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# Design Brief 4840 Bank Street

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Prepared for Pathways South Regional Inc.  
by IBI Group  
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# Table of Contents

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<b>1</b>	<b>INTRODUCTION .....</b>	<b>1</b>
1.1	Scope .....	1
1.2	Subject Site .....	1
1.3	Previous Studies .....	1
1.4	Pre-Consultation.....	1
1.5	Geotechnical Investigation .....	2
<b>2</b>	<b>WATER SUPPLY .....</b>	<b>3</b>
2.1	Existing Conditions.....	3
2.2	Design Criteria.....	3
	<b>2.2.1 Water Demands .....</b>	<b>3</b>
	<b>2.2.2 System Pressure .....</b>	<b>3</b>
	<b>2.2.3 Fire Flow Rates .....</b>	<b>4</b>
	2.2.4 Boundary Conditions .....	4
	<b>2.2.5 Hydraulic Model.....</b>	<b>4</b>
2.3	Proposed Water Plan .....	4
	2.3.1 Modelling Results .....	4
	<b>2.3.2 Watermain Layout .....</b>	<b>5</b>
<b>3</b>	<b>WASTEWATER DISPOSAL .....</b>	<b>6</b>
3.1	Existing Conditions.....	6
3.2	Design Criteria.....	6
3.3	Recommended Wastewater Plan.....	6
<b>4</b>	<b>SITE STORMWATER MANAGEMENT.....</b>	<b>7</b>
4.1	Existing Conditions.....	7
4.2	Phasing .....	7
4.3	Design Criteria.....	7
4.4	Proposed Minor System.....	7
4.5	Stormwater Management.....	8

## Table of Contents (continued)

---

4.6	Inlet Controls .....	8
4.7	On-Site Detention .....	10
4.7.1	Site Inlet Control .....	10
4.7.2	Roof Inlet Controls .....	11
4.7.3	Overall Release Rate .....	11
<b>5</b>	<b>SEDIMENT AND EROSION CONTROL PLAN .....</b>	<b>12</b>
5.1	General .....	12
5.2	Trench Dewatering .....	12
5.3	Bulkhead Barriers .....	12
5.4	Seepage Barriers .....	12
5.5	Surface Structure Filters .....	13
<b>6</b>	<b>APPROVALS AND CITY REQUIREMENTS .....</b>	<b>14</b>
6.1	City of Ottawa .....	14
6.2	Province of Ontario .....	14
6.3	Conservation Authority .....	14
6.4	Federal Government .....	14
<b>7</b>	<b>CONCLUSIONS &amp; RECOMMENDATIONS .....</b>	<b>15</b>
7.1	Conclusions .....	15
7.2	Recommendations .....	15

# Table of Contents (continued)

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## List of Figures

---

<b>Figure 1.1</b>	<b>Location Plan</b>
<b>Figure 1.2</b>	<b>Site Plan</b>

# Table of Contents (continued)

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## List of Appendices

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- Appendix A** City Pre-Consultation Meeting Notes (January 12, 2022)
- Appendix B** Watermain Demand Calculation Sheets  
FUS Calculation  
Boundary Conditions from the City of Ottawa  
Hydraulic Analysis  
Non-Combustible Construction confirmation by Architect  
Fire Protection confirmation by Mechanical Engineer
- Appendix C** Home Hardware Sanitary Sewer Design Sheet  
Drawing 119351-400 – Home Hardware Sanitary Drainage Area Plan  
Sanitary Sewer Design Sheet  
Drawing 137175 C-400 – Sanitary Drainage Area Plan
- Appendix D** Home Hardware Storm Sewer Design Sheet  
Drawing 119351-500 – Home Hardware Storm Drainage Area Plan  
Storm Sewer Design Sheet  
Drawing 137175 C-500 – Storm Drainage Area Plan  
Highlighted Drawing 119351 -001 Home Hardware Site Servicing Plan
- Appendix E** Home Hardware Inlet Controls Calculations  
Stormwater Management Calculations  
A104c - Roof Plan  
Tempest ICD Technical Sheet  
Watts Roof Drain ICD Spec Sheet
- Appendix F** Drawing 137175 C-001 – General Plan of Services  
Drawing 137175 C-010 – Notes, Legend & CB Data  
Drawing 137175 C-200 – Site Grading Plan  
Drawing 137175 C-600 – Ponding Plan  
Drawing 137175 C-900 – Erosion and Sedimentation Control Plan

# 1 INTRODUCTION

## 1.1 Scope

IBI Group has been retained by Pathways South Regional Inc. to prepare the necessary engineering plans, specifications and documents to support a proposed Site Plan Application for the subject lands in accordance with the policies set out by the Planning and Development Branch of the City of Ottawa. This Brief will present a detailed servicing scheme to support development of the property, and will include sections that will review water supply, wastewater disposal, minor and major stormwater management along with erosion and sediment control.

## 1.2 Subject Site

The Block 204 Pathways South Apartments site is part of the Pathways South subdivision. It's eastern limit abuts Bank Street and is immediately south of the Home Hardware Site (4836 Bank Street). An undeveloped property is south of the site and a mid use residential development is located west of the site. The proposed development is approximately 1.55 hectares in size. Refer to **Figure 1.1** for more information regarding the site location.

The subject property is presently unimproved and is covered with trees and sporadic bushes. The proposed re-development of the site will include three new four storey apartment buildings each with 60 units; one vehicular access; dedicated surface parking spaces; an amenity space and landscaped areas. A current concept of the envisioned development is shown on **Figure 1.2**.

## 1.3 Previous Studies

Design of this project has been undertaken in accordance with the following reports:

- **2016 Updated Serviceability Report (Class EA OPA 76 Areas 8a, 9a & 9b) Leitrim Development Area (IBI Group, September 2016)** – The report is an update to an earlier servicing report completed in 2007. The updated report was needed to review the impacts on existing major infrastructure by developing an additional 87 ha in the LDA. IN 2012, under OPA 76, the City of Ottawa increased its urban envelope by over 900 ha including expansion areas 8a, 9a, and 9b in the LDA. The subject site is included in the OPA 76 Expansion Area. The report included a high level review of the development requirements of the subject site. The design of the subject site is based on the report recommendations.
- **Design Brief Pathways at Findlay Creek 4800 Bank Street (Remer Lands) Phase 1 (IBI Group July 2017)** – The report provides detail design criteria for adjacent developments including the subject site and identifies capacity for a water supply and both storm and sanitary sewers for the subject site.
- **Design Brief Bank Street Development 4836 Bank Street (IBI Group April 2019)** – The report covered development of the adjacent and downstream Home Hardware (HH) development. The HH site provides municipal servicing capacity for the subject site.

## 1.4 Pre-Consultation

A pre-consultation meeting with the Owner and City Staff was held on January 12, 2022. Attached in **Appendix A** is a copy of the meeting notes from that meeting. Some of the items discussed during the meeting dealt with the following subjects:

- Official Plan & Zoning
- Infrastructure/Serviceing
- Planning

- Urban Design
- Parks
- Environment
- Transportation
- Forestry
- SNCA
- Waste Collection

## 1.5 Geotechnical Investigation

A geotechnical report entitled “Geotechnical Investigation, Proposed Multi-Storey Buildings, Idone South Apartments, 4840 Bank Street, Ottawa, Ontario” dated May 20, 2022 by Paterson Group has been prepared for the subject site.

The objective of the investigation report include:

- Determination of the subsoil and groundwater conditions;
- Provision of geotechnical recommendations pertaining to the design and development of the subject site including construction considerations.

Among other items, the report comments on the following:

- Site grading;
- Foundation design;
- Pavement structure;
- Infrastructure construction;
- Groundwater control;
- Contamination/corrosive environment.

The report concludes that the subject site is considered suitable for the proposed development



## 2 WATER SUPPLY

### 2.1 Existing Conditions

As previously noted, the 1.55 hectare Block 204 site is located west of Bank Street and south of the Home Hardware site. There is an existing 200 mm dia watermain along the south side of the Home Hardware site adjacent to the subject site. That watermain falls within the City of Ottawa's pressure district Zone 4C and will provide the water requirements to the site.

### 2.2 Design Criteria

#### 2.2.1 Water Demands

Water demands have been calculated for the development using consumption rates from Table 4.2 of the Ottawa Design Guidelines – Water Distribution. The proposed development will include three four storey apartment buildings (buildings A, B and C), with each containing 60 apartments. Per unit population density and consumption rates are taken from Tables 4.1 and 4.2 at the Ottawa Design Guidelines – Water Distribution and are summarized as follows:

- Residential Average Day Demand 280 l/cap/day
- Residential Peak Daily Demand 700 l/cap/day
- Residential Peak Hour Demand 1540 l/cap/day

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

- Average Day 1.05 l/s
- Maximum Day 2.63 l/s
- Peak Hour 5.78 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 subject site plan will contain three apartment buildings. Calculations using the Fire Underwriting Survey (FUS) method were conducted to determine the fire flow requirement for the site for Building A, as its proximity to other buildings makes it the most vulnerable from a fire hazard perspective. The FUS method considers building floor area, type of building construction, type of occupancy, availability of sprinkler systems and separations from adjacent buildings. The architect has confirmed that the building construction will be non-combustible as defined by the FUS. The mechanical engineer has confirmed that the fire protection system is fully supervised and the sprinkler system will be in accordance to NFPA 13, therefore a reduction of 40% has been assumed in accordance with the FUS. An occupancy reduction has been applied since it is a residential building. Results of the calculations show a fire demand of 9,000 l/min (150.0 l/s) for Building A. A copy of the FUS calculation is included in **Appendix B**.

### 2.2.4 Boundary Conditions

The City of Ottawa has provided hydraulic boundary conditions at two locations, one at the existing main on Dun Skipper Drive at the entrance to the site and the other is on the existing Bank Street main at the Bank Street entrance. Boundary conditions have been supplied for the 2019 existing conditions and for the future SUC zone reconfiguration. The existing condition Max HGL is used for the basic day analysis to determine the maximum pressure as it represents the highest HGL elevation. For the peak hour and max day plus fire analysis the existing conditions is again used in the analysis as these represent the lowest HGL elevations. The boundary conditions are included in **Appendix B** and are summarized as follows;

Table 2.2.4: Boundary Conditions Summary

SCENARIO	CONDITION 1 DUN SKIPPER DRIVE	CONDITION 2 BANK STREET
Max HGL (Basic Day)	154.6m	154.6m
Peak Hour	143.7m	143.7m
Max Day + Fire (13,000 l/min)	122.3m	121.3m

### 2.2.5 Hydraulic Model

A computer model for the site has been developed using the Infowater 12.4 program by Innovyze. The model includes the proposed and existing watermains on Bank Street and Dun Skipper Drive and the boundary conditions provided by the City.

## 2.3 Proposed Water Plan

### 2.3.1 Modelling Results

The site will be serviced by two connections to the existing 400 mm watermains on Dun Skipper Drive and Bank Street. All watermains are 200 mm diameter. Results of the hydraulic analysis for the Site is included in **Appendix B** and is summarized as follows:

Table 2.3.1 Hydraulic Analysis Results

SCENARIO	Pressure (kPa)
Basic Day (Max HGL) Pressure (kPa)	506.6 – 526.2

Maximum Day plus Fire Flow Design Fire Flow of 9,000 l/s @ 140 kPa (kPa)	140.4-205.4
Peak Hour Pressure (kPa)	399.7 – 412.4

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

Maximum Pressure	Under Basic Day there are no nodes in which the pressure exceeds 552 kPa (80 psi), thus no pressure reducing control is required. There is also no area where the pressure exceeds the maximum level of 689 kPa (100 psi) in unoccupied areas.
Minimum Pressure	The lowest minimum pressure during peak hour conditions is 399.7 kPa which exceeds the minimum 276 kPa (40 psi) requirement.
Fire Flow	The minimum design fireflow under maximum day conditions with minimum system pressure of 140 kPa (20psi) is 300 l/s which exceeds the requirement of 150.0 l/s.

### 2.3.2 Watermain Layout

In order to provide additional reliability to the system in case of a watermain break, two connections to the adjacent private watermain system are proposed. The proposed water plan is shown on Drawing 137175 C-001, the General Plan of Services, a copy of which is included in **Appendix F**. An accompanying Drawing C-010, Details and Notes is also included in **Appendix F**. Since the average daily water demand for each proposed apartment building is less than 50,000 m<sup>3</sup>/day, only one 200 mm dia water service is proposed for each building. The proposed fire hydrant layout also includes an unobstructed path of no more than 45m between the hydrant and Siamese connections as required by the Ontario Building Code.

## 3 WASTEWATER DISPOSAL

### 3.1 Existing Conditions

The Block 204 Pathways South Apartment site at 4840 Bank Street is located within the Leitrim Development Area where sanitary flows ultimately outlet to the Leitrim Sanitary Pumping Station. As part of the adjacent downstream developments, the outlet sanitary sewer design for the subject site was completed. Those sewers were designed as per the recommendations of the 2016 Updated Serviceability Report. In particular, a proposed 200 mm diameter sanitary sewer in the adjacent Home Hardware (HH) development has been designed to service the subject site.

A highlighted copy of the sanitary sewer design sheet from the Home Hardware design, together with the related Sanitary Drainage Area Plan (drawing 119351-400) are included in **Appendix C**. The Home Hardware sanitary sewer design assumed the subject site would develop as a commercial site and based on the commercial design criteria, estimated the wastewater flow from Block 204 would be approximately 1.25 l/s. However the HH site is being phased and the section of sanitary sewer in that site which is needed to service the subject site has not yet been installed. Consequently, development of the subject site will likely include construction of some sanitary sewers on the HH site.

### 3.2 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:

- Residential flow 280 l/p/d
- Unit Population 1.8 ppu
- Peaking factor Modified Harmon Formula
- Infiltration allowance 0.33 l/s/ha
- Velocities 0.60 m/s min. to 3.0 m/s max.

### 3.3 Recommended Wastewater Plan

The on-site sanitary system will consist of a network of 200mm sewers installed at normal depth and slope and will provide a single service connection to each apartment building. The sewers have been designed using the criteria noted above in Section 3.2 and outlet via a connection to the sanitary sewer at MH1A located north of Building A near the Home Hardware site. A copy of the sanitary drainage area plan 137175 C-400 and the sanitary sewer design sheet can be found in **Appendix C**. Please refer to the site servicing plan 137175 C-001, which is located in **Appendix F**, for further details.

Based on the proposed residential land use for Block 204, the calculated wastewater flow is estimated to be 4.13 l/s or about 2.9 l/s more than calculated in the downstream Home Hardware design. However, based on the sanitary design sheet from that site, the downstream wastewater system has more than sufficient available capacity to accommodate the proposed residential land use.

As noted previously, development of Block 204 will also include construction of some 200 mm dia sanitary sewers on the Home Hardware property. For reference a highlighted copy of drawing 119351-001, General Plan of Services from the Home Hardware site is included in **Appendix F**. The sanitary sewer system between MH4A and 1A will need to be constructed on the Home Hardware site to complete the wastewater servicing for the subject site.

## 4 SITE STORMWATER MANAGEMENT

### 4.1 Existing Conditions

Development of the downstream Home Hardware site (4836 Bank Street) included oversized storm sewers and minor storm sewer capacity for Block 204. The minor storm sewer design of the downstream development included a 600 mm dia storm sewer which is proposed to terminate near Building A at MH1. For reference, a highlighted copy of the Home Hardware site storm sewer design sheet together with a copy of drawing 119351-500, the associated Storm Drainage Area Plan are included in **Appendix D**. Based upon a review of the Home Hardware storm sewer design sheet, the calculated minor storm flow from the subject is about 249 l/s (3.29 A.C x 75.75 mm/hr).

However, development of the Home Hardware site will be phased and to date only the first phase of that property, which does not include the 600 mm dia storm sewer, has been constructed. The timing of the Phase 2 construction is unknown at this time. Consequently the development of the subject site may have to include construction of the oversized storm sewer in the Home Hardware site.

### 4.2 Phasing

Development of the subject site will be completed in one phase..

### 4.3 Design Criteria

The design of the minor storm sewer system in the downstream Home Hardware site included sewer capacity for the subject site, all in accordance with the recommendations from the 2016 Updated Serviceability Report. Based on the storm sewer design sheet for the Home Hardware site, a minor storm flow allowance of about 249 l/s was provided for the subject site. Please refer to the Home Hardware Storm Sewer Design Sheet located in **Appendix D**. Also in keeping with the recommendations from previous designs and reports, the 1:100 year storm event will be self-contained with no overflow to adjacent properties. The emergency overflow for events greater than the 1:100 year event (stress test) will be towards Bank Street.

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

Some of the key criteria include the following:

- Design Storm 1:2 year return (Ottawa)
- Rational Method Sewer Sizing 1:2 year return (Ottawa)
- 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)

### 4.4 Proposed Minor System

Using the criteria identified in Section 4.3, the proposed on-site storm sewers were sized accordingly. A detailed storm sewer design sheet and the associated Storm Sewer Drainage Area plan (drawing 137175 C-500) are both included in **Appendix D**. The General Plan of Services,

drawing 137175 C-001, depicting all on-site storm sewers can be found in **Appendix F**. Based on the Block 204 storm sewer design sheet, the calculated minor storm flow from the subject site will be 213.59 l/s which is less than the provided capacity of 249 l/s.

The proposed minor storm sewers will range in size between 300 mm diameter and 525 mm diameter. Catchbasin lead pipes will mostly be 200 mm diameter with the exception of the CB9 and CB10 lead pipe which will be 300 mm dia. The minor storm sewer outlet will be via the 600 mm dia sewer at MH1 located just north of Building A. That 600 mm pipe, and other downstream sewers on the Home Hardware site, have not yet been constructed. For reference, a marked copy of drawing 119351-001, Site Servicing Plan is included in **Appendix D**. That plan has been highlighted to show the downstream sewers on the Home Hardware property that will need to be constructed to service Block 204.

The existing downstream sewers in the Home Hardware site eventually outlet to the Findlay Creek Village SWMF. That facility provides 80% TSS removal, so no additional on-site stormwater quality control is required within the subject lands.

## 4.5 Stormwater Management

The subject site will be limited to a release rate established using the criteria described in section 4.3. This will be achieved through a combination of inlet control devices (ICD's) at inlet locations and surface storage.

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

The maximum surface retention depth located within the developed areas will be limited to a maximum of 300mm during a 1:100 year event as shown on the drawings 137175 C-200, Site Grading Plan and 137175 C-600 Ponding Plan, both of which are located in **Appendix F**.

Overland flow routes will be provided in the grading to permit emergency overland flow, in excess of the 100 year event, from the site.

At the extremities of the site, north and east of Building A as well as south of buildings B and C, the opportunity to store runoff is limited due to grading constraints and building geometry, this area will flow uncontrolled to Bank Street. In addition, the storm drainage area MH1 (draining into CBMH2) will not be restricted due to grading constraints. These uncontrolled areas – 0.18 and 0.16 hectares in total, have an average C value of 0.30 and 0.88 respectively. Based on 1:100 year storm uncontrolled flows, the uncontrolled areas generate 112.93 l/s runoff (refer to Section 4.6 for the calculation).

The site grading and ponding has been designed to control water generated during the 1:100-year event, with no overflow leaving the site. Please refer to the SWM calculations in **Appendix E**.

## 4.6 Inlet Controls

During the stormwater management analysis for the downstream Home Hardware site, it was discussed that between that property and Block 204 a total release rate of 760 l/s was included in the earlier design of the Pathway subdivision. The Home Hardware allowable release rate calculation was estimated to be 468.42 l/s. In accordance with that calculation, the allowable release rate for Block 204 is 291.58 l/s (i.e.  $760 - 468.42 = 291.58$ ). For reference a copy of the relevant calculation from the 2020 Home Hardware report section 4.6 Inlet Controls is included in **Appendix E**.

As noted in Section 4.5, a small portion of the site will be left to discharge to the Bank Street boulevard at an uncontrolled rate.

Based on a 1:100 year event, the flow from the uncontrolled areas can be determined as:

$$\begin{aligned}
 Q_{\text{uncontrolled1}} &= 2.78 \times C \times i_{100\text{yr}} \times A \quad \text{where:} \\
 C &= \text{Average runoff coefficient of uncontrolled area} = 0.30 \times 1.25 \\
 i_{100\text{yr}} &= \text{Intensity of 100-year storm event (mm/hr)} \\
 &= 1735.688 \times (T_c + 6.014)^{0.820} = 178.56 \text{ mm/hr; where } T_c = 10 \text{ minutes} \\
 A &= \text{Uncontrolled Area} = 0.18 \text{ Ha}
 \end{aligned}$$

Therefore, uncontrolled release rate 1 can be determined as:

$$\begin{aligned}
 Q_{\text{uncontrolled1}} &= 2.78 \times C \times i_{100\text{yr}} \times A \\
 &= 2.78 \times 0.38 \times 178.56 \times 0.18 \\
 &= 33.51 \text{ L/s}
 \end{aligned}$$

Also noted in Section 4.5, one drainage area will enter the storm system unrestricted at CBMH2.

Based on a 1:100 year event, the flow from the uncontrolled areas can be determined as:

$$\begin{aligned}
 Q_{\text{uncontrolled2}} &= 2.78 \times C \times i_{100\text{yr}} \times A \quad \text{where:} \\
 C &= \text{Average runoff coefficient of uncontrolled area} = 0.88 \times 1.25 \text{ (max 1.00)} \\
 i_{100\text{yr}} &= \text{Intensity of 100-year storm event (mm/hr)} \\
 &= 1735.688 \times (T_c + 6.014)^{0.820} = 178.56 \text{ mm/hr; where } T_c = 10 \text{ minutes} \\
 A &= \text{Uncontrolled Area} = 0.16 \text{ Ha}
 \end{aligned}$$

Therefore, uncontrolled release rate 1 can be determined as:

$$\begin{aligned}
 Q_{\text{uncontrolled2}} &= 2.78 \times C \times i_{100\text{yr}} \times A \\
 &= 2.78 \times 1.00 \times 178.56 \times 0.16 \\
 &= 79.42 \text{ L/s}
 \end{aligned}$$

The total uncontrolled release rate is then:

$$\begin{aligned}
 Q_{\text{uncontrolled}} &= Q_{\text{uncontrolled1}} + Q_{\text{uncontrolled2}} \\
 &= 33.51 + 79.42 \\
 &= 112.93 \text{ L/s}
 \end{aligned}$$

The maximum allowable release rate from the remainder of the site can then be determined as:

$$\begin{aligned}
 Q_{\text{max allowable}} &= Q_{\text{restricted}} - Q_{\text{uncontrolled}} \\
 &= 291.58 \text{ L/s} - 112.93 \text{ L/s} \\
 &= 178.65 \text{ L/s}
 \end{aligned}$$

Based on the flow allowance at the various inlet locations, a combination of various sizes of inlet control devices (ICDs) were chosen for the design. The manufacturer’s tech sheets can be found in **Appendix E**. The design of the inlet control devices is unique to each drainage area and is determined based on a number of factors, including hydraulic head and allowable release rate. The inlet control devices were sized according to the manufacturer’s design charts. The restrictions will cause the on-site catchbasins and manholes to surcharge, generating surface ponding in the parking and landscaped areas. Ponding locations and elevations are summarized on the Ponding Plan drawing, 137175 C-600, which is included in **Appendix F**.

## 4.7 On-Site Detention

Any excess storm water up to the 100-year event is to be stored on-site in order to not surcharge the downstream municipal storm sewer system. Detention will be provided in parking and landscape areas and building rooftops, where feasible. As previously noted, the volume of storage is dependent on the characteristics of each individual drainage area and the ICD’s were chosen accordingly. It should be noted that 0.30m of vertical separation has been provided from all maximum ponding elevations to lowest building openings.

Minor ponding will occur in a 2 year storm event. The owner’s group have elected to accept some ponding in the parking lot and not near any of the entrances to the buildings in order to avoid oversizing underground infrastructure (see email in **Appendix E**). Ponding during the 2 year storm event is not typically accepted by the city within municipal right of ways but as this is a private site plan the city has stated it in a meeting that it is willing to accept it as long as the Owner has been advised and accepts this condition.

### 4.7.1 Site Inlet Control

The following Table summarizes the on-site storage requirements during both the 1:5-year and 1:100-year events.

Table 4.7.1 SWM Summary

DRAINAGE AREA(s)	TRIBUTARY AREA	AVAILABLE STORAGE (M <sup>3</sup> )	100-YEAR STORM		5-YEAR STORM	
			RESTRICTED FLOW (L/S)	REQUIRED STORAGE (M <sup>3</sup> )	RESTRICTED FLOW (L/S)	REQUIRED STORAGE (M <sup>3</sup> )
MH5A	0.11	17.62	12.00	22.49	12.00	5.17
MH5	0.08	29.16	10.00	19.54	10.00	3.38
MH3	0.07	56.51	8.00	18.03	8.00	4.41
MH3A	0.08	28.03	9.00	20.25	9.00	5.21
MH3B	0.07	28.03	8.00	18.03	8.00	4.67
MH3C	0.09	53.55	12.00	17.84	12.00	5.91
CBMH2	0.03	3.14	12.00	2.47	12.00	0.00
MH3D	0.11	11.29	40.00	10.48	40.00	0.00
MH4	0.04	2.25	25.00	1.23	25.00	0.00
RYCB1	0.05	6.87	6.00	0.75	6.00	0.00
<b>TOTAL</b>	<b>0.73</b>	<b>236.45</b>	<b>142.00</b>	<b>131.11</b>	<b>142.00</b>	<b>28.75</b>

In most instances within the parking lot, drainage areas meet the required storage volume with surface ponds and underground in structure/pipe storage which retain the stormwater and discharge at the restricted flow rate to the sewer system. Where the surface storage is insufficient (drainage areas MH5A and MH3D), the downstream drainage area has capacity to store the overflow. Refer to the SWM calculations in **Appendix E** for detailed storage information and



Drawing 137175 C-600, Ponding Plan located in **Appendix F**. The calculations have been done with the requirement of restricting rooftop flows as well. Rooftop water storage requirements are detailed in Section 4.7.2.

#### 4.7.2 Roof Inlet Controls

The proposed buildings will have roof inlet controls that help to control the amount of stormwater being released into the system. The restricted flow rate for the proposed building is shown below.

Table 4.7.2 Rooftop SWM Summary

ICD AREA	TRIBUTARY AREA	AVAILABLE STORAGE	100-YEAR STORM		5-YEAR STORM	
			RESTRICTED FLOW (L/S)	REQUIRED STORAGE (M <sup>3</sup> )	RESTRICTED FLOW (L/S)	REQUIRED STORAGE (M <sup>3</sup> )
Bldg A	0.15	Min 48.00	12.00	47.36	12.00	17.47
Bldg B	0.15	Min 48.00	12.00	47.36	12.00	17.47
Bldg C	0.15	Min 48.00	12.00	47.36	12.00	17.47
<b>TOTAL</b>	<b>0.45</b>	<b>144.00</b>	<b>36.00</b>	<b>142.08</b>	<b>36.00</b>	<b>52.41</b>

#### 4.7.3 Overall Release Rate

As noted above, the site uses new inlet control devices to restrict the 100 year storm event to the criteria approved by the City of Ottawa. Restricted stormwater will be contained onsite by utilizing surface ponding, in structure/pipe and rooftop storage. In the 100 year event, there will be no off-site overflow.

The sum of restrictions on the site, rooftops and uncontrolled flows is 290.93 l/s (142.00 l/s + 36.00 l/s + 112.93 l/s), which is less than the allowable release of 291.58 l/s noted in section 4.6.

## 5 SEDIMENT AND EROSION CONTROL PLAN

### 5.1 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 trenches will be pumped into a filter mechanism prior to release to the environment. One half diameter bulkhead barriers will be installed at the nearest downstream manhole in each sewer which connects to an existing downstream sewers.
- Seepage barriers will be constructed in any temporary drainage ditches (where applicable);
- 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.

### 5.2 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).

### 5.3 Bulkhead Barriers

To further reduce downstream sediment loading, ½ diameter bulkheads will be constructed over the lower half of the outletting sewers during construction. These bulkheads will trap any sediment laden flows, thus preventing any construction-related contamination into existing sewers. The bulkheads will be inspected and maintained including periodic sediment removal as needed.

### 5.4 Seepage Barriers

In order to further reduce sediment loading to the surrounding area such as the Bank Street roadside ditch, 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 Erosion and Sedimentation Control Plan drawing 137175 C-900, included in **Appendix F**. 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.

## 5.5 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.

## 6 APPROVALS AND CITY REQUIREMENTS

### 6.1 City of Ottawa

The City of Ottawa reviews all development documents including this report and working drawings. Upon completion, the City will approve the local watermains under Permit No. 008-202, submit the sewer ECA application to the province, and eventually issue a Commence Work Notification.

### 6.2 Province of Ontario

The Ministry of Environment, Conservation and Parks (MECP) will approve the local sewers under Section 53 of the Ontario Water Resources Act and issue an Environmental Compliance Approval. The Ministry will also issue a Permit to Take Water.

### 6.3 Conservation Authority

The South Nation Conservation will be contacted to determine permitting requirements.

### 6.4 Federal Government

There are no required permits, authorizations or approvals needed expressly for this development from the federal government.

## 7 CONCLUSIONS & RECOMMENDATIONS

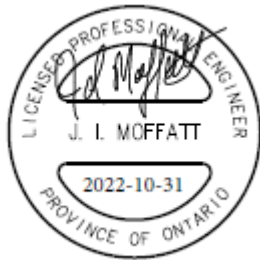
### 7.1 Conclusions

This report and the accompanying working drawings clearly indicate that the proposed development meets the requirements of the stakeholder regulators, including the City of Ottawa, provincial MECP and SNC. The proposed development is in general conformance with the recommendations of both the Pathways Phase 1 design and the design of the downstream Home Hardware site.

There is a reliable water supply available adjacent to the proposed development; a wastewater outlet is available adjacent to the site, local storm sewers have been installed adjacent to the site and an expansion to the existing Findlay Creek Village Stormwater Facility has been constructed to collect and treat runoff from the subject site.

### 7.2 Recommendations

It is recommended that the regulators review this submission with an aim of providing the requisite approvals to permit the owners to proceed to the construction stage of the subject site.

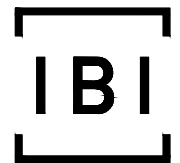
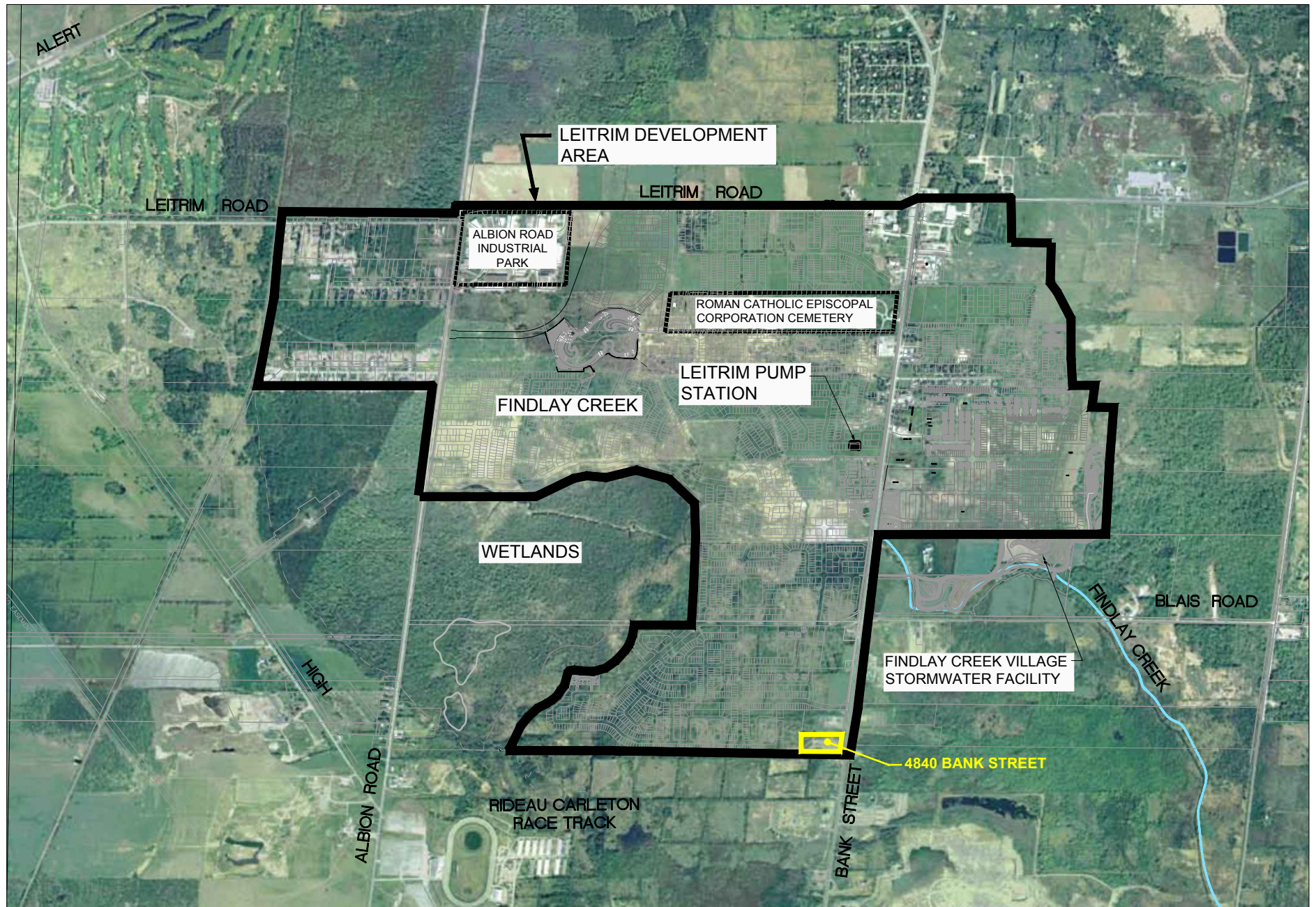


Jim Moffatt, P.Eng.,  
Associate



Samantha E. Labadie, P.Eng.,  
Civil Engineer

j:\137175\_Pathways\_Sou\7.0\_Production\7.03\_Design\04\_Civil\_LAND\Design Brief\FIGURE 1.1 Site Location.dwg Layout Name: FIGURE 1.1



Scale

N.T.S.

Project Title

4840 BANK STREET

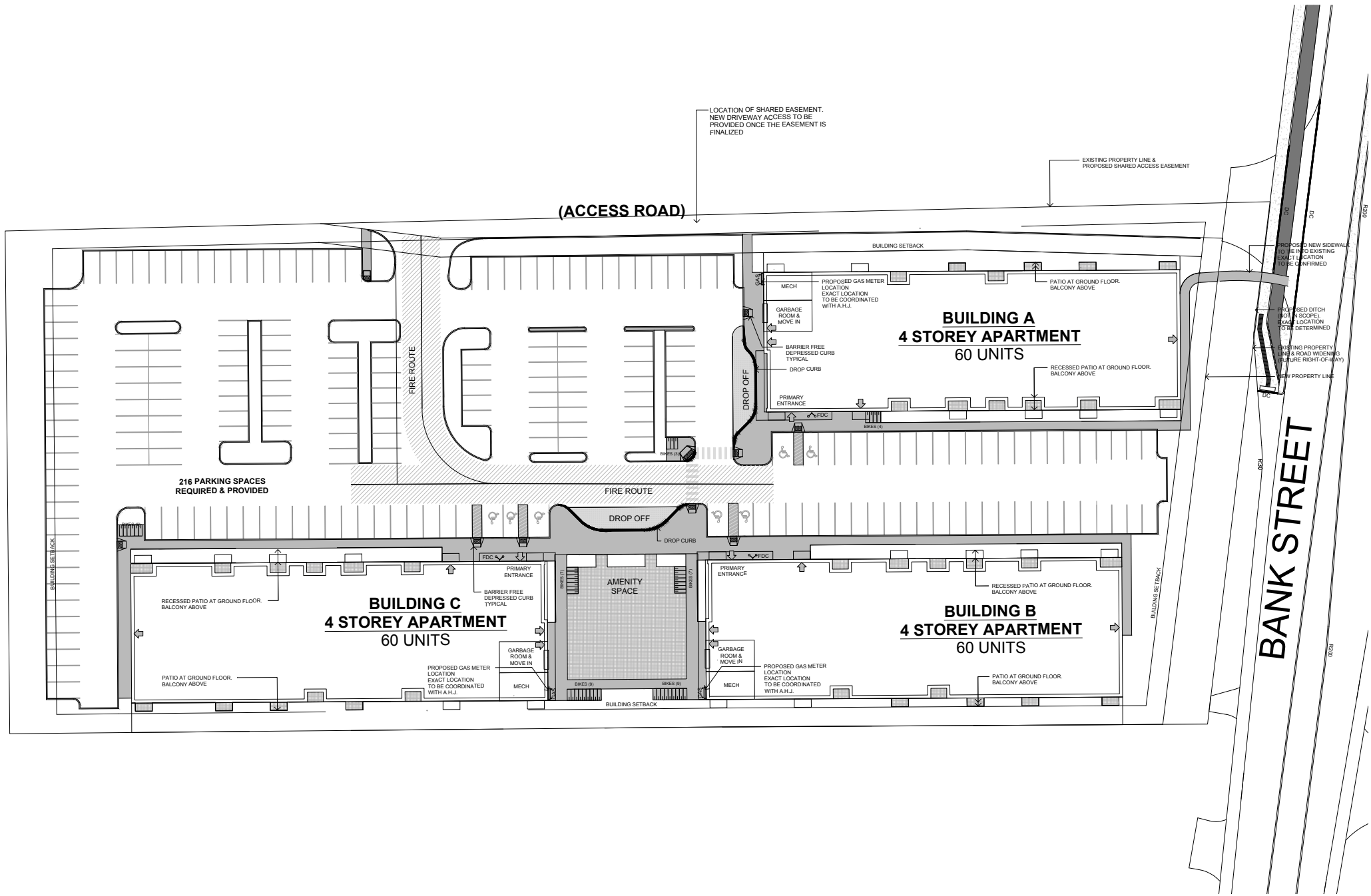
Drawing Title

LOCATION PLAN

Sheet No.

FIGURE 1.1

J:\137175\_Pathways\_Sou\7.0\_Production\7.03\_Design\04\_Civil\LAND\_Design Brief\FIGURE 1.2 Site Plan.dwg Layout Name: FIGURE 1.2



Scale

Project Title

Drawing Title

Sheet No.

N.T.S.

4840 BANK STREET

SITE PLAN

FIGURE 1.2

# **APPENDIX A**

- **City Pre-Consultation Meeting Notes (January 12 2022)**



**4840 Bank Street**  
Meeting Summary Notes  
Jan 12, 2022, Online Teams Meeting

**Attendees:**

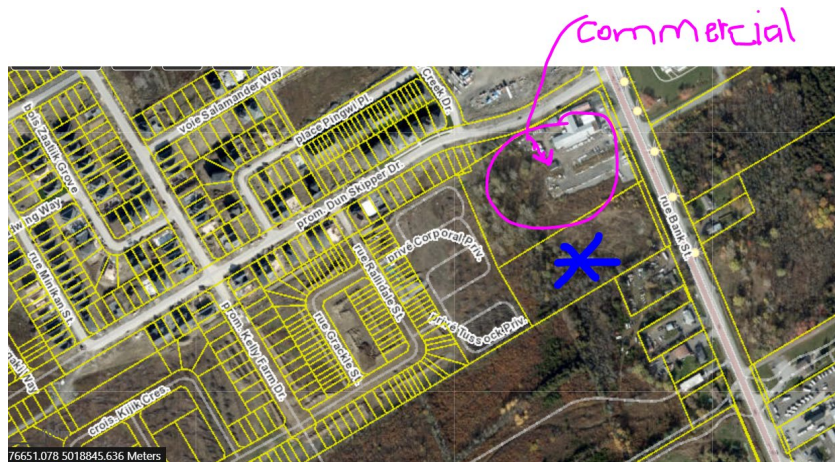
- Kelly Rhodenizer, Regional Group
- Nikita Jariwala, Regional Group
- Erin O'Connor – Regional Group;
- James Ireland (Novatech)
- David Hook – IBI, traffic
- Doug Cave (Jim Moffat) IBI, Civic
- Tyler Cassidy, Kelsey Charie (Project Manager, EIT, City of Ottawa)
- Christopher Moise (Urban Designer, Architect, City of Ottawa)
- Mark Richardson, Planning Forester
- James Holland, SNCA
- Burl Walker, Parks
- Tracey Scaramozzino (File Lead, Planner, City of Ottawa)

**Not in Attendance:**

- Matthew Hayley, Environmental Planner
- Mike Giampa (Transportation Project Manager, City of Ottawa)

**Issue of Discussion:**

- PUD Site Plan for 3, 6-storey rental apts, 92-units each; Total of 276 d/u; 173 parking at grade and 158 parking u/g
- Similar Product to a recently approved site plan at 2045, 2055, 2065 Portobello Blvd, Orleans.
- Within Idone Plan of Subdivision D07-16-17-0006



#### 4. Infrastructure/Servicing (Tyler Cassidy):

1. The Servicing Study Guidelines for Development Applications are available at the following address:

<https://ottawa.ca/en/city-hall/planning-and-development/how-developproperty/development-application-review-process-2/guide-preparing-studies-and-plans>

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

- Ottawa Sewer Design Guidelines (October 2012) and all the Technical Bulletins including, Technical Bulletin PIEDTB-2016-01 and ISTB-2018-01
- Ottawa Design Guidelines – Water Distribution (2010) and Technical Bulletins ISD-2010-2, ISDTB-2014-02 and ISTB-2018-02
- Geotechnical Investigation and Reporting Guidelines for Development Applications in the City of Ottawa (2007)
- City of Ottawa Slope Stability Guidelines for Development Applications (revised 2012)
- City of Ottawa Environmental Noise Control Guidelines (January, 2016)
- City of Ottawa Park and Pathway Development Manual (2012)
- City of Ottawa Accessibility Design Standards (2012)
- Ottawa Standard Tender Documents (latest version)
- Ontario Provincial Standards for Roads & Public Works (2013)

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

4. The Stormwater Management Criteria, for the subject site, is to be based on the following background studies"

- 2016 Updated Servicing Report (Class EA OPA 76 Areas 8a, 9a & 9b) Leitrim Development Area (IBI Group, September 2016)
- Design Brief, Pathways at Findlay Creek, 4800 Bank Street (Remer Lands) Phase 1 (IBI Group July 2017)
- Design Brief, Bank Street Development, 4836 Bank Street (IBI Group April 2019).

The Stormwater Management Criteria is as follows:

- a. Allowable release rate of 291.58 L/s for the site.
- b. Flows to the storm sewer in excess of the 2-year storm release rate, up to and including
- c. the 100-year storm event, must be detained on site
- d. Ensure no overland flow for all storms up to and including the 100-year event.
- e. The 2-yr storm or 5-yr storm event using the IDF information derived from the
- f. Meteorological Services of Canada rainfall data, taken from the Ottawa Macdonald Cartier International Airport, collected 1966 to 1997.
- g. A calculated time of concentration (Cannot be less than 10 minutes).
- h. Quality control requirements to be provided by Rideau Valley Conservation Authority (RVCA). Note that Quality Control for the site is provided by the Findlay Creek Stormwater Management Facility.

## 5. Deep Services



i. A plan view of the approximate services may be seen above. Services should ideally be grouped in a common trench to minimize the number of road cuts. The sizing of available future services is:

- a. Connections (4836 Bank Street):
  - i. MH1 w/ 600 mm dia. STM (Conc.)
  - ii. 203 mm dia. Watermain (PVC)
  - iii. MH1A 200 mm dia. SAN (PVC)

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

iii. Provide information on the monitoring manhole requirements – should be located in an accessible location on private property near the property line (ie. Not in a parking area).

iv. Provide information on the type of connection permitted

Sewer connections to be made above the springline of the sewermain as per:

- a. Std Dwg S11.1 for flexible main sewers – connections made using approved tee or wye fittings.
- b. Std Dwg S11 (For rigid main sewers) – lateral must be less than 50% the diameter of the sewermain,
- c. Std Dwg S11.2 (for rigid main sewers using bell end insert method) – for larger diameter laterals where manufactured inserts are not available; lateral must be less than 50% the diameter of the sewermain,
- d. Connections to manholes permitted when the connection is to rigid main sewers where the lateral exceeds 50% the diameter of the sewermain. – Connect obvert to obvert with the outlet pipe unless pipes are a similar size.
- e. No submerged outlet connections

v. Please note that coordination for servicing is required with the Owner of 4836 Bank Street to ensure that planned services are available for the site's designated outlet once development begins.

6. Civil consultant must request boundary conditions from the City's assigned Project Manager prior to first submission. Water Boundary condition requests must include the

location of the service and the expected loads required by the proposed development. Please provide the following information:

- i. Location of service(s)
- ii. Type of development and the amount of fire flow required (as per FUS, 1999).
- iii. Average daily demand: \_\_\_ l/s.
- iv. Maximum daily demand: \_\_\_ l/s.
- v. Maximum hourly daily demand: \_\_\_ l/s.
- vi. Hydrant location and spacing to meet City's Water Design guidelines.
- vii. Water supply redundancy will be required for more than 50 m<sup>3</sup>/day water demand.

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

8. If applicable, MECP ECA Requirements –

All development applications should be considered for an Environmental Compliance Approval (ECA) by the Ministry of the Environment, Conservation, and Parks (MECP);

a. Consultant determines if an approval for sewage works under Section 53 of OWRA is required. Consultant then determines what type of application is required and the City's project manager confirms. (If the consultant is not clear if an ECA is required, they will work with the City to determine what is required. If the consultant it is still unclear or there is a difference of opinion only then will the City PM approach the MECP.

**b. In our opinion, the stormwater works for 4840 Bank Street are covered under existing ECA NUMBER 7857-BQ3J3V dated June 17, 2020 for 4836 Bank Street. However, please have your consultant review the ECA requirements and determine if one if required.**

## 6. Initial Planning Comments

1. This site was intended to be mixed-use as per the draft plan of subdivision. Why is it now being developed for residential only?
2. Provide street trees at ROW and ample landscaping around property line
3. What is view like on north side of site – abutting the commercial site?
4. Show elevations vis a vis the current and future development on abutting properties.
5. Show some uses in the amenity area – to give an idea of how they might be used and to give us a better understanding of their sizes.
6. Show surrounding uses in grey-ed out lines – especially the full access to the site.
7. Glad to see garbage is inside
8. Appreciate that a lot of the parking is u/g
9. Where is bike parking?
10. Will the site be fenced?
11. Ensure ped access to and through the site. – How does it interact with abutting sites?

12. Keep bird-safe principles in mind – in terms of glazing on corners, use of decals etc.
13. Please consider using a variety of Local, Native, Non-invasive species;
14. Speak to Councillor Darouze and relevant community associations.

## 7. Urban Design Comments (Christopher Moise):

### Comments

- This proposal is not within the City's Design Priority Areas and does not need to attend the City's UDRP. Staff will be responsible for evaluating the proposal and providing design direction;
- If the decision has been made not to develop a mixed use project what are some of the intents that are being left out of the proposal and how can this project accommodate them?
  - Access from Bank street: Vehicles and pedestrians;
  - Buildings that support the public right of way: Buildings that provide a frontage and entrances facing Bank;
    - Create an urban street edge. Landscaping and primary entrances facing Bank Street;
    - Can the Bank Street treatment be designed to act as building front and not side yard condition?
  - Can surface parking be screened and separated from Bank Street with strategic landscaping?
  - We recommend a sidewalk on the Bank Street frontage that would help provide pedestrian connectivity to parks and commercial sites to the north on Bank Street;
  - Would a pedestrian connection to the properties to the west be beneficial?
  - How does the massing relate to the surrounding properties? Please illustrate the massing on the site with dimensions and illustrating transition if necessary;
  - Since there will be residents without cars will there be additional pedestrian connection to Bank street (bus network, etc.);
  - Trees: Are there trees on the site that can be preserved? Ie in the amenity space or around the perimeter of the site?
  - Landscaping: We recommend consideration for trees and screening elements be illustrated on the landscaping plan, detailing amenity spaces and public street frontages;
- We recommend the buildings fronting Bank street provide additional ground floor height to accommodate future commercial uses if possible;
- A scoped Design Brief is a required submittal (and separate from any UDRP submission) for all Site Plan/Re-zoning applications and can be combined with the Planning Rationale. Please see the Design Brief Terms of Reference provided.
  - We would like to see the massing on the site as well as the elevations for the buildings;

## 8. Parks (Burl Walker):

1. The applicant is proposing to develop three 6-storey rental apartment buildings with a total of 276 apartment dwelling units. The total site area is shown as 15,344 sq. m on the Site Plan. The property is described as Block 204 on Plan 4M-1653 within the Pathways at Findlay Creek South subdivision.
2. Condition C.13(a) to Schedule "H" of the Pathways at Findlay Creek South Phase 1 subdivision agreement describes the parkland dedication calculations for the subdivision. The calculations were based on the development of 100% commercial uses on Block 204. A combination of parkland conveyance and cash-in-lieu of parkland dedication was provided at the time of registration of the subdivision agreement. As per subsection 13(1)(b) of the Parkland Dedication By-law, parkland dedication will be required for the proposed development since land that was originally proposed for commercial purposes is now proposed for residential use.
3. This area of Leitrim is serviced by three parks – Salamander Park, Miikana Park and Dun Skipper Park. Salamander Park is currently under construction. Miikana Park is in the detail design phase with construction anticipated to commence this year. The Dun Skipper Park project was recently initiated. Salamander Park and Dun Skipper Park are located approximately 400m from the site, while Miikana Park is about 900m from the site. Additional parkland conveyance is not needed for this area. Cash-in-lieu of parkland dedication will be required as a condition of site plan approval.
4. The following is a draft cash-in-lieu of parkland dedication condition based on the provisions of the current Parkland Dedication By-law:

*The Owner agrees to provide cash-in-lieu of parkland dedication on the subject lands within Ward 20 such value of the land to be determined by the City's Realty Services Branch, to the satisfaction of the General Manager, Recreation, Cultural and Facility Services. The Owner further agrees to pay for the cost of the appraisal inclusive of HST. In accordance with the Planning Act and the City of Ottawa Parkland Dedication By-law, a land area of 0.121 ha has been calculated for the cash-in-lieu of parkland dedication requirement has been calculated as follows:*

<b>Land Use</b>	<b>Proposed Dwelling Units</b>	<b>Land Area</b>	<b>Cash-in-lieu of Parkland Dedication Rate</b>	<b>Parkland Dedication Requirement</b>
<b>Apartment</b>	276	1.534 ha (area of site being developed)	1 ha per 500 dwelling units to a maximum of 10% of the area of the site being developed	0.153 ha
<b>Commercial (credit for previous parkland dedication at the time of registration of the Phase 1 subdivision agreement)</b>		1.594 ha (gross land area including Street Widening Block 212 on Plan 4M-1653 adjacent to Block 204)	2% of gross land area	(0.032 ha)
<b>Net Parkland Dedication Requirement</b>				0.121 ha

*The cash-in-lieu of parkland dedication shall be directed 60% towards the Ward 20 cash-in-lieu of parkland reserve (Account 830309) and 40% towards the City-wide cash-in-lieu of parkland reserve (Account 830015).*

5. The City will be replacing the Parkland Dedication By-law prior to September 18, 2022. If the new Parkland Dedication By-law comes into force during the Site Plan Control application process, the final cash-in-lieu of parkland dedication requirement will be determined based on the provisions of the new Parkland Dedication By-law and the applicable subsections of the Planning Act.
6. Consider how residents from the development will access the parks in the neighbourhood. Provide for connections to the future sidewalk on the west side of Bank Street adjacent to the site. Pedestrian linkages to the abutting commercial site to the north should also be provided to support pedestrian access through the commercial site to reach the sidewalks on Dun Skipper Drive, which connect to Dun Skipper Park and Miikana Park.

## **9. Trees (Mark Richardson):**

### **TCR requirements:**

1. A Tree Conservation Report (TCR) must be supplied for review along with the suite of other plans/reports required by the City
  - a. an approved TCR is a requirement of Site Plan approval.
  - b. The TCR may be combined with the LP or EIS provided all information is supplied
2. Any removal of privately-owned trees 10cm or larger in diameter, or City-owned trees of any diameter requires a tree permit issued under the Tree Protection Bylaw (Bylaw 2020 – 340); the permit will be based on an approved TCR and made available at or near plan approval.
3. The TCR must document all trees on site, as well as off-site trees if the CRZ extends into the developed area, by species, diameter and health condition
4. Please identify trees by ownership – private onsite, private on adjoining site, city owned, co-owned (trees on a property line)
5. If trees are to be removed, the TCR must clearly show where they are, and document the reason they cannot be retained
6. All retained trees must be shown and all retained trees within the area impacted by the development process must be protected as per City guidelines available at [Tree Protection Specification](#) or by searching [Ottawa.ca](http://Ottawa.ca)
7. The City encourages the retention of healthy trees; if possible, please seek opportunities for retention of trees that will contribute to the design/function of the site.
8. For more information on the TCR requirements or help with tree retention options, contact Mark Richardson [mark.richardson@ottawa.ca](mailto:mark.richardson@ottawa.ca) or on [City of Ottawa](#)

## LP tree planting requirements:

For additional information on the following please contact [tracy.smith@Ottawa.ca](mailto:tracy.smith@Ottawa.ca)

### Minimum Setbacks

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

### Tree specifications

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

### Hard surface planting

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

### Soil Volume

- Please ensure adequate soil volumes are met:

Tree Type/Size	Single Tree Soil Volume (m <sup>3</sup> )	Multiple Tree Soil Volume (m <sup>3</sup> /tree)
Ornamental	15	9
Columnar	15	9
Small	20	12
Medium	25	15
Large	30	18



Conifer	25	15
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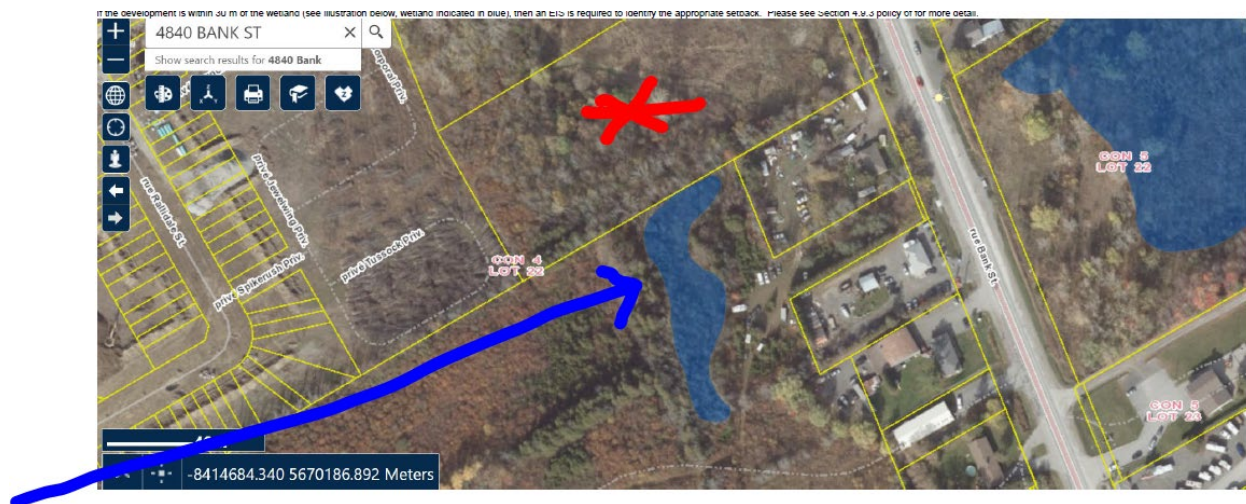
Please note that these soil volumes are not applicable in cases with Sensitive Marine Clay.

**Sensitive Marine Clay**

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

**10. Environment (Matthew Hayley):**

1. Urban Heat Island  
Please add features that reduce the urban heat island effect (see OP 10.3.3) produced by the parking lot and a building footprint. For example, this impact can be reduced by adding large canopy trees, green roofs or vegetation walls, or constructing the parking lot or building differently.
2. Bird Safe  
Given the height of the proposal (mid to high rise) the proposal will need to review and incorporate bird safe design elements. Some of the risk factors include glass and related design traps such as corner glass and fly-through conditions, ventilation grates and open pipes, landscaping, light pollution. More guidance and solutions are available in the guidelines which can be found here: <https://ottawa.ca/en/planning-development-and-construction/developing-property/development-application-review-process/development-application-submission/guide-preparing-studies-and-plans> .
3. Surface Water  
Setback may be required for the wetlands as per the OP and an EIS is required to determine appropriate setback. See OPs. 4.9.3, 6f for more details.



## **11. Conservation Authority (James Holland, SNCA)**

### Natural Heritage

- The CA's mapping does not identify natural heritage features for the site.

### Stormwater Design

- If stormwater management is being directed to approved municipal infrastructure, the Conservation Authority does not complete a technical review of the design. If there is uncontrolled drainage or flows to a watercourse, a technical review may be completed. This will be determined during the first review.
- The stormwater quality control should achieve an 80% TSS removal. The design should include best management practices for sediment and erosion control.

### CA Regulations

- Any interference with a watercourse may require a permit under O. Reg. 170/06, and restrictions may apply. This will be determined during the first review.

## **12. Transportation (Mike Giampa)**

1. A TIA is warranted, please proceed to scoping.
2. The application will not be deemed complete until the submission of the draft step 2-4, including the functional draft RMA package (if applicable) and/or monitoring report (if applicable).
3. Although a full review of the TIA Strategy report (Step 4) is not required prior to an application, it is strongly recommended.
4. Synchro files are required at Step 4.
5. ROW protection on Bank Street is 44.5 m (to be confirmed with the approved Bank Street EA).
6. A Road Noise Impact Study is required
7. Clear throat requirements as per TAC guidelines- this applies to existing and proposed accesses.
8. Bank Street widening (Leitrim to Dunskipper) is tentatively scheduled to begin in 2023.

## **13. Waste Collection**

1. Please see City's Waste Management Guidelines for multi-unit residential:  
<http://ottawa.ca/calendar/ottawa/citycouncil/pec/2012/11-13/Solid%20Waste%20Collection%20Guidelines%20-%20Doc%201.pdf>

## **14. General Information**

1. Ensure that all plans and studies are prepared as per City guidelines – as available online:

<https://ottawa.ca/en/city-hall/planning-and-development/information-developers/development-application-review-process/development-application-submission/guide-preparing-studies-and-plans>

# **APPENDIX B**

- **Watermain Demand Calculation Sheets**
- **FUS Calculation**
- **Boundary Conditions from the City of Ottawa**
- **Hydraulic Analysis**
- **Non-Combustible Construction confirmation by Architect**
- **Fire Protection confirmation by Mechanical Engineer**



IBI GROUP  
 333 PRESTON STREET  
 OTTAWA, ON  
 K1S 5N4

**WATERMAIN DEMAND CALCULATION SHEET**

PROJECT : Pathways Block 204 Apartments  
 LOCATION : 4840 Bank Street  
 DEVELOPER : Regional Group

FILE: 137175.6.04  
 DATE PRINTED: 02-Jun-22  
 DESIGN: SEL  
 PAGE : 1 OF 1

NODE	RESIDENTIAL				NON-RESIDENTIAL			AVERAGE DAILY DEMAND (l/s)			MAXIMUM DAILY DEMAND (l/s)			MAXIMUM HOURLY DEMAND			FIRE DEMAND (l/s)
	UNITS			POP'N	INDTRL (ha.)	INST. (ha.)	COMM. (m <sup>2</sup> )	Res.	Non-res.	Total	Res.	Non-res.	Total	Res.	Non-res.	Total	
	SF	TH	APT														
Site			180	324				1.05	0.00	1.05	2.63	0.00	2.63	5.78	0.00	5.78	150.0

ASSUMPTIONS					
RESIDENTIAL DENSITIES		AVG. DAILY DEMAND		MAX. HOURLY DEMAND	
Single Family	3.4 persons/unit	Residential	280 l / cap / day	Residential	1,540 l / cap / day
Townhouse	2.7 persons/unit				
Apartment	1.8 persons/unit				
		MAX. DAILY DEMAND		FIRE FLOW	
		Residential	700 l / cap / day	Residential	9,000 l / min

**Fire Flow Requirement from Fire Underwriters Survey**

**Building 'A' - 4 Storey Residential**

Building Floor Area

Floors 1-4	5,822 m <sup>2</sup>
Total	5,822 m <sup>2</sup>

Fire Flow

$F = 220C\sqrt{A}$

C	0.8	C =	1.5 wood frame
A	5,822 m <sup>2</sup>		1.0 ordinary
			0.8 non-combustile
F	13,429 l/min		0.6 fire-resistive
Use	13,000 l/min		

Occupancy Adjustment

		-25% non-combustile
		-15% limited combustile
Use	-15%	0% combustile
		+15% free burning
Adjustment	-1950 l/min	+25% rapid burning
Fire flow	11,050 l/min	

Sprinkler Adjustment

		-30% system conforming to NFPA 13
		-50% complete automatic system
Use	-40%	
Adjustment	-4420 l/min	

Exposure Adjustment

Building Face	Separation (m)	Adjacent Exposed Wall			Exposure Charge *
		Length	Stories	L*H Factor	

north	19.9	19	1	19	10%
east	>45				0%
south	24.7	66	4	264	10%
west	>45				0%

Total 20%

Adjustment 2,210 l/min

Required Fire Flow

Total adjustments	(2,210) l/min
Fire flow	8,840 l/min
<b>Use</b>	<b>9,000 l/min</b>
	<b>150.0 l/s</b>

## Boundary Conditions 4840 Bank Street

### Provided Information

Scenario	Demand	
	L/min	L/s
Average Daily Demand	63	1.05
Maximum Daily Demand	158	2.63
Peak Hour	347	5.78
Fire Flow Demand #1	13,000	216.67

### Location



### Results – Existing Conditions

#### Connection 1 – Dun Skipper Dr.

Demand Scenario	Head (m)	Pressure <sup>1</sup> (psi)
Maximum HGL	154.6	77.5
Peak Hour	143.7	62.0
Max Day plus Fire 1	122.3	31.6

Ground Elevation = 100.1 m

**Connection 2 – Bank St.**

Demand Scenario	Head (m)	Pressure <sup>1</sup> (psi)
Maximum HGL	154.6	78.4
Peak Hour	143.7	62.8
Max Day plus Fire 1	121.3	31.0

Ground Elevation = 99.5 m

**Results – SUC Zone Reconfiguration****Connection 1 – Dun Skipper Dr.**

Demand Scenario	Head (m)	Pressure <sup>1</sup> (psi)
Maximum HGL	148.9	69.4
Peak Hour	145.0	63.8
Max Day plus Fire 1	139.1	55.4

Ground Elevation = 100.1 m

**Connection 2 – Bank St.**

Demand Scenario	Head (m)	Pressure <sup>1</sup> (psi)
Maximum HGL	148.9	70.3
Peak Hour	144.6	64.1
Max Day plus Fire 1	137.2	53.6

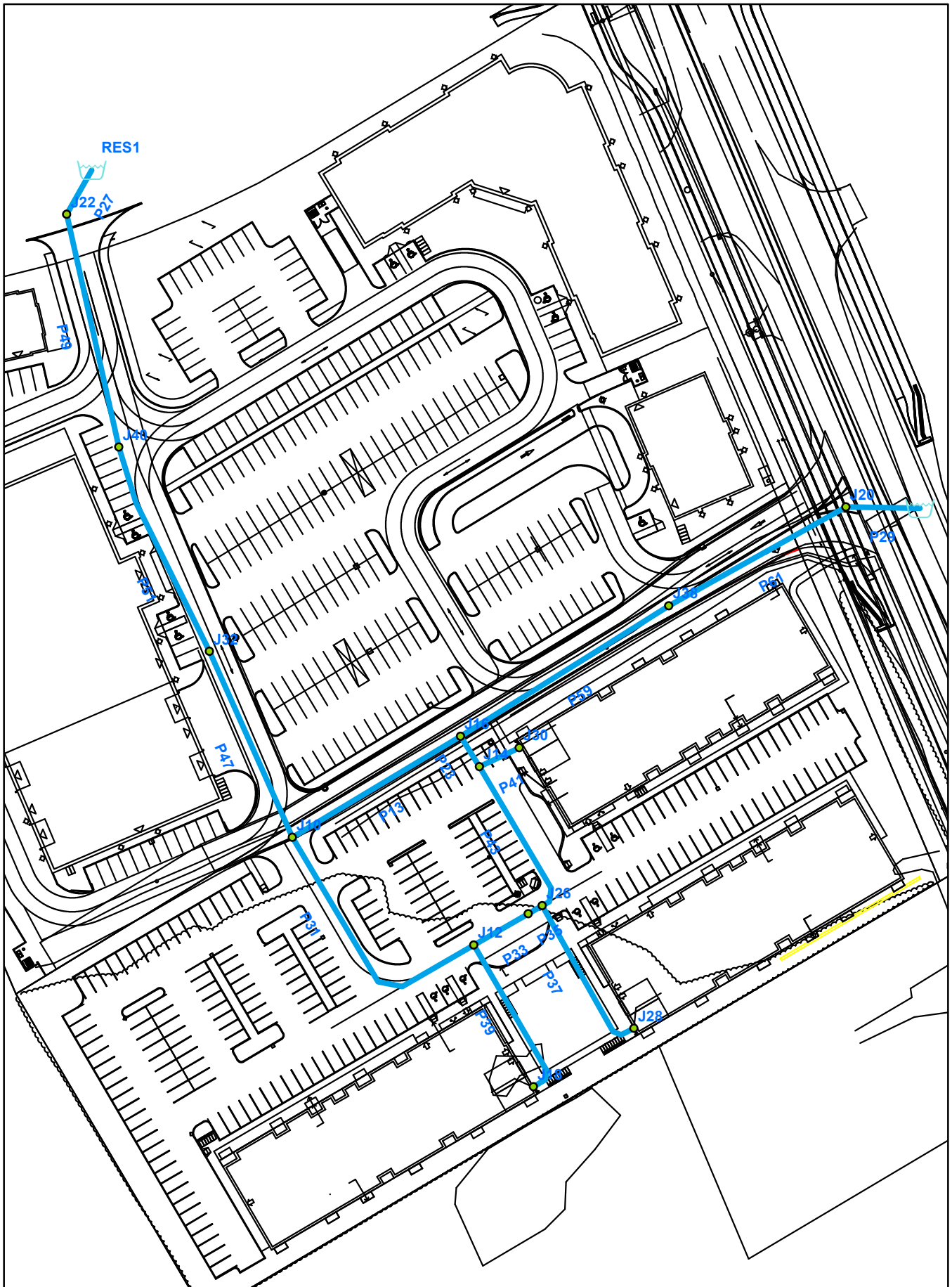
Ground Elevation = 99.5 m

**Disclaimer**

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



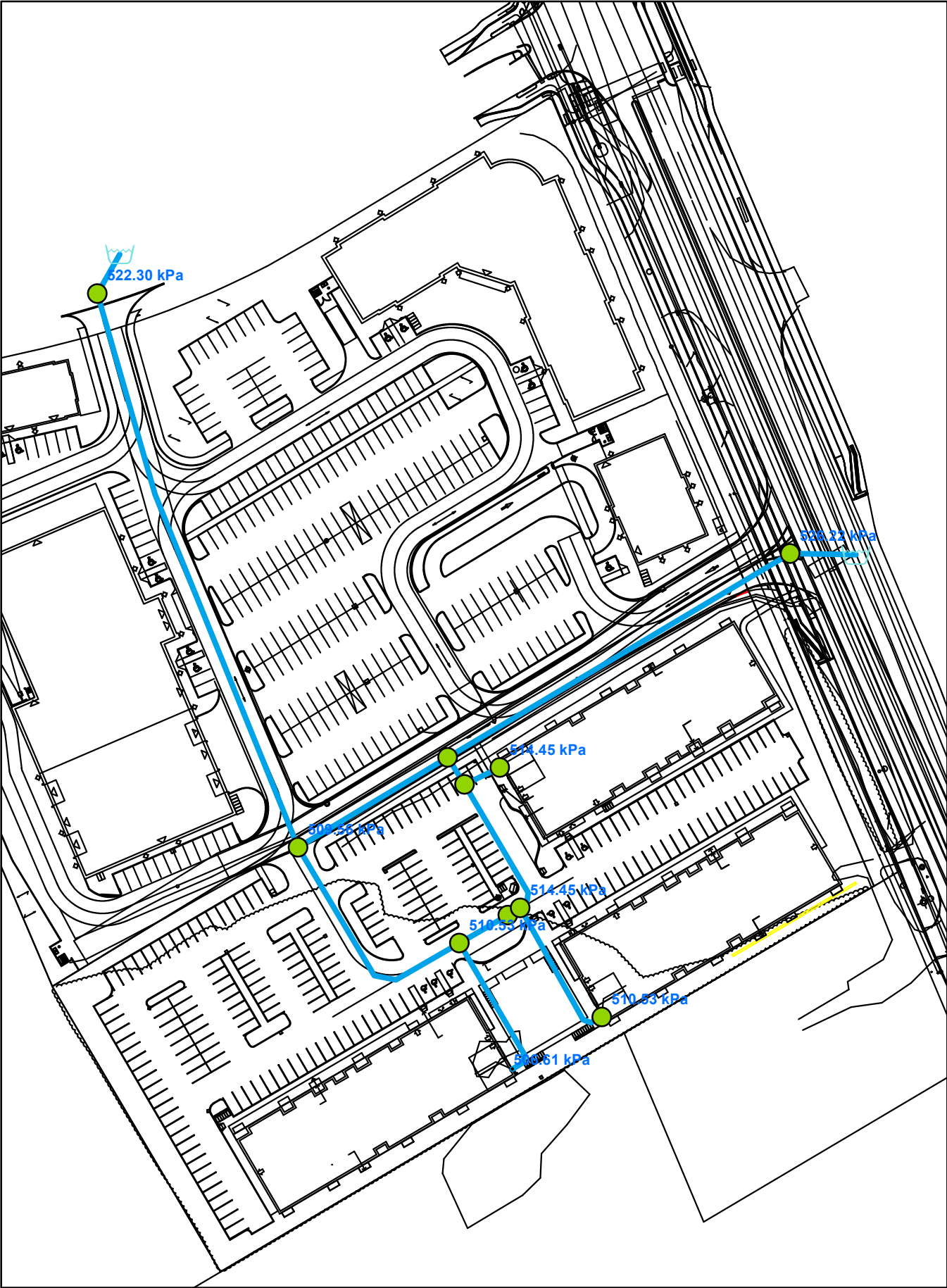
Overall Plan - Node and Pipe IDs



Avg Day - Junction Report

		ID	Demand (L/s)	Elevation (m)	Head (m)	Pressure (kPa)
1	<input type="checkbox"/>	J10	0.00	102.60	154.60	509.56
2	<input type="checkbox"/>	J12	0.00	102.50	154.60	510.53
3	<input type="checkbox"/>	J14	0.00	101.90	154.60	516.41
4	<input type="checkbox"/>	J16	0.00	101.60	154.60	519.35
5	<input type="checkbox"/>	J18	0.35	102.90	154.60	506.61
6	<input type="checkbox"/>	J20	0.00	100.90	154.60	526.22
7	<input type="checkbox"/>	J22	0.00	101.30	154.60	522.30
8	<input type="checkbox"/>	J24	0.00	102.10	154.60	514.45
9	<input type="checkbox"/>	J26	0.00	102.10	154.60	514.45
10	<input type="checkbox"/>	J28	0.35	102.50	154.60	510.53
11	<input type="checkbox"/>	J30	0.35	102.10	154.60	514.45

Avg Day - Junction Pressure



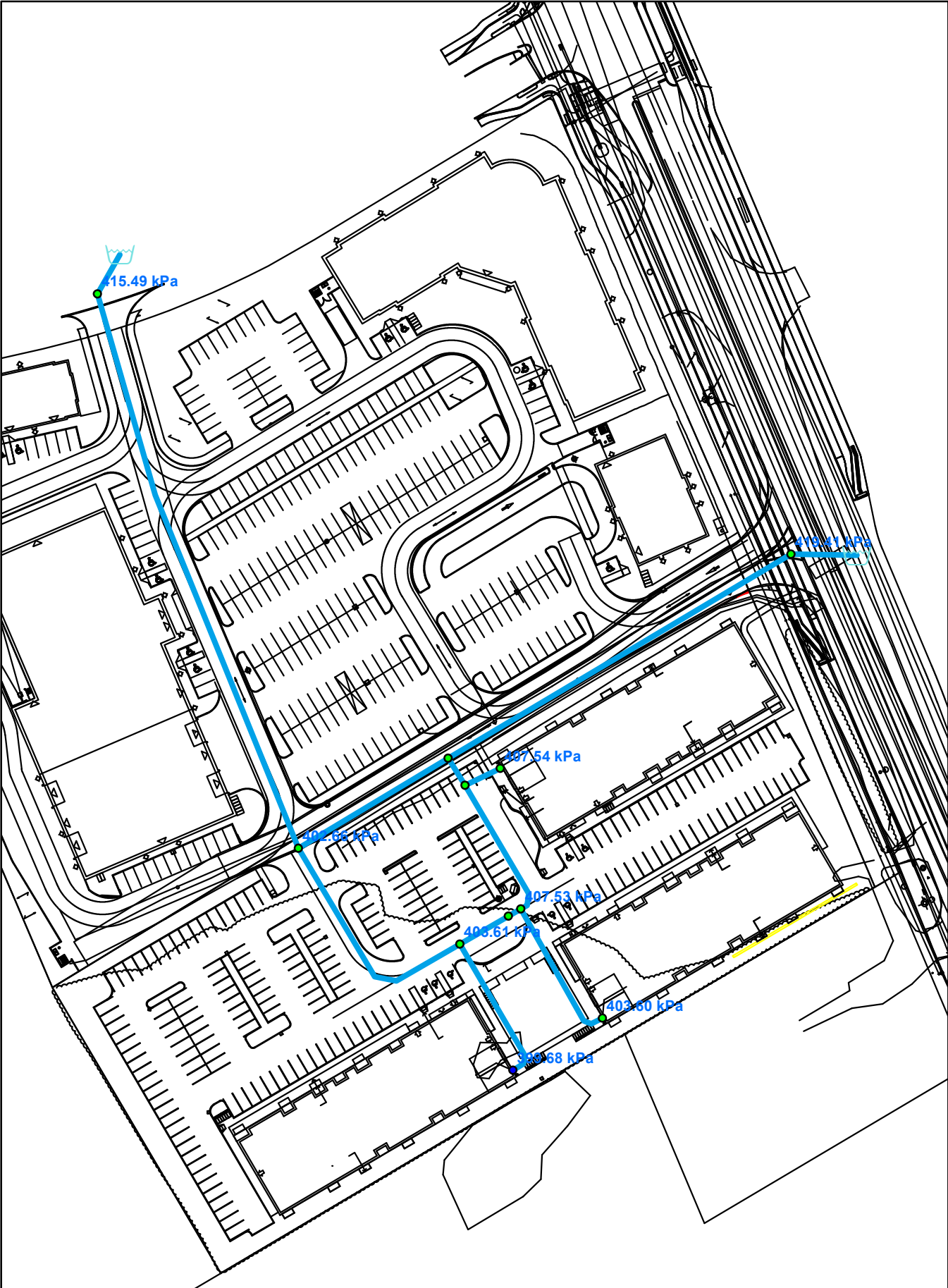
Peak Hour - Junction Report

		ID	Demand (L/s)	Elevation (m)	Head (m)	Pressure (kPa)
1	<input type="checkbox"/>	J10	0.00	102.60	143.69	402.66
2	<input type="checkbox"/>	J12	0.00	102.50	143.69	403.61
3	<input type="checkbox"/>	J14	0.00	101.90	143.69	409.50
4	<input type="checkbox"/>	J16	0.00	101.60	143.69	412.45
5	<input type="checkbox"/>	J18	1.93	102.90	143.69	399.68
6	<input type="checkbox"/>	J20	0.00	100.90	143.70	419.41
7	<input type="checkbox"/>	J22	0.00	101.30	143.70	415.49
8	<input type="checkbox"/>	J24	0.00	102.10	143.69	407.53
9	<input type="checkbox"/>	J26	0.00	102.10	143.69	407.53
10	<input type="checkbox"/>	J28	1.93	102.50	143.69	403.60
11	<input type="checkbox"/>	J30	1.93	102.10	143.69	407.54

Peak Hour - Pipe Report

		ID	From Node	To Node	Length (m)	Diameter (mm)	Roughness	Flow (L/s)	Velocity (m/s)	Headloss (m)	HL/1000 (m/k-m)	Status	Flow Reversal Count
1	<input type="checkbox"/>	P11	J22	J10	142.33	204.00	110.00	2.58	0.08	0.01	0.07	Open	0
2	<input type="checkbox"/>	P13	J10	J16	42.13	204.00	110.00	0.57	0.02	0.00	0.00	Open	0
3	<input type="checkbox"/>	P15	J16	J20	96.34	204.00	110.00	-3.21	0.10	0.01	0.10	Open	0
4	<input type="checkbox"/>	P23	J14	J16	7.68	204.00	110.00	-3.78	0.12	0.00	0.13	Open	0
5	<input type="checkbox"/>	P27	J22	RES1	1.00	204.00	110.00	-2.58	0.08	0.00	0.07	Open	0
6	<input type="checkbox"/>	P29	J20	RES2	1.00	204.00	110.00	-3.21	0.10	0.00	0.10	Open	0
7	<input type="checkbox"/>	P31	J10	J12	59.08	204.00	110.00	2.01	0.06	0.00	0.04	Open	0
8	<input type="checkbox"/>	P33	J12	J24	13.52	204.00	110.00	0.08	0.00	0.00	0.00	Open	0
9	<input type="checkbox"/>	P35	J24	J26	3.45	204.00	110.00	0.08	0.00	0.00	0.00	Open	0
10	<input type="checkbox"/>	P37	J26	J28	35.95	204.00	110.00	1.93	0.06	0.00	0.04	Open	0
11	<input type="checkbox"/>	P39	J12	J18	36.09	204.00	110.00	1.93	0.06	0.00	0.04	Open	0
12	<input type="checkbox"/>	P41	J14	J30	9.48	204.00	110.00	1.93	0.06	0.00	0.04	Open	0
13	<input type="checkbox"/>	P43	J14	J26	34.96	204.00	110.00	1.85	0.06	0.00	0.04	Open	0

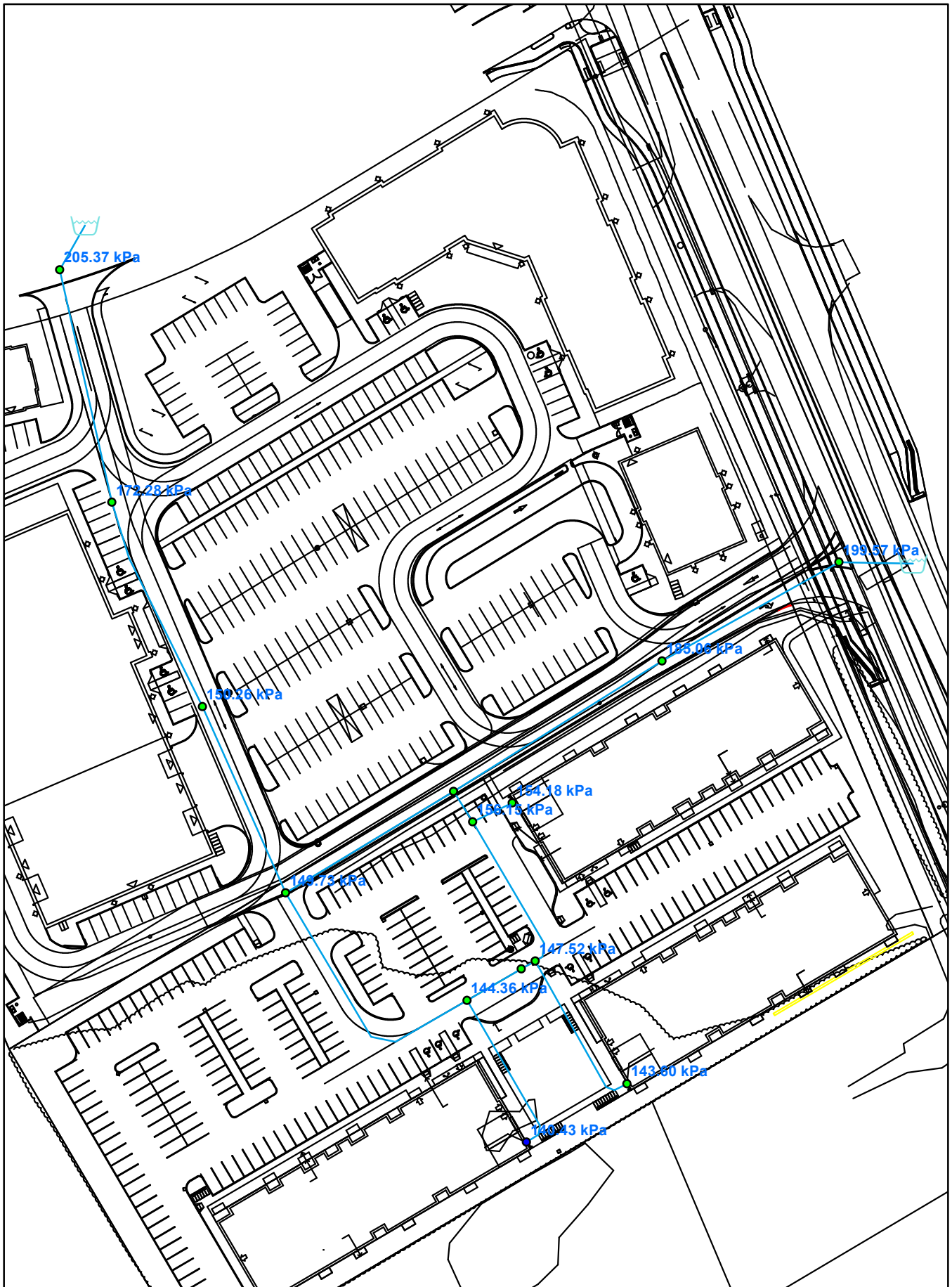
Peak Hour - Junction Pressure



Max Day + Fire - Junction Report

		ID	Demand (L/s)	Elevation (m)	Head (m)	Pressure (kPa)
1	<input type="checkbox"/>	J10	0.00	102.60	117.88	149.73
2	<input type="checkbox"/>	J12	0.00	102.50	117.23	144.36
3	<input type="checkbox"/>	J14	0.00	101.90	117.83	156.15
4	<input type="checkbox"/>	J16	0.00	101.60	117.99	160.59
5	<input type="checkbox"/>	J18	0.88	102.90	117.23	140.43
6	<input type="checkbox"/>	J20	0.00	100.90	121.27	199.57
7	<input type="checkbox"/>	J22	0.00	101.30	122.26	205.37
8	<input type="checkbox"/>	J24	95.00	102.10	117.09	146.88
9	<input type="checkbox"/>	J26	0.00	102.10	117.15	147.52
10	<input type="checkbox"/>	J28	0.88	102.50	117.15	143.60
11	<input type="checkbox"/>	J30	0.88	102.10	117.83	154.18
12	<input type="checkbox"/>	J32	63.00	102.70	118.03	150.26
13	<input type="checkbox"/>	J38	0.00	100.90	119.78	185.06
14	<input type="checkbox"/>	J40	0.00	102.50	120.08	172.28

# Max Day + Fire - Junction Pressures

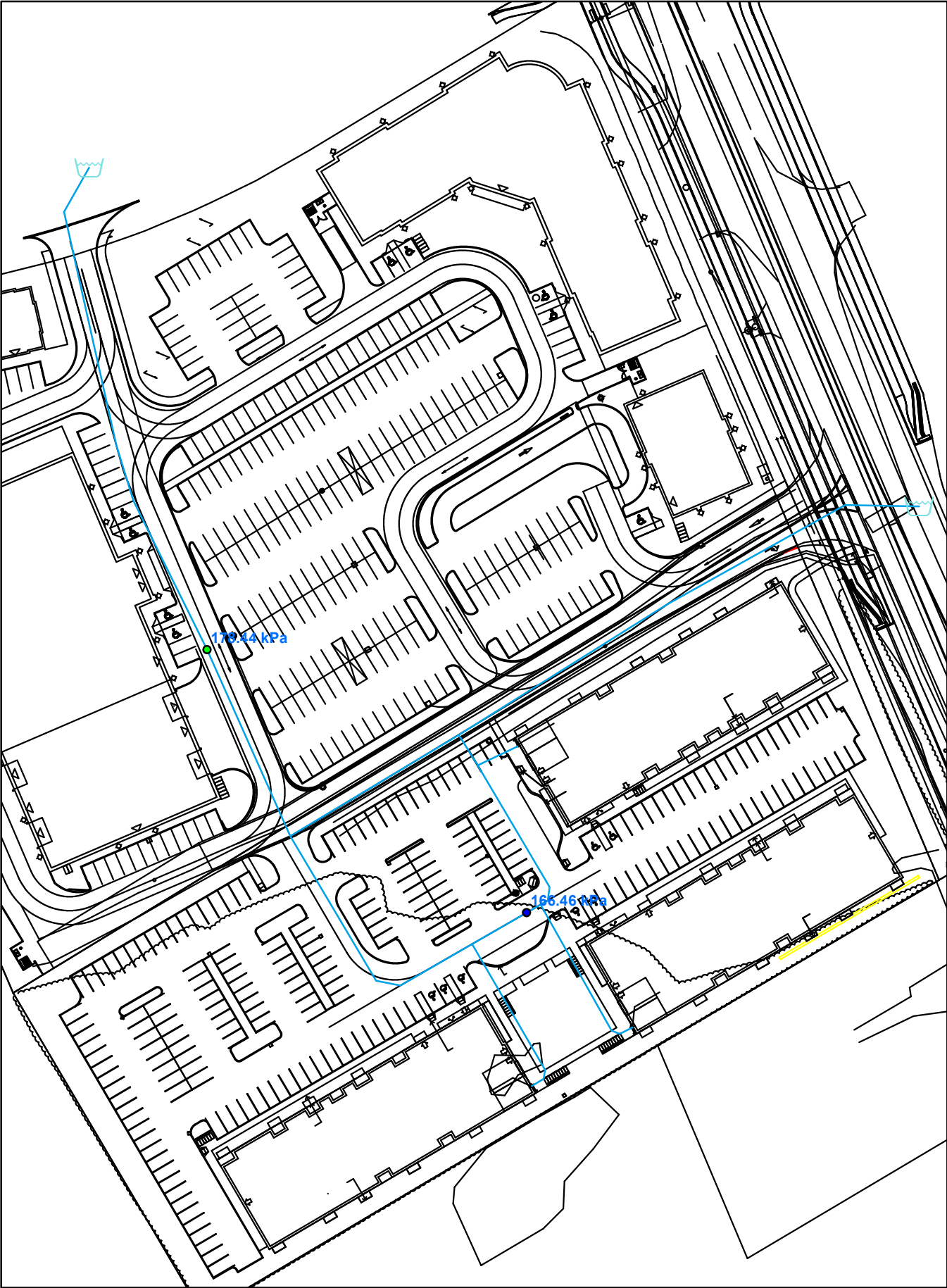




Max Day + Fire - Fireflow Report

		ID	Total Demand (L/s)	Hydrant Available Flow (L/s)	Critical Node ID for Design Run	Critical Node Pressure at Available Flow (kPa)	Critical Node Pressure at Fire Demand (kPa)	Critical Pressure for Design Run (kPa)	Hydrant Design Flow (L/s)	Hydrant Pressure at Design Flow (kPa)
1	<input type="checkbox"/>	J24	95.00	140.47	J24	139.96	166.46	139.96	140.47	139.96
2	<input type="checkbox"/>	J32	63.00	160.96	J32	139.96	178.44	139.96	160.96	139.96

Max Day + Fire - Residual Hydrant Pressures



## Samantha Labadie

---

**From:** Jonathan Morin <jonathan.morin@groupecanam.com>  
**Sent:** Tuesday, August 30, 2022 10:28 AM  
**To:** Marianne Cieslewicz  
**Cc:** steve.beaulieu@groupecanam.com; Pier-Luc Samson; Jackie Doucet; Linnea Chamberlain  
**Subject:** Re: FW: Fire Underwriters Survey

Hi Marianne,

Steve is on vacation this week, but I can confirm that the buildings meet this definition.

If you have other questions, please let me know.

Thanks!

**Jonathan Morin**, Ing. Senior / Senior P. Eng.  
Canam-bâtiments / Canam-Buildings  
T 418 780-4186 #6619  
[jonathan.morin@groupecanam.com](mailto:jonathan.morin@groupecanam.com)



On Mon, Aug 29, 2022 at 5:36 PM Marianne Cieslewicz <[mcieslewicz@chamberlainipd.com](mailto:mcieslewicz@chamberlainipd.com)> wrote:

Hi Steve,

We're looking at a couple items re: Ottawa and fireflows.

Per Fire Underwriters Survey, can you confirm if our building's construction meets Non combustible construction definition as described below?

Thanks!

**Non-combustible Construction** - Any structures having all structural members including walls, columns, piers, beams, girders, trusses, floors, and roofs of non-combustible material and not qualifying as fire-resistive construction. For example, unprotected metal buildings.

Marianne Cieslewicz

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☎: OFFICE - 905.631.7777 ext 240

☎: CELL - 905.580.1052

✉: [mcieslewicz@chamberlainIPD.com](mailto:mcieslewicz@chamberlainIPD.com)

🌐: [www.chamberlainIPD.com](http://www.chamberlainIPD.com)

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---

**From:** Lance Erion <lerion@IBIGroup.com>

**Subject:** Fire Underwriters Survey

As per our meeting today we would like to clarify the building requirements in order to achieve the required Fire Underwriters Survey (FUS) fire flow for this site. Based on boundary conditions provided by the City of Ottawa and our hydraulic analysis we have determined the existing water supply can provide up to 158 l/s of 9,500 l/min of fire flow. The available fire flow will increase substantially after the City conducts a water district zone reconfiguration but this is not expected until the later half of 2024 per the City. As per the City of Ottawa water design guidelines the FUS method

is used to calculate a buildings required fire flow which uses building floor area, type of building construction, use of sprinkler system, occupancy use and separation from other buildings. In order to meet the flow the building construction is required to be **Non-combustible**, the definition of building construction types are shown below, the complete FUS guide is attached.

## TYPES OF CONSTRUCTION

For the specific purpose of using the Guide, the following definitions may be used:

**Fire-Resistive Construction** - Any structure that is considered fully protected, having at least 3-hour rated structural members and floors. For example, reinforced concrete or protected steel.

**Non-combustible Construction** - Any structures having all structural members including walls, columns, piers, beams, girders, trusses, floors, and roofs of non-combustible material and not qualifying as fire-resistive construction. For example, unprotected metal buildings.

**Ordinary Construction** - Any structure having exterior walls of masonry or such non-combustible material, in which the other structural members, including but not limited to columns, floors, roofs, beams, girders, and joists, are wholly or partly of wood or other combustible material.

**Wood Frame Construction** - Any structure in which the structural members are wholly or partly of wood or other combustible material and the construction does not qualify as ordinary construction.

Using the non-combustible building type in the FUS calculation a further reduction is required for the sprinkler system, the FUS allows a 30% reduction for a system conforming to NFPA 13 however in order to meet the required fire flow a 35% reduction is required. As shown below an addition 10% reduction is allowed for a total reduction of 40% if the water supply is standard for both the system and fire department hose lines.

3. The value obtained in No.2 above may be reduced by up to 50% for complete automatic sprinkler protection depending upon adequacy of the system. The credit for the system will be a maximum of 30% for an adequately designed system conforming to NFPA 13 and other NFPA sprinkler standards. Additional credit of up to 10% may be granted if the water supply is standard for both the system and fire department hose lines required. The percentage reduction made for an automatic sprinkler system will depend upon the extent to which the system is judged to reduce the possibility of fires spreading within and beyond the fire area. Normally this reduction will not be the maximum allowed without proper system supervision including water flow and control valve alarm service. Additional credit may be given of up to 10% for a fully supervised system.

Can you please confirm that the building meets the requirements of the FUS definition for non-combustible construction and that a 35% reduction for the sprinkler can be achieved, please note if the building type can be fire-resistive then the 30% sprinkler reduction would be sufficient however this would require the structural members to have a 3 hour rating. Please let us know if you have any questions or require further information.

Regards,

Lance Erion P.ENG

Associate

**IBI GROUP**

Suite 500, 333 Preston Street

Ottawa ON K1S 5N4 Canada

tel +1 613 225 1311 ext 64047



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## Samantha Labadie

---

**From:** Lance Erion  
**Sent:** Wednesday, August 31, 2022 4:57 PM  
**To:** Kelly Rhodenizer; Doug Cave; Samantha Labadie  
**Cc:** Taylor Marquis; Stefanie Kaminski; Linnea Chamberlain  
**Subject:** RE: [EXTERNAL]FW: Pathways Block 204 - Fire Underwriters Survey

I believe this is sufficient for our resubmission to the City, Samantha can you update the FUS calculation in the design brief to show non-combustible construction and 40% sprinkler reduction.

Regards,

Lance Erion P.ENG

Associate

### IBI GROUP

Suite 500, 333 Preston Street  
Ottawa ON K1S 5N4 Canada  
tel +1 613 225 1311 ext 64047



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---

**From:** Kelly Rhodenizer <krhodenizer@regionalgroup.com>  
**Sent:** Wednesday, August 31, 2022 10:28 AM  
**To:** Doug Cave <doug.cave@ibigroup.com>; Samantha Labadie <samantha.labadie@ibigroup.com>; Lance Erion <lerion@ibigroup.com>  
**Cc:** Taylor Marquis <TMarquis@regionalgroup.com>; Stefanie Kaminski <SKaminski@regionalgroup.com>; Linnea Chamberlain <lchamberlain@chamberlainipd.com>  
**Subject:** FW: [EXTERNAL]FW: Pathways Block 204 - Fire Underwriters Survey

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Doug and Team,

Please see below. Let me know if this is sufficient to re-file our site plan and not add any further requirements.

### Kelly Rhodenizer

Vice President, Commercial and Multi-Family Development

T: 613-230-2100 x 7229

C: 613-979-6547

[krhodenizer@regionalgroup.com](mailto:krhodenizer@regionalgroup.com)

---

**From:** Mark Sarasin <[marks@gwal.com](mailto:marks@gwal.com)>  
**Sent:** Wednesday, August 31, 2022 10:26 AM  
**To:** Kelly Rhodenizer <[krhodenizer@regionalgroup.com](mailto:krhodenizer@regionalgroup.com)>  
**Cc:** Bruce Thomas - Ron Eastern Construction Ltd ([bthomas@recl.ca](mailto:bthomas@recl.ca)) <[bthomas@recl.ca](mailto:bthomas@recl.ca)>; Linnea Chamberlain <[lchamberlain@chamberlainipd.com](mailto:lchamberlain@chamberlainipd.com)>; Taylor Marquis <[TMarquis@regionalgroup.com](mailto:TMarquis@regionalgroup.com)>; Stefanie Kaminski <[SKaminski@regionalgroup.com](mailto:SKaminski@regionalgroup.com)>  
**Subject:** RE: [EXTERNAL]FW: Pathways Block 204 - Fire Underwriters Survey

**External Email – Confirm Sender and Beware of Links and Attachments**

Hi Kelly,

I don't know why the city is enforcing FUS as it is not a code requirement. I've had this discussion with Dana at MH on past projects....

That said, from a building perspective, we need 25.3 l/s of water to meet our demand for the building (18.9 l/s for sprinklers and 6.3l/s for the 1-1/2 hose connection). That said, the 2-1/2" hose that the firemen use require 31.5 l/s (for two at 15.7 l/s) but that is provided by the fire department connection as the building is under 84 m. This will still need to be allocated for from a site demand though. You don't need to allow for both 1-1/2 and 2-1/2 at the same time by the way. From what I've been told we also don't need to allow for sprinklers and 2-1/2" flow at the same time so 31.5 l/s would be the peak demand for fire protection for the building.

The fire protection system is fully supervised and the sprinkler system will be in accordance to NFPA 13. Hose requirements is per OBC as that overrules NFPA.

Concerning pressure, if the pressure is to low at the building, then we will need a fire pump to provide pressure to supply the sprinklers at the top of the building. Again, OBC allows us to not provide 65 psi at the top for standpipe if the building is under 84 meters, which can be provided by the fire department connection via the fire pumper truck.

Hope this answers your question.

Mark

**Mark Sarasin** P.Eng.  
Senior Associate, Mechanical Engineer

**Goodkey, Weedmark & Associates Limited**

**Consulting Engineers**  
Office: 613-727-5111, ext. 308  
Mobile: 613-816-0844  
Email: [m.sarasin@gwal.com](mailto:m.sarasin@gwal.com)  
Web: [www.gwal.com](http://www.gwal.com)

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1688 Woodward Drive | Ottawa , Ontario | K2C 3R8



---

**From:** Kelly Rhodenizer <[krhodenizer@regionalgroup.com](mailto:krhodenizer@regionalgroup.com)>  
**Sent:** Wednesday, August 31, 2022 9:21 AM  
**To:** Mark Sarasin <[marks@gwal.com](mailto:marks@gwal.com)>  
**Cc:** Bruce Thomas - Ron Eastern Construction Ltd ([bthomas@recl.ca](mailto:bthomas@recl.ca)) <[bthomas@recl.ca](mailto:bthomas@recl.ca)>; Linnea Chamberlain <[lchamberlain@chamberlainipd.com](mailto:lchamberlain@chamberlainipd.com)>; Taylor Marquis <[TMarquis@regionalgroup.com](mailto:TMarquis@regionalgroup.com)>; Stefanie Kaminski <[SKaminski@regionalgroup.com](mailto:SKaminski@regionalgroup.com)>  
**Subject:** [EXTERNAL]FW: Pathways Block 204 - Fire Underwriters Survey

Mark,

We are working through Site Plan for our second site in Leitrim with almost the exact design we did in Provence. We are waiting for ownership approval, but we are hoping to start detail design later this fall.

IBI is our Civil engineer on this file as they did the entire subdivision. They have confirmed there isn't sufficient water pressure and therefore a Firewall will be required to be installed or if we can achieve as per below then we don't need the firewall. Which I believe is more sprinklers we aren't sure exactly what its asking.

Would you or someone at your office be able to review and provide us with some guidance?

Thanks so much,

**Kelly Rhodenizer**

Vice President, Commercial and Multi-Family Development

T: 613-230-2100 x 7229

C: 613-979-6547

[krhodenizer@regionalgroup.com](mailto:krhodenizer@regionalgroup.com)

---

**From:** Doug Cave <[doug.cave@ibigroup.com](mailto:doug.cave@ibigroup.com)>  
**Sent:** Tuesday, August 30, 2022 1:01 PM  
**To:** Kelly Rhodenizer <[krhodenizer@regionalgroup.com](mailto:krhodenizer@regionalgroup.com)>  
**Cc:** Stefanie Kaminski <[SKaminski@regionalgroup.com](mailto:SKaminski@regionalgroup.com)>; Lance Erion <[lerion@IBIGroup.com](mailto:lerion@IBIGroup.com)>; Samantha Labadie <[samantha.labadie@ibigroup.com](mailto:samantha.labadie@ibigroup.com)>; Marianne Cieslewicz <[mcieslewicz@chamberlainIPD.com](mailto:mcieslewicz@chamberlainIPD.com)>; Linnea Chamberlain <[lchamberlain@chamberlainipd.com](mailto:lchamberlain@chamberlainipd.com)>  
**Subject:** FW: Pathways Block 204 - Fire Underwriters Survey

**External Email – Confirm Sender and Beware of Links and Attachments**

Kelly,

Please see email below with info regarding the sprinkler system.

Doug Cave C.E.T.  
(he/him/his)

Sr. Project Manager  
mob 613 402 9677

**IBI GROUP**

Suite 500, 333 Preston Street  
Ottawa ON K1S 5N4 Canada

tel +1 613 225 1311 ext 64062



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**From:** Lance Erion <[lerion@IBIGroup.com](mailto:lerion@IBIGroup.com)>  
**Sent:** Monday, August 29, 2022 5:30 PM  
**To:** [mcieslewicz@chamberlainipd.com](mailto:mcieslewicz@chamberlainipd.com); [lchamberlain@chamberlainipd.com](mailto:lchamberlain@chamberlainipd.com)  
**Cc:** Samantha Labadie <[samantha.labadie@ibigroup.com](mailto:samantha.labadie@ibigroup.com)>; Doug Cave <[doug.cave@ibigroup.com](mailto:doug.cave@ibigroup.com)>  
**Subject:** Pathways Block 204 - Fire Underwriters Survey

As per our meeting today we would like to clarify the building requirements in order to achieve the required Fire Underwriters Survey (FUS) fire flow for this site. Based on boundary conditions provided by the City of Ottawa and our hydraulic analysis we have determined the existing water supply can provide up to 158 l/s of 9,500 l/min of fire flow. The available fire flow will increase substantially after the City conducts a water district zone reconfiguration but this is not expected until the later half of 2024 per the City. As per the City of Ottawa water design guidelines the FUS method is used to calculate a buildings required fire flow which uses building floor area, type of building construction, use of sprinkler system, occupancy use and separation from other buildings. In order to meet the flow the building construction is required to be **Non-combustible**, the definition of building construction types are shown below, the complete FUS guide is attached.

### TYPES OF CONSTRUCTION

For the specific purpose of using the Guide, the following definitions may be used:

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**Ordinary Construction** - Any structure having exterior walls of masonry or such non-combustible material, in which the other structural members, including but not limited to columns, floors, roofs, beams, girders, and joists, are wholly or partly of wood or other combustible material.

**Wood Frame Construction** - Any structure in which the structural members are wholly or partly of wood or other combustible material and the construction does not qualify as ordinary construction.

Using the non-combustible building type in the FUS calculation a further reduction is required for the sprinkler system, the FUS allows a 30% reduction for a system conforming to NFPA 13 however in order to meet the required fire flow a 35% reduction is required. As shown below an addition 10% reduction is allowed for a total reduction of 40% if the water supply is standard for both the system and fire department hose lines.

3. The value obtained in No.2 above may be reduced by up to 50% for complete automatic sprinkler protection depending upon adequacy of the system. The credit for the system will be a maximum of 30% for an adequately designed system conforming to NFPA 13 and other NFPA sprinkler standards. Additional credit of up to 10% may be granted if the water supply is standard for both the system and fire department hose lines required. The percentage reduction made for an automatic sprinkler system will depend upon the extent to which the system is judged to reduce the possibility of fires spreading within and beyond the fire area. Normally this reduction will not be the maximum allowed without proper system supervision including water flow and control valve alarm service. Additional credit may be given of up to 10% for a fully supervised system.

Can you please confirm that the building meets the requirements of the FUS definition for non-combustible construction and that a 35% reduction for the sprinkler can be achieved, please note if the building type can be fire- resistive then the 30% sprinkler reduction would be sufficient however this would require the structural members to have a 3 hour rating. Please let us know if you have any questions or require further information.

Regards,

Lance Erion P.ENG

Associate

**IBI GROUP**

Suite 500, 333 Preston Street  
Ottawa ON K1S 5N4 Canada  
tel +1 613 225 1311 ext 64047



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## **APPENDIX C**

- **Home Hardware Sanitary Sewer Design Sheet**
- **Drawing 119351-400 – Home Hardware Sanitary Drainage Area Plan**
- **Sanitary Sewer Design Sheet**
- **Drawing 137175 C-400 – Sanitary Drainage Area Plan**



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

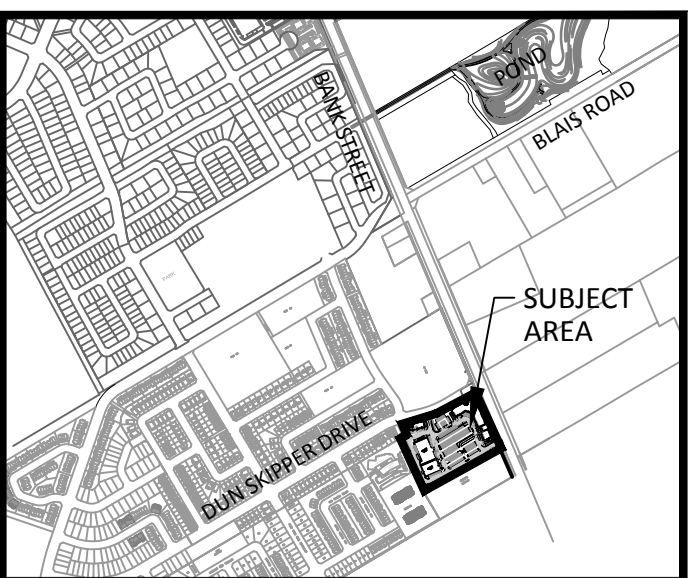
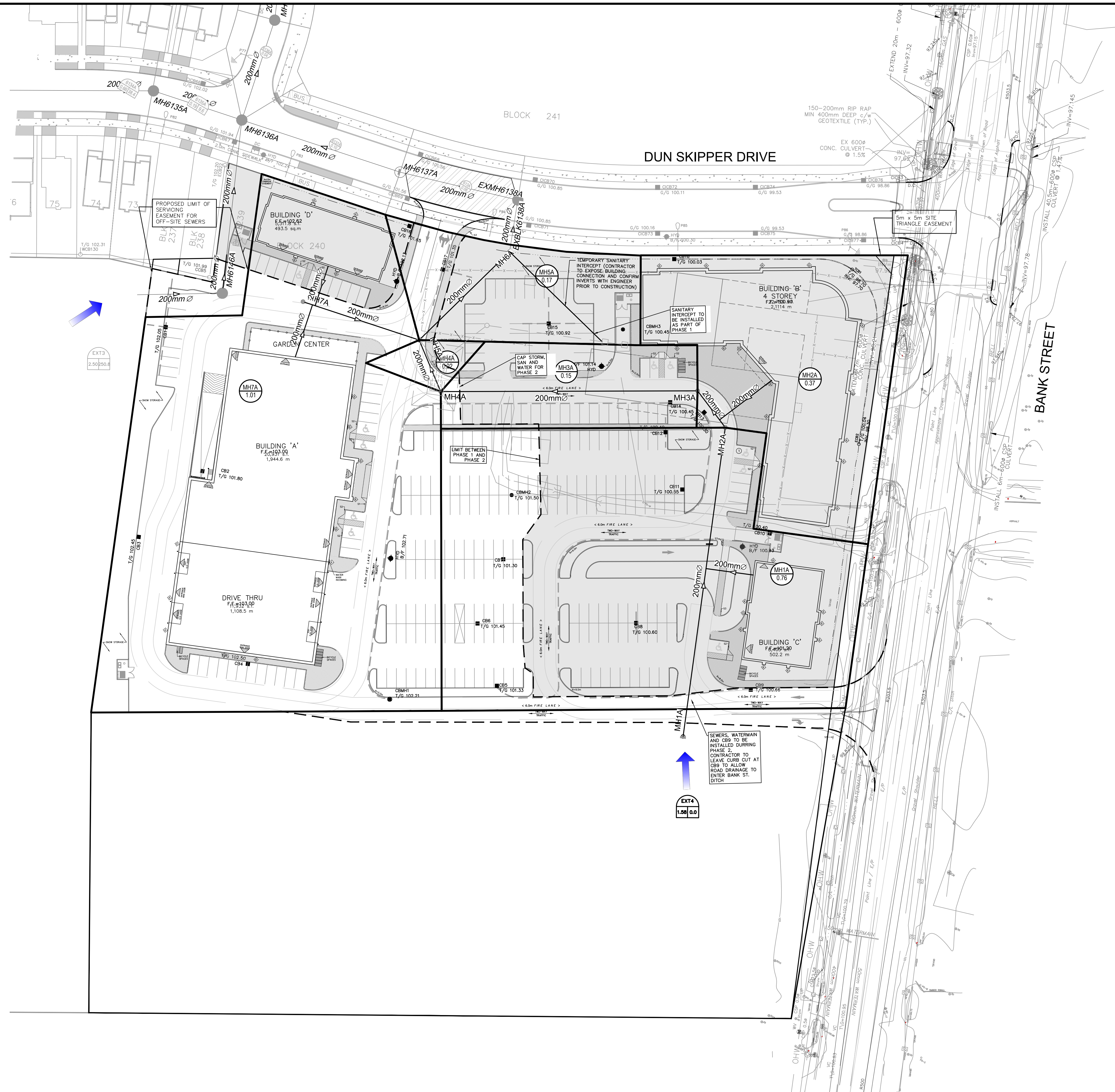
**SANITARY SEWER DESIGN SHEET**

4836 Bank Street  
 CITY OF OTTAWA  
 Home Hardware

LOCATION				RESIDENTIAL										ICI AREAS										INFILTRATION ALLOWANCE				FIXED FLOW (L/s)		TOTAL FLOW	PROPOSED SEWER DESIGN				
STREET	AREA ID	FROM MH	TO MH	AREA w/ Units (Ha)	UNIT TYPES				AREA w/o Units (Ha)	POPULATION		RES PEAK FACTOR	PEAK FLOW (L/s)	AREA (Ha)				ICI PEAK FACTOR	PEAK FLOW (L/s)	AREA (Ha)		FLOW (L/s)	IND	CUM	TOTAL FLOW (L/s)	CAPACITY (L/s)	LENGTH (m)	DIA (mm)	SLOPE (%)	VELOCITY (full) (m/s)	AVAILABLE CAPACITY				
					SF	SD	TH	APT		IND	CUM			IND	CUM	IND	CUM			IND	CUM										IND	CUM	L/s	%	
		BLDG D	MH7A-MH5A						0.0	0.0	3.80	0.00			0.05	0.05			1.50	0.02	0.05	0.05	0.02	0.00	0.00	0.04	34.22	11.10	200	1.00	1.055	34.18	99.88%		
		BLDG A	MH7A-MH5A						0.0	0.0	3.80	0.00			0.30	0.30			1.50	0.15	0.30	0.30	0.10	0.00	0.00	0.24	34.22	14.61	200	1.00	1.055	33.97	99.28%		
		MH7A	MH5A						0.0	0.0	3.80	0.00			1.01	1.01			1.50	0.49	1.01	1.01	0.33	0.00	0.00	0.82	27.59	32.62	200	0.65	0.851	26.76	97.01%		
		BLDG C	MH1A-MH2A						0.0	0.0	3.80	0.00			0.06	0.06			1.50	0.03	0.06	0.06	0.02	0.00	0.00	0.05	34.22	12.70	200	1.00	1.055	34.17	99.86%		
		MH1A	MH2A						0.0	0.0	3.80	0.00			2.35	2.35			1.50	1.14	2.35	2.35	0.78	0.00	0.00	1.92	20.24	85.16	200	0.35	0.624	18.32	90.53%		
		BLDG B	MH2A-MH3A						0.0	0.0	3.80	0.00			0.22	0.22			1.50	0.11	0.22	0.22	0.07	0.00	0.00	0.18	34.22	17.46	200	1.00	1.055	34.04	99.48%		
		MH2A	MH3A						0.0	0.0	3.80	0.00			0.37	2.72			1.50	1.32	0.37	2.72	0.90	0.00	0.00	2.22	20.24	12.25	200	0.35	0.624	18.02	89.03%		
		MH3A	MH4A						0.0	0.0	3.80	0.00			0.15	2.87			1.50	1.40	0.15	2.87	0.95	0.00	0.00	2.34	20.24	66.50	200	0.35	0.624	17.90	88.43%		
		MH4A	MH5A						0.0	0.0	3.80	0.00			0.02	2.89			1.50	1.40	0.02	2.89	0.95	0.00	0.00	2.36	20.24	14.90	200	0.35	0.624	17.88	88.35%		
		MH5A	MH6A						0.0	0.0	3.80	0.00			0.17	4.07			1.50	1.98	0.17	4.07	1.34	0.00	0.00	3.32	20.24	33.69	200	0.35	0.624	16.92	83.59%		

<b>Design Parameters:</b>				<b>Notes:</b>				<b>Designed:</b>				<b>Revision</b>				<b>Date</b>											
Residential		ICI Areas		1. Mannings coefficient (n) = 0.013		2. Demand (per capita): 280 L/day 200 L/day		3. Infiltration allowance: 0.33 L/s/Ha		4. Residential Peaking Factor: Harmon Formula = 1+(14/(4+(P/1000)^0.5))0.8 where K = 0.8 Correction Factor		5. Commercial and Institutional Peak Factors based on total area, 1.5 if greater than 20%, otherwise 1.0		SEL		No. 1.		Report Name (Master Servicing Study, Adequacy of Public Services, Servicing Brief, ect) - Submission No. 1		2019-03-30							
SF	3.4 p/p/u	INST	28,000 L/Ha/day																								
TH/SD	2.7 p/p/u	COM	28,000 L/Ha/day																								
APT	1.8 p/p/u	IND	35,000 L/Ha/day	MOE Chart																							
Other	60 p/p/Ha		17000 L/Ha/day																								
												Dwg. Reference: 119351-501				File Reference: 119351.5.7.1				Date: 2019-03-30				Sheet No: 1 of 1			



**NOTES:**  
 1. SEE DRAWING C-010 FOR ADDITIONAL DETAILS AND NOTES.  
 2. SITE BENCHMARK TO BE OBTAINED FROM LEGAL SURVEYOR H.A. KEN SHIPMAN SURVEYING LTD.

**LEGEND:**

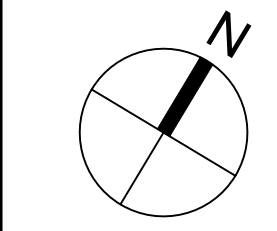
- EXISTING AREA NUMBER  
EXISTING POPULATION
- EXISTING AREA NUMBER  
EXISTING AREA IN HECTARES
- FUTURE FLOW DIRECTION
- AREA NUMBER  
AREA IN HECTARES

14		
13		
12		
11		
10		
9		
8		
7		
6		
5	ADD PHASING	JIM 2020.06.23
4	REVISED AS PER CITY COMMENTS	JIM 2020.04.20
3	REVISED AS PER CITY COMMENTS	JIM 2019.12.09
2	REVISED AS PER NEW SITE PLAN AND CITY COMMENTS	JIM 2019.10.11
1	ISSUED FOR SPA	JIM 2019.04.15
No.	REVISIONS	By Date

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 tel 613 225 1311 fax 613 225 9868  
 ibigroup.com

Project Title  
**BANK STREET DEVELOPMENT**  
 4836 BANK STREET

LICENSÉ PROFESSIONNEL / ENGINEER  
**J. I. MOFFATT**  
 2020/06/23  
 PROVINCE OF ONTARIO



Drawing Title  
**SANITARY DRAINAGE AREA PLAN**

Scale  
 1 : 500

Design	SEL	Date	FEB. 2019
Drawn	DPS	Checked	JIM
Project No.	119351	Drawing No.	400

Project No. 119351 Drawing No. 400

\J:\119351\_4836bankst.dwg | Drawings\119351\000\000.dwg | Layer: SANITARY\_DRAINAGE\_AREA | Plot: Scale: 1:500 | File: 2/19/2019 7:26 AM | User: jmo | Path: \\server\119351\4836bankst.dwg | Jun 23, 20

LOCATION				RESIDENTIAL										ICI AREAS						INFILTRATION ALLOWANCE			FIXED FLOW (L/s)		TOTAL FLOW (L/s)	CAPACITY (L/s)	LENGTH (m)	PROPOSED SEWER DESIGN			AVAILABLE CAPACITY	
STREET	AREA ID	FROM MH	TO MH	AREA w Units (Ha)	UNIT TYPES				AREA w/o Units (Ha)	POPULATION		RES PEAK FACTOR	PEAK FLOW (L/s)	AREA (Ha)				ICI PEAK FACTOR	PEAK FLOW (L/s)	AREA (Ha) FLOW			IND	CUM				DIA (mm)	SLOPE (%)	VELOCITY (m/s)	L/s	%
					SF	SD	TH	APT		IND	CUM			INSY	COMM	INDUS	IND			CUM	IND	CUM										
		MH 5A	MH 3A	0.42				60	108.0	108.0	3.59	1.26							0.42	0.42	0.14			1.39	41.91	57.14	200	1.50	1.292	40.51	96.67%	
		MH 4A	MH 3A	0.28				60	108.0	108.0	3.59	1.26							0.28	0.28	0.09			1.35	26.50	29.52	200	0.60	0.817	25.16	94.91%	
		MH 3A	MH 2A	0.52				0	0.0	216.0	3.51	2.46							0.52	1.22	0.40			2.86	24.19	38.66	200	0.50	0.746	21.34	88.19%	
		MH 2A	MH 1A	0.00				0	0.0	216.0	3.51	2.46							0.00	1.22	0.40			2.86	24.19	44.18	200	0.50	0.746	21.34	88.19%	
		MH 1A	Cut	0.32				60	108.0	324.0	3.45	3.62							0.32	1.54	0.51			4.13	20.24	0.00	200	0.35	0.624	16.11	79.69%	

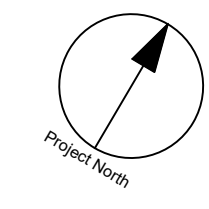
  

<b>Design Parameters:</b>		<b>Notes:</b>		<b>Designed:</b>		<b>No.</b>		<b>Revision</b>		<b>Date</b>	
Residential	ICI Areas	1. Manning's coefficient (n) =	0.013	SEL	1.	Submission No. 1 For City Approval		2022-06-03			
SF 3.4 p/p/u		2. Demand (per capita):	280 L/day		2.	Submission No. 2 For City Approval		2022-08-22			
TH/SD 2.7 p/p/u	INST 28,000 L/Ha/day	3. Infiltration allowance:	0.33 L/s/Ha	<b>Checked:</b> JIM							
APT 1.8 p/p/u	COM 28,000 L/Ha/day	4. Residential Peaking Factor:		<b>Dwg. Reference:</b> 137175-400							
Other 60 p/p/Ha	IND 35,000 L/Ha/day	5. Commercial and Institutional Peak Factors based on total area, 1.5 if greater than 20%, otherwise 1.0			<b>File Reference:</b> 137175.6-0-6-04.04.Sanitary	<b>Date:</b> 2022-08-22	<b>Sheet No:</b> 1 of 1				

**LEGEND :**

MH1A  
0.32 | 108

AREA NUMBER  
POPULATION  
AREA IN HECTARES



CLIENT  
**PATHWAYS SOUTH REGIONAL INC.**

1737 WOODWARD DRIVE, OTTAWA, ON

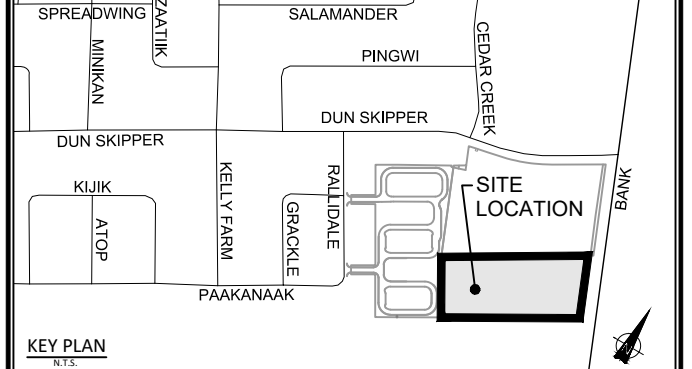
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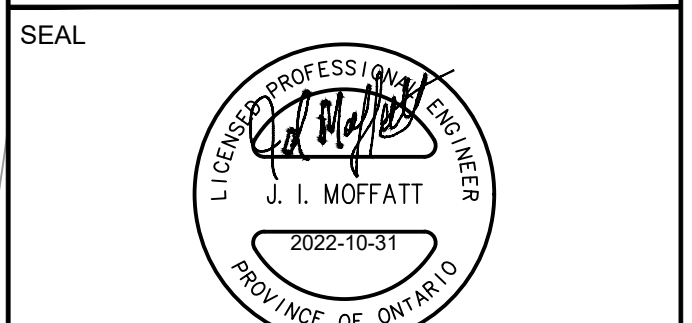
**ISSUES**

No.	DESCRIPTION	DATE
1	SUBMISSION NO. 1 FOR CITY REVIEW	2022-06-03
2	SUBMISSION NO. 2 FOR CITY REVIEW	2022-08-26
3	SUBMISSION NO. 3 FOR CITY REVIEW	2022-10-31
4		
5		
6		
7		
8		

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



**CONSULTANTS**



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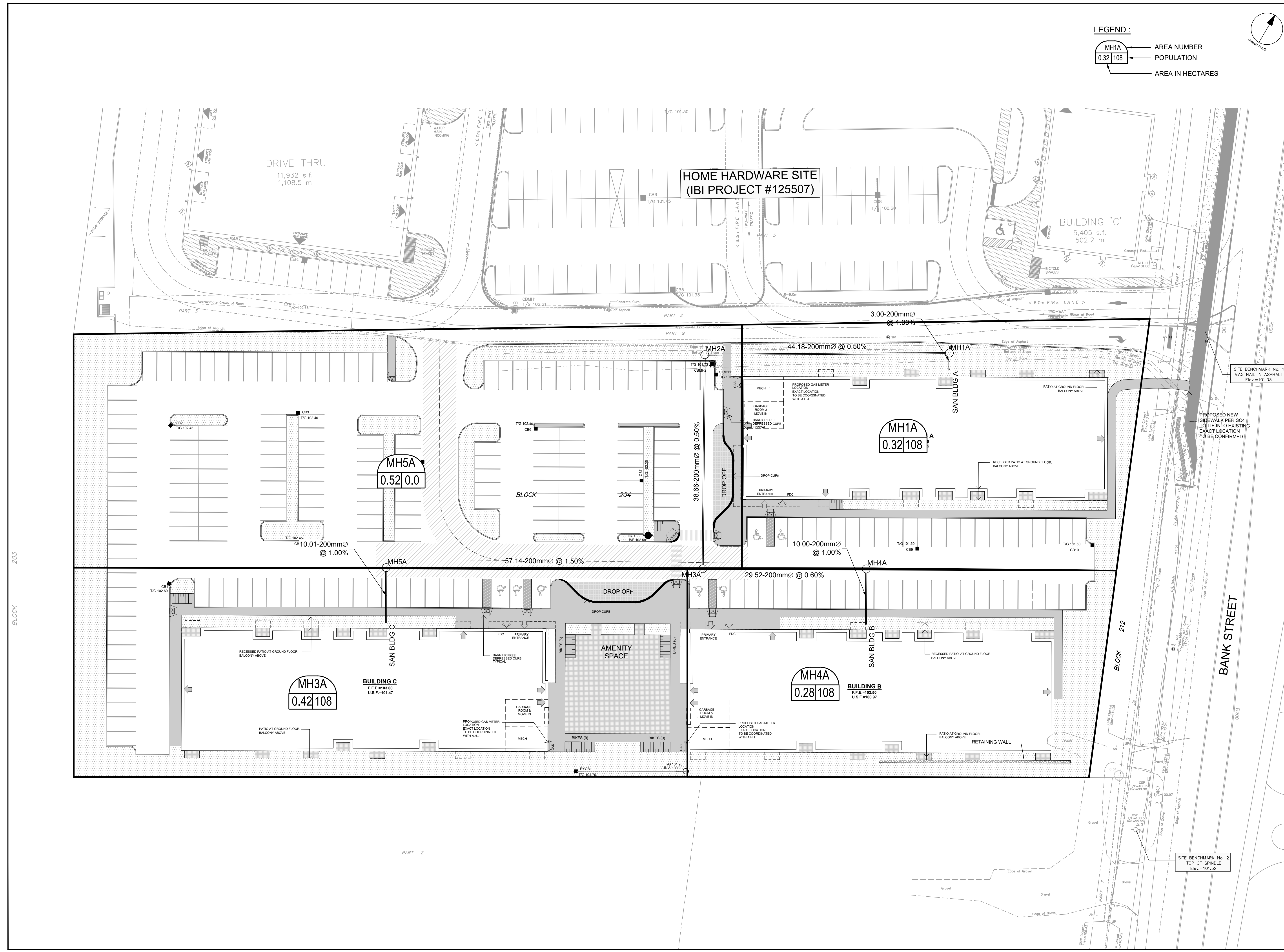
**PROJECT**  
4840 BANK STREET

**PROJECT NO:** 137175  
**DRAWN BY:** M.M.  
**PROJECT MGR:** D.C.

**CHECKED BY:** S.E.L.  
**APPROVED BY:** J.I.M.

**SHEET TITLE**  
SANITARY DRAINAGE AREA PLAN

**SHEET NUMBER** C-400 **ISSUE** 3



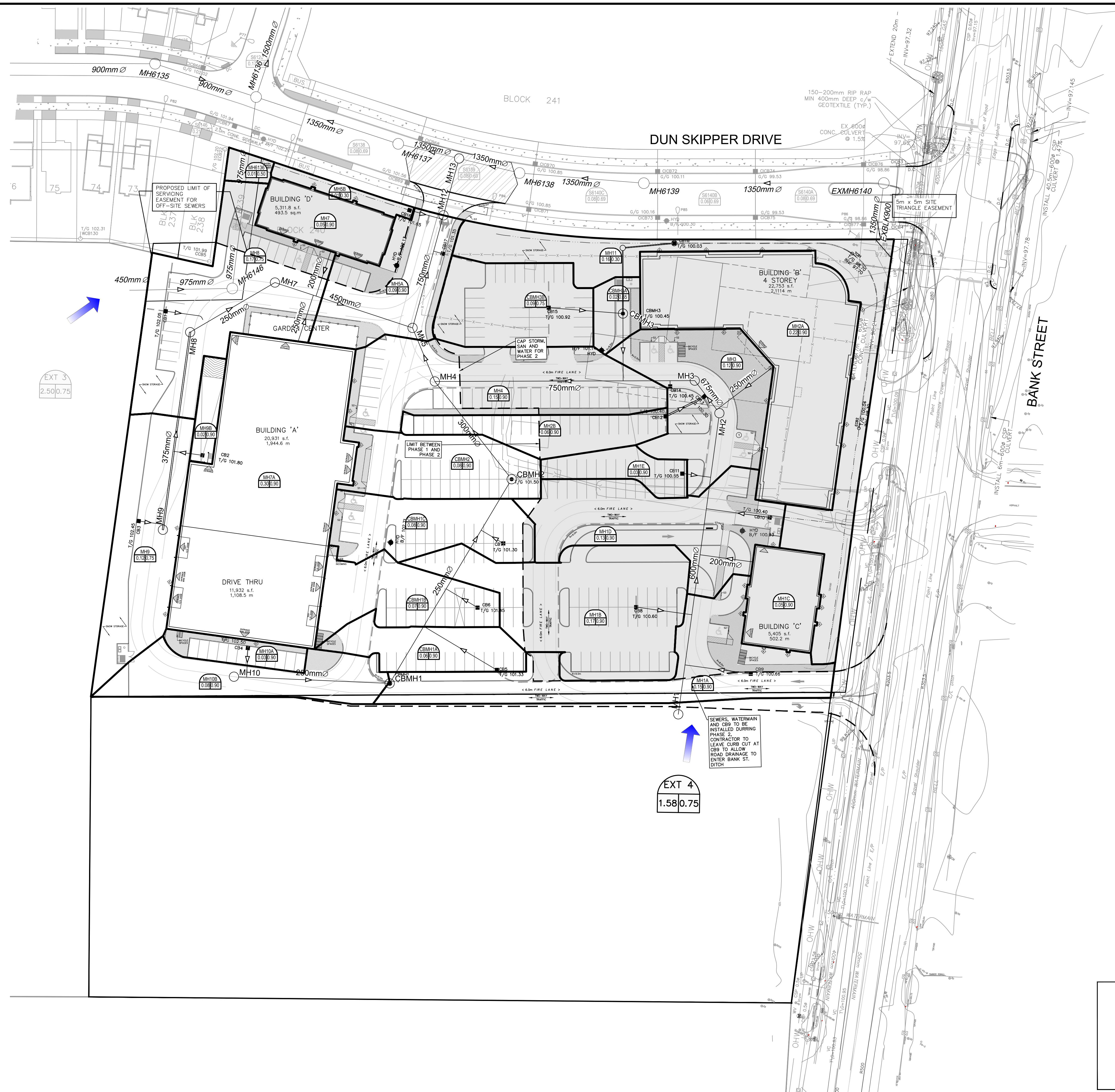
CITY FILE No. D07-12-22-0097



## **APPENDIX D**

- **Home Hardware Storm Sewer Design Sheet**
- **Drawing 119351-500 – Home Hardware Storm Drainage Area Plan**
- **Storm Sewer Design Sheet**
- **Drawing 137175 C-500 – Storm Drainage Area Plan**
- **Highlighted Drawing 119351 001 Home Hardware Site Servicing Plan**

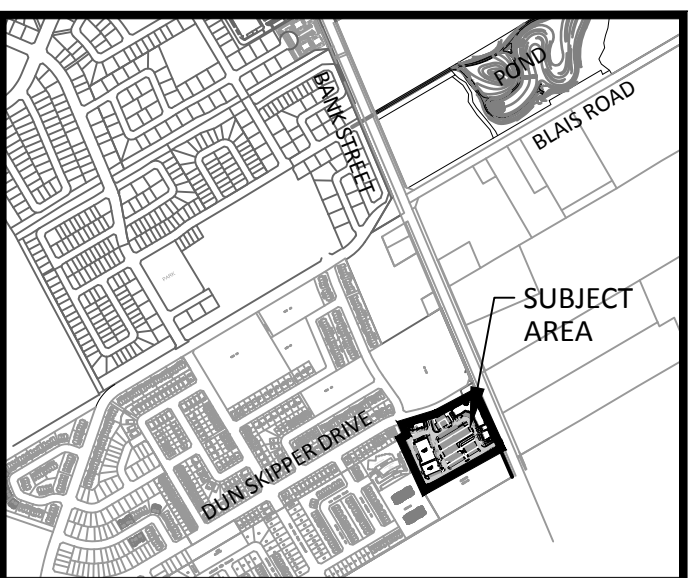




EXT 3  
2.50/0.75

EXT 4  
1.58/0.75

SEWERS, WATERMAIN AND CB9 TO BE INSTALLED DURING PHASE 2. CONTRACTOR TO LEAVE CURB CUT AT CB9 TO ALLOW ROAD DRAINAGE TO ENTER BANK ST. DITCH



**KEY PLAN**  
(NTS)

**NOTES:**  
1. SEE DRAWING C-010 FOR ADDITIONAL DETAILS AND NOTES.  
2. SITE BENCHMARK TO BE OBTAINED FROM LEGAL SURVEYOR H.A. KEN SHIPMAN SURVEYING LTD.

**LEGEND:**

	DRAINAGE AREA LIMITS
	AREA ID RUNOFF COEFFICIENT AREA IN HECTARES
	EXISTING AREA ID EXISTING RUNOFF COEFFICIENT EXISTING AREA IN HECTARES

14		
13		
12		
11		
10		
9		
8		
7		
6		
5		
4	ADD PHASING	JIM 2020-06-23
3	REVISED AS PER CITY COMMENTS	JIM 2019-12-09
2	REVISED AS PER NEW SITE PLAN AND CITY COMMENTS	JIM 2019-10-11
1	ISSUED FOR SPA	JIM 2019-04-15
No.	REVISIONS	By Date

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ibigroup.com

Project Title  
**BANK STREET DEVELOPMENT**  
4836 BANK STREET

Professional Engineer  
**J. I. MOFFATT**  
2020/06/23  
PROVINCE OF ONTARIO

Drawing Title  
**STORM DRAINAGE AREA PLAN**

Scale  
1 : 500

Design	SEL	Date	FEB. 2019
Drawn	DPS	Checked	JIM
Project No.	119351	Drawing No.	500

APPROVED  REFUSED

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

\_\_\_\_\_  
DON HERWEYER, MCIIP, RPP  
MANAGER, DEVELOPMENT REVIEW - SOUTH  
PLANNING, INFRASTRUCTURE & ECONOMIC  
DEVELOPMENT DEPARTMENT, CITY OF OTTAWA

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 Ottawa, Ontario K1S 5N4 Canada  
 tel 613 225 1311 fax 613 225 9868  
 ibigroup.com

1.34 1.51

**STORM SEWER DESIGN SHEET**

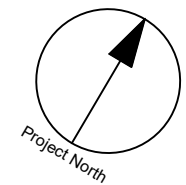
4840 Bank Street  
 City of Ottawa  
 Block 204 Pathways South Apartments

LOCATION				AREA (Ha)											RATIONAL DESIGN FLOW											SEWER DATA																											
STREET	AREA ID	FROM	TO	C=	C=	C=	C=	C=	C=	C=	C=	C=	C=	IND	CUM	INLET	TIME	TOTAL	i (2)	i (5)	i (10)	i (100)	2yr PEAK	5yr PEAK	10yr PEAK	100yr PEAK	FIXED	DESIGN	CAPACITY	LENGTH	PIPE SIZE (mm)			SLOPE	VELOCITY	AVAIL CAP (2yr)																	
				0.20	0.67	0.70	0.80	0.82	0.87	0.88	0.89	0.90	1.00	2.78AC	2.78AC	(min)	IN PIPE	(min)	(mm/hr)	(mm/hr)	(mm/hr)	(mm/hr)	FLOW (L/s)	FLOW (L/s)	FLOW (L/s)	FLOW (L/s)	FLOW (L/s)	FLOW (L/s)	(L/s)	(m)	DIA	W	H	(%)	(m/s)	(L/s)	(%)																
	CB1 to CB6, Bldg C,RYCB1	MH5	MH3	0.05	0.11	0.08	0.15	0.07	0.09				0.15	1.47	1.47	10.00	1.31	11.31	76.81	104.19	122.14	178.56	113.25	153.63	180.10	263.29		113.25	141.68	97.67	375				0.60	1.243	28.43	20.07%															
	CB9,CB10,Bldg B	MH4	MH3				0.04	0.11					0.15	0.72	0.72	10.00	0.70	10.70	76.81	104.19	122.14	178.56	54.92	74.50	87.33	127.67		54.92	78.14	45.00	300				0.60	1.071	23.23	29.72%															
	CB7	MH3	CBMH2									0.03	0.07	2.26	11.31	0.50	11.81	72.12	97.75	114.55	167.41	163.25	221.28	259.32	378.98		163.25	210.32	38.68	450				0.50	1.281	47.06	22.38%																
	CBMH2, Bldg A	CBMH2	MH1									0.16	0.15	0.77	3.03	11.81	0.48	12.29	70.48	95.50	111.91	163.53	213.59	289.41	339.13	495.56		213.59	317.25	40.86	525				0.50	1.420	103.66	32.67%															
<b>Definitions:</b> Q = 2.78CIA, where: Q = Peak Flow in Litres per Second (L/s) A = Area in Hectares (Ha) i = Rainfall intensity in millimeters per hour (mm/hr) [i = 732.951 / (TC+6.199)^0.810] 2 YEAR [i = 998.071 / (TC+6.053)^0.814] 5 YEAR [i = 1174.184 / (TC+6.014)^0.816] 10 YEAR [i = 1735.688 / (TC+6.014)^0.820] 100 YEAR				<b>Notes:</b> 1. Mannings coefficient (n) = 0.013											<b>Designed:</b> SL											<b>No.</b>							<b>Revision</b>							<b>Date</b>													
															<b>Checked:</b> JIM											1.							Submission No. 1 For City Comments							2022-06-03													
																										2.							Submission No. 2 For City Comments							2022-08-22													
															<b>Dwg. Reference:</b> 137175-500																																						
																										<b>File Reference:</b> 137175.6-0.6.04.04.Storm														<b>Date:</b> 2022-08-22							<b>Sheet No:</b> 1 of 1						

**LEGEND :**

MH1  
0.16 | 0.88

AREA NUMBER  
RUNOFF COEFFICIENT  
AREA IN HECTARES



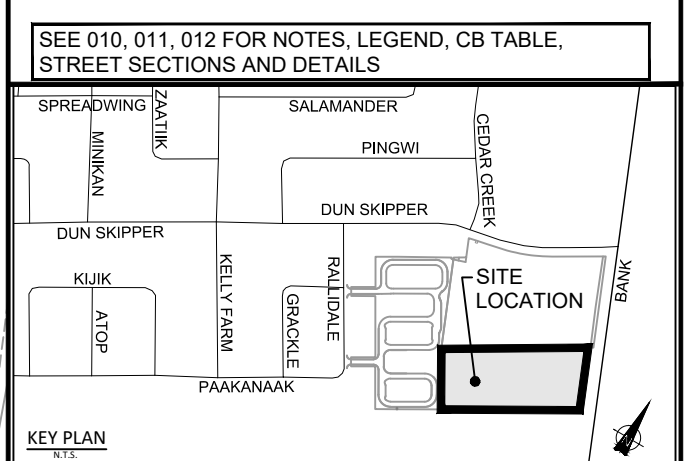
CLIENT  
**PATHWAYS SOUTH REGIONAL INC.**  
1737 WOODWARD DRIVE, OTTAWA, ON

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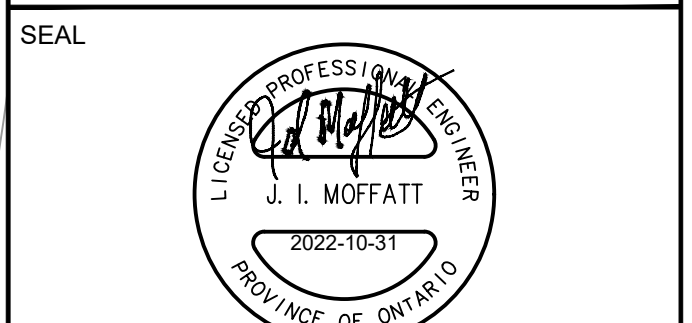
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**ISSUES**

No.	DESCRIPTION	DATE
1	SUBMISSION NO. 1 FOR CITY REVIEW	2022-06-03
2	SUBMISSION NO. 2 FOR CITY REVIEW	2022-08-26
3	SUBMISSION NO. 3 FOR CITY REVIEW	2022-10-31
4		
5		
6		
7		
8		



**CONSULTANTS**



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Ottawa ON K1S 5M4 Canada  
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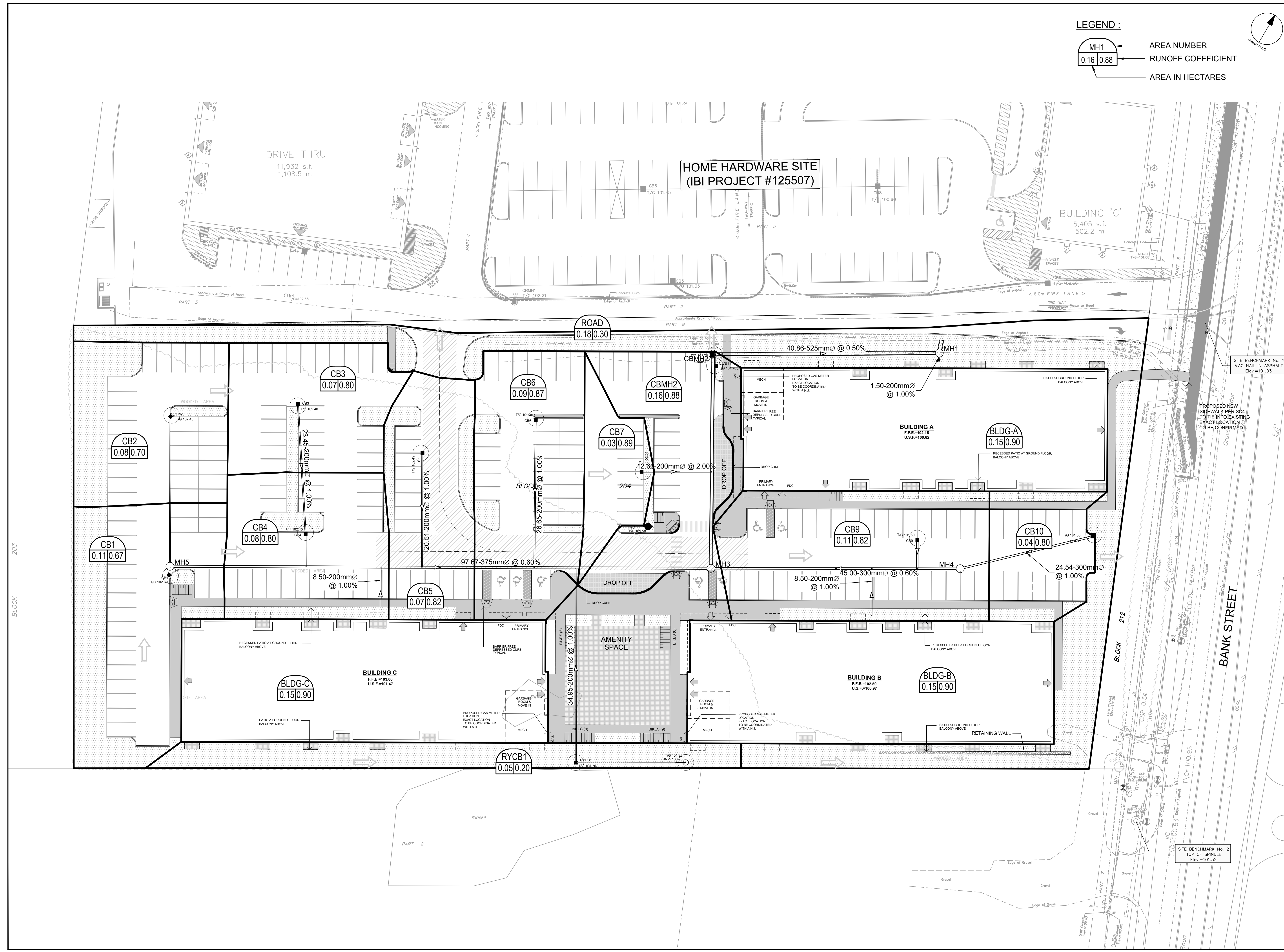
**PROJECT**  
4840 BANK STREET

**PROJECT NO:** 137175  
**DRAWN BY:** M.M.  
**PROJECT MGR:** D.C.**SHEET TITLE:** STORM DRAINAGE AREA PLAN

**CHECKED BY:** S.E.L.  
**APPROVED BY:** J.I.M.

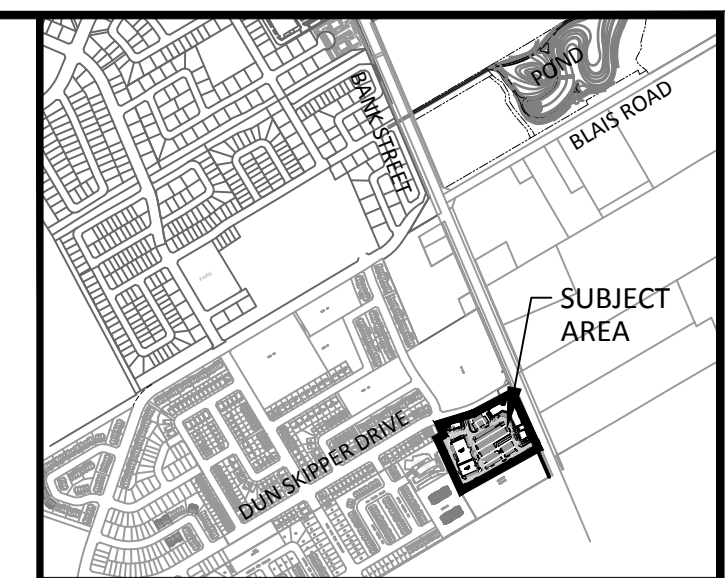
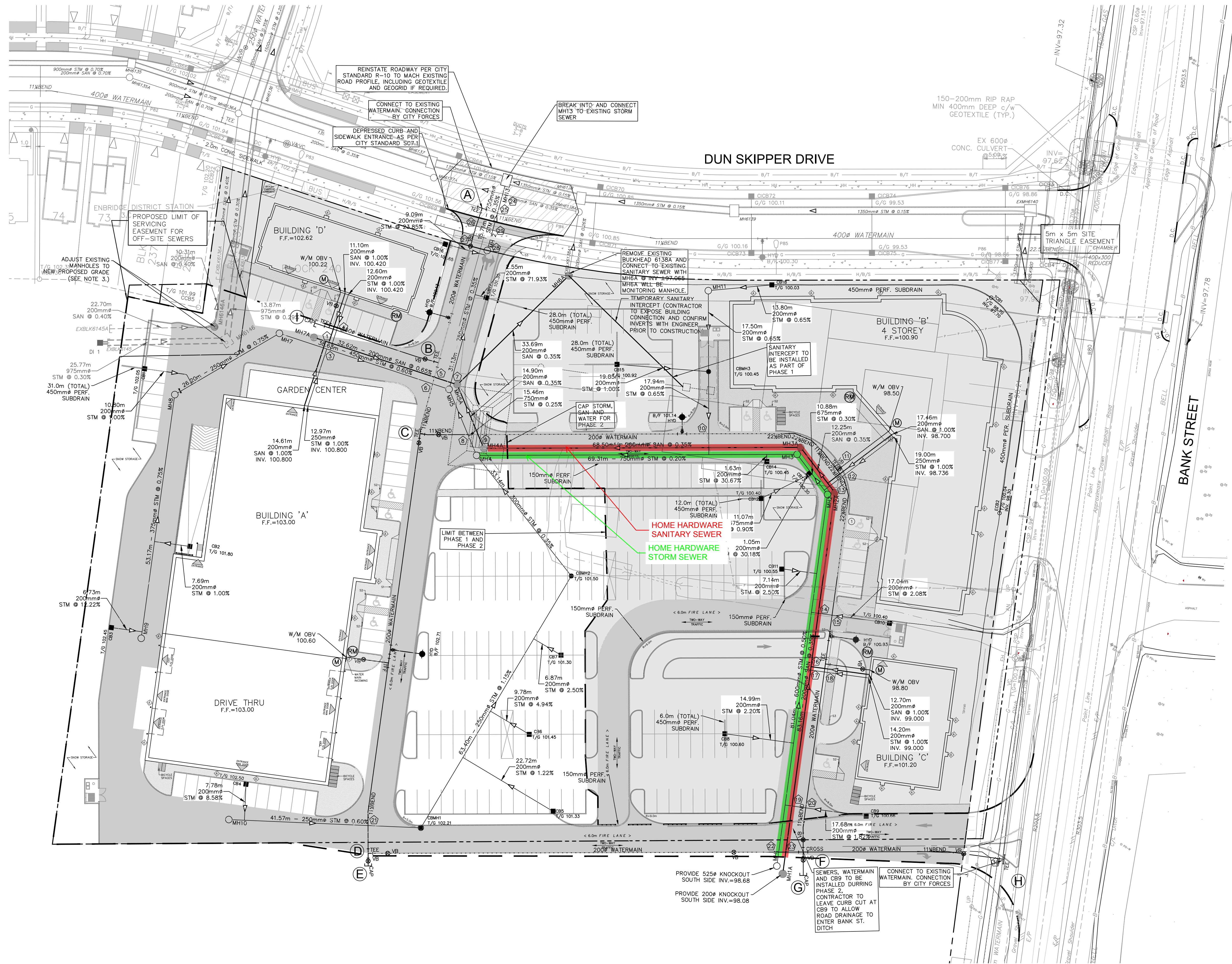
**SHEET NUMBER** C-500  
**ISSUE** 3

CITY PLAN No. xxxxx



BLOCK 203

CITY FILE No. D07-12-22-0097  
Scale Check  
File Location: \\137175\_Pathways\_South\_0\_Production\03\_Design\04\_Civil\Sheets\C500 STORM DRAINAGE AREA PLAN.dwg Last Saved: August 24, 2022, by: adobe Printed: Monday, October 31, 2022 9:50:09 AM by: Marian Mire



**KEY PLAN**  
(INTS)

**NOTES:**  
 1. SEE DRAWING C-010 FOR ADDITIONAL DETAILS AND NOTES.  
 2. SITE BENCHMARK TO BE OBTAINED FROM LEGAL SURVEYOR H.A. KEN SHIPMAN SURVEYING LTD.  
 3. 0 EXISTING SANITARY MANHOLE - MH146A AS-BUILT FIC = 102.019 TO BE ADJUSTED TO 102.160. EXISTING STORM MANHOLE - MH1646 AS-BUILT FIC = 102.018 TO BE ADJUSTED TO 102.24.

No.	REVISIONS	By	Date
14			
13			
12			
11			
10			
9			
8	ADD PHASING	JIM	2020-06-23
7	REVISED AS PER CITY COMMENTS	JIM	2020-04-20
6	REVISED AS PER CITY COMMENTS	JIM	2020-04-02
5	ISSUED FOR TENDER	JIM	2020-03-18
4	REVISED AS PER CITY COMMENTS	JIM	2020-03-13
3	REVISED AS PER CITY COMMENTS	JIM	2019-12-09
2	REVISED AS PER NEW SITE PLAN AND CITY COMMENTS	JIM	2019-10-11
1	ISSUED FOR SPA	JIM	2019-04-15

No.	REVISIONS	By	Date
14			
13			
12			
11			
10			
9			
8	ADD PHASING	JIM	2020-06-23
7	REVISED AS PER CITY COMMENTS	JIM	2020-04-20
6	REVISED AS PER CITY COMMENTS	JIM	2020-04-02
5	ISSUED FOR TENDER	JIM	2020-03-18
4	REVISED AS PER CITY COMMENTS	JIM	2020-03-13
3	REVISED AS PER CITY COMMENTS	JIM	2019-12-09
2	REVISED AS PER NEW SITE PLAN AND CITY COMMENTS	JIM	2019-10-11
1	ISSUED FOR SPA	JIM	2019-04-15

**IBI GROUP**  
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Project Title  
**BANK STREET DEVELOPMENT**  
 4836 BANK STREET

LICENSURE PROFESSIONAL ENGINEER  
**J. I. MOFFATT**  
 2020/05/23  
 PROVINCE OF ONTARIO

**SITE SERVICING PLAN**

Scale  
 1 : 400

Design	SEL	Date	FEB. 2019
Drawn	DPS	Checked	JIM
Project No.	119351	Drawing No.	001

\119351\_4836bankst.3 Design\119351\_4836bankst.3.dwg: 11/13/2019 11:53:23 AM User: jmo

D07-12-19-0092

# **APPENDIX E**

- **Home Hardware Inlet Controls Calculations**
- **Stormwater Management Calculations**
- **A104c - Roof Plan**
- **Tempest ICD Technical Sheet**
- **Watts Roof Drain ICD Spec Sheet**

- 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)

#### 4.4 Proposed Minor System

Using the criteria identified in Section 4.3, the proposed on-site storm sewers were sized accordingly. A detailed storm sewer design sheet and the associated Storm Sewer Drainage Area plan (drawing 119351-500) are both included in **Appendix D**. The Site Servicing Plan, depicting all on-site storm sewers can be found in **Appendix G**.

The proposed minor storm sewer will range in size between 200 mm diameter and 750 mm diameter. Catchbasin lead pipes will mostly be 200 mm diameter with some 250 mm diameter exceptions. The minor storm sewer outlet will be via the 750 mm diameter pipe which is proposed to connect to the existing 1350 mm diameter storm sewer in Dun Skipper Drive. The existing 1350 mm diameter storm sewer behind building B will be terminated with a manhole and will receive some minor storm flow from the landscaped areas behind Building B. The proposed design has also provided minor storm sewer capacity for the future Idone commercial site near MH1.

The 1350 mm diameter storm sewer in Dun Skipper Drive ultimately outlets to the Findlay Creek Village SWMF. This facility provides 80% TSS removal, as such no additional on-site stormwater quality control is required within the subject lands.

#### 4.5 Stormwater Management

The subject site will be limited to a release rate established using the criteria described in section 4.2. This will be achieved through a combination of inlet control devices (ICD's) at inlet locations and surface storage.

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

The maximum surface retention depth located within the developed areas will be limited to 300mm during a 1:100 year event as shown on the ponding and grading plans located in **Appendix G**.

Overland flow routes will be provided in the grading to permit emergency overland flow, in excess of the 100 year event, from the site.

At a single location within the site, west of building D, the opportunity to store runoff is limited due to grading constraints and building geometry, this area will flow uncontrolled to the Dun Skipper right-of-way. This uncontrolled areas – 0.01 hectares in total, have an average C value of 0.6250. Based on 1:100 year storm uncontrolled flows, the uncontrolled areas generate 3.10 l/s runoff (refer to Section 4.6 for the calculation).

The site grading and ponding has been designed to control water generated during the 1:100-year event, with no overflow leaving the site. Please refer to the SWM calculations in **Appendix E**.

#### 4.6 Inlet Controls

The allowable release rate for the 2.49 Ha site can be calculated as follows:

$$\begin{aligned} Q_{\text{allowable}} &= 760 \text{ L/s as per IBI Pathways Phase 1 Report – EXT 4 drainage area} \\ \text{Area Total EXT4} &= 4.04 \text{ Ha} \end{aligned}$$

$$\text{Subject lands share} = 62\% \text{ of EXT4 release rate } (2.5 \text{ Ha} / 4.04 \text{ Ha} = 0.62)$$



$$Q_{\text{Subject Lands}} = 468.42 \text{ L/s}$$

As noted in Section 4.5, a small portion of the site just west of Building D will be left to discharge to the Dun Skipper Drive boulevard at an uncontrolled rate.

Based on a 1:100 year event, the flow from the 0.01 Ha uncontrolled areas can be determined as:

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

$C$  = Average runoff coefficient of uncontrolled area = 0.625

$i_{100\text{yr}}$  = Intensity of 100-year storm event (mm/hr)  
=  $1735.688 \times (T_c + 6.014)^{0.820} = 178.56 \text{ mm/hr}$ ; where  $T_c = 10$  minutes

$A$  = Uncontrolled Area = 0.01 Ha

Therefore, the uncontrolled release rate can be determined as:

$$Q_{\text{uncontrolled}} = 2.78 \times C \times i_{100\text{yr}} \times A$$
$$= 2.78 \times 0.625 \times 178.56 \times 0.01$$
$$= 3.10 \text{ L/s}$$

The maximum allowable release rate from the remainder of the site can then be determined as:

$$Q_{\text{max allowable}} = Q_{\text{restricted}} - Q_{\text{uncontrolled}}$$
$$= 468.42 \text{ L/s} - 3.10 \text{ L/s}$$
$$= 465.31 \text{ L/s}$$

Based on the flow allowance at the various inlet locations, a combination of various sizes of inlet control devices (ICDs) were chosen for the design. The design of the inlet control devices is unique to each drainage area and is determined based on a number of factors, including hydraulic head and allowable release rate. The inlet control devices were sized according to the manufacturer's design charts. The restrictions will cause the on-site catchbasins and manholes to surcharge, generating surface ponding in the parking and landscaped areas. Ponding locations and elevations are summarized on drawing 119351-600, Ponding Plan 119351-600 which is included in **Appendix G**.

## 4.7 On-Site Detention

Any excess storm water up to the 100-year event is to be stored on-site in order to not surcharge the downstream municipal storm sewer system. Detention will be provided in parking and landscape areas and building rooftops, where feasible. As previously noted, the volume of storage is dependent on the characteristics of each individual drainage area and the ICD's were chosen accordingly. It should be noted that 0.30m of vertical separation has been provided from all maximum ponding elevations to lowest building openings.

### 4.7.1 Site Inlet Control

The following Table summarizes the on-site storage requirements during both the 1:5-year and 1:100-year events.



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**PROJECT:** Pathways Blk 2  
**DATE:** 2022-10-22  
**FILE:** 137175.6.04.04  
**REV #:** 3  
**DESIGNED BY:** SEL  
**CHECKED BY:** JIM

**STORMWATER MANAGEMENT**

**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**

Taken from City of Ottawa approved Design Brief "Pathways at Findlay Creek" (D07-16-13-0023) drainage area EXT 4

EXT 4 Release Rate            760.00 L/s  
 Area EXT 4 TOTAL =        4.04 Ha  
 Area Subject Lands        1.55 Ha  
 Percentage Share of release rate    38%

$Q_{TOTAL} = 291.58 \text{ L/s}$

**Uncontrolled Release ROAD ( $Q_{un1} = 2.78 \cdot C \cdot i_{100yr} \cdot A_{uncontrolled}$ )**

C = 0.38  
 $T_c = 10 \text{ min}$   
 $i_{100yr} = 178.56 \text{ mm/hr}$   
 $A_{uncontrolled} = 0.180 \text{ Ha}$

$Q_{un1} = 33.51 \text{ L/s}$

**Uncontrolled Release MH1 ( $Q_{un2} = 2.78 \cdot C \cdot i_{100yr} \cdot A_{uncontrolled}$ )**

C = 1.00  
 $T_c = 10 \text{ min}$   
 $i_{100yr} = 178.56 \text{ mm/hr}$   
 $A_{uncontrolled} = 0.160 \text{ Ha}$

$Q_{un2} = 79.42 \text{ L/s}$

**Total Uncontrolled Release ( $Q_{uncontrolled} = 2.78 \cdot C \cdot i_{100yr} \cdot A_{uncontrolled}$ )**

$Q_{uncontrolled} = 112.93 \text{ L/s}$

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

$Q_{max \text{ allowable}} = 178.65 \text{ L/s}$

**Sub-Surface Storage**

Structure	Height (m)	Width 1 (m)	Width 2 (m)	X-Sec Area	Volume (m3)
Catchbasin	1.4	0.60	0.6	0.36	0.50

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

Drainage Area		MH5A						
Area (Ha)	0.11	Restricted Flow $Q_r$ (L/s)= 12.00						
C =	0.84							
100-Year Ponding						100Yr +20%		
$T_c$ 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 ( $m^3$ )	100YRQp 20% (L/s)	Qp - Qr (L/s)	Volume 100+20 ( $m^3$ )
16	137.55	35.23	12.00	23.23	22.30	38.07	26.07	29.72
18	128.08	32.80	12.00	20.80	22.47			
19	123.87	31.72	12.00	19.72	22.49			
20	119.95	30.72	12.00	18.72	22.46			
22	112.88	28.91	12.00	16.91	22.32			

Storage ( $m^3$ )					100+20		
Overflow	Required	Surface	Sub-surface	Balance	Overflow	Required	Balance
0.00	22.49	17.12	0.5	4.87	0.00	29.72	12.60

overflows to: MH5

Drainage Area		MH5A			
Area (Ha)	0.11	Restricted Flow $Q_r$ (L/s)= 12.00			
C =	0.67				
5-Year Ponding					
$T_c$ Variable (min)	$i_{5yr}$ (mm/hour)	Peak Flow $Q_p = 2.78 \times C i_{5yr} A$ (L/s)	$Q_r$ (L/s)	$Q_p - Q_r$ (L/s)	Volume 5yr ( $m^3$ )
5	141.18	28.93	12.00	16.93	5.08
7	123.30	25.26	12.00	13.26	5.57
9	109.79	22.50	12.00	10.50	5.67
11	99.19	20.32	12.00	8.32	5.49
13	90.63	18.57	12.00	6.57	5.12

Storage ( $m^3$ )				
Overflow	Required	Surface	Sub-surface	Balance
0.00	5.67	17.12	0.5	0.00

overflows to: MH5

Drainage Area		MH5A			
Area (Ha)	0.11	Restricted Flow $Q_r$ (L/s)= 12.00			
C =	0.67				
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 ( $m^3$ )
7	90.66	18.58	12.00	6.58	2.76
9	80.87	16.57	12.00	4.57	2.47
10	76.81	15.74	12.00	3.74	2.24
11	73.17	14.99	12.00	2.99	1.97
13	66.93	13.71	12.00	1.71	1.34

Storage ( $m^3$ )				
Overflow	Required	Surface	Sub-surface	Balance
0.00	2.24	17.12	0.5	0.00

overflows to: MH5

Drainage Area		MH5						
Area (Ha)	0.08	Restricted Flow $Q_r$ (L/s)= 10.00						
C =	0.88							
100-Year Ponding						100Yr +20%		
$T_c$ 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 ( $m^3$ )	100YRQp 20% (L/s)	Qp - Qr (L/s)	Volume 100+20 ( $m^3$ )
25	103.85	20.21	10.00	10.21	15.31	22.48	12.48	20.97
27	98.66	19.20	10.00	9.20	14.90			
28	96.27	18.74	10.00	8.74	14.67			
29	94.01	18.30	10.00	8.30	14.43			
31	89.83	17.48	10.00	7.48	13.91			

Storage ( $m^3$ )					100+20		
Overflow	Required	Surface	Sub-surface	Balance	Overflow	Required	Balance
4.87	19.54	28.66	0.5	0.00	12.60	33.57	4.91

overflows to: MH3

Drainage Area		MH5			
Area (Ha)	0.08	Restricted Flow $Q_r$ (L/s)= 10.00			
C =	0.70				
5-Year Ponding					
$T_c$ Variable (min)	$i_{5yr}$ (mm/hour)	Peak Flow $Q_p = 2.78 \times C i_{5yr} A$ (L/s)	$Q_r$ (L/s)	$Q_p - Q_r$ (L/s)	Volume 5yr ( $m^3$ )
4	152.51	23.74	10.00	13.74	3.30
6	131.57	20.48	10.00	10.48	3.77
8	116.11	18.08	10.00	8.08	3.88
10	104.19	16.22	10.00	6.22	3.73
12	94.70	14.74	10.00	4.74	3.41

Storage ( $m^3$ )				
Overflow	Required	Surface	Sub-surface	Balance
0.00	3.88	28.66	0.5	0.00

overflows to: MH3

Drainage Area		MH5			
Area (Ha)	0.08	Restricted Flow $Q_r$ (L/s)= 10.00			
C =	0.70				
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 ( $m^3$ )
7	90.66	14.11	10.00	4.11	1.73
9	80.87	12.59	10.00	2.59	1.40
10	76.81	11.96	10.00	1.96	1.17
11	73.17	11.39	10.00	1.39	0.92
13	66.93	10.42	10.00	0.42	0.33

Storage ( $m^3$ )				
Overflow	Required	Surface	Sub-surface	Balance
0.00	1.17	28.66	0.5	0.00

overflows to: MH3

Drainage Area		MH3						
Area (Ha)	0.07	Restricted Flow Q <sub>r</sub> (L/s)= 8.00						
C =	1.00							
100-Year Ponding						100Yr +20%		
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> )	100YRQp 20% (L/s)	Qp - Qr (L/s)	Volume 100+20 (m3)
25	103.85	20.21	8.00	12.21	18.31	22.48	14.48	24.33
27	98.66	19.20	8.00	11.20	18.14			
28	96.27	18.74	8.00	10.74	18.03			
29	94.01	18.30	8.00	10.30	17.91			
31	89.83	17.48	8.00	9.48	17.63			
Storage (m <sup>3</sup> )						100+20		
Overflow	Required	Surface	Sub-surface	Balance	Overflow	Required	Balance	
0.00	18.03	56.01	0.5	0.00	4.91	29.24	0.00	

overflows to: MH3B

Drainage Area		MH3			
Area (Ha)	0.07	Restricted Flow Q <sub>r</sub> (L/s)= 8.00			
C =	0.80				
5-Year Ponding					
T <sub>c</sub> Variable (min)	i <sub>5yr</sub> (mm/hour)	Peak Flow Q <sub>p</sub> =2.78xCi <sub>5yr</sub> A (L/s)	Q <sub>r</sub> (L/s)	Q <sub>p</sub> -Q <sub>r</sub> (L/s)	Volume 5yr (m <sup>3</sup> )
7	123.30	19.20	8.00	11.20	4.70
9	109.79	17.09	8.00	9.09	4.91
11	99.19	15.44	8.00	7.44	4.91
13	90.63	14.11	8.00	6.11	4.77
15	83.56	13.01	8.00	5.01	4.51
Storage (m <sup>3</sup> )					
Overflow	Required	Surface	Sub-surface	Balance	
0.00	4.91	56.01	0.5	0.00	

overflows to: MH3B

Drainage Area		MH3			
Area (Ha)	0.07	Restricted Flow Q <sub>r</sub> (L/s)= 8.00			
C =	0.80				
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> )
7	90.66	14.11	8.00	6.11	2.57
9	80.87	12.59	8.00	4.59	2.48
10	76.81	11.96	8.00	3.96	2.37
11	73.17	11.39	8.00	3.39	2.24
13	66.93	10.42	8.00	2.42	1.89
Storage (m <sup>3</sup> )					
Overflow	Required	Surface	Sub-surface	Balance	
0.00	2.37	56.01	0.5	0.00	

overflows to: MH3B

Drainage Area		MH3A						
Area (Ha)	0.08	Restricted Flow Q <sub>r</sub> (L/s)= 9.00						
C =	1.00							
100-Year Ponding						100Yr +20%		
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> )	100YRQp 20% (L/s)	Qp - Qr (L/s)	Volume 100+20 (m3)
29	94.01	20.91	9.00	11.91	20.72	23.45	14.45	27.75
31	89.83	19.98	9.00	10.98	20.42			
32	87.89	19.55	9.00	10.55	20.25			
33	86.03	19.13	9.00	10.13	20.07			
35	82.58	18.37	9.00	9.37	19.67			
Storage (m <sup>3</sup> )						100+20		
Overflow	Required	Surface	Sub-surface	Balance	Overflow	Required	Balance	
0.00	20.25	27.53	0.5	0.00	0.00	27.75	0.22	

overflows to: MH3B

Drainage Area		MH3A			
Area (Ha)	0.08	Restricted Flow Q <sub>r</sub> (L/s)= 9.00			
C =	0.80				
5-Year Ponding					
T <sub>c</sub> Variable (min)	i <sub>5yr</sub> (mm/hour)	Peak Flow Q <sub>p</sub> =2.78xCi <sub>5yr</sub> A (L/s)	Q <sub>r</sub> (L/s)	Q <sub>p</sub> -Q <sub>r</sub> (L/s)	Volume 5yr (m <sup>3</sup> )
7	123.30	21.94	9.00	12.94	5.43
9	109.79	19.53	9.00	10.53	5.69
11	99.19	17.65	9.00	8.65	5.71
13	90.63	16.12	9.00	7.12	5.56
15	83.56	14.87	9.00	5.87	5.28
Storage (m <sup>3</sup> )					
Overflow	Required	Surface	Sub-surface	Balance	
0.00	5.71	27.53	0.5	0.00	

overflows to: MH3B

Drainage Area		MH3A			
Area (Ha)	0.08	Restricted Flow Q <sub>r</sub> (L/s)= 9.00			
C =	0.80				
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> )
7	90.66	16.13	9.00	7.13	3.00
9	80.87	14.39	9.00	5.39	2.91
10	76.81	13.67	9.00	4.67	2.80
11	73.17	13.02	9.00	4.02	2.65
13	66.93	11.91	9.00	2.91	2.27
Storage (m <sup>3</sup> )					
Overflow	Required	Surface	Sub-surface	Balance	
0.00	2.80	27.53	0.5	0.00	

overflows to: MH3B

Drainage Area		MH3B			
Area (Ha)	0.07	Restricted Flow Q <sub>r</sub> (L/s)= 8.00			
C =	1.00				
100-Year 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> )
25	103.85	20.21	8.00	12.21	18.31
27	98.66	19.20	8.00	11.20	18.14
28	96.27	18.74	8.00	10.74	<b>18.03</b>
29	94.01	18.30	8.00	10.30	17.91
31	89.83	17.48	8.00	9.48	17.63
Storage (m <sup>3</sup> )					
Overflow	Required	Surface	Sub-surface	Balance	100+20
0.00	18.03	27.53	0.5	0.00	
overflows to: MH3C					

Drainage Area		MH3B			
Area (Ha)	0.07	Restricted Flow Q <sub>r</sub> (L/s)= 8.00			
C =	0.82				
5-Year Ponding					
T <sub>c</sub> Variable (min)	i <sub>5yr</sub> (mm/hour)	Peak Flow Q <sub>p</sub> =2.78xCi <sub>5yr</sub> A (L/s)	Q <sub>r</sub> (L/s)	Q <sub>p</sub> -Q <sub>r</sub> (L/s)	Volume 5yr (m <sup>3</sup> )
7	123.30	19.68	8.00	11.68	4.90
9	109.79	17.52	8.00	9.52	5.14
11	99.19	15.83	8.00	7.83	<b>5.17</b>
13	90.63	14.46	8.00	6.46	5.04
15	83.56	13.33	8.00	5.33	4.80
Storage (m <sup>3</sup> )					
Overflow	Required	Surface	Sub-surface	Balance	100+20
0.00	5.17	27.53	0.5	0.00	
overflows to: MH3C					

Drainage Area		MH3B			
Area (Ha)	0.07	Restricted Flow Q <sub>r</sub> (L/s)= 8.00			
C =	0.82				
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> )
7	90.66	14.47	8.00	6.47	2.72
9	80.87	12.91	8.00	4.91	2.65
10	76.81	12.26	8.00	4.26	<b>2.55</b>
11	73.17	11.68	8.00	3.68	2.43
13	66.93	10.68	8.00	2.68	2.09
Storage (m <sup>3</sup> )					
Overflow	Required	Surface	Sub-surface	Balance	100+20
0.00	2.55	27.53	0.5	0.00	
overflows to: MH3C					

Drainage Area		MH3C			
Area (Ha)	0.09	Restricted Flow Q <sub>r</sub> (L/s)= 12.00			
C =	1.00				
100-Year 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> )
33	86.03	21.53	12.00	9.53	18.86
35	82.58	20.66	12.00	8.66	18.19
36	80.96	20.26	12.00	8.26	<b>17.84</b>
37	79.42	19.87	12.00	7.87	17.47
39	76.51	19.14	12.00	7.14	16.72
Storage (m <sup>3</sup> )					
Overflow	Required	Surface	Sub-surface	Balance	100+20
0.00	17.84	53.05	0.5	0.00	
overflows to: CBMH2					

Drainage Area		MH3C			
Area (Ha)	0.09	Restricted Flow Q <sub>r</sub> (L/s)= 12.00			
C =	0.87				
5-Year Ponding					
T <sub>c</sub> Variable (min)	i <sub>5yr</sub> (mm/hour)	Peak Flow Q <sub>p</sub> =2.78xCi <sub>5yr</sub> A (L/s)	Q <sub>r</sub> (L/s)	Q <sub>p</sub> -Q <sub>r</sub> (L/s)	Volume 5yr (m <sup>3</sup> )
6	131.57	28.64	12.00	16.64	5.99
8	116.11	25.27	12.00	13.27	6.37
10	104.19	22.68	12.00	10.68	<b>6.41</b>
12	94.70	20.61	12.00	8.61	6.20
14	86.93	18.92	12.00	6.92	5.82
Storage (m <sup>3</sup> )					
Overflow	Required	Surface	Sub-surface	Balance	100+20
0.00	6.41	53.05	0.5	0.00	
overflows to: CBMH2					

Drainage Area		MH3C			
Area (Ha)	0.09	Restricted Flow Q <sub>r</sub> (L/s)= 12.00			
C =	0.87				
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> )
7	90.66	19.74	12.00	7.74	3.25
9	80.87	17.60	12.00	5.60	3.03
10	76.81	16.72	12.00	4.72	<b>2.83</b>
11	73.17	15.93	12.00	3.93	2.59
13	66.93	14.57	12.00	2.57	2.00
Storage (m <sup>3</sup> )					
Overflow	Required	Surface	Sub-surface	Balance	100+20
0.00	2.83	53.05	0.5	0.00	
overflows to: CBMH2					

<b>Drainage Area</b>	<b>CBMH2</b>
Area (Ha)	0.03
C =	1.00

**100-Year 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 ( $m^3$ )
2	315.00	26.27	12.00	14.27	1.71
4	262.41	21.88	12.00	9.88	2.37
5	242.70	20.24	12.00	8.24	<b>2.47</b>
6	226.01	18.85	12.00	6.85	2.47
8	199.20	16.61	12.00	4.61	2.21

**100Yr +20%**

100YRQp 20% (L/s)	$Q_p - Q_r$ (L/s)	Volume 100+20 ( $m^3$ )
24.29	12.29	<b>3.69</b>

**Storage ( $m^3$ )**

Overflow	Required	Surface	Sub-surface	Balance	Overflow	Required	Balance
0.00	2.47	2.64	0.5	<b>0.00</b>	0.00	3.69	1.05

overflows to: MH1/OUT

<b>Drainage Area</b>	<b>CBMH2</b>
Area (Ha)	0.03
C =	0.89

**5-Year Ponding**

$T_c$ Variable (min)	$i_{5yr}$ (mm/hour)	Peak Flow $Q_p = 2.78 \times C i_{5yr} A$ (L/s)	$Q_r$ (L/s)	$Q_p - Q_r$ (L/s)	Volume 5yr ( $m^3$ )
-2	319.47	23.71	12.00	11.71	-1.41
0	230.48	17.11	12.00	5.11	0.00
2	182.69	13.56	12.00	1.56	<b>0.19</b>
4	152.51	11.32	12.00	-0.68	-0.16
6	131.57	9.77	12.00	-2.23	-0.80

**Storage ( $m^3$ )**

Overflow	Required	Surface	Sub-surface	Balance
0.00	0.19	2.64	0.5	0.00

overflows to: MH1/OUT

<b>Drainage Area</b>	<b>CBMH2</b>
Area (Ha)	0.03
C =	0.89

**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 ( $m^3$ )
7	90.66	6.73	12.00	-5.27	-2.21
9	80.87	6.00	12.00	-6.00	-3.24
10	76.81	5.70	12.00	-6.30	<b>-3.78</b>
11	73.17	5.43	12.00	-6.57	-4.34
13	66.93	4.97	12.00	-7.03	-5.49

**Storage ( $m^3$ )**

Overflow	Required	Surface	Sub-surface	Balance
0.00	-3.78	2.64	0.5	0.00

overflows to: MH1/OUT

Drainage Area		MH3D			
Area (Ha)	0.11	Restricted Flow Q <sub>r</sub> (L/s)= 40.00			
C =	1.00				
100-Year 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> )
3	286.05	87.47	40.00	47.47	8.55
5	242.70	74.22	40.00	34.22	10.27
6	226.01	69.11	40.00	29.11	10.48
7	211.67	64.73	40.00	24.73	10.39
9	188.25	57.57	40.00	17.57	9.49
Storage (m <sup>3</sup> )					
Overflow	Required	Surface	Sub-surface	Balance	100+20
0.00	10.48	10.79	0.5	0.00	0.00

overflows to: MH4

Drainage Area		MH3D			
Area (Ha)	0.11	Restricted Flow Q <sub>r</sub> (L/s)= 40.00			
C =	0.82				
5-Year Ponding					
T <sub>c</sub> Variable (min)	i <sub>5yr</sub> (mm/hour)	Peak Flow Q <sub>p</sub> =2.78xCi <sub>5yr</sub> A (L/s)	Q <sub>r</sub> (L/s)	Q <sub>p</sub> -Q <sub>r</sub> (L/s)	Volume 5yr (m <sup>3</sup> )
-2	319.47	80.11	40.00	40.11	-4.81
0	230.48	57.79	40.00	17.79	0.00
2	182.69	45.81	40.00	5.81	0.70
4	152.51	38.24	40.00	-1.76	-0.42
6	131.57	32.99	40.00	-7.01	-2.52
Storage (m <sup>3</sup> )					
Overflow	Required	Surface	Sub-surface	Balance	100+20
0.00	0.70	10.79	0.5	0.00	0.00

overflows to: MH4

Drainage Area		MH3D			
Area (Ha)	0.11	Restricted Flow Q <sub>r</sub> (L/s)= 40.00			
C =	0.82				
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> )
7	90.66	22.73	40.00	-17.27	-7.25
9	80.87	20.28	40.00	-19.72	-10.65
10	76.81	19.26	40.00	-20.74	-12.44
11	73.17	18.35	40.00	-21.65	-14.29
13	66.93	16.78	40.00	-23.22	-18.11
Storage (m <sup>3</sup> )					
Overflow	Required	Surface	Sub-surface	Balance	100+20
0.00	-12.44	10.79	0.5	0.00	0.00

overflows to: MH4

Drainage Area		MH4			
Area (Ha)	0.04	Restricted Flow Q <sub>r</sub> (L/s)= 25.00			
C =	1.00				
100-Year 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> )
0	398.62	44.33	25.00	19.33	0.00
2	315.00	35.03	25.00	10.03	1.20
3	286.05	31.81	25.00	6.81	1.23
4	262.41	29.18	25.00	4.18	1.00
6	226.01	25.13	25.00	0.13	0.05
Storage (m <sup>3</sup> )					
Overflow	Required	Surface	Sub-surface	Balance	100+20
0.00	1.23	1.75	0.5	0.00	4.67

overflows to: OUT

Drainage Area		MH4			
Area (Ha)	0.04	Restricted Flow Q <sub>r</sub> (L/s)= 25.00			
C =	0.80				
5-Year Ponding					
T <sub>c</sub> Variable (min)	i <sub>5yr</sub> (mm/hour)	Peak Flow Q <sub>p</sub> =2.78xCi <sub>5yr</sub> A (L/s)	Q <sub>r</sub> (L/s)	Q <sub>p</sub> -Q <sub>r</sub> (L/s)	Volume 5yr (m <sup>3</sup> )
-4	555.75	49.44	25.00	24.44	-5.87
-2	319.47	28.42	25.00	3.42	-0.41
0	230.48	20.50	25.00	-4.50	0.00
2	182.69	16.25	25.00	-8.75	-1.05
4	152.51	13.57	25.00	-11.43	-2.74
Storage (m <sup>3</sup> )					
Overflow	Required	Surface	Sub-surface	Balance	100+20
0.00	0.00	1.75	0.5	0.00	0.00

overflows to: OUT

Drainage Area		MH4			
Area (Ha)	0.04	Restricted Flow Q <sub>r</sub> (L/s)= 25.00			
C =	0.80				
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> )
7	90.66	8.07	25.00	-16.93	-7.11
9	80.87	7.19	25.00	-17.81	-9.61
10	76.81	6.83	25.00	-18.17	-10.90
11	73.17	6.51	25.00	-18.49	-12.20
13	66.93	5.95	25.00	-19.05	-14.86
Storage (m <sup>3</sup> )					
Overflow	Required	Surface	Sub-surface	Balance	100+20
0.00	-10.90	1.75	0.5	0.00	0.00

overflows to: OUT

Drainage Area		RYCB1									
Area (Ha)	0.05	Restricted Flow Q <sub>r</sub> (L/s)= 6.00									
C =	0.25										
100-Year 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> )	100YRQp 20% (L/s)	Qp - Qr (L/s)	Volume 100+20 (m <sup>3</sup> )			
1	351.38	12.21	6.00	6.21	0.37	10.94	4.94	1.19			
3	286.05	9.94	6.00	3.94	0.71						
4	262.41	9.12	6.00	3.12	0.75						
5	242.70	8.43	6.00	2.43	0.73						
7	211.67	7.36	6.00	1.36	0.57						
Storage (m <sup>3</sup> )									100+20		
Overflow	Required	Surface	Sub-surface	Balance	Overflow				Required	Balance	
0.00	0.75	6.37	0.5	0.00	5.29	6.47	0.10				

overflows to: OUT

Drainage Area		RYCB1									
Area (Ha)	0.05	Restricted Flow Q <sub>r</sub> (L/s)= 6.00									
C =	0.20										
5-Year Ponding											
T <sub>c</sub> Variable (min)	i <sub>5yr</sub> (mm/hour)	Peak Flow Q <sub>p</sub> =2.78xCi <sub>5yr</sub> A (L/s)	Q <sub>r</sub> (L/s)	Q <sub>p</sub> -Q <sub>r</sub> (L/s)	Volume 5yr (m <sup>3</sup> )	100YRQp 20% (L/s)	Qp - Qr (L/s)	Volume 100+20 (m <sup>3</sup> )			
-4	555.75	15.45	6.00	9.45	-2.27	10.94	4.94	1.19			
-2	319.47	8.88	6.00	2.88	-0.35						
0	230.48	6.41	6.00	0.41	0.00						
2	182.69	5.08	6.00	-0.92	-0.11						
4	152.51	4.24	6.00	-1.76	-0.42						
Storage (m <sup>3</sup> )									100+20		
Overflow	Required	Surface	Sub-surface	Balance	Overflow				Required	Balance	
0.00	0.00	6.37	0.5	0.00	5.29	6.47	0.10				

overflows to: OUT

Drainage Area		RYCB1									
Area (Ha)	0.05	Restricted Flow Q <sub>r</sub> (L/s)= 6.00									
C =	0.20										
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> )	100YRQp 20% (L/s)	Qp - Qr (L/s)	Volume 100+20 (m <sup>3</sup> )			
7	90.66	2.52	6.00	-3.48	-1.46	10.94	4.94	1.19			
9	80.87	2.25	6.00	-3.75	-2.03						
10	76.81	2.14	6.00	-3.86	-2.32						
11	73.17	2.03	6.00	-3.97	-2.62						
13	66.93	1.86	6.00	-4.14	-3.23						
Storage (m <sup>3</sup> )									100+20		
Overflow	Required	Surface	Sub-surface	Balance	Overflow				Required	Balance	
0.00	-2.32	6.37	0.5	0.00	5.29	6.47	0.10				

overflows to: OUT

Drainage Area		BLDG A									
Area (Ha)	0.15	Restricted Flow Q <sub>r</sub> (L/s)= 12.00									
C =	1.00										
100-Year 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> )	100YRQp 20% (L/s)	Qp - Qr (L/s)	Volume 100+20 (m <sup>3</sup> )			
27	98.66	41.14	12.00	29.14	47.21	45.97	33.97	61.15			
29	94.01	39.20	12.00	27.20	47.33						
30	91.87	38.31	12.00	26.31	47.36						
31	89.83	37.46	12.00	25.46	47.35						
33	86.03	35.88	12.00	23.88	47.27						
Storage (m <sup>3</sup> )									100+20		
Overflow	Required	Surface	Sub-surface	Balance	Overflow				Required	Balance	
0.00	47.36	48.00	0	0.00	0.10	61.25	13.25				

overflows to: OUT

Drainage Area		BLDG A									
Area (Ha)	0.15	Restricted Flow Q <sub>r</sub> (L/s)= 12.00									
C =	0.90										
5-Year Ponding											
T <sub>c</sub> Variable (min)	i <sub>5yr</sub> (mm/hour)	Peak Flow Q <sub>p</sub> =2.78xCi <sub>5yr</sub> A (L/s)	Q <sub>r</sub> (L/s)	Q <sub>p</sub> -Q <sub>r</sub> (L/s)	Volume 5yr (m <sup>3</sup> )	100YRQp 20% (L/s)	Qp - Qr (L/s)	Volume 100+20 (m <sup>3</sup> )			
13	90.63	34.01	12.00	22.01	17.17	45.97	33.97	61.15			
15	83.56	31.36	12.00	19.36	17.42						
17	77.61	29.13	12.00	17.13	17.47						
19	72.53	27.22	12.00	15.22	17.35						
21	68.13	25.57	12.00	13.57	17.10						
Storage (m <sup>3</sup> )									100+20		
Overflow	Required	Surface	Sub-surface	Balance	Overflow				Required	Balance	
0.00	17.47	48.00	0	0.00	0.10	61.25	13.25				

overflows to: OUT

Drainage Area		BLDG A									
Area (Ha)	0.15	Restricted Flow Q <sub>r</sub> (L/s)= 12.00									
C =	0.90										
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> )	100YRQp 20% (L/s)	Qp - Qr (L/s)	Volume 100+20 (m <sup>3</sup> )			
9	80.87	30.35	12.00	18.35	9.91	45.97	33.97	61.15			
11	73.17	27.46	12.00	15.46	10.20						
12	69.89	26.23	12.00	14.23	10.25						
13	66.93	25.12	12.00	13.12	10.23						
15	61.77	23.18	12.00	11.18	10.06						
Storage (m <sup>3</sup> )									100+20		
Overflow	Required	Surface	Sub-surface	Balance	Overflow				Required	Balance	
0.00	10.25	48.00	0	0.00	0.10	61.25	13.25				

overflows to: OUT



Drainage Area		BLDG B																									
Area (Ha)	0.15	Restricted Flow $Q_r$ (L/s)= 12.00																									
C =	1.00																										
100-Year 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 ( $m^3$ )																						
27	98.66	41.14	12.00	29.14	47.21																						
29	94.01	39.20	12.00	27.20	47.33																						
30	91.87	38.31	12.00	26.31	47.36																						
31	89.83	37.46	12.00	25.46	47.35																						
33	86.03	35.88	12.00	23.88	47.27																						
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overflows to: OUT																											

Drainage Area		BLDG B																									
Area (Ha)	0.15	Restricted Flow $Q_r$ (L/s)= 12.00																									
C =	0.90																										
5-Year Ponding																											
$T_c$ Variable (min)	$i_{5yr}$ (mm/hour)	Peak Flow $Q_p = 2.78 \times C i_{5yr} A$ (L/s)	$Q_r$ (L/s)	$Q_p - Q_r$ (L/s)	Volume 5yr ( $m^3$ )																						
13	90.63	34.01	12.00	22.01	17.17																						
15	83.56	31.36	12.00	19.36	17.42																						
17	77.61	29.13	12.00	17.13	17.47																						
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21	68.13	25.57	12.00	13.57	17.10																						
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9	80.87	30.35	12.00	18.35	9.91																						
11	73.17	27.46	12.00	15.46	10.20																						
12	69.89	26.23	12.00	14.23	10.25																						
13	66.93	25.12	12.00	13.12	10.23																						
15	61.77	23.18	12.00	11.18	10.06																						
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0.00	10.09	48.00	0	0.00																							
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<u>Drainage Area</u>	<u>Tributary Area</u>	<u>Restricted Flow</u>	<u>Req Storage</u>	<u>Avail Storage</u>	<u>Overflow</u>	<u>100-yr + 20% Ponding</u>	<u>5-yr Ponding</u>	<u>2-yr Ponding</u>
MH5A	0.11	12.00	22.49	17.62	4.87	29.22	5.17	1.74
MH5	0.08	10.00	19.54	29.16	-4.87	33.07	3.38	0.67
MH3	0.07	8.00	18.03	56.51	0.00	28.74	4.41	1.87
MH3A	0.08	9.00	20.25	28.03	0.00	27.25	5.21	2.30
MH3B	0.07	8.00	18.03	28.03	0.00	24.05	4.67	2.05
MH3C	0.09	12.00	17.84	53.55	0.00	26.09	5.91	2.33
CBMH2	0.03	12.00	2.47	3.14	0.00	3.69	0.00	0.00
MH3D	0.11	40.00	10.48	11.29	0.00	15.46	0.00	0.00
MH4	0.04	25.00	1.23	2.25	0.00	7.04	0.00	0.00
RYCB1	0.05	6.00	0.75	6.87	0.00	6.47	0.00	0.00
Total Surface	0.73	142.00	131.11	236.45	0.00			
BLDG A	0.15	12.00	47.36	48.00	0.00			
BLDG B	0.15	12.00	47.36	48.00	0.00			
BLDG C	0.15	12.00	47.36	48.00	0.00			
Total Buildings	0.45	36.00	142.07	144.00	0.00			
<b>Total</b>	<b>1.18</b>	<b>178.00</b>	<b>273.17</b>	<b>380.45</b>	<b>0.00</b>			
	<b>Max Allowable</b>	<b>178.65</b>						

\*Ponding = Storm Event Volume - Subsurface Storage

## Samantha Labadie

---

**From:** Stefanie Kaminski  
**Sent:** Friday, October 28, 2022 1:06 PM  
**To:** Doug Cave  
**Subject:** RE: 4840 Bank, Pathways South Block 204 (D07-12-22-0097) - 2 Year Storm Minor Ponding

\*\*\* Exercise caution. This is an EXTERNAL email. DO NOT open attachments or click links from unknown senders or unexpected email. \*\*\*

Doug,

Please consider this as confirmation that Regional Group is accepting of some minor ponding during a 2-year storm event in the design of Block 204.

Thanks,

**Stefanie Kaminski**  
Coordinator, Land Development



**Regional Group**  
1737 Woodward Drive  
Ottawa, ON K2C 0P9  
T: 613-230-2100 x 7301  
C: 613-858-8821

[skaminski@regionalgroup.com](mailto:skaminski@regionalgroup.com)  
[www.regionalgroup.com](http://www.regionalgroup.com)

---

**From:** Doug Cave <doug.cave@ibigroup.com>  
**Sent:** Friday, October 28, 2022 12:59 PM  
**To:** Stefanie Kaminski <SKaminski@regionalgroup.com>  
**Subject:** 4840 Bank, Pathways South Block 204 (D07-12-22-0097) - 2 Year Storm Minor Ponding

**External Email – Confirm Sender and Beware of Links and Attachments**

Stefanie,

On October 17, 2022, IBI and the Regional Group had a meeting with Tyler Cassidy from the City of Ottawa to discuss minor ponding during the 2 year storm event. As discussed in the meeting there will be some minor surface ponding during the 2 year storm event in the parking lot and not near any of the entrances to the buildings. Ponding during the 2 year storm event is not typically accepted by the City within Municipal right of ways but as this is a private site plan the City is willing to accept it as long as the Owner has been advised and accepts this condition.

By return email can you please confirm that you are aware and accept that there will be some minor ponding during the 2 year storm event.

Thank you

Doug

Doug Cave C.E.T.  
(he/him/his)

Sr. Project Manager  
mob 613 402 9677

Suite 500, 333 Preston Street  
Ottawa ON K1S 5N4 Canada  
tel +1 613 225 1311 ext 64062



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NOTE: This email message/attachments may contain privileged and confidential information. If received in error, please notify the sender and delete this e-mail message.

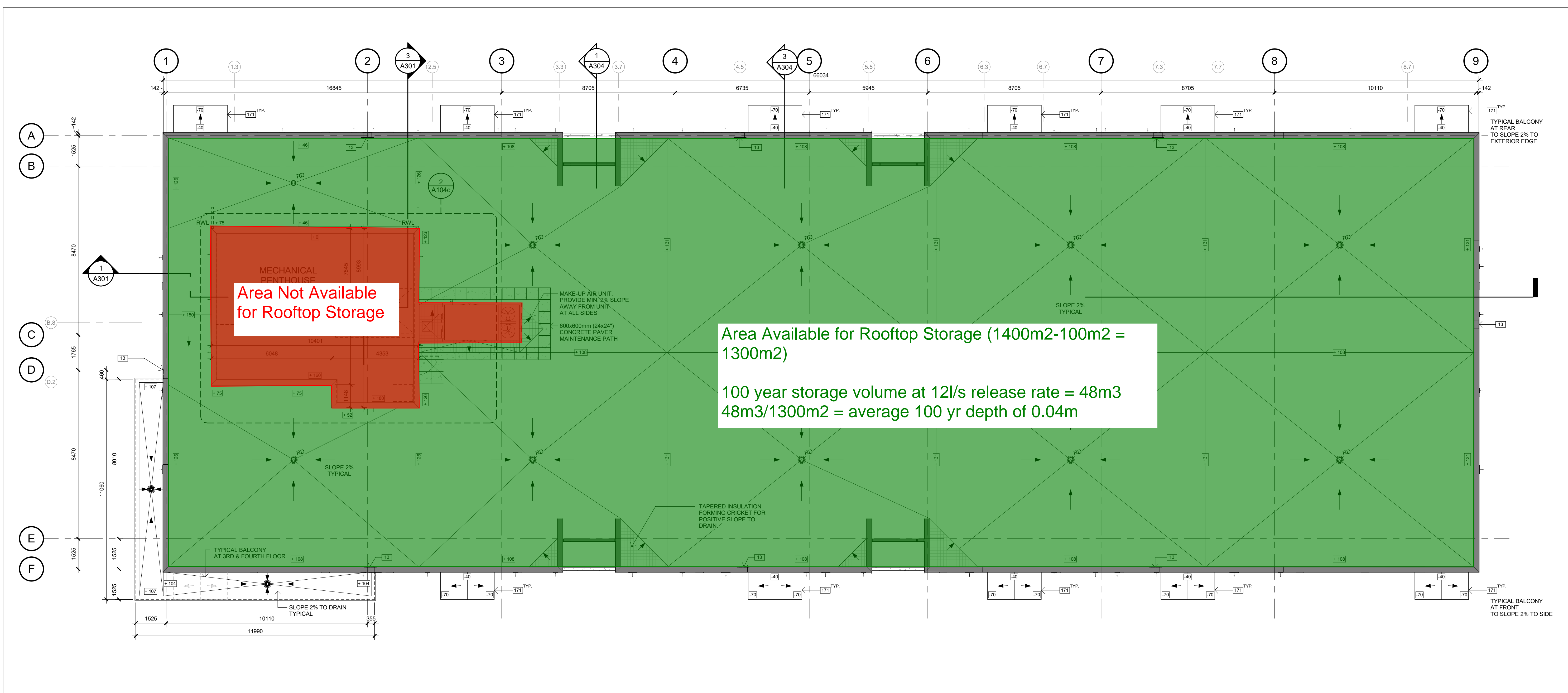
NOTE: Ce courriel peut contenir de l'information privilégiée et confidentielle. Si vous avez reçu ce message par erreur, veuillez le mentionner immédiatement à l'expéditeur et effacer ce courriel.

NO.	ISSUED	DATE
1	ISSUED FOR PERMIT	MAR 24, 2022
2	ISSUED FOR TENDER	APR 12, 2022
3	TENDER ADDENDUM 1	APR 15, 2022
4	BP REV. 1	MAY 11, 2022
5	COORDINATION	JUN 13, 2022
6	ISSUED FOR CONSTRUCTION	JUN 20, 2022

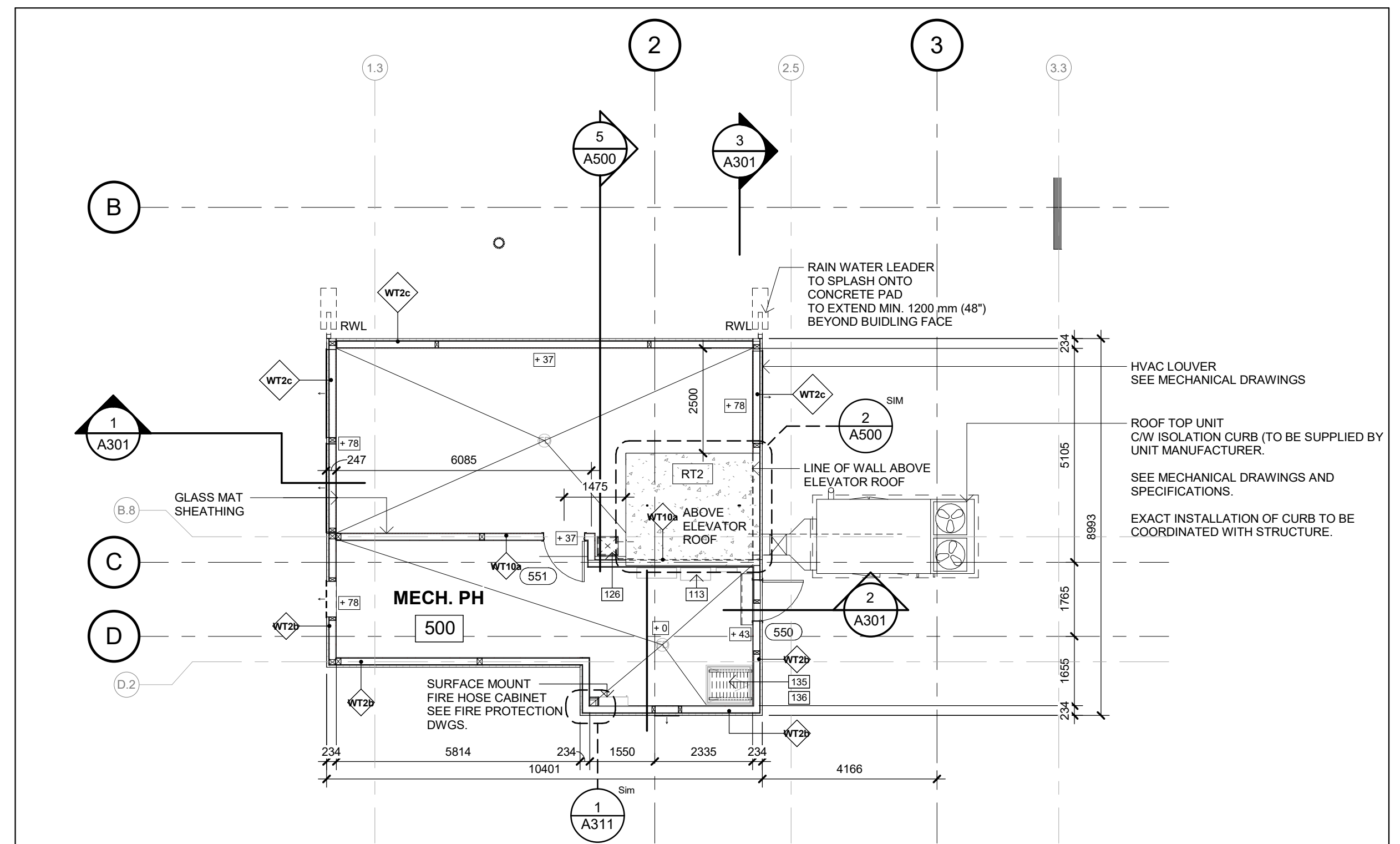
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CHAMBERLAIN ARCHITECT SERVICES LIMITED HAS COPYRIGHT. CONSTRUCTING A SUBSTANTIALLY SIMILAR BUILDING WITHOUT PERMISSION MAY INFRINGE THE COPYRIGHT OWNERS RIGHTS. MAKING MINOR CHANGES TO PLANS DOES NOT NECESSARILY AVOID COPYRIGHT INFRINGEMENT. INNOCENT INFRINGEMENT IS NOT A DEFENSE TO COPYRIGHT INFRINGEMENT. ©



**1** BUILDING C - ROOF PLAN  
A104c 1 : 100



**2** BUILDING C - MECHANICAL PH  
A104c 1 : 100

KEYNOTE LEGEND	
13	SCUPPER TO BE LOCATED 150mm ABOVE FINISHED ROOF. EQUALLY SPACED (AS MUCH AS POSSIBLE) AT MIN. 30m O.C. ALONG FACE OF WALL. EXACT LOCATION TBD BY PANEL MFR. SCUPPER FINISH TO MATCH ADJACENT. ROOF MEMBRANE TO LAP INTO OPENING. SEE TYPICAL DETAIL.
113	PANEL. SEE ELECTRICAL DRAWINGS. PROVIDE FIRE RETARDANT TREATED WOOD (FRTW) PLYWOOD BLOCKING AS REQUIRED TO ENSURE SECURE MOUNTING AND ATTACHMENT.
126	MECHANICAL SHAFT. ALL DUCTS TO BE PROTECTED WITH FIRE DAMPER AT FLOOR LEVEL (SEE MECHANICAL DRAWINGS). ALL OTHER PENETRATIONS TO BE SEALED WITH APPROVED F.R.R. ASSEMBLY TO MAINTAIN MIN. 1 HR. FIRE RATING AT FLOOR ASSEMBLY, AND BETWEEN FLOORS.
136	MIN. 865x900 FLOOR ACCESS HATCH TO BE INSTALLED INTO CONCRETE SLAB. ROUGH OPENING AND INSTALLATION AS RECOMMENDED BY MFR.
171	PRECAST CONCRETE BALCONY. TO BE FINISHED WITH TRAFFIC COATING. SEE SPECIFICATIONS FOR PRODUCT.

**PROVENCE APARTMENTS ORLEANS**  
REGIONAL  
A - 2045 PORTOBELLO BLVD.  
B - 2055 PORTOBELLO BLVD.  
C - 2065 PORTOBELLO BLVD.

OTTAWA, ONTARIO

SHEET NAME

**BLDG C - ROOF PLAN**

START DATE	AUG 31, 2020
DRAWN BY	MC
CHECKED BY	LC
SCALE	1 : 100
PROJECT NO.	120024

DRAWING  
**A104c**

# Volume III: TEMPEST INLET CONTROL DEVICES

Municipal Technical  
Manual Series



SECOND EDITION

LMF (Low to Medium Flow) ICD

HF (High Flow) ICD

MHF (Medium to High Flow) ICD



**IPEX**

by aliaxis

# IPEX Tempest™ Inlet Control Devices

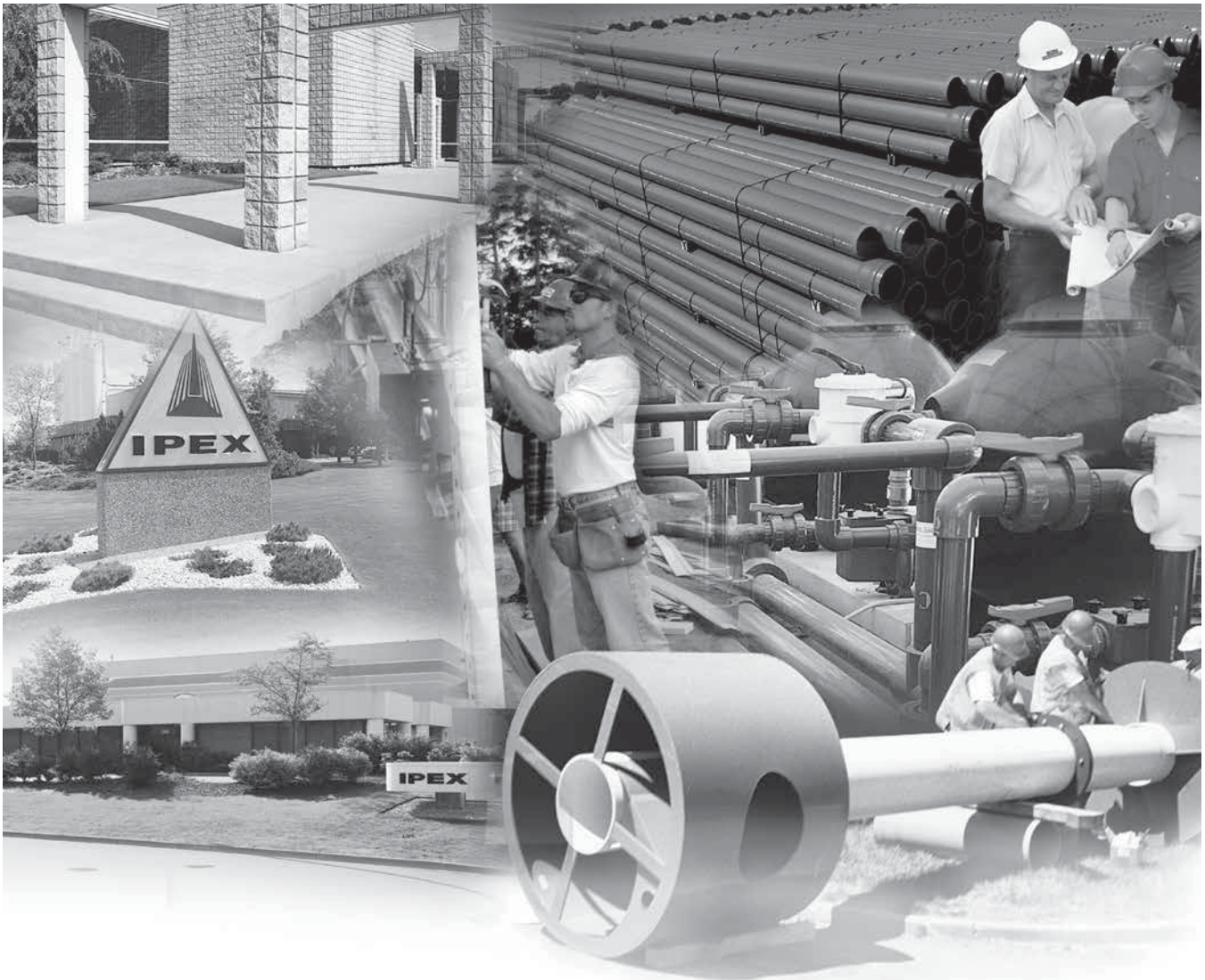
Municipal Technical Manual Series

Vol. I, 2nd Edition

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For information contact: IPEX, Marketing,  
1425 North Service Road East, Oakville, Ontario, Canada, L6H 1A7

The information contained here within is based on current information and product design at the time of publication and is subject to change without notification. IPEX does not guarantee or warranty the accuracy, suitability for particular applications, or results to be obtained therefrom.



## ABOUT IPEX

At IPEX, we have been manufacturing non-metallic pipe and fittings since 1951. We formulate our own compounds and maintain strict quality control during production. Our products are made available for customers thanks to a network of regional stocking locations throughout North America. We offer a wide variety of systems including complete lines of piping, fittings, valves and custom-fabricated items.

More importantly, we are committed to meeting our customers' needs. As a leader in the plastic piping industry, IPEX continually develops new products, modernizes manufacturing facilities and acquires innovative process technology. In addition, our staff take pride in their work, making available to customers their extensive thermoplastic knowledge and field experience. IPEX personnel are committed to improving the safety, reliability and performance of thermoplastic materials. We are involved in several standards committees and are members of and/or comply with the organizations listed on this page.

For specific details about any IPEX product, contact our customer service department.



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# CONTENTS

## TEMPEST INLET CONTROL DEVICES Technical Manual

### About IPEX

<b>Section One:</b>	<b>Product Information: TEMPEST Low, Medium Flow (LMF) ICD</b>	
	Purpose.....	4
	Product Description.....	4
	Product Function.....	4
	Product Construction.....	4
	Product Applications.....	4
	Chart 1: LMF 14 Preset Flow Curves.....	5
	Chart 2: LMF Flow Vs. ICD Alternatives.....	5
	<b>Product Installation</b>	
	Instructions to assemble a TEMPEST LMF ICD into a square catch basin:.....	6
	Instructions to assemble a TEMPEST LMF ICD into a round catch basin:.....	6
	<b>Product Technical Specification</b>	
	General.....	7
	Materials.....	7
	Dimensioning.....	7
	Installation.....	7
<b>Section Two:</b>	<b>Product Information: TEMPEST High Flow (HF) &amp; Medium, High Flow (MHF) ICD</b>	
	Product Description.....	8
	Product Function.....	8
	Product Construction.....	8
	Product Applications.....	8
	Chart 3: HF & MHF Preset Flow Curves.....	9
	<b>Product Installation</b>	
	Instructions to assemble a TEMPEST HF or MHF ICD into a square catch basin:.....	10
	Instructions to assemble a TEMPEST HF or MHF ICD into a round catch basin:.....	10
	Instructions to assemble a TEMPEST HF Sump into a square or round catch basin:...	11
	<b>Product Technical Specification</b>	
	General.....	11
	Materials.....	11
	Dimensioning.....	11
	Installation.....	11

**PRODUCT INFORMATION: TEMPEST LOW, MEDIUM FLOW (LMF) ICD**

**Purpose**

To control the amount of storm water runoff entering a sewer system by allowing a specified flow volume out of a catch basin or manhole at a specified head. This approach conserves pipe capacity so that catch basins downstream do not become uncontrollably surcharged, which can lead to basement floods, flash floods and combined sewer overflows.

**Product Description**

Our LMF ICD is designed to accommodate catch basins or manholes with sewer outlet pipes 6" in diameter and larger. Any storm sewer larger than 12" may require custom modification. However, IPEX can custom build a TEMPEST device to accommodate virtually any storm sewer size.

Available in 14 preset flow curves, the LMF ICD has the ability to provide flow rates: 2lps – 17lps (31gpm – 270gpm)

**Product Function**

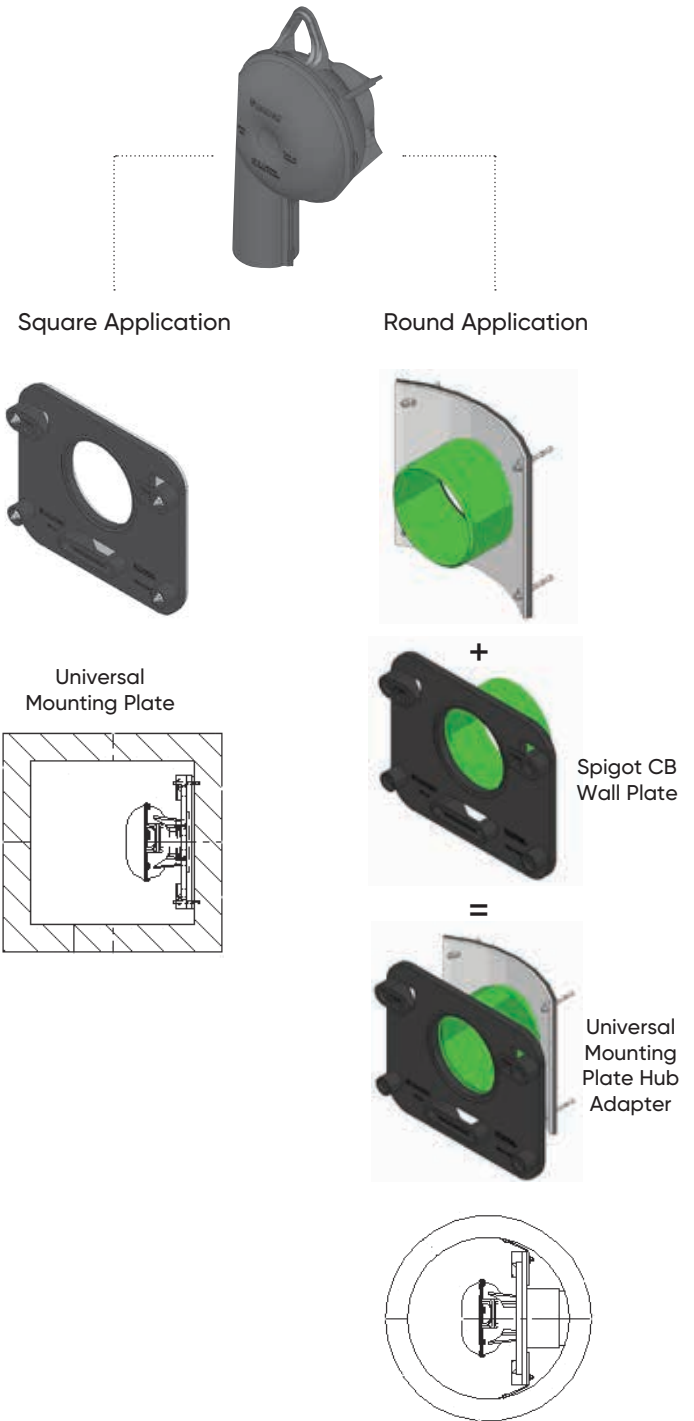
The LMF ICD vortex flow action allows the LMF ICD to provide a narrower flow curve using a larger orifice than a conventional orifice plate ICD, making it less likely to clog. When comparing flows at the same head level, the LMF ICD has the ability to restrict more flow than a conventional ICD during a rain event, preserving greater sewer capacity.

**Product Construction**

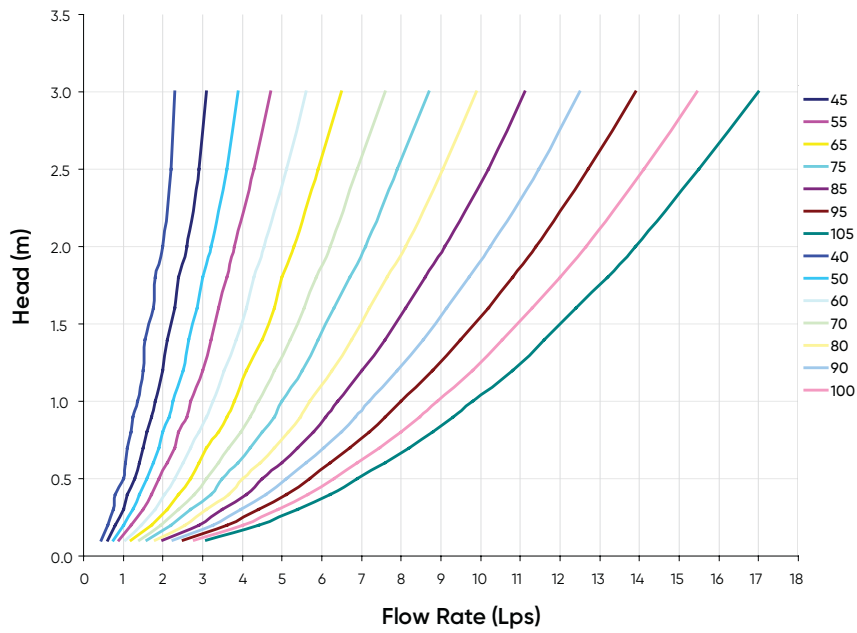
Constructed from durable PVC, the LMF ICD is light weight 8.9 Kg (19.7 lbs).

**Product Applications**

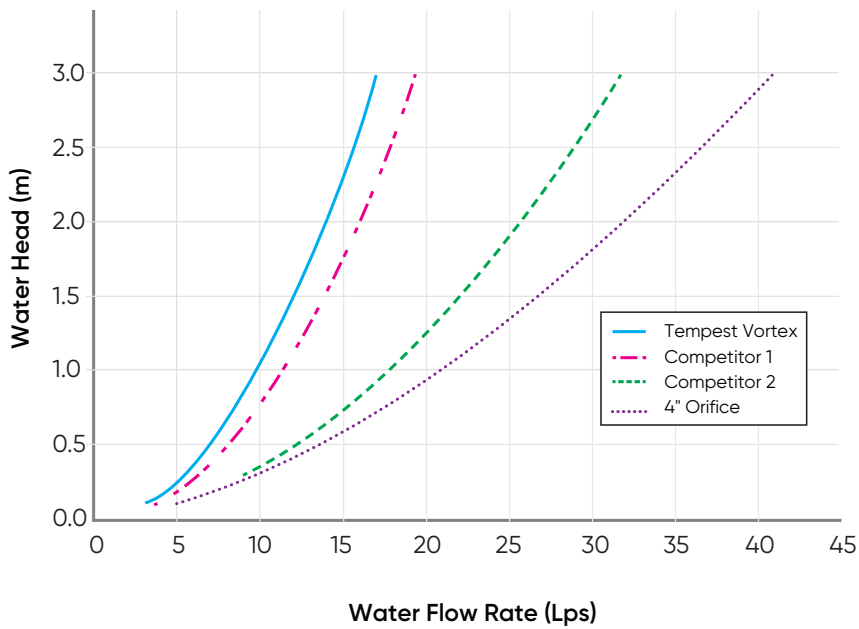
Will accommodate both square and round applications:



**Chart 1: LMF 14 Preset Flow Curves**



**Chart 2: LMF Flow vs. ICD Alternatives**



## PRODUCT INSTALLATION

### Instructions to assemble a TEMPEST LMF ICD into a Square Catch Basin:

#### STEPS:

1. Materials and tooling verification:
  - Tooling: impact drill, 3/8" concrete bit, torque wrench for 9/16" nut, hand hammer, level, and marker.
  - Material: (4) concrete anchor 3/8 x 3-1/2, (4) washers, (4) nuts, universal mounting plate, ICD device.
2. Use the mounting wall plate to locate and mark the hole (4) pattern on the catch basin wall. You should use a level to ensure that the plate is at the horizontal.
3. Use an impact drill with a 3/8" concrete bit to make the four holes at a minimum of 1-1/2" depth up to 2-1/2". Clean the concrete dust from the holes.
4. Install the anchors (4) in the holes by using a hammer. Thread the nuts on the top of the anchors to protect the threads when you hit the anchors with the hammer. Remove the nuts from the ends of the anchors.
5. Install the universal mounting plate on the anchors and screw the 4 nuts in place with a maximum torque of 40 N.m (30 lbf-ft). There should be no gap between the wall mounting plate and the catch basin wall.
6. From the ground above using a reach bar, lower the ICD device by hooking the end of the reach bar to the handle of the ICD device. Align the triangular plate portion into the mounting wall plate. Push down the device to be sure it has centered in to the universal mounting plate and has created a seal.



#### WARNING

- Verify that the outlet pipe doesn't protrude into the catch basin. If it does, cut down the pipe flush to the catch basin wall.
- Call your IPEX representative for more information or if you have any questions about our products.

### Instructions to assemble a TEMPEST LMF ICD into a Round Catch Basin:

#### STEPS:

1. Materials and tooling verification.
  - Tooling: impact drill, 3/8" concrete bit, torque wrench for 9/16" nut, hand hammer, level and marker.
  - Material: (4) concrete anchor 3/8 x 3-1/2, (4) washers and (4) nuts, spigot CB wall plate, universal mounting plate hub adapter, ICD device.
2. Use the spigot catch basin wall plate to locate and mark the hole (4) pattern on the catch basin wall. You should use a level to ensure that the plate is at the horizontal.
3. Use an impact drill with a 3/8" concrete bit to make the four holes at a depth between 1-1/2" to 2-1/2". Clean the concrete dust from the holes.
4. Install the anchors (4) in the holes by using a hammer. Thread the nuts on the top of the anchors to protect the threads when you hit the anchors with the hammer. Remove the nuts from the ends of the anchors.
5. Install the CB spigot wall plate on the anchors and screw the 4 nuts in place with a maximum torque of 40 N.m (30 lbf-ft). There should be no gap between the spigot wall plate and the catch basin wall.
6. Apply solvent cement on the hub of the universal mounting plate, hub adapter and the spigot of the CB wall plate, then slide the hub over the spigot. Make sure the universal mounting plate is at the horizontal and its hub is completely inserted onto the spigot. Normally, the corners of the universal mounting plate hub adapter should touch the catch basin wall.
7. From ground above using a reach bar, lower the ICD device by hooking the end of the reach bar to the handle of the ICD device. Align the triangular plate portion into the mounting wall plate. Push down the device to be sure it has centered in to the mounting plate and has created a seal.



#### WARNING

- Verify that the outlet pipe doesn't protrude into the catch basin. If it does, cut back the pipe flush to the catch basin wall.
- The solvent cement which is used in this installation is to be approved for PVC.
- The solvent cement should not be used below 0°C (32°F) or in a high humidity environment. Refer to the IPEX solvent cement guide to confirm the required curing time or visit the IPEX Online Solvent Cement Training Course available at [ipexna.com](http://ipexna.com).
- Call your IPEX representative for more information or if you have any questions about our products.

## PRODUCT TECHNICAL SPECIFICATION

### General

Inlet control devices (ICD's) are designed to provide flow control at a specified rate for a given water head level and also provide odour and floatable control. All ICD's will be IPEX Tempest or approved equal.

All devices shall be removable from a universal mounting plate. An operator from street level using only a T-bar with a hook will be able to retrieve the device while leaving the universal mounting plate secured to the catch basin wall face. The removal of the TEMPEST devices listed above must not require any unbolting or special manipulation or any special tools.

High Flow (HF) Sump devices will consist of a removable threaded cap which can be accessible from street level with out entry into the catchbasin (CB). The removal of the threaded cap shall not require any special tools other than the operator's hand.

ICD's shall have no moving parts.

### Materials

ICD's are to be manufactured from Polyvinyl Chloride (PVC) or Polyurethane material, designed to be durable enough to withstand multiple freeze-thaw cycles and exposure to harsh elements.

The inner ring seal will be manufactured using a Buna or Nitrile material with hardness between Duro 50 and Duro 70.

The wall seal is to be comprised of a 3/8" thick Neoprene Closed Cell Sponge gasket which is attached to the back of the wall plate.

All hardware will be made from 304 stainless steel.

### Dimensioning

The Low Medium Flow (LMF), High Flow (HF) and the High Flow (HF) Sump shall allow for a minimum outlet pipe diameter of 200mm with a 600mm deep Catch Basin sump.

### Installation

Contractor shall be responsible for securing, supporting and connecting the ICD's to the existing influent pipe and catchbasin/manhole structure as specified and designed by the Engineer.

## PRODUCT INFORMATION: TEMPEST HF & MHF ICD

### Product Description

Our HF, HF Sump and MHF ICD's are designed to accommodate catch basins or manholes with sewer outlet pipes 6" in diameter or larger. Any storm sewer larger than 12" may require custom modification. However, IPEX can custom build a TEMPEST device to accommodate virtually any storm sewer size.

Available in 5 preset flow curves, these ICDs have the ability to provide constant flow rates: 9lps (143 gpm) and greater

### Product Function

**TEMPEST HF (High Flow):** designed to manage moderate to higher flows 15 L/s (240 gpm) or greater and prevent the propagation of odour and floatables. With this device, the cross-sectional area of the device is larger than the orifice diameter and has been designed to limit head losses. The HF ICD can also be ordered without flow control when only odour and floatable control is required.



**TEMPEST HF (High Flow) Sump:** The height of a sewer outlet pipe in a catch basin is not always conveniently located. At times it may be located very close to the catch basin floor, not providing enough sump for one of the other TEMPEST ICDs with universal back plate to be installed. In these applications, the HF Sump is offered. The HF Sump offers the same features and benefits as the HF ICD; however, is designed to raise the outlet in a square or round catch basin structure. When installed, the HF sump is fixed in place and not easily removed. Any required service to the device is performed through a clean-out located in the top of the device which can be often accessed from ground level.



**TEMPEST MHF (Medium to High Flow):** The MHF plate or plug is designed to control flow rates 9 L/s (143 gpm) or greater. It is not designed to prevent the propagation of odour and floatables.



### Product Construction

The HF, HF Sump and MHF ICDs are built to be light weight at a maximum weight of 6.8 Kg (14.6 lbs).

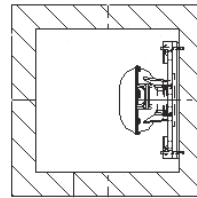
### Product Applications

The HF and MHF ICD's are available to accommodate both square and round applications:



#### Square Application

Universal Mounting Plate



#### Round Application

Spigot CB Wall Plate

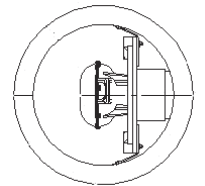


Universal Mounting Plate Hub Adapter

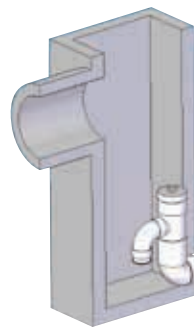


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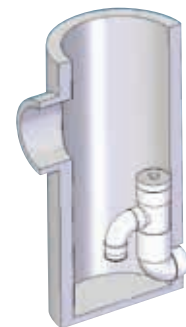
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The HF Sump is available to accommodate low to no sump applications in both square and round catch basins:

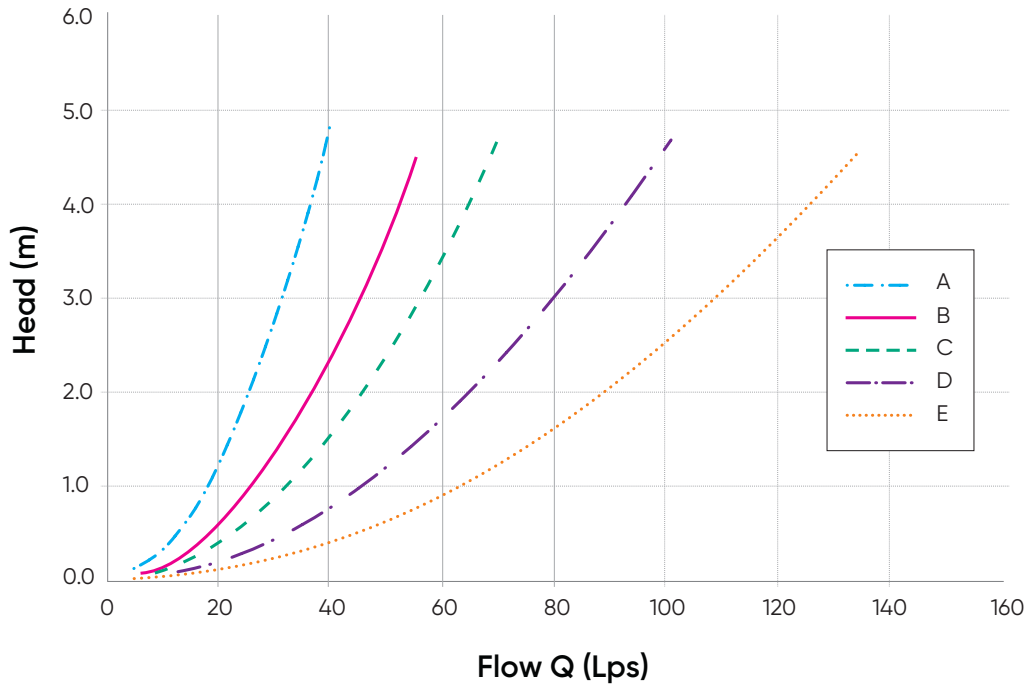


Square Catch Basin



Round Catch Basin

**Chart 3: HF & MHF Preset Flow Curves**



## PRODUCT INSTALLATION

### Instructions to assemble a TEMPEST HF or MHF ICD into a Square Catch Basin:

1. Materials and tooling verification:
  - Tooling: impact drill, 3/8" concrete bit, torque wrench for 9/16" nut, hand hammer, level, and marker.
  - Material: (4) concrete anchor 3/8 x 3-1/2, (4) washers, (4) nuts, universal mounting plate, ICD device
2. Use the mounting wall plate to locate and mark the hole (4) pattern on the catch basin wall. You should use a level to ensure that the plate is at the horizontal.
3. Use an impact drill with a 3/8" concrete bit to make the four holes at a minimum of 1-1/2" depth up to 2-1/2". Clean the concrete dust from the holes.
4. Install the anchors (4) in the holes by using a hammer. Thread the nuts on the top of the anchors to protect the threads when you hit the anchors with the hammer. Remove the nuts from the ends of the anchors.
5. Install the universal wall mounting plate on the anchors and screw the 4 nuts in place with a maximum torque of 40 N.m (30 lbf-ft). There should be no gap between the wall mounting plate and the catch basin wall.
6. From the ground above using a reach bar, lower the device by hooking the end of the reach bar to the handle of the ICD device. Align the triangular plate portion into the mounting wall plate. Push down the device to be sure it has centered in to the universal wall mounting plate and has created a seal.



#### WARNING

- Verify that the outlet pipe doesn't protrude into the catch basin. If it does, cut down the pipe flush to the catch basin wall.
- Call your IPEX representative for more information or if you have any questions about our products.

### Instructions to assemble a TEMPEST HF or MHF ICD into a Round Catch Basin:

#### STEPS:

1. Materials and tooling verification.
  - Tooling: impact drill, 3/8" concrete bit, torque wrench for 9/16" nut, hand hammer, level and marker.
  - Material: (4) concrete anchor 3/8 x 3-1/2, (4) washers and (4) nuts, spigot CB wall plate, universal mounting plate hub adapter, ICD device.
2. Use the round catch basin spigot adaptor to locate and mark the hole (4) pattern on the catch basin wall. You should use a level to ensure that the plate is at the horizontal.
3. Use an impact drill with a 3/8" concrete bit to make the four holes at a depth between 1-1/2" to 2-1/2". Clean the concrete dust from the holes.
4. Install the anchors (4) in the holes by using a hammer. Thread the nuts on the top of the anchors to protect the threads when you hit the anchors with the hammer. Remove the nuts from the ends of the anchors.
5. Install the spigot CB wall plate on the anchors and screw the 4 nuts in place with a maximum torque of 40 N.m (30 lbf-ft). There should be no gap between the spigot CB wall plate and the catch basin wall.
6. Put solvent cement on the hub of the universal mounting plate, hub adapter and the spigot of the CB wall plate, then slide the hub over the spigot. Make sure the universal mounting plate is at the horizontal and its hub is completely inserted onto the spigot. Normally, the corners of the hub adapter should touch the catch basin wall.
7. From ground above using a reach bar, lower the device by hooking the end of the reach bar to the handle of the ICD device. Align the triangular plate portion into the mounting wall plate. Push down the device to be sure it has centered in to the wall mounting plate and has created a seal.



#### WARNING

- Verify that the outlet pipe doesn't protrude into the catch basin. If it does, cut down the pipe flush to the catch basin wall.
- The solvent cement which is used in this installation is to be approved for PVC.
- The solvent cement should not be used below 0°C (32°F) or in a high humidity environment. Refer to the IPEX solvent cement guide to confirm the required curing time or visit the IPEX Online Solvent Cement Training Course available at [www.ipexinc.com](http://www.ipexinc.com).
- Call your IPEX representative for more information or if you have any questions about our products.



## Instructions to assemble a TEMPEST HF Sump into a Square or Round Catch Basin:

### STEPS:

1. Materials and tooling verification:
  - Tooling: impact drill, 3/8" concrete bit, torque wrench for 9/16" nut, hand hammer, level, mastic tape and metal strapping
  - Material: (2) concrete anchor 3/8 x 3-1/2, (2) washers, (2) nuts, HF Sump pieces (2).
2. Apply solvent cement to the spigot end of the top half of the sump. Apply solvent cement to the hub of the bottom half of the sump. Insert the spigot of the top half of the sump into the hub of the bottom half of the sump.
3. Install the 8" spigot of the device into the outlet pipe. Use the mastic tape to seal the device spigot into the outlet pipe. You should use a level to be sure that the fitting is standing at the vertical.
4. Use an impact drill with a 3/8" concrete bit to make a series of 2 holes along each side of the body throat. The depth of the hole should be between 1-1/2" to 2-1/2". Clean the concrete dust from the 2 holes.
5. Install the anchors (2) in the holes by using a hammer. Put the nuts on the top of the anchors to protect the threads when you hit the anchors. Remove the nuts from the ends of the anchors.
6. Cut the metal strapping to length and connect each end of the strapping to the anchors. Screw the nuts in place with a maximum torque of 40 N.m (30 lbf-ft). The device should be completely flush with the catch basin wall.



### WARNING

- Verify that the outlet pipe doesn't protrude into the catch basin. If it does, cut down the pipe flush to the catch basin wall.
- The solvent cement which is used in this installation is to be approved for PVC.
- The solvent cement should not be used below 0°C (32°F) or in a high humidity environment. Refer to the IPEX solvent cement guide to confirm the required curing time or visit the IPEX Online Solvent Cement Training Course available at [www.ipexinc.com](http://www.ipexinc.com).
- Call your IPEX representative for more information or if you have any questions about our products.

## PRODUCT TECHNICAL SPECIFICATION

### General

Inlet control devices (ICD's) are designed to provide flow control at a specified rate for a given water head level and also provide odour and floatable control where specified. All ICD's will be IPEX Tempest or approved equal.

All devices shall be removable from a universal mounting plate. An operator from street level using only a T-bar with a hook shall be able to retrieve the device while leaving the universal mounting plate secured to the catch basin wall face. The removal of the TEMPEST devices listed above shall not require any unbolting or special manipulation or any special tools.

High Flow (HF) Sump devices shall consist of a removable threaded cap which can be accessible from street level with out entry into the catchbasin (CB). The removal of the threaded cap shall not require any special tools other than the operator's hand.

ICD's shall have no moving parts.

### Materials

ICD's are to be manufactured from Polyvinyl Chloride (PVC) or Polyurethane material, designed to be durable enough to withstand multiple freeze-thaw cycles and exposure to harsh elements.

The inner ring seal will be manufactured using a Buna or Nitrile material with hardness between Duro 50 and Duro 70.

The wall seal is to be comprised of a 3/8" thick Neoprene Closed Cell Sponge gasket which is attached to the back of the wall plate.

All hardware will be made from 304 stainless steel.

### Dimensioning

The Low Medium Flow (LMF), High Flow (HF) and the High Flow (HF) Sump shall allow for a minimum outlet pipe diameter of 200mm with a 600mm deep Catch Basin sump.

### Installation

Contractor shall be responsible for securing, supporting and connecting the ICD's to the existing influent pipe and catchbasin/manhole structure as specified and designed by the Engineer.

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NOTES

# SALES AND CUSTOMER SERVICE

IPEX Inc.

Toll Free: (866) 473-9462

[ipexna.com](http://ipexna.com)

## About the IPEX Group of Companies

As leading suppliers of thermoplastic piping systems, the IPEX Group of Companies provides our customers with some of the largest and most comprehensive product lines. All IPEX products are backed by more than 50 years of experience. With state-of-the-art manufacturing facilities and distribution centers across North America, we have established a reputation for product innovation, quality, end-user focus and performance.

Markets served by IPEX group products are:

- Electrical systems
- Telecommunications and utility piping systems
- PVC, CPVC, PP, ABS, PEX, FR-PVDF and PE pipe and fittings (1/4" to 48")
- Industrial process piping systems
- Municipal pressure and gravity piping systems
- Plumbing and mechanical piping systems
- PE Electrofusion systems for gas and water
- Industrial, plumbing and electrical cements
- Irrigation systems

Products manufactured by IPEX Inc.

Tempest™ is a trademark of IPEX Branding Inc.

This literature is published in good faith and is believed to be reliable. However it does not represent and/or warrant in any manner the information and suggestions contained in this brochure. Data presented is the result of laboratory tests and field experience.

A policy of ongoing product improvement is maintained. This may result in modifications of features and/or specifications without notice.





# Adjustable Accutrol Weir

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

## Adjustable Flow Control for Roof Drains

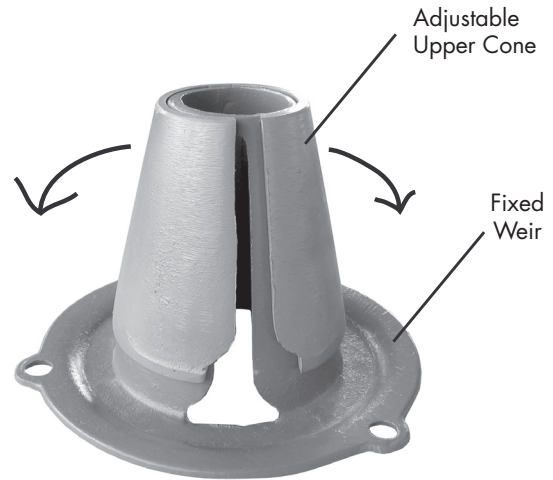
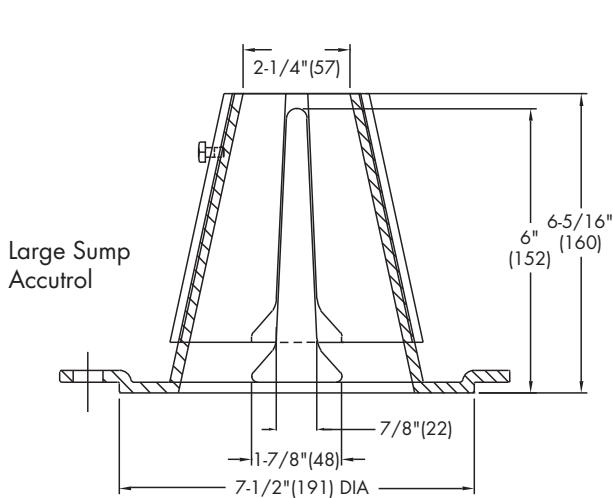
### ADJUSTABLE ACCUTROL (for Large Sump Roof Drains only)

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

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

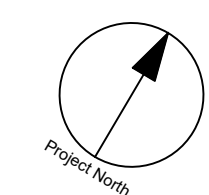
USA: Tel: (800) 338-2581 • Fax: (828) 248-3929 • Watts.com  
 Canada: Tel: (905) 332-4090 • Fax: (905) 332-7068 • Watts.ca  
 Latin America: Tel: (52) 81-1001-8600 • Fax: (52) 81-8000-7091 • Watts.com



A Watts Water Technologies Company

## **APPENDIX F**

- **Drawing 137175-001 – Site Servicing Plan**
- **Drawing 137175-010 – Details and Notes**
- **Drawing 137175-200 – Site Grading Plan**
- **Drawing 137175-600 – Ponding Plan**
- **Drawing 137175-900 – Erosion and Sedimentation Control Plan**



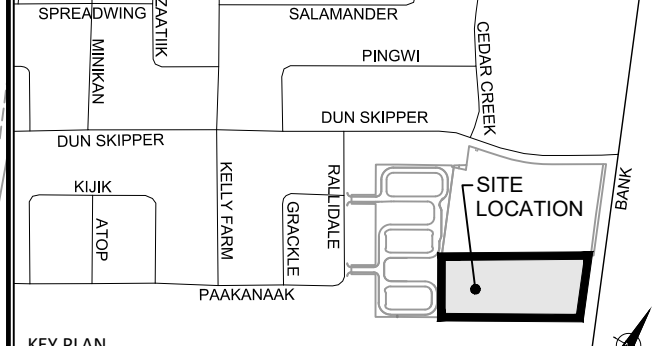
CLIENT  
**PATHWAYS SOUTH REGIONAL INC.**

1737 WOODWARD DRIVE, OTTAWA, ON

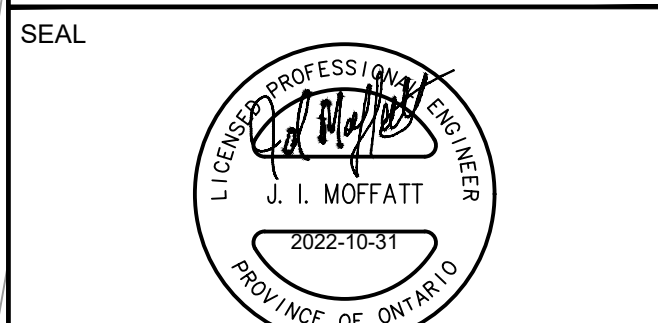
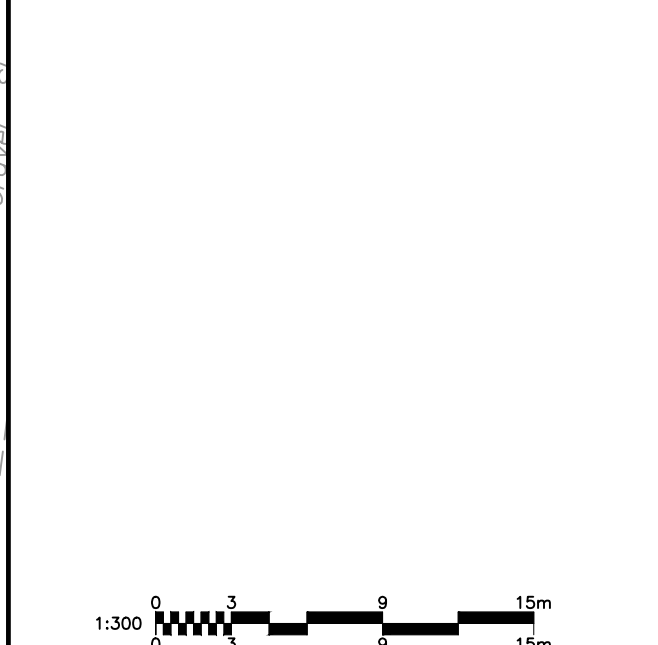
COPYRIGHT  
This drawing has been prepared solely for the intended use. Any reproduction or distribution for any purpose other than authorized by IBI Group is forbidden. Written dimensions shall have precedence over scaled dimensions. Contractors shall verify and be responsible for all dimensions and conditions on the job, and IBI Group shall be informed of any variations from the dimensions and conditions shown on the drawing. Shop drawings shall be submitted to IBI Group for general confirmation before proceeding with fabrication.  
**IBI Group Professional Services (Canada) Inc.**  
is a member of the IBI Group of companies.

ISSUES		
No.	DESCRIPTION	DATE
1	SUBMISSION NO. 1 FOR CITY REVIEW	2022-06-03
2	SUBMISSION NO. 2 FOR CITY REVIEW	2022-08-26
3	SUBMISSION NO. 3 FOR CITY REVIEW	2022-10-31
4		
5		
6		
7		
8		

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



CONSULTANTS



SEAL

**IBI** GROUP  
400 - 333 Preston Street  
Ottawa ON K1S 5M4 Canada  
tel 613 225-5111 fax 613 225-5986  
ibigroup.com

PROJECT  
**4840 BANK STREET**

PROJECT NO:  
**137175**

DRAWN BY:  
**M.M.**

CHECKED BY:  
**S.E.L.**

PROJECT MGR:  
**D.C.**

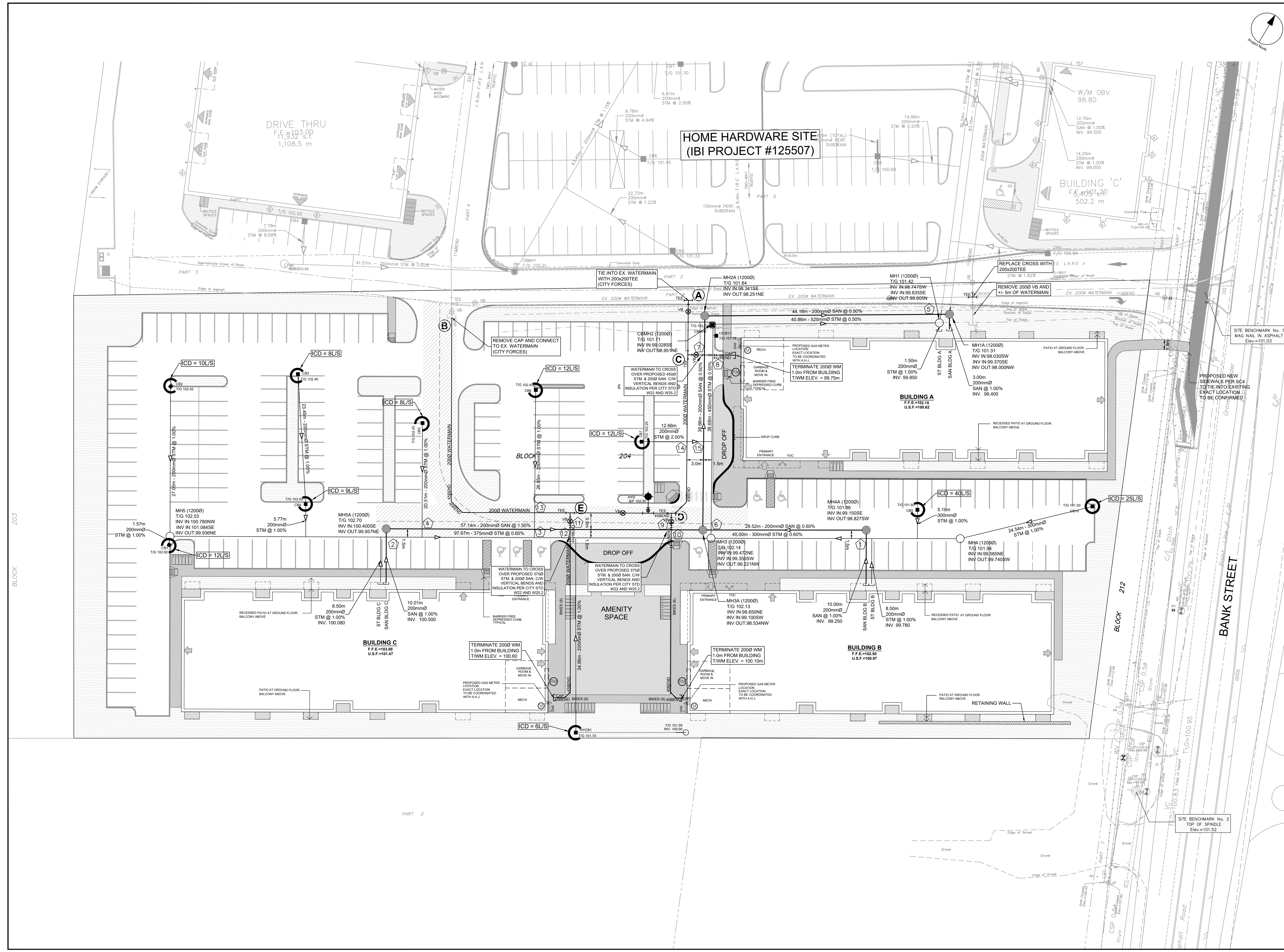
APPROVED BY:  
**J.I.M.**

SHEET TITLE  
**GENERAL PLAN OF SERVICES**

SHEET NUMBER  
**C-001**

ISSUE  
**3**

CITY PLAN No. xxxxx



CITY FILE No. D07-12-22-0097  
SCALE CHECK  
File Location: \\137175\_Pathways\_South\_0\_Production\03\_Design\04\_Civil\Sheets\C001\_GENERAL PLAN OF SERVICES.dwg Last Saved: October 12, 2022, by: mline Plotted: Monday, October 31, 2022 9:49:08 AM by: Marlan Mline

DRAWING NOTES

1.0 GENERAL

- 1.1 CONTRACTOR TO VERIFY ALL DIMENSIONS PRIOR TO CONSTRUCTION.
1.2 DO NOT SCALE DRAWINGS.
1.3 CONTRACTOR TO REVEAL ALL DISCOVERIES OF ERRORS, OMISSIONS OR DISCREPANCIES TO THE ARCHITECT OR DESIGN ENGINEER AS APPLICABLE.
1.4 USE ONLY THE LATEST REVISED DRAWINGS OR THOSE THAT ARE MARKED 'ISSUED FOR CONSTRUCTION'.
1.5 ALL CONSTRUCTION SHALL COMPLY WITH CURRENT CITY OF OTTAWA STANDARDS AND SPECIFICATIONS.
1.6 THIS DRAWING SHALL BE READ IN CONJUNCTION WITH ALL RELEVANT DRAWINGS AND SPECIFICATIONS.
1.7 FOR LEGAL SURVEY INFORMATION REFER TO REGISTERED PLAN.
1.8 REFER TO SITE PLAN BY CHAMBERLAIN ARCHITECT SERVICES LIMITED.
1.9 CONTRACTOR TO IMPLEMENT EROSION AND SEDIMENT CONTROL MEASURES AS IDENTIFIED IN THE EROSION AND SEDIMENT CONTROL PLAN TO THE SATISFACTION OF THE CITY OF OTTAWA.
1.10 ALL CONCRETE CURBS AND SIDEWALKS TO CONFORM TO CITY STANDARDS SC1.1 AND SC1.4.
1.11 ALL CONCRETE CURBS AND SIDEWALKS TO CONFORM TO CITY STANDARDS SC1.1 AND SC1.4.
1.12 ALL CONCRETE SHALL BE 'NORMAL PORTLAND CEMENT' IN ACCORDANCE WITH O.P.S.S. 1350 AND SHALL ACHIEVE A MINIMUM STRENGTH OF 30MPa AT 28 DAYS.
1.13 ALL CONSTRUCTION TRAFFIC TO ACCESS SITE FROM BANK STREET.
1.14 FOR GEOTECHNICAL REPORT SEE GEOTECHNICAL INVESTIGATION PROPOSED MULTISTOREY BUILDINGS (DOME SOUTH APARTMENTS 4840 BANK STREET, OTTAWA, ON, REPORT NO. PG2625 BY PATERSON GROUP DATED MAY 20, 2022.
1.15 CONTRACTOR TO PROTECT EXISTING INFRASTRUCTURE AND PROPERTY SUCH AS TREES, PARKING METERS, SIDEWALKS, CURBS, ASPHALT, AND STREET SIGNS FROM DAMAGE DURING CONSTRUCTION.
1.16 THE POSITION OF POLE LINES, CONDUITS, WATERMAIN, SEWERS, AND OTHER UNDERGROUND AND ABOVEGROUND UTILITIES AND STRUCTURES ARE NOT NECESSARILY SHOWN ON THE CONTRACT DRAWINGS.
1.17 CONTRACTOR TO SUPPLY SUITABLE FILL MATERIAL WHERE REQUIRED TO ROUGH GRADE THE SITE.
1.18 CONTRACTOR TO HALL EXCESS MATERIAL OFFSITE AS NECESSARY TO GRADE SITE TO MEET THE PROPOSED GRADES.
1.19 FILL MATERIAL WITHIN THE PARKING LOT AND BUILDING PAD AREAS, AND SUPPORTING BUILDING FOUNDATIONS SHALL BE COMPACTED TO 98% STANDARD MODIFIED PROCTOR DENSITY AND TO THE SATISFACTION OF THE GEOTECHNICAL ENGINEER.
1.20 ALL COMPACTION METHODS TO BE PERFORMED TO THE SATISFACTION OF THE GEOTECHNICAL ENGINEER TO INCLUDE BUT NOT BE LIMITED TO THE THICKNESS OF LIFTS, AND COMPACTION EQUIPMENT USED.
1.21 ALL DISTURBED BOULEVARDS TO BE REINSTATED WITH 500 ON 100mm TOPSOIL.
1.22 UTILITY DUCTS TO BE INSTALLED PRIOR TO ROAD BASE CONSTRUCTION.
1.23 CLAY DIES TO BE INSTALLED WHERE INDICATED ON THE DRAWINGS OR AS APPROVED AND DIRECTED BY THE GEOTECHNICAL ENGINEER.
1.24 ALL UTILITY BOXES (S, PEDESTALS, TRANSFORMERS, ETC) ARE TO BE INSTALLED IN ACCORDANCE WITH THE LATEST EDITION OF THE CITY OF OTTAWA'S 'GUIDELINES FOR UTILITY PEDESTALS WITHIN THE ROAD RIGHT OF WAY'.
1.25 FOR SITE BENCH MARK SEE SURVEY BY ANNIS O'SULLIVAN, VOLLEBEKK LTD. JOB No. 20749-22 REGIONAL BLK 204 4M-1653 T D1.

2.0 SANITARY

- 2.1 ALL SANITARY SEWER MAINS TO BE CSA CERTIFIED, BELL AND SPIGOT TYPE, ONLY FACTORY FITTINGS TO BE USED.
2.2 ALL SANITARY MAINTENANCE HOLES TO BE 1.2m DIAMETER AS PER CITY OF OTTAWA STANDARDS COMPLETE WITH BENCHING, RUNGS, FRAME AND COVER, DROP PIPES AND LANDINGS WHERE NEEDED.
2.3 SANITARY MANHOLE COVERS TO BE CITY OF OTTAWA STD. S25 (MOD. OPSD. 401.020).
2.4 SANITARY SEWER LEAKAGE TEST AND CCTV INSPECTION SHALL BE COMPLETED AS PER CITY SPECIFICATIONS PRIOR TO INSTALLATION OF BASE COURSE ASPHALT.
2.5 ANY SANITARY SEWER WITH LESS THAN 2.0m COVER REQUIRES THERMAL INSULATION AS PER CITY OF OTTAWA STANDARD W22, OR AS APPROVED BY THE ENGINEER.
2.6 CONNECTION TO THE EXISTING SANITARY SEWER TO BE INCLUDED IN THE COST FOR SANITARY SEWER INSTALLATION. THIS INCLUDES REINSTATEMENT OF ROAD CUTS TO CITY STANDARDS.

3.0 STORM

- 3.1 ALL STORM SEWERS TO BE CSA CERTIFIED, BELL AND SPIGOT TYPE.
3.2 ALL STORM MAINTENANCE HOLES TO BE SIZED IN ACCORDANCE WITH THE PLANS AND AS PER CITY OF OTTAWA STANDARDS COMPLETE WITH BENCHING, RUNGS, AND FRAME AND COVER.

LEGEND:

Legend symbols for manholes (MH3A, MH3), catchbasins (CB, C/CB, RYCB), valves (V&VB, V&C), hydrants (HYD), curbs (D.C.), meters (M, RM), valves (PRV), pipe crossings, and sidewalks (SOD, CONCRETE SIDEWALK, PROPERTY LINE).

CATCHBASIN DATA TABLE with columns: STRUCTURE ID, STORM AREA ID, STRUCTURE, FRAME & COVER, ELEVATION (TOP OF GRATE, INLET, OUTLET), OUTLET PIPE (DIAMETER, TYPE), INLET CONTROL DEVICE (HEAD, FLOW, ICD TYPE).

WATERMAIN SCHEDULE

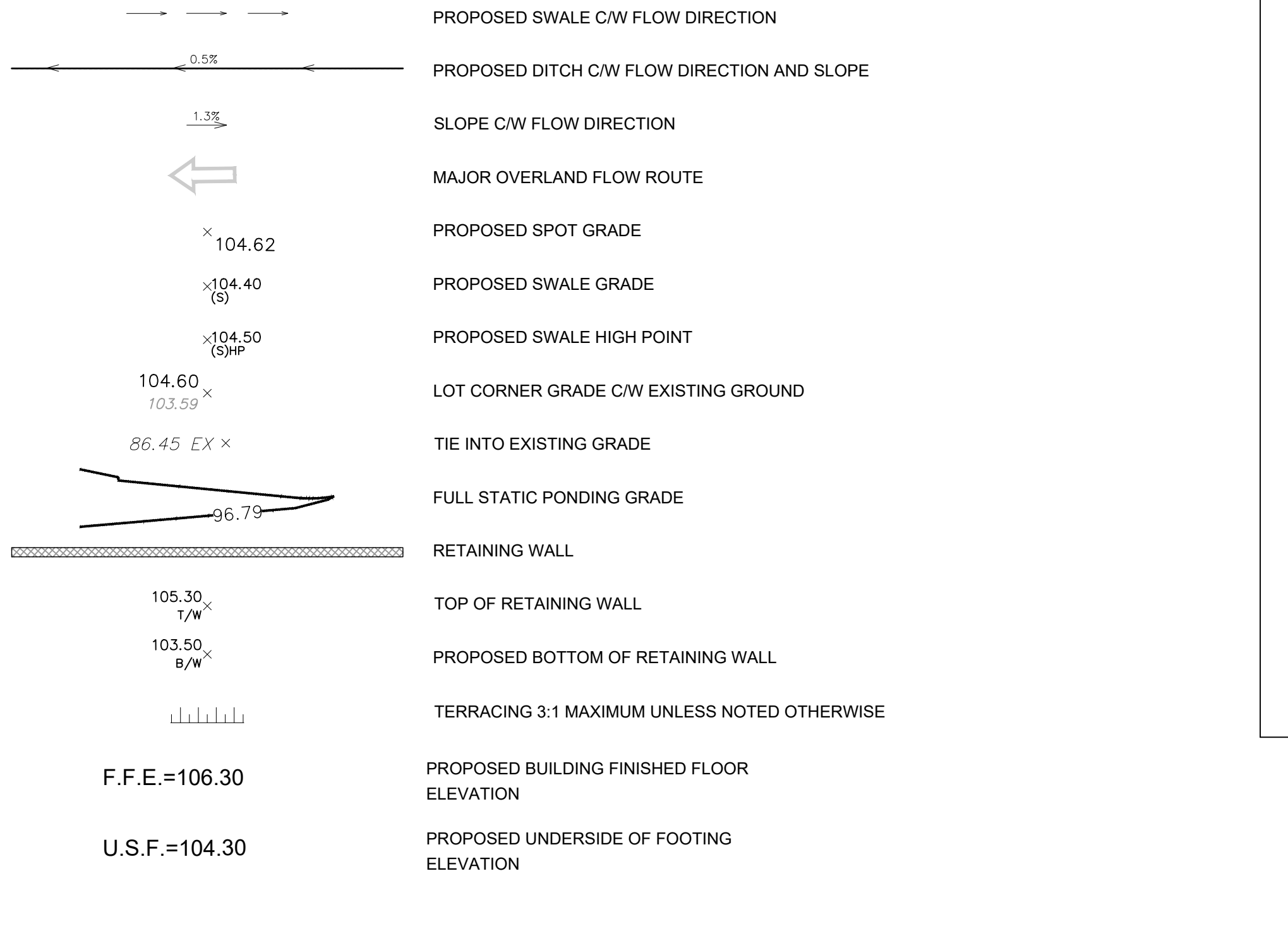
Watermain schedule table with columns: Station, Description, Finished Grade, Top of Watermain, As Built Watermain.

Pipe Interference Table

Pipe interference table with columns: Crossing No., PIPE 1, PIPE 2, Clearance.

PAVEMENT STRUCTURE:

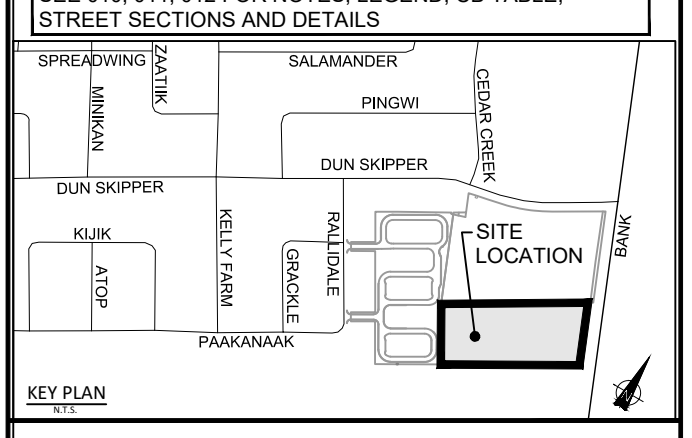
- Light Weight Areas: 50mm - SUPERPAVE 12.5 ASPHALTIC CONCRETE, 150mm - OPSS GRANULAR 'A' CRUSHED STONE, 300mm - OPSS GRANULAR 'B' TYPE II.
Heavy Duty Areas: 40mm - SUPERPAVE 12.5 ASPHALTIC CONCRETE, 50mm - SUPERPAVE 15.0 ASPHALTIC CONCRETE, 150mm - OPSS GRANULAR 'A' CRUSHED STONE, 450mm - OPSS GRANULAR 'B' TYPE II.



CLIENT: PATHWAYS SOUTH REGIONAL INC. 1737 WOODWARD DRIVE, OTTAWA, ON

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ISSUES table with columns: No., DESCRIPTION, DATE. Includes submission numbers 1, 2, 3, 4, 5, 6, 7, 8.

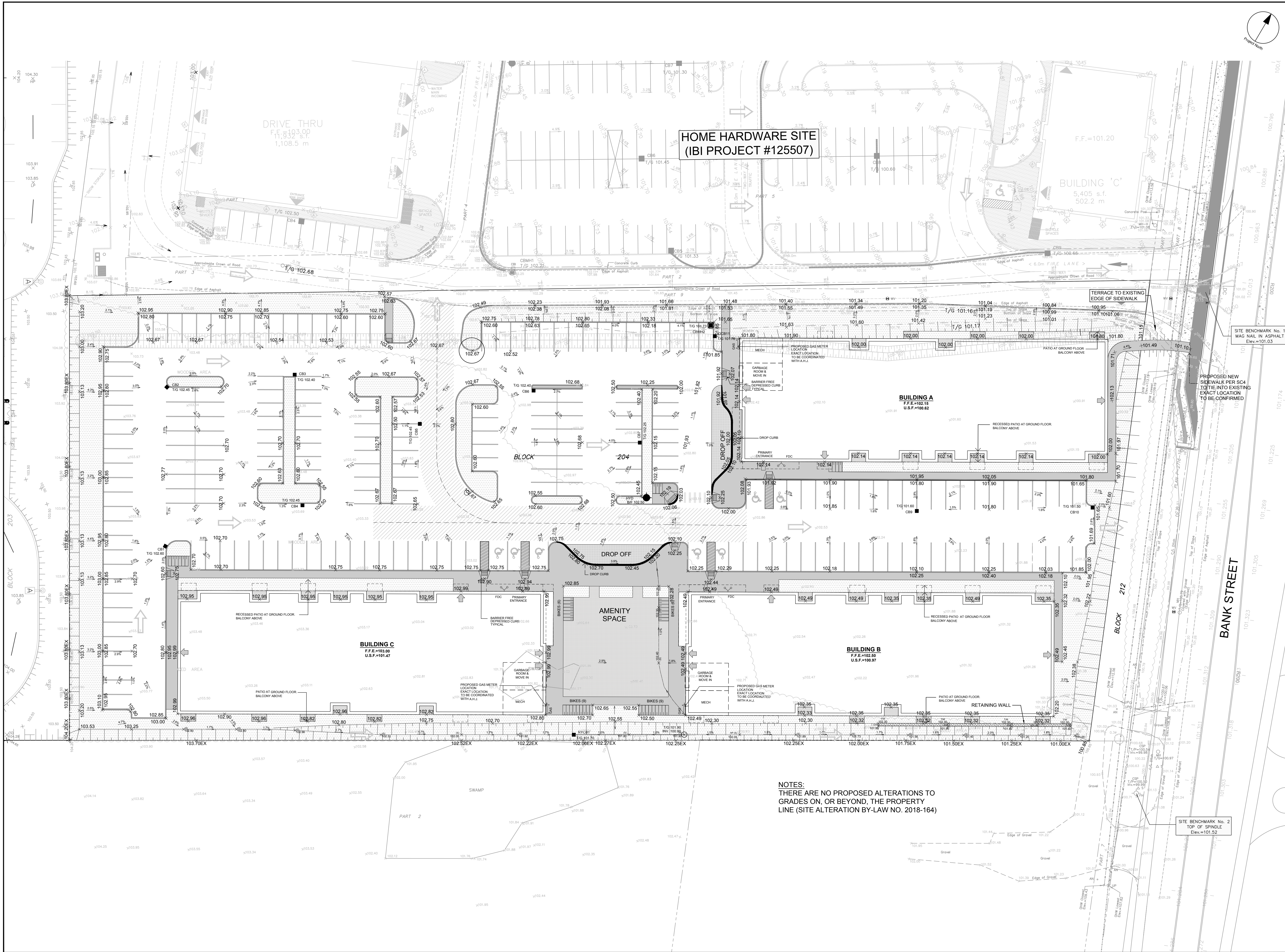


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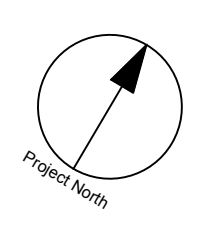
Professional Engineer seal for J. I. MOFFATT, License No. 2022-10-31, Province of Ontario.

PROJECT: 4840 BANK STREET. PROJECT NO: 137175. DRAWN BY: M.M. CHECKED BY: S.E.L. PROJECT MGR: D.C. APPROVED BY: J.I.M.

IBI GROUP logo and contact info. SHEET NUMBER: C-010. ISSUE: 3. SHEET TITLE: NOTES LEGEND CB DATA.



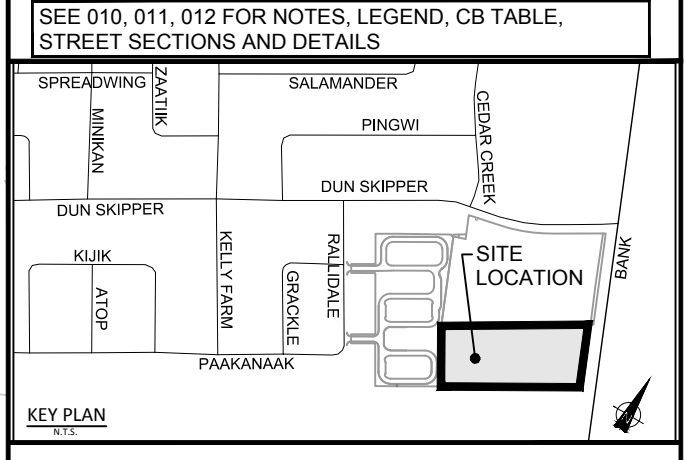
**HOME HARDWARE SITE  
(IBI PROJECT #125507)**



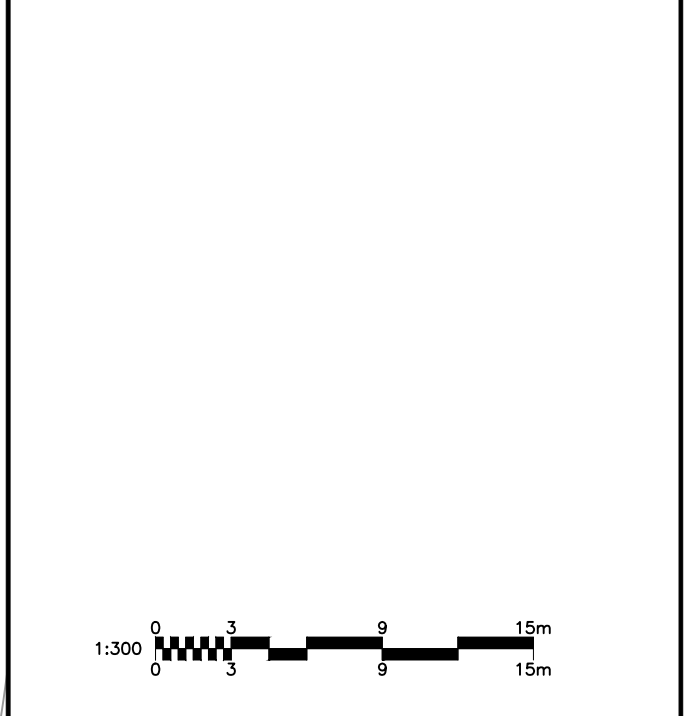
CLIENT  
**PATHWAYS SOUTH  
REGIONAL GROUP**  
1737 WOODWARD DRIVE, OTTAWA, ON

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ISSUES	No.	DESCRIPTION	DATE
1	ISSUED FOR CLIENT REVIEW	2022-05-19	
2	SUBMISSION NO. 1 FOR CITY REVIEW	2022-06-03	
3	SUBMISSION NO. 2 FOR CITY REVIEW	2022-08-26	
4	SUBMISSION NO. 3 FOR CITY REVIEW	2022-10-31	
5			
6			
7			
8			



CONSULTANTS



PROJECT  
**4840 BANK STREET**

PROJECT NO:  
**137175**

DRAWN BY:  
**M.M.**

CHECKED BY:  
**S.E.L.**

PROJECT MGR:  
**D.C.**

APPROVED BY:  
**J.I.M.**

SHEET TITLE  
**SITE GRADING PLAN**

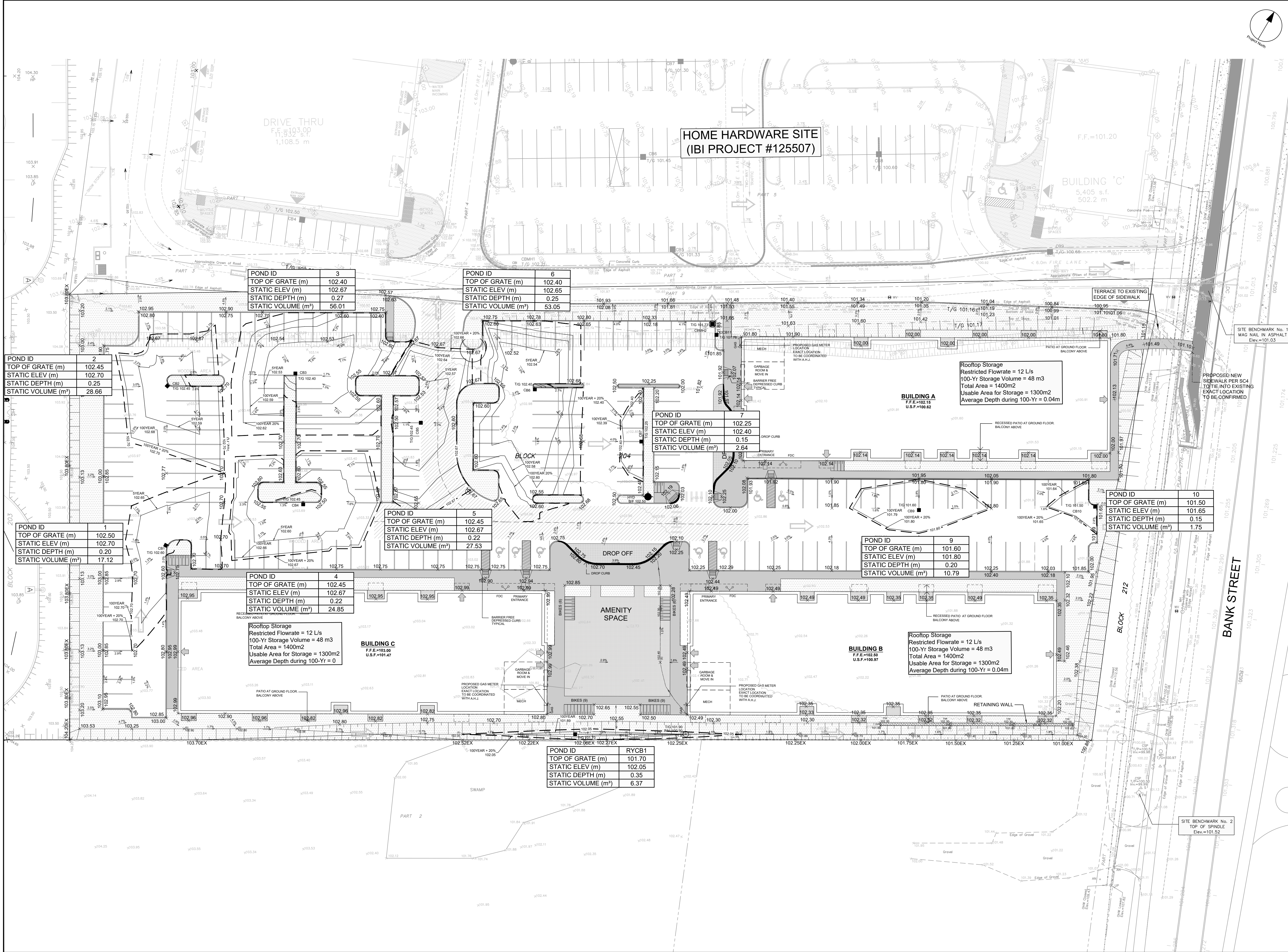
SHEET NUMBER  
**C-200**

ISSUE  
**4**

NOTES:  
THERE ARE NO PROPOSED ALTERATIONS TO GRADES ON, OR BEYOND, THE PROPERTY LINE (SITE ALTERATION BY-LAW NO. 2018-164)

CITY FILE No. D07-12-22-0097





<b>POND ID</b>	<b>2</b>
<b>TOP OF GRATE (m)</b>	102.45
<b>STATIC ELEV (m)</b>	102.70
<b>STATIC DEPTH (m)</b>	0.25
<b>STATIC VOLUME (m³)</b>	28.66

<b>POND ID</b>	<b>3</b>
<b>TOP OF GRATE (m)</b>	102.40
<b>STATIC ELEV (m)</b>	102.67
<b>STATIC DEPTH (m)</b>	0.27
<b>STATIC VOLUME (m³)</b>	56.01

<b>POND ID</b>	<b>6</b>
<b>TOP OF GRATE (m)</b>	102.40
<b>STATIC ELEV (m)</b>	102.65
<b>STATIC DEPTH (m)</b>	0.25
<b>STATIC VOLUME (m³)</b>	53.05

<b>POND ID</b>	<b>7</b>
<b>TOP OF GRATE (m)</b>	102.40
<b>STATIC ELEV (m)</b>	102.40
<b>STATIC DEPTH (m)</b>	0.15
<b>STATIC VOLUME (m³)</b>	2.64

<b>POND ID</b>	<b>5</b>
<b>TOP OF GRATE (m)</b>	102.45
<b>STATIC ELEV (m)</b>	102.67
<b>STATIC DEPTH (m)</b>	0.22
<b>STATIC VOLUME (m³)</b>	27.53

<b>POND ID</b>	<b>9</b>
<b>TOP OF GRATE (m)</b>	101.60
<b>STATIC ELEV (m)</b>	101.80
<b>STATIC DEPTH (m)</b>	0.20
<b>STATIC VOLUME (m³)</b>	10.79

<b>POND ID</b>	<b>10</b>
<b>TOP OF GRATE (m)</b>	101.50
<b>STATIC ELEV (m)</b>	101.65
<b>STATIC DEPTH (m)</b>	0.15
<b>STATIC VOLUME (m³)</b>	1.75

<b>POND ID</b>	<b>4</b>
<b>TOP OF GRATE (m)</b>	102.45
<b>STATIC ELEV (m)</b>	102.67
<b>STATIC DEPTH (m)</b>	0.22
<b>STATIC VOLUME (m³)</b>	24.85

<b>POND ID</b>	<b>RYCB1</b>
<b>TOP OF GRATE (m)</b>	101.70
<b>STATIC ELEV (m)</b>	102.05
<b>STATIC DEPTH (m)</b>	0.35
<b>STATIC VOLUME (m³)</b>	6.37

**Rooftop Storage**  
 Restricted Flowrate = 12 L/s  
 100-Yr Storage Volume = 48 m³  
 Total Area = 1400m²  
 Usable Area for Storage = 1300m²  
 Average Depth during 100-Yr = 0

**Rooftop Storage**  
 Restricted Flowrate = 12 L/s  
 100-Yr Storage Volume = 48 m³  
 Total Area = 1400m²  
 Usable Area for Storage = 1300m²  
 Average Depth during 100-Yr = 0.04m

CLIENT  
**PATHWAYS SOUTH REGIONAL GROUP**

1737 WOODWARD DRIVE, OTTAWA, ON

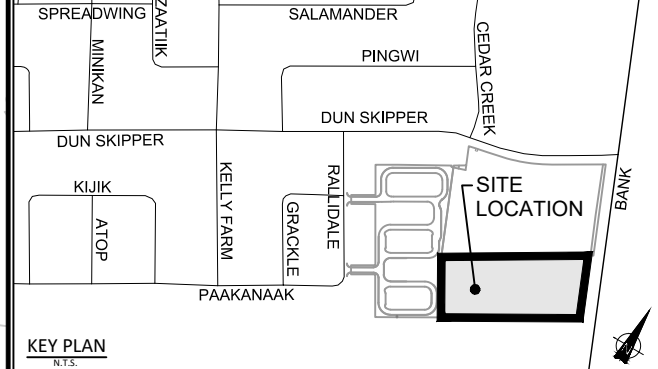
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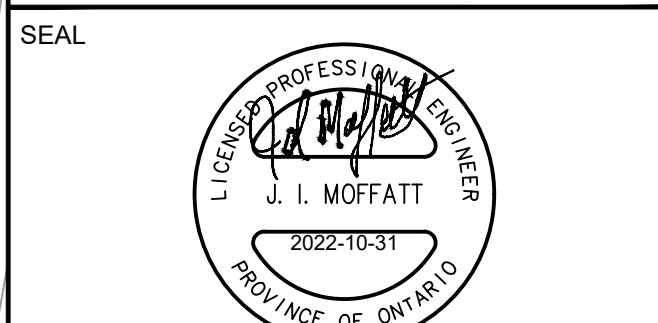
**ISSUES**

No.	DESCRIPTION	DATE
1	SUBMISSION NO. 1 FOR CITY REVIEW	2022-06-03
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5		
6		
7		
8		

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



**CONSULTANTS**



**IBI GROUP**  
 400 - 333 Preston Street  
 Ottawa ON K1S 5M4 Canada  
 tel 613 225-5311 fax 613 225-5866  
 ibigroup.com

**PROJECT**  
 4840 BANK STREET

**PROJECT NO:**  
 137175

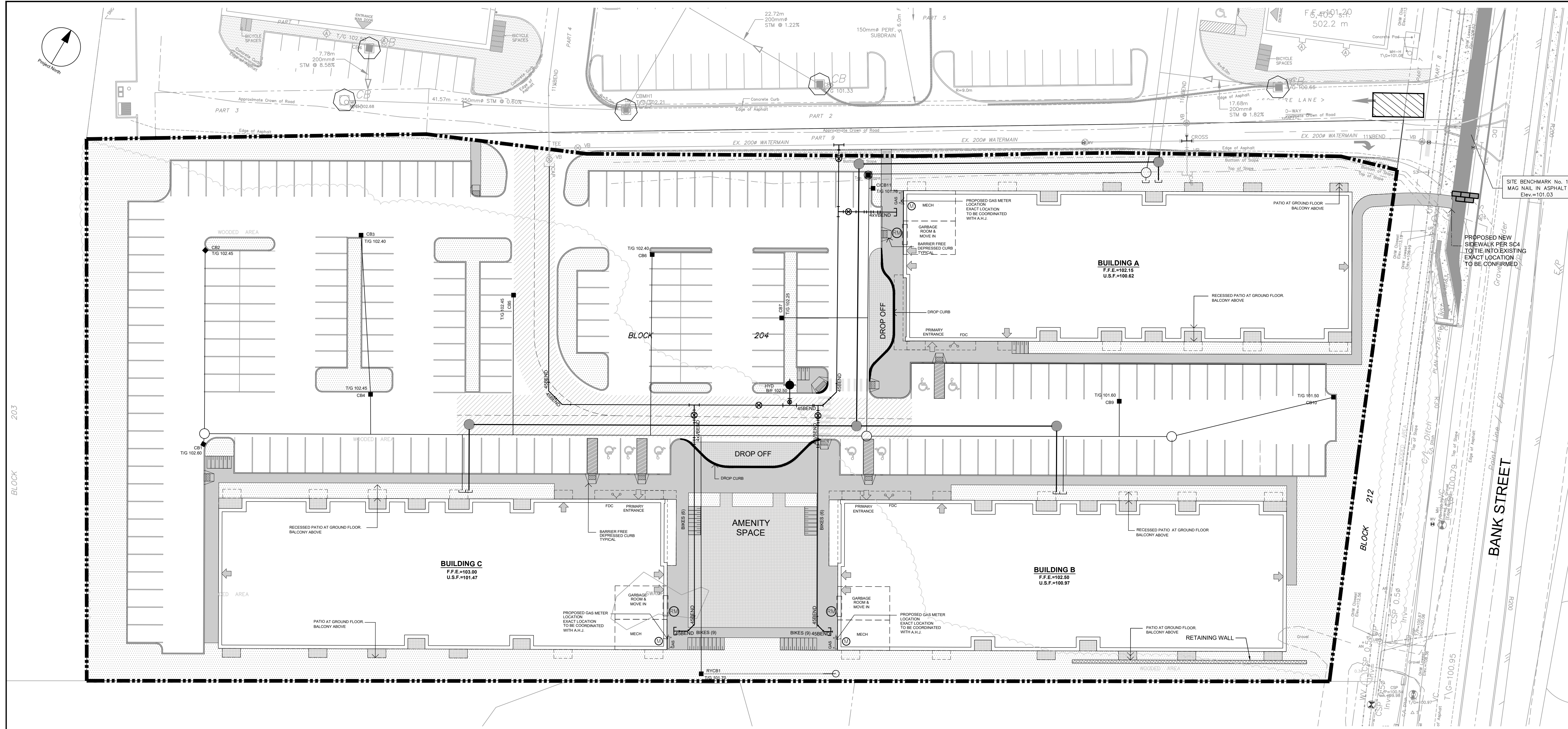
**DRAWN BY:** M.M.  
**CHECKED BY:** S.E.L.  
**PROJECT MGR:** D.C.  
**APPROVED BY:** J.I.M.

**SHEET TITLE**  
 PONDING PLAN

**SHEET NUMBER** C-600 **ISSUE** 3

CITY PLAN No. xxxxx

CITY FILE No. D07-12-22-0097  
 File Location: \\137175\_Pathways\_South\0\_Design\04\_Civil\Sheets\C600\_PONDING PLAN.dwg Last Saved: October 31, 2022 9:02:28 AM by Marianne Milne  
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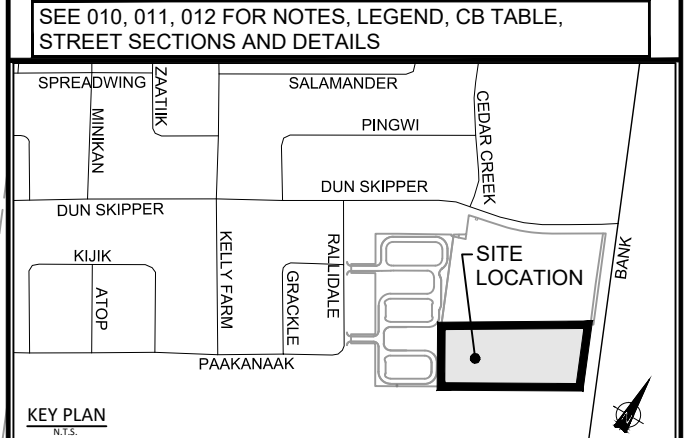


CLIENT  
**PATHWAYS SOUTH REGIONAL INC.**  
 1737 WOODWARD DRIVE, OTTAWA, ON

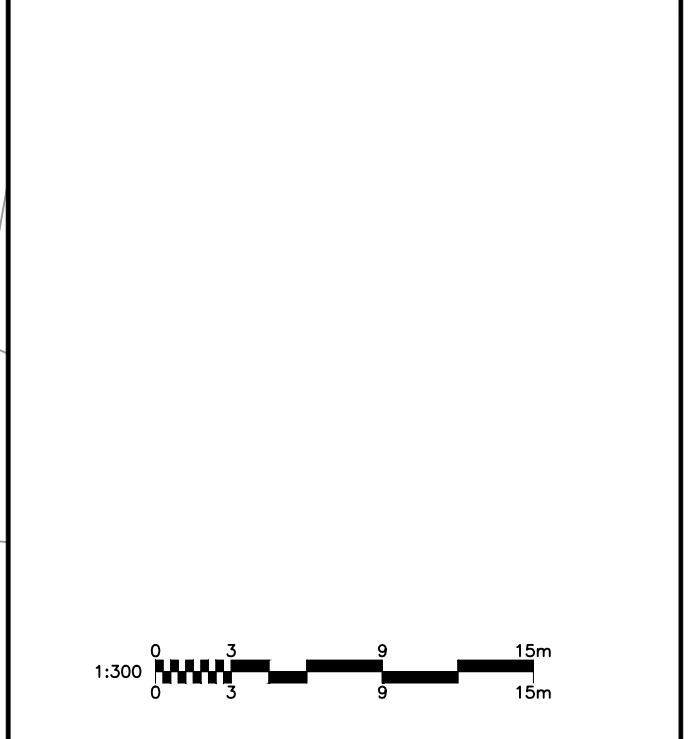
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ISSUES

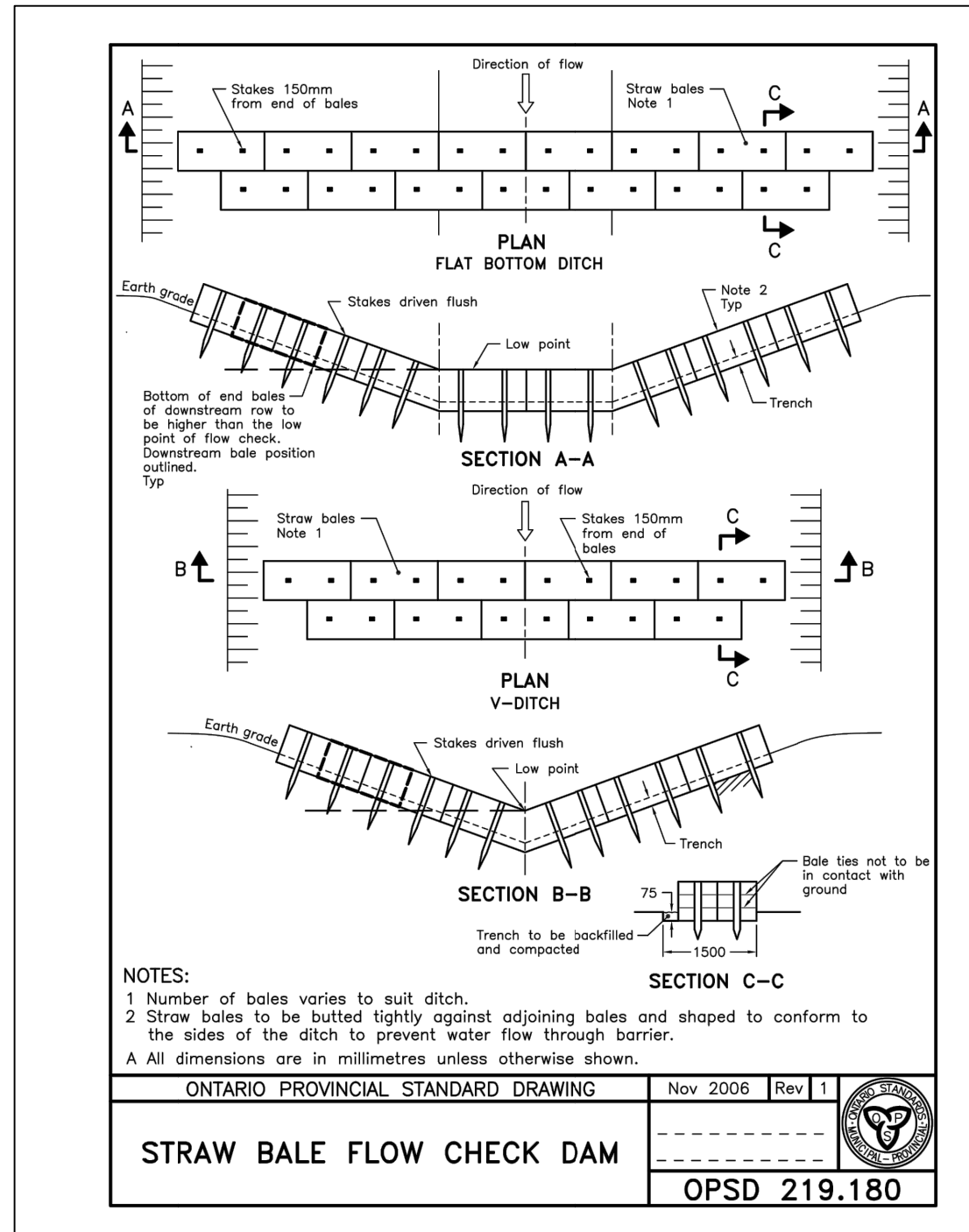
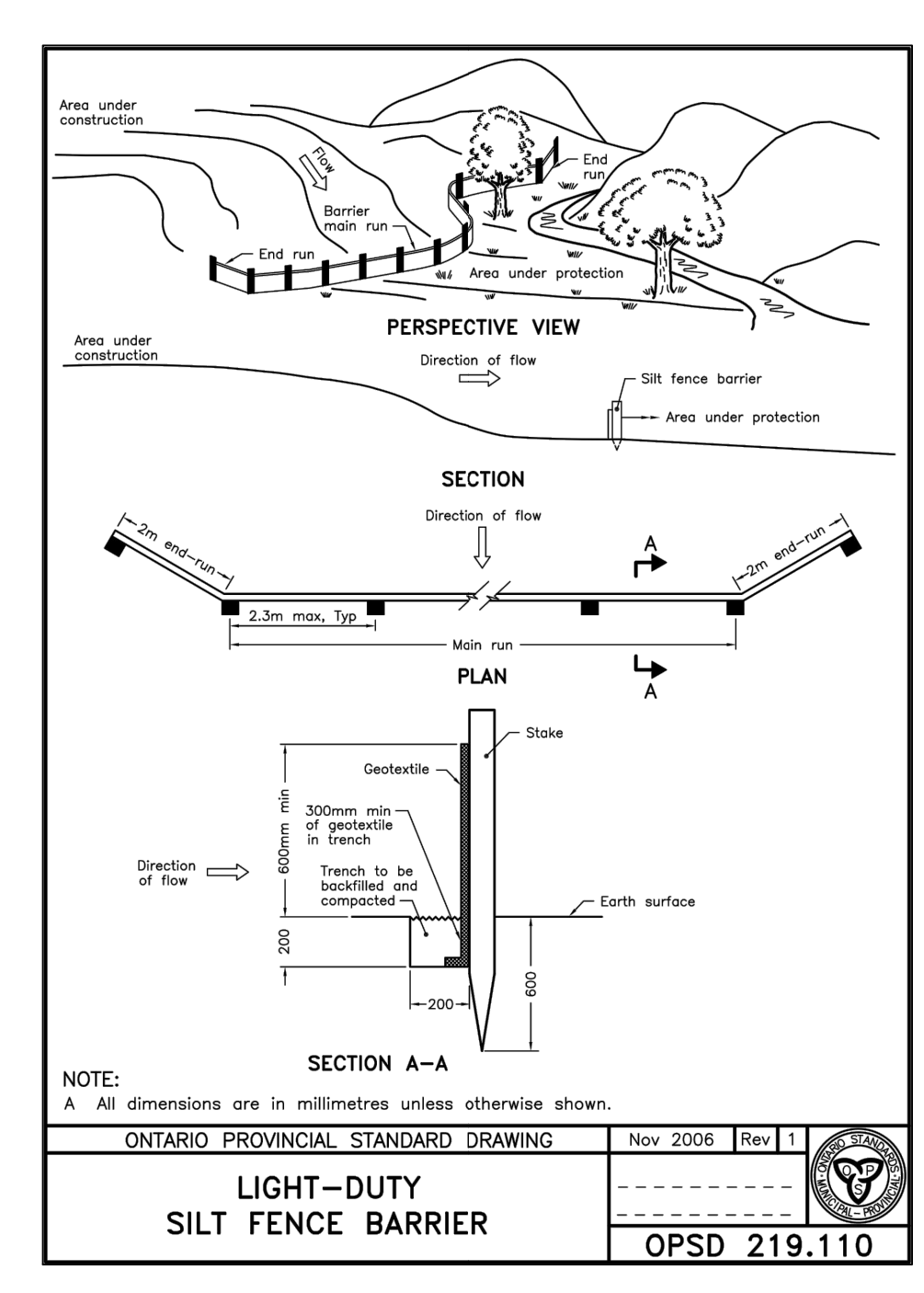
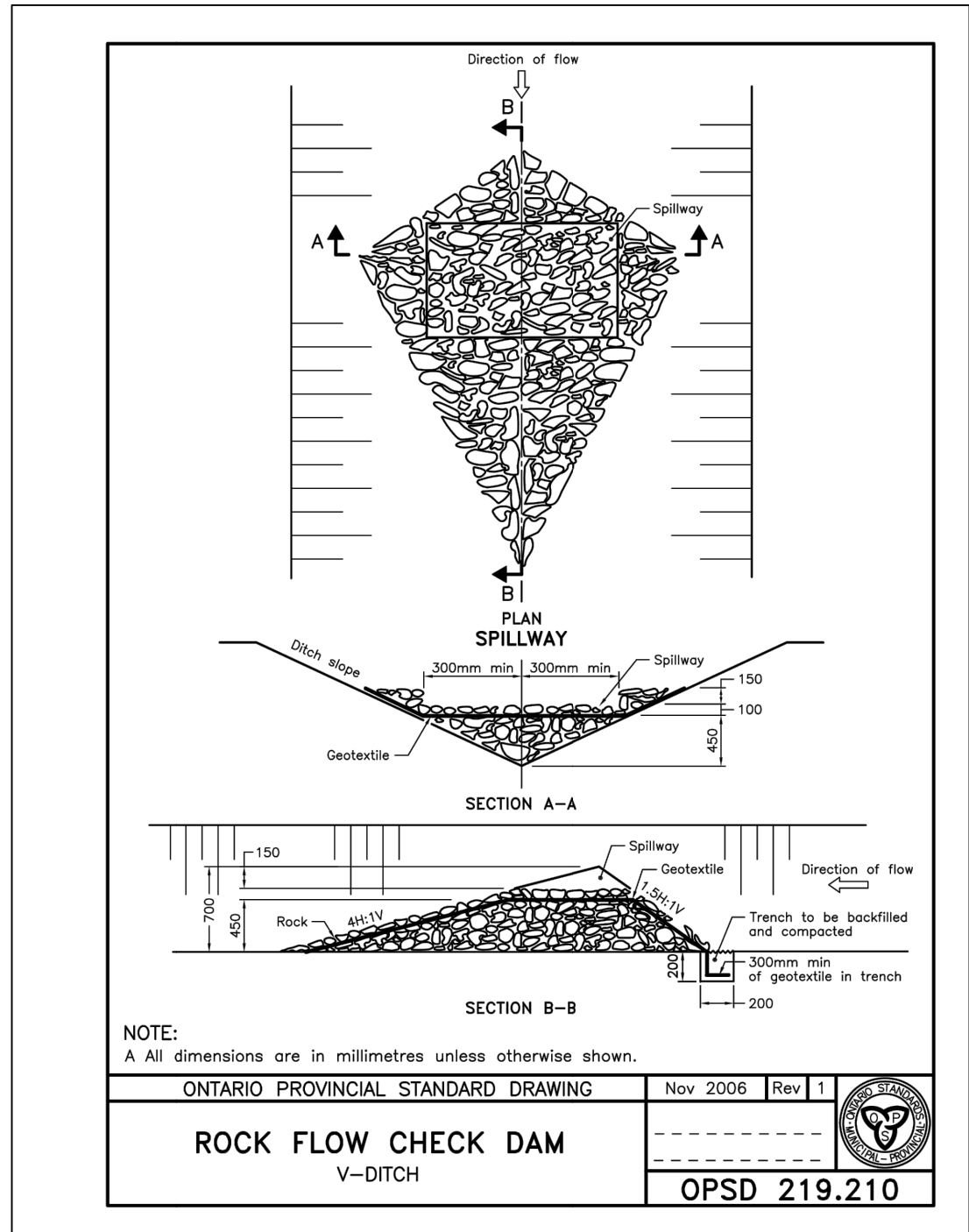
No.	DESCRIPTION	DATE
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SEAL



- NOTES:
- 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.
  - STRAW BALE SEDIMENT TRAPS TO BE CONSTRUCTED IN EXISTING ROAD SIDE DITCHES. TRAPS TO REMAIN AND BE MAINTAINED UNTIL VEGETATION IS ESTABLISHED.
  - SILT SACK TO BE PLACED AND MAINTAINED UNDER COVER OF ALL CATCHBASINS. GEOTEXTILE SILT SACK IN STREET C/S TO REMAIN UNTIL ALL CURBS ARE CONSTRUCTED. GEOTEXTILE FABRIC IN RYCB TO REMAIN UNTIL VEGETATION IS ESTABLISHED. ALL CATCHBASINS TO BE REGULARLY INSPECTED AND CLEANED, AS NECESSARY, UNTIL SOD AND CURBS ARE CONSTRUCTED.
  - WORKS NOTED ABOVE ARE TO BE INSTALLED, INSPECTED, MAINTAINED AND ULTIMATELY REMOVED BY SERVING CONTRACTOR.
  - THIS IS A "LIVING DOCUMENT" AND MAY BE MODIFIED IN THE EVENT THE PROPOSED CONTROL MEASURES ARE INSUFFICIENT.
  - THE CONTRACTOR SHALL IMPLEMENT BEST MANAGEMENT PRACTICES, TO PROVIDE 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.

**IBI GROUP**  
 400 - 333 Preston Street  
 Ottawa ON K1S 5M4 Canada  
 tel 613 225-5111 fax 613 225-5866  
 ibigroup.com

PROJECT  
**4840 BANK STREET**

PROJECT NO:  
**137175**

DRAWN BY:  
**M.M.**

CHECKED BY:  
**S.E.L.**

PROJECT MGR:  
**D.C.**

APPROVED BY:  
**J.I.M.**

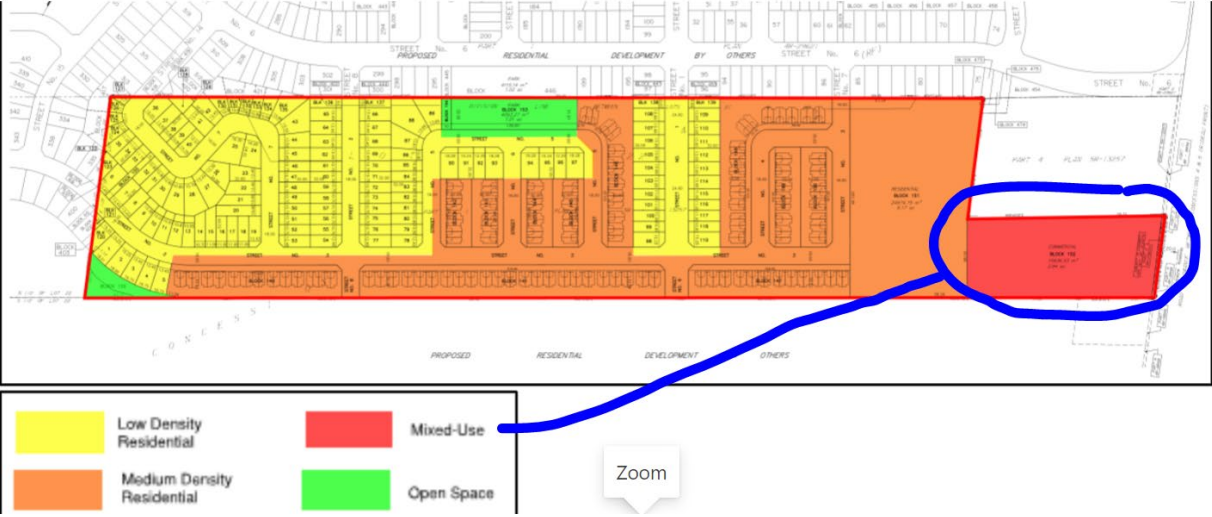
SHEET TITLE  
**SEDIMENT AND EROSION CONTROL PLAN**

SHEET NUMBER  
**C-900**

ISSUE  
**3**

CITY PLAN No. xxxxx

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Planning Rationale from the lone Draft Plan of Subdivision





Elevations from 2045, 2055, 2065 Portobello Blvd, Orleans – similar to current proposal

### 1. Current Official Plan

1. General urban, Developing Community/Expansion Area

### 2. Draft Official Plan

1. Suburban Transect, Hub and Evolving n'hood designation

### 3. Zoning Information

1. GM (with R5 to west, GM to north and rural to the south)
2. Clarification that this site falls is in Area D of the parking schedule and tenant parking is required at 1 space/du.

Table 101- Minimum parking space rates R12 to R21 (By-law 2016-249)

Row	I Land Use	II Area X and Y on Schedule 1A	III Area B on Schedule 1A	IV Area C on Schedule 1A	V Area D on Schedule 1A
R12	Dwelling Apartment Mid-high Rise	0.5 per dwelling unit	0.5 per dwelling unit	1.2 per dwelling unit	1 per dwelling unit
R13	[reserved]				