

Minto Communities

# Arcadia Commercial Site

## Design Brief

April 30, 2025



# Arcadia Commercial Site

**Design Brief**  
**City of Ottawa**  
**Development Application File: D07-12-24-0148**  
April 30, 2025

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# 1 Introduction

## 1.1 Scope

Arcadis Professional Services (Canada) Inc., hereinafter referred to as “Arcadis”, has been retained by Minto Communities to prepare the necessary engineering plans, specifications and documents to support the proposed Site Plan Application for the subject lands, following the policies set out by the Planning and Development Branch of the City of Ottawa. This Brief will present a detailed grading and servicing scheme to support the development of the property and will include sections on water supply, wastewater management, minor and major stormwater management, site grading and erosion and sediment control. Minto Communities intends to sever a small portion of the remaining undeveloped lands of its 370 Huntmar Road site for use as its Sales and Design Centre.

This parcel of land is part of the proponent’s larger “Arcadia” development lands, which are currently being developed. This subject parcel is referred to as Stage 5 in other previously approved Minto reports, including “Conceptual Site Servicing Arcadia Stages 1, 2, 5 and 8”, and “Arcadia Interim SWMF”, which provide details related to the construction and operation of the downstream infrastructure which will service these lands. The subject lands were previously Site Plan Approved (circa 2014), and subsequently severed for the Microtel Hotel. The public road portion of the original Site Plan Application (Country Glen Way), has been constructed and is in service.

This report was prepared in accordance with the Servicing Study Guidelines for Development Applications in the City of Ottawa. **Appendix A** contains a customized copy of the City’s checklist which can be used as a quick reference for the location within this study report of each of the checklist items.

## 1.2 Background

In 2002, the City of Ottawa expanded its urban area to include the lands currently known as Kanata West. In March 2003, the Ottawa City Council approved the general land use and development principles of the Kanata West Concept Plan (KWCP). The plan is a mixed-use community with a population of about 17,000 persons in 6,300 households, 24,000 jobs and approximately 1 million square meters of commercial space. After approval of the KWCP, several supporting technical documents, including the Kanata West Master Servicing Study (KWSS), were prepared. The KWSS provided a master servicing plan for the entire KWCP, including major infrastructure such as water supply, wastewater disposal and stormwater management.

As mentioned, the site was previously Site Plan Approved (D07-12-14-0014). IBI Group (now Arcadis) prepared the Site Servicing Brief and Engineering Drawings to support the original SPA. The approval has since lapsed. This report aims to follow the principles established in the original site plan approval and engineering drawings, and provide adjustments to suit the new severance.

## 1.3 Subject Site

The Arcadia Commercial Site is located at 370 Huntmar Road, at the East intersection of Campeau Drive and Huntmar Drive in Ottawa, to the northeast of Tanger Outlets, and is part of the Kanata West Business Park



(KWBP). The KWBP is proposed to include several types of non-residential uses including Prestige Business Park, High Profile Employment and Extensive Employment.

The subject site severance is approximately 0.46 ha and consists of a two-storey Office and Showroom building as a small phase of a larger future commercial development.

Refer to **Figure 1**, below, for more information regarding the site location.



*Figure 1 Subject Site Location*

The site's natural topography, with the existing grade sloping from west to east, the proposed concept aims to seamlessly integrate the proposed two-storey building into the existing natural slope while taking the future design of the more significant commercial site into consideration to ensure there are no potential conflicts with future work. The building's facades will be maintained at an accessible grade to permit entry into the main levels of the building.

The primary vehicular and pedestrian access to the site is located off Campeau Drive and provides unimpeded access to the site office through a parking area to the South of the building. Two entrances with pedestrian access will be provided to the north of the building.

This project will consist of the construction of a two-storey office and showroom building. The site will also contain vehicular access routes for future commercial area, dedicated parking spaces, Tactile Walking Surface Indicators (TWSI) and landscaping areas. A site plan of the proposed development is included in **Appendix A**.

## 1.4 Previous Studies

### 1. Kanata West Concept Plan

The Kanata West Concept Plan (KWCP) was approved by the City of Ottawa in 2003. The plan provides a framework for the current and future development of the Kanata West lands. It also provides the guidelines and requirements for concept planning, the recommended concept plan, and an implementation strategy. The plan focuses on development of the urban lands with mix uses including office, housing, retail, institutional, entertainment and leisure activities.



## **2. Kanata West Servicing Study**

The Kanata West Servicing Study (KWSS) was completed by the City of Ottawa in 2006. That study provided detailed guidelines for provision of major municipal infrastructure in support of the Kanata West Concept Plan. Among other things it provided guidelines and criteria for water supply, wastewater collection and stormwater management.

## **3. Third Party Review**

The Third Party Review (TPR) was completed after potential omissions in the stormwater management model for KWSS were identified. The TPR was commissioned to be an arm's length review of the model to ensure that it was properly calibrated and validated.

## **4. Signature Ridge Pump Station Hydraulic Grade Line Analysis**

A March 2012 report by IBI Group was completed for Minto Properties and completed an update to the Signature Ridge Pump Station sanitary hydraulics. The report predicted HGL's for several scenarios for the tributary sewers including the sanitary sewer servicing the subject parcel. The HGL analysis was further refined in September 2012 based on current overflow proposals by the City.

## **5. Implementation Plan – Kanata West Development Area**

This Plan was prepared for the City of Ottawa and the Kanata West Land Owners Group. The Implementation Plan recognizes that Kanata West is a large planning area which will take years to fully develop and therefore includes a mixture of short and long-term development plans and the associated infrastructure requirements to support them. The Plan builds on the framework of the KWCP and KWSS and provides updated comments for future approvals and the actions that would bring about the approval requirements. The Plan further reviews actions that would be conducted if "triggered" by an event or set of circumstances, while allowing sufficient flexibility to ensure that appropriate changes to the undertaking(s), once identified, are made.

## **6. Conceptual Site Servicing Arcadia Stages 1, 2, 5 & 8 Kanata West – Minto Communities**

This IBI Group report, completed in September 2012, provided a high-level conceptual site servicing plan specifically for Minto Arcadia Lands, including the subject site which is Stage 5 of the report. The report focused on details related to water supply, wastewater disposal and stormwater management.

## **7. Arcadia Interim Stormwater Management Facility Design Brief June 2012**

This IBI Group report outlines the design of the interim SWM Facility to service Minto's Arcadia development lands, including these commercial lands, until such time as the ultimate stormwater management facility is constructed.

## **8. Arcadia Commercial, 370 Huntmar Drive Design Brief October 2014**

This IBI Group report provides a detailed servicing scheme to support the development of the Arcadia commercial site.

An engineering pre-consultation with the City of Ottawa was held in August, 2024 regarding the proposed development. Notes from this meeting are included in **Appendix A**.

# **1.5 Geotechnical Considerations**

Paterson Group Inc. was retained to prepare a geotechnical investigation for the site. The objectives of the investigation were to prepare a report to:



- Determine the subsoil and groundwater conditions at the site by means of boreholes
- To provide geotechnical recommendations pertaining to the design of the proposed development including construction considerations

The geotechnical investigation report PG7168-LET.01 Rev 2 Dated December 19, 2024 confirmed that the site consists of thick layer of silty clay underlain by glacial till overlying the bedrock surface. Based on the presence of the silty clay layer, a varying permissible grade raise plan was provided. The permissible grade raise of 2.0m is recommended for grading within 5m of the proposed buildings and 3.0m grade raise for the parking areas and access lanes.

The report contains recommendations which include but are not limited to the following:

- Fill used for grading beneath the proposed development to meet OPSS Granular 'A' or Granular 'B' Type II placed in lifts no greater than 300 mm compacted to 98% SPMDD
- Pavement Structures as identified below:

*Table 1-1 Pavement Structure – Car Only Parking Areas*

Local Road – Parking Areas	Thickness
12.5 Asphaltic Concrete	50 mm
OPSS Granular A Base	150 mm
OPSS Granular B Type II Subbase	300 mm

*Table 1-2 Pavement Structure – Heavy Truck Parking Areas and Access Lanes*

Local Road	Thickness
12.5 Asphaltic Concrete	40 mm
19.0 Asphaltic Concrete	50 mm
OPSS Granular A Base	150 mm
OPSS Granular B Type II Subbase	400 mm

The report contains recommendations which include but are not limited to the following:

- Pipe bedding and cover: The pipe bedding for sewer and water pipes should consist of at least 150 mm of OPSS Granular A crushed stone. The material should be placed in maximum 225 mm thick lifts and compacted to a minimum of 99% of its SPMDD. The cover material, which should consist of OPSS Granular A, should extend from the spring line of the pipe to at least 300 mm above the obvert of the pipe.
- The excavation side slopes above the groundwater level extending to a maximum depth of 3 m should be cut back at 1H:1V or flatter. The flatter slope is required for excavation below groundwater level.



## 2 Water Supply

### 2.1 Existing Conditions

As previously noted, the 0.46 ha office and showroom building site is surrounded by Huntmar Drive to the southwest, Campeau Drive to the northwest, and undeveloped land in the remaining surrounding area. An existing PVC 203 mm diameter watermain stub from Campeau Drive was previously installed and is located at the property line to the proposed site. This watermain falls within the City of Ottawa's pressure district Pressure Zone 3W which will provide the water supply to the site.

### 2.2 Design Criteria

#### 2.2.1 Water Demands

Water demands have been calculated for this proposed site. This site consists of a two-storey office and showroom building. Siamese connections will be provided for this building. Consumption rates are taken from Tables 4.1 and 4.2 at the Ottawa Design Guidelines – Water Distribution and are summarized as follows:

• Commercial Shopping Center	2500 l/1000m <sup>2</sup> /day
• Other Commercial	28,000 l/gross ha/day
• ICI Average Day Demand	28,000 l/gross ha/day
• ICI peak Daily Demand	42,000 l/gross ha/day
• ICI Peak Hour Demand	75,600 l/gross ha/day

A watermain demand calculation sheet is included in **Appendix B** and the total water demands are summarized as follows:

• Average Day	0.03 l/s
• Maximum Day	0.04 l/s
• Peak Hour	0.07 l/s

#### 2.2.2 System Pressure

The Ottawa Design Guidelines – Water Distribution (WDG001), July 2010, City of Ottawa, Clause 4.2.2 states that the preferred practice for design of a new distribution system is to have normal operating pressures range between 345 kPa (50 psi) and 480 kPa (80 psi) under maximum daily flow conditions. Other pressure criteria identified in Clause 4.2.2 of the guidelines are as follows:

Minimum Pressure	Minimum system pressure under peak hour demand conditions shall not be less than 276 kPa (40 psi)
Fire Flow	During the period of maximum day demand, the system pressure shall not be less than 140 kPa (20 psi) during a fire flow event.
Maximum Pressure	In accordance with the Ontario Building/Plumbing Code, the maximum pressure should not exceed 552 kPa (80 psi). Pressure reduction controls will be required



for buildings where it is not possible/feasible to maintain the system pressure below 552 kPa.

### 2.2.3 Fire Flow Rates

The proposed site plan contains one commercial building, with automatic sprinkler systems. The building will fall under OBC Section 3.10, F-2 or F3 occupancy and combustibility. The sprinkler system will be designed and installed in accordance with NFPA-13 requirements. The sprinkler system will be supplied from the city water connection and the demand will be calculated using the hazard classification plus the appropriate inside/outside hose allowances.

Calculations using the Fire Underwriting Survey (FUS version 2020) were conducted to determine the fire flow requirement for the site. Results of the analysis provides a maximum fire flow rate of 5,000 l/min or 83.3 l/s is required which is used in the hydraulic analysis. A copy of the FUS calculations is included in **Appendix B**.

### 2.2.4 Boundary Conditions

The City of Ottawa has provided the hydraulic boundary conditions at the site. A copy of the boundary conditions is included in **Appendix B** and summarized as follows:

*Table 2-1 Hydraulic Boundary Conditions*

Criteria	Hydraulic Head	Pressure
Max HGL (Basic Day)	160.7 m	88.8 psi
Peak Hour	156.5 m	82.8 psi
Max Day + Fire Flow (5,000 L/m)	155.4 m	81.2 psi

Ground elevation: 127.5 m

### 2.2.5 Hydraulic Model

A computer model for the subject site has been developed using the InfoWater Pro program by Autodesk. The model includes the existing watermain and boundary condition at Campeau Drive.

## 2.3 Proposed Water Plan

### 2.3.1 Proposed Water Plan

This site will be serviced by connecting to an existing 200mm diameter watermain extending from Campeau Drive. The building will be serviced by a lateral service connection from the proposed watermain. There is one hydrant proposed on site located at the east side of the proposed parking area, within 45m of the proposed building.

Refer to the general plan of services **Drawing C-001** for detailed watermain layout for the subject site.



The hydraulic model was run under basic day conditions to determine the maximum pressure for the site. The minimum pressure for the site is determined in the peak hour analysis using the provided boundary condition. Results of the analysis for the site are summarized in Section 2.3.2 and the water model schematic and model results are included in **Appendix B**.

The hydraulic model was run under basic day, maximum day with fire flows and under peak hour conditions. Results of the hydraulic model are included in **Appendix B** and summarized as follows:

- A comparison of the results and design criteria is summarized as follows:

Fire Flow	The minimum design fire flow under maximum day conditions with minimum system pressure of 140 kPa is 283.83 l/s for retail which exceeds the requirement of 83.3 l/s (5,000 l/min) from Section 2.3.3.
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## 3 Wastewater Disposal

### 3.1 Existing Conditions

There is an existing 375mm diameter sanitary sewer along Campeau Drive, which flows east along Campeau Drive and flows ultimately to the Ottawa Wastewater Treatment Plant at 395 Terry Fox Drive. There is an existing 200mm sanitary cap from existing MH301 to the property line in anticipation of this development. This sewer has been designed to provide wastewater service to the subject development site.

### 3.2 Previous Studies

The October, 2014 IBI Group Design Brief for Arcadia Commercial provided the wastewater servicing plan for the Arcadia Retail Development, including the subject site. The detailed sanitary sewer design sheets and related sanitary drainage area plan 35355 - C-501 are included in **Appendix C**.

### 3.3 Design Criteria

The sanitary sewers for the subject site will be based on the City of Ottawa design criteria. It should be noted that the sanitary sewer design for this study incorporates the latest City of Ottawa design parameters identified in Technical Bulletin ISTB-2018-01. Some of the key criteria will include the following:

- Average commercial flow = 28,000 l/s/ha
- Peak ICI flow factor = 1.5 if ICI area is > 20% total area  
1.0 if ICI area is ≤ 20% total area
- Inflow and Infiltration Rate = 0.33 l/s/ha
- Minimum Full Flow Velocity = 0.60 m/s
- Maximum Full Flow Velocity = 3.0 m/s
- Minimum Pipe Size = 200 mm diameter

### 3.4 Recommended Wastewater Plan

The on-site sanitary system will consist of 200mm PVC sewer installed at standard depth and slope and will provide 150mm service connections to the proposed building. The sewers have been designed using the criteria noted above in section 3.2 and outlet via the existing sanitary stub connection to the sanitary sewer to Campeau Drive.

As noted in the pre-consultation meeting with the City of Ottawa, a monitoring maintenance hole was included just inside the property line of the subject site. The July 2012 Site Servicing Report 'Arcadia – Kanata West Ph 1' by IBI Group identified conceptually the servicing for the 9.84 Ha parcel of land south of Campeau Drive. This site comprises approximately 1.79 Ha of that area. The Campeau Drive sewer was designed and constructed assuming 0.85 Ha of commercial lands connecting to MH301A, with peak flows of 0.98 l/s. This site generates approximately 1.47 l/s to MH 301A. The minor (0.49 l/s) increase in flow to MH 301A has negligible impact on the system as it has over 34 l/s spare capacity up to MH 303A.



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This site is comprised of slab on grade construction (no basements). The minor (0.49 l/s) increase in flow from MH 301A to 303A will not negatively impact this site. Sanitary design sheet from 'Arcadia – Kanata West Ph 1' site servicing report, which demonstrates the capacity in the receiving and downstream wastewater system is included in **Appendix C**.

As identified in the Arcadia Commercial Design Brief, there are existing houses along Campeau Drive and the current freeboard between the HGL and USF is approximately 1.18 m at MH301A. It is anticipated that any minor HGL adjustment (1 to 2 cm) due to the 0.49 l/s increase at this MH will leave these units within excess of 1 m of freeboard.

A copy of the sanitary sewer design sheet can be found in **Appendix C**. Please refer to the General Plan of Services **Drawing C-001** for further details.



## 4 Site Stormwater Management

### 4.1 Existing Conditions

The undeveloped subject lands currently drain east away from Campeau Drive and Huntmar Drive intersection to the recently developed Country Glen Way. There is an existing 825mm diameter downstream storm sewer along Campeau Drive with a 600mm storm stub from the existing MH301 to the property line with an allocation of flows from this development previously taken into consideration.

The Arcadia Commercial Site Plan was allocated a total 100-year release rate of 240L/s/Ha. The original site plan approval included two separate outlets, one to Campeau Drive and one to Country Glen Way. Based on the original site area draining to Campeau, of 0.8Ha, the theoretical maximum release rate is 192.00L/s. However, the site stormwater management plan identified a release rate to Outlet #2 (MH 301 in Campeau Drive) of **125.94 L/s**. This report aims to meet the more restrictive target to MH301 established in the Site Plan. An excerpt from the Arcadia Commercial Stormwater Management Calculations has been provided in **Appendix D**.

### 4.2 Design Criteria

The stormwater system was designed following the principles of dual drainage, making accommodations for both major and minor flow. The on-site minor system design criteria identified below are consistent with the current City of Ottawa Sewer Design Guidelines.

Some of the key criteria include the following:

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

### 4.3 Proposed Minor System

Where possible, the minor system storm sewers for the subject site will be sized based on the rational method and the City of Ottawa 2-year event. Minor storm flow to the downstream storm sewer network will be controlled by Inlet Control Devices (ICDs) to limit flow and prevent sewer surcharging downstream.

Due to the severance area and the need to maintain maximum flexibility for future development opportunities within the existing site, a rebalancing of tributary areas to Campeau has been completed. General Areas 122, 123, 110A and Roof Areas BLK700 and BLK800 (as identified on the original site plan) have been removed from the tributary outletting to Campeau. The sum of the areas removed from Outlet #2 is 0.30Ha. This has permitted an expansion



of the parking lot area adjacent to the proposed sales Center drain into the Campeau outlet without constructing services through the remainder of the site, as originally intended. The sum of the area added to Outlet #2 is 0.23Ha. An overall drainage area plan has been provided in **Appendix D** which demonstrates the areas removed (in red) and the areas added (in green).

The proposed minor storm sewer will range between 300 mm diameter and 600 mm diameter. Catch basin lead pipes will be 200 mm in diameter. The minor storm sewer outlet will be via the 600 mm diameter pipe which is proposed to connect to the existing 825 mm diameter storm sewer in Campeau Drive.

An allocation has been provided in the minor system for future flows to the east. This includes Future Building Block 600 and future parking lot area 120, as were identified on the original site plan approval.

A detailed storm sewer design sheet and the associated storm sewer drainage area plan is included in **Appendix D**. The General Plan of Services, depicting all on-site storm sewers can be found in **Appendix A**.

## 4.4 Stormwater Management

As previously noted, the overall site release rate was determined based on a level of service of 240 L/s/Ha. However, the original SWM concept for the approved site plan had adjusted the overall release rate between the two outlets, and Outlet #2 (MH301 to Campeau) is slightly overcontrolled relative to the level of service for the whole site. The intent is to maintain the outlet dispersion with **125.94 L/s** as the maximum permissible release rate to Campeau.

At certain locations within the site, the opportunity to capture and/or store runoff is limited due to grading constraints and site plan geometry. These locations are generally located at the site's perimeter, where it is necessary to tie into public ROWs and adjacent properties or in areas where ponding stormwater is undesirable. These “uncontrolled” areas – 0.064 hectares in total, have a C value of 0.20 and increased by 25% during 100-year events (as per City SDG). It should be noted that the total uncontrolled areas are based on the uncontrolled areas identified in the original site plan SWM concept and are all located adjacent to future development areas. All areas within the severed parcel are captured and controlled.

## 4.5 Inlet Control

Per the original stormwater management calculations provided for the entire site, the restricted flow rate was used for the Campeau outlet is:

$$Q_{\text{restricted}} = 125.94 \text{ L/s}$$

As noted in Section 4.4, a small, landscaped area along the west property line will drain offsite uncontrolled.

Based on a 100-year event, the flow from the 0.063 Ha uncontrolled area (including storm drainage area UNC1, future UNC1B, UNC1C and UNC1D) can be determined as:

$$Q_{\text{uncontrolled}} = 2.78 \times C \times i_{100\text{yr}} \times A \quad \text{where:}$$

$$C = \text{Average runoff coefficient of uncontrolled area} = 0.20 \times 1.25$$

$$i_{100\text{yr}} = \text{Intensity of 100-year storm event (mm/hr)}$$

$$= 1735.688 \times (T_c + 6.014)^{0.820} = 178.56 \text{ mm/hr; where } T_c = 10 \text{ minutes}$$



$$A = \text{Uncontrolled Area} = 0.063 \text{ Ha}$$

Therefore, the uncontrolled release rate can be determined as:

$$\begin{aligned} Q_{\text{uncontrolled}} &= 2.78 \times 1.25C \times i_{100\text{yr}} \times A \\ &= 2.78 \times 1.25 \times 0.020 \times 178.56 \times 0.063 \\ &= 7.82 \text{ L/s} \end{aligned}$$

The higher roof top area of 0.027 ha will be uncontrolled due to difficulty of maintenance. The total flow from the uncontrolled roof area UNC2 can be determined as:

$$\begin{aligned} Q_{\text{uncontrolled}} &= 2.78 \times 1.25C \times i_{100\text{yr}} \times A \\ &= 2.78 \times 1.0 \times 178.56 \times 0.0269 \\ &= 13.35 \text{ L/s} \end{aligned}$$

The maximum allowable release rate to Campeau Drive (Outlet #2/MH301) can then be determined as:

$$\begin{aligned} Q_{\text{max allowable}} &= Q_{\text{restricted}} - Q_{\text{uncontrolled}} \\ &= 125.94 \text{ L/s} - 7.82 \text{ L/s} - 13.35 \text{ L/s} \\ &= 104.77 \text{ L/s} \end{aligned}$$

Based on the flow allowance at the various inlet locations, various sizes of inlet control devices (ICDs) were chosen in the design. The design of the inlet control devices is unique to each drainage area and is determined based on various factors, including hydraulic head and allowable release rate. Ponding locations and elevations are summarized on the Ponding Plan **Drawing C-600**, and included in **Appendix D**.

## 4.6 On-Site Detention

The site was designed to limit runoff to the allowable release rate up to the 2-year post-development storm event. Flows exceeding the maximum allowable release rate will be contained on-site via underground and surface storage at strategic locations. Orifices are proposed in manholes, catch basins and roof drains to control runoff from the site. The modified rational method determined the storage volumes during a 2-year and 100-year storm event. Available surface ponding volumes at each inlet were determined using CAD surface volume tools. As per the Ottawa SDG, when underground storage is considered available storage, the ICD release rate is to be reduced by 50% to determine the storage requirements.

The proposed roof is partially flat and partially peaked. The drainage area plan considers the roof structure of this building. The flat roof area has accounted for ponding storage with depths not exceeding 150mm per the OBC, and there are five roof drains. Watts roof drain flow control weirs are proposed on each inlet, set to 2 L/s or 30GPM each.

Major flow up to the 100-year storm is contained on-site and is gradually released to the minor system. Apart from the small uncontrolled areas, major flow does not leave the site via overland flow.

The site's stormwater management has ensured that surface ponding will not occur during the 2-year storm event. Stormwater management and on-site underground storage volume calculations, and manufacturers spec sheets are included in **Appendix D**.



A summary of the ICD type for each drainage area and corresponding storage details is provided in Table 4.1 below.

Table 4-1 Post-Development Storage Summary Table

Post – Development Flows							
Location	ICD Type	Drainage Area (Ha)	Restricted / Uncontrolled Flow (L/s)	Storage Required (m³)	Storage Provided (m³)		
			2 - Year	2 - Year	Surface	UGS	Total
Controlled Storm Sewer System							
FUT 600	-	0.06	2	7.22	33.75	0	33.75
FUT 120	-	0.11	15	4.18	33.99	0	33.99
ROOF	WATTS	0.07	10	2.38	18.15	0	18.15
110	IPEX MHF	0.12	28	0	8.49	0	8.49
102	IPEX MHF	0.24	25	20.49	23.30	68.80	92.10
MH100B	IPEX MHF	0.04	24	0	1.57	0	1.57
Total		0.64	104	34.27	119.25	68.80	188.05

The area Future 120 has identified surface level ponding during the 2-year event. The drainage area and release rate have been carried form the original site plan SWM concept. Future site plan development will need to address 2-year ponding in this area.

Area 102 identifies a 20.49m3 storage required during the 2-year event. 68.80m3 of storage is provided underground, therefore there will be no surface ponding during the 2-year event.

## 4.7 100-Year Overflow

A review of the 100-year event, and overflow depth has been performed using the modified rational method. The calculations are included in the modified rational stormwater management sheets **Appendix D**.

A summary of the required storage volumes and overflow balances is provided below.

Table 4-2 Post-Development 100yr Storage Summary Table

Drainage Area	ICD Restricted Flow (L/s)	100 Year Storage Required (m³)	Total Storage Provided* (m3)	Upstream Overflow (m³)	100 – Year Overflow (m³)
FUT 600	2	26.48	33.75	0	0



Drainage Area	ICD Restricted Flow (L/s)	100 Year Storage Required (m <sup>3</sup> )	Total Storage Provided* (m <sup>3</sup> )	Upstream Overflow (m <sup>3</sup> )	100 – Year Overflow (m <sup>3</sup> )
FUT 120	15	26.10	33.99	0	0
ROOF	10	15.64	18.15	0	0
110	28	7.96	8.49	0	0
102	25	90.65	92.10	0	0
MH100B	24	0.20	1.57	0	0
Total	<b>104</b>	<b>167.03</b>	<b>188.05</b>	<b>0</b>	<b>0</b>

\*includes surface storage and underground storage. For building Areas, it includes rooftop storage.

The 100-year flow from all areas within the proposed site plan is contained on-site, with no overland flow offsite or to other areas.

## 4.8 100-Year + 20% Stress Test

A cursory review of the 100-year event + 20% has been performed using the modified rational method. The peak flow from each area during a 100-year event has increased by 20%. The calculations have been included in **Appendix D**.

A summary of the require storage volumes, and overflow balances is provided below.

*Table 4-3 Post-Development 100yr+20% Stress Test Storage Summary Table*

Drainage Area	ICD Restricted Flow (L/s)	100 Year + 20% Storage Required (m <sup>3</sup> )	Total Storage Provided	Upstream Overflow (m <sup>3</sup> )	100 Year + 20% Overflow (m <sup>3</sup> )
FUT 600	2	33.48	33.75	0	0
FUT 120	15	34.56	33.99	0	0.57
ROOF	10	20.80	18.15	0	2.65
110	28	11.57	8.49	0	3.08
102	25	115.68	92.10	2.65	26.23
MH100B	24	0.53	1.57	0	0
Total	<b>104</b>		<b>188.05</b>		

The overland flow from 110 is directed to Campeau Drive. The 100yr +20% overflow volume from Area 110 is **3.08** m<sup>3</sup> at peak. Based on a peak Tc of 6 minutes, the volume can be reverse calculated to **8.55** L/s. A channel depth



conveyance calculation has been provided to determine the overflow depth of **0.02m** above the static ponding elevation.

The overland flow from the area tributary to 102 is directed south to future development lands. The 100yr +20% overflow volume from Area 102, including upstream roof contribution (2.65 m3), is **26.23** m3 at peak. Based on a peak Tc of 46 minutes, this volume can be reverse calculated to **9.50 L/s**. A channel depth conveyance calculation has been provided to determine the overflow depth of **0.03m** above static ponding elevation. These stress test flows will need to be considered in future SWM analysis.

## 4.9 Underground Storage

Due to the site's constraints and the stormwater management plan, underground storage was deemed the best option to contain the 100-year storm event on site. The table below summarizes underground storage, and additional information about the underground storage structures is found in **Appendix D**.

Table 4-3 Underground Storage Summary Table

Storage Name	Structure Type	Storage Provided (m³)
CB102	Stormtech DC-780 or approved equivalent	68.80

## 4.10 Quality Control

As noted in the Arcadia Commercial Design Brief, flows from the subject site discharged into the Arcadia Interim SWM facility, which provided an interim quality and quantity control facility for the Arcadia community. We understand that the ultimate SWM facility has been constructed and is operational.

## 4.11 Hydraulic Grade Line

As identified in the Arcadia Commercial Design Brief, as part of the original site plan approval, the storm Hydraulic Grading Line (HGL) is dictated by downstream infrastructure. The storm HGL within the existing storm sewer on Campeau Drive is at 96.05m at existing MH's 301. The sewers are not surcharged at these points, since the internal sewers are restricted to meet the downstream system design requirements and sized to accommodate the restricted flow. The onsite sewers will not be surcharged, and as such, the HGL will follow the obvert of the pipes. Additionally, this is a slab on grade development, and the City requirement for 0.3 m freeboard to USF to protect basements from flooding is not applicable. The minimum freeboard from the onsite HGL (obvert of storm sewer) to the finished floor elevation is 1.51 m.



## 5 Grading and Roads

### 5.1 Site Grading

The existing grades within portions of the proposed development lands vary significantly due to the existing topography of the site. The grading plan will require the balancing of various requirements including but not limited to geotechnical constraints, minimum/maximum slopes, overland routing of stormwater, all to ensure the site is graded following municipal and accessibility standards.

Special consideration is needed for the building, where elevated foundation walls are required along the west façade to maintain the grade. A minimum of 150mm foundation exposure is required around the perimeter of the building. Internal and external steps will also be required to match grades. The main entrance has been designed to provide barrier-free access to the parking areas.

The parking areas have been designed to meet accessibility requirements, with slopes ranging between 0.5% along curbs to a maximum of 5%.

Refer to the grading plan provided in **Appendix E**.

### 5.2 Road Network

No public roads are proposed through the site. A minimum 8.0m wide drive aisle has been provided, as shown on the Site Plan in **Appendix A**. An internal Fire route has been shown where fire truck access is required, as determined by the site architect.

There are 39 parking stalls provided on the site, of which two are barrier-free.

Pedestrian access facilities and multiple connections to Campeau Drive and Huntmar are provided.

A bicycle parking facility has been proposed adjacent to each building entrance.

Noise attenuation features and indoor noise clause provisions will not be required for commercial use lands for road noise generated by the adjacent roads.



## 6 Source Controls

### 6.1 General

Since an end-of-pipe treatment facility is already provided for the development lands, stormwater site management for the subject lands will focus on the site level or source control management of runoff. Such controls or mitigative measures are proposed for this development not only for final development but also during construction and build-out. Some of these measures are:

- Flat site grading where possible
- Vegetation planting
- Groundwater recharge in landscaped areas

### 6.2 Lot Grading

Where possible, all of the proposed blocks within the development will make use of gentle surface slopes on hard surfaces such as asphalt and concrete. In accordance with local municipal standards, all grading will be between 0.5 and 5.0 percent for hard surfaces and 2.0 and 7.0 percent for all landscaped areas. Significant grade changes will be accomplished through the use of terracing (3:1 max slope), ramps and/or retaining walls. All street and parking lot catchbasins shall be equipped with 3.0m subdrains on opposite sides of a curbside catchbasin running parallel to the curb, and with 3.0m subdrains extending out from all 4 sides of parking lot catchbasins.

### 6.3 Vegetation

As with most site plans, the developer will be required to complete a vegetation and planting program. Vegetation throughout the development including planting along roadsides and within the individual blocks provides opportunities to re-create lost vegetation.

### 6.4 Groundwater Recharge

Groundwater recharge targets have not been identified for this site. Perforated sub-drain systems will be implemented at capture locations in all vegetated areas. This will promote increased infiltration during low flow events before water is collected by the storm sewer system.



## 7 Conveyance Controls

### 7.1 Generals

Besides source controls, the development also proposes to use several conveyance control measures to improve runoff quality. These will include:

- Vegetated swales
- Catchbasin sumps and manhole sumps

### 7.2 Catchbasins and Maintenance Hole Sumps

All catchbasins within the development, either rear yard or street, will be constructed with minimum 600 mm deep sumps. These sumps trap pollutants, sand, grit and debris which can be mechanically removed prior to being flushed into the minor pipe system. Both rear yard and street catchbasins will be to OPSD 705.02. All storm sewer maintenance holes serving local sewers less than 900 mm diameter shall be constructed with a 300 mm sump as per City standards.



## 8 Sediment and Erosion Control Plan

### 8.1 General

During construction, existing stream and conveyance systems can be exposed to significant sediment loadings. Although construction is only a temporary situation, it is proposed to possibly introduce a number of mitigative construction techniques to reduce unnecessary construction sediment loadings. These may include:

- Until the local storm sewer is constructed, groundwater in construction trenches shall be pumped into a filter mechanism prior to release to the environment
- Vegetated swale sediment capture filter socks will remain on open surface structures such as maintenance holes and catchbasins until these structures are commissioned and put into use
- Silt fence on the site perimeter will be installed

### 8.2 Trench Dewatering

Any trench dewatering using pumps will be discharged into a filter trap made up of geotextile filters and straw bales similar in design to the OPSD 219.240 Dewatering Trap. These will be constructed in a bowl shape with the fabric forming the bottom and the straw bales forming the sides. Any pumped groundwater will be filtered prior to release to the existing surface runoff. The contractor will inspect and maintain the filters as needed, including sediment removal and disposal and material replacement as needed. It should be noted that that the contractor will be responsible for the design and management of the trap(s).

### 8.3 Seepage Barriers

In order to further reduce sediment loading to the stormwater management facility, seepage barriers will be installed on any surface water courses at appropriate locations that may become evident during construction. These barriers will be Light Duty Straw Bale Barriers per OPSD 219.100 and Heavy-Duty Silt Fence Barriers per OPSD 219.130; locations are shown on the Sediment and Erosion Control Plan included in **Appendix E**. They are typically made of layers of straw bales or geotextile fabric staked in place. All seepage barriers will be inspected and maintained as needed.

### 8.4 Surface Structure Filters

All catchbasins, and to a lesser degree, manholes, convey surface water to sewers. Until streets are asphalted and curbed, all catchbasins and manholes will be constructed with sediment capture inserts or equivalent located between the structure frame and cover. These will stay in place and be maintained during construction and build until it is appropriate to remove same.



## 9 Conclusion

This report has illustrated that the proposed two-storey office and showroom development can be serviced via existing municipal services. The water network will be extended to provide necessary service. All sanitary and storm sewer designs for this development will be completed in conformance with City of Ottawa standards while acknowledging downstream constraints. By limiting flow into the minor storm sewer system as per the applicable local stormwater management criteria and allowing for excess surface storage on-site, all stormwater management requirements will be met. Adherence to the Sediment and Erosion Control Plan during construction will minimize harmful impacts on surface water.

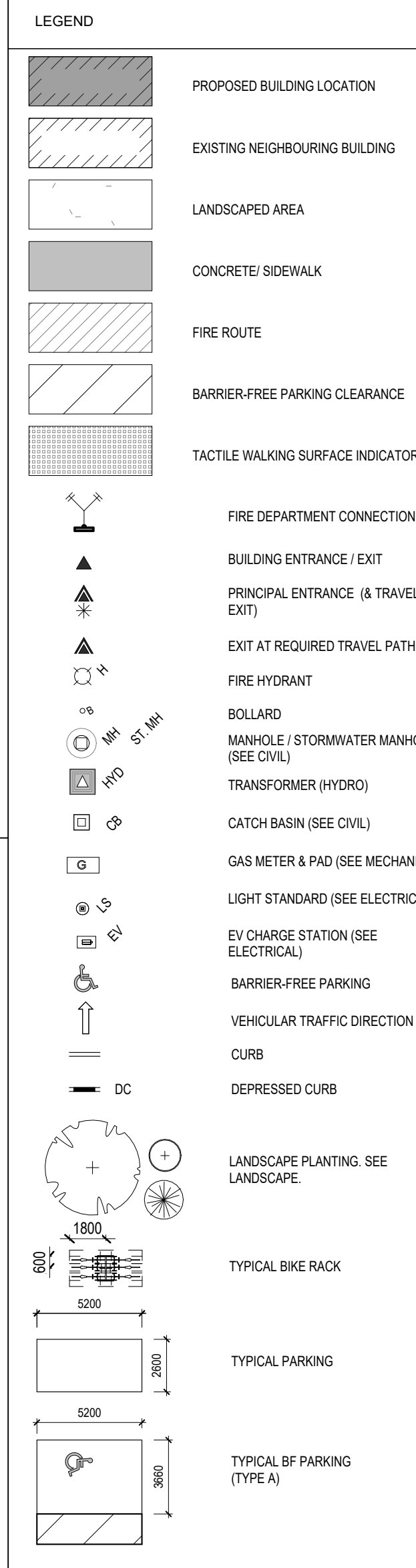
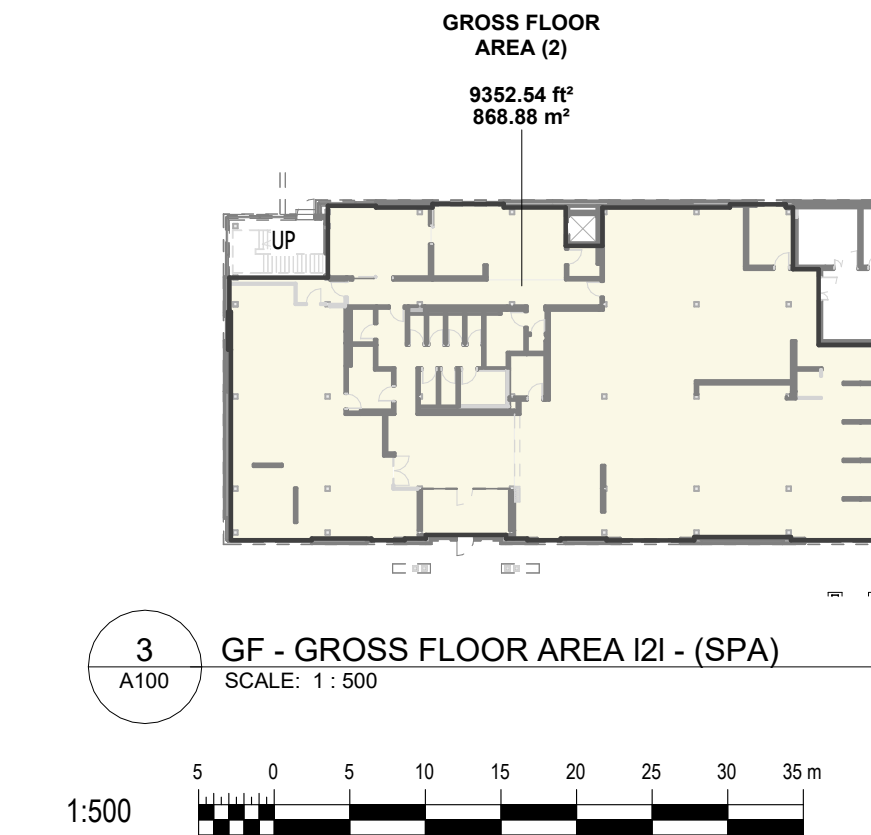
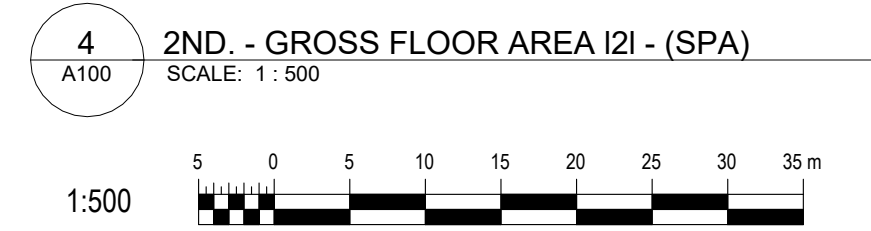
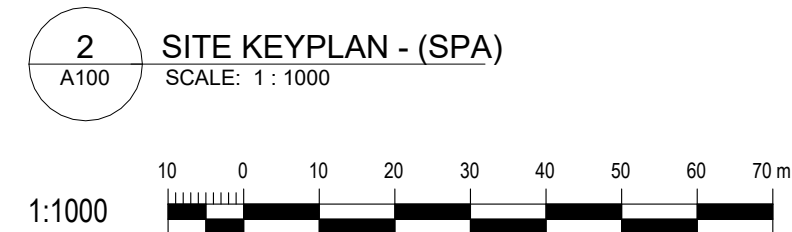
Based on the information provided within this report, the plans prepared for the subject development can be serviced to meet City of Ottawa requirements.



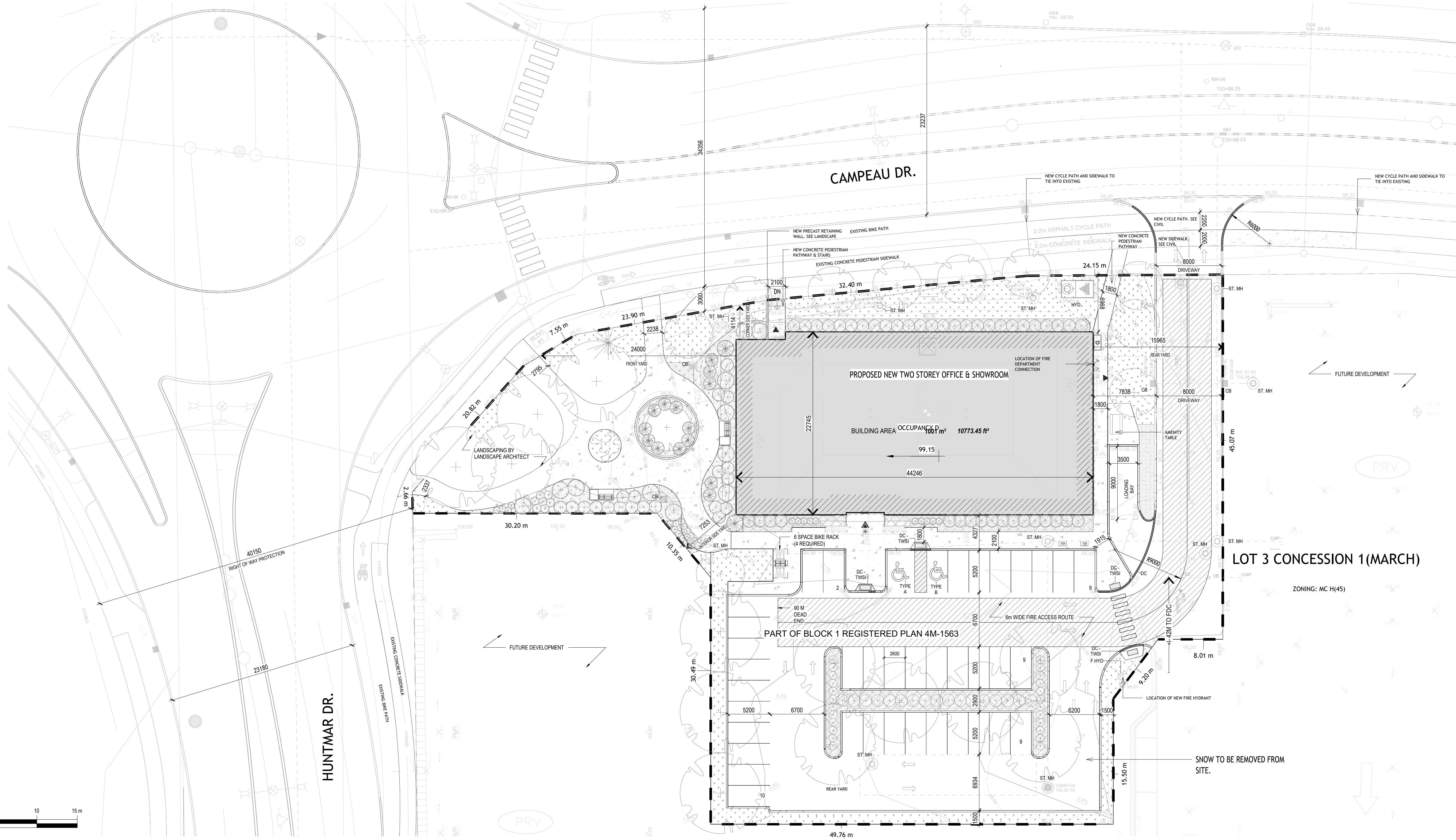
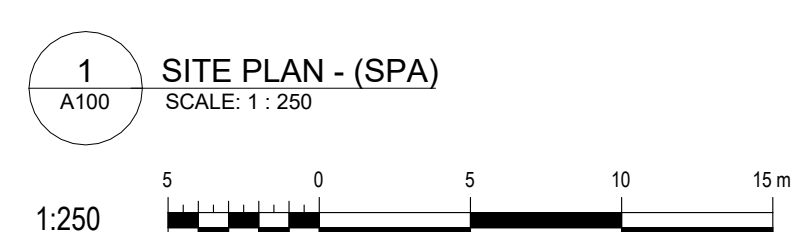
# Appendix A

- **Site Plan**
- **Stantec Plan of Survey**
- **Site Servicing Plan 147391-C-001**
- **Arcadia Site Servicing Plan 35355-C-100**
- **Pre-Consultation City Comments**
- **Study and Plan Identification List**






GENERAL SITE PLAN NOTES:		GENERAL NOTES:	
<b>TOPOGRAPHICAL INFORMATION:</b> PART OF LOT 1 REGISTERED PLAN 4M-1563 GEOGRAPHIC TOWNSHIP OF MARCH CITY OF OTTAWA SURVEY BY: STANTEC GEOMATICS LTD. BY LAW NUMBER: 2008-250 SCHEDULE 1/1A AREA: AREA C		1. DO NOT SCALE DRAWINGS. ONLY FIGURED DIMENSIONS ARE TO BE USED. WHERE DOUBT EXISTS, FILE REQUEST FOR INTERPRETATION AND REQUEST CLARITY. 2. IT IS THE RESPONSIBILITY OF THE GENERAL CONTRACTOR TO VERIFY DIMENSIONS ON SITE. REPORT DISCREPANCIES TO THE ARCHITECT PROMPTLY. 3. GENERAL CONTRACTOR TO TAKE INTO ACCOUNT CONSTRUCTION TOLERANCE. GENERAL CONTRACTOR TO COORDINATE THE WORK OF DIFFERENT TRADES TO COMPLY WITH DESIGN INTENT. 4. ALL WORK DESCRIBED IN THESE DRAWINGS AND SPECIFICATIONS ARE TO COMPLY WITH THE CURRENT EDITION OF THE ONTARIO BUILDING CODE (2015) OR NATIONAL BUILDING CODE (2015) INCLUDING MOST RECENT AMENDMENTS. 5. DRAWINGS AND SPECIFICATIONS ARE COMPLEMENTARY AND ARE TO BE READ TOGETHER.	
<b>SITE AND BUILDING DATA:</b>			
NEW SITE SUB-DIVISION AREA:	4,624 m <sup>2</sup>		
<b>BUILDING HEIGHT:</b>			
MINIMUM HEIGHT:	N/A		
MAXIMUM HEIGHT:	45M		
BUILDING HEIGHT PROVIDED:	9.25M		
<b>AREAS:</b>			
GROSS BUILDING AREA (1)	1270 m <sup>2</sup>	1366.84 ft <sup>2</sup>	
(*) 1			
GROSS FLOOR AREA (2)	1079 m <sup>2</sup>	11609.94 ft <sup>2</sup>	
(*) 2			
(*) SEE GROSS BUILDING AREAS BELOW			
<b>GENERAL NOTES:</b>			
1. FOR PAVED SURFACES, GRADING, SITE SERVICING, DRAINAGE EROSION AND SEDIMENT CONTROL, REFER TO CIVIL DRAWINGS. <div style="display: flex; justify-content: space-around; align-items: center; margin-top: 10px;"> </div>			
2. FOR PLANTING DETAILS, REFER TO LANDSCAPE DRAWINGS.			
<b>1. GROSS BUILDING AREA:</b> (1) TOTAL GROSS BUILDING CODE DEFINITION: THE TOTAL AREA OF ALL FLOORS ABOVE GRADE MEASURED BETWEEN THE OUTSIDE SURFACES OF EXTERIOR WALLS.			
<b>2. GROSS FLOOR AREA:</b> (2.) CITY OF OTTAWA ZONING (BYLAW: DEFINITION FOR THE PURPOSE OF DETERMINING PARKING REQUIREMENTS): GROSS LEASABLE FLOOR AREA MEANS THE TOTAL FLOOR AREA DESIGNATED FOR OCCUPANCY AND EXCLUSIVE USE, MEASURED FROM THE INTERIORS OF OUTSIDE WALLS EXCLUDING FLOOR AREA OCCUPIED BY PARTY WALLS AND,			
EXCLUDING:			
1. INTERIOR PARKING / LOADING (DRIVE THRU).			
2. FLOOR AREA OCCUPIED BY SHARED MECHANICAL, SERVICE AND ELECTRICAL EQUIPMENT THAT SERVE THE BUILDING. (BY-LAW 2008-326)			
3. COMMON HALLWAYS; CORRIDORS; STARWELLS, ELEVATOR SHAFTS AND OTHER VOIDS, STEPS AND LANDINGS. (BY-LAW 2008-326)			
4. BICYCLE PARKING, MOTOR VEHICLE PARKING OR LOADING FACILITIES; COMMON LAUNDRY, STORAGE AND WASHROOM FACILITIES THAT SERVE THE BUILDING OR TENANTS.			
5. COMMON STORAGE AREAS THAT ARE ACCESSORY TO THE PRINCIPAL USE OF THE BUILDING. (BY-LAW 2008-326)			
6. COMMON AMENITY AREA AND PLAY AREAS ACCESSORY TO A PRINCIPLE USE ON THE LOT, AND (BY-LAW 2008-326) LIVING QUARTERS FOR A CARETAKER OF THE BUILDING.			
<b>ZONING:</b>			
ZONING DESIGNATIONS (PART 10): EXISTING ZONING: MC MIXED USE CENTRE (H45)			



PROVISIONS	REQUIRED	PROVIDED
MINIMUM LOT WIDTH (m): MINIMUM LOT AREA (m²): MINIMUM FRONT YARD SETBACK: MINIMUM REAR YARD SETBACK: MINIMUM INTERIOR SIDE YARD SETBACK: MINIMUM CORNER SIDE YARD SETBACK:	NO MIN. NO MIN. NO MIN. NO MIN. NO MIN. NO MIN.	LOT WIDTH 4625 M² 24 M 15.9 M 4.1 M 0.24
MAXIMUM FLOOR SPACE INDEX	NO MAX.	0.24
<b>LANDSCAPING (SECTION 110):</b>		
REQUIRED FRONT AND CORNER SIDE YARDS TO BE LANDSCAPED, EXCEPT FOR DRIVEWAYS CROSSING THE FRONT OR CORNER SIDE YARD LEADING TO PARKING AREA		
PARKING (HARDSCAPE) AREA (LANDSCAPE)	PARKING HARDSCAPE AREA PROVIDED 2337 m²	MIN. LANDSCAPE REQUIREMENT OF 1% 350.6 m²
LANDSCAPING		LANDSCAPE AREA PROVIDED 1354 m²
<b>VEHICLE PARKING (SECTION 101):</b>		
OFFICE (N59):	[2.4 Per 100 mlt] = = 1126m2 x 0.034	
MINIMUM REQUIRED:	26	
PARKING FOR THE PHYSICALLY DISABLED (PARKING BYLAW 2000-530, SECTION 122):		
MINIMUM REQUIRED:	- No. [1x TYPE 'A'   1x TYPE 'B']	
NUMBER PROVIDED:	- No. [1x TYPE 'A'   1x TYPE 'B']	
<b>(*) PARKING PROVIDED - PARKING BAY TYPE:</b>		
PARK-5-X2X-6	1 SITE PARKING	37
PARK-BF-5-X2X-4-TYPE-A	2. BARRIER FREE BAY TYPE A	1
PARK-BF-5-X2X-6-TYPE-B	3. BARRIER FREE BAY TYPE B	1
TOTAL PARKING TYPE PROVIDED.....		39

BICYCLE PARKING (SECTION 111):		CLIENT <b>MINTO GROUP</b>	
MINIMUM REQUIRED (OFFICE): NUMBER PROVIDED:		200 180 KENT STREET, OTTAWA, ON, K1P 0B6 TEL: 613-404-4203	
LOADING ZONE (SECTION 113):		CONSULTANTS <b>STRUCTURAL CONSULTANT</b>	
MINIMUM REQUIRED: NUMBER PROVIDED:		ENTUITIVE ENGINEERS TEL: 613-900-6219	
1 1* [3.5M x 9M]		<b>MECHANICAL CONSULTANT</b> SMITH + ANDERSEN TEL: 613-691-0266	
		<b>ELECTRICAL CONSULTANT</b> SMITH + ANDERSEN TEL: 613-691-0266	
		<b>CIVIL CONSULTANT</b> ARCADIS TEL: 613-795-5610	
		<b>LANDSCAPE CONSULTANT</b> JAMES B. LENNOX & ASSOCIATES INC. TEL: 613-722-5168	
		 <p><b>A GROUP OF ARCHITECTS</b></p> <p>201-1339 WELLINGTON ST. WEST OTTAWA ON K1Y 3B8 WWW.ARCHITECTSDCA.COM 613.725.2294</p>	
		PROJECT TITLE <b>MINTO DESIGN CENTRE</b>	
		DRAWING TITLE <b>SITE PLAN (SPA)</b>	
DATE 2025-01-17		DRAWN	
SCALE As Indicated		REVIEWED Checker	
		JOB NO. <b>3622</b>	
		DRAWING NO. <b>A100</b>	
<b>ARCHITECTURAL</b>			

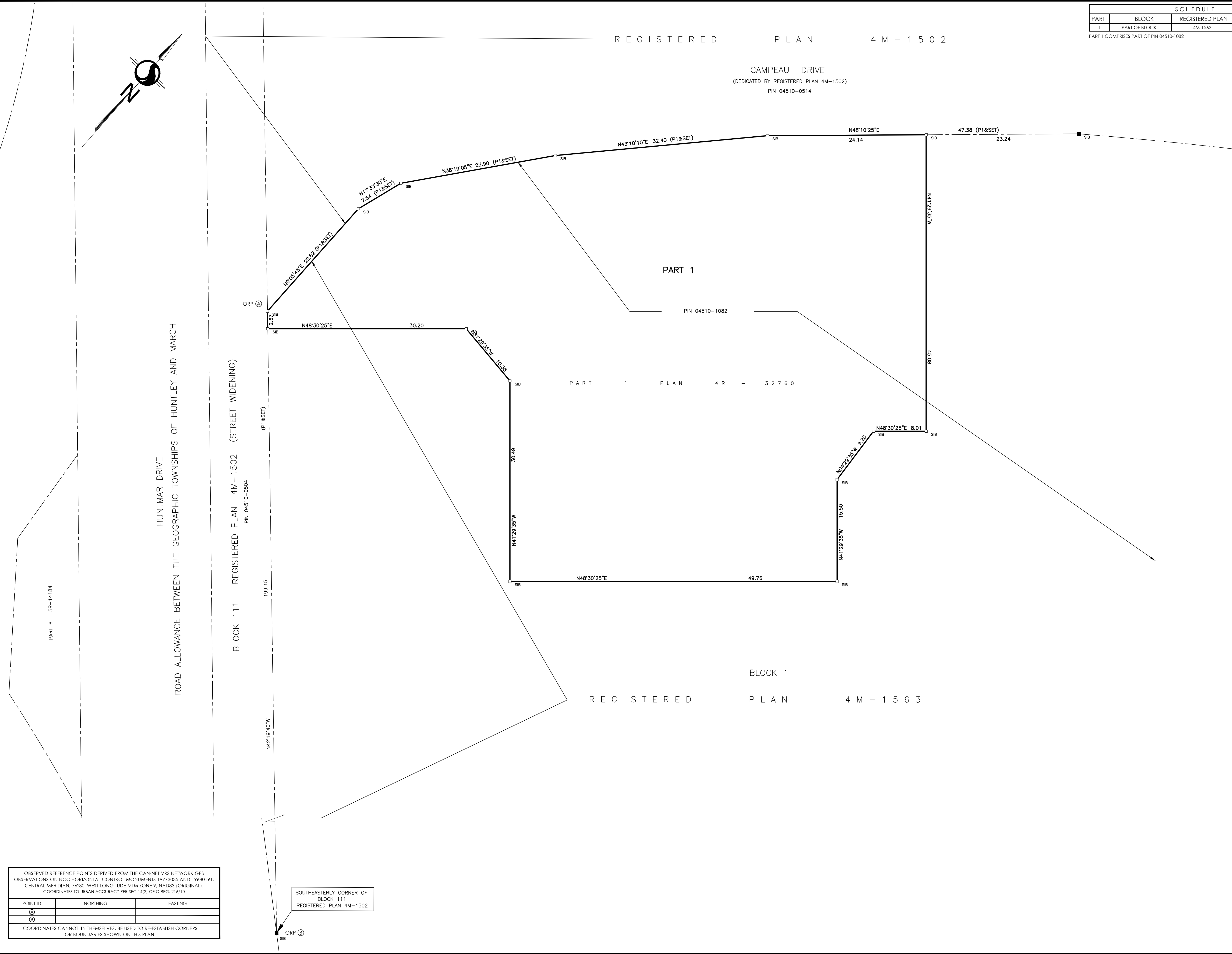


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OBSERVED REFERENCE POINTS DERIVED FROM THE CAN-NET VRS NETWORK GPS OBSERVATIONS ON NCC HORIZONTAL CONTROL MONUMENTS 19773035 AND 19680191. CENTRAL MERIDIAN, 76°30' WEST LONGITUDE MTM ZONE 9, NAD83 (ORIGINAL). COORDINATES TO URBAN ACCURACY PER SEC 14(2) OF O.REG. 216/10		
POINT ID	NORTHING	EASTING
Ⓐ		
Ⓑ		
COORDINATES CANNOT, IN THEMSELVES, BE USED TO RE-ESTABLISH CORNERS OR BOUNDARIES SHOWN ON THIS PLAN.		

SOUTHEASTERLY CORNER OF  
BLOCK 111  
REGISTERED PLAN 4M-1502



SCHEDULE			
PART	BLOCK	REGISTERED PLAN	PIN
1	PART OF BLOCK 1	4M-1563	PART OF PIN 04510-1082

PART 1 COMPRISES PART OF PIN 04510-1082

PLAN OF SURVEY OF  
**PART OF BLOCK 1  
REGISTERED PLAN 4M-1563**  
(GEOGRAPHIC TOWNSHIP OF MARCH)  
**CITY OF OTTAWA**



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

**GRID SCALE CONVERSION**  
DISTANCES ARE GROUND AND CAN BE CONVERTED TO GRID BY MULTIPLYING  
BY THE COMBINED SCALE FACTOR OF 0.999914.

**BEARING NOTE**  
BEARINGS ARE GRID. DERIVED FROM THE CAN-NET VRS NETWORK OBSERVATIONS  
ON NCC HORIZONTAL CONTROL MONUMENTS 19773035 AND 19680191, CENTRAL  
MERIDIAN, 76°30' WEST LONGITUDE MTM ZONE 9, NAD83 (ORIGINAL).

19773035 N:5006040.42 E:324888.04  
19680191 N:5033564.26 E:388064.94

LEGEND	DENOTES	FOUND MONUMENTS
■		SET MONUMENTS
IB	"	IRON BAR
IB2	"	ROUND IRON BAR
SIB	"	STANDARD IRON BAR
SSIB	"	SHORT STANDARD IRON BAR
CC	"	CUT CROSS
CP	"	CONCRETE PIN
WIT	"	WITNESS
PIN	"	IDENTIFICATION NUMBER
M/MEAS	"	MEASURED
INST	"	INSTRUMENT
PROP	"	PROPORTIONED
OU	"	ORIGIN UNKNOWN
SG	"	STANTEC GEOMATICS LTD. PLAN
P1	"	

**SURVEYOR'S CERTIFICATE**  
I CERTIFY THAT:  
1. THIS SURVEY AND PLAN ARE CORRECT AND IN ACCORDANCE WITH THE SURVEYS  
ACT, THE SURVEYORS ACT AND THE LAND TITLES ACT AND THE REGULATIONS MADE  
UNDER THEM.  
2. THE SURVEY WAS COMPLETED ON THE DAY OF . 2024.

April 25, 2025  
DATE

R.G. BENNETT  
ONTARIO LAND SURVEYOR

THIS PLAN OF SURVEY RELATES TO AOLS PLAN SUBMISSION FORM NUMBER #####.

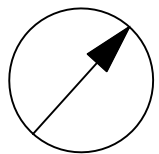
**Stantec Geomatics Ltd.**  
CANADA LANDS SURVEYORS  
ONTARIO LAND SURVEYORS  
1331 CLYDE AVENUE, SUITE 300  
OTTAWA, ONTARIO K2C 3G4  
TEL: 613.722.4420  
stantec.com

DRAWN: DM CHECKED: CT PM: CT FIELD: \* PROJECT No.: 16164833-114



WATERMAIN SCHEDULE						
	Station	Description	Finished Grade	Top of Watermain	Watermain Cover	As Built Watermain
A	0+000.00	MONITORING CHAMBER	98.597	96.197	2.400	
	0+006.00	-	98.585	96.186	2.400	
	0+007.00	-	98.560	95.974	2.586	
	0+008.00	-	98.555	95.878	2.677	
B	0+009.04	200x150 TEE WATER SERVICE	98.550	96.150	2.400	
	0+020.00	-	98.630	96.230	2.400	
	0+030.50	-	98.511	95.309	3.202	
	0+032.000	-	98.522	96.122	2.400	
C	0+036.44	200x200 TEE	98.416	96.016	2.400	
	0+038.05	200x150 REDUCER	98.369	95.969	2.400	
	0+041.23	45 BEND	98.282	95.882	2.400	
	0+045.70	HYDRANT VALVE	98.101	95.701	2.400	
D	0+051.68	HYDRANT	98.170	95.770	2.400	
B	0+000.00	200x150mm TEE WATER SERVICE	98.550	96.150	2.400	
	0+002.46	150 VB	98.484	96.084	2.400	
E	0+009.81	150 CAP	99.000	96.600	2.400	
C	0+000.00	200x200 TEE	98.416	96.016	2.400	
	0+003.50	50mm WATER SERVICE	98.365	95.965	2.400	
F	0+007.50	200 CAP	98.354	95.954	2.400	

Pipe Interference Table			
Crossing No.	PIPE 1	PIPE 2	Clearance
1	STM Bottom 96.174	WTR Top 95.674	0.500
2	STM Bottom 96.178	WTR Top 95.678	0.500
3	STM Bottom 95.809	WTR Top 95.309	0.500
4	STM Bottom 96.144	SAN Top 94.165	1.978
5	STM Bottom 95.804	SAN Top 94.414	1.390
6	STM Bottom 96.763	WTR Top 96.146	0.617
7	STM Bottom 96.718	STM Top 96.409	0.309
8	STM Bottom 96.732	SAN Top 94.219	2.513

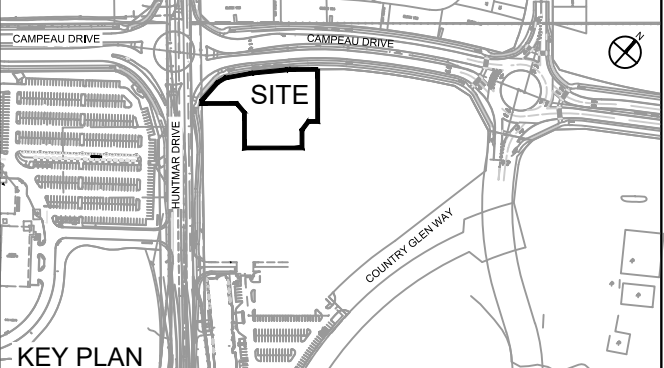


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**Arcadis Professional Services (Canada) Inc.**  
Formerly (B) Group Professional Services (Canada) Inc.

No.	DESCRIPTION	DATE
1	SUBMISSION NO. 1 FOR CITY REVIEW	2024-11-13
2	REVISED AS PER CITY COMMENTS	2025-01-23
3	REVISED AS PER CITY COMMENTS	2025-03-07
4	REVISED AS PER CITY COMMENTS	2025-04-16
5	REVISED AS PER CITY AND MVCA COMMENTS	2025-04-30

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



CONSULTANTS

SEAL



PRIME CONSULTANT



333 Preston Street - Suite 500  
Ottawa ON K1S 5N4 Canada  
tel 613 225 1311  
www.arcadis.com

**PROJECT**  
**MINTO DESIGN CENTRE**  
**370 HUNTMAR DRIVE**

**PROJECT NO:**  
147391

**DRAWN BY:**  
D.P.S.

**CHECKED BY:**  
D.G.Y.

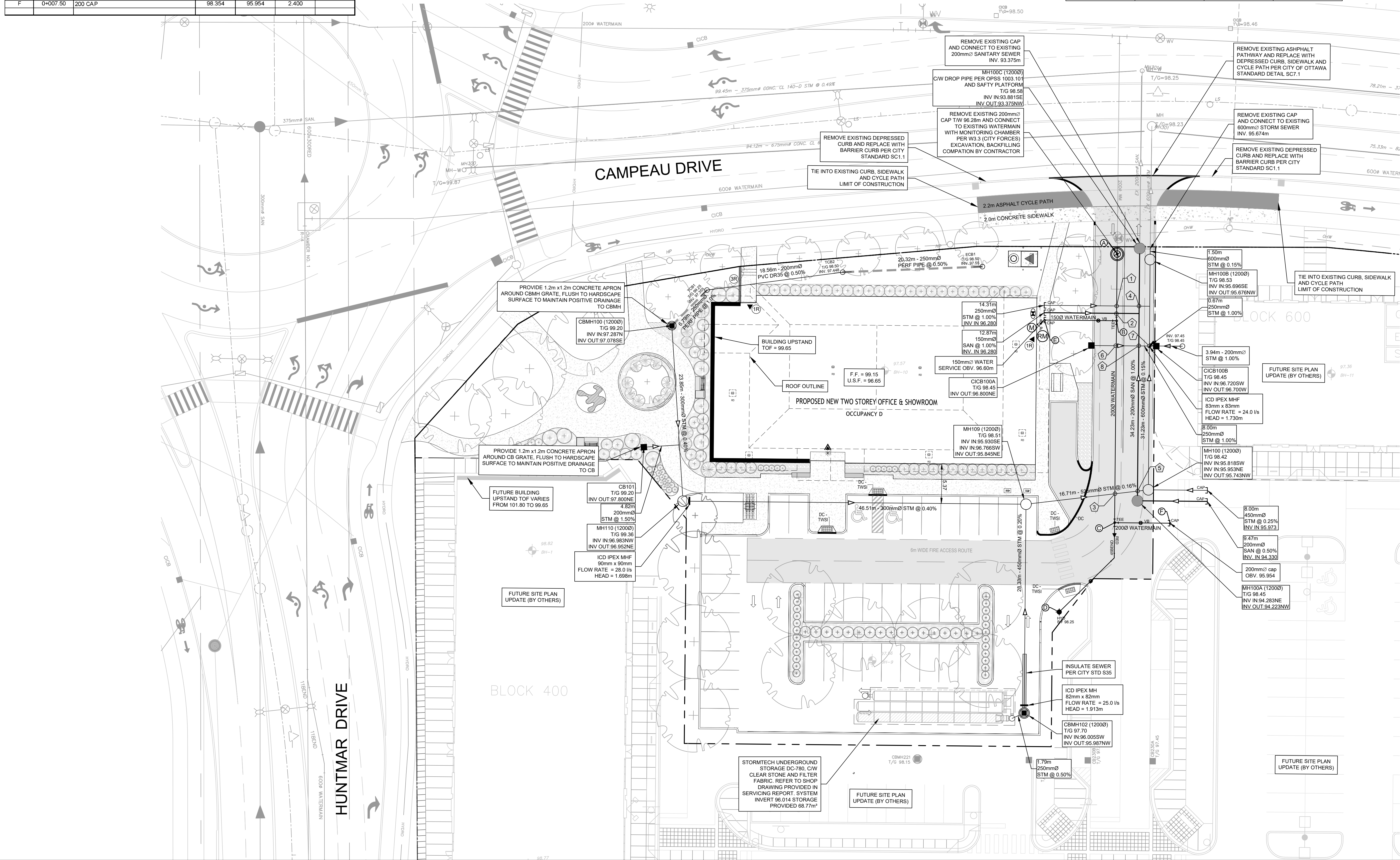
**PROJECT MGR:**  
R.M.

**APPROVED BY:**  
R.M.

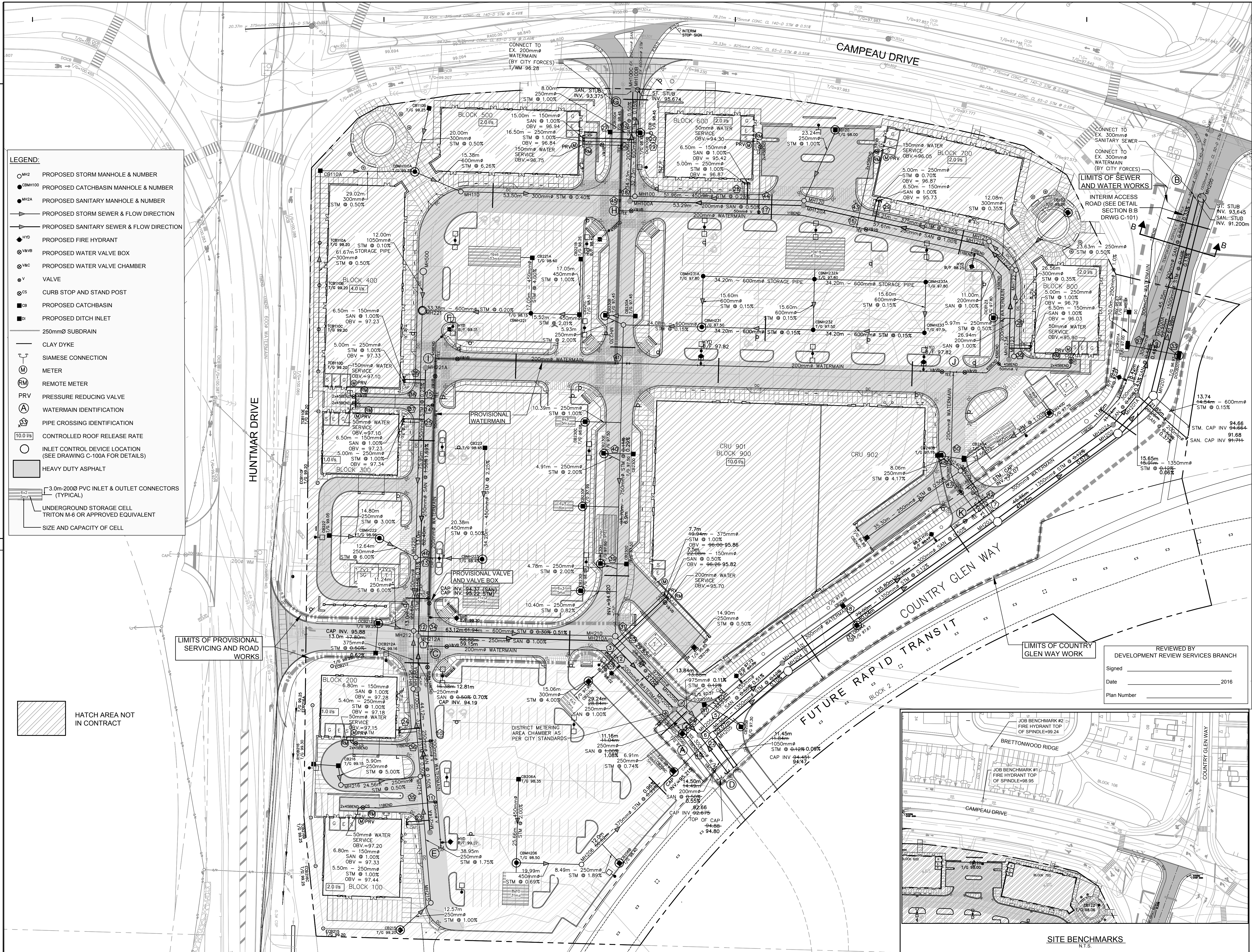
**SHEET TITLE**  
**SITE SERVICING PLAN**

**SHEET NUMBER**  
**C-001**

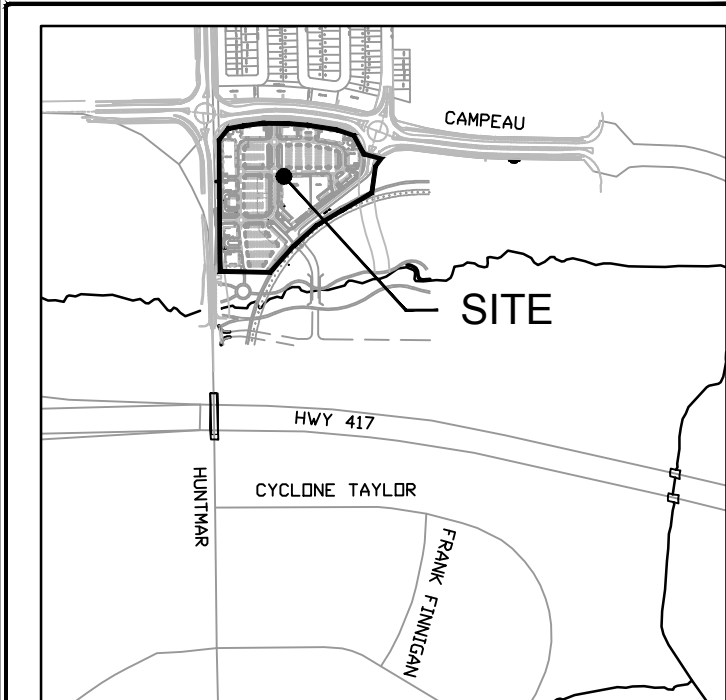
**ISSUE**  
**5**







- 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
  - ⊕ V VALVE
  - CS CURB STOP AND STAND POST
  - CB PROPOSED CATCHBASIN
  - DI PROPOSED DITCH INLET
  - 250mmØ SUBDRAIN
  - CLAY DYKE
  - ⊕ SI SIAMESE CONNECTION
  - ⊕ M METER
  - ⊕ RM REMOTE METER
  - ⊕ PRV PRESSURE REDUCING VALVE
  - ⊕ A WATERMAIN IDENTIFICATION
  - ⊕ X PIPE CROSSING IDENTIFICATION
  - 10.0 I/s CONTROLLED ROOF RELEASE RATE
  - INLET CONTROL DEVICE LOCATION (SEE DRAWING C-100A FOR DETAILS)
  - HEAVY DUTY ASPHALT
  - 3.0m-200Ø PVC INLET & OUTLET CONNECTORS (TYPICAL)
  - UNDERGROUND STORAGE CELL TRITON M-6 OR APPROVED EQUIVALENT
  - SIZE AND CAPACITY OF CELL



**KEY PLAN**

APPROVED ☐ REFUSED ☐

THIS DAY OF , 20

DERRICK MOODIE, ACTING MANAGER  
DEVELOPMENT REVIEW, SUBURBAN SERVICES

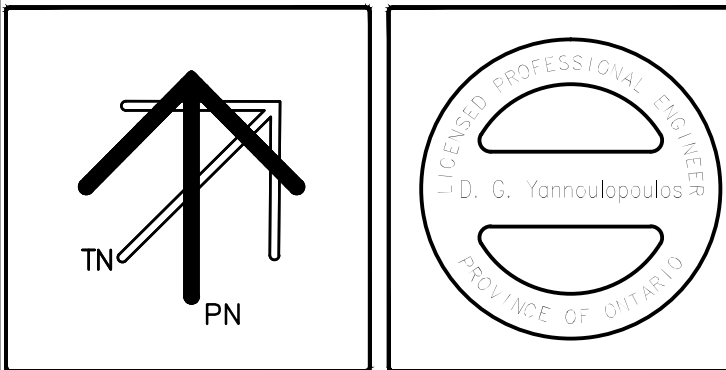
10	As-built	17:01:17	DPS
9	Revised as per City Comments	16:08:26	DGY
8	Revised Campeau Dr per Stantec Plans	16:08:03	DGY
7	Issued for Construction	16:07:13	DGY
6	Add Interim Access Rd.	16:05:16	DGY
5	Issued for Tender	16:04:05	DGY
4	Revised as per City Comments	14:10:02	DGY
3	Revised as per City Comments	14:08:22	DGY
2	Issued for SPA Resubmission	14:06:27	DGY
1	Issued for SPA	13:11:18	D.G.Y.
No.	Description	Date	Checked

Issued for

All measurements and conditions must be checked on the work by the contractor. This drawing not to be used for construction until signed.

Date

plotted 1:35355-ArcadiaComm\5.9 Drawings\Site\Projects\C-100.dwg  
Layout Name: Servicing Plan Plot Style: AIA STANDARD-FULL.ctb  
Plot Scale: 1:1 Plotted At: 3/16/2017 11:06 AM Last Saved By: deluna Last Saved At: Mar. 16, 17



drawn by DPS scale 1:500

checked by DGY date NOV. 2013

printed file 35355

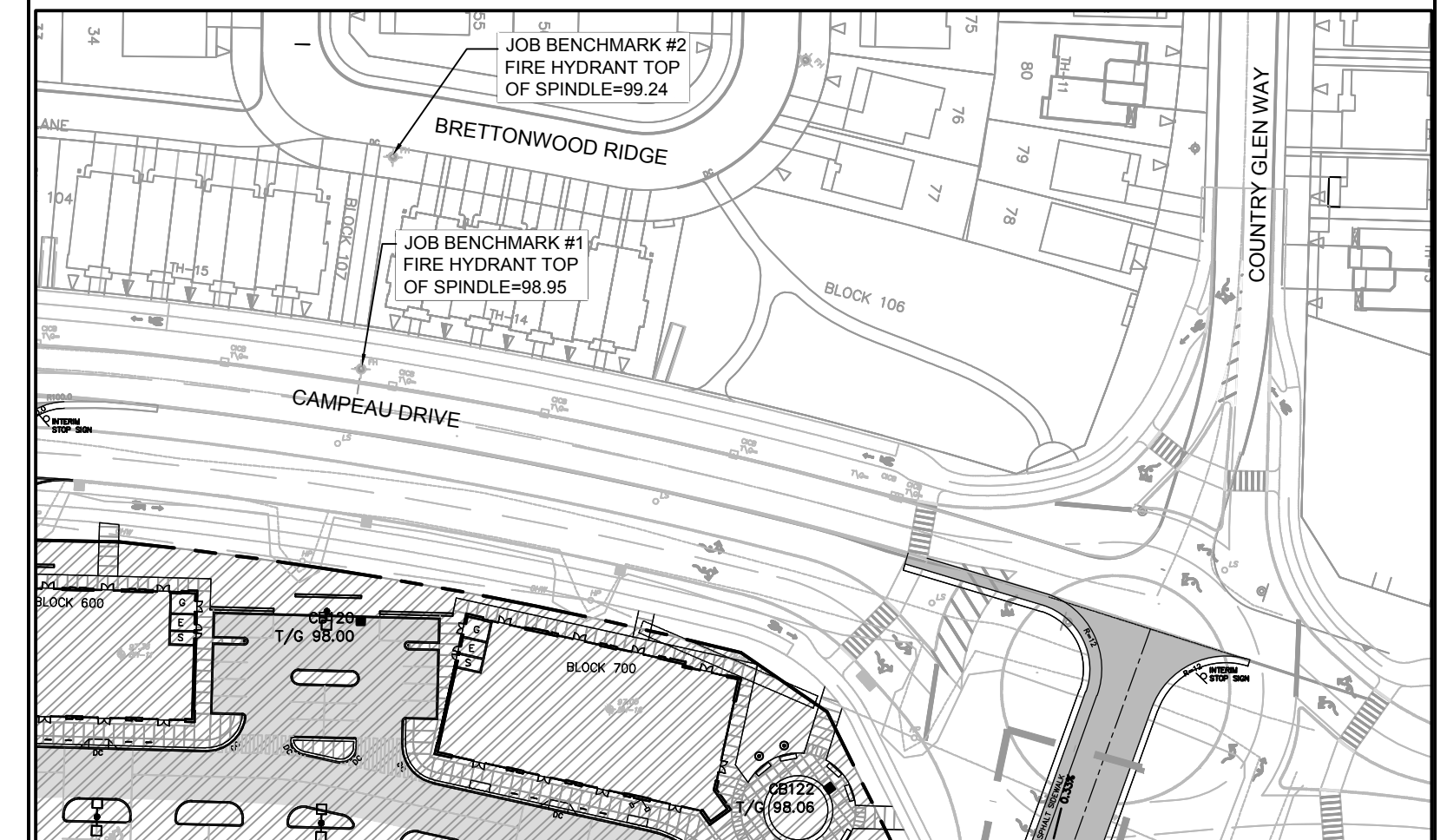
**Arcadia Retail Development**  
Kanata, Ontario

**minto**  
Minto Properties  
200 Kent Street • Suite 180 • Ottawa, Ontario • K1P 0B6  
Telephone: (613)782-3137 Fax: (613)782-5777

drawing title:  
**SITE SERVICING PLAN**  
370 HUNTMAR DRIVE  
OTTAWA, ON.

IBI GROUP  
drawing no.  
**C-100**

333 Preston Street Tower 1, Suite 400  
Ottawa, Ontario Canada K1S 5N4 Tel (613)225-1311 FAX (613)225-9868



**SITE BENCHMARKS**  
N.T.S.

D07-12-14-0014





File No.: PC2024-0304

August 21, 2024

Kevin Harper  
Minto Communities Inc.  
Via email: [kharp@mintocommunities.com](mailto:kharp@mintocommunities.com)

**Subject: Pre-Consultation: Meeting Feedback  
Proposed Site Plan Control Application – 370 Huntmar Drive**

Please find below information regarding next steps as well as consolidated comments from the above-noted pre-consultation meeting held on August 13, 2024.

**Pre-Consultation Preliminary Assessment**

1 <input type="checkbox"/>	2 <input type="checkbox"/>	3 <input type="checkbox"/>	4 <input type="checkbox"/>	5 <input checked="" type="checkbox"/>
----------------------------	----------------------------	----------------------------	----------------------------	---------------------------------------

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 proposal and materials submitted for the above-noted pre-consultation has been undertaken.
2. In your subsequent 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.
3. Please note, if your development proposal changes significantly in scope, design, or density before the next submission, you may be requested to repeat the pre-consultation process before filing an Official application.

**Supporting Information and Material Requirements**

1. The attached **Study and Plan Identification List** outlines the information and material that has been identified, during this phase of pre-consultation, as either required (R) or advised (A) as part of a future complete application submission.
  - a. The required plans and studies must meet the City's Terms of Reference (ToR) and/or Guidelines, as available on [Ottawa.ca](http://Ottawa.ca). These ToR and Guidelines outline





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

### **Consultation with Technical Agencies**

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

### **Planning**

Comments:

1. The following policies apply to the site:
  - a. The site is designated Minor Corridor on Schedule B5 – Suburban (West) Transect.
  - b. Huntmar Drive and Campeau Drive are both identified as Arterial Roads on Schedule C4 – Urban Road Network.
  - c. The site is subject to Area-Specific Policy 2 – Kanata West, per Annex 5 – Urban and Rural areas Subject to Area-Specific Policies. Refer to Volume 2C for applicable policies.
2. It is understood that the owner no longer intends to proceed with the previously approved commercial development on the site (File No. D07-12-14-0014) has lapsed and the owner no longer intends to proceed.
  - a. Please ensure this is clear on any plans submitted in support of the proposed development. The current plans showing the proposal in the context of the previously approved development may be misleading to staff, technical agencies, public, etc. in future reviews.
  - b. Is there an intention to release the registered site plan agreement (Instrument No. OC1817302) on the subject site and surrounding lands?
3. Provide further details on the use(s) of the proposed building. Staff understand that there is an intention to have offices, a combined sales and design centre, as well as showroom space in the building. Zoning interpretation have confirmed that more information is required to confirm whether there is a “retail” component to the use.
4. Landscaping
  - a. Please ensure that the minimum landscaping requirements identified in Section 110(1) of the Zoning By-law are met. Please note that a landscaped



buffer with a minimum width of 1.5 metres must be provided between the perimeter of the parking lot and a lot line not abutting a street, per Table 110(b). It appears that there are deficiencies along the west, south and east lot line.

- b. Consider opportunities for additional trees and landscaping in the development. It appears that parking is being provided above the minimum zoning requirements – consider removing excess parking spaces to meet minimum landscaping buffer requirements and allow for the introduction of additional landscaped islands within the surface parking lot. Refer to Policy 11 of Section 4.1.4 of the Official Plan for additional direction on surface parking lot design.
5. Consider opportunities to visually screen the loading dock from the sightline of the front lot line. Policy 3 of Section 4.6.5 of the Official Plan directs development along corridors shall improve the attractiveness of the realm by internalizing loading areas and visually screening surface parking.
6. Explore opportunities to provide additional bicycle parking on-site to promote active transportation.
7. Required Applications
- a. Site Plan Control (Standard) – more information on the process can be found [here](#).
  - b. If required, zoning relief can be sought through a Minor Variance or Minor Zoning By-law Amendment application.
    - i. Minor Variance – more information on the process can be found [here](#).
    - ii. Zoning By-law Amendment (Minor) – more information on the process can be found [here](#).
  - c. Consent for Severance – more information on this process can be found [here](#). Please continue to engage with [Elizabeth King](#), Planner I (DRAW), on the proposed severance.

Feel free to contact Colette Gorni, Planner II (DR West), for follow-up questions.

### **Urban Design**

#### **Comments:**

- 8. An Urban Design Brief is not required as the project ties into the larger approved Site Plan Control Application for the site.





9. Urban Design staff require an architectural package which includes a Site Plan and Building Elevations, as well as a Landscape Plan as part of the Applicant's submission.

10. Urban Design staff look forward to seeing the planting strategy and would encourage the Applicant to explore opportunities for tree planting.

Feel free to contact Kadri Nader (kadri.nader@ottawa.ca), Urban Design Planner, for follow-up questions.

## **Engineering**

Comments:

### 11. Water Design

- a. A water boundary condition request should be made for this development. Please provide the following information including supporting calculations:
  - i. Location of service
  - ii. Type of development
  - iii. Amount of fire flow required.
  - iv. Average daily demand: \_\_\_\_ l/s.
  - v. Maximum daily demand: \_\_\_\_ l/s.
  - vi. Maximum hourly daily demand: \_\_\_\_ l/s.
- b. A 203mm PVC watermain is available at the site property line
- c. Submission to include watermain system analysis demonstrating adequate pressure as per section 4.2.2 of the Water Distribution Guidelines.
- d. Demonstrate adequate hydrant coverage for fire protection. Please review Technical Bulletin ISTB-2018-02, Appendix I table 1 – maximum flow to be considered from a given hydrant.
- e. Any proposed emergency route (to be satisfactory to Fire Services).

### 12. Sanitary Design

- a. A 200mm sanitary sewer is available at the site property line
- b. A monitoring maintenance hole is required just inside the property line for the proposed development.



- c. Please apply the wastewater design flow parameters in Technical Bulletin PIEDTB-2018-01.
- d. Demonstrate that there is adequate residual capacity in the receiving and downstream wastewater system

### 13. Storm Design

- a. There is access to a 600mm storm sewer at the site property line
- b. IDF information derived from the Meteorological Services of Canada rainfall data, taken from the MacDonald Cartier Airport, collected 1966 to 1997 must be applied
- c. The pre-development runoff shall be the lower of the existing coefficient or a maximum equivalent 'C' of 0.5, whichever is less (§ 8.3.7.3).
- d. Time of concentration: to be calculated, min  $T_c = 10$ mins
- e. Design storm for receiving sewer: 5-year design storm
- f. Allowable release rate: 240L/s/Ha.
- g. Storm sewer outlets should not be submerged.
- h. Provide information on the monitoring manhole – should be located in an accessible location on private property near the property line (ie. Not in a parking area).

14. An MECP Environmental Compliance Approval [Private Sewage Works] will be required should the proposed storm system collect off-site drainage. An exemption to review the application under City's Transfer of Review may be granted for the proposed development provided that specific criteria are met.

### 15. Geotechnical

- a. Sensitive Marine Clay (SMC) is widely found across Ottawa- geotechnical reports should include Atterberg Limits, consolidation testing, sensitivity values, and vane

### 16. Additional Notes

- a. No road moratorium that would impact the application has been identified
- b. Any easement identified should be shown on all plans
- c. For any proposed exterior light fixtures, please provide certification from a licensed professional engineer confirming lighting has been designed only using fixtures that meet the criteria for full cut-off classification as





recognized by the Illuminating Engineering Society of North America and result in minimal light spillage onto adjacent properties (maximum allowable spillage is 0.5 fc). Additionally, include in the submission the location of the fixtures, fixture type (make, model, part number and mounting height).

Feel free to contact Abibatou Dieme ([abibatou.dieme@ottawa.ca](mailto:abibatou.dieme@ottawa.ca)), Infrastructure Project Manager, for follow-up questions.

### **Noise**

Comments:

17. Not required for sales office.

Feel free to contact Mike Giampa ([mike.giampa@ottawa.ca](mailto:mike.giampa@ottawa.ca)), Transportation Project Manager, for follow-up questions.

### **Transportation**

Comments:

18. Right-of-way protection (if required)

- a. See [Schedule C16 of the Official Plan](#).
- b. Any requests for exceptions to ROW protection requirements must be discussed with Transportation Planning and concurrence provided by Transportation Planning management.

19. A TIA is not required.

Feel free to contact Mike Giampa ([mike.giampa@ottawa.ca](mailto:mike.giampa@ottawa.ca)), Transportation Project Manager, for follow-up questions.

### **Environment**

Comments:

20. There are no natural heritage features, surface water features, or species-at-risk habitat on or near the site that would trigger the need for an Environmental Impact Statement (EIS). An EIS is not required as part of this application.

21. Please consider additional tree plantings wherever possible to help meet the City's urban forest canopy goals and to help mitigation the impacts of the urban heat island effect and climate change. Please note that the City prefers that all plantings be of native and non-invasive species.



Feel free to contact Mark Elliott (mark.elliott@ottawa.ca), Environmental Planner, for follow-up questions.

## **Forestry**

Comments:

### 22. Tree Conservation Report

- a. **Please confirm whether any trees >10cm in diameter exist on site or of any size in the ROW;** if yes, a Tree Conservation Report is required, in accordance with Schedule E of the Tree Protection By-law. Ownership of all trees on the subject site and with Critical Root Zones extending onto the subject site must be determined, and plans must show how they will be protected from proposed works.
- b. A permit is required prior to removal of any protected trees 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 (Nancy.young@ottawa.ca) for information on obtaining the tree permit.
- c. 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.

### 23. Landscape Plan

- a. 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](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.
- b. The Landscape Plan must show the soil volumes and setback distances between proposed and existing trees 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.
- c. The Official Plan section 4.8.2, sub 3 provides the following direction related to tree planting related to site plans:
  - i. 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;



- ii. 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
- d. It is a Best Management Practice to plant one tree for every 5 parking spaces to help address the urban heat island effect created by paved areas, and also to work toward the Official Plan target of 40% canopy cover.
- e. Consider increasing the size of the landscape buffers and/or parking lot islands to create plantable spaces with sufficient soil volumes.

Feel free to contact Nancy Young (nancy.young@ottawa.ca), Planning Forester, for follow-up questions.

### **Parkland**

Comments:

- 24. The amount of parkland dedication that is required is to be calculated as per the City of Ottawa Parkland Dedication By-law No 2022-280. For commercial and Industrial development, parkland dedication is required to be provided at the rate of 2% the gross land area.
- 25. Parks & Facilities Planning is requesting **Cash in Lieu** of for this proposal. The value of the property will be determined by market appraisal approved by the City prior to planning approval for the site plan.
- 26. Please provide the City with a surveyor's area certificate/memo which specifies the exact gross land area of the property parcel being developed.
- 27. If parkland dedication for the parcel has been satisfied previously, please provide Parks & Facilities Planning with the supporting documentation.
- 28. Please note that the park comments are preliminary and will be finalized (and subject to change) upon receipt of the development application and the requested supporting documentation. Additionally, if the proposed residential product or land use changes, then the parkland dedication requirement be re-evaluated accordingly.

Feel free to contact Anissa McAlpine (anissa.mcalpine@ottawa.ca), Parks Planner, for follow-up questions.



**Other**

29. The High-Performance Development Standard (HPDS) is a collection of voluntary and required standards that raise the performance of new building projects to achieve sustainable and resilient design. The HPDS was passed by Council on April 13, 2022.
- a. At this time, the HPDS is not in effect and Council has referred the 2023 HPDS Update Report back to staff with direction to bring forward an updated report to Committee with recommendations for revised phasing timelines, resource requirements and associated amendments to the Site Plan Control By-law by no later than Q1 2024.
  - b. Please refer to the HPDS information attached and [ottawa.ca/HPDS](http://ottawa.ca/HPDS) for more information.

---

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

Yours Truly,  
Colette Gorni, Planner II (DR West)

- c.c. Nishant Dave, Planner I (DR West)  
Kadri Nader, Urban Design  
Abibatou Dieme, Infrastructure Project Manager  
Mike Giampa, Transportation Project Manager  
Nancy Young, Planning Forester  
Mark Elliot, Environmental Planner  
Anissa McAlpine, Parks Planner  
Elizabeth King, Planner I (DRAW)



## APPLICANT'S STUDY AND PLAN IDENTIFICATION LIST

### Proposed Site Plan Control Application – 370 Huntmar Drive – PC2024-0304

Legend: **R** = Required, the study or plan is required with application submission

**A** = Advised, the study or plan is advised to evaluate the application or satisfy a condition of approval/draft approval

**1** - OPA, **2** - ZBA, **3** - Plan of Subdivision, **4** - Plan of Condominium, **5** - SPC

Core studies required for certain applications all the time (Remaining studies are site specific)

For information and guidance on preparing required studies and plans refer [here](#):

#### ENGINEERING

R	A	Study/ Plan Name	Description	When Required					Applicable Study Components & Other Comments
				1	2	3	4	5	
<input checked="" type="checkbox"/>	<input type="checkbox"/>	1. Environmental Site Assessment (Phase 1 & Phase 2)	Ensures development only takes place on sites where the environmental conditions are suitable for the proposed use	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	Record of Site Condition Yes <input type="checkbox"/> No <input checked="" type="checkbox"/>
<input checked="" type="checkbox"/>	<input type="checkbox"/>	2. Geotechnical Study	Geotechnical design requirements for the subsurface conditions	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	
<input checked="" type="checkbox"/>	<input type="checkbox"/>	3. Grading and Drainage Plan	Grading relationships between connecting (or abutting) properties and surface runoff control	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	
<input type="checkbox"/>	<input type="checkbox"/>	4. Hydrogeological and Terrain Analysis	A scientific study or evaluation that includes a description of the ground and surface hydrology, geology, terrain, affected landform and its susceptibility	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	Reasonable Use Study Yes <input type="checkbox"/> No <input type="checkbox"/>  Groundwater Impact Study Yes <input type="checkbox"/> No <input type="checkbox"/>
<input type="checkbox"/>	<input type="checkbox"/>	5. Noise Control Study	Potential impacts of noise on a development	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	Vibration Study Yes <input type="checkbox"/> No <input type="checkbox"/>



<input type="checkbox"/>	<input type="checkbox"/>	6. Rail Proximity Study	Development on land adjacent to all Protected Transportation Corridors and facilities shown on Schedule C2 of the Official Plan, to follow rail safety and risk mitigation best practices	<input type="checkbox"/> <input checked="" type="checkbox"/> <input checked="" type="checkbox"/> <input checked="" type="checkbox"/> <input checked="" type="checkbox"/>	<u>Study Trigger Details:</u> Within the Development Zone of Influence for existing and future rapid transit stations and corridors, as shown on Annex 2 of the OP OR on land adjacent to all Protected Transportation Corridors and facilities shown on Schedule C2 of the Official Plan	Rail Safety Report Yes <input type="checkbox"/> No <input type="checkbox"/>  O-Train Network Proximity Study Yes <input type="checkbox"/> No <input type="checkbox"/>
<input checked="" type="checkbox"/>	<input type="checkbox"/>	7. Site Servicing Study	Provides servicing details based on proposed scale of development with an engineering overview taking into consideration surrounding developments and connections.	<input type="checkbox"/> <input checked="" type="checkbox"/> <input checked="" type="checkbox"/> <input checked="" type="checkbox"/> <input checked="" type="checkbox"/>	<u>Study Trigger Details:</u> All cases	Fluvial Geomorphological Report Yes <input type="checkbox"/> No <input checked="" type="checkbox"/>  <b>Assessment of Adequacy of Public Services</b> Yes <input checked="" type="checkbox"/> No <input type="checkbox"/>  Servicing Options Report Yes <input type="checkbox"/> No <input checked="" type="checkbox"/>  <b>Erosion and Sediment Control Plan / Brief</b> Yes <input checked="" type="checkbox"/> No <input type="checkbox"/>  <b>Hydraulic Water Main Analysis</b> Yes <input checked="" type="checkbox"/> No <input type="checkbox"/>  <b>Stormwater Management Report and Detailed Design Brief</b> Yes <input checked="" type="checkbox"/> No <input type="checkbox"/>
<input type="checkbox"/>	<input type="checkbox"/>	8. Slope Stability Study	Assessment of slope stability and measures to provide safe set-back.	<input type="checkbox"/> <input checked="" type="checkbox"/> <input checked="" type="checkbox"/> <input checked="" type="checkbox"/> <input checked="" type="checkbox"/>	<u>Study Trigger Details:</u> Where the potential for Hazard Lands exists on a site.	Retrogressive Landslide Analysis Yes <input type="checkbox"/> No <input type="checkbox"/>
<input type="checkbox"/>	<input type="checkbox"/>	9. Transportation Impact Assessment	Identify on and off-site measures to align a development with City transportation objectives.	<input type="checkbox"/> <input checked="" type="checkbox"/> <input checked="" type="checkbox"/> <input checked="" type="checkbox"/> <input checked="" type="checkbox"/>	<u>Study Trigger Details:</u> If the development generates 60 person-trips or more; or if the development is located in a Location Trigger; or if the development has a Safety Trigger.	Roadway Modification Functional Design Yes <input type="checkbox"/> No <input type="checkbox"/>



<input type="checkbox"/>	<input type="checkbox"/>	10. Water Budget Assessment	Identify impact of land use changes on the hydrologic cycle and post-development mitigation targets.	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<u>Study Trigger Details:</u> May be required for site plan control applications for sites with private servicing and / or proximity to hydrogeologically-sensitive areas. Draft plans of subdivision are required to integrate water budget assessments into supporting stormwater management plans and analysis for the study area.
<input type="checkbox"/>	<input type="checkbox"/>	11. Wellhead Protection Study	Delineate a Wellhead Protection Area (WHPA) and characterize vulnerability for new communal residential drinking water well systems, in accordance with Technical Rules under <i>Clean Water Act</i> .	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	



## PLANNING

R	A	Study/Plan Name	Description	When Required					Applicable Study Components & Other Comments
				1	2	3	4	5	
<input type="checkbox"/>	<input type="checkbox"/>	12. Agrology and Soil Capability Study	Confirm or recommend alterations to mapping of agricultural lands in the City.	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
				<u>Study Trigger Details:</u> For the expansion of a settlement area or identification of a new settlement area through a comprehensive review; or where it is demonstrated that the land does not meet the requirements for an Agricultural Resource Area.					
<input type="checkbox"/>	<input type="checkbox"/>	13. Archaeological Assessment	Discover any archaeological resources on site, evaluate cultural heritage value and conservation strategies	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	
				<u>Study Trigger Details:</u> When the land has either: a known archaeological site; or the potential to have archaeological sites; or where the City's Archaeological Resource Potential Mapping Study indicates archaeological potential, outside of the historic core; or upon discovery of any archaeological resource during construction in the City's historic core area.					
<input checked="" type="checkbox"/>	<input type="checkbox"/>	14. Building Elevations	Visual of proposed development to understand facing of building including direction of sunlight, height, doors, and windows.	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	
				<u>Study Trigger Details:</u> Site Plan: for residential buildings with 25 or more residential units; or for residential buildings with less than 25 residential units, if the units are within the Urban area or the High-performance Development Standard threshold in the rural area.  Official Plan or Zoning By-law: if staff deem it necessary to determine compliance with OP policies, the Zoning By-law or City of Ottawa Urban Design Guidelines.					



<input type="checkbox"/>	<input type="checkbox"/>	15. Heritage Impact Assessment	Determine impacts of proposed development on cultural heritage resources.	<input checked="" type="checkbox"/> <input checked="" type="checkbox"/> <input checked="" type="checkbox"/> <input checked="" type="checkbox"/> <input checked="" type="checkbox"/>	<u>Study Trigger Details:</u> Where development or an application under the Ontario Heritage Act is proposed on, adjacent to, across the street from or within 30 metres of a protected heritage property; or for any development adjacent to the Rideau Canal UNESCO World Heritage Site and its landscaped buffer.	Conservation Plan Yes <input type="checkbox"/> No <input type="checkbox"/>
<input type="checkbox"/>	<input type="checkbox"/>	16. Heritage Act Acknowledgement Report	A submission requirement to demonstrate that the <i>Ontario Heritage Act</i> requirements have been satisfied, to ensure that multiple applications are considered currently.	<input type="checkbox"/> <input checked="" type="checkbox"/> <input checked="" type="checkbox"/> <input checked="" type="checkbox"/> <input checked="" type="checkbox"/>	<u>Study Trigger Details:</u> Where the subject property is listed on the Heritage Register and the applicant must submit a Heritage Permit Application (designated heritage property listed on the Heritage Register) or provide notice of intent to demolish or remove a building (non-designated property listed on the Heritage Register).	Heritage Permit Application Yes <input type="checkbox"/> No <input type="checkbox"/>  Notice of Intent to Demolish Yes <input type="checkbox"/> No <input type="checkbox"/>
<input type="checkbox"/>	<input type="checkbox"/>	17. Impact Assessment Study – Mineral Aggregate	Mineral aggregate extraction activities; and to protect known high quality mineral aggregate resources from development and activities that would preclude or hinder their existence (ability to be extracted) or expansion.	<input checked="" type="checkbox"/> <input checked="" type="checkbox"/> <input checked="" type="checkbox"/> <input checked="" type="checkbox"/> <input checked="" type="checkbox"/>	<u>Study Trigger Details:</u> New Development within 500 metres of lands within the Bedrock Overlay , or within 300 metres of lands within the Sand and Gravel Resource Area Overlay.	
<input type="checkbox"/>	<input type="checkbox"/>	18. Impact Assessment Study – Mining Hazards	To identify or confirm known mineral deposits or petroleum resources and significant areas of mineral potential.  To protect mineral and petroleum resources from development and activities which would preclude or hinder the establishment of new operations or access to the resources.	<input checked="" type="checkbox"/> <input checked="" type="checkbox"/> <input checked="" type="checkbox"/> <input checked="" type="checkbox"/> <input checked="" type="checkbox"/>	<u>Study Trigger Details:</u> For all applications in proximity to mining operations.	



<input type="checkbox"/>	<input type="checkbox"/>	19. Impact Assessment Study – Waste Disposal Sites / Former Landfill Sites	<p>To identify or confirm known proximity of existing or former waste disposal sites.</p> <p>To ensure issues of public health, public safety and environmental impact are addressed.</p>	<input checked="" type="checkbox"/> <input checked="" type="checkbox"/> <input checked="" type="checkbox"/> <input checked="" type="checkbox"/> <input checked="" type="checkbox"/>	<p><u>Study Trigger Details:</u> For the establishment of any new Solid Waste Disposal Site or for a footprint expansion of an operating Solid Waste Disposal Site; or development within three kilometers of an operating or non-operating Waste Disposal Site.</p>	
<input checked="" type="checkbox"/>	<input type="checkbox"/>	20. Landscape Plan	<p>A plan to demonstrate how the canopy cover, urban design, health, and climate change objectives of Official Plan will be met through tree planting and other site design elements.</p>	<input checked="" type="checkbox"/> <input checked="" type="checkbox"/> <input checked="" type="checkbox"/> <input checked="" type="checkbox"/> <input checked="" type="checkbox"/>	<p><u>Study Trigger Details:</u> Site Plan, Plan of Subdivision, and Plan of Condominium: always required, except where it is demonstrated that the landscape component of a project is not relevant to the review of the application.</p> <p>A high-level conceptual Landscape Plan may be required to support Zoning By-law and Official Plan Amendment applications.</p>	
<input type="checkbox"/>	<input type="checkbox"/>	21. Mature Neighbourhood Streetscape Character Analysis	<p>In the Mature Neighbourhoods a Streetscape Character Analysis is required to determine the applicable zoning requirements.</p>	<input type="checkbox"/> <input checked="" type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/>	<p><u>Study Trigger Details:</u> Zoning By-law amendment application in areas covered by the Mature Neighbourhoods zoning overlay for applications of residential development of four storeys or less located in a R1, R2, R3, or R4 zone.</p>	
<input type="checkbox"/>	<input type="checkbox"/>	22. Minimum Distance Separation	<p>Provincial land use planning tool that determines setback distances between livestock barns, manure storages or anaerobic digesters and surrounding land uses, with the objective of minimizing land use conflicts and nuisance complaints related to odour.</p>	<input checked="" type="checkbox"/> <input checked="" type="checkbox"/> <input checked="" type="checkbox"/> <input checked="" type="checkbox"/> <input checked="" type="checkbox"/>	<p><u>Study Trigger Details:</u> Applications in the Rural Area, outside of a village.</p>	



<input type="checkbox"/>	<input type="checkbox"/>	23. Parking Plan	A tool to assess the sufficiency of on-street parking in plans of subdivision.	<input type="checkbox"/> <input type="checkbox"/> <input checked="" type="checkbox"/> <input checked="" type="checkbox"/> <input type="checkbox"/>	<u>Study Trigger Details:</u> For new or revised plans of subdivision with public streets.	
<input checked="" type="checkbox"/>	<input type="checkbox"/>	24. Plan of Survey	A Plan of Survey depicts legal boundaries and is a specialized map of a parcel of land and it delineates boundary locations, building locations, physical features and other items of spatial importance.	<input checked="" type="checkbox"/> <input checked="" type="checkbox"/> <input checked="" type="checkbox"/> <input checked="" type="checkbox"/> <input checked="" type="checkbox"/>	<u>Study Trigger Details:</u> Required for all <i>Planning Act</i> applications.	
<input type="checkbox"/>	<input type="checkbox"/>	25. Plan of Subdivision	Proposed subdivision layout to be used for application approval	<input type="checkbox"/> <input checked="" type="checkbox"/> <input checked="" type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/>	<u>Study Trigger Details:</u> Always required with the submission of plan of subdivision application.  Only required with a Zoning By-law Amendment application, where such ZBLA is in response to enable a subdivision.	
<input type="checkbox"/>	<input type="checkbox"/>	26. Plan of Condominium	Proposed condominium layout to be used for application approval	<input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input checked="" type="checkbox"/> <input type="checkbox"/>	<u>Study Trigger Details:</u> With the submission of plan of condominium application.	
<input type="checkbox"/>	<input type="checkbox"/>	27. Planning Rationale	Provides the planning justification in support of the <i>Planning Act</i> application and to assist staff and the public in the review of the proposal.	<input checked="" type="checkbox"/> <input checked="" type="checkbox"/> <input checked="" type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/>	<u>Study Trigger Details:</u> For all Official Plan amendment, Zoning By-law amendment, or plan of subdivision applications.	Integrated Environmental Review Summary Yes <input type="checkbox"/> No <input type="checkbox"/>
<input checked="" type="checkbox"/>	<input type="checkbox"/>	28. Preliminary Construction Management Plan	A checklist that shows a development proposal's anticipated impacts to all modes of transportation and all elements in the right of way during construction.	<input type="checkbox"/> <input type="checkbox"/> <input checked="" type="checkbox"/> <input type="checkbox"/> <input checked="" type="checkbox"/>	<u>Study Trigger Details:</u> For all Site Plan and plan of subdivision applications.	



<input type="checkbox"/>	<input type="checkbox"/>	29. Public Consultation Strategy	Proposal to reach and collect public input as part of development application.	<input checked="" type="checkbox"/> <input checked="" type="checkbox"/> <input checked="" type="checkbox"/> <input checked="" type="checkbox"/> <input checked="" type="checkbox"/>	<p><u>Study Trigger Details:</u> Official Plan Amendment, Zoning By-law Amendment and Subdivision: Always required.</p> <p>Condominium: Vacant Land only</p> <p>Site Plan: At the discretion of the City's file lead in consultation with the Business and Technical Support Services Manager.</p>	
<input type="checkbox"/>	<input type="checkbox"/>	30. Shadow Analysis	A visual model of how the proposed development will cast its shadow.	<input type="checkbox"/> <input checked="" type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/>	<p><u>Study Trigger Details:</u> When there is an increase in height or massing proposed for a residential, commercial or office use.</p> <p>Two triggers:</p> <p>1. Inside the Greenbelt: proposed development is over 5 storeys in height (<math>\leq 15</math> meters). If a development proposal is 5 storeys or less, but is proposing an increase in height and/or massing and is in close proximity to a shadow sensitive area, a shadow analysis may be requested.</p> <p>2. Outside the Greenbelt: proposed development is over 3 storeys in height (<math>\leq 9</math> meters) and is in close proximity to a shadow sensitive area. Where a proposed development is not in close proximity to a shadow sensitive area (e.g. industrial development) the trigger for a shadow analysis is over 5 storeys in height (<math>\leq 15</math> meters).</p>	
<input checked="" type="checkbox"/>	<input type="checkbox"/>	31. <b>Site Plan</b>	A Site Plan is a visual drawing that illustrates the proposed development of a site in two dimensions.	<input checked="" type="checkbox"/> <input checked="" type="checkbox"/> <input checked="" type="checkbox"/> <input checked="" type="checkbox"/> <input checked="" type="checkbox"/>	<p><u>Study Trigger Details:</u> Site Plan: All</p> <p>Other applications: where a layout of the</p>	<p><b>Site Plan</b> Yes <input checked="" type="checkbox"/> No <input type="checkbox"/></p> <p>Concept Plan Yes <input type="checkbox"/> No <input type="checkbox"/></p>



				public realm, building massing, heights, densities or massing of the proposal provides changes to the planned context; sites proposing multiple land uses; sites with multiple landowners; sites with two or more buildings, on-site park dedication, and/or a new public or private street(s); sites with proposed changes to connectivity (such as active transportation networks, vehicular circulation or access to transit); sites where the development potential on adjacent properties may be impacted by or could be integrated into the proposed site.					Facility Fit Plan Yes <input type="checkbox"/> No <input type="checkbox"/>
<input type="checkbox"/>	<input type="checkbox"/>	32. Urban Design Brief	Illustrate how a development proposal represents high-quality and context sensitive design that implements policies of the Official Plan, relevant secondary plans, and Council approved plans and guidelines.	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<u>Study Trigger Details:</u> For all Official Plan amendment, Zoning By-law amendment, and plan of subdivision applications.  For SPC applications: proposals for residential buildings with 25 or more residential units, or for proposals for residential buildings with less than 25 residential units, if the units are within the Urban area or the High-performance Development Standard threshold in the rural area where OP Policy 11.3 (3) is relevant; for non-residential and mixed-use proposals.
<input type="checkbox"/>	<input type="checkbox"/>	33. Urban Design Review Panel Report	Demonstrates that a development proposal has attended an Urban Design Review Panel formal review meeting, received, and responded to the associated recommendations, if applicable	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	
<input type="checkbox"/>	<input type="checkbox"/>	34. Wind Analysis	A visual model and a written evaluation of how a proposed development will impact pedestrian-level wind conditions.	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<u>Study Trigger Details:</u> Applications seeking an increase in height and/or massing which is either: a tall building(s), 10 storeys or more or a proposed building that is more than twice the height of



				adjacent existing buildings and is greater than five storeys in height and is adjacent to existing or planned low rise development, open spaces, water bodies and large public amenity areas.	
<input checked="" type="checkbox"/>	<input type="checkbox"/>	35. Zoning Confirmation Report	The purpose of the Zoning Confirmation Report (ZCR) is to identify all zoning compliance issues, if any, at the outset of a planning application.	<input type="checkbox"/> <input checked="" type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input checked="" type="checkbox"/>	Study Trigger Details: Required for all SPC and ZBLA applications.

ENVIRONMENTAL									
R	A	Study / Plan Name	Description	When Required					Applicable Study Components & Other Comments
				1	2	3	4	5	
<input type="checkbox"/>	<input type="checkbox"/>	36. Community Energy Plan	Includes a community energy analysis, alongside mitigation measures, and other associated information. The community energy analysis refers to the overall assessment process to identify on and off-site measures to align the design of the development with City climate objectives.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
NOT IMPLEMENTED & NOT REQUIRED									
<input type="checkbox"/>	<input type="checkbox"/>	37. Energy Modelling Report	The Energy Modeling Report is a Site Plan Control application submission requirement to show how climate change mitigation, and energy objectives will be met through exterior building design elements.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
NOT IMPLEMENTED & NOT REQUIRED									
<input type="checkbox"/>	<input type="checkbox"/>	38. Environmental Impact Study	Assessment of environmental impacts of a project and documents the existing natural features, identifies the potential environmental impacts,	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	Assessment of Landform Features Yes <input type="checkbox"/> No <input type="checkbox"/>  Integrated Environmental Review Yes <input type="checkbox"/> No <input type="checkbox"/>
				Study Trigger Details: Is required when development or site alteration is proposed in or within a					



			recommends ways to avoid and reduce the negative impacts, and proposes ways to enhance natural features and functions.	specified distance of environmentally designated lands, natural heritage features, the City's Natural Heritage System, or hazardous forest types for wildland fire.  The EIS Decision Tool (Appendix 2 of the Environmental Impact Study Guidelines) provides a checklist of the natural heritage features and adjacent areas within which an EIS is required to support development applications under the <i>Planning Act</i> .	Protocol for Wildlife Protection during Construction Yes <input type="checkbox"/> No <input type="checkbox"/>  Significant Woodlands Guidelines for Identification, Evaluation, and Impact Assessment Yes <input type="checkbox"/> No <input type="checkbox"/>				
<input type="checkbox"/>	<input type="checkbox"/>	39. Environmental Management Plan	A comprehensive environmental planning document that identifies, evaluates, and mitigates the potential impacts of proposed development on the natural environment and its ecological functions at local planning stage.	<input checked="" type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/>	<u>Study Trigger Details:</u> Official Plan amendments for local plans (area-specific policy or secondary plan, where: there is significant change in the conditions upon which the original study was based; there are proposed changes to planned infrastructure needed to service a subdivision that would have a significant impact on the infrastructure needs of another subdivision within the EMP study area, or the applicable Class Environmental Assessment approval has expired.				
<input type="checkbox"/>	<input type="checkbox"/>	40. High-performance Development Standard	A collection of voluntary and required standards that raise performance of new building projects to achieve sustainable and resilient design	<input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/>	NOT IMPLEMENTED & NOT REQUIRED				
<input type="checkbox"/>	<input checked="" type="checkbox"/>	41. Tree Conservation Report	Demonstrates how tree cover will be retained and protected on the site, including mature trees, stands of trees, and hedgerows.	<input type="checkbox"/> <input type="checkbox"/> <input checked="" type="checkbox"/> <input checked="" type="checkbox"/> <input checked="" type="checkbox"/>	<u>Study Trigger Details:</u> Where there is a tree of 10 centimeters in diameter or greater on the site and/or if there is a tree on an adjacent site that has a Critical Root Zone (CRZ) extending onto the development site.				



# Appendix B

- **Watermain Boundary Conditions**
- **Water Demand Calculations**
- **FUS Calculations**
- **Water Model Results**



## Boundary Conditions 370 Huntmar Drive

### Provided Information

Scenario	Demand	
	L/min	L/s
Average Daily Demand	2	0.03
Maximum Daily Demand	2	0.04
Peak Hour	4	0.07
Fire Flow Demand #1	5,000	83.33
Fire Flow Demand #2	6,000	100.00

### Location





## **Results**

### **Connection Option 1 – Campeau Dr.**

<b>Demand Scenario</b>	<b>Head (m)</b>	<b>Pressure<sup>1</sup> (psi)</b>
Maximum HGL	160.7	88.8
Peak Hour	156.5	82.8
Max Day plus Fire Flow #1	155.4	81.2
Max Day plus Fire Flow #2	154.6	80.1

<sup>1</sup> Ground Elevation = 127.5 m

## **Notes**

1. As per the Ontario Building Code in areas that may be occupied, the static pressure at any fixture shall not exceed 552 kPa (80 psi.) Pressure control measures to be considered are as follows, in order of preference:
  - 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.
  - 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. Demands for proposed Connection 1 at existing stub off Campeau Drive were assigned to upstream junction at Campeau Drive off the public looped watermain. The engineer must calculate headloss off the dead-end main.

## **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 watermain 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.*





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IBI GROUP

WATERMAIN DEMAND CALCULATION SHEET

Arcadia Commercial Site | Minto  
147391 -6.0 | Rev #0 | 2024-11-13  
Prepared By: MP | Checked By: RM

NODE	RESIDENTIAL				NON-RESIDENTIAL (ICI)			AVERAGE DAILY DEMAND (l/s)			MAXIMUM DAILY DEMAND (l/s)			MAXIMUM HOURLY DEMAND (l/s)			FIRE DEMAND (l/min)
	Towns	Medium Density		POPULATION	INDUST. (ha)	COMM. (ha)	INSTIT. (ha)	RESIDENTIAL	ICI	TOTAL	RESIDENTIAL	ICI	TOTAL	RESIDENTIAL	ICI	TOTAL	
Arcadia						0.090			0.03	0.03		0.04	0.04		0.07	0.07	5,000
TOTAL						0.09				0.03			0.04			0.07	

ASSUMPTIONS						
POPULATION DENSITY		WATER DEMAND RATES		PEAKING FACTORS FOR POP. OF 501 TO 3000		FIRE DEMANDS
Townhouse	2.7 persons/unit	Residential	280 l/cap/day	Maximum Daily	Residential 2.5 x avg. day	Single Family 10,000 l/min (166.7 l/s)
Medium Density (Stacks)	1.8 persons/unit	Commercial Shopping Center	2,500 L/(1000m2)/day	Maximum Hourly	Commercial 1.5 x avg. day	Semi Detached & Townhouse 12,000 l/min (200.0 l/s)
					Residential 2.2 x max. day	
					Commercial 1.8 x max. day	Medium Density 15,000 l/min (250.0 l/s)

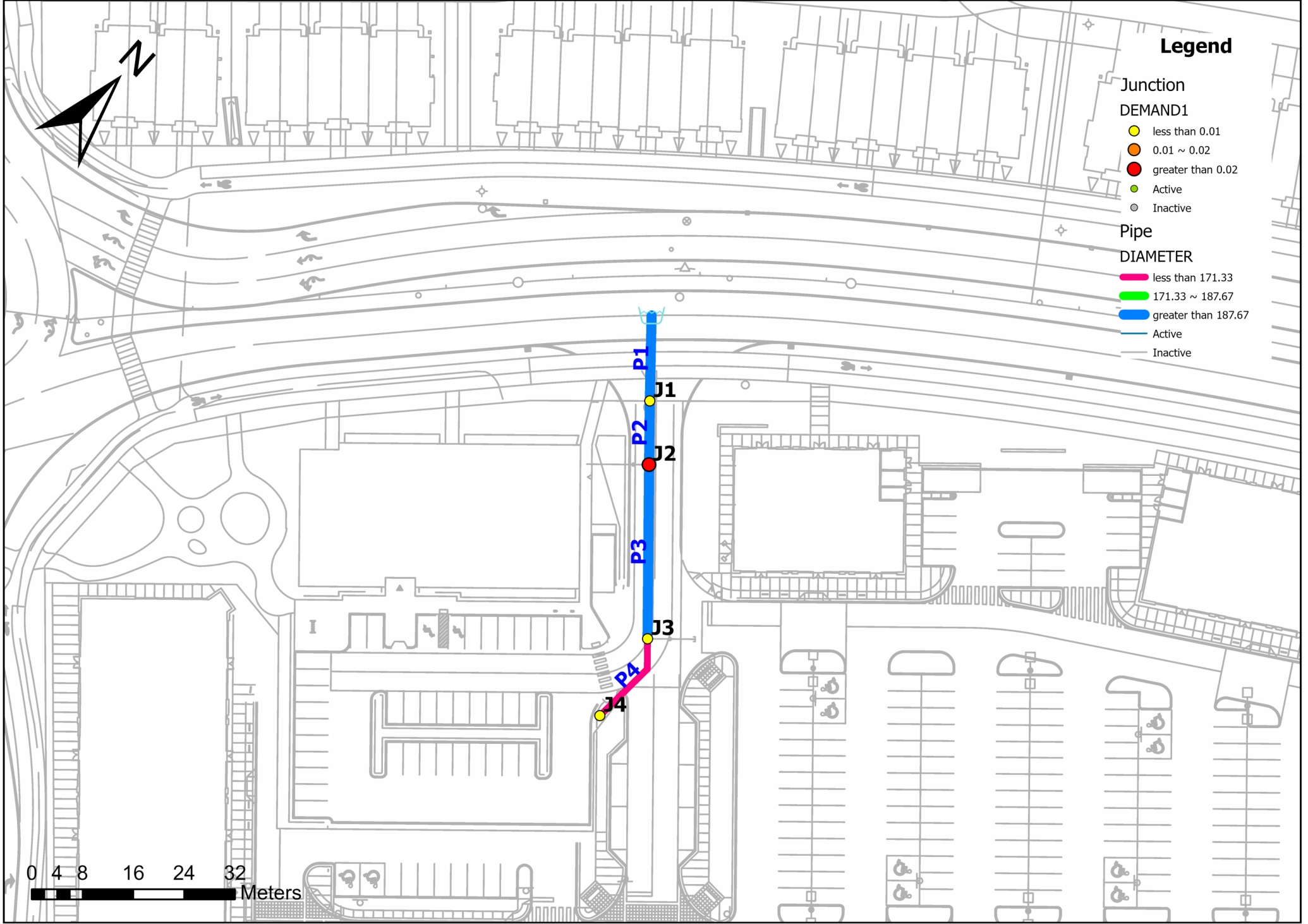


STEP	Contents	Description	Adjustment Factor	Result
1	Floor Area	Arcadia Commercial Site		997 m2
	Total Storey			2 storey
	Total Effective Floor Area			1994 m2
2	Type of Construction	Type V Wood Frame	1.5	Noncombustible Construction 0.8
		Type III Ordinary Construction	1.0	
		Type II Noncombustible Construction	0.8	
		Type I Fire Resistive Construction	0.6	
3	Required Fire Flow	RFF = 220C $\sqrt{A}$		8000 L/min
4	Occupancy and Contents	Noncombustible Contents	-25%	Limited Combustible Contents -15%
		Limited Combustible Contents	-15%	
		Combustible Contents	0%	
		Free Burning Contents	15%	
		Rapid Burning Contents	25%	
	Fire Flow			6800 L/min
5	Automatic Sprinkler Protection	Automatic Sprinkler Conforming to NFPA 13	-30%	Yes
		Standard Water Supply for both the system and Fire Department Hose Lines	-10%	No
		Fully Supervised System	-10%	No
	Fire Flow			-2040 L/min
6	Exposure Adjustment	Based on Table 6 Exposure Adjustment Charges for Subject Building		
	East (Future)	Separation (m)	24.07	Without unprotected opening 0%
		Length X Height Factor (m.storeys)	20	
		Construction Type	Type II	
	South-West (Future)	Separation (m)	10.6	Without unprotected opening 6%
		Length X Height Factor (m.storeys)	64	
		Construction Type	Type II	
	Fire Flow			408 L/min
7	Total Required Fire Flow			5168
		Rounded to Nearest 1000 L/min		
				5000 L/min

Notes 1. Fire flow calculation are based on Fire Underwriters Survey version 2020.

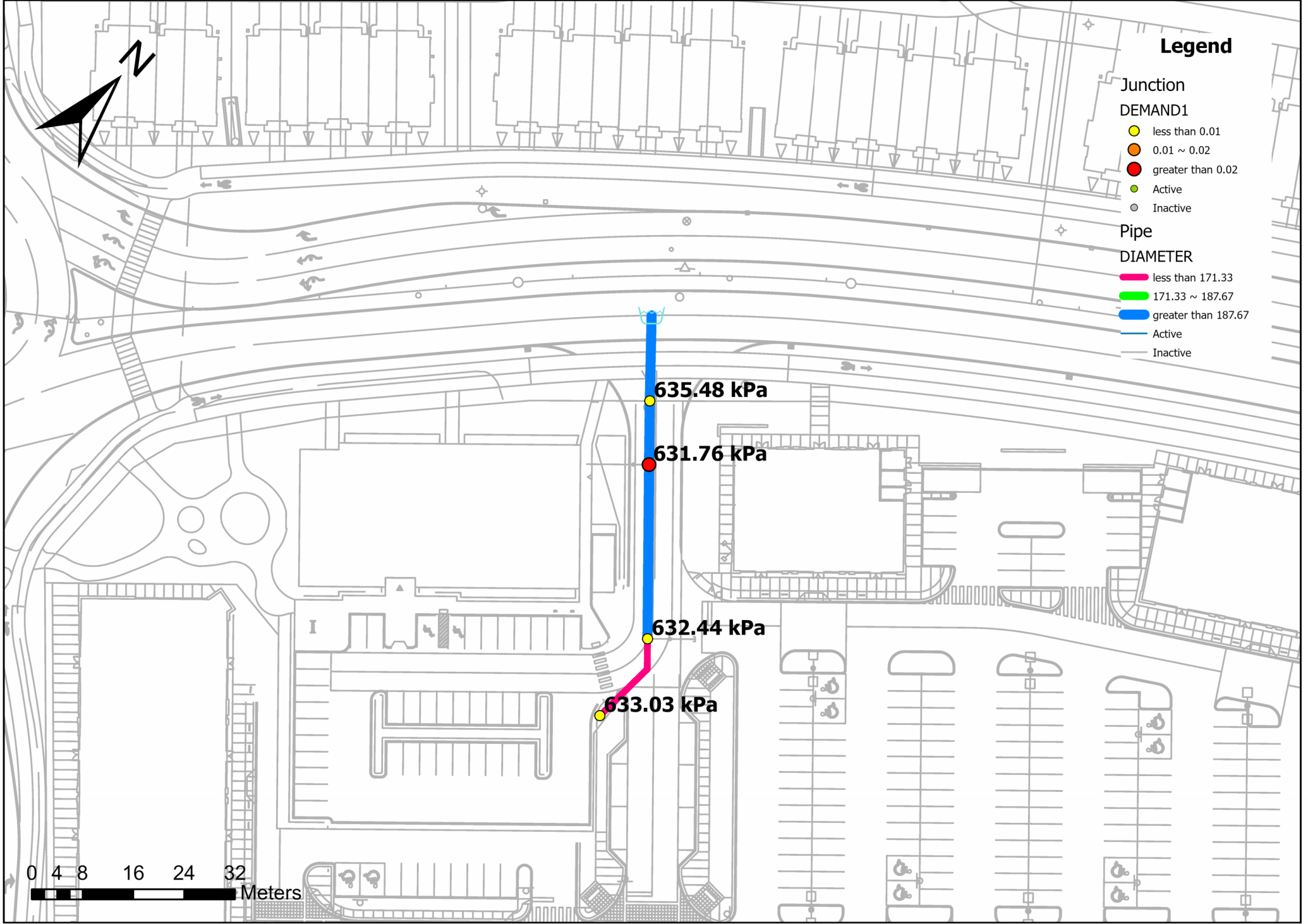


# Junctions and Pipes Layout





# Average Day Pressures



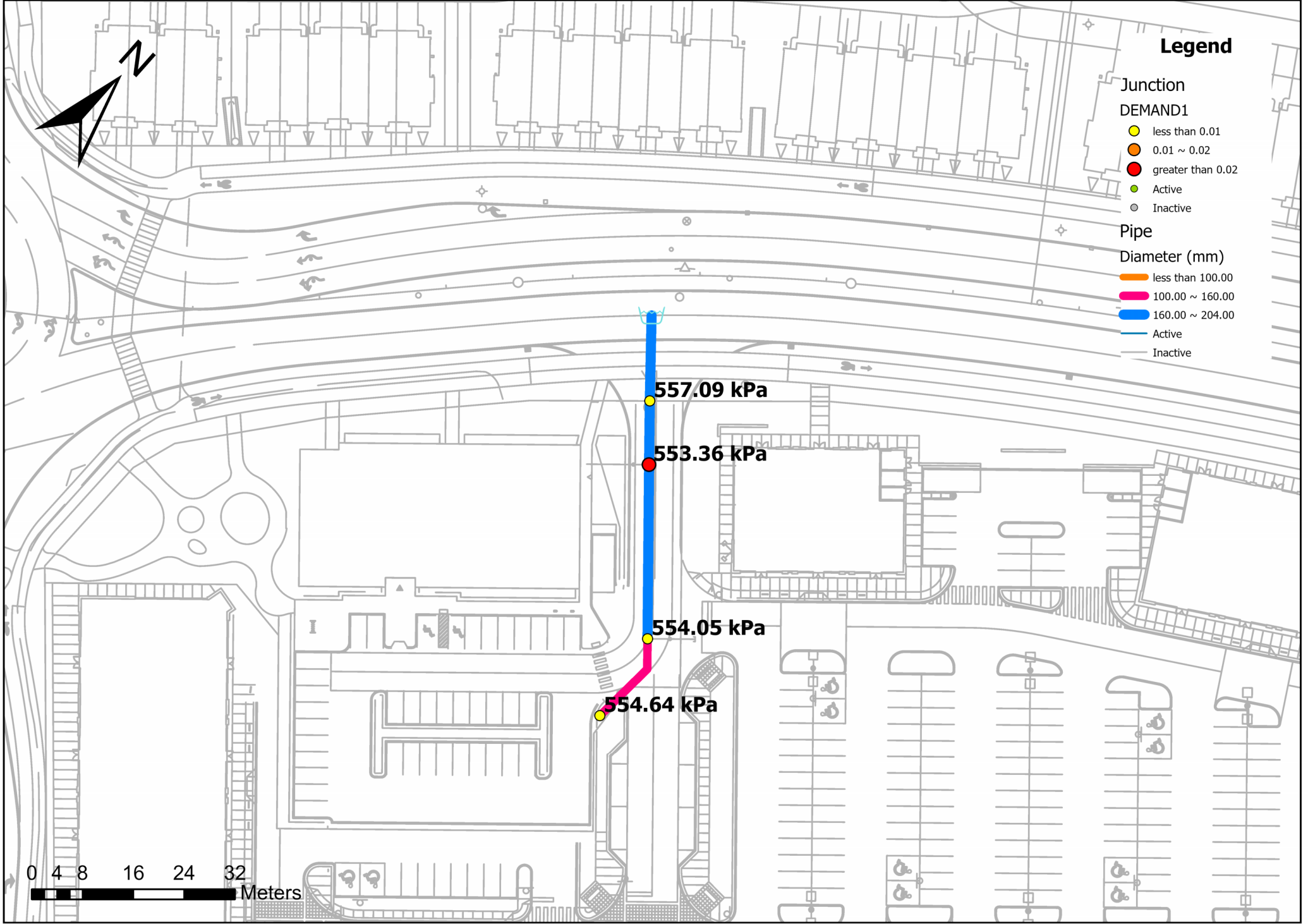


Average Day Pressures

		ID	Demand (L/s)	Elevation (m)	Head (m)	Pressure (kPa)
1	<input type="checkbox"/>	J1	0.00	98.25	160.70	611.96
2	<input type="checkbox"/>	J2	0.03	98.63	160.70	608.24
3	<input type="checkbox"/>	J3	0.00	98.56	160.70	608.92
4	<input type="checkbox"/>	J4	0.00	98.50	160.70	609.51



# Peak Hour Pressures



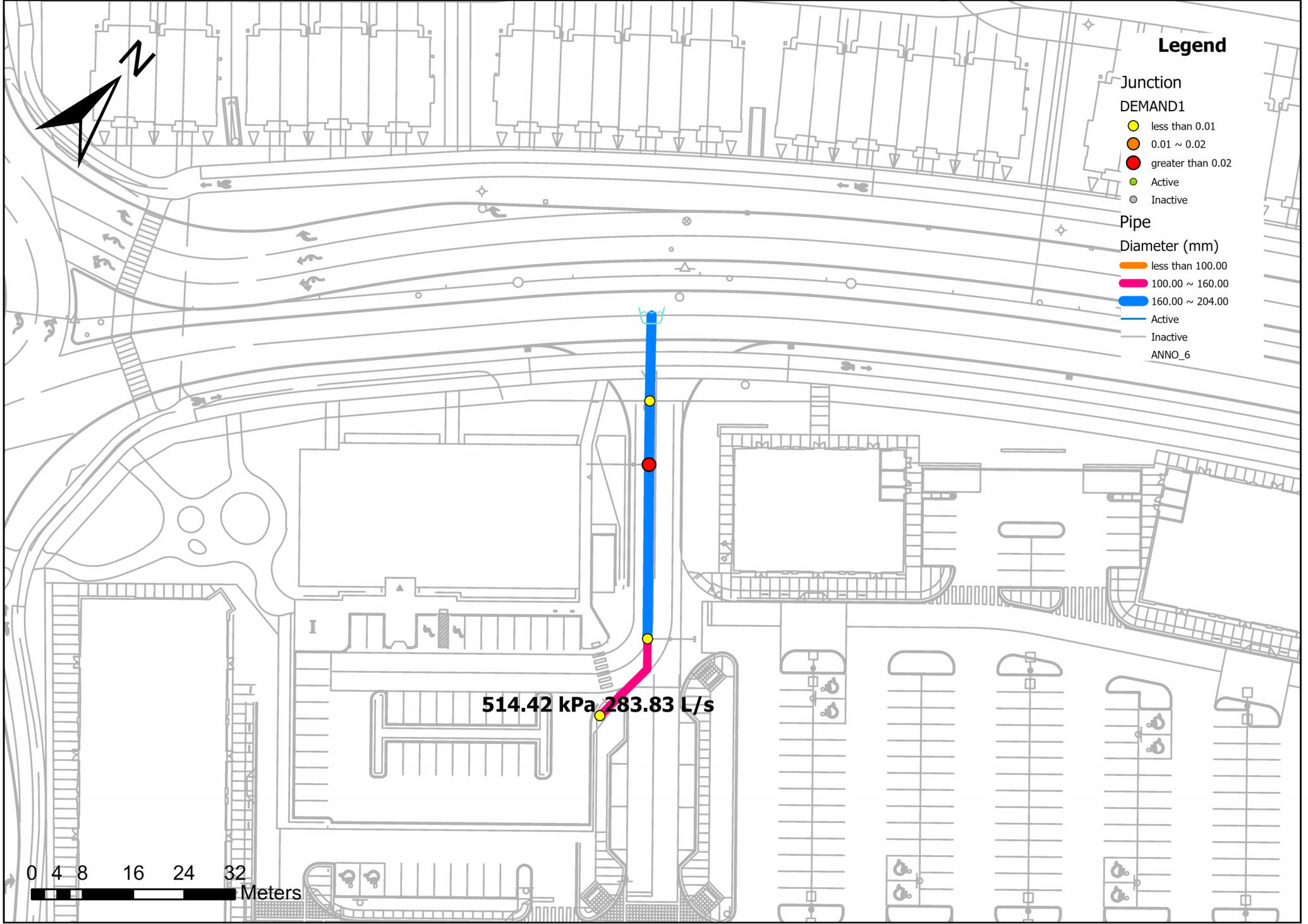


Peak Hour Pressures

		ID	Demand (L/s)	Elevation (m)	Head (m)	Pressure (kPa)
1	<input type="checkbox"/>	J1	0.00	98.25	155.10	557.09
2	<input type="checkbox"/>	J2	0.07	98.63	155.10	553.36
3	<input type="checkbox"/>	J3	0.00	98.56	155.10	554.05
4	<input type="checkbox"/>	J4	0.00	98.50	155.10	554.64



# Max Day + Fire Flow





Max Day + Fire Flow

		ID	Static Demand (L/s)	Static Pressure (kPa)	Static Head (m)	Fire-Flow Demand (L/s)	Residual Pressure (kPa)	Hydrant Available Flow (L/s)	Hydrant Pressure at Available Flow (kPa)
1	<input type="checkbox"/>	J4	0.00	557.58	155.40	83.33	514.42	283.83	140.0



# Appendix C

- **Sanitary Sewer Design Sheet**
- **Sanitary Drainage Area Plan 147391-C-400**
- **Sanitary Sewer Design Sheet 35355**
- **Sanitary Drainage Area Plan 35355-C-501**
- **Sanitary Sewer Design Sheet – Kanata West Servicibility Study**





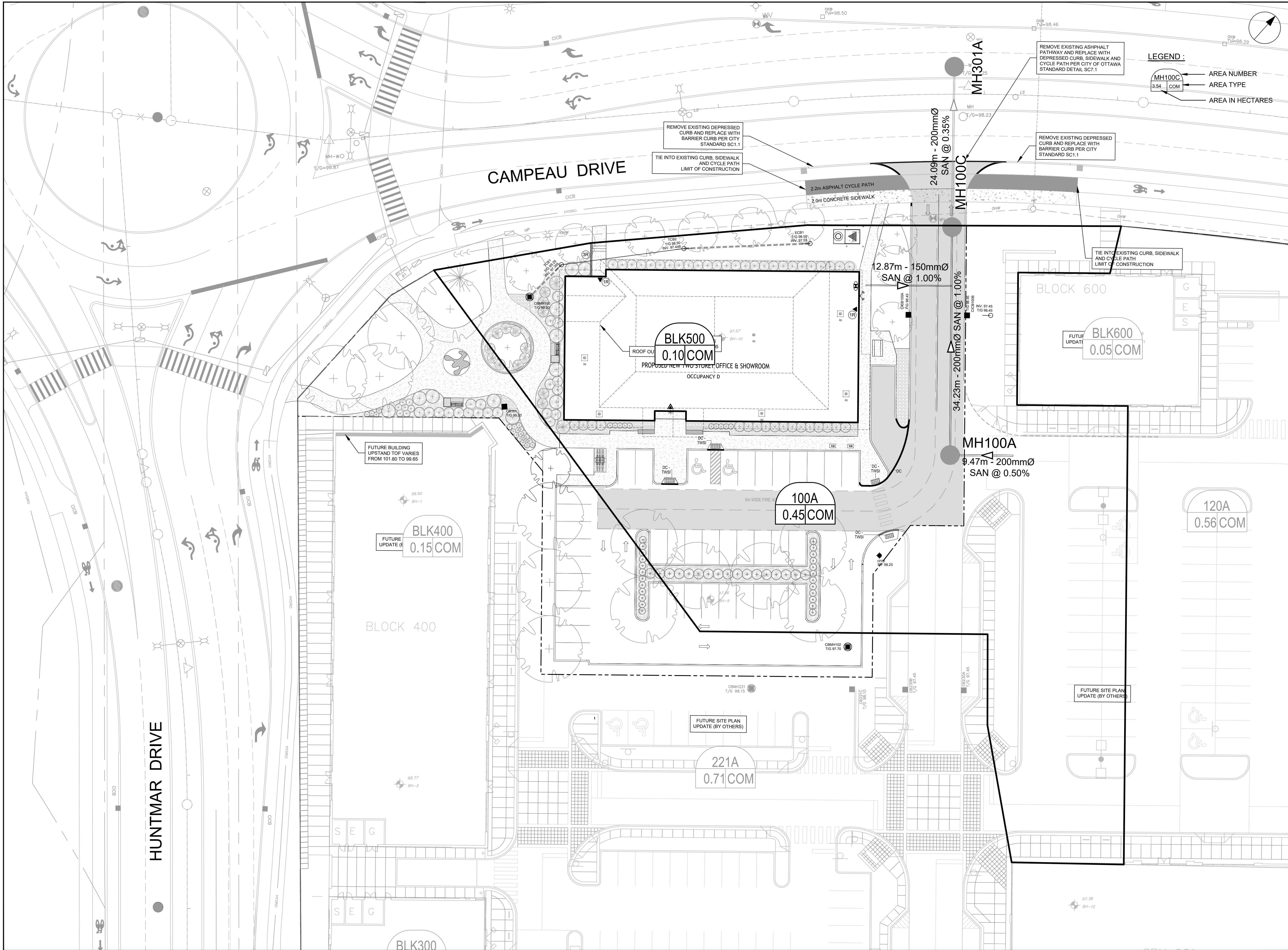
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Ottawa, Ontario K1S 5N4 Canada  
tel 613 225 1311 fax 613 225 9868  
[arcadis.com](http://arcadis.com)

## SANITARY SEWER DESIGN SHEET

147391 - Arcadia Commercial Site  
CITY OF OTTAWA  
Minto Communities

[illegible]





CLIENT

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Arcadis Professional Services (Canada) Inc.  
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No.	DESCRIPTION	DATE
1	SUBMISSION NO. 1 FOR CITY REVIEW	2024-11-13
2	REVISED AS PER CITY COMMENTS	2025-01-23
3	REVISED AS PER CITY COMMENTS	2025-03-07
4	REVISED AS PER CITY COMMENTS	2025-04-16
5	REVISED AS PER CITY AND MVCA COMMENTS	2025-04-30

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

KEY PLAN

CONSULTANTS

1:250

SEAL

PRIME CONSULTANT

333 Preston Street - Suite 500  
Ottawa ON K1S 5N4 Canada  
tel 613 225 1311  
www.arcadis.com

PROJECT

MINTO DESIGN CENTRE  
370 HUNTMAR DRIVE

PROJECT NO:  
147391

DRAWN BY:  
D.P.S.

PROJECT MGR:  
R.M.

CHECKED BY:  
D.G.Y.

APPROVED BY:  
R.M.

SHEET TITLE

SANITARY DRAINAGE AREA  
PLAN

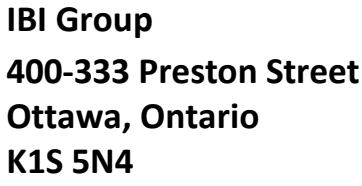
SHEET NUMBER

C-400

ISSUE

5

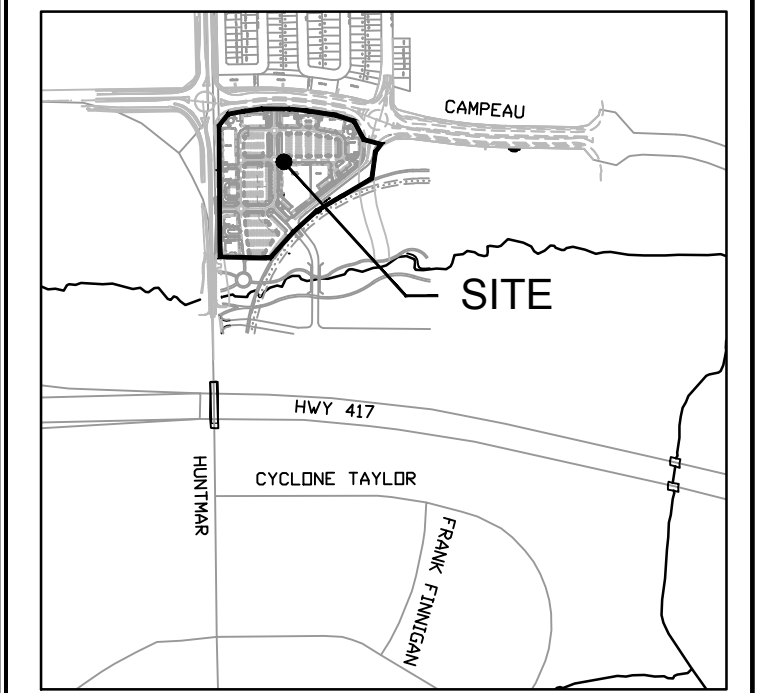
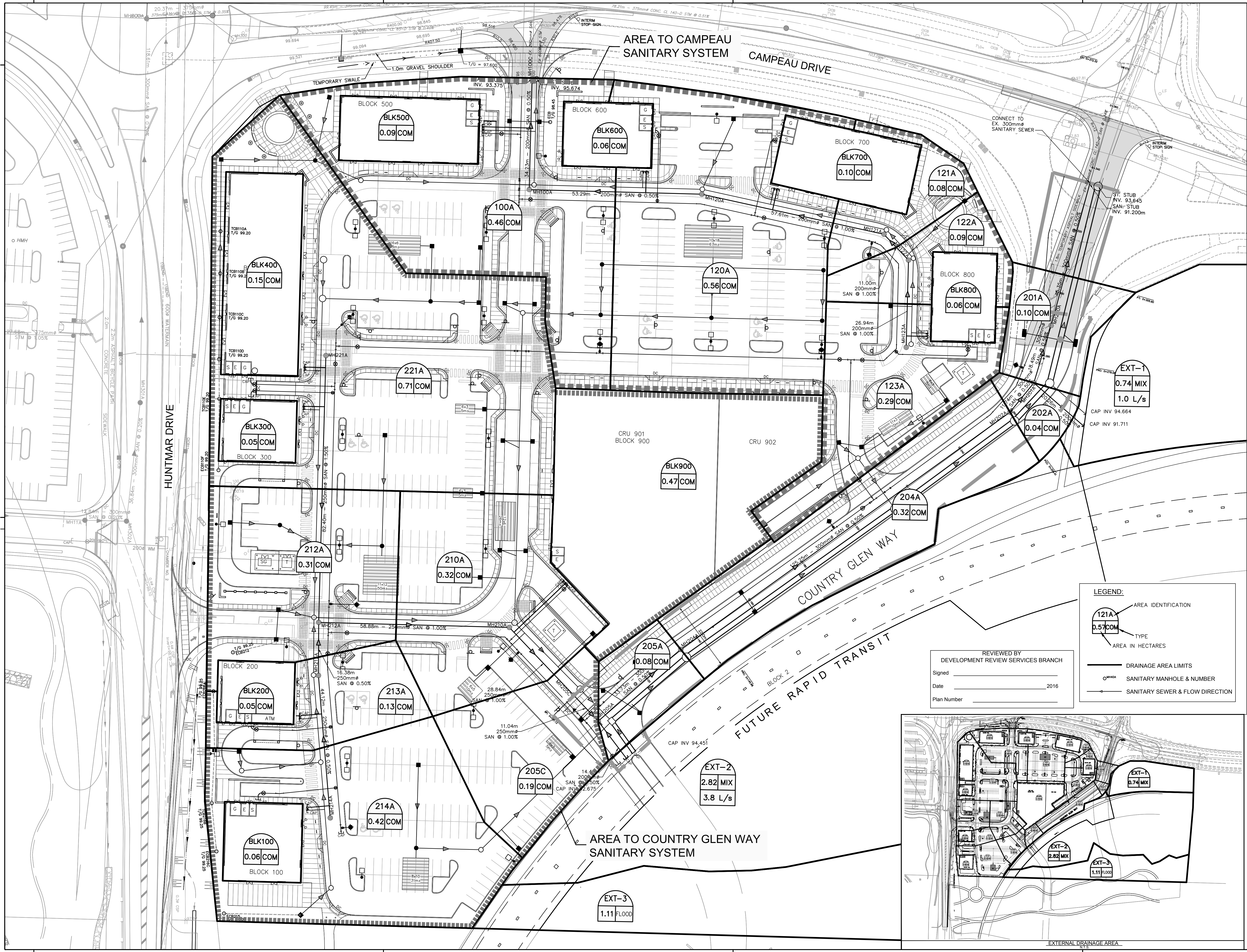




**PROJECT:** NAME OF PROJECT  
**LOCATION:** CITY OF OTTAWA  
**CLIENT:** NAME OF CLIENT

[https://arcadiso365.sharepoint.com/sites/Projects5/147391/Internal Documents/6.0\\_Technical/6.04\\_Civil/04\\_Design-Analysis/CCS\\_35355\\_sanitarysewers\\_2014-10-02](https://arcadiso365.sharepoint.com/sites/Projects5/147391/Internal Documents/6.0_Technical/6.04_Civil/04_Design-Analysis/CCS_35355_sanitarysewers_2014-10-02)





APPROVED ☐ REFUSED ☐

THIS \_\_\_\_ DAY OF \_\_\_\_\_, 20\_\_

DERRICK MOODIE, ACTING MANAGER  
DEVELOPMENT REVIEW, SUBURBAN SERVICES

5	Revised as per City Comments	16:08:26	DGY
4	Revised as per City Comments	14:10:02	DGY
3	Revised as per City Comments	14:08:22	DGY
2	Issued for SPA Resubmission	14:06:27	DGY
1	Issued for SPA	13.11.18	DGY
No.	Description	Date	Checked

Issued for

All measurements and conditions must be checked on the work by the contractor. This drawing not to be used for construction until signed.

Date \_\_\_\_\_

plotted 1:\35355-ArcadiaComm\5.9 Drawings\Special\Outputs\501.dwg  
Layout Name: Sanitary Drainage Plot Style: AIA  
STANDARD-FULL/CTB Plot Scale: 1:1 Plotted At: 9/1/2016 10:57  
AM Last Saved By: delima Last Saved At: Sep 1, 16

drawn by	DPS	scale	1:500
checked by	DGY	date	NOV. 2013
printed		file	35355

**Arcadia Retail Development**  
Kanata, Ontario

Minto Properties  
200 Kent Street • Suite 180 • Ottawa, Ontario • K1P 0B6  
Telephone: (613)782-3137 Fax: (613)782-5777

drawing title:  
**SANITARY DRAINAGE AREA PLAN**  
370 HUNTMAR DRIVE  
OTTAWA, ON.

drawing no.  
**C-501**

333 Preston Street Tower 1, Suite 400  
Ottawa, Ontario Canada K1S 5N4 Tel  
(613)225-1311 FAX (613)225-9868

REVIEWED BY  
DEVELOPMENT REVIEW SERVICES BRANCH

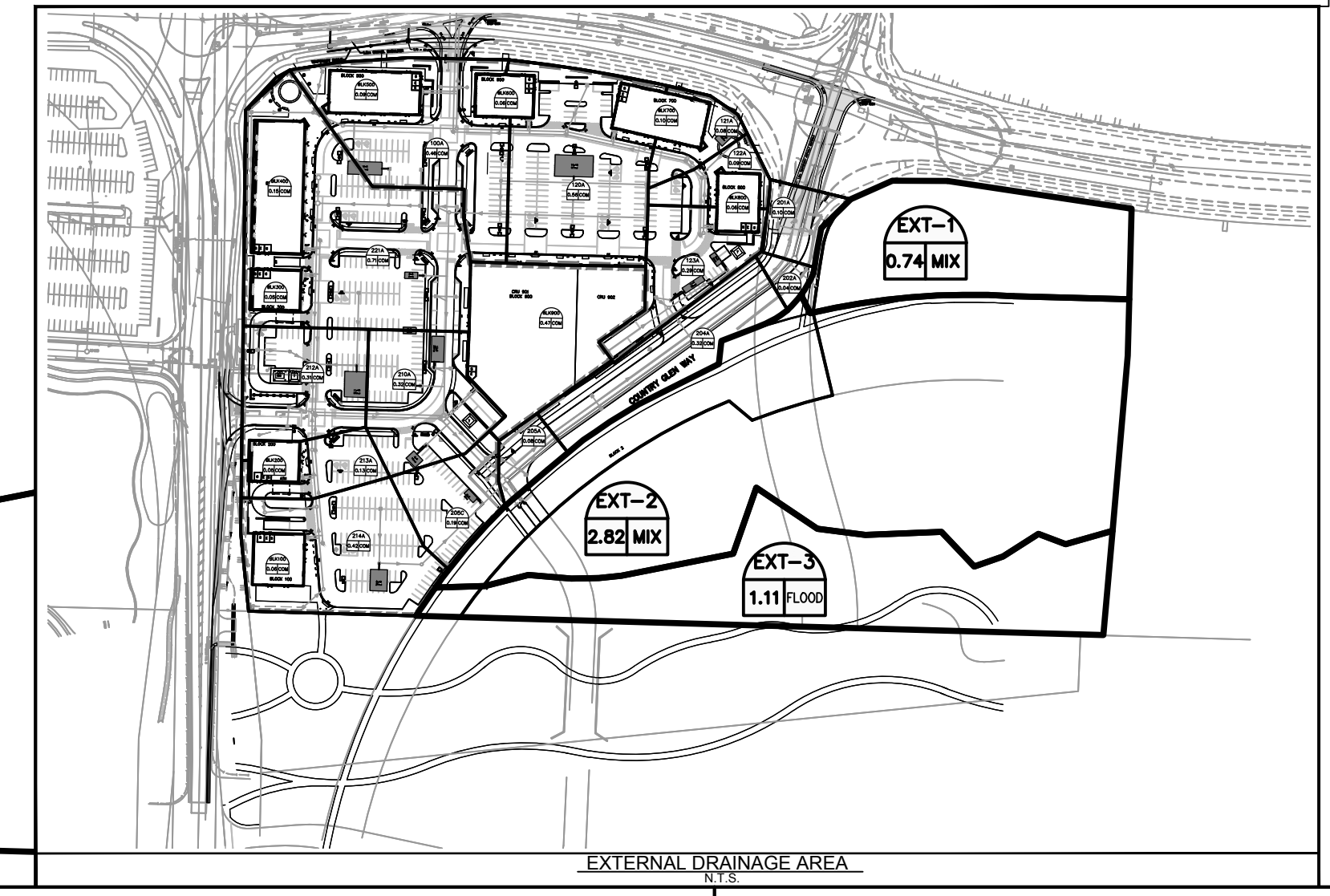
Signed \_\_\_\_\_

Date \_\_\_\_\_ 2016

Plan Number \_\_\_\_\_

**LEGEND:**

- 121A AREA IDENTIFICATION
- 0.57COM TYPE
- AREA IN HECTARES
- DRAINAGE AREA LIMITS
- MANHOLE & NUMBER
- SANITARY SEWER & FLOW DIRECTION



D07-12-14-0014



SANITARY SEWER DESIGN SHEET  
PROJECT : Kanata West Serviceability Study  
LOCATION : CITY OF OTTAWA

PAGE 1 OF 1  
PROJECT: 3596-LD-03  
DATE: April 2006  
DESIGN: JIM  
FILE: 3596LDsewers.XLS

MODEL 1 ULTIMATE (population based criteria, ICI simultaneous peaking)																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																											
LOCATION			TOTAL AREA (Ha)	APPLIC AREA (Ha)	UNIT/Ha	RESIDENTIAL				EMPLOYMENT/RETAIL/BUSINESS PARK/OPEN SPACES						INFILTRATION			TOTAL FLOW (l/s)	PROPOSED SEWER					HARMON PF	ACTUAL q/Q	va/Vf	ACTUAL VELOCITY (m/s)																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																															
STREET	FROM MH	TO MH				TOTAL UNITS	POPULATION INDIV	ACCUM	PEAK FACTOR	PEAK FLOW (l/s)	APPLIC AREA (Ha)	ACCUM AREA (Ha)	TOTAL AREA (Ha)	FLOW RATE (l/Ha/d)	INDIV (l/s)	ACCUM (l/s)	TOTAL (l/s)	INDIV		CUMUL	TOTAL CUMUL	PEAK FLOW (l/s)	CAPACITY l/s	VELOCITY (ft/s) m/s					LGTH. (m)	PIPE (mm)	GRADE %	AVAIL. CAP. (%)																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																											
Campeau Drive Trunk Sewer	1	2	Area 1 (PBP)	38.11										38.11	38.11		35000	23.16	23.16		38.11	38.11																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																					

Average Daily Per capita Flow Rate = 350 l/cap/d  
Infiltration Allowance Flow Rate = 0.28 l/sec/ha  
Infiltration Peaking Factor = 1 + (1.4 \* ((P - 0.5) \*\* 0.5)) P = Pop. in 1000's, Max of 4  
Infiltration density per unit = 3.00  
Flow of Employment/Retail/Business Park = 1.50  
Notes: Uses Assumes: 15% Community Retail, 42.5% Business Park and 42.5% Residential

Revision No. 1: April 01, 2005  
Revision No. 2: April 11, 2005  
Revision No. 3: April 21, 2005  
Revision No. 4: June 07, 2005  
Revision No. 5: August 10, 2005  
Revision No. 6: Oct. 14, 2005  
Revision No. 7: Nov. 10, 2005  
Revision No. 8: Nov. 11, 2005  
Revision No. 9: Apr. 19, 2006

FIG. 4.2-1



SANITARY SEWER DESIGN SHEET  
PROJECT : Kanata West Serviceability Study  
LOCATION : CITY OF OTTAWA

PAGE 1 OF 1  
PROJECT: 3598-LD-03  
DATE: Apr 2005  
DESIGN: JIM  
FILE: 3598LD.sewers.XLS

PHASE 1 SIGNATURE RIDGE (population based criteria, ICI simultaneous peaking)

LOCATION				TOTAL AREA	RESIDENTIAL						EMPLOYMENT/RETAIL/BUSINESS PARK/OPEN SPACES						INFILTRATION				TOTAL FLOW	PROPOSED SEWER								
STREET	FROM MH	TO MH	APPLIC AREA		UNIT/Ha	TOTAL UNITS	POPULATION INDIV	ACCUM	PEAK FACTOR	PEAK FLOW	APPLIC AREA	ACCUM AREA	TOTAL AREA	FLOW RATE	PEAK FLOW		INDIV	AREA (Ha)		PEAK FLOW		CAPACITY	VELOCITY	LGTH.	PIPE	GRADE	AVAIL. CAP.			
															INDIV	ACCUM		TOTAL	INDIV									CUMUL	TOTAL CUMUL	
				(Ha)	(Ha)					(l/s)	(Ha)	(Ha)	(Ha)	(l/Ha/d)	(l/s)	(l/s)	(l/s)	(l/s)	(l/s)	(l/s)	(l/s)	(m/s)	(m)	(mm)	(%)	(%)				
Campeau Drive Trunk Sewer	1	2	Area 1 (PBP)	0.00							0.00	0.00		35000	0.00	0.00		0.00	0.00											
			Area 2 (PBP)	0.00							0.00	0.00		35000	0.00	0.00		0.00	0.00											
			Area 3 Ext Employment	0.00							0.00	0.00		50000	0.00	0.00		0.00	0.00											
			Area 4 HP Employment	0.00							0.00	0.00	0.00	50000	0.00	0.00	0.00		0.00	0.00	0.00	0.00	0.00	283.79	1.27	500.0	525	0.40	100.00%	
			Area 5 Residential	29.19	29.19	19	555	1664	1664	3.65	24.58			0.00					0.00	29.19	29.19									
		2	3	Area 9 Ext Employment	0.00							0.00	0.00		50000	0.00	0.00	0.00		0.00	0.00	29.19	8.17	32.75	286.61	0.98	700.0	600	0.20	88.57%
				Area 6/8 Ext Employment	0.00							0.00	0.00	0.00	50000	0.00	0.00	0.00		0.00	0.00	0.00	0.00							
				Area 7 HP Employment	0.00							0.00	0.00	0.00	50000	0.00	0.00	0.00		0.00	0.00			148.74	0.91	920.0	450	0.25	100.00%	
3	4		Area 10 Residential	27.86	27.86	19	529	1588	1588	3.66	23.55						27.86	27.86	27.86	7.80	31.36	34.00	0.67	750.0	450	0.25	7.76%			
4A	4		14 Mixed Use	4.13	1.76	50	88	263	3515	3.38	48.17	2.37	2.37	123.33	35000	1.44	1.44	1.44	4.13	4.13	61.18	17.13	66.74	200.67	0.90	600.0	750	0.20	66.74%	
Corel Centre Etc. (Existing Sewer)		15	Area 35 HP Employment	6.05							6.05	6.05		30000	3.15	3.15			6.05											
			Area 36 (Corel Centre)																		30.00									
			Area 38 Exten Employment	20.15							20.15	26.20	26.20	14400	5.04	8.19	8.19		20.15	26.20	26.20	7.34	45.52			Existing				
			Area 40 Employment	14.59							14.59	14.59		35000	8.87	8.87			14.59	14.59										
			Area 41 Employment	11.97							11.97	26.56		35000	7.27	16.14			11.97	26.56										
First Line Road Sewer		15	Area 42 Employment	20.66							20.66	47.22		35000	12.55	28.69			20.66	47.22										
			Area 43 Employment	28.89							28.89	76.11	76.11	35000	17.55	46.25	46.25		28.89	76.11	76.11	21.31	67.56	100.21	0.88	694.0	375	0.30	32.59%	
			Totals South Of Queensway To SRPS	102.31	0.00		0	0		0.00	102.31					54.44			102.31		58.65	113.08	203.90	1.24	230.0	450	0.47	44.54%		
			Queensway	5		Area 13 Community Retail	6.35						6.35	108.66		35000	3.86	58.29			6.35	6.35								
						Area 11/12 Mixed Use	11.80	5.02	50	251	752	752	3.88	11.81	6.79	115.45	115.45	35000	4.12	62.42	62.42	11.80	18.15	120.46	63.73	137.96	203.90	1.24	420.0	450
	5	5A	Area 15 Community Retail	3.88							3.88	119.33		35000	2.36	64.77			3.88	124.34										
			Area 44	25.54							25.54	144.87	268.20	35000	15.52	81.73	81.73		25.54	149.88	211.06	89.10	230.81	519.43	1.14	300.0	750	0.20	55.56%	
				149.88																	63.73	63.73								
			Heritage Hills	90.20	90.20	19	1714	5141	5141	3.23	67.35	0.00								90.20										
			Heritage Hills	4.88							67.35	4.88	4.88	50000	4.24	4.24	4.24		4.88	95.08	95.08	26.62	98.21							
Broughton-Richardson / Interstitial		5A																	65.00											
Total To SRPS	5A	SRPS		306.14	154.03		3136	9409		127.33	152.12					85.97					306.14	115.72	394.02	625.68	1.37	30.0	750	0.29	37.03%	

Revision No. 1: April 11, 2005

Average Daily Per capita Flow Rate = 350 l/cap/d  
Infiltration Allowance Flow Rate = 0.28 l/sec/Ha  
Residential Peaking Factor =  $1 + (14 / (4 + (P^{0.5})))$ , P=Pop. in 1000's, Max of 4  
Population density per unit = 3.00  
P. F. For Employment/Retail/Business Park = 1.50  
Mixed Uses Assumes: 15% Community Retail, 42.5% Business Park and 42.5% Residential

Note: Sewer from node 5 to SRPS is existing and is to be replaced.

Revision No. 1: April 11, 2005  
Revision No. 2: April 20, 2005  
Revision No. 3: June 07, 2005  
Revision No. 4: Oct. 14, 2005  
Revision No. 5: Feb. 15, 2006



# Appendix D

- **Storm Sewer Design Sheet**
- **Storm Drainage Area Plan 147391-C-500, C-501, C-502**
- **Ponding Plan 147391-C-600**
- **Storm Water Management Calculations**
- **Orifice Sizing Calculations**
- **Overflow Depth Calculations**
- **Runoff Coefficient Calculations**
- **Stormtech Chamber Specifications**
- **Watts Adjustable Flow Control for Roof Drains**
- **Storm Sewer Design Sheet & SWM Design Summary 53533**
- **Storm Drainage Area Plan 53533-C-500**

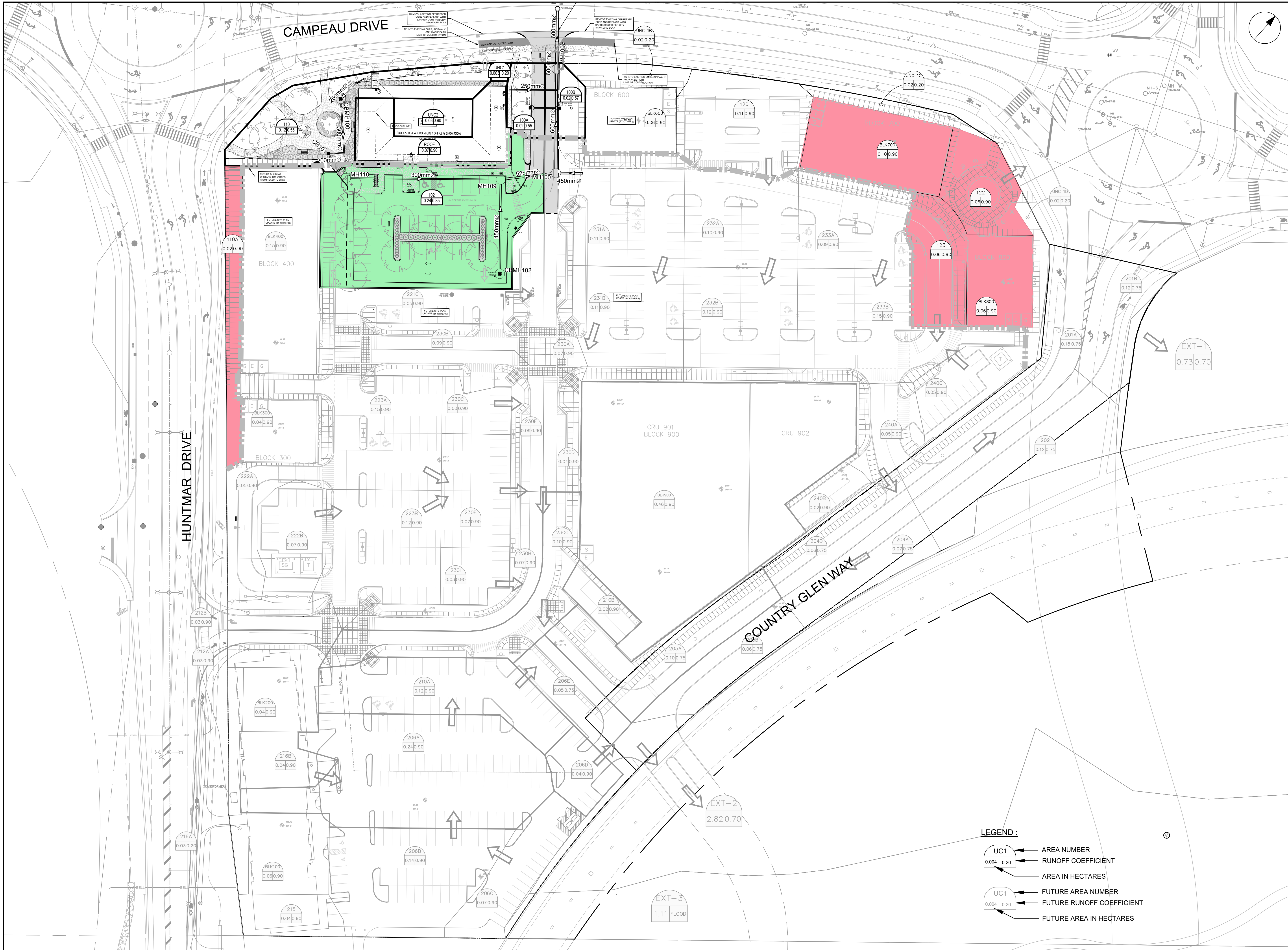




147391 - Arcadia Commercial Site  
CITY OF OTTAWA  
Minto Properties

[https://arcadiso365.sharepoint.com/sites/147391/internal Documents/6.0 Technical/6.04 Civil/04 Design-Analysis/Submission No.4/CCS 147391 Storm ArcadiaComm 2025-04-16](https://arcadiso365.sharepoint.com/sites/147391/internal%20Documents/6.0%20Technical/6.04%20Civil/04%20Design-Analysis/Submission%20No.4/CCS%20147391%20Storm%20ArcadiaComm%202025-04-16)





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1	SUBMISSION NO. 1 FOR CITY REVIEW	2024-11-13
2	REVISED AS PER CITY COMMENTS	2025-01-23
3	REVISED AS PER CITY COMMENTS	2025-03-07
4	REVISED AS PER CITY COMMENTS	2025-04-16
5	REVISED AS PER CITY AND MVCA COMMENTS	2025-04-30

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

KEY PLAN

CONSULTANTS

1:500 0 5 10 15 20 25m

SEAL

PRIME CONSULTANT

333 Preston Street - Suite 500  
Ottawa ON K1S 5N4 Canada  
tel 613 225 1311  
[www.arcadis.com](http://www.arcadis.com)

PROJECT

MINTO DESIGN CENTRE  
370 HUNTMAR DRIVE

PROJECT NO:  
147391

DRAWN BY:  
D.P.S.

PROJECT MGR:  
R.M.

CHECKED BY:  
D.G.Y.

APPROVED BY:  
R.M.

SHEET TITLE

STORM DRAINAGE AREA PLAN

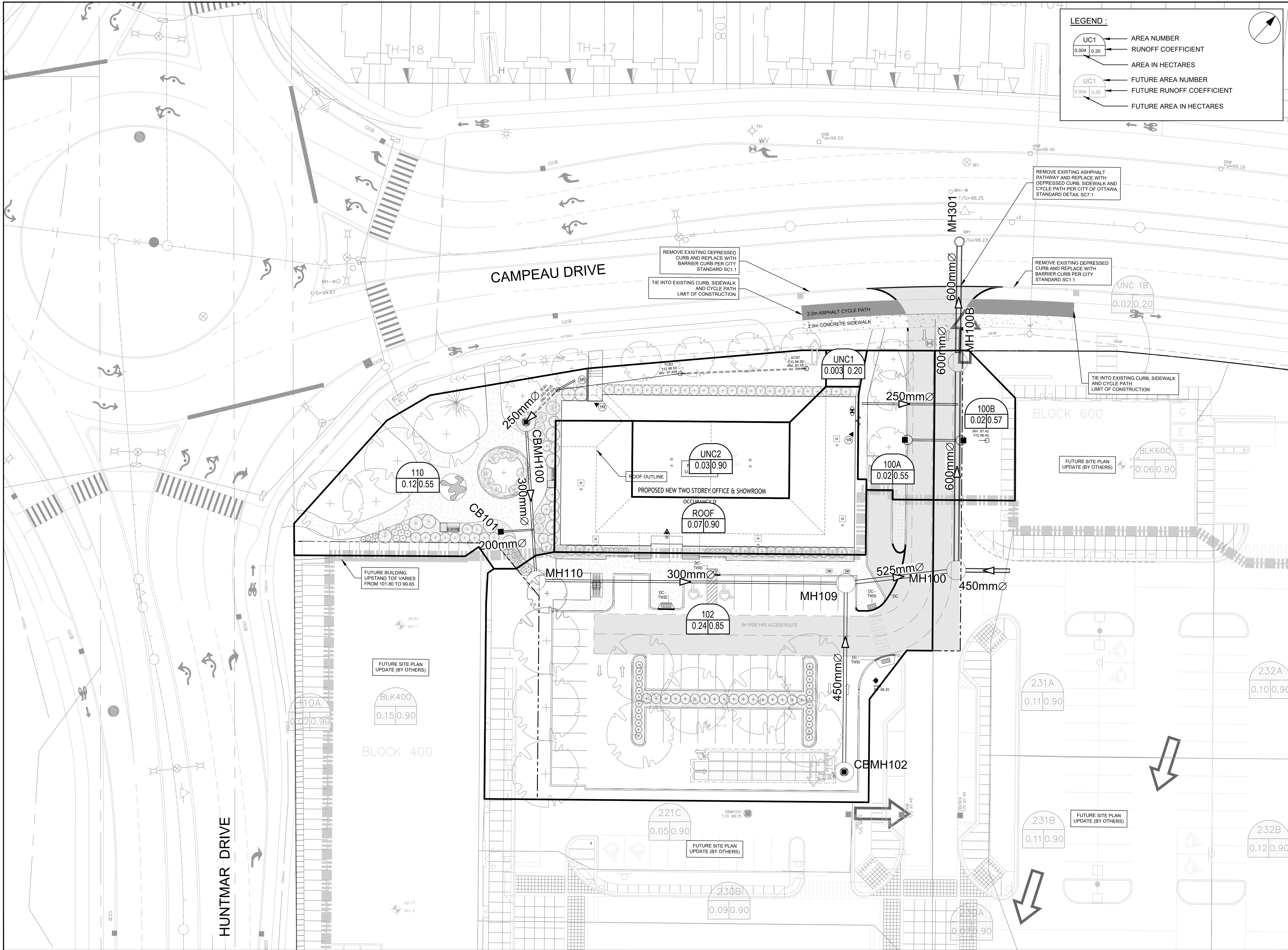
SHEET NUMBER

C-500

ISSUE

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No.	DESCRIPTION	DATE
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3	REVISED AS PER CITY COMMENTS	2025-03-07
4	REVISED AS PER CITY COMMENTS	2025-04-16
5	REVISED AS PER CITY AND MVCA COMMENTS	2025-04-30

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

CONSULTANTS

1:250 0 2.5 7.5 12.5m

SEAL

PRIME CONSULTANT

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www.arcadis.com

PROJECT

MINTO DESIGN CENTRE  
370 HUNTMAR DRIVE

PROJECT NO:  
147391

DRAWN BY:  
D.P.S.

PROJECT MGR:  
R.M.

CHECKED BY:  
D.G.Y.

APPROVED BY:  
R.M.

SHEET TITLE

DESIGN CENTRE  
STORM DRAINAGE  
AREA PLAN

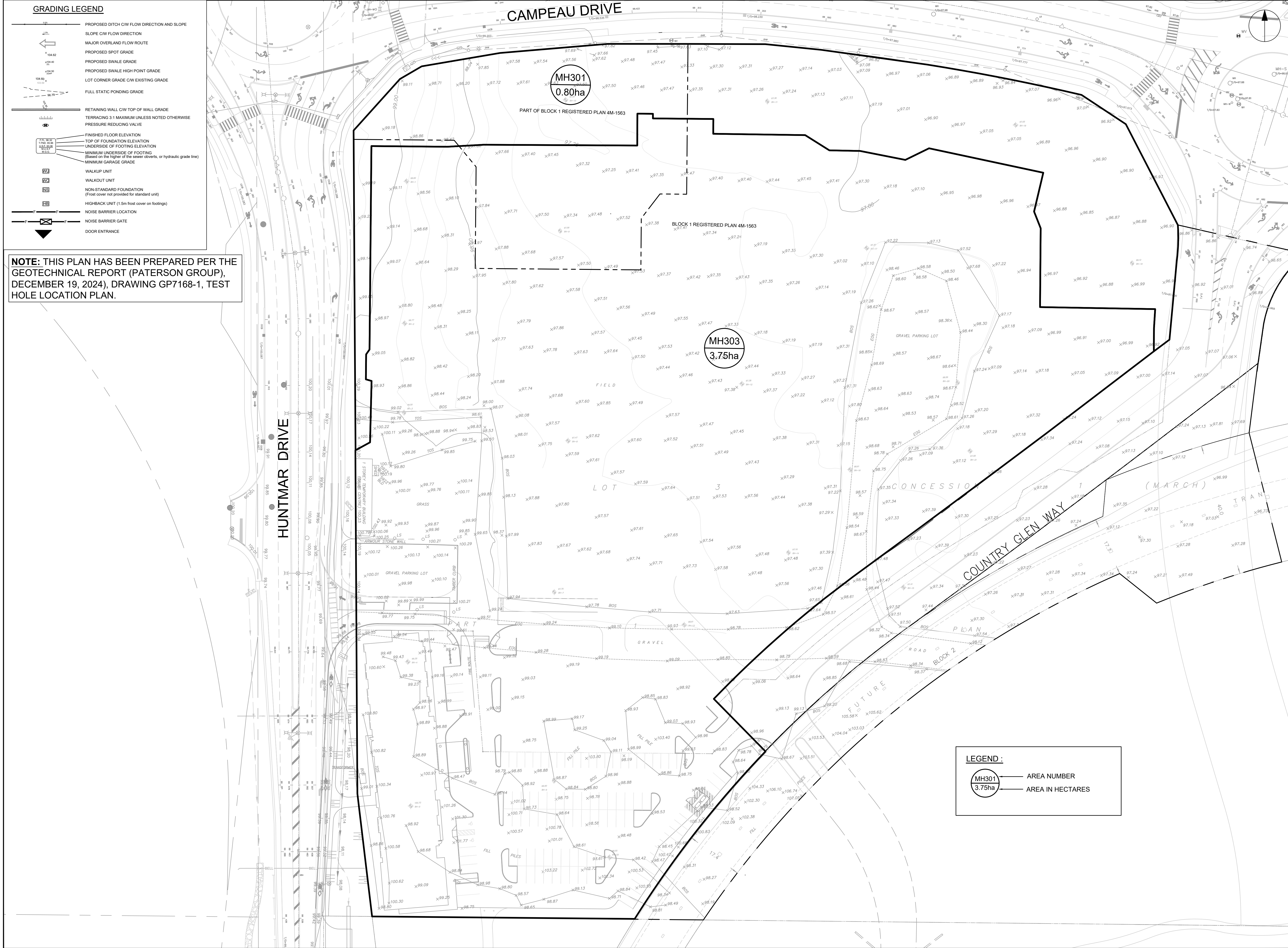
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C-501

ISSUE

5





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**Arcadis Professional Services (Canada) Inc.**  
Formerly ISI Group Professional Services (Canada) Inc.

**ISSUES**

No.	DESCRIPTION	DATE
1	REVISED AS PER CITY AND MVCA COMMENTS	2025-04-30
2		
3		
4		
5		

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

**KEY PLAN**

**CONSULTANTS**

**SEAL**

**LICENCED PROFESSIONAL ENGINEER**  
D. Yanopoulos  
2025/04/30  
PROVINCE OF ONTARIO

**LICENCED PROFESSIONAL ENGINEER**  
W. ZHUANG  
2025/04/30  
PROVINCE OF ONTARIO

**PRIME CONSULTANT**

**ARCADIS**

333 Preston Street - Suite 500  
Ottawa ON K1S 5N4 Canada  
tel 613 225 1311  
www.arcadis.com

**PROJECT**

**MINTO DESIGN CENTRE**  
**370 HUNTMAR DRIVE**

**PROJECT NO:**  
147391

**DRAWN BY:**  
D.P.S.

**CHECKED BY:**  
D.G.Y.

**PROJECT MGR:**  
R.M.

**APPROVED BY:**  
R.M.

**SHEET TITLE**

**PRE-DEVELOPMENT DRAINAGE PLAN**

**SHEET NUMBER**

**C-502**

**ISSUE**

**1**









Formulas and Descriptions

$i_{2yr} = 1:2 \text{ year Intensity} = 732.951 / (T_c + 6.199)^{0.810}$   
 $i_{5yr} = 1:5 \text{ year Intensity} = 998.071 / (T_c + 6.053)^{0.814}$   
 $i_{100yr} = 1:100 \text{ year Intensity} = 1735.688 / (T_c + 6.014)^{0.820}$   
 $T_c$  = Time of Concentration (min)  
C = Average Runoff Coefficient  
A = Area (Ha)  
Q = Flow = 2.78CiA (L/s)

Maximum Allowable Release Rate

Restricted Flowrate

Per the previously completed SWM calculations for the overall commercial site development, the total flow to Outlet #2 (Ex. MH301) is calculated at 125.94 L/s.

$Q_{restricted} =$

125.94 L/s

Uncontrolled Release ( $Q_{uncontrolled} = 2.78 \cdot C \cdot i_{100yr} \cdot A_{uncontrolled}$ ) for 100-yr storm event

Uncontrolled Area UNC1, UNC1B, UNC1C, UNC1D

$C_{100} =$

0.25

$T_c =$

10 min

$i_{100yr} =$

178.56 mm/hr

$A_{uncontrolled} =$

0.063 Ha

$Q_{uncontrolled\ 1} =$

7.82 L/s

$Q_{uncontrolled} =$

21.17 L/s

Uncontrolled Roof Area UNC2

$C_{100} =$

1.0

$T_c =$

10 min

$i_{100yr} =$

178.56 mm/hr

$A_{uncontrolled} =$

0.027 Ha

$Q_{uncontrolled\ 2} =$

13.35 L/s

Maximum Allowable Release Rate ( $Q_{max\ allowable} = Q_{restricted} - Q_{uncontrolled}$ )

$Q_{max\ allowable} =$

104.77 L/s





MODIFIED RATIONAL METHOD (100-Year, 5-Year & 2-Year Ponding)

Drainage Area		FUT 600						
Area (Ha)	0.06	Restricted Flow ICD <i>Actual</i> (L/s)= 2.00						
C =	1.00	Restricted Flow Q <i>r</i> for swm calc (L/s)= 2.00						
		50% reduction if sub-surface storage						
100-Year Ponding						100-Year +20% Ponding		
T <sub>c</sub> Variable (min)	i <sub>100yr</sub> (mm/hour)	Peak Flow Q <sub>p</sub> =2.78xCi <sub>100yr</sub> A (L/s)	Q <sub>r</sub> (L/s)	Q <sub>p</sub> -Q <sub>r</sub> (L/s)	Volume 100yr (m <sup>3</sup> )	100YRQ <sub>p</sub> 20% (L/s)	Qp - Qr (L/s)	Volume 100+20 (m <sup>3</sup> )
69	50.33	8.40	2.00	6.40	26.48			
70	49.79	8.30	2.00	6.30	26.48			
71	49.26	8.22	2.00	6.22	26.48	9.86	7.86	33.48
72	48.74	8.13	2.00	6.13	26.48			
73	48.23	8.05	2.00	6.05	26.48			

Storage ( $m^3$ )					100+20		
Overflow	Required	Surface	Sub-surface	Balance	Overflow	Required	Balance
0.00	26.48	33.75	0	0.00	0.00	33.48	0.00
					convert to flow with peak Tc (L/s)		
					0.00		
overflows to: FUT 120							

Calculations for future block 600 taken from overall Arcadia Commercial site plan swm calculations

Drainage Area		FUT 600			
Area (Ha)	0.06				
C =	0.90	Restricted Flow $Q_r$ (L/s)= 2.00			
2-Year Ponding					
$T_c$ Variable (min)	$i_{2yr}$ (mm/hour)	Peak Flow $Q_p=2.78 \times C i_{2yr} A$ (L/s)	$Q_r$ (L/s)	$Q_p-Q_r$ (L/s)	Volume 2yr ( $m^3$ )
27	42.95	6.45	2.00	4.45	7.21
28	41.93	6.29	2.00	4.29	7.21
29	40.96	6.15	2.00	4.15	7.22
30	40.04	6.01	2.00	4.01	7.22
31	39.17	5.88	2.00	3.88	7.22

Storage ( <i>m<sup>3</sup></i> )				
Overflow	Required	Surface	Sub-surface	Balance
0.00	7.22	33.75	0	0.00
overflows to: FUT 120				

Drainage Area		FUT 120						
Area (Ha)	0.11	Restricted Flow ICD <i>Actual</i> (L/s)=		15.00				
C =	1.00	Restricted Flow $Q_r$ for swm calc (L/s)=		15.00				
50% reduction if sub-surface storage								
100-Year Ponding						100-Year +20% Ponding		
$T_c$ Variable (min)	$i_{100yr}$ (mm/hour)	Peak Flow $Q_p = 2.78 \times C i_{100yr} A$ (L/s)	$Q_r$ (L/s)	$Q_p - Q_r$ (L/s)	Volume 100yr ( $m^3$ )	100YR $Q_p$ 20% (L/s)	$Q_p - Q_r$ (L/s)	Volume 100+20 ( $m^3$ )
16	137.55	42.06	15.00	27.06	25.98			
17	132.63	40.56	15.00	25.56	26.07			
18	128.08	39.17	15.00	24.17	26.10	47.00	32.00	34.56
19	123.87	37.88	15.00	22.88	26.08			
20	119.95	36.68	15.00	21.68	26.02			

Storage ( $m^3$ )					100+20		
Overflow	Required	Surface	Sub-surface	Balance	Overflow	Required	Balance
0.00	26.10	33.99	0	0.00	0.00	34.56	0.57
					convert to flow with peak Tc (L/s)		
					0.53		
overflows to: offsite							

Calculations for future block 120 taken from overall Arcadia Commercial site plan swm calculations

Drainage Area		FUT 120			
Area (Ha)	0.11				
C =	0.90	Restricted Flow $Q_r$ (L/s)=	15.00		
2-Year Ponding					
$T_c$ Variable (min)	$i_{2yr}$ (mm/hour)	Peak Flow $Q_p=2.78 \times C i_{2yr} A$ (L/s)	$Q_r$ (L/s)	$Q_p-Q_r$ (L/s)	Volume 2yr ( $m^3$ )
5	103.57	28.50	15.00	13.50	4.05
6	96.64	26.60	15.00	11.60	4.17
7	90.66	24.95	15.00	9.95	4.18
8	85.46	23.52	15.00	8.52	4.09
9	80.87	22.26	15.00	7.26	3.92

Storage ( <i>m<sup>3</sup></i> )				
Overflow	Required	Surface	Sub-surface	Balance
0.00	4.18	61.88	0	0.00
overflows to: offsite				





STORMWATER MANAGEMENT

Drainage Area		ROOF						
Area (Ha)	0.07	Restricted Flow ICD <small>Actual</small> (L/s)= 10.00						
C =	1.00	Restricted Flow Q <sub>r</sub> for swm calc (L/s)= 10.00						
50% reduction if sub-surface storage								
100-Year Ponding						100-Year +20% Ponding		
$T_c$ Variable (min)	$i_{100yr}$ (mm/hour)	Peak Flow $Q_p=2.78xCi_{100yr}A$ (L/s)	$Q_r$ (L/s)	$Q_p-Q_r$ (L/s)	Volume 100yr (m <sup>3</sup> )	100YRQ <sub>p</sub> 20% (L/s)	Qp - Qr (L/s)	Volume 100+20 (m <sup>3</sup> )
15	142.89	27.29	10.00	17.29	15.56			
16	137.55	26.27	10.00	16.27	15.62			
17	132.63	25.33	10.00	15.33	15.64	30.40	20.40	20.80
18	128.08	24.46	10.00	14.46	15.62			
19	123.87	23.66	10.00	13.66	15.57			

Storage (m <sup>3</sup> )					100+20			
Overflow	Required	Surface	Sub-surface	Balance	Overflow	Required	Balance	
0.00	15.64	18.15	0	0.00	0.00	20.80	2.65	
					convert to flow with peak Tc (L/s)		2.60	

overflows to: 102

Drainage Area		ROOF			
Area (Ha)	0.07				
C =	0.90	Restricted Flow Q <sub>r</sub> (L/s)= 10.00			
2-Year Ponding					
$T_c$ Variable (min)	$i_{2yr}$ (mm/hour)	Peak Flow $Q_p = 2.78 \times C i_{2yr} A$ (L/s)	$Q_r$ (L/s)	$Q_p - Q_r$ (L/s)	Volume 2yr (m <sup>3</sup> )
4	111.72	19.20	10.00	9.20	2.21
5	103.57	17.80	10.00	7.80	2.34
6	96.64	16.61	10.00	6.61	2.38
7	90.66	15.58	10.00	5.58	2.35
8	85.46	14.69	10.00	4.69	2.25

Storage (m <sup>3</sup> )				
Overflow	Required	Surface	Sub-surface	Balance
0.00	2.38	18.15	0	0.00

overflows to: 102.00

15.47

Note: The roof storage volume was calculated by taking the following into consideration:  
Flat roof area = 363m2 with no obstructions (i.e. 100% of usable area), max ponding depth of 0.15m

Drainage Area		110						
Area (Ha)	0.12	Restricted Flow ICD <sub>Actual</sub> (L/s)= 28.00						
C =	0.69	Restricted Flow Q <sub>r</sub> for swm calc (L/s)= 28.00						
50% reduction if sub-surface storage								
100-Year Ponding						100-Year +20% Ponding		
$T_c$ Variable (min)	$i_{100yr}$ (mm/hour)	Peak Flow $Q_p = 2.78 \times C i_{100yr} A$ (L/s)	$Q_r$ (L/s)	$Q_p - Q_r$ (L/s)	Volume 100yr (m <sup>3</sup> )	100YRQ <sub>p</sub> 20% (L/s)	Qp - Qr (L/s)	Volume 100+20 (m <sup>3</sup> )
4	262.41	58.18	28.00	30.18	7.24			
5	242.70	53.81	28.00	25.81	7.74			
6	226.01	50.11	28.00	22.11	7.96	60.13	32.13	11.57
7	211.67	46.93	28.00	18.93	7.95			
8	199.20	44.16	28.00	16.16	7.76			

Storage (m <sup>3</sup> )					100+20			
Overflow	Required	Surface	Sub-surface	Balance	Overflow	Required	Balance	
0.00	7.96	8.49	0	0.00	0.00	11.57	3.08	
					convert to flow with peak Tc (L/s)		8.55	

overflows to: Campeau Drive

Drainage Area		110			
Area (Ha)	0.12				
C =	0.55		Restricted Flow Q <sub>r</sub> (L/s)= 28.00		
2-Year Ponding					
T <sub>c</sub> Variable (min)	i <sub>2yr</sub> (mm/hour)	Peak Flow Q <sub>p</sub> = 2.78xCi <sub>2yr</sub> A (L/s)	Q <sub>r</sub> (L/s)	Q <sub>p</sub> -Q <sub>r</sub> (L/s)	Volume 2yr (m <sup>3</sup> )
8	85.46	15.16	28.00	-12.84	-6.16
9	80.87	14.34	28.00	-13.66	-7.37
10	76.81	13.62	28.00	-14.38	-8.63
11	73.17	12.98	28.00	-15.02	-9.92
12	69.89	12.40	28.00	-15.60	-11.23

Storage (m <sup>3</sup> )				
Overflow	Required	Surface	Sub-surface	Balance
0.00	0.00	8.49	0	0.00

overflows to: Campeau Drive





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STORMWATER MANAGEMENT

Arcadia Comm | Minto Properties  
147391-6.0 | Rev #4R | 2025-04-25  
Prepared By: MP | Checked By: RM/WZ

Drainage Area		102						
Area (Ha)	0.24	Restricted Flow ICD <small>Actual</small> (L/s)=	25.00					
C =	1.00	Restricted Flow $Q_r$ for swm calc (L/s)=	12.50	50% reduction if sub-surface storage				
100-Year Ponding						100-Year +20% Ponding		
$T_c$ Variable (min)	$i_{100yr}$ (mm/hour)	Peak Flow $Q_p = 2.78 \times C i_{100yr} A$ (L/s)	$Q_r$ (L/s)	$Q_p - Q_r$ (L/s)	Volume 100yr ( $m^3$ )	100YR $Q_p$ 20% (L/s)	$Q_p - Q_r$ (L/s)	Volume 100+20 ( $m^3$ )
44	70.18	46.82	12.50	34.32	90.62			
45	69.05	46.07	12.50	33.57	90.64			
46	67.96	45.34	12.50	32.84	90.65	54.41	41.91	115.68
47	66.91	44.64	12.50	32.14	90.64			
48	65.89	43.96	12.50	31.46	90.61			

Storage ( $m^3$ )					100+20			
Overflow	Required	Surface	Sub-surface	Balance	Overflow	Required	Balance	
0.00	90.65	23.30	68.80	0.00	2.65	118.33	26.23	
				convert to flow with peak $T_c$ (L/s)	0.00	convert to flow with peak $T_c$ (L/s)	9.50	
overflows to: offsite								

Drainage Area		102				
Area (Ha)	0.24					
C =	0.85	Restricted Flow $Q_r$ (L/s)=	12.50			
2-Year Ponding						
$T_c$ Variable (min)	$i_{2yr}$ (mm/hour)	Peak Flow $Q_p = 2.78 \times C i_{2yr} A$ (L/s)	$Q_r$ (L/s)	$Q_p - Q_r$ (L/s)	Volume 2yr ( $m^3$ )	
16	59.50	33.75	12.50	21.25	20.40	
17	57.42	32.56	12.50	20.06	20.46	
18	55.49	31.47	12.50	18.97	20.49	
19	53.70	30.45	12.50	17.95	20.47	
20	52.03	29.51	12.50	17.01	20.41	

Storage ( $m^3$ )								
Overflow	Required	Surface	Sub-surface	Balance	Overflow	Required	Balance	
0.00	20.49	23.30	68.8	0.00				
					overflows to: offsite			

Drainage Area		MH100B	CICB100A, CICB100B (DA 100A, 100B)					
Area (Ha)	0.04	Restricted Flow ICD <small>Actual</small> (L/s)=	24.00					
C =	0.70	Restricted Flow $Q_r$ for swm calc (L/s)=	24.00	50% reduction if sub-surface storage				
100-Year Ponding						100-Year +20% Ponding		
$T_c$ Variable (min)	$i_{100yr}$ (mm/hour)	Peak Flow $Q_p = 2.78 \times C i_{100yr} A$ (L/s)	$Q_r$ (L/s)	$Q_p - Q_r$ (L/s)	Volume 100yr ( $m^3$ )	100YR $Q_p$ 20% (L/s)	$Q_p - Q_r$ (L/s)	Volume 100+20 ( $m^3$ )
0	398.62	31.03	24.00	7.03	0.00			
0.5	373.35	29.06	24.00	5.06	0.15			
1	351.38	27.35	24.00	3.35	0.20	32.82	8.82	0.53
1.5	332.09	25.85	24.00	1.85	0.17			
2	315.00	24.52	24.00	0.52	0.06			

Storage ( $m^3$ )					100+20			
Overflow	Required	Surface	Sub-surface	Balance	Overflow	Required	Balance	
0.00	0.20	1.57	0	0.00	0.57	1.10	0.00	
				convert to flow with peak $T_c$ (L/s)	0.00	convert to flow with peak $T_c$ (L/s)	0.00	
overflows to: offsite								

Drainage Area		MH100B				
Area (Ha)	0.04					
C =	0.56	Restricted Flow $Q_r$ (L/s)=	24.00			
2-Year Ponding						
$T_c$ Variable (min)	$i_{2yr}$ (mm/hour)	Peak Flow $Q_p = 2.78 \times C i_{2yr} A$ (L/s)	$Q_r$ (L/s)	$Q_p - Q_r$ (L/s)	Volume 2yr ( $m^3$ )	
8	85.46	5.32	24.00	-18.68	-8.97	
9	80.87	5.04	24.00	-18.96	-10.24	
10	76.81	4.78	24.00	-19.22	-11.53	
11	73.17	4.56	24.00	-19.44	-12.83	
12	69.89	4.35	24.00	-19.65	-14.15	

Storage ( $m^3$ )								
Overflow	Required	Surface	Sub-surface	Balance	Overflow	Required	Balance	
0.00	0.00	1.57	0	0.00				
					overflows to: offsite			





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**STORMWATER MANAGEMENT**  
Arcadia Comm | Minto Properties  
147391-6.0 | Rev #4R | 2025-04-25  
Prepared By: MP | Checked By: RM/WZ

Stormwater Management Summary Table				
Drainage Area	ICD Restricted Flow (L/s)	2 Year Storage Required (m3)	100 Year Storage Required (m3)	Storage Provided
FUT 600	2.00	7.22	26.48	33.75
FUT 120	15.00	4.18	26.10	33.99
ROOF	10.00	2.38	15.64	18.15
110	28.00	0.00	7.96	8.49
102	25.00	20.49	90.65	92.10
MH100B	24.00	0.00	0.20	1.57
TOTAL	104.00	34.27	167.03	188.05

100-yr Overflow:

0.00 L/s

100-yr Total Release Rate:

104.00 L/s

100-yr Max. Allowable Rate:

104.77 L/s

TRUE







**Overflow Area 110**

New Flow Section Required 1:100 year flow =		0 l/s	or	0.000 Cu m/sec
New Flow Section Required 1:100 year + 20% flow		8.55 l/s	or	0.009 Cu m/sec
Overflow Slope		Overflow X-Section		Overflow Capacity - Q
Length =	8.79 m	Side Slope 1 =	1.10 %	From Seelye n = 0.040 (Channels)
Up Stream Ground Elev =	98.80 m	Side Slope 2 =	1.30 %	
Down Stream Ground Elev =	98.56 m	Bottom Width =	0.00 m	100 Year Q = m <sup>3</sup> /s
Difference =	0.24 m			100 Year Velocity = m/s
Ditch Slope =	2.73 %			
			100 Year	100 Year + 20%
		Water depth =	0.000 m	0.02 m
		X-Sect. Area =	0.00 m <sup>2</sup>	0.04 m <sup>2</sup>
		Wetted Per. =	0.00 m	3.86 m
				100 Y +20% Q = 0.009 m <sup>3</sup> /s
				100 Y + 20% Velocity = 0.21 m/s

$$Q = A \cdot (1.0/n) \cdot R^{2/3} \cdot S^{1/2}$$

where:

A = cross sectional area in Sq. m

n = friction coefficient

R = hydraulic radius = A/wetted perimeter (wp) in m

**Overflow Area 102**

New Flow Section Required 1:100 year flow =		0 l/s	or	0.000 Cu m/sec
New Flow Section Required 1:100 year + 20% flow		9.50 l/s	or	0.010 Cu m/sec
Overflow Slope		Overflow X-Section		Overflow Capacity - Q
Length =	- m	Side Slope 1 =	3.80 %	From Seelye n = 0.040 (Channels)
Up Stream Ground Elev =	- m	Side Slope 2 =	1.33 %	
Down Stream Ground Elev =	- m	Bottom Width =	0.00 m	100 Year Q = m <sup>3</sup> /s
Difference =	- m			100 Year Velocity = m/s
Ditch Slope =	1.00 %			
Estimated			100 Year	100 Year + 20%
		Water depth =	0.000 m	0.03 m
		X-Sect. Area =	0.00 m <sup>2</sup>	0.06 m <sup>2</sup>
		Wetted Per. =	0.00 m	3.45 m
				100 Y +20% Q = 0.010 m <sup>3</sup> /s
				100 Y + 20% Velocity = 0.17 m/s

$$Q = A \cdot (1.0/n) \cdot R^{2/3} \cdot S^{1/2}$$

where:

A = cross sectional area in Sq. m

n = friction coefficient

R = hydraulic radius = A/wetted perimeter (wp) in m





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147391-6.0 | Rev #1 | 2024-11-13  
Prepared By: MP | Checked By: RM

	110			102			100A			100B			ROOF			UNC1		
	GRASS	ROOF	ASPHALT	GRASS	ROOF	ASPHALT	GRASS	ROOF	ASPHALT	GRASS	ROOF	ASPHALT	GRASS	ROOF	ASPHALT	GRASS	ROOF	ASPHALT
	676.46	279.77	291.25	164.21		2194.73	116.22		117.65	118.26		129.88		857.86		37.25		
TOTAL (m <sup>2</sup> )	676.46	279.77	291.25	164.21	0.00	2194.73	116.22	0.00	117.65	118.26	0.00	129.88	0.00	857.86	0.00	37.25	0.00	0.00
	1247.48			2358.94			233.87			248.14			857.86			37.25		

Runoff Coefficient (C) :	0.2	0.9	0.9	0.2	0.9	0.9	0.2	0.9	0.9	0.2	0.9	0.9	0.2	0.9	0.9	0.2	0.9	0.9
Ave. Runoff Coefficient (C):	0.52			0.85			0.55			0.57			0.90			0.20		

Runoff Coefficient Used(C):	0.52	0.85	0.55	0.57	0.90	0.20
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PROJECT INFORMATION	
ENGINEERED PRODUCT MANAGER	
ADS SALES REP	
PROJECT NO.	



# ARCADIACOMM

## OTTAWA, ON, CANADA

### DC-780 STORMTECH CHAMBER SPECIFICATIONS

- CHAMBERS SHALL BE STORMTECH DC-780.
- CHAMBERS SHALL BE ARCH-SHAPED AND SHALL BE MANUFACTURED FROM VIRGIN, IMPACT-MODIFIED POLYPROPYLENE COPOLYMERS.
- CHAMBERS SHALL BE CERTIFIED TO CSA B184, "POLYMERIC SUB-SURFACE STORMWATER MANAGEMENT STRUCTURES", AND MEET THE REQUIREMENTS OF ASTM F2418, "STANDARD SPECIFICATION FOR POLYPROPYLENE (PP) CORRUGATED WALL STORMWATER COLLECTION CHAMBERS".
- CHAMBER ROWS SHALL PROVIDE CONTINUOUS, UNOBSTRUCTED INTERNAL SPACE WITH NO INTERNAL SUPPORTS THAT WOULD IMPEDE FLOW OR LIMIT ACCESS FOR INSPECTION.
- THE STRUCTURAL DESIGN OF THE CHAMBERS, THE STRUCTURAL BACKFILL, AND THE INSTALLATION REQUIREMENTS SHALL ENSURE THAT THE LOAD FACTORS SPECIFIED IN THE AASHTO LRFD BRIDGE DESIGN SPECIFICATIONS, SECTION 12.12, ARE MET FOR: 1) LONG-DURATION DEAD LOADS AND 2) SHORT-DURATION LIVE LOADS, BASED ON THE CSA S6 CL-625 TRUCK AND THE AASHTO DESIGN TRUCK WITH CONSIDERATION FOR IMPACT AND MULTIPLE VEHICLE PRESENCES.
- CHAMBERS SHALL BE DESIGNED, TESTED AND ALLOWABLE LOAD CONFIGURATIONS DETERMINED IN ACCORDANCE WITH ASTM F2787, "STANDARD PRACTICE FOR STRUCTURAL DESIGN OF THERMOPLASTIC CORRUGATED WALL STORMWATER COLLECTION CHAMBERS". LOAD CONFIGURATIONS SHALL INCLUDE: 1) INSTANTANEOUS (<1 MIN) AASHTO DESIGN TRUCK LIVE LOAD ON MINIMUM COVER 2) MAXIMUM PERMANENT (75-YR) COVER LOAD AND 3) ALLOWABLE COVER WITH PARKED (1-WEEK) AASHTO DESIGN TRUCK.
- REQUIREMENTS FOR HANDLING AND INSTALLATION:
  - TO MAINTAIN THE WIDTH OF CHAMBERS DURING SHIPPING AND HANDLING, CHAMBERS SHALL HAVE INTEGRAL, INTERLOCKING STACKING LUGS.
  - TO ENSURE A SECURE JOINT DURING INSTALLATION AND BACKFILL, THE HEIGHT OF THE CHAMBER JOINT SHALL NOT BE LESS THAN 50 mm (2").
  - TO ENSURE THE INTEGRITY OF THE ARCH SHAPE DURING INSTALLATION, a) THE ARCH STIFFNESS CONSTANT AS DEFINED IN SECTION 6.2.8 OF ASTM F2418 SHALL BE GREATER THAN OR EQUAL TO 550 LBS/FT/%. AND b) TO RESIST CHAMBER DEFORMATION DURING INSTALLATION AT ELEVATED TEMPERATURES (ABOVE 23° C / 73° F), CHAMBERS SHALL BE PRODUCED FROM REFLECTIVE GOLD OR YELLOW COLORS.
- ONLY CHAMBERS THAT ARE APPROVED BY THE SITE DESIGN ENGINEER WILL BE ALLOWED. UPON REQUEST BY THE SITE DESIGN ENGINEER OR OWNER, THE CHAMBER MANUFACTURER SHALL SUBMIT A STRUCTURAL EVALUATION FOR APPROVAL BEFORE DELIVERING CHAMBERS TO THE PROJECT SITE AS FOLLOWS:
  - THE STRUCTURAL EVALUATION SHALL BE SEALED BY A REGISTERED PROFESSIONAL ENGINEER.
  - THE STRUCTURAL EVALUATION SHALL DEMONSTRATE THAT THE SAFETY FACTORS ARE GREATER THAN OR EQUAL TO 1.95 FOR DEAD LOAD AND 1.75 FOR LIVE LOAD, THE MINIMUM REQUIRED BY ASTM F2787 AND BY SECTIONS 3 AND 12.12 OF THE AASHTO LRFD BRIDGE DESIGN SPECIFICATIONS FOR THERMOPLASTIC PIPE.
  - THE TEST DERIVED CREEP MODULUS AS SPECIFIED IN ASTM F2418 SHALL BE USED FOR PERMANENT DEAD LOAD DESIGN EXCEPT THAT IT SHALL BE THE 75-YEAR MODULUS USED FOR DESIGN.
- CHAMBERS AND END CAPS SHALL BE PRODUCED AT AN ISO 9001 CERTIFIED MANUFACTURING FACILITY.
- MANIFOLD SIZE TO BE DETERMINED BY SITE DESIGN ENGINEER. SEE TECH NOTE #6.32 FOR MANIFOLD SIZING GUIDANCE. DUE TO THE ADAPTATION OF THIS CHAMBER SYSTEM TO SPECIFIC SITE AND DESIGN CONSTRAINTS, IT MAY BE NECESSARY TO CUT AND COUPLE ADDITIONAL PIPE TO STANDARD MANIFOLD COMPONENTS IN THE FIELD.
- ADS DOES NOT DESIGN OR PROVIDE MEMBRANE LINER SYSTEMS. TO MINIMIZE THE LEAKAGE POTENTIAL OF LINER SYSTEMS, THE MEMBRANE LINER SYSTEM SHOULD BE DESIGNED BY A KNOWLEDGEABLE GEOTEXTILE PROFESSIONAL AND INSTALLED BY A QUALIFIED CONTRACTOR.

### IMPORTANT - NOTES FOR THE BIDDING AND INSTALLATION OF THE DC-780 CHAMBER SYSTEM

- STORMTECH DC-780 CHAMBERS SHALL NOT BE INSTALLED UNTIL THE MANUFACTURER'S REPRESENTATIVE HAS COMPLETED A PRE-CONSTRUCTION MEETING WITH THE INSTALLERS.
- STORMTECH DC-780 CHAMBERS SHALL BE INSTALLED IN ACCORDANCE WITH THE "STORMTECH SC-310/SC-740/DC-780 CONSTRUCTION GUIDE".
- CHAMBERS ARE NOT TO BE BACKFILLED WITH A DOZER OR AN EXCAVATOR SITUATED OVER THE CHAMBERS. STORMTECH RECOMMENDS 3 BACKFILL METHODS:
  - STONESHOOTER LOCATED OFF THE CHAMBER BED.
  - BACKFILL AS ROWS ARE BUILT USING AN EXCAVATOR ON THE FOUNDATION STONE OR SUBGRADE.
  - BACKFILL FROM OUTSIDE THE EXCAVATION USING A LONG BOOM HOE OR EXCAVATOR.
- THE FOUNDATION STONE SHALL BE LEVELED AND COMPACTED PRIOR TO PLACING CHAMBERS.
- JOINTS BETWEEN CHAMBERS SHALL BE PROPERLY SEATED PRIOR TO PLACING STONE.
- MAINTAIN MINIMUM - 150 mm (6") SPACING BETWEEN THE CHAMBER ROWS.
- EMBEDMENT STONE SURROUNDING CHAMBERS MUST BE A CLEAN, CRUSHED, ANGULAR STONE OR RECYCLED CONCRETE; AASHTO M43 #3, 357, 4, 467, 5, 56, OR 57.
- THE CONTRACTOR MUST REPORT ANY DISCREPANCIES WITH CHAMBER FOUNDATION MATERIALS BEARING CAPACITIES TO THE SITE DESIGN ENGINEER.
- ADS RECOMMENDS THE USE OF "FLEXSTORM CATCH IT" INSERTS DURING CONSTRUCTION FOR ALL INLETS TO PROTECT THE SUBSURFACE STORMWATER MANAGEMENT SYSTEM FROM CONSTRUCTION SITE RUNOFF.

### NOTES FOR CONSTRUCTION EQUIPMENT

- STORMTECH DC-780 CHAMBERS SHALL BE INSTALLED IN ACCORDANCE WITH THE "STORMTECH SC-310/SC-740/DC-780 CONSTRUCTION GUIDE".
- THE USE OF CONSTRUCTION EQUIPMENT OVER DC-780 CHAMBERS IS LIMITED:
  - NO EQUIPMENT IS ALLOWED ON BARE CHAMBERS.
  - NO RUBBER TIRED LOADERS, DUMP TRUCKS, OR EXCAVATORS ARE ALLOWED UNTIL PROPER FILL DEPTHS ARE REACHED IN ACCORDANCE WITH THE "STORMTECH SC-310/SC-740/DC-780 CONSTRUCTION GUIDE".
  - WEIGHT LIMITS FOR CONSTRUCTION EQUIPMENT CAN BE FOUND IN THE "STORMTECH SC-310/SC-740/DC-780 CONSTRUCTION GUIDE".
- FULL 900 mm (36") OF STABILIZED COVER MATERIALS OVER THE CHAMBERS IS REQUIRED FOR DUMP TRUCK TRAVEL OR DUMPING.

**USE OF A DOZER TO PUSH EMBEDMENT STONE BETWEEN THE ROWS OF CHAMBERS MAY CAUSE DAMAGE TO THE CHAMBERS AND IS NOT AN ACCEPTABLE BACKFILL METHOD. ANY CHAMBERS DAMAGED BY THE "DUMP AND PUSH" METHOD ARE NOT COVERED UNDER THE STORMTECH STANDARD WARRANTY.**

CONTACT STORMTECH AT 1-800-821-6710 WITH ANY QUESTIONS ON INSTALLATION REQUIREMENTS OR WEIGHT LIMITS FOR CONSTRUCTION EQUIPMENT.





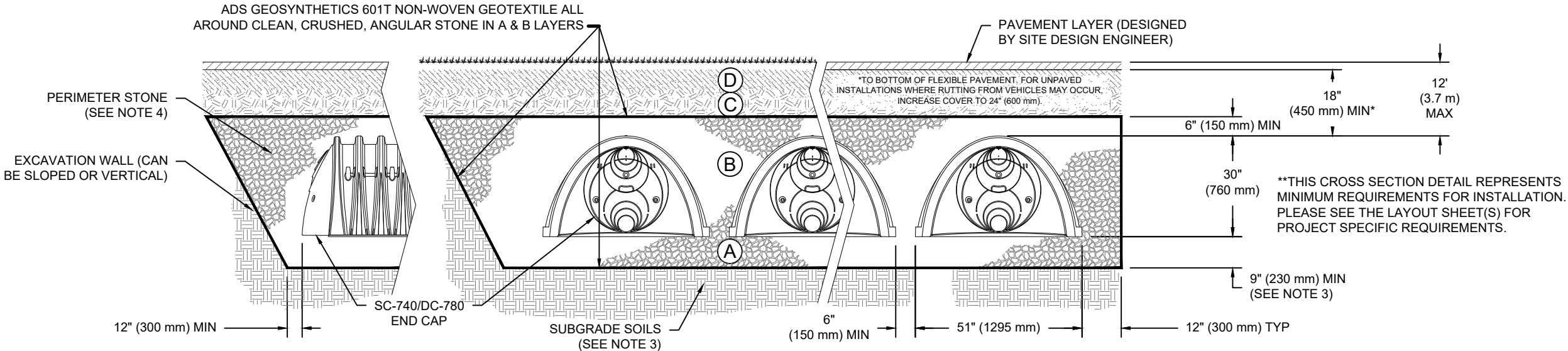


## ACCEPTABLE FILL MATERIALS: STORMTECH DC-780 CHAMBER SYSTEMS

MATERIAL LOCATION		DESCRIPTION	AASHTO MATERIAL CLASSIFICATIONS	COMPACTION / DENSITY REQUIREMENT
D	<b>FINAL FILL:</b> FILL MATERIAL FOR LAYER 'D' STARTS FROM THE TOP OF THE 'C' LAYER TO THE BOTTOM OF FLEXIBLE PAVEMENT OR UNPAVED FINISHED GRADE ABOVE. NOTE THAT PAVEMENT SUBBASE MAY BE PART OF THE 'D' LAYER	ANY SOIL/ROCK MATERIALS, NATIVE SOILS, OR PER ENGINEER'S PLANS. CHECK PLANS FOR PAVEMENT SUBGRADE REQUIREMENTS.	N/A	PREPARE PER SITE DESIGN ENGINEER'S PLANS. PAVED INSTALLATIONS MAY HAVE STRINGENT MATERIAL AND PREPARATION REQUIREMENTS.
C	<b>INITIAL FILL:</b> FILL MATERIAL FOR LAYER 'C' STARTS FROM THE TOP OF THE EMBEDMENT STONE ('B' LAYER) TO 18" (450 mm) ABOVE THE TOP OF THE CHAMBER. NOTE THAT PAVEMENT SUBBASE MAY BE A PART OF THE 'C' LAYER.	GRANULAR WELL-GRADED SOIL/AGGREGATE MIXTURES, <35% FINES OR PROCESSED AGGREGATE.  MOST PAVEMENT SUBBASE MATERIALS CAN BE USED IN LIEU OF THIS LAYER.	AASHTO M145 <sup>1</sup> A-1, A-2-4, A-3  OR  AASHTO M43 <sup>1</sup> 3, 357, 4, 467, 5, 56, 57, 6, 67, 68, 7, 78, 8, 89, 9, 10	BEGIN COMPACTIONS AFTER 12" (300 mm) OF MATERIAL OVER THE CHAMBERS IS REACHED. COMPACT ADDITIONAL LAYERS IN 6" (150 mm) MAX LIFTS TO A MIN. 95% PROCTOR DENSITY FOR WELL GRADED MATERIAL AND 95% RELATIVE DENSITY FOR PROCESSED AGGREGATE MATERIALS. ROLLER GROSS VEHICLE WEIGHT NOT TO EXCEED 12,000 lbs (53 kN). DYNAMIC FORCE NOT TO EXCEED 20,000 lbs (89 kN).
B	<b>EMBEDMENT STONE:</b> FILL SURROUNDING THE CHAMBERS FROM THE FOUNDATION STONE ('A' LAYER) TO THE 'C' LAYER ABOVE.	CLEAN, CRUSHED, ANGULAR STONE OR RECYCLED CONCRETE <sup>5</sup>	AASHTO M43 <sup>1</sup> 3, 357, 4, 467, 5, 56, 57	NO COMPACTION REQUIRED.
A	<b>FOUNDATION STONE:</b> FILL BELOW CHAMBERS FROM THE SUBGRADE UP TO THE FOOT (BOTTOM) OF THE CHAMBER.	CLEAN, CRUSHED, ANGULAR STONE OR RECYCLED CONCRETE <sup>5</sup>	AASHTO M43 <sup>1</sup> 3, 357, 4, 467, 5, 56, 57	PLATE COMPACT OR ROLL TO ACHIEVE A FLAT SURFACE. <sup>2,3</sup>

PLEASE NOTE:

1. THE LISTED AASHTO DESIGNATIONS ARE FOR GRADATIONS ONLY THE STONE MUST ALSO BE CLEAN, CRUSHED, ANGULAR. FOR EXAMPLE, A SPECIFICATION FOR #4 STONE WOULD STATE: "CLEAN, CRUSHED, ANGULAR NO. 4 (AASHTO M43) STONE".
2. STORMTECH COMPACTION REQUIREMENTS ARE MET FOR 'A' LOCATION MATERIALS WHEN PLACED AND COMPACTED IN 9" (230 mm) (MAX) LIFTS USING TWO FULL COVERAGES WITH A VIBRATORY COMPACTOR.
3. WHERE INFILTRATION SURFACES MAY BE COMPROMISED BY COMPACTION, FOR STANDARD DESIGN LOAD CONDITIONS, A FLAT SURFACE MAY BE ACHIEVED BY RAKING OR DRAGGING WITHOUT COMPACTION EQUIPMENT. FOR SPECIAL LOAD DESIGNS, CONTACT STORMTECH FOR COMPACTION REQUIREMENTS.
4. ONCE LAYER 'C' IS PLACED, ANY SOIL/MATERIAL CAN BE PLACED IN LAYER 'D' UP TO THE FINISHED GRADE. MOST PAVEMENT SUBBASE SOILS CAN BE USED TO REPLACE THE MATERIAL REQUIREMENTS OF LAYER 'C' OR 'D' AT THE SITE DESIGN ENGINEER'S DISCRETION.
5. WHERE RECYCLED CONCRETE AGGREGATE IS USED IN LAYERS 'A' OR 'B' THE MATERIAL SHOULD ALSO MEET THE ACCEPTABILITY CRITERIA OUTLINED IN TECHNICAL NOTE 6.20 "RECYCLED CONCRETE STRUCTURAL BACKFILL".



## NOTES:

1. CHAMBERS SHALL MEET THE REQUIREMENTS OF ASTM F2418, "STANDARD SPECIFICATION FOR POLYPROPYLENE (PP) CORRUGATED WALL STORMWATER COLLECTION CHAMBERS".
2. DC-780 CHAMBERS SHALL BE DESIGNED IN ACCORDANCE WITH ASTM F2787 "STANDARD PRACTICE FOR STRUCTURAL DESIGN OF THERMOPLASTIC CORRUGATED WALL STORMWATER COLLECTION CHAMBERS".
3. THE SITE DESIGN ENGINEER IS RESPONSIBLE FOR ASSESSING THE BEARING RESISTANCE (ALLOWABLE BEARING CAPACITY) OF THE SUBGRADE SOILS AND THE DEPTH OF FOUNDATION STONE WITH CONSIDERATION FOR THE RANGE OF EXPECTED SOIL MOISTURE CONDITIONS. REFERENCE STORMTECH DESIGN MANUAL FOR BEARING CAPACITY GUIDANCE.
4. PERIMETER STONE MUST BE EXTENDED HORIZONTALLY TO THE EXCAVATION WALL FOR BOTH VERTICAL AND SLOPED EXCAVATION WALLS.
5. REQUIREMENTS FOR HANDLING AND INSTALLATION:
  - TO MAINTAIN THE WIDTH OF CHAMBERS DURING SHIPPING AND HANDLING, CHAMBERS SHALL HAVE INTEGRAL, INTERLOCKING STACKING LUGS.
  - TO ENSURE A SECURE JOINT DURING INSTALLATION AND BACKFILL, THE HEIGHT OF THE CHAMBER JOINT SHALL NOT BE LESS THAN 2".
  - TO ENSURE THE INTEGRITY OF THE ARCH SHAPE DURING INSTALLATION, a) THE ARCH STIFFNESS CONSTANT SHALL BE GREATER THAN OR EQUAL TO 550 LBS/FT/%. THE ASC IS DEFINED IN SECTION 6.2.8 OF ASTM F2418. AND b) TO RESIST CHAMBER DEFORMATION DURING INSTALLATION AT ELEVATED TEMPERATURES (ABOVE 73° F / 23° C), CHAMBERS SHALL BE PRODUCED FROM REFLECTIVE GOLD OR YELLOW COLORS.

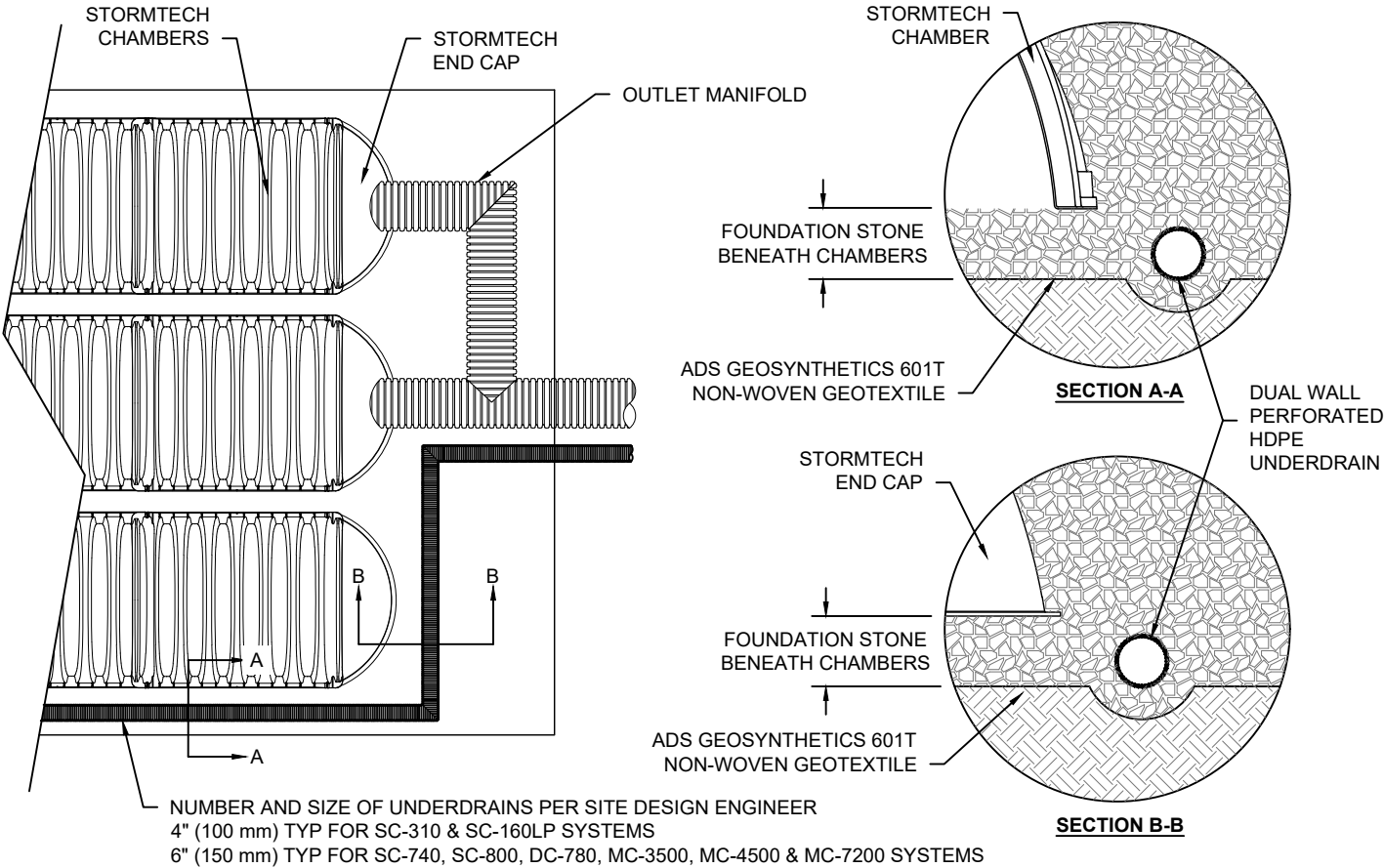






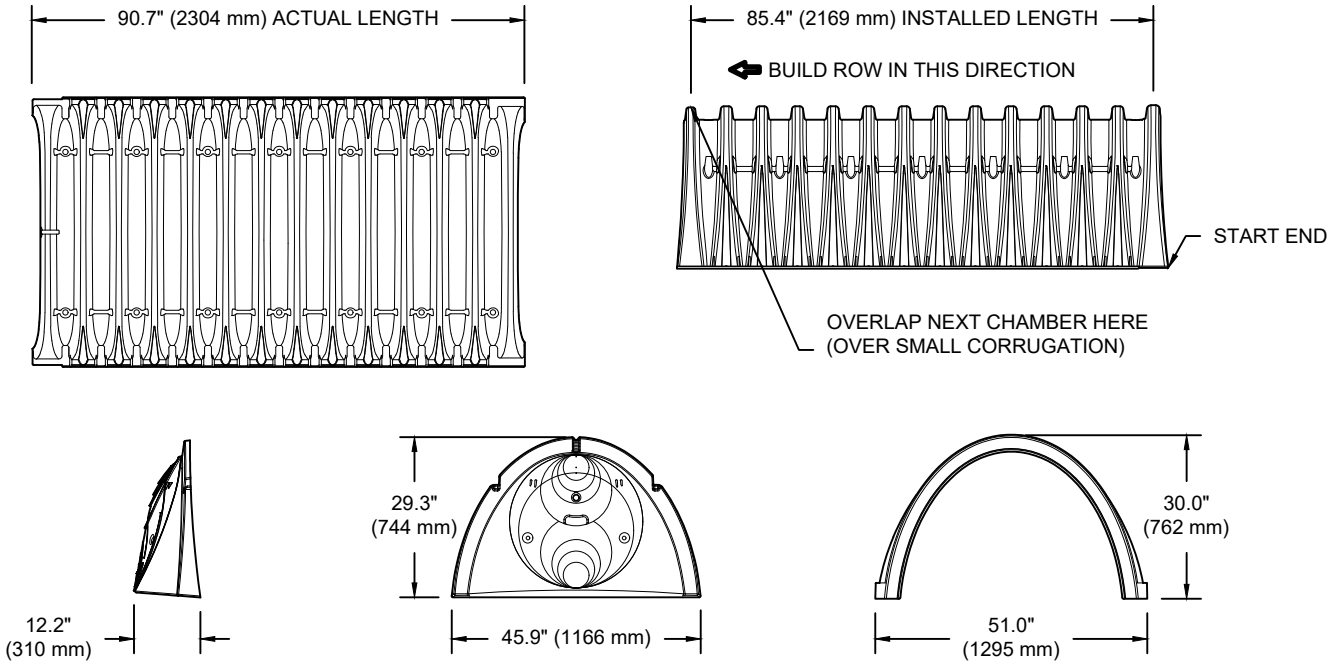
UNDERDRAIN DETAIL

NTS



DC-780 TECHNICAL SPECIFICATION

NTS



NOMINAL CHAMBER SPECIFICATIONS

SIZE (W X H X INSTALLED LENGTH)	51.0" X 30.0" X 85.4"	(1295 mm X 762 mm X 2169 mm)
CHAMBER STORAGE	46.2 CUBIC FEET	(1.30 m³)
MINIMUM INSTALLED STORAGE*	78.4 CUBIC FEET	(2.20 m³)
WEIGHT	75.0 lbs.	(33.6 kg)

NOMINAL END CAP SPECIFICATIONS

SIZE (W X H X INSTALLED LENGTH)	45.9" X 29.3" X 9.6"	(1166 mm X 744 mm X 244 mm)
END CAP STORAGE	2.6 CUBIC FEET	(0.07 m³)
MINIMUM INSTALLED STORAGE**	14.4 CUBIC FEET	(0.40 m³)
WEIGHT	11.7 lbs.	(5.3 kg)

\* ASSUMES 6" (152 mm) STONE ABOVE, 9" (229 mm) BELOW, AND 6" (152 mm) BETWEEN CHAMBERS  
\*\*ASSUMES 6" (152 mm) STONE ABOVE, 9" (229 mm) BELOW END CAPS, 6" (152 mm) BETWEEN ROWS, 12" (305 mm) BEYOND END CAPS

PRE-FAB STUBS AT BOTTOM OF END CAP FOR PART NUMBERS ENDING WITH "B"  
PRE-FAB STUBS AT TOP OF END CAP FOR PART NUMBERS ENDING WITH "T"  
PRE-CORED END CAPS END WITH "PC"

PART #	STUB	A	B	C
SC740EPE06T / SC740EPE06TPC	6" (150 mm)	10.9" (277 mm)	18.5" (470 mm)	---
SC740EPE06B / SC740EPE06BPC			---	0.5" (13 mm)
SC740EPE08T / SC740EPE08TPC	8" (200 mm)	12.2" (310 mm)	16.5" (419 mm)	---
SC740EPE08B / SC740EPE08BPC			---	0.6" (15 mm)
SC740EPE10T / SC740EPE10TPC	10" (250 mm)	13.4" (340 mm)	14.5" (368 mm)	---
SC740EPE10B / SC740EPE10BPC			---	0.7" (18 mm)
SC740EPE12T / SC740EPE12TPC	12" (300 mm)	14.7" (373 mm)	12.5" (318 mm)	---
SC740EPE12B / SC740EPE12BPC			---	1.2" (30 mm)
SC740EPE15T / SC740EPE15TPC	15" (375 mm)	18.4" (467 mm)	9.0" (229 mm)	---
SC740EPE15B / SC740EPE15BPC			---	1.3" (33 mm)
SC740EPE18T / SC740EPE18TPC	18" (450 mm)	19.7" (500 mm)	5.0" (127 mm)	---
SC740EPE18B / SC740EPE18BPC			---	1.6" (41 mm)
SC740ECEZ*	24" (600 mm)	18.5" (470 mm)	---	0.1" (3 mm)

ALL STUBS, EXCEPT FOR THE SC740ECEZ ARE PLACED AT BOTTOM OF END CAP SUCH THAT THE OUTSIDE DIAMETER OF THE STUB IS FLUSH WITH THE BOTTOM OF THE END CAP. FOR ADDITIONAL INFORMATION CONTACT STORMTECH AT 1-800-821-6710.

\* FOR THE SC740ECEZ THE 24" (600 mm) STUB LIES BELOW THE BOTTOM OF THE END CAP APPROXIMATELY 1.75" (44 mm). BACKFILL MATERIAL SHOULD BE REMOVED FROM BELOW THE N-12 STUB SO THAT THE FITTING SITS LEVEL.

NOTE: ALL DIMENSIONS ARE NOMINAL

ARCADIACOMM

OTTAWA, ON, CANADA

DRAWN: MP

DATE: 11/05/2024

CHECKED: N/A

PROJECT #:

DESCRIPTION

CHK

DRW

DATE

StormTech®  
Chamber System

1-800-821-6710 | WWW.STORMTECH.COM

4640 TRUEMAN BLVD  
HILLIARD, OH 43026  
1-800-733-7473



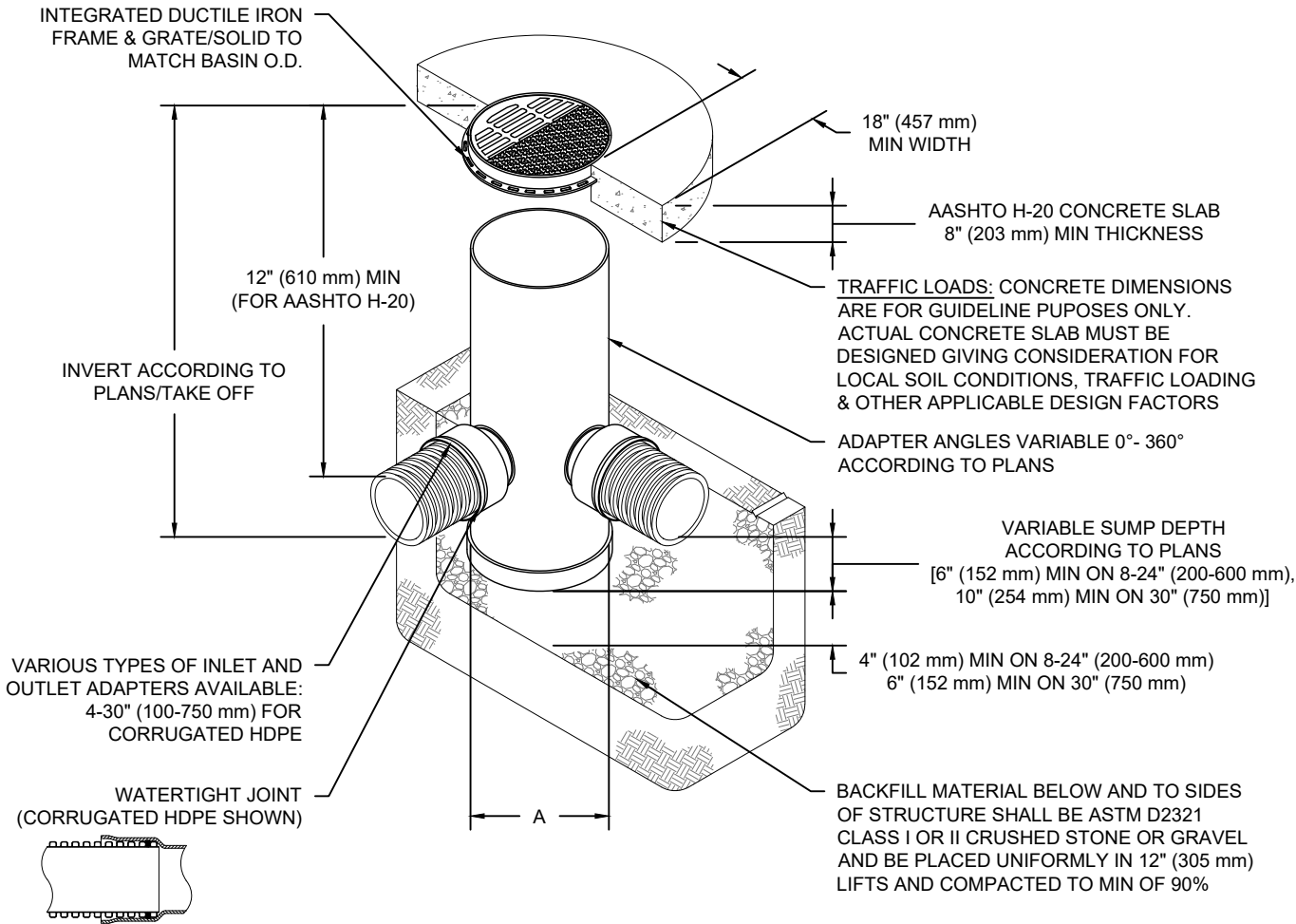
SHEET

5 OF 6



NYLOPLAST DRAIN BASIN

NTS



NOTES

- 8-30" (200-750 mm) GRATES/SOLID COVERS SHALL BE DUCTILE IRON PER ASTM A536 GRADE 70-50-05
- 12-30" (300-750 mm) FRAMES SHALL BE DUCTILE IRON PER ASTM A536 GRADE 70-50-05
- DRAIN BASIN TO BE CUSTOM MANUFACTURED ACCORDING TO PLAN DETAILS
- DRAINAGE CONNECTION STUB JOINT TIGHTNESS SHALL CONFORM TO ASTM D3212 FOR CORRUGATED HDPE (ADS & HANCOR DUAL WALL) & SDR 35 PVC
- FOR COMPLETE DESIGN AND PRODUCT INFORMATION: [WWW.NYLOPLAST-US.COM](http://WWW.NYLOPLAST-US.COM)
- TO ORDER CALL: **800-821-6710**

A	PART #	GRATE/SOLID COVER OPTIONS		
8" (200 mm)	2808AG	PEDESTRIAN LIGHT DUTY	STANDARD LIGHT DUTY	SOLID LIGHT DUTY
10" (250 mm)	2810AG	PEDESTRIAN LIGHT DUTY	STANDARD LIGHT DUTY	SOLID LIGHT DUTY
12" (300 mm)	2812AG	PEDESTRIAN AASHTO H-10	STANDARD AASHTO H-20	SOLID AASHTO H-20
15" (375 mm)	2815AG	PEDESTRIAN AASHTO H-10	STANDARD AASHTO H-20	SOLID AASHTO H-20
18" (450 mm)	2818AG	PEDESTRIAN AASHTO H-10	STANDARD AASHTO H-20	SOLID AASHTO H-20
24" (600 mm)	2824AG	PEDESTRIAN AASHTO H-10	STANDARD AASHTO H-20	SOLID AASHTO H-20
30" (750 mm)	2830AG	PEDESTRIAN AASHTO H-20	STANDARD AASHTO H-20	SOLID AASHTO H-20

ARCADIACOMM

OTTAWA, ON, CANADA

DATE: 11/05/2024

DRAWN: MP

CHECKED: N/A

PROJECT #:

DESCRIPTION

CHK

DRW

DATE

Nyloplast®

770-932-2443 | [WWW.NYLOPLAST-US.COM](http://WWW.NYLOPLAST-US.COM)

4640 TRUEMAN BLVD  
HILLIARD, OH 43026  
1-800-733-7473

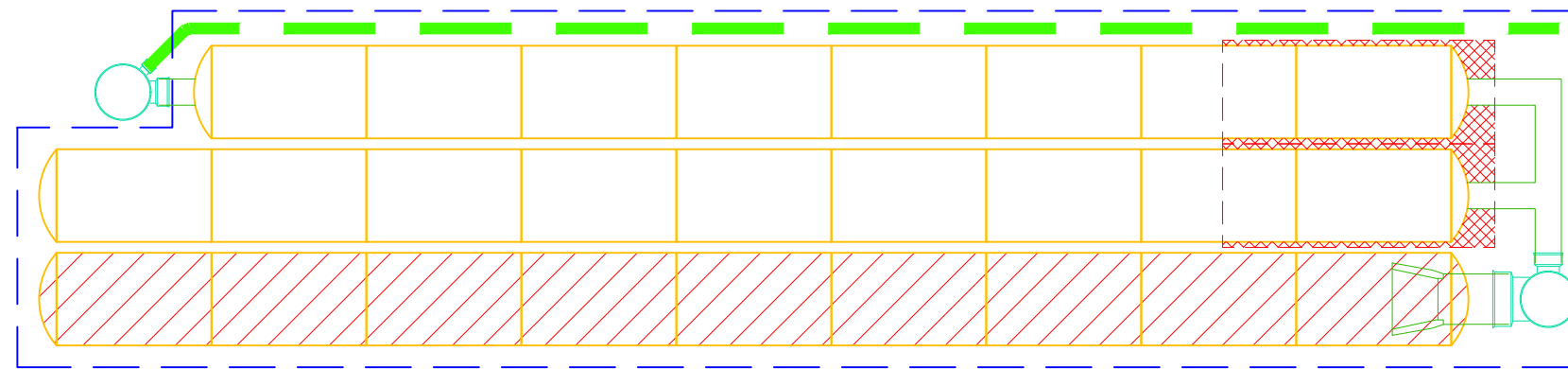


SHEET

6 OF 6

THIS DRAWING HAS BEEN PREPARED BASED ON INFORMATION PROVIDED TO ADS BY THE EOR. ADS IS NOT RESPONSIBLE FOR THE EOR'S DESIGN OR CONSTRUCTION. IT IS THE EOR'S RESPONSIBILITY TO ENSURE THAT THE PRODUCT(S) DEPICTED AND ALL ASSOCIATED DETAILS MEET ALL APPLICABLE LAWS, REGULATIONS, AND PROJECT REQUIREMENTS.









## Adjustable Accutrol Weir

Tag: \_\_\_\_\_

## Adjustable Flow Control for Roof Drains

### ADJUSTABLE ACCUTROL (for Large Sump Roof Drains only)

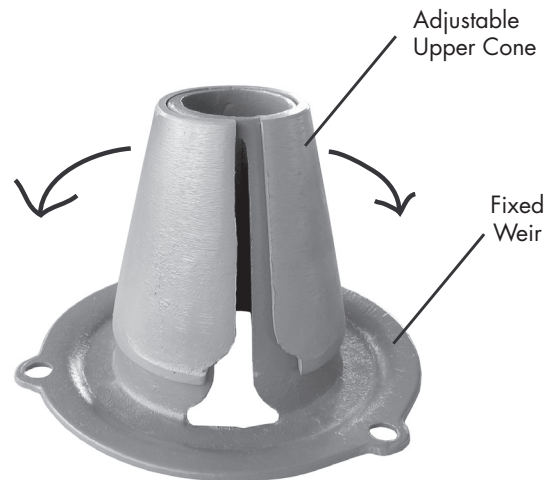
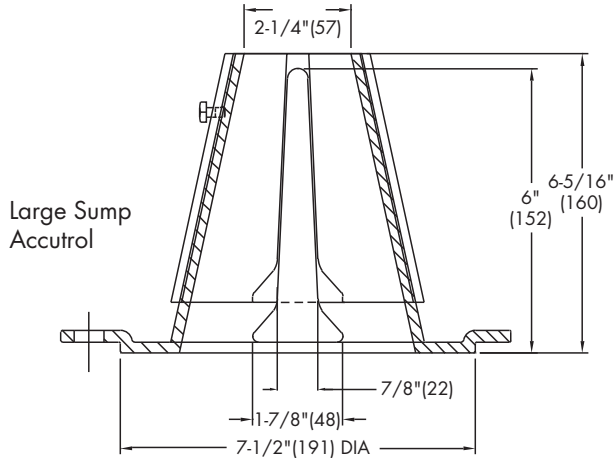
For more flexibility in controlling flow with heads deeper than 2", Watts Drainage offers the Adjustable Accutrol. The Adjustable Accutrol Weir is designed with a single parabolic opening that can be covered to restrict flow above 2" of head to less than 5 gpm per inch, up to 6" of head. To adjust the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

Note: Flow rates are directly proportional to the amount of weir opening that is exposed.

#### EXAMPLE:

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

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



1/2 Weir Opening Exposed Shown Above

TABLE 1. Adjustable Accutrol Flow Rate Settings

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

Job Name \_\_\_\_\_

Contractor \_\_\_\_\_

Job Location \_\_\_\_\_

Contractor's P.O. No. \_\_\_\_\_

Engineer \_\_\_\_\_

Representative \_\_\_\_\_

Watts product specifications in U.S. customary units and metric are approximate and are provided for reference only. For precise measurements, please contact Watts Technical Service. Watts reserves the right to change or modify product design, construction, specifications, or materials without prior notice and without incurring any obligation to make such changes and modifications on Watts products previously or subsequently sold.

**USA:** Tel: (800) 338-2581 • Fax: (828) 248-3929 • Watts.com  
**Canada:** Tel: (905) 332-4090 • Fax: (905) 332-7068 • Watts.ca  
**Latin America:** Tel: (52) 81-1001-8600 • Fax: (52) 81-8000-7091 • Watts.com



A Watts Water Technologies Company





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

STORM SEWER DESIGN SHEET

PROJECT: Arcadia Commercial  
LOCATION: CITY OF OTTAWA  
CLIENT: Minto Development Group

\*HGL at obvert of pipe if pipe is not surcharged  
\*\* Finished floor for slab on grade commercial building  
\*\*\*Freeboard is from upstream MH HGL to FF

LOCATION				AREA (Ha)				RATIONAL DESIGN FLOW														SEWER DATA										surcharged pipe	upstream obvert	HGL* m	FF** m	Freeboard*** m
STREET	AREA ID	FROM MH	TO MH	C= 0.20	C= 0.70	C= 0.75	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)	ICD FIXED FLOW (L/s)	DESIGN FLOW (L/s)	CAPACITY (L/s)	LENGTH (m)	PIPE SIZE (mm)			SLOPE (%)	VELOCITY (m/s)	AVAIL CAP (5yr)								
																							DIA	W	H											
	BLK800	BLK800	MAIN				0.06	0.15	0.18	10.00	0.07	10.07	104.19	122.14	178.56	15.64					15.64	62.04	5.00	250				1.00	1.224	46.40	74.79%			96.79	98.30	1.51
	123	CICB123	MAIN				0.06	0.15	0.18	10.00	0.11	10.11	104.19	122.14	178.56	15.64					15.64	43.87	5.97	250				0.50	0.866	28.23	64.34%					
	-	MH123	MH122					0.00	0.30	10.07	0.54	10.61	103.83	121.72	177.94	31.18					31.18	59.68	26.56	300				0.35	0.818	28.51	47.76%	no	96.79	96.79		
	122	CB122	MAIN				0.06	0.15	0.15	10.00	0.45	10.45	104.19	122.14	178.56	15.64					15.64	43.87	23.63	250				0.50	0.866	28.23	64.34%					
	-	MH122	MH121					0.00	0.45	10.61	0.25	10.86	101.08	118.48	173.18	45.52					45.52	59.68	12.08	300				0.35	0.818	14.16	23.72%	no	96.67	96.67		
	BLK700	BLK700	MAIN				0.10	0.25	0.25	10.00	0.08	10.08	104.19	122.14	178.56	26.07					26.07	51.91	5.00	250				0.70	1.024	25.84	49.78%			96.63	98.45	1.82
	-	MH121	MH120					0.00	0.70	10.86	1.21	12.06	99.88	117.06	171.10	69.97					69.97	91.46	58.21	375				0.25	0.802	21.48	23.49%	no	96.63	96.63		
	120	CB120	MH120				0.11	0.28	0.28	10.00	0.32	10.32	104.19	122.14	178.56	28.68					28.68	62.04	23.24	250				1.00	1.224	33.36	53.78%					
	BLK600	BLK600	MAIN				0.06	0.15	0.15	10.00	0.07	10.07	104.19	122.14	178.56	15.64					15.64	62.04	5.00	250				1.00	1.224	46.40	74.79%			96.45	98.70	2.25
	-	MH120	MH100					0.00	1.13	12.06	0.96	13.02	94.42	110.63	161.66	106.31					106.31	148.72	51.96	450				0.25	0.906	42.41	28.52%	no	96.45	96.45		
	110	CB110A	CBMH110A				0.08	0.20	0.20	10.00	0.49	10.49	104.19	122.14	178.56	20.86					20.86	71.33	29.02	300				0.50	0.978	50.48	70.76%					
		CB110B	CBMH110A				0.04	0.10	0.10	10.00	0.34	10.34	104.19	122.14	178.56	10.43					10.43	71.33	20.00	300				0.50	0.978	60.91	85.38%					
		CBMH110A	MH110					0.00	0.30	10.49	0.26	10.76	101.65	119.15	174.16	30.52					30.52	286.47	15.38	600				0.20	0.982	255.95	89.35%					
	-	MH110	MH100					0.00	0.30	10.76	1.02	11.78	100.36	117.63	171.93	30.13					30.13	63.80	53.50	300				0.40	0.874	33.67	52.77%	no	96.54	96.54		
	BLK500	BLK500	MAIN				0.09	0.23	0.23	10.00	0.22	10.22	104.19	122.14	178.56	23.46					23.46	62.04	16.50	250				1.00	1.224	38.58	62.18%			96.32	99.15	2.83
	100A	CICB100A	CICB100B				0.03	0.08	0.08	10.00	0.11	10.11	104.19	122.14	178.56	7.82					7.82	62.04	8.00	250				1.00	1.224	54.22	87.39%					
	100B	CICB100B	MAIN				0.03	0.08	0.15	10.11	0.01	10.12	103.62	121.47	177.57	15.56					15.56	62.04	0.74	250				1.00	1.224	46.48	74.93%					
	-	MH100	MH100B					0.00	1.80	13.02	0.64	13.66	90.55	106.08	154.97	163.12					163.12	248.09	32.73	600				0.15	0.850	84.97	34.25%	no	96.32	96.32		
	EXISTING	MH100B	EXMH301					0.00	1.80	13.66	0.31	13.98	88.14	103.25	150.81	158.78					158.78	248.09	16.00	600				0.15	0.850	89.30	36.00%	no				
				0.00	0.00	0.00	0.72	1.80	TRUE																						no	96.25	96.052			





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

STORM SEWER DESIGN SHEET

PROJECT: Arcadia Commercial  
LOCATION: CITY OF OTTAWA  
CLIENT: Minto Development Group

\*HGL at obvert of pipe if pipe is not surcharged  
\*\* Finished floor for slab on grade commercial building  
\*\*\*Freeboard is from upstream MH HGL to FF

LOCATION				AREA (Ha)				RATIONAL DESIGN FLOW														SEWER DATA																		
STREET	AREA ID	FROM MH	TO MH	C= 0.20	C= 0.70	C= 0.75	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)	ICD FIXED FLOW (L/s)	DESIGN FLOW (L/s)	CAPACITY (L/s)	LENGTH (m)	PIPE SIZE (mm)			SLOPE (%)	VELOCITY (m/s)	AVAIL CAP (5yr)		surcharged pipe	upstream obvert	HGL* m	FF** m	Freeboard*** m						
																							DIA	W	H			(L/s)	(%)											
	233A	CBMH233A	CBMH233				0.09	0.23	0.23	10.00	0.31	10.31	104.19	122.14	178.56	23.46					23.46	248.09	15.60	600			0.15	0.850	224.63	90.54%	no	95.70	95.70	99.50	3.47					
	233B	CBMH233	CBMH232				0.15	0.38	0.60	10.31	0.67	10.98	102.60	120.27	175.81	61.61					61.61	248.09	34.20	600			0.15	0.850	186.48	75.17%										
	232A	CBMH232A	CBMH232				0.10	0.25	0.25	10.00	0.31	10.31	104.19	122.14	178.56	26.07					26.07	248.09	15.60	600			0.15	0.850	222.02	89.49%										
	232B	CBMH232	CBMH231				0.12	0.30	1.15	10.98	0.67	11.65	99.30	116.38	170.10	114.29					114.29	248.09	34.20	600			0.15	0.850	133.80	53.93%										
	231A	CBMH231A	CBMH231				0.11	0.28	0.28	10.00	0.31	10.31	104.19	122.14	178.56	28.68					28.68	248.09	15.60	600			0.15	0.850	219.41	88.44%										
	231B	CBMH231	MH230				0.11	0.28	1.70	11.65	0.47	12.12	96.23	112.76	164.79	163.72					163.72	248.09	24.08	600			0.15	0.850	84.37	34.01%										
	230A	CICB230A	CICB230B				0.06	0.15	0.15	10.00	0.11	10.11	104.19	122.14	178.56	15.64					15.64	62.04	8.04	250			1.00	1.224	46.40	74.79%										
	230B	CICB230B	MH230				0.13	0.33	0.48	10.11	0.06	10.17	103.62	121.47	177.56	49.26					49.26	87.74	5.93	250			2.00	1.731	38.48	43.86%										
	230C	CB230C	MAIN				0.03	0.08	0.08	10.00	0.14	10.14	104.19	122.14	178.56	7.82					7.82	62.04	10.39	250			1.00	1.224	54.22	87.39%										
	230D	CB230D	CB230E				0.04	0.10	0.10	10.00	0.11	10.11	104.19	122.14	178.56	10.43					10.43	62.04	7.95	250			1.00	1.224	51.61	83.19%										
	230E	CB230E	MAIN				0.09	0.23	0.33	10.11	0.05	10.16	103.62	121.47	177.58	33.70					33.70	87.74	4.91	250			2.00	1.731	54.03	61.58%										
	230F	CB230F	MAIN				0.07	0.18	0.18	10.00	0.17	10.17	104.19	122.14	178.56	18.25					18.25	62.04	12.50	250			1.00	1.224	43.79	70.59%										
	230G	CB230G	CB230H				0.10	0.25	0.25	10.00	0.11	10.11	104.19	122.14	178.56	26.07					26.07	62.04	8.00	250			1.00	1.224	35.97	57.98%										
	230H	CB230H	MAIN				0.07	0.18	0.43	10.11	0.05	10.15	103.62	121.47	177.57	44.07					44.07	87.74	4.78	250			2.00	1.731	43.66	49.77%										
	230I	CB230I	MAIN				0.03	0.08	0.08	10.00	0.12	10.12	104.19	122.14	178.56	7.82					7.82	62.04	8.57	250			1.00	1.224	54.22	87.39%										
	-	MH230	MH220					0.00	1.25	12.12	1.62	13.74	94.19	110.36	161.26	306.36					306.36	449.81	95.70	750			0.15	0.986	143.45	31.89%										
	221A	CB221A	CBMH221				0.16	0.40	0.40	10.00	0.11	10.11	104.19	122.14	178.56	41.71					41.71	420.63	17.05	450			2.00	2.562	378.92	90.08%										
	221B	CB221B	CB221C				0.03	0.08	0.08	10.00	0.16	10.16	104.19	122.14	178.56	7.82					7.82	297.43	17.05	450			1.00	1.812	289.61	97.37%										
	221C	CB221C	CBMH221				0.02	0.05	0.13	10.16	0.09	10.24	103.37	121.17	177.14	12.93					12.93	488.73	15.52	450			2.70	2.977	475.80	97.35%										
	221D	CBMH221	MH221				0.08	0.20	0.73	10.24	0.57	10.81	102.92	120.65	176.36	74.68					74.68	286.47	33.38	600			0.20	0.982	211.79	73.93%										
	BLK400	BLK400	MAIN				0.15	0.38	0.38	10.00	0.07	10.07	104.19	122.14	178.56	39.10					39.10	62.04	5.00	250			1.00	1.224	22.94	36.97%								96.03	99.50	3.47
	BLK300	BLK300	MAIN				0.04	0.10	0.10	10.00	0.07	10.07	104.19	122.14	178.56	10.43					10.43	62.04	5.00	250			1.00	1.224	51.61	83.19%								96.03	99.50	3.47
		MH500	MH221				0.00	0.00	0.00	10.00	0.20	10.20	104.19	122.14	178.56	0.00					0.00	900.87	12.00	1050			0.10	1.008	900.87	100.00%	no	96.03	96.03	99.50	3.47					
	-	MH221	MH220					0.00	1.20	10.81	1.40	12.21	100.10	117.32	171.47	120.21					120.21	148.72	75.90	450			0.25	0.906	28.50	19.17%										
	222A	CB222	CBMH222				0.05	0.13	0.13	10.00	0.12	10.12	104.19	122.14	178.56	13.03					13.03	107.45	14.80	250			3.00	2.121	94.42	87.87%										
	222B	CBMH222	MH220				0.07	0.18	0.30	10.12	0.07	10.19	103.58	121.42	177.50	31.10					31.10	151.96	12.64	250			6.00	2.999	120.86	79.53%										





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

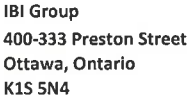
STORM SEWER DESIGN SHEET

PROJECT: Arcadia Commercial  
LOCATION: CITY OF OTTAWA  
CLIENT: Minto Development Group

\*HGL at obvert of pipe if pipe is not surcharged  
\*\* Finished floor for slab on grade commercial building  
\*\*\*Freeboard is from upstream MH HGL to FF

LOCATION				AREA (Ha)				RATIONAL DESIGN FLOW																SEWER DATA										Freeboard is from upstream MHI HGL to FF				
STREET	AREA ID	FROM MH	TO MH	C= 0.20	C= 0.70	C= 0.75	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)	ICD FIXED FLOW (L/s)	DESIGN FLOW (L/s)	CAPACITY (L/s)	LENGTH (m)	PIPE SIZE (mm)			SLOPE (%)	VELOCITY (m/s)	AVAIL CAP (5yr) (L/s) (%)		surcharged pipe	upstream obvert	HGL* m	FF** m	Freeboard*** m				
	223A	CB223	CBMH223				0.15	0.38	0.38	10.00	0.21	10.21	104.19	122.14	178.56	39.10				39.10	446.15	34.20	450				2.25	2.718	407.05	91.24%	no	95.84	95.84					
	223B	CBMH223	MH220				0.12	0.30	0.68	10.21	0.27	10.47	103.10	120.85	176.66	69.65				69.65	210.32	20.38	450				0.50	1.281	140.67	66.88%								
	-	MH220	MH212					0.00	2.18	12.21	0.44	12.65	93.82	109.93	160.62	204.22				204.22	248.09	22.60	600				0.15	0.850	43.86	17.68%								
	212A	CICB212A	CICB212B				0.03	0.08	0.08	10.00	0.12	10.12	104.19	122.14	178.56	7.82				7.82	62.04	8.61	250				1.00	1.224	54.22	87.39%								
	212B	CICB212B	MH212				0.03	0.08	0.15	10.12	0.06	10.18	103.58	121.42	177.49	15.55				15.55	151.96	11.24	250				6.00	2.999	136.41	89.77%								
	215	CB215	MH215				0.04	0.10	0.10	10.00	0.17	10.17	104.19	122.14	178.56	10.43				10.43	62.04	12.57	250				1.00	1.224	51.61	83.19%								
	BLK100	BLK100	MAIN				0.06	0.15	0.15	10.00	0.07	10.07	104.19	122.14	178.56	15.64				15.64	62.04	5.50	250				1.00	1.224	46.40	74.79%			97.23	99.60	2.37			
	-	MH215	MH214					0.00	0.25	10.17	0.40	10.57	103.30	121.09	177.01	25.85				25.85	82.07	38.95	250				1.75	1.620	56.22	68.51%	no	97.23	97.23					
	216A	RYCB216	CB216	0.03				0.02	0.02	10.00	0.05	10.05	104.19	122.14	178.56	1.74				1.74	124.08	7.40	250				4.00	2.449	122.34	98.60%								
	216B	CB216	MH216				0.04	0.10	0.12	10.00	0.04	10.04	104.19	122.14	178.56	12.17				12.17	138.72	5.90	250				5.00	2.738	126.56	91.23%								
		MH216	MH214					0.00	0.12	10.05	0.47	10.52	103.93	121.83	178.10	12.13				12.13	43.87	24.56	250				0.50	0.866	31.73	72.34%	no	97.07	97.07					
	BLK200	BLK200	MAIN				0.04	0.10	0.10	10.00	0.07	10.07	104.19	122.14	178.56	10.43				10.43	62.04	5.40	250				1.00	1.224	51.61	83.19%								96.55
	-	MH214	MH213					0.00	0.47	10.57	0.40	10.97	101.27	118.69	173.49	47.30				47.30	129.34	27.00	375				0.50	1.134	82.04	63.43%	no	96.55	96.55					
	-	MH213	MH212					0.00	0.47	10.97	0.26	11.23	99.34	116.43	170.16	46.40				46.40	129.34	17.80	375				0.50	1.134	82.94	64.13%								
	-	MH212	MH210					0.00	2.79	11.23	0.86	12.09	98.12	114.98	168.05	274.12				274.12	350.85	61.94	600				0.30	1.202	76.72	21.87%	no	95.74	95.74					
	210A	CB210A	MAIN				0.12	0.30	0.30	10.00	0.09	10.09	104.19	122.14	178.56	31.28				31.28	201.76	15.06	300				4.00	2.765	170.48	84.50%								
	BLK900	BLK900	MAIN				0.46	1.15	1.15	10.00	0.21	10.21	104.19	122.14	178.56	119.92				119.92	182.91	19.94	375				1.00	1.604	62.99	34.44%			95.56	98.10	2.54			
DEPRESSED LOADING	210B	CB210B	MAIN				0.02	0.05	0.05	10.00	0.29	10.29	104.19	122.14	178.56	5.21				5.21	43.87	14.90	250				0.50	0.866	38.65	88.11%	no	95.56	95.56					
		MH210	MH205B					0.00	7.55	11.74	0.41	14.15	87.88	102.93	150.35	663.26				663.26	905.48	28.86	975				0.15	1.175	242.23	26.75%								
	206E	CICB206D	MAIN			0.09		0.19	0.19	10.00	0.02	10.02	104.19	122.14	178.56	19.55				19.55	87.74	2.57	250				2.00	1.731	68.18	77.72%								
	-	MH205B	MH205					0.00	7.74	14.15	0.20	14.34	86.42	101.22	147.84	668.51				668.51	905.48	13.88	975				0.15	1.175	236.97	26.17%								
	206A	CB206A	CBMH206				0.24	0.60	0.60	10.00	0.17	10.17	104.19	122.14	178.56	62.57				62.57	420.63	25.66	450				2.00	2.562	358.07	85.13%								
	206B	CBMH206	MH206				0.14	0.35	0.95	10.17	0.26	10.43	103.32	121.11	177.05	98.23				98.23	210.32	19.99	450				0.50	1.281	112.09	53.29%								
	206C	CB206B	MAIN				0.07	0.18	0.18	10.00	0.08	10.08	104.19	122.14	178.56	18.25				18.25	85.29	8.49	250				1.89	1.683	67.04	78.60%								
	206D	CB206C	MAIN				0.04	0.10	0.10	10.00	0.02	10.02	104.19	122.14	178.56	10.43				10.43	87.74	2.32	250				2.00	1.731	77.31	88.11%	no	96.05	96.05					
	-	MH206	MH205					0.00	1.23	10.43	0.59	11.02	101.99	119.55	174.75	125.04				125.04	182.91	56.62	375				1.00	1.604	57.87	31.64%								
External South	EXT-2	STUB	MH205		2.82			5.49	5.49	12.00	0.17	12.17	94.70	110.96	162.13	519.66				519.66	986.85	11.55	1050				0.12	1.104	467.19	47.34%	no	95.50	95.50					





**PROJECT:** Arcadia Commercial  
**LOCATION:** CITY OF OTTAWA  
**CLIENT:** Minto Development Group

\*HGL at obvert of pipe if pipe is not surcharged  
 \*\* Finished floor for slab on grade commercial building  
 \*\*\*Freeboard is from upstream MH HGL to FF

J:\35355-ArcadiaComm\5.7 Calculations\5.7.1 Sewers & Grading\4th submission Oct 2014\CCS\_35355\_stormsewers\_2014-10-2



#### Outlet # 2 (MH301) SUMMARY

Total Flow from Roofs=	8.00 l/s
Total Roof Area =	0.310 Ha
Average roof flow =	25.81 l/s/Ha
Volume Stored on Roofs	149.34 cm
Total Roof Storage rate	481.73 cm/Ha
Total flow from parking lot =	110.00 l/s
Total parking Lot area =	0.410 Ha
Average parking lot flow =	268.29 l/s/Ha
Volume Stored on Parking lot	80.59 cm
Total Parking lot Storage rate	196.56 cm/Ha
Total uncontrolled flow from site	7.94 l/s
Total uncontrolled area	0.080 Ha
Total flow	125.94 l/s
Total area	0.80 Ha
Average flow	157.43 l/s/Ha
Volume Stored	229.93 cm
Total Storage rate	287.41 cm/Ha

#### Outlet # 1 & 2 SUMMARY

Total Flow from Roofs=	26.00 l/s
Total Roof Area =	1.06 Ha
Average roof flow =	24.53 l/s/Ha
Volume Stored on Roofs	516.49 cm
Total Roof Storage rate	487.25 cm/Ha
Total flow from parking lot =	1116.00 l/s
Total parking Lot area =	3.83 Ha
Average parking lot flow =	291.38 l/s/Ha
Volume Stored on Parking lot	895.67 cm
Total Parking lot Storage rate	233.86 cm/Ha
Total uncontrolled flow from site	46.66 l/s
Total uncontrolled area	0.190 Ha
Total flow	1188.66 l/s
Total area	5.080 Ha
Average flow	233.99 l/s/Ha
Volume Stored	1412.16 cm
Total Storage rate	277.98 cm/Ha



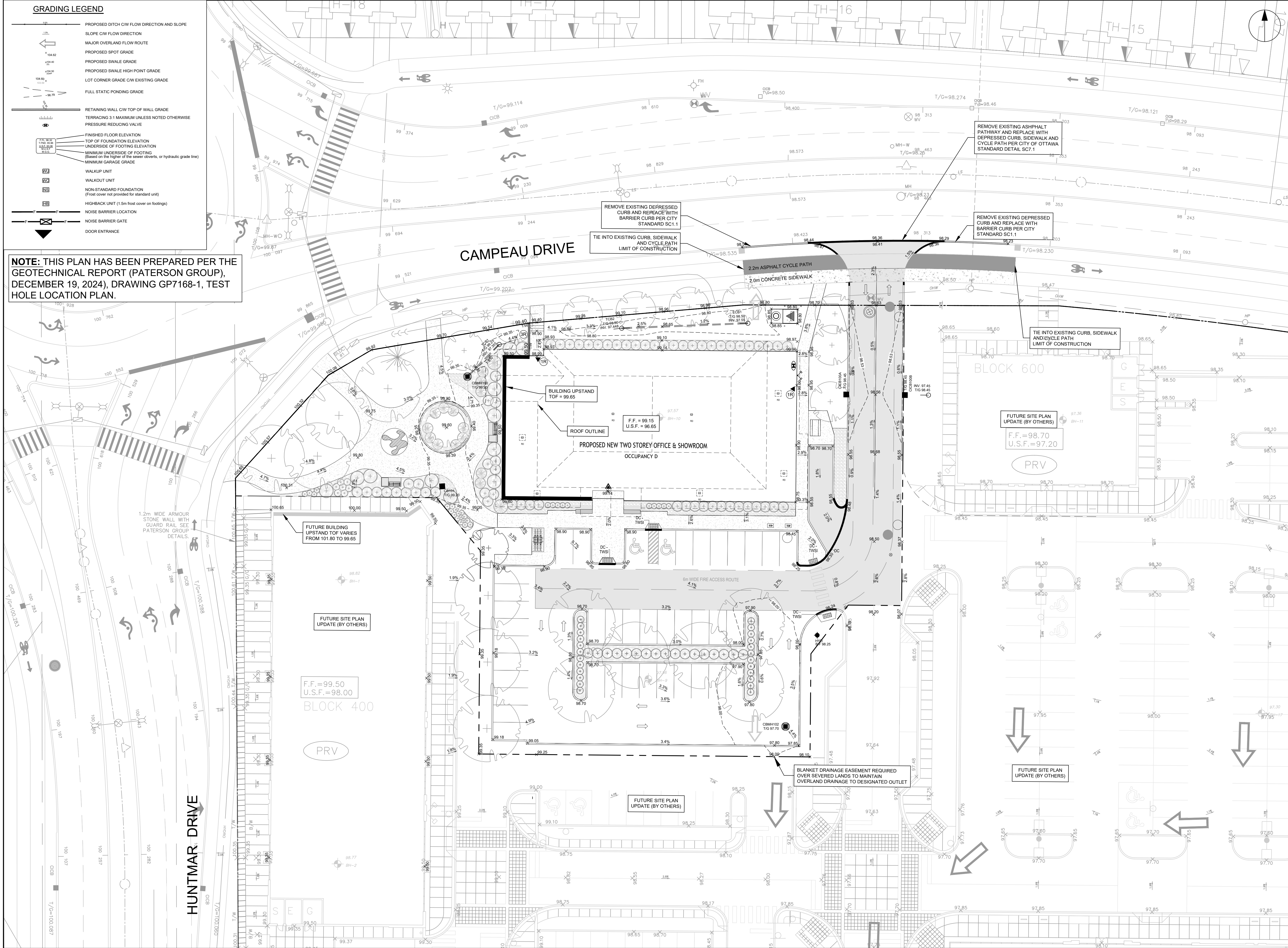




# Appendix E

- **Grading Plan 147391-C-200**
- **Erosion and Sediment Control Plan 147391-C-900**
- **Grading Plan 35355-C-200**





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**Arcadis Professional Services (Canada) Inc.**  
Formerly (B) Group Professional Services (Canada) Inc.

**ISSUES**

No.	DESCRIPTION	DATE
1	SUBMISSION NO. 1 FOR CITY REVIEW	2024-11-13
2	REVISED AS PER CITY COMMENTS	2025-01-23
3	REVISED AS PER CITY COMMENTS	2025-03-07
4	REVISED AS PER CITY COMMENTS	2025-04-16
5	REVISED AS PER CITY AND MVCA COMMENTS	2025-04-30

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

**KEY PLAN**

**CONSULTANTS**

**1:250**

**0 2.5 7.5 12.5m**

**SEAL**

**LICENCED PROFESSIONAL ENGINEER**  
**D. Yanoulopoulos**  
**2025/04/30**  
**PROVINCE OF ONTARIO**

**LICENCED PROFESSIONAL ENGINEER**  
**W. ZHUANG**  
**100231427**  
**2025/04/30**  
**PROVINCE OF ONTARIO**

**PRIME CONSULTANT**

**ARCADIS**

**333 Preston Street - Suite 500**  
**Ottawa ON K1S 5N4 Canada**  
**tel 613 225 1311**  
**www.arcadis.com**

**PROJECT**

**MINTO DESIGN CENTRE**  
**370 HUNTMAR DRIVE**

**PROJECT NO:**  
**147391**

**DRAWN BY:**  
**D.P.S.**

**CHECKED BY:**  
**D.G.Y.**

**PROJECT MGR:**  
**R.M.**

**APPROVED BY:**  
**R.M.**

**SHEET TITLE**

**SITE GRADING PLAN**

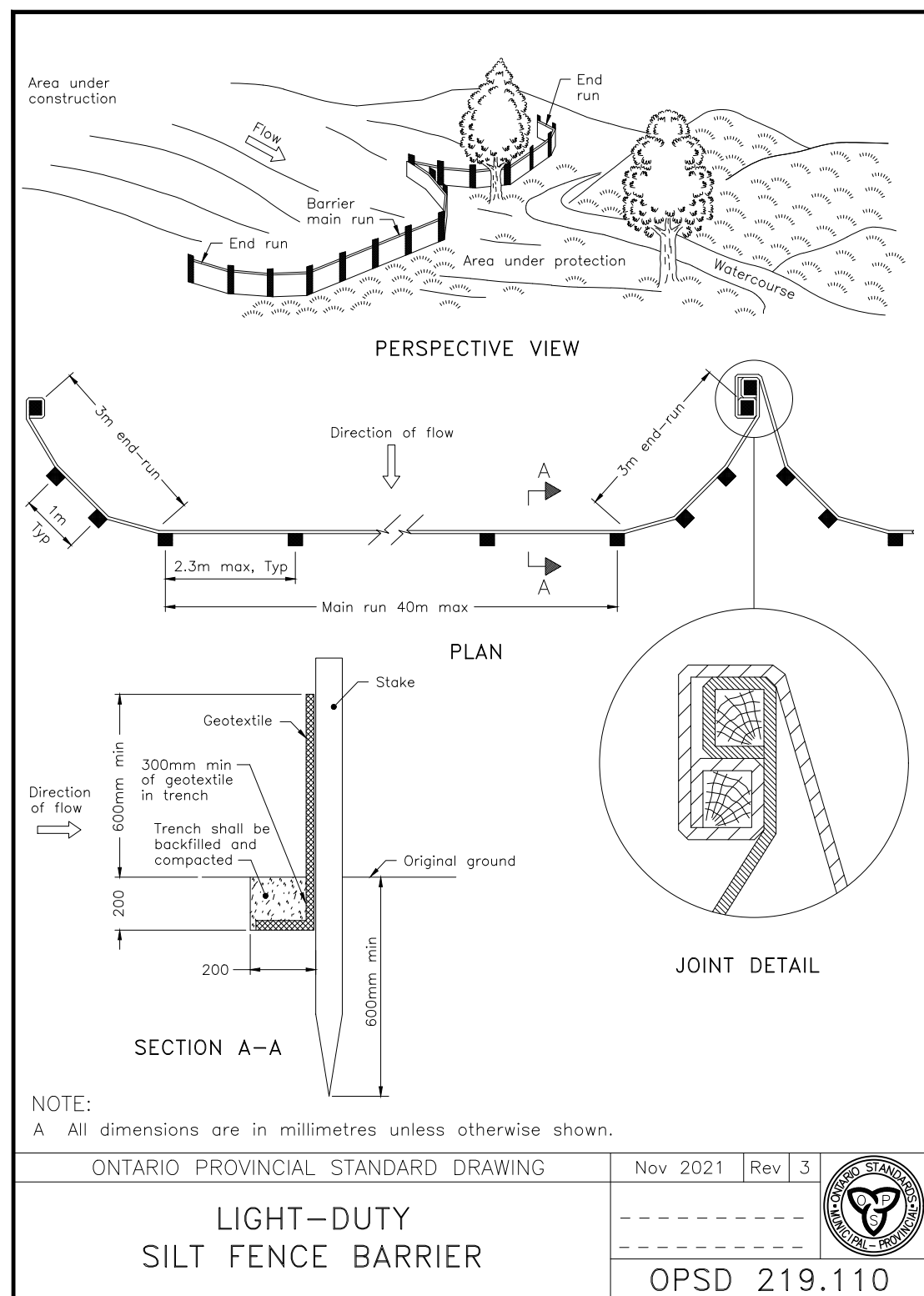
**SHEET NUMBER**

**C-200**

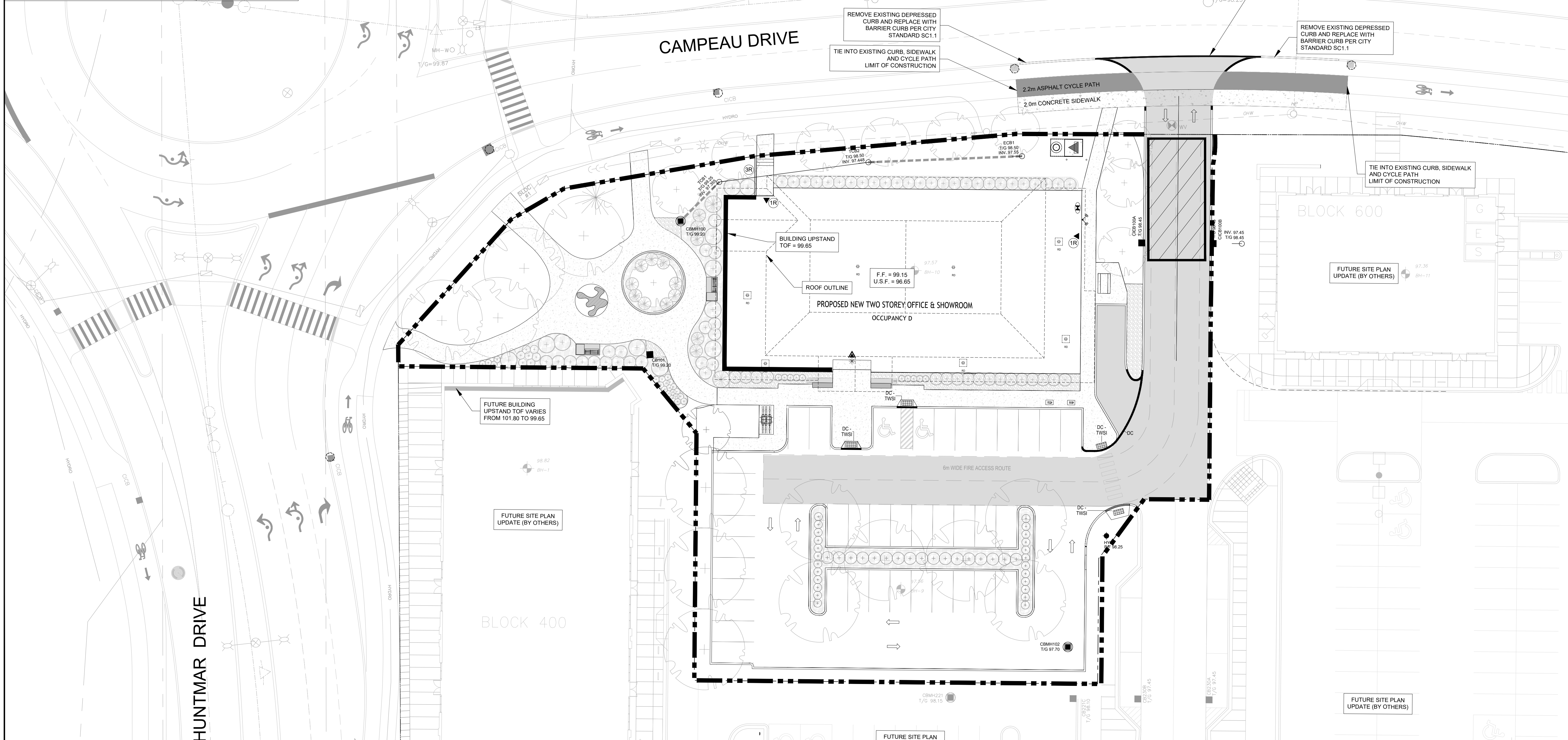
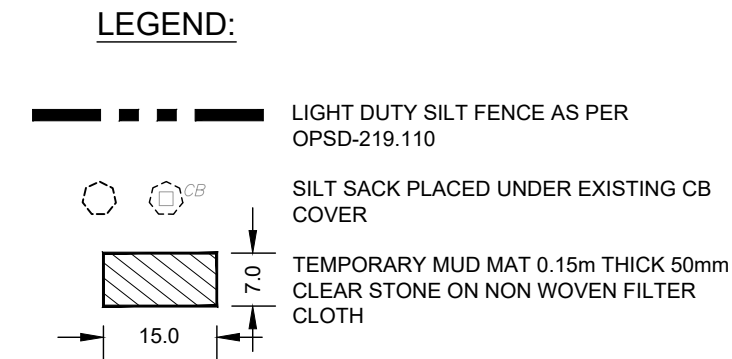
**ISSUE**

**5**





- NOTES:
1. THE CONTRACTOR SHALL IMPLEMENT BEST MANAGEMENT PRACTICES, TO PROVIDE FOR PROTECTION OF THE AREA DRAINAGE SYSTEM AND THE 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. SILT FENCE TO BE ERECTED PRIOR TO EARTH WORKS BEING COMMENCED. SILT FENCE TO BE MAINTAINED UNTIL VEGETATION IS ESTABLISHED OR UNTIL START OF SUBSEQUENT PHASE.
  3. STRAW BALE SEDIMENT TRAPS TO BE CONSTRUCTED IN EXISTING ROAD SIDE DITCHES. TRAPS TO REMAIN AND BE MAINTAINED UNTIL VEGETATION IS ESTABLISHED.
  4. SILT SACK TO BE PLACED AND MAINTAINED UNDER COVER OF ALL CATCHBASINS. GEOTEXTILE SILT SACK IN STREET CBs TO REMAIN UNTIL ALL CURBS ARE CONSTRUCTED. GEOTEXTILE FABRIC IN RYCBs TO REMAIN UNTIL VEGETATION IS ESTABLISHED. ALL CATCHBASINS TO BE REGULARLY INSPECTED AND CLEANED, AS NECESSARY, UNTIL SOD AND CURBS ARE CONSTRUCTED.
  5. CONTRACTOR TO PROVIDE DETAILS ON LOCATION(S) AND DESIGN OF DEWATERING TRAP(S) PRIOR TO COMMENCING WORK. CONTRACTOR ALSO RESPONSIBLE FOR MAINTAINING TRAP(S) AND ADJUSTING SIZE(S) IF DEEMED REQUIRED BY THE ENGINEER DURING CONSTRUCTION.
  6. CONTRACTOR TO PROTECT EXISTING CATCHBASINS WITH FILTER CLOTH UNDER THE COVERS TO TRAP SEDIMENTATION. REFER TO IDENTIFIED STRUCTURES.
  7. WORKS NOTED ABOVE ARE TO BE INSTALLED, INSPECTED, MAINTAINED AND ULTIMATELY REMOVED BY SERVICING CONTRACTOR.
  8. THIS IS A "LIVING DOCUMENT" AND MAY BE MODIFIED IN THE EVENT THE PROPOSED CONTROL MEASURES ARE INSUFFICIENT.



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**Arcadis Professional Services (Canada) Inc.**  
formerly (B) Group Professional Services (Canada) Inc.

No.	DESCRIPTION	DATE
1	SUBMISSION NO. 1 FOR CITY REVIEW	2024-11-13
2	REVISED AS PER CITY COMMENTS	2025-01-23
3	REVISED AS PER CITY COMMENTS	2025-03-07
4	REVISED AS PER CITY COMMENTS	2025-04-16
5	REVISED AS PER CITY AND MVCA COMMENTS	2025-04-30

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

KEY PLAN

CONSULTANTS

1:250

0 2.5 7.5 12.5m

SEAL

LICENSED PROFESSIONAL ENGINEER  
D. Yannakopoulos  
2025/04/30  
PROVINCE OF ONTARIO

LICENSED PROFESSIONAL ENGINEER  
W. ZHUANG  
100231427  
2025/04/30  
PROVINCE OF ONTARIO

PRIME CONSULTANT

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Ottawa ON K1S 5N4 Canada  
tel 613 225 1311  
www.arcadis.com

PROJECT

**MINTO DESIGN CENTRE**  
370 HUNTMAR DRIVE

PROJECT NO:  
147391

DRAWN BY:  
D.P.S.

CHECKED BY:  
D.G.Y.

PROJECT MGR:  
R.M.

APPROVED BY:  
R.M.

SHEET TITLE

**SEDIMENT - EROSION PLAN**

SHEET NUMBER

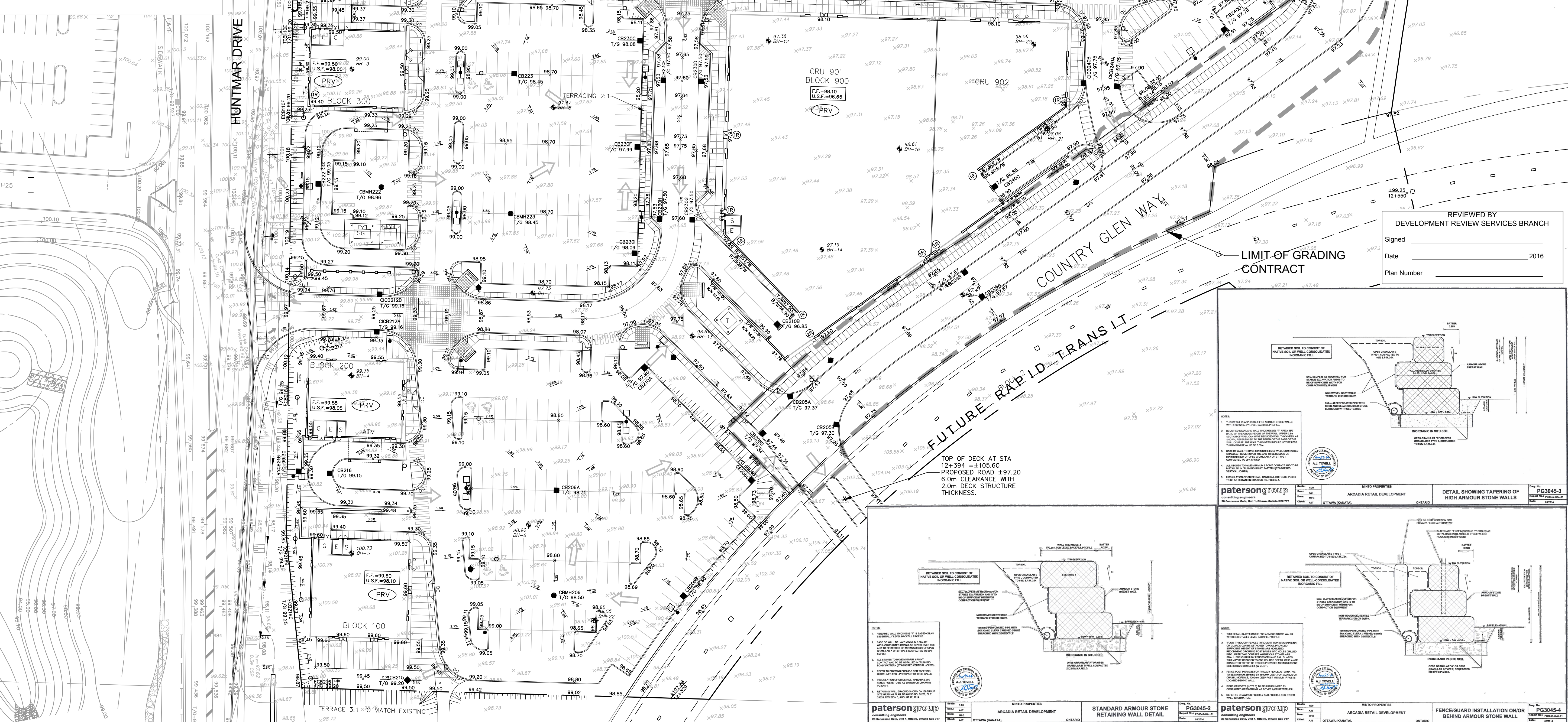
**C-900**

ISSUE

**5**



- LEGEND:**
- BORE HOLE LOCATIONS
  - EXISTING GRADE
  - PROPOSED GRADE
  - PROPOSED GRADE
  - FUTURE DECK HEIGHT OF RAPID TRANSIT (STA. AND GRADE FROM DELCAN)
  - TOP OF RETAINING WALL
  - BOTTOM OF RETAINING WALL
  - RISERS REQUIRED
  - PROPOSED CURB
  - PROPOSED DEPRESSED CURB
  - PROPOSED DEPRESSED CURB AND RAMP
  - PROPOSED ARMOUR STONE RETAINING WALL
  - PROPOSED BUILDING UPSTAND
  - PROPOSED BUILDING FINISHED FLOOR ELEVATION
  - PROPOSED STORM MANHOLE
  - PROPOSED SANITARY MANHOLE
  - PROPOSED FIRE HYDRANT
  - PROPOSED CATCHBASIN C/W TOP OF GRATE ELEVATION
  - PROPOSED DITCH INLET C/W TOP OF GRATE ELEVATION
  - PROPOSED TEE CB (ECB OR TCB) C/W TOP OF GRATE
  - PROPOSED SUBDRAIN
  - MAJOR STORM ROUTING
  - PRESSURE REDUCING VALVE
  - TERRACING @ 3:1 UNLESS OTHERWISE NOTED





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