Block 10 Longfields Subdivision

Site Servicing and Stormwater Management Report

Stantec

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Campanale Group

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1 Introduction

Stantec Consulting Ltd. has been commissioned by Campanale Group to prepare the following Servicing and Stormwater Management Report in support of a Site Plan Control (SPC) application for the proposed development located at Block 10 of the Longfields Subdivision with the civic address of 609 Longfields Drive in the City of Ottawa.

The site is 0.23 ha in area and is situated along the west side of Campanale Avenue. The site is currently zoned Mixed-Use Centre (MC [1642]) and is currently vacant. The site is bounded by existing residential development to the north, existing parklands to the south, Campanale Avenue and existing mixed-use development to the east, and an existing recreational pathway, Longfields Transitway Station, and the Southwest Transitway to the west, as shown in **Figure 1.1** below.

Figure 1.1: Key Plan of Site

The proposed 0.23 ha site will consist of a 9-storey residential medium-rise building with commercial space at the ground floor. Woodman Architects has prepared a site plan dated May 7th, 2024, as shown in **Appendix A.1**, while the unit and use type breakdown are listed in **Table 1.1** below.

Table 1.1: Unit Type Breakdown

Unit Type	Total
1 Bedroom	20
2 Bedroom + Den	42
2 Bedroom	27
3 Bedroom	1
Residential Total	**90**
Commercial (m^2)	**466**

1.1 Objective

This site servicing and stormwater management (SWM) report presents a servicing scheme that is free of conflicts, provides on-site servicing in accordance with City of Ottawa Design Guidelines, and uses the existing municipal infrastructure in accordance with any limitations communicated during consultation with the City of Ottawa staff. Details of the existing infrastructure located within the Campanale Avenue right of way (ROW) were obtained from available as-built drawings and site topographic survey.

Criteria and constraints provided by the City of Ottawa have been used as a basis for the detailed servicing design of the proposed development. Specific and potential development constraints to be addressed are as follows:

- Potable Water Servicing
    - Estimated water demands to characterize the proposed feed(s) for the proposed development which will be serviced from the existing 250 mm diameter watermain within the Campanale Avenue ROW.
    - Watermain servicing for the development is to be able to provide average day and maximum day (including peak hour) demands (i.e., non-emergency conditions) at pressures within the acceptable range of 345 to 552 kPa (50 to 80 psi)
    - Under fire flow (emergency) conditions, the water distribution system is to maintain a minimum pressure greater than 140 kPa (20 psi)
- Wastewater (Sanitary) Servicing
    - Define and size the sanitary service lateral which will be connected to the existing 200 mm diameter sanitary sewer within the Campanale Avenue ROW.
- Storm Sewer Servicing
    - Define major and minor conveyance systems in conjunction with the proposed grading plan.
    - Determine the stormwater management storage requirements to meet the allowable release rate for the site.

  - Define and size the proposed storm service lateral that will be connected to the existing 525 mm diameter storm sewer within the Campanale Avenue ROW.
- Prepare a grading plan in accordance with the proposed site plan and existing grades.

Drawing SSP-1 illustrate the proposed internal servicing scheme for the site.

2 Background

Documents referenced in preparing of this stormwater and servicing report for the Block 10 Longfields Station 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
- *Design Guidelines for Drinking Water Systems*, Ministry of the Environment, Conservation, and Parks (MECP), 2008
- *Fire Protection Water Supply Guideline* for Part 3 in the Ontario Building Code, Office of the Fire Marshal (OFM), October 2020
- *Water Supply for Public Fire Protection*, Fire Underwriters Survey (FUS), 2020
- *Geotechnical Investigation – Proposed Apartment Building – Block 10, 609 Longfields Drive, Ottawa, Ontario,* Paterson Group Inc., June 12, 2024
- *Campanale Homes – Longfields Development, City of Ottawa, Stormwater Management Report,* Stantec Consulting Ltd., February 4, 2011
- *Campanale Homes – Longfields Development, City of Ottawa, Servicing Report,* Revision 1*,* Stantec Consulting Ltd., May 4, 2011

3 Water Servicing

3.1 Background

The proposed building is in Pressure Zone 2W2C of the City of Ottawa's Water Distribution System. The existing watermains along the boundaries of the site consist of the 250 mm diameter PVC watermains within Campanale Avenue and Via Modugno Place, the latter which terminates at the existing Longfields Transitway Station as a stub. There are existing fire hydrants on both watermains. Furthermore, an existing private 200 mm diameter watermain stub enters the site from Campanale Avenue and is expected to service the site. Due to changes in City criteria since the site was originally developed, a second watermain feed has been added which will be valve separated from the original service lateral. This secondary feed will provide supply redundance for the apartment building.

3.2 Water Demands

3.2.1 Potable (Domestic) Water Demands

The City of Ottawa Water Distribution Guidelines (July 2010) and ISTB 2021-03 Technical Bulletin were used to determine water demands based on projected population densities for residential areas and associated peaking factors. The population was estimated using an occupancy of 1.4 persons per unit for one-bedroom apartments, 2.1 persons per unit for one-bedroom with den and two-bedroom apartments, and 3.1 persons per unit for three-bedroom apartments. Based on the unit type breakdown in **Table 1.1**, the proposed building is estimated to have a total population of 176 persons.

A daily rate of 280 L/cap/day has been used to estimate average daily (AVDY) potable water demand for the residential units, and 28,000 L/ha/day for the commercial areas. Maximum day (MXDY) demands were determined by multiplying the AVDY demands by a factor of 2.5 for residential areas and 1.5 for commercial areas. Peak hourly (PKHR) demands were determined by multiplying the MXDY by a factor of 2.2 for residential areas and 1.8 for commercial areas. The estimated demands for each tower are summarized in **Table 3.1** below and detailed in **Appendix B.1**.

Table 3.1: Estimated Water Demands

Demand Type	Units	Area (m^2)	Population	AVDY (L/s)	MXDY (L/s)	PKHR (L/s)
Residential	90	-	176	**0.57**	**1.43**	**3.14**
Commercial	-	466	-	**0.02**	**0.02**	**0.04**
Total	**90**	**466**	**176**	**0.59**	**1.45**	**3.18**

3.2.2 Fire Flow Demands

Based on the site plan, the fire flow requirement was calculated in accordance with Fire Underwriters Survey (FUS) methodology. Through confirmation from the architect (see **Appendix A.3**), the fire flow demands were estimated based on a building of non-combustible construction type with two-hour fire rated structural members, and the final sprinkler design to conform to the NFPA 13 standard. The gross floor area of the two largest floors + 50 % of the gross floor area of eight additional floors were used in the FUS calculation for the two high-rises, as per Page 22 of the *Fire Underwriters Survey's Water Supply for Public Fire Protection* (2020).

Based on the construction type, the building's required fire flow was determined to be 116.7 L/s (7,000 L/min). Detailed fire flow calculations per the FUS methodology and the supporting FUS exposure sketch are provided in **Appendix B.2**.

3.3 Level of Servicing

3.3.1 Boundary Conditions

The estimated domestic potable water demands, and fire flow demands, were used to define the level of servicing required for the proposed development from the municipal watermain and hydrants within the Campanale Avenue ROW. As the South Urban Community (SUC) watermain network will undergo a pressure zone reconfiguration, the boundary conditions includes both pre-reconfiguration and post-reconfiguration HGLs. **Table 3.2** below outlines the boundary conditions for the proposed connections at Campanale Avenue servicing the site.

Table 3.2: Campanale Avenue Boundary Conditions

Conditions	Pre-SUC Reconfiguration	Post-SUC Reconfiguration
Min. HGL (m)	125.0	144.5
Max. HGL (m)	133.1	146.9
MXDY+FF (116.7 L/s) (m)	124.4	141.8

3.3.2 Allowable Domestic Pressures

The desired normal operating pressure range in occupied areas as per the City of Ottawa 2010 Water Distribution Design Guidelines is 345 kPa to 552 kPa (50 psi to 80 psi) under a condition of maximum daily flow and no less than 276 kPa (40 psi) under a condition of maximum hourly demand. Furthermore, the maximum pressure at any point in the water distribution should not exceed 689 kPa (100 psi) as per the Ontario Building/Plumbing Code; pressure reducing measures are required to service areas where pressures greater than 552 kPa (80 psi) are anticipated in occupied areas.

The proposed finished floor elevation at the ground floor of 93.8 m will serve as the floor elevation for the calculation of residual pressures at ground level. As per the boundary conditions, under the pre-SUC

reconfiguration scenarios, the on-site pressures are expected to range from 306 kPa to 385.3 kPa (44.4 psi to 55.9 psi) under normal operating conditions. Under the post-SUC reconfiguration scenarios, the on-site pressures are expected to range from 497 kPa to 521 kPa (72.1 psi to 75.5 psi), which are within the normal operating pressure range defined by the City of Ottawa design guidelines as within 276 kPa to 552 kPa (40 psi to 80 psi).

Therefore, should the site be constructed prior to the SUC watermain pressure zone reconfiguration, the building is expected to require booster pumps to meet the normal operating pressures at the ground floor level. It is also anticipated that booster pumps will be required to service the upper floors of the towers.

3.3.3 Allowable Fire Flow Pressures

The boundary conditions provided by the City of Ottawa indicate that the watermain within Campanale Avenue is expected to maintain a residual pressure of 30.6 m equivalent to 300 kPa (43.5 psi) under the pre-SUC reconfiguration conditions and a residual pressure of 48 m equivalent to 471 kPa (68.2 psi) under the post-SUC reconfiguration conditions. This demonstrates that the existing watermains and nearby hydrants can provide the required fire flows while maintaining a residual pressure of 20 psi.

3.3.4 Fire Hydrant Coverage

The building will be sprinklered and a Siamese (fire department) connection is to be provided at the main entrance on the south side. There are two hydrants in the proximity of the proposed development site, as shown in **Figure 3.1**. The distance of each hydrant from the proposed building is less than 115 m.

According to the NFPA 1 Table 18.5.4.3 in Appendix I of the City of Ottawa Technical Bulletin ISTB-2018-02, a hydrant situated less than 76 m away from a building can supply a maximum capacity of 5,678 L/min, while a hydrant situated between 76 m and 152 m away from a building can supply a maximum capacity of 3,785 L/min. Hence, the required fire flow for this site (7,000 L/min) can be achieved with the two hydrants. See **Appendix B.4** for fire hydrant coverage table calculations and NFPA Table 18.5.4.3.

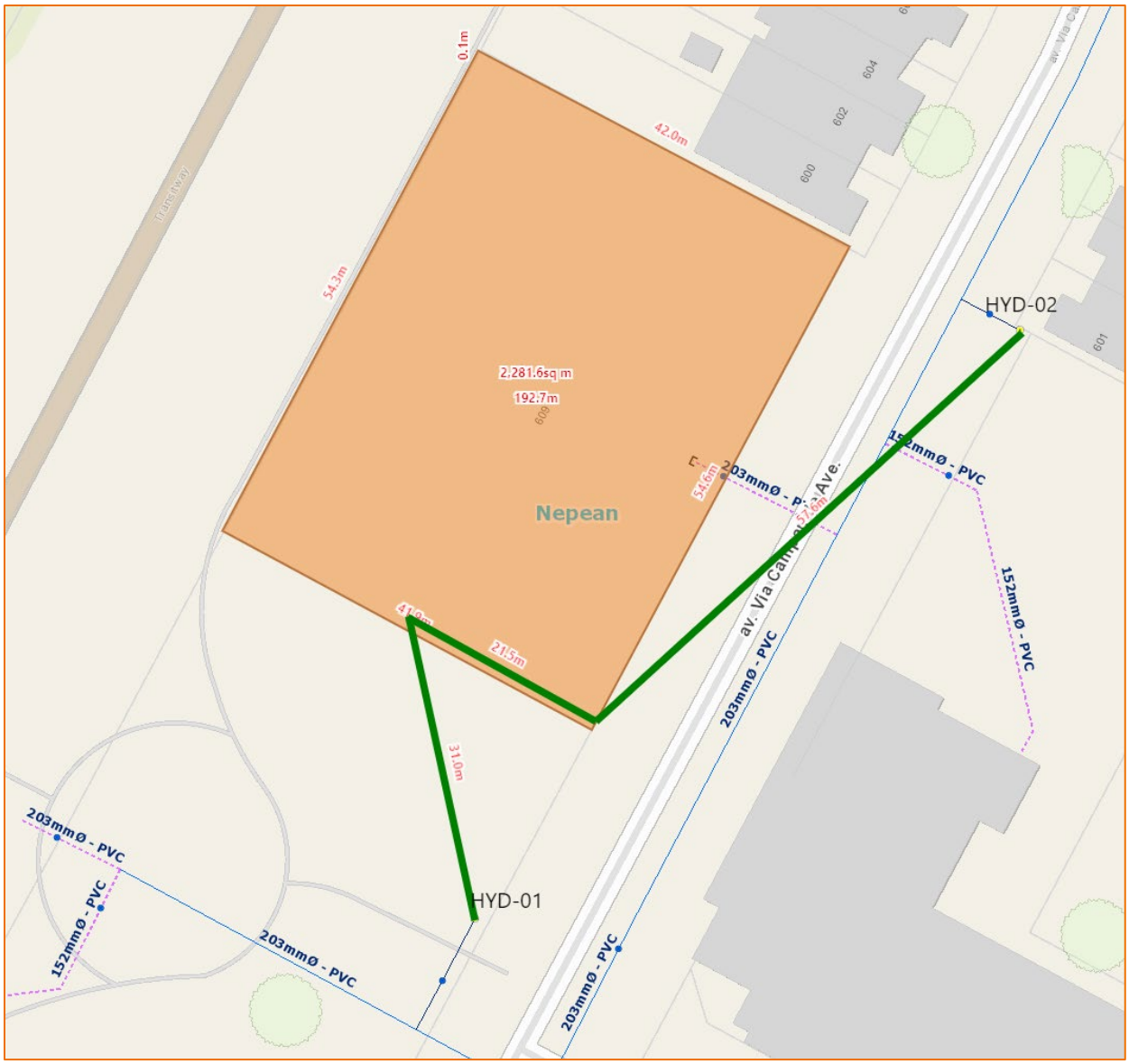


Figure 3.1: Fire Hydrant Coverage Sketch

As per Section 3.2.5.16 of the Ontario Building Code, the distance between the fire department connection and hydrant cannot be obstructed or more than 45 m. As such, HYD-01 meets the OBC requirements.

3.4 Proposed Water Servicing

The development will be serviced from the existing 250 mm diameter watermain on Campanale Avenue via the existing 200 mm building service stub and a new 200 mm diameter service connection, separated

by a 250 mm main isolation valve. The sizing of the service connection is to be confirmed by the mechanical consultant.

The proposed water servicing is shown on **Drawing SSP-1**. Based on the City of Ottawa Water Design Guidelines and the provided boundary conditions the existing 250 mm diameter watermain on Campanale Avenue can provide adequate fire and domestic flows for the subject site.

Booster pumps are required to service the upper stories of the building. The mechanical consultant or plumbing contractor will ultimately be responsible to confirm building pressures are adequate to meet building code requirements.

4 Wastewater Servicing

4.1 Background

The existing sewers adjacent to the development site consist of the 200 mm diameter sanitary sewers on Campanale Avenue and Via Modugno Place. An existing 200 mm diameter sanitary sewer stub is in place from Campanale Avenue. The viability of this existing stub will be verified prior to construction. Current City of Ottawa criteria require a slope of 1% be provided for sanitary service laterals. If the existing lateral does not provide sufficient slope the service will need to be re-laid at min. 1% slope.

4.2 Design Criteria

As outlined in the City of Ottawa Sewer Design Guidelines and the MECP 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 (per City Design Guidelines)
- 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 one-bedroom apartments – 1.4 persons/apartment
- Population density for one-bedroom with den and two-bedroom apartments – 2.1 persons/apartment
- Population density for three-bedroom apartments – 3.1 persons/apartment
- Average commercial wastewater generation – 28,000 L/ha/day of building space

4.3 Proposed Servicing

Block 10 will be serviced through a 200 mm diameter sanitary sewer stub, which will direct wastewater peak flows (approximately 2.1 L/s with allowance for infiltration) to the existing 200 mm diameter PVC sanitary sewer in Campanale Avenue. The receiving sewers within Campanale Avenue and downstream have been sized to accommodate wastewater from Block 10. Design flows are less than those assumed as part of the subdivision design. The sanitary sewer design sheet for the proposed sanitary sewers within the Block 10 site plan development and the sanitary design sheet and sanitary drainage area plan for the Longfields Subdivision are included in **Appendix C**.

5 Stormwater Management and Servicing

5.1 Objectives

The following section describes the stormwater management (SWM) design for Block 10 in accordance with the background documents and governing criteria for the Longfields subdivision established in the Longfields Subdivision Stormwater Management Report (Stantec, May 2011).

5.2 Stormwater Management (SWM) Criteria

The overall approach for storm servicing and stormwater management for the proposed development is outlined in the Longfields Subdivision SWM Report by Stantec (May 2011), excerpts can be found in **Appendix D.3**. The following summarizes the SWM criteria and constraints that will govern the detailed design of the proposed site as per the latest revision of the City of Ottawa Sewer Design Guidelines as well as the conclusions made in the subdivision SWM Report.

General

- Use of the dual drainage principle (City of Ottawa SDG)
- Wherever feasible and practical, site-level measures should be used to reduce and control the volume and rate of runoff (City of Ottawa SDG)
- Assess impact of 100-year event outlined in the City of Ottawa Sewer Design Guidelines on the major and minor drainage systems (City of Ottawa SDG)

Storm Sewer & Inlet Controls

- Discharge for each storm event to be restricted to an inflow rate of 12.5 L/s (City of Ottawa pre-consultation and Longfields SWM (2011))
- Peak flows generated from events greater than the 5-year and including the 100-year storm must be detained on site (Longfields SWM (2011))
- The preferred stormwater system outlet for this site is the 525 mm diameter storm sewers within the Campanale Avenue ROW. (City of Ottawa pre-consultation, **Appendix A.2**)
- The foundation drainage system is to be independently connected to sewer main,being pumped with appropriate back up power, sufficient sized pump, and backflow prevention. (City of Ottawa pre-consultation, **Appendix A.2**)
- T_c should be not less than 10 minutes since IDF curves become unrealistic at less than 10 min (City of Ottawa SDG).

Surface Storage & Overland Flow

- Building openings to be a minimum of 0.15 m above the 100-year water level (City of Ottawa SDG)
- Maximum depth of flow under either static or dynamic conditions shall be less than 0.35 m (City of Ottawa SDG)

- Provide adequate emergency overflow conveyance off-site with a minimum vertical clearance of 15 cm between the spill elevation and the ground elevation at the building envelope in the proximity of the flow route or ponding area (City of Ottawa SDG)
- Block to provide minimum storage of 25.9 m^3. (Longfields SWM (2011))

5.3 Existing Conditions

The existing site (0.23 ha) is presently vacant and is currently equipped with a temporary catchbasin to collect surface drainage and discharge into the existing 525 mm diameter storm sewer on Campanale Avenue. The temporary catchbasin and lead will be removed, with the lead reinstalled at 1% minimum as a storm service lateral for the development.

5.4 Stormwater Management Design

The Modified Rational Method was employed to assess the rate and volume of runoff anticipated during post-development rainfall runoff events. The site was subdivided into sub-catchments (subareas) as defined by the proposed grades and the location, nature, or presence/absence of inlet control devices (ICDs). Each sub-catchment was assigned a runoff coefficient based on the proposed finished surface. A summary of subareas and runoff coefficients is provided in **Table 5.1** below. Further details can be found in **Appendix D.1**, while **Drawing SD-1** illustrates the proposed sub-catchments.

Table 5.1: Summary of Subcatchment Areas

Catchment Areas	C	A (ha)	Flow Type	Outlet
ROOF-1	0.90	0.14	Uncontrolled	Cistern
RAMP-1	0.90	0.04		
CISTRN-1	0.90	0.02		
CISTRN-2	0.20	0.01		
CISTRN-3	0.20	0.01		
UNC-2	0.57	0.01		Campanale Avenue ROW
Total Site	**0.83**	**0.23**	-	-

5.4.1 Allowable Release Rate

The Longfields Subdivision SWM report (Stantec, 2011) has assigned an allowable release rate per block. Block 10 (identified as Future Block 315 in the subdivision report) was assigned an allowable release rate of 12.5 L/s. Consequently, the target release rate for Block 10 under all events up to and including the 100-year event will be 12.5 L/s. Runoff coefficient values have been increased by 25 % for the post-development 100-year storm event based on the City of Ottawa SDG.

5.4.2 Quantity Control: Storage Requirements

The site requires quantity control measures to meet the restrictive stormwater release criteria. It is proposed that the discharge from the site be collected and routed to an internal cistern to reduce the site peak outflow, with discharge from the building roof area collected via roof drains, the ramp via the trench drain, and the remaining site via area drains, catchbasins, and subdrains. A spreadsheet using the Modified Rational Method (MRM) was used to size the cistern storage, as shown in **Appendix D.1.**

5.4.2.1 Uncontrolled Areas

There is a single uncontrolled subcatchment area (Area UNC-1), which drains south to the Campanale Avenue ROW. The peak post-development discharge rate from the uncontrolled areas is summarized in **Table 5.2**.

Table 5.2: Peak Post-Development Uncontrolled Surface Release Rate (UNC-1)

Storm Event	UNC-1
5-Year	1.0
100-Year	2.1

The reverse sloped ramp to the parking garage is to be equipped with a trench drain at the bottom of the ramp to provide an outlet for the driveway area (RAMP-1 subcatchment). As per Section 5.7.6 of the City SDG (as amended), separate stormwater service piping is proposed to connect the trench drain to the cistern, also separate from the foundation drain and will be designed by the mechanical engineer.

5.4.2.1 Stormwater Cistern

As part of the stormwater management design of the site development, a stormwater cistern located in the underground parking area and equipped with a mechanical pump is proposed to attenuate peak flows from the catch basin and ramp drain areas. The final location of the cistern within the proposed building is to be coordinated by the architect with mechanical and structural engineers.

The stormwater cistern is to be designed to provide a minimum active storage volume of 90 m^3 with a maximum controlled release rate of 10.4 L/s. The stormwater cistern is to discharge at the specified controlled release rate using a pump. **Table 5.3** summarizes the respective flow rates and volume of retained stormwater in the 5-year and 100-year storm events.

Table 5.3: Proposed Cistern 5 and 100-Year Storage Requirement

Storm Return Period	Area IDs	Drainage Area (ha)	$Q_{release}$ (L/s)	$V_{required}$ (m^3)	$V_{available}$ (m^3)
5-year	ROOF-1, RAMP-1, CISTRN-1, CISTRN-2, CISTRN-3	0.22	10.4	31.8	90.0
100-year				80.0	

5.4.2.2 Results

The proposed stormwater management plan meets the requirements identified during pre-consultation that all stormwater release under all storm events, including the 100-year storm event, are to be controlled to the 5-year pre-development target release rate. **Table 5.4** provides a summary of the peak design discharge rates calculated from the MRM analysis, shown in **Appendix D.1**.

Table 5.4: Summary of Total 5-Year and 100-Year Event Release Rates

Drainage areas	5-year Peak Discharge (L/s)	100-Year Peak Discharge (L/s)
Uncontrolled to Campanale ROW	1.0	2.1
Cistern to Sewer	10.4	10.4
Target (L/s)	**12.5**	**12.5**
Total (L/s)	**11.5**	**12.5**

5.4.3 Quality Control

Water quality treatment for Block 10 is provided at the end-of-pipe stormwater management facility off Leikin Drive, this facility has been previously designed to accommodate the site (and the overall Longfields Subdivision development) and is known as the Clarke Bellinger Environmental Facility. No additional water quality treatment will be provided on-site.

5.5 Proposed Stormwater Servicing

One 250 mm diameter stormwater building service, complete with full port backwater valve as per City standard S14.1, is proposed for the storm service lateral, as per **Drawing SSP-1**. A stormwater sump and pump are required for the proposed foundation drain.

The ground floor area drains, roof drains, ramp drain, and the rear yard catch basin and subdrains will outlet to the cistern, which then pumps the discharge at a controlled rate to the existing 525 mm diameter storm sewer within the Campanale Avenue ROW. The lateral is to connect to the main as per City standard S11. The proposed stormwater servicing is shown on **Drawing SSP-1** and **SD-1**.

6 Site Grading

The proposed site measures approximately 0.23 ha in area and is vacant. The topography across the site generally slopes inward from the Campanale Avenue ROW at the south and the neighbouring property to the east with the existing catch basin at the low point to collect discharge.

A detailed grading plan (see **Drawing GP-1**) has been provided to satisfy the stormwater management requirements as detailed in **Section 5**, adhere to any grade raise restrictions for the site, and provide for minimum cover requirements for storm and sanitary sewers where possible. Site grading has been established to provide emergency overland flow routes required for stormwater management.

7 Utilities

Overhead (OH) hydro-wires run northeast-southwest along the north property line, parallel to the Southwest Transitway. All utilities within the work area will require relocation during construction. The existing utility poles within the public right of way are to be protected during construction.

As the site is surrounded by existing residential and commercial development, Hydro Ottawa, Bell, Rogers, and Enbridge servicing is readily available through existing infrastructure to service this site. The exact size, location, and routing of utilities will be finalized after design circulation. Existing overhead wires and utility plants may need to be temporarily moved/reconfigured to allow sufficient clearance for the movement of heavy machinery required for construction. The relocation of existing utilities will be coordinated with the individual utility providers upon design circulation.

8 Approvals

The proposed development lies on a private site under singular ownership and the storm discharge drains to an existing storm sewer outlet, therefore, the site will not require an Environmental Compliance Approval (ECA) from the Ministry of the Environment, Conservation and Parks (MECP).

For 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). It is possible that groundwater may be encountered during the foundation excavation on this site. 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. An MECP Permit to Take Water (PTTW), which is required for dewatering volumes exceeding 400,000L/day, is not anticipated for the site.

9 Erosion and Sediment Control During Construction

To protect downstream water quality and prevent sediment build-up 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. Install silt barriers/fencing around the perimeter of the site as indicated in **Drawing ECDS-1** to prevent the migration of sediment offsite.
7. Install trackout control mats (mud mats) at the entrance/egress to prevent migration of sediment into the public ROW.
8. Provide sediment traps and basins during dewatering works.
9. Install sediment traps (such as SiltSack® by Terrafix) between catch basins and frames.
10. 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 ECDS-1** for the proposed location of silt fences, sediment traps, and other erosion control measures.

10 Geotechnical Investigation

A geotechnical investigation report was prepared by Paterson Group on June 12, 2024 to provide an assessment of the subsurface conditions found at the site. Three (3) boreholes, numbered BH 1-24 to BH 3-24, were advanced to a maximum depth of 10.6 metres below the existing ground surface in the investigation carried out on June 3 and 4, 2024. The information obtained from the field investigation will guide the detailed design of the site and identify development constraints. Excerpts from the geotechnical investigation report are attached in **Appendix E**.

The subsurface profile encountered at the test hole locations are characterized primarily by topsoil and/or fill underlain by a brown silty clay deposit and grey silt deposit, which in turn is underlain by glacial till and the underlying bedrock formation. From available geological mapping, the bedrock consists of interbedded sandstone and dolomite of the March formation at depths ranging from 7.5 m to 10.6 m. Groundwater levels were measured from monitoring wells at all three boreholes in the June 2024 investigation and are expected to be 2.4 metres to 4.0 metres below the existing ground surface, though as groundwater levels are subject to seasonal fluctuations, they could vary at the time of construction.

Based on Paterson's recommendations, the site is suitable for the proposed development. It is recommended that the foundation support for the proposed mixed-use building consist of conventional spread footings placed on an undisturbed glacial till layer or a clean, surface sounded bedrock bearing surface. Due to the presence of the silty clay deposit, grading is subject to a permissible grade raise restriction of 2.0 m.

The recommended pavement structure is further presented in **Table 10.1** below.

Table 10.1: Recommended Pavement Structure

Material	Car-only Parking Areas	Access Lanes, Ramp and Heavy Truck Parking Areas
Wear Course – HL-3 or Superpave 12.5 Asphaltic Concrete	50 mm	40 mm
Binder Course – HL-8 or Superpave 19.0 Asphaltic Concrete	-	50 mm
BASE – OPSS Granular A Crushed Stone	150 mm	
SUBBASE – OPSS Granular B Type II	300 mm	450 mm

Refer to the full geotechnical report attached as part of the submission package.

11 Conclusions

11.1 Water Servicing

Based on the supplied boundary conditions for existing watermains and calculated domestic and fire flow demands for the subject site the adjacent watermain on Campanale Avenue has sufficient capacity to sustain both the required domestic and emergency fire flow demands for the development. Booster pump(s) are required to provide adequate pressures to the building's upper stories. The building will be serviced by the existing 200 mm diameter water service stub and a new service lateral, separated by a main isolation valve at the 250 mm watermain on Campanale Avenue. Sizing of the water service and requirements for booster pump(s) are to be confirmed by the mechanical consultant.

11.2 Sanitary Servicing

The proposed sanitary sewer service will consist of a sanitary service lateral, a sanitary sump pit, and sump pump(s) directing wastewater to a 200 mm diameter sanitary sewer on Campanale Avenue. A sump pump may be required for sewage discharge from the mechanical room. Sizing of the service lateral, sump pit, and sump pump are to be confirmed by the mechanical consultant.

11.3 Stormwater Servicing and Management

A cistern in the underground parking has been proposed to limit the stormwater discharge rate for all rainfall events up to and including the 100-year event to the Block 10 allowable discharge rate as established in the Longfields Subdivision SWM report. The remaining site area drains uncontrolled to the adjacent Campanale Avenue ROW as per existing conditions.

A 250 mm diameter storm service lateral is proposed for the building's foundation drain and internal storm sewer system, which is to be mechanically pumped and include a full port backwater valve. The roof drains, ramp drain, and rear yard catch basins are to be connected through internal plumbing to the cistern, which will pump discharge at a controlled rate through the service lateral and the backwater valve to the 525 mm diameter municipal storm sewer in the Campanale Avenue ROW. Sizing of the service lateral, cistern, and foundation drain pump are to be confirmed by the mechanical consultant.

11.4 Grading

Site grading has been designed to provide an adequate emergency overland flow route. The north and east sides drain uncontrolled to the adjacent right-of-ways and properties as per existing conditions.

11.5 Erosion and Sediment Control During Construction

Erosion and sediment control measures and best management practices outlined in this report and included in the drawing set, will be implemented during construction to reduce the impact on adjacent properties, the public ROW, and existing facilities.

11.6 Geotechnical Investigation

Based on the geotechnical investigation, the site is considered suitable for the proposed building, and it is recommended that the foundation support for the proposed mixed-use building consist of conventional spread footings placed on an undisturbed glacial till layer or a clean, surface sounded bedrock bearing surface. Due to the presence of the silty clay deposit, grading is subject to a permissible grade raise restriction of 2.0 m.

11.7 Utilities

The site is situated within an established neighbourhood, hence existing utility infrastructure is readily available to service the proposed development. Overhead wires along all boundaries of the site will need to be accommodated during construction. It is anticipated that existing infrastructure will be sufficient to provide a means of distribution for the proposed site. Exact size, location and routing of utilities will be finalized after design circulation.

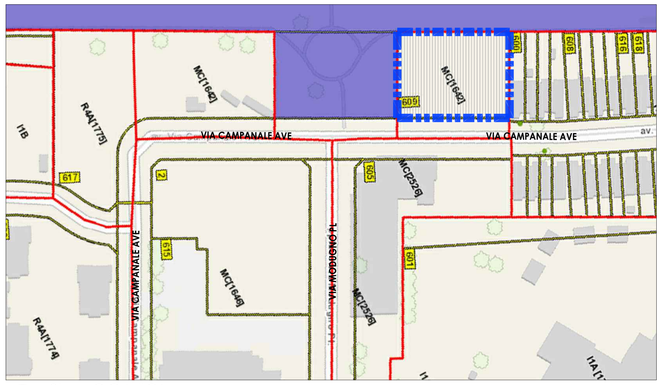
11.8 Approvals

This site is not anticipated to be subject to the Ministry of the Environment, Conservation and Parks (MECP) Environmental Compliance Approval (ECA) process. 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, for dewatering needs in excess of 400,000 L/day, is not anticipated for this site.

Appendices

Appendix A Background

A.1 Site Plan



2 SITE LOCATION
SCALE: NTS

MATERIAL LEGEND

	NEW SOD
	CONCRETE
	ASPHALT
	BRICK INTERLOCK
ENTRANCE	BUILDING ENTRANCE / EXIT
	PROPERTY BOUNDARY
	SETBACKS
	FIRE HYDRANT
	SIAMESE CONNECTION

	DIRECTIONAL ARROW
	1.5m Ht. IRON FENCE TO BE SUPPLIED
HP	PROPOSED HYDRO POLE

PROPOSED HEIGHT

	STOREY	HEIGHT IN M.
	PENTHOUSE	30.60
	9	26.80
	2	8.05
	MAIN LEVEL - FOOTPRINT	
	OUTLINE - PARKING BELOW	

3 LEGEND
SCALE: NTS

BLOCK 10 - 609 LONGFIELDS DR // 2024-07-11 // SITE AREA = 2268.05 SQ M

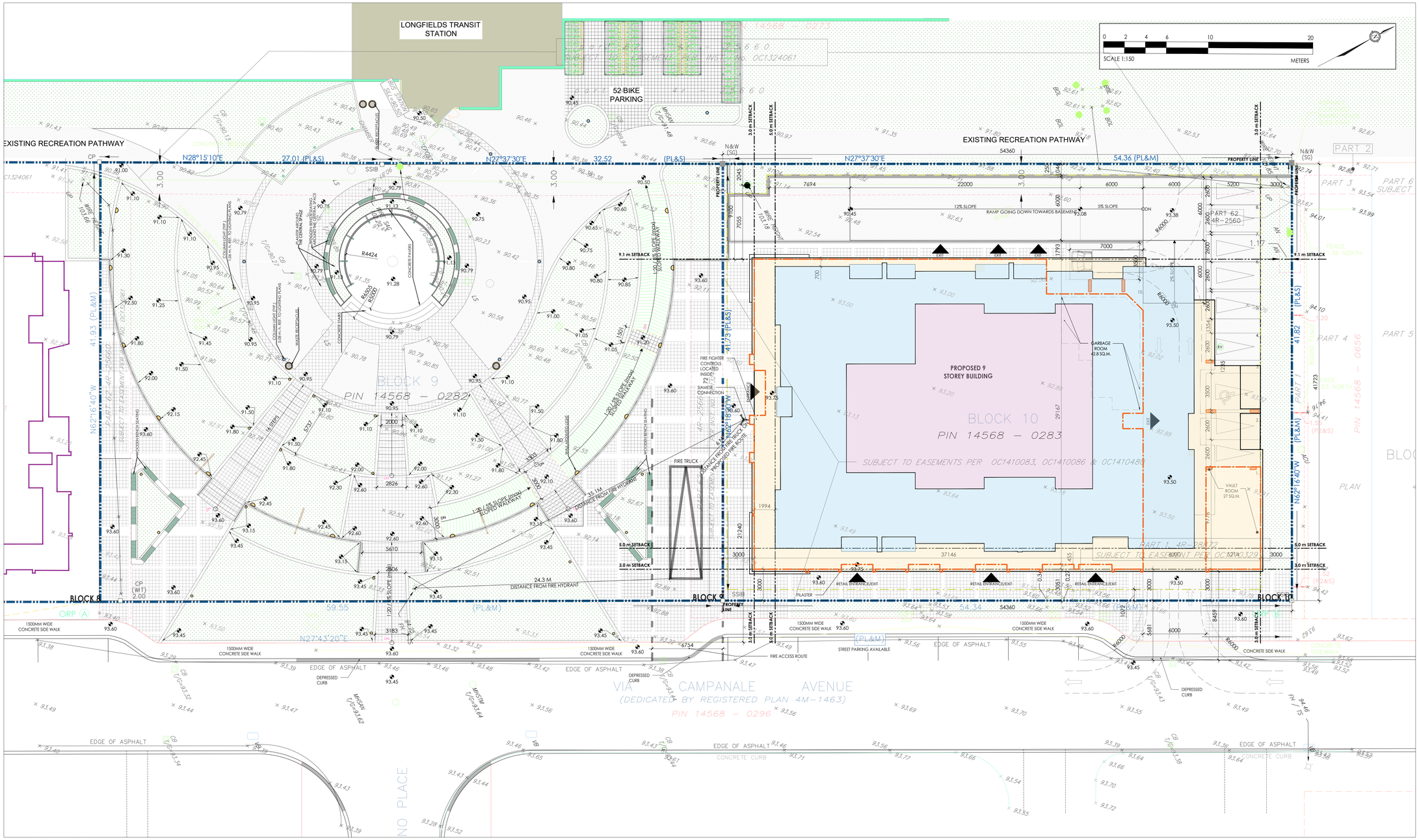
LEVEL	ONE BEDROOM	ONE BEDROOM + DEN	ONE BEDROOM B.F.	2 BEDROOM	2 BEDROOM B.F.	3 BEDROOM + DEN	3 BEDROOM B.F.	TOTAL UNITS	GROSS BUILDING AREA SQ.M.	GROSS BUILDING AREA SQ.FT.	GROSS FLOOR AREA SQ.M.	GROSS FLOOR AREA SQ.FT.
MAIN LEVEL	0	0	0	0	0	0	0	0	1,103	11,871	466	5,016
MEZZANINE	0	0	0	0	0	0	0	0	274	2,952	0	0
SECOND	3	6	1	2	0	1	1	14	1,280	13,774	1,037	11,162
THIRD	2	6	1	3	1	0	0	13	1,060	11,410	846	9,106
FOURTH	2	6	1	3	1	0	0	13	1,060	11,410	846	9,106
FIFTH	2	6	1	3	1	0	0	13	1,060	11,410	846	9,106
SIXTH	2	6	1	3	1	0	0	13	1,055	11,351	846	9,106
SEVENTH	0	6	2	3	1	0	0	12	1,017	10,946	809	8,708
EIGTH	0	6	2	3	1	0	0	12	1,017	10,947	809	8,708
TOTAL UNITS	11	42	9	20	6	1	1	90	8,925	96,071	6,505	70,020
PARKING LEVEL 1									2,009	21,625		
PARKING LEVEL 2									2,009	21,625		
TOTAL UPER LEVELS + PARKING									19,212	206,795		

TOTAL UNITS	90	
TOTAL BARRIER FREE UNITS	16	18%

PARKING BY LEVEL	UNITS
MAIN LEVEL	9
PARKING LEVEL ONE	53
PARKING LEVEL TWO	55
TOTAL PARKING PROVIDED	117

PARKING	REQUIRED	PROVIDED
RESIDENTIAL	45	90
VISITOR PARKING REQUIRED	18	18
RETAIL	11.65~12	9
TOTAL/BUILDING REQUIRED	75	117

4 AREAS
SCALE: NTS



1 SITE PLAN
SCALE: 1:150

CLIENT:

CAMPANALE GROUP

KEY PLAN:

GENERAL NOTES:

SURVEY INFORMATION IS AS PER THE DRAWINGS PROVIDED BY THE CLIENT.

SURVEY INFORMATION IS ONLY FOR REPRESENTATION.

ALL CONTRACTORS TO VERIFY ALL DIMENSIONS ON SITE AND TO REPORT ALL ERRORS AND/OR OMISSIONS TO THE ARCHITECT.

ALL CONTRACTORS MUST COMPLY WITH ALL CODES AND BYLAWS AND OTHER AUTHORITIES HAVING JURISDICTION OVER THE WORK.

DO NOT SCALE DRAWINGS.

THIS DRAWING MAY NOT BE USED FOR CONSTRUCTION UNTIL SIGNED BY THE ARCHITECT.

NO.	REVISION	DD/MM/YY DATE
06	FOR REVIEW	12/07/24
05	FOR REVIEW	09/07/24
04	FOR REVIEW	07/05/24
03	FOR REVIEW	23/04/24
02	FOR REVIEW	18/04/24
01	FOR REVIEW	01/03/24

FOTENN
PLANNING + DESIGN

WOODMAN ARCHITECT & ASSOCIATES LTD.
201-4 BEECHWOOD AVENUE, OTTAWA, ONTARIO, CANADA K1L8L9
TEL: 613 228 9850, FAX 613 228 9848, mailbox@woodmanarchitect.com

CONSULTANTS:

STRUCTURAL	- D+M Structural Ltd
MECHANICAL	- Jain Consultants
CIVIL	- Stantec
ELECTRICAL	- Jain Consultants
NOISE	- Gradient Wind Engineering Inc.
LANDSCAPE	- Thakar Associates Design Consultants
INFRASTRUCTURE	- Parsons

PROJECT:

BLOCK 9&10
609 LONGFIELDS DR.
NEPEAN, BARRHAVEN EAST - OTTAWA

DRAWING:

SITE PLAN

DATE	23/11/2023
SCALE	1:150
DRAWN BY	JG
REVIEWED BY	RW
JOB NO.	2314A
DRAWING NO.	SP01

A.2 Pre-Consultation

File No.: PC2023-0302

Bria Aird
Fotenn
Via email: Aird@fotenn.com

Subject: Pre-Consultation: Meeting Feedback
Proposed Site Plan Control, Zoning By-law Amendment, Official Plan Amendment Applications – 609, 617, 621 Longfields

Please find below information regarding next steps as well as consolidated comments from the above-noted pre-consultation meeting held on November 20, 2023.

Pre-Consultation Preliminary Assessment

1 ☒	**2** ☐	**3** ☐	**4** ☐	**5** ☐

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

Next Steps

1. A review of the proposal and materials submitted for the above-noted pre-consultation has been undertaken. Please proceed to complete a Phase 2 Pre-consultation Application Form and submit it together with the necessary studies and/or plans to planningcirculations@ottawa.ca.

2. In your subsequent pre-consultation submission, please ensure that all comments or issues detailed herein are addressed. A detailed cover letter stating how each issue has been addressed must be included with the submission materials. Please coordinate the numbering of your responses within the cover letter with the comment number(s) herein.

3. Please note, if your development proposal changes significantly in scope, design, or density before the Phase 3 pre-consultation, you may be required to complete or repeat the Phase 2 pre-consultation process.

Supporting Information and Material Requirements

1. The attached **Study and Plan Identification List** outlines the information and material that has been identified, during this phase of pre-consultation, as either required (R) or advised (A) as part of a future complete application submission.

   a. The required plans and studies must meet the City's Terms of Reference (ToR) and/or Guidelines, as available on Ottawa.ca. These ToR and Guidelines outline

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

Consultation with Technical Agencies

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

Planning

Comments:

1. Staff will require individual phase 1 pre-consultations for the remaining Block 5 and Block 8 developments due to the complexity of the proposals. Some comments below will address aspects of the three sites, however, these are not comprehensive comments for Blocks 5 and 8. Largely only Block 10 comments for the proposed Site Plan Control application will be included. Similarly, the Studies and Plans Identification List (SPIL) contains the submission requirements for a Site Plan Control application for Block 10.

2. Block 10 will require a Zoning By-law Amendment Application and/or Minor Variances to permit the increased height, as well as a Site Plan Control application. Minor Variances/zoning must be approved prior to submitting a Phase 3 preconsultation for the Site Plan Control application.

    a. There may be some flexibility in that Staff will accept the Phase 3 preconsultation for the purposes of reviewing the Site Plan to ensure the building proposal is largely reviewed prior to attending Committee of Adjustment. Should you have any questions on the timing, please reach out to discuss further.

3. As the applicant mentioned in the preconsultation, minor variances will be required for the location/height of the 9th floor amenity areas as well as the underground parking structure. Please contact Justin Grift (justin.grift@ottawa.ca) to discuss the variances or arrange a meeting on the application.

4. Planning Staff strongly suggest attendance at UDRP for Blocks 5, 8 and 10 as the buildings are the first instances of mid-rise apartment dwellings in the community. There are currently no other residential buildings of this scale in the area. Please consult with Will Fleury (Will.fleury@ottawa.ca) and Christopher Moise (Christopher.moise@ottawa.ca) to determine the organization of the sites, and whether they can be presented together.

5. The subject site (block 10) is zoned MC [1642] wherein mid-rise dwellings are permitted, subject to the respective zoning standards.

6. The Official Plan designates the lands as Evolving Neighbourhood. Within the Official Plan, there are some supporting policies for increasing height and the proposed 9-storey building.

7. Currently, Staff do not have concerns with the proposed mid-rise apartment dwelling on Block 10.

8. Any opportunity for soft landscaping and tree planting is preferred and appreciated. However, we do recognize the adjacent open space that holds the potential for larger soft landscaping and tree planting areas.

9. Section 37 requirements / Community Benefits Charge

    a. The former Section 37 regime has been replaced with a "Community Benefits Charge", By-law No. 2022-307, of 4% of the land value. This charge will be required for ALL buildings that are 5 or more storeys and 10 or more units and will be required at the time of building permit unless the development is subject to an existing registered Section 37 agreement. Questions regarding this change can be directed to Ranbir.Singh@ottawa.ca.

Urban Design

Comments:

10. This proposal for Block 10 does not run along or does not meet the threshold in one of the City's Design Priority Areas and need not attend the City's UDRP. Staff will be responsible for evaluating the Urban Design Brief and providing design direction.

Comments related to the design:

11. Recommend reviewing each site separately.

12. Policy discussion about density and height on other blocks should follow.

13. Will there be a change to requirements for commercial, parks, schools, etc. available for the increase in density?

14. We recommend a parking reduction for any increase in density above the zoning allotment.

15. Transition should be analysed on all sites.

16. High-rise guidelines should be considered.

17. UDRP will be a question regarding blocks 8 & 5.

18. BLOCK 10: SPC

a. Two storey all around the building to support pedestrian scale and neighbourhood character. Note p152/3/4.

b. Recommend looking for opportunities to reduce parking requirements.

19. BLOCK 8: OPA/ZBA/SPA

a. To follow.

20. BLOCK 5: OPA/ZBA/SPA

a. To follow.

21. An Urban Design Brief is a required submittal. The Urban Design Brief should be structured by generally following the headings highlighted under Section 3 – Contents of these Terms of Reference. Please see the Urban Design Brief Terms of Reference provided and consult the City's website for details regarding the UDRP schedule (if applicable).

a. It is important to study the broader existing and future contexts.

b. It is important to explore and analyze alternative site planning and massing options. Alternative options explored and the analysis should be documented in the Design Brief.

c. When a wind and/or shadow studies are required please refer to the Terms of Reference for the wind analysis and shadow analysis to conduct the studies and evaluate the impacts.

d. Note. The Urban Design Brief submittal should have a section which addresses these pre-consultation comments.

Engineering

22. Please refer to GeoOttawa with the Water and Wastewater Infrastructure turned on to determine what servicing is available for this site: geoOttawa

23. Plans and reports can be retrieved at the Information Centre at geoinformation@ottawa.ca.

Water:

24. Submission documents must include:

Boundary Conditions - civil consultant to request boundary conditions from the City's assigned Project Manager, Development Review. Water boundary conditions request must include the location of the service and the expected loads required by the proposed development. Please provide all the following information:

- Location of service (show on a plan or map)
- Type of development
- Average daily demand: ____l/s.
- Maximum daily demand: ___l/s.
- Maximum hourly daily demand: ____l/s.
- Required fire flow and completed FUS Design Declaration if applicable
- Supporting Calculations for all demands listed above and required fire flow as per Ontario Building Code or Fire Underwriter Surveys (See technical Bulletin ISTB-2021-03.

- Watermain system analysis demonstrating adequate pressure as per Section 4.2.2 of the Water Distribution Guidelines.
- Demonstrate adequate hydrant coverage for fire protection. Please review Technical Bulletin ISTB-2018-02, Appendix I Table 1 – maximum flow to be considered from a given hydrant
- Any proposed emergency route (to be satisfactory to Fire Services).

Sanitary:

25. The Sanitary Criteria, for the subject site, is to be based on the following:

The Campanale Homes – Longfields Development Report

Storm:

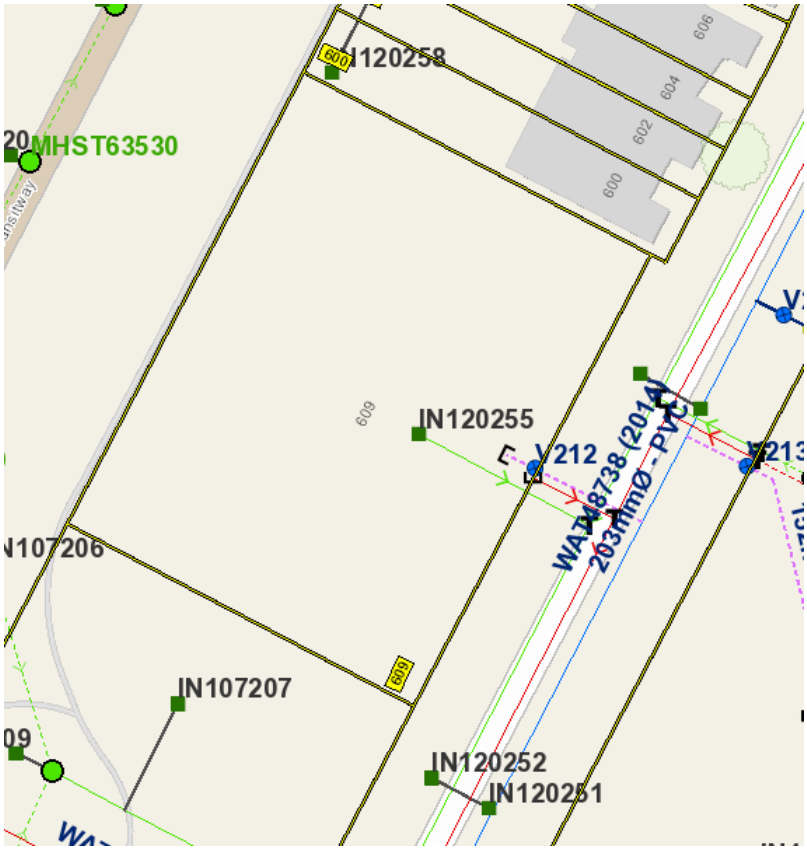
26. The Stormwater Management Criteria, for the subject site, is to be based on the following:

a. The Campanale Homes – Longfields Development Report (12.5L/s for block 10)

b. A calculated time of concentration (Cannot be less than 10 minutes).

c. Flows to the storm sewer in excess of the allowable storm release rate, with all drainage contained on-site up to and including the stress test event (100-year + 20% event).

Deep Services (Storm, Sanitary & Water Supply)



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

e. Connections to trunk sewers and easement sewers are typically not permitted.

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

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

h. Std Dwg S11.1 for flexible main sewers – connections made using approved tee or wye fittings.

i. Std Dwg S11 (For rigid main sewers) – lateral must be less that 50% the diameter of the sewermain,

j. Std Dwg S11.2 (for rigid main sewers using bell end insert method) – for larger diameter laterals where manufactured inserts are not available; lateral must be less that 50% the diameter of the sewermain,

i. Connections to manholes permitted when the connection is to rigid main sewers where the lateral exceeds 50% the diameter of the sewermain. – Connect obvert to obvert with the outlet pipe unless pipes are a similar size.

ii. No submerged outlet connections.

Additional Notes:

- No Capital Work Project that would impact the application has been identified at this time.
- No road moratorium that would impact the application has been identified.
- Any easement identified should be shown on all plans.
- For any proposed exterior light fixtures, please provide certification from a licensed professional engineer confirming lighting has been designed only using fixtures that meet the criteria for full cut-off classification as recognized by the Illuminating Engineering Society of North America and result in minimal light spillage onto adjacent properties (maximum allowable spillage is 0.5 fc). Additionally, include in the submission the location of the fixtures, fixture type (make, model, part number and mounting height.
- Sensitive Marine Clay (SMC) is widely found across Ottawa- geotechnical reports should include Atterberg Limits, consolidation testing, sensitivity values, and vane shear testing.

For information on preparing required studies and plans refer to:

Planning application submission information and materials | City of Ottawa

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

City of Ottawa Guidelines:

- Ottawa Sewer Design Guidelines (October 2012) and associated technical bulletins
- Ottawa Design Guidelines – Water Distribution (2010) and associated technical bulletins
- Geotechnical Investigation and Reporting Guidelines for Development Applications in the City of Ottawa (2007)
- City of Ottawa Slope Stability Guidelines for Development Applications (revised 2012)
- City of Ottawa Environmental Noise Control Guidelines (January 2016)
- City of Ottawa Park and Pathway Development Manual (2012)
- City of Ottawa Accessibility Design Standards (2012)

- Ottawa Standard Tender Documents (latest version)

Please refer to other applicable Guidelines (provincial and federal)

City of Ottawa Bylaws:

- Site Alteration (By-law No. 2018-164) | City of Ottawa
- Sewer Connection (By-law No. 2003-513) | City of Ottawa
- Sewer Use (By-law No. 2003-514) | City of Ottawa
- Building (By-law No. 2014-220) | City of Ottawa
- Community Benefits Charge By-law (By-law No. 2022-307) | City of Ottawa
- Delegation of Authority (By-law No. 2023-67) | City of Ottawa
- Encroachments on City Highways (By-law No. 2003-446) | City of Ottawa
- Fence (By-law No. 2003-462) | City of Ottawa
- Fire Routes (By-law No. 2003-499) | City of Ottawa
- Noise (By-law No. 2017-255) | City of Ottawa
- Private Approach (By-law No. 2003-447) | City of Ottawa
- Road Activity (By-law No. 2003-445) | City of Ottawa
- Site Plan Control (By-law No. 2014 - 256) | City of Ottawa
- Tree Protection (By-law No. 2020-340) | City of Ottawa
- Water (By-law No. 2019-74) | City of Ottawa
- Zoning (By-law No. 2008-250) | City of Ottawa

Feel free to contact Natasha Baird, Infrastructure Project Manager, for follow-up questions at Natasha.baird@ottawa.ca.

Noise

Comments:

27. Noise Impact Study required and must address:

    a. proximity of Transitway, both existing BRT and ultimate Future LRT noise levels must be assessed,

    b. proximity of Smiths Falls rail corridor, and

    c. aircraft noise, as site is within the Airport Vicinity Development Zone.

28. Stationary Noise Study required due to the proximity to neighboring exposed mechanical equipment and/or if there will be any exposed mechanical equipment due to the proximity to neighboring noise sensitive land uses.

Feel free to contact Josiane Gervais, TPM, for follow-up questions.

Transportation

Comments:

29. A TIA is not required. Due to the proximity of the BRT/LRT station, TDM measures are strongly encouraged. Submit TDM measures and TDM design checklists.

30. Ensure that the development proposal complies with the Right-of-Way protection requirements of the Official Plan's Schedule C16.

    a. See Schedule C16 of the Official Plan.

    b. Any requests for exceptions to ROW protection requirements must be discussed with Transportation Planning and concurrence provided by Transportation Planning management.

    c. If applicable, ROW and corner triangles must be unincumbered and conveyed at no cost to the City. Note that conveyance of the ROW will be required prior to registration of the SP agreement. Additional information on the conveyance process can be provided upon request.

31. Existing Longfields BRT Station within proximity to site

32. Longfields LRT Station within proximity to site (Ultimate Network)

33. As the proposed sites are mixed use and for general public use, AODA legislation applies.

    a. 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.

    b. 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).

    c. 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

34. On the Site Plan:

    a. Show all details of the roads abutting the site; include such items as pavement markings, accesses and/or sidewalks.

    b. Ensure site accesses meet the City's Private Approach Bylaw.

c. Turning movement diagrams required for all accesses showing the largest vehicle to access/egress the site.

d. Turning movement diagrams required for internal movements (loading areas, garbage).

e. 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).

f. Show dimensions for site elements (i.e. lane/aisle widths, access width and throat length, parking stalls, sidewalks, pedestrian pathways, etc.)

35. Sidewalks required along Campanale Ave frontage. Sidewalks are to be continuous across access as per City Specification 7.1.

36. Consider a barrier-free connection to the existing cycling path at the rear of the building.

37. Show slope of garage ramp 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.

Feel free to contact Josiane Gervais, Transportation Project Manager, for follow-up questions.

Environment and Trees

Comments:

38. Tree Conservation Report requirements – Planning Forester

    a. **If there are trees greater than 10cm in diameter on site, a TCR will be required – please confirm to the Planning Forester (mark.richardson@ottawa.ca)**
    b. 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.
    c. The TCR must contain 2 separate plans:
        a. Plan/Map 1 - show existing conditions with tree cover information
        b. Plan/Map 2 - show proposed development with tree cover information
        c. Please ensure retained trees are shown on the landscape plan
    d. 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
        a. for ease of review, the Planning Forester suggests that all trees be numbered and referenced in an inventory table

e. please identify trees by ownership – private onsite, private on adjoining site, city owned, co-owned (trees on a property line)
    a. Compensation may be required for the removal of city owned trees.
f. If trees are to be removed, the TCR must clearly show where they are, and document the reason they cannot be retained
g. 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
h. the location of tree protection fencing must be shown on the plan
    a. show the critical root zone of the retained trees

39. Tree Planting Specification requirements – Planning Forester

a. Please ensure any retained trees are shown on the LP
b. Minimum Setbacks
    i. Maintain 1.5m from sidewalk or MUP/cycle track or water service laterals.
    ii. Maintain 2.5m from curb
    iii. Coniferous species require a minimum 4.5m setback from curb, sidewalk or MUP/cycle track/pathway.
    iv. 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.
c. Tree specifications
    i. Minimum stock size: 50mm tree caliper for deciduous, 200cm height for coniferous.
    ii. Maximize the use of large deciduous species wherever possible to maximize future canopy coverage
d. Tree planting on city property shall be in accordance with the City of Ottawa's Tree Planting Specification; and if possible, include watering and warranty as described in the specification.
e. No root barriers, dead-man anchor systems, or planters are permitted.
f. No tree stakes unless necessary (and only 1 on the prevailing winds side of the tree)
g. Hard surface planting - if there are hard surface plantings, a planting detail must be provided
    i. Curb style planters are highly recommended
    ii. No grates are to be used and if guards are required, City of Ottawa standard (which can be provided) shall be used.
h. Trees are to be planted at grade
i. Soil Volume

j. Please demonstrate as per the Landscape Plan Terms of Reference that the available soil volumes for new plantings will meet or exceed the following:

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

It is suggested that the proposed species list include a column listing the available soil volume.

k. If sensitive marine clay soils are present, please follow the City's 2017 Tree Planting in Sensitive Marine Clay guidelines
l. The City requests that consideration be given to planting native species where ever there is a high probability of survival to maturity.
m. Efforts shall be made to provide as much future canopy cover as possible at a site level, through tree planting and tree retention. The Landscape Plan shall show/document that the proposed tree planting and retention will contribute to the City's overall canopy cover over time. Please provide a projection of the future canopy cover for the site to 40 years.

40. Significant environmental features

a. Woodlot and wetlands south of 621 Longfields.

41. Species at risk

a. No concerns.

42. Environmental impact statements

a. Though technically the development at 621 Longfield is within the 120m adjacency trigger for an EIS due to the woodlot and wetlands, I believe that the EIS can be waived in this case. The EIS guidelines grant the reviewer the authority to waive a report in the event that they believe "the risk of negative impacts occurring as a result of the proposed project is extremely low to non-existent, such that the completion of the Scoped EIS Form would not afford any useful benefit to the environment, the applicant or the City "

The amount of existing development between the site and the protected features, as well as the fact that the site is already cleared, lead me to believe that this would be the case. It is unlikely that the proposed development would have any discernable effect on the ecological function of the protected features located at 330 Via Verona Ave.

However, as these protected features provide substantial bird habitat, part of the waiving of the EIS is predicated on the need for the Bird Safe Guidelines to be adhered to (see following entry).

43. Bird-Safe Design Guidelines

    a. All mid-rise buildings are subject to the stipulations of the Bird Safe Design Guidelines. In particular, Guideline 2, concerning the use of low-reflectivity glass or visual markers, is of highest concern and **must** be implemented on 90% of all glazing below 16m. In addition, the all-glass corners are a notable design trap that should be treated with mitigation measures or changed in design in order to reduce the chance of bird mortality.

44. Tree plantings to help the city meet the urban forest canopy goals and to reduce the effects of climate change and the urban heat island are encouraged. The City prefers that plantings be done with native and non-invasive species.

    This site is within the Airport Bird Hazard Zone, which places certain restrictions on the types of trees to be planted. A list, titled “Airport Bird Hazard Plant Species” has been uploaded to the sharepoint folder and details species to avoid while planting.

Feel free to contact Mark Elliott, Environmental Planner, or Mark Richardson mark.richardson@Ottawa.ca, Forester, for follow-up questions.

Parkland

Comments:

45. To be provided under separate cover.

Feel free to contact Jeannette Krabicka, Parks Planner, for follow-up questions.

Corporate Real Estate Office (City of Ottawa)

Comments:

46. The subject lands are part of the Longfields Subdivision that was developed by Build Ottawa (formerly OCLDC). As part of these subdivision agreement, there are triggers for the development of the transit station courtyard (Block 9) in relation to Blocks 8 and 10. As part of the site plan control approval for Block 10, we would expect that the required “preliminary design plan” be in place, which

will of course need input from various internal groups. A concept plan was prepared for the plaza which the current concept departs from and can certainly form a basis for a re-think given current design standards and practices. If there are future meetings for Block 8 that will trigger the final design, securities etc., we can provide additional comments or conditions to be included in the SPC agreement.

61. **Longfields Transit Station Courtyard**
The Owner covenants and agrees, at its cost and expense, to construct the Longfields Transit Station Courtyard located on Block 9 of the Plan (the "Courtyard") in accordance with the following:

(a) At the time of a site plan application for Block 8 or Block 10, whichever of these blocks is developed first (with the undeveloped block hereinafter referred to as the "remaining block"), the Owner shall submit a preliminary design plan for the Courtyard for review and approval by the General Manager of Planning and Growth Management;

(b) At the time of a site plan application for the remaining block to be developed, the Owner shall submit a detailed design plan and construction drawings for the Courtyard for review and approval by the General Manager of Planning and Growth Management;

(c) The Owner shall deposit security with the City for the costs of construction of the Courtyard at the time of execution of the site plan agreement for the remaining block;

(d) The Owner covenants and agrees to complete construction of the Courtyard in conjunction with the landscaping Works for the remaining Block, such construction to be to the satisfaction of the General Manager of Planning and Growth Management.

47. With respect to the plaza design, please note that The Longfields Urban Design Guidelines dated October 9, 2009 state the following:

a. "**2.1 Transit Courtyard:** The transit courtyard, being Block 316 on the draft plan of subdivision, is to be developed in keeping with the concept plan illustrated in Figures 2A and the perspective illustrated in Figure 2B which depicts the courtyard looking west towards the proposed transitway station. The intent of this guideline is to ensure that that the key elements of this concept including landscaping, bike paths, lighting, stairwells and overall layout are incorporated in the final design for this important civic space. In addition, the street furniture to be utilized in the courtyard shall be consistent in look and character to the street furniture described in this report."

b. Figures 2A and 2B are attached, being the Plan and Perspective Plaza plans.

48. For Block 10 apartment building, some of the 2009 Guidelines document items that as I see as relevant are:

a. “The provision of sidewalks, at least one per street, to facilitate and encourage pedestrian activity; the ability to accommodate a wide range of housing types which in turn will create the opportunity to satisfy all types of household requirements from young families to seniors; the ability to work and live in the same community; there will be employment space to buy /lease in the mixed use centre”

b. “2.12 Community Mailboxes: Community mailboxes shall be located where there are higher levels of activity such as adjacent to parks, walkways, commercial areas, and bus stops. The developer, in cooperation with Canada Post, shall explore the opportunity of providing mailbox pedestals in keeping with the look and character of the street furniture”

c. “3.1 Overall Architectural Expectation The architectural character of this new community is intended to result in the creation of interesting and vibrant streetscapes incorporating a variety of styles centred around a neo-traditional theme. To achieve this, all buildings will be expected to provide varied exterior designs and a wide variety of materials both in colour and texture.

- Overall building forms should include:
  - strong pronounced main roof forms (gable/hip etc), roof pitches not less than 6/12
  - a variety of heights
  - a main entrance door that is clearly identifiable and facing the street
- Roof design should include:
  - deeper soffit overhangs (shadow lines for solar protection) that could be supported by cornices/brackets
  - complimentary additional roof forms such as dormers, chimneys, roof vents (louvers) or cupolas
  - secondary roof forms created by offsetting exterior walls
- Exterior walls facing streets should include:
  - abundant use and variety of window sizes with transoms for interior ceiling
  - heights of 9 feet and over
  - combination of brick, stone, acrylic stucco, pre-finished wood siding ,cedar
  - shingles and, fibre cement board siding or panels
  - style of sidings which can be shingle, horizontal ,vertical (board and batten) and textured panels
  - strong accent colours for entrance and garage doors (they do not need to be the same)
  - complimentary use of colour for window frames with predominant material

        - include projections in the form of canopies, recessed entrances, signage (in the case of mixed use) to emphasis the ground floor at street level.
    - Upper levels should:
        - provide for offsetting of upper levels from ground level to reduce their scale
        - include a variation in fenestration (windows)size and placement to provide visual interest. Each level does not need to repeat the same window pattern and shape of window.
    - Rooflines should:
        - include roof forms which can be either sloped or flat assuming that all mechanical equipment, when required, will be concealed.
        - include strong accents in the use/detailing of materials to be used to "cap" the top of the building form.
        - consist of varying heights."

49. With respect to discussions on the future design and maintenance of this plaza, I would suggest that the following people be included. I would also suggest that we keep comments on the plaza from one point of contact rather and Campanale having multiple comments coming in. We have reached out to the groups below and are waiting for comments to come, so their comments have not been incorporated to date. Perhaps a meeting in the near future can resolve this, but I will leave that up to your team.

    - Jeanette Krabicka – Parks
    - Adrian Richardson,Travis Droeski, Shane McCarney – Public works (taking care of weeds, etc. in the plaza area)
    - Jake Gravelle or Paul Mantil – existing pathway is currently maintained by roads in the winter
    - Claire O'Donnell – LRT Transit Services (may provided comments on design consistency and other transit plaza designs)

Feel free to contact Simon Deiaco, Planner, CREO for follow-up questions at simon.deiaco@ottawa.ca.

OC Transpo

Pedestrian Access:

50. Prioritize transit customer access between Campanale and the Station to ensure this plaza accommodates Transitway Station and future LRT (Light Rail Transit) Station use.

51. Ensure simple, intuitive, and direct pedestrian access to the accessible paths that lead to the platform level of the station (these ramps provide an alternative means of vertical circulation when the elevators are out of service), as well as to the elevator lobbies on the station's concourse level.

52. Build integrated pedestrian access for all users, irrespective of their abilities, into the landscape design (ramps or graded pathways, rather than stairs)

53. The pedestrian path from Campanale to the Station entrance may need to be wider to accommodate Stage 3 LRT projected ridership. Modelling to be provided to Campanale once finalized.

54. Page 20 design shows what may be steps outside of the station entrance. Please confirm that this area will be as level as possible for accessibility and snow maintenance (no steps).

55. The existing condition contains a circular grassy area at the intersection of the pedestrian pathways. See snip below. This grassy area has an informal trail in the middle which is evidence of a straight pedestrian desire line. Consider formalizing this straight desire line in the final design.

- What material will be in the future circle – grass or hardscaping?

Amenities

56. Provide 6 inverted U bike racks and a bike shelter as close to the station entrance as possible, plus a placeholder for future bike parking (an additional 6 inverted U bike racks but no shelter footprint required). The future placeholder can be anywhere on the parcel.

57. Provide waste receptacles for users of the amphitheater.

58. Maintain existing lighting at a minimum.

59. **Accessibility**

60. The design must, at a minimum, conform to the following accessible design standards:

61. AODA Integrated Accessibility Standards Regulation (Design of Public Spaces Standards)

62. City of Ottawa Accessibility Design Standards -- particularly, section 6.1 on Assembly Areas

63. Amphitheatre space should be designed to:

64. Accommodate and integrate a wide variety of users into the design.

65. Provide viewing and/or seating spaces for persons using mobility devices, which are adjacent to an accessible exterior path of travel/egress route and located adjacent to other seating.

66. Ensure seating areas for persons with disabilities are dispersed throughout, on all levels.

Multi-Use Pathway

67. Page 1 does not show the existing Multi-Use Pathway (MUP) that extends south.

68. OC Transpo and Transportation Planning may wish to reconsider how the MUP connects through space. Discussion may be required.

69. Mitigation required where the MUPs (Multi Use Pathway) meet the pedestrian paths, such as “yield to pedestrian” signage and shark teeth for traffic calming.

70. Page 21 shows the MUP immediately adjacent to an amphitheater seat. There should be a buffer between the two uses to prevent collisions between users of the space.

Other

71. Collaborate with Fire Services on the placement of the existing fire hydrant. Balance this placement with the yet TBD winter maintenance plans to ensure clear access.

72. Depending on who is responsible for maintaining this parcel, it’s possible that only the main path will be winter maintained; the remainder of the space will likely not be cleared for winter use.

73. The group responsible for maintenance may require snow storage space. Size TBD by the responsible group.

74. The City’s Transportation Planning Environmental Assessments lead has been briefed by OC; however, their input will also be required to ensure alignment with the Stage 3 LRT EA/planning.

Policy Planning

The Policy Planning team would recommend the proponent consider including affordable residential units. Policy 4) in section 4.2.2 of the Official Plan states:

75. In accordance with the City's 10-Year Housing and Homelessness Plan, the City shall set a target that ***20 per cent of all new residential units be affordable***. Of all affordable units, 70 per cent are to be targeted to households whose needs fall within the definition of core affordability, and the remaining 30 per cent are to be targeted to households whose needs fall within the definition of market-affordability.

76. The proposal includes 80 units. Therefore it is recommended that they provide 16 affordable units (11 core-affordable + 5 market-affordable).

77. The Canadian Mortgage and Housing Corporation provides a number of funding opportunities and low-interest loans for private-sector developers who build affordable housing.

Community issues

n/a

Other

78. The High Performance Development Standard (HPDS) is a collection of voluntary and required standards that raise the performance of new building projects to achieve sustainable and resilient design. The HPDS was passed by Council on April 13, 2022.

    a. At this time, the HPDS is not in effect and Council has referred the 2023 HPDS Update Report back to staff with direction to bring forward an updated report to Committee with recommendations for revised phasing timelines, resource requirements and associated amendments to the Site Plan Control By-law by no later than Q1 2024.

    b. Please refer to the HPDS information attached and ottawa.ca/HPDS for more information.

Submission Requirements and Fees

1. The attached **Study and Plan Identification List** outlines the information and material that has been identified as either required (R) or advised (A) as part of a future complete application submission.

    a. The required plans and studies must meet the City's Terms of Reference (ToR) and/or Guidelines, as available on Ottawa.ca. These ToR and Guidelines outline the specific requirements that must be met for each plan or study to be deemed adequate.

2. All of the above comments or issues should be addressed to ensure the effectiveness of the application submission review.

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

Yours Truly,
Craig Hamilton

cc.

- Natasha Baird
- Christopher Moise
- Mark Elliot
- Jeanette Krabicka
- Jocelyn Cadieux
- Simon Deiaco
- Dhaneshwar Neermul
- Claire O'Donnell

A.3 Confirmation of Building Construction Type

WOODMAN ARCHITECT & ASSOCIATES LTD.
4 Beechwood Ave, Suite 201, Ottawa, ON, K1L 8L9
Tel. (613) 228-9850 Fax. (613) 228-9848
E-mail. mailbox@woodmanarchitect.com

May 31, 2024

Stantec Consulting Ltd.
1331 Clyde Avenue
Suite 300
Ottawa, ON K2C 3G4

RE: **Longfields Block 10**

Attention: **Michael Wu**

To Whom it May Concern:

The Construction Classification for the above referenced Project is:

Of non-combustible construction and the building is sprinklered. The floor assemblies have fire separations and are fire rated for no less than 2 hours. The load bearing walls, columns, and arches have a fire-resistance rating that is not less than that required for the support assembly.

FUS: **(Fire Resistive Construction)**
C=0.6 to 0.8

Other required rated wall assemblies will have a Fire Resistance less than 2 hours but not less than 1 hour.

Trusting that these responses to your inquiries are satisfactory.

Yours truly,

Woodman Architect & Associates Ltd.
Robert J. Woodman, OAA, OAQ, NSAA, MRAIC

ONTARIO ASSOCIATION OF ARCHITECTS
R. J. WOODMAN
LICENCE
2425

Appendix B Water Demands

B.1 Domestic Water Demands

Block 10 Longfields Station, Ottawa, ON - Domestic Water Demand Estimates

Site Plan provided by Fotenn Planning + Design (2024-07-04)

Project No. 160401885

City File No.: PC2023-0302

Population densities per Table 4.1 City of Ottawa Water Design Guidelines:		
1 Bedroom	1.4	ppu
2 Bedroom	2.1	ppu
3 Bedroom	3.1	ppu

Demand conversion factors per Table 4.2 of the City of Ottawa Water Design Guidelines and Technical Bulletin ISTB-2021-03:		
Residential	280	L/cap/day
Commercial	28000	L/ha/day

Unit Type	Commercial (m^2)	No. of Units	Population	Avg Day Demand		Max Day Demand [1 2]		Peak Hour Demand [1 2]	
				(L/min)	(L/s)	(L/min)	(L/s)	(L/min)	(L/s)
1 Bedroom		20	28	5.4	0.09	13.6	0.23	29.9	0.50
1 Bedroom + Den[3]		42	88	17.2	0.29	42.9	0.71	94.3	1.57
2 Bedroom		27	57	11.0	0.18	27.6	0.46	60.6	1.01
3 Bedroom		1	3	0.6	0.01	1.5	0.03	3.3	0.06
Residential Subtotal		90	176	34.2	0.57	85.6	1.43	188.2	3.14
Commercial	466			**0.9**	**0.02**	**1.4**	**0.02**	**2.4**	**0.04**
Total Site :	**466**	**90**	**176**	**35.1**	**0.59**	**86.9**	**1.45**	**190.7**	**3.18**

Notes:

1 The City of Ottawa water demand criteria used to estimate peak demand rates for residential areas are as follows:

maximum day demand rate = 2.5 x average day demand rate

peak hour demand rate = 2.2 x maximum day demand rate (as per Technical Bulletin ISD-2010-02)

2 Water demand criteria used to estimate peak demand rates for gross commercial area 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 (as per Technical Bulletin ISD-2010-02)

3 Assumption that "1 bedroom with den" has a density of 2.1 ppu

B.2 Fire Flow Demands (FUS 2020)

FUS Fire Flow Calculation Sheet - 2020 FUS Guidelines

Stantec Project #: 160401885
Project Name: Block 10 Longfields Subdivision
Date: 2024-05-23
Fire Flow Calculation #: 1
Description: 9-storey mixed-use medium-rise building

Notes: Site Plan provided by Fotenn Planning + Design (2024-05-07)

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 Eight Additional Floors					Vertical Openings Protected?					NO	-
		1066	1270	1055	1055	1055	1055	1055	1017	1017		5990.5	-
3	Determine Required Fire Flow	($F = 220 \times C \times A^{1/2}$). Round to nearest 1000 L/min										-	14000
4	Determine Occupancy Charge	Non-Combustible										-25%	10500
5	Determine Sprinkler Reduction	Conforms to NFPA 13										-30%	-5250
		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	3.1 to 10	30	2	41-60	Type V	NO				17%	1785
		East	20.1 to 30	10	2	0-20	Type V	NO				0%	
		South	> 30	30	2	41-60	Type V	NO				0%	
		West	> 30	10	2	0-20	Type V	NO				0%	
7	Determine Final Required Fire Flow	Total Required Fire Flow in L/min, Rounded to Nearest 1000L/min											7000
		Total Required Fire Flow in L/s											116.7
		Required Duration of Fire Flow (hrs)											2.00
		Required Volume of Fire Flow (m^3)											840

B.3 Boundary Conditions

Boundary Conditions
Longfields Block 10

Provided Information

Scenario	Demand	
	L/min	L/s
Average Daily Demand	36	0.60
Maximum Daily Demand	90	1.50
Peak Hour	192	3.20
Fire Flow Demand #1	7,000	116.67

Location

Results

Existing Condition (2W2C, Pre- SUC Pressure Zone Reconfiguration)

Connection 1 – Campanale Ave.

Demand Scenario	Head (m)	Pressure[1] (psi)
Maximum HGL	133.1	56.3
Peak Hour	125.0	44.9
Max Day plus Fire Flow #1	124.4	44.0

[1] Ground Elevation = 93.4 m

Future Condition (Post- SUC Pressure Zone Reconfiguration)

Connection 1 – Campanale Ave.

Demand Scenario	Head (m)	Pressure[1] (psi)
Maximum HGL	146.9	76.0
Peak Hour	144.5	72.6
Max Day plus Fire Flow #1	141.8	68.8

[1] Ground Elevation = 93.4 m

Notes

1. In accordance with Ottawa Water Design Guideline Technical Bulletin ISTB-2021-03 Section 4.3.1,

   Individual residential facilities with a basic day demand greater than 50 m3/day shall be connected with a minimum of two water services, separated by an isolation valve, to avoid the creation of a vulnerable service area.

Disclaimer

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

B.4 Fire Hydrant Coverage Calculations

Stantec	Project:	**Block 10 Longfields Subdivision**	160401885
	TABLE 1: FIRE HYDRANT COVERAGE TABLE		
	Revision: 01	Prepared By: MW	
	Revision Date: 2024-07-16	Checked By:	

Description	Hydrants[1]			Total Available Fire Flow (L/min)	Total Required Fire Flow[2] (L/min)
	HYD-01	**HYD-02**			
Block 10					
Distance from building (m)	31.0	79.1		-	-
Maximum fire flow capacity[3] (L/min)	5,678	3,785		**9,463**	7,000

NFPA 1 Table 18.5.4.3	
Distance to Building (m)	Maximum Capacity (L/min)
≤ 76	**5,678**
> 76 and ≤ 152	**3,785**
> 152 and ≤ 305	**2,839**

Notes:

1. Hydrant locations as per GeoOttawa accessed on July 12, 2024. Refer to Figure 3.1 in report
2. See FUS Calculations, Appendix B.2 for fire flow requirements.
3. See NFPA 1 Table 18.5.4.3 for maxiumim fire flow capacity of hydrants by distance to building.

Appendix C Wastewater Servicing

C.1 Sanitary Design Sheet

Stantec

SUBDIVISION:
Longfields Subdivision Block 10

DATE: 2024-05-24
REVISION: 1
DESIGNED BY: MW
CHECKED BY: AG

SANITARY SEWER DESIGN SHEET
(City of Ottawa)

FILE NUMBER: 160401885

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	INFILTRATION	0.33 l/s/Ha	HARMON CORRECTION FACTOR	0.8
PERSONS / 3 BEDROOM	3.1				

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	UNITS 1 BEDROOM	2 BEDROOM	3 BEDROOM	POP.	CUMULATIVE AREA	CUMULATIVE POP.	PEAK FACT.	PEAK FLOW	AREA	ACCU. AREA	AREA	ACCU. AREA	AREA	ACCU. AREA	AREA	ACCU. AREA	AREA	ACCU. AREA	PEAK FLOW	TOTAL AREA	ACCU. AREA	INFILT. FLOW	FLOW	LENGTH	DIA	MATERIAL	CLASS	SLOPE	CAP. (FULL)	CAP. V PEAK FLOW	VEL. (FULL)
			(ha)					(ha)			(l/s)	(ha)	(ha)	(ha)	(ha)	(ha)	(ha)	(ha)	(ha)	(ha)	(ha)	(l/s)	(ha)	(ha)	(l/s)	(l/s)	(m)	(mm)			(%)	(l/s)	(%)	(m/s)
R100A, C100A	BLDG	EXISTING	0.127	20	69	1	176	0.127	176	3.53	2.02	0.047	0.047	0.00	0.00	0.00	0.00	0.00	0.00	0.10	0.10	0.02	0.227	0.23	0.07	2.11	10.3	200	PVC	SDR 35	1.00	33.4	**6.32%**	1.05

Notes
1. Unit breakdown provided by Fotenn and dated July 12, 2024
2. Site to outlet to existing 200 mm dia. sanitary sewer on Campanale Avenue.
3. Entire site area considered as potential source of infiltration.
4. Assume "1 bedroom with den" has 2.1 ppu, "2 bedroom with den" has 3.1 ppu.

C.2 Sanitary Exercpts from the Longfields Subdivision Servicing Report (Stantec 2011)

Longfields Subdivision, Campanale Homes - City of Ottawa

SERVICING REPORT
Revision #1

Prepared by:
Stantec Consulting Ltd.
1505 Laperriere Avenue
Ottawa, ON K1Z 7T1

File: 160400850/83

Revision #1: May 4, 2011

Original submission : June 18, 2010

5.0 Sanitary Drainage

The Longfields subdivision will be serviced by a network of gravity sanitary sewers and will have three separate outlets to the sewer on Longfields Drive (tributary to the E.B.H.T.), as well as an existing outlet sewer that makes a direct connection to the E.B.H.T. which was constructed to service the nearby southwest transitway station. All connections are detailed on **Drawing SAN-1**.

The Longfields and Davidson Heights Serviceability Study submitted by Stantec on June 18, 2010 concluded that the East Barrhaven Trunk (E.B.H.T.) located in an easement passing through the proposed site roughly southwest to northeast, has sufficient capacity to service the proposed levels of development in the Longfields community. The trunk sewer has been designed to accommodate flows from a population of 25,000 (approx. 7,800 dwellings) and two external areas (the existing Barrhaven and Knollsbrook communities). The EBHT drains to the West Rideau Collector Sewer within Prince of Wales Drive.

As per the City of Ottawa's request, a detailed analysis of the capacity within the 375mm sewer in Longfields Drive has been performed for this submission. The results of this analysis indicate that sufficient capacity does exist within the sewer to accommodate the proposed development. The design analysis for the Longfields Community sanitary network considered the external tributary flows in the existing network. Existing drainage areas were divided into developed and undeveloped areas, for which measured or design flows were used to estimate sewer flows.

5.1 SANITARY SEWER

The 750 mm dia. East Barrhaven Trunk has already been installed, as well as a section of 200mm diameter sewer that connects to the southwest transitway station northwest of block 316. Due to cover constraints and site phasing, each local street connecting to Longfields Drive will be constructed with its own sanitary outlet as per **Drawing SAN-1**.

Design flows for the EBHT were developed in the *Longfields and Davidson Heights Serviceability Study* by means of a population estimate of 86 persons per gross hectare of undeveloped residential lands. The proposed site falls within drainage boundaries as presented in the 1998 study review and update.

The initial serviceability report submitted to the City of Ottawa on June 18, 2010 indicated that the total flow generated within the Longfields Subdivision was estimated to be approximately 35.56 L/s (an approximate population of 1,896), which included external flows (non-residential) through the site from a pump station servicing the southwest transitway station building. Using an overall site area of 11.83ha, population was estimated at 1,017 using the serviceability study's design criteria. As such, an additional flow contribution corresponding to 879 persons plus proposed commercial areas within mixed development areas (approximately 14.71L/s) was anticipated at the EBHT.

At the City's request the sanitary sewer analysis has been revised to include all tributary flows to the EBHT in order to confirm available capacity within the 375mm sewer in Longfields Drive. Tributary areas were delineated and divided into developed and undeveloped areas (see attached sketch of developed and undeveloped areas). A design flow rate of 350L/c/d was used for all undeveloped lands and 300L/c/d for developed lands as per measured flow rates specified in section 4.10 of the City of Ottawa Sewer Design Guidelines (November 2004). Sanitary drainage areas for the external flows were determined based on the 1998 *Longfields and Davidson Heights Serviceability Study* as well as the 2007 *Servicing Report for Longfields Development* prepared by David McManus Engineering Ltd. Any modifications to these areas were made based on the drainage areas of the proposed development (see **Appendix G** for sketch of modified areas)

As evidenced by the sanitary sewer design sheets, the additional flows are well within downstream capacity of the trunk sewer (Proposed site outlets between nodes 15 and 310). Furthermore, sanitary sewer design sheets indicate that sufficient capacity does exist within the sewer in Longfields Drive to accommodate the proposed Longfields Community development. Sanitary sewer design sheets for the proposed site, as well as those from the Longfields and Davidson Heights study are included as **Appendix G**.

Stantec

SUBDIVISION:

Longfields Subdivision

DATE: 8-Apr-2011
REVISION: 22-Nov-2013
DESIGNED BY: MJS
CHECKED BY: TJW

SANITARY SEWER DESIGN SHEET

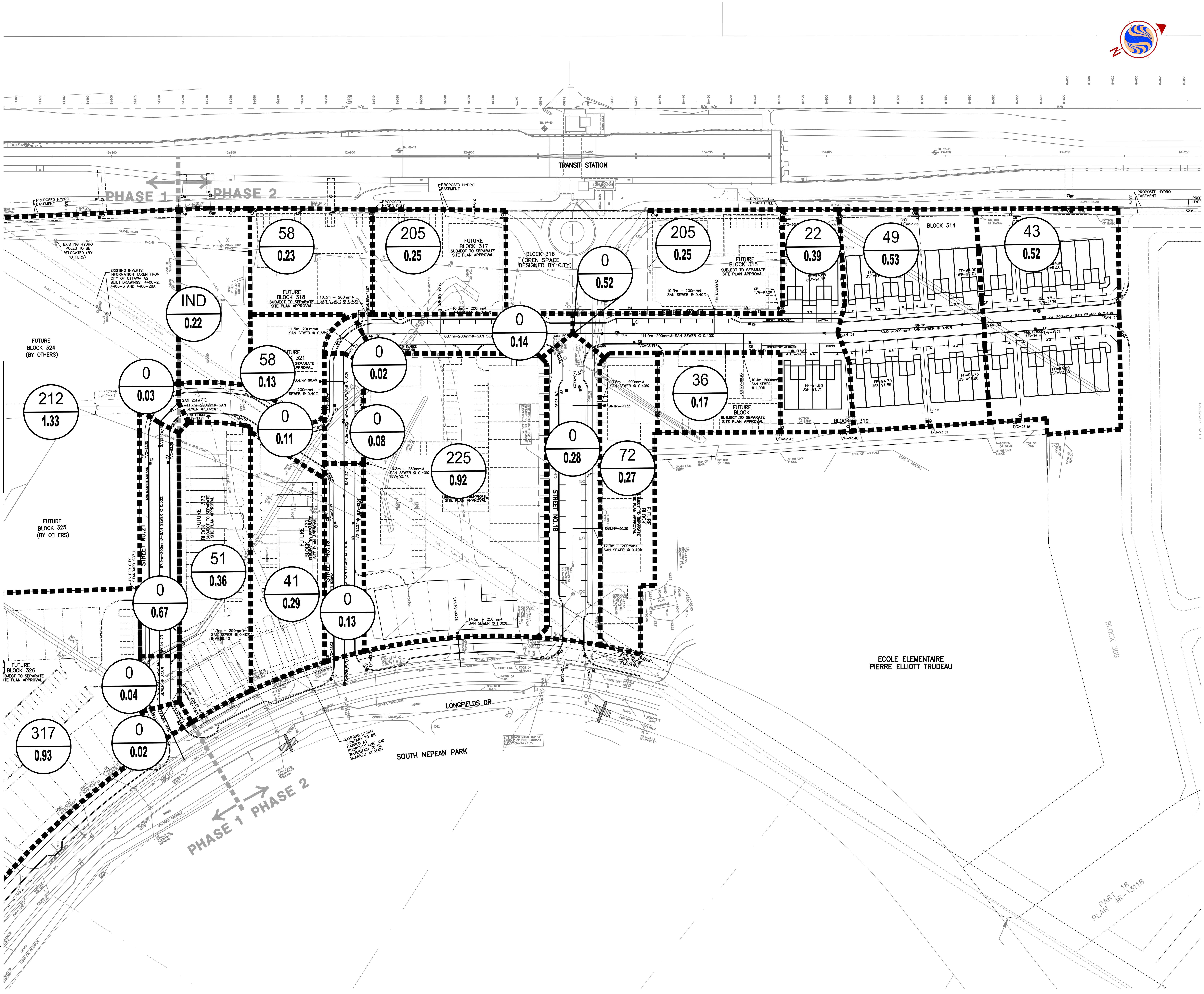
(City of Ottawa)

FILE NUMBER: 160400850

DESIGN PARAMETERS

AVG. DAILY FLOW / PERSON =	350	l/p/day	COMMERCIAL	0.60	l/s/Ha
MINIMUM VELOCITY =	0.60	m/s	INDUSTRIAL	0.40	l/s/Ha
n =	0.013		INSTITUTIONAL	0.60	l/s/Ha
MAX PEAK FACTOR =	4.0		INFILTRATION	0.28	l/s/Ha
MIN PEAK FACTOR =	2.0		RESIDENTIAL HARMON PEAKING FACTOR		
Peaking Factor Industrial:	2.4		PERSONS/ Ssingle UNIT =	3.4	
Peaking Factor Comm. / Inst.:	1.5		PERSONS/ med density unit =	3.1	
			PERSONS/ back to back unit =	2.7	

LOCATION			RESIDENTIAL AREA AND POPULATION									COMM		INDUST		INSTIT		C+I+I	INFILTRATION				PIPE					
STREET	FROM M.H.	TO M.H.	AREA (ha)	single units	med density units	back to back units	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)	PEAK FLOW (l/s)	TOTAL AREA (ha)	ACCU. AREA (ha)	INFILT. FLOW (l/s)	**TOTAL FLOW (l/s)**	DIST (m)	DIA (mm)	SLOPE (%)	CAP. (FULL) (l/s)	VEL. (FULL) (m/s)	VEL. (ACT.) (m/s)
Private	Stub	15	0.93	0	0	0	317	0.93	317	4.00	5.14		0.00		0.00		0.00	0.00	0.93	0.93	0.260	**5.40**	1.0	200	0.60	25.92	0.81	0.62
Via Verona Ave	15	4	0.04	0	0	0	0	3.82	762	3.87	0.00		0.00		0.22		0.00	0.00	0.04	4.04	0.011	**13.71**	22.9	200	0.44	22.08	0.69	0.73
Via Verona Ave	4	3	0.10	0	0	0	0	7.56	1018	3.80	0.00		0.00		0.22		0.00	0.00	0.10	7.78	0.028	**18.94**	47.4	200	0.40	21.12	0.66	0.75
Via Verona Ave	3	2	0.03	0	0	0	0	7.59	1018	3.80	0.00		0.00		0.22		0.00	0.00	0.03	7.81	0.008	**18.95**	13.4	200	0.45	22.40	0.70	0.79
Via Verona Ave	2	1	0.12	0	0	0	0	7.71	1018	3.80	0.00		0.00		0.22		0.00	0.00	0.12	7.93	0.034	**18.98**	63.7	200	1.00	33.60	1.05	1.08
Longfields Drive	1	EX N15b	0.06	0	0	0	0	74.70	5622	3.20	0.00		0.00		0.22		0.00	0.00	0.06	74.92	0.017	**83.91**	20.3	375	0.25	91.20	0.80	0.92
Longfields Drive	EX N15b	EX N15c	0.17	0	0	0	0	74.87	5622	3.20	0.00		0.00		0.22		0.00	0.00	0.17	75.09	0.048	**83.96**	56.8	375	0.25	91.20	0.80	0.92
Longfields Drive	EX N15c	EX N15d	0.16	0	0	0	0	75.03	5622	3.20	0.00		0.00		0.22		0.00	0.00	0.16	75.25	0.045	**84.01**	52.8	375	0.25	91.20	0.80	0.92
Via Chianti Grove	25	24	0.10	0	0	0	0	0.10	0				0.00		0.00		0.00	0.00	0.10	0.10	0.028	**0.03**	11.7	200	0.65	26.88	0.84	0.00
Via Chianti Grove	24	23	0.16	0	0	0	0	0.26	0				0.00		0.00		0.00	0.00	0.16	0.26	0.045	**0.08**	97.9	200	0.50	23.68	0.74	0.00
Private	Stub	23	0.65	0	0	34	92	0.65	92	4.00	1.49		0.00		0.00		0.00	0.00	0.65	0.65	0.182	**1.67**	11.7	200	0.60	25.92	0.81	0.42
Via Chianti Grove	23	22	0.04	0	0	0	0	0.95	92	4.00	0.00		0.00		0.00		0.00	0.00	0.04	0.95	0.011	**1.76**	21.3	250	0.50	44.37	0.87	0.35
Via Chianti Grove	22	EX N15d	0.02	0	0	0	0	0.97	92	4.00	0.00		0.00		0.00		0.00	0.00	0.02	0.97	0.006	**1.77**	4.5	250	1.55	78.03	1.53	0.61
Longfields Drive	EX N15d	EX N17	0.19	0	0	0	0	76.19	5714	3.19	0.00		0.00		0.22		0.00	0.00	0.19	76.41	0.053	**85.83**	61.3	375	0.25	91.20	0.80	0.92
Longfields Drive	EX N17	26	0.04	0	0	0	0	76.23	5714	3.19	0.00		0.00		0.22		0.00	0.00	0.04	76.45	0.011	**85.84**	13.9	375	0.30	100.32	0.88	0.99
Via Campanale Ave	30	28	0.02	0	0	0	0	0.02	0				0.00		0.00		0.00	0.00	0.02	0.02	0.006	**0.01**	11.5	200	0.65	26.88	0.84	0.00
Via Campanale Ave	28	27	0.28	0	0	0	58	0.30	58	4.00	0.94		0.00		0.00		0.00	0.00	0.28	0.30	0.078	**1.03**	80.0	200	0.84	30.72	0.96	0.38
Private	Stub	27	0.52	0	0	0	168	0.52	168	4.00	2.72	0.15	0.15		0.00		0.00	0.14	0.67	0.67	0.188	**3.05**	10.3	200	0.60	25.92	0.81	0.50
Via Campanale Ave	27	26	0.08	0	0	0	0	0.90	226	4.00	0.00		0.15		0.00		0.00	0.00	0.08	1.05	0.022	**4.10**	58.7	250	1.60	79.56	1.56	0.73
Longfields Drive	26	EX N17a	0.07	0	0	0	0	77.20	5940	3.18	0.00		0.15		0.22		0.00	0.00	0.07	77.57	0.020	**89.96**	22.1	375	0.30	100.32	0.88	1.00
Longfields Drive	EX N17a	EX N19	0.36	0	0	21	57	77.56	5997	3.17	0.73	0.05	0.20		0.22		0.00	0.05	0.41	77.98	0.115	**90.86**	61.5	375	0.30	100.32	0.88	1.01
Longfields Drive	EX N19	EX N310	0.06	0	0	0	0	77.62	5997	3.17	0.00		0.20		0.22		0.00	0.00	0.06	78.04	0.017	**90.88**	23.0	375	0.30	100.32	0.88	1.01
Private	Stub	30	0.23	0	0	0	58	0.23	58	4.00	0.94		0.00		0.00		0.00	0.00	0.23	0.23	0.064	**1.00**	10.3	200	0.40	21.12	0.66	0.31
Via Campanale Ave	30	29	0.36	0	66	0	205	0.59	263	4.00	3.32	0.05	0.05		0.00		0.00	0.05	0.41	0.64	0.115	**4.49**	88.1	200	0.65	26.88	0.84	0.60
Via Campanale Ave	32	31	0.52	0	0	18	49	0.52	49	4.00	0.79		0.00		0.00		0.00	0.00	0.52	0.52	0.146	**0.94**	60.0	200	0.40	21.12	0.66	0.31
Via Campanale Ave	31	29	0.73	0	78	8	263	1.25	312	4.00	4.26	0.08	0.08		0.00		0.00	0.07	0.81	1.33	0.227	**5.50**	111.0	200	0.40	21.12	0.66	0.54



ORIGINAL SHEET – ISO A1

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Legend

PROPOSED SANITARY SEWER

10 POPULATION

0.09 SANITARY DRAINAGE AREA (ha)

LIMIT OF SANITARY DRAINAGE AREA

Notes

0 ISSUED TO CITY FOR REVIEW	DT	TW	10.06.18
Revision	By	Appd.	YY.MM.DD

File Name: 160400850c–SAN	NI	PM	TJW	10.05.17
	Dwn.	Chkd.	Dsgn.	YY.MM.DD

Permit-Seal

Client/Project

CAMPANALE HOMES

LONGFIELDS SUBDIVISION

Ottawa ON Canada

Title

SANITARY DRAINAGE PLAN

Project No. 160400850

Scale 1:750 0 7.5 22.5 37.5m

Drawing No. SAN-2

Sheet 29 of 29

Revision 0

Appendix D Stormwater Servicing

D.1 Modified Rational Method Sheet

Stormwater Management Calculations

File No: **160401885**
Project: **Longfields Block 10**
Date: **14-Jan-25**

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 - Non-Tributary	UNC-1	Hard	0.003		0.9	0.003		
		Soft	0.003		0.2	0.001		
		Subtotal		0.01			0.003	0.570
Uncontrolled - Tributary	RAMP-1	Hard	0.041		0.9	0.037		
		Soft	0.000		0.2	0.000		
		Subtotal		0.04			0.037	0.900
Uncontrolled - Tributary	CISTRN-3	Hard	0.000		0.9	0.000		
		Soft	0.007		0.2	0.001		
		Subtotal		0.01			0.001	0.200
Uncontrolled - Tributary	CISTRN-2	Hard	0.000		0.9	0.000		
		Soft	0.012		0.2	0.002		
		Subtotal		0.01			0.002	0.200
Uncontrolled - Tributary	CISTRN-1	Hard	0.024		0.9	0.021		
		Soft	0.000		0.2	0.000		
		Subtotal		0.02			0.021	0.900
Uncontrolled - Tributary	ROOF-1	Hard	0.139		0.9	0.125		
		Soft	0.000		0.2	0.000		
		Subtotal		0.14			0.125	0.900
Total				**0.229**			**0.190**	
Overall Runoff Coefficient= C:								**0.83**

Total Roof Areas	**0.000 ha**
Total Tributary Surface Areas (Controlled and Uncontrolled)	**0.222 ha**
Total Tributary Area to Outlet	**0.222 ha**
Total Uncontrolled Areas (Non-Tributary)	**0.006 ha**
Total Site	**0.229 ha**

Stormwater Management Calculations

Project #160401885, Longfields Block 10
Modified Rational Method Calculations 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	104.2
20	70.3
30	53.9
40	44.2
50	37.7
60	32.9
70	29.4
80	26.6
90	24.3
100	22.4
110	20.8
120	19.5

5 YEAR Predevelopment Target Release from Portion of Site

Subdrainage Area: Predevelopment Tributary Area to Outlet
Area (ha): 0.23
C: 0.20

Target Discharge for Block 10 from Longfields Subdivision

Qtarget (L/s)
12.5

5 YEAR Modified Rational Method for Entire Site

Subdrainage Area: CISTERN — Cistern
Area (ha): 0.22
C: 0.84

tc (min)	I (5 yr) (mm/hr)	Qactual (L/s)	Qrelease (L/s)	Qstored (L/s)	Vstored (m^3)
10	104.2	54.2	10.4	43.8	26.3
20	70.3	36.5	10.4	26.2	31.4
30	53.9	28.0	10.4	17.7	**31.8**
40	44.2	23.0	10.4	12.6	30.3
50	37.7	19.6	10.4	9.2	27.7
60	32.9	17.1	10.4	6.8	24.4
70	29.4	15.3	10.4	4.9	20.6
80	26.6	13.8	10.4	3.5	16.6
90	24.3	12.6	10.4	2.3	12.3
100	22.4	11.6	10.4	1.3	7.8
110	20.8	10.8	10.4	0.5	3.1
120	19.5	10.1	10.4	0.0	0.0

Storage: Cistern

	Stage	Head (m)	Discharge (L/s)	Vreq (cu. m)	Vavail (cu. m)	Volume Check
5-year Water Level	-	-	10.4	31.8	90.0	OK

Subdrainage Area: UNC-1 — Uncontrolled - Non-Tributary
Area (ha): 0.01
C: 0.57

tc (min)	I (5 yr) (mm/hr)	Qactual (L/s)	Qrelease (L/s)	Qstored (L/s)	Vstored (m^3)
10	104.2	1.0	1.0		
20	70.3	0.7	0.7		
30	53.9	0.5	0.5		
40	44.2	0.4	0.4		
50	37.7	0.4	0.4		
60	32.9	0.3	0.3		
70	29.4	0.3	0.3		
80	26.6	0.3	0.3		
90	24.3	0.2	0.2		
100	22.4	0.2	0.2		
110	20.8	0.2	0.2		
120	19.5	0.2	0.2		

Subdrainage Area: RAMP-1 — Uncontrolled - Tributary
Area (ha): 0.04
C: 0.90

tc (min)	I (5 yr) (mm/hr)	Qactual (L/s)	Qrelease (L/s)	Qstored (L/s)	Vstored (m^3)
10	104.2	10.6	10.6		
20	70.3	7.1	7.1		
30	53.9	5.5	5.5		
40	44.2	4.5	4.5		
50	37.7	3.8	3.8		
60	32.9	3.3	3.3		
70	29.4	3.0	3.0		
80	26.6	2.7	2.7		
90	24.3	2.5	2.5		
100	22.4	2.3	2.3		
110	20.8	2.1	2.1		
120	19.5	2.0	2.0		

Subdrainage Area: CISTRN-3 — Uncontrolled - Tributary
Area (ha): 0.01
C: 0.20

tc (min)	I (5 yr) (mm/hr)	Qactual (L/s)	Qrelease (L/s)	Qstored (L/s)	Vstored (m^3)
10	104.2	0.4	0.4		
20	70.3	0.3	0.3		
30	53.9	0.2	0.2		
40	44.2	0.2	0.2		
50	37.7	0.1	0.1		
60	32.9	0.1	0.1		
70	29.4	0.1	0.1		

Project #160401885, Longfields Block 10
Modified Rational Method Calculations 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	178.6
20	120.0
30	91.9
40	75.1
50	64.0
60	55.9
70	49.8
80	45.0
90	41.1
100	37.9
110	35.2
120	32.9

100 YEAR Predevelopment Target Release from Portion of Site

Subdrainage Area: Predevelopment Tributary Area to Outlet
Area (ha): 0.23
C: 0.20

100 YEAR Modified Rational Method for Entire Site

Subdrainage Area: CISTERN — Cistern
Area (ha): 0.22
C: 1.00

tc (min)	I (100 yr) (mm/hr)	Qactual (L/s)	Qrelease (L/s)	Qstored (L/s)	Vstored (m^3)
10	178.6	103.4	10.4	93.0	55.8
20	120.0	69.5	10.4	59.1	70.9
30	91.9	53.2	10.4	42.8	77.1
40	75.1	43.5	10.4	33.2	79.6
50	64.0	37.0	10.4	26.7	**80.0**
60	55.9	32.4	10.4	22.0	79.2
70	49.8	28.8	10.4	18.5	77.6
80	45.0	26.0	10.4	15.7	75.3
90	41.1	23.8	10.4	13.5	72.6
100	37.9	21.9	10.4	11.6	69.6
110	35.2	20.4	10.4	10.0	66.2
120	32.9	19.0	10.4	8.7	62.6

Storage: Cistern

	Stage	Head (m)	Discharge (L/s)	Vreq (cu. m)	Vavail (cu. m)	Volume Check
100-year Water Level	-	-	10.4	80.0	90.0	OK
					10.0	

Subdrainage Area: UNC-1 — Uncontrolled - Non-Tributary
Area (ha): 0.01
C: 0.71

tc (min)	I (100 yr) (mm/hr)	Qactual (L/s)	Qrelease (L/s)	Qstored (L/s)	Vstored (m^3)
10	178.6	2.1	2.1		
20	120.0	1.4	1.4		
30	91.9	1.1	1.1		
40	75.1	0.9	0.9		
50	64.0	0.8	0.8		
60	55.9	0.7	0.7		
70	49.8	0.6	0.6		
80	45.0	0.5	0.5		
90	41.1	0.5	0.5		
100	37.9	0.5	0.5		
110	35.2	0.4	0.4		
120	32.9	0.4	0.4		

Subdrainage Area: RAMP-1 — Uncontrolled - Tributary
Area (ha): 0.04
C: 1.00

tc (min)	I (100 yr) (mm/hr)	Qactual (L/s)	Qrelease (L/s)	Qstored (L/s)	Vstored (m^3)
10	178.6	20.2	20.2		
20	120.0	13.5	13.5		
30	91.9	10.4	10.4		
40	75.1	8.5	8.5		
50	64.0	7.2	7.2		
60	55.9	6.3	6.3		
70	49.8	5.6	5.6		
80	45.0	5.1	5.1		
90	41.1	4.6	4.6		
100	37.9	4.3	4.3		
110	35.2	4.0	4.0		
120	32.9	3.7	3.7		

Subdrainage Area: CISTRN-3 — Uncontrolled - Tributary
Area (ha): 0.01
C: 0.25

tc (min)	I (100 yr) (mm/hr)	Qactual (L/s)	Qrelease (L/s)	Qstored (L/s)	Vstored (m^3)
10	178.6	0.8	0.8		
20	120.0	0.6	0.6		
30	91.9	0.4	0.4		
40	75.1	0.3	0.3		
50	64.0	0.3	0.3		
60	55.9	0.3	0.3		
70	49.8	0.2	0.2		

Stormwater Management Calculations

Project #160401885, Longfields Block 10
Modified Rational Method Calculations for Storage

80	26.6	0.1	0.1
90	24.3	0.1	0.1
100	22.4	0.1	0.1
110	20.8	0.1	0.1
120	19.5	0.1	0.1

Subdrainage Area: CISTRN-2 — Uncontrolled - Tributary
Area (ha): 0.01
C: 0.20

tc (min)	I (5 yr) (mm/hr)	Qactual (L/s)	Qrelease (L/s)	Qstored (L/s)	Vstored (m^3)
10	104.2	0.7	0.7		
20	70.3	0.5	0.5		
30	53.9	0.4	0.4		
40	44.2	0.3	0.3		
50	37.7	0.3	0.3		
60	32.9	0.2	0.2		
70	29.4	0.2	0.2		
80	26.6	0.2	0.2		
90	24.3	0.2	0.2		
100	22.4	0.2	0.2		
110	20.8	0.1	0.1		
120	19.5	0.1	0.1		

Subdrainage Area: CISTRN-1 — 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	104.2	6.2	6.2		
20	70.3	4.2	4.2		
30	53.9	3.2	3.2		
40	44.2	2.6	2.6		
50	37.7	2.2	2.2		
60	32.9	2.0	2.0		
70	29.4	1.7	1.7		
80	26.6	1.6	1.6		
90	24.3	1.4	1.4		
100	22.4	1.3	1.3		
110	20.8	1.2	1.2		
120	19.5	1.2	1.2		

Subdrainage Area: ROOF-1 — Uncontrolled - Tributary
Area (ha): 0.14
C: 0.90

tc (min)	I (5 yr) (mm/hr)	Qactual (L/s)	Qrelease (L/s)	Qstored (L/s)	Vstored (m^3)
10	104.2	36.3	36.3		
20	70.3	24.5	24.5		
30	53.9	18.8	18.8		
40	44.2	15.4	15.4		
50	37.7	13.1	13.1		
60	32.9	11.5	11.5		
70	29.4	10.2	10.2		
80	26.6	9.3	9.3		
90	24.3	8.5	8.5		
100	22.4	7.8	7.8		
110	20.8	7.3	7.3		
120	19.5	6.8	6.8		

SUMMARY TO OUTLET

			Vrequired	Vavailable*	
Tributary Area	0.22	ha			
Total 5yr Flow to Sewer	10.4	L/s	31.8	90.0 m^3	Ok
Non-Tributary Area	0.01	ha			
Total 5yr Flow Uncontrolled	1.0	L/s			
Total Area	0.23	ha			
Total 5yr Flow	11.4	L/s			
Target	12.5	L/s			

Project #160401885, Longfields Block 10
Modified Rational Method Calculations for Storage

80	45.0	0.2	0.2
90	41.1	0.2	0.2
100	37.9	0.2	0.2
110	35.2	0.2	0.2
120	32.9	0.2	0.2

Subdrainage Area: CISTRN-2 — Uncontrolled - Tributary
Area (ha): 0.01
C: 0.25

tc (min)	I (100 yr) (mm/hr)	Qactual (L/s)	Qrelease (L/s)	Qstored (L/s)	Vstored (m^3)
10	178.6	1.5	1.5		
20	120.0	1.0	1.0		
30	91.9	0.8	0.8		
40	75.1	0.6	0.6		
50	64.0	0.5	0.5		
60	55.9	0.5	0.5		
70	49.8	0.4	0.4		
80	45.0	0.4	0.4		
90	41.1	0.4	0.4		
100	37.9	0.3	0.3		
110	35.2	0.3	0.3		
120	32.9	0.3	0.3		

Subdrainage Area: CISTRN-1 — 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	178.6	11.7	11.7		
20	120.0	7.9	7.9		
30	91.9	6.0	6.0		
40	75.1	4.9	4.9		
50	64.0	4.2	4.2		
60	55.9	3.7	3.7		
70	49.8	3.3	3.3		
80	45.0	3.0	3.0		
90	41.1	2.7	2.7		
100	37.9	2.5	2.5		
110	35.2	2.3	2.3		
120	32.9	2.2	2.2		

Subdrainage Area: ROOF-1 — Uncontrolled - Tributary
Area (ha): 0.14
C: 1.00

tc (min)	I (100 yr) (mm/hr)	Qactual (L/s)	Qrelease (L/s)	Qstored (L/s)	Vstored (m^3)
10	178.6	69.1	69.1		
20	120.0	46.4	46.4		
30	91.9	35.6	35.6		
40	75.1	29.1	29.1		
50	64.0	24.8	24.8		
60	55.9	21.6	21.6		
70	49.8	19.3	19.3		
80	45.0	17.4	17.4		
90	41.1	15.9	15.9		
100	37.9	14.7	14.7		
110	35.2	13.6	13.6		
120	32.9	12.7	12.7		

SUMMARY TO OUTLET

			Vrequired	Vavailable*	
Tributary Area	0.22	ha			
Total 100yr Flow to Sewer	10.4	L/s	80.0	90.0 m^3	Ok
Non-Tributary Area	0.01	ha			
Total 100yr Flow Uncontrolled	2.1	L/s			
Total Area	0.23	ha			
Total 100yr Flow	12.5	L/s			
Target	12.5	L/s			

D.2 Storm Sewer Design Sheet

Stantec

Block 10 Longfields Subdivision

DATE: 2024-07-16
REVISION: 1
DESIGNED BY: MW
CHECKED BY: -

FILE NUMBER: **160401885**

STORM SEWER DESIGN SHEET
(City of Ottawa)

DESIGN PARAMETERS

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

	1:2 yr	1:5 yr	1:10 yr	1:100 yr
a =	732.951	998.071	1174.184	1735.688
b =	6.199	6.053	6.014	6.014
c =	0.810	0.814	0.816	0.820

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

LOCATION			DRAINAGE AREA																						PIPE SELECTION									
AREA ID NUMBER	FROM M.H.	TO M.H.	AREA (2-YEAR) (ha)	AREA (5-YEAR) (ha)	AREA (10-YEAR) (ha)	AREA (100-YEAR) (ha)	AREA (ROOF) (ha)	C (2-YEAR) (-)	C (5-YEAR) (-)	C (10-YEAR) (-)	C (100-YEAR) (-)	A x C (2-YEAR) (ha)	ACCUM AxC (2YR) (ha)	A x C (5-YEAR) (ha)	ACCUM. AxC (5YR) (ha)	A x C (10-YEAR) (ha)	ACCUM. AxC (10YR) (ha)	A x C (100-YEAR) (ha)	ACCUM. AxC (100YR) (ha)	T of C (min)	$I_{2\text{-YEAR}}$ (mm/h)	$I_{5\text{-YEAR}}$ (mm/h)	$I_{10\text{-YEAR}}$ (mm/h)	$I_{100\text{-YEAR}}$ (mm/h)	$Q_{CONTROL}$ (L/s)	ACCUM. $Q_{CONTROL}$ (L/s)	Q_{ACT} (CIA/360) (L/s)	LENGTH (m)	PIPE WIDTH OR DIAMETE (mm)	PIPE HEIGHT (mm)	PIPE SHAPE (-)	MATERIAL (-)	CLASS (-)	SLOPE %	Q_{CAP} (FULL) (L/s)	% FULL (-)	VEL. (FULL) (m/s)
ROOF-1, RAMP-1, CISTRN-1	BLDG	EXISTING	0.00	0.20	0.00	0.00	0.00	0.00	0.90	0.00	0.00	0.000	0.000	0.183	0.183	0.000	0.000	0.000	0.000	10.00	76.81	104.19	122.14	178.56	10.4	10.4	63.2	292.8	900	900	CIRCULAR	CONCRETE	-	0.15	731.4	**8.64%**	1.11

D.3 Excerpts from the Longfields Subdivision SWM Report (Stantec, 2011)

Campanale Homes – Longfields Development, City of Ottawa Stormwater Management Report

Stantec Consulting Ltd.
1505 Laperriere Avenue
Ottawa, ON K1Z 7T1
t: (613)-722-4420
f: (613)-722-2799

February 4, 2011

160400850/83

utilized where possible to further limit the inflow to the system. Rear yard catchbasins will have inlet controls placed at the downstream-most structure before entering the storm sewer.

Solid covers will be installed on all manholes located in ponding areas to limit inflows to the minor system to that of the ICD. In consultation with the City of Ottawa, rear yard storage as recommended by the LDH reports will be acceptable for this subdivision. Rear yard storage will be maximized where possible to no more than 0.30 m depth, and road sags will have no more than 0.25 m ponding depth.

Drawings SD-1 to SD-2 outline the proposed storm sewer alignment, orifice locations, ponding areas, and drainage divides and labels. The major flow from most of the site generated from larger events will be safely conveyed by engineered (overland) channels such as roadways and walkways safely to SWM Park 958 (also known as the soccer field in South Nepean Park). A portion of the major flow from two uncontrolled grassed rear yard areas (UNC1 and UNC2) will be directed to the future road located along the north edge of the subject site. The minor system from the proposed subdivision will outlet at four locations to the existing Longfields Drive stormwater sewer (see **Drawings OSD-1, SD-1, SD-2** for locations).

4.3 FUTURE BLOCKS

There are 14 parcels of land within the proposed development that will be developed under separate site plan applications and have been termed “Future Development Blocks”. A land use / zoning plan has been prepared by Nicholas Caragianis Architect Inc. showing what type of development is expected for each future block and can be found in the “Figures” section of this report, located just after the body of this text and before the appendices.

Assumed design criteria were developed for the future development blocks and are listed below in **Table 4.1**. The development blocks are also displayed **Figure: Blocks** located in the “Figures” section of the report, showing which criteria apply to each block.

Table 4.1: Future Block Development SWM Criteria

Model Catchment ID	Description	Area (ha)	Inflow Rate per ha	Allowable Inflow (L/s)	Storage Rate per ha	Required Storage (cu.m)	Minimum USF (based on HGL + 0.30 m)
'115'	Future Block 326	0.924	53	48.9	110	101.6	91.27
'116a'	Future Block 327	0.834		44.2		91.8	91.49
'125a'	Future Block 324	1.333		85.3		133.3	90.95
'123'	Future Blocks 322 & 323	0.642		34.0	25	16.1	90.49
'125b'	Hydro Ottawa Block	0.221		11.7	110	24.3	90.95
'127a'	Future Block 320	0.919		48.7		101.1	90.65
'128a'	Future Block 321	0.126		6.7		13.9	91.24
'129a'	Block 316*	0.262		16.0		As Req'd	90.50
'129c'	Future Block 319	0.126		6.7		13.8	90.65
'130a'	Future Block 318	0.228		12.1		25.1	91.24
'130c'	Future Block 317	0.245		13.0		27.0	91.24

Model Catchment ID	Description	Area (ha)	Inflow Rate per ha	Allowable Inflow (L/s)	Storage Rate per ha	Required Storage (cu.m)	Minimum USF (based on HGL + 0.30 m)
'131a'	Future Block 315	0.235		12.5		25.9	90.77
'131b'	Future Block 319	0.172		9.1		18.9	90.77
'134b'	Future Block 319	0.146		7.7		16.0	90.62

* Block 316 is the proposed Transitway Plaza which is adjacent to the existing Transitway Pedestrian underpass. The catchment does not have an overland flow route, therefore the detailed design of this parcel will need to provide whatever storage is required in order to ensure that HGLs on-site do not rise above the existing tunnel elevation (which houses among other things, the electrical room) of 90.5 m during the critical design event.

It is noted that blocks with allowable flows less than 18 L/s may have difficulty meeting the target rate. In these cases, an allowable rate of 18 L/s may be used, if modeling can show that none of the downstream USFs are encroached on within 0.30m vertically by the raised HGL; it has been calculated that if these "low-flow" blocks discharge at 18 L/s, the overall development will still be within its allowable flow target to the minor system.

Until the Future Blocks are developed, temporary catchbasins will be installed to pick up surface drainage. IPEX type 'A' ICDs or equivalent are to be installed in the temporary. Fourteen blocks multiplied by 22 L/s/ICD = 308 L/s total inflow from the undeveloped blocks under interim conditions. This is less than the total allowable inflow rate calculated in **Table 4.1** above, of 357 L/s, therefore the temporary measures will not exceed the allowable inflows into the storm sewer.

Two future blocks will be required to provide overland flow conveyance capacity to two off-site areas. Catchment 116a (Future Block 327) will be required to convey overland flow from catchment 113b; catchment 113a (Future Block 315) will need to convey overland flow from catchment 132d.

4.4 HYDROLOGY

A comprehensive hydrologic modeling exercise was completed with DDSWMM, accounting for the estimated major and minor systems to evaluate the storm sewer infrastructure. Surface storage estimates were based on the final grading plan design (see **Drawings GP-1 to GP-3**). The following assumptions were applied to the detailed model:

- Hydrologic parameters as per Ottawa Sewer Design Guidelines, including Horton infiltration, Manning's 'n', and depression storage values
- 3-hour Chicago Storm distribution for 5 Year Analysis, July 1, 1979 City of Ottawa Historical Storm used to assess impact of major storm
- Runoff Coefficient calculated based on actual soft and hard surfaces on each phase, converted to equivalent percent imperviousness using the relationship C = (Imp. x 0.7) + 0.2
- Subcatchment areas and segment lengths defined from high-point to high-point where sags occur

Appendix C: Storm Sewer Design Sheet

Stantec

LONGFIELDS SUBDIVISION

SUBDIVISION SERVICING

DATE: 3-Feb-11
REVISION: Rev 3
DESIGNED BY: npc
CHECKED BY:

STORM SEWER DESIGN SHEET

(City of Ottawa)

FILE NUMBER: 1604-00850

DESIGN PARAMETERS

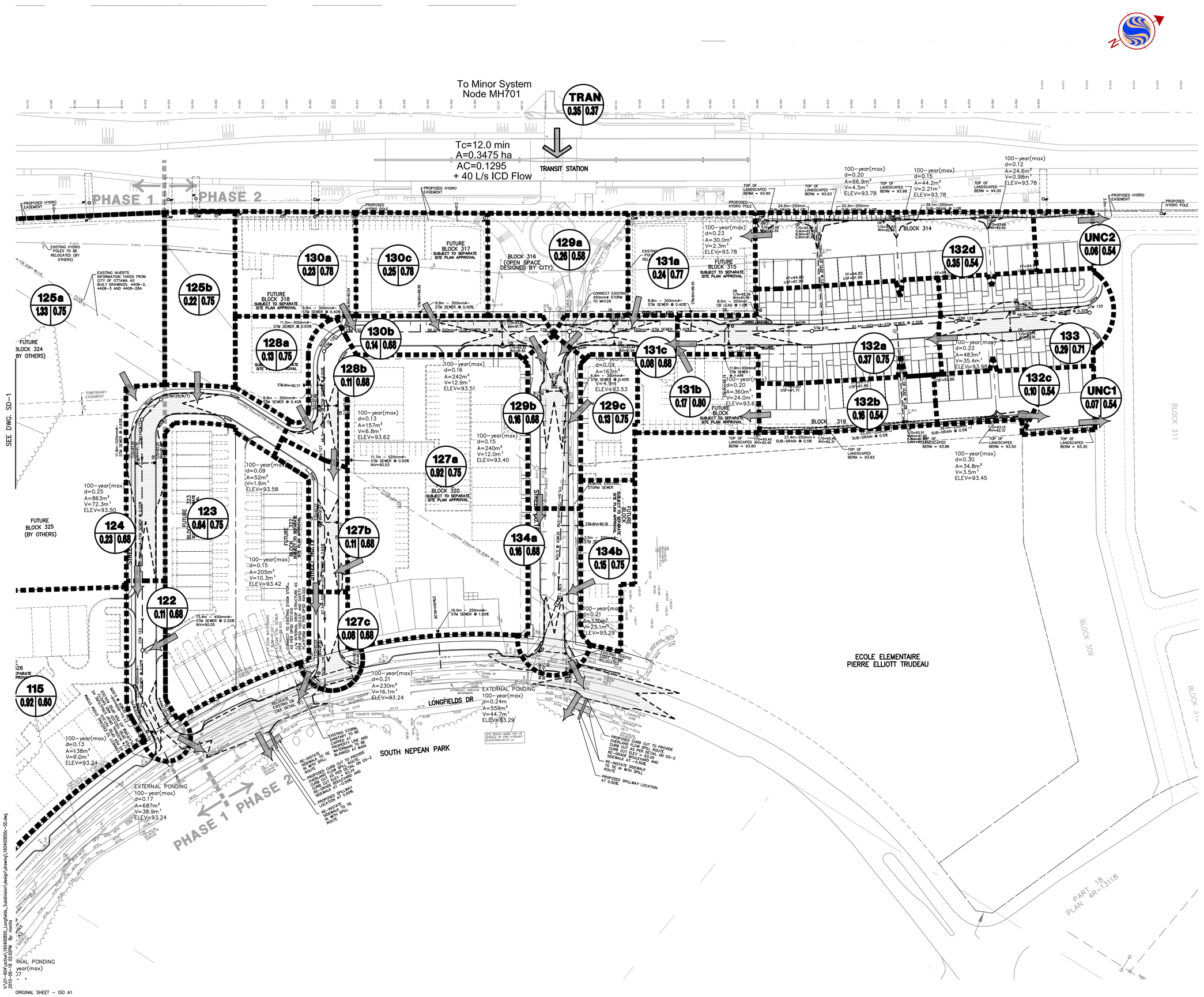
$I = a / (t+b)^c$ (As per City of Ottawa Guidelines, 2004)

	1:5 yr	1:10 yr
a =	998.07	1174.184
b =	6.053	6.014
c =	0.814	0.816

MANNING'S n = 0.013
MINIMUM COVER: 2.00 m
MIN T_C 15 min

LOCATION			DRAINAGE AREA								PIPE SELECTION							
					5-year													
AREA ID / STREET	FROM M.H.	TO M.H.	AREA	C	ACCUM. AREA	A x C	ACCUM. AxC	T of C	$I_{5\text{-YEAR}}$	$Q_{5\text{-YEAR}}$ (CIA/360)	LENGTH	PIPE SIZE	SLOPE	Q_{CAP} (FULL)	Q_{ACT}/Q_{CAP}	VEL. (FULL)	VEL. (ACT)	TIME OF FLOW
			(ha)	(-)	(ha)	(ha)	(ha)	(min)	(mm/h)	(L/s)	(m)	(mm)	%	(L/s)	(-)	(m/s)	(m/s)	(min)
125a+b STREET 21	N125	N124	1.55	0.80	1.545	1.228	1.228	15.00	83.54	285.0	11.8	525	0.65	361.7	0.79	1.62	1.80	0.12
124 STREET 21	N124	N123	0.22	0.68	1.760	0.145	1.373	15.13	83.15	317.2	97.9	525	0.50	318.5	1.00	1.43	1.65	1.14
								16.27										
123 BLOCK 323 / 322	STUB	N123	0.64	0.80	0.642	0.514	0.514	15.00	83.56	119.2	33.4	450	0.25	148.7	0.80	0.91	1.01	0.61
								15.61										
STREET 21	N123	N122	0.00	0.00	2.402		1.887	16.27	79.66	417.6	23.2	600	0.50	453.0	0.92	1.55	1.78	0.25
122 STREET 21	N122	N121	0.11	0.68	2.509	0.073	1.960	16.52	78.95	429.8	27.7	600	0.50	453.0	0.95	1.55	1.79	0.30
								16.82										
STREET 19	N130	N128	0.00	0.00	0.000	0.000	0.000	0.00	230.48	0.0	11.5	300	0.65	81.3	0.00	1.11	1.11	0.17
								0.00										
128a BLOCK 321	STUB	N128	0.13	0.80	0.126	0.101	0.101	10.00	104.19	29.2	23.5	300	0.40	64.1	0.46	0.88	0.85	0.45
								10.45										
128b STREET 19	N128	N127	0.11	0.68	0.232	0.072	0.173	10.45	101.90	48.9	80.0	300	0.65	81.3	0.60	1.11	1.17	1.20
								11.64										
127a BLOCK 320	STUB	N127	0.92	0.80	0.919	0.735	0.735	15.00	83.56	170.6	24.1	525	0.50	317.3	0.54	1.42	1.43	0.28
								15.28										
127b+c STREET 19	N127	N126	0.18	0.68	1.334	0.125	1.033	15.28	82.65	237.1	63.6	525	0.65	361.7	0.66	1.62	1.73	0.65
								15.94										
133 STREET 17	N133	N132	0.29	0.69	0.287	0.198	0.198	10.00	104.19	57.3	56.9	375	0.35	108.2	0.53	0.95	0.96	1.00
132b,c,d STREET 17	N132	N131	0.60	0.54	0.890	0.326	0.524	11.00	99.20	144.3	61.4	525	0.35	267.0	0.54	1.19	1.22	0.86
								11.86										
131a BLOCK 315	STUB	N131	0.24	0.80	0.235	0.188	0.188	15.00	83.56	43.6	19.8	300	0.40	64.1	0.68	0.88	0.95	0.38
								15.38										
131b BLOCK 319A	STUB	N131	0.17	0.80	0.172	0.137	0.137	15.00	83.56	31.9	11.9	300	0.40	63.8	0.50	0.87	0.87	0.23
								15.23										
131c,d STREET 17	N131	N129	0.45	0.69	1.747	0.310	1.159	15.38	82.36	265.1	102.9	525	1.90	618.5	0.43	2.77	2.63	0.62
								16.00										
130c BLOCK 317	STUB	N130	0.25	0.80	0.245	0.196	0.196	15.00	83.56	45.5	8.8	300	0.40	63.8	0.71	0.87	0.95	0.17
								15.17										
130a BLOCK 318	STUB	N130	0.23	0.80	0.228	0.182	0.182	15.00	83.56	42.3	8.8	300	0.40	63.8	0.66	0.87	0.94	0.17
								15.17										
130b STREET 17	N130	N129	0.14	0.68	0.613	0.095	0.474	15.17	83.02	109.2	96.2	300	2.12	146.7	0.74	2.01	2.22	0.80
								15.97										
129a, TRAN STREET 18	EX	N129	0.61	0.46	0.612	0.282	0.282	12.00	94.70	114.1	39.4	450	0.20	133.0	0.86	0.81	0.92	0.81
								12.81										
129c BLOCK 319B	STUB	N129	0.13	0.80	0.126	0.100	0.100	15.00	83.56	23.3	6.9	300	0.40	63.8	0.37	0.87	0.80	0.13
								15.13										
134b BLOCK 319C	STUB	N129	0.15	0.80	0.146	0.117	0.117	15.00	83.56	27.1	17.8	300	0.40	63.8	0.42	0.87	0.83	0.34
								15.34										
134a, 129b STREET 18	N129	EX. STM 134	0.32	0.68	3.563	0.217	2.348	16.00	80.47	565.0	115.3	900	0.11	626.4	0.90	0.95	1.09	2.01
								18.01										
		CHECK	14.79		14.788	10.006	10.006											

Apndx C p.4



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Legend

- A / 0.00 | 0.90 — DRAINAGE AREA NO. / RUNOFF COEFFICIENT / STORM DRAINAGE AREA (ha)
- DRAINAGE DIVIDE
- PROPOSED STORM SEWER
- PROPOSED CATCH BASIN
- TYPICAL SERVICE LATERAL LOCATION
- EXISTING STORM SEWER
- EXISTING CATCH BASIN
- DIRECTION OF OVERLAND FLOW
- 75mm CIRCULAR ORIFICE TO BE INSTALLED IN STREET AND REAR YARD CATCHBASINS WHERE NOTED. (SEE DWG. DS-2)
- EXTERNAL FLOWS INTO MINOR SYSTEM

Notes

1. ALL PAIRED CATCHBASINS TO BE INTERCONNECTED AND TO HAVE A SINGLE SEWER CONNECTION UNLESS OTHERWISE NOTED.
2. FINAL SERVICE LATERALS SIZES TO APARTMENT BUILDINGS TO BE CONFIRMED BY MECHANICAL CONSULTANT

Revision	By	Appd.	YY.MM.DD
File Name: 160400850-SD	NI	PM	TJW	10.05.17
	Dwn.	Chkd.	Dsgn.	YY.MM.DD

Permit-Seal

Client/Project

CAMPANALE HOMES

LONGFIELDS SUBDIVISION

Ottawa ON Canada

Title

STORM DRAINAGE PLAN

Project No.	Scale	
160400850C	1:750	0 7.5 22.5 37.5m
Drawing No.	Sheet	Revision
SD-2	26 of 29	0

Appendix E External Reports

PATERSON GROUP

Geotechnical Investigation

Proposed Apartment Building – Block 10

609 Longfields Drive, Ottawa, Ontario

Prepared for Campanale Homes

Report PG2119-4 dated June 12, 2024

5.0 Discussion

5.1 Geotechnical Assessment

From a geotechnical perspective, the subject site is considered suitable for the proposed building. With two (2) levels of underground parking, the founding elevation will be approximately 7 m below the ground surface. The proposed apartment building will be founded on conventional spread footings placed on an undisturbed glacial till layer and/or a clean, surface sounded bedrock bearing surface. However, if design building loads are too high, consideration could be given to founding the proposed building on a raft foundation.

Due to the presence of crystallized calcite within the bedrock, specifically below the proposed founding elevation. It is expected that the crystals were formed due to precipitation and surface water infiltrating pre-existing cracks within the limestone which forms crystals in the presence of minerals. The presence of calcite may weaken the bedrock where the calcite is present. Therefore, extra precautions should be made prior to the placement of the footings as well as a review of the vertical excavation faces should be done during excavation to assess the need for bedrock stabilization measures.

Bedrock removal is expected to be required to complete the excavation of the proposed basement levels for the building. Line drilling and controlled blasting where large quantities of bedrock need to be removed is recommended. All contractors should be prepared for bedrock and oversized boulder removal. The blasting operations should be planned and completed under the guidance of a professional engineer with experience in blasting operations.

Due to the presence of a silty clay layer, the proposed grading throughout the subject site will be subjected to a permissible grade restriction. Our permissible grade raise recommendations are discussed in Subsection 5.3.

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

Footings placed on a clean, surface sounded sandstone and dolomite bedrock surface can be designed using a factored bearing resistance value at ultimate limit states (ULS) of **1,500 kPa**, incorporating a geotechnical resistance factor of 0.5. A reduced bearing resistance value of **1000 kPa** is recommended for areas where the bedrock is found to contain traces of crystallized calcite of weak bedrock surface. Footings bearing on an acceptable bedrock bearing surface and designed using the bearing resistance values provided herein will be subjected to negligible potential post-construction total and differential settlements.

Footings placed on concrete in-filled, zero entry, vertical tranches extended to the bedrock surface can be designed to a similar bearing resistance values as the bedrock surface. It should be noted that the vertical trenches should extend horizontally a minimum of 150 mm beyond the footing faces in all directions. A minimum of 25 MPa concrete (28-day strength) should be used below the proposed footings.

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.

Permissible Grade Raise Recommendations

Based on the undrained shear strength values of the silty clay deposit encountered throughout the subject site and our experience with the local silty clay deposit, **a permissible grade raise restriction of 2.0 m** is recommended in the immediate area of settlement sensitive structures. A post-development groundwater lowering of 0.5 m was considered in our permissible grade raise restriction calculations.

If higher than permissible grade raises are required, preloading with or without a surcharge, lightweight fill and/or other measures should be investigated to reduce the risks of unacceptable long-term post construction total and differential settlements.

Settlement

Footings bearing on an undisturbed soil or an acceptable weathered bedrock bearing surface and designed for the bearing resistance values provided herein will be subjected to potential post- construction total and differential settlements of 25 and 20 mm, respectively.

5.7 Pavement Structure

Pavement Structure Over Overburden

The following pavement structures may be considered for rigid pavement, car only parking, and heavy traffic areas. The proposed pavement structures are shown in Tables 2, 3, and 4.

Table 2 - Recommended Rigid Pavement Structure - Lower Level

Thickness (mm)	Material Description
125	**Rigid Concrete Pavement -** 32 MPa concrete with air entrainment
300	**BASE** - OPSS Granular A Crushed Stone
SUBGRADE - Either fill, OPSS Granular B Type II material placed over in situ soil, fill or rock	

Table 3 - Recommended Pavement Structure - Car-Only Parking Areas and Fire-Truck Routes

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 in situ soil, fill or OPSS Granular B Type I or II material placed over in situ soil.	

Table 4 - Recommended Pavement Structure - Heavy-Truck Traffic and Loading Areas

Thickness (mm)	Material Description
40	**Wear Course** - HL-3 or Superpave 12.5 Asphaltic Concrete
50	**Binder Course** - HL-8 or Superpave 19.0 Asphaltic Concrete
150	**BASE** - OPSS Granular A Crushed Stone
450	**SUBBASE** - OPSS Granular B Type II
SUBGRADE - Either in situ soil, fill or OPSS Granular B Type I or II material placed over in situ soil.	

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 and replaced with OPSS Granular B Type II material.

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.

Pavement Structure Over Podium Deck Area and Raft Foundations

It is anticipated that the podium deck structure may be provided for landscaping or to accommodate car only parking areas, access lanes, fire truck lanes, and loading areas. Based on the concrete slab subgrade for this area and/or over basements located over a raft slab, the pavement structure indicated in the following tables may be considered for design purposes:

Table 5 - Recommended Pavement Structure - Car-Only Parking Areas (Podium Deck and Raft Slab)

Thickness (mm)	Material Description
50	**Wear Course** - HL-3 or Superpave 12.5 Asphaltic Concrete
200**	**Base** - OPSS Granular A Crushed Stone
See Below*	**Thermal Break*** - Rigid insulation (See Paragraph Below)
n/a	**Waterproofing Membrane and Protection Board**

SUBGRADE – Reinforced Concrete Podium Deck or Raft Slab
*If specified by others, not required from a geotechnical perspective. Also not required in basements over a raft slab.
**Thickness is dependent on grade of insulation as noted in paragraphs below.

Table 6 - Recommended Pavement Structure – Access Lane, Fire Truck Lane, Ramp and Heavy Truck Parking Areas (Podium Deck and Raft Slab)	
Thickness (mm)	**Material Description**
40	**Wear Course** - HL-3 or Superpave 12.5 Asphaltic Concrete
50	**Wear Course** - HL-8 or Superpave 19.0 Asphaltic Concrete
300**	**Base** - OPSS Granular A Crushed Stone
See Below*	**Thermal Break*** - Rigid insulation (See Paragraph Below)
n/a	**Waterproofing Membrane and Protection Board**
SUBGRADE – Reinforced Concrete Podium Deck or Raft Slab * If specified by others, not required from a geotechnical perspective. Also not required in basements over a raft slab. **Thickness is dependent on grade of insulation as noted in paragraphs below.	

The transition between the pavement structure over the podium deck subgrade and soil subgrade beyond the footprint of the podium deck is recommended to be transitioned to match the pavement structures provided in the following section. For this transition, a 5H:1V frost taper is recommended between the two subgrade surfaces. Further, the base layer thickness should be increased to a minimum thickness of 600 mm below the top of the podium slab a minimum of 1.5 m horizontally from the face of the foundation wall prior to providing the recommended taper.

Should the proposed podium deck be specified by others to be provided a thermal break by the use of a layer of rigid insulation below the pavement structure, its placement within the pavement structure is recommended to be as per the above-noted tables. The layer of rigid insulation is recommended to consist of a DOW Chemical High-Load 100 (HI-100), High-Load 60 (HI-60), or High Load (HI-40) extruded polystyrene. The pavement structures' base layer thickness in Table 5 and Table 6 may be reduced by 25 mm if HI-100 is considered for this project. It should be noted that Styrofoam rigid insulation is not considered suitable for this application.

Pavement Structure Drainage

Satisfactory performance of the pavement structure is largely dependent on 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.

7.0 Recommendations

It is recommended that the following be carried out by Paterson once preliminary and future details of the proposed development have been prepared:

- ❑ Review preliminary and detailed grading, servicing, landscaping, and structural plan(s) from a geotechnical perspective.
- ❑ Review of the geotechnical aspects of the excavation contractor's shoring design, if not designed by Paterson, prior to construction, if applicable.
- ❑ Review of architectural plans pertaining to groundwater suppression systems, underfloor drainage systems, and waterproofing details for elevator shafts.

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

- ❑ Review and inspection of the installation of the foundation drainage systems.
- ❑ Observation of all bearing surfaces prior to the placement of concrete.
- ❑ Observation of driving and re-striking of all pile foundations.
- ❑ 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.
- ❑ Observation of all subgrades prior to backfilling and follow-up field density tests to determine the level of compaction achieved.
- ❑ Field density tests to determine the level of compaction achieved.
- ❑ Sampling and testing of the bituminous concrete including mix design reviews.

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.

All excess soil must be handled as per ***Ontario Regulation 406/19: On-Site and Excess Soil Management.***

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 Campanale Homes 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.

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