Stormwater Management Report and Servicing Brief

Wateridge Village Development Block 3
800 Winisik Street, Ottawa, ON

Prepared for:

Figurr Architects Collective
252 Argyle Avenue, Ottawa, Ontario

Attention: Roberto Campos

LRL File No.: 250290

June 2026

5430 Canotek Road | Ottawa, ON, K1J 9G2 | info@lrl.ca | www.lrl.ca | (613) 842-3434

TABLE OF CONTENTS

1 INTRODUCTION AND SITE DESCRIPTION 1
2 BACKGROUND STUDIES AND GUIDELINES 2
3 EXISTING INFRASTRUCTURE AND DRAINAGE DESCRIPTION 3
4 CONSULTATION AND REGULATORY APPROVALS 4
5 GEOTECHNICAL CONSIDERATIONS 5
6 PROPOSED DEVELOPMENT 5
7 SCOPE OF WORK 6
8 WATER SUPPLY AND FIRE PROTECTION 6
8.1 Residential Water Demands 7
8.2 Amenity Water Demands 8
8.3 Total Water Demands 8
8.4 Fire Flow Demands 9
8.5 Boundary Conditions 10
9 SANITARY SERVICE 11
9.1 Existing Sanitary Sewer Services 11
9.2 Sanitary Sewer Service Design 11
10 STORMWATER MANAGEMENT 11
10.1 Design Criteria 11
10.2 Existing Stormwater Infrastructure and Management 12
10.3 Watershed Areas 12
10.3.1 Pre-Development Drainage 12
10.3.2 Post-Development Drainage 12
10.4 Proposed Stormwater Quantity Controls 14
11 EROSION & SEDIMENT CONTROL 15
12 CONCLUSION 16
13 REPORT CONDITIONS AND LIMITATIONS 17

APPENDICES

Appendix A	**Site Topographical Survey**
	As-built drawings
	Pre-Con Meeting Notes
Appendix B	**Site Plan and Architectural Floor Plans**
Appendix C	**Water Demand Calculations**
	Boundary Conditions
	Fire Hydrant Coverage
Appendix D	**Sanitary Calculations**
Appendix E	**Stormwater Management Design Calculations**
Appendix F	**Civil Engineering Drawings**
Appendix G	**Design Brief Wateridge Village at Rockcliffe**
	335 St. Laurent Boulevard Phase 4

LIST OF TABLES

Table 1: City of Ottawa Design Guidelines- Water Design Parameters 7
Table 2: Residential Population Estimate 7
Table 3: Fire Protection Summary Table 10
Table 4: Summary of Boundary Conditions 10

LIST OF FIGURES

Figure 1: Aerial View of Subject Site 1

1 INTRODUCTION AND SITE DESCRIPTION

LRL Associates LTD. was retained by Figurr Architects Collective to prepare a Stormwater Management Report and Serviceability Brief to support Site Plan Control application for the proposed development located at 800 Winisik Street, Ottawa, ON.

The subject property is legally described as Block 3, Registered Plan 4M-1718, in the City of Ottawa. The lot is zoned GM31 H(20), and forms part of the Wateridge Village Development. A mid-rise, mixed use apartment building under 20m in height is a permitted land use. It is located within the Rideau-Rockcliffe Ward, on the east side of Winisik Street and the north side of Hemlock Road with an approximate area of 1.0 ha.

It should also be noted that Block 3 is located to the east of Block 2 and a city multi-use pathway divides the two blocks. This report addresses the development of Block 3 although the multi-use pathway block and Block 2 are being development simultaneously.

The subject site can be seen below in Figure 1.

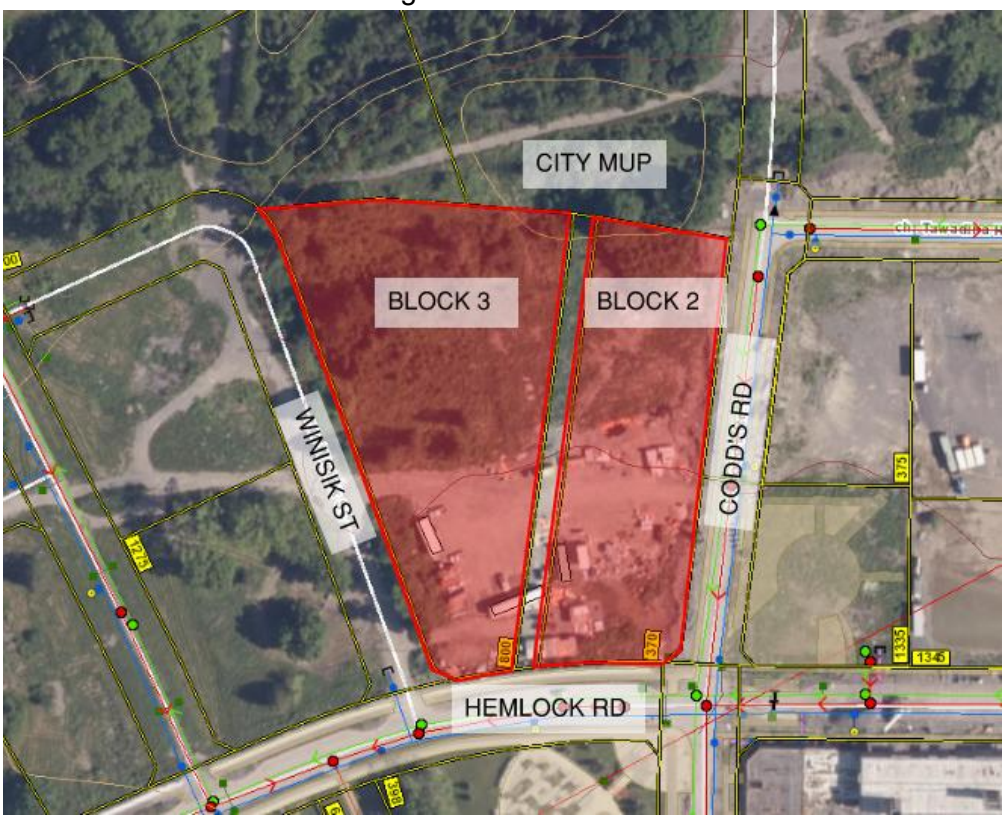


Figure 1: Aerial View of Subject Site

This report has been prepared in consideration of the terms and conditions noted above and with the civil drawings prepared for the new development. Should there be any changes in the design features, which may relate to the stormwater and servicing considerations, LRL Associates Ltd. should be advised to review the report recommendations.

2 BACKGROUND STUDIES AND GUIDELINES

The following guidelines were utilized in the preparation of this report:

- **Ottawa Sewer Design Guidelines**
  City of Ottawa, SDG002, October 2012
    - Technical Bulleting ISDTB-2014-01
      City of Ottawa, February 5, 2014
    - Technical Bulleting PIEDTB-2016-01
      City of Ottawa, September 6, 2016
    - Technical Bulleting ISTB-2018-01
      City of Ottawa, March 21, 2018
    - Technical Bulleting ISTB-2018-04
      City of Ottawa, June 27, 2018
    - Technical Bulleting ISTB-2019-02
      City of Ottawa, July 8, 2019
- **City of Ottawa Design Guidelines – Water Distribution**
  City of Ottawa, WDG001, July 2010
    - Technical Bulleting ISD-2010-2
      City of Ottawa, December 15, 2010
    - Technical Bulleting ISDTB-2014-02
      City of Ottawa, May 27, 2014
    - Technical Bulleting ISDTB-2018-02
      City of Ottawa, March 21, 2018
    - Technical Bulleting ISDTB-2021-03
      City of Ottawa, August 18, 2021
    - Technical Bulleting IWSTB-2024-05
      City of Ottawa, November 18, 2024
- Soil Quality Report Proposed Residential Development Block 1 to 3 Codd's Road, Ottawa, ON (*OTT-25007988-A0*) EXP Services Inc. dated 11 August 2025.
- Wateridge Subdivision Phase 4 Low Impact Development Drawings, D07-16-15-0003_P4, dated 09-12-2022

- 1345 Hemlock Road, 375 Codd's Road And 1375 Hemlock Road, Residential Development, Ottawa, On - Servicing Report - Bayview Wateridge Inc. 4th submission dated February 2024, Project number: 221-00473-00
- Design Brief Wateridge Village at Rockcliffe 335 St. Laurent Boulevard Phase 4, IBI Group dated March 2023, (*Project:118863-5.2.2*)
- Design Brief Wateridge Village at Rockcliffe Phase 1A, IBI Group dated revised March 2016, (*Project:38298-5.2.2*)

3 EXISTING INFRASTRUCTURE AND DRAINAGE DESCRIPTION

The site is currently undeveloped vacant land. The existing site topographical survey can be found in **Appendix A**.

The servicing for the site was accounted for within the Wateridge Village Phase 1B, Phase 2 and Phase 4 development. As designed in the Wateridge Phase 4 sanitary and storm drainage area plan, Block 3 will be serviced by the existing infrastructure located within Winisik St. The sanitary drainage area plan, drawing no 410, rev 5 2023-01-31 and storm drainage area plan, drawing no 510, rev 5 2023-01-31, can be found in **Appendix A**.

City of Ottawa sewer and watermain mapping, in addition to as-built information collected from the City of Ottawa indicate the following existing infrastructure located within the adjacent rights-of-way.

Winisik Street- Approved for construction

Winisik Street represent the Wateridge Village at Rockcliffe Phase 4, contract number 118863, city file number D07-16-15-0003_PH4 and has been approved for construction and was used as reference for the development of Block 3.

A storm sewer begins are Hemlock Road extends north along Winisik st and then west with a connection to the existing 3000mm diam storm sewer on Oshedinaa Street.

- 525 mmØ conc. CL 65-D Storm Sewer
- 250 mmØ conc. CL 65-D Storm Sewer

The sanitary sewer along Winisik St begins approximately 60m north of Hemlock Rd, extends north and then west along Winisik St and connects to the existing MH191A on Oshedinaa Street.

- 250 mmØ PVC DR-35 Sanitary Sewer

The watermain on Winisik St loops the existing watermain stub from Hemlock St to a proposed watermain main extension along Oshedinaa Street to be completed in Phase 4.

- 200 mmØ PVC DR18 CL-150 Watermain

Hemlock Road:
Existing infrastructure, water, sanitary, and storm sewers extends along the frontage of the property along Hemlock Road. Although Block 3 will be fully serviced by Winisik Street.

- 3000 mmØ conc. CL 100-D Storm Sewer
- 250 mmØ PVC DR-35 Sanitary Sewer
- 300 mmØ PVC DR18 CL-150 Watermain

Oshedinaa Street

The water, sanitary and storm sewer main along Oshedinaa Street are part of the Wateridge Village at Rockcliffe Phase 4 development. Infrastructure from Hemlock Rd is extended north on Oshedinaa Street and then east and south along Winisik St. This extension provides servicing for the Block 3 development.

- 3000 mmØ conc. Storm Sewer
- 300 mmØ PVC Sanitary Sewer
- 250 mmØ PVC Sanitary Sewer
- 200 mmØ Watermain

The existing 3000 mm dia trunk sewer in Oshedinaa Street is the legal outlet for the Winisik Street storm sewers. The existing sanitary sewer in Oshedinaa Street will be the legal outlet for the Winisik Street sanitary sewer.

4 CONSULTATION AND REGULATORY APPROVALS

A pre-consultation meeting with the City of Ottawa was held on September 9, 2025. A copy of the meeting feedback letter dated September 17, 2026, has been included in **Appendix A**.

City of Ottawa pre-consultation comment summary of high-level items:

> *Stormwater Management Criteria* – servicing design it to be consistent with Wateridge Phase 4 – Design brief. Excerpts are to be included in appendices of the design Site Servicing and SWM report. Deviations will required updates to the subdivision level MSS.
>
> *LID Design* – conform to City Design Guidelines and Technical Bulletins (IWSTB-2024-04) & MECP Stormwater Planning and Design Manual (Section 4 & 5 specifically). Required 4 m setback from footing face for soak away pits and infiltration measures. Reference to Wateridge Phase 2B Developer's Checklist, dated May 13th, 2018 (specifically Table 2.1).
>
> Approved drainage patterns to be followed.
>
> HGL Analysis is to be completed, if basement levels are contemplated.
>
> *Water Quality* – Provided at Eastern Stormwater Manager Facility.
>
> *Water Quantity Control* – refer to Wateridge Phase 4 – Design brief.

The proposed bioswale on Winisik Street fronting Block 3 will need to be coordinated with any entrances for the development.

5 GEOTECHNICAL CONSIDERATIONS

A geotechnical investigation was completed by EXP Services Inc. (Report No. OTT-25007988-A0), dated August 11, 2025.

The subsurface conditions generally consist of approximately 200 mm of topsoil. In paved areas, the pavement structure comprises 75 mm of asphaltic concrete underlain by 125 mm of granular fill consisting of silty sand and crushed gravel.

Below the ground surface and pavement structure, the fill materials consist of varying proportions of gravel, sand, silt, clay, cobbles, boulders, and blast-shattered rock fragments. Organic zones were identified within the fill, containing roots, rootlets, and tree fragments. In some areas, the fill also contains debris such as asphalt, brick, geotextile fabric, plastic bags, and plastic piping. The moisture content of the fill ranges from approximately 6% to 36%.

In certain areas, a buried topsoil layer was encountered beneath the fill, with a thickness ranging from 200 mm to 400 mm. The moisture content of the buried topsoil is approximately 20%.

Silty sand to sandy silt was encountered beneath the fill and buried topsoil, and locally below the surficial topsoil layer. The natural moisture content of these soils ranges from approximately 11% to 16%.

Limestone bedrock of the Ottawa Formation, with shale partings, was encountered in most areas of the site. Variations in bedrock depth suggest that the bedrock surface may exhibit a stepped profile at certain locations. The average Rock Quality Designation (RQD) value is approximately 60%, indicating fair bedrock quality. Based on a review of the unconfined compressive strength test results, the bedrock is classified as strong (R4) to very strong (R5) in accordance with the 2023 Fifth Edition of the Canadian Foundation Engineering Manual.

Based on groundwater level measurements obtained on August 8, 2025, groundwater was encountered at depths ranging from approximately 5.1 m to 5.9 m below existing grade, subject to seasonal fluctuations.

The report also provides design recommendations regarding seismic design, Grade Raise Restrictions, Foundation Considerations, Floor Slab and Drainage Requirements, Lateral Earth Pressure Against Subsurface Walls, Excavation and De-Watering Requirements, Pipe Bedding Requirements, Backfilling Requirements and Suitability of On-Site Soils for Backfilling Purposes, Pavement Structures, Subsurface Concrete and Steel Requirements and Tree Planting Restrictions

6 PROPOSED DEVELOPMENT

The proposed development will consist of three multi-storey buildings, identified as Building 3.1 C, 3.2 D and 3.3 E which will be accessed from Winisik Street and share an underground parking garage.

The development will accommodate a total 277 residential units, distributed as follows: 83 units in Building 3.1 C, 93 units in Building 3.2 D and 101 units in Building 3.3 E. The total parking provisions include 241 parking spaces and 301 bicycle parking spaces.

Outdoor amenity spaces and green area will be provided at the main level. The building is equipped with a new cistern at the basement garage of building 3.2 D.

For additional detail of the proposed development, refer to the Site Plan & Architectural Floor Plans prepared by Figurr Architects Collective included in ***Appendix B***.

7 SCOPE OF WORK

As per applicable guidelines, the scope of work includes the following:

Stormwater management

- Calculate the allowable stormwater release rate.
- Calculate the anticipated post-development stormwater release rates.
- Demonstrate how the target quantity and quality control objectives will be achieved.

Water services

- Calculate the expected water supply demand at average and peak conditions.
- Calculate the required fire flow as per the Fire Underwriters Survey (FUS) method.
- Confirm the adequacy of water supply and pressure during peak flow and fire flow.
- Describe the proposed water distribution network and connection to the existing system.

Sanitary services

- Describe the existing sanitary sewers available to receive wastewater from the proposed buildings.
- Calculate peak flow rates from the proposed development.
- Describe the proposed sanitary sewer system.

8 WATER SUPPLY AND FIRE PROTECTION

The subject property lies within the City of Ottawa's Montreal Road Pressure Zone (Zone MONT).

According to the City of Ottawa Water Distribution Guidelines (Technical Bulletin ISTB-2021-03), since the subject site is anticipated to house more than 50 residential units, it is required to be serviced by two water service laterals, separated by an isolation valve, for redundancy and to avoid creation of a vulnerable service area. Hence, the proposed development in Block 3 will be serviced by two (2) 200 mmØ connections to the existing 200 mmØ watermain on Winisik Street. For the layout of proposed water servicing network, refer to the Servicing Plan C401 included in **Appendix F**.

Table 1, shown below, summarizes the City of Ottawa Design Guidelines parameters used in the preparation of the water demand estimate and servicing design.

Table 1: City of Ottawa Design Guidelines- Water Design Parameters

Design Parameters	Value
Residential Bachelor / 1 Bedroom Apartment	1.4 P/unit
Residential 2 Bedroom Apartment	2.1 P/unit
Residential 3 Bedroom Apartment	3.1 P/unit
Commercial Average Daily Demand	2.8 L/m^2/d
Average Daily Demand	280 L/c/d
Minimum Depth of Cover	2.4 m from top of watermain to finished grade
Desired operating pressure range during maximum day operating conditions	345 kPa (50 psi) and 552 kPa (80 psi)
During peak hour operating conditions pressure must not drop below	275 kPa (40 psi)
During normal operating conditions pressure shall not exceed	552 kPa (80 psi)
During fire flow operating conditions pressure must not drop below	140 kPa (20 psi)

8.1 Residential Water Demands

Anticipated population demands have been calculated from the architectural floor plan drawings completed by Figurr Architects Collective. The proposed development is anticipated to include 277 residential units, which translates to a population of approximately **424.7** people in as per the City of Ottawa Water Distribution Design Guidelines. Table 2 below summarizes the proposed population count, based on the criteria outlined in Table 4.1 of the Guidelines.

Table 2: Residential Population Estimate

Population Count						
		Building 3.1 (C)	**Building 3.2 (D)**	**Building 3.3 (E)**		
Unit Type	**Persons Per Unit**	**Number of Units**	**Number of Units**	**Number of Units**	**Total Number of Units**	**Total Population**
1 Bedroom Apartment	1.4	57	39	60	156	218.4
2 Bedroom Apartment	2.1	23	50	32	105	220.5
3 Bedroom Apartment	3.1	3	4	9	16	49.6
	Total	**83**	**93**	**101**	**277**	**488.5**

The required water supply for the residential units in the proposed development have been calculated using the following formula:

Where:

$$Q = (q \times P \times M)$$

q = average water consumption (L/capita/day)
P = design population (capita)
M = peak factor

With reference to *Table 4.2 of the City of Ottawa Water Distribution Design Guidelines*, using an average water consumption rate of 280 L/c/d, a calculated Maximum Daily Demand Factor and Maximum Hour Demand Factor of 2.5 and 2.2*,* respectively, anticipated demands were calculated as follows:

- Average daily domestic water demand is **1.58 L/s**,
- Maximum daily demand is **4.64 L/s**, and
- Maximum hourly demand is **6.92 L/s**.

8.2 Amenity Water Demands

As per the architectural floor plan drawings completed by Figurr Architects Collective, there will be a total of **0.3972 ha** of proposed amenity space in block 3. The required water supply requirements for the Amenity space within the proposed subdivision have been calculated using the following formula:

Where:

$$Q = (q \times A \times M)$$

q = average water consumption (L/m^2/day)
A = commercial area (m^2)
M = Peak factor

With reference to Table 4.2 of the *City of Ottawa Water Distribution Design Guidelines*, using an average water consumption rate of 2.8 L/m^2/d, a calculated Maximum Daily Demand Factor and Maximum Hour Demand Factor of 1.5 and 1.8*,* respectively, anticipated commercial demands were calculated as follows:

- Average daily water demand is **0.008 L/s**,
- Maximum daily demand is **0.13 L/s**, and
- Maximum hourly demand is **0.023 L/s**.

8.3 Total Water Demands

Based on calculated residential and Amenity demands for the proposed development, the total anticipated water demands are as follows:

- Average daily domestic water demand is **1.59 L/s**,

- Maximum daily demand is **4.65 L/s**, and
- Maximum hourly demand is **6.94 L/s**.

For greater detail on Water Demand Calculations, please refer to **Appendix C**.

8.4 Fire Flow Demands

The estimated fire flow for the proposed buildings was calculated in accordance with *IWSTB 2024-05*. The parameters such as Type of construction, Occupancy type, Sprinkler Protection were provided by the Architect.

The Fire Underwriters Survey 2020 was used to calculate the fire flow demand for the site. The total effective area considers the two largest adjoining floor areas plus 50% of all floors immediately above them up to a maximum of eight. Buildings 3.1 C,3.2 D and 3.3 E although sharing the same parking garage were considered as three separate buildings since the parking garage is separated from the buildings by a fire separation. The building with the larger fire flow requirement was used for boundary condition request.

Building 3.1 C:

Type of construction – Mass Timber Construction
Occupancy type – Limited Combustible
Sprinkler Protection – Automatic & Fully Supervised Sprinkler System.
Minimum required fire flow = 10000 L/min = 166.7 L/s
Required duration of fire flow = 2 Hr

Building 3.2 D:

Type of construction – Mass Timber Construction
Occupancy type – Limited Combustible
Sprinkler Protection – Automatic & Fully Supervised Sprinkler System.
Minimum required fire flow = 10000 L/min = 166.7 L/s
Required duration of fire flow = 2 Hr

Building 3.3 E:

Type of construction – Mass Timber Construction
Occupancy type – Limited Combustible
Sprinkler Protection – Automatic & Fully Supervised Sprinkler System.
Minimum required fire flow = 12000 L/min =200.0 L/s
Required duration of fire flow = 2.5 Hr

The min fire flow demand was calculated to be **12,000 L/min** for Block 3. See **Appendix C** for details.

The Phase 4 development on Winisik St is proposing 3 fire hydrants within 75 m of the Block 3 development. In existing conditions there is a fire hydrant located on south side of Hemlock St directly across from the city MUP. In addition, a new fire hydrant is being proposed inside block 3.

Table 3 below summarizes the aggregate fire flow of the contributing hydrants near the proposed development based on Table 18.5.4.3 of *ISTB-2018-02*.

Table 3: Fire Protection Summary Table

	Max. Fire Flow Demand (L/min)	Fire Hydrants(s) within 75m	Fire Hydrant(s) within 150m	Available Combined Fire Flow (L/min)
Building 3.1 C	10,000	2	0	(2 x 5678) + (0 x 3785) = 11356
Building 3.2 D	10,000	2	0	(2 x 5678) + (0 x 3785) = 11356
Building 3.3 E	12,000	2	0	(2 x 5678) + (0 x 3785) = 11356

The total available fire flow from contributing hydrants is equal to **11356 L/min** each for building C, D and E, which is sufficient to provide adequate fire flow for the proposed development. A certified fire protection system specialist will need to be employed to design the building's fire suppression system and confirm the actual fire flow demand.

8.5 Boundary Conditions

The City of Ottawa was contacted to obtain boundary conditions associated with the estimated water demand, as indicated in the boundary request correspondence included in ***Appendix D***. Table 4 below summarizes the boundary conditions for the proposed development.

Table 4: Summary of Boundary Conditions

Scenario	Connection	
	Connection 1 Head (m)	Connection 2 Head (m)
Maximum HGL	143.3	143.2
Minimum HGL	143.6	143.6
Max Day plus Fire Flow #1	139.4	124.3

As shown in Table 4, the pressures in all scenarios satisfy the required pressure ranges stated in the *City of Ottawa Design Guidelines-Water Distribution* (see Table 1).

9 SANITARY SERVICE

9.1 Existing Sanitary Sewer Services

There is an existing municipal sanitary sewer being constructed within the Winisik Street right of way. As per pre-consultation with City staff, it is proposed that the proposed development will connect to the existing 250 mm dia. sanitary sewer within the Winisik Street right of way via a single 200 mm dia. sanitary service lateral. This lateral will service all the proposed buildings through the underground parking garage.

The 250mm dia Winisik Street sewer was designed as part of the Wateridge Village at Rockcliffe Phase 4 and the sanitary sewer design sheets can be found in the *Phase 4 report Appendix C.* Drainage area for Winisik Street sewer included development of Block 3, drainage area *MH320A – 1.48 ha*, total flow of 4.24 L/s.

9.2 Sanitary Sewer Service Design

The estimated post-development total sanitary flow is **6.68 L/s** accounting for the proposed residential population, commercial uses and infiltration allowances. The parameters included: an average daily flow of 280L/person/day, a commercial flow of 28,000L/ha/day, an extraneous flow allowance of 0.33L/s/ha, a residential peaking factor of 4, a commercial peaking factor of 1.5 and a total residential population of 488.5 persons. Details of the sanitary flow calculations are provided in **Appendix D.**

10 STORMWATER MANAGEMENT

10.1 Design Criteria

The stormwater management criteria for this development are based on the Wateridge Village Development Phase 4 Report, pre-consultation with City of Ottawa officials, City's 'Ottawa Design Guidelines Sewer', Second Edition, document no. SDG002, October 2012, City of Ottawa, including technical bulletins: ISDTB-2014-01, PIEDTB-2016-01, ISTB 2018-01, ISTB-2018-04, ISTB-2019-02.

Based on pre-consultation with the city on 9th September 2025, correspondence included in ***Appendix A***, the stormwater management strategy is to be consistent with Wateridge Village Development Phase 4 – Design Brief. The main points are as follows.

- Drainage area are to respect the Phase 4 report and approved drainage patters to be respected.
- Water Quality control is provided at the Eastern Stormwaters Management Facility.
- Water Quantity control shall conform to the Wateridge Phase 4 – Design Brief.

The Modified Rational Method has been used to calculate the runoff rate from the site to quantify the storage required for quantity control of the development.

10.2 Existing Stormwater Infrastructure and Management

The subject property forms part of the Wateridge Village Development. The Former CFB Rockcliffe Master Servicing Study was completed in 2015 and then updated in 2020. In summary the Wateridge Village at Rockcliffe site was design with two Stormwater Management Ponds, the Wester Stormwater Management Facility and the Eastern Stormwater Management Facility. The Eastern Pond was development during the Phase 1A design and put into service in 2017. According to Master Servicing Study (MSS) a series of local and trunk sewers collect the runoff from Phase 1 and 2 and route all runoff to the Eastern Stormwater Management Facility. *Figure 6.7* for the Master Servicing Study has been provided in ***Appendix E*** for reference.

10.3 Watershed Areas

10.3.1 Pre-Development Drainage

In pre-development conditions, drainage from subject lots is depicted by existing catchments ECA-01 (0.996 ha), drains uncontrolled overland towards Hemlock Road right-of-way. Refer to the Pre-development Watershed Plan C701 included in ***Appendix F*** for pre-development drainage characteristics. Refer to ***Appendix E*** for pre- and post-development watershed information. Table 1 below summarizes pre-development release rate.

The Wateridge Phase 4 design labels the Block 3 property as drainage area B319 and states that this block is to have minor system inflow restrictions to a 100-year flow as detailed in *Phase 4 Servicing Report Section 5 Tabel 5.3*. In addition, the storm sewer design sheet states a 5-year design flow for sewer sizing. Table 5 below summarizes restricted release rate.

Table 5: Summary of Pre-development Release Rate

Catchment	Area (ha)	Release Rate (L/s)		
		2-year	5-year	100-year
ECA-01	0.996			398
			282.18	

**Release rates as per Phase 4 Servicing report section -5*

10.3.2 Post-Development Drainage

The site has been analyzed, and post-development catchments have been allocated. The site is divided into a total of twenty-four (24) catchment areas. Refer to Post-development Watershed Plan C702 included in ***Appendix E***.

Catchment CA-01 to CA-04 (0.082 ha) consists mainly of the landscape grass area and paved entrance pathways along the west property boundary. Runoff from these catchments will flow uncontrolled overland and drain to Winisik Street.

Catchment CA-06 (0.020 ha) mainly consists of the area at the side of the building. This includes the asphalt ramp to the underground parking. The stormwater from the ramp will flow overland to a linear drain and controlled via a Storage Cistern proposed at the underground parking of building 3.2 D.

Catchment CA-11 (0.148 ha,) CA-13 (0.136 ha) and CA-22 *(0.110 ha)* comprise the building envelopes. The water will be collected by roofs drain and directed and controlled via a Storage Cistern proposed at the underground parking of building 3.2 D.

Catchment CA-07 to CA-10, CA-12, CA-14 to CA-16, CA-19 to CA-21, CA-23 & CA-24 (0.471 ha) mainly consists of the grass area, concrete sidewalk and paved backyards. The flow from these catchments will be collected by area drains and directed and controlled via a Storage Cistern proposed at the underground parking of building 3.2 D.

Catchment CA-17 & CA18 (0.117 ha) consists mainly of the landscape grass area, asphalt parking spots, asphalt road and concrete sidewalk. The flow from these catchments will be collected by area drains and directed and controlled via a Storage Cistern proposed at the underground parking of building 3.2 D.

To achieve the allowable post-development stormwater release rate, the proposed development will utilize a Cistern chamber at the underground parking of building D. Table 5 below summarizes post-development drainage areas. Refer to ***Appendix E*** for calculations detail.

Table 6: Post-development Catchment Areas and Runoff Coefficients

Catchment	Total Area (ha)	Combined C
CA-01 (un-controlled)	0.020	0.20
CA-02 (un-controlled)	0.029	0.44
CA-03 (un-controlled)	0.006	0.61
CA-04 (un-controlled)	0.027	0.42
CA-05 (un-controlled)	0.003	0.63
CA-06 (controlled)	0.020	0.81
CA-07 (controlled)	0.019	0.51
CA-08 (controlled)	0.018	0.58
CA-09 (controlled)	0.002	0.34
CA-10 (controlled)	0.002	0.35
CA-11 (controlled)	0.148	0.90
CA-12 (controlled)	0.137	0.55
CA-13 (controlled)	0.136	0.90
CA-14 (controlled)	0.009	0.48

CA-15 (controlled)	0.015	0.41
CA-16 (controlled)	0.011	0.44
CA-17 (controlled)	0.074	0.90
CA-18 (controlled)	0.043	0.90
CA-19 (controlled)	0.003	0.33
CA-20 (controlled)	0.042	0.53
CA-21 (controlled)	0.091	0.38
CA-22 (controlled)	0.110	0.90
CA-23 (controlled)	0.004	0.51
CA-24 (controlled)	0.028	0.55
Total	**0.996**	**0.70**

10.4 Proposed Stormwater Quantity Controls

The proposed stormwater management quantity control for this development will be accomplished by means of an underground Cistern storage. In accordance with the City of Ottawa's standard methodology for underground storage, an average release rate equal to 50% of the peak allowable release rate has been applied to account for the natural fluctuations in head-driven discharge rates from cisterns.

The allowable release rate for the site is to be 398 L/s as per the Phase 4 Wateridge Village Development Report. Although *Table 5.3 of the Phase 4 Wateridge Village Development Report* stated that the restricted flow from Block 3 (*B319 – 100-year design target*) is to be 398L/s the Phase 4 Sewer design sheets states that the design flow is 282.18 L/s (*5-year peak flow*). The controlled design flow of 282.18 L/s will be used for design purposes. Phase 4 Storm Sewer Design sheets have been included in ***Appendix E.***

A proposed 300 mm Ø free-flowing storm sewer service is proposed at the north-west corner of Building 3.2 (D), with a Storm Monitoring Manhole located in close proximity to the property line. This service will convey the controlled site flows for the site in its entirety to the existing 525 mm Ø Storm Sewer within the Winisik St right of way. The proposed servicing layout and connection points are shown on the Servicing Plan C401 in ***Appendix F.***

The total site area is **0.996 ha** with an allowable release rate of 282.18 L/s. The uncontrolled drainage flow was calculated to be 20.83 L/s, therefore the controlled release rate is required to be **261.17 L/s.** Fifty percent (50%) of the controlled release rate is **130.59 L/s**. This controlled release rate determined a storage volume of **178.96 m^3.** The available site storage volume is **175.00 m^3.** Design sheets have been provided in ***Appendix E***.

Table 6, below, summarizes post-development flow rates and required storage. Most of the roofs and asphalt parking area between buildings A and B will be controlled and the remainder of the site will be uncontrolled.

Table 7: Summary of 100 Year Release Rates and Storage Requirements

Catchment	**Drainage Area (ha)**	**100 Year Release Rate (L/s)**	**50% 100 Year Release Rate (L/s)**	**Increased 100 Year Required Storage(m^3)**
CA-06 to CA-24 (cistern_controlled)	0.911	261.17	130.89	178.96
CA-01 to CA-05 (uncontrolled)	0.085	20.83	NA	N/A
Total	**0.996**	**282.0**	**Storage Volume provide 180.0 m^3**	

Refer to ***Appendix E*** for storage calculations. The proposed cisterns will be installed within the underground parking area. Refer to Stormwater Management Plan C601 for the location of proposed cisterns.

11 EROSION & SEDIMENT CONTROL

During construction, best management practices (BMPs) shall be undertaken to Control Erosion and Sediment. These BMPs aim to minimize soil erosion, sedimentation, and other negative impacts on water quality and natural habitats. Some examples of BMPs for erosion and sediment control are:

- Controlling mud tracking by installing, maintaining, and using stabilized construction entrances and exits at all access locations. Mud matts shall be maintained and cleaned on a regular basis.
- Installing inlet sediment control devices to prevent surface erosion from entering any storm sewer system during construction; filter bags shall be placed under grates of nearby catch basins and structures.
- Establishing vegetation such as grasses and trees, can help stabilize soil and prevent erosion. In areas where vegetation is not present, consider planting native species that are well adapted to the local soil and climate conditions.
- Installing silt fences to trap sediment and prevent it from entering nearby waterways, to be erected along the perimeter of the site where runoff has the potential of leaving the site.
- Manage construction activities: Proper management of construction activities is essential to minimize soil disturbance and sedimentation. This may include controlling runoff from

disturbed areas, using proper excavation techniques, and minimizing the amount of time that soil is exposed.

- Implement good housekeeping practices: This includes properly managing and disposing of waste materials, regularly maintaining equipment to prevent leaks and spills, and keeping work areas clean and free of debris. It's important to note that the specific BMPs used for erosion and sediment control may vary depending on the site conditions and project requirements. Therefore, it's important to ensure that the appropriate BMPs are selected and implemented for this site.
- A Light Duty Straw Bail Barrier is to be installed downstream of the development's storm outlet within the Ditch as per OPSD 219.100.

12 CONCLUSION

This Stormwater Management and Servicing Report for the development proposed at 370 Codd's Road presents the rationale and details for the servicing requirements for the subject property. In accordance with the report objectives, the servicing requirements for the development are summarized below:

Water Service

- The minimum required fire flow was calculated at **12,000 L/min** using the FUS method.
- The anticipated water demands for the site are **1.34 L/s** (average daily), **4.19 L/s** (maximum daily), and **6.29 L/s** (maximum hourly).
- The new development will be serviced via two (2) 200mmØ water services from the 200mmØ City watermain located at the Winisik Street.

Sanitary Service

- The post-development total sanitary flow was calculated to be **6.69 L/s**, accounting for the proposed residential populations, amenity areas as well as a minor infiltration allowance.
- The proposed development will be serviced via a 200 mm diameter sanitary service lateral connected to the existing 250 mm diameter sanitary sewer located within the Winisik Street right of way.

Stormwater Management

- Stormwater quantity control objectives will be met via underground stormwater storage Cistern chamber, storm pipes, and structures.
- Post-development peak flows for the 100-yr events have been restrict as required to 282.18 L/s and restricted flows from the underground storage system have been restricted by 50%.
- The proposed stormwater management design will provide on-site storage volume of **180.00 m^3** within the Underground Cistern.
- The stormwater quality control objectives are not considered in this report, as it is provided at the Eastern Stormwater Management Facility.

13 Report Conditions and Limitations

The report conclusions are applicable only to this specific project described in the preceding pages. Any changes, modifications or additions will require a subsequent review by LRL Associates Ltd. to ensure compatibility with the recommendations contained in this document.

If you have any questions or comments, please contact the undersigned.

Prepared by:
LRL Associates Ltd.



Maxime Longtin
Civil Engineering Technologist

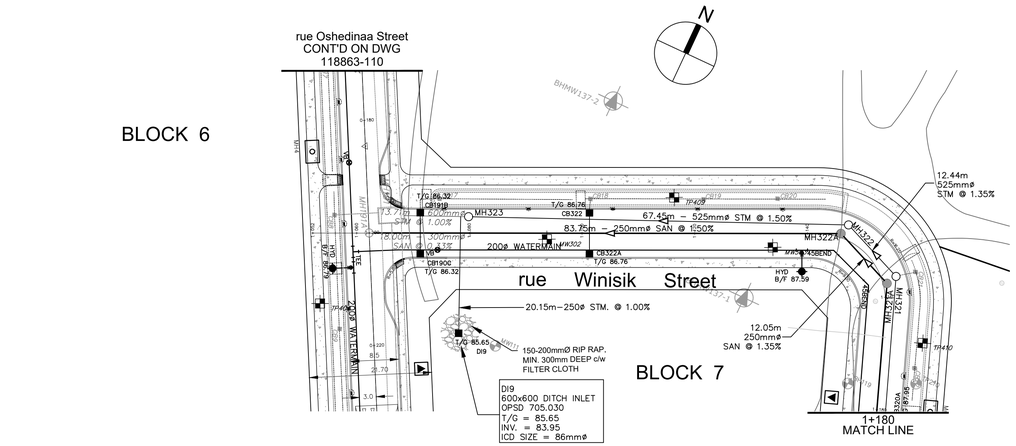


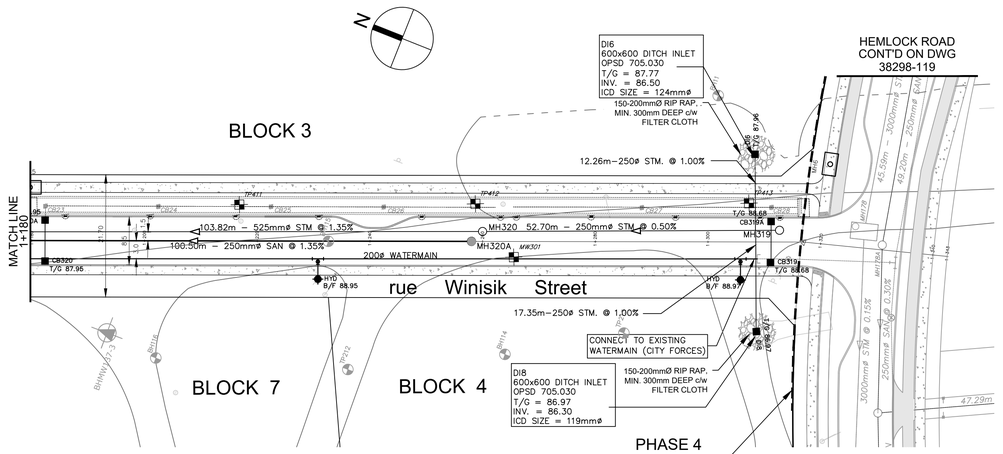


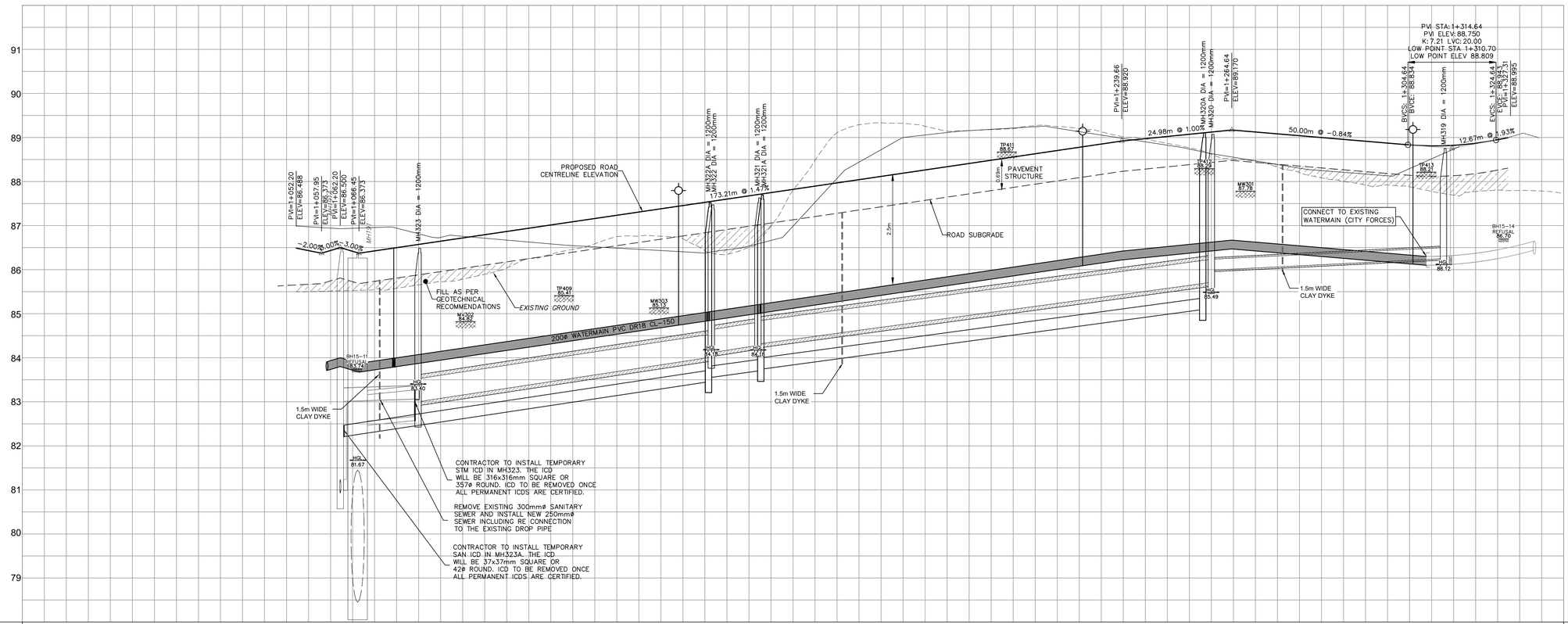
Kelly Paradis, PEng. PMP
Sr Manager of Civil Engineering

APPENDIX A

As-Built, Topographical Survey,
Pre-con Meeting Notes

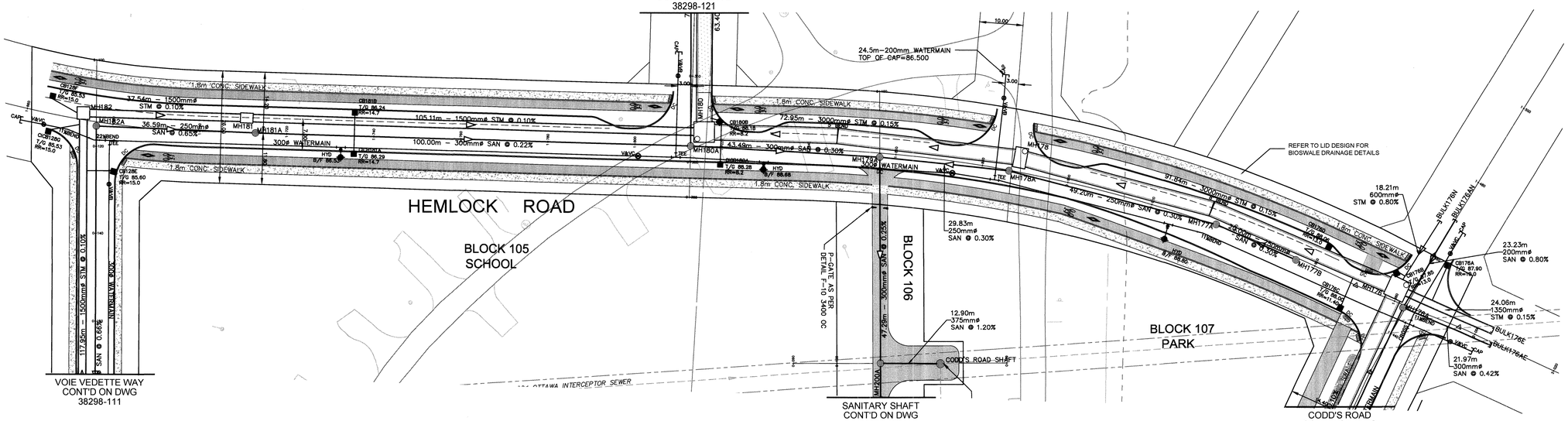

BLOCK 6
rue Oshedinaa Street
CONT'D ON DWG
118863-110
N
BHMW137-2
T/G 86.32
CB1918
MH323
T/G 86.76
CB322
67.45m – 525mmø STM @ 1.50%
83.75m – 250mmø SAN @ 1.50%
12.44m
525mmø
STM @ 1.35%
600mmø
STM @ 1.00%
300mmø
SAN @ 1.35%
200ø WATERMAIN
MW302
CB322A
T/G 86.76
CB1900
T/G 86.32
MH322A
MH322
T/G 86.65
DI9
150-200mmØ RIP RAP,
MIN. 300mm DEEP c/w
FILTER CLOTH
rue Winisik Street
20.15m–250ø STM. @ 1.00%
12.05m
250mmø
SAN @ 1.35%
HYD
B/F 87.59
BLOCK 7
1+180
MATCH LINE
DI9
600x600 DITCH INLET
OPSD 705.030
T/G = 85.65
INV. = 83.95
ICD SIZE = 86mmø


BLOCK 3
N
DI6
600x600 DITCH INLET
OPSD 705.030
T/G = 87.77
INV. = 86.50
ICD SIZE = 124mmø
150-200mmØ RIP RAP,
MIN. 300mm DEEP c/w
FILTER CLOTH
HEMLOCK ROAD
CONT'D ON DWG
38298-119
12.26m–250ø STM. @ 1.00%
MATCH LINE
1+180
103.82m – 525mmø STM @ 1.35%
100.00m – 250mmø SAN @ 1.35%
MH320 52.70m – 250mmø STM @ 0.50%
MH319
MH320A
200ø WATERMAIN
CB320
T/G 87.95
CB319
T/G 88.68
HYD
B/F 88.95
HYD
B/F 88.87
rue Winisik Street
17.35m–250ø STM. @ 1.00%
CONNECT TO EXISTING
WATERMAIN (CITY FORCES)
DI8
600x600 DITCH INLET
OPSD 705.030
T/G = 86.97
INV. = 86.30
ICD SIZE = 119mmø
150-200mmØ RIP RAP,
MIN. 300mm DEEP c/w
FILTER CLOTH
PHASE 4
CONSTRUCTION LIMITS
BLOCK 7
BLOCK 4


PROPOSED ROAD
CENTRELINE ELEVATION
PVI=1+052.20
ELEV=86.488
PVI=1+057.95
ELEV=86.373
PVI=1+062.20
ELEV=86.500
PVI=1+066.45
ELEV=86.373
2.00%
-0.00%
3.00%
MH323 DIA = 1200mm
MH322A DIA = 1200mm
MH322 DIA = 1200mm
MH321 DIA = 1200mm
MH321A DIA = 1200mm
173.21m @ 1.47%
FILL AS PER
GEOTECHNICAL
RECOMMENDATIONS
EXISTING GROUND
ROAD SUBGRADE
2.5m
0.61m
PAVEMENT
STRUCTURE
200ø WATERMAIN PVC DR18 CL-150
1.5m WIDE
CLAY DYKE
CONTRACTOR TO INSTALL TEMPORARY
STM ICD IN MH323. THE ICD
WILL BE 316x316mm SQUARE OR
357ø ROUND. ICD TO BE REMOVED ONCE
ALL PERMANENT ICDS ARE CERTIFIED.
REMOVE EXISTING 300mmø SANITARY
SEWER AND INSTALL NEW 250mmø
SEWER INCLUDING RE CONNECTION
TO THE EXISTING DROP PIPE
CONTRACTOR TO INSTALL TEMPORARY
SAN ICD IN MH323A. THE ICD
WILL BE 37x37mm SQUARE OR
42ø ROUND. ICD TO BE REMOVED ONCE
ALL PERMANENT ICDS ARE CERTIFIED.
PVI=1+230.66
ELEV=88.320
24.98m @ 1.00%
50.00m @ -0.84%
PVI=1+264.64
ELEV=88.170
MH320A DIA = 1200mm
MH320 DIA = 1200mm
PVI STA:1+314.64
PVI ELEV: 88.750
K: 7.21 LVC: 20.00
LOW POINT STA 1+310.70
LOW POINT ELEV 88.809
BVCE: 88.654
MH319 DIA = 1200mm
12.67m @ 0.93%
EVCE: 88.771
PVI=1+327.31
ELEV=88.995
CONNECT TO EXISTING
WATERMAIN (CITY FORCES)
1.5m WIDE
CLAY DYKE
BH15-14
PEUSAL
86.70
2022
HG
86.12
HG
85.49
HG
84.10
HG
81.67
BH15-11
PEUSAL
83.74
2022

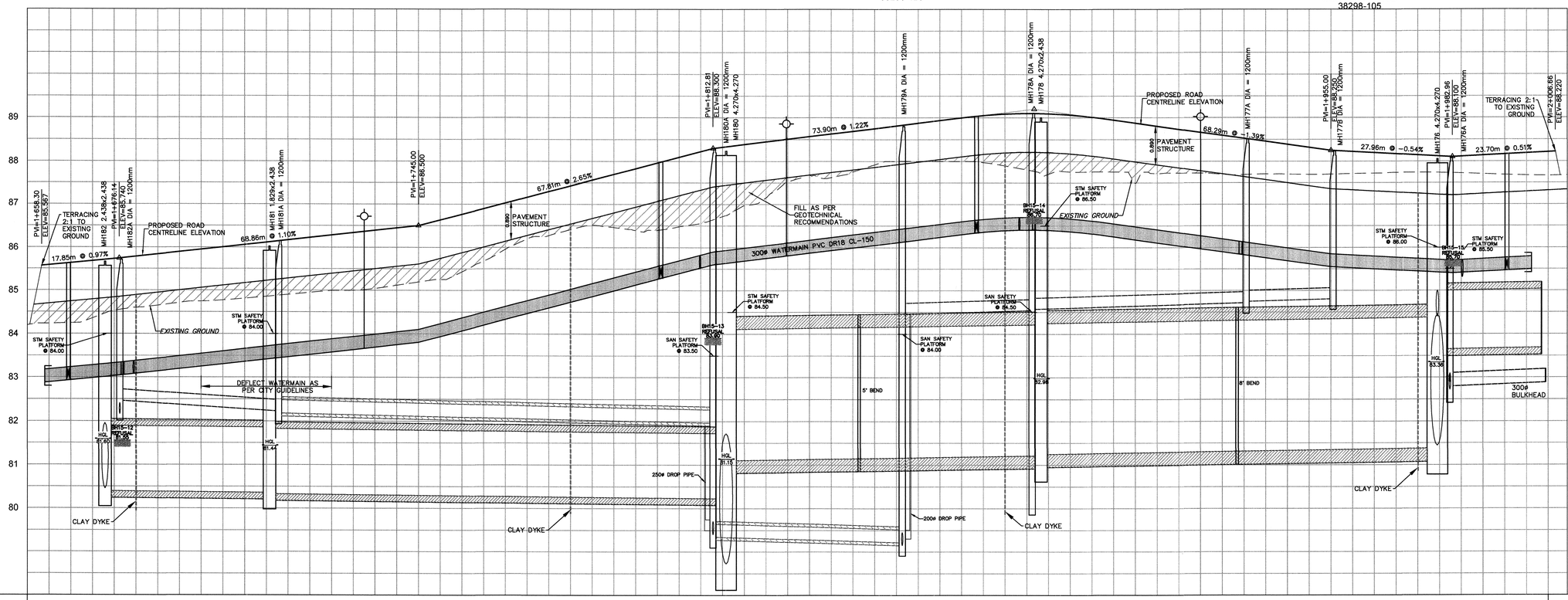
| | | |

REVIEWED BY
DEVELOPMENT REVIEW SERVICES BRANCH
Signed Will Lung
Date March 8 2016
Plan Number 17063

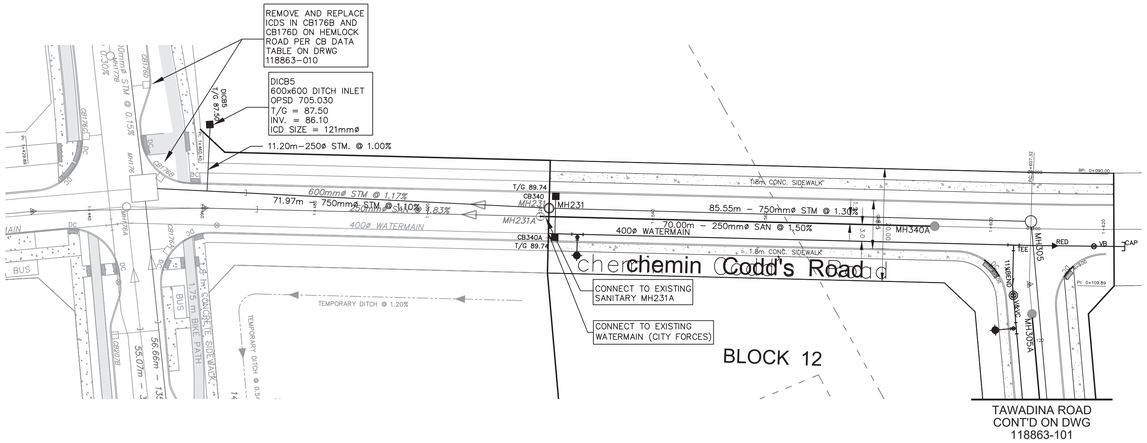


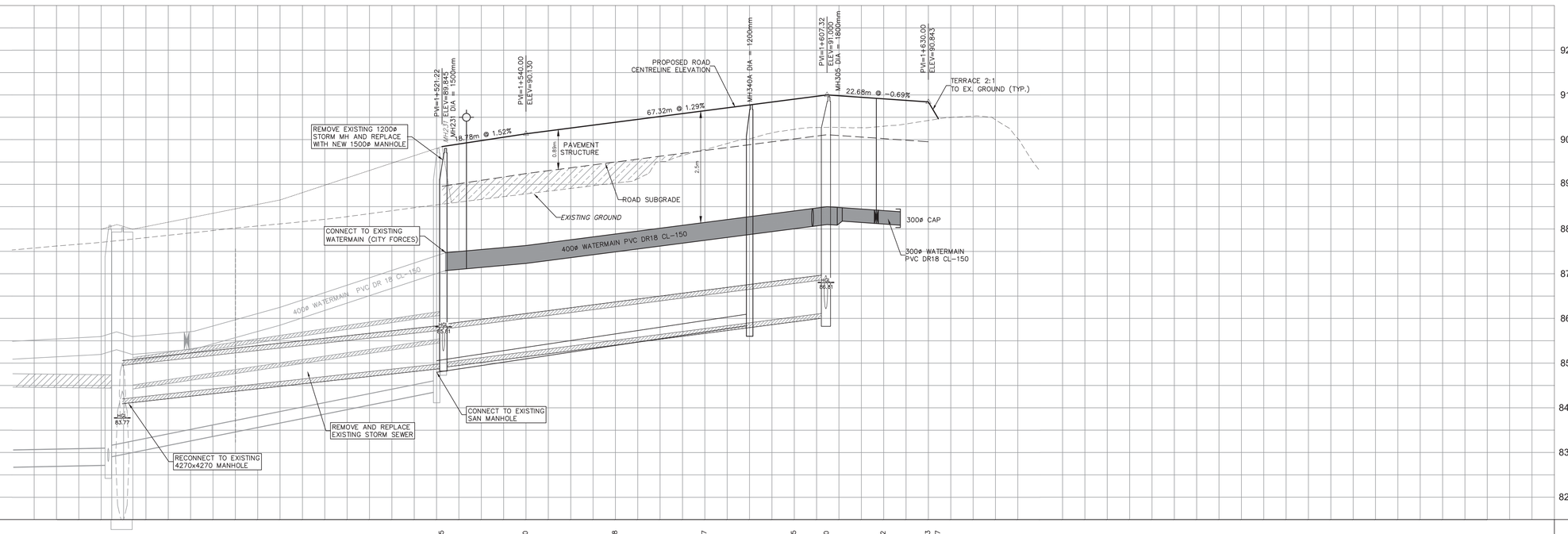


No.	REVISIONS	By	Date
14			
13			
12			
11			
10			
9			
8	ISSUED FOR CITY APPROVAL	J.I.M.	2016: 02: 29
7	ISSUED FOR MOE APPROVAL	J.I.M.	2016: 02: 18
6	REVISED PER CITY COMMENTS	J.I.M.	2016: 01: 27
5	REVISED PER CITY COMMENTS	J.I.M.	2015: 11: 30
4	REVISED PER CITY COMMENTS	J.I.M.	2015: 11: 20
3	REVISED PER CITY COMMENTS	J.I.M.	2015: 11: 13
2	ISSUED FOR CITY INTERNAL CIRCULATION	J.I.M.	2015: 09: 22
1	SUBMISSION No.1 FOR CITY REVIEW	J.I.M.	2015: 06: 30



| | | |


REMOVE AND REPLACE ICDS IN CB176B AND CB176D ON HEMLOCK ROAD PER CB DATA TABLE ON DRWG 118863-010
DICB5
600x600 DITCH INLET
OPSD 705.030
T/C = 87.50
INV. = 86.10
ICD SIZE = 121mmø
11.20m–250ø STM. @ 1.00%
600mmø STM @ 1.17%
71.97m – 750mmø STM @ 1.10%
250mmø SAN @ 1.83%
400ø WATERMAIN
T/G 89.74
CB340
MH231
MH231A
CB340A
85.55m – 750mmø STM @ 1.30%
70.00m – 250mmø SAN @ 1.50%
MH340A
MH305
1.8m CONC. SIDEWALK
CONNECT TO EXISTING SANITARY MH231A
CONNECT TO EXISTING WATERMAIN (CITY FORCES)
chemin Codd's Road
BLOCK 12
TEMPORARY DITCH @ 1.20%
TEMPORARY DITCH @ 0.5%
BUS
3.75m BIKE PATH
2.5m CONCRETE SIDEWALK
TAWADINA ROAD
CONT'D ON DWG
118863-101


PROPOSED ROAD CENTRELINE ELEVATION
PVI=1+521.22
ELEV=89.845
MH231
MH231A
DIA = 1200mm
PVI=1+540.00
ELEV=90.130
MH340A DIA = 1200mm
PVI=1+607.32
ELEV=91.000
MH305 DIA = 1800mm
PVI=1+630.00
ELEV=90.843
REMOVE EXISTING 1200ø STORM MH AND REPLACE WITH NEW 1500ø MANHOLE
18.78m @ 1.52%
67.32m @ 1.29%
22.68m @ –0.69%
TERRACE 2:1 TO EX. GROUND (TYP.)
0.89m
PAVEMENT STRUCTURE
2.5m
ROAD SUBGRADE
EXISTING GROUND
CONNECT TO EXISTING WATERMAIN (CITY FORCES)
400ø WATERMAIN PVC DR18 CL–150
300ø CAP
300ø WATERMAIN PVC DR18 CL–150
400ø WATERMAIN PVC DR 18 CL–150
86.81
86.16
HB
83.77
CONNECT TO EXISTING SAN MANHOLE
REMOVE AND REPLACE EXISTING STORM SEWER
RECONNECT TO EXISTING 4270x4270 MANHOLE

| | | |

TOPOGRAPHIC PLAN OF SURVEY OF

BLOCKS 1, 2 AND 3 REGISTERED PLAN 4M-1718 CITY OF OTTAWA

Surveyed by Annis, O'Sullivan, Vollebekk Ltd.

Revised December 5,2025 to show existing ground elevations after stock pile and boulder were removed.

Scale 1 : 300

12 9 6 3 0 6 12 Metres

Metric

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

Surveyor's Certificate

I CERTIFY THAT :

1. This survey and plan are correct and in accordance with the Surveys Act, the Surveyors Act and the regulations made under them.
2. The survey was completed on the 20th day of July, 2025.

JULY 24, 2025
Date

Mirel Aradau
Ontario Land Surveyor

Notes & Legend

Denotes

—□—	=	Survey Monument Planted
—■—	=	Survey Monument Found
SSIB	=	Short Standard Iron Bar
IB	=	Iron Bar
CC	=	Cut Cross
Meas.	=	Measured
(AOG)	=	Annis, O'Sullivan, Vollebekk Ltd.
(PI)	=	Registered Plan 4M-1718
○ MH-ST	=	Maintenance Hole (Storm Sewer)
○ MH-S	=	Maintenance Hole (Sanitary)
○ MH-H	=	Maintenance Hole (Hydro)
⊖ VC	=	Valve Chamber (Watermain)
—— OHW ——	=	Overhead Wires
∘ TP	=	Test Pit
○ LS	=	Light Standard
□ CB	=	Catch Basin
⊟ H-T	=	Hydro Transformer
⊣FH	=	Fire Hydrant
∘ B	=	Bollard
○ PO-W	=	Wood Pole
T/G	=	Top of Grate
TOS	=	Top of Slope
BOS	=	Bottom of Slope
SWC	=	Concrete Sidewalk
TWIS	=	Tactile Walking Surface Indicators
Ø	=	Diameter
+ 65.00	=	Location of Elevations
+ 65.00	=	Top of Concrete Curb Elevation
C/L	=	Centreline
	=	Property Line
	=	Deciduous Tree

ASSOCIATION OF ONTARIO LAND SURVEYORS
PLAN SUBMISSION FORM
V-110864

THIS PLAN IS NOT VALID UNLESS IT IS AN EMBOSSED ORIGINAL COPY ISSUED BY THE SURVEYOR In accordance with Regulation 1026, Section 29 (3).

SITE AREA BLOCK 1 = 1192.5 m²
SITE AREA BLOCK 2 = 6617.7 m²
SITE AREA BLOCK 3 = 9959.8 m²

All found bars are AOG unless otherwise noted.

Bearings are grid, derived from the easterly limit of Rue Oshedinna Street on Registered Plan 4M-1718, shown to be N27°29'10"W thereon, are referred to the Central Meridian of MTM Zone 9 (76°30' West Longitude) NAD-83 (original).

ELEVATION NOTES

1. Elevations shown are geodetic and are referred to City of Ottawa Vertical Benchmark No. 396 (01919680138), having an elevation of 95.06 metres, CGVD 28.
2. It is the responsibility of the user of this information to verify that the job benchmarks have not been altered or disturbed and that their relative elevation and description agrees with the information shown on this drawing.

UTILITY NOTES

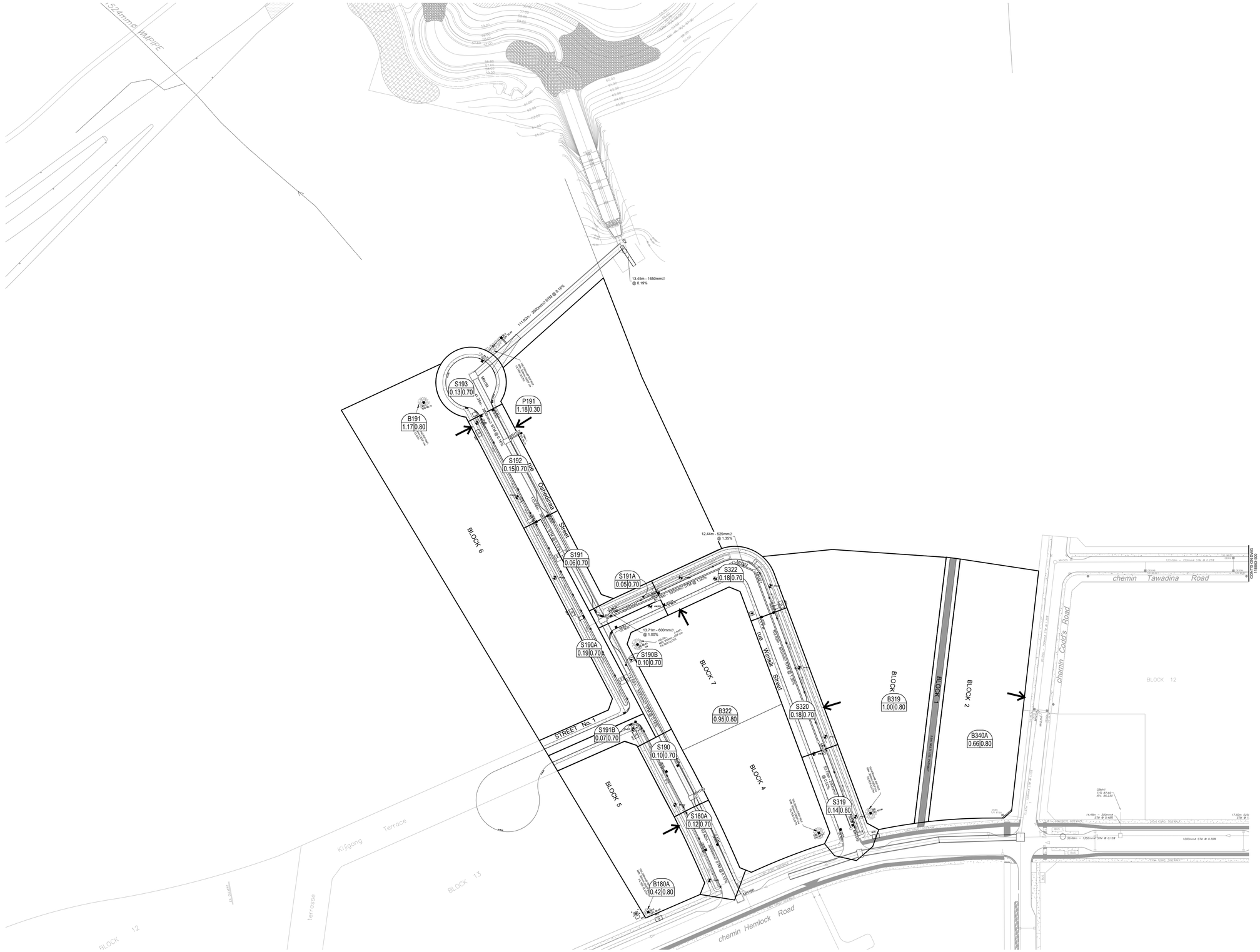
1. This drawing cannot be accepted as acknowledging all of the utilities and it will be the responsibility of the user to contact the respective utility authorities for confirmation.
2. Only visible surface utilities were located.
3. A field location of underground plant by the pertinent utility authority is mandatory before any work involving breaking ground, probing, excavating etc.

© Annis, O'Sullivan, Vollebekk Ltd. 2025. "THIS PLAN IS PROTECTED BY COPYRIGHT"

ANNIS, O'SULLIVAN, VOLLEBEKK LTD.
14 Concourse Gate, Suite 500
Nepean, Ont. K2E 7S6
Phone: (613) 727-0850 / Fax: (613) 727-1079
Email: Nepean@aovltd.com
Ontario Land Surveyors

Job No. 23640-25 NCH Trust Blks 1, 2and 3 4M-1718 0 05 - CHP4D


1524mmø WM PIPE
MH193A
1.69 319.2
MH323A
1.15 258.4
MH320A
1.48 330.6
MH240
0.43 59.6
MH170
0.23 81.7
MH190A
0.76 91.2
MH317A
MH317B
MH317C
MH317D
MH317E
MH317F
MH317G
MH317H
MH317J
MH317K
MH317L
MH317M
MH317N
MH317P
MH317Q
MH317R
MH317S
MH317T
MH317U
MH317V
MH317W
MH317X
MH317Y
MH317Z
MH177A
MH177B
MH176A
MH179A
MH179B
MH179C
MH179D
MH179E
MH179F
MH179G
MH179H
MH179J
MH179K
MH179L
MH179M
MH179N
MH179P
MH179Q
MH179R
MH179S
MH179T
MH179U
MH179V
MH179W
MH179X
MH179Y
MH179Z
MH180A
MH180B
MH180C
MH180D
MH180E
MH180F
MH180G
MH180H
MH180J
MH180K
MH180L
MH180M
MH180N
MH180P
MH180Q
MH180R
MH180S
MH180T
MH180U
MH180V
MH180W
MH180X
MH180Y
MH180Z
MH181A
MH181B
MH181C
MH181D
MH181E
MH181F
MH181G
MH181H
MH181J
MH181K
MH181L
MH181M
MH181N
MH181P
MH181Q
MH181R
MH181S
MH181T
MH181U
MH181V
MH181W
MH181X
MH181Y
MH181Z
MH182A
MH182B
MH182C
MH182D
MH182E
MH182F
MH182G
MH182H
MH182J
MH182K
MH182L
MH182M
MH182N
MH182P
MH182Q
MH182R
MH182S
MH182T
MH182U
MH182V
MH182W
MH182X
MH182Y
MH182Z
MH183A
MH183B
MH183C
MH183D
MH183E
MH183F
MH183G
MH183H
MH183J
MH183K
MH183L
MH183M
MH183N
MH183P
MH183Q
MH183R
MH183S
MH183T
MH183U
MH183V
MH183W
MH183X
MH183Y
MH183Z
MH184A
MH184B
MH184C
MH184D
MH184E
MH184F
MH184G
MH184H
MH184J
MH184K
MH184L
MH184M
MH184N
MH184P
MH184Q
MH184R
MH184S
MH184T
MH184U
MH184V
MH184W
MH184X
MH184Y
MH184Z
MH185A
MH185B
MH185C
MH185D
MH185E
MH185F
MH185G
MH185H
MH185J
MH185K
MH185L
MH185M
MH185N
MH185P
MH185Q
MH185R
MH185S
MH185T
MH185U
MH185V
MH185W
MH185X
MH185Y
MH185Z
MH186A
MH186B
MH186C
MH186D
MH186E
MH186F
MH186G
MH186H
MH186J
MH186K
MH186L
MH186M
MH186N
MH186P
MH186Q
MH186R
MH186S
MH186T
MH186U
MH186V
MH186W
MH186X
MH186Y
MH186Z
MH187A
MH187B
MH187C
MH187D
MH187E
MH187F
MH187G
MH187H
MH187J
MH187K
MH187L
MH187M
MH187N
MH187P
MH187Q
MH187R
MH187S
MH187T
MH187U
MH187V
MH187W
MH187X
MH187Y
MH187Z
MH188A
MH188B
MH188C
MH188D
MH188E
MH188F
MH188G
MH188H
MH188J
MH188K
MH188L
MH188M
MH188N
MH188P
MH188Q
MH188R
MH188S
MH188T
MH188U
MH188V
MH188W
MH188X
MH188Y
MH188Z
MH189A
MH189B
MH189C
MH189D
MH189E
MH189F
MH189G
MH189H
MH189J
MH189K
MH189L
MH189M
MH189N
MH189P
MH189Q
MH189R
MH189S
MH189T
MH189U
MH189V
MH189W
MH189X
MH189Y
MH189Z
MH190B
MH190C
MH190D
MH190E
MH190F
MH190G
MH190H
MH190J
MH190K
MH190L
MH190M
MH190N
MH190P
MH190Q
MH190R
MH190S
MH190T
MH190U
MH190V
MH190W
MH190X
MH190Y
MH190Z
MH191A
MH191B
MH191C
MH191D
MH191E
MH191F
MH191G
MH191H
MH191J
MH191K
MH191L
MH191M
MH191N
MH191P
MH191Q
MH191R
MH191S
MH191T
MH191U
MH191V
MH191W
MH191X
MH191Y
MH191Z
MH192A
MH192B
MH192C
MH192D
MH192E
MH192F
MH192G
MH192H
MH192J
MH192K
MH192L
MH192M
MH192N
MH192P
MH192Q
MH192R
MH192S
MH192T
MH192U
MH192V
MH192W
MH192X
MH192Y
MH192Z
MH193B
MH193C
MH193D
MH193E
MH193F
MH193G
MH193H
MH193J
MH193K
MH193L
MH193M
MH193N
MH193P
MH193Q
MH193R
MH193S
MH193T
MH193U
MH193V
MH193W
MH193X
MH193Y
MH193Z
MH194A
MH194B
MH194C
MH194D
MH194E
MH194F
MH194G
MH194H
MH194J
MH194K
MH194L
MH194M
MH194N
MH194P
MH194Q
MH194R
MH194S
MH194T
MH194U
MH194V
MH194W
MH194X
MH194Y
MH194Z
MH195A
MH195B
MH195C
MH195D
MH195E
MH195F
MH195G
MH195H
MH195J
MH195K
MH195L
MH195M
MH195N
MH195P
MH195Q
MH195R
MH195S
MH195T
MH195U
MH195V
MH195W
MH195X
MH195Y
MH195Z
MH196A



LEGEND :

S317
0.06 0.60

AREA NUMBER
RUNOFF COEFFICIENT
AREA IN HECTARES

PROPOSED SERVICE LATERAL LOCATION

KEY PLAN
NTS

No.	REVISIONS	By	Date
14			
13			
12			
11			
10			
9			
8			
7			
6			
5	SUBMISSION NO. 5 FOR CITY REVIEW	J.I.M.	2023.01.31
4	SUBMISSION NO. 4 FOR CITY REVIEW	J.I.M.	2022.09.23
3	SUBMISSION NO. 3 FOR CITY REVIEW	J.I.M.	2021.12.10
2	SUBMISSION NO. 2 FOR CITY REVIEW	J.I.M.	2020.07.08
1	SUBMISSION NO. 1 FOR CITY REVIEW	J.I.M.	2018.12.20

CANADA LANDS COMPANY
SOCIÉTÉ IMMOBILIÈRE DU CANADA
100 Queen Street
Ottawa,On
K1P 1J9

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

Project Title

WATERIDGE VILLAGE AT ROCKCLIFFE

PHASE 4

PROFESSIONAL ENGINEER
J. I. MOFFATT
2023/01/31
PROVINCE OF ONTARIO

N

Drawing Title

STORM DRAINAGE AREA PLAN

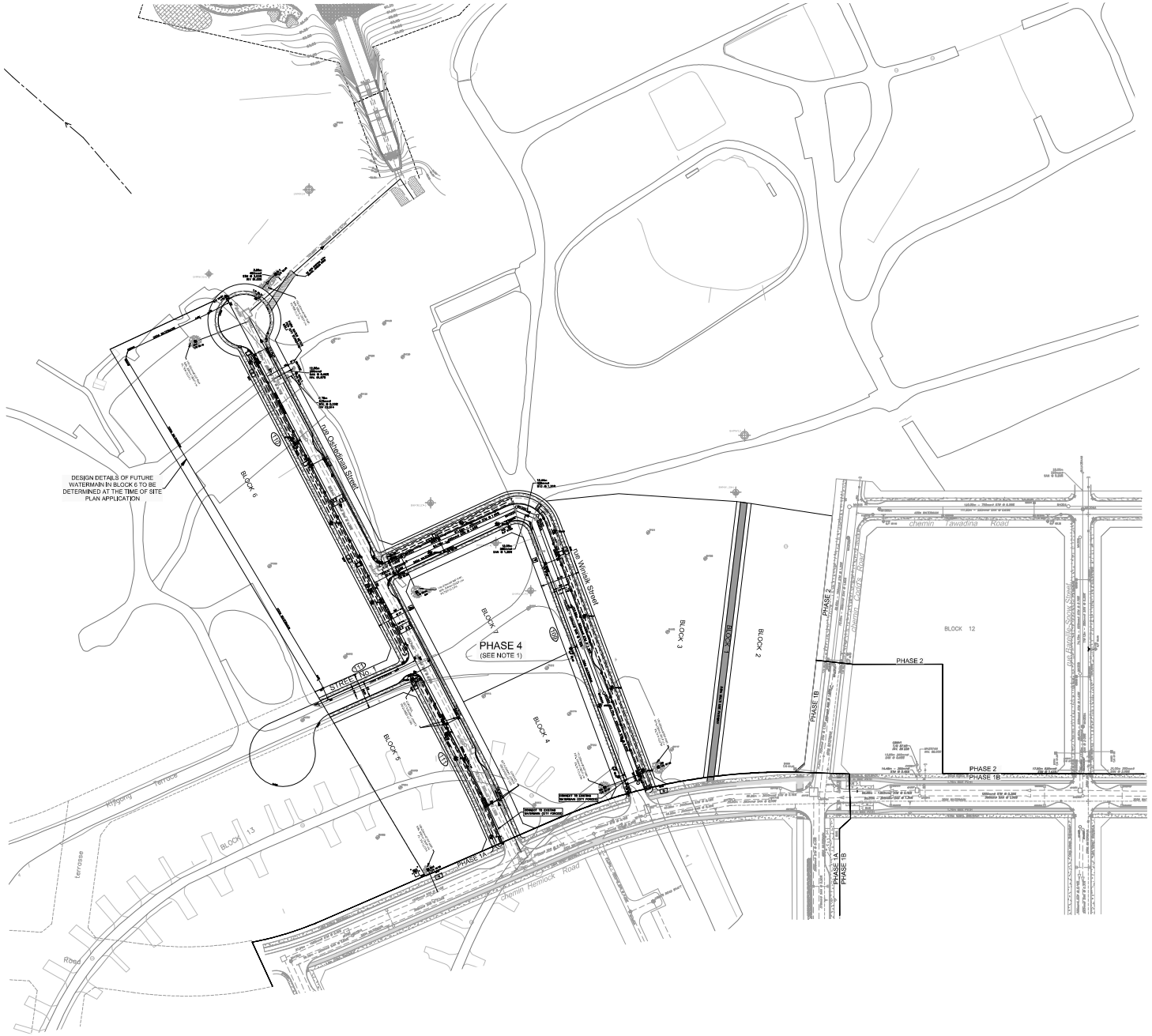
Scale
10 0 10 20
1:1000

Design	Date
J.I.M.	JUNE 2020
Drawn	Checked
M.M.	A.C.
Project No.	Drawing No.
118863	510

D07-16-15-0003_P4

#17063

J:\118863_Wtridge2A2B\3.0 Drawings\3.0\cad\Layouts\3.0 STORM.dwg Layout Name: 510 Plot Style: AIA STANDARD--HALF CTB Plot Scale: 1.50:0 Plotted At: 1/31/2023 11:59 AM Last Saved By: MMALNE Last Saved At: Jan 26, 23

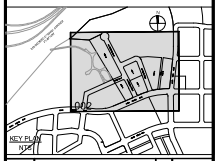


NOTES:

1. THE EXISTING STORM AND SANITARY SEWERS ON OSHEDINAA STREET, WHICH WERE INSTALLED AS PART OF THE PHASE 1A WORKS, ARE BASED ON RECORD INFORMATION.

2. THE FOLLOWING ASSUMPTIONS HAVE BEEN MADE IN THE SWM MODELING FOR THE PHASE 4 DEVELOPMENT BLOCKS:

- MINOR SYSTEM CAPTURE: 5 AND 100 YEAR SIMULATED FLOW (REFER TO REPORT TABLE 5-3)
- MAJOR SYSTEM STORAGE: NONE ASSUMED (REFER TO REPORT TABLE 5-2)
- MAJOR FLOW ROUTING: TO ADJACENT STREETS (REFER TO REPORT TABLE 5-7 AND DRAWING 751)



No.	REVISIONS	By	Date
14			
13			
12			
11			
10			
9			
8			
7			
6			
5	SUBMISSION NO. 5 FOR CITY REVIEW	JJM.	2023/01/31
4	SUBMISSION NO. 4 FOR CITY REVIEW	JJM.	2022/09/23
3	SUBMISSION NO. 3 FOR CITY REVIEW	JJM.	2021/12/10
2	SUBMISSION NO. 2 FOR CITY REVIEW	JJM.	2020/07/08
1	SUBMISSION NO. 1 FOR CITY REVIEW	JJM.	2019/12/20

CANADA LANDS COMPANY
SOCIÉTÉ IMMOBILIÈRE DU CANADA
100 Queen Street
Ottawa,On
K1P 1J9

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

Project Title:

WATERIDGE VILLAGE AT ROCKCLIFFE

PHASE 4

J. I. MOFFATT
2023/01/31

N

Drawing Title:

GENERAL PLAN OF SERVICES

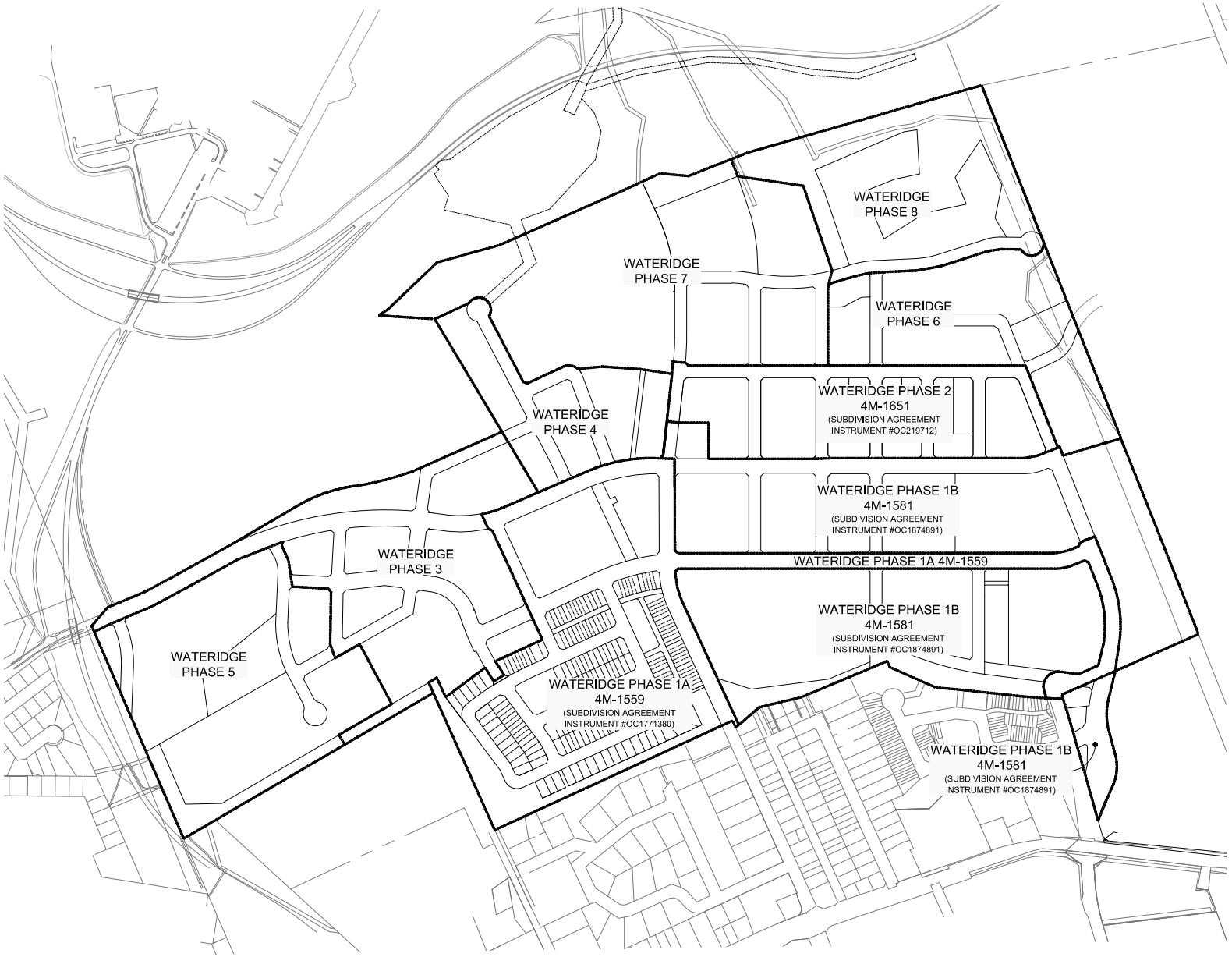
Scale: 1:1000

Design	Date
J.I.M.	JUNE 2020
Drawn	Checked
M.M.	A.C.
Project No.	Drawing No.
118863	002

D07-16-15-0003_P4

#17063

J:\118863_Wateridge\2.0 Design\2.2 Drawings\Civil\Layouts\002 GENERAL PLAN.dwg Layout Name: GENERAL PLAN Plot Style: AIA STANDARD.ctb(LOW QUALITY PLOTTING) Plot Scale: 1:1000 Plotted At: 1/31/2023 11:24 AM Last Saved By: MMUIE Last Saved At: Jan. 31,



No.	REVISIONS	By	Date
14			
13			
12			
11			
10			
9			
8			
7			
6			
5			
4			
3			
2			
1	SUBMISSION NO. 3 FOR CITY REVIEW	J.J.M.	2021.12.10

CANADA LANDS COMPANY
SOCIÉTÉ IMMOBILIÈRE DU CANADA
100 Queen Street
Ottawa,On
K1P 1J9

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

Project Title
WATERIDGE VILLAGE AT ROCKCLIFFE
PHASE 4

J. I. MOFFATT
2021/12/10
PROFESSIONAL ENGINEER
PROVINCE OF ONTARIO

N

Drawing Title
REGISTRATION PHASING AREA PLAN

Scale
1:2000

Design	Date
J.J.M.	JUNE 2020
Drawn	Checked
M.M.	A.C.
Project No.	Drawing No.
118863	003

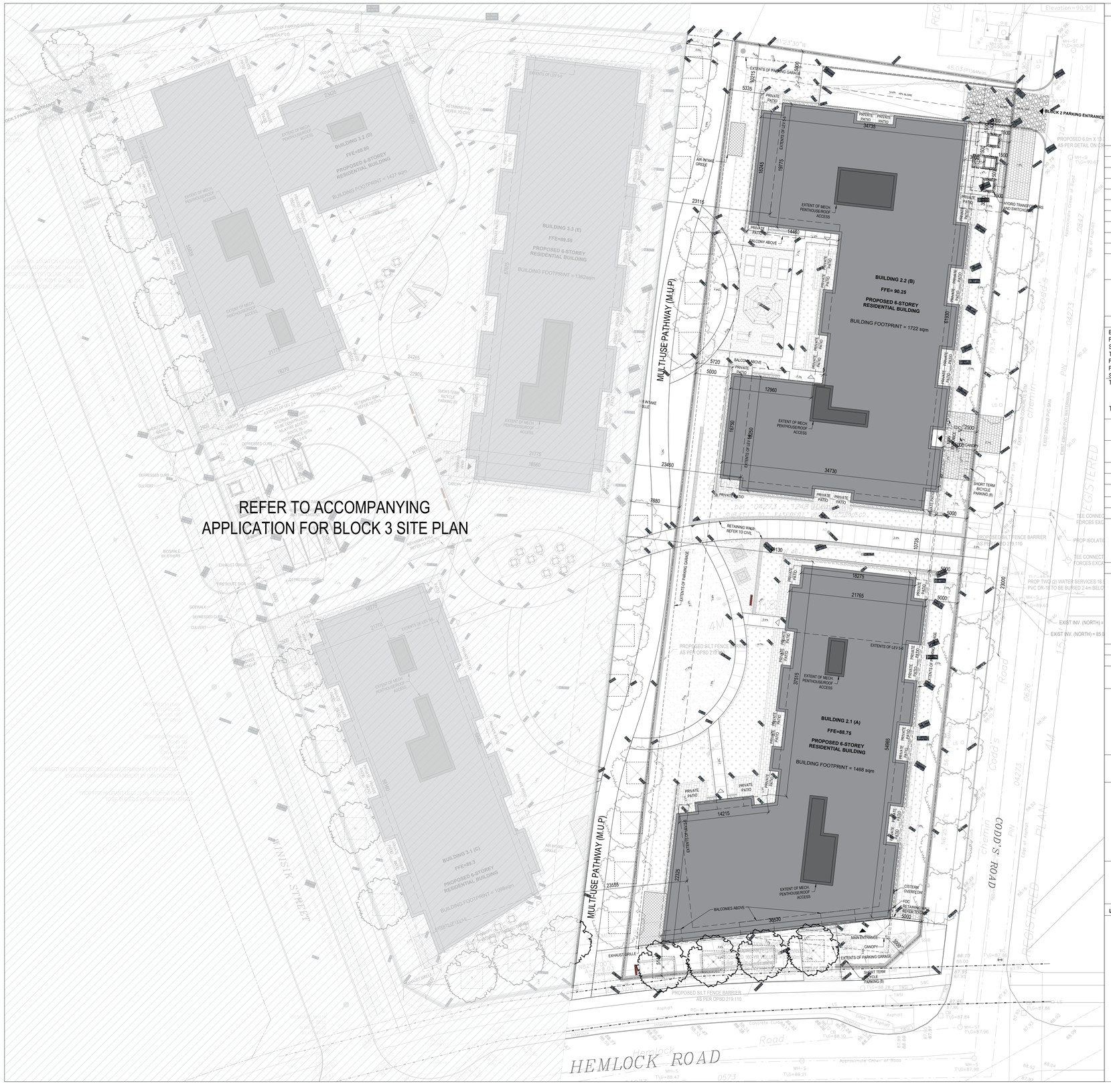
D07-16-15-0003_P4

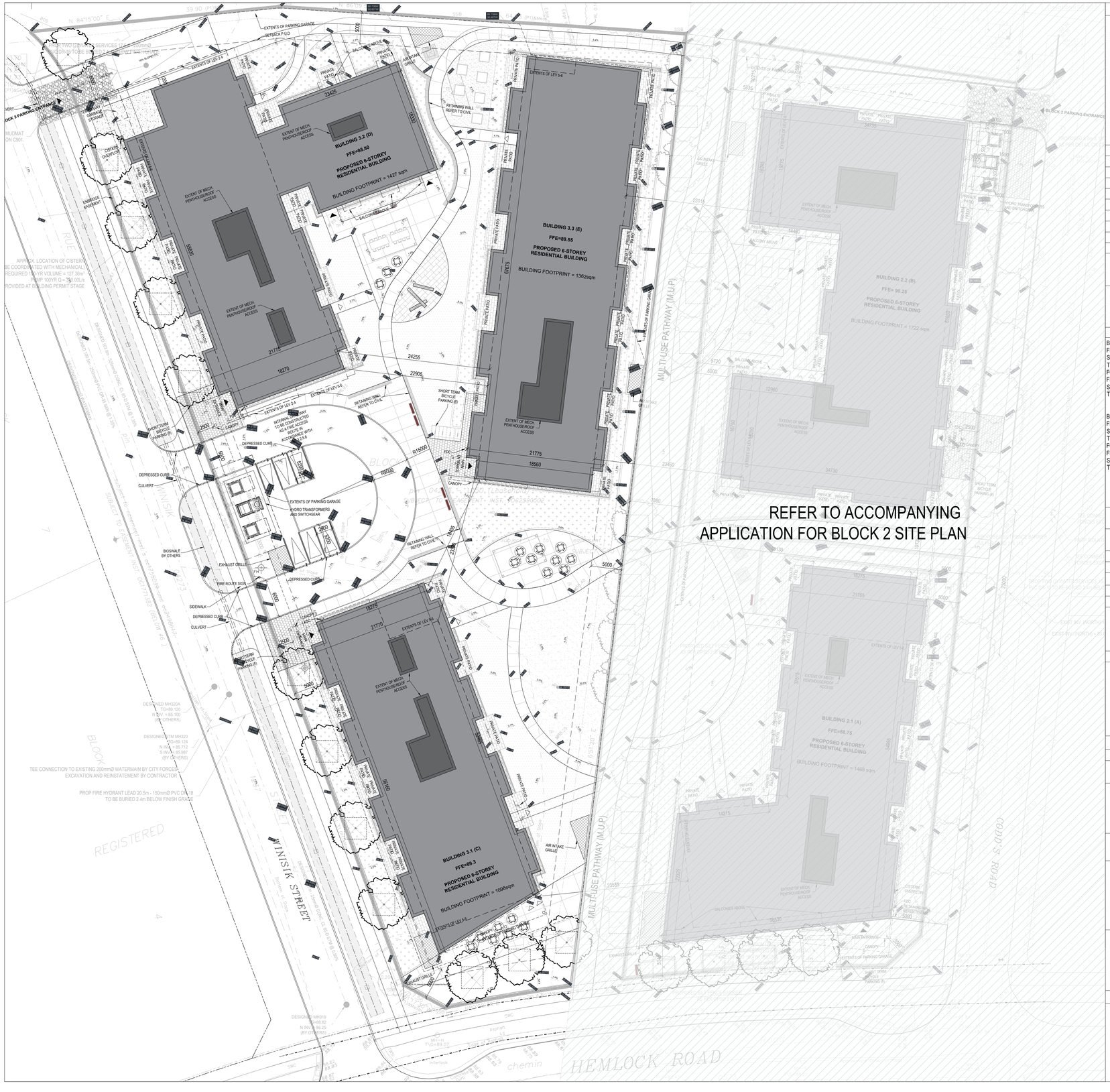
#17063

APPENDIX B

Site Plan

REFER TO ACCOMPANYING
APPLICATION FOR BLOCK 3 SITE PLAN


BUILDING 2.2 (B)
FFE= 90.25
PROPOSED 6-STOREY
RESIDENTIAL BUILDING
BUILDING FOOTPRINT = 1722 sqm
BUILDING 2.1 (A)
FFE=88.75
PROPOSED 6-STOREY
RESIDENTIAL BUILDING
BUILDING FOOTPRINT = 1468 sqm
BUILDING 3.2 (D)
FFE=88.80
PROPOSED 6-STOREY
RESIDENTIAL BUILDING
BUILDING FOOTPRINT = 1427 sqm
BUILDING 3.3 (E)
FFE=89.55
PROPOSED 6-STOREY
RESIDENTIAL BUILDING
BUILDING FOOTPRINT = 1362sqm
BUILDING 3.1 (C)
FFE=89.3
PROPOSED 6-STOREY
RESIDENTIAL BUILDING
BUILDING FOOTPRINT = 1096sqm
MULTI-USE PATHWAY (M.U.P)
HEMLOCK ROAD
CODD'S ROAD
BLOCK 2 PARKING ENTRANCE
BLOCK 3 PARKING ENTRANCE
MAIN ENTRANCE
CANOPY
BALCONIES ABOVE
EXTENTS OF PARKING GARAGE
EXTENT OF MECH. PENTHOUSE/ROOF ACCESS
EXTENTS OF LEV 5-6
PROPOSED SILT FENCE BARRIER AS PER OPSD 219.110
RETAINING WALL REFER TO CIVIL
AIR INTAKE GRILLE
EXHAUST GRILLE
SHORT TERM BICYCLE PARKING (B)
SHORT TERM BICYCLE PARKING (A)
CISTERN OVERFLOW
FDC
RETAINING WALL REFER TO CIVIL
PROPOSED 6.0m X 15.0m AS PER DETAIL ON OPSD 400.030
HYDRO TRANSFORMERS AND SWITCHGEAR
PROP ISOLATION VALVE
PROP TWO (2) WATER SERVICES 19mm PVC DR-11 TO BE BURIED 2.4m BELOW GRADE
EXIST INV. (NORTH) = 85.0
EXIST INV. (NORTH) = 85.0
PROPOSED SILT FENCE BARRIER AS PER OPSD 219.110
TEE CONNECTION FORCES EXCAVATION
TEE CONNECTION FORCES EXCAVATION
EXIST 300mm PVC STORM
EXIST 250mm PVC SAN
EXIST 200mm PVC WM
EXIST 600mm PVC STORM
EXIST 375mm PVC STORM
EXIST 300



KEY PLAN

PROPOSED SITE
800 Winisik Street
Block 3



PROPERTY DESCRIPTION

3x SIX STOREY RESIDENTIAL BUILDING

CITY OF OTTAWA PIN NUMBER	04273 - 1249, 04273 - 1250 (LEASEHOLD)
MUNICIPAL ADDRESS	800 Winisik Street

SITE INFORMATION

LOT AREA:	9958.66 m²
LOT FRONTAGE:	20.48 m
LOT DEPTH:	155.64 m

BUILDING INFORMATION

BUILDING AREA (OBC):
3.1: 1098 m²
3.2: 1427 m²
3.3: 1362 m²

BUILDING FLOOR AREA (OBC):
3.1: 5736m²
3.2: 7251m²
3.3: 7553m²
Parking: 8662m²

BUILDING FLOOR AREA (ZONING):
3.1: 5000m²
3.2: 6363m²
3.3: 6597m²

PROPOSED USE: APARTMENT DWELLING, MID-RISE

BUILDING 3.1		
FIRST FLOOR:	12 UNITS	9- 1 BD, 3- 2 BD, 0- 3 BD
SECOND FLOOR:	15 UNITS	10- 1 BD, 4- 2BD, 1- 3 BD
THIRD FLOOR:	15 UNITS	10- 1 BD, 4- 2BD, 1- 3 BD
FOURTH FLOOR:	15 UNITS	10- 1 BD, 4- 2BD, 1- 3 BD
FIFTH FLOOR:	13 UNITS	9- 1BD, 4- 2BD
SIXTH FLOOR:	13 UNITS	9- 1BD, 4- 2BD
TOTAL:	83 UNITS	57- 1 BD, 23- 2 BD, 3-3BD

BUILDING 3.2		
FIRST FLOOR:	13 UNITS	5- 1 BD, 7- 2 BD, 1- 3BD
SECOND FLOOR:	18 UNITS	8- 1 BD, 9- 2BD, 1- 3BD
THIRD FLOOR:	18 UNITS	8- 1 BD, 9- 2BD, 1- 3BD
FOURTH FLOOR:	18 UNITS	8- 1 BD, 9- 2BD, 1- 3BD
FIFTH FLOOR:	13 UNITS	5- 1BD, 8- 2BD
SIXTH FLOOR:	13 UNITS	5- 1BD, 8- 2BD
TOTAL:	93 UNITS	39- 1 BD, 50- 2 BD, 4- 3BD

BUILDING 3.3		
FIRST FLOOR:	16 UNITS	11- 1 BD, 4- 2 BD, 1- 3BD
SECOND FLOOR:	17 UNITS	9- 1 BD, 6- 2BD, 2- 3BD
THIRD FLOOR:	17 UNITS	9- 1 BD, 6- 2BD, 2- 3BD
FOURTH FLOOR:	17 UNITS	9- 1 BD, 6- 2BD, 2- 3BD
FIFTH FLOOR:	17 UNITS	11- 1BD, 5- 2BD, 1- 3BD
SIXTH FLOOR:	17 UNITS	11- 1BD, 5- 2BD, 1- 3BD
TOTAL:	101UNITS	60- 1 BD, 32- 2 BD, 9- 3BD

TOTAL UNITS: 277 UNITS

ZONING TABLE	CM1A H(20) *Planned Unit Development	
CITY OF OTTAWA ZONING BY-LAW No. 2008-250	REQUIRED	PROPOSED
MINIMUM LOT AREA	No minimum	
MINIMUM LOT WIDTH	No minimum	
FRONT YARD SETBACK	5m	B 3.1: 8m
HYDRO SETBACK	6m	14.6m
ROAD WIDENING EASEMENT (ROW)	N/A	N/A
MINIMUM SIDE YARD SETBACK	5m	M.U.P B 3.1: 7m B 3.3: 5m WINISIK ST: B 3.1: 5m B 3.2: 5m
MINIMUM REAR YARD SETBACK	5m	B 3.2: , B 3.3: 5m
MINIMUM SEPARATION DISTANCE	LEV 1-4: ref. article (31) (f) (the sum of the 25% of the height of the abutting buildings, per building) LEV 5-6: ref. article (31) (k) (2) (the minimum separation distance between portions of a building above four storeys is 23 metres)	LEV 1-4: 25%(19.24+19.24)= 9.62m LEV 5-6: 23m
MAXIMUM BUILDING HEIGHT	20m	3.1: 19.24m / 3.2: 19.24m / 3.3: 19.24m
MAXIMUM FLOOR SPACE INDEX	No maximum	
LANDSCAPED AREA	Abutting a street: 3m Other Cases: No minimum	5115m² or 51% LANDSCAPED AREA
VEHICLE PARKING REQUIREMENTS (AREA X, SCHEDULE 1A)	0 parking spaces for first 12 units Table 101 - Dwelling, Mid-high Rise Apartment 0.5 per dwelling unit = 133spaces Electric vehicles (E.V.) = 25% of total parking space	0.77 PARKING SPACE / UNIT 241 TOTAL PARKING SPACES E.V. = 65
VISITOR PARKING REQUIREMENTS (AREA X, SCHEDULE 1A)	0 parking spaces for first 12 units 0.1 per dwelling unit = 27 spaces	27 SPACES (6 OUTSIDE)
AMENITY AREA REQUIREMENTS	6m² per dwelling unit = 1662m² 50% Communal = 831m²	COMMUNAL -340m² OUTDOOR PLAZA (FRONT) -682m² OUTDOOR PLAZA (SIDE) -1359m² OUTDOOR GREENSPACE (REAR) -511m² ROOFTOP TERRACES TOTAL COMMUNAL: 2892m² BALCONIES -3.9m² X 277 units= 1080m² TOTAL AMENITY= 3972m²
BICYCLE PARKING SPACES (mid rise; apartment dwelling)	Required for Area B Inner Urban : long term : 1 per dwelling unit = 277 short term: 1 per 20 dwelling unit +2 = 16 inclusive bicycle parking: 5% of the total bicycle parking spaces	TOTAL: 277 + 24 = 301 INCLUSIVE: 15 LONG TERM: 262 SHORT TERM: 24

LEGEND OF SYMBOLS

- DESIGNATED BUILDING ENTRANCE / EXIT
- FH — FIRE HYDRANT. REFER TO CIVIL
- CB — CATCH BASIN
- MH — MANHOLE
- FD — FLOOR DRAIN
- UP — UTILITY POLE
- L.S. — LIGHT STANDARD
- DC — DEPRESSED CURB
- PROPOSED TREES
- TREES BY OTHERS
- 77.70 — EXISTING GROUND ELEVATION [TO DETERMINE EXISTING AVERAGE GRADE]
- 58.84 — NEW GROUND ELEVATION REFER TO CIVIL

NOTE: 'X'-E INDICATES EXISTING TO REMAIN

No.	Date	Émis pour / Object
01	2026-06-19	DRAFT SPC SITE PLAN

Ingénieur / Engineer
(Mécanique & Électricité / Mechanical & Electrical)

GWAL

Ingénieur / Engineer
(Structure / Structure)

D+M STRUCTURAL ENGINEERING

Architecte/ Architect
(paysagiste / Landscape)

NAK design strategies

Ingénieur / Engineer
(Civil / Civil)

LRL ENGINEERING

Client / Client

NEW COMMONS DEVELOPMENT

Architecte / Architect

fig. 1
3550, Saint-Antoine O.
Montréal QC H4C 1A9
T. 514 861-5122

fig. 2
252 Argyle Ave
Ottawa ON K2P 1B9
T. 613 695-6122

www.figurr.ca

figurr architects collective

Droit d'auteur / Copyright

Ce dessin est sujet au droit d'auteur. Il ne peut être reproduit pour quelques intentions ou usages que ce soit, il ne peut être utilisé uniquement avec l'apposition de la signature et de l'estampe originale.

This drawing is subject to copyright. It is not to be reproduced for any purpose or by any means, and may only be used if it bears an original stamp and signature.

Sceau / Seal

Note:

L'entrepreneur doit vérifier toutes les dimensions et informations sur le site et aviser immédiatement l'architecte de toutes erreurs ou omissions.

Contractor shall verify all information and dimensions on site and immediately report any errors or omissions to the architect.

Projet / Project

Wateridge Village Block 3

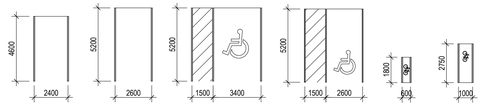
800 Winisik Street, Ottawa, ON K1K 3X3

Titre / Title

Site Plan

Dessiné par / Drawn by: GS	No. projet / Project number: *2513 / 2514*	
Vérifié par / Verified by: RC	No. dessin / Drawing number	Révision / Revision: 0
Échelle / Scale: *1:300*		
Date de création du dessin / Drawing creation date: 2026-01-20		A100

PARKING LEGEND



PARKING	
Type	Count
BF TYPE A	2
BF TYPE B	3
EV 2.6m X 5.2m	33
MOTORBIKE - 1.4m X 5.2m	2
REGULAR 2.6m X 5.2m	66
SMALL CAR 2.6m X 4.6m	6
VISITOR 2.6m X 5.2m	22

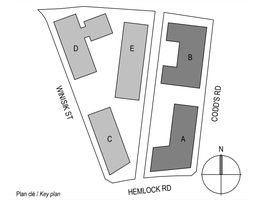
TOTAL: 132 CAR PARKING SPACES

BIKE PARKING	
Type	Count
1800 x 600mm - STACKED	110 (x2)
2750mm x 1000Mm - INCLUSIVE	12

TOTAL: 232 BICYCLE PARKING SPACES

STORAGE LOCKERS	
Type	Count
1441-11 LOCKERS	138

TOTAL: 138

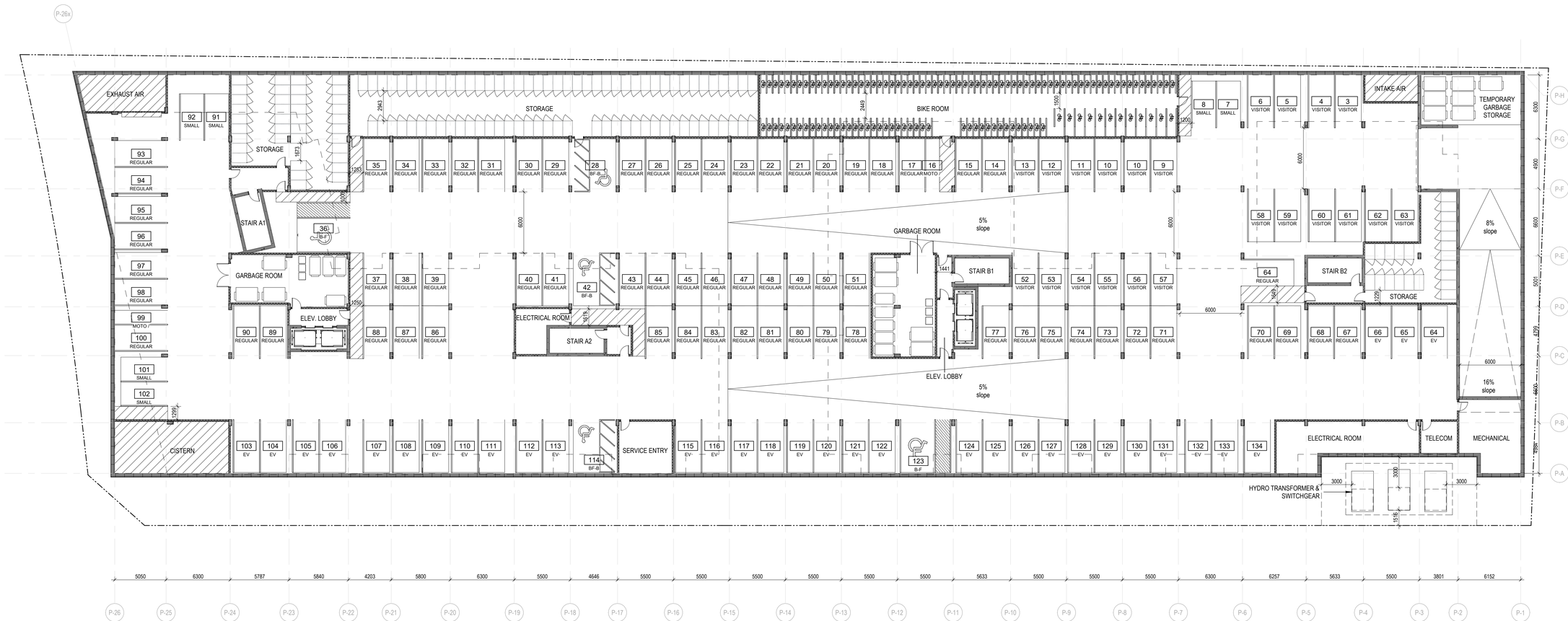


Plan clé / Key plan

GARBAGE CALCULATIONS

Building A (104 units)
4 CY Garbage: 0.11 × 104 units = 11.44 CY, requiring 3 containers.
2 CY GMP: 0.018 × 104 units = 1.87 CY, requiring 1 container.
2 CY Fibre: 0.038 × 104 units = 3.95 CY, requiring 2 containers.
240 L Organics: 104 ÷ 50 units = 2.08, requiring 3 carts.

Building B (128 units)
4 CY Garbage: 0.11 × 128 units = 14.08 CY, requiring 4 containers.
2 CY GMP: 0.018 × 128 units = 2.30 CY, requiring 2 containers.
2 CY Fibre: 0.038 × 128 units = 4.86 CY, requiring 3 containers.
240 L Organics: 128 ÷ 50 units = 2.56, requiring 3 carts.



N

FORMAT PAPIER / *SHEET SIZE* : ARCH D (24" X 36") DATE D'IMPRESSION / *PRINT DATE* : 2026-06-19 1:00:53 PM

No.	Date	Émis pour / Issuance	Par / By
5	2026-06-30	SPC APPLICATION	

PAS POUR CONSTRUCTION / *NOT FOR CONSTRUCTION*

NAK design strategies

LRL ENGINEERING

Structural Engineer

D+M STRUCTURAL ENGINEERING
333 Preston St Suite 110, Ottawa, ON K1S 5N4
613-631-9450

Mechanical & Electrical Engineer

Goodkey Weedmark *Consulting Engineers*
1688 Woodward Dr, Ottawa, ON K2C 3R8
613-727-5111

Client

NEW COMMONS DEVELOPMENT
400-119 Spadina Ave., Toronto, ON M5V 2L1
604-674-7441

Architecte / Architect

figurr — Architectes
www.figurr.ca
fg. 1
fg. 2
252, Argyle ave.
Ottawa ON K2P 1B9
T 613 695–6122

Droit d'auteur / *Copyright* ©2025

Ce dessin est sujet au droit d'auteur. Il ne peut être reproduit pour quelques intentions ou usages que ce soit, il ne peut être utilisé uniquement avec l'apposition de la signature et de l'estampe originale.

This drawing is subject to copyright. It is not to be reproduced for any purpose or by any means, and may only be used if it bears an original stamp and signature.

Sceau / *Seal*

Note:

L'entrepreneur doit vérifier toutes les dimensions et informations sur le site et aviser immédiatement l'architecte de toutes erreurs ou omissions.

Contractor shall verify all information and dimensions on site and immediately report any errors or omissions to the architect.

Projet / *Project*

Wateridge Village Block 2

Wateridge Village Block 2
360 Codd's Rd, Ottawa ON, K1K 3X3

Titre / *Title*

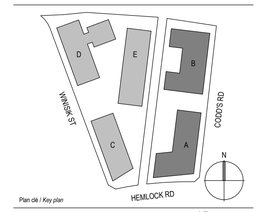
BLOCK 2 - PARKING PLAN

Dessiné par / *Drawn by*	Vérifié par / *Verified by*
ES	EC
Scellé par / *Stamped by*	No. projet / *Project number*
	2514
Échelle / *Scale*	No. dessin / *Drawing number*
1 : 200	A.120
Date de création de la feuille / *Sheet creation date*	Révision / *Revision*
2026/01/12	5

4.8%

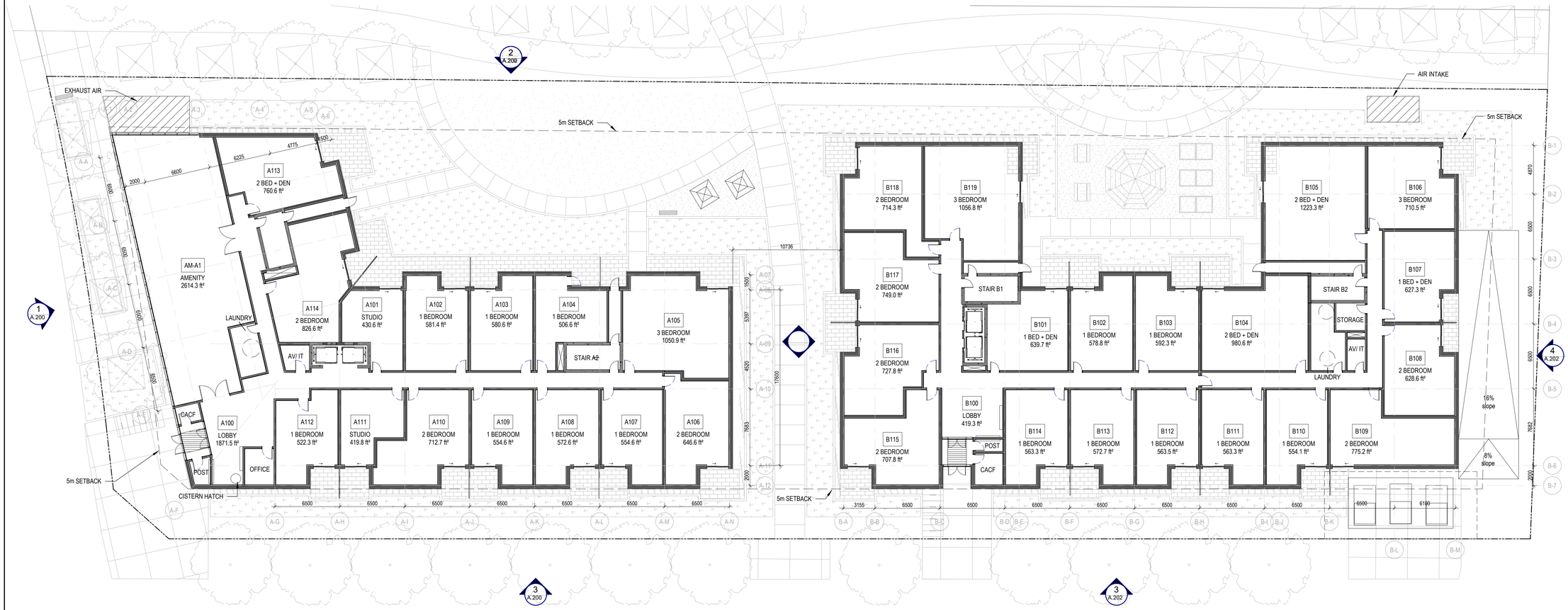
2.8%

UNIT COUNT LEV 1		
Level	Name	Count
B2.1 LEVEL 1	1 BEDROOM	7
B2.1 LEVEL 1	2 BED + DEN	1
B2.1 LEVEL 1	2 BEDROOM	3
B2.1 LEVEL 1	3 BEDROOM	1
B2.1 LEVEL 1	CACF	1
B2.1 LEVEL 1	OFFICE	1
B2.1 LEVEL 1	POST	1
B2.1 LEVEL 1	STUDIO	2
B2.2 LEVEL 1	1 BED + DEN	2
B2.2 LEVEL 1	1 BEDROOM	7
B2.2 LEVEL 1	2 BED + DEN	2
B2.2 LEVEL 1	2 BEDROOM	6
B2.2 LEVEL 1	3 BEDROOM	2
B2.2 LEVEL 1	CACF	1
B2.2 LEVEL 1	POST	1

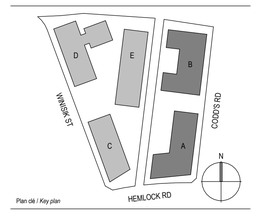


Plan clé / Key plan

5.0%


2
A.200
EXHAUST AIR
AIR INTAKE
5m SETBACK
5m SETBACK
5m SETBACK
A113
2 BED + DEN
760.6 ft²
AM-A1
AMENITY
2614.3 ft²
LAUNDRY
A114
2 BEDROOM
826.6 ft²
A101
STUDIO
430.6 ft²
A102
1 BEDROOM
581.4 ft²
A103
1 BEDROOM
580.6 ft²
A104
1 BEDROOM
506.6 ft²
A105
3 BEDROOM
1050.9 ft²
AV/ IT
STAIR A2
CACF
A100
LOBBY
1871.5 ft²
POST
OFFICE
CISTERN HATCH
A112
1 BEDROOM
522.3 ft²
A111
STUDIO
419.8 ft²
A110
2 BEDROOM
712.7 ft²
A109
1 BEDROOM
554.6 ft²
A108
1 BEDROOM
572.6 ft²
A107
1 BEDROOM
554.6 ft²
A106
2 BEDROOM
646.6 ft²
B118
2 BEDROOM
714.3 ft²
B119
3 BEDROOM
1056.8 ft²
B117
2 BEDROOM
749.0 ft²
B116
2 BEDROOM
727.8 ft²
B115
2 BEDROOM
707.8 ft²
STAIR B1
B101
1 BED + DEN
639.7 ft²
B102
1 BEDROOM
578.8 ft²
B103
1 BEDROOM
592.3 ft²
B104
2 BED + DEN
980.6 ft²
B100
LOBBY
419.3 ft²
POST
CACF
B114
1 BEDROOM
563.3 ft²
B113
1 BEDROOM
572.7 ft²
B112
1 BEDROOM
563.5 ft²
B111
1 BEDROOM
563.3 ft²
B110
1 BEDROOM
554.1 ft²
B109
2 BEDROOM
775.2 ft²
B105
2 BED + DEN
1223.3 ft²
B106
3 BEDROOM
710.5 ft²
B107
1 BED + DEN
627.3 ft²
B108
2 BEDROOM
628.6 ft²
STAIR B2
STORAGE
AV/ IT
LAUNDRY
16%
slope
8%
slope
1
A.200
3
A.200
3
A.202
4
A.202
10736
17600
6500
6500
6500

UNIT COUNT LEV 2-4		
Level	Name	Count
B2.1 LEVEL 2	1 BED + DEN	2
B2.1 LEVEL 2	1 BEDROOM	13
B2.1 LEVEL 2	2 BED + DEN	1
B2.1 LEVEL 2	2 BEDROOM	3
B2.1 LEVEL 2	STUDIO	2
B2.2 LEVEL 2	1 BED + DEN	1
B2.2 LEVEL 2	1 BEDROOM	11
B2.2 LEVEL 2	2 BED + DEN	1
B2.2 LEVEL 2	2 BEDROOM	8
B2.2 LEVEL 2	3 BEDROOM	1



Plan clé / Key plan



No.	Date	Émis pour / Issuance	Par / By
5	2026-06-30	SPC APPLICATION	

PAS POUR CONSTRUCTION /
NOT FOR CONSTRUCTION

NAK design strategies

LRL ENGINEERING

Structural Engineer

D+M STRUCTURAL ENGINEERING

333 Preston St Suite 110, Ottawa, ON K1S 5N4
613-691-9490

Mechanical & Electrical Engineer

Goodkey Weedmark *Consulting Engineers*

1688 Woodward Dr, Ottawa, ON K2C 3R8
613-727-5111

Client

NEW COMMONS DEVELOPMENT

405-119 Spadina Ave,. Toronto, ON M5V 2L1
604-874-7441

Architecte / *Architect*

figurr — Architect Collective

www.figurr.ca

fg. 1

fg. 2

252, Argyle ave.
Ottawa ON K2P 1B9
T 613 695-6122

Droit d'auteur / *Copyright* ©2025

Ce dessin est sujet au droit d'auteur. Il ne peut être reproduit pour quelques intentions ou usages que ce soit, il ne peut être utilisé uniquement avec l'apposition de la signature et de l'estampe originale.

This drawing is subject to copyright. It is not to be reproduced for any purpose or by any means, and may only be used if it bears an original stamp and signature.

Sceau / *Seal*

Note:

L'entrepreneur doit vérifier toutes les dimensions et informations sur le site et aviser immédiatement l'architecte de toutes erreurs ou omissions.

Contractor shall verify all information and dimensions on site and immediately report any errors or omissions to the architect.

Projet / *Project*

Wateridge Village Block 2

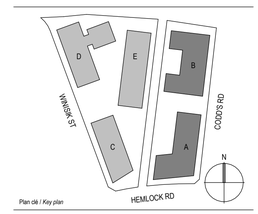
Wateridge Village Block 2
360 Codd's Rd, Ottawa ON, K1K 3X3

Titre / *Title*

BLOCK 2 - LEVEL 2-4

Dessiné par / *Drawn by*	Vérifié par / *Verified by*
G.S	K.C
Scellé par / *Stamped by*	No. projet / *Project number* 2514
Échelle / *Scale* 1 : 200	No. dessin / *Drawing number* A.122
Date de création de la feuille / *Sheet creation date* 2026/01/12	Révision / *Revision* 5

UNIT COUNT LEV 5-6		
Level	Name	Count
B2.1 LEVEL 5	1 BED + DEN	1
B2.1 LEVEL 5	1 BEDROOM	9
B2.1 LEVEL 5	2 BEDROOM	4
B2.1 LEVEL 5	STUDIO	1
B2.2 LEVEL 5	1 BED + DEN	1
B2.2 LEVEL 5	1 BEDROOM	11
B2.2 LEVEL 5	2 BED + DEN	2
B2.2 LEVEL 5	2 BEDROOM	6



Plan clé / Key plan



No.	Date	Émis pour / Issuance	Par / By
5	2026-06-30	SPC APPLICATION	

PAS POUR CONSTRUCTION / *NOT FOR CONSTRUCTION*

NAK design strategies

LRL ENGINEERING

Structural Engineer

D+M STRUCTURAL ENGINEERING

333 Preston St Suite 110, Ottawa, ON K1S 5N4
613-691-9490

Mechanical & Electrical Engineer

Goodkey Weedmark *Consulting Engineers*

1688 Woodward Dr, Ottawa, ON K2C 3R8
613-727-5111

Client

NEW COMMONS DEVELOPMENT

400-119 Spadina Ave., Toronto, ON M5V 2L1
604-674-7441

Architecte / *Architect*

figurr — Architectes

www.figurr.ca

fg. 1 fg. 2

252, Argyle ave.
Ottawa ON K2P 1B9
T 613 695-6122

Droit d'auteur / *Copyright* ©2025

Ce dessin est sujet au droit d'auteur. Il ne peut être reproduit pour quelques intentions ou usages que ce soit, il ne peut être utilisé uniquement avec l'apposition de la signature et de l'estampe originale.

This drawing is subject to copyright. It is not to be reproduced for any purpose or by any means, and may only be used if it bears an original stamp and signature.

Sceau / *Seal*

Note:

L'entrepreneur doit vérifier toutes les dimensions et informations sur le site et aviser immédiatement l'architecte de toutes erreurs ou omissions.

Contractor shall verify all information and dimensions on site and immediately report any errors or omissions to the architect.

Projet / *Project*

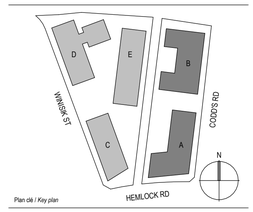
Wateridge Village Block 2

Wateridge Village Block 2
360 Codd's Rd, Ottawa ON, K1K 3X3

Titre / *Title*

BLOCK 2 - LEVEL 5

Dessiné par / *Drawn by*	Vérifié par / *Verified by*
R.S.	R.D.
Scellé par / *Stamped by*	No. projet / *Project number* 2514
Échelle / *Scale* 1 : 200	No. dessin / *Drawing number* A.123
Date de création de la feuille / *Sheet creation date* 2026/01/12	Révision / *Revision* 5



Plan clé / Key plan

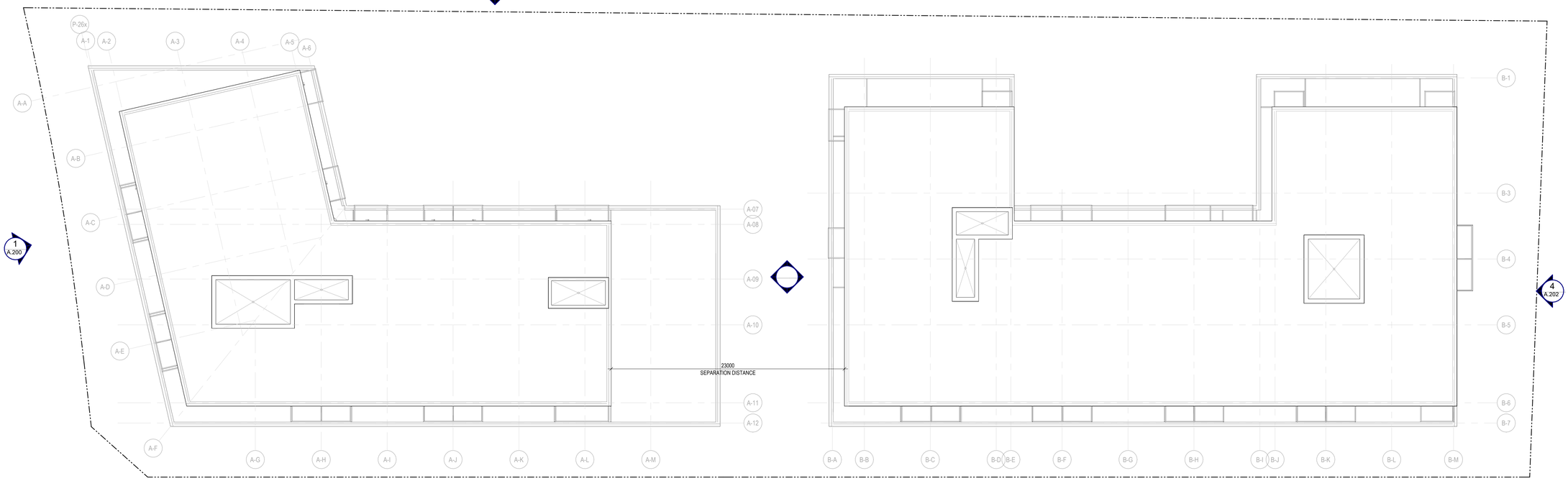
2
A.200

1
A.200

4
A.202

3
A.200

3
A.202



N

No.	Date	Émis pour / Issuance	Par / By
5	2026-06-30	SPC APPLICATION	

PAS POUR CONSTRUCTION /
NOT FOR CONSTRUCTION

NAK design strategies

LRL ENGINEERING

Structural Engineer

D+M STRUCTURAL ENGINEERING

333 Preston St Suite 110, Ottawa, ON K1S 5N4
613-691-9490

Mechanical & Electrical Engineer

Goodkey Weedmark *Consulting Engineers*

1688 Woodward Dr, Ottawa, ON K2C 3R8
613-727-0111

Client

NEW COMMONS DEVELOPMENT

400-119 Spadina Ave., Toronto, ON M5V 2L1
604-674-7441

Architecte / Architect

figurr — Architect collective

www.figurr.ca

fg. 1 fg. 2

252, Argyle ave.
Ottawa ON K2P 1B9
T. 613 695-6122

Droit d'auteur / *Copyright* ©2025

Ce dessin est sujet au droit d'auteur. Il ne peut être reproduit pour quelques intentions ou usages que ce soit, il ne peut être utilisé uniquement avec l'apposition de la signature et de l'estampe originale.

This drawing is subject to copyright. It is not to be reproduced for any purpose or by any means, and may only be used if it bears an original stamp and signature.

Sceau / *Seal*

Note:

L'entrepreneur doit vérifier toutes les dimensions et informations sur le site et aviser immédiatement l'architecte de toutes erreurs ou omissions.

Contractor shall verify all information and dimensions on site and immediately report any errors or omissions to the architect.

Projet / *Project*

Wateridge Village Block 2

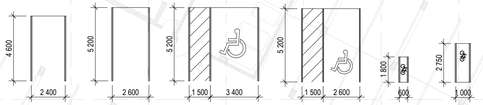
Wateridge Village Block 2
360 Codd's Rd, Ottawa ON, K1K 3X3

Titre / *Title*

BLOCK 2 - ROOF PLAN

Dessiné par / *Drawn by*	Vérifié par / *Verified by*
G.S.	R.C.
Scellé par / *Stamped by*	No. projet / *Project number* 2514 — Révision / *Revision* 5
Échelle / *Scale* 1 : 200	No. dessin / *Drawing number* A.125
Date de création de la feuille / *Sheet creation date* 08/25/25	

PARKING LEGEND



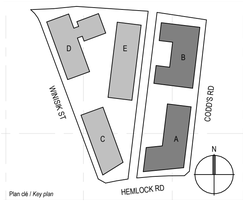
PARKING	
Type	Count
BF TYPE A - 3.4mX5.2m	3
BF TYPE B - 2.4mX5.2m	4
EV - 2.6m X 5.2m	65
MOTORBIKE 1.4m X 5.2m	3
REGULAR - 2.6m X 5.2m	139
SMALL CAR - 2.6m X 4.6m	2
VISITOR - 2.6m X 5.2m	22

TOTAL: 235 CAR PARKING SPACES

BIKE PARKING	
Type	Count
1800 x 600mm - FLOOR MOUNTED	53
1800 x 600mm - STACKED	105 (x2)
2750 x 1000mm - INCLUSIVE	14

TOTAL: 277 BICYCLE PARKING SPACES

STORAGE LOCKERS	
Type	Count
1441-11 LOCKERS	62
TOTAL: 62	



Plan clé / Key plan

GARBAGE CALCULATIONS

Building C (83 units):
4 CY Garbage: 0.11 × 83 units = 9.13 CY, requiring 3 containers.
2 CY GMP: 0.018 × 83 units = 1.49 CY, requiring 1 container.
2 CY Fibre: 0.038 × 83 units = 3.15 CY, requiring 2 containers.
240 L Organics: 83 ÷ 50 units = 1.66, requiring 2 carts.

Building D (93 units):
4 CY Garbage: 0.11 × 93 units = 10.23 CY, requiring 3 containers.
2 CY GMP: 0.018 × 93 units = 1.67 CY, requiring 1 container.
2 CY Fibre: 0.038 × 93 units = 3.53 CY, requiring 2 containers.
240 L Organics: 93 ÷ 50 units = 1.86, requiring 2 carts.

Building E (101 units):
4 CY Garbage: 0.11 × 101 units = 11.11 CY, requiring 3 containers.
2 CY GMP: 0.018 × 101 units = 1.82 CY, requiring 1 container.
2 CY Fibre: 0.038 × 101 units = 3.84 CY, requiring 2 containers.
240 L Organics: 101 ÷ 50 units = 2.02, requiring 3 carts.

No.	Date	Émis pour / Issuance	Par / By
1	2026-06-30	SPC APPLICATION	

PAS POUR CONSTRUCTION / *NOT FOR CONSTRUCTION*

Landscape Architect

NAK design strategies

1285 Wellington Street West, Ottawa, ON K1Y 3A8
613-237-2345

Civil Engineer

LRL ENGINEERING

5430 Canotek Rd, Ottawa, ON K1J 9G2
613-842-3434

Structural Engineer

D+M STRUCTURAL ENGINEERING

333 Preston St Suite 110, Ottawa, ON K1S 5N4
613-651-9450

Mechanical & Electrical Engineer

Goodkey Weedmark *Consulting Engineers*

1688 Woodward Dr, Ottawa, ON K2C 3R8
613-727-5111

Client

NEW COMMONS DEVELOPMENT

400-119 Spadina Ave., Toronto, ON M5V 2L1
604-674-7441

Architecte / *Architect*

figurr — Architectes/Architects
www.figurr.ca

fig. 1 — fig. 2
252, Argyle ave.
Ottawa ON K2P 1B9
T 613 695-6122

Droit d'auteur / *Copyright* ©2025

Ce dessin est sujet au droit d'auteur. Il ne peut être reproduit pour quelques intentions ou usages que ce soit, il ne peut être utilisé uniquement avec l'approbation de la signature et de l'estampe originale.

This drawing is subject to copyright. It is not to be reproduced for any purpose or by any means, and may only be used if it bears an original stamp and signature.

Sceau / *Seal*

Note:

L'entrepreneur doit vérifier toutes les dimensions et informations sur le site et aviser immédiatement l'architecte de toutes erreurs ou omissions.

Contractor shall verify all information and dimensions on site and immediately report any errors or omissions to the architect.

Projet / *Project*

Wateridge Village Block 3

Wateridge Village Block 3
800 Winisk St, Ottawa ON, K1K 3X3

Titre / *Title*

BLOCK 3 - PARKING PLAN

Dessiné par / *Drawn by*	Vérifié par / *Verified by*
CS	KD
Scellé par / *Stamped by*	No. projet / *Project number*
	2513/ 2514
Échelle / *Scale*	No. dessin / *Drawing number*
1 : 200	A.120
Date de création de la feuille / *Sheet creation date*	Révision / *Revision*
12/15/25	1

FORMAT PAPIER / *SHEET SIZE* : ARCH D (24" X 36") DATE D'IMPRESSION / *PRINT DATE* : 2026-06-19 1:23:15 PM



LEVEL 1 UNITS		
Level	Type	Count
B3.1 - LEVEL 1	1 BED + DEN	1
B3.1 - LEVEL 1	1 BEDROOM	8
B3.1 - LEVEL 1	2 BEDROOM	3
B3.1 - LEVEL 1	CACF	1
B3.1 - LEVEL 1	POST	1
B3.2 - LEVEL 1	1 BED + DEN	1
B3.2 - LEVEL 1	1 BEDROOM	4
B3.2 - LEVEL 1	2 BED + DEN	2
B3.2 - LEVEL 1	2 BEDROOM	5
B3.2 - LEVEL 1	3 BEDROOM	1
B3.2 - LEVEL 1	CACF	1
B3.2 - LEVEL 1	POST	1
B3.3 - LEVEL 1	1 BEDROOM	11
B3.3 - LEVEL 1	2 BED + DEN	2
B3.3 - LEVEL 1	2 BEDROOM	2
B3.3 - LEVEL 1	3 BEDROOM	1
B3.3 - LEVEL 1	CACF	1
B3.3 - LEVEL 1	POST	1

Plan clé / Key plan

No.	Date	Émis pour / Issuance	Par / By
1	2026-06-30	SPC APPLICATION	

PAS POUR CONSTRUCTION /
NOT FOR CONSTRUCTION

Landscape Architect

NAK design strategies

1285 Wellington Street West, Ottawa, ON K1Y 3A8
613-237-2345

Civil Engineer

LRL ENGINEERING

5430 Canotek Rd, Ottawa, ON K1J 9G2
613-842-3434

Structural Engineer

D+M STRUCTURAL ENGINEERING

333 Preston St Suite 110, Ottawa, ON K1S 5N4
613-691-9490

Mechanical & Electrical Engineer

Goodkey Weedmark *Consulting Engineers*

1688 Woodward Dr, Ottawa, ON K2C 3R8
613-727-5111

Client

NEW COMMONS DEVELOPMENT

400-119 Spadina Ave., Toronto, ON M5V 2L1
604-674-7441

Architecte / Architect

figurr — Architecture

www.figurr.ca

fig. 1

fig. 2

252, Argyle ave.
Ottawa ON K2P 1B9
T 613 695–6122

Droit d'auteur / Copyright ©2025

Ce dessin est sujet au droit d'auteur. Il ne peut être reproduit pour quelques intentions ou usages que ce soit, il ne peut être utilisé uniquement avec l'apposition de la signature et de l'estampe originale.

This drawing is subject to copyright. It is not to be reproduced for any purpose or by any means, and may only be used if it bears an original stamp and signature.

Sceau / Seal

Note:

L'entrepreneur doit vérifier toutes les dimensions et informations sur le site et aviser immédiatement l'architecte de toutes erreurs ou omissions.

Contractor shall verify all information and dimensions on site and immediately report any errors or omissions to the architect.

Projet / Project

Wateridge Village Block 3

Wateridge Village Block 3
800 Winisik St, Ottawa ON, K1K 3X3

Titre / Title

BLOCK 3 - LEVEL 1

Dessiné par / *Drawn by* G.S	Vérifié par / *Verified by* K.C
Scellé par / Stamped by	No. projet / *Project number* 2513/ 2514
Échelle / *Scale* 1 : 200	Révision / *Revision* 1
Date de création de la feuille / *Sheet creation date* 12/15/25	No. dessin / *Drawing number* A.121

FORMAT PAPIER / *SHEET SIZE* : ARCH D (24" X 36") DATE D'IMPRESSION / *PRINT DATE* : 2026-06-19 1:23:16 PM



LEVEL 2-4 UNITS		
Level	Type	Count
B3.1 - LEVEL 2	1 BEDROOM	9
B3.1 - LEVEL 2	2 BEDROOM	5
B3.1 - LEVEL 2	3 BEDROOM	1
B3.2 - LEVEL 2	1 BED + DEN	1
B3.2 - LEVEL 2	1 BEDROOM	7
B3.2 - LEVEL 2	2 BED + DEN	4
B3.2 - LEVEL 2	2 BEDROOM	5
B3.2 - LEVEL 2	3 BEDROOM	1
B3.3 - LEVEL 2	1 BEDROOM	9
B3.3 - LEVEL 2	2 BED + DEN	2
B3.3 - LEVEL 2	2 BEDROOM	4
B3.3 - LEVEL 2	3 BEDROOM	2

No.	Date	Émis pour / Issuance	Par / By
1	2026-06-30	SPC APPLICATION	

PAS POUR CONSTRUCTION /
NOT FOR CONSTRUCTION

Landscape Architect

NAK design strategies

1285 Wellington Street West, Ottawa, ON K1Y 3A8
613-237-2345

Civil Engineer

LRL ENGINEERING

5430 Canotek Rd, Ottawa, ON K1J 9G2
613-842-3434

Structural Engineer

D+M STRUCTURAL ENGINEERING

333 Preston St Suite 110, Ottawa, ON K1S 5N4
613-691-9490

Mechanical & Electrical Engineer

Goodkey Weedmark *Consulting Engineers*

1688 Woodward Dr, Ottawa, ON K2C 3R8
613-727-5111

Client

NEW COMMONS DEVELOPMENT

400-119 Spadina Ave., Toronto, ON M5V 2L1
604-674-7441

Architecte / *Architect*

figurr — Architecture

www.figurr.ca

fig. 1

fig. 2

252, Argyle ave.
Ottawa ON K2P 1B9
T 613 695–6122

Droit d'auteur / *Copyright* ©2025

Ce dessin est sujet au droit d'auteur. Il ne peut être reproduit pour quelques intentions ou usages que ce soit, il ne peut être utilisé uniquement avec l'apposition de la signature et de l'estampe originale.

This drawing is subject to copyright. It is not to be reproduced for any purpose or by any means, and may only be used if it bears an original stamp and signature.

Sceau / *Seal*

Note:

L'entrepreneur doit vérifier toutes les dimensions et informations sur le site et aviser immédiatement l'architecte de toutes erreurs ou omissions.

Contractor shall verify all information and dimensions on site and immediately report any errors or omissions to the architect.

Projet / *Project*

Wateridge Village Block 3

Wateridge Village Block 3
800 Winisik St, Ottawa ON, K1K 3X3

Titre / *Title*

BLOCK 3 - LEVEL 2-4

Dessiné par / *Drawn by*	Vérifié par / *Verified by*
G.S	K.C
Scellé par / *Stamped by*	No. projet / *Project number* 2513/ 2514
Échelle / *Scale* 1 : 200	No. dessin / *Drawing number*
Date de création de la feuille / *Sheet creation date* 12/15/25	A.122

Révision / *Revision* 1

FORMAT PAPIER / *SHEET SIZE* : ARCH D (24" X 36") DATE D'IMPRESSION / *PRINT DATE* : 2026-06-19 1:23:18 PM



LEVEL 5-6 UNITS		
Level	Type	Count
B3.1 - LEVEL 5	1 BEDROOM	9
B3.1 - LEVEL 5	2 BEDROOM	4
B3.2 - LEVEL 5	1 BED + DEN	1
B3.2 - LEVEL 5	1 BEDROOM	4
B3.2 - LEVEL 5	2 BEDROOM	8
B3.3 - LEVEL 5	1 BEDROOM	11
B3.3 - LEVEL 5	2 BEDROOM	5
B3.3 - LEVEL 5	3 BEDROOM	1

Plan clé / Key plan

No.	Date	Émis pour / Issuance	Par / By
1	2026-06-30	SPC APPLICATION	

PAS POUR CONSTRUCTION / *NOT FOR CONSTRUCTION*

Landscape Architect

NAK design strategies

1285 Wellington Street West, Ottawa, ON K1Y 3A8
613-237-2345

Civil Engineer

LRL ENGINEERING

5430 Canotek Rd, Ottawa, ON K1J 9G2
613-842-3434

Structural Engineer

D+M STRUCTURAL ENGINEERING

333 Preston St Suite 110, Ottawa, ON K1S 5N4
613-691-9490

Mechanical & Electrical Engineer

Goodkey Weedmark *Consulting Engineers*

1688 Woodward Dr, Ottawa, ON K2C 3R8
613-727-5111

Client

NEW COMMONS DEVELOPMENT

400-119 Spadina Ave., Toronto, ON M5V 2L1
604-674-7441

Architecte / *Architect*

figurr — Architectes

www.figurr.ca

fg. 1 fg. 2

252, Argyle ave.
Ottawa ON K2P 1B9
T 613 695-6122

Droit d'auteur / *Copyright* ©2025

Ce dessin est sujet au droit d'auteur. Il ne peut être reproduit pour quelques intentions ou usages que ce soit, il ne peut être utilisé uniquement avec l'apposition de la signature et de l'estampe originale.

This drawing is subject to copyright. It is not to be reproduced for any purpose or by any means, and may only be used if it bears an original stamp and signature.

Sceau / *Seal*

Note:

L'entrepreneur doit vérifier toutes les dimensions et informations sur le site et aviser immédiatement l'architecte de toutes erreurs ou omissions.

Contractor shall verify all information and dimensions on site and immediately report any errors or omissions to the architect.

Projet / *Project*

Wateridge Village Block 3

Wateridge Village Block 3
800 Winisik St, Ottawa ON, K1K 3X3

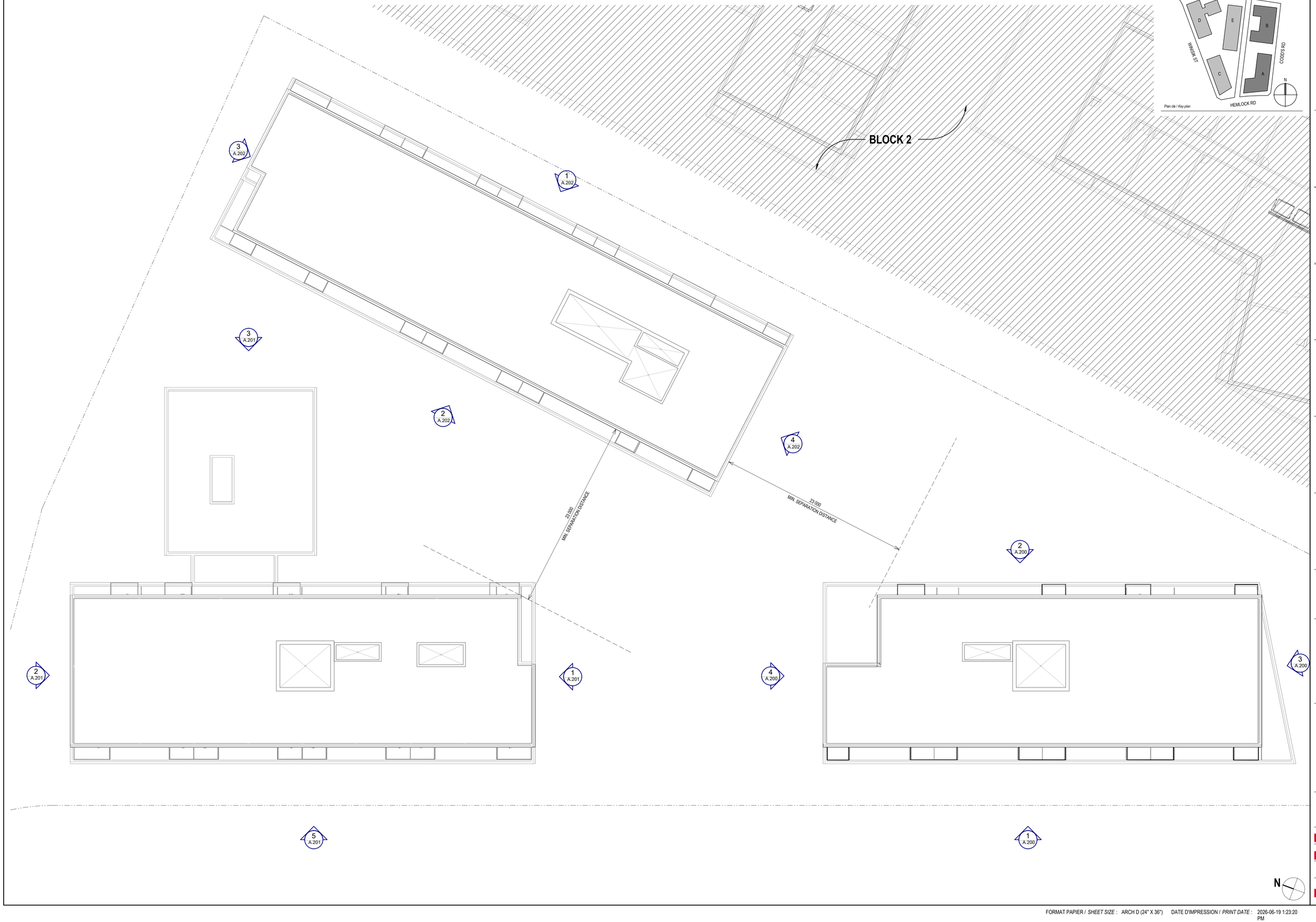
Titre / *Title*

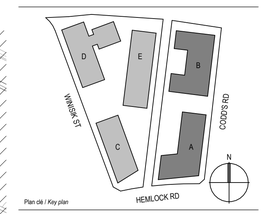
BLOCK 3 - LEVEL 5

Dessiné par / *Drawn by*	Vérifié par / *Verified by*
KS	KD
Scellé par / *Stamped by*	**No. projet / *Project number***
	2513/ 2514
Échelle / *Scale*	**No. dessin / *Drawing number***
1 : 200	
Date de création de la feuille / *Sheet creation date*	**Révision / *Revision***
12/15/25	1

A.123

FORMAT PAPIER / *SHEET SIZE* : ARCH D (24" X 36") DATE D'IMPRESSION / *PRINT DATE* : 2026-06-19 1:23:18 PM





Plan clé / Key plan

N

No.	Date	Émis pour / Issuance	Par / By
1	2026-06-30	SPC APPLICATION	

PAS POUR CONSTRUCTION /
NOT FOR CONSTRUCTION

Landscape Architect

NAK design strategies

1285 Wellington Street West, Ottawa, ON K1Y 3A8
613-237-2345

Civil Engineer

LRL ENGINEERING

5430 Canotek Rd, Ottawa, ON K1J 9G2
613-842-3434

Structural Engineer

D+M STRUCTURAL ENGINEERING

333 Preston St Suite 110, Ottawa, ON K1S 5N4
613-691-9490

Mechanical & Electrical Engineer

Goodkey Weedmark *Consulting Engineers*

1688 Woodward Dr, Ottawa, ON K2C 3R8
613-727-5111

Client

NEW COMMONS DEVELOPMENT

400-119 Spadina Ave., Toronto, ON M5V 2L1
604-674-7441

Architecte / *Architect*

figurr — Architect Collective

www.figurr.ca

fig. 1 fig. 2

252, Argyle ave.
Ottawa ON K2P 1B9
T 613 695-6122

Droit d'auteur / *Copyright* ©2025

Ce dessin est sujet au droit d'auteur. Il ne peut être reproduit pour quelques intentions ou usages que ce soit, il ne peut être utilisé uniquement avec l'apposition de la signature et de l'estampe originale.

This drawing is subject to copyright. It is not to be reproduced for any purpose or by any means, and may only be used if it bears an original stamp and signature.

Sceau / *Seal*

Note:

L'entrepreneur doit vérifier toutes les dimensions et informations sur le site et aviser immédiatement l'architecte de toutes erreurs ou omissions.

Contractor shall verify all information and dimensions on site and immediately report any errors or omissions to the architect.

Projet / *Project*

Wateridge Village Block 3

Wateridge Village Block 3
800 Winisik St, Ottawa ON, K1K 3X3

Titre / *Title*

BLOCK 3 - ROOF PLAN

Dessiné par / *Drawn by* G.S	Vérifié par / *Verified by* K.C
Scellé par / *Stamped by*	No. projet / *Project number* 2513/ 2514
Échelle / *Scale* 1 : 200	Révision / *Revision* 1
Date de création de la feuille / *Sheet creation date* 12/15/25	No. dessin / *Drawing number* A.125

FORMAT PAPIER / *SHEET SIZE* : ARCH D (24" X 36") DATE D'IMPRESSION / *PRINT DATE* : 2026-06-19 1:23:20 PM

APPENDIX C

WATER DEMAND CALCULATIONS

Boundary Conditions
Fire Hydrant Coverage

Fire Flow Calculations
LRL File No. 250290
Project: Block 3- Wateridge Village Development
Location: 80 Winisik St, Ottawa
Date: June 28, 2026
Method: Fire Underwriter's Survey (FUS)

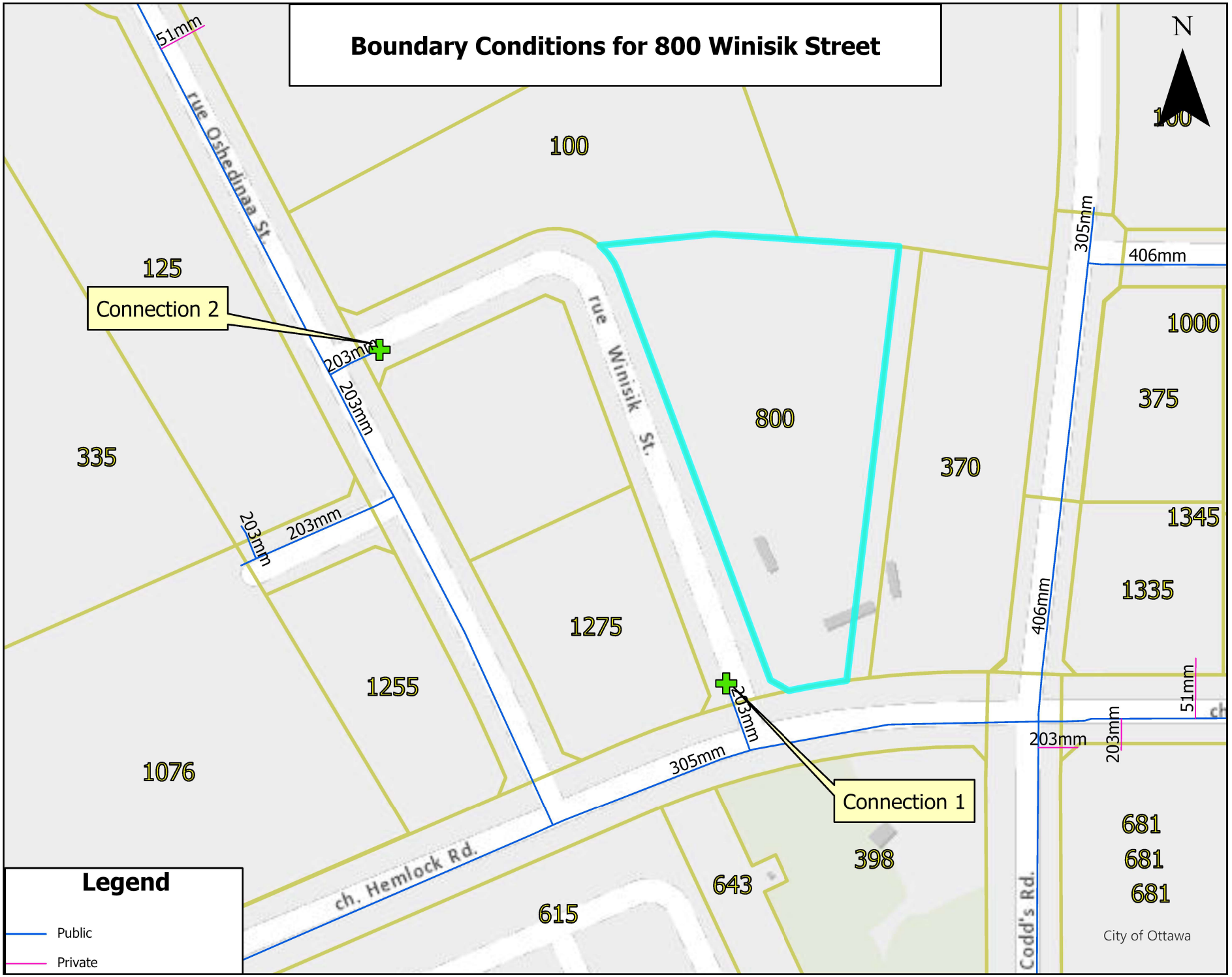
BUILDING: 3.2 (D)

Step	Task	Term	Options	Multiplier	Choose:	Value	Unit	Fire Flow
Construction Coefficient (C)								
1	Choose frame used for building	Coefficient C related to the type of construction	Wood Frame Construction (Type V)	1.5	Mass Timber Construction (Type IV-B)	**0.9**		
			Mass Timber Construction (Type IV-A)	0.8				
			Mass Timber Construction (Type IV-B)	0.9				
			Mass Timber Construction (Type IV-C)	1.0				
			Mass Timber Construction (Type IV-D)	1.5				
			Ordinary Construction (Type III)	1.0				
			Noncombustible Construction (Type II)	0.8				
			Fire Resistive Construction (Type I)	0.6				
Floor Area (A)- Building 3.2 (D)								
2	Total Effective Floor Area (First 1427s.m ./ Second 1427 s.m. / 4 Floors @50% 1427s.m.)					**5,708**	m^2	
3	Obtain fire flow before reductions	Required fire flow (rounded to nearest 1000)	Fire Flow = 220 x C x $A^{0.5}$				L/min	**15,000**
Occupancy and Contents Adjustment								
4	Choose combustibility of contents	Occupancy hazard reduction or surcharge	Noncombustible	-25%	Limited combustible	**-15%**	L/min	**12,750**
			Limited combustible	-15%				
			Combustible	0%				
			Free burning	15%				
			Rapid burning	25%				
Sprinkler Protection								
5	Choose reduction for sprinklers	Sprinkler reduction	Automatic sprinkler protection designed & installed in accordance with NFPA 13	-30%	True	**-30%**	L/min	**6,375**
			Water supply is standard for both the system and fire department hose lines	-10%	True	**-10%**		
			Fully supervised system	-10%	True	**-10%**		
Exposure Adjustment								
6	Choose separation	Exposure distance	North side	>30m	0%	**25%**	L/min	**9,563**
			East side	10.1 to 20m	15%			
			South side	20.1 to 30m	10%			
			West side	>30m	0%			
Net Required Fire Flow								
7	Obtain fire flow and duration				Minimum required fire flow (rounded to nearest 1000)		L/min	**10,000**
					Minimum required fire flow		L/s	**166.7**
					Required duration of fire flow		hr	**2**

Fire Flow Calculations
LRL File No. 250290
Project: Block 3- Wateridge Village Development
Location: 80 Winisik St, Ottawa
Date: June 28, 2026
Method: Fire Underwriter's Survey (FUS)

BUILDING: 3.3 (E)

Step	Task	Term	Options	Multiplier	Choose:	Value	Unit	Fire Flow
Construction Coefficient (C)								
1	Choose frame used for building	Coefficient C related to the type of construction	Wood Frame Construction (Type V)	1.5	Mass Timber Construction (Type IV-B)	**0.9**		
			Mass Timber Construction (Type IV-A)	0.8				
			Mass Timber Construction (Type IV-B)	0.9				
			Mass Timber Construction (Type IV-C)	1.0				
			Mass Timber Construction (Type IV-D)	1.5				
			Ordinary Construction (Type III)	1.0				
			Noncombustible Construction (Type II)	0.8				
			Fire Resistive Construction (Type I)	0.6				
Floor Area (A)- Building 3.3 (E)								
2	Total Effective Floor Area (First 1362s.m ./ Second 1362 s.m. / 4 Floors @50% 1362 s.m.)					**5,448**	m^2	
3	Obtain fire flow before reductions	Required fire flow (rounded to nearest 1000)	Fire Flow = 220 x C x $A^{0.5}$				L/min	**15,000**
Occupancy and Contents Adjustment								
4	Choose combustibility of contents	Occupancy hazard reduction or surcharge	Noncombustible	-25%	Limited combustible	**-15%**	L/min	**12,750**
			Limited combustible	-15%				
			Combustible	0%				
			Free burning	15%				
			Rapid burning	25%				
Sprinkler Protection								
5	Choose reduction for sprinklers	Sprinkler reduction	Automatic sprinkler protection designed & installed in accordance with NFPA 13	-30%	True	**-30%**	L/min	**6,375**
			Water supply is standard for both the system and fire department hose lines	-10%	True	**-10%**		
			Fully supervised system	-10%	True	**-10%**		
Exposure Adjustment								
6	Choose separation	Exposure distance	North side	>30m	0%	**45%**	L/min	**12,113**
			East side	10.1 to 20m	15%			
			South side	10.1 to 20m	15%			
			West side	10.1 to 20m	15%			
Net Required Fire Flow								
7	Obtain fire flow and duration	Minimum required fire flow (rounded to nearest 1000)					L/min	**12,000**
		Minimum required fire flow					L/s	**200.0**
		Required duration of fire flow					hr	**2.5**


Boundary Conditions for 800 Winisik Street
N
51mm
rue Oshedinaa St.
100
125
Connection 2
203mm
203mm
rue Winisik St.
800
335
370
203mm
203mm
1275
1255
1076
305mm
406mm
1000
375
1345
1335
406mm
51mm
203mm
203mm
203mm
Connection 1
ch. Hemlock Rd.
615
643
398
681
681
681
Codd's Rd.
City of Ottawa
Legend
Public
Private

Outlook

FW: LRL250290- 800 Winsik St (Block 3)_Boundary Conditions Request & Sanitary Sewer Capacity

From Maxime Longtin <mlongtin@lrl.ca>
Date Wed 2026-06-24 1:26 PM
To Kelly Paradis <kparadis@lrl.ca>

1 attachment (1 MB)
800 Winisik Street May 2026.pdf;

Maxime Longtin, Civil Project Manager

LRL ENGINEERING | INGÉNIERIE
Head Office – 5430 Canotek Rd., Ottawa, ON
C +1 613-915-8043 **E** mlongtin@lrl.ca
Ottawa | *Pembroke* | *Moncton*
www.lrl.ca

From: Chetrar, Anton <anton.chetrar@ottawa.ca>
Sent: Friday, May 15, 2026 2:10 PM
To: Sarthak Vora <svora@lrl.ca>
Cc: Maxime Longtin <mlongtin@lrl.ca>; Mottalib, Abdul <Abdul.Mottalib@ottawa.ca>
Subject: RE: LRL250290- 800 Winsik St (Block 3)_Boundary Conditions Request & Sanitary Sewer Capacity

Hi Sarthak,

Please find attached updated Boundary Conditions for 800 Winisik Street.

The following are the updated boundary conditions, HGL, for hydraulic analysis at 800 Winisik Street (zone MONT) assumed to be connected via two (2) locations to the 203mm on Winisik Street. (see attached PDF for location).

Connection 1: 203 mm on Winisik St. (south stub)
Minimum HGL = 143.3 m
Maximum HGL = 143.6 m
Max Day + Fire Flow (200 L/s) = 135.2 m

Connection 2: 203 mm on Winisik St. (north stub)
Minimum HGL = 143.2 m
Maximum HGL = 143.6 m
Max Day + Fire Flow (200 L/s) = 103.7 m

These are for current conditions and are based on computer model simulation.

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.

Thanks,
Anton Chetrar | P. Eng
Project Manager, Infrastructure - Gestionnaire de projet, Projets d'infrastructure
Development Review – South Services | Direction de l'examen des projets d'aménagement – Service Sud
Planning, Development and Building Services Department (PDBS) and Direction générale des services de la planification, de l'aménagement et du bâtiment (DGSPAB)

City of Ottawa | Ville d'Ottawa
110 Laurier Avenue West |110 avenue Laurier Ouest
Ottawa, ON K1P 1J1
Tel.|Tél. 613.580.2424 ext.60865
anton.chetrar@ottawa.ca

Classified as City of Ottawa - Internal / Ville d'Ottawa - classé interne

From: Chetrar, Anton
Sent: March 18, 2026 2:23 PM
To: Sarthak Vora <svora@lrl.ca>
Cc: Maxime Longtin <mlongtin@lrl.ca>; Mottalib, Abdul <Abdul.Mottalib@ottawa.ca>
Subject: RE: LRL250290- 800 Winsik St (Block 3)_Boundary Conditions Request & Sanitary Sewer Capacity

Hi Sarthak,

Please find attached Boundary Conditions for 800 Winisik Street.

The following are boundary conditions, HGL, for hydraulic analysis at 800 Winisik Street (zone MONT) assumed to be connected via two (2) locations to the 203mm on Winisik Street. (see attached PDF for location).

Connection 1 – 203 mm on Winisik St. (south stub)
Minimum HGL = 143.3 m
Maximum HGL = 143.6 m
Max Day + Fire Flow (133.3 L/s) = 139.4 m

Connection 2 – 203 mm on Winisik St. (north stub)
Minimum HGL = 143.2 m
Maximum HGL = 143.6 m
Max Day + Fire Flow (133.3 L/s) = 124.3 m

These are for current conditions and are based on computer model simulation.

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.

Thanks,
Anton Chetrar | P. Eng
Project Manager, Infrastructure - Gestionnaire de projet, Projets d'infrastructure
Development Review – South Services | Direction de l'examen des projets d'aménagement – Service Sud
Planning, Development and Building Services Department (PDBS) and Direction générale des services de la planification, de l'aménagement et du bâtiment (DGSPAB)
City of Ottawa | Ville d'Ottawa
110 Laurier Avenue West |110 avenue Laurier Ouest
Ottawa, ON K1P 1J1
Tel.|Tél. 613.580.2424 ext.60865
anton.chetrar@ottawa.ca

From: Sarthak Vora <svora@lrl.ca>
Sent: February 23, 2026 12:32 PM
To: Chetrar, Anton <anton.chetrar@ottawa.ca>
Cc: Maxime Longtin <mlongtin@lrl.ca>
Subject: RE: LRL250290- 800 Winsik St (Block 3)_Boundary Conditions Request & Sanitary Sewer Capacity

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

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

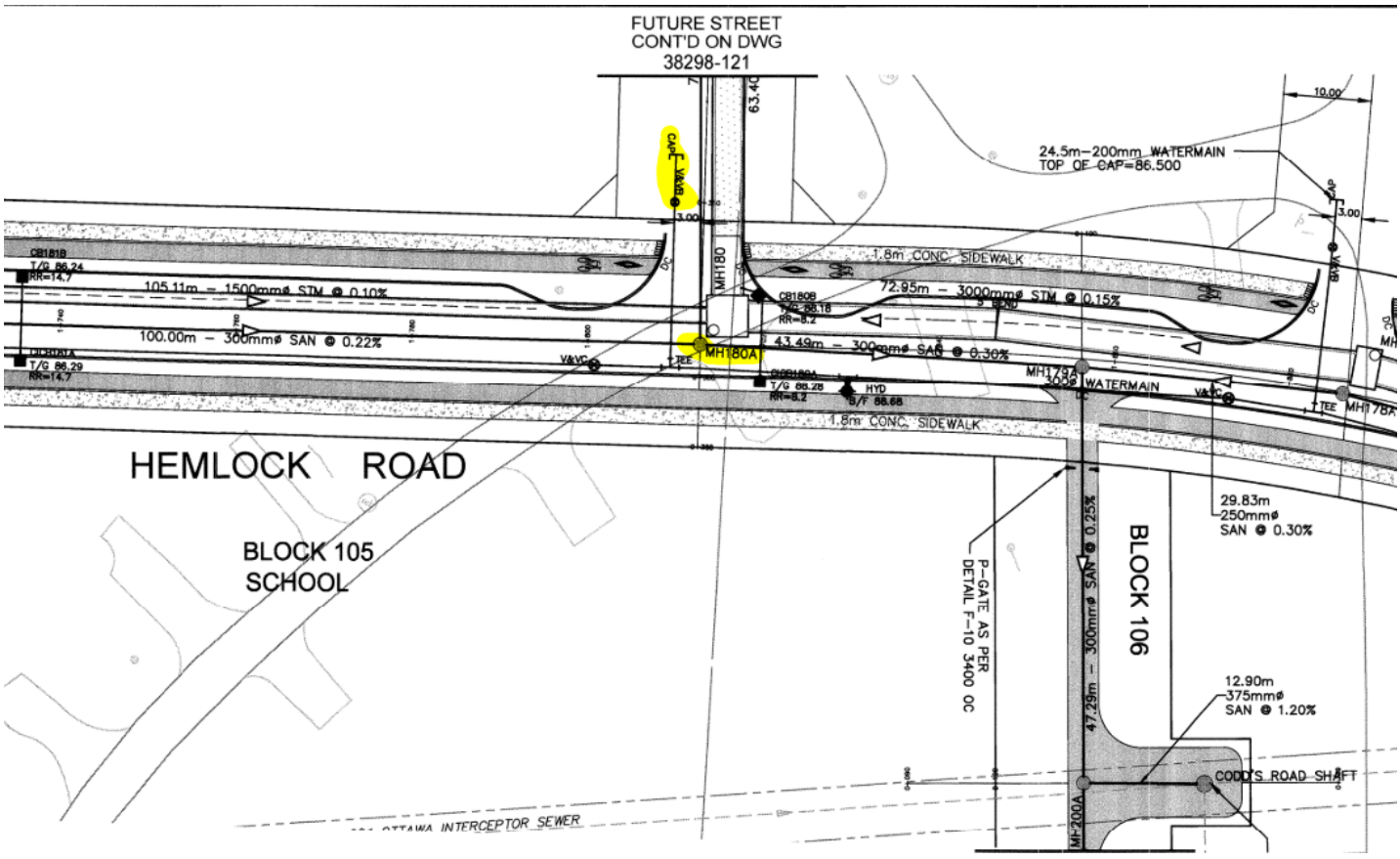
Good Afternoon Anton,

I would like to request boundary conditions and confirmation on the Sanitary sewer capacity for the proposed development located at 800 Winsik St- (Block 3). It is proposed that three 6-storey buildings with one common underground parking will be developed on this site. The building will house a total of 277 units (Building 3.1- 80 units, Building 3.2- 85 units and Building 3.3- 112 units). We are proposing a dual service connection to the proposed 200mm municipal watermain in Winsik St (see pdf attached for tentative connection points). Based on current information, the watermain within Winsik Street has not yet been constructed. As such, could boundary conditions as per the proposed development demands be provided at the service stub located within Hemlock Road, which is intended to feed the future Winsik watermain? (see the snip of the service stubs below):

	Demand (L/s)
Avg. Daily	1.67
Max. Day + FUS	4.76 + 216.7
Peak Hour	7.15

Sanitary Connection

We also determined that the sanitary sewer discharge from the site would be equal to **6.69L/s**. We are proposing to tie into the proposed 250mm sanitary sewer located within Winsik St (see pdf attached for tentative connection point). Similar to the watermain, the sanitary sewer within Winsik Street has not yet been constructed. As such, could a confirmation on sufficient sewer capacity as per the proposed development demands be provided at the Sanitary MH180A located within Hemlock Road, which is intended to feed the future Winsik sanitary sewer.



Thanks,

Sarthak Vora, Civil E.I.T

LRL ENGINEERING | INGÉNIERIE

Head Office – 5430 Canotek Rd., Ottawa, ON
T +1 613-842-3434 **C** +1 613-915-7633 **E** svora@lrl.ca
Ottawa | *Pembroke* | *Moncton*
www.lrl.ca

'

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

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

'

Water Supply Calculations

LRL File No. : 250290
Project: Block 3- Wateridge Village Development
Location: 80 Winisik St, Ottawa
Date: 2026-06-28
Dwg Reference: C.401

Water Demand based on the City of Ottawa Design Guidelines-Water Distribution, 2010

Domestic Demand- Building 3.1 (C) + Building 3.2 (D) + Building 3.3 (E)

Unit Type	Persons Per Unit	Number of Units	Population
1 Bedroom	1.4	156	218.4
2 Bedroom	2.1	105	220.5
3 Bedroom	3.1	16	49.6
	Total	**277**	**488.5**

Average Water Consumption Rate =	280	L/c/d		
Average Day Demand =	**136,780**	**L/d**	**1.58**	**L/s**
Maximum Day Factor =	2.93		(Table 3-3 MOE Peaking Factors)	
Maximum Daily Demand =	**400,720**	**L/d**	**4.64**	**L/s**
Peak Hour Factor =	4.37		(Table 3-3 MOE Peaking Factors)	
Maximum Hour Demand =	**597,472**	**L/d**	**6.92**	**L/s**

Amenity Demand

Property Type	Unit Rate (L/ha/d)	Area (ha)	Demand (L/d)
Amenity Space	**28000**	**0.026**	**728**

Average Day Demand	**728**	**L/d**	**0.008**	**L/s**
Maximum Day Factor	1.5		(Design Guidelines-Water Distribution Table 4.2)	
Maximum Daily Demand	**1,092**	**L/d**	**0.013**	**L/s**
Peak Hour Factor	1.8		(Design Guidelines-Water Distribution Table 4.2)	
Maximum Hour Demand	**1,966**	**L/d**	**0.023**	**L/s**

TOTAL DEMAND				
Average Day Demand	**137,508**	**L/d**	**1.59**	**L/s**
Maximum Daily Demand	**401,812**	**L/d**	**4.65**	**L/s**
Maximum Hour Demand	**599,438**	**L/d**	**6.94**	**L/s**

Water Service Pipe Sizing

Q = VA

Where: V = velocity (m/s)
A = area of pipe (m^2)
Q = flow rate (L/s)

Assuming a maximum velocity of 1.8m/s, the diameter of pipe is calculated as:

Minimum pipe diameter (d) =	$(4Q/\pi V)^{1/2}$		
=	0.070	m	
=	70	mm	
Proposed pipe diameter (d) =	**200**	mm	(to be confirmed with hydraulic pressure analysis)
=	**8**	Inches	

Fire Flow Calculations
LRL File No. 250290
Project: Block 3- Wateridge Village Development
Location: 80 Winisik St, Ottawa
Date: June 28, 2026
Method: Fire Underwriter's Survey (FUS)

BUILDING: 3.1 (C)

Step	Task	Term	Options	Multiplier	Choose:	Value	Unit	Fire Flow
Construction Coefficient (C)								
1	Choose frame used for building	Coefficient C related to the type of construction	Wood Frame Construction (Type V)	1.5	Mass Timber Construction (Type IV-B)	**0.9**		
			Mass Timber Construction (Type IV-A)	0.8				
			Mass Timber Construction (Type IV-B)	0.9				
			Mass Timber Construction (Type IV-C)	1.0				
			Mass Timber Construction (Type IV-D)	1.5				
			Ordinary Construction (Type III)	1.0				
			Noncombustible Construction (Type II)	0.8				
			Fire Resistive Construction (Type I)	0.6				
Floor Area (A)- Building 3.1 (C)								
2	Total Effective Floor Area (First 1098s.m ./ Second 1098 s.m. / 4 Floors @50% 1098 s.m.)					**4,392**	m^2	
3	Obtain fire flow before reductions	Required fire flow (rounded to nearest 1000)	Fire Flow = 220 x C x $A^{0.5}$				L/min	**14,000**
Occupancy and Contents Adjustment								
4	Choose combustibility of contents	Occupancy hazard reduction or surcharge	Noncombustible	-25%	Limited combustible	**-15%**	L/min	**11,900**
			Limited combustible	-15%				
			Combustible	0%				
			Free burning	15%				
			Rapid burning	25%				
Sprinkler Protection								
5	Choose reduction for sprinklers	Sprinkler reduction	Automatic sprinkler protection designed & installed in accordance with NFPA 13	-30%	True	**-30%**	L/min	**5,950**
			Water supply is standard for both the system and fire department hose lines	-10%	True	**-10%**		
			Fully supervised system	-10%	True	**-10%**		
Exposure Adjustment								
6	Choose separation	Exposure distance	North side	10.1 to 20m	15%	**30%**	L/min	**9,520**
			East side	10.1 to 20m	15%			
			South side	>30m	0%			
			West side	>30m	0%			
Net Required Fire Flow								
7	Obtain fire flow and duration				Minimum required fire flow (rounded to nearest 1000)		L/min	**10,000**
					Minimum required fire flow		L/s	**166.7**
					Required duration of fire flow		hr	**2**

APPENDIX D
SANITARY CALCULATIONS

LRL Associates Ltd.

Sanitary Sewer Design Sheet

LRL File No.: 250290
Project: Block 3- Wateridge Village Development
Location: 80 Winisik St, Ottawa
Date: June 28, 2026
DWG. Reference: C.401

Sanitary Design Parameters

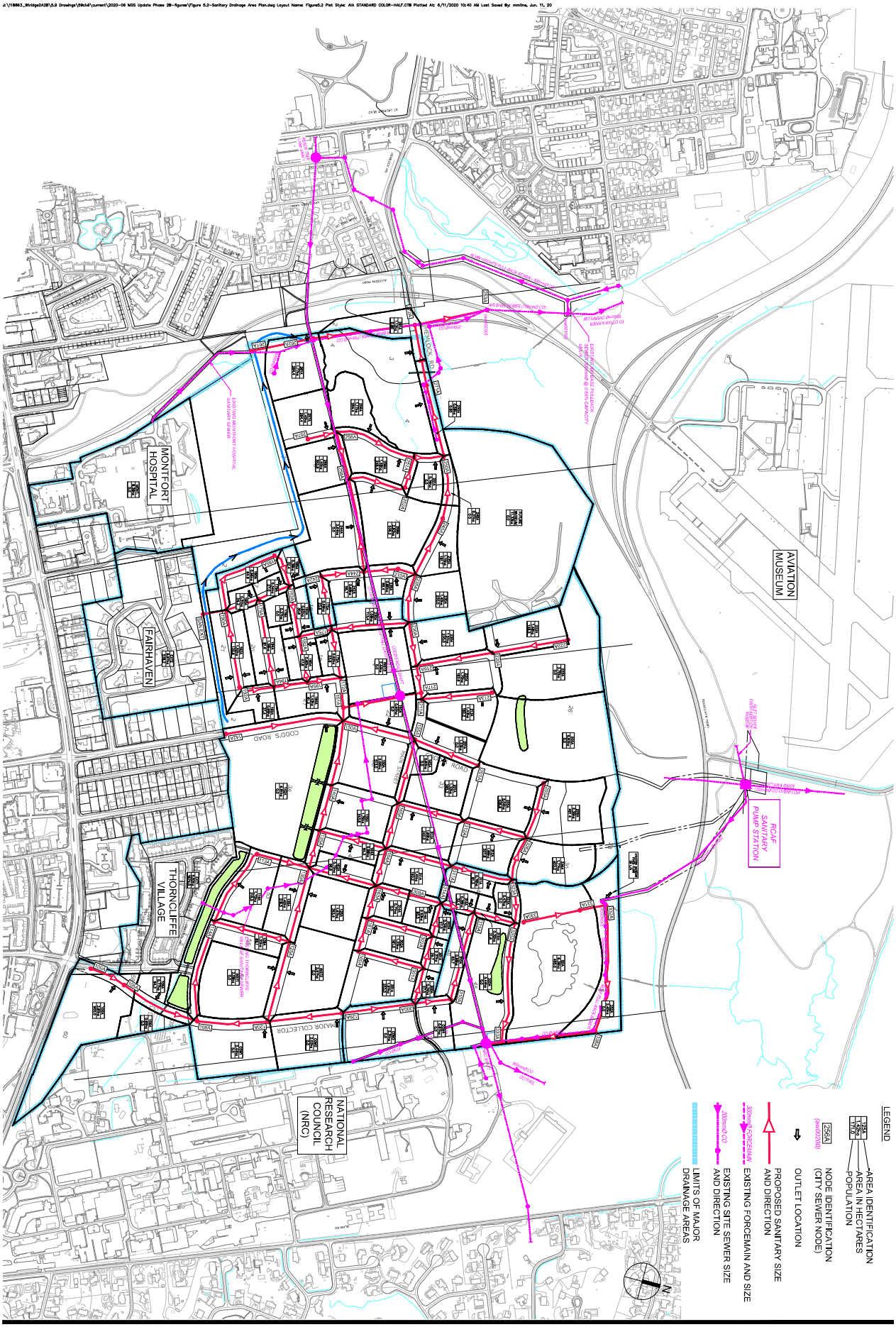
Commercial & Amenity Flow = 28000 L/ha/day
Average Daily Flow = 280 L/p/day
Extraneous Flow = 0.33 L/s/ha
Maximum Residential Peak Factor = 4.0
Commercial & Institutional Peak Factor = 1.5

Pipe Design Parameters

Maximum Velocity = 3.00 m/s
Minimum Velocity = 0.60 m/s
Manning's n = 0.013

LOCATION			RESIDENTIAL						COMMERCIAL/ AMENITY			INFILTRATION			TOTAL FLOW, Q	PIPE						
STREET	FROM	TO	AREA	POP.	ACCU. AREA	ACCU. POP.	PEAK FACT.	PEAK FLOW	AREA	ACCU. AREA	PEAK FLOW	TOTAL AREA	ACCU. AREA	INFILT. FLOW		LENGTH	DIA.	SLOPE	MATERIAL	CAP. Q(FULL)	VEL. V(FULL)	RATIO Q /QFULL
			(Ha)		(Ha)			(L/s)	(Ha)	(Ha)	(L/s)	(Ha)	(Ha)	(L/s)	(L/s)	(m)	(mm)	(%)		(L/s)	(m/s)	
	BLDG 3.1+ 3.2+3.3	Ex. SAN	1.018	488.5	1.018	488.5	4.0	6.33	0.026	0.026	0.01	1.018	1.018	0.34	**6.68**	10.7	200	2.00%	PVC	46.38	1.48	0.14

Notes: Existing inverts and slopes are estimated. They are to be confirmed on-site.



Sheet No.

Drawing Title

SANITARY DRAINAGE AREA PLAN

Project Title

FORMER CFB ROCKCLIFFE MASTER SERVICING STUDY

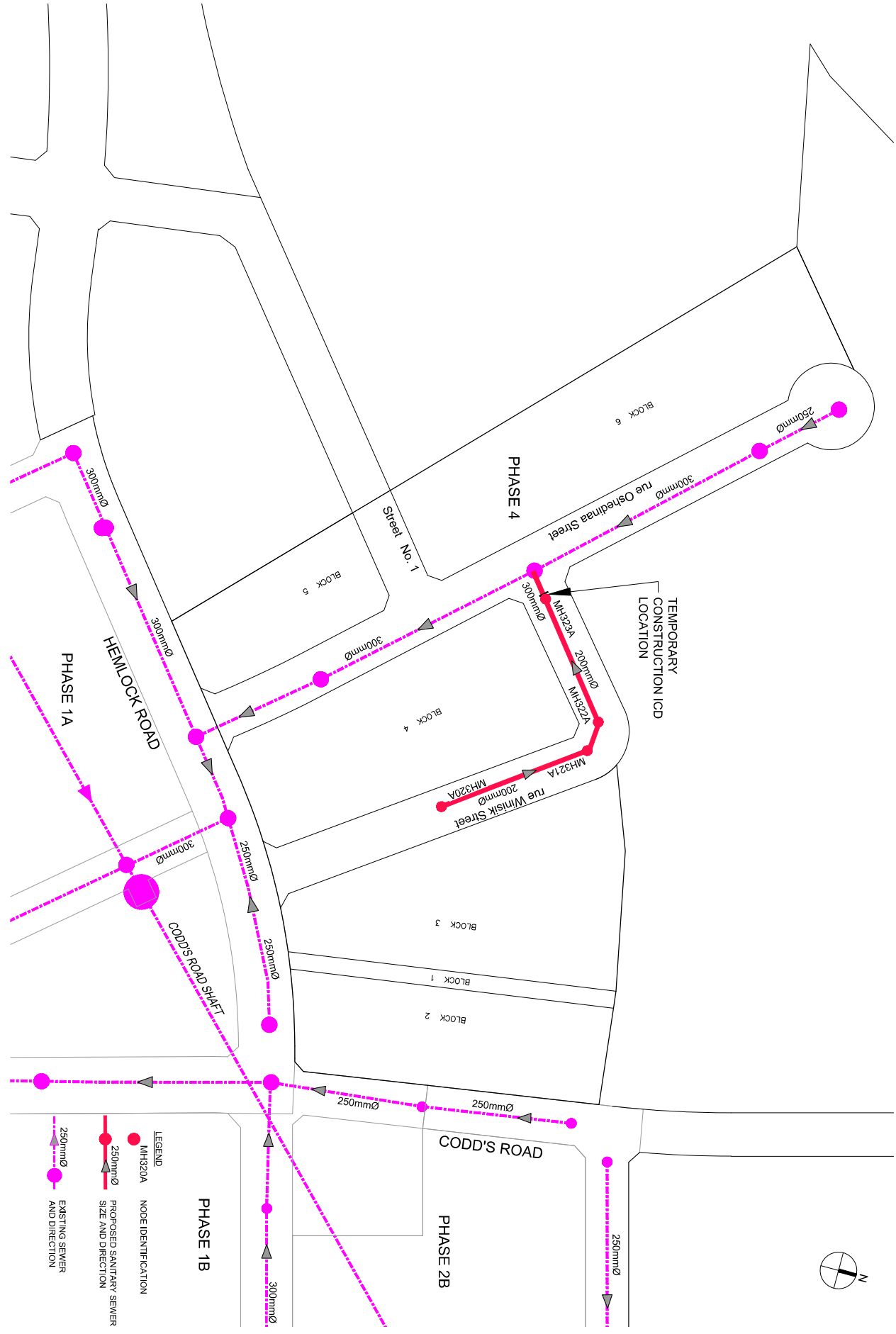
Scale

0 100 200

FIGURE 5.2

IBI

J:\118863_WrIdge2428\5.0 Drawings\50civil\current\Design Brief\Phase 4\Figure 3.1 Recommended Wastewater Plan.dwg Layout Name: FIGURE 3.1 Plot Style: AIA STANDARD COLOR-HALF.CTB Plot Scale: 1:0.969 Plotted At: 12/9/2021 10:33 AM Last Saved By: mmline Last Saved At: Dec. 9, 21



Sheet No.	Drawing Title	Project Title	Scale
FIGURE 3.1	RECOMMENDED WASTEWATER PLAN	DESIGN BRIEF WATERIDGE VILLAGE AT ROCKCKIFFE PHASE 4	0 100 200

IBI

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

LEGEND
MH176 Existing infrastructure (shown for information only)

SANITARY SEWER DESIGN SHEET

Wateridge at Rockcliffe - Phase 4
City of Ottawa
Canada Lands Company

LOCATION				RESIDENTIAL										ICI AREAS								INFILTRATION ALLOWANCE			FIXED FLOW (L/s)		TOTAL FLOW	PROPOSED SEWER DESIGN						
				AREA	UNIT TYPES				AREA	POPULATION		RES PEAK	PEAK	AREA (Ha)						ICI PEAK	PEAK	AREA (Ha)		FLOW				CAPACITY	LENGTH	DIA	SLOPE	VELOCITY	AVAILABLE CAPACITY	
STREET	AREA ID	FROM MH	TO MH	w/ Units (Ha)	SF	SD / TH/F	TH/S	APT	w/o Units (Ha)	IND	CUM	FACTOR	FLOW (L/s)	INSTITUTIONAL IND	INSTITUTIONAL CUM	COMMERCIAL IND	COMMERCIAL CUM	INDUSTRIAL IND	INDUSTRIAL CUM	FACTOR	FLOW (L/s)	IND	CUM	(L/s)	IND	CUM	(L/s)	(L/s)	(m)	(mm)	(%)	(full) (m/s)	L/s	(%)
Winisik Street	MH320A	MH320A	MH321A	1.48				174		330.6	330.6	3.45	3.69	0.00	0.00	0.09	0.09	0.00	0.00	1.00	0.03	1.57	1.57	0.52	0.00	0.00	4.24	72.08	100.50	250	1.35	1.423	67.84	94.12%
Winisik Street		MH321A	MH322A	0.00						0.0	330.6	3.45	3.69	0.00	0.00	0.00	0.09	0.00	0.00	1.00	0.03	0.00	1.57	0.52	0.00	0.00	4.24	72.08	12.05	250	1.35	1.423	67.84	94.12%
Winisik Street	MH323A	MH322A	MH191A	1.15				136		258.4	589.0	3.35	6.39	0.00	0.00	0.12	0.21	0.00	0.00	1.00	0.07	1.27	2.84	0.94	0.00	0.00	7.40	75.98	83.75	250	1.50	1.500	68.58	90.26%
Oshedinaa Street	*MH193A*	*MH193A*	*MH192A*	*1.69*				*168*	*1.18*	*319.2*	*319.2*	*3.45*	*3.57*	*0.00*	*0.00*	*0.00*	*0.00*	*0.00*	*0.00*	*1.00*	*0.00*	*2.87*	*2.87*	*0.95*	*0.00*	*0.00*	*4.52*	*54.44*	*83.66*	*250*	*0.77*	*1.074*	*49.92*	*91.70%*
Oshedinaa Street		*MH192A*	*MH191A*					*43*		*81.7*	*400.9*	*3.42*	*4.44*	*0.00*	*0.00*	*0.00*	*0.00*	*0.00*	*0.00*	*1.00*	*0.00*	*0.00*	*2.87*	*0.95*	*0.00*	*0.00*	*5.39*	*49.42*	*83.87*	*300*	*0.24*	*0.677*	*44.03*	*89.10%*
Oshedinaa Street	*MH190A*	*MH191A*	*MH190A*	*0.76*				*48*		*91.2*	*1081.1*	*3.22*	*11.29*	*0.00*	*0.00*	*0.00*	*0.21*	*0.00*	*0.00*	*1.00*	*0.07*	*0.76*	*6.47*	*2.14*	*0.00*	*0.00*	*13.49*	*43.97*	*104.71*	*300*	*0.19*	*0.603*	*30.48*	*69.32%*

Design Parameters:

Residential			ICI Areas		
SF	3.2	p/p/u			
TH/F/SD	2.4	p/p/u	INST	28,000	L/Ha/day
TH/S	2.4	p/p/u	COM	28,000	L/Ha/day
APT	1.9	p/p/u	IND	35,000	L/Ha/day
Other	60	p/p/Ha		17000	L/Ha/day

MOE Chart

Notes:
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

Designed: AC

Checked: J.I.M.

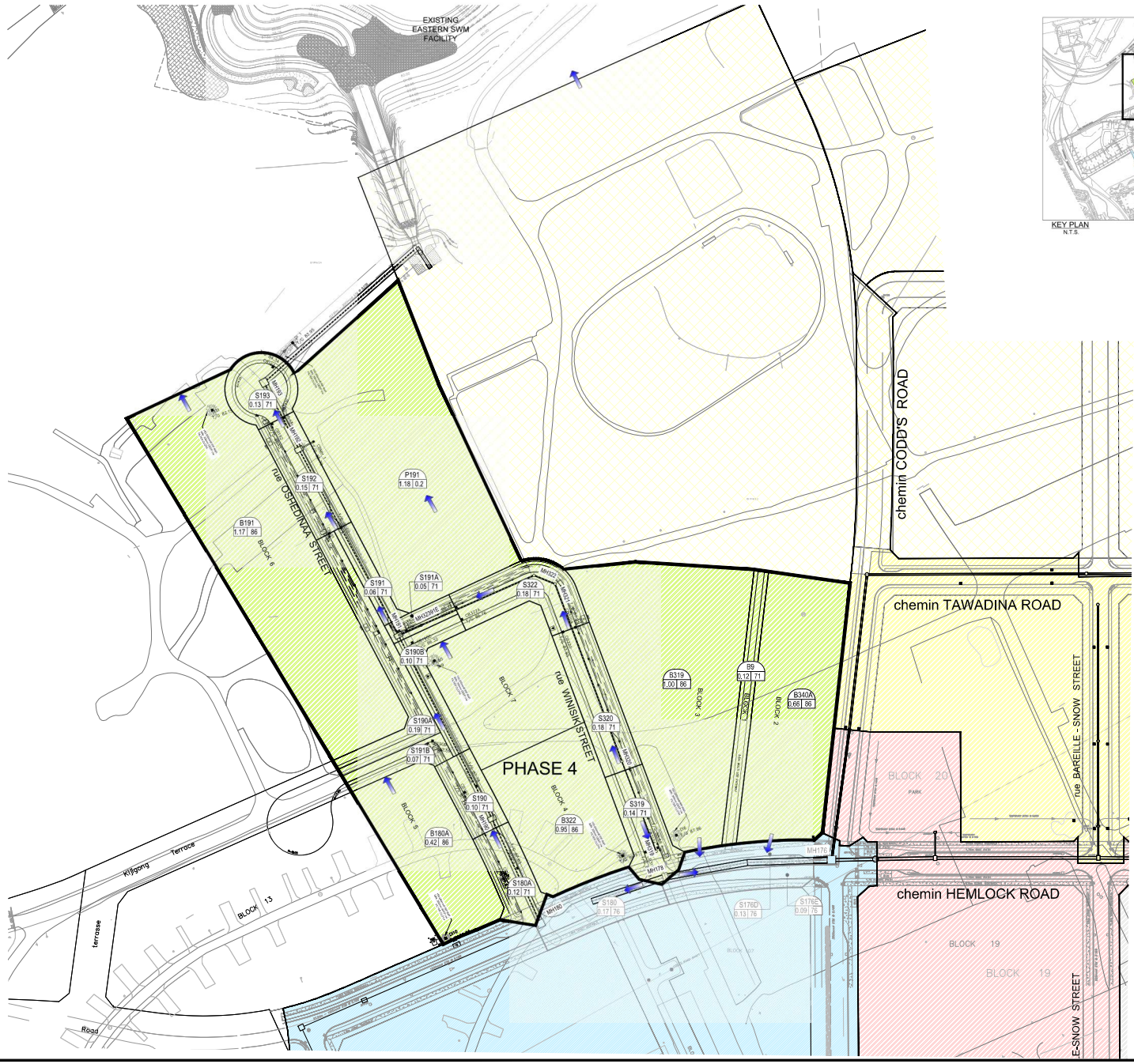
Dwg. Reference: 118863-410

No.	Revision	Date
1	Submission No. 1 for City Review	2018-12-20
2	Submission No. 2 for City Review	2020-07-03
3	Submission No. 3 for City Review	2021-12-13
4	Submission No. 4 for City Review	2022-09-21

File Reference: 118863.5.7.1 **Date:** 2020-06-03 **Sheet No:** 1 of 1

APPENDIX E

Stormwater Management Design Calculations


EXISTING EASTERN SWM FACILITY
chemin CODD'S ROAD
chemin TAWADINA ROAD
rue OSHEDINNA STREET
rue WINISK STREET
rue BAREILLE - SNOW STREET
chemin HEMLOCK ROAD
PHASE 4
BLOCK 20
BLOCK 19
BLOCK 13
Kilgorry Terrace
terrasse
Road
S193 0.13 71
S192 0.15 71
P191 1.18 0.2
B191 1.17 86
S191 0.06 71
S191A 0.05 71
S322 0.18 71
S190B 0.10 71
S190A 0.19 71
S191B 0.07 71
S190 0.10 71
B180A 0.42 86
S180A 0.12 71
S320 0.18 71
B319 1.00 86
B9 0.12 71
B340A 0.66 86
S319 0.14 71
B322 0.95 86
S176D 0.13 76
S176E 0.09 76
S180 0.17 76
MH172
MH178
MH180
MH182
MH183
MH184
MH185
MH186
MH187
MH188
MH189
MH190
MH191
MH192
MH193
MH194
MH195
MH196
MH197
MH198
MH199
MH200
MH201
MH202
MH203
MH204
MH205
MH206
MH207
MH208
MH209
MH210
MH211
MH212
MH213
MH214
MH215
MH216
MH217
MH218
MH219
MH220
MH221

LRL Associates Ltd.

Storm Watershed Summary

LRL File No. 250290
Project: Block 3- Wateridge Village Development
Location: 80 Winisik St, Ottawa
Date: June 30, 2026
Designed: S.V
Checked:
Dwg Reference: C701, C702

Pre-Development Catchments

Watershed	C = 0.20	C = 0.80	C = 0.90	Total Area (ha)	Combined C
ECA-01 (uncontrolled)	0.996	0.000	0.000	0.996	0.20
Total	**0.996**	**0.000**	**0.000**	**0.996**	**0.20**

Post-Development Catchments

Watershed	C = 0.20	C = 0.8	C = 0.90	Total Area (ha)	Combined C
CA-01 (un-controlled)	0.020	0.000	0.000	0.020	0.20
CA-02 (un-controlled)	0.019	0.001	0.009	0.029	0.44
CA-03 (un-controlled)	0.003	0.000	0.004	0.006	0.61
CA-04 (un-controlled)	0.019	0.001	0.007	0.027	0.42
CA-05 (un-controlled)	0.001	0.000	0.002	0.003	0.63
CA-06 (controlled)	0.002	0.000	0.017	0.020	0.81
CA-07 (controlled)	0.010	0.001	0.008	0.019	0.51
CA-08 (controlled)	0.008	0.002	0.008	0.018	0.58
CA-09 (controlled)	0.001	0.000	0.000	0.002	0.34
CA-10 (controlled)	0.001	0.001	0.000	0.002	0.35
CA-11 (controlled)	0.000	0.000	0.148	0.148	0.90
CA-12 (controlled)	0.066	0.014	0.057	0.137	0.55
CA-13 (controlled)	0.000	0.000	0.136	0.136	0.90
CA-14 (controlled)	0.006	0.000	0.003	0.009	0.48
CA-15 (controlled)	0.010	0.001	0.004	0.015	0.41
CA-16 (controlled)	0.007	0.001	0.003	0.011	0.44
CA-17 (controlled)	0.000	0.000	0.074	0.074	0.90
CA-18 (controlled)	0.000	0.000	0.043	0.043	0.90
CA-19 (controlled)	0.002	0.000	0.000	0.003	0.33
CA-20 (controlled)	0.022	0.001	0.019	0.042	0.53
CA-21 (controlled)	0.067	0.002	0.022	0.091	0.38
CA-22 (controlled)	0.000	0.000	0.110	0.110	0.90
CA-23 (controlled)	0.002	0.000	0.002	0.004	0.51
CA-24 (controlled)	0.014	0.000	0.014	0.028	0.55
Total	**0.281**	**0.024**	**0.691**	**0.996**	**0.70**

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

LEGEND
Black text 5 year event curve design
Blue text 100 year event curve design
MH191 Existing infrastructure (shown for information only)

STORM SEWER DESIGN SHEET

Wateridge at Rockcliffe - Phase 4
City of Ottawa
Canada Lands Company

LOCATION				AREA (Ha)										RATIONAL DESIGN FLOW												SEWER DATA									
STREET	AREA ID	FROM	TO	C= 0.20	C= 0.30	C= 0.40	C= 0.49	C= 0.57	C= 0.65	C= 0.66	C= 0.70	C= 0.73	C= 0.80	IND 2.78AC	CUM 2.78AC	INLET (min)	TIME IN PIPE	TOTAL (min)	i (2) (mm/hr)	i (5) (mm/hr)	i (10) (mm/hr)	i (100) (mm/hr)	2yr PEAK FLOW (L/s)	5yr PEAK FLOW (L/s)	10yr PEAK FLOW (L/s)	100yr PEAK FLOW (L/s)	FIXED FLOW (L/s	DESIGN FLOW (L/s)	CAPACITY (L/s)	LENGTH (m)	PIPE SIZE (mm) DIA	W	H	SLOPE (%)	VELOCITY (m/s)	AVAIL CAP (2yr) (L/s)	(%)
PHASE 1A AS-BUILT DESIGN SHEET - AUGUST 2017															107.74	21.53																				
Oshedinaa Street	*S180A, B180A*	*MH180*	*MH190*								*0.12*		*0.42*	*1.17*	*108.91*	*21.53*	*0.42*	*21.95*	*49.69*	*67.06*	*78.46*	*114.46*		*7,303.61*			*6,660.00*	*13,963.61*	*18,135.33*	*62.96*	*3000*			*0.15*	*2.485*	*4171.72*	*23.00%*
Oshedinaa Street	*S190, S191B*	*MH190*	*MH191*								*0.17*			*0.33*	*109.24*	*21.95*	*0.85*	*22.81*	*49.09*	*66.24*	*77.50*	*113.04*		*7,235.77*			*6,660.00*	*13,895.77*	*16,220.73*	*113.83*	*3000*			*0.12*	*2.223*	*2324.96*	*14.33%*
Winisik Street	S319	MH319	MH320											0.27	0.27	10.00	1.01	11.01	76.81	104.19	122.14	178.56		28.39				28.39	43.87	52.70	250			0.50	0.866	15.48	35.29%
Winisik Street	S320, B319	MH320	MH321								0.18		1.00	2.57	2.85	11.01	0.74	11.76	73.12	99.12	116.17	169.79		282.18				282.18	521.29	103.82	525			1.35	2.333	239.12	45.87%
Winisik Street		MH321	MH322											0.00	2.85	11.76	0.09	11.85	70.66	95.75	112.20	163.95		272.57				272.57	521.29	12.44	525			1.35	2.333	248.72	47.71%
Winisik Street	B323, S322	MH322	MH323								0.18		0.95	2.46	5.31	11.85	0.42	12.26	70.38	95.36	111.74	163.28		506.35				506.35	784.52	67.45	600			1.50	2.688	278.17	35.46%
Winisik Street	*S190B, S191A*	*MH323*	*MH191*								*0.15*			*0.29*	*5.60*	*12.26*	*0.10*	*12.37*	*69.08*	*93.59*	*109.65*	*160.21*		*524.24*				*524.24*	*640.56*	*13.71*	*600*			*1.00*	*2.195*	*116.32*	*18.16%*
Kijigong Road			*MH 191*											0.00	0.00	10.00	0.77	10.77	76.81	104.19	122.14	178.56		0.00				0.00	43.87	40.00	250			0.50	0.866	43.87	100.00%
Oshedinaa Street	*S191, S190A*	*MH191*	*MH192*								*0.25*			*0.49*	*116.33*	*22.81*	*0.67*	*23.47*	*47.92*	*64.64*	*75.62*	*110.29*		*7,454.65*			*6,660.00*	*14,114.65*	*20,940.87*	*115.05*	*3000*			*0.20*	*2.870*	*6826.23*	*32.60%*
Oshedinaa Street	*B191, P191, S192*	*MH192*	*MH193*		*1.18*						*0.15*		*1.17*	*3.88*	*119.20*	*23.47*	*0.23*	*23.70*	*47.04*	*63.45*	*74.22*	*108.23*		*7,563.10*			*6,660.00*	*14,223.10*	*21,962.97*	*41.76*	*3000*			*0.22*	*3.010*	*7739.88*	*35.24%*
		DI 1	*MH193*											0.00	0.00	10.00	0.10	10.10	76.81	104.19	122.14	178.56				283.00		283.00	420.63	*15.00*	*450*			*2.00*	2.562	137.63	32.72%
Oshedinaa Street	*S193*	*MH193*	*MH194*								*0.13*			*0.25*	*119.46*	*23.70*	*0.68*	*24.38*	*46.74*	*63.04*	*73.75*	*107.54*		*7,531.17*			*6,660.00*	*14,191.17*	*19,306.53*	*107.85*	*3000*			*0.17*	*2.646*	*5115.36*	*26.50%*
TEMPORARY DITCH INLETS																																				
Block 3	-	DI 6	Pipe	1.00										0.56	0.56	51.82	0.18	52.00	27.33	36.69	42.83	62.30				34.64		34.64	62.04	12.89	250			1.00	1.224	27.40	44.17%
Block 4	-	DI 8	Pipe	0.60										0.33	0.33	47.23	0.24	47.47	29.21	39.24	45.82	66.67				22.24		22.24	62.04	17.90	250			1.00	1.224	39.80	64.15%
Block 4	-	DI 9	Pipe	0.35										0.19	0.19	32.88	0.28	33.16	37.64	50.66	59.21	86.25				16.78		16.78	62.04	20.81	250			1.00	1.224	45.25	72.94%
Block 5	-	DI 10	Pipe	0.42										0.23	0.23	60.52	0.18	60.70	24.40	32.73	38.21	55.54				12.97		12.97	62.04	13.20	250			1.00	1.224	49.07	79.10%
Block 6	-	DI 11	Pipe	1.17										0.65	0.65	111.60	0.44	112.04	15.40	20.59	24.00	34.81				22.64		22.64	62.04	32.46	250			1.00	1.224	39.39	63.50%

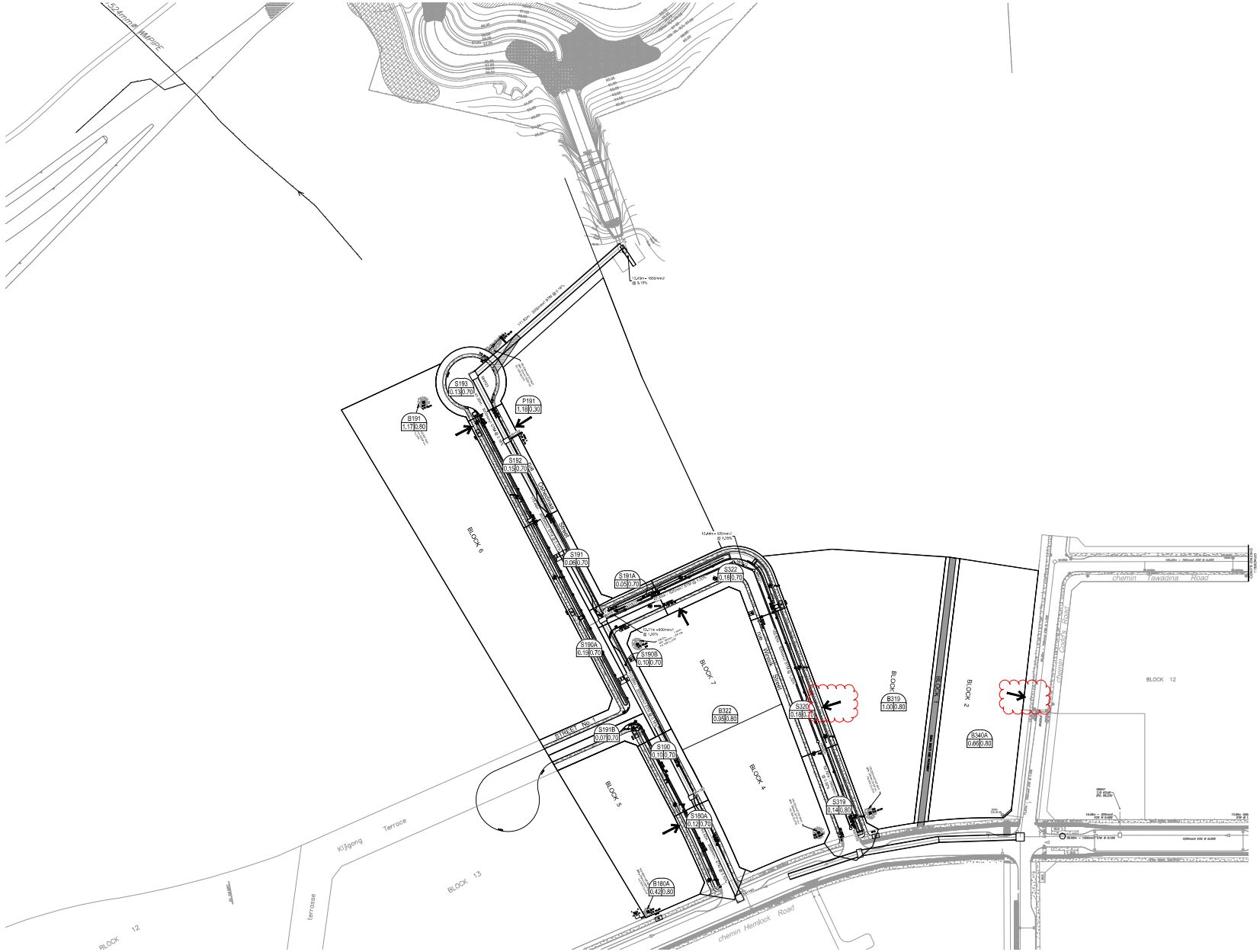
Definitions:
Q = 2.78CIA, where:
Q = Peak Flow in Litres per Second (L/s)
A = Area in Hectares (Ha)
i = Rainfall intensity in millimeters per hour (mm/hr)
[i = 732.951 / (TC+6.199)^0.810] 2 YEAR
[i = 998.071 / (TC+6.053)^0.814] 5 YEAR
[i = 1174.184 / (TC+6.014)^0.816] 10 YEAR
[i = 1735.688 / (TC+6.014)^0.820]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

Notes:
1. Mannings coefficient (n) = 0.013

Designed: AC
Checked: JIM
Dwg. Reference: 118863-510

No.	Revision	Date
1	Submission No. 1 for City Review	2018-12-20
2	Submission No. 2 for City Review	2020-07-03
3	Submission No. 3 for City Review	2021-12-13

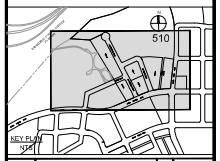
File Reference: 118863.5.7.1
Date: 2020-07-08
Sheet No: 1 of 1



LEGEND :

S317 | 0.06 | 0.60 — AREA NUMBER / RUNOFF COEFFICIENT / AREA IN HECTARES

PROPOSED SERVICE LATERAL LOCATION



No.	REVISIONS	By	Date
14			
13			
12			
11			
10			
9			
8			
7			
6			
5	SUBMISSION NO. 5 FOR CITY REVIEW	JJM.	2023/01/31
4	SUBMISSION NO. 4 FOR CITY REVIEW	JJM.	2022.09.23
3	SUBMISSION NO. 3 FOR CITY REVIEW	JJM.	2021.12.10
2	SUBMISSION NO. 2 FOR CITY REVIEW	JJM.	2020.07.08
1	SUBMISSION NO. 1 FOR CITY REVIEW	JJM.	2018.12.20

CANADA LANDS COMPANY
SOCIÉTÉ IMMOBILIÈRE DU CANADA
100 Queen Street
Ottawa,On
K1P 1J9

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

Project Title
WATERIDGE VILLAGE AT ROCKCLIFFE
PHASE 4

J. I. MOFFATT
2023/01/31

N

Drawing Title
STORM DRAINAGE AREA PLAN

Scale
1:1000

Design	Date
J.I.M.	JUNE 2020
Drawn	Checked
M.M.	A.C.
Project No.	Drawing No.
118863	510

D07-16-15-0003_P4

#17063

a:\118863_storage\CAD\3.0 Drawings\Default\Layouts\510 - STORM.dwg Layout Name: 510 Plot Style: ACAD.STB(MOD).ctb Plot Scale: 1.0000 Plotted At: 1/31/2023 11:36 AM Last Saved By: MMUIC Last Saved At: Jan. 26, 23

LRL
ENGINEERING | INGÉNIERIE

LRL File No. 250290
Project: Block 3- Wateridge Village Development
Location: 80 Winisik St, Ottawa
Date: 2026-06-30
Designed: SV
Checked: KP
Drawing Ref.: C601

Stormwater Management Design Sheet

STORM - 100 YEAR

Runoff Equation

Q = 2.78CIA (L/s)
C = Runoff coefficient
I = Rainfall intensity (mm/hr) = $A / (T_d + C)^B$
A = Area (ha)
T_d = Time of duration (min)

Restricted Release Rate = 398 L/s as per Phase 4 Servicing Report Table 5.3
Restricted Release Rate = 282 L/s as per Phase 4 Servicing Report Sewer design sheets

Post-development Stormwater Management

					$\sum R_{2\&5}$	$\sum R_{100}$
	Total Site Area =	**0.996**	**ha**	**∑R =**	**0.70**	**0.88**
	CA-06 (controlled)	0.020	ha	R =	0.81	1.00
	CA-07 (controlled)	0.019	ha	R =	0.51	0.64
	CA-08 (controlled)	0.018	ha	R =	0.58	0.73
	CA-09 (controlled)	0.002	ha	R =	0.34	0.42
	CA-10 (controlled)	0.002	ha	R =	0.35	0.44
	CA-11 (controlled)	0.148	ha	R =	0.90	1.00
	CA-12 (controlled)	0.137	ha	R =	0.55	0.69
	CA-13 (controlled)	0.136	ha	R =	0.90	1.00
	CA-14 (controlled)	0.009	ha	R =	0.48	0.60
	CA-15 (controlled)	0.015	ha	R =	0.41	0.51
	CA-16 (controlled)	0.011	ha	R =	0.44	0.55
	CA-17 (controlled)	0.074	ha	R =	0.90	1.00
	CA-18 (controlled)	0.043	ha	R =	0.90	1.00
	CA-19 (controlled)	0.003	ha	R =	0.33	0.42
	CA-20 (controlled)	0.042	ha	R =	0.53	0.66
	CA-21 (controlled)	0.091	ha	R =	0.38	0.48
	CA-22 (controlled)	0.110	ha	R =	0.90	1.00
	CA-23 (controlled)	0.004	ha	R =	0.51	0.64
	CA-24 (controlled)	0.028	ha	R =	0.55	0.69
	Total (controlled)	**0.911**	**ha**	**R =**	**0.73**	**0.91**
	CA-01 (un-controlled)	0.020	ha	R =	0.20	0.25
	CA-02 (un-controlled)	0.029	ha	R =	0.44	0.55
	CA-03 (un-controlled)	0.006	ha	R =	0.61	0.76
	CA-04 (un-controlled)	0.027	ha	R =	0.42	0.52
	CA-05 (un-controlled)	0.003	ha	R =	0.63	0.79
	Total (uncontrolled)	**0.085**	**ha**	**R =**	**0.40**	**0.49**
	Total	**0.996**	**ha**	**R =**	**0.70**	**0.88**

100 Year Post-development Stormwater Management (CA 04-15D)

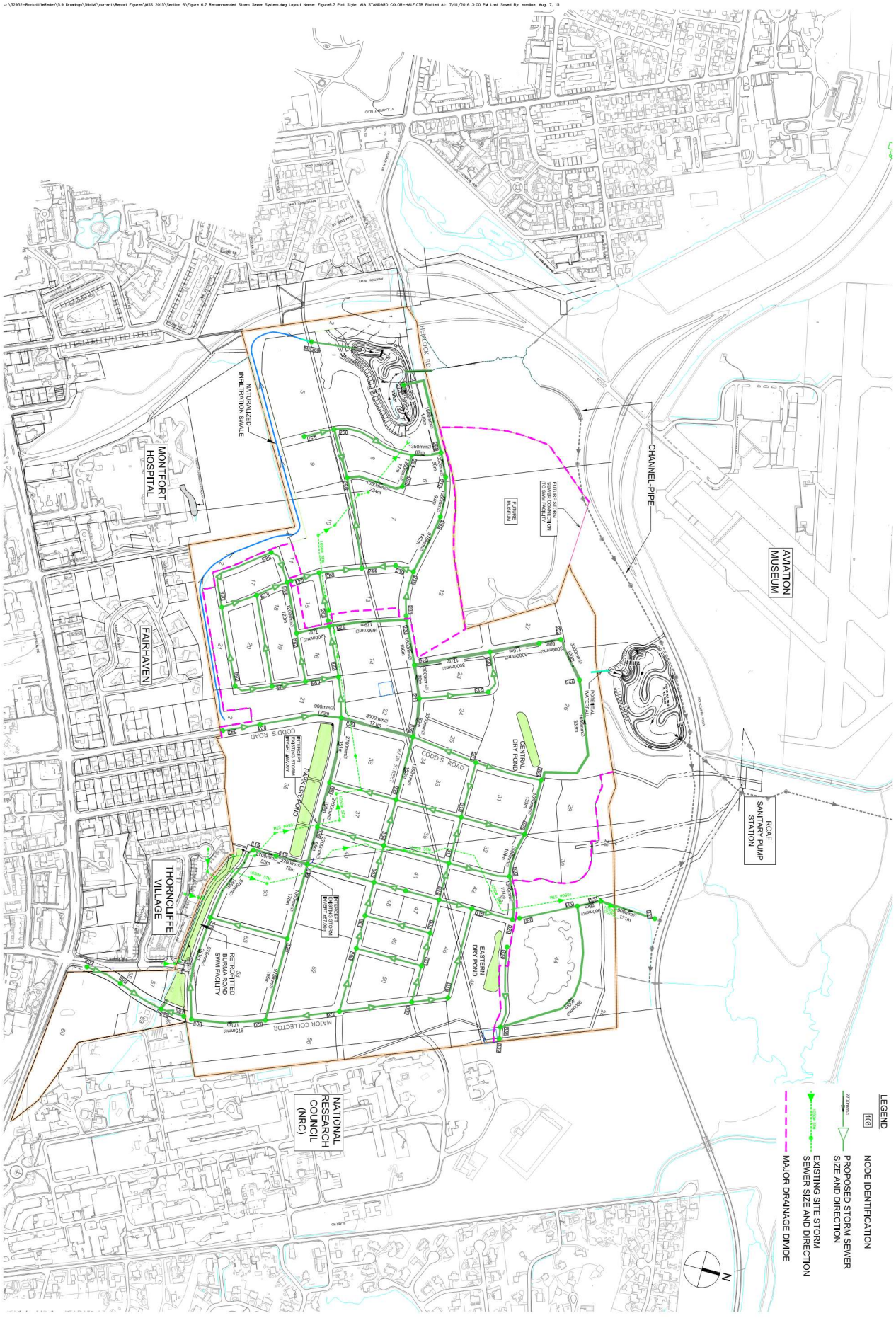
Time (min)	Intensity (mm/hr)	Controlled Runoff (L/s)	Storage Volume (m^3)	Controlled Release Rate (L/s)	Uncontrolled Runoff (L/s)	Total Release Rate (L/s)
10	178.56	411.66	90.29	261.17	20.83	282.00
15	142.89	329.43	61.43	261.17	16.67	277.84
20	119.95	276.54	18.44	261.17	13.99	275.16
25	103.85	239.41	0.00	261.17	12.11	273.29
30	91.87	211.80	0.00	261.17	10.71	271.89
35	82.58	190.38	0.00	261.17	9.63	270.81
40	75.15	173.24	0.00	261.17	8.76	269.94
45	69.05	159.19	0.00	261.17	8.05	269.23
50	63.95	147.44	0.00	261.17	7.46	268.63
55	59.62	137.46	0.00	261.17	6.95	268.13
60	55.89	128.86	0.00	261.17	6.52	267.69
65	52.65	121.37	0.00	261.17	6.14	267.31
70	49.79	114.79	0.00	261.17	5.81	266.98
75	47.26	108.94	0.00	261.17	5.51	266.69
80	44.99	103.72	0.00	261.17	5.25	266.42
85	42.95	99.03	0.00	261.17	5.01	266.18
90	41.11	94.78	0.00	261.17	4.79	265.97
95	39.43	90.91	0.00	261.17	4.60	265.77
100	37.90	87.38	0.00	261.17	4.42	265.60
105	36.50	84.14	0.00	261.17	4.26	265.43
110	35.20	81.16	0.00	261.17	4.11	265.28
115	34.01	78.40	0.00	261.17	3.97	265.14
120	32.89	75.84	0.00	261.17	3.84	265.01

100 Year Post-development Stormwater Management (CA 03, 04, 05, 06)
50% of the Controlled Release Rate considered for Storage Calculations

Time (min)	Intensity (mm/hr)	Controlled Runoff (L/s)	Storage Volume (m^3)	Controlled Release Rate (L/s)*	Uncontrolled Runoff (L/s)
10	178.56	411.66	168.64	130.59	20.83
15	142.89	329.43	178.96	130.59	16.67
20	119.95	276.54	175.14	130.59	13.99
25	103.85	239.41	163.24	130.59	12.11
30	91.87	211.80	146.18	130.59	10.71
35	82.58	190.38	125.56	130.59	9.63
40	75.15	173.24	102.37	130.59	8.76
45	69.05	159.19	77.23	130.59	8.05
50	63.95	147.44	50.57	130.59	7.46
55	59.62	137.46	22.68	130.59	6.95
60	55.89	128.86	0.00	130.59	6.52
65	52.65	121.37	0.00	130.59	6.14
70	49.79	114.79	0.00	130.59	5.81
75	47.26	108.94	0.00	130.59	5.51
80	44.99	103.72	0.00	130.59	5.25
85	42.95	99.03	0.00	130.59	5.01
90	41.11	94.78	0.00	130.59	4.79
95	39.43	90.91	0.00	130.59	4.60
100	37.90	87.38	0.00	130.59	4.42
105	36.50	84.14	0.00	130.59	4.26
110	35.20	81.16	0.00	130.59	4.11
115	34.01	78.40	0.00	130.59	3.97
120	32.89	75.84	0.00	130.59	3.84

On-site stormwater detention
Storage required = 178.96 m^3
Storage provided = 175.00 m^3 (Refer to DWG C601)

J:\32952-RockcliffeRedev\5.0 Drawings\59civil\current\Report Figures\MSS 2015\Section 6\Figure 6.7 Recommended Storm Sewer System.dwg Layout Name: Figure6.7 Plot Style: AIA STANDARD COLOR-HALF.CTB Plotted At: 7/11/2016 3:00 PM Last Saved By: mmilne, Aug. 7, 15



Sheet No.	Drawing Title	Project Title	Scale
FIGURE 6.7	RECOMMENDED STORM SEWER SYSTEM	FORMER CFB ROCKCLIFFE MASTER SERVICING STUDY	0 100 200

IBI

APPENDIX F
CIVIL ENGINEERING DRAWINGS

BLOCK 3 - WATERIDGE VILLAGE DEVELOPMENT
OTTAWA, ON

REVISION 01



KEY PLAN (N.T.S.)

DRAWING INDEX	
TITLE PAGE	C000
GENERAL NOTES	C001
SEDIMENT AND EROSION CONTROL PLAN	C101
DEMOLITION PLAN	C102
GRADING AND DRAINAGE PLAN	C301
SERVICING PLAN	C401
STORMWATER MANAGEMENT PLAN	C601
PRE-DEVELOPMENT WATERSHED PLAN	C701
POST-DEVELOPMENT WATERSHED PLAN	C702
CONSTRUCTION DETAIL PLAN	C901

LRL
ENGINEERING | INGÉNIERIE
5430 Canotek Road | Ottawa, ON, K1J 9G2
www.lrl.ca | (613) 842-3434

USE AND INTERPRETATION OF DRAWINGS

GENERAL CONDITIONS OF THE CONTRACT FOR CONSTRUCTION ARE PART OF THE CONTRACT DOCUMENTS AND DESCRIBE USE AND INTENT OF THE DRAWING. THE CONTRACT DOCUMENTS INCLUDE NOT ONLY THE DRAWINGS, BUT ALSO THE OWNER-CONTRACTOR AGREEMENTS, CONDITIONS OF THE CONTRACT, THE SPECIFICATIONS, ADDENDA, AND MODIFICATIONS ISSUED AFTER EXECUTION OF THE CONTRACT. THESE CONTRACT DOCUMENTS ARE COMPLEMENTARY, AND WHAT IS REQUIRED BY ANY ONE SHALL BE BINDING AS IF REQUIRED BY ALL. WORK NOT COMPLETELY DELINEATED HEREON SHALL BE CONSTRUCTED OF THE SAME MATERIALS AND DETAILED SIMILARLY AS WORK SHOWN MORE COMPLETELY ELSEWHERE IN THE CONTRACT DOCUMENTS.

BY USE OF THE DRAWINGS FOR CONSTRUCTION OF THE PROJECT, THE OWNER CONFIRMS THAT HE HAS REVIEWED AND APPROVED THE DRAWINGS. THE CONTRACTOR CONFIRMS THAT HE HAS VISITED THE SITE, FAMILIARIZED HIMSELF WITH THE LOCAL CONDITIONS, VERIFIED FIELD DIMENSIONS AND CORRELATED HIS OBSERVATIONS WITH THE REQUIREMENTS OF THE CONTRACT DOCUMENTS.

AS INSTRUMENTS OF SERVICE, ALL DRAWINGS, SPECIFICATIONS, CADD FILES OR OTHER ELECTRONIC MEDIA AND COPIED THERE OF FURNISHED BY THE ENGINEER ARE HIS PROPERTY. THEY ARE TO BE USED ONLY FOR THIS PROJECT AND ARE NOT TO BE USED ON ANY OTHER PROJECT, INCLUDING REPEATS OF THE PROJECT. CHANGES TO THE DRAWINGS MAY ONLY BE MADE BY THE ENGINEER.

UNLESS THE REVISION TITLE IS "ISSUED FOR CONSTRUCTION", THESE DRAWINGS SHALL BE CONSIDERED PRELIMINARY AND SHALL NOT BE USED AS A CONSTRUCTION DOCUMENT.

THESE DRAWINGS ILLUSTRATES THE WORK TO BE DONE. THE ENGINEER IS NOT RESPONSIBLE FOR THE MEANS, METHODS, TECHNIQUES, SEQUENCES, AND PROCEDURES USED TO DO THE WORK, OR THE SAFETY ASPECTS OF CONSTRUCTION, AND NOTHING ON THESE DRAWINGS EXPRESSED OR IMPLIED CHANGES THIS CONDITION. CONTRACTOR SHALL DETERMINE ALL CONDITIONS AT THE SITE AND SHALL BE RESPONSIBLE FOR KNOWING HOW THEY AFFECT THE WORK. SUBMITTAL OF A BID TO PERFORM THIS WORK IS ACKNOWLEDGEMENT OF THE RESPONSIBILITIES, AND THAT THEY HAVE BEEN FULLY CONSIDERED IN PLANNING OF THE WORK, AND THE BID PRICE. NO CLAIMS FOR EXTRA CHARGES DUE TO THESE CONDITIONS WILL BE FORTHCOMING.

UNAUTHORIZED CHANGES:

IN THE EVENT THE CLIENT, THE CLIENT'S CONTRACTORS OR SUBCONTRACTORS, OR ANYONE FOR WHOM THE CLIENT IS LEGALLY LIABLE MAKES OR PERMITS TO BE MADE ANY CHANGES TO ANY REPORTS, PLANS, SPECIFICATIONS OR OTHER CONSTRUCTION DOCUMENTS PREPARED BY LRL ASSOCIATES LTD. (LRL) WITHOUT OBTAINING LRL'S PRIOR WRITTEN CONSENT, THE CLIENT SHALL ASSUME FULL RESPONSIBILITY FOR THE RESULTS OF SUCH CHANGES, THEREFORE THE CLIENT AGREES TO WAIVE ANY CLAIM AGAINST LRL AND TO RELEASE LRL FROM ANY LIABILITY ARISING DIRECTLY OR INDIRECTLY FROM SUCH UNAUTHORIZED CHANGES.

IN ADDITION, THE CLIENT AGREES, TO THE FULLEST EXTENT PERMITTED BY LAW, TO INDEMNIFY AND HOLD HARMLESS LRL FROM ANY DAMAGES, LIABILITIES OR COST, INCLUDING REASONABLE ATTORNEY'S FEES AND COST OF DEFENSE, ARISING FROM SUCH CHANGES.

IN ADDITION, THE CLIENT AGREES TO INCLUDE IN ANY CONTRACTS FOR CONSTRUCTION APPROPRIATE LANGUAGE THAT PROHIBITS THE CONTRACTOR OR ANY SUBCONTRACTORS OF ANY TIER FROM MAKING ANY CHANGES OR MODIFICATIONS TO LRL'S CONSTRUCTION DOCUMENTS WITHOUT THE PRIOR WRITTEN APPROVAL OF LRL AND THAT FURTHER REQUIRES THE CONTRACTOR TO INDEMNIFY BOTH LRL AND THE CLIENT FROM ANY LIABILITY OR COST ARISING FROM SUCH CHANGES MADE WITHOUT SUCH PROPER AUTHORIZATION.

GENERAL NOTES:

EXISTING SERVICES AND UTILITIES SHOWN ON THESE DRAWINGS ARE TAKEN FROM THE BEST AVAILABE RECORDS, BUT MAY NOT BE COMPLETE OR TO DATE. CONTRACTOR SHALL VERIFY IN FIELD FOR LOCATION AND ELEVATION OF PIPES AND CHECK WITH THE UTILITY COMPANIES BEFORE DIGGING OR PERFORMING WORK.

CONTRACTOR IS ADVISED TO COLLECT INFORMATION ON SOIL CONDITIONS BEFORE START OF CONSTRUCTION.

THE ENGINEER WAIVES ANY AND ALL RESPONSIBILITY AND LIABILITY FOR PROBLEMS WHICH ARISE FROM FAILURE TO FOLLOW THESE PLANS, SPECIFICATIONS AND THE DESIGN INTENT THEY CONVEY, OR FOR PROBLEMS WHICH ARISE FROM OTHERS' FAILURE TO OBTAIN AND/OR FOLLOW THE ENGINEER'S GUIDANCE WITH RESPECT TO ANY ERRORS, OMISSIONS, INCONSISTENCIES AMBIGUITIES OR CONFLICTS WHICH ARE ALLEGED.

CONTRACTOR TO VERIFY ALL DIMENSIONS AND NOTIFY THE ENGINEER OF ANY DISCREPANCIES BEFORE WORK COMMENCES. DO NOT SCALE DRAWINGS.

No.	REVISIONS	BY	DATE
01	ISSUED FOR APPROVAL	M.L.	30 JUN 2026

LICENSED PROFESSIONAL ENGINEER
K.L. PARADIS
100045152
2026-06-30
PROVINCE OF ONTARIO

NOT AUTHENTIC UNLESS SIGNED AND DATED

LRL
ENGINEERING | INGÉNIERIE
5430 Canotek Road | Ottawa, ON, K1J 9G2
www.lrl.ca | (613) 842-3434

CLIENT
FIGURR ARCHITECTS COLLECTIVE

DESIGNED BY:	DRAWN BY:	APPROVED BY:
S.V. / M.L.	M.L.	K.P.

PROJECT
BLOCK 3
WATERIDGE VILLAGE DEVELOPEMENT
OTTAWA, ON

DRAWING TITLE
TITLE PAGE

PROJECT NO.
250290

C000

GENERAL NOTES

1. ALL WORKS MATERIALS SHALL CONFIRM TO THE LAST REVISION OF THE STANDARDS AND SPECIFICATIONS FOR THE CITY OF OTTAWA, ONTARIO PROVINCIAL STANDARD DRAWINGS (OPSD) AND SPECIFICATIONS (OPSS), WHERE APPLICABLE. LOCAL UTILITY STANDARDS AND MINISTRY OF TRANSPORTATION STANDARDS WILL APPLY WHERE REQUIRED.
2. THE CONTRACTORS SHALL CONFIRM THE LOCATION OF ALL EXISTING UTILITIES WITHIN THE SITE AND ADJACENT WORK AREAS. THE CONTRACTORS SHALL BE RESPONSIBLE FOR PROTECTING ALL EXISTING UTILITIES TO THE SATISFACTION OF THE AUTHORITY HAVING JURISDICTION. THE CONTRACTOR SHALL BE RESPONSIBLE FOR THE REPAIR OR REPLACEMENT OF ANY SERVICES OR UTILITIES DISTURBED DURING CONSTRUCTION , TO THE SATISFACTION OF THE AUTHORITY HAVING JURISDICTION.
3. ALL DIMENSIONS SHALL BE CHECKED AND VERIFIED IN THE FIELD BY THE CONTRACTOR PRIOR TO THE START OF CONSTRUCTION. ANY DISCREPANCIES SHALL BE REPORTED IMMEDIATELY TO THE ENGINEER. LOST TIME DUE TO FAILURE OF THE CONTRACTORS TO CONFIRM UTILITY LOCATIONS AND NOTIFY ENGINEER OF POSSIBLE CONFLICTS PRIOR TO CONSTRUCTION WILL BE AT CONTRACTOR'S EXPENSE.
4. ANY AREA BEYOND THE LIMIT OF THE SITE DISTURBED DURING CONSTRUCTION SHALL BE RESTORED TO ORIGINAL CONDITION OR BETTER TO THE SATISFACTION OF THE AUTHORITY HAVING JURISDICTION AT THE CONTRACTOR'S EXPENSE. RELOCATING OF EXISTING SERVICES AND/OR UTILITIES SHALL BE AS SHOWN ON THE DRAWINGS OR DETECTED BY THE ENGINEER AT THE EXPENSE OF DEVELOPERS.
5. ALL WORK SHALL BE COMPLETED IN ACCORDANCE WITH THE 'OCCUPATIONAL HEALTH AND SAFETY ACT AND REGULATIONS FOR CONSTRUCTION PROJECTS'. THE GENERAL CONTRACTORS SHALL BE DEEMED TO BE THE 'CONTRACTOR' AS DEFINED IN THE ACT.
6. ALL THE CONSTRUCTION SIGNAGE MUST CONFIRM TO THE MINISTRY OF TRANSPORTATION OF ONTARIO MANUAL OF UNIFORM TRAFFIC CONTROL DEVICES PER LATEST AMENDMENT.
7. THE CONTRACTOR IS ADVISED THAT WORKS BY OTHERS MAY BE ONGOING DURING THE PERIOD OF THE CONTRACT. THE CONTRACTOR SHALL COORDINATE CONSTRUCTION ACTIVITIES TO PREVENT CONFLICTS.
8. ALL DIMENSIONS ARE IN METRES UNLESS SPECIFIED OTHERWISE.
9. THERE WILL BE NO SUBSTITUTION OF MATERIALS UNLESS PRIOR WRITTEN APPROVAL IS RECEIVED FROM THE ENGINEER.
10. ALL CONSTRUCTION SHALL BE CARRIED OUT IN ACCORDANCE WITH THE RECOMMENDATIONS MADE IN THE GEOTECHNICAL REPORT.
11. FOR DETAILS RELATING TO STORMWATER MANAGEMENT AND ROOF DRAINAGE REFER TO THE SITE SERVICING AND STORMWATER MANAGEMENT REPORT.
12. ALL SEWERS CONSTRUCTED WITH GRADES LESS THAN 1.0% SHALL BE INSTALLED USING LASER ALIGNMENT AND CHECKED WITH LEVEL INSTRUMENT PRIOR TO BACKFILLING.
13. THE CONTRACTOR IS RESPONSIBLE FOR OBTAINING ALL PERMITS REQUIRED AND TO BEAR THE COST OF THE SAME.
14. THE CONTRACTOR SHALL BE RESPONSIBLE FOR ADDITIONAL BEDDING, OR ADDITIONAL STRENGTH PIPE IF THE MAXIMUM TRENCH WIDTH AS SPECIFIED BY OPSD IS EXCEEDED.
15. ALL PIPE/CULVERT SECTION SIZES REFER TO INSIDE DIMENSIONS.
16. SHOULD DEEPLY BURIED ARCHAEOLOGICAL REMAINS BE FOUND ON THE PROPERTY DURING CONSTRUCTION ACTIVITIES, THE HERITAGE OPERATIONS UNIT OF THE ONTARIO MINISTRY OF CULTURE MUST BE NOTIFIED IMMEDIATELY.
17. ALL NECESSARY CLEARING AND GRUBBING SHALL BE COMPLETED BY THE CONTRACTOR. REVIEW WITH CONTRACT ADMINISTRATOR AND THE CITY OF OTTAWA PRIOR TO ANY TREE CUTTING/REMOVAL.
18. DRAWINGS SHALL BE READ ON CONJUNCTION WITH ARCHITECTURAL SITE PLAN.
19. THE CONTRACTOR SHALL PROVIDE THE PROJECT ENGINEER ON SET OF AS CONSTRUCTED SITE SERVICING AND GRADING DRAWINGS.
20. BENCHMARKS: IT IS THE RESPONSIBILITY OF THE CONTRACTOR TO VERIFY THAT THE SITE BENCHMARK(S) HAS NOT BEEN ALTERED OR DISTURBED AND THAT ITS RELATIVE ELEVATION AND DESCRIPTION AGREES WITH THE INFORMATION DEPICTED ON THIS PLAN.

EROSION AND SEDIMENT CONTROL NOTES

GENERAL

THE CONTRACTOR SHALL IMPLEMENT BEST MANAGEMENT PRACTICES, TO PROVIDE FOR PROTECTION OF THE AREA DRAINAGE SYSTEM AND THE RECEIVING WATERCOURSE, DURING CONSTRUCTION ACTIVITIES. THE CONTRACTOR ACKNOWLEDGES THAT FAILURE TO IMPLEMENT APPROPRIATE EROSION AND SEDIMENT CONTROL MEASURES MAY BE SUBJECT TO PENALTIES IMPOSED BY ANY APPLICABLE REGULATORY AGENCY.

THE CONTRACTOR ACKNOWLEDGES THAT SURFACE EROSION AND SEDIMENT RUNOFF RESULTING FROM THEIR CONSTRUCTION OPERATIONS HAS POTENTIAL TO CAUSE A DETRIMENTAL IMPACT TO ANY DOWNSTREAM WATERCOURSE OR SEWER, AND THAT ALL CONSTRUCTION OPERATIONS THAT MAY IMPACT UPON WATER QUALITY SHALL BE CARRIED OUT IN MANNER THAT STRICTLY MEETS THE REQUIREMENT OF ALL APPLICABLE LEGISLATION AND REGULATIONS.

AS SUCH, THE CONTRACTOR SHALL BE RESPONSIBLE FOR CARRYING OUT THEIR OPERATIONS, AND SUPPLYING AND INSTALLING ANY APPROPRIATE CONTROL MEASURES, SO AS TO PREVENT SEDIMENT LADEN RUNOFF ENTERING ANY SEWER OR WATERCOURSE WITHIN OR DOWNSTREAM OF THE WORKING AREA.

THE CONTRACTOR ACKNOWLEDGES THAT NO ONE MEASURE IS LIKELY TO BE 100% EFFECTIVELY FOR EROSION PROTECTION AND CONTROLLING SEDIMENT RUNOFF AND DISCHARGES FROM THE SITE. THEREFORE, WHERE NECESSARY THE CONTRACTOR SHALL IMPLEMENT ADDITIONAL MEASURES ARRANGED IN SUCH MANNER AS TO MITIGATE SEDIMENT RELEASE FROM THE CONSTRUCTION OPERATIONS AND ACHIEVE SPECIFIC MAXIMUM PERMITTED CRITERIA WHERE APPLICABLE. SUGGESTED ON-SITE MEASURES MAY INCLUDE, BUT SHALL NOT BE LIMITED TO, THE FOLLOWING METHODS: SEDIMENT PONDS, FILTER BAGS, PUMP FILTERS, SETTLING TANKS, SILT FENCE, STRAW BALES, FILTER CLOTHS, CATCH BASIN FILTERS, CHECK DAMS AND/OR OTHER RECOGNIZED TECHNOLOGIES AND METHOD AVAILABLE AT THE TIME OF CONSTRUCTION. SPECIFIC MEASURES SHALL BE INSTALLED IN ACCORDANCE WITH REQUIREMENTS OF OPSS 577 WHERE APPROPRIATE, OR IN ACCORDANCE WITH MANUFACTURER'S RECOMMENDATIONS.

WHERE, IN THE OPINION OF THE CONTRACT ADMINISTRATOR OR REGULATORY AGENCY, THE INSTALLED CONTROL MEASURES FAIL TO PERFORM ADEQUATELY, THE CONTRACTOR SHALL SUPPLY AND INSTALL ADDITIONAL OR ALTERNATIVE MEASURES AS DIRECTED BY THE CONTRACT ADMINISTRATOR OR REGULATORY AGENCY, AS SUCH, THE CONTRACTOR SHALL HAVE ADDITIONAL CONTROL MATERIALS ON SITE AT ALL TIME WHICH ARE EASILY ACCESSIBLE AND MAY BE IMPLEMENTED BY HIM AT THE MOMENT'S NOTICE.

PRIOR TO COMMENCING WORK, THE CONTRACTOR SHALL SUBMIT TO THE CONTRACT ADMINISTRATOR SIX COPIES OF A DETAILED EROSION AND SEDIMENT CONTROL PLAN (ESCP). THE ESCP WILL CONSIST OF WRITTEN DESCRIPTION AND DETAILED DRAWINGS INDICATING THE ON-SITE ACTIVITIES AND MEASURES TO BE USED TO CONTROL EROSION AND SEDIMENT MOVEMENT FOR EACH STEP OF THE WORK.

CONTRACTOR'S RESPONSIBILITIES

THE CONTRACTOR SHALL ENSURE THAT ALL WORKERS, INCLUDING SUB-CONTRACTOR, IN THE WORKING ARE ARE AWARE OF THE IMPORTANCE OF THE EROSION AND SEDIMENT CONTROL MEASURES AND INFORMED OF THE CONSEQUENCES OF THE FAILURE TO COMPLY WITH THE REQUIREMENTS OF ALL REGULATORY AGENCIES.

THE CONTRACTOR SHALL PERIODICALLY, AND WHEN REQUESTED BY THE CONTRACT ADMINISTRATOR, CLEAN OUT ACCUMULATED SEDIMENT DEPOSITS AS REQUIRED AT THE SEDIMENT CONTROL DEVICES, INCLUDING THOSE DEPOSITS THAT MAY ORIGINATE FROM OUTSIDE THE CONSTRUCTION AREA. ACCUMULATED SEDIMENT SHALL BE REMOVED IN SUCH A MANNER THAT PREVENTS THE DEPOSITION OF THIS MATERIAL INTO THE SEWER WATERCOURSE AND AVOIDS DAMAGE TO CONTROL MEASURES. THE SEDIMENT SHALL BE REMOVED FROM THE SITE AT THE CONTRACTOR'S EXPENSE AND MANAGED IN COMPLIANCE WITH REQUIREMENTS FRO EXCESS EARTH MATERIAL, AS SPECIFIED ELSEWHERE IN THE CONTRACT.

THE CONTRACTOR SHALL IMMEDIATELY REPORT TO THE CONTRACT ADMINISTRATOR ANY ACCIDENTAL DISCHARGES OF SEDIMENT MATERIAL INTO EITHER THE WATERCOURSE OR THE STORM SEWER SYSTEM. FAILURE TO REPORT WILL BE CONSTITUTE A BRACH OF THIS SPECIFICATION AND THE CONTRACTOR MAY ALSO BE SUBJECT TO THE PENALTIES IMPOSED BY THE APPLICABLE REGULATORY AGENCY. APPROPRIATE RESPONSE MEASURES, INCLUDING ANY REPAIRS TO EXISTING CONTROL MEASURES OR THE IMPLEMENTATION OF ADDITIONAL CONTROL MEASURES, SHALL BE CARRIED OUT BY THE CONTRACTOR WITHOUT DELAY.

THE SEDIMENT CONTROL MEASURES SHALL ONLY BE REMOVED WHEN, IN THE OPINION OF THE CONTRACT ADMINISTRATOR, THE MEASURE OR MEASURES, IS NO LONGER REQUIRED. NO CONTROL MEASURE MAY BE PERMANENTLY REMOVED WITHOUT PRIOR AUTHORIZATION FROM THE CONTRACT ADMINISTRATOR. ALL SEDIMENT AND EROSION CONTROL MEASURES SHALL BE REMOVED IN A MANNER THAT AVOIDS THE ENTRY OF ANY EQUIPMENT, OTHER THAN HAND-HELD EQUIPMENT, INTO ANY WATERCOURSE, AND PREVENTS THE RELEASE OF ANY SEDIMENT OR DEBRIS INTO ANY SEWER OR WATERCOURSE WITHIN OR DOWNSTREAM OF THE WORKING AREA. ALL ACCUMULATED SEDIMENT SHALL BE REMOVED FROM THE WORKING AREA AT THE CONTRACTOR'S EXPENSE AND MANAGED IN COMPLIANCE WITH THE REQUIREMENTS FOR EXCESS EARTH MATERIAL

WHERE, IN THE OPINION OF EITHER THE CONTRACT ADMINISTRATOR OR A REGULATORY AGENCY, ANY OF THE TERMS SPECIFIED HEREIN HAVE NOT BEEN COMPLIED WITH OR PERFORMED IN A SUITABLE MANNER, OR TAT ALL, THE CONTRACTOR ADMINISTRATOR OR A REGULATORY AGENCY HAS THE RIGHT TO IMMEDIATELY WITHDRAW ITS PERMISSION TO CONTINUE THE WORK BUT MAY RENEW ITS PERMISSION UPON BEING SATISFIED THAT THE DEFAULTS OR DEFICIENCIES IN THE PERFORMANCE OF THIS SPECIFICATION BY THE CONTRACTOR HAVE BEEN REMEDIED.

SPILL CONTROL NOTES

1. ALL CONSTRUCTION EQUIPMENT SHALL BE RE-FUELED, MAINTAINED, AND STORED NO LESS THAN 30 METRES FROM WATERCOURSE, STEAMS, CREEKS, WOODLOTS, AND ANY ENVIRONMENTALLY SENSITIVE AREAS, OR AS OTHERWISE SPECIFIED.
2. THE CONTRACTOR MUST IMPLEMENT ALL NECESSARY MEASURES IN ORDER TO PREVENT LEAKS, DISCHARGES OR SPILLS OF POLLUTANTS, DELETERIOUS MATERIALS, OR OTHER SUCH MATERIALS OR SUBSTANCES WHICH WOULD OR COULD CAUSE AN ADVERSE IMPACT TO THE NATURAL ENVIRONMENT.
3. IN THE EVENT OF A LEAK, DISCHARGE OR SPILL OF POLLUTANT, DELETERIOUS MATERIAL OR OTHER SUCH MATERIAL OR SUBSTANCE WHICH WOULD OR COULD CAUSE AN ADVERSE IMPACT TO THE NATURAL ENVIRONMENT, THE CONTRACTOR SHALL:
   - 3.1. IMMEDIATELY NOTIFY APPROPRIATE FEDERAL, PROVINCIAL, AND LOCAL GOVERNMENT MINISTRIES, DEPARTMENTS, AGENCIES, AND AUTHORITIES OF THE INCIDENT IN ACCORDANCE WITH ALL CURRENT LAWS, LEGISLATION, ACTS, BY-LAWS, PERMITS, APPROVALS, ETC.
   - 3.2. TAKE IMMEDIATE MEASURES TO CONTAIN THE MATERIAL OR SUBSTANCE, AND TO TAKE SUCH MEASURES TO MITIGATE AGAINST ADVERSE IMPACTS TO THE NATURAL ENVIRONMENT.
   - 3.3. RESTORE THE AFFECTED AREA TO THE ORIGINAL CONDITION OR BETTER TO THE SATISFACTION OF THE AUTHORITIES HAVING JURISDICTION.

MUD MAT NOTES

1. THE GRANULAR MATERIAL WILL REQUIRE PERIODIC REPLACEMENT AS IT BECOMES CONTAMINATED BY VEHICLE TRAFFIC.
2. SEDIMENT SHALL BE CLEANED FROM PUBLIC ROADS AT THE END OF EACH DAY.
3. SEDIMENT SHALL BE REMOVED FROM PUBLIC ROADS BY SHOVELING OR SWEEPING AND DISPOSED OR PROPERLY IN A CONTROLLED SEDIMENT DISPOSAL AREA.

SITE GRADING NOTES

1. PRIOR TO THE COMMENCEMENT OF THE SITE GRADING WORKS, ALL SILTATION CONTROL DEVICES SHALL BE INSTALLED AND OPERATIONAL PER EROSION CONTROL PLAN.
2. ALL GRANULAR AND PAVEMENT FOR ROADS/PARKING AREAS SHALL BE CONSTRUCTED IN ACCORDANCE WITH GEOTECHNICAL ENGINEER'S RECOMMENDATIONS.
3. ALL TOPSOIL AND ORGANIC MATERIAL SHALL BE STRIPPED WITHIN THE ROAD AND PARKING AREAS ALLOWANCE PRIOR TO THE COMMENCEMENT OF CONSTRUCTION.
4. CONCRETE CURB SHALL BE IN ACCORDANCE WITH THE CITY OF OTTAWA STD. SC1.1 OR OPSD 600.110. PROVISION SHALL BE MADE OR CURB DEPRESSIONS AS INDICATED ON ARCHITECTURAL SITE PLAN. CONCRETE SIDEWALK SHALL BE IN ACCORDANCE WITH CITY OF OTTAWA STD SC1.4. ALL CURBS, CONCRETE ISLANDS, AND SIDEWALKS SHOWN O THIS DRAWING ARE TO BR PRICED IN SITE WORKS PORTION OF THE CONTRACT.
5. PAVEMENT REINSTATEMENT FOR SERVICE AND UTILITY CUTS SHALL BE IN ACCORDANCE WITH THE CITY OF OTTAWA STD. R10 AND OPSD 509.010 AND OPSS 310.
6. GRANULAR 'A' SHALL BE PLACED TO A MINIMUM THICKNESS OF 300MM AROUND ALL STRUCTURES WITHIN THE PAVEMENT AREA.
7. SUB-EXCAVATE SOFT AREAS AND FILL WITH GRANULAR 'B' COMPACTED IN MAXIMUM 300MM LIFTS.
8. ALL WORK ON THE MUNICIPAL RIGHT OF WAY AND EASEMENTS TO BE INSPECTED BY THE MUNICIPALITY PRIOR BACKFILLING.
9. CONTRACTOR TO OBTAIN A ROAD OCCUPANCY PERMIT 48 HOURS PRIOR TO COMMENCING ANY WORK WITHIN THE MUNICIPAL ROAD ALLOWANCE, IF REQUIRED BY THE MUNICIPALITY.
10. ALL PAVEMENT MARKING FEATURES AND SITE SIGNAGE SHALL BE PLACED PER ARCHITECTURAL SITE PLAN. LINE PAINTING AND DIRECTIONAL SYMBOLS SHALL BE APPLIED WITH A MINIMUM OF TWO COATS OF ORGANIC SOLVENT PAINT.
11. REFER TO ARCHITECTURAL SITE PLAN FOR DIMENSIONS AND SITE DETAILS.
12. STEP JOINTS ARE TO BE USED WHERE PROPOSED ASPHALT MEETS EXISTING ASPHALT. ALL JOINTS MUST BE SEALED.
13. SIDEWALKS TO BE 13MM & BEVELED AT 2:1 OR 6MM WITH NO BEVEL REQUIRED BELOW THE FINISHED FLOOR SLAB ELEVATION AT ENTRANCES REQUIRED TO BE BARRIER-FREE, UNLESS OTHERWISE NOTED. ALL IN ACCORDANCE WITH OBC 3.8.1.3 & OTTAWA ACCESSIBILITY DESIGN STANDARDS.
14. WHERE APPLICABLE THE CONTRACTOR IS TO SUBMIT SHOP DRAWINGS TO THE ENGINEER FOR APPROVAL PRIOR TO CONSTRUCTION. SHOP DRAWINGS MUST BE SITE SPECIFIC, SIGNED AND SEALED BY A LICENSED STRUCTURAL ENGINEER. THE CONTRACTOR WILL ALSO BE REQUIRED TO SUPPLY AND GEOTECHNICAL CERTIFICATION OF THE AS-CONSTRUCTED RETAINING WALL TO THE ENGINEER PRIOR TO FINAL ACCEPTANCE.

ROADWORK SPECIFICATIONS

15. ROADWORK TO BE COMPLETED IN ACCORDANCE WITH GEOTECHNICAL REPORT.
16. ALL TOPSOIL AND ORGANIC MATERIAL SHALL BE STRIPPED WITHIN THE ROAD ALLOWANCE PRIOR TO THE COMMENCEMENT OF CONSTRUCTION AND STOCK PILLED ON SITE AS DIRECTED BY NATIONAL MUNICIPALITY.
17. THE SUBGRADE SHALL BE CROWNED AND SLOPED AT LEAST 2% AND PROOF ROLLED WITH HEAVY ROLLERS.
18. SUB-EXCAVATE SOFT AREAS AND FILL WITH GRANULAR 'A', TYPE II COMPACTED IN MAXIMUM 300MM LIFTS.
19. ALL GRANULAR FOR ROADS SHALL BE COMPACTED TO MINIMUM OF 100% STANDARD PROCTOR DENSITY MAXIMUM DRY DENSITY (SPMDD).
20. CONCRETE RAMP C/W TACTILE WALKING SURFACE INDICATORS COMPONENT AS PER OPSD 310.039. TACTILE WALKING SURFACE INDICATORS TO BE INSTALLED AT ALL RAMPS. MATERIAL TO BE POLYMER COMPOSITE, COLOR GREY.

SANITARY, FOUNDATION DRAIN, STORM SEWER AND WATERMAIN NOTES

GENERAL

1. LASER ALIGNMENT CONTROL TO BE UTILIZED ON ALL SEWER INSTALLATIONS.
2. CLAY SEALS TO BE INSTALLED AS PER CITY STANDARD DRAWING S8. THE SEALS SHOULD BE AT LEAST 1.5M LONG (IN THE TRENCH DIRECTION) AND SHOULD EXTEND FROM TRENCH WALL TO TRENCH WALL. THE SEALS SHOULD EXTEND FROM THE FROST LINE AND FULLY PENETRATE THE BEDDING, SUB-BEDDING, AND COVER MATERIAL. THE BARRIERS SHOULD CONSIST OF RELATIVELY DRY AND COMPATIBLE BROWN SILTY CLAY PLACED IN MAXIMUM 225MM LIFTS AND COMPACTED TO A MINIMUM OF 95% SPMDD. THE CLAY SEALS SHOULD BE PLACED AT THE SITE BOUNDARIES AND AT 60M INTERVALS IN THE SERVICE TRENCHES.
3. SERVICES TO BUILDING TO BE TERMINATED 1.0M FROM THE OUTSIDE FACE OF BUILDING UNLESS OTHERWISE NOTED.
4. ALL MAINTENANCE STRUCTURE AND CATCH BASIN EXCAVATIONS TO BE BACKFILLED WITH GRANULAR MATERIAL COMPACTED TO 98% STANDARD PROCTOR DENSITY. A MINIMUM OF 300MM AROUND STRUCTURES.
5. "MODULOC" OR APPROVED PRE-CAST MAINTENANCE STRUCTURE AND CATCH BASIN ADJUSTERS TO BE USED IN LIEU OF BRICKING. PARGE ADJUSTING UNITS ON THE OUTSIDE ONLY.
6. SAFETY PLATFORMS SHALL BE PER OPSD 404.02.
7. DROP STRUCTURES SHALL BE IN ACCORDANCE WITH OPSD 1003.01, IF APPLICABLE.
8. THE CONTRACTOR IS TO PROVIDE CCTV CAMERA INSPECTIONS OF ALL SEWERS, INCLUDING PICTORIAL REPORT, ONE (1) CD COPY AND TWO (2) VIDEO RECORDING IN A FORMAT ACCEPTABLE TO ENGINEER. ALL SEWER ARE TO BE FLUSHED PRIOR TO CAMERA INSPECTION. ASPHALT WEAR COURSE SHALL NOT BE PLACED UNTIL THE VIDEO INSPECTION OF SEWERS AND NECESSARY REPAIRS HAVE BEEN COMPLETED TO THE SATISFACTION OF THE ENGINEER.
9. CONTRACTOR SHALL PERFORM LEAKAGE TESTING, IN THE PRESENCE OF THE CONSULTANT, FOR SANITARY SEWERS IN ACCORDANCE WITH OPSS 407. CONTRACTOR SHALL PERFORM VIDEO INSPECTION OF ALL SEWERS. A COPY OF THE VIDEO AND INSPECTION REPORT SHALL BE SUBMITTED TO THE CONSULTANT FOR REVIEW AND APPROVAL PRIOR TO PLACEMENT OF WEAR COURSE ASPHALT.

SANITARY

10. ALL SANITARY SEWER INSTALLATION SHALL CONFORM TO THE LATEST REVISIONS OF THE CITY OF OTTAWA AND THE ONTARIO PROVINCIAL STANDARD DRAWINGS (OPSD). AND SPECIFICATIONS (OPSS).
11. ALL SANITARY GRAVITY SEWER SHALL BE PVC SDR 35, IPEX 'RING-TITE' (OR APPROVED EQUIVALENT) PER CSA STANDARD B182.2 OR LATEST AMENDMENT, UNLESS SPECIFIED OTHERWISE.
12. EXISTING MAINTENANCE STRUCTURES TO BE RE-BENCHED WHERE A NEW CONNECTION IS MADE.
13. SANITARY GRAVITY SEWER TRENCH AND BEDDING SHALL BE PER CITY OF OTTAWA STD. S6 AND S7 CLASS 'B' BEDDING, UNLESS SPECIFIED OTHERWISE.
14. SANITARY MAINTENANCE STRUCTURE FRAME AND COVERS SHALL BE PER CITY OF OTTAWA STD. S24 AND S25.
15. SANITARY MAINTENANCE STRUCTURES SHALL BE BENCHED PER OPSD 701.021.
16. 100MM THICK HIGH-DENSITY GRADE 'A' POLYSTYRENE INSULATION TO BE INSTALLED IN ACCORDANCE WITH CITY STD W22 WHERE INDICATED ON DRAWING SSP-1.

STORM

17. ALL REINFORCED CONCRETE STORM SEWER PIPE SHALL BE IN ACCORDANCE WITH CSA A257.2, OR LATEST AMENDMENT. ALL NON-REINFORCED CONCRETE STORM SEWER PIPE SHALL BE IN ACCORDANCE WITH CSA A257.1, OR LATEST AMENDMENT. PIPE SHALL BE JOINED WITH STD. RUBBER GASKETS AS PER CSA A257.3, OR LATEST AMENDMENT.
18. ALL STORM SEWER TRENCH AND BEDDING SHALL BE IN ACCORDANCE WITH THE CITY OF OTTAWA STD. S6 AND S7 CLASS 'B' UNLESS OTHERWISE SPECIFIED. BEDDING AND COVER MATERIAL SHALL BE SPECIFIED BY PROJECT GEOTECHNICAL ENGINEER.
19. ALL PVC STORM SEWERS ARE TO BE SDR 35 APPROVED PER C.S.A. B182.2 OR LATEST AMENDMENT, UNLESS OTHERWISE SPECIFIED.
20. CATCH BASIN SHALL BE IN ACCORDANCE WITH OPSD 705.010.
21. CATCH BASIN LEADS SHALL BE IN 200MM DIA. AT 1% SLOPE (MIN) UNLESS SPECIFIED OTHERWISE.
22. ALL CATCH BASINS SHALL HAVE 600MM SUMPS, UNLESS SPECIFIED OTHERWISE.
23. ALL CATCH BASIN LEAD INVERTS TO BE 1.5M BELOW FINISHED GRADE UNLESS SPECIFIED OTHERWISE.
24. THE STORM SEWER CLASSES HAVE BEEN DESIGNED BASED ON BEDDING CONDITIONS SPECIFIED ABOVE. WHERE THE SPECIFIED TRENCH WIDTH IS EXCEEDED , THE CONTRACTOR IS REQUIRED TO PROVIDE AND SHALL BE RESPONSIBLE FOR EXTRA TEMPORARY AND/OR PERMANENT REPAIRS MADE NECESSARY BY THE WIDENED TRENCH.
25. ALL ROAD AND PARKING LOT CATCH BASINS TO BE INSTALLED WITH ORTHOGONALLY PLACED SUBDRAINS IN ACCORDANCE WITH DETAIL. PERFORATED SUBDRAIN FOR ROAD AND PARKING LOT CATCH BASIN SHALL BE INSTALLED PER CITY STD R1 UNLESS OTHERWISE NOTED.
26. PERFORATED SUBDRAIN FOR REAR YARD AND LANDSCAPING APPLICATIONS SHALL BE INSTALLED PER CITY STD S29, S30 AND S31, WHERE APPLICABLE.
27. RIP-RAP TREATMENT SEWER AND CULVERT OUTLETS PER OPSD 810.010.
28. ALL STORM SEWER/ CULVERTS TO BE INSTALLED WITH FROST TREATMENT PER OPSD 803.031 WHERE APPLICABLE.
29. ALL STORM MANHOLES WITH PIPE LESS THAN 900MM IN DIAMETER SHALL BE CONSTRUCTED WITH A 300MM SUMP AS PER SDG, CLAUSE 6.2.6.

WATERMAIN

30. ALL WATERMAIN INSTALLATION SHALL CONFORM TO THE LATEST REVISIONS OF THE CITY OF OTTAWA AND THE ONTARIO PROVINCIAL STANDARD DRAWINGS (OPSD) AND SPECIFICATIONS (OPSS).
31. ALL PVC WATERMAINS SHALL BE AWWA C-900 CLASS 150, SDR 18 OR APPROVED EQUIVALENT.
32. ALL WATER SERVICES LESS THAN OR EQUAL TO 50MM IN DIAMETER TO BE TYPE 'K' COPPER.
33. WATERMAIN TRENCH AND BEDDING SHALL BE IN ACCORDANCE WITH CITY OF OTTAWA STANDARD W17. UNLESS SPECIFIED OTHERWISE. BEDDING AND COVER MATERIAL SHALL BE SPECIFIED BY THE PROJECT GEOTECHNICAL ENGINEER.
34. ALL PVC WATERMAINS, SHALL BE INSTALLED WITH A 10 GAUGE STRANDED COPPER TWU OR RWU TRACER WIRE IN ACCORDANCE WITH CITY OF OTTAWA STD. W.36.
35. CATHODIC PROTECTION IS REQUIRED ON ALL METALLIC FITTINGS PER CITY OF OTTAWA STD.25.5 AND W25.6.
36. VALVE BOXES SHALL BE INSTALLED PER CITY OF OTTAWA STD W24.
37. WATERMAIN IN FILL AREAS TO BE INSTALLED WITH RESTRAINED JOINTS PER CITY OF OTTAWA STD.25.5 AND W25.6.
38. THRUST BLOCKING OF WATERMAINS TO BE INSTALLED PER CITY OF OTTAWA STD. W25.3 AND W25.4.
39. THE CONTRACTOR SHALL PROVIDE ALL TEMPORARY CAPS, PLUGS, BLOW-OFFS, AND NOZZLES REQUIRED FOR TESTING AND DISINFECTION OF THE WATERMAIN.
40. WATERMAIN CROSSING OVER AND BELOW SEWERS SHALL BE IN ACCORDANCE WITH THE CITY OF OTTAWA STD. W25,2 AND W25, RESPECTIVELY.
41. WATER SERVICES ARE TO BE INSULATED PER CITY STD. W23 WHERE SEPARATION BETWEEN SERVICES AND MAINTENANCE HOLES ARE LESS THAN 2.4M.
42. THE MINIMUM VERTICAL CLEARANCE BETWEEN WATERMAIN AND SEWER/UTILITY IS 0.5M PER MOE GUIDELINES. FOR CROSSING UNDER SEWERS, ADEQUATE STRUCTURAL SUPPORT FOR THE SEWER IS REQUIRED TO PREVENT EXCESSIVE DEFLECTION OF JOINTS AND SETTLING. THE LENGTH OF WATER PIPE SHALL BE CENTERED AT THE POINT OF CROSSING TO ENSURE THAT THE JOINTS WILL BE EQUIDISTANT AND AS FAR AS POSSIBLE FROM THE SEWER.
43. ALL WATERMAINS SHALL HAVE A MINIMUM COVER OR 2.4M, OTHERWISE THERMAL INSULATION IS REQUIRED AS PER STD DWG W22.
44. GENERAL WATER PLANT TO UTILITY CLEARANCE AS PER STD DWG R20.
45. FIRE HYDRANT INSTALLATION AS PER STD DWG W19, ALL BOTTOM OF HYDRANT FLANGE ELEVATIONS TO BE INSTALLED 0.10M ABOVE PROPOSED FINISHED GRADE AT HYDRANT; FIRE HYDRANT LOCATION AS PER STD DWG W18.
46. BUILDING SERVICE TO BE CAPPED 1.0M OFF THE FACE OF THE BUILDING UNLESS OTHERWISE NOTED AND MUST BE RESTRAINED A MINIMUM OF 12M BACK FROM STUB.
47. ALL WATERMAINS SHALL BE HYDROSTATICALLY TESTED IN ACCORDANCE WITH THE CITY OF OTTAWA AND ONTARIO GUIDELINES UNLESS OTHERWISE DIRECTED. PROVISIONS FOR FLUSHING WATER LINE PRIOR TO TESTING, ETC. MUST BE PROVIDED.
48. ALL WATERMAINS SHALL BE BACTERIOLOGICALLY TESTED IN ACCORDANCE WITH THE CITY OF OTTAWA AND ONTARIO GUIDELINES. ALL CHLORINATED WATER TO BE DISCHARGED AND PRETREATED TO ACCEPTABLE LEVELS PRIOR TO DISCHARGE. ALL DISCHARGED WATER MUST BE CONTROLLED AND TREATED SO AS NOT TO ADVERSELY EFFECT ENVIRONMENT. IT IS RESPONSIBILITY OF THE CONTRACTOR TO ENSURE THAT ALL MUNICIPAL AND/OR PROVINCIAL REQUIREMENTS ARE FOLLOWED.
49. ALL WATERMAIN STUBS SHALL BE TERMINATED WITH A PLUG AND 50MM BLOW OFF UNLESS OTHERWISE NOTED.

PAVEMENT STRUCTURE

COURSE	MATERIAL	THICKNESS (mm) AUTOMOBILE PARKING	THICKNESS (mm) TRUCK ROUTE (HEAVY TRAFFIC)
SURFACE	HL.3 A/C (PG 58-34)	40	50
BINDER	HL.8 A/C (PG 58-34)	50	60
BASECOURSE	OPSS GRANULAR "A"	150	150
SUBBASE	OPSS GRANULAR "B" TYPE II	300	300

NOTE:
IN PREPARATION FOR PAVEMENT CONSTRUCTION AT THIS SITE, ANY SURFICIAL OR NEAR SURFACE/SUBGRADE LEVEL TOPSOIL AND ANY SOFT, WET OR DELETERIOUS MATERIALS SHOULD BE REMOVED FROM THE PROPOSED PAVED AREAS. THE EXPOSED SUBGRADE SHOULD BE INSPECTED AND APPROVED BY GEOTECHNICAL PERSONNEL AND ANY SOFT AREAS EVIDENT SHOULD BE SUBEXCAVATED AND REPLACED WITH SUITABLE EARTH BORROW APPROVED BY THE GEOTECHNICAL ENGINEER. THE SUBGRADE SHOULD BE SHAPED AND CROWNED TO PROMOTE DRAINAGE OF THE SITE DRAINAGE STRUCTURES. FOLLOWING APPROVAL OF THE PREPARATION OF THE SUBGRADE, THE PAVEMENT GRANULARS MAY BE PLACED.

REFER TO GEOTECHNICAL REPORT PREPARED BY EXP SERVICES INC., DATED AUGUST 11 2025.

USE AND INTERPRETATION OF DRAWINGS

GENERAL CONDITIONS OF THE CONTRACT FOR CONSTRUCTION ARE PART OF THE CONTRACT DOCUMENTS AND DESCRIBE USE AND INTENT OF THE DRAWING. THE CONTRACT DOCUMENTS INCLUDE NOT ONLY THE DRAWINGS, BUT ALSO THE OWNER-CONTRACTOR AGREEMENTS, CONDITIONS OF THE CONTRACT, THE SPECIFICATIONS, ADDENDA, AND MODIFICATIONS ISSUED AFTER EXECUTION OF THE CONTRACT. THESE CONTRACT DOCUMENTS ARE COMPLEMENTARY, AND WHAT IS REQUIRED BY ANY ONE SHALL BE BINDING AS IF REQUIRED BY ALL. WORK NOT COMPLETELY DELINEATED HEREON SHALL BE CONSTRUCTED OF THE SAME MATERIALS AND DETAILED SIMILARLY AS WORK SHOWN MORE COMPLETELY ELSEWHERE IN THE CONTRACT DOCUMENTS.

BY USE OF THE DRAWINGS FOR CONSTRUCTION OF THE PROJECT, THE OWNER CONFIRMS THAT HE HAS REVIEWED AND APPROVED THE DRAWINGS. THE CONTRACTOR CONFIRMS THAT HE HAS VISITED THE SITE, FAMILIARIZED HIMSELF WITH THE LOCAL CONDITIONS, VERIFIED FIELD DIMENSIONS AND CORRELATED HIS OBSERVATIONS WITH THE REQUIREMENTS OF THE CONTRACT DOCUMENTS.

AS INSTRUMENTS OF SERVICE, ALL DRAWINGS, SPECIFICATIONS, CADD FILES OR OTHER ELECTRONIC MEDIA AND COPIED THERE OF FURNISHED BY THE ENGINEER ARE HIS PROPERTY. THEY ARE TO BE USED ONLY FOR THIS PROJECT AND ARE



LEGEND:

- EXISTING PROPERTY LINE TO REMAIN
- PROPOSED CURB
- PROPOSED DEPRESSED CURB
- PROPOSED TERRACING (3:1 MIN.)
- PROPOSED SILT FENCE AS PER OPSD 219.110
- PROPOSED FENCE
- PROPOSED DOOR ENTRANCE/EXIT
- PROPOSED GRASS AREA (100mm TOP SOIL & SOD)
- PROPOSED CONCRETE FEATURES/SLAB
- PROPOSED HEAVY DUTY ASPHALT
- PROPOSED LIGHT DUTY ASPHALT
- PROPOSED RIP RAP
- ×50.00 PROPOSED ELEVATION
- ×50.00HP PROPOSED HIGH POINT ELEVATION
- ×50.00S PROPOSED SWALE ELEVATION
- ×50.00BC PROPOSED BOTTOM OF CURB / ASPHALT ELEVATION
- ×50.00TC PROPOSED TOP OF CURB ELEVATION
- ×50.00BW PROPOSED EXPOSED BOTTOM OF RETAINING WALL
- ×50.00TW PROPOSED TOP OF RETAINING WALL
- ×50.00EX MATCH INTO EXISTING ELEVATION
- ×70.19 EXISTING ELEVATION
- PROPOSED OVERLAND MAJOR FLOW ROUTE
- SUB SUB PROPOSED 100mmØ PERFORATED SUBDRAIN
- STM STM PROPOSED STORM SEWER
- SAN SAN PROPOSED SANITARY SEWER
- WTR WTR PROPOSED WATERMAIN
- STM STM EXISTING STORM SEWER
- SAN SAN EXISTING SANITARY SEWER
- WTR WTR EXISTING WATERMAIN
- GAS GAS EXISTING GAS LINE
- EXISTING MANHOLE
- EXISTING CATCHBASIN
- PROPOSED CATCHBASIN-MANHOLE/CATCHBASIN
- PROPOSED MANHOLE
- PROPOSED CURB STOP
- PROPOSED PIPE INSULATION
- PROPOSED 100 YEAR HIGH WATER LEVEL
- STORM WATERSHED EXTENT
- WS-XX CONTROLLED — WATERSHED NAME
- AREA / RUNOFF — RUNOFF COEFFICIENT
- AREA IN HECTARES

USE AND INTERPRETATION OF DRAWINGS

GENERAL CONDITIONS OF THE CONTRACT FOR CONSTRUCTION ARE PART OF THE CONTRACT DOCUMENTS AND DESCRIBE USE AND INTENT OF THE DRAWING. THE CONTRACT DOCUMENTS INCLUDE NOT ONLY THE DRAWINGS, BUT ALSO THE OWNER-CONTRACTOR AGREEMENTS, CONDITIONS OF THE CONTRACT, THE SPECIFICATIONS, ADDENDA, AND MODIFICATIONS ISSUED AFTER EXECUTION OF THE CONTRACT. THESE CONTRACT DOCUMENTS ARE COMPLEMENTARY, AND WHAT IS REQUIRED BY ANY ONE SHALL BE BINDING AS IF REQUIRED BY ALL. WORK NOT COMPLETELY DELINEATED HEREON SHALL BE CONSTRUCTED OF THE SAME MATERIALS AND DETAILED SIMILARLY AS WORK SHOWN MORE COMPLETELY ELSEWHERE IN THE CONTRACT DOCUMENTS.

BY USE OF THE DRAWINGS FOR CONSTRUCTION OF THE PROJECT, THE OWNER CONFIRMS THAT HE HAS REVIEWED AND APPROVED THE DRAWINGS. THE CONTRACTOR CONFIRMS THAT HE HAS VISITED THE SITE, FAMILIARIZED HIMSELF WITH THE LOCAL CONDITIONS, VERIFIED FIELD DIMENSIONS AND CORRELATED HIS OBSERVATIONS WITH THE REQUIREMENTS OF THE CONTRACT DOCUMENTS.

AS INSTRUMENTS OF SERVICE, ALL DRAWINGS, SPECIFICATIONS, CADD FILES OR OTHER ELECTRONIC MEDIA AND COPIED THERE OF FURNISHED BY THE ENGINEER ARE HIS PROPERTY. THEY ARE TO BE USED ONLY FOR THIS PROJECT AND ARE NOT TO BE USED ON ANY OTHER PROJECT, INCLUDING REPEATS OF THE PROJECT. CHANGES TO THE DRAWINGS MAY ONLY BE MADE BY THE ENGINEER.

UNLESS THE REVISION TITLE IS "ISSUED FOR CONSTRUCTION", THESE DRAWINGS SHALL BE CONSIDERED PRELIMINARY AND SHALL NOT BE USED AS A CONSTRUCTION DOCUMENT.

THESE DRAWINGS ILLUSTRATES THE WORK TO BE DONE. THE ENGINEER IS NOT RESPONSIBLE FOR THE MEANS, METHODS, TECHNIQUES, SEQUENCES, AND PROCEDURES USED TO DO THE WORK, OR THE SAFETY ASPECTS OF CONSTRUCTION, AND NOTHING ON THESE DRAWINGS EXPRESSED OR IMPLIED CHANGES THIS CONDITION. CONTRACTOR SHALL DETERMINE ALL CONDITIONS AT THE SITE AND SHALL BE RESPONSIBLE FOR KNOWING HOW THEY AFFECT THE WORK. SUBMITTAL OF A BID TO PERFORM THIS WORK IS ACKNOWLEDGEMENT OF THE RESPONSIBILITIES, AND THAT THEY HAVE BEEN FULLY CONSIDERED IN PLANNING OF THE WORK, AND THE BID PRICE. NO CLAIMS FOR EXTRA CHANGES DUE TO THESE CONDITIONS WILL BE FORTHCOMING.

UNAUTHORIZED CHANGES:

IN THE EVENT THE CLIENT, THE CLIENT'S CONTRACTORS OR SUBCONTRACTORS, OR ANYONE FOR WHOM THE CLIENT IS LEGALLY LIABLE MAKES OR PERMITS TO BE MADE ANY CHANGES TO ANY REPORTS, PLANS, SPECIFICATIONS OR OTHER CONSTRUCTION DOCUMENTS PREPARED BY LRL ASSOCIATES LTD. (LRL) WITHOUT OBTAINING LRL'S PRIOR WRITTEN CONSENT, THE CLIENT SHALL ASSUME FULL RESPONSIBILITY FOR THE RESULTS OF SUCH CHANGES, THEREFORE THE CLIENT AGREES TO WAIVE ANY CLAIM AGAINST LRL AND TO RELEASE LRL FROM ANY LIABILITY ARISING DIRECTLY OR INDIRECTLY FROM SUCH UNAUTHORIZED CHANGES.

IN ADDITION, THE CLIENT AGREES, TO THE FULLEST EXTENT PERMITTED BY LAW, TO INDEMNIFY AND HOLD HARMLESS LRL FROM ANY DAMAGES, LIABILITIES OR COST, INCLUDING REASONABLE ATTORNEY'S FEES AND COST OF DEFENSE, ARISING FROM SUCH CHANGES.

IN ADDITION, THE CLIENT AGREES TO INCLUDE IN ANY CONTRACTS FOR CONSTRUCTION APPROPRIATE LANGUAGE THAT PROHIBITS THE CONTRACTOR OR ANY SUBCONTRACTORS OF ANY TIER FROM MAKING ANY CHANGES OR MODIFICATIONS TO LRL'S CONSTRUCTION DOCUMENTS WITHOUT THE PRIOR WRITTEN APPROVAL OF LRL AND THAT FURTHER REQUIRES THE CONTRACTOR TO INDEMNIFY BOTH LRL AND THE CLIENT FROM ANY LIABILITY OR COST ARISING FROM SUCH CHANGES MADE WITHOUT SUCH PROPER AUTHORIZATION.

GENERAL NOTES:

EXISTING SERVICES AND UTILITIES SHOWN ON THESE DRAWINGS ARE TAKEN FROM THE BEST AVAILABLE RECORDS, BUT MAY NOT BE COMPLETE OR TO DATE. CONTRACTOR SHALL VERIFY IN FIELD FOR LOCATION AND ELEVATION OF PIPES AND CHECK WITH THE UTILITY COMPANIES BEFORE DIGGING OR PERFORMING WORK.

CONTRACTOR IS ADVISED TO COLLECT INFORMATION ON SOIL CONDITIONS BEFORE START OF CONSTRUCTION.

THE ENGINEER WAIVES ANY AND ALL RESPONSIBILITY AND LIABILITY FOR PROBLEMS WHICH ARISE FROM FAILURE TO FOLLOW THESE PLANS, SPECIFICATIONS AND THE DESIGN INTENT THEY CONVEY, OR FOR PROBLEMS WHICH ARISE FROM OTHERS' FAILURE TO OBTAIN AND/OR FOLLOW THE ENGINEER'S GUIDANCE WITH RESPECT TO ANY ERRORS, OMISSIONS, INCONSISTENCIES AMBIGUITIES OR CONFLICTS WHICH ARE ALLEGED.

CONTRACTOR TO VERIFY ALL DIMENSIONS AND NOTIFY THE ENGINEER OF ANY DISCREPANCIES BEFORE WORK COMMENCES. DO NOT SCALE DRAWINGS.

5m 0 10 20m

SCALE: 1:400

No.	REVISIONS	BY	DATE
01	ISSUED FOR APPROVAL	M.L.	30 JUN 2026

LICENSED PROFESSIONAL ENGINEER
K.L. PARADIS
100045152
2026-06-30
PROVINCE OF ONTARIO

NOT AUTHENTIC UNLESS SIGNED AND DATED

LRL
ENGINEERING | INGÉNIERIE
5430 Canotek Road | Ottawa, ON, K1J 9G2
www.lrl.ca | (613) 842-3434

CLIENT

FIGURR ARCHITECTS COLLECTIVE

DESIGNED BY:	DRAWN BY:	APPROVED BY:
S.V. / M.L.	M.L.	K.P.

PROJECT

BLOCK 3
WATERIDGE VILLAGE DEVELOPEMENT
OTTAWA, ON

DRAWING TITLE

EROSION AND SEDIMENT CONTROL PLAN

PROJECT NO.

250290 C101



LEGEND:

- EXISTING PROPERTY LINE TO REMAIN
- PROPOSED CURB
- PROPOSED DEPRESSED CURB
- PROPOSED TERRACING (3:1 MIN.)
- PROPOSED SILT FENCE AS PER OPSD 219.110
- PROPOSED FENCE
- PROPOSED DOOR ENTRANCE/EXIT
- PROPOSED GRASS AREA (100mm TOP SOIL & SOD)
- PROPOSED CONCRETE FEATURES/SLAB
- PROPOSED HEAVY DUTY ASPHALT
- PROPOSED LIGHT DUTY ASPHALT
- PROPOSED RIP RAP
- ×50.00 PROPOSED ELEVATION
- ×50.00HP PROPOSED HIGH POINT ELEVATION
- ×50.00S PROPOSED SWALE ELEVATION
- ×50.00BC PROPOSED BOTTOM OF CURB / ASPHALT ELEVATION
- ×50.00TC PROPOSED TOP OF CURB ELEVATION
- ×50.00BW PROPOSED EXPOSED BOTTOM OF RETAINING WALL
- ×50.00TW PROPOSED TOP OF RETAINING WALL
- ×50.00EX MATCH INTO EXISTING ELEVATION
- ×70.19 EXISTING ELEVATION
- PROPOSED OVERLAND MAJOR FLOW ROUTE
- SUB — SUB PROPOSED 100mmØ PERFORATED SUBDRAIN
- STM — STM PROPOSED STORM SEWER
- SAN — SAN PROPOSED SANITARY SEWER
- WTR — WTR PROPOSED WATERMAIN
- STM — STM EXISTING STORM SEWER
- SAN — SAN EXISTING SANITARY SEWER
- WTR — WTR EXISTING WATERMAIN
- GAS — GAS EXISTING GAS LINE
- EXISTING MANHOLE
- EXISTING CATCHBASIN
- PROPOSED CATCHBASIN-MANHOLE/CATCHBASIN
- PROPOSED MANHOLE
- PROPOSED CURB STOP
- PROPOSED PIPE INSULATION
- PROPOSED 100 YEAR HIGH WATER LEVEL
- STORM WATERSHED EXTENT
- WS-XX CONTROLLER — WATERSHED NAME
- AREA — RUNOFF — RUNOFF COEFFICIENT
- AREA IN HECTARES

N

5m 0 10 20m

SCALE: 1:400

USE AND INTERPRETATION OF DRAWINGS

GENERAL CONDITIONS OF THE CONTRACT FOR CONSTRUCTION ARE PART OF THE CONTRACT DOCUMENTS AND DESCRIBE USE AND INTENT OF THE DRAWING. THE CONTRACT DOCUMENTS INCLUDE NOT ONLY THE DRAWINGS, BUT ALSO THE OWNER-CONTRACTOR AGREEMENTS, CONDITIONS OF THE CONTRACT, THE SPECIFICATIONS, ADDENDA, AND MODIFICATIONS ISSUED AFTER EXECUTION OF THE CONTRACT. THESE CONTRACT DOCUMENTS ARE COMPLEMENTARY, AND WHAT IS REQUIRED BY ANY ONE SHALL BE BINDING AS IF REQUIRED BY ALL. WORK NOT COMPLETELY DELINEATED HEREON SHALL BE CONSTRUCTED OF THE SAME MATERIALS AND DETAILED SIMILARLY AS WORK SHOWN MORE COMPLETELY ELSEWHERE IN THE CONTRACT DOCUMENTS.

BY USE OF THE DRAWINGS FOR CONSTRUCTION OF THE PROJECT, THE OWNER CONFIRMS THAT HE HAS REVIEWED AND APPROVED THE DRAWINGS. THE CONTRACTOR CONFIRMS THAT HE HAS VISITED THE SITE, FAMILIARIZED HIMSELF WITH THE LOCAL CONDITIONS, VERIFIED FIELD DIMENSIONS AND CORRELATED HIS OBSERVATIONS WITH THE REQUIREMENTS OF THE CONTRACT DOCUMENTS.

AS INSTRUMENTS OF SERVICE, ALL DRAWINGS, SPECIFICATIONS, CADD FILES OR OTHER ELECTRONIC MEDIA AND COPIED THERE OF FURNISHED BY THE ENGINEER ARE HIS PROPERTY. THEY ARE TO BE USED ONLY FOR THIS PROJECT AND ARE NOT TO BE USED ON ANY OTHER PROJECT, INCLUDING REPEATS OF THE PROJECT. CHANGES TO THE DRAWINGS MAY ONLY BE MADE BY THE ENGINEER.

UNLESS THE REVISION TITLE IS "ISSUED FOR CONSTRUCTION", THESE DRAWINGS SHALL BE CONSIDERED PRELIMINARY AND SHALL NOT BE USED AS A CONSTRUCTION DOCUMENT.

THESE DRAWINGS ILLUSTRATES THE WORK TO BE DONE. THE ENGINEER IS NOT RESPONSIBLE FOR THE MEANS, METHODS, TECHNIQUES, SEQUENCES, AND PROCEDURES USED TO DO THE WORK, OR THE SAFETY ASPECTS OF CONSTRUCTION, AND NOTHING ON THESE DRAWINGS EXPRESSED OR IMPLIED CHANGES THIS CONDITION. CONTRACTOR SHALL DETERMINE ALL CONDITIONS AT THE SITE AND SHALL BE RESPONSIBLE FOR KNOWING HOW THEY AFFECT THE WORK. SUBMITTAL OF A BID TO PERFORM THIS WORK IS ACKNOWLEDGEMENT OF THE RESPONSIBILITIES, AND THAT THEY HAVE BEEN FULLY CONSIDERED IN PLANNING OF THE WORK, AND THE BID PRICE. NO CLAIMS FOR EXTRA CHARGES DUE TO THESE CONDITIONS WILL BE FORTHCOMING.

UNAUTHORIZED CHANGES:

IN THE EVENT THE CLIENT, THE CLIENT'S CONTRACTORS OR SUBCONTRACTORS, OR ANYONE FOR WHOM THE CLIENT IS LEGALLY LIABLE MAKES OR PERMITS TO BE MADE ANY CHANGES TO ANY REPORTS, PLANS, SPECIFICATIONS OR OTHER CONSTRUCTION DOCUMENTS PREPARED BY LRL ASSOCIATES LTD. (LRL) WITHOUT OBTAINING LRL'S PRIOR WRITTEN CONSENT, THE CLIENT SHALL ASSUME FULL RESPONSIBILITY FOR THE RESULTS OF SUCH CHANGES, THEREFORE THE CLIENT AGREES TO WAIVE ANY CLAIM AGAINST LRL AND TO RELEASE LRL FROM ANY LIABILITY ARISING DIRECTLY OR INDIRECTLY FROM SUCH UNAUTHORIZED CHANGES.

IN ADDITION, THE CLIENT AGREES, TO THE FULLEST EXTENT PERMITTED BY LAW, TO INDEMNIFY AND HOLD HARMLESS LRL FROM ANY DAMAGES, LIABILITIES OR COST, INCLUDING REASONABLE ATTORNEY'S FEES AND COST OF DEFENSE, ARISING FROM SUCH CHANGES.

IN ADDITION, THE CLIENT AGREES TO INCLUDE IN ANY CONTRACTS FOR CONSTRUCTION APPROPRIATE LANGUAGE THAT PROHIBITS THE CONTRACTOR OR ANY SUBCONTRACTORS OF ANY TIER FROM MAKING ANY CHANGES OR MODIFICATIONS TO LRL'S CONSTRUCTION DOCUMENTS WITHOUT THE PRIOR WRITTEN APPROVAL OF LRL AND THAT FURTHER REQUIRES THE CONTRACTOR TO INDEMNIFY BOTH LRL AND THE CLIENT FROM ANY LIABILITY OR COST ARISING FROM SUCH CHANGES MADE WITHOUT SUCH PROPER AUTHORIZATION.

GENERAL NOTES:

EXISTING SERVICES AND UTILITIES SHOWN ON THESE DRAWINGS ARE TAKEN FROM THE BEST AVAILABLE RECORDS, BUT MAY NOT BE COMPLETE OR TO DATE. CONTRACTOR SHALL VERIFY IN FIELD FOR LOCATION AND ELEVATION OF PIPES AND CHECK WITH THE UTILITY COMPANIES BEFORE DIGGING OR PERFORMING WORK.

CONTRACTOR IS ADVISED TO COLLECT INFORMATION ON SOIL CONDITIONS BEFORE START OF CONSTRUCTION.

THE ENGINEER WAIVES ANY AND ALL RESPONSIBILITY AND LIABILITY FOR PROBLEMS WHICH ARISE FROM FAILURE TO FOLLOW THESE PLANS, SPECIFICATIONS AND THE DESIGN INTENT THEY CONVEY, OR FOR PROBLEMS WHICH ARISE FROM OTHERS' FAILURE TO OBTAIN AND/OR FOLLOW THE ENGINEER'S GUIDANCE WITH RESPECT TO ANY ERRORS, OMISSIONS, INCONSISTENCIES AMBIGUITIES OR CONFLICTS WHICH ARE ALLEGED.

CONTRACTOR TO VERIFY ALL DIMENSIONS AND NOTIFY THE ENGINEER OF ANY DISCREPANCIES BEFORE WORK COMMENCES. DO NOT SCALE DRAWINGS.

No.	REVISIONS	BY	DATE
01	ISSUED FOR APPROVAL	M.L.	30 JUN 2026

LICENSED PROFESSIONAL ENGINEER
K. L. PARADIS
100045152
2026-06-30
PROVINCE OF ONTARIO

NOT AUTHENTIC UNLESS SIGNED AND DATED

LRL
ENGINEERING | INGÉNIERIE
5430 Canotek Road I Ottawa, ON, K1J 9G2
www.lrl.ca I (613) 842-3434

CLIENT

FIGURR ARCHITECTS COLLECTIVE

DESIGNED BY:	DRAWN BY:	APPROVED BY:
S.V. / M.L.	M.L.	K.P.

PROJECT

BLOCK 3
WATERIDGE VILLAGE DEVELOPEMENT
OTTAWA, ON

DRAWING TITLE

DEMOLITION PLAN

PROJECT NO.

250290 C102


F.F.E. = 88.80
F.F.E. = 89.55
F.F.E. = 90.25
F.F.E. = 89.30
F.F.E. = 88.75
PROPOSED 6-STOREY RESIDENTIAL BUILDING
BUILDING FOOTPRINT = 1437 sqm
BUILDING FOOTPRINT = 1362sqm
BUILDING FOOTPRINT = 1640 sqm
BUILDING FOOTPRINT = 1595 sqm
BUILDING 3 (E)
BUILDING 3 (W)
BUILDING 2 (A)
BUILDING 2 (B)
REFER TO ACCOMPANYING APPLICATION FOR BLOCK 2 SITE PLAN
SITE BENCHMARK
CUT CROSS ON CONCRETE PAD
ELEV. = 90.90m
Site Benchmark
Cut Cross
on Concrete Pad
Elevation=90.90
SITE BENCHMARK
FIRE HYDRANT
TOP OF SPINDLE ELEV. = 89.63m
Site Benchmark
Fire Hydrant
Top of Spindle
Elevation=89.63
ASPHALT REINSTATEMENT SHALL MATCH EXISTING GRANULAR AND ASPHALT THICKNESS WHILE MAINTAINING A MINIMUM OF:
40mm OF HL3
50mm OF HL8
150mm OF GRANULAR "A"
400mm OF GRANULAR "B"
CONTRACTOR TO COMPLETE ROAD CUT AS PER CITY OF OTTAWA DETAIL R10
CISTERN OVERFLOW
EXIST. HYDRANT
MOUNTAIN ASH WAY
MOUNTAIN ASH WAY (PRIVATE)
MOUNTAIN ASH WAY (PUBLIC)
MOUNTAIN ASH WAY (PRIVATE)
MOUNTAIN ASH WAY (PUBLIC)
MOLTHOUSE PATHWAY (M.U.P.)
WINISK STREET
Hemlock Road
Chemin Cobb's Road
LOT 23 CONCESSION 1 (OTTAWA FRONT) (GLOUCESTER)
PIN 04273 – 1225
subject to easement inst.'S oc2498617 AND oc1755039
PART 7 (Above 46m.)
PART 8 (Below 46m.)
4r – 36606
subject to easement inst. oc1771382 (Below 46m.)
REGISTERED PLAN 4M–1651
BLOCK 14, 0.30 RESERVE
PIN 04273 – 1225
REGISTERED PLAN 4M–1718
BLOCK 1
BLOCK 2
BLOCK 3
BLOCK 4
REGISTERED PLAN 4M–1559
PIN 04273 – 0572
PIN 04273 – 0573
PIN 04273 – 0574
PIN 04273 – 0575
PIN 04273 – 0576
PIN 04273 – 0577
PIN 04273 – 0578
PIN 04273 – 0579
PIN 04273 – 0580
PIN 04273 – 0581
PIN 04273 –



LEGEND:

- EXISTING PROPERTY LINE TO REMAIN
- PROPOSED CURB
- PROPOSED DEPRESSED CURB
- PROPOSED TERRACING (3:1 MIN.)
- PROPOSED SILT FENCE AS PER OPSD 219.110
- PROPOSED FENCE
- PROPOSED DOOR ENTRANCE/EXIT
- PROPOSED GRASS AREA (100mm TOP SOIL & SOD)
- PROPOSED CONCRETE FEATURES/SLAB
- PROPOSED HEAVY DUTY ASPHALT
- PROPOSED LIGHT DUTY ASPHALT
- PROPOSED RIP RAP
- ×50.00 PROPOSED ELEVATION
- ×50.00HP PROPOSED HIGH POINT ELEVATION
- ×50.00S PROPOSED SWALE ELEVATION
- ×50.00BC PROPOSED BOTTOM OF CURB / ASPHALT ELEVATION
- ×50.00TC PROPOSED TOP OF CURB ELEVATION
- ×50.00BW PROPOSED EXPOSED BOTTOM OF RETAINING WALL
- ×50.00TW PROPOSED TOP OF RETAINING WALL
- ×50.00EX MATCH INTO EXISTING ELEVATION
- ×70.19 EXISTING ELEVATION
- PROPOSED OVERLAND MAJOR FLOW ROUTE
- SUB — PROPOSED 100mmØ PERFORATED SUBDRAIN
- STM — PROPOSED STORM SEWER
- SAN — PROPOSED SANITARY SEWER
- WTR — PROPOSED WATERMAIN
- STM — EXISTING STORM SEWER
- SAN — EXISTING SANITARY SEWER
- WTR — EXISTING WATERMAIN
- GAS — EXISTING GAS LINE
- EXISTING MANHOLE
- EXISTING CATCHBASIN
- PROPOSED CATCHBASIN-MANHOLE/CATCHBASIN
- PROPOSED MANHOLE
- PROPOSED CURB STOP
- PROPOSED PIPE INSULATION
- PROPOSED 100 YEAR HIGH WATER LEVEL
- STORM WATERSHED EXTENT
- WS-XX CONTROLLED — WATERSHED NAME
- AREA, RUNOFF — RUNOFF COEFFICIENT
- AREA IN HECTARES

USE AND INTERPRETATION OF DRAWINGS

GENERAL CONDITIONS OF THE CONTRACT FOR CONSTRUCTION ARE PART OF THE CONTRACT DOCUMENTS AND DESCRIBE USE AND INTENT OF THE DRAWING. THE CONTRACT DOCUMENTS INCLUDE NOT ONLY THE DRAWINGS, BUT ALSO THE OWNER-CONTRACTOR AGREEMENTS, CONDITIONS OF THE CONTRACT, THE SPECIFICATIONS, ADDENDA, AND MODIFICATIONS ISSUED AFTER EXECUTION OF THE CONTRACT. THESE CONTRACT DOCUMENTS ARE COMPLEMENTARY, AND WHAT IS REQUIRED BY ANY ONE SHALL BE BINDING AS IF REQUIRED BY ALL. WORK NOT COMPLETELY DELINEATED HEREON SHALL BE CONSTRUCTED OF THE SAME MATERIALS AND DETAILED SIMILARLY AS WORK SHOWN MORE COMPLETELY ELSEWHERE IN THE CONTRACT DOCUMENTS.

BY USE OF THE DRAWINGS FOR CONSTRUCTION OF THE PROJECT, THE OWNER CONFIRMS THAT HE HAS REVIEWED AND APPROVED THE DRAWINGS. THE CONTRACTOR CONFIRMS THAT HE HAS VISITED THE SITE, FAMILIARIZED HIMSELF WITH THE LOCAL CONDITIONS, VERIFIED FIELD DIMENSIONS AND CORRELATED HIS OBSERVATIONS WITH THE REQUIREMENTS OF THE CONTRACT DOCUMENTS.

AS INSTRUMENTS OF SERVICE, ALL DRAWINGS, SPECIFICATIONS, CADD FILES OR OTHER ELECTRONIC MEDIA AND COPIED THERE OF FURNISHED BY THE ENGINEER ARE HIS PROPERTY. THEY ARE TO BE USED ONLY FOR THIS PROJECT AND ARE NOT TO BE USED ON ANY OTHER PROJECT, INCLUDING REPEATS OF THE PROJECT. CHANGES TO THE DRAWINGS MAY ONLY BE MADE BY THE ENGINEER.

UNLESS THE REVISION TITLE IS "ISSUED FOR CONSTRUCTION", THESE DRAWINGS SHALL BE CONSIDERED PRELIMINARY AND SHALL NOT BE USED AS A CONSTRUCTION DOCUMENT.

THESE DRAWINGS ILLUSTRATES THE WORK TO BE DONE. THE ENGINEER IS NOT RESPONSIBLE FOR THE MEANS, METHODS, TECHNIQUES, SEQUENCES, AND PROCEDURES USED TO DO THE WORK, OR THE SAFETY ASPECTS OF CONSTRUCTION, AND NOTHING ON THESE DRAWINGS EXPRESSED OR IMPLIED CHANGES THIS CONDITION. CONTRACTOR SHALL DETERMINE ALL CONDITIONS AT THE SITE AND SHALL BE RESPONSIBLE FOR KNOWING HOW THEY AFFECT THE WORK. SUBMITTAL OF A BID TO PERFORM THIS WORK IS ACKNOWLEDGEMENT OF THE RESPONSIBILITIES, AND THAT THEY HAVE BEEN FULLY CONSIDERED IN PLANNING OF THE WORK, AND THE BID PRICE. NO CLAIMS FOR EXTRA CHANGES DUE TO THESE CONDITIONS WILL BE FORTHCOMING.

UNAUTHORIZED CHANGES:

IN THE EVENT THE CLIENT, THE CLIENT'S CONTRACTORS OR SUBCONTRACTORS, OR ANYONE FOR WHOM THE CLIENT IS LEGALLY LIABLE MAKES OR PERMITS TO BE MADE ANY CHANGES TO ANY REPORTS, PLANS, SPECIFICATIONS OR OTHER CONSTRUCTION DOCUMENTS PREPARED BY LRL ASSOCIATES LTD. (LRL) WITHOUT OBTAINING LRL'S PRIOR WRITTEN CONSENT, THE CLIENT SHALL ASSUME FULL RESPONSIBILITY FOR THE RESULTS OF SUCH CHANGES. THEREFORE THE CLIENT AGREES TO WAIVE ANY CLAIM AGAINST LRL AND TO RELEASE LRL FROM ANY LIABILITY ARISING DIRECTLY OR INDIRECTLY FROM SUCH UNAUTHORIZED CHANGES.

IN ADDITION, THE CLIENT AGREES, TO THE FULLEST EXTENT PERMITTED BY LAW, TO INDEMNIFY AND HOLD HARMLESS LRL FROM ANY DAMAGES, LIABILITIES OR COST, INCLUDING REASONABLE ATTORNEY'S FEES AND COST OF DEFENSE, ARISING FROM SUCH CHANGES.

IN ADDITION, THE CLIENT AGREES TO INCLUDE IN ANY CONTRACTS FOR CONSTRUCTION APPROPRIATE LANGUAGE THAT PROHIBITS THE CONTRACTOR OR ANY SUBCONTRACTORS OF ANY TIER FROM MAKING ANY CHANGES OR MODIFICATIONS TO LRL'S CONSTRUCTION DOCUMENTS WITHOUT THE PRIOR WRITTEN APPROVAL OF LRL AND THAT FURTHER REQUIRES THE CONTRACTOR TO INDEMNIFY BOTH LRL AND THE CLIENT FROM ANY LIABILITY OR COST ARISING FROM SUCH CHANGES MADE WITHOUT SUCH PROPER AUTHORIZATION.

GENERAL NOTES:

EXISTING SERVICES AND UTILITIES SHOWN ON THESE DRAWINGS ARE TAKEN FROM THE BEST AVAILABLE RECORDS, BUT MAY NOT BE COMPLETE OR TO DATE. CONTRACTOR SHALL VERIFY IN FIELD FOR LOCATION AND ELEVATION OF PIPES AND CHECK WITH THE UTILITY COMPANIES BEFORE DIGGING OR PERFORMING WORK.

CONTRACTOR IS ADVISED TO COLLECT INFORMATION ON SOIL CONDITIONS BEFORE START OF CONSTRUCTION.

THE ENGINEER WAIVES ANY AND ALL RESPONSIBILITY AND LIABILITY FOR PROBLEMS WHICH ARISE FROM FAILURE TO FOLLOW THESE PLANS, SPECIFICATIONS AND THE DESIGN INTENT THEY CONVEY, OR FOR PROBLEMS WHICH ARISE FROM OTHERS' FAILURE TO OBTAIN AND/OR FOLLOW THE ENGINEER'S GUIDANCE WITH RESPECT TO ANY ERRORS, OMISSIONS, INCONSISTENCIES AMBIGUITIES OR CONFLICTS WHICH ARE ALLEGED.

CONTRACTOR TO VERIFY ALL DIMENSIONS AND NOTIFY THE ENGINEER OF ANY DISCREPANCIES BEFORE WORK COMMENCES. DO NOT SCALE DRAWINGS.

5m 0 10 20m

SCALE: 1:400

No.	REVISIONS	BY	DATE
01	ISSUED FOR APPROVAL	M.L.	30 JUN 2026

LICENSED PROFESSIONAL ENGINEER
K.L. PARADIS
100045152
2026-06-30
PROVINCE OF ONTARIO

NOT AUTHENTIC UNLESS SIGNED AND DATED

LRL
ENGINEERING | INGÉNIERIE
5430 Canotek Road | Ottawa, ON, K1J 9G2
www.lrl.ca | (613) 842-3434

CLIENT

FIGURR ARCHITECTS COLLECTIVE

DESIGNED BY:	DRAWN BY:	APPROVED BY:
S.V. / M.L.	M.L.	K.P.

PROJECT

BLOCK 3
WATERIDGE VILLAGE DEVELOPEMENT
OTTAWA, ON

DRAWING TITLE

SERVICING PLAN

PROJECT NO.

250290 C401



LEGEND:

- EXISTING PROPERTY LINE TO REMAIN
- PROPOSED CURB
- PROPOSED DEPRESSED CURB
- PROPOSED TERRACING (3:1 MIN.)
- PROPOSED SILT FENCE AS PER OPSD 219.110
- PROPOSED FENCE
- PROPOSED DOOR ENTRANCE/EXIT
- PROPOSED GRASS AREA (100mm TOP SOIL & SOD)
- PROPOSED CONCRETE FEATURES/SLAB
- PROPOSED HEAVY DUTY ASPHALT
- PROPOSED LIGHT DUTY ASPHALT
- PROPOSED RIP RAP
- ×50.00 PROPOSED ELEVATION
- ×50.00HP PROPOSED HIGH POINT ELEVATION
- ×50.00S PROPOSED SWALE ELEVATION
- ×50.00BC PROPOSED BOTTOM OF CURB / ASPHALT ELEVATION
- ×50.00TC PROPOSED TOP OF CURB ELEVATION
- ×50.00BW PROPOSED EXPOSED BOTTOM OF RETAINING WALL
- ×50.00TW PROPOSED TOP OF RETAINING WALL
- ×50.00EX MATCH INTO EXISTING ELEVATION
- ×70.19 EXISTING ELEVATION
- PROPOSED OVERLAND MAJOR FLOW ROUTE
- SUB SUB PROPOSED 100mmØ PERFORATED SUBDRAIN
- STM STM PROPOSED STORM SEWER
- SAN SAN PROPOSED SANITARY SEWER
- WTR WTR PROPOSED WATERMAIN
- STM STM EXISTING STORM SEWER
- SAN SAN EXISTING SANITARY SEWER
- WTR WTR EXISTING WATERMAIN
- GAS GAS EXISTING GAS LINE
- EXISTING MANHOLE
- EXISTING CATCHBASIN
- PROPOSED CATCHBASIN-MANHOLE/CATCHBASIN
- PROPOSED MANHOLE
- PROPOSED CURB STOP
- PROPOSED PIPE INSULATION
- PROPOSED 100 YEAR HIGH WATER LEVEL
- STORM WATERSHED EXTENT

WS-XX (WATERSHED NAME) / CONTROLLED (RUNOFF COEFFICIENT) / AREA (AREA IN HECTARES)

5m 0 10 20m

SCALE: 1:400

USE AND INTERPRETATION OF DRAWINGS

GENERAL CONDITIONS OF THE CONTRACT FOR CONSTRUCTION ARE PART OF THE CONTRACT DOCUMENTS AND DESCRIBE USE AND INTENT OF THE DRAWING. THE CONTRACT DOCUMENTS INCLUDE NOT ONLY THE DRAWINGS, BUT ALSO THE OWNER-CONTRACTOR AGREEMENTS, CONDITIONS OF THE CONTRACT, THE SPECIFICATIONS, ADDENDA, AND MODIFICATIONS ISSUED AFTER EXECUTION OF THE CONTRACT. THESE CONTRACT DOCUMENTS ARE COMPLEMENTARY, AND WHAT IS REQUIRED BY ANY ONE SHALL BE BINDING AS IF REQUIRED BY ALL. WORK NOT COMPLETELY DELINEATED HEREON SHALL BE CONSTRUCTED OF THE SAME MATERIALS AND DETAILED SIMILARLY AS WORK SHOWN MORE COMPLETELY ELSEWHERE IN THE CONTRACT DOCUMENTS.

BY USE OF THE DRAWINGS FOR CONSTRUCTION OF THE PROJECT, THE OWNER CONFIRMS THAT HE HAS REVIEWED AND APPROVED THE DRAWINGS. THE CONTRACTOR CONFIRMS THAT HE HAS VISITED THE SITE, FAMILIARIZED HIMSELF WITH THE LOCAL CONDITIONS, VERIFIED FIELD DIMENSIONS AND CORRELATED HIS OBSERVATIONS WITH THE REQUIREMENTS OF THE CONTRACT DOCUMENTS.

AS INSTRUMENTS OF SERVICE, ALL DRAWINGS, SPECIFICATIONS, CADD FILES OR OTHER ELECTRONIC MEDIA AND COPIED THERE OF FURNISHED BY THE ENGINEER ARE HIS PROPERTY. THEY ARE TO BE USED ONLY FOR THIS PROJECT AND ARE NOT TO BE USED ON ANY OTHER PROJECT, INCLUDING REPEATS OF THE PROJECT. CHANGES TO THE DRAWINGS MAY ONLY BE MADE BY THE ENGINEER.

UNLESS THE REVISION TITLE IS "ISSUED FOR CONSTRUCTION", THESE DRAWINGS SHALL BE CONSIDERED PRELIMINARY AND SHALL NOT BE USED AS A CONSTRUCTION DOCUMENT.

THESE DRAWINGS ILLUSTRATES THE WORK TO BE DONE. THE ENGINEER IS NOT RESPONSIBLE FOR THE MEANS, METHODS, TECHNIQUES, SEQUENCES, AND PROCEDURES USED TO DO THE WORK, OR THE SAFETY ASPECTS OF CONSTRUCTION, AND NOTHING ON THESE DRAWINGS EXPRESSED OR IMPLIED CHANGES THIS CONDITION. CONTRACTOR SHALL DETERMINE ALL CONDITIONS AT THE SITE AND SHALL BE RESPONSIBLE FOR KNOWING HOW THEY AFFECT THE WORK. SUBMITTAL OF A BID TO PERFORM THIS WORK IS ACKNOWLEDGEMENT OF THE RESPONSIBILITIES, AND THAT THEY HAVE BEEN FULLY CONSIDERED IN PLANNING OF THE WORK, AND THE BID PRICE. NO CLAIMS FOR EXTRA CHARGES DUE TO THESE CONDITIONS WILL BE FORTHCOMING.

UNAUTHORIZED CHANGES:

IN THE EVENT THE CLIENT, THE CLIENT'S CONTRACTORS OR SUBCONTRACTORS, OR ANYONE FOR WHOM THE CLIENT IS LEGALLY LIABLE MAKES OR PERMITS TO BE MADE ANY CHANGES TO ANY REPORTS, PLANS, SPECIFICATIONS OR OTHER CONSTRUCTION DOCUMENTS PREPARED BY LRL ASSOCIATES LTD. (LRL) WITHOUT OBTAINING LRL'S PRIOR WRITTEN CONSENT, THE CLIENT SHALL ASSUME FULL RESPONSIBILITY FOR THE RESULTS OF SUCH CHANGES, THEREFORE THE CLIENT AGREES TO WAIVE ANY CLAIM AGAINST LRL AND TO RELEASE LRL FROM ANY LIABILITY ARISING DIRECTLY OR INDIRECTLY FROM SUCH UNAUTHORIZED CHANGES.

IN ADDITION, THE CLIENT AGREES, TO THE FULLEST EXTENT PERMITTED BY LAW, TO INDEMNIFY AND HOLD HARMLESS LRL FROM ANY DAMAGES, LIABILITIES OR COST, INCLUDING REASONABLE ATTORNEY'S FEES AND COST OF DEFENSE, ARISING FROM SUCH CHANGES.

IN ADDITION, THE CLIENT AGREES TO INCLUDE IN ANY CONTRACTS FOR CONSTRUCTION APPROPRIATE LANGUAGE THAT PROHIBITS THE CONTRACTOR OR ANY SUBCONTRACTORS OF ANY TIER FROM MAKING ANY CHANGES OR MODIFICATIONS TO LRL'S CONSTRUCTION DOCUMENTS WITHOUT THE PRIOR WRITTEN APPROVAL OF LRL AND THAT FURTHER REQUIRES THE CONTRACTOR TO INDEMNIFY BOTH LRL AND THE CLIENT FROM ANY LIABILITY OR COST ARISING FROM SUCH CHANGES MADE WITHOUT SUCH PROPER AUTHORIZATION.

GENERAL NOTES:

EXISTING SERVICES AND UTILITIES SHOWN ON THESE DRAWINGS ARE TAKEN FROM THE BEST AVAILABLE RECORDS, BUT MAY NOT BE COMPLETE OR TO DATE. CONTRACTOR SHALL VERIFY IN FIELD FOR LOCATION AND ELEVATION OF PIPES AND CHECK WITH THE UTILITY COMPANIES BEFORE DIGGING OR PERFORMING WORK.

CONTRACTOR IS ADVISED TO COLLECT INFORMATION ON SOIL CONDITIONS BEFORE START OF CONSTRUCTION.

THE ENGINEER WAIVES ANY AND ALL RESPONSIBILITY AND LIABILITY FOR PROBLEMS WHICH ARISE FROM FAILURE TO FOLLOW THESE PLANS, SPECIFICATIONS AND THE DESIGN INTENT THEY CONVEY, OR FOR PROBLEMS WHICH ARISE FROM OTHERS' FAILURE TO OBTAIN AND/OR FOLLOW THE ENGINEER'S GUIDANCE WITH RESPECT TO ANY ERRORS, OMISSIONS, INCONSISTENCIES AMBIGUITIES OR CONFLICTS WHICH ARE ALLEGED.

CONTRACTOR TO VERIFY ALL DIMENSIONS AND NOTIFY THE ENGINEER OF ANY DISCREPANCIES BEFORE WORK COMMENCES. DO NOT SCALE DRAWINGS.

No.	REVISIONS	BY	DATE
01	ISSUED FOR APPROVAL	M.L.	30 JUN 2026

LICENSED PROFESSIONAL ENGINEER
K.L. PARADIS
100045152
2026-06-30
PROVINCE OF ONTARIO

NOT AUTHENTIC UNLESS SIGNED AND DATED

LRL
ENGINEERING | INGÉNIERIE
5430 Canotek Road | Ottawa, ON, K1J 9G2
www.lrl.ca | (613) 842-3434

CLIENT

FIGURR ARCHITECTS COLLECTIVE

DESIGNED BY:	DRAWN BY:	APPROVED BY:
S.V. / M.L.	M.L.	K.P.

PROJECT

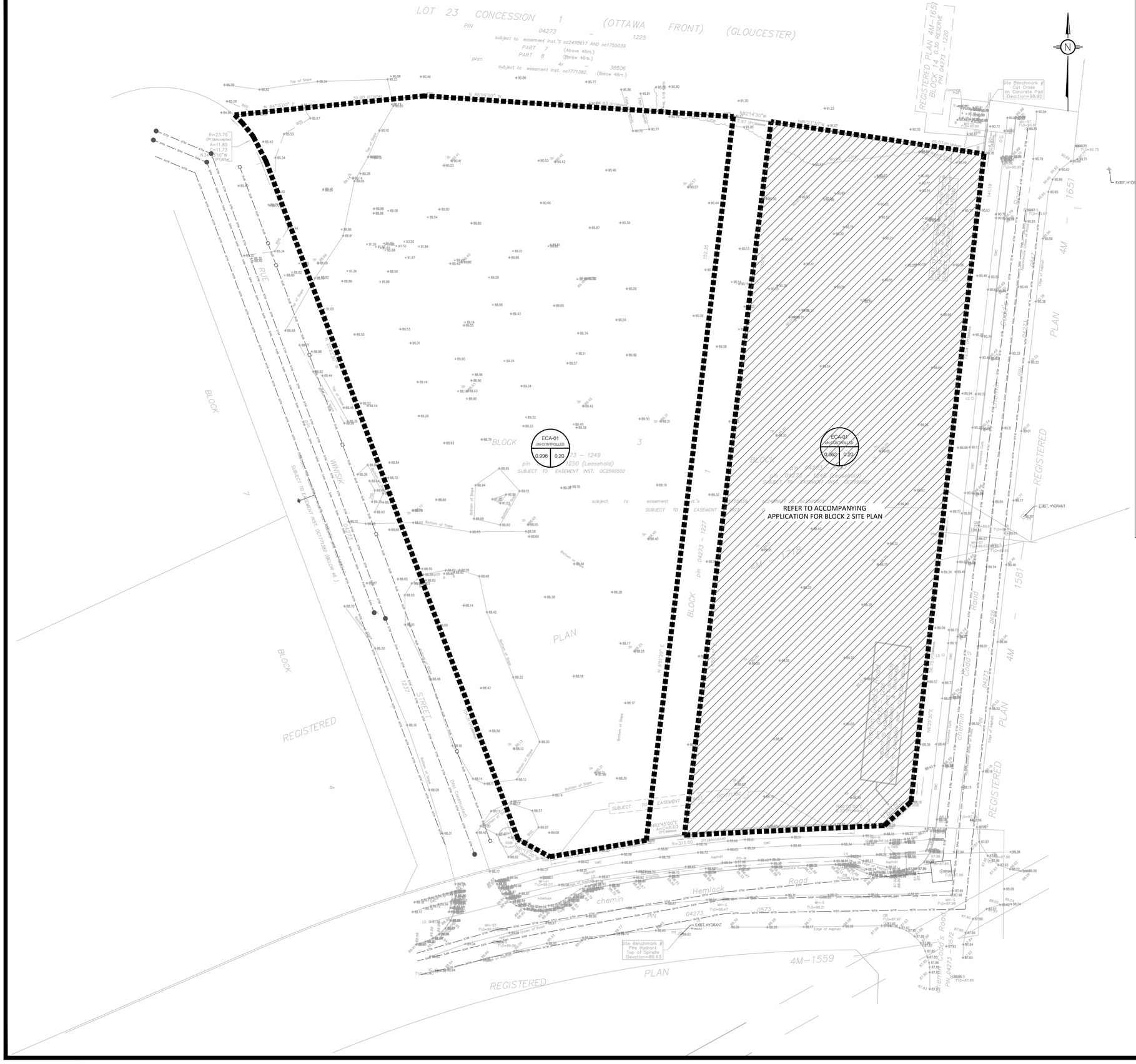
BLOCK 3
WATERIDGE VILLAGE DEVELOPEMENT
OTTAWA, ON

DRAWING TITLE

STORMWATER MANAGEMENT PLAN

PROJECT NO.

250290 C601


ECA-01
UN-CONTROLLED
0.996
0.20
ECA-01A
UN-CONTROLLED
0.662
0.20
REFER TO ACCOMPANYING
APPLICATION FOR BLOCK 2 SITE PLAN
Site Benchmark # Cut Cross on Concrete Pad Elevation=90.90
Site Benchmark # Fire Hydrant Top of Spindle Elevation=89.63
EXIST. HYDRANT
EXIST. HYDRANT
EXIST. HYDRANT
N
Hemlock Road
Winsik Crescent
Winsik Street
Chemin Winsik
REGISTERED PLAN 4M-1651
BLOCK 1 LOT 1250
PIN 04273 - 1220
REGISTERED PLAN 4M-1651
BLOCK 1
PIN 04273 - 1227
REGISTERED PLAN 4M-1651
BLOCK 1
PIN 04273 - 1249
REGISTERED PLAN 4M-1651
BLOCK 1
PIN 04273 - 1581
REGISTERED PLAN 4M-1559
BLOCK 1
PIN 04273 - 1572
LOT 23 CONCESSION 1 (OTTAWA FRONT) (GLOUCESTER)
PIN 04273 - 1225
subject to easement inst.'s oc2498617 AND oc1755039
PART 7 (Above 46m.)
PART 8 (Below 46m.)
plan 4r - 36606 (Below 46m.)
subject to easement inst. oc1771382
SUBJECT TO EASEMENT INST. OC2590502
SUBJECT TO EASEMENT INST. OC2590502
SUBJECT TO EASEMENT INST. OC2590502



LEGEND:

- EXISTING PROPERTY LINE TO REMAIN
- PROPOSED CURB
- PROPOSED DEPRESSED CURB
- PROPOSED TERRACING (3:1 MIN.)
- PROPOSED SILT FENCE AS PER OPSD 219.110
- PROPOSED FENCE
- PROPOSED DOOR ENTRANCE/EXIT
- PROPOSED GRASS AREA (100mm TOP SOIL & SOD)
- PROPOSED CONCRETE FEATURES/SLAB
- PROPOSED HEAVY DUTY ASPHALT
- PROPOSED LIGHT DUTY ASPHALT
- PROPOSED RIP RAP
- ×50.00 PROPOSED ELEVATION
- ×50.00HP PROPOSED HIGH POINT ELEVATION
- ×50.00S PROPOSED SWALE ELEVATION
- ×50.00BC PROPOSED BOTTOM OF CURB / ASPHALT ELEVATION
- ×50.00TC PROPOSED TOP OF CURB ELEVATION
- ×50.00BW PROPOSED EXPOSED BOTTOM OF RETAINING WALL
- ×50.00TW PROPOSED TOP OF RETAINING WALL
- ×50.00EX MATCH INTO EXISTING ELEVATION
- ×70.19 EXISTING ELEVATION
- PROPOSED OVERLAND MAJOR FLOW ROUTE
- SUB SUB PROPOSED 100mmØ PERFORATED SUBDRAIN
- STM STM PROPOSED STORM SEWER
- SAN SAN PROPOSED SANITARY SEWER
- WTR WTR PROPOSED WATERMAIN
- STM STM EXISTING STORM SEWER
- SAN SAN EXISTING SANITARY SEWER
- WTR WTR EXISTING WATERMAIN
- GAS GAS EXISTING GAS LINE
- EXISTING MANHOLE
- EXISTING CATCHBASIN
- PROPOSED CATCHBASIN-MANHOLE/CATCHBASIN
- PROPOSED MANHOLE
- PROPOSED CURB STOP
- PROPOSED PIPE INSULATION
- PROPOSED 100 YEAR HIGH WATER LEVEL
- STORM WATERSHED EXTENT

WS-XX CONTROLLED AREA RUNOFF
- WATERSHED NAME
- RUNOFF COEFFICIENT
- AREA IN HECTARES

USE AND INTERPRETATION OF DRAWINGS

GENERAL CONDITIONS OF THE CONTRACT FOR CONSTRUCTION ARE PART OF THE CONTRACT DOCUMENTS AND DESCRIBE USE AND INTENT OF THE DRAWING. THE CONTRACT DOCUMENTS INCLUDE NOT ONLY THE DRAWINGS, BUT ALSO THE OWNER-CONTRACTOR AGREEMENTS, CONDITIONS OF THE CONTRACT, THE SPECIFICATIONS, ADDENDA, AND MODIFICATIONS ISSUED AFTER EXECUTION OF THE CONTRACT. THESE CONTRACT DOCUMENTS ARE COMPLEMENTARY, AND WHAT IS REQUIRED BY ANY ONE SHALL BE BINDING AS IF REQUIRED BY ALL. WORK NOT COMPLETELY DELINEATED HEREON SHALL BE CONSTRUCTED OF THE SAME MATERIALS AND DETAILED SIMILARLY AS WORK SHOWN MORE COMPLETELY ELSEWHERE IN THE CONTRACT DOCUMENTS.

BY USE OF THE DRAWINGS FOR CONSTRUCTION OF THE PROJECT, THE OWNER CONFIRMS THAT HE HAS REVIEWED AND APPROVED THE DRAWINGS. THE CONTRACTOR CONFIRMS THAT HE HAS VISITED THE SITE, FAMILIARIZED HIMSELF WITH THE LOCAL CONDITIONS, VERIFIED FIELD DIMENSIONS AND CORRELATED HIS OBSERVATIONS WITH THE REQUIREMENTS OF THE CONTRACT DOCUMENTS.

AS INSTRUMENTS OF SERVICE, ALL DRAWINGS, SPECIFICATIONS, CADD FILES OR OTHER ELECTRONIC MEDIA AND COPIED THERE OF FURNISHED BY THE ENGINEER ARE HIS PROPERTY. THEY ARE TO BE USED ONLY FOR THIS PROJECT AND ARE NOT TO BE USED ON ANY OTHER PROJECT, INCLUDING REPEATS OF THE PROJECT. CHANGES TO THE DRAWINGS MAY ONLY BE MADE BY THE ENGINEER.

UNLESS THE REVISION TITLE IS "ISSUED FOR CONSTRUCTION", THESE DRAWINGS SHALL BE CONSIDERED PRELIMINARY AND SHALL NOT BE USED AS A CONSTRUCTION DOCUMENT.

THESE DRAWINGS ILLUSTRATES THE WORK TO BE DONE. THE ENGINEER IS NOT RESPONSIBLE FOR THE MEANS, METHODS, TECHNIQUES, SEQUENCES, AND PROCEDURES USED TO DO THE WORK, OR THE SAFETY ASPECTS OF CONSTRUCTION, AND NOTHING ON THESE DRAWINGS EXPRESSED OR IMPLIED CHANGES THIS CONDITION. CONTRACTOR SHALL DETERMINE ALL CONDITIONS AT THE SITE AND SHALL BE RESPONSIBLE FOR KNOWING HOW THEY AFFECT THE WORK. SUBMITTAL OF A BID TO PERFORM THIS WORK IS ACKNOWLEDGEMENT OF THE RESPONSIBILITIES, AND THAT THEY HAVE BEEN FULLY CONSIDERED IN PLANNING OF THE WORK, AND THE BID PRICE. NO CLAIMS FOR EXTRA CHANGES DUE TO THESE CONDITIONS WILL BE FORTHCOMING.

UNAUTHORIZED CHANGES:

IN THE EVENT THE CLIENT, THE CLIENT'S CONTRACTORS OR SUBCONTRACTORS, OR ANYONE FOR WHOM THE CLIENT IS LEGALLY LIABLE MAKES OR PERMITS TO BE MADE ANY CHANGES TO ANY REPORTS, PLANS, SPECIFICATIONS OR OTHER CONSTRUCTION DOCUMENTS PREPARED BY LRL ASSOCIATES LTD. (LRL) WITHOUT OBTAINING LRL'S PRIOR WRITTEN CONSENT, THE CLIENT SHALL ASSUME FULL RESPONSIBILITY FOR THE RESULTS OF SUCH CHANGES, THEREFORE THE CLIENT AGREES TO WAIVE ANY CLAIM AGAINST LRL AND TO RELEASE LRL FROM ANY LIABILITY ARISING DIRECTLY OR INDIRECTLY FROM SUCH UNAUTHORIZED CHANGES.

IN ADDITION, THE CLIENT AGREES, TO THE FULLEST EXTENT PERMITTED BY LAW, TO INDEMNIFY AND HOLD HARMLESS LRL FROM ANY DAMAGES, LIABILITIES OR COST, INCLUDING REASONABLE ATTORNEY'S FEES AND COST OF DEFENSE, ARISING FROM SUCH CHANGES.

IN ADDITION, THE CLIENT AGREES TO INCLUDE IN ANY CONTRACTS FOR CONSTRUCTION APPROPRIATE LANGUAGE THAT PROHIBITS THE CONTRACTOR OR ANY SUBCONTRACTORS OF ANY TIER FROM MAKING ANY CHANGES OR MODIFICATIONS TO LRL'S CONSTRUCTION DOCUMENTS WITHOUT THE PRIOR WRITTEN APPROVAL OF LRL AND THAT FURTHER REQUIRES THE CONTRACTOR TO INDEMNIFY BOTH LRL AND THE CLIENT FROM ANY LIABILITY OR COST ARISING FROM SUCH CHANGES MADE WITHOUT SUCH PROPER AUTHORIZATION.

GENERAL NOTES:

EXISTING SERVICES AND UTILITIES SHOWN ON THESE DRAWINGS ARE TAKEN FROM THE BEST AVAILABLE RECORDS, BUT MAY NOT BE COMPLETE OR TO DATE. CONTRACTOR SHALL VERIFY IN FIELD FOR LOCATION AND ELEVATION OF PIPES AND CHECK WITH THE UTILITY COMPANIES BEFORE DIGGING OR PERFORMING WORK.

CONTRACTOR IS ADVISED TO COLLECT INFORMATION ON SOIL CONDITIONS BEFORE START OF CONSTRUCTION.

THE ENGINEER WAIVES ANY AND ALL RESPONSIBILITY AND LIABILITY FOR PROBLEMS WHICH ARISE FROM FAILURE TO FOLLOW THESE PLANS, SPECIFICATIONS AND THE DESIGN INTENT THEY CONVEY, OR FOR PROBLEMS WHICH ARISE FROM OTHERS' FAILURE TO OBTAIN AND/OR FOLLOW THE ENGINEER'S GUIDANCE WITH RESPECT TO ANY ERRORS, OMISSIONS, INCONSISTENCIES AMBIGUITIES OR CONFLICTS WHICH ARE ALLEGED.

CONTRACTOR TO VERIFY ALL DIMENSIONS AND NOTIFY THE ENGINEER OF ANY DISCREPANCIES BEFORE WORK COMMENCES. DO NOT SCALE DRAWINGS.

5m 0 10 20m

SCALE: 1:400

No.	REVISIONS	BY	DATE
01	ISSUED FOR APPROVAL	M.L.	30 JUN 2026

LICENSED PROFESSIONAL ENGINEER
K. L. PARADIS
100045152
2026-06-30
PROVINCE OF ONTARIO

NOT AUTHENTIC UNLESS SIGNED AND DATED

LRL
ENGINEERING I INGÉNIERIE
5430 Canotek Road I Ottawa, ON, K1J 9G2
www.lrl.ca I (613) 842-3434

CLIENT
FIGURR ARCHITECTS COLLECTIVE

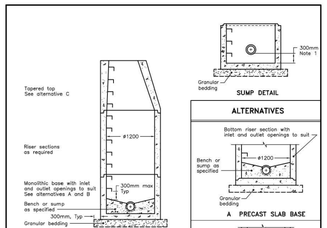
DESIGNED BY:	DRAWN BY:	APPROVED BY:
S.V. / M.L.	M.L.	K.P.

PROJECT
BLOCK 3
WATERIDGE VILLAGE DEVELOPEMENT
OTTAWA, ON

DRAWING TITLE
POST-DEVELOPMENT
WATERSHED PLAN

PROJECT NO.
250290

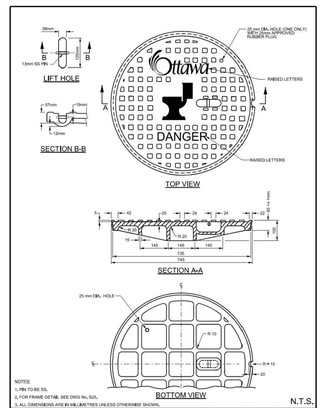
C702



ALTERNATIVES

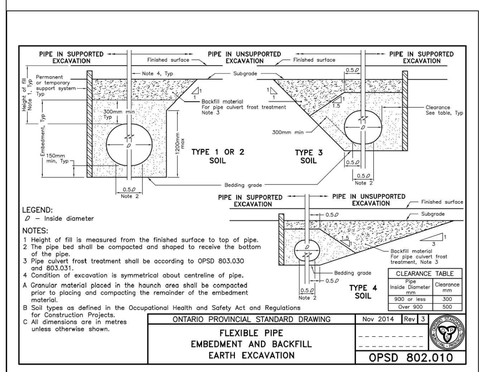
NOTES:
1 The sump is measured from the lowest invert.
A Granular backfill shall be placed to a minimum thickness of 300mm all around the maintenance hole.
B Precast concrete components shall be according to OPSD 701.030, 701.031, or 701.032.
C Structure exceeding 5.0m in depth shall include safety platform according to OPSD 404.020.
D Pipe support according to OPSD 708.020.
E For benching and pipe opening details, see OPSD 701.021.
F For adjustment unit and frame installation, see OPSD 704.010.
G All dimensions are nominal.
H All dimensions are in millimetres unless otherwise shown.

ONTARIO PROVINCIAL STANDARD DRAWING	Nov 2014	Rev 5
PRECAST CONCRETE MAINTENANCE HOLE 1200mm DIAMETER		
	OPSD 701.010	



NOTES:
1. PIN TO BE SS.
2. FOR FRAME DETAIL, SEE DWG No. S25.
3. ALL DIMENSIONS ARE IN MILLIMETRES UNLESS OTHERWISE SHOWN.

Ottawa	STANDARD CIRCULAR SANITARY & COMBINED MAINTENANCE HOLE COVER	DATE:	MARCH 2008
		REV. DATE:	MARCH 2017
		DWG. No.:	S24

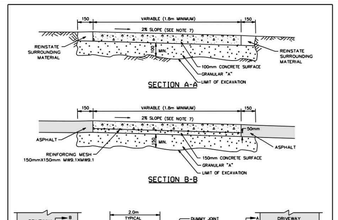


CLEARANCE TABLE	
Pipe Inside Diameter mm	Clearance mm
900 or less	300
Over 900	500

LEGEND:
Ø – Inside diameter

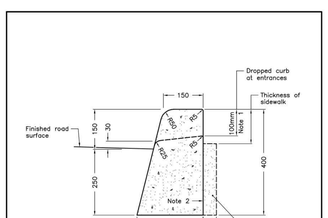
NOTES:
1 Height of fill is measured from the finished surface to top of pipe.
2 The pipe bed shall be compacted and shaped to receive the bottom of the pipe.
3 Pipe culvert frost treatment shall be according to OPSD 803.030 and 803.031.
4 Condition of excavation is symmetrical about centreline of pipe.
A Granular material placed in the haunch area shall be compacted prior to placing and compacting the remainder of the embedment material.
B Soil types as defined in the Occupational Health and Safety Act and Regulations for Construction Projects.
C All dimensions are in metres unless otherwise shown.

ONTARIO PROVINCIAL STANDARD DRAWING	Nov 2014	Rev 3
FLEXIBLE PIPE EMBEDMENT AND BACKFILL EARTH EXCAVATION		
	OPSD 802.010	



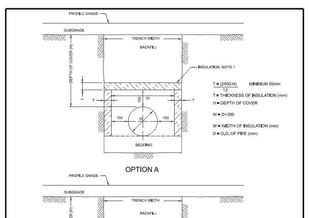
NOTES:
1. CONCRETE AND GRANULAR "A" IS TO BE INCREASED TO 150mm AT THE ENTRANCE AND 150x150mm WWR.1 x WWR.1 REINFORCING MESH IS TO BE PLACED MID DEPTH WITHIN DRIVEWAY ACCESS.
2. TRANSVERSE EXPANSION JOINTS ARE REQUIRED AT THE ENDS, THE MIDPOINT, AT INTERVALS OF 4m MAXIMUM, AND ALSO TO ISOLATE OBSTRUCTIONS FROM SIDEWALK, HYDRANTS, POLES, BUILDINGS, ETC.
3. WHEN THE OVERALL SIDEWALK WIDTH EXCEEDS 2.5m, A LONGITUDINAL CONSTRUCTION JOINT SHALL BE CREATED AT ITS MIDPOINT.
4. EDGES AND JOINTS ARE TO BE FINISHED WITH A 75mm EDGING TOOL.
5. ALL CONCRETE SIDEWALKS ARE TO HAVE A BROOM FINISH UNLESS OTHERWISE SPECIFIED.
6. ALL DIMENSIONS ARE IN MILLIMETERS UNLESS SHOWN OTHERWISE.
7. THE MAXIMUM SLOPE IS NOT TO EXCEED 2%.
8. INSTALL DUMMY TRANSVERSE JOINTS AS REQUIRED SO THERE IS A MAXIMUM SPACING OF 2m BETWEEN ALL JOINTS.
9. SIDEWALK NOT TO BE DEPRESSED ACROSS DRIVEWAY ACCESSES.
10. EXPANSION AND DUMMY JOINTS AS PER SC5

Ottawa	TYPICAL CONCRETE SIDEWALK IN BOULEVARD	DATE:	MAY 2001
		REV. DATE:	MARCH 2016
		DWG. No.:	SC4



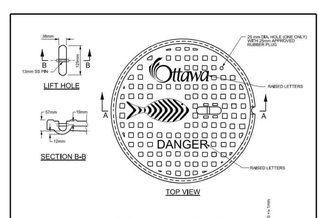
NOTES:
1 When sidewalk is continuously adjacent, the dropped curb at entrances shall be reduced to 75mm.
2 For slipforming procedure a 5% batter is acceptable.
A Treatment at entrances shall be according to OPSD 351.010.
B Outlet treatment shall be according to the OPSD 610 Series.
C The transition from one curb type to another shall be a minimum length of 3.0m, except in conjunction with guide rail where it shall be according to the OPSD 900 Series.
D All dimensions are in millimetres unless otherwise shown.

ONTARIO PROVINCIAL STANDARD DRAWING	Nov 2012	Rev 2
CONCRETE BARRIER CURB		
	OPSD 600.110	



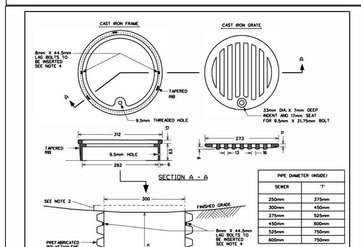
NOTES:
1. THE INSULATION MATERIAL SHALL BE EXTRUDED POLYSTYRENE ACCORDING TO MMA-15.15 WITH A MINIMUM COMPRESSIVE STRENGTH OF 275 kPA.
2. MINIMUM INSULATION THICKNESS SHALL BE 50MM.
3. JOINTS SHALL BE STAGGERED FOR MULTIPLE INSULATION SHEETS.
4. ALL DIMENSIONS ARE IN MILLIMETRES UNLESS OTHERWISE SHOWN.

Ottawa	INSULATION FOR SHALLOW SEWERS	DATE:	MARCH 2003
		REV. DATE:	
		DWG. No.:	S35



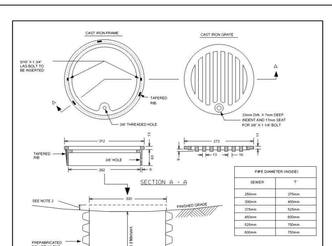
NOTES:
1. PIN TO BE SS.
2. FOR FRAME DETAIL, SEE DWG No. S25.
3. ALL DIMENSIONS ARE IN MILLIMETRES UNLESS OTHERWISE SHOWN.

Ottawa	STANDARD CIRCULAR STORM MAINTENANCE HOLE COVER	DATE:	MARCH 2019
		REV. DATE:	MARCH 2017
		DWG. No.:	S24.1



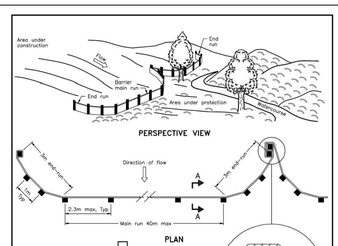
NOTES:
1. ALL DIMENSIONS ARE IN MILLIMETRES UNLESS OTHERWISE SHOWN.
2. FOR DITCHED PIPE APPLICATIONS, TOP OF CB SHALL BE MIN. 5cm ABOVE BOTTOM OF THE DITCH/SWALE AND BE LOCATED AND CONNECT WITH MANUFACTURER RECOMMENDED CONNECTION SLEEVE.
3. WHEN NON-PERFORATED PIPE IS USED, MATCH THE "I" HORIZONTAL OPENING DIAMETERS TO THE PIPE DIAMETER AND CONNECT WITH MANUFACTURER RECOMMENDED CONNECTION SLEEVE.
4. CAST IRON FRAME TO BE SECURED TO PIPE WITH 2 LAG BOLTS AS SHOWN.

Ottawa	CATCH BASIN - 'T' FOR REAR YARD, DITCHED PIPE AND LANDSCAPING APPLICATIONS	DATE:	MARCH 2007
		REV. DATE:	MARCH 2021
		DWG. No.:	S30



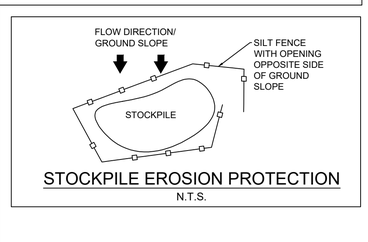
NOTES:
1. ALL DIMENSIONS ARE IN MILLIMETRES UNLESS OTHERWISE SHOWN.
2. FOR DITCHED PIPE APPLICATIONS, TOP OF CB SHALL BE MIN. 5cm ABOVE BOTTOM OF THE DITCH/SWALE AND BE LOCATED AND CONNECT WITH MANUFACTURER RECOMMENDED CONNECTION SLEEVE.
3. WHEN NON-PERFORATED PIPE IS USED, MATCH THE "I" HORIZONTAL OPENING DIAMETERS TO THE PIPE DIAMETER AND CONNECT WITH MANUFACTURER RECOMMENDED CONNECTION SLEEVE.
4. SEE MOUD 1.9.1.FOR ALTERNATE APPROVED FITTING MANUFACTURERS

Ottawa	CATCH BASIN - ELBOW FOR REAR YARD, DITCHED PIPE AND LANDSCAPING APPLICATIONS	DATE:	MARCH 2007
		REV. DATE:	MARCH 2019
		DWG. No.	S31



NOTE:
A All dimensions are in millimetres unless otherwise shown.

ONTARIO PROVINCIAL STANDARD DRAWING	Nov 2021	Rev 3
LIGHT–DUTY SILT FENCE BARRIER		
	OPSD 219.110	



STOCKPILE EROSION PROTECTION
N.T.S.

USE AND INTERPRETATION OF DRAWINGS

GENERAL CONDITIONS OF THE CONTRACT FOR CONSTRUCTION ARE PART OF THE CONTRACT DOCUMENTS AND DESCRIBE USE AND INTENT OF THE DRAWING. THE CONTRACT DOCUMENTS INCLUDE NOT ONLY THE DRAWINGS, BUT ALSO THE OWNER-CONTRACTOR AGREEMENTS, CONDITIONS OF THE CONTRACT, THE SPECIFICATIONS, ADDENDA, AND MODIFICATIONS ISSUED AFTER EXECUTION OF THE CONTRACT. THESE CONTRACT DOCUMENTS ARE COMPLEMENTARY, AND WHAT IS REQUIRED BY ANY ONE SHALL BE BINDING AS IF REQUIRED BY ALL. WORK NOT COMPLETELY DELINEATED HEREON SHALL BE CONSTRUCTED OF THE SAME MATERIALS AND DETAILED SIMILARLY AS WORK SHOWN MORE COMPLETELY ELSEWHERE IN THE CONTRACT DOCUMENTS.

BY USE OF THE DRAWINGS FOR CONSTRUCTION OF THE PROJECT, THE OWNER CONFIRMS THAT HE HAS REVIEWED AND APPROVED THE DRAWINGS. THE CONTRACTOR CONFIRMS THAT HE HAS VISITED THE SITE, FAMILIARIZED HIMSELF WITH THE LOCAL CONDITIONS, VERIFIED FIELD DIMENSIONS AND CORRELATED HIS OBSERVATIONS WITH THE REQUIREMENTS OF THE CONTRACT DOCUMENTS.

AS INSTRUMENTS OF SERVICE, ALL DRAWINGS, SPECIFICATIONS, CADD FILES OR OTHER ELECTRONIC MEDIA AND COPIED THERE OF FURNISHED BY THE ENGINEER ARE HIS PROPERTY. THEY ARE TO BE USED ONLY FOR THIS PROJECT AND ARE NOT TO BE USED ON ANY OTHER PROJECT, INCLUDING REPEATS OF THE PROJECT. CHANGES TO THE DRAWINGS MAY ONLY BE MADE BY THE ENGINEER.

UNLESS THE REVISION TITLE IS "ISSUED FOR CONSTRUCTION", THESE DRAWINGS SHALL BE CONSIDERED PRELIMINARY AND SHALL NOT BE USED AS A CONSTRUCTION DOCUMENT.

THESE DRAWINGS ILLUSTRATES THE WORK TO BE DONE. THE ENGINEER IS NOT RESPONSIBLE FOR THE MEANS, METHODS, TECHNIQUES, SEQUENCES, AND PROCEDURES USED TO DO THE WORK, OR THE SAFETY ASPECTS OF CONSTRUCTION, AND NOTHING ON THESE DRAWINGS EXPRESSED OR IMPLIED CHANGES THIS CONDITION. CONTRACTOR SHALL DETERMINE ALL CONDITIONS AT THE SITE AND SHALL BE RESPONSIBLE FOR KNOWING HOW THEY AFFECT THE WORK. SUBMITTAL OF A BID TO PERFORM THIS WORK IS ACKNOWLEDGEMENT OF THE RESPONSIBILITIES, AND THAT THEY HAVE BEEN FULLY CONSIDERED IN PLANNING OF THE WORK, AND THE BID PRICE. NO CLAIMS FOR EXTRA CHARGES DUE TO THESE CONDITIONS WILL BE FORTHCOMING.

UNAUTHORIZED CHANGES:

IN THE EVENT THE CLIENT, THE CLIENT'S CONTRACTORS OR SUBCONTRACTORS, OR ANYONE FOR WHOM THE CLIENT IS LEGALLY LIABLE MAKES OR PERMITS TO BE MADE ANY CHANGES TO ANY REPORTS, PLANS, SPECIFICATIONS OR OTHER CONSTRUCTION DOCUMENTS PREPARED BY LRL ASSOCIATES LTD. (LRL) WITHOUT OBTAINING LRL'S PRIOR WRITTEN CONSENT, THE CLIENT SHALL ASSUME FULL RESPONSIBILITY FOR THE RESULTS OF SUCH CHANGES. THEREFORE THE CLIENT AGREES TO WAIVE ANY CLAIM AGAINST LRL AND TO RELEASE LRL FROM ANY LIABILITY ARISING DIRECTLY OR INDIRECTLY FROM SUCH UNAUTHORIZED CHANGES.

IN ADDITION, THE CLIENT AGREES, TO THE FULLEST EXTENT PERMITTED BY LAW, TO INDEMNIFY AND HOLD HARMLESS LRL FROM ANY DAMAGES, LIABILITIES OR COST, INCLUDING REASONABLE ATTORNEY'S FEES AND COST OF DEFENSE, ARISING FROM SUCH CHANGES.

IN ADDITION, THE CLIENT AGREES TO INCLUDE IN ANY CONTRACTS FOR CONSTRUCTION APPROPRIATE LANGUAGE THAT PROHIBITS THE CONTRACTOR OR ANY SUBCONTRACTORS OF ANY TIER FROM MAKING ANY CHANGES OR MODIFICATIONS TO LRL'S CONSTRUCTION DOCUMENTS WITHOUT THE PRIOR WRITTEN APPROVAL OF LRL AND THAT FURTHER REQUIRES THE CONTRACTOR TO INDEMNIFY BOTH LRL AND THE CLIENT FROM ANY LIABILITY OR COST ARISING FROM SUCH CHANGES MADE WITHOUT SUCH PROPER AUTHORIZATION.

GENERAL NOTES:

EXISTING SERVICES AND UTILITIES SHOWN ON THESE DRAWINGS ARE TAKEN FROM THE BEST AVAILABLE RECORDS, BUT MAY NOT BE COMPLETE OR TO DATE. CONTRACTOR SHALL VERIFY IN FIELD FOR LOCATION AND ELEVATION OF PIPES AND CHECK WITH THE UTILITY COMPANIES BEFORE DIGGING OR PERFORMING WORK.

CONTRACTOR IS ADVISED TO COLLECT INFORMATION ON SOIL CONDITIONS BEFORE START OF CONSTRUCTION.

THE ENGINEER WAIVES ANY AND ALL RESPONSIBILITY AND LIABILITY FOR PROBLEMS WHICH ARISE FROM FAILURE TO FOLLOW THESE PLANS, SPECIFICATIONS AND THE DESIGN INTENT THEY CONVEY, OR FOR PROBLEMS WHICH ARISE FROM OTHERS' FAILURE TO OBTAIN AND/OR FOLLOW THE ENGINEER'S GUIDANCE WITH RESPECT TO ANY ERRORS, OMISSIONS, INCONSISTENCIES AMBIGUITIES OR CONFLICTS WHICH ARE ALLEGED.

CONTRACTOR TO VERIFY ALL DIMENSIONS AND NOTIFY THE ENGINEER OF ANY DISCREPANCIES BEFORE WORK COMMENCES. DO NOT SCALE DRAWINGS.

No.	REVISIONS	BY	DATE
01	ISSUED FOR APPROVAL	M.L.	30 JUN 2026

LICENSED PROFESSIONAL ENGINEER
K. L. PARADIS
100045152
2026-06-30
PROVINCE OF ONTARIO

NOT AUTHENTIC UNLESS SIGNED AND DATED

LRL
ENGINEERING | INGÉNIERIE
5430 Canotek Road I Ottawa, ON, K1J 9G2
www.lrl.ca I (613) 842-3434

CLIENT
FIGURR ARCHITECTS COLLECTIVE

DESIGNED BY:	DRAWN BY:	APPROVED BY:
S.V. / M.L.	M.L.	K.P.

PROJECT
BLOCK 3
WATERIDGE VILLAGE DEVELOPEMENT
OTTAWA, ON

DRAWING TITLE
CONSTRUCTION DETAIL PLAN

PROJECT NO.
250290 C901

APPENDIX G

Design Brief Wateridge Village at Rockcliffe

335 St. Laurent Boulevard Phase 4

CANADA LANDS COMPANY
SOCIÉTÉ IMMOBILIÈRE DU CANADA

REPORT
Project: 118863-5.2.2

DESIGN BRIEF
WATERIDGE VILLAGE AT ROCKCLIFFE
335 ST. LAURENT BOULEVARD
PHASE 4

IBI

Prepared for CANADA LANDS COMPANY
by IBI GROUP
MARCH 2023

Table of Contents

1 Introduction 1
1.1 Scope 1
1.2 Background 1
1.2.1 General 1
1.2.2 Previous Studies 1
1.2.3 Municipal Infrastructure 2
1.3 Subject Property 2
1.4 Watercourses 2
1.5 Limits of Existing Infrastructure 3
1.6 Pre-Consultation 3
1.6.1 City of Ottawa 3
1.6.2 Conservation Authority 3
1.6.3 MECP 3
1.7 Geotechnical Considerations 4
1.8 Existing Private Services 4
1.9 Phasing 4
1.10 Legal Outlet 5
1.11 Municipal Class EA 5

2 Water Supply 6
2.1 Existing Conditions 6
2.2 Master Servicing Study 6
2.3 Design Criteria 6
2.3.1 Water Demands 6
2.3.2 System Pressure 6
2.3.3 Fire Flow Rate 7
2.3.4 Boundary Conditions 7
2.3.5 Hydraulic Model 7

Table of Contents (continued)

2.3.6 Proposed Water Plan 7

3 Wastewater Disposal 9

3.1 Existing Conditions 9
3.2 Master Servicing Study 9
3.3 Design Criteria 10
3.4 Proposed Wastewater Plan 11
3.5 Local Extraneous Flows 11
3.6 Wastewater Outlet 11
3.7 Sewer Calculations 11
3.8 Environmental Constraints 11
3.9 Emergency Overflow 12

4 Minor Storm System 13

4.1 Existing Conditions 13
4.2 Master Servicing Study 13
4.3 Minor Storm Sewer Design Criteria 13
4.4 Proposed Minor Storm Sewer Plan 14
4.5 Erosion and Sedimentation Control 15
4.6 Miscellaneous Elements 15

5 Stormwater Management 16

5.1 Background 16
5.2 Objective 16
5.3 Stormwater Management Design 16
5.3.1 Dual Drainage System 16
5.4 Hydrological Analysis 18
5.4.1 Summary of Model Files 18
5.4.2 Storm and Design Parameters 20
5.4.3 Results of Hydrological Modeling 24
5.5 Storm Hydraulic Grade Line Analysis 28

Table of Contents (continued)

5.6 Eastern SWM Facility 29
5.6.1 Water Quality Control 29
5.6.2 Performance of the SWM Facility 30
5.7 Coordination of Conventional SWM and LID Models 31

6 LID Design 32
6.1 **LID Targets** 32
6.2 Field Investigations – Infiltration Testing 32
6.3 Bioswales 34
6.4 Soil Amendments 36
6.5 PCSWMM LID Modelling 37
6.5.1 Water Balance Modelling 40
6.5.2 Event Based Model Results 40
6.5.3 Soil Amendment Benefits 42
6.5.4 Maintenance Requirements 42
6.5.5 LID Status 45
6.5.6 Summary 46

7 Approvals and Permit Requirements 47
7.1 City of Ottawa 47
7.2 Province of Ontario 47
7.3 Conservation Authority 47
7.4 Federal Government 47

8 Conclusions and Recommendations 48
8.1 Conclusions 48
8.2 Recommendations 48

Table of Contents (continued)

List of Appendices

Appendix A
- Draft 4M- Plan
- December 24, 2020 e-mail from City of Ottawa
- December 5, 2018 e-mail from RVCA
- December 19, 2018 e-mail from MECP Ottawa Office
- Permit To Take Water
- ECA No. 6929-A7MRBC for Phase 1A sewers
- ECA No. 0824-A8CR5H for Eastern SWM facility
- Notice of Completion of Class Environmental Assessment (EA)

Appendix B
- Figure 4.4 Proposed Pipe alignment and Diameters
- Watermain Demand Calculation Sheet
- Boundary Conditions
- Water Quality Calculations
- Hydraulic Modeling Results

Appendix C
- Figure 5.1 – Recommended Wastewater Plan (MSS)
- Figure 3.1 – Recommended Wastewater Plan
- Temporary ICD Calculations
- Sanitary Sewer Design Sheets
- Sanitary Drainage Area Plans - Drawings 118863-410

Appendix D
- Figure 6.7 – Recommended Storm Sewer System (MSS)
- Figure 4.1 – Recommended Minor Storm Plan
- Storm Sewer Design Sheets
- Storm Drainage Area Plans - Drawing 118863-510,
- Temporary Ditch Inlet ICD Calculations
- Time of Concentration Calculations
- Major Overflow Ditch Design

Appendix E
- Drawing 118863-910, Erosion and Sedimentation Control Plan

Appendix F
- Drawing 118863-751 DDSWMM Model Schematic
- Drawing 118863-601
- Velocity x Depth Calculation
- XPSWMM Schematic
- HGL results
- Model Files

Appendix G
- Pilot Project Information Form

1 Introduction

1.1 Scope

The purpose of this Design Brief is to provide stakeholder regulators with the project background together with the design philosophy and criteria incorporated in the sub-division design. This report will provide a logical framework to assist reviewers with evaluation of the design of the development.

1.2 Background

1.2.1 General

In 2011, Canada Lands Company (CLC), bought and took ownership of about 125 ha of the former CFB Rockcliffe air base site. The acquisition of the decommissioned base by CLC offers the opportunity today to reconnect this site back into the urban fabric of the City and create a highly desirable mixed-use community for approximately 10,000 residents. The long-term development period to full build out is estimated to be 15-20 years. There is also the opportunity to provide space for a variety of employment uses providing up to 2,600 permanent jobs.

Due to the proximity to the downtown, the new community will allow for more intensive development than in the outer suburbs, yet at a lower scale than one would see closer to the core.

A variety of housing types will be built to provide a range of choices for people with different housing needs. A community core will have the greatest mix of land uses to provide amenities to the new neighbourhoods, and it will also have the most active and vibrant streets in the community.

1.2.2 Previous Studies

In anticipation of development of the subject site, numerous reports and studies have been completed over the last five years. The most significant of these is the Community Design Plan (CDP) for which a Master Servicing Study was also prepared as a supporting document. Those documents were approved by City Council on October 14, 2015.

The “Former CFB Rockcliffe Community Design Plan, August 14, 2015”, includes a Draft Preferred Plan – Land Use which is shown in **Figure 1.1**. That figure illustrates the overall land use, road and block pattern for the community. That land use plan provides guidance and information upon which the balance of the development will be based.

In support of the CDP, there were numerous supporting documents including the “Former CFB Rockcliffe Master Servicing Study” (MSS), August 2015, prepared by IBI Group. That report provided a plan for provision of major infrastructure needed to support the proposed development of the subject site. The first three developments in the sub-division were Phases 1A, 1B and 2. Those phases are currently under construction. The design of these phases built upon the infrastructure recommendations of the earlier MSS document including the Eastern Stormwater Management Facility with an outlet to the Ottawa River; major trunk sewer outlets and most of the backbone watermain designs. Municipal services in Phase 4 will connect to infrastructure previously installed in Phase 1A.

In July 2020, at the request of the City of Ottawa, and on behalf of CLC, IBI Group completed an update to the 2015 MSS. In accordance with the 2015 MSS, the storm sewer outlet for the northern portion of Phase 2 was a trunk storm sewer proposed to be constructed through the “northern” community park which is now known as Kishkabika Park. Because of Records of Site Condition issues, the original outlet storm sewer pipe could not be constructed through the community park in a timely manner to service Phase 2. Instead, it was agreed to re-route the impacted Phase 2

stormwater flows to an existing storm sewer built during Phases 1A and 1B. Accordingly, the MSS was updated to reflect that change. That change has a negligible impact on Phase 4.

1.2.3 Municipal Infrastructure

The former site was serviced with central municipal services including a potable water supply and combined sewers. The water distribution system that previously serviced the property has been decommissioned and is no longer in service. The combined sewers discharged to the Ottawa Interceptor Sewer (IOS) which is a large diameter trunk combined sewer servicing a large portion of the City of Ottawa and a portion of which is located about 40 m below the Wateridge Village at Rockcliffe site. Combined sewage from the west portion of the site previously discharged to the Alvin Heights Pullback Sewer and combined flows from the eastern portion of the site discharged to the RCAF Pullback Sewer. Both these connections are fitted with overflow mechanisms which divert some flow away from the IOS sewer towards the Ottawa River during infrequent storm events. There is a third sewer connection to the IOS sewer which is located in the center of the sub-division and which was upgraded in Phase 1A. That connection is a dedicated sanitary sewer structure with no stormwater flows.

1.3 Subject Property

CLC plans to develop the Wateridge Village property in several phases. Phases 1A, 1B and 2, which cover about 50 ha, are currently under development. The current location now planned for development is Phase 4. The draft M-Plan for that location is shown in **Figure 1.2**. This phase covers about 5.72 ha and includes 2 low to mid-rise residential blocks and 3 low to mid-rise mixed use blocks and one multi-use pathway block. The draft 4M-Plan is also included in drawing format in **Appendix A**.

In 2018 when this Phase was originally submitted to the City for review, it was known as Phase 2A. In 2020, Canada Lands Company revised the Phasing Plan for the entire property and the subject site has been renamed Phase 4 and the former Phase 2B has been re-named Phase 2. This report will refer to these phases based on the current Phasing Plan which is now included in **Figure 1.7**.

1.4 Watercourses

There are two significant watercourses downstream of the Rockcliffe property. Please refer to **Figure 1.3**, Existing Water Courses. These are the Western Creek located west of the Aviation Parkway and the Eastern Creek located east of the Aviation Museum. Runoff from the former site not yet re-developed presently drains to both those watercourses. However, runoff from Phases 1 and 2 will be directed away from those two creeks and routed to the Eastern Stormwater Facility which was constructed and put into service in 2017 and discharges directly to the Ottawa River.

There is an existing shallow ditch that runs along the southern and western edges of Phase 1A of Wateridge Village site. That ditch collects runoff from adjacent upstream developments, including Codd's Road, the Fairhaven Community and the Montfort Woods. The upper reaches of that swale were improved as part of the Phase 1A sub-division and runoff from the ditch which is known as the Southwest Swale, is temporarily routed to the local storm sewer system and outlets to an existing ditch upstream of Hemlock Road. That runoff eventually discharges to the Western Creek.

The second remaining storm sewer on the property empties over the northeast escarpment and directs its runoff to the Eastern Creek. As with the storm sewer on the western side of the site, the "eastern" storm sewer was once the outlet from the original Burma Storm Pond. As development advances towards the northeast of the property the "eastern" storm sewer will be removed.

The Phase 4 development will have no physical impact on the downstream watercourses.

1.5 Limits of Existing Infrastructure

Figures 1.4 to Figure 1.6 indicate the limits of the existing municipal infrastructure which was constructed to provide the servicing requirements of the former CFB Rockcliffe airbase and subsequently revised as per the previous development Phases. **Figure 1.4** indicates the limits of existing water plant infrastructure and **Figure 1.5** and **Figure 1.6** respectively show the locations of existing sanitary/combined and storm sewers. Both the Brittany Drive Pump Station and Montreal Road Pump Station provide water to both the Zone 1E and Zone Mont. The subject site is located in Zone Mont. The Ottawa Interceptor Sewer (IOS) is a 2400 mm diameter combined sewer to which wastewater and some storm runoff from the property presently outlets. Codd's Road was the approximate drainage divide for the former development and combined site sewers to the west of Codd's Road discharged to the existing 300 mm diameter Airbase Pullback sewer which empties into the Alvin Heights Pullback Sewer which discharges to the IOS at the Peach Tree Road Shaft located west of the CLC property. Wastewater flows from the east portion of the site previously outletted to the existing 300 mm diameter RCAP Pullback sewer which connects to the IOS via the NRC shaft.

Sanitary flows from the Thorncliffe Village Community were previously routed through the subject site and connected to the IOS at the Codd's Road Shaft which is located in the center of the site. Development of Phase 1A and 1B included a permanent interception of the sanitary sewer from the Thorncliffe Village development and an improved connection at the Codd's Road Shaft.

All existing site sewers in the former airbase are proposed to be eventually removed in favour of new sewers. There were no existing stormwater management facilities servicing the former development.

Development of Phase 1A included a large diameter storm sewer in Oshedinaa Street. That 3000 mm dia sewer was designed to carry stormwater flows from most of the subdivision. The proposed Phase 4 storm sewer will connect to the existing trunk sewer. Development of Phase 1A also included construction of a local sanitary sewer in Oshedinaa Street. The proposed sanitary sewer in Phase 4 will connect to that existing sanitary sewer.

1.6 Pre-Consultation

1.6.1 City of Ottawa

A pre-consultation meeting with the City of Ottawa was held on November 20, 2018. Attached and included in **Appendix A** is a November 29, 2018 summary e-mail from the City. While the usual host of requirements needed at registration were reviewed, some of the highlights included discussions about the Low Impact Development (LID) features and related modelling approach and the situation concerning development of a Composite Utility Plan.

1.6.2 Conservation Authority

The Rideau Valley Conservation Authority (RVCA) was contacted and asked if any permits for the proposed Phase 4 construction would be required. None are. Please refer to a November 24, 2020 e-mail response from the RVCA confirming same in **Appendix A**.

1.6.3 MECP

The local MECP office was contacted to initiate the pre-consultation process with the province. IBI has reached out to the local MECP office for a pre-consultation for Phase 4. Attached is a copy of a December 19, 2018 e-mail from the MECP in Ottawa that recommends that the LID features, as well as services, can be approved under the transfer of review program. Please refer to a December 19, 2018 e-mail response from the local MECP located in **Appendix A**.

1.7 Geotechnical Considerations

Terrapex Environmental Ltd. prepared the October 14, 2020, Geotechnical Investigation Report Proposed Mixed-Use Development Phase 4 Wateridge Village Ottawa, Ontario. The objectives of the investigation were to prepare a report to:

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

Terrapex Environmental Ltd. completed a supplementary investigation as requested by the City on March 11, 2022. The objectives of the supplementary investigation were to:

- Install additional monitoring wells that would extend below the invert of the proposed sewers
- Complete test pits along Winisik Street and Oshedinaa Street to determine the depth of the bedrock

The investigations revealed that the site consists of grey limestone bedrock overlaid by gravelly sand in some areas, clay and silt in other areas and silty sand to sand in other areas. The bedrock depths range from 0.4 m to 3.1 m below grade. Some of the recommendations of the report include:

- Tree planting in sensitive clay soils
- Building construction
- Clay seals every 100 m in service trenches
- Pavement designs
- Earthquake design
- Chemical characterization
- Permit to take water – one already exists and is included in **Appendix A**.
- Grading comments.

1.8 Existing Private Services

There are existing private services within the Fairhaven Community located south of and adjacent to Phase 4 and at the Aviation Museum. None of the private services will be impacted by Phase 4 construction.

1.9 Phasing

The development of the Wateridge Village at Rockcliffe site will be completed in multiple phases. **Figure 1.7** shows the limits of the proposed phase. Phases 1A, 1B and 2 are currently under construction. The timing of development of future phases after Phase 4 will be confirmed by CLC. The current vision is that full build out will take 15 to 20 years. Based on that schedule, the property may not be fully developed until the early 2030's.

1.10 Legal Outlet

Phase 1A construction in 2016-2017 included installation of a 3000 mm dia trunk storm sewer in Oshedinaa Street. Included in **Appendix A** is a copy of the provincial ECA number 6929-A7MRBC dated March 3, 2016 which includes approval for the trunk sewer. That trunk sewer eventually empties into the Eastern SWM facility for which a separate EPA was obtained from the province. Also included in **Appendix A** is a copy of ECA number 0824-A8CR5H dated April 12, 2016 which is the ECA for the Eastern SWM facility. The existing 3000 mm dia trunk sewer in Oshedinaa Street is the legal outlet for the proposed Winisik Street storm sewers.

Part of the Phase 1A development included construction of a local sanitary sewer in Oshedinaa Street. That sewer was granted provincial approval by the then Ministry of Environment and Climate Change. This sanitary sewer is also included in the 6929-A7MRBC ECA dated March 3, 2016 included in **Appendix A**. The existing sanitary sewer in Oshedinaa Street will be the legal outlet for the proposed Winisik Street sanitary sewer.

1.11 Municipal Class EA

All proposed municipal infrastructure in the Wateridge Village subdivision including watermains, sewers and SWM facilities were the subject of a Municipal Class Environmental Assessment (EA) process. The Notice of Completion of Class Environmental Assessment (EA) was published on October 31, 2015. A copy of the Notice is included in **Appendix A**.

The details of the Assessment are included in the MSS. The Assessment included an integrated approach under the Environmental Assessment Act and the Planning Act. The proposed watermains and sewers in Phase 4 will now be planned and approved through the development application process under Section 51 of the Planning Act in a manner that fulfils the requirements of Phases 1 and 2 of the Municipal Class EA process. As such these projects will require no additional EA approvals after completion of that process. All that remains to complete Phase 2 of the Municipal Class EA is for the Phase 4 watermains and sewers to be granted City and provincial approval under the Planning Act.

2 Water Supply

2.1 Existing Conditions

Phase 4 of Wateridge Village at Rockcliffe will be serviced with potable water from the City of Ottawa's Montreal Road Pressure Zone (Zone MONT). The water distribution system that previously serviced the property has been decommissioned. An existing 406 mm diameter watermain on Montreal Road will supply the site with connections at Codd's Road and Winaki Road.

The MSS water plan recommended that a 300 mm dia watermain be constructed in Hemlock Road in the area adjacent to Phase 4. The previous development Phase 1A included construction of that pipe which was commissioned in 2016. Existing watermains in the Wateridge Village development are shown on **Figure 1.4**.

2.2 Master Servicing Study

A recommended water distribution plan was included in the former CFB Rockcliffe Master Servicing Study, August 2015 by IBI Group. A copy of Figure 4.4 Proposed Pipe Alignment and Diameters from the Master Servicing Study is included in **Appendix B**. The recommended plan for the previous Phase 1A was implemented in accordance with the MSS recommendations as discussed in Section 2.1.

The Phase 4 water plan, which will be in general accordance with the MSS recommendations, will include connections to the Hemlock Road pipe.

2.3 Design Criteria

2.3.1 Water Demands

Water demands for Phase 4 are based on Table 4.2 – Consumption Rates for Subdivisions of 501 to 3,000 Persons of the Ottawa Design Guidelines – Water Distribution. The preferred Concept Plan from the Master Servicing Study for land uses in Phase 4 consists of low rise residential, mid-rise mixed use. Populations for this phase are determined by the conceptual site plan which consists of 4 to 8 storey residential buildings. A watermain demand calculation sheet is included in **Appendix B** and the total water demands for Phase 4 are summarized as follows:

- Average Day 2.98 l/s
- Maximum Day 7.44 l/s
- Peak Hour 16.36 l/s

2.3.2 System Pressure

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

Minimum Pressure	Minimum system pressure under peak hour demand conditions shall not be less than 276 kPa (40 psi)
Fire Flow	During the period of maximum day demand, the system pressure shall not be less than 140 kPa (20 psi) during a fire flow event.
Maximum Pressure	Maximum pressure at any point in the distribution system shall not exceed 689 kPa (100 psi). In accordance with the Ontario Building/Plumbing Code, the maximum pressure should not exceed 552 kPa (80 psi). Pressure reduction controls may be required for buildings where it is not possible/feasible to maintain the system pressure below 552 kPa.

2.3.3 Fire Flow Rate

In the recent Technical Bulletin 'ISDTB-2014-02, Revisions to Ottawa Design Guidelines – Water', the fire flow requirements for single detached dwellings and traditional town and row houses can be capped at 10,000 l/min providing that there is a minimum separation of 10 meters between the backs of adjacent units and that the town and row house blocks are limited to 600 square meters of building areas and seven dwelling units.

Fire flow calculations have been conducted using the Fire Underwriters Survey (FUS) method for representative buildings shown on the conceptual site plan. A calculation was performed for Building B on Winisik, Building A on Hemlock which represents 6 and 8 storey residential buildings and Building B on Oshedinaa which represents the 4 storey residential buildings. Results of the analysis result in fire flows of 233.3 l/s, 216.7 l/s and 183.3 l/s respectively. A fire flow demand of 183.3 l/s has been added to the nodes adjacent to the 4 story building and a demand of 233.3 l/s has been added to all other nodes. A copy of the FUS calculations is included in **Appendix B**.

2.3.4 Boundary Conditions

The City of Ottawa has provided two hydraulic boundary conditions on Hemlock Road at the two watermain connections to Phase 4.

A copy of the boundary conditions contained in a September 23, 2021 email, is included in **Appendix B** and summarized as follows:

Max HGL (Basic Day)	143.0 m
Min HGL (Peak Hour)	143.0 m
Max Day + Fire (183.3 l/min Fire Flow)	137.7 m
Max Day + Fire (233.3 l/s Fire Flow)	134.8 m

2.3.5 Hydraulic Model

A computer model for the Phase 4 site has been developed using the InfoWater program produced by Innovyze. The model incorporates the boundary conditions at Hemlock Road. Basic day (max HGL), Peak hour (min HGL) and max day plus fire scenarios were run using the HGLs discussed in **Section 2.3.4**.

2.3.6 Proposed Water Plan

The hydraulic model has a 200 mm diameter watermain on Winisik Road from Hemlock Road to Oshedinaa Street. A 200 mm watermain is required on Oshedinaa Street from Hemlock to the intersection of Winisik to meet the required fire flows. A 200 mm watermain is proposed on the

northern portion of Oshedinaa however, to meet the fire flow requirement and to improve water quantity, a 200 mm watermain is required in Block 6 to loop back from Oshedinaa Street to the 200 mm watermain on Street No. 1 at the west limit of the site. As the site plan is only conceptual at this point, the ultimate design and location of the 200 mm watermain will be determined when the Block 6 site plan is developed.

Results of the hydraulic model are included in **Appendix B** and summarized as follows:

Scenario	**Results**
Basic Day (Max HGL) kPa	527.19 to 573.21
Peak Hour (Min HGL) kPa	527.15 to 573.08
Max Day + Fire Flow	(233.3 l/s)
Minimum Residual Pressure kPa	276.49

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

Maximum Pressure — Under the basic day (Max HGL) scenario several nodes exceed 552 kPa (80 psi) requiring pressure reducing control by means of pressure reducing valves as outlined in Technical Bulletin ISDTB-2014-02. The location of the nodes are at the north end of the site below the road elevation of 87.00. There are no areas where the pressure exceeds 689 kPa (100 psi).

Minimum Pressure — The minimum peak hour pressures at all nodes exceed the minimum requirement of 276 kPa (40 psi).

Fire Flow — As per Section 2.3.3 there are nodes with a 183.3 l/s fire flow demand and nodes with a 233.3 l/s demand. In the boundary conditions in Section 2.3.4 a separate condition has been provided for a 183.3 l/s and 233.3 l/s fire. The model was run for only the 233.3 l/s boundary condition. Results of the analysis results show all nodes exceeding the minimum residual pressure of 140 kPa (20 psi) therefore the fire flow requirement has been achieved.

Water Age — A calculation is included in **Appendix B** to determine how long it will take to turn over the water in all the mains in Phase 4 assuming buildout and a basic day consumption rate of 200 l/cap/day. Results of the analysis shows a turnover time 3.6 hours due to the population based on the conceptual site plan. Should the phase be constructed in advance of final site plans it is recommended that the watermains not be commissioned until required. An automatic flusher unit is another method to turn over the water in advance of the buildings, however, a large quantity of water could be “wasted” if there is a long period between the construction of the watermains and the construction of the buildings.

3 Wastewater Disposal

3.1 Existing Conditions

The existing wastewater collection system for the Wateridge Village at Rockcliffe property consists of the new Phases 1A, 1B and 2 sanitary sewers together with the remaining older combined sewers not already impacted by the re-development of the property. All wastewater flow from the former air base development was directed to the Ottawa Interceptor Sewer (IOS). That sewer is a 2.4 mm diameter trunk facility which bisects the Rockcliffe site about 40 meters below ground. The IOS is a large combined sewer which services a large portion of the City of Ottawa.

Combined wastewater flow from the former development was directed to the IOS via one of two existing connections. **Figure 1.5** shows the existing wastewater network in and around the subject site. Prior to the re-development of the Rockcliffe Base site, generally wastewater flow from lands located west of Codd's Road was directed to the IOS sewer via the Air Base and Alvin Heights pull-back sewers. Wastewater flows east of Codd's Road were routed and connected to the IOS via the RCAF pull back sewer.

There are also three external areas which pass wastewater flows through the CLC lands and also outlet to the IOS. The Montfort Hospital is located adjacent to and immediately southwest of the CLC property. Sanitary wastewater flow from the hospital outlets to an existing combined sewer located near the west portion of the CLC lands which in turn outlets to the Air Base Pull back sewer and the Alvin Heights sewer. That pull back sewer system will remain in service and will not be impacted by the early phases of development of Wateridge Village, including Phase 4.

The National Research Council (NRC) campus abuts the CLC property to the east. Combined wastewater from the NRC campus was previously collected in a 750 mm diameter combined sewer and routed through the CLC property to the NRC Shaft at the IOS. In 2017, the NRC completed a sewer separation plan and the 750 mm diameter sewer is no longer in service. The development of Phase 4 will also not impact the NRC outlet sewer.

The Thorncliffe Community is located south of the Wateridge Village at Rockcliffe site. Wastewater from the community was originally routed in a dedicated sanitary sewer through the CLC property and connected to the IOS combined sewer at the Codd's Road Shaft which is located near the middle of the property. This connection to the Interceptor Outfall Sewer was added in 1991 as part of the development of the Thorncliffe Village community and subsequently upgraded as part of Phase 1A. The Thorncliffe Village Sanitary sewer was intercepted by the Phase 1 development and the wastewater flows from the Thorncliffe Village, as well as both Phases 1A and 1B, were re-routed to the IOS sewer via the Codd's Road Shaft. The Codd's Road Shaft location is indicated on **Figure 1.5**.

3.2 Master Servicing Study

Canada Lands Company completed a Community Design Plan (CDP) in 2015. To support that plan, a number of technical reports were prepared including the 'Former CFB Rockcliffe Master Servicing Study, August, 2015' (MSS). As stated earlier in Section 1.2.2, the 2015 document was updated in 2020. Both reports recommended that the existing combined sewers on the subject site be abandoned in favour of dedicated sanitary and storm sewer systems.

In particular, the MSS recommended that future wastewater flow from Phase 4 be directed to the Codd's Road Shaft. Accordingly, wastewater flows from the subject site will be designed to outlet to that location. The previous Phase 1A design included the new connection to that shaft and the proposed Phase 4 sanitary sewers will connect to the Phase 1A system. For reference, a copy of Figure 5.1, Recommended Wastewater Plan, from the MSS document is included in **Appendix C**.

Figure 5.1 shows that the recommended sanitary sewers in Winisik Street should be 250 mm dia. In 2015 during the MSS development, the City of Ottawa requested that the minimum sanitary sewer size in the re-development of the property be 250 mm dia. The reason for this is that there is a Sewer Design Guideline that states that all sanitary sewers for developments inside the Greenbelt must be a minimum of 250 mm dia.

3.3 Design Criteria

The City of Ottawa recently revised its wastewater design criteria in 2018. The MSS Report, which was completed in 2015, recommended that the wastewater system proposed for the re-development of the Rockcliffe Airbase site be designed with the City's criteria in effect in 2015. However, because of the recent changes, the Phase 4 sanitary sewers are proposed to be designed with the current criteria. Table 3.1 shows a comparison of the two criteria. Because the new criteria predicts less wastewater flows, the existing downstream sewers will have sufficient capacity for predicted flows from Phase 4.

Table 3.1 – Comparison of City of Ottawa Wastewater Criteria

	CITY OF OTTAWA DESIGN CRITERIA	
	PRE 2018	2018
Minimum Velocity	0.60 m/s	0.60 m/s
Maximum Velocity	3.00 m/s	3.00 m/s
Roughness Coefficient	0.013	0.013
Average Residential Flow	350 l/c/r	280 l/c/d
Residential Peaking Factor	Harmon (2.00 – 4.00)	Modified Harmon
Commercial Flow	50,000 l/ha/d	27,000 l/ha/d
Institutional Flow	50,000 l/ha/d	23,000 l/ha/d
Commercial/Institutional Peaking Factor	1.5	1.5
Infiltration Rate	0.28 l/s/ha	0.33 l/s/ha

Minimum allowable slopes as listed below remain unchanged:

DIAMETER (mm)	SLOPE (%)
250	0.240
300	0.186
375	0.140
450	0.111
525 and larger	0.100

Where practical and where there are less than 10 residential connections, the first lengths of sanitary sewers are designed as 250 mm diameter pipes with a minimum slope of 0.65%.

The population densities identified in the CFB Rockcliffe MSS are:

- Single Family Units 3.4 ppu

- Semi Detached Units 2.7 ppu
- Freehold Townhouses 2.7 ppu
- Apartments 1.8 ppu

3.4 Proposed Wastewater Plan

The recommended wastewater plan for Phase 4 is shown on **Figure 3.1** which is included in **Appendix C**. In accordance with the recommendations from the 2020 MSS report, all wastewater flows from Phase 4 will be directed and connected to the Phase 1A sewers. All new sanitary sewers proposed for the subject site will be 250 mm diameter.

It is noted that the only new sanitary sewers in Phase 4 are those in Winisik Street. The Oshedinaa Street sanitary sewers were the subject of our earlier review and approval and were put into service in 2016. Given that the specific drainage limits and characteristics of the Phase 4 area may have changed since then, the sanitary sewer design street also includes an updated review of the Oshedinaa Street sanitary sewers to demonstrate available capacity and is included at this time only for information purposes.

The new sewers are proposed to be fitted with temporary Inlet Control Devices (ICDs) at MH 191B on Oshedinaa Street and at MH 322A on Winisik Street. The ICDs are intended to ensure that existing downstream sewers are not accidently flooded during construction. The ICDs will remain in place until the time of preliminary acceptance, at which time they will be removed. The locations are shown on **Figure 3.1** and on the working drawings and the detail sizing calculations are included in **Appendix C**.

3.5 Local Extraneous Flows

Ground water levels are expected to be in a clay or rock stratum. All new sanitary sewers will be tested to the City of Ottawa standards prior to being put into service. For the subject site, there are no unusual local conditions that are expected to contribute to extraneous flows that are higher than those noted in the City's guidelines.

3.6 Wastewater Outlet

As stated above, the wastewater outlet for the subject site will be the Ottawa Interceptor Sewer. That sewer bisects the CLC property and previously accepted combined flows from the site and wastewater from the Thorncliffe Village Community. The Phase 1A and 1B wastewater plan included new local sewers that were routed to the reconstructed Codd's Road Shaft. Wastewater flows from Phase 4 are proposed to connect to the upper reaches of the Phase 1A sewer system.

3.7 Sewer Calculations

Detailed sewer design spreadsheets, using MECP and City design criteria, together with the Sanitary Drainage Area Plan Drawing 118863-410 is included in **Appendix C**. In accordance with the recommendations of the MSS document, wastewater flows from the Phase 4 site will be routed to the IOS trunk sewer via the Phase 1A sewers.

3.8 Environmental Constraints

There are limited environmental constraints related to the development of Phase 4. The Tree Conservation Report recommended that a number of the trees near the north perimeter of Block 2 be retained. Tree 36 in that report is very close to the north limit of Block 2 so the proposed

grading in that area is to match original ground to ensure there will be no grading impact to that tree.

Other than scattered roadside ditches remaining from the former airbase development, there are no significant water courses on the subject site which will be impacted by the development of Phase 4.

3.9 Emergency Overflow

All wastewater flows from the Wateridge Village at Rockcliffe property, including the subject site, are proposed to be directed to their outlets by gravity. Therefore, no pumping stations and related emergency overflows are needed for this development.

4 Minor Storm System

4.1 Existing Conditions

Figure 1.6 shows the existing storm sewers in and around the Wateridge Village at Rockcliffe site. Prior to the re-development of the property, most of the existing site sewers were combined sewers. Ultimately the existing combined sewers are proposed to be abandoned in favour of separated sanitary and storm sewers. Accordingly, Phase 4 will include both dedicated storm and sanitary sewers.

Previously, the only dedicated storm sewers on the CLC property include two 1050 mm diameter sewer outlet pipes from the existing Burma Road SWM Facility. Development of the previous Phase 1A, 1B and 2 included interception and de-commissioning of most of the two existing storm sewers. Flows from the Burma Pond are now directed to the Eastern SWM facility before release to the Ottawa River.

4.2 Master Servicing Study

CLC completed the servicing report, “Former CFB Rockcliffe Master Servicing Study” in 2015. As noted earlier, that report was updated in 2020.That report recommended a preferred Stormwater Management Plan for the Wateridge Village at Rockcliffe site, which including construction of two stormwater ponds and related appurtenances to service the CLC property; the Western Stormwater Management Facility and the Eastern Stormwater Management Facility.

The Eastern Pond is proposed to provide management of flows from most of the CLC property including the subject site. The Eastern pond construction was included as part of the development of Phase 1A and the facility was put into service in 2017.

The MSS reports also recommends a series of local and trunk storm sewers to collect runoff from Phases 1 and 2 and route those flows to the Eastern Facility. The Phase 1 design followed the recommendations of the MSS report, including construction of the large diameter sewers, which outlets to the Eastern Stormwater Management Facility. The Phase 1A development included construction of a 3000 mm diameter storm trunk sewer in Oshedinaa Street in Phase 4. For reference, a copy of Figure 6.7, Recommended Storm Sewer System from the MSS Report, is included in **Appendix D**. The Phase 4 minor storm sewer plan will follow the recommendations of the MSS document.

4.3 Minor Storm Sewer Design Criteria

In keeping with guidelines published by the City of Ottawa for storm sewers, the storm drainage system proposed for the Wateridge Village at Rockcliffe Phase 4 lands will follow the principles of dual drainage.

The minor storm flow estimates were calculated by the Rational Method. Some of the significant criteria used in the minor storm sewer design are:

- Initial Time of Concentration 10 min
- Runoff Coefficients 0.70 roadways
  0.80 blocks
  0.30 parks
- Velocities 0.80 m/s to 3.0 m/s

- Manning roughness coefficients 0.013 (smooth wall pipes)
- Minimal allowable slopes

DIAMETER (MM)	SLOPE (%)
250	0.43
300	0.34
375	0.25
450	0.20
525	0.16
600	0.13
675	0.11

- Minimum depth of cover of 2.0 m
- Inlet-control rate to capture 2 year peak flows
- 100 year Hydraulic Grade Line (HGL) separation to be greater than 0.30 m from the underside of footings. In this instance where basement elevations are unknown, USF's are assumed to be 2.0 m below adjacent finished street grades.
- HGL analysis calculated with XPSWMM

4.4 Proposed Minor Storm Sewer Plan

Figure 4.1, which is also included in **Appendix D**, shows the recommended minor storm plan. All new Phase 4 sewers will connect to the existing 3000 mm diameter sewer which was installed in Oshedinaa Street as part of the Phase 1A development. The new sewers will range in size from 250 mm diameter to 600 mm diameter. The minor storm sewer design sheet together with the Storm Drainage Area Plans Drawing 118863-510 is included in **Appendix D**.

It is noted that the only new storm sewers in Phase 4 are those in Winisik Street. The Oshedinaa Street storm sewer was the subject of an earlier review and approval and was put into service in 2016. Given that the specific drainage limits and characteristics of the Phase 4 area may have change since then, the storm sewer design sheet also includes another review of the Oshedinaa storm sewers and included at this time only for information purposes to demonstrate available capacity.

The new sewers are proposed to be fitted with a temporary Inlet Control Device (ICD) at MH 323 on Winisik Street. The ICD is intended to ensure that existing downstream sewers are not accidently flooded during construction. The ICDs will remain in place until the time of preliminary acceptance, at which time they will be removed. The locations are shown on **Figure 4.1** and on the working drawings and the detail sizing calculation is included in **Appendix D**.

The development of Phase 4 will also impact existing surface runoff patterns. A series of temporary drainage ditches is recommended to ensure existing undeveloped areas do not flood. These temporary ditches are included in **Figure 4.1**, Proposed Minor Storm Plan. Signing calculations for the temporary DI's are included on the storm sewer design sheet. ICD calculations and Time of Concentrations are also included in Appendix D. When appropriate, each of the proposed temporary drainage ditches will be removed.

There is also one proposed permanent ditch near the north end of Oshedinaa Street. This ditch is designed to carry the 100 year major overflow from the subdivision. The approximately 10 m long ditch is proposed to drain to DI1 which will outlet to the existing 3000 mm dia trunk storm sewer. The ditch design is included in **Appendix D**. The ditch is designed to carry a flow of 283 l/s.

4.5 Erosion and Sedimentation Control

Development of a subdivision such as Phase 4 of the Wateridge Village at Rockcliffe site can potentially create deleterious material which can enter the natural environment and gain access to fish habitat. In order to prevent site generated sediments from entering the environment, an Erosion and Sedimentation Control Plan will be implemented prior to development.

The erosion and sedimentation strategy for the subject site will include erection of silt fences around most of the site perimeter. The silt fences will ensure protection of both adjacent developments and the natural environment including the Western and Eastern Creeks and the Ottawa River.

It is expected that installation of municipal infrastructure on the subject site will include some dewatering. Accordingly, the Erosion and Sedimentation Control Plan also includes the installation of dewatering traps (OPSD 219-240). The final Erosion and Sedimentation Plan will be designed by the site's civil contractor.

A copy of the Erosion and Sedimentation Control Plan, Drawing 118863-910, is included in **Appendix E**.

4.6 Miscellaneous Elements

The following section includes brief comments for items indicated in the current Servicing Study Guidelines for which the proposed development will have little or no impact.

These include:

- Setbacks
- Drainage catchment diversions
- Municipal drains
- 100 year flood lands
- Floodplains

The geotechnical report completed as part of the supporting documents for the CDP included recommended setbacks along the northern escarpment of the CLC lands. **Figure 4.2** shows the proposed development setbacks along the northern escarpment. These setbacks do not impact the proposed Phase 4 development.

Any runoff from the site, as with all future developments in Wateridge Village at Rockcliffe, will have end of pipe quality treatment. Any impacts to receiving watercourses will therefore be mitigated.

There are no municipal drains in the vicinity of the subject development and there are no drainage catchment diversions proposed by the current development.

Because the site is located well above the receiving waters of the Ottawa River, there will be no 1:100 yr water levels in that watercourse that will impact the site development.

5 Stormwater Management

5.1 Background

Wateridge Phase 4 is part of the larger development referred to as the Former CFB Rockcliffe. The stormwater management strategy was outlined in the "Former CFB Rockcliffe Master Servicing Study" (MSS) (IBI Group, August 2015).

The subject Phase 4 site is part of the drainage area that ultimately discharges to the Eastern SWM Facility. The trunk storm sewer to the pond and the pond itself were constructed as part of Wateridge Phase 1A.

5.2 Objective

The purpose of this evaluation is to prepare the dual drainage design, including the minor and major system, of Phase 4.

The dual drainage evaluation includes assessment of the on-site detention versus cascading major flow, maximum depth and velocity of flow on the street segments, sizing of inlet control devices and hydraulic grade line analysis.

The design takes into consideration the August 2015 MSS, the "Design Brief Wateridge Village at Rockcliffe Phase 2B" (IBI Group, April 2019), the "Design Brief Wateridge Village at Rockcliffe Phase 1B" (IBI Group, June 2017), the "Design Brief Wateridge Village at Rockcliffe Phase 1A" (IBI Group, April 2016), the City of Ottawa Sewer Design Guidelines (OSDG) (October 2012), and the February 2014 Technical Bulletin ISDTB-2014-01.

5.3 Stormwater Management Design

The site was designed with dual drainage features, accommodating minor and major system flow. Minor flow will be conveyed through storm sewer connections to the existing trunk storm sewer to the Eastern SWM Facility. There are multiple major flow outlets, outlined in detail this section.

5.3.1 Dual Drainage System

Due to the flat topography of the majority of street segments within the site, on-site detention is available to facilitate ponding in street sags (see **Drawings 601**). Inlet control devices (ICDs) are proposed to minimize the surcharge in the minor system during infrequent storm events and maximize use of available on-site storage. The minor system capture of ICDs is generally based on the 5 year simulated flow for individual catchments, consistent with the MSS. The balance of the surface flow not captured by the minor system will be conveyed via the major system.

The dual drainage system has been evaluated using the DDSWMM hydrological model, while the minor system hydraulic grade line analysis has been evaluated using the XPSWMM dynamic model and is discussed in **Section 5.5**.

Street segments

As noted, the site includes a combination of continuous and saw-tooth road grade pattern. The saw-tooth road grade pattern is based on maximum 350 mm separation between the low point at the catchbasin and the high overflow point at the downstream end of the segment. Inflow into the minor system will be controlled by ICDs to meet the flow allowance of the downstream system. **Table 5.3** indicates whether a street segment is continuous or sawtoothed.

Further details regarding the street segment minor and major system design are presented in **Section 0**.

Rear yards

Rear yards have minor system inflow restriction with major flow cascading to a street segment. ICDs will control the inflow into the minor system from rear yards. Further discussion regarding the rear yard minor and major system design is presented in **Section 0**.

Development Blocks

Development blocks have minor system inflow restriction with major flow cascading to a street segment. At the time of detailed design of each block, the developer's engineering consultant will be required to limit the minor system inflow in accordance with **Table 5.3**.

External Areas

Areas external to Phase 4 considered in this design submission are those existing Phase 1B drainage areas on Hemlock Road that receive major flow from Phase 4. Refer to **Drawing 751**.

Summary of dual drainage design

The sewer design and rational method spreadsheet for the subject site for the 5 year storm event is enclosed in **Appendix D** (and corresponding drainage areas indicated on **Drawing 510**). The rational method design indicates that the 5 year rational flow for local roads is conveyed to the storm sewer under free flow conditions. For the subject site, ICD sizing has been based on a 5 year level of service for all local streets and the majority of development blocks, consistent with the MSS. Minor system capture at two development blocks has been increased to the 100 year due to downstream major system constraints.

With respect to the minor system, runoff from Phase 4 is conveyed to the Eastern SWM Facility via the existing trunk storm sewer on Oshedinaa Street.

Major flow from the southern and eastern part of Phase 4 is conveyed south to Hemlock Road (constructed as part of Phase 1A). Major flow on Winisik Street and Oshedinaa Street is conveyed north on Oshedinaa Street to a ditch provided with a DICB that ties into the storm sewer downstream of MH193 (for more information, refer to **Section 4.4**). Major flow from B191 and P191 cascades north over the escarpment, towards the existing Eastern SWM Facility.

As part of the stormwater evaluation, where major flow from Phase 4 enters existing development, the surface conveyance of flow was evaluated and is reported in **Table 5.5** and

Table 5.6.

5.4 Hydrological Analysis

Hydrological analysis of the proposed dual drainage system of the subject site was conducted using DDSWMM. This technique offers a single storm event flow generation and routing. Land use, selected modeling routines, and input parameters are discussed in the following sections. A drainage area plan is presented in **Drawing 751** and the model files are included as part of the digital submission.

The model was based on the existing detailed Phase 2B modeling of the Rockcliffe development, updated to account for detailed design of Phase 4. The overall model includes drainage areas from Phase 2B, relevant drainage areas from Phases 1A and 1B, and semi-lumped drainage areas in Phases 2C and 2D. Only Phase 4 is part of the current submission.

The primary focus of the hydrological analysis was to generate minor flow hydrographs for the hydraulic analysis, and to evaluate surface flow and ponding conditions during the 100 year storm event in order to satisfy City of Ottawa Sewer Design Guidelines with respect to velocity and depth. The parameters used to model the subject site are presented in **Table 5.2**.

5.4.1 Summary of Model Files

For ease of review, the following is a reference list of the model files including file names and storm events evaluated. The files are included as part of digital submission.

DDSWMM:

- 5 year 3 hour Chicago: 118863-3CHI5.DAT
- 100 year 3 hour Chicago: 118863-3CHI100.DAT
- 100 year 3 hour Chicago + 20%: 118863-3CHI120.DAT
- 100 year 24 hour SCS Type II (103.2 mm): 118863-24SCS100.DAT
- July 1979: 118863-JUL79.DAT
- August 1988: 118863-AUG88.DAT
- August 1996: 118863-Aug96.DAT

SWMHYMO – Velocity x Depth:

- 118863VD.DAT

XPSWMM Subdivision:

- 25 mm 4 hour Chicago: 118863-25MM_SUB2_2021-10-13.xp

- 2 year 24 hour SCS Type II: 118863-24SCS002_SUB2_2021-10-13.xp
- 5 year 24 hour SCS Type II: 118863-24SCS005_SUB2_2021-10-13.xp
- 100 year 24 hour SCS Type II: 118863-24SCS100_SUB2_2021-10-13.xp
- 100 year 24 hour SCS Type II+20%: 118863-24SCS120_SUB2_2021-10-13.xp

- 100 year 3 hour Chicago: 118863-3CHI100_SUB2_2021-10-13.xp
- 100 year 3 hour Chicago + 20%: 118863-3CHI120_SUB2_2021-10-13.xp

- July 1979: 118863-JUL1979_SUB2_2021-10-13.xp
- August 1988: 118863-AUG1988_SUB2_2021-10-13.xp
- August 1996: 118863-AUG1996_SUB2_2021-10-13.xp

XPSWMM Pond:

- 25 mm 4 hour Chicago: 118863-ESWM-PH4_25MM.xp

- 2 year 24 hour SCS Type II: 118863-ESWM-PH4_24SCS002.xp
- 5 year 24 hour SCS Type II: 118863-ESWM-PH4_24SCS005.xp
- 100 year 24 hour SCS Type II: 118863-ESWM-PH4_24SCS100.xp
- 100 year 24 hour SCS Type II+20%: 118863-ESWM-PH4_24SCS120.xp

- July 1979: 118863-ESWM-PH4_JUL1979.xp
- August 1988: 118863-ESWM-PH4_AUG1988.xp
- August 1996: 118863-ESWM-PH4_AUG1996.xp

5.4.2 Storm and Design Parameters

The following storms and design parameters have been used in the evaluation of the stormwater management system for the subject site.

Land Use

Phase 4 will be developed as mix of low- to mid-rise residential and low to mid-rise mixed-use, and parks.

Storms and Drainage Area Parameters

The main hydrological parameters are outlined below and summarized in **Table 5.2**.

- **Design Storms:** The subject site was evaluated with the following storms:
    - 25 mm 4 hour Chicago storm, the water quality design storm for the pond;
    - 2, 5 and 100 year 24 hour SCS Type II storm events, and associated stress test; applied in the evaluation of the pond;
    - 5 and 100 year 3 hour Chicago storm events, and associated stress test; applied for the evaluation of the trunk storm sewers;
    - July 1979, August 1988, August 1996 historical storms per the OSD.

- **Area and Imperviousness:** Catchment areas are based on the rational method spreadsheet. See **Drawing 751** for the catchment areas used in the DDSWMM modeling for the subject site.

  Imperviousness values are based on runoff coefficients used in the rational method. Park areas were assigned an imperviousness of 14%.

- **Infiltration:** Infiltration losses were selected to be consistent with the OSDG. The Horton values are as follows: f_o = 76.2 mm/h, f_c = 13.2 mm/h, k = 0.00115 s^{-1}.

- **Subcatchment Width:** The catchment width was based on the conveyance route length of the drainage area and multiplied by two. The multiplier of two was only used if the drainage area had runoff contribution from both sides of the drainage area. For the future external areas the subcatchment width of 225 m/ha was used.

- **Slope:** The ground slope was based upon the average slope for both impervious and pervious area. Generally, the slope is approximately 2% (0.02 m/m). This assumes a slope of approximately 1% for impervious or road surfaces and 3% for pervious surfaces (lot grading).

- **Initial Abstraction (Detention Storage):** Detention storage depths of 1.5 mm and 4.67 mm were used for impervious and pervious areas, respectively. These values are consistent with the OSDG.

- **Manning's roughness:** Manning's roughness coefficients of 0.013 and 0.25 were used for impervious and pervious areas, respectively.

- **Baseflow:** No baseflow components were assumed for any of the areas contributing runoff to the minor system within the DDSWMM model.

- **Minor System Capture:** The minor system from the subject site is conveyed via the existing trunk storm sewer to the Eastern SWM Facility.

  Inlet control devices (ICDs) are proposed to limit the flow into the minor system during the 100 year event. The ICD sizes for street and rear yard segments were selected from the

standard orifice sizes summarized in the City of Ottawa Standard Tender Documents MS-18.4 (March 2017).

Table 5.1 Standard ICD Sizes per City of Ottawa Standard Tender Documents MS-18.4

ICD DIAMETER (MM)	ORIFICE AREA (M2)
83	0.0054
94	0.0069
102	0.0082
108	0.0092
127	0.0127
152	0.0181
178	0.0249

Standard head values were applied in the calculation of flow rates. A head of 1.65 m was used for street segments and 1.3 m for rear yards. In addition to the above, the Vortex ICD was considered for street segments. The minor system inflow rate was optimized to minimize ponding at street segments during the 5 year storm event. Further information on the ICDs can be found in the catchbasin table (refer to Drawing 020).

Park areas are assumed to be restricted to the 5 year modeled flow.

- **Major System Storage and Routing:** The subject site contains street segments with a saw-tooth design grade pattern with catchbasins installed with inlet control devices (ICDs) at the low points. The flow is attenuated within these localized low points with potential overflow cascading to the next segment downstream. The total volume at each low point, up to the overflow depth, is the maximum static storage.

  For street segments, the cascading overflow to the next segment or low point, utilizes the static storage available plus an additional amount of storage equivalent to the depth required for the flow to carry over the high point. The attenuation in street sags was evaluated to account for static storage and, if overflow occurs, dynamic storage. Within this report it is referred to as double routing.

  The DDSWMM model does not have a direct way of coding double routing since it does not allow the user to code dynamic storage over the high point. For this analysis, an alternative method was employed where the overflow from a street segment (regular static storage at a sag) is conveyed to a dummy segment. In other words, a regular low point segment was provided with a downstream dummy segment for further flow attenuation to account for the dynamic ponding during overflow.

  The dummy segment does not have any drainage area attributes associated with it since it is a segment for routing. In addition, there is no inflow to the minor system from these dummy segments. The overflow hydrograph from the upstream catchment is routed in the dummy segment to the next “real” downstream segment. The dummy segments have specific characteristics which are noted below:

  - Segment Length – equivalent to length of maximum static storage from the street segment contributing to it.
  - Road Type – equivalent to appropriate right-of-way characteristics from the segment contributing to it, but with a longitudinal slope is 0.01% (0.0001 m/m).

The double routing method noted above, and applied to DDSWMM, is a recommended double routing method presented within the February 2014 City of Ottawa Technical Bulletin.

The dummy segments for major system routing were applied to the analysis of the subject site. The segments are referenced as D1, D2, D3, etc. within the DDSWMM modelling file. The DDSWMM schematic presented in **Drawing 751** does not show the dummy segments, but DDSWMM computer output file shows the dummy segments immediately following the corresponding major segment which cascades into that dummy segment.

Street segments

Where surface storage is available, the storage-outflow characteristics for each low point were taken into consideration. The evaluation was undertaken assuming static conditions. The ponding plan for the subject site is presented on **Drawings 601**.

For continuous grade profiles, the computer simulations were based on the approach-capture characteristics of the catchbasin with the constraint that during the critical storms the maximum cascading flow would not exceed 350 mm.

Rear yards

Rear yards were considered independently of street segments. DDSWMM simulations were based on the total interception of runoff by the storm inlets. This was done by specifying a one-to-one relationship between approach flow and capture flow. No storage volume was accounted for in rear yards. Overflow from the rear yards cascades to a major system road segment via swales.

Development blocks

Development blocks were considered independently. As previously noted, DDSWMM simulations were generally based on a minor system capture between the 5 and 100 year, with major flow cascading to an adjacent street segment. No on-site storage has been assumed.

The below table summarizes the main hydrological parameters used in the DDSWMM model. The storm drainage area plan (**Drawing 751**) is provided in **Appendix F**. Model files are enclosed with the digital submission.

Table 5.2 Hydrological Parameters

DRAINAGE AREA ID	AREA (HA)	D/S SEGMENT ID	XPSWMM NODE ID	IMP RATIO [TP (H)]	SEGMENT LENGTH (M)	SUBCATCHMENT WIDTH (M)	AVAILABLE STATIC PONDING (M^3)
Phase 4							
B340A	0.66	S176D	MH231	0.86	74	149	0[(1)]
S319	0.144	S180	MH319	0.71	66	131	46.17
B319	0.995	S176D	MH322	0.86	112	224	0[(1)]
S320	0.18	S322	MH320	0.71	83	166	0
S322	0.181	S191A	MH322	0.71	85	171	0
B322	0.95	S190B	MH322	0.86	107	214	0[(1)]
S190	0.098	S190B	MH190	0.71	99	198	1
S190A	0.189	S192	MH191	0.71	171	171	0
S190B	0.099	S191A	MH190	0.71	109	109	0.56
S191A	0.045	S191	MH191	0.71	38	38	0
S191B	0.066	S190A	MH190	0.71	61	61	0

DRAINAGE AREA ID	AREA (HA)	D/S SEGMENT ID	XPSWMM NODE ID	IMP RATIO [TP (H)]	SEGMENT LENGTH (M)	SUBCATCHMENT WIDTH (M)	AVAILABLE STATIC PONDING (M^3)
S191	0.063	S192	MH191	0.71	59	118	0
S192	0.148	S193	MH192	0.71	69	137	0
S193	0.126	DITCH	MH193	0.71	39	78	0.12
P191	1.176	NORTH(3)	MH192	0.20	133	266	0
B180A	0.418	S191B	MH190	0.86	47	95	0(1)
B191	1.166	NORTH(3)	MH193	0.86	132	263	0(1)
B9	0.12	S176D	MH305	0.07	151	302	0(1)
S180A	0.118	S190	MH180	0.71	57	115	7
Relevant Existing Phase 1A							
S176D	0.13	DS142(2)	MH176	0.76	95	95	2.60
S176E	0.09	DS142(2)	MH176	0.76	80	80	0
S180	0.16	DNCC(4)	MH180	0.76	68	68	0

(1) Assumed ponding volume
(2) Existing Phase 1B
(3) North towards existing SWM facility
(4) West to future phase

Table 5.3 Minor Flow Capture

DRAINAGE AREA ID	CONTINUOUS/ SAG(1),(2)	ROAD TYPE	MINOR SYSTEM DESIGN TARGET	GENERATED FLOW ON INDIVIDUAL SEGMENT FOR MINOR SYSTEM DESIGN TARGET (DDSWMM SIMULATION) (L/S)	ICD (L/S)	NOTE
Phase 4						
B340A	Block	N/A	5	144	204	Minor system restriction for future development block
S319	Sag	22m Row, 8.5m asphalt	5	26	38	
B319	Block	N/A	100	398	490	Minor system restriction for future development block
S320	Continuous	22m Row, 8.5m asphalt	5	32	12	CB on continuous grade, capture in downstream sag
S322	Continuous	22m Row, 8.5m asphalt	5	30	25	CB on continuous grade, capture in downstream sag
B322	Block	N/A	5	200	200	Minor system restriction for future development block
S190	Sag	22m Row, 8.5m asphalt	5	17	76	
S190A	Continuous	22m Row, 8.5m asphalt	5	21	24	CB on continuous grade, capture in downstream sag

DRAINAGE AREA ID	CONTINUOUS/ SAG[1],[2]	ROAD TYPE	MINOR SYSTEM DESIGN TARGET	GENERATED FLOW ON INDIVIDUAL SEGMENT FOR MINOR SYSTEM DESIGN TARGET (DDSWMM SIMULATION) (L/S)	ICD (L/S)	NOTE
S190B	Sag	22m Row, 8.5m asphalt	5	19	24	
S191A	Sag	22m Row, 8.5m asphalt	5	7	63	
S191B	Continuous	22m Row, 8.5m asphalt	5	19	19	CB on continuous grade, capture in downstream sag
S191	Continuous	22m Row, 8.5m asphalt	5	23	19	
S192	Continuous	22m Row, 8.5m asphalt	5	25	12	
S193	Sag	22m Row, 8.5m asphalt	5	21	86	
P191	Park	N/A	5	22	24	
B180A	Block	N/A	5	145	120	Minor system restriction for future development block
B191	Block	N/A	5	162	162	Minor system restriction for future development block
B9	Park	N/A	5	12	0	No CBs located in this green space block
S180A	Sag	22m Row, 8.5m asphalt	5	21	25	
Relevant Existing Phase 1A						
S176D	Sag	26m Row, 9.5m asphalt	5		37	Replacing existing ICDs
S176E	Continuous	26m Row, 9.5m asphalt	5		11.4	ICD(s) installed
S180	Continuous	26m Row, 9.5m asphalt	5		16.3	ICD(s) installed

(1) Capture on continuous grade is limited to capacity of grate
(2) The minor flow restriction has been increased in sags to allow full capture of overflow from upstream segments on continuous grade during the design storm event without ponding.

5.4.3 Results of Hydrological Modeling

5.4.3.1 Street Segment Storage

The storage available on-site storage and the results of the DDSWMM major system evaluation for the design storm are presented in **Table 5.4**. The ponding plan for the subject site is presented in **Appendix F** on **Drawings 601.** The DDSWMM output files are presented in **Appendix F**.

Table 5.4 Summary of On-site Storage during Target Minor System Design Storm

STREET SEGMENT ID	MINOR SYSTEM DESIGN STORM	AVAILABLE STATIC STORAGE (M^3)	TOTAL STORAGE USED DURING 5 YEAR STORM (DDSWMM SIMULATION) (M^3)	OVERFLOW (DDSWMM SIMULATION) (L/S)
Phase 4				
S319	5	46.17	0	0
S190B	5	0.56	0	0
S191A	5	0.19	0	0
S193	5	0.12	0	0
S180A	5	7.44	0	0
S190	2	1	0	0

The results of the on-site detention analysis show that during the 5 year storm event there is no ponding on the street segments.

5.4.3.2 Velocity x Depth

According to the City of Ottawa Sewer Design Guidelines (October 2012), the maximum depth of flow should not exceed 350 mm and the product of velocity x depth on all the street segments should not exceed 0.6 m^2/s during the 100 year storm event.

The cascading overflow is the flow exiting a drainage area when maximum minor system inflow and maximum available ponding has been utilized. To determine velocity of the cascading overflow, a SWMHYMO file was created (118863VD.dat).

To determine velocity of the cascading overflow at critical locations, SWMHYMO was used. The ROW sections were entered into the model with the appropriate longitudinal slopes to obtain the maximum velocity of flow using the Route Channel routine. The output files are provided as part of the digital submission. The overflow is obtained from the respective DDSWMM output file and is noted in the title in the tables below.

To determine depth of the cascading overflow, the *Calculation Sheet: Overflow From Typical Road Ponding Area* provided at the February 2014 Technical Bulletin ISDTB-2014-01 was used. The exception to this is where the road is on grade in which case the depths were obtained from the SWMHYMO model.

The results are presented in **Table 5.5** and

Table 5.6 and the supporting calculations are included in **Appendix F**. The results of velocity by depth for the Phase 1A streets included in the DDSWMM model are also included in the below tables.

Major flow from the southern and eastern part of Phase 4 is conveyed south to Hemlock Road, constructed as part of Phase 1A. The major flow hydrographs generated by the current modeling exercise were compared to those in the Phase 1A model to assure that there is no increase in major flow to the existing system. Major flow from Phase 4 has been kept at or below that accounted for in the Phase 1A model.

Table 5.5 Summary of Cascading Flow during the 100 year 3 hour Chicago storm

DRAINAGE AREA ID	DUMMY SEGEMENT ID	OVERFLOW (L/S)[1]	VELOCITY (M/S)[2]	MAX. STATIC PONDING DEPTH UTILIZED (WHERE APPLICABLE) (M)	DYNAMIC DEPTH OF FLOW (WHERE APPLICABLE) (M)[3]	MAX. DEPTH (STATIC + DYNAMIC, WHERE APPLICABLE) (M)	VELOCITY X DEPTH (M^2/S)
Phase 4							
S319	D20	0	N/A	N/A	N/A	N/A	N/A
S320		0.054	0.74	N/A	0.05	0.05	0.03
S322		0.094	0.86	N/A	0.06	0.06	0.05
S190	D21	0	N/A	N/A	N/A	N/A	N/A
S190A		0.084	0.79	N/A	0.11	0.11	0.09
S190B	D22	0.161	0.97	0.09	0.14	0.23	0.13
S191A	D23	0.201	1.06	0.06	0.15	0.21	0.16
S191B		0.043	1.18	N/A	0.07	0.07	0.08
S191		0.202	0.83	N/A	0.12	0.12	0.10
S192		0.315	1.55	N/A	0.08	0.08	0.12
S193	D24	0.266	1.25	0.05	0.13	0.18	0.16
S180A	D26	0.002	0.25	0.13	0.02	0.15	0.01
Relevant Existing Phases 1A							
S176D	D19	0.042	0.48	0.15	0.07	0.22	0.03
S176E		0.025	0.44	N/A	0.04	0.04	0.02
S180		0.042	0.53	N/A	0.05	0.05	0.03

(1) Overflow from DDSWMM output 118863-3CHI100.out
(2) Velocity from SWMHYMO output 118863VD.out
(3) Depth of the cascading overflow was determined from the Calculation Sheet: Overflow From Typical Road Ponding Area provided in the February 2014 Technical Bulletin ISDTB-2014-01. For those areas which have a continuous road grade (or no dummy segment), the depth was taken from SWMHYMO VxD simulation.

Table 5.6 Summary of Cascading Flow during the 100 year 3 hour Chicago storm + 20% increase in intensity

DRAINAGE AREA ID	DUMMY SEGEMENT ID	OVERFLOW (L/S)[1]	VELOCITY (M/S)[2]	MAX. STATIC PONDING DEPTH UTILIZED (WHERE APPLICABLE) (M)	DYNAMIC DEPTH OF FLOW (WHERE APPLICABLE) (M)[3]	MAX. DEPTH (STATIC + DYNAMIC, WHERE APPLICABLE) (M)	VELOCITY X DEPTH (M^2/S)
Phase 4							
S319	D20	0	N/A	N/A	N/A	N/A	N/A
S320		0.072	0.80	N/A	0.05	0.05	0.04
S322		0.128	0.47	N/A	0.06	0.06	0.03
S190A		0.143	0.86	N/A	0.14	0.14	0.12
S190B	D22	0.254	0.46	0.09	0.16	0.25	0.07
S191A	D23	0.331	1.28	0.06	0.18	0.24	0.23
S191B		0.085	1.40	N/A	0.09	0.09	0.12
S191		0.336	0.99	N/A	0.14	0.14	0.14
S192		0.518	1.76	N/A	0.09	0.09	0.16
S193	D24	0.477	1.45	0.05	0.15	0.20	0.22
S180A	D26	0.022	0.45	0.13	0.05	0.18	0.02
Relevant Existing Phases 1A							
S176D	D19	0.150	1.29	0.15	0.10	0.25	0.13
S176E		0.032	0.46	N/A	0.04	0.04	0.02
S180		0.057	0.58	N/A	0.05	0.05	0.03

(1) Overflow from DDSWMM output 118863-3CHI120.out
(2) Velocity from SWMHYMO output 118863VD.out
(3) Depth of the cascading overflow was determined from the Calculation Sheet: Overflow From Typical Road Ponding Area provided in the February 2014 Technical Bulletin ISDTB-2014-01. For those areas which have a continuous road grade (or no dummy segment), the depth was taken from SWMHYMO VxD simulation.

During the 100 year 3 hour Chicago storm, the summation of depth of ponding and depth of cascading flow for all street segments is less than the City guideline of 0.35 m. The product of depth and velocity is also less than the City guideline of 0.6 m^2/s.

During the sensitivity analysis applying the 100 year 3 hour Chicago storm increased by 20%, the summation of depth of ponding and depth of cascading flow for all street segments is less than the City guideline of 0.35 m. At all locations, the product of depth and velocity is less than the City guideline of 0.6 m^2/s.

To assist in the design of future site plan proposals, a summary of major flow from development blocks is summarized in the below table. Refer also to **Drawing 751** for major flow connectivity.

Table 5.7 Summary of Major Flow from Development Blocks (100 year 3 hour Chicago storm and corresponding stress test)

DRAINAGE AREA ID	MAJOR FLOW RECIPIENT		MAJOR FLOW (L/S)	
	STREET	MODEL DRAINAGE AREA ID	100 YEAR 3 HOUR CHICAGO STORM	100 YEAR 3 HOUR CHICAGO STORM + 20%
B340A	Hemlock	S176D	0.042	0.101
B319	Hemlock	S176D	0	0
B322	Winisik	S190B	0.155	0.240
B180A	Street No. 1	S191B	0.036	0.074
B191	North (towards escarpment)	NORTH	0.274	0.378
B9	Hemlock	S176D	0	0

5.5 Storm Hydraulic Grade Line Analysis

The hydraulic grade line (HGL) was evaluated using the XPSWMM hydraulic model. The existing overall model for the Wateridge site was expanded to include the detailed design of the storm sewer laterals within the subject site.

The minor system hydrographs for Phase 4 was obtained from the DDSWMM evaluation undertaken as outlined in **Section 5.4**. Minor system losses along the storm sewer pipes were accounted for in accordance with Appendix 6-B of the City of Ottawa Sewer Design Guidelines.

XPSWMM simulations were conducted for the 100 year 3 hour Chicago storm to ensure that the HGL is at least 0.3 m below the underside of footing elevations. For locations at which under-side of footing (USF) elevations are not available, it was assumed that the USF elevations are 2.4 m below ground elevation. A sensitivity analysis was also performed using the 100 year Chicago storm with a 20% increase in intensity and the July 1 1979 historical storm to ensure that there would be no severe flooding to properties. Hydraulic grade line values for the various storms are presented in the below table, along with a comparison of USF elevations. A summary of the entire HGL for the entire Wateridge Village site is included in **Appendix F**.

The XPSWMM model schematic and files are provided within **Appendix F**.

Table 5.8 Storm Hydraulic Grade Line

XPSWMM NODE	PROPOSED GROUND ELEV. (M)	USF (M)	100 YEAR 3 HOUR CHICAGO		100 YEAR 3 HOUR CHICAGO + 20%		100 YEAR 24 HOUR SCS TYPE II		JULY 1 1979	
			HGL (M)	USF – HGL (M)	HGL (M)	USF – HGL (M)	HGL (M)	USF – HGL (M)	HGL (M)	USF – HGL (M)
Phase 4										
MH319	88.81	86.61	86.13	0.48	86.12	0.49	86.12	0.49	86.12	0.49
MH320	89.12	86.92	85.49	1.43	85.49	1.43	85.49	1.43	85.49	1.43
MH321	87.67	85.47	84.18	1.29	84.39	1.08	84.10	1.37	84.11	1.36
MH322	87.50	85.30	84.18	1.12	84.39	0.91	84.10	1.20	84.10	1.20

XPSWMM NODE	PROPOSED GROUND ELEV. (M)	USF (M)	100 YEAR 3 HOUR CHICAGO		100 YEAR 3 HOUR CHICAGO + 20%		100 YEAR 24 HOUR SCS TYPE II		JULY 1 1979	
			HGL (M)	USF – HGL (M)	HGL (M)	USF – HGL (M)	HGL (M)	USF – HGL (M)	HGL (M)	USF – HGL (M)
MH323	86.57	84.37	83.40	0.97	83.48	0.89	83.31	1.06	83.32	1.05
Existing Phase 1A Trunk										
MH176	88.03	85.63	83.77	1.86	83.86	1.77	83.67	1.96	83.75	1.88
MH178	89.00	86.60	83.41	3.19	83.48	3.12	83.33	3.27	83.40	3.20
MH180	88.23	85.83	82.20	3.63	82.54	3.29	81.91	3.92	82.17	3.66
MH190	88.10	85.70	81.90	3.80	82.13	3.57	81.58	4.12	81.87	3.83
MH191	86.36	83.96	81.66	2.30	81.88	2.09	81.40	2.56	81.63	2.33
MH192	85.92	83.52	81.41	2.11	81.60	1.92	81.19	2.33	81.38	2.14
MH193	84.85	82.45	81.08	1.37	81.25	1.20	80.90	1.55	81.06	1.39
MH194	82.44	N/A	80.45	N/A	80.54	N/A	80.34	N/A	80.44	N/A

The results indicate that the minimum 0.3 m clearance between the USF and HGL is maintained across Phase 4, as well as in the existing Phase 1A trunk sewer, during the 100 year 3 hour Chicago storm, sensitivity analysis and historical storm.

5.6 Eastern SWM Facility

5.6.1 Water Quality Control

The Eastern SWM Facility is designed to provide an Enhanced Level of Protection. According to the MOE Stormwater Management Planning and Design Manual, March 2003, the treatment volume is a function of the drainage area, the urban imperviousness ratio and the level of protection.

The water quality calculations have been updated as the detailed design of various phases has been completed. Corresponding water quality volume requirements are summarized in the below table.

Table 5.9 Water Quality Volume Calculations

LEVEL OF PROTECTION	URBAN DRAINAGE AREA, TYPE OF FACILITY, % IMP	PERMANENT STORAGE (HA-M)		EXTENDED STORAGE (HA-M)		TOTAL STORAGE (HA-M)	
		REQ.	PROV.(1)	REQ.	PROV. (1)	REQ.	PROV. (1)
Enhanced	163.54 Wet Pond 67%	2.69	2.95	0.87	1.92	3.56	4.87

(1) From 2016 Pond Design Brief

As development within the Eastern SWM Facility drainage area has progressed, there have been minor changes to the overall contributing drainage area and corresponding imperviousness. The

above table indicates that the Eastern SWM Facility is adequately sized to provide water quality treatment for the contributing drainage area.

5.6.2 Performance of the SWM Facility

The hydraulic evaluation of the Eastern SWM Facility has been updated to reflect the most up-to-date hydrograph from the contributing development. The performance of the facility is summarized in the below table.

Table 5.10 Performance of the Eastern SWM Facility

		Table 4-1 from 2016 Design Brief			Current Evaluation		
Storm Event		Extended Storage (ha-m)	Discharge (cms)	Elevation (m)	Extended Storage (ha-m)	Discharge (cms)	Elevation (m)
Permanent		2.95	N/A	56.00	2.95	N/A	56.00
25 mm 4 hour Chicago Storm		1.92	0.43	57.00	2.02	0.45	57.05
24 hour SCS Type II	2 year	2.62	2.38	57.35	2.63	2.44	57.36
	5 year	2.98	4.81	57.53	3.09	5.46	57.58
	100 year	3.92	12.37	57.96	4.48	18.51	58.21
Sensitivity Analysis							
Historical Storms	August 1988	3.94	13.21	57.97	4.23	15.63	58.09
	August 1996	3.45	8.44	57.75	3.24	6.60	57.64
	July 1979	4.20	15.61	58.09	4.45	17.81	58.19
100 year 24 Hour SCS Type II + 20% increase in intensity		4.21	15.47	58.09	4.58	19.34	58.25

Results indicate that the function of the Eastern SWM Facility during the design storms corresponds closely with the maximum water levels results presented in the 2016 Pond Design Brief. During the stress test, the water level will not trigger an overflow at the emergency weir.

5.7 Coordination of Conventional SWM and LID Models

The modeling outlined in the previous sections has been completed to demonstrate the design of the conventional stormwater infrastructure satisfies the City of Ottawa's guidelines with respect to depth and velocity of flow on the surface and hydraulic grade line of the storm sewers.

The modeling to support the LID features has been completed in PCSWMM and is presented in **Section** Error! Reference source not found.. The existing Phases 1A and 1B PCSWMM model has been expanded to include critical elements of the conventional SWM design for Phase 4 (as well as Phase 2B). These elements are as follows:

- Drainage Areas: Areas are consistent with those simulated in DDSWMM
- Imperviousness: Values are consistent with those applied in DDSWMM. PCSWMM provides an opportunity to specify direct and indirect routing to a pervious or impervious area. For this evaluation, all street segments were assumed to be 100% routed to an impervious surface and all rear yards were assumed to be 100% routed to a pervious surface.
- Infiltration: Values are consistent with those applied in the Phases 1A and 1B PCSWMM model.
- Subcatchment Width: Values are consistent with those applied in DDSWMM.
- Slope: Values are consistent with those applied in DDSWMM.
- Initial Abstraction (Detention Storage): Values are consistent with those applied in DDSWMM.
- Manning's Roughness: Values are consistent with those applied in DDSWMM.
- Baseflow: No baseflow components assumed, consistent with DDSWMM.
- Major System Connectivity and Routing: The major system has been accounted for in a consistent manner as the existing Phases 1A 1B PCSWMM model. Specifically, the major system has been coded in PCSWMM catchbasin to catchbasin. Each drainage area has one node representative of the top of grate elevation of the catchbasin. For drainage areas with two catchbasins, one node has been entered with the greater of the two top of grate elevations.
- Minor System Capture: Minor system restrictions are consistent with those applied in DDSWMM. Standard ICD sizes presented in **Table 5.1** were considered. For street segments where there are two catchbasins represented by one node in PCSWMM, a composite rating curve representative of the ICDs in both catchbasins was applied.
- Storm Sewers: Pipe data, including losses, are consistent with XPSWMM.

6 LID Design

Phase 4 of the Wateridge Village Subdivision LID pilot project, includes the following LID practices:

Future Municipal Property:

1. **Bioswales** on Oshedinaa Street and Winisik Street
2. **Soil Amendments** including all boulevard areas that do not have bioswales as detailed above.

The subsequent sections include the LID field investigations, additional detail for each LID practice, and the PCSWMM LID model. **Appendix G** includes the Pilot Project Information Form per ISD Directive SDD-2011-02 regarding Pilot Projects.

6.1 LID Targets

LID targets were developed based on the approved MSS/ LID Pilot Scoping Study. All LID measures implemented in Phase 4 of the Wateridge Village development shall be designed to achieve the infiltration, erosion, and water quality design targets summarized in **Table 6.1**. The proposed LID practices, as described in the subsequent sections, will achieve these targets as shown in the table.

Table 6.1 LID Design Targets

	TARGET	PROVIDED
Infiltration*	4mm applied to the full catchment area	28mm
Erosion Control*	4mm applied to the full catchment area	
Water Quality†	Minimum Target: 15mm Enhanced Target: 25mm	

* *Catchment Based Target* – target applied over the full catchment area

† *Contributing Impervious Area Target* – applied to the directly contributing impervious area to the LID control and should focus on the "treatment" of the required event through a combination of filtration, storage and release, evaporation and infiltration. Note: the water quality target shall include the required water balance (infiltration) targets i.e. water quality treatment = 15mm water quality event – 4mm infiltration

6.2 Field Investigations – Infiltration Testing

Infiltration testing was completed using Guelph Permeameter Testing protocols to facilitate the design and construction of the proposed LID facilities. Testing was performed on September 12th and 13th, 2019. Weather conditions were warm and frost penetration into the ground had no yet occurred. Testing was completed at four (4) sites corresponding to locations within the proposed bioswales along Oshedinaa Street and Winisik Street and the formerly proposed permeable multi-use trail (subsequently removed from the design). These locations are displayed in **Figure 6.1**.

Testing was conducted at 0.45-1.3m below the ground surface within the fill layer implemented as part of the grade raise required for Phase 4.

Guelph Permeameter testing was performed in order to determine the field saturated hydraulic conductivity (Kfs) of the in-situ soils. The experimentally determined Kfs was then converted to a calculated infiltration rate (mm/hr) and a factor of safety was applied as per Appendix C of the Low Impact Development Planning and Design Guide (2010). The safety factors were selected based on the ratio of the tested infiltration rate versus the infiltration rate of the least permeable soil horizon (the native clay) within 1.5 metres below the proposed bottom elevation of the BMP. **Table 6.2** summarizes the Guelph Permeameter testing results completed in 2019 for the purposes of detailed design.

Table 6.2 - Detailed In-situ Infiltration Testing Results (2019)

TEST LOCATION	UTM EASTING	UTM NORTHING	KFS (CM/S)	CALCULATED INFILTRATION RATE (MM/HR)	SAFETY FACTOR (SF)	DESIGN INFILTRATION RATE (MM/HR)
#1	450127	5033725	8.81E-06	24.32	3.5	6.9
#2	450177	5033619	1.04E-06	13.82	3.5	3.9
#3	450245	5033479	7.29E-05	42.54	3.5	12.2
#4	450349	5033641	1.06E-04	46.97	3.5	13.4
					Average	9.1



Figure 6.1 2019 In-Situ Infiltration Locations

6.3 Bioswales

Bioswales are proposed for the west side of Oshedinaa and east side of Winisik Street. The bioswales will accept runoff from ½ of the adjacent roadway (center-line to curb) and provide water quality and quantity improvements, encourage infiltration to meet water balance requirements and reduce downstream erosion.



Figure 6.2 Example Bioswales - Mississauga, ON

Bioswale facilities are linear systems which act as media filter systems that temporarily store and then filter the desired water quality volume. Bioswales are generally comprised of three components: filtering bed, gravel storage layer and underdrain. During storms, runoff temporarily ponds above the filter bed surface and then filters through the media to the gravel storage reservoir below. A portion of the filtrated runoff is stored below the underdrain embedded with the gravel layers and allowed to infiltrate back into the native sub-soils over a 24-72 hour period (see **Table 6.3**). Excess stormwater not infiltrated is conveyed by the perforated underdrain and discharged either to a storm sewer network or watercourse. The bioswales at Wateridge village will discharge to the proposed conventional storm sewer network and are controlled by a series of inlet control devices.

A bioswale can be applied in most soils or topography, since underdrains which collect and return filtered water to the surface system may be used when full infiltration into native soils is not feasible (as is the case with the Wateridge Village). If infiltration rates in native soils permit, filtration practices can be designed without an underdrain for full infiltration and water balance benefits. Generally, a combination of these methods is used to infiltrate a portion of the filtered runoff and to avoid prolonged periods of media saturation. Bioswales may also be used in a treatment train with traditional detention practices to meet the geomorphic peak discharge requirements.

Bioswales themselves also act as snow storage areas. To function as snow storage, bioswales should include an internal overflow for snow melt in excess of the designed ponding depth. Internal overflows have been included within the bioswales at Wateridge Village in the form of an OPSD 705.010 catch basin with no sump.

Additionally, the plant material must be salt-tolerant, perennial, and tolerant of periodic inundation (shrub type plants are not recommended due to anticipated snow loads and potential salt impacts). Conveyance of excessive flows can be directed out or away from the bioswales by using an overflow structure with its invert set at the maximum ponding depth.

Bioswales are well suited to meet water quality objectives but can also be used to meet water balance objectives by reducing runoff volume through evapotranspiration and infiltration of runoff. A conservative runoff reduction rate of 80% is assigned to designs that rely upon full infiltration (Note: Runoff reductions correspond to rain events up to a 25 mm rainfall). Bioswales may also be used in a treatment train with traditional detention practices that meet the geomorphic peak discharge requirements. The most recent studies indicate that bioswales provides effective pollutant removal for many pollutants as a result of sedimentation, filtering, plant uptake, soil adsorption, and microbial processes and can do so with and without an underdrain.

The proposed bioswales for Wateridge Village are designed to accept road runoff from the urbanized roadway. Multiple curb cut inlets have been integrated within the proposed curb and gutter system to direct runoff to the bioswales in the form of un-concentrated sheet flow. The following inlet width calculation was used to determine the maximum design flow for the inlet width. The maximum design flow was then used to back-calculate the maximum drainage area per inlet, and therefore the maximum inlet spacing of 15 m.

$$W_T = 0.817 Q^{0.42} S_0^{0.3} \left(\frac{1}{n S_x} \right)^{0.6}$$

Where:

PARAMETER	DESCRIPTION	VALUE
W_T	width of the inlet for complete capture (m)	0.3 (1.5SF applied to become 0.45)
Q	design flow perpendicular to the inlet (m^3/s)	$2.55x10^{-5}$
S_0	longitudinal slope ratio	0.02
n	Manning's 'n' for concrete	0.015
S_x	cross-slope ratio (typically between 0.015 and 0.04)	0.03

Filtered stormwater collected within the gravel storage layer is either infiltrated or conveyed by an underdrain which is directly connected to the proposed storm sewer network. Inlet control devices have been included within catch basins which are upstream of the main storm sewer connection. Bioswales have been designed to conform to City of Ottawa accessibility standards through the provision of 0.6m turf strip abutting the sidewalk areas and back of curb at a 2% slope and 3:1 side slopes for the bioswale feature. Maximum bioswale depth is 0.3m and maximum corresponding ponding depth is 0.15m.

Table 6.3 below summarizes the physical attributes of the proposed bioswale facilities and provides the overall storage volumes which can be accommodated.

Table 6.3 – Summary of the Bioswale Physical Attributes

ATTRIBUTE	UNITS	OSHEDINAA AND WINISIK STREET
Drainage Area	ha	0.45
Impervious Area	ha	0.18
I/P Ratio	-	2.5:1
Length	m	521
Typical Bottom width	m	2.2
Depth of 19mmØ clear stone and pea gravel	m	0.7
Void ratio of Granular 'O' clear stone and pea gravel	n/a	0.4
Depth below underdrain	m	0.50
Storage Volume below underdrain (Infiltration volume with 0.4 Void Ratio)	m^3	229.2
Design infiltration rate*	mm/hr	9.1
Drawdown time	hrs	48
Media depth	m	0.7
Void ratio of media	n/a	0.4
Media side slope (trench wall)	Rise:Run	3:1
Nominal Surface ponding depth	m	0.15
Total Storage Volume	**m^3**	**882.6**

* Includes safety factor (SF) of 3.5

6.4 Soil Amendments

Soil Amendments are proposed on municipal property and all boulevard areas that do not have bioswales as detailed previously as well as all residential properties within Wateridge Village.



Figure 6.3 Example Soil Amendments – Wateridge Village Phase 1A

Soil amendments are typically composed of the addition of additional organic matter in the form of compost. Compost amendments are tilled or mixed into existing soils thereby enhancing or restoring soil properties by reversing the loss of organic matter and compaction.

In general, soils with appropriate levels of organics, nutrients and good structure are capable of supporting plant and animal life while also providing important stormwater management functions. Healthy soils efficiently infiltrate and store water, adsorb excess nutrients, filter sediments, remove pollutants through biological decomposition, as well as moderate peak stream flows and temperatures. In addition, healthy soils support vigorous plant and tree growth that also intercepts rainfall and return it to the atmosphere through evaporation and transpiration. Healthy soils also support urban tree canopy cover, a focus of many urban planners and ecologists.

The large body of evidence which now existing shows that urban construction activities negatively affect the ability of native soils to infiltrate water and support healthy vegetation. Standard construction practices commonly involve the removal and temporary stockpiling of topsoil during and through the many phases of the construction process. Often the existing topsoil is replaced with only a shallow layer (typically 10 to 15cm) of the previously stockpiled topsoil, as one of the final site operations. These soils are typically placed over the now compacted subsoil. General construction activities, use of heavy equipment, material storage, even repeated foot traffic can cause damage to the soil structure by increasing compaction.

Healthy soils cannot by definition be overly compacted. When a soil is compacted the porosity decreases and the bulk density increases (dry mass divided by volume). This inverse relationship of porosity and bulk density:

- Affects the soil's ability to infiltrate and store rainwater by reducing the pore spaces between individual soil particles,
- Limits the diversity of soils organisms
- Reduces the ability of vegetation to uptake nutrients
- Impedes root growth and healthy development. Generally, once bulk density exceeds 1.7g/cm^3 roots are no longer able to penetrate soils (Morris and Lowery, 1998)
- Reduces the exchange of gases resulting in aeration-related issues.
- Produces a poor quality growing environment that requires excessive irrigation and fertilizer
- Increases the likelihood that surface that should be pervious can become a source of contaminated runoff during storm events
- Reduces beneficial mycorrhizal fungi which have a mutualistic relationship with the roots of plants whereby the plant provides carbohydrates and the plant gains higher absorptive capacity of water and nutrients

In general, soils with a higher percentage of clay and silt have more pore space and a lower bulk density than sandier soil, but sandy soils are better able to withstand compaction than clay soils (Pitt, 2009a).

Efforts to alter construction practices to prevent these undesired consequences have been largely thwarted by common agricultural myths and misconceptions (UME, 2001) including that "mother nature" and freeze-thaw cycles will alleviate soil compaction and return the soils to their original state. In fact, even in cold climates where the frost-line can extend to 1.2m or greater, only the top 50mm to 100mm will experience more than a single freeze thaw cycle per year and is insufficient to reverse negative impacts. USEPA (1999) and Webb (2002) indicated that

several decades to over 70 years respectively may be necessary before compacted loam soils recover to conditions similar to pre-development. Similarly, Schueler (2000) reported that even the best tillage practices could only reverse one-third of the expected increase in bulk density during construction.

By amending poor quality topsoil and compacted subsoil with enriched organic matter content, it improves the potential of the soil to absorb, infiltrate and evapotranspire a greater amount of precipitation, thereby providing hydrologic and stormwater management benefits. The organic matter content increases the moisture and pollutant retention capacity and permeability and reduces bulk density and erosivity. Amended soils also provide a better growing environment for grass, shrub and tree plantings, requiring less irrigation and fertilizer to become established than plantings in more shallow, unimproved topsoil overlying compacted subsoil (TRCA, 2012).

Hydrologically speaking, soil amendments are used to make Hydrologic Group C and D soils suitable for on-site stormwater control and infiltration. Soil amendments benefits include increased infiltration, stormwater storage in the soil matrix, survival rate of new plantings, root growth and stabilization against erosion, improved overall tree and plant health and decreased need for irrigation and fertilization of landscaping. Amended soils are suitable for any pervious area where soils have been or will be compacted by the grading and construction process.

While soil amendments will never be used solely to meet stormwater management objectives, they are effective in reducing the overall runoff volume, will contribute to a lower peak discharge, and can help reduce the size of total runoff storage needed.

Table 6.4 below summarizes the attributes of the proposed soil amendments.

Table 6.4 – Summary of the Soil Amendments Physical Attributes

ATTRIBUTE	UNITS	SOIL AMENDMENTS
Minimum Amendment Depth	mm	300mm
Organic Content (by loss on ignition)	%	8-15% by dry weight
pH	n/a	6.0 to 8.0
Min. Depth of Native Soil Ripping (decompaction)	mm	100

6.5 PCSWMM LID Modelling

The main objective of the PCSWMM model is to assess the capacity and performance of the stormwater management system before and after the installation of the Bioswales. The assessment includes the evaluation of the runoff volume and peak flows for pre- and post-LID implementation for the Phase 4 area. Note: soil amendments have not been modelled to ensure the Phase 4 model is conservative and based on quantifiable inputs (facility dimensions, soils parameter etc.). It is intended that the effect of the soil amendments will be added to model as part of model calibration, such that they can be accurately reflect within the model (note: an industry standard method does not currently exist for modelling LID soils amendments).

The modelling approaches of LID controls are summarized as follows:

Bioswales along Oshedinaa and Winisik Street: Were modelled as LID controls within the catchments. The LID controls varied in coverage within each catchment based on the designed geometry, but had the same characteristics in terms of vegetation cover, engineered soil, underdrain, and storage characteristics.

LID controls are low impact development practices and green infrastructure designed to capture surface runoff and provide some combination of detention, infiltration, and evapotranspiration in an attempt to mimic natural hydrology. LID controls are considered as properties of a given subcatchment within SWMM's hydrology module, similar to how Aquifers and Snow packs are treated. LID controls area created in the LID Control Editor.

For more information on hydrology and LID modeling used in SWMM, please see the SWMM Reference Manual Volume I - Hydrology and SWMM Reference Manual Volume III - Water Quality.

Bio-swales include surface depressions with vegetation grown in an engineered soil mixture placed above a gravel drainage bed. They provide storage, infiltration and evaporation of both direct rainfall and runoff captured from surrounding areas.

Figure 6.4 shows the components of a modelled Bio-Swale in PCSWMM. There are three components:

- *Infiltration*: The infiltration model was based on the Green-Ampt Method. According to geotechnical testing in the project area, the average infiltration is approximately 9.1 mm/hr, therefore, seepage rate of the storage layer is set to the infiltration rate. Green and Ampt was selected for use in the PCSWMM model as it allows for the use of field verified in-situ soil parameters derived from infiltration testing (See section 4.0) to be utilized in the modelling which more accurately represents soil performance as it relates to infiltration capacity.
- *Percolation*: Engineered soil media was modelled as sand with hydraulic conductivity of 50 mm/hr. Percolation into a storage layer of gravel was also modelled.
- *Underdrainage*: Each Bioswale contains a 200mm outlet pipe that connects to the sewer system. The excess of storage was modelled to drain to the sewer system through the outlet pipes.

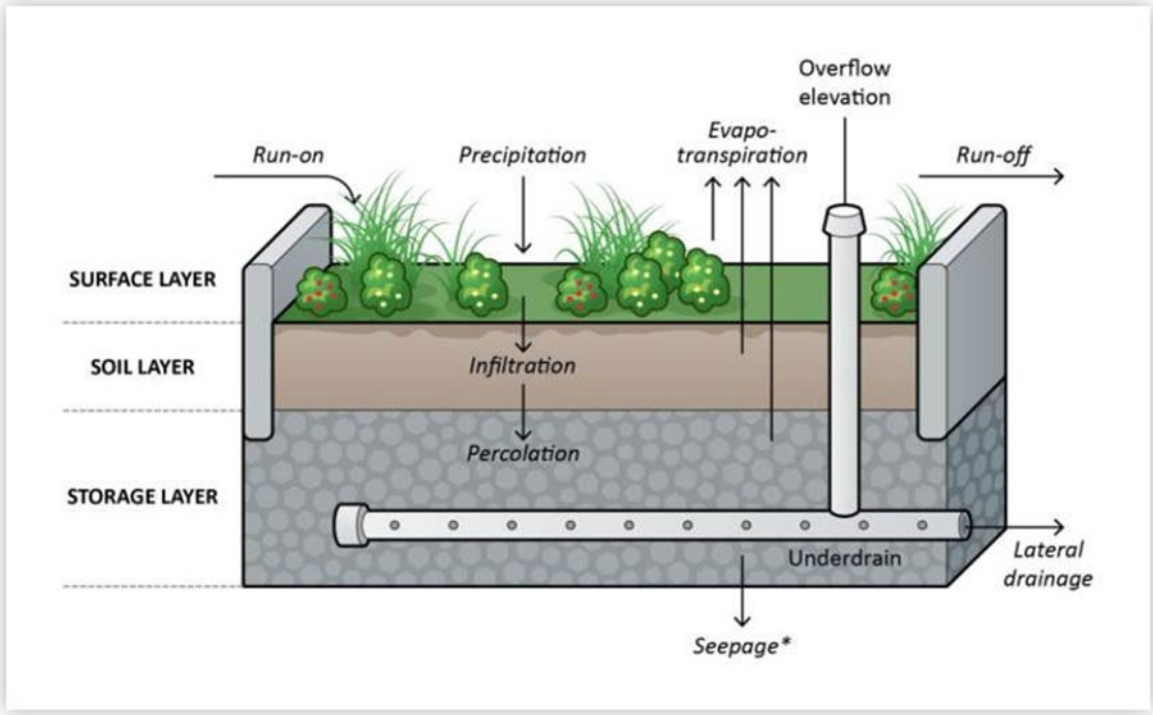


Figure 6.4 - Schematic Showing Drainage within a Typical Bio-Swale in PCSWMM

Table 6.5.2 Summarizes the LID devices implemented in the Phase 4 dual drainage model.

LID		DRAINAGE AREA						LID PARAMETERS				
Drainage Area ID	CB Outlet ID	Total Area (m2)	Impervious Area (m2)	Pervious Area (m2)	% Area Treated by LIDs	Area Treated by LIDs (m2)	Runoff Coefficient	Surface Area (m2)	Length (m)	Surface Width (m)	Depth (m)	Infiltration Storage Volume (m3)
S322	CB322A	1810	1292.86	517.14	50	905	0.39	193.6	86.76	2.2	0.85	65.82
S320	CB320A	1800	1285.72	514.28	50	900	0.39	186.7	83.42	2.2	0.85	63.48
S319	CB319A	1440	1028.58	411.42	40	576	0.49	114	51.9	2.2	0.85	38.76
S192	CB192A	1482	1058.58	423.42	50	741	0.40	142.7	45.6	2.2	0.85	48.52
S191A	CB191	450	321.43	128.57	58	261	0.32	57.1	25.4	2.2	0.85	19.41
S190	CB190	1890	1350.01	539.99	100	1890	0.15	113	114.5	2.2	0.85	38.42
S190	CB190A	976	697.15	278.85	50	488	0.38	115	52	2.2	0.85	39.1
S180A	CB180A	1178	841.43	336.57	50	589	0.53	55.7	49.2	2.2	0.85	18.94

Table 6.5.2 - LID Summary (Phase 4)

	Total Phase 4 Drainage Area (ha)	Total % of Phase 4 Drainage Area Controlled by LIDs	Total Drainage Area Treated by LIDs (ha)	Catchment Impervious Area (ha)	I/P Ratio Drainage Area Controlled By LIDs	Infiltration Rate (mm/hr) with 3.5 SF
Bio-Swale	**6.94**	9.22%	0.64	0.78	2.5:1	9.1

6.5.1 Water Balance Modelling

In addition to the event based modelling, water balance models were also setup to investigate the long term hydrologic performance of the proposed condition. The general approach of the Water Balance model is summarized as follows:

- Historical precipitation and temperature data from August 1st, 1996 to January 1st, 2014 were used as continuous model input
    - The Ropec rain gauge was used because of long record (1996-2013) and proximity to the study area. Since the Ropec gauge included only rainfall data, snowfall data was augmented by Environment Canada station (45°23'00.000" N, 75°43'00.000" W, 79.2 masl).
- Average monthly evaporation data was used for evaporation input

The input data for rainfall, temperature, and evaporation can be found in Appendix G.

6.5.2 Event Based Model Results

Results of the dual drainage model without LID devices were compared to that of the model with LID devices. The performance of the LID devices was compared at junction CB192, directly downstream of the Phase 4 bioswales on Oshedinaa and Winisik Street. The permeable multi-use trail treats the runoff that intercepts the trail, therefore reducing the runoff entering the main storm sewer running along Hemlock Road. Figure 6.5 illustrates the location of the junction utilized to complete the performance comparison.

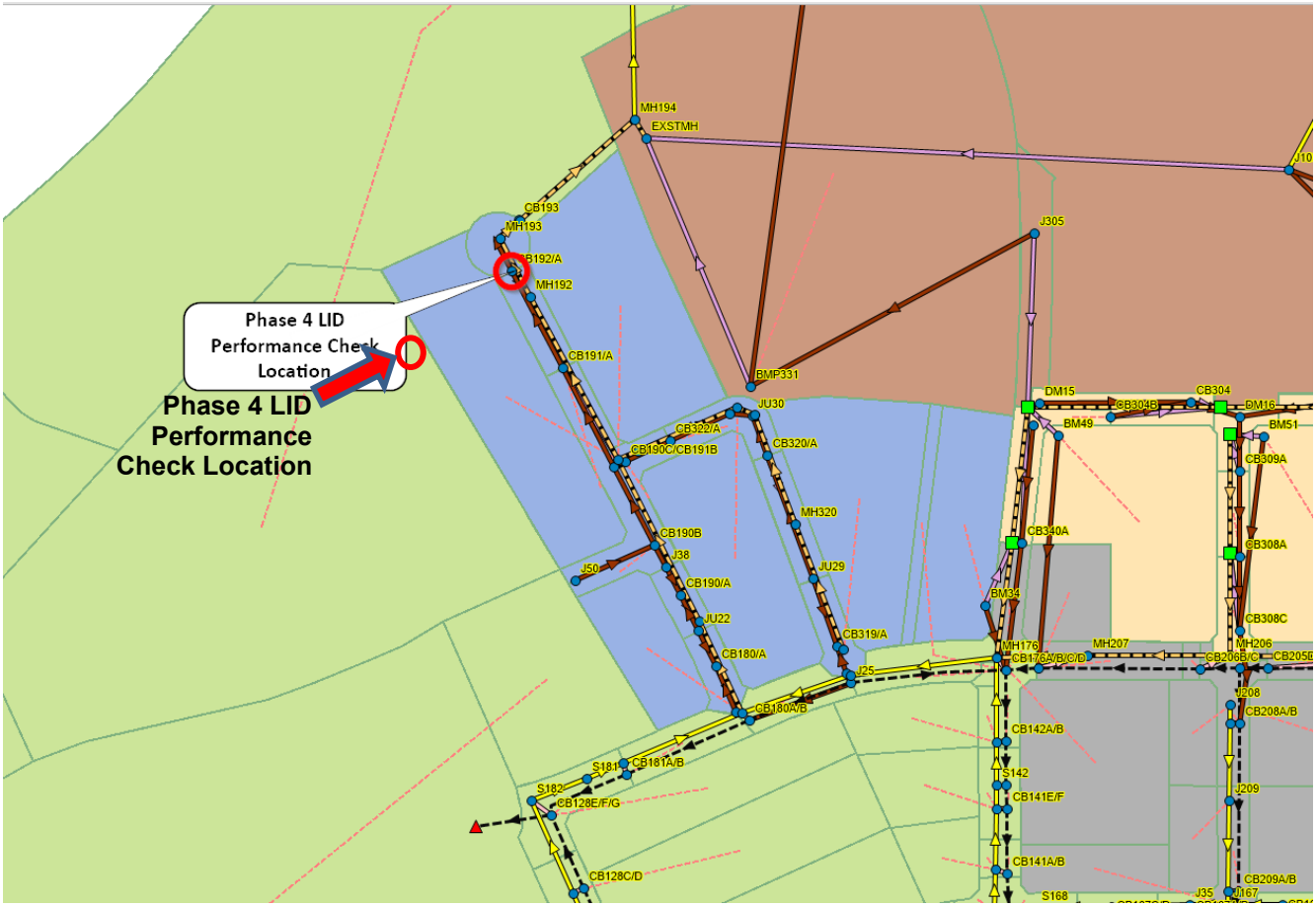


Figure 6.5 PCSWMM LID Model Comparison Location

The models were run for the 25mm 4hr Chicago, 2 year 24hr SCS II, and 5 year 24hr SCS II storm event. The peak flow and volume results for the Proposed Development model with and without LIDs are summarized in **Table 6.5** and **Table 6.6** respectively.

Table 6.5 - Phase 4 LID Performance Comparison Peak Flows (cms)

Scenario	25mm 4hr Chicago	2year 24hr SCS II	5year 24hr SCS II
Proposed Development (No LIDs)	0.023	0.027	0.043
Proposed Development with LIDs	0.014	0.019	0.034
Reduction	**39%**	**30%**	**21%**

Table 6.6 - LID Performance Comparison Volumes (10^6 L)

Scenario	25mm 4hr Chicago	2year 24hr SCS II	5year 24hr SCS II
Proposed Development (No LIDs)	0.032	0.064	0.09
Proposed Development with LIDs	0.015	0.033	0.05
Reduction	**53%**	**48%**	**44%**

It can be noted from the above tables that the implementation of LID devices results in significant reductions in peak flows of 21-39% and reductions of volumes of 44-53% during more frequent events, which is the intended use of LID devices.

6.5.3 Soil Amendment Benefits

Although soil amendments have not been modelled to ensure the Phase 4 model is conservative and based on quantifiable inputs (facility dimensions, soils parameter etc.), it is intended that the effect of the soil amendments will be added to model as part of model calibration, such that they can be accurately reflect within the model (note: an industry standard method does not currently exist for modelling LID soils amendments).

The following section summarizes the stormwater benefits of soil amendments from various small-scale test plots, field studies, and catchment scale studies. **Table 6.7** has been adapted from TRCA, 2012 and summarizes the stormwater benefits of amended topsoil and shall be used as parameter/ performance guidelines for the integration of soil amendments into the EPA SWMM model.

Table 6.7 - Summary of Stormwater Benefits of Amended Topsoil

RESEARCH FOCUS	RESULT	REFERENCE
Hydrologic response of residential lawns on compacted soils vs. amended soils	• Reduces surface runoff by 29 to 50% • Bulk density reduced by as much as 0.35 g/cm^3	Kosti (1995)
Effect of compost amendments on water and nutrient retention	• 2:1 soil to compost amendment nearly doubled water holding capacity • Greater lag times from the start of the event to time of peak flow	Harrison et al. (1997)
Infiltration rates	• Infiltration rates of compost amended soil were 1.5 to 10.5 times higher than un-amended soils	US EPA (1999)
Reversing the effects of soil compaction	• deep tilling followed by chisel plowing and amendment with compost derived from municipal yard waste reduced runoff by 74 to 91% compared to un-amended soil	Balousek (2003)
Downspout redirection to pervious surfaces	• flow reductions ranging from 25% to 62% for rainfall depths between 6 and 25.4 mm	Kaufmann et al (1997)
Water holding capacity of organic matter	• For every 1% of organic matter in a soil of 30cm in depth can hold 16 litres of plant available water/m^2	Tyler et al., 2010
Stormwater benefits – initial abstraction, runoff volumes and reduced soil erosion under 50yr and 100yr events	• Compared to bare soils, compost depth of 37.5mm ○ absorbed 51 to 65% more water ○ reduced runoff by 30 to 60% ○ reduced soil erosion by 95%	Faucette et al., 2005 & 2007
Water use by turf	• Turf planted on amended topsoil used 30% less water, fertilizer and pesticides	USEPA, 1997

6.5.4 Maintenance Requirements

In preparing this section the following documents were reviewed:

- MECP Stormwater Management Planning and Design Manual (2003)
- Low Impact Development Stormwater Management Design Guide (2010)

Adequate maintenance is essential to ensure the long-term achievement of stormwater management performance targets. In recognition of this, Aquafor Beech Limited has developed typical operations and maintenance requirements for LID facilities which set out maintenance and monitoring objectives and procedures for all of the functional components of stormwater management facilities. The following section sets out management and maintenance recommendations that are specific to the proposed LID facilities.

6.5.4.1 Clogging

The most frequent maintenance item common to LID facilities is the clogging of inlets. Large storms transport significant amounts of debris into the facility. Monitoring should include the periodic (typically three times per year) inspection of the following components:

- Inlets/Outlets;
- Downstream Pipes;
- Underdrains;

Maintenance activities of piping may be relatively straightforward. Most clogging is resolved by removing the debris by hand or by high velocity spray devices.

6.5.4.2 Pipe Repairs

Poor construction practice or inadequate maintenance may result in damage to pipes. If the pipes are damaged, then the functions of the facility may be impacted.

Physical inspections of the piping conditions should be carried out 3 times per year. The inspections may involve identification of obvious failures such as damaged inlet pipes.

Maintenance activities will typically involve repair or replacement of the deficient pipe. Various methods that may be used to repair or rehabilitate piping include joint sealing, invert protection, pipe replacement, slip-lining, spray lining, pipe-pulling, pipe bursting, cure-in-place pipe and folded liners.

6.5.4.3 Weed Control

Weeds are generally defined as any kind of vegetation which is unwanted in a particular area. In terms of LID facilities, weeds are generally invasive species which cannot provide the intended function of the planting strategy. Weed control by-laws should be consulted for local requirements. Weed control may be required annually.

Weeding should be done by hand to prevent the destruction of surrounding vegetation. The use of herbicides and insecticides is prohibited near LID facilities. The use of fertilizer should also be limited.

6.5.4.4 Vegetation Management

Vegetation is an integral functional component of stormwater management facilities, contributing to the maintenance of infiltration rates, erosion protection, evapotranspiration rates and filtration of stormwater. Consequently, it is important that the vegetation community within LIDs be maintained appropriately in order to ensure that the facility performs as originally intended over the long-term.

All vegetation communities should be monitored to confirm their health and identify any factors that may act as stressors and contribute to the eventual decline of specific species or the entire vegetation community. At a minimum, vegetation communities should be assessed at least twice a year to identify signs of dieback, infestation or disease.

The following maintenance activities should be implemented.

A. Tree and Shrub Maintenance and Management

- Adjust stakes and guys to prevent girdling
- Ensure rodent protection measures are functional and remain in contact with the ground.
- Prune out dead or damaged limbs of the plant
- Water trees as required to maintain tree health when necessary.
- Top up mulch as required

B. Seeded Area Maintenance

- Monitor after initial seeding to ensure that adequate cover density is achieved.
- Overseed as required to eliminate bare patches.
- Repair and reseed any rills or gullies that may have formed.
- Remove any weeds that may have become established during the germination and grow-in periods.
- Irrigate seeded areas as required to ensure adequate germination and growth.

C. Shrubs and Shrub Beds

- Prune out dead or damaged branches.
- Remove weeds from mulched beds, ensure that adequate levels of mulch are maintained.
- Water shrubs to ensure healthy growth as dictated by meteorological trends and species requirements.

6.5.4.5 Routine Maintenance

Table 6.8 describes routine maintenance tasks organized by BMP component, along with recommended minimum frequencies. It also suggests higher frequencies for certain tasks that may be warranted for BMPs located in highly visible locations or those receiving flow from large or high traffic (vehicle or pedestrian) drainage areas. Tasks involving removal of trash, debris and sediment and weeding/trimming of vegetation for BMPs in such contexts may need to be done more frequently (i.e. higher standards may be warranted).

Table 6.8 - Routine Maintenance Tasks

Component	Routine Maintenance Task	Frequency[1]	
		Minimum[2]	High[3]
Contributing drainage area (CDA)	Remove trash, natural debris, clippings and sediment.	BA	Q
	Re-plant or seed bare soil areas.	A	BA
Overflow Outlets	Remove trash, natural debris and clippings.	BA & MS	Q & MS
	Remove accumulated sediment.	A	BA
Vegetation	Watering during first two months after planting.	BW	BW
	Watering for the remainder of the first two (2) growing seasons (i.e. May to September) after planting or until vegetation is established.	W	W
	Watering for the remainder of the BMP lifespan	PD	PD
	Mow turf grass to maintain height between 10 and 15 cm.	M	BM

Component	Routine Maintenance Task	Frequency[1]	
		Minimum[2]	High[3]
	Remove undesirable vegetation (e.g. tree seedlings, invasive/weeds).	A	BA
	Overseed and top dress bare areas with compost to maintain a minimum of 80% turfgrass cover.[4]	A	BA
Sub-drain & Monitoring well	Flush out accumulated sediment with hose or pressure washer.	A	A

Notes:

1. A = Annually; AN = As needed based on Routine Operation inspections; BA = Bi-annually or twice per year, ideally in the spring and late fall/early winter; BM = Bi-monthly; BW = Biweekly or twice per week; M = Monthly; MS = After a major storm event (i.e. 5 year return period storm event or greater); PD = After a prolonged dry weather period (e.g. 21 days with less than 5 mm of rainfall); Q = Quarterly or four times per year, ideally in the spring, summer, early fall and late fall/early winter.
2. These frequencies are recommended as the minimum necessary to ensure the BMP functions adequately over its expected lifespan.
3. BMPs located in prominent locations or those receiving flow from large or high traffic drainage areas (vehicles or pedestrians) may warrant a higher frequency of routine maintenance tasks involving removal of trash/debris/sediment and mowing/weeding/trimming of vegetation.
4. Aim to achieve 80% turfgrass cover by the end of the establishment/warranty period for the original plantings (e.g. two years after planting).

6.5.5 LID Status

The proposed LID implementation process for former CFB Rockcliffe was developed using a phased Adaptive Management System (AMS) approach whereby a science-based methodology is developed and applied to understand and quantify the function, potential benefits and drawbacks from the proposed LID approaches. In this regard, each phase of potential LID implementation corresponding to the phases of development involve the completion of six steps. These steps are summarized in **Table 6.9**, which also outlines the current status of each step.

Table 6.9 - LID Implementation Status

STEP	PHASE 1A STATUS	PHASE 2B STATUS	PHASE 4 STATUS
1. Planning (subject of the LID SWM Pilot Project Study)	Complete	Complete	Under way
2. Construction	Enhanced Swales and Soakaways complete Bioswales completion anticipated by October 2022	Bioswales and Permeable Pavement Layby completion anticipated in spring and fall 2023, respectively	Pending planning approvals
3. Monitoring	Year 1 monitoring report submitted for Soakaways. Year 2		N/A
4. Reporting			N/A

5. Quantification of Benefits	report pending completion. Bioswales monitoring anticipated to begin in spring 2023.	Bioswales monitoring anticipated to begin in spring 2023.	N/A
6. Refinement of the LID Approach	N/A - first phase, so no results available	N/A - insufficient results available	N/A (insufficient results available)

6.5.6 Summary

The results of the dual drainage model show up to 39% reduction in peak flows and up to 53% reduction in volume by implementing LID devices in the Phase 4 area during frequent storm events.

It should be noted that the model setup for this study is not calibrated and includes drainage systems in the Phase 1A, 1B, and 4 area. Ultimate build-out conditions were applied for the external catchments. Verification of model results and calibration of the model using additional flow monitoring data is recommended. The model should also be refined and additional modelling completed as the design of future developments take place.

7 Approvals and Permit Requirements

7.1 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.

7.2 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. A Permit To Take Water for the subject site has been provided by the MECP. The permit, number 0565-A5AMP8, expires on December 31, 2025.

7.3 Conservation Authority

Since no watercourses are impacted by the proposed development, no permits will be required from the local Conservation Authority (Rideau Valley Conservation Authority).

7.4 Federal Government

There are no federal permits, authorizations or approvals needed for this development.

8 Conclusions and Recommendations

8.1 Conclusions

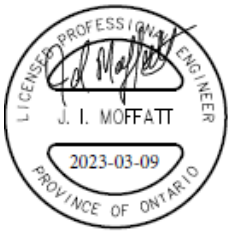
This report and the accompanying working drawings clearly indicate that the proposed development meets the requirements of the stakeholder regulators, including the City of Ottawa, provincial MECP and RVCA. The proposed development is in general conformance with the 'Former CFB Rockcliffe Master Servicing Study, August 2015', and the subsequent 2020 Update including provision of major municipal infrastructure such as water supply, wastewater collection and disposal, and management of stormwater runoff.

8.2 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 development stage of the subject site.

Report Prepared by:

IBI Group



James Moffatt, P. Eng.
Associate

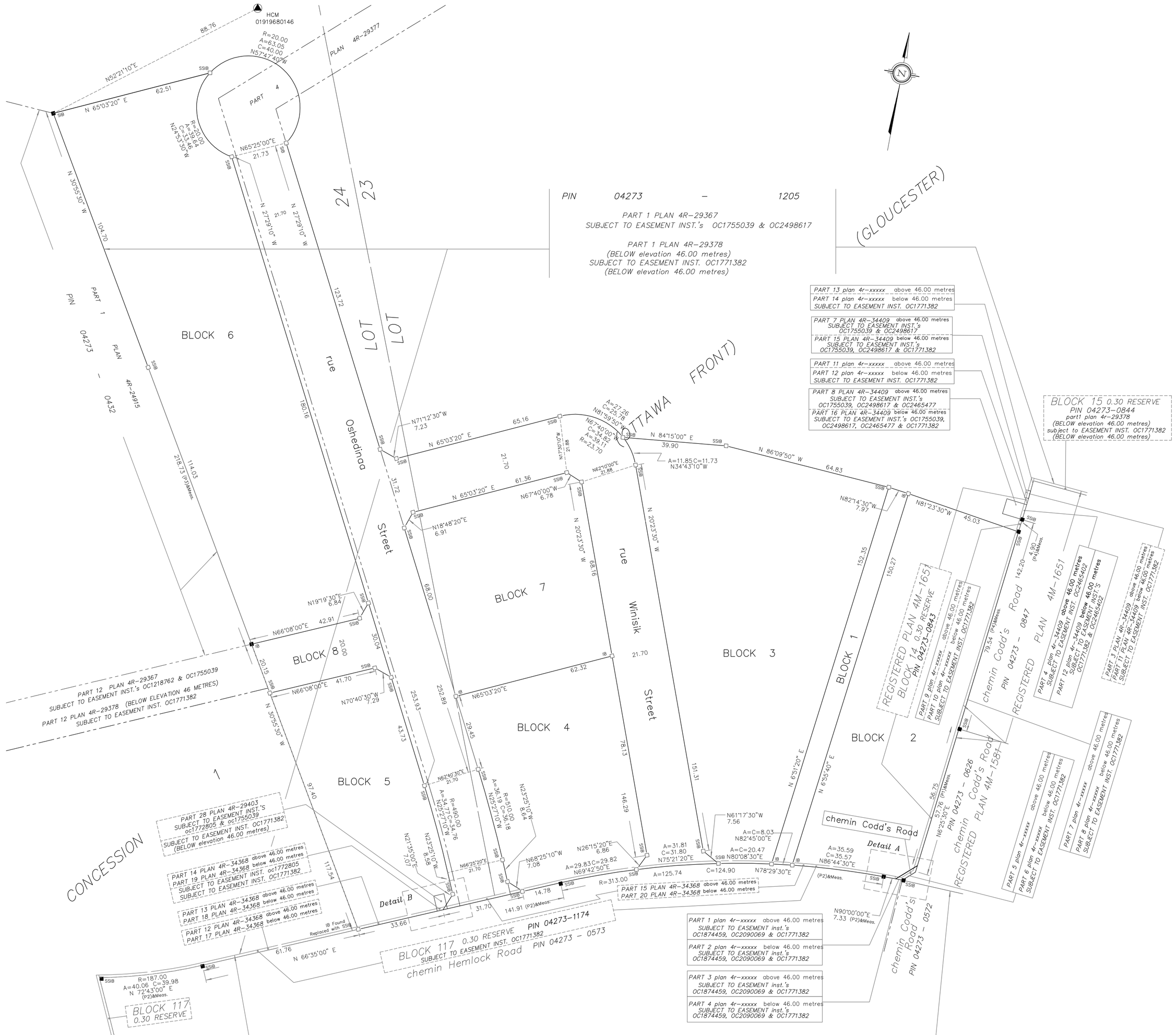


Meghan Black, P. Eng.
Associate

J:\118863_Wtridge2A2B\5.2 Reports\5.2.2 Civil\5.2.2.1 Sewers\2023-01 Phase 4 Design Brief Sub 5\CTR_Design Brief Phase 4_2023-03.docx\

APPENDIX A

- Draft 4M- Plan
- December 24, 2020 e-mail from City of Ottawa
- December 5, 2018 e-mail from RVCA
- December 19, 2018 e-mail from MECP Ottawa Office
- Permit To Take Water
- ECA No. 6929-A7MRBC for Phase 1A sewers
- ECA No. 0824-A8CR5H for Eastern SWM facility
- Notice of Completion of Class Environmental Assessment (EA)



APPROVED UNDER SECTION 51 OF THE PLANNING ACT
BY THE CITY OF OTTAWA.

THIS _____ DAY OF _____, 2023

_____
DON HERWEYER, MCIP, RPP.
ACTING GENERAL MANAGER
PLANNING, REAL ESTATE AND ECONOMIC
DEVELOPMENT DEPARTMENT
CITY OF OTTAWA

PLAN 4M-

I CERTIFY THAT THIS PLAN
IS REGISTERED IN THE LAND REGISTRY OFFICE
FOR THE LAND TITLES DIVISION OF OTTAWA-CARLETON NO. 4
AT _____ O'CLOCK ON THE ____ DAY OF _____
AND ENTERED IN THE PARCEL REGISTER FOR
PROPERTY IDENTIFIERS _____
_____
AND THE REQUIRED CONSENTS ARE REGISTERED AS
PLAN DOCUMENT NO._____

_____
LAND REGISTRAR

This plan comprises part of PIN'S 04273-1174, 04273-1205 and 04273-0843.

NOTES AND LEGEND

-□-	denotes	Survey Monument Planted.
-■-	-	Survey Monument Found
SIB	-	Standard Iron Bar.
SSIB	-	Short Standard Iron Bar.
IB	-	Iron Bar.
(AOG)	-	Annis, O'Sullivan, Vollebekk Ltd.
(P1)	-	Registered Plan 4M-1651
(P2)	-	Registered Plan 4M-1559
(P3)	-	Plan 4R-29367
(P4)	-	Plan 4R-XXXXX
HCM	-	Horizontal Control Monument

PART OF BLOCKS 1 TO 8 (both inclusive), PART OF RUE OSHEDINAA STREET, PART OF RUE WINISIK STREET AND PART OF CHEMIN CODD'S ROAD ARE SUBJECT TO EASEMENT INST. OC1771382 ;

BLOCKS 6 TO 8 (both inclusive), PART OF BLOCKS 1 TO 5 (both inclusive), PART OF RUE WINISIK STREET, PART OF RUE OSHEDINAA STREET AND PART OF CHEMIN CODD'S ROAD ARE SUBJECT TO EASEMENT INST.'S OC1755039 & OC2498617.

PART OF BLOCK 5 IS SUBJECT TO EASEMENT INST. OC1772805.

PART OF BLOCK 2 IS SUBJECT TO EASEMENT INST. OC2090069.

PART OF BLOCK 2 IS SUBJECT TO EASEMENT INST. OC1874459.

PLAN OF SUBDIVISION OF

PART OF LOTS 23 And 24
CONCESSION 1 (OTTAWA FRONT)
Geographic Township of Gloucester
and
PART OF RESERVE BLOCK 14
REGISTERED PLAN 4M-1651
and
PART OF RESERVE BLOCK 117
REGISTERED PLAN 4M-1559
CITY OF OTTAWA

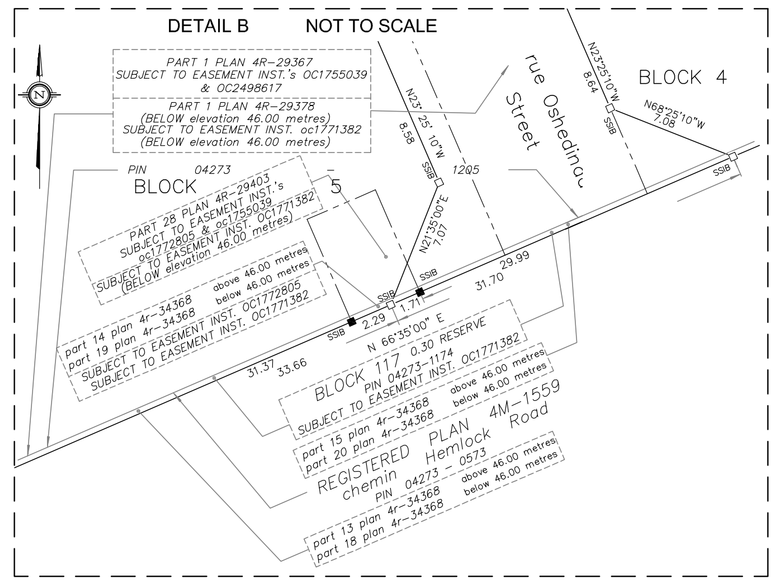
Surveyed by Annis , O'Sullivan , Vollebekk Ltd.

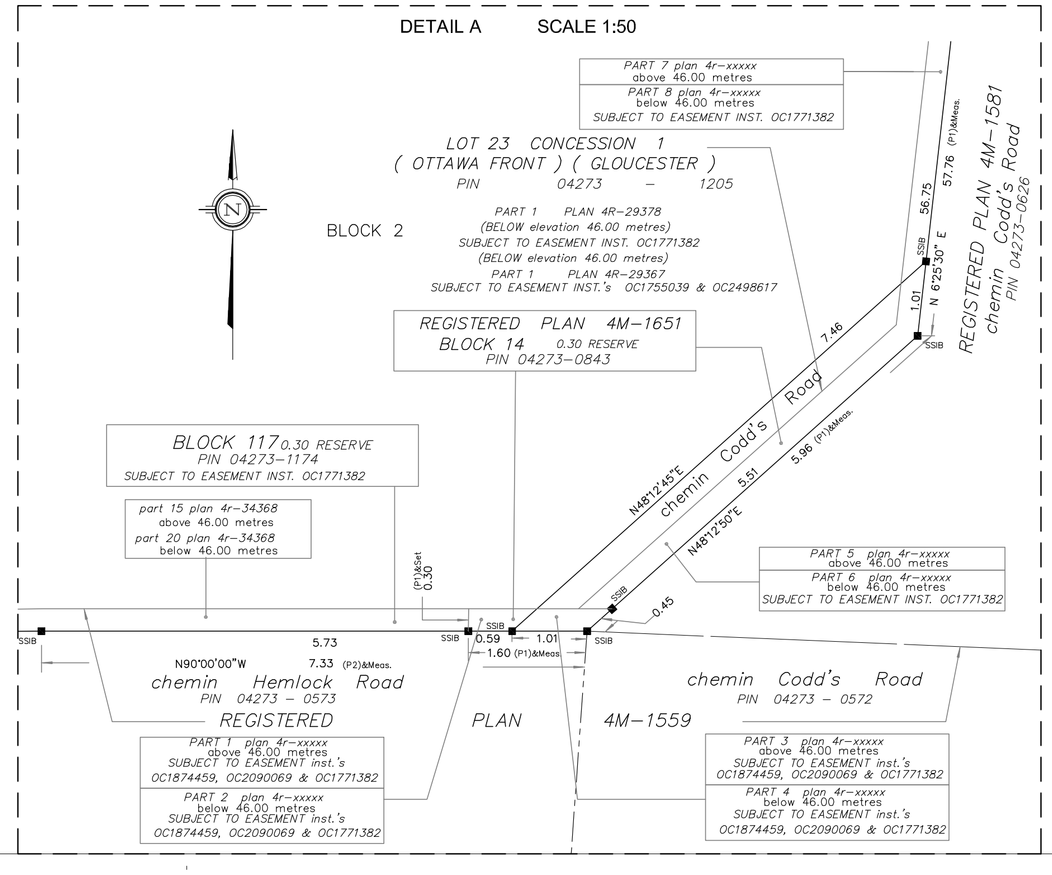
Scale 1 : 750

30 22.5 15 7.5 0 15 30 Metres

Metric

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





Surveyor's Certificate

I CERTIFY THAT :

1. This survey and plan are correct and in accordance with the Surveys Act, the Surveyors Act and the Land Titles Act and the regulations made under them.
2. The survey was completed on the __ day of _____, 2023.

_____ _____
Date E. H. Herweyer
Ontario Land Surveyor

OWNER'S CERTIFICATE

THIS IS TO CERTIFY THAT :

1. Blocks 1 to 8, both inclusive, the Streets, namely, rue Oshedinaa Street, chemin Codd's Road and rue Winisik Street have been laid out in accordance with our instructions.
2. The Streets are dedicated to City of Ottawa as public highways.

Dated the _____ day of _____ 2023

_____
Tara Dinsmore, Vice President,
Real Estate (National Captial Region, Atlantic and Acquisitions)
Canada Lands Company CLC Limited
I have authority to bind the corporation.

Dated the _____ day of _____ 2023

_____
Mary Jarvis, Acting Senior Director
Real Estate (National Captial Region, Atlantic and Acquisitions)
Canada Lands Company CLC Limited
I have authority to bind the corporation.

All found survey monuments are (AOG), unless otherwise noted.
Distances shown on curved limits are Arc distances unless otherwise noted.

Distances shown on this plan are ground distances and can be converted to grid distances by multiplying by the combined scale factor of 0.999947.

Bearings are grid, derived from Specified Control Points 01919843761 and 01919680146 having a resultant bearing of N 17°28'55" E and are referred to the Central Meridian of MTM Zone 9 (76°30' West Longitude) NAD-83 (orliginal).

Coordinates are referred to the Central Meridian of MTM Zone 9 (76°30' West Longitude) NAD-83 (orliginal).

Coordinate values are to urban accuracy in accordance with O. Reg. 216/10.

. 01919843761 Northing 5036178.12 Easting 372436.11
. 01919680146 Northing 5035456.42 Easting 372208.81

Caution: Coordinates cannot, in themselves, be used to re-establish corners or boundaries shown on this plan.

ANNIS, O'SULLIVAN, VOLLEBEKK LTD.
14 Concourse Gate, Suite 500
Nepean, Ont. K2E 7S6
Phone: (613) 727-0850 / Fax: (613) 727-1079
Email: mapper@aovltd.com
Ontario Land Surveyors

Job No.21181-20 CLC Pt Lts 22-24 C1 OF GL SUB Pl4 03 N/g

Jim Moffatt

From:	O'Connell, Erin <Erin.O'Connell@Ottawa.ca>
Sent:	Thursday, November 29, 2018 12:01 PM
To:	Jean Lachance; 'Mary Jarvis'; 'Coffey, Matt'; 'Whyte, Pamela'; Buchanan, Richard; Dubyk, Wally; Franklin, Carol; Jim Moffatt; Conway, Darlene; Jolliet, Laurent; Meghan Black; 'Chris Denich'
Subject:	Phase 2 Wateridge Follow up from November 20th meeting
Attachments:	Proposed Land Use Summary Table-subdivisions.docx; Wateridge Village_Subdivision Conditions_Registration of Phases 2A and 2....pdf

Good morning all,

As a follow up from the Wateridge Phase 2 meeting on November 20th, here are some notes and plan for next steps:

- In order to officially start the process for Phase 2 registration, I will require from CLC a draft 4M plan, five paper copies and a filled out land use table (attached)
- Once the above is received, I will contact legal to start drafting the agreement
- The target date for registration is the end of March 2019 and this Phase will contain approximately 1100 units
- The attached table will be used to track conditions and requirements prior to registration moving forward
- On the attached table, it looks like from the draft conditions, 38 (traffic calming measures), 79 (EIS) and 118 (Conservation Handbook) could be added to ensure they are tracked
- We spoke at the meeting on some of the conditions that could be removed from the table that are not relevant such as the gateway ones
- The street naming process should commence as street names need to be included on plan for registration and addresses should be assigned to blocks
- There will likely be an additional transportation condition for a pavement markings and signage plan prior to registration
- CLC requested that parks timing be extended until 2024, I will follow up with parks staff regarding this possibility
- The intended approach for LID measures is to submit one set of drawings for review, but consolidated modelling will not be used until likely Phase 3A/3B
- It is likely that there will be LID measures in Phase 2A, but not 2B
- I will provide Chris with the storm brief and servicing plans approved as part of Phase 1B
- Following that, Chris will provide a memo indicating tracking targets, how they have been met, and send the tracking tool. This will be provided to all on this email
- A tracking tool is required prior to registration to ensure targets are met
- Prior to registration, we need the monitoring plan for LID measures for previous phases
- CLC requested we investigate whether slope stability studies can be delayed until the site plan stage for Block 78 on the draft plan
- IBI indicated they are running into difficulty in designing the CUP at the plan of subdivision stage as the utilities are not cooperating until the stage when specifics are better known (site plan control)
- IBI requested confirmation on turning radii for intersections, as other groups are modifying them from approved 9 m to 5 m now

- CLC indicated for Phase 2A soil has been remediated, but there is an issue with groundwater. City suggested that a proposal for addressing this be provided and the city will review accordingly
- CLC requested confirmation if an IERS is required prior to registration
- Prior to registration, all relevant clearances are required
- The plans and studies required prior to registration are as follows:
    - Surveyor certificate
    - 4M plan for registration
    - Transportation Impact Study
    - Construction traffic management plan
    - Traffic calming measures/memo
    - Pavement markings and signage plan
    - Conservation Authority handbook
    - Environmental Impact Study
    - Geotechnical study and slope stability study
    - Tree Conservation Report
    - Landscape plan
    - Stormwater management plan
    - LID measures
    - Waste collection plan
    - Servicing study/plan
    - Grading and drainage plan
    - Erosion and sediment control plan
    - Noise study
    - Confirmation of RSCs
    - CUP (to be discussed further)

Please feel free to amend the above based on your own notes or understanding.

Sincerely,

Erin O'Connell, MCIP, RPP
Planner III
Development Review (Urban Services)
Urbaniste III
Examen des projects d'amenagement (Services urbains)

Planning, Infrastructure and Economic Development Department
City of Ottawa | Ville d'Ottawa
613.580.2424 ext./poste 27967
ottawa.ca/planning / ottawa.ca/urbanisme

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

Jim Moffatt

From:	Hal Stimson <hal.stimson@rvca.ca>
Sent:	Wednesday, December 5, 2018 3:22 PM
To:	Ed Ireland
Cc:	Jim Moffatt; Jamie Batchelor
Subject:	RE: RVCA Consultation for Standard Sewage Works - Transfer of Review at Wateridge Phase 2 in the City of Ottawa
Attachments:	wateridge.pdf

Hi Ed,

I don't believe there are any other issues for RVCA from a permit perspective.

I've attached a map showing the two water courses at Hemlock Private and Burma.

These would be the only areas of concern for RVCA if anything is proposed that impacts these watercourses (Hemlock intersection improvements?).

I know all the work at the river is complete per previous permits.

Unless there are Planning issues for the development agreement to be resolved I don't think there is any further RVCA involvement.

Regards,

Hal Stimson
Inspector, RVCA
hal.stimson@rvca.ca ext. 1127

Rideau Valley Conservation Authority
3889 Rideau Valley Drive
PO Box 599, Manotick ON K4M 1A5
T 613-692-3571 | 1-800-267-3504 F 613-692-0831 | www.rvca.ca

This message may contain information that is privileged or confidential and is intended to be for the use of the individual(s) or entity named above. This material may contain confidential or personal information which may be subject to the provisions of the Municipal *Freedom of Information & Protection of Privacy Act*. If you are not the intended recipient of this e-mail, any use, review, revision, retransmission, distribution, dissemination, copying, printing or otherwise use of, or taking of any action in reliance upon this e-mail, is strictly prohibited. If you have received this e-mail in error, please contact the sender and delete the original and any copy of the e-mail and any printout thereof, immediately. Your cooperation is appreciated.

From: Ed Ireland <ed.ireland@IBIGroup.com>
Sent: Wednesday, December 05, 2018 1:50 PM
To: Hal Stimson <hal.stimson@rvca.ca>
Cc: Jim Moffatt <jmoffatt@IBIGroup.com>
Subject: RVCA Consultation for Standard Sewage Works - Transfer of Review at Wateridge Phase 2 in the City of Ottawa

Good afternoon Hal,

IBI is preparing a servicing report and drawings for phase 2 at Wateridge Village in the City of Ottawa. The storm and sanitary sewers are all in public right of ways and will discharge into existing previously ECA approved storm and sanitary sewers with Phase 1. The project is located off Montreal Road and access to the site is from Codd's Road and Burma (now Wanaki) Road.

Does IBI need to do any further consultation with RVCA or do we just continue working with the City of Ottawa on this project?

I can speak with you about this project if you want more information.

Thank you.

Ed

Ed Ireland

IBI GROUP
400-333 Preston Street
Ottawa ON K1S 5N4 Canada
tel +1 613 225 1311 ext 64033 fax +1 613 225 9868





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.

Wateridge Development

RIDEAU VALLEY CONSERVATION AUTHORITY



Legend

- Lot
- RVCA Admin Boundary
- Regulation Limit
- 100yr Floodline
  - Floodplain
  - Area of Reduced Flood Risk
  - Area of Shallow Flooding
- Reg Limit Dominant Hazard
  - Floodplain
  - Geo-technical Hazard Limit
  - Meander Belt
  - Spill Line
  - Stable-Toe Slope
  - Top of Slope
  - Unstable-Toe Slope
  - Wetland
- Regulated Wetlands
- OMAFRA Constructed Drains
  - <all other values>
  - Award Drain
  - Municipal Drain
  - Natural
  - Private Drain
- Municipal Drains
- RVCA Sub-Watersheds
- RVCA Catchments
- Water Control Structures
  - Lock-Gate
  - Dam

Notes

Parcel data is owned by Teranet Enterprises Inc and its suppliers. All rights reserved. May not be reproduced without permission.

1,297.2 0 648.58 1,297.2

Meters

© Rideau Valley Conservation Authority

Map created: 12/5/2018

Map produced by RVCA, under License with the Ontario Ministry of Natural Resources © Queen's Printer for Ontario, 2016. This map is the property of the RVCA, and the RVCA holds a copyright on them. These maps may be copied or reproduced, provided that the RVCA is properly acknowledged as the original source of the information and provided that no fee is charged (other than to cover handling charges). The RVCA cannot guarantee the accuracy of the mapping for all possible uses. End-users of the information contained herein must therefore determine if the information is of suitable accuracy for their purposes

1: 25,534.73

Map Projection: WGS_1984_Web_Mercator_Auxiliary_Sphere

Ed Ireland

From: Des Rochers, Christina (MECP) <Christina.Desrochers@ontario.ca>
Sent: Wednesday, December 19, 2018 11:02 AM
To: Ed Ireland
Cc: Jim Moffatt
Subject: RE: MOE Consultation for Sewage Works - Wateridge Phase 2 in the City of Ottawa

Good morning Ed,

I recommend reviewing the proposed LID in phase 2A against the ToR agreement. Specifically, Schedule A, 2.0 Additional Works Allowed, c. Lot Level and Conveyance Control (Low Impact Development) Measures permits:

"installing new LID measures, including storm water outfalls, provided that:

- if the proposed works are required to provide quality control, the LID measures are designed to achieve Enhanced Level water quality control and erosion protection (i.e. 80% TSS removal);
- any attenuation design requirements are satisfied; and
- the design considers corrective and remediation measure in the event of lack of performance of the LID measures:"

If the project complies with the provisions and the City agrees, a single application can be submitted under the ToR-Additional Works process for all of Phase 2.

Thanks and Happy New Year!

Christina
Christina Des Rochers
Water Inspector | Inspectrice de l'eau
Safe Drinking Water Branch | Direction du contrôle de la qualité de l'eau potable
Ministry of the Environment, Conservation and Parks | Ministère de l'Environnement, de la Protection de la nature et des Parcs
Tel. 613-521-3450 ex. 231
Fax. 613-521-5437
Spills Action Centre | Centre d'intervention en cas de déversement 1-800-268-6060
Please consider the environment before printing this email note

---

From: Ed Ireland [mailto:ed.ireland@IBIGroup.com]
Sent: December-13-18 5:02 PM
To: Des Rochers, Christina (MECP)
Cc: Jim Moffatt
Subject: MOE Consultation for Sewage Works - Wateridge Phase 2 in the City of Ottawa

Good afternoon Christina,

IBI coordinated with the City and they asked us to confirm the following with your office.

Phase 2 has a couple of sub-phases – 2A and 2B

2A has Lids (bioswales) and storm and sanitary sewers

2B no Lids – just storm and sanitary sewers

IBI proposes to prepare 2 separate applications:

1. A Transfer of Review Application that includes all of Phase 2A and 2B storm and sanitary sewers
2. A Direct Submission Application for the Phase 2A Lids

Is this how we should proceed? I believe this is what was done on a previous phase of the project. IBI prepared a transfer of review application for sewage works – storm and sanitary pipes - while another consultant prepared a direct submission application for LIDs.

Ed

Ed Ireland

IBI GROUP
400-333 Preston Street
Ottawa ON K1S 5N4 Canada
tel +1 613 225 1311 ext 64033 fax +1 613 225 9868





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 recu ce message par erreur, veuillez le mentionner immédiatement à l'expéditeur et effacer ce courriel.

PERMIT TO TAKE WATER

Surface and Ground Water
NUMBER 0565-A5AMP8

Pursuant to Section 34.1 of the Ontario Water Resources Act, R.S.O. 1990 this Permit To Take Water is hereby issued to:

Canada Lands Company CLC Limited
Suite 601 - 30 Metcalfe St
Ottawa, Ontario, K1P 5L4
Canada

For the water taking from: Excavation Dewatering

Located at: Lot 20 & 22-25, Concession 1 Ottawa Front, Geographic Township of Gloucester Ottawa

For the purposes of this Permit, and the terms and conditions specified below, the following definitions apply:

DEFINITIONS

(a) "Director" means any person appointed in writing as a Director pursuant to section 5 of the OWRA for the purposes of section 34.1, OWRA.

(b) "Provincial Officer" means any person designated in writing by the Minister as a Provincial Officer pursuant to section 5 of the OWRA.

(c) "Ministry" means Ontario Ministry of the Environment and Climate Change.

(d) "District Office" means the Ottawa District Office.

(e) "Permit" means this Permit to Take Water No. 0565-A5AMP8 including its Schedules, if any, issued in accordance with Section 34.1 of the OWRA.

(f) "Permit Holder" means Canada Lands Company CLC Limited.

(g) "OWRA " means the *Ontario Water Resources Act*, R.S.O. 1990, c. O. 40, as amended.

You are hereby notified that this Permit is issued subject to the terms and conditions outlined below:

TERMS AND CONDITIONS

1. Compliance with Permit

1.1 Except where modified by this Permit, the water taking shall be in accordance with the application for this Permit To Take Water, dated November 3, 2015 and signed by George Thomas, and all Schedules included in this Permit.

1.2 The Permit Holder shall ensure that any person authorized by the Permit Holder to take water under this Permit is provided with a copy of this Permit and shall take all reasonable measures to ensure that any such person complies with the conditions of this Permit.

1.3 Any person authorized by the Permit Holder to take water under this Permit shall comply with the conditions of this Permit.

1.4 This Permit is not transferable to another person.

1.5 This Permit provides the Permit Holder with permission to take water in accordance with the conditions of this Permit, up to the date of the expiry of this Permit. This Permit does not constitute a legal right, vested or otherwise, to a water allocation, and the issuance of this Permit does not guarantee that, upon its expiry, it will be renewed.

1.6 The Permit Holder shall keep this Permit available at all times at or near the site of the taking, and shall produce this Permit immediately for inspection by a Provincial Officer upon his or her request.

1.7 The Permit Holder shall report any changes of address to the Director within thirty days of any such change. The Permit Holder shall report any change of ownership of the property for which this Permit is issued within thirty days of any such change. A change in ownership in the property shall cause this Permit to be cancelled.

2. General Conditions and Interpretation

2.1 Inspections

The Permit Holder must forthwith, upon presentation of credentials, permit a Provincial Officer to carry out any and all inspections authorized by the OWRA, the *Environmental Protection Act* , R.S.O. 1990, the *Pesticides Act* , R.S.O. 1990, or the *Safe Drinking Water Act*, S. O. 2002.

2.2 Other Approvals

The issuance of, and compliance with this Permit, does not:

(a) relieve the Permit Holder or any other person from any obligation to comply with any other applicable legal requirements, including the provisions of the *Ontario Water Resources Act* , and the *Environmental Protection Act* , and any regulations made thereunder; or

(b) limit in any way any authority of the Ministry, a Director, or a Provincial Officer, including the authority to require certain steps be taken or to require the Permit Holder to furnish any further information related to this Permit.

2.3 Information

The receipt of any information by the Ministry, the failure of the Ministry to take any action or require any person to take any action in relation to the information, or the failure of a Provincial Officer to prosecute any person in relation to the information, shall not be construed as:

(a) an approval, waiver or justification by the Ministry of any act or omission of any person that contravenes this Permit or other legal requirement; or

(b) acceptance by the Ministry of the information's completeness or accuracy.

2.4 Rights of Action

The issuance of, and compliance with this Permit shall not be construed as precluding or limiting any legal claims or rights of action that any person, including the Crown in right of Ontario or any agency thereof, has or may have against the Permit Holder, its officers, employees, agents, and contractors.

2.5 Severability

The requirements of this Permit are severable. If any requirements of this Permit, or the application of any requirements of this Permit to any circumstance, is held invalid or unenforceable, the application of such requirements to other circumstances and the remainder of this Permit shall not be affected thereby.

2.6 Conflicts

Where there is a conflict between a provision of any submitted document referred to in this Permit, including its Schedules, and the conditions of this Permit, the conditions in this Permit shall take precedence.

3. Water Takings Authorized by This Permit

3.1 **Expiry**

This Permit expires on **December 31, 2025**. No water shall be taken under authority of this Permit after the expiry date.

3.2 Amounts of Taking Permitted

The Permit Holder shall only take water from the source, during the periods and at the rates and amounts of taking specified in Table A. Water takings are authorized only for the purposes specified in Table A.

Table A

	Source Name / Description:	Source: Type:	Taking Specific Purpose:	Taking Major Category:	Max. Taken per Minute (litres):	Max. Num. of Hrs Taken per Day:	Max. Taken per Day (litres):	Max. Num. of Days Taken per Year:	Zone/ Easting/ Northing:
1	Western SWM Pond	Pond Dugout	Other - Construction	Construction	281	24	405,000	365	18 459576 5033167
2	Northern SWM Pond	Pond Dugout	Other - Construction	Construction	1,995	24	2,815,500	365	18 450223 5034056
3	Trench - Southern Portion	Pond Dugout	Other - Construction	Construction	8	24	12,000	365	18 450855 5033249
4	Trench - Southern Portion	Pond Dugout	Other - Construction	Construction	8	24	12,000	365	18 450227 5033167
5	Trench - Center/North	Pond Dugout	Other - Construction	Construction	49	24	70,500	365	18 450530 5033558
6	Trench - South of Rockcliffe Parkway	Pond Dugout	Other - Construction	Construction	10	24	15,000	365	18 450420 5034102
7	Trench - South of Rockcliffe Parkway	Pond Dugout	Other - Construction	Construction	10	24	15,000	365	18 450057 5034931
8	Trench - North of Rockcliffe	Pond Dugout	Other - Construction	Construction	1	24	1,500	365	18 450319 5034331
9	Trench - North of Rockcliffe	Pond Dugout	Other - Construction	Construction	125	24	180,000	365	18 450397 5034607
						Total Taking:	3,824,000		

4. Monitoring

4.1 The Permit Holder shall maintain a record of all water takings. This record shall include the dates and times of water takings, the rates of taking, and an estimated calculation of the total amounts of water taken per day for each day that water is taken under the authorization of this Permit. A separate record shall be maintained for each source. The Permit Holder shall keep all required records up to date and available at or near the site of the taking and shall produce the records immediately for inspection by a Provincial Officer upon his or her request.

4.2 The Permit Holder shall provide written confirmation to the Director that all soil and groundwater remediation on the site has been completed prior to the taking of water authorized by this Permit. The Permit Holder shall also retain the services of a qualified professional (practising Professional Geoscientist or Professional Engineer) to determine if there is any potential for water takings authorized by this Permit to mobilize any remaining groundwater contamination following remediation activities on the site. The written opinion of the qualified professional shall be provided to the Director along with the confirmation of site remediation. If it is determined that groundwater contamination may be mobilized by water takings authorized by this Permit, the qualified person shall develop and submit a groundwater monitoring and mitigation plan to the Director for ministry review and approval. This plan must be accepted in writing by the Director prior to the taking of water authorized by this Permit.

4.3 The Permit Holder shall retain the services of a qualified professional (practising Professional Geoscientist or Professional Engineer) to develop a groundwater monitoring program for the Fairhaven Community in accordance with Section 5.2 of the report entitled "Hydrogeological Study In Support of Category 3 Application for Permit to Take Water, Former Canadian Forces Base Rockcliffe, Canada Lands Company CLC Limited, Ottawa Ontario" completed by DST Consulting Engineers and dated October 2015.

5. Impacts of the Water Taking

5.1 Notification

The Permit Holder shall immediately notify the local District Office of any complaint arising from the taking of water authorized under this Permit and shall report any action which has been taken or is proposed with regard to such complaint. The Permit Holder shall immediately notify the local District Office if the taking of water is observed to have any significant impact on the surrounding waters. After hours, calls shall be directed to the Ministry's Spills Action Centre at 1-800-268-6060.

5.2 For Surface-Water Takings

The taking of water (including the taking of water into storage and the subsequent or simultaneous withdrawal from storage) shall be carried out in such a manner that streamflow is not stopped and is not reduced to a rate that will cause interference with downstream uses of water or with the natural functions of the stream.

For Groundwater Takings

If the taking of water is observed to cause any negative impact to other water supplies obtained from any adequate sources that were in use prior to initial issuance of a Permit for this water taking, the Permit Holder shall take such action necessary to make available to those affected, a supply of water equivalent in quantity and quality to their normal takings, or shall compensate such persons for their reasonable costs of so doing, or shall reduce the rate and amount of taking to prevent or alleviate the observed negative impact. Pending permanent restoration of the affected supplies, the Permit Holder shall provide, to those affected, temporary water supplies adequate to meet their normal requirements, or shall compensate such persons for their reasonable costs of doing so.

If permanent interference is caused by the water taking, the Permit Holder shall restore the water supplies of those permanently affected.

5.3 Prevention of Adverse Effects:

The Permit Holder shall ensure the taking of water under authority of this Permit does not result in an adverse effect on area waters.

5.4 Prevention of Structural Adverse Effects:

The Permit Holder shall take all measures necessary to prevent damage to buildings, bridges, structures, roads and/or railway lines that may be impacted either directly or indirectly by this taking.

5.5 Discharge Control Measures for Water that is Discharged to the Natural Environment:

Siltation control measures shall be installed at the discharge site(s) and shall be sufficient to control the volumes. Continuous care shall be taken to properly maintain the siltation control devices.

5.6 The discharge of water shall be controlled in such a way as to avoid erosion and sedimentation in the receiving stream.

5.7 The Permit Holder shall ensure that any water discharged to the natural environment does not result in scouring, erosion or physical alteration of stream channels or banks and that there is no flooding in the receiving area or water body, downstream water bodies, ditches or properties caused or worsened by this discharge.

5.8 The Permit Holder shall not discharge turbid water to any watercourse. Turbid water shall be defined as any discharge water from the excavation or diverted water with a maximum increase of 8 NTUs above the receiving stream's background levels.

5.9 Discharged Water to the Sanitary or Storm Sewer System:
The Permit Holder shall ensure that any water that is taken for dewatering purposes and discharged to the City of Ottawa sewer system is in accordance with a City of Ottawa Sewer Use Agreement.

6. Director May Amend Permit
The Director may amend this Permit by letter requiring the Permit Holder to suspend or reduce the taking to an amount or threshold specified by the Director in the letter. The suspension or reduction in taking shall be effective immediately and may be revoked at any time upon notification by the Director. This condition does not affect your right to appeal the suspension or reduction in taking to the Environmental Review Tribunal under the *Ontario Water Resources Act* , Section 100 (4).

The reasons for the imposition of these terms and conditions are as follows:

1. Condition 1 is included to ensure that the conditions in this Permit are complied with and can be enforced.

2. Condition 2 is included to clarify the legal interpretation of aspects of this Permit.

3. Conditions 3 through 6 are included to protect the quality of the natural environment so as to safeguard the ecosystem and human health and foster efficient use and conservation of waters. These conditions allow for the beneficial use of waters while ensuring the fair sharing, conservation and sustainable use of the waters of Ontario. The conditions also specify the water takings that are authorized by this Permit and the scope of this Permit.

In accordance with Section 100 of the Ontario Water Resources Act, R.S.O. 1990, you may by written notice served upon me, the Environmental Review Tribunal and the Environmental Commissioner, ***Environmental Bill of Rights****, R.S.O. 1993, Chapter 28, within 15 days after receipt of this Notice, require a hearing by the Tribunal. The Environmental Commissioner will place notice of your appeal on the Environmental Registry. Section 101 of the Ontario Water Resources Act, as amended provides that the Notice requiring a hearing shall state:*

1. The portions of the Permit or each term or condition in the Permit in respect of which the hearing is required, and;
2. The grounds on which you intend to rely at the hearing in relation to each portion appealed.

In addition to these legal requirements, the Notice should also include:

3. The name of the appellant;
4. The address of the appellant;
5. The Permit to Take Water number;
6. The date of the Permit to Take Water;
7. The name of the Director;
8. The municipality within which the works are located;

This notice must be served upon:

The Secretary
Environmental Review Tribunal
655 Bay Street, 15th Floor
Toronto ON
M5G 1E5
Fax: (416) 326-5370
Email:
ERTTribunalsecretary@ontario.ca

AND

The Environmental Commissioner
1075 Bay Street
6th Floor, Suite 605
Toronto, Ontario M5S 2W5

AND

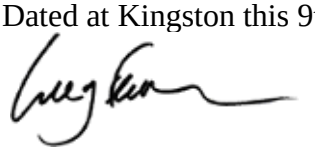
The Director, Section 34.1,
Ministry of the Environment and Climate Change
1259 Gardiners Rd, PO Box 22032
Kingston, ON
K7P 3J6

Further information on the Environmental Review Tribunal's requirements for an appeal can be obtained directly from the Tribunal:

by Telephone at	by Fax at	by e-mail at
(416) 212-6349	(416) 326-5370	www.ert.gov.on.ca
Toll Free 1(866) 448-2248	Toll Free 1(844) 213-3474	

This instrument is subject to Section 38 of the ***Environmental Bill of Rights*** *that allows residents of Ontario to seek leave to appeal the decision on this instrument. Residents of Ontario may seek to appeal for 15 days from the date this decision is placed on the Environmental Registry. By accessing the Environmental Registry, you can determine when the leave to appeal period ends.*

Dated at Kingston this 9th day of March, 2016.



Greg Faaren
Director, Section 34.1
Ontario Water Resources Act , R.S.O. 1990

Schedule A

This Schedule “A” forms part of Permit To Take Water 0565-A5AMP8, dated March 9, 2016.

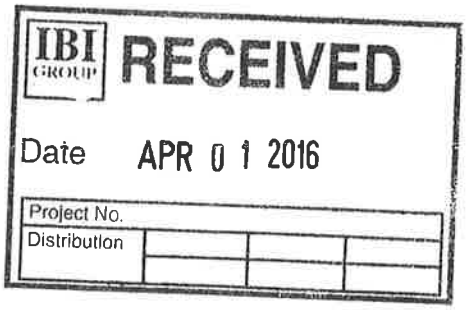
Section 5.2 of the report entitled "Hydrogeological Study In Support of Category 3 Application for Permit to Take Water, Former Canadian Forces Base Rockcliffe, Canada Lands Company CLC Limited, Ottawa Ontario" completed by DST Consulting Engineers and dated October 2015.

Ontario

Ministry of the Environment and Climate Change
Ministère de l'Environnement et de l'Action en matière de changement climatique

ENVIRONMENTAL COMPLIANCE APPROVAL
NUMBER 6929-A7MRBC
Issue Date: March 3, 2016

Canada Lands Company CLC Limited
30 Metcalfe Street, Suite 601
Ottawa, Ontario
K1P 5L4



Site Location: Wateridge at Rockcliffe Subdivision
335 St. Laurent Boulevard
City of Ottawa, Ontario

You have applied under section 20.2 of Part II.1 of the Environmental Protection Act, R.S.O. 1990, c. E. 19 (Environmental Protection Act) for approval of:

sanitary and storm sewers to be constructed in the City of Ottawa, on Block 126 and Burma Road (from Station 1+300 to Station 1+682.25), Chemin Wanaki Road (from Station 1+300 to Station 1+510), Codd's Road (from Montreal to Station 0+980, from Station 0+980 to Station 1+330, and from Station 1+330 to Station 1+480), Chemin Mikinak Road (from Voie Chêne Way to Station 0+430, from Station 430 to Station 0+780, from Station 0+780 to Station 1+120, and from Station 1+120 to Wanaki Road), Voie Chêne Way (from Station 0+360 to Station 0+620, Voie Vedette Way (from Hemlock to Avro Circle), Place Lysander Place (from Chêne Way to Avro Circle), Cercle Avro Circle (from Chêne Way to Avro Circle, from Station 0+100 to Station 0+420, from Station 0+420 to Station 0+720, from 0+720 to Mikinak Road), Private Lane No. 2 (from Station 1+100 to Station 1+315), Private Lane No. 3 (from Station 1+100 to 1+220), Hemlock Road (from Station 1+660 to Station 2+000), Sanitary Shaft Block 106 (from Hemlock Road to Mikinak Road), Future Street (from Station 0+020 to Hemlock Road), and Easements (from Station 0+100 to Station 0+240 and from Station 0+230 to Station 0+270);

all in accordance with the application from Canada Lands Company CLC Limited, dated January 26, 2016, including final plans and specifications prepared by IBI Group.

In accordance with Section 139 of the Environmental Protection Act, you may by written Notice served upon me and the Environmental Review Tribunal within 15 days after receipt of this Notice, require a hearing by the Tribunal. Section 142 of the Environmental Protection Act provides that the Notice requiring the hearing shall state:

1. The portions of the environmental compliance approval or each term or condition in the environmental compliance approval in respect of which the hearing is required, and;
2. The grounds on which you intend to rely at the hearing in relation to each portion appealed.

The Notice should also include:

3. The name of the appellant;
4. The address of the appellant;
5. The environmental compliance approval number;
6. The date of the environmental compliance approval;
7. The name of the Director, and;
8. The municipality or municipalities within which the project is to be engaged in.

And the Notice should be signed and dated by the appellant.

This Notice must be served upon:

The Secretary*
Environmental Review Tribunal
655 Bay Street, Suite 1500
Toronto, Ontario
M5G 1E5

AND

The Director appointed for the purposes of
Part II.1 of the Environmental Protection Act
Ministry of the Environment and
Climate Change
135 St. Clair Avenue West, 1st Floor
Toronto, Ontario
M4V 1P5

*** Further information on the Environmental Review Tribunal's requirements for an appeal can be obtained directly from the Tribunal at: Tel: (416) 212-6349, Fax: (416) 326-5370 or www.ert.gov.on.ca**

The above noted activity is approved under s.20.3 of Part II.1 of the Environmental Protection Act.

DATED AT TORONTO this 3rd day of March, 2016

THIS APPROVAL WAS MAILED
ON March 23, 2016
(Signed)

Gregory Zimmer, P.Eng.
Director
appointed for the purposes of Part II.1 of the
Environmental Protection Act

YH/

c: District Manager, MOECC Ottawa District Office
M. Rick O'Connor, City Clerk, City of Ottawa
Abdul Mottalib, City of Ottawa (File No. D07-16-15-0003)
Linda Carkner, Program Manager, City of Ottawa, Infrastructure Services
Jim Moffatt, P.Eng., IBI Group

Ontario

Ministry of the Environment and Climate Change
Ministère de l'Environnement et de l'Action en matière de changement climatique

ENVIRONMENTAL COMPLIANCE APPROVAL

NUMBER 0824-A8CR5H
Issue Date: April 12, 2016

Canada Lands Company CLC Limited
30 Metcalfe Street, Suite 601
Ottawa, Ontario
K1P 5L4

Site Location: Wateridge Village at Rockcliffe
Lot 21, 22, 23, 24 and 25, Concession 1 (Ottawa Front)
City of Ottawa

You have applied under section 20.2 of Part II.1 of the Environmental Protection Act, R.S.O. 1990, c. E. 19 (Environmental Protection Act) for approval of:

establishment of a stormwater management facility for the collection, treatment and disposal of stormwater run-off from an area of approximately 161.5 hectares including part of the Wateridge Village at Rockcliffe residential subdivision development on the former CFB Rockcliffe site in the City of Ottawa, providing Enhanced Level water quality control and erosion protection with an outfall directly to the Ottawa River, consisting of the following:

stormwater management facility (Eastern SWM Facility - catchment area 161.5 hectares): - one (1) wet pond with a stilling basin and sediment forebay, located on the south side of Sir Charles Etienne Cartier Parkway, east of Aviation Parkway and west of Blair Road, having a permanent pool volume of 29,500 m^3, an extended detention volume of 39,200 m^3, and a total storage volume for the 100-year storm event of approximately 68,700 m^3, including the permanent pool volume, at a total depth of approximately 4.26 m, receiving inflow from the eastern and central portions of the Rockcliffe development lands via a waterfall discharging to the stilling basin and discharging via an outlet structure and 2400 mm diameter outfall sewer to the Ottawa River, identified below, and a 200 mm diameter baseflow augmentation pipe, identified below;

outfall sewer (Eastern SWM Facility Outlet Pipe): - approximately 609 m of 2400 mm diameter storm sewer and 3000 mm by 1200 mm outfall storm sewer receiving inflow from the Eastern SWM Facility and from the Western SWM Facility Overflow Pipe, identified below, discharging to the Ottawa River;

outfall sewer (Western SWM Facility Overflow Pipe): - approximately 288 m of 1200 mm diameter outfall storm sewer along the north side of the Eastern SWM Facility designed to receive inflow from the future Western SWM Facility and discharge to the Eastern SWM Facility Outlet Pipe, identified above;

baseflow augmentation pipe: - approximately 591 m of 200 mm diameter storm sewer along the south side of Sir Charles Etienne Cartier Parkway, receiving inflow from the Eastern SWM Facility and discharging eastward to Eastern Creek and the Ottawa River;

including erosion/sedimentation control measures during construction and all other controls and appurtenances essential for the proper operation of the aforementioned Works;

all in accordance with the submitted supporting documents listed in Schedule "A" forming part of this Approval.

For the purpose of this environmental compliance approval, the following definitions apply:

"Approval" means this entire document including the application and any supporting documents listed in any schedules in this Approval;

"Director" means a person appointed by the Minister pursuant to section 5 of the Environmental Protection Act for the purposes of Part II.1 of the Environmental Protection Act;

"Ministry" means the ministry of the government of Ontario responsible for the Environmental Protection Act and the Ontario Water Resources Act and includes all officials, employees or other persons acting on its behalf;

"Owner" means Canada Lands Company CLC Limited and includes their successors and assignees;

"Works" means the sewage works described in the Owner's application(s) and this Approval.

You are hereby notified that this environmental compliance approval is issued to you subject to the terms and conditions outlined below:

TERMS AND CONDITIONS

1. GENERAL PROVISIONS

(1) The Owner shall ensure that any person authorized to carry out work on or operate any aspect of the Works is notified of this Approval and the Conditions herein and shall take all reasonable measures to ensure any such person complies with the same.

(2) The designation of the City of Ottawa as the operating authority of the site on the application for approval of the Works does not relieve the Owner from the responsibility of complying with any and all of the Conditions of this Approval.

(3) Except as otherwise provided by these Conditions, the Owner shall design, build, install, operate and maintain the Works in accordance with the description given in this Approval, and the application for

approval of the Works.

(4) Where there is a conflict between a provision of any submitted document referred to in this Approval and the Conditions of this Approval, the Conditions in this Approval shall take precedence, and where there is a conflict between the listed submitted documents, the document bearing the most recent date shall prevail.

(5) Where there is a conflict between the listed submitted documents, and the application, the application shall take precedence unless it is clear that the purpose of the document was to amend the application.

(6) The Conditions of this Approval are severable. If any Condition of this Approval, or the application of any requirement of this Approval to any circumstance, is held invalid or unenforceable, the application of such Condition to other circumstances and the remainder of this Approval shall not be affected thereby.

(7) The issuance of, and compliance with the Conditions of this Approval does not:

(a) relieve any person of any obligation to comply with any provision of any applicable statute, regulation or other legal requirement, including, but not limited to, the obligation to obtain approval from the local conservation authority necessary to construct or operate the sewage Works; or

(b) limit in any way the authority of the Ministry to require certain steps be taken to require the Owner to furnish any further information related to compliance with this Approval.

(8) This Approval includes the treatment and disposal of stormwater run-off draining to the Eastern SWM Facility for a total catchment area of approximately 161.5 hectares, assuming an average imperviousness of approximately 63%. Any changes within the drainage areas that might increase the required storage volumes or increase the flows to or from the stormwater management facility or any structural/physical changes to the stormwater management facility, including the inlets or outlets, will require an amendment to this Approval.

2. EXPIRY OF APPROVAL

(1) This Approval will cease to apply to those parts of the new Works which have not been constructed within **five (5) years** of the date of this Approval.

3. CHANGE OF OWNER

(1) The Owner shall notify the Director, in writing, of any of the following changes within **thirty (30) days** of the change occurring:

(a) change of Owner;

(b) change of address of the Owner;

(c) change of partners where the Owner is or at any time becomes a partnership, and a copy of the most recent declaration filed under the Business Names Act, R.S.O. 1990, c. B17 shall be included in the notification to the Director;

(d) change of name of the corporation where the Owner is or at any time becomes a corporation, and a copy of the most current information filed under the Corporations Information Act, R.S.O. 1990, c. C39 shall be included in the notification to the Director.

4. OPERATION AND MAINTENANCE

(1) The Owner shall inspect the Works at least **once a year** and, if necessary, clean and maintain the Works to prevent the excessive build-up of sediments and/or vegetation.

(2) The Owner shall maintain a record the results of these inspections and any cleaning and maintenance operations undertaken. The record shall include the following:

(a) the name of the Works; and

(b) the date and results of each inspection, maintenance and cleaning, including an estimate of the quantity of any materials removed.

5. MONITORING AND REPORTING

(1) The Owner shall carry out a monitoring program and evaluate the performance of the stormwater management Works commencing at the initial completion of construction of the Works and continuing for a minimum of **five (5) years**.

(2) The monitoring program shall include obtaining grab samples at the outlet structure from the outfall headwall of the 3000 mm by 1200 mm outfall pipe from the stormwater management facility (Eastern SWM Facility) to the Ottawa River for at least three (3) rainfall wet events per year (a wet event is defined as a minimum of 15 mm of rain in the previous 24 hours). Two (2) of the events must occur within the May to September time period.

(3) Samples should be tested for Total Suspended Solids (mg/L) and results recorded.

(4) The methods and protocols for sampling, analysis and recording shall conform, in order of precedence, to the methods and protocols specified in the following:

(a) the Ministry's Procedure F-10-1, "Procedures for Sampling and Analysis Requirements for Municipal and Private Sewage Treatment Works (Liquid Waste Streams Only)", as amended from time to time by more recently published editions;

(b) the Ministry's publication "Protocol for the Sampling and Analysis of Industrial/Municipal Wastewater" (January 1999), ISBN 0-7778-1880-9, as amended from time to time by more

recently published editions;

(c) the publication "Standard Methods for the Examination of Water and Wastewater" (21st edition), as amended from time to time by more recently published editions.

(5) The Owner shall prepare a Performance Report, **every five (5) years**, a Performance Assessment Report, addressing the following:

(a) a description of any operating problems encountered and corrective actions taken during the reporting period and the need for further investigations in the following reporting period for system refinements or ways of improving the performance of the Works;

(b) measurement of the mass of accumulated sediment removed when undertaking maintenance of the Works as per the Operations and Maintenance Conditions, above;

(6) The Owner shall maintain a record of all test results and all reports related to the sampling, monitoring and maintenance program for the Works, and shall make the information available to the Ministry, upon request.

(7) The measurement frequency specified in Condition 5, Subsections (1) and (2), above, and reporting frequency specified in Condition 5, Subsection (5), above, may, **after five (5) years** of monitoring in accordance with this Condition, be modified by the MOECC District Manager of the Ottawa office in writing from time to time.

6. TEMPORARY EROSION AND SEDIMENT CONTROL

(1) The Owner shall install and maintain temporary sediment and erosion control measures during construction and conduct inspections once every **two (2) weeks** and after each significant storm event (a significant storm event is defined as a minimum of 25 mm of rain in any 24 hours period). The inspections and maintenance of the temporary sediment and erosion control measures shall continue until they are no longer required and at which time they shall be removed and all disturbed areas reinstated properly.

(2) The Owner shall maintain records of inspections and maintenance which shall be made available for inspection by the Ministry, upon request. The record shall include the name of the inspector, date of inspection, and the remedial measures, if any, undertaken to maintain the temporary sediment and erosion control measures.

7. RECORD KEEPING

The Owner shall retain for a minimum of **five (5) years** from the date of their creation, all records and information related to or resulting from the operation and maintenance activities required by this Approval.

Schedule "A"

1. Application for Environmental Compliance Approval, dated December 2, 2015 and received on February 8, 2016, submitted by the City of Ottawa;

2. Eastern Stormwater Management Facility Design Wateridge Village at Rickcliffe, Phase 1A, dated February 2016, prepared by IBI Group;

3. Set of Engineering Drawings (13 drawings) for Eastern Stormwater Management Facility Phase 1A, Wateridge Village at Rockcliffe, dated February 1, 2016, prepared by IBI Group;

4. Geotechnical Investigation Phase 1A Development - Site Servicing Former CFB Rockcliffe Development Ottawa, Ontario, dated February 1, 2016, prepared by DST Consulting Engineers Inc.;

5. Letter from Shagha Attar of IBI Group to the Ministry, date March 29, 2016;

6. E-mail from Peter Spal of IBI Group to the Ministry, dated April 7, 2016; and

7. E-mail from Shagha Attar of IBI Group to the Ministry, dated April 11, 2016.

The reasons for the imposition of these terms and conditions are as follows:

1. Condition 1 is imposed to ensure that the Works are built and operated in the manner in which they were described for review and upon which approval was granted. This Condition is also included to emphasize the precedence of Conditions in the Approval and the practice that the Approval is based on the most current document, if several conflicting documents are submitted for review.

2. Condition 2 is included to ensure that, when the Works are constructed, the Works will meet the standards that apply at the time of construction to ensure the ongoing protection of the environment.

3. Condition 3 is included to ensure that the Ministry records are kept accurate and current with respect to approved Works and to ensure that any subsequent Owner of the Works is made aware of the Approval and continue to operate the Works in compliance with it.

4. Condition 4 is included to require that the Works be properly operated and maintained such that the environment is protected.

5. Condition 5 is included to enable the Owner to evaluate and demonstrate the performance of the Works on a continual basis, so that the Works are properly operated and maintained at a level which is consistent with the design objectives specified in the Approval and that the Works do not cause any impairment of the receiving watercourse.

6. Condition 6 is included as installation, regular inspection and maintenance of the temporary sediment and erosion control measures is required to mitigate the impact on the downstream receiving watercourse during construction, until they are no longer required.

7. Condition 7 is included to require that all records are retained for a sufficient time period to adequately evaluate the long-term operation and maintenance of the Works.

In accordance with Section 139 of the Environmental Protection Act, you may by written Notice served upon me and the Environmental Review Tribunal within 15 days after receipt of this Notice, require a hearing by the Tribunal. Section 142 of the Environmental Protection Act provides that the Notice requiring the hearing shall state:

1. The portions of the environmental compliance approval or each term or condition in the environmental compliance approval in respect of which the hearing is required, and;
2. The grounds on which you intend to rely at the hearing in relation to each portion appealed.

The Notice should also include:

3. The name of the appellant;
4. The address of the appellant;
5. The environmental compliance approval number;

6. The date of the environmental compliance approval;
7. The name of the Director, and;
8. The municipality or municipalities within which the project is to be engaged in.

And the Notice should be signed and dated by the appellant.

This Notice must be served upon:

The Secretary*
Environmental Review Tribunal
655 Bay Street, Suite 1500
Toronto, Ontario
M5G 1E5

AND

The Director appointed for the purposes of
Part II.1 of the Environmental Protection Act
Ministry of the Environment and
Climate Change
135 St. Clair Avenue West, 1st Floor
Toronto, Ontario
M4V 1P5

*** Further information on the Environmental Review Tribunal's requirements for an appeal can be obtained directly from the Tribunal at: Tel: (416) 212-6349, Fax: (416) 326-5370 or www.ert.gov.on.ca**

The above noted activity is approved under s.20.3 of Part II.1 of the Environmental Protection Act.

DATED AT TORONTO this 12th day of April, 2016



Gregory Zimmer, P.Eng.
Director
appointed for the purposes of Part II.1 of the
Environmental Protection Act

DC/
c: District Manager, MOECC Ottawa office
Peter Spal, IBI Group

Notice of Completion of Class Environmental Assessments (EA)

Former CFB Rockcliffe Airbase

The City of Ottawa has granted approval of the following Concept Plan for lands within the Former CFB Rockcliffe Development area subject to conditions of the *Planning Act* and O. *Reg. 543/06*. The map illustrates the Former CFB Rockcliffe Redevelopment Area.



The City of Ottawa and the Project Team have planned to ensure infrastructure capacity is available for the proposed developments in the approved redevelopment area. This process has been conducted in accordance with Section A.2.9 of the *Municipal Class Environmental Assessment* to integrate approvals under the *Environmental Assessment Act* and the *Planning Act*. As such, approval of the Concept Plan and associated OPA are supported by the following Class EAs which document the preferred municipal infrastructure projects:

- Former CFB Rockcliffe – Master Servicing Study
- Former CFB Rockcliffe – Transportation Master Plan
- Public Consultation Plan

Transportation Projects:

- Two-lane major collector road (26m ROW) from east of Montreal Road to Aviation Parkway, including Hemlock Core Street (24m ROW) (Schedule C)
- Two-lane collector road (26m ROW) from Hemlock to Burma, including a portion of Codd's Road (Schedule C)

Water Supply Projects:

- New watermains in the existing roadways or utility corridors (Schedule A)
- New watermains in future roadways and utility corridors (Schedule B)

Sanitary Servicing Projects:

- New sanitary sewers within existing roadways or utility corridors (Schedule A).
- New sanitary sewers within future roadways and utility corridors (Schedule B).

Stormwater Management Projects:

- New storm sewer system in existing roadways or utility corridors (Schedule A)
- New storm sewer system within future roadways and utility corridors (Schedule B)
- New stormwater retention ponds and appurtenances including outfall (Schedule B)
  - Eastern Stormwater Management Facility and associated sewers and outlet
  - Western Stormwater Management Facility and associated sewers and outlet
  - Park Dry Pond
  - Eastern Dry Pond
  - Central Dry Pond

Enlarge stormwater retention ponds (Schedule B)

- Enlarge Burma Road Stormwater Management Facility

By way of this Notice, the Class EA reports are being placed on the public record for a 30 day review at the following locations:

City Hall, Client Service Centre
110 Laurier Avenue West
Ottawa, ON K1P 1J1
Tel. 613-580-2400

Ottawa Public Library – Rockcliffe Park Branch
380 SpringField
Ottawa ON K1M 0L7
Tel. (613) 580-2940

Ottawa Public Library - Main Branch
3rd Floor (Library Room)
120 Metcalfe Street
Ottawa, ON K1P 5M2
Tel. 613-580-2945

Ottawa Public Library - Vanier Branch
310 Pères Blancs
Ottawa Ontario, K1L 7L5
Tel. (613) 580-2940

The Rockcliffe Project is following an integrated planning and environmental assessment process. This 30 day review period is being provided and any person or public body with objections to any of the projects identified in the Class EAs and/or to the OPA may file an appeal to the Ontario Municipal Board in respect of the OPA in accordance with section 22(7) of the *Planning Act*. The notice of appeal must be received by mail addressed to the City Clerk, at *110 Laurier Avenue West, Ottawa, Ontario, K1P 1J1*, or delivered in person to the Information Desk in the Rotunda on the 1st floor of Ottawa City Hall, 110 Laurier Avenue West, no later than **9 November 2015**, identify in writing the reasons for the appeal and be accompanied by a cheque in the amount $125.00 (payable to the Minister of Finance).

If there are concerns which cannot be resolved in discussion, a party or person may request that the Minister of the Environment make an order for the above noted projects to comply with Part II of the EA Act (Part II Order). Requests must be received by the Minister at the address below within 30 days. A copy of the request must also be sent to the City and the Rockcliffe Redevelopment Proponent.

If no notice of appeal or Part II Order request is received, the decision to approve the Concept Plan and OPA is final. All municipal infrastructure projects identified in the Class EAs for the Rockcliffe Redevelopment area are also approved and can proceed to construction.

Minister of the Environment and Climate Change:
The Honourable Glen Murray
77 Wellesley Street West
11th Floor, Ferguson Block
Toronto ON M7A 2T5
Telephone: (416) 314-6790

Don Schultz
Director, Real Estate
Canada Lands Company (Proponent)
30 Metcalfe Street
Ottawa, ON K1P 5L4
Tel: 613 998 7765
Email: dschultz@clc.ca

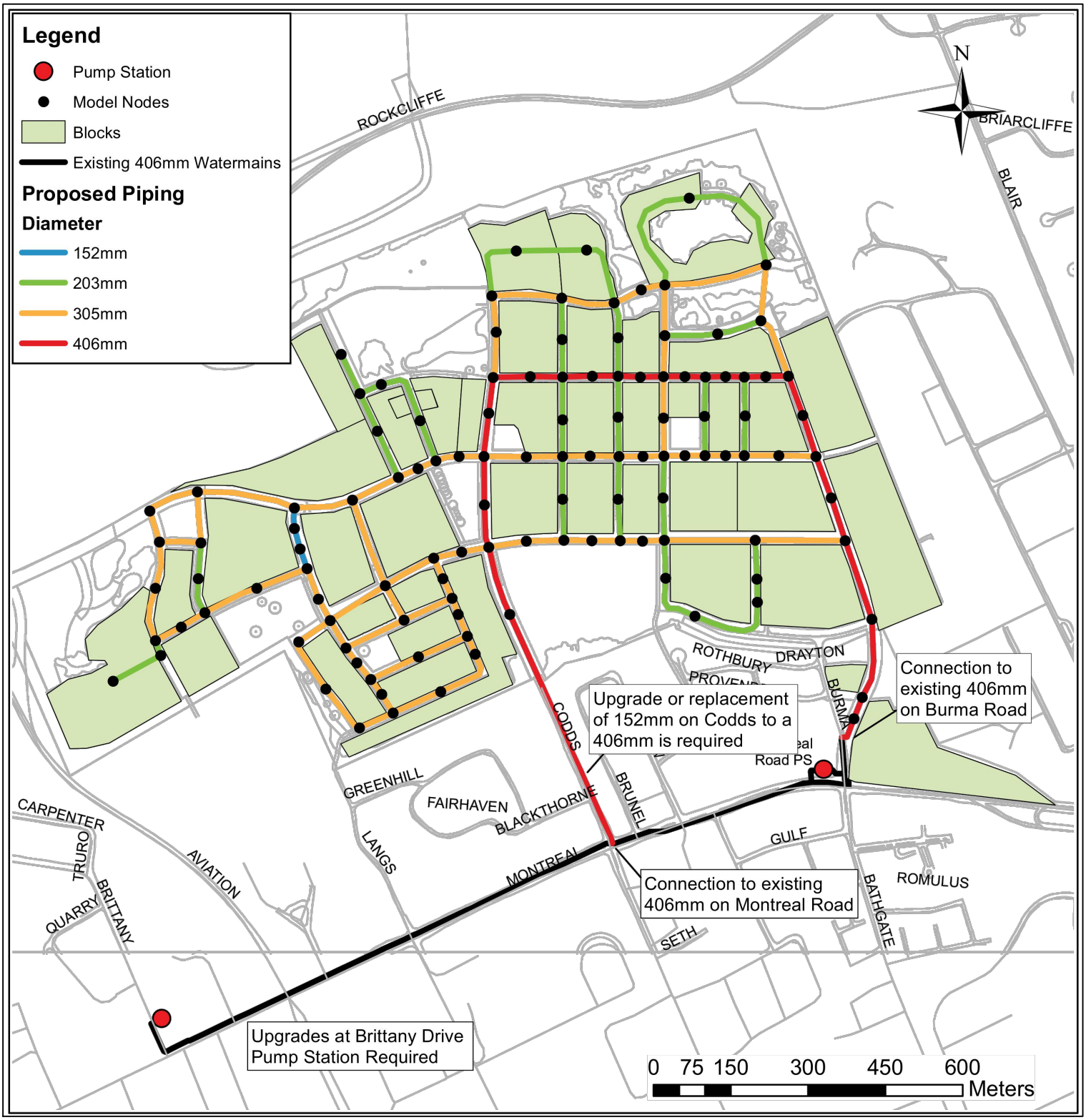
Selma Hassan
City of Ottawa
110 Laurier Avenue West, 4th Floor
Ottawa, ON K1P 1J1
Tel: (613) 580-2424, ext. 27588
Email: Selma.Hassan@ottawa.ca

This Notice was first issued on October 31, 2015.

10649347

APPENDIX B

- Figure 4.4 Proposed Pipe alignment and Diameters
- Watermain Demand Calculation Sheet
- Boundary Conditions
- Water Quality Calculations
- Hydraulic Modeling Results



J:\32952-RockcliffeRedev\5.9 Drawings\59civil\current\Report Figures\MSS 2015\Section 4\FIGURE4.4 Proposed Pipe alignment and Diameters-REV.dwg Layout Name: FIGURE4.4

Stantec

IBI

Project Title	Drawing Title	Sheet No.
FORMER CFB ROCKCLIFFE MASTER SERVICING STUDY	PROPOSED PIPE ALIGNMENT AND DIAMETERS	FIGURE 4.4

IBI GROUP
333 PRESTON STREET
OTTAWA, ON
K1S 5N4

WATERMAIN DEMAND CALCULATION SHEET

PROJECT : FORMER CFB ROCKCLIFFE - PHASE 4
LOCATION : CITY OF OTTAWA

FILE: 118863.5.7
DATE PRINTED: 05-Dec-21
DESIGN: LE
PAGE : 1 OF 1

NODE	RESIDENTIAL UNITS TH/SD	TH/S	APT	POP'N	NON-RESIDENTIAL INDTRL (ha.)	COMM. (ha.)	INST. (ha.)	AVERAGE DAILY DEMAND (l/s) Res.	Non-res.	Total	MAXIMUM DAILY DEMAND (l/s) Res.	Non-res.	Total	MAXIMUM HOURLY DEMAND (l/s) Res.	Non-res.	Total	FIRE DEMAND (l/min)
PHASE 4																	
P05			80	144.0				0.47	0.00	0.47	1.17	0.00	1.17	2.57	0.00	2.57	14,000
P10			106	190.8				0.62	0.00	0.62	1.55	0.00	1.55	3.40	0.00	3.40	14,000
P15			44	79.2				0.26	0.00	0.26	0.64	0.00	0.64	1.41	0.00	1.41	11,000
P20			32	57.6				0.19	0.00	0.19	0.47	0.00	0.47	1.03	0.00	1.03	11,000
P25			32	57.6				0.19	0.00	0.19	0.47	0.00	0.47	1.03	0.00	1.03	14,000
P30			32	57.6				0.19	0.00	0.19	0.47	0.00	0.47	1.03	0.00	1.03	11,000
P35			16	28.8				0.09	0.00	0.09	0.23	0.00	0.23	0.51	0.00	0.51	11,000
P40			16	28.8				0.09	0.00	0.09	0.23	0.00	0.23	0.51	0.00	0.51	11,000
P45			16	28.8				0.09	0.00	0.09	0.23	0.00	0.23	0.51	0.00	0.51	11,000
P50			56	100.8				0.33	0.00	0.33	0.82	0.00	0.82	1.80	0.00	1.80	14,000
P55			40	72.0				0.23	0.00	0.23	0.58	0.00	0.58	1.28	0.00	1.28	14,000
P60			40	72.0				0.23	0.00	0.23	0.58	0.00	0.58	1.28	0.00	1.28	14,000
TOTALS	**0**	**0**	**510**	**918**						**2.98**			**7.44**			**16.36**	

ASSUMPTIONS

RESIDENTIAL DENSITIES
- Townhouse/Semi Detached (TH/SD) 2.7 p / p / u
- Townhouse Stacked (TH/S) 2.3 p / p / u
- Apartment (APT) 1.8 p / p / u

AVG. DAILY DEMAND
- Residential 280 l / cap / day
- ICI 50,000 l / ha / day

MAX. DAILY DEMAND
- Residential 700 l / cap / day
- ICI 75,000 l / ha / day

MAX. HOURLY DEMAND
- Residential 1,540 l / cap / day
- ICI 135,000 l / ha / day

FIRE FLOW
- 12 - 24 Unit Bldg 11,000 l / min
- 40 - 78 Unit Bldg 14,000 l / min

Lance Erion

From: Wessel, Shawn <shawn.wessel@ottawa.ca>
Sent: Thursday, September 23, 2021 2:23 PM
To: Lance Erion
Subject: Waterridge Village Phase 4 - Water Boundary Request
Attachments: WaterRidge Village Rockcliffe Phase 4 September 2021.pdf

Good afternoon Lance.

Please find requested boundary conditions, as per below and attached:

The following are boundary conditions, HGL, for hydraulic analysis at Wateridge Village – Phase 4 (zone MONT) assumed to be connected to the 203mm diameter watermain on Oshedinaa Street and the 203mm diameter watermain on Winisik Street (see attached PDF for location).
Both Connections:

Minimum HGL = 143.0 m

Maximum HGL = 143.0 m

Max Day + Fire Flow (183.3 L/s) = 137.7 m

Max Day + Fire Flow (233.3 L/s) = 134.8 m

The maximum pressure is estimated to be more than 80 psi. A pressure check at completion of construction is recommended to determine if pressure control is required.

These are for current conditions and are based on computer model simulation.

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.

If you require additional information or clarification, please do not hesitate to contact me anytime.

Thank you

Regards,

Shawn Wessel, A.Sc.T.,rcji
Project Manager - Infrastructure Approvals
Gestionnaire de projet – Approbation des demandes d'infrastructures

Development Review Central Branch | Direction de l'examen des projets d'aménagement, Centrale
Planning, Infrastructure and Economic Development Department | Direction générale de la planification de l'infrastructure et du développement économique
City of Ottawa | Ville d'Ottawa
110 Laurier Ave. W. | 110, avenue Laurier Ouest, Ottawa ON K1P 1J1
(613) 580 2424 Ext. | Poste 33017
Int. Mail Code | Code de Courrier Interne 01-14
shawn.wessel@ottawa.ca


Please consider the environment before printing this email

*****Please also note that, while my work hours may be affected by the current situation and am working from home, I still have access to email, video conferencing and telephone. Feel free to schedule video conferences and/or telephone calls, as necessary.*****

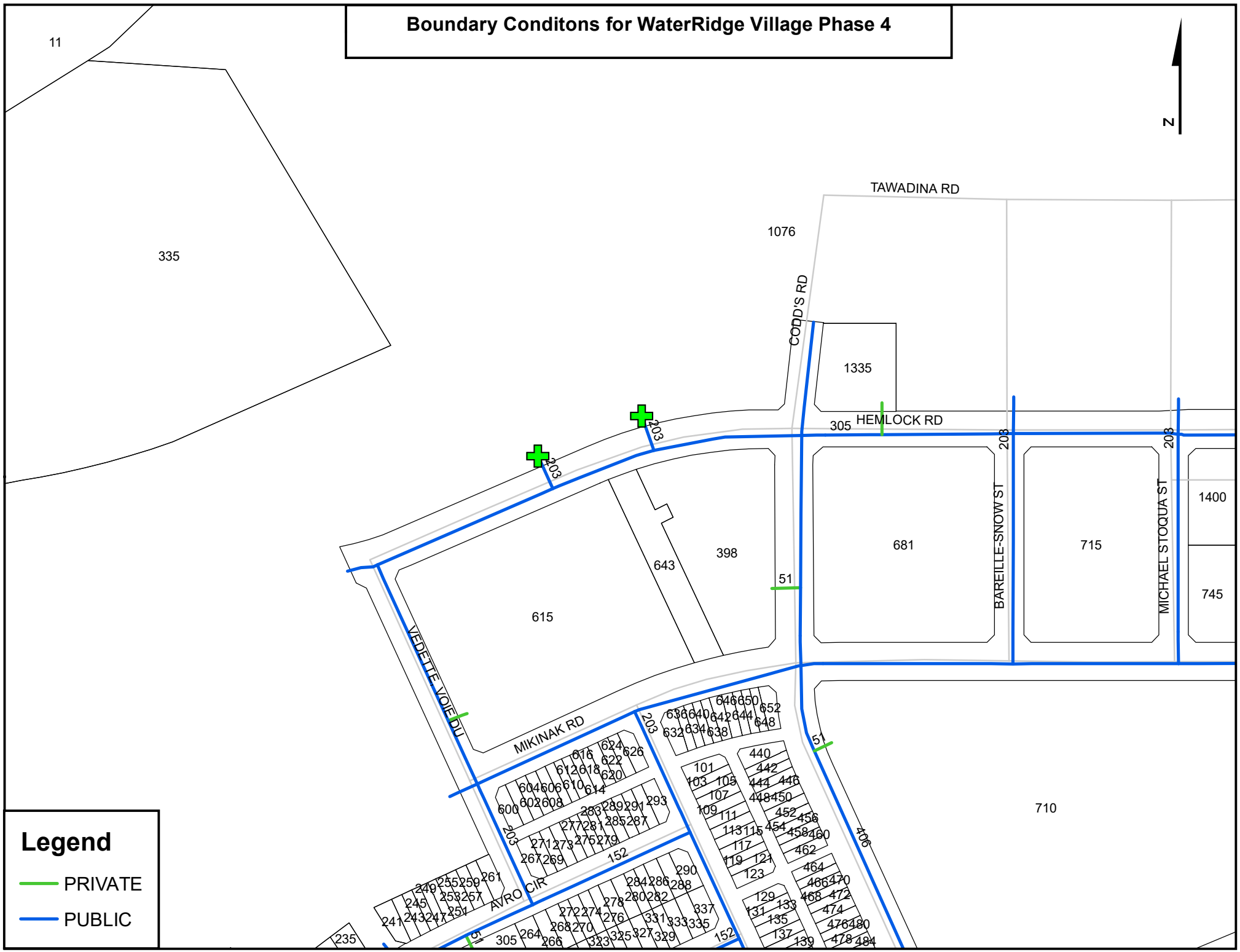
'

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

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

'

Boundary Conditons for WaterRidge Village Phase 4



Fire Flow Requirement from Fire Underwriters Survey

Waterridge Village Phase 4 - Building A Hemlock Road

Building Floor Area

area	1,200	m^2
stories	8	
Area	9,600	m^2

$F = 220C\sqrt{A}$

C	0.8	
A	9,600	m^2
F	17,244	l/min
use	17,000	l/min

C =

1.5	wood frame
1.0	ordinary
0.8	non-combustile
0.6	fire-resistive

Occupancy Adjustment

Use	-15%	
Adjustment	-2,550	l/min
Fire flow	14,450	l/min

-25%	non-combustile
-15%	limited combustile
0%	combustile
+15%	free burning
+25%	rapid burning

Sprinkler Adjustment

Use	-30%	
Adjustment	-4,335	l/min

Exposure Adjustment

Building Face	Separation (m)	Adjacent Exposed Wall			Exposure Charge *
		Length	Stories	L*H Factor	
north	24.0	16.0	4	64	8%
east	30.0	40.0	8	320	5%
south	>45				0%
west	32.0	27.0	4	108	5%
Total					18%

Adjustment	2,601	l/min
Total adjustments	-1,734	l/min
Fire flow	12,716	l/min
Use	**13,000**	**l/min**
	216.7	**l/s**

* Exposure charges from Techinical Bulletin ISTB 2018-02 Appendix H (ISO Method)

Fire Flow Requirement from Fire Underwriters Survey

Waterridge Village Phase 4 - Building B Winisik

Building Floor Area

area	1,367	m^2
stories	6	
Area	8,202	m^2

$F = 220C\sqrt{A}$

C	0.8	
A	8,202	m^2
F	15,939	l/min
use	16,000	l/min

C =
- 1.5 wood frame
- 1.0 ordinary
- 0.8 non-combustile
- 0.6 fire-resistive

Occupancy Adjustment

Use -15%

Adjustment -2,400 l/min

Fire flow 13,600 l/min

- -25% non-combustile
- -15% limited combustile
- 0% combustile
- +15% free burning
- +25% rapid burning

Sprinkler Adjustment

Use -30%

Adjustment -4,080 l/min

Exposure Adjustment

Building Face	Separation (m)	Adjacent Exposed Wall			Exposure Charge *
		Length	Stories	L*H Factor	
north	18.0	34.0	4	136	15%
east	>45				0%
south	23.0	22.0	8	176	10%
west	32.0	27.0	4	108	5%
Total					30%

Adjustment	4,080	l/min
Total adjustments	0	l/min
Fire flow	13,600	l/min
Use	**14,000**	**l/min**
	233.3	**l/s**

* Exposure charges from Techinical Bulletin ISTB 2018-02 Appendix H (ISO Method)

Fire Flow Requirement from Fire Underwriters Survey

Waterridge Village Phase 4 - Building B Oshedinaa

Building Floor Area

width	36	m
depth	26	
stories	4	
Area	3,672	m^2

$F = 220C\sqrt{A}$

C	0.8	
A	3,672	m^2
F	10,665	l/min
use	11,000	l/min

C =
1.5 wood frame
1.0 ordinary
0.8 non-combustile
0.6 fire-resistive

Occupancy Adjustment

Use	-15%	
Adjustment	-1,650	l/min
Fire flow	9,350	l/min

-25% non-combustile
-15% limited combustile
0% combustile
+15% free burning
+25% rapid burning

Sprinkler Adjustment

Use	-30%	
Adjustment	-2,805	l/min

Exposure Adjustment

Building Face	Separation (m)	Adjacent Exposed Wall			Exposure Charge *
		Length	Stories	L*H Factor	
north	8.0	36.0	4	144	19%
east	>45				0%
south	7.0	25.5	4	102	19%
west	>45				0%
Total					38%

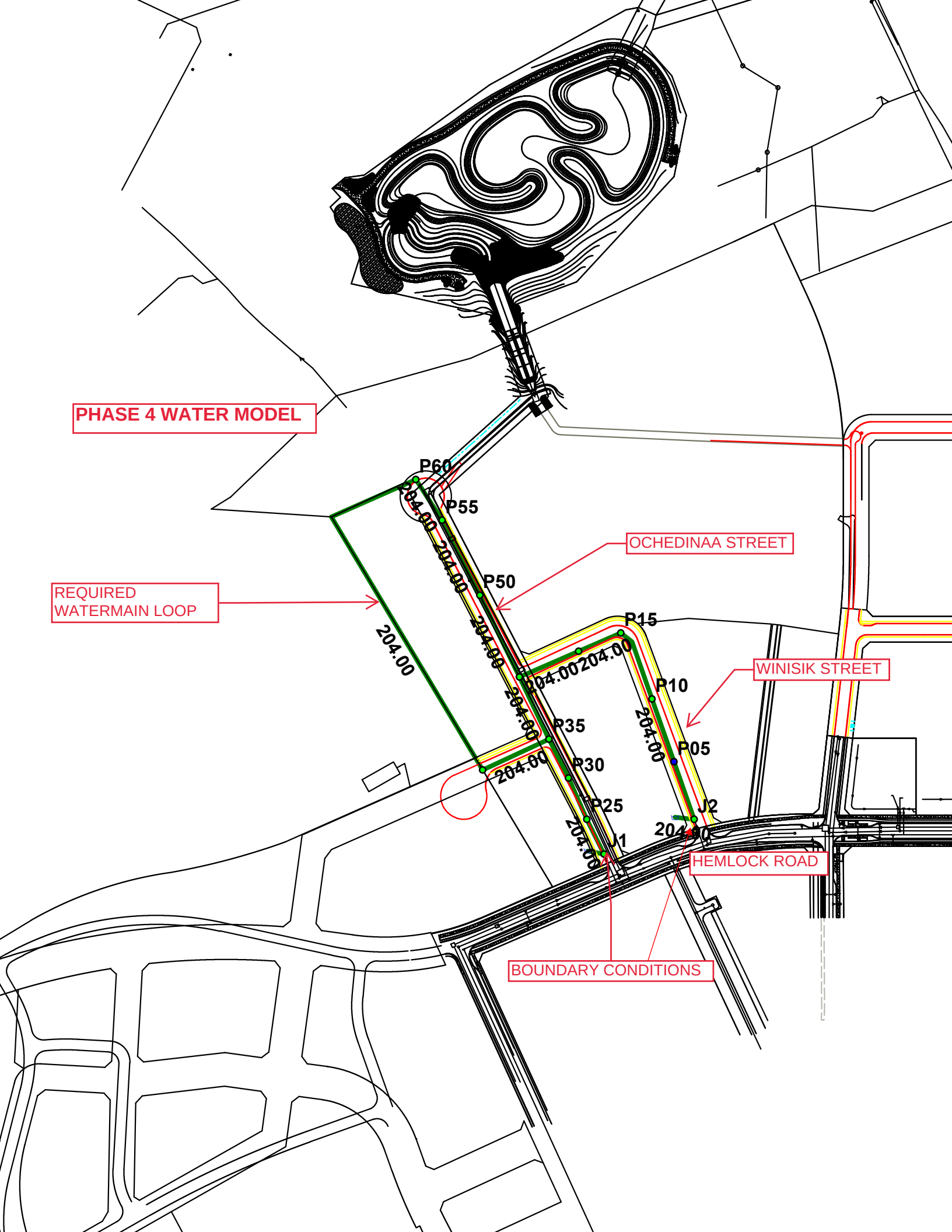
Adjustment	3,553	l/min
Total adjustments	748	l/min
Fire flow	10,098	l/min
Use	**11,000**	**l/min**
	183.3	**l/s**

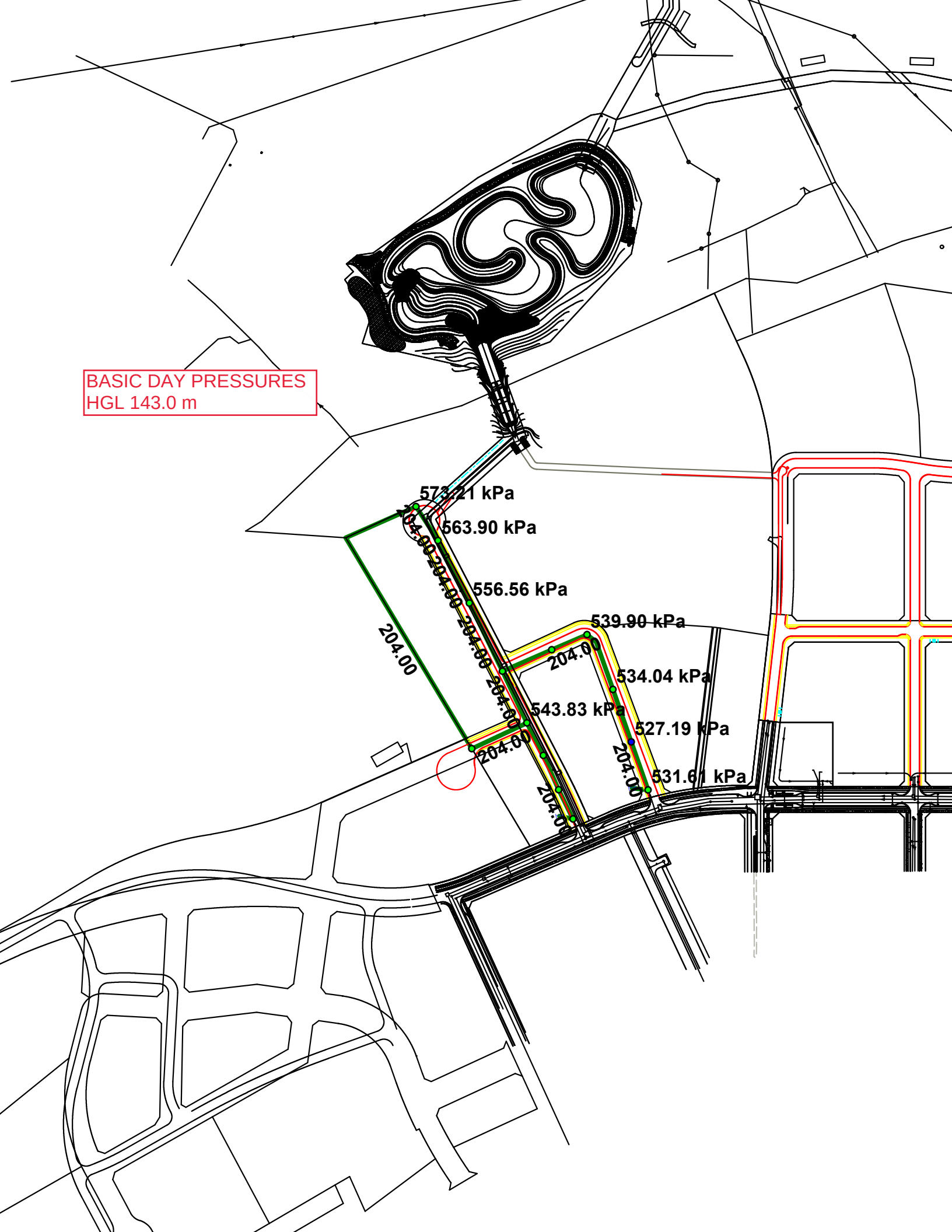
* Exposure charges from Techinical Bulletin ISTB 2018-02 Appendix H (ISO Method)

Waterridge Village Phase 4 Water Quality Analysis

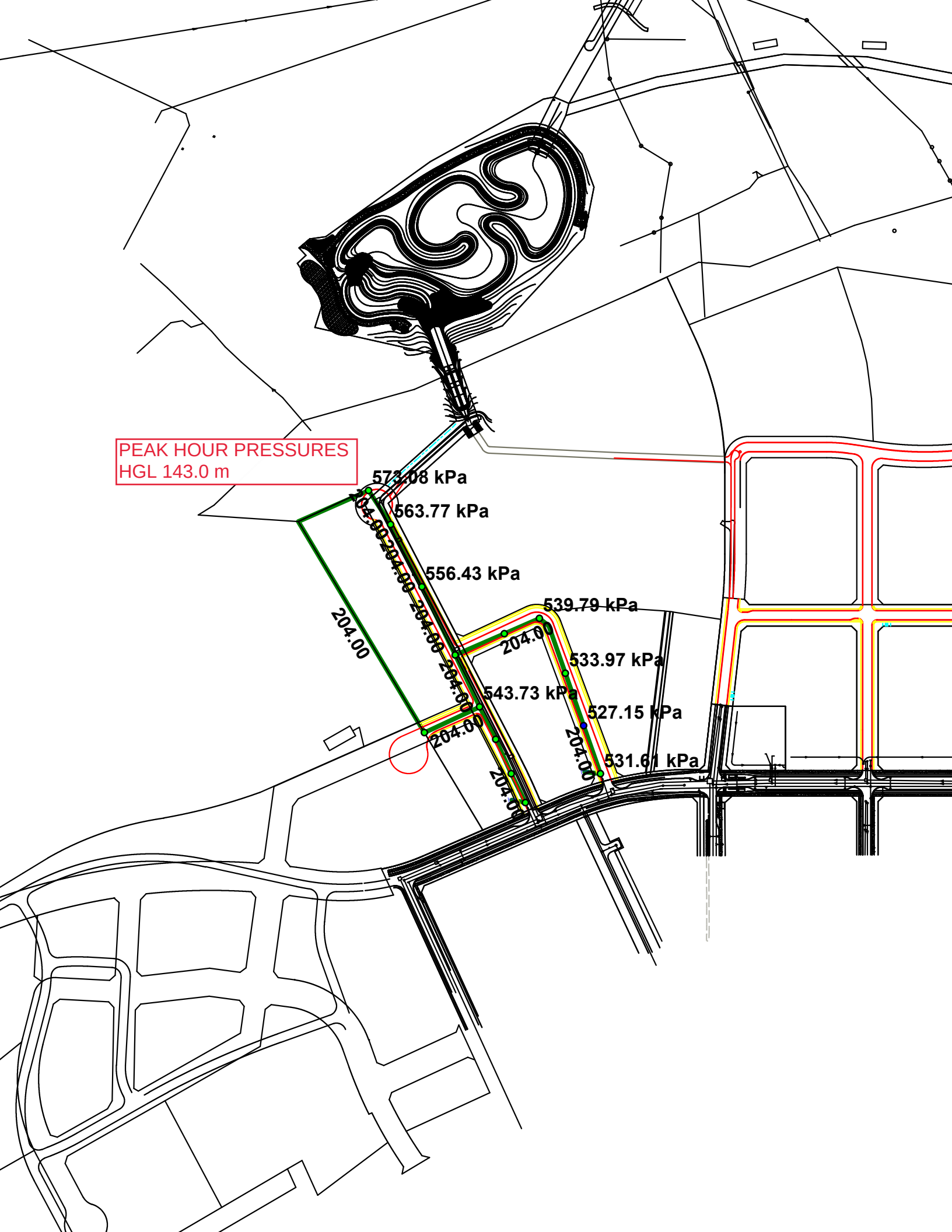
Street	Pipe Size (mm)	Pipe Length (m)	Volume of Water in Pipe (liters)	Population	Basic Flow (200 l/c/d) (l/s)	Time to Empty (hours)
	150	302.0	5,337			
	200	475.1	14,926			
	250	153.1	7,515			
Total			27,778	918	2.13	3.6

0.002314815


PHASE 4 WATER MODEL
P60
P55
P50
P15
P10
P05
P35
P30
P25
J1
J2
204.00
OCHEDINAA STREET
REQUIRED
WATERMAIN LOOP
WINISIK STREET
HEMLOCK ROAD
BOUNDARY CONDITIONS

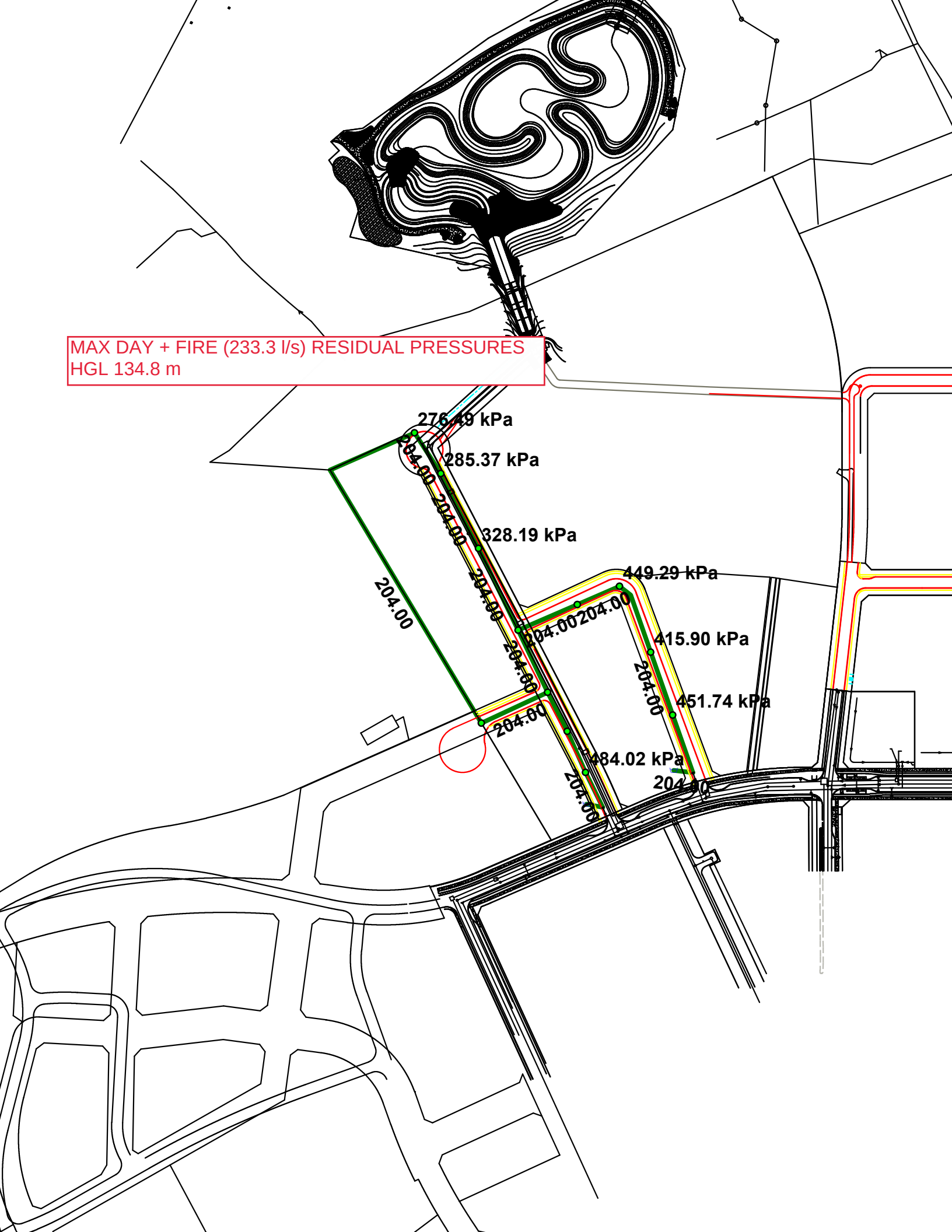

BASIC DAY PRESSURES
HGL 143.0 m
573.21 kPa
563.90 kPa
556.56 kPa
539.90 kPa
534.04 kPa
543.83 kPa
527.19 kPa
531.61 kPa
204.00
204.00
204.00
204.00
204.00
204.00
204.00
204.00
204.00

		ID	Demand (L/s)	Elevation (m)	Head (m)	Pressure (kPa)
1	☐	J1	2.17	88.10	143.00	537.98
2	☐	J2	0.00	88.75	143.00	531.61
3	☐	P05	0.00	89.20	143.00	527.19
4	☐	P10	0.00	88.50	143.00	534.04
5	☐	P15	0.95	87.90	143.00	539.90
6	☐	P20	0.00	87.00	143.00	548.72
7	☐	P25	0.00	88.00	143.00	538.95
8	☐	P30	0.00	87.90	143.00	539.92
9	☐	P35	0.00	87.50	143.00	543.83
10	☐	P40	0.27	86.50	143.00	553.62
11	☐	P45	0.91	86.50	143.00	553.62
12	☐	P50	0.00	86.20	143.00	556.56
13	☐	P55	0.68	85.45	143.00	563.90
14	☐	P60	0.27	84.50	143.00	573.21


PEAK HOUR PRESSURES
HGL 143.0 m
572.08 kPa
563.77 kPa
556.43 kPa
539.79 kPa
533.97 kPa
543.73 kPa
527.15 kPa
531.61 kPa
204.00
204.00
204.00
204.00
204.00
204.00
204.00
204.00
204.00

		ID	Demand (L/s)	Elevation (m)	Head (m)	Pressure (kPa)
1	☐	J1	3.91	88.10	143.00	537.97
2	☐	J2	0.00	88.75	143.00	531.61
3	☐	P05	0.00	89.20	143.00	527.15
4	☐	P10	0.00	88.50	142.99	533.97
5	☐	P15	2.09	87.90	142.99	539.79
6	☐	P20	0.00	87.00	142.98	548.61
7	☐	P25	0.00	88.00	143.00	538.91
8	☐	P30	0.00	87.90	142.99	539.85
9	☐	P35	0.00	87.50	142.99	543.73
10	☐	P40	0.60	86.50	142.99	553.51
11	☐	P45	2.01	86.50	142.98	553.50
12	☐	P50	0.00	86.20	142.98	556.43
13	☐	P55	1.50	85.45	142.98	563.77
14	☐	P60	0.60	84.50	142.98	573.08

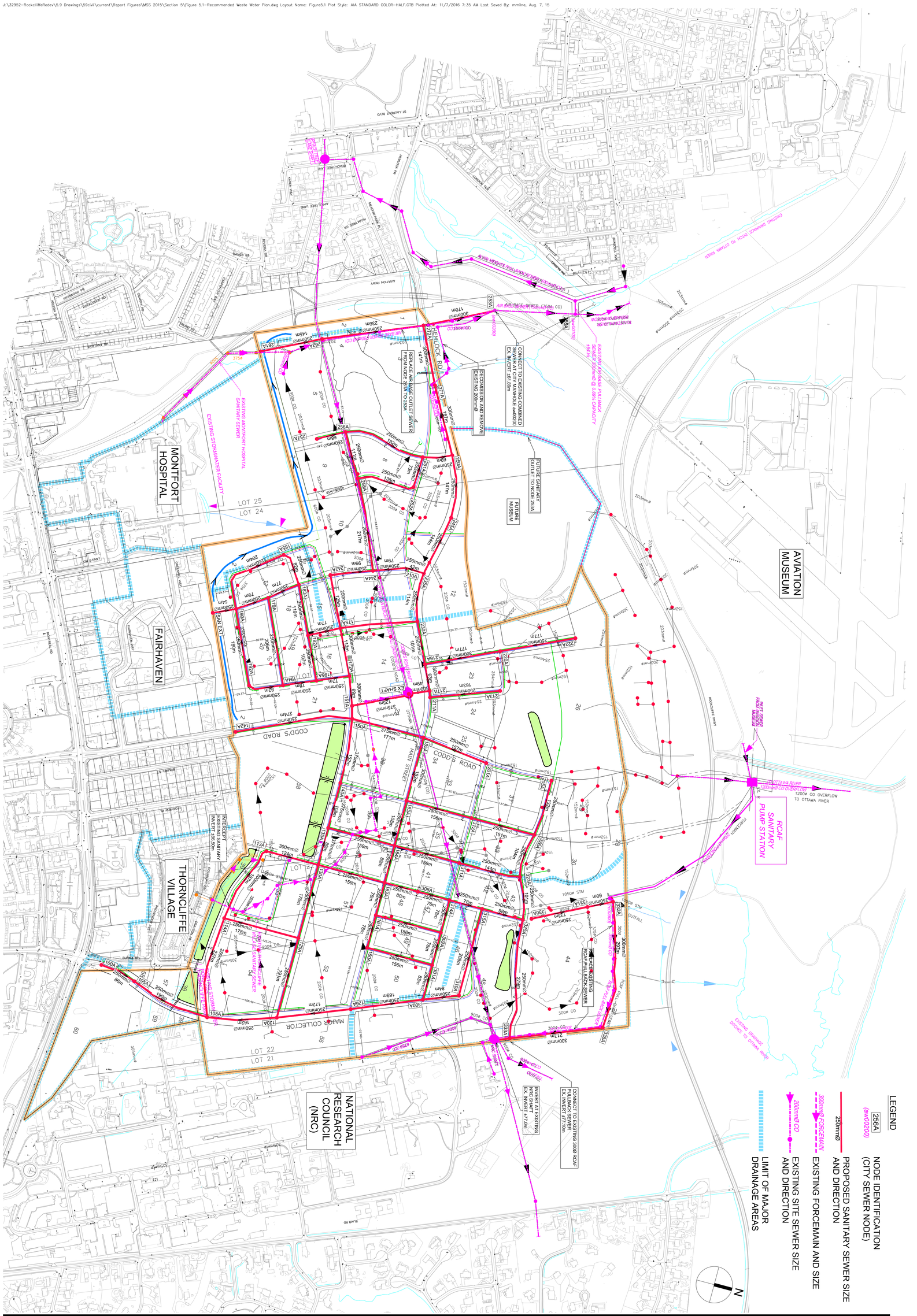
		ID	From Node	To Node	Length (m)	Diameter (mm)	Roughness	Flow (L/s)	Velocity (m/s)	Headloss (m)	HL/1000 (m/k-m)	Status	Flow Reversal Count
1	☐	123	J1	P25	30.34	204.00	110.00	3.69	0.11	0.00	0.13	Open	0
2	☐	125	P45	P50	70.95	204.00	110.00	1.16	0.04	0.00	0.01	Open	0
3	☐	127	P55	P60	37.85	204.00	110.00	-0.34	0.01	0.00	0.00	Open	0
4	☐	131	P40	P35	57.08	204.00	110.00	-1.54	0.05	0.00	0.03	Open	0
5	☐	133	P45	P20	50.29	204.00	110.00	-1.02	0.03	0.00	0.01	Open	0
6	☐	135	P15	P10	58.25	204.00	110.00	-3.11	0.10	0.01	0.09	Open	0
7	☐	P11	CON1	J1	1.00	204.00	110.00	7.60	0.23	0.00	0.48	Open	0
8	☐	P13	CON2	J2	1.00	204.00	110.00	3.11	0.10	0.00	0.09	Open	0
9	☐	P15	P05	J2	47.58	204.00	110.00	-3.11	0.10	0.00	0.09	Open	0
10	☐	P17	P10	P05	51.89	204.00	110.00	-3.11	0.10	0.00	0.09	Open	0
11	☐	P19	P20	P15	35.94	204.00	110.00	-1.02	0.03	0.00	0.01	Open	0
12	☐	P21	P35	P45	53.54	204.00	110.00	2.15	0.07	0.00	0.05	Open	0
13	☐	P23	P50	P55	65.31	204.00	110.00	1.16	0.04	0.00	0.01	Open	0
14	☐	P25	P25	P30	35.20	204.00	110.00	3.69	0.11	0.00	0.13	Open	0
15	☐	P27	P30	P35	33.98	204.00	110.00	3.69	0.11	0.00	0.13	Open	0
16	☐	P29	P60	P40	301.95	204.00	110.00	-0.94	0.03	0.00	0.01	Open	0


MAX DAY + FIRE (233.3 l/s) RESIDUAL PRESSURES
HGL 134.8 m
276.49 kPa
285.37 kPa
328.19 kPa
449.29 kPa
415.90 kPa
451.74 kPa
484.02 kPa
204.00

		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	☐	P05	233.30	566.26	P05	139.96	451.74	139.96	566.27	139.96
2	☐	P10	233.30	448.66	P10	139.96	415.90	139.96	448.66	139.96
3	☐	P15	184.25	412.21	P15	139.96	449.29	139.96	412.21	139.96
4	☐	P20	183.30	411.60	P20	139.96	456.22	139.96	411.60	139.97
5	☐	P25	233.30	684.51	P25	139.96	484.02	139.96	684.51	139.97
6	☐	P30	183.30	513.53	P30	139.96	479.72	139.96	513.53	139.97
7	☐	P35	183.30	453.85	P35	139.96	467.38	139.96	453.85	139.97
8	☐	P40	183.57	340.37	P40	139.96	420.91	139.96	340.37	139.97
9	☐	P45	184.21	430.54	P45	139.96	466.93	139.96	430.54	139.97
10	☐	P50	233.30	323.46	P50	139.96	328.19	139.96	323.46	139.96
11	☐	P55	233.98	293.81	P55	139.96	285.37	139.96	293.81	139.96
12	☐	P60	233.57	286.83	P60	139.96	276.49	139.96	286.83	139.96

APPENDIX C

- Figure 5.1 – Recommended Wastewater Plan (MSS)
- Figure 3.1 – Recommended Wastewater Plan
- Temporary ICD Calculations
- Sanitary Sewer Design Sheets
- Sanitary Drainage Area Plans - Drawings 118863-410



Sheet No.

FIGURE 5.1

Drawing Title

RECOMMENDED WASTEWATER PLAN

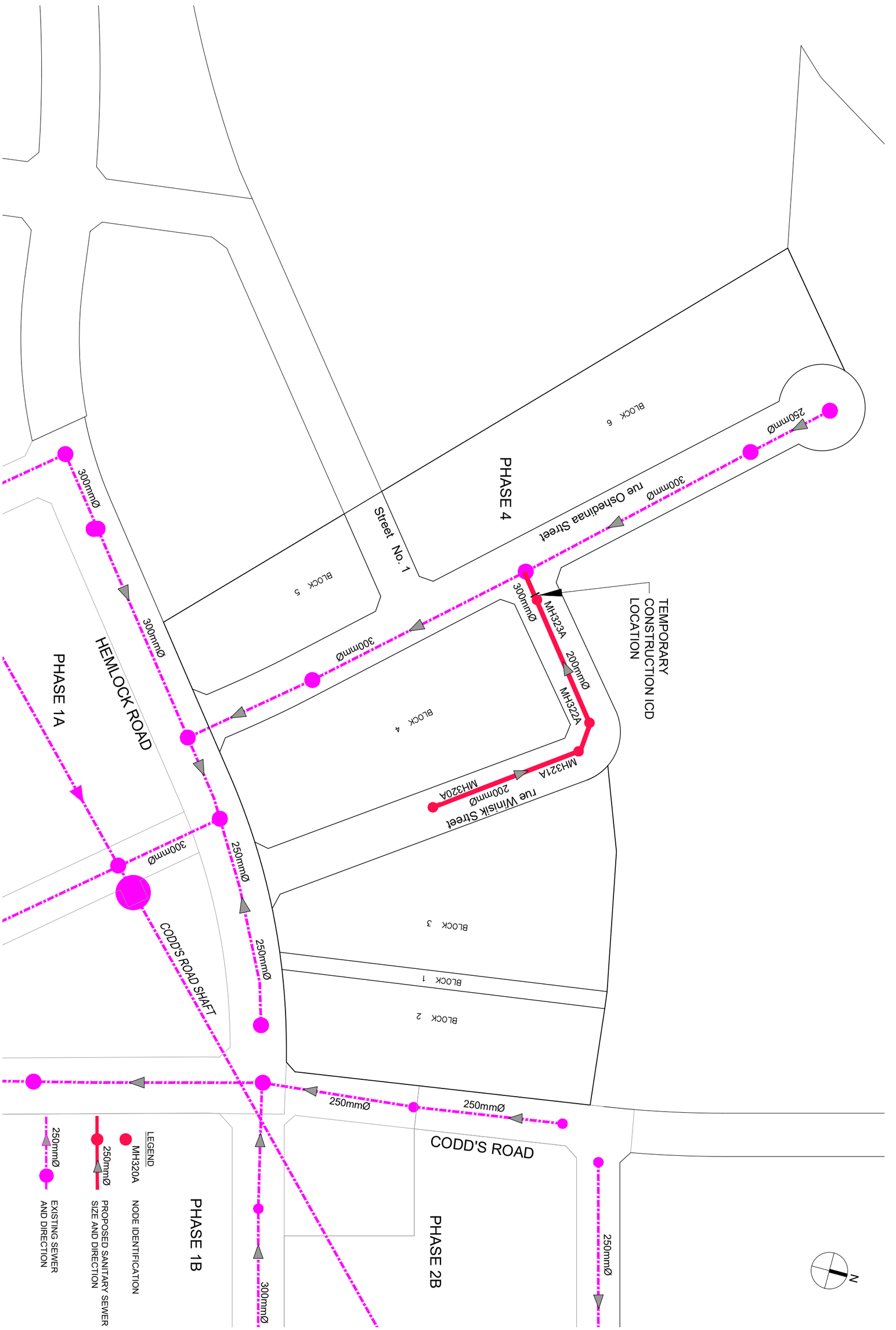
Project Title

FORMER CFB ROCKCLIFFE MASTER SERVICING STUDY

Scale

IBI

J:\118863_Wtridge2A28\5.9 Drawings\59civil\current\Design Brief\Phase 4\Figure 3.1 Recommended Wastewater Plan.dwg Layout Name: FIGURE 3.1 Plot Style: AIA STANDARD COLOR-HALF.CTB Plot Scale: 1:0.969 Plotted At: 12/9/2021 10:33 AM Last Saved By: mmilne Last Saved At: Dec. 9, 21



Sheet No.

FIGURE 3.1

Drawing Title

RECOMMENDED WASTEWATER PLAN

Project Title

DESIGN BRIEF
WATERIDGE VILLAGE
AT ROCKCKIFFE
PHASE 4

Scale

0 100 200

IBI

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

LEGEND
MH176 Existing infrastructure (shown for information only)

SANITARY SEWER DESIGN SHEET

Wateridge at Rockcliffe - Phase 4
City of Ottawa
Canada Lands Company

LOCATION				RESIDENTIAL										ICI AREAS								INFILTRATION ALLOWANCE			FIXED FLOW (L/s)		TOTAL FLOW	PROPOSED SEWER DESIGN						
				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				CAPACITY	LENGTH	DIA	SLOPE	VELOCITY (full) (m/s)	AVAILABLE CAPACITY	
STREET	AREA ID	FROM MH	TO MH		SF	SD / TH/F	TH/S	APT		IND	CUM			INSTITUTIONAL		COMMERCIAL		INDUSTRIAL				IND	CUM	(L/s)	IND	CUM	(L/s)	(L/s)	(m)	(mm)	(%)		L/s	(%)
														IND	CUM	IND	CUM	IND	CUM														
Winisik Street	MH320A	MH320A	MH321A	1.48				174		330.6	330.6	3.45	3.69	0.00	0.00	0.09	0.09	0.00	0.00	1.00	0.03	1.57	1.57	0.52	0.00	0.00	4.24	72.08	100.50	250	1.35	1.423	67.84	94.12%
Winisik Street		MH321A	MH322A	0.00						0.0	330.6	3.45	3.69	0.00	0.00	0.00	0.09	0.00	0.00	1.00	0.03	0.00	1.57	0.52	0.00	0.00	4.24	72.08	12.05	250	1.35	1.423	67.84	94.12%
Winisik Street	MH323A	MH322A	MH191A	1.15				136		258.4	589.0	3.35	6.39	0.00	0.00	0.12	0.21	0.00	0.00	1.00	0.07	1.27	2.84	0.94	0.00	0.00	7.40	75.98	83.75	250	1.50	1.500	68.58	90.26%
Oshedinaa Street	*MH193A*	*MH193A*	*MH192A*	*1.69*				*168*	*1.18*	*319.2*	*319.2*	*3.45*	*3.57*	*0.00*	*0.00*	*0.00*	*0.00*	*0.00*	*0.00*	*1.00*	*0.00*	*2.87*	*2.87*	*0.95*	*0.00*	*0.00*	*4.52*	*54.44*	*83.66*	*250*	*0.77*	*1.074*	*49.92*	*91.70%*
Oshedinaa Street		*MH192A*	*MH191A*					*43*		*81.7*	*400.9*	*3.42*	*4.44*	*0.00*	*0.00*	*0.00*	*0.00*	*0.00*	*0.00*	*1.00*	*0.00*	*0.00*	*2.87*	*0.95*	*0.00*	*0.00*	*5.39*	*49.42*	*83.87*	*300*	*0.24*	*0.677*	*44.03*	*89.10%*
Oshedinaa Street	*MH190A*	*MH191A*	*MH190A*	*0.76*				*48*		*91.2*	*1081.1*	*3.22*	*11.29*	*0.00*	*0.00*	*0.00*	*0.21*	*0.00*	*0.00*	*1.00*	*0.07*	*0.76*	*6.47*	*2.14*	*0.00*	*0.00*	*13.49*	*43.97*	*104.71*	*300*	*0.19*	*0.603*	*30.48*	*69.32%*

Design Parameters:

Residential		
SF	3.2	p/p/u
TH/F/SD	2.4	p/p/u
TH/S	2.4	p/p/u
APT	1.9	p/p/u
Other	60	p/p/Ha

ICI Areas		
INST	28,000	L/Ha/day
COM	28,000	L/Ha/day
IND	35,000	L/Ha/day
	17000	L/Ha/day

MOE Chart

Notes:
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

Designed: AC
Checked: J.I.M.
Dwg. Reference: 118863-410

No.	Revision	Date
1	Submission No. 1 for City Review	2018-12-20
2	Submission No. 2 for City Review	2020-07-03
3	Submission No. 3 for City Review	2021-12-13
4	Submission No. 4 for City Review	2022-09-21

File Reference: 118863.5.7.1
Date: 2020-06-03
Sheet No: 1 of 1


1524mmø WM PIPE
MH193A
1.69 319.2
MH323A
1.15 258.4
MH320A
1.48 330.6
MH240
0.43 59.6
MH170
0.23 81.7
MH190A
0.76 91.2
MH317A
MH317B
MH317C
MH317D
MH317E
MH317F
MH317G
MH317H
MH317J
MH317K
MH317L
MH317M
MH317N
MH317P
MH317Q
MH317R
MH317S
MH317T
MH317U
MH317V
MH317W
MH317X
MH317Y
MH317Z
MH177A
MH177B
MH176A
MH179A
MH179B
MH179C
MH179D
MH179E
MH179F
MH179G
MH179H
MH179J
MH179K
MH179L
MH179M
MH179N
MH179P
MH179Q
MH179R
MH179S
MH179T
MH179U
MH179V
MH179W
MH179X
MH179Y
MH179Z
MH180A
MH180B
MH180C
MH180D
MH180E
MH180F
MH180G
MH180H
MH180J
MH180K
MH180L
MH180M
MH180N
MH180P
MH180Q
MH180R
MH180S
MH180T
MH180U
MH180V
MH180W
MH180X
MH180Y
MH180Z
MH181A
MH181B
MH181C
MH181D
MH181E
MH181F
MH181G
MH181H
MH181J
MH181K
MH181L
MH181M
MH181N
MH181P
MH181Q
MH181R
MH181S
MH181T
MH181U
MH181V
MH181W
MH181X
MH181Y
MH181Z
MH182A
MH182B
MH182C
MH182D
MH182E
MH182F
MH182G
MH182H
MH182J
MH182K
MH182L
MH182M
MH182N
MH182P
MH182Q
MH182R
MH182S
MH182T
MH182U
MH182V
MH182W
MH182X
MH182Y
MH182Z
MH183A
MH183B
MH183C
MH183D
MH183E
MH183F
MH183G
MH183H
MH183J
MH183K
MH183L
MH183M
MH183N
MH183P
MH183Q
MH183R
MH183S
MH183T
MH183U
MH183V
MH183W
MH183X
MH183Y
MH183Z
MH184A
MH184B
MH184C
MH184D
MH184E
MH184F
MH184G
MH184H
MH184J
MH184K
MH184L
MH184M
MH184N
MH184P
MH184Q
MH184R
MH184S
MH184T
MH184U
MH184V
MH184W
MH184X
MH184Y
MH184Z
MH185A
MH185B
MH185C
MH185D
MH185E
MH185F
MH185G
MH185H
MH185J
MH185K
MH185L
MH185M
MH185N
MH185P
MH185Q
MH185R
MH185S
MH185T
MH185U
MH185V
MH185W
MH185X
MH185Y
MH185Z
MH186A
MH186B
MH186C
MH186D
MH186E
MH186F
MH186G
MH186H
MH186J
MH186K
MH186L
MH186M
MH186N
MH186P
MH186Q
MH186R
MH186S
MH186T
MH186U
MH186V
MH186W
MH186X
MH186Y
MH186Z
MH187A
MH187B
MH187C
MH187D
MH187E
MH187F
MH187G
MH187H
MH187J
MH187K
MH187L
MH187M
MH187N
MH187P
MH187Q
MH187R
MH187S
MH187T
MH187U
MH187V
MH187W
MH187X
MH187Y
MH187Z
MH188A
MH188B
MH188C
MH188D
MH188E
MH188F
MH188G
MH188H
MH188J
MH188K
MH188L
MH188M
MH188N
MH188P
MH188Q
MH188R
MH188S
MH188T
MH188U
MH188V
MH188W
MH188X
MH188Y
MH188Z
MH189A
MH189B
MH189C
MH189D
MH189E
MH189F
MH189G
MH189H
MH189J
MH189K
MH189L
MH189M
MH189N
MH189P
MH189Q
MH189R
MH189S
MH189T
MH189U
MH189V
MH189W
MH189X
MH189Y
MH189Z
MH190B
MH190C
MH190D
MH190E
MH190F
MH190G
MH190H
MH190J
MH190K
MH190L
MH190M
MH190N
MH190P
MH190Q
MH190R
MH190S
MH190T
MH190U
MH190V
MH190W
MH190X
MH190Y
MH190Z
MH191A
MH191B
MH191C
MH191D
MH191E
MH191F
MH191G
MH191H
MH191J
MH191K
MH191L
MH191M
MH191N
MH191P
MH191Q
MH191R
MH191S
MH191T
MH191U
MH191V
MH191W
MH191X
MH191Y
MH191Z
MH192A
MH192B
MH192C
MH192D
MH192E
MH192F
MH192G
MH192H
MH192J
MH192K
MH192L
MH192M
MH192N
MH192P
MH192Q
MH192R
MH192S
MH192T
MH192U
MH192V
MH192W
MH192X
MH192Y
MH192Z
MH193B
MH193C
MH193D
MH193E
MH193F
MH193G
MH193H
MH193J
MH193K
MH193L
MH193M
MH193N
MH193P
MH193Q
MH193R
MH193S
MH193T
MH193U
MH193V
MH193W
MH193X
MH193Y
MH193Z
MH194A
MH194B
MH194C
MH194D
MH194E
MH194F
MH194G
MH194H
MH194J
MH194K
MH194L
MH194M
MH194N
MH194P
MH194Q
MH194R
MH194S
MH194T
MH194U
MH194V
MH194W
MH194X
MH194Y
MH194Z
MH195A
MH195B
MH195C
MH195D
MH195E
MH195F
MH195G
MH195H
MH195J
MH195K
MH195L
MH195M
MH195N
MH195P
MH195Q
MH195R
MH195S
MH195T
MH195U
MH195V
MH195W
MH195X
MH195Y
MH195Z
MH196A

Sanitary Temporary Construction ICDs
Wateridge Village Phase 4

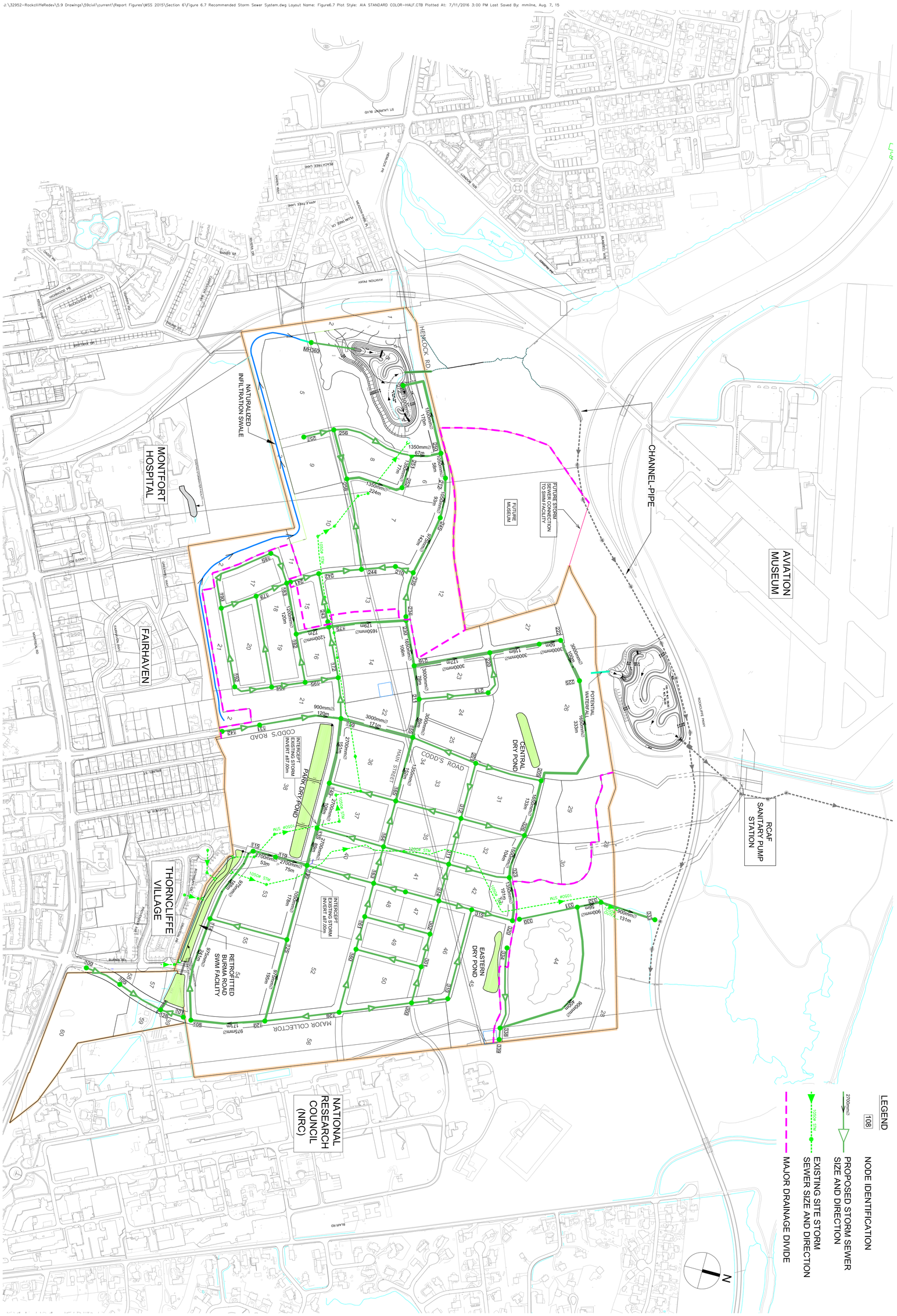
Structure	Flow (l/s)	Grade Elev. (m)	Pipe Invert (m)	Pipe Size (m)	Height (m)	Area (Sq m)	Orifice Size	
							Sq. mm	mm dia.
Sanitary								
Winisik Street (MH322A)	7.40	86.55	82.40	0.250	4.02	0.001	37	42

Based On Equation: Where: A=(Q/(C*(2*g*h)^.5)
C= 0.61
g= 9.81

APPENDIX D

- Figure 6.7 – Recommended Storm Sewer System (MSS)
- Figure 4.1 – Recommended Minor Storm Plan
- Storm Sewer Design Sheets
- Storm Drainage Area Plans - Drawing 118863-510,
- Temporary Ditch Inlet ICD Calculations
- Time of Concentration Calculations
- Major Overflow Ditch Design

J:\32952-RockcliffeRedev\5.9 Drawings\59civil\current\Report Figures\MSS 2015\Section 6\Figure 6.7 Recommended Storm Sewer System.dwg Layout Name: Figure6.7 Plot Style: AIA STANDARD COLOR-HALF.CTB Plotted At: 7/11/2016 3:00 PM Last Saved By: mmilne, Aug. 7, 15



Sheet No.	Drawing Title	Project Title	Scale
FIGURE 6.7	RECOMMENDED STORM SEWER SYSTEM	FORMER CFB ROCKCLIFFE MASTER SERVICING STUDY	0 100 200

IBI

J:\118863_Wtridge2A28\5.9 Drawings\59civil\current\Design Brief\Phase 4\Figure 4.1 Recommended Minor Storm Plan.dwg Layout Name: FIGURE 4.1 Plot Style: AIA STANDARD COLOR-HALF.CTB Plot Scale: 1:0.969 Plotted At: 12/9/2021 10:33 AM Last Saved By: mmline Last Saved At: Dec. 9, 21



Sheet No.

FIGURE 4.1

Drawing Title

RECOMMENDED MINOR STORM PLAN

Project Title

DESIGN BRIEF
WATERIDGE VILLAGE
AT ROCKCLIFFE
PHASE 4

Scale

0 100 200

IBI

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

LEGEND

Black text	5 year event curve design
Blue text	100 year event curve design
MH191	Existing infrastructure (shown for information only)

STORM SEWER DESIGN SHEET

Wateridge at Rockcliffe - Phase 4
City of Ottawa
Canada Lands Company

LOCATION				AREA (Ha)										RATIONAL DESIGN FLOW													SEWER DATA								
STREET	AREA ID	FROM	TO	C= 0.20	C= 0.30	C= 0.40	C= 0.49	C= 0.57	C= 0.65	C= 0.66	C= 0.70	C= 0.73	C= 0.80	IND 2.78AC	CUM 2.78AC	INLET (min)	TIME IN PIPE	TOTAL (min)	i (2) (mm/hr)	i (5) (mm/hr)	i (10) (mm/hr)	i (100) (mm/hr)	2yr PEAK FLOW (L/s)	5yr PEAK FLOW (L/s)	10yr PEAK FLOW (L/s)	100yr PEAK FLOW (L/s)	FIXED FLOW (L/s)	DESIGN FLOW (L/s)	CAPACITY (L/s)	LENGTH (m)	PIPE SIZE (mm) DIA	PIPE SIZE (mm) W	PIPE SIZE (mm) H	SLOPE (%)	VELOCITY (m/s)	AVAIL CAP (2yr) (L/s)	AVAIL CAP (2yr) (%)
PHASE 1A AS-BUILT DESIGN SHEET - AUGUST 2017															107.74	21.53																				
Oshedinaa Street	*S180A, B180A*	*MH180*	*MH190*								*0.12*		*0.42*	*1.17*	*108.91*	*21.53*	*0.42*	*21.95*	*49.69*	*67.06*	*78.46*	*114.46*		*7,303.61*			*6,660.00*	*13,963.61*	*18,135.33*	*62.96*	*3000*			*0.15*	*2.485*	*4171.72*	*23.00%*
Oshedinaa Street	*S190, S191B*	*MH190*	*MH191*								*0.17*			*0.33*	*109.24*	*21.95*	*0.85*	*22.81*	*49.09*	*66.24*	*77.50*	*113.04*		*7,235.77*			*6,660.00*	*13,895.77*	*16,220.73*	*113.83*	*3000*			*0.12*	*2.223*	*2324.96*	*14.33%*
Winisik Street	S319	MH319	MH320								0.14			0.27	0.27	10.00	1.01	11.01	76.81	104.19	122.14	178.56		28.39				28.39	43.87	52.70	250			0.50	0.866	15.48	35.29%
Winisik Street	S320, B319	MH320	MH321								0.18		1.00	2.57	2.85	11.01	0.74	11.76	73.12	99.12	116.17	169.79		282.18				282.18	521.29	103.82	525			1.35	2.333	239.12	45.87%
Winisik Street		MH321	MH322											0.00	2.85	11.76	0.09	11.85	70.66	95.75	112.20	163.95		272.57				272.57	521.29	12.44	525			1.35	2.333	248.72	47.71%
Winisik Street	B323, S322	MH322	MH323								0.18		0.95	2.46	5.31	11.85	0.42	12.26	70.38	95.36	111.74	163.28		506.35				506.35	784.52	67.45	600			1.50	2.688	278.17	35.46%
Winisik Street	*S190B, S191A*	*MH323*	*MH191*								*0.15*			*0.29*	*5.60*	*12.26*	*0.10*	*12.37*	*69.08*	*93.59*	*109.65*	*160.21*		*524.24*				*524.24*	*640.56*	*13.71*	*600*			*1.00*	*2.195*	*116.32*	*18.16%*
Kijigong Road			*MH 191*											0.00	0.00	10.00	0.77	10.77	76.81	104.19	122.14	178.56		0.00				0.00	43.87	40.00	250			0.50	0.866	43.87	100.00%
Oshedinaa Street	*S191, S190A*	*MH191*	*MH192*								*0.25*			*0.49*	*115.33*	*22.81*	*0.67*	*23.47*	*47.92*	*64.64*	*75.62*	*110.29*		*7,454.65*			*6,660.00*	*14,114.65*	*20,940.87*	*115.05*	*3000*			*0.20*	*2.870*	*6826.23*	*32.60%*
Oshedinaa Street	*B191, P191, S192*	*MH192*	*MH193*		*1.18*						*0.15*		*1.17*	*3.88*	*119.20*	*23.47*	*0.23*	*23.70*	*47.04*	*63.45*	*74.22*	*108.23*		*7,563.10*			*6,660.00*	*14,223.10*	*21,962.97*	*41.76*	*3000*			*0.22*	*3.010*	*7739.88*	*35.24%*
		DI 1	*MH193*											0.00	0.00	10.00	0.10	10.10	76.81	104.19	122.14	178.56				283.00		283.00	420.63	*15.00*	*450*			*2.00*	2.562	137.63	32.72%
Oshedinaa Street	*S193*	*MH193*	*MH194*								*0.13*			*0.25*	*119.46*	*23.70*	*0.68*	*24.38*	*46.74*	*63.04*	*73.75*	*107.54*		*7,531.17*			*6,660.00*	*14,191.17*	*19,306.53*	*107.85*	*3000*			*0.17*	*2.646*	*5115.36*	*26.50%*
TEMPORARY DITCH INLETS																																				
Block 3	-	DI 6	Pipe	1.00										0.56	0.56	51.82	0.18	52.00	27.33	36.69	42.83	62.30				34.64		34.64	62.04	12.89	250			1.00	1.224	27.40	44.17%
Block 4	-	DI 8	Pipe	0.60										0.33	0.33	47.23	0.24	47.47	29.21	39.24	45.82	66.67				22.24		22.24	62.04	17.90	250			1.00	1.224	39.80	64.15%
Block 4	-	DI 9	Pipe	0.35										0.19	0.19	32.88	0.28	33.16	37.64	50.66	59.21	86.25				16.78		16.78	62.04	20.81	250			1.00	1.224	45.25	72.94%
Block 5	-	DI 10	Pipe	0.42										0.23	0.23	60.52	0.18	60.70	24.40	32.73	38.21	55.54				12.97		12.97	62.04	13.20	250			1.00	1.224	49.07	79.10%
Block 6	-	DI 11	Pipe	1.17										0.65	0.65	111.60	0.44	112.04	15.40	20.59	24.00	34.81				22.64		22.64	62.04	32.46	250			1.00	1.224	39.39	63.50%

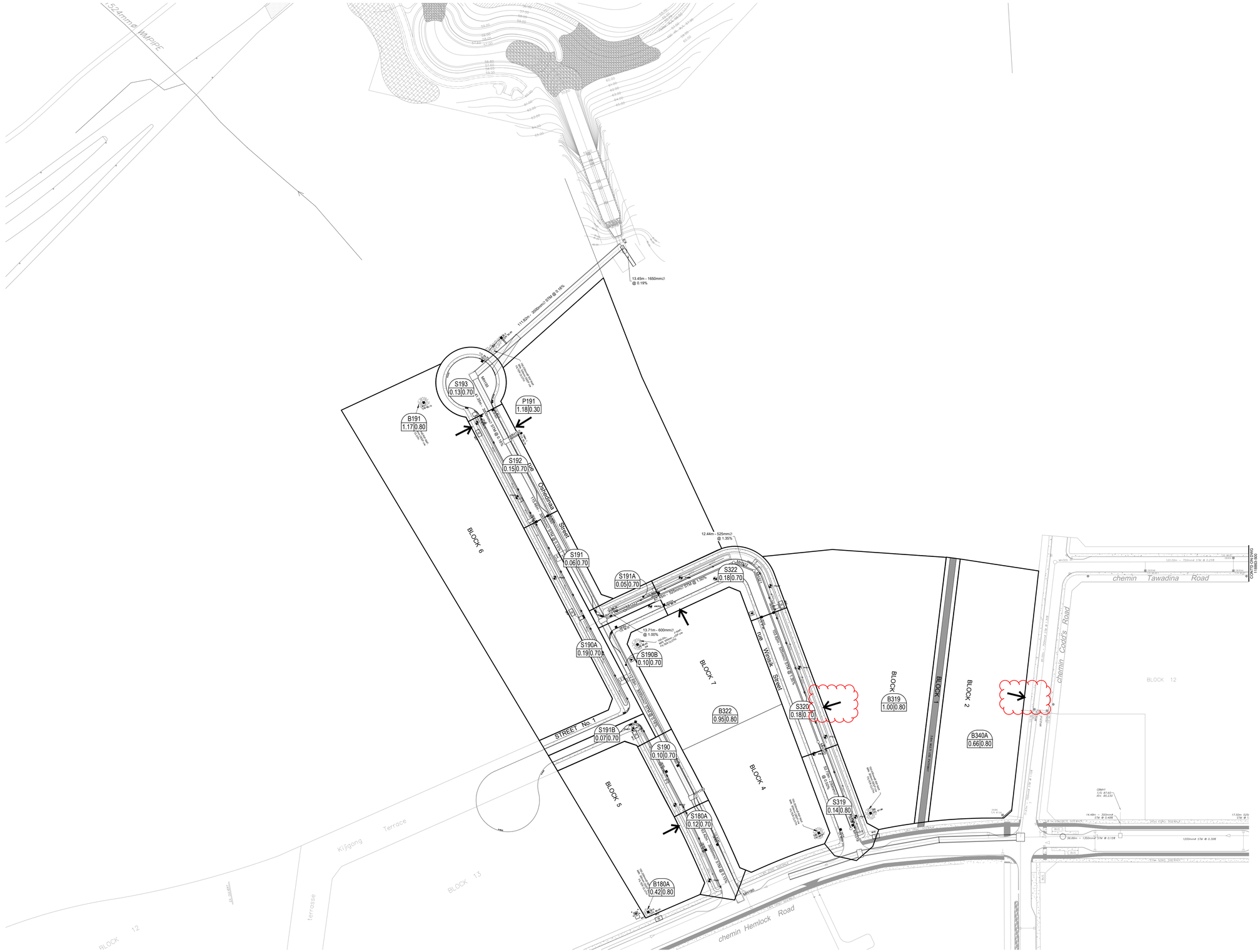
Definitions:
Q = 2.78CiA, where:
Q = Peak Flow in Litres per Second (L/s)
A = Area in Hectares (Ha)
i = Rainfall intensity in millimeters per hour (mm/hr)
[i = 732.951 / (TC+6.199)^0.810] 2 YEAR
[i = 998.071 / (TC+6.053)^0.814] 5 YEAR
[i = 1174.184 / (TC+6.014)^0.816] 10 YEAR
[i = 1735.688 / (TC+6.014)^0.820]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

Notes:
1. Mannings coefficient (n) = 0.013

Designed: AC
Checked: JIM
Dwg. Reference: 118863-510

No.	Revision	Date
1	Submission No. 1 for City Review	2018-12-20
2	Submission No. 2 for City Review	2020-07-03
3	Submission No. 3 for City Review	2021-12-13

File Reference: 118863.5.7.1
Date: 2020-07-08
Sheet No: 1 of 1

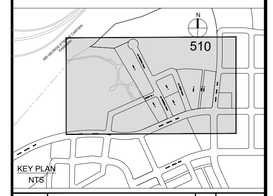


LEGEND :

S317
0.06 0.60

AREA NUMBER
RUNOFF COEFFICIENT
AREA IN HECTARES

PROPOSED SERVICE LATERAL LOCATION



No.	REVISIONS	By	Date
14			
13			
12			
11			
10			
9			
8			
7			
6			
5	SUBMISSION NO. 5 FOR CITY REVIEW	J.I.M.	2023:01:31
4	SUBMISSION NO. 4 FOR CITY REVIEW	J.I.M.	2022:09:23
3	SUBMISSION NO. 3 FOR CITY REVIEW	J.I.M.	2021:12:10
2	SUBMISSION NO. 2 FOR CITY REVIEW	J.I.M.	2020:07:08
1	SUBMISSION NO. 1 FOR CITY REVIEW	J.I.M.	2018:12:20

CANADA LANDS COMPANY
SOCIÉTÉ IMMOBILIÈRE DU CANADA
100 Queen Street
Ottawa,On
K1P 1J9

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

Project Title

WATERIDGE VILLAGE AT ROCKCLIFFE

PHASE 4

PROFESSIONAL ENGINEER
J. I. MOFFATT
2023/01/31
PROVINCE OF ONTARIO

N

Drawing Title

STORM DRAINAGE AREA PLAN

Scale
10 0 10 20
1:1000

Design	Date
J.I.M.	JUNE 2020
Drawn	Checked
M.M.	A.C.
Project No.	Drawing No.
118863	510

D07-16-15-0003_P4

#17063

J:\118863_Wteridge2A2B\3.0 Drawings\3.0Civil\Layouts\3.0.01 STORM.dwg Layout Name: 510 Plot Style: AIA STANDARD--HALF CTB Plot Scale: 1:50.8 Plotted At: 1/31/2023 11:39 AM Last Saved By: MMALNE Last Saved At: Jan 26, 23

Storm Temporary Construction ICDs
Wateridge Village Phase 4

Structure	Flow (l/s)	Grade Elev. (m)	Pipe Invert (m)	Pipe Size (m)	Height (m)	Area (Sq m)	Orifice Size	
							Sq. mm	mm dia.
Storm								
Winisik Street (MH323)	506.35	86.50	82.68	0.600	3.52	0.100	316	357

Based On Equation: Where: A=(Q/(C*(2*g*h)^.5)

C= 0.61

g= 9.81

Wateridge Phase 4
Internal Interim Block Drainage

Time Of Concentration Calculations

DICB 6

Section	Area (ha)			Airport Formula (min)
TC1	1.00	**High Point**	90.70	$= \frac{3.36\ (1.1 - C_{factor})\ distance^{0.5}}{slope^{0.33}}$
		Low Point	87.85	
		Distance	149.00	$= 29.80$
		Slope	1.91%	
		C_{factor}	0.20	
TC2		**High Point**	87.85	$= \frac{3.36\ (1.1 - C_{factor})\ distance^{0.5}}{slope^{0.33}}$
		Low Point	87.77	
		Distance	25.00	$= 22.02$
		Slope	0.32%	
		C_{factor}	0.20	
TC1 + TC2 = 51.82 min				

DICB 8

Section	Area (ha)			Airport Formula (min)
TC1	0.60	**High Point**	89.00	$= \frac{3.36\ (1.1 - C_{factor})\ distance^{0.5}}{slope^{0.33}}$
		Low Point	87.21	
		Distance	96.00	$= 24.12$
		Slope	1.86%	
		C_{factor}	0.20	
TC2		**High Point**	87.21	$= \frac{3.36\ (1.1 - C_{factor})\ distance^{0.5}}{slope^{0.33}}$
		Low Point	86.97	
		Distance	41.00	$= 23.11$
		Slope	0.59%	
		C_{factor}	0.20	
TC1 + TC2 = 47.23 min				

DICB 9

Section	Area (ha)			Airport Formula (min)
TC1	0.35	**High Point**	89.00	$= \frac{3.36\ (1.1 - C_{factor})\ distance^{0.5}}{slope^{0.33}}$
		Low Point	87.55	
		Distance	52.00	$= 15.55$
		Slope	2.79%	
		C_{factor}	0.20	
TC2		**High Point**	87.55	$= \frac{3.36\ (1.1 - C_{factor})\ distance^{0.5}}{slope^{0.33}}$
		Low Point	85.65	
		Distance	66.00	$= 17.33$
		Slope	2.88%	
		C_{factor}	0.20	
TC1 + TC2 = 32.88 min				

DICB 10

Section	Area (ha)			Airport Formula (min)
TC1	0.42	**High Point**	88.00	$= \frac{3.36\ (1.1 - C_{factor})\ distance^{0.5}}{slope^{0.33}}$
		Low Point	86.70	
		Distance	36.00	$= 11.88$
		Slope	3.61%	
		C_{factor}	0.20	
TC2		**High Point**	86.70	$= \frac{3.36\ (1.1 - C_{factor})\ distance^{0.5}}{slope^{0.33}}$
		Low Point	86.17	
		Distance	35.00	$= 15.60$
		Slope	1.51%	
		C_{factor}	0.20	
TC3		**High Point**	86.17	$= \frac{3.36\ (1.1 - C_{factor})\ distance^{0.5}}{slope^{0.33}}$
		Low Point	86.00	
		Distance	55.00	$= 33.04$
		Slope	0.31%	
		C_{factor}	0.20	
TC1 + TC2 + TC3 = 60.52 min				

DICB 11

Section	Area (ha)			Airport Formula (min)
TC1	1.17	**High Point**	86.62	$= \frac{3.36\ (1.1 - C_{factor})\ distance^{0.5}}{slope^{0.33}}$
		Low Point	86.32	
		Distance	23.00	$= 13.29$
		Slope	1.30%	
		C_{factor}	0.20	
TC2		**High Point**	86.32	$= \frac{3.36\ (1.1 - C_{factor})\ distance^{0.5}}{slope^{0.33}}$
		Low Point	85.50	
		Distance	57.00	$= 20.25$
		Slope	1.44%	
		C_{factor}	0.20	
TC3		**High Point**	85.50	$= \frac{3.36\ (1.1 - C_{factor})\ distance^{0.5}}{slope^{0.33}}$
		Low Point	84.80	
		Distance	73.00	$= 26.20$
		Slope	0.96%	
		C_{factor}	0.20	
TC4		**High Point**	84.80	$= \frac{3.36\ (1.1 - C_{factor})\ distance^{0.5}}{slope^{0.33}}$
		Low Point	82.70	
		Distance	24.00	$= 7.24$
		Slope	8.75%	
		C_{factor}	0.20	
TC5		**High Point**	82.70	$= \frac{3.36\ (1.1 - C_{factor})\ distance^{0.5}}{slope^{0.33}}$
		Low Point	82.30	
		Distance	31.00	$= 15.48$
		Slope	1.29%	
		C_{factor}	0.20	
TC6		**High Point**	82.30	$= \frac{3.36\ (1.1 - C_{factor})\ distance^{0.5}}{slope^{0.33}}$
		Low Point	82.15	
		Distance	45.00	$= 29.15$
		Slope	0.33%	
		C_{factor}	0.20	

TC1 + TC2 + TC3 + TC4 + TC5 + TC6 = 111.60 min

Wateridge Phase 4
Ditch Inlet ICD Calculations

Structure	Flow (l/s)	Grade Elev. (m)	Pipe Invert (m)	Pipe Size (m)	Height (m)	Area (Sq m)	Orifice Size	
							Sq. mm	mm dia.
DI 1	283.00	82.95	81.00	0.450	1.73	0.080	282	319
DI 6	34.64	87.77	86.50	0.250	1.15	0.012	109	124
DI 8	22.24	86.97	86.30	0.250	0.55	0.011	106	119
DI 9	19.78	85.65	83.95	0.250	1.58	0.006	76	86
DI 10	12.97	86.00	83.30	0.250	2.58	0.003	55	62
DI 11	22.64	82.15	80.50	0.250	1.53	0.007	82	93

Based On Equation: Where: $A=(Q/(C*(2*g*h)^{.5})$

C= 0.61

g= 9.81

Wateridge Village Phase 4 Overflow Ditch Design 2021-12-09
Canada Lands Company

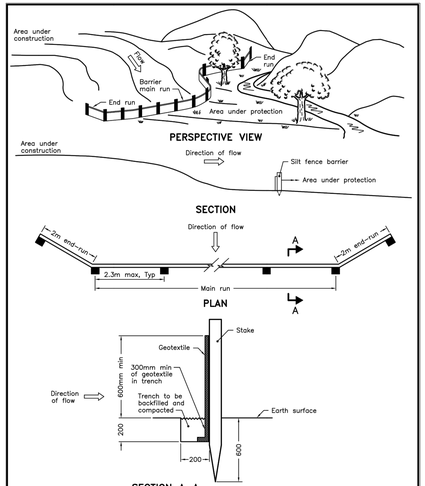
Length = 11.00 m

New Ditch Section Required 1:100 yr. flow = 283 l/s			0.283 Cu m/sec				
From Seelye use n =	0.040	(Natural Stream Channels)				area=	0.15
choose: slope S =	13.00	%	Up Stream Ditch btm=	84.38		wp=	1.39
Ditch Bottom	0.00	metres	Dn Stream Ditch Btm =	82.95			
Ditch slopes	3.00	:1	Difference =	1.43			
Water depth	**0.22**	metres (depth needed to carry 0.283 Cu. M/sec)			Top Bank =	103.3	
Check Ditch Capacity (Q)					Free Board =	20.13	
Q =	0.290	Cu M/sec	and Velocity =	2.00 M/s			

Q = A*(1.0/n)*R^2/3*S^1/2 where: A = cross sectional area in Sq. m
n = friction coefficient
R = hydraulic radius = A/wetted perimetre (wp) in m

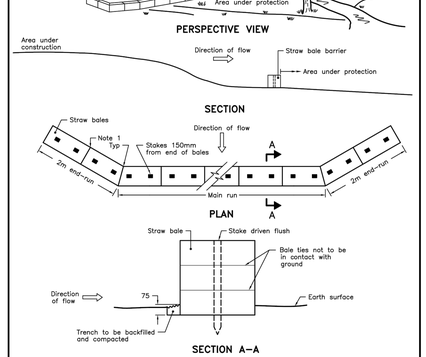
APPENDIX E

- Drawing 118863-910, Erosion and Sedimentation Control Plan



NOTE:
A All dimensions are in millimetres unless otherwise shown.

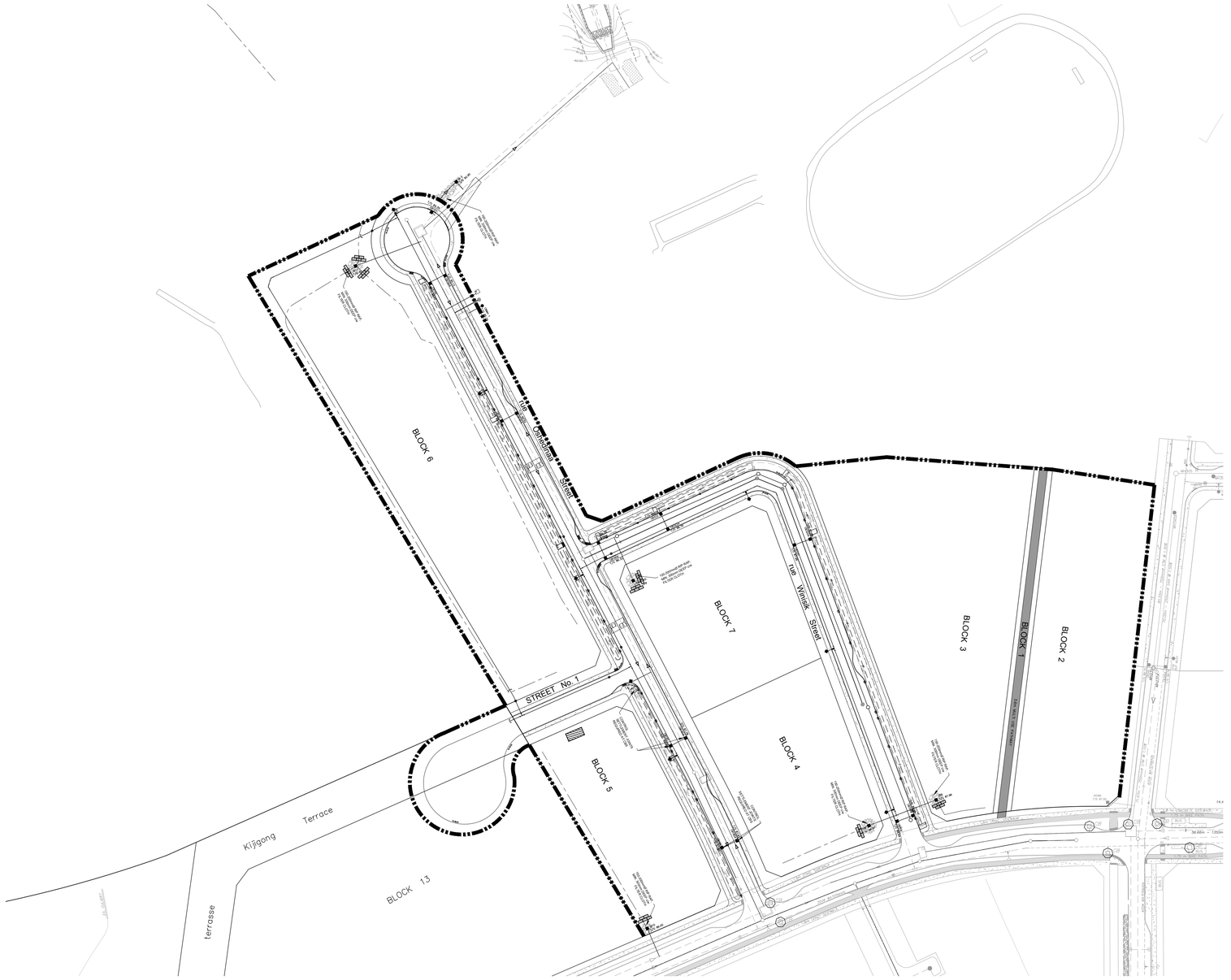
ONTARIO PROVINCIAL STANDARD DRAWING	Nov 2006	Rev 1
LIGHT–DUTY SILT FENCE BARRIER		OPSD 219.110



NOTES:
1 Straw bales to be butted tightly against adjoining bales to prevent sediment flow through barrier.

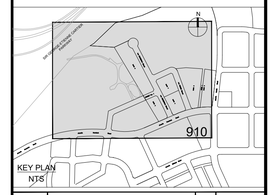
A All dimensions are in millimetres unless otherwise shown.

ONTARIO PROVINCIAL STANDARD DRAWING	Nov 2006	Rev 1
LIGHT–DUTY STRAW BALE BARRIER		OPSD 219.100



NOTES:

1. 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.
2. SILT SACK TO BE PLACED AND MAINTAINED UNDER COVER OF ALL CATCHBASINS. GEOTEXTILE SILT SACK IN STREET CBs TO REMAIN UNTIL ALL CURBS ARE CONSTRUCTED. GEOTEXTILE FABRIC IN RYCBs TO REMAIN UNTIL VEGETATION IS ESTABLISHED. ALL CATCHBASINS TO BE REGULARLY INSPECTED AND CLEANED, AS NECESSARY, UNTIL SOD AND CURBS ARE CONSTRUCTED.
3. CONTRACTOR TO PROTECT EXISTING CATCHBASINS WITH FILTER CLOTH UNDER THE COVERS TO TRAP SEDIMENTATION. REFER TO IDENTIFIED STRUCTURES.
4. IF DEEMED NECESSARY BY CITY INSPECTOR, LOCATION OF MUD MATS TO BE DETERMINED IN THE FIELD.
5. THE SEDIMENT AND EROSION CONTROL MEASURES MAY BE MODIFIED IN THE FIELD AT THE DISCRETION OF THE CITY OF OTTAWA SITE INSPECTOR OR CONSERVATION AUTHORITY.

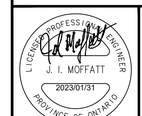


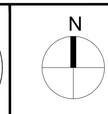
No.	REVISIONS	By	Date
14			
13			
12			
11			
10			
9			
8			
7			
6			
5	SUBMISSION NO. 5 FOR CITY REVIEW	J.I.M.	2023.01.31
4	SUBMISSION NO. 4 FOR CITY REVIEW	J.I.M.	2022.09.23
3	SUBMISSION NO. 3 FOR CITY REVIEW	J.I.M.	2021.12.10
2	SUBMISSION NO. 2 FOR CITY REVIEW	J.I.M.	2020.07.08
1	SUBMISSION NO. 1 FOR CITY REVIEW	J.I.M.	2018.12.20

CANADA LANDS COMPANY
SOCIÉTÉ IMMOBILIÈRE DU CANADA
100 Queen Street
Ottawa,On
K1P 1J9

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

Project Title
WATERIDGE VILLAGE AT ROCKCLIFFE
PHASE 4





Drawing Title
EROSION AND SEDIMENTATION CONTROL PLAN

Scale
10 0 10 20
1:1000

Design	Date
J.I.M.	JUNE 2020
Drawn	Checked
M.M.	A.C.
Project No.	Drawing No.
118863	910

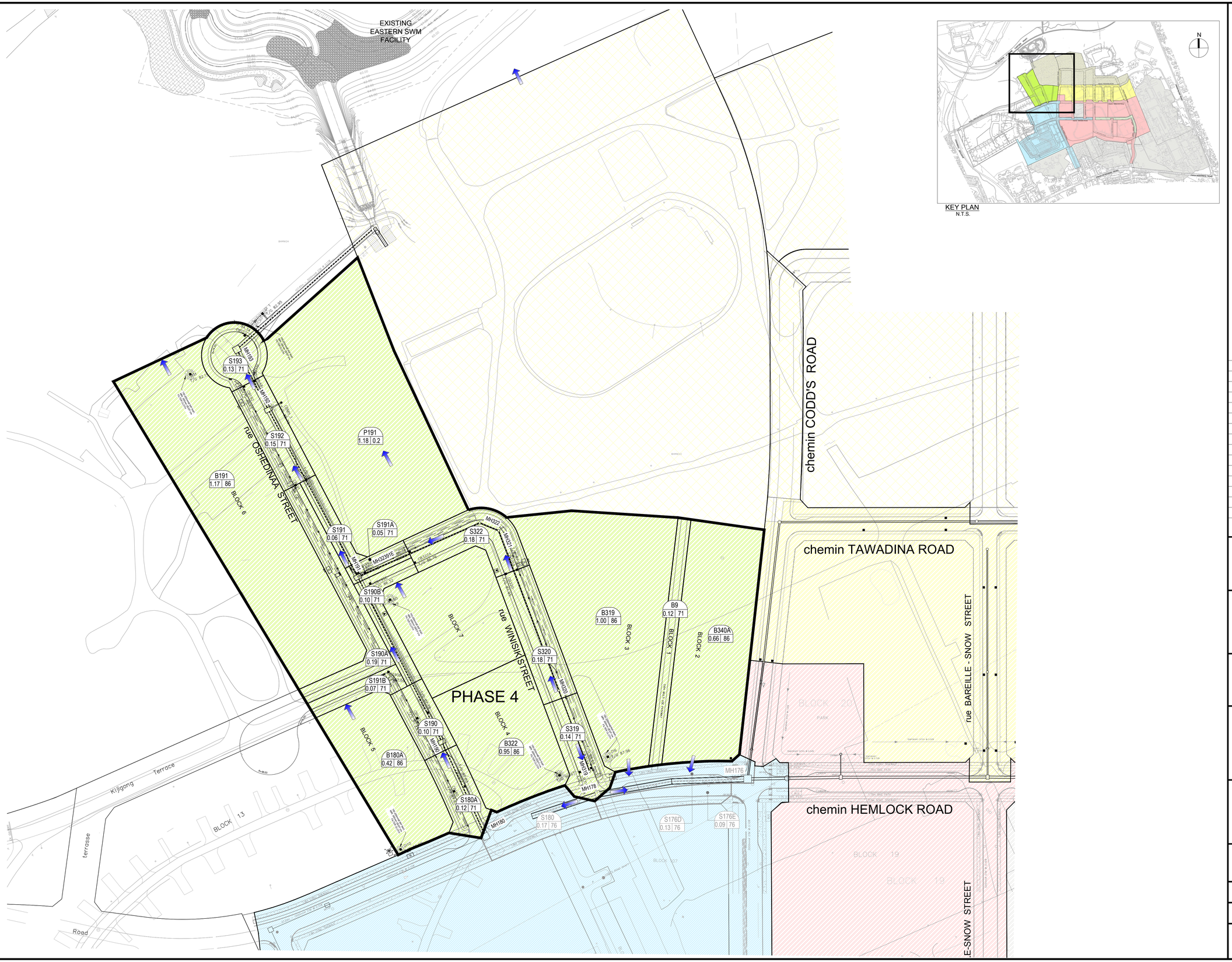
D07-16-15-0003_P4

#17063

J:\118863_Wrdge2428\5.9 Drawings\5Acad\layouts\910 EROSION SEDIMENT.dwg Layout Name: EROSION & SEDIMENT Plot Style: AIA STANDARD--HALF.CTB Plot Scale: 1:50.8 Plotted At: 1/31/2023 11:38 AM Last Saved By: MMUNE Last Saved At:

APPENDIX F

- Drawing 118863-751 DDSWMM Model Schematic
- Drawing 118863-601
- Velocity x Depth Calculation
- XPSWMM Schematic
- HGL results
- Model Files



KEY PLAN
N.T.S.

LEGEND:

- PHASE 4 DRAINAGE AREA
- PHASE 2B DRAINAGE AREA (DESIGN COMPLETE)
- PHASE 2C 2D DRAINAGE AREA (FUTURE)
- PHASE 1B DRAINAGE AREA (EXISTING)
- PHASE 1A DRAINAGE AREA (EXISTING)
- EXTERNAL DRAINAGE AREA

S318 — AREA ID
0.13 | 71 — Imp.(%)
AREA (ha)
MAJOR FLOW
MH136 MANHOLE ID

No.	REVISIONS	By	Date
14			
13			
12			
11			
10			
9			
8			
7			
6			
5			
4	SUBMISSION No. 4 FOR CITY REVIEW	P.S.	2023.01.27
3	SUBMISSION No. 3 FOR CITY REVIEW	P.S.	2021.12.10
2	SUBMISSION No. 2 FOR CITY REVIEW	P.S.	2020.07.03
1	SUBMISSION No.1 FOR CITY REVIEW	P.S.	2018.12.20

CANADA LANDS COMPANY
SOCIÉTÉ IMMOBILIÈRE DU CANADA
30 Metcalfe Street Suite 601
Ottawa, On K1P 5L4
613 998 7777

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

Project Title
WATERIDGE VILLAGE
AT ROCKCLIFFE
PHASE 4

PROFESSIONAL ENGINEER
M.S.BLACK
100107136
2023/01/27
PROVINCE OF ONTARIO

N

Drawing Title
DDSWMM
MODEL SCHEMATIC

Scale
1:1000 0 10 20 30 40 50m

Design	Date
M.B	DEC. 2018
Drawn	Checked
S.V.	P.S.
Project No.	Drawing No.
118863	751

D07-16-15-0003

#17063

J:\118863_Wridge2a2b\5.0 Drawings\5Sewers\Layouts\118863 - Sewers-751-Rev3.dwg Layout Name: 751 Plot Style: AIA STANDARD-HALF.CTB Plot Scale: 1:25.4 Plotted At: 1/20/2023 1:28 PM Last Saved By: swalsh Last Saved At: Jan. 20, 23

CONT'D ON DWG
118863-600

BLOCK 1
BLOCK 2
BLOCK 3
BLOCK 4
BLOCK 5
BLOCK 6
BLOCK 7

rue Winisik Street
rue Oshedinaa Street
STREET No. 1
chemin Hemlock Road

90.0m MULTI USE PATHWAY

150-200mmØ RIP RAP, MIN. 300mm DEEP c/w FILTER CLOTH

POND ID	193
TOP OF GRATE (m)	84.33
STATIC ELEV (m)	84.38
STATIC DEPTH (m)	0.05
STATIC VOLUME (m³)	0.12
CLIMATE CHANGE(m)	84.53

POND ID	319
TOP OF GRATE (m)	88.68
STATIC ELEV (m)	88.92
STATIC DEPTH (m)	0.24
STATIC VOLUME (m³)	46.17
CLIMATE CHANGE(m)	88.92

POND ID	190A
TOP OF GRATE (m)	87.78
STATIC ELEV (m)	87.85
STATIC DEPTH (m)	0.07
STATIC VOLUME (m³)	0.52
CLIMATE CHANGE(m)	87.85

POND ID	180A
TOP OF GRATE (m)	87.83
STATIC ELEV (m)	87.96
STATIC DEPTH (m)	0.13
STATIC VOLUME (m³)	3.74
CLIMATE CHANGE(m)	88.00

POND ID	190
TOP OF GRATE (m)	87.78
STATIC ELEV (m)	87.85
STATIC DEPTH (m)	0.07
STATIC VOLUME (m³)	0.48
CLIMATE CHANGE(m)	87.85

POND ID	180
TOP OF GRATE (m)	87.83
STATIC ELEV (m)	87.96
STATIC DEPTH (m)	0.13
STATIC VOLUME (m³)	3.70
CLIMATE CHANGE(m)	88.00

97m SWALE @ 0.5%
27.5m SWALE @ 0.5%
13.5m SWALE @ 3.0%
45m SWALE @ 0.5%
31m SWALE @ 1.3%
24m SWALE @ 8.9%
53m SWALE @ 1.0%
57m SWALE @ 1.4%
24m SWALE @ 1.2%
35.0m DITCH @ 1.50%
55.0m DITCH @ 0.30%
25m SWALE @ 0.3%
35m SWALE @ 0.5%
41m SWALE @ 0.5%

KEY PLAN
NTS

No.	REVISIONS	By	Date
14			
13			
12			
11			
10			
9			
8			
7			
6			
5	SUBMISSION NO. 5 FOR CITY REVIEW	J.I.M.	2023:01:31
4	SUBMISSION NO. 4 FOR CITY REVIEW	J.I.M.	2022:09:23
3	SUBMISSION NO. 3 FOR CITY REVIEW	J.I.M.	2021:12:10
2	SUBMISSION NO. 2 FOR CITY REVIEW	J.I.M.	2020:07:08
1	SUBMISSION NO. 1 FOR CITY REVIEW	J.I.M.	2018:12:20

CANADA LANDS COMPANY
SOCIÉTÉ IMMOBILIÈRE DU CANADA
100 Queen Street
Ottawa,On
K1P 1J9

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

Project Title
WATERIDGE VILLAGE AT ROCKCLIFFE
PHASE 4

LICENSED PROFESSIONAL ENGINEER
J. I. MOFFATT
2023/01/31
PROVINCE OF ONTARIO

Drawing Title
PONDING PLAN

Scale
1:500

Design	Date
J.I.M	JUNE 2020
Drawn	Checked
M.M.	A.C.
Project No.	Drawing No.
118863	601

D07-16-15-0003_P4

#17063

J:\118863_Wridge2A2B\3.0 Drawings\3.05civil\Layouts\601 PONDING.dwg Layout Name: 601 Plot Style: AIA STANDARD-FULL.CTB Plot Scale: 1:25.4 Plotted At: 1/25/2023 11:37 AM Last Saved By: MMUNE Last Saved At: Jan. 25, 23

Velocity x Depth Calculation

Iteration equation:

Velocity:

$$v_x = v_{min} + \frac{Q_x - Q_{min}}{Q_{max} - Q_{min}} (v_{max} - v_{min})$$

Depth:

$$d_x = d_{min} + \frac{Q_x - Q_{min}}{Q_{max} - Q_{min}} (d_{max} - d_{min})$$

100 Year 3 Hour Chicago Storm

Area ID (Dummy Segment, if applicable)	Road ROW Section	Longitudinal Slope (%)	Overflow Flowrate		SWMHYMO (118863VD.OUT)					Calculation Sheet: Overflow for Typical Road Ponding Area					SWMHYMO (118863VD.OUT)			Velocity x Depth	Maximum Static Ponding Depth	Total Depth (Static + Dynamic)
					Flowrate (cms)		Velocity (m/s)			Flowrate (cms)		Depth (m)			Depth (m)					
			Qx (l/s)	Qx (cms)	Qmin	Qmax	vmin	vmax	vx	Qmin	Qmax	dmin	dmax	dx	dmin	dmax	dx	(m^2/s)	(m)	(m)
S176D	26	0.55	**42**	0.042	0.023	0.050	0.421	0.509	**0.483**	0.042	0.051	0.065	0.070	**0.065**	N/A	N/A	**N/A**	**0.031**	0.15	0.215
S319	22	1.25	**0**	0	0.000	0.002	0.000	0.305	**0.000**	0.000	0.001	0.000	0.001	**0.000**	N/A	N/A	**N/A**	**0.000**	0.24	0.240
S320	22	1.47	**54**	0.054	0.038	0.082	0.687	0.833	**0.740**	N/A	N/A	N/A	N/A	**N/A**	0.041	0.055	**0.046**	**0.034**	0.00	0.046
S322	22	1.47	**94**	0.094	0.082	0.149	0.833	0.966	**0.857**	N/A	N/A	N/A	N/A	**N/A**	0.055	0.068	**0.057**	**0.049**	0.00	0.057
S190	22	1.00	**0**	0	0.000	0.002	0.000	0.273	**0.000**	0.000	0.001	0.000	0.001	**0.000**	N/A	N/A	**N/A**	**0.000**	0.07	0.070
S190A	22	0.50	**168**	0.168	0.153	0.209	0.771	0.834	**0.788**	N/A	N/A	N/A	N/A	**N/A**	0.109	0.123	**0.113**	**0.089**	0.00	0.113
S190B	22	0.50	**322**	0.322	0.287	0.380	0.930	1.039	**0.971**	0.304	0.340	0.135	0.140	**0.138**	N/A	N/A	**N/A**	**0.134**	0.09	0.228
S191A	22	0.50	**402**	0.402	0.380	0.512	1.039	1.151	**1.058**	0.377	0.417	0.145	0.150	**0.148**	N/A	N/A	**N/A**	**0.157**	0.06	0.208
S191B	22	2.30	**86**	0.086	0.052	0.093	1.042	1.209	**1.180**	N/A	N/A	N/A	N/A	**N/A**	0.055	0.068	**0.066**	**0.078**	0.00	0.066
S191	22	0.50	**202**	0.202	0.153	0.209	0.771	0.834	**0.826**	N/A	N/A	N/A	N/A	**N/A**	0.109	0.123	**0.121**	**0.100**	0.00	0.121
S192	22	3.20	**315**	0.315	0.221	0.359	1.426	1.610	**1.551**	N/A	N/A	N/A	N/A	**N/A**	0.068	0.082	**0.078**	**0.120**	0.00	0.078
S193	22	2.00	**266**	0.266	0.174	0.284	1.127	1.273	**1.249**	0.255	0.287	0.125	0.130	**0.127**	N/A	N/A	**N/A**	**0.158**	0.05	0.177
S176E	26	0.53	**25**	0.025	0.024	0.053	0.439	0.532	**0.442**	N/A	N/A	N/A	N/A	**N/A**	0.041	0.055	**0.041**	**0.018**	0.00	0.041
S180A	20	0.72	**2**	0.002	0.001	0.009	0.231	0.367	**0.248**	0.002	0.003	0.020	0.025	**0.021**	N/A	N/A	**N/A**	**0.005**	0.13	0.151
S180	26	0.50	**42**	0.042	0.027	0.058	0.481	0.583	**0.530**	N/A	N/A	N/A	N/A	**N/A**	0.041	0.055	**0.048**	**0.025**	0.00	0.048

Velocity x Depth Calculation

Iteration equation:

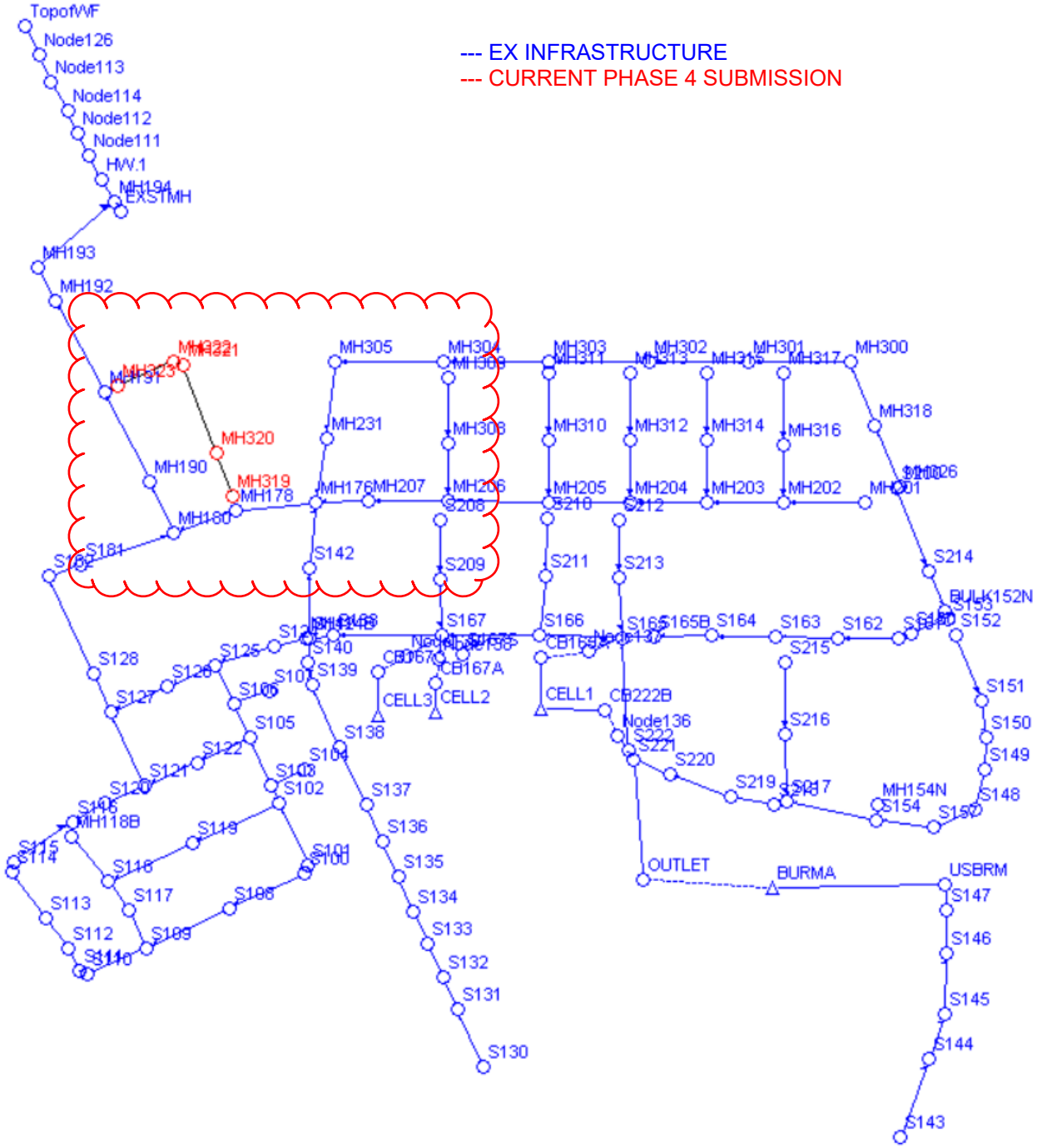
Velocity:

$$v_x = v_{min} + \frac{Q_x - Q_{min}}{Q_{max} - Q_{min}} (v_{max} - v_{min})$$

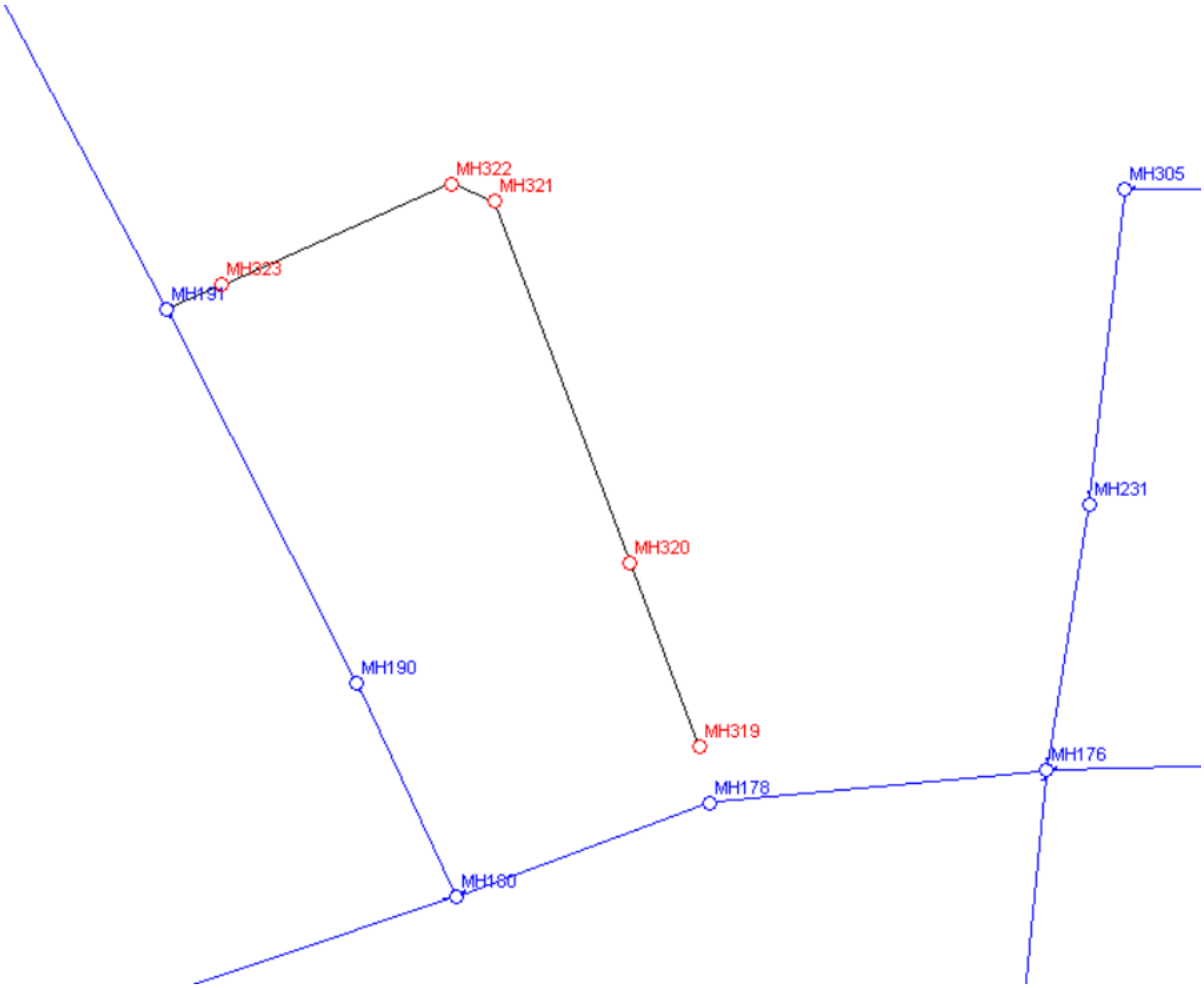
Depth:

$$d_x = d_{min} + \frac{Q_x - Q_{min}}{Q_{max} - Q_{min}} (d_{max} - d_{min})$$

100 Year 3 Hour Chicago Storm + 20%																				
					SWMHYMO (118863VD.OUT)					Calculation Sheet: Overflow for Typical Road Ponding Area					SWMHYMO (118863VD.OUT)			Velocity x Depth	Maximum Static Ponding Depth	Total Depth (Static + Dynamic)
Area ID (Dummy Segment, if applicable)	Road ROW Section	Longitudinal Slope (%)	Overflow Flowrate		Flowrate (cms)		Velocity (m/s)			Flowrate (cms)		Depth (m)			Depth (m)					
			Qx (l/s)	Qx (cms)	Qmin	Qmax	vmin	vmax	vx	Qmin	Qmax	dmin	dmax	dx	dmin	dmax	dx	(m^2/s)	(m)	(m)
S176D	26	0.55	**108**	0.108	0.091	0.149	0.591	0.668	**0.614**	0.100	0.115	0.090	0.095	**0.093**	N/A	N/A	**N/A**	**0.057**	0.15	0.243
S319	22	1.25	**0**	0.000	0.000	0.002	0.000	0.305	**0.000**	0.000	0.001	0.000	0.001	**0.000**	N/A	N/A	**N/A**	**0.000**	0.24	0.240
S320	22	1.47	**72**	0.072	0.038	0.082	0.687	0.833	**0.800**	N/A	N/A	N/A	N/A	**N/A**	0.041	0.055	**0.052**	**0.041**	0.00	0.052
S322	22	1.47	**128**	0.128	0.082	0.149	0.833	0.966	**0.475**	N/A	N/A	N/A	N/A	**N/A**	0.055	0.068	**0.064**	**0.030**	0.00	0.064
S190	22	1.00	**0**	0.000	0.000	0.002	0.000	0.273	**0.822**	0.000	0.001	0.000	0.001	**0.000**	N/A	N/A	**N/A**	**0.000**	0.07	0.070
S190A	22	0.50	**286**	0.286	0.209	0.287	0.834	0.930	**0.862**	N/A	N/A	N/A	N/A	**N/A**	0.123	0.136	**0.136**	**0.117**	0.00	0.136
S190B	22	0.50	**508**	0.508	0.380	0.512	1.039	1.151	**0.458**	0.500	0.544	0.160	0.165	**0.161**	N/A	N/A	**N/A**	**0.074**	0.09	0.251
S191A	22	0.50	**662**	0.662	0.380	0.512	1.039	1.151	**1.278**	0.638	0.687	0.175	0.180	**0.177**	N/A	N/A	**N/A**	**0.227**	0.06	0.237
S191B	22	2.30	**170**	0.170	0.152	0.229	1.365	1.513	**1.400**	N/A	N/A	N/A	N/A	**N/A**	0.082	0.095	**0.085**	**0.119**	0.00	0.085
S191	22	0.50	**336**	0.336	0.287	0.380	0.930	1.039	**0.987**	N/A	N/A	N/A	N/A	**N/A**	0.136	0.150	**0.143**	**0.142**	0.00	0.143
S192	22	3.20	**518**	0.518	0.359	0.541	1.610	1.784	**1.762**	N/A	N/A	N/A	N/A	**N/A**	0.082	0.095	**0.093**	**0.164**	0.00	0.093
S193	22	2.00	**477**	0.477	0.428	0.611	1.411	1.542	**1.446**	0.443	0.487	0.150	0.155	**0.154**	N/A	N/A	**N/A**	**0.222**	0.05	0.204
S176E	26	0.53	**32**	0.032	0.024	0.053	0.439	0.532	**0.465**	N/A	N/A	N/A	N/A	**N/A**	0.041	0.055	**0.045**	**0.021**	0.00	0.045
S180A	20	0.72	**22**	0.022	0.009	0.027	0.367	0.481	**0.449**	0.021	0.027	0.050	0.055	**0.051**	N/A	N/A	**N/A**	**0.023**	0.13	0.181
S180	26	0.50	**57**	0.057	0.027	0.058	0.481	0.583	**0.580**	N/A	N/A	N/A	N/A	**N/A**	0.041	0.055	**0.055**	**0.032**	0.00	0.055



XPSWMM Schematic
Overall Model to Eastern SWM Facility



--- EX INFRASTRUCTURE
--- CURRENT PHASE 4 SUBMISSION

XPSWMM Schematic
Phase 4

HGL

XPSWMM NODE ID	PROPOSED GROUND ELEVATION (M)	USF (M)	100 YEAR 3 HOUR CHICAGO		100 YEAR 3 HOUR CHICAGO + 20%		100 YEAR 24 HOUR SCS TYPE II		JULY 1 1979		AUGUST 1988		AUGUST 1996	
			HGL (M)	USF - HGL (M)	HGL (M)	USF - HGL (M)	HGL (M)	USF - HGL (M)	HGL (M)	USF - HGL (M)	HGL (M)	USF - HGL (M)	HGL (M)	USF - HGL (M)
Phase 2B														
MH317	94.08	91.68	91.17	0.51	91.18	0.50	91.14	0.54	91.15	0.53	91.14	0.54	91.11	0.57
MH316	94.09	91.69	90.96	0.73	90.96	0.73	90.95	0.74	90.95	0.74	90.95	0.74	90.92	0.77
MH315	93.39	91.36	90.28	1.08	90.29	1.07	90.25	1.11	90.27	1.09	90.27	1.09	90.26	1.10
MH314	93.00	91.16	89.91	1.25	89.91	1.25	89.91	1.25	89.91	1.25	89.91	1.25	89.89	1.27
MH313	92.62	90.71	89.35	1.36	89.34	1.37	89.35	1.36	89.35	1.36	89.35	1.36	89.34	1.37
MH312	91.36	89.68	88.42	1.26	88.42	1.26	88.41	1.27	88.42	1.26	88.42	1.26	88.38	1.30
MH311	90.69	88.29	87.39	0.90	87.39	0.90	87.34	0.95	87.38	0.91	87.39	0.90	87.38	0.91
MH310	90.04	87.64	86.84	0.80	86.86	0.78	86.83	0.81	86.84	0.80	86.85	0.79	86.80	0.84
MH309	90.15	87.75	87.29	0.46	87.32	0.43	87.18	0.57	87.19	0.56	87.19	0.56	87.11	0.64
MH308	89.68	87.28	86.65	0.63	86.65	0.63	86.59	0.69	86.61	0.67	86.61	0.67	86.56	0.72
MH326	94.76	92.36	91.33	1.03	91.33	1.03	91.32	1.04	91.32	1.04	91.32	1.04	91.33	1.03
MH318	94.40	92.00	91.03	0.97	91.03	0.97	91.00	1.00	91.00	1.00	91.00	1.00	91.00	1.00
MH300	94.00	91.60	90.71	0.89	90.70	0.90	90.67	0.93	90.68	0.92	90.68	0.92	90.68	0.92
MH301	93.73	91.33	90.21	1.12	90.21	1.12	90.20	1.13	90.21	1.12	90.20	1.13	90.20	1.13
MH302	92.80	90.40	88.64	1.76	88.64	1.76	88.63	1.77	88.64	1.76	88.63	1.77	88.63	1.77
MH303	90.67	88.27	87.78	0.49	87.80	0.47	87.63	0.64	87.79	0.48	87.72	0.55	87.64	0.63
MH304	90.30	87.90	87.37	0.53	87.37	0.53	87.30	0.60	87.38	0.52	87.34	0.56	87.30	0.60
MH305	91.00	88.60	86.73	1.87	86.82	1.78	86.61	1.99	86.69	1.91	86.65	1.95	86.60	2.00
Phase 4														
MH319	88.81	86.61	86.13	0.48	86.12	0.49	86.12	0.49	86.12	0.49	86.12	0.49	86.12	0.49
MH320	89.12	86.92	85.49	1.43	85.49	1.43	85.49	1.43	85.49	1.43	85.49	1.43	85.49	1.43
MH321	87.67	85.47	84.18	1.29	84.39	1.08	84.10	1.37	84.11	1.36	84.13	1.34	84.09	1.38
MH322	87.50	85.30	84.18	1.12	84.39	0.91	84.10	1.20	84.10	1.20	84.12	1.18	84.09	1.21
MH323	86.57	84.37	83.40	0.97	83.48	0.89	83.31	1.06	83.32	1.05	83.34	1.03	83.30	1.07
Existing Phase 1B Trunk														
MH201	94.29	91.89	90.72	1.17	90.73	1.16	90.72	1.17	90.72	1.17	90.72	1.17	90.71	1.18
MH202	93.91	91.51	90.42	1.09	90.43	1.08	90.41	1.10	90.41	1.10	90.41	1.10	90.40	1.11
MH203	92.38	89.98	88.66	1.32	88.68	1.30	88.63	1.35	88.63	1.35	88.64	1.34	88.61	1.37
MH204	90.40	88.00	87.08	0.92	87.10	0.90	87.06	0.94	87.06	0.94	87.07	0.93	87.02	0.98
MH205	89.35	86.95	85.80	1.15	85.83	1.12	85.78	1.17	85.78	1.17	85.79	1.16	85.73	1.22
MH206	89.10	86.70	85.59	1.11	85.61	1.09	85.56	1.14	85.57	1.13	85.57	1.13	85.52	1.18
MH207	88.53	86.13	84.60	1.53	84.61	1.52	84.58	1.55	84.58	1.55	84.59	1.54	84.54	1.59
MH231	89.81	87.41	85.89	1.52	86.00	1.41	85.73	1.67	85.84	1.57	85.77	1.63	85.71	1.69
Existing Phase 1A Trunk														
MH176	88.03	85.63	83.77	1.86	83.86	1.77	83.67	1.96	83.75	1.88	83.73	1.90	83.48	2.15
MH178	89.00	86.60	83.41	3.19	83.48	3.12	83.33	3.27	83.40	3.20	83.37	3.23	83.16	3.44
MH180	88.23	85.83	82.21	3.62	82.61	3.21	81.93	3.90	82.17	3.66	82.05	3.78	81.46	4.36
MH190	88.10	85.70	81.91	3.79	82.15	3.55	81.60	4.10	81.87	3.83	81.75	3.95	81.21	4.49
MH191	86.36	83.96	81.67	2.29	81.88	2.09	81.40	2.56	81.63	2.33	81.52	2.44	81.04	2.93
MH192	85.92	83.52	81.41	2.11	81.60	1.92	81.19	2.33	81.38	2.14	81.27	2.25	80.87	2.65
MH193	84.85	82.45	81.09	1.36	81.25	1.20	80.90	1.55	81.06	1.39	80.97	1.48	80.58	1.87
MH194	82.44	N/A	80.45	N/A	80.54	N/A	80.34	N/A	80.44	N/A	80.38	N/A	80.11	N/A

APPENDIX G

- Pilot Project Information Form

City of Ottawa Pilot Project Tracking No.
ISD - Infrastructure Services Department
PILOT PROJECT INFORMATION FORM

Pilot Initiator:	Canada Lands Company	Date:	July 3, 2020
		Phone/ Email:	519-224-3744
City Contact:	Chris Denich, Aquafor Beech		denich.c@aquaforbeech.com
Project Title:	Wateridge Village Subdivision LID Design – Phase 1B		
Type of Pilot:	Product: yes Method: yes Other: yes See: Former CFB Rockcliffe Redevelopment Stormwater Management Existing Conditions & LID Demonstration Project Scoping Document (Aquafor Beech, February 2015).		

Pilot Description: The City of Ottawa and the Canada Lands Company (CLC) have agreed to pursue a phased stormwater management demonstration project for the former CFB Rockcliffe, here after referred to as Wateridge Village, using Low Impact Development (LID) Best Management Practices (BMPs). An integral component of this process is the City of Ottawa and CLC's desire to advance the Wateridge Village as a pilot (or demonstration) project for Low Impact Development (LID).

Pilot Location: Wateridge Village Subdivision

Pilot Start Date: March 15, 2019

Estimated Pilot End Date: 2021 – 2024

Name and Section of Design Guidelines and/ or Standard which the pilot is applicable:

Multiple sections and standards – see ISD Deviation Report & Pilot Project Information Report: Waterbridge Village Subdivision LID Design - Phase 1B, Aquafor Beech May 2020, Section 3.0

Title of the deviation report describing the proposed pilot: Design Brief Wateridge Village at Rockliffe Phase 4 (IBI, July 2020); and, ISD Deviation Report & Pilot Project Information Report: Wateridge Village Subdivision LID Design –Phase 1B (Aquafor Beech Ltd, May, 2020)

Has the deviation report been included: Yes it has been included

Name of Product(s): Beehive Grate (Prod. # JW-105B)

Product Contact: Crowle Fitting and Supply

Phone Number and E-mail: Crowle P: 905-793-2222; E: marc@crowlefittings.com

Pilot Monitoring: Assumption Protocols and Monitoring Requirements are provided - See ISD Deviation Report & Pilot Project Information Report: Waterbridge Village Subdivision LID Design - Phase 1B, Aquafor Beech May 2020, Section 6.4 for Soil Amendment, Section 6.5 for Bioswales, Section 6.6 for Permeable Pavement Layby, and Section 6.7 and 6.8 for Overall system monitoring and during construction monitoring respectively. Section 7.9 details reporting requirements.

Final Pilot Report

Is a report required at the end of the pilot?: Yes a report is required

Name of individual or consultant to write the report: Chris Denich, Aquafor Beech Ltd.

Phone Number and e-mail: 647-993-2267 denich.c@aquaforbeech.com

Document Change Authority Notified at end of pilot:

Other Information: see ISD Deviation Report & Pilot Project Information Report: Wateridge Village Subdivision LID Design – Phase 1B (Aquafor Beech Ltd, May, 2020)