1867 Alta Vista

Assessment of Adequacy of Public Services

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Assessment of Adequacy of Public Services

1. INTRODUCTION AND SITE DESCRIPTION

Parsons has been retained by TCU Devcorp to conduct an Assessment on the Adequacy of Public Services in support of the Site Plan Control (SPC) application. This application pertains to the proposed development of one (1) residential building, along with associated surface and underground parking facilities, located at 1867 Alta Vista Drive.

The subject property consists of a single lot, legally described as part of Lot 15, Concession Junction Gore, in the Township of Gloucester. The property is currently designated as IP (Business Park and Industrial Zone), Subzone 12 (Hospital Lands). The proposed OPA and ZBA applications seek to rezone the property to R5B (Residential Fifth Density Zone).

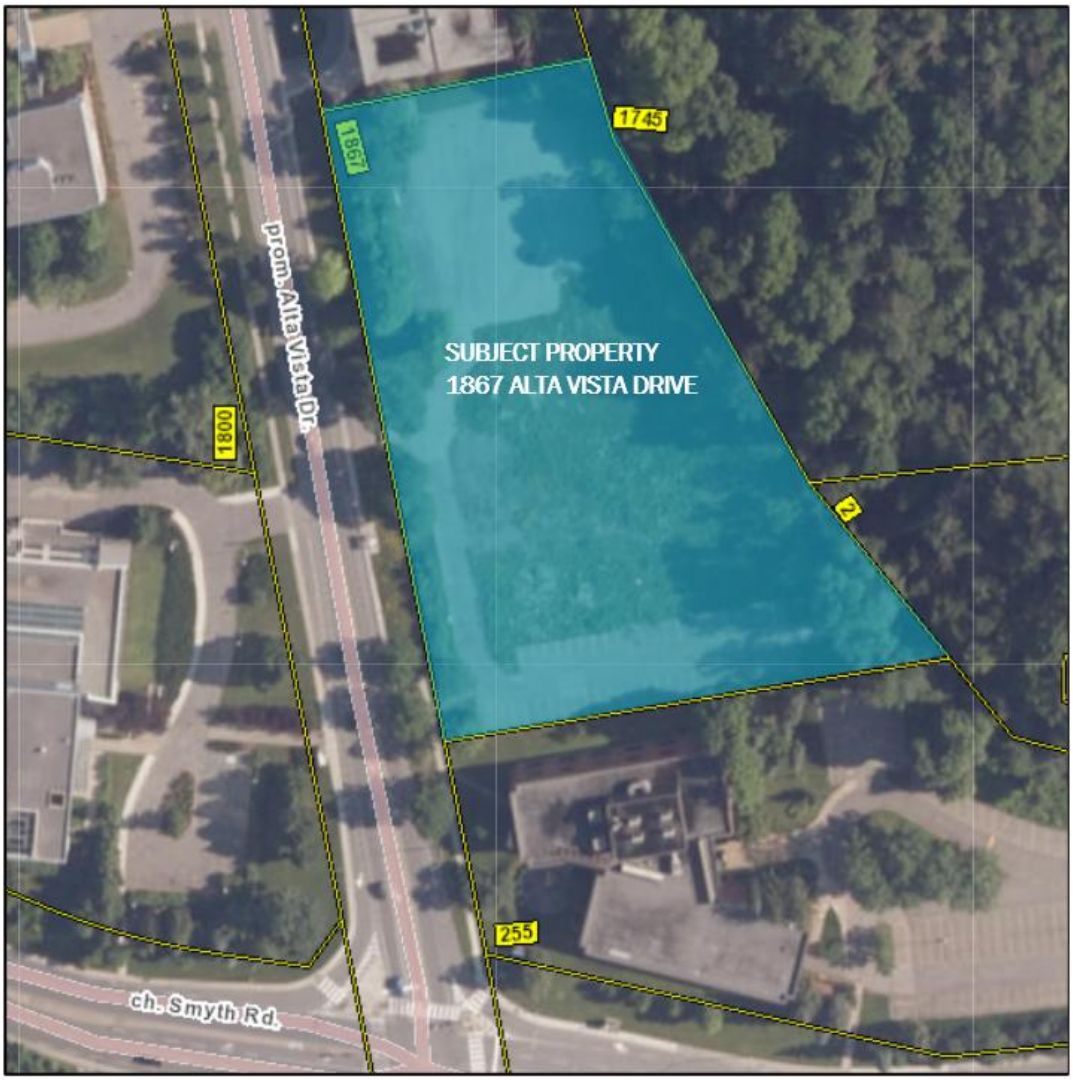


Figure 1: Aerial View of Proposed Development

The property has a frontage of approximately 145 meters along Alta Vista Drive. It is bordered by industrial properties and buildings to the south and north, and by a creek to the east. The total site area is approximately 1.21 hectares.

According to the Site Plan and Floor Plans prepared by RLA Architecture, the proposed development will consist of one residential building with two levels of underground parking. The site will have two vehicular accesses via Alta Vista Drive. The building is proposed to be 9 stories tall. There will be a total of 379 residential units, with a unit mix of studio, 1-bedroom, 1-bedroom+den, 2-bedroom, 2-bedroom+den, and 3-bedroom apartments. For further details, refer to the Site Plan and architectural Floor Plans provided in **Appendix F**.

2. EXISTING SITE AND DRAINAGE DESCRIPTION

2.1.1. EXISTING DRAINAGE

The existing site covers an area of approximately 1.21 hectares. Approximately from the late 1960s to 2016 there were three existing buildings located on this site, one standalone building and two that were connected by a podium. These were later demolished around the year 2016 making this site a brownfield site. Currently the site consists of grassed areas, two paved parking lots, and a single access road connecting to Alta Vista Drive. Mature trees line both the western and eastern boundaries of the property, providing a natural buffer. The northern and southern boundaries are adjacent to existing buildings, while a creek is located along the eastern edge of the site.

Surface drainage across the site generally flows northeast, ultimately discharging toward the creek to the east. However, localized variations in topography influence the drainage patterns, as follows:

- Portions of the site near the western boundary direct flow uncontrolled westward toward Alta Vista Drive.
- A small area along the northern boundary drains northeast toward an adjacent property. However, these overland flows remain close to the property line and eventually also discharge into the creek.

A steep embankment runs along the eastern edge of the site, transitioning from the upper site elevations down to the creek. This embankment varies in width from approximately 2 to 15 meters, with slopes ranging between 10% and 30%. The highest elevation on the site is approximately 74.80 meters, located near the southwest corner, while the lowest elevation (at bottom of embankment) is approximately 69.96 meters, located at the northeast corner. This results in a total elevation change of approximately 4.84 meters across the site. The elevation difference from the upper site down to the top of the embankment is approximately 2.63 meters. Outside of the embankment, site slopes are generally mild, ranging between 1% and 4%.

Refer to **Appendix G** for the topographical survey.

2.1.2. EXISTING SERVIES

The following municipal infrastructure is located within the Alta Vista Drive right-of-way, adjacent to the subject site:

- A 305 mm PVC watermain runs within Alta Vista Drive, with a water service stub provided near the southwest corner of the site.
- A 250 mm concrete sanitary sewer is located within Alta Vista Drive, approximately 60 meters north of the site.
- A 200 mm sanitary force main is also present within Alta Vista Drive, with a stub connection located adjacent to the southwest corner of the property.
- There are no storm sewers within Alta Vista Drive. However, a creek located to the east of the site has been identified by the City of Ottawa as the designated stormwater outlet for the property.

2.1.3. GEOTECHNICAL STUDY

A geotechnical investigation conducted by Paterson Group (Report PG7401-1 Revision 1, dated April 22, 2025) was reviewed to inform the municipal servicing design. Subsurface conditions encountered across the site generally consist of a layer of fill material overlaying native glacial till and bedrock. The fill is composed primarily of brown silty sand with varying amounts of clay, gravel, and construction debris, and was observed to extend to depths between approximately 0.9 and 5.0 meters below the existing ground surface. Beneath the fill, a very dense layer of glacial till was identified, made up of silty sand to sandy silt with inclusions of gravel, cobbles, and occasional boulders.

Groundwater was observed within the range of approximately 1.5 to 2.5 meters below the ground surface. Based on the soil conditions and groundwater observations, infiltration into shallow excavations is expected to be manageable using conventional open sump pumping methods. However, it is noted that groundwater levels are subject to seasonal variation and may differ at the time of construction.

For the underground parking structure, a subsurface drainage system is recommended using perforated 100 mm pipes in clear stone, spaced roughly six meters apart and connected to the building's sump pit(s). A perimeter drainage system should also be included and linked to the underslab network to effectively manage water infiltration.

The geotechnical report recommends standard trench bedding and backfill practices, including 150 mm of OPSS Granular A bedding beneath water and sewer pipes, compacted to 99% SPMDD and Granular A cover extending from the spring line to at least 300 mm above the pipe. Native silty sand and glacial till may be reused above the pipe cover zone where conditions are dry. In areas beneath hard surfaces, native soil should be used within the frost zone to minimize differential frost heave.

For more information refer to the Geotechnical Report in **Appendix G**.

3. SCOPE OF WORK

The scope of work, as per applicable guidelines, includes stormwater management, water services, and sanitary services. For stormwater management, the work involves calculating allowable and post-development release rates, as well as demonstrating how target quantity objectives will be met and conducting a water balance assessment. For water services, the scope includes estimating average and peak water supply demands, determining fire flow requirements using the Fire Underwriters Survey (FUS) method, confirming the adequacy of water supply and pressure during peak and fire flow conditions, and describing the proposed water distribution network and its connection to the existing system. For sanitary services, the work involves describing the existing sanitary sewers available for wastewater discharge, calculating peak flow rates, detailing the proposed sanitary sewer system, and reviewing the impact of increased sanitary flow on downstream infrastructure.

4. REGULATORY APPROVALS

An MECP Environmental Compliance Approval (ECA) for Municipal/Private Sewage Works will likely be required for the proposed sanitary sewer extension. The project will also need to be registered with the Environmental Activity and Sector Registry (EASR) to permit dewatering activities during sewer installation and for the stormwater management components of the design.

Any project that alters a property in proximity to a waterbody, wetland, steep slope, or floodplain within the Rideau Valley watershed requires a permit under Ontario Regulation 41/24 – Prohibited Activities, Exemptions and Permits, made under Section 28 of the Conservation Authorities Act. The Rideau Valley Conservation Authority (RVCA) is mandated to administer and enforce this regulation through permitting and inspections.

Consultation with, and approvals from, Public Services and Procurement Canada (PSPC) may also be required to relocate the storm outlet pipe or to repair the existing outlet, as the works are located on federal land. Federal approvals such as the FLUDTA may also be required for this development depending on the type of storm sewer connection to the creek.

5. WATER SUPPLY AND FIRE PROTECTION

5.1.1. EXISTING WATER SERVICES

The subject site will be serviced by the existing water infrastructure within the City of Ottawa's 1E water distribution network pressure zone, as identified in Appendix A of the Infrastructure Master Plan (September 2024). A 305 mm watermain is currently located within Alta Vista Drive, providing water supply to the surrounding area.

In addition, there are three existing public fire hydrants located near the site, all situated along the east side of Alta Vista Drive. These hydrants form part of the existing water infrastructure supporting fire protection for the area. For detailed fire hydrant locations, refer to **Appendix C**.

5.1.2. PROPOSED SERVICING DESIGN

The interior layout and architectural floor plans for the proposed building were reviewed to determine the total number of residential units and their breakdown. The building will include a total of **379 residential units**, consisting of 112 studio units, 93 one-bedroom units, 39 one-bedroom plus den units, 88 two-bedroom units, 21 two-bedroom plus den units and 26 three-bedroom units.

Based on the City of Ottawa Design Guidelines for population projections, this unit mix translates to an estimated residential population of approximately **699.4 persons**.

According to the *Ottawa Design Guidelines – Water Distribution (May 2026),* the average daily water consumption rate for subdivisions with populations ranging from 501 to 3,000 persons is 280 L/capita/day.

The table below summarizes the proposed development's population projections, as calculated using *Table 4.1 ("Per Unit Populations") from the Ottawa Design Guidelines – Water Distribution (May 2026.*

Table 1: Residential Populations

Domestic Demands – Building 1 (North)			
Apartment Type	**Persons per unit**	**Number of units**	**Population**
Studio	1.4	112	156.8
1 Bedroom	1.4	93	130.2
1 Bedroom + Den	2.1	39	81.9
2 Bedroom	2.1	88	184.8
2 Bedroom +Den	3.1	21	65.1
3 Bedroom	3.1	26	80.6
	Total	**379**	**699.4**

Based on the architectural floor plans provided, the total amenity area is approximately 0.266 hectares. The water consumption rate for these spaces, as outlined in Table 4.2 of the *Ottawa Design Guidelines – Water Distribution (May 2026),* is assumed to be 28,000 liters per hectare per day (L/ha/day). This rate is used to estimate water demand for infrastructure planning and to ensure the adequacy of the existing water distribution system to support the proposed development.

To determine the water supply required to service the development, the following formula was used:

$$Q = q * P * M$$

Where, q = the average consumption (L/cap/day), P=design population (cap), and M=Peak Factor.

As outlined in Table 4.2, "Consumption Rates for Subdivisions of 501 to 3,000 Persons," in the *Ottawa Design Guidelines – Water Distribution (May 2026),* the specified factors are applicable to sites with populations within this range. Since the proposed development is projected to have an approximate population of 699.4, the parameters of Table 4.2 are applicable. The following factors were used for the assessment:

Maximum Day Demand:

- Residential: 2.5 x average day (L/c/d)
- Commercial: 1.5 x average day (L/gross ha/d)

Maximum Hour Demand:

- Residential: 2.2 x max day (L/c/d)
- Commercial: 1.8 x max day (L/gross ha/d)

Based on the above parameters the combined demands for the site are the following:
Average Day Demand: 2.4L/s
Maximum Day Demand: 5.8L/s
Maximum Hour Demand: 12.7L/s

In accordance with the *Ottawa Design Guidelines – Water Distribution (May 2026),* service areas with a basic day demand exceeding 50 m^3/day must have a minimum of two feeder main connections, separated by an isolation valve, to prevent the creation of a vulnerable service area. Since the average day demand for the site is 2.4 L/s (207.3 m^3/day) and based on the maximum day demand of 5.8L/s and an assumed sprinkler demand of 67L/s, the site is proposed to be serviced by dual 200 mm diameter watermain connections, which will tie into the existing 305 mm PVC watermain located within Alta Vista Drive. Refer to **Appendix C** for detailed water demand calculations and **Appendix H** for servicing drawings.

5.1.3. FIRE FLOWS

The estimated fire flow for the proposed building was calculated in accordance with ISTB-2018-02 and the Fire Underwriters Survey, *Water Supply for Public Fire Protection* (2020).

The following parameters, provided by the Architect, were used to calculate the fire flow demands:

- Type of Building Construction: Type II Non-combustible Construction
- Sprinkler System: Present, fully automatic, and supervised
- Building Content Combustibility: Limited combustible
- Interconnected Floor Spaces or Unprotected Openings: None

Based on this information, the estimated fire flow for the site is 9,000 L/min (150.0L/s), with a required fire flow duration of 2 hours. There are three existing fire hydrants in proximity to the proposed buildings that can provide the required fire flow of 9,000 L/min. Refer to **Appendix C**, for fire hydrant locations and detailed fire flow calculations. Table 2 below summarizes the aggregate fire flow of the contributing hydrants near the proposed development, as calculated using Table Appendix I of the *Ottawa Design Guidelines – Water Distribution (May 2026)*.

Table 2: Fire Hydrant Coverage

Fire Flow Demand	Fire Hydrant(s) within 75m	Fire Hydrant(s) within 150m	Available Combined Flow
9000 L/min	1	2	= 1x5700L/min+2x3800L/min = 13,300 L/min

The total available flow from the contributing hydrants is 13,300 L/min, which exceeds the required fire flow of 9,000 L/min and is sufficient to provide adequate fire protection for the proposed development. A certified fire protection system specialist will be required to design the building's fire suppression system and confirm the actual fire flow demand during detailed design.

5.1.4. BOUNDARY CONDITIONS

The City of Ottawa was contacted to obtain boundary conditions associated with the proposed water demands. Correspondence regarding the boundary conditions is provided in **Appendix A**. Please note that boundary conditions were originally requested at two different locations along Alta Vista, however, during the detailed design stage it has been confirmed that the dual water services will enter the building near connection point 1. Table 3 below summarizes the boundary conditions at the proposed water connection locations.

Table 3: Boundary Conditions

Design Parameters	Demand (L/s)	Boundary Conditions at Alta Vista Drive (1) * (mH2O/ kPa)	Boundary Conditions at Alta Vista Drive (2) * (mH2O/ kPa)
Average Day Demand	2.4	47.00 / 460.9	47.00 / 460.9
Max Day + Fire Flow	5.8 + 150.0	26.80 / 262.8	26.80 / 262.8
Peak Hour	12.7	38.60 / 378.5	38.60 / 378.50
* Assumed ground elevation at connection point 1 (and 2) = 71.60m			

As indicated in Table 2, pressures in all scenarios meet the required pressure ranges stated in section *4.2.2 of the Water Distribution Ottawa Design Guidelines and Technical Bulletin ISD-2010-02*. The proposed water supply design complies with all relevant City of Ottawa Guidelines and Policies.

6. SANITARY SERVICE

6.1.1. EXISTING SANITARY SERVICES

An existing 200 mm sanitary force main is located within Alta Vista Drive, approximately 8 meters south of the site, with a stub connection situated near the southwest corner of the property. This force main connects to the 300 mm sanitary sewer on Smyth Road to the south. Additionally, a 250 mm concrete sanitary sewer is located within Alta Vista Drive, approximately 60 meters north of the site. This sewer flows northward and discharges into the Rideau River Collector.

It is proposed that the site will connect to the existing 250 mm concrete sanitary sewer to the north. To facilitate this connection, the existing City sewer will need to be extended approximately 95 meters south along Alta Vista Drive to reach the site. Coordination with the City of Ottawa will be required during the detailed design stage to implement the sewer extension.

6.1.2. SANITARY FLOWS

The parameters used to calculate the anticipated sanitary flows are a residential daily demand of 280 L/p/day, a residential peaking factor of 3.4 calculated by using the Harmon Equation, and a total infiltration rate of 0.33 L/s/ha as per the *Ottawa Sewer Design Guidelines (December 2025)*. Based on these parameters, a population of 699.4 and the total site area of 1.21 ha, the total anticipated wastewater flow for the developments is estimated to be **8.2 L/s**. Refer to **Appendix D** for sanitary flow calculations.

6.1.3. SANITARY SEWER EXTENSION AND SITE SERVICING

There are currently no sanitary sewers fronting the development along Alta Vista Drive. As a result, a sanitary sewer extension will be required to extend the existing sewer from MHSA30147, located north of the site, approximately 75 m

south to service the property. The proposed development will connect to a future manhole at the upstream end of the proposed 250 mm diameter sewer extension. Additionally, a sanitary monitoring hole will be installed near the property line. Based on a high-level analysis, the proposed sanitary sewer on Alta Vista Drive will have sufficient cover and flows from the building and will be able to drain by gravity. The City of Ottawa has confirmed that the existing sanitary sewer on Alta Vista Drive can accommodate the anticipated flows. Refer to **Appendix A** for City correspondence.

The proposed sanitary sewer extension will meet *the Ottawa Sewer Design Guidelines (December 2025) and* CLI-ECA design standards. The sanitary sewer will follow the centerline of the road as per City of Ottawa Standards which results in a separation from the existing watermain of approximately 4.7 m which is well above the minimum required separation of 2.4 m. A proposed slope of 0.6% is proposed for the sanitary sewer which results in a velocity of 0.8 m/s.
Refer to **Appendix H** for servicing drawings and sewer extension drawings.

7. STORMWATER MANAGEMENT

7.1.1. EXISTING STROMWATER INFRASTRUCTURE AND WATERSHEDS

The existing property is tributary to the Rideau River – Rideau Falls sub-catchment. Most of the stormwater runoff from the subject property flows east towards an existing creek which flows north and is tributary to the City of Ottawa sewer system. Approvals for the proposed development within this area are under the approval authority of the City of Ottawa. However, the Rideau Valley Conservation Authority will have to be notified of the work, as runoff from the site will enter the existing creek. Additionally, since the creek is located on Federal Lands, consultation with and review from Public Services and Procurement Canada (PSPC) will be required at the detailed design stage.

In pre-development conditions, drainage from the subject property is depicted by existing watersheds EWS-01 and EWS-02. EWS-01 (0.187ha) surface drains west to Alta Vista Drive and EWS-02 (1.027ha) surface drains northeast to the existing creek. Refer to **Appendix H** for the Pre-Development Watershed Drawing. Table 4 below details the existing watershed information.

Table 4: Existing Watersheds

WATERSHED	Total Area (ha)	Combined C
EWS-01 to Alta Vista	0.187	0.64
EWS-02 to Creek	1.027	0.42
TOTAL	**1.214**	**0.45**

Currently there is no existing storm sewer infrastructure within the Alta Vista Drive Right of Way. Based on the pre-consultation meeting feedback with the City of Ottawa it was determined that the designated outlet for the site is the creek bordering the eastern property line. Only a single outlet to the creek will be permitted and it is recommended to re-use the existing outlet if it is in a suitable condition.

7.1.2. STORMWATER DESIGN

Based on the pre-consultation meeting feedback with the City of Ottawa, included in **Appendix B**, the following stormwater management requirements were identified for the subject site:

- Use a calculated time of concentration (cannot be less than 10 minutes);
- Storm sewer outlets should not be submerged;
- The quantity control criteria is pre-to-post with the designated outlet being the creek bordering the easterly property line;

- 5-year post-development flows to be controlled to 5-year pre-development, 100-year post-development controlled to 100-year pre-development;
- Flows to the storm sewer in excess of the pre-development flow for the respective design storm must be detained on site for storms up to the 1:100 year return;
- The pre-development runoff coefficient or a maximum equivalent 'C' of 0.5, whichever is less;
- Quality control criteria: 'enhanced' target (80% TSS removal); and
- A water balance assessment is required to support this application, due to the proximity of the adjacent watercourse.

7.1.3. WATER QUALITY

To achieve the enhanced Total Suspended Solids (TSS) removal target of 80%, as identified through pre-consultation meeting feedback, the stormwater management design will incorporate a Jellyfish Membrane Filtration System.
The majority of runoff from the site will be generated from the building rooftop and landscaped grassed areas, which are not anticipated to require enhanced water quality treatment. However, a small drainage area, identified as Watershed WS-02, will collect runoff from the onsite laneway. Runoff from this watershed will require enhanced treatment and will therefore be directed through a Jellyfish Membrane Filtration System prior to discharge to the proposed cistern.

7.1.4. WATER QUANTITY

Under existing conditions, the site drains to two primary outlets. The majority of the site drains uncontrolled in a northeasterly direction toward the existing creek, while a smaller portion drains uncontrolled to the west toward Alta Vista Drive. Allowable release rates to both Alta Vista Drive and the creek were established for the 5-year and 100-year storm events. These rates were calculated using the runoff equation and the Modified Rational Method. Table 5 summarizes the allowable release rates.

In post-development conditions, the design will seek to generally maintain the existing drainage patterns by preserving, to the extent possible, the areas currently draining to the creek and those draining to Alta Vista Drive. This approach is intended to avoid introducing significant additional runoff volume to the existing creek.

Table 5: Allowable Release Rates

	Allowable Release Rates (L/s)
Alta Vista Drive 5-Year	27.14
Alta Vista Drive100-Year	46.51
Creek 5–Year	123.63
Creek 100-Year	211.87

Under proposed conditions, the majority of runoff from the building roofs, onsite laneway, and some grassed areas south of the building will be captured and conveyed to the underground parking garage. All other areas west of the building, including walkways and the privately owned public space (POPS), will consist predominantly of grassed surfaces and permeable pavers, and will sheet flow uncontrolled west toward the Alta Vista Drive right-of-way. All remaining areas east of the building will continue to drain northeast toward the creek, consistent with existing drainage patterns.
It is assumed that these eastern areas will remain undisturbed, with existing grades maintained from the Top-of-Bank 30 m offset eastward toward the creek. Refer to **Appendix H** for the Post-Development Watershed Plan.

Based on the proposed grading plan, Table 6 summarizes the post-development watersheds.

Table 6: Post Development Watersheds

WATERSHED	Total Area (ha)	Combined C
WS-01 (Controlled - Roof)	0.36	0.90
WS-02 (Controlled - Laneway)	0.04	0.52
WS-03 (Controlled - Grass)	0.01	0.20
WS-04 (Controlled - Grass)	0.01	0.20
WS-05 (Uncontrolled)	0.63	0.21
Total (To Creek)	**1.06**	**0.46**
WS-06 (Uncontrolled)	0.052	0.66
WS-07 (Uncontrolled)	0.105	0.28
Total (To Alta Vista)	**0.157**	**0.41**

Flows to Alta Vista

All areas draining toward Alta Vista Drive will remain uncontrolled and will surface drain to the right-of-way. Surface flows from these areas will come from grassed areas, a small portion of the paved onsite laneway and permeable pavers within the POPS area and walkways. The uncontrolled watersheds to Alta Vista Drive will have a release rate of 18.62 L/s during the 5-year storm and 31.91 L/s during the 100-year storm.

Since these release rates are below the design allowable release rate limits to Alta Vista Drive, no additional controls will be required. These areas will continue to surface drain uncontrolled toward Alta Vista Drive, consistent with existing conditions.

Flows to Creek

Under post-development conditions, the uncontrolled release rate to the creek is estimated to be 38.41 L/s during the 5-year storm and 82.27 L/s during the 100-year storm. With allowable release rates of 123.63 L/s for the 5-year storm and 211.87 L/s for the 100-year storm, the remaining allowable release rates at 5-year and 100-year storms are 85.22 L/s and 129.60 L/s, respectively. Under existing conditions, most of the site flows uncontrolled to the creek. In post-development conditions, most of the uncontrolled runoff will originate from the undeveloped 30-meter buffer adjacent to the creek, as well as any areas east of the building. There is a back amenity area which will drain uncontrolled towards the creek. This area will be composed of permeable pavers.

To manage runoff exceeding the allowable rates, **15.14 m³** of storage will be required at the 5-year storm event and **52.11 m³** will be required at the 100-year storm event.

Table 7 below summarizes the stormwater release and storage requirements.

Table 7: Post-development Release Rates and Storage Requirements

	Allowable Release Rate (L/s)	Uncontrolled Release Rate (L/s)	Controlled Release Rate (L/s)	Required Storage (m^3)
5-Year Storm	123.63	38.41	85.23	32.09
100-Year Storm	211.87	82.27	129.60	55.11

Runoff captured from Watersheds WS-01, WS-02, WS-03, and WS-04 will be directed to the parking garage and conveyed through the building's mechanical system to the proposed cistern. The cistern will be oversized to accommodate peak storm event flows, while also providing storage reserves for site irrigation in order to satisfy water balance requirements. The cistern will provide a stormwater retention storage volume of $55\ m^3$ and an irrigation storage volume of $143\ m^3$.

The cistern will be divided internally by a wall separating the irrigation storage volume from the stormwater storage volume. Incoming runoff from roof drains, landscape area drains, and the laneway catchbasin will initially be directed to the irrigation compartment of the tank. The internal wall will retain the irrigation storage volume and allow excess flows to spill over into the stormwater storage compartment during larger storm events.

Flows from the cistern will be pumped to a proposed 450 mm PVC storm sewer, which will convey runoff to the creek. The release rate from the cistern at the 5-year storm will be 85.23L/s and at the 100-year storm it will be 129.60L/s. The outlet to the creek will be free-draining and will not be submerged. It will be constructed with a headwall in accordance with OPSD 804.040, and will include riprap for erosion protection and a rodent protection grate for added security.

For detailed stormwater calculations, including release rates, storage volumes, and storm sewer sizing, refer to **Appendix E**. For stormwater servicing drawings, refer to **Appendix H**.

8. WATER BALANCE

8.1.1. WATER BALANCE – THORNTHWAITE MATHER

A water balance assessment evaluates how precipitation is distributed within the hydrologic cycle, including evapotranspiration, surface runoff, groundwater recharge (infiltration), and changes in soil moisture storage. The purpose of the water balance is to quantify how development alters the natural movement of water across and through the site, and to assess changes in both total runoff volume leaving the site and groundwater recharge relative to existing conditions.

This water balance assessment is distinct from event-based stormwater quantity control analyses (e.g., 2-year, 5-year, and 100-year storm events), which focus on peak flow rates and detention storage requirements. Instead, the water balance is a climate-based analysis that evaluates the annual distribution of precipitation and the cumulative effects of development on runoff volumes and infiltration.

In accordance with the City of Ottawa, the Rideau Valley Conservation Authority (RVCA), and the MECP Stormwater Management Planning and Design Manual (2003), the water balance for the subject site has been assessed using the Thornthwaite–Mather water balance method. This method is a continuous soil-water accounting approach based on climatic data that evaluates how precipitation is partitioned into actual evapotranspiration, soil moisture storage, and surplus water.

Site-specific Thornthwaite water balance data from 1945 to 2024 were obtained from Environment and Climate Change Canada by providing a soil water holding capacity of 75 mm, which is representative of the fine sandy loam soil conditions at the site. Based on the climatic data provided, the Thornthwaite–Mather method was applied to quantify precipitation,

actual evapotranspiration, and surplus water for the subject site. See **Appendix A** for the site-specific water balance data obtained. Table 8 below provides a summary of the average precipitation, potential evapotranspiration, actual evapotranspiration and surplus amounts in mm/year.

Table 8: Average Data

PCPN (Precipitation)	902 mm/year
PE (Potential Evapotranspiration)	620 mm/year
AE (Actual Evapotranspiration)	543 mm/year
SURP (Surplus)	356 mm/year

8.1.2. WATER BALANCE CALCULATIONS

The Thornthwaite-Mather Soil Water Balance equation was used for our calculations.

$$P = AE + \Delta S + SURP$$

Where:

- P: Precipitation
- AE: Actual Evapotranspiration
- ΔS: Change in soil moisture storage
- SURP: Surplus

$$SURP = Runoff + Recharge$$

The surplus water represents the portion of precipitation that remains after evapotranspiration and soil moisture demands have been satisfied and is available to contribute to surface runoff and groundwater recharge. The Thornthwaite surplus was subsequently partitioned into runoff and infiltration using infiltration factors based on site-specific soil type, land cover, and topographic conditions, in accordance with Tables 3.1 Hydrologic Cycle Component Values from the MECP Stormwater Management Planning and Design Manual. See Table 9 below for infiltration factors.

Table 9: MECP Infiltration Factors

Topography Infiltration Factors	
Flat Land, average slope < 0.6 m/km	0.3
Rolling Land, average slope 2.8 m to 3.8 m/km	0.2
Hilly Land, average slope 28 m to 47 m/km	**0.1**
Soils Infiltration Factors	
Tight impervious clay	0.1
Medium combinations of clay and loam	0.2
Open Sandy loam	**0.4**
Cover Infiltration Factors	
Cultivated Land	**0.1**
Woodland	0.2

Based on the existing and proposed site conditions the following were selected; hilly land with a factor of 0.1, open sandy loam with a factor of 0.4 and cultivated land with a factor of 0.1. Therefore, the total infiltration factor for the site is 0.6.

The following formulas were used to determine the annual infiltration and the annual runoff based on a surplus of 356mm/year and a total infiltration factor of 0.6.

Taking the infiltration factors and the surplus, the following is determined:

$$I_{recharge} = F \times SURP = 0.6 \times 356mm = 213.6mm$$

Runoff from pervious areas is then calculated:

$$R_{pervious} = (1 - F) \times SURP = 0.4 \times 356mm = 142.4mm$$

Therefore, for the site and soil type the annual soil recharge (infiltration) is **213.6mm/year** and the annual runoff on pervious areas is **142.4mm/year**.

Based on our predevelopment and post-development areas; the following formulas were used to calculate the change in groundwater recharge (infiltration) resulting from the proposed development and the change in total annual runoff volume leaving the site.

Recharge volumes for pre-development and post development:

$$V_{recharge,pre} = \frac{213.6mm}{1000} \times 7103.6m^2 = 1517.3m^3/year$$

$$V_{recharge,post} = \frac{213.6mm}{1000} \times 6785.6m^2 = 1449.4m^3/year$$

Annual runoff pre-development and post-development:

$$Runoff_{predevelopmet} = \left(\frac{902mm}{1000} \times 3163.9m^2\right) + \left(\frac{142.4mm}{1000} \times 7103.6m^2\right) = 3865.4m^3/year$$

$$Runoff_{post\ development} = \left(\frac{902mm}{1000} \times 3898.1m^2\right) + \left(\frac{142.4mm}{1000} \times 6785.6m^2\right) = 4482.4m^3/year$$

Therefore, under post-development conditions, the site is expected to experience a groundwater recharge deficit of approximately **67.9 m³/year** and an increase in total runoff volume of approximately **617.0 m³/year** relative to pre-development conditions. See **Appendix E** for the Water Balance parameters and calculations.

8.1.3. WATER BALANCE CONCLUSIONS AND MITIGATION STRATEGY

Based on the results of the water balance assessment, under post-development conditions the site is anticipated to experience a groundwater recharge deficit of approximately 67.9m³/year and an increase in total runoff volume of approximately 617 m³/year relative to existing conditions. These changes reflect the increase in impervious area associated with the proposed development and the corresponding reduction in pervious cover.

To help mitigate these impacts, runoff from Watersheds WS-01, WS-02, WS-03, and WS-04 will be directed to the proposed underground cistern for reuse in irrigation and to support stormwater quantity control requirements. An irrigation schedule was prepared by Smart Watering Systems to determine the required irrigation demand for the site. Refer to **Appendix E** for the irrigation calculations. The assessment determined that the site would require approximately 711m³ of irrigation water between the months of May and September. This estimate accounts for landscaped areas within the property boundaries and does not include any reforestation areas.

Table 10 summarizes the monthly irrigation water requirements.

Table 10: Monthly Irrigation Water Requirements

	Volume (m^3)
May	138.4
June	166.4
July	175.1
August	140.1
September	91.1
Annual Water Use	**711.1**
Average Daily Water Use	4.6
Average 72hour Water Use	13.9

Based on this irrigation demand, the irrigation holdback volume within the cistern was estimated at 143m^3. This storage volume is expected to provide approximately 655m^3 of irrigation water annually, thereby offsetting the projected post-development increase in runoff volume of 617.0m^3/year and it will allow for 655m^3 of water to infiltrate into the ground throughout the year, which will offset the ground water recharge deficit.

Based on the proposed stormwater management measures, which maintain post-development peak flows at pre-development levels and offset the increase in annual runoff through reuse and infiltration, significant downstream erosion impacts to the receiving creek are not anticipated.

9. EROSION AND SEDIMENT CONTROL

During construction, erosion and sediment controls will be implemented to prevent sediment runoff from leaving the site and entering the creek. A sediment control fence will be installed along the entire site perimeter to intercept runoff at all potential exit points. Inlet sediment control devices will also be placed in any catch basins and/or manholes in and around the site that may be affected by construction activities.

Straw bales will be installed downstream of the storm sewer outlet in the creek, during construction, as per OPSD 219.180. These bales will temporarily filter sediment runoff and will remain in place until the rip-rap is installed at the outlet for permanent erosion protection.

All erosion and sediment control measures will be constructed and maintained in compliance with Ontario Provincial Standard Specification (OPSS) 577.

10. CONCLUSION

The Assessment of Adequacy of Public Services for the proposed development at **1867 Alta Vista Drive** presents the servicing strategy for the subject property in support of the Site Plan Control application. Based on the analyses completed for water servicing, sanitary servicing, stormwater management, and water balance, the proposed development can be adequately serviced. The servicing conclusions are summarized below.

Water Service

- The proposed development will be serviced from the existing **305 mm PVC watermain** on Alta Vista Drive within the City of Ottawa's **1E pressure zone**.
- Based on the calculated average day demand of approximately 2.4 L/s, and in accordance with City requirements for developments with a basic day demand exceeding 50 m^3/day, the site is proposed to be serviced by **dual 200 mm diameter water service connections** to provide redundancy and avoid the creation of a vulnerable service area.
- The estimated fire flow demand for the proposed building, calculated in accordance with **ISTB-2018-02** and the **Fire Underwriters Survey**, is **9,000 L/min** for a duration of **2 hours**.

- There are **three existing public fire hydrants** in proximity to the site. The available combined hydrant capacity is approximately **13,300 L/min**, which exceeds the required fire flow demand.
- Boundary conditions provided by the City of Ottawa indicate that adequate pressure is available under average day, peak hour, and maximum day plus fire flow conditions. Accordingly, the proposed water servicing design is adequate to support the development.

Sanitary Service

- The proposed development is anticipated to generate a total peak sanitary flow of approximately 8.2 L/s, based on the projected population, applicable peaking factors, and infiltration allowance in accordance with the **Ottawa Sewer Design Guidelines**.
- An existing **250 mm concrete sanitary sewer** is located within Alta Vista Drive, approximately 60 m north of the site. To service the development, this sewer will be extended approximately **75 m south** along Alta Vista Drive.
- The site will connect via a **200 mm diameter sanitary service** to a future manhole at the upstream end of the proposed sewer extension, with a sanitary monitoring hole provided near the property line.
- Based on the analysis completed and correspondence received from the City, the existing municipal sanitary system has sufficient capacity to accommodate the proposed flows, and the site can be serviced by gravity.

Stormwater Management

- The designated stormwater outlet for the site is the existing creek located along the eastern property boundary, as established through pre-consultation with the City of Ottawa. The storm system will connect to this outlet near the property line to prevent any work on the neighboring property.
- The stormwater management design has been developed to maintain the existing drainage regime to the extent possible, with a majority of uncontrolled areas continuing to drain northeast toward the creek and a smaller portion continuing to drain west toward Alta Vista Drive.
- Allowable release rates were established for both the 5-year and 100-year storm events. The allowable release rates are:
    - **Alta Vista Drive:** 27.14L/s for the 5-year event and 46.5L/s for the 100- year event;
    - **Creek:** 123.63L/s for the 5-year event and 211.87L/s for the 100-year event.
- Post-development uncontrolled flows to Alta Vista Drive are below the allowable release rates and therefore do not require additional quantity controls.
- For runoff directed to the creek, the required onsite storage is approximately 32.09m^3 for the 5-year storm event and 55.11m^3 for the 100-year storm event.
- Runoff from Watersheds **WS-01**, **WS-02**, **WS-03**, and **WS-04** will be captured and conveyed to a proposed underground cistern. The cistern will provide:
    - **stormwater retention storage** of 55m^3; and
    - **irrigation storage** of 143m^3.
- Flows from the cistern will be pumped to a proposed 300mm **PVC storm sewer** discharging to the creek. The release rate from the cistern at the 5-year storm will be 85.23L/s and at the 100-year storm it will be 129.60L/s.
- Enhanced stormwater quality treatment will be provided through a **Jellyfish Membrane Filtration System** to achieve the required 80% **TSS removal target**. This treatment will be applied to runoff from **WS-02**, which collects flows from the onsite laneway.

Water Balance

- The Thornthwaite-Mather water balance assessment indicates that, under post-development conditions, the site is expected to experience:
    - a groundwater recharge deficit of approximately 67.9m^3/year; and
    - an increase in total runoff volume of approximately 617m^3/year relative to existing conditions.
- To mitigate these impacts, runoff captured from Watersheds **WS-01** to **WS-04** will be directed to the underground cistern for irrigation reuse and stormwater quantity control.

- Based on the irrigation schedule prepared by Smart Watering Systems, the site is expected to require approximately 711.1m³/year of irrigation water annually between May and September.
- The proposed irrigation holdback volume of 143m³ is expected to supply approximately **655m³** of irrigation water annually, thereby offsetting the projected increase in annual runoff volume and the groundwater recharge deficit and helping satisfy the site's water balance objectives.

Should you have any questions or require additional clarification regarding this report, please do not hesitate to contact the undersigned.

Best regards,



TAMARA HARB, P.Eng.
Municipal Engineer
1223 Michael St, Gloucester, ON K1J 7T2, Canada
tamara.harb@parsons.com
Mobile: +1 343.998.1436

Appendix A

Correspondence

Harb, Tamara [NN-CA]

From: Cassidy, Tyler <tyler.cassidy@ottawa.ca>
Sent: Friday, May 15, 2026 2:19 PM
To: Harb, Tamara [NN-CA]
Cc: Evan Johnson
Subject: [EXTERNAL] RE: 479542_1867 Alta Visa Dr_Updated Water and Sanitary Demands for OPA/ZBA Submission
Attachments: 1867 Alta Vista Drive May 2026.pdf

Hi Tamara,

I can confirm that there are no sanitary capacity concerns and the receiving sewer can handle the proposed 8.2 L/s.

The following are boundary conditions, HGL, for hydraulic analysis at 1867 Alta Vista Drive (zone 1E) assumed to be connected via two (2) connections on Alta Vista Drive and looped internally (see attached PDF for location).

Connection 1: 305 mm on Alta Vista Drive (south)
Minimum HGL = 110.2 m
Maximum HGL = 118.6 m
Max Day + Fire Flow (150 L/s) = 98.4 m

Connection 2: 305 mm on Alta Vista Drive (north)
Minimum HGL = 110.2 m
Maximum HGL = 118.6 m
Max Day + Fire Flow (150 L/s) = 99.3 m

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

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

Tyler Cassidy, P.Eng
Infrastructure Project Manager,
Planning, Development and Building Services department (PDBS)/ Direction générale des services de la planification, de l'aménagement et du bâtiment (DGSPAB) - Rural Branch
City of Ottawa | Ville d'Ottawa
110 Laurier Avenue West Ottawa, ON | 110, avenue. Laurier Ouest. Ottawa (Ontario) K1P 1J1
613.580.2424 ext./poste 12977, Tyler.Cassidy@ottawa.ca

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

From: Cassidy, Tyler
Sent: May 14, 2026 10:35 AM

THORNWAITE WATER BALANCE

Ottawa CDA WATER BUDGET MEANS FOR THE PERIOD 1945-2024 DC20492

LAT.... 45.38 WATER HOLDING CAPACITY... 75 MM HEAT INDEX... 37.84
LONG... 75.72 LOWER ZONE..... 45 MM A..... 1.097

DATE	TEMP (C)	PCPN	RAIN	MELT	PE	AE	DEF	SURP	SNOW	SOIL	ACC P
31- 1	-10.1	59	11	16	0	0	0	26	70	74	287
28- 2	-8.6	53	11	20	1	1	0	30	91	75	340
31- 3	-2.4	62	32	74	6	6	0	100	47	75	401
30- 4	6.1	74	71	50	32	32	0	89	0	74	475
31- 5	13.3	77	77	0	81	81	0	14	0	56	551
30- 6	18.5	89	89	0	117	108	-9	4	0	33	639
31- 7	21.0	89	89	0	137	108	-29	1	0	13	729
31- 8	19.8	89	89	0	118	87	-31	1	0	14	817
30- 9	15.3	84	84	0	77	70	-7	3	0	25	900
31-10	8.8	79	78	0	39	38	-1	13	0	52	79
30-11	1.9	74	60	8	11	11	0	38	6	71	153
31-12	-6.2	73	26	16	1	1	0	37	37	75	227
AVE	6.4 TTL	902	717	184	620	543	-77	356			

Ottawa CDA STANDARD DEVIATIONS FOR THE PERIOD 1945-2024 DC20492

DATE	TEMP (C)	PCPN	RAIN	MELT	PE	AE	DEF	SURP	SNOW	SOIL	ACC P
31- 1	3.1	24	13	18	1	1	0	27	39	4	57
28- 2	2.8	25	14	22	1	1	0	31	52	2	63
31- 3	2.6	29	21	42	5	5	0	49	69	0	73
30- 4	1.7	33	33	72	8	8	0	75	0	3	84
31- 5	1.9	36	36	0	12	12	0	25	0	22	96
30- 6	1.2	38	38	0	8	18	19	13	0	29	109
31- 7	1.2	40	40	0	9	30	32	7	0	21	118
31- 8	1.4	39	39	0	9	29	31	5	0	23	128
30- 9	1.5	35	35	0	8	14	14	13	0	24	125
31-10	1.6	36	36	2	7	7	2	22	0	26	36
30-11	1.8	26	27	9	4	4	0	30	9	9	43
31-12	3.1	28	22	15	2	2	0	29	29	1	52

Appendix B

Pre-Consultation Meeting Notes

File No.: PC2025-0051

March 20, 2025

Lisa Dalla Rosa
Fotenn
dallarosa@fotenn.com

Subject: Pre-Consultation: Meeting Feedback
Proposed Rezoning and Site Plan Control Application – 1867 Alta Vista Drive

Please find below information regarding next steps as well as consolidated comments from the above-noted pre-consultation meeting held on **March 11, 2025**.

Additional comments are provided from the email received from you on March 19, 2025.

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.

Proposal Image, attendance and details from precon meeting:

1. 2, 9-storey residential buildings with 4-storey podiums at Alta Vista frontage
2. 445 du, unknown # of parking spaces; 283 are required for the du and visitor as per the zoning
3. Amenity amount is unknown (544 + 975 m2 is shown); 2670m2 is req'd as per the zoning
4. 928 m2 Parkland dedication, calculated at 10% of the buildable land area (does not include the creek setback lands as part of the base calculation, as it is un-buildable)
5. 2 amenity areas
6. Underground parking, mostly to be located under the building and hard surfaces, so as to not impede tree root growth on the surface
7. Applicant asked whether the City would prefer to have the buildings close to the Alta Vista ROW or setback, in keeping with the current built form.
8. They are considering an R5B [xxxx] zone



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.

2. 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. Policies and provisions: Official Plan, Secondary Plan

    a. Some high-level policies are met. Residential use is permitted; the proposal supports intensification, 15min n'hoods, supports transit, more diverse housing forms

b. Some policies are not met from the N'hood policies which has a cap at 4-storeys (the proposal is 9-storeys) – Policy 6.3.1 (2,34,5). Can these requirements be satisfied?

c. The Secondary Plan speaks to proper transitioning to lower density residential properties.

2. Zoning By-law

   a. Current zone: IP12 (note: IP12 does not permit residential)

   b. Draft Zoning By-Law: permits residential, but has max ht of 18m

   c. ZBLA has been requested from IP12 to R5B [xxxx] to permit the use, height

3. 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.

4. Wind Analysis, Preliminary is required if the proposed building is more than 2x the height of adjacent existing buildings and is proposed to be greater than 5-storeys. A secondary Wind Analysis could be required based on the results of the Preliminary study.

5. Shadow Analysis is required, due to the proposal being greater than 5-storeys and being within the Greenbelt

6. Ensure all zoning provisions especially for amenity, bicycle parking, vehicular parking are provided

7. Staff have confirmed that the typical area to be included when referring to taller buildings are areas within the same designation, that are contiguous without a major physical barrier. In this situation, the Beachburg Rail corridor would be seen as a dividing line which would mean that the majority of the buildings 'in the immediate vicinity of 1867 Alta Vista Drive' would be low-rise, non-residential uses.

8. The height of 9-storeys will require an OPA and a strong rationale. We look forward to seeing revised plans, taking all permissions and restrictions into account.

9. Please provide images/massing to show the building in-situ in the current and planned context.

10. As a follow up to the March 19, 2025 email from Lisa Dalla Rosa:

    a. Thank you for reaching out to the Councillor.

    b. An OPA would be required to request the 9-storeys, since the area is NOT characterized by taller buildings.

    c. Staff are willing to review a more shallow setback along Alta Vista Drive than what currently exists for the other properties. The intent of the 'evolving neighbourhood overlay' is to shift to a more urban condition, and not to replicate what is there now. I believe Christopher was asking to see massing/elevations with setbacks to assess the proposal more fully.

Feel free to contact tracey.scaramozzino@ottawa.ca, Planner, File Lead, for follow-up questions.

Urban Design (Christopher Moise):

1. The following element of the preliminary design are of concern:
    a. Establishing a low-rise expression fronting the right-of-way appears to be the right move.
    b. Establishing what the suitable height for the buildings requires additional analysis using massing models and a site section that includes the building heights and the street.
    c. Regarding the park relationship to the building to the north, there is sensitivity, and we recommend some separation to city lands from built form, especially if it is a nine-storey wall.
    d. The surrounding context employ significant building setbacks from the public right-of-way so additional analysis needs to focus on what an appropriate set-back for the buildings might be.
    e. See attached Urban Design Terms of Reference.

Engineering

Comments:

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

    a. Application of the IDF information derived from the Meteorological Services of Canada rainfall data, taken from the MacDonald Cartier Airport, collected 1966 to 1997.

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

    a) Storm sewer outlets should not be submerged.

    c. The quantity control criteria is pre-to-post with the designated outlet being the creek bordering the easterly property line (5-year post-development flows controlled to 5-year pre-development, 100-year post-development controlled to 100-year pre-development.

    d. The pre-development condition is how the site is currently (gravel, asphalt and grass).

    e. Flows to the storm sewer in excess of the pre-development flow for the respective design storm must be detained on site for storms up to the 1:100 year return.

    f. The pre-development runoff coefficient or a maximum equivalent 'C' of 0.5, whichever is less (§ 8.3.7.3).

    g. Quality control criteria.: 'enhanced' target (80% TSS removal).

    h. A water balance assessment is required to support this application, due to the proximity of the adjacent watercourse. See the MECP Stormwater Management Planning and Design Manual (2003) for methodology.

12. Deep Services (Storm, Sanitary and/or Water Supply)

    a. Water: 305mm dia. PVC on Alta Vista Drive.

    b) Sanitary: We have record of an existing 200mm/250mm dia. SAN sewer on Alta Vista Drive. If the intent is to connect to this sewer, it will be the applicants responsibility to provide a CCTV inspection and stamped memo stating the sewer is in suitable condition for use.

    In the event a sewer extension is required, reach out to the Infrastructure Project Manager to obtain additional design requirements.

c) Stormwater: The designated outlet for the site is the creek bordering the eastern property line. Only a single outlet to the creek will be permitted and it is recommended to re-use the existing outlet if it is in suitable condition.

a) A sanitary monitoring maintenance hole is required.

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

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

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

iii. 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,

iv. 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.

13. An MECP Environmental Compliance Approval **Municipal/Private Sewage Works** will likely be required for the proposed development. A Ministry contact has been provided below but please work with City staff on the need (or not) of an application.

a) Patrick Lalonde at (613) 521-3450 or Patrick.Lalonde@ontario.ca

14. Water

a) Water Boundary condition requests must include the location of the service (map or plan with connection location(s) indicated) and the expected loads required by the proposed development, including calculations. Please provide the following information:

i. Location of service

ii. Type of development

iii. The amount of fire flow required (per OBC or FUS).

iv. Average daily demand: ___ l/s.

v. Maximum daily demand: ___l/s.

vi. Maximum hourly daily demand: ___ l/s.

b. Looping of the private watermain will be required if average day demands are greater than 50m3/day.

c. Twin service connections are required for buildings with a unit count greater than 50.

15. Sanitary Sewer Capacity: At the time of the pre-consultation meeting, the downstream sewers on Smyth Road have are able to convey 8.99 L/s from this development. In the event the wastewater flows are greater than the anticipated 8.99 L/s, reach out to the Project Manager to determine if additional capacity is available.

16. If a fire route is placed over an underground parking structure, additional design requirements are required by Ottawa Fire Services. Please reach out to the Infrastructure Project Manager for additional design requirements.

17. Geotechnical Investigation report is required for this development.

18. A Slope Stability analysis is required to determine the developable area of this project. Assess the geotechnical setback and setback from natural hazards. Please include all relevant setbacks on the Site Plan, Grading & Servicing Plan.

Feel free to contact Tyler Cassidy, P.Eng., Project Manager, for follow-up questions.

Noise

Comments:

19. A road noise study is required.

Feel free to contact Mike Giampa, TPM, for follow-up questions.

Transportation

Comments:

20. Right-of-way protection (Alta Vista).

a) See Schedule C16 of the Official Plan.

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

21. A TIA is warranted, please proceed to Step 2 Scoping. The application will not be deemed complete without Step 2 being submitted at least 14 calendar days prior to a Phase 3 pre-consultation or formal application. A TIA Strategy report (Step

3) with the Synchro files will be required at or prior to the formal application. Refer to the City of Ottawa website for the updated July 2023 TIA process: Transportation Impact Assessment Guidelines | City of Ottawa.

Feel free to contact Mike Giampa, Transportation Project Manager, for follow-up questions.

Environment

1. The current plan appears to have development within the watercourse setback. This setback is enabled in section 4.9.3 of the Official Plan, which reads:

> "2) Where a Council-approved watershed, subwatershed or environmental management plan does not exist, or provides incomplete recommendations, the minimum setback from surface water features shall be the greater of the following:
>
> a) Development limits as established by the conservation authority's hazard limit, which includes the regulatory flood line, geotechnical hazard limit and meander belt;
>
> b) Development limits as established by the geotechnical hazard limit in keeping with Council approved Slope Stability Guidelines for Development Applications;
>
> c) 30 metres from the top of bank, or the maximum point to which water can rise within the channel before spilling across the adjacent land; and
>
> d) 15 metres from the existing stable top of slope, where there is a defined valley slope or ravine."

2. It is likely that this development is within the setbacks established in a), c), and d). Note that a) and d) are geotechnical hazards and that exceptions to these should be discussed with the City's project managers and the Conservation Authority.

3. The 30m setback in c), however, is an ecological one. The watercourse in question is entombed both upstream and downstream of the exposed stretch upon which the site exists. As a result of this, it is possible that the full 30m setback may not be necessary here – the stream may be degraded to the point that a reduced setback is justified.

4. If the applicant seeks a reduction in this setback, the proper tool to do so is an Environmental Impact Statement (EIS). The EIS must investigate the ecological function of the watercourse and take all measures necessary to ensure that no negative impact to the features or functions occurs as a result of the development.

5. Note that the provisions of policy 7) of section 4.9.3 will guide staff's review. That policy reads:

> "7) Exceptions to the setbacks in Policy 2) shall be considered by the City in consultation with the conservation authority in situations where development is proposed on existing lots where, due to the historical development in the area, it is impossible to achieve the minimum setback because of the size or location of the lot, approved or existing use on the lot or other physical constraint, providing the following conditions are met to the City's satisfaction:
>
> > a) The ecological function of the site is restored and enhanced, to the greatest extent possible, through naturalization with native, non-invasive vegetation and bioengineering techniques to mitigate erosion and stabilize soils; and
> >
> > b) Buildings and structures are located, or relocated, to an area within the existing lot that improves the existing setback, to the greatest extent possible, and does not encroach closer to the surface water feature."

6. The City will be seeking as great a setback as possible (without preventing development), while also showing substantial replanting between the development and the watercourse.

7. In addition to the watercourse setbacks, an EIS is also required to address natural heritage feature present in the area. Other matters that must be addressed are potential significant woodlands, potential significant valleylands, and species-at-risk habitat. Note that black ash may be present on site; previous works that may inform the current application may not have included black ash as it was only recently added (back) to the endangered species list.

8. The City's Bird Safe Design Guidelines apply to any residential development over 4 storeys in height. Of particular note is Guideline 2, requiring mitigation measures for 90% of glazing below 16m.

9. While it is expected that plantings between the development and the watercourse will be required as part of the setback exemption, please consider additional

plantings on site wherever possible to help meet the urban forest canopy goals and to reduce the impacts of climate change and the urban heat island effect. In particular, Staff would prefer to see an increasing gradation of density, diversity, and naturalization in plantings as proximity to the watercourse buffer increases. Please note that the City prefers that all plantings be of native and non-invasive species.

Feel free to contact mark.elliott@ottawa.ca, Environmental Planner, for follow-up questions.

Forestry

Comments:

- A Tree Conservation Report and Landscape Plan are submission requirements. The TCR and EIS can be combined.
- Section 4.8.2 of the Official Plan, policies 3 a and b respectively must be adhered to:
    - Preserve and provide space for mature, healthy trees on private and public property, including the provision of adequate volumes of high-quality soil as recommended by a Landscape Architect;
    - On urban properties subject to site plan control or community planning permits, development shall create tree planting areas within the site and in the adjacent boulevard, as applicable, that meet the soil volume requirements in any applicable City standards or best management practices or in accordance with the recommendation of a Landscape Architect;
- There are Secondary Plan policies relevant to trees that must be followed:
    - Section 2 – Policy 2) Where lot sizes vary as a result of redevelopment, street trees at the same interval as the established street tree alignment must be provided in order to maintain streetscape continuity.
        - The Alta Vista Drive Minor Corridor from Dale Avenue to Heron Road, excluding that portion of Alta Vista Drive from the Green Transportation and Utility Corridor to Smyth Road; and
    - Section 2- Policy 3) For new development, existing mature vegetation (trees, shrubs) is to be retained or replaced with vegetation of comparable size, where possible. Where not possible, there shall be a reinstatement of an appropriate quantity and quality of urban tree canopy on the site of the development.
- Removal of a healthy City owned tree from the Right of Way is not permitted unless justified. Locate drive isles, services, drainage features…etc. with least impact to existing trees. If removal of a City of Ottawa tree is justified, monetary compensation and replacement planting will be required. Monetary compensation would have to be paid before the tree removal permit is released for the site.
- A parking garage design that underlays the buildings and hard surfaces (i.e. surface parking lot and drive isle) is desirable. Providing unencumbered soft

landscaped amenity areas would be highly desirable for tree planting and align well with policies in Section 4.8.2 of the OP.

- Ensure the Geotechnical Investigation provides recommendations on tree planting setbacks. If a parking garage is present, please have the consultant address how this influences tree planting if sensitive soils are present.
- Prioritize large canopy native tree species especially in proximity to the rear lot line. Plantings along the rear property should reflect naturalized forest habitat. If restoration planting stock is proposed, maintenance information should be included on the LP. Restoration stock (e.g. pots) should not be planted closer than 2m from each other.

Tree Conservation Report requirements. The following Tree Conservation Report (TCR) requirements have been adapted from the Schedule E of the Urban Tree Protection Guidelines – for more information on these requirements please contact hayley.murray@ottawa.ca

- A Tree Conservation Report (TCR) must be supplied for review along with the suite of other plans/reports required by the City
- Any tree 10 cm in diameter or greater and 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.
- The TCR must contain 2 separate plans/maps:
    i. Plan/Map 1 - show existing conditions with tree cover information.
    ii. Plan/Map 2 - show proposed development with tree cover information.
- The TCR must list all trees on site, as well as off-site trees if the CRZ (critical root zone) extends into the developed area, by species, diameter, and health condition. Please note that averages can be used if there are forested areas.
- Please identify trees by ownership – private onsite, private on adjoining site, city owned, co-owned (trees on a property line)
- If trees are to be removed, the TCR must clearly show where they are, and document the reason they cannot be retained.
- The removal of trees on a property line will require the permission of both property owners.
- 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
- The City encourages the retention of healthy trees; if possible, please seek opportunities for retention of trees that will contribute to the design/function of the site.
- Removal of a City tree is not permitted unless justified. If justified, monetary compensation for the value of the tree must be paid before a tree removal permit is issued.

Landscape Plan (LP) requirements

- Landscape Plan Terms of Reference must be adhered to for all tree planting: Click Here. For more information on these requirements please contact hayley.murray@ottawa.ca

Additional Elements for Tree Planting in the Right of Way:

- Please ensure any retained trees are shown on the LP
- Sensitive Marine Clay - Please follow the City's 2017 Tree Planting in Sensitive Marine Clay guidelines.
- Soil Volume - Please demonstrate as per the Landscape Plan Terms of Reference that the available soil volumes for new plantings will meet or exceed the minimum soil volumes requested.
- The city requests that consideration be given to planting native species wherever there is a high probability of survival to maturity.
- 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

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

- Tree specifications
  - Minimum stock size: 50mm tree caliper for deciduous, 200cm height for coniferous.
  - Maximize the use of large deciduous species wherever possible to maximize future canopy coverage.

- Tree planting on city property shall be in accordance with the City of Ottawa's Tree Planting Specification; and if possible, include watering and warranty as described in the specification.
- No root barriers, dead-man anchor systems, or planters are permitted.
- No tree stakes unless necessary (and only 1 on the prevailing winds side of the tree)

Feel free to contact Hayley Murray, Planning Forester, for follow-up questions.

Parkland

Comments:

22. Please provide total developable land area excluding the watercourse setback.

23. A block west and equivalent in width to the park block up to the watercourse should be transferred to the City. Such block area is not to be counted toward parkland dedication.

Feel free to contact steve.gauthier@ottawa.ca for follow-up questions.

Conservation Authority

A portion of the subject lands at 1867 Alta Vista Drive are located within RVCA's Regulated Area due to a river/stream valley associated with the adjacent watercourse. RVCA's regulated extends 15 metres from the extent of the erosion hazard. Any site alteration or development within the regulated area on the property would require a permit from RVCA following the planning process.

RVCA has a mandate through provincial legislation to regulate development and site alteration within and directly adjacent to natural features (i.e., valley and stream corridors and wetlands) and areas subject to natural hazards, such as flooding, erosion, unstable soils/bedrock. The purpose of the legislation is to ensure people and property are being protected from natural hazards.

Requirements for Review of Future Planning Act Applications

1. It is the expectation of RVCA staff that all development will be appropriately setback from the erosion hazard associated with the stream/river valley. RVCA policies and

Provincial guidelines require a 6 metre setback from the erosion hazard as determined through the applicable technical studies in order to provide for an erosion access allowance (i.e., an unencumbered area free and clear of any structures, both above and below ground, established to provide space for machinery/equipment and workers to access a slope area and undertake repairs/maintenance in the event that there is erosion or slope instability issues.

2. Slope stability/erosion hazard assessment – Report to delineate the extent of the erosion hazard associated with the river/stream valley slope.

3. Stormwater management report – Outlining how the proposed stormwater management design conforms with requirements for water quantity (i.e., controls to protect downstream properties from flood increases due to upstream development) and water balance (i.e., matching the pre-development proportions of infiltration, runoff, and evapotranspiration) per the Ministry of Environment, Conservation and Parks' Stormwater Management Planning and Design Manual.

4. Shoring and foundation plans - Details for the proposed excavation and shoring methods to be utilized for any proposed excavation. Details regarding proposed mitigation measures/foundation treatments for reducing risks associated with undertaking site alteration and construction within sensitive/unstable soils.

5. Dewater plan - If dewatering is required as a component of the development, a plan/report should be submitted that identifies the applicable details (e.g., how long will dewatering occur, what are the anticipated volumes, where will water be discharged to and what method/set up will be used to discharge the water).

6. Engineering Drawings/Plans – Including Site Plan, Grading Plan, Site Servicing Plan, Erosion and Sediment Control Plan, cross-sections and associated details.

7. Current topographic survey of the property prepared by an Ontario Land Surveyor.

8. Landscape restoration plans – Outlining how disturbed areas around the river/stream corridor will be protected/stabilized/naturalized.

Feel free to contact Stephen.bohan@rvca.ca, for follow-up questions.

Community issues

Comments:

24. The Community was not invited to the pre-consultation meeting.

Other

25. 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 and will be applicable to Site Plan Control and Plan of Subdivision applications.

    a) The HPDS was passed by Council on April 13, 2022, but is not in effect at this time, as Council has referred the 2023 HPDS Update Report back to staff with the direction to bring forward an updated report to Committee at a later date. The timing of an updated report to Committee is unknown at this time, and updates will be shared when they are available.

    b) Please refer to the HPDS information at ottawa.ca/HPDS for more information.

26. Under the Affordable Housing Community Improvement Plan, a Tax Increment Equivalent Grant (TIEG) program was created to incentivize the development of affordable rental units. It provides a yearly fixed grant for 20 years. The grant helps offset the revenue loss housing providers experience when incorporating affordable units in their developments.

    a. To be eligible for the TIEG program you must meet the following criteria:

        i. the greater of five units OR 15 per cent of the total number of units within the development must be made affordable

        ii. provide a minimum of 15 per cent of each unit type in the development as affordable

        iii. enter into an agreement with the city to ensure the units maintain affordable for a minimum period of 20 years at or below the city-wide average market rent for the entire housing stock based on building form and unit type, as defined by the Canada Mortgage and Housing Corporation

        iv. must apply after a formal Site Plan Control submission, or Building Permit submission for projects not requiring Site Plan Control, and prior to Occupancy Permit issuance

b. Please refer to the TIEG information *at Affordable housing community improvement plan / Plan d'améliorations communautaires pour le logement abordable for more details or contact the TIEG coordinator via email at affordablehousingcip@ottawa.ca.*

Submission Requirements and Fees

1. Zoning By-Law Amendment and Site Plan Control Application
    a. Additional information regarding fees related to planning applications can be found here.
2. 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.
3. The required plans and studies **must meet all 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.
4. 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 contacts identified for the above disciplines.

Regards,
Tracey Scaramozzino

c.c. SME's as per above

Appendix C

Water Calculations and Fire Hydrant Locations

Water Supply Calculations

Date	5/13/2026
Project Name	1867 Alta Vista
Address	1867 Alta Vista
Prepared by	Tamara Harb, P.Eng

Domestic Demands			
Property Type	**Persons per unit**	**Number of units**	**Population**
Studio	1.4	112	156.8
1 Bedroom Apartment	1.4	93	130.2
1 Bedroom + Den	2.1	39	81.9
2 Bedroom Apartment	2.1	88	184.8
2 Bedroom + Den	3.1	21	65.1
3 Bedroom Apartment	3.1	26	80.6
	Total	**379**	**699.4**

Average Water Consumption Rate	280	L/c/d	
Average Day Demand	**195832.0**	**L/d**	**2.27 L/s**
Maximum Day Factor	2.50		**City of Ottawa Guidelines (Table 4.2)**
Maximum Daily Demand	**489580.0**	**L/d**	**5.67 L/s**
Peak Hour Factor	2.20		**City of Ottawa Guidelines (Table 4.2)**
Maximum Hour Demand	**1077076.0**	**L/d**	**12.47 L/s**

Commerical Demands					
Property Type	**Unit**	**Rate**	**Units**		**Demand (L/d)**
Amenity	28000	L/ha/d	0.266	ha	7448.0
				Total	**7448.0**

Average Day Demand	**7,448**	**L/d**	**0.086 L/s**
Maximum Day Factor	1.5		(City of Ottawa Design Guidelines-Table 4.2)
Maximum Daily Demand	**11,172**	**L/d**	**0.129 L/s**
Peak Hour Factor	1.8		(City of Ottawa Design Guidelines-Table 4.2)
Maximum Hour Demand	**20,110**	**L/d**	**0.233 L/s**

Domestic plus Commerical/Amenity		
Average Day Demand	**2.4**	**L/s**
Maximum Daily Demand	**5.8**	**L/s**
Maximum Hour Demand	**12.7**	**L/s**
max plus sprinkler	**72.80**	**L/s**

Assuming a maximum velocity of 3.0m/s, the diameter of pipe is calculated as:

Minimum pipe diameter (d) =	$(4Q/\pi V)^{1/2}$	
=	0.176	m
=	176	mm
Proposed pipe diameter (d) =	**200**	mm
=	**8**	Inches

Fire Flow Calculations

Project	479542 - 1867 Alta Vista Drive
Date	May 13, 2026
Method	Fire Underwriters Survey (FUS)
Prepared by	Tamara Harb, P.Eng.

Step	Task	Term	Options	Multiplier	Choose:	Value	Unit	Fire Flow
Structural Framing Material								
1	Choose frame used for building	Coefficient C related to the type of construction	Type V - Wood Frame	1.5	Type II Non-combustible construction	**0.8**		
			Type IV-A Mass Timber Construction	0.8				
			Type IV-B Mass Timber Construction	0.9				
			Type IV-C Mass Timber Construction	1.0				
			Type IV-D Mass Timber Construction	1.5				
			Type III Ordinary Construction	1.0				
			Type II Non-combustible construction	0.8				
			Type I Fire resistive construction	0.6				
Floor Space Area (A)								
2	Building Footprint					**5,270**	m^2	
3	Obtain fire flow before reductions	Required fire flow *(rounded to nearest 1,000 L/min)*	Fire Flow = 220 x C x $A^{0.5}$				L/min	**13,000**
Reductions or surcharge due to factors affecting burning								
4	Choose combustibility of contents	Occupancy hazard reduction or surcharge	Non-combustible	-25%	Limited combustible	**-15%**	L/min	**11,050**
			Limited combustible	-15%				
			Combustible	0%				
			Free burning	15%				
			Rapid burning	25%				
5	Choose reduction for sprinklers	Sprinkler reduction	Full automatic sprinklers	-30%	True	**-30%**	L/min	**5,525**
			Water supply is standard for both the system and fire department hose lines	-10%	True	**-10%**		
			Fully supervised system	-10%	True	**-10%**		
6	Choose separation	Exposure distance between units	North Side	10.1 to 20m	15%		L/min	**8,840**
			East Side	>30m	0%			
			West Side	>30m	0%			
			South Side	10.1 to 20m	15%	**30%**		
Net required fire flow								
7	Obtain fire flow, duration, and volume	Minimum required fire flow rate (rounded to nearest 1000)					L/min	**9,000**
		Minimum required fire flow rate					L/s	**150.0**
		Required duration of fire flow					hr	**2**

1867 Alta Vista Drive
Hydrant Coverage Map

- Hydrant Within 75m
- Hydrant Within 150m



Appendix D

Wastewater Calculations

Sanitary Flow Calculations

Project: 1867 Alta Vista
Location: 1867 Alta Vista
Designed: Tamara Harb, P.Eng
Date: 10/02/2026

Sanitary Design Parameters
Commercial & Institutional Flow = 28000 L/ha/day
Light Industrial Flow = 35000 L/ha/day
Heavy Industrial Flow = 55000 L/ha/day
Maximum Residential Peak Factor = 4.0
Commercial & Institutional Peak Factor = 1.5
Average Daily Flow = 280 L/p/day
Industrial Peak Factor = as per Appendix 4-B
Extraneous Flow = 0.33 L/s/ha

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

LOCATION			RESIDENTIAL						COMMERCIAL		INDUSTRIAL			INSTITUTIONAL		C+I+I	INFILTRATION			TOTAL FLOW, Q (L/s)	PIPE						
STREET	FROM	TO	AREA (ha)	POP.	ACCU. AREA (ha)	ACCU. POP.	PEAK FACT.	PEAK FLOW (L/s)	AREA (ha)	ACCU. AREA (ha)	AREA	ACCU. AREA (ha)	PEAK FACT.	AREA (ha)	ACCU. AREA (ha)	PEAK FLOW (L/s)	TOTAL AREA (ha)	ACCU. AREA (ha)	INFILT. FLOW (L/s)		LENGTH (m)	DIA. (mm)	SLOPE (%)	MATERIAL	CAP. Q(FULL) (L/s)	VEL. V(FULL) (m/s)	RATIO Q /QFULL
	Bldg Parking Garage	SAN MH4	1.210	699.4	1.210	699.4	3.3	7.57	0.185	0.185	0.00	0.00	0.0	0.0	1.5	0.09	1.210	1.210	0.40	**8.06**	13.3	200	2.60%	PVC	52.89	1.68	0.15
	SAN MH4	SAN MH3	0.000	0.0	1.210	699.4	3.3	7.57	0.000	0.185	1.00	1.00	1.0	0.0	1.5	0.09	0.000	1.210	0.40	**8.06**	9.8	200	1.00%	PVC	32.80	1.04	0.25
	SAN MH3	SAN MH2	0.000	0.0	1.210	699.4	3.3	7.57	0.000	0.185	2.00	2.00	2.0	0.0	1.5	0.09	0.000	1.210	0.40	**8.06**	54.0	200	1.00%	PVC	32.80	1.04	0.25
	SAN MH2	SAN MH1	0.000	0.0	1.210	699.4	3.3	7.57	0.000	0.185	3.00	3.00	3.0	0.0	1.5	0.09	0.000	1.210	0.40	**8.06**	17.0	200	1.35%	PVC	38.11	1.21	0.21
Alta Vista Drive	SAN MH1	EXMHSA30147	0.000	0.0	1.210	699.4	3.3	7.57	0.000	0.185	4.00	4.00	4.0	0.0	1.5	0.09	0.000	1.210	0.40	**8.06**	75.5	200	1.10%	PVC	34.40	1.09	0.23

Appendix E

Stormwater Calculations, Water Balance Calculations & Irrigation Calculations

PARSONS

1867 Alta Vista Drive

Project No.: 479542

Date:10/02/2026

Designer: Tamara Harb, P.Eng

Pre-Development Catchments

WATERSHED	C = 0.2	C=0.7	C = 0.90	Total Area (m^2)	Total Area (ha)	Combined C
EWS-01 to Alta Vista	684.1	0.0	1189.8	1873.9	0.187	0.64
EWS-02 to Creek	7103.6	0.0	3163.9	10267.5	1.027	0.42
TOTAL	**7787.7**	**0.0**	**4353.6**	**12141.4**	**1.214**	**0.45**

Post-Development Catchments

Alta Vista

WATERSHED	C = 0.20	C = 0.3	C = 0.90	Total Area (m^2)	Total Area (ha)	Combined C
WS-06 (UnControlled)	175.66	0.00	342.26	517.92	0.052	0.66
WS-07 (Uncontrolled)	520.69	472.14	59.97	1052.80	0.105	0.28
TOTAL	**696.4**	**472.1**	**402.2**	**1570.7**	**0.157**	**0.41**

Creek

WATERSHED	C = 0.20	0.30	C = 0.90	Total Area (m^2)	Total Area (ha)	Combined C
WS-01 (Controlled - Roof)	0.00	0.00	3618.49	3618.49	0.36	0.90
WS-02 (Controlled - Laneway)	0.00	280.12	166.58	446.70	0.04	0.52
WS-03 (Controlled - Grass)	120.35	0.00	0.00	120.35	0.01	0.20
WS-04 (Controlled - Grass)	115.20	0.00	0.00	115.20	0.01	0.20
WS-05 (Uncontrolled)	5550.86	719.05	0.00	6269.91	0.63	0.21
TOTAL	**5786.4**	**999.2**	**3785.1**	**10570.7**	**1.06**	**0.46**

	C = 0.20	C = 0.70	C = 0.90	Total Area (m^2)	Total Area (ha)	Combined C
Total Areas for Entire Site	**6482.76**	**1471.31**	**4187.30**	**12141.4**	**1.214**	**0.45**

PARSONS

1867 Alta Vista Drive
Project No.: 479542
Date: 10/02/2026
Designer: Tamara Harb, P.Eng

Stormwater Management
Design Sheet
100-Year Post to 100-Year Pre to Alta Vista

Runoff Equation

Q = 2.78CIA (L/s)
C = Runoff coefficient
I = Rainfall intensity (mm/hr) = A / (Td + C) ^{B}
A = Area (ha)
T_c = Time of concentration (min)

Pre-Development Stormwater Management 100 Year Storm

100 year storm

I_{100} = **1735.688** / **(Td + 6.014)$^{0.820}$** **a = 1735.688** **b = 0.820** **c = 6.014**

C =	0.50	max of 0.5 as per City of Ottawa
I =	178.6	mm/hr
Tc =	10	min
Total Area =	0.187	ha

Allowable Release Rate= **46.51** L/s

5412.597

6727.443

Post-development Stormwater Management

					$\sum R_{2\&5}$	$\sum R100$
	Total Site Area =	**0.157**	ha	**∑R=**		
	WS-06 (UnControlled)	0.052	ha	R=	0.66	0.83
	WS-07 (Uncontrolled)	0.105	ha	R=	0.28	0.36
	Total Un-Controlled =	**0.157**	**ha**	**∑R=**	**0.41**	**0.51**

Post-development Stormwater Management (Uncontrolled Catchments)

100 Year Storm Event:

I_{100} = **1735.688** / **(Td + 6.014)$^{0.820}$** **a = 1735.688** **b = 0.820** **c = 6.014**

Time (min)	Intensity (mm/hr)	Uncontrolled Runoff (L/s)	Controlled Release Rate Constant (L/s)	Total Release Rate (L/s)
10	178.6	31.91	0.00	**31.91**

PARSONS

1867 Alta Vista Drive
Project No.: 479542
Date: 10/02/2026
Designer: Tamara Harb, P.Eng

Stormwater Management
Design Sheet
5-Year Post to 5-Year Pre to Alta Vista

Runoff Equation

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

Pre-development Stormwater Management - 5 Year Storm

5 year storm

$I_5 = 998.071 / (Td + 6.053)^{0.814}$ **a = 998.071** **b = 0.814** **C = 6.053**

C =	0.50	max of 0.5 as per City of Ottawa
I =	104.2	mm/hr
Tc =	10	min
Total Area =	0.187	ha

Allowable Release Rate= **27.14** L/s 0.136 1355.944

5412.597

6727.443

Post-development Stormwater Management

					$\sum R_{2\&5}$
	Total Site Area =	**0.157**	ha	**∑R=**	
	WS-06 (UnControlled)	0.052	ha	R=	0.66
	WS-07 (Uncontrolled)	0.105	ha	R=	0.28
	Total Un-Controlled =	**0.157**	**ha**	**∑R=**	**0.41**

Post-development Stormwater Management (Uncontrolled Catchments)

5 Year Storm Event:

$I_5 = 998.071 / (Td + 6.053)^{0.814}$ **a = 998.071** **b = 0.814** **C = 6.053**

Time (min)	Intensity (mm/hr)	Uncontrolled Runoff (L/s)	Controlled Release Rate Constant (L/s)	Total Release Rate (L/s)
10	104.2	18.62	0.00	**18.62**

PARSONS

1867 Alta Vista Drive
Project No.: 479542
Date: 10/02/2026
Designer: Tamara Harb, P.Eng

Stormwater Management
Design Sheet
100-Year Post to 100-Year Pre to Creek

Runoff Equation

Q = 2.78CIA (L/s)
C = Runoff coefficient
I = Rainfall intensity (mm/hr) = A / (Td + C) ^{B}
A = Area (ha)
T_c = Time of concentration (min)

Pre-development Stormwater Management - 100 Year Storm

100 year storm

I_{100} = **1735.688 / (Td + 6.014)$^{0.820}$** **a = 1735.688** **b = 0.820** **c = 6.014**

C =	0.42	max of 0.5 as per City of Ottawa
I =	178.6	mm/hr
Tc =	10	min
Total Area =	1.027	ha

Allowable Release Rate= **211.87** L/s

Post-development Stormwater Management

					$\sum R_{2\&5}$	$\sum$R100
	Total Site Area =	**1.06**	ha	**∑R=**		
Controlled	WS-01 (Controlled - Roof)	0.36	ha	R=	0.90	1.00
	WS-02 (Controlled - Laneway)	0.04	ha	R=	0.52	0.65
	WS-03 (Controlled - Grass)	0.01	ha	R=	0.20	0.25
	WS-04 (Controlled - Grass)	0.01	ha	R=	0.20	0.25
	Total Controlled	**0.43**	**ha**	**∑R=**	**0.82**	**1.00**
Un-controlled	WS-05 (Uncontrolled)	0.63	ha	R=	0.21	0.26
	Total Un-Controlled =	**0.63**	**ha**	**∑R=**	**0.21**	**0.26**

Post-development Stormwater Management (Uncontrolled)

100 Year Storm Event:

I_{100} = **1735.688 / (Td + 6.014)$^{0.820}$** **a = 1735.688** **b = 0.820** **c = 6.014**

Time (min)	Intensity (mm/hr)	Uncontrolled Runoff (L/s)	Controlled Release Rate Constant (L/s)	Total Release Rate (L/s)
10	178.6	82.27	0.00	82.27

Post-development Stormwater Management (Controlled)

100 Year Storm Event:

I_{100} = **1735.688 / (Td + 6.014)$^{0.820}$** **a = 1735.688** **b = 0.820** **c = 6.014**

		Storage Required				
Time (min)	Intensity (mm/hr)	Controlled Runoff (L/s)	Storage Volume (m^3)	Controlled Release Rate Constant (L/s)	Uncontrolled Runoff (L/s)	Total Release Rate (L/s)
7	211.7	253.07	51.86	129.60	0.00	129.60
8	199.2	238.17	52.11	129.60	0.00	129.60
9	188.3	225.08	51.56	129.60	0.00	129.60
10	178.6	213.49	50.33	129.60	0.00	129.60
15	142.9	170.85	37.12	129.60	0.00	129.60
20	120.0	143.41	16.58	129.60	0.00	129.60
25	103.8	124.16	0.00	129.60	0.00	129.60
30	91.9	109.84	0.00	129.60	0.00	129.60
35	82.6	98.73	0.00	129.60	0.00	129.60
40	75.1	89.84	0.00	129.60	0.00	129.60
45	69.1	82.56	0.00	129.60	0.00	129.60
50	64.0	76.46	0.00	129.60	0.00	129.60
60	55.9	66.83	0.00	129.60	0.00	129.60
80	45.0	53.79	0.00	129.60	0.00	129.60
90	41.1	49.15	0.00	129.60	0.00	129.60
110	35.2	42.09	0.00	129.60	1.00	130.60
120	32.9	39.33	0.00	129.60	0.00	129.60

Total Storage Required = **52.11** **m^3**

PARSONS

1867 Alta Vista Drive
Project No.: 479542
Date: 10/02/2026
Designer: Tamara Harb, P.Eng

Stormwater Management
Design Sheet
5-Year Post to 5-Year Pre to Creek

Runoff Equation

Q = 2.78CIA (L/s)
C = Runoff coefficient
I = Rainfall intensity (mm/hr) = A / (Td + C) ^{B}
A = Area (ha)
T_c = Time of concentration (min)

Pre-Development Stormwater Management 5 Year Storm

5 year storm

I_5 = 998.071/ (Td + 6.053)$^{0.814}$ **a = 998.071** **b = 0.814** **c = 6.053**

C = 0.42 max of 0.5 as per City of Ottawa
I = 104.2 mm/hr
Tc = 10 min
Total Area = 1.027 ha

Allowable Release Rate= 123.63 L/s

Post-development Stormwater Management

					$\sum R_{2\&5}$
	Total Site Area =	**1.06**	ha	**∑R=**	
Controlled	WS-01 (Controlled - Roof)	0.36	ha	R=	0.90
	WS-02 (Controlled - Laneway)	0.04	ha	R=	0.52
	WS-03 (Controlled - Grass)	0.01	ha	R=	0.20
	WS-04 (Controlled - Grass)	0.01	ha	R=	0.20
	Total Controlled	**0.43**	**ha**	**∑R=**	**0.82**
Un-controlled	WS-05 (Uncontrolled)	0.63	ha	R=	0.21
	Total Un-Controlled =	**0.63**	**ha**	**∑R=**	**0.21**

Post-development Stormwater Management (Uncontrolled)

5 Year Storm Event:

I_5 = 998.071/ (Td + 6.053)$^{0.814}$ **a = 998.071** **b = 0.814** **C = 6.053**

Time (min)	Intensity (mm/hr)	Uncontrolled Runoff (L/s)	Controlled Release Rate Constant (L/s)	Total Release Rate (L/s)
10	104.2	38.41	0.00	38.41

Post-development Stormwater Management (Controlled)

5 Year Storm Event:

I_5 = 998.071/ (Td + 6.053)$^{0.814}$ **a = 998.071** **b = 0.814** **C = 6.053**

		Storage Required				
Time (min)	Intensity (mm/hr)	Controlled Runoff (L/s)	Storage Volume (m^3)	Controlled Release Rate Constant (L/s)	Uncontrolled Runoff (L/s)	Total Release Rate (L/s)
7	123.3	121.27	15.14	85.23	0.00	85.23
8	116.1	0.00	0.00	85.23	0.00	85.23
9	109.8	0.00	0.00	85.23	0.00	85.23
10	104.2	0.00	0.00	85.23	0.00	85.23
15	83.6	0.00	0.00	85.23	0.00	85.23
20	70.3	0.00	0.00	85.23	0.00	85.23
30	53.9	0.00	0.00	85.23	0.00	85.23
40	44.2	0.00	0.00	85.23	0.00	85.23
50	37.7	0.00	0.00	85.23	0.00	85.23
60	32.9	0.00	0.00	85.23	0.00	85.23
70	29.4	0.00	0.00	85.23	0.00	85.23
80	26.6	0.00	0.00	85.23	0.00	85.23
90	24.3	0.00	0.00	85.23	0.00	85.23
100	22.4	0.00	0.00	85.23	0.00	85.23
110	20.8	0.00	0.00	85.23	0.00	85.23
120	19.5	0.00	0.00	85.23	0.00	85.23

Total Storage Required = 15.14 m^3

PARSONS

Storm Design Parameters

1867 Alta Vista Drive
Project No.: 479542
Date: 10/02/2026
Designer: Tamara Harb, P.Eng

Rational Method Q = 2.78CIA

Q = Peak flow in litres per second (L/s)
A = Drainage area in hectares (ha)
C = Runoff coefficient
I = Rainfall intensity (mm/hr)

Runoff Coefficient (C)	
Grass	0.20
Gravel	0.70
Asphalt / rooftop	0.90

Ottawa Macdonald-Cartier International Airport IDF curve equation (100 year event, intensity in mm/hr)

I100 = 1735.688 / (Td + 6.014)0.820

Min. velocity = 0.80 m/s
Manning's "n" = 0.013

LOCATION			AREA (ha)			FLOW						STORM SEWER							
WATERSHED / STREET	FROM	TO	C = 0.20	C = 0.70	C = 0.90	Indiv. 2.78AC	Accum. 2.78AC	Time of Conc. (min.)	Rainfall Intensity (mm/hr)	Peak Flow Q (L/s)	Controlled Flow Q (L/s)	Pipe Diameter (mm)	Type	Slope (%)	Length (m)	Capacity Full (L/s)	Velocity Full (m/s)	Time of Flow (min.)	Ratio (Q/Q_{FULL})
WS-02 (Controlled - Laneway)	CB1	BLDG	0.000	0.028	0.017	0.096	0.096	10.00	178.6	17.18		200	PVC	1.00%	9.0	32.8	1.04	0.14	0.52
WS-01, WS-02, WS-03, WS-04	Cistern	STMH01	0.02	0.03	0.38	1.015	1.015	10.00	178.6	181.17	129.60	300	PVC	2.50%	10.2	152.9	2.16	0.08	0.85
	STMH01	STMH02									129.60	300	PVC	2.50%	28.0	152.9	2.16	0.22	0.85
	STMMH02	Creek Outlet									129.60	300	CSP	12.30%	6.0	339.1	4.80	0.02	0.38

measure . manage . monitor
smart watering systems

1867 Alta Vista Drive Irrigation Water Use Calculations - Landscape Area

Note: All area measurements are for plantings located within the property line.

***July Eto =** 140 **mm** ***Average Rainfall in July** 81 **mm**

Irrigation Water Requirement for July

Planting Description		Area (m2)	Landscape Coefficient	Irrigation Efficiency (%)		Gross Monthly Water Requirement (Litres)
Turf		953	0.5	0.70		**67,731**
Shrubs		649	0.5	0.90		**35,875**
Trees - Deciduous		1280	0.5	0.90		**70,756**
Trees - Evergreen		90	0.2	0.90		**775**
				Total Monthly Water Use=		**175,137**

Monthly Water Requirement

Month	Eto (mm)	Days Per Month	Volume (L)	Volume (m3)
May	110.6	31	138,358	138.4
June	133.0	30	166,380	166.4
July	140.0	31	175,137	175.1
August	112.0	31	140,110	140.1
September	72.8	30	91,071	91.1
Total	**568.4**	**153**		
Annual Water Use			**711,056**	**711.1**
Average Daily Water Use (153 Days)			**4,647**	**4.6**
Average 72-Hour Water Use			**13,942**	**13.9**

ANDREW FIRTH CERTIFIED 004895 IRRIGATION · DESIGNER COMMERCIAL

*Values for Eto and Average Rainfall are from EPA WaterSense Water Budget Tool

Appendix F

Site Plan



KEY MAP

PROJECT DEVELOPER

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Email: john.kingsley@cghtransportation.com

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SURVEYOR

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Nepean, Ontario K2E 7S6
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Fax: (613) 727-1079

LEGAL DESCRIPTION

PLAN OF SURVEY OF

PART OF LOT 15
CONCESSION JUNCTION GORE
GEOGRAPHIC TOWNSHIP OF GLOUCESTER
CITY OF OTTAWA

Surveyed by Annis, O'Sullivan, Vollebekk Ltd.

PROJECT INFORMATION

Zoning By-law 2008-250 Consolidation IP12 F (1.5) SITE AREA 1.2 ha. 12,140.3 sq. m 130,677 sq. ft

ZONING	REQUIRED	PROVIDED
DEVELOPABLE AREA		7,653.0m²
ZONE	R5B	R5B
BUILDING HEIGHT: GRADE ELEVATION 73.00	----	9 STOREY'S / 33.2m
ALLOWABLE PROJECTION - AMENITY LEVEL	----	1 STOREY / 4.0m
DENSITY: RESIDENTIAL USE, ___ units/hectare MIN.	----	316
DENSITY: RESIDENTIAL FSI	----	1.5
FRONT YARD SETBACK	3.0m	7.9m
INTERIOR YARD SETBACK:	1.5m	6.7m & 3.9m
REAR YARD SETBACK:	25% OF LOT DEPTH / MAX 7.5m	28.9m
MINIMUM LOT WIDTH	22.5m	144.28m
LANDSCAPED AREA	30%	38.9%
SET BACK FROM WATERCOURSES/BODIES	30m	30m
MINIMUM LOT AREA	675m²	12,140.3m²
AMENITY AREA - TOTAL 6.0m² PER UNIT (379 Units)	2,274.0m²	2,763.5m²
AMENITY AREA - 50% COMMUNAL PER UNIT	1,137.0m²	1,893.5m²
VEHICLE PARKING: RESIDENTIAL - 0.5 PER UNIT AFTER 12 UNITS PER BUILDING	184	201
VEHICLE PARKING: VISITOR - 0.2 PER UNIT, MAX. 60 PER BUILDING	60	30
BICYCLE PARKING - RESIDENTIAL - 0.5 PER UNIT	190	301
AISLE & DRIVEWAY MINIMUM / MAXIMUM WIDTH	3.0m / 6.7m	3.0m / 6.7m

SITE PLAN SYMBOLS:

- SOFT LANDSCAPE PLANTING
- 30.0m EMBANKMENT OFFSET
- PARKING LOT AREA TO BE REMEDIATED: NATURALIZATION AREA
- SEASONAL SNOW STORAGE
- PEDESTRIAN HARD SURFACE
- PROPOSED POPS: 10% OF DEVELOPABLE AREA
- BIKE RACK (0.6x1.8m BIKE PARKING SPACE)
- MAIN ENTRANCE DOOR
- SERVICE / EXIT DOOR
- VEHICULAR DIRECTION
- EXISTING TREE TO REMAIN
- EXISTING TREE TO BE REMOVED
- PROPOSED TREE
- SIAMESE CONNECTION
- FIRE HYDRANT

DRAWING NOTES

1. PROPERTY LINE
2. BUILDING SETBACK LINES
3. ENTRY RAMP TO U/G GARAGE WITH TRENCH DRAIN
4. OUTLINE OF BUILDING ABOVE
5. OUTLINE OF PARKING GARAGE
6. LOADING AREA: 3.5m x 9.0m
7. EX. 1.5m WIDE CONCRETE SIDEWALK TO REMAIN
8. SOFT LANDSCAPING, SEE LANDSCAPE PLAN
9. BELOW GRADE CISTERN IN PARKING GARAGE
10. 1.5 X 3.0 CONCRETE PAD FOR GAS EQUIPMENT WITH BOLLARDS AS REQUIRED: LOCATION T.B.C.
11. SIAMESE CONNECTION
12. PROPOSED UTILITIES, SEE CIVIL
13. 6.0m WIDE FIRE TRUCK ROUTE
14. CONCRETE SIDEWALK, CONTINUOUS & DEPRESSED THROUGH DRIVEWAY, SEE CITY DETAIL SC 7.1
15. 150mm HT CONCRETE BARRIER CURB
16. EXISTING STREET LIGHT
17. FIRE HYDRANT: RELOCATE AS REQUIRED
18. HARD SURFACE WALK, SEE LANDSCAPE
19. EXISTING TREE TO BE REMOVED
20. EXISTING TREE TO REMAIN: PROTECT AS REQUIRED
21. NEW TREE: SEE LANDSCAPE
22. SURFACE MOUNTED BIKE RACK (0.6x1.8m) 2 PER RACK
23. LAY-BY WITH SHORT TERM PARALLEL PARKING SPACE
24. EXISTING BUS STOP WITH SHELTER / CONCRETE PAD
25. SUNKEN PRIVATE TERRACE
26. CONCRETE RETAINING WALL: SEE CIVIL
27. COMMUNAL AMENITY TERRACE
28. EXISTING ASPHALT PARKING LOT TO BE REMEDIATED
29. PROPOSED POPS AREA
30. EXISTING UTILITY BOX
31. FLUSH / MOUNTABLE CURB
32. BOLLARDS
33. 1.8m WIDE CONCRETE SIDEWALK: TO CITY STANDARDS
34. SIGNAGE: NO STOPPING, FIRE ROUTE, PRIVATE AREA...
35. HYDRO TRANSFORMER / SWITCHGEAR W/H PAD
36. PAINTED CROSSWALK WITH DEPRESSED CURBS
37. --

LOT COVERAGE

DEVELOPABLE LANDS =	7,653.0 sq. m.	63.0%
NON-DEVELOPABLE LANDS =	4,487.3 sq. m.	37.0%
TOTAL =	12,140.3 sq. m	100.0%

DEVELOPABLE AREA BRAKE DOWN

POPS =	765.3 sq. m.	10.0%
PAVED SURFACE =	756.0 sq. m.	9.9%
BUILDING FOOTPRINT=	3,182.8 sq. m.	41.6%
LANDSCAPE OPEN SPACE =	2,948.9 sq. m.	38.5%
TOTAL =	7,653.0 sq. m	100.0%

BUILDING STATISTICS

GROSS BUILDING - AREA

(CITY OF OTTAWA'S DEFINITION)

GROUND FLOOR		1,806.7 sq. m, 19,447 sq. ft.
2nd FLOOR		2,884.3 sq. m, 31,046 sq. ft.
3rd & 4th FLOOR	2 x 2,857.7 sq. m, 2 x 30,760 sq. ft.	5,715.4 sq. m, 61,520 sq. ft.
5th & 6th FLOOR	2 x 2,857.7 sq. m, 2 x 30,760 sq. ft.	5,715.4 sq. m, 61,520 sq. ft.
7th FLOOR		2,237.9 sq. m, 24,089 sq. ft.
8th & 9th FLOOR	2 x 2,237.9 sq. m, 2 x 24,089 sq. ft.	4,475.9 sq. m, 48,178 sq. ft.
AMENITY / MECHANICAL LEVEL		0.0 sq. m, 000 sq. ft.
TOTAL AREA		22,835.6 sq. m, 245,800 sq. ft.

UNIT STATISTICS

STUDIO	19.55%	112
1 BEDROOM UNIT	24.54%	93
1 BEDROOM + DEN UNIT	10.29%	39
2 BEDROOM UNIT	23.22%	88
2 BEDROOM + DEN UNIT	5.54%	21
3 BEDROOM UNIT	6.86%	26
TOTAL	100.00%	379

CAR PARKING

AREA 'X' on SCHEDULE 1A

MINIMUM REQUIRED

RESIDENCE	- 0.5 PER UNIT AFTER 12	184
VISITOR	- 0.2 PER UNIT AFTER 12	60
TOTAL		244

PROVIDED

RESIDENCE	- 0.58 PER UNIT	201
VISITOR	- 0.08 PER UNIT	30
TOTAL		231

LOCATION

EXTERIOR	5
P1 LEVEL GARAGE	113
P2 LEVEL GARAGE	113
TOTAL	231

PARKING SPACE SIZE

STANDARD SPACE (2.60 x 5.20)	190
PARALLEL CAR SPACE (2.60 x 6.70)	5
SMALL CAR SPACE (2.40 x 4.60)	20
SMALL CAR SPACE (2.60 x 4.60)	14
BARRIER FREE SPACE TYPE A (3.40 x 5.20)	1
BARRIER FREE SPACE TYPE B (2.40 x 5.20)	1

BICYCLE PARKING

REQUIRED	0.5 PER UNIT	190
PROVIDED		
LONG TERM	0.75 PER UNIT	285
SHORT TERM	2 + 1 PER 20 UNITS	16
TOTAL		301
5% INCLUSIVE SPACES		15

LOCATION

EXTERIOR	16
GROUND FLOOR	29
P1 LEVEL GARAGE	52
P2 LEVEL GARAGE	204
TOTAL	301

PROVIDED BICYCLE BRAKE DOWN

USE	TYPE	SIZE	TOTAL
LONG-TERM	HORIZONTAL	0.6 x 1.8 m	270
LONG-TERM	INCLUSIVE	1.0 x 2.75 m	15
SHORT-TERM	HORIZONTAL	0.6 x 1.8 m	16
SHORT-TERM	INCLUSIVE	1.0 x 2.75 m	0
TOTAL			301

AMENITY SPACE

EXTERIOR: COMMUNAL =	808.1 sq. m.
1st FL. INTERIOR: COMMUNAL =	158.2 sq. m.
2nd/6th FL. INTERIOR: COMMUNAL, (6 x 5) =	30.0 sq. m.
PENTHOUSE AMENITY ROOM =	522.9 sq. m.
PENTHOUSE AMENITY TERRACE =	401.0 sq. m.
PRIVATE BALCONIES / TERRACE =	1,025.1 sq. m.
TOTAL =	2,945.3 sq. m.
TOTAL COMMUNAL =	1,920.2 sq. m.
REQUIRED - 6.0m² PER UNIT (379) =	2,274.0 sq. m.
REQUIRED COMMUNAL @ 50% =	1,137.0 sq. m.

WASTE REQUIREMENT

GARBAGE	- 0.11 PER UNIT	11 - 4Y BINS	42 YARDS
RECYCLING GMP	- 0.018 PER UNIT	2 - 4Y BINS	7 YARDS
RECYCLING FIBER	- 0.038 PER UNIT	4 - 4Y BINS	15 YARDS
COMPOST	- 240L PER 50 UNITS		8
OVERSIZED GARBAGE AREA (SUGGESTED)			10m²

IT IS THE RESPONSIBILITY OF THE APPROPRIATE CONTRACTOR TO CHECK AND VERIFY ALL DIMENSIONS ON SITE AND TO REPORT ALL ERRORS AND/OR OMISSIONS TO THE ARCHITECT.

ALL CONTRACTORS MUST COMPLY WITH ALL PERTINENT CODES AND BY-LAWS.

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

DO NOT SCALE DRAWINGS.

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NOTATION SYMBOLS:

- (00) INDICATES DRAWING NOTES, LISTED ON EACH SHEET.
- (00) INDICATES ASSEMBLIE TYPE; REFER TO TYPICAL ASSEMBLIES SCHEDUAL.
- (00) INDICATES WINDOW TYPE; REFER TO WINDOW ELEVATIONS AND DETAILS ON A900 SERIES.
- (000) INDICATES DOOR TYPE; REFER TO DOOR SCHEDULE AND DETAILS ON A900 SERIES.
- 00 DETAIL NUMBER / TITLE / SCALE / DETAIL REFERENCE PAGE / DETAIL CROSS REFERENCE PAGE

No.	DESCRIPTION	DATE
8	ISSUES WITH GENERAL UPDATES	2026 09 04
7	ISSUES FOR SITE PLAN CONTROL APPLICATION	2026 07 14
6	ISSUES WITH GENERAL UPDATES	2026 06 10
5	REVISED AS PER CITY COMMENT LETTER 2	2026 05 15
4	ISSUES WITH GENERAL UPDATES (DRAFT)	2026 05 08
3	REVISED AS PER CITY COMMENT LETTER	2026 01 30
2	ISSUED FOR OPA & ZBLA APPLICATION	2025 12 17
1	ISSUED FOR OWNER / CONSULTANT REVIEW	2025 12 05

REVISIONS:

ARCHITECT SEAL: ONTARIO ASSOCIATION OF ARCHITECTS — KEVIN D. REID LICENCE 8667 — SEAL DATE: STAMP DATE

NORTH ARROW:

CLIENT:

TCU Development Corporation

ARCHITECT:

rla/architecture
roderick lahey architect inc.
56 beech street, ottawa, ontario K1S 3J6
t. 613.724.9932 f. 613.724.1209 rlaarchitecture.ca

PROJECT TITLE:

1867 ALTA VISTA DRIVE

OTTAWA ONTARIO

SHEET TITLE:

SITE PLAN

1 SP-1 SITE PLAN
SCALE = 1 : 250

0m 5 10 20
SCALE 1: 250

DRAWN:	CHECKED:
R.V.	K.R.
SCALE: 1:250	SHEET No. SP-1
PROJECT No. 2516	

D07-12-26-00

DWG # ____

PAPER SIZE: ISO_B1_(707.00_x_1000.00_MM) | PLOT DATE: Wednesday, September 16, 2026 | PLOT SCALE: 1:1 | PEN STYLE: 0-RLA-MASTER-100%.ctb | F:\2025\2516 - 1867 Alta Vista\01 Design Development\01 Site Plan\2516 SP-1 Site Plan 2026 09 16.dwg

Appendix G

Topographical Survey & Geotechnical Report

PLAN OF SURVEY OF

PART OF LOT 15
CONCESSION JUNCTION GORE
GEOGRAPHIC TOWNSHIP OF GLOUCESTER
CITY OF OTTAWA

Surveyed by Annis, O'Sullivan, Vollebekk Ltd.

Scale 1 : 200

8.0 6.0 4.0 2.0 0 4 8 Metres

Metric

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

Surveyor's Certificate

I CERTIFY THAT :

1. This survey and plan are correct and in accordance with the Surveys Act and the Surveyors Act and the regulations made under them.
2. The survey was completed on the 26th day of June, 2025.

Date

D. S. McMorran
Ontario Land Surveyor

ASSOCIATION OF ONTARIO LAND SURVEYORS
PLAN SUBMISSION FORM
V-110830

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

Notes & Legend

Denotes

- Survey Monument Found
- SIB — Standard Iron Bar
- (WIT) — Witness
- Meas. — Measured
- (AOG) — Annis, O'Sullivan, Vollebekk Ltd.
- (P1) — (857) Plan dated October 3, 1985
- (P2) — (857) Plan dated April 19, 1985
- (P3) — (857) Plan dated December 13, 1984
- (P4) — (1287) Plan dated April 26, 2016
- (P5) — Plan 4R-19941
- (DI) — Inst. N561626
- TOS — Top of Slope
- BOS — Bottom of Slope
- C/L — Centreline
- CSP — Corrugated Steel Pipe
- CPP — Corrugated Plastic Pipe
- CCP — Concrete Pipe
- T/P — Top of Pipe
- T/G — Top of Grate
- Inv. — Invert
- CB — Catch Basin
- MH-ST — Maintenance Hole (Storm)
- MH-S — Maintenance Hole (Sanitary)
- MH-B — Maintenance Hole (Bell)
- MH-H — Maintenance Hole (Hydro)
- MH — Maintenance Hole (Unidentified)
- VC — Valve Chamber (Watermain)
- WV — Water Valve
- FH — Fire Hydrant
- ST — Underground Storm Sewer
- S — Underground Sanitary Sewer
- W — Underground Water
- P — Underground Power
- B — Underground Bell
- Underground Allstream
- G — Underground Gas
- TO — Telecom Ottawa
- C — Underground Roger's Cable
- LS — Light Standard
- Edge of Asphalt
- HH — Handhole
- TB-B — Bell Terminal Box
- TB-C — Cable Terminal Box
- S — Sign
- BH — Bore Hole
- M-W — Monitoring Well
- Deciduous Tree
- Coniferous Tree
- d — Diameter
- 65.00 — Location of Elevations
- 65.00 — Location of Top of Curb Elevations

Bearings are grid, derived from Can-Net 2016 Real Time Network GPS observations and are referenced to Specified Control Points 01919680105 and 01919843476 1, MTM Zone 9 (76°30' West Longitude) NAD-83 (original).

ELEVATION NOTES

1. Elevations shown are geodetic, derived from City of Ottawa Vertical Control Monument No. 3641 (Index No. 32B), having a published elevation of 68.78 metres, and are referred to the CGVD28 geodetic datum.
2. It is the responsibility of the user of this information to verify that the job benchmark has not been altered or disturbed and that it's relative elevation and description agrees with the information shown on this drawing.

UTILITY NOTES

1. This drawing cannot be accepted as acknowledging all of the utilities and it will be the responsibility of the user to contact the respective utility authorities for confirmation.
2. Only visible surface utilities were located.
3. Underground utility data derived from City of Ottawa utility sheet reference: Drawings H-16-05, H-16-06, I-16-11 (all with a revision date of Nov. 2021) and Plan No. 3069 (Sheets 3 & 4 of 13 with a revision date of Aug. 29, 1997).
4. A field location of underground plant by the pertinent utility authority is mandatory before any work involving breaking ground, probing, excavating etc.

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PATERSON GROUP

Geotechnical Investigation

Proposed Development

1867 Alta Vista Drive
Ottawa, Ontario

Prepared for TC United

Report PG7401-1 Revision 1 dated April 22, 2025

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Appendix 1

Soil Profile and Test Data Sheets
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Borehole Logs by Others
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Analytical Testing Results

Appendix 2

Figure 1 – Key Plan
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Drawing PG7401-1 – Test Hole Location Plan

1.0 Introduction

Paterson Group (Paterson) was commissioned by TC United to conduct a geotechnical investigation for the proposed development to be located at 1867 Alta Vista Drive in the City of Ottawa, Ontario (refer to Figure 1 – Key Plan in Appendix 2 for the general site location).

The objectives of the geotechnical investigation were to:

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

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

2.0 Proposed Development

Based on the available conceptual plan, it is understood that the proposed development at the subject site will consist of 2 high-rise buildings with 3 levels of underground parking. At finished grades, the proposed building will be surrounded by asphalt-paved access lanes and landscaped amenity areas.

It is also expected that the proposed building will be municipally serviced.

3.0 Method of Investigation

3.1 Field Investigation

Field Program

The field program for the geotechnical investigation was conducted on December 20, 2024 and consisted of advancing a total of 3 boreholes to a maximum depth of 7.8 m and a total of 4 test pits down to a maximum depth of 3.1 m. The test hole locations were determined by Paterson personnel and distributed in a manner to provide general coverage of the subject site taking into consideration site features and underground utilities.

Further, a previous investigation at the subject site by others was conducted on September 19 and 20, 2022, and consisted of 8 boreholes advanced to a maximum depth of 6.2 m below the existing ground surface.

The test hole locations are presented on Drawing PG7401-1 – Test Hole Location Plan included in Appendix 2.

The boreholes were advanced using a track-mounted auger drill rig operated by a two-person crew. The drilling procedure consisted of augering and rock coring to the required depths at the selected borehole locations, and sampling and testing the soil and bedrock. The test pits were advanced using a backhoe and backfilled with the excavated soil upon the completion of logging and sampling. All fieldwork was conducted under the full-time supervision of our personnel under the direction of a senior engineer.

Sampling and In Situ Testing

The soil samples were collected from the boreholes using a 50 mm diameter split-spoon (SS) sampler or from the drill auger flights (AU). Rock cores were obtained using 47.6 mm inside diameter coring equipment. Grab samples (G) were collected at selected intervals from the test pit sidewalls. The samples were initially classified on site, placed in sealed plastic bags or core boxes, and transported to our laboratory.

The depths at which the drill auger, split-spoon, rock core, and grab samples were recovered from the boreholes and test pits are shown as AU, SS, RC and G, respectively, on the Soil Profile and Test Data sheets in Appendix 1.

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

Groundwater

Groundwater monitoring well was installed in borehole BH 3-24 to permit long-term groundwater measurement subsequent to the field investigation. Flexible polyethylene standpipes were installed in the remaining boreholes to permit further groundwater measurement.

Typical monitoring well construction details are described below:

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

The groundwater observations are discussed in Section 4.3 and are presented in the Soil Profile and Test Data sheets in Appendix 1. Refer to the Soil Profile and Test Data sheets in Appendix 1 for specific well construction details.

3.2 Field Survey

The test hole locations, and ground surface elevation at each test hole location, were surveyed by Paterson using a high precision GPS unit and referenced to a geodetic datum. The locations of the test holes are presented on Drawing PG7401-1 – Test Hole Location Plan in Appendix 2.

3.3 Laboratory Testing

Soil samples were recovered from the subject site and visually examined in our laboratory to review the results of the field logging. Unconfined compressive strength testing was carried out by Paterson on bedrock samples from borehole BH 1-24. The results of the testing are discussed in Section 4.2 and are provided in Appendix 1.

Soil samples and bedrock cores will be stored for a period of 1 month after this report is completed. They will then be discarded, unless we are otherwise directed.

3.4 Analytical Testing

One (1) soil sample was submitted for analytical testing to assess the corrosion potential for exposed ferrous metals and the potential of sulphate attacks against subsurface concrete structures. The sample was submitted to determine the concentration of sulphate and chloride, the resistivity, and the pH of the sample. The results are presented in Appendix 1 and are discussed further in Section 6.7.

4.0 Observations

4.1 Surface Conditions

The subject site is currently vacant, but was historically occupied by a 2-storey building which was demolished around 2017. The north and south portions of the site are mainly covered in asphalt pads used for vehicle parking. The ground surface slopes downward gradually from south to north, from approximate geodetic elevation 74.3 m to 72.3 m.

A creek was observed to be running north-south adjacent to the eastern boundary of the site. The creek corridor was observed to be approximately 1 to 2 m wide, 2 to 3 m deep, and surrounded by dense vegetation and mature trees.

This parcel is generally bordered by commercial buildings to the north and south, Alta Vista Drive to the west, and densely vegetated vacant land to the east.

4.2 Subsurface Profile

Overburden

Generally, the soil profile at the test holes consists of a layer of fill underlain by glacial till and bedrock. The fill was generally observed to consist of brown silty sand with traces of clay, gravel, brick, and metal fragments, extending to approximate depths ranging between 0.9 to 5 m below the existing ground surface.

The glacial till was encountered immediately underlying the fill, and was observed to consist of very dense, brown silty sand to sandy silt with gravel, cobbles, and boulders.

Refusal to augering was generally encountered at depths of about 4.6 m to 6.2 m below existing ground surface.

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

Bedrock

Bedrock was cored at boreholes BH 1-24 and BH 2-24, and was observed to consist of shale interbedded with limestone, and based on the recovered bedrock core, was generally poor to fair in quality.

Based on available geological mapping, the subject site is located in an area where the bedrock consists of interbedded limestone and dolomite of the Carlsbad formation, with an overburden drift thickness of 2 to 3 m.

Unconfined Compressive Strength Testing of Bedrock Core Samples

The bedrock cores in borehole BH 1-24 were tested for their unconfined compressive strength. The results of the testing are summarized in Table 1 below and are also presented on the Unconfined Compressive Strength Testing Results sheets in Appendix 1.

Table 1 – Summary of Unconfined Bedrock Compressive Strength Testing Results

Borehole	Sample	Test Core Depth (m)	Unconfined Compressive Strength (MPa)
BH 1-24	RC2	7.05 - 7.20	27
BH 1-24	RC2	7.20 - 7.35	39

4.3 Groundwater

The groundwater level was recorded at borehole BH 3-24 on January 3rd, 2025. The measured groundwater level reading is presented in Table 1 below, and is also shown on the Soil Profile and Test Data sheet in Appendix 2.

Table 2 – Summary of Groundwater Levels

Test hole Number	Ground Surface Elevation (m)	Measured Groundwater Level		Date Recorded
		Depth (m)	Elevation (m)	
BH 3-24	74.01	1.70	72.31	January 3rd, 2025

Note:
-The ground surface elevation at each test hole location was surveyed using a high precision GPS and are referenced to a geodetic datum.
- '*' Indicates groundwater monitoring well installed by others.

Based on these observations, the long-term groundwater level is expected to range between approximately 1.5 to 2.5 m below ground surface.

However, it should be noted that groundwater levels are subject to seasonal fluctuations, therefore, the groundwater levels could vary at the time of construction.

5.0 Discussion

5.1 Geotechnical Assessment

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

Bedrock removal will be required to complete the underground parking levels. The above and other considerations are further discussed in the following sections.

5.2 Site Grading and Preparation

Stripping Depth

Topsoil and deleterious fill, such as those containing organic materials, should be stripped from under the building, paved areas, pipe bedding, and other settlement sensitive structures. However, due to the depth of bedrock and the anticipated founding level for the proposed buildings, it is anticipated that all existing overburden material will be excavated from within the proposed building footprints.

Bedrock Removal

Bedrock removal can be accomplished by hoe ramming where the bedrock is weathered and/or where only small quantities of the bedrock need to be removed. Sound bedrock may be removed by line drilling in conjunction with controlled blasting and/or hoe ramming. Prior to considering blasting operations, the blasting effects on the existing services, buildings and other structures should be addressed. A pre-blast or pre-construction survey of the existing structures located in proximity of the blasting operations should be completed prior to commencing site activities.

The extent of the survey should be determined by the blasting consultant and should be sufficient to respond to any inquiries/claims related to the blasting operations. The blasting operations should be planned and conducted under the supervision of a licensed professional engineer who is an experienced blasting consultant.

Vibration Considerations

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

The following construction equipment could be a source of vibrations: piling rig, hoe ram, compactor, dozer, crane, truck traffic, etc. Vibrations, whether caused by blasting operations or by construction operations, could be the cause of the source of detrimental vibrations on the nearby buildings and structures. Therefore, it is recommended that all vibrations be limited.

Two parameters are used to determine the permissible vibrations, namely, the maximum peak particle velocity and the frequency. For low frequency vibrations, the maximum allowable peak particle velocity is less than that for high frequency vibrations. As a guideline, the peak particle velocity should be less than 15 mm/s between frequencies of 4 to 12 Hz, and 50 mm/s above a frequency of 40 Hz (interpolate between 12 and 40 Hz).

It should be noted that these guidelines are for today's construction standards. Considering that these guidelines are above perceptible human level and, in some cases, could be very disturbing to some people, it is recommended that a pre-construction survey be completed to minimize the risks of claims during or following the construction of the proposed building.

Fill Placement

Fill used for grading beneath the building footprint, unless otherwise specified, should consist of clean imported granular fill, such as Ontario Provincial Standard Specifications (OPSS) Granular A or Granular B Type II. Imported fill should be tested and approved prior to delivery to the site.

Non-specified existing fill along with site-excavated soil can be placed as general landscaping fill where surface settlement is a minor concern. The backfill materials should be spread in thin lifts and at a minimum compacted by the tracks of the spreading equipment to minimize voids. If non-specified backfill, reviewed and approved by Paterson, is to be placed to build up the subgrade level for areas to be paved, the fill should be compacted in maximum 300 mm lifts and compacted to 98% of the material's SPMDD.

If excavated rock is to be used as fill, it should be suitably fragmented to produce a well-graded material with a maximum particle size of 300 mm. This can be assessed at the time of construction. Site generated blast rock fill should be compacted using a suitably sized smooth drum vibratory roller when considered for placement.

Lean Concrete Filled Trenches

If bedrock overbreak occurs at the underside of footing (USF) elevation, then the footing excavation can be backfilled with lean concrete (minimum **17 MPa** 28-day compressive strength) up to the founding elevation. Typically, the excavation side walls will be used as the form to support the concrete, and once the trench excavation is approved by the geotechnical engineer, lean concrete can be poured up to the proposed founding elevation.

5.3 Foundation Design

Bearing Resistance Values

Footings supported on clean, surface sounded bedrock, or on lean concrete which is placed directly over the clean, surface-sounded bedrock, can be designed using a factored bearing resistance value at serviceability limit states (SLS) and ultimate limit states (ULS) of **3,000 kPa.** A geotechnical resistance factor of 0.5 was applied to the bearing resistance value at ULS.

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.

Footings supported on clean, surface sounded bedrock, or on lean concrete which is placed directly on the clean, surface sounded bedrock, and designed for the bearing resistance values provided herein, will be subjected to negligible post-construction total and differential settlements.

Lateral Support

The bearing medium under footing-supported structures is required to be provided with adequate lateral support with respect to excavations and different foundation levels. Adequate lateral support is provided to a sound bedrock bearing medium when a plane extending horizontally and vertically from the footing perimeter at a minimum of 1H:6V (or shallower) passes only through sound bedrock or a material of the same or higher capacity as the bedrock, such as concrete.

5.4 Design for Earthquakes

The site class for seismic site response can be taken as **Class X_C**. If a higher seismic site class (Class X_A or X_B) is required, a site-specific shear wave velocity test may be completed to accurately determine the applicable seismic site classification for foundation design of the proposed building, as presented in Table 4.1.8.4.A of the Ontario Building Code (OBC) 2024. The soils underlying the site are not susceptible to liquefaction.

5.5 Basement Floor Slab

The bedrock will provide a suitable founding medium for the basement floor slab. It is anticipated that the basement area for the proposed building will be mostly parking and the recommended pavement structures noted in Section 5.8 will be applicable. However, if storage or other uses of the lower level will involve the construction of a concrete floor slab, the upper 200 mm of sub-slab fill is recommended to consist of 19 mm clear crushed stone.

Any soft areas in the basement slab subgrade should be removed and backfilled with appropriate backfill material prior to placing fill. OPSS Granular A or Granular B Type II, with a maximum particle size of 50 mm, is recommended for backfilling below the floor slab. All backfill material within the footprint of the proposed building should be placed in maximum 300 mm thick loose layers and compacted to a minimum of 98% of the SPMDD.

In consideration of the groundwater conditions at the site, an underslab drainage system, consisting of lines of perforated drainage pipe subdrains connected to a positive outlet, should be provided in the subfloor fill under the lower basement floor. This is discussed further in Section 6.1.

5.6 Basement Wall

There are several combinations of backfill materials and retained soils that could be applicable for the basement walls of the proposed building. However, the conditions can be well-represented by assuming the retained soil consists of a material with an angle of internal friction of 30 degrees and a drained unit weight of 20 kN/m^3 (effective unit weight 13 kN/m^3).

Lateral Earth Pressures

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

K_o = at-rest earth pressure coefficient of the applicable retained soil (0.5)
γ = unit weight of fill of the applicable retained soil (kN/m3)
H = height of the wall (m)

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

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

Seismic Earth Pressures

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

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

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

The peak ground acceleration, (a_{max}), for the Ottawa area is 0.326g according to the OBC 2024. Note that the vertical seismic coefficient is assumed to be zero.

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

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

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

The earth forces calculated are unfactored. For the ULS case, the earth loads should be factored as live loads, as per OBC 2024.

5.7 Rock Anchor Design

Overview of Anchor Features

The geotechnical design of grouted rock anchors in sedimentary bedrock is based upon two possible failure modes. The anchor can fail either by shear failure along the grout/rock interface or a 60 to 90 degree pullout of rock cone with the apex of the cone near the middle of the bonded length of the anchor.

Interaction may develop between the failure cones of anchors that are relatively close to one another resulting in a total group capacity smaller than the sum of the load capacity of each individual anchor.

A third failure mode of shear failure along the grout/steel interface should be reviewed by the structural engineer to ensure all typical failure modes have been reviewed. The anchor should be provided with a bonded length at the base of the anchor which will provide the anchor capacity, as well an unbonded length between the rock surface and the top of the bonded length. Permanent anchors should be provided with corrosion protection. As a minimum, the entire drill hole should be filled with cementious grout. The free anchor length is provided by installing a plastic sleeve to act as a bond break, with the sleeve filled with grout or a corrosion inhibiting mastic.

Double corrosion protection can be provided with factory assembled systems, such as those available from Dywidag Systems or Williams Form Engineering Corp. Recognizing the importance of the anchors for the long-term performance of the foundation of the proposed building, any permanent rock anchors for this project are recommended to be provided with double corrosion protection.

Grout to Rock Bond

The Canadian Foundation Engineering Manual recommends a maximum allowable grout to rock bond stress (for sound rock) of 1/30 of the unconfined compressive strength (UCS) of either the grout or rock (but less than 1.3 MPa) for an anchor of minimum length (depth) of 3 m.

Generally, the UCS of sound shale bedrock ranges between about 25 and 40 MPa, which is similar in strength to most routine grouts. A factored tensile grout to rock

bond resistance value at ULS of **1.0 MPa**, incorporating a resistance factor of 0.3, can be calculated. A minimum grout strength of 40 MPa is recommended.

Rock Cone Uplift

As discussed previously, the geotechnical capacity of the rock anchors depends on the dimensions of the rock anchors and the configuration of the anchorage system. Based on existing bedrock information, a **Rock Mass Rating (RMR) of 65** was assigned to the bedrock, and Hoek and Brown parameters (**m and s**) were taken as **0.821 and 0.00293**, respectively.

Recommended Rock Anchor Lengths

Parameters used to calculate rock anchor lengths are provided in Table 3 below:

Table 3 – Parameters used in Rock Anchor Review

Grout to Rock Bond Strength – Factored at ULS	1.0 MPa
Compressive Strength – Grout	40 MPa
Rock Mass Rating (RMR) – Good Quality Shale	65
Hoek and Brown Parameters	m=0.821 and s=0.00293
Unconfined Compressive Strength – Shale Bedrock	40 MPa
Unit weight – Submerged Bedrock	15.2 kN/m^3
Apex Angle of Failure Cone	60°
Apex of Failure Cone	Mid-point of fixed anchor length

The fixed anchor length will depend on the diameter of the drill holes. Recommended anchor lengths for a 75 mm and 125 mm diameter hole are provided in Table 4 on the next page. The factored tensile resistance values given in Table 4 are based on a single anchor with no group influence effects.

A detailed analysis of the anchorage system, including potential group influence effects, could be provided once the details of the loading for the proposed building are determined.

Table 4 – Recommended Rock Anchor Lengths – Grouted Rock Anchor

Diameter of Drill Hole (mm)	Anchor Lengths (m)			Factored Tensile Resistance (kN)
	Bonded Length	Unbonded Length	Total Length	
75	0.9	1.1	2.0	210
	1.8	1.2	3.0	420
	4.0	1.2	5.0	900
	5.0	1.0	6.0	1150
125	0.7	1.4	2.1	250
	1.2	1.7	2.9	470
	2.0	1.9	3.9	800
	3.0	2.0	5.0	1150

Other Considerations

The anchor drill holes should be within 1.5 to 2 times the rock anchor tendon diameter and should be flushed clean prior to grouting under inspection from geotechnical personnel. A tremie tube is recommended to place grout from the bottom of the anchor holes. Compressive strength testing is recommended to be completed for the rock anchor grout. A set of grout cubes should be tested for each day that grout is prepared.

The geotechnical capacity of each rock anchor should be proof tested at the time of construction. More information on testing can be provided upon request.

5.8 Pavement Design

Lowest Underground Parking Level

For design purposes, it is recommended that the rigid pavement structure for the lowest underground parking level of the proposed building consist of Category C2, 32 MPa concrete at 28 days with air entrainment of 5 to 8%. The recommended rigid pavement structure is further presented in Table 5 on the next page.

Table 5 - Recommended Rigid Pavement Structure - Lower Parking Level	
Thickness (mm)	**Material Description**
125	**Exposure Class C2 - 32 MPa Concrete** (5 to 8% Air Entrainment)
300	**BASE** - OPSS Granular A Crushed Stone
SUBGRADE - Existing imported fill, or OPSS Granular B Type I or II material placed over in situ soil or bedrock.	

To control cracking due to shrinking of the concrete floor slab, it is recommended that strategically located saw cuts be used to create control joints within the concrete floor slab of the lower underground parking level. The control joints are generally recommended to be located at the center of the column lines and spaced at approximately 24 to 36 times the slab thickness (for example; a 0.15 m thick slab should have control joints spaced between 3.6 and 5.4 m). The joints should be cut between 25 and 30% of the thickness of the concrete floor slab and completed as early as 4 hours after the concrete has been poured during warm temperatures, and up to 12 hours during cooler temperatures.

Pavement Structure Over Podium Deck

The pavement structures presented in Tables 6 and 7 should be used for car only parking areas, at grade access lanes and heavy loading parking areas over the top of the podium structure, should they be required.

Table 6 - Recommended Pavement Structure - Car Only Parking Areas Over Podium Deck	
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 Following Paragraph)
n/a	**Waterproofing Membrane and IKO Protection Board**
SUBGRADE – Reinforced concrete podium deck * Thickness of base course is dependent on grade of insulation as noted in proceeding paragraph ** If specified by others, not required from a geotechnical perspective	

Table 7 - Recommended Pavement Structure – Access Lanes, Fire Truck Lane, Ramp, and Heavy Loading Areas Over Podium Deck	
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
300*	**BASE** - OPSS Granular A Crushed Stone
See below**	**Thermal Break** ** - Rigid Insulation (See Following Paragraph)
n/a	**Waterproofing Membrane and IKO Protection Board**
SUBGRADE – Reinforced concrete podium deck * Thickness of base course is dependent on grade of insulation as noted in proceeding paragraph ** If specified by others, not required from a geotechnical perspective	

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 is recommended between the two subgrade surfaces. Further, the base layer thickness should be increased to a minimum thickness of 500 mm below the top of the podium slab a minimum of 1.5 m from the face of the foundation wall prior to providing the recommended taper.

Should the proposed podium deck be specified 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 40 (HI-40). The base layer thickness will be dependent on the grade of insulation considered for this project and should be reassessed by the geotechnical consultant once pertinent design details have been prepared.

The higher grades of insulation have more resistance to deformation under wheel-loading and require less granular cover to avoid being crushing by vehicular loading. It should be noted that SM (Styrofoam) rigid insulation is **not** considered suitable for this application.

Pavement Structure on Overburden Soils

The following pavement structures may be considered for at-grade car only parking and heavy traffic areas, should they be required. The proposed pavement structures are shown in Tables 8 and 9, on the next page.

Table 8 - Recommended Pavement Structure - Car-Only Parking Areas	
Thickness (mm)	**Material Description**
50	**Wear Course** - HL-3 or Superpave 12.5 Asphaltic Concrete
150	**BASE** - OPSS Granular A Crushed Stone
300	**SUBBASE** - OPSS Granular B Type II
SUBGRADE - Either in situ soils, bedrock or OPSS Granular B Type I or II material placed over in situ soil or bedrock	

Table 9 - 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 soils, bedrock or OPSS Granular B Type I or II material placed over in situ soil or bedrock	

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 99% of the material's SPMDD using suitable compaction equipment.

6.0 Design and Construction Precautions

6.1 Foundation Drainage and Backfill

It is anticipated that the proposed building foundation walls located below finished grades be blind-poured and placed against a composite drainage board and waterproofing membrane which is fastened to the temporary shoring system or vertical bedrock face.

For the portion of the composite drainage board and waterproofing membrane installed against vertical bedrock face, the following is recommended:

- ❑ Line drill the excavation perimeter (usually at 150 to 200 mm spacing).
- ❑ Mechanically remove bedrock along the foundation walls, up to approximately 150 mm from the finished vertical excavation face.
- ❑ Grind the bedrock surface up to the outer face of the line drilled holes to create a satisfactory surface for the waterproofing membrane and/or composite drainage board.
- ❑ If bedrock overbreaks occur, shotcrete these areas to fill in cavities and to smooth out angular features of the bedrock surface, as required based on site inspection by Paterson.
- ❑ Place a composite drainage board, such as Delta Drain 6000 or equivalent, against the prepared vertical bedrock surface. The composite drainage layer should extend from the finished grade to the underside of the footing.
- ❑ Place a suitable waterproofing membrane (such as Grace Preprufe 275 or approved equivalent) over the composite drainage board. The waterproofing membrane should extend from the finished grade to the underside of the footing.
- ❑ Pour the foundation wall against the waterproofing membrane and composite drainage board.

It is recommended that 100 mm diameter sleeves at 3 m centres be cast at the foundation wall/footing interface to allow for the infiltration of water that breaches the waterproofing system to flow to an interior perimeter drainage pipe. The perimeter drainage pipe should direct water to sump pit(s) within the lower basement area.

Elevators and any other pits located below the underslab drainage system should be waterproofed. A full waterproofing detail for the foundation walls and the mechanical pits can be provided by Paterson, if required.

Perimeter and Underslab Drainage System

The perimeter and underslab drainage system is recommended to control water infiltration below the underground parking level slab and to re-direct water from the buildings foundation drainage system to the building's sump pit(s). For preliminary design purposes, it is recommended that 100 mm perforated pipes provided with a geosock, surrounded on all sides by a minimum 150 mm thick layer of 19 mm clear crushed stone, be placed at approximate 6 m centres underlying the underground parking level slab.

The perimeter drainage system should be mechanically connected to the 100 mm drainage sleeves and gravity connected to the underslab drainage system, which in turn is connected to the building's sump pit(s).

The spacing of the underslab drainage system should be confirmed by the geotechnical consultant at the time of completing the excavation when water infiltration can be better assessed.

Foundation Backfill

Where the foundation walls are not poured directly against the temporary shoring system, the perimeter foundation walls can be backfilled with the site excavated soils, provided that they are maintained in an unfrozen state and at a suitable moisture content for compaction. Imported granular materials, such as clean sand or OPSS Granular B Type II granular material, should otherwise be used for this purpose.

6.2 Protection of Footings Against Frost Action

Perimeter footings of heated structures are recommended to be insulated against the deleterious effects of frost action. A minimum 1.5 m thick soil cover, or an equivalent combination of soil cover and foundation insulation should be provided in this regard.

Exterior unheated footings, such as isolated exterior piers, are more prone to deleterious movement associated with frost action than the exterior walls of the structure proper and require additional protection, such as soil cover of 2.1 m or a combination of soil cover and foundation insulation.

However, the footings are generally not expected to require protection against frost action due to the founding depth. Unheated structures such as the access ramp may require insulation for protection against the deleterious effects of frost action.

6.3 Excavation Side Slopes

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

Unsupported Side Slopes

The excavation side slopes above the groundwater level extending to a maximum depth of 3 m should be cut back at 1H:1V or flatter. The flatter slope is required for excavation below groundwater level. The subsurface soil at this site is considered to be mainly a Type 2 and 3 soil according to the Occupational Health and Safety Act and Regulations for Construction Projects.

Excavation side slopes carried out for the building footprint are recommended to be provided with surface protection from erosion by rain and surface water runoff, where shoring is not anticipated to be implemented. This can be accomplished by covering the entire surface of the excavation side slopes with tarps secured between the top and bottom of the overburden excavation, and approved by Paterson personnel at the time of construction. It is further recommended to maintain a relatively dry surface along the bottom of the excavation footprint to mitigate the potential for sloughing of the side slopes.

Excavated soil should not be stockpiled directly at the top of excavations and heavy equipment should be kept away from the excavation sides.

Slopes in excess of 3 m in height should be periodically inspected by the geotechnical consultant in order to detect if the slopes are exhibiting signs of distress.It is recommended that a trench box be used at all times to protect personnel working in trenches with steep or vertical sides.

It is expected that services will be installed by “cut and cover” methods and excavations will not be left open for extended periods of time.

Temporary Shoring

Temporary shoring may be required for the overburden soils to complete the required excavations, where insufficient room is available for open cut methods. The shoring requirements, designed by a structural engineer specializing in those works, will depend on the depth of the excavation, the proximity of the adjacent structures and the elevation of the adjacent building foundations and underground services. The design and implementation of these temporary systems will be the responsibility of the excavation contractor and their design team.

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

The temporary shoring system should consist of a soldier pile and lagging system. Any additional loading due to street traffic, neighbouring buildings, construction equipment, adjacent structures and facilities, etc., should be included in the earth pressures described below. These systems could be cantilevered, anchored, or braced.

The earth pressures acting on the temporary shoring system may be calculated with the parameters presented in Table 10, presented below.

Table 10 – Soil Parameters

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

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

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

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

Bedrock Stabilization

The excavation side slopes in sound bedrock can be carried out using vertical side walls. A minimum 1 m horizontal ledge should be left between the bottom of the overburden excavation and the top of the bedrock surface to provide an area to allow for potential sloughing or to provide a stable base for the overburden shoring system.

The requirement for bedrock stabilization measures such as temporary chainlink fencing, shotcrete, and/or rock bolts, particularly for the upper weathered bedrock, should be evaluated during the excavation operations and should be discussed with the structural engineer during the design stage of the project.

6.4 Pipe Bedding and Backfill

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

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

The cover material, which should consist of OPSS Granular A crushed stone, should extend from the spring line of the pipe to a minimum of 300 mm above the obvert of the pipe. The material should be placed in maximum 300 mm thick lifts and compacted to a minimum of 99% of its SPMDD.

Generally, it should be possible to re-use the moist (not wet) silty sand to sandy silt and glacial till above the cover material if the excavation and filling operations are carried out in dry weather conditions.

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

6.5 Groundwater Control

It is anticipated that groundwater infiltration into the excavations should be relatively low to moderate, and controllable using open sumps. The contractor should be prepared to direct water away from all bearing surfaces and subgrades, regardless of the source, to prevent disturbance to the founding medium.

Permit to Take Water

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

For typical ground or surface water volumes being pumped during the construction phase, typically between 50,000 to 400,000 L/day, it is required to register on the Environmental Activity and Sector Registry (EASR). A minimum of two to four weeks should be allotted for completion of the EASR registration and the Water Taking and Discharge Plan to be prepared by a Qualified Persons as stipulated under O.Reg. 63/16.

Adverse Effects of Dewatering on Adjacent Properties

Given the glacial till and bedrock soils present at the subject site and its vicinity, the neighbouring structures are expected to be founded on the glacial till or bedrock surface, which are not susceptible to settlement from dewatering. Therefore, no issues are expected with respect to groundwater lowering that would cause damage to adjacent structures surrounding the proposed development.

6.6 Winter Construction

Precautions must be taken if winter construction is considered for this project. The subsoil conditions at this site consist of frost susceptible materials. In the presence of water and freezing conditions, ice could form within the soil mass. Heaving and settlement upon thawing could occur.

In the event of construction during below zero temperatures, the founding stratum should be protected from freezing temperatures using straw, propane heaters and tarpaulins or other suitable means.

In this regard, the base of the excavations should be insulated from sub-zero temperatures immediately upon exposure and until such time as heat is adequately supplied to the building and the footings are protected with sufficient soil cover to prevent freezing at founding level.

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

6.7 Corrosion Potential and Sulphate

The analytical test results of the soil sample indicate that the sulphate content is less than 0.1%. These results along with the chloride and pH value are indicative that Type 10 Portland cement (Type GU) would be appropriate for this site. The chloride content and the pH of the sample indicate they are not significant factors in creating a corrosive environment for exposed ferrous metals at this site, whereas the resistivity is indicative of a severe to very aggressive environment.

6.8 Slope Stability Assessment

As part of the ongoing geotechnical investigation, Paterson has conducted a review of the slope along the creek adjacent to the eastern boundary of the site.

Based on the current field investigation and available topographic information, a cross-section was analyzed for slope stability using SLIDE, a computer program for two-dimensional slope stability analysis. Overall, 1 slope cross-section throughout the above-noted locations was analyzed as part of the slope stability analysis.

Slope Stability Analysis

The slope stability analysis was modelled in SLIDE, a computer program which permits a two-dimensional slope stability analysis calculating several methods including the Bishop's method, which is a widely accepted slope analysis method. The program calculates a factor of safety, which represents the ratio of the forces resisting failure to forces favoring failure.

Theoretically, a factor of safety of 1.0 represents a condition where the slope is stable. However, due to intrinsic limitations of the calculation methods and the variability of the subsurface soil and groundwater conditions, a factor of safety greater than 1.0 is generally required for the failure risk to be considered acceptable.

A minimum factor of safety of 1.5 is generally recommended for conditions where the slope failure would comprise permanent structures. An analysis considering seismic loading was also completed. A horizontal acceleration of 0.18 g was considered for the sections for the seismic loading condition. A factor of safety of 1.1 is considered to be satisfactory for stability analyses including seismic loading. It should be noted that only the figures with the lowest factor of safety are presented and considered the governing factors.

One (1) slope cross-section (Section A-A') was studied as the worst case scenario. The cross-section location is presented in Drawing PG7401-1 – Test Hole Location Plan in Appendix 2. It should be noted that details of the slope height and slope angle at the cross-section locations are presented in Figures 2 and 3 in Appendix 2, based on the topographic data obtained during the field investigation, as well as the available topographic data.

The effective and total strength soil parameters used for the static and seismic analyses were chosen based on the subsoil information recovered during the site investigation. The effective and total strength soil parameters used for the analyses are presented in Table 11 below.

Table 11 – Effective and Total Stress Soil Parameters

Soil Layer	Unit Weight (kN/m^3)	Friction Angle (degrees)	Cohesion (kPa)
Topsoil	16	28	5
Fill	20	35	-
Glacial Till	20	38	-
Bedrock	22	-	1,000+

Stable Slope Allowance

The result of the static analysis, shown on Figure 2 in Appendix 2, indicates a factor of safety of 1.32. The result of the seismic analysis, shown on Figure 3, indicates a factor of safety of 0.72, respectively. As a result, a **stable slope allowance of 1.8 m** is required from the top of the slope at this site, which extends to the required factors of safety of 1.5 and 1.1 under static and seismic analysis conditions, respectively.

Toe Erosion Allowance

Since the slopes are in direct contact with an active watercourse, erosion of the toe of slope is considered to be a notable factor contributing to the stability of the subject slopes.

The toe erosion allowance is based on the nature of the soils, the observed current erosion activities, and the width and location of the current watercourse, and has been determined in accordance with the City of Ottawa's Slope Stability Guidelines for Development Application in the City of Ottawa (2004) and the Ontario Ministry of Natural Resource Technical Guide – River and Stream Systems: Erosion Hazard Limit (2002).

Generally, subsurface conditions at the toe of slope were observed to consist of a layer of glacial till underlain by bedrock. Based on this and the consistency of the subsoil materials encountered throughout our investigation and field review along the watercourse, a **toe erosion allowance of 1 m** is recommended to be considered for the associated Limit of Hazard Lands.

Erosion Access Allowance

Based on our review and current guidelines, a **6 m erosion access allowance** is recommended from the top of the stable slope for the slopes to allow for future maintenance of the slope.

Limit of Hazard Lands

Based on these observations and the results of the slope stability analysis, Paterson has established a Limit of Hazard Lands setback from the observed top of the slope. The Limit of Hazard Lands is determined by a combination of stable slope allowance, toe erosion allowance, and erosion access allowance.

As a result, a Limit of Hazard Lands designation of **8.8 m** is required from the top of the slope along the creek at the subject site. This Limit of Hazard Land setback is shown on the attached Drawing PG7401-1 - Test Hole Location Plan, located in Appendix 2.

It is recommended that the existing vegetation on the slope faces not be removed, as it plays a vital role in maintaining slope stability and mitigating erosion.

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 servicing plan, from a geotechnical perspective.
- ❑ Review of the geotechnical aspects of the foundation drainage systems prior to construction, if applicable.
- ❑ Review of the geotechnical aspects of the excavation contractor's shoring design, if not designed by Paterson, prior to construction, if applicable.

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 and waterproofing systems.
- ❑ Observation of all bearing surfaces prior to the placement of concrete.
- ❑ Sampling and testing of the concrete and fill materials.
- ❑ Periodic observation of the condition of unsupported excavation side slopes in excess of 3 m in height, if applicable.
- ❑ 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 herein 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 TC United, 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.



Puneet Bandi, M.Eng.





Scott S. Dennis, P.Eng.

Report Distribution:

- ❑ TC United
- ❑ Paterson Group

APPENDIX 1

SOIL PROFILE AND TEST DATA SHEETS

SYMBOLS AND TERMS

BOREHOLE LOGS BY OTHERS

CONCRETE CORE COMPRESSIVE STRENGTH RESULTS

ANALYTICAL TESTING RESULTS

SOIL PROFILE AND TEST DATA

Geotechnical Investigation

1867 Alta Vista Drive, Ottawa, Ontario

COORD. SYS.: MTM ZONE 9 **EASTING:** 370447.07 **NORTHING:** 5029287.66 **ELEVATION:** 72.63

PROJECT: Proposed Residential Development

BORINGS BY: CME-55 Track Mounted Drill Rig

REMARKS:

DATE: December 20, 2024

FILE NO. : PG7401

HOLE NO. : BH 1-24

SAMPLE DESCRIPTION	STRATA PLOT	DEPTH (m)	SAMPLE TYPE AND NO.	RECOVERY (%)	N, Nc OR RQD	ANALYTICAL TESTS	GASTECH (ppm) / GASTECH (% LEL) 50 100 150 200 — PID (ppm) / PID (% LEL) 20 40 60 80	PIEZOMETER CONSTRUCTION	ELEVATION (m)
GROUND SURFACE		0							72
ASPHALT 0.08m [72.55m]			AU 1						
FILL: Compact, brown silty sand, with gravel and crushed stone 0.69m [71.94m]									
FILL: Stiff, brown silty clay, with sand, gravel and cobbles		1	SS 2	71	4-23-7-7 30				
1.45m [71.18m]									
FILL: Dense, brown silty sand, with gravel and cobbles		2	SS 3	67	12-18-17-17 35				71
			SS 4	87	10-15-32-27 47				70
2.97m [69.66m]		3							
GLACIAL TILL: Very dense, grey silty sand to sandy silt, with gravel, cobbles and boulders			SS 5	92	20-30-30-22 60				69
		4	SS 6	75	13-15-15-19 30				
			SS 7	100	18-50-/-/ 50/0.15				68
		5	SS 8	51	50-/-/-/ 50/0.05				
5.49m [67.14m]									67
BEDROCK: Weathered		6	SS 9	0	50-/-/-/ 50/0.03				
6.10m [66.53m]									
BEDROCK: Poor to fair quality shale, interbedded with limestone			RC 1	100	RQD 47				66
		7							
			RC 2	92	RQD 32				65
7.72m [64.91m]									
End of Borehole		8							64
		9							

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SOIL PROFILE AND TEST DATA

Geotechnical Investigation

1867 Alta Vista Drive, Ottawa, Ontario

COORD. SYS.: MTM ZONE 9 **EASTING:** 370459.66 **NORTHING:** 5029249.36 **ELEVATION:** 73.61

PROJECT: Proposed Residential Development

BORINGS BY: CME-55 Track Mounted Drill Rig

REMARKS:

DATE: December 20, 2024

FILE NO. : PG7401

HOLE NO. : BH 2-24

SAMPLE DESCRIPTION	STRATA PLOT	DEPTH (m)	SAMPLE TYPE AND NO.	SAMPLE RECOVERY (%)	SAMPLE N, Nc OR RQD	SAMPLE ANALYTICAL TESTS	GASTECH (ppm) / GASTECH (% LEL) 50 100 150 200 / PID (ppm) / PID (% LEL) 20 40 60 80	PIEZOMETER CONSTRUCTION	ELEVATION (m)
GROUND SURFACE		0							73
TOPSOIL and organics 0.08m [73.53m]			AU 1						
FILL: Loose to compact, brown silty sand, with gravel, cobbles and crushed stone		1	SS 2	50	4-4-3-2 7				72
		2	SS 3	46	4-4-3-8 7				71
2.59m [71.02m]									
GLACIAL TILL: Dense, brown silty sand to sandy silt, some gravel and cobbels		3	SS 4	100	14-21-23-22 44				70
4.11m [69.50m]		4							
GLACIAL TILL: Very dense, grey silty sand to sandy silt, with gravel, cobbles and boulders		5	SS 5	98	39-54-/-/ 54/0.15				69
- Clay at 5.94 m depth		6	SS 6	51	50-/-/-/ 50/0.05				68
5.99m [67.62m]									
BEDROCK: Poor quality shale, interbedded wtith limestone		7	RC 1	91	RQD 15				67
			RC 2	92	RQD 41				66
7.80m [65.81m]		8							65
End of Borehole		9							

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SOIL PROFILE AND TEST DATA

Geotechnical Investigation

1867 Alta Vista Drive, Ottawa, Ontario

COORD. SYS.: MTM ZONE 9 **EASTING:** 370496.33 **NORTHING:** 5029207.70 **ELEVATION:** 74.01

PROJECT: Proposed Residential Development

BORINGS BY: CME-55 Track Mounted Drill Rig

REMARKS:

DATE: December 20, 2024

FILE NO. : PG7401

HOLE NO. : BH 3-24

SAMPLE DESCRIPTION	STRATA PLOT	DEPTH (m)	SAMPLE TYPE AND NO.	SAMPLE RECOVERY (%)	SAMPLE N, Nc OR RQD	SAMPLE ANALYTICAL TESTS	GASTECH (ppm) / GASTECH (% LEL) / PID (ppm) / PID (% LEL)	MONITORING WELL CONSTRUCTION	ELEVATION (m)
GROUND SURFACE		0					50 100 150 200 / 20 40 60 80		74
FILL: Compact to dense, brown silty sand, with gravel and cruhsed stone			AU 1						
		1	SS 2	50	18-11-22-13 33				73
		2	SS 3	46	6-11-21-12 32			1.7 m – 2025-01-03	72
2.59m [71.42m]									
GLACIAL TILL: Very dense grey silty sand to sandy silt, with gravel, cobbles and boulders		3	SS 4	83	15-25-27-21 52				71
		4							70
		5	SS 5	83	11-18-28-24 46				69
6.15m [67.86m]		6	SS 6	102	50-/-/-/ 50/0.05				68
End of Borehole Pracical refusal to augering on inferred bedrock at 6.15 m depth (GWL at 1.70 m depth - January 3, 2025)		7							67
		8							66
		9							

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SOIL PROFILE AND TEST DATA

Geotechnical Investigation

1867 Alta Vista Drive, Ottawa, Ontario

COORD. SYS.: MTM ZONE 9 **EASTING:** 370460.54 **NORTHING:** 5029194.69 **ELEVATION:** 74.00

PROJECT: Proposed Residential Development

BORINGS BY: Backhoe

REMARKS:

DATE: December 20, 2024

FILE NO. : PG7401

HOLE NO. : TP 1-24

SAMPLE DESCRIPTION	STRATA PLOT	DEPTH (m)	SAMPLE: TYPE AND NO.	SAMPLE: RECOVERY (%)	SAMPLE: N, Nc OR RQD	SAMPLE: ANALYTICAL TESTS	GASTECH (ppm) / GASTECH (% LEL) 50 100 150 200 / PID (ppm) / PID (% LEL) 20 40 60 80	PIEZOMETER CONSTRUCTION	ELEVATION (m)
GROUND SURFACE		0							74
FILL: Compact, brown silty sand, with gravel, some shale fragments, trace brick 0.50m [73.50m]			G 1						
FILL: Very dense, brown silty sand, with crushed stone, gravel and cobbles, trace concrete, metal and trash		1	G 2						73
			G 3						
		2	G 4						72
2.70m [71.30m]			G 5						
End of Test Pit Groundwater infiltration was observed at 0.60 m depth		3							71
		4							70
		5							69
		6							68
		7							67
		8							66
		9							

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SOIL PROFILE AND TEST DATA

Geotechnical Investigation

1867 Alta Vista Drive, Ottawa, Ontario

COORD. SYS.: MTM ZONE 9 **EASTING:** 370447.93 **NORTHING:** 5029176.78 **ELEVATION:** 74.30

PROJECT: Proposed Residential Development

BORINGS BY: Backhoe

REMARKS:

DATE: December 20, 2024

FILE NO. : PG7401

HOLE NO. : TP 2-24

SAMPLE DESCRIPTION	STRATA PLOT	DEPTH (m)	SAMPLE: TYPE AND NO.	SAMPLE: RECOVERY (%)	SAMPLE: N, Nc OR RQD	SAMPLE: ANALYTICAL TESTS	GASTECH (ppm) / GASTECH (% LEL) 50 100 150 200 / PID (ppm) / PID (% LEL) 20 40 60 80	PIEZOMETER CONSTRUCTION	ELEVATION (m)
GROUND SURFACE		0							74
FILL: Compact, brown silty sand, some crushed stone and gravel, trace clay and topsoil			G 1						
0.80m [73.50m]		1	G 2						73
FILL: Dense, brown silty sand, with crushed stone, gravel and cobbles, some trash and topsoil			G 3						
2.30m [72.00m]		2	G 4						72
GLACIAL TILL: Compact, grey silty clay, some gravel and cobbles									
2.50m [71.80m]		3							71
End of Test Pit									
Groundwater infiltration was observed at 1.05 m depth		4							70
		5							69
		6							68
		7							67
		8							66
		9							

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SOIL PROFILE AND TEST DATA

Geotechnical Investigation

1867 Alta Vista Drive, Ottawa, Ontario

COORD. SYS.: MTM ZONE 9 **EASTING:** 370517.04 **NORTHING:** 5029185.02 **ELEVATION:** 74.66

PROJECT: Proposed Residential Development

BORINGS BY: Backhoe

REMARKS:

DATE: December 20, 2024

FILE NO. : PG7401

HOLE NO. : TP 3-24

SAMPLE DESCRIPTION	STRATA PLOT	DEPTH (m)	SAMPLE: TYPE AND NO.	SAMPLE: RECOVERY (%)	SAMPLE: N, Nc OR RQD	SAMPLE: ANALYTICAL TESTS	GASTECH (ppm) / GASTECH (% LEL) 50 100 150 200 / PID (ppm) / PID (% LEL) 20 40 60 80	PIEZOMETER CONSTRUCTION	ELEVATION (m)
GROUND SURFACE		0							74
FILL: Compact, brown silty sand, some gravel and cobbles, trace concrete and topsoil			G 1						
0.90m [73.75m]		1	G 2						73
Compact to loose, brown **SILTY SAND**, trace gravel and cobbles to 1.50 m depth		2	G 3						72
3.10m [71.56m]		3	G 4 G 5						71
End of Test Pit		4							70
Groundwater infiltration was observed at 2.80 m depth		5							69
		6							68
		7							67
		8							66
		9							

DISCLAIMER: THE DATA PRESENTED IN THIS LOG IS THE PROPERTY OF PATERSON GROUP AND THE CLIENT FOR WHO IT WAS PRODUCED. THIS LOG SHOULD BE READ IN CONJUNCTION WITH ITS COORESPONDING REPORT. PATERSON GROUP IS NOT RESPONSIBLE FOR THE UNAUTHORIZED USE OF THIS DATA.

P:/AutoCAD Drawings/Test Hole Data Files/PG74xx/PG7401/data.sqlite 2025-01-15, 15:02 Paterson_Template MR

SOIL PROFILE AND TEST DATA

Geotechnical Investigation

1867 Alta Vista Drive, Ottawa, Ontario

COORD. SYS.: MTM ZONE 9 **EASTING:** 370473.15 **NORTHING:** 5029261.10 **ELEVATION:** 73.25

PROJECT: Proposed Residential Development

BORINGS BY: Backhoe

REMARKS:

DATE: December 20, 2024

FILE NO. : PG7401

HOLE NO. : TP 4-24

SAMPLE DESCRIPTION	STRATA PLOT	DEPTH (m)	SAMPLE: TYPE AND NO.	SAMPLE: RECOVERY (%)	SAMPLE: N, Nc OR RQD	SAMPLE: ANALYTICAL TESTS	GASTECH (ppm) / GASTECH (% LEL) 50 100 150 200 / PID (ppm) / PID (% LEL) 20 40 60 80	PIEZOMETER CONSTRUCTION	ELEVATION (m)
GROUND SURFACE		0							73
FILL: Loose to compact, brown silty sand, some gravel and cobbles, metal, crushed stone, topsoil, asphalt, trace brick			G 1						
		1	G 2						72
		2	G 3						71
2.60m [70.65m]			G 4						
End of Test Pit		3							70
Groundwater Infiltration was observed at 2.10 m depth		4							69
		5							68
		6							67
		7							66
		8							65
		9							

DISCLAIMER: THE DATA PRESENTED IN THIS LOG IS THE PROPERTY OF PATERSON GROUP AND THE CLIENT FOR WHO IT WAS PRODUCED. THIS LOG SHOULD BE READ IN CONJUNCTION WITH ITS COORESPONDING REPORT. PATERSON GROUP IS NOT RESPONSIBLE FOR THE UNAUTHORIZED USE OF THIS DATA.

P:/AutoCAD Drawings/Test Hole Data Files/PG74xx/PG7401/data.sqlite 2025-01-15, 15:02 Paterson_Template MR

SYMBOLS AND TERMS

SOIL DESCRIPTION

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

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

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

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

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

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

SYMBOLS AND TERMS (continued)

SOIL DESCRIPTION (continued)

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

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

ROCK DESCRIPTION

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

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

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

SAMPLE TYPES

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

SYMBOLS AND TERMS (continued)

PLASTICITY LIMITS AND GRAIN SIZE DISTRIBUTION

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

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

CONSOLIDATION TEST

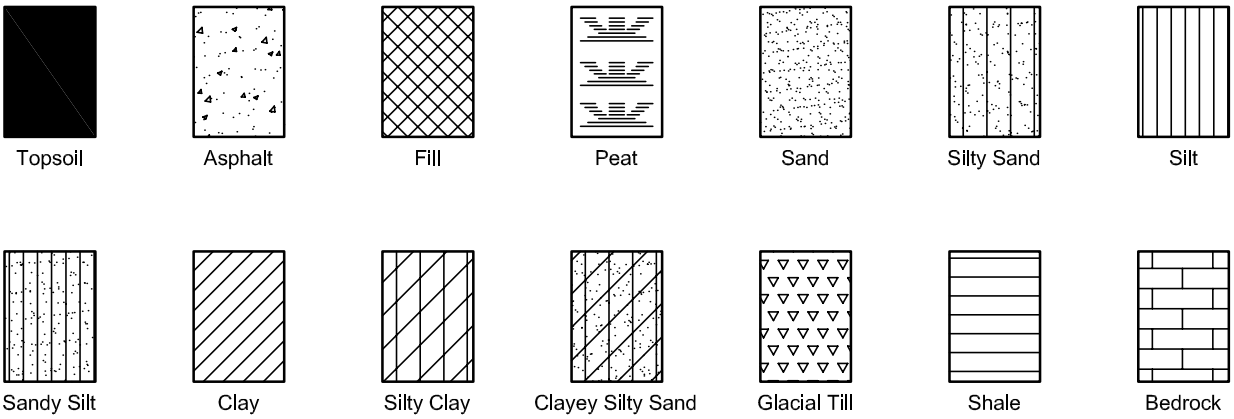
p'_o	-	Present effective overburden pressure at sample depth
p'_c	-	Preconsolidation pressure of (maximum past pressure on) sample
Ccr	-	Recompression index (in effect at pressures below p'_c)
Cc	-	Compression index (in effect at pressures above p'_c)
OC Ratio		Overconsolidaton ratio = p'_c / p'_o
Void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

PERMEABILITY TEST

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

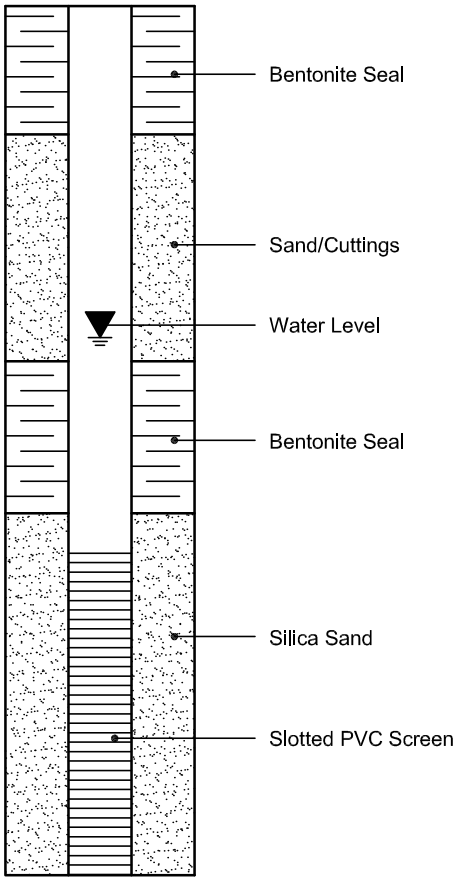
SYMBOLS AND TERMS (continued)

STRATA PLOT

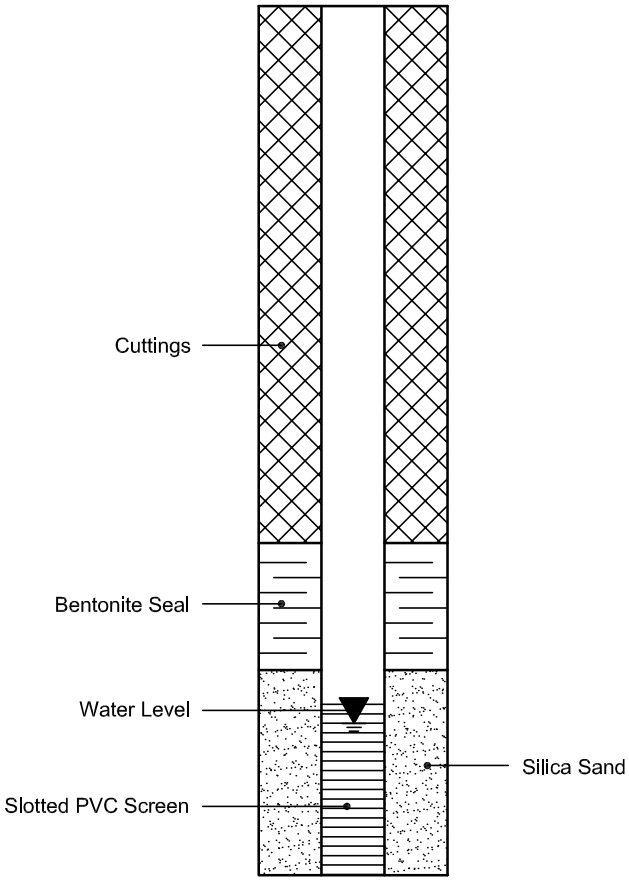


MONITORING WELL AND PIEZOMETER CONSTRUCTION

MONITORING WELL CONSTRUCTION



PIEZOMETER CONSTRUCTION



LOG OF BOREHOLE

NO. BH1(MW) SHEET. 1 of 1

PROJECT NO.: FE-P# 22-12467/68

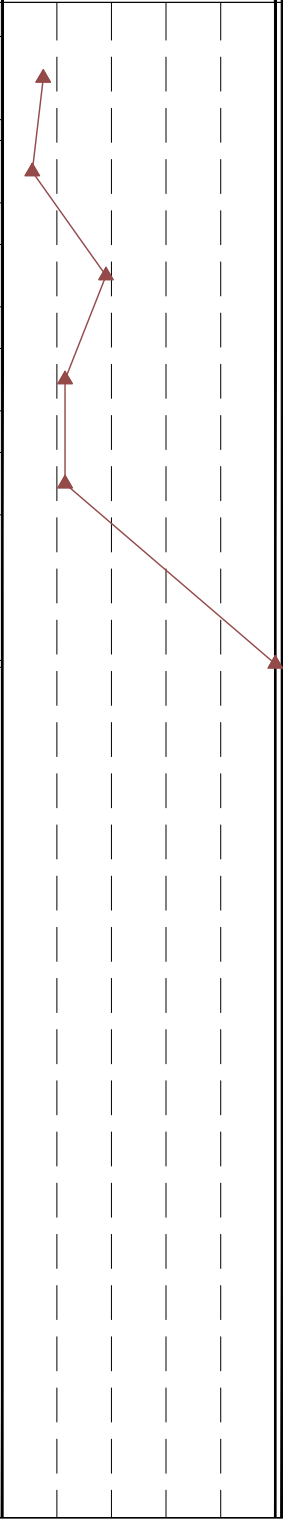
PROJECT NAME: GEOTECHNICAL & HYDROGEOLOGICAL INVESTIGATIONS

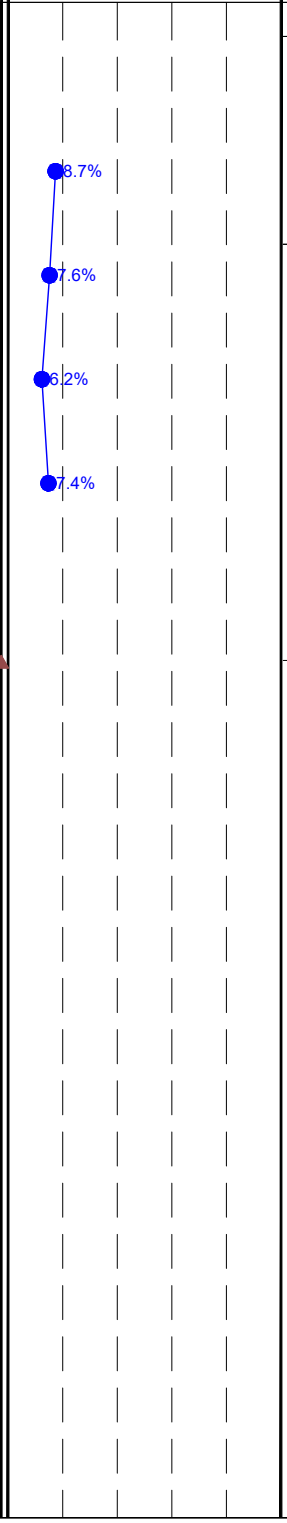
LOCATION: 1867 Alta Vista Drive, Ottawa, ON

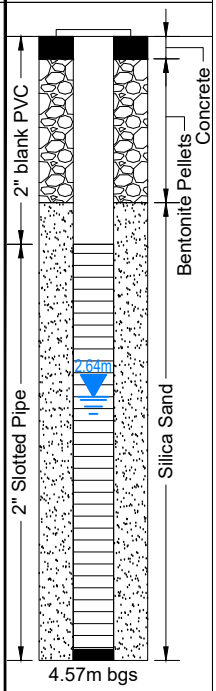
DRILLING METHOD: Truck, Soild Stem

DRILLING DATE: 19 September, 2022

DEPTH (feet)	DEPTH (meters)	DESCRIPTION	STRATA PLOT	ELEV. DEPTH (m)	LAB ID	Type NO.	"N" VALUE
				72.29			
0	0	~2" ASPHALT ~3" GRANULAR MATERIAL		0.13 72.16			
2	1	FILL: Greenish brown silty sand to silt & sand, trace gravel, mixed soil, cobbles, moist to wet, compact to dense				SS-1	15
4	1					SS-2	11
6	2					SS-3	38
8	2	Wet @ 2.31m				SS-4	23
10	3					SS-5	23
12	4						
14	4			4.57 67.72			
16	5	CLAYEY SILT TO SILTY CLAY: Grey, dry, hard		4.62 67.67		SS-6	100+
18	5	End of borehole at refusal to auger on suspected bedrock at 4.62m					
20	6						
22	7						
24	7						
26	8						
28	8						
30	9						
32	10						
34	10						







Groundwater Depth (m): on completion: 3.66m; on 7 October, 2022: 2.64m

DRAWN: D.C. | LOGGED: J.Y. | CHECKED: C.W.

FISHER ENGINEERING

LOG OF BOREHOLE

NO. BH2 SHEET. 1 of 1

PROJECT NO.: FE-P# 22-12467/68

PROJECT NAME: GEOTECHNICAL & HYDROGEOLOGICAL INVESTIGATIONS

LOCATION: 1867 Alta Vista Drive, Ottawa, ON

DRILLING METHOD: Truck, Solid Stem

DRILLING DATE: 20 September, 2022

DEPTH (feet)	DEPTH (meters)	DESCRIPTION	STRATA PLOT	ELEV. DEPTH (m)	LAB ID	Type NO.	"N" VALUE
				72.86			
0	0	~3" TOPSOIL					
		FILL: Brown sand, some silt, trace clay & gravel, moist, loose to dense				SS-1	6
2	1					SS-2	7
4							
6	2					SS-3	8
8						SS-4	6
10	3					SS-5	31
				3.51 / 69.35			
12	4	BEDROCK: Grey, dry, hard					
14		Auger refusal @ 4.62m		4.62 / 68.24		SS-6	100+
		End of borehole at 4.62m					
16	5						
18							
20	6						
22							
24	7						
26	8						
28							
30	9						
32							
34	10						

PENETRATION TESTING (SPT) ▲ 20 40 60 80

SHEAR STRENGTH (Kpa) ✚ 40 80 120 160

VAPOUR READING (ppm) □ 20 40 60 80

MOISTURE CONTENT (%) ● 10 20 30 40

PIEZOMETER OR WELL CONSTRUCTION

Groundwater Depth (m): on completion: Dry

DRAWN: D.C. LOGGED: J.Y. CHECKED: C.W.

FISHER ENGINEERING

LOG OF BOREHOLE

NO. BH3(MW) SHEET. 1 of 1

PROJECT NO.: FE-P# 22-12467/68

PROJECT NAME: GEOTECHNICAL & HYDROGEOLOGICAL INVESTIGATIONS

LOCATION: 1867 Alta Vista Drive, Ottawa, ON

DRILLING METHOD: Truck, Solid Stem

DRILLING DATE: 19 September, 2022

DEPTH (feet)	DEPTH (meters)	DESCRIPTION	STRATA PLOT	ELEV. DEPTH (m)	LAB ID	Type NO.	"N" VALUE
				73.47			
0	0	FILL: Brown silty sand, trace gravel, moist, compact				SS-1	15
2				0.79 / 72.68			
4	1	SILTY GRAVELLY SAND (POSSIBLY FILL): Brown to grey, moist, compact				SS-2	16
6	2					SS-3	10
8						SS-4	16
10	3					SS-5	21
12	4						
14				4.62 / 68.85			
16	5	SILTY SAND (POSSIBLY FILL): Grey, trace gravel & clay, moist, very dense		5.03 / 68.44		SS-6	62
18		End of borehole at 5.03m					
20	6						
22	7						
24							
26	8						
28							
30	9						
32	10						
34							

PENETRATION TESTING (SPT) ▲ 20 40 60 80

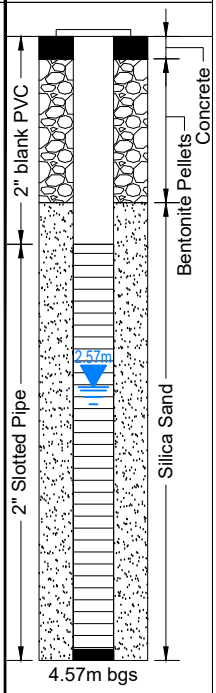
SHEAR STRENGTH (Kpa) ✚ 40 80 120 160

VAPOUR READING (ppm) □ 20 40 60 80

MOISTURE CONTENT (%) ● 10 20 30 40

● 12.9%

PIEZOMETER OR WELL CONSTRUCTION



Groundwater Depth (m): on completion: 2.41m; on 7 October, 2022: 2.57m

DRAWN: D.C. LOGGED: J.Y. CHECKED: C.W.

FISHER ENGINEERING

LOG OF BOREHOLE

NO. BH4 SHEET. 1 of 1

PROJECT NO.: FE-P# 22-12467/68

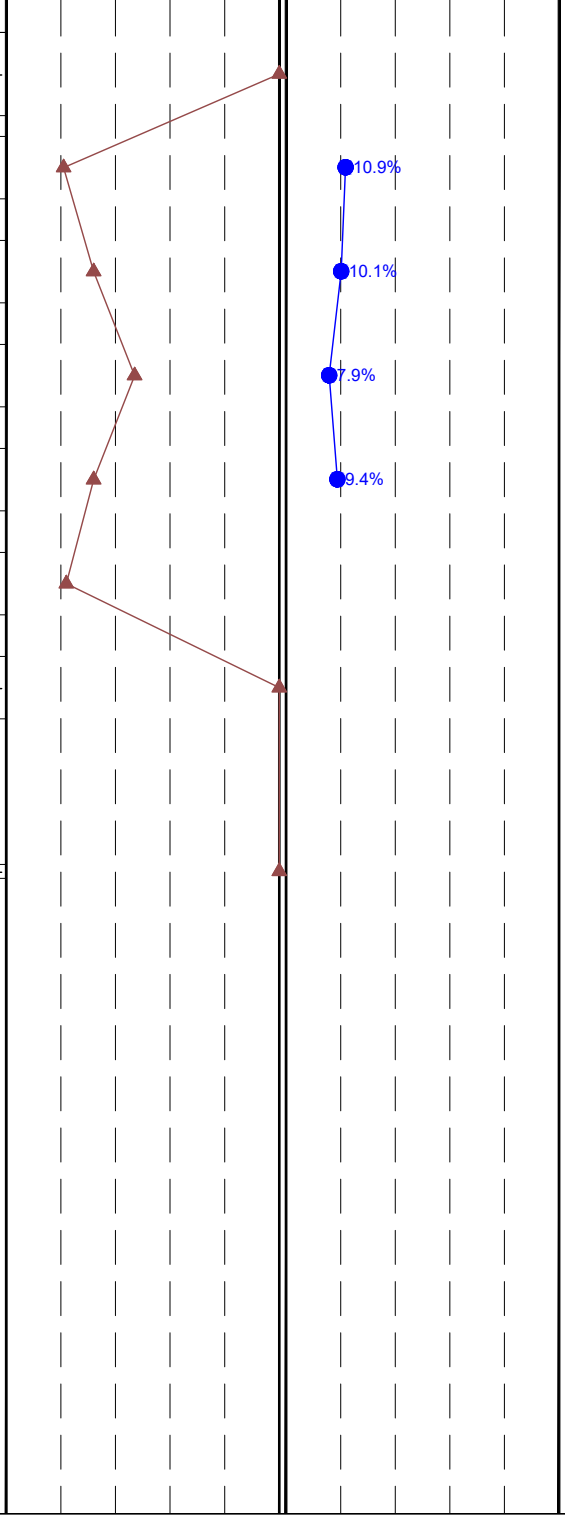
PROJECT NAME: GEOTECHNICAL & HYDROGEOLOGICAL INVESTIGATIONS

LOCATION: 1867 Alta Vista Drive, Ottawa, ON

DRILLING METHOD: Truck, Solid Stem

DRILLING DATE: 19 September, 2022

DEPTH (feet)	DEPTH (meters)	DESCRIPTION	STRATA PLOT	ELEV. DEPTH (m)	LAB ID	Type NO.	"N" VALUE
				73.48			
0	0	~2" ASPHALT ~3" GRANULAR MATERIAL		0.13 73.35			
		FILL: Brown to grey silty sand to sand, trace gravel, mixed soil, moist, very dense to compact				SS-1	100+
2	1					SS-2	21
4							
6	2					SS-3	32
8						SS-4	47
10	3					SS-5	32
12							
14	4					SS-6	22
16	5	CLAYEY SILT TO SILTY CLAY: Grey, dry, hard		4.97 68.51		SS-7	100+
18							
20	6					SS-8	100+
		End of borehole at refusal to auger on suspected bedrock at 6.20m		6.20 67.28			
22	7						
24							
26	8						
28							
30	9						
32							
34	10						



PIEZOMETER OR WELL CONSTRUCTION

Groundwater Depth (m): on completion: Dry

DRAWN: D.C. | LOGGED: J.Y. | CHECKED: C.W.

LOG OF BOREHOLE

NO. BH5 SHEET. 1 of 1

PROJECT NO.: FE-P# 22-12467/68

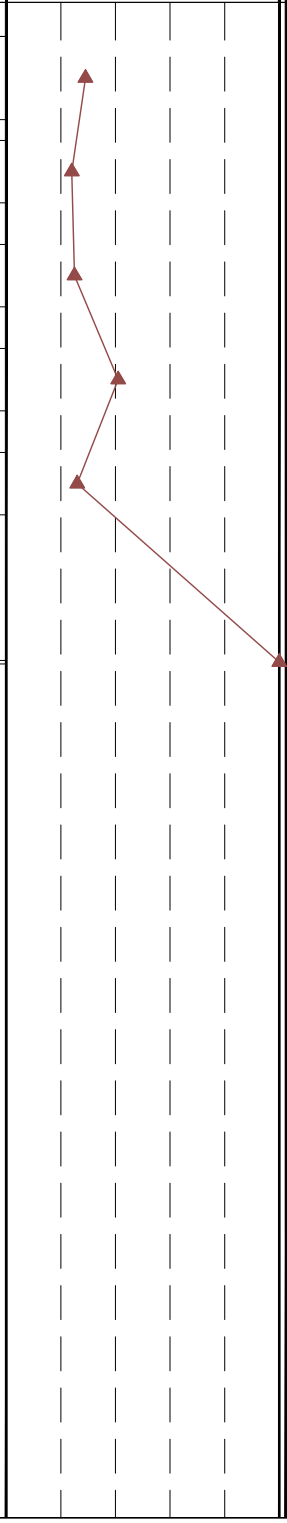
PROJECT NAME: GEOTECHNICAL & HYDROGEOLOGICAL INVESTIGATIONS

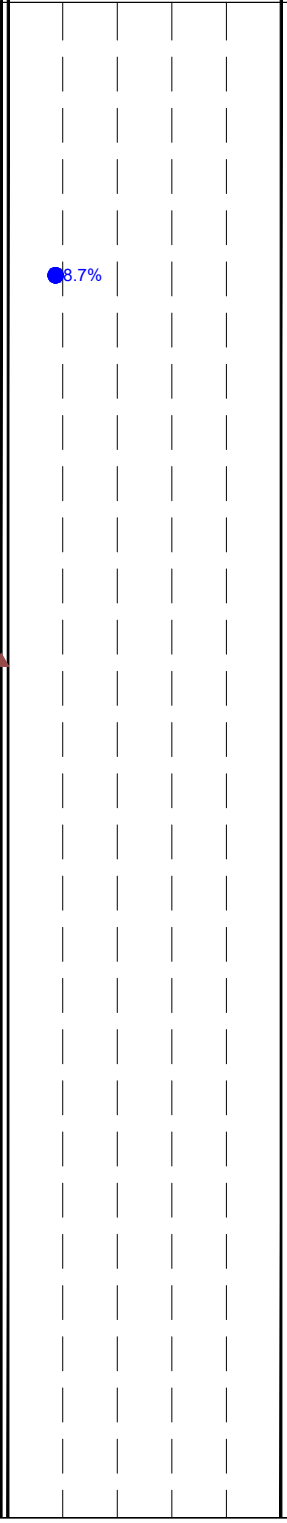
LOCATION: 1867 Alta Vista Drive, Ottawa, ON

DRILLING METHOD: Truck, Solid Stem

DRILLING DATE: 20 September, 2022

DEPTH (feet)	DEPTH (meters)	DESCRIPTION	ELEV. DEPTH (m)	LAB ID	Type NO.	"N" VALUE
			73.99			
0	0	~2" TOPSOIL				
		FILL: Grey/brown silt & sand to sand, with gravel, trace silt, mixed soil, moist to wet, compact to dense			SS-1	29
2	1				SS-2	24
4						
6	2				SS-3	25
		Wet @ 2.44m				
8					SS-4	41
10	3				SS-5	26
12						
14	4		4.60 / 69.39			
		End of borehole at refusal to auger on suspected bedrock at 4.60m			SS-6	100+
16	5					
18						
20	6					
22						
24	7					
26	8					
28						
30	9					
32						
34	10					





PIEZOMETER OR WELL CONSTRUCTION

Groundwater Depth (m): on completion: 2.44m

DRAWN: D.C. | LOGGED: J.Y. | CHECKED: C.W.

LOG OF BOREHOLE

NO. BH6(MW) SHEET. 1 of 1

PROJECT NO.: FE-P# 22-12467/68

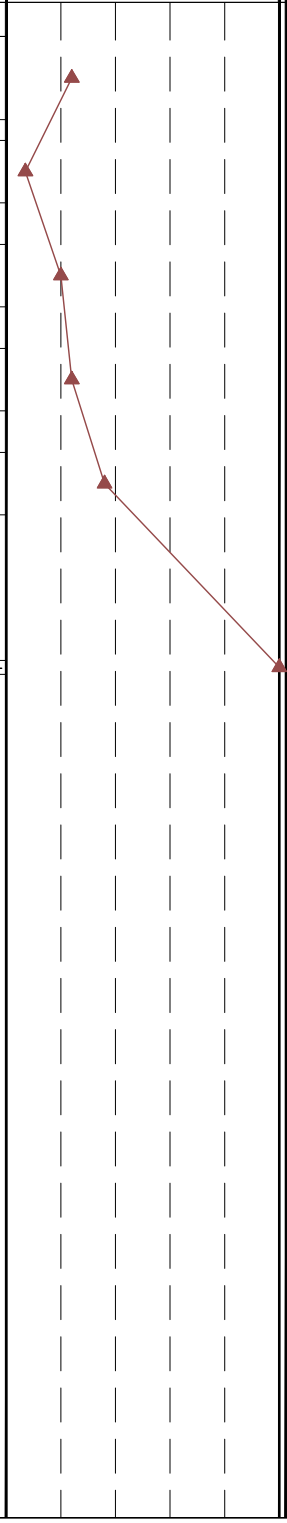
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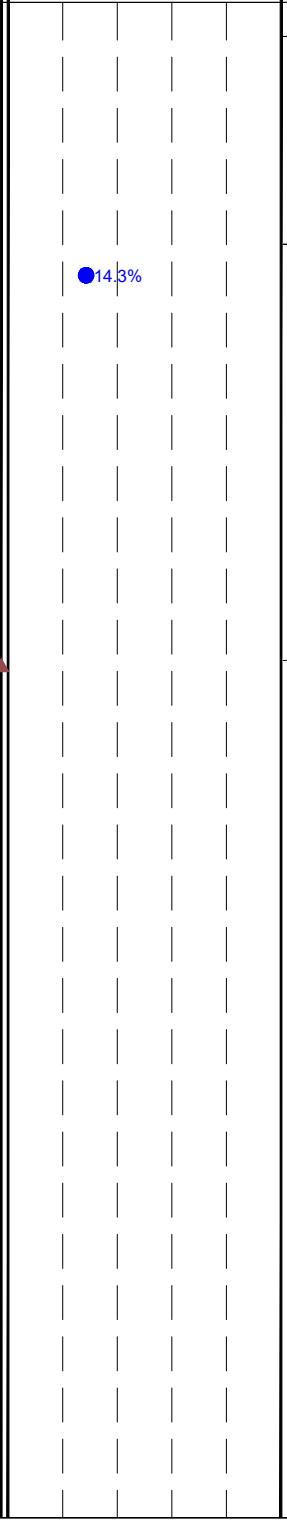
LOCATION: 1867 Alta Vista Drive, Ottawa, ON

DRILLING METHOD: Truck, Solid Stem

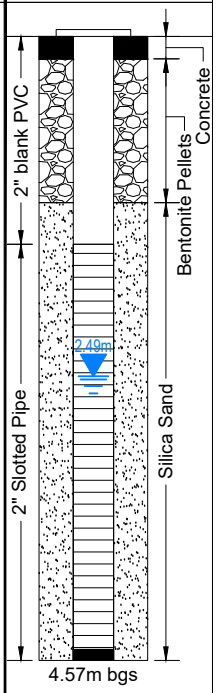
DRILLING DATE: 19 September, 2022

DEPTH (feet)	DEPTH (meters)	DESCRIPTION	STRATA PLOT	ELEV. DEPTH (m)	LAB ID	Type NO.	"N" VALUE
				72.82			
0	0	~3" ASPHALT		0.15			
		~3" GRANULAR MATERIAL		72.67			
2	1	FILL: Greenish brown, silt and sand, trace gravel & clay, some mixed soil, moist to wet, loose to dense				SS-1	24
4		Wet @ 1.52m				SS-2	7
6	2					SS-3	20
8						SS-4	24
10	3					SS-5	36
12	4						
14				4.60			
				68.22		SS-6	100+
		CLAYEY SILT TO SILTY CLAY: Grey, dry, hard		4.67			
16	5	End of borehole at refusal to auger on suspected bedrock at 4.67m		68.15			
18							
20	6						
22							
24	7						
26	8						
28							
30	9						
32							
34	10						





PIEZOMETER OR WELL CONSTRUCTION



Groundwater Depth (m): on completion: 4.57m; on 7 October, 2022: 2.49m

DRAWN: D.C. LOGGED: J.Y. CHECKED: C.W.

FISHER ENGINEERING

LOG OF BOREHOLE

NO. BH7 SHEET. 1 of 1

PROJECT NO.: FE-P# 22-12467/68

PROJECT NAME: GEOTECHNICAL & HYDROGEOLOGICAL INVESTIGATIONS

LOCATION: 1867 Alta Vista Drive, Ottawa, ON

DRILLING METHOD: Truck, Solid Stem

DRILLING DATE: 19 September, 2022

DEPTH (feet)	DEPTH (meters)	DESCRIPTION	STRATA PLOT	ELEV. DEPTH (m)	LAB ID	Type NO.	"N" VALUE
				73.76			
0	0	~6" ASPHALT & GRANULAR MATERIAL		0.15 / 73.61			
		FILL: Greyish brown silty sand to silt & sand, trace gravel & clay, moist, compact to dense				SS-1	18
2	1					SS-2	18
4							
6	2					SS-3	36
8						SS-4	25
10	3					SS-5	32
12	4						
14				4.60 / 69.16			
		CLAYEY SILT TO SILTY CLAY: Grey, dry, hard		4.62 / 69.14		SS-6	100+
16	5	End of borehole at refusal to auger on suspected bedrock at 4.62m					
18							
20	6						
22	7						
24							
26	8						
28							
30	9						
32	10						
34							

PENETRATION TESTING (SPT) ▲ 20 40 60 80

SHEAR STRENGTH (Kpa) ✚ 40 80 120 160

VAPOUR READING (ppm) □ 20 40 60 80

MOISTURE CONTENT (%) ● 10 20 30 40

PIEZOMETER OR WELL CONSTRUCTION

Groundwater Depth (m): on completion: Dry

DRAWN: D.C. LOGGED: J.Y. CHECKED: C.W.

LOG OF BOREHOLE

NO. BH8(MW) SHEET. 1 of 1

PROJECT NO.: FE-P# 22-12467/68

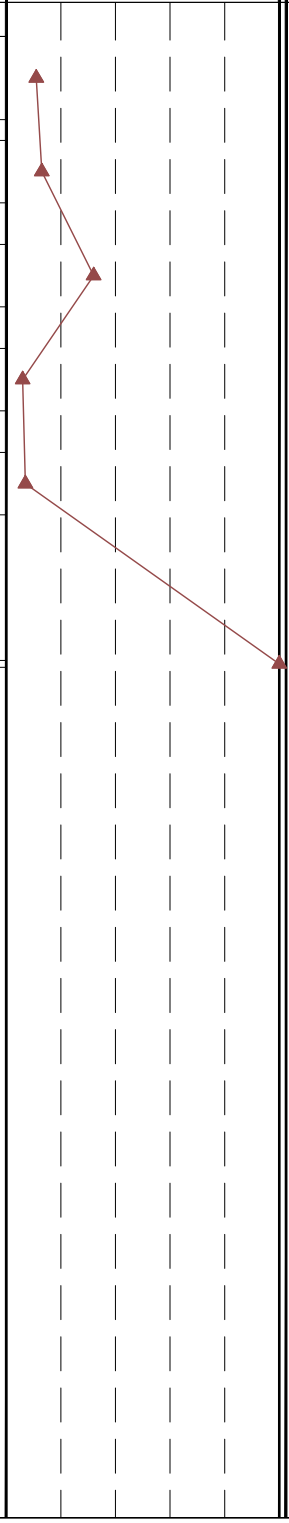
PROJECT NAME: GEOTECHNICAL & HYDROGEOLOGICAL INVESTIGATIONS

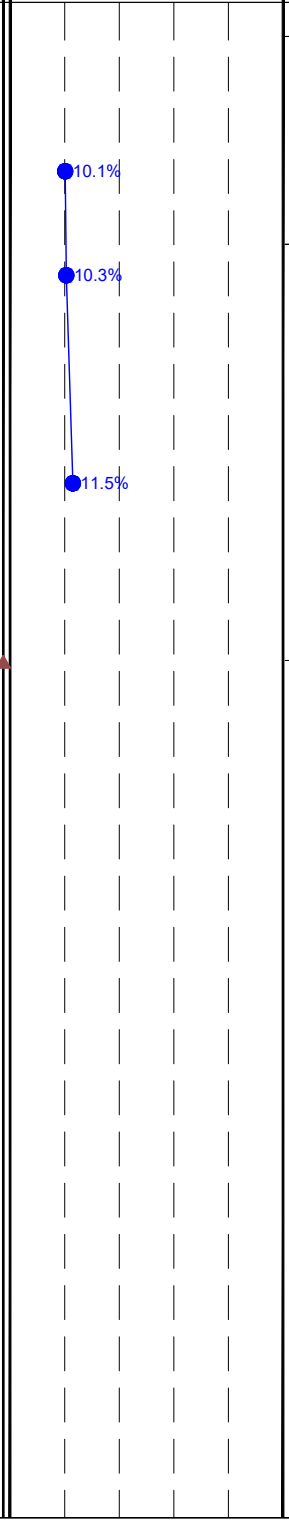
LOCATION: 1867 Alta Vista Drive, Ottawa, ON

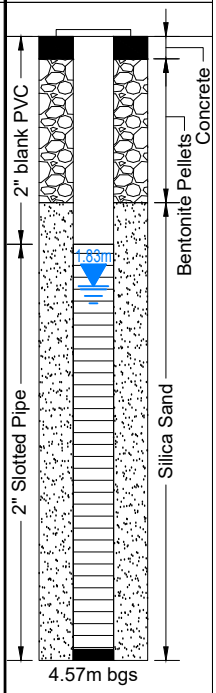
DRILLING METHOD: Truck, Solid Stem

DRILLING DATE: 19 September, 2022

DEPTH (feet)	DEPTH (meters)	DESCRIPTION	STRATA PLOT	ELEV. DEPTH (m)	LAB ID	Type NO.	"N" VALUE
				74.23			
0	0	~4" TOPSOIL					
		FILL: Brown sand, some silt, trace gravel, mixed soil, trace clay, moist, dense to loose				SS-1	11
2	1					SS-2	13
4							
6	2					SS-3	32
8						SS-4	6
10	3			3.11			
		SILTY SAND (POSSIBLY FILL): Grey, some clay, trace gravel, wet, loose		71.12		SS-5	7
12	4						
14				4.60			
				69.63			
		CLAYEY SILT TO SILTY CLAY: Grey, dry, hard		4.62		SS-6	100+
16	5			69.61			
		End of borehole at refusal to auger on suspected bedrock at 4.62m					
18							
20	6						
22							
24	7						
26	8						
28							
30	9						
32							
34	10						







Groundwater Depth (m): on completion: 2.44m; on 7 October, 2022: 1.83m

DRAWN: D.C. | LOGGED: J.Y. | CHECKED: C.W.

PATERSON GROUP

CONCRETE CORE COMPRESSIVE STRENGTH CSA A23.2-14C

CLIENT:	**Claridge Homes**	FILE No.:	**PG7401**
PROJECT:	1867 Alta Vista Drive	REPORT No.:	1
SITE ADDRESS:	**1867 Alta Vista Drive**	DATE REPT'D:	3-Jan-25
STRUCTURE TYPE & LOCATION:	Rock Core		

SAMPLE INFORAMTION			
LAB NO.:	**58811 Top**	**58811 Bottom**	
SAMPLE NO.:	BH1-24 RC2	BH1-24 RC2	
LOCATION:	23'5" - 23'11"	23'5" - 23'11"	
SAMPLE DATES			
DATE CAST	-	-	
DATE CORED	-	-	
DATE RECEIVED	23-Dec-24	23-Dec-24	
DATE TESTED	3-Jan-25	3-Jan-25	
SAMPLE DIMENSIONS			
AVERAGE DIAMETER (mm)	47.00	47.00	
HEIGHT (mm)	51.00	67.00	
WEIGHT (g)	230	320	
AREA (mm^2)	1735	1735	
VOLUME (cm^3)	88	116	
UNIT WEIGHT (kg/m^3)	**2599**	**2753**	
TEST RESULTS			
H / D RATIO	1.09	1.43	
CORRECTION FACTOR	0.901	0.951	
LOAD (lbs)	11700	16000	
GROSS Mpa	30.0	41.0	
MPa CORRECTED	**27.0**	**39.0**	
FORM OF BREAK	**Type A**	**Type A**	
DIRECTION OF LOADING	PARALLEL	PARALLEL	
CURING CONDITIONS	SITE→→→→→→→→→→→→→→→→→→→→→→→→→→→→→→→		
REMARKS			

TECHNICAL PERSONNEL			
TECHNICIAN:	**VERIFIED BY:** **C. Beadow**	**APPROVED BY:**	**Joe Forsyth, P. Eng.**

CERTIFIED LAB

John D. Paterson & Associates Ltd., 28 Concourse Gate, Nepean, ON

Photo 1:

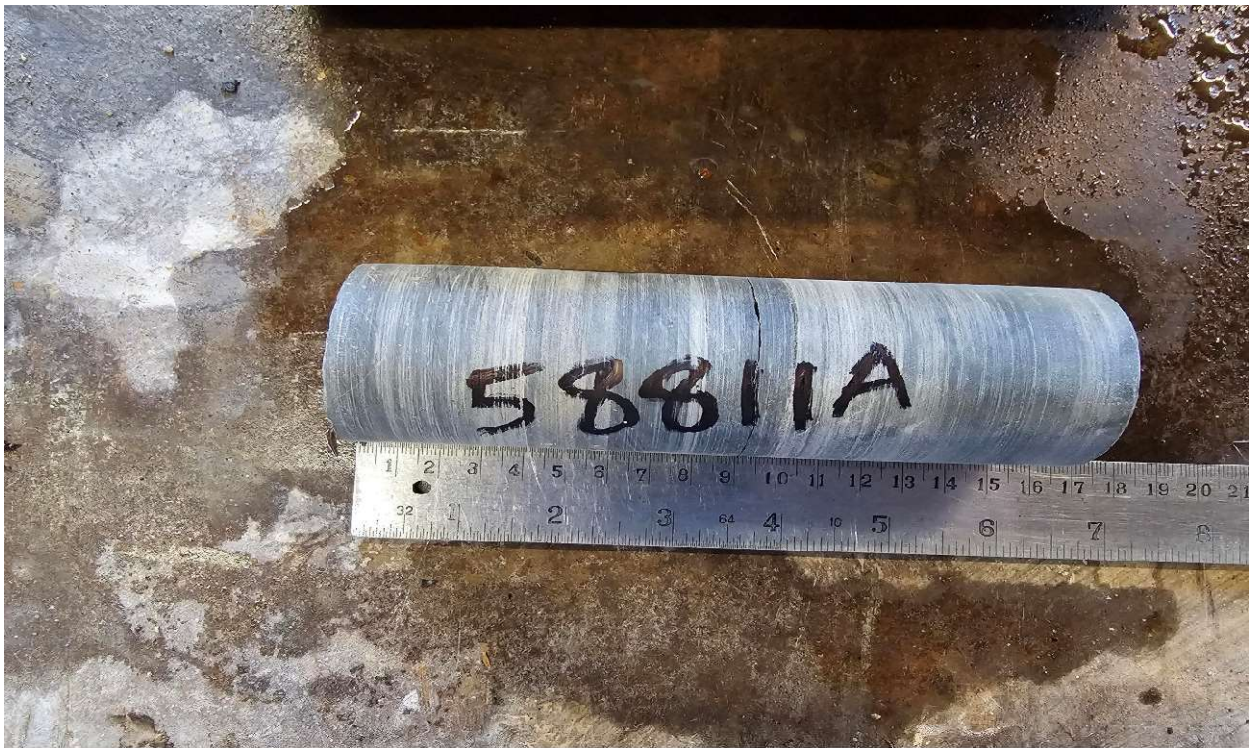


Photo 2:

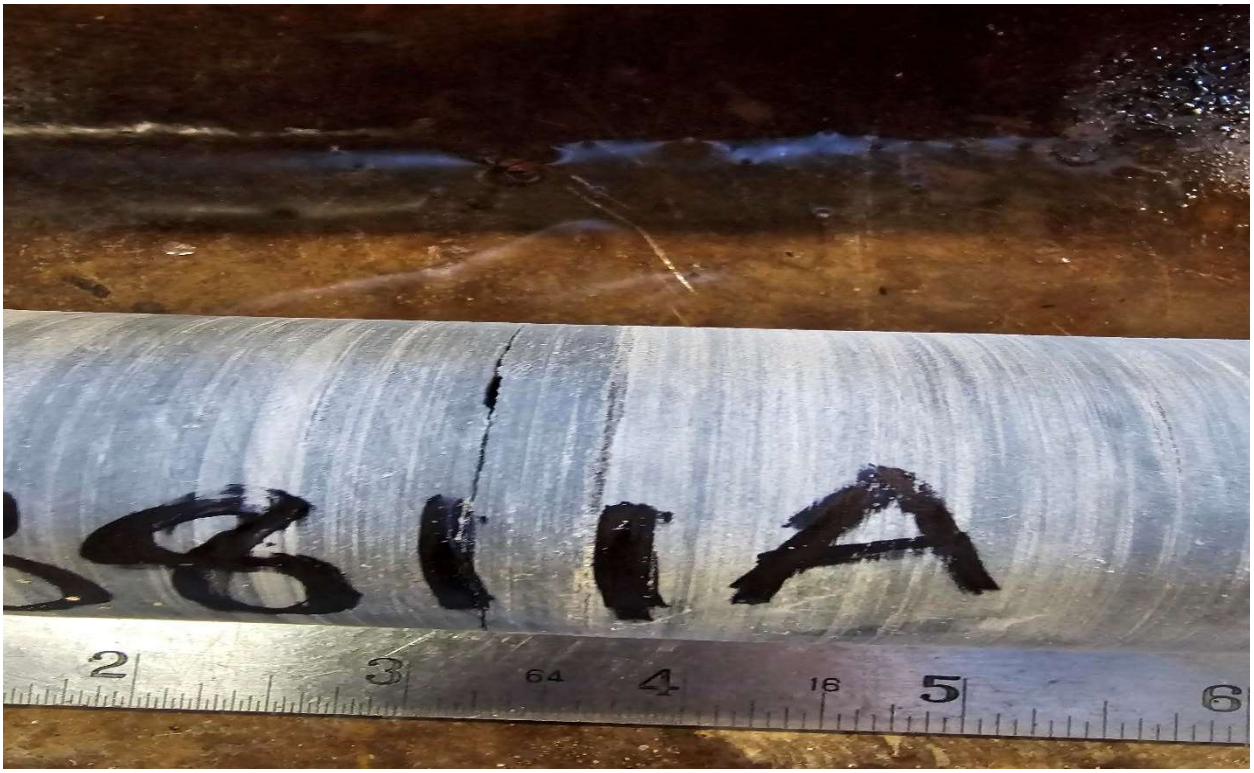
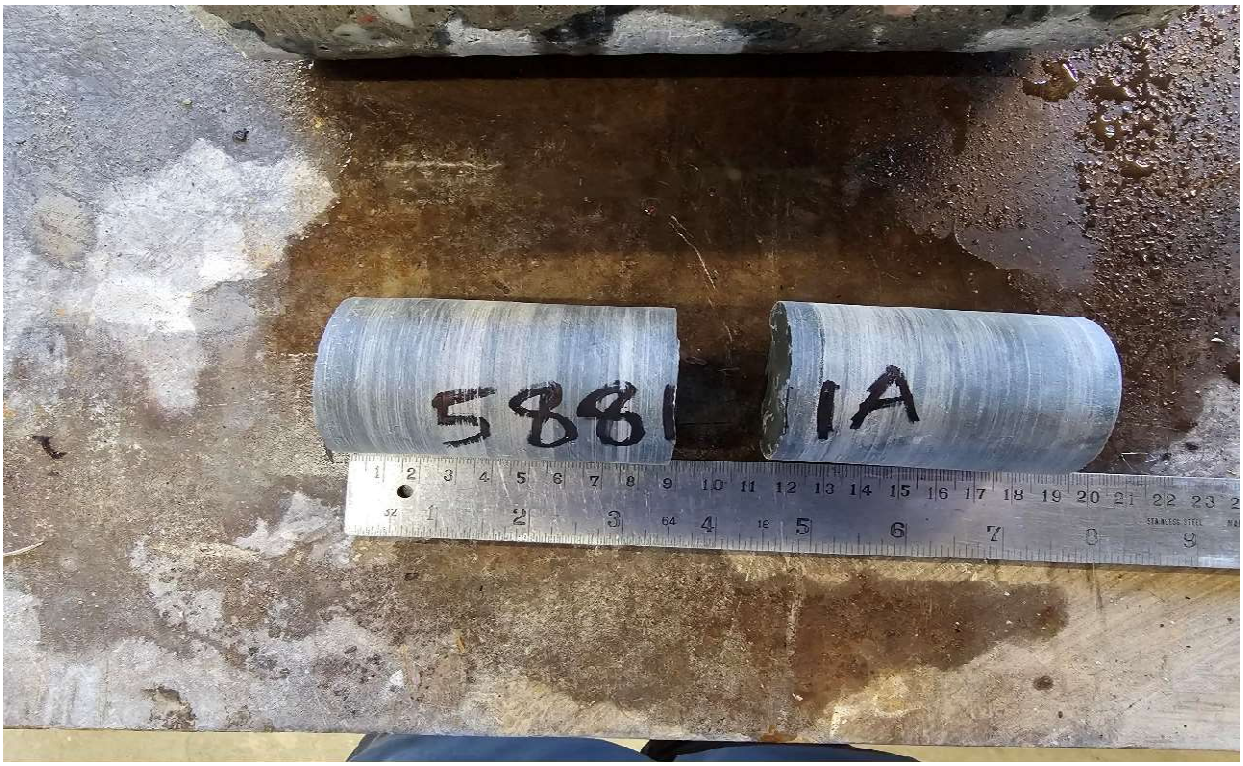


Photo 3:



PARACEL LABORATORIES LTD.

Order #: 2452099

Certificate of Analysis

Report Date: 02-Jan-2025

Client: Paterson Group Consulting Engineers (Ottawa)

Order Date: 24-Dec-2024

Client PO: 62083

Project Description: PE6830

	Client ID:	BH1-24 SS4	-	-	-		
	Sample Date:	20-Dec-24 09:00	-	-	-	-	-
	Sample ID:	2452099-01	-	-	-		
	Matrix:	Soil	-	-	-		
	MDL/Units						
Physical Characteristics							
% Solids	0.1 % by Wt.	91.3	-	-	-	-	-
General Inorganics							
pH	0.05 pH Units	7.16	-	-	-	-	-
Resistivity	0.1 Ohm.m	4.8	-	-	-	-	-
Anions							
Chloride	10 ug/g	260	-	-	-	-	-
Sulphate	10 ug/g	84	-	-	-	-	-

APPENDIX 2

FIGURE 1 – KEY PLAN

FIGURES 2 & 3 – SLOPE STABILITY ANALYSIS CROSS-SECTIONS

DRAWING PG7401-1 – TEST HOLE LOCATION PLAN

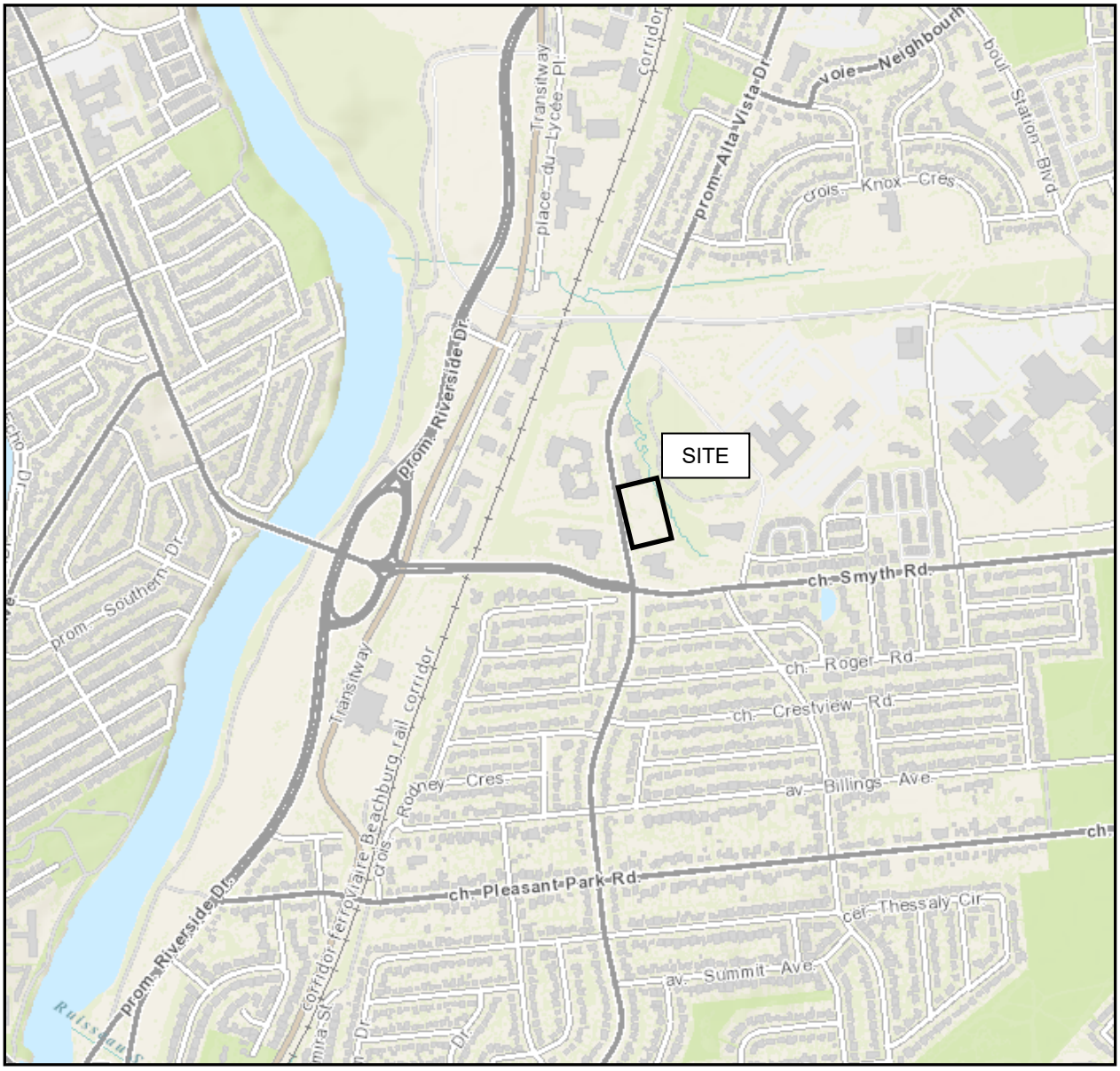
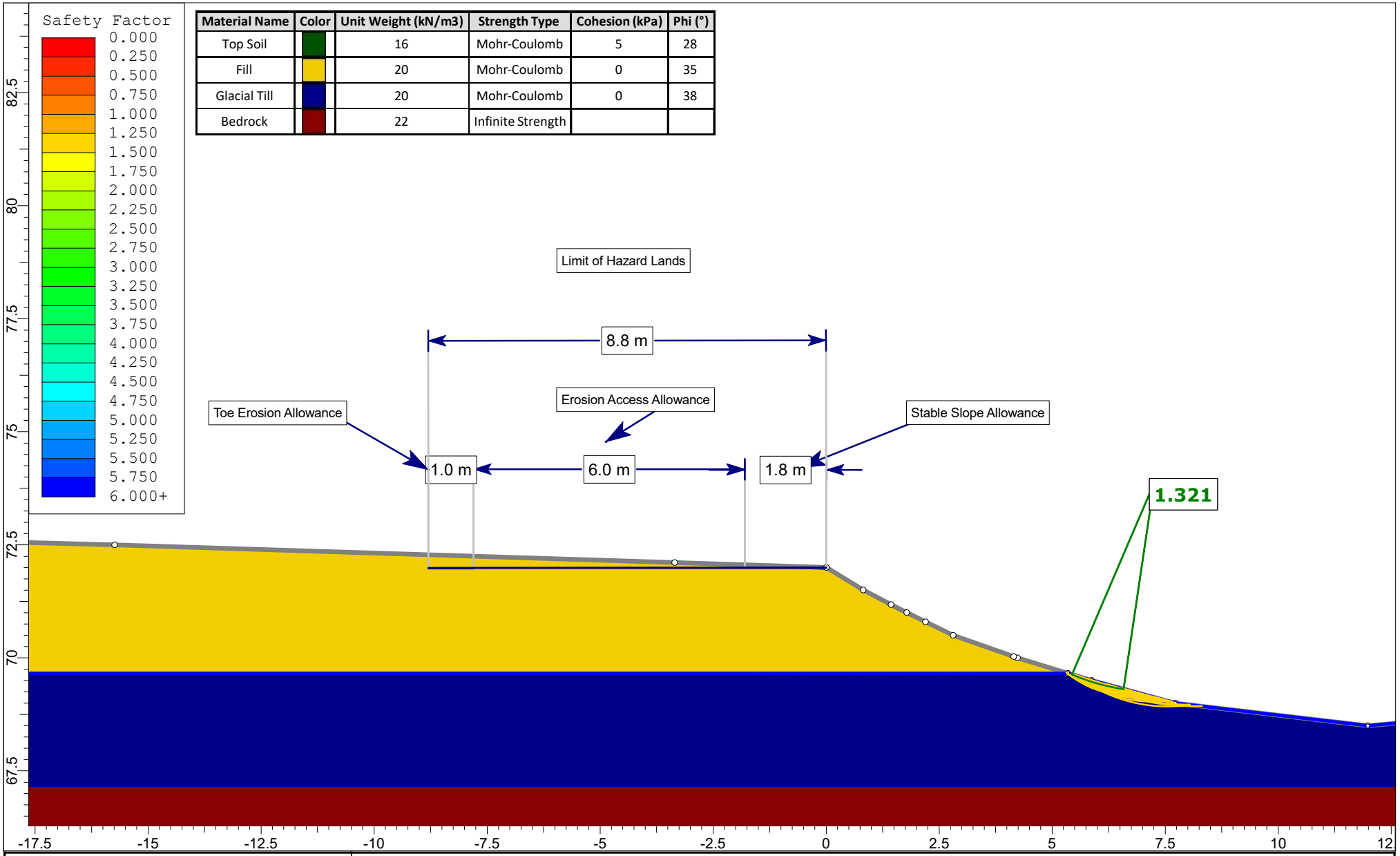


FIGURE 1

KEY PLAN

PATERSON GROUP

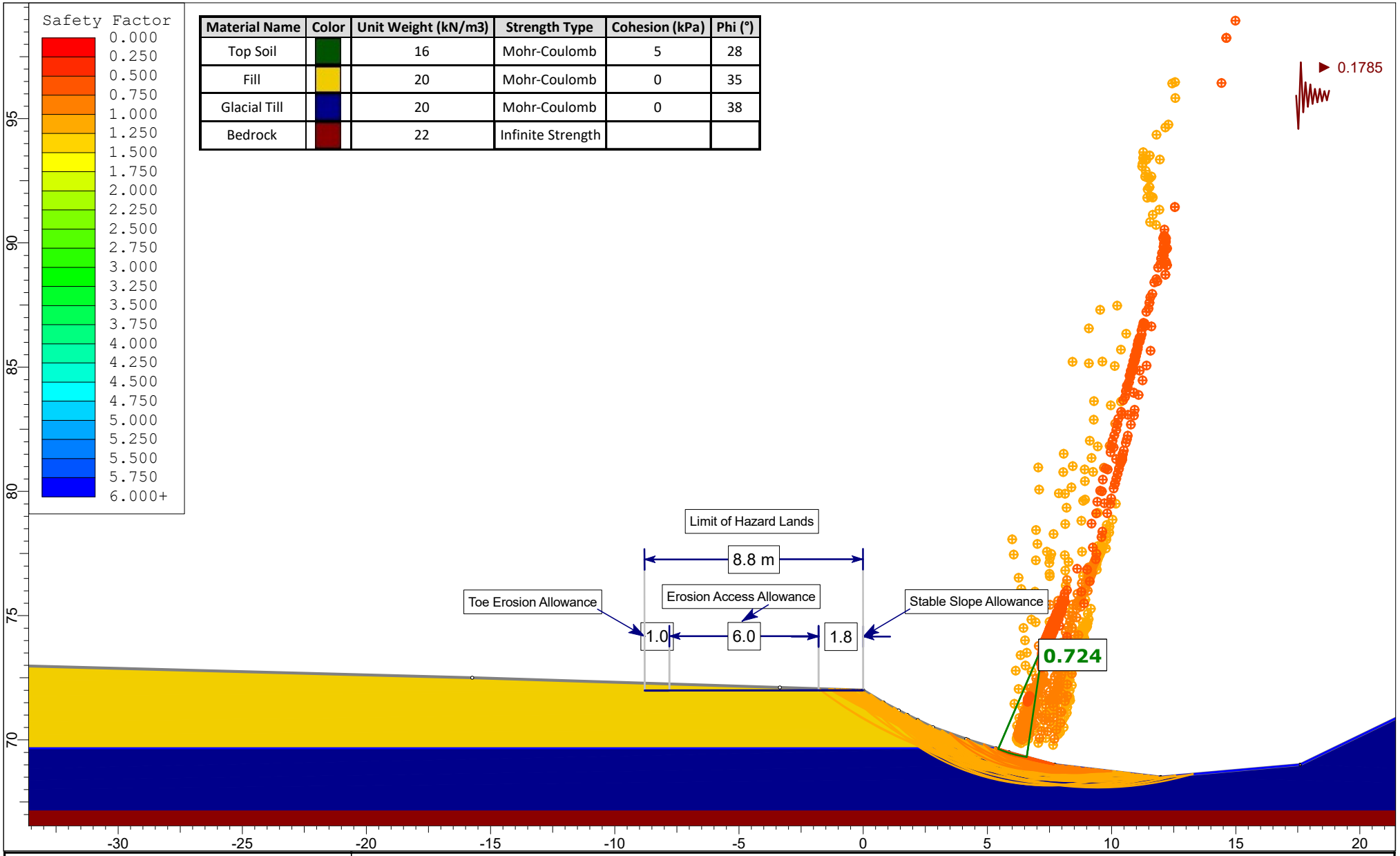
Material Name	Color	Unit Weight (kN/m3)	Strength Type	Cohesion (kPa)	Phi (°)
Top Soil		16	Mohr-Coulomb	5	28
Fill		20	Mohr-Coulomb	0	35
Glacial Till		20	Mohr-Coulomb	0	38
Bedrock		22	Infinite Strength		



PATERSON GROUP

SLIDEINTERPRET 9.031

Project	1867 Alta Vista Drive - Ottawa, Ontario		
Group	Cross Section A-A - Figure 2	*Scenario*	Static Condition
Drawn By	EA	*Client*	Claridge Homes
Date	1/15/2025	*File Name*	PG7401-1

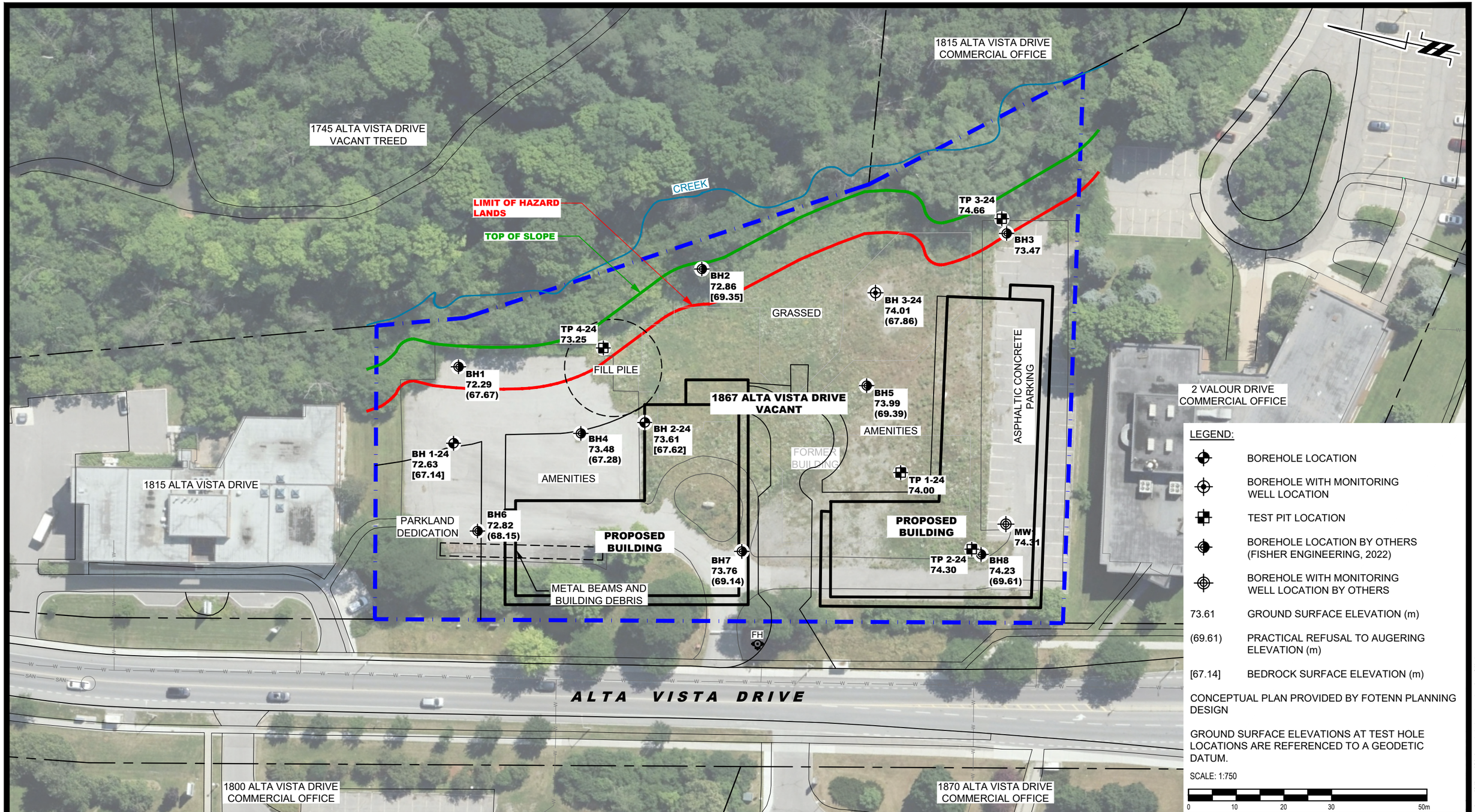


Material Name	Color	Unit Weight (kN/m3)	Strength Type	Cohesion (kPa)	Phi (°)
Top Soil		16	Mohr-Coulomb	5	28
Fill		20	Mohr-Coulomb	0	35
Glacial Till		20	Mohr-Coulomb	0	38
Bedrock		22	Infinite Strength		

PATERSON GROUP

SLIDEINTERPRET 9.031

Project	1867 Alta Vista Drive - Ottawa, Ontario		
Group	Cross Section A-A - Figure 3	Scenario	Seismic Condition
Drawn By	EA	Client	Claridge Homes
Date	1/15/2025	File Name	PG7401-1



LEGEND:

- BOREHOLE LOCATION
- BOREHOLE WITH MONITORING WELL LOCATION
- TEST PIT LOCATION
- BOREHOLE LOCATION BY OTHERS (FISHER ENGINEERING, 2022)
- BOREHOLE WITH MONITORING WELL LOCATION BY OTHERS
- 73.61 GROUND SURFACE ELEVATION (m)
- (69.61) PRACTICAL REFUSAL TO AUGERING ELEVATION (m)
- [67.14] BEDROCK SURFACE ELEVATION (m)

CONCEPTUAL PLAN PROVIDED BY FOTENN PLANNING DESIGN

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

SCALE: 1:750

0 10 20 30 50m

PATERSON GROUP
9 AURIGA DRIVE
OTTAWA, ON
K2E 7T9
TEL: (613) 226-7381

NO.	REVISIONS	DATE	INITIAL
1	ADDED CONCEPTUAL PLAN	21/04/2025	PB

TC UNITED
GEOTECHNICAL INVESTIGATION
PROPOSED DEVELOPMENT
1867 ALTA VISTA DRIVE
OTTAWA, ONTARIO

Title:
TEST HOLE LOCATION PLAN

Scale: 1:750	Date: 01/2025
Drawn by: GK	Report No.: PG7401-1
Checked by: PB	Dwg. No.: PG7401-1
Approved by: SD	Revision No.: 1

11x17

p:\autocad drawings\geotechnical\pg74xx\pg7401\pg7401-1 test hole location plan (rev.01).dwg

Appendix H

Engineering Drawings

LEGEND:

- SITE PROPERTY LINE
- STRUCTURE TO BE REMOVED
- SERVICE TO BE REMOVED
- EXISTING CURB REMOVAL
- REMOVALS

EXISITING STORM LINE TO BE CONFIRM AND LOCATED AND REMOVED CLOSE THE THE PL TO ALLOW FOR NEW STORM SEWER COUPLING CONNECTION.

WATER VALVES NOTED ON SURVEY. CONFIRM ON SITE IF THIS WATER SERVICE HAS ALREADY BEEN ABANDONED. IF NOT ABANDON AND CAP SERVICE AT PL.

POTENTIAL EXSITING WATER SERVICE LOCATION

ROAD CUT LIMITS MATCH TO EXISTING ASPHALT

REMOVE AND RELOCATE EXISTING FIRE HYDRANT AND ALL ASSOCIATED APPURTENANCES 4.5m NORTH



KEY PLAN

TOPOGRAPHIC INFORMATION & BENCHMARK

TOPOGRAPHIC SURVEY COMPLETED BY ANNIS O'SULLIVAN VOLLEBEKK LTD. ON JUNE 26th, 2025. ELEVATIONS SHOWN ARE GEODETIC AND ARE REFERRED TO THE CGVD-28 GEODETIC DATUM.

SITE BENCHMARK No.1 LOCATED AT HYDRANT AT EXISTING ENTRANCE ALONG ALTA VISTA DRIVE. FIRE HYDRANT TOP OF SPINDLE = 73.83

NOT FOR CONSTRUCTION

No.	DATE	DESCRIPTION	BY
03	2026-10-05	RE-ISSUED FOR SPA	T.H.
02	2026-06-30	ISSUED FOR SPA	T.H.
01	2025-12-17	ISSUED FOR OPA/ZBA	T.H.

REVISIONS

LICENSED PROFESSIONAL ENGINEER
T. HARB
100223503
10-05-2026
PROVINCE OF ONTARIO

5m 2 0 5 10m
SCALE: 1:300

PARSONS
1223 Michael Street, Suite 100, Ottawa, Ontario, Canada K1J 7T2
Tel: (613) 738-4160 Fax: (613) 739-7105

CLIENT
TCU DEVCORP

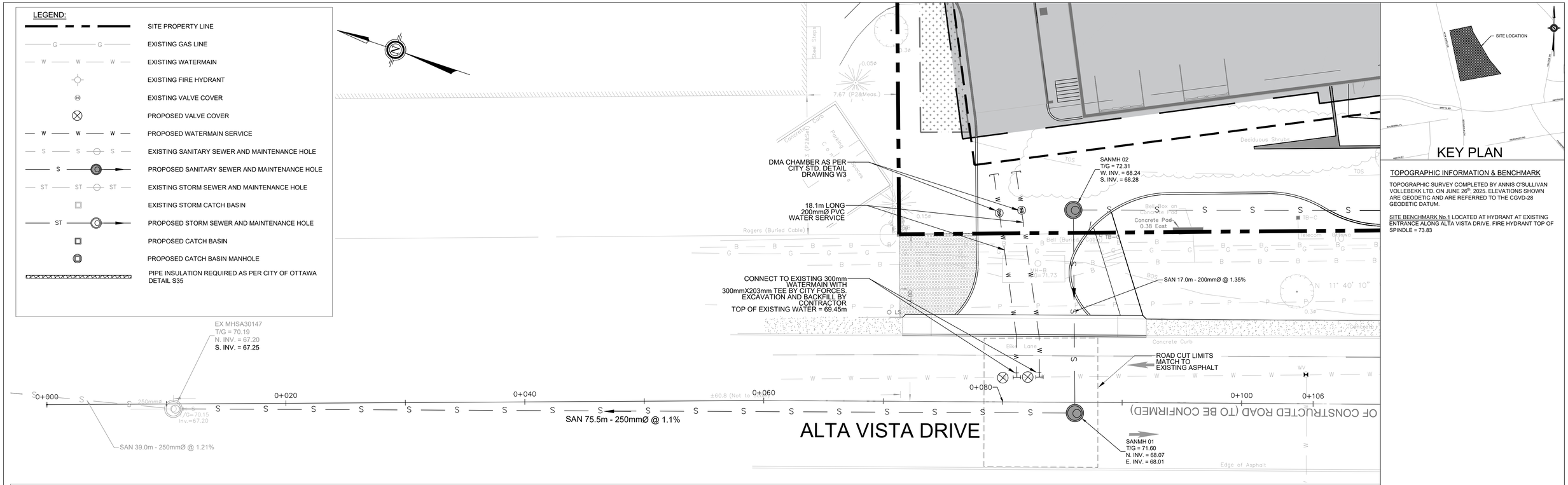
PROJECT
1867 ALTA VISTA DRIVE
OTTAWA, ONTARIO

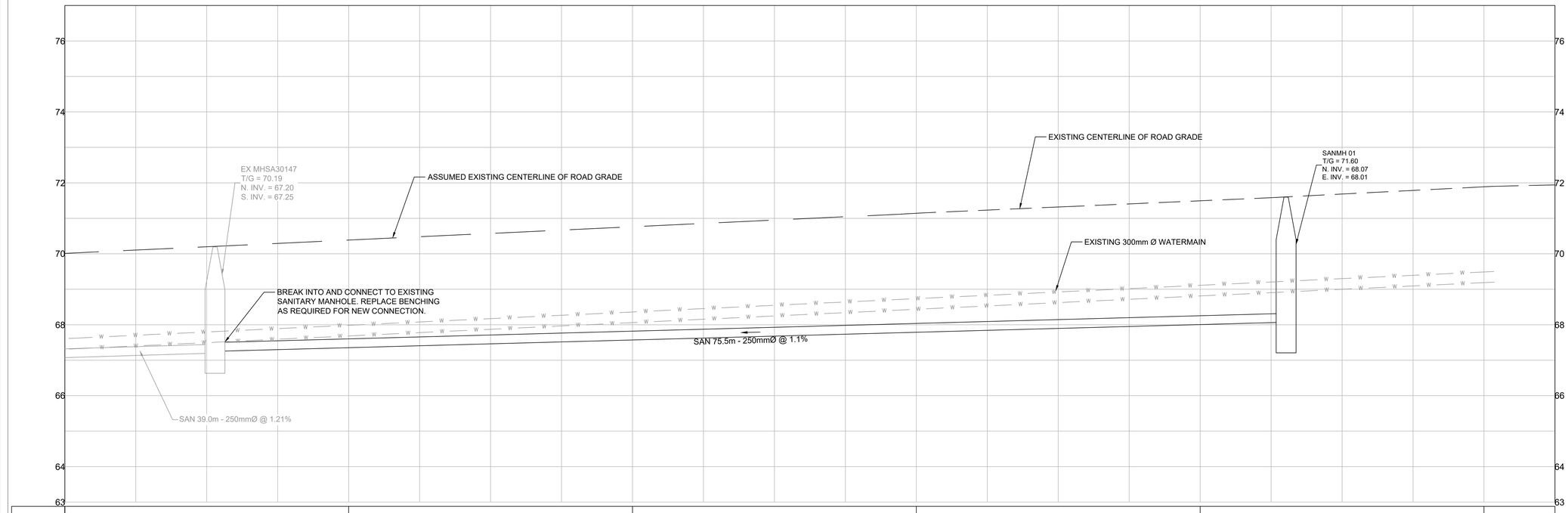
TITLE
REMOVALS PLAN

DESIGNED BY	T.H.
DRAWN BY	R.G
CHECKED BY	M.M.
DATE	OCTOBER 2026
SCALE	1:300
PROJECT NO.	479542
DRAWING NO.	C-102
DRAWING	REM

LEGEND:

- SITE PROPERTY LINE
- EXISTING GAS LINE
- EXISTING WATERMAIN
- EXISTING FIRE HYDRANT
- EXISTING VALVE COVER
- PROPOSED VALVE COVER
- PROPOSED WATERMAIN SERVICE
- EXISTING SANITARY SEWER AND MAINTENANCE HOLE
- PROPOSED SANITARY SEWER AND MAINTENANCE HOLE
- EXISTING STORM SEWER AND MAINTENANCE HOLE
- EXISTING STORM CATCH BASIN
- PROPOSED STORM SEWER AND MAINTENANCE HOLE
- PROPOSED CATCH BASIN
- PROPOSED CATCH BASIN MANHOLE
- PIPE INSULATION REQUIRED AS PER CITY OF OTTAWA DETAIL S35





EXISTING ELEVATION					
SANITARY PIPE DATA	EXISTING 39.0m LONG 250mm Ø SANITARY@ 1.21%	0+34.72 230.28	75.50m - 250mmØ PVC SDR35 SANITARY SEWER @ 1.1%		2+82.33 234.90
STATION					

TOPOGRAPHIC INFORMATION & BENCHMARK

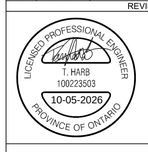
TOPOGRAPHIC SURVEY COMPLETED BY ANNIS O'SULLIVAN VOLLEBEKK LTD. ON JUNE 26th, 2025. ELEVATIONS SHOWN ARE GEODETIC AND ARE REFERRED TO THE CGVD-28 GEODETIC DATUM.

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02	2026-06-30	ISSUED FOR SPA	T.H.
01	2025-12-17	ISSUED FOR OPA/ZBA	T.H.

REVISIONS



3.0m 1.5 0 3.0 6.0m
SCALE: 1:150

PARSONS
1223 Michael Street, Suite 100, Ottawa, Ontario, Canada K1J 7T2
Tel: (613) 738-4160 Fax: (613) 739-7105

CLIENT: TCU DEVCORP

PROJECT: 1867 ALTA VISTA DRIVE OTTAWA, ONTARIO

TITLE: SITE SERVICING PLAN AND PROFILE

DESIGNED BY	T.H.	PROJECT NO.	479542
DRAWN BY	R.G		
CHECKED BY	M.M.	C-103	SS
DATE	OCTOBER 2026		
SCALE	1:150	DRAWING NO.	DRAWING

LEGEND:

- SITE PROPERTY LINE
- EXISTING GAS LINE
- EXISTING WATERMAIN
- EXISTING FIRE HYDRANT
- EXISTING VALVE COVER
- PROPOSED VALVE COVER
- PROPOSED WATERMAIN SERVICE
- EXISTING SANITARY SEWER AND MAINTENANCE HOLE
- PROPOSED SANITARY SEWER AND MAINTENANCE HOLE
- EXISTING STORM SEWER AND MAINTENANCE HOLE
- EXISTING STORM CATCH BASIN
- PROPOSED STORM SEWER AND MAINTENANCE HOLE
- PROPOSED CATCH BASIN
- PROPOSED CATCH BASIN MANHOLE
- PIPE INSULATION REQUIRED AS PER CITY OF OTTAWA DETAIL S35

CONNECT TO EXISTING 300mm STORM SEWER. STORM SEWER INVERT AT PL IS APPROXIMATELY 71.53

STMH02
T/G = 72.52
SW. INV. = 71.53

STM 11.6m - 300mmØ @ 2.50%

STMH01
T/G = 73.87
W. INV. = 72.14
NE. INV. = 72.08

STM 10.6m - 300mmØ @ 2.50%

UNDERGROUND STORM WATER AND IRRIGATION CISTERN.
STORMTANK VOLUME = 56CU.M
IRRIGATION TANK VOLUME = 143CU.M

IRRIGATION RESERVES AND STORM TANK TO BE SEPARATED BY AN INTERNAL WALL. INCOMING WATER FROM ROOF DRAINS, LANDSCAPE AREA DRAINS AND LANEWAY CATCHBASIN TO BE DIRECTED THROUGH BUILDINGS MECHANICAL SYSTEM TO THE IRRIGATION SIDE OF THE TANK. THE WALL INSIDE THE TANK WILL HOLD BACK THE IRRIGATION WATER VOLUME, BUT WILL ALLOW EXCESS WATER TO SPILL OVER DURING STORM EVENTS. CISTERN PUMP TO CONTROL RELEASE RATE AT 5-YEAR STORM TO 85.2(L/S AND AT 100-YEAR STORM TO 129.6L/S.

INV. AT BUILDING 72.41m

RYCB 1
T/G=74.81

RYCB 2
T/G=74.83

FLOWS FROM LANDSCAPE AREA DRAINS TO BE CARRIED TO UNDERGROUND PARKING GARAGE, THROUGH BUILDING MECHANICAL SYSTEM AND DIRECTED TO UNDERGROUND CISTERN..

OUTLINE OF PARKING LEVELS BELOW

PROPOSED 9 STOREY RESIDENTIAL BUILDING
FFE = 74.00m
USF = 65.30m

SANITARY BACKWATER VALVE AS PER CITY STD. DETAIL DWG. S14.1 REFER TO MECHANICAL DRAWINGS FOR BACKWATER VALVE DETAILS

CONNECT TO UNDERGROUND PARKING GARAGE. FLOWS TO BE CARRIED THROUGH BUILDING MECHANICAL SYSTEM AND DIRECTED TO UNDERGROUND CISTERN.

INVERT AT BUILDING APPROX. 68.78m

AREA DRAIN

NO. 1815 2 Storey Brick Building

NO. 255 Smyth Road 2 Storey Brick Building

SAN 9.8m - 200mmØ @ 2.6%

STM 9.0m - 200mmØ @ 1.00%

CBMH 01
(JELLYFISH STORMWATER FILTER MANHOLE OR APPROVED EQUAL)
T/G = 73.05
E. INV. = 70.85

SAN 54.0m - 200mmØ @ 1.0%

SANMH 04
T/G = 73.53
NW. INV. = 68.98
E. INV. = 69.04

SANMH 02
T/G = 72.31
W. INV. = 68.24
S. INV. = 68.28

DMA CHAMBER AS PER CITY STD. DETAIL DRAWING W3

18.1m LONG 200mmØ PVC WATER SERVICE

SANMH 03
T/G = 73.25
N. INV. = 68.82
SE. INV. = 68.88
SAN 9.8m - 200mmØ @ 1.0%

CONNECT TO EXISTING 300mm WATERMAIN WITH 300mmX203mm TEE BY CITY FORCES EXCAVATION AND BACKFILL BY CONTRACTOR
TOP OF EXISTING WATER = 69.45m

SAN 17.0m - 200mmØ @ 1.35%

EX MHSA30147
T/G = 70.19
N. INV. = 67.20
S. INV. = 67.25

0+020 0+040 0+060 0+080 0+100 0+106

SAN 75.5m - 250mmØ @ 1.1%

SAN 39.0m - 250mmØ @ 1.21%

ROAD CUT LIMITS MATCH TO EXISTING ASPHALT

SANMH 01
T/G = 71.60
N. INV. = 68.07
E. INV. = 68.01

REMOVE AND RELOCATE EXISTING FIRE HYDRANT AND ALL ASSOCIATED APPURTENANCES 4.5m NORTH

ROAD CUT LIMITS MATCH TO EXISTING ASPHALT

SITE BENCHMARK
Fire Hydrant
Top of Spindle
Elevn=73.83
BENCHMARK LOCATION WILL HAVE TO BE MOVED AS THE HYDRANT WILL BE RELOCATED.

APPROXIMATE CENTRELINE OF CONSTRUCTED ROAD TO BE CONFIRMED

PART 1 PLAN 4R-16451

PART 16 PLAN 4R-19941



KEY PLAN

TOPOGRAPHIC INFORMATION & BENCHMARK

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REVISIONS

LICENSED PROFESSIONAL ENGINEER
T. HARB
100223503
10-05-2026
PROVINCE OF ONTARIO

5m 2 0 5 10m
SCALE: 1:300

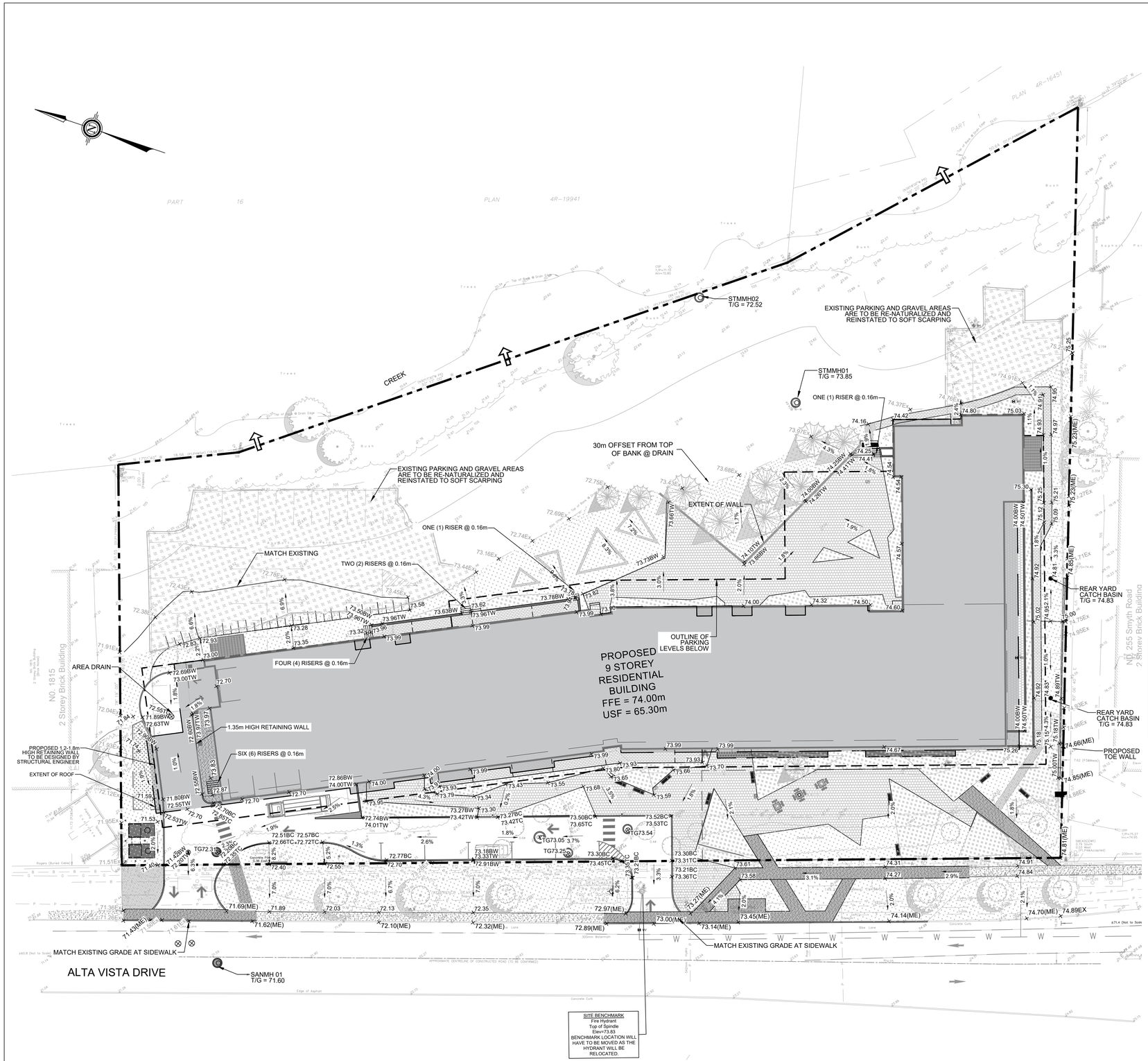
PARSONS
1223 Michael Street, Suite 100, Ottawa, Ontario, Canada K1J 7T2
Tel: (613) 738-4160 Fax: (613) 739-7105

CLIENT
TCU DEVCORP

PROJECT
1867 ALTA VISTA DRIVE
OTTAWA, ONTARIO

TITLE
SITE SERVICING PLAN

DESIGNED BY: T.H.	PROJECT NO.: 479542
DRAWN BY: R.G	
CHECKED BY: M.M.	C-104 / SS
DATE: OCTOBER 2026	
SCALE: 1:300	DRAWING NO. / DRAWING



LEGEND:

- EXISTING PROPERTY LINE
- TERRACE (3:1 MAX)
- 99.99 * EXISTING GRADE
- 99.99 PROPOSED GRADE
- 99.99 TW PROPOSED TOP OF WALL GRADE
- 99.99 BW PROPOSED BOTTOM OF WALL GRADE
- 99.99 FF PROPOSED FINISHED FLOOR ELEVATION
- 99.99 SW PROPOSED SWALE ELEVATION
- 99.99 ME MATCH EXISTING ELEVATION
- 99.99 TC PROPOSED TOP OF CURB GRADE
- 99.99 BC PROPOSED BOTTOM OF CURB GRADE
- 99.9% PROPOSED SURFACE SLOPE
- PROPOSED VALVE COVER
- PROPOSED SANITARY MAINTENANCE HOLE
- PROPOSED STORM MAINTENANCE HOLE
- PROPOSED CATCH BASIN
- PROPOSED TRENCH DRAIN
- PROPOSED CURB
- GRADE BREAK LINE
- PROPOSED DEPRESSED CONCRETE CURB WITH TWSI PER CITY STD DWG SC7.3
- PROPOSED PAVERS
- PROPOSED CONCRETE AREA / SIDEWALK
- PROPOSED PLANTING AREA
- PROPOSED LANDSCAPE

PAVEMENT STRUCTURES

MATERIAL	LIGHT DUTY	HEAVY DUTY
Asphaltic Concrete Surface Course: HL-3 (OPSS 1150) (PG 58-34) OR SUPERPAVE 12.5	60 mm	40 mm
Asphaltic Concrete Binder Course: HL-8 (OPSS 1150) (PG 58-34) OR SUPERPAVE 19.0	-	60 mm
Granular Base: OPSS 1010 Granular A	225 mm	200 mm
Granular Sub-base: OPSS 1010 Granular B, Type II	350 mm	450 mm
Geotextile membrane as per OPSS	YES	NO



KEY PLAN

TOPOGRAPHIC INFORMATION & BENCHMARK

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REVISIONS

LICENSED PROFESSIONAL ENGINEER
T. HARB
100223503
10-05-2026
PROVINCE OF ONTARIO

5m 2 0 5 10m
SCALE: 1:300

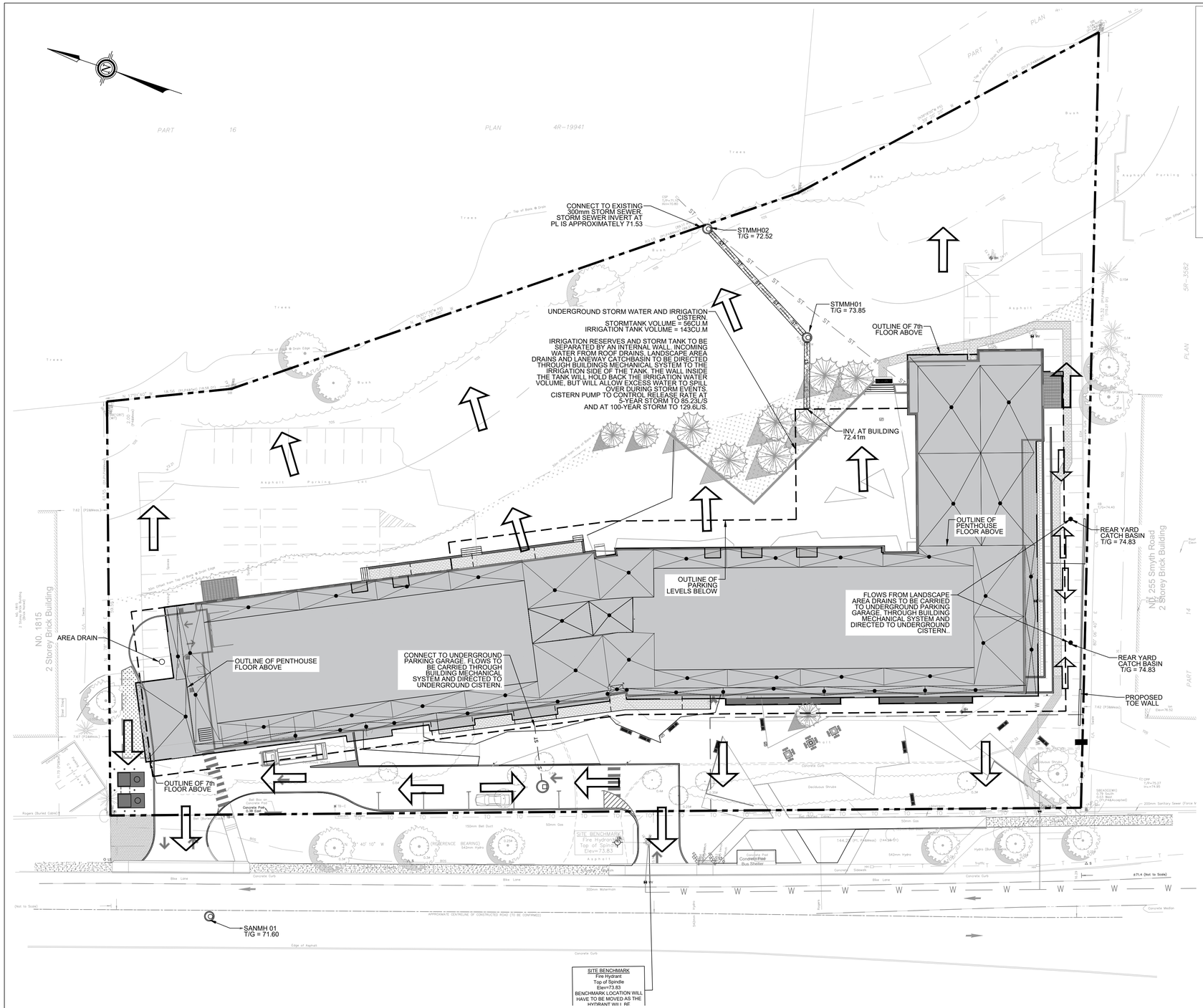
PARSONS
1223 Michael Street, Suite 100, Ottawa, Ontario, Canada K1J 7T2
Tel: (613) 738-4160 Fax: (613) 739-7105

CLIENT
TCU DEVCORP

PROJECT
1867 ALTA VISTA DRIVE
OTTAWA, ONTARIO

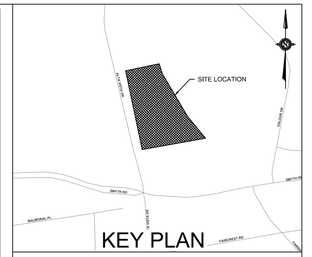
TITLE
GRADING PLAN

DESIGNED BY	T.H.	PROJECT NO.	479542
DRAWN BY	R.G		
CHECKED BY	M.M.	C-105	GR
DATE	OCTOBER 2026		
SCALE	1:300	DRAWING NO.	DRAWING



LEGEND:

- SITE PROPERTY LINE
- EXISTING STORM SEWER AND MAINTENANCE HOLE
- EXISTING STORM CATCH BASIN
- PROPOSED STORM SEWER AND MAINTENANCE HOLE
- PROPOSED CATCH BASIN
- PROPOSED TRENCH DRAIN
- PIPE INSULATION REQUIRED AS PER CITY OF OTTAWA DETAIL S35
- PROPOSED ROOF DRAINS
- OVERLAND FLOW DIRECTION



KEY PLAN

TOPOGRAPHIC INFORMATION & BENCHMARK

TOPOGRAPHIC SURVEY COMPLETED BY ANNIS O'SULLIVAN VOLLEBEKK LTD. ON JUNE 26th, 2025. ELEVATIONS SHOWN ARE GEODETIC AND ARE REFERRED TO THE CGVD-28 GEODETIC DATUM.

SITE BENCHMARK No.1 LOCATED AT HYDRANT AT EXISTING ENTRANCE ALONG ALTA VISTA DRIVE. FIRE HYDRANT TOP OF SPINDLE = 73.83

NOT FOR CONSTRUCTION

No.	DATE	DESCRIPTION	BY
03	2026-10-05	RE-ISSUED FOR SPA	T.H.
02	2026-06-30	ISSUED FOR SPA	T.H.
01	2025-12-17	ISSUED FOR OPA/ZBA	T.H.

REVISIONS

LICENSED PROFESSIONAL ENGINEER
T. HARB
100223503
10-05-2026
PROVINCE OF ONTARIO

5m 2 0 5 10m
SCALE: 1:300

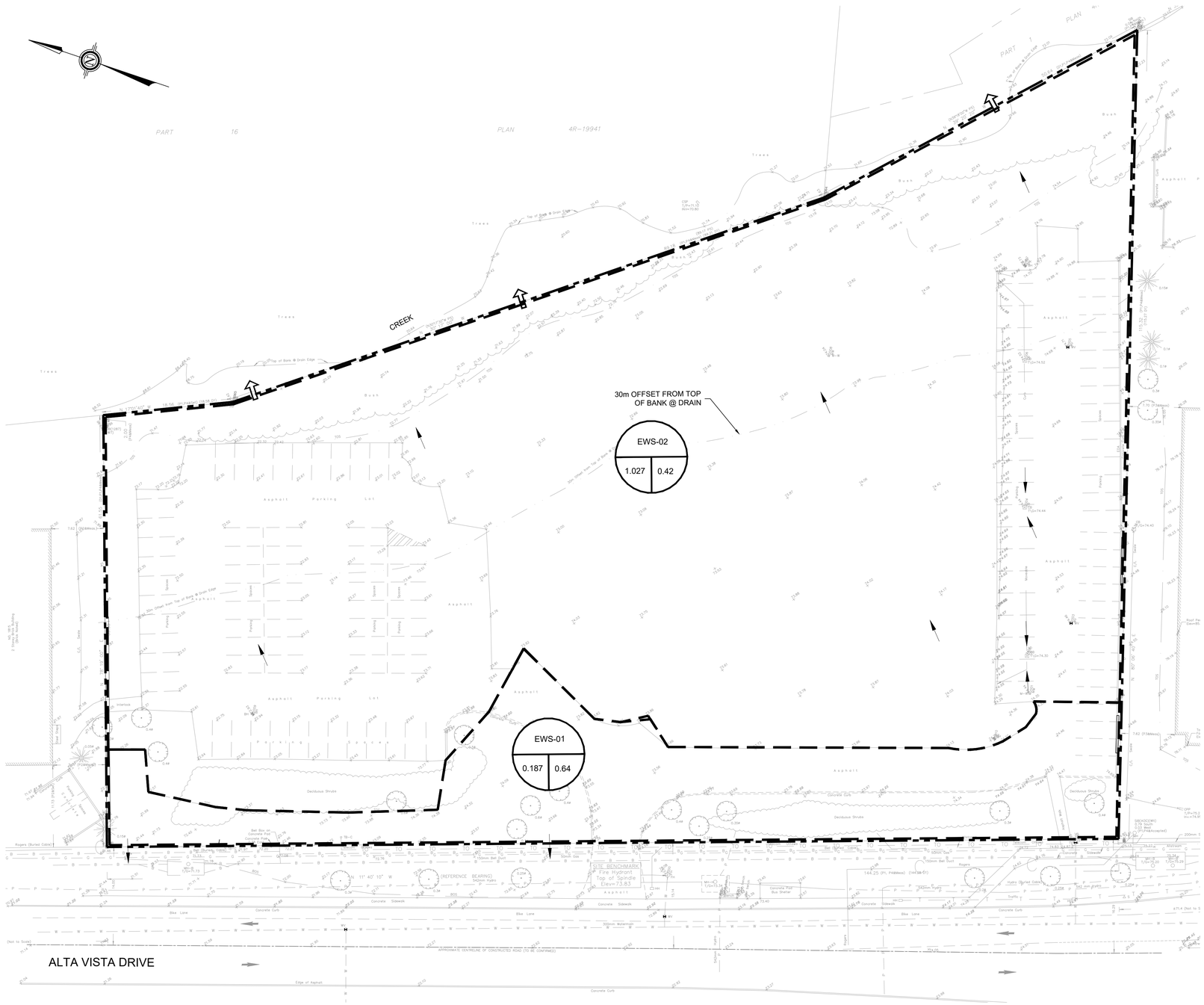
PARSONS
1223 Michael Street, Suite 100, Ottawa, Ontario, Canada K1J 7T2
Tel: (613) 738-4160 Fax: (613) 739-7105

CLIENT
TCU DEVCORP

PROJECT
1867 ALTA VISTA DRIVE
OTTAWA, ONTARIO

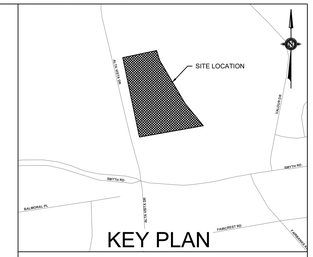
TITLE
STORM WATER MANAGEMENT PLAN

DESIGNED BY	T.H.	PROJECT NO.	479542
DRAWN BY	R.G		
CHECKED BY	M.M.	C-106	SWM
DATE	OCTOBER 2026		
SCALE	1:300	DRAWING NO.	DRAWING



LEGEND:

- PROPOSED NEW PROPERTY LINE
- WATERSHED BOUNDARY
- WATERSHED NAME (WS-XX / EWS-01)
- RUNOFF COEFFICIENT (1.0XX / XX5)
- AREA IN HECTARES
- MINOR OVERLAND FLOW ROUTE
- MAJOR OVERLAND FLOW ROUTE



KEY PLAN

TOPOGRAPHIC INFORMATION & BENCHMARK

TOPOGRAPHIC SURVEY COMPLETED BY ANNIS O'SULLIVAN VOLLEBEKK LTD. ON JUNE 26th, 2025. ELEVATIONS SHOWN ARE GEODETIC AND ARE REFERRED TO THE CGVD-28 GEODETIC DATUM.

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NOT FOR CONSTRUCTION

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03	2026-10-05	RE-ISSUED FOR SPA	T.H.
02	2026-06-30	ISSUED FOR SPA	T.H.
01	2025-12-17	ISSUED FOR OPA/ZBA	T.H.

REVISIONS

LICENSED PROFESSIONAL ENGINEER
T. HARB
100223503
10-05-2026
PROVINCE OF ONTARIO

5m 2 0 5 10m
SCALE: 1:300

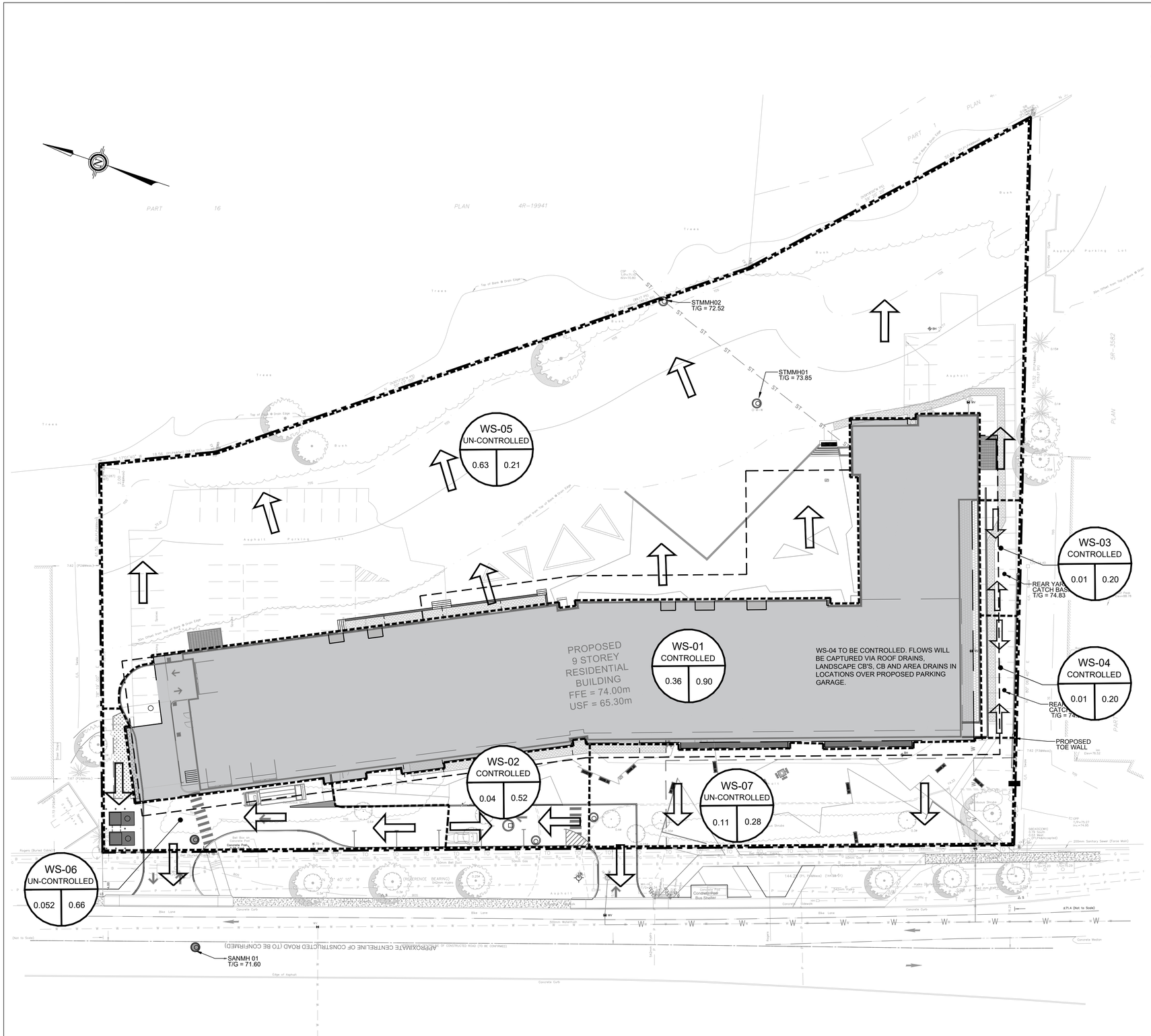
PARSONS
1223 Michael Street, Suite 100, Ottawa, Ontario, Canada K1J 7T2
Tel: (613) 738-4160 Fax: (613) 739-7105

CLIENT: TCU DEVCORP

PROJECT: 1867 ALTA VISTA DRIVE OTTAWA, ONTARIO

TITLE: PRE DEVELOPMENT DRAINAGE AREAS

DESIGNED BY	T.H.
DRAWN BY	R.G
CHECKED BY	M.M.
DATE	OCTOBER 2026
SCALE	1:300
PROJECT NO.	479542
DRAWING NO.	C107
DRAWING	PRE



LEGEND:

- PROPERTY LINE
- WATERSHED BOUNDARY
- WATERSHED NAME
- RUNOFF COEFFICIENT
- AREA IN HECTARES
- MINOR OVERLAND FLOW ROUTE
- MAJOR OVERLAND FLOW ROUTE



KEY PLAN

TOPOGRAPHIC INFORMATION & BENCHMARK

TOPOGRAPHIC SURVEY COMPLETED BY ANNIS O'SULLIVAN VOLLEBEKK LTD. ON JUNE 26th, 2025. ELEVATIONS SHOWN ARE GEODETIC AND ARE REFERRED TO THE CGVD-28 GEODETIC DATUM.

SITE BENCHMARK No.1 LOCATED AT HYDRANT AT EXISTING ENTRANCE ALONG ALTA VISTA DRIVE. FIRE HYDRANT TOP OF SPINDLE = 73.83

NOT FOR CONSTRUCTION

No.	DATE	DESCRIPTION	BY
03	2026-10-05	RE-ISSUED FOR SPA	T.H.
02	2026-06-30	ISSUED FOR SPA	T.H.
01	2025-12-17	ISSUED FOR OPA/ZBA	T.H.

REVISIONS

LICENSED PROFESSIONAL ENGINEER
T. HARB
100223503
10-05-2026
PROVINCE OF ONTARIO

SCALE: 1:300

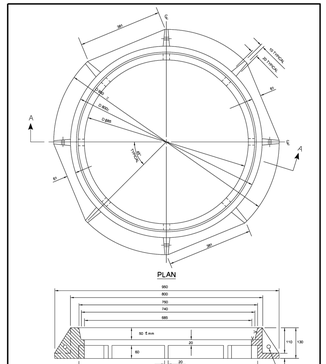
PARSONS
1223 Michael Street, Suite 100, Ottawa, Ontario, Canada K1J 7T2
Tel: (613) 738-4160 Fax: (613) 739-7105

CLIENT: TCU DEVCORP

PROJECT: 1867 ALTA VISTA DRIVE OTTAWA, ONTARIO

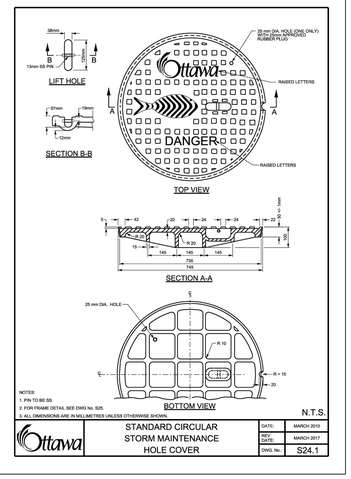
TITLE: POST DEVELOPMENT DRAINAGE AREAS

DESIGNED BY	T.H.
DRAWN BY	R.G
CHECKED BY	M.M.
DATE	OCTOBER 2026
SCALE	1:300
PROJECT NO.	479542
DRAWING NO.	C108
DRAWING	POST



STANDARD CIRCULAR FRAME FOR MAINTENANCE HOLES (MODIFIED OPSD-401.020)

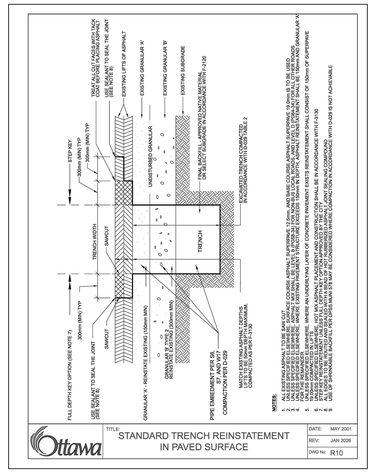
DATE: MAY 2001 | REV. DATE: MARCH 2015 | DWG No. S25



N.T.S.

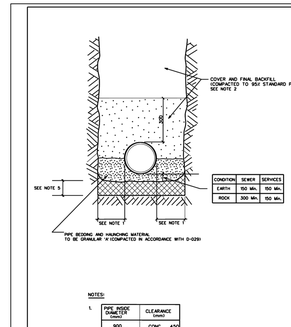
STANDARD CIRCULAR STORM MAINTENANCE HOLE COVER

DATE: MARCH 2015 | REV. DATE: MARCH 2017 | DWG No. S24.1



STANDARD TRENCH TERMINOLOGY

DATE: MARCH 2008 | REV. DATE: | DWG No. S5



CONDITION	SEWER	SERVICES
EARTH	150 Min.	150 Min.
ROCK	300 Min.	150 Min.

PIPE BEDDING THICKNESS (mm)	CLEARANCE (mm)	
300 OR LESS	CONC	450
	PVC	450
OVER 900		500

SINGLE TRENCH (SEWER & SEWER SERVICES)

DATE: MAY 2001 | REV. DATE: JAN 2026 | DWG No.: S6



KEY PLAN

TOPOGRAPHIC INFORMATION & BENCHMARK

TOPOGRAPHIC SURVEY COMPLETED BY ANNIS O'SULLIVAN VOLLEBEKK LTD. ON JUNE 26th, 2025. ELEVATIONS SHOWN ARE GEODETIC AND ARE REFERRED TO THE CGVD-28 GEODETIC DATUM.

SITE BENCHMARK No.1 LOCATED AT HYDRANT AT EXISTING ENTRANCE ALONG ALTA VISTA DRIVE. FIRE HYDRANT TOP OF SPINDLE = 73.83

NOT FOR CONSTRUCTION

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

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

ONTARIO PROVINCIAL STANDARD DRAWING	Nov 2018	Rev 3
CAST IRON, SQUARE FRAME WITH SQUARE OVERFLOW TYPE DISHED GRATE FOR CATCH BASINS, HERRING BONE OPENINGS		
	OPSD 400.010	

CLAY SEAL FOR PIPE TRENCHES

DATE: MAY 2001 | REV. DATE: MARCH 2008 | DWG No.: S8

DITCHED PIPE STORM SEWER INSTALLATION

DATE: MAY 2001 | REV. DATE: MARCH 2007 | DWG No.: S9

CATCH BASIN MAINTENANCE HOLE COVER (MODIFIED OPSD-401.020)

DATE: MARCH 2009 | REV. DATE: MARCH 2017 | DWG No.: S28.1

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

SEWER SERVICE ABANDONMENT BENEATH PAVEMENT

DATE: MARCH 2011 | REV. DATE: | DWG No.: S11.4

HEAVY DUTY "FISH" TYPE SQUARE CATCH BASIN COVER

DATE: MARCH 2005 | REV. DATE: | DWG No.: S19.1

INSULATION FOR SHALLOW SEWERS

DATE: MAY 2001 | REV. DATE: JULY 2024 | DWG No. S35

No.	DATE	DESCRIPTION	BY
03	2026-10-05	RE-ISSUED FOR SPA	T.H.
02	2026-06-30	ISSUED FOR SPA	T.H.
01	2025-12-17	ISSUED FOR OPA/ZBA	T.H.

REVISIONS

LICENSED PROFESSIONAL ENGINEER
T. HARB
100223503
10-05-2026
PROVINCE OF ONTARIO

5m 2 0 5 10m
SCALE: 1:300

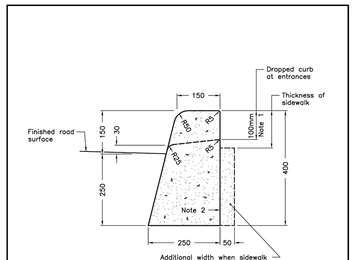
PARSONS
1223 Michael Street, Suite 100, Ottawa, Ontario, Canada K1J 7T2
Tel: (613) 738-4160 Fax: (613) 739-7105

CLIENT: TCU DEVCORP

PROJECT: 1867 ALTA VISTA DRIVE OTTAWA, ONTARIO

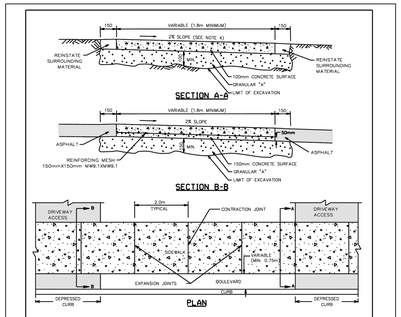
TITLE: DETAIL PAGE 1

DESIGNED BY	T.H.	PROJECT NO.	479542
DRAWN BY	R.G		
CHECKED BY	M.M.	C110	DET1
DATE	OCTOBER 2026		
SCALE	N/A	DRAWING NO.	DRAWING



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

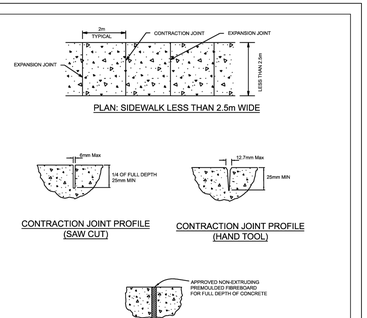
ONTARIO PROVINCIAL STANDARD DRAWING	Nov 2012	Rev. 2
CONCRETE BARRIER CURB		
	OPSD 600.110	



NOTES:
1. LONGITUDINAL EDGES TO BE FINISHED WITH A 50mm EDGING TOOL.
2. ALL CONCRETE SIDEWALKS ARE TO HAVE A BROOM FINISH UNLESS OTHERWISE SPECIFIED.
3. ALL DIMENSIONS ARE IN MILLIMETRES UNLESS SHOWN OTHERWISE.
4. THE MAXIMUM SLOPE IS NOT TO EXCEED 2%.
5. SIDEWALK NOT TO BE DEPRESSED ACROSS DRIVEWAY ACCESSES.
6. EXPANSION AND CONTRACTION JOINT CONSTRUCTION PER SC5

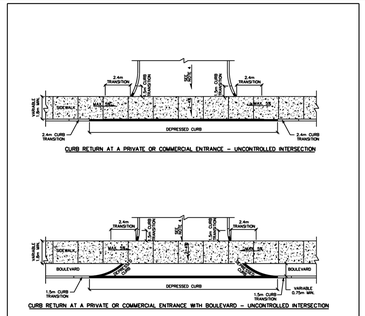
NTS

TYPICAL CONCRETE SIDEWALK IN BOULEVARD	DATE: MAY 2001
	REV. DATE: JANUARY 2026
	DWG. No.: SC4



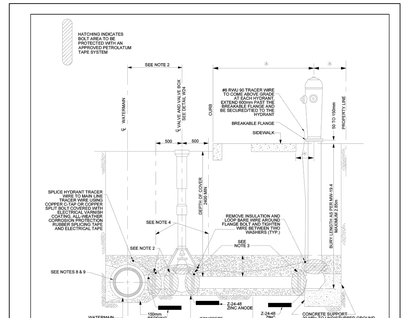
NOTES:
1. TRANSVERSE EXPANSION JOINTS ARE REQUIRED AT THE ENDS, THE MIDPOINT, AT INTERVALS OF 4M MAXIMUM, AND ALSO TO ISOLATE OBSTRUCTIONS FROM SIDEWALK, HYDRANTS, POLES, BUILDINGS, ETC.
2. LONGITUDINAL EDGES ARE TO BE FINISHED WITH A 50mm EDGING TOOL.
3. CONTRACTION JOINTS ARE TO BE CONSTRUCTED AT 2m INTERVALS BY HAND TOOLING
4. THE TERMINATION OF THE JOINTS AT BOTH THE FRONT AND BACK OF SIDEWALKS SHALL BE NO LESS THAN 600mm APART
5. JOINTS IN ALL CONCRETE ELEMENTS SHALL BE LAID OUT TO ENSURE THAT NO INDIVIDUAL RESULTING CONCRETE PANEL IS LESS THAN 0.5m2 OR GREATER THAN 6m2

SIDEWALK CONSTRUCTION JOINTS	DATE: MAY 2001
	REV. DATE: JAN 2026
	DWG No.: SC5



NOTES:
1. ALL DIMENSIONS ARE IN MILLIMETRES UNLESS SHOWN OTHERWISE.
2. CURB DETAILS SEE SC1.1, SC1.2 AND SC1.3.
3. SIDEWALK DETAILS SEE SC2 AND SC3.
4. MAXIMUM SLOPE VARIES, SEE PRIVATE APPROACH BYLAW.
5. UNCONTROLLED INTERSECTION MEANS AN ENTRANCE NOT LOCATED AT A TRAFFIC SIGNAL OR ALL-WAY STOP CONTROL.

CURB RETURN ENTRANCES - UNCONTROLLED INTERSECTIONS	DATE: MARCH 2007
	REV. DATE: MARCH 2021
	DWG. No.: SC7.1



NOTES:
FOR ALL WATERMAINS
1. SEE DETAIL W20 FOR HYDRANTS IN DITCH AREAS
2. FOR WATERMAINS 400mm AND UNDER, LOCATE VALVE WITHIN 1.0m OF CENTRELINE. RETAINING/RESTRAINING DEVICES TO BE UTILIZED. FOR WATERMAINS 600mm AND OVER, BOLT VALVE WITH FLANGED END DIRECTLY TO FLANGED TEE
3. HYDRANT BREAKABLE FLANGE TO BE 150mm MIN.
4. HYDRANT BREAKABLE FLANGE ELEVATION TO BE ESTABLISHED PRIOR TO INSTALLATION. REFER TO MW-18.4 AND F-4414
5. SEE SPF-2120 FOR BACKFILL REQUIREMENTS IN THIS AREA
6. SEE F-4414 FOR HYDRANT LOCATION REQUIREMENTS
7. ALL MEASUREMENTS ARE IN MILLIMETRES UNLESS OTHERWISE NOTED
8. FOR ALL 300mm WATERMAINS USE A 300 x 150 TANGENTIAL TEE WITH THE 150mm OUTLET ON TOP
9. FOR ALL 400mm WATERMAINS USE A 400 x 150 TANGENTIAL TEE WITH THE 150mm OUTLET ON TOP
10. ALL METALLIC COMPONENTS SHALL BE ELECTRICALLY CONNECTED TO EACH PERPETTING JOINT OR CONNECTION TO ENSURE ELECTRICAL CONTINUITY ALONG ALL METALLIC COMPONENTS
11. ALL MATERIALS SHALL BE IN ACCORDANCE WITH MW-18.15
12. TRACER WIRE BOLT CONNECTIONS TO BE COMPLETED PER W65
13. TRACER WIRE SPLICES TO BE COMPLETED PER W47

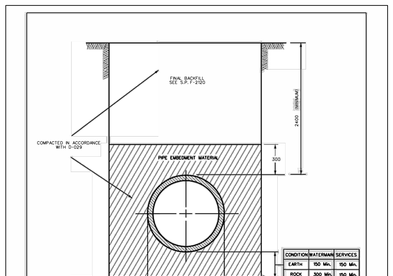
HYDRANT INSTALLATION - NEW CONSTRUCTION	DATE: MAY 2001
	REV.: MAR 2023
	DWG No: W19



TOPOGRAPHIC INFORMATION & BENCHMARK

TOPOGRAPHIC SURVEY COMPLETED BY ANNIS O'SULLIVAN VOLLEBEKK LTD. ON JUNE 26th, 2025. ELEVATIONS SHOWN ARE GEODETIC AND ARE REFERRED TO THE CGVD-28 GEODETIC DATUM.

SITE BENCHMARK No.1 LOCATED AT HYDRANT AT EXISTING ENTRANCE ALONG ALTA VISTA DRIVE. FIRE HYDRANT TOP OF SPINDLE = 73.83

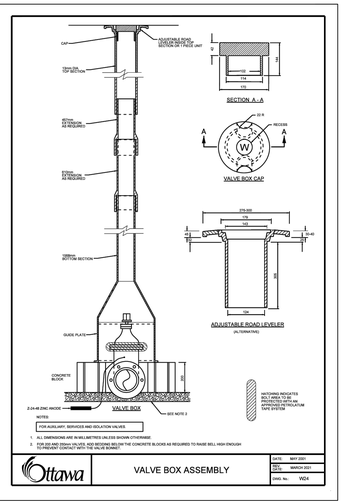


NOTES:
1. PIPE EMBEDMENT MATERIAL - GRANULAR 'A'.
2. FINAL BACKFILL - APPROVED NATIVE MATERIAL OR SELECT SUBGRADE IN ACCORDANCE WITH F-4120 AND F-2120
3. ALL DIMENSIONS ARE IN MILLIMETRES UNLESS SHOWN OTHERWISE.
4.

TRENCH WIDTH	
OUTSIDE DIA.	CLEARANCE (mm)
900 or LESS	450
OVER 900	500

5. WHEN APPROVED BY THE CONTRACT ADMINISTRATOR, POOR SOILS SHALL BE EXCAVATED TO CREATE A FOUNDATION THAT SHALL BE FILLED TO THE BEDDING WITH GRANULAR 'B'.

STANDARD TRENCH DETAIL	DATE: MAY 2001
	REV. DATE: JANUARY 2026
	DWG. No.: W17



NOTES:
FOR AUXILIARY SERVICES AND ISOLATION VALVES
1. ALL DIMENSIONS ARE IN MILLIMETRES UNLESS SHOWN OTHERWISE.
2. FOR 200 AND 250mm VALVES, ADD SECOND MDL@THE CONCRETE BLOCKS AS REQUIRED TO RAISE BELL HIGH ENOUGH TO PREVENT CONTACT WITH THE VALVE BONNET.

VALVE BOX ASSEMBLY	DATE: MAY 2001
	REV. DATE: MARCH 2021
	DWG. No.: W04

1. SOIL DESCRIPTION: VERY FINE SANDS, SANDY CLAYS, CLAYS.
SOILS WITH TYPICAL BEARING STRENGTH OF 100 TO 199 KPa

PIPE DIAMETER	DIMENSION NOTED ON W25.3			
	A	B	C	D
102	250	250	200	200
152	400	400	250	300
203	550	550	300	450
254	650	650	400	500
305	800	800	450	650
406	1050	1050	600	850

2. SOIL DESCRIPTION: SILTY SAND GRAVELS OR CLAYEY SAND GRAVEL MIXTURES, MODERATE AMOUNT OF FINES.
SOILS WITH TYPICAL BEARING STRENGTH OF 200 TO 299 KPa

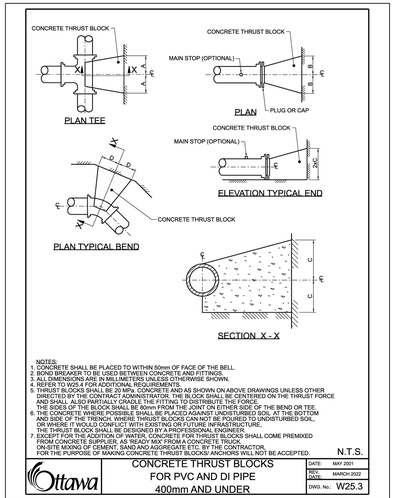
PIPE DIAMETER	DIMENSION NOTED ON W25.3			
	A	B	C	D
102	200	200	150	150
152	250	250	200	200
203	350	350	250	270
254	450	450	300	350
305	500	500	350	400
406	750	750	400	600

3. SOIL DESCRIPTION: SANDS, GRAVELS AND GRAVEL-SAND MIXTURES, LITTLE OR NO FINES.
SOILS WITH TYPICAL BEARING STRENGTH OF 300 KPa AND OVER

PIPE DIAMETER	DIMENSION NOTED ON W25.3			
	A	B	C	D
102	150	150	150	150
152	200	200	200	200
203	300	300	200	230
254	400	400	250	270
305	450	450	300	300
406	650	650	350	450

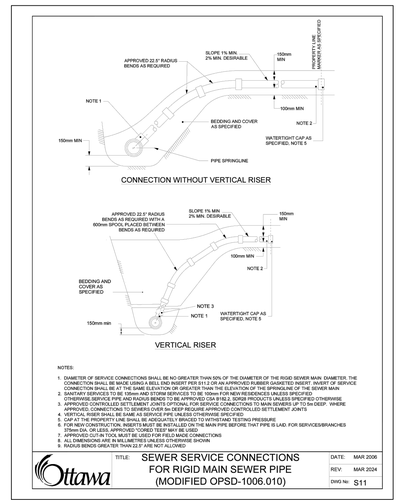
NOTES
1. THE ABOVE THRUST BLOCK DIMENSIONS MEET OR EXCEED THE WATERMAIN DESIGN CRITERIA FOR FUTURE ALTERATIONS AUTHORIZED UNDER A DRINKING WATER WORKS PERMIT.
2. THE ASSUMPTIONS MADE IN DETERMINING THE VALUES ARE AS FOLLOWS:
a) MAXIMUM OPERATING PRESSURE OF 690 kPa
b) MAXIMUM SURGE PRESSURE WITH A FLOW VELOCITY CHANGE OF 0.6 m/s
OF 1140 kPa FOR CLASS 52 DI AND FOR PVC MAX. SURGE IS 1190 psi
3. THE TABLES APPLY TO BOTH DUCTILE IRON AND PVC. WHERE ONE LENGTH EXCEEDED THE OTHER THE LONGER LENGTH WAS USED.
4. DIMENSIONS MAY BE ADJUSTED SO LONG AS THE BEARING SURFACE AREA OF THE THRUST BLOCK IS NOT REDUCED.
5. TO BE USED IN CONJUNCTION WITH W25.3.

THRUST BLOCK DIMENSION TABLES FOR PVC AND DI PIPE 400mm AND UNDER	DATE: MAY 2001
	REV. DATE: JAN 2026
	DWG No.: W25.4



NOTES:
1. CONCRETE SHALL BE PLACED TO WITHIN 50mm OF FACE OF THE BELL.
2. BOND BREAKER TO BE USED BETWEEN CONCRETE AND FITTINGS.
3. ALL DIMENSIONS ARE IN MILLIMETERS UNLESS OTHERWISE SHOWN.
4. REFER TO W25.4 FOR ADDITIONAL REQUIREMENTS.
5. THE SIZES OF THE BLOCK SHALL BE 80mm FROM THE JOINT ON EITHER SIDE OF THE BEND OR TEE.
6. THE CONCRETE WHERE POSSIBLE SHALL BE PLACED AGAINST UNDISTURBED SOIL. AT THE BOTTOM OF TRENCHES IN ROCK, THE CONCRETE SHALL BE PLACED AGAINST UNDISTURBED SOIL, OR WHERE IT WOULD CONFLICT WITH EXISTING OR FUTURE INFRASTRUCTURE.
7. THE THRUST BLOCK SHALL BE DESIGNED BY A PROFESSIONAL ENGINEER.
8. EXCEPT FOR THE ADDITION OF WATER, CONCRETE FOR THRUST BLOCKS SHALL COME PREMIXED FROM CONCRETE SUPPLIER, AS 'READY MIX' FROM A CONCRETE TRUCK. ON-SITE MIXING OF CEMENT, SAND AND AGGREGATES BY THE CONTRACTOR, OR FOR THE PURPOSE OF MAKING CONCRETE CYLINDERS FOR TESTING PURPOSES WILL NOT BE ACCEPTED. N.T.S.

CONCRETE THRUST BLOCKS FOR PVC AND DI PIPE 400mm AND UNDER	DATE: MAY 2001
	REV. DATE: MARCH 2022
	DWG. No.: W25.3



NOTES:
1. DIAMETER OF SERVICE CONNECTIONS SHALL BE NO GREATER THAN 50% OF THE DIAMETER OF THE RIGID SEWER MAIN. DIAMETER, THE CONNECTION SHALL BE MADE USING A BELL END INSERT PER S11.2 OR AN APPROVED RUBBER GASKETED INSERT. INVERT OF SERVICE CONNECTION SHALL BE AT THE SAME ELEVATION OR GREATER THAN THE ELEVATION OF THE SPRINGLINE OF THE SEWER MAIN.
2. SANITARY SERVICES TO BE 150mm AND STORM SERVICES TO BE 100mm FOR NEW RESIDENCES UNLESS SPECIFIED OTHERWISE.SERVICE PIPE AND RADIUS BENDS TO BE APPROVED CSA B182.2, SDR28 PRODUCTS UNLESS SPECIFIED OTHERWISE
3. SANITARY SERVICES TO BE 1200mm AND STORM SERVICES TO BE 1500mm DEEP AT PROPERTY LINE FOR NEW BUILDINGS UP TO 5m DEEP. WHERE APPROVED, CONNECTIONS TO SEWERS OVER 5m DEEP REQUIRE APPROVED CONTROLLED SETTLEMENT JOINTS
4. VERTICAL RISER SHALL BE SAME AS SERVICE PIPE UNLESS OTHERWISE SPECIFIED
5. CAP AT THE PROPERTY LINE SHALL BE ADEQUATELY BRACED TO WITHSTAND TESTING PRESSURE
6. FOR NEW CONSTRUCTION, INSERTS MUST BE INSTALLED ON THE MAIN PIPE BEFORE THAT PIPE IS LAID. FOR SERVICES/BRANCHES ON EXISTING MAINS, SADDLES MAY BE USED.
7. APPROVED CUT-IN TOOL MUST BE USED FOR FIELD MADE CONNECTIONS
8. ALL DIMENSIONS ARE IN MILLIMETRES UNLESS OTHERWISE SHOWN
9. RADIUS BENDS GREATER THAN 22.5° ARE NOT ALLOWED

SEWER SERVICE CONNECTIONS FOR RIGID MAIN SEWER PIPE (MODIFIED OPSD-1006.010)	DATE: MAR 2006
	REV.: MAR 2024
	DWG No: S11

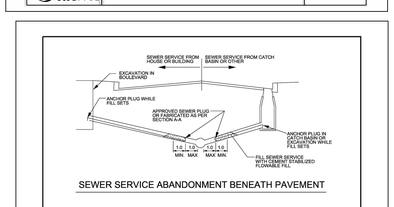
NOT FOR CONSTRUCTION

No.	DATE	DESCRIPTION	BY
03	2026-10-05	RE-ISSUED FOR SPA	T.H.
02	2026-06-30	ISSUED FOR SPA	T.H.
01	2025-12-17	ISSUED FOR OPA/ZBA	T.H.

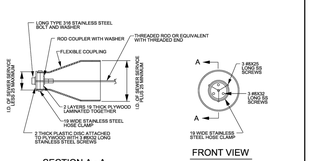
REVISIONS

LICENSED PROFESSIONAL ENGINEER
T. HARB
100223503
10-05-2026
PROVINCE OF ONTARIO

5m 2 0 5 10m
SCALE: 1:300



SEWER SERVICE ABANDONMENT BENEATH PAVEMENT

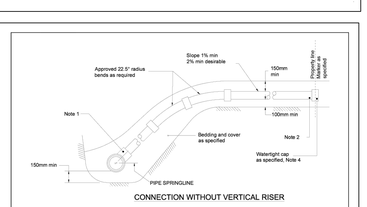


SECTION A - A
FABRICATED SEWER PLUG

NOTES:
1. ALL DIMENSIONS IN MILLIMETERS UNLESS OTHERWISE SHOWN.

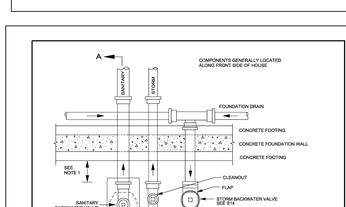
N.T.S.

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



NOTES:
1. THE CONNECTION SHALL BE MADE USING AN APPROVED TEE OR WYE FITTINGS. INVERT OF SERVICE CONNECTION SHALL BE AT THE SAME ELEVATION OR GREATER THAN THE ELEVATION OF THE SPRINGLINE OF THE SEWER MAIN.
2. SANITARY SERVICES TO BE 150mm AND STORM SERVICES TO BE 100mm FOR MAIN RESIDENCES UNLESS SPECIFIED OTHERWISE. SERVICE PIPE AND RADIUS BENDS TO BE APPROVED CSA B182.2, SDR28 PRODUCTS UNLESS SPECIFIED OTHERWISE
3. SANITARY SERVICES TO BE 1200mm AND STORM SERVICES TO BE 1500mm DEEP AT PROPERTY LINE FOR NEW BUILDINGS UP TO 5m DEEP, WHERE APPROVED, CONNECTIONS TO SEWERS OVER 5m DEEP REQUIRE APPROVED CONTROLLED SETTLEMENT JOINTS
4. CAP AT THE PROPERTY LINE SHALL BE ADEQUATELY BRACED TO WITHSTAND TESTING PRESSURE
5. ALL DIMENSIONS ARE IN MILLIMETRES UNLESS OTHERWISE SHOWN
6. RADIUS BENDS GREATER THAN 22.5° ARE NOT ALLOWED

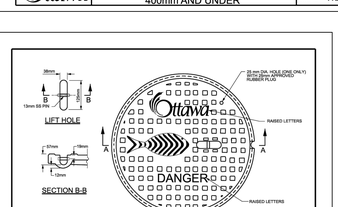
SEWER SERVICE CONNECTIONS FOR FLEXIBLE MAIN SEWER PIPE	DATE: MAR 2006
	REV. DATE: JAN 2026
	DWG No: S11.1



NOTES:
1. BACKWATER VALVE, CLEAN-OUTS AND ANY OTHER FITTINGS MUST BE INSTALLED A MINIMUM OF 300mm INSIDE OF THE BASEMENT FOOTING. THIS IS TO ENSURE THERE IS SUFFICIENT ROOM TO REPLACE THESE COMPONENTS IN THE FUTURE WITHOUT HAVING TO DAMAGE THE FOOTING/WALL DURING THE PROCESS.
2. JOINTS BETWEEN THE ACCESS BOX SECTIONS AND THE ACCESS BOX AND THE BACKWATER VALVE AND THE FLOOR SLAB SHALL BE SEALED.

N.T.S.

SANITARY BACKWATER VALVE INSTALLATION TYPE 1	DATE: MARCH 2010
	REV. DATE: MARCH 2011
	DWG No.: S14.1



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

N.T.S.

STANDARD CIRCULAR STORM MAINTENANCE HOLE COVER	DATE: MARCH 2010
	REV. DATE: MARCH 2017
	DWG. No.: S24.1

PARSONS
1223 Michael Street, Suite 100, Ottawa, Ontario, Canada K1J 7T2
Tel: (613) 738-4160 Fax: (613) 739-7105

CLIENT: TCU DEVCORP

PROJECT: 1867 ALTA VISTA DRIVE OTTAWA, ONTARIO

TITLE: DETAIL PAGE 2

DESIGNED BY	T.H.	PROJECT NO.	479542	
DRAWN BY	R.G			
CHECKED BY	M.M.		C111	DET2
DATE	OCTOBER 2026			
SCALE	N/A		DRAWING NO.	DRAWING

EROSION AND SEDIMENT CONTROL MEASURES:

- CONTRACTOR IS RESPONSIBLE FOR ALL INSTALLATION, MONITORING, REPAIR AND REMOVAL OF ALL EROSION AND SEDIMENT CONTROL FEATURES. THE CONTRACTOR SHALL IMPLEMENT BEST MANAGEMENT PRACTICES, TO PROVIDE FOR PROTECTION OF THE AREA DRAINAGE SYSTEM AND THE RECEIVING WATERCOURSE, DURING CONSTRUCTION ACTIVITIES. THE CONTRACTOR ACKNOWLEDGES THAT FAILURE TO IMPLEMENT APPROPRIATE EROSION AND SEDIMENT CONTROL MEASURE MAY BE SUBJECT TO PENALTIES IMPOSED BY ANY APPLICABLE REGULATORY AGENCY.
- SEDIMENT AND EROSION CONTROL PLAN OBJECTIVES:
- PREVENT SOIL EROSION. THIS CAN RESULT FROM STREAMING RAIN WATER OR WIND EROSION DURING CONSTRUCTION,
- PREVENT SEDIMENT DEPOSITS IN THE SEWER PIPES AND NEARBY COLLECTING STREAMS (AS APPLICABLE),
- PREVENT AIR POLLUTION FROM PARTICULATE MATTER AND DUST.

1. PRIOR TO START OF CONSTRUCTION:

PRIOR TO THE REMOVAL OF ANY VEGETATIVE COVER, MOVING OF SOIL AND CONSTRUCTION:

- INSTALL SILT FENCE (AS PER OPSD 219.110) ALONG DITCHES IMMEDIATELY DOWNSTREAM FROM AREAS TO BE DISTURBED (SEE PLAN FOR LOCATION).
- INSTALL FILTER CLOTH ON DOWNSTREAM MANHOLE COVERS.
- INSTALL SILTSACK FILTERS IN ALL CONCRETE CATCH BASINS STRUCTURES.
- INSPECT MEASURES IMMEDIATELY AFTER INSTALLATION.
- THE CONTRACTOR MUST SET UP THE MEASURES INDICATED ON THE PLAN, INSPECT THEM FREQUENTLY AND CLEAN AND REPAIR OR REPLACE THE DETERIORATED STRUCTURES. AT THE END OF THE CONSTRUCTION PERIOD, THE CONTRACTOR IS RESPONSIBLE FOR REMOVAL OF THE TEMPORARY STRUCTURES AND RECONDITIONING THE AFFECTED AREAS

2. DURING CONSTRUCTION:

- SEDIMENT AND EROSION CONTROL MEASURES TO BE CONSTRUCTED AS PER OPSS 805.
- WHEN SEDIMENT AND EROSION CONTROL MEASURES MUST BE REMOVED TO COMPLETE A PORTION OF THE WORK, THE SAME MEASURES MUST BE REINSTATED UPON THE WORK'S COMPLETION.
- WORK TO BE DONE IN THE VICINITY OF MAJOR WATERWAYS TO BE CARRIED OUT FROM JULY AND SEPTEMBER ONLY.
- MINIMIZE THE EXTENT OF DISTURBED AREAS AND THE DURATION OF EXPOSURE.
- PROTECT DISTURBED AREAS FROM RUNOFF.
- PROVIDE TEMPORARY COVER SUCH AS SEEDING OR MULCHING IF DISTURBED AREA WILL NOT BE REHABILITATED SHORTLY.
- INSPECT STRAW BALE FLOW CHECK DAMS, SILT FENCES, SILT SACKS, AND CATCH BASIN SUMPS REGULARLY AND AFTER EVERY MAJOR STORM EVENT. CLEAN AND REPAIR WHEN NECESSARY.
- PLAN TO BE REVIEWED AND REVISED AS REQUIRED DURING CONSTRUCTION.
- EROSION CONTROL FENCING TO BE ALSO INSTALLED AROUND THE BASE OF ALL STOCKPILES.
- DO NOT LOCATE TOPSOIL PILES AND EXCAVATION MATERIAL CLOSER THAN 2.5m FROM ANY PAVED SURFACE, OR ONE WHICH IS TO BE PAVED BEFORE THE PILE IS REMOVED. ALL TOPSOIL PILES ARE TO BE SEEDED IF THEY ARE TO REMAIN ON SITE LONG ENOUGH FOR SEEDS TO GROW (LONGER THAN 30 DAYS). WHEN STORING SOIL ON SITE IN PILES THE CONTRACTOR MUST COVER EACH PILE WITH TARPS, STRAW OR A GEOTEXTILE FABRIC TO AVOID FINE PARTICLE TRANSPORT BY WIND AND/OR STREAMING RAIN WATER.
- CONTROL WIND-BLOWN DUST OFF SITE TO ACCEPTABLE LEVELS BY SEEDING TOPSOIL PILES AND OTHER AREAS TEMPORARILY (PROVIDE WATERING AS REQUIRED). FOR DUST CONTROL, CONTRACTOR TO APPLY CALCIUM CHLORIDE (TYPE I – OPSS 2501 AND CAN/CGSB-15-1) AND WATER WITH EQUIPMENT APPROVED BY THE OWNER'S REPRESENTATIVE AT RATE IN ACCORDANCE TO OPSS 506 WHEN DIRECTED BY OWNER'S REPRESENTATIVE.
- ALL EROSION CONTROL STRUCTURE TO REMAIN IN PLACE UNTIL ALL DISTURBED GROUND SURFACES HAVE BEEN STABILIZED EITHER BY PAVING OR RESTORATION OF VEGETATIVE GROUND COVER. SEDIMENT CAPTURE SILT SACKS MUST BE MAINTAINED AND CANNOT BE REMOVED UNTIL ALL LANDSCAPING AREAS ARE COMPLETED.
- NO ALTERNATE METHODS OF EROSION PROTECTION SHALL BE PERMITTED UNLESS APPROVES BY THIS CONSULTING ENGINEER AND THE CITY OF OTTAWA DEPARTMENT OF PUBLIC WORKS.
- CONTRACTOR RESPONSIBLE FOR MUNICIPAL ROADWAY AND SIDEWALK TO BE CLEANED OF ALL SEDIMENT FROM VEHICULAR TRACKING ETC. AT THE END OF EACH WORK DAY.
- DURING WET CONDITIONS, TIRES OF ALL VEHICLES/EQUIPMENT LEAVING THE SITE ARE TO BE SCRAPED.
- ANY MUD/MATERIAL TRACKED ONTO THE ROAD SHALL BE REMOVED IMMEDIATELY BY HAND OR RUBBER TIRE LOADER.
- TAKE ALL NECESSARY STEPS TO PREVENT BUILDING MATERIAL, CONSTRUCTION DEBRIS OR WASTE BEING SPILLED OR TRACKED ONTO ABUTTING PROPERTIES OR PUBLIC STREETS DURING CONSTRUCTION AND PROCEED IMMEDIATELY TO CLEAN UP ANY AREAS SO AFFECTED.
- PROVIDE GRAVEL ENTRANCE WHEREVER EQUIPMENT LEAVES THE SITE TO PROVIDE MUD TRACKING ONTO PAVED SURFACES. GRAVEL BED SHALL BE A MINIMUM OF 10m LONG, 4m WIDE, AND 0.15m DEEP AND SHALL CONSIST OF COARSE MATERIAL. MAINTAIN GRAVEL ENTRANCE IN CLEAN CONDITION.

3. AFTER CONSTRUCTION:

- PROVIDE PERMANENT COVER CONSISTING OF TOPSOIL AND SEED TO DISTURBED AREAS.
- ALL SEDIMENT AND EROSION CONTROL MEASURES TO BE REMOVED BY THE CONTRACTOR FOLLOWING THE COMPLETION OF WORK AND AFTER DISTURBED AREAS HAVE BEEN REHABILITATED AND STABILIZED, THIS INCLUDES REMOVE STRAW BALE FLOW CHECK DAMS, SILT FENCES AND FILTER CLOTHS ON CATCH BASINS AND MANHOLE COVERS.
- INSPECT AND CLEAN CATCH BASIN SUMPS AND STORM SEWERS.

NOTES: REMOVALS AND DEMOLITION

1. PRE-REMOVAL, THE CONTRACTOR MUST VISIT THE PREMISES IN ORDER TO BE FULLY AWARE OF EXISTING CONDITIONS ON SITE, INCLUDING ALL ELEMENTS TO BE REMOVED AND DEMOLISHED. NO CLAIM WILL BE ACCEPTED DUE TO A POOR EVALUATION OF THE WORK TO BE COMPLETED.
2. THE CONTRACTOR IS RESPONSIBLE FOR LOCATING AND THE REQUEST FOR INTERRUPTION OF PUBLIC UTILITY SERVICES, SUCH AS GAS, TELEPHONE, POWER, CABLE, SEWERS, WATERMAIN, ETC. BEFORE PROCEEDING WITH WORK, COORDINATE WITH ALL APPLICABLE UTILITY COMPANIES.
3. FIRE HYDRANTS TO BE TAGGED AND BAGGED AND/OR PROTECTED AS INDICATED ON DRAWING.
4. CURB, ASPHALT, SIDEWALK, AND GRANULAR BASE TO BE EXCAVATED WITHIN LIMITS OF DEMOLITION REMOVAL. THE CONTRACTOR MUST CARRY OUT NECESSARY SAW CUTS.
5. SEWER / WATERMAIN PIPES TO BE ABANDONED MUST BE CUT, FILL WITH UNSHRINKABLE CONCRETE CONFORMING TO OPSS 1359, AND CAPPED.
6. REMOVE AND DISPOSE SEWERS AS INDICATED. PLUG ANY SERVICE LATERALS TO BE ABANDONED.
7. THE CONTRACTOR MUST ENTIRELY REMOVE THE DEMOLITION WRECKAGE FROM THE CONSTRUCTION SITE OFFSITE IN ACCORDANCE WITH THE REQUIREMENTS OF THE MINISTRY OF ENVIRONMENT CONSERVATION AND PARKS (MECP).
   a. THE CONTRACTOR MUST DISCARD RECYCLABLE DEMOLITION MATERIALS IN COLLABORATION WITH A REGIONAL RECYCLING COMPANY.
   b. ALL OTHER DEMOLITION MATERIALS MUST BE DISPOSED OFF-SITE AT AUTHORIZED LICENSED LANDFILLS AND IN CONFORMITY WITH THE APPLICABLE LAWS AND REGULATIONS. THE CONTRACTOR MUST BE ABLE TO PROVIDE, UPON REQUEST, COPIES OF THE DISPOSAL TICKETS TO THE OWNER'S REPRESENTATIVE.
8. SURFACES AND WORKS LOCATED OUTSIDE OF THE CONSTRUCTION WORK LIMIT MUST BE REINSTATED AS THEY WERE BEFORE BEGINNING OF WORK. CONTRACTOR IS RESPONSIBLE TO MAKE GOOD ON ANY DAMAGES TO EXISTING CURB AND ASPHALT NOT SCHEDULED FOR REMOVAL.
9. ALL MATERIALS, PRODUCTS AND OTHERS COMING FROM THE DEMOLITION BELONG TO THE CONTRACTOR, UNLESS SPECIFIED OTHERWISE.
10. THE CONTRACTOR MUST COMPLETE ALL REMOVALS AS SHOWN ON THE DRAWINGS AND AS REQUIRED TO MAKE THE WORK COMPLETE.
11. THE CONTRACTOR MUST PROTECT AND MAINTAIN IN SERVICE THE EXISTING WORKS WHICH MUST REMAIN IN PLACE. IF THEY ARE DAMAGED, THE CONTRACTOR MUST IMMEDIATELY MAKE THE REPLACEMENTS AND NECESSARY REPAIRS TO THE SATISFACTION OF THE OWNER'S REPRESENTATIVE AND WITHOUT ADDITIONAL EXPENSE TO THE OWNER.
12. THE CONTRACTOR MUST NOT PERFORM ANY TREE CUTTING DURING THE CORE MIGRATORY BIRDS NESTING PERIOD, WHICH IS APRIL 15 TO AUGUST 15.

NOTES: SEWER

1. ALL CATCH BASIN, TRENCH DRAIN, MAINTENANCE HOLE COVERS AND OTHER STORM SEWER CONNECTION SHALL BE EQUIPPED WITH NITRILE RUBBER GASKET.
2. CONTRACTOR TO CONFIRM ELEVATION OF EXISTING STORM AND SANITARY SEWERS AT PROPOSED CONNECTION POINTS AND REPORT ANY DISCREPANCIES TO THE ENGINEER BEFORE COMMENCING ANY WORK.
3. ALL WORK SHALL BE PERFORMED, AS APPLICABLE IN ACCORDANCE WITH OPSS 407, AND 410.
4. PIPE MATERIAL TO BE PVC SDR-35 AND CONFORMING TO OPSS 1841, UNLESS INDICATED OTHERWISE. PVC SEWERS TO BE INSTALLED PER OPSD 802.010 (MODIFIED). BEDDING AND COVER MATERIALS TO BE OPSS 1010 GRANULAR 'A' CRUSHER-RUN LIMESTONE BEDDING COMPACTED TO 95% SPMDD.
5. ALL SEWERS WITH LESS THAN 1.8 METERS OF COVER ARE SUBJECTED TO INSULATION DETAIL S35 OF THE CITY OF OTTAWA ON DRAWING C-104
6. PIPE BACKFILL MATERIAL TO BE APPROVED NATIVE MATERIAL OR SELECT SUBGRADE MATERIAL IN CONFORMANCE WITH OPSS 212.
7. ALL MAINTENANCE HOLES AND CATCH BASIN MAINTENANCE HOLES TO BE 1200mmØ AS PER OPSD 701.010, UNLESS INDICATED OTHERWISE. MAINTENANCE HOLES AND CATCH BASIN MAINTENANCE HOLES TO BE INSTALLED PER OPSS 407.
8. ALL CATCH BASINS TO BE 600x600mm AS PER OPSD 705.010, UNLESS INDICATED OTHERWISE. CATCH BASINS TO BE INSTALLED PER OPSS 407.
9. EXCAVATING, BACKFILLING, AND COMPACTING REQUIRED FOR MAINTENANCE HOLES, CATCH BASIN MAINTENANCE HOLES, AND CATCH BASINS TO BE COMPLETED AS PER OPSS 402. THEY ARE TO BE BACKFILLED WITH OPSS GRANULAR 'B' COMPACTED TO 98% SPMDD. JOINTS BETWEEN SECTIONS TO BE WRAPPED WITH NON-WOVEN GEOTEXTILE.
10. FOR SANITARY STRUCTURES: CAST IRON MAINTENANCE HOLE COVER AS PER OPSD 401.010 TYPE 'A'.
11. FOR STORM STRUCTURES: CAST IRON CATCH BASIN MAINTENANCE HOLE COVER AS PER OPSD 401.010 TYPE 'B' AND CAST IRON CATCH BASIN COVER AS PER OPSD 400.020.
12. SANITARY MAINTENANCE HOLES REQUIRE BENCHING AS PER OPSD 701.021.
13. THE CONTRACTOR IS RESPONSIBLE FOR MAKING OR ARRANGING ALL CONNECTIONS TO THE EXISTING SEWERS AS PER MUNICIPAL REQUIREMENTS. PRIOR TO CONNECTION, THE CONTRACTOR MUST PROVIDE, TO THE CONSULTANT / ENGINEER AND THE CITY FOR APPROVAL, ALL TEST RESULTS PERFORMED ON THE INTERNAL SERVICES.
14. ADVISE THE CITY PUBLIC WORKS AT LEAST 72 HOURS IN ADVANCE BEFORE ANY CONNECTION TO THE CITY SERVICES. CO-ORDINATE WITH CITY OF OTTAWA AS REQUIRED.
15. TERMINATE AND PLUG ALL SERVICE CONNECTIONS AT 1.0 m FROM EDGE OF THE BUILDING.
16. ALL SEWERS TO BE C.C.T.V. INSPECTED BY THE CONTRACTOR AS PER OPSS 409. TWO COPIES OF THE INSPECTION REPORT MUST BE PROVIDED TO THE CONSULTANT AND THE C.C.T.V. INSPECTION IN DVD FORMAT ONLY.
17. SUBDRAIN KNOCKOUT (KO) WILL BE PRE-MANUFACTURED WITH CATCH BASINS AND MAINTENANCE HOLES.
18. THE STORMWATER TSS QUALITY REQUIREMENTS WILL BE ACHIEVED BY INSTALLING A EFO-04 OR EQUIVALENT TO ACHIEVE 80% TSS REMOVAL. THE OIL/GRIT SEPARATOR IS TO HAVE A SEDIMENT CAPACITY OF 1190L, AN OIL CAPACITY OF 265L, AND FOR A MAXIMUM TREATMENT FLOW RATE OF 12.9 L/s.
19. OGS WILL REQUIRE PERIODIC MAINTENANCE AND CLEANING AS PER MANUFACTURERS SPECIFICATIONS - TYPICAL CLEANING INTERVAL IS ONCE A YEAR. ANNUAL CLEANING AGREEMENT NEEDS TO BE WITNESSED BY THE CITY.
20. ALL BUILDINGS FOUNDATION DRAINS TO BE CONNECTED TO THE STORM SEWER DOWNSTREAM OF THE ICD.

NOTES: WATERMAIN

1. ALL WATERMAIN TO BE INSTALLED AT MINIMUM COVER OF 2.4m BELOW FINISHED GRADE. WHERE THE MINIMUM COVER OF 2.4m IS NOT REACHED, THERMAL INSULATION IS REQUIRED AS PER CITY OF OTTAWA DETAIL W22.
2. WATERMAIN PIPE MATERIALS TO BE CLASS PVC DR-18, OR APPROVED EQUIVALENT, UNLESS INDICATED OTHERWISE.
3. WATERMAIN TO BE CONSTRUCTED AS PER OPSS 441 AND OPSD 802.010. WATERMAIN BEDDING AND COVER MATERIAL TO BE OPSS 1010 GRANULAR 'A' CRUSHER-RUN LIMESTONE COMPACTED TO 95% SPMDD.
4. A CONTINUOUS 12 GAUGE COPPER TRACER WIRE MUST BE INSTALLED OVER ALL WATERMAINS. TRACER WIRE SHALL BE TIED TO ALL FIRE HYDRANTS.
5. INSTALLATION OF A WATERMAIN PIPE CROSSING A SEWER PIPE SHALL BE AS PER CITY OF OTTAWA DETAILS W25 AND W25.2.
6. IF WATERMAIN PIPE MUST BE DEFLECTED TO MEET ALIGNMENT, ENSURE THAT THE AMOUNT OF DEFLECTION USED IS LESS THAN HALF THAT RECOMMENDED BY THE MANUFACTURER.
7. CATHODIC PROTECTION REQUIRED FOR ALL IRON FITTINGS AS PER OPSD 1109.011.
8. THRUST BLOCKS AND RESTRAINING AS PER OPSD 1103.010 AND OPSD 1103.020.
9. HYDRANT INSTALLATION AS PER OPSD 1105.010 AND OPSS 441. HYDRANT TO COMPLY WITH AWWA C502.
   a. HYDRANTS MUST HAVE THREE EXITS (TWO 65.5 mm AND ONE 100.0 mm 'STORZ' OF STAINLESS STEEL) WITH DRAIN. FIRE HYDRANTS MUST BE INSTALLED SUCH THAT THE 'STORZ' EXIT POINTS TOWARDS THE BUILDING IT WILL SERVICE. THE CONTRACTOR MUST ENSURE THAT THE BREAKAWAY FLANGE IS LOCATED ABOVE THE FINISHED GROUND (APPROXIMATELY 150 mm).
   b. FIRE FLOW TESTS FOLLOWED BY COLOUR CODING OF HYDRANTS (AS PER NFPA-291) SHALL BE CARRIED OUT PRIOR TO SUBSTANTIAL COMPLETION OF THE WORK.
10. WATERMAIN AND HYDRANT CONTROL VALVES IN THE 100 – 300 mm RANGE WILL BE RESILIENT SEATING GATE VALVES (AWWA C509) WITH MECHANICAL JOINT CONNECTIONS. VALVES WILL OPERATE COUNTER-CLOCKWISE TO OPEN WITH A NON-RISING STEM. VALVES WILL BE COMPLETE WITH THE STANDARD AWWA 50 mm OPERATING NUT. VALVES TO BE INSTALLED AS PER OPSS 441.
11. PIPE FITTINGS (BENDS, TEES, CROSSES, REDUCERS, ETC.) WILL BE MECHANICAL JOINT (AWWA C-111) WITH CEMENT MORTAR LINING (AWWA C-104).
12. COUPLERS MUST BE COMPRESSION TYPE WITH MINIMUM PRESSURE RATING OF 1035 kPa. COUPLERS MUST BE MUELLER 11-12940.
13. VALVE BOXES MUST BE COMPLETE (FULLY METALLIC) 3 PIECE SLIDING TYPE WITH GUIDE PLATES.
14. WATERMAINS MUST BE THOROUGHLY FLUSHED AND CLEANED TO REMOVE ALL DIRT AND DEBRIS PRIOR TO THE DISINFECTION PROCESS.
15. ALL WATERMAINS SHALL BE HYDROSTATICALLY AND BACTERIOLOGICALLY TESTED AS PER PROVINCIAL AND MUNICIPAL REGULATIONS. IT IS THE CONTRACTOR'S RESPONSIBILITY TO ENSURE THAT ALL REQUIREMENTS ARE FOLLOWED.
16. THE DISINFECTION PROCEDURE WHICH FOLLOWS INITIAL FLUSHING AND CLEANING CONSISTS OF CHLORINATION, FINAL FLUSHING AND BACTERIOLOGICAL TESTING. DISINFECTION MUST BE PERFORMED BY THE CONTRACTOR USING METHODS APPROVED BY THE CITY OF OTTAWA AND IN ACCORDANCE WITH MINISTRY OF ENVIRONMENT AND CLIMATE CHANGE GUIDELINES. DOSAGE MUST BE 100 ppm WITH A MINIMUM RESIDUAL OF 25 ppm AFTER 24 HOURS. DISINFECTANT MUST BE SUPPLIED BY THE CONTRACTOR AND MUST BE ANSI APPROVED. TESTING AND TEST RESULTS MUST BE WITNESSED BY CITY OF OTTAWA PERSONNEL.
17. ALL DISINFECTANT WATER IS TO BE REMOVED FROM THE NEW WATERMAINS AND REPLACED WITH DISTRIBUTION SYSTEM WATER PRIOR TO PRESSURE TESTING OF THE WATERMAIN.
18. PRESSURE TESTING OF ALL WATERMAINS AND APPURTENANCES INSTALLED BY THE CONTRACTOR MUST BE PERFORMED BY THE CONTRACTOR USING METHODS MEETING THE APPROVAL OF THE CITY OF OTTAWA. TESTING AND RESULTS MUST BE WITNESSED BY CITY OF OTTAWA PERSONNEL.
19. MAINS AND SERVICES MUST BE PRESSURE TESTED AT 1035 kPa (150 psi) IN ACCORDANCE WITH AWWA C-600-82 (MINIMUM REQUIREMENT).
20. LEAKAGE TESTS MUST BE CONDUCTED AS PER AWWA C-600-82 (MINIMUM REQUIREMENT).
21. ONCE THE DISINFECTION AND PRESSURE TESTING RESULTS HAVE BEEN APPROVED, THE CONTRACTOR MUST ENSURE THAT ALL WATERMAIN PIPES ARE FLUSHED UNTIL THE CHLORINE LEVEL IN THE WATER IS SIMILAR TO THE LEVEL OF CHLORINE IN THE MUNICIPAL WATERMAIN NETWORK IN THE AREA.
22. BACTERIOLOGICAL TESTING MUST CONSIST OF TWO SAMPLINGS TWENTY FOUR HOURS APART. IF BACTERIOLOGICAL SAMPLES ARE SATISFACTORY THE WATERMAIN MAY BE PLACED ON LINE.
23. ALL WATERMAIN VALVES TO BE OPERATED BY THE CITY OF OTTAWA ONLY.

NOTES: GENERAL

1. THE CONTRACTOR MUST CONFORM TO ALL LAWS, CODES, ORDINANCES, AND REGULATIONS ADOPTED BY FEDERAL, PROVINCIAL OR MUNICIPAL GOVERNMENT COUNCILS AND GOVERNMENT AGENCIES, APPLYING TO WORK TO BE CARRIED OUT. WHEREVER STANDARDS, LAWS AND/OR REGULATIONS ARE MENTIONED THEY REFER TO THEIR CURRENT VERSIONS, MODIFICATIONS INCLUDED.
2. ALL MATERIALS AND CONSTRUCTION METHODS SHALL BE IN ACCORDANCE WITH THE LATEST EDITION OF THE ONTARIO PROVINCIAL STANDARD SPECIFICATIONS AND DRAWINGS (OPSS AND OPSD), THE ONTARIO MINISTRY OF ENVIRONMENT AND CLIMATE CHANGE, THE ONTARIO MINISTRY OF NATURAL RESOURCES, APPLICABLE CONSERVATION AUTHORITIES, THE MUNICIPAL STANDARD SPECIFICATIONS AND DRAWINGS, AND ALL OTHER GOVERNING AUTHORITIES AS THEY APPLY, UNLESS OTHERWISE INDICATED.
3. ALL MATERIAL SUPPLIED AND PLACED FOR PARKING LOT AND ACCESS ROAD CONSTRUCTION SHALL BE TO OPSS STANDARDS AND SPECIFICATIONS UNLESS OTHERWISE NOTED. CONSTRUCTION TO OPSS 206, 310 & 314. MATERIALS TO OPSS 1001, 1003 & 1010.
4. THE LOCATION OF EXISTING UNDERGROUND MUNICIPAL SERVICES AND PUBLIC UTILITIES AS SHOWN ON THE PLANS ARE APPROXIMATE. THE CONTRACTOR MUST DETERMINE THE EXACT LOCATION, SIZE, MATERIAL AND ELEVATION OF ALL EXISTING UTILITIES (ON-SITE AND OFF-SITE) PRIOR TO ANY EXCAVATION WORK. DAMAGE TO ANY EXISTING SERVICES AND/OR EXISTING UTILITIES DURING CONSTRUCTION, WHETHER OR NOT SHOWN ON THE DRAWINGS MUST BE REPAIRED BY THE CONTRACTOR AT HIS OWN EXPENSE.
5. THE CONTRACTOR SHALL DETERMINE THE EXACT INVERT (GEODETIC ELEVATION), DIAMETER AND CONSTRUCTION MATERIAL OF THE EXISTING CONDUITS AT THE PROPOSED CONNECTIONS. THEY SHALL ALSO CARRY OUT, IF NECESSARY, EXPLORATORY DIGS IN ORDER TO DETERMINE THE EXACT LOCATION AND INVERTS OF EXISTING DUCK BANKS. THIS INFORMATION SHALL IMMEDIATELY BE PROVIDED TO THE CONSULTANT PRIOR TO START UNDERTAKING ANY MUNICIPAL SERVICES WORK AND A 48 HOUR PERIOD MUST BE ALLOCATED TO THE CONSULTANT FOR DESIGN REVIEW.
6. AT PROPOSED UTILITY CONNECTION POINTS AND CROSSINGS (I.E. STORM SEWER, SANITARY SEWER, WATER, ETC.) THE CONTRACTOR SHALL DETERMINE THE PRECISE LOCATION AND DEPTH OF EXISTING UTILITIES AND REPORT ANY DISCREPANCIES OR CONFLICTS TO THE ENGINEER BEFORE COMMENCING WORK.
7. CONTRACTOR IS RESPONSIBLE FOR ALL LAYOUT FOR CONSTRUCTION PURPOSES.
8. THE CONTRACTOR IS RESPONSIBLE FOR THE COORDINATION OF ALL WORK AND ACTIVITIES WITH OTHERS TRADES AND CONTRACTORS.
9. THE CONTRACTOR IS THE ONLY PERSON IN CHARGE OF SAFETY ON THE BUILDING SITE. THE CONTRACTOR IS RESPONSIBLE FOR PROVIDING ADEQUATE PROTECTION OF THE WORKERS, OTHER PERSONNEL AND THE GENERAL PUBLIC, PROTECTION OF MATERIALS, AS WELL AS MAINTAINING IN GOOD CONDITION THE COMPLETED WORKS AND WORKS TO BE COMPLETED. THE CONTRACTOR MUST PROVIDE AT ANY TIME:
   a. A SUFFICIENT NUMBER OF FENCES, BARRIERS, POSTERS, GUARDS AND OTHERS TO ENSURE SAFETY;
   b. NECESSARY CONVENIENCES FOR THE COMPLETION OF WORK SUCH AS HEATING, LIGHTING, VENTILATION ETC.
10. CONTRACTOR IS RESPONSIBLE TO OBTAIN THE VARIOUS PERMITS/APPROVALS REQUIRED TO COMPLETE ALL THE WORKS AND ACTIVITIES AND BEAR COST OF THE SAME, SUCH AS BUT NOT LIMITED TO; ROAD CUT PERMITS, SEWER PERMITS, WATER PERMIT, ETC. AND THEIR ASSOCIATED COSTS.
11. ALL ELEVATIONS ARE GEODETIC AND UTILIZE METRIC UNITS.
12. JOB BENCH MARK - CONFIRM WITH PARSONS PRIOR TO UTILIZATION. THE CONTRACTOR MUST MAINTAIN BENCHMARKS AND LANDMARK REFERENCES AS IS. OTHERWISE THESE REFERENCES WILL BE REPOSITIONED BY A CERTIFIED LAND SURVEYOR AT THE CONTRACTOR'S EXPENSE.
13. ALL GROUND SURFACES SHALL BE EVENLY GRADED WITHOUT PONDING AREAS AND LOW POINTS EXCEPT WHERE APPROVED SWALE OR CATCH BASIN OUTLETS ARE PROVIDED.
14. IF GROUNDWATER IS ENCOUNTERED DURING CONSTRUCTION, DEWATERING OF EXCAVATIONS COULD BE REQUIRED. IT IS ASSUMED THAT GROUNDWATER MAY BE CONTROLLED BY SUMP AND PUMPING METHODS. THE CONTRACTOR SHALL OBTAIN A PERMIT TO TAKE WATER IF SITE CONDITIONS REQUIRE TAKING MORE THAN A TOTAL OF 400 000 L/DAY.
15. STRIP AND REMOVE ALL TOPSOIL FROM IMPROVED AREAS. SITE PREPARATION INCLUDES CLEARING, GRUBBING, STRIPPING OF TOPSOIL, DEMOLITION, REMOVAL OF UNSUITABLE MATERIALS, CUT, FILL AND ROUGH GRADING OF ALL AREAS TO RECEIVE FINISHED SURFACES.
16. ABUTTING PROPERTY GRADE TO BE MATCHED.
17. ALL EDGES OF DISTURBED PAVEMENT SHALL BE SAW CUT TO FORM A NEAT AND STRAIGHT LINE PRIOR TO PLACING NEW PAVEMENT. PAVEMENT REINSTATEMENT SHALL BE WITH STEP JOINTS OF 300mm WIDTH MINIMUM.
18. CURBS TO BE BARRIER, CONSTRUCTED AS PER OPSD 600.110, EXCEPT WHERE INDICATED OTHERWISE. ELEVATION AT TOP OF CONCRETE CURBS TO BE 150 mm ABOVE THE ASPHALT, UNLESS OTHERWISE INDICATED ON THE DRAWINGS.
19. DEPRESSED CURBS TO BE MOUNTABLE, CONSTRUCTED AS PER OPSD 600.100.
20. LIGHT DUTY AND HEAVY DUTY ASPHALT PAVEMENTS TO BE CONSTRUCTED AS PER TABLE ON DRAWING C103.
21. TRANSITION BETWEEN EXISTING AND PROPOSED PAVEMENT SHALL BE CONSTRUCTED AS PER DETAIL D3 ON DRAWING C104.
22. RESTORE PAVEMENT STRUCTURE AND SURFACES ON EXISTING ROADS TO A CONDITION AT LEAST EQUAL TO ORIGINAL AND TO THE SATISFACTION OF THE CITY AUTHORITIES.
23. CLEANLINESS ON THE SITE, INCLUDES THE CONTRACTOR SHALL CLEAN ROADWAYS AT HIS OWN COST AS DIRECTED BY THE OWNER'S REPRESENTATIVE, MATERIALS AND EQUIPMENT MUST BE LAID OUT IN AN ORGANIZED AND SAFE MANNER, AND ALL MATERIAL, EQUIPMENT AND TEMPORARY STRUCTURES WHICH ARE NO LONGER NECESSARY FOR THE EXECUTION OF THE CONTRACT MUST BE REMOVED FROM THE SITE.
24. CONTRACTOR TO ENSURE MITIGATION MEASURES ARE IMPLEMENTED TO REDUCED THE RISK OF GROUND CONTAMINATION FROM PETROLEUM PRODUCTS.
25. THE CONTRACTOR MUST ENSURE THE FOLLOWING MEASURES ARE IMPLEMENTED REGARDING THE HANDLING OF CONCRETE:
   a. CONCRETE SHOULD EITHER BE MIXED AWAY FROM THE SITE OR SHOULD BE PREPARED ON PAVED SURFACES IF ONLY SMALL QUANTITIES ARE REQUIRED (I.E. MINOR REPAIRS);
   b. EXCESS CONCRETE MUST BE DISPOSED OFF-SITE AT A LOCATION THAT MEETS ALL REGULATORY REQUIREMENTS;
   c. THE WASHING OF CONCRETE TRUCKS AND OTHER EQUIPMENT USED FOR MIXING CONCRETE SHOULD NOT BE CARRIED OUT WITHIN 30 METERS OF A WATERCOURSE OR WETLAND AND SHOULD TAKE PLACE OUTSIDE OF THE WORK SITE;
   d. ALL CONCRETE TRUCKS SHOULD COLLECT THEIR WASH WATER AND RECYCLE IT BACK INTO THEIR TRUCKS FOR DISPOSAL OFF-SITE AT A LOCATION MEETING ALL REGULATORY REQUIREMENTS.
26. THE CONTRACTOR SHALL ENSURE THAT ALL EXCAVATED SURPLUS MATERIALS THAT WILL BE REQUIRED TO BE DISPOSED OFFSITE BE STOCKPILED TEMPORALLY FOR SAMPLING PRIOR BEING LOADED OFFSITE.
27. MINIMIZE DISTURBANCE TO EXISTING VEGETATION DURING THE EXECUTION OF ALL WORKS.
28. TRENCHING, BACKFILLING AND COMPACTING MUST CONFORM TO OPSS 401.
29. DEWATERING OF PIPELINE, UTILITY AND ASSOCIATED STRUCTURE EXCAVATIONS TO BE COMPLETED AS PER OPSS 517.
30. THE CONTRACTOR MUST CONTROL SURFACE RUNOFF FROM PRECIPITATION DURING CONSTRUCTION.
31. FOR ALL GEOTECHNICAL WORK, CONTRACTOR TO REFER TO "GEOTECHNICAL INVESTIGATION, PROPOSED DEVELOPMENT, 1867 ALTA VISTA DRIVE, OTTAWA, ONTARIO, BY PATERSONGROUP. DATED APRIL 22, 2025, PG7401-1
32. REMOVE FROM SITE ALL EXCESS EXCAVATED MATERIAL UNLESS OTHERWISE DIRECTED FROM THE ENGINEER. EXCAVATE AND REMOVE ALL ORGANIC MATERIAL AND DEBRIS LOCATED WITHIN THE PROPOSED BUILDING, PARKING AND ROADWAY LOCATIONS.
33. THE CONTRACTOR IS RESPONSIBLE FOR ALL EXCAVATION, BACKFILL AND REINSTATEMENT OFF ALL AREAS DISTURBED DURING CONSTRUCTION TO EXISTING CONDITIONS OR BETTER AND ALL ASSOCIATED WORKS TO THE SATISFACTION OF THE CONSULTANT AND MUNICIPAL AUTHORITIES. ASPHALT REINSTATEMENT MUST BE IN ACCORDANCE WITH OPSS 310. LANDSCAPE AREAS TO BE REINSTATED WITH 150 mm OF TOPSOIL AND SOD IN ACCORDANCE WITH OPSS 802 AND OPSS 803.
34. DURING THE CONSTRUCTION PERIOD THE CONTRACTOR IS RESPONSIBLE FOR INSTALLING AND MAINTAINING TEMPORARY TRAFFIC SIGNAGE, INCLUDING TRAFFIC SIGNS, TRAFFIC MARKINGS AND TEMPORARY TRAFFIC LIGHTS, AND FLAGMEN, AS REQUIRED BY THE OWNER, THE CONSULTANT, THE MUNICIPALITY, THE MTO, AND OTHER GOVERNING AUTHORITIES.
35. CONSTRUCT SIDEWALK EXPANSION JOINTS & CONTROL JOINTS AS PER OPSD 310.020.
36. CONSTRUCT CONCRETE SIDEWALK AS PER OPSD 310.020 AND OPSS 351. TACTILE WALKING SURFACE INDICATORS PER OPSS 351.
37. DISPOSE OF CONTAMINATED MATERIALS AT APPROPRIATE OFF-SITE FACILITY THAT MEETS ALL REGULATORY REQUIREMENTS.
38. BE PREPARED TO INTERCEPT, CLEAN UP, AND DISPOSE OF SPILLS OR RELEASES THAT MAY OCCUR WHETHER ON LAND OR WATER. MAINTAIN MATERIALS AND EQUIPMENT REQUIRED FOR CLEANUP OF SPILLS OR RELEASES READILY ACCESSIBLE ON SITE.
39. PROMPTLY REPORT SPILLS AND RELEASES POTENTIALLY CAUSING DAMAGE TO ENVIRONMENT TO: AUTHORITY HAVING JURISDICTION OR INTEREST IN SPILL OR RELEASE INCLUDING CONSERVATION AUTHORITY, WATER SUPPLY AUTHORITIES, DRAINAGE AUTHORITY, ROAD AUTHORITY, AND FIRE DEPARTMENT.
40. DECONTAMINATE EQUIPMENT AFTER WORKING IN POTENTIALLY CONTAMINATED WORK AREAS AND PRIOR TO SUBSEQUENT WORK OR TRAVEL ON CLEAN AREAS.
41. DO NOT DISCHARGE DECONTAMINATED WATER, OR SURFACE WATER RUNOFF, OR GROUNDWATER WHICH MAY HAVE COME IN CONTACT WITH POTENTIALLY CONTAMINATED MATERIAL, OFF SITE OR TO MUNICIPAL SEWERS.
42. CONTRACTOR IS TO SUBMIT A TRAFFIC MANAGEMENT PLAN FOR APPROVAL ONE (1) WEEK PRIOR TO ANY WORK WITHIN THE ROW LIMITS TO MEET THE REQUIREMENTS OF MTO BOOK 7. THE CONTRACTOR WILL BE REQUIRED TO IMPLEMENT ALL REQUIREMENTS OF THE MTO BOOK 7.
43. CITY PUBLIC WORKS DEPARTMENT TO BE CONTACTED MINIMUM 7 DAYS PRIOR TO PLANNED DATE FOR CONNECTION TO EXISTING STORM SEWERS, SANITARY SEWERS, AND WATERMAIN. CONNECTION TO EXISTING TO TAKE PLACE IN THE PRESENCE OF APPROPRIATE CITY OF OTTAWA STAFF.
44. ALL THREE SITE ENTRANCES TO BE INSTALLED AS PER CITY OF OTTAWA STANDARD DETAIL SC7.1



KEY PLAN

TOPOGRAPHIC INFORMATION & BENCHMARK

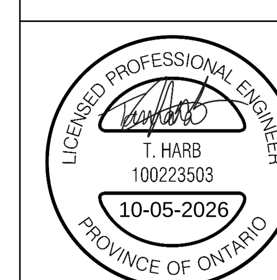
TOPOGRAPHIC SURVEY COMPLETED BY ANNIS O'SULLIVAN VOLLEBEKK LTD. ON JUNE 26th, 2025. ELEVATIONS SHOWN ARE GEODETIC AND ARE REFERRED TO THE CGVD-28 GEODETIC DATUM.

SITE BENCHMARK No.1 LOCATED AT HYDRANT AT EXISTING ENTRANCE ALONG ALTA VISTA DRIVE. FIRE HYDRANT TOP OF SPINDLE = 73.83

NOT FOR CONSTRUCTION

No.	DATE	DESCRIPTION	BY
03	2026-10-05	RE-ISSUED FOR SPA	T.H.
02	2026-06-30	ISSUED FOR SPA	T.H.
01	2025-12-17	ISSUED FOR OPA/ZBA	T.H.

REVISIONS



5m 2 0 5 10m

SCALE: 1:300

PARSONS

1223 Michael Street, Suite 100, Ottawa, Ontario, Canada K1J 7T2
Tel: (613) 738-4160 Fax: (613) 739-7105

CLIENT: TCU DEVCORP

PROJECT: 1867 ALTA VISTA DRIVE OTTAWA, ONTARIO

TITLE: GENERAL NOTES

DESIGNED BY	T.H.	PROJECT NO.	479542
DRAWN BY	R.G	DRAWING NO.	DRAWING
CHECKED BY	M.M.	C109	NOTES
DATE	OCTOBER 2026		
SCALE	N/A		