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Proposed Low-Rise Residential Development 455 Wanaki Road

Site Servicing & Stormwater Management Report

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Proposed Low-Rise Residential Development
455 Wanaki Road (Block 29)

Site Servicing and
Stormwater Management Report

(D07-12-19-0117)

Prepared By:

NOVATECH
Suite 200, 240 Michael Cowpland Drive
Ottawa, Ontario
K2M 1P6

Revised: November 8th, 2019
Revised: September 18th, 2019
Submitted: June 25th, 2019

Novatech File: 119066
Ref: R-2019-094

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Engineers, Planners & Landscape Architects

November 8, 2019

City of Ottawa
Planning, Infrastructure and Economic Development Department
Planning and Infrastructure Approvals
110 Laurier Avenue West, 4th Floor
Ottawa, ON K1P 1J1

Attention: **Mark Fraser, Project Manager, Development Review Central**

Dear Mark:

Reference: **Site Servicing and Stormwater Management Report**
455 Wanaki Road
Our File No.: 119066

Enclosed is the revised 'Site Servicing and Stormwater Management Report' prepared for the proposed low-rise residential development located at 455 Wanaki Road in the City of Ottawa.

This report is submitted in support of a Site Plan Control application.

Please contact the undersigned, should you have any questions or require additional information.

Yours truly,

NOVATECH

Greg MacDonald, P.Eng.
Director, Land Development and Public Sector Infrastructure

Suite 200, 240 Michael Cowpland Drive, Ottawa ON K2M 1P6 Tel: 613.254.9643 Fax: 613.254.5867 www.novatech-eng.com

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1.0 INTRODUCTION

It is proposed to construct a low-rise residential development for Habitat for Humanity at 455 Wanaki Road, in the City of Ottawa. Novatech has been retained to complete a Site Servicing and Stormwater Management report for the proposed development.

This report addresses the approach to site servicing and stormwater management for the proposed development and is being submitted in support of a site plan control application.

1.1 Location and Site Description

The subject site is located at 455 Wanaki Road in the City of Ottawa (Ward 13-Rideau-Rockcliffe), as shown in **Figure 1 (Aerial Plan)**. The site is approximately 1,015 square metres (m^2) in area. 455 Wanaki Road is legally described as Block 29, Plan 4M-1581, City of Ottawa. A reduced copy of the topographical survey plan is included in **Appendix A**.

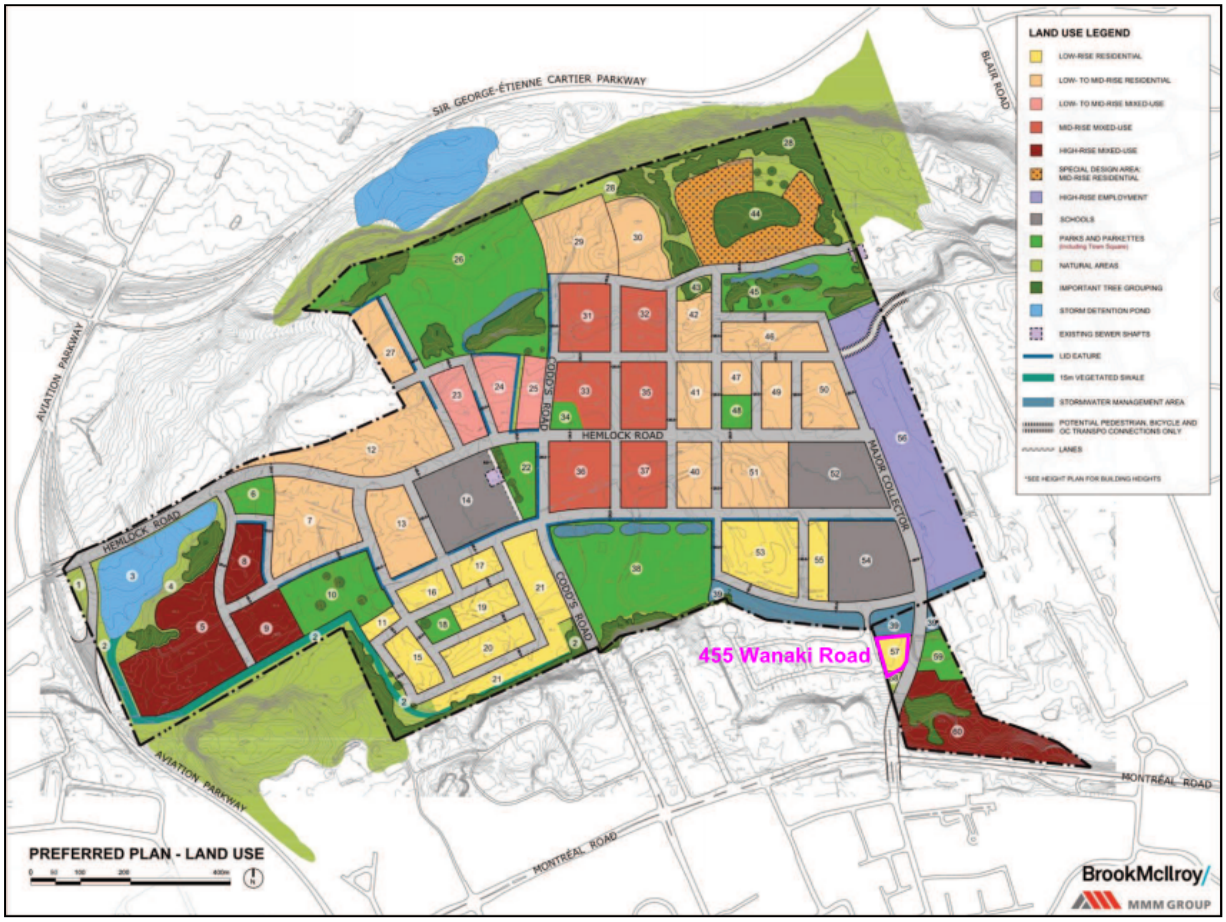
The site is located within the Wateridge Village development on the former CFB Rockcliffe lands, which are currently under re-development by the Canada Lands Company. The site is bordered by Burma Road (existing) to the west, Wanaki Road to the east, Provender Avenue to the south and the Burma stormwater management facility to the north.

Figure 1 – **Aerial Plan** provides an aerial view of the site.

Image Source: geoOttawa 2017 Aerial map

The land to the north of the subject property was formerly occupied by CFB Rockcliffe. These lands are being redeveloped through a Plan of Subdivision and are known as Wateridge Village. The general limits of the Wateridge Village development are shown in **Figure 2 (Wateridge Village Land Use Concept Plan).**

Figure 2 – **Wateridge Village Land Use Concept Plan** (from Former CFB Rockcliffe Community Design Plan) provides a general layout of the overall proposed Wateridge Village development.



The subject site is currently undeveloped.

1.2 Pre-Consultation Information

A pre-consultation meeting was held with the City of Ottawa on March 14, 2019, at which time the client was advised of the general submission requirements. Refer to **Appendix B** for a summary of the correspondence related to the proposed development.

1.3 Regulatory Approvals

The following regulatory approvals are understood to be required to facilitate this proposed development:

- City of Ottawa - Site Plan Control
- Rideau Valley Conservation Authority (RVCA) clearance

1.4 Reference Material

The following material has been consulted to develop the servicing and grading design.

1 "Design Brief - Wateridge Village at Rockcliffe - Phase 1B", prepared by IBI Group, January 2017

2 "Burma Stormwater Management Facility Design, Wateridge Village at Rockcliffe - Phase 1B report", prepared by IBI Group dated June, 2017 (Rev. 5)

3 "Former CFB Rockcliffe Master Servicing Study", prepared by IBI Group, August 2015

4 Approved Wateridge Phase 1B design plans, prepared by IBI Group, individual plans with various revisions dated from February 2017 to November 2018

5 "Geotechnical Investigation Proposed Residential Development – Wateridge - Block 29 Wanaki Road - Ottawa" report (PG4965-1), prepared by Paterson Group, September 13, 2019

6 "Former CFB Rockcliffe Redevelopment, Stormwater Management Existing Conditions & LID Pilot Project Scoping" report, prepared by Aquafor Beech, May 2015

7 Wateridge Village Phase 1B As-built Sewer Design Sheets for storm and sanitary, prepared by IBI Group, stamp dated March 2018

8 "Wateridge Phase 1B Developer's Checklist", prepared by Aquafor Beech, October 22, 2019

It is also noted that the following Environmental Site Assessment reports were completed for Wateridge Village Phase 1B:

9 "Phase One Environmental Site Assessment, Former CFB Rockcliffe, Ottawa, Ontario", prepared by DST Consulting Engineers, dated March 2015

10 "Phase Two Environmental Site Assessment Update, Former CFB Rockcliffe, Ottawa, Ontario", prepared by DST Consulting Engineers, dated May 2015

2.0 PROPOSED DEVELOPMENT

The proposed development will consist of a three (3) storey building with a walk-out basement level with a maximum of 9 residential units. The site will have a parking lot with a single two-way access to Burma Road. The units are proposed to be either 3-bedroom or 4-bedroom units. It is anticipated that there will be five (5) 3-bedroom units and four (4) 4-bedroom units. A small common bicycle storage room is proposed in the centre of the proposed building, which will also allow residents access from the parking lot to the exterior stairs to the front units facing Wanaki Road and Provender Avenue. The Gross Floor Area (GFA) of the proposed building is 1,042m^2.

Refer to **Appendix C** for a copy of the latest Site Plan (by CSV Architects) showing the general layout of the proposed development.

3.0 SITE SERVICING

The objective of the site servicing design is to conform to the requirements of the City of Ottawa, to provide suitable sewage outlets and to ensure that a domestic water supply and appropriate fire protection are provided for the proposed development.

Servicing criteria, expected sewage flows and water demands for the proposed development have been established using the City of Ottawa design guidelines for sewer systems and water distribution.

3.1 Wateridge Phase 1B Services

The site is located adjacent to sections of Wanaki Road and Provender Avenue which are part of the Wateridge Phase 1B proposed works. These works were under construction at the time of writing of this report, however the municipal services and roadway up to the first lift of asphalt have been constructed. As-built plans are not yet available so design information from the approved Phase 1B design plans (by IBI Group)[4] and Phase 1B as-built sewer design sheets[7] provided by the City of Ottawa have been used to obtain pipe information for the adjacent municipal services in these roads. Refer to **Appendix D** for copies of the relevant Wateridge Village Phase 1B plans and the as-built sewer design sheets.

3.2 Proposed Servicing Overview

In general, the proposed development will be serviced for water, stormwater and sanitary by extending new private water, stormwater and sanitary services to the existing municipal watermain and sewers located in Wanaki Road. The existing sanitary and stormwater manholes on the site will be removed.

Refer to the subsequent sections of the report and to the attached drawing **119066-GP** for further details.

4.0 SANITARY SERVICING

The site currently has an existing 250mm dia. sanitary service from the existing on-site sanitary manhole (SAN MH 147AW) to the existing 250mm dia. municipal sanitary sewer located in Wanaki Road. There is also an existing 250mm dia. municipal sanitary sewer located in Burma Road.

The municipal sanitary sewer in Wanaki Road and the 250mm dia. service to the site were recently constructed as part of the Wateridge Phase 1B works (by IBI) and were designed to allow for future development of this site[1]. The estimated future peak sanitary flow from this site was calculated to be 0.54 L/s [1]. Refer to **Appendix E** for relevant excerpts of the sanitary design calculations and sanitary drainage area map from the Phase 1B Design Brief (1).

The proposed development will be serviced by extending a new private 200mm dia. sanitary service from the north-eastern corner of the site to the existing 250mm dia. municipal sewer in Wanaki Road. A private sanitary sewer system is proposed to extend from this connection to the western side of the proposed building. The existing sanitary manhole on site (MH 147AW) will be removed and the existing 250mm dia. outlet will be capped at the property line as this existing infrastructure is not in a suitable location to service the proposed development.

The theoretical sanitary flows for the proposed development are summarized below in **Table 4.1.** Refer to **Appendix E** for detailed calculations and design criteria.

Table 4.1: Sanitary Design Flows for the Proposed Development

Unit Count	Design Population [1] (people)	Average Flow [2] (L/s)	Peak Flow [3] (L/s)
9 x Single Family Units	30.6	0.10	0.40 [4]

[1] A single home population density of 3.4 people/unit ha been used to calculate the design population as it is anticipated that the proposed units may have a higher than usual occupancy due to the nature of the development.
[2] Average Dry Weather Flow
[3] Peak Wet Weather Flow includes an infiltration allowance of 0.33 L/s/gross ha.
[4] Residential Peaking Factor = 3.68 (per Harmon Equation).

Based on Manning's Equation, a 200mm dia. sanitary gravity sewer at a minimum slope of 1.0% has a full flow conveyance capacity of approximately 34 L/s, which is sufficient to convey the theoretical sanitary design flows calculated above.

The theoretical peak sanitary flow from the proposed development of 0.40 L/s is less than the estimated future peak sanitary flow allowed for in the design of the Phase 1B works of 0.54 L/s. Therefore, the existing municipal sanitary sewer system in Wanaki Road has sufficient capacity to accommodate the proposed development.

5.0 WATER SERVICING

There is an existing 406mm dia. municipal watermain located adjacent to the site in Wanaki Road. There are also existing 305mm dia. municipal watermains in Provender Avenue and Burma Road. The site is located in the Montreal (MONT) water distribution pressure zone. The proposed development will be serviced by extending a new water service from the proposed building to the existing 406mm dia. municipal watermain in Wanaki Road.

Some previous Wateridge Phase 1B drawings received from IBI indicated that a 150mm dia. watermain connection from the existing 406mm dia. municipal watermain in Wanaki Road to the eastern side of the site near existing stormwater manhole STM MH 147W was proposed as part of the Wateridge Phase 1B works. However, no as-built information is available at this time and a standpost has not been observed at the property line on site, so it is assumed that this connection was not installed. If it is discovered during construction that there is an existing water service to the site at this location, the water service will be blanked at the main and abandoned as it is not in a suitable location for the proposed development.

5.1 Water Demands

The theoretical domestic water demands for the proposed development are given in **Table 5.1.** Refer to **Appendix F** for the design criteria used, taken from Section 4 of the Ottawa Design Guidelines – Water Distribution.

Table 5.1: Theoretical Water Demands for Proposed Development

Average Water Demand (L/s)	Maximum Day Demand (L/s)	Peak Hour Demand (L/s)
0.13	0.33	0.73

The municipal watermain system on Wanaki Road forms part of the Wateridge Phase 1B works (by IBI) and the Phase 1B Design Brief (1) indicates this system was designed to allow for future development of this site as low-rise residential.

5.2 Water Supply for Fire-Fighting

The Fire Underwriters Survey (FUS) was used to estimate fire flow requirements for the proposed development. The following building construction details were confirmed with the architect:

- Wood frame construction
- 3-storey as defined by OBC
- Non-combustible occupancy type (OBC Group C residential)
- Non-sprinklered

It should be noted that fire flow requirements calculated using the FUS method tend to generate higher values when compared to flows being calculated using the Ontario Building Code (OBC).

The calculated fire flow demand for the proposed residential building is 183 L/s (11,000L/min). Refer to **Appendix F** for a copy of the FUS fire flow calculations.

There are five (5) existing municipal fire hydrants within 75m of the property. Refer to attached drawing **119066-GP** for their locations.

5.3 Municipal Boundary Conditions, Summary of Watermain Analysis Results and Multi Hydrant Analysis

The water demands and fire flow calculations presented above were provided to the City of Ottawa. These values were used to generate the municipal watermain network boundary conditions and to perform a multi hydrant analysis.

Table 5.3-A summarizes the boundary conditions provided by the City of Ottawa for the existing municipal watermain network. Refer to **Appendix F** for a copy of the correspondence from the City of Ottawa.

Table 5.3-A: Hydraulic Boundary Condition Provided by the City

Municipal Watermain Boundary Condition	Wanaki Rd Watermain
Minimum HGL	146.8 m
Maximum HGL	147.0 m

Table 5.3-B summarizes the theoretical water demands for the proposed development under the various operating conditions and compares the anticipated operating pressures at the existing

water service connection to the acceptable operating pressures outlined in the City of Ottawa Design Guidelines. It is assumed that hydraulic losses in the short length of the proposed 50mm dia. water service are negligible.

Table 5.3-B: Water Analysis Results Summary

Condition	Total Water Demand (L/s)	Approximate Design Operating Pressures (psi) / Relative Head (m) [1]	Acceptable Municipal Operating Pressures (psi)
Average Demand	0.13	77 psi (54.4 m)	40-80 psi
Peak Hour Demand	0.73	77 psi (54.2 m)	40-80 psi

1 – The finished floor elevation of the bike storage room is approximately 92.60 m.

The City of Ottawa performed a multi hydrant analysis assuming the four (4) hydrants closest to the property, all within 75m of the property, were running simultaneously. The total aggregate flow from the four hydrants exceeds the required fire flow of 183 L/s. Refer to **Appendix F** for email correspondence with the City of Ottawa.

Table 5.3-C summarizes the existing fire hydrants within 150m of the proposed building and the combined available fire flow for the sit. The combined fire flow was calculated using the individual fire flow contribution rates given in Technical Bulletin ISTB-2018-02.

Table 5.3-C: Summary of Existing Fire Hydrants Within 150m of the Proposed Building and Combined Available Fire Flow

Building	Fire Flow Demand (L/min)	Fire Hydrants Within 0-75m	Fire Hydrants Within 75- 150m	Combined Available Fire Flow [1] (L/min)
Proposed residential building	11,000	5 X AA-rated [1] hydrants	3 x AA-rated [1] hydrants	39,900

[1] – It is assumed that the hydrants recently constructed as part of the Wateridge Phase 1B works are AA-rated hydrants.

Based on the above analysis, the existing municipal watermain system can provide adequate water supply (domestic and fire) to the proposed development.

6.0 STORMWATER

6.1 Stormwater Management Criteria and Objectives

The stormwater management criteria and objectives for the site are as follows:

- Provide a dual drainage system (i.e. minor and major system flows).
- Control the post-development flows from the site to an allowable release rate, as specified in the “Burma Stormwater Management Facility Design, Wateridge Village at Rockcliffe -

Phase 1B" report (2). Post-development peak flows will be controlled for storms up to and including the 100-year design event, prior to being released into the municipal storm system.

- Provide on-site stormwater storage to control flows to the allowable release rate using surface ponding in the proposed parking lot area. Limit ponding to 300mm depth.
- Provide guidelines to ensure that site preparation and construction is in accordance with the current Best Management Practices for Erosion and Sediment Control.
- Investigate and provide low impact development (LID) measures as outlined in the "Former CFB Rockcliffe Redevelopment, Stormwater Management Existing Conditions & LID Pilot Project Scoping" report (6) and "Wateridge Phase 1B Developer's Checklist" (8), where possible.

6.2 Pre-Development Conditions

Under existing conditions, the 0.102 ha site is undeveloped and overlain with a mixture of topsoil and gravel. Stormwater flows from the site are currently being conveyed to an existing temporary catchbasin located near the north-west corner of the site which was constructed as part of the Wateridge Phase 1B works. It is unknown where this existing catchbasin outlets to. It has been confirmed with the City of Ottawa Development Inspections Unit that the temporary 375mm dia. outlet from this temporary catchbasin to the existing Burma SWM facility to the north of the site, shown on several Wateridge Phase 1B plans, was not constructed.

The site currently has an existing 300mm dia. storm service from the existing on-site stormwater manhole (STM MH 147W), located near the northeast corner of the site, to the existing 1050mm dia. municipal storm sewer located in Wanaki Road. The municipal storm sewer system in Wanaki Road ultimately outlets to the existing Burma SWM facility to the north of the site. The Burma SWM facility was recently retrofitted as part of the Wateridge Phase 1B works [2]. The Burma SWM facility outlets to the existing Wateridge municipal storm sewer system and ultimately discharges to the Wateridge Eastern Stormwater Management Facility which was constructed as part of the Wateridge Phase 1A works. There is also an existing 300mm dia. municipal storm sewer located in Burma Avenue.

The uncontrolled pre-development peak flows for the 5-year and the 100-year design events assuming a time of concentration of 10 minutes and a runoff coefficient of 0.60 were calculated using the Rational Method and are summarized in **Table 6.2.**

Table 6.2: Pre-Development Site Flows

Design Storm	Peak Flow
5-year	17.6 L/s
100-year	37.8 L/s

Refer to **Appendix G** for detailed calculations and design criteria.

6.3 Allowable Release Rate

The Burma SWM Pond was recently retrofitted to provide quantity control for approximately 50 ha of upstream development, including the subject site. The design criteria for the subject site used

in the hydrological and hydraulic modelling completed as part of the pond design assumed a total site imperviousness of 73% for future development of the site. This was calculated to be equivalent to a 5-year runoff coefficient (C) of 0.71. Refer to **Appendix G** for detailed calculations. A modelled flow of 26.0 L/s for both the 5-year and the 100-year design event was used for the subject site. Relevant extracts from the Burma Stormwater Management Facility Design report (2) are included in **Appendix G**.

The allowable release rate for the site was calculated using the Rational Method with the same design criteria as the Burma SWM Facility model (2): a runoff coefficient (C) of 0.71, a 5-year rainfall intensity of 104.2 mm/hr, based on City of Ottawa IDF Curves using a time of concentration of 10 minutes.

The allowable release rate was calculated to be 20.9 L/s. This is less than the modelled flow of 26.0 L /s used for the design of the Burma SWM Facility (2) and the Wateridge Phase 1B storm sewer system (1), so is therefore conservative. Refer to **Appendix G** for detailed calculations.

6.4 Post-Development Conditions

The proposed development will be serviced by connecting a new 250mm dia. storm service to the existing 1050mm dia. municipal storm sewer in Wanaki Road. A new private storm sewer system will be extended from this connection to the proposed parking lot. The existing temporary catchbasin and on-site stormwater manhole will be abandoned and removed and the existing catchbasin lead and storm service capped at the property line. Refer to attached plan **119066-GP** for details.

The proposed development will consist of two (2) drainage sub-catchment areas. Refer to attached plan **119066-STM** for details. A brief description of these areas is as follows:

- A-1: Direct Runoff Areas - Runoff from areas around the exterior of the site and the front of the building will drain uncontrolled towards the municipal Right-of-Ways and the Burma SWM Facility lands.
- A-2: Controlled Runoff Area - Runoff from the parking lot and most of the proposed building roof will be controlled by the use of an inlet control device on the outlet of the proposed catchbasin in the parking lot area.

The proposed foundation drain system for the building will be connected to the private storm sewer system downstream of any inlet control devices. A cleanout/inspection port will be provided within one of the basement level units.

The post-development flows for the site were calculated using the Rational Method and are detailed in the subsequent sections of the report. Refer to **Appendix G** for detailed SWM calculations.

6.4.1 Proposed Low Impact Design Measures

As the site is being developed as part of Phase 1B of the Wateridge Village development, low impact development (LID) measures as outlined in the “Former CFB Rockcliffe Redevelopment, Stormwater Management Existing Conditions & LID Pilot Project Scoping” report (6) and “Wateridge Phase 1B Developer’s Checklist” (8) are required and have been provided for the proposed site.

In order to conform to the LID requirements, the following LID measures are proposed:

- Downspout redirection to subsurface soakaway pit: Runoff from approximately 225 m^2 of the proposed building roof area will be directed to a subsurface soakaway pit via a roof leader conveyance system. The proposed soakaway pit is located to the west of the proposed building underneath the proposed parking lot.
- On-site soil amendment works: All green space will include soil amendments in conformance with the "Wateridge Phase 1B Developer's Checklist" (8).

Geotechnical investigation results for the site show that the subsurface soil profile of the site consists of topsoil and/or fill consisting of crushed stone followed by hard to very stiff silty clay crust, followed by a stiff to firm silty clay deposit up to approximately 3m below the existing surface [5]. Based on correspondence with Paterson Group, the expected infiltration rate for the subsoil conditions at the proposed soakaway pit location can be expected to be in the range of 14 - 46 mm/hour. For design purposes, an average infiltration rate of 30 mm/hr has been assumed. The LID infiltration target for the site is to in infiltrate an equivalent volume of a 4 mm event applied to the full catchment area. For this site, the required infiltration volume is 4.06 m^3. The proposed soakaway pit provides 4.15 m^3 of storage volume, exceeding the required infiltration volume, designed with a maximum drawdown time of 48 hours.

The soakaway pit has been designed in accordance with the "Wateridge Phase 1B Developer's Checklist" (8), the Ministry of the Environment Stormwater Planning and Design Manual and the Credit Valley Conservation Low Impact Design SWM Planning and Design Manual. Regular inspection of the soakaway pit will be required.

Relevant excerpts from the Former CFB Rockcliffe SWM Existing Conditions & LID report (6) and Wateridge Phase 1B Developer's Checklist (8) are included in **Appendix G.** Refer to plans **119066-GP** and **119066-DET** for details of the proposed soakaway pit.

6.4.2 Area A-1 – Uncontrolled Direct Runoff

The uncontrolled post-development flows from this direct runoff sub-catchment area (0.037 ha) are shown in **Table 6.4-A.**

Table 6.4-A: Area A-1 - Post-Development Uncontrolled Flows

Design Event	Uncontrolled Flow
5-year	5.2 L/s
100-year	10.2 L/s

6.4.3 Area A-2– Controlled Flows

Stormwater runoff from the ground surface areas of sub-catchment area A-2 will be directed to the proposed parking lot area and captured by the proposed catchbasin located in the parking lot. Runoff from the building rooftop areas within sub-catchment area A-2 will be directed to the proposed soakaway pit, which when full will overflow to the surface into sub-catchment area A-2. The post-development flows from this sub-catchment will be attenuated by the use of a vortex type ICD installed within the outlet pipe of the proposed catchbasin. Stormwater runoff from this

drainage area will be temporarily stored on the surface of the parking lot prior to being discharged into the proposed storm sewer system. There will be no ponding during the 2-year design event.

The design flows for this sub-catchment area were determined by subtracting the uncontrolled flows from Area A-1 from the allowable release rate for both the 5-year and 100-year design storms. The Modified Rational Method was used to determine the required storage volumes for the 5-year and 100-year design events. For the purposes of stormwater management calculations, it was conservatively assumed that all flows to the infiltration pit will overflow and drain to the proposed catchbasin during the 5-year and 100-year design events. The stage-storage curve for the proposed catchbasin and parking lot ponding was determined from the proposed grading. Refer to attached drawing **119066-GR** for details of the proposed grading. An iterative process was used to determine the required orifice size for a plug type ICD and the approximate ponding depths for the 5-year and 100-year design storms. As a circular orifice with a diameter less than 83mm would be required, a vortex-type ICD was specified. Refer to **Appendix G** for details of the proposed ICD.

Table 6.4-B summarizes the controlled flows, the type of ICD, required storage volumes and approximate ponding depths for the 5-year and 100-year design events and the total storage volume available.

Table 6.4-B: Area A-2 – Post-Development Controlled Flows

Design Event	ICD Type	Controlled Flow	Storage Volume Required	Approximate Ponding Depth (Elevation)	Maximum Storage Volume Available [1]
5-year	Tempest LMF ICD Vortex 98	10.1 L/s	1.3 m^3	6 cm (92.16m)	10 m^3 (excluding soakaway pit)
100-year		10.3 L/s	6.2 m^3	12 cm (92.22m)	

1 – At the emergency spill elevation of 92.25m

Refer to **Appendix G** for detailed calculations.

Based on Manning's Equation, a 250mm dia. gravity storm sewer at a minimum slope of 0.75% has a full flow conveyance capacity of approximately 54 L/s, which is sufficient to convey the stormwater design flows calculated above.

The 100-year hydraulic grade line (HGL) within the existing municipal storm sewer in Wanaki Road was modelled by IBI to be 90.93m at MH 147 [1, 5.] Based on the pipe invert information available for this existing storm sewer system (4), with the proposed storm service connection located downstream of this manhole, the HGL at the proposed storm service connection location is more than 300mm below the weeping tile invert and front underside of footing elevation of 92.10m.

6.4.4 Summary of Post-Development Flows

Table 6.4-C compares the total post-development flows from the site to the allowable release rate and to the total pre-development flows for the 5-year and the 100-year design events.

Table 6.4-C: Stormwater Flow Comparison Table

Design Event	Pre-Development Flow	Allowable Release Rate	Post-Development Total Flow
5-year	17.6 L/s	20.9 L/s	15.2 L/s
100-year	37.8 L/s		20.5 L/s

The total stormwater flows from the site will decrease from the pre-development flows and the post-development flows will meet the allowable release rate for both the 5-year and 100-year design storm events.

6.5 Stormwater Quality Control

The subject site is located within the jurisdiction of the Rideau Valley Conservation Authority (RVCA). As per the Wateridge Phase 1B Design Brief (1), stormwater quality control will be provided by the Eastern Stormwater Management Facility for the Wateridge development area, constructed as part of Phase 1A. Relevant correspondence from the RVCA is included in **Appendix G.**

7.0 SITE GRADING

The existing site is generally flat at an elevation of approximately ± 91.3 with sloped sides rising between approximately 1-3m to the adjacent higher right-of-ways and Burma SWM Facility lands. The finished floor elevations (FFE) of the proposed development have been set to accommodate the elevations of the proposed curbs along Wanaki Road and Provender Avenue and the existing elevations along Burma Road and the asphalt path along the exterior of the Burma SWM Facility. Refer to plan **119066-GR** for details.

7.1 Major System Overflow Route

In the case of a major rainfall event exceeding the design storms provided for, stormwater from the site will overflow towards the adjacent right-of-ways. The parking lot area will overflow towards the Burma Road right-of-way. The basement finished floor elevations have been set to be a minimum of 0.3m above the major system overflow points in the adjacent streets, and a minimum of 0.25m above the site's overland flow spill point located in the proposed driveway. The major system overflow route is shown on plan **119066-GR**.

8.0 GEOTECHNICAL INVESTIGATIONS AND ENVIRONMENTAL SITE ASSESSMENT REPORT

A Geotechnical Investigation Report (5) has been prepared by Paterson Group. Refer to the Geotechnical Report for sub-surface conditions, construction recommendations and geotechnical inspection requirements.

It is noted that a Phase One Environmental Site Assessment (9) and a Phase Two Environmental Site Assessment Update (10) were previously completed in support of the Wateridge Village at Rockcliffe Subdivision Phase 1B.

9.0 EROSION AND SEDIMENT CONTROL

To mitigate erosion and to prevent sediment from entering the storm sewer system, temporary erosion and sediment control measures will be implemented on-site during construction in accordance with the Best Management Practices for Erosion and Sediment Control. This includes the following temporary measures:

- Filter socks will be placed under the grates of nearby catchbasins and manholes and will remain in place until construction is completed.
- Silt fencing will be placed per OPSS 577 and OPSD 219.110 along the surrounding construction limits, where applicable.
- Mud mats will be installed at the site entrances.
- Street sweeping and cleaning will be performed, as required, to suppress dust and to provide safe and clean roadways adjacent to the construction site.
- On-site dewatering is to be directed to a sediment trap and/or gravel splash pad and discharged safely to an approved outlet as directed by the engineer.

The temporary erosion and sediment control measures will be implemented prior to construction and will remain in place during all phases of construction. Regular inspection and maintenance of the erosion control measures will be undertaken.

10.0 CONCLUSIONS

This report has been prepared in support of a site plan control application for the proposed low-rise residential development at 455 Wanaki Road. The proposed development will consist of a maximum of 9 residential units.

The conclusions are as follows:

- The proposed development will be serviced for sanitary by extending a new 200mm dia. connection to the existing 250mm dia. municipal sanitary sewer in Wanaki Road and constructing a new private sanitary system to the western side of the proposed building.
- The proposed development will be serviced for stormwater by extending a new 250mm dia. connection to the existing 1050mm dia. stormwater sewer in Wanaki Road and constructing a new private stormwater system to the proposed parking lot.
- The existing sanitary and stormwater manholes on the eastern side of the proposed building will be removed and the existing services capped and abandoned as they are not in suitable locations to service the proposed development.
- The proposed development will be serviced for water by extending a new 50mm dia. water service from the proposed building to the existing 400mm dia. municipal watermain located in Wanaki Road.
- If required, the existing (unconfirmed) water service will be blanked at the main as it is not in a suitable location to service the proposed development.
- Based on information in the Wateridge Development Phase 1B Design Brief by IBI (1), the municipal sanitary sewer and municipal watermain in Wanaki Road were sized to accommodate low-rise residential development of this site.

9.0 EROSION AND SEDIMENT CONTROL

To mitigate erosion and to prevent sediment from entering the storm sewer system, temporary erosion and sediment control measures will be implemented on-site during construction in accordance with the Best Management Practices for Erosion and Sediment Control. This includes the following temporary measures:

- Filter socks will be placed under the grates of nearby catchbasins and manholes and will remain in place until construction is completed.
- Silt fencing will be placed per OPSS 577 and OPSD 219.110 along the surrounding construction limits, where applicable.
- Mud mats will be installed at the site entrances.
- Street sweeping and cleaning will be performed, as required, to suppress dust and to provide safe and clean roadways adjacent to the construction site.
- On-site dewatering is to be directed to a sediment trap and/or gravel splash pad and discharged safely to an approved outlet as directed by the engineer.

The temporary erosion and sediment control measures will be implemented prior to construction and will remain in place during all phases of construction. Regular inspection and maintenance of the erosion control measures will be undertaken.

10.0 CONCLUSIONS

This report has been prepared in support of a site plan control application for the proposed low-rise residential development at 455 Wanaki Road. The proposed development will consist of a maximum of 9 residential units.

The conclusions are as follows:

- The proposed development will be serviced for sanitary by extending a new 200mm dia. connection to the existing 250mm dia. municipal sanitary sewer in Wanaki Road and constructing a new private sanitary system to the western side of the proposed building.
- The proposed development will be serviced for stormwater by extending a new 250mm dia. connection to the existing 1050mm dia. stormwater sewer in Wanaki Road and constructing a new private stormwater system to the proposed parking lot.
- The existing sanitary and stormwater manholes on the eastern side of the proposed building will be removed and the existing services capped and abandoned as they are not in suitable locations to service the proposed development.
- The proposed development will be serviced for water by extending a new 50mm dia. water service from the proposed building to the existing 400mm dia. municipal watermain located in Wanaki Road.
- If required, the existing (unconfirmed) water service will be blanked at the main as it is not in a suitable location to service the proposed development.
- Based on information in the Wateridge Development Phase 1B Design Brief by IBI (1), the municipal sanitary sewer and municipal watermain in Wanaki Road were sized to accommodate low-rise residential development of this site.

- Based on hydraulic boundary conditions and multi hydrant analysis results provided by the City of Ottawa, the existing municipal watermain network within the vicinity of the site is adequate to service the proposed development.
- On-site stormwater quantity control will be provided by using surface storage in the proposed parking lot area. A Tempest LMF Vortex 98 Inlet Control Device will be installed within the proposed catchbasin. The ponding depth will be approximately 6 cm and 12 cm during the 5-year and 100-year design events respectively.
- The total post-development stormwater flows from the site will be approximately 15.2 L/s during the 5-year design event and 20.5 L/s during the 100-year design event, both less than the allowable release rate of 20.9 L/s. This represents a reduction in total stormwater flows from the site from the pre-development conditions.
- On-site stormwater quality control is not required, nor being provided. The Wateridge Eastern SWM pond located downstream provides quality treatment of stormwater runoff from the site.
- Some low impact design (LID) measures are being provided, including a soakaway pit, as required by the "Former CFB Rockcliffe Redevelopment, Stormwater Management Existing Conditions & LID Pilot Project Scoping" report (6).
- Temporary erosion and sediment controls will be provided during construction.

NOVATECH

Prepared by:

Lydia Bolam, P. Eng.
Project Engineer

Approved by:

Greg MacDonald, P. Eng.
Director | Land Development and
Public Sector Infrastructure

Reviewed by:

Justin Gauthier, B.A.Sc.
Project Manager | Land Development
Engineering

APPENDIX A

Topographic Plan of Survey

TOPOGRAPHICAL PLAN OF SURVEY OF

BLOCK 29
REGISTERED PLAN 4M-1581
CITY OF OTTAWA

Surveyed by Annis, O'Sullivan, Vollebekk Ltd.

Scale 1 : 300

12 9 6 3 0 6 12 Metres

Metric

DISTANCES 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 22nd day of April, 2019.

May 2, 2019
Date

A. J. Broxham
Andrew J. Broxham
Ontario Land Surveyor

Notes & Legend

	Denotes	
—□—	"	Survey Monument Planted
—■—	"	Survey Monument Found
SIB	"	Standard Iron Bar
SSIB	"	Short Standard Iron Bar
SSIB*	"	Short Standard Iron Bar (0.3 Long)
IB	"	Iron Bar
(PI)	"	Registered Plan 4M-1581
(WIT)	"	Witness
Meas.	"	Measured
(AOG)	"	Annis, O'Sullivan, Vollebekk Ltd.
○ MH-ST	"	Maintenance Hole (Storm Sewer)
○ MH	"	Maintenance Hole (Unidentified)
○ MH-S	"	Maintenance Hole (Sanitary)
○ MH-H	"	Maintenance Hole (Hydro)
⊖ VC	"	Valve Chamber (Watermain)
⊖ WV	"	Water Valve
CCP	"	Concrete Pipe
Ø	"	Diameter
+65.00	"	Location of Elevations
+65.00	"	Top of Curb Elevations
+65.00*	"	Top of Wall
———	"	Property Line
○ FH	"	Fire Hydrant
T/P	"	Top of Pipe
□ CB	"	Catch Basin
□ CBI	"	Catch Basin Inlet
T/G	"	Top of Grate
□ DI	"	Ditch Inlet
○ B	"	Bollard
▫ TB-B	"	Bell Terminal Box
▫ TB-C	"	Cable Terminal Box
○ LS	"	Light Standard
CRW	"	Concrete Retaining Wall

SITE AREA=1015.1 square metres

ASSOCIATION OF ONTARIO LAND SURVEYORS
PLAN SUBMISSION FORM
2086184

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

ELEVATION NOTES

1. Elevations shown are geodetic and are referred to the CGVD28 geodetic datum.
2. It is the responsibility of the user of this information to verify that the job benchmark has not been altered or disturbed and that it's 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.

All bearing and distances between found survey monuments are (P1)&Meas.

Bearings are grid, derived from the easterly limit of Burma Road shown to be N 15°46'00" W on Registered plan 4M-1581 and are referred to the Central Meridian of MTM Zone 9 (76°30' West Longitude) NAD-83 (original).

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. 17726-19 Habitat Blk29 4M-1581 T F | ig

APPENDIX B

Pre-Consultation Correspondence

Pre-Application Consultation Meeting Notes

Property Address: 455 Wanaki Road
PC2019-0062
March 14, 2019, 4103E

Attendees:

Internal Invitees:
Planner (File Lead) – Kimberley Baldwin
Urban Designer – Christopher Moise
Project Manager, Infrastructure – Richard Buchanan
Project Manager, Transportation – Wally Dubyk
Planning Co-op Student – Caleb Miller

External Invitees:
Applicant, Colonnade BridgePort – Bonnie Martell
Architect – Anthony Leaning
Habitat for Humanity – Marc Caron
Habitat for Humanity – Steve Walsh

Wateridge Community Association – Lysanne Brault
Wateridge Community Association – Jane Thompson

Meeting notes:

Opening & attendee introduction

- Introduction of meeting attendees
- Confirmation of signed N.D.A. by Community Association Representatives
- Overview of proposal: A 3 storey residential building with a total of 8 stacked units. The building is defined as 3-storey per Code, and by bylaw is also likely 3-storey as the 2nd level (ground floor) is closest to grade. We haven't calculated this exactly yet, so it will be confirmed. If the bylaw provision that grade is to be calculated based on existing grades, prior to raising levels as part of the plan of subdivision, then it might still be a 4-storey building. Mr. Leaning asked staff to verify whether that provision applies, as it would also affect compliance with maximum building height.
- The units will be ground oriented. Some of the units will be barrier free accessible units. 8 Parking spaces planned to accommodate the Habitat for Humanity families who may rely on vehicle transportation.
- Mr. Caron provided a brief background of Habitat for Humanity and the work that they do across Canada.

Preliminary comments and questions from staff and agencies, including follow-up actions:

Planning – Kim Baldwin and John Lunney

- Staff explained some of the Secondary policies applicable to the site.
  - As per Secondary Plan, the site is designated low-rise residential
  - The required density for the site is 32 units per net hectare, which on this site results in a minimum of 9 units
  - The building(s) should face Wanaki
  - A cycle track is proposed along Wanaki.
- Staff confirmed that 5 metre setback is required on all sides regardless if the development is deemed a townhouse or an apartment
  - *Correction: A 5m setback on all sides of the site applies to a PUD development only (ie. Multiple buildings on one lot). The setbacks that would apply to a single low-rise apartment building or stacked dwelling is complex. Ms. Baldwin and Mr. Lunney are currently examining the provisions applying to those other uses with Zoning Interpreter staff. Confirmation to follow next week.*
- Amenity space requirements are dependent on the use proposed. See Section 137 of the Zoning Bylaw. Note that amenity space cannot technically be provided in the front and/or corner side yards.
- Ms. Baldwin highlighted that community consultation is currently required for this development. in June 2019, the threshold for public consultation in a site plan control application process will be changing. For the community's information, a four to 13-unit residential development would not trigger public consultation in the new process.

Urban Design – Christopher Moise

- Through the lens of local context, the site may be over-accommodating in parking. A large area of the site is currently designated for surface parking.
- This site will be setting design precedents for future nearby development and should seek every opportunity to achieve excellent design
- The size of the lot looks like it could accommodate additional density. More density would be compatible with the adjacent dwelling units immediately west of the site and the vision for the Wateridge community.

Engineering – Richard Buchanan

- Site Plan will need to reflect effective servicing for whatever building type is finalized
- Staff can provide the servicing plan from the approved subdivision.
- If there is only one building proposed, only one service can be provided.
- ESA not required (Study already completed through subdivision process)
- Geotechnical report and noise study will be required
- A complete list of plans and studies will be submitted to the applicant in a follow-up email.

Transportation – Wally Dubyk

- 8 Parking spaces has no significant impact on traffic, so a Traffic Impact Assessment is not likely required
- Please fill out a Traffic Screening form to confirm
- Along Wanaki, a cycle track and sidewalk is proposed. Canada Lands Company will construct the works in the right-of-way. Please show all the proposed works on your site plan. A cross section of the approved CLC plans will be provided to you.
    - Comment from Mr. Moise: If sidewalks are proposed along Wanaki, consider removing the in-lot sidewalks if they are redundant

Questions and comments from the Community Association representative

Lysanne Brault – General Comments

- This development is welcomed by the community. The community may even want to participate in the project.
- Comments on parking
    - Not sure less than one car per unit is desirable on this Habitat for Humanity site as living at Wateridge, is not like people living downtown who can easily walk to all amenities. One car per household is to be expected.
    - If insufficient parking is provided and the residents and their visitors at this site start parking on the street, Wanaki being a collector and main access to Wateridge, this would not be appropriate, nor would it be appropriate that they park on neighboring Provender area.

Jane Thompson – Site Specific comments

- The site is a gateway to the neighbourhood that requires special design considerations
- The frontage of Burma appears to have many mature trees. If mature trees still exists on site, efforts to conserve them would be greatly preferred

Next steps

- Planning staff to send applicant list of plans and studies required.
- Planning staff to respond to applicant's zoning questions.
- Encourage applicant to discuss the proposal with Councillor, community groups and neighbours

APPLICANT'S STUDY AND PLAN IDENTIFICATION LIST

Legend:

The letter **S** indicates that the study or plan is required with application submission.
The letter **A** indicates that the study or plan may be required to satisfy a condition of approval/draft approval.

For information on preparing required studies and plans refer to:

http://ottawa.ca/en/city-hall/planning-and-development/guide-preparing-studies-and-plans

S/A	Number of copies	ENGINEERING		S/A	Number of copies
S	5	1. Site Servicing Plan	2. Assessment of Adequacy of Public Services / Site Servicing Brief	S	3
S	5	3. Grade Control and Drainage Plan	4. Geotechnical Study / Slope Stability Study	S	3
	2	5. Composite Utility Plan	6. Groundwater Impact Study		6
	5	7. Servicing Options Report	8. Wellhead Protection Study		6
	9	9. Community Transportation Study and / or Transportation Impact Study / Brief	10. Erosion and Sediment Control Plan / Brief	S	3
S	3	11. Storm water Management Brief	12. Hydro geological and Terrain Analysis		8
	3	13. Hydraulic Water main Analysis	14. Noise / Vibration Study	S	3
	10	15. Roadway Modification Design Plan	16. Confederation Line Proximity Study		9

S/A	Number of copies	PLANNING / DESIGN / SURVEY		S/A	Number of copies
	50	17. Draft Plan of Subdivision	18. Plan Showing Layout of Parking Garage		2
	30	19. Draft Plan of Condominium	20. Planning Rationale	S	2
S	5	21. Site Plan	22. Minimum Distance Separation (MDS)		3
	10	23. Concept Plan Showing Proposed Land Uses and Landscaping	24. Agrology and Soil Capability Study		5
	3	25. Concept Plan Showing Ultimate Use of Land	26. Cultural Heritage Impact Statement		3
S	5	27. Landscape Plan	28. Archaeological Resource Assessment Requirements: **S** (site plan) **A** (subdivision, condo)		3
S	2	29. Survey Plan	30. Shadow Analysis		3
S	3	31. Architectural Building Elevation Drawings (dimensioned)	32. Design Brief (includes the Design Review Panel Submission Requirements)	S	Available online
	6	33. Wind Analysis			

S/A	Number of copies	ENVIRONMENTAL		S/A	Number of copies
	3	34. Phase 1 Environmental Site Assessment	35. Impact Assessment of Adjacent Waste Disposal/Former Landfill Site		6
	3	36. Phase 2 Environmental Site Assessment (depends on the outcome of Phase 1)	37. Assessment of Landform Features		7
	4	38. Record of Site Condition	39. Mineral Resource Impact Assessment		4
S	5	40. Tree Conservation Report *(can be provided on the landscape plan)*	41. Scoped Environmental Impact Statement		11
	4	42. Mine Hazard Study / Abandoned Pit or Quarry Study			

S/A	Number of copies	ADDITIONAL REQUIREMENTS		S/A	Number of copies
		43.	44.		

Meeting Date: March 14, 2019

Application Type: ,*Site Plan Control , with Public Consultation (now until June 2019)*

File Lead: Kimberley Baldwin

Engineer/Project Manager: Richard Buchanan

Site Address: 455 Wanaki Road

*Preliminary Assessment: 1☐ 2☐ 3☐ 4☐ 5☐

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

It is important to note that the need for additional studies and plans may result during application review. If following the submission of your application, it is determined that material that is not identified in this checklist is required to achieve complete application status, in accordance with the Planning Act and Official Plan requirements, City Planning will notify you of outstanding material required within the required 30 day period. Mandatory pre-application consultation will not shorten the City's standard processing timelines, or guarantee that an application will be approved. It is intended to help educate and inform the applicant about submission requirements as well as municipal processes, policies, and key issues in advance of submitting a formal development application. This list is valid for one year following the meeting date. If the application is not submitted within this timeframe the applicant must again pre-consult with the City.

Last updated January, 2014

APPENDIX C

Site Plan

1 SITE PLAN
A100 | 1 : 100

PRINTED: 10/29/2019 12:40:05 PM

GENERAL NOTES:

LEGAL DESCRIPTION:
BLOCK 29
REGISTERED PLAN 4M-1581
CITY OF OTTAWA

ADDRESS:
455 WANAKI ROAD (BLOCK 29),
OTTAWA, ONTARIO

SURVEY INFORMATION FROM:
THIS DRAWING IS BASED ON A SURVEY PREPARED BY ANNIS, O'SULLIVAN, VOLLEBEKK LTD., MAY 2ND, 2019

PROPOSED SITE

LOCATION PLAN

LOW-RISE APARTMENT ZONE: R4Y[2311]		
PERFORMANCE STANDARDS	**REQUIRED**	**PROVIDED**
MIN. LOT WIDTH	18m	19.24m
MIN. LOT AREA	450sqm	1015sqm
MIN. FRONT YARD SETBACK (FOR A CORNER THROUGH LOT)	AS PER SECTION 135 (2) - CORNER SIDE YARD SETBACK APPLIES : 3m	4.4m
MIN.CORNER YARD SETBACK (AS PER SECTION 135(2))	APPLIES TO PROVENDER AVE. AS WELL AS BURMA RD. AND WANAKI RD.: 3m	3m
MIN. INTERIOR SIDE YARD SETBACK	N/a	N/A
MIN. REAR YARD SETBACK	AS PER SECTION 135 (1) - FRONT YARD SETBACK APPLIES: 5m	5m
MAX. BUILDING HEIGHT	16m	11.6m
LANDSCAPE AREA	30% OF LOT AREA = 338.2.SQM	505.6SQM
AMENITY AREA TABLE 137(2)	TOTAL AMENITY AREA: 15SQM PER DWELLING UNIT UP TO 8 UNITS, PLUS 6SQM PER UNIT IN EXCESS OF 8: 120SQM	147SQM
	COMMUNAL AMENITY AREA: 100% OF AMENITY AREA REQUIRED FOR FIRST 12 UNITS: 120SQM	147SQM EXTERIOR 26SQM INTERIOR 18SQM PRIVATE AMENITY 191SQM TOTAL
	LAYOUT OF COMMUNAL AMENITY AREA -BE LOCATED AT GRADE AND IN THE REAR YARD -BE LANDSCAPED -CONSIST OF AT LEAST 80% SOFT LANDSCAPING (96SQM) -BE LOCATED AT GRADE AND IN THE REAR YARD AND MAY INCLUDE ON INTERIOR YARD THAT ABUTS BOTH THE REAR YARD AND INTERIOR SIDE YARD, UNLESS THE LOT HAS ACCESS TO A REAR LANE.	
PARKING REQUIREMENTS	**REQUIRED**	**PROVIDED**
MIN. PARKING SPACE RATES (SECTION 101(3))	AREA X ON SCHEDULE 1A, NO OFF-STREET MOTOR VEHICLE PARKING REQUIRED FOR THEFIRST 12UNITS: 0 SPACES REQUIRED	8 SPACES
MIN. VISITOR PARKING RATES SECTION 102(2))	AREA X ON SCHEDULE 1A, NO VISITOR PARKING REQUIRED FOR THEFIRST 12UNITS: 0 SPACES REQUIRED	0 SPACES
MIN. BICYCLE PARKING SPACE RATES (TABLE 111A(b)(i))	1 PER DWELLING UNIT:	9 SPACES

GENERAL NOTES:

1. ALL GENERAL SITE INFORMATION AND CONDITIONS COMPILED FROM EXISTING PLANS AND SURVEYS.
2. DO NOT SCALE THIS DRAWING
3. REPORT ANY DISCREPANCIES PRIOR TO COMMENCING WORK. NO RESPONSIBILITY IS BORN BY THE CONSULTANT FOR UNKNOWN SUBSURFACE CONDITIONS
4. CONTRACTOR TO CHECK AND VERIFY ALL DIMENSIONS ON SITE AND REPORT AN ERRORS AND/OR OMISSIONS TO THE CONSULTANT
5. REINSTATE ALL AREAS AND ITEMS DAMAGED AS A RESULT OF CONSTRUCTION ACTIVITIES TO THE SATISFACTION OF THE CONSULTANT
6. CONTRACTOR TO LAYOUT PLANTING BEDS, PATHWAYS, ETC. TO APPROVAL OF CONSULTANT PRIOR TO ANY JOB EXCAVATION
7. DRAWING MAY NOT BE USED FOR CONSTRUCTION UNTIL SIGNED BY THE LANDSCAPE ARCHITECT AND ISSUED FOR CONSTRUCTION
8. THE ACCURACY OF THE POSITION OF UTILITIES IS NOT GUARANTEED
9. INDIVIDUAL UTILITY COMPANIES MUST BE CONTACTED FOR CONFIRMATION OF UTILITY EXISTENCE AND LOCATION PRIOR TO DIGGING
10. THIS DRAWING IS AN INSTRUMENT OF SERVICE AND REQUIRES THE PERMISSION OF THE ARCHITECT FOR USE
11. ALL DISTURBED AREAS TO BE RESTORED TO ORIGINAL CONDITION OR BETTER UNLESS OTHERWISE SPECIFIED.
12. CONTRACTORIS RESPONSIBLE TO KEEP THE ROADS FREE AND CLEAN FROM MUD OR DEBRIS AT ALL TIMES.
13. INLET PROTECTION FILTER CLOTH IS REQUIRED.
14. SLOPE GRADE AWAY FROM BUILDING FACE & PROVIDE AT OR BELOW GRADE LEVEL.

NOTES:

1. LANDSCAPE WALL - SEE LANDSCAPING
2. DEPRESSED CURB B.F. ACCESS
3. CURB CUT FOR OVERFLOW - SEE CIVIL
4. PAINTED PARKING LINES
5. ASPHALT PARKING / DRIVEWAY w/ HEAVY DUTY ASPHALT - SEE CIVIL
6. CONCRETE PATH - SEE LANDSCAPE
7. TIERED LIGHT WELL - SEE LANDSCAPE
8. PRECAST CONCRETE STAIRS W/ GUARDRAIL
9. WOOD FENCE - SEE LANDSCAPE
10. GARBAGE ENCLOSURE:
    GARBAGE 1 X 2 YARD BIN
    FIBER 1 X 360L CART
    GLASS, METAL AND PLASTIC 1 X 360L CART
    ORGANICS 1 X 240L CART
11. AMENITY SPACE
12. COMMUNITY MAILBOX
13. DOWNSPOUT - SEE ALSO CIVIL
14. BIKE PARKING W/ RACK

CSV ARCHITECTS
sustainable design · conception écologique
613.564.8118
www.csv.ca
402-1066 Somerset St. W
Ottawa, Ontario, K1Y 4T3

CIVIL ENGINEER
NOVA TECH
SUITE 200, 240 MICHAEL COWPLAND DR.
613-254-9643
g.Mcdonald@novatech-eng.com

LANDSCAPE ARCHITECT
GINO J. AIELLO LANDSCAPE ARCHITECT
50 CAMELOT DR.
613-852-1343
gino@gjala.com

STAMP

REV	DATE	ISSUE
5	2019/10/22	ISSUED FOR SP COMMENTS
4	2019/10/04	ISSUED FOR 33% REVIEW
3	2019/09/17	ISSUED FOR SPCA COMMENTS
2	2019/06/27	ISSUED FOR SITE PLAN CONTROL

CLIENT

HABITAT FOR HUMANITY

Client Street Address,
Province, Postal Code,
Country

PROJECT

HABITAT GREATER OTTAWA

455 WANAKI ROAD (BLOCK 29),
OTTAWA, ONTARIO

TITLE

SITE PLAN

PROJECT NO: 2018-0320
DRAWN: RP
APPROVED AL
SCALE As indicated
FIRST ISSUE: 04/23/19

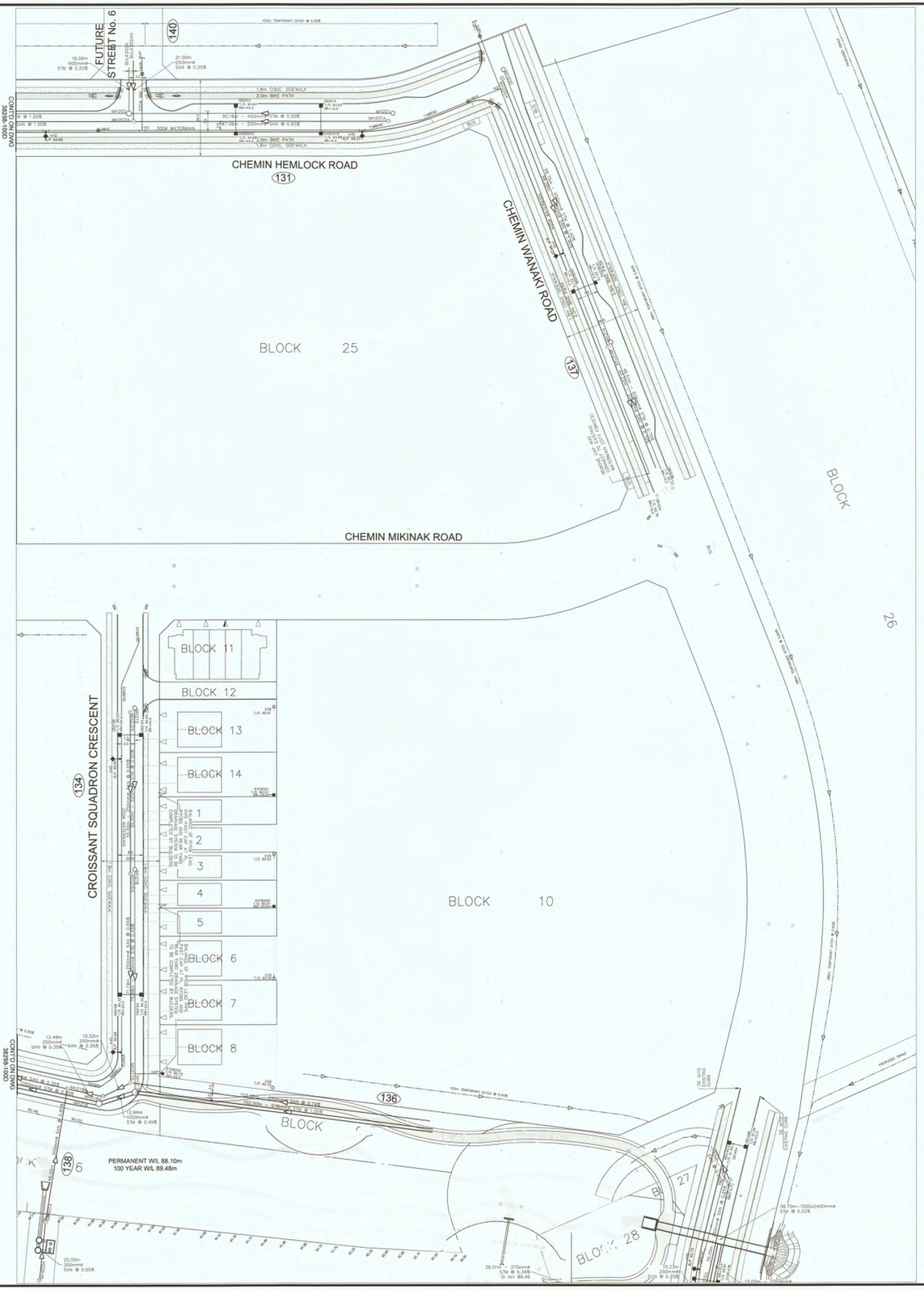
REV	DRAWING NO.
5	A100

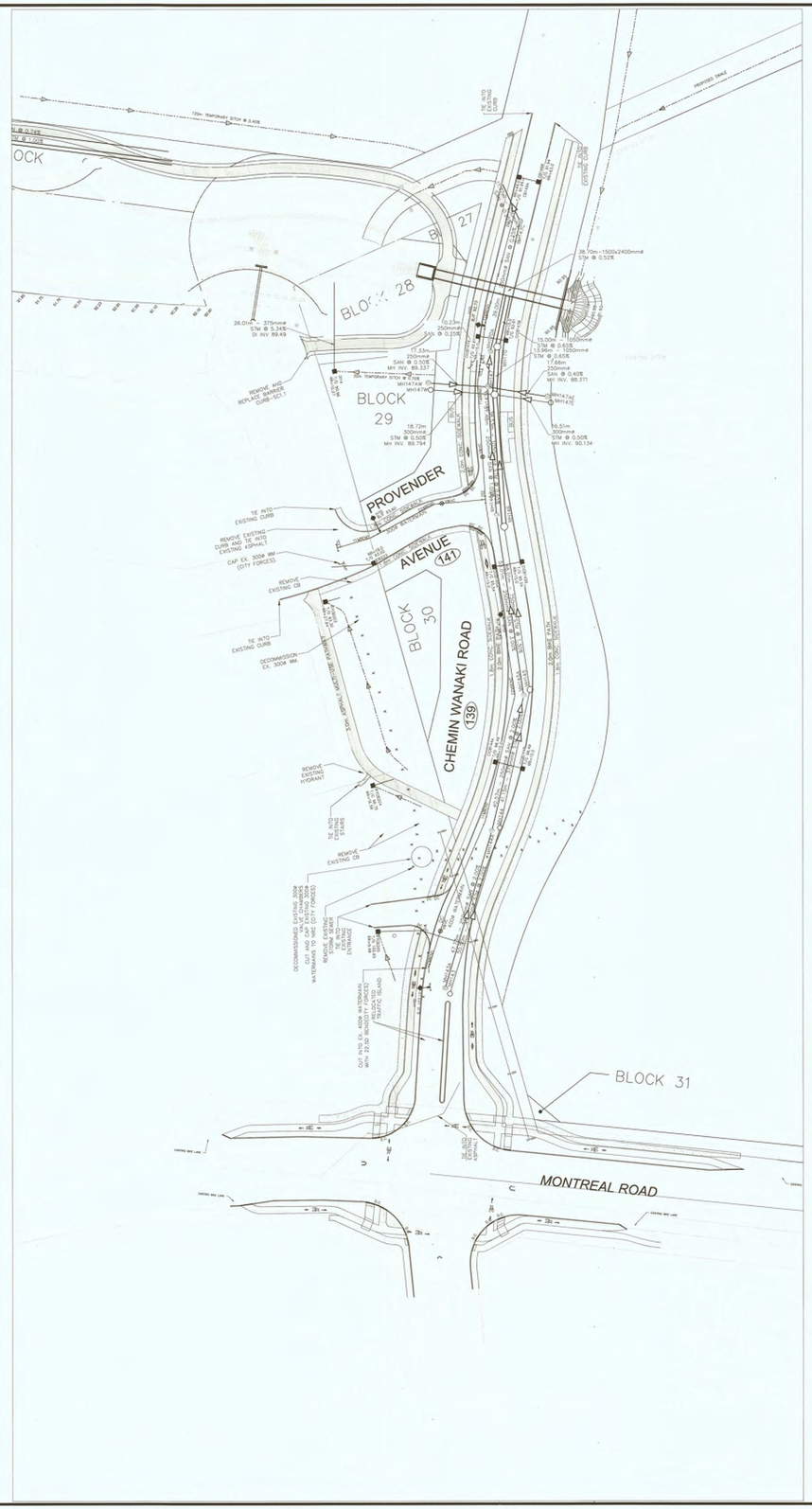
D07-12-19-0117

17982

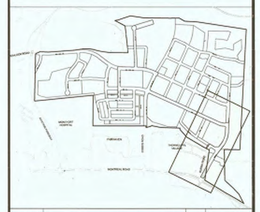
APPENDIX D

Wateridge Phase 1B Design Plans





REVIEWED BY
DEVELOPMENT REVIEW SERVICES BRANCH
Signed Will Curry
Date June 19 2017
Plan Number 17063



No.	REVISIONS	By	Date
14			
13			
12			
11			
10			
9			
8			
7	REVISED PER CITY COMMENTS	J.I.M.	2017:06:16
6	REVISED PER MOECC COMMENTS	J.I.M.	2017:06:07
5	ISSUED FOR TENDER	J.I.M.	2017:03:23
4	SUBMISSION FOR MOECC APPROVAL	J.I.M.	2017:02:16
3	SUBMISSION No.3 FOR CITY REVIEW	J.I.M.	2017:01:25
2	SUBMISSION No.2 FOR CITY REVIEW	J.I.M.	2016:11:04
1	SUBMISSION No.1 FOR CITY REVIEW	J.I.M.	2016:07:08

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 1B

J. I. MOFFATT
17/06/16
PROVINCE OF ONTARIO

N

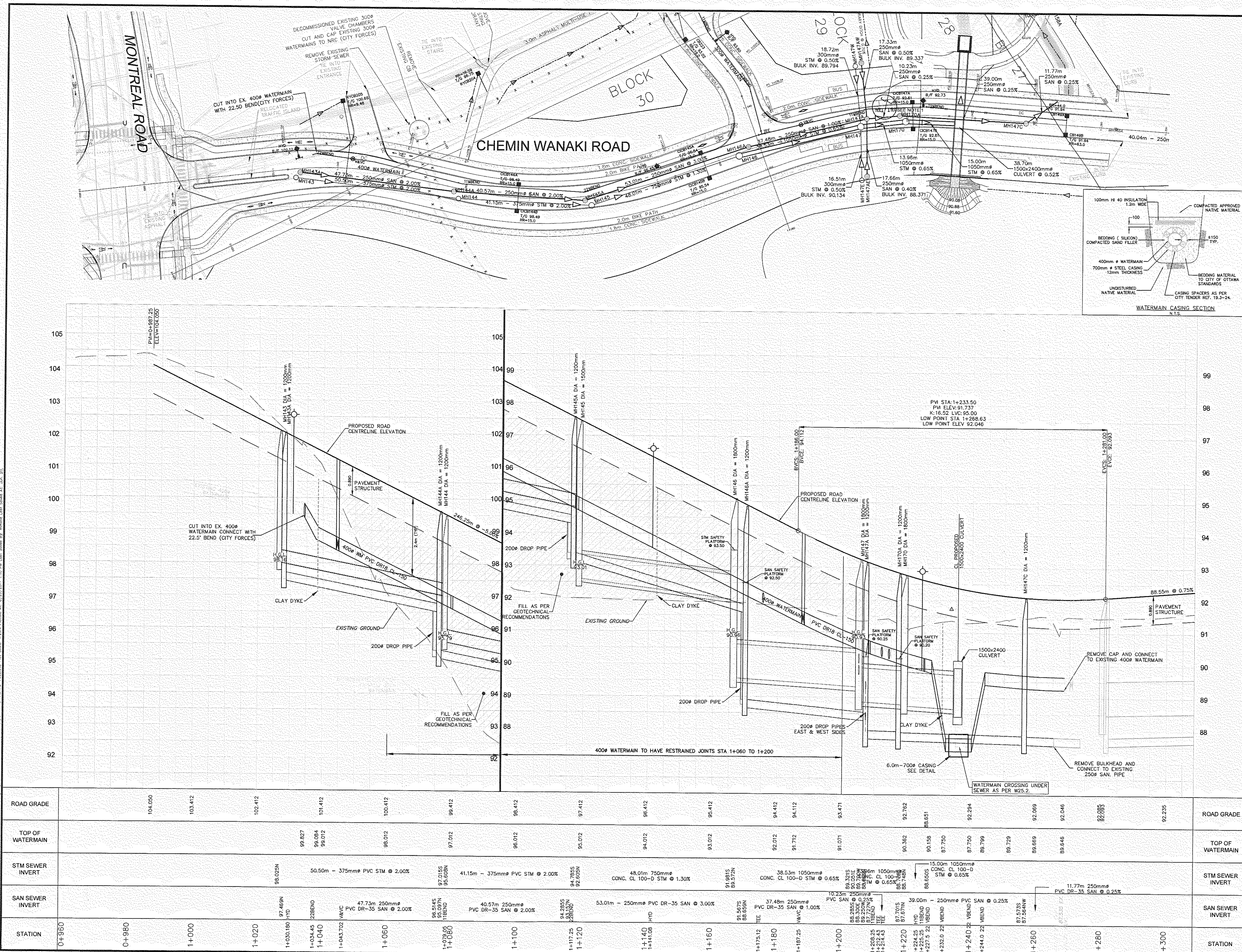
Drawing Title
GENERAL PLAN OF SERVICES

Scale
1 : 750

Design	Date
J.I.M.	MAY 2016
Drawn	Checked
M.M.	J.I.M.
Project No.	Drawing No.
38298	100E

D07-16-15-0003

#17063



REVIEWED BY
DEVELOPMENT REVIEW SERVICES BRANCH

Signed: Will Curry

Date: June 19 2017

Plan Number: 17063

NOTE:
1. CUT AND CAP EXISTING NRC TWIN WATERMAINS-WEST SIDE. CUT AND CONNECT TO EXISTING NRC TWIN WATERMAINS-EAST SIDE. CONTRACTOR TO COORDINATE CONNECTIONS WITH CITY FORCES AND NRC.

No.	REVISIONS	By	Date
14			
13			
12			
11			
10			
9			
8			
7	REVISED PER CITY COMMENTS	J.I.M.	2017:06:16
6	REVISED PER MOECC COMMENTS	J.I.M.	2017:06:07
5	ISSUED FOR TENDER	J.I.M.	2017:03:23
4	SUBMISSION FOR MOECC APPROVAL	J.I.M.	2017:02:16
3	SUBMISSION No.3 FOR CITY REVIEW	J.I.M.	2017:01:25
2	SUBMISSION No.2 FOR CITY REVIEW	J.I.M.	2016:11:04
1	SUBMISSION No.1 FOR CITY REVIEW	J.I.M.	2016:07:08

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 1B

LICENSED PROFESSIONAL ENGINEER
J. L. MOFFATT
17/06/16
PROVINCE OF ONTARIO

Drawing Title

WANAKI ROAD

MONTREAL ROAD TO STA. 1+300

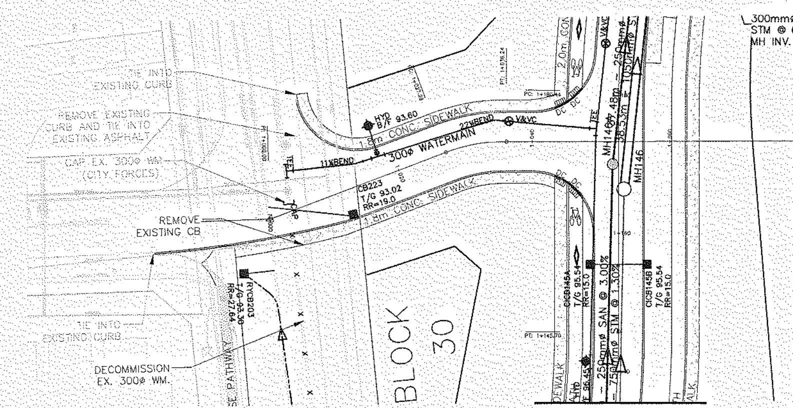
Scale
HORIZ. SCALE 1 : 500
VERT. SCALE 1 : 50

Design	J.I.M.	Date	MAY 2016
Drawn	M.M.	Checked	J.I.M.
Project No.	38298	Drawing No.	139

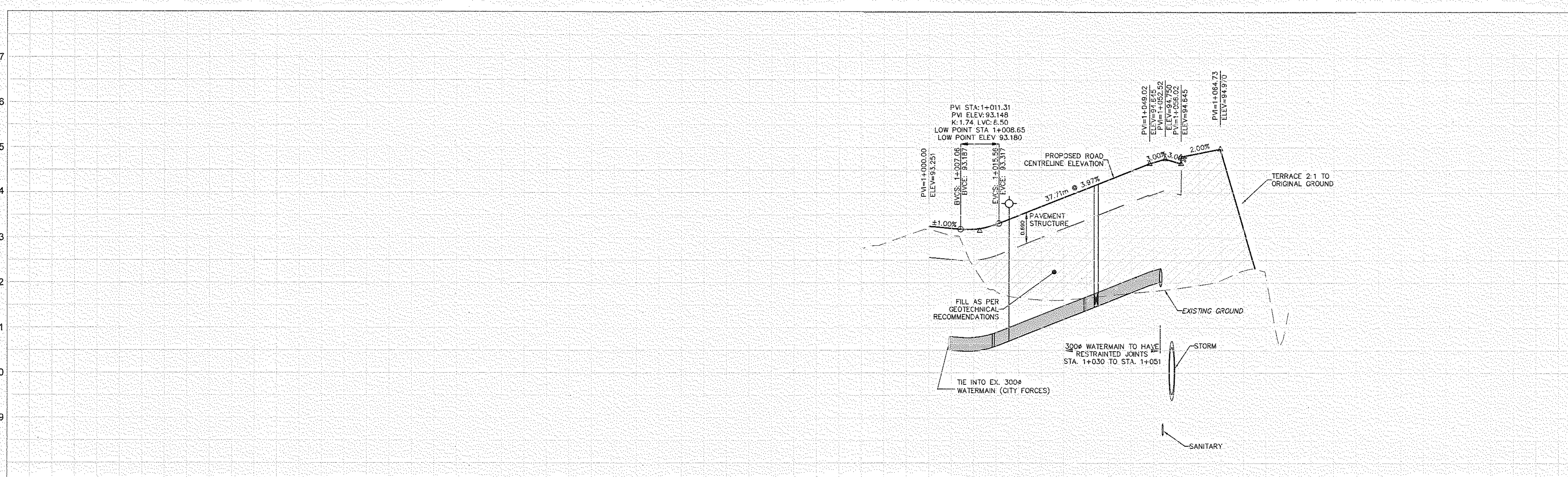
D07-16-15-0003

#17063

PROVENDER AVENUE EXTENSION

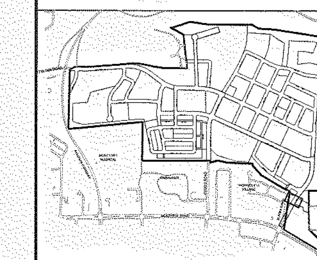


CHEMIN WANAKI ROAD CONT'D ON DWG 38298-139



ROAD GRADE	93.251, 93.187, 93.180, 93.317, 93.493, 94.287, 94.645, 94.750, 94.795, 94.875, 94.970, 92.320
TOP OF WATERMAIN	90.808, 90.786, 90.779, 90.917, 91.093, 91.887, 92.245, 92.321
STM SEWER INVERT	
SAN SEWER INVERT	TEE, 11BEND, HYDRANT, 22BEND, V&VC, TEE
STATION	1+000, 1+004.62, 1+014.34, 1+017.82, 1+020, 1+034.73, 1+036.83, 1+040, 1+051.54, 1+060, 1+080

REVIEWED BY
DEVELOPMENT REVIEW SERVICES BRANCH
Signed Will Curry
Date June 19 2017
Plan Number 17063



No.	REVISIONS	By	Date
14			
13			
12			
11			
10			
9			
8			
7	REVISED PER CITY COMMENTS	J.I.M.	2017:06:16
6	REVISED PER MOECC COMMENTS	J.I.M.	2017:06:07
5	ISSUED FOR TENDER	J.I.M.	2017:03:23
4	SUBMISSION FOR MOECC APPROVAL	J.I.M.	2017:02:16
3	SUBMISSION No.3 FOR CITY REVIEW	J.I.M.	2017:01:25
2	SUBMISSION No.2 FOR CITY REVIEW	J.I.M.	2016:11:04
1	SUBMISSION No.1 FOR CITY REVIEW	J.I.M.	2016:07:08

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 1B

LICENSED PROFESSIONAL ENGINEER
J. I. MOFFATT
17/06/16
PROVINCE OF ONTARIO

N

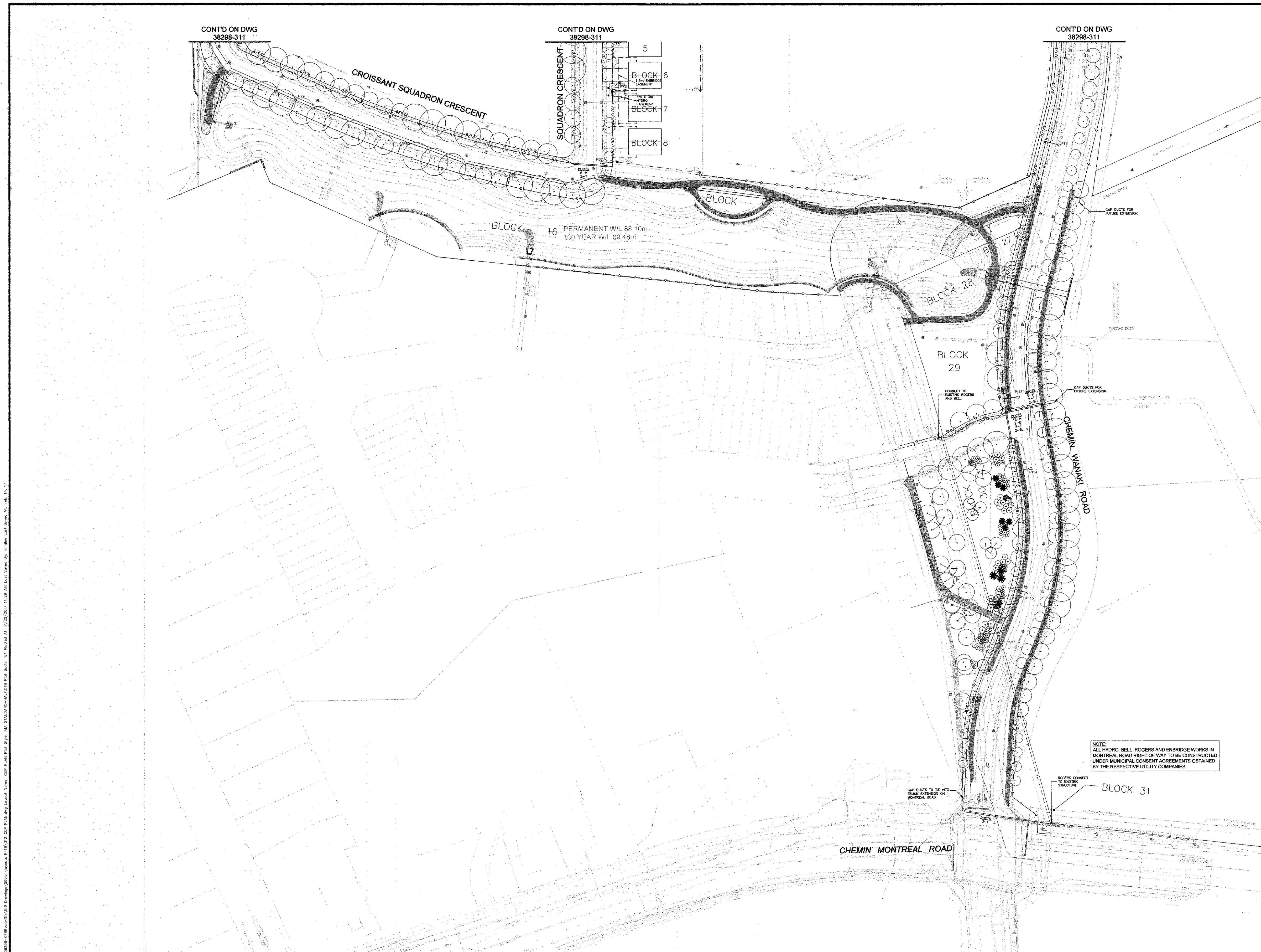
Drawing Title
PROVENDER AVENUE EXTENSION

Scale
HORIZ. SCALE 1 : 500
VERT. SCALE 1 : 50

Design J.I.M. | Date MAY 2016
Drawn M.M. | Checked J.I.M.
Project No. 38298 | Drawing No. 141

D07-16-15-0003

#17063



REVIEWED BY
DEVELOPMENT REVIEW SERVICES BRANCH
Signed Will Curry
Date Feb 21 2017
Plan Number

No.	REVISIONS	By	Date
14			
13			
12			
11			
10			
9			
8	REVISED PER HYDRO	J.I.M.	2017:02:17
7	REVISED PER CITY COMMENTS	J.I.M.	2017:02:14
6	ISSUED FOR CIRCULATION #5	J.I.M.	2017:02:06
5	ISSUED FOR CIRCULATION #4	J.I.M.	2016:12:23
4	REVISED PER HYDRO, ROGERS, OC TRANSPO	J.I.M.	2016:11:25
3	ISSUED FOR CIRCULATION #3	J.I.M.	2016:11:16
2	ISSUED FOR CIRCULATION #2	J.I.M.	2016:10:14
1	ISSUED FOR CIRCULATION #1	J.I.M.	2016:10:03

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 1B

LICENSED PROFESSIONAL ENGINEER
J. I. MOFFATT
17/02/17
PROVINCE OF ONTARIO

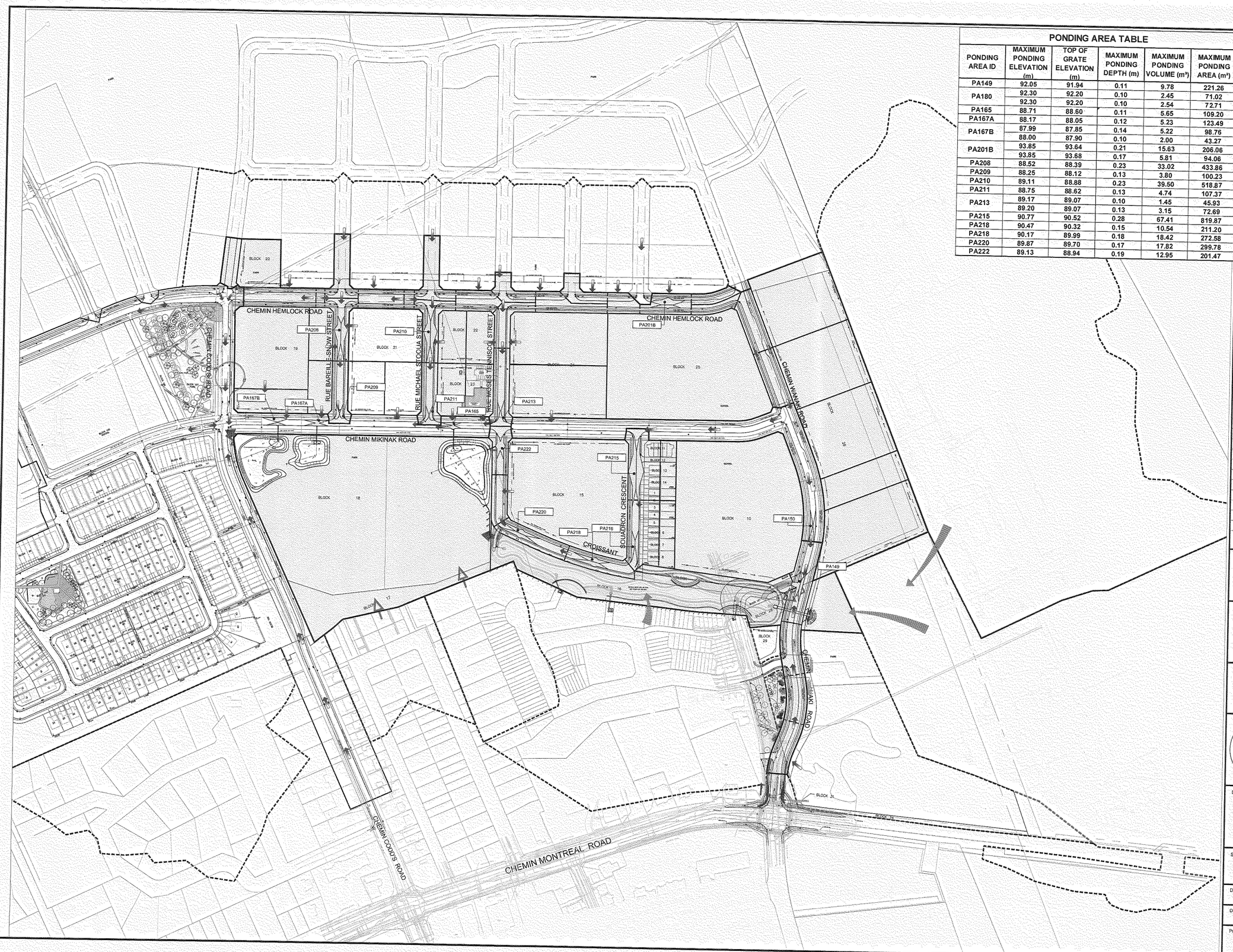
N

Drawing Title
COMPOSITE UTILITY PLAN

Scale 1 : 750

Design	J.I.M.	Date	MAY 2016
Drawn	M.M.	Checked	J.I.M.
Project No.	38298	Drawing No.	312

D07-16-15-0003



PONDING AREA TABLE

PONDING AREA ID	MAXIMUM PONDING ELEVATION (m)	TOP OF GRATE ELEVATION (m)	MAXIMUM PONDING DEPTH (m)	MAXIMUM PONDING VOLUME (m³)	MAXIMUM PONDING AREA (m²)
PA149	92.05	91.94	0.11	9.78	221.26
PA180	92.30	92.20	0.10	2.45	71.02
	92.30	92.20	0.10	2.54	72.71
PA165	88.71	88.60	0.11	5.65	109.20
PA167A	88.17	88.05	0.12	5.23	123.49
PA167B	87.99	87.85	0.14	5.22	98.76
	88.00	87.90	0.10	2.00	43.27
PA201B	93.85	93.64	0.21	15.63	206.06
	93.85	93.68	0.17	5.81	94.06
PA208	88.52	88.39	0.23	33.02	433.86
PA209	88.25	88.12	0.13	3.80	100.23
PA210	89.11	88.88	0.23	39.50	518.87
PA211	88.75	88.62	0.13	4.74	107.37
PA213	89.17	89.07	0.10	1.45	45.93
	89.20	89.07	0.13	3.15	72.69
PA215	90.77	90.52	0.28	67.41	819.87
PA218	90.47	90.32	0.15	10.54	211.20
PA218	90.17	89.99	0.18	18.42	272.58
PA220	89.87	89.70	0.17	17.82	299.78
PA222	89.13	88.94	0.19	12.95	201.47

REVIEWED BY
DEVELOPMENT REVIEW SERVICES BRANCH
Signed Wil Cumy
Date June 19 2016
Plan Number 17063

LEGEND:

- PHASE 1B DRAINAGE AREA
- PHASE 1A DRAINAGE AREA
- EXTERNAL DRAINAGE AREA
- PA115 — POND ID
- MAJOR FLOW
- TOTAL FLOW
- MAJOR FLOW TO PARK DRY POND
- MAJOR FLOW TO BURMA SWMF
- EMERGENCY OVERLAND FLOW
- MH136 — MANHOLE ID

No.	REVISIONS	By	Date
14			
13			
12			
11			
10			
9			
8			
7			
6	REVISED PER CITY COMMENTS	JJ.M.	2017:06:16
5	REVISED PER MOECC COMMENTS	JJ.M.	2017:06:07
4	SUBMISSION FOR MOECC APPROVAL	JJ.M.	2017:02:16
3	SUBMISSION No.3 FOR CITY REVIEW	JJ.M.	2017:01:25
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1	SUBMISSION No.1 FOR CITY REVIEW	P.S.	2016:07:11

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Project Title
WATERIDGE VILLAGE AT ROCKCLIFFE
PHASE 1B

PROFESSIONAL ENGINEER
J. L. MOFFATT
17/06/16
PROVINCE OF ONTARIO

N

Drawing Title
PONDING PLAN

Scale 1:2000

Design	Scale
P.S.	JULY 2016
Drawn	Checked
S.V.	P.S.
Project No.	Drawing No.
38298	751

D07-16-15-0003

#17063

APPENDIX E

Sanitary Flow Calculations and Relevant Excerpts from Wateridge Phase 1B Design Report

PROJECT #: 119066
PROJECT NAME: 455 Wanaki Road

THEORETICAL SANITARY FLOW DESIGN SHEET

NOVATECH
Engineers, Planners & Landscape Architects

LOCATION		RESIDENTIAL FLOW					EXTRANEOUS FLOW		TOTAL FLOWS			PIPE DATA					
Use	Total Area	Number of Units	Design Population	Avg Flow	Peak Factor	Res. Peak Flow	Infiltration Allowance Dry Weather (I/I dry)	Infiltration Allowance Wet Weather (I/I wet)	Average Dry Weather Flow (ADWF)	Peak Dry Weather Flow (PDWF)	Peak Wet Weather Flow (PWWW)	Size	Slope	Total Length	Capacity	Full Flow Velocity	Q/Qfull
	(ha)	(units)	(persons)	(l/s)	-	(l/s)	(l/s)	(l/s)	(l/s)	(l/s)	(l/s)	(mm)	(%)	(m)	(l/s)	(m/s)	(%)
THEORETICAL PROPOSED BUILDING USE																	
Residential	0.101	9	30.6	0.10	3.68	0.37	0.01	0.03	**0.10**	**0.37**	**0.40**	200	1.0	16.6	32.8	1.04	11.2%

Design Parameters:

Residential Population Densities
Single Family unit 3.40 people / unit
(Assumed due to nature of proposed development being an affordable housing project, even though units are more similar to typical apartment units)

Average Sanitary Flows
Residential 280 L/person/day

Peaking Factors
Residential Harmon Equation, K=0.8, Max. = 4.0

Peak Extraneous Flows
Infiltration Allowance (Dry Weather) 0.05 l/s
Infiltration Allowance (Wet Weather) 0.28 l/s

Designed: LGB
Checked: GJM

Date: September 10, 2019

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

SANITARY SEWER DESIGN SHEET

Former CFB Rockcliffe
City of Ottawa
Canada Lands Company

LOCATION				RESIDENTIAL										ICI AREAS							INFILTRATION ALLOWANCE			FIXED FLOW	TOTAL FLOW	PROPOSED SEWER DESIGN						
				AREA	UNIT TYPES				AREA	POPULATION		PEAK	PEAK	AREA (Ha)						PEAK	AREA (Ha)		FLOW			CAPACITY	LENGTH	DIA	SLOPE	VELOCITY	AVAILABLE CAPACITY	
														INSTITUTIONAL		COMMERCIAL		INDUSTRIAL													
STREET	AREA ID	FROM MH	TO MH	Phase 1B (Ha)	SF	SD	TH	APT	EXTERNAL (Ha)	IND	CUM	FACTOR	FLOW (L/s)	IND	CUM	IND	CUM	IND	CUM	FLOW (L/s)	IND	CUM	(L/s)	(L/s)	(L/s)	(L/s)	(m)	(mm)	(%)	(full) (m/s)	L/s	(%)
Phase 1B																																
Hemlock Road	201A	MH201A	MH202A	0.31						0.0	0.0	4.00	0.00		0.00		0.00		0.00	0.00	0.31	0.31	0.09	0.00	0.09	50.02	87.06	250	0.65	0.987	49.93	99.83%
Future Street No. 6	EX202A	BULK202AN	MH202A						2.08	358.5	358.5	4.00	5.81		0.00		0.00		0.00	0.00	2.08	2.08	0.58	0.00	6.39	31.02	21.00	250	0.25	0.612	24.63	79.40%
Hemlock Road	202A	MH202A	MH203A	0.21						0.0	358.5	4.00	5.81		0.00		0.00		0.00	0.00	0.21	2.60	0.73	0.00	6.54	75.98	86.00	250	1.50	1.500	69.44	91.40%
Future Street No. 5	EX203A	BULK203AN	MH203A						1.40	160.5	160.5	4.00	2.60		0.00		0.00		0.00	0.00	1.40	1.40	0.39	0.00	2.99	83.23	21.00	250	1.80	1.643	80.24	96.40%
Hemlock Road	203A, EXPARK2	MH203A	MH204A	0.20					0.44	0.0	0.0	4.00	0.00		0.00		0.00		0.00	0.00	0.64	0.64	0.18	0.00	0.18	82.07	86.00	250	1.75	1.620	81.89	99.78%
rue Moses Tennisco Street	EX204A	BULK204AN	MH204A						1.39	153.5	153.5	4.00	2.49		0.00		0.00		0.00	0.00	1.39	1.39	0.39	0.00	2.88	83.23	21.00	250	1.80	1.643	80.36	96.54%
Hemlock Road	204A	MH204A	MH205A	0.21						0.0	153.5	4.00	2.49		0.00		0.00		0.00	0.00	0.21	1.60	0.45	0.00	2.94	67.96	90.00	250	1.20	1.341	65.02	95.68%
rue Michael Stoqua Street	EX205A	BULK205AN	MH205A						1.38	241.5	241.5	4.00	3.91		0.00		0.00		0.00	0.00	1.38	1.38	0.39	0.00	4.30	67.96	21.00	250	1.20	1.341	63.66	93.67%
Hemlock Road	205A	MH205A	MH206A	0.25						0.0	395.0	4.00	6.40		0.00		0.00		0.00	0.00	0.25	3.23	0.90	0.00	7.30	31.02	112.00	250	0.25	0.612	23.71	76.45%
rue Bareille-Snow Street	EX206A-B	BULK206AN	MH206A						9.61	1755.0	1755.0	3.63	25.80		0.00		0.00		0.00	0.00	9.61	9.61	2.69	0.00	28.49	87.74	21.00	250	2.00	1.731	59.24	67.52%
Hemlock Road	206A	MH206A	MH207A	0.20						0.0	2150.0	3.56	31.02		0.00		0.00		0.00	0.00	0.20	13.04	3.65	0.00	34.67	55.26	89.33	300	0.30	0.757	20.59	37.26%
Block 20	PARK1	MH207AN	MH207A	0.32						0.0	0.0	4.00	0.00		0.00		0.00		0.00	0.00	0.32	0.32	0.09	0.00	0.09	39.24	14.00	250	0.40	0.774	39.15	99.77%
Hemlock Road	PARK1, 207A	MH207A	*BULK176AE*	0.12						0.0	2150.0	3.56	31.02		0.00		0.00		0.00	0.00	0.12	13.48	3.77	0.00	34.79	65.38	33.16	300	0.42	0.896	30.59	46.79%
Phase 1A																																
Hemlock Road		*BULK176AE*	*MH176A*							0.0	2150.0	3.56	31.02		0.00		0.00		0.00	0.00	0.00	13.48	3.77	0.00	34.79	65.38	*21.97*	*300*	*0.42*	0.896	30.59	46.79%
Phase 1B																																
chemin Wanaki Road	200A, COM1	MH200A	MH214A	0.25						0.0	0.0	4.00	0.00		0.00	0.90	0.90		0.00	0.78	1.15	1.15	0.32	0.00	1.10	73.41	98.28	250	1.40	1.449	72.30	98.50%
chemin Wanaki Road	214A, COM2	MH214A	*BULK153AN*	0.16						0.0	0.0	4.00	0.00		0.00	0.65	1.55		0.00	1.35	0.81	1.96	0.55	0.00	1.89	51.91	44.22	250	0.70	1.024	50.01	96.35%
Phase 1B																																
chemin Wanaki Road	143B	BULK143AE	MH143A	0.31						104.0	104.0	4.00	1.69		0.00		0.00		0.00	0.00	0.31	0.31	0.09	0.00	1.77	43.87	21.50	250	0.50	0.866	42.10	95.96%
chemin Wanaki Road	143A	MH143A	MH144A	0.27						0.0	104.0	4.00	1.69		0.00		0.00		0.00	0.00	0.27	0.58	0.16	0.00	1.85	87.74	47.73	250	2.00	1.731	85.89	97.89%
chemin Wanaki Road	144A, 144B	MH144A	MH145A	0.72						0.0	104.0	4.00	1.69		0.00		0.00		0.00	0.00	0.72	1.30	0.36	0.00	2.05	87.74	40.57	250	2.00	1.731	85.69	97.66%
chemin Wanaki Road	145A, 145B, 145C	MH145A	MH146A	2.77						835.6	939.6	3.82	14.53		0.00		0.00		0.00	0.00	2.77	4.07	1.14	0.00	15.67	107.45	53.01	250	3.00	2.121	91.79	85.42%
chemin Wanaki Road	146A	MH146A	MH147A	0.14						0.0	939.6	3.82	14.53		0.00		0.00		0.00	0.00	0.14	4.21	1.18	0.00	15.71	43.54	37.48	250	1.00	1.224	27.83	63.92%
chemin Wanaki Road	PARK2	BLK147AE	MH147A	0.55						0.0	0.0	4.00	0.00		0.00		0.00		0.00	0.00	0.55	0.55	0.15	0.00	0.15	39.24	17.66	250	0.40	0.774	39.08	99.61%
chemin Wanaki Road	147C	BLK147AW	MH147A	0.10						33.6	33.6	4.00	0.54		0.00		0.00		0.00	0.00	0.10	0.10	0.03	0.00	0.57	43.87	17.33	250	0.50	0.866	43.30	98.70%
chemin Wanaki Road	147A	MH147A	MH170A	0.03						0.0	973.2	3.81	15.01		0.00		0.00		0.00	0.00	0.03	4.89	1.37	0.00	16.38	31.02	10.23	250	0.25	0.612	14.64	47.19%
chemin Wanaki Road	147B	MH107A	MH147C	0.16						0.0	973.2	3.81	15.01		0.00		0.00		0.00	0.00	0.16	5.05	1.41	0.00	16.42	31.02	39.00	250	0.25	0.612	14.59	47.05%
chemin Wanaki Road		MH147C	*BLK148AW*							0.0	973.2	3.81	15.01		0.00		0.00		0.00	0.00	0.00	5.05	1.41	0.00	16.42	31.02	11.77	250	0.25	0.612	14.59	47.05%
Phase 1B																																
Block 9	154A	*MH158A*	MH217A	0.19						0.0	973.2	3.81	15.01		2.62		3.83		0.00	5.60	0.19	12.94	3.62	0.00	24.23	53.37	171.95	250	0.74	1.053	29.13	54.59%
croissant Squadron Crescent	215Aa-b	MH215A	MH216A	0.79	3	4				117.8	117.8	4.00	1.91		0.00		0.00		0.00	0.00	0.79	0.79	0.22	0.00	2.13	50.02	80.00	250	0.65	0.987	47.89	95.74%
croissant Squadron Crescent	216Aa-b	MH216A	MH217A	0.67	2	6				94.5	212.3	4.00	3.44		0.00		0.00		0.00	0.00	0.67	1.46	0.41	0.00	3.85	50.02	71.19	250	0.65	0.987	46.17	92.30%
croissant Squadron Crescent	217A	MH217A	MH218A	0.02						0.0	1185.5	3.75	18.01		2.62		3.83		0.00	5.60	0.02	14.42	4.04	0.00	27.65	36.70	10.52	250	0.35	0.724	9.05	24.66%
croissant Squadron Crescent	218A	MH218A	MH218B	0.02						0.0	1185.5	3.75	18.01		2.62		3.83		0.00	5.60	0.02	14.44	4.04	0.00	27.66	36.70	12.49	250	0.35	0.724	9.05	24.65%
	THORN1	*EX SANMH*	MH218B						5.55	1574.0	1574.0	3.66	23.36		0.00		0.00		0.00	0.00	5.55	5.55	1.55	0.00	24.92	74.13	46.02	300	0.54	1.016	49.21	66.39%
croissant Squadron Crescent	218B	MH218B	MH219A	0.07						0.0	2759.5	3.47	38.82		2.62		3.83		0.00	5.60	0.07	20.06	5.62	0.00	50.04	59.68	37.08	300	0.35	0.818	9.64	16.16%
croissant Squadron Crescent	219A	MH219A	MH220A	0.15						0.0	2759.5	3.47	38.82		2.62		3.83		0.00	5.60	0.15	20.21	5.66	0.00	50.08	59.68	72.49	300	0.35	0.818	9.60	16.09%
croissant Squadron Crescent	220A, 220B	MH220A	MH221A	1.46						319.0	3078.5	3.43	42.81		2.62		3.83		0.00	5.60	1.46	21.67	6.07	0.00	54.48	59.68	43.77	300	0.35	0.818	5.21	8.72%
croissant Squadron Crescent	221A	MH221A	MH222A	0.02						0.0	3078.5	3.43	42.81		2.62		3.83		0.00	5.60	0.02	21.69	6.07	0.00	54.48	59.68	8.66	300	0.35	0.818	5.20	8.71%
croissant Squadron Crescent	222A	MH222A	*MH169A*	0.22						0.0	3078.5	3.43	42.81		2.62		3.83		0.00	5.60	0.22	21.91	6.13	0.00	54.54	59.68	89.42	300	0.35	0.818	5.14	8.61%

Design Parameters:

Residential			ICI Areas			
						Peak Factor
SF	3.4	p/p/u	INST	50,000	L/Ha/day	1.5
TH/SD	2.7	p/p/u	COM	50,000	L/Ha/day	1.5
APT	1.8	p/p/u	IND	35,000	L/Ha/day	MOE Chart
Other	60	p/p/Ha		17000	L/Ha/day	

Notes:
1. Mannings coefficient (n) = 0.013
2. Demand (per capita): 350 L/day 300 L/day
3. Infiltration allowance: 0.28 L/s/Ha
4. Residential Peaking Factor:
Harmon Formula = 1+(14/(4+P^0.5))
where P = population in thousands

Designed: WY

Checked: JIM

Dwg. Reference: 38298-501

No.	Revision	Date
1.	City submission No. 1	7/8/2016
2.	City submission No. 2	11/4/2016
3.	City submission No. 3	1/25/2017

File Reference:	Date:	Sheet No:
38298.5.7.1	7/8/2016	1 of 2

REVIEWED BY
DEVELOPMENT REVIEW SERVICES BRANCH

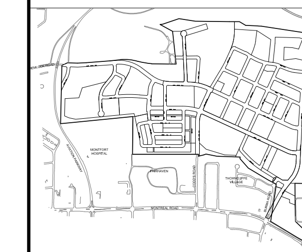
Signed ______________________

Date ______________________ 2017

Plan Number ______________________

LEGEND :

- AREA NUMBER
- RUNOFF COEFFICIENT
- AREA IN HECTARES
- POTENTIAL DRAINAGE DIRECTION



No.	REVISIONS	By	Date
14			
13			
12			
11			
10			
9			
8			
7			
6	REVISED PER MOECC COMMENTS	J.I.M.	2017:06:07
5	ISSUED FOR TENDER	J.I.M.	2017:03:23
4	SUBMISSION FOR MOECC APPROVAL	J.I.M.	2017:02:16
3	SUBMISSION No.3 FOR CITY REVIEW	J.I.M.	2017:01:25
2	SUBMISSION No.2 FOR CITY REVIEW	J.I.M.	2016:11:04
1	SUBMISSION No.1 FOR CITY REVIEW	J.I.M.	2016:07:08

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 1B

LICENSED PROFESSIONAL ENGINEER
J. I. MOFFATT
17/06/07
PROVINCE OF ONTARIO

N

Drawing Title

SANITARY DRAINAGE AREA PLAN

Scale 1 : 2000

Design	Date
J.I.M.	MAY 2016
Drawn	**Checked**
M.M.	J.I.M.
Project No.	**Drawing No.**
38298	501A

D07-16-15-0003

#17063

APPENDIX F

Water Demand and FUS Calculations

and Correspondence

NOVATECH
Engineers, Planners & Landscape Architects

455 Wanaki Road
PRELIMINARY WATER DEMAND CALCULATIONS

JOB NO. 119066

Water Demand (Proposed)

Building	Residential		Demands (L/s)		
	Units	Total Pop'n (pers)	Average Day	Max. Daily	Peak Hour
Proposed	9	31	0.13	0.33	0.73
Total	**9**	**31**	**0.13**	**0.33**	**0.73**

Notes:

Residential Densities (from City of Ottawa data):
- Singe Family Unit = 3.4 persons/unit

Avg. Day Demand:
- Residential 350 L/c/day

Max. Daily Demand:
- Residential 2.5 x Avg. Day

Peak Hour Demand:
- Residential 2.2 x Max. Day

Prepared By:
NOVATECH
Date: June 19, 2019

FUS - Fire Flow Calculations

As per 1999 Fire Underwriter's Survey Guidelines

NOVATECH
Engineers, Planners & Landscape Architects

Novatech Project #: 119066
Project Name: 455 Wanaki Road
Date: 10/9/2019
Input By: LGB
Reviewed By: GJM

Legend: Input by User; No Information or Input Required

Building Description: 3-storey residential building with walk-out basement (GFA=1042m2)
Wood frame

Step			Input		Value Used	Total Fire Flow (L/min)
Base Fire Flow						
1	**Construction Material**			**Multiplier**		
	Coefficient related to type of construction **C**	Wood frame	Yes	1.5	1.5	
		Ordinary construction		1		
		Non-combustible construction		0.8		
		Modified Fire resistive construction (2 hrs)		0.6		
		Fire resistive construction (> 3 hrs)		0.6		
2	**Floor Area**					
	A	Building Footprint (m^2)	1042			
		Number of Floors/Storeys	1			
		Area of structure considered (m^2)			**1,042**	
	F	**Base fire flow without reductions**				**11,000**
		F = 220 C (A)$^{0.5}$				
Reductions or Surcharges						
3	**Occupancy hazard reduction or surcharge**			**Reduction/Surcharge**		
	(1)	Non-combustible		-25%	-15%	**9,350**
		Limited combustible	Yes	-15%		
		Combustible		0%		
		Free burning		15%		
		Rapid burning		25%		
4	**Sprinkler Reduction**			**Reduction**		
	(2)	Adequately Designed System (NFPA 13)	No	-30%		**0**
		Standard Water Supply		-10%		
		Fully Supervised System		-10%		
				Cumulative Total	**0%**	
5	**Exposure Surcharge (cumulative %)**				**Surcharge**	
	(3)	North Side	> 45.1m		0%	**1,870**
		East Side	30.1- 45 m		5%	
		South Side	30.1- 45 m		5%	
		West Side	20.1 - 30 m		10%	
				Cumulative Total	**20%**	
Results						
6	**(1) + (2) + (3)**	**Total Required Fire Flow, rounded to nearest 1000L/min**			**L/min**	**11,000**
		(2,000 L/min < Fire Flow < 45,000 L/min)		or	L/s	**183**
				or	USGPM	2,906
7	**Storage Volume**	Required Duration of Fire Flow (hours)			Hours	2
		Required Volume of Fire Flow (m^3)			m^3	1320

Lydia Bolam

From: Fraser, Mark <Mark.Fraser@ottawa.ca>
Sent: Tuesday, August 27, 2019 8:44 AM
To: Lydia Bolam
Cc: Greg MacDonald
Subject: RE: 455 Wanaki Road - Watermain Boundary Condition Request
Attachments: FIRE HYDRANT PLAN.pdf; 455 Wanaki June 2019.pdf

Hi Lydia,

Please find below boundary conditions for hydraulic analysis at 455 Wanaki Road (zone MONT) assumed to be connected to the 406mm dia. watermain within Wanaki Road as requested. See attached PDF for assumed connection location.

CONNECTION [406mm dia. – Wanaki Road]:
Minimum HGL = 146.8m
Maximum HGL = 147.0m
The total aggregate flow from the four hydrants identified in the attached plan exceeds the required fire flow of 183 L/s

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

Please refer to *City of Ottawa, Ottawa Design Guidelines – Water Distribution, First Edition, July 2010, WDG001 Clause 4.2.2* for watermain pressure and demand objectives.

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.

Regards,

Mark Fraser
Project Manager, Planning Services
Development Review Central Branch
City of Ottawa | Ville d'Ottawa
Planning, Infrastructure and Economic Development Department
110 Laurier Avenue West. 4th Floor, Ottawa ON, K1P 1J1
Tel:613.580.2424 ext. 27791
Fax: 613-580-2576
Mail: Code 01-14
Email: Mark.Fraser@ottawa.ca

From: Lydia Bolam <l.bolam@novatech-eng.com>
Sent: June 06, 2019 11:11 AM
To: Buchanan, Richard <Richard.Buchanan@ottawa.ca>
Cc: Greg MacDonald <g.Macdonald@novatech-eng.com>
Subject: 455 Wanaki Road - Watermain Boundary Condition Request

Hi Richard,

We would like to please request the municipal watermain boundary conditions for the proposed residential development at 455 Wanaki Road. It is proposed to construct a 3-storey residential building with a walk-out basement level with a total of 8 units.

The location of the proposed 150mm dia. water service connection and the 4 existing fire hydrants within the vicinity of the site are shown on the attached plan. Ideally, the City could provide the boundary conditions and the maximum available fire flow for this development.

Based on preliminary calculations, using the City of Ottawa Guidelines for Drinking Water Systems, the water demands for the proposed building are as follows:

- Average Day Demand = 0.11 L/s (8 Units x 3.4 people/unit x 350 L/c/d)
- Max. Day Demand = 0.28 L/s (2.5 x Avg. Demand)
- Peak Hour Demand = 0.62 L/s (2.2 x Max. Day Demand)

Based on the Fire Underwriters Survey (FUS) Guidelines, the fire flow for the proposed non-sprinklered building is approximately 183 L/s (see attached FUS calculations sheet).

Please let me know if you have any questions.

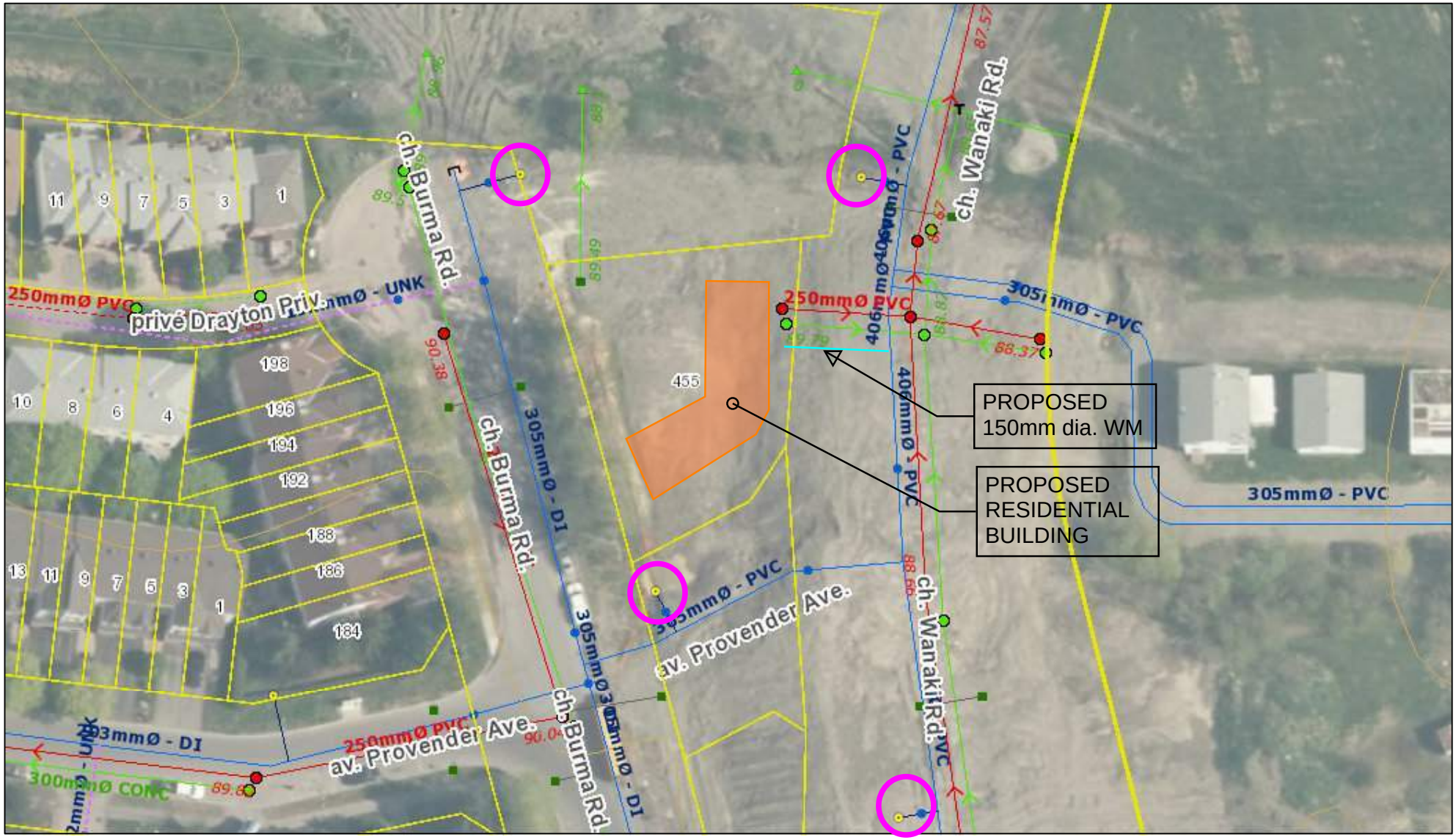
Kind regards,

Lydia Bolam, P.Eng., Project Engineer
NOVATECH Engineers, Planners & Landscape Architects
240 Michael Cowpland Drive, Suite 200, Ottawa, ON, K2M 1P6 | Tel: 613.254.9643 Ext:276 | Fax: 613.254.5867

'

'

455 WANAKI ROAD



June 5, 2019

1:1,000

0 0.0075 0.015 0.03 mi

0 0.0125 0.025 0.05 km

City of Ottawa

Addresses

Property Parcels

Road Names

Water Features

Dam

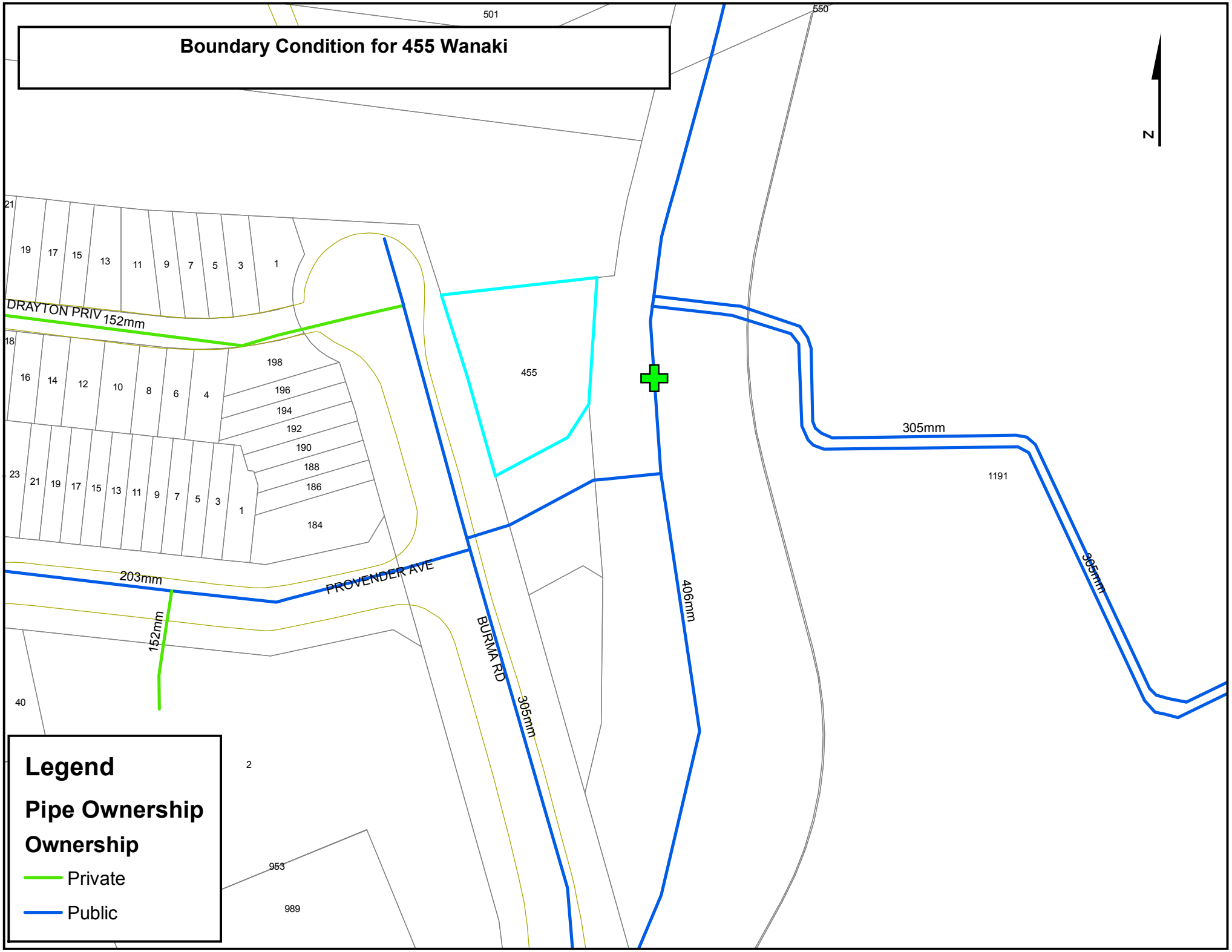
Falls

Hydro Wall

Lock-Gate

Rapids

LOCATION OF FIRE HYDRANTS BOUNDARY CONDITIONS ARE REQUESTED FOR (WITHIN 65M OF PROPOSED BUILDING)


Boundary Condition for 455 Wanaki
N
501
550
455
DRAYTON PRIV 152mm
PROVENDER AVE
203mm
152mm
BURMA RD
305mm
406mm
305mm
305mm
1191
953
989
40
2
Legend
Pipe Ownership
Ownership
Private
Public

CSV ARCHITECTS

30 August 2019

Kimberley Baldwin
Planner II, Development Review, Central Area
City of Ottawa

Re: 455 Wanaki Raod Site Plan Control Application
D07-12-19-0117

Dear Ms Baldwin,

I provide the following response to your letter with first review comments dated 2019-08-21.

1. **General Comments**
   Our revised drawings (attached) are updated with the D07 file number as required.

2. **Planning**
   2.1 We have added a note indicating the source of property boundary information.
   2.2 The front lot line is labelled
   2.3 The Zoning Chart is revised as requested.
   2.4 Bicycle parking has been added to the plan
   2.5 The hatched area was used in an earlier calculation of the required rear yard setback and is no longer applicable and removed from the updated drawing.
   2.6 Amenity areas are shown and labelled.

3. **Urban Design**
   3.1 The building is in a prominent location on an entry route into the development. Because it is affordable housing and constrained by economics, there are limited tools to use to create an attractive building. The careful use of contrasting colours, and more than one material is intended to provide visual interest. The cladding is arranged into blocks that are sized in proportion to the scale of low-rise residential buildings. The intention is to be compatible with a residential neighbourhood context and fit in, while providing the design with its own architectural expression that is suited to this building form.
   3.2 Windows have been visually aggregated with an additional siding material into larger panels to create the sense of larger openings. The roof with its generous overhangs provides both long-term durability and protection for the wall and windows below as well as a strong visual element that identifies these as homes. Windows have been generously sized to provide plenty of light into interiors while not oversized with the attendant risks of overheating in summer, heat loss during the winter and the maintenance concerns of large glazed area.

4. Engineering (selected comments)

GENERAL:
2. The current design proposal includes building mounted lighting with full cut-off over building entrance doorways, and adjacent to paths leading to the parking area. No light standards are intended.

REPORTS
10. Part 9 OBC, wood frame construction, 3 storey as defined by OBC. no sprinklers required per OBC Group C Residential occupancy,
33. The roofs are hip roofs with drainage to the perimeter. The central bicycle and service area room has a single pitch towards the parking area. Eavestroughs will be provided to protect entrances and window wells with downspouts co-ordinated as shown on the civil engineering Grading and Lot Drainage drawing. Downspouts to be located away from paths, entrances and window wells.

Grading and Erosion and Sediment Control Plan
3. The grades have been selected to optimize access on both sides of the building. In general, the grades at the parking (interior of the lot) side are slightly sloped for wheelchair access to lowest floor level apartments, while those on the street side (facing Wanaki and Provender) are at the limit for reasonable grading of paths to the municipal sidewalk with stairs from paths to front entrances for 2nd level apartments. If the building was raised any higher, the proposed steps would not fit within the lot boundaries. Furthermore, the current grading design maintains an average grade around the building that permits the building to fit within the height constraints imposed for a 3-storey building under Part 9 of the Code and the height limits in the Zoning Bylaw.
15. Snow storage will be located as shown on the engineering plan.

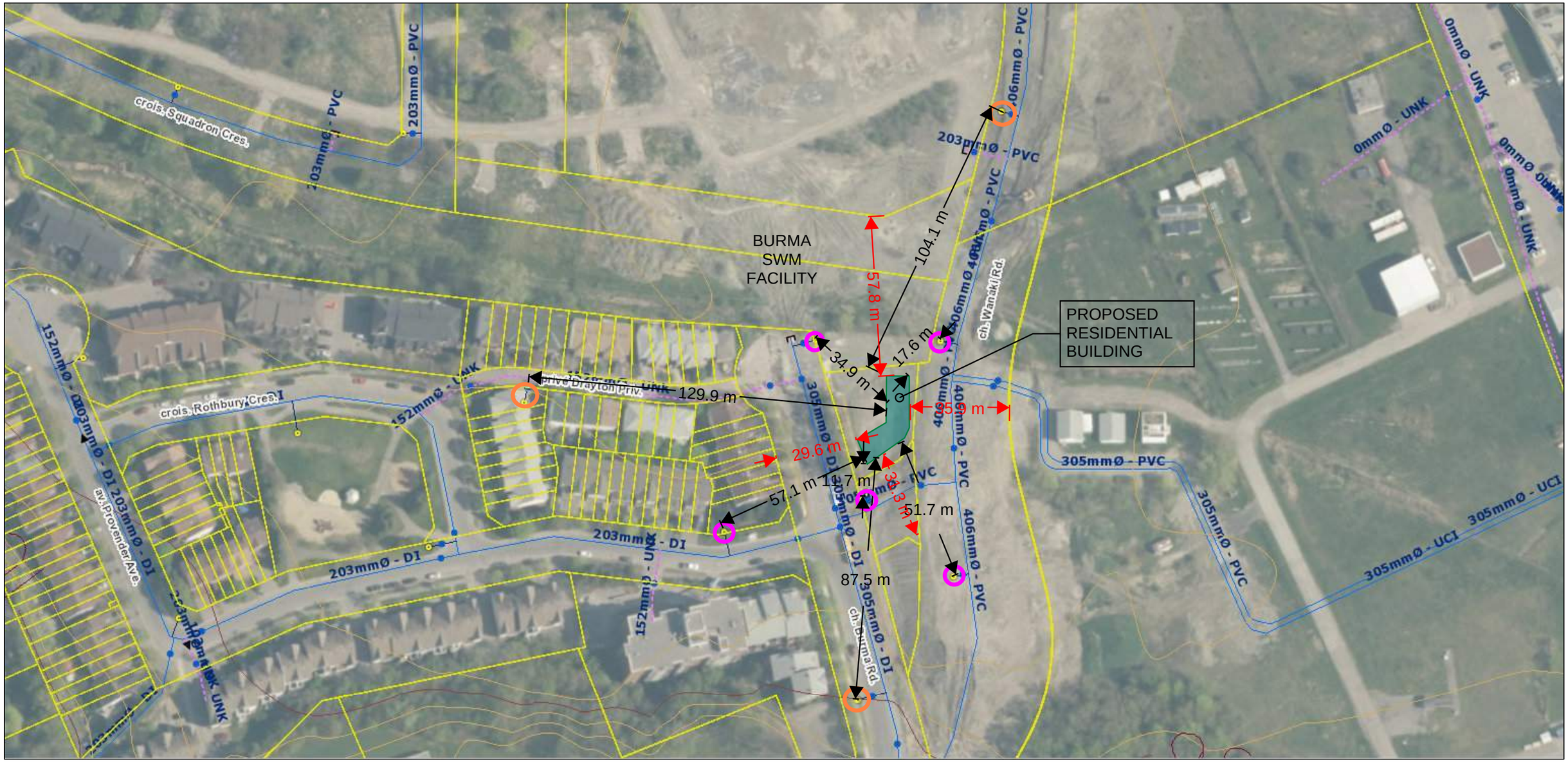
5. Transportation
n/a

6. Solid Waste Services
Information is added to the Site Plan with dimensions and layout of the containers listed in the review.

7. Building Code Services
I confirm that the building conforms with the OBC designation as a three-storey building with *grade* and *first floor* in accordance with definitions in 1.4.1.2.

Anthony Leaning
CSV Architects

EXISTING FIRE HYDRANT LOCATIONS AND EXPOSURE DISTANCES



September 13, 2019

○	FIRE HYDRANTS WITHIN 75M OF PROPOSED BUILDING
○	FIRE HYDRANTS WITHIN 150M OF PROPOSED BUILDING
◄30.6 m►	APPROXIMATE DISTANCE TO EXISTING FIRE HYDRANT
◄32.4 m►	SEPARATION DISTANCE (FOR FUS EXPOSURE SURCHARGE CALCULATIONS)

0 50m 100m

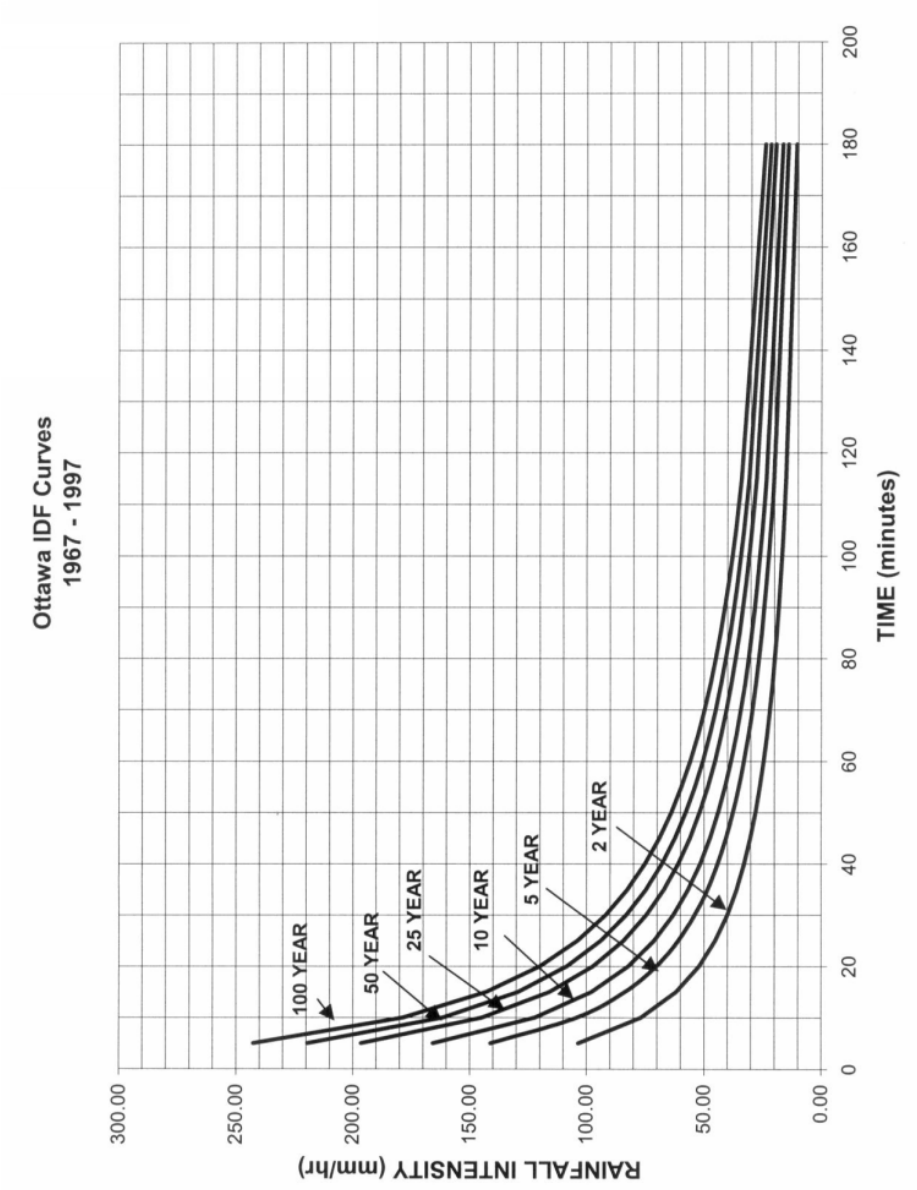
City of Ottawa

APPENDIX G

SWM Calculations, Relevant Report Excerpts,

ICD details and RVCA Correspondence

APPENDIX 5-A OTTAWA INTENSITY DURATION FREQUENCY (IDF) CURVE



Stormwater Design
Proposed Development
455 Wanaki Road
Project No: 119066

Pre - Development: Overall Flows								
Description	***A (ha)***	***A imp (ha) C=0.9***	***A grav (ha) C=0.6***	***A perv (ha) C= 0.20***	**C_5**	**C_{100} (25% increase)**	**Q-pre (L/s)**	
							5 year	**100 year**
Site Area	0.102	0.000	0.102	0.000	0.60	0.75	17.6	37.8
Total =	0.102	0.000	0.102	0.000			**17.6**	**37.8**
							t_c=10mins	t_c=10mins

Allowable Site Flows								
Description	***A (ha)***	***A imp (ha) C=0.9***	***A grav (ha) C=0.6***	***A perv (ha) C= 0.20***	**C_5**	**C_{100} (25% increase)**	**Q-allowable (L/s)**	
							5 year	**100 year**
Site Area (73% impervious)	0.102	0.074	0	0.027	0.71	N/A	20.9	20.9
							Allowable Site Flow	
							t_c=10mins	t_c=10mins

Post - Development: Total Flows for Uncontrolled Sub Catchments										
Area	**Description**	***A (ha)***	***A imp (ha) C=0.9***	***A pavers (ha) C=0.6***	***A perv (ha) C=0.2***	**C_5**	**C_{100} (25% increase)**	**Q-post uncontrolled (L/s)**		
								5 year	**100 year**	**2 year**
A-1	Direct Runoff	0.037	0.015	0	0.022	0.48	0.55	5.2	10.2	3.8
A-2	Controlled Area	0.065	0.034	0	0.030	0.57	0.65	10.7	20.7	7.9
	Total =	0.102	0.049	0	0.0525	0.54	0.61	**15.8**	**30.9**	**11.7**
								t_c=10mins	t_c=10mins	t_c=10mins

Post - Development : Total Flows for Controlled Site						
Area	**Description**	**Q-post controlled (L/s)**		**Storage Required (m^3)**		**Provided (m^3)**
		5 year	**100 year**	**5 year**	**100 year**	
A-1	Direct Runoff (Uncontrolled)	5.2	10.2	N/A	N/A	N/A
A-2	Controlled Area	10.1	10.3	1.3	6.2	10.5
Total =		**15.2**	**20.5**	**1.2**	**6.2**	**10.5**
		Meet Allowable Site Flow				

455 Wanaki Road
Project No: 119066
REQUIRED STORAGE - 1:5 YEAR EVENT
AREA A-1 Uncontrolled Off Site Drainage

OTTAWA IDF CURVE

Area =	0.037	ha	Qallow =	5.16	L/s
C =	0.48		Vol(max) =	0.5	m3

Time (min)	Intensity (mm/hr)	Q (L/s)	Qnet (L/s)	Vol (m3)
5	141.18	7.00	1.83	0.55
10	104.19	5.16	0.00	0.00
15	83.56	4.14	-1.02	-0.92
20	70.25	3.48	-1.68	-2.02
25	60.90	3.02	-2.15	-3.22
30	53.93	2.67	-2.49	-4.48
35	48.52	2.40	-2.76	-5.80
40	44.18	2.19	-2.97	-7.14
45	40.63	2.01	-3.15	-8.51
50	37.65	1.87	-3.30	-9.89
55	35.12	1.74	-3.42	-11.30
60	32.94	1.63	-3.53	-12.71
65	31.04	1.54	-3.63	-14.14
70	29.37	1.46	-3.71	-15.58
75	27.89	1.38	-3.78	-17.02
90	24.29	1.20	-3.96	-21.39
105	21.58	1.07	-4.09	-25.80
120	19.47	0.96	-4.20	-30.24
135	17.76	0.88	-4.28	-34.70
150	16.36	0.81	-4.35	-39.18

455 Wanaki Road
Project No: 119066
REQUIRED STORAGE - 1:100 YEAR EVENT
AREA A-1 Uncontrolled Off Site Drainage

OTTAWA IDF CURVE

Area =	0.037	ha	Qallow =	10.1	L/s
C =	0.55		Vol(max) =	1.1	m3

Time (min)	Intensity (mm/hr)	Q (L/s)	Qnet (L/s)	Vol (m3)
5	242.70	13.78	3.64	1.09
10	178.56	10.14	0.00	0.00
15	142.89	8.11	-2.03	-1.82
20	119.95	6.81	-3.33	-3.99
25	103.85	5.90	-4.24	-6.36
30	91.87	5.22	-4.92	-8.86
35	82.58	4.69	-5.45	-11.44
40	75.15	4.27	-5.87	-14.09
45	69.05	3.92	-6.22	-16.79
50	63.95	3.63	-6.51	-19.52
55	59.62	3.39	-6.75	-22.29
60	55.89	3.17	-6.97	-25.07
65	52.65	2.99	-7.15	-27.88
70	49.79	2.83	-7.31	-30.71
75	47.26	2.68	-7.46	-33.55
90	41.11	2.33	-7.80	-42.14
105	36.50	2.07	-8.07	-50.82
120	32.89	1.87	-8.27	-59.55
135	30.00	1.70	-8.44	-68.33
150	27.61	1.57	-8.57	-77.14

455 Wanaki Road
Project No: 119066
REQUIRED STORAGE - 1:5 YEAR EVENT
AREA A-2 Controlled Flow-Parking Lot Storage

OTTAWA IDF CURVE

Area =	0.065	ha	Qallow =	10.1	L/s
C =	0.57		Vol(max) =	1.3	m3

Time (min)	Intensity (mm/hr)	Q (L/s)	Qnet (L/s)	Vol (m3)
5	141.18	14.43	4.33	1.30
10	104.19	10.65	0.55	0.33
15	83.56	8.54	-1.56	-1.40
20	70.25	7.18	-2.92	-3.50
25	60.90	6.22	-3.88	-5.81
30	53.93	5.51	-4.59	-8.26
35	48.52	4.96	-5.14	-10.80
40	44.18	4.52	-5.58	-13.40
45	40.63	4.15	-5.95	-16.06
50	37.65	3.85	-6.25	-18.75
55	35.12	3.59	-6.51	-21.48
60	32.94	3.37	-6.73	-24.24
65	31.04	3.17	-6.93	-27.01
70	29.37	3.00	-7.10	-29.81
75	27.89	2.85	-7.25	-32.62
90	24.29	2.48	-7.62	-41.13
105	21.58	2.21	-7.89	-49.73
120	19.47	1.99	-8.11	-58.39
135	17.76	1.82	-8.28	-67.10
150	16.36	1.67	-8.43	-75.85

455 Wanaki Road
Project No: 119066
REQUIRED STORAGE - 1:100 YEAR EVENT
AREA A-2 Controlled Flow-Parking Lot Storage

OTTAWA IDF CURVE

Area =	0.065	ha	Qallow =	10.3	L/s
C =	0.65		Vol(max) =	6.2	m3

Time (min)	Intensity (mm/hr)	Q (L/s)	Qnet (L/s)	Vol (m3)
5	242.70	28.14	17.84	5.35
10	178.56	20.70	10.40	6.24
15	142.89	16.57	6.27	5.64
20	119.95	13.91	3.61	4.33
25	103.85	12.04	1.74	2.61
30	91.87	10.65	0.35	0.63
35	82.58	9.57	-0.73	-1.53
40	75.15	8.71	-1.59	-3.81
45	69.05	8.00	-2.30	-6.20
50	63.95	7.41	-2.89	-8.66
55	59.62	6.91	-3.39	-11.18
60	55.89	6.48	-3.82	-13.75
65	52.65	6.10	-4.20	-16.37
70	49.79	5.77	-4.53	-19.02
75	47.26	5.48	-4.82	-21.70
90	41.11	4.77	-5.53	-29.88
105	36.50	4.23	-6.07	-38.23
120	32.89	3.81	-6.49	-46.70
135	30.00	3.48	-6.82	-55.26
150	27.61	3.20	-7.10	-63.89

Structures	Size (mm)	Area (m^2)	T/G	Inv IN	Inv OUT
CB	600 x 600	0.36	92.10	-	90.60

Area A-2: Storage Table

		Underground Storage					Surface Storage			Total Storage
				CB			Ponding @ CB			
Elevation (m)	System Head (m)			Volume (m^3)		Total U/G Volume (m^3)	Area (m^2)	Volume (m^3)	Total Surface Volume (m^3)	Volume (m^3)
90.60	0.00			0.0		0.00			0.00	**0.00**
91.00	0.40			0.1		0.14			0.00	**0.14**
91.50	0.90			0.32		0.32			0.00	**0.32**
92.00	1.40			0.50		0.50			0.00	**0.50**
92.10	1.50			0.54		0.54	0.0	0.00	0.00	**0.54**
92.15	1.55			0.54		0.54	20.0	0.50	0.50	**1.04**
92.20	1.60			0.54		0.54	81.0	3.02	3.02	**3.56**
92.25	1.65			0.54		0.54	195.0	9.92	9.92	**10.46**

Inlet Control Device - Circular Plug

1:100 Yr

Flow (L/s) =	10.3
Head (m) =	1.52
Elevation (m) =	**92.22**
Outlet Pipe Dia.(mm) =	200
Volume (m3) =	6.2

1:5 Yr

Flow (L/s) =	10.1
Head (m) =	1.46
Elevation (m) =	**92.16**
Outlet Pipe Dia.(mm) =	200
Volume (m3) =	1.3

Maximum Ponding Depth	(cm)
1:100 Yr	**12**
1:5 Yr	**6**

Orifice Size - 1:100 yr Flow Check

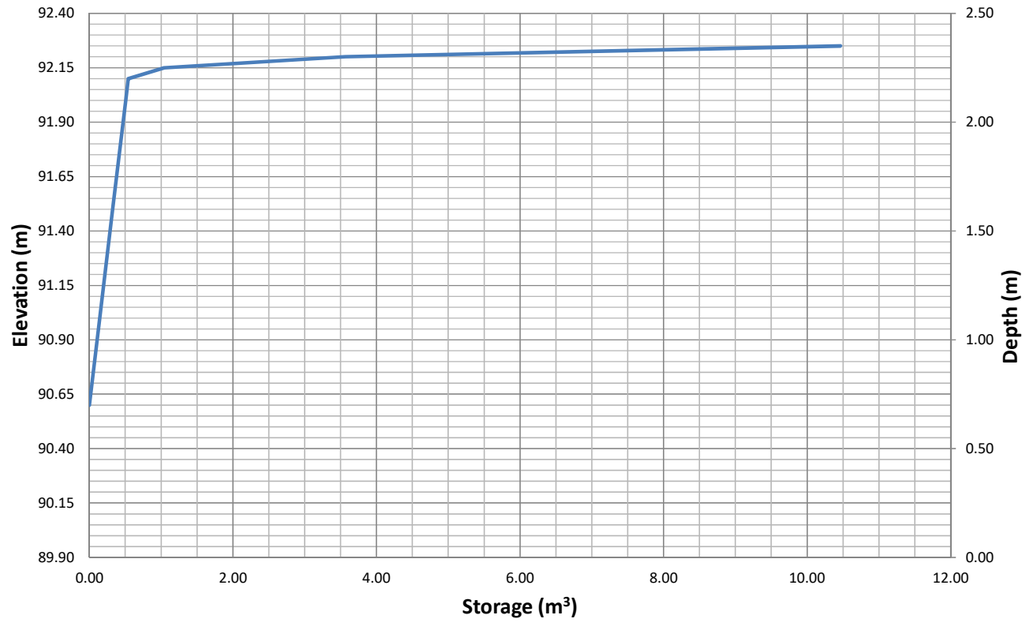
Q=0.62xAx(2gh)^0.5

	1:100 yr	Flow Check
Q (m^3/s) =	0.0103	**0.0102**
g (m/s^2) =	9.81	9.81
h (m) =	**1.52**	1.52
A (m^2) =	**0.003042105**	**0.00302**
D (m) =	**0.062236073**	**0.06200**
D (mm) =	**62**	62.0

1:5 yr Flow Check

	1:5 yr
Q (m^3/s) =	0.0100
g (m/s^2) =	9.81
h (m) =	**1.46**
A (m^2) =	**0.00302**
D (m) =	**0.062**
D (mm) =	**62**

Stage Storage Curve
Area A-2



455 Wanaki Road **PROPOSED SOAKAWAY PIT SIZING**
Project No: 119066

Required WQV for Infiltration (From LID Aquafor Beech Report)

Site Area	1015	m2	
Infiltration Target	4	mm	
WQV =	**A * 4mm =**	**4.06**	**m3**

From MOE SWM Planning and Design Manual:
Maximum Target Storage WQV

A (Roof Area)	225	m2	(clean, no pre-treatment required except leaf screens)
d (depth)	18.2	mm	(min. 5mm to max. 20mm)
WQV =	A * d =	4.10	m3

Equation 4.2: Maximum Allowable Soakaway Pit Depth

d = PT / 1000

d =	maximum allowable depth of the soakaway pit (m)				
P =	percolation rate (mm/h)	=	30	mm/hr	(average from range of 14-46 mm/hr given by Paterson Group memo)
T =	drawdown time (24-48h) (h)	=	24	h	(24h recommended to be conservative, recognizing percolation rates will decrease over time etc.)

d = 0.72 m

From Credit Valley Conservation (CVC) LID SWM Planning and Design Guide (Section 4.4):
BMP Sizing:

dr max = i * ts / Vr

where,

dr max =	Maximum stone reservoir depth (mm)			
i =	Infiltation rate for native soils (mm/hr) (design infiltration rate incorporating safety factor)	=	8.6	mm/hr (calculated using 30mm/hr as above, with safety factor of 3.5 as per Table C2 (Appendix C), assuming ratio of mean measured infiltration rates to be between 1.1 to 4.0)
Vr =	Void space ration for aggregate used	=	0.4	(typical for 50mm clear stone)
ts =	Time to drain (48 hour recommended)	=	24	hour

dr max = 514 mm = 0.51 m (Selected as worst case scenario)

BMP Footprint:

Af = WQV / (dr * Vr)

where,

Af =	Footprint surface area (m2)			
WQV =	Water quality volume (m3)	=	4.10	m3
dr =	Stone reservoir depth (m)	=	0.51	m
Vr =	Void space ratio for aggregate used	=	0.4	(typical for 50mm clear stone)

Af = 19.9 m2

Check: Ratio impervious drainage area to footprint surface area between 5:1 and 20:1

Ratio = 225 m2 / 19.9 m2 = 11 :1

Proposed Soakaway Pit Area:

A = L * W

L =	7.2	m			
W =	2.8	m			
A =	**20.2**	**m2**	>	19.9 m2	= OK

Proposed Soakaway Pit Total Volume:

V tot = A * D

A =	20.2	m2
D =	0.51	m2
V tot =	**10.37**	**m3**

Proposed Soakaway Pit Water Storage Volume

V sto = V tot * Vr

Vr =	Void space ratio for aggregate used	=	0.4	(typical for 50mm clear stone)
V sto =	**4.15**	**m3**		

455 Wanaki Road
Project No.: 119066

STORM SEWER DESIGN SHEET

FLOW RATES BASED ON RATIONAL METHOD

NOVATECH
Engineers, Planners & Landscape Architects

LOCATION				AREA (ha)			FLOW							TOTAL FLOW	SEWER DATA							
Street	Catchment ID	From Manhole	To Manhole	Area (ha)	C	AC (ha)	Indiv 2.78 AC	Accum 2.78 AC	Time of Concentration	Rainfall Intensity 2 Year (mm/hr)	Rainfall Intensity 5 Year (mm/hr)	Rainfall Intensity 10 Year (mm/hr)	Peak Flow (L/s)	Total Peak Flow, Q (L/s)	Dia. (m) Actual	Dia. (mm)	Type	Slope (%)	Length (m)	Capacity (L/s)	Velocity (m/s)	Flow Time (min)	Ratio Q/Q full
455 Wanaki	**A-2**	STM MH1	Connection to municipal sewer	0.063	0.60	0.04	0.104	0.104	10.00	N/A	104.19	N/A	10.8	10.8	0.254	250	PVC	0.75	35.0	53.7	1.06	0.55	20%
		CB1	STM MH1												0.203	200	PVC	1.00	10.6	34.2	1.05	0.17	32%

Q = 2.78 AIC, where
Q = Peak Flow in Litres per Second (L/s)
A = Area in hectares (ha)
I = Rainfall Intensity (mm/hr), 5 year storm
C = Runoff Coefficient

Date:
Design By:

Novatech
September 16, 2019
LGB

Dwg. Reference:	**Checked By:**
119066-GP	JAG

Relevant Excerpts from 'Burma

SWM Facility Design' report

(IBI, June 2017)

3 Overall Stormwater Management Approach

As established in the August 2015 MSS, the proposed stormwater management concept for the Rockcliffe development consists of a dual drainage network and two end-of-pipe stormwater management facilities. That study also recommended that in addition to the two SWM facilities, several major flow features be provided across the site to aid in reducing surface flow to meet City of Ottawa criteria and reduce pipe sizes within the Rockcliffe development. The Phase 1B design will follow the recommendations of the approved August 2015 MSS, including construction of the Wanaki Road culvert crossing.

One of the major flow features proposed to be constructed as part of Phase 1B is the retrofitted Burma SWM Facility. Several retrofit options were considered. The proposed solution includes the installation of a new culvert at Wanaki Road to convey runoff to the pond; the widening and deepening of the existing pond, including the introduction of a permanent pool; and a new outlet structure.

In addition, as part of the Burma SWM facility construction, it is proposed to install end-of-pipe Vortechs units for a basic treatment of the minor flows, or 60% removal of total suspended solids, from Thorncliffe Village, prior to discharge to the pond. Further discussion is provided in **Section 3.2.3**.

The total drainage area tributary to the Burma SWM Facility is approximately 60.8 ha, including the external areas, school (SC154), and the employment lands (Areas LOT 200, LOT214, LOT152, LOT151, and LOT150). It should be noted that on-site storage requirements up to the 100 year storm event have been determined for the employment lands, school block, and the future high-rise mix use (Area EX145) within the NRC area. **Figure 1** shows the area tributary to Burma SWM Facility.

The August 2015 MSS presented a tributary drainage area of approximately 50 ha. The increase in area is due to the revised drainage area boundaries and the revised grading on Wanaki Road as part of the detailed design. Specifically, major flow from Wanaki Road; and emergency overflow from the adjacent employment lands, in excess of the 100 year on-site storage, is now directed to the retrofitted facility at the location shown on **Figure 1**.

The retrofitted facility is a wet pond and provides water quantity control only for approximately 58.2 ha of development as shown on **Figure 1**. Areas tributary to the retrofitted Burma SWM Facility are listed in **Table 3-1**. Further discussion on the flow routing is provided within **Section 3.2**. The catchment areas are shown on **Figure 1** and **Drawing 750** enclosed in **Appendix A.**

Table 3-1: Areas Tributary to the Retrofitted Burma SWM Facility

CONTRIBUTING DRAINAGE AREA (LOCATION, AREA ID)		CONTRIBUTING FLOW
Thorncliffe Village	EXTRNE	Total Flow
	EXTRNC	Total Flow
	EXTRNN	Total Flow
	EXTRNW	Minor Flow
NRC Lands	EXNRCN	Total Flow
	EXNRCS	Total Flow
	SWM1	Total Flow

CONTRIBUTING DRAINAGE AREA (LOCATION, AREA ID)		CONTRIBUTING FLOW
Wanaki Road	S149	Cascading Flow*
Future High-Rise Mix Use, east side of Wanaki Road (NRC land)	EXP147	Total Flow
South End of Wanaki Road	MH 147	Minor Flow

Notes: * maximum ponding is utilized on-site during the 100 year design storm event, prior to being discharged to the park dry pond.
on-site storage requirements up to the 100 year storm event to be provided.

3.1 Dual Drainage Concept

The dual drainage system for the portion of Phase 1B tributary to the Burma SWM Facility accommodates both major and minor stormwater runoff. During frequent storms, the effective runoff collected by catchment areas is directly released via catchbasin inlets into the network of storm sewers, called the minor system. During less frequent storms, the balance of the flow (in excess of the minor flow) is accommodated by a system of rear yard swales and street segments called the major system. The main advantage of this arrangement is its ability to adjust the rate of total inflow into the minor system to satisfy the required level of service.

The proposed dual drainage system for post-development conditions of former CFB Rockcliffe was evaluated using the DDSWMM model for both Phase 1A and Phase 1B of the development. The dual drainage evaluation of Phase 1A development is provided in the "Design Brief Wateridge Village at Rockcliffe Phase 1A" (IBI Group, April 2016). Detailed design of the Phase 1B is being completed concurrently with the SWM facility design and detailed discussion is provided in the Draft "Design Brief Wateridge Village at Rockcliffe Phase 1B" (IBI, January 2017) report.

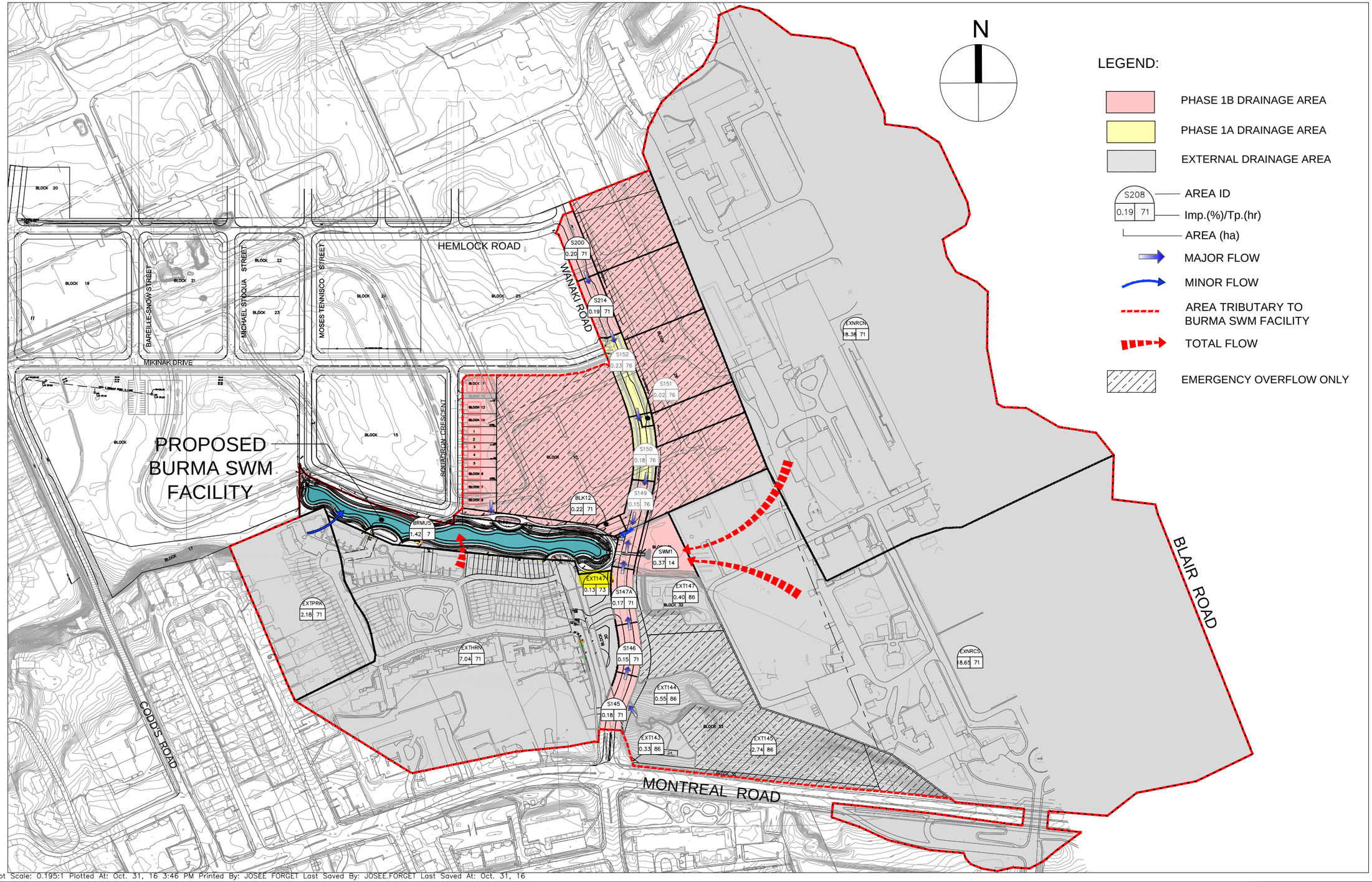
3.2 Retrofitted Burma SWM Facility

The retrofitted Burma SWM Facility is located at the northern boundary of Thorncliffe Village, west of Wanaki Road. The area tributary to the pond is shown on **Figure 1.** The retrofitted SWMF is comprised of a wet cell, with four (4) inlet pipes and an outlet structure connected to the Phase 1B storm sewers on Squador Crescent (MH221). Further discussion on the flow routing is provided within **Sections 3.2.1 and 3.2.2**.

Outflow from the Burma SWM Facility will be conveyed via the main storm trunk to the Eastern SWMF for water quality treatment. The outlet pipe will direct flow from the facility to the storm sewers on Squador Crescent (MH221) and from there flow will be routed to Eastern SWM Facility via the main trunk along Codd's Road (see **Figure 1**). Detailed discussion on each component is provided in **Section 5**.

The main trunk storm sewer servicing the study area has been designed as part of Phase 1A development and is extended north from the development towards the escarpment bordering the Rockcliffe development area. The trunk storm sewer terminates at the top of the escarpment and the runoff cascades to the Eastern SWMF below via a waterfall. Refer to the "Design Brief Wateridge Village at Rockcliffe Phase 1A" (IBI Group, April 2016) for the detailed site stormwater management design of the Phase 1A development, and to the Phase 1B Design Brief for the design of the Phase 1B storm sewer trunk which is being completed concurrent with the Burma SWM Facility design.

The overall plan of the proposed stormwater management system is presented on **Drawing 700**.



J:\38298--CFBRockcliffe\5.9 Drawings\59civil\SWM Ph1B\Figures\Subdivision\38298--Ph1B_Swm_Figure1.dwg Sheet Set: ####

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Scale
N.T.S.

Project Title
BURMA SWM FACILITY
WATERIDGE VILLAGE AT ROCKLIFFE
PHASE 1B

Drawing Title
AREA TRIBUTARY TO
BURMA SWM FACILITY

Sheet No.
FIGURE 1

Drainage Area		Downstream Segment ID‡	MH	IMP Ratio (%)	Segment Length (m)	Subcatchment Width (m)	Road ROW Cross Section (m)	Ponding Area ID¶	Maximum Storage Available (m^3)	5 Year Modeled Flow (l/s)*	100 Year Captured Flow (l/s)†
Segment ID	Area (ha)										
EX145	2.74	S145	S145	0.86	308.25	616.50	N/A	100yr S.C	352.00	554.00	554.00
EX147	0.13	EXTRNE	S147	0.86	40.00	29.25	N/A			26.00	26.00
EX166	0.61	S166	S166	0.86	68.63	137.25	N/A			123.00	128.00
EX201	0.56	S201B	S201	0.86	63.00	126.00	N/A			113.00	165.20
EX202A	0.90	EX202B	S202	0.86	101.25	202.50	20.00			182.00	265.40
EX202B	0.35	S202A	S202	0.86	39.38	78.75	20.00			71.00	103.20
EX202C	0.20	S203B	S202	0.86	22.50	45.00	N/A			40.00	59.00
EX203	0.73	S203B	S203	0.86	82.13	164.25	20.00			147.00	215.30
EX204A	0.72	S204A	S204	0.86	81.00	162.00	20.00			145.00	145.00
EX204B	0.47	S204A	S204	0.86	52.88	105.75	N/A			95.00	138.60
EX205A	0.81	S205A	S205	0.86	91.13	182.25	20.00			164.00	165.00
EX205B	0.63	S205C	S205	0.86	70.88	141.75	N/A			127.00	128.00
EX206A	1.02	S206A	S206	0.86	114.75	229.50	20.00			206.00	206.00
EX206B	0.46	S207	S206	0.86	51.75	103.50	N/A			93.00	95.00
EX208A	0.81	S208	S208	0.86	91.13	182.25	N/A			164.00	164.00
EX231A	0.86	S231	S231	0.86	96.75	193.50	20.00			174.00	174.00
EX231B	0.30	S231	S231	0.86	33.75	67.50	N/A			61.00	64.00
EXNRCN	18.39	USBRM	USBRM	0.71	450.00	1200.00	N/A			2578.00	4847.30
EXNRCS	18.65	USBRM	USBRM	0.71	514.00	2628.00	N/A			2994.00	5641.40
EXP147	0.40	SWM1	S147	0.14	45.00	90.00	N/A			16.00	15.00
EXP203	0.44	S204B	S203	0.14	49.50	99.00	N/A			18.00	20.00
EXTFOX	1.90	CELL3	OUT	0.86	213.75	427.50	N/A			384.00	311.00
EXTRNE	0.99	BRMA	BURMA	0.71	111.38	222.75	N/A			169.00	340.00
EXTRNC	5.70	BRMA	BURMA	0.71	239.00	4282.50	N/A			1086.00	2075.50
EXTRNN	0.53	BRMA	BURMA	0.71	59.63	119.25	N/A			91.00	171.60
EXTRNW	2.18	CELL1	BURMA	0.71	193.00	981.00	N/A			399.00	435.00

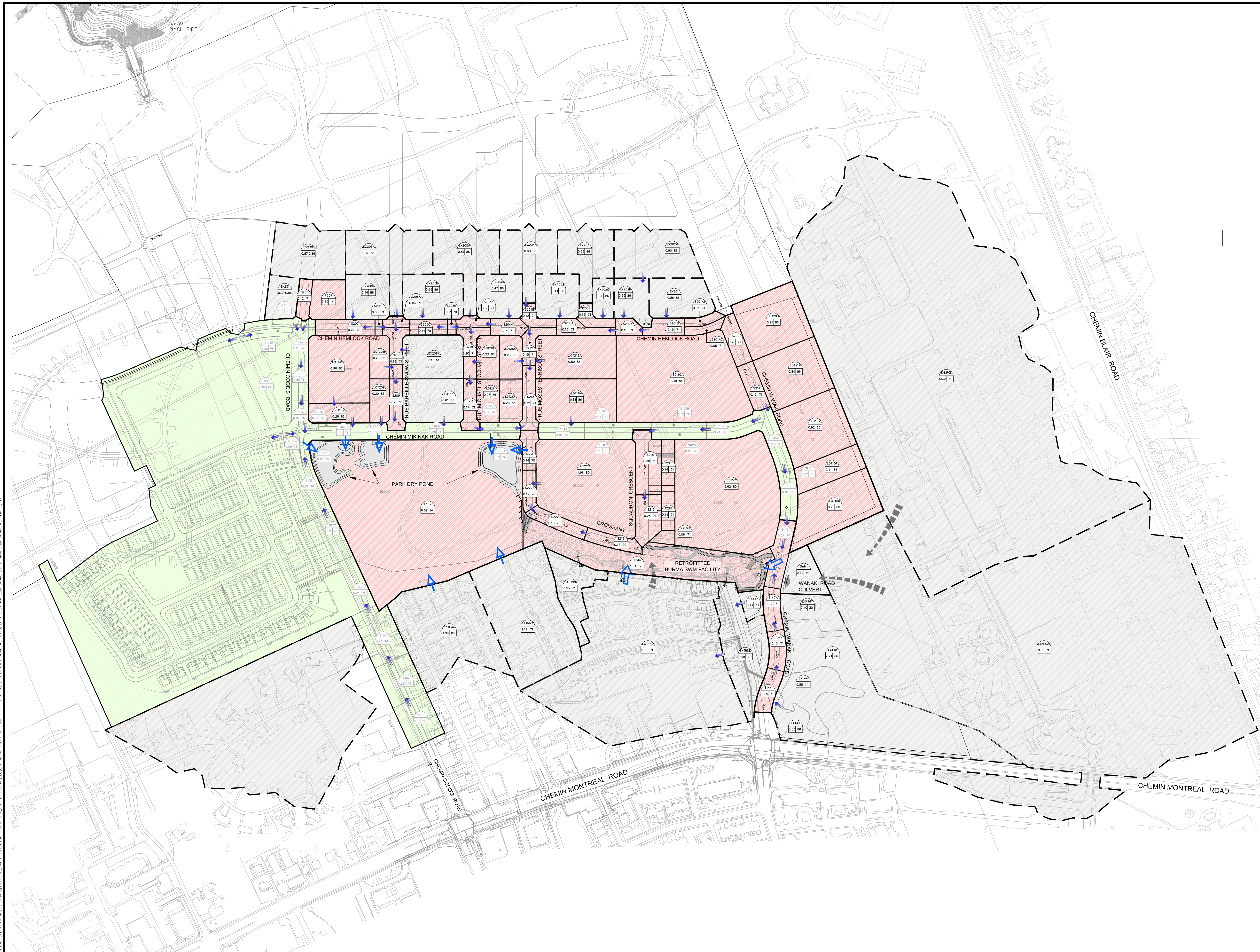
Notes: ***** Values reported are from the DDSWMM output file 38298-PH1B-5CH.dat/out. † ICD flow is from the DDSWMM output file 38298--100CH.dat/out.

FOR HYDROLOGICAL PARAMETERS:

1. Refer to **Drawing 750** for the DDSWMM model schematic.

2. Catchment areas are based on the rational method spreadsheet with some minor modifications for modeling purposes. See **Drawing 750** for the catchment areas used in the DDSWMM modeling for the subject site.

   Imperviousness for the subject site was determined by obtaining the footprint of the model units intended for the site and placing the maximum footprint on the lots. The imperviousness ratios for single family units were calculated for a typical single family unit street segment and rear yard segment.



REVIEWED BY
DEVELOPMENT REVIEW SERVICES BRANCH

Signed ______________________

Date ______________________ 2016

Plan Number ______________________

LEGEND:

- PHASE 1B DRAINAGE AREA
- PHASE 1A DRAINAGE AREA
- EXTERNAL DRAINAGE AREA
- PHASE 1B DRAINAGE BOUNDARY
- S208 — AREA ID; 0.19 | 71 — Imp.(%), AREA (ha)
- MAJOR FLOW
- TOTAL FLOW
- MH136 — MANHOLE ID
- FLOW ROUTE TO PARK DRY POND
- MAJOR FLOW TO BURMA SWMF

No.	REVISIONS	By	Date
14			
13			
12			
11			
10			
9			
8			
7			
6	REVISED PER CITY COMMENTS	P.S.	2017:06:16
5	REVISED PER MOECC COMMENTS	P.S.	2017:06:07
4	SUBMISSION FOR MOECC APPROVAL	P.S.	2017:02:16
3	SUBMISSION No.3 FOR CITY REVIEW	P.S.	2017:01:25
2	SUBMISSION No.2 FOR CITY REVIEW	P.S.	2016:11:04
1	SUBMISSION No.1 FOR CITY REVIEW	P.S.	2016:07:11

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 1B

LICENSED PROFESSIONAL ENGINEER
P. SPAL
2017/06/16
PROVINCE OF ONTARIO

N

Drawing Title

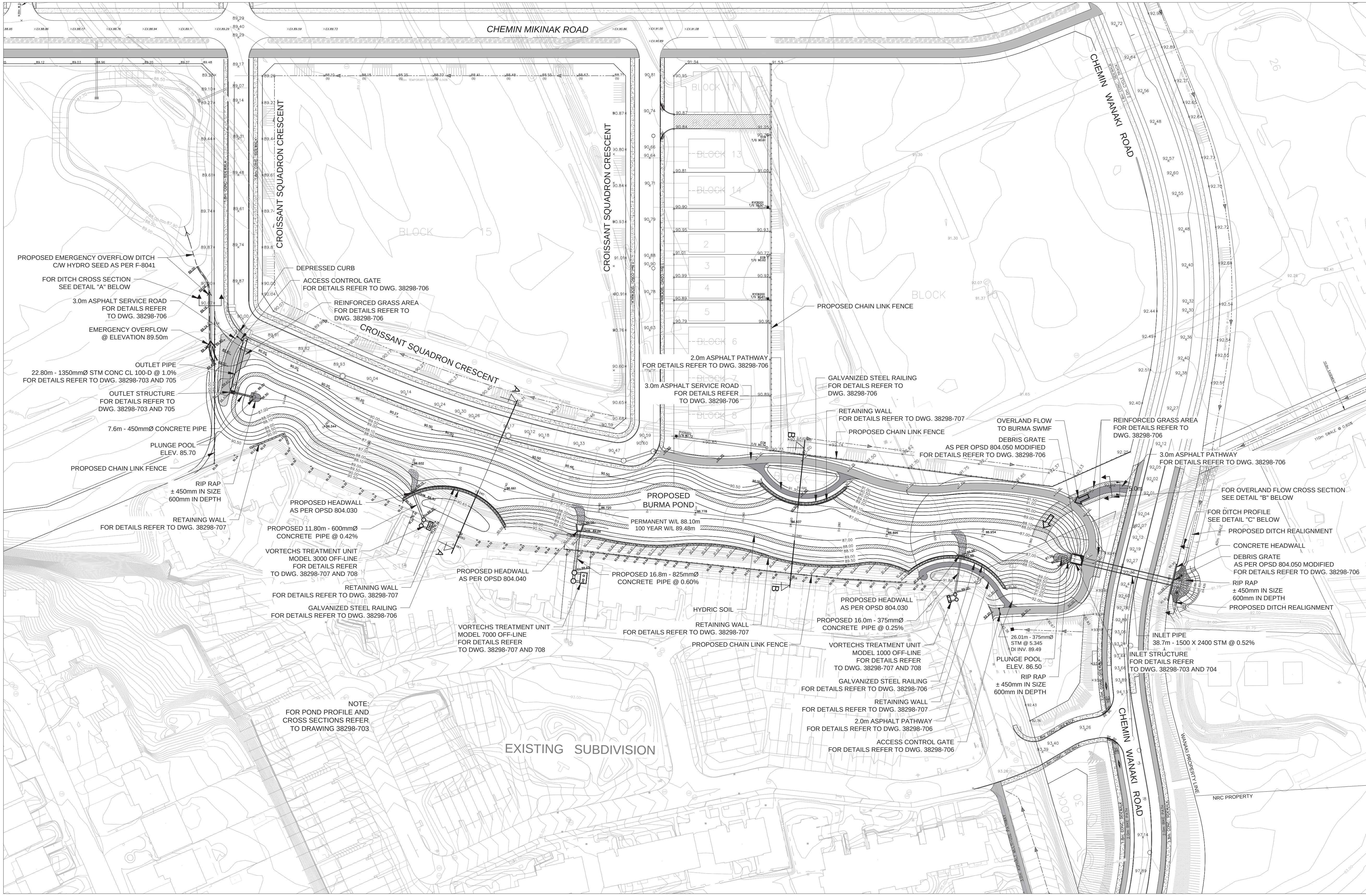
DDSWMM MODEL SCHEMATIC

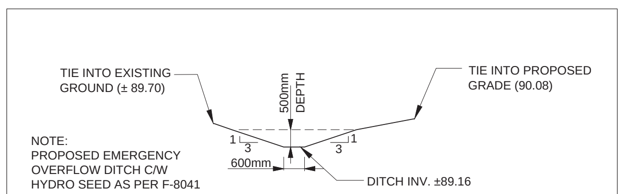
Scale 1:2500

Design	Scale
P.S.	JULY 2016
Drawn	Checked
S.V.	P.S.
Project No.	Drawing No.
38298	750

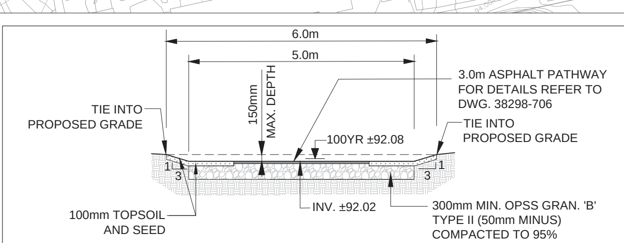
D07-16-15-0003

#17063

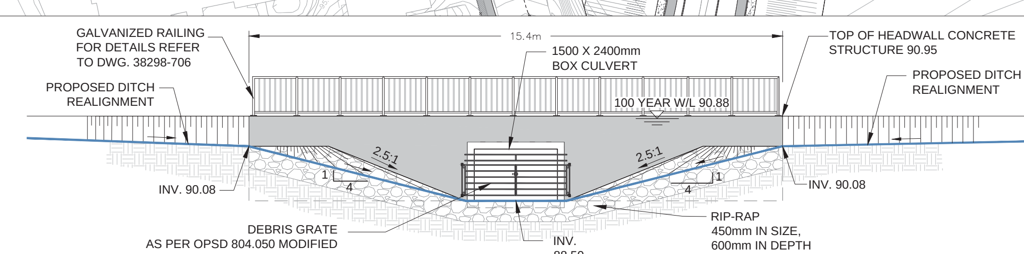




DITCH CROSS SECTION -DETAIL "A"
NTS



OVERLAND FLOW CROSS SECTION -DETAIL "B"
NTS



DITCH CROSS SECTION -DETAIL "C"
NTS

REVIEWED BY
DEVELOPMENT REVIEW SERVICES BRANCH

Signed ______________
Date ______________ 2017
Plan Number ______________

LEGEND:
- HYDRIC SOIL
- REINFORCED GRASSED SERVICE AREA
- ASPHALT SERVICE ROAD
- ASPHALT PATHWAY

NOTE:
HYDRIC SOILS (0.3m DEPTH) TO BE PLACED BETWEEN ELEVATIONS 88.00m AND PERMANENT WATER LEVEL 88.10m. TOPSOIL TO BE PLACED ABOVE PERMANENT WATER LEVEL 88.10 AND TO COVER ALL AREAS DISTURBED OR ALTERED BY EARTH WORKS

No.	REVISIONS	By	Date
14			
13			
12			
11			
10			
9			
8	REVISED PER CITY COMMENTS	P.S.	2017:06:16
7	SUBMISSION FOR MOECC APPROVAL	P.S.	2017:04:24
6	REISSUED FOR TENDER	P.S.	2017:04:12
5	ISSUED FOR TENDER	P.S.	2017:03:23
4	SUBMISSION FOR MOECC APPROVAL	P.S.	2017:02:16
3	SUBMISSION No.3 FOR CITY REVIEW	P.S.	2017:01:25
2	SUBMISSION No.2 FOR CITY REVIEW	P.S.	2016:11:04
1	SUBMISSION No.1 FOR CITY REVIEW	P.S.	2016:07:11

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 1B

2017/06/16

N

Drawing Title
POND LAYOUT AND GRADING PLAN

Scale	1:750
Design: P.S.	Scale: JUJY 2016
Drawn: S.V.	Checked: P.S.
Project No.: 38298	Drawing No.: 702

D07-16-15-0003

#17063

Relevant Excerpts from 'Design Brief – Wateridge Village

At Rockcliffe – Phase 1B' report

(IBI, June 2017)

In all locations within the subject site and under the 100 year Chicago storm event, the velocity by depth product is less than the maximum allowable product of 0.6 per City's OSDG. During the sensitivity analysis, using the 100 year Chicago storm with a 20% increase, the velocity by depth product is less than the maximum allowable product of 0.6 for all locations throughout the site.

Within the subject site under the 100 year Chicago design storm event, for all the street segments the summation of depth of ponding and depth of cascading flow is less than 0.3 m per City's OSDG.

During the 100 year Chicago design storm event increased by 20%, the summation of depth of ponding and depth of cascading flow is less than 0.30 m in the majority of the locations throughout the site. However, there are four (4) locations where the total depth exceeds 0.30 m. The street segments are S210, S208, S213, and S149. These areas are noted in **Table 5-7** in red and bold.

The following table summarizes the elevation of the low points and high points, depth of the sags, property line elevation and the garage elevations for the street segments where summation of depth of ponding and depth of cascading flow exceeds 0.30 m during the 100 year Chicago design storm event increased by 20%.

Table 5-8: Summary of Extent of Cascading Flow in Relation to Property Lines and Garage Elevations (38298--100CH_20.dat/out)

MAJOR SYSTEM SEGMENT ID	TOP OF GRATE ELEVATION (M)	SPILL POINT ELEVATION (M)	DEPTH OF SAG (M)	LOWEST PROPERTY LINE ELEVATION (M)	ELEVATION AT CLOSEST GARAGE (M)	EXTEND OF PONDING AND CASCADING DEPTH (M)*
Wateridge Village - Phase 1B Area						
S210(D10)	88.88	89.11	0.23	89.14	N/A	89.25
S208(D12)	88.39	88.62	0.23	88.65	N/A	88.76
S213(D9)	89.07	89.2	0.13	89.53	N/A	89.38
Wateridge Village - Phase 1A Area - Servicing Phase 1B						
S149(D20)	91.94	92.05	0.11	91.3	N/A	92.32

Notes:
* Extent of ponding and cascading depth is the addition of the low point elevation for each major system segment with the cascading depth presented in **Table 5-7** (i.e., for S141B: 87.39 + 0.31 = 87.70 m).

During the 100 year Chicago design storm event increased by 20%, the major system will cascade from each street segment noted in **Table 5-8** and will encroach the lowest property line for all street segments.

5.5 Hydraulic Analysis

5.5.1 Storm Hydraulic Grade Line

The hydraulic grade line (HGL) was evaluated using the XPSWMM hydraulic model. A model was created for the detail design of the laterals and storm sewers within the subject site. The model also includes the Phase 1A laterals and trunk sewers. The XPSWMM analysis was also used to evaluate the hydraulic function of the park dry pond; the retrofitted Burma SWM Facility; and the proposed culvert crossing along Wanaki Road.

The hydraulic function of the retrofitted Burma SWM Facility is discussed in the Draft "Burma Stormwater Management Facility Design Wateridge Village at Rockcliffe Phase 1B" (IBI Group, January 2017), and the Phase 1A hydraulic grade line results were presented in the "Design

Brief Wateridge Village at Rockcliffe Phase 1A (IBI Group, April 2016)". The models terminates at the Eastern SWMF.

The minor system hydrographs for the subject site and Phase 1A development were obtained from the DDSWMM evaluation undertaken as outlined in **Section 5.4**. Relevant hydrographs developed in the MSS study using SWMHYMO model were downloaded into the XPSWMM model at nodes S320, S323, and S225 to account for the future Phase 3 flows. Locations of the imported hydrographs are indicated in bold in XPSWMM schematic provided within **Appendix E**.

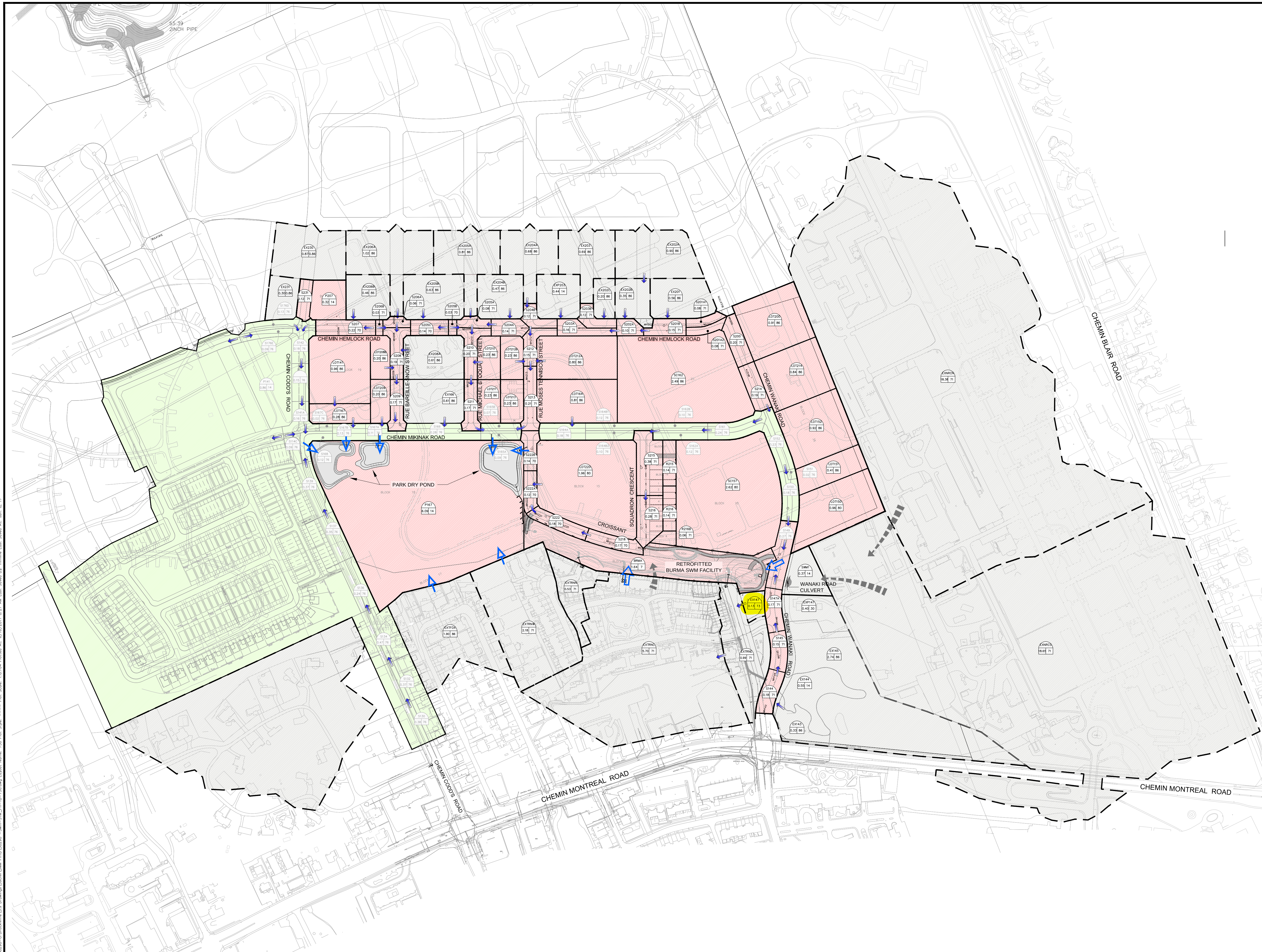
The stage-area curves of the park dry pond and the retrofitted Burma SWM Facility have been entered into the model. Minor system losses along the storm sewer pipes were accounted for in accordance with Appendix 6-B of the City of Ottawa Sewer Design Guidelines (November 2012).

XPSWMM simulations were conducted for the 100 year 3 hour Chicago storm to ensure that the HGL is at least 0.3m below the underside of footing elevations. It was assumed that the underside of footing 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 **Table 5-9** below, along with a comparison of under-side of footing (USF) elevations.

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

Table 5-9: Summary of Hydraulic Grade Line Analysis

XP-SWMM NODE ID	MH NO.	GROUND ELEVATION (M)	USF (M)	100 YEAR 3 HOUR CHICAGO†		100 YEAR 24 HOUR SCS (103.2MM)‡		JULY 1, 1979¥		100 YEAR 3 HOUR CHICAGO INCREASED BY 20%£	
				HGL (M)	FREE BOARD (M)*	HGL (M)	FREE BOARD (M)*	HGL (M)	FREE BOARD (M)*	HGL (M)	FREE BOARD (M)*
Wateridge Village Phase 1B											
S143	143	102.40	100.00	98.16	1.84	98.16	1.84	98.16	1.84	98.16	1.84
S144	144	99.41	97.01	95.79	1.22	95.78	1.23	95.78	1.23	95.79	1.22
S145	145	97.64	95.24	93.01	2.23	93.01	2.23	93.00	2.24	93.01	2.23
S146	146	95.28	92.88	90.96	1.92	90.77	2.11	90.91	1.97	91.82	1.06
S147	147	93.27	N/A	90.93	N/A	90.72	N/A	90.88	N/A	91.78	N/A
USBRM	N/A	N/A	N/A	90.88	N/A	90.67	N/A	90.83	N/A	91.72	N/A
BURMA	N/A	N/A	N/A	89.41	N/A	89.24	N/A	89.43	N/A	89.87	N/A
OUTLET	N/A	N/A	N/A	89.26	N/A	89.07	N/A	89.28	N/A	89.76	N/A
S152	152	92.73	90.33	89.71	0.62	89.71	0.62	89.71	0.62	89.71	0.62
S151	151	92.50	90.10	89.58	0.52	89.58	0.52	89.58	0.52	89.58	0.52
S150	150	92.32	89.92	89.49	0.43	89.49	0.43	89.49	0.43	89.49	0.43
S149	149	92.34	89.94	89.42	0.52	89.42	0.52	89.42	0.52	89.43	0.51
S148	148	92.14	89.74	89.30	0.44	89.30	0.44	89.30	0.44	89.30	0.44
S157	157	91.24	N/A	89.21	N/A	89.21	N/A	89.21	N/A	89.21	N/A
S154	154	91.02	N/A	87.68	N/A	87.68	N/A	87.68	N/A	87.68	N/A
S215	215	90.77	88.37	87.58	0.79	87.58	0.79	87.58	0.79	87.58	0.79
S216	216	90.85	88.45	87.30	1.15	87.30	1.15	87.30	1.15	87.30	1.15
S217	217	90.66	88.26	87.14	1.12	87.12	1.14	87.14	1.12	87.19	1.07



REVIEWED BY
DEVELOPMENT REVIEW SERVICES BRANCH

Signed ______________________

Date ______________________ 2016

Plan Number ______________________

LEGEND:

- PHASE 1B DRAINAGE AREA
- PHASE 1A DRAINAGE AREA
- EXTERNAL DRAINAGE AREA
- PHASE 1B DRAINAGE BOUNDARY
- S208 — AREA ID
- 71 — Imp.(%)
- 0.19 — AREA (ha)
- MAJOR FLOW
- TOTAL FLOW
- MH136 — MANHOLE ID
- FLOW ROUTE TO PARK DRY POND
- MAJOR FLOW TO BURMA SWMF

No.	REVISIONS	By	Date
14			
13			
12			
11			
10			
9			
8			
7			
6	REVISED PER CITY COMMENTS	P.S.	2017:06:16
5	REVISED PER MOECC COMMENTS	P.S.	2017:06:07
4	SUBMISSION FOR MOECC APPROVAL	P.S.	2017:02:16
3	SUBMISSION No.3 FOR CITY REVIEW	P.S.	2017:01:25
2	SUBMISSION No.2 FOR CITY REVIEW	P.S.	2016:11:04
1	SUBMISSION No.1 FOR CITY REVIEW	P.S.	2016:07:11

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 1B

P. SPAL
2017/06/16

Drawing Title

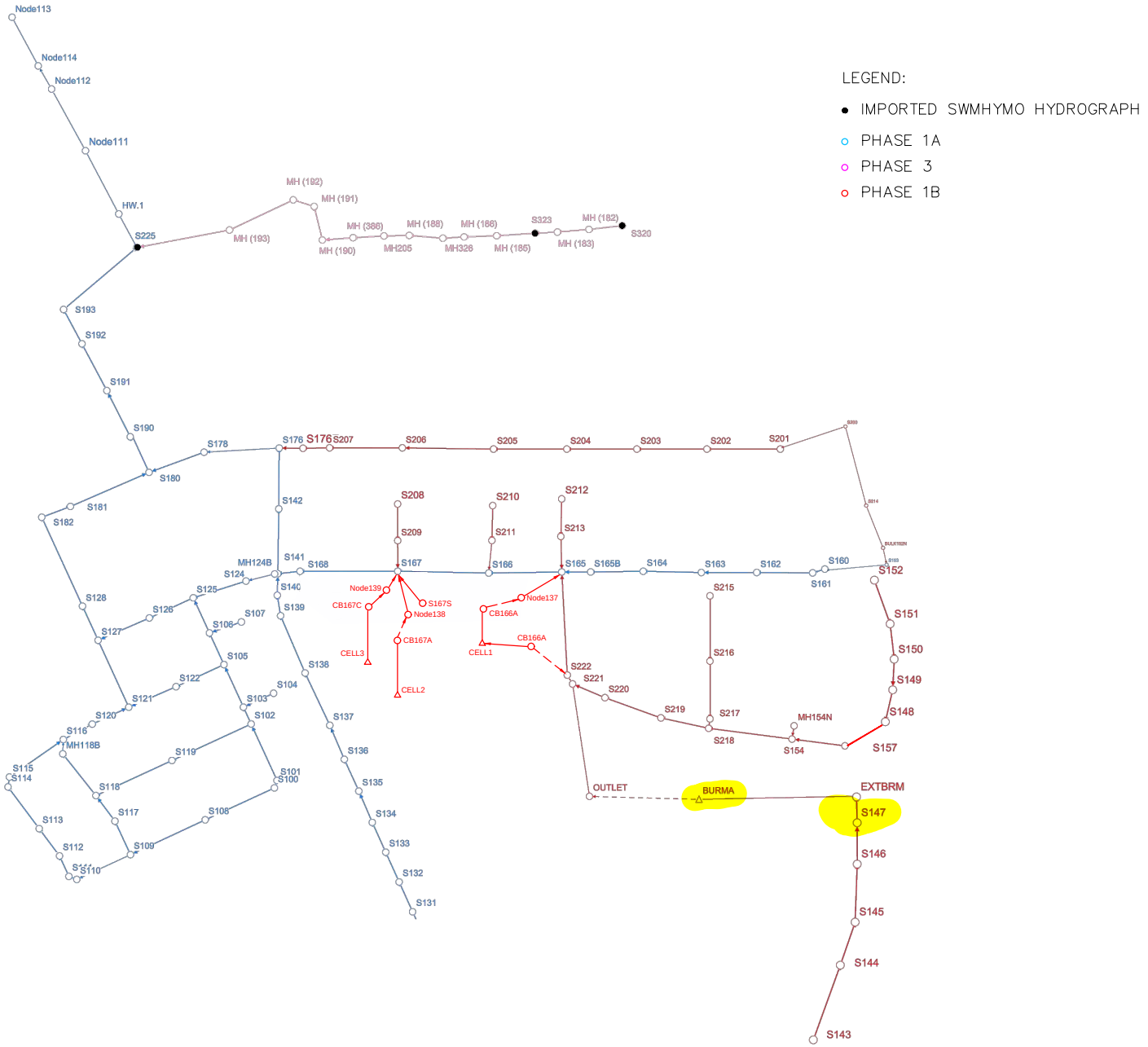
DDSWMM MODEL SCHEMATIC

Scale: 1:2500

Design	Scale
P.S.	JULY 2016
Drawn: S.V.	Checked: P.S.
Project No.: 38298	Drawing No.: 750

D07-16-15-0003

#17063



J:\38298-CFBRockvliffe\5.9 Drawings\59civil\SWM Ph1B\Figures\Subdivision\Figure XPSWMM Schematic.dwg Layout Name: Figure

Scale	Project Title	Drawing Title	Sheet No.
NTS	DESIGN BRIEF WATERIDGE VILLAGE AT ROCKCLIFFE PHASE 1B	XPSWMM SCHEMATIC	

Relevant Excerpts from 'Former CFB Rockcliffe

Redevelopment, Stormwater Management Existing Conditions

& LID Pilot Project Scoping' report

(Aquafor Beech, May 2015)

5.11 OVERVIEW OF PROPOSED LIDS FOR IMPLEMENTATION

This section and Figure 34-A provides additional detail in regards to the recommended LID Lot-level and LID Conveyance Controls as well as specific projects for further consideration as part of the Phased LID Demonstration Project Phase 1A- 3. Refer to Table 23.

Low/Medium Rise Residential and Mixed-Use

For low and medium rise residential land-uses (Figure 2) potential LIDs for consideration include:

a) Downspout disconnection/ redirection will direct roof runoff to front yard subsurface soakaways/chambers for detention and infiltration. For low and medium rise mixed-use land-use, the use of subsurface chambers beneath landscaped or hard-surface elements (i.e. driveways) should be anticipated. The potential to include rear yard infiltration facilities where year yard catch basins are proposed may also be considered at the detailed design stage.

b) All green space (grassed and vegetated) include soil amendments in conformance with the:
   - Implementation Guide for the Pinecrest Creek/ Westboro SWM Guidelines: Development Requiring a Building Permit Only (Draft, 2013) and
   - Preserving and Restoring Healthy Soil: Best Management for Urban Construction (Sustainable Technologies Evaluation Program – STEP, June 2012, Version 1.0)

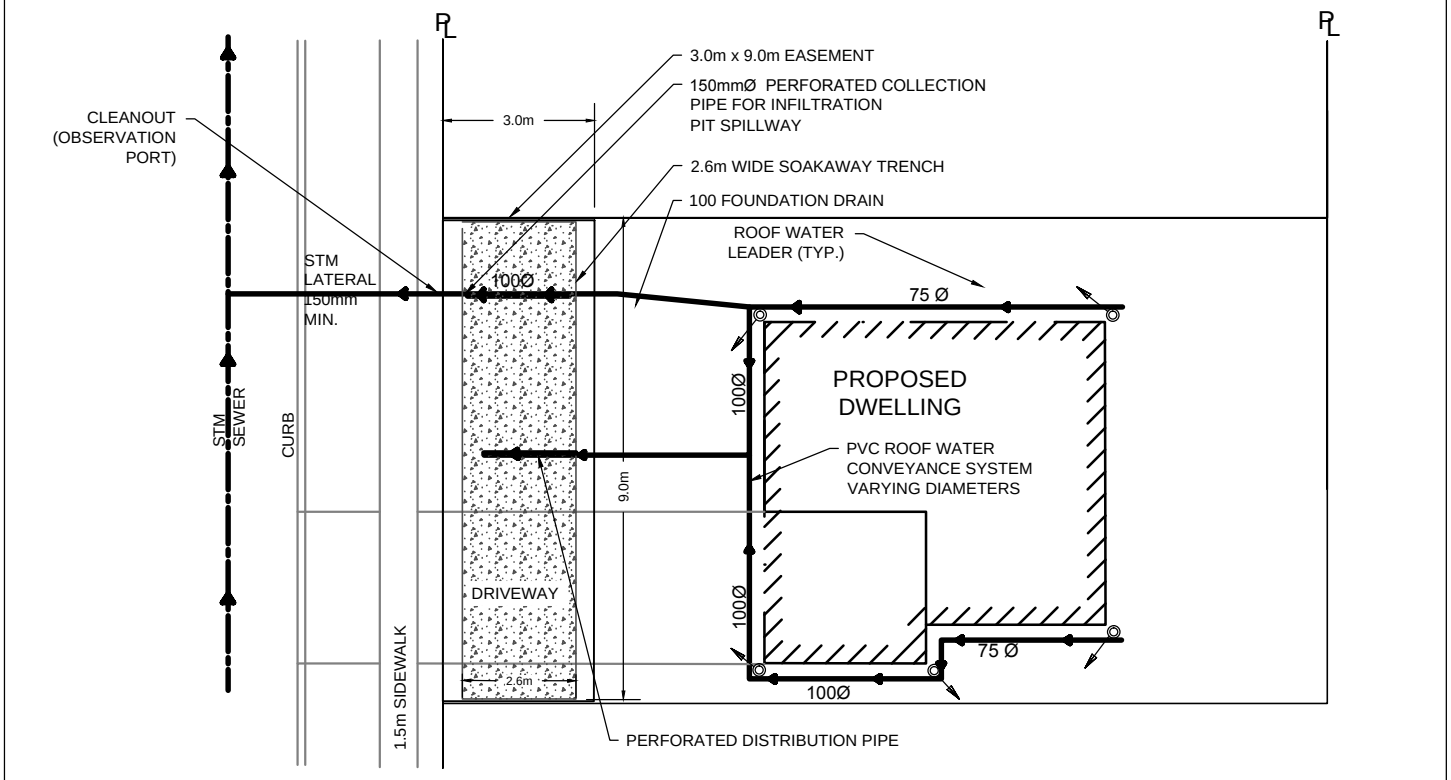
Other potential LID controls for consideration may include the use of bioretention areas to replace conventional landscape areas and or the use of permeable pavements driveways in place of conventional impermeable surfaces.

High-Rise Mixed-Use

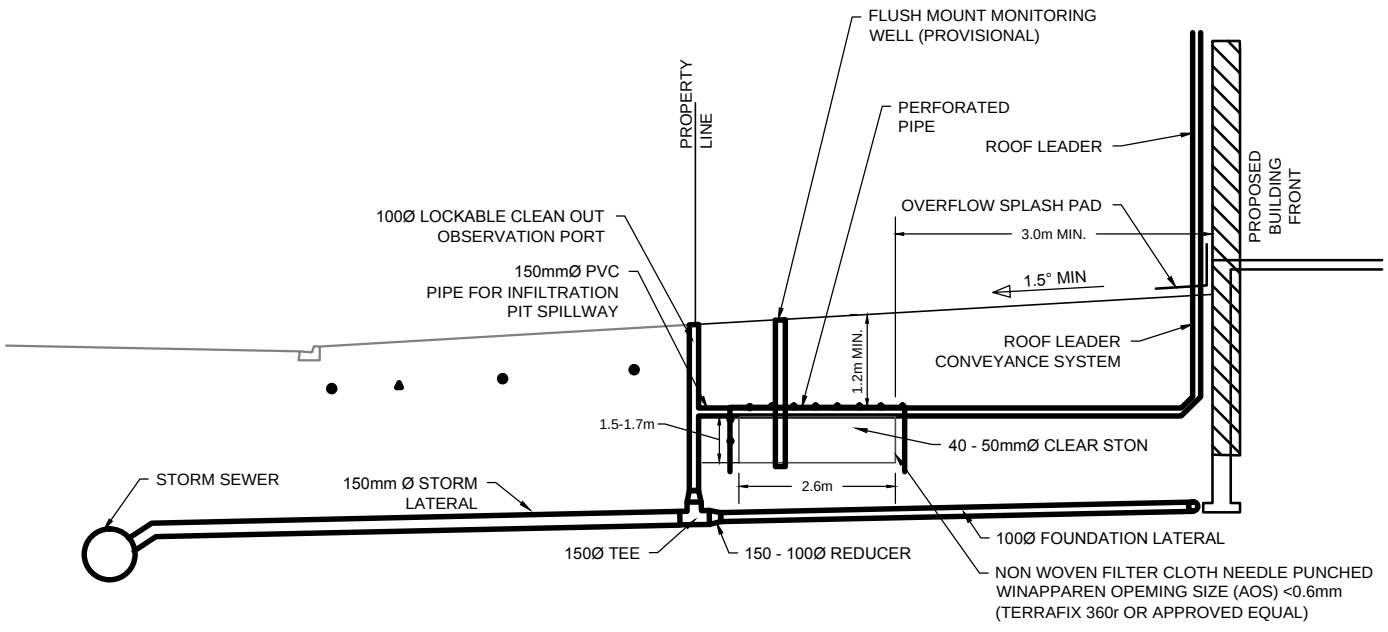
For high-rise mixed-use land-uses (Figure 2) potential LIDs for consideration include:

a) Downspout disconnection be utilized to harvest roof water and direct it to sub-surface cisterns (i.e. rain water harvesting) in accordance with the 2006 amendments to the Ontario Building Code (OBC) which permits the use of collected rain water to supplement indoor, non-potable uses i.e. toilet flushing, vehicles washing etc. in addition to outdoor irrigation of landscaping.

b) All green space (grassed and vegetated) include soil amendments in conformance with the:
   - Implementation Guide for the Pinecrest Creek/ Westboro SWM Guidelines: Development Requiring a Building Permit Only (Draft, 2013) and
   - Preserving and Restoring Healthy Soil: Best Management for Urban Construction (Sustainable Technologies Evaluation Program – STEP, June 2012, Version 1.0)



N.T.S



N.T.S

Aquafor Beech Limited

TYPICAL SINGLE LOT FRONT YARD INFILTRATION PIT DETAIL

STANDARD DETAIL

APPROVED	DWG No.
REVISION No.	Figure 46
DATE	

Relevant Excerpts from 'Wateridge Phase

1B Developer's Checklist'

(Aquafor Beech, October 22, 2019)

October 22nd, 2019
Ref No. 65578.1

To: **Jean Lachance, Canada Lands Company (CLC)**

From: **Chris Denich, M.Sc., Aquafor Beech Ltd., Meaghan Dustin, E.I.T., Aquafor Beech Ltd.**

Re: **Wateridge Phase 1B Developer's Checklist**

1.0 Phase 1B

Wateridge Village Phase 1B includes 7 development blocks located between Codd's Road and Wanaki Road to the west and east, and Hemlock Road and Wanaki Road to the north and south, in addition to Squadron Crescent. The land-use within this block includes semi-detached singles, townhouse blocks, low-rise residential, mid-rise residential, mid-rise mixed-use, and parks.

As part of the Wateridge Village low impact development (LID) Demonstration project, this phase will include stormwater management treatment strategies that maximize pervious surfaces and increase infiltration and groundwater recharge through a combination of lot-level (source), conveyance and end-of-pipe stormwater management controls.

The following sections outline the stormwater criteria the developer is required to meet with the implementation of LID measures. The testing requirements necessary for design and implementation are also described. Finally, LIDs recommended to be incorporated within Phase 1B are summarized.

2.0 SWM Criteria

All LID measures implemented in Phase 1B of the Wateridge Village development shall be designed to achieve the infiltration, erosion, and water quality design targets summarized in **Table 2.1**. These targets represent minimum volumes to achieve water balance (infiltration), water quality, and erosion controls.

All landscaped areas (turf or garden) will require Topsoil Amendments per Option 1 or Option 2; these options are outlined in **Appendix B**.

Table 2.1 LID Design Targets

LID Design Targets		
Infiltration*	**Erosion***	**Water Quality†**
LID Infiltration target = 4mm Maintain groundwater recharge per the existing conditions water budget. Groundwater recharge includes hydrological connection and linkages to wetlands, woodlots, streams and other natural features. LID lot-level and conveyance controls shall infiltrate an equivalent volume a 4mm event applied to the full catchment area.	LID Erosion Control Target = 4mm LID lot-level and conveyance controls shall match the existing conditions water balance through the application of the infiltration targets in order to reduce or eliminate the effects of hydro-modification (magnitude, duration and frequency) form the contributing drainage area. As such the infiltration targets shall be considered the erosion control targets for LID controls.	Min. Target = 15mm The minimum water quality event for LID lot-level and conveyance controls for the Former CFB Rockcliffe shall be the 15mm event. LID controls shall treat the runoff from a 15mm event through filtration, detention, evapotranspiration, detention and release and infiltration. Drainage areas which achieve the minimum 15mm water quality target shall be required to discharge to another LID in the treatment train and or an end-of-pipe pond to achieve the full enhanced level of control per the MOE SWMPD. Enhanced Target = 25mm To achieve the enhanced level of control, per the MSS, the target water quality event for LID lot-level and conveyance controls shall be the 25mm event. LID controls shall treat the runoff from a 25mm event through filtration, detention, evapotranspiration, detention and release and infiltration. Drainage areas which achieve the enhanced water quality target do not require treatment in an end-of-pipe facility.
*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/erosion target.		

3.0 Testing Requirements

The implementation of LIDs requires a geotechnical assessment (including groundwater monitoring) and infiltration tests to determine the in-situ conditions prior to design.

3.1 Geotechnical Assessment

A soils report will be required to accompany the design of all infiltration facilities to ensure adequate soil permeability and depth to the seasonally high water table. This report should include:

- Borehole information, including soil stratigraphy, composition, grain-size and chemical analysis (additional testing may be required for individual LID techniques per the requirement of the Low Impact Development Stormwater Management Planning and Design Guide, Version 1.0 (TRCA/CVC - 2010); number of boreholes can range from 2 to greater than 20 based on size of facility and site specific conditions. Boreholes should be extended a minimum of 1.5m below the proposed invert of the proposed LID facility.
- Geotechnical assessment will generally include:
    - particle size distribution (ASTM D422 and D2217),
    - Stratigraphy, Piezometer(s) and Standpipes –to determine seasonally high (March – April or Late fall before snowfall) groundwater elevation information per O.Reg 389/09
    - natural moisture content (ASTM D2216),
    - plasticity characteristics (ASTM D4318),
    - soil strength assessment (CBR and Soaked CBR) for permeable pavement designs.

The scope of the geotechnical assessment shall be determined based on the need to confirm that the following conditions are not present. The following conditions are considered unsuitable or may increase facility failure rate for infiltration based controls.

1. Slopes ≥20% and contributing catchment area slopes ≥15%;
2. Seasonally-high water table elevations that are within 1.0-0.60 metres of the bottom of proposed infiltration based facilities;
3. Bedrock within 1 metre of the bottom of the proposed infiltration facility;
4. Wetlands and associated hydric soils;
5. Proposed Land uses that are classified as potential “hot spots”;
6. Drinking water wells within 30 metres; and
7. Karst topography.

It is not anticipated that conditions 1, 6 or 7 above will be of concern.

3.2 Infiltration Testing

For design purposes, the preferred approach to measure field saturated hydraulic conductivity (Kfs) at a subject site include:

- Guelph Permeameter
- Double Ring Infiltrometers (constant head)
- Single ring (constant head pressure)

At least one (1) test will be required at 2 soil depths for each 450m^2 footprint surface area at each location. **Note: Infiltration rates derived from borehole analysis, T-test, slug or other generalized test shall not be accepted for design purposes.** All infiltration testing should be completed per Appendix C of the TRCA/CVC LID Planning and Design Guide (2010). As per this procedure, the safety factor should account for the fill implementation required for the grade raise in this phase overlaying the existing native

material. Based on in-situ soil testing of previous phases, it is anticipated that the soils tested in Phase 1B will have a field saturated hydraulic conductivity below 15mm/hr and therefore will require the installation of an underdrain per the TRCA/CVC LID Stormwater Planning and Design Guide (2010).

4.0 Recommended LID Types

The Draft Wateridge Village Phases 1B - Master Concept Plan (Appendix A) displays the proposed land-use in Phase 1B; including: low & medium rise residential and mixed-use, parks, and municipal ROW. Table 4.1 summarizes suitable LID measures by each land use.

Table 4.1 Low Impact Development (LID) Suitability Matrix by Land-Use

		Phase 1B Proposed Land-Uses			
		Low & Medium Rise Residential	Low and Medium Rise Mixed-Use	Schools & Parks	Municipal ROW
	Assumed Lot Coverage	**50-60%**	**80-100%**	**10-30%**	**n/a**
LID Type					
Lot-Level Controls	Green Roofs	□	□	n/a	n/a
	Bioretention	□□	□□	□□□	□□□
	Rainwater Harvesting	□	□	n/a	n/a
	Soakaways, Trenches & Chambers	□□□	□□□	□□□	n/a
	Downspout Disconnection	□□□	□□□	n/a	n/a
	Soil Amendments	□□□	□□□	□□□	n/a
	Permeable Pavements	□□	□□	□□	See Conveyance Controls
	Infiltration Basins	n/a	n/a	□□□	n/a
Conveyance Controls	Vegetated/Grass Swales	n/a	n/a	□	□□
	Bioswales/Biofilters	n/a	n/a	□□	□□□
	Perforated Pipes	n/a	n/a	□	□□
	Permeable Pavements	n/a	n/a	□□	□□□

*Assumed lot coverage indicates percentage of development with hard surface land cover

□□□ = **Highly Suitable,** □□ = **Suitable,** □ = **Poor Suitability,** n/a = **Not Applicable**

In areas where infiltration is not possible, i.e. over underground parking structures, runoff can be collected using ditch inlets, catch basins, or eavestroughs for roof surfaces and conveyed via pipe to an infiltration system or end-of-pipe facility.

Based on the land-use proposed in the Master Concept Plan for Phase 1B, the following LIDs can be implemented in Phase 1B:

- Soakaways, Trenches & Chambers
- Downspout Disconnection
- Soil Amendments
- Bioretention
- Infiltration Basins

- Bioswales/Biofilters
- Permeable Pavements
- Vegetated/Grass Swales
- Perforated Pipe

Of the options listed above, bioswales, permeable pavement laybys, and soil amendments have been implemented in the proposed Phase 1B design.

Relevant resources detailing the constraints, implementation, construction, and monitoring of all suitable LID measures are included in **Appendix C**. These resources also include the Stormwater Management Planning and Design Manual, background groundwater information, permitting requirements, and monitoring and costing information.

Appendix B: Topsoil Amendment Options

OPTION 1
On-Site Soil Amendment - Default Ratio 3:1
All Building Types

Materials

- Amend existing site topsoil using 3:1 ratio by volume (3 parts existing topsoil, 1 part amendment material)
- Amendment Material: organic matter primarily leaf, yard and bark waste compost of 20-30% by dry weight as determined by Loss-on-Ignition (LOI) and a pH of 6.0 to 8.0
- No uncomposted manure or other organic materials, sphagnum peat or organic amendments that contain sphagnum peat

Placement and Amendments

1. Remove existing topsoil and preserve on-site.
2. Rip native subsoil (decompaction) using the teeth of an excavator or bobcat bucket or equivalent to a depth of 100-200mm. Rip using a perpendicular pattern (See Detail No.1) ensuring full site coverage. No ripping within tree protection areas (See Detail No.2) or within 3m of building foundations (See Detail No.3).
3. Amend existing site topsoil to meet post construction soil amendment requirements using 3:1 ratio by volume (topsoil : amendment material).
4. Two (2) methods for amending the existing soils in place are acceptable:

Method No.1 - Layer and Incorporate (Detail No.4)

i. Apply 100mm of existing site topsoil followed by 50mm of amendment material and incorporate/mix amended material.
ii. Lightly roll or smooth using the back of the machinery bucket.
iii. Repeat i. and ii.
iv. Adjust layer quantities to ensure a settled amended topsoil depth of 300m and compliance with site grading. Placement should account for 10% settlement.

Method No.2 - Mechanical or Bucket Mix

i. Successively add, mix and pile one (1) unit of amendment material with three (3) units of existing site topsoil.
ii. Thoroughly mix.
iii. Repeat i. and ii to ensure thorough mixing until required volume is achieved.
iv. Place 150mm of amended topsoil, lightly roll or smooth using the back of the machinery bucket.
v. Repeat iv.
vi. Adjust layer quantities to ensure a settled amended topsoil depth of 300m and compliance with site grading.

Amended topsoil should be wetted after application, allowed to settle for a minimum of one (1) week and grades adjusted as required prior to installation of turf.

-IMPORTANT-

Documentation Requirements

As part of verification, the owners shall produce delivery tickets, receipts and specifications detailing the delivery address, quantities and product description and sources for verification by City inspectors. Delivery address is to be listed and must correspond to the property/site being inspected. Site without proper documentation may be subject to additional verification procedures including laboratory testing at the expense of the owner. The owner's engineer shall provide a duly notarized letter with all supporting documentation certifying the proper installation and placement of amended soil.

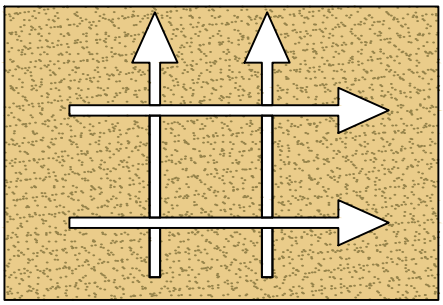
Consultant Verification/Inspection

Verification may occur after the minimum one (1) week settlement period. Verification is suggested prior to turf placement. Non-compliant sites shall be rectified at the expense of the owner.

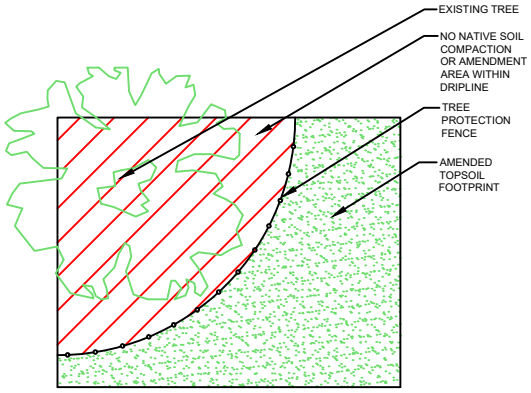
At random, the Developer's consultant shall dig at least one (1) test hole to verify amended topsoil depth and uncompacted soil depths.

Requirements:

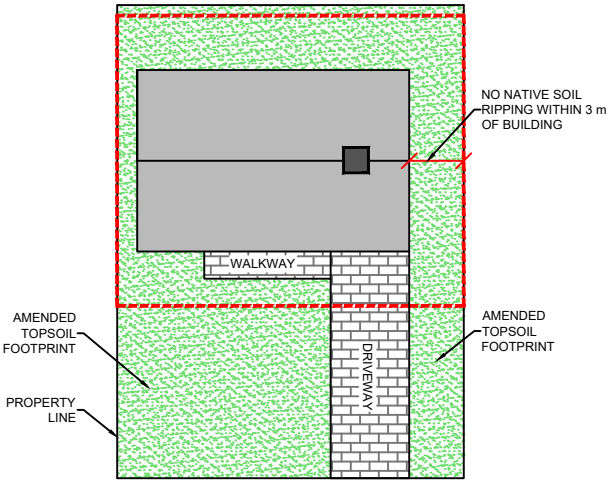
1. Amended topsoil layer shall be easily dug using only the inspector's weight or cored without other mechanical assistance.
2. The amended topsoil layer shall be darker in color than the unamended- ripped subsoil and particles of organic matter should be easily visible.
3. Measured amended topsoil depths shall be deemed to be in conformance based on the following:
   - Using a common garden spade, the measured depth of amended topsoil shall be equal to the required 300mm depth (±25mm)
   - Using a small diameter coring unit, the measured core depth of amended topsoil shall be equal to the required 300mm depth (±50mm)



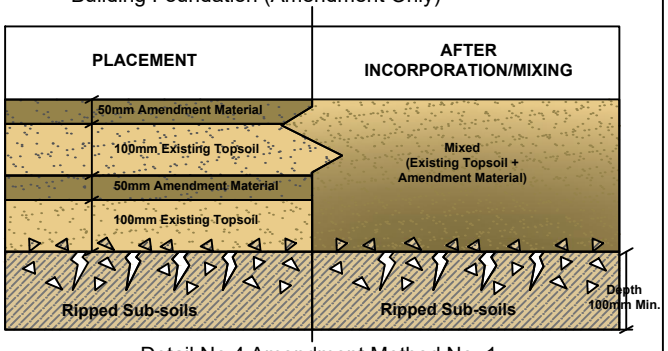
Detail No.1 - Perpendicular Native Soil Ripping Pattern



Detail No.2 - No Native Soil Ripping within Tree Protection Areas or Amendment



Detail No.3 - No native soil ripping within 3.0m of Building Foundation (Amendment Only)



Detail No.4 Amendment Method No. 1

Soil Amendment Requirements for Wateridge Village Phase 1B - For Development Requiring a Building Permit Only

City of Ottawa
October 22, 2019

OPTION 2
On-Site Soil Amendment
Import and Replace Topsoil with Amendment Material
All Building Types and Parks

Materials

- Amendment material shall be obtained from a Compost Quality Assurance (CQA) licensed and OMOE/ CCME approved facility and shall comply with the Category "A" compost designation. The amendment material must contain:
  - Organic matter primarily leaf, yard and bark waste compost of 8-15% by dry weight as determined by Loss-on-Ignition (LOI) and a pH of 6.0 to 8.0.
  - No uncomposted manure or other organic materials, sphagnum peat or organic amendments that contain sphagnum peat.

Placement and Amendments

1. Remove existing topsoil and dispose off-site in accordance with OPSS 206 and OPSS 180, O. Reg. 153/06, the Environmental Protection Act or municipal by-laws and policies, whichever supersedes.
2. Rip native subsoil (decompaction) using the teeth of an excavator or bobcat bucket or equivalent to a native subsoil at depth of 100-200mm. Rip using a perpendicular pattern (See Detail No.1) ensuring full site coverage. No ripping within tree protection areas (See Detail No.2) or within 3m of building foundations (See Detail No.3).
3. Import pre-mixed amended topsoil (300mm depth of coverage required).
4. Place imported pre-mixed amended topsoil in 150mm lifts, lightly roll or smooth using machinery bucket and repeat. Adjust layer quantities to ensure a settled amended topsoil depth of 300mm and compliance with site grading. (See Detail No.4).

Amended topsoil should be wetted after application, allowed to settle for a minimum of one (1) week and grades adjusted as required prior to installation of turf.

-IMPORTANT-

Documentation Requirements

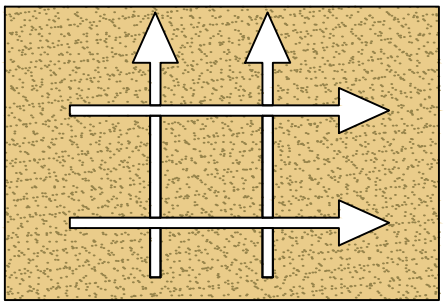
As part of verification, the owners shall produce delivery tickets, receipts and specifications detailing the delivery address, quantities and product description and sources for verification by City inspectors. Delivery address is to be listed and must correspond to the property/site being inspected. Sites without proper documentation may be subject to additional verification procedures including laboratory testing at the expense of the owner. The owner's engineer shall provide a duly notarized letter with all supporting documentation certifying the proper installation and placement of amended soil.

Consultant Verification/Inspection

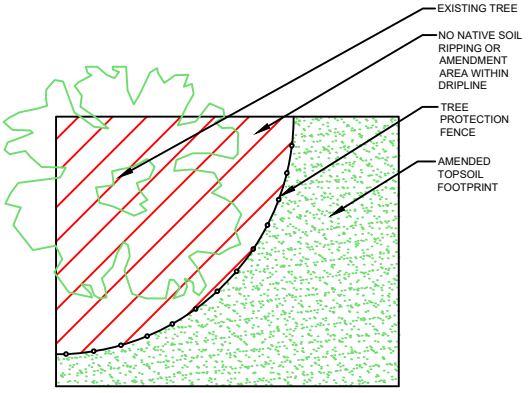
Verification may occur after the minimum one (1) week settlement period. Verification is suggested prior to turf placement. Non-compliant sites shall be rectified at the expense of the owner

At random, the Developer's consultant shall dig at least one (1) test hole to verify amended topsoil depth and uncompacted soil depths.
Requirements:

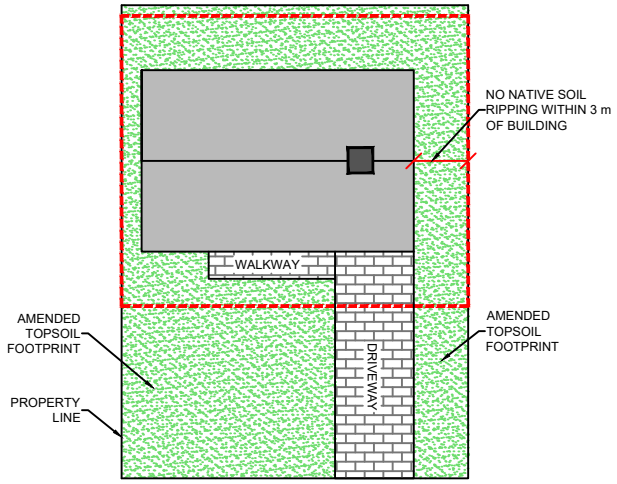
1. Amended topsoil layer shall be easily dug using only the inspector's weight or cored without other mechanical assistance.
2. The amended topsoil layer shall be darker in color than the unamended- ripped subsoil and particles of organic matter should be easily visible.
3. Measured amended topsoil depths shall be deemed to be in conformance based on the following:
   - Using a common garden spade, the measured depth of amended topsoil shall be equal to the required 300mm depth (±25mm)
   - Using a small diameter coring unit, the measured core depth of amended topsoil shall be equal to the required 300mm depth (±50mm)



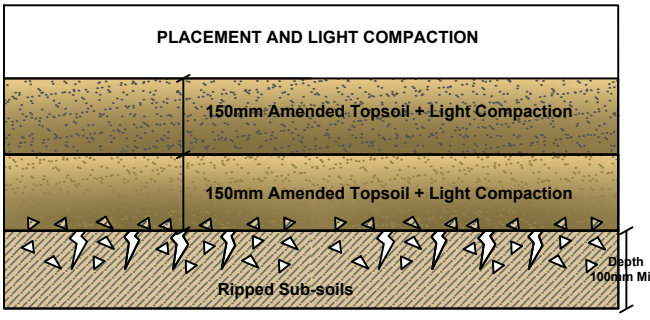
Detail No.1 - Perpendicular Native Soil Ripping Pattern



Detail No.2 - No Native Soil Ripping within Tree Protection Areas or Amendment



Detail No.3 - No Native Soil Ripping within 3.0m of Building Foundation (Amendment Only)

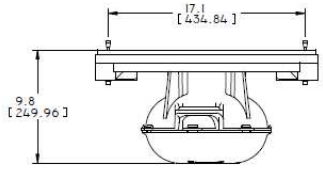


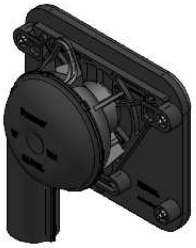
Detail No.4 Placement and Compaction Lifts for Amended Topsoil

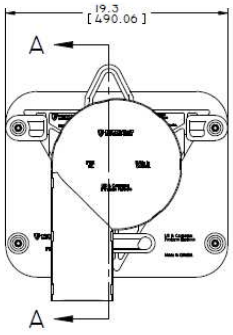
Soil Amendment Requirements for Wateridge Village Phase 1B
- For Development Requiring a Building Permit Only

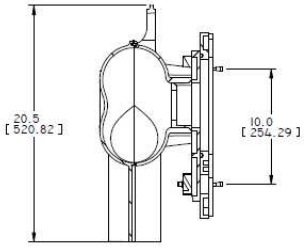
City of Ottawa
October 22, 2019

<u>Tempest LMF ICD Sq</u> Shop Drawing

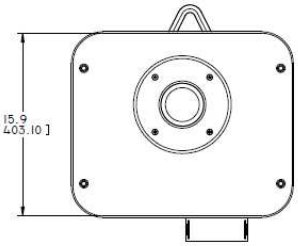








SECTION A-A



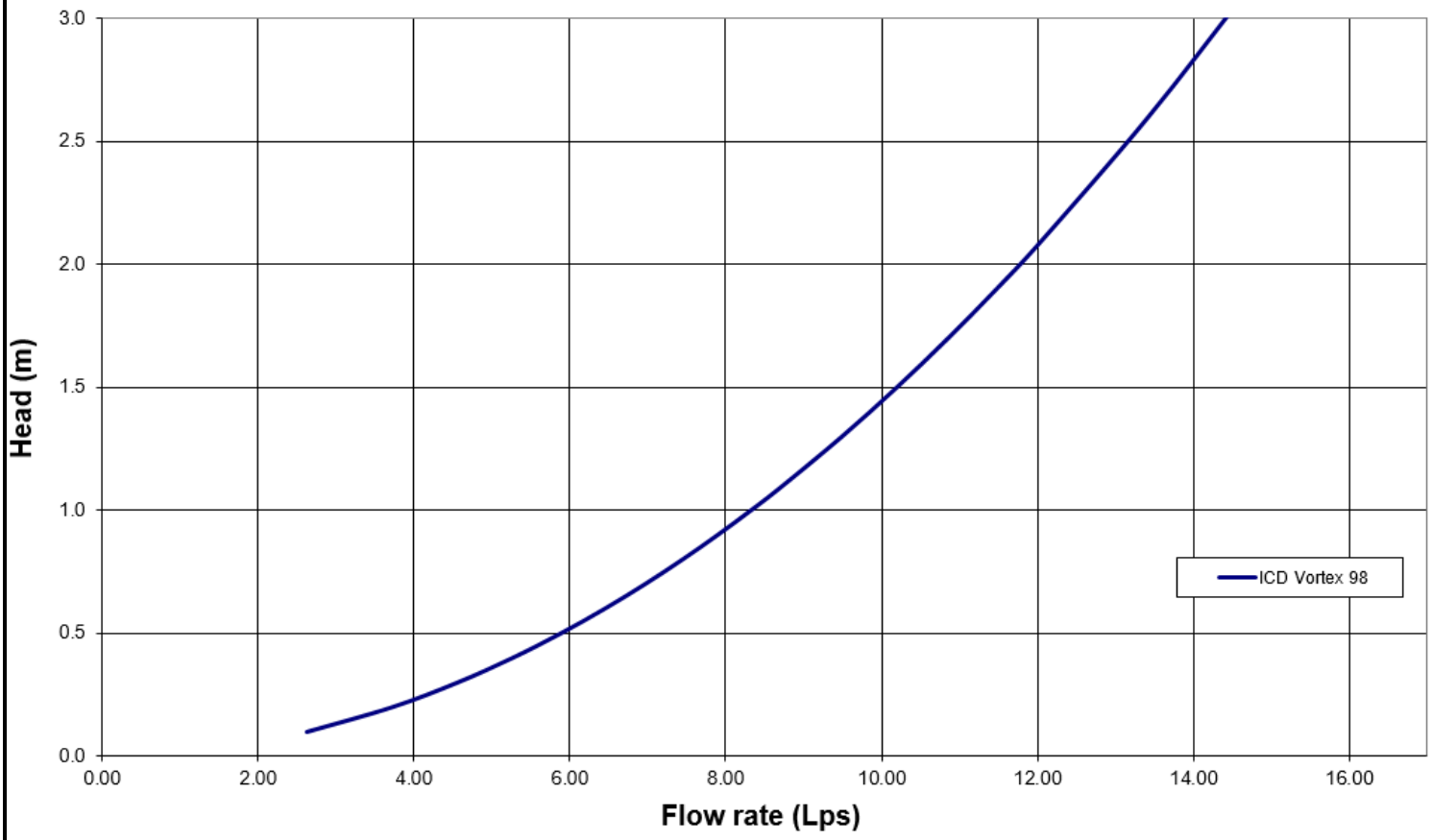
IPEX TECHNOLOGIES INC.

PROJECTION	UNITS: in (mm)	TITLE: LMF SQUARE CB ASSEMBLY	
DRAWN BY: M. M-MARTIN	DATE: 2011-07-27	SIZE: B	SCALE: 1/8
VERIFIED BY	DATE: 2011-07-27	DRAWING NUMBER: SGM74_FA00IR03	REV: 3

IPEX

Tempest LMF ICD Flow Curve – 5yr

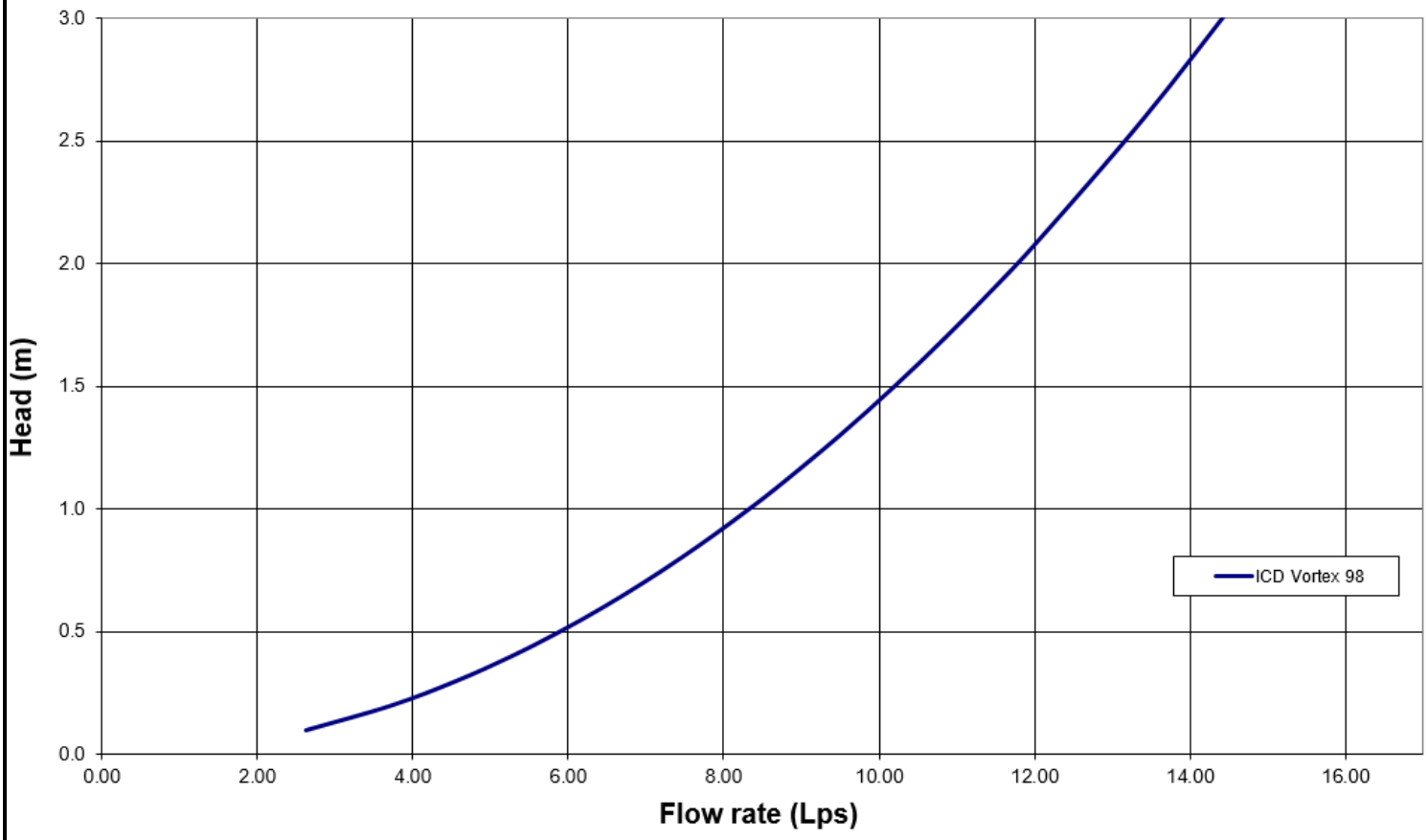
Flow: 10.1 L/s
Head: 1.46 m
CB1



IPEX

Tempest LMF ICD Flow Curve – 100yr

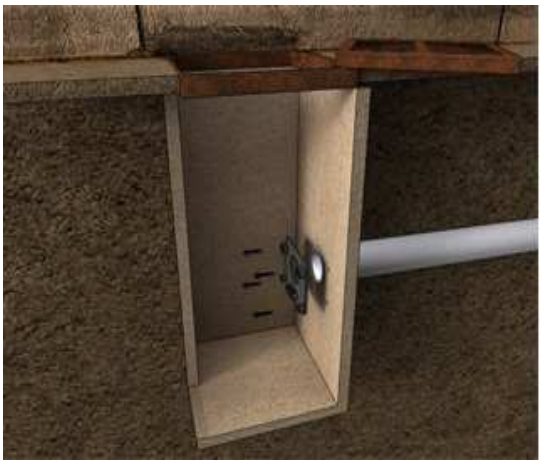
Flow: 10.3 L/s
Head: 1.52 m
CB1

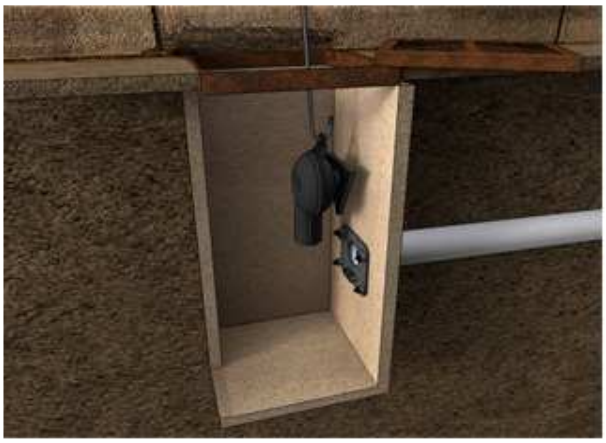


IPEX

Square CB Installation Notes:

1. Materials and tooling verification:
   - Tooling: impact drill, 3/8'' concrete bit, torque wrench for 9/16''nut, hand hammer, level, and marker.
   - Material: (4) concrete anchor 3/8x3-1/2, (4) washers, (4) nuts
2. Use the mounting wall plate to locate and mark the hole (4) pattern on the catch basin wall. You should use a level to ensure that the plate is at the horizontal.
3. Use an impact drill with a 3/8'' concrete bit to make the four holes at a minimum of 1-1/2'' depth up to 2-1/2''. Clean the concrete dust from the holes.
4. Install the anchors (4) in the holes by using a hammer. Put the nuts on the top of the anchors to protect the threads when you will hit the anchors with the hammer. Remove the nuts on the ends of the anchors
5. Install the wall mounting plate on the anchors and screw the nut in place with a maximum torque of 40 N.m (30 lbf-ft). There should be no gap between the wall mounting plate and the catch basin wall.
6. From ground above using a reach bar, lower the device by hooking the end of the reach bar to the handle of the LMF device. Align the triangular plate portion into the mounting wall plate. Push down the device to be sure it has centered in to the wall mounting plate and has created a seal.



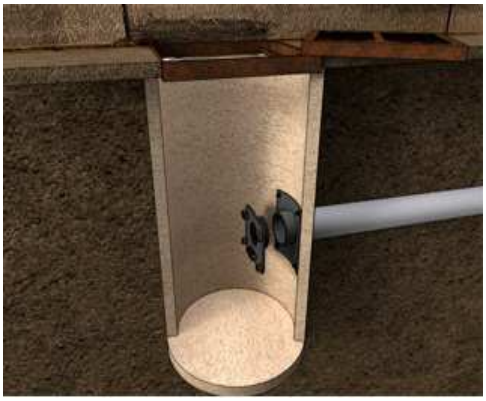


IPEX

Round CB Installation Notes: (Refer to square install notes above for steps 1 , 3, & 4)

2. Use spigot catch basin wall plate to locate and mark the hole (4) pattern on the catch basin wall. You should use a level to ensure that the plate is at the horizontal.
5. Install the CB spigot wall plate on the anchors and screw the 4 nuts in place with a maximum torque of 40 N.m (30 lb-ft). There should be no gap between the CB spigot wall plate and the catch basin wall.
6. Apply solvent cement on the hub of the universal mounting plate and the spigot of the spigot CB wall plate. Slide the hub over the spigot. Make sure the universal mounting plate is at the horizontal and its hub is completely inserted onto the spigot. Normally, the corners of the universal mounting plate hub adapter should touch the catch basin wall.
7. From ground above using a reach bar, lower the ICD device by hooking the end of the reach bar to the handle of the ICD device. Align the triangular plate portion into the mounting wall plate. Push down the device to be sure it has centered into the mounting plate and has created a seal.






CAUTION/WARNING/DISCLAIM:

- Verify that the inlet(s) pipe(s) is not protruding into the catch basin. If it is, cut it back so that the inlet pipe is flush with the catch basin wall.
- Any required cement in the installation must be approved for PVC.
- The solvent cement should not be used below 0°C (32°F) or in a high humidity environment. Please refer to the IPEX solvent cement guide to confirm required curing times or attend the IPEX **Online Solvent Cement Training Course**.
- Call your IPEX representative for more information or if you have any questions about our products.

IPEX

IPEX TEMPEST Inlet Control Devices Technical Specification

General

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

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

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

ICD's must have no moving parts.

Materials

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

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

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

All hardware will be made from 304 stainless steel.

Dimensioning

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

Installation

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

Lydia Bolam

From: Jamie Batchelor <jamie.batchelor@rvca.ca>
Sent: Friday, September 13, 2019 3:23 PM
To: Lydia Bolam
Subject: FW: RVCA Comments RE: D07-12-19-0117 455 Wanaki Road

FYI

Jamie Batchelor, MCIP, RPP
Planner, ext. 1191
Jamie.batchelor@rvca.ca

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

From: Jamie Batchelor
Sent: Friday, September 13, 2019 3:22 PM
To: Baldwin, Kimberley <Kimberley.Baldwin@ottawa.ca>
Cc: l.bloam@novatech-eng.com
Subject: RVCA Comments RE: D07-12-19-0117 455 Wanaki Road

Good Afternoon Kimberley,

Please accept this e-mail as the RVCA's formal response. The stormwater for this site is being directed to an existing stormwater management facility which provides water quality treatment. Therefore, the RVCA accepts that no further water quality measures are required. The RVCA has not conducted a technical review of the stormwater management plan. We will rely on the City to ensure that the design assumptions in the report are consistent with the overall stormwater management plan.

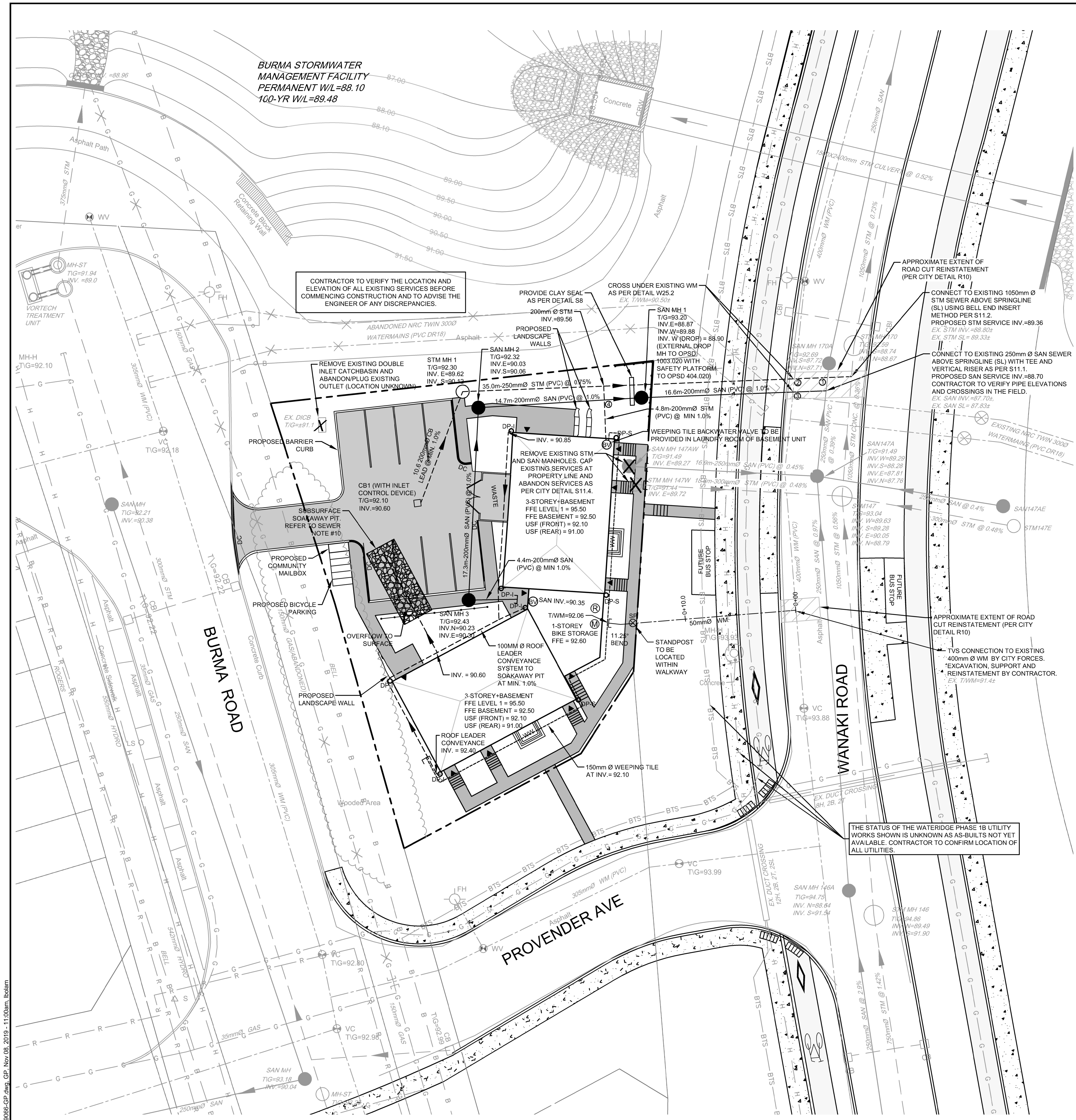
The RVCA has no objection to this site plan control application.

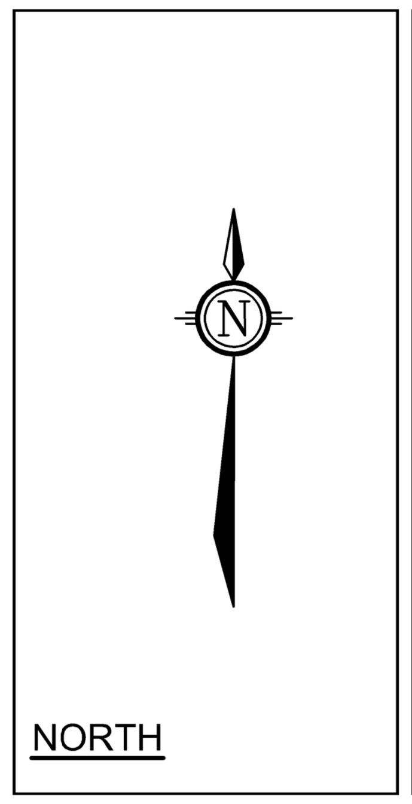
Jamie Batchelor, MCIP, RPP
Planner, ext. 1191
Jamie.batchelor@rvca.ca

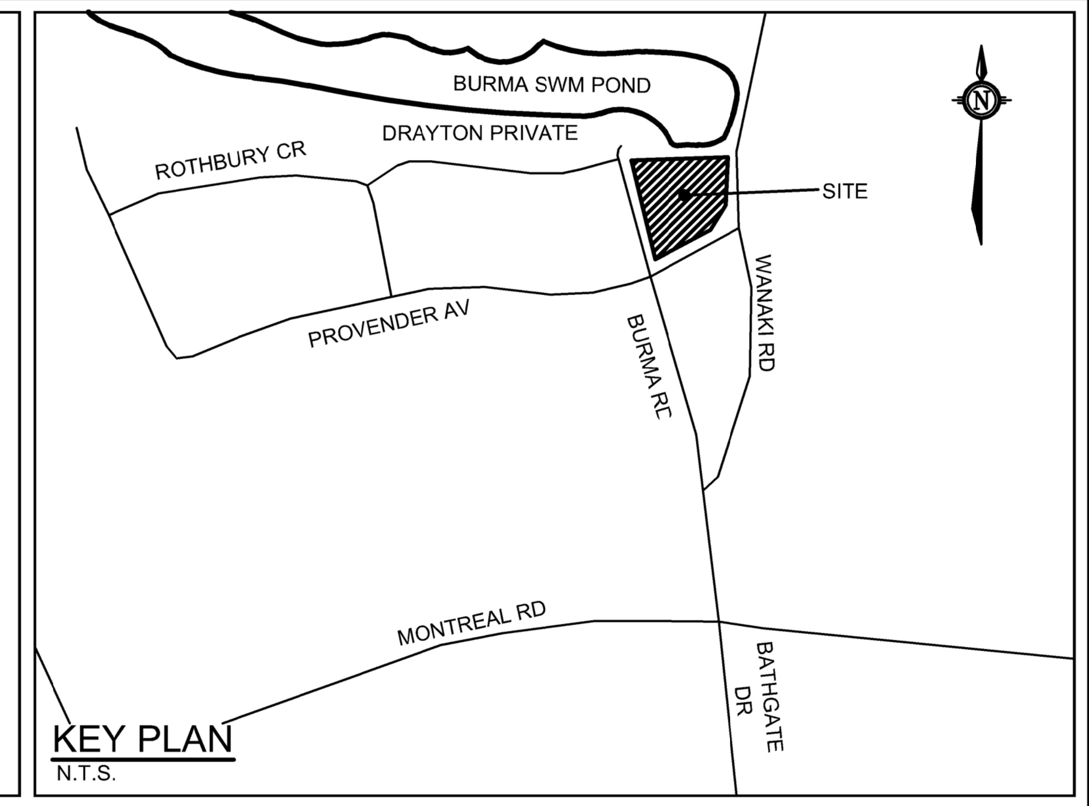
Rideau Valley Conservation Authority

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

ATTACHED DRAWINGS







LEGEND

- 50mmØ WM — PROPOSED WATER SERVICE
- SAN MH 1 — PROPOSED SANITARY SEWER AND MANHOLE
- STM MH 1 — PROPOSED STORM SEWER AND MANHOLE
- 300mmØ STM, STM147E — EXISTING STORM SEWER AND MANHOLE
- 250mmØ SAN, SAN100 — EXISTING SANITARY SEWER AND MANHOLE
- 150mmØ WM (PVC) — EXISTING WATERMAIN
- CB — PROPOSED CATCHBASIN
- EXISTING INFRASTRUCTURE TO BE REMOVED
- PROPOSED SOAKAWAY PIT (REFER TO 119066-DET)
- PROPOSED ROAD CUT REINSTATEMENT (PER CITY DETAIL R10)
- EXISTING FIRE HYDRANT
- EXISTING VALVE CHAMBER
- SP — EXISTING STANDPOST
- SP — PROPOSED STANDPOST (AS PER CITY DETAIL W3.3)
- PROPOSED BEND
- PROPOSED BARRIER CURB (AS PER CITY DETAIL SC1.1)
- DC — PROPOSED DEPRESSED CURB (AS PER CITY DETAIL SC1.1)
- PROPOSED SIDEWALK
- FUTURE PROPOSED CYCLE TRACK (BY OTHERS)
- FUTURE PROPOSED SIDEWALK (BY OTHERS)
- G — EXISTING GASMAIN
- B — EXISTING BELL CABLE
- R — EXISTING ROGERS CABLE
- H — EXISTING HYDRO CABLE
- BTS — EXISTING BELL/TELUS/ STREET LIGHT CABLE
- M — PROPOSED WATER METER
- BV — PROPOSED SANITARY / STORM BACKWATER VALVE
- R — PROPOSED REMOTE WATER METER
- DP-I — PROPOSED DOWNPIPE (TO DRAIN TO SOAKAWAY PIT)
- DP-S — PROPOSED DOWNPIPE (TO DRAIN TO SURFACE)

GENERAL NOTES:

1. COORDINATE AND SCHEDULE ALL WORK WITH OTHER TRADES AND CONTRACTORS.
2. DETERMINE THE EXACT LOCATION, SIZE, MATERIAL AND ELEVATION OF ALL EXISTING UTILITIES PRIOR TO COMMENCING CONSTRUCTION. PROTECT AND ASSUME RESPONSIBILITY FOR ALL EXISTING UTILITIES WHETHER OR NOT SHOWN ON THIS DRAWING.
3. OBTAIN ALL NECESSARY PERMITS AND APPROVALS FROM THE CITY OF OTTAWA BEFORE COMMENCING CONSTRUCTION.
4. BEFORE COMMENCING CONSTRUCTION OBTAIN AND PROVIDE PROOF OF COMPREHENSIVE, ALL RISK AND OPERATIONAL LIABILITY INSURANCE FOR $5,000,000.00. INSURANCE POLICY TO NAME OWNERS, ENGINEERS AND ARCHITECTS AS CO-INSURED.
5. RESTORE ALL DISTURBED AREAS ON-SITE AND OFF-SITE, INCLUDING TRENCHES AND SURFACES ON PUBLIC ROAD ALLOWANCES TO EXISTING CONDITIONS OR BETTER TO THE SATISFACTION OF THE CITY OF OTTAWA AND ENGINEER.
6. REMOVE FROM SITE ALL EXCESS EXCAVATED MATERIAL, ORGANIC MATERIAL AND DEBRIS UNLESS OTHERWISE INSTRUCTED BY ENGINEER. EXCAVATE AND REMOVE FROM SITE ANY CONTAMINATED MATERIAL. ALL CONTAMINATED MATERIAL SHALL BE DISPOSED OF AT A LICENSED LANDFILL FACILITY.
7. ALL ELEVATIONS ARE GEODETIC.
8. REFER TO THE GEOTECHNICAL INVESTIGATION REPORT (REPORT NO. PG4965-1, DATED SEPTEMBER 13, 2019, PREPARED BY PATERSON GROUP INC.) FOR SUBSURFACE CONDITIONS, CONSTRUCTION RECOMMENDATIONS, AND GEOTECHNICAL INSPECTION REQUIREMENTS. THE GEOTECHNICAL CONSULTANT IS TO REVIEW ON-SITE CONDITIONS AFTER EXCAVATION PRIOR TO PLACEMENT OF THE GRANULAR MATERIAL.
9. REFER TO ARCHITECT'S AND LANDSCAPE ARCHITECT'S DRAWINGS FOR BUILDING AND HARDSURFACE AREAS AND DIMENSIONS.
10. REFER TO SITE SERVICING AND STORMWATER MANAGEMENT REPORT (R-2019-094) PREPARED BY NOVATECH ENGINEERING CONSULTANTS LTD.
11. SAW CUT AND KEY GRIND ASPHALT AT ALL ROAD CUTS AND ASPHALT TIE IN POINTS AS PER CITY OF OTTAWA STANDARDS (R10).
12. PROVIDE LINE/PARKING PAINTING.
13. CONTRACTOR TO PROVIDE THE CONSULTANT WITH A GENERAL PLAN OF SERVICES INDICATING ALL SERVICING AS-BUILT INFORMATION SHOWN ON THIS PLAN. AS-BUILT INFORMATION MUST INCLUDE: PIPE MATERIAL, SIZES, LENGTHS, SLOPES, INVERT AND T/G ELEVATIONS, STRUCTURE LOCATIONS, VALVE AND HYDRANT LOCATIONS, T/WM ELEVATIONS AND ANY ALIGNMENT CHANGES, ETC.
14. REFER TO TOPOGRAPHICAL PLAN OF SURVEY (BLOCK 29-REGISTERED PLAN 4M-1581) BY ANNIS, O'SULLIVAN VOLLEBEKK FOR DETAILS OF THE EXISTING SITE.

CRITICAL SEWER PIPE CROSSING TABLE

CROSSING	LOWER PIPE	HIGHER PIPE	CLEARANCE
①	EX. 250mm Ø SAN OBV.=87.85±	250mm Ø STM INV.=89.37	1.52m±
②	250mm Ø STM OBV.=89.65	EX. 400mm Ø WM B/W=90.10±	0.45m±
③	200mm Ø SAN OBV.=88.93	EX. 400mm Ø WM B/W=90.10±	1.17m±
④	200mm Ø STM OBV.=89.77	200mm Ø SAN INV.=89.92	0.15m

50mmØ WATER SERVICE TABLE

STATION	SURFACE ELEVATION	T/WM ELEVATION	COMMENTS
0+00	93.8±	91.4±	TVS CONNECTION TO EXISTING 400mmØ WM
0+14.9	94.38	91.98	STANDPOST AT PROPERTY LINE
0+16.6	94.46	92.06	CAP 1m FROM BUILDING FACE

INLET CONTROL DEVICE DATA - CB1

ICD TYPE: TEMPEST LMF ICD VORTEX 98 (AS PER S4.1)
DIAMETER OF OUTLET PIPE: 200mm

DESIGN EVENT	DESIGN FLOW (L/s)	DESIGN HEAD (m)	WATER ELEVATION (m)	VOLUME (m^3)
1:5 YR	10.1	1.46	92.16	1.3
1:100 YR	10.3	1.52	92.22	6.2

SEWER NOTES:

1. SPECIFICATIONS:

ITEM	SPEC. No.	REFERENCE
CATCHBASIN (600x600mm)	705.010	OPSD
STORM / SANITARY MANHOLE (1200Ø)	701.010	OPSD
CB, FRAME & COVER	400.020	OPSD
STORM / SANITARY MH FRAME & COVER	401.010	OPSD
SEWER TRENCH - BEDDING (GRANULAR A) COVER (GRANULAR A OR GRANULAR B TYPE I, WITH MAXIMUM PARTICLE SIZE=25mm)		
STORM SEWER	PVC DR 35	
SANITARY SEWER	PVC DR 35	
CATCHBASIN LEAD	PVC DR 35	

2. INSULATE ALL PIPES (SAN/STM) THAT HAVE LESS THAN 1.5m COVER WITH 50mmX1200mm HI-40 INSULATION. PROVIDE 150mm CLEARANCE BETWEEN PIPE AND INSULATION.
3. SERVICES ARE TO BE CONSTRUCTED TO 1.0m FROM FACE OF BUILDING AT A MINIMUM SLOPE OF 0.5%.
4. PIPE BEDDING, COVER AND BACKFILL ARE TO BE COMPACTED TO AT LEAST 98% OF THE STANDARD PROCTOR MAXIMUM DRY DENSITY. THE USE OF CLEAR CRUSHED STONE AS A BEDDING LAYER SHALL NOT BE PERMITTED.
5. FLEXIBLE CONNECTIONS ARE REQUIRED FOR CONNECTING PIPES TO MANHOLES (FOR EXAMPLE KOR-N-SEAL, PSX: POSITIVE SEAL AND DURASEAL). THE CONCRETE CRADLE FOR THE PIPE CAN BE ELIMINATED.
6. THE OWNER SHALL REQUIRE THAT THE SITE SERVICING CONTRACTOR PERFORM FIELD TESTS FOR QUALITY CONTROL OF ALL SANITARY SEWERS. LEAKAGE TESTING SHALL BE COMPLETED IN ACCORDANCE WITH OPSS 410.07.16, 410.07.16.04 AND 407.07.24. DYE TESTING IS TO BE COMPLETED ON ALL SANITARY SERVICES TO CONFIRM PROPER CONNECTION TO THE SANITARY SEWER MAIN. THE FIELD TESTS SHALL BE PERFORMED IN THE PRESENCE OF A CERTIFIED PROFESSIONAL ENGINEER WHO SHALL SUBMIT A CERTIFIED COPY OF THE TEST RESULTS.
7. STORM MANHOLES AND CBMHS ARE TO HAVE 300mm AND 600mm SUMPS RESPECTIVELY, UNLESS OTHERWISE INDICATED.
8. CONTRACTOR TO TELEVISE (CCTV) ALL PROPOSED SEWERS, 200mmØ OR GREATER PRIOR TO BASE COURSE ASPHALT. UPON COMPLETION OF CONTRACT, THE CONTRACTOR IS RESPONSIBLE TO FLUSH AND CLEAN ALL SEWERS & APPURTENANCES.
9. ALL STORM AND SANITARY SERVICES SHALL BE EQUIPPED WITH BACKFLOW PREVENTERS AS PER THE CITY OF OTTAWA STANDARD DETAILS S14 AND S14.1 OR S14.2.
10. FOR SOAKAWAY PIT DETAILS, REFER TO DRAWING 119066-DET.
11. All PROPOSED COVER FRAMES LOCATED OUTSIDE OF THE TRAVELLED PORTION OF THE ROADWAY OR THE SIDEWALK SHALL BE ANCHORED DIRECTLY TO THE TOPS OF THE PRECAST TOPS/CAPS AS PER S.P. NO. F-4070 (SAN MH1 AND STM MH1)

WATERMAIN NOTES:

1. SPECIFICATIONS:

ITEM	SPEC. No.	REFERENCE
WATERMAIN TRENCHING	W17	CITY OF OTTAWA
THERMAL INSULATION IN SHALLOW TRENCHES	W22	CITY OF OTTAWA
WATERMAIN	COPPER "TYPE K"	

2. SUPPLY AND CONSTRUCT ALL WATERMAINS AND APPURTENANCES IN ACCORDANCE WITH THE CITY OF OTTAWA STANDARDS AND SPECIFICATIONS. EXCAVATION, INSTALLATION, BACKFILL AND RESTORATION OF ALL WATERMAINS BY THE CONTRACTOR. CONNECTIONS AND SHUT-OFFS AT THE MAIN AND CHLORINATION OF THE WATER SYSTEM SHALL BE PERFORMED BY CITY OFFICIALS.
3. WATERMAIN SHALL BE MINIMUM 2.4m DEPTH BELOW GRADE UNLESS OTHERWISE INDICATED.
4. PROVIDE MINIMUM 0.50m VERTICAL CLEARANCE BETWEEN OUTSIDE OF PIPES AT ALL CROSSINGS WHEN WATERMAIN IS BELOW AND A MINIMUM OF 0.25m VERTICAL CLEARANCE WHEN WATERMAIN IS ABOVE.
5. WATER SERVICE IS TO BE CONSTRUCTED TO WITHIN 1.0m OF FOUNDATION WALL AND CAPPED, UNLESS OTHERWISE INDICATED.
6. CONTRACTOR TO INVESTIGATE THE PRESENCE OF AN EXISTING WATER SERVICE ON SITE AND IF EXISTING, THE EXISTING STAND POST TO BE REMOVED AND THE EXISTING WATER SERVICE TO BE BLANKED AT THE MAIN.

REFER TO 119066-DET FOR ADDITIONAL DETAILS

NOTE:
THE POSITION OF ALL POLE LINES, CONDUITS, WATERMAINS, SEWERS AND OTHER UNDERGROUND AND OVERGROUND UTILITIES AND STRUCTURES IS NOT NECESSARILY SHOWN ON THE CONTRACT DRAWINGS, AND WHERE SHOWN, THE ACCURACY OF THE POSITION OF SUCH UTILITIES AND STRUCTURES IS NOT GUARANTEED. BEFORE STARTING WORK, DETERMINE THE EXACT LOCATION OF ALL SUCH UTILITIES AND STRUCTURES AND ASSUME ALL LIABILITY FOR DAMAGE TO THEM.

OWNER INFORMATION

HABITAT FOR HUMANITY GREATER OTTAWA
768 BELFAST ROAD
OTTAWA, ON K1G 0Z7

PHONE: 613-749-9950

No.	REVISION	DATE	BY
4.	REVISED PER CITY COMMENTS	08 NOV 2019	GJM
3.	REVISED PER CITY COMMENTS	18 SEPT 2019	GJM
2.	ISSUED FOR COORDINATION	13 SEPT 2019	GJM
1.	ISSUED FOR SITE PLAN APPROVAL	22 JUN 2019	GJM

SCALE 1:200
1:200 (0 2 4 6 8)

DESIGN: LGB
CHECKED: JAG
DRAWN: RG
CHECKED: LGB/JAG
APPROVED: GJM

FOR REVIEW ONLY

LICENSED PROFESSIONAL ENGINEER — L. G. BOLAM — 100523457 — Nov-8-2019 — PROVINCE OF ONTARIO

LICENSED PROFESSIONAL ENGINEER — G.J. MacDONALD — Nov. 8/19 — PROVINCE OF ONTARIO

NOVATECH
Engineers, Planners & Landscape Architects
Suite 200, 240 Michael Cowpland Drive
Ottawa, Ontario, Canada K2M 1P6
Telephone (613) 254-9643
Facsimile (613) 254-5867
Website www.novatech-eng.com

LOCATION
CITY OF OTTAWA
455 WANAKI ROAD (BLOCK 29)

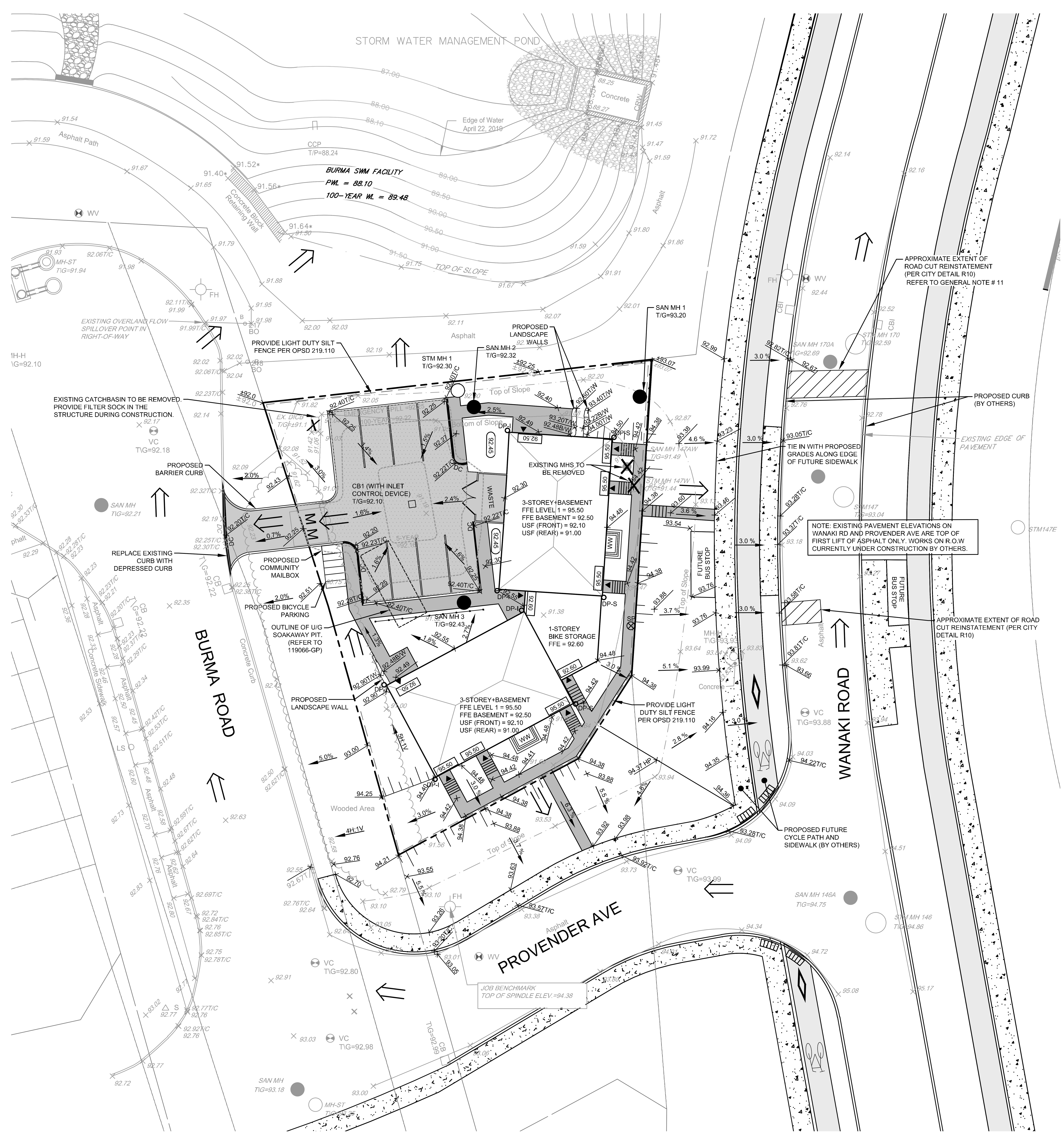
DRAWING NAME
GENERAL PLAN OF SERVICES

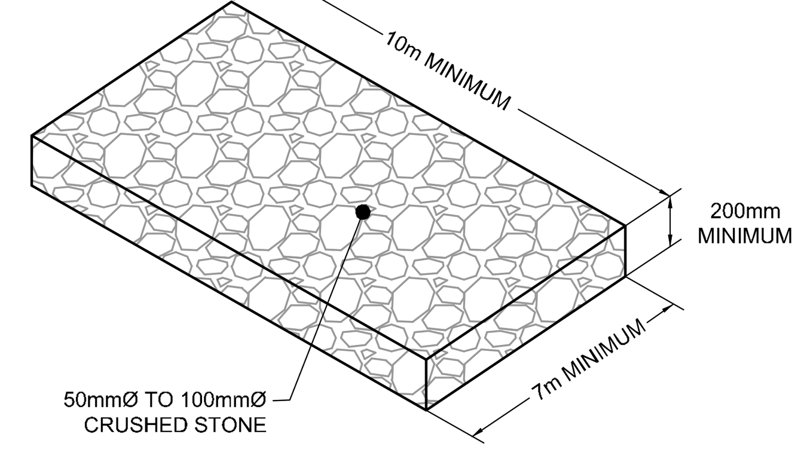
PROJECT No. 119066-00
REV: REV # 4
DRAWING No. 119066-GP

D07-12-19-0117

#17982

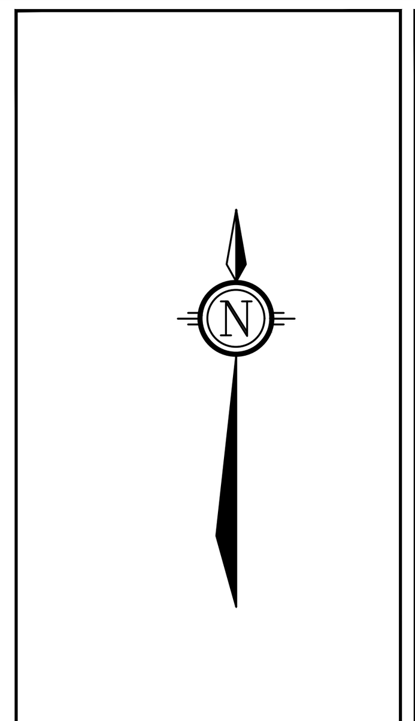
PLANA1.DWG - 841mmx594mm



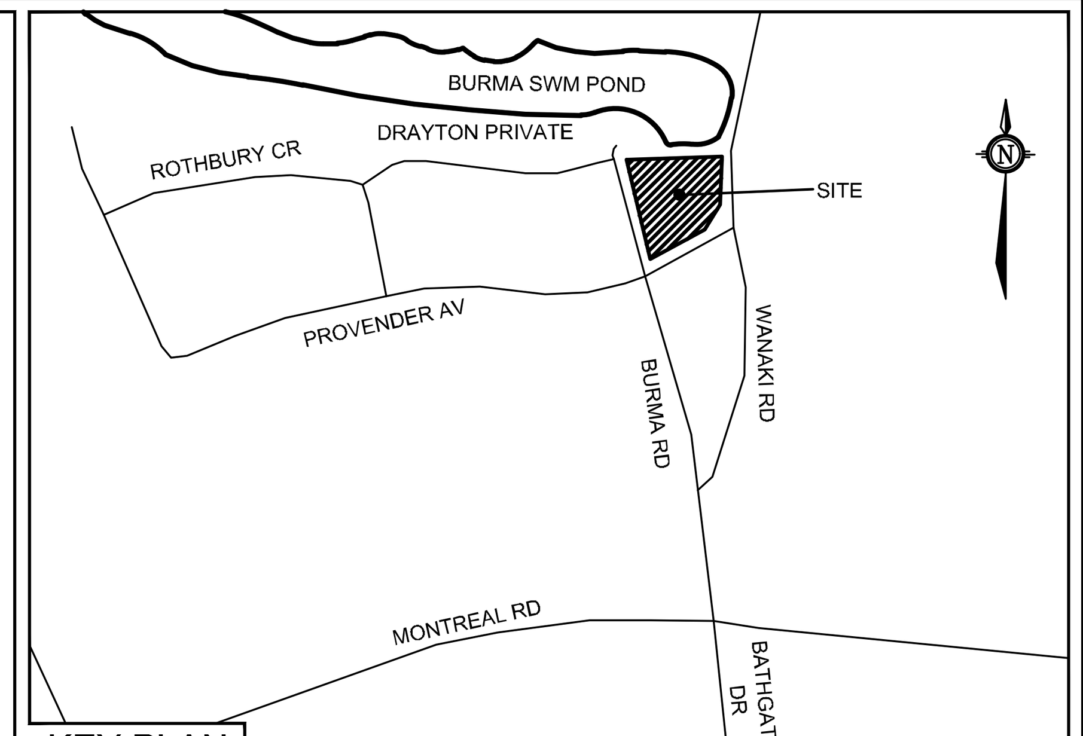


MUD MAT DETAIL

NOT TO SCALE



NORTH



KEY PLAN

N.T.S.

LEGEND

- x 93.15 — EXISTING ELEVATION
- x 93.30T/C — EXISTING TOP OF CURB ELEVATION
- 93.20 — PROPOSED ELEVATION
- 93.35T/C — PROPOSED TOP OF CURB ELEVATION
- 94.00T/W — PROPOSED TOP OF WALL ELEVATION
- 91.20B/W — PROPOSED BOTTOM OF WALL ELEVATION
- (92.45) — PROPOSED PLANTER ELEVATION
- FFE= — FINISHED FLOOR ELEVATION
- USF= — UNDERSIDE OF FOOTING ELEVATION
- 2.0% — GRADE AND DIRECTION
- PROPOSED TERRACE GRADING (3:1 MAX)
- PROPOSED RETAINING WALL
- PROPERTY LINE
- WW — PROPOSED WINDOW WELL
- CB — PROPOSED CATCH BASIN WITH INLET CONTROL DEVICE
- FH — EXISTING FIRE HYDRANT
- VC — EXISTING VALVE CHAMBER
- STM MH — PROPOSED STORM MANHOLE
- SAN MH — PROPOSED SANITARY MANHOLE
- STM MH — EXISTING STORM MANHOLE
- SAN MH — EXISTING SANITARY MANHOLE
- PROPOSED SILT FENCE
- PROPOSED ROAD CUT REINSTATEMENT (PER CITY DETAIL R10)
- DIRECTION OF OVERLAND FLOW
- SP — PROPOSED STANDPOST (AS PER CITY DETAIL W3.3)
- PROPOSED BARRIER CURB (AS PER CITY DETAIL SC1.1)
- DC — PROPOSED DEPRESSED CURB (AS PER CITY DETAIL SC1.1)
- PROPOSED SIDEWALK
- FUTURE PROPOSED CYCLE TRACK (BY OTHERS)
- FUTURE PROPOSED SIDEWALK (BY OTHERS)
- 5-YEAR=92.16, 100-YEAR=92.22, MAXIMUM/EMERGENCY SPILL=92.25 — APPROXIMATE PONDING LIMITS AND ELEVATIONS
- M M — PROPOSED MUD MAT LOCATION
- DP-I — PROPOSED DOWNPIPE (TO DRAIN TO INFILTRATION PIT)
- DP-S — PROPOSED DOWNPIPE (TO DRAIN TO SURFACE)

PAVEMENT STRUCTURE: PARKING LOT

40mm HL3 OR SUPERPAVE 12.5 AC
50mm SUPERPAVE 19.0 AC
150mm OPSS GRAN "A"
400mm OPSS GRAN "B" TYPE II
(REFER TO GEOTECHNICAL REPORT)

GENERAL NOTES:

1. COORDINATE AND SCHEDULE ALL WORK WITH OTHER TRADES AND CONTRACTORS.
2. DETERMINE THE EXACT LOCATION, SIZE, MATERIAL AND ELEVATION OF ALL EXISTING UTILITIES PRIOR TO COMMENCING CONSTRUCTION. PROTECT AND ASSUME RESPONSIBILITY FOR ALL EXISTING UTILITIES WHETHER OR NOT SHOWN ON THIS DRAWING.
3. OBTAIN ALL NECESSARY PERMITS AND APPROVALS FROM THE CITY OF OTTAWA BEFORE COMMENCING CONSTRUCTION.
4. BEFORE COMMENCING CONSTRUCTION OBTAIN AND PROVIDE PROOF OF COMPREHENSIVE, ALL RISK AND OPERATIONAL LIABILITY INSURANCE FOR $5,000,000.00. INSURANCE POLICY TO NAME OWNERS, ENGINEERS AND ARCHITECTS AS CO-INSURED.
5. RESTORE ALL DISTURBED AREAS ON-SITE AND OFF-SITE, INCLUDING TRENCHES AND SURFACES ON PUBLIC ROAD ALLOWANCES TO EXISTING CONDITIONS OR BETTER TO THE SATISFACTION OF THE CITY OF OTTAWA AND ENGINEER.
6. REMOVE FROM SITE ALL EXCESS EXCAVATED MATERIAL, ORGANIC MATERIAL AND DEBRIS UNLESS OTHERWISE INSTRUCTED BY ENGINEER. EXCAVATE AND REMOVE FROM SITE ANY CONTAMINATED MATERIAL. ALL CONTAMINATED MATERIAL SHALL BE DISPOSED OF AT A LICENSED LANDFILL FACILITY.
7. ALL ELEVATIONS ARE GEODETIC.
8. REFER TO THE GEOTECHNICAL INVESTIGATION REPORT (No. PG4965-1, DATED SEPTEMBER 13, 2019, PREPARED BY PATERSON GROUP INC.) FOR SUBSURFACE CONDITIONS, CONSTRUCTION RECOMMENDATIONS, AND GEOTECHNICAL INSPECTION REQUIREMENTS. THE GEOTECHNICAL CONSULTANT IS TO REVIEW ON-SITE CONDITIONS AFTER EXCAVATION PRIOR TO PLACEMENT OF THE GRANULAR MATERIAL.
9. REFER TO ARCHITECT'S AND LANDSCAPE ARCHITECT'S DRAWINGS FOR BUILDING AND HARDSURFACE AREAS AND DIMENSIONS.
10. REFER TO 'SITE SERVICING AND STORMWATER MANAGEMENT REPORT' (R-2019-094) PREPARED BY NOVATECH ENGINEERING CONSULTANTS LTD.
11. SAW CUT AND KEY GRIND ASPHALT AT ALL ROAD CUTS AND ASPHALT TIE IN POINTS AS PER CITY OF OTTAWA STANDARDS (R10).
12. PROVIDE LINE/PARKING PAINTING.
13. REFER TO TOPOGRAPHICAL PLAN OF SURVEY (BLOCK 29-REGISTERED PLAN 4M-1581) BY ANNIS, O'SULLIVAN VOLLEBEKK FOR DETAILS OF THE EXISTING SITE.
14. SNOW WILL BE REMOVED FROM SITE WITH A HIRED SNOW REMOVAL SERVICE.

GRADING NOTES:

1. ALL TOPSOIL, ORGANIC OR DELETERIOUS MATERIAL MUST BE ENTIRELY REMOVED FROM BENEATH THE PROPOSED PAVED AREAS AS DIRECTED BY THE SITE ENGINEER OR GEOTECHNICAL ENGINEER.
2. EXPOSED SUBGRADES IN PROPOSED PAVED AREAS SHOULD BE PROOF ROLLED WITH A LARGE STEEL DRUM ROLLER AND INSPECTED BY THE GEOTECHNICAL ENGINEER PRIOR TO THE PLACEMENT OF GRANULARS.
3. ANY SOFT AREAS EVIDENT FROM THE PROOF ROLLING SHOULD BE SUB-EXCAVATED AND REPLACED WITH SUITABLE MATERIAL THAT IS FROST COMPATIBLE WITH THE EXISTING SOILS AS RECOMMENDED BY THE GEOTECHNICAL ENGINEER.
4. THE GRANULAR BASE SHOULD BE COMPACTED TO AT LEAST 100% OF THE STANDARD PROCTOR MAXIMUM DRY DENSITY VALUE. ANY ADDITIONAL GRANULAR FILL USED BELOW THE PROP OSED PAVEMENT SHOULD BE COMPACTED TO AT LEAST 95% OF THE STANDARD PROCTOR MAXIMUM DRY DENSITY VALUE.
5. MINIMUM OF 2% GRADE FOR ALL GRASS AREAS UNLESS OTHERWISE NOTED.
6. MAXIMUM TERRACING GRADE TO BE 3:1 UNLESS OTHERWISE NOTED.
7. ALL GRADES BY CURBS ARE EDGE OF PAVEMENT GRADES UNLESS OTHERWISE INDICATED.
8. ALL CURBS SHALL BE BARRIER CURB (150mm) UNLESS OTHERWISE NOTED AND CONSTRUCTED AS PER CITY OF OTTAWA STANDARDS (SC1.1).
9. REFER TO LANDSCAPE PLAN FOR PLANTING AND OTHER LANDSCAPE FEATURE DETAILS.
10. CONTRACTOR TO PROVIDE THE CONSULTANT WITH A GRADING PLAN INDICATING AS-BUILT ELEVATIONS OF ALL DESIGN GRADES SHOWN ON THIS PLAN.
11. THERE WILL BE NO PONDING IN THE PARKING AREA DURING A 2 YEAR STORM EVENT. 250mm FREEBOARD IS PROVIDED TO THE BASEMENT FFE.
12. PROPOSED BUILDING GFA = 1,042 m2
13. ALL GRASSED AREAS ON SITE TO BE TOP SOILED WITH A MINIMUM 300mm OF APPROVED AMENDMENT TOPSOIL MATERIAL FOR STORMWATER MANAGEMENT PURPOSES. REFER TO 119066-DET FOR DETAILS.

EROSION AND SEDIMENT CONTROL NOTES:

1. THE OWNER AGREES TO PREPARE AND IMPLEMENT AN EROSION AND SEDIMENT CONTROL PLAN TO THE SATISFACTION OF THE CITY OF OTTAWA, APPROPRIATE TO THE SITE CONDITIONS, PRIOR TO UNDERTAKING ANY SITE ALTERATIONS (FILLING, GRADING, REMOVAL OF VEGETATION, ETC.) AND DURING ALL PHASES OF SITE PREPARATION AND CONSTRUCTION IN ACCORDANCE WITH THE CURRENT BEST MANAGEMENT PRACTICES FOR EROSION AND SEDIMENT CONTROL SUCH AS BUT NOT LIMITED TO INSTALLING FILTER SOCKS IN MANHOLES/CATCHBASINS TO CAPTURE SEDIMENTS THAT HAVE ENTERED STRUCTURES AND INSTALL AND MAINTAIN A LIGHT DUTY SILT FENCE BARRIER AS REQUIRED.
2. THE CONTRACTOR SHALL PLACE SEDIMENT CAPTURE FILTER SOCKS IN THE CATCHBASIN(S) AND MANHOLE GRATES AND MAINTAIN THESE FOR THE DURATION OF CONSTRUCTION.
3. SILT FENCING SHALL BE UTILIZED TO CONTROL EROSION FROM THE SITE DURING CONSTRUCTION.
4. THE CONTRACTOR ACKNOWLEDGES THAT FAILURE TO IMPLEMENT EROSION AND SEDIMENT CONTROL MEASURES MAY BE SUBJECT TO PENALTIES IMPOSED BY ANY APPLICABLE REGULATORY AGENCY.
5. THE CONTRACTOR IS RESPONSIBLE FOR KEEPING THE ROADS FREE AND CLEAR OF MUD AND DEBRIS. BURMA ROAD IS TO BE CLEANED ON A CONTINUOUS BASIS DURING CONSTRUCTION. THE ROAD IS TO BE CLEAN AND FREE OF MUD, DUST, AND OTHER MATERIAL RESULTING FROM VEHICLES INVOLVED IN CONSTRUCTION.
6. SEDIMENT AND EROSION CONTROLS MEASURES MAY BE MODIFIED IN THE FIELD AT THE DISCRETION OF THE CITY OF OTTAWA SITE INSPECTOR OR CONSERVATION AUTHORITY.

NOTE:
THE POSITION OF ALL POLE LINES, CONDUITS, WATERMAINS, SEWERS AND OTHER UNDERGROUND AND OVERGROUND UTILITIES AND STRUCTURES IS NOT NECESSARILY SHOWN ON THE CONTRACT DRAWINGS, AND WHERE SHOWN, THE ACCURACY OF THE POSITION OF SUCH UTILITIES AND STRUCTURES IS NOT GUARANTEED. BEFORE STARTING WORK, DETERMINE THE EXACT LOCATION OF ALL SUCH UTILITIES AND STRUCTURES AND ASSUME ALL LIABILITY FOR DAMAGE TO THEM.

OWNER INFORMATION

HABITAT FOR HUMANITY GREATER OTTAWA
768 BELFAST ROAD
OTTAWA, ON K1G 0Z7

PHONE: 613-749-9950

No.	REVISION	DATE	BY
4.	REVISED PER CITY COMMENTS	08 NOV 2019	GJM
3.	REVISED PER CITY COMMENTS	18 SEPT 2019	GJM
2.	ISSUED FOR COORDINATION	13 SEPT 2019	GJM
1.	ISSUED FOR SITE PLAN APPLICATION	25 JUN 2019	GJM

SCALE 1:200

DESIGN RG/LGB
CHECKED JAG
DRAWN RG
CHECKED LGB/JAG
APPROVED GJM

FOR REVIEW ONLY

LICENSED PROFESSIONAL ENGINEER L. G. BOLAM 100523457 Nov-8-2019 PROVINCE OF ONTARIO

LICENSED PROFESSIONAL ENGINEER G.J. MacDONALD Nov. 8/19 PROVINCE OF ONTARIO

NOVATECH
Engineers, Planners & Landscape Architects
Suite 200, 240 Michael Cowpland Drive
Ottawa, Ontario, Canada K2M 1P6
Telephone (613) 254-9643
Facsimile (613) 254-5867
Website www.novatech-eng.com

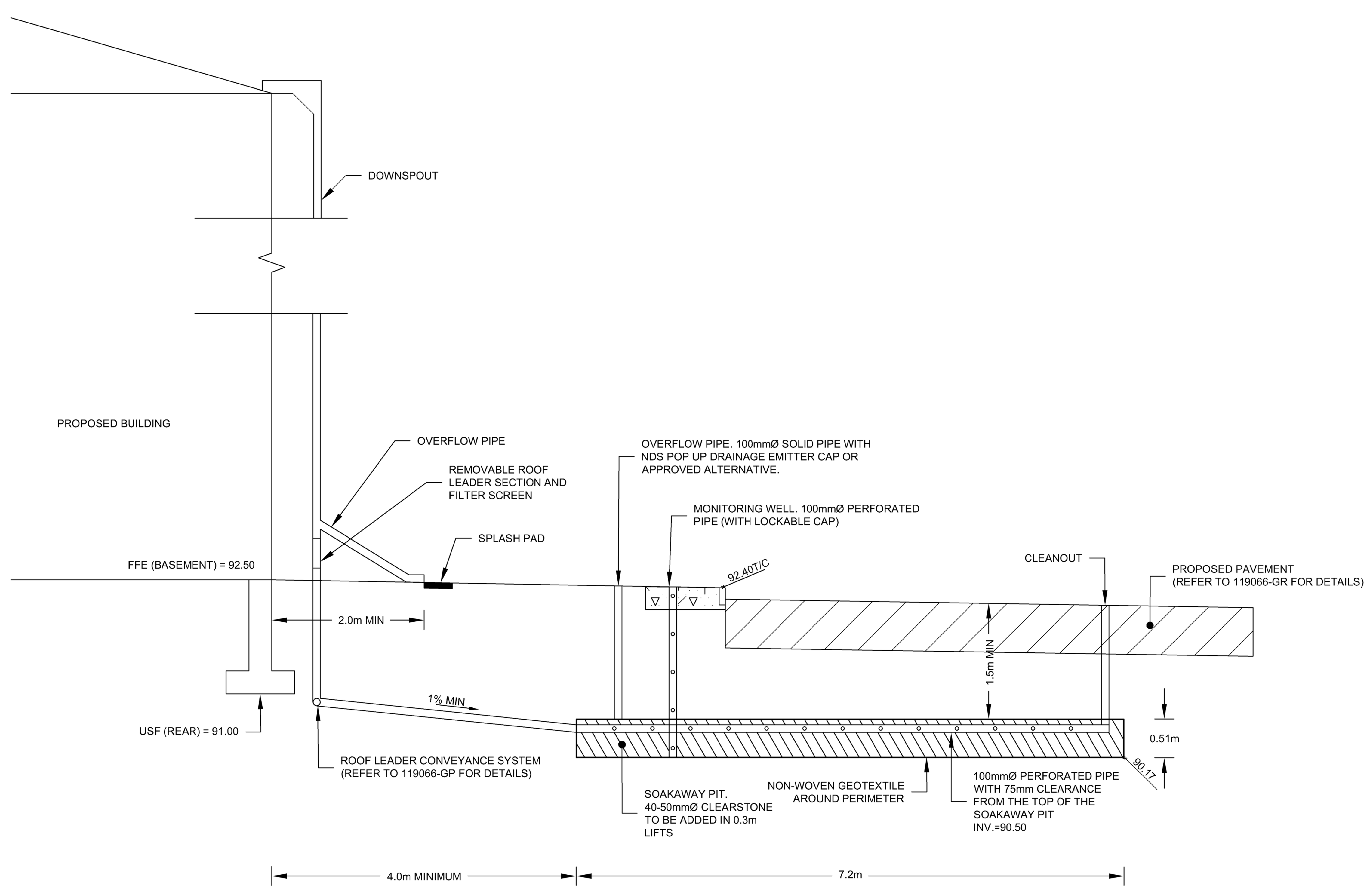
LOCATION
CITY OF OTTAWA
455 WANAKI ROAD (BLOCK 29)

DRAWING NAME
GRADING AND EROSION AND SEDIMENT CONTROL PLAN

PROJECT No. 119066-00
REV REV # 4
DRAWING No. 119066-GR

D07-12-19-0117

#17982



A — TYPICAL SECTION THROUGH SOAKAWAY PIT

1:50

OPTION 1
On-Site Soil Amendment - Default Ratio 3:1
All Building Types

Materials

- Amend existing site topsoil using 3:1 ratio by volume (3 parts existing topsoil, 1 part amendment material)
- Amendment Material: organic matter primarily leaf, yard and bark waste compost of 20-30% by dry weight as determined by Loss-on-Ignition (LOI) and a pH of 6.0 to 8.0
- No uncomposted manure or other organic materials, sphagnum peat or organic amendments that contain sphagnum peat

Placement and Amendments

1. Remove existing topsoil and preserve on-site.
2. Rip native subsoil (decompaction) using the teeth of an excavator or bobcat bucket or equivalent to a depth of 100-200mm. Rip using a perpendicular pattern (See Detail No.1) ensuring full site coverage. No ripping within tree protection areas (See Detail No.2) or within 3m of building foundations (See Detail No.3).
3. Amend existing site topsoil to meet post construction soil amendment requirements using 3:1 ratio by volume (topsoil : amendment material).
4. Two (2) methods for amending the existing soils in place are acceptable:

   Method No.1 - Layer and Incorporate (Detail No.4)

   i. Apply 100mm of existing site topsoil followed by 50mm of amendment material and incorporate/mix amended material.
   ii. Lightly roll or smooth using the back of the machinery bucket.
   iii. Repeat i. and ii.
   iv. Adjust layer quantities to ensure a settled amended topsoil depth of 300m and compliance with site grading. Placement should account for 10% settlement.

   Method No.2 - Mechanical or Bucket Mix

   i. Successively add, mix and pile one (1) unit of amendment material with three (3) units of existing site topsoil.
   ii. Thoroughly mix.
   iii. Repeat i. and ii to ensure thorough mixing until required volume is achieved.
   iv. Place 150mm of amended topsoil, lightly roll or smooth using the back of the machinery bucket.
   v. Repeat iv.
   vi. Adjust layer quantities to ensure a settled amended topsoil depth of 300m and compliance with site grading.

Amended topsoil should be wetted after application, allowed to settle for a minimum of one (1) week and grades adjusted as required prior to installation of turf.

-IMPORTANT-

Documentation Requirements

As part of verification, the owners shall produce delivery tickets, receipts and specifications detailing the delivery address, quantities and product description and sources for verification by City inspectors. Delivery address is to be listed and must correspond to the property/site being inspected. Site without proper documentation may be subject to additional verification procedures including laboratory testing at the expense of the owner. The owner's engineer shall provide a duly notarized letter with all supporting documentation certifying the proper installation and placement of amended soil.

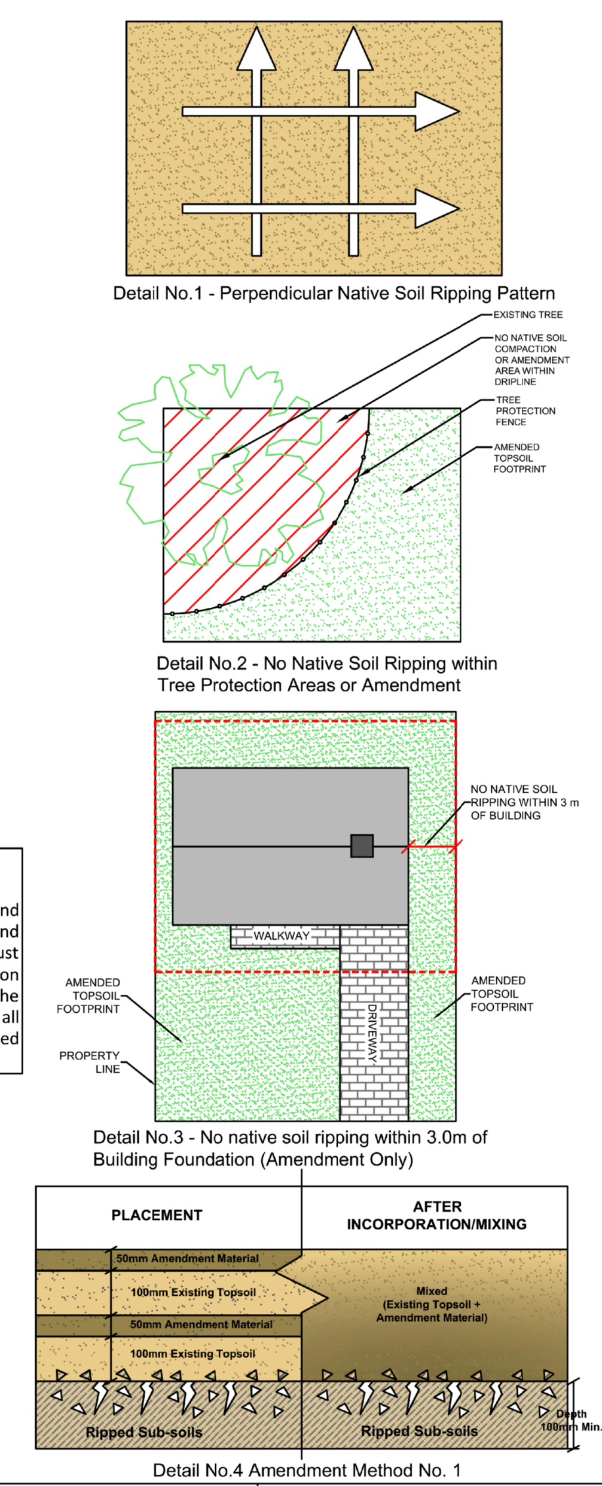
Consultant Verification/Inspection

Verification may occur after the minimum one (1) week settlement period. Verification is suggested prior to turf placement. Non-compliant sites shall be rectified at the expense of the owner.

At random, the Developer's consultant shall dig at least one (1) test hole to verify amended topsoil depth and uncompacted soil depths.

Requirements:

1. Amended topsoil layer shall be easily dug using only the inspector's weight or cored without other mechanical assistance.
2. The amended topsoil layer shall be darker in color than the unamended- ripped subsoil and particles of organic matter should be easily visible.
3. Measured amended topsoil depths shall be deemed to be in conformance based on the following:
   - Using a common garden spade, the measured depth of amended topsoil shall be equal to the required 300mm depth (±25mm)
   - Using a small diameter coring unit, the measured core depth of amended topsoil shall be equal to the required 300mm depth (±50mm)



Detail No.1 - Perpendicular Native Soil Ripping Pattern

Detail No.2 - No Native Soil Ripping within Tree Protection Areas or Amendment

Detail No.3 - No native soil ripping within 3.0m of Building Foundation (Amendment Only)

Detail No.4 Amendment Method No. 1

Soil Amendment Requirements for Wateridge Village Phase 1B - For Development Requiring a Building Permit Only

City of Ottawa October 22, 2019

OPTION 2
On-Site Soil Amendment
Import and Replace Topsoil with Amendment Material
All Building Types and Parks

Materials

- Amendment material shall be obtained from a Compost Quality Assurance (CQA) licensed and OMOE/ CCME approved facility and shall comply with the Category "A" compost designation. The amendment material must contain:
  - Organic matter primarily leaf, yard and bark waste compost of 8-15% by dry weight as determined by Loss-on-Ignition (LOI) and a pH of 6.0 to 8.0.
  - No uncomposted manure or other organic materials, sphagnum peat or organic amendments that contain sphagnum peat.

Placement and Amendments

1. Remove existing topsoil and dispose off-site in accordance with OPSS 206 and OPSS 180, O. Reg. 153/06, the Environmental Protection Act or municipal by-laws and policies, whichever supersedes.
2. Rip native subsoil (decompaction) using the teeth of an excavator or bobcat bucket or equivalent to a native subsoil at depth of 100-200mm. Rip using a perpendicular pattern (See Detail No.1) ensuring full site coverage. No ripping within tree protection areas (See Detail No.2) or within 3m of building foundations (See Detail No.3).
3. Import pre-mixed amended topsoil (300mm depth of coverage required).
4. Place imported pre-mixed amended topsoil in 150mm lifts, lightly roll or smooth using machinery bucket and repeat. Adjust layer quantities to ensure a settled amended topsoil depth of 300mm and compliance with site grading. (See Detail No.4).

Amended topsoil should be wetted after application, allowed to settle for a minimum of one (1) week and grades adjusted as required prior to installation of turf.

-IMPORTANT-

Documentation Requirements

As part of verification, the owners shall produce delivery tickets, receipts and specifications detailing the delivery address, quantities and product description and sources for verification by City inspectors. Delivery address is to be listed and must correspond to the property/site being inspected. Sites without proper documentation may be subject to additional verification procedures including laboratory testing at the expense of the owner. The owner's engineer shall provide a duly notarized letter with all supporting documentation certifying the proper installation and placement of amended soil.

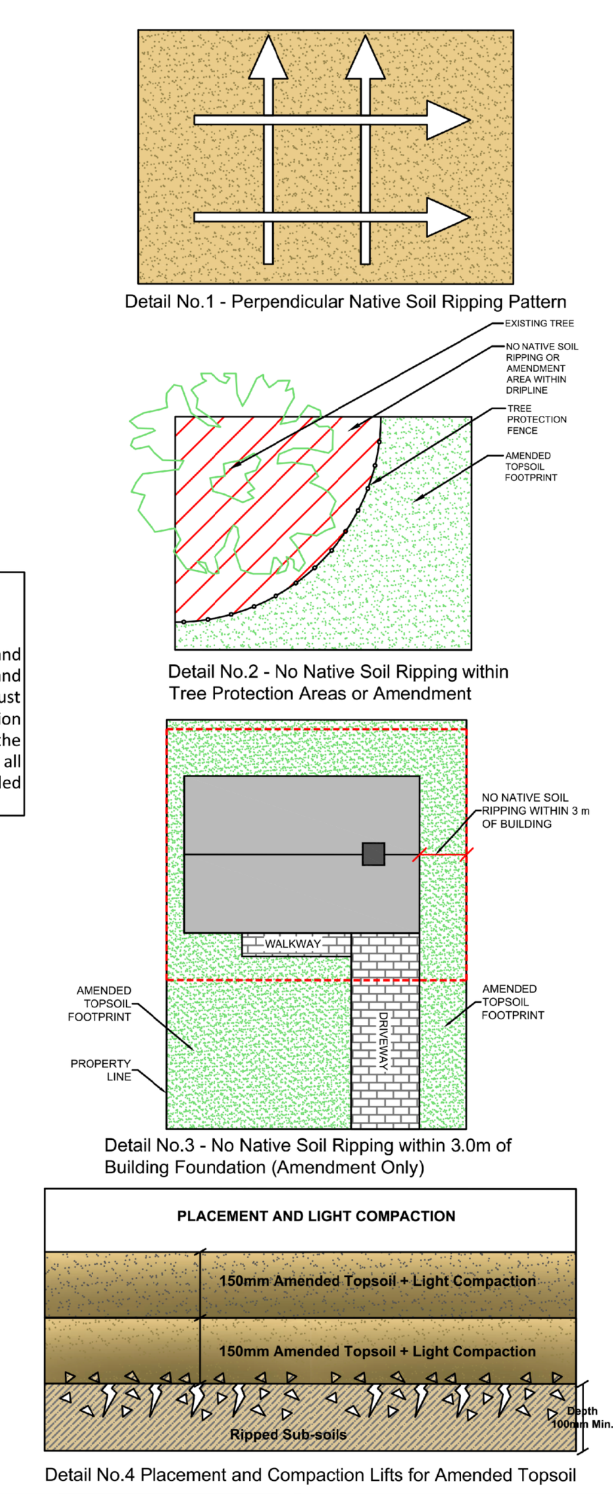
Consultant Verification/Inspection

Verification may occur after the minimum one (1) week settlement period. Verification is suggested prior to turf placement. Non-compliant sites shall be rectified at the expense of the owner

At random, the Developer's consultant shall dig at least one (1) test hole to verify amended topsoil depth and uncompacted soil depths.

Requirements:

1. Amended topsoil layer shall be easily dug using only the inspector's weight or cored without other mechanical assistance.
2. The amended topsoil layer shall be darker in color than the unamended- ripped subsoil and particles of organic matter should be easily visible.
3. Measured amended topsoil depths shall be deemed to be in conformance based on the following:
   - Using a common garden spade, the measured depth of amended topsoil shall be equal to the required 300mm depth (±25mm)
   - Using a small diameter coring unit, the measured core depth of amended topsoil shall be equal to the required 300mm depth (±50mm)



Detail No.1 - Perpendicular Native Soil Ripping Pattern

Detail No.2 - No Native Soil Ripping within Tree Protection Areas or Amendment

Detail No.3 - No Native Soil Ripping within 3.0m of Building Foundation (Amendment Only)

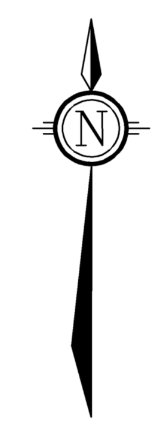
Detail No.4 Placement and Compaction Lifts for Amended Topsoil

Soil Amendment Requirements for Wateridge Village Phase 1B - For Development Requiring a Building Permit Only

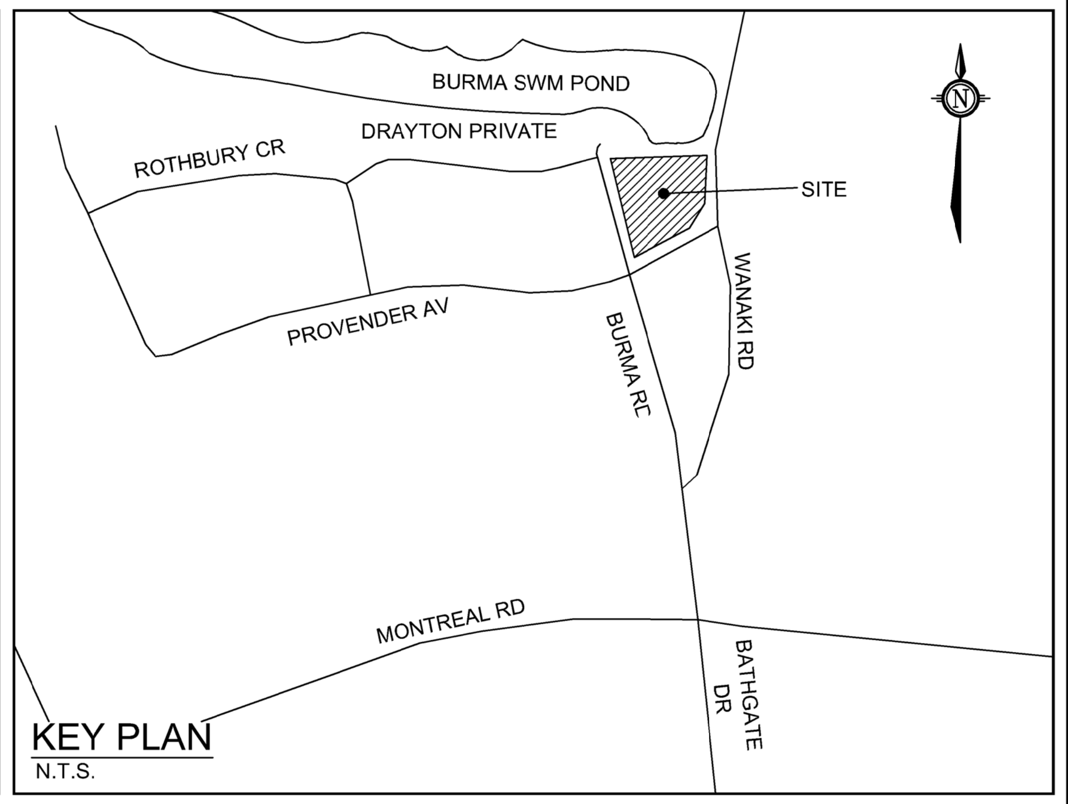
City of Ottawa October 22, 2019

B — TOPSOIL AMENDMENT DETAILS

NOT TO SCALE



NORTH



KEY PLAN

N.T.S.

NOTES

1. SOAKAWAY PIT TO PROVIDE A MINIMUM STORAGE VOLUME OF $4.05m^3$
2. SOAKAWAY IS TO BE 2.8m(W) x 7.2m(L) x 0.51m(D) OF 40-50mm Ø CLEARSTONE WRAPPED WITH NON WOVEN FILTER CLOTH (TERRAFIX 360r OR APPROVED EQUAL), WITH MINIMUM 1.5m COVER. BACKFILL TO BE SITE EXCAVATED MATERIAL, FREE OF DELETERIOUS AND ORGANICS CAN BE PLACED IN 300mm LOOSE LIFTS AND COMPACTED TO 98% SPMDD; UNDER DRY AND ABOVE FREEZING CONDITIONS. ALTERNATIVELY, AN ENGINEERED FILL SUCH AS G/B TYPE II CAN BE PLACED IN 300mm LOOSE LIFTS AND COMPACTED TO 98% SPMDD.
3. ASSUMED DESIGN INFILTRATION RATE OF SUBSOIL IS 30mm/hr.
4. ALL GRASSED AREAS ON SITE TO BE TOPSOILED WITH A MINIMUM 300mm OF APPROVED TOPSOIL MATERIAL FOR STORMWATER MANAGEMENT PURPOSES, AS PER OPTION 1 OR OPTION 2 OF DETAIL B.

NOTE:
THE POSITION OF ALL POLE LINES, CONDUITS, WATERMAINS, SEWERS AND OTHER UNDERGROUND AND OVERGROUND UTILITIES AND STRUCTURES IS NOT NECESSARILY SHOWN ON THE CONTRACT DRAWINGS, AND WHERE SHOWN, THE ACCURACY OF THE POSITION OF SUCH UTILITIES AND STRUCTURES IS NOT GUARANTEED. BEFORE STARTING WORK, DETERMINE THE EXACT LOCATION OF ALL SUCH UTILITIES AND STRUCTURES AND ASSUME ALL LIABILITY FOR DAMAGE TO THEM.

OWNER INFORMATION

HABITAT FOR HUMANITY GREATER OTTAWA
768 BELFAST ROAD
OTTAWA, ON K1G 0Z7

PHONE: 613-749-9950

No.	REVISION	DATE	BY
1.	ISSUED FOR SITE PLAN APPROVAL	08 NOV 2019	GJM

SCALE	AS SHOWN
DESIGN	LGB
CHECKED	JAG
DRAWN	RG
CHECKED	LGB
APPROVED	GJM

FOR REVIEW ONLY

LICENSED PROFESSIONAL ENGINEER L. G. BOLAM 100523457 Nov-8-2019 PROVINCE OF ONTARIO

LICENSED PROFESSIONAL ENGINEER G.J. MacDONALD Nov 8/19 PROVINCE OF ONTARIO

NOVATECH
Engineers, Planners & Landscape Architects
Suite 200, 240 Michael Cowpland Drive
Ottawa, Ontario, Canada K2M 1P6
Telephone (613) 254-9643
Facsimile (613) 254-5867
Website www.novatech-eng.com

LOCATION
CITY OF OTTAWA
455 WANAKI ROAD (BLOCK 29)

DRAWING NAME
DETAILS SHEET

PROJECT No. 119066-00
REV REV # 1
DRAWING No. 119066-DET

D07-12-19-0117

#17982

PLANA1.DWG - 841mmx594mm

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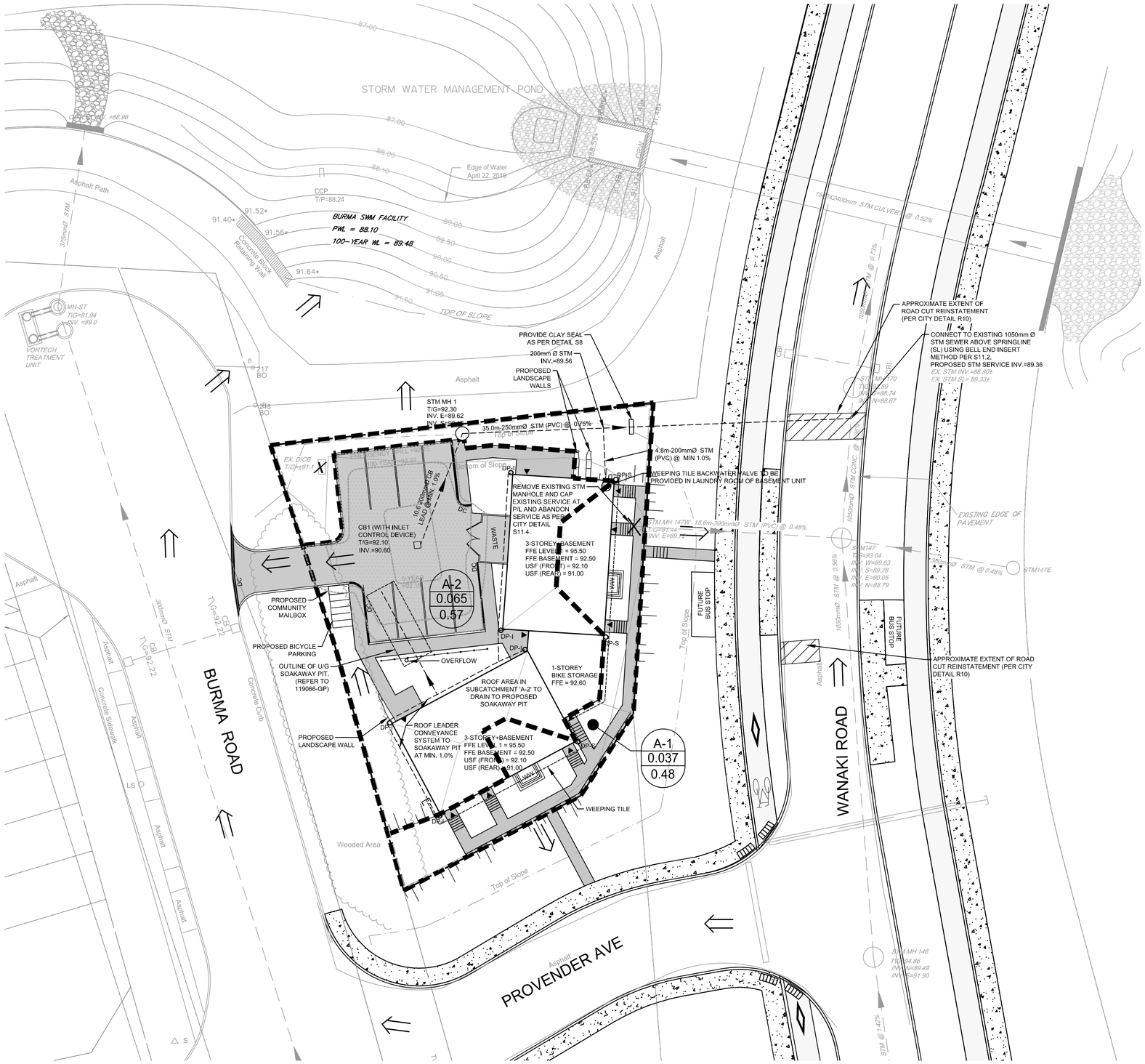

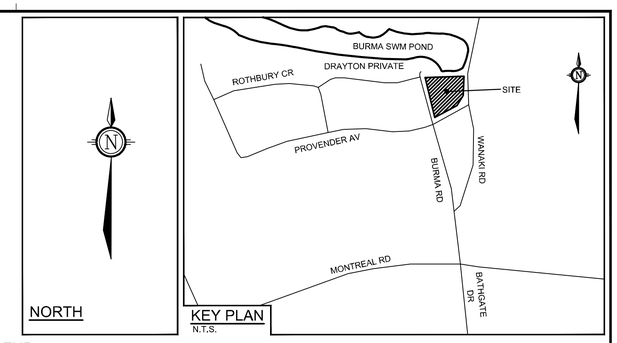

LEGEND

- DRAINAGE AREA LIMITS
- A-1 / 0.039 / 0.46 — DRAINAGE AREA ID; AREA (ha); RUNOFF COEFFICIENT (5-YEAR)
- STM MH — PROPOSED STORM MANHOLE
- *STM MH* — *EXISTING STORM MANHOLE*
- CB — PROPOSED CATCH BASIN WITH INLET CONTROL DEVICE
- PROPOSED STORM SEWER
- *EXISTING STORM SEWER*
- DIRECTION OF OVERLAND FLOW
- APPROXIMATE PONDING LIMITS AND ELEVATIONS
- PROPERTY LINE
- WW — PROPOSED WINDOW WELL
- PROPOSED TERRACE GRADING (3:1 MAX)
- DC — PROPOSED DEPRESSED CURB
- FFE= — FINISHED FLOOR ELEVATION
- DP-I — PROPOSED DOWNPIPE (TO DRAIN TO INFILTRATION PIT)
- DP-S — PROPOSED DOWNPIPE (TO DRAIN TO SURFACE)

STORMWATER MANAGEMENT NOTES:

1. REFER TO 'SITE SERVICING AND STORMWATER MANAGEMENT REPORT' (R-2019-094) PREPARED BY NOVATECH ENGINEERING CONSULTANTS LTD.

INLET CONTROL DEVICE DATA - CB1

ICD TYPE: TEMPEST LMF ICD VORTEX 98 (AS PER S4.1)
DIAMETER OF OUTLET PIPE: 200mm

DESIGN EVENT	DESIGN FLOW (L/s)	DESIGN HEAD (m)	WATER ELEVATION (m)	VOLUME (m^3)
1:5 YR	10.1	1.46	92.16	1.3
1:100 YR	10.3	1.52	92.22	6.2

NOTE:
THE POSITION OF ALL POLE LINES, CONDUITS, WATERMAINS, SEWERS AND OTHER UNDERGROUND AND OVERGROUND UTILITIES AND STRUCTURES IS NOT NECESSARILY SHOWN ON THE CONTRACT DRAWINGS, AND WHERE SHOWN, THE ACCURACY OF THE POSITION OF SUCH UTILITIES AND STRUCTURES IS NOT GUARANTEED. BEFORE STARTING WORK, DETERMINE THE EXACT LOCATION OF ALL SUCH UTILITIES AND STRUCTURES AND ASSUME ALL LIABILITY FOR DAMAGE TO THEM.

OWNER INFORMATION

HABITAT FOR HUMANITY GREATER OTTAWA
768 BELFAST ROAD
OTTAWA, ON K1G 027

PHONE: 613-749-9950

No.	REVISION	DATE	BY
3.	ISSUED WITH REVISED SS&SWM REPORT	08 NOV 2019	GJM
2.	ISSUED WITH REVISED SS&SWM REPORT	18 SEPT 2019	GJM
1.	ISSUED WITH SITE SERVICING & SWM REPORT	25 JUN 2019	GJM

SCALE 1:200 (1:200 0 2 4 6 8)

DESIGN LGB | CHECKED JAG | DRAWN RG | CHECKED LGB/JAG | APPROVED GJM

FOR REVIEW ONLY

LICENSED PROFESSIONAL ENGINEER — L. G. BOLAM — 100523457 — Nov-8-2019 — PROVINCE OF ONTARIO

LICENSED PROFESSIONAL ENGINEER — G.J. MacDONALD — Nov. 8/19 — PROVINCE OF ONTARIO

NOVATECH
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Telephone (613) 254-9643
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Website www.novatech-eng.com

LOCATION
CITY OF OTTAWA
455 WANAKI ROAD (BLOCK 29)

DRAWING NAME
STORM DRAINAGE AREA PLAN

PROJECT No. 119066-00
REV REV # 3
DRAWING No. 119066-STM

D07-12-19-0117

#17982