SUNNY FOODMART 陽光超級市場

1000514608 ONTARIO INC.

PROPOSED COMMERCIAL DEVELOPMENT

3075 PALLADIUM DRIVE, CITY OF OTTAWA, ON.

FUNCTIONAL SERVICING & STORMWATER MANAGEMENT REPORT

CITY SPA FILE NO. PC2024-0078

WPE PROJECT #:2034

JULY. 15, 2024

REVISION HISTORY

REVISION	DATE	REVISION DETAILS
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DISCLAIMER

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1 INTRODUCTION

1.1 Scope of the SWM Report

W.P.E. Engineering Limited has been retained by 3075 Palladium GP 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.

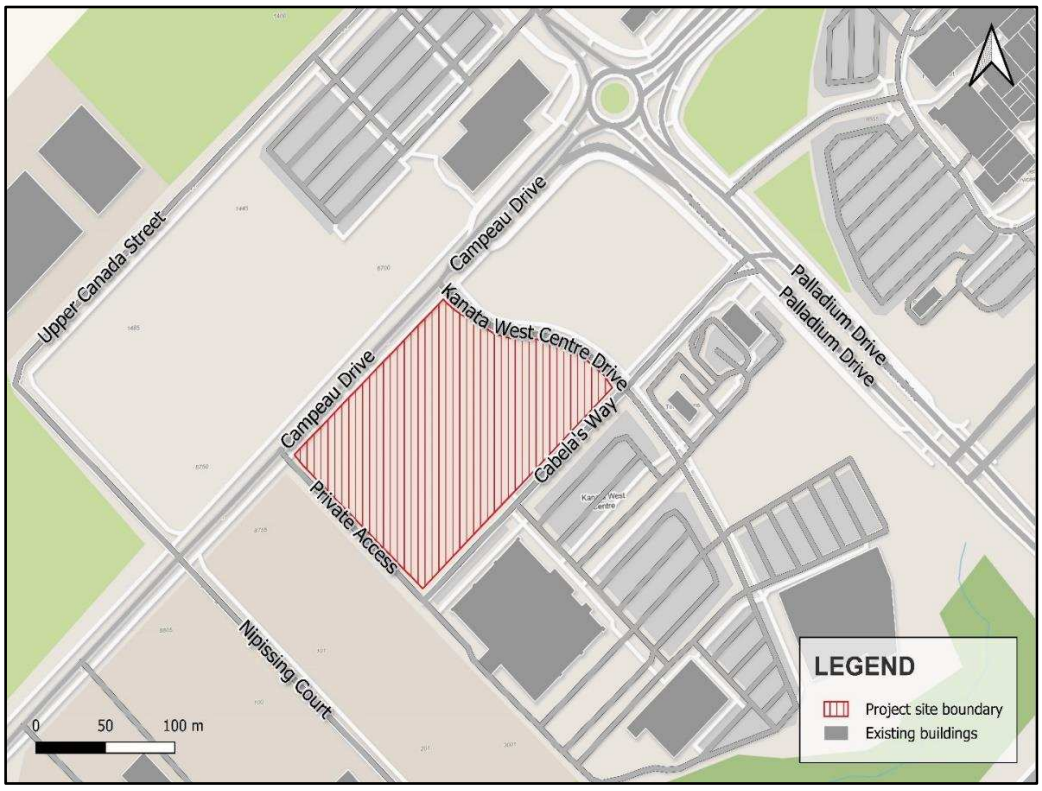


FIG. 1: Site Location

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**, YME, July 2024 and GEMTIC, Oct 2023.
- **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 0.08 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 19.2 L/s and 35.2 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 0.05 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 14.0 L/s and 24.5 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 0.04 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 9.8 L/s and 17.9 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 investigation determined that the water table is 1.55 meters below the existing surface, based on measurements taken in July, 2024. Consequently, the groundwater elevation ranges between 102.85 meters and 103.09 meters.

However, a previous Geotechnical Investigation (October 2023) by GEMTEC involved installing monitoring wells in boreholes 23-1 and 23-2 to monitor groundwater conditions at the site. Measurements from May 2023 indicated groundwater elevations between 102.50 meters and 102.60 meters.

While the proposed infiltration gallery has a bottom elevation ranging from 102.61m to 102.77m, which is above the groundwater table based on GEMTEC Geotechnical investigation but submerged based on YME geotechnical investigation due to seasonal variation, it does not achieve the recommended 1.0-meter separation. 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 recommendations outlined in the report, the following design parameters have been applied to the subject site:

Sanitary Demand Rate for Sewers:

- Extensive Employment Area/Commercial 50,000 L/ha/day

Peaking Factors:

- Commercial 1.5

Extraneous Flows:

- Infiltration Allowance 0.28 L/s/ha (all areas)

Velocity:

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

The above parameters align with the sanitary sewer design guidelines specified in the design brief for Kanata West Retail Centre (KWRC), dated September 2016, prepared by the IBI Group.

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 and KWRC Sanitary Sewer Design Sheet in **Appendix D**.

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, 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 2.79 L/s, consistent with the allocated flows 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 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)	Allocated Pipe Run
D21	0.2	0.9	52.14	MH21-MH22
L21	0.19	0.9	84.88[*2]	MH21-MH22
R55, P55	1.73	0.9	451	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. 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. 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.

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: Wood Frame 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**.

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.

WPE Engineering Ltd.
Abdul Rahman Mosameem
Water Resource Analyst

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)

PRE-APPLICATION CONSULTATION MEETING NOTES
AUGUST 30, 2022

File Number: PC2022-0206
August 30, 2022

Pre-Application Consultation Meeting Notes

Property Address: 3075 Palladium Drive
Location: Virtual – Microsoft Teams
Meeting Date: August 30, 2022

Attendees: Molly Smith – Planner, City of Ottawa
Gabrielle Schaeffer – Engineer (Infrastructure), City of Ottawa
Selma Hassan – Planner (Urban Design), City of Ottawa
Neeti Paudel – Project Manager (Infrastructure), City of Ottawa
Amber Chen – Co-op Student, City of Ottawa
Mercedes Liedtke - MVCA
Barry Godfrey – Quaestus Corp.
Allan Stone - AJS Architecture Ltd.
Chris Collins - EXP
Dave Meikle – DBM Consulting Inc.
Alain Nadeau – MTO
Andrew Harte – CGH Transportation
Tim Eisner – JFSA
Jocelyn Chandler - JFSA

Regrets: Matthew Hayley – Planner (Environment), City of Ottawa
Jeff Goettling – Planner (Parks & Facilities), City of Ottawa
Mark Richardson, Planner (Forester), City of Ottawa

Applicant Comments:

1. Two options are discussed:
    a. First one is a retail concept plan that fits within the existed zoning (SPC).
    b. Second one is to include a car wash that is around 60 000 square feet.
        i. Will move forward only if the staff supports it because a Zoning By-Law Amendment would be needed.
2. Designated as a neighbourhood in the new OP, there is a lot of flexibility as long as it fits the surrounding uses.
    a. The area is predominately retail.
3. The property has previously been cleared, very little vegetation.
4. The site servicing has been pre-determined on the site.
    a. IBI have previously done a site servicing report that includes all the lands.
    b. The original master servicing indicated that 100m infiltration was required per year.
5. Loading spaces will be through the front door for retail shops.

Planning:

1. If choosing to not include a car wash, the application will be a Site Plan Control – Complex (Manager Approval), subject to public consultation of the postage of signs and notifications.
2. If choosing to include a car wash, the application will be a Rezoning and Site Plan Control.
3. In the GM zone, there are subzones that include a car wash, so it is up to you if you want to apply for a Zoning amendment.

4. A planning rationale is required for a Zoning By-law Amendment, please include a review on the Kanata West Concept Plan as the site is within the prestige business park. This can be combined with the Design Brief to address policy points.
5. There is an exception (Urban Exception 2167) on the site prohibiting residential uses.
6. More landscaped areas on the site should be included to attempt to achieve the goals of the KWCP for Prestige Lands.
7. If applying for a Zoning By-law Amendment to include a car wash:
    a. More landscape around Retail 1C.
    b. See a landscape buffer adjacent to the car wash through the utilization of a berm or heavy plantings.
8. Since there aren't any cycling lanes on the site, please add bike parking closer to Campeau.
9. The south-facing car wash is preferred over the north due to the roadway exit.
10. Please incorporate an active and engaging commercial use at the corner of Campeau and the entrance of the plaza for Retail 1E (ex. restaurant, café, etc.) rather than an inactive unengaging use (ex. a bank) to achieve active frontages, and an engaging public realm.

Please contact Molly Smith, Planner (File Lead), at Molly.Smith@ottawa.ca if you have any questions or require additional information relating to the comments above.

Urban Design

1. A Design Brief is required with the application. The Terms of Reference is attached and all items highlighted in yellow must be included.

2. A broad and interconnected pedestrian network should be clearly show on the site plan. As discussed in the pre-consult, this would include sidewalks along Campeau, Kanata West Centre Drive, east-west across the site adjacent to the main entrance drive, and in front of all of the retail units. The Kanata West Concept Plan states "Provide 2 m sidewalks on both sides of all internal streets as well as the higher order collectors and arterial". Please see the attached sketch where the orange dashed lines show a connected pedestrian network.

3. As discussed during the pre-consult, there are key locations where building facades are expected to include functional entrances and clear glazing to create more animation along the public realm. Please see the attached sketch where the red lines note such facades. The sketch assumes that the units shown in retail D are back-to-back units.

4. On the portions of a façade where there are not active entrances and clear glazing, decorative façades are to be provided. This could include features such as enhanced architectural treatment, murals, photo panels etc. Facades that are formed predominantly of rear service doors (e.g. retail B and C) should be heavily screened with vegetation.

5. This site is defined as Prestige Business Parkin the Kanata West Concept Plan. Numerous sections of the Plan speak to the need for significant vegetation both in the ROW and on private property. For example, the Plan states:

    - "Low profile building form and generous landscaping will set the character of the Prestige Business Park"

- "The Prestige Business Park's distinctive character will be largely that of green open space. This open space will be predominately on the private development land in the form of generous side yards flanking parking lots, landscape courts between buildings…"

- "Provide informal groupings of trees spanning the boulevard and front and side yards to create a park-like landscape character rather than regimented street tree planting".

- "Side yards and the street boulevard should be generous, no less than 8 m between parking lots of abutting properties with grouped informal landscape treatments which conveying a park-like quality rather than deliberate screening and separation of individual properties"

- "Provide minimum 4 m side yard setbacks with informal groupings of trees which convey a park-like quality to the open space rather than a buffer or screen between properties"

Given the direction from the Plan, the proposed planting is expected to be generous and dense. Please see the attached sketch where the green lines note locations for planting. In all locations, adequate soil volume and growing space must be provided for trees.

6. With regards to the possible car wash, there should be a berm along Kanata West Centre Drive to help screen the car wash. This berm should be well landscaped. Berming could also be used around the other sides of the car wash to help discourage pedestrians from walking across the car wash area. It will also be very important to resolve the pedestrian movements around the car wash in order to maintain a connected pedestrian network through the site.

<u>Transportation</u>

1. TIA will be required. Saturday peak hour traffic should be included in assessment.

2. There is a temporary median opening on Palladium Drive to facilitate north bound left turning movements into the Kanata West Retail Center. RMA was approved in 2015 to close the median opening/left turn lane when there is a need for a dual west bound right turn lanes at the on- ramp or when signals become warranted at the median opening. The concern is that the northbound left turning lanes accessing the site will queue back to the Highway 417 intersection and impact the queues on the ramp. Signal warrant may be satisfied by traffic volumes, or more probable by reaching a collision threshold. Please note the conditions above are only to close the median if there are operational/safety concerns and not to build a signal. This should be assessed in the TIA for review.

3. TIA will be required. Saturday peak hour traffic should be included in assessment.

4. On site plan:
    a. Show all details of the roads abutting the site up to and including the opposite curb; include such items as pavement markings, accesses and/or sidewalks.
    b. Turning templates will be required for all accesses showing the largest vehicle to access the site; required for internal movements and at all access (entering and exiting and going in both directions).
    c. Show all curb radii measurements; ensure that all curb radii are reduced as much as possible
    d. Show lane/aisle widths.

5. Ensure the car wash meets the minimum number of queueing spaces (10 before wash bay).

6. Noise Impact Studies required for the following:
    a. Stationary (due to the proximity to neighbouring exposed mechanical equipment) or (if there will be any exposed mechanical equipment due to the proximity to neighbouring noise sensitive land uses)

7. As the proposed site is commercial, AODA legislation applies.
    a. Clearly define accessible parking stalls and ensure they meet AODA standards (include an access aisle next to the parking stall and a pedestrian curb ramp at the end of the access aisle, as required).
    b. Please consider using the City's Accessibility Design Standards, which provide a summary of AODA requirements. https://ottawa.ca/en/city-hall/creating-equal-inclusive-and-diverse-city/accessibility-services/accessibility-design-standards-features#accessibility-design-standards

Environmental Planning

1. If the carwash is added as a use, for the site plan / zoning we will need to consider the following:

    a. Urban heat island - Please add features that reduce the urban heat island effect (see OP 10.3.3) produced by the parking lot and a building footprint. For example, this impact can be reduced by adding large canopy trees, green roofs or vegetation walls, or constructing the parking lot or building differently.

    b. Bird-safe design - Given the proposal for commercial, they will need to review and incorporate bird safe design elements. Some of the risk factors include glass and related design traps such as corner glass and fly-through conditions, ventilation grates and open pipes, landscaping, light pollution. More guidance and solutions are available in the guidelines which can be found here: https://documents.ottawa.ca/sites/documents/files/birdsafedesign_guidelines_en.pdf

Forestry

Landscape Plan tree planting requirements:

- For additional information on the following please contact adam.palmer@Ottawa.ca

Minimum Setbacks

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

Tree specifications

- Minimum stock size: 50mm tree caliper for deciduous, 200cm height for coniferous.
- Maximize the use of large deciduous species wherever possible to maximize future canopy coverage
- Tree planting on city property shall be in accordance with the City of Ottawa's Tree Planting Specification; and include watering and warranty as described in the specification (can be provided by Forestry Services).
- Plant native trees whenever possible
- No root barriers, dead-man anchor systems, or planters are permitted.
- No tree stakes unless necessary (and only 1 on the prevailing winds side of the tree)

Hard surface planting

- Curb style planter is highly recommended
- No grates are to be used and if guards are required, City of Ottawa standard (which can be provided) shall be used.
- Trees are to be planted at grade

Soil Volume

- Please document on the LP that adequate soil volumes can be met:

Tree Type/Size	Single Tree Soil Volume (m3)	Multiple Tree Soil Volume (m3/tree)
Ornamental	15	9
Columnar	15	9
Small	20	12
Medium	25	15
Large	30	18
Conifer	25	15

Please note that these soil volumes are not applicable in cases with Sensitive Marine Clay.

Sensitive Marine Clay

- Please follow the City's 2017 Tree Planting in Sensitive Marine Clay guidelines

2. Tree Canopy Cover

- The landscape plan shall show how the proposed tree planting will replace and increase canopy cover on the site over time, to support the City's 40% urban forest canopy cover target.
- At a site level, efforts shall be made to provide as much canopy cover as possible, through tree planting and tree retention, with an aim of 40% canopy

cover at 40 years, as appropriate.
- Indicate on the plan the projected future canopy cover at 40 years for the site.

Conservation Authority – MVCA

1. MVCA's information sources do not identify any potential natural hazard/heritage features within the scope of our review as being associated with the subject lands.

2. We will require a stormwater management plan.

    a. Please include the design criteria for the existing pond (Pond 6 West).

    b. 80% TSS removal, or enhanced level of protection, is required as per the Carp River Watershed Subwatershed Study.

    c. Thermal mitigation is required as Feedmill Creek is a coolwater watercourse

3. The Carp River Watershed Subwatershed Study identifies this site as a low groundwater recharge area, which has an annual infiltration target of 73mm/year.

Regarding the proposed site plan with the car wash, MVCA technical staff stated that water from a car wash is considered wastewater and a separate treatment system should be proposed to be connected into the sanitary sewers. Sanitary and water sewers are not in MVCA's scope of review, therefore we would not require additional on-site quality control for the design with the car wash.

Parks

1. Cash-in-lieu of parkland and associated appraisal fee will be required as a condition of approval as per the Parkland Dedication Bylaw Parkland Dedication (By-law No. 2009-95) | City of Ottawa. Value of noted lands to be appraised through a Real Estate Valuation Advisor within the Planning Infrastructure & Eco Development Department. The exact amount will be identified as a condition of site plan approval.

2. For Commercial purposes, the parkland requirement is calculated at 2% of the gross site land area.

3. Has there been any past Parkland Dedication credited to the subject property parcel(s)? If so, please provide the associated documentation for Parks and Facilities Planning (PFP) review/ consideration. The conveyance of land for purposes or the payment of money in-lieu of accepting the conveyance is not required for development, redevelopment, subdivisions or consents, where it is known, or can be demonstrated that the required parkland conveyance or money in-lieu thereof has been previously satisfied.

4. Parks and Facilities Planning (PFP) is currently undertaking a legislated replacement of the Parkland Dedication By-law, with the new by-law to be considered by City Council on August 31, 2022. The by-law recommended for approval by Council increases the required parkland conveyance for mid-rise and high-rise residential development, and includes one-year transition policies for in-stream development and building permit applications or those that will be submitted and meet the requirements for completeness by September 1, 2022.

    To ensure you are aware of parkland dedication requirements for your proposed development, we encourage you to familiarize yourself with the staff report and recommended by-law that were

recommended for Council approval by Planning Committee on July 7, 2022. For any questions or information, please contact the project lead at Kersten.Nitsche@ottawa.ca .

Infrastructure

Please note the following information regarding the engineering design submission for the above noted site:

1. The Servicing Study Guidelines for Development Applications are available at the following address: https://ottawa.ca/en/planning-development-and-construction/development-information-residents/development-application-20#section-servicing-study-guidelines-for-development-applications

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

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

3. Record drawings and utility plans are also available for purchase from the City (Contact the City's Information Centre by email at geoinformation@ottawa.ca or by phone at (613) 580-2424 x.44455).

4. The Stormwater Management Criteria, for the subject site, is to be based on the previous approved Kanata West Retail Centre plans and report(s).

5. There is an area specific SWM Criteria that applies from the Carp River Sub-Watershed Study. The requirements of this study, specifically infiltration, were discussed in previously approved documents. Ultimately, the new application is to comply with the approved documents and the sub-watershed study.

6. Since the site has been serviced based on the previously approved plans and report(s), re-use of the existing servicing with minimal to no changes is encouraged.

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

    - Location of service
    - Type of development and the amount of fire flow required (as per FUS).
    - Average daily demand: ___ l/s.
    - Maximum daily demand: ___l/s.
    - Maximum hourly daily demand: ___ l/s.

8. The Water Metering/Billing Department requires property parcels to have one service. If multiple dwellings are proposed to be serviced separately from the public main, consultation with the Development Review Project Manager is required prior to an application being filed so all parties can coordinate and agree to a water servicing layout.

9. MECP ECA Requirements

    An MECP Environmental Compliance Approval (Industrial Sewage Works) will be required for the proposed development if a car wash or gas station is part of the development. This application may be completed through the Transfer of Review Program through special request permission,

10. Phase 1 ESAs and Phase 2 ESAs must conform to clause 4.8.4 of the Official Plan that requires that development applications conform to Ontario Regulation 153/04.

Should you have any questions or require additional information, please contact me directly at (613) 580-2424, ext. 22517 or by email at gabrielle.schaeffer@ottawa.ca.

NEXT STEPS:

Please refer to the links to Guide to preparing studies and plans and fees for further information. Additional information is available related to building permits, development charges, and the Accessibility Design Standards. Be aware that other fees and permits may be required, outside of the development review process. You may obtain background drawings by contacting informationcentre@ottawa.ca.

These pre-con comments are valid for one year. If you submit a development application(s) after this time, you may be required to meet for another pre-consultation meeting and/or the submission requirements may change. You are as well encouraged to contact us for a follow-up meeting if the plan/concept will be further refined.

Please do not hesitate to contact Molly Smith, at Molly.Smith@ottawa.ca, if you have any questions.

PHASE 2 PRE- CONSULTATION: MEETING FEEDBACK
AUGUST 29, 2023

File No.: PC2022-0206

Tim Eisner
JFSA
Via email: teisner@jfsa.com

Subject: **Phase 2 Pre-Consultation: Meeting Feedback**
Proposed Site Plan Control Application – 3075 Palladium Drive

Please find below information regarding next steps as well as consolidated comments from the above-noted pre-consultation meeting held on August 29, 2023.

Pre-Consultation Preliminary Assessment

1 ☐	**2** ☐	**3** ☒	**4** ☐	**5** ☐

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

Next Steps

1. A review of the materials submitted for the above-noted pre-consultation has been undertaken and staff are satisfied that the information is consistent with the previous direction provided and sufficient to move to a Phase 3 pre-consultation.

2. Please note that if your development proposal changes significantly in scope, design, or density between the Phase 2 pre-consultation review and Phase 3 pre-consultation submission, you may be required to repeat the Phase 2 pre-consultation process.

3. In your 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

Supporting Information and Material Requirements

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

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

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

Consultation with Technical Agencies

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

Planning

Context/Policies Related to the Site:

- The Official Plan designation is Neighbourhood as Schedule B5, and the site is within the Suburban Transect.

- The site is zoned General Mixed-use Exception 2167. GM[2167] the exception does not allow residential uses and contains specific setback requirements along Palladium Drive, Campeau Drive and Nippissing Court.

Comments:

1. Although the site is not within the Kanata West area-specific policies, the applicant is encouraged to include more landscaped areas to keep the spirit of the KWCP for Prestige Lands.

2. Please consider including a sidewalk along the east side of buildings B and C to improve pedestrian circulation.

3. Staff has some reservations about the location of the loading area as the truck movement in that area appears tight, given the garbage location and parking.

4. Section 104 of the Zoning By-law outlines shared parking provisions. Has this been considered?

5. Section 111 of the Zoning By-law outlines the bicycle parking requirements.

    a. For a bank; convenience store; day care; office; post office; post-secondary educational institution; restaurant; retail food store; retail store: 1 per 250m2 of gross floor area.

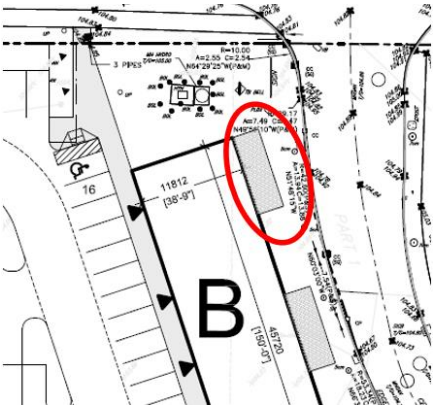
6. The site plan should include a full zoning statistics table showing the site's requirements.

7. Staff would like to reiterate their previous comment about incorporating active and engaging commercial uses at the corner of Campeau to achieve an inviting public realm.

Urban Design

8. While a formal Design Brief package is not required until the submission of an application, the drawings requested in the Terms of Reference (TOR) for the Design Brief are required as part of the Phase 3 review process. The applicant is asked to provide a landscape plan, elevations and floor plans, and perspectives; the TOR is attached for reference.

9. The site and landscape plans need to clearly distinguish between all hard and soft surface materials and include a legend. For example, it is assumed that the rectangular spaces behind the units (area circled in red) are hard surface areas for fire exits, but this should be clear.



Site Stats

10. The applicant is requested to provide some site statistics (e.g., GFA, parking provided vs. parking required, bicycle parking).

Buildings

11. As noted in the Phase 1 pre-consultation notes, on the portions of a façade where there are not active entrances or clear glazing, decorative façades are to be provided. This could include features such as enhanced architectural treatment, murals, photo panels etc.

Pedestrian movement

12. Below are screen captures from GeoOttawa. The first image shows sidewalks along Campeau and half way along the southern site edge (also seen in second image). The sidewalk along the southern edge should be extended the entire length of the block (location shown in third image).

13. Sidewalks should be added along the ‘east’ and ‘west’ frontages (behind buildings A, B and C) to complete a perimeter pedestrian network, the same way one has been completed to surround 3095 Palladium.

14. All perimeter sidewalks need to be logically connected to the internal pedestrian network.

15. On future drawings, please dimension the width of internal pedestrian walkways (through the parking lot and in front of buildings). These should be 2m at the narrowest points.

Landscape

16. There are some existing trees on the site. Will any of these be retained?

17. As indicated by the City Forester, there should be substantial planting around the perimeter and within the site, in order to address the City's policies on the urban heat island effect.

18. The Phase 1 pre-consultation comments referenced planting policies from the Kanata West Concept Plan. The comment / response letter addressed the comments by indicating that the KWCP was no longer valid. As indicated in the Phase 2 pre-consult meeting, we will follow up with the Policy group to understand why the KWCP was not included in the OP and if this was an oversight.

    As detailed in the Phase 1 comments and as noted in the Phase 2 meeting, numerous sections of the KWCP speak to the need for significant vegetation both in the ROW and on private property. Regardless of the status of the KWCP, the direction on vegetation remains important, in particular to meet the OP direction on urban tree canopy and the urban heat island. The landscape plan should reflect the Phase 1 pre-consultation comments.

19. As noted in the Phase 1 pre-consultation comments, facades that are formed predominantly of rear service doors should be heavily screened with vegetation.

Marked up sketch

20. The attached sketch shows the locations:

    - of new or extended perimeter sidewalks (red lines)
    - of additional internal pedestrian connections (red dashed line)
    - where building facades are expected to include functional entrances and clear glazing to create more animation along the public realm (purple lines)
    - Where there should be significant vegetation (e.g., to screen service areas and blank facades, to address OP policies on urban heat island and urban tree canopy) (green lines)

Engineering

In addition to the Phase 1 pre-consultation comments provided please see the following based on Phase 2 pre-consultation meeting.

21. Please include in the servicing report which of previously approved site plan infrastructure was installed on-site already, and which have not. This will help in justifying any deviations from the existing servicing layout. It is noted the GeoOttawa shows the previously approved infrastructure, but the Applicant team states it was not installed.

22. It was identified in the phase 2 pre-consultation meeting that this site plan will be developed in two phases (1: buildings A1 and A2, 2: buildings B,C and D).

    a. Please include an interim stormwater and servicing report, which could be section(s) of the overall site servicing and SWM report. Depending on the watermain servicing approach an interim hydraulic watermain analysis may be required.

    b. Please also provide interim:

        i. Site Servicing Plan,

        ii. Grade Control and Drainage Plan, and

        iii. Erosion and Sediment Control Plan

Feel free to contact Gabrielle Schaefer, Infrastructure Project Manager, for follow-up questions.

Transportation

23. Comments from Phase 1 pre-consultation still apply.

24. Ensure the curb ramps at access aisle are connected to the sidewalks.

25. A TIA is required with the Phase 3 package. Ensure to update the TIA with the proposed changes.

26. Depressed curbs with TWSI's at all crosswalks should be provided.

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

Environment and Trees

27. There are no natural heritage features, surface water features, or habitat for species at risk on or near the site.

28. Urban heat island - Please add features that reduce the urban heat island effect (see OP 10.3.3) produced by the parking lot and a building footprint. For example, this impact can be reduced by adding large canopy trees, green roofs or vegetation walls, or constructing the parking lot or building differently.

29. Bird-safe design - Given the proposal for commercial, they will need to review and incorporate bird safe design elements. Some of the risk factors include glass and related design traps such as corner glass and fly-through conditions, ventilation grates and open pipes, landscaping, light pollution. More guidance and solutions are available in the guidelines which can be found here: https://documents.ottawa.ca/sites/documents/files/birdsafedesign_guidelines_en.pdf

30. More in-depth comments will be provided once a landscaping plan has been submitted.

Tree preservation / distinctive trees

31. This site has newly-planted trees around the perimeter. A Tree Conservation Report must be provided, confirming the current condition of these trees and how they will be incorporated into the site design. The setbacks of buildings, parking, and services must account for their retention and adequate protection.

32. Section 4.8.2 of the New Official Plan provides strong direction to maintain the urban forest canopy and its ecosystem services during intensification noting when considering the impacts on individual trees, planning and development decisions, including Committee of Adjustment decisions, shall give priority to the retention and protection of large, healthy trees over replacement plantings and compensation. Applications must address the cumulative impacts on the urban forest, over time and space, with the goal of 40% urban forest canopy cover in mind. Further, that the City and the Committee of Adjustment may refuse a development application where it deems the loss of a tree(s) avoidable.

33. A permit is required prior to any tree removal on site. The tree permit will be released upon site plan approval. Please contact the planner associated with the file or the Planning Forester, Nancy Young (Young.Nancy@ottawa.ca) for information on obtaining the tree permit.

34. To ensure that no harm is caused to breeding birds, tree removal and vegetation clearing should be avoided during the migratory bird season (April 15 – August 15) as specified by The City of Ottawa's Environmental Impact Study Guidelines.

Tree Planting/Landscape Plan comments

35. A Landscape Plan is required with this application and must address all requirements within the Landscape Plan Terms of Reference https://documents.ottawa.ca/sites/documents/files/landscape_tor_en.pdf , including the projection of canopy cover toward the target of 40%, and confirmation of adequate soil volumes to support any proposed trees.

36. The Official Plan section 4.8.2, sub 3 provides the following direction related to tree planting related to site plans:

a. Preserve and provide space for mature, healthy trees on private and public property, including the provision of adequate volumes of high-quality soil as recommended by a Landscape Architect.

b. On urban properties subject to site plan control or community planning permits, development shall create tree planting areas within the site and in the adjacent boulevard, as applicable, that meet the soil volume requirements in any applicable City standards or best management practices or in accordance with the recommendation of a Landscape Architect.

37. Please provide space for planting and landscaping internal to the site.

    - The Landscape Plan must also show the setback distances to buildings and underground structures to ensure that both the above and below-ground space proposed is sufficient for tree planting in the Right of Way and other landscaped areas.

Feel free to contact Mark Elliott, Environmental Planner, or Nancy Young, Forester, for follow-up questions.

Parkland

38. Cash in Lieu of Parkland was paid at the commercial rate through the subdivision process. Parks staff have no further comments on the 3075 Palladium proposal.

Conservation Authority

39. The subject property is not regulated by the Mississippi Valley Conservation Authority (MVCA) under Ontario Regulation 153/06, *Development, Interference with Wetlands and Alterations to Shorelines and Watercourses.*

40. MVCA will screen the application, and if deemed necessary, complete a review of the stormwater management plans with a focus on quantity management with respect to natural hazards from the receiving watercourse perspective.

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

We look forward to further discussing your project with you.

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

Yours Truly,
Solé Soyak

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.

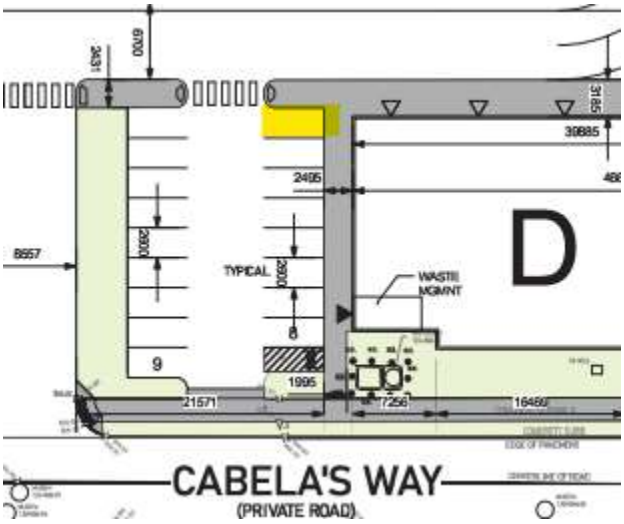
Deficiencies:

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:

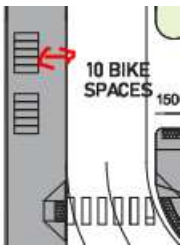
- **Site Plan**, A100, prepared by Allan Stone Architect, dated 16 Feb 2024.
- **Building A Elevations**, A-201, prepared by TAES Architects Inc., dated 2023-11-30, revision 6 dated 2024-02-16.
- **Building B – Elevation**, A200, prepared by Rossmann Architecture, dated 2023-10-11, revision 1.1 dated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

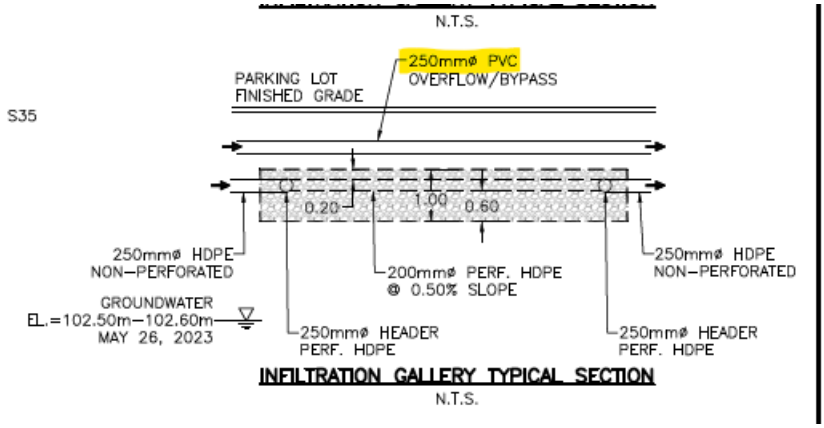
Servicing and Stormwater Management Report

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.

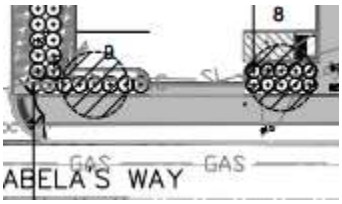
67. Please ensure the ownership of all trees is listed correctly in the table (trees 9-16 are City-owned).

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

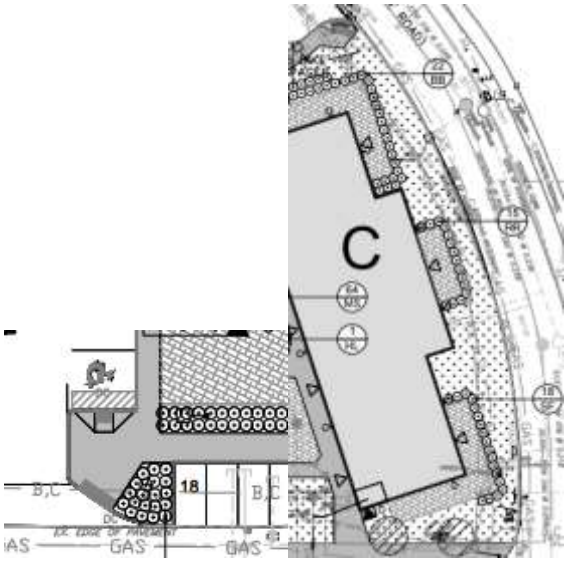
69. Please include all required items listed within the Landscape Plan Terms of Reference on the Landscape Plan. The soil volume calculations must be demonstrated on the plans to ensure that all greenspace with sufficient soil includes a tree and that all trees are provided with sufficient soil volume.

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

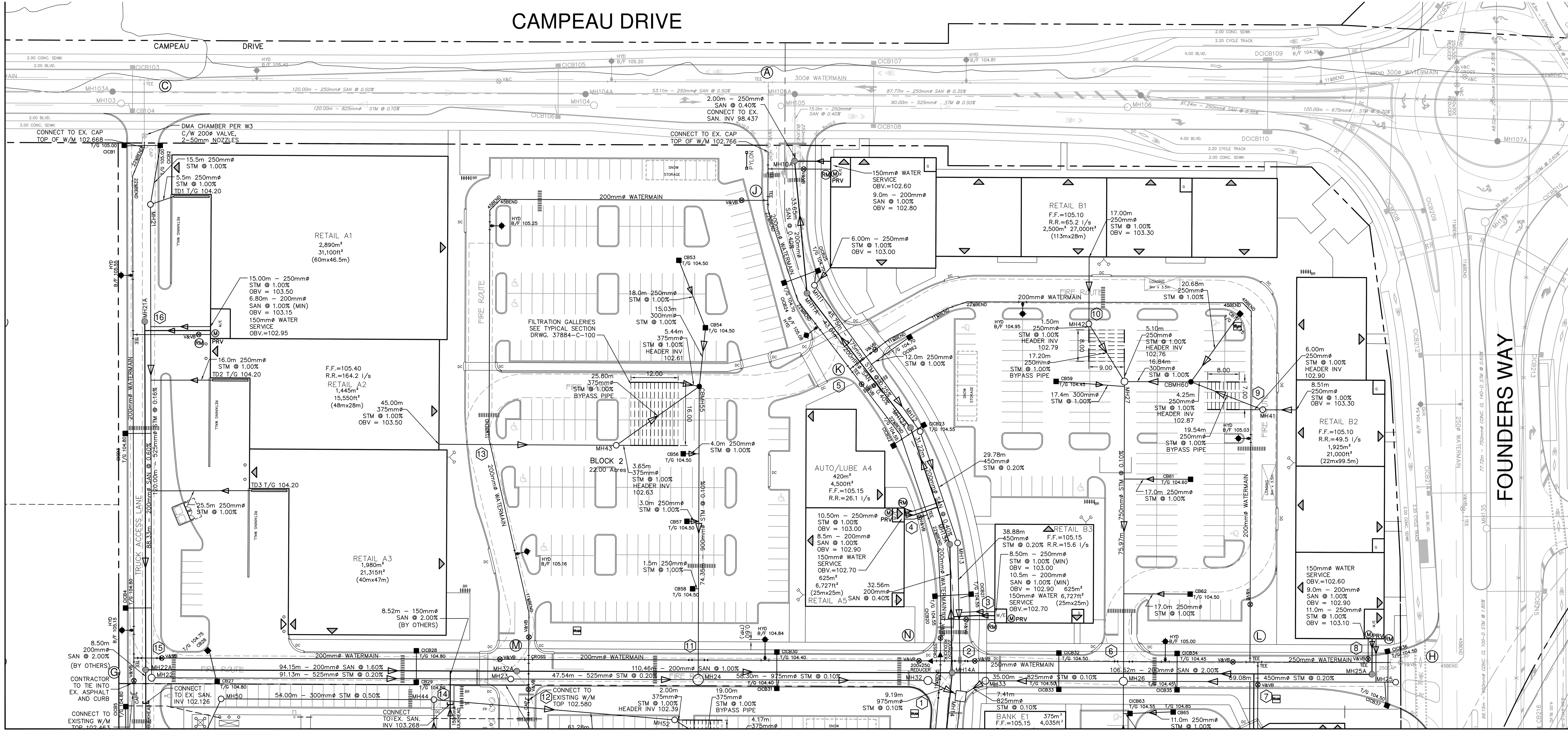
1. Please see a letter from the Mississippi Valley Conservation Authority attached to this email.

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

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



	STATION	DESCRIPTION	FINISHED	TOP OF	AS-BUILT
A	0+017.74	EX.200Ø CAP	105.128	102.766	
	0+022.00	200Ø x 150Ø TEE DOMESTIC SERVICE	105.057	102.657	
J	0+029.97	200Ø x 200Ø TEE	104.930	102.530	
	0+032.25	200Ø – 11 1/4° BEND	104.903	102.503	
	0+040	--	104.860	102.460	
	0+056.24	200Ø – 11 1/4° BEND	104.779	102.379	
	0+064.50	HYDRANT TEE	104.919	102.519	
K	0+077.98	200Ø x 200Ø TEE	104.840	102.085	
	0+099.07	200Ø - 22 1/2° BEND	104.623	102.223	
	0+120.35	200Ø x 150Ø TEE DOMESTIC SERVICE	104.806	102.165	
	0+128.88	200Ø – 22 1/2° BEND	104.753	102.353	
	0+147.84	200Ø x 150Ø TEE DOMESTIC SERVICE	104.631	102.231	
	0+152.33	200Ø V&VB	104.689	102.289	
	0+156.42	200Ø x 250Ø REDUCER	104.784	102.384	
N	0+157.90	250Ø x 250Ø CROSS	104.809	102.409	
	0+161.00	250Ø – 11 1/4° BEND	104.856	102.456	
	0+161.19	250Ø 45° BEND VERTICAL BEND	104.852	102.452	
	0+162.58	250Ø 45° BEND VERTICAL BEND	104.82	101.170	
	0+166.10	250Ø 45° BEND VERTICAL BEND	104.765	101.170	
	0+167.38	250Ø 45° BEND VERTICAL BEND	104.738	102.338	
	0+177.98	HYDRANT TEE	104.621	102.221	
	0+187.06	250Ø x 150Ø TEE DOMESTIC SERVICE	104.549	102.149	
	0+200	--	104.508	102.108	
	0+213.41	250Ø V&VB	104.621	102.221	
F	0+219.24	250Ø x 200Ø TEE	104.675	102.275	
	0+228.56	250Ø – 11 1/4° BEND	104.625	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	250Ø 45° BEND VERTICAL BEND	104.614	102.214	
	0+322.42	250Ø 45° BEND VERTICAL BEND	104.645	99.860	
N	0+324.97	250Ø x 250Ø CROSS	104.673	99.860	
	0+326.93	200Ø x 250Ø REDUCER	104.628	99.860	
	0+329.92	200Ø 45° BEND VERTICAL BEND	104.602	99.886	
	0+332.29	200Ø 45° BEND VERTICAL BEND	104.575	102.175	
	0+332.74	200Ø V&VB	105.569	103.169	
	0+340	--	104.537	102.137	
	0+360	--	104.515	102.115	
	0+370.60	HYDRANT TEE	104.543	102.143	
	0+373	150Ø x 200Ø REDUCER	104.527	102.127	
	0+388.60	150Ø – 45° BEND	104.548	101.480	
	0+394.97	150Ø – 45° BEND	104.586	101.480	
	0+400.46	150Ø CS	104.689	102.289	
B	0+406.28	BUILDING - DOMESTIC SERVICE	104.977	102.550	
C	0+017.13	EX. 200Ø CAP REPLACE WITH 200Ø– 22 1/2° BEND	105.048	102.668	
	0+024.97	200Ø – 22 1/2° BEND	105.124	102.724	
	0+050.14	HYDRANT TEE	105.293	102.893	
	0+065.16	200Ø x 150Ø TEE DOMESTIC SERVICE	105.122	102.722	
	0+080	--	104.922	102.522	
	0+100	--	104.924	102.524	
	0+120	--	104.987	102.587	
	0+140.13	HYDRANT TEE	104.868	102.468	
G	0+147.15	200Ø x 200Ø TEE	104.938	102.538	
	0+152.87	200Ø V&VB	104.913	102.513	
	0+156.32	200Ø CAP	104.863	102.463	
	0+160	--	104.859	102.459	
	0+175	200Ø x 75Ø TEE DOMESTIC SERVICE	105.078	102.678	
	0+176	200Ø x 200Ø TEE DOMESTIC SERVICE	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	HYDRANT TEE	104.988	102.588	
	0+240	--	105.036	102.636	
	0+260	--	104.927	102.527	
	0+280	--	104.626	102.226	
	0+292.80	200Ø CAP	104.781	102.381	
	0+298.77	200Ø V&VB	104.836	102.436	
	0+300	--	104.85	102.450	
D	0+303.19	250Ø x 200Ø TEE	104.919	102.519	
E	0+000.00	250Ø CAP	105.450	103.050	
D	0+083.31	200Ø x 250Ø TEE	104.919	102.519	
	0+085.31	250Ø V&VB	104.941	102.541	
	0+085.93	250Ø 45° BEND VERTICAL BEND	104.948	102.548	
	0+86.52	250Ø 45° BEND VERTICAL BEND	104.955	101.970	
	0+089.10	250Ø 45° BEND VERTICAL BEND	104.985	101.970	
	0+089.71	250Ø 45° BEND VERTICAL BEND	104.992	102.592	
	0+093.94	HYDRANT TEE	104.963	102.563	
	0+100	--	104.910	102.510	
	0+120	--	104.727	102.327	
	0+121.40	--	104.712	102.270	
	0+123.54	--	104.692	102.270	
	0+140	--	104.630	102.230	
	0+147.48	250Ø 45° BEND VERTICAL BEND	104.694	102.294	
	0+148.17	250Ø 45° BEND VERTICAL BEND	104.700	101.620	
	0+150.57	250Ø 45° BEND VERTICAL BEND	104.720	101.620	
	0+151.27	250Ø 45° BEND VERTICAL BEND	104.726	102.326	
	0+160.46	250Ø x 150Ø TEE DOMESTIC SERVICE	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	200Ø x 250Ø TEE	104.810	102.410	
	0+187.90	250Ø V&VB	104.761	102.361	
	0+200	--	104.654	102.254	
	0+220	--	104.459	102.059	
	0+233.26	250Ø 45° BEND VERTICAL BEND	104.348	101.948	
	0+234.21	250Ø 45° BEND VERTICAL BEND	104.357	101.030	
	0+236.82	250Ø – 22 1/2° BEND	104.381	101.030	
	0+237.37	250Ø 45° BEND VERTICAL BEND	104.390	101.030	
	0+238.33	250Ø 45° BEND VERTICAL BEND	104.406	102.006	
	0+245.71	250Ø V&VB	104.524	102.124	
	0+246.27	250Ø 45° BEND VERTICAL BEND	104.535	102.135	
	0+248.58	250Ø 45° BEND VERTICAL BEND	104.582	99.860	
N	0+255.00	250Ø x 250Ø CROSS	104.673	99.860	
	0+260.55	250Ø x 200Ø REDUCER	104.647	99.860	
	0+261.63	200Ø 45° BEND VERTICAL BEND	104.645	99.860	
	0+264.02	200Ø 45° BEND VERTICAL BEND	104.626	102.226	
	0+266.98	200Ø V&VB	104.617	102.217	
	0+280	--	104.644	102.244	
	0+300.88	HYDRANT TEE	104.693	102.293	
	0+324.36	200Ø – 45° BEND	104.707	102.307	
	0+326.90	200Ø – 45° BEND	104.677	102.277	
	0+333.29	200Ø – 11 1/4° BEND	104.586	102.186	
	0+340	--	104.543	102.143	
	0+360	--	104.480	102.080	
	0+371.06	HYDRANT TEE	104.585	102.185	
	0+375.08	200Ø x 150Ø TEE DOMESTIC SERVICE	104.615	102.215	
	0+375.25	200Ø 45° BEND VERTICAL BEND	104.615	102.215	
	0+376.97	200Ø 45° BEND VERTICAL BEND	104.624	100.750	
	0+380.87	200Ø 45° BEND VERTICAL BEND	104.647	100.750	
	0+382.16	200Ø 45° BEND VERTICAL BEND	104.676	102.276	
	0+396.20	200Ø V&VB	104.706	102.306	
	0+400	--	104.703	102.303	
	0+420	--	104.703	102.303	
	0+432.27	--	104.703	102.220	
	0+435.62	--	104.706	102.220	
	0+445.01	HYDRANT TEE	104.734	102.334	
	0+447.63	200Ø – 45° BEND	104.762	102.362	
	0+452.62	200Ø – 11 1/4° BEND	104.800	102.400	
	0+457.82	200Ø – 45° BEND	104.788	102.388	
	0+480	--	104.782	102.382	
	0+500	--	104.681	102.281	
	0+500.71	200Ø – 11 1/4° BEND	104.680	102.280	
	0+511	200Ø V&VB	104.723	102.323	
	0+514.04	200Ø 45° BEND VERTICAL BEND	104.679	102.279	
	0+515.64	200Ø 45° BEND VERTICAL BEND	104.651	100.700	
	0+519.18	200Ø 45° BEND VERTICAL BEND	104.691	100.700	
	0+520.80	200Ø 45° BEND VERTICAL BEND	104.731	102.331	
F	0+523.14	250Ø x 200Ø TEE	104.675	102.275	
G	0+000.00	200Ø x 200Ø TEE	104.939	102.539	
	0+000.72	200Ø 45° BEND VERTICAL BEND	104.944	102.544	
	0+001.89	200Ø 45° BEND VERTICAL BEND	104.950	101.380	
	0+005.86	200Ø 45° BEND VERTICAL BEND	104.984	101.380	
	0+007.00	200Ø 45° BEND VERTICAL BEND	105.000	102.600	
	0+007.11	200Ø V&VB	104.999	102.599	
	0+020	--	104.850	102.450	
	0+040	--	104.994	102.594	
	0+060	--	104.926	102.526	
	0+080	--	104.929	102.529	
	0+092.85	200Ø V&VB	104.994	102.594	
M	0+100.17	200Ø x 200Ø CROSS	104.897	102.497	
	0+120	--	104.734	102.334	
	0+140	--	104.596	102.196	
	0+140.79	200Ø 45° BEND VERTICAL BEND	104.59	102.190	
	0+141.64	200Ø 45° BEND VERTICAL BEND	104.584	101.350	
	0+144.78	200Ø 45° BEND VERTICAL BEND	104.563	101.350	
	0+145.60	200Ø 45° BEND VERTICAL BEND	104.557	102.157	
	0+160.13	HYDRANT TEE	104.458	102.058	
	0+180	--	104.584	102.184	
	0+199.20	200Ø V&VB	104.722	102.322	
	0+202.22	200Ø x 250Ø REDUCER	104.775	102.375	
N	0+205.28	250Ø x 250Ø CROSS	104.809	102.409	
	0+207.66	250Ø 45° BEND VERTICAL BEND	104.863	102.463	
	0+208.33	250Ø 45° BEND VERTICAL BEND	104.848	101.770	
	0+210.89	250Ø 45° BEND VERTICAL BEND	104.802	101.770	
	0+211.55	250Ø 45° BEND VERTICAL BEND	104.794	102.394	
	0+213.36	250Ø V&VB	104.767	102.367	
	0+220	--	104.696	102.296	
	0+240	--	104.589	102.189	
	0+248.81	250Ø 45° BEND VERTICAL BEND	104.679	102.279	
	0+249.61	250Ø 45° BEND VERTICAL BEND	104.687	101.490	
	0+252.57	250Ø 45° BEND VERTICAL BEND	104.649	101.490	
	0+253.33	250Ø 45° BEND VERTICAL BEND	104.639	102.239	
	0+261.68	HYDRANT TEE	104.527	102.127	
	0+278.85	250Ø V&VB	104.658	102.258	
	0+283.18	200Ø x 250Ø TEE	104.711	102.311	
L	0+285.18	250Ø x 150Ø TEE DOMESTIC SERVICE	104.734	102.334	
	0+300	--	104.734	102.334	
	0+313.14	250Ø x 150Ø TEE DOMESTIC SERVICE	104.593	102.115	
H	0+318.77	250Ø CAP	104.557	102.157	
I	0+000.00	200Ø x 250Ø TEE	104.810	102.410	
	0+001.52	200Ø V&VB	104.786	102.386	
	0+007.55	200Ø CAP	104.841	102.362	
	0+020	--	104.892	102.492	
	0+039.89	HYDRANT TEE	105.000	102.600	
	0+060	--	105.100	102.700	
	0+080	--	105.050	102.650	
	0+100	--	105.069	102.669	
	0+120	--	105.028	102.628	
	0+125.10	HYDRANT TEE	105.121	102.721	
	0+140	--	105.039	102.639	
	0+141.98	200Ø 45° BEND VERTICAL BEND	104.986	102.586	
	0+142.57	200Ø 45° BEND VERTICAL BEND	105.054	102.066	
	0+145.15	200Ø 45° BEND VERTICAL BEND	104.997	102.066	
	0+145.68	200Ø 45° BEND VERTICAL BEND	105.006	102.606	
	0+146	200Ø CAP	104.980	102.580	
	0+148.50	200Ø V&VB	104.900	102.500	
	0+149.12	200Ø 45° BEND VERTICAL BEND	104.876	102.476	
	0+149.73	200Ø 45° BEND VERTICAL BEND	104.864	101.840	
	0+152.44	200Ø 45° BEND VERTICAL BEND	104.932	101.840	
	0+153.14	200Ø 45° BEND VERTICAL BEND	104.949	102.549	
M	0+156.08	200Ø x 200Ø CROSS	104.897	102.497	
	0+161.73	200Ø V&VB	104.928	102.528	
	0+167.92	200Ø – 11 1/4° BEND	104.910	102.510	
	0+183.15	HYDRANT TEE	105.083	102.683	
	0+200	--	104.921	102.521	
	0+213.11	200Ø – 11 1/4° BEND	104.967	102.567	
	0+220	--	105.003	102.603	
	0+240	--	105.007	102.607	
	0+260	--	105.019	102.619	
	0+267.16	HYDRANT TEE	105.050	102.650	
	0+271.14	200Ø – 45° BEND	105.023	102.623	
	0+274.99	200Ø – 45° BEND	104.979	102.579	
	0+280	--	104.975	102.575	
	0+300	--	104.836	102.436	
	0+320	--	104.838	102.438	
	0+336.13	200Ø V&VB	104.907	102.507	
J	0+342.80	200Ø x 200Ø TEE	104.930	102.530	
K	0+000.00	200Ø x 200Ø TEE	104.840	102.440	
	0+003.41	200Ø 45° BEND VERTICAL BEND	104.885	102.485	
	0+003.86	200Ø 45° BEND VERTICAL BEND	104.874	102.030	
	0+006.39	200Ø 45° BEND VERTICAL BEND	104.809	102.030	
	0+006.76	200Ø 45° BEND VERTICAL BEND	104.803	102.403	
	0+008.05	200Ø V&VB	104.816	102.416	
	0+012.55	200Ø – 11 1/4° BEND	104.793	102.393	
	0+029.31	200Ø – 11 1/4° BEND	104.796	102.396	
	0+034.46	200Ø - 22 1/2° BEND	104.779	102.379	
	0+048.57	HYDRANT 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	200Ø – 45° BEND	104.793	102.393	
	0+107.47	200Ø – 45° BEND	104.792	102.392	
	0+120	--	104.803	102.403	
	0+139.70	HYDRANT TEE	104.819	102.419	
	0+160	--	104.815	102.415	
	0+180	--	104.688	102.288	
	0+181.77	200Ø V&VB	104.875	102.475	
L	0+196.37	200Ø x 250Ø TEE	104.711	102.311	

J:\37884-KNWRetailCentre\5.9 Drawings\59civil\layouts\KWRC\C-100.dwg Layout Name: C-100 Plot Style: AIA STANDARD-FULL.CTB Plot Scale: 1:1 Plotted At: 4/27/2015 12:35 PM Last Saved By: dsiurna Last Saved At: Apr. 27, 15

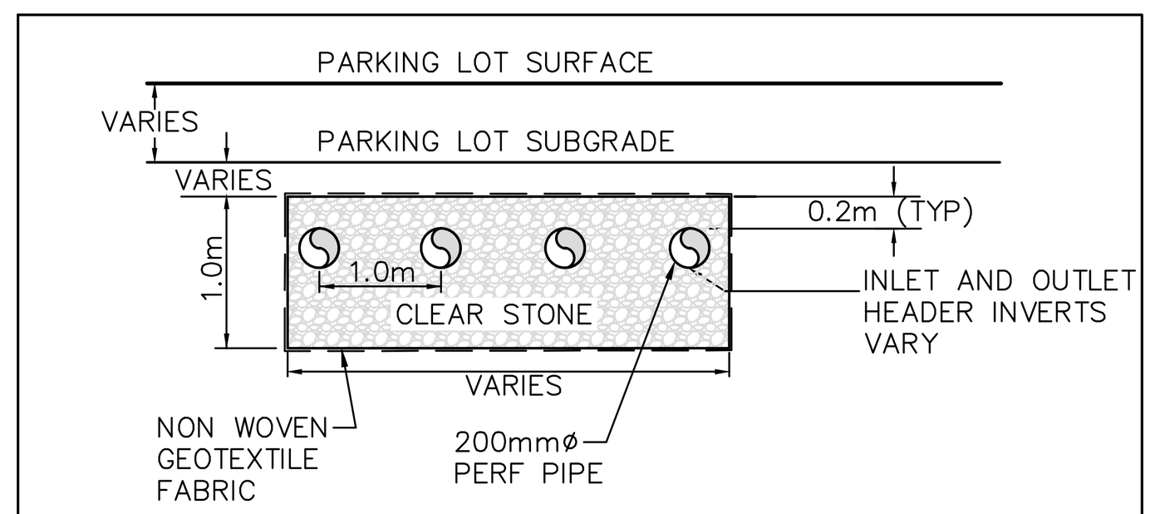
STORM SEWER STRUCTURE TABLE

NAME	RIM ELEV.	INVERT IN	INVERT OUT	DESCRIPTION
CBMH 45	104.35	NW101.660	SE101.660	1500ø OPSD 701.011
CBMH34	104.45	NE102.167	NW101.867	1500ø OPSD 701.011
CBMH39	104.45	NE102.592 NE102.832	SE102.359	1200ø OPSD 701.010
CBMH46	104.50	N102.586	SW102.374	1200ø OPSD 701.010
CBMH47	104.55	NE102.348 N102.598	W102.203	1200ø OPSD 701.010
CBMH53	104.30	S102.380 E102.560 S102.636	NW102.156	1200ø OPSD 701.010
CBMH55	104.50	SW102.556 NW102.551 S102.792	SE102.038	1500ø OPSD 701.011
CBMH60	104.45	NE102.827 N102.817 E103.025	SW102.767	1200ø OPSD 701.010
MH11	104.78		E102.663	1200ø OPSD 701.010
MH12	104.57	W102.549	SE102.474	1200ø OPSD 701.010
MH13	104.74	NW102.414	SE102.394	1200ø OPSD 701.010
MH14	104.73	NW102.316 W101.791 N101.941	SE101.416	2438x2438 Rectangular Metric
MH15	104.65	NW101.360	SE101.360	2400ø OPSD 701.013
MH16	104.59	NW101.303 NE101.753	SE101.153	1829x2438 Rectangular Metric
MH17	104.64	NW101.103	W101.053	2438x2438 Rectangular Metric
MH18	104.42	E101.031 NW101.643	SW100.893	1289x2438 Rectangular Metric
MH18B	104.00	NE100.881 SE101.781	SW100.881	1829x2438 Rectangular Metric
MH19	104.75	NE100.806 NW102.025	SW100.806	1829x2438 Rectangular Metric
MH20	105.01	NE100.745 NW101.945 E101.945	SW100.745	1829x2438 Rectangular Metric
MH21	105.18		SE102.868	1200ø OPSD 701.010
MH22	104.98	NW102.676	NE102.616	1200ø OPSD 701.010
MH23	104.96	SW102.434	NE102.434	1200ø OPSD 701.010
MH24	104.57	SW102.339 NW101.964	NE101.889	2400ø OPSD 701.013
MH25	104.62		SW102.527	1200ø OPSD 701.010
MH26	104.67	NE102.389 NW102.089 SE102.389	SW102.014	1800ø OPSD 701.012
MH27	104.62	NW102.709 NE102.599 W102.868	SE102.165	1500ø OPSD 701.011
MH28	104.82		NW102.474	1200ø OPSD 701.010
MH29	105.23		SE102.259	1200ø OPSD 701.010
MH30	105.26	NW102.134	SE102.060	1200ø OPSD 701.010
MH31	104.49	SW102.328 W102.600	SE101.777	1800ø OPSD 701.012
MH32	104.22	SW101.831	E101.801	2400ø OPSD 701.013
MH33	104.20	NE101.979	S101.949	1800ø OPSD 701.012
MH34	104.45		SW102.281	1200ø OPSD 701.010
MH35	104.74	E102.115	W102.040	1200ø OPSD 701.010
MH36	104.77	NE102.520	SW102.510 S102.770	1200ø OPSD 701.010
MH37	104.55	S102.494	N102.483 N102.865	1200ø OPSD 701.010
MH38	104.60	NE102.249 NW102.261 SE102.110	SW101.799	1800ø OPSD 701.012
MH40	104.75	NE102.773	SW102.760 SW103.020	1200ø OPSD 701.010
MH41	104.85	NE102.965	SW102.960 W103.220	1200ø OPSD 701.010
MH42	104.64	NW102.880	SE102.805 E103.040	1200ø OPSD 701.010
MH43	104.68	SW102.675	NE102.666 N103.050	1200ø OPSD 701.010
MH44	104.97	SE103.287 SW102.860	NE102.788	1200ø OPSD 701.010
MH45	105.07	N103.179 SW102.491	SE102.416 S102.800	1200ø OPSD 701.010
MH45A	104.29	NW102.318 N102.608	SE102.263	1200ø OPSD 701.010
MH50	104.98	S103.425	NE103.130	1200ø OPSD 701.010
MH51	105.12	NW103.345	NE102.803	1200ø OPSD 701.010
MH52	104.74	SW102.420	NE102.410 E102.790	1200ø OPSD 701.010

SANITARY SEWER STRUCTURE TABLE

NAME	RIM ELEV.	INVERT IN	INVERT OUT	DESCRIPTION	
MH10A	105.10	SE98.495	NW97.445	1200ø OPSD 701.010	SANITARY LANDING PER OPSD 404.02
MH11A	104.85	E98.650	NW98.630	1200ø OPSD 701.010	SANITARY LANDING PER OPSD 404.02
MH12A✱	104.64	SE98.842	W98.822	1200ø OPSD 701.010	SANITARY LANDING PER OPSD 404.02
MH13A	104.79	SE98.987	NW98.967	1200ø OPSD 701.010	SANITARY LANDING PER OPSD 404.02
MH14A	104.88	SW99.177 NE100.117 SE99.127	NW99.117	1200ø OPSD 701.010	200mm DROP PIPE PER OPSD 1003.010 SW AND NW SANITARY LANDING PER OPSD 404.02
MH15A	104.68	SE99.531	NW99.511	1200ø OPSD 701.010	SANITARY LANDING PER OPSD 404.02
MH16A	104.66	SE99.879 NE99.929	NW99.869	1200ø OPSD 701.010	
MH17A	104.64	S100.311 SW100.351	NW100.301	1200ø OPSD 701.010	
MH19A	104.80	SW101.166 NW102.836	NE101.156	1200ø OPSD 701.010	200mm DROP PIPE PER OPSD 1003.010 NW
MH20A✱	104.71	NW102.719	NE102.255	1200ø OPSD 701.010	
MH21A	105.19		SE102.388	1200ø OPSD 701.010	
MH22A✱	104.99	NW101.858 SE101.858	NE101.798	1200ø OPSD 701.010	
MH23A	105.15	SW103.273	SE103.173	1200ø OPSD 701.010	
MH25A	104.64		SW102.247	1200ø OPSD 701.010	
MH29A	105.19	NE103.380	NW102.881	1200ø OPSD 701.010	
MH32A	104.99	SW100.291	NE100.281	1200ø OPSD 701.010	
MH34A	104.54		N102.104	1200ø OPSD 701.010	
MH46A	104.78		SW101.841	1200ø OPSD 701.010	

✱ WATERTIGHT COVERS PER NOTE 2.7



FILTRATION GALLERY TYPICAL SECTION
N.T.S.

ROAD STRUCTURE ⊛

CAR ONLY PARKING AREAS:

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

HEAVY TRUCK PARKING AREAS AND ACCESS LANES:

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

⊛ REFER TO NOTE 1.15

APPROVED ☐ REFUSED ☐

DATE ______________

Felice Petti, P.Eng., Manager, Development Review
Suburban Services
City of Ottawa

PIPE CROSSING TABLE

1.	200 mm dia. SAN	2.28 m	Clearance Under	975 mm dia. STM
	250 mm dia. WM	0.50 m (Min.)	Clearance Under	975 mm dia. STM
	200 mm dia. SAN	2.74 m	Clearance Under	250 mm dia. WM
2.	200 mm dia. SAN	1.88 m	Clearance Under	450 mm dia. STM
	250 mm dia. WM	0.50 m (Min.)	Clearance Under	450 mm dia. STM
	200 mm dia. SAN	2.16 m	Clearance Under	250 mm dia. WM
3.	200 mm dia. SAN	0.25 m (Min.)	Clearance Under	450 mm dia. STM
	150 mm dia. WM	0.50 m (Min.)	Clearance Under	450 mm dia. STM
4.	200 mm dia. SAN	3.76 m	Clearance Under	250 mm dia. STM
	200 mm dia. WM	0.50 m (Min.)	Clearance Under	250 mm dia. STM
5.	200 mm dia. SAN	2.92 m	Clearance Under	200 mm dia. WM
	200 mm dia. WM	0.50 m (Min.)	Clearance Under	375 mm dia. STM
6.	200 mm dia. SAN	0.77 m	Clearance Under	750 mm dia. STM
	250 mm dia. WM	0.50 m (Min.)	Clearance Under	750 mm dia. STM
7.	200 mm dia. SAN	0.25 m (Min.)	Clearance Under	450 mm dia. STM
	150 mm dia. WM	0.50 m (Min.)	Clearance Under	450 mm dia. STM
	150 mm dia. WM	0.50 m (Min.)	Clearance Under	200 mm dia. SAN
8.	250 mm dia. WM	0.50 m (Min.)	Clearance Under	250 mm dia. STM
	250 mm dia. WM	0.50 m (Min.)	Clearance Under	200 mm dia. SAN
9.	200 mm dia. WM	0.50 m (Min.)	Clearance Under	250 mm dia. STM
10.	200 mm dia. WM	0.50 m (Min.)	Clearance Under	250 mm dia. STM
11.	200 mm dia. SAN	1.80 m	Clearance Under	900 mm dia. STM
	200 mm dia. WM	0.50 m (Min.)	Clearance Under	900 mm dia. STM
12.	200 mm dia. WM	0.50 m (Min.)	Clearance Under	525 mm dia. STM
	200 mm dia. SAN	1.84 m	Clearance Under	200 mm dia. WM
	200 mm dia. WM	0.50 m (Min.)	Clearance Under	375 mm dia. STM
13.	200 mm dia. WM	0.50 m (Min.)	Clearance Under	375 mm dia. STM
14.	150 mm dia. SAN	0.23 m	Clearance Under	375 mm dia. STM
15.	200 mm dia. SAN	0.59 m	Clearance Under	525 mm dia. STM
	200 mm dia. WM	0.50 m (Min.)	Clearance Under	525 mm dia. STM
	200 mm dia. WM	1.21 m	Clearance Under	200 mm dia. SAN
16.	200 mm dia. SAN	0.11 m	Clearance Under	525 mm dia. STM
	150 mm dia. WM	0.50 m (Min.)	Clearance Under	200 mm dia. SAN
	150 mm dia. WM	0.50 m (Min.)	Clearance Under	525 mm dia. STM
17.	375 mm dia. STM	0.75 m	Clearance Under	150 mm dia. SAN
18.	200 mm dia. SAN	0.25 m (Min.)	Clearance Under	1350 mm dia. STM
	150 mm dia. WM	0.50 m (Min.)	Clearance Under	1350 mm dia. STM
19.	200 mm dia. WM	0.50 m (Min.)	Clearance Under	1350 mm dia. STM
	200 mm dia. SAN	1.21 m	Clearance Under	200 mm dia. WM
20.	200 mm dia. SAN	0.79 m	Clearance Under	1500 mm dia. STM
21.	200 mm dia. SAN	0.21 m	Clearance Under	1500 mm dia. STM
	250 mm dia. WM	0.50 m (Min.)	Clearance Under	200 mm dia. SAN
	250 mm dia. WM	1.02 m	Clearance Under	1500 mm dia. STM
22.	200 mm dia. SAN	0.12 m	Clearance Under	1500 mm dia. STM
	250 mm dia. WM	0.50 m (Min.)	Clearance Under	200 mm dia. SAN
	250 mm dia. WM	1.00 m	Clearance Under	1500 mm dia. STM
23.	250 mm dia. WM	0.50 m (Min.)	Clearance Under	900 mm dia. STM
24.	200 mm dia. SAN	0.76 m	Clearance Under	750 mm dia. STM
25.	1650 mm dia. STM	0.13 m	Clearance Under	200 mm dia. SAN
	250 mm dia. WM	0.50 m (Min.)	Clearance Under	200 mm dia. SAN
26.	150 mm dia. WM	0.50 m (Min.)	Clearance Under	1650 mm dia. STM
	150 mm dia. WM	0.50 m (Min.)	Clearance Under	200 mm dia. SAN
27.	250 mm dia. WM	0.50 m (Min.)	Clearance Under	450 mm dia. STM
	200 mm dia. SAN	0.40 m	Clearance Under	250 mm dia. STM
28.	1650 mm dia. STM	0.10 m	Clearance Under	150 mm dia. SAN
	250 mm dia. WM	0.50 m (Min.)	Clearance Under	150 mm dia. SAN
29.	250 mm dia. WM	0.50 m (Min.)	Clearance Under	450 mm dia. STM
30.	150 mm dia. WM	0.50 m (Min.)	Clearance Under	200 mm dia. SAN
31.	200 mm dia. WM	0.50 m (Min.)	Clearance Under	375 mm dia. STM
32.	200 mm dia. SAN	0.65 m	Clearance Under	600 mm dia. STM
33.	200 mm dia. WM	0.50 m (Min.)	Clearance Under	200 mm dia. SAN
	200 mm dia. WM	1.45 m	Clearance Under	450 mm dia. STM
34.	200 mm dia. SAN	0.12 m	Clearance Under	450 mm dia. STM
	150 mm dia. WM	0.50 m (Min.)	Clearance Under	450 mm dia. STM
35.	200 mm dia. WM	0.50 m (Min.)	Clearance Under	250 mm dia. STM

CATCH BASIN DATA TABLE

STRUCTURE ID	AREA ID	STRUCTURE	COVER	ELEVATION: TOP OF GRATE	ELEVATION: INVERT INLET	ELEVATION: INVERT OUTLET	OUTLET PIPE: DIAMETER (mm)	OUTLET PIPE: TYPE	HEAD	FLOW	CUSTOM ICD TYPE	ORIFICE SIZE: AREA	ORIFICE SIZE: DIAMOND	ORIFICE SIZE: CIRCULAR
CICB 1	D21	OPSD 705.010	S22 & S23	105.00		103.43	200	PVC DR-35						
CICB 2		OPSD 705.010	S22 & S23	105.00	103.33	103.23	250	PVC DR-35	1.64	13.0	Tempest LHF			
CICB 3	D21	OPSD 705.010	S22 & S23	104.80		103.23	250	PVC DR-35	1.44	23.5	Tempest HF			
CICB 4	D21	OPSD 705.010	S22 & S23	104.80		103.23	250	PVC DR-35	1.44	15.6	Tempest HF			
CICB 5	D29	OPSD 705.010	S22 & S23	104.80		103.23	200	PVC DR-35						
CICB 6		OPSD 705.010	S22 & S23	104.80	103.13	103.03	250	PVC DR-35	1.64	23.5	Tempest HF			
CB 9	D29	OPSD 705.010	S19	105.20		103.63	150	PVC DR-35	1.49	2.6	Tempest LHF			
CICB 7	D29	OPSD 705.010	S22 & S23	104.85		103.28	250	PVC DR-35	1.44	7.8	Tempest LHF			
CB 10	L29	OPSD 705.010	S19	104.15		102.58	250	PVC DR-35	1.44	13.4	Tempest LHF			
CICB 8	D30	OPSD 705.010	S22 & S23	104.60		103.03	250	PVC DR-35	1.44	46.9	Tempest HF			
CICB 9	P19	OPSD 705.010	S22 & S23	104.55		102.98	200	PVC DR-35						
CICB 10		OPSD 705.010	S22 & S23	104.55	102.88	102.78	250	PVC DR-35	1.64	28.7	Tempest HF			
CB 8	P19	OPSD 705.010	S19	104.55		102.98	250	PVC DR-35	1.44	10.4	Tempest LHF			
CB 11	P19	OPSD 705.010	S19	104.50		102.93	250	PVC DR-35	1.44	54.8	Tempest HF			
CICB 12	D18	OPSD 705.010	S22 & S23	104.30		102.73	200	PVC DR-35						
CICB 13		OPSD 705.010	S22 & S23	104.30	102.63	102.53	250	PVC DR-35	1.64	39.1	Tempest HF			
CICB 14	D16	OPSD 705.010	S22 & S23	104.35		102.78	200	PVC DR-35						
CICB 15		OPSD 705.010	S22 & S23	104.35	102.68	102.58	250	PVC DR-35	1.64	26.1	Tempest HF			
CICB 16	D15	OPSD 705.010	S22 & S23	104.30		102.73	200	PVC DR-35						
CICB 17		OPSD 705.010	S22 & S23	104.30	102.63	102.53	250	PVC DR-35	1.64	31.3	Tempest HF			
CICB 18	D14	OPSD 705.010	S22 & S23	104.45		102.88	200	PVC DR-35						
CICB 19		OPSD 705.010	S22 & S23	104.45	102.78	102.68	250	PVC DR-35	1.64	23.5	Tempest HF			
CICB 20	D13	OPSD 705.010	S22 & S23	104.55		102.98	200	PVC DR-35						
CICB 21		OPSD 705.010	S22 & S23	104.55	102.88	102.78	250	PVC DR-35	1.64	26.1	Tempest HF			
CICB 22	D11	OPSD 705.010	S22 & S23	104.55		102.98	200	PVC DR-35						
CICB 23		OPSD 705.010	S22 & S23	104.55	102.88	102.78	250	PVC DR-35	1.64	28.7	Tempest HF			
CICB 24	D11	OPSD 705.010	S22 & S23	104.70		103.13	200	PVC DR-35						
CICB 25		OPSD 705.010	S22 & S23	104.70	103.03	102.93	250	PVC DR-35	1.64	23.5	Tempest HF			
CICB 62	D11	OPSD 705.010	S19	104.55		102.98	250	PVC DR-35	1.44	13.0	Tempest LHF			
CICB 26	D22	OPSD 705.010	S22 & S23	104.75		103.18	200	PVC DR-35						
CICB 27		OPSD 705.010	S22 & S23	104.80	103.08	102.98	250	PVC DR-35	1.69	23.5	Tempest HF			
CICB 28	D22	OPSD 705.010	S22 & S23	104.80		103.23	200	PVC DR-35						
CICB 29		OPSD 705.010	S22 & S23	104.80	103.13	103.03	250	PVC DR-35	1.64	28.7	Tempest HF			
CICB 30	D24	OPSD 705.010	S22 & S23	104.40		102.83	200	PVC DR-35						
CICB 31		OPSD 705.010	S22 & S23	104.40	102.73	102.63	250	PVC DR-35	1.64	52.1	Tempest HF			
CICB 32	D26	OPSD 705.010	S22 & S23	104.50		102.93	200	PVC DR-35						
CICB 33		OPSD 705.010	S22 & S23	104.50	102.83	102.73	250	PVC DR-35	1.64	20.9	Tempest HF			
CICB 34	D25	OPSD 705.010	S22 & S23	104.45		102.88	200	PVC DR-35						
CICB 35		OPSD 705.010	S22 & S23	104.45	102.78	102.68	250	PVC DR-35	1.64	23.5	Tempest HF			
CICB 36	D25	OPSD 705.010	S22 & S23	104.50		102.93	200	PVC DR-35						
CICB 37		OPSD 705.010	S22 & S23	104.50	102.83	102.73	250	PVC DR-35	1.64	18.3	Tempest HF			
CB 38	P31	OPSD 705.010	S19	104.35		102.78	250	PVC DR-35						
CB 39		OPSD 705.010	S19	104.35		102.78	250	PVC DR-35						
CICB 40		OPSD 705.010	S22 & S23	104.30		102.73	250	PVC DR-35						
CICB 41		OPSD 705.010	S22 & S23	104.25	102.63	102.53	250	PVC DR-35						
CB 42		OPSD 705.010	S19	104.35		102.78	250	PVC DR-35						
CB 43		OPSD 705.010	S19	104.35		102.78	250	PVC DR-35						
CB 44		OPSD 705.010	S19	104.40		102.83	250	PVC DR-35						
CBMH 45		OPSD 701.010	S19	104.35	101.66	101.66	900	CONC CL 100-D	2.24	507.9		0.128		0.403
CB 46	P35	OPSD 705.010	S19	104.65		103.08	250	PVC DR-35	1.44	20.9	Tempest HF			
CBMH 47	P35	OPSD 701.010	S19	104.55	102.35	102.20	375	PVC DR-35	2.16	106.9		0.027		0.187
TD 6	L34	S15	S15	103.80		102.23	375	PVC DR-35						
TD 7		S15	S15	103.80		102.18	375	PVC DR-35						
CB 78		OPSD 705.010	S19	104.15		102.31	300	PVC DR-35						
CBMH 34		OPSD 701.010	S19	104.45	102.17	101.87	750	CONC CL 100-D	2.21	85.3		0.022		0.170
CB 23	P34	OPSD 705.010	S19	104.60		103.03	250	PVC DR-35	1.44	26.1	Tempest HF			
CB 24	P34	OPSD 705.010	S19	104.45		102.88	250	PVC DR-35	1.44	15.6	Tempest HF			
CB 49	P34	OPSD 705.010	S19	104.45		102.88	250	PVC DR-35						
CB 50		OPSD 705.010	S19	104.45	102.71	102.71	250	PVC DR-35	1.62	49.5	Tempest HF			
CB 51	P34	OPSD 705.010	S19	104.45		102.88	250	PVC DR-35	1.44	20.9	Tempest HF			
CB 53	P55	OPSD 705.010	S19	104.50		102.93	250	PVC DR-35						
CB 54		OPSD 705.010	S19	104.50	102.75	102.75	250	PVC DR-35						
CBMH 55		OPSD 701.010	S19	104.50	102.55	102.04	900	CONC CL 100-D	2.01	325.9		0.086		0.332
CB 56	P55	OPSD 705.010	S19	104.50		102.93	250	PVC DR-35	1.44	41.7	Tempest HF			
CB 57	P55	OPSD 705.010	S19	104.50		102.93	250	PVC DR-35	1.44	39.1	Tempest HF			
CB 58	P55	OPSD 705.010	S19	104.50		102.93	250	PVC DR-35	1.44	44.3	Tempest HF			
CB 77	P27	OPSD 705.010	S19	104.75		103.06	250	PVC DR-35						
CBMH 60		OPSD 701.010	S19	104.45	102.83	102.77	300	PVC DR-35	1.53	99.1		0.030		0.196
CB 59	P27	OPSD 705.010	S19	104.45		102.88	250	PVC DR-35	1.44	73.0	Tempest HF			
CB 61	P27	OPSD 705.010	S19	104.60		103.03	250	PVC DR-35	1.44	23.5	Tempest HF			
CB 62	P27	OPSD 705.010	S19	104.50		102.93	250	PVC DR-35	1.44	39.1	Tempest HF			
CB 65	P28	OPSD 705.010	S19	104.85		103.13	250	PVC DR-35						
CICB 63		OPSD 705.010	S22 & S23	104.55	103.02	103.02	250	PVC DR-35	1.41	28.7	Tempest HF			
CB 64	P28	OPSD 705.010	S19	104.60		103.03	250	PVC DR-35	1.44	20.9	Tempest HF			
CICB 75	P28	OPSD 705.010	S22 & S23	104.60		103.03	250	PVC DR-35	1.44	20.9	Tempest HF			
CICB 76	P28	OPSD 705.010	S22 & S23	104.60		103.03	250	PVC DR-35	1.44	31.3	Tempest HF			
CB 73	P46	OPSD 705.010	S19	104.50		102.93	250	PVC DR-35						
CBMH 46		OPSD 701.010	S19	104.50	102.58	102.37	450	CONC CL 100-D	1.90	60.0		0.016		0.144
CBMH 39	P38	OPSD 701.010	S19	104.45		102.36	450	CONC CL 100-D	1.87	91.2		0.025		0.179
CB 69	P38	OPSD 705.010	S19	104.45		102.88	250	PVC DR-35	1.44	33.9	Tempest HF			
CB 72	P38	OPSD 705.010	S19	104.30		102.73	300	PVC DR-35						
CBMH 53		OPSD 701.010	S19	104.30	102.56	102.16	600	CONC CL 100-D	1.84	255.5		0.071		0.300
CB 66	P38	OPSD 705.010	S19	104.40		102.83	250	PVC DR-35						
CB 68		OPSD 705.010	S19	104.40	102.61	102.61	250	PVC DR-35	1.67	46.9	Tempest HF			
CB 70	P38	OPSD 705.010	S19	104.30		102.73	250	PVC DR-35	1.44	36.5	Tempest HF			
TD 1	L21	S15	S15	104.20		103.05	250	PVC DR-35	1.03	22.3	Tempest HF			
TD 2	L21	S15	S15	104.20		103.05	250	PVC DR-35	1.03	31.3	Tempest HF			
TD 3	L21	S15	S15	104.20		103.05	250	PVC DR-35	1.03	31.3	Tempest HF			
TD 5	L19	S15	S15	103.90		102.75	250	PVC DR-35	1.03	13.4	Tempest LHF			

Bold font indicates CB's with ICD's

Signed ______________

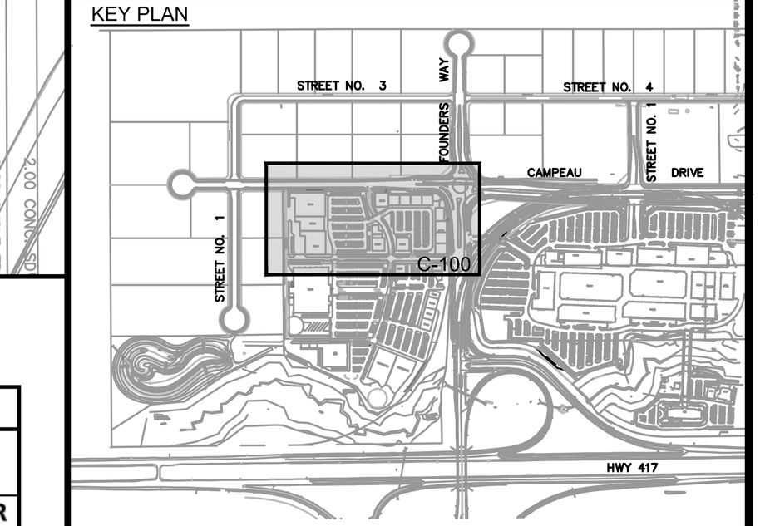
Date ______________ 2015

Plan Number ______________

LEGEND:

- MH2 PROPOSED STORM MANHOLE & NUMBER
- CBMH100 PROPOSED CATCHBASIN MANHOLE & NUMBER
- MH2A PROPOSED SANITARY MANHOLE & NUMBER
- PROPOSED STORM SEWER & FLOW DIRECTION
- PROPOSED SANITARY SEWER & FLOW DIRECTION
- HYD PROPOSED FIRE HYDRANT
- V&VB PROPOSED WATER VALVE BOX
- V&C PROPOSED WATER VALVE CHAMBER
- TVS TAPPING VALVE AND SLEEVE
- CB T/G 101.50 PROPOSED CATCHBASIN C/W TOP OFf GRATE ELEVATION
- 250mmØ SUBDRAIN
- TD1 T/G 101.50 TRENCH DRAIN C/W TOP OF GRATE
- CLAY DYKE
- SIAMESE CONNECTION (IF REQUIRED)
- M METER
- RM REMOTE METER
- PRV PRESSURE REDUCING VALVE
- A WATERMAIN IDENTIFICATION
- 9 PIPE CROSSING IDENTIFICATION
- R.R.=10.0 l/s CONTROLLED ROOF RELEASE RATE
- INLET CONTROL DEVICE LOCATION
- HEAVY DUTY ASPHALT / FIRE ROUTE
- PROPOSED CURB
- DC PROPOSED DEPRESSED CURB
- DC PROPOSED DEPRESSED CURB AND RAMP
- ×101.37 EXISTING GRADE
- 101.25 PROPOSED GRADE
- 101.25 PROPOSED GRADE
- PROPOSED BUILDING UPSTAND
- F.F.=89.25 PROPOSED BUILDING FINISHED FLOOR ELEVATION
- TCB T/G 98.25 PROPOSED TEE CB (ECB OR TCB) C/W TOP OF GRATE
- EMERGENCY FLOW ROUTE
- ROOF DRAINS
- CLAY DYKES PER S8

KEY PLAN



SCALE 0m 5 10 15 20 25 30m

No.	REVISIONS	By	Date
14			
13			
12			
11			
10			
9			
8			
7			
6			
5			
4			
3			
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 BUSINESS PARK
KANATA WEST RETAIL CENTRE

LICENSED PROFESSIONAL ENGINEER
L. M. ERION
2015/04/27
PROVINCE OF ONTARIO

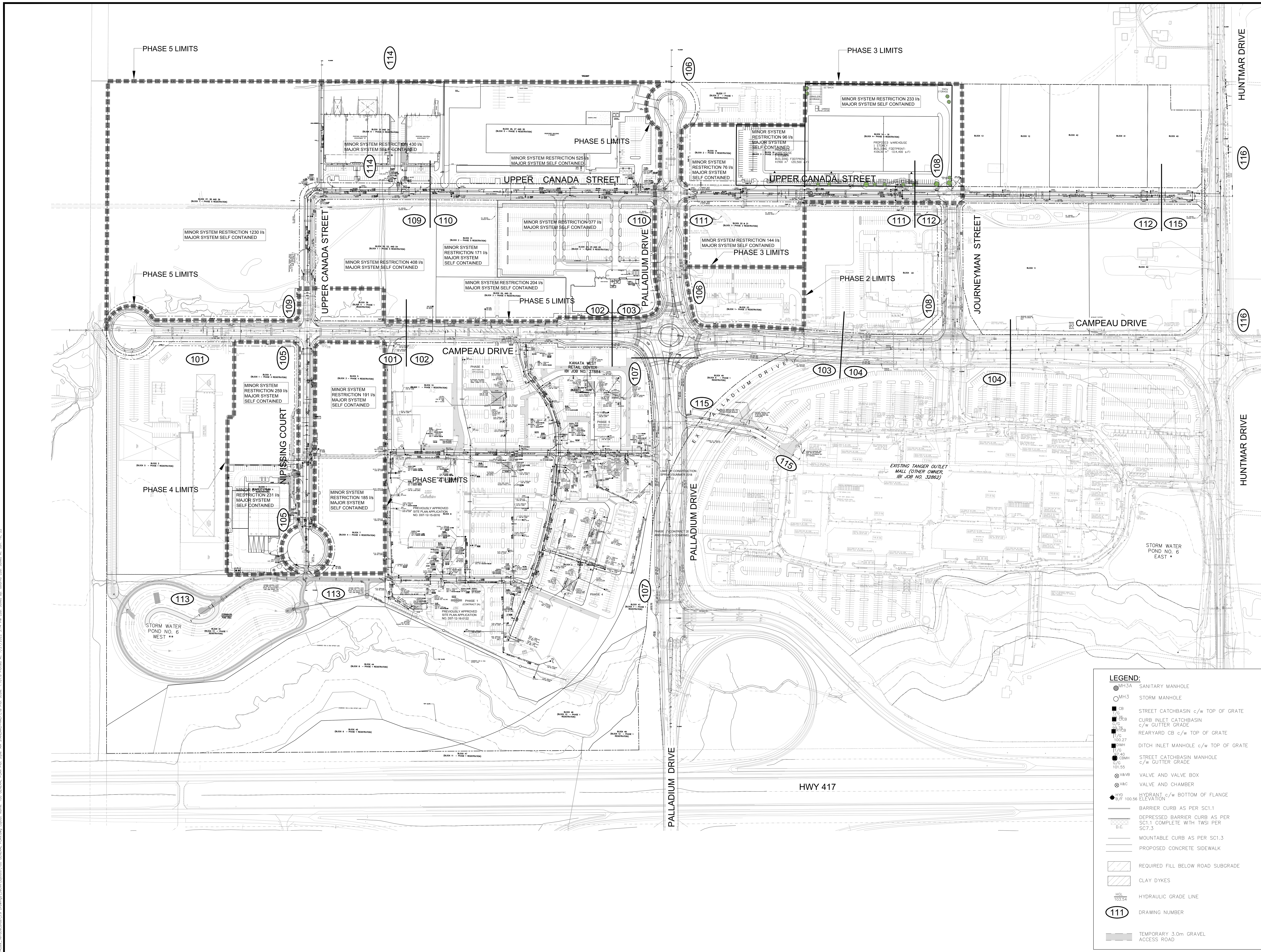
N

Drawing Title
GENERAL PLAN OF SERVICES

Scale 1:500

Design	Date
LME	JAN. 2015
Drawn	**Checked**
DPS	TRB
Project No.	**Drawing No.**
37884	C-100

D07-12-15-0016



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
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Project Title

KANATA WEST BUSINESS PARK PHASE 5

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

Drawing Title

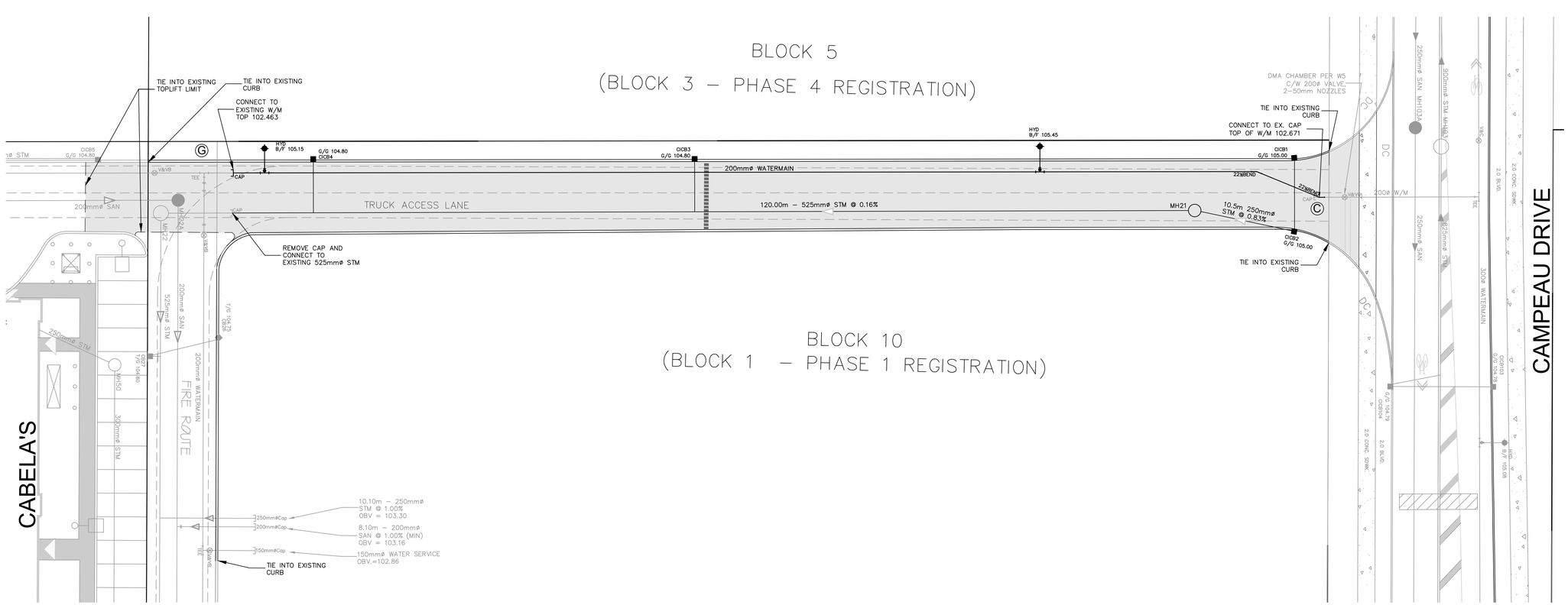
GENERAL PLAN OF SERVICES

Scale: 1:2000

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

D07-16-14-0003_P5

#17661



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		DIAMETER (mm)	TYPE				AREA	DIAMOND	CIRCULAR
					INLET	OUTLET								
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

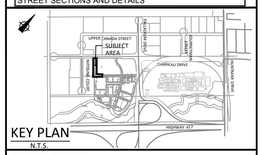
CLIENT

TAGGART REALTY MANAGEMENT

ISSUES

No.	DESCRIPTION	DATE
1	ISSUED FOR COORDINATION	XXXX-XX-XX
2		
3		
4		
5		
6		
7		
8		
9		
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 PLAN No. 17253

CITY FILE No. D07-12-17-0064

SCALE CHECK 1:250

File Location: J:\37884-KNWRetailCentre\5 0 Drawings\05civil\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 (2?*)	18 M	TABLE 187
NO. OF STORIES		2		
GFA TOTAL		**7910.24 sm**		
PHASE 1: BUILIDING 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		**7768.08 sm**		
PHASE 1: BUILIDING 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:		4577 sm		
PHASE 2:		2009 sm		

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

LANDSCAPED AREA	EXISTING	PROPOSED		REQUIRED	SECTION
MIN. AREA OF LANDSCAPING IN PARKING LOT:		3096 sm	26%	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 m2 of GLA = 237	TABLE 101
INCLUDING ACCESSIBLE PARKING		7 SPACES		
BICYCLE PARKING SPACE		28 SPACES	28 SPACES	

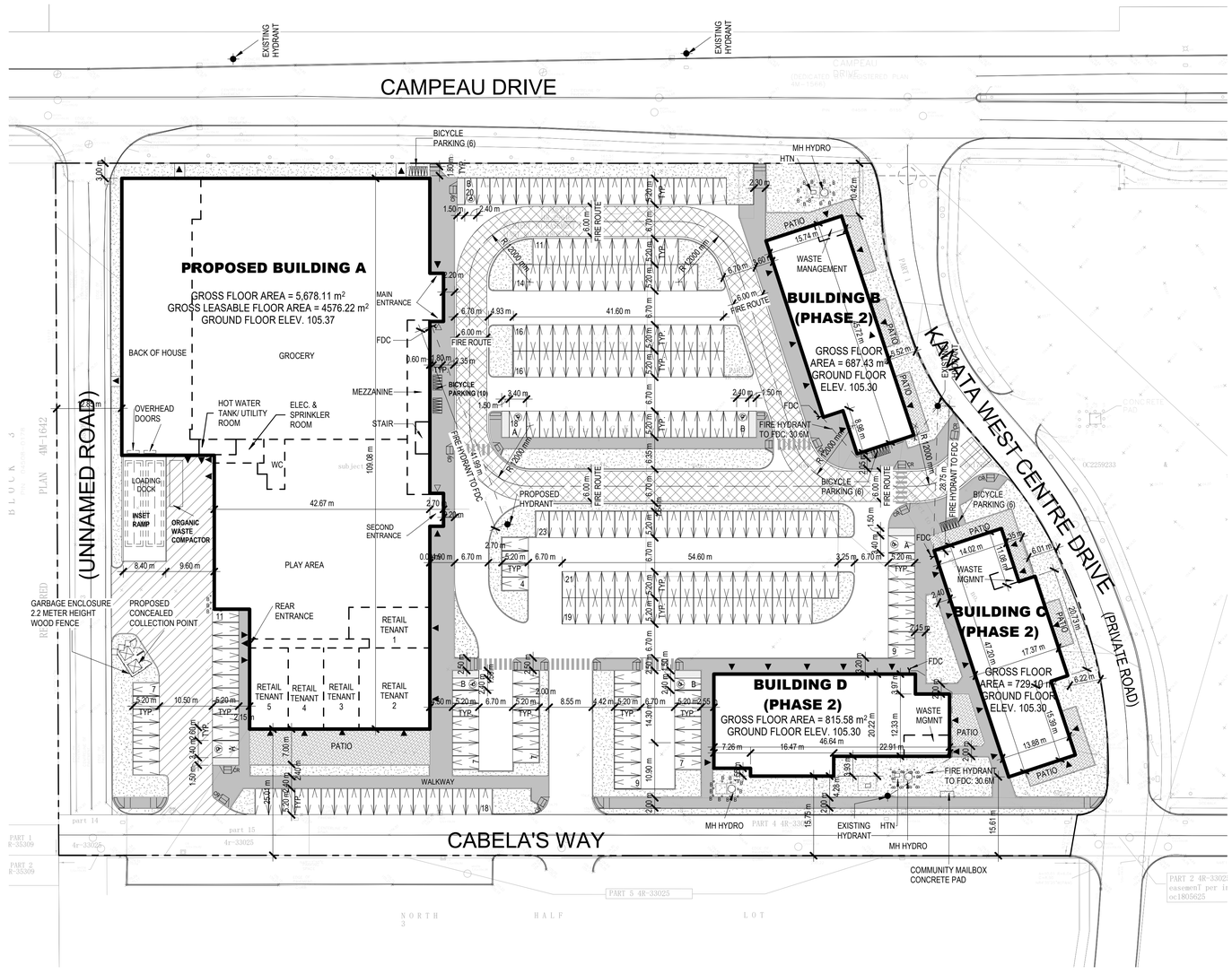
LOADING	EXISTING	PROPOSED	REQUIRED	SECTION
TOTAL NUMBER OF LOADING SPACES		2 SPACES	2 SPACES	TABLE 101

NOTES

1. BUILDING A, BUILDING B, BUILDING C AND BUILDING D TO BE NON-COMBUSTIBLE CONSTRUCTION.
2. THE SNOW TO BE REMOVED OFF-SITE.

SITE LEGENDS

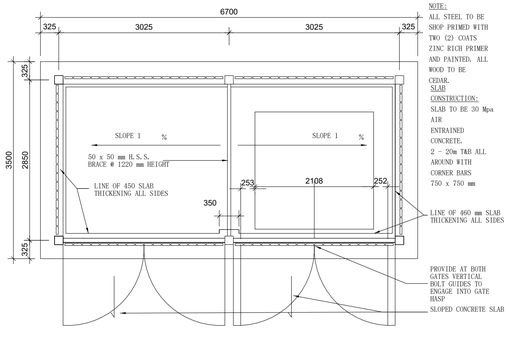
- FIRE HYDRANT
- FIRE DEPARTMENT CONNECTION
- PEDESTRIAN DOORS
- B — BOLLARD
- CR — CURB RAMP W/TWSI
- PROPERTY LINE
- OUTLINE OF BUILDING
- SOFT LANDSCAPING
- CONCRETE SIDEWALK
- FIRE ROUTE
- PATIO



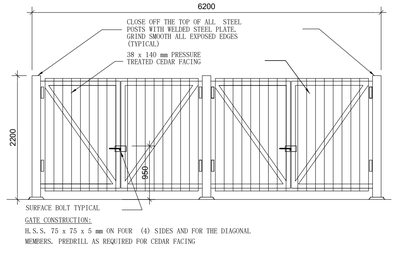
1 A001 — Site Plan
SCALE: 1 : 500

LEGAL DESCRIPTION

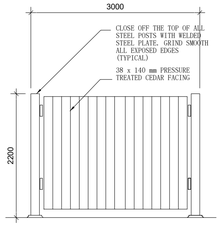
BLOCK 1, PLAN 4M1566 SUBJECT TO AN EASEMENT AS IN OC1776587 SUBJECT TO AN EASEMENT IN GROSS OVER PART 1, 4R29646 AS IN OC1808376 TOGETHER WITH AN EASEMENT OVER PART BLOCK 2 4M1566 PARTS 3,10 & 11 4R33025 AS IN OC2259230 TOGETHER WITH AN EASEMENT OVER PART BLOCK 2 4M1566,PARTS 3,8,9,10 & 11 4R33025 AS 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



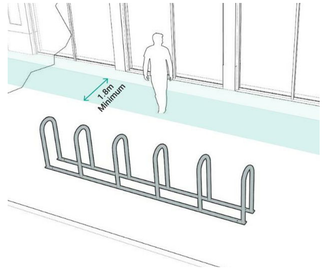
2 A001 — Garbage Enclosure Plan
SCALE: 1 : 50



3 A001 — Garbage Enclosure Front Elevation
SCALE: 1 : 50



4 A001 — Garbage Enclosure Side Elevation
SCALE: 1 : 50



5 A001 — Bicycle Parking Detail

No.	Issued	Date	By
1	For Site Plan Approval	2024-07-05	JW

KEY PLAN

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

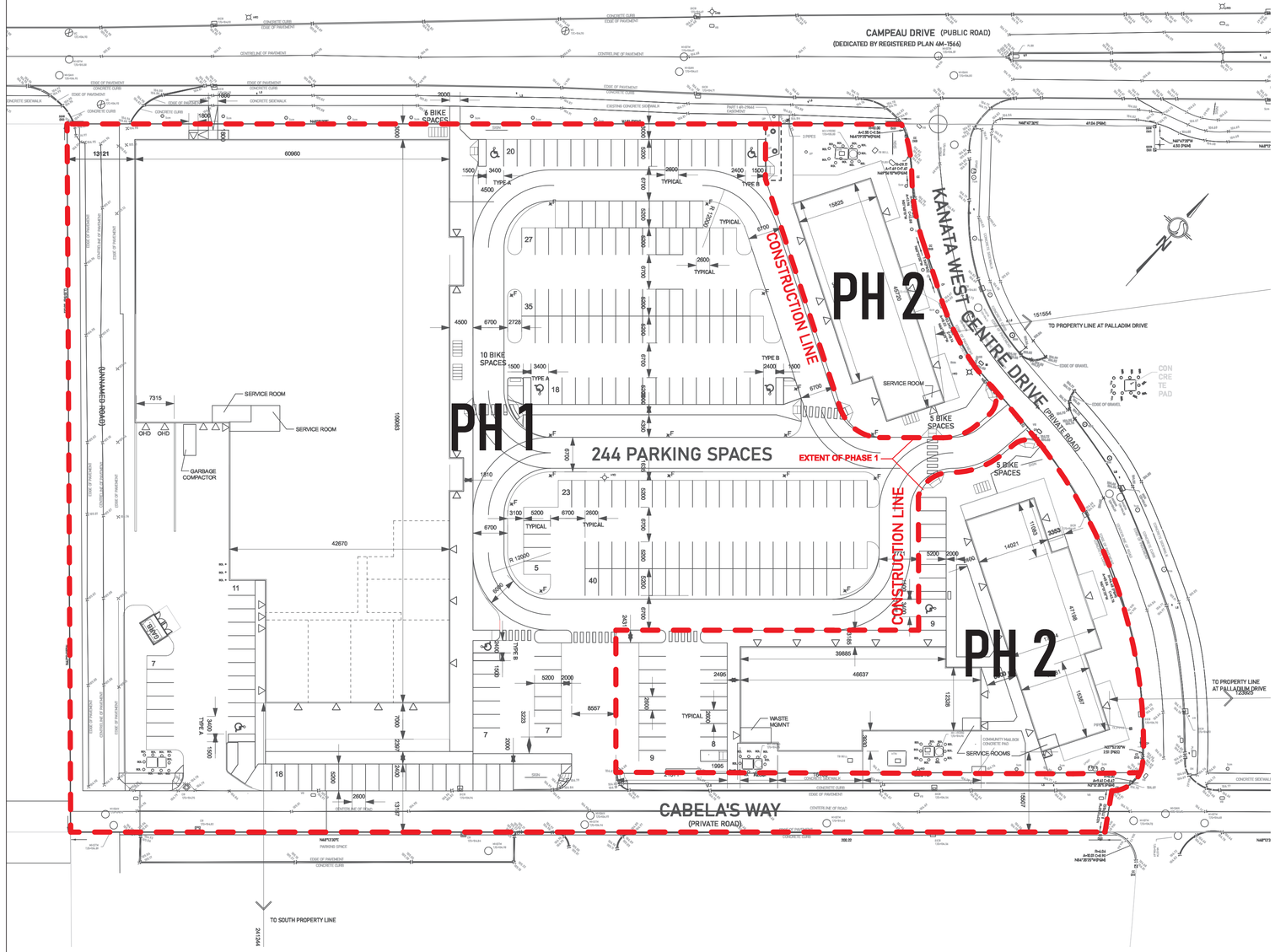
SUNNY FOODMART

3075 PALLADIUM DRIVE, OTTAWA, ON

Project No.		T2023043
Drawn	Scale	As indicated
Checked	Date	06/28/24

SITE PLAN

Drawing No. A001



1
A100
SCALE: 1:500

5000 0 10000 30000
2500 5000 20000
SCALE: 1:500 metric

LEGAL DESCRTIPTION
Block 1 on Registered Plan 4M-1566
Concession 1 Part of Lot 3
Geographic Township of Huntley
City of Ottawa

INFORMATION FOR THIS DRAWING TAKEN FROM PLAN OF SURVEYOF
PART OF BLOCKS 1 AND 14 REGISTERED PLAN 4M-1566
AND PART OF BLOCKS 3 AND 4 REGISTERED PLAN 4M-1642
CITY OF OTTAWA COMPLETED JANUARY 24, 2023
PREPARED BY STANTEC GEOMATICS LTD., OLS

REVISIONS AND DISTRIBUTION LOG

No.	Date	Note
001	16 FEB 2024	ISSUED FOR SITE PLAN CONTROL

Project:
3075 PALLADIUM DRIVE COMMERCIAL DEVELOPMENT

3075 Palladium Drive

Ottawa Ontario

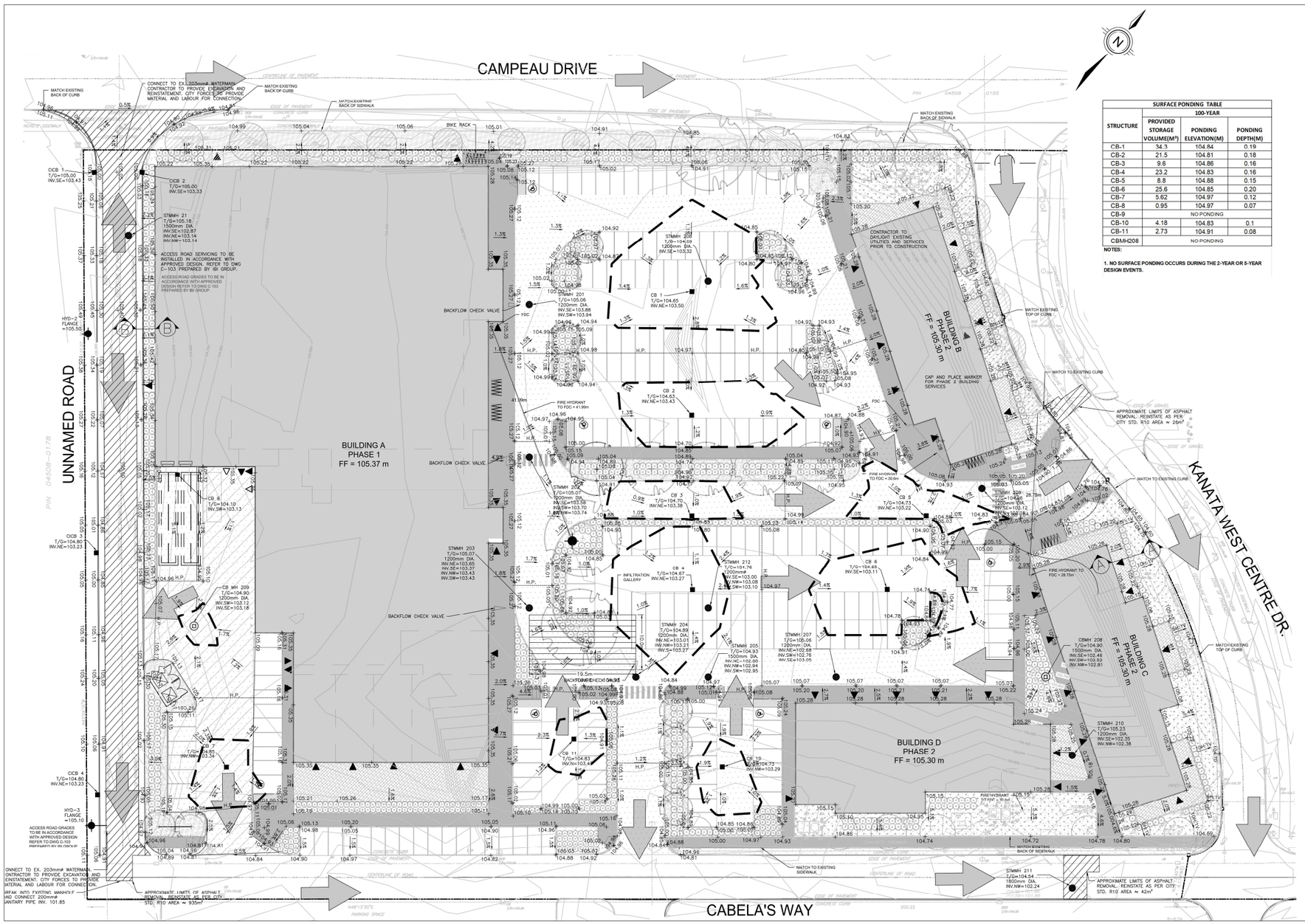
Drawing Title:
PHASING - SITE PLAN

Drawn By:	Checked By:	Date Checked:	Project No.

Date Plotted:	Scale:
Oct 02, 2023 - 10:21am	AS SHOWN

Drawing No.:	Revision No.:
A101	001

ISO A1



SURFACE PONDING TABLE

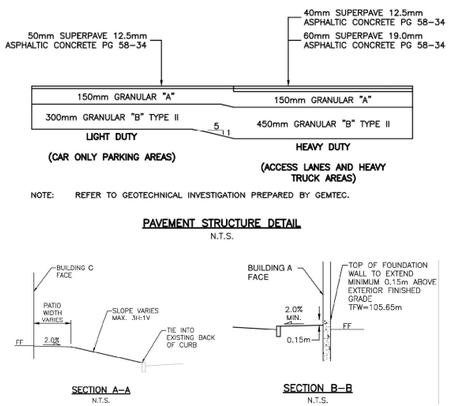
STRUCTURE	PROVIDED STORAGE VOLUME(M^3)	100-YEAR PONDING ELEVATION(M)	100-YEAR PONDING DEPTH(M)
CB-1	34.3	104.84	0.19
CB-2	21.5	104.81	0.16
CB-3	9.6	104.86	0.16
CB-4	23.2	104.83	0.16
CB-5	8.8	104.88	0.15
CB-6	25.6	104.85	0.20
CB-7	5.62	104.97	0.12
CB-8	0.95	104.97	0.07
CB-9	NO PONDING		
CB-10	4.18	104.83	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.

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



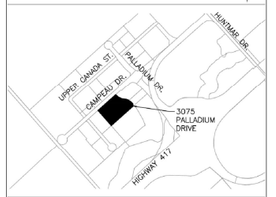
NOTE: REFER TO GEOTECHNICAL INVESTIGATION PREPARED BY GEMTEC.

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
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 2024-07-15 PROVINCE OF ONTARIO

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

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

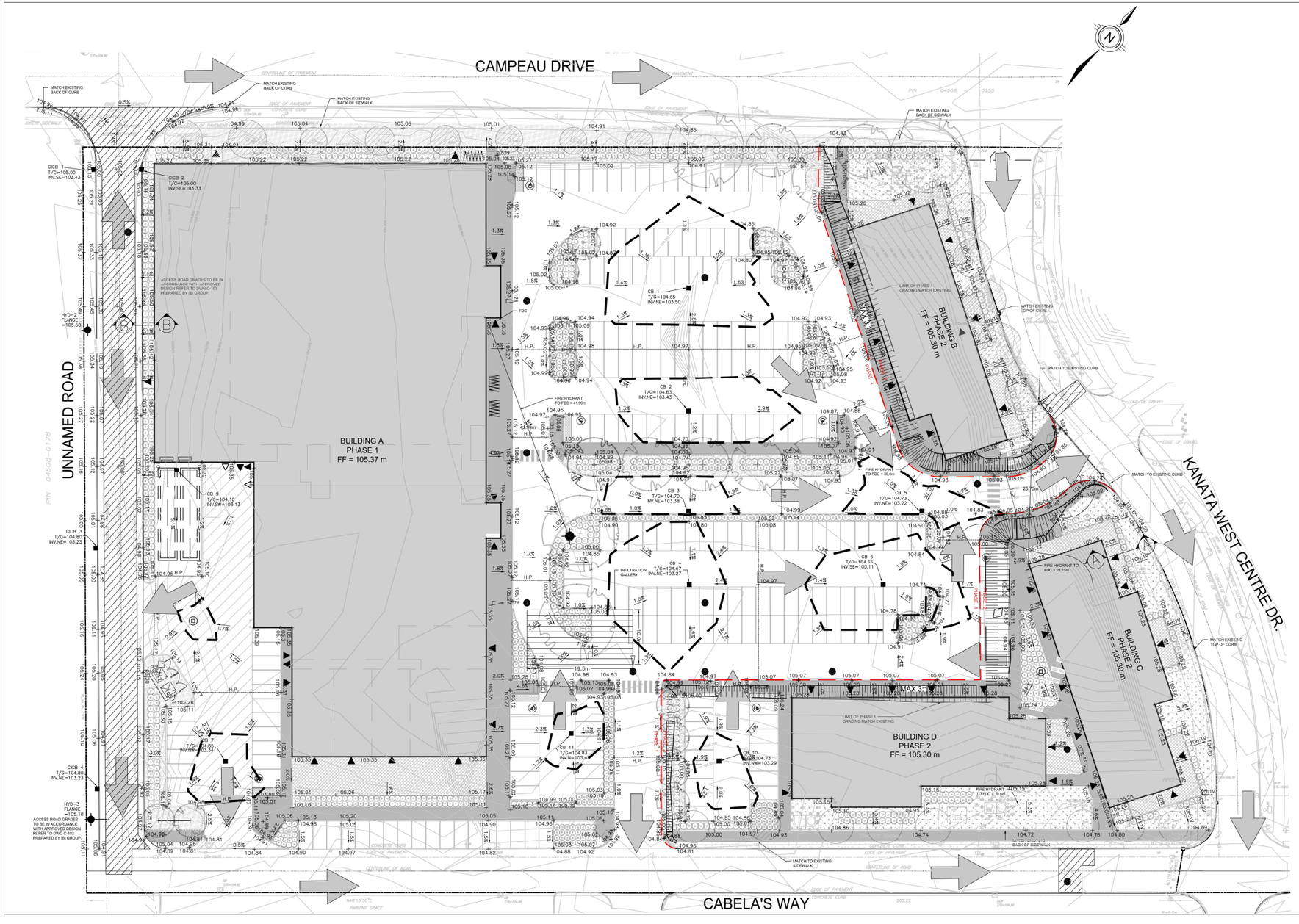
PROP. COMMERCIAL DEVELOPMENT

3075 PALLADIUM DRIVE
CITY OF OTTAWA

SITE GRADING PLAN

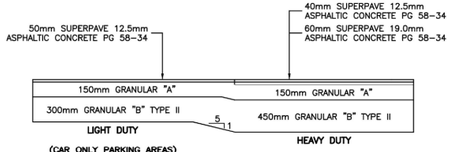
CITY FILE NO.PC2024-0078

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



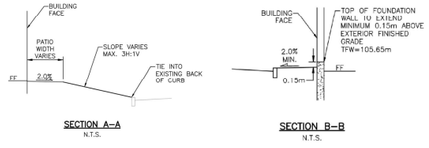
LEGEND

- PROPERTY LINE
- PHASING LIMITS
- ENTRANCE
- DEPRESSED CURB WITH TWSI
- HYDRANT
- EXISTING WATER VALVE
- EXISTING TREE
- 100 - YEAR PONDING LIMIT
- TC/RAMPING (3H:1V MAX.)
- +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
- PROPOSED HYDRANT
- EXISTING MAJOR MINOR CONTOURS
- HEAVY-DUTY ASPHALT
- EXISTING 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.

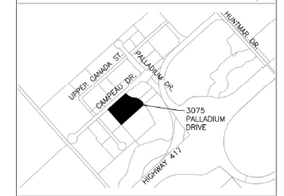
PAVEMENT STRUCTURE DETAIL
N.T.S.



SECTION A–A
N.T.S.

SECTION B–B
N.T.S.

KEY PLAN
N.T.S



No.	Issued	Date	By
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.

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LICENSED PROFESSIONAL ENGINEER
Z. DU
2024-07-15
PROVINCE OF ONTARIO

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

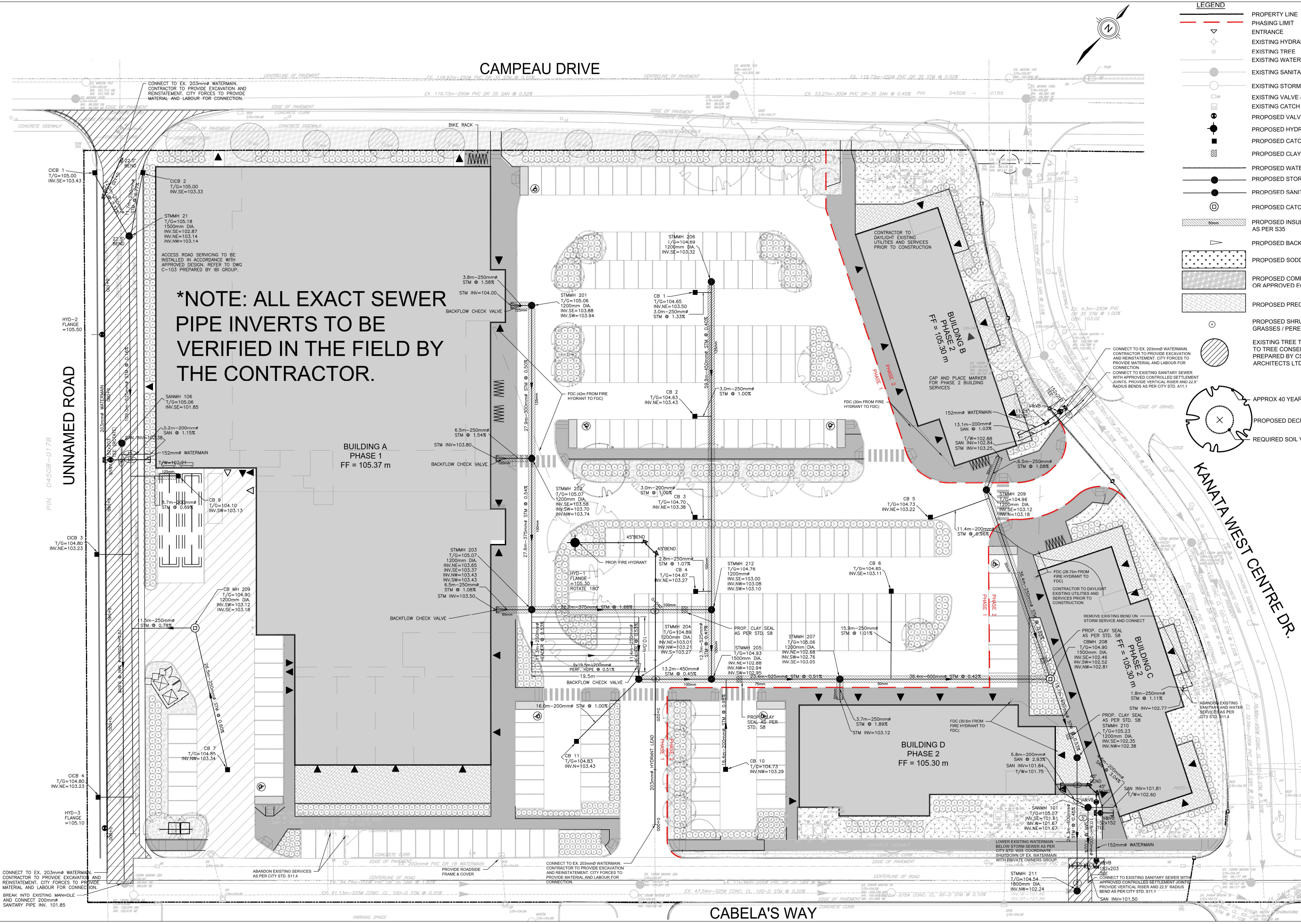
SCALE BAR
1:300 0 2 4 6 8 10 12m

PROP. COMMERCIAL DEVELOPMENT
3075 PALLADIUM DRIVE
CITY OF OTTAWA

INTERIM GRADING PLAN

CITY FILE NO.PC2024-0078

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



LEGEND

- PROPERTY LINE
- PHASING LIMIT
- ENTRANCE
- EXISTING HYDRANT
- EXISTING TREE
- EXISTING WATERMAIN
- EXISTING SANITARY SEWER & MANHOLE
- EXISTING STORM SEWER & MANHOLE
- EXISTING VALVE & BOX
- EXISTING CATCH BASIN
- PROPOSED VALVE & BOX
- PROPOSED HYDRANT
- PROPOSED CATCH BASIN
- PROPOSED CLAY SEAL
- PROPOSED WATERMAIN
- PROPOSED STORM SEWER & MANHOLE
- PROPOSED SANITARY SEWER & MANHOLE
- PROPOSED CATCHBASIN MANHOLE
- PROPOSED INSULATION AND THICKNESS AS PER S35
- PROPOSED BACKFLOW CHECK VALVE
- 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

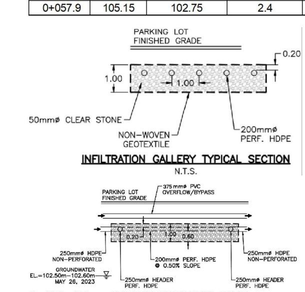
ACCESS ROAD WATERMAIN				
STATION	FINISHED GRADE(m)	TOP OF WATER(M)	COVER DEPTH(M)	COMMENTS
0+000	104.88	102.46	2.4	CONNECT TO EXISTING
0+001	104.87	102.47	2.4	HYDRANT
0+006.6	104.82	102.42	2.4	TOP OF WATERMAIN
0+020	104.97	102.57	2.4	TOP OF WATERMAIN
0+027.9	105.07	102.67	2.4	TOP OF WATERMAIN
0+040	104.94	102.54	2.4	TOP OF WATERMAIN
0+050.9	104.83	102.43	2.4	TOP OF WATERMAIN
0+060	104.91	102.51	2.4	TOP OF WATERMAIN
0+068.1	105.00	102.6	2.4	152 OFF 203 TEE
0+080	105.14	102.74	2.4	TOP OF WATERMAIN
0+091	105.28	102.88	2.4	HYDRANT
0+095.4	105.33	102.93	2.4	TOP OF WATERMAIN
0+100	105.27	102.87	2.4	TOP OF WATERMAIN
0+116.2	105.07	102.67	2.4	22.5' BEND
0+120	105.02	102.62	2.4	TOP OF WATERMAIN
0+123.5	105.00	102.67	2.4	22.5' BEND (EXISTING)

CROSSING TABLE			
CROSSING NO.	SERVICE	INVERT/OBVERT	SEPARATION (m)
1	SANITARY	102.73	0.3
	EX WATER	102.43	
2	STORM	102.15	2.61
	EX SAN	99.54	
3	STORM	102.16	0.5
	EX WATER	101.66	
4	EX WATER	102.57	0.3
	SANITARY	101.7	
5	WATER	102.45	0.53
	SANITARY	101.92	
6	STORM	102.21	0.27
	SANITARY	101.94	
7	STORM	102.23	0.5
	WATER	101.73	
8	STORM	102.92	0.5
	WATER	102.42	
9	STORM	103.27	0.92
	WATER	102.35	
10	STORM	102.71	0.5
	WATER	102.21	
11	STORM	102.72	0.18
	SANITARY	102.54	
12	WATER	102.45	0.42
	SANITARY	102.03	

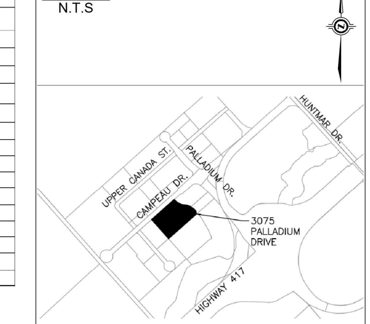
BUILDING C-D WATER SERVICE				
STATION	FINISHED GRADE(m)	TOP OF WATER(M)	COVER DEPTH(M)	COMMENTS
0+000	104.59	102.19	2.4	152 OFF 203 TEE
0+001	104.56	102.16	2.4	VALVE & VALVE BOX
0+009.7	104.99	102.59	2.4	152 OFF 203 TEE
0+11.7	105.1	102.7	2.4	VALVE & VALVE BOX
0+013.3	105.17	102.77	2.4	45°BEND (ROTATE)
0+015.2	105.19	102.25	2.94	45°BEND (ROTATE)
0+020.3	105.28	101.75	3.53	CAP

INLET CONTROL DEVICE (ICD) TABLE				
STRUCTURE	100-YR HEAD(M)	100-YR OUTFLOW(L/S)	ORIFICE DIAMETER (MM)	ORIFICE TYPE
CB-1	1.21	65.3	167.1	CIRCULAR,SLIDE
CB-2	1.25	43.2	134.9	CIRCULAR,SLIDE
CB-3	1.38	21.3	92.4	CIRCULAR,SLIDE
CB-4	1.43	42.4	129.2	CIRCULAR,SLIDE
CB-5	1.56	21.0	89.1	CIRCULAR,SLIDE
CB-6	1.61	42.7	125.9	CIRCULAR,SLIDE
CB-8	1.72	49.0	132.6	CIRCULAR,SLIDE
CB-10	1.44	20.7	90.2	CIRCULAR,SLIDE
CB-11	1.38	20.6	90.9	CIRCULAR,SLIDE
CICB-2	1.64	13.0		TEMPEST LHF
CICB-3	1.44	23.5		TEMPEST HF
CICB-4	1.44	15.6		TEMPEST HF

203mmØ HYDRANT LEAD				
STATION	FINISHED GRADE(m)	TOP OF WATER(M)	COVER DEPTH(M)	COMMENTS
0+000	104.92	102.52	2.4	CONNECT TO EXISTING
0+010	105.02	102.62	2.4	TOP OF WATERMAIN
0+020	104.93	102.42	2.51	TOP OF WATERMAIN
0+030	104.83	102.42	2.41	TOP OF WATERMAIN
0+039.8	104.75	102.35	2.4	45°BEND
0+042.6	104.77	102.37	2.4	46°BEND
0+057.9	105.15	102.75	2.4	HYDRANT



KEY PLAN
N.T.S



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1	ISSUED FOR SPA	2024-07-15	MD

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LICENSED PROFESSIONAL ENGINEER
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2024-07-15
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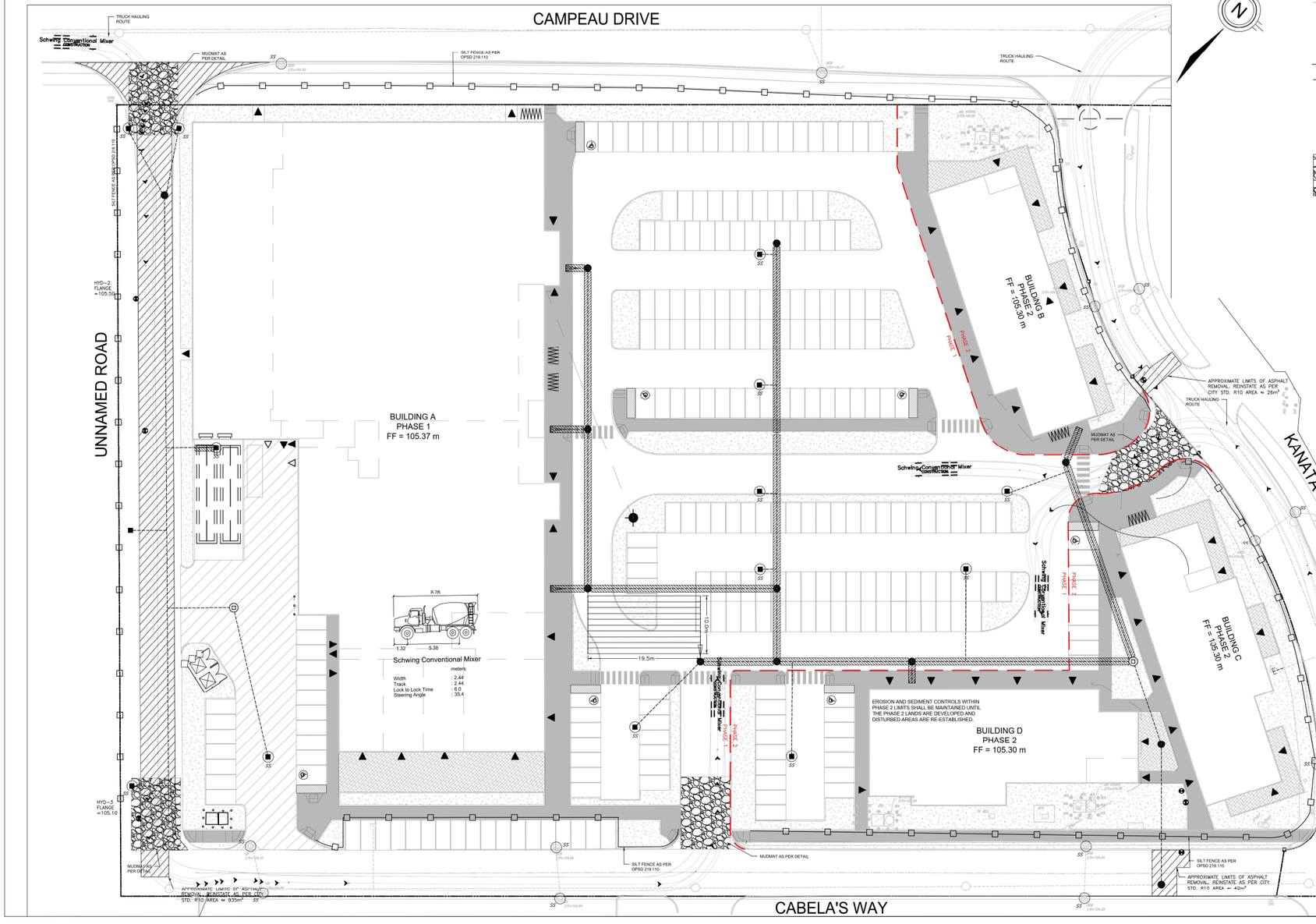
SCALE BAR
1:300 0 2 4 6 8 10 12m

PROP. COMMERCIAL DEVELOPMENT
3075 PALLADIUM DRIVE
CITY OF OTTAWA

SITE SERVICING PLAN

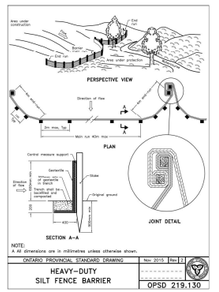
CITY FILE NO.PC2024-0078

Design A.M.	Scale 1:300
Checked M.D	Date 2024-06-24
Project No. 2034	Drawing No. C-03



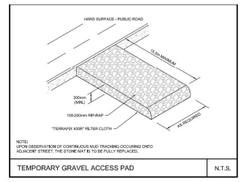
LEGEND

- 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

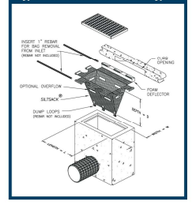


NOTES:

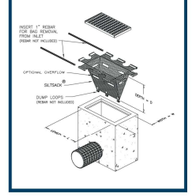
1. THE CONTRACTOR SHALL IMPLEMENT BEST MANAGEMENT PRACTICES TO PROVIDE FOR PROTECTION OF THE AREA DRAINAGE SYSTEM AND THE ULTIMATE RECEIVING WATERCOURSE DURING CONSTRUCTION ACTIVITIES. THE CONTRACTOR ACKNOWLEDGES THAT FAILURE TO IMPLEMENT APPROPRIATE EROSION AND SEDIMENT CONTROL MEASURES MAY BE SUBJECT 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 TEMPORARILY 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



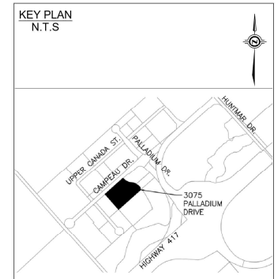
Typical Siltsack® Construction - Type A



Typical Siltsack® Construction - Type B



KEY PLAN
N.T.S



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

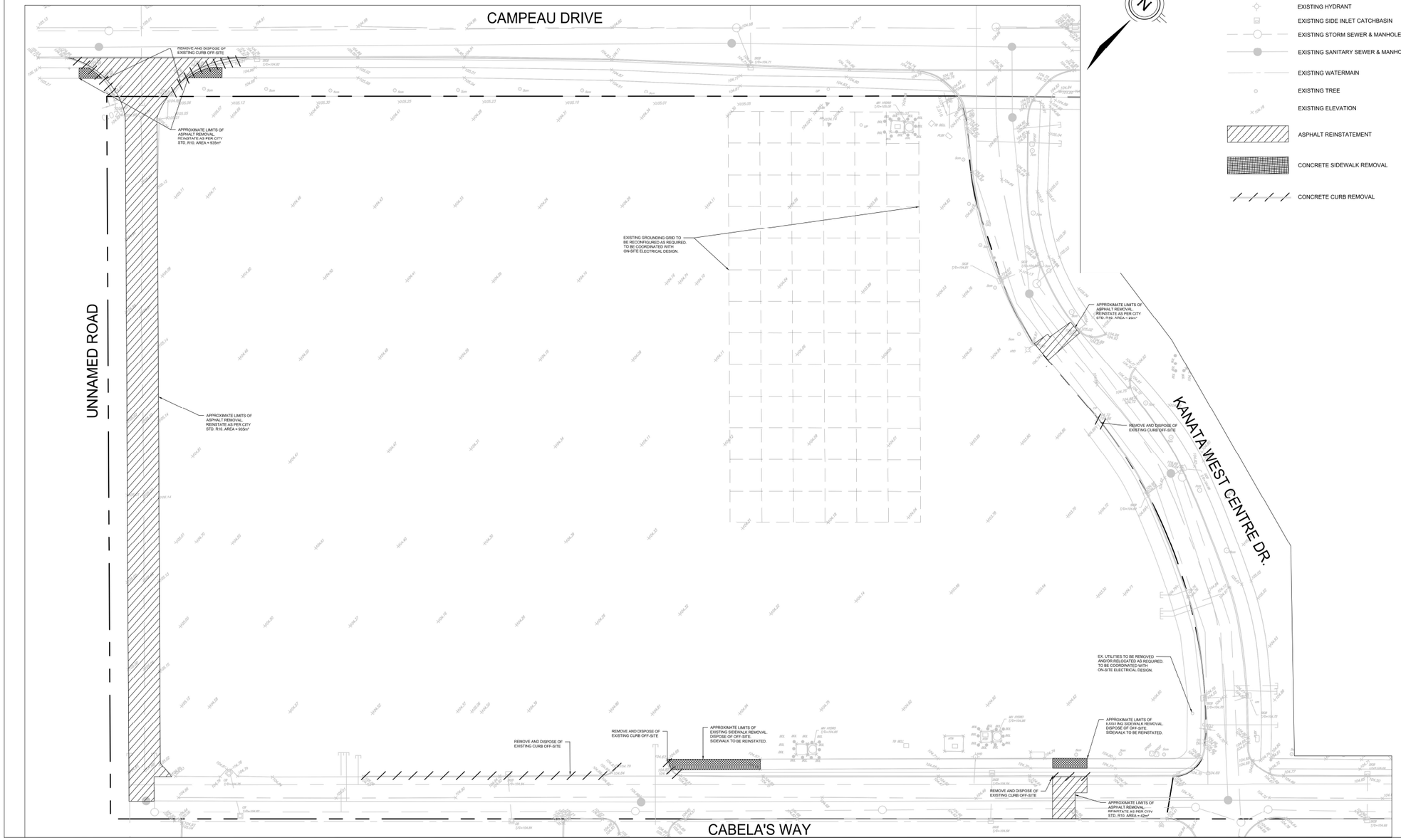
PROP. COMMERCIAL DEVELOPMENT

3075 PALLADIUM DRIVE
CITY OF OTTAWA

EROSION & SEDIMENT CONTROL PLAN

CITY FILE NO.PC2024-0078

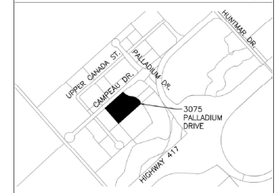
Design	A.M.	Scale	1:300
Checked	M.D	Date	2024-06-24
Project No.	2034	Drawing No.	C-04



LEGEND

- PROPERTY BOUNDARY
- EXISTING CATCHBASIN
- EXISTING HYDRANT
- EXISTING SIDE INLET CATCHBASIN
- EXISTING STORM SEWER & MANHOLE
- EXISTING SANITARY SEWER & MANHOLE
- EXISTING WATERMAIN
- EXISTING TREE
- EXISTING ELEVATION
- ASPHALT REINSTATEMENT
- CONCRETE SIDEWALK REMOVAL
- CONCRETE CURB REMOVAL

KEY PLAN
N.T.S



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PROP. COMMERCIAL DEVELOPMENT

3075 PALLADIUM DRIVE
CITY OF OTTAWA

EXISTING CONDITIONS AND REMOVALS PLAN

CITY FILE NO.PC2024-0078

Design A.M.	Scale 1:300
Checked M.D	Date 2024-06-24
Project No. 2034	Drawing No. C-05

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 ARES BEYOND THE LIMIT OF THE SITE DISTURBED DURING CONSTRUCTION SHALL BE RESTORED TO ORIGINAL CONDITION OR BETTER TO THE SATISFACTION OF THE AUTHORITY HAVING JURISDICTION 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:

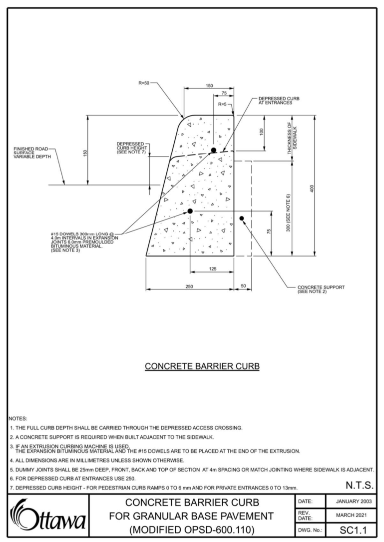
1. ALL SANITARY SEWERS SHALL BE PVC SDR 35, IN ACCORDANCE WITH CITY OF OTTAWA STANDARDS.
2. SANITARY SEWER TRENCH AND BEDDING SHALL BE AS PER CITY OF OTTAWA STD.S6 AND S7, CLASS "B" BEDDING UNLESS OTHERWISE NOTED.
3. ALL SANITARY SERVICES ARE TO BE EQUIPPED WITH APPROVED BACKWATER VALVES.
4. SANITARY 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.

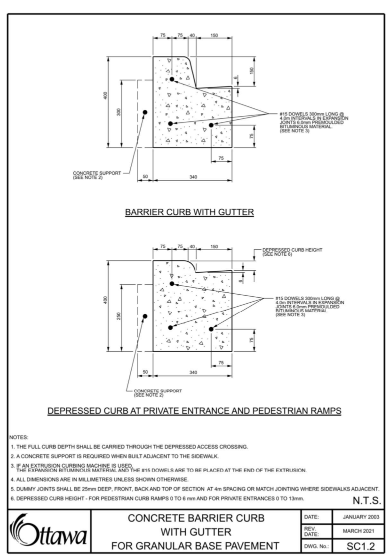
WATER SUPPLY:

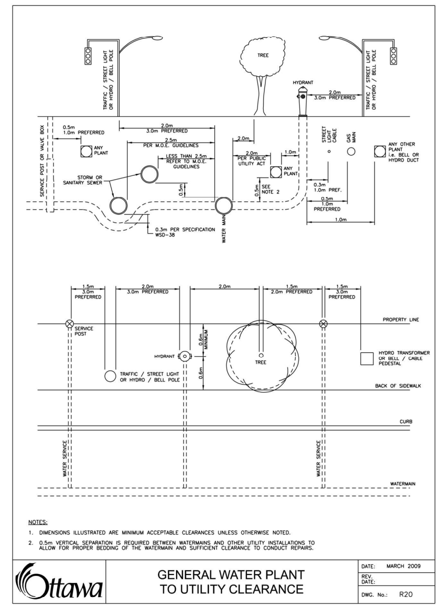
1. ALL PVC WATERMAINS SHALL BE EQUAL TO AWWA C-900 CLASS 150, SDR 18, OR APPROVED EQUAL
2. WATERMAIN TRENCH AND BEDDING AND COVER MATERIAL SHALL BE SPECIFIED BY PROJECT GEOTECHNICAL ENGINEER.
3. ALL PVC WATERMAINS SHALL BE INSTALLED WITH A 10 GAUGE STRANDED COPPER TWU OR RWU TRACER WIRE IN ACCORDANCE 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.

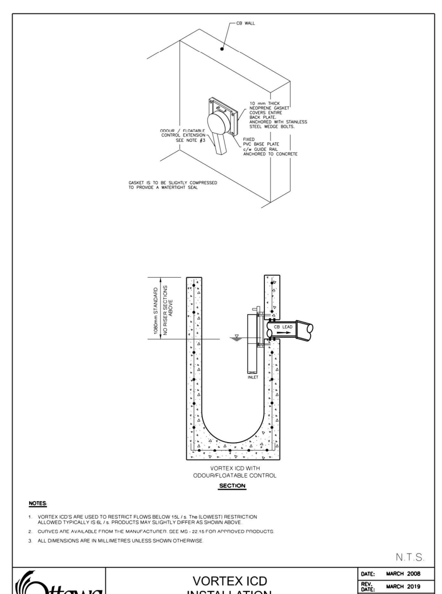
ROADWORK SPECIFICATIONS:

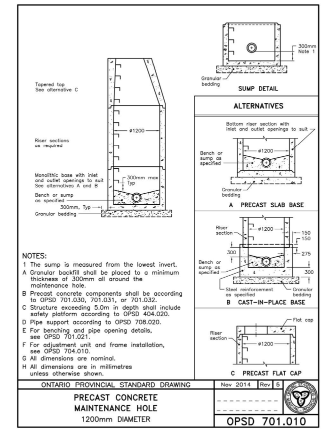
1. CONCRETE CURB SHALL BE IN ACCORDANCE WITH CITY OF OTTAWA STD. SC1.1 (BARRIER CURB). PROVISION SHALL BE MADE FOR CURB DEPRESSIONS AT SIDEWALKS AND DRIVEWAYS.
2. ALL BARRIER CURB TO BE 150MM ABOVE FINISHED ASPHALT GRADE UNLESS OTHERWISE NOTED.
3. CONCRETE SIDEWALK SHALL BE IN ACCORDANCE WITH THE CITY 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 THICKENS 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.

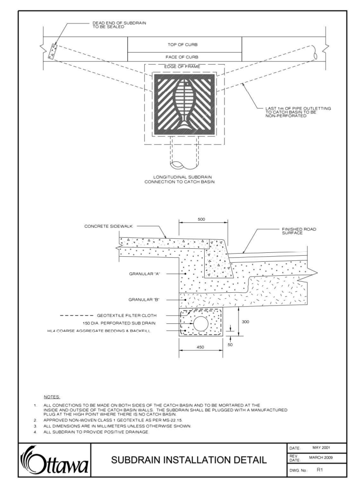


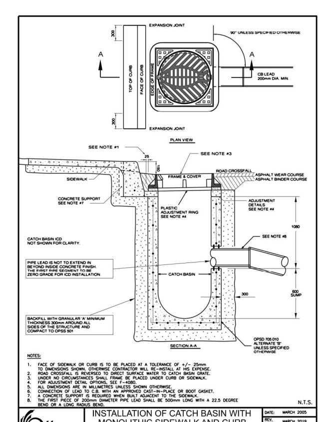


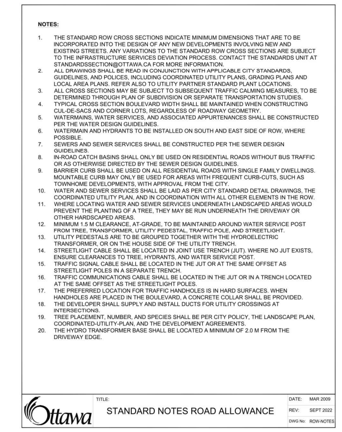


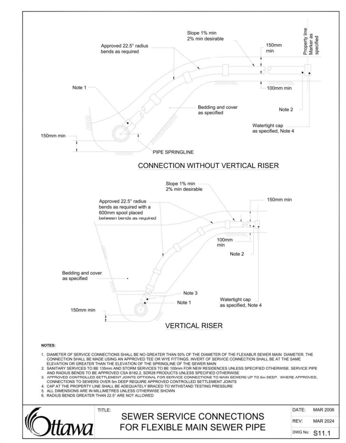


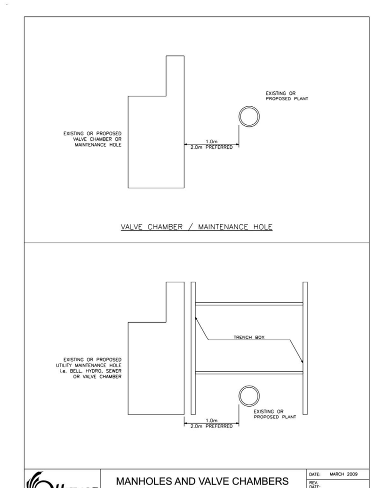


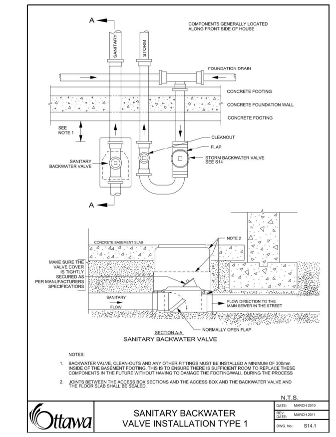


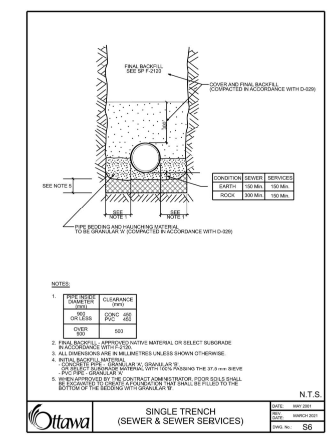


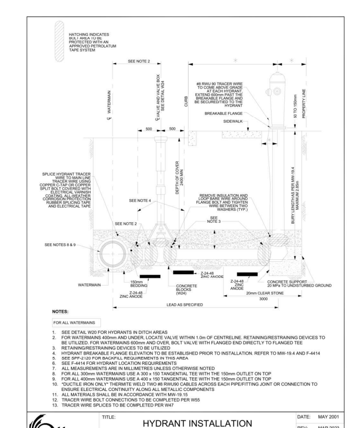












KEY PLAN
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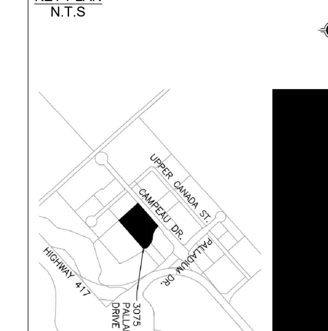

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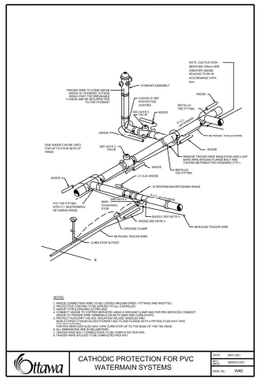
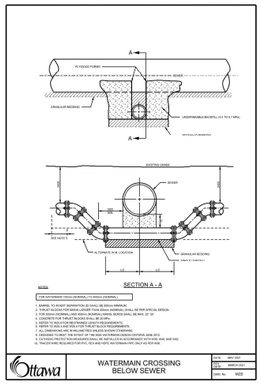
SCALE BAR
1:300 0 2 4 6 8 10 12m

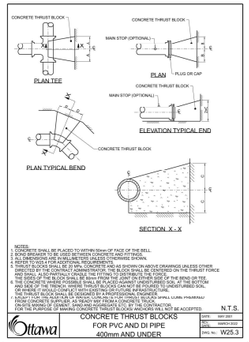
PROP. COMMERCIAL DEVELOPMENT
3075 PALLADIUM DRIVE
CITY OF OTTAWA
NOTES & DETAILS

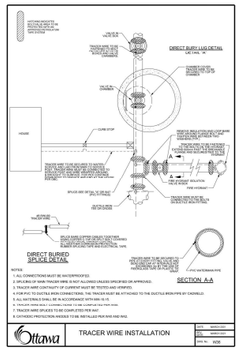
CITY FILE NO.PC2024-0078

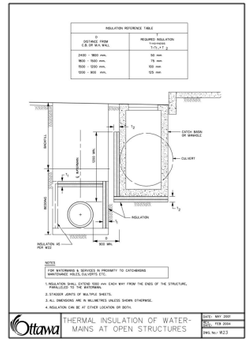
Design F.T.	Scale N.T.S
Checked M.D	Date 2024-06-24
Project No. 2034	Drawing No. C-06

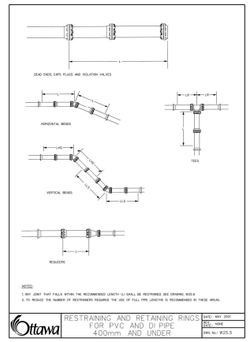


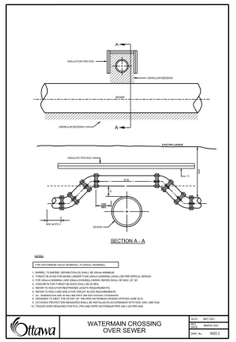


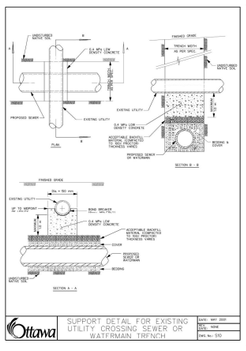


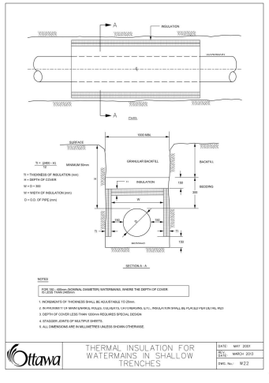


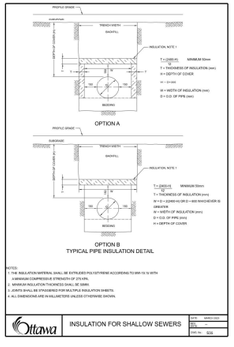


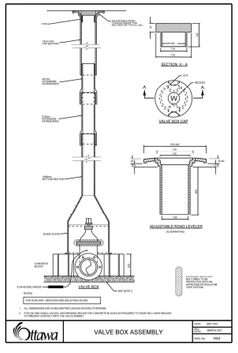


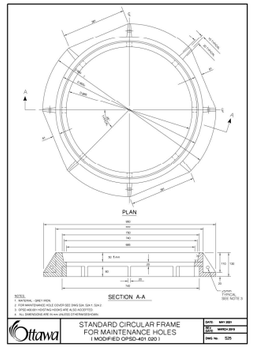


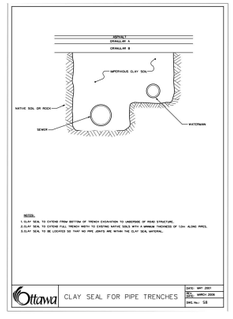


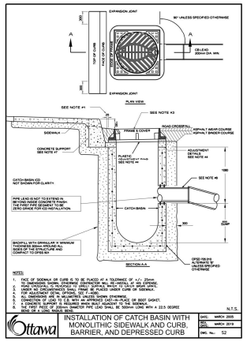


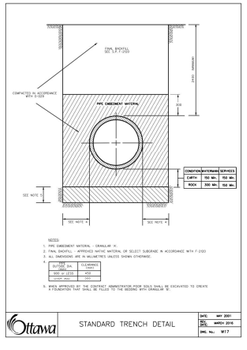












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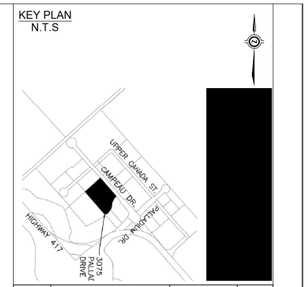

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SCALE BAR
1:300 0 2 4 6 8 10 12m

PROP. COMMERCIAL DEVELOPMENT
3075 PALLADIUM DRIVE
CITY OF OTTAWA
DETAILS

CITY FILE NO.PC2024-0078

Design F.T.	Scale N.T.S
Checked M.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)

Design Water Demand Calculation (Table C-05)

Hydrant Coverage Plan

Hydraulic Model Network (FIG. 03)

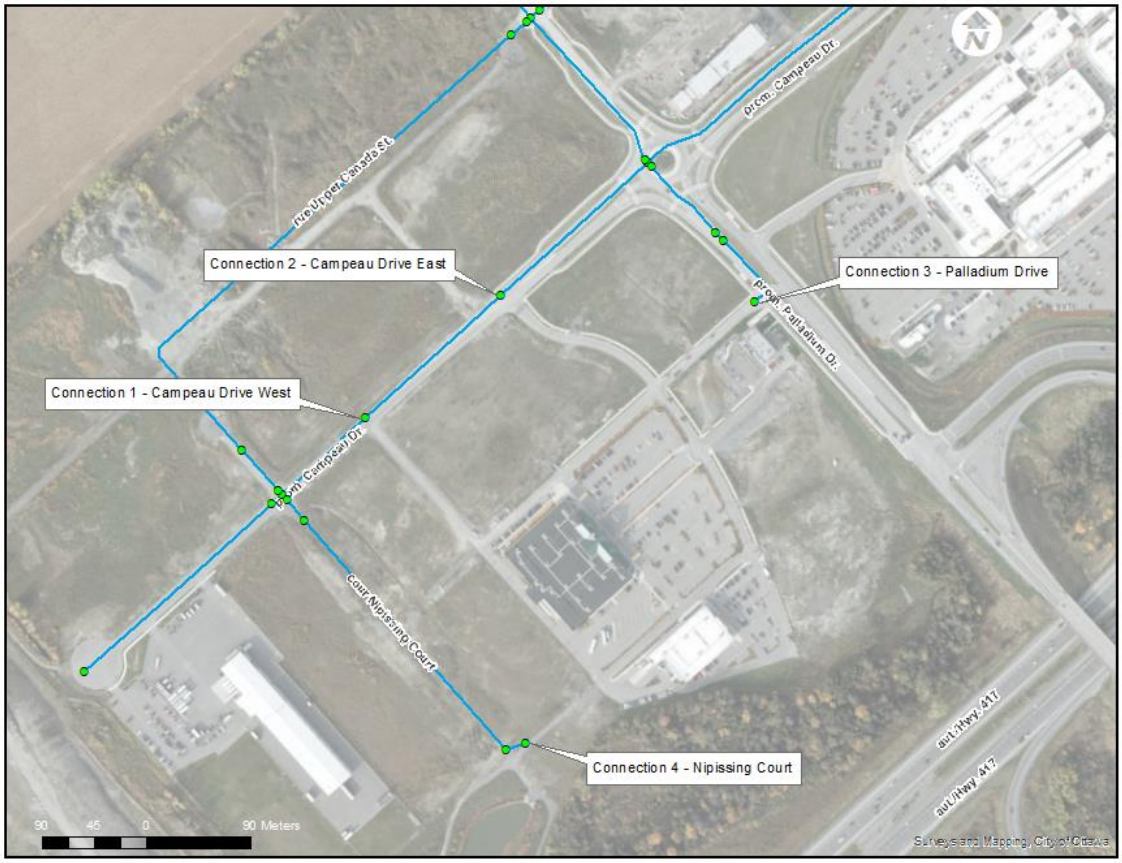
Hydraulic Model Outputs (Table C-06 to C-10)

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.

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

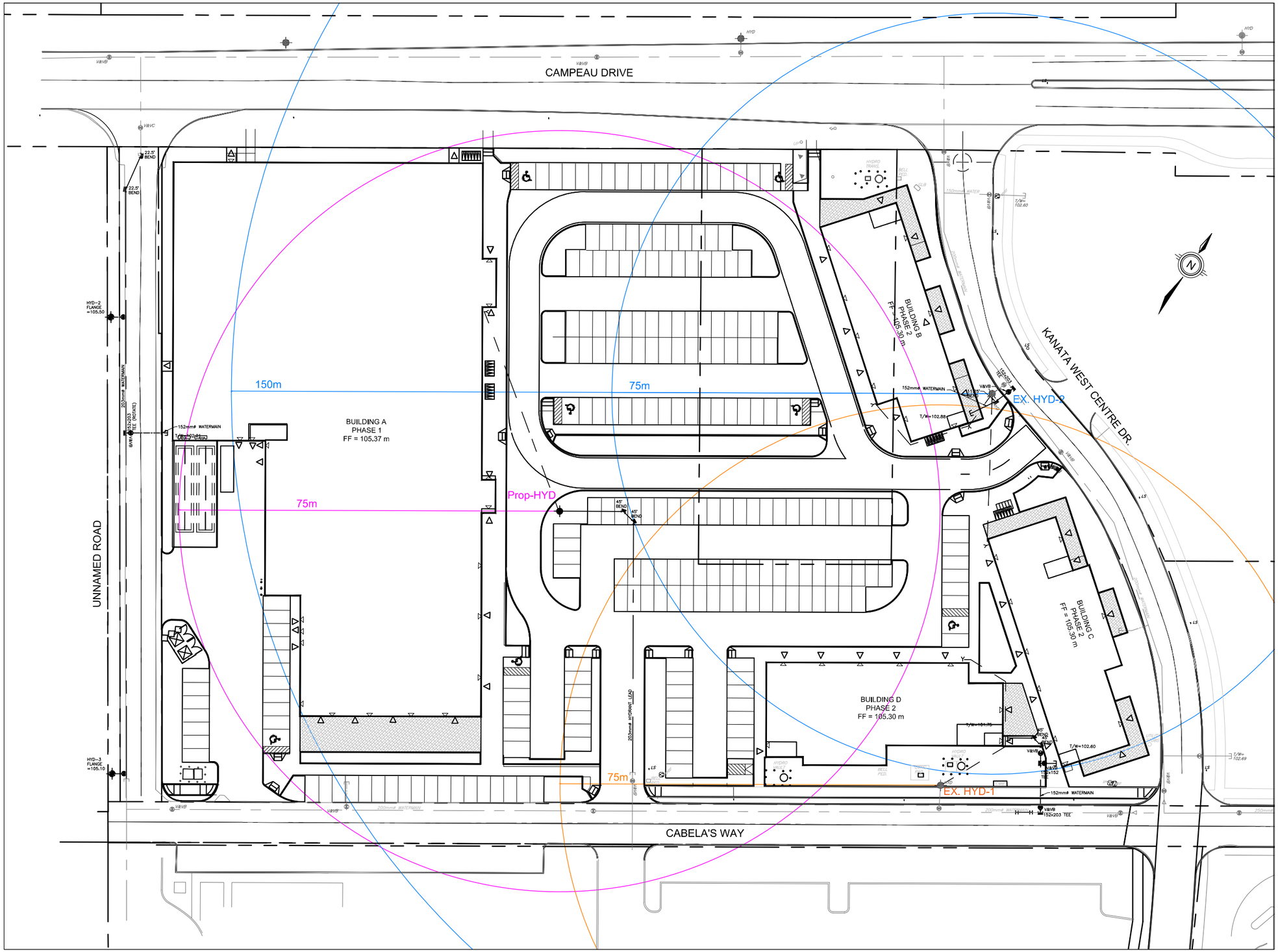
WPE Engineering Ltd. Engineers, Planners and Project Managers	Table C-05: Water Demand Calculation Proposed Condition			
	Prepared:	A.R.M	Page No.	C-05
	Checked:	M.D.		
Project: Proposed Commercial Development, 3075 Palladium Drive, City of Ottawa, ON.	Proj. #	2034		
	Date:	30-May-24		

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**



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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

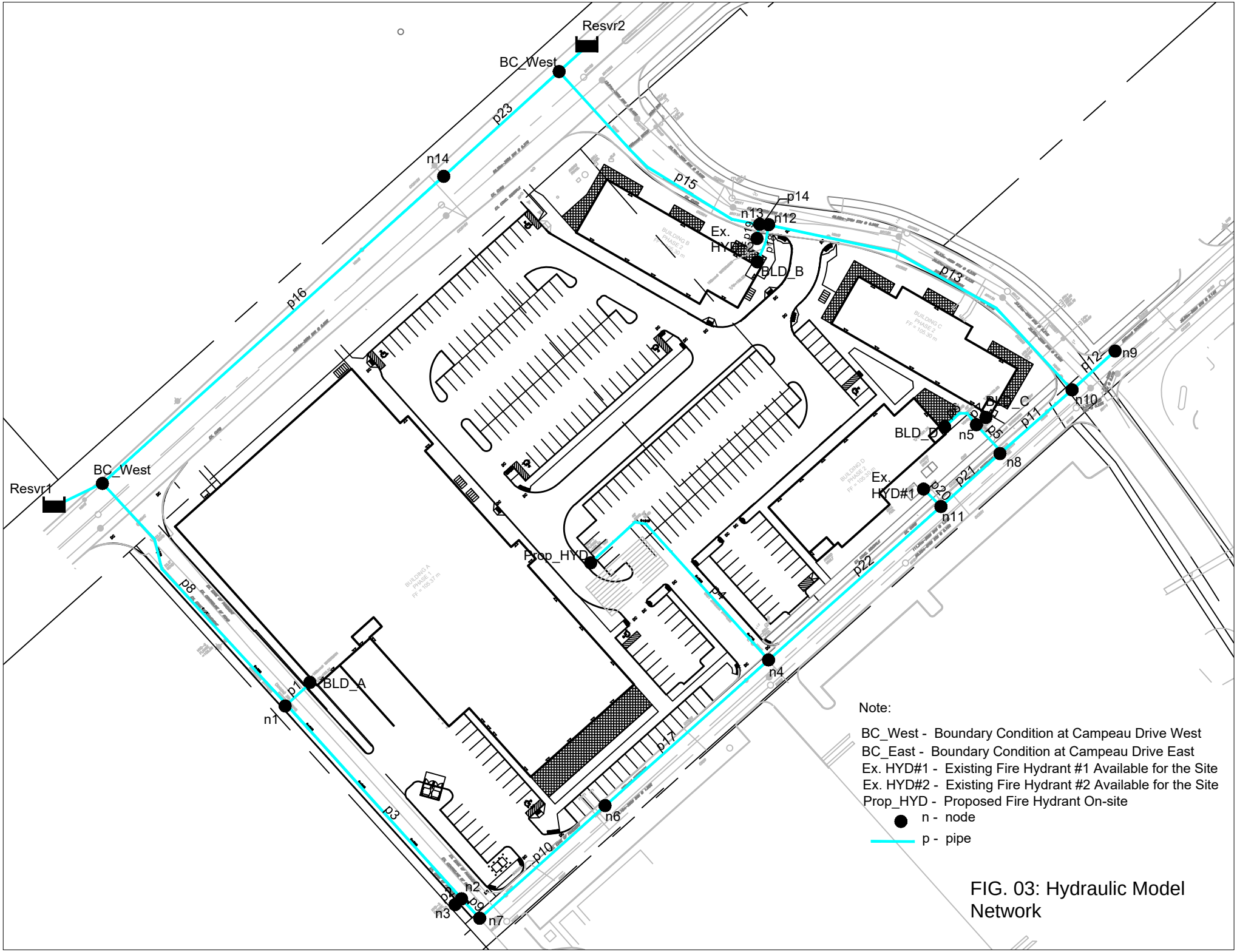


FIG. 03: Hydraulic Model Network

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

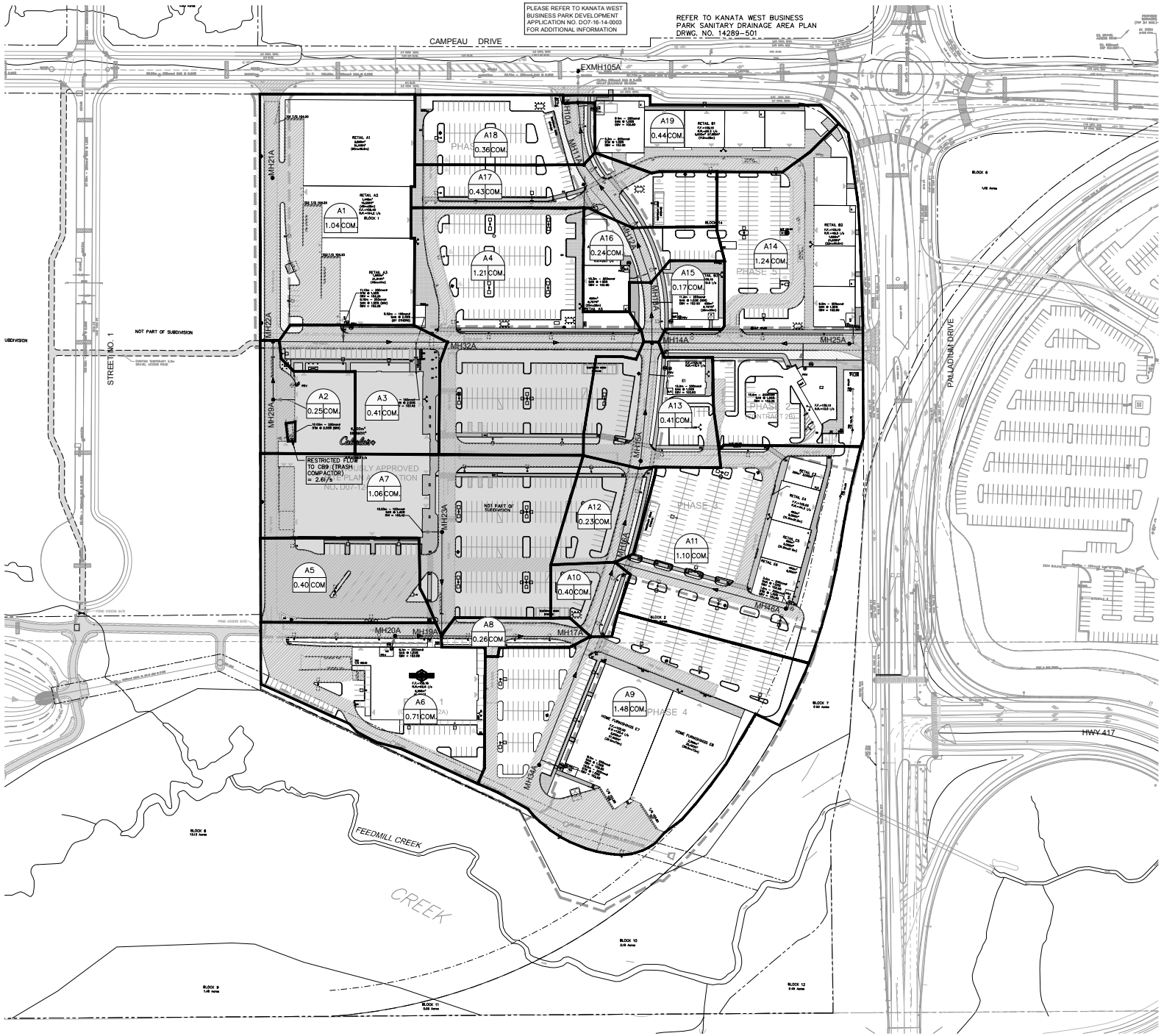
Appendix D

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)



LEGEND:

- A1 / 1.04 COM. — AREA ID / LAND USE TYPE / AREA IN HECTARES
- PBP — PRESTIGE BUSINESS PARK - 35 000 l/S/ha
- COM — COMMERCIAL - 50 000 l/S/ha
- ROW — RIGHT OF WAY (INFILTRATION FLOW ONLY)
- DRAINAGE AREA LIMITS
- MH601A — SANITARY MANHOLE & NUMBER
- SANITARY SEWER & FLOW DIRECTION
- AREA CONSTRUCTED AS PART OF PLAN OF SUBDIVISION FILE NO. D07-16-14-0003

KEY PLAN

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

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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
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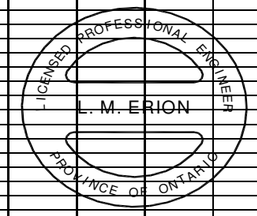
SANITARY SEWER DESIGN SHEET

Kanata West Retail Center
CITY OF OTTAWA
Taggart Realty Management

LOCATION				RESIDENTIAL										ICI AREAS								INFILTRATION ALLOWANCE			FIXED FLOW	TOTAL FLOW	PROPOSED SEWER DESIGN							
				AREA	UNIT TYPES				AREA	POPULATION		PEAK	PEAK	AREA (Ha)							PEAK	AREA (Ha)		FLOW			CAPACITY	LENGTH	DIA	SLOPE	VELOCITY	VELOCITY	AVAILABLE CAPACITY	
														INDUSTRIAL		COMMERCIAL		PRESTIGE BUISNESS PK			FLOW												
STREET	AREA ID	FROM MH	TO MH	w/ Units (Ha)	SF	SD	TH	APT	w/o Units (Ha)	IND	CUM	FACTOR	FLOW (L/s)	IND	CUM	IND	CUM	IND	CUM	(L/s)	IND	CUM	(L/s)	(L/s)	(L/s)	(L/s)	(m)	(mm)	(%)	(full) (m/s)	(actual) (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

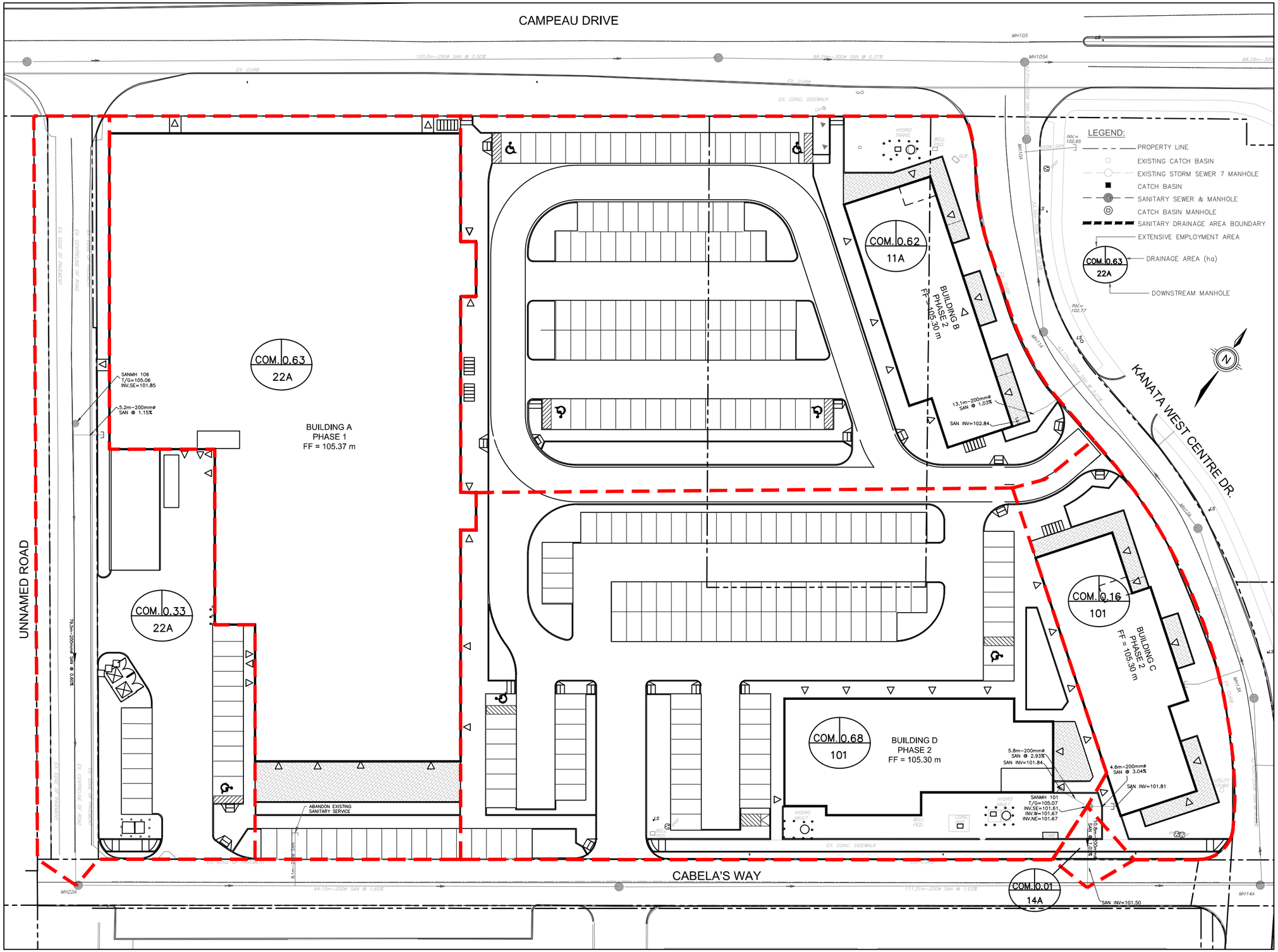
Designed: LME

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
Z. DU
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	1:300
Checked	MD	Date	2024-07-08

PROPOSED SANITARY DRAINAGE AREA PLAN

Drawing No.

FIG.04

WPE Engineering Ltd.
Engineers, Planners and Project Managers

Table D-01: Sanitary Sewer Design Sheet
Proposed Condition

Prepared:	A.R.M	Page No.	D-01
Checked:	Z.D		
Project #:	2034		
Date:	30-May-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	0.18	0.55	0.72	201.16	1.15	35.72	1.12	29.63
UNNAMMED ROAD	106	EX 22A	0.33	0.96	1.50	0.27	0.83	1.10	201.16	0.60	25.80	0.81	20.83
TO CABELA'S WAY U/S MH 14A													
CABELA'S WAY	BLDG D	101	0.68	0.68	1.50	0.19	0.59	0.78	201.16	2.93	57.01	1.79	47.68
CABELA'S WAY	BLDG C	101	0.16	0.16	1.50	0.04	0.14	0.18	201.16	3.04	58.07	1.83	49.17
CABELA'S WAY	101	EX MAIN	0.01	0.85	1.50	0.24	0.74	0.98	201.16	1.02	33.64	1.06	27.61
TO KANATA WEST CENTRE DRIVE U/S MH 11A													
KANATA WEST CENTRE DR.	BLDG B	EX MAIN	0.62	0.62	1.50	0.17	0.54	0.71	201.16	1.03	33.80	1.06	28.02
		Total Area (ha)	**2.43**		1.5		**Total Design Flow (L/s)**	**2.79**					

DESIGN PARAMETERS:

Extensive Employment Area:	50,000 L/ha/day
Max. Residentail Peak Factor:	4
Harmon - Correct Factor (K):	0.8
Peaking Factor (PF):	1.5
Extraneous Flow:	0.28 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

Notes: Sanitary sewer design parameters are in accordance Design with Brief Kanata West retail Centre, Sept. 2016, IBI Group.

Appendix E

KWRC Storm Drainage Area Plan (prepared by IBI Group)

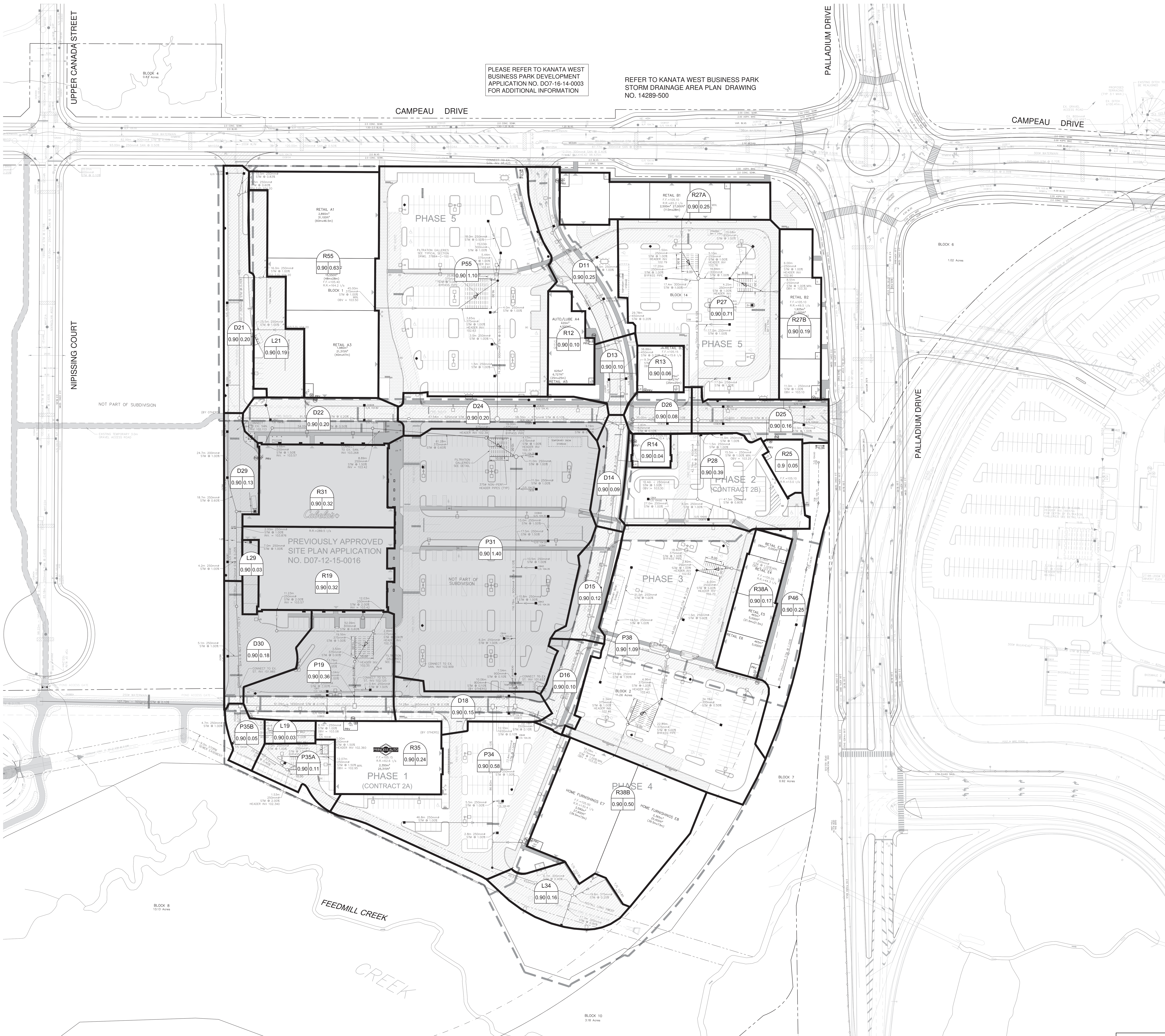
KWRC Storm Sewer Design Sheet (prepared by IBI Group)

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)



LEGEND:

- DRAINAGE AREA LIMITS
- MH601 STORM MANHOLE & NUMBER
- STORM SEWER & FLOW DIRECTION
- R25 AREA ID
- 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

TAGGART REALTY MANAGEMENT

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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

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

APPROVED ☐ REFUSED ☐

THIS ___ DAY OF __________, 20___

DERRICK MOODIE, ACTING MANAGER
DEVELOPMENT REVIEW, SUBURBAN SERVICES

D07-12-16-0122

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Ottawa, Ontario K1S 5N4 Canada
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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
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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**					**641.6**	**905.5**	**120.00**	**975**			**0.15**	**1.175**	**263.92**	**29.15%**
						0.32									**0.51**	**0.51**	**12.70**	**1.70**	**14.40**	**91.81**	**107.56**	**157.14**			**79.68**											
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

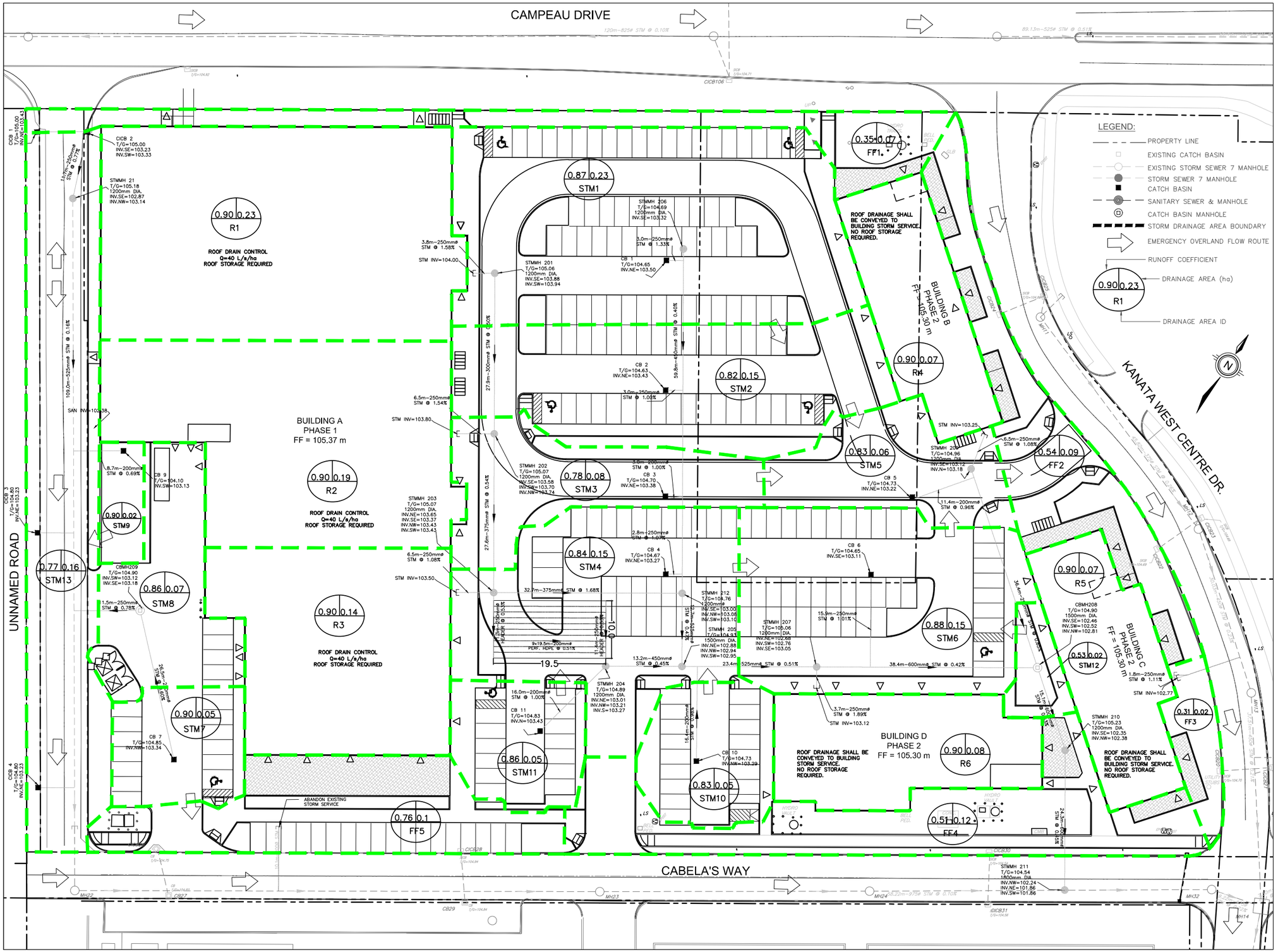
Notes:
1. Mannings coefficient (n) = 0.013

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)

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)

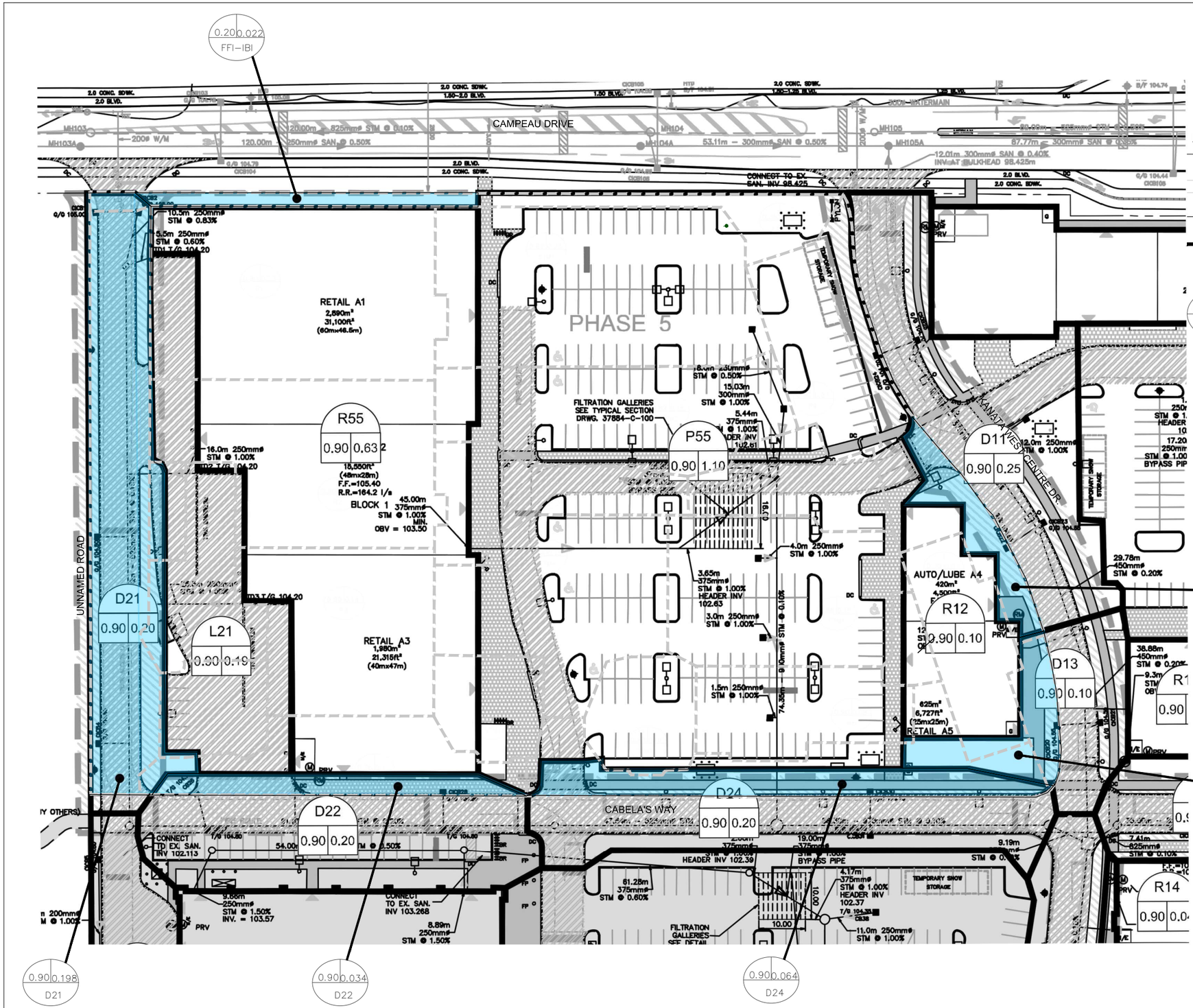
Hydraulic Grade Line Computation Form (Table F-11)

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**:



LEGEND:

- PROPERTY LINE
- EXISTING CATCH BASIN
- EXISTING STORM SEWER 7 MANHOLE
- STORM SEWER 7 MANHOLE
- CATCH BASIN
- SANITARY SEWER & MANHOLE
- CATCH BASIN MANHOLE
- STORM DRAINAGE AREA BOUNDARY
- MAJOR OVERLAND FLOW ROUTE
- IBI DESIGN RUNOFF COEFFICIENT
- SITE CONTRIBUTION AREA (ha)
- IBI DESIGN DRAINAGE AREA ID

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.
222 - 7250 KEELE STREET
VAUGHAN, ONTARIO
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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-24		

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

Flow Calculations - Area R1

Area ID	R1
Area (ha)	0.2291
C	0.9
C (100yr)	1
Controlled Rate (L/s)	9.164

Design Event	Time (min)	Rainfall Intensity (mm/hr)	Flow (L/s)
2-yr	10	76.8	44.0
	15	61.8	35.4
	20	52.0	29.8
	25	45.2	25.9
	30	40.0	23.0
	35	36.1	20.7
5-yr	10	104.2	59.7
	15	83.6	47.9
	20	70.3	40.3
	25	60.9	34.9
	30	53.9	30.9
	35	48.5	27.8
100-yr	10	178.6	113.7
	15	142.9	91.0
	20	120.0	76.4
	25	103.8	66.1
	30	91.9	58.5
	35	82.6	52.6

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)

Flow Calculations - Area R3

Area ID	R3
Area (ha)	0.14
C	0.90
C (100yr)	1
Controlled Rate (L/s)	5.5

Design Event	Time (min)	Rainfall Intensity (mm/hr)	Flow (L/s)
2-yr	10	76.8	26.3
	15	61.8	21.2
	20	52.0	17.8
	25	45.2	15.5
	30	40.0	13.7
	35	36.1	12.4
5-yr	10	104.2	35.7
	15	83.6	28.6
	20	70.3	24.1
	25	60.9	20.9
	30	53.9	18.5
	35	48.5	16.6
100-yr	10	178.6	68.0
	15	142.9	54.4
	20	120.0	45.7
	25	103.8	39.6
	30	91.9	35.0
	35	82.6	31.5

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
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

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)	0.19
C	0.90
C (100yr)	1
Controlled Rate (L/s)	7.5

Design Event	Time (min)	Rainfall Intensity (mm/hr)	Flow (L/s)
2-yr	10	76.8	36.1
	15	61.8	29.0
	20	52.0	24.5
	25	45.2	21.2
	30	40.0	18.8
	35	36.1	16.9
5-yr	10	104.2	49.0
	15	83.6	39.3
	20	70.3	33.0
	25	60.9	28.6
	30	53.9	25.3
	35	48.5	22.8
100-yr	10	178.6	93.2
	15	142.9	74.6
	20	120.0	62.6
	25	103.8	54.2
	30	91.9	48.0
	35	82.6	43.1

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 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
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

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
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

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 #:	2034		
Date:	45449		

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

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 FF2 to Kanata West Centre Drive

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
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

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
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

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)

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
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

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-24		

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	88.0	0.064	15.4	28.2	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**	**703.0**	**1.8**	**439.4**	**643.2**	**Sub-Total**	**1.8**	**341.2**	**416.7**	**98.1**	**226.5**
Total	**3.0**	**785.8**	**1190.8**	**2.4**	**660.1**	**964.0**	**Total**	**2.5**	**513.6**	**659.2**	**146.4**	**304.8**

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 (FIG.05) and the KWRC Storm Drainage Area Plan in **Appendix E**.

WPE Engineering Ltd.
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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

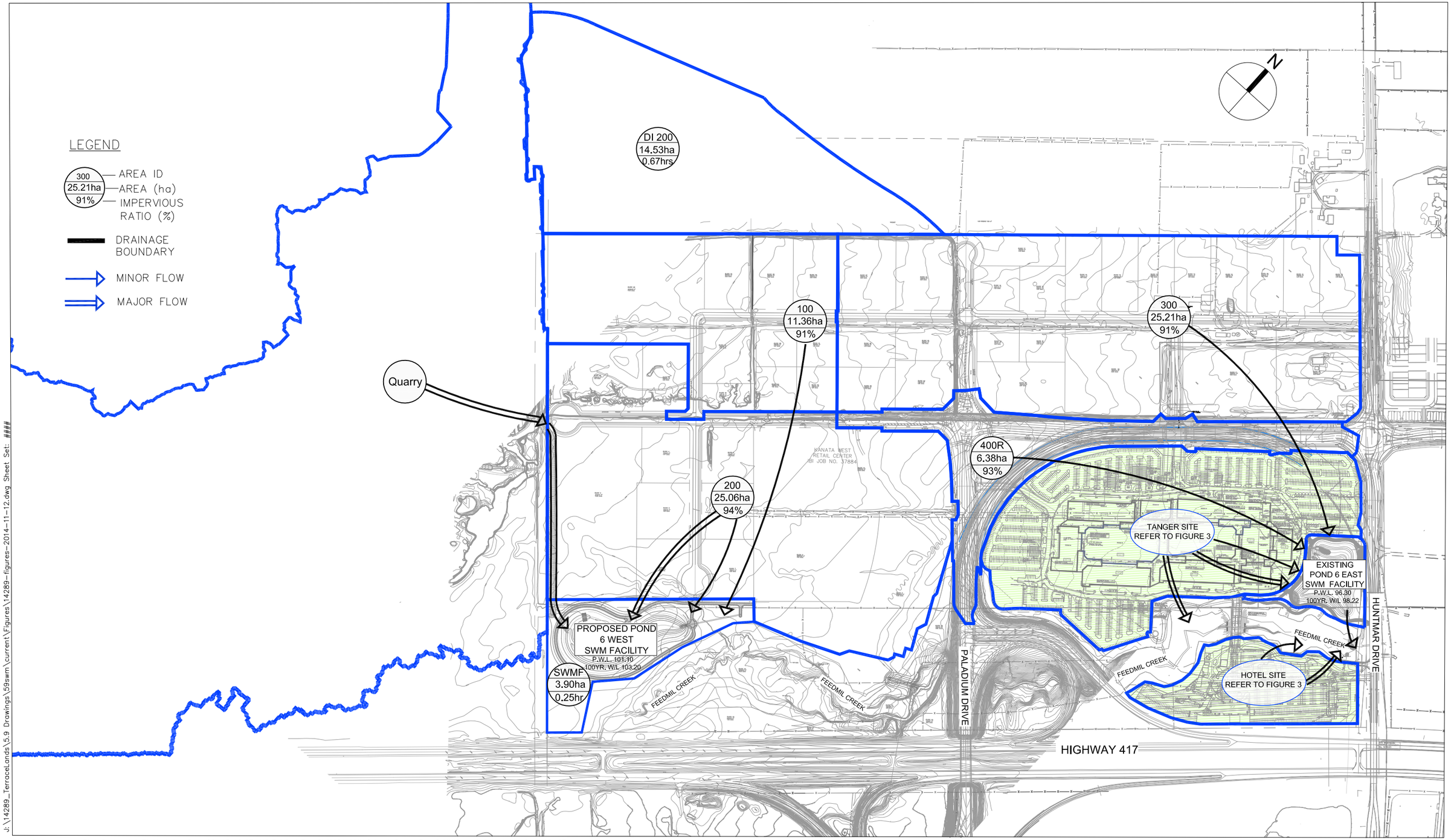
Notes:
1. Rainfall intesnity calculated using City of Ottawa IDF curve equations.
2. Provided storage volumes have been calculated using AutoCAD Civil 3D.
3. Flow calculated using the Rational Method. Q=2.78CiA.
4. C (100yr) = C + 25% (Max. 1.0).

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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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 #:		2034	
Date:		06-Jun-24	

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

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**

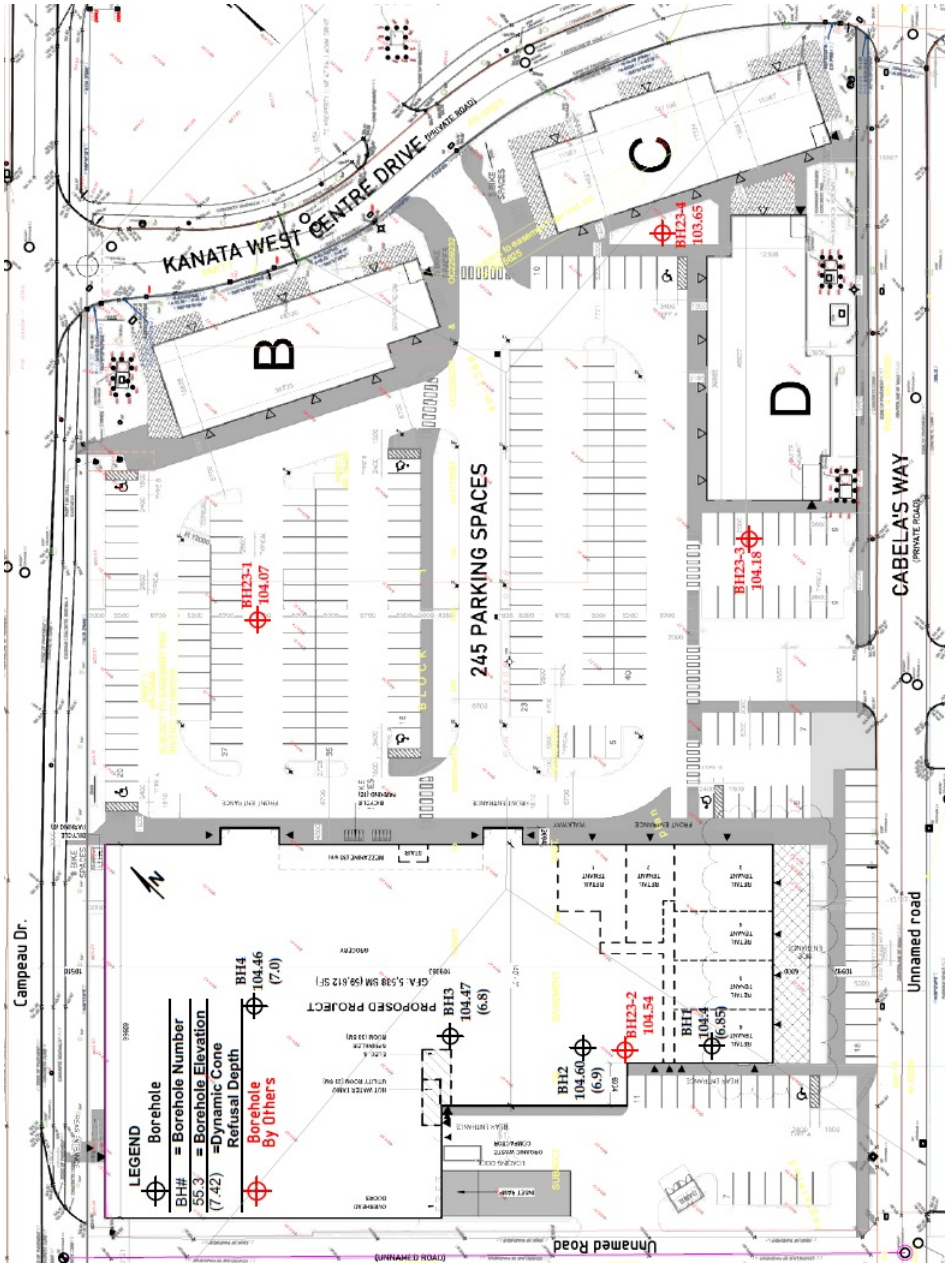


Figure 1: Test hole Locations Plan

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

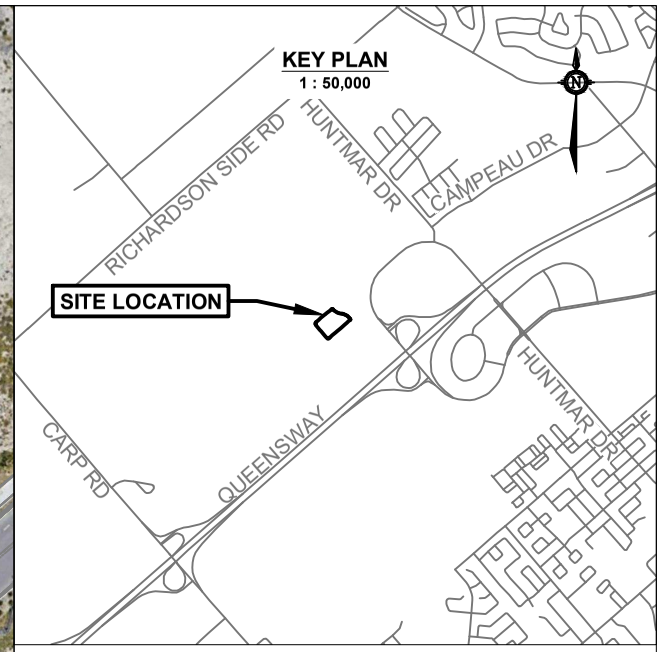
6.6.1 Proposed Buildings

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).