0.0
08-May	0	0	0.0	0.0	0.0	0.0	0.0	0	0.0
09-May	23.4	0.975	126.2	44.5	44.5	81.8	44.5	0	0.0
10-May	0.5	0.021	2.7	2.7	2.7	0.0	2.7	0	0.0
11-May	0	0	0.0	0.0	0.0	0.0	0.0	0	0.0
12-May	22.3	0.929	120.3	44.5	44.5	75.8	44.5	0	0.0
13-May	0	0	0.0	0.0	0.0	0.0	0.0	0	0.0
14-May	0	0	0.0	0.0	0.0	0.0	0.0	0	0.0
15-May	2.3	0.096	12.4	12.4	12.4	0.0	12.4	0	0.0
16-May	0.3	0.013	1.6	1.6	1.6	0.0	1.6	0	0.0
17-May	0	0	0.0	0.0	0.0	0.0	0.0	0	0.0
18-May	0	0	0.0	0.0	0.0	0.0	0.0	0	0.0
19-May	0	0	0.0	0.0	0.0	0.0	0.0	0	0.0

20-May	0	0	0.0	0.0	0.0	0.0	0.0	0	0.0
21-May	0	0	0.0	0.0	0.0	0.0	0.0	0	0.0
22-May	8.4	0.35	45.3	44.5	44.5	0.9	44.5	0	0.0
23-May	10	0.417	53.9	44.5	44.5	9.5	44.5	0	0.0
24-May	3.4	0.142	18.3	18.3	18.3	0.0	18.3	0	0.0
25-May	6.2	0.258	33.4	33.4	33.4	0.0	33.4	0	0.0
26-May	1.9	0.079	10.2	10.2	10.2	0.0	10.2	0	0.0
27-May	0.3	0.013	1.6	1.6	1.6	0.0	1.6	0	0.0
28-May	1.3	0.054	7.0	7.0	7.0	0.0	7.0	0	0.0
29-May	1.1	0.046	5.9	5.9	5.9	0.0	5.9	0	0.0
30-May	0	0	0.0	0.0	0.0	0.0	0.0	0	0.0
31-May	10.9	0.454	58.8	44.5	44.5	14.3	44.5	0	0.0
01-Jun	0	0	0.0	0.0	0.0	0.0	0.0	0	0.0
02-Jun	0.5	0.021	2.7	2.7	2.7	0.0	2.7	0	0.0
03-Jun	0	0	0.0	0.0	0.0	0.0	0.0	0	0.0
04-Jun	0	0	0.0	0.0	0.0	0.0	0.0	0	0.0
05-Jun	0	0	0.0	0.0	0.0	0.0	0.0	0	0.0
06-Jun	0	0	0.0	0.0	0.0	0.0	0.0	0	0.0
07-Jun	0	0	0.0	0.0	0.0	0.0	0.0	0	0.0
08-Jun	0	0	0.0	0.0	0.0	0.0	0.0	0	0.0
09-Jun	0	0	0.0	0.0	0.0	0.0	0.0	0	0.0
10-Jun	0	0	0.0	0.0	0.0	0.0	0.0	0	0.0
11-Jun	0	0	0.0	0.0	0.0	0.0	0.0	0	0.0
12-Jun	0.3	0.013	1.6	1.6	1.6	0.0	1.6	0	0.0
13-Jun	12.2	0.508	65.8	44.5	44.5	21.3	44.5	0	0.0
14-Jun	0.3	0.013	1.6	1.6	1.6	0.0	1.6	0	0.0
15-Jun	1.3	0.054	7.0	7.0	7.0	0.0	7.0	0	0.0
16-Jun	11.8	0.492	63.7	44.5	44.5	19.2	44.5	0	0.0
17-Jun	6.4	0.267	34.5	34.5	34.5	0.0	34.5	0	0.0
18-Jun	0.8	0.033	4.3	4.3	4.3	0.0	4.3	0	0.0
19-Jun	0	0	0.0	0.0	0.0	0.0	0.0	0	0.0
20-Jun	5.2	0.217	28.0	28.0	28.0	0.0	28.0	0	0.0
21-Jun	3.2	0.133	17.3	17.3	17.3	0.0	17.3	0	0.0
22-Jun	0	0	0.0	0.0	0.0	0.0	0.0	0	0.0
23-Jun	0	0	0.0	0.0	0.0	0.0	0.0	0	0.0
24-Jun	0.3	0.013	1.6	1.6	1.6	0.0	1.6	0	0.0
25-Jun	0	0	0.0	0.0	0.0	0.0	0.0	0	0.0
26-Jun	0	0	0.0	0.0	0.0	0.0	0.0	0	0.0
27-Jun	0	0	0.0	0.0	0.0	0.0	0.0	0	0.0
28-Jun	0	0	0.0	0.0	0.0	0.0	0.0	0	0.0
29-Jun	0	0	0.0	0.0	0.0	0.0	0.0	0	0.0
30-Jun	1.1	0.046	5.9	5.9	5.9	0.0	5.9	0	0.0
01-Jul	0.5	0.021	2.7	2.7	2.7	0.0	2.7	0	0.0
02-Jul	6.1	0.254	32.9	32.9	32.9	0.0	32.9	0	0.0
03-Jul	0	0	0.0	0.0	0.0	0.0	0.0	0	0.0
04-Jul	6.4	0.267	34.5	34.5	34.5	0.0	34.5	0	0.0
05-Jul	0.8	0.033	4.3	4.3	4.3	0.0	4.3	0	0.0
06-Jul	0	0	0.0	0.0	0.0	0.0	0.0	0	0.0
07-Jul	0	0	0.0	0.0	0.0	0.0	0.0	0	0.0
08-Jul	0	0	0.0	0.0	0.0	0.0	0.0	0	0.0
09-Jul	6.7	0.279	36.1	36.1	36.1	0.0	36.1	0	0.0
10-Jul	0	0	0.0	0.0	0.0	0.0	0.0	0	0.0
11-Jul	0	0	0.0	0.0	0.0	0.0	0.0	0	0.0
12-Jul	0	0	0.0	0.0	0.0	0.0	0.0	0	0.0
13-Jul	0	0	0.0	0.0	0.0	0.0	0.0	0	0.0
14-Jul	0	0	0.0	0.0	0.0	0.0	0.0	0	0.0
15-Jul	0	0	0.0	0.0	0.0	0.0	0.0	0	0.0
16-Jul	0	0	0.0	0.0	0.0	0.0	0.0	0	0.0
17-Jul	0	0	0.0	0.0	0.0	0.0	0.0	0	0.0
18-Jul	20.9	0.871	112.7	44.5	44.5	68.3	44.5	0	0.0
19-Jul	11.5	0.479	62.0	44.5	44.5	17.6	44.5	0	0.0
20-Jul	0	0	0.0	0.0	0.0	0.0	0.0	0	0.0
21-Jul	0	0	0.0	0.0	0.0	0.0	0.0	0	0.0
22-Jul	0	0	0.0	0.0	0.0	0.0	0.0	0	0.0
23-Jul	6.9	0.288	37.2	37.2	37.2	0.0	37.2	0	0.0
24-Jul	9.2	0.383	49.6	44.5	44.5	5.2	44.5	0	0.0
25-Jul	0	0	0.0	0.0	0.0	0.0	0.0	0	0.0
26-Jul	0.3	0.013	1.6	1.6	1.6	0.0	1.6	0	0.0
27-Jul	1.3	0.054	7.0	7.0	7.0	0.0	7.0	0	0.0
28-Jul	0	0	0.0	0.0	0.0	0.0	0.0	0	0.0
29-Jul	1.1	0.046	5.9	5.9	5.9	0.0	5.9	0	0.0
30-Jul	0.3	0.013	1.6	1.6	1.6	0.0	1.6	0	0.0
31-Jul	4.1	0.171	22.1	22.1	22.1	0.0	22.1	0	0.0
01-Aug	0	0	0.0	0.0	0.0	0.0	0.0	0	0.0
02-Aug	8.9	0.371	48.0	44.5	44.5	3.5	44.5	0	0.0
03-Aug	11.5	0.479	62.0	44.5	44.5	17.6	44.5	0	0.0
04-Aug	0.8	0.033	4.3	4.3	4.3	0.0	4.3	0	0.0
05-Aug	0	0	0.0	0.0	0.0	0.0	0.0	0	0.0
06-Aug	0	0	0.0	0.0	0.0	0.0	0.0	0	0.0
07-Aug	0	0	0.0	0.0	0.0	0.0	0.0	0	0.0
08-Aug	0.8	0.033	4.3	4.3	4.3	0.0	4.3	0	0.0
09-Aug	0	0	0.0	0.0	0.0	0.0	0.0	0	0.0
10-Aug	0	0	0.0	0.0	0.0	0.0	0.0	0	0.0
11-Aug	0	0	0.0	0.0	0.0	0.0	0.0	0	0.0

12-Aug	1.3	0.054	7.0	7.0	7.0	0.0	7.0	0	0.0
13-Aug	0	0	0.0	0.0	0.0	0.0	0.0	0	0.0
14-Aug	0	0	0.0	0.0	0.0	0.0	0.0	0	0.0
15-Aug	0	0	0.0	0.0	0.0	0.0	0.0	0	0.0
16-Aug	0	0	0.0	0.0	0.0	0.0	0.0	0	0.0
17-Aug	0.6	0.025	3.2	3.2	3.2	0.0	3.2	0	0.0
18-Aug	0	0	0.0	0.0	0.0	0.0	0.0	0	0.0
19-Aug	5.5	0.229	29.7	29.7	29.7	0.0	29.7	0	0.0
20-Aug	0	0	0.0	0.0	0.0	0.0	0.0	0	0.0
21-Aug	0	0	0.0	0.0	0.0	0.0	0.0	0	0.0
22-Aug	0	0	0.0	0.0	0.0	0.0	0.0	0	0.0
23-Aug	0.8	0.033	4.3	4.3	4.3	0.0	4.3	0	0.0
24-Aug	0	0	0.0	0.0	0.0	0.0	0.0	0	0.0
25-Aug	0	0	0.0	0.0	0.0	0.0	0.0	0	0.0
26-Aug	0	0	0.0	0.0	0.0	0.0	0.0	0	0.0
27-Aug	3.3	0.138	17.8	17.8	17.8	0.0	17.8	0	0.0
28-Aug	0	0	0.0	0.0	0.0	0.0	0.0	0	0.0
29-Aug	0	0	0.0	0.0	0.0	0.0	0.0	0	0.0
30-Aug	0	0	0.0	0.0	0.0	0.0	0.0	0	0.0
31-Aug	0.8	0.033	4.3	4.3	4.3	0.0	4.3	0	0.0
01-Sep	0	0	0.0	0.0	0.0	0.0	0.0	0	0.0
02-Sep	0.9	0.038	4.9	4.9	4.9	0.0	4.9	0	0.0
03-Sep	8.4	0.35	45.3	44.5	44.5	0.9	44.5	0	0.0
04-Sep	0	0	0.0	0.0	0.0	0.0	0.0	0	0.0
05-Sep	0	0	0.0	0.0	0.0	0.0	0.0	0	0.0
06-Sep	0	0	0.0	0.0	0.0	0.0	0.0	0	0.0
07-Sep	0	0	0.0	0.0	0.0	0.0	0.0	0	0.0
08-Sep	0	0	0.0	0.0	0.0	0.0	0.0	0	0.0
09-Sep	0.6	0.025	3.2	3.2	3.2	0.0	3.2	0	0.0
10-Sep	4.4	0.183	23.7	23.7	23.7	0.0	23.7	0	0.0
11-Sep	0	0	0.0	0.0	0.0	0.0	0.0	0	0.0
12-Sep	3.5	0.146	18.9	18.9	18.9	0.0	18.9	0	0.0
13-Sep	11.7	0.488	63.1	44.5	44.5	18.7	44.5	0	0.0
14-Sep	0	0	0.0	0.0	0.0	0.0	0.0	0	0.0
15-Sep	0	0	0.0	0.0	0.0	0.0	0.0	0	0.0
16-Sep	0	0	0.0	0.0	0.0	0.0	0.0	0	0.0
17-Sep	1.1	0.046	5.9	5.9	5.9	0.0	5.9	0	0.0
18-Sep	0	0	0.0	0.0	0.0	0.0	0.0	0	0.0
19-Sep	0	0	0.0	0.0	0.0	0.0	0.0	0	0.0
20-Sep	3.1	0.129	16.7	16.7	16.7	0.0	16.7	0	0.0
21-Sep	1.4	0.058	7.6	7.6	7.6	0.0	7.6	0	0.0
22-Sep	0.6	0.025	3.2	3.2	3.2	0.0	3.2	0	0.0
23-Sep	0	0	0.0	0.0	0.0	0.0	0.0	0	0.0
24-Sep	0	0	0.0	0.0	0.0	0.0	0.0	0	0.0
25-Sep	4.9	0.204	26.4	26.4	26.4	0.0	26.4	0	0.0
26-Sep	0.3	0.013	1.6	1.6	1.6	0.0	1.6	0	0.0
27-Sep	0	0	0.0	0.0	0.0	0.0	0.0	0	0.0
28-Sep	3.9	0.163	21.0	21.0	21.0	0.0	21.0	0	0.0
29-Sep	2.1	0.088	11.3	11.3	11.3	0.0	11.3	0	0.0
30-Sep	0	0	0.0	0.0	0.0	0.0	0.0	0	0.0
01-Oct	0	0	0.0	0.0	0.0	0.0	0.0	0	0.0
02-Oct	4.5	0.188	24.3	24.3	24.3	0.0	24.3	0	0.0
03-Oct	0	0	0.0	0.0	0.0	0.0	0.0	0	0.0
04-Oct	0	0	0.0	0.0	0.0	0.0	0.0	0	0.0
05-Oct	0	0	0.0	0.0	0.0	0.0	0.0	0	0.0
06-Oct	0	0	0.0	0.0	0.0	0.0	0.0	0	0.0
07-Oct	3	0.125	16.2	16.2	16.2	0.0	16.2	0	0.0
08-Oct	0	0	0.0	0.0	0.0	0.0	0.0	0	0.0
09-Oct	0	0	0.0	0.0	0.0	0.0	0.0	0	0.0
10-Oct	2	0.083	10.8	10.8	10.8	0.0	10.8	0	0.0
11-Oct	0	0	0.0	0.0	0.0	0.0	0.0	0	0.0
12-Oct	1.8	0.075	9.7	9.7	9.7	0.0	9.7	0	0.0
13-Oct	0	0	0.0	0.0	0.0	0.0	0.0	0	0.0
14-Oct	8.9	0.371	48.0	44.5	44.5	3.5	44.5	0	0.0
15-Oct	0	0	0.0	0.0	0.0	0.0	0.0	0	0.0
16-Oct	0	0	0.0	0.0	0.0	0.0	0.0	0	0.0
17-Oct	6.8	0.283	36.7	36.7	36.7	0.0	36.7	0	0.0
18-Oct	0	0	0.0	0.0	0.0	0.0	0.0	0	0.0
19-Oct	0	0	0.0	0.0	0.0	0.0	0.0	0	0.0
20-Oct	0	0	0.0	0.0	0.0	0.0	0.0	0	0.0
21-Oct	0	0	0.0	0.0	0.0	0.0	0.0	0	0.0
22-Oct	0	0	0.0	0.0	0.0	0.0	0.0	0	0.0
23-Oct	0	0	0.0	0.0	0.0	0.0	0.0	0	0.0
24-Oct	0	0	0.0	0.0	0.0	0.0	0.0	0	0.0
25-Oct	6.6	0.275	35.6	35.6	35.6	0.0	35.6	0	0.0
26-Oct	0	0	0.0	0.0	0.0	0.0	0.0	0	0.0
27-Oct	0	0	0.0	0.0	0.0	0.0	0.0	0	0.0
28-Oct	0	0	0.0	0.0	0.0	0.0	0.0	0	0.0
29-Oct	0	0	0.0	0.0	0.0	0.0	0.0	0	0.0
30-Oct	5.5	0.229	29.7	29.7	29.7	0.0	29.7	0	0.0
31-Oct	0.3	0.013	1.6	1.6	1.6	0.0	1.6	0	0.0
Total	**405.1**	**16.9**	**2185.2**	**1760.4**	**1760.4**	**424.7**	**1760.4**	**0.0**	**0.0**

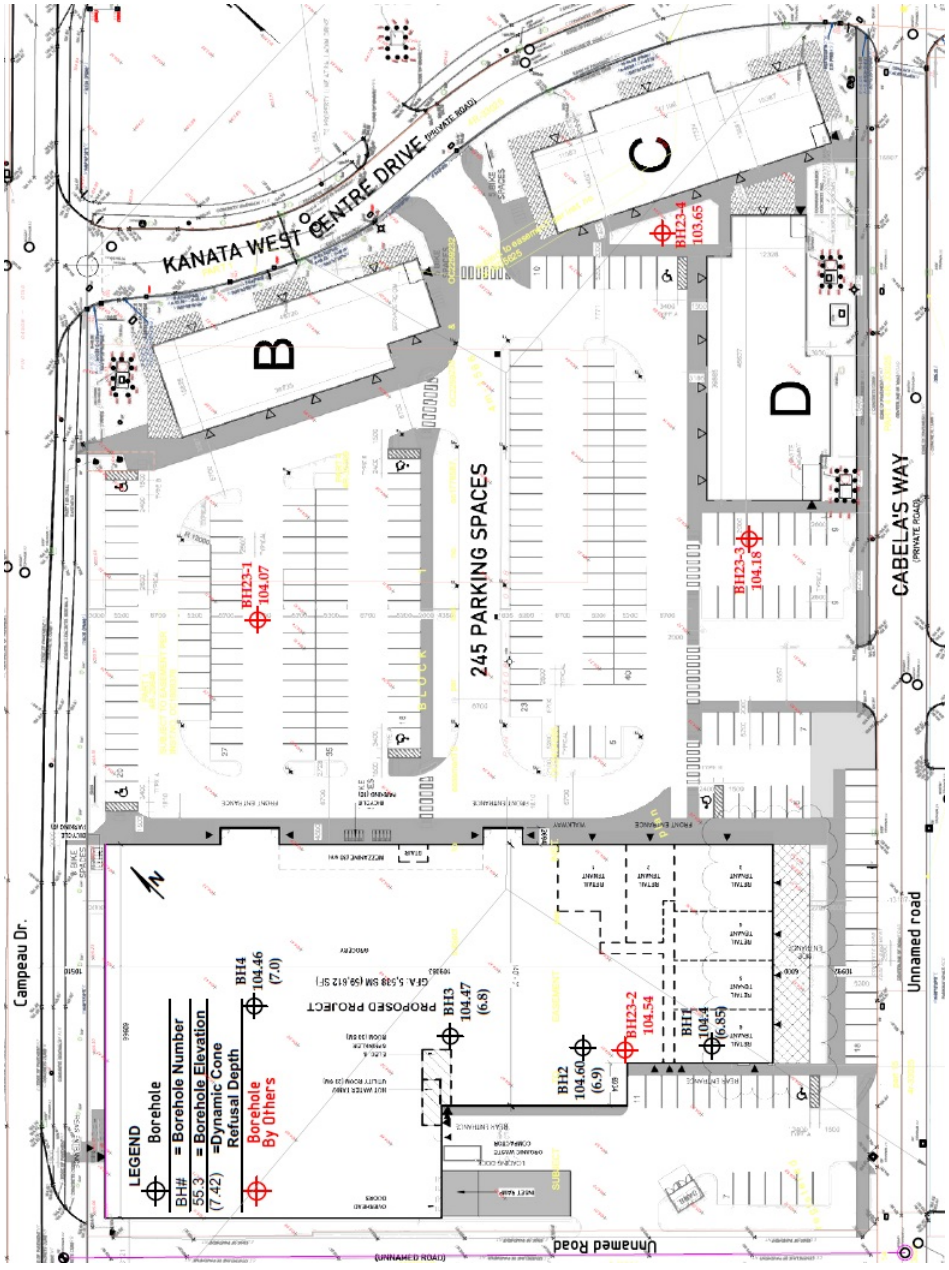


Figure 1: Test hole Locations Plan

It can be seen in the borehole logs that at all borehole locations bedrock is inferred from DCPT testing at 6.8 to 7 m depth. Throughout the depth profile at all borehole locations dense sandy silt was found in all 4 boreholes. The site is covered with roughly 0.15 m of topsoil.

Gradation testing indicates that the silt encountered has 20.7% content of very fine sand finer than 0.18 mm.

Sandy silt is very susceptible to caving onto excavations exceeding the high water table encountered at this site. Refer to the excavation/open-cut section for guidance.

Refer to the borehole logs in appendix B for specific details at each location.

5.1 Groundwater and Moisture

Assessments completed during field sampling and testing indicate very shallow water conditions at all borehole locations. These assessments suggest a 0.9m depth to the water table.

The water level measured at BH1 was found at a 0.9 m depth during our March, 2024 measurement.

The investigation findings confirm shallow water conditions. Moisture contents vary above the ground water table.

5.2 Freezing Index, Frost Depth and Frost Susceptibility

It is generally assumed that the frost depth for the 1,000 degree Celsius-days freezing index applicable to Ottawa will reach no deeper than 1.8 m on bare ground (snow free) or pavement. It is also assumed that frost depth will reach no deeper than 1.5 m on snow covered ground.

The soil materials encountered at this site are frost susceptible and thus will heave upon exposure to freezing temperatures. Heaving destroys the mechanical properties of soils so that any soil which has been frozen is considered disturbed.

Part III
Recommendations

The following set of the recommendations result from sampling and testing outlined in section 3 and from geotechnical engineering evaluation and assessments.

It is understood that the proposed development will consist of a Proposed 2 Storey Commercial Buildings and that consideration is being given to the preservation of the foundation walls of the existing building.

6.3 Settlements

For the footing loads provided in section 6.1 building settlements for foundations on undisturbed sandy silt are not to exceed service limit values (SLS) of 25 mm and 20 mm total and differential settlements respectively at this site.

6.4 Frost Protection for Foundations

Shallow foundations on frost susceptible soils which may be required on the perimeter of the building for canopies or other structures are considered to be frost protected when placed at sufficient depth to prevent supporting soils from freezing. Foundations in the perimeter of heated buildings where snow is not cleared are considered frost protected at 1.5 m depth (as having a soil cover of 1.5 m). Foundations away from heated buildings or in areas where snow is cleared, need to be at about 1.8 m depth to be frost protected. On the alternative frost protection can be provided by using foundation insulation for shallower foundations.

6.5 Foundation Insulation

To meet the required frost protection in section 6.4 for foundations for canopies or other structures in the perimeter of the building and in unheated areas in otherwise heated buildings 50 mm of extruded polystyrene insulation (XPS) type V, VI or VII meet foundation insulation requirements for the freezing index in the Ottawa area.

6.5.1 Creep Deformation of Insulation

Service loads on foundation insulation must be kept at no more than 1/3 of its rated capacity. Creep deformations occur on insulation at loads exceeding 1/3 of its rated capacity. The rated capacity is at 10 % strains.

6.6 Foundation Wall Damproofing and Drainage

Foundation walls damproofing and foundation drainage are not required for foundations serving buildings of slab-on-grade construction not having floor levels lower than the finished grade on the perimeter for the conditions encountered at this site.

Elevator pits deeper than the exterior grade of buildings do require foundation drainage.

Appendix E.1 presents page 2 of NRC Construction Evaluation Reports CCMC 12658-R showing damproofing and foundation wall drainage system details satisfying the provisions under OBC 2012 and suitable for the conditions found at this site. Other available similar systems having the components shown in CCMC 12658-R may be used. Foundation drainage must be provided to daylight or a positive outlet, or sump.

7 Rates of Infiltration, Percolation and Permeability

Values of permeability, infiltration and percolation which could be associated[2] to the sandy silt encountered at this site are the following:

- Permeability of 5×10^{-5} cms/sec
- Percolation of 15 min/cm
- Infiltration of 5 cm/hr

8 Site Class for Seismic Design

At this site, the geotechnical testing completed along with the estimated soil properties via Dynamic Cone Penetration (DCPT) conducted in all boreholes are indicative of a Vs(30) exceeding 360 m/s. As such, site class C is assigned under the provisions in section 4.1.8.4 of the Ontario Building Code 2012 (OBC 2012) for seismic design.

9 Roadbed Soils and Pavement Structure

The flexible pavement structures supplied in this report follow the guidelines set out in AASHTO 1993 Guide for Design of Pavement Structures (AASHTO) for climatic Region III. Under AASHTO pavements are designed to withstand 20 year accumulated design Equivalent Single Axle 80 kN (18,000 pounds) load applications (ESALs). ESALs are a measure of mix traffic loads including vehicle loads and truck loads. The number of ESALs applications depend on traffic class and use.

Roadbed denotes the materials beneath pavement structures. The term pavement is used to denote the layered structure that forms a road carriageway or vehicle parking. *The general quality of the near surface undisturbed soil to serve as foundation for pavement structure (Roadbed soil) at this site are assumed to be very poor* as defined in the AASHTO guide. It is hence recommended to refer to the following information in appendix D:

- *Yuri Mendez Engineering's pavement catalog in appendix D.1 to select pavement structures* for traffic classes on the very poor roadbed soils encountered at this site.
- Appendix D.2 for guidelines regarding frost heave.
- Appendix D.3 for frost protection recommendations for manholes and catch basin construction.

[2]MMAH Supplementary Standard SB-6 and approximate relationship between the permeability and infiltration rate

time a long-term monitoring logger was also installed at MW23-02. Table 5.2 summarizes the groundwater levels observed on May 26, 2023 and June 2, 2023.

Table 5.2 – Summary of Groundwater Levels

Date	Borehole	Well Screen	Ground Surface Elevation (metres)	Groundwater Depth (metres)	Groundwater Elevation (metres)
May 26	23-01	Sandy Silt	104.1	1.6	102.5
	23-02	Sandy Silt	104.5	1.9	102.6
June 2	23-01	Sandy Silt	104.1	2.0	102.1
	23-02	Sandy Silt	104.5	2.3	102.2

It should be noted that the groundwater levels may be higher during wet periods of the year such as the early spring or following periods of precipitation.

5.3 Soil Chemistry Relating to Corrosion

The results of chemical testing on samples of the Sandy Silt recovered from borehole 23-02 are provided in Appendix B and are summarized in Table 5.3 below.

Table 5.3 – Summary of Corrosion Testing – Sandy Silt

Parameter	Borehole 23-02, Sample 2 Sandy Silt	Borehole 23-02, Sample 4 Sandy Silt
Resistivity (Ohm.m)	16.5	62.3
Conductivity (µS/cm)	606	161
pH	7.52	7.68
Sulphate Content (µg/g)	52	28
Chloride Content (µg/g)	337	29

5.4 Infiltration Test Results

The infiltration rates of native soils were estimated based on in-situ Guelph Permeameter testing as well as grain size analyses.

5.4.1 Grain Size

The soil samples and corresponding relationships that met the suitability criteria, based on their grain size relationships, are summarized in Table 5.4 (refer to data output in Appendix E).

Table 5.4 – Grain Size – Estimated Infiltration Rates

Location	Sampling Interval (m)	Soil Description	Hydraulic Conductivity Estimate[1] (m/s)	Estimated Infiltration based on grain size[2] (mm/hr)
GP23-01	0.75 – 0.90	Silt	Geomean: 2×10^{-5} Range: 2×10^{-5} to 2×10^{-5}	Geomean: 105 Range: 105 to 105
GP23-03	0.75 – 0.90	Sandy Silt	Geomean: 3×10^{-6} Range: 3×10^{-8} to 4×10^{-5}	Geomean: 60 Range: 18 to 120
BH23-01 SA2	0.8 – 1.4	Silt	Geomean: 1×10^{-6} Range: 3×10^{-8} to 2×10^{-5}	Geomean: 50 Range: 18 to 100
BH23-01 SA4	2.3 – 2.9	Sandy Silt	Geomean: 4×10^{-5} Range: 2×10^{-5} to 1×10^{-4}	Geomean: 120 Range: 104 to 163
BH23-02 SA5	3.1 - 3.7	Silt and Sand	Geomean: 3×10^{-5} Range: 2×10^{-5} to 1×10^{-4}	Geomean: 119 Range:100 to 163

Notes:
1. Hydraulic conductivity estimated based on grain size distribution.
2. Infiltration based on the approximate relationship between infiltration rate and hydraulic conductivity (CVC; TRCA, 2010).

It should be noted that the estimated infiltration rates are based on soil texture only and do not consider site specific factors that may affect the infiltration rate, such as soil heterogeneity, compaction, groundwater level, etc.

5.4.2 Guelph Permeameter

The infiltration rates at the hand auger locations were estimated based on in-situ testing completed using a Guelph Permeameter. The measured field saturated hydraulic conductivities

(K_{fs}) range from 2 x 10^{-6} to 6 x 10^{-6} m/s (Appendix E). The corresponding estimated infiltration rates, based on K_{fs}, range from 55 to 75 mm/hr (Table 5.5).

Table 5.5 – Guelph Permeameter – Estimated Infiltration Rates

Location	Soil Description	Hydraulic Conductivity Field Estimate (m/s)	Estimated Infiltration Field Measured[1,2] (mm/hr)
GP23-01	Silt	2 x 10^{-6}	55
GP23-03	Sandy silt	6 x 10^{-6}	75

Notes:
1. Infiltration based on the approximate relationship between infiltration rate and hydraulic conductivity (CVC, TRCA, 2010).

The estimated infiltration rates based on in-situ testing using the Guelph Permeameter, at depth of 0.90 metres below ground surface, were 55 mm/hr in silt (GP23-01) and 75 mm/hr in sandy silt (GP23-03). In-situ Guelph Permeameter testing was not completed at shallower depths due to topsoil and/or low permeability silty clay (BH23-03 and 23-04) or at greater depths, due to measured groundwater levels at 1.6 metres below ground surface. Infiltration rates are expected to slightly increase at depths based on the increasing sand content in silty sands / silt and sands encountered and corresponding increases in estimated infiltration rates (refer to Table 5.4).

6.0 RECOMMENDATIONS

6.1 Grade Raise Restrictions

The site is underlain by deposits of stiff to very stiff silty clay (weathered crust) overlying sandy silt overlying glacial till. As such, it is GEMTEC's opinion that a grade raise restriction is unnecessary at this site, from a geotechnical perspective.

6.2 Seismic Design of Proposed Addition

It is anticipated that the foundations of the proposed buildings will be supported on native deposits of stiff to very stiff weathered silty clay crust, sandy silt, and/or glacial till, or on a pad of engineered fill constructed on the noted overburden materials.

Based on Table 4.1.8.4.A. of the National Building Code of Canada, the seismic site class can be determined based on the Average Standard Penetration Resistance or the Soil Undrained Shear Strength from the borehole data. Based on the results of this investigation, it is our opinion that Site Class D may be used for the seismic design of the structures.

In GEMTEC's opinion, the soils at this site will not be susceptible to liquefaction under the design earthquake loading due to the high fines content (i.e., silt and clay).

available to carry out excavations using the open excavation methods discussed in the preceding section.

6.4 Groundwater Management

Based on our previous experience, groundwater inflow from the silty clay deposits into the excavations should be relatively small and controlled during construction by pumping from filtered sumps within the excavations. However, greater groundwater inflows should be expected where silty sand and till are encountered. Where groundwater pumping is required, suitable detention and filtration will be required before discharging water. The contractor should be required to submit an excavation and groundwater management plan for review. The discharge of pumped water must be carried-out following City of Ottawa 'Sewer Use By-Law 2003-514'. It is not expected that short term pumping during excavation will have any significant effect on nearby structures and services.

The groundwater level in May of 2023 was measured in boreholes 23-01 and 23.02 at about 1.6 and 1.9 metres below ground surface, respectively (elevations 102.5 and 102.6 metres). The noted level may not represent the seasonal high groundwater level, nor future conditions, as the groundwater level will fluctuate seasonally and during periods of notable precipitation, as well as possibly due to construction activities in the area of the project.

The amount of water entering the excavation for the construction of the foundations and municipal services (e.g., water, sanitary sewer, storm sewer) at this site will depend on the size and depth of the excavation, as well as the water table height. Depending on inflow volumes, dewatering permits may be required. An Environmental Activity and Sector Registry (EASR) is required for groundwater takings between 50,000 to 400,000 litres/day, and a Category 3 Permit to Take Water (PTTW) is required for water takings great than 400,000 litres/day. Based on the encountered conditions, groundwater levels and proposed excavation depths, the daily groundwater taking during construction may exceed 50,000 litres per day and, as such, an EASR may be required. EASR registration requires a Water Taking and Discharge Plan, to be completed by a Qualified Professional.

6.5 Low Impact Development (LID) Features

The implementation of LID features on-site will depend on infiltration capacity of on-site soils and groundwater conditions. In-situ testing completed on-site indicates infiltration rates of 55 mm/hr in silt (GP23-01) and 75 mm/hr in sandy silt (GP23-03). It is noted that low permeability silty clay soils were encountered near ground surface at two boreholes locations, as well as lower permeability glacial till at depths ranging from 3.58 to 5.39 metres. It is recommended that the LID inverts extend below the silty clay layers or that the silty clay is excavated and backfilled with higher permeability soils.

The estimated infiltration rates do not include a design safety factor. The safety correction factor depends on the ratio of mean measured infiltration rates (geometric mean measured infiltration rate at the proposed bottom elevation divided by the geometric mean infiltration rate of the least permeable soil horizon within 1.5 metres below the proposed bottom elevation). Given the increasing permeability of soils at depths, the minimum safety factor of 2.5 may be appropriate for LID features with inverts less than 2.0 metres below ground surface, which should be confirmed by the LID designer. LID features with inverts below 2.0 metres will require a higher safety factor based on the presence of lower permeability glacial till (3.5 to 8.5); however, given the high groundwater conditions, deeper LID features may not be practical.

A minimum separation distance of 1.0 metre from the groundwater and proposed bottom of the proposed LID is recommended. Groundwater levels were measured at depths of 1.6 to 2.3 metres below ground surface in May and June 2023. Further, previous investigations noted groundwater depths of 1.1 metres below ground surface in December, 2010 (Paterson, 2010). Prior to finalizing LID system design, seasonal water level data should be obtained over a one-year period.

6.6 Foundation Design

6.6.1 Proposed Buildings

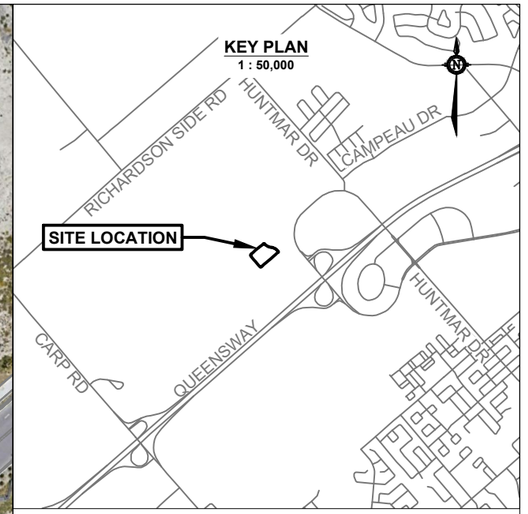
Based on the results of the investigation, the proposed buildings can be founded on shallow foundations bearing on or within the native undisturbed silty clay or sandy silt or a pad of compacted engineered fill overlying these materials.

The topsoil is considered to be highly compressible and should be removed from below the proposed foundations and floor slabs.

In areas where the proposed founding level is above the level of the native soil, or where subexcavation of disturbed material or fill is required below proposed founding level, the grade could be raised with compacted granular material (engineered fill). The engineered fill should consist of granular material meeting Ontario Provincial Standard Specifications (OPSS) requirements for Granular A or Granular B Type II and should be compacted in maximum 200 millimetre thick lifts to at least 98 percent of the standard Proctor maximum dry density. To provide adequate spread of load beneath the footings, the engineered fill should extend horizontally at least 0.3 metres beyond the footings and then down and out from this point at 1 horizontal to 1 vertical, or flatter; the excavations should be sized for this allowance. The native soils at the site are not suitable for reuse as engineered fill for structures. Where groundwater flow is encountered, the excavation will need to be dewatered during placement of the engineered fill.

For design purposes, the foundations of the proposed buildings should be sized using the bearing values provided in Table 6.1.





LEGEND

BH/TP # ← BOREHOLE ID

XX.XX ← GROUND SURFACE ELEVATION, IN METRES

BOREHOLE LOCATION
(Gemtec, 2023)

APPROXIMATE BOREHOLE LOCATION
(Patterson, 2014)

APPROXIMATE TEST PIT LOCATION
(Patterson, 2014)

GENERAL NOTE(S)

1. Contains information licensed under the Open Government Licence – Ontario.
2. Maps Data: Google, @2023 CNES / Airbus, First Base Solutions, Maxar Technologies.
3. Geographic dataset source: Ontario GeoHub.
4. "Site Plan" provided by Allan Stone Architect, October 2, 2023.

SCALE 1:1000

0 20 40 60m

DRAWING
BOREHOLE LOCATION PLAN

CLIENT
3075 PALLADIUM GP INC.

PROJECT
3075 PALLADIUM DRIVE
OTTAWA, ONTARIO

DRAWN BY	CHECKED BY
S.L.	M.R.
PROJECT NO.	REVISION NO.
102670.001	1
DATE	FIGURE NO.
OCTOBER 2023	FIGURE 1

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Infiltration Calculations
Kanata West Retail Center and Cabela's Site

The Carp River Watershed/Subwatershed Study provided water balance calculations and outlined infiltration targets within the subwatershed area from the stormwater management perspective, based on soil characteristics. Following the CRWS, infiltration targets for the Kanata West development were established within the KWMSS. That study indicated that a range of 50 - 70 mm/year of runoff be infiltrated from the eastern portion of the KWBP site, and a range of 70 - 100 mm/year of runoff be infiltrated from the western portion of the KWBP site. The KWMSS also indicated that post development infiltration rates are to be increased by 25% above these pre-development rates to compensate for areas (ie. Roadway corridors) that cannot provide infiltration. Relevant excerpts from the Kanata West MSS are provided within Appendix C for reference.

As indicated above, the KWMSS indicated that post development infiltration rates are to be increased by 25%. For the KWRC this target is 25% above the average of 50-70mm/year for a target of 75mm/year. The subject site has limited pervious area available for infiltration, and will therefore be provided with engineered infiltration galleries fed by the rooftop drains to achieve the required infiltration rate.

The proposed infiltration galleries have been sized to maximize infiltration potential for the site. The sizing was based on individual roof drainage area, daily precipitation data (taken for wet year to minimize overflow), infiltration through the bottom and the bottom 1/3 of the side walls, and percolation rates confirmed by Hydrogeological investigation of the site. The sizing of the galleries has been tailored for each Building roof area. Detailed building specific example calculation is provided herewith for reference. A summary of the infiltration calculations are provided below:

1. **Infiltration Gallery Calculations on an Annual Basis:**

Building ID	Area (m^2)	Annual Runoff Volume (m^3)	Average Overflow Volume (m^3)	Average Annual Volume Infiltrated (m^3)
RETAIL A1/A2/A3	6318	5522	1134	4387
AUTO/LUBE RETAIL A5	1048	916	916	0
RETAIL B1	2484	2171	481	1690
RETAIL B2	1933	1689	375	1315
RETAIL B3	625	546	546	0
BANK E1	375	328	328	0
FAST FOOD E2	486	425	425	0
RETAIL E3/E4/E5/E6	1675	1464	275	1189
CABELA'S	6402	5595	1137	4459
AUTOPARTS	2357	2060	420	1640
HOME FURNISHINGS E7/E8	4924	4304	939	3364
Totals	28627	25020	6976	18044

Where:

- Annual Runoff Volume is based on rooftop area and 95% of the annual precipitation from rooftops available as runoff
- Overflow Volume is based on building specific infiltration gallery sizing

The required infiltration will be provided by infiltration galleries fed by rooftop drains. The infiltration galleries will provide an estimated 18044m^3 of infiltration on an annual basis, or 147mm/year. The total infiltration provided by the site is therefore above the required post-development rate of 75mm/year.

SUMMARY OF INFILTRATION GALLERY CALCULATIONS

AVERAGE SILTY SAND PERCOLATION RATE

annual precipitation (mm)	920
95% available runoff (mm)	874
area (ha)	12.277

Building ID	Area (m^2)	Available Runoff Volume (m^3)	Gallery ID	Width (m)	Length (m)	Area (m2)	Depth (m)	Infiltration Gallery Overflow (%)			Overflow Volume (m^3)			Infiltration Volume (m^3)		
								WET YEAR	DRY YEAR	AVERAGE	WET YEAR	DRY YEAR	AVERAGE	WET YEAR	DRY YEAR	AVERAGE
RETAIL A1/A2/A3	6318	5522	1	16	12	192	1.25	32.22%	8.87%	20.54%	1779	490	1134	3743	5032	4387
AUTO/LUBE RETAIL A5	1048	916	2	0	0	0	0	100.00%	100.00%	100.00%	916	916	916	0	0	0
RETAIL B1	2484	2171	3	9	8	72	1.25	34.54%	9.80%	22.17%	750	213	481	1421	1958	1690
RETAIL B2	1933	1689	4	7	8	56	1.25	34.56%	9.81%	22.19%	584	166	375	1106	1524	1315
RETAIL B3	625	546	5	0	0	0	0	100.00%	100.00%	100.00%	546	546	546	0	0	0
BANK E1	375	328	6	0	0	0	0	100.00%	100.00%	100.00%	328	328	328	0	0	0
FAST FOOD E2	486	425	7	0	0	0	0	100.00%	100.00%	100.00%	425	425	425	0	0	0
RETAIL E3/E4/E5/E6	1675	1464	8	9	6	54	1.25	29.56%	8.00%	18.78%	433	117	275	1031	1347	1189
CABELA'S	6402	5595	9	14	14	196	1.25	31.87%	8.76%	20.31%	1783	490	1137	3812	5105	4459
AUTOPARTS	2357	2060	10	9	8	72	1.25	31.97%	8.79%	20.38%	659	181	420	1401	1879	1640
HOME FURNISHINGS E7/E8	4924	4304	11	12	12	144	1.25	34.07%	9.58%	21.82%	1466	412	939	2837	3891	3364
TOTAL		25020											6976			18044

AVERAGE INFILTRATION RATE	147
REQUIRED INFILTRATION RATE	75

INFILTRATION GALLERY SIZING CALCULATION

WET YEAR CALCULATION

RETAIL A1 A2 A3	6318	m^2	PRECIPITATION DATA APRIL 1 TO OCTOBER 31 (WET YEAR)		
Effective Runoff	0.95	%	TOT PRECIP DEPTH	800.4	mm
Percolation	1.08	(m/day, avg silty sand)	TOTAL PRECIP VOLUME	4803	m3
INFILTRATION GALLERY SIZING			TOT INFILTRATION VOL	3633	m3
Width	16	m	DEVELOPMENT AREA	12.2766	ha
Length	12	m	INFIL RATE	29.59	mm/year
depth	1.25	m	OVERFLOW VOL	1170	m3/year
Number Cells	1				
void ratio	0.38	(3/4" clearstone)	RUNOFF VOLUME OVERFLOW	32.22%	
	91.2	TOTAL DRYCELL VOL			

DATE	RAINFALL	RAINFALL INTENSITY (AVG)	RAINWATER AVAILABLE	VOLUME INFLOW TO DRYCELL	VOLUME IN DRY CELL	VOLUME PASSING DRY CELL	INFILTRATION FROM BOTTOM	INFILTRATION FROM SIDES (BOTTOM 1/3)	BALANCE IN DRYCELL
	[MM]	[MM/HR]	[M^3]	[M^3]	[M^3]	[M^3]	[M^3]	[M^3]	[M^3]
1-Apr	0.2	0.008	0	0	0	0	0	0	0
2-Apr	0.4	0.017	2	2	2	0	2	0	0
3-Apr	0	0.000	0	0	0	0	0	0	0
4-Apr	0	0.000	0	0	0	0	0	0	0
5-Apr	0	0.000	0	0	0	0	0	0	0
6-Apr	7.8	0.325	47	47	47	0	47	0	0
7-Apr	3.4	0.142	20	20	20	0	20	0	0
8-Apr	4.6	0.192	28	28	28	0	28	0	0
9-Apr	4.2	0.175	25	25	25	0	25	0	0
10-Apr	0	0.000	0	0	0	0	0	0	0
11-Apr	0	0.000	0	0	0	0	0	0	0
12-Apr	0	0.000	0	0	0	0	0	0	0
13-Apr	0	0.000	0	0	0	0	0	0	0
14-Apr	0	0.000	0	0	0	0	0	0	0
15-Apr	0	0.000	0	0	0	0	0	0	0
16-Apr	0	0.000	0	0	0	0	0	0	0
17-Apr	0	0.000	0	0	0	0	0	0	0
18-Apr	0	0.000	0	0	0	0	0	0	0
19-Apr	0	0.000	0	0	0	0	0	0	0
20-Apr	8.2	0.342	49	49	49	0	49	0	0
21-Apr	2.8	0.117	17	17	17	0	17	0	0
22-Apr	0	0.000	0	0	0	0	0	0	0
23-Apr	0	0.000	0	0	0	0	0	0	0
24-Apr	0	0.000	0	0	0	0	0	0	0
25-Apr	0	0.000	0	0	0	0	0	0	0
26-Apr	0	0.000	0	0	0	0	0	0	0
27-Apr	0	0.000	0	0	0	0	0	0	0
28-Apr	0	0.000	0	0	0	0	0	0	0
29-Apr	0	0.000	0	0	0	0	0	0	0
30-Apr	0	0.000	0	0	0	0	0	0	0
1-May	9	0.375	54	54	54	0	54	0	0
2-May	0	0.000	0	0	0	0	0	0	0
3-May	0	0.000	0	0	0	0	0	0	0
4-May	2.4	0.100	14	14	14	0	14	0	0
5-May	8	0.333	48	48	48	0	48	0	0
6-May	1	0.042	6	6	6	0	6	0	0
7-May	1.6	0.067	10	10	10	0	10	0	0
8-May	0.8	0.033	5	5	5	0	5	0	0
9-May	0	0.000	0	0	0	0	0	0	0
10-May	0	0.000	0	0	0	0	0	0	0
11-May	0	0.000	0	0	0	0	0	0	0
12-May	0	0.000	0	0	0	0	0	0	0
13-May	0	0.000	0	0	0	0	0	0	0
14-May	0	0.000	0	0	0	0	0	0	0
15-May	1	0.042	6	6	6	0	6	0	0
16-May	17.4	0.725	104	91	91	13	91	0	0
17-May	0	0.000	0	0	0	0	0	0	0
18-May	11	0.458	66	66	66	0	66	0	0
19-May	30.2	1.258	181	91	91	90	91	0	0
20-May	29.4	1.225	176	91	91	85	91	0	0
21-May	5.9	0.246	35	35	35	0	35	0	0
22-May	26.9	1.121	161	91	91	70	91	0	0
23-May	11.3	0.471	68	68	68	0	68	0	0
24-May	0.4	0.017	2	2	2	0	2	0	0
25-May	0	0.000	0	0	0	0	0	0	0
26-May	0	0.000	0	0	0	0	0	0	0
27-May	7.8	0.325	47	47	47	0	47	0	0
28-May	0	0.000	0	0	0	0	0	0	0
29-May	0	0.000	0	0	0	0	0	0	0
30-May	0	0.000	0	0	0	0	0	0	0
31-May	0	0.000	0	0	0	0	0	0	0
1-Jun	10.6	0.442	64	64	64	0	64	0	0
2-Jun	0	0.000	0	0	0	0	0	0	0
3-Jun	0	0.000	0	0	0	0	0	0	0
4-Jun	0	0.000	0	0	0	0	0	0	0
5-Jun	1.4	0.058	8	8	8	0	8	0	0
6-Jun	0	0.000	0	0	0	0	0	0	0
7-Jun	5	0.208	30	30	30	0	30	0	0
8-Jun	0.2	0.008	1	1	1	0	1	0	0
9-Jun	0	0.000	0	0	0	0	0	0	0
10-Jun	0	0.000	0	0	0	0	0	0	0
11-Jun	4.8	0.200	29	29	29	0	29	0	0
12-Jun	26.2	1.092	157	91	91	66	91	0	0
13-Jun	1	0.042	6	6	6	0	6	0	0
14-Jun	0	0.000	0	0	0	0	0	0	0
15-Jun	0	0.000	0	0	0	0	0	0	0
16-Jun	5.6	0.233	34	34	34	0	34	0	0
17-Jun	0	0.000	0	0	0	0	0	0	0
18-Jun	0	0.000	0	0	0	0	0	0	0
19-Jun	4	0.167	24	24	24	0	24	0	0
20-Jun	0	0.000	0	0	0	0	0	0	0
21-Jun	0	0.000	0	0	0	0	0	0	0
22-Jun	0	0.000	0	0	0	0	0	0	0
23-Jun	1	0.042	6	6	6	0	6	0	0
24-Jun	27.2	1.133	163	91	91	72	91	0	0
25-Jun	0	0.000	0	0	0	0	0	0	0
26-Jun	0	0.000	0	0	0	0	0	0	0
27-Jun	29	1.208	174	91	91	83	91	0	0
28-Jun	0	0.000	0	0	0	0	0	0	0
29-Jun	0.2	0.008	1	1	1	0	1	0	0
30-Jun	0	0.000	0	0	0	0	0	0	0
1-Jul	0	0.000	0	0	0	0	0	0	0
2-Jul	10	0.417	60	60	60	0	60	0	0
3-Jul	14.8	0.617	89	89	89	0	89	0	0
4-Jul	7.6	0.317	46	46	46	0	46	0	0
5-Jul	14.8	0.617	89	89	89	0	89	0	0
6-Jul	0	0.000	0	0	0	0	0	0	0
7-Jul	0	0.000	0	0	0	0	0	0	0

8-Jul	0	0.000	0	0	0	0	0	0	0
9-Jul	0	0.000	0	0	0	0	0	0	0
10-Jul	0	0.000	0	0	0	0	0	0	0
11-Jul	0	0.000	0	0	0	0	0	0	0
12-Jul	0	0.000	0	0	0	0	0	0	0
13-Jul	10.6	0.442	64	64	64	0	64	0	0
14-Jul	0.4	0.017	2	2	2	0	2	0	0
15-Jul	0	0.000	0	0	0	0	0	0	0
16-Jul	0	0.000	0	0	0	0	0	0	0
17-Jul	0	0.000	0	0	0	0	0	0	0
18-Jul	0	0.000	0	0	0	0	0	0	0
19-Jul	0	0.000	0	0	0	0	0	0	0
20-Jul	6.2	0.258	37	37	37	0	37	0	0
21-Jul	0	0.000	0	0	0	0	0	0	0
22-Jul	0	0.000	0	0	0	0	0	0	0
23-Jul	0	0.000	0	0	0	0	0	0	0
24-Jul	0	0.000	0	0	0	0	0	0	0
25-Jul	3.6	0.150	22	22	22	0	22	0	0
26-Jul	31.6	1.317	190	91	91	98	91	0	0
27-Jul	0	0.000	0	0	0	0	0	0	0
28-Jul	0	0.000	0	0	0	0	0	0	0
29-Jul	42.4	1.767	254	91	91	163	91	0	0
30-Jul	2.4	0.100	14	14	14	0	14	0	0
31-Jul	0	0.000	0	0	0	0	0	0	0
1-Aug	0.6	0.025	4	4	4	0	4	0	0
2-Aug	10.8	0.450	65	65	65	0	65	0	0
3-Aug	0	0.000	0	0	0	0	0	0	0
4-Aug	0	0.000	0	0	0	0	0	0	0
5-Aug	0.4	0.017	2	2	2	0	2	0	0
6-Aug	4	0.167	24	24	24	0	24	0	0
7-Aug	1.2	0.050	7	7	7	0	7	0	0
8-Aug	2.8	0.117	17	17	17	0	17	0	0
9-Aug	11	0.458	66	66	66	0	66	0	0
10-Aug	0	0.000	0	0	0	0	0	0	0
11-Aug	0	0.000	0	0	0	0	0	0	0
12-Aug	0	0.000	0	0	0	0	0	0	0
13-Aug	0	0.000	0	0	0	0	0	0	0
14-Aug	0	0.000	0	0	0	0	0	0	0
15-Aug	2	0.083	12	12	12	0	12	0	0
16-Aug	0	0.000	0	0	0	0	0	0	0
17-Aug	0	0.000	0	0	0	0	0	0	0
18-Aug	14.2	0.592	85	85	85	0	85	0	0
19-Aug	0	0.000	0	0	0	0	0	0	0
20-Aug	0	0.000	0	0	0	0	0	0	0
21-Aug	15.6	0.650	94	91	91	2	91	0	0
22-Aug	0	0.000	0	0	0	0	0	0	0
23-Aug	6.6	0.275	40	40	40	0	40	0	0
24-Aug	0.8	0.033	5	5	5	0	5	0	0
25-Aug	0	0.000	0	0	0	0	0	0	0
26-Aug	3.8	0.158	23	23	23	0	23	0	0
27-Aug	24.2	1.008	145	91	91	54	91	0	0
28-Aug	0.8	0.033	5	5	5	0	5	0	0
29-Aug	0	0.000	0	0	0	0	0	0	0
30-Aug	0	0.000	0	0	0	0	0	0	0
31-Aug	0	0.000	0	0	0	0	0	0	0
1-Sep	0	0.000	0	0	0	0	0	0	0
2-Sep	0.4	0.017	2	2	2	0	2	0	0
3-Sep	0	0.000	0	0	0	0	0	0	0
4-Sep	1.9	0.079	11	11	11	0	11	0	0
5-Sep	5.8	0.242	35	35	35	0	35	0	0
6-Sep	0	0.000	0	0	0	0	0	0	0
7-Sep	0	0.000	0	0	0	0	0	0	0
8-Sep	0	0.000	0	0	0	0	0	0	0
9-Sep	0	0.000	0	0	0	0	0	0	0
10-Sep	6.4	0.267	38	38	38	0	38	0	0
11-Sep	61.8	2.575	371	91	91	280	91	0	0
12-Sep	20.6	0.858	124	91	91	32	91	0	0
13-Sep	5.8	0.242	35	35	35	0	35	0	0
14-Sep	0	0.000	0	0	0	0	0	0	0
15-Sep	8.1	0.338	49	49	49	0	49	0	0
16-Sep	2.3	0.096	14	14	14	0	14	0	0
17-Sep	0	0.000	0	0	0	0	0	0	0
18-Sep	0	0.000	0	0	0	0	0	0	0
19-Sep	0	0.000	0	0	0	0	0	0	0
20-Sep	0.8	0.033	5	5	5	0	5	0	0
21-Sep	0	0.000	0	0	0	0	0	0	0
22-Sep	0	0.000	0	0	0	0	0	0	0
23-Sep	13	0.542	78	78	78	0	78	0	0
24-Sep	0	0.000	0	0	0	0	0	0	0
25-Sep	0	0.000	0	0	0	0	0	0	0
26-Sep	0	0.000	0	0	0	0	0	0	0
27-Sep	0	0.000	0	0	0	0	0	0	0
28-Sep	1.3	0.054	8	8	8	0	8	0	0
29-Sep	14.1	0.588	85	85	85	0	85	0	0
30-Sep	25.2	1.050	151	91	91	60	91	0	0
1-Oct	0	0.000	0	0	0	0	0	0	0
2-Oct	0.4	0.017	2	2	2	0	2	0	0
3-Oct	7.8	0.325	47	47	47	0	47	0	0
4-Oct	7.8	0.325	47	47	47	0	47	0	0
5-Oct	6	0.250	36	36	36	0	36	0	0
6-Oct	0.4	0.017	2	2	2	0	2	0	0
7-Oct	0	0.000	0	0	0	0	0	0	0
8-Oct	1	0.042	6	6	6	0	6	0	0
9-Oct	1.2	0.050	7	7	7	0	7	0	0
10-Oct	0	0.000	0	0	0	0	0	0	0
11-Oct	0	0.000	0	0	0	0	0	0	0
12-Oct	0	0.000	0	0	0	0	0	0	0
13-Oct	10.4	0.433	62	62	62	0	62	0	0
14-Oct	9	0.375	54	54	54	0	54	0	0
15-Oct	0	0.000	0	0	0	0	0	0	0
16-Oct	0.2	0.008	1	1	1	0	1	0	0
17-Oct	1.6	0.067	10	10	10	0	10	0	0
18-Oct	0	0.000	0	0	0	0	0	0	0
19-Oct	0	0.000	0	0	0	0	0	0	0
20-Oct	0	0.000	0	0	0	0	0	0	0
21-Oct	5.8	0.242	35	35	35	0	35	0	0
22-Oct	0	0.000	0	0	0	0	0	0	0
23-Oct	1	0.042	6	6	6	0	6	0	0
24-Oct	0	0.000	0	0	0	0	0	0	0
25-Oct	0	0.000	0	0	0	0	0	0	0
26-Oct	1.3	0.054	8	8	8	0	8	0	0
27-Oct	10.9	0.454	65	65	65	0	65	0	0
28-Oct	0	0.000	0	0	0	0	0	0	0
29-Oct	13	0.542	78	78	78	0	78	0	0
30-Oct	0	0.000	0	0	0	0	0	0	0
31-Oct	0	0.000	0	0	0	0	0	0	0

INFILTRATION GALLERY SIZING CALCULATION

DRY YEAR CALCULATION

RETAIL A1 A2 A3	6318	m^2	PRECIPITATION DATA APRIL 1 TO OCTOBER 31 (DRY YEAR)		
Effective Runoff	0.95	%	TOT PRECIP DEPTH	405.1	mm
Percolation	1.08	(m/day, avg silty sand)	TOTAL PRECIP VOLUME	2431	m3
INFILTRATION GALLERY SIZING			TOT INFILTRATION VOL	2233	m3
Width	16	m	DEVELOPMENT AREA	12.2766	ha
Length	12	m	INFIL RATE	18.19	mm/year
depth	1	m	OVERFLOW VOL	198	m3/year
Number Cells	1				
void ratio	0.38	(3/4" clearstone)	RUNOFF VOLUME OVERFLOW	8.87%	
	72.96	TOTAL DRYCELL VOL			

DATE	RAINFALL	RAINFALL INTENSITY (AVG)	RAINWATER AVAILABLE	VOLUME INFLOW TO DRYCELL	VOLUME IN DRY CELL	VOLUME PASSING DRY CELL	INFILTRATION FROM BOTTOM	INFILTRATION FROM SIDES (BOTTOM 1/3)	BALANCE IN DRYCELL
	[MM]	[MM/HR]	[M^3]	[M^3]	[M^3]	[M^3]	[M^3]	[M^3]	[M^3]
1-Apr	0	0.000	0	0	0	0	0	0	0
2-Apr	0	0.000	0	0	0	0	0	0	0
3-Apr	0	0.000	0	0	0	0	0	0	0
4-Apr	15	0.625	90	73	73	17	73	0	0
5-Apr	0	0.000	0	0	0	0	0	0	0
6-Apr	0	0.000	0	0	0	0	0	0	0
7-Apr	0.3	0.013	2	2	2	0	2	0	0
8-Apr	0	0.000	0	0	0	0	0	0	0
9-Apr	0	0.000	0	0	0	0	0	0	0
10-Apr	0	0.000	0	0	0	0	0	0	0
11-Apr	0	0.000	0	0	0	0	0	0	0
12-Apr	1	0.042	6	6	6	0	6	0	0
13-Apr	1.6	0.067	10	10	10	0	10	0	0
14-Apr	5.9	0.246	35	35	35	0	35	0	0
15-Apr	2.3	0.096	14	14	14	0	14	0	0
16-Apr	0	0.000	0	0	0	0	0	0	0
17-Apr	0	0.000	0	0	0	0	0	0	0
18-Apr	0	0.000	0	0	0	0	0	0	0
19-Apr	0	0.000	0	0	0	0	0	0	0
20-Apr	0	0.000	0	0	0	0	0	0	0
21-Apr	0	0.000	0	0	0	0	0	0	0
22-Apr	6.9	0.288	41	41	41	0	41	0	0
23-Apr	4.8	0.200	29	29	29	0	29	0	0
24-Apr	0.3	0.013	2	2	2	0	2	0	0
25-Apr	0	0.000	0	0	0	0	0	0	0
26-Apr	0	0.000	0	0	0	0	0	0	0
27-Apr	0	0.000	0	0	0	0	0	0	0
28-Apr	0	0.000	0	0	0	0	0	0	0
29-Apr	10.8	0.450	65	65	65	0	65	0	0
30-Apr	1.6	0.067	10	10	10	0	10	0	0
1-May	3.8	0.158	23	23	23	0	23	0	0
2-May	0	0.000	0	0	0	0	0	0	0
3-May	11.3	0.471	68	68	68	0	68	0	0
4-May	0	0.000	0	0	0	0	0	0	0
5-May	0	0.000	0	0	0	0	0	0	0
6-May	4.1	0.171	25	25	25	0	25	0	0
7-May	3	0.125	18	18	18	0	18	0	0
8-May	0	0.000	0	0	0	0	0	0	0
9-May	23.4	0.975	140	73	73	67	73	0	0
10-May	0.5	0.021	3	3	3	0	3	0	0
11-May	0	0.000	0	0	0	0	0	0	0
12-May	22.3	0.929	134	73	73	61	73	0	0
13-May	0	0.000	0	0	0	0	0	0	0
14-May	0	0.000	0	0	0	0	0	0	0
15-May	2.3	0.096	14	14	14	0	14	0	0
16-May	0.3	0.013	2	2	2	0	2	0	0
17-May	0	0.000	0	0	0	0	0	0	0
18-May	0	0.000	0	0	0	0	0	0	0
19-May	0	0.000	0	0	0	0	0	0	0
20-May	0	0.000	0	0	0	0	0	0	0
21-May	0	0.000	0	0	0	0	0	0	0
22-May	8.4	0.350	50	50	50	0	50	0	0
23-May	10	0.417	60	60	60	0	60	0	0
24-May	3.4	0.142	20	20	20	0	20	0	0
25-May	6.2	0.258	37	37	37	0	37	0	0
26-May	1.9	0.079	11	11	11	0	11	0	0
27-May	0.3	0.013	2	2	2	0	2	0	0
28-May	1.3	0.054	8	8	8	0	8	0	0
29-May	1.1	0.046	7	7	7	0	7	0	0
30-May	0	0.000	0	0	0	0	0	0	0
31-May	10.9	0.454	65	65	65	0	65	0	0
1-Jun	0	0.000	0	0	0	0	0	0	0
2-Jun	0.5	0.021	3	3	3	0	3	0	0
3-Jun	0	0.000	0	0	0	0	0	0	0
4-Jun	0	0.000	0	0	0	0	0	0	0
5-Jun	0	0.000	0	0	0	0	0	0	0
6-Jun	0	0.000	0	0	0	0	0	0	0
7-Jun	0	0.000	0	0	0	0	0	0	0
8-Jun	0	0.000	0	0	0	0	0	0	0
9-Jun	0	0.000	0	0	0	0	0	0	0
10-Jun	0	0.000	0	0	0	0	0	0	0
11-Jun	0	0.000	0	0	0	0	0	0	0
12-Jun	0.3	0.013	2	2	2	0	2	0	0
13-Jun	12.2	0.508	73	73	73	0	73	0	0
14-Jun	0.3	0.013	2	2	2	0	2	0	0
15-Jun	1.3	0.054	8	8	8	0	8	0	0
16-Jun	11.8	0.492	71	71	71	0	71	0	0
17-Jun	6.4	0.267	38	38	38	0	38	0	0
18-Jun	0.8	0.033	5	5	5	0	5	0	0
19-Jun	0	0.000	0	0	0	0	0	0	0
20-Jun	5.2	0.217	31	31	31	0	31	0	0
21-Jun	3.2	0.133	19	19	19	0	19	0	0
22-Jun	0	0.000	0	0	0	0	0	0	0
23-Jun	0	0.000	0	0	0	0	0	0	0
24-Jun	0.3	0.013	2	2	2	0	2	0	0
25-Jun	0	0.000	0	0	0	0	0	0	0
26-Jun	0	0.000	0	0	0	0	0	0	0
27-Jun	0	0.000	0	0	0	0	0	0	0
28-Jun	0	0.000	0	0	0	0	0	0	0
29-Jun	0	0.000	0	0	0	0	0	0	0
30-Jun	1.1	0.046	7	7	7	0	7	0	0
1-Jul	0.5	0.021	3	3	3	0	3	0	0
2-Jul	6.1	0.254	37	37	37	0	37	0	0
3-Jul	0	0.000	0	0	0	0	0	0	0
4-Jul	6.4	0.267	38	38	38	0	38	0	0
5-Jul	0.8	0.033	5	5	5	0	5	0	0
6-Jul	0	0.000	0	0	0	0	0	0	0
7-Jul	0	0.000	0	0	0	0	0	0	0

8-Jul	0	0.000	0	0	0	0	0	0	0
9-Jul	6.7	0.279	40	40	40	0	40	0	0
10-Jul	0	0.000	0	0	0	0	0	0	0
11-Jul	0	0.000	0	0	0	0	0	0	0
12-Jul	0	0.000	0	0	0	0	0	0	0
13-Jul	0	0.000	0	0	0	0	0	0	0
14-Jul	0	0.000	0	0	0	0	0	0	0
15-Jul	0	0.000	0	0	0	0	0	0	0
16-Jul	0	0.000	0	0	0	0	0	0	0
17-Jul	0	0.000	0	0	0	0	0	0	0
18-Jul	20.9	0.871	125	73	73	52	73	0	0
19-Jul	11.5	0.479	69	69	69	0	69	0	0
20-Jul	0	0.000	0	0	0	0	0	0	0
21-Jul	0	0.000	0	0	0	0	0	0	0
22-Jul	0	0.000	0	0	0	0	0	0	0
23-Jul	6.9	0.288	41	41	41	0	41	0	0
24-Jul	9.2	0.383	55	55	55	0	55	0	0
25-Jul	0	0.000	0	0	0	0	0	0	0
26-Jul	0.3	0.013	2	2	2	0	2	0	0
27-Jul	1.3	0.054	8	8	8	0	8	0	0
28-Jul	0	0.000	0	0	0	0	0	0	0
29-Jul	1.1	0.046	7	7	7	0	7	0	0
30-Jul	0.3	0.013	2	2	2	0	2	0	0
31-Jul	4.1	0.171	25	25	25	0	25	0	0
1-Aug	0	0.000	0	0	0	0	0	0	0
2-Aug	8.9	0.371	53	53	53	0	53	0	0
3-Aug	11.5	0.479	69	69	69	0	69	0	0
4-Aug	0.8	0.033	5	5	5	0	5	0	0
5-Aug	0	0.000	0	0	0	0	0	0	0
6-Aug	0	0.000	0	0	0	0	0	0	0
7-Aug	0	0.000	0	0	0	0	0	0	0
8-Aug	0.8	0.033	5	5	5	0	5	0	0
9-Aug	0	0.000	0	0	0	0	0	0	0
10-Aug	0	0.000	0	0	0	0	0	0	0
11-Aug	0	0.000	0	0	0	0	0	0	0
12-Aug	1.3	0.054	8	8	8	0	8	0	0
13-Aug	0	0.000	0	0	0	0	0	0	0
14-Aug	0	0.000	0	0	0	0	0	0	0
15-Aug	0	0.000	0	0	0	0	0	0	0
16-Aug	0	0.000	0	0	0	0	0	0	0
17-Aug	0.6	0.025	4	4	4	0	4	0	0
18-Aug	0	0.000	0	0	0	0	0	0	0
19-Aug	5.5	0.229	33	33	33	0	33	0	0
20-Aug	0	0.000	0	0	0	0	0	0	0
21-Aug	0	0.000	0	0	0	0	0	0	0
22-Aug	0	0.000	0	0	0	0	0	0	0
23-Aug	0.8	0.033	5	5	5	0	5	0	0
24-Aug	0	0.000	0	0	0	0	0	0	0
25-Aug	0	0.000	0	0	0	0	0	0	0
26-Aug	0	0.000	0	0	0	0	0	0	0
27-Aug	3.3	0.138	20	20	20	0	20	0	0
28-Aug	0	0.000	0	0	0	0	0	0	0
29-Aug	0	0.000	0	0	0	0	0	0	0
30-Aug	0	0.000	0	0	0	0	0	0	0
31-Aug	0.8	0.033	5	5	5	0	5	0	0
1-Sep	0	0.000	0	0	0	0	0	0	0
2-Sep	0.9	0.038	5	5	5	0	5	0	0
3-Sep	8.4	0.350	50	50	50	0	50	0	0
4-Sep	0	0.000	0	0	0	0	0	0	0
5-Sep	0	0.000	0	0	0	0	0	0	0
6-Sep	0	0.000	0	0	0	0	0	0	0
7-Sep	0	0.000	0	0	0	0	0	0	0
8-Sep	0	0.000	0	0	0	0	0	0	0
9-Sep	0.6	0.025	4	4	4	0	4	0	0
10-Sep	4.4	0.183	26	26	26	0	26	0	0
11-Sep	0	0.000	0	0	0	0	0	0	0
12-Sep	3.5	0.146	21	21	21	0	21	0	0
13-Sep	11.7	0.488	70	70	70	0	70	0	0
14-Sep	0	0.000	0	0	0	0	0	0	0
15-Sep	0	0.000	0	0	0	0	0	0	0
16-Sep	0	0.000	0	0	0	0	0	0	0
17-Sep	1.1	0.046	7	7	7	0	7	0	0
18-Sep	0	0.000	0	0	0	0	0	0	0
19-Sep	0	0.000	0	0	0	0	0	0	0
20-Sep	3.1	0.129	19	19	19	0	19	0	0
21-Sep	1.4	0.058	8	8	8	0	8	0	0
22-Sep	0.6	0.025	4	4	4	0	4	0	0
23-Sep	0	0.000	0	0	0	0	0	0	0
24-Sep	0	0.000	0	0	0	0	0	0	0
25-Sep	4.9	0.204	29	29	29	0	29	0	0
26-Sep	0.3	0.013	2	2	2	0	2	0	0
27-Sep	0	0.000	0	0	0	0	0	0	0
28-Sep	3.9	0.163	23	23	23	0	23	0	0
29-Sep	2.1	0.088	13	13	13	0	13	0	0
30-Sep	0	0.000	0	0	0	0	0	0	0
1-Oct	0	0.000	0	0	0	0	0	0	0
2-Oct	4.5	0.188	27	27	27	0	27	0	0
3-Oct	0	0.000	0	0	0	0	0	0	0
4-Oct	0	0.000	0	0	0	0	0	0	0
5-Oct	0	0.000	0	0	0	0	0	0	0
6-Oct	0	0.000	0	0	0	0	0	0	0
7-Oct	3	0.125	18	18	18	0	18	0	0
8-Oct	0	0.000	0	0	0	0	0	0	0
9-Oct	0	0.000	0	0	0	0	0	0	0
10-Oct	2	0.083	12	12	12	0	12	0	0
11-Oct	0	0.000	0	0	0	0	0	0	0
12-Oct	1.8	0.075	11	11	11	0	11	0	0
13-Oct	0	0.000	0	0	0	0	0	0	0
14-Oct	8.9	0.371	53	53	53	0	53	0	0
15-Oct	0	0.000	0	0	0	0	0	0	0
16-Oct	0	0.000	0	0	0	0	0	0	0
17-Oct	6.8	0.283	41	41	41	0	41	0	0
18-Oct	0	0.000	0	0	0	0	0	0	0
19-Oct	0	0.000	0	0	0	0	0	0	0
20-Oct	0	0.000	0	0	0	0	0	0	0
21-Oct	0	0.000	0	0	0	0	0	0	0
22-Oct	0	0.000	0	0	0	0	0	0	0
23-Oct	0	0.000	0	0	0	0	0	0	0
24-Oct	0	0.000	0	0	0	0	0	0	0
25-Oct	6.6	0.275	40	40	40	0	40	0	0
26-Oct	0	0.000	0	0	0	0	0	0	0
27-Oct	0	0.000	0	0	0	0	0	0	0
28-Oct	0	0.000	0	0	0	0	0	0	0
29-Oct	0	0.000	0	0	0	0	0	0	0
30-Oct	5.5	0.229	33	33	33	0	33	0	0
31-Oct	0.3	0.013	2	2	2	0	2	0	0

4.6 Hydraulic Evaluation

4.6.1 PCSWMM Model of Feedmill Creek

The City of Ottawa has provided IBI with a PCSWMM Model of Feedmill Creek (100 year, 12 hour SCS design storm) for use in confirming the water levels in the creek at the SWMF outfall locations for the KWBP. The outflow hydrographs from the XPSWMM model of the Pond 6 West and Pond 6 East SWMFs have been uploaded to the PCSWMM model to confirm water levels in the creek and to generate tailwater curves to be used in the XPSWMM models. An electronic copy of the updated PCSWMM model is provided on CD within **Appendix C**. The results of the updated PCSWMM model with the outflow hydrographs from XPSWMM indicate water levels as follows:

Table 4.7 Summary of Updated PCSWMM Model Results during the 100 year 12 hour SCS design storm (Model File: CarpInterim2_100ySCS_FinalDraft_IBI2015-09-17.out)

LOCATION	PCSWMM NODE ID	MAX WATER LEVEL (M)
Pond 6 West Outfall	FJ038	101.32
Pond 6 East Outfall	FJ032	97.87

For modelling purposes for the other design storm events, the maximum water level in Feedmill Creek during the 100 year, 12 hour SCS design storm event (as indicated within the above table) was used to generate tailwater curves based on the outflow hydrograph from XPSWMM.

4.6.2 XPSWMM Model of Kanata West Retail Centre

The proposed storm sewers within the subject site have been analyzed using fully dynamic XPSWMM model of the proposed trunk storm sewer and Pond 6 West SWMF. The HGL is dictated by water levels in Feedmill Creek as well as the 1:100 year water level in the proposed Pond 6 West SWMF.

For modelling purposes, manhole storage equivalent to the area of the manhole has been incorporated in the XPSWMM model to help stabalize the HGL results. A summary of the manhole sizes and calculated areas is provided within **Appendix C**.

The following table presents a summary of the HGL for the 100 year 12 hour SCS design storm and the 100 year 3 hour Chicago design storm, finished floor elevations and associated freeboard at each manhole location. XPSWMM output files (32862-100YRSCS-2015-11-02.out and 14289-100YRSCS-2015-11-02.out) and model schematic are provided within **Appendix C**

Table 4.8 Summary of Hydraulic Grade Line during the 100 year 12 hour SCS Storm and 100 year 3 hour Chicago Storm

(Model Files: 14289-100YRSCS-2015-11-02.out, 14289-100YRCHI-2015-11-02.out)

LOCATION	MH	FINISHED FLOOR ELEVATION (M)	100 YEAR 12 HOUR SCS		100 YEAR 3 HOUR CHICAGO	
			HGL (M)	FB (M)	HGL (M)	FB (M)
Nipissing Court	P6WEST	N/A	103.26	**N/A**	102.94	**N/A**
	MH123	106.20	103.29	2.08	102.95	2.42
	MH122	106.20	103.40	2.80	102.98	3.22
	MH121	106.30	103.57	2.63	103.11	3.09
	MH120	105.51	103.71	2.59	103.23	3.07
Upper Canada St	MH150	106.00	103.79	2.51	103.30	3.00
	MH151	106.30	103.90	3.00	103.41	3.49
	MH152	106.90	103.95	2.95	103.45	3.45

LOCATION	MH	FINISHED FLOOR ELEVATION (M)	100 YEAR 12 HOUR SCS		100 YEAR 3 HOUR CHICAGO	
			HGL (M)	FB (M)	HGL (M)	FB (M)
	MH153	105.90	104.07	1.83	103.55	2.35
	MH154	105.70	104.19	1.51	103.77	1.93
Campeau Dr.	MH99	106.70	104.20	2.50	103.72	2.98
	MH100	106.75	103.94	2.76	103.47	3.23
	MH101	106.60	103.78	2.52	103.30	3.00
	MH102	106.00	103.73	2.27	103.25	2.75
	MH103	105.85	103.79	2.06	103.31	2.54
	MH104	105.75	103.96	1.79	103.48	2.27
KANATA WEST RETAIL CENTRE	CBMH46	104.50	103.47	1.58	103.10	1.95
	CBMH55	104.50	103.69	1.71	103.00	2.40
	11	104.82	103.68	1.42	102.98	2.12
	12	104.59	103.61	1.54	102.97	2.18
	13	104.74	103.57	1.58	102.97	2.18
	14	104.79	103.48	1.67	102.96	2.19
	15	104.59	103.41	1.64	102.97	2.08
	16	104.59	103.36	1.69	102.98	2.07
	17	104.57	103.28	1.72	102.98	2.02
	18	104.42	103.28	1.72	102.98	2.02
	19	104.78	103.29	1.81	102.97	2.13
	20	105.01	103.29	2.11	102.97	2.43
	21	105.21	104.15	1.25	103.27	2.13
	22	104.97	104.07	1.33	103.13	2.27
	23	104.96	103.72	1.68	102.99	2.41
	24	104.57	103.62	1.78	102.96	2.44
	25	104.62	103.63	1.47	103.04	2.06
	26	104.67	103.60	1.55	102.99	2.16
	27	104.62	103.70	1.40	103.05	2.05
	28	104.73	103.67	1.43	103.01	2.09
	29	105.14	103.32	2.08	103.00	2.40
	30	105.00	103.31	2.09	102.98	2.42
	31	104.44	103.36	2.04	103.52	1.88
	35	104.80	103.33	1.77	102.99	2.11
	38	104.60	103.43	1.57	102.99	2.01

The above results indicate that the hydraulic grade line will be at least 1.25 m below the finished floor elevation within the Kanata West Retail Centre. XPSWMM Profile plots from the 100 year Chicago and 100 year SCS design storm event are provided within Appendix C for reference.

WPE Engineering Ltd.
Engineers, Planners and Project Managers

Table F-11: Hydraulic Grade Line Computation Form
Proposed Condition

Prepared:	A.R.M	Page No.	F-11
Checked:	Z.D.		
Project #:	2034		
Date:	06-Jun-24		

Project: Proposed Commercial Development, 3075 Palladium Drive, City of Ottawa, ON.

Hydraulic Grade Line Computation and Analysis

From Manhole	To Manhole	U/S Invert (m)	D/S Invert (m)	U/S Obvert (m)	D/S Obvert (m)	Slope (m/m)	TW (m)	Diameter (m)	Area (m^2)	Hydraulic Radiue - R (m)	100-year Peak Flow - Q_0 (m^3/s)	Length - L_0 (m)	Velocity - V_0 (m/s)	Velocity Head -$V_0^2/2g$ (m)	Friction Slope (Sf_0)	Friction Loss- $H_{f\,(m)}$	Angle of Deflection at U/S MH	Sewer Bend Loss Coefficient[*1]	Hydralic Loss at MH	EGL_0	EGL_i	HGL_0	HGL_i	Ground Elev. (m)	Surcharge Depth (m)	Free Board (m)
211	210	102.35	102.24	102.96	102.85	0.0045	103.55	0.610	0.292	0.153	0.379	24.300	1.298	0.086	0.0035	0.085	20	0.12	0.0103	103.64	103.73	103.55	103.65	105.23	0.69	1.58
210	208	102.46	102.38	103.07	102.99	0.0053	103.65	0.610	0.292	0.153	0.379	15.100	1.298	0.086	0.0035	0.053	0	0.02	0.0017	103.73	103.79	103.65	103.70	104.90	0.63	1.20
208	209	103.12	102.81	103.37	103.06	0.0085	103.70	0.251	0.050	0.063	0.055	36.400	1.111	0.063	0.0083	0.304	40	0.32	0.0201	103.76	104.09	103.70	104.02	104.96	0.65	0.94
209	BLDG B	103.25	103.18	103.50	103.43	0.0108	104.02	0.251	0.050	0.063	0.034	6.500	0.687	0.024	0.0032	0.021	0	0.02	0.0005	104.05	104.07	104.02	104.04	105.30	0.54	1.26
211	210	102.35	102.24	102.96	102.85	0.0045	103.55	0.610	0.292	0.153	0.379	24.300	1.298	0.086	0.0035	0.085	20	0.12	0.0103	103.64	103.73	103.55	103.65	105.23	0.69	1.58
210	208	102.46	102.38	103.07	102.99	0.0053	103.65	0.610	0.292	0.153	0.379	15.100	1.298	0.086	0.0035	0.053	70	0.84	0.0722	103.73	103.86	103.65	103.77	104.90	0.70	1.13
208	207	102.68	102.52	103.29	103.13	0.0041	103.77	0.610	0.292	0.153	0.319	38.400	1.091	0.061	0.0025	0.095	90	1.32	0.0801	103.83	104.01	103.77	103.95	105.03	0.66	1.08
207	BLDG D	103.12	103.05	103.37	103.30	0.0189	103.95	0.251	0.050	0.063	0.040	3.700	0.815	0.034	0.0045	0.017	0	0.02	0.0007	103.98	104.00	103.95	103.96	105.30	0.59	1.34
211	210	102.35	102.24	102.96	102.85	0.0045	103.55	0.610	0.292	0.153	0.379	24.300	1.298	0.086	0.0035	0.085	20	0.12	0.0103	103.64	103.73	103.55	103.65	105.23	0.69	1.58
210	208	102.46	102.38	103.07	102.99	0.0053	103.65	0.610	0.292	0.153	0.379	15.100	1.298	0.086	0.0035	0.053	70	0.84	0.0722	103.73	103.86	103.65	103.77	104.90	0.70	1.13
208	207	102.68	102.52	103.29	103.13	0.0041	103.77	0.610	0.292	0.153	0.319	38.400	1.091	0.061	0.0025	0.095	0	0.02	0.0012	103.83	103.93	103.77	103.87	105.03	0.58	1.16
207	205	102.88	102.76	103.41	103.29	0.0051	103.87	0.533	0.223	0.133	0.236	23.400	1.057	0.057	0.0028	0.065	0	0.02	0.0011	103.92	103.99	103.87	103.93	104.92	0.52	0.99
205	204	103.01	102.95	103.47	103.41	0.0045	103.93	0.457	0.164	0.114	0.043	13.200	0.261	0.003	0.0002	0.003	90	1.32	0.0046	103.94	103.94	103.93	103.94	104.89	0.47	0.95
204	HEADER	103.27	103.21	103.52	103.46	0.0053	103.94	0.250	0.049	0.063	0.022	11.400	0.451	0.010	0.0014	0.016	90	1.32	0.0137	103.95	103.98	103.94	103.97	105.07	0.45	1.10
HEADER	203	103.37	103.27	103.57	103.47	0.0051	103.97	0.200	0.031	0.050	0.022	19.500	0.705	0.025	0.0046	0.089	90	1.32	0.0335	103.99	104.12	103.97	104.09	105.07	0.52	0.98
203	BLDG A/R3	103.50	103.43	103.75	103.68	0.0108	104.09	0.251	0.050	0.063	0.005	6.500	0.110	0.001	0.0001	0.001	0	0.02	0.00001	104.09	104.09	104.09	104.09	105.37	0.34	1.28
203	202	103.58	103.43	103.95	103.80	0.0054	104.09	0.366	0.105	0.092	0.017	27.600	0.158	0.001	0.0001	0.003	90	1.32	0.00168	104.09	104.10	104.09	104.10	105.07	0.15	0.97
202	BLDG A/R2	103.80	103.70	104.05	103.95	0.0154	104.10	0.251	0.050	0.063	0.008	6.500	0.151	0.001	0.0002	0.001	0	0.02	0.00002	104.10	104.10	104.10	104.10	105.37	0.05	1.27
202	201	103.88	103.74	104.18	104.04	0.005	104.10	0.299	0.070	0.075	0.009	27.900	0.130	0.001	0.0001	0.003	90	1.32	0.00114	104.10	104.10	104.10	104.10	105.06	-0.08	0.96
201	BLDG A/R1	104.00	103.94	104.25	104.19	0.0158	104.10	0.251	0.050	0.063	0.009	3.800	0.185	0.002	0.0002	0.001	0	0.02	0.00003	104.10	104.10	104.10	104.10	105.37	-0.15	1.27
211	210	102.35	102.24	102.96	102.85	0.0045	103.55	0.610	0.292	0.153	0.379	24.300	1.298	0.086	0.0035	0.085	20	0.12	0.0103	103.64	103.73	103.55	103.65	105.23	0.69	1.58
210	208	102.46	102.38	103.07	102.99	0.0053	103.65	0.610	0.292	0.153	0.379	15.100	1.298	0.086	0.0035	0.053	70	0.84	0.0722	103.73	103.86	103.65	103.77	104.90	0.70	1.13
208	207	102.68	102.52	103.29	103.13	0.0041	103.77	0.610	0.292	0.153	0.319	38.400	1.091	0.061	0.0025	0.095	0	0.02	0.0012	103.83	103.93	103.77	103.87	105.03	0.58	1.16
207	205	102.88	102.76	103.41	103.29	0.0051	103.87	0.533	0.223	0.133	0.236	23.400	1.057	0.057	0.0028	0.065	90	1.32	0.0751	103.92	104.06	103.87	104.01	104.92	0.59	0.91
205	212	103.00	102.94	103.53	103.47	0.0047	104.01	0.533	0.223	0.133	0.172	12.700	0.772	0.030	0.0015	0.019	0	0.02	0.0006	104.04	104.06	104.01	104.03	104.76	0.49	0.73
212	206	103.32	103.08	103.78	103.54	0.004	104.03	0.457	0.164	0.114	0.172	59.800	1.050	0.056	0.0034	0.201	0	0.02	0.0011	104.08	104.28	104.03	104.23	104.69	0.45	0.46
EX22	21	102.87	102.70	103.41	103.23	0.0016	104.07	0.533	0.223	0.133	0.108	109.000	0.484	0.012	0.0006	0.063	0	0.02	0.0002	104.08	104.15	104.07	104.13	105.18	0.73	1.05

Notes:

1. Sewer Bend Loss Coefficient: The design chart utilized is from the "Sewer Bend Loss Coefficient Design Chart" found in Appendix 6-B of the City of Ottawa Sewer Design Guidelines, 2004 BLM 3075 Palladium Drive.
2. 100-Year Peak Flows: These flows correspond to the cumulative 100-year restricted flow rates.
3. Starting Hydraulic Grade Line (HGL): The starting HGL is interpolated from Table 4.8 in the IBI Design Brief.

Deflection Angle	0	5	10	15	20	25	30	35	40	45	50	55	60	65	70	75	80	85	90
Bend Loss Coefficient (K_b)	0.02	0.02	0.05	0.08	0.12	0.16	0.22	0.27	0.32	0.39	0.46	0.54	0.64	0.73	0.84	0.95	1.07	1.2	1.32

Source: Sewer Bend Loss Coefficient Design Chart - no special shaping curve, City of Ottawa Sewer Design Guidelines (2004).