1345 BASLINE ROAD

Functional Servicing Report

June 16, 2022

Prepared for:

Scouts Canada – National Service Centre
c/o Colliers Strategy and Consulting Group
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1.0 INTRODUCTION

Stantec Consulting Ltd. has been commissioned by Scouts Canada to prepare the following adequacy of services report in support of the re-zoning application for the proposed development located at 1345 Baseline Road. The 1.32 ha site is located approximately 300 metres east of the Baseline Road and Clyde Avenue intersection and is adjacent to Laurentian Place - SmartCentres to the west, and Government of Canada buildings to the east in Ottawa, Ontario. The proposed re-development would replace an existing two-storey office building owned by Scouts Canada, with the current parcel zoned as “AM5”: Arterial Mainstreet Zone. A key plan showing the location of the site is included below in **Figure 1**.

Figure 1: Key Plan of Site

The proposed mixed-use development will consist of three (3) high-rise buildings consisting of apartment units with amenity space provided. Building C will provide commercial space on the ground and second floor. The three buildings will surround a common courtyard area with a provided access road, will contain three (3) levels of underground parking with bike storage, will provide a total of 952 residential units, 1,137 m^2 of commercial space, and 1,178 m^2 of parkland. The proposed site plan has been included in **Appendix D.1**.

The intent of this report is to provide a servicing scenario for the site that is free of conflicts, provides on-site servicing in accordance with City of Ottawa design guidelines, and uses the existing local infrastructure in accordance with any limitations communicated during consultation with City of Ottawa staff.

2.0 BACKGROUND

Documents referenced in preparation of the design for the 1345 Baseline Road development include:

- City of Ottawa Sewer Design Guidelines (SDG), City of Ottawa, October 2012, including all subsequent technical bulletins.
- City of Ottawa Design Guidelines – Water Distribution, City of Ottawa, July 2010, including all subsequent technical bulletins.
- Technical Bulletin ISDTB-2014-01, City of Ottawa, February 2014
- Technical Bulletin ISTB-2018-01, City of Ottawa, March 21, 2018
- Technical Bulletin ISTB-2018-02, City of Ottawa, March 21, 2018
- Technical Bulletin ISTB-2018-03, City of Ottawa, March 21, 2018
- *Geotechnical Investigation*, Proposed High-Rise Development 1345 Baseline Road, Ottawa, Ontario, Prepared for Scouts Canada c/o Colliers by Paterson Group (Report: PG6129-1), March 2022.
- *Phase I – Environmental Site Assessment*, 1345 Baseline Road, Ottawa, Ontario, Prepared for Scouts Canada c/o Colliers by Paterson Group (Report: PE5585-1), May 2022.

3.0 POTABLE WATER SERVICING

3.1 BACKGROUND

The proposed mixed-use development comprises of three residential apartment buildings complete with associated infrastructure, and amenity areas. The site will be serviced by the existing 406 mm watermain within Baseline Road and is located within the City's 2W2C Pressure Zone. The existing building is currently serviced by a 152 mm watermain, and 51 mm service fed via connections to the 406 mm diameter watermain within Baseline Road which will be blanked and decommissioned prior to construction. The existing ground elevations at the site vary from approximately 100.30 m to 101.30 m. Under normal operating conditions, the hydraulic grade line at the proposed site ranges from approximately 133.0 m to 124.9 m, as confirmed by the boundary conditions provided by the City of Ottawa (refer to **Appendix A.3** - Hydraulic Boundary Conditions).

3.2 WATER DEMANDS

3.2.1 Domestic Water Demands

Water demands for the development were estimated using the City of Ottawa Design Guidelines – Water Distribution (2010). A domestic demand rate of 280 L/cap/day was applied for the population of the proposed site per technical bulletin ISTB 2021-03. The future population of the proposed development was estimated to be 1551 persons as per the City of Ottawa Design Guideline population densities of 1.4 persons per studio and one-bedroom apartments, 2.1 persons per two-bedroom apartment, and 3.1 persons per three-bedroom apartment. See **Appendix A.1** for detailed domestic water demand calculations. The resulting average day demand (AVDY) for the proposed development was projected to be 5.8 L/s (501 m^3/day). As the average domestic demand for the site is greater than 50m^3/day, the site will require water service redundancy. The maximum daily demand (MXDY) is 2.5 times the AVDY for residential units and 1.5 for commercial and amenity space, which equals 13.7 L/s. The peak hour demand (PKHR) is 2.2 times the MXDY for residential and 1.8 for commercial and amenity use, totaling 29.6 L/s. The estimated demands are summarized in **Table 3-1** below.

Table 3-1: Estimated Water Demands

Demand Type	Population/Area	AVDY (L/s)	MXDY (L/s)	PKHR (L/s)
Residential	1551 persons	5.03	12.6	27.6
Commercial/Amenity	2277 m^2	0.74	1.10	1.99
Total Site:		**5.77**	**13.7**	**29.6**

1. Population density for all residential units based on a population densities provided in Table 4.1 - Per Unit Populations of the City of Ottawa Water Distribution Design Guidelines (July 2010).

3.2.2 Fire Flow Demands

Fire flow requirements were estimated using Fire Underwriters Survey (FUS) and determined to be approximately 6,000 L/min (100.0 L/s). The FUS estimate is based on a building of non-combustible construction with a two-hour fire separation provided between each floor per Ontario Building Code (OBC) requirements for buildings over six storeys. As a result, the 'gross construction area' of the two floors with the largest footprint (Building C: 1824 m^2) + 50% of the gross construction area of the six immediately adjoining floors above were used for the purpose of the FUS calculation, as per Page 22 of the Fire Underwriters Survey's Water Supply for Public Fire Protection, 2020. Additionally, it is anticipated that the building will be sprinklered, with final sprinkler design to conform to the NFPA 13 standards. Detailed fire flow calculations per the FUS methodology are provided in **Appendix A.2**.

3.2.3 Boundary Conditions

The boundary conditions provided by the City of Ottawa on June 6th, 2022, as illustrated in **Table 3-2**, shows the hydraulic boundary conditions for the site which have been used to determine the residual watermain pressure on Baseline Road. Correspondence with the City has been provided in **Appendix A.3**.

Table 3-2: Boundary Conditions

	Connection at Baseline Road
Min. HGL (m)	124.9
Max. HGL (m)	133.0
Max. Day + Fire Flow (100 L/s) (m)	127.8

The proposed finished floor elevation of 100.75 m will serve as the ground elevation for the calculation of residual pressures at ground level. On-site (ground level) pressures are expected to range from 237 kPa to 316 kPa (34 psi to 45 psi**)** under normal operating conditions. These values are outside the normal operating pressure range as defined by City of Ottawa design guidelines (desired 345 kPa (50 psi) to 552 kPa (80 psi) and not less than 276 kPa (40 psi)). Booster pump(s) internal to the buildings will be required to provide adequate pressures for the buildings within the proposed development. These pump(s) are to be designed by the buildings' mechanical consultant.

The boundary conditions provided for the proposed development under maximum day demands establish that a maximum flowrate of 100 L/s is available at the municipal watermain at 265 kPa (39 psi) and that a residual pressure above the required minimum 138 kPa (20 psi) can be achieved. This indicates that sufficient fire flow is available for the proposed development.

3.3 PROPOSED SERVICING

The site will be serviced from the existing 406 mm diameter CI watermain within the Baseline Road ROW via a proposed single 150 mm diameter service equipped with a new valve box located at the property line. The proposed service redundancy meets the City of Ottawa water supply objective that limits a single feed to 50 m^3/d during basic day demands. With the use of booster pumps internal to the building, the proposed servicing meets the design guideline pressure range objectives. The existing water service shall be blanked at the existing main. The proposed water servicing strategy is shown on **Drawing SSP-1** in **Appendix F**.

The existing 406 mm diameter watermain within Baseline Road can provide adequate fire and domestic flows for the subject site based on the City of Ottawa Design Guidelines and FUS 2020 calculations.

4.0 WASTEWATER SERVICING

As illustrated on **Drawing SSP-1**, sanitary servicing for the proposed development will be provided through a proposed 150 mm diameter service lateral connecting to the existing 225 mm diameter concrete sanitary sewer within Baseline Road.

4.1 DESIGN CRITERIA

As outlined in the City of Ottawa Sewer Design Guidelines and the MECP's Design Guidelines for Sewage Works, the following criteria were used to calculate the estimated wastewater flow rates, and to determine the size and location of the sanitary service lateral:

- Minimum velocity = 0.6 m/s (0.8 m/s for upstream sections)
- Maximum velocity = 3.0 m/s
- Manning roughness coefficient for all smooth wall pipes = 0.013
- Minimum size of sanitary sewer service = 135 mm
- Minimum grade of sanitary sewer service = 1.0% (2.0% preferred)
- Average wastewater generation = 280 L/person/day
- Peak Factor = based on Harmon Equation; maximum of 4.0 (residential)
- Harmon correction factor = 0.8
- Infiltration allowance = 0.33 L/s/ha (per City Design Guidelines)
- Minimum cover for sewer service connections – 2.0 m
- Population density for bachelor and one-bedroom apartments – 1.4 persons/apartment
- Population density for two-bedroom apartments – 2.1 persons/apartment
- Population density for three-bedroom apartments – 3.1 persons/apartment

4.2 WASTEWATER GENERATION

The proposed 1.32 ha re-development area will consist of three (3) multi-storey buildings with three levels of underground parking, a common courtyard area, and an access road. The proposed buildings will include commercial space within the ground floor of Building C (1,137 m^2), 714 studio and one-bedroom apartments, 186 two-bedroom apartments, 52 three-bedroom apartments, underground parking, bicycle storage, and amenity space. The anticipated wastewater peak flow generated from the proposed development is summarized in **Table 4-1** while the sanitary sewer design sheet is included in **Appendix C.1**.

Table 4-1: Estimated Wastewater Peak Flow

Residential/Amenity Peak Flows					Infiltration Flow (L/s)	Total Peak Flow (L/s)
Demand Type	**No. of Units/ Area (ha)**	**Population**	**Peak Factor**	**Peak Flow (L/s)**		
Residential	952 units	1551	3.67	18.19	0.51	18.81
Commercial/Amenity	0.23 m^2	N/A	1.5	0.11		

1. Average residential sanitary flow = 280 L/p/day per City of Ottawa Sewer Design Guidelines.
2. Peak factor for residential units calculated using Harmon's formula.
3. Apartment population estimated based on 1.4 persons/unit for studio & one-bedroom apartments, 2.1 persons/unit for two-bedroom apartments, and 3.1 persons/unit for three-bedroom apartments.
4. Infiltration flow = 0.33 L/s/ha.

The total anticipated peak flow from the site was calculated to be 18.81 L/s. Correspondence with the City of Ottawa project manager, provided in **Appendix C.2**, will establish if the existing downstream municipal infrastructure has the capacity to accept the proposed 18.81 L/s wastewater generated from the proposed site, or if sanitary infrastructure improvements will be required to accommodate sanitary flows from the proposed development.

4.3 PROPOSED SERVICING

The proposed site will be serviced by a new 150 mm diameter service lateral, flowing by gravity, connected to the existing 225 mm diameter sanitary main on Baseline Road. Total peak flow from the site (18.81 L/s) will outlet to the existing sanitary sewer in the Baseline Road ROW via a new 150 mm diameter PVC connection which will replace the existing sanitary servicing infrastructure. A backwater valve is to be installed on the proposed sanitary service within the site to prevent any surcharge from the downstream sanitary sewer from impacting the proposed property.

5.0 STORMWATER MANAGEMENT AND SERVICING

5.1 OBJECTIVES

The goal of this stormwater servicing and stormwater management (SWM) plan is to determine the measures necessary to control the quantity and quality of stormwater released from the proposed development to meet the criteria established during the consultation process with City of Ottawa and Rideau Valley Conservation Authority (RVCA) staff, and to provide sufficient details required for approval and construction.

5.2 SWM CRITERIA AND CONSTRAINTS

SWM criteria were established using the City of Ottawa Sewer Design Guidelines (SDG) and through consultation with City of Ottawa and RVCA staff. The following summarizes the list of criteria applicable to the stormwater servicing design of the site, with the source of each criterion indicated in parentheses:

General

- Use the dual drainage principle (SDG).
- Wherever feasible and practical, site-level measures should be used to reduce and control the volume and rate of runoff (SDG).

Storm Sewer & Inlet Controls

- Maximum discharge rates for the site under all storm events are to be restricted to the maximum runoff resulting from a pre-development 2-year storm event.
- Calculated pre-development runoff coefficient cannot be greater than C = 0.5 (City staff).
- Stormwater discharge from the site will be directed to the existing 375 mm dia. reinforced concrete storm sewer within Baseline Road (City staff).
- The site will not have quality control requirements, but best management practices should be applied throughout. Quality control requirements were confirmed by consultation with the RVCA.

Surface Storage & Overland Flow

- A 15 cm vertical clearance is necessary between the spill elevation and the ground elevation at the building envelope that is in proximity of the flow route or ponding area (City staff).
- Maximum depth of flow under either static or dynamic conditions shall be less than 0.30 m (SDG).
- Provide adequate emergency overflow conveyance off-site (SDG).

5.3 STORMWATER MANAGEMENT

The 375 mm diameter concrete sewer within the Baseline Road ROW has been considered the stormwater outlet for this site. For the purposes of the overall stormwater management (SWM) plan and modified rational method (MRM) calculations, any drainage subcatchments on the site that outlet to the Baseline Road ROW will be considered non-tributary areas (UNC-1 & UNC-2). In addition, subcatchment EXT-1 which is intended to be zoned "O1" (Parks and Open Space) will be conveyed to the City upon full build-out of the proposed development. Therefore, the parkland area will be controlled independently of the proposed development and does not contribute to the allowable release rate from the site. All proposed sub-catchments on the site, except for the uncontrolled areas, will drain to the storm sewer within Baseline Road or to the stormwater cistern within Building C. All sub-catchment areas that allocate flows to the minor system are considered tributary areas.

5.3.1 Allowable Release Rate

Based on pre-consultation with City of Ottawa staff, the peak post-development discharge from the subject site is to be limited to the discharge resulting from the 2-year event and using a site runoff coefficient of C= 0.50. An existing storm drainage plan was developed to outline the existing conditions and subcatchment areas (see **Drawing EX-SD-1** in **Appendix F)**. Information from **Drawing EX-SD-1** was used to calculate the pre-development runoff coefficient, and a C=0.55 was applied to compare existing peak flow conditions to the allowable release rate from the site (C=0.5). The utilization of a C=0.50 to determine the allowable release rate provides an appropriate balance between the current stormwater system dynamics and the goal of mitigating development impacts on existing downstream infrastructure.

The pre-development and post-development release rates for the site have been determined using the rational method based on the criteria above. A time of concentration for the pre-development area (10 minutes) was used based on recommendations provided during pre-consultation by the City. The runoff coefficient values have been increased by 25% for the post-development 100-year storm event based on MTO Drainage Manual recommendations. Peak flow rates have been calculated using the rational method as follows:

$$Q = 2.78\,(C)(I)(A)$$

Where:

$Q = peak\ flow\ rate, L/s$

$C = site\ runoff\ coefficient$

$I = rainfall\ intensity, mm/hr\ (per\ City\ of\ Ottawa\ IDF\ curves)$

$A = drainage\ area, ha$

$$Intensity\ (mm/hr) = \frac{732.951}{(10 + 6.199)^{0.810}} = 76.81\ mm/hr$$

$$Q = 2.78(0.50)(76.81\ mm/hr)(1.14\ ha) = \mathbf{121.7\ L/s}$$

For the proposed development, a target allowable release rate will be set at 121.72 L/s (C=0.50) which will allow roof storage to be maximized and the remainder of the site discharge to be directed to a stormwater cistern and discharged via a pump or gravity at a controlled rate to the storm sewer within the Baseline Road ROW. **Table 5-1** shows the 2, 5, and 100-year pre-development discharge rates for a range of runoff coefficients based on pre-consultation with City staff and existing conditions.

Table 5-1: Pre-Development Discharge Rates Based on Varying Runoff Coefficients (C)

Design Storm	Pre-Development Discharge (L/s)	
	C=0.5	C=0.55
2-year	121.7 [1]	133.9 [2]
5-year	165.1	181.6
100-year	282.9	311.2

1. *City specified runoff coefficient to be used when determining the target release rate (2-year event, C=0.5).*
2. *The runoff coefficient based on existing conditions as shown in Drawing EX-SD-1 (2-year, C=0.55).*

5.3.2 Rooftop Storage

It is proposed to retain stormwater on the building rooftops by installing restricted flow roof drains. The roof drain arrangement and capacities are summarized in **Table 5-2** below. The following calculations assume that the roof will be equipped with standard Watts *Accutrol* Roof Drain Weirs.

Table 5-2: Rooftop Storage Details

Subcatchment ID	Building ID	Roof Drains	Storage Depth Available (m)	Storage Volume Available (m^3)
ROOF-1	Building C	4 @ 50% Open	0.15	36.0
ROOF-2		4 @ 50% Open	0.15	44.0
ROOF-3	Building B	5 @ 50% Open	0.15	48.0
ROOF-4	Building A	7 @ 50% Open	0.15	72.0

Watts Drainage *Adjustable Accutrol* roof drain weir data (see data sheet in **Appendix C.5**) has been used to calculate a practical roof release rate and detention storage volume for the rooftops**.** It should be noted that the *Accutrol* weir has been used as an example only, and that other products may be specified for use, provided that the peak roof drain release rate is restricted to match the maximum rate of release indicated in **Table 5-3**, and that sufficient roof storage is provided to meet (or exceed) the resulting volume of detained stormwater.

Proposed drain release rates have been calculated based on the *Accutrol* weir setting at 50% open for ROOF-1, ROOF-2, ROOF-3, and ROOF-4. All building roofs will have a maximum allowable roof ponding depth of 150 mm as per OBC 7.4.10.4.(2)(c) and each will provide their respective storage volumes. The peak volume stored and the controlled release rates from each roof are summarized in **Table 5-3**:

Table 5-3: Roof Control Area

Roof ID	Design Storm	Storage Depth Utilized (mm)	Peak Discharge (L/s)	Peak Volume Stored (m^3)
ROOF-1	5-Year	109.7	4.0	14.6
	100-Year	145.5	4.9	33.3
ROOF-2	5-Year	112.7	4.1	19.3
	100-Year	149.4	5.0	43.6
ROOF-3	5-Year	110.7	5.1	20.0
	100-Year	146.8	6.2	45.4
ROOF-4	5-Year	111.7	7.1	30.9
	100-Year	148.2	8.8	69.8

5.3.3 Uncontrolled Areas

The uncontrolled portion of the site will be directed to the Baseline Road right of way and adjacent properties should not be impacted. The subcatchment area UNC-1 and UNC-2 will direct uncontrolled discharge by surface flow to the front of the property and off-site to the adjacent Baseline Road ROW. Peak discharges from the uncontrolled area have been considered in the overall SWM plan and included in the total site release rates. The uncontrolled peak discharge has been balanced through overcontrolling the discharge rates for the rooftop areas and the pump discharge rate from the stormwater cistern to meet target levels.

Table 5-4: Peak Discharge of Uncontrolled Area

Subcatchment ID	Design Storm	Post-Development Discharge (L/s)
UNC-1	5-year	2.61
	100-Year	4.96
UNC-2	5-year	3.19
	100-Year	6.83

5.3.4 Results

Table 5-5 provides a summary of the peak design discharge rates from the MRM analysis based on the proposed stormwater management plan. As the table demonstrates, the site's SWM design adheres to the target peak outflow rate in the MRM analysis.

Table 5-5: Summary of Total 5-Year and 100-Year Event Release Rates

	5-year Peak Discharge (L/s) using MRM	100-Year Peak Discharge (L/s) using MRM
Uncontrolled – Surface	5.80	11.79
Controlled – Cistern Storage & Rooftop Storage [1]	100.00	100.00
Parkland (EXT-1) [2]	19.81	42.44
Total Peak Flows (L/s)	**105.8**	**111.8**
Target Release Rate (L/s)	**121.7**	

1.Flows from the roof are directed internally to the building system and discharged by gravity or pump from the stormwater cistern to the storm sewer outlet.
2. Parkland to be conveyed to the City and runoff controlled independently from the proposed development.
3. The target release rate is the 2-year Pre-development Peak Discharge at C=0.50

5.4 PROPOSED STORMWATER SERVICING

The proposed building is to be serviced by a 300 mm diameter lateral which will convey the flows from the roof drains, foundation drain, and the stormwater cistern. The adequacy of the lead size is to be confirmed at detailed design with final sizing confirmed by the building's mechanical consultant. See **Drawing SSP-1** in **Appendix E** for the proposed locations of the stormwater infrastructure.

5.4.1 Quantity Control Requirements

The site requires quantity control measures to meet the restrictive stormwater release criteria. It is proposed that rooftop storage via restricted roof release be used to reduce site peak outflow to meet target rates in addition to a stormwater cistern that will be pumped or flow by gravity at a constant flow rate (100 L/s). The stormwater cistern within Building C has been sized to attenuate peak flows and will have a volume capacity of 120 m^3. A spreadsheet using the Modified Rational Method (MRM) was used to determine the available rooftop storage, required stormwater cistern storage, and subsequent release rates (see **Appendix C.2**).

5.4.2 Quality Control Requirements

The development will not be subject to quality control requirements as per pre-consultation with the RVCA (See **Appendix C.3**). The RVCA has no additional stormwater quality requirements based on the overall site design but encourage the implementation of best management practices where possible. Best management practices will be implemented, and erosion and sediment control measures will be provided during construction with further details provided at detailed design.

6.0 SITE GRADING AND DRAINAGE

The proposed development site measures approximately 1.32 ha in area. The site is generally flat but maintains gentle slopes within the existing grassed portion and asphalt parking area of the property parcel. The average site grade is 100.75 m and generally drains toward the south with overland flow generally being directed to the adjacent Baseline Road right-of-way. A functional grading plan (see **Appendix F**) has been provided to satisfy stormwater management requirements, adhere to any geotechnical restrictions (see **Section 10.0**) for the site, and provide the minimum required cover for storm and sanitary sewers where possible. Site grading has been established to provide emergency overland flow routes required for stormwater management in accordance with City requirements.

The emergency overland flow route will actively convey flow during each storm event due to the controlled portion of the site. It is expected that compared to the existing conditions with the site almost entirely uncontrolled, the site runoff will be controlled more effectively in the post-development scenario due to the rooftop capture and the controlled rooftop and stormwater cistern release.

7.0 UTILITIES

Hydro, gas, and cable servicing should be readily available for the development, as the site lies within a mature, residential area with commercial and institutional buildings adjacent to the development along Baseline Road. The existing building on the site is presumed to be currently serviced by all major utilities. The exact size, location, and routing of utilities, including determining whether off-site works are required to extend any additional utility services to the property, shall be coordinated by others.

8.0 APPROVALS

The proposed development lies on a private site under singular ownership, drains to an approved separated sewer outlet, and is not intended to service industrial land or land uses. Therefore, the site is exempt from the Ministry of the Environment, Conservation and Parks (MECP) Environmental Compliance Application (ECA) process under O.Reg. 525/98).

As per the geotechnical report for the site, for typical ground or surface water volumes being pumped during the construction phase, typically between 50,000 to 400,000 L/day, it is required to register on the Environmental Activity and Sector Registry (EASR). A minimum of two to four weeks should be allotted for completion of the EASR registration and the preparation of the Water Taking and Discharge Plan by a Qualified Person as stipulated under O.Reg. 63/16. A Permit to Take Water (PTTW) through the MECP would be required for dewatering volumes exceeding 400,000 L/day, which may be required for this project. However, if a PTTW is required, at least 4 to 5 months should be allowed for completion of the application and issuance of the permit by the MECP.

Please refer to the geotechnical report, included in **Appendix D.2** for further discussion regarding potential construction limitations due to the site conditions.

9.0 EROSION CONTROL DURING CONSTRUCTION

To protect downstream water quality and prevent sediment buildup in catch basins and storm sewers, erosion and sediment control measures must be implemented during construction. The following recommendations will be included in the contract documents and communicated to the Contractor.

1. Implement best management practices to provide appropriate protection of the existing and proposed drainage system and the receiving water course(s).
2. Limit the extent of the exposed soils at any given time.
3. Re-vegetate exposed areas as soon as possible.
4. Minimize the area to be cleared and grubbed.
5. Protect exposed slopes with geotextiles, geogrid, or synthetic mulches.
6. Provide sediment traps and basins during dewatering works.
7. Install sediment traps (such as SiltSack® by Terrafix) between catch basins and frames.
8. Schedule the construction works at times which avoid flooding due to seasonal rains.

The Contractor will also be required to complete inspections and guarantee the proper performance of their erosion and sediment control measures at least after every rainfall. The inspections are to include:

- Verification that water is not flowing under silt barriers.
- Cleaning and changing the sediment traps placed on catch basins.

Refer to **Drawing EC DS-1** in **Appendix F** for the proposed location of silt fences, sediment traps, and other erosion control measures.

10.0 GEOTECHNICAL INVESTIGATION AND ENVIRONMENTAL SITE ASSESSMENT

10.1 GEOTECHNICAL INVESTIGATION

A geotechnical investigation report was prepared by Paterson Group Inc. on March 15th, 2022 regarding the existing soil conditions within the subject area and construction recommendations. For details which are not summarized below, please see the report in its entirety in **Appendix D.2**.

Subsurface soil conditions within the subject area were determined from five (5) boreholes advanced within the proposed site. The subsurface profile consisted of pavement underlain by 0.5 to 1.0 m of fill. The fill consisted of granular crushed stone to brown silty sand with crushed stone. Bedrock was encountered at depths of 1.0 to 1.2 m below the existing ground surface consisting of grey limestone. The bedrock within the proposed development area consists of interbedded limestone and dolomite of the Gull River formation. The bedrock can be classified as being of good to excellent in quality based on the Rock Quality Designation values.

The groundwater level, measured on March 3rd, 2022 at the monitoring well installed at borehole BH 2-22, was found to be 2.63 m below ground surface (geodetic elevation: 97.84 m). According to the geotechnical investigation, the long-term groundwater table can be expected approximately 2.6 m below the ground surface within the bedrock, however, these levels are subject to seasonal fluctuations and could vary at the time of construction.

Removal of bedrock will be required to complete the underground parking levels and to install the proposed building foundations. The investigation found that the in-situ bedrock was generally suitable to support the proposed building using conventional spread footings placed on clean, surface sounded bedrock. Bedrock removal will be required to complete the underground levels of the proposed development and can likely be removed by hoe-ramming and using conventional excavation methods. Recommendations are provided in the geotechnical report for the drainage of the footings and building slab. These components will form part of the building design. A single outlet for the foundation drains, the stormwater cistern, and rooftop drains has been provided as part of the functional site servicing design as shown on **Drawing SSP-1** (attached in **Appendix E**) and described in **Section 5.4**.

10.2 ENVIRONMENTAL SITE ASSESSMENT (ESA)

A Phase I Environmental Site Assessment (ESA) was completed for the site by Paterson Group Inc in general accordance with Ontario Regulation 153/04, as amended under the Environmental Protection Act, and complies with the requirements of CSA Z768-01. The Phase I ESA specified that no environmental concerns were identified with respect to the current use of the subject site and that a Phase II ESA will not be required for the subject site.

Geotechnical Investigation and Environmental Site Assessment

The report identifies hazardous substances that may be present in the existing dwelling based on the age of the building. Lead-based paints and asbestos containing building materials may be present, however, do not represent an immediate concern to the occupants of the building. Prior to demolition, the appropriate surveys should be conducted in accordance with Ontario Regulations. For details which are not summarized above, please see the report in its entirety in **Appendix D.3**.

11.0 CONCLUSIONS

11.1 WATER SERVICING

Based on the supplied boundary conditions for existing watermain, and the calculated domestic and fire flow demands for the subject site, the 406 mm watermain within Baseline road has sufficient capacity. The required domestic demands can be met under normal operating conditions and the existing fire hydrants within the vicinity of the site can sufficiently provide the required fire flow in emergency cases. The proposed development requires dual 150 mm diameter water services which will be connected to the existing main on Baseline Road.

11.2 SANITARY SERVICING

The proposed development will be serviced by a 150 mm dia. sanitary service lateral directing wastewater by gravity to the existing 225 mm diameter concrete sanitary sewer on Baseline Road. A full-port backwater valve on the sanitary service lateral will prevent flooding if the sanitary sewer on Baseline Road surcharges. The proposed outlet may not have sufficient capacity to receive the projected sanitary discharge from the site, as confirmed by City staff, and improvements to the sanitary infrastructure fronting the site may be required.

11.3 STORMWATER SERVICING AND MANAGEMENT

A 300 mm diameter storm service is proposed for the building's foundation drain, stormwater cistern, and controlled rooftop drains, to outlet from Building C's mechanical room on the south face of Building C to the existing sewer located in the Baseline Road ROW. A full-port backwater valve on the stormwater service will prevent flooding if the storm sewer on Baseline Road surcharges. The rooftop drains should be connected on the downstream side of the sump pump and full-port backwater valve. The water captured by the foundation drains, rooftops, and stormwater cistern will discharge to the 375 mm diameter storm sewer within Baseline Road.

Roof storage and cistern storage has been proposed as the main controls to limit the peak 100-year stormwater discharge rate for the development area to 154.2 L/s. This discharge rate is less than 155.02 L/s, the maximum allowable discharge rate for the site, as determined by using a C=0.55 to provide a more appropriate balance between the existing SWM conditions of the site and the aim of mitigating development impacts on existing downstream infrastructure. No water quality requirements have been issued by the RVCA, however, best management practices have been considered and implemented.

11.4 GRADING

Functional site grading has been designed to provide an emergency overland flow route as per City requirements and to follow the recommendations made in the geotechnical investigation report prepared by Paterson Group. Grading has been coordinated to provide barrier-free entrances to the proposed

building and to ensure all City grading criteria requirements for the site are met. Erosion and sediment control measures will be implemented during construction to reduce the impact on existing facilities.

11.5 UTIILITIES

It is anticipated that the existing infrastructure will be sufficient to provide service for the proposed development. The exact size, location, and routing of utilities will be finalized after design circulation.

11.6 APPROVALS/RESTRICTIONS

For the expected dewatering needs of 50,000 to 400,000 L/day, the proponent will need to register on the MECP's Environmental Activity and Sector Registry (EASR). A Permit to Take Water will only be required for dewatering needs in excess of 400,000 L/day which is not expected for this site. The Phase I ESA found that no environmental concerns were identified with respect to the current use of the subject site and that a Phase II ESA will not be required for the subject site. All studies are to be submitted as part of the site plan application.

APPENDICES

Appendix A – POTABLE WATER SERVICING

A.1 DOMESTIC WATER DEMAND CALCULATIONS

1345 Baseline Road (Scouts Canada Site) - Domestic Water Demand Estimates

Based on conceptual development plans from rla architecture (2022-04-22)

Last updated on May 20, 2022

Ottawa Design Guidelines - Water Distribution

Table 4.1 Per Unit Populations		
Average Apt.	1.8	ppu
Studio	1.4	ppu
1 Bedroom	1.4	ppu
2 Bedroom	2.1	ppu
3 Bedroom	3.1	ppu

Development Block/Area ID	Commercial/Amenity Area (m^2)	Number of Residential Units	Population	Daily Demand Rate (L/cap/day or L/ha/d)	Avg. Day Demand [1,2]		Max. Day Demand [1, 2]		Peak Hour Demand [1, 2]	
					(L/min)	(L/s)	(L/min)	(L/s)	(L/min)	(L/s)
Tower A (28 Storeys)										
Studio	-	96	134	280	26.1	0.44	65.3	1.09	143.7	2.40
1 Bedroom	-	153	214	280	41.7	0.69	104.1	1.74	229.1	3.82
1 Bedroom + Den	-	9	13	280	2.5	0.04	6.1	0.10	13.5	0.22
2 Bedroom	-	60	126	280	24.5	0.41	61.3	1.02	134.8	2.25
2 Bedroom + Den	-	3	6	280	1.2	0.02	3.1	0.05	6.7	0.11
3 Bedroom	-	18	56	280	10.9	0.18	27.1	0.45	59.7	0.99
Amenity	833	-	-	28000	16.2	0.27	24.3	0.40	43.7	0.73
Tower B (24 Storeys)										
Studio	-	44	62	280	12.0	0.20	29.9	0.50	65.9	1.10
1 Bedroom	-	116	162	280	31.6	0.53	78.9	1.32	173.7	2.89
1 Bedroom + Den	-	12	17	280	3.3	0.05	8.2	0.14	18.0	0.30
2 Bedroom	-	66	139	280	27.0	0.45	67.4	1.12	148.2	2.47
2 Bedroom + Den	-	0	0	280	0.0	0.00	0.0	0.00	0.0	0.00
3 Bedroom	-	22	68	280	13.3	0.22	33.2	0.55	72.9	1.22
Amenity	228	-	-	28000	4.4	0.07	6.7	0.11	12.0	0.20
Tower C (32 Storeys)										
Studio	-	80	112	280	21.8	0.36	54.4	0.91	119.8	2.00
1 Bedroom	-	200	280	280	54.4	0.91	136.1	2.27	299.4	4.99
1 Bedroom + Den	-	4	6	280	1.1	0.02	2.7	0.05	6.0	0.10
2 Bedroom	-	57	120	280	23.3	0.39	58.2	0.97	128.0	2.13
2 Bedroom + Den	-	0	0	280	0.0	0.00	0.0	0.00	0.0	0.00
3 Bedroom	-	12	37	280	7.2	0.12	18.1	0.30	39.8	0.66
Commercial	1,137	-	-	28000	22.1	0.37	33.2	0.55	59.7	0.99
Amenity	79	-	-	28000	1.5	0.03	2.3	0.04	4.1	0.07
Total Site :	**2277**	**952**	**1551**	**-**	**345.9**	**5.8**	**820.6**	**13.7**	**1778.7**	**29.6**

1 Water demand criteria used to estimate peak demand rates for residential areas are as follows:
maximum daily demand rate = 2.5 x average day demand rate
peak hour demand rate = 2.2 x maximum day demand rate

2 Water demand criteria used to estimate peak demand rates for commercial/amenity/lobby areas are as follows:
maximum daily demand rate = 1.5 x average day demand rate
peak hour demand rate = 1.8 x maximum day demand rate

3 Population density for all residential units based on an population densities provided in *Table 4.1 - Per Unit Populations* of the City of Ottawa Water Distribution Design Guidelines (July 2010).

A.2 FIRE FLOW REQUIREMENTS PER OBC CALCULATIONS

FUS Fire Flow Calculation Sheet - 2020 FUS Guidelines

Stantec Project #: 160410394
Project Name: 1345 Baseline Road
Date: 5/25/2022
Fire Flow Calculation #: 1
Description: High Rise Residential (Building A, 28 Storeys)

Notes: 28 Strorey Residential Building with amenity space. Building information taken from Site Plan by rla architecture (22/04/2022)

Step	Task	Notes							Value Used	Req'd Fire Flow (L/min)
1	Determine Type of Construction	Type II - Noncombustible Construction / Type IV-A - Mass Timber Construction							0.8	-
2	Determine Effective Floor Area	Sum of Two Largest Floors + 50% of Six Additional Floors					Vertical Openings Protected?		NO	-
		1643	1643	1643	1628	781	781	781	781	6483.5	-
3	Determine Required Fire Flow	($F = 220 \times C \times A^{1/2}$). Round to nearest 1000 L/min							-	14000
4	Determine Occupancy Charge	Limited Combustible							-15%	11900
5	Determine Sprinkler Reduction	Conforms to NFPA 13							-30%	-5950
		Standard Water Supply							-10%	
		Fully Supervised							-10%	
		% Coverage of Sprinkler System							100%	
6	Determine Increase for Exposures (Max. 75%)	Direction	Exposure Distance (m)	Exposed Length (m)	Exposed Height (Stories)	Length-Height Factor (m x stories)	Construction of Adjacent Wall	Firewall / Sprinklered ?	-	-
		North	> 30	51	2	> 100	Type V	NO	0%	0
		East	20.1 to 30	21	24	> 100	Type I-II - Unprotected Openings	YES	0%	
		South	20.1 to 30	20	32	> 100	Type I-II - Unprotected Openings	YES	0%	
		West	> 30	46	2	81-100	Type I-II - Unprotected Openings	NO	0%	
7	Determine Final Required Fire Flow	**Total Required Fire Flow in L/min, Rounded to Nearest 1000L/min**								**6000**
		Total Required Fire Flow in L/s								**100.0**
		Required Duration of Fire Flow (hrs)								**2.00**
		Required Volume of Fire Flow (m^3)								**720**

FUS Fire Flow Calculation Sheet - 2020 FUS Guidelines

Stantec Project #: 160410394
Project Name: 1345 Baseline Road
Date: 5/25/2022
Fire Flow Calculation #: 2
Description: High Rise Residential (Building B, 24 Storeys)

Notes: 24 Strorey Residential Building with amenity space. Building information taken from Site Plan by rla architecture (22/04/2022)

Step	Task	Notes							Value Used	Req'd Fire Flow (L/min)
1	Determine Type of Construction	Type II - Noncombustible Construction / Type IV-A - Mass Timber Construction							0.8	-
2	Determine Effective Floor Area	Sum of Two Largest Floors + 50% of Six Additional Floors					Vertical Openings Protected?		NO	-
		1346	1249	1249	1249	671	671	671	671	5185.6	-
3	Determine Required Fire Flow	($F = 220 \times C \times A^{1/2}$). Round to nearest 1000 L/min							-	13000
4	Determine Occupancy Charge	Limited Combustible							-15%	11050
5	Determine Sprinkler Reduction	Conforms to NFPA 13							-30%	-5525
		Standard Water Supply							-10%	
		Fully Supervised							-10%	
		% Coverage of Sprinkler System							100%	
6	Determine Increase for Exposures (Max. 75%)	Direction	Exposure Distance (m)	Exposed Length (m)	Exposed Height (Stories)	Length-Height Factor (m x stories)	Construction of Adjacent Wall	Firewall / Sprinklered ?	-	-
		North	> 30	21	2	41-60	Type V	NO	0%	0
		East	> 30	62	1	61-80	Type I-II - Unprotected Openings	NO	0%	
		South	10.1 to 20	19	32	> 100	Type I-II - Unprotected Openings	YES	0%	
		West	20.1 to 30	62	28	> 100	Type I-II - Unprotected Openings	YES	0%	
7	Determine Final Required Fire Flow	Total Required Fire Flow in L/min, Rounded to Nearest 1000L/min								6000
		Total Required Fire Flow in L/s								100.0
		Required Duration of Fire Flow (hrs)								2.00
		Required Volume of Fire Flow (m^3)								720

FUS Fire Flow Calculation Sheet - 2020 FUS Guidelines

Stantec Project #: 160410394
Project Name: 1345 Baseline Road
Date: 5/25/2022
Fire Flow Calculation #: 3
Description: High Rise Residential w/ Ground Floor Commercial (L1-L2) (Building C, 32 Storeys)
Notes: 32 Strorey Residential Building with amenity space and commercial space. Building information taken from Site Plan by rla architecture (22/04/2022)

Step	Task	Notes								Value Used	Req'd Fire Flow (L/min)
1	Determine Type of Construction	Type II - Noncombustible Construction / Type IV-A - Mass Timber Construction								0.8	-
2	Determine Effective Floor Area	Sum of Two Largest Floors + 50% of Six Additional Floors					Vertical Openings Protected?			NO	-
		1824	1824	1752	1612	781	781	781	781	6891.65	-
3	Determine Required Fire Flow	($F = 220 \times C \times A^{1/2}$). Round to nearest 1000 L/min								-	15000
4	Determine Occupancy Charge	Limited Combustible								-15%	12750
5	Determine Sprinkler Reduction	Conforms to NFPA 13								-30%	-6375
		Standard Water Supply								-10%	
		Fully Supervised								-10%	
		% Coverage of Sprinkler System								100%	
6	Determine Increase for Exposures (Max. 75%)	Direction	Exposure Distance (m)	Exposed Length (m)	Exposed Height (Stories)	Length-Height Factor (m x stories)	Construction of Adjacent Wall		Firewall / Sprinklered ?	-	-
		North	20.1 to 30	71	24	> 100	Type I-II - Unprotected Openings		YES	0%	0
		East	> 30	21	1	21-49	Type I-II - Unprotected Openings		NO	0%	
		South	> 30	71	2	> 100	Type I-II - Unprotected Openings		NO	0%	
		West	> 30	21	2	41-60	Type I-II - Unprotected Openings		NO	0%	
7	Determine Final Required Fire Flow	Total Required Fire Flow in L/min, Rounded to Nearest 1000L/min									6000
		Total Required Fire Flow in L/s									100.0
		Required Duration of Fire Flow (hrs)									2.00
		Required Volume of Fire Flow (m^3)									720

A.3 HYDRAULIC BOUNDARY CONDITIONS

Mott, Peter

From: Bramah, Bruce <bruce.bramah@ottawa.ca>
Sent: Monday, June 6, 2022 9:59 AM
To: Mott, Peter
Subject: RE: 1345 Baseline Road - Boundary Conditions Request
Attachments: 1345 Baseline Road May 2022.pdf

Good morning Peter,

The following are boundary conditions, HGL, for hydraulic analysis at 1345 Baseline Road (zone 2W2C) assumed to connected to the 406 mm on Baseline Road (see attached PDF for location).

Both Connections:

Minimum HGL: 124.9 m

Maximum HGL: 133.0 m

Max Day + Fire Flow (100 L/s): 127.8 m

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

Disclaimer: The boundary condition information is based on current operation of the city water distribution system. The computer model simulation is based on the best information available at the time. The operation of the water distribution system can change on a regular basis, resulting in a variation in boundary conditions. The physical properties of watermains deteriorate over time, as such must be assumed in the absence of actual field test data. The variation in physical watermain properties can therefore alter the results of the computer model simulation.

If you have any questions, please feel free to contact me.
Thank you,

Bruce Bramah, EIT
Project Manager

Planning, Real Estate and Economic Development

Development Review South

110 Laurier Avenue
Ottawa, ON K1P 1J1
Bruce.Bramah@ottawa.ca
Tel: (613) 580-2424 ext. 29686

From: Mott, Peter <Peter.Mott@stantec.com>
Sent: May 25, 2022 11:06 AM
To: Bramah, Bruce <bruce.bramah@ottawa.ca>
Subject: 1345 Baseline Road - Boundary Conditions Request

Good Morning Bruce,

I would like to request the hydraulic boundary conditions for the proposed site located at 1345 Baseline Road. Please find attached the site plan, the key map showing the location of the proposed development, domestic water demand calculations, and fire flow calculations.

A summary of the proposed site is provided below:

We anticipate a connection to the existing watermain infrastructure to service the site. The following connection(s) is expected for servicing:

➢Connection(s) to existing 406 mm (CI) watermain on Baseline Road.

*Existing fire hydrant fronting site and adjacent property to the east along Baseline Road.

For the purpose of the boundary conditions request, may you please provide us with the boundary conditions for the following servicing option:

i. Watermain connection to the existing 406 mm (CI) watermain on Baseline Road; assuming a fire flow requirement of **6,000 L/min** for the site in addition to the domestic water demands provided below.

- The intended land use is residential and ground floor commercial in Building C, per the summary provided in the Domestic Demands spreadsheet. (See attached Site Plan with project stats)
- Estimated fire flow demand per the FUS methodology: 6000 L/min (100 L/s)
- Domestic water demands for the entire development:
    - **Average day: 333.1 L/min (5.6 L/s)**
    - **Maximum day: 788.6 L/min (13.1 L/s)**
    - **Peak hour: 1708.3 L/min (28.5 L/s)**

Thank you for your time and please contact me at your earliest convenience if any additional information or clarification is required.

Best,

Peter Mott EIT
Engineering Intern, Community Development

Mobile: +1 (343) 999-8172
Peter.Mott@stantec.com
Stantec
400 - 1331 Clyde Avenue
Ottawa ON K2C 3G4

Appendix B – WASTEWATER SERVICING

B.1 SANITARY SEWER DESIGN SHEET

SUBDIVISION:

Scouts Canada - 1345 Baseline Road

DATE: 6/14/2022
REVISION: 0
DESIGNED BY: AMP
CHECKED BY:

SANITARY SEWER DESIGN SHEET
(City of Ottawa)

FILE NUMBER: 160410536

DESIGN PARAMETERS

MAX PEAK FACTOR (RES.)=	4.0	AVG. DAILY FLOW / PERSON	280	L/p/day	MINIMUM VELOCITY	0.60	m/s
MIN PEAK FACTOR (RES.)=	2.0	COMMERCIAL	28,000	L/ha/day	MAXIMUM VELOCITY	3.00	m/s
PEAKING FACTOR (INDUSTRIAL):	2.4	INDUSTRIAL (HEAVY)	55,000	L/ha/day	MANNINGS n	0.013	
PEAKING FACTOR (ICI >20%):	1.5	INDUSTRIAL (LIGHT)	35,000	L/ha/day	BEDDING CLASS	B	
PERSONS / 1 BEDROOM	1.4	INSTITUTIONAL	28,000	L/ha/day	MINIMUM COVER	2.50	m
PERSONS / 2 BEDROOM	2.1						
PERSONS / 3 BEDROOM	3.1	INFILTRATION	0.33	L/s/ha	HARMON CORRECTION FACTOR	0.8	
PERSONS / TOWNHOME	2.7						

LOCATION			RESIDENTIAL AREA AND POPULATION										COMMERCIAL		INDUSTRIAL (L)		INDUSTRIAL (H)		INSTITUTIONAL		GREEN / UNUSED		C+I+I	INFILTRATION			TOTAL	PIPE								
AREA ID NUMBER	FROM M.H.	TO M.H.	AREA (ha)	1 BEDROOM	2 BEDROOM	3 BEDROOM	TOWNHOME	POP.	CUMULATIVE AREA (ha)	CUMULATIVE POP.	PEAK FACT.	PEAK FLOW (L/s)	AREA (ha)	ACCU. AREA (ha)	AREA (ha)	ACCU. AREA (ha)	AREA (ha)	ACCU. AREA (ha)	AREA (ha)	ACCU. AREA (ha)	AREA (ha)	ACCU. AREA (ha)	PEAK FLOW (L/s)	TOTAL AREA (ha)	ACCU. AREA (ha)	INFILT. FLOW (L/s)	FLOW (L/s)	LENGTH (m)	DIA (mm)	MATERIAL	CLASS	SLOPE (%)	CAP. (FULL) (l/s)	CAP. V PEAK FLOW (%)	VEL. (FULL) (m/s)	VEL. (ACT.) (m/s)
Proposed Site	BLDG A	MHSA26885	1.320	714	186	52	0	1551	1.320	1551	3.67	18.45	0.228	0.228	0.000	0.00	0.000	0.00	0.000	0.00	0.000	0.00	0.11	1.548	1.548	0.51	19.07	10.0	150	PVC	SDR 35	1.00	15.3	**124.40%**	0.86	0.86
	BLDG B																																		
	BLDG C																																		

B.2 SANITARY SEWER CAPACITY (CITY CORRESPONDENCE)

From: Bramah, Bruce
To: Mott, Peter
Cc: Moroz, Peter; Thiffault, Dustin
Subject: RE: Sanitary Sewer Capacity - 1345 Baseline Road
Date: Friday, June 10, 2022 8:30:35 AM

Hi Peter,

We are currently looking into the available capacity for the Baseline SAN sewer. With all the developments in the area, we need to determine expected timelines for construction as potential sewer improvements may be required.
Please let me know the expected start and completion time of 1345 Baseline.
Thank you,

Bruce Bramah, EIT
Project Manager
Planning, Real Estate and Economic Development Department / Direction générale de la planification, des biens immobiliers et du développement économique
Development Review - South Branch
City of Ottawa | Ville d'Ottawa
110 Laurier Avenue West Ottawa, ON | 110, avenue. Laurier Ouest. Ottawa (Ontario) K1P 1J1
613.580.2424 ext./poste 29686, Bruce.Bramah@ottawa.ca

From: Mott, Peter <Peter.Mott@stantec.com>
Sent: June 08, 2022 1:05 PM
To: Bramah, Bruce <bruce.bramah@ottawa.ca>
Cc: Moroz, Peter <peter.moroz@stantec.com>; Thiffault, Dustin <dustin.thiffault@stantec.com>
Subject: Sanitary Sewer Capacity - 1345 Baseline Road

Good afternoon Bruce,

We are currently working on servicing the three high-rise residential apartment buildings at 1345 Baseline Road . The proposed development of a 28 storey, 24 storey, and 32 storey building comprises a total of 760 one-bedroom units, 144 two bedrooms units, and 52 three bedroom units designed to contain a total population of 1528 persons.

We intend to connect to the existing 225 mm diameter concrete sanitary sewer on Baseline Road. Can you please confirm if there is adequate capacity to capture 18.2 L/s into the receiving and downstream wastewater system from the proposed development?

Thanks for your time.

Best,

Peter Mott EIT

Engineering Intern, Community Development

Mobile: +1 (343) 999-8172
Peter.Mott@stantec.com
Stantec
400 - 1331 Clyde Avenue
Ottawa ON K2C 3G4

Appendix C – STORMWATER MANAGEMENT

C.1 STORM SEWER DESIGN SHEET

Stantec

1345 Baseline Road

DATE: 2022-06-14
REVISION: 1
DESIGNED BY: PM
FILE NUMBER: 160410394
CHECKED BY:

STORM SEWER DESIGN SHEET
(City of Ottawa)

DESIGN PARAMETERS

$I = a / (t+b)^c$ (As per City of Ottawa Guidelines, 2012)

	1:5 yr	1:100 yr
a =	998.071	1735.688
b =	6.053	6.014
c =	0.814	0.820

MANNING'S n = 0.013 BEDDING CLASS = B
MINIMUM COVER: 2.00 m
TIME OF ENTRY 10 min

LOCATION			DRAINAGE AREA															PIPE SELECTION										
AREA ID NUMBER	FROM M.H.	TO M.H.	AREA (5-YEAR) (ha)	AREA (10-YEAR) (ha)	AREA (ROOF) (ha)	C (-)	ACCUM. AREA (5YR) (ha)	A x C (5-YEAR) (ha)	ACCUM. AxC (5YR) (ha)	ACCUM. AREA (100YR) (ha)	A x C (100-YEAR) (ha)	ACCUM. AxC (100YR) (ha)	T of C (min)	$I_{5\text{-YEAR}}$ (mm/h)	$I_{10\text{-YEAR}}$ (mm/h)	$Q_{CONTROL}$ (L/s)	ACCUM. $Q_{CONTROL}$ (L/s)	Q_{ACT} (CIA/360) (L/s)	LENGTH (m)	PIPE WIDTH OR DIAMETEI (mm)	PIPE HEIGHT (mm)	PIPE SHAPE (-)	MATERIAL (-)	CLASS (-)	SLOPE %	Q_{CAP} (FULL) (L/s)	% FULL (-)	VEL. (FULL) (m/s)	VEL. (ACT) (m/s)	TIME OF FLOW (min)
1345 Baseline Road.	BLDG	CISTRN	0.820	0.00	0.50	0.72	0.820	0.590	0.590	0.00	0.000	0.000	10.00	104.19	178.56	100.00	100.0	270.9	10.0	300	300	CIRCULAR	PVC	DR 28	1.00	96.2	**281.72%**	1.37	1.37	0.12
	CISTRN	Ex.Main	0.000	0.00	0.00	0.72	0.000	0.000	0.590	0.00	0.000	0.000	10.12	103.55	177.45	100.00	100.0	269.8	10.0	300	300	CIRCULAR	PVC	DR 28	1.00	96.2	**280.63%**	1.37	1.37	0.12
													10.24																	

C.2 MODIFIED RATIONAL METHOD CALCULATIONS

Stormwater Management Calculations

File No: **PROJECT #**
Project: **PROJECT DESCRIPTION**
Date: **DATE**

SWM Approach:
Post-development to Pre-development flows

Post-Development Site Conditions:

Overall Runoff Coefficient for Site and Sub-Catchment Areas

Runoff Coefficient Table

Catchment Type	Sub-catchment Area ID / Description		Area (ha) "A"		Runoff Coefficient "C"	"A x C"		Overall Runoff Coefficient
Uncontrolled - Tributary	CISTRN-1	Hard	0.364		0.9	0.328		
		Soft	0.136		0.2	0.027		
		Subtotal		0.5			0.355	0.710
Controlled - Tributary	CISTRN-2	Hard	0.030		0.9	0.027		
		Soft	0.000		0.2	0.000		
		Subtotal		0.03			0.027	0.900
Uncontrolled - Tributary	CISTRN-3	Hard	0.020		0.9	0.018		
		Soft	0.000		0.2	0.000		
		Subtotal		0.02			0.018	0.900
Uncontrolled - Tributary	CISTRN-4	Hard	0.000		0.9	0.000		
		Soft	0.060		0.2	0.012		
		Subtotal		0.06			0.012	0.200
Roof	ROOF-1	Hard	0.090		0.9	0.081		
		Soft	0.000		0.2	0.000		
		Subtotal		0.09			0.081	0.900
Roof	ROOF-2	Hard	0.110		0.9	0.099		
		Soft	0.000		0.2	0.000		
		Subtotal		0.11			0.099	0.900
Roof	ROOF-3	Hard	0.120		0.9	0.108		
		Soft	0.000		0.2	0.000		
		Subtotal		0.12			0.108	0.900
Roof	ROOF-4	Hard	0.180		0.9	0.162		
		Soft	0.000		0.2	0.000		
		Subtotal		0.18			0.162	0.900
Controlled - Tributary	EXT-1	Hard	0.046		0.9	0.042		
		Soft	0.134		0.2	0.027		
		Subtotal		0.18			0.0684	0.380
Uncontrolled - Non-Tributary	UNC-1	Hard	0.010		0.9	0.009		
		Soft	0.000		0.2	0.000		
		Subtotal		0.01			0.009	0.900
Uncontrolled - Non-Tributary	UNC-2	Hard	0.010		0.9	0.009		
		Soft	0.010		0.2	0.002		
		Subtotal		0.02			0.011	0.550
Total				**1.320**			**0.950**	
Overall Runoff Coefficient= C:								**0.72**

Total Roof Areas	**0.500 ha**
Total Tributary Surface Areas (Controlled and Uncontrolled)	**0.610 ha**
Total Tributary Area to Outlet	**1.110 ha**
Total Uncontrolled Areas (Non-Tributary)	**0.030 ha**
Total Site	**1.140 ha**

Stormwater Management Calculations

Project #PROJECT #, PROJECT DESCRIPTION
Modified Rational Method Calculatons for Storage

5 yr Intensity
City of Ottawa

$I = a/(t + b)^c$

a =	998.071
b =	6.053
c =	0.814

t (min)	I (mm/hr)
10	104.19
20	70.25
30	53.93
40	44.18
50	37.65
60	32.94
70	29.37
80	26.56
90	24.29
100	22.41
110	20.82
120	19.47

5 YEAR Predevelopment Target Release from Portion of Site

Subdrainage Area: Predevelopment Tributary Area to Outlet
Area (ha): 1.1400
C: 0.50

Typical Time of Concentration

tc (min)	I (2 yr) (mm/hr)	Qtarget (L/s)
10	76.81	**121.71**

5 YEAR Modified Rational Method for Entire Site

Subdrainage Area: CISTRN-1 (Flows to Stormwater Cistern) Uncontrolled - Tributary
Area (ha): 0.50
C: 0.71

tc (min)	I (5 yr) (mm/hr)	Qactual (L/s)	Qrelease (L/s)	Qstored (L/s)	Vstored (m^3)
10	104.19	102.83	102.83	0.00	**0.00**
20	70.25	69.33	69.33	0.00	**0.00**
30	53.93	53.22	53.22	0.00	**0.00**
40	44.18	43.61	43.61	0.00	**0.00**
50	37.65	37.16	37.16	0.00	**0.00**
60	32.94	32.51	32.51	0.00	**0.00**
70	29.37	28.99	28.99	0.00	**0.00**
80	26.56	26.21	26.21	0.00	**0.00**
90	24.29	23.97	23.97	0.00	**0.00**
100	22.41	22.11	22.11	0.00	**0.00**
110	20.82	20.55	20.55	0.00	**0.00**
120	19.47	19.21	19.21	0.00	**0.00**

Subdrainage Area: CISTRN-2 (Flows to Stormwater Cistern) Controlled - Tributary
Area (ha): 0.03
C: 0.90

tc (min)	I (5 yr) (mm/hr)	Qactual (L/s)	Qrelease (L/s)	Qstored (L/s)	Vstored (m^3)
10	104.19	138.67	100.00	38.67	**23.20**
20	70.25	100.61	100.00	0.61	0.74
30	53.93	82.11	100.00	0.00	0.00
40	44.18	70.90	100.00	0.00	0.00
50	37.65	63.25	100.00	0.00	0.00
60	32.94	57.62	100.00	0.00	0.00
70	29.37	53.26	100.00	0.00	0.00
80	26.56	49.75	100.00	0.00	0.00
90	24.29	46.80	100.00	0.00	0.00
100	22.41	44.28	100.00	0.00	0.00
110	20.82	42.05	100.00	0.00	0.00
120	19.47	40.09	100.00	0.00	0.00

1) All flows from ROOF-1, ROOF-2, ROOF-3, ROOF-4, CISTRN-1, CISTRN-2, CISTRN-3 and CISTRN-4 to be directed to a stormwater cistern.
2) Outflow from the 120 cu.m cistern to be set by pump (maximum outflow rate of 100 L/s)

	Stage	Head (m)	Discharge (L/s)	Vreq (cu. m)	Vavail (cu. m)	Volume Check
5-year Water Level	N/A	N/A	100.00	23.20	115.00	OK

Subdrainage Area: CISTRN-3 (Flows to Stormwater Cistern) Uncontrolled - Tributary
Area (ha): 0.02
C: 0.90

tc (min)	I (5 yr) (mm/hr)	Qactual (L/s)	Qrelease (L/s)	Qstored (L/s)	Vstored (m^3)
10	104.19	5.21	5.21	0.00	**0.00**
20	70.25	3.52	3.52	0.00	**0.00**
30	53.93	2.70	2.70	0.00	**0.00**
40	44.18	2.21	2.21	0.00	**0.00**
50	37.65	1.88	1.88	0.00	**0.00**
60	32.94	1.65	1.65	0.00	**0.00**
70	29.37	1.47	1.47	0.00	**0.00**
80	26.56	1.33	1.33	0.00	**0.00**
90	24.29	1.22	1.22	0.00	**0.00**
100	22.41	1.12	1.12	0.00	**0.00**
110	20.82	1.04	1.04	0.00	**0.00**
120	19.47	0.97	0.97	0.00	**0.00**

Subdrainage Area: CISTRN-4 (Flows to Stormwater Cistern) Uncontrolled - Tributary
Area (ha): 0.06
C: 0.20

tc (min)	I (5 yr) (mm/hr)	Qactual (L/s)	Qrelease (L/s)	Qstored (L/s)	Vstored (m^3)
10	104.19	3.48	3.48	0.00	**0.00**
20	70.25	2.34	2.34	0.00	**0.00**
30	53.93	1.80	1.80	0.00	**0.00**
40	44.18	1.47	1.47	0.00	**0.00**
50	37.65	1.26	1.26	0.00	**0.00**
60	32.94	1.10	1.10	0.00	**0.00**
70	29.37	0.98	0.98	0.00	**0.00**
80	26.56	0.89	0.89	0.00	**0.00**
90	24.29	0.81	0.81	0.00	**0.00**
100	22.41	0.75	0.75	0.00	**0.00**
110	20.82	0.69	0.69	0.00	**0.00**
120	19.47	0.65	0.65	0.00	**0.00**

Subdrainage Area: ROOF-1 Roof
Area (ha): 0.09 Maximum Storage Depth: 150 mm
C: 0.90

tc (min)	I (5 yr) (mm/hr)	Qactual (L/s)	Qrelease (L/s)	Qstored (L/s)	Vstored (m^3)	Depth (mm)	
10	104.19	23.46	3.85	19.61	11.76	102.7	0.00
20	70.25	15.82	4.00	11.82	14.18	108.6	0.00
30	53.93	12.14	4.03	8.11	14.60	**109.7**	0.00
40	44.18	9.95	4.01	5.94	14.26	108.8	0.00
50	37.65	8.48	3.96	4.51	13.54	107.1	0.00
60	32.94	7.42	3.91	3.51	12.64	104.8	0.00
70	29.37	6.61	3.85	2.77	11.63	102.4	0.00
80	26.56	5.98	3.78	2.20	10.58	99.7	0.00
90	24.29	5.47	3.68	1.79	9.65	95.9	0.00
100	22.41	5.05	3.59	1.46	8.74	92.2	0.00

Project #PROJECT #, PROJECT DESCRIPTION
Modified Rational Method Calculatons for Storage

100 yr Intensity
City of Ottawa

$I = a/(t + b)^c$

a =	1735.688
b =	6.014
c =	0.820

t (min)	I (mm/hr)
10	178.56
20	119.95
30	91.87
40	75.15
50	63.95
60	55.89
70	49.79
80	44.99
90	41.11
100	37.90
110	35.20
120	32.89

100 YEAR Predevelopment Target Release from Portion of Site

Subdrainage Area: Predevelopment Tributary Area to Outlet
Area (ha): 1.1400
C: 0.50

100 YEAR Modified Rational Method for Entire Site

Subdrainage Area: CISTRN-1 (Flows to Stormwater Cistern) Uncontrolled - Tributary
Area (ha): 0.50
C: 0.89

tc (min)	I (100 yr) (mm/hr)	Qactual (L/s)	Qrelease (L/s)	Qstored (L/s)	Vstored (m^3)
10	178.56	220.27	220.27	0.00	**0.00**
20	119.95	147.97	147.97	0.00	**0.00**
30	91.87	113.33	113.33	0.00	**0.00**
40	75.15	92.70	92.70	0.00	**0.00**
50	63.95	78.90	78.90	0.00	**0.00**
60	55.89	68.95	68.95	0.00	**0.00**
70	49.79	61.42	61.42	0.00	**0.00**
80	44.99	55.50	55.50	0.00	**0.00**
90	41.11	50.72	50.72	0.00	**0.00**
100	37.90	46.76	46.76	0.00	**0.00**
110	35.20	43.43	43.43	0.00	**0.00**
120	32.89	40.58	40.58	0.00	**0.00**

Subdrainage Area: CISTRN-2 (Flows to Stormwater Cistern) Controlled - Tributary
Area (ha): 0.03
C: 1.00

tc (min)	I (100 yr) (mm/hr)	Qactual (L/s)	Qrelease (L/s)	Qstored (L/s)	Vstored (m^3)
10	178.56	275.35	100.00	175.35	105.21
20	119.95	193.80	100.00	93.80	**112.56**
30	91.87	154.61	100.00	54.61	98.31
40	75.15	131.17	100.00	31.17	74.80
50	63.95	115.37	100.00	15.37	46.12
60	55.89	103.91	100.00	3.91	14.07
70	49.79	95.15	100.00	0.00	0.00
80	44.99	88.19	100.00	0.00	0.00
90	41.11	82.50	100.00	0.00	0.00
100	37.90	77.75	100.00	0.00	0.00
110	35.20	73.70	100.00	0.00	0.00
120	32.89	70.19	100.00	0.00	0.00

1) All flows from ROOF-1, ROOF-2, ROOF-3, ROOF-4, CISTRN-1, CISTRN-2, CISTRN-3 and CISTRN-4 to be directed to a stormwater cistern.
2) Outflow from the 120 cu.m cistern to be set by pump (maximum outflow rate of 100 L/s)

	Stage	Head (m)	Discharge (L/s)	Vreq (cu. m)	Vavail (cu. m)	Volume Check
100-year Water Level	N/A	N/A	100.00	112.56	115.00	OK
			Excess storage (m3):		2.44	

Subdrainage Area: CISTRN-3 (Flows to Stormwater Cistern) Uncontrolled - Tributary
Area (ha): 0.02
C: 1.00

tc (min)	I (100 yr) (mm/hr)	Qactual (L/s)	Qrelease (L/s)	Qstored (L/s)	Vstored (m^3)
10	178.56	9.93	9.93	0.00	**0.00**
20	119.95	6.67	6.67	0.00	**0.00**
30	91.87	5.11	5.11	0.00	**0.00**
40	75.15	4.18	4.18	0.00	**0.00**
50	63.95	3.56	3.56	0.00	**0.00**
60	55.89	3.11	3.11	0.00	**0.00**
70	49.79	2.77	2.77	0.00	**0.00**
80	44.99	2.50	2.50	0.00	**0.00**
90	41.11	2.29	2.29	0.00	**0.00**
100	37.90	2.11	2.11	0.00	**0.00**
110	35.20	1.96	1.96	0.00	**0.00**
120	32.89	1.83	1.83	0.00	**0.00**

Subdrainage Area: CISTRN-4 (Flows to Stormwater Cistern) Uncontrolled - Tributary
Area (ha): 0.06
C: 0.25

tc (min)	I (100 yr) (mm/hr)	Qactual (L/s)	Qrelease (L/s)	Qstored (L/s)	Vstored (m^3)
10	178.56	7.45	7.45	0.00	**0.00**
20	119.95	5.00	5.00	0.00	**0.00**
30	91.87	3.83	3.83	0.00	**0.00**
40	75.15	3.13	3.13	0.00	**0.00**
50	63.95	2.67	2.67	0.00	**0.00**
60	55.89	2.33	2.33	0.00	**0.00**
70	49.79	2.08	2.08	0.00	**0.00**
80	44.99	1.88	1.88	0.00	**0.00**
90	41.11	1.71	1.71	0.00	**0.00**
100	37.90	1.58	1.58	0.00	**0.00**
110	35.20	1.47	1.47	0.00	**0.00**
120	32.89	1.37	1.37	0.00	**0.00**

Subdrainage Area: ROOF-1 Roof
Area (ha): 0.09 Maximum Storage Depth: 150 mm
C: 1.00

tc (min)	I (100 yr) (mm/hr)	Qactual (L/s)	Qrelease (L/s)	Qstored (L/s)	Vstored (m^3)	Depth (mm)	
10	178.56	44.68	4.55	40.12	24.07	130.3	0.00
20	119.95	30.01	4.81	25.20	30.24	140.5	0.00
30	91.87	22.99	4.90	18.08	32.55	144.3	0.00
40	75.15	18.80	4.93	13.87	33.28	**145.5**	0.00
50	63.95	16.00	4.93	11.07	33.21	145.4	0.00
60	55.89	13.98	4.91	9.08	32.67	144.5	0.00
70	49.79	12.46	4.87	7.58	31.85	143.2	0.00
80	44.99	11.26	4.83	6.42	30.84	141.5	0.00
90	41.11	10.29	4.79	5.50	29.70	139.6	0.00
100	37.90	9.48	4.73	4.75	28.49	137.6	0.00

Stormwater Management Calculations

Project #PROJECT #, PROJECT DESCRIPTION
Modified Rational Method Calculatons for Storage

110	20.82	4.69	3.50	1.19	7.86	88.6	0.00
120	19.47	4.38	3.41	0.97	7.00	85.2	0.00

Storage: Roof Storage

	Depth (mm)	Head (m)	Discharge (L/s)	Vreq (cu. m)	Vavail (cu. m)	Discharge Check
5-year Water Level	109.68	0.11	4.0	14.6	36.0	0.0

Subdrainage Area: ROOF-2 Roof
Area (ha): 0.11 Maximum Storage Depth: 150 mm
C: 0.90

tc (min)	I (5 yr) (mm/hr)	Qactual (L/s)	Qrelease (L/s)	Qstored (L/s)	Vstored (m^3)	Depth (mm)	
10	104.19	28.68	3.88	24.80	14.88	103.7	0.00
20	70.25	19.33	4.05	15.28	18.34	110.7	0.00
30	53.93	14.84	4.10	10.74	19.33	112.7	0.00
40	44.18	12.16	4.11	8.05	19.33	**112.7**	0.00
50	37.65	10.36	4.08	6.28	18.85	111.7	0.00
60	32.94	9.07	4.04	5.02	18.09	110.2	0.00
70	29.37	8.08	4.00	4.09	17.17	108.3	0.00
80	26.56	7.31	3.94	3.37	16.16	106.3	0.00
90	24.29	6.68	3.89	2.79	15.09	104.1	0.00
100	22.41	6.17	3.83	2.33	14.00	101.9	0.00
110	20.82	5.73	3.77	1.96	12.91	99.6	0.00
120	19.47	5.36	3.70	1.66	11.97	96.4	0.00

Storage: Roof Storage

	Depth (mm)	Head (m)	Discharge (L/s)	Vreq (cu. m)	Vavail (cu. m)	Discharge Check
5-year Water Level	112.66	0.11	4.1	19.3	44.0	0.0

Subdrainage Area: ROOF-3 Roof
Area (ha): 0.12 Maximum Storage Depth: 150 mm
C: 0.90

tc (min)	I (5 yr) (mm/hr)	Qactual (L/s)	Qrelease (L/s)	Qstored (L/s)	Vstored (m^3)	Depth (mm)	
10	104.19	31.28	4.83	26.46	15.87	103.0	0.00
20	70.25	21.09	5.03	16.07	19.28	109.3	0.00
30	53.93	16.19	5.07	11.12	20.02	**110.7**	0.00
40	44.18	13.27	5.05	8.21	19.72	110.1	0.00
50	37.65	11.30	5.00	6.30	18.90	108.6	0.00
60	32.94	9.89	4.94	4.95	17.82	106.6	0.00
70	29.37	8.82	4.87	3.95	16.59	104.4	0.00
80	26.56	7.97	4.79	3.18	15.27	101.9	0.00
90	24.29	7.29	4.71	2.59	13.96	99.2	0.00
100	22.41	6.73	4.59	2.13	12.80	95.7	0.00
110	20.82	6.25	4.49	1.77	11.66	92.2	0.00
120	19.47	5.84	4.38	1.47	10.55	88.8	0.00

Storage: Roof Storage

	Depth (mm)	Head (m)	Discharge (L/s)	Vreq (cu. m)	Vavail (cu. m)	Discharge Check
5-year Water Level	110.69	0.11	5.1	20.0	48.0	0.0

Subdrainage Area: ROOF-4 Roof
Area (ha): 0.18 Maximum Storage Depth: 150 mm
C: 0.90

tc (min)	I (5 yr) (mm/hr)	Qactual (L/s)	Qrelease (L/s)	Qstored (L/s)	Vstored (m^3)	Depth (mm)	
10	104.19	46.92	6.77	40.15	24.09	103.4	0.00
20	70.25	31.64	7.07	24.57	29.49	110.0	0.00
30	53.93	24.29	7.14	17.15	30.86	**111.7**	0.00
40	44.18	19.90	7.13	12.77	30.65	111.4	0.00
50	37.65	16.96	7.08	9.88	29.65	110.2	0.00
60	32.94	14.84	7.00	7.84	28.22	108.5	0.00
70	29.37	13.23	6.91	6.32	26.55	106.4	0.00
80	26.56	11.96	6.81	5.15	24.74	104.2	0.00
90	24.29	10.94	6.71	4.23	22.85	101.9	0.00
100	22.41	10.09	6.59	3.50	20.99	99.3	0.00
110	20.82	9.38	6.45	2.93	19.35	96.0	0.00
120	19.47	8.77	6.30	2.46	17.74	92.7	0.00

Storage: Roof Storage

	Depth (mm)	Head (m)	Discharge (L/s)	Vreq (cu. m)	Vavail (cu. m)	Discharge Check
5-year Water Level	111.71	0.11	7.1	30.9	72.0	0.0

Subdrainage Area: EXT-1 Controlled - Tributary
Area (ha): 0.18 Parkland to be conveyed to City (To be controlled independently from Development)
C: 0.38

tc (min)	I (5 yr) (mm/hr)	Qactual (L/s)	Qrelease (L/s)	Qstored (L/s)	Vstored (m^3)
10	104.19	19.81	19.81	0.00	**0.00**
20	70.25	13.36	13.36	0.00	**0.00**
30	53.93	10.25	10.25	0.00	**0.00**
40	44.18	8.40	8.40	0.00	**0.00**
50	37.65	7.16	7.16	0.00	**0.00**
60	32.94	6.26	6.26	0.00	**0.00**
70	29.37	5.59	5.59	0.00	**0.00**
80	26.56	5.05	5.05	0.00	**0.00**
90	24.29	4.62	4.62	0.00	**0.00**
100	22.41	4.26	4.26	0.00	**0.00**
110	20.82	3.96	3.96	0.00	**0.00**
120	19.47	3.70	3.70	0.00	**0.00**

Storage: Surface Storage Above CB

Orifice Equation: = CdA(2gh)^0.5 Where C = 0.61
Orifice Diameter: 127.00 mm
Invert Elevation 98.60 m
T/G Elevation 100.42 m
Max Ponding Depth 0.00 m
Downstream W/L 0.00 m

	Stage	Head (m)	Discharge (L/s)	Vreq (cu. m)	Vavail (cu. m)	Volume Check
5-year Water Level	100.42	1.82	46.18	0.00	0.00	Adjust ICD

Subdrainage Area: UNC-1 Uncontrolled - Non-Tributary
Area (ha): 0.01
C: 0.90

tc (min)	I (5 yr) (mm/hr)	Qactual (L/s)	Qrelease (L/s)	Qstored (L/s)	Vstored (m^3)
10	104.19	2.61	2.61		
20	70.25	1.76	1.76		
30	53.93	1.35	1.35		
40	44.18	1.11	1.11		
50	37.65	0.94	0.94		
60	32.94	0.82	0.82		
70	29.37	0.73	0.73		
80	26.56	0.66	0.66		
90	24.29	0.61	0.61		
100	22.41	0.56	0.56		

Project #PROJECT #, PROJECT DESCRIPTION
Modified Rational Method Calculatons for Storage

110	35.20	8.81	4.68	4.13	27.23	135.5	0.00
120	32.89	8.23	4.63	3.60	25.93	133.4	0.00

Storage: Roof Storage

	Depth (mm)	Head (m)	Discharge (L/s)	Vreq (cu. m)	Vavail (cu. m)	Discharge Check
100-year Water Level	145.52	0.15	4.9	33.3	36.0	0.0

Subdrainage Area: ROOF-2 Roof
Area (ha): 0.11 Maximum Storage Depth: 150 mm
C: 1.00

tc (min)	I (100 yr) (mm/hr)	Qactual (L/s)	Qrelease (L/s)	Qstored (L/s)	Vstored (m^3)	Depth (mm)	
10	178.56	54.60	4.57	50.03	30.02	131.1	0.00
20	119.95	36.68	4.85	31.83	38.20	142.2	0.00
30	91.87	28.09	4.97	23.13	41.63	146.8	0.00
40	75.15	22.98	5.02	17.96	43.11	148.8	0.00
50	63.95	19.56	5.03	14.52	43.57	**149.4**	0.00
60	55.89	17.09	5.03	12.06	43.43	149.2	0.00
70	49.79	15.23	5.01	10.22	42.91	148.5	0.00
80	44.99	13.76	4.98	8.77	42.12	147.5	0.00
90	41.11	12.57	4.95	7.62	41.16	146.2	0.00
100	37.90	11.59	4.91	6.68	40.06	144.7	0.00
110	35.20	10.76	4.87	5.89	38.89	143.1	0.00
120	32.89	10.06	4.83	5.23	37.64	141.4	0.00

Storage: Roof Storage

	Depth (mm)	Head (m)	Discharge (L/s)	Vreq (cu. m)	Vavail (cu. m)	Discharge Check
100-year Water Level	149.42	0.15	5.0	43.6	44.0	0.0

Subdrainage Area: ROOF-3 Roof
Area (ha): 0.12 Maximum Storage Depth: 150 mm
C: 1.00

tc (min)	I (100 yr) (mm/hr)	Qactual (L/s)	Qrelease (L/s)	Qstored (L/s)	Vstored (m^3)	Depth (mm)	
10	178.56	59.57	5.70	53.87	32.32	130.6	0.00
20	119.95	40.02	6.03	33.99	40.79	141.1	0.00
30	91.87	30.65	6.16	24.49	44.08	145.2	0.00
40	75.15	25.07	6.20	18.87	45.28	146.6	0.00
50	63.95	21.34	6.21	15.13	45.38	**146.8**	0.00
60	55.89	18.65	6.19	12.46	44.86	146.1	0.00
70	49.79	16.61	6.15	10.46	43.93	145.0	0.00
80	44.99	15.01	6.10	8.90	42.74	143.5	0.00
90	41.11	13.71	6.05	7.66	41.38	141.8	0.00
100	37.90	12.64	5.99	6.65	39.91	140.0	0.00
110	35.20	11.74	5.93	5.81	38.35	138.1	0.00
120	32.89	10.97	5.87	5.10	36.75	136.1	0.00

Storage: Roof Storage

	Depth (mm)	Head (m)	Discharge (L/s)	Vreq (cu. m)	Vavail (cu. m)	Discharge Check
100-year Water Level	146.77	0.15	6.2	45.4	48.0	0.0

Subdrainage Area: ROOF-4 Roof
Area (ha): 0.18 Maximum Storage Depth: 150 mm
C: 1.00

tc (min)	I (100 yr) (mm/hr)	Qactual (L/s)	Qrelease (L/s)	Qstored (L/s)	Vstored (m^3)	Depth (mm)	
10	178.56	89.35	7.99	81.36	48.82	130.9	0.00
20	119.95	60.02	8.46	51.56	61.87	141.7	0.00
30	91.87	45.97	8.66	37.31	67.17	146.0	0.00
40	75.15	37.60	8.73	28.87	69.29	147.8	0.00
50	63.95	32.00	8.75	23.25	69.76	**148.1**	0.00
60	55.89	27.97	8.73	19.24	69.25	147.7	0.00
70	49.79	24.91	8.69	16.22	68.14	146.8	0.00
80	44.99	22.51	8.64	13.88	66.61	145.6	0.00
90	41.11	20.57	8.57	12.00	64.81	144.1	0.00
100	37.90	18.97	8.50	10.47	62.81	142.4	0.00
110	35.20	17.62	8.42	9.19	60.68	140.7	0.00
120	32.89	16.46	8.34	8.12	58.47	138.8	0.00

Storage: Roof Storage

	Depth (mm)	Head (m)	Discharge (L/s)	Vreq (cu. m)	Vavail (cu. m)	Discharge Check
100-year Water Level	148.15	0.15	8.8	69.8	72.0	0.0

Subdrainage Area: EXT-1 Controlled - Tributary
Area (ha): 0.18 Parkland to be conveyed to City (To be controlled independently from Development)
C: 0.48

tc (min)	I (100 yr) (mm/hr)	Qactual (L/s)	Qrelease (L/s)	Qstored (L/s)	Vstored (m^3)
10	178.56	42.44	42.44	0.00	**0.00**
20	119.95	28.51	28.51	0.00	**0.00**
30	91.87	21.84	21.84	0.00	**0.00**
40	75.15	17.86	17.86	0.00	**0.00**
50	63.95	15.20	15.20	0.00	**0.00**
60	55.89	13.29	13.29	0.00	**0.00**
70	49.79	11.83	11.83	0.00	**0.00**
80	44.99	10.69	10.69	0.00	**0.00**
90	41.11	9.77	9.77	0.00	**0.00**
100	37.90	9.01	9.01	0.00	**0.00**
110	35.20	8.37	8.37	0.00	**0.00**
120	32.89	7.82	7.82	0.00	**0.00**

Storage: Surface Storage Above CB

Orifice Equation: Q = CdA(2gh)^0.5 Where C = 0.61
Orifice Diameter: 127.00 mm
Invert Elevation 98.60 m
T/G Elevation 100.42 m
Max Ponding Depth 0.00 m
Downstream W/L 0.00 m

	Stage	Head (m)	Discharge (L/s)	Vreq (cu. m)	Vavail (cu. m)	Volume Check
100-year Water Level	100.42	1.82	46.18	0.00	0.00	OK
					0.00	

Subdrainage Area: UNC-1 Uncontrolled - Non-Tributary
Area (ha): 0.01
C: 1.00

tc (min)	I (100 yr) (mm/hr)	Qactual (L/s)	Qrelease (L/s)	Qstored (L/s)	Vstored (m^3)
10	178.56	4.96	4.96		
20	119.95	3.33	3.33		
30	91.87	2.55	2.55		
40	75.15	2.09	2.09		
50	63.95	1.78	1.78		
60	55.89	1.55	1.55		
70	49.79	1.38	1.38		
80	44.99	1.25	1.25		
90	41.11	1.14	1.14		
100	37.90	1.05	1.05		

Stormwater Management Calculations

Project #PROJECT #, PROJECT DESCRIPTION
Modified Rational Method Calculatons for Storage

110	20.82	0.52	0.52
120	19.47	0.49	0.49

Subdrainage Area: UNC-2 Uncontrolled - Non-Tributary
Area (ha): 0.02
C: 0.55

tc (min)	I (5 yr) (mm/hr)	Qactual (L/s)	Qrelease (L/s)	Qstored (L/s)	Vstored (m^3)
10	104.19	3.19	3.19		
20	70.25	2.15	2.15		
30	53.93	1.65	1.65		
40	44.18	1.35	1.35		
50	37.65	1.15	1.15		
60	32.94	1.01	1.01		
70	29.37	0.90	0.90		
80	26.56	0.81	0.81		
90	24.29	0.74	0.74		
100	22.41	0.69	0.69		
110	20.82	0.64	0.64		
120	19.47	0.60	0.60		

SUMMARY TO OUTLET

			Cistern + Roof Storage: Vrequired	Vavailable*	
Tributary Area (Controlled)	1.110	ha			
Maximum 5yr Flow to Sewer	100	L/s	108	315 m^3	Ok
Tributary Area (Uncontrolled)	0.030	ha			
Maximum 5yr Flow Uncontrolled	6	L/s			
Total Area	1.140	ha			
Total 5yr Flow	105.8	L/s			
Target	**122**	**L/s**			

Project #PROJECT #, PROJECT DESCRIPTION
Modified Rational Method Calculatons for Storage

110	35.20	0.98	0.98
120	32.89	0.91	0.91

Subdrainage Area: UNC-2 Uncontrolled - Non-Tributary
Area (ha): 0.02
C: 0.69

tc (min)	I (100 yr) (mm/hr)	Qactual (L/s)	Qrelease (L/s)	Qstored (L/s)	Vstored (m^3)
10	178.56	6.83	6.83		
20	119.95	4.59	4.59		
30	91.87	3.51	3.51		
40	75.15	2.87	2.87		
50	63.95	2.44	2.44		
60	55.89	2.14	2.14		
70	49.79	1.90	1.90		
80	44.99	1.72	1.72		
90	41.11	1.57	1.57		
100	37.90	1.45	1.45		
110	35.20	1.35	1.35		
120	32.89	1.26	1.26		

SUMMARY TO OUTLET

			Cistern + Roof Storage: Vrequired	Vavailable*	
Tributary Area (Controlled)	1.110	ha			
Maximum 100yr Flow to Sewer	100	L/s	305	315 m^3	Ok
Tributary Area (Uncontrolled)	0.030	ha			
Maximum 100yr Flow Uncontrolled	12	L/s			
Total Area	1.140	ha			
Total 100yr Flow	111.8	L/s			
Target	**122**	**L/s**			

Project #PROJECT #, PROJECT DESCRIPTION
Roof Drain Design Sheet, Area ROOF-1
Standard Watts Model R1100 Accuflow Roof Drain

Rating Curve				Volume Estimation				
Elevation (m)	Discharge Rate (cu.m/s)	Outlet Discharge (cu.m/s)	Storage (cu. m)	Elevation (m)	Area (sq. m)	Volume (cu. m) Increment	Volume (cu. m) Accumulated	Water Depth (m)
0.000	0.0000	0.0000	0	0.000	0	0	0	0.000
0.025	0.0003	0.0013	0	0.025	20	0	0	0.025
0.050	0.0006	0.0025	1	0.050	80	1	1	0.050
0.075	0.0008	0.0032	5	0.075	180	3	5	0.075
0.100	0.0009	0.0038	11	0.100	320	6	11	0.100
0.125	0.0011	0.0044	21	0.125	500	10	21	0.125
0.150	0.0013	0.0050	36	0.150	720	15	36	0.150

Drawdown Estimate			
Total Volume (cu.m)	Total Time (sec)	Vol (cu.m)	Detention Time (hr)
0.0	0.0	0.0	0
1.2	462.3	1.2	0.12842
4.3	1003.9	3.2	0.40727
10.5	1629.1	6.2	0.85978
20.7	2302.1	10.2	1.49925
35.8	3005.0	15.2	2.33396

Rooftop Storage Summary		
Total Building Area (sq.m)		900
Assume Available Roof Area (sq.m)	80%	720
Roof Imperviousness		0.99
Roof Drain Requirement (sq.m/Notch)		232
Number of Roof Notches*		4
Max. Allowable Depth of Roof Ponding (m)		0.15
Max. Allowable Storage (cu.m)		36
Estimated 100 Year Drawdown Time (h)		2.2

* As per Ontario Building Code section OBC 7.4.10.4.(2)(c).

From Watts Drain Catalogue

Head (m)	L/s Open	75%	**50%**	25%	Closed
0.025	0.3155	0.31545	**0.31545**	0.31545	0.31545
0.050	0.6309	0.6309	**0.6309**	0.6309	0.6309
0.075	0.9464	0.86749	**0.78863**	0.70976	0.6309
0.100	1.2618	1.10408	**0.94635**	0.78863	0.6309
0.125	1.5773	1.34067	**1.10408**	0.86749	0.6309
0.150	1.8927	1.57726	**1.2618**	0.94635	0.6309

* Note: Number of drains can be reduced if multiple-notch drain used.

Calculation Results	5yr	100yr	Available
Qresult (cu.m/s)	0.004	0.005	-
Depth (m)	0.110	0.146	0.150
Volume (cu.m)	14.6	33.3	36.0
Draintime (hrs)	1.1	2.2	

Project #PROJECT #, PROJECT DESCRIPTION
Roof Drain Design Sheet, Area ROOF-2
Standard Watts Model R1100 Accuflow Roof Drain

Rating Curve				Volume Estimation				
Elevation (m)	Discharge Rate (cu.m/s)	Outlet Discharge (cu.m/s)	Storage (cu. m)	Elevation (m)	Area (sq. m)	Volume (cu. m) Increment	Volume (cu. m) Accumulated	Water Depth (m)
0.000	0.0000	0.0000	0	0.000	0	0	0	0.000
0.025	0.0003	0.0013	0	0.025	24	0	0	0.025
0.050	0.0006	0.0025	2	0.050	98	1	2	0.050
0.075	0.0008	0.0032	6	0.075	220	4	6	0.075
0.100	0.0009	0.0038	13	0.100	391	8	13	0.100
0.125	0.0011	0.0044	25	0.125	611	12	25	0.125
0.150	0.0013	0.0050	44	0.150	880	19	44	0.150

Drawdown Estimate			
Total Volume (cu.m)	Total Time (sec)	Vol (cu.m)	Detention Time (hr)
0.0	0.0	0.0	0
1.4	565.0	1.4	0.15695
5.3	1226.9	3.9	0.49777
12.8	1991.1	7.5	1.05084
25.3	2813.6	12.4	1.83241
43.8	3672.7	18.5	2.85261

Rooftop Storage Summary

Total Building Area (sq.m)		1100
Assume Available Roof Area (sq.	80%	880
Roof Imperviousness		0.99
Roof Drain Requirement (sq.m/Notch)		232
Number of Roof Notches*		4
Max. Allowable Depth of Roof Ponding (m)		0.15
Max. Allowable Storage (cu.m)		44
Estimated 100 Year Drawdown Time (h)		2.8

* As per Ontario Building Code section OBC 7.4.10.4.(2)(c).

From Watts Drain Catalogue

Head (m)	L/s Open	75%	**50%**	25%	Closed
0.025	0.3155	0.31545	**0.31545**	0.31545	0.31545
0.050	0.6309	0.6309	**0.6309**	0.6309	0.6309
0.075	0.9464	0.86749	**0.78863**	0.70976	0.6309
0.100	1.2618	1.10408	**0.94635**	0.78863	0.6309
0.125	1.5773	1.34067	**1.10408**	0.86749	0.6309
0.150	1.8927	1.57726	**1.2618**	0.94635	0.6309

* Note: Number of drains can be reduced if multiple-notch drain used.

Calculation Results	5yr	100yr	Available
Qresult (cu.m/s)	0.004	0.005	-
Depth (m)	0.113	0.149	0.150
Volume (cu.m)	19.3	43.6	44.0
Draintime (hrs)	1.5	2.8	

Project #PROJECT #, PROJECT DESCRIPTION
Roof Drain Design Sheet, Area ROOF-3
Standard Watts Model R1100 Accuflow Roof Drain

Rating Curve				Volume Estimation				
Elevation (m)	Discharge Rate (cu.m/s)	Outlet Discharge (cu.m/s)	Storage (cu. m)	Elevation (m)	Area (sq. m)	Volume (cu. m) Increment	Volume (cu. m) Accumulated	Water Depth (m)
0.000	0.0000	0.0000	0	0.000	0	0	0	0.000
0.025	0.0003	0.0016	0	0.025	27	0	0	0.025
0.050	0.0006	0.0032	2	0.050	107	2	2	0.050
0.075	0.0008	0.0039	6	0.075	240	4	6	0.075
0.100	0.0009	0.0047	14	0.100	427	8	14	0.100
0.125	0.0011	0.0055	28	0.125	667	14	28	0.125
0.150	0.0013	0.0063	48	0.150	960	20	48	0.150

Drawdown Estimate			
Total Volume (cu.m)	Total Time (sec)	Vol (cu.m)	Detention Time (hr)
0.0	0.0	0.0	0
1.6	493.1	1.6	0.13698
5.8	1070.8	4.2	0.43442
14.0	1737.7	8.2	0.9171
27.6	2455.5	13.6	1.5992
47.8	3205.3	20.2	2.48955

Rooftop Storage Summary

Total Building Area (sq.m)		1200
Assume Available Roof Area (sq.	80%	960
Roof Imperviousness		0.99
Roof Drain Requirement (sq.m/Notch)		232
Number of Roof Notches*		5
Max. Allowable Depth of Roof Ponding (m)		0.15
Max. Allowable Storage (cu.m)		48
Estimated 100 Year Drawdown Time (h)		2.4

* As per Ontario Building Code section OBC 7.4.10.4.(2)(c).

From Watts Drain Catalogue

Head (m)	L/s Open	75%	**50%**	25%	Closed
0.025	0.3155	0.31545	**0.31545**	0.31545	0.31545
0.050	0.6309	0.6309	**0.6309**	0.6309	0.6309
0.075	0.9464	0.86749	**0.78863**	0.70976	0.6309
0.100	1.2618	1.10408	**0.94635**	0.78863	0.6309
0.125	1.5773	1.34067	**1.10408**	0.86749	0.6309
0.150	1.8927	1.57726	**1.2618**	0.94635	0.6309

* Note: Number of drains can be reduced if multiple-notch drain used.

Calculation Results	5yr	100yr	Available
Qresult (cu.m/s)	0.005	0.006	-
Depth (m)	0.111	0.147	0.150
Volume (cu.m)	20.0	45.4	48.0
Draintime (hrs)	1.2	2.4	

Project #PROJECT #, PROJECT DESCRIPTION
Roof Drain Design Sheet, Area ROOF-4
Standard Watts Model R1100 Accuflow Roof Drain

Rating Curve				Volume Estimation				
Elevation (m)	Discharge Rate (cu.m/s)	Outlet Discharge (cu.m/s)	Storage (cu. m)	Elevation (m)	Area (sq. m)	Volume (cu. m) Increment	Volume (cu. m) Accumulated	Water Depth (m)
0.000	0.0000	0.0000	0	0.000	0	0	0	0.000
0.025	0.0003	0.0022	0	0.025	40	0	0	0.025
0.050	0.0006	0.0044	3	0.050	160	2	3	0.050
0.075	0.0008	0.0055	9	0.075	360	6	9	0.075
0.100	0.0009	0.0066	21	0.100	640	12	21	0.100
0.125	0.0011	0.0077	42	0.125	1000	20	42	0.125
0.150	0.0013	0.0088	72	0.150	1440	30	72	0.150

Drawdown Estimate			
Total Volume (cu.m)	Total Time (sec)	Vol (cu.m)	Detention Time (hr)
0.0	0.0	0.0	0
2.3	528.3	2.3	0.14676
8.7	1147.3	6.3	0.46545
21.0	1861.8	12.3	0.98261
41.3	2630.9	20.3	1.71342
71.7	3434.2	30.3	2.66738

Rooftop Storage Summary

Total Building Area (sq.m)		1800
Assume Available Roof Area (sq.m)	80%	1440
Roof Imperviousness		0.99
Roof Drain Requirement (sq.m/Notch)		232
Number of Roof Notches*		7
Max. Allowable Depth of Roof Ponding (m)		0.15
Max. Allowable Storage (cu.m)		72
Estimated 100 Year Drawdown Time (h)		2.6

* As per Ontario Building Code section OBC 7.4.10.4.(2)(c).

From Watts Drain Catalogue

Head (m)	L/s Open	75%	**50%**	25%	Closed
0.025	0.3155	0.31545	**0.31545**	0.31545	0.31545
0.050	0.6309	0.6309	**0.6309**	0.6309	0.6309
0.075	0.9464	0.86749	**0.78863**	0.70976	0.6309
0.100	1.2618	1.10408	**0.94635**	0.78863	0.6309
0.125	1.5773	1.34067	**1.10408**	0.86749	0.6309
0.150	1.8927	1.57726	**1.2618**	0.94635	0.6309

* Note: Number of drains can be reduced if multiple-notch drain used.

Calculation Results	5yr	100yr	Available
Qresult (cu.m/s)	0.007	0.009	-
Depth (m)	0.112	0.148	0.150
Volume (cu.m)	30.9	69.8	72.0
Draintime (hrs)	1.3	2.6	

C.3 RECORD OF CONSULTATION WITH THE RVCA

From: Mott, Peter
To: eric.lalande@rvca.ca
Cc: Moroz, Peter; Thiffault, Dustin
Subject: 1345 Baseline Road - Water Quality Control
Date: Monday, June 13, 2022 1:06:00 PM
Attachments: 160410394.DB-SD-1.pdf
160410394.DB-SSP-1.pdf

Hi Eric,

We've been retained to help develop three high-rise residential apartment buildings at 1345 Baseline Road . The proposed development of a 28 storey, 24 storey, and 32 storey building comprises a total of 714 one-bedroom units, 186 two bedrooms units, and 52 three-bedroom units designed to contain a total population of 1551 persons as shown in the attached SD-1 drawing.

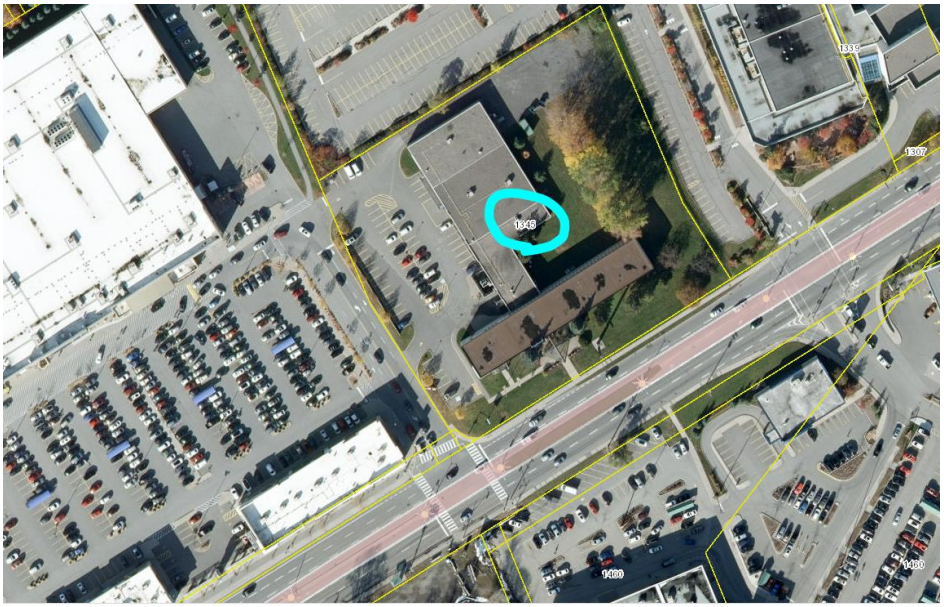
We are looking to confirm if quality control measures are required on-site. The proposed buildings include flat roofs and flows will be allocated to a stormwater cistern which will store and discharge stormwater into the 375 mm diameter storm sewer within Baseline Road. We understand that rooftop runoff is considered clean water and does not require further water quality treatment. Please review the site servicing plan attached and confirm if quality treatment is required for the site. If you need any other information, feel free to reach out.

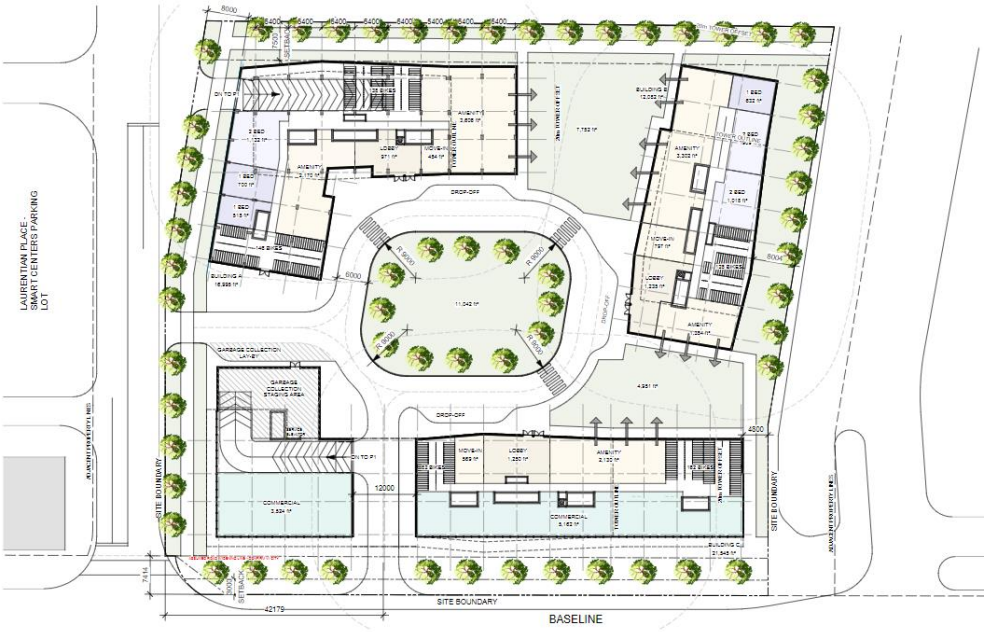
Thank you,

Peter Mott EIT
Engineering Intern, Community Development

Mobile: +1 (343) 999-8172
Peter.Mott@stantec.com
Stantec
400 - 1331 Clyde Avenue
Ottawa ON K2C 3G4

C.4 CITY PRE-CONSULTATION SWM CRITERIA





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1. **Current Official Plan -** designated “Arterial Mainstreet”.
   a. Site is located within 400m of future BRT station at Baseline and Clyde Ave and is permitted 9-storeys as of right, but high-rises can be contemplated through ZBLA when community amenity is provided and with proper transitioning to lower-rise bldgs.

2. **New Draft Official Plan, Approved by Council, Oct 27, 2021, Pending Approval from the Province in June 2022**
    a. Outer Urban Transect, Mainstreet corridor, evolving neighbourhood,
    b. Hi-rise are permitted when within 400m transit.

3. **Zoning Information:** AM5[436]

4. **Infrastructure/Servicing (Bruce Bramah):**

Water:
Connection point: 406mm CI on Baseline
Water redundancy would be required for this development based on the number of proposed units.

- Watermain Frontage Fees to be paid ($190.00 per metre) ☐ **Yes** ☒ **No**

Boundary conditions:
Civil consultant must request boundary conditions from the City's assigned Project Manager prior to submission.

- Water boundary condition requests must include the location of the service(s) and the expected loads required by the proposed developments. Please provide all the following information:
    - Location of service(s)
    - Type of development and the amount of fire flow required (as per FUS, 1999).
    - Average daily demand: ___ l/s.
    - Maximum daily demand: ___l/s.
    - Maximum hourly daily demand: ___ l/s.
- Fire protection (Fire demand, Hydrant Locations)

Sanitary Sewers:
Connection point: 225mm concrete on Baseline

Is a monitoring manhole required on private property? ☒ Yes ☐ No

- The designer should be aware there may be limited capacity in the downstream sanitary sewer system. The sanitary demand needs to be coordinated with the City Planning Dept. to determine if the existing sanitary sewer system has sufficient capacity to support the proposed rezoning. Provide sanitary demands to the City project manager for coordination.

Storm Sewers:
Connection point: 375mm concrete on Baseline

Storm Water Management:
Quality Control:

- Rideau Valley Conservation Authority to provide quality control requirements for property.

Quantity Control:
- Allowable Runoff coefficient (C): C = the lesser of the existing pre-development conditions to a maximum of 0.5.
- Time of concentration (Tc): Tc = pre-development; maximum Tc = 10 min
- Allowable flowrate: Control the 100-year/5-year storm events to the existing 2-year storm event.

Ministry of Environment, Conservation and Parks (MECEP)
All development applications should be considered for an Environmental Compliance Approval, under MECP regulations.

a. The consultants determine if an approval for sewage works under Section 53 of OWRA is required and determines what type of application. The City's project manager may help confirm and coordinate with the MECP as required.
b. The project will be either transfer of review (standard), transfer of review (additional), direct submission, or exempt as per O. Reg. 525/98.
c. Pre-consultation is not required if applying for standard or additional works (Schedule A of the Agreement) under Transfer Review.
d. Pre-consultation with local District office of MECP is recommended for direct submission.
e. Consultant completes an MECP request form for a pre-consultation. Sends request to moeccottawasewage@ontario.ca
f. ECA applications are required to be submitted online through the MECP portal. A business account required to submit ECA application. For more information visit https://www.ontario.ca/page/environmental-compliance-approval
g. It is unclear if the proposed development will remain as one property. An ECA will be required where the stormwater management services more than one property parcel.

NOTE: Site Plan Approval, or Draft Approval, is required before any Ministry of the Environment and Climate Change (MOECC) application is sent.
General Service Design Comments

- The City of Ottawa requests that all new services be located within the existing service trench to minimize necessary road cuts.
- Monitoring manholes should be located within the property near the property line in an accessible location to City forces and free from obstruction (i.e. not a parking).
- Where service length is greater than 30 m between the building and the first maintenance hole / connection, a cleanout is required.
- The City of Ottawa Standard Detail Drawings should be referenced where possible for all work within the Public Right-of-Way.
- The upstream and downstream manhole top of grate and invert elevations are required for all new sewer connections.

- No tree stakes unless necessary (and only 1 on the prevailing winds side of the tree)

Hard surface planting

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

Soil Volume

- Please ensure adequate soil volumes are met:

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

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

Sensitive Marine Clay

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

Tree Canopy Cover

· The landscape plan shall show how the proposed tree planting will replace and increase canopy cover on the site over time, to support the City's 40% urban forest canopy cover target.

· At a site level, efforts shall be made to provide as much canopy cover as possible, through tree planting and tree retention, with an aim of 40% canopy cover at 40 years, as appropriate.

· Indicate on the plan the projected future canopy cover at 40 years for the site.

9. Environment (Sami Rehman)

a. No concerns.

10. Conservation Authority (RVCA - Eric Lalande)

- The RVCA has no concerns or objections. The RVCA would not have any additional stormwater quality requirements based on the overall site design but encourage the Applicant to implement best management practices where possible.

C.5 WATTS ADJUSTABLE ACCUTROL WEIR SPECIFICATION

WATTS® DRAINAGE

Adjustable Accutrol Weir

Tag: _____

Adjustable Flow Control for Roof Drains

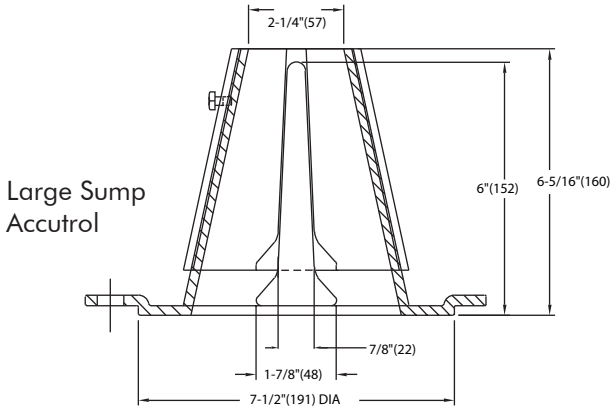
ADJUSTABLE ACCUTROL(for Large Sump Roof Drains only)

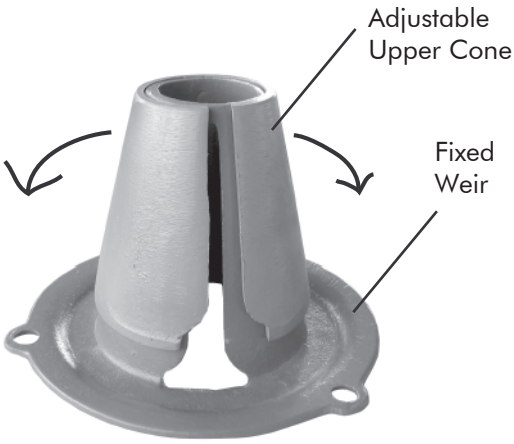
For more flexibility in controlling flow with heads deeper than 2", Watts Drainage offers the Adjustable Accutrol. The Adjustable Accutrol Weir is designed with a single parabolic opening that can be covered to restrict flow above 2" of head to less than 5 gpm per inch, up to 6" of head. To adjust the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

EXAMPLE:

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

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





1/2 Weir Opening Exposed Shown Above

TABLE 1. Adjustable Accutrol Flow Rate Settings

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

Job Name _____ Contractor _____

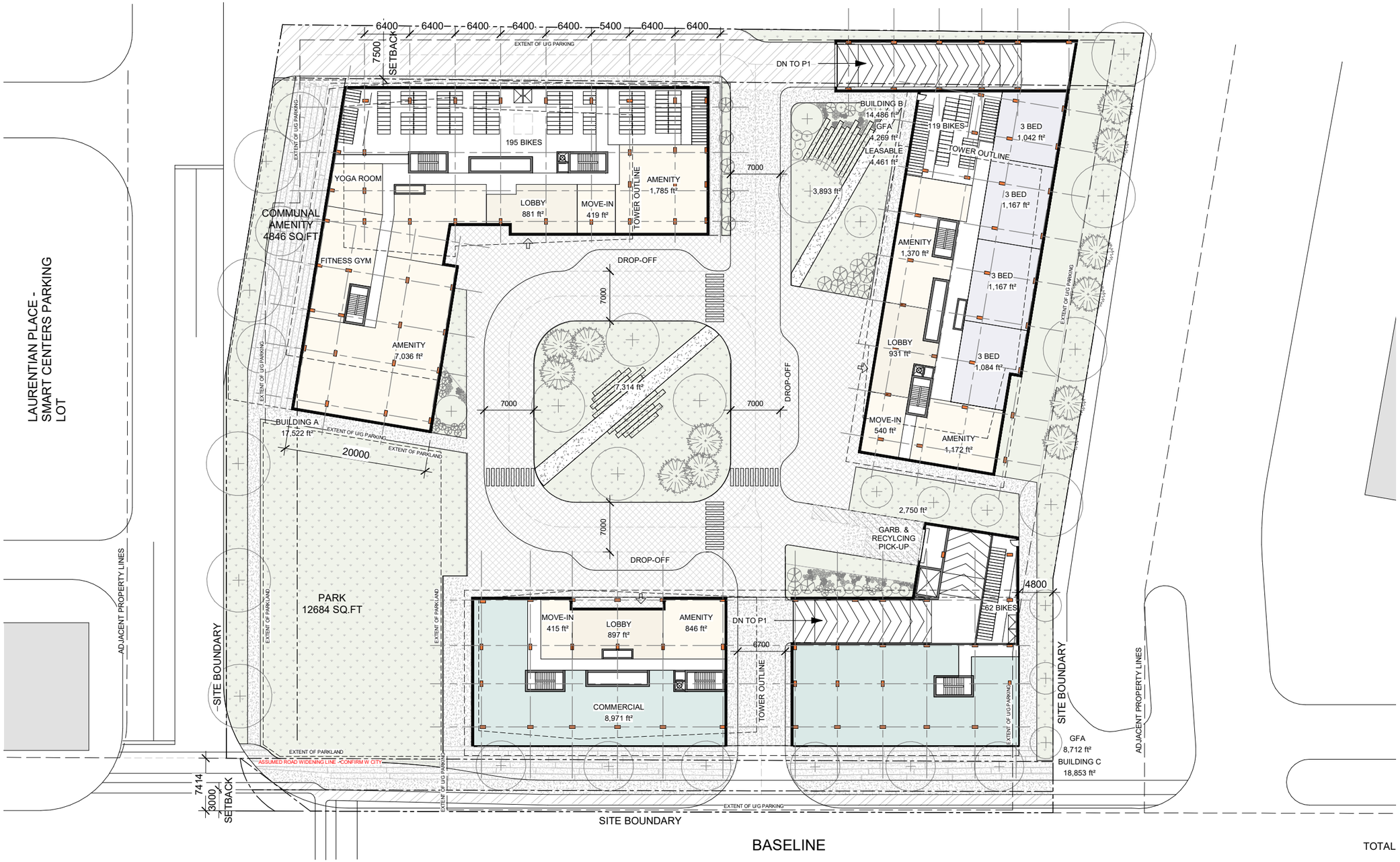
Job Location _____ Contractor's P.O. No. _____

Engineer _____ Representative _____

WATTS® DRAINAGE
CANADA: 5435 North Service Road, Burlington, ON, L7L 5H7 TEL: 905-332-6718 TOLL-FREE: 1-888-208-8927 Website: www.wattsdrainage.ca
CANADA

Appendix D – EXTERNAL PLANS AND REPORTS

D.1 SITE PLAN



Plan: Ground floor

rla/architecture Stantec LASHLEY +ASSOCIATES CORPORATION LANDSCAPE ARCHITECTURE AND SITE ENGINEERING

D.2 GEOTECHNICAL INVESTIGATION REPORT

Geotechnical Engineering

Environmental Engineering

Hydrogeology

Geological Engineering

Materials Testing

Building Science

Noise and Vibration Studies

patersongroup

Geotechnical Investigation

Proposed High-Rise Development
1345 Baseline Road
Ottawa, Ontario

Prepared For

Scouts Canada
c/o Colliers

March 15, 2022

Report: PG6129-1

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Appendices

1.0 Introduction

Paterson Group (Paterson) was commissioned by Colliers on behalf of Scouts Canada to conduct a geotechnical investigation for the proposed high-rise development to be located at 1345 Baseline Road in the City of Ottawa (refer to Figure 1 - Key Plan in Appendix 2 of this report).

The objective of the geotechnical investigation was to:

- Determine the subsoil and groundwater conditions at this site by means of test holes.
- Provide geotechnical recommendations pertaining the design of the proposed development including construction considerations which may affect the design.

The following report has been prepared specifically and solely for the aforementioned project which is described herein. It contains our findings and includes geotechnical recommendations pertaining to the design and construction of the subject development as they are understood at the time of writing this report.

2.0 Proposed Development

Based on available plans for the proposed development and information provided by the client, it is our understanding that the proposed development will consist of a high-rise development with three towers and two levels of underground parking, encompassing the majority of the subject site. The three high rise towers will consist of one 28-storey tower, one 24-storey tower, and one 32-storey tower. It is further understood that the underground parking structure will potentially be constructed in two phases. Associated roadways, access lanes, walkways, and landscaped margins are also anticipated for the development. It is further anticipated that the proposed development will be municipally serviced.

3.0 Method of Investigation

3.1 Field Investigation

Field Program

The field program for the current geotechnical investigation was carried out on February 25, 2022 and consisted of drilling a total of 5 boreholes advanced to a maximum depth of 9.2 m below the existing ground surface. The borehole locations were distributed in a manner to provide general coverage of the subject site, taking into consideration underground utilities and site features. The borehole locations are shown on Drawing PG6129-1 - Test Hole Location Plan included in Appendix 2.

The test holes were completed using a low-clearance drill rig operated by a two-person crew. All fieldwork was conducted under the full-time supervision of Paterson personnel under the direction of a senior engineer. The drilling procedure consisted of augering and coring to the required depths at the selected locations, and sampling and testing the overburden.

Sampling and In Situ Testing

The soil samples were recovered either directly from the auger flights or using a 50 mm diameter split-spoon sampler. Rock cores were obtained in two boreholes using 47.6 mm inside diameter coring equipment and diamond drilling techniques. All samples were visually inspected and initially classified on site. The auger and split-spoon samples were placed in sealed plastic bags, and rock cores were placed securely in cardboard core boxes. All samples were transported to our laboratory for further examination and classification. The depths at which the auger, split spoon, and rock core samples were recovered from the boreholes are shown as AU, SS and RC, respectively, on the Soil Profile and Test Data sheets in Appendix 1.

The Standard Penetration Test (SPT) was conducted in conjunction with the recovery of the split-spoon samples. The SPT results are recorded as “N” values on the Soil Profile and Test Data sheets. The “N” value is the number of blows required to drive the split-spoon sampler 300 mm into the soil after a 150 mm initial penetration using a 63.5 kg hammer falling from a height of 760 mm.

The recovery value and a Rock Quality Designation (RQD) value were calculated for each drilled section of bedrock and are presented on the borehole logs. The recovery value is the length of the bedrock sample recovered over the length of the drilled section. The RQD value is the total length of intact rock pieces longer than 100 mm over the length of the core run. The values indicate the bedrock quality.

The subsurface conditions observed in the boreholes were recorded in detail in the field. The soil profiles are logged on the Soil Profile and Test Data sheets in Appendix 1 of this report.

Groundwater

Borehole BH2-22 was fitted with a groundwater monitoring well to permit groundwater level monitoring subsequent to the field investigation. The observed groundwater levels were recorded in the field. Groundwater observations are discussed in Subsection 4.3 and presented in the Soil Profile and Test Data sheets in Appendix 1.

Monitoring Well Installation

Typical monitoring well construction details are described below:

- ❑ 3.0 m of slotted 51 mm diameter PVC screen at the base of the borehole.
- ❑ 51 mm diameter PVC riser pipe from the top of the screen to the ground surface.
- ❑ No.3 silica sand backfill within annular space around screen.
- ❑ 300 mm thick bentonite hole plug directly above PVC slotted screen.
- ❑ Clean backfill from top of bentonite plug to the ground surface.

Refer to the Soil Profile and Test Data sheets in Appendix 1 for specific well construction details.

Sample Storage

All samples will be stored in the laboratory for a period of one (1) month after issuance of this report. They will then be discarded unless we are otherwise directed.

3.2 Field Survey

The borehole locations were selected by Paterson to provide general coverage of the proposed development, taking into consideration the existing site features and underground utilities. The test hole locations and ground surface elevation at each test hole location were surveyed by Paterson using a handheld GPS and referenced to a geodetic datum. The location of the boreholes and ground surface elevation at each test hole location are presented on Drawing PG6129-1 - Test Hole Location Plan in Appendix 2.

3.3 Laboratory Testing

Soil samples were recovered from the subject site and visually examined in our laboratory to review the results of the field logging. Soil samples will be stored for a period of one month after this report is completed, unless otherwise directed.

3.4 Analytical Testing

One (1) soil sample was submitted for analytical testing to assess the corrosion potential for exposed ferrous metals and the potential of sulphate attacks against subsurface concrete structures, one of which was collected from borehole BH1-22. The sample was submitted to determine the concentration of sulphate and chloride, the resistivity, and the pH of the samples. The results are presented in Appendix 1 and are discussed further in Subsection 6.7.

4.0 Observations

4.1 Surface Conditions

The subject site consists of a one to two-storey commercial building with an asphalt paved parking lot, access lanes, and associated landscaped areas.

The site is bordered by Baseline Road to the south, by commercial developments to the east and west, and boarded by a parking lot and further by a residential development to the north. The existing ground surface across the site is relatively level at approximate geodetic elevations between 99.2 to 100.0 m and the site is at grade with Baseline Road.

4.2 Subsurface Profile

Generally, the subsurface profile encountered at the borehole locations consists of a 50 mm thick asphalt pavement structure at BH 1-22 and BH 5-22, and 0.2 m of topsoil at BH 2-22, BH 3-22 at the ground surface level, underlain by a 0.5 to 1.0 m thick fill layer. The fill material was encountered at the surface level at BH 4-22. The fill was generally observed to consist of granular crushed stone to brown silty sand with crushed stone. Practical refusal to augering was encountered below the fill material at depths ranging from 0.7 to 1.2 m below ground surface.

Reference should be made to the Soil Profile and Test Data sheets in Appendix 1 for the details of the soil profile encountered at each test hole location.

Bedrock

A good to excellent quality grey limestone bedrock was encountered underlying the fill at approximate depths of 1.0 to 1.2 m.

Based on available geological mapping, the bedrock in the subject area consists of interbedded limestone and dolomite of the Gull River formation, with an overburden drift thickness of 0 to 1 m depth for most of the subject site. The overburden drift thickness is 3 to 5 m at the south-east corner of the site.

4.3 Groundwater

A groundwater level of 2.63 m below ground surface, corresponding to a geodetic elevation of 97.84 m, was recorded in the monitoring well installed at borehole BH 2-22 on March 3, 2022. Based on field observations of the recovered soil samples, the long-term groundwater table is anticipated to be within the bedrock at an approximate depth of 2.6 m. However, it should be noted that the groundwater levels are subject to seasonal fluctuations and could vary at the time of construction.

5.0 Discussion

5.1 Geotechnical Assessment

From a geotechnical perspective, the subject site is suitable for the proposed development. The proposed building is recommended to be founded on conventional spread footings placed on clean, surface sounded bedrock.

Bedrock removal will be required to complete the underground parking levels. Line drilling and controlled blasting is recommended where large quantities of bedrock need to be removed. The blasting operations should be planned and completed under the guidance of a professional engineer with experience in blasting operations.

The above and other considerations are discussed in the following sections.

5.2 Site Grading and Preparation

Stripping Depth

Asphalt, topsoil, and deleterious fill, such as those containing organic materials, should be stripped from under any buildings, paved areas, pipe bedding and other settlement sensitive structures.

Existing foundation walls and other construction debris should be entirely removed from within the perimeter of the proposed buildings. Under paved areas, existing construction remnants such as foundation walls should be excavated to a minimum of 1 m below final grade.

Fill Placement

Fill placed for grading beneath the building areas should consist, unless otherwise specified, of clean imported granular fill, such as Ontario Provincial Standard Specifications (OPSS) Granular A or Granular B Type II. The imported fill material should be tested and approved prior to delivery to the site. The fill should be placed in maximum 300 mm thick loose lifts and compacted by suitable compaction equipment. Fill placed beneath the building should be compacted to a minimum of 98% of the standard Proctor maximum dry density (SPMDD).

Non-specified existing fill along with site-excavated soil could be placed as general landscaping fill and beneath exterior parking areas where settlement of the ground surface is of minor concern. In landscaped areas, these materials should be spread in lifts with a maximum thickness of 300 mm and compacted by the tracks of the spreading equipment to minimize voids.

If these materials are to be used to build up the subgrade level for areas to be paved, they should be compacted in thin lifts to a minimum density of 95% of their respective SPMDD.

Non-specified existing fill and site-excavated soils are not suitable for placement as backfill against foundation walls, unless a composite drainage blanket connected to a perimeter drainage system is provided.

Bedrock Removal

Based on the bedrock encountered in the area, it is expected that line-drilling in conjunction with hoe-ramming and controlled blasting will be required to remove the bedrock. In areas of weathered bedrock and where only a small quantity of bedrock is to be removed, bedrock removal may be possible by hoe-ramming.

Prior to considering blasting operations, the blasting effects on the existing services, buildings, and other structures should be addressed. A pre-blast or pre-construction survey of the existing structures located in the proximity of the blasting operations should be carried out prior to commencing site activities. The extent of the survey should be determined by the blasting consultant and should be sufficient to respond to any inquiries or claims related to the blasting operations.

As a general guideline, peak particle velocities (measured at the structures) should not exceed 25 mm/s during the blasting program to reduce the risks of damage to the existing surrounding structures.

The blasting operations should be planned and conducted under the supervision of a licensed professional engineer who is also an experienced blasting consultant.

Excavation side slopes in sound bedrock can be carried out using near vertical sidewalls. Where bedrock is of lower quality, the excavation face should be free of any loose rock. An area specific review should be completed by the geotechnical consultant at the time of construction to determine if rock bolting or other remedial measures are required to provide a safe excavation face for areas where lower quality bedrock is encountered.

Vibration Considerations

Construction operations could cause vibrations, and possibly, sources of nuisance to the community. Therefore, means to reduce the vibration levels as much as possible should be incorporated in the construction operations to maintain a cooperative environment with the residents.

The following construction equipment could cause vibrations: piling equipment, hoe ram, compactor, dozer, crane, truck traffic, etc. The construction of a temporary shoring system with soldier piles or sheet piling would require these pieces of equipment.

Vibrations, caused by blasting or construction operations, could cause detrimental vibrations on the adjoining buildings and structures. Therefore, it is recommended that all vibrations be limited.

Two parameters determine the recommended vibration limit: the maximum peak particle velocity and the frequency. For low frequency vibrations, the maximum allowable peak particle velocity is less than that for high frequency vibrations. As a guideline, the peak particle velocity should be less than 15 mm/s between frequencies of 4 to 12 Hz, and 50 mm/s above a frequency of 40 Hz (interpolate between 12 and 40 Hz). These guidelines are for current construction standards. These guidelines are above perceptible human level and, in some cases, could be very disturbing to some people, a pre-construction survey is recommended to minimize the risks of claims during or following the construction of the proposed building.

5.3 Foundation Design

Bearing Resistance Values

Footings placed on a clean, surface sounded bedrock bearing surface can be designed using a bearing resistance value at ultimate limits states (ULS) of **3,000 kPa**. A geotechnical factor of 0.5 was applied to the above noted bearing resistance value.

A clean, surface-sounded bedrock bearing surface should be free of loose materials, and have no near surface seams, voids, fissures, or open joints which can be detected from surface sounding with a rock hammer.

Lateral Support

The bearing medium under footing-supported structures is required to be provided with adequate lateral support with respect to excavations and different foundation levels. Adequate lateral support is provided to a sound bedrock bearing media when a plane extending down and out from the bottom edges of the footing at a minimum of 1H:6V (or flatter) passes only through sound bedrock or a material of the same or higher capacity as that of the bearing medium. A weathered bedrock bearing medium will require a lateral support zone of 1H:1V (or flatter).

Settlement

Footings bearing on an acceptable bedrock bearing surface and designed for the bearing resistance values provided herein will be subjected to negligible potential post-construction total and differential settlements.

5.4 Design for Earthquakes

The site class for the seismic site response can be taken as a **Class C** for foundations constructed on the subject site. If a higher seismic site class is required (Class A or Class B), a site-specific seismic shear wave velocity test may be completed to accurately determine the applicable seismic site classification for foundation design of the proposed building, as presented in Table 4.1.8.4.A of the Ontario Building Code (OBC).

The soils underlying the subject site are not susceptible to liquefaction. Reference should be made to the latest revision of the 2012 OBC for a full discussion of the earthquake design requirements.

5.5 Basement Slab

For the building founded on footings, it is recommended that the upper 200 mm of sub-slab fill consist of 19 mm clear crushed stone. All backfill material within the footprint of the proposed building should be placed in maximum 300 mm thick loose layers and compacted to at least 98% of its SPMDD.

A sub-slab drainage system, consisting of lines of perforated drainage pipe sub-drains connected to a positive outlet should be provided under the lowest level floor slab. The spacing of the sub-slab drainage pipes can be determined at the time of the construction to confirm groundwater infiltration levels, if any. This is discussed further in Subsection 6.1.

5.6 Basement Wall

There are several combinations of backfill materials and retained soils that could be applicable for the basement walls of the subject structure. However, the conditions can be well-represented by assuming the retained soil consists of a material with an angle of internal friction of 30 degrees and a bulk (drained) unit weight of 20 kN/m3.

Where undrained conditions are anticipated (i.e., below the groundwater level), the applicable effective (undrained) unit weight of the retained soil can be taken as 13 kN/m3, where applicable. A hydrostatic pressure should be added to the total static earth pressure when using the effective unit weight.

It is also expected that a portion of the basement walls are to be poured against a composite drainage blanket, which will be placed against the exposed bedrock face. A nominal coefficient of at-rest earth pressure of 0.05 is recommended in conjunction with a dry unit weight of 23.5 kN/m3 (effective unit weight of 15.5 kN/m3) where this condition occurs.

A seismic earth pressure component will not be applicable for the foundation wall, which is to be poured against the bedrock face. It is expected that the seismic earth pressure will be transferred to the underground floor slabs, which should be designed to accommodate these pressures. A hydrostatic groundwater pressure should be added for the portion below the groundwater level.

Two distinct conditions, static and seismic, should be reviewed for design calculations. The parameters for design calculations for the two conditions are presented below.

Lateral Earth Pressures

The static horizontal earth pressure (p_o) can be calculated using a triangular earth pressure distribution equal to $K_o \cdot \gamma \cdot H$ where:

K_o = at-rest earth pressure coefficient of the applicable retained soil (0.5)
γ = unit weight of fill of the applicable retained soil (kN/m^3)
H = height of the wall (m)

An additional pressure having a magnitude equal to $K_o \cdot q$ and acting on the entire height of the wall should be added to the above diagram for any surcharge loading, q (kPa), that may be placed at ground surface adjacent to the wall. The surcharge pressure will only be applicable for static analyses and should not be used in conjunction with the seismic loading case.

Actual earth pressures could be higher than the “at-rest” case if care is not exercised during the compaction of the backfill materials to maintain a minimum separation of 0.3 m from the walls with the compaction equipment.

Seismic Earth Pressures

The total seismic force (P_{AE}) includes both the earth force component (P_o) and the seismic component (ΔP_{AE}).

The seismic earth force (ΔP_{AE}) can be calculated using $0.375 \cdot a_c \cdot \gamma \cdot H^2/g$ where:

a_c = $(1.45-a_{max}/g)a_{max}$
γ = unit weight of fill of the applicable retained soil (kN/m^3)
H = height of the wall (m)
g = gravity, 9.81 m/s^2

The peak ground acceleration, (a_{max}), for the Ottawa area is 0.32 g according to OBC 2012. Note that the vertical seismic coefficient is assumed to be zero.

The earth force component (P_o) under seismic conditions can be calculated using $P_o = 0.5\ K_o\ \gamma\ H^2$, where $K_o = 0.5$ for the soil conditions noted above.

The total earth force (P_{AE}) is considered to act at a height, h (m), from the base of the wall, where:

$h = \{P_o \cdot (H/3) + \Delta P_{AE} \cdot (0.6 \cdot H)\}/P_{AE}$

The earth forces calculated are unfactored. For the ULS case, the earth loads should be factored as live loads, as per OBC 2012.

5.7 Pavement Design

For design purposes, the pavement structure presented in the following tables could be used for the design of car parking areas and access lanes.

Table 1 – Recommended Pavement Structure – Car Only Parking Areas	
Thickness (mm)	**Material Description**
50	**Wear Course –** HL-3 or Superpave 12.5 Asphaltic Concrete
150	**BASE –** OPSS Granular A Crushed Stone
300	**SUBBASE –** OPSS Granular B Type II
Subgrade – Either fill, in-situ soil, or OPSS Granular B Type I or II material placed over in-situ soil, bedrock, or concrete fill.	

Table 2 – Recommended Pavement Structure – Access Lanes	
Thickness (mm)	**Material Description**
40	**Wear Course –** HL-3 or Superpave 12.5 Asphaltic Concrete
50	**Binder Course –** HL-8 or Superpave 19 Asphaltic Concrete
150	**BASE –** OPSS Granular A Crushed Stone
450	**SUBBASE –** OPSS Granular B Type II
Subgrade – Either fill, in-situ soil, or OPSS Granular B Type I or II material placed over in-situ soil, bedrock, or concrete fill.	

Minimum Performance Graded (PG) 58-34 asphalt cement should be used for this project.

If soft spots develop in the subgrade during compaction or due to construction traffic, the affected areas should be excavated to a competent layer and replaced with OPSS Granular B Type II material. Weak subgrade conditions may be experienced over service trench fill materials. This may require the use of geotextile, such as Terratrack 200 or equivalent, thicker subbase or other measures than can be recommended at the time of construction as part of the field observation program.

The pavement granular base and subbase should be placed in maximum 300 mm thick lifts and compacted to a minimum of 100% of the material's SPMDD using suitable compaction equipment, nothing that excessive compaction can result in subgrade softening.

Pavement Structure Drainage

Satisfactory performance of the pavement structure is largely dependent on maintaining the contact zone between the subgrade material and the base stone in a dry condition. Failure to provide adequate drainage under conditions of heavy wheel loading can result in the fine subgrade soil being pumped into the voids in the stone subbase, thereby reducing load carrying capacity.

Due to the low permeability of the subgrade materials consideration should be given to installing subdrains during the pavement construction as per City of Ottawa standards. The subdrain inverts should be approximately 300 mm below subgrade level. The subgrade surface should be crowned to promote water flow to the drainage lines.

6.0 Design and Construction Precautions

6.1 Foundation Drainage and Backfill

Foundation Drainage and Waterproofing

For the proposed underground parking levels, it is understood that the building foundation walls will be placed in close proximity to the site boundaries. Therefore, it is recommended that the foundation walls be blind poured against a drainage system and waterproofing system fastened to the bedrock face or temporary shoring system.

For the groundwater infiltration control system for the lower portion of the foundation walls, the following is recommended:

- ❑ Line drill the excavation perimeter.
- ❑ Hoe ram any irregularities and prepare the bedrock surface. Shotcrete areas to fill in cavities and smooth out angular features at the bedrock surface, as required based on site inspections by Paterson.

Waterproofing of the foundation walls is recommended to limit groundwater in-flow towards the building sump pit.

It is also recommended that a composite drainage system, such as Delta Drain 6000 or equivalent, be installed and extended from the exterior finished grade to the founding elevation (underside of footing). The purpose of the composite drainage system is to direct any water infiltration resulting from a breach of the waterproofing membrane to the building sump pit. It is recommended that 150 mm diameter sleeves at 3 m centres be cast in the foundation wall at the perimeter footing interface to allow the infiltration of water to flow to an interior perimeter underfloor drainage pipe. The perimeter drainage pipe should direct water to the building's sump pit within the lower basement area.

Sub-Slab Drainage

It is anticipated that underfloor drainage will be required to control water infiltration. For preliminary design purposes, we recommend that 150 mm diameter perforated PVC pipes be placed at 6 m centres. The spacing of the underfloor drainage system should be confirmed at the time of completing the excavation when water infiltration can be better assessed.

Foundation Backfill

Where space is available for conventional wall construction, backfill against the exterior sides of the foundation walls should consist of free-draining, non-frost susceptible granular materials. The greater part of the site excavated materials will be frost susceptible and, as such, are not recommended for re-use as backfill against the foundation walls, unless used in conjunction with a drainage geocomposite, such as Delta Drain 6000, connected to the perimeter foundation drainage system. Imported granular materials, such as clean sand or OPSS Granular B Type I granular material, should otherwise be used for this purpose.

6.2 Protection of Footings Against Frost Action

Perimeter footings of heated structures are required to be insulated against the deleterious effects of frost action. A minimum 1.5 m thick soil cover (or insulation equivalent) should be provided in this regard.

Other exterior unheated footings, such as those for isolated exterior, are more prone to deleterious movement associated with frost action. These should be provided with a minimum 2.1 m thick soil cover (or insulation equivalent).

The foundations for the underground parking levels are expected to have sufficient frost protection due to the founding depth. However, it has been our experience that insufficient soil cover is typically provided at entrance ramps to underground parking garages. Paterson requests permission to review design drawings prior to construction to ensure proper frost protection is provided to these areas.

6.3 Excavation Side Slopes

Temporary Side Slopes

The side slopes of excavations in the overburden materials should be either cut back at acceptable slopes or should be retained by shoring systems from the start of the excavation until the structure is backfilled.

The excavation side slopes above the groundwater level extending to a maximum depth of 3 m should be cut back at 1H:1V or flatter. The flatter slope is required for excavation below groundwater level. The subsurface soil at this site is considered to be mainly a Type 2 and 3 soil according to the Occupational Health and Safety Act and Regulations for Construction Projects.
Excavated soil should not be stockpiled directly at the top of excavations and heavy equipment should be kept away from the excavation sides.

Slopes in excess of 3 m in height should be periodically inspected by the geotechnical consultant in order to detect if the slopes are exhibiting signs of distress.

It is recommended that a trench box be used at all times to protect personnel working in trenches with steep or vertical sides. It is expected that services will be installed by "cut and cover" methods and excavations will not be left open for extended periods of time.

Temporary Shoring

Temporary shoring may be required for the overburden soil to complete the required excavations where insufficient room is available for open cut methods. The shoring requirements designed by a structural engineer specializing in those works will depend on the depth of the excavation, the proximity of the adjacent structures and the elevation of the adjacent building foundations and underground services. It is the responsibility of the shoring contractor to ensure that the temporary shoring system is in compliance with safety requirements, designed to avoid any damage to adjacent structures and include dewatering control measures. Inspections and approval of the temporary system will also be the responsibility of the designer.

Geotechnical information provided below is to assist the designer in completing a suitable and safe shoring system. The designer should take into account the impact of a significant precipitation event and designate design measures to ensure that precipitation will not negatively impact the shoring system or soils supported by the system. Any changes to the approved shoring design system should be reported immediately to the owner's structural designer prior to implementation.

The temporary shoring system could consist of a soldier pile and lagging system or steel sheet piles. Any additional loading due to street traffic, construction equipment, adjacent structures, and facilities, etc., should be included to the earth pressures described below. This system could be cantilevered, anchored, or braced. The shoring system is recommended to be adequately supported to resist toe failure, if required, by means of extending the piles into the bedrock through pre-augered holes, if a soldier pile and lagging system is the preferred method.

The earth pressures acting on the temporary shoring system may be calculated with the following parameters.

Table 3 – Soils Parameter for Shoring System Design

Parameters	Values
Active Earth Pressure Coefficient (K_a)	0.33
Passive Earth Pressure Coefficient (K_p)	3
At-Rest Earth Pressure Coefficient (K_O)	0.5
Unit Weight (γ), kN/m^3	20
Submerged Unit Weight (γ), kN/m^3	13

The active earth pressure should be calculated where wall movements are permissible while the at-rest pressure should be calculated if no movement is permissible. The dry unit weight should be calculated above the groundwater level while the effective unit weight should be calculated below the groundwater level.

The hydrostatic groundwater pressure should be included to the earth pressure distribution wherever the effective unit weight is calculated for earth pressures. If the groundwater level is lowered, the dry unit weight for the soil/bedrock should be calculated full weight, with no hydrostatic groundwater pressure component.

For design purposes, the minimum factor of safety of 1.5 should be calculated.

6.4 Pipe Bedding and Backfill

Bedding and backfill materials should be in accordance with the most recent Material Specifications and Standard Detail Drawings from the Department of Public Works and Services, Infrastructure Services Branch of the City of Ottawa.

The pipe bedding for sewer and water pipes should consist of at least 150 mm of OPSS Granular A material. The material should be placed in maximum 300 mm thick lifts and compacted to a minimum of 99% of the SPMDD. The bedding should extend at least to the spring line of the pipe.

The cover material, from the spring line to at least 300 mm above the obvert of the pipe, should consist of OPSS Granular A. The bedding and cover materials should be placed in maximum 300 mm thick lifts compacted to a minimum of 99% of the material's standard Proctor maximum dry density (SPMDD).

It should generally be possible to re-use the upper portion of the dry to moist (not wet) brown silty clay and silty sand above the cover material if the excavation and filling operations are carried out in dry weather conditions. Wet silty clay materials will be difficult for placement, as the high-water content is impractical for the desired compaction without an extensive drying period.

Any stones greater than 200 mm in their longest dimension should be removed from these materials prior to placement. Well fractured bedrock should be acceptable as backfill for the lower portion of the trenches when the excavation is within bedrock provided the rock fill is placed only from at least 300 mm above the top of the service pipe and that all stones are 300 mm or smaller in their longest dimension.

Where hard surface areas are considered above the trench backfill, the trench backfill material within the frost zone (about 1.8 m below finished grade) should match the soils exposed at the trench walls to reduce potential differential frost heaving. The backfill should be placed in maximum 300 mm thick loose lifts and compacted to a minimum of 95% of the material's SPMDD.

6.5 Groundwater Control

Groundwater Control for Building Construction

Based on our observations, it is anticipated that groundwater infiltration into the excavations should be low and controllable using open sumps and pumps. Pumping from open sumps should be sufficient to control the groundwater influx through the sides of shallow excavations. The contractor should be prepared to direct water away from all bearing surfaces and subgrades, regardless of the source, to prevent disturbance to the founding medium.

Permit to Take Water

A temporary Ministry of the Environment, Conservation and Parks (MECP) permit to take water (PTTW) may be required for this project if more than 400,000 L/day of ground and/or surface water is to be pumped during the construction phase. A minimum 4 to 5 months should be allowed for completion of the PTTW application package and issuance of the permit by the MECP.

For typical ground or surface water volumes being pumped during the construction phase, typically between 50,000 to 400,000 L/day, it is required to register on the Environmental Activity and Sector Registry (EASR). A minimum of two to four weeks should be allotted for completion of the EASR registration and the Water Taking and Discharge Plan to be prepared by a Qualified Person as stipulated under O.Reg. 63/16. If a project qualifies for a PTTW based upon anticipated conditions, an EASR will not be allowed as a temporary dewatering measure while awaiting the MECP review of the PTTW application.

Long-term Groundwater Control

Any groundwater encountered along the buildings' perimeter or underfloor drainage system will be directed to the proposed buildings' cistern/sump pit. Provided the proposed groundwater infiltration control system is properly implemented and approved by the geotechnical consultant at the time of construction, the expected long-term groundwater flow should be low (i.e., less than 40,000 L/day) with peak periods noted after rain events. A more accurate estimate can be provided at the time of construction once groundwater infiltration levels are observed. The long-term groundwater flow is anticipated to be controllable using conventional open sumps.

Impacts on Neighboring Properties

It is understood that multiple underground parking levels are being planned for the proposed structure, with the lower portion of the foundation having a groundwater infiltration control system in place. Due to the presence of a groundwater infiltration control system in place, long-term groundwater lowering is anticipated to be negligible for the area. Therefore, no adverse effects to the neighboring properties are to be expected.

6.6 Winter Construction

Precautions must be taken if winter construction is considered for this project.

The subsoil conditions at this site consist of frost susceptible materials. In the presence of water and freezing conditions, ice could form within the soil mass. Heaving and settlement upon thawing could occur.

In the event of construction during below zero temperatures, the founding stratum should be protected from freezing temperatures by the use of straw, propane heaters and tarpaulins or other suitable means. In this regard, the base of the excavations should be insulated from sub-zero temperatures immediately upon exposure and until such time as heat is adequately supplied to the building and the footings are protected with sufficient soil cover to prevent freezing at founding level.

Trench excavations and pavement construction are also difficult activities to complete during freezing conditions without introducing frost in the subgrade or in the excavation walls and bottoms. Precautions should be taken if such activities are to be carried out during freezing conditions. Additional information could be provided, if required.

Precautions must be taken where excavations are carried in proximity of existing structures which may be adversely affected due to the freezing conditions. In particular, it should be recognized that where a shoring system is used, the soil behind the shoring system will be subjected to freezing conditions and could result in heaving of the structure(s) placed within or above frozen soil. Provisions should be made in the contract document to protect the walls of the excavations from freezing, if applicable.

6.7 Corrosion Potential and Sulphate

The results of analytical testing show that the sulphate content is less than 0.1%. This result is indicative that Type 10 Portland cement (normal cement) would be appropriate for this site. The chloride content and the pH of the sample indicate that they are not significant factors in creating a corrosive environment for exposed ferrous metals at this site, whereas the resistivity is indicative of a non-aggressive to slightly aggressive corrosive environment.

7.0 Recommendations

It is a requirement for the foundation design data provided herein to be applicable that the following material testing and observation program be performed by the geotechnical consultant.

- ❑ Review of the final design details from a geotechnical perspective.
- ❑ Observation of all bearing surfaces prior to the placement of concrete.
- ❑ Sampling and testing of the concrete and fill materials.
- ❑ Periodic observation of the condition of unsupported excavation side slopes in excess of 3 m in height, if applicable.
- ❑ Periodic observation of the condition of the vertical bedrock face during excavation.
- ❑ Observation of all subgrades prior to backfilling.
- ❑ Field density tests to determine the level of compaction achieved.
- ❑ Sampling and testing of the bituminous concrete including mix design reviews.
- ❑ Review of waterproofing details for elevator shafts and building sump pits.
- ❑ Review and inspection of the foundation waterproofing system and all foundation drainage systems.

A report confirming that these works have been conducted in general accordance with our recommendations could be issued upon the completion of a satisfactory inspection program by the geotechnical consultant.

8.0 Statement of Limitations

The recommendations provided are in accordance with the present understanding of the project. Paterson requests permission to review the recommendations when the drawings and specifications are completed.

A soils investigation is a limited sampling of a site. Should any conditions at the site be encountered which differ from those at the test locations, Paterson requests immediate notification to permit reassessment of our recommendations.

The recommendations provided herein should only be used by the design professionals associated with this project. They are not intended for contractors bidding on or undertaking the work. The latter should evaluate the factual information provided in this report and determine the suitability and completeness for their intended construction schedule and methods. Additional testing may be required for their purposes.

The present report applies only to the project described in this document. Use of this report for purposes other than those described herein or by person(s) other than Scouts Canada c/o Colliers or their agents is not authorized without review by Paterson for the applicability of our recommendations to the alternative use of the report.

Paterson Group Inc.

Nicole Patey, B.Eng.

David J. Gilbert, P.Eng.

Report Distribution:

- ❑ Colliers (email copy)
- ❑ Paterson Group (1 copy)

APPENDIX 1

SOIL PROFILE AND TEST DATA SHEETS

SYMBOLS AND TERMS

ANALYTICAL TESTING RESULTS

patersongroup Consulting Engineers

154 Colonnade Road South, Ottawa, Ontario K2E 7J5

SOIL PROFILE AND TEST DATA

Geotechnical Investigation
Proposed High Rise Development
1345 Baseline Road, Ottawa, Ontario

DATUM Geodetic

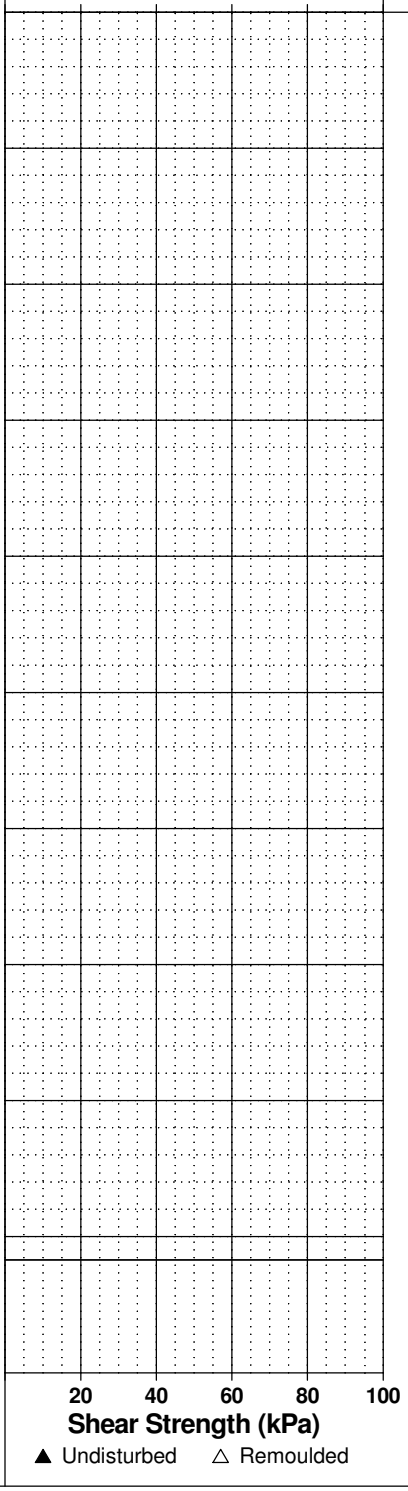
FILE NO. PG6129

REMARKS

HOLE NO. BH 1-22

BORINGS BY CME-55 Low Clearance Drill **DATE** 2022 February 25

SOIL DESCRIPTION	STRATA PLOT	SAMPLE TYPE	SAMPLE NUMBER	SAMPLE % RECOVERY	SAMPLE N VALUE or RQD	DEPTH (m)	ELEV. (m)	Pen. Resist. Blows/0.3m ● 50 mm Dia. Cone ○ Water Content %	Monitoring Well Construction
GROUND SURFACE						0	100.62		
Asphalt 0.05									
FILL: Granular crushed stone 0.08		AU	1						
FILL: Brown silty sand with gravel, some crushed stone 1.04		SS	2	55	50+	1	99.62		
BEDROCK: Good to excellent quality grey limestone		RC	1	100	33				
		RC	2	100	75	2	98.62		
						3	97.62		
		RC	3	100	82				
						4	96.62		
		RC	4	100	68	5	95.62		
						6	94.62		
		RC	5	100	100				
						7	93.62		
						8	92.62		
		RC	6	100	100				
9.17						9	91.62		
End of Borehole									



patersongroup Consulting Engineers

154 Colonnade Road South, Ottawa, Ontario K2E 7J5

SOIL PROFILE AND TEST DATA

Geotechnical Investigation
Proposed High Rise Development
1345 Baseline Road, Ottawa, Ontario

DATUM Geodetic

FILE NO. PG6129

REMARKS

HOLE NO. BH 2-22

BORINGS BY CME-55 Low Clearance Drill **DATE** 2022 February 25

SOIL DESCRIPTION	STRATA PLOT	SAMPLE TYPE	SAMPLE NUMBER	SAMPLE % RECOVERY	SAMPLE N VALUE or RQD	DEPTH (m)	ELEV. (m)
GROUND SURFACE						0	100.47
TOPSOIL 0.23							
FILL: Brown silty sand with gravel, trace clay		AU	1				
		SS	2	100	22	1	99.47
1.24		RC	1	100	100		
BEDROCK: Good to excellent quality grey limestone						2	98.47
		RC	2	100	74		
						3	97.47
		RC	3	100	100		
						4	96.47
						5	95.47
		RC	4	100	100		
						6	94.47
		RC	5	100	100		
						7	93.47
						8	92.47
		RC	6	100	100		
9.02						9	91.47
End of Borehole							
(GWL at 2.63 m depth - Mar 3, 2022)							

Pen. Resist. Blows/0.3m
● 50 mm Dia. Cone
○ Water Content %
20 40 60 80

Monitoring Well Construction

20 40 60 80 100
Shear Strength (kPa)
▲ Undisturbed △ Remoulded

patersongroup Consulting Engineers

154 Colonnade Road South, Ottawa, Ontario K2E 7J5

SOIL PROFILE AND TEST DATA

Geotechnical Investigation
Proposed High Rise Development
1345 Baseline Road, Ottawa, Ontario

DATUM Geodetic

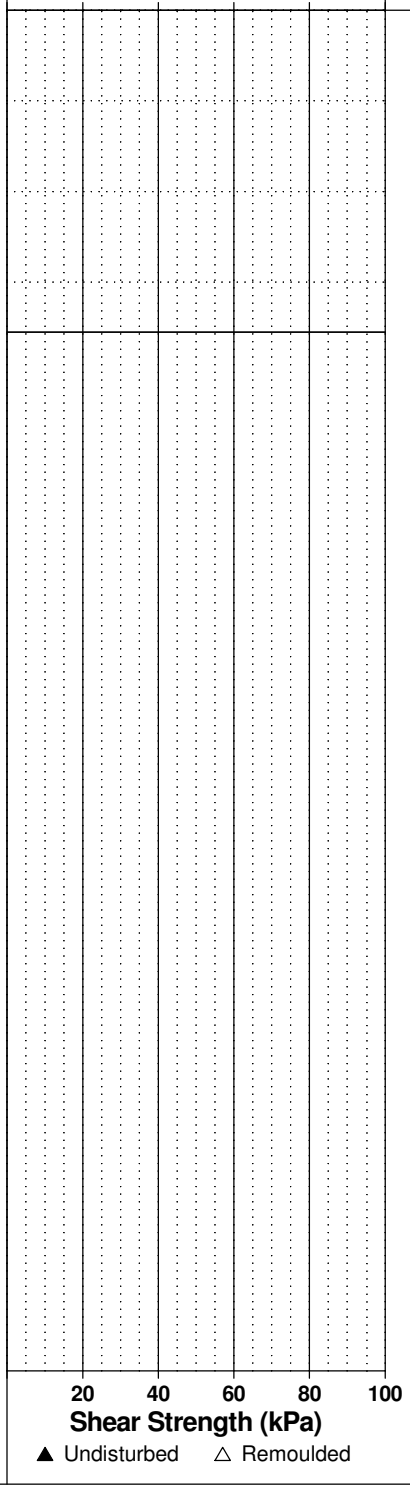
FILE NO. PG6129

REMARKS

HOLE NO. BH 3-22

BORINGS BY CME-55 Low Clearance Drill **DATE** 2022 February 25

SOIL DESCRIPTION	STRATA PLOT	SAMPLE TYPE	SAMPLE NUMBER	SAMPLE % RECOVERY	SAMPLE N VALUE or RQD	DEPTH (m)	ELEV. (m)	Pen. Resist. Blows/0.3m ● 50 mm Dia. Cone ○ Water Content %	Monitoring Well Construction
GROUND SURFACE									
TOPSOIL						0	100.82		
0.20									
FILL: Brown silty sand with gravel		AU	1						
0.71									
End of Borehole									
Practical refusal to augering at 0.71m depth									



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154 Colonnade Road South, Ottawa, Ontario K2E 7J5

SOIL PROFILE AND TEST DATA

Geotechnical Investigation
Proposed High Rise Development
1345 Baseline Road, Ottawa, Ontario

DATUM Geodetic

FILE NO. PG6129

REMARKS

HOLE NO. BH 4-22

BORINGS BY CME-55 Low Clearance Drill **DATE** 2022 February 25

SOIL DESCRIPTION	STRATA PLOT	SAMPLE TYPE	SAMPLE NUMBER	SAMPLE % RECOVERY	SAMPLE N VALUE or RQD	DEPTH (m)	ELEV. (m)	Pen. Resist. Blows/0.3m ● 50 mm Dia. Cone ○ Water Content %	Monitoring Well Construction
GROUND SURFACE									
FILL: Brown silty sand with crushed stone and gravel		AU	1			0	100.64		
0.66									
End of Borehole Practical refusal to augering at 0.66m depth									

20 40 60 80

20 40 60 80 100

Shear Strength (kPa)

▲ Undisturbed △ Remoulded

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154 Colonnade Road South, Ottawa, Ontario K2E 7J5

SOIL PROFILE AND TEST DATA

Geotechnical Investigation
Proposed High Rise Development
1345 Baseline Road, Ottawa, Ontario

DATUM Geodetic

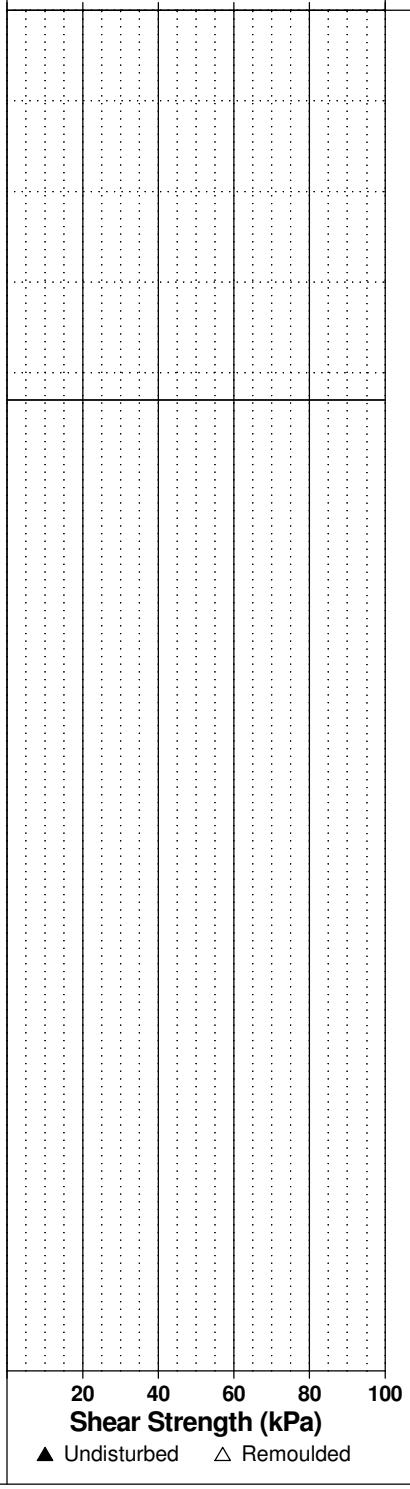
FILE NO. PG6129

REMARKS

HOLE NO. BH 5-22

BORINGS BY CME-55 Low Clearance Drill **DATE** 2022 February 25

SOIL DESCRIPTION	STRATA PLOT	SAMPLE TYPE	SAMPLE NUMBER	SAMPLE % RECOVERY	SAMPLE N VALUE or RQD	DEPTH (m)	ELEV. (m)	Pen. Resist. Blows/0.3m ● 50 mm Dia. Cone ○ Water Content %	Monitoring Well Construction
GROUND SURFACE						0	100.47		
Asphalt 0.05									
FILL: Granular crushed stone 0.25									
FILL: Brown silty sand with gravel and crushed stone		AU	1						
0.86		SS		0	50+				
End of Borehole									
Practical refusal to augering at 0.86m depth									



SYMBOLS AND TERMS

SOIL DESCRIPTION

Behavioural properties, such as structure and strength, take precedence over particle gradation in describing soils. Terminology describing soil structure are as follows:

Desiccated	-	having visible signs of weathering by oxidation of clay minerals, shrinkage cracks, etc.
Fissured	-	having cracks, and hence a blocky structure.
Varved	-	composed of regular alternating layers of silt and clay.
Stratified	-	composed of alternating layers of different soil types, e.g. silt and sand or silt and clay.
Well-Graded	-	Having wide range in grain sizes and substantial amounts of all intermediate particle sizes (see Grain Size Distribution).
Uniformly-Graded	-	Predominantly of one grain size (see Grain Size Distribution).

The standard terminology to describe the relative strength of cohesionless soils is the compactness condition, usually inferred from the results of the Standard Penetration Test (SPT) 'N' value. The SPT N value is the number of blows of a 63.5 kg hammer, falling 760 mm, required to drive a 51 mm O.D. split spoon sampler 300 mm into the soil after an initial penetration of 150 mm. An SPT N value of "P" denotes that the split-spoon sampler was pushed 300 mm into the soil without the use of a falling hammer.

Compactness Condition	'N' Value	Relative Density %
Very Loose	<4	<15
Loose	4-10	15-35
Compact	10-30	35-65
Dense	30-50	65-85
Very Dense	>50	>85

The standard terminology to describe the strength of cohesive soils is the consistency, which is based on the undisturbed undrained shear strength as measured by the in situ or laboratory shear vane tests, unconfined compression tests, or occasionally by the Standard Penetration Test (SPT). Note that the typical correlations of undrained shear strength to SPT N value (tabulated below) tend to underestimate the consistency for sensitive silty clays, so Paterson reviews the applicable split spoon samples in the laboratory to provide a more representative consistency value based on tactile examination.

Consistency	Undrained Shear Strength (kPa)	'N' Value
Very Soft	<12	<2
Soft	12-25	2-4
Firm	25-50	4-8
Stiff	50-100	8-15
Very Stiff	100-200	15-30
Hard	>200	>30

SYMBOLS AND TERMS (continued)

SOIL DESCRIPTION (continued)

Cohesive soils can also be classified according to their "sensitivity". The sensitivity, S_t, is the ratio between the undisturbed undrained shear strength and the remoulded undrained shear strength of the soil. The classes of sensitivity may be defined as follows:

Low Sensitivity:	$S_t < 2$
Medium Sensitivity:	$2 < S_t < 4$
Sensitive:	$4 < S_t < 8$
Extra Sensitive:	$8 < S_t < 16$
Quick Clay:	$S_t > 16$

ROCK DESCRIPTION

The structural description of the bedrock mass is based on the Rock Quality Designation (RQD).

The RQD classification is based on a modified core recovery percentage in which all pieces of sound core over 100 mm long are counted as recovery. The smaller pieces are considered to be a result of closely-spaced discontinuities (resulting from shearing, jointing, faulting, or weathering) in the rock mass and are not counted. RQD is ideally determined from NQ or larger size core. However, it can be used on smaller core sizes, such as BQ, if the bulk of the fractures caused by drilling stresses (called "mechanical breaks") are easily distinguishable from the normal in situ fractures.

RQD %	**ROCK QUALITY**
90-100	Excellent, intact, very sound
75-90	Good, massive, moderately jointed or sound
50-75	Fair, blocky and seamy, fractured
25-50	Poor, shattered and very seamy or blocky, severely fractured
0-25	Very poor, crushed, very severely fractured

SAMPLE TYPES

SS	-	Split spoon sample (obtained in conjunction with the performing of the Standard Penetration Test (SPT))
TW	-	Thin wall tube or Shelby tube, generally recovered using a piston sampler
G	-	"Grab" sample from test pit or surface materials
AU	-	Auger sample or bulk sample
WS	-	Wash sample
RC	-	Rock core sample (Core bit size BQ, NQ, HQ, etc.). Rock core samples are obtained with the use of standard diamond drilling bits.

SYMBOLS AND TERMS (continued)

PLASTICITY LIMITS AND GRAIN SIZE DISTRIBUTION

WC%	-	Natural water content or water content of sample, %
LL	-	Liquid Limit, % (water content above which soil behaves as a liquid)
PL	-	Plastic Limit, % (water content above which soil behaves plastically)
PI	-	Plasticity Index, % (difference between LL and PL)
Dxx	-	Grain size at which xx% of the soil, by weight, is of finer grain sizes These grain size descriptions are not used below 0.075 mm grain size
D10	-	Grain size at which 10% of the soil is finer (effective grain size)
D60	-	Grain size at which 60% of the soil is finer
Cc	-	Concavity coefficient = $(D30)^2$ / (D10 x D60)
Cu	-	Uniformity coefficient = D60 / D10

Cc and Cu are used to assess the grading of sands and gravels:
Well-graded gravels have: $1 < Cc < 3$ and $Cu > 4$
Well-graded sands have: $1 < Cc < 3$ and $Cu > 6$
Sands and gravels not meeting the above requirements are poorly-graded or uniformly-graded.
Cc and Cu are not applicable for the description of soils with more than 10% silt and clay
(more than 10% finer than 0.075 mm or the #200 sieve)

CONSOLIDATION TEST

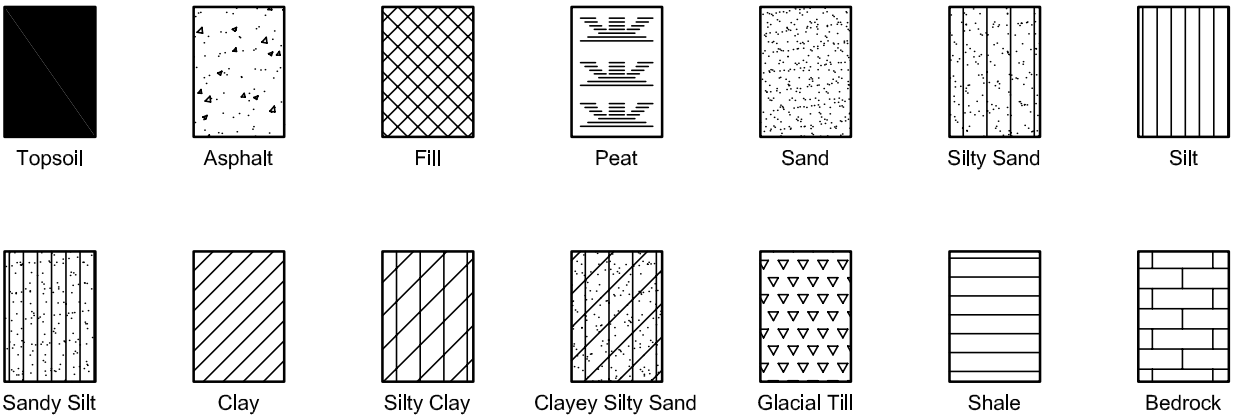
p'_o	-	Present effective overburden pressure at sample depth
p'_c	-	Preconsolidation pressure of (maximum past pressure on) sample
Ccr	-	Recompression index (in effect at pressures below p'_c)
Cc	-	Compression index (in effect at pressures above p'_c)
OC Ratio		Overconsolidaton ratio = p'_c / p'_o
Void Ratio		Initial sample void ratio = volume of voids / volume of solids
Wo	-	Initial water content (at start of consolidation test)

PERMEABILITY TEST

k	-	Coefficient of permeability or hydraulic conductivity is a measure of the ability of water to flow through the sample. The value of k is measured at a specified unit weight for (remoulded) cohesionless soil samples, because its value will vary with the unit weight or density of the sample during the test.

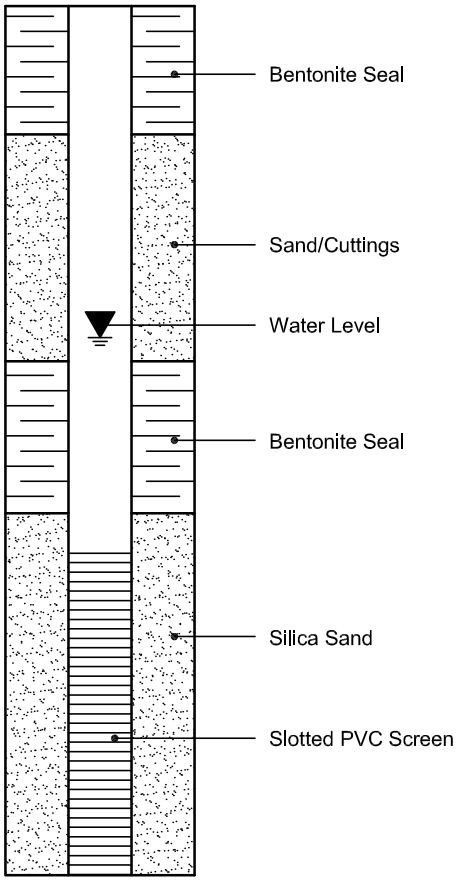
SYMBOLS AND TERMS (continued)

STRATA PLOT

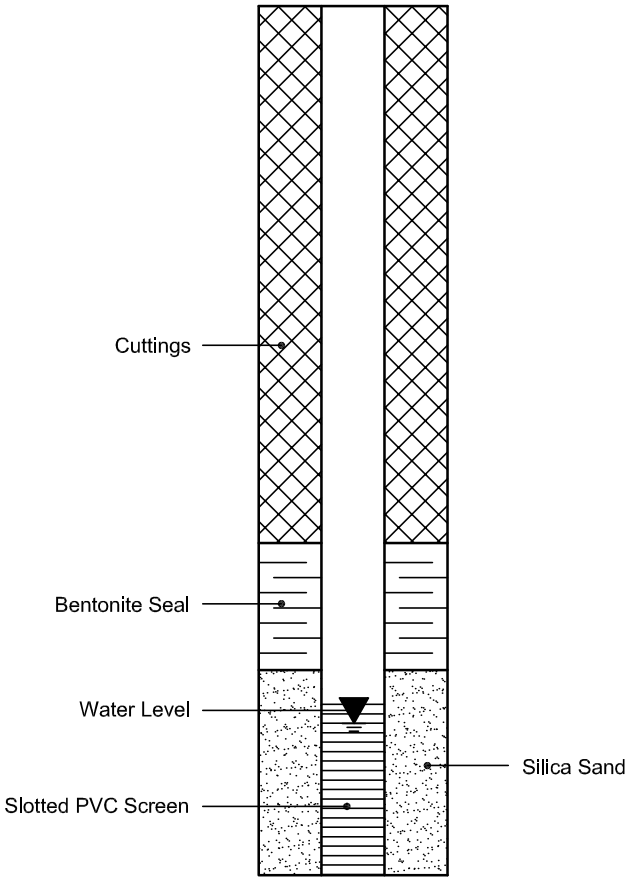


MONITORING WELL AND PIEZOMETER CONSTRUCTION

MONITORING WELL CONSTRUCTION



PIEZOMETER CONSTRUCTION



Certificate of Analysis

Report Date: 03-Mar-2022

Client: Paterson Group Consulting Engineers

Order Date: 25-Feb-2022

Client PO: 33971

Project Description: PG6129

	Client ID:	BH1-22 SS2	-	-	-
	Sample Date:	25-Feb-22 09:00	-	-	-
	Sample ID:	2209497-01	-	-	-
	MDL/Units	Soil	-	-	-
Physical Characteristics					
% Solids	0.1 % by Wt.	96.3	-	-	-
General Inorganics					
pH	0.05 pH Units	7.76	-	-	-
Resistivity	0.10 Ohm.m	9.80	-	-	-
Anions					
Chloride	5 ug/g dry	369	-	-	-
Sulphate	5 ug/g dry	182	-	-	-

APPENDIX 2

FIGURE 1 – KEY PLAN

DRAWING PG6129-1 – TEST HOLE LOCATION PLAN

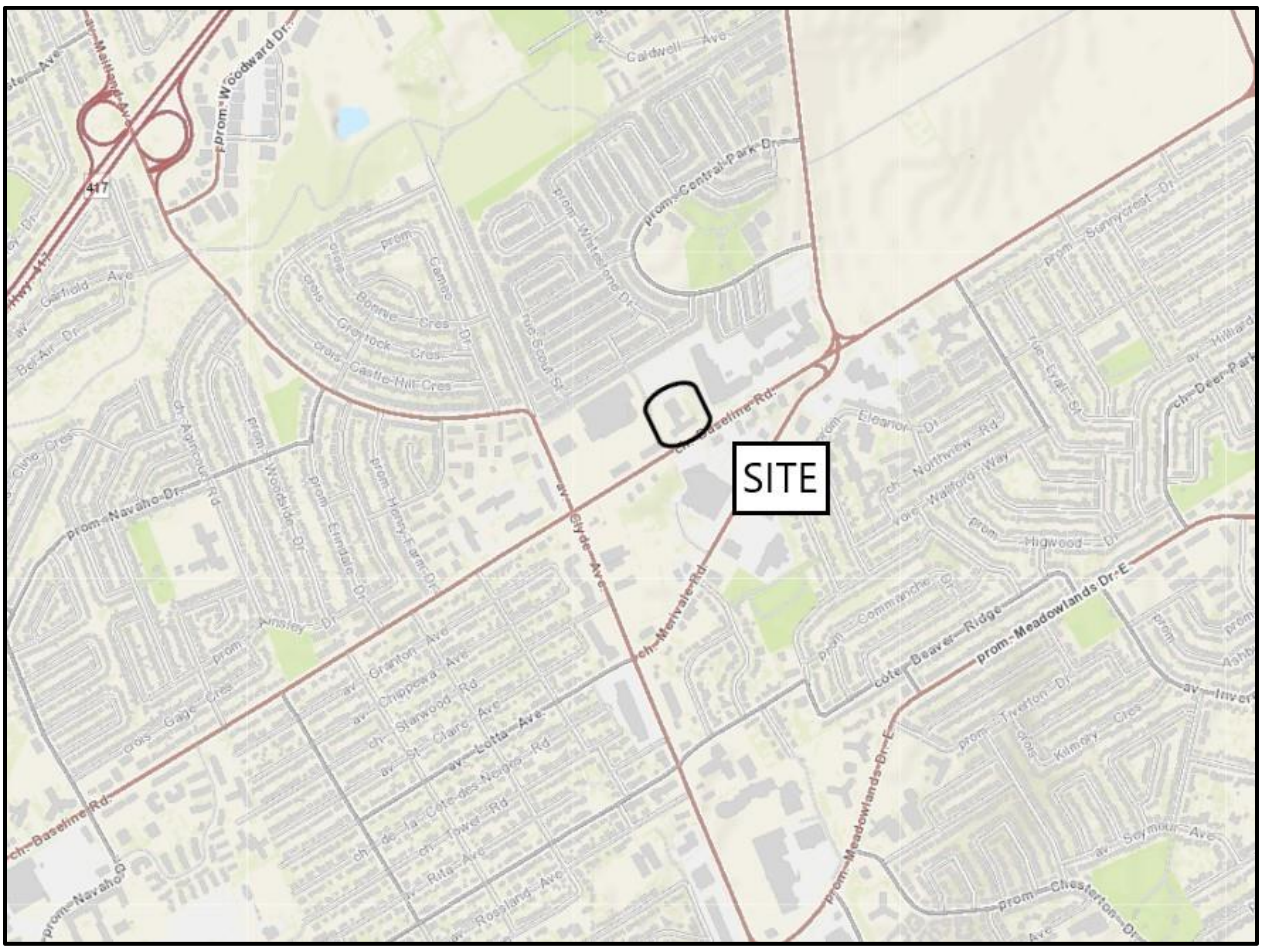
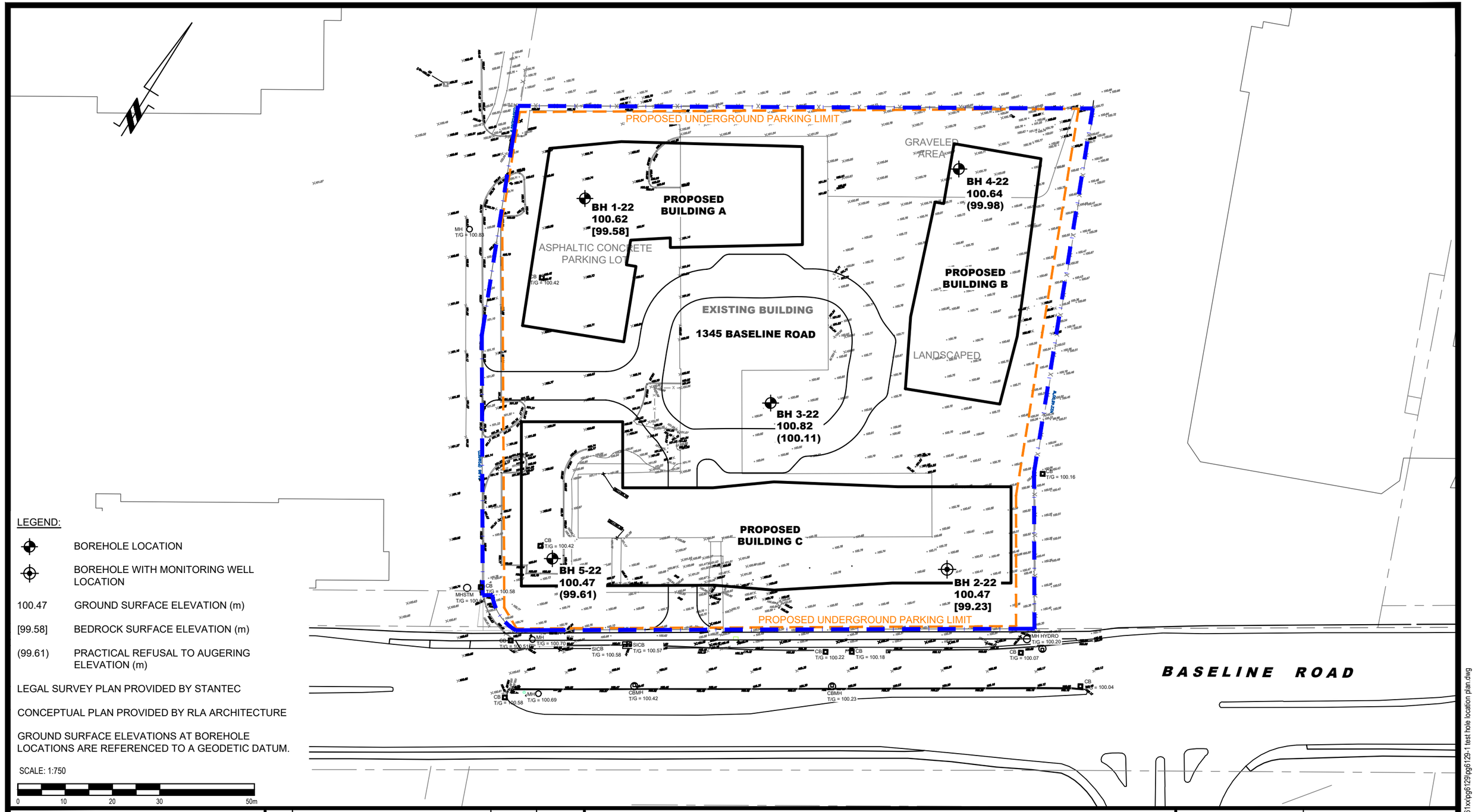


FIGURE 1

KEY PLAN



LEGEND:

- BOREHOLE LOCATION
- BOREHOLE WITH MONITORING WELL LOCATION
- 100.47 GROUND SURFACE ELEVATION (m)
- [99.58] BEDROCK SURFACE ELEVATION (m)
- (99.61) PRACTICAL REFUSAL TO AUGERING ELEVATION (m)

LEGAL SURVEY PLAN PROVIDED BY STANTEC

CONCEPTUAL PLAN PROVIDED BY RLA ARCHITECTURE

GROUND SURFACE ELEVATIONS AT BOREHOLE LOCATIONS ARE REFERENCED TO A GEODETIC DATUM.

SCALE: 1:750

0 10 20 30 50m

patersongroup
consulting engineers

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NO.	REVISIONS	DATE	INITIAL

SCOUTS CANADA C/O COLLIERS

GEOTECHNICAL INVESTIGATION
PROPOSED HIGH-RISE DEVELOPMENT
1345 BASELINE ROAD

OTTAWA, ONTARIO

Title:

TEST HOLE LOCATION PLAN

Scale: 1:750	Date: 03/2022
Drawn by: JM	Report No.: PG6129-1
Checked by: NP	Dwg. No.: PG6129-1
Approved by: DJG	Revision No.:

11x17

p:\autocad drawings\geotechnical\pg6129\pg6129-1 test hole location plan.dwg

D.3 ENVIRONMENTAL SITE ASSESSMENT REPORT

Geotechnical Engineering

Environmental Engineering

Hydrogeology

Geological Engineering

Materials Testing

Building Science

patersongroup

Phase I - Environmental Site Assessment

1345 Baseline Road
Ottawa, Ontario

Prepared For

Scouts Canada

May 5, 2022

Report: PE5585-1

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EXECUTIVE SUMMARY

Assessment

Paterson Group was commissioned by Colliers Canada to conduct a Phase I – Environmental Site Assessment (Phase I ESA) for the property addressed 1345 Baseline Road in the City of Ottawa, Ontario. The purpose of this Phase I ESA was to research the past and current use of the subject site and study area as well as to identify any environmental concerns with the potential to have impacted the subject site.

According to the historical research, the subject site was vacant before it was first developed for Scouts Canada National Office circa 1959. The 1965 FIPs state that the building was heated by fuel oil, however, they do not show the location of the AST or UST on the subject site.

The neighbouring lands in the vicinity of the subject site have historically been developed for commercial retail, government office buildings and residential purposes. Multiple off-site PCAs identified within the Phase I study area are not considered to result in APECs on the Phase I - Property based on their separation distances, as well as their inferred down-gradient or cross-gradient orientation with respect to anticipated groundwater flow.

An RSC was filed in December 2009 by Paterson Group Inc. for the property immediately west of the subject site, approximately 360 m^3 of contaminated soil was removed from this property and 15,700 litres of impacted water were removed from the site by a licenced pumping contractor. The RSC indicated that no soil, sediment or groundwater has been remediated or removed within 3 meters of the RSC property boundary. It is our opinion that this property does not pose a potential environmental concern to the Phase I - Property.

Following the historical review, a site inspection was conducted to assess the present-day environmental conditions of the subject site. The subject site is currently occupied with Scouts Canada. No evidence of a former AST or UST was identified during the site visit. No environmental concerns were identified with respect to the current use of the subject site.

The neighbouring lands within the vicinity of the subject site were generally observed to be used for commercial retail, office, and residential purposes. No environmental concerns were identified with respect to the surrounding properties.

A geophysical survey was recommended and conducted by Notra to assess the possibility of a UST in the vicinity of the boiler room. The survey did not find evidence of

a large or medium sized buried tank. The survey did not rule out the former presence of a UST that was removed, or a smaller UST, however, it is our opinion that it is unlikely that a small tank would have been used to heat a building of this size.

Based on the information currently available, more specifically, the lack of evidence of a former underground storage tank, **it is our opinion that a Phase II ESA is not required at this time**. Should information contrary to our current findings be encountered we request that we be notified to reassess our conclusion.

Recommendations

Prior to the completion of a Phase II-ESA, further effort should be given to determining whether or not an AST or a UST was utilized to store heating oil. This information would aid in establishing the nature of the Phase II-ESA. If no information can be found to determine this, consideration should be given to conduct a geophysical survey to try to locate any subsurface structure that may indicate the presence of an exterior UST.

Hazardous Building Materials

Based on the age of the subject building (c.1959), asbestos containing materials (ACMs) may be present within the structure. Potential ACMs identified include drywall joint compound, plaster, vinyl and ceiling tiles. These materials were noted to be in good condition at the time of our inspection and do not represent an immediate concern. An asbestos survey of the buildings should be conducted in accordance with Ontario Regulation 278/05, under the Occupational Health and Safety Act, prior to demolition or renovation, if one has not already been conducted.

Based on the age of the subject building (c. 1959), lead-based paints may be present, on any original or older painted surfaces. The painted surfaces within the subject buildings were generally observed to be in good condition and do not pose an immediate concern to the occupants of the buildings. Major work involving lead-based paint or other lead containing products must be done in accordance with O.Reg. 843, under the Occupational Health and Safety Act.

1.0 INTRODUCTION

At the request of Colliers Canada acting on behalf Scouts Canada, Paterson Group (Paterson) conducted a Phase I – Environmental Site Assessment (Phase I ESA) for 1345 Baseline Road, in the City of Ottawa, Ontario. The purpose of this Phase I ESA was to research the past and current use of the subject site and study area as well as to identify any environmental concerns with the potential to have impacted the subject site.

Paterson was engaged to conduct this Phase I ESA by Mr. Aaron Clodd of Colliers Canada. Mr. Clodd can be reached at 181 Bay Street, Suite 1400, Toronto, ON.

This report has been prepared specifically and solely for the above noted project which is described herein. It contains all our findings and results of the environmental conditions at this site.

This Phase I ESA report has been prepared in general accordance with Ontario Regulation 153/04, as amended under the Environmental Protection Act, and also complies with the requirements of CSA Z768-01 (reaffirmed 2016). The conclusions presented herein are based on information gathered from a limited historical review and field inspection program. The findings of the Phase I ESA are based on a review of readily available geological, historical, and regulatory information, as well as a cursory review made at the time of the field assessment. The historical research relies on information supplied by others, such as local, provincial, and federal agencies, and was limited within the scope-of-work, time, and budget of the project herein.

2.0 PROPERTY INFORMATION

Address:	1345 Baseline Road, Ottawa, Ontario.
Legal Description:	Part of Lot N, Concession A (Rideau Front), Formerly the Township of Nepean, in the City of Ottawa, Ontario.
Location:	The subject site is located on the north side of Baseline Road, approximately 365m east of the Clyde Avenue and Baseline Road intersection, in the City of Ottawa, Ontario. Refer to Figure 1 – Key Plan for the site location. For the purposes of this report, Baseline Road is assumed to run in an east-west direction and lies to the south of the Phase I Property.
Latitude and Longitude:	45° 21' 49.3344" N, 75° 44' 10.7124" W

Site Description:

Configuration:	Irregular.
Site Area:	1.32 ha.
Zoning:	AM5 – Arterial Mainstreet Zone.
Current Uses:	The subject site is currently occupied with one and a half storey office building with associated courtyard and asphaltic concrete parking lot.
Services:	The subject site is located within a municipally serviced area.

3.0 SCOPE OF INVESTIGATION

The scope of work for this Phase I – Environmental Site Assessment was as follows:

- ❒ Determine the historical activities on the subject site and study area by conducting a review of readily available records, reports, photographs, plans, mapping, databases, and regulatory agencies;
- ❒ Investigate the existing conditions present at the subject site and study area by conducting site reconnaissance;
- ❒ Conduct interviews with persons knowledgeable of current and historic operations on the subject property and, if warranted, neighbouring properties;
- ❒ Present the results of our findings in a comprehensive report in general accordance with the requirements of Ontario Regulation 269/11 amending O.Reg. 153/04 made under the Environmental Protection Act and in compliance with the requirements of CSA Z768-01;
- ❒ Provide a preliminary environmental site evaluation based on our findings;
- ❒ Provide preliminary remediation recommendations and further investigative work if contamination is suspected or encountered.

4.0 RECORDS REVIEW

4.1 General

Phase I ESA Study Area Determination

A radius of approximately 250 m was determined to be appropriate as a Phase I ESA study area for this assignment. Properties located outside of this 250 m radius are not considered to have had the potential to impact the subject site, based on their significant distance away from the site.

First Developed Use Determination

Based on a review of available historical information, the subject site was first developed circa 1959 for Scouts Canada National Office.

City of Ottawa Street Directories

City directories were reviewed at approximate ten-year intervals for the subject site and surrounding properties.

Based on the directories, the subject property was vacant prior to being developed with Boy Scouts Canada National Office. Based on the available information, adjacent properties have generally been used for office, institutional or commercial purposes since their development. Several retail fuel outlets and car garages/dealerships were located to the south of the Phase I Property. Based on their distance and downgradient locations, these properties do not pose an environmental risk to the subject property

Fire Insurance Plans

Fire insurance plans (FIPs) from 1965 were reviewed for the subject site and surrounding properties. The subject site is occupied by the Boy Scouts Canada National Office. The FIPs state that the building was heated by fuel oil, however, they do not show any above ground storage tanks (ASTs) or underground storage tanks (USTs) on the subject site. The former use of fuel oil as a heating source was considered to be an item that required further investigation (refer to “Geophysical Survey” on page 9)

The neighbouring property to the west is occupied by a high school while the property to the east was occupied by a bowling lane. The property to the southeast of the subject site, addressed 1292 Baseline Road, is occupied by an auto service garage, with an UST located on the northeast corner of the property, approximately 160m from the subject site. The property to the southeast of the subject site,

addressed 1450 Merivale Road, is occupied by Westway Motors Ltd., which consists of one (1) structure with a repair garage, approximately 160m from the subject site. The property to the southeast of the subject site, addressed 1460A was occupied by a gas bar, with one UST located approximately 60m from the subject site. Based on their distance and primarily down-gradient locations, these properties do not pose an environmental risk to the subject site.

4.2 Environmental Source Information

National Pollutant Release Inventory

A search of the National Pollutant Release Inventory (NPRI) was conducted as part of this assessment. No records of any pollutant releases were identified for the subject site or for any properties situated within the Phase I study area.

PCB Waste Storage Site Inventory

A search of the provincial PCB waste storage site inventory was conducted as part of this assessment. According to the database, no PCB waste storage sites are located within 250m of the vicinity of the subject property.

MECP Waste Disposal Site Inventory

The Ontario Ministry of Environment, Conservation and Parks document entitled, *"Waste Disposal Site Inventory in Ontario, 1991"* was reviewed as part of this assessment. This document includes all recorded active and closed waste disposal sites, industrial manufactured gas plants, and coal tar distillation plants situated in the Province of Ontario. A review of this document did not identify any relevant records pertaining to the subject site or for properties located within the Phase I study area.

MECP Coal Gasification Plant Inventory

The Ontario Ministry of Environment, Conservation and Parks document entitled, *"Municipal Coal Gasification Plant Site Inventory, 1991"* was reviewed as part of this assessment. This document provides a reference to the locations of former plants with respect to the subject site. A review of this document did not identify any former coal gasification plants located on the subject site or within the Phase I study area.

MECP Brownfields Environmental Site Registry

A search of the MECP Brownfields Environmental Site Registry was conducted as part of this assessment.

One RSC was identified for properties situated within the Phase I study area:

- *1357 Baseline Road (RSC #66519)* – Located immediately west of the Phase I - Property. According to the RSC, filed in December 2009 by Paterson Group Inc., approximately 360 m^3 of contaminated soil was removed from this property and 15,700 litres of impacted water was pumped and removed from the site by a licenced pumping contractor.

  The RSC indicated that no soil, sediment or groundwater has been removed within 3 meters of the RSC property boundary. It is our opinion that this property does not pose a potential environmental concern to the Phase I - Property.

MECP Instruments

A request was submitted to the MECP Freedom of Information office for information with respect to certificates of approval, permits to take water, certificates of property use, or any other similar MECP issued instruments for the subject site. A response from the MECP had not been received prior to the issuance of this report.

MECP Submissions

A request was submitted to the MECP Freedom of Information office for information with respect to reports related to environmental conditions for the subject site. A response from the MECP had not been received prior to the issuance of this report.

MECP Waste Management Records

A request was submitted to the MECP Freedom of Information office for information with respect to waste management records for the subject site. A response from the MECP had not been received prior to the issuance of this report.

MECP Incident Reports

A request was submitted to the MECP Freedom of Information office for information with respect to records concerning environmental incidents, orders, offences, spills, discharges of contaminants, or inspections maintained by the MECP for the subject site or neighbouring properties. A response from the MECP had not been received prior to the issuance of this report.

Areas of Natural Significance

A search for areas of natural and scientific interest situated within the Phase I study area was conducted electronically via the Ontario Ministry of Natural Resources and Forestry (OMNRF) website. The search did not identify any natural features of areas of natural significance within the Phase I study area.

Technical Standards and Safety Authority (TSSA)

The TSSA Fuels Safety Branch in Toronto was contacted electronically, as part of this assessment, to inquire about current and former underground fuel storage tanks, spills, and historical incidents for the Phase I - Property and neighbouring properties. The response from the TSSA indicated that no records were identified pertaining to the Phase I - Property.

One off-site record was identified for the following property within the Phase I study area:

- *1460 Merivale Road* – Located approximately 60 m to the southeast of the Phase I - Property. The response from the TSSA identified sixteen records pertaining to this property, which include:
    - 3 expired self and full serve gasoline stations;
    - 6 expired underground fuel storage tanks;
    - 1 expired propane tank;
    - 2 active underground fuel storage tanks;
    - 2 cylinder exchange.
    - 1 expired gasoline station (full serve).

The former and current presence of a retail fuel outlet is not considered to pose a potential environmental concern due to the down gradient orientation. A copy of the correspondence with the TSSA is included in Appendix 2.

City of Ottawa Old Landfill Sites

The document prepared by Golder Associates entitled, *"Old Landfill Management Strategy, Phase I - Identification of Sites, City of Ottawa"*, was reviewed as part of this assessment. No former landfill sites were identified on the subject site or within the Phase I study area.

City of Ottawa Historical Land Use Inventory (HLUI) Database

As part of this assessment, a requisition form was submitted to the City of Ottawa to request information from the City's Historical Land Use Inventory (HLUI) database for any environmental records pertaining to the subject site as well as any properties situated within the Phase I study area. A copy of the response letter has been included in Appendix 2.

Based on the response, two activities were identified within 50m of the Phase I property. A former UST was located at 1357 Baseline Road and multiple expired and active UST records pertaining to a gas station located at 1460 Merivale Road were identified. The gas station located at 1460 Merivale Road is down-gradient and does not pose a potential environmental concern to the subject site. The property located at 1357 has been remediated and contaminated soil was removed according to an RSC filed in 2009, therefore, this property does not pose an environmental concern to the subject property.

ERIS Database Report

A database report, prepared by ERIS (Environmental Risk Information Services) Ltd., dated April 14, 2022, was acquired and reviewed as part of this assessment. The complete ERIS report has been included in Appendix 2.

❒ *On-Site Records:*

The ERIS report identified two (2) Waste Generators on the subject site. The documented waste classes associated with the generator records are limited to detergents and soaps, inorganic laboratory chemicals, paint residues and alkaline wastes. The Waste Generator records do not pose an environmental risk to the subject site due to the nature of the organization.

No environmental concerns were identified with respect to the ERIS findings of the subject site.

Off-Site Records:

The ERIS report identified two hundred and twenty-three (223) records pertaining to properties located within a 250 m radius of the subject site. Several Waste Generator records and historic fuel tanks, delisted fuel tanks and private and retail fuel storage tanks were identified for the properties located within 250m of the subject site. The off-site records identified in the ERIS report are listed for properties which are situated at a significant distance away, or are situated in a down-gradient or cross-gradient orientation, with respect to the subject site, and thus are not considered to pose an environmental concern.

OPTA Information Systems (OPTA)

One of each 1982 Commercial Property Fire Inspection Survey Report, Commercial Property Fire Rating Form Report and Siteplan Report were acquired for the subject property. The reports indicate that natural gas was being used in the property for hot water/steam and there was no mention of any under or above ground fuel storage tank usage on the property. Copies of these reports are included in Appendix 2.

Geophysical Survey

A Geophysical Survey was recommended and conducted by Notra Inc., as detailed in their April 8, 2022 report, a copy of which is attached in Appendix 2. The survey investigated the open areas outside the boiler room to determine if an underground storage tank may be present on-site. A magnetic anomaly was identified 9 meters from the boiler room along the edge of the parking lot, however, cross referencing this survey with two other types of surveys indicated that the magnetic anomaly is not likely due to an object as large as a UST, but, a smaller distribution or smaller metals, likely vertical pieces and greater than 40 cm deep.

In brief, the survey did not identify evidence of a medium to large UST. While the survey did not rule out the presence of a small UST, the likelihood was considered to be low. It is our opinion that given the size of the building, any UST would have been of a larger size. The survey results do not rule out the possibility that there was a UST that has since been removed. Reference should be made to the Notra Report for specific details of the survey work.

4.3 Physical Setting Sources

Aerial Photographs

Historical air photos from the National Air Photo Library were reviewed in approximate ten (10) year intervals, commencing with the earliest available photograph. Based on the review, the following observations have been made:

1958 The subject site and the neighbouring properties to the north appear to be vacant, undeveloped lands. What appear to be several houses and commercial buildings occupy some properties along Baseline Road. Laurentian High School can be seen immediately west of the subject site.

1965 The subject site is now occupied with the present-day Scouts Canada building. What appears to be a commercial building has been constructed immediately east of the subject site. An addition has been

made on to the high school immediately west of the subject site. According to the FIPs, a gas bar is present southeast of the subject site, across Baseline Road. Multiple commercial/light industrial buildings have been constructed in the general vicinity of the subject site.

1976 *(City of Ottawa Website)* No significant changes are apparent with respect to the subject site. An addition has been made onto the commercial property east of the subject site. Residential dwellings and residential apartment buildings have been constructed further west of the subject site.

1991 *(City of Ottawa Website)* No significant changes are apparent with respect to the subject property. According to Google Maps, government office buildings have been constructed east of the subject site. What appears to be commercial properties are now present further southeast of the subject site.

2002 *(City of Ottawa Website)* No significant changes are apparent with respect to the subject property. An asphaltic parking lot and Residential dwellings have been constructed north of the subject site. A commercial building has been constructed southwest of the subject site, across Baseline Road.

2011 *(City of Ottawa Website)* No significant changes are apparent with respect to the subject property. The high school occupying the property west of the subject site has been replaced by commercial retail buildings. The gas bar southeast of the subject site has been removed and the present-day retail fuel outlet is now occupying the property. A commercial retail/office building has been constructed south of the subject site, across Baseline Road. Multiple commercial retail buildings have been constructed further south of the subject site, along Merivale Road.

2019 *(City of Ottawa Website)* No significant changes are apparent with respect to the subject site. A commercial retail/office building has been constructed west of the subject site. What appears to be two commercial office/retail buildings have been constructed further southeast of the subject site.

Copies of selected aerial photographs reviewed are included in Appendix 1.

Geological Maps

The Geological Survey of Canada website on the Urban Geology of the National Capital Area was reviewed as part of this assessment. Based on the available information, the bedrock in the area of the subject site consists of an interbedded limestone and dolomite of the Gull River Formation, whereas the surficial geology consists of Paleozoic bedrock, with an overburden thickness ranging from approximately 0 to 3m.

Topographic Maps

A topographic map was reviewed from the Natural Resources Canada – The Atlas of Canada website as part of this assessment. The regional topography in the general area of the subject site slopes downward towards the south. An illustration of the referenced topographic map is presented on Figure 2 – Topographic Map, appended to this report.

Physiographic Maps

A physiographic map was reviewed from the Natural Resources Canada – The Atlas of Canada website, as a part of this assessment. According to the publication and mapping information, the subject site is situated within the St. Lawrence Lowlands. According to the description provided: *"The lowlands are plain-like areas that were affected by the Pleistocene glaciations and are therefore covered by surficial deposits and other features associated with the ice sheets."* The subject site is specifically located within the Central St. Lawrence Lowland area, which is rarely more than 150 m above sea level.

Water Bodies

No water bodies are present on the subject site. The nearest named water body with respect to the subject site is the Rideau River, located approximately 2.7 km to the southeast.,

MECP Water Well Records

A search of the MECPs website for all drilled well records within a 250 m radius of the subject site was conducted as part of this assessment. The search did not identify any well records on-site. The search identified twenty-five (25) well record within the Phase I study area. The records pertain to wells installed between 1955 and 2019. Based on the availability of municipal services, no drinking water wells are expected to be in use within the Phase I study area.

According to the well records, the overburden stratigraphy in the area of the subject site generally consists of sand, gravel and silty clay. Bedrock, consisting of shale and limestone, was typically encountered at depths of approximately 0.6m to 4.5m below ground surface. A copy of the aforementioned well record has been included in Appendix 2.

5.0 PERSONAL INTERVIEWS

Mr. Jeff Schaffhauser, with Scouts Canada, was present during the site inspections on January 20, 2022 and February 4, 2022. Mr. Schaffhauser indicated that Scouts Canada has occupied the Phase I Property since its construction circa 1959. Mr. Schaffhauser stated that the building is heated by natural gas and was not aware of any fuel tanks historically used as a former heating source for the building. Mr. Schaffhauser mentioned that the key for the hydro vault room is with Hydro Ottawa and a copy of the key is not available on-site. Mr. Schaffhauser was also not aware if any asbestos or designated substance surveys have been done on the subject site or any potential environmental concerns associated with the subject site.

6.0 SITE RECONNAISSANCE

6.1 General Requirements

Two inspections were conducted for the subject site on January 20, 2022 and February 4, 2022, between 1:00 PM and 2:00 PM. Weather conditions were clear, with temperatures of approximately -11 and -10°C. Mr. Mohammed Ramadan, from the Environmental Department of Paterson Group, conducted the inspection. In addition to the subject site, the uses of neighbouring properties within the Phase I study area were also assessed at the time of the site inspection.

6.2 Site Inspection Observations

Site Description

The subject site is currently occupied with a two-storey building. It is constructed with a slab-on-grade foundation and finished on the exterior with decorative concrete, as well as a flat tar and gravel style roof.

The remainder of the property consists of a courtyard and landscaped areas in the eastern and southern portions of the property, as well as an asphaltic concrete and gravel parking lots in the western and northern portions of the property.

The site and regional topography appear to slope down to the southeast. The subject site is considered to be slightly above grade with respect to Baseline Road.

Water drainage on the subject site occurs primarily via infiltration throughout the landscaped areas, as well as via surface run-off towards catch basins located in the parking lot and on Baseline Road. No ponded water, stressed vegetation, surficial staining, or any other indications of potential sub-surface contamination were observed on the subject site at time of the site inspection.

A depiction of the subject site is illustrated on Drawing PE5585-1 – Site Plan, in the Figures section of this report.

Existing Buildings and Structures

The subject site is currently occupied by Scouts Canada National building, The building is currently heated via natural gas.

Potential Environmental Concerns

❒ **Transformer Oil and Polychlorinated Biphenyls (PCBs)**

No concerns were identified with respect to PCBs or transformer oil on the exterior of the subject site.

❒ **Hazardous Materials and Unidentified Substances**

No hazardous materials, unidentified substances, spills, surficial staining, abnormal odours, or indications of potential sub-surface contamination were observed on the exterior of the subject site at the time of the site inspection, although the site was partially snow covered at the time of the field work.

❒ **Fuels and Chemical Storage**

No chemical storage areas, vent and fill pipes, above ground storage tanks (ASTs), or signs of underground storage tanks (USTs) were observed on the exterior of the subject site at the time of the site inspection.

❒ **Waste Management**

Solid, non-hazardous domestic waste and recyclable products are stored in plastic bins adjacent to the exterior of the building and are collected by the municipality on a regular basis. No environmental concerns were identified with respect to waste management practices on the subject site.

Interior Assessment

A general description of the interior of the building is as follows:

- The floors consist of vinyl tiles, carpet, and concrete;
- The walls consist of drywall and concrete;
- The ceilings consist of ceiling tiles, metal sheet and drywall;
- Lighting throughout the building is provided by incandescent and fluorescent light fixtures.

Potentially Hazardous Building Products

- **Asbestos-Containing Materials (ACMs)**

  Based on the age of the subject building (c. 1959), asbestos containing building materials may be present within the structure. Potential ACMs observed at the time of the site inspection include: vinyl tiles, drywall joint compound, plaster and ceiling tiles. These building materials were observed to be in good condition at the time of the site inspection and do not represent an immediate concern.

- **Lead-Based Paint**

  Based on the age of the subject building (c. 1959), lead-based paints may be present on any original or older painted surfaces. Painted surfaces were generally observed to be in good condition at the time of the site inspection and do not represent an immediate concern.

- **Polychlorinated Biphenyls (PCBs) and Transformer Oil**

  No potential sources of PCBs were identified within the interior of the subject building at the time of the site inspection. A transformer vault room was identified in the building but access was not granted as the room key is only available with Hydro Ottawa. A secondary transformer is present inside the building and was determined to be dry-cell type transformer.

- **Urea Formaldehyde Foam Insulation (UFFI)**

  UFFI was not observed during the site visit, however, wall cavities were not inspected for insulation type. Based on the age of the building (c.1959), UFFI is potentially present within the building.

Other Potential Environmental Concerns

❒ **Interior Fuel and Chemical Storage**

No aboveground fuel storage tanks or signs of underground fuel storage tanks were observed within the subject building at the time of the site inspection.

Chemical products stored in the subject building were observed to be limited to domestically available cleaning products, stored in their original containers.

No environmental concerns were identified with respect to chemical storage practices within the subject building.

❒ **Ozone Depleting Substances (ODSs)**

Potential sources of ODSs observed on site include fire extinguishers and refrigerators. These appliances appeared to be in good condition at the time of the site inspection and should be regularly serviced by a licensed contractor.

❒ **Wastewater Discharges**

No floor drains or sump pits were observed inside the subject building at the time of the site inspection.

Wastewater from the building (wash water and sewage) is discharged into the City of Ottawa sanitary sewer system. Roof drainage is discharged towards catch basins located in the parking lot and along Baseline Road, which drain into the City of Ottawa storm water system. No concerns were noted with respect to wastewater discharge on the subject site.

Neighbouring Properties

Land use adjacent to the subject site was observed as follows:

North: Asphaltic concrete parking lot, followed by residential dwellings;

South: Baseline Road, followed by commercial retail/office buildings;

East: Government office buildings;

West: Commercial retail buildings.

A retail fuel outlet and an auto repair shop are present approximately 60m southeast and 140m southwest of the subject site, respectively. Due to their down gradient orientation, these properties are considered to be potentially contaminated activities (PCAs) that do not result in areas of potential environmental concern (APECs). Current land use adjacent to the subject site is illustrated on Drawing PE5585-2 – Surrounding Land Use Plan, appended to this report.

7.0 REVIEW AND EVALUATION OF INFORMATION

7.1 Land Use History

Based on a review of available historical information, the subject site was first developed circa 1959 for Scouts Canada National Office and has been used for that purpose since.

Potentially Contaminating Activities (PCAs)

Based on the findings of the Phase I ESA, no potentially contaminating activities were identified on the Phase I property.

Seven off-site PCAs were identified within the Phase I study area but were deemed not to be of any environmental concern to the subject site based on their significant distance away from the subject site and their cross or down gradient orientation to the subject site.

Areas of Potential Environmental Concern (APECs)

No areas of potential environmental concern were identified on the subject site.

Contaminants of Potential Concern (CPCs)

No contaminants of potential concern were identified on the subject site.

7.2 Conceptual Site Model

Water Bodies

No water bodies are present on the subject site. The nearest named water body with respect to the subject site is the Rideau River, located approximately 2.7 km to the southeast.

Geological and Hydrogeological Setting

The Geological Survey of Canada website on the Urban Geology of the National Capital Area was reviewed as part of this assessment. Based on the available information, the bedrock in the area of the subject site consists of an interbedded limestone and dolomite of the Gull River Formation, whereas the surficial geology consists of Paleozoic bedrock, with an overburden thickness ranging from approximately 0 to 3m.

Groundwater is anticipated to flow in a southeastern direction.

Areas of Natural Significance

No areas of natural significance were identified on the subject site or within the Phase I study area.

Existing Buildings and Structures

The subject site is currently occupied by Scouts Canada National building, The building is currently heated via natural gas.

Drinking Water Wells

Based on the availability of municipal services, no drinking water wells are expected to be present within the Phase I study area.

Neighbouring Land Use

Neighbouring land use within the Phase I study area consists mainly of residential dwellings, government offices and commercial/retail buildings.

Potentially Contaminating Activities and Areas of Potential Environmental Concern

As per Section 7.1, no potentially contaminating activities (PCAs) resulting in areas of potential environmental concern (APECs) were identified with respect to the subject site.

Other off-site PCAs identified within the Phase I study area are not considered to result in APECs on the Phase I - Property based on their separation distances, as well as their inferred down-gradient or cross-gradient orientation with respect to anticipated groundwater flow.

Contaminants of Potential Concern

No contaminants of potential concern were identified on the subject site.

Assessment of Uncertainty and/or Absence of Information

The information available for review as part of the preparation of this Phase I ESA is considered to be sufficient to conclude that there are no PCAs or APECs associated with the subject site. The absence of any PCAs was confirmed by a variety of independent sources, and as such, the conclusions of this report are not affected by uncertainty which may be present with respect to the individual sources.

8.0 CONCLUSION

8.1 Assessment

Paterson Group was commissioned by Colliers Canada to conduct a Phase I – Environmental Site Assessment (Phase I ESA) for the property addressed 1345 Baseline Road in the City of Ottawa, Ontario. The purpose of this Phase I ESA was to research the past and current use of the subject site and study area as well as to identify any environmental concerns with the potential to have impacted the subject site.

According to the historical research, the subject site was vacant before it was first developed for Scouts Canada National Office circa 1959. The 1965 FIPs state that the building was heated by fuel oil, however, they do not show the location of the AST or UST on the subject site.

The neighbouring lands in the vicinity of the subject site have historically been developed for commercial retail, government office buildings and residential purposes. Multiple off-site PCAs identified within the Phase I study area are not considered to result in APECs on the Phase I - Property based on their separation distances, as well as their inferred down-gradient or cross-gradient orientation with respect to anticipated groundwater flow.

An RSC was filed in December 2009 by Paterson Group Inc. for the property immediately west of the subject site, approximately 360 m^3 of contaminated soil was removed from this property and 15,700 litres of impacted water were removed from the site by a licenced pumping contractor. The RSC indicated that no soil, sediment or groundwater has been remediated or removed within 3 meters of the RSC property boundary. It is our opinion that this property does not pose a potential environmental concern to the Phase I - Property.

Following the historical review, a site inspection was conducted to assess the present-day environmental conditions of the subject site. The subject site is currently occupied with Scouts Canada. No evidence of a former AST or UST was identified during the site visit. No environmental concerns were identified with respect to the current use of the subject site.

The neighbouring lands within the vicinity of the subject site were generally observed to be used for commercial retail, office, and residential purposes. No environmental concerns were identified with respect to the surrounding properties.

A geophysical survey was recommended and conducted by Notra to assess the possibility of a UST in the vicinity of the boiler room. The survey did not find

evidence of a large or medium sized buried tank. The survey did not rule out the former presence of a UST that was removed, or a smaller UST, however, it is our opinion that it is unlikely that a small tank would have been used to heat a building of this size.

Based on the information currently available, more specifically, the lack of evidence of a former underground storage tank, **it is our opinion that a Phase II ESA is not required at this time**. Should information contrary to our current findings be encountered we request that we be notified to reassess our conclusion.

8.2 Recommendations

Hazardous Building Materials

Based on the age of the subject building (c.1959), asbestos containing materials (ACMs) may be present within the structure. Potential ACMs identified include drywall joint compound, plaster, vinyl and ceiling tiles. These materials were noted to be in good condition at the time of our inspection and do not represent an immediate concern. An asbestos survey of the buildings should be conducted in accordance with Ontario Regulation 278/05, under the Occupational Health and Safety Act, prior to demolition or renovation.

Based on the age of the subject building (c. 1959), lead-based paints may be present, on any original or older painted surfaces. The painted surfaces within the subject buildings were generally observed to be in good condition and do not pose an immediate concern to the occupants of the buildings. Major work involving lead-based paint or other lead containing products must be done in accordance with O.Reg. 843, under the Occupational Health and Safety Act.

9.0 STATEMENT OF LIMITATIONS

This Phase I – Environmental Site Assessment report has been prepared in general accordance with O.Reg. 153/04, as amended, and CSA Z768-01 (reaffirmed 2016), however, it is not intended to be used for the filing of a records of site condition. The conclusions presented herein are based on information gathered from a limited historical review and field inspection program. The findings of the Phase I ESA are based on a review of readily available geological, historical, and regulatory information as well as a cursory review made at the time of the field assessment. The historical research relies on information supplied by others, such as local, provincial, and federal agencies and was limited within the scope-of-work, time, and budget of the project herein.

Should any conditions be encountered at the subject site and/or historical information that differ from our findings, we request that we be notified immediately in order to allow for a reassessment.

This report was prepared for the sole use of Colliers Canada and Scouts Canada. Permission and notification from Colliers Canada, Scouts Canada and Paterson Group will be required prior to the release of this report to any other party.

Paterson Group Inc.

Mohammed Ramadan, B.Sc.

Mark S. D'Arcy, P.Eng., QP$_{ESA}$

Report Distribution:

- Colliers Canada
- Scouts Canada
- Paterson Group Inc.

10.0 REFERENCES

Federal Records

- ❒ Natural Resources Canada: Air Photo Library.
- ❒ Natural Resources Canada: The Atlas of Canada.
- ❒ Geological Survey of Canada: Surficial and Subsurface Mapping.
- ❒ Environment Canada: National Pollutant Release Inventory.
- ❒ National PCB Waste Storage Site Inventory.
- ❒ National Archives of Canada.

Provincial Records

- ❒ MECP: Freedom of Information and Privacy Office.
- ❒ MECP: Municipal Coal Gasification Plant Site Inventory, 1991.
- ❒ MECP: Waste Disposal Site Inventory, 1991.
- ❒ MECP: Brownfields Environmental Site Registry.
- ❒ MECP: Water Well Inventory.
- ❒ Office of Technical Standards and Safety Authority, Fuels Safety Branch.
- ❒ Ministry of Natural Resources and Forestry Areas of Natural Significance.
- ❒ Chapman, L.J., and Putnam, D.F., 1984: 'The Physiography of Southern Ontario, Third Edition', Ontario Geological Survey Special Volume 2.

Municipal Records

- ❒ City of Ottawa: eMap website.
- ❒ City of Ottawa: Historical Land Use Inventory Database
- ❒ City of Ottawa: document entitled, "Old Landfill Management Strategy, Phase I – Identification of Sites", prepared by Golder Associates, 2004.

Local Information Sources

- ❒ Personal Interviews.

Public Information Sources

- ❒ ERIS Database Report.
- ❒ Google Earth.
- ❒ Google Maps/Street View.

FIGURES

FIGURE 1 – KEY PLAN

FIGURE 2 – TOPOGRAPHIC MAP

DRAWING PE5585-1 – SITE PLAN

DRAWING PE5585-2 – SURROUNDING LAND USE PLAN

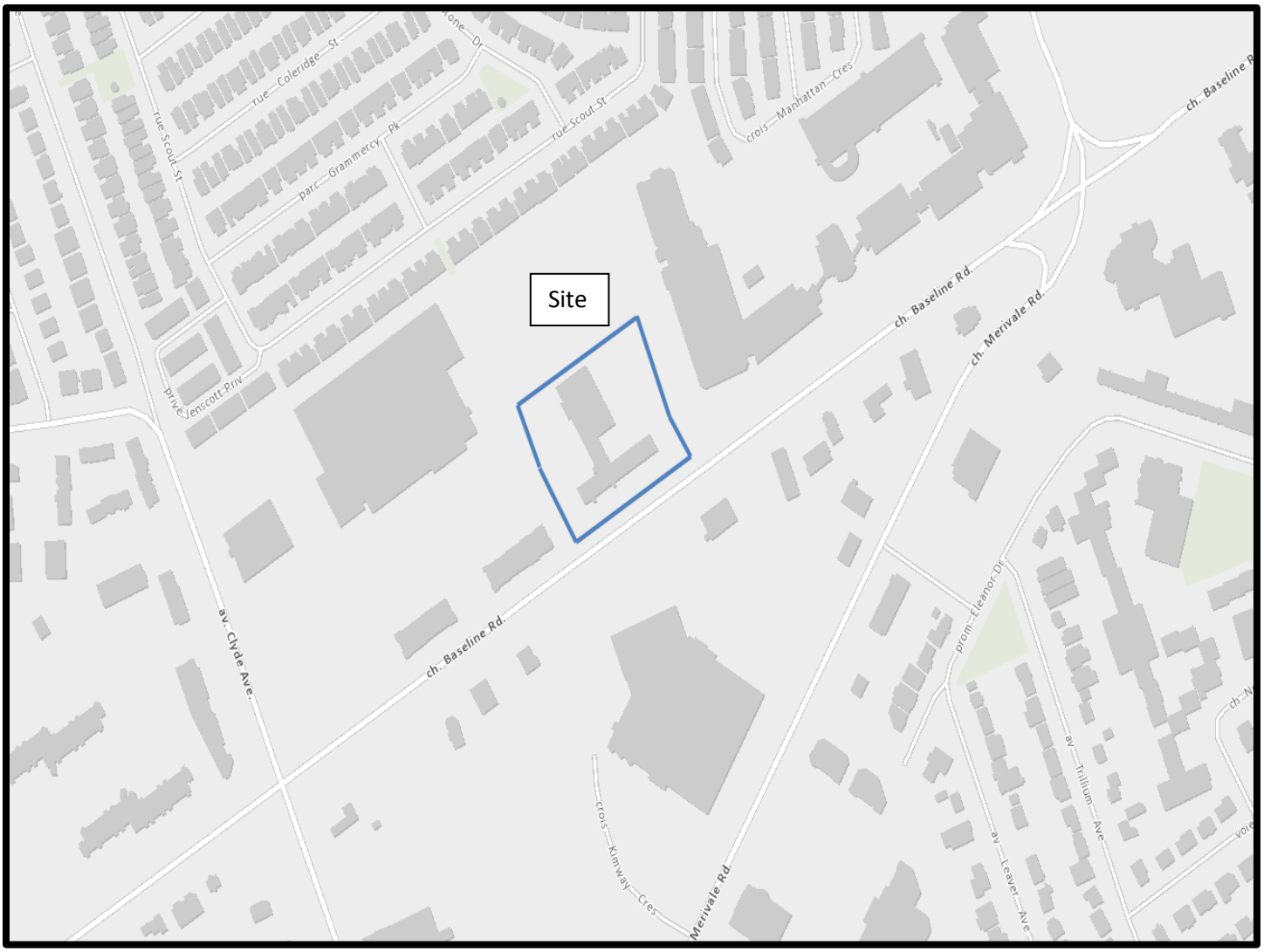


FIGURE 1

KEY PLAN

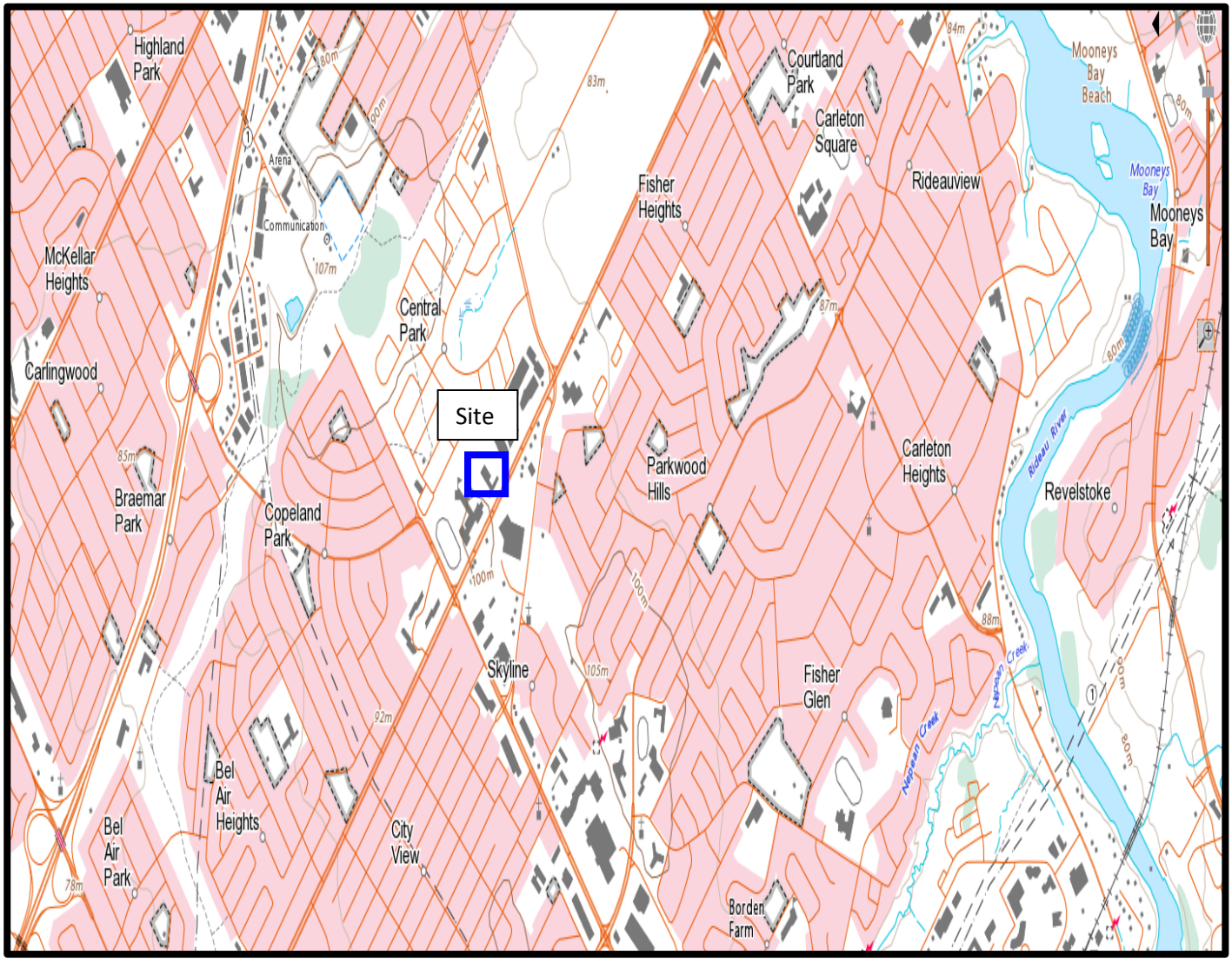
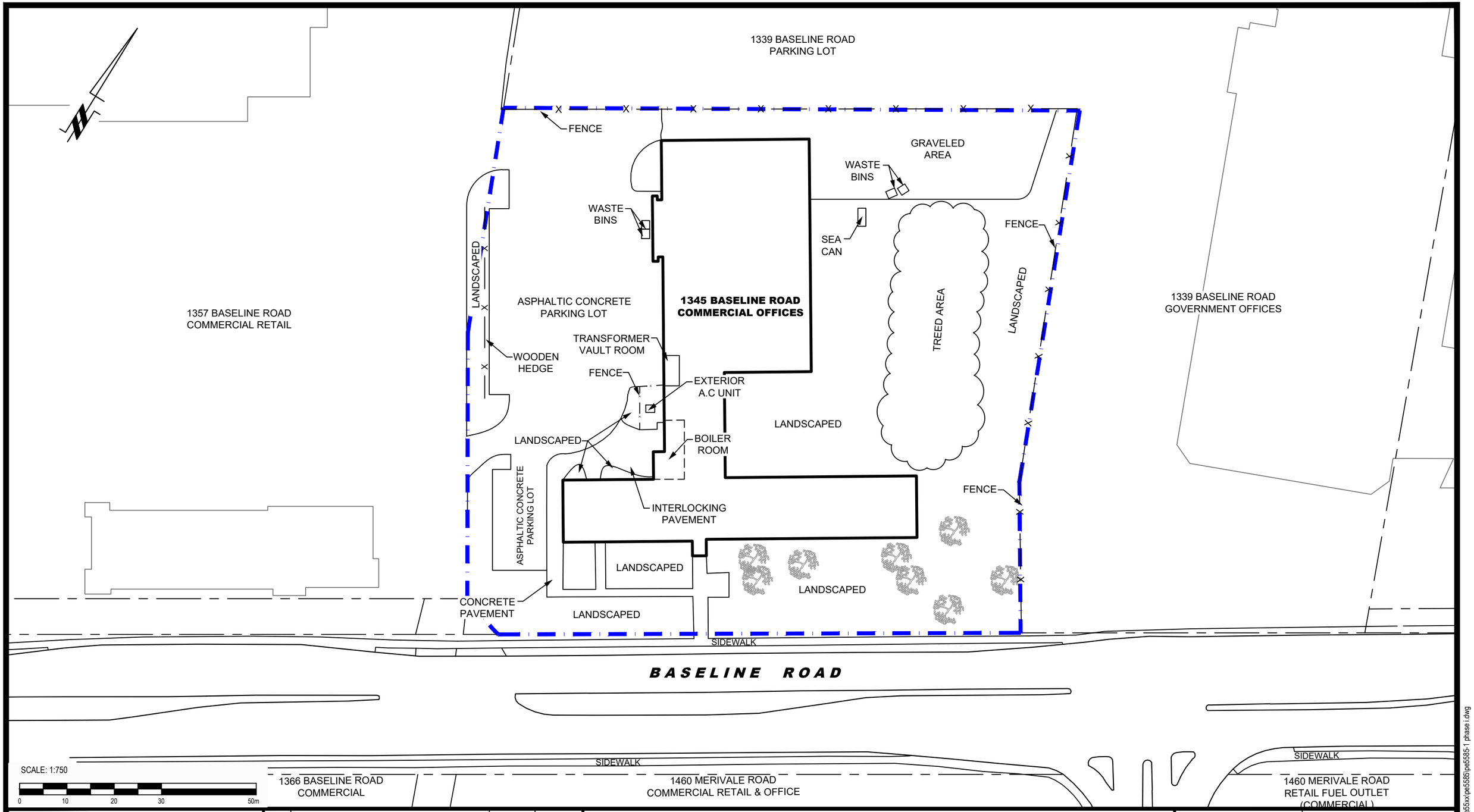


FIGURE 2

TOPOGRAPHIC MAP



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Tel: (613) 226-7381 Fax: (613) 226-6344

NO.	REVISIONS	DATE	INITIAL

SCOUTS CANADA

PHASE I - ENVIRONMENTAL SITE ASSESSMENT
1345 BASELINE ROAD

OTTAWA, ONTARIO

Title:

SITE PLAN

Scale: 1:750	**Date:** 02/2022
Drawn by: JM	**Report No.:** PE5585-1
Checked by: MR	**Dwg. No.:** PE5585-1
Approved by: MSD	**Revision No.:**

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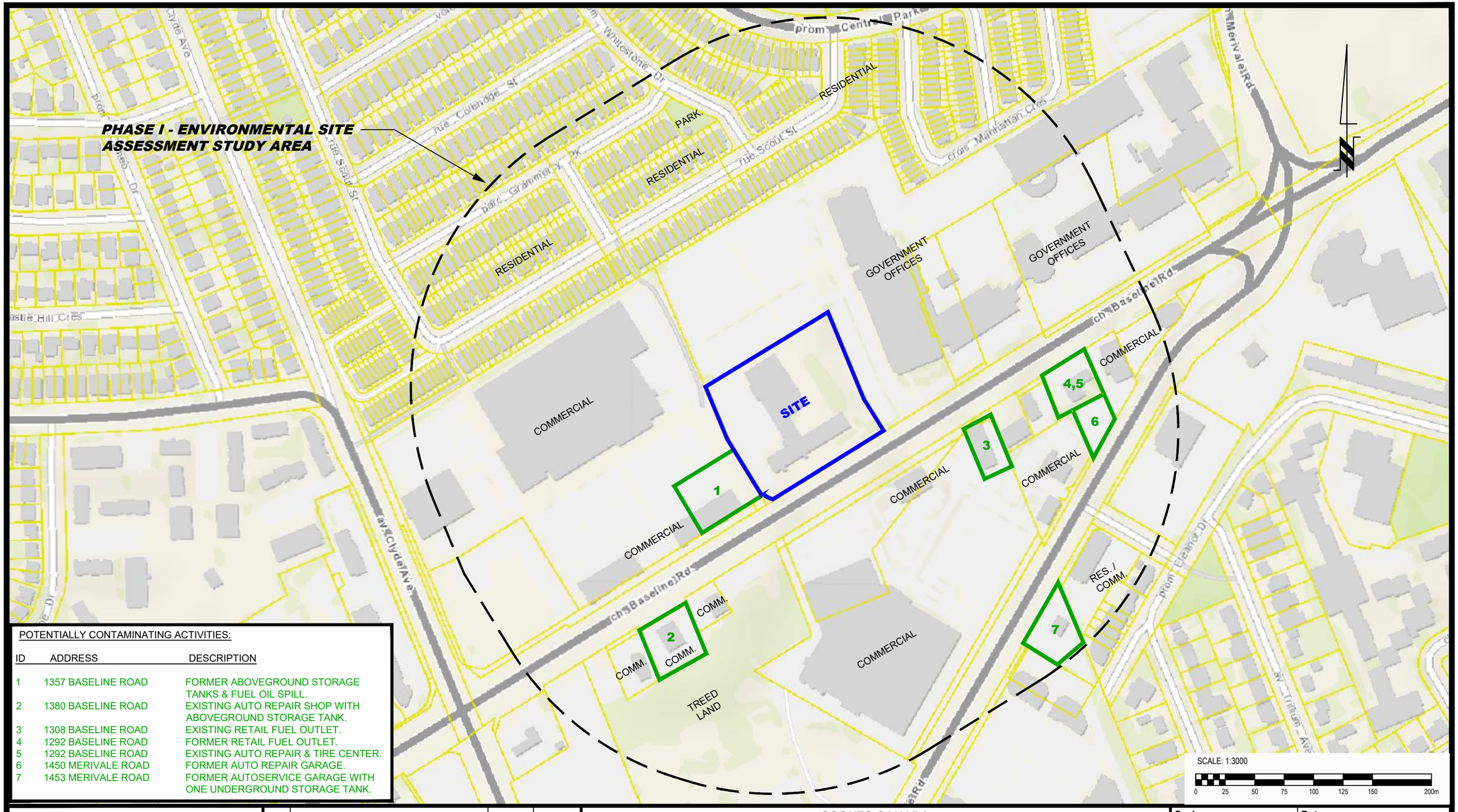

POTENTIALLY CONTAMINATING ACTIVITIES:

ID	ADDRESS	DESCRIPTION
1	1357 BASELINE ROAD	FORMER ABOVEGROUND STORAGE TANKS & FUEL OIL SPILL.
2	1380 BASELINE ROAD	EXISTING AUTO REPAIR SHOP WITH ABOVEGROUND STORAGE TANK.
3	1308 BASELINE ROAD	EXISTING RETAIL FUEL OUTLET.
4	1292 BASELINE ROAD	FORMER RETAIL FUEL OUTLET.
5	1292 BASELINE ROAD	EXISTING AUTO REPAIR & TIRE CENTER.
6	1450 MERIVALE ROAD	FORMER AUTO REPAIR GARAGE.
7	1453 MERIVALE ROAD	FORMER AUTOSERVICE GARAGE WITH ONE UNDERGROUND STORAGE TANK.

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NO.	REVISIONS	DATE	INITIAL

SCOUTS CANADA

PHASE I - ENVIRONMENTAL SITE ASSESSMENT
1345 BASELINE ROAD

OTTAWA, ONTARIO

Title:

SURROUNDING LAND USE PLAN

Scale: 1:3000	Date: 02/2022
Drawn by: JM	Report No.: PE5585-1
Checked by: MR	Dwg. No.: PE5585-2
Approved by: MSD	Revision No.:

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Appendix E– OTHER CORRESPONDENCE

E.1 CITY PRE-CONSULTATION NOTES

1345 Baseline

Meeting Summary Notes

March 9, 2022, Online Teams Meeting

Attendees:

- Jeff Schaffhauser, Owner Scouts Canada
- Aaron Clodd, Colliers, Applicant
- Kevin Reid, RLA architects Consultant
- Peter Moroz, Stantec
- Dave Lashley, Landscape architect
- Barrett Wagar, Planner, Stantec
- Nancy Meloshe Planner, Stantec

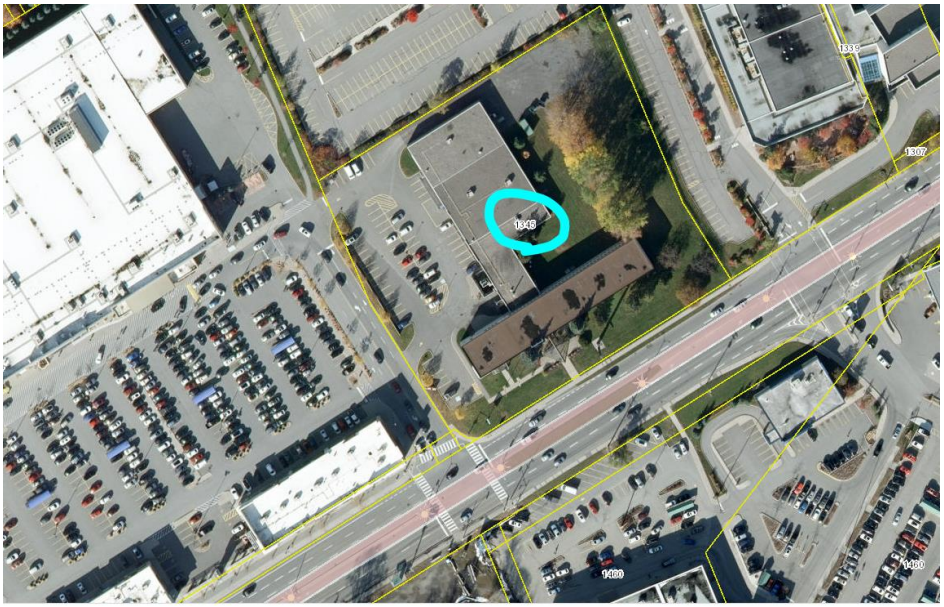
- Josiane Gervais (Transportation Project Manager, City of Ottawa)
- Bruce Bramah (Project Manager, City of Ottawa)
- Selma Hassan (Urban Designer, City of Ottawa)
- Burl (Parks Planner, City of Ottawa)
- Aamani Sidhu, Planning Student
- Tracey Scaramozzino (File Lead, Planner, City of Ottawa)

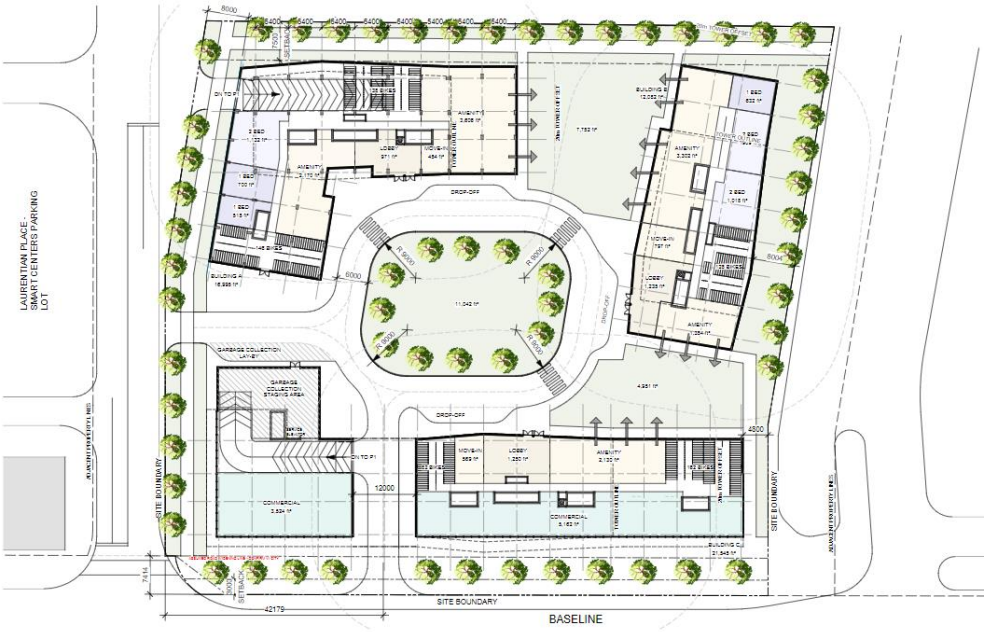
Unable to Attend:

- Mark Richardson, Forestry Planner
- Sami Rehman, Environmental Planner
- Eric Lalande, RVCA

Issue of Discussion:

- Proposed Rezoning to permit 3 high-rise, mixed-use towers with 8,686 sf of ground retail, 1014 residential units, 612 u/g vehicle parking spaces (0.6 ratio), 846 Bicycle storage spaces (0.83 ratio) and 107,328 sf of amenity space.
- Proposed heights are 32, 28 and 24 storeys are below the height restrictions for the Ottawa International Airport
- Property will likely be sold by Scouts Canada once the new zoning is in effect
- A site plan would be submitted in the future by the new owner.





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1. **Current Official Plan -** designated “Arterial Mainstreet”.
   a. Site is located within 400m of future BRT station at Baseline and Clyde Ave and is permitted 9-storeys as of right, but high-rises can be contemplated through ZBLA when community amenity is provided and with proper transitioning to lower-rise bldgs.

2. **New Draft Official Plan, Approved by Council, Oct 27, 2021, Pending Approval from the Province in June 2022**
    a. Outer Urban Transect, Mainstreet corridor, evolving neighbourhood,
    b. Hi-rise are permitted when within 400m transit.

3. **Zoning Information:** AM5[436]

4. **Infrastructure/Servicing (Bruce Bramah):**

Water:
Connection point: 406mm CI on Baseline
Water redundancy would be required for this development based on the number of proposed units.

- Watermain Frontage Fees to be paid ($190.00 per metre) ☐ **Yes** ☒ **No**

Boundary conditions:
Civil consultant must request boundary conditions from the City's assigned Project Manager prior to submission.

- Water boundary condition requests must include the location of the service(s) and the expected loads required by the proposed developments. Please provide all the following information:
    - Location of service(s)
    - Type of development and the amount of fire flow required (as per FUS, 1999).
    - Average daily demand: ___ l/s.
    - Maximum daily demand: ___l/s.
    - Maximum hourly daily demand: ___ l/s.
- Fire protection (Fire demand, Hydrant Locations)

Sanitary Sewers:
Connection point: 225mm concrete on Baseline

Is a monitoring manhole required on private property? ☒ Yes ☐ No

- The designer should be aware there may be limited capacity in the downstream sanitary sewer system. The sanitary demand needs to be coordinated with the City Planning Dept. to determine if the existing sanitary sewer system has sufficient capacity to support the proposed rezoning. Provide sanitary demands to the City project manager for coordination.

Storm Sewers:
Connection point: 375mm concrete on Baseline

Storm Water Management:
Quality Control:

- Rideau Valley Conservation Authority to provide quality control requirements for property.

Quantity Control:
- Allowable Runoff coefficient (C): C = the lesser of the existing pre-development conditions to a maximum of 0.5.
- Time of concentration (Tc): Tc = pre-development; maximum Tc = 10 min
- Allowable flowrate: Control the 100-year/5-year storm events to the existing 2-year storm event.

Ministry of Environment, Conservation and Parks (MECEP)
All development applications should be considered for an Environmental Compliance Approval, under MECP regulations.

a. The consultants determine if an approval for sewage works under Section 53 of OWRA is required and determines what type of application. The City's project manager may help confirm and coordinate with the MECP as required.
b. The project will be either transfer of review (standard), transfer of review (additional), direct submission, or exempt as per O. Reg. 525/98.
c. Pre-consultation is not required if applying for standard or additional works (Schedule A of the Agreement) under Transfer Review.
d. Pre-consultation with local District office of MECP is recommended for direct submission.
e. Consultant completes an MECP request form for a pre-consultation. Sends request to moeccottawasewage@ontario.ca
f. ECA applications are required to be submitted online through the MECP portal. A business account required to submit ECA application. For more information visit https://www.ontario.ca/page/environmental-compliance-approval
g. It is unclear if the proposed development will remain as one property. An ECA will be required where the stormwater management services more than one property parcel.

NOTE: Site Plan Approval, or Draft Approval, is required before any Ministry of the Environment and Climate Change (MOECC) application is sent.
General Service Design Comments

- The City of Ottawa requests that all new services be located within the existing service trench to minimize necessary road cuts.
- Monitoring manholes should be located within the property near the property line in an accessible location to City forces and free from obstruction (i.e. not a parking).
- Where service length is greater than 30 m between the building and the first maintenance hole / connection, a cleanout is required.
- The City of Ottawa Standard Detail Drawings should be referenced where possible for all work within the Public Right-of-Way.
- The upstream and downstream manhole top of grate and invert elevations are required for all new sewer connections.

Services crossing the existing watermain or sewers need to clearly provide the obvert/invert elevations to demonstration minimum separation distances. A watermain crossing table may be provided.

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5. Initial Planning Comments

a. Discuss proposal with local Councillor and Community Associations
b. Ensure ample greenspace/useable amenity space
c. What community amenity is proposed to support the extra ht? This should be discussed with the local Councillor. This must be over and above the parkland which is a standard requirement.
d. This development will also be subject to the Community Benefits Charge or Section 37.
e. Provide confirmation from NAVCanada that the hts are acceptable
f. Within Design Priority Area – UDRP req'd
g. Are there any ped connection opportunities to outside of the site? North??
h. Are you reducing parking? It is permitted in the new OP – if they are reduced, it would allow more space along boundary for trees
i. Will they apply once the new OP is approved? Should be by end of June.
j. It would be nice to incorporate the totem pole, as it is a landmark in this area.
k. Overhang for pedestrians along Baseline is nice

6. Urban Design Comments (Selma Hassan):

Design Brief, UDRP and Design Guidelines

1. The applicant is required to submit a Design Brief that addresses all of the items highlighted in the attached Terms of Reference.
2. The site is located within a Design Priority Area and the proposal is, therefore, required to be reviewed by the City's Urban Design Review Panel.
3. The plan is subject to both City of Ottawa Guidelines for High-rise Buildings and Arterial Mainstreets. The applicant's Design Brief must demonstrate that the requirements of the guidelines have been met.

Built Form

4. The applicant is proposing three towers on the site. The parking lot to the north is likely to redevelop at some point in the future and sits between the site and existing ground-oriented residential. For us to properly assess the appropriateness of the applicant's submission, we would like to understand the potential build out of the parking lot to the north. We request that the applicant model the build out scenario, including potential building heights, as well as vehicular and pedestrian connections.
5. It is not clear that tower separation requirements are met along the north and east property edges. The tower to the north-west, in particular, appears to be less than 10m from the property line. Could the applicant clearly dimension the 10m setback from the north and east property lines?

6. We would like the applicant to consider orienting the north-west tower so that its long façade faced north-south (narrow end facing rear parking lot). Would this be an optimal orientation, in particular given the potential future redevelopment of the rear parking lot?
7. As the building design evolves, it will be important that the towers are clearly residential in character and do not read as office buildings.
8. As per the Urban Design Guidelines for High-rise Buildings, careful consideration of the massing of both individual buildings and of groups of buildings on a site, the interface with the public realm, as well as of the design building base, middle, top is critical.
9. Attention the design and character of the streetwall along Baseline Road is important
    - Distinct and prominent principal entries on Baseline are important for both the commercial and residential components of the building.
    - The proposed building on Baseline is long. The façade should be visually broken down.
    - Both the architecture and landscape treatment along Baseline should contribute to a coherent and continuous streetscape.

Parkland and Tree Planting

10. As note by the RCFS Parks Planner in the pre-consultation meeting, parkland is required for this site. Urban Design agrees that an unencumbered public park must front onto Baseline Road, as Baseline is the only public street.
    - The Council approved new Official Plan and the Council approved Parks and Recreation Master Plan both identify the requirement to take land as a priority where development sites would generate parkland dedication of at least 400m^2. The Parks and Recreation Master Plan also identifies a city-wide target of 2.0ha of active parkland per 1,000 people. As shown on Map 2 of the Parks and Recreation Facilities Master Plan, this area of Baseline Road currently does not meet the city-wide target. Multiple development sites in this area of Baseline Road will add many more people; the proposal for 1345 Baseline Road includes approximately 1,000 units itself. Parkland is required.
    - In terms of orientation, the applicant could consider a shorter park frontage on Baseline Road and a deeper park block.
    - Zoning setbacks will be required from the park property line to any building frontages. Building design and location of windows, ground floor uses, projections, building shadows, wind effects and access for exterior maintenance and repairs, all impact the dimension of a required setback.
11. The trees planted in front of the Smart Centres site have not done well. The applicant is asked to provide tree planting details and demonstrate how the proposed trees in the ROW will achieve their growth potential.
12. Similarly, the applicant is asked to show the footprint of below grade parking garage in relation to the proposed trees and to demonstrate that trees can achieve their growth potential. What are the proposed soil volumes, planting depths and structural supports given the underground parking garage? The

applicant is asked to explore shrinking the footprint of the below grade parking so that the trees do not sit on top of the parking structure.

Circulation

13. We are pleased to see that the existing pedestrian pathway on the east side of Walmart, that leads from the residential neighbourhood, has been extended to Baseline Road.
14. Is the pathway at the north end of site open to public access? Who is the expected user? How will the pathway related to future development to the north?

7. Parks (Burl Walker):

Parkland Dedication Requirement

1. The applicant should verify the lot area. The application form describes a lot area of 11,550 m^2. However, the property report on geoOttawa indicates that the lot area is 13,156 m^2.
2. The New Official Plan designates the site as a Hub with an overlapping Mainstreet Corridor designation. It is noted that there is no existing parkland within the Hub / Mainstreet Corridor designation for the segment of Baseline Road between Clyde Avenue and Merivale Road. Celebration Park, which is approximately 500m from the site, is the only park within walking distance of the subject property.
3. Under Policy 4.4.1(2) of the New Official Plan, the City shall prioritize land for parks over cash-in-lieu of parkland for sites that generate a requirement for more than 400 square metres of parkland. Cash-in-lieu of parkland dedication shall only be accepted when land or location are not suitable. For Site Plan Control applications in the Downtown, Inner Urban, Outer Urban and Suburban Transects, Policy 4.4.1(3) indicates that where the development site is more than 4,000 square metres, the City shall place a priority on acquisition of land for parks as per the Planning Act and the Parkland Dedication By-law. The site is situated in the Outer Urban Transect and exceeds 4,000 square metres in size. Accordingly, Parks and Facilities Planning will be seeking all of the parkland dedication requirement for the future site plan application in the form of parkland conveyance. The land to be conveyed shall be:
    - Be free of encumbrances above and below ground (including the underground parking garage);
    - Be of a usable shape, topography and size that reflects its intended use;
    - Meet applicable provincial soil regulations; and
    - Meet the minimum standards for drainage, grading and general condition.
4. Please note that Parks and Facilities Planning is currently undertaking a legislated review for the replacement of the City's Parkland Dedication By-law, with the new By-law to be considered by City Council in early July 2022. To

ensure the applicant is aware of any potential parkland dedication requirements for the proposed development, we encourage the applicant to familiarize themselves with the existing Parkland Dedication By-law and to sign up for project notifications on the Engage Ottawa project page or by emailing the project lead at Kersten.Nitsche@ottawa.ca.

5. The Planning Rationale to be submitted with the Zoning By-law Amendment application should include a calculation of the parkland dedication requirement for the proposed development based on the provisions of the Parkland Dedication By-law, the actual lot area and the proposed gross floor area of the commercial and apartment uses. If the new By-law comes into effect prior to the submission of the application, the Planning Rationale should address the provisions of the new By-law.

   To provide interim guidance until the new Parkland Dedication By-law comes into effect, the proposed development was reviewed in the context of the existing Parkland Dedication By-law. A high-level preliminary estimate of the parkland dedication requirement based on the available information in the pre-application submission and the current By-law provisions is shown in the table below. The final parkland dedication requirement will be based on the future Site Plan Control application submission(s) and the new By-law.

Item	Description	Value	Unit	Comment
INPUT VARIABLES				
Site	Area of Site Being Developed	13,156	m²	Area based on geoOttawa property report
Residential	Proposed Units	1,014		As per application form
	Existing Units	-		
	Proposed Residential GFA	771,624	ft²	780,310 ft² GFA shown on concept plan less 8,686 ft² commercial
Commercial	Proposed Commercial GFA	8,686	ft²	As per application form
CALCULATION				
1. Area Ratio	Residential	98.9%		
	Commercial	1.11%		
2. Residential	Parkland Dedication Requirement	1,301	m²	1 ha per 300 dwelling units to a maximum of 10% of the area of the site being developed
3. Commerical	Parkland Dedication Requirement	-	m²	No parkland dedication required for a change of an existing commercial use to another commercial use
4. Total	Parkland Dedication Requirement	1,301	m²	

6. If the applicant can demonstrate that parkland dedication or cash-in-lieu of parkland dedication was previously provided for the site, the parkland dedication requirement would need to be adjusted to take this into account.
7. Based on the calculations above and the current Parkland Dedication By-law provisions, a park with an area of 1,301 m^2 would need to be conveyed to the City through the future Site Plan Control application.
8. The park area correspond with an urban parkette or plaza. Note that Policy 4.4.4(1)(b) of the New Official Plan indicates that urban parkettes and plazas are intended to be provided in Hubs and Corridors in the Outer Urban and Suburban

Transects to provide central gathering spaces and recreational components and to complement larger parks.

Park Location

9. The initial preference from Parks and Facilities Planning is to locate the park block at the southwest corner of the site adjacent to Baseline Road and the proposed north-south sidewalk extension connecting to the Central Park neighbourhood. Note that the north-south sidewalk should not be included within the park block. The southeast corner of the site adjacent to Baseline Road is an alternative location that could also be considered for the park.
10. Please review if the right-in, right-out driveway on Baseline Road could be situated so that it is not located immediately adjacent to the park block.
11. Policy 4.4.6(1)(e) of the New Official Plan indicates that a preferred minimum of 50% of the park perimeter shall be continuous frontage on abutting streets. It will not be possible to achieve the preferred 50% minimum because there is only one public street, Baseline Road, that will be adjacent to the park. Staff would be open to considering a rectangular shaped park with the short side located along Baseline Road, which would increase the depth of the park block and allow part of the park amenity space to be situated further away from the traffic on Baseline Road. The park should not be overly narrow, though.
12. Vehicular access to the park block will be required for park maintenance. Access will likely need to be from a site driveway rather than from Baseline Road.
13. The concept plan to be submitted with the Zoning By-law Amendment application should identify the proposed location, area and dimensions of the park block.
14. The final park location, area and configuration would need to be acceptable to Parks and Facilities Planning. The Urban Design Review Panel may also provide comments on the park location and configuration.

Public Realm

15. The park will form part of the overall public realm for the Hub designation in the New Official Plan. The design of the buildings and landscape surrounding the park should be informed by the following policies in the New Official Plan regarding the public realm:

    Policy 6.1.1

    (3) Development within a Hub:

    (e) Shall create a high-quality, comfortable public realm throughout the Hub that prioritizes the needs of pedestrians, cyclists and transit users;

    (f) Shall establish buildings that:

        (i) Edge, define, address and enhance the public realm through building placement, entrances, fenestration, signage and building facade design;
        (ii) Place principal entrances so as to prioritize convenient pedestrian access to the transit station and the public realm; and

(ii) Place parking, loading, vehicle access, service entrances and similar facilities so as to minimize their impact on the public realm.

Zoning

16. The park should be rezoned to "O1" (Parks and Open Space) through the Zoning By-law Amendment application.
17. Site-specific zoning provisions should be included in the Zoning By-law Amendment to provide acceptable setbacks between the proposed buildings and the lot lines of the future park to mitigate impacts such as shadows and wind from the proposed buildings.

Development Servicing Report

18. The Development Servicing Report submitted with the Zoning By-law Amendment application should address the servicing issues and requirements for the park block.

Shadow Analysis

19. The Terms of Reference for a Shadow Analysis include evaluation criteria for Public Spaces. The Shadow Analysis to be submitted with the Zoning By-law Amendment application will need to demonstrate that the park will satisfy the applicable criteria for Public Spaces (i.e. "The new net shadow must not result in an average of 50% of any public space being cast in shadow for 5 or more hourly interval times during the September test date only.")

Preliminary Wind Analysis

20. The Preliminary Wind Analysis to be submitted with the Zoning By-law Amendment application should specifically address the wind impact of the proposed buildings on the park and include recommendations for any mitigation measures, if necessary.

Phase I and/or II Environmental Site Assessment

21. The Phase I and/or II Environmental Site Assessment to be submitted with the Zoning By-law Amendment application should take into account the proposed park use and location in the assessment(s).

Future Site Plan Control Application

22. A Record of Site Condition would be required prior to registration of the site plan agreement.
23. The conditions of site plan approval would require the Owner to convey the parkland to the City at the time or registration of the site plan agreement. The Owner would be responsible for retaining a land surveyor to prepare a draft reference plan describing the park parcel.
24. The conditions of site plan approval will require the Owner to provide services for the park. The services required would be confirmed during the Site Plan Control application review process. At a minimum, the park would require the following:
    a. 300mm diameter storm sewer connection to a municipal storm sewer and CB/MH located 2m inside the park lot line
    b. A 120/240 volt, 200 amperes single phase hydro service at 2m inside the park property line

25. The conditions of site plan approval will require the Owner to prepare the park block including removals, grading, and supplying and installing a minimum depth of 150mm of topsoil and seed or sod to City standards.
26. The Owner may be required to supply and install a minimum 1.5m high commercial grade chain link fence or approved equivalent along the park lot lines depending on the final location of the park block and the existing and proposed land use(s) adjacent to the park. An ornamental fence style may be appropriate for the park context to complement the architecture and landscape of the proposed development.
27. The City would take over the park block after the site works have been completed and the grassed areas in the park have been established to the satisfaction of the Public Works Department.
28. The City will be responsible for the future development of the park. The park development project would be identified for funding as part of a future update to the Development Charges Background Study and the Development Charges By-law.
29. The amenities for the park will be determined at a future date.

Potential Draft Plan of Condominium Application

If a future Draft Plan of Condominium application is submitted, the conditions of approval would typically include the requirement for the Owner to include a warning clause in all agreements of purchase and sale warning purchasers that the park may have lighting, active uses and/or other features.

8. Trees (Mark Richardson):

TCR requirements:

1. a Tree Conservation Report (TCR) must be supplied for review along with the suite of other plans/reports required by the City
    a. an approved TCR is a requirement of Site Plan approval.
    b. The TCR may be combined with the LP provided all information is supplied
2. Any removal of privately-owned trees 10cm or larger in diameter, or city-owned trees of any diameter requires a tree permit issued under the Tree Protection Bylaw (Bylaw 2020 – 340); the permit will be based on an approved TCR and made available at or near plan approval.
3. The Planning Forester from Planning and Growth Management as well as foresters from Forestry Services will review the submitted TCR
    a. If tree removal is required, both municipal and privately-owned trees will be addressed in a single permit issued through the Planning Forester
    b. Compensation may be required for city owned trees – if so, it will need to be paid prior to the release of the tree permit

4. the TCR must list all trees on site, as well as off-site trees if the CRZ extends into the developed area, by species, diameter and health condition
5. please identify trees by ownership – private onsite, private on adjoining site, city owned, co-owned (trees on a property line)
6. If trees are to be removed, the TCR must clearly show where they are, and document the reason they cannot be retained
7. All retained trees must be shown, and all retained trees within the area impacted by the development process must be protected as per City guidelines available at Tree Protection Specification or by searching Ottawa.ca
    a. the location of tree protection fencing must be shown on the plan
    b. show the critical root zone of the retained trees
    c. if excavation will occur within the critical root zone, please show the limits of excavation
8. the City encourages the retention of healthy trees; if possible, please seek opportunities for retention of trees that will contribute to the design/function of the site.
9. For more information on the process or help with tree retention options, contact Mark Richardson mark.richardson@ottawa.ca or on City of Ottawa

LP tree planting requirements:

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

Minimum Setbacks

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

Tree specifications

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

- No tree stakes unless necessary (and only 1 on the prevailing winds side of the tree)

Hard surface planting

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

Soil Volume

- Please ensure adequate soil volumes are met:

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

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

Sensitive Marine Clay

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

Tree Canopy Cover

· The landscape plan shall show how the proposed tree planting will replace and increase canopy cover on the site over time, to support the City's 40% urban forest canopy cover target.

· At a site level, efforts shall be made to provide as much canopy cover as possible, through tree planting and tree retention, with an aim of 40% canopy cover at 40 years, as appropriate.

· Indicate on the plan the projected future canopy cover at 40 years for the site.

9. Environment (Sami Rehman)

a. No concerns.

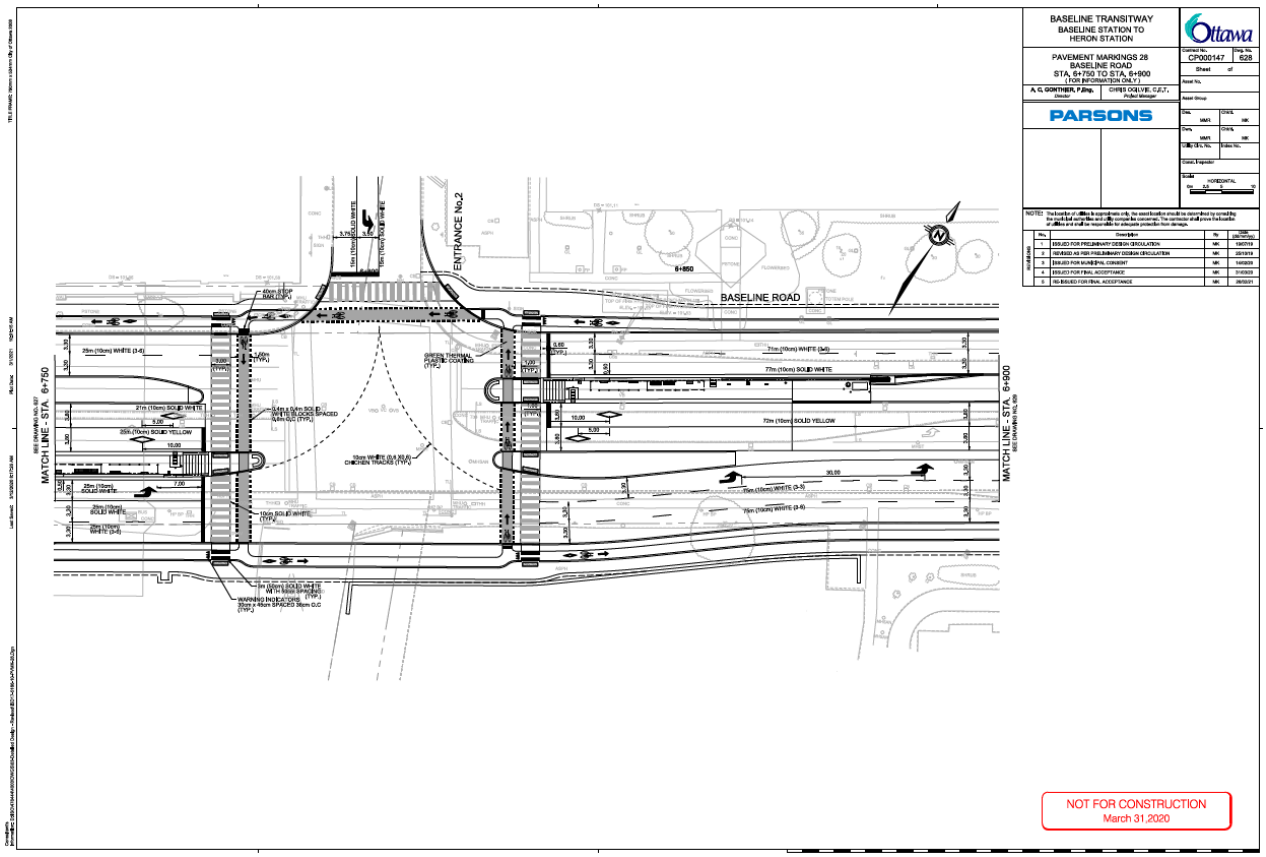
10. Conservation Authority (RVCA - Eric Lalande)

- The RVCA has no concerns or objections. The RVCA would not have any additional stormwater quality requirements based on the overall site design but encourage the Applicant to implement best management practices where possible.

11. Transportation (Josiane Gervais):

- Follow Transportation Impact Assessment Guidelines:
    - A TIA is required. As this is a re-zoning application, the scope will be confirmed with Step 2.
    - Correct Screening Form, there is a proposed access within 150m of a traffic signal.
    - Start this process asap. The application will not be deemed complete until the submission of the draft step 1-4, including the functional draft RMA package (if applicable) and/or monitoring report (if applicable).
    - Request base mapping asap if RMA is required. Contact Engineering Services (https://ottawa.ca/en/city-hall/planning-and-development/engineering-services)
    - An update to the *TRANS Trip Generation Manual* has been completed (October 2020). This manual is to be utilized for this TIA. A copy of this document can be provided upon request.
- TMP includes:
    - BRT with At-Grade Crossings along Baseline (Affordable Network, Map 5)
    - Baseline Road as a Cross-town Bikeway (Map 1)
- ROW protection on Baseline Road between Greenbelt boundary and Prince of Wales is 44.5m even. Future ROW line must be shown on the concept plan (site plan), and all set-backs must be measured from this new property line. Note that additional ROW beyond what is identified in the OP is required to accommodate the BRT design. Please see included plan for BRT design, note that the Baseline BRT design is still subject to change.
- The following comments are related to a Site Plan application but are provided for information purposes:
    - Clear throat requirements for >200 apartments on an arterial is 40m. Ensure this length is provided. The clear throat length is measured from the ends of the driveway.
      curb return radii at the roadway and the point of first conflict on-site. Note the minimum throat length provided must be maintained with the future ROW protection.
    - Corner clearances are to follow minimum distances set out within TAC Figure 8.8.2. For this site, the access should be spaced between the two signals on Baseline to meet the corner clearances from both intersections (i.e. 70m distance).
    - As the proposed site is multi-use and for general public use, AODA legislation applies.
        - Ensure all crosswalks located internally on the site provide a TWSI at the depressed curb, per requirements of the Integrated Accessibility Standards Regulation under the AODA.
        - Clearly define accessible parking stalls and ensure they meet AODA standards (include an access aisle next to the parking stall and a pedestrian curb ramp at the end of the access aisle, as required).

        - Please consider using the City's Accessibility Design Standards, which provide a summary of AODA requirements. https://ottawa.ca/en/city-hall/creating-equal-inclusive-and-diverse-city/accessibility-services/accessibility-design-standards-features#accessibility-design-standards
    - Ensure site access meets the City's Private Approach Bylaw.
    - Show all details of the roads abutting the site up to and including the opposite curb; include such items as pavement markings, accesses and/or sidewalks.
    - Turning movement diagrams required for all accesses showing the largest vehicle to access/egress the site.
    - Turning movement diagrams required for internal movements (loading areas, garbage).
    - Show all curb radii measurements; ensure that all curb radii are reduced as much as possible and fall within TAC guidelines (Figure 8.5.1).
    - Show dimensions for site elements (i.e. lane/aisle widths, access width and throat length, parking stalls, sidewalks, pedestrian pathways, etc.)
    - Sidewalk is to be continuous across access as per City Specification 7.1.
    - Show slope of garage ramps on site plan. Note that underground ramps should be limited to a 12% grade and must contain a subsurface melting device when exceeding 6%. Ramp grades greater than 15% can be psychological barriers to some drivers.
    - Ensure all crosswalks located internally on the site provide a TWSI at the depressed curb, per requirements of the Integrated Accessibility Standards Regulation under the AODA.
    - Parking stalls at the end of dead-end parking aisles require adequate turning around space
    - Grey out any area that will not be impacted by this application.
    - Because access is being provided via the private property at 1357 Baseline, a letter of support from the adjacent property owner is required and/or the easement should be shown on the plan.
    - Road and Stationary Noise Impact Studies will be required.



12. Waste Collection

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

13. General Information

a. Ensure that all plans and studies are prepared as per City guidelines – as available online…
   https://ottawa.ca/en/city-hall/planning-and-development/information-developers/development-application-review-process/development-application-submission/guide-preparing-studies-and-plans

Appendix F– DRAWINGS

Stantec

SCOUTS CANADA - NATIONAL SERVICE CENTRE

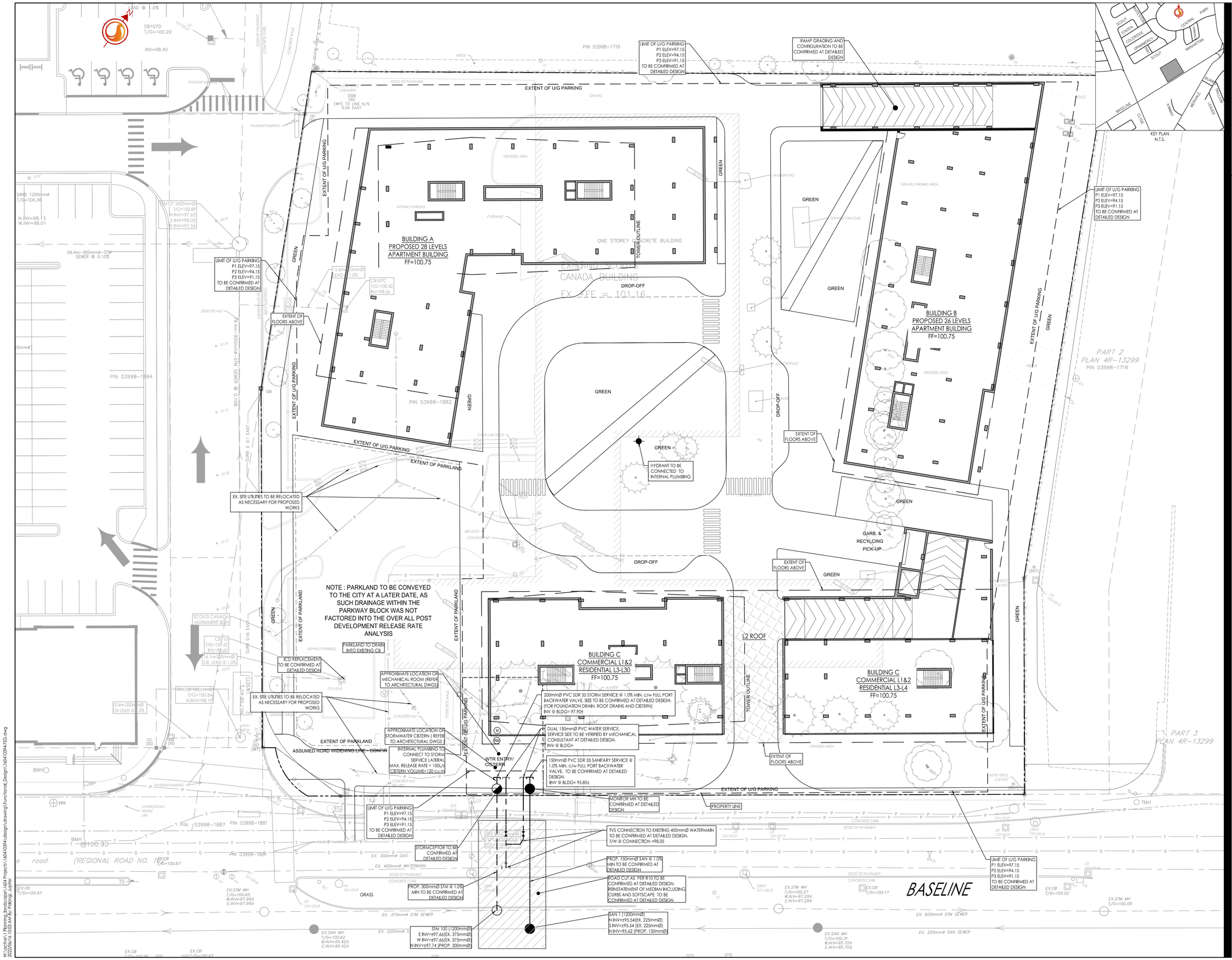
1345 BASELINE ROAD FUNCTIONAL GRADING AND SERVICING PLAN

JUNE 2022

Project Number: 160410394

KEY PLAN N.T.S

INDEX	
SHEET NO.	DESCRIPTION
1 OF 5	SSP-1 - FUNCTIONAL SITE SERVICING PLAN
2 OF 5	GP-1 - FUNCTIONAL GRADING PLAN
3 OF 5	EC-1 - FUNCTIONAL DETAIL SHEET
4 OF 5	SD-1 - FUNCTIONAL STORM DRAINAGE PLAN
5 OF 5	SA-1 - FUNCTIONAL SANITARY DRAINAGE PLAN



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Legend

- PROPOSED WATERMAIN
- PROPOSED VALVE AND VALVE BOX
- PROPOSED SANITARY SEWER
- PROPOSED STORM SEWER
- PROPOSED STORMCEPTOR
- EXISTING WATERMAIN
- EXISTING VALVE AND VALVE BOX
- EXISTING FIRE HYDRANT
- EXISTING SANITARY SEWER
- EXISTING STORM SEWER
- EXISTING CATCHBASIN
- PROPOSED WATER METER
- PROPOSED REMOTE WATER METER
- C — EXISTING CABLE
- B — EXISTING BELL
- T — EXISTING TELUS
- TR — EXISTING TRAFFIC
- H — EXISTING HYDRO
- SL — EXISTING STREETLIGHT

NOTES:

1. FINAL SERVICE LATERAL SIZE, LOCATION AND ELEVATION TO BE CONFIRMED AT DETAILED DESIGN
2. SERVICE LATERALS TO CONNECT TO EXISTING MAIN AS PER CITY STANDARD S11.
3. CONTRACTOR TO LOCATE EXISTING SERVICES AND ANY CONFLICTS WITH EXISTING SERVICING MUST BE REPORTED TO THE ENGINEER PRIOR TO CONTINUING WITH CONSTRUCTION.
4. SITE PLAN PREPARED BY DIAMOND RODERICK LAHEY ARCHITECTS , DATED MAY 10, 2022.
5. TOPOGRAPHIC SURVEY SUPPLIED BY STANTEC CONSULTING LTD., DATED JAN 27, 2022.

JOB BENCHMARK:
1. FIRE HYDRANT ON BASELINE TOP OF SPINDLE ELEVATION 101.57

1	ISSUED FOR REVIEW	JP	DT	22.06.16
	Revision	By	Appd.	YY.MM.DD

File Name: 160410394.FSG.dwg	JP	DT	JP	22.06.06
	Dwn.	Chkd.	Dsgn.	YY.MM.DD

Permit-Seal

Client/Project
SCOUTS CANADA - NATIONAL SERVICE CENTRE

1345 BASELINE ROAD

Ottawa, ON

Title
FUNCTIONAL SITE SERVICING PLAN

Project No.	Scale				
160410394	1:250	0	2.5	7.5	12.5m
Drawing No.	Sheet		Revision		
SSP-1	1 of 5		1		

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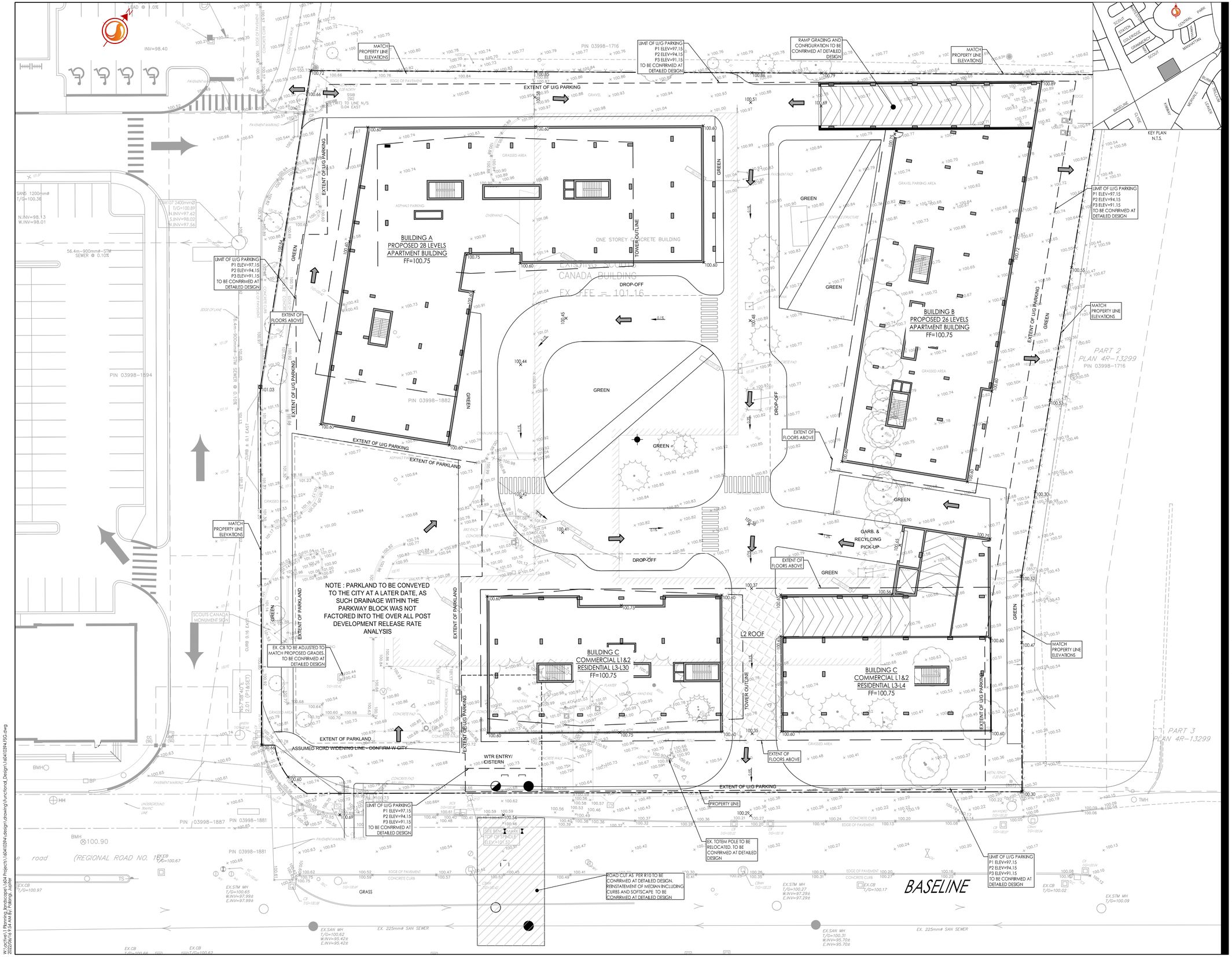

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Legend

- ORIGINAL GROUND ELEVATIONS
- EXISTING TOP OF CURB / WALL ELEVATION
- PROPOSED ELEVATION
- PROPOSED ELEVATION / EXISTING ELEVATION
- FLOW DIRECTION AND GRADE
- FF=99.99 FINISHED FIRST FLOOR ELEVATION
- TF=99.99 TOP OF FOUNDATION ELEVATION
- USF=99.99 UNDERSIDE OF FOOTING ELEVATION
- TERRACING 3:1 SLOPE MAXIMUM (UNLESS OTHERWISE SHOWN)
- PROPOSED SWALE
- DIRECTION OF OVERLAND FLOW
- EXISTING VALVE AND VALVE BOX
- EXISTING FIRE HYDRANT
- EXISTING SANITARY SEWER
- EXISTING STORM SEWER
- EXISTING CATCHBASIN
- PROPOSED VALVE BOX
- PROPOSED SANITARY SEWER MANHOLE
- PROPOSED STORM SEWER MANHOLE
- PROPOSED CATCHBASIN
- PROPOSED DEPRESSED CURB LOCATIONS
- PROPOSED MOUNTABLE/BARRIER CURB LOCATION

NOTES:

1. SITE PLAN PREPARED BY DIAMOND RODERICK LAHEY ARCHITECTS , DATED MAY 10, 2022.
2. TOPOGRAPHIC SURVEY SUPPLIED BY STANTEC CONSULTING LTD.. DATED JAN 27, 2022.

JOB BENCHMARK:
1, FIRE HYDRANT ON BASELINE TOP OF SPINDLE ELEVATION 101.57

1	ISSUED FOR REVIEW	JP	DT	22.06.16
Revision		By	Appd.	YY.MM.DD

File Name: 160410394.FSG.dwg		JP	DT	JP	22.06.06
		Dwn.	Chkd.	Dsgn.	YY.MM.DD

Permit-Seal

Client/Project
SCOUTS CANADA - NATIONAL SERVICE CENTRE

1345 BASELINE ROAD

Ottawa, ON

Title
FUNCTIONAL GRADING PLAN

Project No.	Scale	Sheet	Revision
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Drawing No.			
GP-1		2 of 5	1

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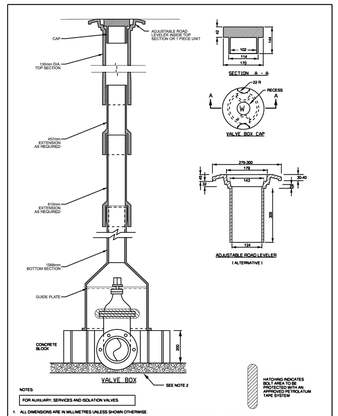
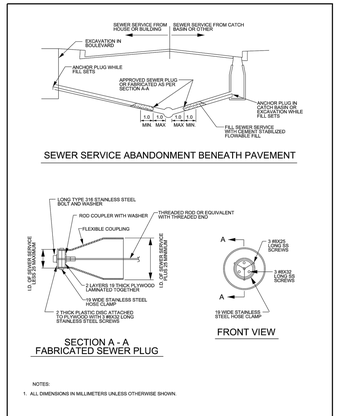
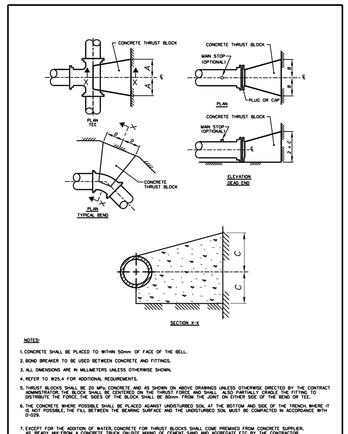


Ottawa | VALVE BOX ASSEMBLY | DATE: MAY 2001 REV. DATE: MARCH 2016 | DWG No. W24

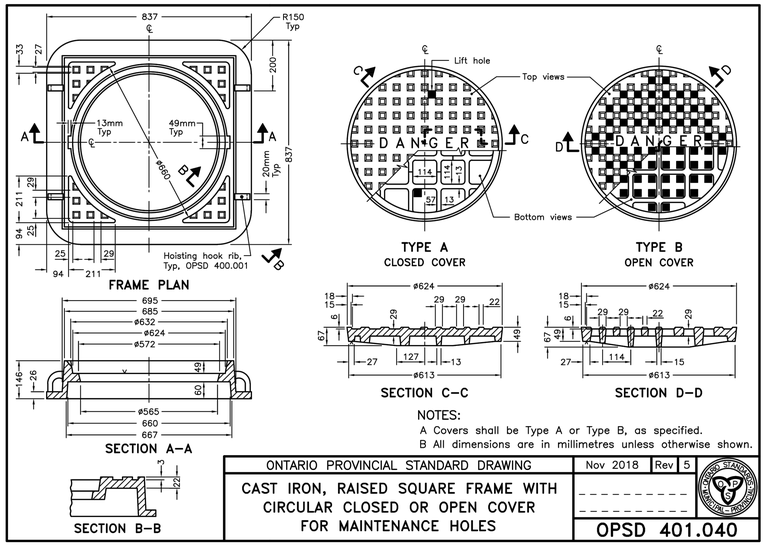


Ottawa | SEWER SERVICE ABANDONMENT BENEATH PAVEMENT | DATE: MARCH 2011 REV. DATE: | DWG. No.: S11.4

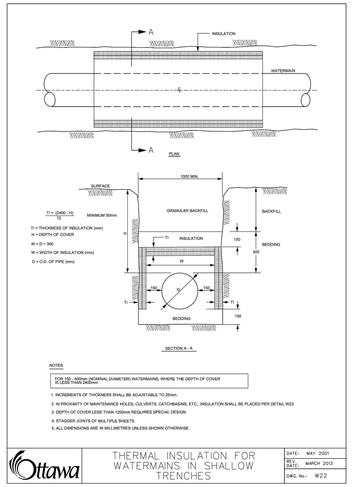
N.T.S.



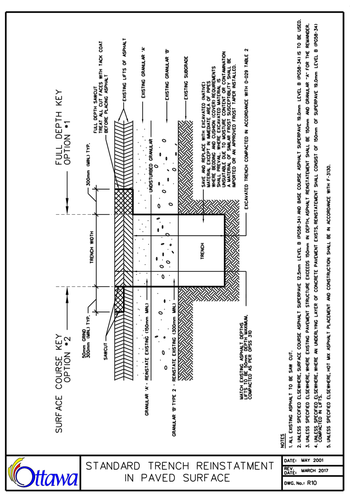
Ottawa | CONCRETE THRUST BLOCKS FOR PVC AND DI PIPE 400mm AND UNDER | DATE: MAY 2001 REV. DATE: MARCH 2016 | DWG. No.: W25.3



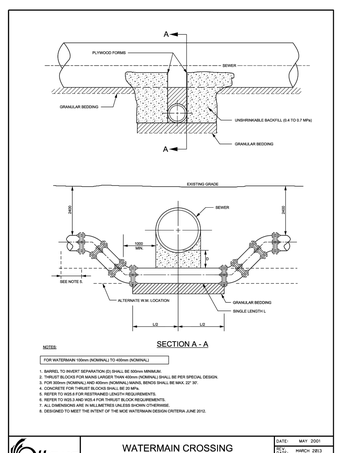
ONTARIO PROVINCIAL STANDARD DRAWING	Nov 2018	Rev 5
CAST IRON, RAISED SQUARE FRAME WITH CIRCULAR CLOSED OR OPEN COVER FOR MAINTENANCE HOLES		OPSD 401.040



Ottawa | THERMAL INSULATION FOR WATERMAINS IN SHALLOW TRENCHES | DATE: MAY 2001 REV. DATE: MARCH 2013 | DWG. No.: W22



Ottawa | STANDARD TRENCH REINSTATMENT IN PAVED SURFACE | DATE: MAY 2001 REV. DATE: MARCH 2017 | DWG. No.: R10



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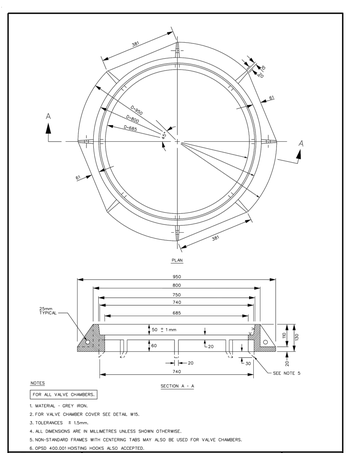

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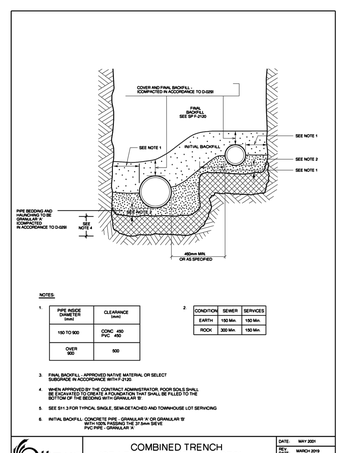

Ottawa | COMBINED TRENCH (SEWERS & SEWER SERVICES) | DATE: MAY 2001 REV. DATE: MARCH 2019 | DWG No.: S7

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1 ISSUED FOR REVIEW	JP	DT	22.06.16

File Name: 160410394.FSG.dwg	Dwn.	Chkd.	Dsgn.	YY.MM.DD
	JP	DT	JP	22.06.06

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Client/Project
SCOUTS CANADA - NATIONAL SERVICE CENTRE

1345 BASELINE ROAD

Ottawa, ON

Title
FUNCTIONAL DETAILS SHEET

Project No. 160410394
Scale AS SHOWN
Drawing No. DS-1
Sheet 3 of 5
Revision 1

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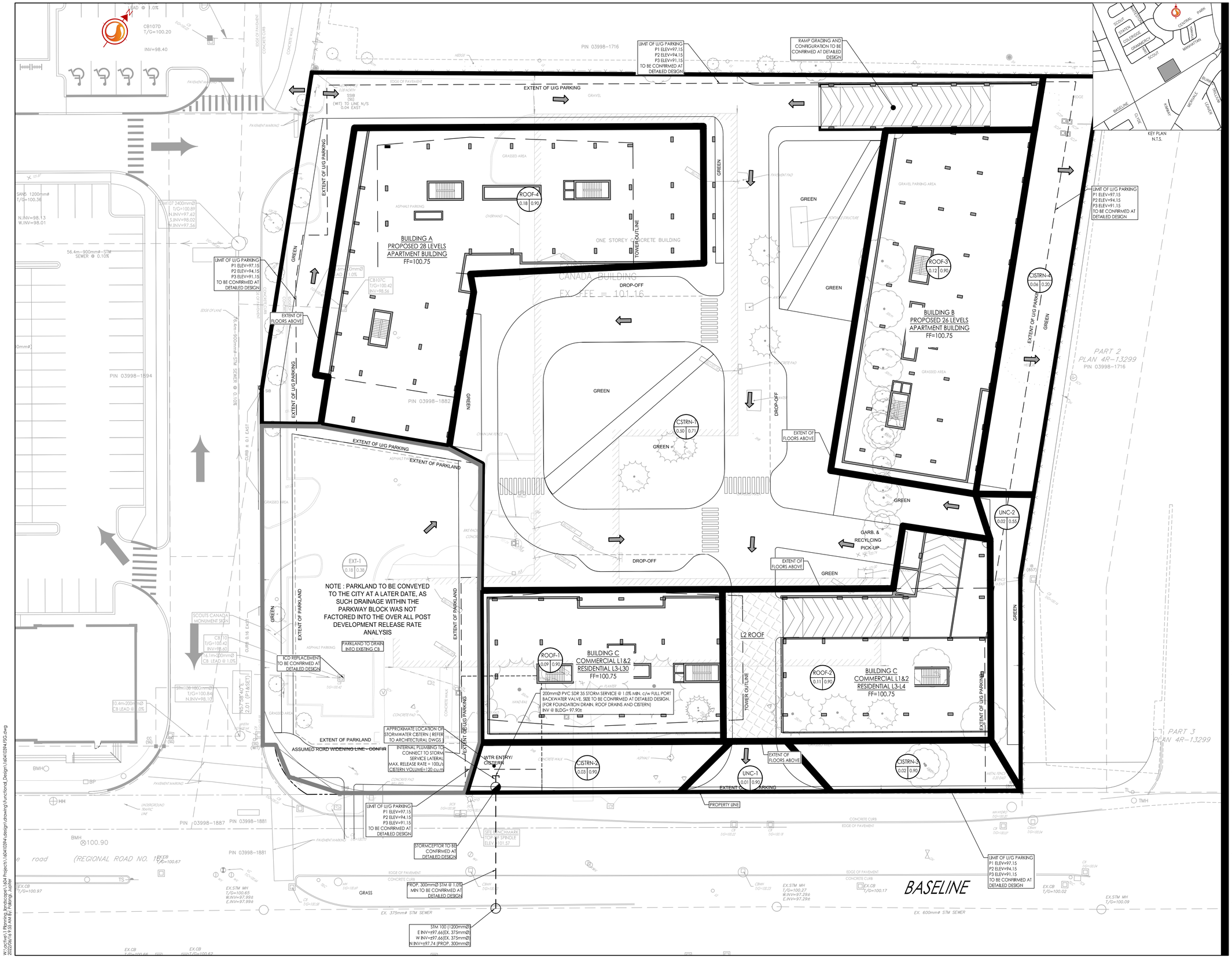

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Legend

- L101A / 1.00 / 0.85 — AREA ID, RUNOFF COEFFICIENT, STORM DRAINAGE AREA ha.
- STORM DRAINAGE BOUNDARY
- DIRECTION OF OVERLAND FLOW
- PROPOSED STORM MH AND SEWER
- EXISTING STORM MH AND SEWER
- EXISTING CATCHBASIN
- PHASE 2
- PHASE LINES

1	ISSUED FOR REVIEW	JP	DT	22.06.16
	Revision	By	Appd.	YY.MM.DD
File Name: 160410394.FSG.dwg		JP	DT	JP 22.06.06
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Permit-Seal

Client/Project
SCOUTS CANADA - NATIONAL SERVICE CENTRE

1345 BASELINE ROAD

Ottawa, ON

Title
FUNCTIONAL
STORM DRAINAGE PLAN

Project No.	Scale	Sheet	Revision
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Drawing No.			
SD-1			

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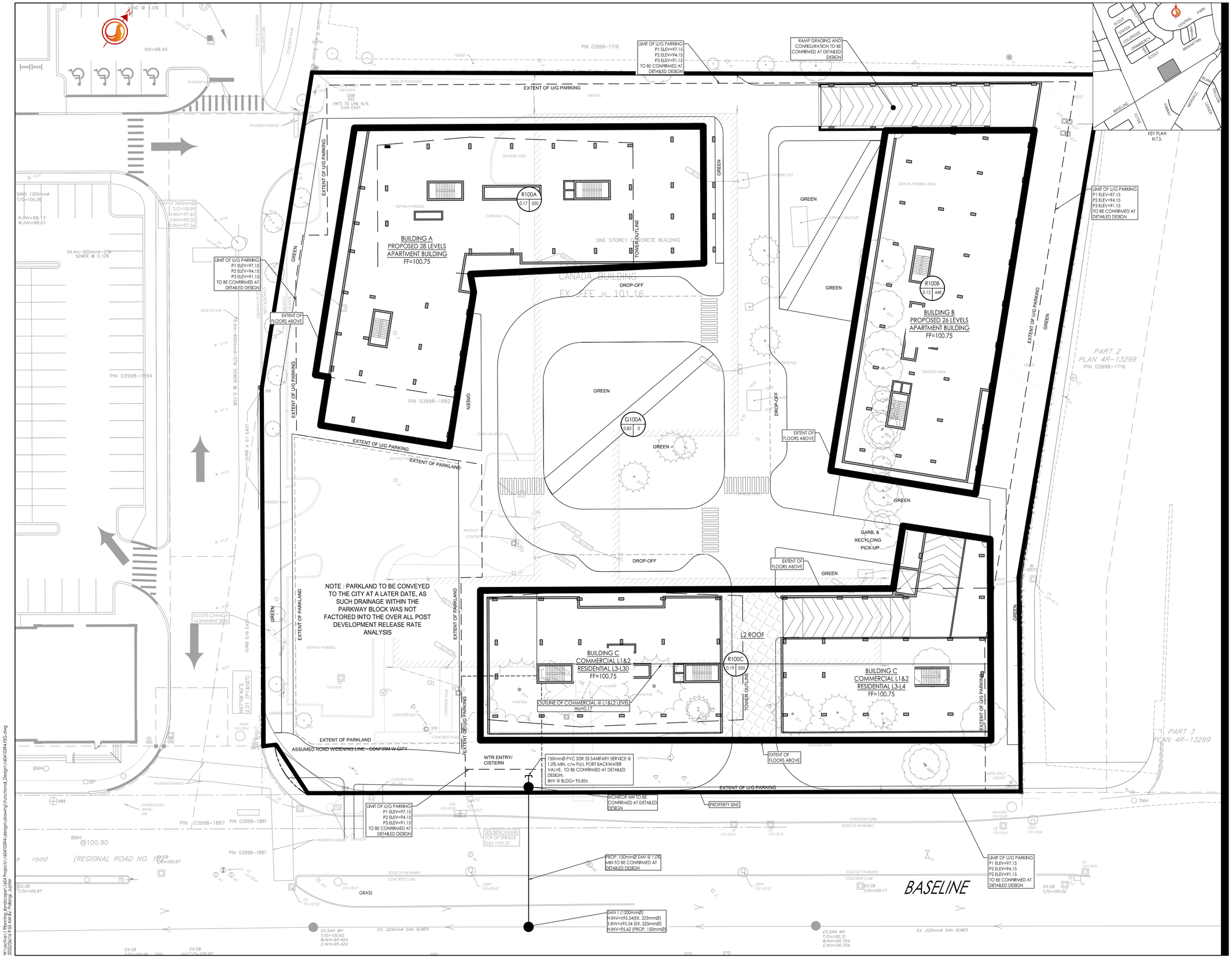

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Legend

R100A
0.31 | 50
- SANITARY DRAINAGE AREA ID#
- POPULATION COUNT
- SANITARY DRAINAGE AREA ha.

G100A
0.11 | INFL
- SANITARY DRAINAGE AREA ID#
- INFILTRATION RATE OF 0.33 L/s/Ha APPLIED
- SANITARY DRAINAGE AREA ha.

- SANITARY DRAINAGE AREA
- PROPOSED SANITARY MH AND SEWER
- EXISTING SANITARY MH AND SEWER

SANITARY STATS

BUIDLING A
162 - 1 BEDROOM UNITS @ 1.4 PPU = 227 PEOPLE
63 - 2 BEDROOM UNITS @ 2.1 PPU = 133 PEOPLE
18 - 3 BEDROOM UNITS @ 3.1 PPU = 56 PEOPLE
96 - STUDIO UNITS @ 1.4 PPU = 96 PEOPLE

BUILDING B
128 - 1 BEDROOM UNITS @ 1.4 PPU = 99 PEOPLE
66 - 2 BEDROOM UNITS @ 2.1 PPU = 172 PEOPLE
22 - 3 BEDROOM UNITS @ 3.1 PPU = 37 PEOPLE
44 - STUDIO UNITS @ 1.4 PPU = 24 PEOPLE

BUILDING C
204 - 1 BEDROOM UNITS @ 1.4 PPU = 221 PEOPLE
57 - 2 BEDROOM UNITS @ 2.1 PPU = 223 PEOPLE
12 - 3 BEDROOM UNITS @ 3.1 PPU = 28 PEOPLE
80 - STUDIO UNITS @ 1.4 PPU = 24 PEOPLE

TOTAL POPULATION = 1553

1	ISSUED FOR REVIEW	JP	DT	22.06.16
	Revision	By	Appd.	YY.MM.DD

File Name: 160410394.FSG.dwg	JP	DT	JP	22.06.06
	Dwn.	Chkd.	Dsgn.	YY.MM.DD

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Client/Project
SCOUTS CANADA - NATIONAL SERVICE CENTRE

1345 BASELINE ROAD

Ottawa, ON

Title
FUNCTIONAL
SANITARY DRAINAGE PLAN

Project No.	Scale	Sheet	Revision
160410394	1:250 (0 2.5 7.5 12.5m)	5 of 5	1

Drawing No.
SA-1

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2022/06/16 9:55 AM By: Padraig, Jupher

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