Servicing & Stormwater Management

Final

New Half Moon Bay Secondary School
3853 Cambrian Rd, Ottawa, ON K2J 5P5

July 24, 2026

Jp2g Project # 24-5128A

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Jp2g Consultants Inc.
ENGINEERS · PLANNERS · PROJECT MANAGERS

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Author and Review Panel

Prepared by:

Bahar Radan, B.Sc., M.Eng
Civil Intern

Reviewed by:

Zach Bauman, P. Eng
Civil Engineer

Approved by:

Ali Sammour, M.Eng., P.Eng., PMP
Manager, Senior Civil Engineer

1 Introduction

1.1 Site Description and Proposed Development

Jp2g Consultants Inc. (Jp2g) was retained by N45 Architecture Inc. to complete a Servicing & Stormwater Management Report suitable for the City of Ottawa Site Plan Control Application, for the Ottawa-Carleton District School Board New Half Moon Bay Secondary School development located at 3853 Cambrian Road, hereafter referred to as the 'site'.

Figure 1: Site Location

The site is approximately 6.05 ha in size and is bound by Cambrian Road to the North, Elevation Road to the West, future residential developments on Crested Lark Way to the South, and an underdeveloped parcel block to the East. The site fronts Cambrian Road and forms part of the planned secondary school block within the Half Moon Bay West development area. The proposed development includes the construction of a new school with associated parking areas, bus loop and drop-off facilities, pedestrian connections, landscaped areas, and outdoor recreational amenities. The building footprint is approximately 7,105m^2.

A pre-consultation meeting was held with City of Ottawa staff on March 19, 2026, to determine the project constraints and requirements. The following report details the site servicing and stormwater management calculations used for capacity and water quantity control in accordance with the City's requirements.

1.2 Estimated School Population

Per correspondence with the architect and school board, the school is estimated to serve 2,195 students and 80 staff, for a total estimated school population of 2,275. This population estimate will be used to estimate peak sanitary, and water demands for the school development.

1.3 Existing Infrastructure

Full municipal services are available for connection surrounding the subject site:

Water

A 200mm diameter PVC watermain stub was left at the property line near Cambrian Road. A 300mm PVC watermain is available on Elevation Road. Refer to the City of Ottawa As-builts included in Appendix E.

Sanitary

A 200mm PVC sanitary sewer pipe extends to the property line near Cambrian Road and connects to the existing 1200mm sanitary manhole EX. SAN MH 3A. Refer to the City of Ottawa As-builts included in Appendix E.

Storm

A 1200mm diameter concrete storm sewer pipe connects to a 2400mm storm maintenance hole EX STM CONTROL MH4 at the property line near Cambrian Road. Refer to the City of Ottawa As-builts included in Appendix E.

1.4 List of Relevant Guidelines and Studies

The following guidelines were used as reference related to the design of the proposed servicing and grading considerations for the subject site:

- City of Ottawa Sewer Design Guidelines
- Chapter 8 of the City of Ottawa Sewer Design Guidelines (Stormwater guidelines)
- City of Ottawa Stormwater Management Policies
- City of Ottawa Water Design Guidelines
- City of Ottawa Design Specifications
- Ministry of Environment (MOE) Guidelines for the Design of Water Distribution Systems and Design of Sanitary Sewage Systems
- Stormwater Management Planning and Design Manual 2003
- Ontario Building Code (2012)
- Stormwater Management Report -for the Phase 1 of the Half Moon Bay West Subdivision
- Design Brief for the Half Moon Bay West Subdivision Phase 1 Mattamy Homes, Project No. 16-888

1.5 Design Drawings

The following reference civil design drawings are included in Appendix A:

- C1 – Site Servicing Plan
- C2 – Site Grading Plan
- C3 – Details, Notes, and Schedules
- C4 – Stormwater Management, Erosion and Sediment Control Plan
- FIG.1 – Pre-Development Drainage Areas
- FIG.2 – Post-Development Drainage Areas
- FIG.3 – Fire Hydrant Coverage Areas

1.6 Environmental Compliance Assessment

Our understanding is that an environmental compliance assessment for the site is not required. This site is exempt by O. Reg. 525/98, applicable as follows:

> *"Subsections 53 (1) and (3) of the Act do not apply to the use, operation, establishment, alteration, extension or replacement of or a change in the storm water management facility that,*
>
> *(a) is designed to service one lot or parcel of land;*
>
> *(b) discharges into a storm sewer that is not a combined sewer;*

(c) does not service industrial land or a structure located on industrial land; and
(d) is not located on industrial land. O. Reg. 525/98, s. 3; O. Reg. 40/15, s. 4."

2 Objective

The objective of this study is to outline the servicing requirements for the development of the site and identify the impact of the development on the existing municipal services, including water, storm, and sanitary.

3 Stormwater Management

3.1 Stormwater Management Criteria

3.1.1 Quantity Control

In accordance with the Half Moon Bay West Phase 1 Design Brief and the Stormwater Management Report for Phase 1 of the Half Moon Bay West Subdivision, the quantity control criteria for this site are to control the 100-year post-development release rate to the 5-year storm event. All storms up to and including the 100-year storm event must be detained on site. City of Ottawa IDF curves included in the City of Ottawa Sewer Design Guidelines will be used in determining peak runoff for each storm event. The storm servicing design for the secondary school block, Block 173, is based on a contributing area of 6.05 ha, a runoff coefficient of 0.65, a 5-year design return period, and an allowable release rate of 1,139 L/s. Refer to the excerpt from the Stormwater Management Report for Phase 1 of the Half Moon Bay West Subdivision included in Appendix B, showing stormwater management criteria for the secondary school block 173.

3.1.2 Quality Control

Per pre-consultation with the City of Ottawa and Stormwater Management Report for Phase 1 of the Half Moon Bay West Subdivision, water quality control for runoff from the subject site is provided downstream through the Clarke SWM Pond, which is designed to achieve the MECP Enhanced Level of Protection, providing 80% TSS removal. No additional quality control measures are required for the site.

3.2 Pre-Development Conditions

The existing site consists of an undeveloped parcel of land located at 3853 Cambrian Road. Most of the site has been stripped of topsoil, and earthworks have occurred across the property over the past 10 years. The site previously consisted primarily of agricultural fields, except for the southern portion of the property, where a treed area formerly existed. The existing elevations within the proposed development area generally range from 94.75 in the southwest corner to 93.58 in the northeast corner. There is an existing ditch running along the southern property line to the east property. Full municipal water, sanitary, and storm services are available for connection at the subject site.

3.2.1 Predevelopment Allowable Flow Rates

Per the approved stormwater management criteria for the Half Moon Bay West Phase 1 subdivision, the secondary school block, Block 173, the site was allocated a runoff coefficient of 0.65 (C) for the 5-year storm event. For the 6.05 ha site, the allowable release rate is **1,138.80 L/s**. Under post-development conditions, all storms up to and including the 100-year storm event must be controlled to less than or equal to this allowable release rate. Refer to the applicable stormwater management criteria excerpt included in Appendix B.

3.3 Post-Development Conditions

The proposed site development includes the construction of a new three-storey high school with no basement, asphalt parking areas, a bus loop and fire lanes, school paved yards, a running track and sports field, a mini practice field, and landscaped areas. The proposed building has an approximate footprint of 7,105m^2.

3.3.1 Post-Development Drainage Areas

Subcatchment drainage areas were delineated based on the proposed grading design to provide a separate drainage area for each storm sewer inlet. Area-weighted runoff coefficients were determined using a value of 0.20 for pervious areas and a value of 0.90 for impervious areas in accordance with the City of Ottawa Sewer Design Guidelines. Runoff coefficients were increased by 25% for the 100-year event, to a maximum value of 1.00. A post-development drainage plan is included in **Appendix A as Figure 2 – Post-Development Drainage Plan**. Detailed calculations and information for each subcatchment
The areas are shown in Appendix B-2.

3.3.2 Stormwater Management Controls

Stormwater management control is provided by a combination of roof drain controls and Inlet Control Devices (ICDs), which are orifice control plates at the outlet pipes of certain catch basins and catch basin-manhole structures, as follows:

- ICD-1 located in structure CB-1, which controls subcatchment B1
- ICD-2 located in structure CB-2, which controls subcatchment B2
- ICD-3 located in structure CBMH-1, which controls subcatchments B3, B4 and B5
- ICD-4 located in structure CB-3, which controls subcatchment B6
- ICD-5 located in structure CB-4, which controls subcatchment B7
- ICD-6 located in structure CB-6, which controls subcatchment B8
- ICD-7 located in structure CB-7, which controls subcatchment B9
- ICD-8 located in structure CB-8, which controls subcatchment B10
- ICD-9 located in structure CBMH-3, which controls subcatchments B11 and B12
- Roof drains, which control roof drainage from subcatchment B13.
- Subcatchments B14, B15a through B15e, B16 and B17 flow uncontrolled

For roof drainage, parabolic weirs (Watts Drainage Adjustable Flow Control Roof Drains, or equivalent approved product) will be used to control flow. 41 roof drains are proposed in the “fully exposed” position, which each deliver a flow rate of 23.6 gpm (1.49 L/s) at a maximum 120mm of head. To ensure the maximum release rate based on the head provided in the roof drain specifications, scuppers are to be provided on the building roof at 150mm above the roof drain elevation, so that each flow-control roof drain will restrict flow to the 1.49 L/s maximum. The modified rational method was used to determine the peak storage requirements behind each control device. Based on the restricted flow rates and the roof discharge curve, the required storage for the roof area was calculated to be 219.36 m^3 for the 100-year storm event, whereas 286.8 m^3 of storage is provided based on the 0.717 ha roof area and a maximum roof ponding depth of 0.12 m. At 0.12 m of head, the total allowable roof discharge is 61.2 L/s. Refer to the roof calculations and roof drain flow rates provided in Appendix B-12.

Civil 3D stage-storage analysis was used to determine the available surface storage upstream of the proposed inlet control devices based on the proposed site grading. The modified rational method was used to determine peak storage requirements behind each control device. The orifice equation was used to size the proposed orifice plates based on the respective headwater levels and orifice invert. Detailed modified rational method calculations, including a stage-storage-discharge analysis for each control device, are included in Appendix B for each ICD-1 through ICD-9, and proposed roof storage. Provided surface storage, as determined through Civil 3D stage-storage analysis exceeds the required storage for each restricted release rate.

The minimum orifice size proposed is 75mm, in accordance with the City of Ottawa Sewer Design Guidelines. The maximum ponding depth proposed in a paved area is 0.28m for the 100-year storm, in accordance with the City of Ottawa Sewer Design Guidelines. The highest proposed ponding elevation during the 100-year storm is at an elevation of 94.77, meeting the minimum 300mm clearance to any building opening or ramp as the building FFE is at an elevation of 95.20m. Proposed stormwater management controls, and ponding limits are

shown in **Appendix A - C4 Stormwater Management Plan**. Additionally, no surface ponding is required in any paved area during the 2-year storm event in accordance with the City of Ottawa Design Guidelines.

3.3.3 Post-Development Site Outflow

Resultant post-development site outflow, accounting for the summation of all 100-year flow controls and 100-year uncontrolled flow, is shown in Table 3-1 below. Evidently, the resultant post-development site outflow is restricted to the allowable release rate of 1,138.80 L/s identified in section 3.2.1 above, for all storms up to and including the 100-year storm event.

Table 3-1: Post-Development 100 Year Outflow and 100 Year Storage Summary

Total Site Outflow Summary

Source	100 Yr Release Rate (L/s)	100 Yr Provided Storage (m^3)
ICD-1	25.30	33.1
ICD-2	55.30	37.4
ICD-3	117.10	42.0
ICD-4	30.20	46.8
ICD-5	69.10	51.9
ICD-6	51.50	57.2
ICD-7	35.60	62.8
ICD-8	36.20	68.6
ICD-9	16.00	74.7
Roof	61.20	239.0
100 Year Uncontrolled	484.08	N/A
Total	**981.58**	**713.45**
Allowable	**1138.80**	
Difference	**157.22**	

3.4 Proposed Storm Sewer Servicing

The proposed on-site storm sewer pipe design has been sized to convey the 5-year event, or the restricted flow control, in accordance with City requirements. Sewers were sized and sloped to ensure that a maximum of 85% of full flow capacity, while staying above the minimum slopes specified in the City of Ottawa *Sewer Design Guidelines*.

Foundation drains will be connected to the storm sewer system through their own independent service connection. A Proline fittings backwater valve will be installed on the 100mm foundation drain service. The building storm service for the roof drains will be connected independently, downstream of the proposed foundation drain backwater valve.

3.5 Overland Flow Route

In the case of system blockages, an emergency overland flow route must be provided to the city ROW. Site grading has been designed to provide an overflow route such that surface runoff will be directed to the ROW before touching any part of the building envelope. An overland flow route is presented in **Appendix A – C4 Stormwater Management Plan**.

In the proposed parking lot on the northeast of the site, drainage will be directed over the top of the curb at CB-1 and towards the Cambrian Road ROW. In the paved yard in the basketball courts at the southeast of the school, drainage will be directed across the highpoints between the catch basins, through the green areas, across the south bus loop, and ultimately toward the ROW on Elevation Road in the southwest corner of the site. The

overland flow route is demonstrated in **Appendix A – C4 Stormwater Management Plan**, as well as the site grading shown in **Appendix A – C2 Site Grading Plan**.

4 Sanitary Servicing

4.1 Sanitary Design Criteria

The sanitary servicing design for the site is to conform to the City of Ottawa Sewer Design Guidelines and the MECP Design Guidelines for Sewage Works. The following criteria were used to estimate the peak sanitary flow rates and to determine the required sanitary servicing for the site:

- Minimum velocity = 0.6m/s
- Maximum velocity = 3.0 m/s
- Manning roughness coefficient n=0.013
- A sewage flow rate of 70 L/student/d (Table 5-3 of MOE Design Guidelines for Sewage Works)
- Student and Staff Population = 2275 (See section 1.2)
- Peak Factor of 1.5 (City of Ottawa Institutional Peak Factor)
- Infiltration allowance of 0.33 L/s/ha.

4.2 Existing Sanitary Servicing

There is an existing 200mm diameter sanitary sewer pipe that extends to the property line near Cambrian Road and connects to the existing 1200mm sanitary manhole EX. SAN MH 3A. Per the City of Ottawa as-built, the existing 200mm diameter sanitary sewer stub extends to the property at a 1.0% slope. Refer to **Appendix E - Additional Documents** for available as-built information.

4.3 Proposed Sanitary Servicing and Calculations

A new 200mm diameter on-site sanitary sewer will connect to the proposed school building, conveying sanitary flows from the development to the existing 1200mm sanitary manhole. Refer to drawing **C1 – Site Servicing Plan in Appendix A** for proposed servicing.

Peak sanitary flow from the site is calculated based on the estimated student and staff population described in section 1.2. Sanitary flows were estimated using the per student water consumption demands of 70l/student/day within the City of Ottawa Water Design Guidelines. This is additionally in accordance with Table 5-3 of the MOE Design Guidelines for Sewage Works, with an estimated sewage flow rate of 70 l/student/day. An infiltration allowance of 0.33 L/s/ha was allocated for the site's infiltration flow.

As such, peak flows from the proposed addition were estimated to be 4.76 L/s. The new 200mm sanitary sewer at 1.0% slope will have a full flow capacity of 32.8 L/s. The full flow capacities are sufficient to convey the sanitary flows from the proposed school development, as calculated based on the City of Ottawa *Sewer Design Guidelines* (October 2012) and *Technical Bulletin ISTB-2018-01* (March 2018). Refer to the sanitary sewer design sheet in **Appendix C** for detailed calculations. The proposed sanitary servicing meets the velocity requirements and is satisfactory to the Sanitary Design Criteria included in the City of Ottawa Design Guidelines.

Per the Half Moon Bay West Phase 1 Design Brief Report, the subject site's sanitary flow was estimated to be 6.94 L/s. Refer to the block 173 sanitary design flows from the Half Moon Bay West Phase 1 Design Brief Report included in Appendix C. The calculated sanitary release rate based on the estimated student and staff population is within the allocated sanitary release rate from the Half Moon Bay West Phase 1 Design Brief Report.

A backwater valve is not proposed to be installed on the proposed building's sanitary service. Per the Ontario Building Code, section 7.4.6.4 section 3:

"Except as provided in Sentences (4) and (5), where a building drain or a branch may be subject to backflow,
(a) a backwater valve shall be installed on every fixture drain connected to it when the fixture is located below the level of the adjoining street, or

(b) A backwater valve shall be installed to protect fixtures which are below the upstream sanitary manhole cover when a residential building is served by a public sanitary sewer."

The proposed building is a slab-on-grade building with no basement, and therefore, the connecting sanitary fixtures will be above the floor slab elevation of 95.20. The fixtures are not subject to clause a) or b) above, as the building's fixture elevations are above the adjoining street elevation and above the upstream sanitary manhole cover elevation. The existing sanitary manhole on Cambrian Road is at an elevation of 93.44. In the event of a sanitary backflow event, the backflow would spill out of the upstream sanitary manhole to the street elevation, and flow through the provided overland flow route, without touching the building envelope. Additionally, according to the City of Ottawa materials specifications, sanitary backwater valves are approved for a 125mm sanitary service size. The proposed sanitary building service is 200mm in diameter, and there does not appear to be any commercially available backwater valves for sanitary services of this size that meet the City of Ottawa Material Specifications and the provisions of the OBC with a normally open flap.

5 Water Servicing

5.1 Design Criteria

The water servicing design for the site is to conform to the City of Ottawa Water Distribution and the MOE Design Guidelines for Drinking Water Systems. The following criteria were used to estimate the peak water servicing demands and to determine the required water servicing for the site:

- Normal operating pressure of 345 kPa – 552 kPa (50 – 80 psi) under max day flow
- Pressure not to be less than 276 kPa (40 psi) under max hour conditions
- Under max day plus fire flow, the residual pressure at any point in the system is not to be less than 140 kPa (20 psi)
- Fire department connections to comply with OBC 3.2.5.16
- Consumption rate of 70 L/student/d (Table 4.2 of City of Ottawa Design Guidelines Water Distribution)
- Estimated student and staff population of 2275 students (See Section 1.2)
- Minimum depth of cover = 2.4m or insulated as per City of Ottawa Detail W22

5.2 Existing Water Servicing

There is an existing 200mm diameter PVC watermain stub left at the property line near Cambrian Road. A 300mm PVC watermain is available on Elevation Road. There are two City of Ottawa fire hydrants along Elevations Road within the vicinity of the subject site.

5.3 Domestic Water Demand

The domestic water demands for the proposed school development are calculated based on Table 4.2 of the City's 2010 *Ottawa Design Guidelines - Water Distribution*. A domestic consumption rate of 70 L/student/day was allocated for the calculation of the domestic demand. Domestic water demands were calculated based on the estimated student and staff population identified in section 1.2. The average domestic demand for the proposed addition exceeds 50 m^3 per day. As such, two water services will be required to service the proposed school to avoid a vulnerable service area.

A population estimate of the total number of students and staff was discussed with OCSB staff and the architect, as referred to section 1.2. The total population used to calculate the domestic water demand is 2275 students and staff.

The average daily domestic water demand rate and the maximum daily and hourly peaking factors are obtained from Table 4.2 of the *Ottawa Design Guidelines – Water Distribution*. As per Table 5-1 below, the average daily rate of 70 L/student/day is equivalent to an average daily demand rate of 1.84 L/s for 2275 students and staff.

The maximum daily factor of 1.5 yields a maximum daily demand of 2.76 L/s, and the maximum hourly factor of 1.8 yields a maximum hourly demand of 4.98 L/s. Refer to **Appendix D** for detailed calculations.

Table 5-1: Domestic Water Demand

Parameter	Value	Unit	Source
Unit Type			Site plan
Persons Per Unit	N/A	p/unit	*Ottawa Design Guidelines - Water Distribution* Table 4.1
Number of Units		units	Site plan
Number of Persons	N/A	p	

Domestic Demand - Pre-Zoned Land

Parameter	Value	Unit	Source
Demand Type	Schools		Site plan
Average Daily Rate	70	L/student/d	*Ottawa Design Guidelines - Water Distribution* Table 4.2
Amount of students	2275	students	Site plan
Average Daily Demand	159250 1.84	L/d L/s	
Maximum Daily Factor	1.5		*Ottawa Design Guidelines - Water Distribution* Table 4.2
Maximum Daily Demand	2.76	L/s	
Maximum Hourly Factor	1.8		*Ottawa Design Guidelines - Water Distribution* Table 4.2
Maximum Hourly Demand	4.98	L/s	

5.4 Fire Flow Demand

Fire flow demands accounting for the proposed high school were calculated using the OBC and FUS 2020 method for fire flow demands.

Based on the OBC fire flow demand, the fire flow demand is calculated to be 150 L/s. Refer to the attached calculation sheet in **Appendix D** for details. Based on the 2020 Fire Underwriters Survey (FUS) Method, the fire flow demand for the school is calculated to be 250 L/s. Refer to the attached calculation sheet in Appendix D for details. In accordance with the City of Ottawa pre-consultation requirements, if the OBC fire demand exceeds 9,000 L/min (150 L/s), the FUS method is to be used.

5.4.1 Fire Hydrant Coverage

Two City of Ottawa fire hydrants on Elevation Road are within 78m of the proposed high school. A private fire hydrant is proposed adjacent to the bus loop in front of the school's main entrance off of Cambrian Road. The private fire hydrant is located within 45m of the proposed building and satisfies the requirements of OBC 3.2.5.16, stating that a fire department connection shall be located such that the distance from the fire department connection to a hydrant is not more than 45m, and is unobstructed.
Based on Table 1 of Appendix I of the City of Ottawa Technical Bulletin ISTB-2018-02, a class AA hydrant located at a separation distance of less than 75 m provides a maximum contributing fire flow of 5,700 L/min (95 L/s). A Class AA hydrant located at a separation distance between 75 m and 150 m provides a maximum contributing fire flow of 3,800 L/min (63.3 L/s). From a review of street view, the existing City of Ottawa fire hydrants on Elevation Road are painted with light blue caps and are therefore assumed to be Class AA-rated fire hydrants. With the addition of one new proposed private fire hydrant, the total available contributing fire flow is 253.3 L/s, which exceeds the required fire flow demand of 250 L/s. Refer to Table 5-2 below for a summary of the available fire hydrant coverage.

Table 5-2: Fire Hydrant Coverage

Fire Hydrant	Fire Hydrant Classification	Distance to Building (m)	Contributing Fire Flow (L/s)
Elevation Road North	AA	27.5	95
Elevation Road South	AA	78	63.3
Private Fire hydrant	AA	22	95
		Total Fire Flow	253.3

5.5 Proposed Water Servicing

The average domestic demand for the proposed addition (1.84 L/s) exceeds 50 m^3 per day. As such, two water services will be required to service the existing school and the proposed addition to avoid a vulnerable service area:

Connection 1 – Cambrian Road: A connection to the existing 200mm PVC water stub at the property line on Cambrian Road will be provided for the school building.

Connection 2 – Elevation Road: A new 200mm water service is proposed to connect to the existing 300mm PVC watermain on Elevation Road to introduce a secondary water service to the proposed building.

The two separate water services will be connected to the internal building's plumbing and will be looped internally. A private fire hydrant will be constructed on site to service the school's building. Servicing for the proposed private fire hydrant is to be connected from within the internal building's plumbing. The two 200mm water services will be provided to the internal building plumbing and separated into domestic and fire protection water lines. The building's fire protection water lines will be complete with backflow prevention. The private fire hydrant is proposed to connect to the building's fire prevention line after backflow prevention, such that the fire hydrant lead is connected with backflow prevention to the building's domestic water servicing. The proposed water servicing for the building and fire hydrants meets the City of Ottawa's normal operating pressure requirements as mentioned in sections 5.6 below.

5.6 Boundary Conditions Pressure Check

The domestic demand and fire flow requirements were provided to the City of Ottawa for the hydraulic analysis of the boundary conditions at the proposed school location. Boundary conditions provided by the City of Ottawa are included in **Appendix D**.

Using the provided boundary conditions for each connection, pressure checks within the system were conducted under maximum-hour demand conditions. Boundary conditions were calculated for four scenarios: Connection 1 at Cambrian Road and Connection 2 at Elevation Road under both existing conditions and future SUC conditions. Frictional loss calculations are included in **Appendix D**, calculating the head loss through the system using the Hazen-Williams Formula. Under maximum-hour demand, the operating pressures of the municipal water supply system were within the 345–552 kPa range and remained above the minimum required pressure of 276 kPa at the building connection. Under existing conditions, Connections 1 and 2 from Cambrian Road and Elevation Road are estimated to provide approximately 62.83 psi and 62.80 psi, respectively, at the building connection during maximum-hour demand. Under future SUC conditions, the corresponding pressures are estimated to be approximately 67.09 psi from the Cambrian Road connection and 67.06 psi from the Elevation Road water service connection at the building. Detailed calculations are provided in **Appendix D**. The requirement for a pressure-reducing valve at the building connection will be coordinated with the mechanical engineer.

5.6.1 Hydrant Pressure

A private fire hydrant will be introduced on site and will be connected to the 200mm diameter watermain from the building. Based on the provided boundary conditions for Cambrian Road by the City of Ottawa, pressure

checks for the proposed private fire hydrant were conducted for two scenarios: existing conditions and future SUC conditions. For both scenarios, it was assumed that the maximum fire flow of 95 L/s would be drawn from the hydrant, in accordance with Table 1 of Appendix I of the City of Ottawa Water Design Guidelines, representing a Class AA fire hydrant. Frictional losses were calculated using the Hazen–Williams formula, considering the total watermain length from Cambrian Road to the building and from the building to the proposed fire hydrant. The available pressure at the hydrant during the 95 L/s fire-flow condition was estimated to be 60.21 psi under existing conditions and 55.94 psi under future SUC conditions. Both pressures exceed the minimum residual pressure requirement of 20 psi for a Class AA fire hydrant.

6 Sediment and Erosion Control

Erosion and sediment control measures will be implemented during construction to protect downstream water quality and prevent sediment from entering the catch basins and storm sewer system. The following recommendations will be included in the contract documents, refer to **Appendix A Drawing C4 – Stormwater Management, Erosion and Sediment Control Plan**.

1. The contractor shall implement best management practices to provide for the protection of the area drainage system and receiving water course during construction activities. This includes:
2. Limiting the amount of exposed soil
3. Revegetation on exposed areas as soon as possible
4. A silt barrier/fence will be installed around the perimeter of the site to prevent sedimentation from leaving the site.
5. Installing and maintaining mud mats at the construction entrance to prevent migration of sedimentation to the city ROW
6. Providing filter cloths/bags on downstream catch basins and storm structures, and the newly constructed catch basins until construction has been completed.
7. Construction works to be scheduled at times that avoid flooding during seasonal rains

The contractor will be required to inspect the erosion and sediment control measures after every rainfall. Inspection measures include:

1. Inspection of the silt fence to ensure water and sediments are not flowing underneath the silt fence
2. Inspection of sedimentation traps on all catch basins and catch basin manholes

Upon completion of construction, erosion and sedimentation control will be provided through the on-site storm system. All storm manholes and catch basin manholes will be constructed with 300 mm sumps, while all catch basins will be constructed with 600 mm sumps to collect sediment and suspended solids from the finished asphalt surfaces. The catch basin and manhole sumps will be required to be cleaned and maintained by the owner after construction completion in accordance with the manufacturer's instructions.

7 Conclusions

The proposed new school development can be serviced with new on-site storm sewers, sanitary sewers, and water mains connecting to existing City of Ottawa infrastructure in accordance with the City of Ottawa Design Sewer Design Guidelines, Water Design Guidelines, and standards.

Storm servicing will be provided through a connection to the 1200mm diameter storm sewer provided at the property line at the existing 2400mm diameter storm maintenance hole located on the subject site property. Quantity control will be provided in accordance with the site's allocated release rate per the Half Moon Bay West Phase 1 Design Brief and the Stormwater Management Report for Phase 1 of the Half Moon Bay West Subdivision. Provided site storage exceeds the required storage for each restricted subcatchment area release rate 100-year post-development site outflow, for all controlled and uncontrolled subcatrchments areas are restricted to the allocated 5-year allowable release rate for the subject site.

Site grading will provide accessibility to the proposed addition in accordance with AODA standards and City of Ottawa standard details. Site grading has been designed to provide an adequate overland flow route for the 100-year + 20% stress test event, allowing for a minimum 15cm vertical clearance between the overland flow route and the lowest building elevation within the vicinity of the spill elevation.

New on-site 200mm diameter sanitary sewers will convey sanitary flows to the existing 200mm diameter sanitary sewer provided at the property line off Cambrian Road for the subject site. The estimated sanitary peak flows from the school development are within the allocated sanitary release rate per the Stormwater Management Report for Phase 1 of the Half Moon Bay West Subdivision.

Water servicing will be provided from the existing 200mm PVC watermain stub left on the subject site. A second water service to the school will be provided from a new tee connection to the existing 300mm PVC watermain on Elevation Road. A private fire hydrant will be constructed on site to provide coverage for the school's building. Boundary conditions provided by the City of Ottawa were analyzed to confirm that the operating pressures of the proposed water servicing are in accordance with the City of Ottawa Water Design Guidelines.

Erosion and sediment control will be provided during construction through the installation of a silt fence around the perimeter of construction and the installation of filter cloths in all catch basins/catch basin manholes. An erosion and sediment control plan will be included in the contract documents, requiring the contractor to follow best management practices and provide regular maintenance of the measures. Long-term sediment control will be provided in catch basin sumps. The owner will be responsible for the regular maintenance of all catch basin and catch basin manholes upon completion of construction.

It is recommended that this report be filed in support of the proposed development. No adverse impacts are anticipated on the existing services as a result of the approval and construction of this development.

End of report.

Appendix A
Design Drawings

LEGEND

- PROPERTY LINE
- NEW BUILDING
- DC — DEPRESSED CURB
- BREAK IN SLOPE - NEW
- SA — EXISTING SANITARY SEWER
- ST — EXISTING STORM SEWER
- W — EXISTING WATERMAIN
- NEW SANITARY SEWER
- NEW STORM SEWER
- W — NEW WATERMAIN
- SD — NEW PERFORATED DRAIN PIPE
- NEW PERIMETER FOUNDATION DRAINAGE
- NEW SWALE
- EXISTING STORM CULVERT
- NEW STORM CULVERT
- NEW LIGHT DUTY ASPHALT AS PER DETAIL 1 / C3
- NEW HEAVY DUTY ASPHALT AS PER DETAIL 2 / C3
- NEW CONCRETE SIDEWALK
- NEW GRASS
- MILLING & OVERLAY 50mm THICK HEAVY DUTY ASPHALT AS PER DETAIL 3 / C3
- NEW PRECAST PAVERS
- NEW EWF / MULCH
- NEW CLEAR STONE SUBDRAIN TRENCH
- NEW RUBBERIZED ASPHALT TRACK
- NEW STONE DUST PATH
- HIGH LOAD RIGID INSULATION AS PER CITY DETAIL W22
- Concrete Sidewalk — EXISTING SIDEWALK

LEGEND CONTINUED

- EXISTING CONCRETE CURB
- NEW CONCRETE CURB
- EXISTING CATCHBASIN
- EXISTING DITCH INLET
- EXISTING STORM MANHOLE
- EXISTING SANITARY MANHOLE
- EXISTING STORM /SANITARY MANHOLE TO BE ADJUSTED
- EXISTING FIRE HYDRANT
- EXISTING WATER VALVE
- NEW CATCHBASIN
- NEW STORM MANHOLE / CATCHBASIN MANHOLE
- NEW SANITARY MANHOLE
- NEW REAR YARD CATCH BASIN
- NEW FIRE HYDRANT
- NEW WATER VALVE
- NEW INLET CONTROL DEVICE
- RD — NEW ROOF DRAIN
- SC — NEW SCUPPER AT 150mm ABOVE ROOF DRAIN LEVEL
- T — NEW TRANSFORMER PAD
- SEWER FLOW DIRECTION
- BUILDING ENTRANCE
- PROPOSED TWSI
- NEW SIAMESE CONNECTION
- WATER CHAMBER
- SEE SHEET NUMBER "C3"
- SEE SHEET NUMBER "C3"

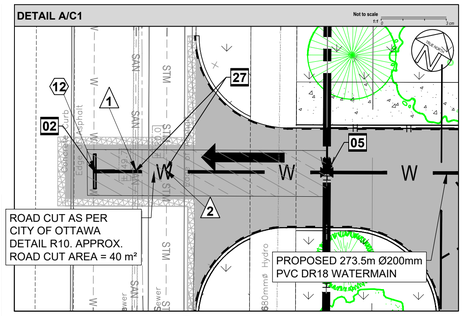
LEGEND CONTINUED

- EXISTING UTILITY POLE
- EXISTING LIGHT STANDARD
- EXISTING TREE
- PROPOSED TREE, SEE LANDSCAPE
- CLAY SEAL AS PER CITY OF OTTAWA DETAIL S8

GENERAL NOTES

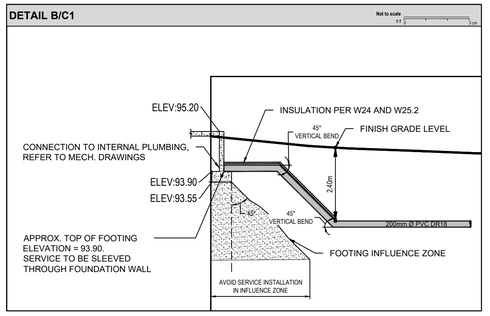
1. DESIGN AND CONSTRUCTION IS TO BE IN ACCORDANCE WITH MOST RECENT ONTARIO BUILDING CODE.
2. THE CONTRACTOR IS RESPONSIBLE FOR CHECKING AND VERIFYING ALL DIMENSIONS WITH RESPECT TO SITE CONDITIONS AND ALL MATERIALS TO THE PROJECT. ANY DISCREPANCY SHALL BE REPORTED TO THE ENGINEER.
3. THIS DRAWING IS TO BE READ IN CONJUNCTION WITH ALL MATERIAL RELEVANT TO THE PROJECT.
4. ADDITIONAL DRAWINGS MAY BE ISSUED FOR CLARIFICATION TO ASSIST PROPER EXECUTION OF WORK. SUCH DRAWINGS WILL HAVE THE SAME MEANING AND INTENT AS IF THEY WERE INCLUDED WITH THE CONTRACT DOCUMENTS.
5. CONTRACTOR MUST COMPLY WITH LOCAL BY-LAWS, ONTARIO OCCUPATIONAL HEALTH AND SAFETY ACT AND ALL REGULATIONS SET BY AUTHORITIES HAVING JURISDICTION. IN CASE OF CONFLICT OR DISCREPANCY, THE MORE STRINGENT REQUIREMENTS SHALL APPLY.
6. CONTRACTOR RESPONSIBLE FOR OBTAINING ALL REQUIRED UTILITY LOCATES, DAYLIGHTING, INSPECTIONS, PERMITS, AND APPROVALS, INCLUDING ALL ASSOCIATED COSTS. LOCATION OF EXISTING UTILITIES ARE APPROXIMATE ONLY AND BASED ON BEST AVAILABLE INFORMATION.
7. FOR EXACT LOCATIONS AND NUMBERS OF ROOF DRAINS AND SCUPPERS, REFER TO MECHANICAL, STRUCTURE AND ARCHITECTURAL DRAWINGS.

DETAIL A/C1



A C1 **DETAIL** Scale: **N.T.S.**

DETAIL B/C1



B C1 **WATER ENTRY DETAIL** Scale: **N.T.S.**

DRAWING NOTES

01 SUPPLY AND INSTALL NEW 200mm Ø PVC DR18 WATER MAIN SERVICE, MINIMUM 2.4m COVER, OTHERWISE PROVIDE HL40 THERMAL INSULATION IN ACCORDANCE WITH OPSD 1109.030. COORDINATE NEW WATER SERVICE CONNECTION WITH MECHANICAL PLANS.THRUST BLOCKS SHALL BE AS PER OPSD 1103.010 & 1103.020.

CONTRACTOR SHALL BE RESPONSIBLE FOR COMMUNICATING,COORDINATING, OBTAINING AND PAYING FOR ALL REQUIRED PERMITS NOT LIMITED TO THE FOLLOWING:

- WITH CITY OF OTTAWA FOR A WATER PERMIT,NEW WATER SERVICE CONNECTION, FIRE HYDRANT ON SITE,CONNECTION TO PROPOSED BUILDING, INSPECTION,DISINFECTION CHLORINATION, TESTING, WATER METERING AND ALL REQUIREMENTS FOR A COMPLETE SYSTEM COMMISSIONING AS PER MUNICIPAL REQUIREMENTS.
- WITH CITY OF OTTAWA FOR A ROAD CUT PERMIT.
- WITH CITY OF OTTAWA FOR UTILITY LOCATES, EXCAVATION, SUPPORTING UTILITIES DURING CONSTRUCTION IF REQUIRED, INSPECTION,AND BACKFILLING.

02 INSTALLATION OF NEW SERVICE CONNECTION TEE 300mmX200mm Ø PVC TO EXISTING MUNICIPAL WATERMAIN TO BY CONTRACTOR.

03 BREAK IN AND CONNECT TO EXISTING 1200mm DIAMETER SANITARY MANHOLE. EXISTING 200mm DIAMETER INVERT NORTH = 88.62. CONNECT NEW 200mm DIAMETER SANITARY SEWER AT 90.20, PARGE AND PROVIDE WATER TIGHT CONNECTION. PROVIDE DROP STRUCTURE AS PER OPSD 1003.010. CONTRACTOR TO CONFIRM EXISTING INVERT PRIOR TO CONSTRUCTION AND ADVISE OF ANY DISCREPANCY.

04 INSTALL FOUR WAY 3.0m LONG 150mm Ø PERFORATED SUBDRAIN WRAPPED IN GEOTEXTILE SOCK EXTENDING FROM CB/CBMH AT PAVEMENT SUBGRADE LEVEL. PROVIDE WATERTIGHT CONNECTION (TYP).

05 SUPPLY AND INSTALL NEW 200mm WATER VALVE AND VALVEBOX ASSEMBLY AS PER CITY OF OTTAWA STANDARD DETAIL DRAWING W24 AND W50.

06 SUPPLY AND INSTALL WATTS ROOF DRAIN CONTROLS TO BE INSTALLED ON ROOF DRAINS. SPECIFIC WEIR SETTINGS IN 'OPEN POSITION'. MAXIMUM DISCHARGE 61.2 l/s TOTAL. MAXIMUM ROOF PONDING DEPTH 120mm. 100 YEAR PONDING VOLUME = 286.8m³.

07 SUPPLY AND INSTALL NEW INLET CONTROL DEVICE FLOW REGULATOR AT CATCHBASIN, CB-1 OUTLET. MAXIMUM DISCHARGE 25.3 l/s AT 2.31m HEAD AND ORIFICE DIAMETER AT 89mm.

08 SUPPLY AND INSTALL NEW INLET CONTROL DEVICE FLOW REGULATOR AT CATCHBASIN, CB-2 OUTLET. MAXIMUM DISCHARGE 55.3 l/s AT 2.39m HEAD AND ORIFICE DIAMETER AT 130mm.

09 SUPPLY AND INSTALL NEW INLET CONTROL DEVICE FLOW REGULATOR AT CATCHBASIN, CBMH-1 OUTLET. MAXIMUM DISCHARGE 117.1 l/s AT 2.73m HEAD AND ORIFICE DIAMETER AT 183mm.

10 SUPPLY AND INSTALL NEW INLET CONTROL DEVICE FLOW REGULATOR AT CATCHBASIN, CB-3 OUTLET. MAXIMUM DISCHARGE 30.2 l/s AT 2.30m HEAD AND ORIFICE DIAMETER AT 97mm.

11 SUPPLY AND INSTALL NEW INLET CONTROL DEVICE FLOW REGULATOR AT CATCHBASIN, CB-4 OUTLET. MAXIMUM DISCHARGE 69.1 l/s AT 2.50m HEAD AND ORIFICE DIAMETER AT 144mm.

12 SUPPLY AND INSTALL NEW INLET CONTROL DEVICE FLOW REGULATOR AT CATCHBASIN, CB-6 OUTLET. MAXIMUM DISCHARGE 51.5 l/s AT 2.43m HEAD AND ORIFICE DIAMETER AT 125mm.

13 SUPPLY AND INSTALL NEW INLET CONTROL DEVICE FLOW REGULATOR AT CATCHBASIN, CB-7 OUTLET. MAXIMUM DISCHARGE 35.6 l/s AT 1.90m HEAD AND ORIFICE DIAMETER AT 110mm.

14 SUPPLY AND INSTALL NEW INLET CONTROL DEVICE FLOW REGULATOR AT CATCHBASIN, CB-8 OUTLET. MAXIMUM DISCHARGE 36.2 l/s AT 1.67m HEAD AND ORIFICE DIAMETER AT 115mm.

15 SUPPLY AND INSTALL NEW INLET CONTROL DEVICE FLOW REGULATOR AT CATCHBASIN, CBMH-3 OUTLET. MAXIMUM DISCHARGE 16.0 l/s AT 1.8m HEAD AND ORIFICE DIAMETER AT 75mm.

16 CONNECT NEW 100mm PERIMETER FOUNDATION DRAINAGE WITH FILTER SOCK TO 100mm STORM SERVICE AT INVERT 93.55 AT USF LEVEL.

17 INSTALL NEW REAR YARD CATCH BASIN AS PER CITY OF OTTAWA DETAIL S30 AND S31.

18 BREAK IN AND CONNECT TO EXISTING 2400mm DIAMETER STORM MANHOLE. EXISTING 1200mm DIA. INVERT N. = 89.839. CONNECT NEW 900mm DIA. STORM SEWER AT INVERT S = 90.14. PARGE AND PROVIDE WATER TIGHT CONNECTION. CONTRACTOR TO CONFIRM EXISTING INVERT PRIOR TO CONSTRUCTION AND ADVISE OF ANY DISCREPANCY.

19 NEW FIRE HYDRANT AS PER CITY OF OTTAWA W19. CONTRACTOR IS RESPONSIBLE TO PROVIDE FIRE HYDRANT TESTING AND PAINTING OF CAP AS PER MUNICIPAL STANDARD. INSTALL VALVE ON HYDRANT LEAD PER CITY DETAIL W24 & W50.

20 SUBDRAINS SHOULD BE INSTALLED UNDER CURBS ON THE SIDES OF THE ACCESS ROAD AND PARKING AREA AND TO CONNECT TO STORM WATER NETWORK. SEE GEOTECHNICAL NOTES AND REFER TO GEOTECHNICAL REPORT.

21 WATER SERVICE ENTRY, TOP OF WATERMAIN AT 93.9 TO BE SLEEVED TO THE FOUNDATION WALL. INVERT LEVELS TO BE COORDINATED AND MATCHING WITH STRUCTURAL AND MECHANICAL DRAWINGS. INSULATE PER CITY OF OTTAWA W22 WHERE LESS THAN 2.4m COVER IS PROVIDED. REFER TO DETAIL B /C1.

22 NEW SIAMESE CONNECTION, REFER TO MECHANICAL & ARCHITECTURAL DRAWINGS FOR EXACT LOCATION.

23 ALL WATERMAIN SHALL BE PROVIDED WITH TRACER WIRE AS PER CITY OF OTTAWA STANDARD DETAILS AND SPECIFICATIONS.

24 NEW TRANSFORMER AND BOLLARDS.

25 ROOF TOP SCUPPERS TO BE PROVIDED AT 150mm ABOVE LEVEL OF ROOF DRAINS.

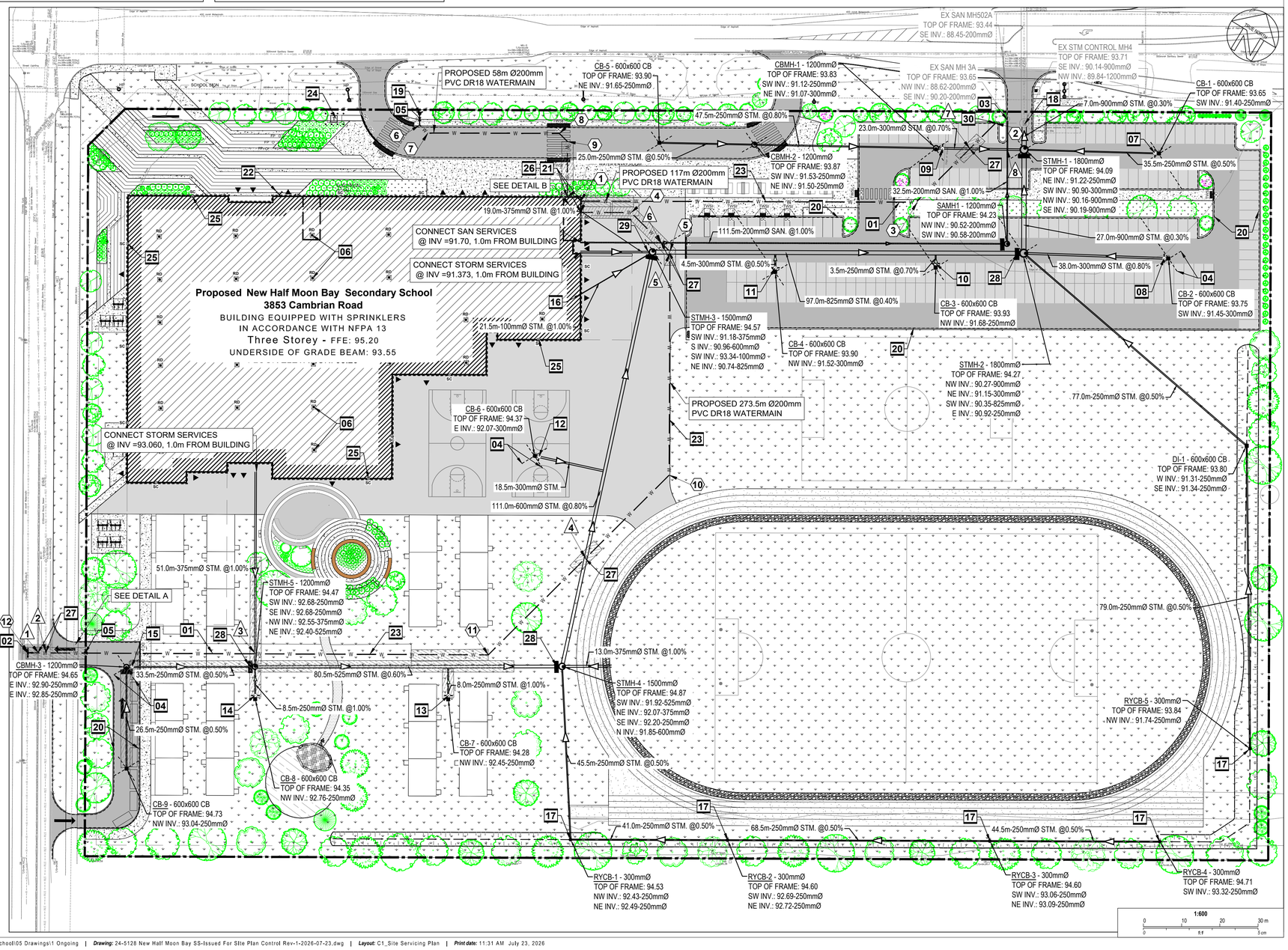
26 PRESSURE REDUCING VALVE TO BE INSTALLED AS PER ONTARIO PLUMBING CODE, COORDINATE WITH MECHANICAL CONTRACTOR.

27 CONSTRUCT WATERMAIN CROSSING COMPLETE WITH 45° VERTICAL BENDS OVER SEWER AS PER CITY OF OTTAWA DETAIL W25.2 WITH MINIMUM 0.30m BARREL TO BARREL SEPARATION. PROVIDE THERMAL INSULATION AS PER DETAIL W22.

28 CLAY SEAL AS PER CITY OF OTTAWA S8.

29 SUPPLY AND INSTALL PROLINE FITTINGS BACKWATER VALVE AT STMH-3 100mm DIAMETER PIPE OUTLET.

30 EXISTING 200mm WATERMAIN STUB AT 90.225. REMOVE EXISTING CAP AND PROVIDE NEW 45° HORIZONTAL BEND c/w RESTRAINS AND THRUST BLOCKS.

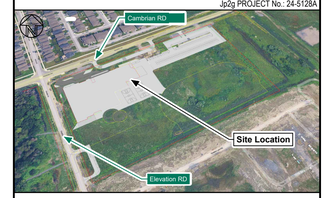


OTTAWA-CARLETON DISTRICT SCHOOL BOARD

Jp2g Consultants Inc.
ENGINEERS · PLANNERS · PROJECT MANAGERS

12 INTERNATIONAL DR, PEMBROKE, ON, K8A 6W5 T: 613-735-2507 PEMBROKE@JP2G.COM
1150 MORRISON DR., #410 OTTAWA, ON, K2H 8S9 T: 613-828-7800 OTTAWA@JP2G.COM
16 EDWARD ST. S., #211 ARNPRIOR, ON, K7S 3H4 T: 613-626-0780 ARNPRIOR@JP2G.COM

Jp2g PROJECT No.: 24-5128A



No.	DESCRIPTION	YYYY-MM-DD
2	ISSUED FOR SITE PLAN CONTROL REV-1	2026-07-24
1	ISSUED FOR 33% DESIGN SUBMISSION	2026-07-17

N45 ARCHITECTURE INC.
71 Bank Street, 7th Floor - Ottawa, Ontario K1P 5N2
tel. 613.224.0095 fax 613.224.9811

project
Half Moon Bay Secondary School
3853 Cambrian Road,Ottawa, ON

seal: LICENSED PROFESSIONAL ENGINEER — Z. E. BAUMAN — 100578796 — July 24, 2026 — PROVINCE OF ONTARIO

seal: LICENSED PROFESSIONAL ENGINEER — A. SAMMOUR — 100227665 — July 24, 2026 — PROVINCE OF ONTARIO

drawing title
Site Servicing Plan

scale: As Shown	drawn by: B.Radan / R.Ismail
date: July 2026	checked by: Z.Bauman / A.Sammour
project number: 26-056	drawing number: C1

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

revision

DXX–XX–XX–XXXX
PLAN #XXXXX

LEGEND

- PROPERTY LINE
- NEW BUILDING
- DC — DEPRESSED CURB
- BREAK OF SLOPE - NEW
- NEW SWALE
- H — LIMIT OF HIGH POINT
- NEW LIGHT DUTY ASPHALT AS PER DETAIL 1 / C3
- NEW HEAVY DUTY ASPHALT AS PER DETAIL 2 / C3
- NEW CONCRETE SIDEWALK
- NEW GRASS
- MILLING & OVERLAY 50mm THICK HEAVY DUTY ASPHALT AS PER DETAIL 3 / C3
- NEW PRECAST PAVERS
- NEW EWF / MULCH
- NEW CLEAR STONE SUBDRAIN TRENCH
- NEW RUBBERIZED ASPHALT TRACK
- NEW STONE DUST PATH
- Concrete Sidewalk — EXISTING SIDEWALK
- EXISTING CONCRETE CURB
- NEW CONCRETE CURB
- PROPOSED TWSI
- T — NEW TRANSFORMER PAD
- EXISTING STREET LIGHT
- EXISTING HYDRO POLE

LEGEND CONTINUED

- EXISTING CATCHBASIN
- EXISTING DITCH INLET
- D — EXISTING STORM MANHOLE
- S — EXISTING SANITARY MANHOLE
- EXISTING STORM /SANITARY MANHOLE TO BE ADJUSTED
- EXISTING FIRE HYDRANT
- EXISTING WATER VALVE
- NEW CATCHBASIN
- NEW STORM MANHOLE / CATCHBASIN MANHOLE
- NEW SANITARY MANHOLE
- NEW REAR YARD CATCH BASIN
- FH — NEW FIRE HYDRANT
- NEW WATER VALVE
- NEW INLET CONTROL DEVICE
- RD — NEW ROOF DRAIN
- SC — NEW SCUPPER AT 150mm ABOVE ROOF DRAIN LEVEL
- BUILDING ENTRANCE
- NEW SIAMESE CONNECTION
- XX.XX — EXISTING NATURAL GRADE
- XX.XX — PROPOSED ELEVATION & EXISTING NATURAL GRADE
- XX.XX — PROPOSED ELEVATION
- XX.XX — PROPOSED BOTTOM OF CURB ELEVATION
- XX.XX — PROPOSED TOP OF CURB ELEVATION
- -XX% — PROPOSED SLOPE

GEOTECHNICAL NOTES

1. A GEOTECHNICAL ENGINEER LICENSED IN THE PROVINCE OF ONTARIO SHALL INSPECT ALL SUBGRADE SURFACES FOR FOOTING AND TRENCHES, PIPE BEDDING AND PAVEMENT STRUCTURES PRIOR TO CONSTRUCTION.
2. IT IS STRICTLY RECOMMENDED TO REFER GEOTECHNICAL INVESTIGATION REPORT - PROPOSED HALF MOON BAY SECONDARY SCHOOL 3853 CAMBRIAN ROAD OTTAWA, ONTARIO BY EXP SERVICES INC. .
3. IT IS ANTICIPATED THAT THE MAJORITY OF THE MATERIAL REQUIRED FOR BACKFILLING PURPOSES AND FOR TRENCH BACKFILL WOULD HAVE TO BE IMPORTED AND SHOULD CONFORM TO THE RECOMMENDATION STATED IN THE GEOTECHNICAL REPORT.
4. CONTRACTOR BIDDING ON THIS PROJECT MUST REVIEW AVAILABLE DATA AND DECIDE ON THEIR OWN THE BEST METHOD FOR THE EXCAVATION OF THE BEDROCK IF DEEMED REQUIRED.
5. IT IS RECOMMENDED THAT THE BEDDING FOR THE UNDERGROUND SERVICES INCLUDING MATERIAL SPECIFICATIONS, THICKNESS OF COVER MATERIAL AND COMPACTION REQUIREMENTS CONFORM TO MUNICIPAL REQUIREMENTS AND/OR ONTARIO PROVINCIAL STANDARD SPECIFICATION AND DRAWINGS (OPSS AND OPSD).
6. IT IS RECOMMENDED THAT THE PIPE BEDDING BE 300 MM THICK AND CONSIST OF OPSS GRANULAR A. THE BEDDING MATERIAL SHOULD BE PLACED ALONG THE SIDES AND ON TOP OF THE PIPE TO PROVIDE A MINIMUM COVER OF 300 MM. THE BEDDING SHOULD BE COMPACTED TO AT LEAST 98 PERCENT OF THE SPMDD.
7. THE BEDDING THICKNESS MAY BE FURTHER INCREASED IN AREAS WHERE THE SUBGRADE BECOMES DISTURBED.
8. SINCE PAVED SURFACES WILL BE LOCATED OVER SERVICE TRENCHES, IT IS RECOMMENDED THAT THE TRENCH BACKFILL MATERIAL WITHIN THE FROST ZONE (UP TO 1.8 M BELOW FINISHED GRADE), SHOULD MATCH THE EXISTING MATERIAL IN THE ROADWAY TO MINIMIZE DIFFERENTIAL FROST HEAVING OF THE SUBGRADE. THE TRENCH BACKFILL SHOULD BE PLACED IN 300 MM THICK LIFTS AND EACH LIFT SHOULD BE COMPACTED TO 95 PERCENT SPMDD.
9. THE BEDROCK/AUGER REFUSAL DEPTHS ACROSS THE SITE WERE VARIABLE SHALLOW BEDROCK AND LARGE BOULDERS SHOULD BE EXPECTED DURING THE INSTALLATION OF ANY SERVICES AT THE SITE AND CONTRACTORS BIDDING ON THIS WORK SHOULD ANTICIPATE THESE CONDITIONS.
10. IT IS ANTICIPATED THAT THE MAJORITY OF THE MATERIAL REQUIRED FOR TRENCH BACKFILL AND SUBGRADE FILL IN PARKING AREA AND ACCESS ROADS WOULD HAVE TO BE IMPORTED AND SHOULD CONFORM TO OPSS 1010 SELECT SUBGRADE MATERIAL (SSM) - COMPACTED TO 95 PERCENT OF THE SPMDD AND THE UPPER 300 MM OF THE SUBGRADE FILL MUST BE COMPACTED TO 98% SPMDD.
11. AS PART OF THE SUBGRADE PREPARATION, THE PROPOSED PARKING AREA, PAVED AREA AND ACCESS ROADS SHOULD BE STRIPPED OF TOPSOIL AND OTHER OBVIOUSLY UNSUITABLE MATERIAL. THE SUBGRADE SHOULD BE PROPERLY SHAPED, CROWNED, THEN PROOF ROLLED WITH A HEAVY VIBRATORY ROLLER IN THE FULL-TIME PRESENCE OF A REPRESENTATIVE OF THE GEOTECHNICAL ENGINEER. ANY SOFT OR SPONGY SUBGRADE AREAS DETECTED SHOULD BE SUB EXCAVATED AND PROPERLY REPLACED WITH SUITABLE APPROVED BACKFILL COMPACTED TO 95 PERCENT SPMDD (ASTM D698-12E2).

GEOTECHNICAL NOTES CONTINUED

12. THE SUBDRAINS ILLUSTRATED ON PLANS ARE SCHEMATIC. FULL SCHEME OF SUBDRAINS SHOULD BE INSTALLED ON BOTH SIDES OF THE ACCESS ROAD(S).SUBDRAINS SHOULD BE INSTALLED ON BOTH SIDES OF THE ACCESS ROAD(S). SUBDRAINS MUST BE INSTALLED IN THE PROPOSED PARKING AREA AT LOW POINTS AND SHOULD BE CONTINUOUS BETWEEN CATCHBASINS TO INTERCEPT EXCESS SURFACE AND SUBSURFACE MOISTURE AND TO PREVENT SUBGRADE SOFTENING. THIS WILL ENSURE NO WATER COLLECTS IN THE GRANULAR COURSE, WHICH COULD RESULT IN PAVEMENT FAILURE DURING THE SPRING THAW. THE LOCATION AND EXTENT OF SUBDRAINS REQUIRED WITHIN THE PAVED AREAS SHOULD BE REVIEWED BY THE GEOTECHNICAL ENGINEER IN CONJUNCTION WITH THE PROPOSED SITE GRADING.
13. TO MINIMIZE THE PROBLEMS OF DIFFERENTIAL MOVEMENT BETWEEN THE PAVEMENT AND CATCHBASINS/MANHOLE DUE TO FROST ACTION, THE BACKFILL AROUND THE STRUCTURES SHOULD CONSIST OF FREE-DRAINING GRANULAR PREFERABLY CONFORMING TO OPSS GRANULAR B TYPE II MATERIAL. WEEP HOLES SHOULD BE PROVIDED IN THE CATCHBASINS/MANHOLES TO FACILITATE DRAINAGE OF ANY WATER THAT MAY ACCUMULATE IN THE GRANULAR FILL.
14. THE MOST SEVERE LOADING CONDITIONS ON LIGHT-DUTY PAVEMENT AREAS AND THE SUBGRADE MAY OCCUR DURING CONSTRUCTION. CONSEQUENTLY, SPECIAL PROVISIONS SUCH AS RESTRICTED LANES, HALF-LOADS DURING PAVING, TEMPORARY CONSTRUCTION ROADWAYS, ETC., MAY BE REQUIRED, ESPECIALLY IF CONSTRUCTION IS CARRIED OUT DURING UNFAVORABLE WEATHER.
15. THE FINISHED PAVEMENT SURFACE SHOULD BE FREE OF DEPRESSIONS AND SHOULD BE SLOPED (PREFERABLY AT A MINIMUM CROSS FALL OF 2 PERCENT) TO PROVIDE EFFECTIVE SURFACE DRAINAGE TOWARDS CATCH BASINS. SURFACE WATER SHOULD NOT BE ALLOWED TO POND ADJACENT TO THE OUTSIDE EDGES OF PAVED AREAS.
16. RELATIVELY WEAKER SUBGRADE MAY DEVELOP OVER SERVICE TRENCHES AT SUBGRADE LEVEL. THESE AREAS MAY REQUIRE THE USE OF THICKER/COARSER SUB-BASE MATERIAL AND THE USE OF A GEOTEXTILE AT THE SUBGRADE LEVEL. IF THIS IS THE CASE, IT IS RECOMMENDED THAT ADDITIONAL 150 MM THICK GRANULAR SUB-BASE, OPSS GRANULAR B TYPE II, SHOULD BE PROVIDED IN THESE AREAS, IN ADDITION TO THE USE OF A GEOTEXTILE AT THE SUBGRADE LEVEL.
17. THE GRANULAR MATERIALS USED FOR PAVEMENT CONSTRUCTION SHOULD CONFORM TO ONTARIO PROVINCIAL STANDARD SPECIFICATIONS (OPSS 1010) FOR GRANULAR A AND GRANULAR B TYPE II AND SHOULD BE COMPACTED TO 100 PERCENT OF THE SPMDD.
18. THE ASPHALTIC CONCRETE USED, AND ITS PLACEMENT SHOULD MEET OPSS 1150 OR 1151 REQUIREMENTS. IT SHOULD BE COMPACTED FROM 92 PERCENT TO 97 PERCENT OF THE MRD (ASTM D2041). ASPHALT PLACEMENT SHOULD BE IN ACCORDANCE WITH OPSS 310 AND OPSS 313.
19. ALL EARTHWORK ACTIVITIES FROM PLACEMENT AND COMPACTION OF FILL IN THE SERVICE TRENCHES TO SUBGRADE PREPARATION, PLACEMENT AND COMPACTION OF GRANULAR MATERIALS AND ASPHALTIC CONCRETE SHOULD BE INSPECTED BY QUALIFIED GEOTECHNICIANS TO ENSURE THAT CONSTRUCTION OF THE SEWERS AND PAVEMENT PROCEEDS ACCORDING TO THE SPECIFICATIONS.
20. STRINGENT CONSTRUCTION CONTROL PROCEDURES SHOULD BE MAINTAINED TO ENSURE THAT UNIFORM SUBGRADE MOISTURE AND DENSITY CONDITIONS ARE ACHIEVED.

GEOTECHNICAL NOTES CONTINUED

21. SHOULD SURFACE AND SUBSURFACE WATER SEEPAGE OCCUR INTO THE EXCAVATIONS COLLECT ANY WATER ENTERING THE EXCAVATIONS AND REMOVE IT BY PUMPING FROM SUMP.
22. IF THE BACKFILL IN THE SERVICE TRENCHES WILL CONSIST OF GRANULAR FILL, CLAY SEALS SHOULD BE INSTALLED IN THE SERVICE TRENCHES AT SELECT INTERVALS (SPACING) AS PER CITY OF OTTAWA DRAWING NO. S8. THE SEALS SHOULD BE 1m WIDE, EXTEND OVER THE ENTIRE TRENCH WIDTH AND FROM THE BOTTOM OF THE TRENCH TO THE UNDERSIDE OF THE PAVEMENT STRUCTURE. THE CLAY SHOULD BE COMPACTED TO 95 PERCENT SPMDD. THE PURPOSE OF THE CLAY SEALS IS TO PREVENT THE PERMANENT LOWERING OF THE GROUNDWATER LEVEL. CLAY SEAL LOCATIONS SHALL BE APPROVED BY THE GEOTECHNICAL ENGINEER.
23. IT IS RECOMMENDED THAT A GEOTEXTILE BE PLACED ON THE SURFACE OF THE SUBGRADE PRIOR TO OF PLACEMENT OF ANY GRANULAR SUB-BASE. THIS MUST BE ALLOWED FOR BY THE CONTRACTOR AND INSTALLED WHEN DIRECTED BY THE GEOTECHNICAL ENGINEER.
24. THE MUNICIPAL SERVICES SHOULD BE INSTALLED IN SHORT OPEN TRENCH SECTIONS THAT ARE EXCAVATED AND BACKFILLED THE SAME DAY.

GENERAL NOTES

1. DESIGN AND CONSTRUCTION IS TO BE IN ACCORDANCE WITH MOST RECENT ONTARIO BUILDING CODE.
2. THE CONTRACTOR IS RESPONSIBLE FOR CHECKING AND VERIFYING ALL DIMENSIONS WITH RESPECT TO SITE CONDITIONS AND ALL MATERIALS TO THE PROJECT. ANY DISCREPANCY SHALL BE REPORTED TO THE ENGINEER.
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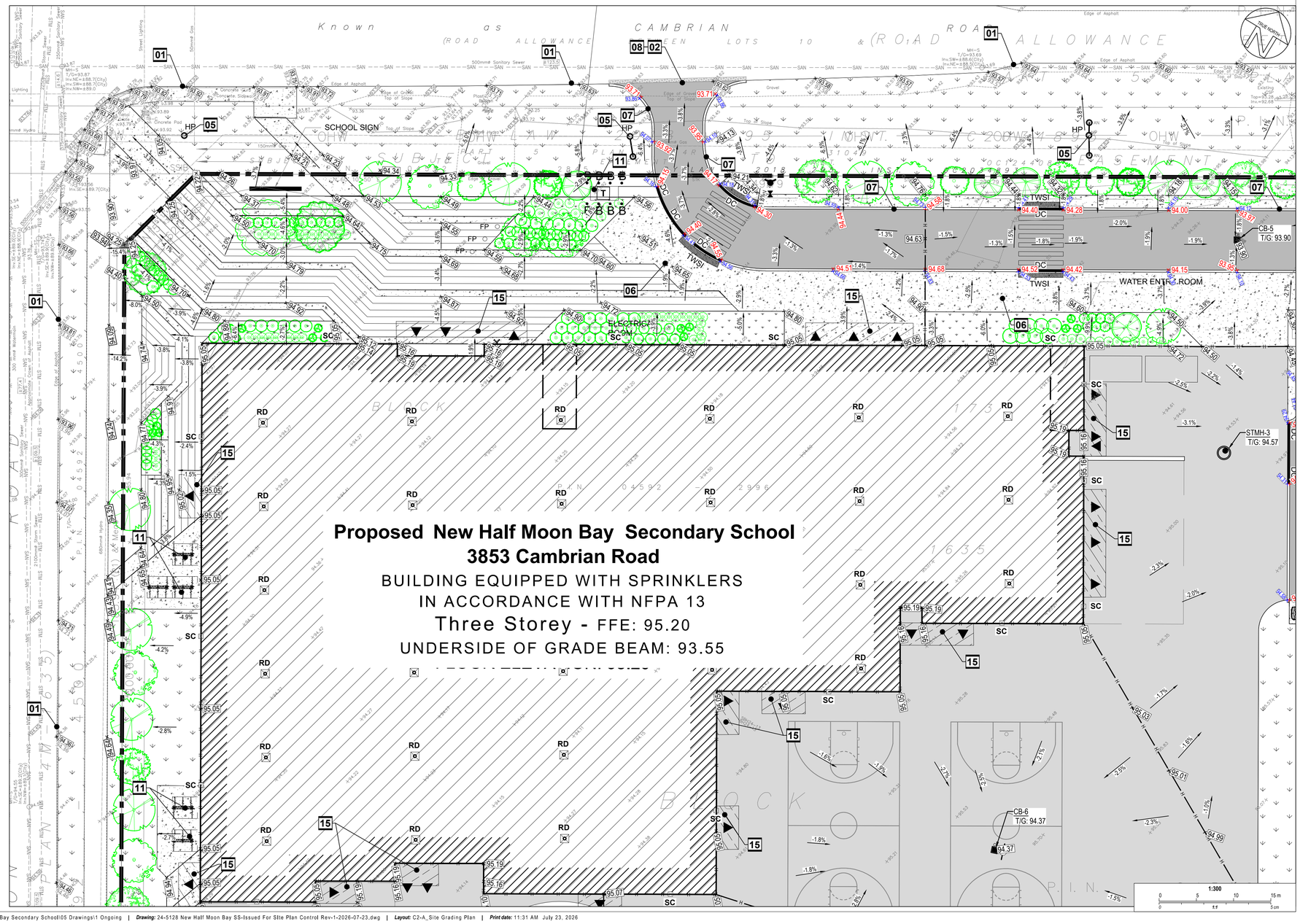

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Jp2g Consultants Inc.
ENGINEERS · PLANNERS · PROJECT MANAGERS
12 INTERNATIONAL DR, PEMBROKE, ON, K8A 6W5 T: 613-735-2507 PEMBROKE@JP2G.COM
1150 MORRISON DR., #410 OTTAWA, ON, K2H 8S9 T: 613-828-7800 OTTAWA@JP2G.COM
16 EDWARD ST. S., #211 ARNPRIOR, ON, K7S 3H4 T: 613-626-0780 ARNPRIOR@JP2G.COM

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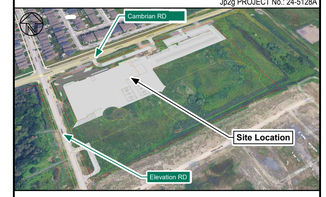

No.	DESCRIPTION	YYYY-MM-DD
2	ISSUED FOR SITE PLAN CONTROL REV-1	2026-07-24
1	ISSUED FOR 33% DESIGN SUBMISSION	2026-07-17

N45 ARCHITECTURE INC.
71 Bank Street, 7th Floor - Ottawa, Ontario K1P 5N2
tel. 613.224.0095 fax 613.224.9811

project
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drawing title
Site Grading Plan

scale	drawn by
As Shown	B.Radan / R.Ismail
date	checked by
July 2026	Z.Bauman / A.Sammour
project number	drawing number
26-056	**C2-A**

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revision

DXX–XX–XX–XXXX

PLAN #XXXXX

LEGEND

- PROPERTY LINE
- NEW BUILDING
- DC — DEPRESSED CURB
- BREAK OF SLOPE - NEW
- NEW SWALE
- H — H — LIMIT OF HIGH POINT
- NEW LIGHT DUTY ASPHALT AS PER DETAIL 1 / C3
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- EXISTING CONCRETE CURB
- NEW CONCRETE CURB
- PROPOSED TWSI
- T — NEW TRANSFORMER PAD
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LEGEND CONTINUED

- EXISTING CATCHBASIN
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- D — EXISTING STORM MANHOLE
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GEOTECHNICAL NOTES

1. A GEOTECHNICAL ENGINEER LICENSED IN THE PROVINCE OF ONTARIO SHALL INSPECT ALL SUBGRADE SURFACES FOR FOOTING AND TRENCHES, PIPE BEDDING AND PAVEMENT STRUCTURES PRIOR TO CONSTRUCTION.
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3. IT IS ANTICIPATED THAT THE MAJORITY OF THE MATERIAL REQUIRED FOR BACKFILLING PURPOSES AND FOR TRENCH BACKFILL WOULD HAVE TO BE IMPORTED AND SHOULD CONFORM TO THE RECOMMENDATION STATED IN THE GEOTECHNICAL REPORT.
4. CONTRACTOR BIDDING ON THIS PROJECT MUST REVIEW AVAILABLE DATA AND DECIDE ON THEIR OWN THE BEST METHOD FOR THE EXCAVATION OF THE BEDROCK IF DEEMED REQUIRED.
5. IT IS RECOMMENDED THAT THE BEDDING FOR THE UNDERGROUND SERVICES INCLUDING MATERIAL SPECIFICATIONS, THICKNESS OF COVER MATERIAL AND COMPACTION REQUIREMENTS CONFORM TO MUNICIPAL REQUIREMENTS AND/OR ONTARIO PROVINCIAL STANDARD SPECIFICATION AND DRAWINGS (OPSS AND OPSD).
6. IT IS RECOMMENDED THAT THE PIPE BEDDING BE 300 MM THICK AND CONSIST OF OPSS GRANULAR A. THE BEDDING MATERIAL SHOULD BE PLACED ALONG THE SIDES AND ON TOP OF THE PIPE TO PROVIDE A MINIMUM COVER OF 300 MM. THE BEDDING SHOULD BE COMPACTED TO AT LEAST 98 PERCENT OF THE SPMDD.
7. THE BEDDING THICKNESS MAY BE FURTHER INCREASED IN AREAS WHERE THE SUBGRADE BECOMES DISTURBED.
8. SINCE PAVED SURFACES WILL BE LOCATED OVER SERVICE TRENCHES, IT IS RECOMMENDED THAT THE TRENCH BACKFILL MATERIAL WITHIN THE FROST ZONE (UP TO 1.8 M BELOW FINISHED GRADE), SHOULD MATCH THE EXISTING MATERIAL IN THE ROADWAY TO MINIMIZE DIFFERENTIAL FROST HEAVING OF THE SUBGRADE. THE TRENCH BACKFILL SHOULD BE PLACED IN 300 MM THICK LIFTS AND EACH LIFT SHOULD BE COMPACTED TO 95 PERCENT SPMDD.
9. THE BEDROCK/AUGER REFUSAL DEPTHS ACROSS THE SITE WERE VARIABLE SHALLOW BEDROCK AND LARGE BOULDERS SHOULD BE EXPECTED DURING THE INSTALLATION OF ANY SERVICES AT THE SITE AND CONTRACTORS BIDDING ON THIS WORK SHOULD ANTICIPATE THESE CONDITIONS.
10. IT IS ANTICIPATED THAT THE MAJORITY OF THE MATERIAL REQUIRED FOR TRENCH BACKFILL AND SUBGRADE FILL IN PARKING AREA AND ACCESS ROADS WOULD HAVE TO BE IMPORTED AND SHOULD CONFORM TO OPSS 1010 SELECT SUBGRADE MATERIAL (SSM) - COMPACTED TO 95 PERCENT OF THE SPMDD AND THE UPPER 300 MM OF THE SUBGRADE FILL MUST BE COMPACTED TO 98% SPMDD.
11. AS PART OF THE SUBGRADE PREPARATION, THE PROPOSED PARKING AREA, PAVED AREA AND ACCESS ROADS SHOULD BE STRIPPED OF TOPSOIL AND OTHER OBVIOUSLY UNSUITABLE MATERIAL. THE SUBGRADE SHOULD BE PROPERLY SHAPED, CROWNED, THEN PROOF ROLLED WITH A HEAVY VIBRATORY ROLLER IN THE FULL-TIME PRESENCE OF A REPRESENTATIVE OF THE GEOTECHNICAL ENGINEER. ANY SOFT OR SPONGY SUBGRADE AREAS DETECTED SHOULD BE SUB EXCAVATED AND PROPERLY REPLACED WITH SUITABLE APPROVED BACKFILL COMPACTED TO 95 PERCENT SPMDD (ASTM D698-12E2).

GEOTECHNICAL NOTES CONTINUED

12. THE SUBDRAINS ILLUSTRATED ON PLANS ARE SCHEMATIC. FULL SCHEME OF SUBDRAINS SHOULD BE INSTALLED ON BOTH SIDES OF THE ACCESS ROAD(S).SUBDRAINS SHOULD BE INSTALLED ON BOTH SIDES OF THE ACCESS ROAD(S). SUBDRAINS MUST BE INSTALLED IN THE PROPOSED PARKING AREA AT LOW POINTS AND SHOULD BE CONTINUOUS BETWEEN CATCHBASINS TO INTERCEPT EXCESS SURFACE AND SUBSURFACE MOISTURE AND TO PREVENT SUBGRADE SOFTENING. THIS WILL ENSURE NO WATER COLLECTS IN THE GRANULAR COURSE, WHICH COULD RESULT IN PAVEMENT FAILURE DURING THE SPRING THAW. THE LOCATION AND EXTENT OF SUBDRAINS REQUIRED WITHIN THE PAVED AREAS SHOULD BE REVIEWED BY THE GEOTECHNICAL ENGINEER IN CONJUNCTION WITH THE PROPOSED SITE GRADING.
13. TO MINIMIZE THE PROBLEMS OF DIFFERENTIAL MOVEMENT BETWEEN THE PAVEMENT AND CATCHBASINS/MANHOLE DUE TO FROST ACTION, THE BACKFILL AROUND THE STRUCTURES SHOULD CONSIST OF FREE-DRAINING GRANULAR PREFERABLY CONFORMING TO OPSS GRANULAR B TYPE II MATERIAL. WEEP HOLES SHOULD BE PROVIDED IN THE CATCHBASINS/MANHOLES TO FACILITATE DRAINAGE OF ANY WATER THAT MAY ACCUMULATE IN THE GRANULAR FILL.
14. THE MOST SEVERE LOADING CONDITIONS ON LIGHT-DUTY PAVEMENT AREAS AND THE SUBGRADE MAY OCCUR DURING CONSTRUCTION. CONSEQUENTLY, SPECIAL PROVISIONS SUCH AS RESTRICTED LANES, HALF-LOADS DURING PAVING, TEMPORARY CONSTRUCTION ROADWAYS, ETC., MAY BE REQUIRED, ESPECIALLY IF CONSTRUCTION IS CARRIED OUT DURING UNFAVORABLE WEATHER.
15. THE FINISHED PAVEMENT SURFACE SHOULD BE FREE OF DEPRESSIONS AND SHOULD BE SLOPED (PREFERABLY AT A MINIMUM CROSS FALL OF 2 PERCENT) TO PROVIDE EFFECTIVE SURFACE DRAINAGE TOWARDS CATCH BASINS. SURFACE WATER SHOULD NOT BE ALLOWED TO POND ADJACENT TO THE OUTSIDE EDGES OF PAVED AREAS.
16. RELATIVELY WEAKER SUBGRADE MAY DEVELOP OVER SERVICE TRENCHES AT SUBGRADE LEVEL. THESE AREAS MAY REQUIRE THE USE OF THICKER/COARSER SUB-BASE MATERIAL AND THE USE OF A GEOTEXTILE AT THE SUBGRADE LEVEL. IF THIS IS THE CASE, IT IS RECOMMENDED THAT ADDITIONAL 150 MM THICK GRANULAR SUB-BASE, OPSS GRANULAR B TYPE II, SHOULD BE PROVIDED IN THESE AREAS, IN ADDITION TO THE USE OF A GEOTEXTILE AT THE SUBGRADE LEVEL.
17. THE GRANULAR MATERIALS USED FOR PAVEMENT CONSTRUCTION SHOULD CONFORM TO ONTARIO PROVINCIAL STANDARD SPECIFICATIONS (OPSS 1010) FOR GRANULAR A AND GRANULAR B TYPE II AND SHOULD BE COMPACTED TO 100 PERCENT OF THE SPMDD.
18. THE ASPHALTIC CONCRETE USED, AND ITS PLACEMENT SHOULD MEET OPSS 1150 OR 1151 REQUIREMENTS. IT SHOULD BE COMPACTED FROM 92 PERCENT TO 97 PERCENT OF THE MRD (ASTM D2041). ASPHALT PLACEMENT SHOULD BE IN ACCORDANCE WITH OPSS 310 AND OPSS 313.
19. ALL EARTHWORK ACTIVITIES FROM PLACEMENT AND COMPACTION OF FILL IN THE SERVICE TRENCHES TO SUBGRADE PREPARATION, PLACEMENT AND COMPACTION OF GRANULAR MATERIALS AND ASPHALTIC CONCRETE SHOULD BE INSPECTED BY QUALIFIED GEOTECHNICIANS TO ENSURE THAT CONSTRUCTION OF THE SEWERS AND PAVEMENT PROCEEDS ACCORDING TO THE SPECIFICATIONS.
20. STRINGENT CONSTRUCTION CONTROL PROCEDURES SHOULD BE MAINTAINED TO ENSURE THAT UNIFORM SUBGRADE MOISTURE AND DENSITY CONDITIONS ARE ACHIEVED.

GEOTECHNICAL NOTES CONTINUED

21. SHOULD SURFACE AND SUBSURFACE WATER SEEPAGE OCCUR INTO THE EXCAVATIONS COLLECT ANY WATER ENTERING THE EXCAVATIONS AND REMOVE IT BY PUMPING FROM SUMP.
22. IF THE BACKFILL IN THE SERVICE TRENCHES WILL CONSIST OF GRANULAR FILL, CLAY SEALS SHOULD BE INSTALLED IN THE SERVICE TRENCHES AT SELECT INTERVALS (SPACING) AS PER CITY OF OTTAWA DRAWING NO. S8. THE SEALS SHOULD BE 1m WIDE, EXTEND OVER THE ENTIRE TRENCH WIDTH AND FROM THE BOTTOM OF THE TRENCH TO THE UNDERSIDE OF THE PAVEMENT STRUCTURE. THE CLAY SHOULD BE COMPACTED TO 95 PERCENT SPMDD. THE PURPOSE OF THE CLAY SEALS IS TO PREVENT THE PERMANENT LOWERING OF THE GROUNDWATER LEVEL. CLAY SEAL LOCATIONS SHALL BE APPROVED BY THE GEOTECHNICAL ENGINEER.
23. IT IS RECOMMENDED THAT A GEOTEXTILE BE PLACED ON THE SURFACE OF THE SUBGRADE PRIOR TO PLACEMENT OF ANY GRANULAR SUB-BASE. THIS MUST BE ALLOWED FOR BY THE CONTRACTOR AND INSTALLED WHEN DIRECTED BY THE GEOTECHNICAL ENGINEER.
24. THE MUNICIPAL SERVICES SHOULD BE INSTALLED IN SHORT OPEN TRENCH SECTIONS THAT ARE EXCAVATED AND BACKFILLED THE SAME DAY.

GENERAL NOTES

1. DESIGN AND CONSTRUCTION IS TO BE IN ACCORDANCE WITH MOST RECENT ONTARIO BUILDING CODE.
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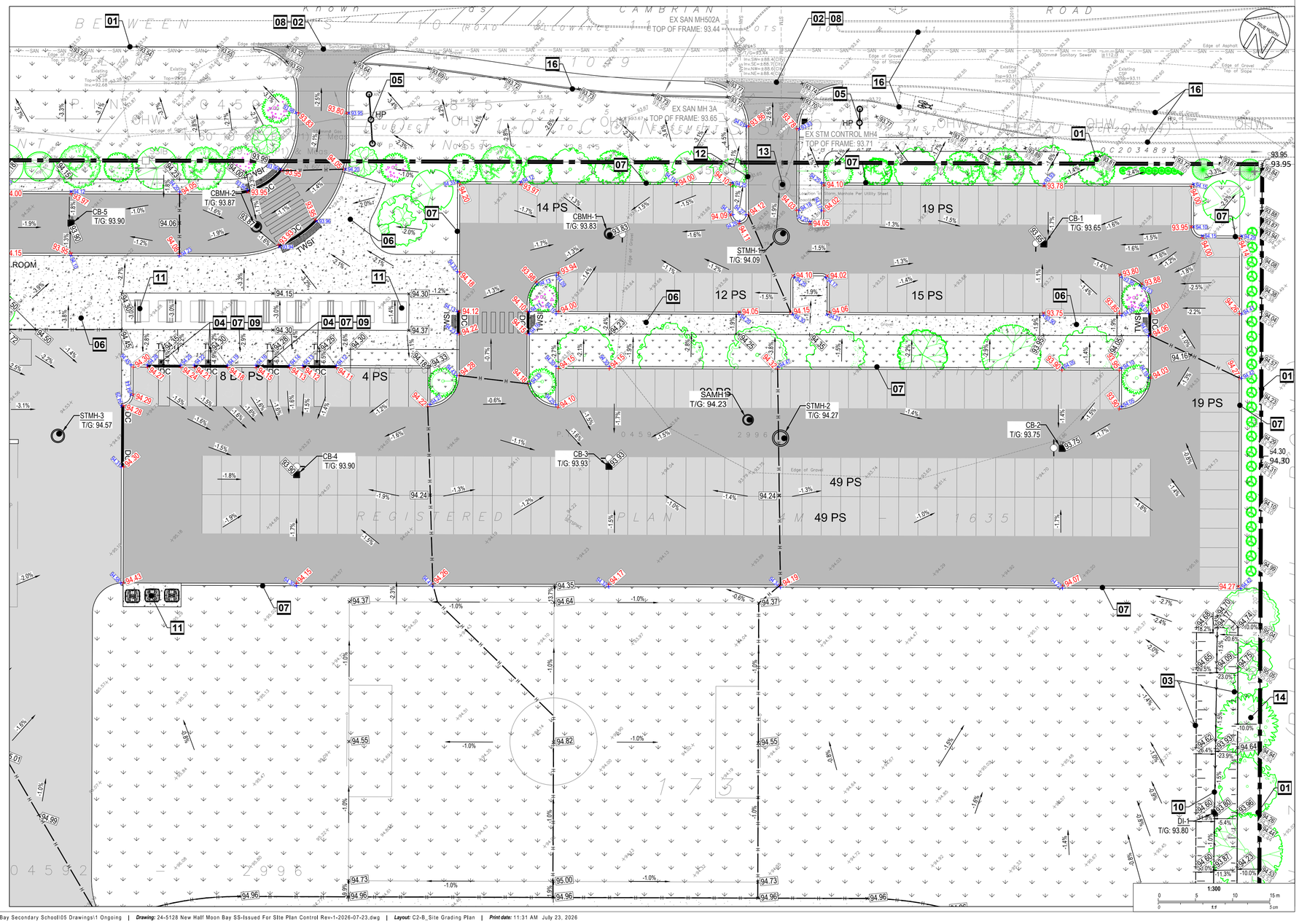

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1150 MORRISON DR., #410 OTTAWA, ON, K2H 8S9
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7. THE BEDDING THICKNESS MAY BE FURTHER INCREASED IN AREAS WHERE THE SUBGRADE BECOMES DISTURBED.
8. SINCE PAVED SURFACES WILL BE LOCATED OVER SERVICE TRENCHES, IT IS RECOMMENDED THAT THE TRENCH BACKFILL MATERIAL WITHIN THE FROST ZONE (UP TO 1.8 M BELOW FINISHED GRADE), SHOULD MATCH THE EXISTING MATERIAL IN THE ROADWAY TO MINIMIZE DIFFERENTIAL FROST HEAVING OF THE SUBGRADE. THE TRENCH BACKFILL SHOULD BE PLACED IN 300 MM THICK LIFTS AND EACH LIFT SHOULD BE COMPACTED TO 95 PERCENT SPMDD.
9. THE BEDROCK/AUGER REFUSAL DEPTHS ACROSS THE SITE WERE VARIABLE SHALLOW BEDROCK AND LARGE BOULDERS SHOULD BE EXPECTED DURING THE INSTALLATION OF ANY SERVICES AT THE SITE AND CONTRACTORS BIDDING ON THIS WORK SHOULD ANTICIPATE THESE CONDITIONS.
10. IT IS ANTICIPATED THAT THE MAJORITY OF THE MATERIAL REQUIRED FOR TRENCH BACKFILL AND SUBGRADE FILL IN PARKING AREA AND ACCESS ROADS WOULD HAVE TO BE IMPORTED AND SHOULD CONFORM TO OPSS 1010 SELECT SUBGRADE MATERIAL (SSM) - COMPACTED TO 95 PERCENT OF THE SPMDD AND THE UPPER 300 MM OF THE SUBGRADE FILL MUST BE COMPACTED TO 98% SPMDD.
11. AS PART OF THE SUBGRADE PREPARATION, THE PROPOSED PARKING AREA, PAVED AREA AND ACCESS ROADS SHOULD BE STRIPPED OF TOPSOIL AND OTHER OBVIOUSLY UNSUITABLE MATERIAL. THE SUBGRADE SHOULD BE PROPERLY SHAPED, CROWNED, THEN PROOF ROLLED WITH A HEAVY VIBRATORY ROLLER IN THE FULL-TIME PRESENCE OF A REPRESENTATIVE OF THE GEOTECHNICAL ENGINEER. ANY SOFT OR SPONGY SUBGRADE AREAS DETECTED SHOULD BE SUB EXCAVATED AND PROPERLY REPLACED WITH SUITABLE APPROVED BACKFILL COMPACTED TO 95 PERCENT SPMDD (ASTM D698-12E2).

GEOTECHNICAL NOTES CONTINUED

12. THE SUBDRAINS ILLUSTRATED ON PLANS ARE SCHEMATIC. FULL SCHEME OF SUBDRAINS SHOULD BE INSTALLED ON BOTH SIDES OF THE ACCESS ROAD(S).SUBDRAINS SHOULD BE INSTALLED ON BOTH SIDES OF THE ACCESS ROAD(S). SUBDRAINS MUST BE INSTALLED IN THE PROPOSED PARKING AREA AT LOW POINTS AND SHOULD BE CONTINUOUS BETWEEN CATCHBASINS TO INTERCEPT EXCESS SURFACE AND SUBSURFACE MOISTURE AND TO PREVENT SUBGRADE SOFTENING. THIS WILL ENSURE NO WATER COLLECTS IN THE GRANULAR COURSE, WHICH COULD RESULT IN PAVEMENT FAILURE DURING THE SPRING THAW. THE LOCATION AND EXTENT OF SUBDRAINS REQUIRED WITHIN THE PAVED AREAS SHOULD BE REVIEWED BY THE GEOTECHNICAL ENGINEER IN CONJUNCTION WITH THE PROPOSED SITE GRADING.
13. TO MINIMIZE THE PROBLEMS OF DIFFERENTIAL MOVEMENT BETWEEN THE PAVEMENT AND CATCHBASINS/MANHOLE DUE TO FROST ACTION, THE BACKFILL AROUND THE STRUCTURES SHOULD CONSIST OF FREE-DRAINING GRANULAR PREFERABLY CONFORMING TO OPSS GRANULAR B TYPE II MATERIAL. WEEP HOLES SHOULD BE PROVIDED IN THE CATCHBASINS/MANHOLES TO FACILITATE DRAINAGE OF ANY WATER THAT MAY ACCUMULATE IN THE GRANULAR FILL.
14. THE MOST SEVERE LOADING CONDITIONS ON LIGHT-DUTY PAVEMENT AREAS AND THE SUBGRADE MAY OCCUR DURING CONSTRUCTION. CONSEQUENTLY, SPECIAL PROVISIONS SUCH AS RESTRICTED LANES, HALF-LOADS DURING PAVING, TEMPORARY CONSTRUCTION ROADWAYS, ETC., MAY BE REQUIRED, ESPECIALLY IF CONSTRUCTION IS CARRIED OUT DURING UNFAVORABLE WEATHER.
15. THE FINISHED PAVEMENT SURFACE SHOULD BE FREE OF DEPRESSIONS AND SHOULD BE SLOPED (PREFERABLY AT A MINIMUM CROSS FALL OF 2 PERCENT) TO PROVIDE EFFECTIVE SURFACE DRAINAGE TOWARDS CATCH BASINS. SURFACE WATER SHOULD NOT BE ALLOWED TO POND ADJACENT TO THE OUTSIDE EDGES OF PAVED AREAS.
16. RELATIVELY WEAKER SUBGRADE MAY DEVELOP OVER SERVICE TRENCHES AT SUBGRADE LEVEL. THESE AREAS MAY REQUIRE THE USE OF THICKER/COARSER SUB-BASE MATERIAL AND THE USE OF A GEOTEXTILE AT THE SUBGRADE LEVEL. IF THIS IS THE CASE, IT IS RECOMMENDED THAT ADDITIONAL 150 MM THICK GRANULAR SUB-BASE, OPSS GRANULAR B TYPE II, SHOULD BE PROVIDED IN THESE AREAS, IN ADDITION TO THE USE OF A GEOTEXTILE AT THE SUBGRADE LEVEL.
17. THE GRANULAR MATERIALS USED FOR PAVEMENT CONSTRUCTION SHOULD CONFORM TO ONTARIO PROVINCIAL STANDARD SPECIFICATIONS (OPSS 1010) FOR GRANULAR A AND GRANULAR B TYPE II AND SHOULD BE COMPACTED TO 100 PERCENT OF THE SPMDD.
18. THE ASPHALTIC CONCRETE USED, AND ITS PLACEMENT SHOULD MEET OPSS 1150 OR 1151 REQUIREMENTS. IT SHOULD BE COMPACTED FROM 92 PERCENT TO 97 PERCENT OF THE MRD (ASTM D2041). ASPHALT PLACEMENT SHOULD BE IN ACCORDANCE WITH OPSS 310 AND OPSS 313.
19. ALL EARTHWORK ACTIVITIES FROM PLACEMENT AND COMPACTION OF FILL IN THE SERVICE TRENCHES TO SUBGRADE PREPARATION, PLACEMENT AND COMPACTION OF GRANULAR MATERIALS AND ASPHALTIC CONCRETE SHOULD BE INSPECTED BY QUALIFIED GEOTECHNICIANS TO ENSURE THAT CONSTRUCTION OF THE SEWERS AND PAVEMENT PROCEEDS ACCORDING TO THE SPECIFICATIONS.
20. STRINGENT CONSTRUCTION CONTROL PROCEDURES SHOULD BE MAINTAINED TO ENSURE THAT UNIFORM SUBGRADE MOISTURE AND DENSITY CONDITIONS ARE ACHIEVED.

GEOTECHNICAL NOTES CONTINUED

21. SHOULD SURFACE AND SUBSURFACE WATER SEEPAGE OCCUR INTO THE EXCAVATIONS COLLECT ANY WATER ENTERING THE EXCAVATIONS AND REMOVE IT BY PUMPING FROM SUMP.
22. IF THE BACKFILL IN THE SERVICE TRENCHES WILL CONSIST OF GRANULAR FILL, CLAY SEALS SHOULD BE INSTALLED IN THE SERVICE TRENCHES AT SELECT INTERVALS (SPACING) AS PER CITY OF OTTAWA DRAWING NO. S8. THE SEALS SHOULD BE 1m WIDE, EXTEND OVER THE ENTIRE TRENCH WIDTH AND FROM THE BOTTOM OF THE TRENCH TO THE UNDERSIDE OF THE PAVEMENT STRUCTURE. THE CLAY SHOULD BE COMPACTED TO 95 PERCENT SPMDD. THE PURPOSE OF THE CLAY SEALS IS TO PREVENT THE PERMANENT LOWERING OF THE GROUNDWATER LEVEL. CLAY SEAL LOCATIONS SHALL BE APPROVED BY THE GEOTECHNICAL ENGINEER.
23. IT IS RECOMMENDED THAT A GEOTEXTILE BE PLACED ON THE SURFACE OF THE SUBGRADE PRIOR TO PLACEMENT OF ANY GRANULAR SUB-BASE. THIS MUST BE ALLOWED FOR BY THE CONTRACTOR AND INSTALLED WHEN DIRECTED BY THE GEOTECHNICAL ENGINEER.
24. THE MUNICIPAL SERVICES SHOULD BE INSTALLED IN SHORT OPEN TRENCH SECTIONS THAT ARE EXCAVATED AND BACKFILLED THE SAME DAY.

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1. DESIGN AND CONSTRUCTION IS TO BE IN ACCORDANCE WITH MOST RECENT ONTARIO BUILDING CODE.
2. THE CONTRACTOR IS RESPONSIBLE FOR CHECKING AND VERIFYING ALL DIMENSIONS WITH RESPECT TO SITE CONDITIONS AND ALL MATERIALS TO THE PROJECT. ANY DISCREPANCY SHALL BE REPORTED TO THE ENGINEER.
3. THIS DRAWING IS TO BE READ IN CONJUNCTION WITH ALL MATERIAL RELEVANT TO THE PROJECT.
4. ADDITIONAL DRAWINGS MAY BE ISSUED FOR CLARIFICATION TO ASSIST PROPER EXECUTION OF WORK. SUCH DRAWINGS WILL HAVE THE SAME MEANING AND INTENT AS IF THEY WERE INCLUDED WITH THE CONTRACT DOCUMENTS.
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6. CONTRACTOR RESPONSIBLE FOR OBTAINING ALL REQUIRED UTILITY LOCATES, DAYLIGHTING, INSPECTIONS, PERMITS, AND APPROVALS, INCLUDING ALL ASSOCIATED COSTS. LOCATION OF EXISTING UTILITIES ARE APPROXIMATE ONLY AND BASED ON BEST AVAILABLE INFORMATION.
7. IN THE EVENT THAT EXCAVATION IS REQUIRED ON THE CITY OF OTTAWA ROW OR ADJACENT PROPERTY, CONTRACTOR IS RESPONSIBLE TO ENSURE ADDITIONAL PERMIT AND/OR PERMISSION

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01 MATCH EXISTING GRADES AT PROPERTY LINE AND LIMITS OF WORK.

02 ANY DISTURBED AREA WITHIN THE RIGHT-OF-WAY SHALL BE REINSTATED TO EQUAL OR BETTER CONDITION TO THE SATISFACTION OF THE CITY OF OTTAWA.

03 TOP OF BANK. PROVIDE MAXIMUM 4:1 SLOPE TO TIE INTO EXISTING / PROPOSED GRADES.

04 TWSI AS PER CITY STANDARDS.

05 EXISTING LIGHT STANDARD TO BE PROTECTED DURING CONSTRUCTION.

06 CONSTRUCT SIDEWALK AS PER CITY OF OTTAWA STANDARD DETAIL SC2 & SC5 . PROVIDE MAXIMUM SLOPE OF 2.0% INSTALL REINFORCING MESH 150X150mm MW9.1XMW9.1 THROUGHOUT NEW SIDEWALK. STOP WIRE MESH AT EXPANSION JOINTS.

07 CONSTRUCT CONCRETE BARRIER / DEPRESSED CURB AS PER CITY OF OTTAWA STANDARD DETAIL SC1.1.

08 SAW CUT INTO EXISTING ASPHALT AS PER DETAIL 3/C3. MATCH EXISTING PAVEMENT AND GRANULAR STRUCTURE.

09 NEW ACCESSIBLE PARKING ACCESS RAMP. PROVIDE MAXIMUM 8% SLOPE.

10 CONSTRUCT NEW SWALE IN ACCORDANCE WITH CITY OF OTTAWA STANDARD DETAIL DRAWING S29.

11 CONCRETE PADS FOR GARBAGE STORAGE / BIKE RACKS & NEW TRANSFORMER.

12 PROVIDE RISERS AND ADJUSTMENT UNITS OVER EXISTING 1200mm DIAMETER SANITARY MANHOLE TO BRING TOP OF FRAME TO FINISHED GRADE. EXISTING TOP OF FRAME AT APPROXIMATELY 93.87, FINISHED GRADE AT 94.01. PARGE AND PROVIDE WATER TIGHT CONNECTION. PROVIDE NEW FRAME AND GRATE AS PER CITY OF OTTAWA DETAIL S25 / S24 AS NECESSARY.

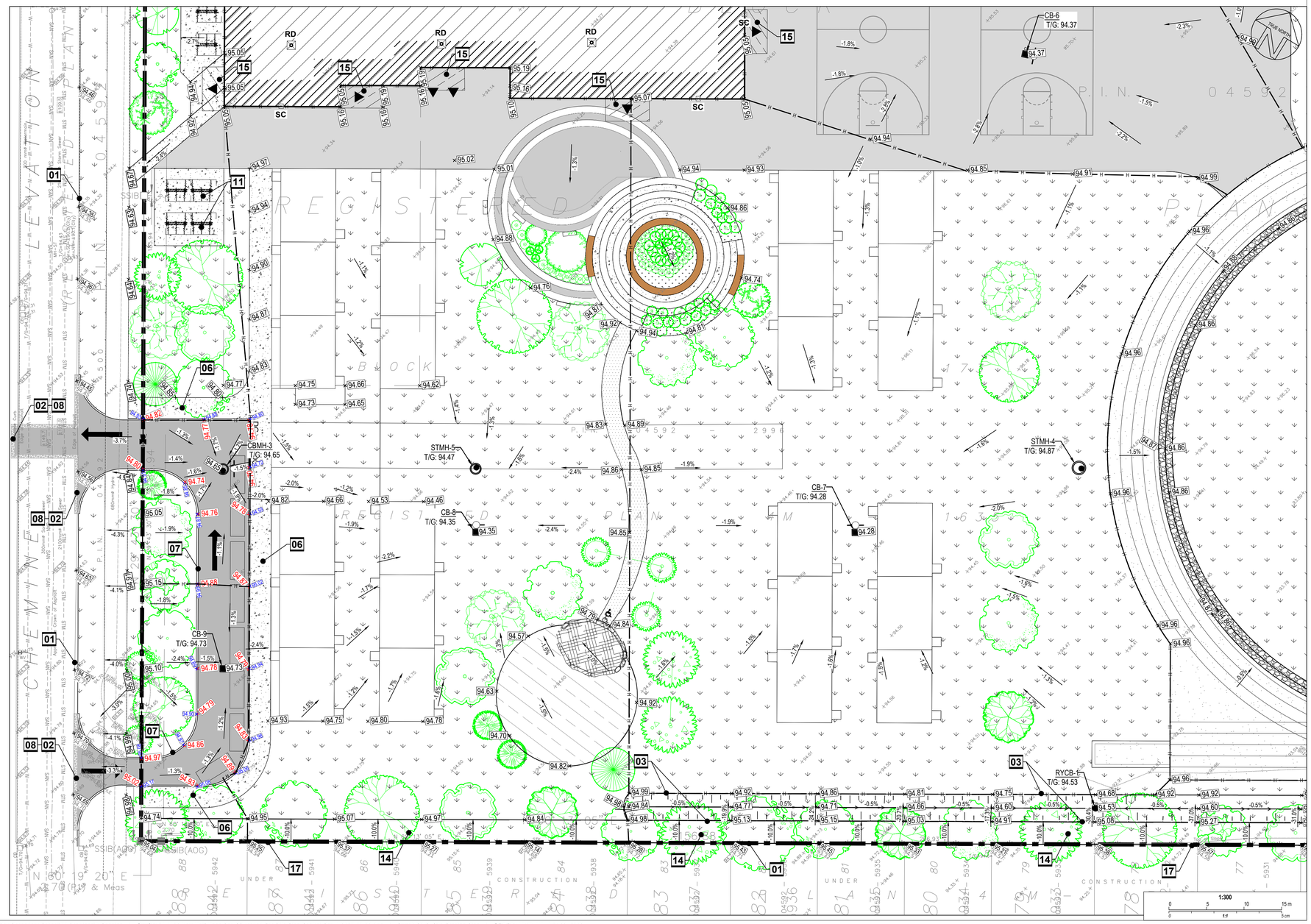
13 PROVIDE RISERS AND ADJUSTMENT UNITS OVER EXISTING 2400MM DIAMETER STORM MANHOLE TO BRING TOP OF FRAME TO FINISHED GRADE. EXISTING TOP OF FRAME AT APPROXIMATELY 93.88, FINISHED GRADE AT 93.98. PARGE AND PROVIDE WATER TIGHT CONNECTION. PROVIDE NEW FRAME AND GRATE AS PER CITY OF OTTAWA DETAIL S25 / S24.1 AS NECESSARY.

14 PROVIDE MAX 3H:1V SLOPE FROM PROPERTY LINE TO TIE INTO EXISTING DITCH GRADE.

15 PROVIDE INSULATION AT SUBGRADE UNDER ENTRANCE PAVING / PAVERS EXTENDING 3m BEYOND DOORS. REFER TO ARCHITECTURAL DETAILS.

16 FUTURE MULTI USE PATH AND FUTURE CAMBRIAN ROAD WIDENING. MATCH PROPOSED SITE GRADING INTO FUTURE CAMBRIAN ROAD AND MUP GRADING.

17 MATCH GRADING AT SOUTH PROPERTY LINE INTO GRADING PROPOSED FOR RESIDENTIAL DEVELOPMENTS, REFER TO DSEL PROJECT NUMBER 19-1089 GRADING PLANS, SHEET NO. 38 AND SHEET NO. 40.



OTTAWA-CARLETON DISTRICT SCHOOL BOARD

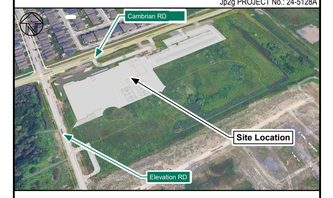
Jp2g Consultants Inc.
ENGINEERS · PLANNERS · PROJECT MANAGERS

12 INTERNATIONAL DR, PEMBROKE, ON, K8A 6W5
T: 613-735-2507
PEMBROKE@JP2G.COM

1150 MORRISON DR., #410 OTTAWA, ON, K2H 8S9
T: 613-828-7800
OTTAWA@JP2G.COM

16 EDWARD ST. S., #211 ARNPRIOR, ON, K7S 3W4
T: 613-626-0780
ARNPRIOR@JP2G.COM

Jp2g PROJECT No.: 24-5128A



No.	DESCRIPTION	YYYY-MM-DD
2	ISSUED FOR SITE PLAN CONTROL REV-1	2026-07-24
1	ISSUED FOR 33% DESIGN SUBMISSION	2026-07-17

N45 ARCHITECTURE INC.
71 Bank Street, 7th Floor - Ottawa, Ontario K1P 5N2
tel. 613.224.0095 fax 613.224.9811

project
Half Moon Bay Secondary School

3853 Cambrian Road,Ottawa, ON

seal: LICENSED PROFESSIONAL ENGINEER — Z. E. BAUMAN — 100578796 — July 24, 2026 — PROVINCE OF ONTARIO

seal: LICENSED PROFESSIONAL ENGINEER — A. SAMMOUR — 100227665 — July 24, 2026 — PROVINCE OF ONTARIO

drawing title
Site Grading Plan

scale: As Shown	drawn by: B.Radan / R.Ismail
date: July 2026	checked by: Z.Bauman / A.Sammour
project number: 26-056	drawing number: C2-C
	revision

CONTRACTOR TO VERIFY ALL DIMENSIONS AND NOTIFY THE ARCHITECT OF ANY DISCREPANCIES BEFORE WORK COMMENCES.

DO NOT SCALE DRAWINGS.

DXX-XX-XX-XXXX

PLAN #XXXXX

Folder: \\jp2g.com\project1\Project Data\5-Civil\2024\24-5128A - OCDSB - New Half Moon Bay Secondary School\05 Drawings\1 Ongoing | **Drawing:** 24-5128 New Half Moon Bay SS-Issued For Site Plan Control Rev-1-2026-07-23.dwg | **Layout:** C2-C_Site Grading Plan | **Print date:** 11:31 AM July 23, 2026

LEGEND

- PROPERTY LINE
- NEW BUILDING
- DC — DEPRESSED CURB
- BREAK OF SLOPE - NEW
- NEW SWALE
- H — H — LIMIT OF HIGH POINT
- NEW LIGHT DUTY ASPHALT AS PER DETAIL 1 / C3
- NEW HEAVY DUTY ASPHALT AS PER DETAIL 2 / C3
- NEW CONCRETE SIDEWALK
- NEW GRASS
- MILLING & OVERLAY 50mm THICK HEAVY DUTY ASPHALT AS PER DETAIL 3 / C3
- NEW PRECAST PAVERS
- NEW EWF / MULCH
- NEW CLEAR STONE SUBDRAIN TRENCH
- NEW RUBBERIZED ASPHALT TRACK
- NEW STONE DUST PATH
- Concrete Sidewalk — EXISTING SIDEWALK
- EXISTING CONCRETE CURB
- NEW CONCRETE CURB
- PROPOSED TWSI
- T — NEW TRANSFORMER PAD
- EXISTING STREET LIGHT
- EXISTING HYDRO POLE

LEGEND CONTINUED

- EXISTING CATCHBASIN
- EXISTING DITCH INLET
- D — EXISTING STORM MANHOLE
- S — EXISTING SANITARY MANHOLE
- EXISTING STORM /SANITARY MANHOLE TO BE ADJUSTED
- EXISTING FIRE HYDRANT
- WV — EXISTING WATER VALVE
- NEW CATCHBASIN
- NEW STORM MANHOLE / CATCHBASIN MANHOLE
- NEW SANITARY MANHOLE
- NEW REAR YARD CATCH BASIN
- FH — NEW FIRE HYDRANT
- W — NEW WATER VALVE
- NEW INLET CONTROL DEVICE
- RD — NEW ROOF DRAIN
- SC — NEW SCUPPER AT 150mm ABOVE ROOF DRAIN LEVEL
- BUILDING ENTRANCE
- NEW SIAMESE CONNECTION
- XX.XX — EXISTING NATURAL GRADE
- XX.XX — PROPOSED ELEVATION & EXISTING NATURAL GRADE
- XX.XX — PROPOSED ELEVATION
- XX.XX — PROPOSED BOTTOM OF CURB ELEVATION
- XX.XX — PROPOSED TOP OF CURB ELEVATION
- X.XX% — PROPOSED SLOPE

GEOTECHNICAL NOTES

1. A GEOTECHNICAL ENGINEER LICENSED IN THE PROVINCE OF ONTARIO SHALL INSPECT ALL SUBGRADE SURFACES FOR FOOTING AND TRENCHES, PIPE BEDDING AND PAVEMENT STRUCTURES PRIOR TO CONSTRUCTION.
2. IT IS STRICTLY RECOMMENDED TO REFER GEOTECHNICAL INVESTIGATION REPORT - PROPOSED HALF MOON BAY SECONDARY SCHOOL 3853 CAMBRIAN ROAD OTTAWA, ONTARIO BY EXP SERVICES INC. .
3. IT IS ANTICIPATED THAT THE MAJORITY OF THE MATERIAL REQUIRED FOR BACKFILLING PURPOSES AND FOR TRENCH BACKFILL WOULD HAVE TO BE IMPORTED AND SHOULD CONFORM TO THE RECOMMENDATION STATED IN THE GEOTECHNICAL REPORT.
4. CONTRACTOR BIDDING ON THIS PROJECT MUST REVIEW AVAILABLE DATA AND DECIDE ON THEIR OWN THE BEST METHOD FOR THE EXCAVATION OF THE BEDROCK IF DEEMED REQUIRED.
5. IT IS RECOMMENDED THAT THE BEDDING FOR THE UNDERGROUND SERVICES INCLUDING MATERIAL SPECIFICATIONS, THICKNESS OF COVER MATERIAL AND COMPACTION REQUIREMENTS CONFORM TO MUNICIPAL REQUIREMENTS AND/OR ONTARIO PROVINCIAL STANDARD SPECIFICATION AND DRAWINGS (OPSS AND OPSD).
6. IT IS RECOMMENDED THAT THE PIPE BEDDING BE 300 MM THICK AND CONSIST OF OPSS GRANULAR A. THE BEDDING MATERIAL SHOULD BE PLACED ALONG THE SIDES AND ON TOP OF THE PIPE TO PROVIDE A MINIMUM COVER OF 300 MM. THE BEDDING SHOULD BE COMPACTED TO AT LEAST 98 PERCENT OF THE SPMDD.
7. THE BEDDING THICKNESS MAY BE FURTHER INCREASED IN AREAS WHERE THE SUBGRADE BECOMES DISTURBED.
8. SINCE PAVED SURFACES WILL BE LOCATED OVER SERVICE TRENCHES, IT IS RECOMMENDED THAT THE TRENCH BACKFILL MATERIAL WITHIN THE FROST ZONE (UP TO 1.8 M BELOW FINISHED GRADE), SHOULD MATCH THE EXISTING MATERIAL IN THE ROADWAY TO MINIMIZE DIFFERENTIAL FROST HEAVING OF THE SUBGRADE. THE TRENCH BACKFILL SHOULD BE PLACED IN 300 MM THICK LIFTS AND EACH LIFT SHOULD BE COMPACTED TO 95 PERCENT SPMDD.
9. THE BEDROCK/AUGER REFUSAL DEPTHS ACROSS THE SITE WERE VARIABLE SHALLOW BEDROCK AND LARGE BOULDERS SHOULD BE EXPECTED DURING THE INSTALLATION OF ANY SERVICES AT THE SITE AND CONTRACTORS BIDDING ON THIS WORK SHOULD ANTICIPATE THESE CONDITIONS.
10. IT IS ANTICIPATED THAT THE MAJORITY OF THE MATERIAL REQUIRED FOR TRENCH BACKFILL AND SUBGRADE FILL IN PARKING AREA AND ACCESS ROADS WOULD HAVE TO BE IMPORTED AND SHOULD CONFORM TO OPSS 1010 SELECT SUBGRADE MATERIAL (SSM) - COMPACTED TO 95 PERCENT OF THE SPMDD AND THE UPPER 300 MM OF THE SUBGRADE FILL MUST BE COMPACTED TO 98% SPMDD.
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12. THE SUBDRAINS ILLUSTRATED ON PLANS ARE SCHEMATIC. FULL SCHEME OF SUBDRAINS SHOULD BE INSTALLED ON BOTH SIDES OF THE ACCESS ROAD(S).SUBDRAINS SHOULD BE INSTALLED ON BOTH SIDES OF THE ACCESS ROAD(S). SUBDRAINS MUST BE INSTALLED IN THE PROPOSED PARKING AREA AT LOW POINTS AND SHOULD BE CONTINUOUS BETWEEN CATCHBASINS TO INTERCEPT EXCESS SURFACE AND SUBSURFACE MOISTURE AND TO PREVENT SUBGRADE SOFTENING. THIS WILL ENSURE NO WATER COLLECTS IN THE GRANULAR COURSE, WHICH COULD RESULT IN PAVEMENT FAILURE DURING THE SPRING THAW. THE LOCATION AND EXTENT OF SUBDRAINS REQUIRED WITHIN THE PAVED AREAS SHOULD BE REVIEWED BY THE GEOTECHNICAL ENGINEER IN CONJUNCTION WITH THE PROPOSED SITE GRADING.
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11 CONCRETE PADS FOR GARBAGE STORAGE / BIKE RACKS & NEW TRANSFORMER.

12 PROVIDE RISERS AND ADJUSTMENT UNITS OVER EXISTING 1200mm DIAMETER SANITARY MANHOLE TO BRING TOP OF FRAME TO FINISHED GRADE. EXISTING TOP OF FRAME AT APPROXIMATELY 93.87, FINISHED GRADE AT 94.01. PARGE AND PROVIDE WATER TIGHT CONNECTION. PROVIDE NEW FRAME AND GRATE AS PER CITY OF OTTAWA DETAIL S25 / S24 AS NECESSARY.

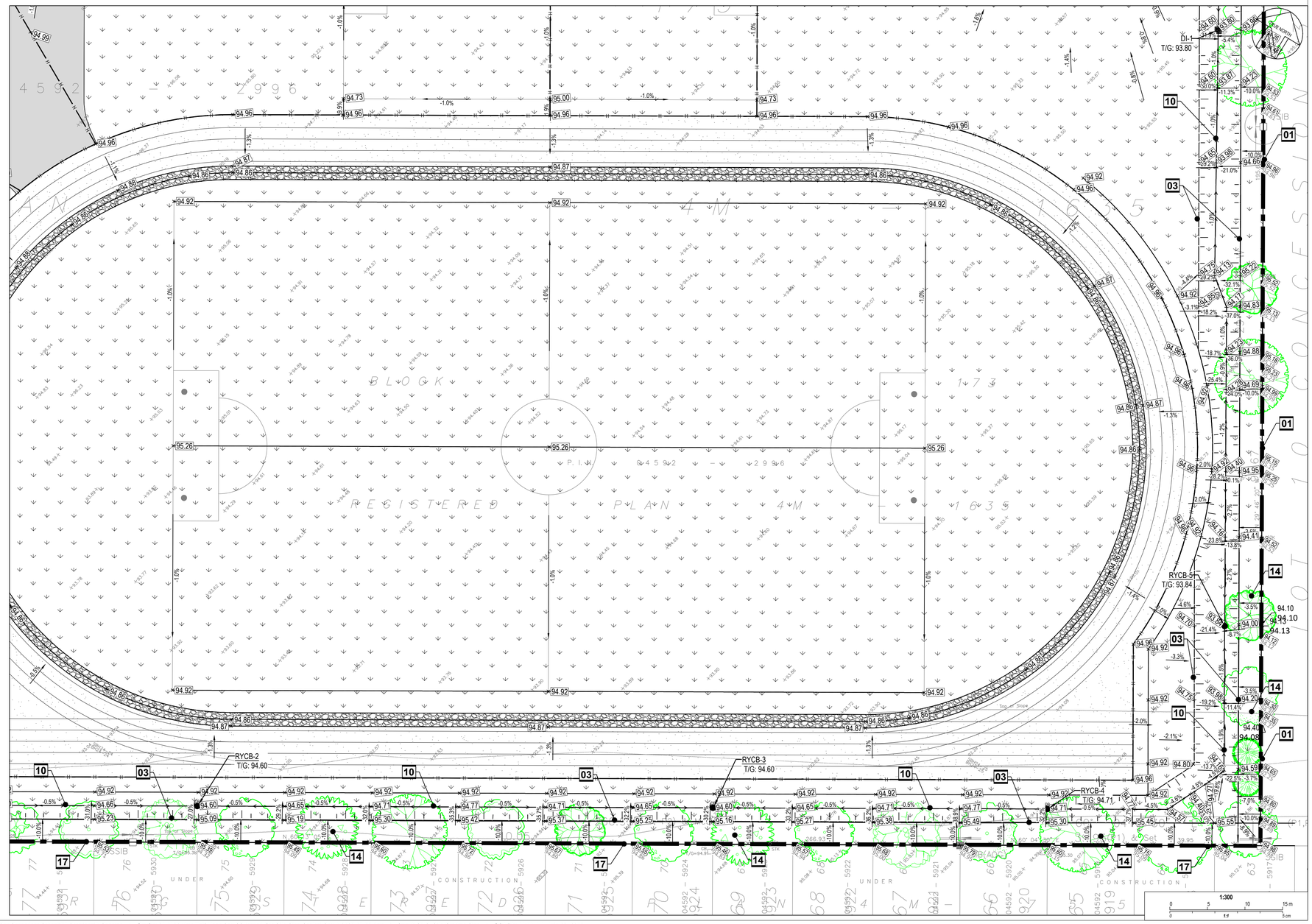
13 PROVIDE RISERS AND ADJUSTMENT UNITS OVER EXISTING 2400MM DIAMETER STORM MANHOLE TO BRING TOP OF FRAME TO FINISHED GRADE. EXISTING TOP OF FRAME AT APPROXIMATELY 93.88, FINISHED GRADE AT 93.98. PARGE AND PROVIDE WATER TIGHT CONNECTION. PROVIDE NEW FRAME AND GRATE AS PER CITY OF OTTAWA DETAIL S25 / S24.1 AS NECESSARY.

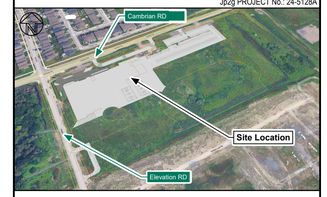
14 PROVIDE MAX 3H:1V SLOPE FROM PROPERTY LINE TO TIE INTO EXISTING DITCH GRADE.

15 PROVIDE INSULATION AT SUBGRADE UNDER ENTRANCE PAVING / PAVERS EXTENDING 3m BEYOND DOORS. REFER TO ARCHITECTURAL DETAILS.

16 FUTURE MULTI USE PATH AND FUTURE CAMBRIAN ROAD WIDENING. MATCH PROPOSED SITE GRADING INTO FUTURE CAMBRIAN ROAD AND MUP GRADING.

17 MATCH GRADING AT SOUTH PROPERTY LINE INTO GRADING PROPOSED FOR RESIDENTIAL DEVELOPMENTS, REFER TO DSEL PROJECT NUMBER 19-1089 GRADING PLANS, SHEET NO. 38 AND SHEET NO. 40.





Jp2g PROJECT No.: 24-5128A

No.	DESCRIPTION	YYYY-MM-DD
2	ISSUED FOR SITE PLAN CONTROL REV-1	2026-07-24
1	ISSUED FOR 33% DESIGN SUBMISSION	2026-07-17

OTTAWA-CARLETON DISTRICT SCHOOL BOARD

Jp2g Consultants Inc.
ENGINEERS · PLANNERS · PROJECT MANAGERS
12 INTERNATIONAL DR, PEMBROKE, ON, K8A 6W5 T: 613-735-2507 PEMBROKE@JP2G.COM
1150 MORRISON DR., #410 OTTAWA, ON, K2H 8S9 T: 613-828-7800 OTTAWA@JP2G.COM
16 EDWARD ST. S., #211 ARNPRIOR, ON, K7S 3H4 T: 613-626-0780 ARNPRIOR@JP2G.COM

N45 ARCHITECTURE INC.
71 Bank Street, 7th Floor - Ottawa, Ontario K1P 5N2
tel. 613.224.0095 fax 613.224.9811

project
Half Moon Bay Secondary School
3853 Cambrian Road,Ottawa, ON

seal: LICENSED PROFESSIONAL ENGINEER — Z. E. BAUMAN — 100578796 — July 24, 2026 — PROVINCE OF ONTARIO

seal: LICENSED PROFESSIONAL ENGINEER — A. SAMMOUR — 100227665 — July 24, 2026 — PROVINCE OF ONTARIO

drawing title
Site Grading Plan

scale: As Shown	drawn by: B.Radan / R.Ismail
date: July 2026	checked by: Z.Bauman / A.Sammour
project number: 26-056	drawing number: C2-D

revision

CONTRACTOR TO VERIFY ALL DIMENSIONS AND NOTIFY THE ARCHITECT OF ANY DISCREPANCIES BEFORE WORK COMMENCES.

DO NOT SCALE DRAWINGS.

PLAN #XXXXX

DXX–XX–XX–XXXX

General Notes

1. DRAWINGS TO BE READ IN CONJUNCTION WITH ARCHITECTURAL AND LANDSCAPE DRAWINGS.
2. ALL SERVICES, MATERIALS, CONSTRUCTION METHODS AND INSTALLATIONS SHALL BE IN ACCORDANCE WITH THE LATEST STANDARDS AND REGULATIONS OF THE: CITY OF OTTAWA STANDARD SPECIFICATIONS AND DRAWINGS, ONTARIO PROVINCIAL SPECIFICATION STANDARD SPECIFICATION (OPSS) AND ONTARIO PROVINCIAL STANDARD DRAWINGS (OPSD), UNLESS OTHERWISE SPECIFIED, TO THE SATISFACTION OF THE CITY OF OTTAWA AND THE CONSULTANT.
3. THE POSITION OF EXISTING POLE LINES, CONDUITS, WATERMAINS, SEWERS AND OTHER UNDERGROUND AND ABOVEGROUND UTILITIES, STRUCTURES AND APPURTENANCES IS NOT NECESSARILY SHOWN ON THE CONTRACT DRAWING, AND WHERE SHOWN, THE ACCURACY OF THE POSITION OF SUCH UTILITIES AND STRUCTURES IS NOT GUARANTEED. PRIOR TO CONSTRUCTION, THE CONTRACTOR SHALL SATISFY HIMSELF OF THE EXACT LOCATION OF ALL SUCH UTILITIES AND STRUCTURES, AND SHALL ASSUME ALL LIABILITY FOR DAMAGE TO THEM DURING THE COURSE OF CONSTRUCTION. ANY RELOCATION OF EXISTING UTILITIES REQUIRED BY THE DEVELOPMENT OF SUBJECT LANDS IS TO BE UNDERTAKEN AT CONTRACTOR'S EXPENSE.
4. THE CONTRACTOR MUST NOTIFY ALL EXISTING UTILITY COMPANY OFFICIALS FIVE (5) BUSINESS DAYS PRIOR TO START OF CONSTRUCTION AND HAVE ALL EXISTING UTILITIES AND SERVICES LOCATED IN THE FIELD OR EXPOSED PRIOR TO THE START OF CONSTRUCTION, INCLUDING BUT NOT LIMITED TO POWER, COMMUNICATION AND GAS LINES.
5. ALL TRENCHING AND EXCAVATIONS TO BE IN ACCORDANCE WITH THE LATEST REVISIONS OF THE OCCUPATIONAL HEALTH AND SAFETY ACT AND REGULATIONS FOR CONSTRUCTION PROJECTS AND AS PER THE RECOMMENDATIONS INCLUDED IN THE GEOTECHNICAL REPORT.
6. REFER TO ARCHITECTS PLANS FOR BUILDING DIMENSIONS, LAYOUT AND REMOVALS. REFER TO LANDSCAPE PLAN FOR LANDSCAPED DETAILS AND OTHER RELEVANT INFORMATION. ALL INFORMATION SHALL BE CONFIRMED PRIOR TO COMMENCEMENT OF CONSTRUCTION.
7. TOPOGRAPHIC SURVEY AND PROPERTY BOUNDARY INFORMATION COMPLETED AND PROVIDED BY FARLEY, SMITH & DENIS SURVEYING LTD. FILE NO.: 335-24, DATED JULY 25, 2025. CONTRACTOR TO VERIFY IN THE FIELD PRIOR TO CONSTRUCTION OF ANY WORK AND NOTIFY THE ENGINEER OF ANY DISCREPANCIES.
8. ALL ELEVATIONS ARE GEODETIC AND UTILIZE METRIC UNITS. VERIFY THAT JOB BENCHMARKS HAVE NOT BEEN ALTERED OR DISTURBED.
9. ALL GROUND SURFACES SHALL BE EVENLY GRADED WITHOUT PONDING AREAS AND WITHOUT LOW POINTS EXCEPT WHERE APPROVED SWALE OR CATCH BASIN OUTLETS ARE PROVIDED.
10. 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 500mm WIDTH MINIMUM.
11. ALL DISTURBED AREAS OUTSIDE PROPOSED GRADING LIMITS TO BE RESTORED TO ORIGINAL ELEVATIONS AND CONDITIONS UNLESS OTHERWISE SPECIFIED. ALL RESTORATION SHALL BE COMPLETED WITH THE GEOTECHNICAL REQUIREMENTS FOR BACKFILL AND COMPACTION.
12. ABUTTING PROPERTY GRADES TO BE MATCHED UNLESS OTHERWISE SHOWN.
13. CONTRACTOR SHALL OBTAIN AND PAY FOR ALL NECESSARY PERMITS AND APPROVALS FROM THE MUNICIPAL AUTHORITIES PRIOR TO COMMENCING CONSTRUCTION, INCLUDING WATER PERMIT AND ROAD CUT PERMIT.
14. MINIMIZE DISTURBANCE TO EXISTING VEGETATION DURING THE EXECUTION OF ALL WORKS.
15. EXCAVATE AND REMOVE ALL ORGANIC MATERIAL AND DEBRIS LOCATED WITHIN THE PROPOSED BUILDING, PARKING AND ROADWAY LOCATIONS. ALL EXCESS SOIL MANAGEMENT, TESTING AND DISPOSAL MUST COMPLY WITH CURRENT O.REG. 406/19. ALL ASSOCIATED COSTS ARE TO BE BORNE BY THE CONTRACTOR.
16. 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.
17. CONTRACTOR TO OBTAIN POST-CONSTRUCTION TOPOGRAPHIC SURVEY, COMPLETED BY OLS OR P.ENG CONFIRMING COMPLIANCE WITH DESIGN GRADING AND SERVICING. SURVEY IS TO INCLUDE LOCATION AND INVERTS FOR BURIED UTILITIES.
18. ABIDE BY RECOMMENDATIONS OF GEOTECHNICAL REPORT. REPORT ANY VARIATIONS IN OBSERVED CONATIONS FROM THOSE INCLUDED IN REPORT.
19. REPORT REFERENCES:

    GEOTECHNICAL INVESTIGATION

    PROPOSED HALF MOON BAY SECONDARY SCHOOL,
    3853 CAMBRIAN ROAD, OTTAWA, ONTARIO
    PREPARED BY EXP, PROJECT No; OTT-23012778-G0
    DATED DECEMBER 22,2025.
20. PROVIDE CCTV INSPECTION REPORT FOR ALL SEWERS AND CATCHBASIN LEADS 200mm DIAMETER AND LARGER. REPEAT CCTV INSPECTION FOLLOWING RECTIFICATION OF ANY DEFICIENCIES.

Notes: Sanitary Sewer and Manholes

1. ALL SANITARY SEWER, SANITARY SEWER APPURTENANCES AND CONSTRUCTION METHODS SHALL CONFORM TO THE CURRENT CITY OF OTTAWA STANDARDS AND SPECIFICATIONS. PROVIDE CCTV INSPECTION REPORTS FOR ALL NEW SANITARY PIPING. PROVIDE DYE TESTING FOR NEW SERVICES.
2. SANITARY SEWER PIPE SIZE 150mm DIAMETER AND GREATER TO BE PVC SDR-35 (UNLESS SPECIFIED OTHERWISE) WITH RUBBER GASKET TYPE JOINTS IN CONFORMANCE WITH CSA B-182.2,3,4 .
3. SEWER BEDDING AS PER CITY OF OTTAWA DETAIL S6.
4. ALL SANITARY MANHOLES 1200mm IN DIAMETER TO BE AS PER OPSD 701.01. FRAME AND COVER TO BE AS PER CITY OF OTTAWA STANDARD S25 AND S24.
5. MAINTENANCE HOLE BENCHING AND PIPE OPENING ALTERNATIVES AS PER THE OPSD 701.021
6. ANY SANITARY SEWER WITH LESS THAN 2.0m COVER REQUIRES THERMAL INSULATION AS PER CITY OF OTTAWA STANDARD S35, OR APPROVED BY THE ENGINEER.

Notes: Storm Sewer and Manholes

1. ALL STORM SEWER MATERIALS AND CONSTRUCTION METHODS SHALL CONFORM TO THE CURRENT CITY OF OTTAWA STANDARDS AND SPECIFICATIONS. PROVIDE CCTV INSPECTION REPORTS FOR ALL NEW STORM SEWERS, SERVICES AND CB LEADS.
2. STORM SEWERS 375mm DIAMETER AND SMALLER SHALL BE PVC SDR-35, WITH RUBBER GASKET PER CSA A-257.3.
3. STORM SEWERS 450mm AND LARGER SHALL BE REINFORCED CONCRETE CLASS 100.
4. SEWER BEDDING AS PER CITY OF OTTAWA DETAIL S6.
5. ALL STORM MANHOLES TO BE AS PER MANHOLE AND CATCHBASIN SCHEDULE.
6. ANY NEW OR EXISTING STORM SEWER WITH LESS THAN 2.0m COVER REQUIRES THERMAL INSULATION AS PER CITY OF OTTAWA STANDARD S35, OR APPROVED BY THE ENGINEER.
7. CB IN LANDSCAPE AREAS SHALL BE AS PER CITY OF OTTAWA STANDARD S29, S30 AND S31.
8. ALL CATCHBASIN LEADS TO BE MINIMUM 200mm DIAMETER AT MINIMUM 1.0% SLOPE UNLESS OTHERWISE SPECIFIED.
9. STORM CATCHBASINS AS PER OPSD 705.010 AND FRAME/COVER AS PER CITY STANDARD DRAWINGS S19. STORM CBMH'S AS INDICATED IN TABLE WITH SUMP, ADJUSTMENT SECTIONS SHALL BE AS PER OPSD 704.010.
10. INSTALLATION OF FLOW CONTROL ICD'S TO BE VERIFIED BY QUALITY VERIFICATION ENGINEER RETAINED BY CONTRACTOR.

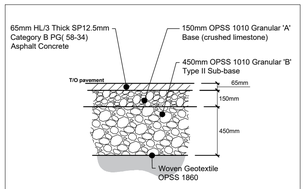
Parking Lot and Work in Public Rights of Way

**** CONTRACTOR IS RESPONSIBLE FOR ALL INSTALLATION, MONITORING, REPAIR AND REMOVAL OF ALL EROSION AND SEDIMENT CONTROL FEATURES.****

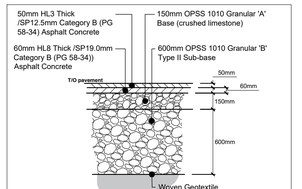
1. PRIOR TO START OF CONSTRUCTION:
   - 1.1. INSTALL SILT FENCE IN LOCATION SHOWN ON DWG C4.
   - 1.2. INSTALL FILTER FABRIC OR SILT SACK FILTERS IN ALL THE CATCHBASINS AND MANHOLES TO REMAIN DURING CONSTRUCTION WITHIN THE SITE (SEE TYPICAL DETAIL).
   - 1.3. INSPECT MEASURES IMMEDIATELY AFTER INSTALLATION.
2. DURING CONSTRUCTION:
   - 2.1. MINIMIZE THE EXTENT OF DISTURBED AREAS AND THE DURATION OF EXPOSURE AND IMPACTS TO EXISTING GRADING.
   - 2.2. PERIMETER VEGETATION TO REMAIN IN PLACE UNTIL PERMANENT STORM WATER MANAGEMENT IS IN PLACE. OTHERWISE, IMMEDIATELY INSTALL SILT FENCE WHEN THE EXISTING SITE IS DISTURBED AT THE PERIMETER.
   - 2.3. PROTECT DISTURBED AREAS FROM OVERLAND FLOW BY PROVIDING TEMPORARY SWALES TO THE SATISFACTION OF THE FIELD ENGINEER. TIE-IN TEMPORARY SWALE TO EXISTING CB'S AS REQUIRED.
   - 2.4. PROVIDE TEMPORARY COVER SUCH AS SEEDING OR MULCHING IF DISTURBED AREA WILL NOT BE REHABILITATED WITHIN 30 DAYS.
   - 2.5. INSPECT SILT FENCES, FILTER FABRIC FILTERS AND CATCH BASIN SUMPS WEEKLY AND WITHIN 24 HOURS AFTER A STORM EVENT. CLEAN AND REPAIR WHEN NECESSARY.
   - 2.6. DRAWING TO BE REVIEWED AND REVISED AS REQUIRED DURING CONSTRUCTION.
   - 2.7. EROSION CONTROL FENCING TO BE ALSO INSTALLED AROUND THE BASE OF ALL STOCKPILES.
   - 2.8. 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).
   - 2.9. CONTROL WIND-BLOWN DUST OFF SITE BY SEEDING TOPSOIL PILES AND OTHER AREAS TEMPORARILY (PROVIDE WATERING AS REQUIRED AND TO THE SATISFACTION OF THE ENGINEER).
   - 2.10. NO ALTERNATE METHODS OF EROSION PROTECTION SHALL BE PERMITTED UNLESS APPROVED BY THE FIELD ENGINEER.
   - 2.11. CITY OF OTTAWA ROADWAY AND SIDEWALK TO BE CLEANED OF ALL SEDIMENT FROM VEHICULAR TRACKING AS REQUIRED.
   - 2.12. DURING WET CONDITIONS, TIRES OF ALL VEHICLES/EQUIPMENT LEAVING THE SITE ARE TO BE SCRAPED.
   - 2.13. ANY MUD/MATERIAL TRACKED ONTO THE ROAD SHALL BE REMOVED IMMEDIATELY BY HAND OR RUBBER TIRE LOADER.
   - 2.14. 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.
   - 2.15. 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.
   - 2.16. THE CONTRACTOR SHALL IMPLEMENT BEST MANAGEMENT PRACTICES, TO PROVIDE FOR PROTECTION OF THE AREA DRAINAGE SYSTEM AND THE RECEIVING WATERCOURSE, DURING CONSTRUCTION ACTIVITIES. THE CONTRACTOR ACKNOWLEDGES THAT FAILURE TO IMPLEMENT APPROPRIATE EROSION AND SEDIMENT CONTROL MEASURES MAY BE SUBJECT TO PENALTIES IMPOSED BY ANY APPLICABLE REGULATORY AGENCY.

Parking Lot and Work in Public Rights of Way

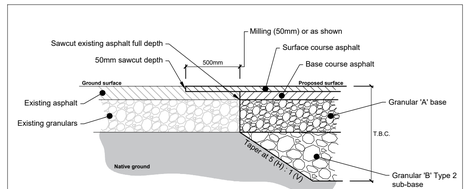
1. CONTRACTOR TO REINSTATE ROAD CUTS AS PER CITY OF OTTAWA DETAIL R10.
2. CONTRACTOR TO PREPARE SUBGRADE, INCLUDING PROOFROLLING, TO THE SATISFACTION OF THE GEOTECHNICAL CONSULTANT PRIOR TO THE COMMENCEMENT OF PLACEMENT OF GRANULAR B MATERIAL.
3. FILL TO BE PLACED AND COMPACTED PER THE GEOTECHNICAL REPORT REQUIREMENTS.
4. CONTRACTOR TO SUPPLY, PLACE AND COMPACT GRANULAR B MATERIAL IN ACCORDANCE WITH THE RECOMMENDATIONS OF THE GEOTECHNICAL CONSULTANT. CONTRACTOR TO PROVIDE CONSULTANT WITH SAMPLES OF GRANULAR B MATERIAL FOR TESTING AND CERTIFICATION FROM THE GEOTECHNICAL CONSULTANT THAT THE MATERIAL MEETS THE GRADATION REQUIREMENTS SPECIFIED IN THE GEOTECHNICAL REPORT.
5. GRANULAR A MATERIAL TO BE PLACED ONLY UPON APPROVAL BY THE GEOTECHNICAL CONSULTANT OF GRANULAR B PLACEMENT.
6. CONTRACTOR TO SUPPLY, PLACE AND COMPACT GRANULAR A MATERIAL IN ACCORDANCE WITH THE RECOMMENDATIONS OF THE GEOTECHNICAL CONSULTANT. CONTRACTOR TO PROVIDE CONSULTANT WITH SAMPLES OF GRANULAR A MATERIAL FOR TESTING AND CERTIFICATION FROM THE GEOTECHNICAL CONSULTANT THAT THE MATERIAL MEETS THE GRADATION REQUIREMENTS SPECIFIED IN THE GEOTECHNICAL REPORT.
7. ASPHALT MATERIAL TO BE PLACED ONLY UPON APPROVAL BY THE GEOTECHNICAL CONSULTANT OF GRANULAR A PLACEMENT.
8. CONTRACTOR TO SUPPLY, PLACE AND COMPACT ASPHALT MATERIAL IN ACCORDANCE WITH THE RECOMMENDATIONS OF THE GEOTECHNICAL CONSULTANT. CONTRACTOR TO PROVIDE CONSULTANT WITH SAMPLES OF ASPHALT MATERIAL FOR TESTING AND CERTIFICATION FROM THE GEOTECHNICAL CONSULTANT THAT THE MATERIAL MEETS THE REQUIREMENTS SPECIFIED IN THE GEOTECHNICAL REPORT.
9. CONTRACTOR IS RESPONSIBLE FOR ESTABLISHING LINE AND GRADE IN ACCORDANCE WITH THE PLANS, AND FOR PROVIDING THE CONSULTANT WITH VERIFICATION PRIOR TO PLACEMENT.
10. ALL EXCESS MATERIAL TO BE HAULED OFFSITE AND DISPOSED OF AT AN APPROVED DUMP SITE. SHOULD THE CONTRACTOR DISCOVER ANY HAZARDOUS MATERIAL, CONTRACTOR IS TO NOTIFY CONSULTANT. CONSULTANT TO DETERMINE APPROPRIATE DISPOSAL METHOD/LOCATION.
11. PAVEMENT STRUCTURE (MATERIAL TYPES AND THICKNESS) FOR HEAVY DUTY AND LIGHT DUTY AREAS TO BE AS SPECIFIED IN THE GEOTECHNICAL REPORT AND SHOWN ON THE PLANS.



1 C3 **Pavement Structure for Light Duty Traffic**
Scale: **As shown**



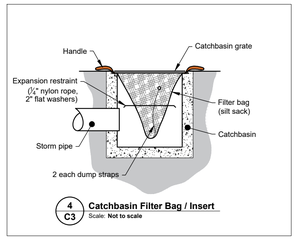
2 C3 **Pavement Structure for Heavy Duty Traffic**
Scale: **As shown**



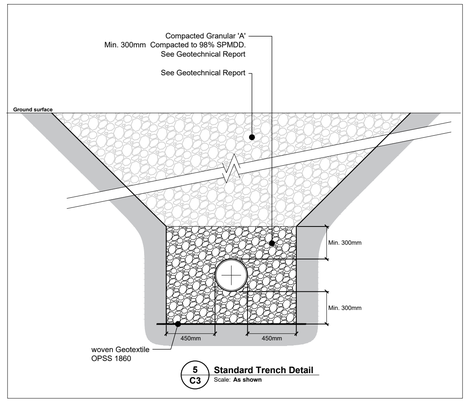
3 C3 **Key Joint Detail**
Scale: **As shown**

Notes: Protection of City Sewers

1. CONTRACTOR RESPONSIBLE TO:
   - 1.1. OBTAIN A VIDEO INSPECTION OF THE CITY SEWER SYSTEM WITHIN CAMBRIAN ROAD AND ELEVATION ROAD PRIOR TO ANY CONSTRUCTION TO DETERMINE THE CONDITION OF THE EXISTING CITY SEWER SYSTEM PRIOR TO CONSTRUCTION ON THE LANDS AND TO PROVIDE SAID VIDEO INSPECTION TO THE GENERAL MANAGER, PLANNING, DEVELOPMENT AND BUILDING SERVICES.
2. UPON COMPLETION OF CONSTRUCTION ON THE LANDS, THE CONTRACTOR SHALL, AT ITS EXPENSE AND TO THE SATISFACTION OF THE GENERAL MANAGER, PLANNING, DEVELOPMENT AND BUILDING SERVICES:
   - 2.1. OBTAIN A VIDEO INSPECTION OF THE EXISTING CITY SEWER SYSTEM WITHIN CAMBRIAN ROAD AND ELEVATION ROAD TO DETERMINE IF THE CITY SEWER SYSTEM SUSTAINED ANY DAMAGES AS A RESULT OF CONSTRUCTION ON THE LANDS; AND
   - 2.2. ASSUME ALL LIABILITY FOR ANY DAMAGES CAUSED TO THE CITY SEWER SYSTEM WITHIN ATLAS TERRACE AND COPE DRIVE AND COMPENSATE THE CITY FOR THE FULL AMOUNT OF ANY REQUIRED REPAIRS TO THE CITY SEWER SYSTEM.



4 C3 **Catchbasin Filter Bag / Insert**
Scale: **Not to scale**



5 C3 **Standard Trench Detail**
Scale: **As shown**

NEW STORM SEWER STRUCTURE SCHEDULE

MANHOLE NO.	DESCRIPTION	T/GRATE ELEVATION	INVERT ELEVATION / PIPE DIAMETER	OPSD No.	FRAME (CITY OF OTTAWA)
CB-1	600x600mm CATCHBASIN	93.65	SW INV.: 91.40 - 250mmØ	705.010	S19
CB-2	600x600mm CATCHBASIN	93.75	SW INV.: 91.45 - 300mmØ	705.010	S19
CB-3	600x600mm CATCHBASIN	93.93	NW INV.: 91.68 - 250mmØ	705.010	S19
CB-4	600x600mm CATCHBASIN	93.90	NW INV.: 91.52 - 300mmØ	705.010	S19
CB-5	600x600mm CATCHBASIN	93.90	NE INV.: 91.65 - 250mmØ	705.010	S19
CB-6	600x600mm CATCHBASIN	94.37	E INV.: 92.07 - 300mmØ	705.010	S19
CB-7	600x600mm CATCHBASIN	94.28	NW INV.: 92.45 - 250mmØ	705.010	S19
CB-8	600x600mm CATCHBASIN	94.35	NW INV.: 92.76 - 250mmØ	705.010	S19
CB-9	600x600mm CATCHBASIN	94.73	NW INV.: 93.04 - 250mmØ	705.010	S19
CBMH-1	1,200mmØ MAINTENANCE HOLE	93.83	SW INV.: 91.12 - 250mmØ NE INV.: 91.07 - 300mmØ	701.010	S25 / S28.1
CBMH-2	1,200mmØ MAINTENANCE HOLE	93.87	SW INV.: 91.53 - 250mmØ NE INV.: 91.50 - 250mmØ	701.010	S25 / S28.1
CBMH-3	1,200mmØ MAINTENANCE HOLE	94.65	SE INV.: 92.90 - 250mmØ NE INV.: 92.85 - 250mmØ	701.010	S25 / S28.1
STMH-1	1,800mmØ Manhole	94.09	NE INV.: 91.22 - 250mmØ SW INV.: 90.90 - 300mmØ NW INV.: 90.16 - 900mmØ SE INV.: 90.19 - 900mmØ	701.012	S25 / S24.1
STMH-2	1,800mmØ Manhole	94.27	NW INV.: 90.27 - 900mmØ NE INV.: 91.15 - 300mmØ SW INV.: 90.35 - 825mmØ E INV.: 90.92 - 250mmØ	701.012	S25 / S24.1
STMH-3	1,500mmØ MAINTENANCE HOLE	94.57	SW INV.: 91.18 - 375mmØ S INV.: 90.96 - 600mmØ SW INV.: 93.34 - 100mmØ NE INV.: 90.74 - 825mmØ	701.011	S25 / S24.1
STMH-4	1,500mmØ MAINTENANCE HOLE	94.87	SW INV.: 91.92 - 525mmØ NE INV.: 92.07 - 375mmØ SE INV.: 92.20 - 250mmØ N INV.: 91.85 - 600mmØ	701.011	S25 / S24.1
STMH-5	1,200mmØ MAINTENANCE HOLE	94.47	SW INV.: 92.68 - 250mmØ SE INV.: 92.68 - 250mmØ NW INV.: 92.55 - 375mmØ NE INV.: 92.40 - 525mmØ	701.010	S25 / S24.1

NEW SANITARY SEWER STRUCTURE SCHEDULE

MANHOLE NO.	DESCRIPTION	T/GRATE ELEVATION	INVERT ELEVATION / PIPE DIAMETER	OPSD No.	FRAME (CITY OF OTTAWA)
SAMH1	1,200mmØ MAINTENANCE HOLE	94.23	NW INV.: 90.52 - 200mmØ SW INV.: 90.58 - 200mmØ	701.010	S25 / S24

Notes: Watermain

1. ALL WATERMAIN AND WATERMAIN APPURTANANCES, MATERIALS, CONSTRUCTION AND TESTING METHODS SHALL CONFORM TO THE CURRENT CITY OF OTTAWA AND MINISTRY OF ENVIRONMENT STANDARDS AND SPECIFICATIONS.
2. ALL WATERMAIN 300mm DIAMETER AND SMALLER TO BE POLY VINYL CHLORIDE (PVC) CLASS 150 DR 18 MEETING AWWA SPECIFICATION C900.
3. ALL WATERMAIN TO BE INSTALLED AT MINIMUM COVER OF 2.4m BELOW FINISHED GRADE. WHERE WATERMAINS CROSS OVER OTHER UTILITIES, A MINIMUM 0.30m CLEARANCE SHALL BE MAINTAINED. WHERE WATERMAINS CROSS UNDER OTHER UTILITIES, A MINIMUM 0.50m CLEARANCE SHALL BE MAINTAINED. WHERE THE MINIMUM SEPARATION CANNOT BE ACHIEVED, THE WATERMAIN SHALL BE INSTALLED AS PER CITY OF OTTAWA STANDARDS W25 AND W25.2. WHERE 2.4m MINIMUM DEPTH CANNOT BE ACHIEVED, THERMAL INSULATION SHALL BE PROVIDED AS PER CITY OF OTTAWA STANDARD W22. WHERE A WATERMAIN IS IN CLOSE PROXIMITY TO AN OPEN STRUCTURE, THERMAL INSULATION SHALL BE PROVIDED AS PER CITY OF OTTAWA STANDARD W23.
4. CONCRETE THRUST BLOCKS AND MECHANICAL RESTRAINTS ARE TO BE INSTALLED AT ALL TEES, BENDS, HYDRANTS, REDUCERS, ENDS OF MAINS AND CONNECTIONS 100mm AND LARGER, IN ACCORDANCE WITH CITY OF OTTAWA STANDARDS W25.3 & W25.4.
5. CATHODIC PROTECTION REQUIRED FOR ALL IRON FITTINGS AS PER CITY OF OTTAWA STANDARD W40 & W42.
6. ALL VALVES AND VALVE BOXES AND CHAMBERS, HYDRANTS, AND HYDRANT VALVES AND ASSEMBLES SHALL BE INSTALLED AS PER CITY OF OTTAWA STANDARD
7. FIRE HYDRANT LOCATION AND INSTALLATION AS PER CITY OF OTTAWA STANDARD W18 & W19. CONTRACTOR TO PROVIDE FLOW TEST AND PAINTING OF NEW HYDRANT IN ACCORDANCE WITH CITY STANDARDS.
8. IF WATER MAIN MUST BE DEFLECTED TO MEET ALIGNMENT, ENSURE THAT THE AMOUNT OF DEFLECTION USED IS LESS THAN HALF THAT RECOMMENDED BY THE MANUFACTURER.

Excess Soil And O.REG. 406/19

1. EXCAVATE AND REMOVE ALL ORGANIC MATERIAL AND DEBRIS LOCATED WITHIN THE PROPOSED BUILDING, FOUNDATION, PAVED AREAS, SUBDRAINS AND SERVICE TRENCHES. EXCESS MATERIAL REMOVAL FROM SITE SHALL FOLLOW THE GEOTECHNICAL AND ENVIRONMENTAL ENGINEER'S RECOMMENDATION.
2. CONTRACTOR TO STOCKPILE UN-USABLE FILL TO BE REMOVED FROM SITE TO ALLOW THE GEOTECHNICAL ENGINEER 96 10 DAYS TO INSPECT THE MATERIALS AND TO PROVIDE GUIDANCE TO CONTRACTOR PRIOR TO DISPOSAL. EROSION CONTROL MEASURE ARE TO BE APPLIED TO STOCKPILE AREA. EXCESS MATERIALS SHALL BE DISPOSED AS PER THE REQUIREMENTS OF OPSS 180.
3. IF CONTAMINATION HAZARDOUS MATERIAL IS SUSPECTED DURING CONSTRUCTION (E.G. STAINING, ODOURS, ETC.), THE CONTRACTOR MUST NOTIFY THE PROPERTY OWNER(S), PROJECT LEADER, PRIME CONSULTANT, AND GEOTECHNICAL ENGINEER, FOR DIRECTION ON HOW TO PROCEED ACCORDING TO FEDERAL AND PROVINCIAL LEGISLATION. THE GEOTECHNICAL ENGINEER UNDER THE GUIDANCE OF A QUALIFIED PERSON, MUST DETERMINE IF ADDITIONAL SAMPLING (INCLUDING LEACHATE TESTING) IS REQUIRED TO MEET THE MINIMUM SAMPLING PROVISIONS UNDER O.REG. 406/19 (AS AMENDED).
4. EXCESS SOIL MANAGEMENT, TESTING AND DISPOSAL MUST COMPLY WITH O.REG. 406/19.
5. ALL SOIL HAULAGE RECORDS SHALL BE KEPT AND PROVIDED BY THE CONTRACTOR AND SUBMITTED TO THE CONSULTANT .
6. ALL EXCESS MATERIAL TO BE HAULED OFFSITE AND DISPOSED AT AN APPROVED DUMP SITE BY CONTRACTOR. .

CROSSING TABLE

LOCATION	OVER / UNDER	T/G	OBVERT	INVERT	CLEARANCE (m)
1	NEW WATERMAIN - EXISTING SANITARY SEWER	94.57	89.58 (SAN)	92.80 (WM)	3.22
2	NEW WATERMAIN - EXISTING STORM SEWER	94.55	92.40 (STM)	92.80 (WM)	0.40
3	NEW STORM SEWER - NEW WATERMAIN	94.51	92.12 (WM)	92.57 (STM)	0.45
4	NEW WATERMAIN - NEW STORM SEWER	94.84	92.31 (STM)	92.71 (WM)	0.40
5	NEW WATERMAIN - NEW STORM SEWER	94.42	91.65 (STM)	92.15 (WM)	0.50
6	NEW WATERMAIN - NEW SANITARY SEWER	94.49	91.69 (SAN)	92.15 (WM)	0.46
7	NEW WATERMAIN - NEW STORM SEWER	93.97	91.37 (STM)	91.77 (WM)	0.40
8	NEW STORM SEWER - NEW SANITARY SEWER	94.12	90.48 (SAN)	90.87 (STM)	0.39

WATER SERVICE TABLE

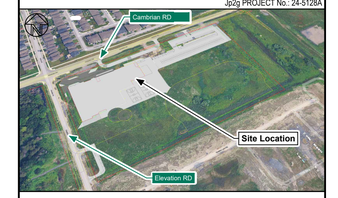
ID	DESCRIPTION	FINISHED GRADE (m)	T/O WATERMAIN (m)
1	BUILDING CONNECTION	95.20	93.90
2	EXISTING WATERMAIN STUB CONNECTION	94.10	90.225
3	45° HORIZONTAL BEND C/W THRUST BLOCK	94.20	91.80
4	45° HORIZONTAL BEND C/W THRUST BLOCK	94.68	92.28
5	45° HORIZONTAL BEND C/W THRUST BLOCK	94.42	91.96
6	45° HORIZONTAL BEND C/W THRUST BLOCK	94.36	91.96
7	45° HORIZONTAL BEND C/W THRUST BLOCK	94.37	91.96
8	45° HORIZONTAL BEND C/W THRUST BLOCK	94.36	91.96
9	45° HORIZONTAL BEND C/W THRUST BLOCK	94.36	91.96
10	45° HORIZONTAL BEND C/W THRUST BLOCK	94.93	92.53
11	45° HORIZONTAL BEND C/W THRUST BLOCK	94.45	92.05
12	CONNECTION TEE 200mmX300mm	94.46	92.05

NOTE: PROVIDE MINIMUM 2.4m COVER OVER T/O WATERMAIN TO FINISHED GRADE, OTHERWISE PROVIDE THERMAL INSULATION HL40 AS PER DETAIL A/C1.

OTTAWA-CARLETON
DISTRICT SCHOOL BOARD

Jp2g Consultants Inc.
ENGINEERS · PLANNERS · PROJECT MANAGERS
12 INTERNATIONAL DR, PEMBROKE, ON, K8A 6W5 T: 613-735-2507 PEMBROKE@JP2G.COM
1150 MORRISON DR., #410 OTTAWA, ON, K2H 8S9 T: 613-828-7800 OTTAWA@JP2G.COM
16 EDWARD ST. S., #211 ARNPRIOR, ON, K7S 3H4 T: 613-626-0780 ARNPRIOR@JP2G.COM

Jp2g PROJECT No.: 24-5128A



No.	DESCRIPTION	YYYY-MM-DD
2	ISSUED FOR SITE PLAN CONTROL REV-1	2026-07-24
1	ISSUED FOR 33% DESIGN SUBMISSION	2026-07-17

N45 ARCHITECTURE INC.
71 Bank Street, 7th Floor - Ottawa, Ontario K1P 5N2
tel. 613.224.0095 fax 613.224.9811

project
Half Moon Bay Secondary School
3853 Cambrian Road,Ottawa, ON

seal: LICENSED PROFESSIONAL ENGINEER — Z. E. BAUMAN — 100578796 — July 24, 2026 — PROVINCE OF ONTARIO

seal: LICENSED PROFESSIONAL ENGINEER — A. SAMMOUR — 100227665 — July 24, 2026 — PROVINCE OF ONTARIO

drawing title
Details, Notes And Schedules

scale: As Shown	drawn by: B.Radan / R.Ismail
date: July 2026	checked by: Z.Bauman / A.Sammour
project number: 26-056	drawing number: C3
CONTRACTOR TO VERIFY ALL DIMENSIONS AND NOTIFY THE ARCHITECT OF ANY DISCREPANCIES BEFORE WORK COMMENCES. DO NOT SCALE DRAWINGS.	revision

DXX–XX–XX–XXXX
PLAN #XXXXX

EROSION AND SEDIMENT CONTROL NOTES

**** CONTRACTOR IS RESPONSIBLE FOR ALL INSTALLATION, MONITORING, REPAIR AND REMOVAL OF ALL EROSION AND SEDIMENT CONTROL FEATURES.****

1. PRIOR TO START OF CONSTRUCTION:
   - 1.1. INSTALL SILT FENCE IN LOCATION SHOWN ON DRAWINGS.
   - 1.2. INSTALL FILTER FABRIC OR SILT SACK FILTERS IN ALL THE CATCHBASINS AND MANHOLES TO REMAIN DURING CONSTRUCTION WITHIN THE SITE (SEE TYPICAL DETAIL)
   - 1.3. INSPECT MEASURES IMMEDIATELY AFTER INSTALLATION.
2. DURING CONSTRUCTION:
   - 2.1. MINIMIZE THE EXTENT OF DISTURBED AREAS AND THE DURATION OF EXPOSURE AND IMPACTS TO EXISTING GRADING.
   - 2.2. PERIMETER VEGETATION TO REMAIN IN PLACE UNTIL PERMANENT STORM WATER MANAGEMENT IS IN PLACE. OTHERWISE, IMMEDIATELY INSTALL SILT FENCE WHEN THE EXISTING SITE IS DISTURBED AT THE PERIMETER.
   - 2.3. PROTECT DISTURBED AREAS FROM OVERLAND FLOW BY PROVIDING TEMPORARY SWALES TO THE SATISFACTION OF THE FIELD ENGINEER. TIE-IN TEMPORARY SWALE TO EXISTING CB'S AS REQUIRED.
   - 2.4. PROVIDE TEMPORARY COVER SUCH AS SEEDING OR MULCHING IF DISTURBED AREA WILL NOT BE REHABILITATED WITHIN 30 DAYS.
   - 2.5. INSPECT SILT FENCES, FILTER FABRIC FILTERS AND CATCH BASIN SUMPS WEEKLY AND WITHIN 24 HOURS AFTER A STORM EVENT. CLEAN AND REPAIR WHEN NECESSARY.
   - 2.6. DRAWING TO BE REVIEWED AND REVISED AS REQUIRED DURING CONSTRUCTION.
   - 2.7. EROSION CONTROL FENCING TO BE ALSO INSTALLED AROUND THE BASE OF ALL STOCKPILES.
   - 2.8. 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).
   - 2.9. CONTROL WIND-BLOWN DUST OFF SITE BY SEEDING TOPSOIL PILES AND OTHER AREAS TEMPORARILY (PROVIDE WATERING AS REQUIRED AND TO THE SATISFACTION OF THE ENGINEER).
   - 2.10. NO ALTERNATE METHODS OF EROSION PROTECTION SHALL BE PERMITTED UNLESS APPROVED BY THE FIELD ENGINEER.
   - 2.11. CITY OF OTTAWA ROADWAY AND SIDEWALK TO BE CLEANED OF ALL SEDIMENT FROM VEHICULAR TRACKING AS REQUIRED.
   - 2.12. DURING WET CONDITIONS, TIRES OF ALL VEHICLES/EQUIPMENT LEAVING THE SITE ARE TO BE SCRAPED.
   - 2.13. ANY MUD/MATERIAL TRACKED ONTO THE ROAD SHALL BE REMOVED IMMEDIATELY BY HAND OR RUBBER TIRE LOADER.
   - 2.14. 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.
   - 2.15. 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.
   - 2.16. THE CONTRACTOR SHALL IMPLEMENT BEST MANAGEMENT PRACTICES, TO PROVIDE FOR PROTECTION OF THE AREA DRAINAGE SYSTEM AND THE RECEIVING WATERCOURSE, DURING CONSTRUCTION ACTIVITIES. THE CONTRACTOR ACKNOWLEDGES THAT FAILURE TO IMPLEMENT APPROPRIATE EROSION AND SEDIMENT CONTROL MEASURES MAY BE SUBJECT TO PENALTIES IMPOSED BY ANY APPLICABLE REGULATORY AGENCY.

LEGEND

- PROPERTY LINE
- NEW BUILDING
- DEPRESSED CURB
- BREAK OF SLOPE - NEW
- NEW SWALE
- NEW SILT FENCE
- LIMIT OF HIGH POINT
- NEW LIGHT DUTY ASPHALT AS PER DETAIL 1 / C3
- NEW HEAVY DUTY ASPHALT AS PER DETAIL 2 / C3
- NEW CONCRETE SIDEWALK
- NEW GRASS
- MILLING & OVERLAY 50mm THICK HEAVY DUTY ASPHALT AS PER DETAIL 3 / C3
- NEW PRECAST PAVERS
- NEW EWF / MULCH
- NEW CLEAR STONE SUBDRAIN TRENCH
- NEW RUBBERIZED ASPHALT TRACK
- NEW STONE DUST PATH
- EXISTING SIDEWALK
- EXISTING CONCRETE CURB
- NEW CONCRETE CURB
- PROPOSED TWSI
- PONDING LIMIT
- MUD MAT

LEGEND CONTINUED

- EXISTING CATCHBASIN
- EXISTING DITCH INLET
- EXISTING STORM MANHOLE
- EXISTING SANITARY MANHOLE
- EXISTING STORM /SANITARY MANHOLE TO BE ADJUSTED
- NEW CATCHBASIN
- NEW STORM MANHOLE / CATCHBASIN MANHOLE
- NEW REAR YARD CATCH BASIN
- NEW REAR YARD CATCH BASIN
- NEW INLET CONTROL DEVICE
- RD — NEW ROOF DRAIN
- SC — NEW SCUPPER AT 150mm ABOVE ROOF DRAIN LEVEL
- BUILDING ENTRANCE
- NEW SIAMESE CONNECTION
- OVERLAND FLOW ROUTE

ICD SCHEDULE

ICD	LOCATION	PIPE SIZE (mm)	ICD SIZE (mm)	100 YEAR HEAD (m)	100 YEAR FLOW RATE (lps)
ICD-1	CB-1	250	89	2.31	25.3
ICD-2	CB2	300	130	2.39	55.3
ICD-3	CBMH-1	300	183	2.73	117.1
ICD-4	CB-3	250	97	2.30	30.2
ICD-5	CB-4	300	144	2.50	69.1
ICD-6	CB-6	300	125	2.43	51.5
ICD-7	CB-7	250	110	1.90	35.6
ICD-8	CB-8	250	115	1.67	16.0
ICD-9	CBMH-3	250	75	1.80	61.2

DRAWING NOTES

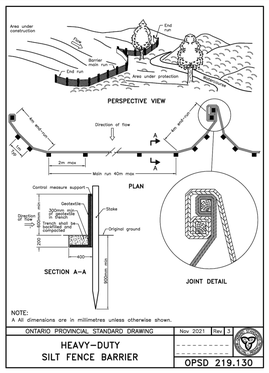
01 INSTALL SILT FENCE IN ACCORDANCE WITH OPSD 219.130.

02 INSTALL FILTER BAG (SILT SACK) TO PROTECT EXISTING CATCHBASINS & CATCHBASIN MANHOLES AS PER DETAIL 4/C3.

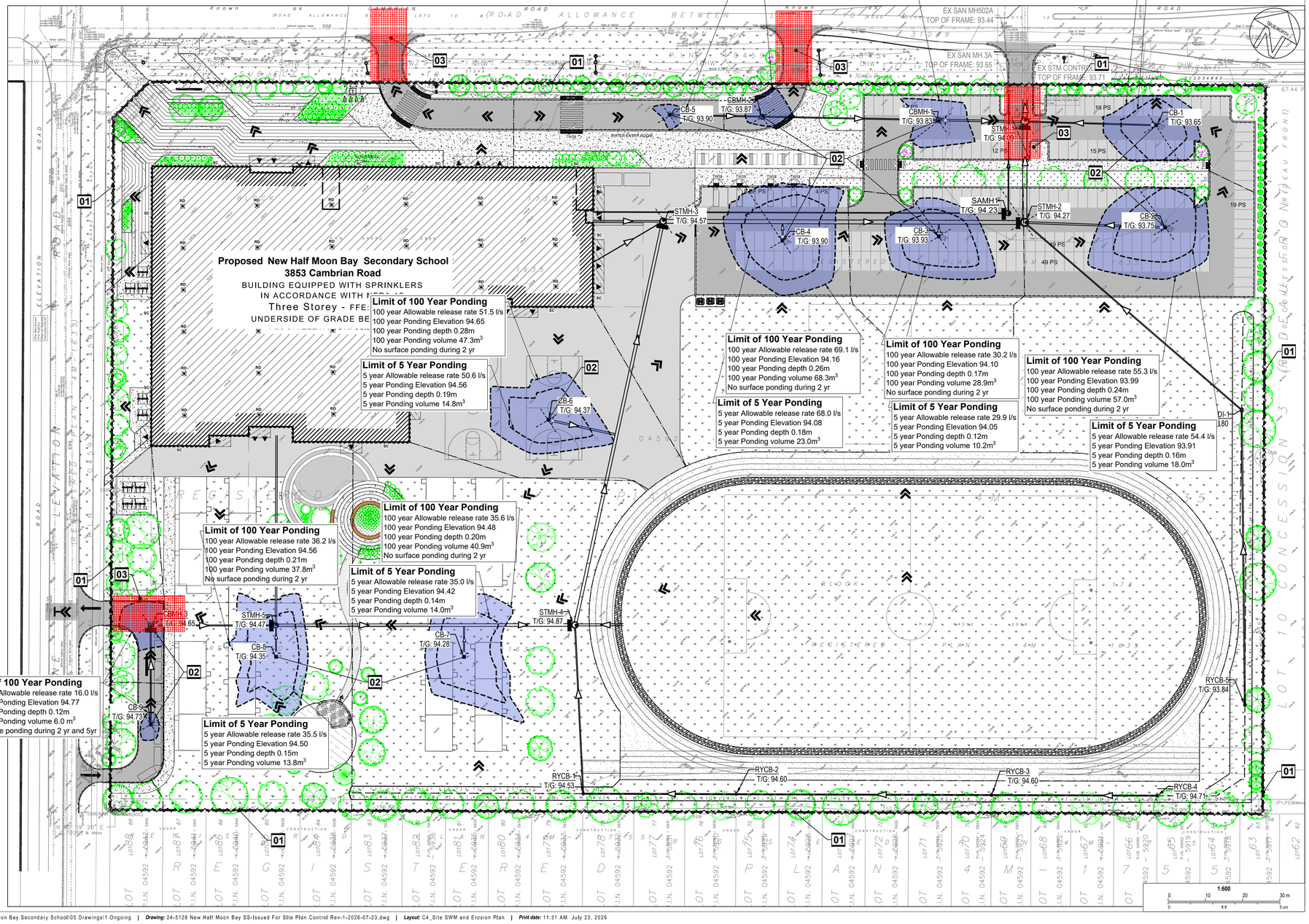
03 PROPOSE MUD MAT DURING CONSTRUCTION.

EROSION AND SEDIMENT CONTROL NOTES

1. THE CONTRACTOR SHALL IMPLEMENT BEST MANAGEMENT PRACTICES TO PROVIDE FOR PROTECTION OF THE AREA DRAINAGE SYSTEM AND THE RECEIVING WATER COURSE, DURING CONSTRUCTION ACTIVITIES; THIS INCLUDES LIMITING THE AMOUNT OF EXPOSED SOIL, INSTALLING SILT FENCES AND OTHER EFFECTIVE SEDIMENT TRAPS, AND INSTALLING AND MAINTAINING MUD MATS FOR OUTGOING CONSTRUCTION TRAFFIC DURING CONSTRUCTION ACTIVITIES.
2. PREVENT SOIL LOSS DURING CONSTRUCTION (BY STORM WATER RUNOFF OR WIND EROSION).
3. PROTECT TOPSOIL BY STOCKPILING FOR REUSE.
4. PREVENT SEDIMENTATION OF STORM SEWERS AND RECEIVING STREAMS.
5. PREVENT AIR POLLUTION FROM DUST AND PARTICULATE MATTER.
6. ALL STORM MANHOLES AND CATCHBASIN MANHOLES TO HAVE 300mm SUMPS; ALL CATCHBASINS TO HAVE 600mm SUMPS.
7. INSTALL FILTER BAG INSERT IN ALL STORM MANHOLES AND CATCH BASINS IMPACTED DURING CONSTRUCTION, INCLUDING CATCH BASINS IN THE RIGHT OF WAY.
8. SEDIMENT AND EROSION CONTROL MEASURES MAY BE MODIFIED IN THE FIELD AT THE DISCRETION OF THE CITY OF OTTAWA INSPECTOR OR CONSERVATION AUTHORITY.
9. STORM WATER PUMPED INTO MUNICIPALITY OF CITY OF OTTAWA SERVICE SHALL FLOW THROUGH A FILTER SOCK.
10. THE CONTRACTOR ACKNOWLEDGES THAT FAILURE TO IMPLEMENT APPROPRIATE EROSION AND SEDIMENTATION CONTROL MEASURES MAY BE SUBJECT TO PENALTIES IMPOSED BY ANY APPLICABLE REGULATORY AGENCY.



1 / C4 **Heavy Duty Silt Fence Barrier**
Scale: **Not to scale**



No.	DESCRIPTION	YYYY-MM-DD
2	ISSUED FOR SITE PLAN CONTROL REV-1	2026-07-24
1	ISSUED FOR 33% DESIGN SUBMISSION	2026-07-17

OTTAWA-CARLETON DISTRICT SCHOOL BOARD

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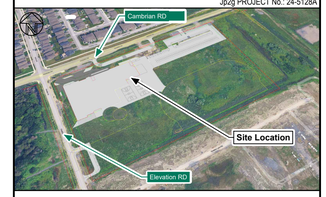
ENGINEERS · PLANNERS · PROJECT MANAGERS

12 INTERNATIONAL DR, PEMBROKE, ON, K8A 6W5 T: 613-735-2507 PEMBROKE@JP2G.COM
1150 MORRISON DR., #410 OTTAWA, ON, K2H 8S9 T: 613-828-7800 OTTAWA@JP2G.COM
16 EDWARD ST. S., #211 ARNPRIOR, ON, K7S 3H4 T: 613-626-0780 ARNPRIOR@JP2G.COM

Jp2g PROJECT No.: 24-5128A



N45 ARCHITECTURE INC.
71 Bank Street, 7th Floor - Ottawa, Ontario K1P 5N2
tel. 613.224.0095 fax 613.224.9811

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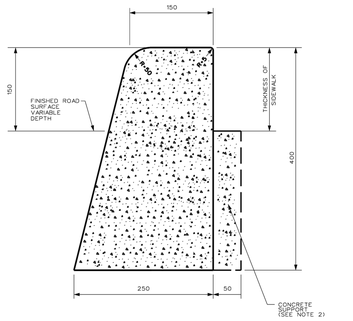
seal: LICENSED PROFESSIONAL ENGINEER — A. SAMMOUR — 100227665 — July 24, 2026 — PROVINCE OF ONTARIO

drawing title
Storm Water Management and Erosion Sediment Control Plan

scale: As Shown	drawn by: B.Radan / R.Ismail
date: July 2026	checked by: Z.Bauman / A.Sammour
project number: 26-056	drawing number: C4
	revision

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

DXX–XX–XX–XXXX
PLAN #XXXXX



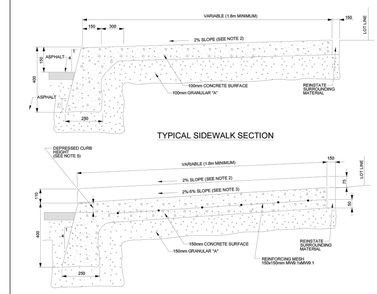
CONCRETE BARRIER CURB

NOTES:

1. THE FULL CURB DEPTH SHALL BE CARRIED THROUGH THE DEPRESSED ACCESS CROSSING.
2. A CONCRETE SUPPORT IS REQUIRED WHEN BUILT ADJACENT TO THE SIDEWALK.
3. IF AN EXTRUSION CURBING MACHINE IS USED, THE EXPANSION BITUMINOUS MATERIAL AND THE #15 DOWELS ARE TO BE PLACED AT THE END OF THE EXTRUSION
4. EXPANSION AND CONTRACTION JOINTS AS PER SCS.
5. DEPRESSED CURB HEIGHT = FOR PEDESTRIAN CURB RAMPS 0 TO 6 mm AND FOR PRIVATE ENTRANCES 0 TO 13mm

(DIMENSIONS mm)
NTS

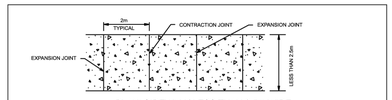
Ottawa	CONCRETE BARRIER CURB FOR GRANULAR BASE PAVEMENT (MODIFIED OPSD 600.110)	DATE:	JAN 2003
		REV. DATE:	JANUARY 2026
		DWG. No.:	SCL1



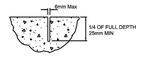
NOTES:

1. ALL MEASUREMENTS ARE IN MILLIMETRES UNLESS OTHERWISE NOTED
2. THE MAXIMUM SLOPE IS NOT TO EXCEED 2%
3. FOR CURB RAMPS, SLOPE OF 2% TO 5%, MAXIMUM 6%
4. EXPANSION AND CONTRACTION JOINTS AS PER SCS.
5. DEPRESSED CURB HEIGHT - FOR PEDESTRIAN CURB RAMPS 0 TO 6 mm AND FOR PRIVATE ENTRANCES 0 TO 13mm

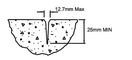
Ottawa	MONOLITHIC CONCRETE CURB AND SIDEWALK	DATE:	MAY 2001
		REV:	JULY 2025
		DWG No:	SC2



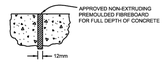
PLAN: SIDEWALK LESS THAN 2.5m WIDE



CONTRACTION JOINT PROFILE (SAW CUT)



CONTRACTION JOINT PROFILE (HAND TOOL)

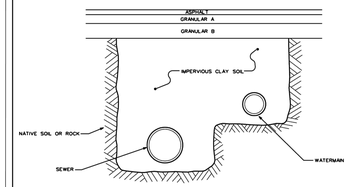


EXPANSION JOINT PROFILE

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 SAWCUT WITH A GREEN SAW OR BY HANDTOOLING.
4. JOINTS SHALL BE PLACED SO THAT 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.

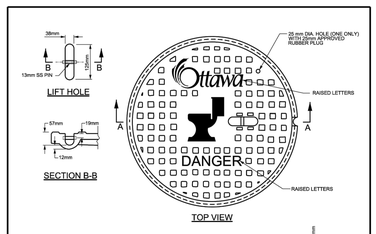
Ottawa	SIDEWALK CONSTRUCTION JOINTS	DATE:	MAY 2001
		REV:	JAN 2026
		DWG No:	SC5



NOTES:

1. CLAY SEAL TO EXTEND FROM BOTTOM OF TRENCH EXCAVATION TO UNDERSIDE OF ROAD STRUCTURE.
2. CLAY SEAL TO EXTEND FULL TRENCH WIDTH TO EXISTING NATIVE SOILS WITH A MINIMUM THICKNESS OF 1.0m ALONG PIPES.
3. CLAY SEAL TO BE LOCATED SO THAT NO PIPE JOINTS ARE WITHIN THE CLAY SEAL MATERIAL.

Ottawa	CLAY SEAL FOR PIPE TRENCHES	DATE:	MAY 2001
		REV. DATE:	MARCH 2006
		DWG. No.:	S8

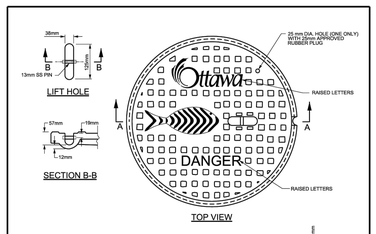


NOTES:

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.

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

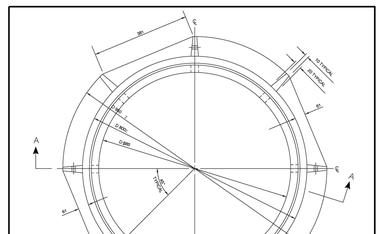


NOTES:

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.

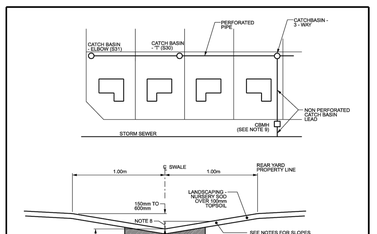
Ottawa	STANDARD CIRCULAR STORM MAINTENANCE HOLE COVER	DATE:	MARCH 2010
		REV. DATE:	MARCH 2017
		DWG. No.	S24.1



NOTES:

1. MATERIAL - GREY IRON
2. FOR MAINTENANCE HOLE COVER SEE DWG S24, S24.1, S24.2
3. OPSD 400.030 HOISTING HOOKS ARE ALSO ACCEPTED
4. ALL DIMENSIONS ARE IN mm UNLESS OTHERWISE SHOWN.

Ottawa	STANDARD CIRCULAR FRAME FOR MAINTENANCE HOLES (MODIFIED OPSD-401.020)	DATE:	MAY 2001
		REV. DATE:	MARCH 2019
		DWG No:	S25

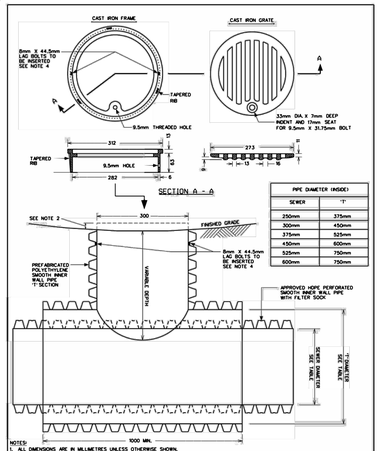


NOTES:

1. SIDE SLOPE OF SWALE - MIN. 1.5%, MAX. 3:1.
2. LONGITUDINAL SLOPE OF SWALE WITHOUT PERFORATED PIPE 1.5% MIN.
3. LONGITUDINAL SLOPE OF SWALE WITH PERFORATED PIPE 0.5% MIN. WITH 1% OR GREATER PREFERRED.
4. UNDER DRIVEWAYS NON PERFORATED PIPE TO BE USED WITH 75mm BEDDING AND BACKFILLED WITH APPROVED NATIVE MATERIAL.
5. CB "T" TO BE SPACED ABOUT EVERY 20 TO 25m AND LOCATED 1m OFF REAR YARD AND SIDE YARD PROPERTY LINES.
6. CB ELBOW TO BE AT UPPER ENDS OF PERFORATED PIPE AND LOCATED 1m OFF REAR YARD AND SIDE YARD PROPERTY LINES.
7. GEOTEXTILE SHALL BE APPROVED NON-WOVEN CLASS 1 OR AS SPECIFIED.
8. MAXIMUM REAR YARD WATER DEPTH IS 300mm.
9. A STANDARD CATCHBASIN NO DEEPER THAN 2.4m OR A CATCHBASIN MAINTENANCE HOLE. STANDARD FRAMES C/W PERFORATED OR SOLID COVER AS SPECIFIED. STANDARD S27/S.A3 SPECIFIED

N.T.S.

Ottawa	PERFORATED PIPE INSTALLATION FOR REAR YARD AND LANDSCAPING APPLICATIONS	DATE:	MARCH 2007
		REV. DATE:	MARCH 2019
		DWG. No.:	S29

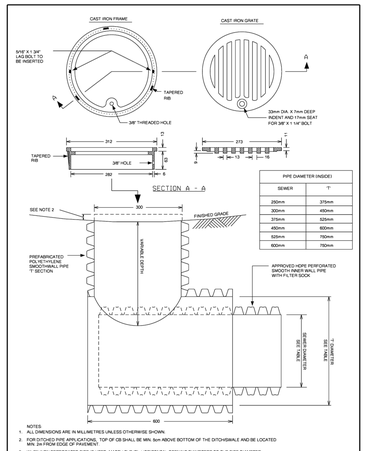


PIPE DIAMETER (NOMINAL)	
SEWER	"T"
250mm	375mm
300mm	450mm
375mm	525mm
450mm	600mm
525mm	750mm
600mm	750mm

NOTES:

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

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

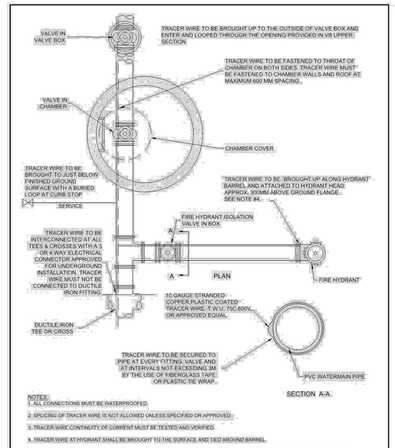


PIPE DIAMETER (NOMINAL)	
SEWER	"T"
250mm	375mm
300mm	450mm
375mm	525mm
450mm	600mm
525mm	750mm
600mm	750mm

NOTES:

1. ALL DIMENSIONS ARE IN MILLIMETRES UNLESS OTHERWISE SHOWN.
2. FOR DITCHED PIPE APPLICATIONS, TOP OF CB SHALL BE MIN. 5cm ABOVE BOTTOM OF THE DITCH/SWALE AND BE LOCATED MIN. 2m FROM EDGE OF PAVEMENT.
3. WHEN NON PERFORATED PIPE IS USED MATCH THE CB HORIZONTAL OPENING DIAMETERS TO THE PIPE DIAMETER AND CONNECT WITH MANUFACTURER'S RECOMMENDED CONNECTION SLEEVE.
4. SEE WS 22.13 FOR ALTERNATE APPROVED FITTING MANUFACTURERS.

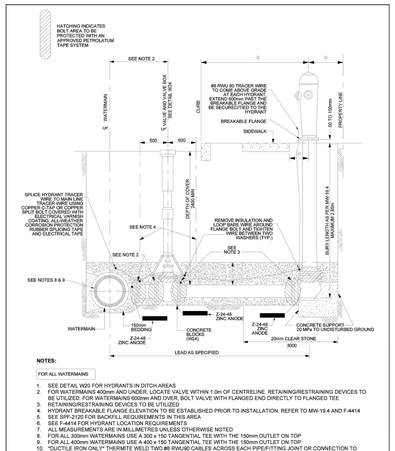
Ottawa	CATCH BASIN - ELBOW FOR REAR YARD, DITCHED PIPE AND LANDSCAPING APPLICATIONS	DATE:	MARCH 2007
		REV. DATE:	MARCH 2019
		DWG No:	S31



NOTES:

1. ALL CONNECTIONS MUST BE WATERPROOFED.
2. SPLICING OF TRACER WIRE IS NOT ALLOWED UNLESS SPECIFIED OR APPROVED.
3. TRACER WIRE CONTINUITY, OF CURRENT MUST BE TESTED AND VERIFIED.
4. TRACER WIRE AT HYDRANT SHALL BE BROUGHT TO THE SURFACE AND TIED AROUND BARREL.
5. FOR PVC TO DUCTILE IRON CONNECTIONS THE TRACER WIRE MUST BE ATTACHED TO THE DUCTILE IRON PIPE BY CADWELD.
6. TRACER WIRE TO CONNECT TO ALL COPPER SERVICE CONNECTIONS AT OR NEAR MAIN STOP. INSTALL BRASS CONNECTOR TO COPPER PIPE AND FASTEN TRACER WIRE TO CONNECTOR.

Jp2g Consultants Inc. ENGINEERS · PLANNERS · PROJECT MANAGERS	TRACER WIRE INSTALLATION PVC WATERMAIN	DATE:	MAY 2001
		REV:	MAR 2022
		DWG No:	W-4



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. VALVE BOX TO BE CENTERED OVER VALVE
4. HYDRANT BREAKABLE FLANGE ELEVATION TO BE ESTABLISHED PRIOR TO INSTALLATION. REFER TO MW-19.4 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. DUCTILE IRON ONLY* THERMITE WELD TWO #8 RWU90 CABLES ACROSS EACH PIPE/FITTING JOINT OR CONNECTION TO ENSURE ELECTRICAL CONTINUITY ALONG ALL METALLIC COMPONENTS
11. ALL MATERIALS SHALL BE IN ACCORDANCE WITH MW-19.15
12. TRACER WIRE BOLT CONNECTIONS TO BE COMPLETED PER W65
13. TRACER WIRE SPLICES TO BE COMPLETED PER W47

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

Not to scale

0 1:1 5 cm

OTTAWA-CARLETON DISTRICT SCHOOL BOARD

Jp2g Consultants Inc.
ENGINEERS · PLANNERS · PROJECT MANAGERS

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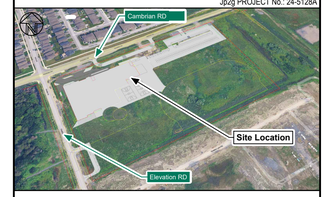
1150 MORRISON DR., #410 OTTAWA, ON, K2H 8S9 T: 613-828-7800 OTTAWA@JP2G.COM

16 EDWARD ST. S., #211 ARNPRIOR, ON, K7S 3W4 T: 613-626-0780 ARNPRIOR@JP2G.COM

Jp2g PROJECT No.: 24-5128A



1	ISSUED FOR SITE PLAN CONTROL REV-1	2026-07-24
No.	DESCRIPTION	YYYY-MM-DD

N45 ARCHITECTURE INC.
71 Bank Street, 7th Floor - Ottawa, Ontario K1P 5N2
tel. 613.224.0095 fax 613.224.9811

project

Half Moon Bay Secondary School

3853 Cambrian Road,Ottawa, ON

seal

LICENSED PROFESSIONAL ENGINEER
Z. E. BAUMAN
100578796
July 24, 2026
PROVINCE OF ONTARIO

seal

LICENSED PROFESSIONAL ENGINEER
A. SAMMOUR
100227665
July 24, 2026
PROVINCE OF ONTARIO

drawing title

Standard Details

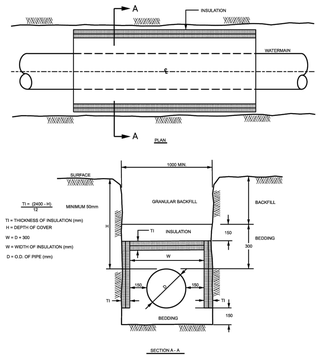
scale: As Shown	drawn by: B.Radan / R.Ismail
date: July 2026	checked by: Z.Bauman / A.Sammour
project number: 26-056	drawing number: DET-1
	revision

CONTRACTOR TO VERIFY ALL DIMENSIONS AND NOTIFY THE ARCHITECT OF ANY DISCREPANCIES BEFORE WORK COMMENCES.

DO NOT SCALE DRAWINGS.

DXX-XX-XX-XXXX

PLAN #XXXXX

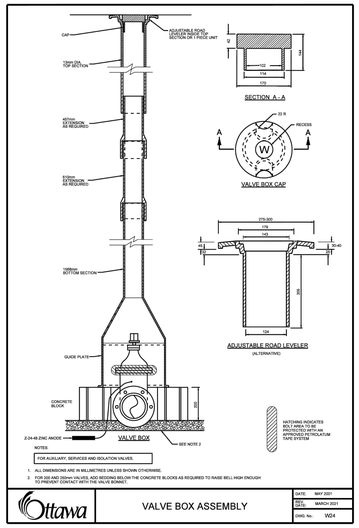


NOTES

FOR 150 - 400mm (NOMINAL DIAMETER) WATERMAINS, WHERE THE DEPTH OF COVER IS LESS THAN 2400mm

1. INCREMENTS OF THICKNESS SHALL BE ADJUSTABLE TO 25mm.
2. IN PROXIMITY OF MAINTENANCE HOLES, CULVERTS, CATCHBASINS, ETC., INSULATION SHALL BE PLACED PER DETAIL W23
3. DEPTH OF COVER LESS THAN 1200mm REQUIRES SPECIAL DESIGN.
4. STAGGER JOINTS OF MULTIPLE SHEETS.
5. ALL DIMENSIONS ARE IN MILLIMETRES UNLESS SHOWN OTHERWISE.
7. INSULATION NOT TO BE USED AS A MEANS TO AVOID EXCAVATION.

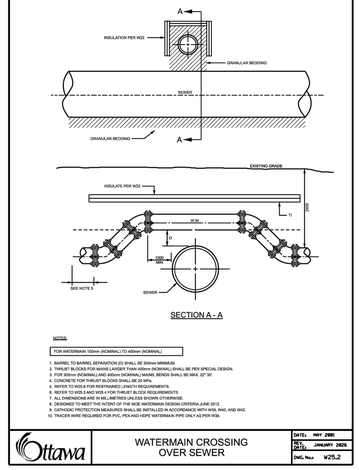
Ottawa	THERMAL INSULATION FOR WATERMAINS	DATE: MAY 2001 REV. DATE: JANUARY 2026 DWG. No.: W22



NOTES:

1. ALL DIMENSIONS ARE IN MILLIMETRES UNLESS SHOWN OTHERWISE.
2. FOR 200 AND 250mm VALVES, ADD BEDDING BELOW THE CONCRETE BLOCKS AS REQUIRED TO RAISE BELL HIGH ENOUGH TO PREVENT CONTACT WITH THE VALVE BONNET.

Ottawa	VALVE BOX ASSEMBLY	DATE: MAY 2001 REV. DATE: MARCH 2021 DWG. No.: W24

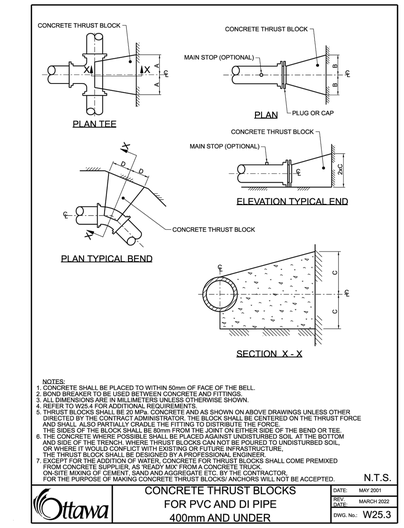


NOTES

FOR WATERMAIN 150mm (NOMINAL) TO 400mm (NOMINAL)

1. BARREL TO BARREL SEPARATION (D SHALL BE 500mm MINIMUM.
2. THRUST BLOCKS FOR MAINS LARGER THAN 400mm (NOMINAL) SHALL BE PER SPECIAL DESIGN.
3. FOR 300mm (NOMINAL) AND 400mm (NOMINAL) MAINS, BENDS SHALL BE MAX. 22° 30'.
4. CONCRETE FOR THRUST BLOCKS SHALL BE 20 MPa.
5. REFER TO W23.6 FOR RESTRAINED LENGTH REQUIREMENTS.
6. REFER TO W23.5 AND W20.4 FOR THRUST BLOCK REQUIREMENTS.
7. GP SOILS ARE DESCRIBED AS POORLY GRADED GRAVEL AND SAND-GRAVEL MIXES WITH LITTLE OR NO FINES.
8. S.I.C MUST BE OF SOLID PIPE WITHOUT JOINTS, FITTINGS, ETC.
9. THE TABLES APPLY TO BOTH DUCTILE IRON AND PVC. WHERE ONE LENGTH EXCEEDED THE OTHER THE LONGER LENGTH WAS USED.
10. TRACER WIRE REQUIRED FOR PVC, PEX AND HDPE WATERMAIN PIPE ONLY AS PER W36.

Ottawa	WATERMAIN CROSSING OVER SEWER	DATE: MAY 2001 REV. DATE: JANUARY 2026 DWG. No.: W25.2



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 SIZE OF THE THRUST BLOCKS SHALL BE AS SHOWN ON ABOVE DRAWINGS UNLESS OTHER DIRECTED BY THE CONTRACT ADMINISTRATOR. THE BLOCK SHALL BE CENTERED ON THE THRUST FORCE AND SHALL ALSO PARTIALLY CRADLE THE FITTING TO DISTRIBUTE THE FORCE. THE SIDES 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 AND SIDE OF THE TRENCH. WHERE THRUST BLOCKS CAN NOT BE POURED TO UNDISTURBED SOIL, OR WHERE IT WOULD CONFLICT WITH EXISTING OR FUTURE INFRASTRUCTURE, THE CONCRETE SHALL BE CONTAINED WITH FORMWORK TO THE EXTENT REQUIRED.
7. 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 AGGREGATE ETC. BY THE CONTRACTOR, FOR THE PURPOSE OF MAKING CONCRETE THRUST BLOCKS/ ANCHORS WILL NOT BE ACCEPTED.

N.T.S.

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

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	600	600	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 FOR THE ABOVE CALCULATIONS ARE AS FOLLOWS:
   a) MAXIMUM OPERATING PRESSURE OF 100 psi.
   b) MAXIMUM SURGE PRESSURE WITH A FLOW VELOCITY CHANGE OF 0.8 m/s OF 115 psi (115 psi FOR CLASS 52 DI AND FOR PVC MAX. SURGE IS 135 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.

Ottawa	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. ANY JOINT THAT FALLS WITHIN THE RECOMMENDED LENGTH (L) SHALL BE RESTRAINED. SEE DRAWING W25.6
2. TO REDUCE THE NUMBER OF RESTRAINERS REQUIRED THE USE OF FULL PIPE LENGTHS IS RECOMMENDED IN THESE AREAS.

Ottawa	RESTRAINING AND RETAINING RINGS FOR PVC AND DI PIPE 400mm AND UNDER	DATE: MAY 2001 REV. DATE: NONE DWG. No.: W25.5

TABLE OF RESTRAINED LENGTHS FOR DI AND PVC WATERMAIN PIPE IN STANDARD GRANULAR 'A' EMBEDMENT IN SOILS OF BEARING CAPACITY OF 100 KPa AND OVER

REDUCERS — LARGER DIAMETER SIDE (TO BE RESTRAINED)

SMALLER DIAMETER (UNRESTRAINED)	100mm	150mm	200mm	250mm	300mm	400mm
100mm	N/A	3	6	8	10	14
150mm	N/A	N/A	4	6	9	13
200mm	N/A	N/A	N/A	3	6	11
250mm	N/A	N/A	N/A	N/A	4	9
300mm	N/A	N/A	N/A	N/A	N/A	7
400mm	N/A	N/A	N/A	N/A	N/A	N/A

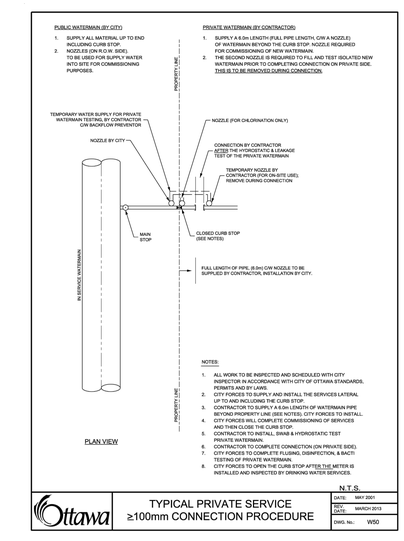
PIPE DIAMETER

	100mm	150mm	200mm	250mm	300mm	400mm
DEAD ENDS, CAPS, PLUGS, VALVES						
BEFORE CAPS AND EITHER SIDE OF VALVES - L	5	6	9	10	12	16
VERTICAL BENDS						
LENGTH HIGH SIDE - LHS	3	4	5	6	7	9
LENGTH LOW SIDE - LLS	1.5	2	2.5	3	3.5	4.5
TEES						
LENGTH ALONG THE BRANCH - L	1	1	1	1	1	1
LENGTH ALONG THE RUN - Lr	3	3	3	3	3	3
HORIZONTAL BENDS						
11.25, 22.5, AND 45 DEGREE BENDS	1	1.5	1.5	2	2	2.5

NOTES:

1. THE ABOVE RESTRAINED LENGTHS MEET OR EXCEED THE WATERMAIN DESIGN CRITERIA FOR FUTURE ATERATIONS AUTHORIZED UNDER A DRINKING WATER WORKS PERMIT.
2. THE ASSUMPTIONS MADE FOR THE ABOVE CALCULATIONS ARE AS FOLLOWS:
   a) MAXIMUM OPERATING PRESSURE OF 100 psi.
   b) MAXIMUM SURGE PRESSURE WITH A FLOW VELOCITY CHANGE OF 0.8 m/s OF 115 psi (115 psi FOR CLASS 52 DI AND FOR PVC MAX. SURGE IS 135 psi).
3. FOR SOFTWARE CALCULATIONS A TEST PRESSURE OF 150 psi AND A SAFETY FACTOR OF 1.5 WAS USED WHICH RESULTS IN 225 psi MAXIMUM PRESSURE.
4. TYPE 5 TRENCH BEDDING.
5. THE TABLES ARE BASED EXCEPT FOR VERTICAL BENDS WHERE THE HIGH SIDE IS AT 1.8 METRES.
6. EMBEDMENT MATERIAL GRANULAR 'A' WITH CHARACTERISTICS OF ASTM D2487 GP.
7. GP SOILS ARE DESCRIBED AS POORLY GRADED GRAVEL AND SAND-GRAVEL MIXES WITH LITTLE OR NO FINES.
8. S.I.C MUST BE OF SOLID PIPE WITHOUT JOINTS, FITTINGS, ETC.
9. THE TABLES APPLY TO BOTH DUCTILE IRON AND PVC. WHERE ONE LENGTH EXCEEDED THE OTHER THE LONGER LENGTH WAS USED.
10. RESTRAINED LENGTHS ARE IN METRES.

Ottawa	TABLES OF RESTRAINED LENGTHS FOR PVC AND DI PIPE 400mm AND UNDER	DATE: MAY 2001 REV. DATE: JANUARY 2026 DWG. No.: W25.6

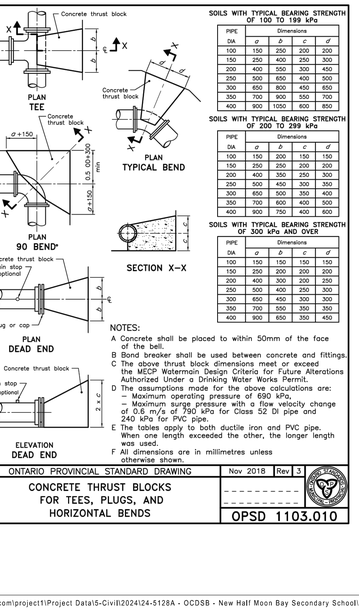


NOTES:

1. ALL WORK TO BE INSPECTED AND SCHEDULED WITH CITY INSPECTOR IN ACCORDANCE WITH CITY OF OTTAWA STANDARDS, PERMITS AND BY LAWS.
2. CITY FORCES TO SUPPLY AND INSTALL THE SERVICES LATERAL UP TO AND INCLUDING THE CURB STOP.
3. CONTRACTOR TO SUPPLY A 6.0m LENGTH OF WATERMAIN PIPE BEYOND PROPERTY LINE (SEE NOTES). CITY FORCES TO INSTALL.
4. CITY FORCES WILL COMPLETE COMMISSIONING OF SERVICES AND THEN CLOSE THE CURB STOP.
5. CONTRACTOR TO INSTALL, BRAB & HYDROSTATIC TEST PRIVATE WATERMAIN.
6. CONTRACTOR TO COMPLETE CONNECTION (ON PRIVATE SIDE).
7. CITY FORCES TO COMPLETE FLUSHING, DISINFECTION, & BACTI TESTING OF PRIVATE WATERMAIN.
8. CITY FORCE TO OPEN THE CURB STOP AFTER THE METER IS INSTALLED AND INSPECTED BY DRINKING WATER SERVICES.

N.T.S.

Ottawa	TYPICAL PRIVATE SERVICE ≥100mm CONNECTION PROCEDURE	DATE: MAY 2001 REV. DATE: MARCH 2013 DWG. No.: W50



SOILS WITH TYPICAL BEARING STRENGTH OF 100 TO 199 kPa

PIPE DIA	Dimensions a	b	c	d
100	150	250	200	200
150	250	400	250	300
200	400	550	300	450
250	500	650	400	500
300	650	800	450	650
350	700	900	550	700
400	900	1050	600	850

SOILS WITH TYPICAL BEARING STRENGTH OF 200 TO 299 kPa

PIPE DIA	Dimensions a	b	c	d
100	150	200	150	150
150	250	250	200	200
200	400	350	250	300
250	500	450	300	350
300	650	500	350	400
350	700	600	400	500
400	900	750	400	600

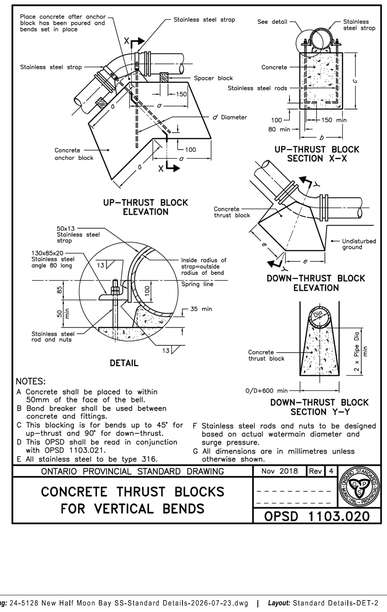
SOILS WITH TYPICAL BEARING STRENGTH OF 300 kPa AND OVER

PIPE DIA	Dimensions a	b	c	d
100	150	150	150	150
150	250	200	200	200
200	400	300	200	250
250	500	400	250	300
300	650	450	300	300
350	700	550	350	350
400	900	650	350	450

NOTES:

A Concrete shall be placed to within 50mm of the face of the bell.
B Bond breaker shall be used between concrete and fittings.
C The above thrust block dimensions meet or exceed the MECP Watermain Design Criteria for Future Alterations Authorized Under a Drinking Water Works Permit.
D The assumptions made for the above calculations are:
   – Maximum operating pressure of 690 kPa,
   – Maximum surge pressure with a flow velocity change of 0.6 m/s of 790 kPa for Class 52 DI pipe and 240 kPa for PVC pipe.
E The tables apply to both ductile iron and PVC pipe. When one length exceeded the other, the longer length was used.
F All dimensions are in millimetres unless otherwise shown.

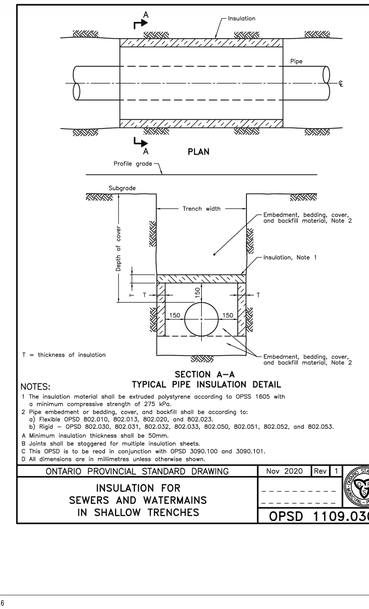
ONTARIO PROVINCIAL STANDARD DRAWING		Nov 2018	Rev 3
CONCRETE THRUST BLOCKS FOR TEES, PLUGS, AND HORIZONTAL BENDS			
OPSD 1103.010			



NOTES:

A Concrete shall be placed to within 50mm of the face of the bell.
B Bond breaker shall be used between concrete and fittings.
C This blocking is for bends up to 45° for up–thrust and 90° for down–thrust.
D This OPSD shall be read in conjunction with OPSD 1103.021.
E All stainless steel to be type 316.
F Stainless steel rods and nuts to be designed based on actual watermain diameter and surge pressure.
G All dimensions are in millimetres unless otherwise shown.

ONTARIO PROVINCIAL STANDARD DRAWING		Nov 2018	Rev 4
CONCRETE THRUST BLOCKS FOR VERTICAL BENDS			
OPSD 1103.020			



TYPICAL PIPE INSULATION DETAIL

NOTES:

1 The insulation material shall be extruded polystyrene according to OPSS 1605 with a minimum compressive strength of 275 kPa.
2 Pipe embedment or bedding, cover, and backfill shall be according to:
   a) Flexible OPSD 802.010, 802.013, 802.020, and 802.023.
   b) Rigid – OPSD 802.030, 802.031, 802.032, 802.033, 802.050, 802.051, 802.052, and 802.053.
A Minimum insulation thickness shall be 50mm.
B Joints shall be staggered for multiple insulation sheets.
C This OPSD is to be read in conjunction with OPSD 3090.100 and 3090.101.
D All dimensions are in millimetres unless otherwise shown.

ONTARIO PROVINCIAL STANDARD DRAWING		Nov 2020	Rev 1
INSULATION FOR SEWERS AND WATERMAINS IN SHALLOW TRENCHES			
OPSD 1109.030			

Not to scale

0 1:f 5 cm

OTTAWA-CARLETON DISTRICT SCHOOL BOARD

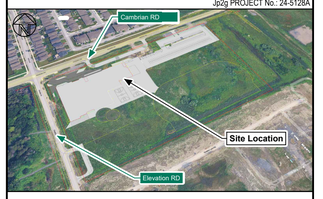
Jp2g Consultants Inc.
ENGINEERS · PLANNERS · PROJECT MANAGERS

12 INTERNATIONAL DR. PEMBROKE, ON, K8A 6W5
T: 613-735-2507
PEMBROKE@JP2G.COM

1150 MORRISON DR., #410 OTTAWA, ON, K2H 8S9
T: 613-828-7800
OTTAWA@JP2G.COM

16 EDWARD ST. S., #211 ARNPRIOR, ON, K7S 3W4
T: 613-626-0780
ARNPRIOR@JP2G.COM

Jp2g PROJECT No.: 24-5128A



No.	DESCRIPTION	YYYY-MM-DD
1	ISSUED FOR SITE PLAN CONTROL REV-1	2026-07-24

N45 ARCHITECTURE INC.
71 Bank Street, 7th Floor - Ottawa, Ontario K1P 5N2
tel. 613.224.0095 fax 613.224.9811

project
Half Moon Bay Secondary School

3853 Cambrian Road,Ottawa, ON

seal
LICENSED PROFESSIONAL ENGINEER
Z. E. BAUMAN
100578796
July 24, 2026
PROVINCE OF ONTARIO

seal
LICENSED PROFESSIONAL ENGINEER
A. SAMMOUR
100227665
July 24, 2026
PROVINCE OF ONTARIO

drawing title
Standard Details

scale: As Shown	drawn by: B.Radan / R.Ismail
date: July 2026	checked by: Z.Bauman / A.Sammour
project number: 26-056	drawing number: DET-2

revision

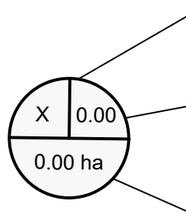
CONTRACTOR TO VERIFY ALL DIMENSIONS AND NOTIFY THE ARCHITECT OF ANY DISCREPANCIES BEFORE WORK COMMENCES.

DO NOT SCALE DRAWINGS.

XXXX-XX-XXXX DXD

PLAN #XXXXX

LEGEND



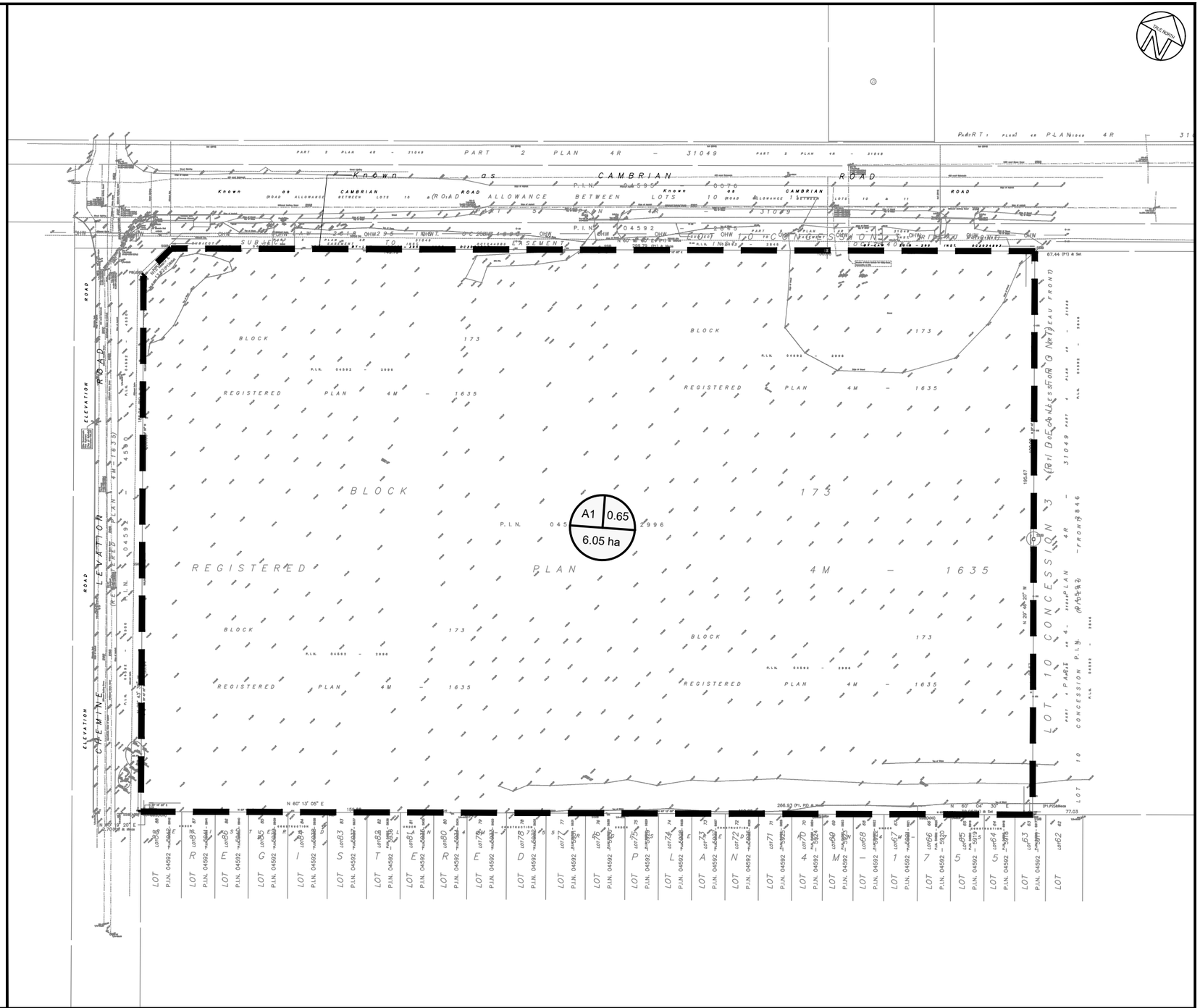
DRAINAGE AREA ID

WEIGHTED RUNOFF COEFFICIENT

DRAINAGE AREA HECTARES

DRAINAGE AREA LIMIT

* ALLOWABLE RELEASE RATE = 1499.0 l/s .
REFER TO PRE-CONSULTING MEETING NOTES : PC2025-0021 .



No.	YYYY-MM-DD	BY	DESCRIPTION
4			
3			
2			
1	2026-07-24	ZB	ISSUED FOR SITE PLAN CONTROL

Jp2g PROJECT No.: 24-5128A

PROJECT
NEW HALF MOON BAY SECONDARY SCHOOL
3853 CAMBRIAN RD, OTTAWA, ON K2J 5P5

DRAWING
FIGURE-1
PRE-DEVELOPMENT DRAINAGE AREAS

CLIENT No.:
DRAFTED: R.ISMAIL
DESIGNED: R.ISMAIL / Z.BAUMAN
REVIEWED: Z.BAUMAN
APPROVED: A.SAMMOUR

NORTH: TRUE NORTH

SCALE
0 m 25 50 75 m
1:1,500

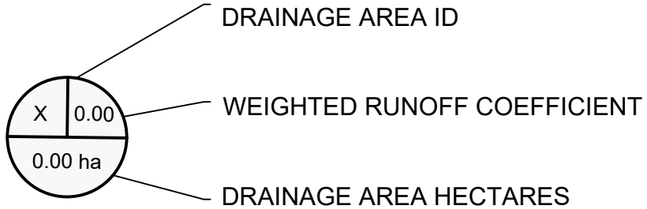
SHEET#
FIG.1

D07-XX

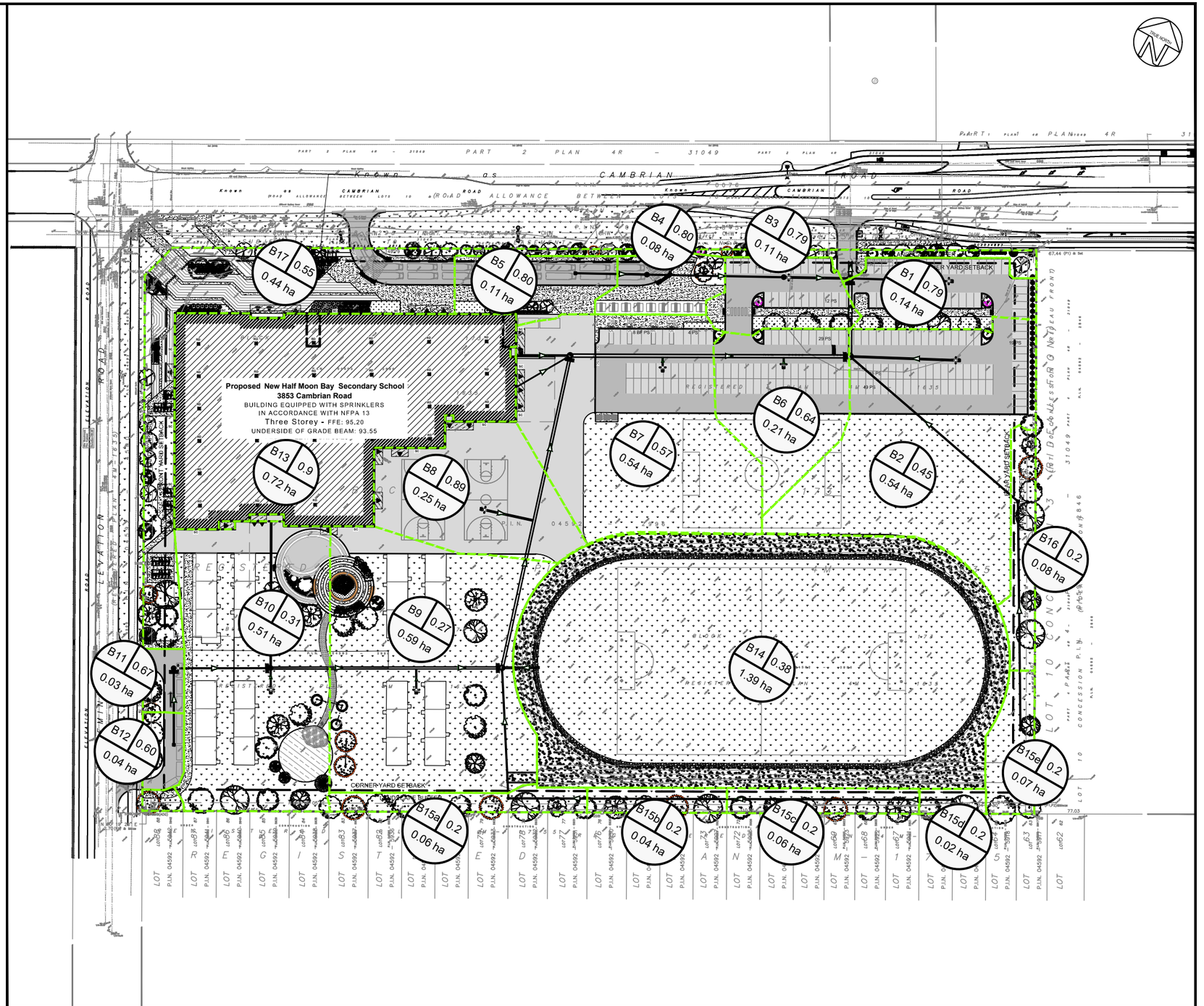
PLAN #XX

DWG NAME: J:\5-CIVIL\2024\24-5128A - OCDSB - NEW HALF MOON BAY SECONDARY SCHOOL\05 DRAWINGS\1 ONGOING\24-5128 NEW HALF MOON BAY SS-ISSUED FOR SITE PLAN CONTROL REV-1-2026-07-23.DWG LAYOUT: FIG.1_PRE_DEVELOPMENT_AREA SAVED ON 2026-07-24

LEGEND



- DRAINAGE AREA LIMIT
- OVERLAND FLOW ROUTE
- NEW BUILDING
- NEW LIGHT DUTY ASPHALT
- NEW HEAVY DUTY ASPHALT
- NEW CONCRETE SIDEWALK
- NEW PRECAST PAVERS
- NEW EWF / MULCH
- NEW CLEAR STONE SUBDRAIN TRENCH
- NEW RUBBERIZED ASPHALT TRACK
- NEW STONE DUST PATH
- NEW GRASS
- NEW ROOF DRAIN



No.	YYYY-MM-DD	BY	DESCRIPTION
4			
3			
2			
1	2026-07-24	ZB	ISSUED FOR SITE PLAN CONTROL

Jp2g PROJECT No.: 24-5128A

PROJECT
NEW HALF MOON BAY SECONDARY SCHOOL
3853 CAMBRIAN RD, OTTAWA, ON K2J 5P5

DRAWING
FIGURE-2
POST-DEVELOPMENT DRAINAGE AREAS

CLIENT No.:
DRAFTED: R.ISMAIL
DESIGNED: R.ISMAIL / Z.BAUMAN
REVIEWED: Z.BAUMAN
APPROVED: A.SAMMOUR

NORTH: TRUE NORTH

SCALE: 1:1,500
0 m 25 50 75 m

SHEET# **FIG.2**

D07–XX

PLAN #XX

DWG NAME: J:\5-CIVIL\2024\24-5128A - OCDSB - NEW HALF MOON BAY SECONDARY SCHOOL\05 DRAWINGS\1 ONGOING\24-5128 NEW HALF MOON BAY SS-ISSUED FOR SITE PLAN CONTROL REV-1-2026-07-23.DWG LAYOUT: FIG.2_POST_DEVELOPMENT_AREA SAVED ON 2026-07-24

Appendix B
Stormwater Management

24-5128A New Half Moon Bay Secondary School
PreDevelopment Allocated Area

Appendix B-1: Predevelopment Allowable Release Rate					5 Year		
Receiving Structure	Subcatchment	Area (ha)	PreAllocated Area (C = 0.65) (m^2)	PreAllocated Area (C = 0.65) (ha)	C <=10yr	Rainfall Intensity (mm/hr)	Runoff (L/s)
Controlled							
	A1	6.05	60485.6	6.049	0.65	104.2	1138.80
Total Controlled		**6.05**			**0.65**		**1138.8**
Total Assuming No Control		**6.05**					**1138.8**

24-5128A New Half Moon Bay Secondary School
Appendix B-2: Post Development Summary

Subcatchment Runoff

Receiving Structure	Subcatchment	Area	Impervious Area (C = 0.90)		Pervious Area (C = 0.20)		5 Year C	5 Year Rainfall Intensity	5 Year Runoff	100 Year C (25% Increase)	100 Year Rainfall Intensity	100 Year Runoff	Structure Elevation
		(ha)	(m^2)	(ha)	(m^2)	(ha)	<=10yr	(mm/hr)	(L/s)	100yr	(mm/hr)	(L/s)	(m)
Controlled													
CB-1	**B1**	0.14	1217.049	0.122	220.74	0.022	0.79	104.2	33.01	0.88	178.6	63.15	93.65
CB-2	**B2**	0.54	1961.259	0.196	3463.122	0.346	0.45	104.2	71.19	0.52	178.6	140.33	93.75
CBMH-1	**B3**	0.11	949.522	0.095	186.415	0.019	0.79	104.2	25.83	0.88	178.6	49.45	93.83
CBMH-2	**B4**	0.08	680.078	0.068	116.06	0.012	0.80	104.2	18.40	0.89	178.6	35.20	93.87
CB-5	**B5**	0.11	964.188	0.096	157.683	0.016	0.80	104.2	26.05	0.89	178.6	49.82	93.90
CB-3	**B6**	0.21	1338.013	0.134	793.036	0.079	0.64	104.2	39.47	0.72	178.6	76.26	93.93
CB-4	**B7**	0.54	2845.214	0.285	2504.978	0.250	0.57	104.2	88.68	0.65	178.6	172.32	93.90
CB-6	**B8**	0.25	2515.792	0.252	31.95	0.003	0.89	104.2	65.77	0.99	178.6	125.28	94.37
CB-7	**B9**	0.59	554.893	0.055	5393.356	0.539	0.27	104.2	45.71	0.32	178.6	94.48	94.28
CB-8	**B10**	0.51	804.991	0.080	4296.311	0.430	0.31	104.2	45.87	0.37	178.6	93.28	94.35
CBMH-3	**B11**	0.03	214.398	0.021	101.948	0.010	0.67	104.2	6.18	0.76	178.6	11.91	94.65
CB-9	**B12**	0.04	213.012	0.021	160.602	0.016	0.60	104.2	6.48	0.68	178.6	12.57	94.73
ROOF	**B13**	0.72	7168.059	0.717	0	0.000	0.90	104.2	186.86	1.00	178.6	355.82	
Total Controlled		**3.89**					**0.59**		**659.5**	**0.66**		**1279.9**	
FIELD	**B14**	1.39	3581.632	0.358	10286.211	1.029	0.38	104.2	152.96	0.44	178.6	305.44	
RYCB-1	**B15a**	0.06	0	0.000	649.606	0.065	0.20	104.2	3.76	0.25	178.6	8.06	
RYCB-2	**B15b**	0.04	0	0.000	420.461	0.042	0.20	104.2	2.44	0.25	178.6	5.22	
RYCB-3	**B15c**	0.06	0	0.000	580.929	0.058	0.20	104.2	3.37	0.25	178.6	7.21	
RYCB-4	**B15d**	0.02	0	0.000	201.734	0.020	0.20	104.2	1.17	0.25	178.6	2.50	
RYCB-5	**B15e**	0.07	0	0.000	718.289	0.072	0.20	104.2	4.16	0.25	178.6	8.91	
DI-1	**B16**	0.08	0	0.000	757.444	0.076	0.20	104.2	4.39	0.25	178.6	9.40	
Uncontrolled	**B17**	0.44	2208.047	0.221	2234.379	0.223	0.55	104.2	70.51	0.62	178.6	137.33	
Total Uncontrolled		**2.16**					**0.39**		**242.7**	**0.45**		**484.1**	
Total Assuming No Control		**6.05**							**902.3**			**1763.9**	

SWM Control Summary - Refer to Individual Sheets

ICD	Allowable Outflow (L/s)	100 Yr Required Storage (m^3)	Structure Elevation (m)	Spill Elevation (m)	100 Yr Ponding Elevation (m)	100 Yr Ponding Depth (m)	Outlet Invert (m)	Pipe Diameter (mm)	Head over Centroid (m)	Orifice Coefficient	Orifice Diameter (mm)
ICD-1	25.3	22.72	93.65	93.93	93.83	0.18	91.40	250	2.31	0.61	89
ICD-2	55.3	51.30	93.75	94.04	93.99	0.24	91.45	300	2.39	0.61	130
ICD-3	117.1	10.42	93.83	93.96	93.96	0.13	91.07	300	2.73	0.61	183
ICD-4	30.2	27.74	93.93	94.18	94.11	0.18	91.68	250	2.30	0.61	97
ICD-5	69.1	61.93	93.90	94.20	94.16	0.26	91.53	300	2.50	0.61	144
ICD-6	51.5	44.27	94.37	94.84	94.65	0.28	92.07	300	2.43	0.61	125
ICD-7	35.6	36.00	94.28	94.68	94.48	0.20	92.45	250	1.90	0.61	110
ICD-8	36.2	34.60	94.35	94.75	94.56	0.21	92.76	250	1.67	0.61	115
ICD-9	16.0	5.08	94.65	94.80	94.77	0.12	92.85	250	1.80	0.61	75
Roof	61.2	219.36	0.00	Na	0.12	0.12	n/a - roof drain control				
Total	**497.50**	**513.43**									

Total Site Outflow Summary

Source	100 Yr Release Rate (L/s)	100 Yr Provided Storage (m^3)
ICD-1	25.30	33.1
ICD-2	55.30	37.4
ICD-3	117.10	42.0
ICD-4	30.20	46.8
ICD-5	69.10	51.9
ICD-6	51.50	57.2
ICD-7	35.60	62.8
ICD-8	36.20	68.6
ICD-9	16.00	74.7
Roof	61.20	239.0
100 Year Uncontrolled	484.08	N/A
Total	**981.58**	**713.45**
Allowable	**1138.80**	
Difference	**157.22**	

24-5128A New Half Moon Bay Secondary School
Appendix B-3: ICD-1 Calculations
ICD-1

Upstream Structure	Subcatchment	Area (ha)	C <10yr	C 100yr	Rim. Elev. (m)	$Q_{allowable}$ (L/s) 2Yr	5 Yr	100 Yr	Storage Requirements 2 Yr (m^3)	5 Yr (m^3)	100 Yr (m^3)	100 Yr Ponding Elev. (m)	Spill Elev. (m)	100 Yr Ponding Depth (m)
CB-1	B1	0.144	0.79	0.88	93.65									
ICD-1 Total		0.144	0.79	0.88	93.65	24.3	25.0	25.3	0.0	7.1	22.7	93.83	93.930	0.18

Stage below ponding (m)
93.82

ICD-1 - Rational Method 2 Year Storage Requirements Calculation

Time (min.)	Intensity (mm/hr)	Q_{actual} (L/s)	$Q_{allowable}$ (L/s)	Q_{stored} (L/s)	V_{stored} (m^3)
10	76.8	24.33	24.33	0.00	0.0
15	61.8	19.57	24.33	-4.76	-4.3
20	52.0	16.48	24.33	-7.85	-9.4
25	45.2	14.31	24.33	-10.02	-15.0
30	40.0	12.68	24.33	-11.65	-21.0
35	36.1	11.42	24.33	-12.91	-27.1
40	32.9	10.41	24.33	-13.92	-33.4
45	30.2	9.58	24.33	-14.75	-39.8
50	28.0	8.88	24.33	-15.45	-46.3
55	26.2	8.29	24.33	-16.04	-52.9
60	24.6	7.78	24.33	-16.55	-59.6

ICD-1 - Rational Method 5 Year Storage Requirements Calculation

Time (min.)	Intensity (mm/hr)	Q_{actual} (L/s)	$Q_{allowable}$ (L/s)	Q_{stored} (L/s)	V_{stored} (m^3)
10	104.2	36.85	25.00	11.85	7.1
15	83.6	29.55	25.00	4.55	4.1
20	70.3	24.85	25.00	-0.15	-0.2
25	60.9	21.54	25.00	-3.46	-5.2
30	53.9	19.07	25.00	-5.93	-10.7
35	48.5	17.16	25.00	-7.84	-16.5
40	44.2	15.63	25.00	-9.37	-22.5
45	40.6	14.37	25.00	-10.63	-28.7
50	37.7	13.32	25.00	-11.68	-35.0
55	35.1	12.42	25.00	-12.58	-41.5
60	32.9	11.65	25.00	-13.35	-48.1

ICD-1 - Rational Method 100 Year Storage Requirements Calculation

Time (min.)	Intensity (mm/hr)	Q_{actual} (L/s)	$Q_{allowable}$ (L/s)	Q_{stored} (L/s)	V_{stored} (m^3)
10	178.6	63.15	25.30	37.85	22.7
15	142.9	50.54	25.30	25.24	22.7
20	120.0	42.42	25.30	17.12	20.5
25	103.8	36.73	25.30	11.43	17.1
30	91.9	32.49	25.30	7.19	12.9
35	82.6	29.21	25.30	3.91	8.2
40	75.1	26.58	25.30	1.28	3.1
45	69.1	24.42	25.30	-0.88	-2.4
50	64.0	22.62	25.30	-2.68	-8.0
55	59.6	21.09	25.30	-4.21	-13.9
60	55.9	19.77	25.30	-5.53	-19.9

ICD-1 - Stage-Storage Table

Elevation (m)	Incremental Depth (m)	Total Depth (m)	Cumulative Volume CB-1 (m^3)					Total Volume (m^3)	Orifice Head (m)	Orifice Flow (L/s)	Rainfall Event
93.65	0.00	0.00	0.00					0.0	2.13	24.3	2 Yr
93.66	0.01	0.01	0.00					0.0	2.14	24.4	
93.67	0.01	0.02	0.03					0.0	2.15	24.4	
93.68	0.01	0.03	0.12					0.1	2.16	24.5	
93.69	0.01	0.04	0.30					0.3	2.17	24.6	
93.70	0.01	0.05	0.59					0.6	2.18	24.6	
93.71	0.01	0.06	1.03					1.0	2.19	24.7	
93.72	0.01	0.07	1.64					1.6	2.20	24.7	
93.73	0.01	0.08	2.44					2.4	2.21	24.8	
93.74	0.01	0.09	3.48					3.5	2.22	24.8	
93.75	0.01	0.10	4.78					4.8	2.23	24.9	
93.76	0.01	0.11	6.33					6.3	2.24	25.0	
93.77	0.01	0.12	8.16					8.2	2.25	25.0	5 Yr
93.78	0.01	0.13	10.29					10.3	2.26	25.1	
93.79	0.01	0.14	12.69					12.7	2.27	25.1	
93.80	0.01	0.15	15.38					15.4	2.28	25.2	
93.81	0.01	0.16	18.35					18.4	2.29	25.2	
93.82	0.01	0.17	21.62					21.6	2.30	25.3	
93.83	0.01	0.18	25.16					25.2	2.31	25.3	100 Yr
93.84	0.01	0.19	28.98					29.0	2.32	25.4	
93.85	0.01	0.20	33.07					33.1	2.33	25.4	
93.86	0.01	0.21	37.41					37.4	2.34	25.5	
93.87	0.01	0.22	41.98					42.0	2.35	25.6	
93.88	0.01	0.23	46.81					46.8	2.36	25.6	
93.89	0.01	0.24	51.88					51.9	2.37	25.7	
93.90	0.01	0.25	57.20					57.2	2.38	25.7	
93.91	0.01	0.26	62.78					62.8	2.39	25.8	
93.92	0.01	0.27	68.61					68.6	2.40	25.8	
93.93	0.01	0.28	74.71					74.71	2.41	25.9	

Orifice Sizing

Elevation (m)	Outlet Structure	Pipe Diameter (mm)	Pipe Invert (m)	Area (m2)	Area (mm2)	Orifice Diameter (mm)	100 Yr Orifice Head (m)
	CB-1	250.00	91.40	0.01	6177.08	89	2.31
93.65							
93.66							
93.67							
93.68							
93.69							
93.70							
93.71							
93.72							
93.73							
93.74							
93.75							
93.76							
93.77							
93.78							
93.79							
93.80							
93.81							
93.82							
93.83							
93.84							
93.85							
93.86							
93.87							
93.88							
93.89							
93.90							
93.91							
93.92							
93.93							

$Q\ (cms) = 0.61 * A * \sqrt{2 * g * H}$

Where Q = release rate in cms
0.61 = coefficient
A = Area of the orifice (m2)
g = gravitational constant (9.81 m/s2)
H = Head above centerline of orifice (m). if orifice is not submerged.

24-5128A New Half Moon Bay Secondary School
Appendix B-4: ICD-2 Calculations
ICD-2

Upstream Structure	Subcatchment	Area (ha)	C <10yr	C 100yr	Rim. Elev. (m)	$Q_{allowable}$ (L/s) 2Yr	5 Yr	100 Yr	Storage Requirements 2 Yr (m^3)	5 Yr (m^3)	100 Yr (m^3)	100 Yr Ponding Elev. (m)	Spill Elev. (m)	100 Yr Ponding Depth (m)
CB-2	B2	0.542	0.45	0.52	93.75									
ICD-2 Total		0.542	0.45	0.52	93.75	52.5	54.4	55.3	0.0	16.5	51.3	93.99	94.040	0.24

Stage below ponding (m)
93.98

ICD-2 - Rational Method 2 Year Storage Requirements Calculation

Time (min.)	Intensity (mm/hr)	Q_{actual} (L/s)	$Q_{allowable}$ (L/s)	Q_{stored} (L/s)	V_{stored} (m^3)
10	76.8	52.48	52.48	0.00	0.0
15	61.8	42.20	52.48	-10.28	-9.2
20	52.0	35.55	52.48	-16.93	-20.3
25	45.2	30.86	52.48	-21.62	-32.4
30	40.0	27.36	52.48	-25.12	-45.2
35	36.1	24.64	52.48	-27.84	-58.5
40	32.9	22.45	52.48	-30.03	-72.1
45	30.2	20.66	52.48	-31.82	-85.9
50	28.0	19.16	52.48	-33.32	-100.0
55	26.2	17.88	52.48	-34.60	-114.2
60	24.6	16.78	52.48	-35.70	-128.5

ICD-2 - Rational Method 5 Year Storage Requirements Calculation

Time (min.)	Intensity (mm/hr)	Q_{actual} (L/s)	$Q_{allowable}$ (L/s)	Q_{stored} (L/s)	V_{stored} (m^3)
10	104.2	81.89	54.40	27.49	16.5
15	83.6	65.67	54.40	11.27	10.1
20	70.3	55.21	54.40	0.81	1.0
25	60.9	47.86	54.40	-6.54	-9.8
30	53.9	42.38	54.40	-12.02	-21.6
35	48.5	38.13	54.40	-16.27	-34.2
40	44.2	34.73	54.40	-19.67	-47.2
45	40.6	31.93	54.40	-22.47	-60.7
50	37.7	29.59	54.40	-24.81	-74.4
55	35.1	27.60	54.40	-26.80	-88.4
60	32.9	25.89	54.40	-28.51	-102.6

ICD-2 - Rational Method 100 Year Storage Requirements Calculation

Time (min.)	Intensity (mm/hr)	Q_{actual} (L/s)	$Q_{allowable}$ (L/s)	Q_{stored} (L/s)	V_{stored} (m^3)
10	178.6	140.33	55.30	85.03	51.0
15	142.9	112.30	55.30	57.00	51.3
20	120.0	94.27	55.30	38.97	46.8
25	103.8	81.62	55.30	26.32	39.5
30	91.9	72.20	55.30	16.90	30.4
35	82.6	64.90	55.30	9.60	20.2
40	75.1	59.06	55.30	3.76	9.0
45	69.1	54.27	55.30	-1.03	-2.8
50	64.0	50.26	55.30	-5.04	-15.1
55	59.6	46.86	55.30	-8.44	-27.9
60	55.9	43.93	55.30	-11.37	-40.9

ICD-2 - Stage-Storage Table

Elevation (m)	Incremental Depth (m)	Total Depth (m)	Cumulative Volume CB-2 (m^3)					Total Volume (m^3)	Orifice Head (m)	Orifice Flow (L/s)	Rainfall Event
93.75	0.00	0.00	0.00					0.0	2.15	52.5	2 Yr
93.76	0.01	0.01	0.00					0.0	2.16	52.6	
93.77	0.01	0.02	0.03					0.0	2.17	52.7	
93.78	0.01	0.03	0.11					0.1	2.18	52.8	
93.79	0.01	0.04	0.28					0.3	2.19	53.0	
93.80	0.01	0.05	0.54					0.5	2.20	53.1	
93.81	0.01	0.06	0.95					1.0	2.21	53.2	
93.82	0.01	0.07	1.50					1.5	2.22	53.3	
93.83	0.01	0.08	2.25					2.3	2.23	53.4	
93.84	0.01	0.09	3.20					3.2	2.24	53.6	
93.85	0.01	0.10	4.40					4.4	2.25	53.7	
93.86	0.01	0.11	5.86					5.9	2.26	53.8	
93.87	0.01	0.12	7.60					7.6	2.27	53.9	
93.88	0.01	0.13	9.67					9.7	2.28	54.0	
93.89	0.01	0.14	12.08					12.1	2.29	54.2	
93.90	0.01	0.15	14.86					14.9	2.30	54.3	
93.91	0.01	0.16	18.00					18.0	2.31	54.4	5 Yr
93.92	0.01	0.17	21.50					21.5	2.32	54.5	
93.93	0.01	0.18	25.38					25.4	2.33	54.6	
93.94	0.01	0.19	29.66					29.7	2.34	54.7	
93.95	0.01	0.20	34.32					34.3	2.35	54.9	
93.96	0.01	0.21	39.38					39.4	2.36	55.0	
93.97	0.01	0.22	44.82					44.8	2.37	55.1	
93.98	0.01	0.23	50.68					50.7	2.38	55.2	
93.99	0.01	0.24	56.96					57.0	2.39	55.3	100 Yr
94.00	0.01	0.25	63.69					63.7	2.40	55.4	
94.01	0.01	0.26	70.87					70.9	2.41	55.6	
94.02	0.01	0.27	78.53					78.5	2.42	55.7	
94.03	0.01	0.28	86.66					86.7	2.43	55.8	
94.04	0.01	0.29	95.27					95.27	2.44	55.9	

Orifice Sizing

Elevation (m)	Outlet Structure	Pipe Diameter (mm)	Pipe Invert (m)	Area (m2)	Area (mm2)	Orifice Diameter (mm)	100 Yr Orifice Head (m)
	CB-2	300.00	91.45	0.01	13246.32	130	2.39
93.75							
93.76							
93.77							
93.78							
93.79							
93.80							
93.81							
93.82							
93.83							
93.84							
93.85							
93.86							
93.87							
93.88							
93.89							
93.90							
93.91							
93.92							
93.93							
93.94							
93.95							
93.96							
93.97							
93.98							
93.99							
94.00							
94.01							
94.02							
94.03							
94.04							

$$Q\ (cms) = 0.61 * A * \sqrt{2 * g * H}$$

Where Q = release rate in cms
0.61 = coefficient
A = Area of the orifice (m2)
g = gravitational constant (9.81 m/s2)
H = Head above centerline of orifice (m). if orifice is not submerged.

24-5128A New Half Moon Bay Secondary School
Appendix B-5: ICD-3 Calculations
ICD-3

Upstream Structure	Subcatchment	Area (ha)	C <10yr	C 100yr	Rim. Elev. (m)	$Q_{allowable}$ (L/s) 2Yr	5 Yr	100 Yr	Storage Requirements 2 Yr (m^3)	5 Yr (m^3)	100 Yr (m^3)	100 Yr Ponding Elev. (m)	Spill Elev. (m)	100 Yr Ponding Depth (m)
CBMH-1	B3	0.114	0.79	0.88	93.83									
CBMH-2	B4	0.080	0.80	0.89	93.87									
CB-5	B5	0.112	0.80	0.89	93.90									
ICD-3 Total		0.305	0.79	0.89	93.83	114.40	114.4	117.1	-37.6	-21.6	10.42	93.96	93.960	0.13

Stage below ponding (m)
93.94

ICD-3 - Rational Method 2 Year Storage Requirements Calculation

Time (min.)	Intensity (mm/hr)	Q_{actual} (L/s)	$Q_{allowable}$ (L/s)	Q_{stored} (L/s)	V_{stored} (m^3)
10	76.8	51.81	114.40	-62.59	-37.6
15	61.8	41.67	114.40	-72.73	-65.5
20	52.0	35.10	114.40	-79.30	-95.2
25	45.2	30.47	114.40	-83.93	-125.9
30	40.0	27.01	114.40	-87.39	-157.3
35	36.1	24.32	114.40	-90.08	-189.2
40	32.9	22.17	114.40	-92.23	-221.4
45	30.2	20.40	114.40	-94.00	-253.8
50	28.0	18.92	114.40	-95.48	-286.5
55	26.2	17.65	114.40	-96.75	-319.3
60	24.6	16.57	114.40	-97.83	-352.2

ICD-3 - Rational Method 5 Year Storage Requirements Calculation

Time (min.)	Intensity (mm/hr)	Q_{actual} (L/s)	$Q_{allowable}$ (L/s)	Q_{stored} (L/s)	V_{stored} (m^3)
10	104.2	78.46	114.40	-35.94	-21.6
15	83.6	62.92	114.40	-51.48	-46.3
20	70.3	52.90	114.40	-61.50	-73.8
25	60.9	45.86	114.40	-68.54	-102.8
30	53.9	40.61	114.40	-73.79	-132.8
35	48.5	36.54	114.40	-77.86	-163.5
40	44.2	33.27	114.40	-81.13	-194.7
45	40.6	30.60	114.40	-83.80	-226.3
50	37.7	28.35	114.40	-86.05	-258.1
55	35.1	26.45	114.40	-87.95	-290.2
60	32.9	24.81	114.40	-89.59	-322.5

ICD-3 - Rational Method 100 Year Storage Requirements Calculation

Time (min.)	Intensity (mm/hr)	Q_{actual} (L/s)	$Q_{allowable}$ (L/s)	Q_{stored} (L/s)	V_{stored} (m^3)
10	178.6	134.46	117.10	17.36	10.4
15	142.9	107.61	117.10	-9.49	-8.5
20	120.0	90.33	117.10	-26.77	-32.1
25	103.8	78.20	117.10	-38.90	-58.3
30	91.9	69.18	117.10	-47.92	-86.3
35	82.6	62.19	117.10	-54.91	-115.3
40	75.1	56.59	117.10	-60.51	-145.2
45	69.1	52.00	117.10	-65.10	-175.8
50	64.0	48.16	117.10	-68.94	-206.8
55	59.6	44.90	117.10	-72.20	-238.3
60	55.9	42.09	117.10	-75.01	-270.0

ICD-3 - Stage-Storage Table

Elevation (m)	Incremental Depth (m)	Total Depth (m)	Cumulative Volume CB-5 (m^3)	CBMH-2 (m^3)	CBMH-1 (m^3)			Total Volume (m^3)	Orifice Head (m)	Orifice Flow (L/s)	Rainfall Event
93.83	0.00	0.00	0.00	0.00	0.00			0.0	2.61	114.5	2 Yr, 5 Yr
93.84	0.01	0.01	0.00	0.00	0.00			0.0	2.62	114.7	
93.85	0.01	0.02	0.00	0.00	0.03			0.0	2.63	114.9	
93.86	0.01	0.03	0.00	0.00	0.11			0.1	2.64	115.2	
93.87	0.01	0.04	0.00	0.00	0.27			0.3	2.65	115.4	
93.88	0.01	0.05	0.00	0.00	0.54			0.5	2.66	115.6	
93.89	0.01	0.06	0.00	0.03	0.93			1.0	2.67	115.8	
93.90	0.01	0.07	0.00	0.12	1.48			1.6	2.68	116.0	
93.91	0.01	0.08	0.00	0.30	2.21			2.5	2.69	116.2	
93.92	0.01	0.09	0.04	0.59	3.15			3.8	2.70	116.5	
93.93	0.01	0.10	0.13	1.02	4.32			5.5	2.71	116.7	
93.94	0.01	0.11	0.32	1.61	5.75			7.7	2.72	116.9	
93.95	0.01	0.12	0.63	2.36	7.47			10.46	2.73	117.1	100 Yr

Orifice Sizing

Elevation (m)	Outlet Structure	Pipe Diameter (mm)	Pipe Invert (m)	Area (m2)	Area (mm2)	Orifice Diameter (mm)	100 Yr Orifice Head (m)
	CBMH-1	300.00	91.07	0.03	26210.68	183	2.73
93.83							
93.84							
93.85							
93.86							
93.87							
93.88							
93.89							
93.90							
93.91							
93.92							
93.93							
93.94							
93.95							

$$Q\ (cms) = 0.61 * A * \sqrt{2 * g * H}$$

Where Q = release rate in cms
0.61 = coefficient
A = Area of the orifice (m2)
g = gravitational constant (9.81 m/s2)
H = Head above centerline of orifice (m). if orifice is not submerged.

24-5128A New Half Moon Bay Secondary School
Appendix B-6: ICD-4 Calculations
ICD-4

Upstream Structure	Subcatchment	Area (ha)	C <10yr	C 100yr	Rim. Elev. (m)	$Q_{allowable}$ (L/s) 2Yr	5 Yr	100 Yr	Storage Requirements 2 Yr (m^3)	5 Yr (m^3)	100 Yr (m^3)	100 Yr Ponding Elev. (m)	Spill Elev. (m)	100 Yr Ponding Depth (m)
CB-3	B6	0.213	0.64	0.72	93.93									
ICD-4 Total		0.213	0.64	0.72	93.93	29.10	29.9	30.2	0.0	8.8	27.7	94.11	94.180	0.18

Stage below ponding (m)
94.09

ICD-4 - Rational Method 2 Year Storage Requirements Calculation

Time (min.)	Intensity (mm/hr)	Q_{actual} (L/s)	$Q_{allowable}$ (L/s)	Q_{stored} (L/s)	V_{stored} (m^3)
10	76.8	29.10	29.10	0.00	0.0
15	61.8	23.40	29.10	-5.70	-5.1
20	52.0	19.71	29.10	-9.39	-11.3
25	45.2	17.11	29.10	-11.99	-18.0
30	40.0	15.17	29.10	-13.93	-25.1
35	36.1	13.66	29.10	-15.44	-32.4
40	32.9	12.45	29.10	-16.65	-40.0
45	30.2	11.46	29.10	-17.64	-47.6
50	28.0	10.62	29.10	-18.48	-55.4
55	26.2	9.92	29.10	-19.18	-63.3
60	24.6	9.30	29.10	-19.80	-71.3

ICD-4 - Rational Method 5 Year Storage Requirements Calculation

Time (min.)	Intensity (mm/hr)	Q_{actual} (L/s)	$Q_{allowable}$ (L/s)	Q_{stored} (L/s)	V_{stored} (m^3)
10	104.2	44.50	29.90	14.60	8.8
15	83.6	35.69	29.90	5.79	5.2
20	70.3	30.00	29.90	0.10	0.1
25	60.9	26.01	29.90	-3.89	-5.8
30	53.9	23.03	29.90	-6.87	-12.4
35	48.5	20.72	29.90	-9.18	-19.3
40	44.2	18.87	29.90	-11.03	-26.5
45	40.6	17.35	29.90	-12.55	-33.9
50	37.7	16.08	29.90	-13.82	-41.5
55	35.1	15.00	29.90	-14.90	-49.2
60	32.9	14.07	29.90	-15.83	-57.0

ICD-4 - Rational Method 100 Year Storage Requirements Calculation

Time (min.)	Intensity (mm/hr)	Q_{actual} (L/s)	$Q_{allowable}$ (L/s)	Q_{stored} (L/s)	V_{stored} (m^3)
10	178.6	76.26	30.20	46.06	27.6
15	142.9	61.03	30.20	30.83	27.7
20	120.0	51.23	30.20	21.03	25.2
25	103.8	44.35	30.20	14.15	21.2
30	91.9	39.24	30.20	9.04	16.3
35	82.6	35.27	30.20	5.07	10.6
40	75.1	32.09	30.20	1.89	4.5
45	69.1	29.49	30.20	-0.71	-1.9
50	64.0	27.31	30.20	-2.89	-8.7
55	59.6	25.46	30.20	-4.74	-15.6
60	55.9	23.87	30.20	-6.33	-22.8

ICD-4 - Stage-Storage Table

Elevation (m)	Incremental Depth (m)	Total Depth (m)	Cumulative Volume CB-3 (m^3)					Total Volume (m^3)	Orifice Head (m)	Orifice Flow (L/s)	Rainfall Event
93.93	0.00	0.00	0.00					0.0	2.13	29.1	2 Yr
93.94	0.01	0.01	0.00					0.0	2.14	29.2	
93.95	0.01	0.02	0.04					0.0	2.15	29.2	
93.96	0.01	0.03	0.15					0.2	2.16	29.3	
93.97	0.01	0.04	0.37					0.4	2.17	29.4	
93.98	0.01	0.05	0.73					0.7	2.18	29.4	
93.99	0.01	0.06	1.27					1.3	2.19	29.5	
94.00	0.01	0.07	2.02					2.0	2.20	29.6	
94.01	0.01	0.08	3.02					3.0	2.21	29.6	
94.02	0.01	0.09	4.30					4.3	2.22	29.7	
94.03	0.01	0.10	5.90					5.9	2.23	29.8	
94.04	0.01	0.11	7.86					7.9	2.24	29.8	
94.05	0.01	0.12	10.20					10.2	2.25	29.9	5 Yr
94.06	0.01	0.13	12.96					13.0	2.26	30.0	
94.07	0.01	0.14	16.18					16.2	2.27	30.0	
94.08	0.01	0.15	19.88					19.9	2.28	30.1	
94.09	0.01	0.16	24.11					24.1	2.29	30.2	
94.10	0.01	0.17	28.88					28.9	2.30	30.2	100 Yr
94.11	0.01	0.18	34.24					34.2	2.31	30.3	
94.12	0.01	0.19	40.20					40.2	2.32	30.4	
94.13	0.01	0.20	46.79					46.8	2.33	30.4	
94.14	0.01	0.21	54.04					54.0	2.34	30.5	
94.15	0.01	0.22	61.97					62.0	2.35	30.6	
94.16	0.01	0.23	70.59					70.6	2.36	30.6	
94.17	0.01	0.24	79.86					79.9	2.37	30.7	
94.18	0.01	0.25	89.73					89.73	2.38	30.8	

Orifice Sizing

Elevation (m)	Outlet Structure	Pipe Diameter (mm)	Pipe Invert (m)	Area (m2)	Area (mm2)	Orifice Diameter (mm)	100 Yr Orifice Head (m)
	CB-3	250.00	91.68	0.01	7388.12	97	2.30
93.93							
93.94							
93.95							
93.96							
93.97							
93.98							
93.99							
94.00							
94.01							
94.02							
94.03							
94.04							
94.05							
94.06							
94.07							
94.08							
94.09							
94.10							
94.11							
94.12							
94.13							
94.14							
94.15							
94.16							
94.17							
94.18							

$$Q\ (cms) = 0.61 * A * \sqrt{2 * g * H}$$

Where Q = release rate in cms
0.61 = coefficient
A = Area of the orifice (m2)
g = gravitational constant (9.81 m/s2)
H = Head above centerline of orifice (m). if orifice is not submerged.

24-5128A New Half Moon Bay Secondary School
Appendix B-7: ICD-5 Calculations
ICD-5

Upstream Structure	Subcatchment	Area (ha)	C <10yr	C 100yr	Rim. Elev. (m)	$Q_{allowable}$ (L/s) 2Yr	5 Yr	100 Yr	Storage Requirements 2 Yr (m^3)	5 Yr (m^3)	100 Yr (m^3)	100 Yr Ponding Elev. (m)	Spill Elev. (m)	100 Yr Ponding Depth (m)
CB-4	B7	0.535	0.57	0.65	93.90									
ICD-5 Total		0.535	0.57	0.65	93.90	65.37	68.0	69.1	0.0	19.5	61.9	94.16	94.200	0.26

Stage below ponding (m)
94.15

ICD-5 - Rational Method 2 Year Storage Requirements Calculation

Time (min.)	Intensity (mm/hr)	Q_{actual} (L/s)	$Q_{allowable}$ (L/s)	Q_{stored} (L/s)	V_{stored} (m^3)
10	76.8	65.37	65.37	0.00	0.0
15	61.8	52.57	65.37	-12.80	-11.5
20	52.0	44.29	65.37	-21.08	-25.3
25	45.2	38.44	65.37	-26.93	-40.4
30	40.0	34.08	65.37	-31.29	-56.3
35	36.1	30.69	65.37	-34.68	-72.8
40	32.9	27.97	65.37	-37.40	-89.8
45	30.2	25.74	65.37	-39.63	-107.0
50	28.0	23.87	65.37	-41.50	-124.5
55	26.2	22.28	65.37	-43.09	-142.2
60	24.6	20.90	65.37	-44.47	-160.1

ICD-5 - Rational Method 5 Year Storage Requirements Calculation

Time (min.)	Intensity (mm/hr)	Q_{actual} (L/s)	$Q_{allowable}$ (L/s)	Q_{stored} (L/s)	V_{stored} (m^3)
10	104.2	100.55	68.00	32.55	19.5
15	83.6	80.64	68.00	12.64	11.4
20	70.3	67.80	68.00	-0.20	-0.2
25	60.9	58.77	68.00	-9.23	-13.8
30	53.9	52.04	68.00	-15.96	-28.7
35	48.5	46.82	68.00	-21.18	-44.5
40	44.2	42.64	68.00	-25.36	-60.9
45	40.6	39.21	68.00	-28.79	-77.7
50	37.7	36.34	68.00	-31.66	-95.0
55	35.1	33.90	68.00	-34.10	-112.5
60	32.9	31.79	68.00	-36.21	-130.3

ICD-5 - Rational Method 100 Year Storage Requirements Calculation

Time (min.)	Intensity (mm/hr)	Q_{actual} (L/s)	$Q_{allowable}$ (L/s)	Q_{stored} (L/s)	V_{stored} (m^3)
10	178.6	172.32	69.10	103.22	61.9
15	142.9	137.90	69.10	68.80	61.9
20	120.0	115.76	69.10	46.66	56.0
25	103.8	100.22	69.10	31.12	46.7
30	91.9	88.66	69.10	19.56	35.2
35	82.6	79.69	69.10	10.59	22.2
40	75.1	72.52	69.10	3.42	8.2
45	69.1	66.64	69.10	-2.46	-6.6
50	64.0	61.72	69.10	-7.38	-22.1
55	59.6	57.54	69.10	-11.56	-38.1
60	55.9	53.94	69.10	-15.16	-54.6

ICD-5 - Stage-Storage Table

Elevation (m)	Incremental Depth (m)	Total Depth (m)	Cumulative Volume CB-4 (m^3)					Total Volume (m^3)	Orifice Head (m)	Orifice Flow (L/s)	Rainfall Event
93.90	0.00	0.00	0.00					0.0	2.23	65.4	2 Yr
93.91	0.01	0.01	0.00					0.0	2.24	65.5	
93.92	0.01	0.02	0.03					0.0	2.25	65.7	
93.93	0.01	0.03	0.10					0.1	2.26	65.8	
93.94	0.01	0.04	0.25					0.3	2.27	66.0	
93.95	0.01	0.05	0.49					0.5	2.28	66.1	
93.96	0.01	0.06	0.85					0.9	2.29	66.2	
93.97	0.01	0.07	1.35					1.4	2.30	66.4	
93.98	0.01	0.08	2.01					2.0	2.31	66.5	
93.99	0.01	0.09	2.86					2.9	2.32	66.7	
94.00	0.01	0.10	3.93					3.9	2.33	66.8	
94.01	0.01	0.11	5.23					5.2	2.34	67.0	
94.02	0.01	0.12	6.80					6.8	2.35	67.1	
94.03	0.01	0.13	8.64					8.6	2.36	67.3	
94.04	0.01	0.14	10.80					10.8	2.37	67.4	
94.05	0.01	0.15	13.28					13.3	2.38	67.5	
94.06	0.01	0.16	16.12					16.1	2.39	67.7	
94.07	0.01	0.17	19.34					19.3	2.40	67.8	
94.08	0.01	0.18	22.96					23.0	2.41	68.0	5 Yr
94.09	0.01	0.19	27.00					27.0	2.42	68.1	
94.10	0.01	0.20	31.48					31.5	2.43	68.2	
94.11	0.01	0.21	36.43					36.4	2.44	68.4	
94.12	0.01	0.22	41.86					41.9	2.45	68.5	
94.13	0.01	0.23	47.77					47.8	2.46	68.7	
94.14	0.01	0.24	54.16					54.2	2.47	68.8	
94.15	0.01	0.25	61.02					61.0	2.48	68.9	
94.16	0.01	0.26	68.31					68.3	2.49	69.1	100 Yr
94.17	0.01	0.27	76.01					76.0	2.50	69.2	
94.18	0.01	0.28	84.16					84.2	2.51	69.4	
94.19	0.01	0.29	92.75					92.8	2.52	69.5	
94.20	0.01	0.30	101.76					101.76	2.53	69.6	

Orifice Sizing

Elevation (m)	Outlet Structure	Pipe Diameter (mm)	Pipe Invert (m)	Area (m2)	Area (mm2)	Orifice Diameter (mm)	100 Yr Orifice Head (m)
	CB-4	300.00	91.525	0.02	16219.38	144	2.50
93.90							
93.91							
93.92							
93.93							
93.94							
93.95							
93.96							
93.97							
93.98							
93.99							
94.00							
94.01							
94.02							
94.03							
94.04							
94.05							
94.06							
94.07							
94.08							
94.09							
94.10							
94.11							
94.12							
94.13							
94.14							
94.15							
94.16							
94.17							
94.18							
94.19							
94.20							

$$Q\ (cms) = 0.61 * A * \sqrt{2 * g * H}$$

Where Q = release rate in cms
0.61 = coefficient
A = Area of the orifice (m2)
g = gravitational constant (9.81 m/s2)
H = Head above centerline of orifice (m). if orifice is not submerged.

24-5128A New Half Moon Bay Secondary School
Appendix B-8: ICD-6 Calculations
ICD-6

Upstream Structure	Subcatchment	Area (ha)	C <10yr	C 100yr	Rim. Elev. (m)	$Q_{allowable}$ (L/s) 2Yr	5 Yr	100 Yr	Storage Requirements 2 Yr (m^3)	5 Yr (m^3)	100 Yr (m^3)	100 Yr Ponding Elev. (m)	Spill Elev. (m)	100 Yr Ponding Depth (m)
CB-6	B8	0.255	0.89	0.99	94.37									
ICD-6 Total		0.255	0.89	0.99	94.37	48.48	50.6	51.5	0.0	13.5	44.3	94.65	94.840	0.28

Stage below ponding (m)
94.64

ICD-6 - Rational Method 2 Year Storage Requirements Calculation

Time (min.)	Intensity (mm/hr)	Q_{actual} (L/s)	$Q_{allowable}$ (L/s)	Q_{stored} (L/s)	V_{stored} (m^3)
10	76.8	48.48	48.48	0.00	0.0
15	61.8	38.99	48.48	-9.49	-8.5
20	52.0	32.84	48.48	-15.64	-18.8
25	45.2	28.51	48.48	-19.97	-30.0
30	40.0	25.28	48.48	-23.20	-41.8
35	36.1	22.76	48.48	-25.72	-54.0
40	32.9	20.74	48.48	-27.74	-66.6
45	30.2	19.09	48.48	-29.39	-79.4
50	28.0	17.70	48.48	-30.78	-92.3
55	26.2	16.52	48.48	-31.96	-105.5
60	24.6	15.50	48.48	-32.98	-118.7

ICD-6 - Rational Method 5 Year Storage Requirements Calculation

Time (min.)	Intensity (mm/hr)	Q_{actual} (L/s)	$Q_{allowable}$ (L/s)	Q_{stored} (L/s)	V_{stored} (m^3)
10	104.2	73.10	50.60	22.50	13.5
15	83.6	58.62	50.60	8.02	7.2
20	70.3	49.29	50.60	-1.31	-1.6
25	60.9	42.73	50.60	-7.87	-11.8
30	53.9	37.84	50.60	-12.76	-23.0
35	48.5	34.04	50.60	-16.56	-34.8
40	44.2	31.00	50.60	-19.60	-47.0
45	40.6	28.51	50.60	-22.09	-59.7
50	37.7	26.42	50.60	-24.18	-72.5
55	35.1	24.64	50.60	-25.96	-85.7
60	32.9	23.11	50.60	-27.49	-99.0

ICD-6 - Rational Method 100 Year Storage Requirements Calculation

Time (min.)	Intensity (mm/hr)	Q_{actual} (L/s)	$Q_{allowable}$ (L/s)	Q_{stored} (L/s)	V_{stored} (m^3)
10	178.6	125.28	51.50	73.78	44.3
15	142.9	100.26	51.50	48.76	43.9
20	120.0	84.16	51.50	32.66	39.2
25	103.8	72.86	51.50	21.36	32.0
30	91.9	64.46	51.50	12.96	23.3
35	82.6	57.94	51.50	6.44	13.5
40	75.1	52.72	51.50	1.22	2.9
45	69.1	48.45	51.50	-3.05	-8.2
50	64.0	44.87	51.50	-6.63	-19.9
55	59.6	41.83	51.50	-9.67	-31.9
60	55.9	39.22	51.50	-12.28	-44.2

ICD-6 - Stage-Storage Table

Elevation (m)	Incremental Depth (m)	Total Depth (m)	Cumulative Volume CB-6 (m^3)					Total Volume (m^3)	Orifice Head (m)	Orifice Flow (L/s)	Rainfall Event
94.37	0.00	0.00	0.00					0.0	2.15	48.5	2 Yr
94.38	0.01	0.01	0.00					0.0	2.16	48.6	
94.39	0.01	0.02	0.01					0.0	2.17	48.7	
94.40	0.01	0.03	0.06					0.1	2.18	48.8	
94.41	0.01	0.04	0.14					0.1	2.19	48.9	
94.42	0.01	0.05	0.27					0.3	2.20	49.0	
94.43	0.01	0.06	0.46					0.5	2.21	49.2	
94.44	0.01	0.07	0.74					0.7	2.22	49.3	
94.45	0.01	0.08	1.10					1.1	2.23	49.4	
94.46	0.01	0.09	1.57					1.6	2.24	49.5	
94.47	0.01	0.10	2.15					2.2	2.25	49.6	
94.48	0.01	0.11	2.86					2.9	2.26	49.7	
94.49	0.01	0.12	3.72					3.7	2.27	49.8	
94.50	0.01	0.13	4.73					4.7	2.28	49.9	
94.51	0.01	0.14	5.91					5.9	2.29	50.0	
94.52	0.01	0.15	7.27					7.3	2.30	50.1	
94.53	0.01	0.16	8.82					8.8	2.31	50.3	
94.54	0.01	0.17	10.58					10.6	2.32	50.4	
94.55	0.01	0.18	12.56					12.6	2.33	50.5	
94.56	0.01	0.19	14.77					14.8	2.34	50.6	5 Yr
94.57	0.01	0.20	17.23					17.2	2.35	50.7	
94.58	0.01	0.21	19.95					20.0	2.36	50.8	
94.59	0.01	0.22	22.94					22.9	2.37	50.9	
94.60	0.01	0.23	26.21					26.2	2.38	51.0	
94.61	0.01	0.24	29.78					29.8	2.39	51.1	
94.62	0.01	0.25	33.65					33.7	2.40	51.2	
94.63	0.01	0.26	37.85					37.9	2.41	51.3	
94.64	0.01	0.27	42.38					42.4	2.42	51.4	
94.65	0.01	0.28	47.26					47.3	2.43	51.5	100 Yr
94.66	0.01	0.29	52.50					52.5	2.44	51.6	
94.67	0.01	0.30	58.11					58.1	2.45	51.8	
94.68	0.01	0.31	64.11					64.1	2.46	51.9	
94.69	0.01	0.32	70.50					70.5	2.47	52.0	
94.70	0.01	0.33	77.31					77.3	2.48	52.1	
94.71	0.01	0.34	84.53					84.5	2.49	52.2	
94.72	0.01	0.35	92.19					92.2	2.50	52.3	
94.73	0.01	0.36	100.29					100.3	2.51	52.4	
94.74	0.01	0.37	108.86					108.9	2.52	52.5	
94.75	0.01	0.38	117.89					117.9	2.53	52.6	
94.76	0.01	0.39	127.40					127.4	2.54	52.7	
94.77	0.01	0.40	137.42					137.4	2.55	52.8	
94.78	0.01	0.41	147.94					147.9	2.56	52.9	
94.79	0.01	0.42	158.98					159.0	2.57	53.0	
94.80	0.01	0.43	170.55					170.6	2.58	53.1	
94.81	0.01	0.44	182.67					182.7	2.59	53.2	
94.82	0.01	0.45	195.34					195.3	2.60	53.3	
94.83	0.01	0.46	208.59					208.6	2.61	53.4	
94.84	0.01	0.47	222.42					222.42	2.62	53.5	

Orifice Sizing

Elevation (m)	Outlet Structure	Pipe Diameter (mm)	Pipe Invert (m)	Area (m2)	Area (mm2)	Orifice Diameter (mm)	100 Yr Orifice Head (m)
	CB-6	300.00	92.070	0.01	12236.69	125	2.43
94.37							
94.38							
94.39							
94.40							
94.41							
94.42							
94.43							
94.44							
94.45							
94.46							
94.47							
94.48							
94.49							
94.50							
94.51							
94.52							
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94.56							
94.57							
94.58							
94.59							
94.60							
94.61							
94.62							
94.63							
94.64							
94.65							
94.66							
94.67							
94.68							
94.69							
94.70							
94.71							
94.72							
94.73							
94.74							
94.75							
94.76							
94.77							
94.78							
94.79							
94.80							
94.81							
94.82							
94.83							
94.84							

$$Q\ (cms) = 0.61 * A * \sqrt{2 * g * H}$$

Where Q = release rate in cms
0.61 = coefficient
A = Area of the orifice (m2)
g = gravitational constant (9.81 m/s2)
H = Head above centerline of orifice (m). if orifice is not submerged.

24-5128A New Half Moon Bay Secondary School
Appendix B-9: ICD-7 Calculations
ICD-7

Upstream Structure	Subcatchment	Area (ha)	C <10yr	C 100yr	Rim. Elev. (m)	$Q_{allowable}$ (L/s) 2Yr	5 Yr	100 Yr	Storage Requirements 2 Yr (m^3)	5 Yr (m^3)	100 Yr (m^3)	100 Yr Ponding Elev. (m)	Spill Elev. (m)	100 Yr Ponding Depth (m)
CB-7	B9	0.595	0.27	0.32	94.28									
ICD-7 Total		0.595	0.27	0.32	94.28	33.69	35.0	35.6	0.0	12.1	36.0	94.48	94.680	0.20

Stage below ponding (m)
94.47

ICD-7 - Rational Method 2 Year Storage Requirements Calculation

Time (min.)	Intensity (mm/hr)	Q_{actual} (L/s)	$Q_{allowable}$ (L/s)	Q_{stored} (L/s)	V_{stored} (m^3)
10	76.8	33.69	33.69	0.00	0.0
15	61.8	27.10	33.69	-6.59	-5.9
20	52.0	22.83	33.69	-10.86	-13.0
25	45.2	19.81	33.69	-13.88	-20.8
30	40.0	17.57	33.69	-16.12	-29.0
35	36.1	15.82	33.69	-17.87	-37.5
40	32.9	14.42	33.69	-19.27	-46.3
45	30.2	13.27	33.69	-20.42	-55.1
50	28.0	12.30	33.69	-21.39	-64.2
55	26.2	11.48	33.69	-22.21	-73.3
60	24.6	10.77	33.69	-22.92	-82.5

ICD-7 - Rational Method 5 Year Storage Requirements Calculation

Time (min.)	Intensity (mm/hr)	Q_{actual} (L/s)	$Q_{allowable}$ (L/s)	Q_{stored} (L/s)	V_{stored} (m^3)
10	104.2	55.13	35.00	20.13	12.1
15	83.6	44.21	35.00	9.21	8.3
20	70.3	37.17	35.00	2.17	2.6
25	60.9	32.22	35.00	-2.78	-4.2
30	53.9	28.53	35.00	-6.47	-11.6
35	48.5	25.67	35.00	-9.33	-19.6
40	44.2	23.38	35.00	-11.62	-27.9
45	40.6	21.50	35.00	-13.50	-36.5
50	37.7	19.92	35.00	-15.08	-45.2
55	35.1	18.58	35.00	-16.42	-54.2
60	32.9	17.43	35.00	-17.57	-63.3

ICD-7 - Rational Method 100 Year Storage Requirements Calculation

Time (min.)	Intensity (mm/hr)	Q_{actual} (L/s)	$Q_{allowable}$ (L/s)	Q_{stored} (L/s)	V_{stored} (m^3)
10	178.6	94.48	35.60	58.88	35.3
15	142.9	75.61	35.60	40.01	36.0
20	120.0	63.47	35.60	27.87	33.4
25	103.8	54.95	35.60	19.35	29.0
30	91.9	48.61	35.60	13.01	23.4
35	82.6	43.69	35.60	8.09	17.0
40	75.1	39.76	35.60	4.16	10.0
45	69.1	36.53	35.60	0.93	2.5
50	64.0	33.84	35.60	-1.76	-5.3
55	59.6	31.55	35.60	-4.05	-13.4
60	55.9	29.57	35.60	-6.03	-21.7

ICD-7 - Stage-Storage Table

Elevation (m)	Incremental Depth (m)	Total Depth (m)	Cumulative Volume CB-7 (m^3)					Total Volume (m^3)	Orifice Head (m)	Orifice Flow (L/s)	Rainfall Event
94.28	0.00	0.00	0.00					0.0	1.70	33.7	2 Yr
94.29	0.01	0.01	0.00					0.0	1.71	33.8	
94.30	0.01	0.02	0.04					0.0	1.72	33.9	
94.31	0.01	0.03	0.13					0.1	1.73	34.0	
94.32	0.01	0.04	0.32					0.3	1.74	34.1	
94.33	0.01	0.05	0.63					0.6	1.75	34.2	
94.34	0.01	0.06	1.10					1.1	1.76	34.3	
94.35	0.01	0.07	1.75					1.8	1.77	34.4	
94.36	0.01	0.08	2.61					2.6	1.78	34.5	
94.37	0.01	0.09	3.72					3.7	1.79	34.6	
94.38	0.01	0.10	5.11					5.1	1.80	34.7	
94.39	0.01	0.11	6.80					6.8	1.81	34.8	
94.40	0.01	0.12	8.83					8.8	1.82	34.9	
94.41	0.01	0.13	11.22					11.2	1.83	35.0	
94.42	0.01	0.14	14.02					14.0	1.84	35.0	5 Yr
94.43	0.01	0.15	17.25					17.3	1.85	35.1	
94.44	0.01	0.16	20.93					20.9	1.86	35.2	
94.45	0.01	0.17	25.11					25.1	1.87	35.3	
94.46	0.01	0.18	29.81					29.8	1.88	35.4	
94.47	0.01	0.19	35.06					35.1	1.89	35.5	
94.48	0.01	0.20	40.89					40.9	1.90	35.6	100 Yr
94.49	0.01	0.21	47.34					47.3	1.91	35.7	
94.50	0.01	0.22	54.43					54.4	1.92	35.8	
94.51	0.01	0.23	62.18					62.2	1.93	35.9	
94.52	0.01	0.24	70.65					70.7	1.94	36.0	
94.53	0.01	0.25	79.84					79.8	1.95	36.1	
94.54	0.01	0.26	89.80					89.8	1.96	36.2	
94.55	0.01	0.27	100.55					100.6	1.97	36.3	
94.56	0.01	0.28	112.12					112.1	1.98	36.4	
94.57	0.01	0.29	124.55					124.6	1.99	36.4	
94.58	0.01	0.30	137.86					137.86	2.00	36.5	

Orifice Sizing

Elevation (m)	Outlet Structure	Pipe Diameter (mm)	Pipe Invert (m)	Area (m2)	Area (mm2)	Orifice Diameter (mm)	100 Yr Orifice Head (m)
	CB-7	250.00	92.451	0.01	9551.84	110	1.90
94.28							
94.29							
94.30							
94.31							
94.32							
94.33							
94.34							
94.35							
94.36							
94.37							
94.38							
94.39							
94.40							
94.41							
94.42							
94.43							
94.44							
94.45							
94.46							
94.47							
94.48							
94.49							
94.50							
94.51							
94.52							
94.53							
94.54							
94.55							
94.56							
94.57							
94.58							

$$Q\ (cms) = 0.61 * A * \sqrt{2 * g * H}$$

Where Q = release rate in cms
0.61 = coefficient
A = Area of the orifice (m2)
g = gravitational constant (9.81 m/s2)
H = Head above centerline of orifice (m). if orifice is not submerged.

24-5128A New Half Moon Bay Secondary School
Appendix B-10: ICD-8 Calculations
ICD-8

Upstream Structure	Subcatchment	Area (ha)	C <10yr	C 100yr	Rim. Elev. (m)	$Q_{allowable}$ (L/s) 2Yr	5 Yr	100 Yr	Storage Requirements 2 Yr (m^3)	5 Yr (m^3)	100 Yr (m^3)	100 Yr Ponding Elev. (m)	Spill Elev. (m)	100 Yr Ponding Depth (m)
CB-8	B10	0.510	0.31	0.37	94.35									
ICD-8 Total		0.510	0.31	0.37	94.35	33.82	35.5	36.2	0.0	11.4	34.6	94.56	94.750	0.21

Stage below ponding (m)
94.55

ICD-8 - Rational Method 2 Year Storage Requirements Calculation

Time (min.)	Intensity (mm/hr)	Q_{actual} (L/s)	$Q_{allowable}$ (L/s)	Q_{stored} (L/s)	V_{stored} (m^3)
10	76.8	33.82	33.82	0.00	0.0
15	61.8	27.20	33.82	-6.62	-6.0
20	52.0	22.91	33.82	-10.91	-13.1
25	45.2	19.89	33.82	-13.93	-20.9
30	40.0	17.63	33.82	-16.19	-29.1
35	36.1	15.88	33.82	-17.94	-37.7
40	32.9	14.47	33.82	-19.35	-46.4
45	30.2	13.31	33.82	-20.51	-55.4
50	28.0	12.35	33.82	-21.47	-64.4
55	26.2	11.52	33.82	-22.30	-73.6
60	24.6	10.81	33.82	-23.01	-82.8

ICD-8 - Rational Method 5 Year Storage Requirements Calculation

Time (min.)	Intensity (mm/hr)	Q_{actual} (L/s)	$Q_{allowable}$ (L/s)	Q_{stored} (L/s)	V_{stored} (m^3)
10	104.2	54.43	35.50	18.93	11.4
15	83.6	43.65	35.50	8.15	7.3
20	70.3	36.70	35.50	1.20	1.4
25	60.9	31.81	35.50	-3.69	-5.5
30	53.9	28.17	35.50	-7.33	-13.2
35	48.5	25.34	35.50	-10.16	-21.3
40	44.2	23.08	35.50	-12.42	-29.8
45	40.6	21.22	35.50	-14.28	-38.5
50	37.7	19.67	35.50	-15.83	-47.5
55	35.1	18.35	35.50	-17.15	-56.6
60	32.9	17.21	35.50	-18.29	-65.8

ICD-8 - Rational Method 100 Year Storage Requirements Calculation

Time (min.)	Intensity (mm/hr)	Q_{actual} (L/s)	$Q_{allowable}$ (L/s)	Q_{stored} (L/s)	V_{stored} (m^3)
10	178.6	93.28	36.20	57.08	34.2
15	142.9	74.65	36.20	38.45	34.6
20	120.0	62.66	36.20	26.46	31.8
25	103.8	54.25	36.20	18.05	27.1
30	91.9	47.99	36.20	11.79	21.2
35	82.6	43.14	36.20	6.94	14.6
40	75.1	39.25	36.20	3.05	7.3
45	69.1	36.07	36.20	-0.13	-0.3
50	64.0	33.41	36.20	-2.79	-8.4
55	59.6	31.15	36.20	-5.05	-16.7
60	55.9	29.20	36.20	-7.00	-25.2

ICD-8 - Stage-Storage Table

Elevation (m)	Incremental Depth (m)	Total Depth (m)	Cumulative Volume CB-8 (m^3)					Total Volume (m^3)	Orifice Head (m)	Orifice Flow (L/s)	Rainfall Event
94.35	0.00	0.00	0.00					0.0	1.46	33.8	2 Yr
94.36	0.01	0.01	0.00					0.0	1.47	33.9	
94.37	0.01	0.02	0.03					0.0	1.48	34.1	
94.38	0.01	0.03	0.11					0.1	1.49	34.2	
94.39	0.01	0.04	0.26					0.3	1.50	34.3	
94.40	0.01	0.05	0.51					0.5	1.51	34.4	
94.41	0.01	0.06	0.88					0.9	1.52	34.5	
94.42	0.01	0.07	1.39					1.4	1.53	34.6	
94.43	0.01	0.08	2.08					2.1	1.54	34.7	
94.44	0.01	0.09	2.97					3.0	1.55	34.8	
94.45	0.01	0.10	4.08					4.1	1.56	35.0	
94.46	0.01	0.11	5.43					5.4	1.57	35.1	
94.47	0.01	0.12	7.05					7.1	1.58	35.2	
94.48	0.01	0.13	8.96					9.0	1.59	35.3	
94.49	0.01	0.14	11.20					11.2	1.60	35.4	
94.50	0.01	0.15	13.77					13.8	1.61	35.5	5 Yr
94.51	0.01	0.16	16.72					16.7	1.62	35.6	
94.52	0.01	0.17	20.05					20.1	1.63	35.7	
94.53	0.01	0.18	23.80					23.8	1.64	35.8	
94.54	0.01	0.19	28.00					28.0	1.65	35.9	
94.55	0.01	0.20	32.65					32.7	1.66	36.1	
94.56	0.01	0.21	37.80					37.8	1.67	36.2	100 Yr
94.57	0.01	0.22	43.45					43.5	1.68	36.3	
94.58	0.01	0.23	49.65					49.7	1.69	36.4	
94.59	0.01	0.24	56.41					56.4	1.70	36.5	
94.60	0.01	0.25	63.75					63.8	1.71	36.6	
94.61	0.01	0.26	71.71					71.7	1.72	36.7	
94.62	0.01	0.27	80.30					80.3	1.73	36.8	
94.63	0.01	0.28	89.55					89.6	1.74	36.9	
94.64	0.01	0.29	99.48					99.5	1.75	37.0	
94.65	0.01	0.30	110.13					110.1	1.76	37.1	
94.66	0.01	0.31	121.50					121.5	1.77	37.2	
94.67	0.01	0.32	133.63					133.6	1.78	37.3	
94.68	0.01	0.33	146.55					146.6	1.79	37.4	
94.69	0.01	0.34	160.27					160.3	1.80	37.5	
94.70	0.01	0.35	174.81					174.8	1.81	37.6	
94.71	0.01	0.36	190.21					190.2	1.82	37.7	
94.72	0.01	0.37	206.49					206.5	1.83	37.9	
94.73	0.01	0.38	223.67					223.7	1.84	38.0	
94.74	0.01	0.39	241.77					241.8	1.85	38.1	
94.75	0.01	0.40	260.82					260.8	1.86	38.2	
94.76	0.01	0.41	280.84					280.8	1.87	38.3	
94.77	0.01	0.42	301.86					301.9	1.88	38.4	
94.78	0.01	0.43	323.89					323.9	1.89	38.5	
94.79	0.01	0.44	346.97					347.0	1.90	38.6	
94.80	0.01	0.45	371.12					371.1	1.91	38.7	
94.81	0.01	0.46	396.36					396.4	1.92	38.8	
94.82	0.01	0.47	422.71					422.7	1.93	38.9	
94.83	0.01	0.48	450.21					450.2	1.94	39.0	
94.84	0.01	0.49	478.86					478.9	1.95	39.1	
94.85	0.01	0.50	508.65					508.65	1.96	39.2	

Orifice Sizing

Elevation (m)	Outlet Structure	Pipe Diameter (mm)	Pipe Invert (m)	Area (m2)	Area (mm2)	Orifice Diameter (mm)	100 Yr Orifice Head (m)
	CB-8	250.00	92.761	0.01	10344.84	115	1.67
94.35							
94.36							
94.37							
94.38							
94.39							
94.40							
94.41							
94.42							
94.43							
94.44							
94.45							
94.46							
94.47							
94.48							
94.49							
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94.66							
94.67							
94.68							
94.69							
94.70							
94.71							
94.72							
94.73							
94.74							
94.75							
94.76							
94.77							
94.78							
94.79							
94.80							
94.81							
94.82							
94.83							
94.84							
94.85							

$$Q\ (cms) = 0.61 * A * \sqrt{2 * g * H}$$

Where Q = release rate in cms
0.61 = coefficient
A = Area of the orifice (m2)
g = gravitational constant (9.81 m/s2)
H = Head above centerline of orifice (m). if orifice is not submerged.

24-5128A New Half Moon Bay Secondary School
Appendix B-11: ICD-9 Calculations
ICD-9

Upstream Structure	Subcatchment	Area (ha)	C <10yr	C 100yr	Rim. Elev. (m)	$Q_{allowable}$ (L/s) 2Yr	5 Yr	100 Yr	Storage Requirements 2 Yr (m^3)	5 Yr (m^3)	100 Yr (m^3)	100 Yr Ponding Elev. (m)	Spill Elev. (m)	100 Yr Ponding Depth (m)
CBMH-3	B11	0.032	0.67	0.76	94.65									
CB-9	B12	0.037	0.60	0.68	94.73									
ICD-9 Total		0.069	0.63	0.71	94.65	15.50	15.5	16.0	-3.7	-0.7	5.1	94.77	94.800	0.12

Stage below ponding (m)
94.76

ICD-9 - Rational Method 2 Year Storage Requirements Calculation

Time (min.)	Intensity (mm/hr)	Q_{actual} (L/s)	$Q_{allowable}$ (L/s)	Q_{stored} (L/s)	V_{stored} (m^3)
10	76.8	9.33	15.50	-6.17	-3.7
15	61.8	7.51	15.50	-7.99	-7.2
20	52.0	6.32	15.50	-9.18	-11.0
25	45.2	5.49	15.50	-10.01	-15.0
30	40.0	4.87	15.50	-10.63	-19.1
35	36.1	4.38	15.50	-11.12	-23.3
40	32.9	3.99	15.50	-11.51	-27.6
45	30.2	3.68	15.50	-11.82	-31.9
50	28.0	3.41	15.50	-12.09	-36.3
55	26.2	3.18	15.50	-12.32	-40.7
60	24.6	2.98	15.50	-12.52	-45.1

ICD-9 - Rational Method 5 Year Storage Requirements Calculation

Time (min.)	Intensity (mm/hr)	Q_{actual} (L/s)	$Q_{allowable}$ (L/s)	Q_{stored} (L/s)	V_{stored} (m^3)
10	104.2	14.28	15.50	-1.22	-0.7
15	83.6	11.45	15.50	-4.05	-3.6
20	70.3	9.63	15.50	-5.87	-7.0
25	60.9	8.35	15.50	-7.15	-10.7
30	53.9	7.39	15.50	-8.11	-14.6
35	48.5	6.65	15.50	-8.85	-18.6
40	44.2	6.06	15.50	-9.44	-22.7
45	40.6	5.57	15.50	-9.93	-26.8
50	37.7	5.16	15.50	-10.34	-31.0
55	35.1	4.81	15.50	-10.69	-35.3
60	32.9	4.52	15.50	-10.98	-39.5

ICD-9 - Rational Method 100 Year Storage Requirements Calculation

Time (min.)	Intensity (mm/hr)	Q_{actual} (L/s)	$Q_{allowable}$ (L/s)	Q_{stored} (L/s)	V_{stored} (m^3)
10	178.6	24.47	16.00	8.47	5.1
15	142.9	19.59	16.00	3.59	3.2
20	120.0	16.44	16.00	0.44	0.5
25	103.8	14.23	16.00	-1.77	-2.6
30	91.9	12.59	16.00	-3.41	-6.1
35	82.6	11.32	16.00	-4.68	-9.8
40	75.1	10.30	16.00	-5.70	-13.7
45	69.1	9.46	16.00	-6.54	-17.6
50	64.0	8.77	16.00	-7.23	-21.7
55	59.6	8.17	16.00	-7.83	-25.8
60	55.9	7.66	16.00	-8.34	-30.0

ICD-9 - Stage-Storage Table

Elevation (m)	Incremental Depth (m)	Total Depth (m)	Cumulative Volume CBMH-3 (m^3)	CB-9 (m3)				Total Volume (m^3)	Orifice Head (m)	Orifice Flow (L/s)	Rainfall Event
94.65	0.00	0.00	0.00	0.00				0.0	1.68	15.5	2 Yr, 5 Yr
94.66	0.01	0.01	0.00	0.00				0.0	1.69	15.5	
94.67	0.01	0.02	0.03	0.00				0.0	1.70	15.6	
94.68	0.01	0.03	0.10	0.00				0.1	1.71	15.6	
94.69	0.01	0.04	0.24	0.00				0.2	1.72	15.7	
94.70	0.01	0.05	0.47	0.00				0.5	1.73	15.7	
94.71	0.01	0.06	0.81	0.00				0.8	1.74	15.8	
94.72	0.01	0.07	1.26	0.00				1.3	1.75	15.8	
94.73	0.01	0.08	1.85	0.00				1.9	1.76	15.9	
94.74	0.01	0.09	2.58	0.00				2.6	1.77	15.9	
94.75	0.01	0.10	3.45	0.04				3.5	1.78	16.0	
94.76	0.01	0.11	4.47	0.16				4.6	1.79	16.0	
94.77	0.01	0.12	5.62	0.40				6.0	1.80	16.0	100 Yr
94.78	0.01	0.13	6.92	0.79				7.7	1.81	16.1	
94.79	0.01	0.14	8.35	1.35				9.7	1.82	16.1	
94.80	0.01	0.15	9.87	2.06				11.93	1.83	16.2	

Orifice Sizing

Elevation (m)	Outlet Structure	Pipe Diameter (mm)	Pipe Invert (m)	Area (m2)	Area (mm2)	Orifice Diameter (mm)	100 Yr Orifice Head (m)
	CBMH-3	250.00	92.845	0.00	4425.86	75	1.80
94.65							
94.66							
94.67							
94.68							
94.69							
94.70							
94.71							
94.72							
94.73							
94.74							
94.75							
94.76							
94.77							
94.78							
94.79							
94.80							

$$Q\ (cms) = 0.61 * A * \sqrt{2 * g * H}$$

Where Q = release rate in cms
0.61 = coefficient
A = Area of the orifice (m2)
g = gravitational constant (9.81 m/s2)
H = Head above centerline of orifice (m). if orifice is not submerged.

24-5128A New Half Moon Bay Secondary School
Appendix B-9: Roof Calculations
Roof

Upstream Structure	Subcatchment	Area (ha)	C <10yr	C 100yr	Rim. Elev. (m)	$Q_{allowable}$ (L/s) 2Yr	5 Yr	100 Yr	Storage Requirements 2 Yr (m^3)	5 Yr (m^3)	100 Yr (m^3)	100 Yr Ponding Elev. (m)	Spill Elev. (m)	Storage Depth (m)
Roof	B13	0.717	0.90	1.00	0.00									
Roof Total		0.717	0.90	1.00	0.00	20.4	30.6	61.2	92.97	138.77	219.36	0.12	0.150	0.12

Stage below ponding (m)
0.08

Roof - Rational Method 2 Year Storage Requirements Calculation

Time (min.)	Intensity (mm/hr)	Q_{actual} (L/s)	$Q_{allowable}$ (L/s)	Q_{stored} (L/s)	V_{stored} (m^3)
15	61.8	110.777	20.40	90.38	81.34
20	52.0	93.32	20.40	72.92	87.50
25	45.2	81.00	20.40	60.60	90.91
30	40.0	71.82	20.40	51.42	92.55
35	36.1	64.67	20.40	44.27	92.97
40	32.9	58.94	20.40	38.54	92.50
45	30.2	54.23	20.40	33.83	91.35
50	28.0	50.29	20.40	29.89	89.67
55	26.2	46.94	20.40	26.54	87.57
60	24.6	44.04	20.40	23.64	85.11
65	23.2	41.52	20.40	21.12	82.37

Roof - Rational Method 5 Year Storage Requirements Calculation

Time (min.)	Intensity (mm/hr)	Q_{actual} (L/s)	$Q_{allowable}$ (L/s)	Q_{stored} (L/s)	V_{stored} (m^3)
15	83.6	166.51	30.60	135.91	122.32
20	70.3	139.99	30.60	109.39	131.27
25	60.9	121.35	30.60	90.75	136.12
30	53.9	107.46	30.60	76.86	138.35
35	48.5	96.68	30.60	66.08	138.77
40	44.2	88.05	30.60	57.45	137.87
45	40.6	80.96	30.60	50.36	135.98
50	37.7	75.03	30.60	44.43	133.30
55	35.1	69.99	30.60	39.39	129.99
60	32.9	65.65	30.60	35.05	126.17
65	31.0	61.86	30.60	31.26	121.92

Roof - Rational Method 100 Year Storage Requirements Calculation

Time (min.)	Intensity (mm/hr)	Q_{actual} (L/s)	$Q_{allowable}$ (L/s)	Q_{stored} (L/s)	V_{stored} (m^3)
20	120.0	239.03	61.20	177.83	213.39
25	103.8	206.94	61.20	145.74	218.61
30	91.9	183.07	61.20	121.87	219.36
35	82.6	164.56	61.20	103.36	217.05
40	75.1	149.74	61.20	88.54	212.50
45	69.1	137.60	61.20	76.40	206.28
50	64.0	127.44	61.20	66.24	198.73
55	59.6	118.81	61.20	57.61	190.12
60	55.9	111.38	61.20	50.18	180.66
65	52.6	104.91	61.20	43.71	170.47
70	49.8	99.22	61.20	38.02	159.67

Roof - Stage-Storage Table **No. of Drains 41**

Elevation (m)	Incremental Depth (m)	Total Depth (m)	Cumulative Volume Area (m2)				Total Volume (m^3)	Roof Drain Head (m)	Roof Drain Flow (L/s)	Rainfall Event
0.00	0.00	0.00	7170.00				0.0	0.00	0.0	
0.02	0.02	0.02	7170.00				47.8	0.02	10.3	
0.04	0.02	0.04	7170.00				95.6	0.04	20.4	2 Yr
0.06	0.02	0.06	7170.00				143.4	0.06	30.6	5 Yr
0.08	0.02	0.08	7170.00				191.2	0.08	40.5	
0.10	0.02	0.10	7170.00				239.0	0.10	48.5	
0.12	0.02	0.12	7170.00				286.8	0.12	61.2	100 Yr
0.14	0.02	0.14	7170.00				334.6	0.14	71.2	
0.15	0.01	0.15	7170.00				358.5	0.15	76.1	

Elevation (m)
0.00
0.02
0.04
0.06
0.08
0.10
0.12
0.14
0.15

Roof Drain Selection - Gallons Per Minute Per Roof Drain

Weir Setting	1	2	3	4	5	6
Fully Exposed	5.00	10.00	15.00	20.00	25	30
0.75	5.00	10.00	13.75	17.50	21	25
0.50	5.00	10.00	12.50	15.00	18	20
0.25	5.00	10.00	11.25	12.50	14	15
Closed	5.00	5.00	5.00	5.00	5	5

Roof Drain Selection - Litres Per Second Per Roof Drain

Weir Setting	25.4	50.8	76.2	101.6	127	152.4
Fully Exposed	0.32	0.63	0.95	1.26	1.58	1.89
0.75	0.32	0.63	0.87	1.10	1.34	1.58
0.50	0.32	0.63	0.79	0.95	1.10	1.26
0.25	0.32	0.63	0.71	0.79	0.87	0.95
Closed	0.32	0.32	0.32	0.32	0.32	0.32

STORM SEWER DESIGN SHEET

LOCATION					CONTRIBUTING AREA				FLOW				STORM SEWER DESIGN								
1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22
ROAD SEGMENT	FROM	TO	SEWER TYPE (Lateral or Trunk)	AREA ID	AREA (A) (ha)	RUNOFF COEFF. (C) (--)	SECTION (C*A) [6]x[7] (ha)	ACCUM. (C*A) [8]+ prev[9] (ha)	TIME OF CONCEN. (Tc) (min)	RAINFALL INTENSITY (I) (mm/hr)	ACTUAL FLOW (Q =2.78*C*A*I) 2.78x[9]x[11] (L/s)	ACTUAL FLOW [12] or CONTROLLED FLOW (L/s)	LENGTH (m)	SLOPE (%)	DIA. (mm)	FULL FLOW CAPACITY (L/s)	% OF PIPE CAPACITY (%)	FULL FLOW VELOCITY (m/s)	TIME OF FLOW IN PIPE (min)	TIME OF CONCEN AFT. PIPE (min)	COMMENTS
	CB-9	CBMH-3	Lateral	B12	0.04	0.60	0.022	0.022	10.00	104.193	6.48	6.48	26.5	0.50%	250	42.05	15%	0.86	0.52	10.52	
	CBMH-3	STMH-5	Trunk	B11	0.03	0.67	0.021	0.044	10.52	101.546	12.34	12.34	33.5	0.50%	250	42.05	29%	0.86	0.65	11.17	ICD-9
	Roof	STMH-5	Lateral	B13	0.72	0.90	0.645	0.645	10.00	104.193	186.86	61.20	51.0	1.00%	375	175.33	35%	1.59	0.54	10.54	Roof Drain Control
	CB-7	Tee.	Lateral	B9	0.59	0.27	0.158	0.158	10.00	104.193	45.71	35.60	8.0	1.00%	250	59.47	60%	1.21	0.11	10.11	ICD-7
	CB-8	STMH-5	Lateral	B10	0.51	0.31	0.158	0.158	10.00	104.193	45.87	36.20	8.5	1.00%	250	59.47	61%	1.21	0.12	10.12	ICD-8
	STMH-5	STMH-4	Trunk	-	-	-	-	1.005	11.17	98.406	274.94	274.94	80.5	0.60%	525	333.12	83%	1.54	0.87	12.04	
	RYCB-4	RYCB-3	Lateral	B15d	0.02	0.20	0.004	0.004	10.00	104.193	1.17	1.17	44.5	0.50%	250	42.05	3%	0.86	0.87	10.87	
	RYCB-3	RYCB-2	Lateral	B15c	0.06	0.20	0.012	0.016	10.00	104.193	4.53	4.53	68.5	0.50%	250	42.05	11%	0.86	1.33	11.33	
	RYCB-2	RYCB-1	Lateral	B15b	0.04	0.20	0.008	0.024	10.00	104.193	6.97	6.97	41.0	0.50%	250	42.05	17%	0.86	0.80	10.80	
	RYCB-1	STMH-4	Lateral	B15a	0.06	0.20	0.013	0.037	10.00	104.193	10.73	10.73	45.5	0.50%	250	42.05	26%	0.86	0.89	10.89	
	FIELD	STMH-4	Lateral	B14	1.39	0.38	0.528	0.528	10.00	104.193	152.96	152.96	13.0	1.00%	375	175.33	87%	1.59	0.14	10.14	
	CB-6	Tee.	Lateral	B8	0.25	0.89	0.227	0.227	10.00	104.193	65.77	51.50	18.5	0.80%	300	86.49	60%	1.22	0.25	10.25	ICD-6
	STMH-4	STMH-3	Trunk	-	-	-	-	1.797	12.04	94.529	472.29	472.29	111.0	0.80%	600	549.19	86%	1.94	0.95	12.99	
	Roof	STMH-3	Lateral	B13	0.72	0.90	0.645	0.645	10.00	104.193	186.86	61.20	19.0	1.00%	375	175.33	35%	1.59	0.20	10.20	Roof Drain Control
	CB-4	Tee.	Lateral	B7	0.54	0.57	0.306	0.306	10.00	104.193	88.68	69.10	4.5	1.00%	300	96.70	71%	1.37	0.05	10.05	ICD-5
	CB-3	Tee.	Lateral	B6	0.21	0.64	0.136	0.136	10.00	104.193	39.47	30.20	3.5	0.70%	250	49.75	61%	1.01	0.06	10.06	ICD-4
	STMH-3	STMH-2	Trunk	-	-	-	-	2.885	12.99	90.662	727.08	727.08	97.0	0.40%	825	907.85	80%	1.70	0.95	13.94	
	RYCB-5	DI-1	Lateral	B15e	0.07	0.20	0.014	0.014	10.00	104.193	4.16	4.16	79.0	0.50%	250	42.05	10%	0.86	1.54	11.54	
	DI-1	STMH-2	Lateral	B16	0.08	0.20	0.015	0.030	11.54	96.720	7.94	7.94	77.0	0.50%	250	42.05	19%	0.86	1.50	13.04	
	CB-2	STMH-2	Lateral	B2	0.54	0.45	0.246	0.246	10.00	104.193	71.19	55.30	38.0	0.80%	300	86.49	64%	1.22	0.52	10.52	ICD-2
	STMH-2	STMH-1	Trunk	-	-	-	-	3.160	13.94	87.133	765.47	765.47	27.0	0.30%	900	991.55	77%	1.56	0.29	14.23	
	CB-5	CBMH-2	Lateral	B5	0.11	0.80	0.090	0.090	10.00	104.193	26.05	26.05	25.0	0.50%	250	42.05	62%	0.86	0.49	10.49	
	CBMH-2	CBMH-1	Lateral	B4	0.08	0.80	0.064	0.153	10.49	101.692	43.38	43.38	47.5	0.80%	250	53.19	82%	1.08	0.73	11.22	
	CBMH-1	STMH-1	Lateral	B3	0.11	0.79	0.089	0.243	11.22	98.176	66.22	66.22	23.0	0.70%	300	80.91	82%	1.14	0.33	11.55	ICD-3
	CB-1	STMH-1	Lateral	B1	0.14	0.79	0.114	0.114	10.00	104.193	33.01	25.30	35.5	0.50%	250	42.05	60%	0.86	0.69	10.69	ICD-1
	STMH-1	EX STM CONTROL MH4	Trunk	-	-	-	-	3.517	14.23	86.122	841.96	841.96	7.0	0.30%	900	991.55	85%	1.56	0.07	14.31	

Notes:

Project Name:	New Half Moon Bay Secondary School
Jp2g Project No.:	24-5128A
Client Ref No.:	

Prepared By:	Bahar R
Reviewed By:	Zach B
Approved By:	Ali S
Date:	6/29/2026
Revision:	1

Storm Event:	1:5 Year
Rainfall Intensity Formula:	Ottawa IDF
Mannings, n =	0.013

Rational Method: $Q = 2.78 * C * A * I$

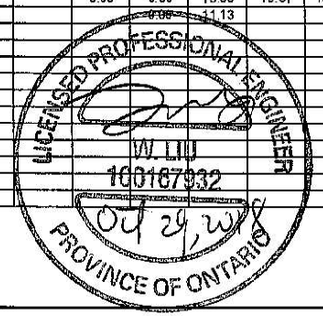
where, Q = peak flow (L/s)
C = runoff coefficient
I = average rainfall intensity (mm/hr)
A = area (ha)

STORM SEWER CALCULATION SHEET (RATIONAL METHOD)

Local Roads Return Frequency = 2 years
Collector Roads Return Frequency = 5 years
Manning 0.013 Arterial Roads Return Frequency = 10 years

Ottawa

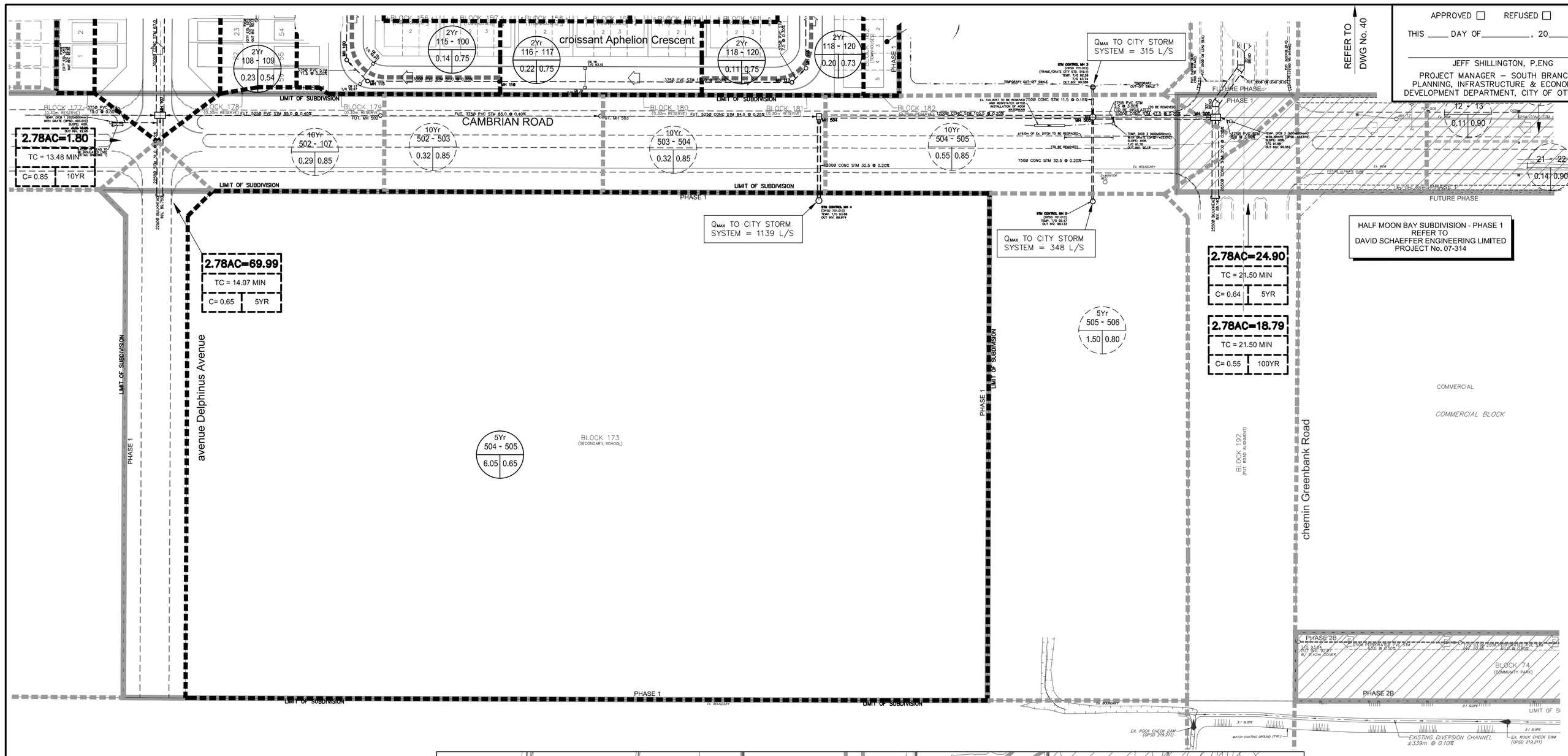
	LOCATION		AREA (Ha)																FLOW					SEWER DATA							
			2 YEAR				5 YEAR				10 YEAR				100 YEAR				Time of	Intensity	Intensity	Intensity	Intensity	Peak Flow	DIA.	DIA.	TYPE	SLOPE	LENGTH	CAPACITY	VELOCITY	TIME OF	RATIO
			AREA	R	Indiv.	Accum.	AREA	R	Indiv.	Accum.	AREA	R	Indiv.	Accum.	AREA	R	Indiv.	Accum.	Conc.	2 Year	5 Year	10 Year	100 Year		(mm)	(mm)						FLOW	
Location	From Node	To Node	(Ha)		2.78 AC	2.78 AC	(Ha)		2.78 AC	2.78 AC	(Ha)		2.78 AC	2.78 AC	(Ha)		2.78 AC	2.78 AC	(min)	(mm/h)	(mm/h)	(mm/h)	(mm/h)	Q (l/s)	(actual)	(nominal)		(%)	(m)	(l/s)	(m/s)	(min.)	Q/Q full
Contribution From Future Phase 3						3.25				3.07				0.00				0.00	16.38														
	Fut. 221	Fut. 226	0.15	0.72	0.30	3.55			0.00	3.07			0.00	0.00			0.00	0.00	16.38	58.89	79.35	92.90	135.83	452	900	900	CONC	0.15	78.5	701	1.10	1.19	0.64
Contribution From Future Street 15, Fut. Pipe 212 - 226						6.18				1.67				1.75				1.96	16.38					522	(100 - 2YR, 100 - 5YR & 100 - 10YR Flows)								
Contribution From Future Phase 3						1.83				0.00				0.00				0.00	12.66														
	Fut. 226	Fut. 227			0.00	11.56			0.00	4.74			0.00	1.75			0.00	1.96	17.57	56.31	76.09	89.07	130.01	1945	1650	1650	CONC	0.15	54.0	3530	1.65	0.55	0.55
	Fut. 227	Fut. 228	0.23	0.54	0.35	11.91			0.00	4.74			0.00	1.75			0.00	1.96	18.11	55.28	74.69	87.42	127.59	1938	1650	1650	CONC	0.15	31.5	3530	1.65	0.32	0.55
To Servicing Block, Pipe 228 - 229						11.91				4.74				1.75				1.96	18.43					522	(100 - 2YR, 100 - 5YR & 100 - 10YR Flows)								
Future Street 12A																																	
	Fut. 208	Fut. 209			0.00	0.00			0.00	0.00			0.00	0.00			0.00	0.00	10.00	76.81	104.19	122.14	178.56	0	300	300	PVC	0.75	29.0	84	1.18	0.41	0.00
			0.06	0.56	0.09	0.09			0.00	0.00			0.00	0.00			0.00	0.00															
			0.06	0.54	0.12	0.21			0.00	0.00			0.00	0.00			0.00	0.00															
	Fut. 209	Fut. 210	0.30	0.72	0.60	0.81			0.00	0.00			0.00	0.00			0.00	0.00	10.41	75.27	102.09	119.66	174.91	61	300	300	PVC	0.75	46.0	84	1.18	0.65	0.73
To Future Street 15, Fut. Pipe 210 - 211						0.81				0.00				0.00				0.00	11.06														
			0.11	0.56	0.17	0.17			0.00	0.00			0.00	0.00			0.00	0.00															
			0.12	0.54	0.18	0.35			0.00	0.00			0.00	0.00			0.00	0.00															
	Fut. 201	Fut. 202	0.26	0.72	0.52	0.87			0.00	0.00			0.00	0.00			0.00	0.00	10.00	76.81	104.19	122.14	178.56	67	300	300	PVC	0.65	51.5	78	1.10	0.78	0.86
	Fut. 202	Fut. 203			0.00	0.87			0.00	0.00			0.00	0.00			0.00	0.00	10.78	73.94	100.25	117.50	171.74	84	375	375	PVC	0.30	58.0	96	0.87	1.07	0.67
	Fut. 203	Fut. 204	0.37	0.72	0.74	1.61			0.00	0.00			0.00	0.00			0.00	0.00	11.85	70.38	95.33	111.71	163.24	113	600	600	CONC	0.15	14.0	238	0.84	0.28	0.48
To terrasse Alcor Terrace, Fut. Pipe 204 - 128						1.61				0.00				0.00				0.00	12.13														
Future Street 13A																																	
Contribution From Greenbank Road, Pipe 802 - Fut. 205						0.00				1.67				1.02				1.57	14.47					201	(100 - 5YR & 100 - 10YR Flows)								
	Fut. 205	Fut. 206			0.00	0.00			0.00	1.67			0.00	1.02			0.00	1.57	14.47	63.04	85.30	99.90	145.90	674	1050	1050	CONC	0.15	42.0	1058	1.22	0.57	0.64
To Futura Street 15, Fut. Pipe 206 - 207						0.00				1.67				1.02				1.57	15.05					201	(100 - 5YR & 100 - 10YR Flows)								
Future Street 15																																	
Contribution From Futura Street 13, Fut. Pipe 205 - 206						0.00				1.87				1.02				1.57	15.05					201	(100 - 5YR & 100 - 10YR Flows)								
Contribution From Greenbank Road / Phase 8, Pipe 1 - 206						3.53				0.00				0.00				0.39	14.65					321	(100 - 2YR Flow)								
					0.00	3.53			0.00	1.67	0.13	0.85	0.31	1.32			0.00	1.96															
	Fut. 206	Fut. 207			0.00	3.53			0.00	1.67	0.18	0.85	0.43	1.75			0.00	1.96	15.05	61.66	83.41	97.68	142.64	1330	1350	1350	CONC	0.15	15.5	2067	1.44	0.18	0.84
			0.10	0.73	0.20	3.73			0.00	1.67			0.00	1.75			0.00	1.96															
			0.15	0.54	0.23	3.96			0.00	1.67			0.00	1.75			0.00	1.96															
	Fut. 207	Fut. 210	0.23	0.72	0.46	4.42			0.00	1.67			0.00	1.75			0.00	1.96	15.23	61.24	82.84	97.00	141.65	1379	1350	1350	CONC	0.15	63.5	2067	1.44	0.73	0.67
Contribution From Fut. Street 12A, Fut. Pipe 209 - 210						0.81				0.00				0.00				0.00	11.06														
	Fut. 210	Fut. 211			0.00	5.23			0.00	1.67			0.00	1.75			0.00	1.96	15.96	59.59	80.58	94.36	137.76	1404	1350	1350	CONC	0.15	37.5	2067	1.44	0.43	0.68
			0.26	0.54	0.39	5.62			0.00	1.67			0.00	1.75			0.00	1.96															
	Fut. 211	Fut. 212	0.28	0.72	0.56	6.18			0.00	1.67			0.00	1.75			0.00	1.96	16.39	58.67	79.32	92.87	135.58	1446	1350	1350	CONC	0.15	27.5	2067	1.44	0.32	0.70
	Fut. 212	Fut. 226			0.00	6.18			0.00	1.67				1.75			0.00	1.96	16.71	58.01	78.42	91.81	134.02	1435	1350	1350	CONC	0.15	14.5	2067	1.44	0.17	0.69
To bo's Celestial Grove, Fut. Pipe 226 - 227						6.18				1.67				1.75				1.96	16.88					522	(100 - 2YR, 100 - 5YR & 100 - 10YR Flows)								
Cambrian Road																																	
	Fut. 502	Fut.503			0.00	0.00			0.00	0.00	0.32	0.85	0.76	0.76			0.00	0.00	10.00	76.81	104.19	122.14	178.56	92	375	375	PVC	0.40	85.0	111	1.00	1.41	0.83
	Fut. 503	504			0.00	0.00			0.00	0.00	0.32	0.85	0.76	1.51			0.00	0.00	11.41	71.78	97.29	114.01	166.61	172	525	525	CONC	0.25	84.5	215	0.99	1.42	0.80
School					0.00	0.00	6.05	0.65	10.93	10.93			0.00	0.00			0.00	0.00	10.00	76.81	104.19	122.14	178.56	1139	1200	1200	CONC	0.20	32.5	1744	1.54	0.35	0.65
	504	505			0.00	0.00			0.00	10.93	0.55	0.85	1.30	2.81			0.00	0.00	12.83	67.42	91.30	108.96	156.26	1299	1200	1200	CONC	0.20	103.5	1744	1.54	1.14	0.74
					0.00	0.00	1.36	0.80	3.02	3.02			0.00	0.00			0.00	0.00	10.00	76.81	104.19	122.14	178.56	315	750	750	CONC	0.15	11.5	431	0.98	0.20	0.73
					0.00	0.00	1.50	0.80	3.34	3.34			0.00	0.00			0.00	0.00	10.00	76.81	104.19	122.14	178.56	348	750	750	CONC	0.20	32.5	498	1.13	0.48	0.70
	505	506			0.00	0.00			0.00	17.29			0.00	2.81			0.00	0.00	13.97	64.31	87.04	101.95	148.91	1792	1500	1500	CONC	0.25	47.5	3534	2.00	0.40	0.51
To Greenbank Road Pipe 506 - 507						0.00				17.29				2.81				0.00	14.37														
	Fut. 502	107			0.00	0.00			0.00	0.00	0.29	0.85	0.69	0.69			0.00	0.00	10.00	76.81	104.19	122.14	178.56	84	525	525	CONC	0.40	85.0	272	1.26	1.13	0.31
To rue Apolune Street, Pipe 107 - 108						0.00				0.00				0.69				0.00	11.13														



Definitions:
Q = 2.78 AIR, where
Q = Peak Flow in Litres per second (L/s)
A = Areas in hectares (ha)
I = Rainfall Intensity (mm/h)
R = Runoff Coefficient

Notes:
1) Ottawa Rainfall-Intensity Curve
2) Min. Velocity = 0.80 m/s

Designed: P.P.	PROJECT: Half Moon Bay West - Phase 1		
Checked: W.L.	LOCATION: City of Ottawa		
Dwg. Reference: Dwgs. No. 39, 40 & 41	File Ref: 15-888	Date: October, 2018	Sheet No. 3 of 5

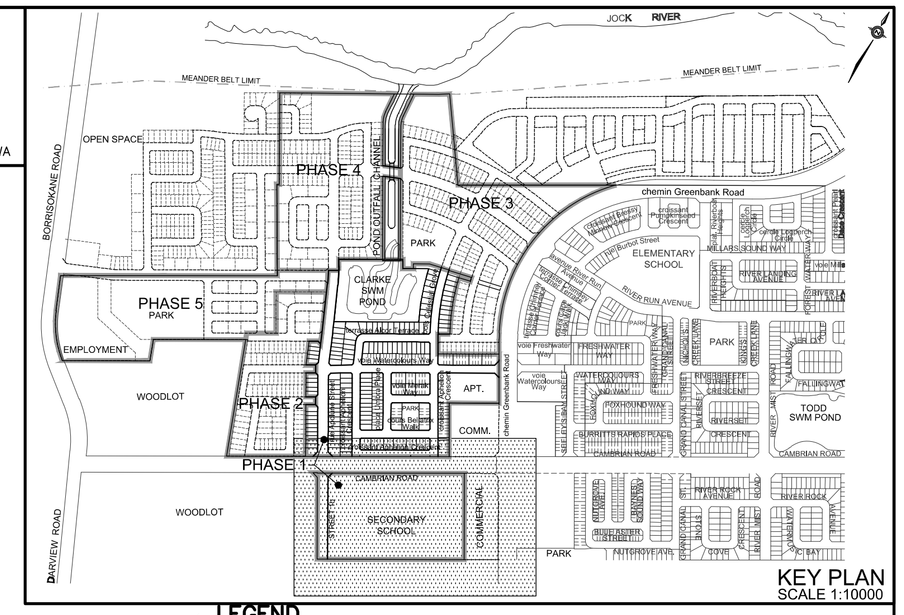


APPROVED ☐ REFUSED ☐

THIS ____ DAY OF _____, 20____

JEFF SHILLINGTON, P.ENG
PROJECT MANAGER – SOUTH BRANCH
PLANNING, INFRASTRUCTURE & ECONOMIC
DEVELOPMENT DEPARTMENT, CITY OF OTTAWA

HALF MOON BAY SUBDIVISION - PHASE 1
REFER TO
DAVID SCHAEFFER ENGINEERING LIMITED
PROJECT No. 07-314



LEGEND

- STORM DRAINAGE BOUNDARY
- SUB-DRAINAGE BOUNDARY
- STORM DRAINAGE BOUNDARY (OTHER PHASES)
- STORM FREQUENCY / UPSTREAM MH TO DOWNSTREAM MH / AREA IN HECTARES / RUNOFF COEFFICIENT — 2Yr | 43 - 44 | 0.37 | 0.51
- EXTERNAL 2.78AC = — 2.78AC=14.40
- EXTERNAL TIME OF CONCENTRATION — TC=14.5 MIN
- EXTERNAL BLENDED RUNOFF COEFFICIENT — C= 0.70
- EXTERNAL STORM FREQUENCY — 2YR
- UPSTREAM MH TO DOWNSTREAM MH / AREA IN OTHER PHASES IN HECTARES / RUNOFF COEFFICIENT — 21 - 23 | 0.28 | 0.78
- STREET CATCHBASIN & LEAD
- STREET CATCHBASIN WITH CLOSED LID & LEAD MAINTENANCE HOLE — 375MM I.S. MH202
- CURB INLET CATCHBASIN & LEAD CATCHBASIN/ MAINTENANCE HOLE — CBMH201
- INTERCONNECTED CATCH BASIN & LEADS CAP
- OVERLAND FLOW DIRECTION
- EXTERNAL OVERLAND FLOW DIRECTION
- EMERGENCY OVERLAND FLOW DIRECTION — E

TOPOGRAPHIC INFORMATION

TOPOGRAPHIC INFORMATION PROVIDED BY J.D. BARNES LIMITED, PROJECT No. 16-10-100-00. SURVEY DATED FEBRUARY 22, 2017. CITY OF OTTAWA 2K MAPPING, RECEIVED ON JANUARY 18, 2016.

LEGAL INFORMATION

CALCULATED DRAFT PLAN PROVIDED BY J.D. BARNES LIMITED, PROJECT No. 16-10-100-00-ph1 (HALF MOON BAY WEST PHASE 1), RECEIVED ON JULY 25, 2018.

4th SUBMISSION 18-10-29

EXTERNAL PRE-DEVELOPMENT STORM DRAINAGE PLAN

SCALE: 1:6000

BENCH MARK No. 00820010126

POINT IS LOCATED 1.65km NORTH OF BARNSDALE ROAD AND 5km SOUTH OF FALLOWFIELD ROAD ON HIGHWAY 416 NORTH OF KEMPTVILLE. THE POINT IS SET EAST OF THE NORTHBOUND LANE IN THE GRASSY SHOULDER.

ELEVATION = 96.923 m

No.	BY	DATE	DESCRIPTION	BY
5	W.L.	18-10-29	4th SUBMISSION	
4	W.L.	18-10-19	ISSUED FOR REVIEW	
3	W.L.	18-09-05	3rd SUBMISSION	
2	W.L.	18-07-13	2nd SUBMISSION	
1	W.L.	18-03-09	1st SUBMISSION	

CITY OF OTTAWA

PROJECT No. 16-888

LICENSED PROFESSIONAL ENGINEER — W. LIU — 100167932 — PROVINCE OF ONTARIO — 18-10-29

© DSEL

STORM DRAINAGE PLAN & EXTERNAL PRE-DEVELOPMENT DRAINAGE PLAN

MATTAMY (HALF MOON BAY) LIMITED

HALF MOON BAY WEST SUBDIVISION
PHASE 1

DSEL
david schaeffer engineering ltd
120 Iber Road, Unit 103
Stittsville, ON K2S 1E9
Tel. (613) 836-0856
Fax. (613) 836-7183
www.DSEL.ca

DRAWN BY:	V.W./S.L.	CHECKED BY:	P.P./C.M.	DRAWING NO.	SHEET NO.
DESIGNED BY:	W.L./C.M.	CHECKED BY:	K.M.		41
SCALE:	1:1000	DATE:	MARCH 2018		

CITY FILE No. D07-16-16-0023 P1 CITY PLAN No. 17586

Table 5 summarizes the relevant City Standards employed in the design of the proposed storm sewer system referred to as the minor system.

Table 5: Storm Sewer Design Criteria

Design Parameter	Value
Minor System Design Return Period	2-Year (Local Streets), 5-Year (Collector Streets), 10-Year (Arterial Streets) – PIEDTB-2016-01
Major System Design Return Period	100-Year
Intensity Duration Frequency Curve (IDF) 2-year storm event: A = 723.951, B = 6.199, C = 0.810 5-year storm event: A = 998.071, B = 6.053, C = 0.814	$i = \frac{A}{(t_c + B)^C}$
Initial Time of Concentration	10 minutes
Rational Method	$Q = CiA$
Runoff coefficient for paved and roof areas	0.9
Runoff coefficient for landscaped areas	0.2
Storm sewers are to be sized employing the Manning's Equation	$Q = \frac{1}{n} AR^{2/3} S^{1/2}$
Minimum Sewer Size	250 mm diameter
Minimum Manning's 'n'	0.013
Minimum Depth of Cover	2.0 m from crown of sewer to grade
Minimum Full Flowing Velocity	0.8 m/s
Maximum Full Flowing Velocity	6.0 m/s
Clearance from 100-Year HGL	Should not be above ground surface

Table 6 summarizes the stormwater criteria for the apartment block, the commercial blocks, and the secondary school block.

Table 6: Stormwater Management Criteria for Apartment, Commercial, and Secondary School Blocks

Parameter	Park (Block 172)	Apartment Block (Block 166)	Future Commercial Block	Future Commercial Block	Secondary School Block (Block 173)
Area	0.24 ha	0.93 ha	1.36 ha	1.50 ha	6.05 ha
Runoff Coefficient	0.4	0.80	0.80	0.80	0.65
Return Period	5-Year	5-Year	5-Year	5-Year	5-Year
Release Rate	28 L/s	235 L/s	315 L/s	348 L/s	1139 L/s
The storage requirements for the commercial/institutional lands are designed up to the 100-year water level					

There is some design criteria which could not be met for HMB West – Phase 1. An outline of these deviations is summarized in ***Table 7***.

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WATTS®	Adjustable Accutrol Weir Tag: _____	Adjustable Flow Control for Roof Drains

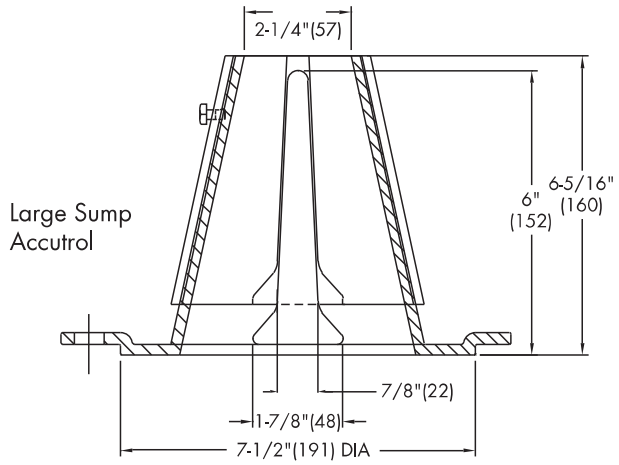
ADJUSTABLE ACCUTROL (for Large Sump Roof Drains only)

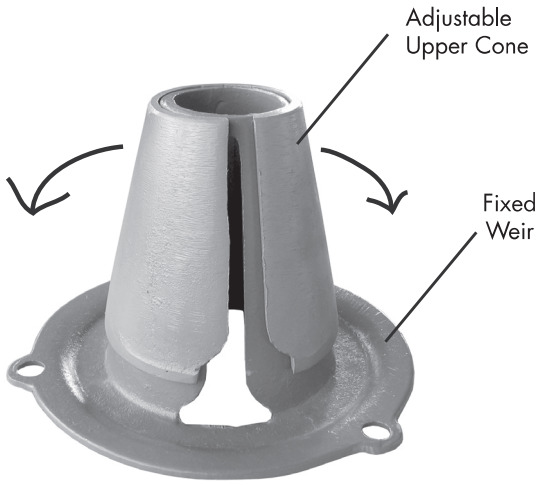
For more flexibility in controlling flow with heads deeper than 2", Watts Drainage offers the Adjustable Accutrol. The Adjustable Accutrol Weir is designed with a single parabolic opening that can be covered to restrict flow above 2" of head to less than 5 gpm per inch, up to 6" of head. To adjust the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

EXAMPLE:

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

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





1/2 Weir Opening Exposed Shown Above

TABLE 1. Adjustable Accutrol Flow Rate Settings

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

Job Name _____ Contractor _____

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

Engineer _____ Representative _____

Watts product specifications in U.S. customary units and metric are approximate and are provided for reference only. For precise measurements, please contact Watts Technical Service. Watts reserves the right to change or modify product design, construction, specifications, or materials without prior notice and without incurring any obligation to make such changes and modifications on Watts products previously or subsequently sold.

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Appendix C
Sanitary Servicing Calculations

24-5128A - New Half Moon Bay Secondary School - 3853 Cambrian Rc
Appendix C - Sanitary Sewer Design Sheet
Peak Flow Design Based on Population Estimate

Location			Sewer Data						Residential Flow							Commercial / Institutional Flow					Infiltration Flow			Total Flow	
Note	From	To	Length	Dia.	Slope	Capacity (full)	Velocity (full)	Utilization	Area	Units	Population	Cumulative		Average Flow	Peak Flow	Student Population	Area *(ha)*		Average Flow	Peak Flow	Area *(ha)*		Inf. Flow	Average Flow	Peak Flow
			(m)	*(mm)*		*(l/s)*	*(m/s)*	*(%)*	*(ha)*		*(p)*	Area	Population	*(l/s)*	*(l/s)*		Individual	Cumulative	*(l/s)*	*(l/s)*	Individual	Cumulative	*(l/s)*	*(l/s)*	*(l/s)*
School	School	SAN MH1	111.5	200	1.00%	32.8	1.0	14.5	0.00	0	0	0.00	0	0.00	0.00	2275	0.00	0.00	1.84	2.76	6.05	6.05	2.00	3.84	4.76
School	SAN MH1	EX-SAMH	32.5	200	1.00%	32.8	1.0	14.5	0.00	0	0	0.00	0	0.00	0.00	2275	0.00	0.00	1.84	2.76	0.00	6.05	2.00	3.84	4.76
Municipal Connection	EX-SAMH	Cambrian Road	17.5	200	1.00%	32.8	1.0	14.5	0.00	0	0	0.00	0	0.00	0.00	2275	0.00	0.00	1.84	2.76	0.00	6.05	2.00	3.84	4.76

Parameter	Value	Unit	Source
Manning's Roughness (n)	0.013		City of Ottawa *Sewer Design Guidelines* , October 2012, Table 6.3
Residential Average Flow	280	L/p/d	City of Ottawa *Technical Bulletin ISTB-2018-01* , March 2018
Commercial Average Flow	28000	L/ha/d	City of Ottawa *Technical Bulletin ISTB-2018-01* , March 2018
Institutional Average Flow	28000	L/ha/d	City of Ottawa *Technical Bulletin ISTB-2018-01* , March 2018
Industrial Average Flow	35000	L/ha/d	City of Ottawa *Technical Bulletin ISTB-2018-01* , March 2018
Infiltration Allowance	0.33	L/s/ha	City of Ottawa *Technical Bulletin ISTB-2018-01* , March 2018
Schools - per student allowance	70	L/student/d	City of Ottawa *Water Design Guidelines* , July 2010, Table 4.2

Table 6.2 Sanitary Sewer Dia vs. Minimum Slope

Diameter	Minimum Slope
200 mm	0.32%
250 mm	0.24%
300 mm	0.186%
375 mm	0.14%
450 mm	0.111%
525 mm and larger	0.10%

Table 6.3 Material vs. Roughness Coefficient "n"

Material	Roughness Coefficient "n"
All Smooth Wall Pipes (PVC, Concrete, HDPE, all Linings etc.)	0.013
Brick	0.015
Corrugated Metal Pipe (paved)	0.017
Corrugated Metal Pipe (unpaved)	0.024

Table 4.2 Per Unit Populations

Unit Type	Persons Per Unit
Single Family	3.4
Semi-detached	2.7
Duplex	2.3
Townhouse (row)	2.7
Apartments:	
Bachelor	1.4
1 Bedroom	1.4
2 Bedroom	2.1
3 Bedroom	3.1
Average Apt.	1.8

Table 4: Wastewater Design Criteria

Design Parameter	Value
Residential – Detached Single	3.4 p/unit
Residential – Townhouse	2.7 p/unit
Residential – Apartment	1.8 p/unit
Peak Wastewater Generation per Person	350 L/p/d
Peaking Factor Applied	Harmon's Equation. Max 4.0, Min 2.0
Commercial / Institutional Flows	50,000 L/ha/day
Commercial / Institutional Peaking Factor	1.5
Infiltration and Inflow Allowance	0.28 L/s/ha
Park Flows	28,000 L/ha/day
Sanitary sewers are to be sized employing the Manning's Equation	$Q = \frac{1}{n} A R^{2/3} S^{1/2}$
Minimum Sewer Size	200 mm diameter
Minimum Manning's 'n'	0.013
Service Lateral Size	135 mm dia PVC SDR 28 with a minimum slope of 1.0%
Minimum Depth of Cover	2.5 m from crown of sewer to grade
Minimum Full Flowing Velocity	0.6 m/s
Maximum Full Flowing Velocity	3.0 m/s
Extracted from Sections 4 and 6 of the City of Ottawa Sewer Design Guidelines, October 2012	

The supporting sanitary sewer calculation sheets are contained in ***Appendix C.***

4.2.1 External Flows

The HMB West – Phase 1 sanitary system is designed to accept external flows from future lands. Refer to the External Sanitary Drainage Plan, Sheet 38 and the sanitary sewer design sheet, enclosed in ***Appendix C*** for details.

4.2.2 Design Flows

In addition to the residential peak flows, the following is a summary of the design flows for the commercial and institutional blocks in HMB West – Phase 1:

<u>Future Commercial Block MH503A to MH504A (Cambrian Road)</u>

- Area = 1.36 ha
- Population Flow = 1.36 ha x 50,000 L/ha/day x 1.5 = 1.18 L/s
- Infiltration Flow = 0.38 L/s
- Total Peak Flow = 1.56 L/s

<u>Future Commercial Block MH503A to MH504A (Cambrian Road)</u>

- Area = 1.50 ha
- Population Flow = 1.5 ha x 50,000 L/ha/day x 1.5 = 1.30 L/s
- Infiltration Flow = 0.42 L/s

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- Total Peak Flow = 1.72 L/s

Block 173 – School Block MH502A to MH503A (Cambrian Road)

- Area = 6.05 ha
- Population Flow = 6.07 ha x 50,000 L/ha/day x 1.5 = 5.25 L/s
- Infiltration Flow = 1.69 L/s
- Total Peak Flow = 6.94 L/s

The peak flow from HMB West – Phase 1, including future external flows is 119.44 L/s at proposed sanitary MH 504A on Cambrian Road. This flow will be directed to the existing trunk sanitary on Cambrian Road from MH 504A to existing MH 57A.

There is a 250 mm diameter sanitary sewer on Apolune Street, which has been oversized from its nominal size of 200 mm diameter. The storm sewers and sanitary sewers along this street are flowing in opposite directions. The larger sized sanitary was designed to take advantage of a gentler slope (0.25%) to avoid a crossing conflict. If the sanitary were to run from the tie-in at Cambrian Road at the minimum slope for a 200 mm sanitary sewer, storm pipes would need to be raised and all of the homes would have to be raised to be serviced. It is beneficial to take advantage of the lower grades due to the known grade raise constraints on-site.

The ***Stantec MSS Addendum*** was updated with the most current detailed design information at the time and the associated design sheet for Cambrian Road is the most accurate document to assess capacity. The ***Stantec MSS Addendum*** flow for this section of sewer on Cambrian Road is 108.2 L/s, which is less than the current design flow of 119.44 L/s. The capacity of the 500 mm diameter trunk on Cambrian Road in the ***Stantec MSS Addendum*** is 188.2 L/s. There is sufficient capacity in the Cambrian Road trunk and downstream infrastructure to support HMB West – Phase 1, including external flows.

4.3 Stantec MSS Addendum Conformance

The sanitary drainage plan generally conforms to the ***Stantec MSS Addendum*** as it all drains to the Cambrian Road sewer. The Cambrian Road sewer has been confirmed to have capacity to accommodate the HMB West lands as well as the Barrhaven South Urban Expansion Area lands. Refer to ***DSEL MSS Addendum*** for discussion and calculations confirming the capacity of the Cambrian Road sewer. The extension of the Cambrian Road sewer has been upsized in the proposed design. To maximize the use of the residual capacity in the Cambrian Road sewer, additional lands to the north and south have been included as external flows. Refer to ***DSEL MSS Addendum*** for details on the upsizing of the sewer on Cambrian Road and support for the redirection of flows to existing trunks and drainage areas.

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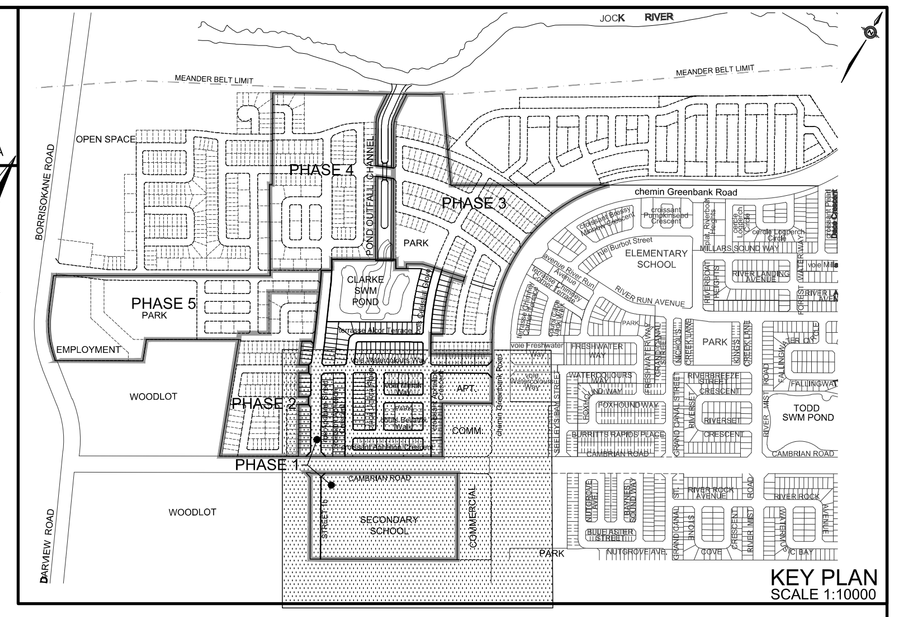
APPROVED ☐ REFUSED ☐

THIS ____ DAY OF_____, 20____

JEFF SHILLINGTON, P.ENG
PROJECT MANAGER – SOUTH BRANCH
PLANNING, INFRASTRUCTURE & ECONOMIC
DEVELOPMENT DEPARTMENT, CITY OF OTTAWA



KEY PLAN
SCALE 1:10000

HALF MOON BAY SUBDIVISION
PHASE 6
REFER TO
DAVID SCHAEFFER ENGINEERING LIMITED
PROJECT No. 17-926

HALF MOON BAY SUBDIVISION - PHASES 5 AND 6
REFER TO
DAVID SCHAEFFER ENGINEERING LIMITED
PROJECT No. 09-384

PRELIMINARY DESIGN FOR
FUTURE chemin Greenbank Road
REFER TO
STANTEC
PROJECT No. 163600994

LEGEND

- SANITARY DRAINAGE BOUNDARY
- SANITARY SUB-DRAINAGE BOUNDARY
- SANITARY DRAINAGE BOUNDARY (OTHER PHASES)
- UPSTREAM MH TO DOWNSTREAM MH — AREA IN HECTARES — POPULATION (e.g. 43A-44A / 0.78 / 61)
- UPSTREAM MH TO DOWNSTREAM MH — AREA IN OTHER PHASES IN HECTARES — POPULATION (e.g. 43A-44A / 0.78 / 61)
- EXTERNAL AREA IN HECTARES — EXTERNAL POPULATION — DENSITY (PERSONS/HECTARE) — EXTERNAL LAND USE (e.g. A=53.63 / 107 / POP=5739 / RESIDENTIAL)
- MAINTENANCE HOLE (e.g. 200mmø SAN MH202A)
- CAP

TOPOGRAPHIC INFORMATION

TOPOGRAPHIC INFORMATION PROVIDED BY J.D. BARNES LIMITED, PROJECT No. 16-10-100-00, SURVEY DATED FEBRUARY 22, 2017. CITY OF OTTAWA 2K MAPPING, RECEIVED ON JANUARY 18, 2016.

LEGAL INFORMATION

CALCULATED DRAFT PLAN PROVIDED BY J.D. BARNES LIMITED, PROJECT No. 16-10-100-00-ph1 (HALF MOON BAY WEST PHASE 1), RECEIVED ON JULY 25, 2018.

4th SUBMISSION 18-10-29

BENCH MARK No. 00820010126

POINT IS LOCATED 1.65km NORTH OF BARNSDALE ROAD AND 5km SOUTH OF FALLOWFIELD ROAD ON HIGHWAY 416 NORTH OF KEMPTVILLE. THE POINT IS SET EAST OF THE NORTHBOUND LANE IN THE GRASSY SHOULDER.

ELEVATION = 96.923 m

No.	BY	DATE	DESCRIPTION	BY
5	W.L.	18-10-29	4th SUBMISSION	
4	W.L.	18-10-19	ISSUED FOR REVIEW	
3	W.L.	18-09-05	3rd SUBMISSION	
2	W.L.	18-07-13	2nd SUBMISSION	
1	W.L.	18-03-09	1st SUBMISSION	

CITY OF OTTAWA

PROJECT No. 16-888

LICENSED PROFESSIONAL ENGINEER
W. LIU
100167932
18-10-29
PROVINCE OF ONTARIO

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SANITARY DRAINAGE PLAN

MATTAMY (HALF MOON BAY) LIMITED

HALF MOON BAY WEST SUBDIVISION
PHASE 1

DSEL
david schaeffer engineering ltd
120 Iber Road, Unit 103
Stittsville, ON K2S 1E9
Tel. (613) 836-0856
Fax. (613) 836-7183
www.DSEL.ca

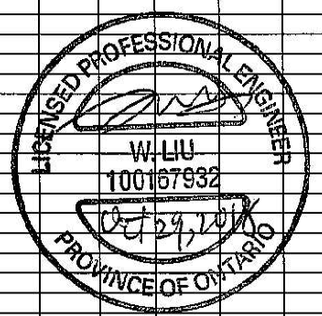
DRAWN BY: V.W./S.L.	CHECKED BY: P.P./C.M.	DRAWING NO.	SHEET NO.	
DESIGNED BY: W.L./C.M.	CHECKED BY: K.M.		38	
SCALE: 1:1000	DATE: MARCH 2018			

CITY FILE No. D07-16-16-0023 P1 CITY PLAN No. 17586

SANITARY SEWER CALCULATION SHEET

Manning's n=0.013

LOCATION			RESIDENTIAL AREA AND POPULATION									COMM		INSTIT		PARK		I+C+I+P	INFILTRATION				PIPE							
STREET	FROM M.H.	TO M.H.	AREA (ha)	UNITS	UNITS Singles	UNITS Townhouse	POP.	CUMULATIVE AREA (ha)	CUMULATIVE POP.	PEAK FACT.	PEAK FLOW (l/s)	AREA (ha)	ACCU. AREA (ha)	AREA (ha)	ACCU. AREA (ha)	AREA (ha)	ACCU. AREA (ha)	PEAK FLOW (l/s)	TOTAL AREA (ha)	ACCU. AREA (ha)	INFILT FLOW (l/s)	TOTAL FLOW (l/s)	DIST (m)	DIA (Nominal) (mm)	DIA (Actual) (mm)	SLOPE (%)	CAP. (FULL) (l/s)	RATIO Q act/Q cap	VEL (FULL) (m/s)	VEL (ACT.) (m/s)
Contribution From Phase 2 Future Street 27, Pipe PLUG - 123A								0.92	99										0.92	1.64										
	PLUG	123A	0.01					0.93	99	4.00	1.80								0.01	0.93	0.26	1.86	10.0	200	200	0.35	19.40	0.10	0.62	0.39
	123A	124A	0.22	5	5.00		17	1.87	184	4.00	2.98								0.22	1.87	0.52	3.50	82.5	250	250	0.25	29.73	0.12	0.81	0.41
	124A	125A	0.01					1.88	184	4.00	2.98								0.01	1.88	0.53	3.51	6.5	250	250	0.25	29.73	0.12	0.61	0.41
Contribution From Phase 2 Fut. Street 13, Pipe PLUG - 125A								1.20	129										1.20	3.08										
	PLUG	125A						1.20	129	4.00	2.09								0.00	1.20	0.34	2.43	10.0	200	200	0.35	19.40	0.13	0.62	0.42
	125A	127A	0.23	5	5.00		17	3.31	330	4.00	5.35								0.23	3.31	0.93	6.28	72.0	250	250	0.25	29.73	0.21	0.61	0.48
Contribution From Phase 2 Fut. Street 12, Pipe PLUG - 127A								2.67	286										2.67	5.98										
	PLUG	127A						2.67	286	4.00	4.63								0.00	2.67	0.75	5.38	15.0	200	200	0.35	19.40	0.28	0.62	0.53
	127A	128A	0.25	6	6.00		21	6.23	637	3.92	10.12								0.25	6.23	1.74	11.66	73.5	250	250	0.25	29.73	0.40	0.61	0.57
			0.05					6.28	637										0.05	6.28										
	128A	500A	0.21	5	5.00		17	6.49	654	3.91	10.36								0.21	6.49	1.82	12.18	78.0	250	250	0.25	29.73	0.41	0.61	0.58
To Cambrian Road, Pipe 500A - 501A								6.49	654											6.49										
Cambrian Road																														
Contribution From External								32.44	3473										32.44	32.44										
Contribution From External								13.44											13.44	45.88										
Contribution From External (BSUEA)								17.26	1179				0.60		1.23		1.21		20.30	66.18										
Contribution From rue Apolune Street, Pipe 128A - 500A								6.49	654										6.49	72.67										
	500A	501A	0.48					70.11	5308	3.22	89.21		0.60		1.23		1.21	1.78	0.48	73.15	20.48	91.47	6.5	**500**	**500**	**0.12**	130.80	0.70	0.67	0.72
Contribution From rue Apolune Street, Pipe 132A - 501A								1.29	91										1.29	74.44										
	501A	5010A	0.95					72.35	5397	3.21	70.18		0.80		1.23		1.21	1.78	0.95	75.39	21.11	93.07	124.0	**500**	**500**	0.12	130.80	0.71	0.87	0.72
	5010A	502A						72.35	5397	3.21	70.18		0.60		1.23		1.21	1.78	0.00	75.39	21.11	93.07	124.0	**500**	**500**	0.12	130.80	0.71	0.67	0.72
Contribution From croissant Aphelion Crescent, Pipe 121A - 502A								11.06	1144								0.24		11.30	88.69										
School														8.05	7.28			6.32	6.05	6.05	1.69	8.01	16.5	200	200	1.00	32.80	0.24	1.04	0.85
	502A	503A	0.42					83.83	6541	3.13	82.94		0.60		7.28		1.45	7.07	0.42	93.16	26.08	116.09	111.5	**500**	**500**	**0.15**	146.24	0.79	0.74	0.82
Future Commercial Block												1.36	1.36					1.18	1.36	1.36	0.38	1.58	25.5	200	200	1.00	32.80	0.05	1.04	0.54
Future Commercial Block												1.50	1.50					1.30	1.50	1.50	0.42	1.72	17.0	200	200	1.00	32.80	0.05	1.04	0.54
	503A	504A	0.20					84.03	6541	3.13	82.94		3.46		7.28		1.45	9.56	0.20	96.22	26.94	119.44	29.5	**500**	**500**	**0.15**	148.24	0.82	0.74	0.82
To Cambrian Road, Ex. Pipe 504A - 57A								84.03	6541				3.46		7.28		1.45			98.22										



DESIGN PARAMETERS

Park Flow =	9300	L/ha/day
Average Daily Flow =	350	L/p/day
Comm / Inst Flow =	50000	L/ha/day
Industrial Flow =	35000	L/ha/day
Max Res. Peak Factor =	4.00	
Commercial / Inst. / Park Peak Factor =	1.50	

Industrial Peak Factor = as per MOE Graph

Extraneous Flow =	0.280	L/s/ha	
Mirimum Velocity =	0.600	m/s	
Manning's n =	(Conc) 0.013	(PVC)	0.013
Townhouse coeff=	2.7		
Single house coeff=	3.4		

Designed: P.P.	PROJECT: **Half Moon Bay West - Phase 1**		
Checkec: W.L	LOCATION: **City of Ottawa**		
Dwg. Reference: Sanitary Drainage Plan, Dwgs. No. 33, 37 & 38	File Ref: 16-888	Date: October, 2018	Sheet No. 3 of 3

Appendix D
Water Servicing Calculations

New Half Moon Bay Secondary School - 3853 Cambrian Road
Appendix D-1 Water Distribution Calculations

Domestic Demand - Known Number & Type of Units

Parameter	Value	Unit	Source
Unit Type			Site plan
Persons Per Unit	N/A	p/unit	*Ottawa Design Guidelines - Water Distribution* Table 4.1
Number of Units		units	Site plan
Number of Persons	N/A	p	

Domestic Demand - Pre-Zoned Land

Parameter	Value	Unit	Source
Demand Type	Schools		Site plan
Average Daily Rate	70	L/student/d	*Ottawa Design Guidelines - Water Distribution* Table 4.2
Amount of students	2275	students	Site plan
Average Daily Demand	159250 1.84	L/d L/s	
Maximum Daily Factor	1.5		*Ottawa Design Guidelines - Water Distribution* Table 4.2
Maximum Daily Demand	2.76	L/s	
Maximum Hourly Factor	1.8		*Ottawa Design Guidelines - Water Distribution* Table 4.2
Maximum Hourly Demand	4.98	L/s	

New Half Moon Bay Secondary School - 3853 Cambrian Road

Jp2g Consultants Inc.
ENGINEERS · PLANNERS · PROJECT MANAGERS

Appendix D-2 Fire Flow Demand Requirements (FUS)

Fire Flow Demand Requirements (Fire Underwritters Survey (FUS Guidelines))

Fire Flow Formula

Estimated Fire Flow Formula: $F=220*C*A^{1/2}$(L/min)

Designed ZB
Checked AS
Dwg. Reference C1
Jp2g project No 24-5128A

F = Required fire flow (L/min)
C = Coefficient related to the type of construction
$C_{1.5}$ = 1.5 for wood frame construction
$C_{1.0}$ = 1.0 for ordinary construction
$C_{0.8}$ = 0.8 for non-combustible construction
$C_{0.6}$ = 0.6 for fire-resistive construction
A = Total floor area in square metres

Ground Floor (m2)	7105.518272
Second Floor (m2)	6998.184302
Third Floor (m2)	4726.681159
Future Addition (m2)	1010.902366

New School Building

Design Parameters*

Type of Building Construction = Type II (Noncombustible)
Floor Area*** = 18994.3 m^2
Occupany and Contents Class Limited combustible
Sprinkler System = Automatic sprinkler system conforming to NFPA standards
Sprinkler Building Coverage = Complete building coverage
Factor of Building Coverage X = 1
Number of Storeys = 3

Exposure Parameters*

	West	North	East	South (Portables 1)	South (Portables 2)	
Separation Distance =	over 30m	over 30m	over 30m	12.5	10.5	m
Length of Exposed Wall =	NA	NA	NA	20.5	20.5	m
Length-Height Factor =	NA	NA	NA	20.5	20.5	m-storeys (up to a maximum of 5-storeys)

Building Construction	Floor Area***	Coefficient	A	Adjustments (increases or decreases) B = A +/- % Occupancy		C = B x % Sprinkler		D = B x % Exposure**						Final Adjusted Fire Flow	Final Adjusted Fire Flow
			Fire Flow (F)												
Type II (Noncombustible)	(m^2)		(L/min)	%	Adjusted Fire Flow(s) (L/min)	%	Fire Adjustment Flow(s) (L/min)	West	North	East	South (Portables 1)	Total Exposure	Fire Adjustment Flow(s) (L/min)	E = B - C + D (L/min)"	(L/s)
	18,994.3	0.8	24,000.0	-0.15	20,400.0	50%	10,200.0	0%	0%	0%	22%	22%	4,488.0	15,000.0	250.0

Assumptions and Parameters

*Water Supply for Public Protection (Fire Underwriters Survey, 2020).
**Exposures to portables are considered to be Type V construction
***Assumes non protected vertical openins and considers two largest adjoining floor areas plus 50% of all floor areas immediately above

Appendix D-3 Fire Flow Demand Requirements OBC

Project Number	24-5128A
Date	26-May-26
Designed By	ZB
Checked By	AS

Appenix D-6: OBC 3.2.5.7 CALCULATIONS:

Calculate minimum water supply flow rate using OBC table 3.2.5.7(3) Table 2 lookup from Minimum Water Supply (Q)

Minimum Water Supply (Q) formula

$$Q = KVS_{tot}$$

WATER SUPPLY COEFFICIENT (K)

Select appropriate coefficient from OBC App A-3.2.5.7(3), Table 1

TYPE OF CONSTRUCTION	CLASSIFICATION BY GROUP OR DIVISION IN ACCORDANCE WITH TABLE 3.1.2.1 OBC				
	A2 B1 B2 B3 C D	A4 F3	A1 A3	E F2	F1
Building is of Noncombustible construction with fire separation and fire-resistance ratings provided in accordance with Subsection 3.2.2 of the OBC, including loadbearing walls, columns and arches.	10	12	14	17	23
Building is of Noncombustible construction or of heavy timber construction conforming to Article 3.1.4.6 of the OBC. Floor assemblies are fire separations but no fireresistance rating. Roof assemblies, mezzanines, loadbearing walls, columns and arches do not have a fireresistance rating.	16	19	22	27	37
Building is of Combustible Construction with fire separations and fire-resistance ratings provided in accordance with Subsection 3.2.2 of the OBC, including loadbearing walls, columns and arches. Noncombustible construction may be used in lieu of fire resistance rating where permitted in subsection 3.2.2 of the OBC	18	22	25	31	41
Building is of combustible construction. Floor assemblies are fire separations but with no fire-resistance rating. Roof assemblies, mezzanines, loadbearing walls, columns and arches do not have a fire-resistance rating.	23	28	32	39	53

SELECTED SUPPLY COEFFICIENT (K)	**10**
BUILDING CLASSIFICATION	**A2**

SPATIAL COEFFICIENTS (S_{tot})

Calculate total spatial coefficients from a review of exposure distances and spacial coefficient lookups.

		DISTANCE (m)	S_{side}
North	Exposure Distance 1 (m)	over 10m	0
East	Exposure Distance 2 (m)	over 10m	0
South	Exposure Distance 3 (m)	over 10m	0
West	Exposure Distance 4 (m)	over 10m	0.0
		S_{tot}	**1.00**

BUILDING VOLUME

Calculate building volumes

Building Length (m)		
Building Width (m)		
Building Area (sq.m.)	8101	**COMMENT ON BUILDING HEIGHT**
Building Height (m)	12.5	To u/s of roof decking.
Stories	3	

VOLUME (cu.m.)	**101,263**

MINIMUM WATER SUPPLY (Q)

Calculate Minimum Water Supply (Q) from formula

$$Q = KVS_{tot}$$

K	10
V	101,263
S_{tot}	1.00

Q	**1,012,625**	**Minimum Water Supply (Litres)**

MINIMUM SUPPLY FIOW RATE

Calculate Minimum Water Supply Flow Rate from OBC App A-3.2.5.7 Table 2 Lookup

BUILDING CODE, PART 3 BUILDINGS	REQUIRED MINIMUM WATER SUPPLY FLOW RATE (L/min)		
One Story Buildings with Building area not exceeding 600 m2 (excluding F1 Occupancy)			1,800
All Other Buildings	if Q > and	Q<=	
	0	108,000	2,700
	108,000	135,000	3,600
	135,000	162,000	4,500
	162,000	190,000	5,400
	190,000	270,000	6,300
	270,000		9,000

MINIMUM WATER SUPPLY FLOW RATE (L/min)	**9,000**	or	**150**	L/s

GPM (US)	**2,378**

VOLUME OF WATER

Under OBC 3.2.5.7. (c) 30min of fire fighting water is to be provided.

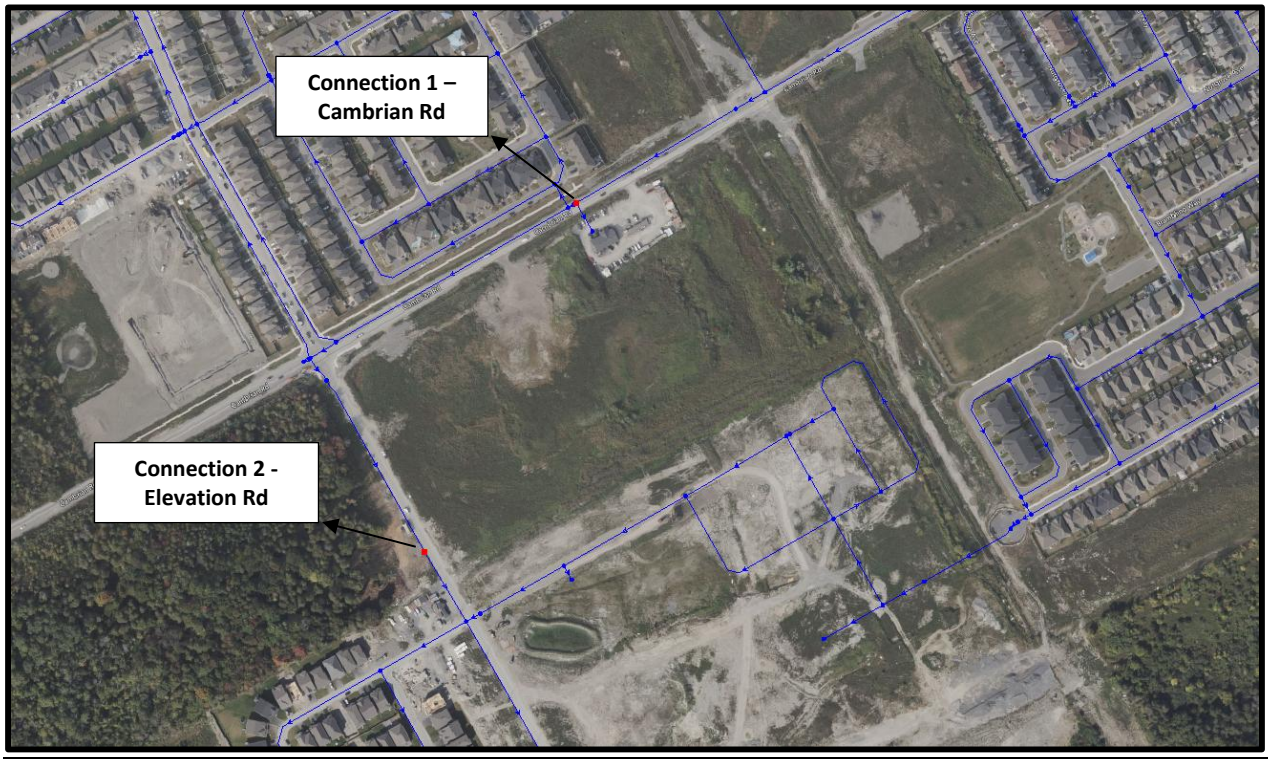
VOLUME (cu.m.)	**270**

Appendix D-4: Boundary Conditions
3853 Cambrian Rd – 2026

Provided Information

Scenario	Demand	
	L/min	L/s
Average Daily Demand	110.4	1.84
Maximum Daily Demand	165.6	2.76
Peak Hour	298.8	4.98
Fire Flow Demand #1	9,000.0	150.00
Fire Flow Demand #2	15,000.0	250.00

Location



Results

Existing Conditions

Connection 1 – Cambrian Road

Demand Scenario	Head (m)	Pressure[1] (psi)
Maximum HGL	155.9	89
Peak Hour	139.4	65
Max Day plus Fire Flow #1	139.4	65
Max Day plus Fire Flow #2	132.5	56

[1] Ground Elevation = 93.4 m

Connection 2 – Elevation Road

Demand Scenario	Head (m)	Pressure[1] (psi)
Maximum HGL	155.9	89
Peak Hour	139.4	66
Max Day plus Fire Flow #1	139.4	66
Max Day plus Fire Flow #2	130.5	53

[1] Ground Elevation = 93.1 m

Future SUC

Connection 1 – Cambrian Road

Demand Scenario	Head (m)	Pressure[1] (psi)
Maximum HGL	146.9	76
Peak Hour	142.4	70
Max Day plus Fire Flow #1	141.1	68
Max Day plus Fire Flow #2	137.0	62

[1] Ground Elevation = 93.4 m

Connection 2 – Elevation Road

Demand Scenario	Head (m)	Pressure[1] (psi)
Maximum HGL	146.9	77
Peak Hour	142.4	70
Max Day plus Fire Flow #1	140.3	67
Max Day plus Fire Flow #2	135.1	60

[1] Ground Elevation = 93.1 m

Notes

1. Demands for proposed Connection 1 at existing stub were assigned to upstream junction at Cambrian Rd off the public looped watermains. The engineer must calculate headloss off the dead-end main.

2. As per the Ontario Building Code in areas that may be occupied, the static pressure at any fixture shall not exceed 552 kPa (80 psi.) Pressure control measures to be considered are as follows, in order of preference:

    - If possible, systems to be designed to residual pressures of 345 to 552 kPa (50 to 80 psi) in all occupied areas outside of the public right-of-way without special pressure control equipment.
    - Pressure reducing valves to be installed immediately downstream of the isolation valve in the home/ building, located downstream of the meter so it is owner maintained.

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.

Appendix D-4.1 Existing Water Boundary Conditions - Connection 1 - Cambrian Road Existing Conditions

Water Demands

Average Daily Demand:	1.84	l/s
Maximum Daily Demand:	2.76	l/s
Maximum Hour Demand:	4.98	l/s
Fire Flow Demand:	250.00	l/s
Maximum Daily + Fire Flow Demand:	252.76	l/s

Design Parameters

Pipe Diameter:	200	mm
Pipe Material:	PVC	
Pipe Length (total network):	117.0	m
Finished Floor Elevation:	95.20	
Pavement (R.O.W.) Elevation:	93.40	

Boundary Conditions

Max. HGL:	155.9	m
Min HGL:	139.4	m
Max. Day + Fire:	132.5	m

Boundary Condition Check

Check water pressure at municipal connection:

Min. HGL - Pavement elevation =	46.00	m	
=	65.41	psi*	***Normal operating pressure ranges between 345 kPa (50 psi) and 552 kPa (80 psi) under a condition of maximum daily flow as per City of Ottawa Design Guidelines - Water Distribution (Section 4.2.2)**
=	450.99	kPa*	

Pressure at municipal connection OK

Check water pressure at building connection (at max. hour demand):

Min. HGL - Finished floor elevation - Friction Loss** =	44.18	m	****Friction loss calculated using the Hazen-Williams Equation**
=	62.83	psi***	*****Under maximum hourly demand conditions the pressures shall not be less than 276 kPa (40 psi) as per City of Ottawa Design Guidelines - Water Distribution (Section 4.2.2)**
=	433.18	kPa***	

Pressure at building connection (at max. hour demand) OK

Appendix D-4.1.1 Cambrian Road Existing Conditions Max Hour
Hazen-Williams Equation for Pressure Loss in Pipes
SI Units

Specified Data

l = length of pipe (m)	117	
c = Hazen-Williams roughness constant	150	
q = volume flow (liter/sec)	4.98	0.00498 m3/s
dh = inside or hydraulic diameter (mm)	200	

Calculated Pressure Loss

f = friction head loss in mm of water per 100 m of pipe (mm H20 per 100 m pipe)	13.99	
f = friction head loss in kPa per 100 m of pipe (kPa per 100 m pipe)	0.14	
Head loss (mm H20)	16.37	**0.016369243 METERS**
Head loss (kPa)	0.16	

Calculated Flow Velocity

v = flow velocity (m/s)	0.16

Material	Hazen-Williams Coefficient - *c* -
ABS - Acrylonite Butadiene Styrene	130
Aluminum	130 - 150
Asbestos Cement	140
Asphalt Lining	130 - 140
Brass	130 - 140
Brick sewer	90 - 100
Cast-Iron - new unlined (CIP)	130
Cast-Iron 10 years old	107 - 113
Cast-Iron 20 years old	89 - 100
Cast-Iron 30 years old	75 - 90
Cast-Iron 40 years old	64-83
Cast-Iron, asphalt coated	100
Cast-Iron, cement lined	140
Cast-Iron, bituminous lined	140
Cast-Iron, sea-coated	120
Cast-Iron, wrought plain	100
Cement lining	130 - 140
Concrete	100 - 140
Concrete lined, steel forms	140
Concrete lined, wooden forms	120
Concrete, old	100 - 110
Copper	130 - 140
Corrugated Metal	60
Ductile Iron Pipe (DIP)	140
Ductile Iron, cement lined	120
Fiber	140
Fiber Glass Pipe - FRP	150
Galvanized iron	120
Glass	130
Lead	130 - 140
Metal Pipes - Very to extremely smooth	130 - 140
Plastic	130 - 150
Polyethylene, PE, PEH	140
Polyvinyl chloride, PVC, CPVC	150
Smooth Pipes	140
Steel new unlined	140 - 150
Steel, corrugated	60
Steel, welded and seamless	100
Steel, interior riveted, no projecting rivets	110
Steel, projecting girth and horizontal rivets	100
Steel, vitrified, spiral-riveted	90 - 110
Steel, welded and seamless	100
Tin	130
Vitrified Clay	110
Wrought iron, plain	100
Wooden or Masonry Pipe - Smooth	120
Wood Stave	110 - 120

Appendix D-4.2 Existing Water Boundary Conditions - Connection 2 - Elevation Road Existing Conditions

Water Demands		Design Parameters		Boundary Conditions	
Average Daily Demand:	1.84 l/s	Pipe Diameter:	200 mm	Max. HGL:	155.9 m
Maximum Daily Demand:	2.76 l/s	Pipe Material:	PVC	Min HGL:	139.4 m
Maximum Hour Demand:	4.98 l/s	Pipe Length (total network):	273.5 m	Max. Day + Fire:	130.5 m
Fire Flow Demand:	250.00 l/s	Finished Floor Elevation:	95.20		
Maximum Daily + Fire Flow Demand:	252.76 l/s	Pavement (R.O.W.) Elevation:	93.10		

Boundary Condition Check

Check water pressure at municipal connection:

Min. HGL - Pavement elevation = 46.30 m
= 65.84 psi*
= 453.93 kPa*

***Normal operating pressure ranges between 345 kPa (50 psi) and 552 kPa (80 psi) under a condition of maximum daily flow as per City of Ottawa Design Guidelines - Water Distribution (Section 4.2.2)**

Pressure at municipal connection OK

Check water pressure at building connection (at max. hour demand):

Min. HGL - Finished floor elevation - Friction Loss** = 44.16 m
= 62.80 psi***
= 432.97 kPa***

****Friction loss calculated using the Hazen-Williams Equation**

*****Under maximum hourly demand conditions the pressures shall not be less than 276 kPa (40 psi) as per City of Ottawa Design Guidelines - Water Distribution (Section 4.2.2)**

Pressure at building connection (at max. hour demand) OK

Appendix D-4.2.1 Existing Water Boundary Conditions - Elevation Road Max Hour
Hazen-Williams Equation for Pressure Loss in Pipes
SI Units

Specified Data

l = length of pipe (m)	273.5	
c = Hazen-Williams roughness constant	150	
q = volume flow (liter/sec)	4.98	0.00498 m3/s
dh = inside or hydraulic diameter (mm)	200	

Calculated Pressure Loss

f = friction head loss in mm of water per 100 m of pipe (mm H20 per 100 m pipe)	13.99	
f = friction head loss in kPa per 100 m of pipe (kPa per 100 m pipe)	0.14	
Head loss (mm H20)	38.26	**0.038265 METERS**
Head loss (kPa)	0.38	

Calculated Flow Velocity

v = flow velocity (m/s)	0.16	

Material	Hazen-Williams Coefficient - *c* -
ABS - Acrylonite Butadiene Styrene	130
Aluminum	130 - 150
Asbestos Cement	140
Asphalt Lining	130 - 140
Brass	130 - 140
Brick sewer	90 - 100
Cast-Iron - new unlined (CIP)	130
Cast-Iron 10 years old	107 - 113
Cast-Iron 20 years old	89 - 100
Cast-Iron 30 years old	75 - 90
Cast-Iron 40 years old	64-83
Cast-Iron, asphalt coated	100
Cast-Iron, cement lined	140
Cast-Iron, bituminous lined	140
Cast-Iron, sea-coated	120
Cast-Iron, wrought plain	100
Cement lining	130 - 140
Concrete	100 - 140
Concrete lined, steel forms	140
Concrete lined, wooden forms	120
Concrete, old	100 - 110
Copper	130 - 140
Corrugated Metal	60
Ductile Iron Pipe (DIP)	140
Ductile Iron, cement lined	120
Fiber	140
Fiber Glass Pipe - FRP	150
Galvanized iron	120
Glass	130
Lead	130 - 140
Metal Pipes - Very to extremely smooth	130 - 140
Plastic	130 - 150
Polyethylene, PE, PEH	140
Polyvinyl chloride, PVC, CPVC	150
Smooth Pipes	140
Steel new unlined	140 - 150
Steel, corrugated	60
Steel, welded and seamless	100
Steel, interior riveted, no projecting rivets	110
Steel, projecting girth and horizontal rivets	100
Steel, vitrified, spiral-riveted	90 - 110
Steel, welded and seamless	100
Tin	130
Vitrified Clay	110
Wrought iron, plain	100
Wooden or Masonry Pipe - Smooth	120
Wood Stave	110 - 120

Appendix D-4.3 Future SUC Water Boundary Conditions - Connection 1 - Cambrian Road

Water Demands

Average Daily Demand:	1.84	l/s
Maximum Daily Demand:	2.76	l/s
Maximum Hour Demand:	4.98	l/s
Fire Flow Demand:	250.00	l/s
Maximum Daily + Fire Flow Demand:	252.76	l/s

Design Parameters

Pipe Diameter:	200	mm
Pipe Material:	PVC	
Pipe Length (total network):	117.0	m
Finished Floor Elevation:	95.20	
Pavement (R.O.W.) Elevation:	93.40	

Boundary Conditions

Max. HGL:	146.9	m
Min HGL:	142.4	m
Max. Day + Fire:	137	m

Boundary Condition Check

Check water pressure at municipal connection:

Min. HGL - Pavement elevation =	49.00	m	
=	69.68	psi*	***Normal operating pressure ranges between 345 kPa (50 psi) and 552 kPa (80 psi) under a condition of maximum daily flow as per City of Ottawa Design Guidelines - Water Distribution (Section 4.2.2)**
=	480.40	kPa*	

Pressure at municipal connection OK

Check water pressure at building connection (at max. hour demand):

Min. HGL - Finished floor elevation - Friction Loss** =	47.18	m	****Friction loss calculated using the Hazen-Williams Equation**
=	67.09	psi***	*****Under maximum hourly demand conditions the pressures shall not be less than 276 kPa (40 psi) as per City of Ottawa Design Guidelines - Water Distribution (Section 4.2.2)**
=	462.59	kPa***	

Pressure at building connection (at max. hour demand) OK

Appendix D-4.3.1 Future SUC Water Boundary Conditions - Cambrian Road Max Hour
Hazen-Williams Equation for Pressure Loss in Pipes
SI Units

Specified Data

l = length of pipe (m)	117	
c = Hazen-Williams roughness constant	150	
q = volume flow (liter/sec)	4.98	0.00498 m3/s
dh = inside or hydraulic diameter (mm)	200	

Calculated Pressure Loss

f = friction head loss in mm of water per 100 m of pipe (mm H20 per 100 m pipe)	13.99	
f = friction head loss in kPa per 100 m of pipe (kPa per 100 m pipe)	0.14	
Head loss (mm H20)	16.37	**0.016369 METERS**
Head loss (kPa)	0.16	

Calculated Flow Velocity

v = flow velocity (m/s)	0.16

Material	Hazen-Williams Coefficient - *c* -
ABS - Acrylonite Butadiene Styrene	130
Aluminum	130 - 150
Asbestos Cement	140
Asphalt Lining	130 - 140
Brass	130 - 140
Brick sewer	90 - 100
Cast-Iron - new unlined (CIP)	130
Cast-Iron 10 years old	107 - 113
Cast-Iron 20 years old	89 - 100
Cast-Iron 30 years old	75 - 90
Cast-Iron 40 years old	64-83
Cast-Iron, asphalt coated	100
Cast-Iron, cement lined	140
Cast-Iron, bituminous lined	140
Cast-Iron, sea-coated	120
Cast-Iron, wrought plain	100
Cement lining	130 - 140
Concrete	100 - 140
Concrete lined, steel forms	140
Concrete lined, wooden forms	120
Concrete, old	100 - 110
Copper	130 - 140
Corrugated Metal	60
Ductile Iron Pipe (DIP)	140
Ductile Iron, cement lined	120
Fiber	140
Fiber Glass Pipe - FRP	150
Galvanized iron	120
Glass	130
Lead	130 - 140
Metal Pipes - Very to extremely smooth	130 - 140
Plastic	130 - 150
Polyethylene, PE, PEH	140
Polyvinyl chloride, PVC, CPVC	150
Smooth Pipes	140
Steel new unlined	140 - 150
Steel, corrugated	60
Steel, welded and seamless	100
Steel, interior riveted, no projecting rivets	110
Steel, projecting girth and horizontal rivets	100
Steel, vitrified, spiral-riveted	90 - 110
Steel, welded and seamless	100
Tin	130
Vitrified Clay	110
Wrought iron, plain	100
Wooden or Masonry Pipe - Smooth	120
Wood Stave	110 - 120

Appendix D-4.4 Future SUC Water Boundary Conditions - Connection 2 - Elevation Road

Water Demands

Average Daily Demand:	1.84	l/s
Maximum Daily Demand:	2.76	l/s
Maximum Hour Demand:	4.98	l/s
Fire Flow Demand:	250.00	l/s
Maximum Daily + Fire Flow Demand:	252.76	l/s

Design Parameters

Pipe Diameter:	200	mm
Pipe Material:	PVC	
Pipe Length (total network):	273.5	m
Finished Floor Elevation:	95.20	
Pavement (R.O.W.) Elevation:	93.10	

Boundary Conditions

Max. HGL:	146.9	m
Min HGL:	142.4	m
Max. Day + Fire:	135.1	m

Boundary Condition Check

Check water pressure at municipal connection:

Min. HGL - Pavement elevation =	49.30	m	
=	70.10	psi*	***Normal operating pressure ranges between 345 kPa (50 psi) and 552 kPa (80 psi) under a condition of maximum daily flow as per City of Ottawa Design Guidelines - Water Distribution (Section 4.2.2)**
=	483.34	kPa*	

Pressure at municipal connection OK

Check water pressure at building connection (at max. hour demand):

Min. HGL - Finished floor elevation - Friction Loss** =	47.16	m	****Friction loss calculated using the Hazen-Williams Equation**
=	67.06	psi***	*****Under maximum hourly demand conditions the pressures shall not be less than 276 kPa (40 psi) as per City of Ottawa Design Guidelines - Water Distribution (Section 4.2.2)**
=	462.38	kPa***	

Pressure at building connection (at max. hour demand) OK

Appendix D-4.4.1 Future SUC Water Boundary Conditions - Connection 2 - Elevation Road Max H

Hazen-Williams Equation for Pressure Loss in Pipes

SI Units

Specified Data

l = length of pipe (m)	273.5	
c = Hazen-Williams roughness constant	150	
q = volume flow (liter/sec)	4.98	0.00498 m3/s
dh = inside or hydraulic diameter (mm)	200	

Calculated Pressure Loss

f = friction head loss in mm of water per 100 m of pipe (mm H20 per 100 m pipe)	13.99	
f = friction head loss in kPa per 100 m of pipe (kPa per 100 m pipe)	0.14	
Head loss (mm H20)	38.26	**0.038265 METERS**
Head loss (kPa)	0.38	

Calculated Flow Velocity

v = flow velocity (m/s)	0.16	

Material	Hazen-Williams Coefficient - *c* -
ABS - Acrylonite Butadiene Styrene	130
Aluminum	130 - 150
Asbestos Cement	140
Asphalt Lining	130 - 140
Brass	130 - 140
Brick sewer	90 - 100
Cast-Iron - new unlined (CIP)	130
Cast-Iron 10 years old	107 - 113
Cast-Iron 20 years old	89 - 100
Cast-Iron 30 years old	75 - 90
Cast-Iron 40 years old	64-83
Cast-Iron, asphalt coated	100
Cast-Iron, cement lined	140
Cast-Iron, bituminous lined	140
Cast-Iron, sea-coated	120
Cast-Iron, wrought plain	100
Cement lining	130 - 140
Concrete	100 - 140
Concrete lined, steel forms	140
Concrete lined, wooden forms	120
Concrete, old	100 - 110
Copper	130 - 140
Corrugated Metal	60
Ductile Iron Pipe (DIP)	140
Ductile Iron, cement lined	120
Fiber	140
Fiber Glass Pipe - FRP	150
Galvanized iron	120
Glass	130
Lead	130 - 140
Metal Pipes - Very to extremely smooth	130 - 140
Plastic	130 - 150
Polyethylene, PE, PEH	140
Polyvinyl chloride, PVC, CPVC	150
Smooth Pipes	140
Steel new unlined	140 - 150
Steel, corrugated	60
Steel, welded and seamless	100
Steel, interior riveted, no projecting rivets	110
Steel, projecting girth and horizontal rivets	100
Steel, vitrified, spiral-riveted	90 - 110
Steel, welded and seamless	100
Tin	130
Vitrified Clay	110
Wrought iron, plain	100
Wooden or Masonry Pipe - Smooth	120
Wood Stave	110 - 120

Appendix D-4.5 Existing Water Boundary Conditions - Private Hydrant Check - Cambrian Road

Water Demands

Average Daily Demand:	1.84	l/s
Maximum Daily Demand:	2.76	l/s
Maximum Hour Demand:	4.98	l/s
Fire Flow Demand at hydrant	95.00	l/s

Design Parameters

Pipe Diameter:	200	mm
Pipe Material:	PVC	
Pipe Length (municipal connection to building):	117.0	m
Pipe Length (building to hydrant):	58.0	m
Pipe Length (total network):	175.0	m
Finished Floor Elevation:	95.20	
Pavement elevation at hydrant:	94.30	

Boundary Conditions

Max. HGL:	155.90	m
Min HGL:	139.40	m
Max. Day + Fire:	132.50	m

Boundary Condition Check

Check water pressure at fire hydrant

Min. HGL - elevation at hydrant- Friction Loss** = 39.34 m
= 55.94 psi****
= 385.70 kPa****

****Friction loss calculated using the Hazen-Williams Equation**

*****Appendix I Ottawa design guidelines table 1 hydrant class AA, 5,700 l/min =95 l/s at a minimum 20 psi**

Appendix D-4.5.1 Existing Water Boundary Conditions - Check at Private Fire Hydrant - Cambrian Road

Hazen-Williams Equation for Pressure Loss in Pipes

SI Units

Specified Data

l = length of pipe (m)	175	
c = Hazen-Williams roughness constant	150	
q = volume flow (liter/sec)	95.00	0.095 m3/s
dh = inside or hydraulic diameter (mm)	200	

Calculated Pressure Loss

f = friction head loss in mm of water per 100 m of pipe (mm H20 per 100 m pipe	3290.93	
f = friction head loss in kPa per 100 m of pipe (kPa per 100 m pipe)	32.28	
Head loss (mm H20)	5759.12	**5.75912 METERS**
Head loss (kPa)	56.50	

Calculated Flow Velocity

v = flow velocity (m/s)	3.02	

Material	Hazen-Williams Coefficient - c -
ABS - Acrylonite Butadiene Styrene	130
Aluminum	130 - 150
Asbestos Cement	140
Asphalt Lining	130 - 140
Brass	130 - 140
Brick sewer	90 - 100
Cast-Iron - new unlined (CIP)	130
Cast-Iron 10 years old	107 - 113
Cast-Iron 20 years old	89 - 100
Cast-Iron 30 years old	75 - 90
Cast-Iron 40 years old	64-83
Cast-Iron, asphalt coated	100
Cast-Iron, cement lined	140
Cast-Iron, bituminous lined	140
Cast-Iron, sea-coated	120
Cast-Iron, wrought plain	100
Cement lining	130 - 140
Concrete	100 - 140
Concrete lined, steel forms	140
Concrete lined, wooden forms	120
Concrete, old	100 - 110
Copper	130 - 140
Corrugated Metal	60
Ductile Iron Pipe (DIP)	140
Ductile Iron, cement lined	120
Fiber	140
Fiber Glass Pipe - FRP	150
Galvanized iron	120
Glass	130
Lead	130 - 140
Metal Pipes - Very to extremely smooth	130 - 140
Plastic	130 - 150
Polyethylene, PE, PEH	140
Polyvinyl chloride, PVC, CPVC	150
Smooth Pipes	140
Steel new unlined	140 - 150
Steel, corrugated	60
Steel, welded and seamless	100
Steel, interior riveted, no projecting rivets	110
Steel, projecting girth and horizontal rivets	100
Steel, vitrified, spiral-riveted	90 - 110
Steel, welded and seamless	100
Tin	130
Vitrified Clay	110
Wrought iron, plain	100
Wooden or Masonry Pipe - Smooth	120
Wood Stave	110 - 120

Appendix D-4.6 Future SUC Water Boundary Conditions - Private Hydrant Check - Cambrian Road

Water Demands

Average Daily Demand:	1.84	l/s
Maximum Daily Demand:	2.76	l/s
Maximum Hour Demand:	4.98	l/s
Fire Flow Demand at hydrant	95.00	l/s

Design Parameters

Pipe Diameter:	200	mm
Pipe Material:	PVC	
Pipe Length (municipal connection to building):	117.0	m
Pipe Length (building to hydrant):	58.0	m
Pipe Length (total network):	175.0	m
Finished Floor Elevation:	95.20	
Pavement elevation at hydrant:	94.30	

Boundary Conditions

Max. HGL:	146.90	m
Min HGL:	142.40	m
Max. Day + Fire:	137.00	m

Boundary Condition Check

Check water pressure at fire hydrant

Min. HGL - elevation at hydrant- Friction Loss** = 42.34 m
= 60.21 psi****
= 415.12 kPa****

****Friction loss calculated using the Hazen-Williams Equation**

*****Appendix I Ottawa design guidelines table 1 hydrant class AA, 5,700 l/min =95 l/s at a minimum 20 psi**

Appendix D-4.6.1 Future SUC Water Boundary Conditions - Check at Private Fire Hydrant - Cambrian Road

Hazen-Williams Equation for Pressure Loss in Pipes

SI Units

Specified Data

l = length of pipe (m)	175	
c = Hazen-Williams roughness constant	150	
q = volume flow (liter/sec)	95.00	0.095 m3/s
dh = inside or hydraulic diameter (mm)	200	

Calculated Pressure Loss

f = friction head loss in mm of water per 100 m of pipe (mm H20 per 100 m pipe)	3290.93	
f = friction head loss in kPa per 100 m of pipe (kPa per 100 m pipe)	32.28	
Head loss (mm H20)	5759.12	**5.75912 METERS**
Head loss (kPa)	56.50	

Calculated Flow Velocity

v = flow velocity (m/s)	3.02	

Material	Hazen-Williams Coefficient - *c* -
ABS - Acrylonite Butadiene Styrene	130
Aluminum	130 - 150
Asbestos Cement	140
Asphalt Lining	130 - 140
Brass	130 - 140
Brick sewer	90 - 100
Cast-Iron - new unlined (CIP)	130
Cast-Iron 10 years old	107 - 113
Cast-Iron 20 years old	89 - 100
Cast-Iron 30 years old	75 - 90
Cast-Iron 40 years old	64-83
Cast-Iron, asphalt coated	100
Cast-Iron, cement lined	140
Cast-Iron, bituminous lined	140
Cast-Iron, sea-coated	120
Cast-Iron, wrought plain	100
Cement lining	130 - 140
Concrete	100 - 140
Concrete lined, steel forms	140
Concrete lined, wooden forms	120
Concrete, old	100 - 110
Copper	130 - 140
Corrugated Metal	60
Ductile Iron Pipe (DIP)	140
Ductile Iron, cement lined	120
Fiber	140
Fiber Glass Pipe - FRP	150
Galvanized iron	120
Glass	130
Lead	130 - 140
Metal Pipes - Very to extremely smooth	130 - 140
Plastic	130 - 150
Polyethylene, PE, PEH	140
Polyvinyl chloride, PVC, CPVC	150
Smooth Pipes	140
Steel new unlined	140 - 150
Steel, corrugated	60
Steel, welded and seamless	100
Steel, interior riveted, no projecting rivets	110
Steel, projecting girth and horizontal rivets	100
Steel, vitrified, spiral-riveted	90 - 110
Steel, welded and seamless	100
Tin	130
Vitrified Clay	110
Wrought iron, plain	100
Wooden or Masonry Pipe - Smooth	120
Wood Stave	110 - 120

Domestic Demand Calculations and Allocation

Demand Polygon / Junction ID	Dwelling Type	Number of Units	Population		Average Day Demand			Max Day 2.5 x Avg. Day (L/s)	Peak Hour 5.5 x Avg. Day (L/s)	Min Hour 0.5 x Avg. Day (L/s)
			Persons per Unit (Ottawa Design Guidelines)	Population per dwelling type	L/c/d	L/d	L/s			
J-03	Townhome	8	2.7	22	350	7,560	0.09	0.22	0.48	0.04
J-04	Single Detached	12	3.4	41	350	14,280	0.17	0.41	0.91	0.08
J-05	Townhome	12	2.7	32	350	11,340	0.13	0.33	0.72	0.07
J-06	Single Detached	6	3.4	20	350	7,140	0.08	0.21	0.45	0.04
J-07	Townhome	18	2.7	49	350	17,010	0.20	0.49	1.08	0.10
J-08	Townhome	6	2.7	16	350	5,670	0.07	0.16	0.36	0.03
J-10	Townhome	11	2.7	30	350	10,395	0.12	0.30	0.66	0.06
J-11	Townhome	20	2.7	54	350	18,900	0.22	0.55	1.20	0.11
J-12	Single Detached	13	3.4	44	350	15,470	0.18	0.45	0.98	0.09
J-13	Single Detached	14	3.4	48	350	16,660	0.19	0.48	1.06	0.10
J-14	Single Detached	14	3.4	48	350	16,660	0.19	0.48	1.06	0.10
J-15	Townhome	17	2.7	46	350	16,065	0.19	0.46	1.02	0.09
J-16	Single Detached	21	3.4	71	350	24,990	0.29	0.72	1.59	0.14
J-17	Single Detached	15	3.4	51	350	17,850	0.21	0.52	1.14	0.10
J-20	Single Detached	19	3.4	65	350	22,610	0.26	0.65	1.44	0.13
J-22	Townhome	15	2.7	41	350	14,175	0.16	0.41	0.90	0.08
J-23	Back-to-back Townhome	44	2.7	119	350	41,580	0.48	1.20	2.65	0.24
J-25	Single Detached	19	3.4	65	350	22,610	0.26	0.65	1.44	0.13
Subtotal:		**284**		**860**		**300,965**	**3.48**	**8.71**	**19.16**	**1.74**

Demand Polygon / Junction ID	Land Use Type	Area (ha)	Population			Average Day Demand			Max Day 2.5 x Avg. Day (L/s)	Peak Hour 2.2 x Max Day (L/s)	Min Hour 0.5 x Avg. Day
			Units per Net Ha	Persons per Unit	Population	(L/c/d)	(L/d)	(L/s)			
J-26	Apartment Block	0.77	120	1.8	166	350	58,212	0.67	1.68	3.71	0.34
Subtotal:		**0.77**					**58,212**	**0.67**	**1.68**	**3.71**	**0.34**

Demand Polygon / Junction ID	Land Use Type	Area (ha)				Average Day Demand			Max Day 1.5 x Avg. Day (L/s)	Peak Hour 1.8 x Max Day (L/s)	Min Hour 0.5 x Avg. Day
						(L/ha/d)	(L/d)	(L/s)			
J-07	Parkette	0.23				28,000	6,440	0.07	0.11	0.20	0.04
J-26	Commercial Block 2	1.36				50,000	68,000	0.79	1.18	2.13	0.39
J-27	Secondary School	6.07				50,000	303,500	3.51	5.27	9.48	1.76
	Commercial Block 1	1.51				50,000	75,500	0.87	1.31	2.36	0.44
Subtotal:		**9.17**					**453,440**	**5.25**	**7.87**	**14.17**	**2.62**

Total:								**9.41**	**18.27**	**37.03**	**4.70**

Table 3: Water Supply Design Criteria

Design Parameter	Value
Residential – Single Family	3.4 p/unit
Residential – Townhome	2.7 p/unit
Residential – Average Daily Demand	350 L/p/day
Residential – Maximum Daily Demand	2.5 x Average Daily Demand
Residential – Maximum Hourly Demand	2.2 x Maximum Daily Demand
Residential – Minimum Hourly Demand	0.5 x Average Daily Demand
Commercial / Institutional Average Daily Demand	50,000 L/ha/day
Park Average Daily Demand	9,300 L/ha/day
Commercial / Institutional Maximum Hour Demand	1.8 x Maximum Daily Demand
Fire Flow	Calculated as per the Fire Underwriter's Survey 1999.
Minimum Watermain Size	150 mm diameter
Service Lateral Size	19 mm dia. Copper or equivalent
Minimum Depth of Cover	2.4 m from top of watermain to finished grade
Peak hourly demand operating pressure	275 kPa and 690 kPa
Fire flow operating pressure minimum	140 kPa
Extracted from Section 4: Ottawa Design Guidelines, Water Distribution (July 2010), ISDTB-2010-2	

The proposed water supply network is depicted on ***Figure 3***.

A complete hydraulic analysis has been prepared for the proposed water distribution network to confirm that water supply is available within the required pressure range under the anticipated demand during average day, peak hour and fire flow conditions. Refer to the ***Hydraulic Capacity and Modeling Analysis, Half Moon Bay West – Phase 1 Development*** prepared by GeoAdvice Engineering Inc. dated July 6, 2018 (GeoAdvice Report), enclosed in ***Appendix B***.

3.2.1 Fire Flow Demand

Fire flow calculations for single detached dwellings and townhouses are detailed in the ***GeoAdvice Report***, enclosed in ***Appendix B***. Calculations for the single detached dwellings and traditional townhomes reached the City of Ottawa's cap of 10,000 L/min (167 L/s) as outlined in *ISDTB-2014-02*. The required fire flow for back-to-back townhomes is 15,000 L/min (250 L/s). At this time, there is not enough information available to calculate the required fire flows of the apartment block, secondary school, commercial blocks and parkette so a required fire flow of 250 L/s was assumed, which is a typical requirement for similar land uses. The fire flows are calculated in accordance with the Fire Underwriters Survey's Water Supply for Public Fire Protection Guideline (1999).

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Table 3.2: Boundary Conditions Post Pressure Zone Reconfiguration

	Connection 1 Cambrian Road		Connection 2 River Run Avenue	
Condition	**HGL (m)**	**Pressure (psi)**	**HGL (m)**	**Pressure (psi)**
Maximum HGL	147.7	78.1	147.7	78.8
Peak Hour (min pressure)	144.5	73.4	144.5	74.2
Max Day + Fire (167 L/s)	141.4	69.8	142.0	69.9
Max Day + Fire (250 L/s)	138.1	64.3	136.8	63.3

3.2.3 Water Demand Calculations

A summary of water demands for HMB West – Phase 1 is presented in ***Table 3.3.***

Table 3.3 – Summary of Water Demands

Dwelling Type	Number of Units	**Population**		**Avg Day** (L/s)	**Max Day** 2.5 x Avg Day (L/s)	**Peak Hour** 2.2 x Max Day (L/s)	**Min Hour** 0.5 x Avg Day (L/s)
		Persons per unit	Population per dwelling type				
Single Detached	133	3.4	449	1.82	4.55	10.00	0.91
Townhomes	106	2.7	286	1.16	2.90	6.38	0.58
Back-to-back Townhomes	44	2.7	119	0.48	1.20	2.65	0.24
Apartment Block	90	1.8	166	0.67	1.68	3.71	0.34

Land Use Type	**Area** (ha)	**Average Day** (L/s)	**Maximum Day** (L/s)	**Peak Hour** (L/s)	**Minimum Hour** (L/s)
Secondary School	6.07	3.51	5.27	9.48	1.76
Commercial Block 1	1.51	0.87	1.31	2.36	0.44
Commercial Block 2	1.36	0.79	1.18	2.13	0.39
Parkette	0.23	0.07	0.11	0.20	0.04

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Appendix E
Additional Documents

From: Vladimir Popovic <vladimirp@n45.ca>
Sent: Tuesday, June 2, 2026 10:53 AM
To: Brad Byvelds; Zachary Bauman
Subject: RE: [External Sender] RE: New HMB High School (126035)

Zach,

I think you can use those same numbers we sent to Brad. This works.

Vlad

Vladimir Popovic, oaa, fraic, leed ap
partner

N45 Architecture Inc
The Sovereign Building
71 Bank Street, 7th Floor, Ottawa, Ontario, K1P 5N2

Phone (613) 224-0095 ext 224
Fax (613) 224-9811

From: Brad Byvelds <B.Byvelds@novatech-eng.com>
Sent: June 2, 2026 10:36 AM
To: Vladimir Popovic <vladimirp@n45.ca>; zach.bauman <zach.bauman@jp2g.com>
Subject: FW: [External Sender] RE: New HMB High School (126035)

Hi Vlad and Zach,

We developed enrollment and staff assumptions for the traffic report based on the below email. Please see the below paragraph outlining the assumptions from our Traffic Scoping report. To ensure consistency between reports, please confirm the enrollment and staff assumptions.

> The development proposes a secondary school in the Half Moon Bay Community. The initially have a capacity of 1,475 students. As enrollment increases, the site can accom additional 24 portables. A future building expansion can accommodate an ad classrooms, or about 720 students, and would decommission the portables. For the p this TIA, it is assumed that the maximum enrollment is 2,195 students. The school and will employ 80 staff members. The anticipated school bell times are 8:00AM and 2:00 subject to school bus availability.

Thanks,
Brad Byvelds, P.Eng., Senior Project Manager | Transportation
NOVATECH
Engineers, Planners & Landscape Architects
240 Michael Cowpland Drive, Suite 200, Ottawa, ON, K2M 1P6 | Tel: 613.254.9643 x 286
The information contained in this email message is confidential and is for exclusive use of the addressee.

From: Vladimir Popovic <vladimirp@n45.ca>
Sent: Thursday, April 9, 2026 3:41 PM
To: Brad Byvelds <B.Byvelds@novatech-eng.com>
Subject: Fwd: [External Sender] RE: New HMB High School (126035)

PROJECT INFORMATION (FOR BUILDING CODE AND ZONNING BY-LAW PURPOSES):

BUILDING CLASSIFICATION:
THE BUILDING IS CLASSIFIED AND DESIGN TO CONFORM TO THE ONTARIO BUILDING CODE 2024 (CURRENT EDITION) PART 3

OCCUPANCY:
GROUP A, DIVISION 2, SPRINKLERED, THREE STOREYS (3.2.2.24)

BUILDING STATISTICS:

SCHOOL AREA (FOOTPRINT):	7,105 sq.m.
SCHOOL ZONING GFA:	15,360 sq.m.
SCHOOL NUMBER OF STOREYS:	3
BUILDING SPRINKLERED:	YES
# OF STREET ACCESS ROUTES:	1
CONSTRUCTION TYPE:	NON-COMB.
FLOOR ASSEMBLY & F.R.R.:	1 HOUR

TOPOGRAPHICAL PLAN INFORMATION:

SURVEY PROPERTY BOUNDARIES TAKEN FROM TOPOGRAPHICAL PLAN, PLAN OF BLOCK 173, REGISTERED PLAN 4M-1635, CITY OF OTTAWA

PREPARED BY FARLE Y, SMITH & DENIS SURVEYING LTD, JULY 7, 2026

SYMBOL LEGEND:

EXHYD	EXISTING FIRE HYDRANT
FP	FLAG POLE
HP	EXISTING HYDRO POLE
EXLS	EXISTING LIGHT STANDARD
R-EXLS	RELOCATED EXISTING LIGHT STANDARD
LS	LIGHT STANDARD - REFER TO ELECTRICAL
EXCB	EXISTING CATCH BASIN
CB	CATCH BASIN - REFER TO CIVIL
CBMH	CATCH BASIN/MANHOLE - REFER TO CIVIL
STMH	STORM MANHOLE - REFER TO CIVIL
	BUILDING ENTRANCE/EXIT
EXTRNSF	EXISTING TRANSFORMER
FDC	FIRE DEPARTMENT CONNECTION
DC	NEW DEPRESSED CURB
	NEW CURB
	PROPERTY LINE
	NEW CHAIN LINK FENCE - REFER TO LANDSCAPE

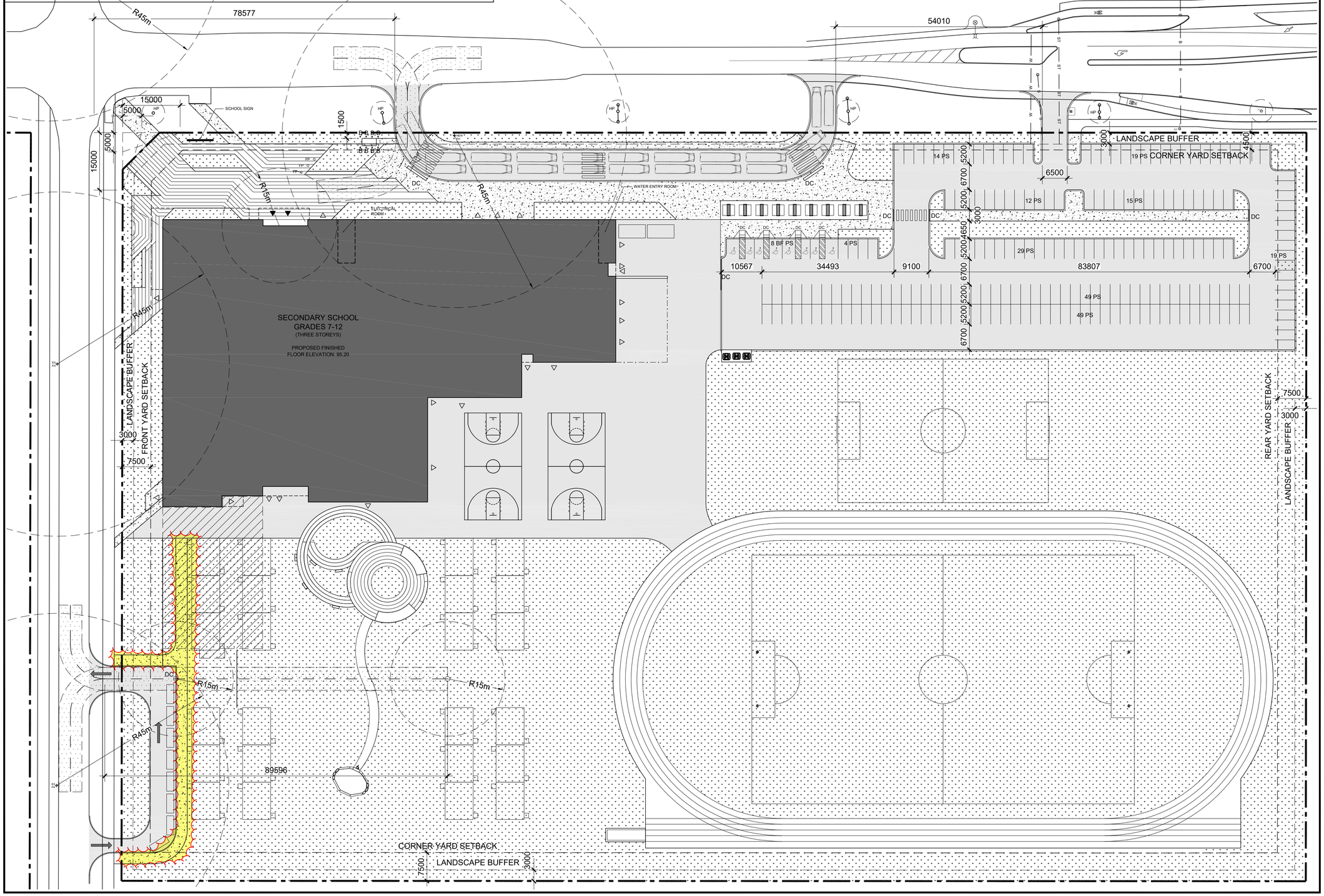
SIGNAGE LEGEND:

	NO TRESPASSING
FR	FIRE ROUTE
BF	BARRIER FREE PARKING
	ONE WAY (DOUBLE SIDED)
	NO ENTRY
VP	VISITOR PARKING
SP	STAFF PARKING
SCS	SCHOOL SIGN (DETAIL 6/A001)

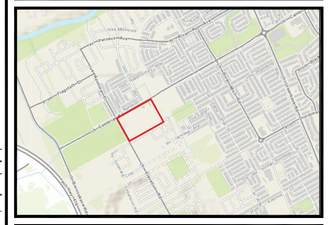
GROUNDCOVER LEGEND:

	GRASS / LANDSCAPING
	ASPHALT
	CONCRETE
	PAVERS

1 A001 SITE PLAN
SCALE 1:500



OTTAWA - CARLETON
DISTRICT SCHOOL BOARD



ARCHITECT:
N45 ARCHITECTURE INC
71 BANK STREET, 7TH FLOOR
OTTAWA, ONTARIO, K1P 5N2
613.224.0095
VLADIMIRP@N45.CA

LANDSCAPE ARCHITECT:
RUHLAND & ASSOCIATES LTD.
200-1750 COURTWOOD CRESCENT
OTTAWA, ONTARIO, K2C 2B5
613.224.4744
MRUHLAND@RALA.CA

CIVIL ENGINEER:
JP2G CONSULTANTS INC.
1150 MORRISON DRIVE, SUITE 410
OTTAWA, ONTARIO, K2H 8S9
613.828.7800
ZACH.BAUMAN@JP2G.COM

MECHANICAL & ELECTRICAL ENGINEER:
GOODKEY, WEEDMARK & ASSOCIATES LTD.
1888 WOODWARD DRIVE
OTTAWA, ONTARIO, K2C 3R8
613.727.5111 x299
RAJV@GWAL.COM

LAND SURVEYOR:
FARLEY, SMITH & DENIS SURVEYING LTD.
30 COLONNADE ROAD, UNIT 275
OTTAWA, ONTARIO, K2E 7J6
613.727.8226
INFO@FSDSURVEYS.CA

GEOTECHNICAL & ENVIRONMENTAL:
EXP SERVICES INC.
100-2650 QUEENSVIEW DRIVE
OTTAWA, ONTARIO K2B 8H6
613.688.1899 x63242
ISMAIL.TAKI@EXP.COM

TRAFFIC ENGINEER:
NOVATECH
240 MICHAEL COWPLAND DR, # 200
OTTAWA, ONTARIO, K2V 1P6
613.254.9643 x286
B.BYVELDS@NOVATECH-ENG.COM

no.	revision	date

N45 ARCHITECTURE INC.
71 Bank Street, 7th Floor - Ottawa, Ontario, K1P 5N2
tel. 613.224.0095 fax 613.224.9811

HALF MOON BAY SECONDARY SCHOOL

3853 CAMBRIAN ROAD
OTTAWA, ONTARIO
K2J 5P5

seal

drawing title
SITE PLAN

scale AS SHOWN	drawn by N.F.
date APRIL 2025	checked by V.P.
project number 26-923	drawing number **A001**

CONTRACTOR TO VERIFY ALL DIMENSIONS AND NOTIFY THE ARCHITECT OF ANY DISCREPANCIES BEFORE WORK COMMENCES.

DO NOT SCALE DRAWINGS

revision

D07-12-26-XXXX

99999

NOTE:
FOR CROSS SECTION 5–5
REFER TO DRAWING No. 24.
FOR CROSS SECTION 8–8
REFER TO DRAWING No. 45.

NOTE:
A GEOTECHNICAL ENGINEER LICENSED IN THE PROVINCE OF ONTARIO IS TO INSPECT ALL SUBGRADE SURFACES FOR FOOTING AND PAVEMENT STRUCTURES PRIOR TO CONSTRUCTION

NOTE:
ALL EXISTING POST & WIRE FENCE, CULVERTS, UTILITY WIRE / POLES, TREES, SHRUBS ETC. WITHIN LOTS, BLOCKS AND ROADS TO BE REMOVED, UNLESS OTHERWISE NOTED

NOTE RE: PERFORATED PIPE
PERFORATED PIPE IS REQUIRED FOR SWALE SLOPE LESS THAN 1.5%. REFER TO CITY STD. S29, S30 FOR REAR YARD TRENCH AND PIPE DETAIL ONLY

PERMISSION REQUIRED FOR WORK ON ADJACENT LANDS

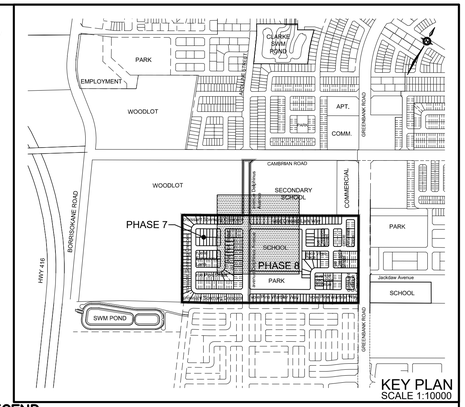
HALF MOON BAY SUBDIVISION PHASE 1 REFER TO DAVID SCHAEFFER ENGINEERING LIMITED PROJECT No. 16-888

ANY DISTURBED AREA DURING CONSTRUCTION TO BE RESTORED TO THE ORIGINAL CONDITION OR BETTER TO THE SATISFACTION OF THE AUTHORITIES HAVING JURISDICTION

CONTRACTOR TO VERIFY THE PRECISE LOCATIONS AND INVERT ELEVATIONS OF EX. UNDERGROUND SERVICES AND Ex. UTILITIES PRIOR TO STARTING CONSTRUCTION

REVIEWED BY DEVELOPMENT REVIEW BRANCH
Signed
Date June 4, 2024
Plan Number 15776

NOTE:
ALL SWALES SHALL BE 0.15m DEEP WITH 3:1 SIDE SLOPES UNLESS OTHERWISE INDICATED



KEY PLAN
SCALE 1:10000

LEGEND

- PROPOSED ELEVATION — 103.45
- EXISTING ELEVATION — *102.73*
- FUTURE ELEVATION — [93.900]
- PROPOSED SWALE GRADE — 1.5%
- HIGH POINT — 102.16
- STREET CATCHBASIN
- STREET CATCHBASIN WITH CLOSED LID
- CATCHBASIN MANHOLE
- TEE CATCHBASIN
- ELBOW CATCHBASIN
- HYDRANT, VALVE & VB
- VALVE & VC
- VALVE & VB
- BUILDING ENVELOPE
- TOP OF FOUNDATION (TOF) — 94.70
- FINISHED FLOOR ELEVATION (FFE) — 95.00
- UNDERSIDE OF FOOTING ELEVATION (USF) — 92.00
- MIN. UNDERSIDE OF FOOTING ELEV. (BASED ON 100 YR HGL/SERVICING CONNECTION/GWL PER GEOTECH RECOMMENTATION) — 92.00
- FOUNDATION WALL UNDERSIDE OF FOOTING ELEVATION — <92.00
- UNITS REQUIRING WATER PRESSURE REDUCING VALVES — PRV
- WALKOUT UNITS — W.O.
- HYDRO SWITCHGEAR
- HYDRO TRANSFORMER
- STREET LIGHT STANDARD
- TACTILE WALKING SURFACE INDICATOR (AS PER CITY OF OTTAWA STD. SC6)
- OVERLAND FLOW DIRECTION
- EXTERNAL OVERLAND FLOW DIRECTION
- EMERGENCY OVERLAND FLOW DIRECTION
- RETAINING WALL AND ELEVATIONS — T/W=103.10, B/W=102.44
- CHAINLINK FENCE (1.5m UNLESS OTHERWISE NOTED)
- NOISE BARRIER (3.0m UNLESS OTHERWISE NOTED) — 3.000K
- DECORATIVE FENCE (SEE LANDSCAPE DWGS FOR DETAIL)
- CONSTRUCTION FENCE
- PROPERTY BOUNDARY
- 3:1 TERRACING MAXIMUM SLOPE — 100.20 / 99.20
- PONDING AREA WITH SPILLWAY ELEVATION (MAXIMUM 0.30m) — 99.64
- 250ø PVC PERFORATED PIPE (REFER TO CITY STD S29 FOR REAR YARD TRENCH AND PIPE DETAILS ONLY)
- (SUBDRAIN APPLIED FOR SLOPE LESS THAN 1.5%)
- CLAY SEAL (REFER TO GENERAL NOTES, No.18. ON DWG. No. 1, AND GEOTECHNICAL CONSULTANT'S SPECIFICATIONS)
- PHASING LIMITS
- PREVIOUS PHASES / PHASES NOT PART OF CURRENT GRADING APPROVAL

REFER TO DWG No.40

TOPOGRAPHIC INFORMATION

CITY OF OTTAWA 1K MAPPING, RECEIVED ON FEBRUARY 7, 2017 AND DECEMBER 21, 2018.

LEGAL INFORMATION

CALCULATED M–PLAN PHASE 7 PROVIDED BY ANNIS, O'SULLIVAN, VOLLEBEKK LTD., JOB No. 18814–19, RECEIVED ON OCTOBER 5, 2020.
CALCULATED M–PLAN PHASE 8 PROVIDED BY ANNIS, O'SULLIVAN, VOLLEBEKK LTD., JOB No. 22079–21, DATED FEBRUARY 8, 2024.

BENCH MARK No. 00820010126
POINT IS LOCATED 1.65km NORTH OF BARNSDALE ROAD AND 5km SOUTH OF FALLOWFIELD ROAD ON HIGHWAY 416 NORTH OF KEMPTVILLE. THE POINT IS SET EAST OF THE NORTHBOUND LANE IN THE GRASSY SHOULDER.
ELEVATION = 96.923 m

No.	BY	DATE	DESCRIPTION
21	S.L.M.	24–05–14	REVISED PER NEW M–PLAN
20	S.L.M.	24–04–17	REVISED GRADING
19	S.L.M.	23–12–14	REVISED BLOCK 67–74 GRADING
18	W.L.	23–03–23	UPDATED PER CITY COMMENTS
17	W.L.	23–03–10	UPDATED PER GREENBANK ROAD DESIGN
16	W.L.	22–06–13	PHASE 8 HYDRO DESIGN REVISIONS
15	W.L.	22–05–05	REVISED PER NEW M–PLAN
14	W.L.	21–12–23	REVISED PER NEW M–PLAN
13	W.L.	21–03–18	REVISED AS PER CITY COMMENTS
12	W.L.	21–02–10	REVISED AS PER CITY COMMENTS
11	W.L.	21–01–27	REVISED GRADING PLAN PER CITY COMMENTS
10	W.L.	21–01–18	REVISED GRADING PLAN PER CITY COMMENTS

Ottawa CITY OF OTTAWA

PROJECT No. 19–1089

LICENSED PROFESSIONAL ENGINEER S. L. MERRICK 100186523 2024-06-04 PROVINCE OF ONTARIO — SEAL IN LOFT

© DSEL

GRADING PLAN

TAMARACK (NEPEAN) CORPORATION

THE MEADOWS IN HALF MOON BAY
PHASES 7 & 8 (3640 Greenbank Road)

DSEL
120 Iber Road, Unit 103
Stittsville, ON K2S 1E9
Tel. (613) 836-0856
Fax. (613) 836-7183
www.DSEL.ca

DRAWN BY: R.A./A.K..	CHECKED BY: C.M.K.	SHEET NO.	
DESIGNED BY: W.L.	CHECKED BY: W.L.	38	
SCALE: 1:500	DATE: APRIL 2019		

CITY FILE No. D07-16-16-0018PH1 CITY PLAN No. XXXX

TYPICAL GRADE CONTROL SWALE
N.T.S.

NOTE:
A GEOTECHNICAL ENGINEER LICENSED IN THE PROVINCE OF ONTARIO IS TO INSPECT ALL SUBGRADE SURFACES FOR FOOTING AND PAVEMENT STRUCTURES PRIOR TO CONSTRUCTION

NOTE:
ALL EXISTING POST & WIRE FENCE, CULVERTS, UTILITY WIRE / POLES, TREES, SHRUBS ETC. WITHIN LOTS, BLOCKS AND ROADS TO BE REMOVED, UNLESS OTHERWISE NOTED

NOTE RE: PERFORATED PIPE
PERFORATED PIPE IS REQUIRED FOR SWALE SLOPE LESS THAN 1.5% REFER TO CITY STD. S29, S30 FOR REAR YARD TRENCH AND PIPE DETAIL ONLY

PERMISSION REQUIRED FOR WORK ON ADJACENT LANDS

NOTE:
ALL SWALES SHALL BE 0.15m DEEP WITH 3:1 SIDE SLOPES UNLESS OTHERWISE INDICATED

CONTRACTOR TO VERIFY THE PRECISE LOCATIONS AND INVERT ELEVATIONS OF Ex. UNDERGROUND SERVICES AND Ex. UTILITIES PRIOR TO STARTING CONSTRUCTION

ANY DISTURBED AREA DURING CONSTRUCTION TO BE RESTORED TO THE ORIGINAL CONDITION OR BETTER TO THE SATISFACTION OF THE AUTHORITIES HAVING JURISDICTION

NOTE:
FOR CROSS SECTIONS 8–8, 9–9, 10–10 AND 11–11 REFER TO DRAWING No. 45

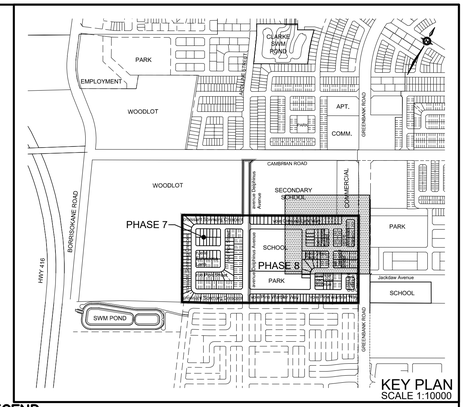
REVIEWED BY DEVELOPMENT REVIEW BRANCH
Signed
Date June 4, 2024
Plan Number 15776

REFER TO DWG No.42
REFER TO DWG No.38
REFER TO DWG No.41

HALF MOON BAY WEST SUBDIVISION PHASE 1 REFER TO DAVID SCHAEFFER ENGINEERING LIMITED PROJECT No. 16-888

THE MEADOWS OF HALF MOON BAY SUBDIVISION PHASE 4 REFER TO IBI GROUP INC. PROJECT No. 12054

BLK 173 (SECONDARY SCHOOL)
COMMERCIAL BLOCK
BLK 109 (0.30m RESERVE)
LIMIT OF SUBDIVISION
PHASE 8A
PHASE 8B
PHASE 8C
BLK 108 (TOWNHOUSES)
BLK 107 (TOWNHOUSES)
BLK 106 (TOWNHOUSES)
BLK 105 (TOWNHOUSES)
BLK 104 (TOWNHOUSES)
BLK 103 (TOWNHOUSES)
BLK 102 (TOWNHOUSES)
BLK 101 (TOWNHOUSES)
BLK 100 (TOWNHOUSES)
BLK 99 (TOWNHOUSES)
BLK 98 (TOWNHOUSES)
BLK 97 (TOWNHOUSES)
BLK 96 (TOWNHOUSES)
BLK 1 (0.30m RESERVE)
BLOCK 69
BLOCK 70
Place Vireo Place
STREET 3
FUTURE GREENBANK ROAD
1.8m CONC. SIDEWALK
8.0m CONC. SIDEWALK
TEMPORARY CUT-OFF SWALE
CURB TRANSITION (OPSD 608.010)
MATCH EXISTING
Ex. CULVERT TO BE SHORTENED
Ex. CULVERT TO BE REMOVED



KEY PLAN
SCALE 1:10000

LEGEND

- PROPOSED ELEVATION — 103.45
- EXISTING ELEVATION — 102.73
- FUTURE ELEVATION — [93.900]
- PROPOSED SWALE GRADE — 1.5%
- HIGH POINT — 102.16
- STREET CATCHBASIN / CATCHBASIN WITH CLOSED LID
- CATCHBASIN MANHOLE
- TEE CATCHBASIN
- ELBOW CATCHBASIN
- HYDRANT, VALVE & VB
- VALVE & VC
- VALVE & VB
- BUILDING ENVELOPE
- TOP OF FOUNDATION (TOF) — 94.70
- FINISHED FLOOR ELEVATION (FFE) — 95.00
- UNDERSIDE OF FOOTING ELEVATION (USF) — 92.00
- MIN. UNDERSIDE OF FOOTING ELEV. (BASED ON 100 YR HGL/SERVICING CONNECTION/GWL PER GEOTECH RECOMMENTATION) — 92.00
- FOUNDATION WALL UNDERSIDE OF FOOTING ELEVATION — <92.00
- UNITS REQUIRING WATER PRESSURE REDUCING VALVES — PRV
- WALKOUT UNITS — W.O.
- HYDRO SWITCHGEAR
- HYDRO TRANSFORMER — T
- STREET LIGHT STANDARD — LS
- TACTILE WALKING SURFACE INDICATOR (AS PER CITY OF OTTAWA STD. SC6)
- OVERLAND FLOW DIRECTION
- EXTERNAL OVERLAND FLOW DIRECTION
- EMERGENCY OVERLAND FLOW DIRECTION — E
- RETAINING WALL AND ELEVATIONS — T/W=103.10 B/W=102.44
- CHAINLINK FENCE (1.5m UNLESS OTHERWISE NOTED)
- NOISE BARRIER (3.0m UNLESS OTHERWISE NOTED)
- DECORATIVE FENCE (SEE LANDSCAPE DWGS FOR DETAIL)
- CONSTRUCTION FENCE
- PROPERTY BOUNDARY
- 3:1 TERRACING MAXIMUM SLOPE — 100.20 / 99.20
- PONDING AREA WITH SPILLWAY ELEVATION (MAXIMUM 0.30m) — 99.60
- 250ø PVC PERFORATED PIPE (REFER TO CITY STD S29 FOR REAR YARD TRENCH AND PIPE DETAILS ONLY)
- UNDERSIDE OF FOOTING (USF) SHALL BE MINIMUM 0.30m BELOW SLOPE LESS THAN 1.5%)
- CLAY SEAL (REFER TO GENERAL NOTES, No.18. ON DWG. No. 1, AND GEOTECHNICAL CONSULTANT'S SPECIFICATIONS)
- PHASING LIMITS
- PREVIOUS PHASES / PHASES NOT PART OF CURRENT GRADING APPROVAL

TOPOGRAPHIC INFORMATION

CITY OF OTTAWA 1K MAPPING, RECEIVED ON FEBRUARY 7, 2017 AND DECEMBER 21, 2018.

LEGAL INFORMATION

CALCULATED M–PLAN PHASE 7 PROVIDED BY ANNIS, O'SULLIVAN, VOLLEBEKK LTD., JOB No. 18814–19, RECEIVED ON OCTOBER 5, 2020.
CALCULATED M–PLAN PHASE 8 PROVIDED BY ANNIS, O'SULLIVAN, VOLLEBEKK LTD., JOB No. 22079–21, DATED FEBRUARY 8, 2024.

BENCH MARK No. 00820010126
POINT IS LOCATED 1.65km NORTH OF BARNSDALE ROAD AND 5km SOUTH OF FALLOWFIELD ROAD ON HIGHWAY 416 NORTH OF KEMPTVILLE. THE POINT IS SET EAST OF THE NORTHBOUND LANE IN THE GRASSY SHOULDER.
ELEVATION = 96.923 m

No.	BY	DATE	DESCRIPTION
21	S.L.M.	24–05–14	REVISED PER NEW M–PLAN
20	S.L.M.	24–04–17	REVISED GRADING
19	S.L.M.	23–12–14	REVISED BLOCK 67–74 GRADING
18	W.L.	23–03–23	UPDATED PER CITY COMMENTS
17	W.L.	23–03–10	UPDATED PER GREENBANK ROAD DESIGN
16	W.L.	22–06–13	PHASE 8 HYDRO DESIGN REVISIONS
15	W.L.	22–05–05	REVISED PER NEW M–PLAN
14	W.L.	21–12–23	REVISED PER NEW M–PLAN
13	W.L.	21–03–18	REVISED AS PER CITY COMMENTS
12	W.L.	21–02–10	REVISED AS PER CITY COMMENTS
11	W.L.	21–01–27	REVISED GRADING PLAN PER CITY COMMENTS
10	W.L.	21–01–18	REVISED GRADING PLAN PER CITY COMMENTS

Ottawa CITY OF OTTAWA

PROJECT No. 19–1089

LICENSED PROFESSIONAL ENGINEER — S. L. MERRICK — 100186523 — PROVINCE OF ONTARIO — 2024-05-14

© DSEL

GRADING PLAN

TAMARACK (NEPEAN) CORPORATION

THE MEADOWS IN HALF MOON BAY
PHASES 7 & 8 (3640 Greenbank Road)

DSEL
120 Iber Road, Unit 103
Stittsville, ON K2S 1E9
Tel. (613) 836-0856
Fax. (613) 836-7183
www.DSEL.ca

DRAWN BY:	R.A./A.K..	CHECKED BY:	C.M.K.
DESIGNED BY:	W.L.	CHECKED BY:	W.L.
SCALE:	1:500	DATE:	APRIL 2019
		SHEET NO.	40

CITY FILE No. D07-16-16-0018PH1 CITY PLAN No. XXXX

SWALE TO BE A DEFINED CHANNEL — 1.00m MIN. — GRADE AT LOT CORNER — 2% – 7% — 3:1 — P.L. — MIN. 0.15m MAX. 0.60m — SWALE DETAIL

TYPICAL GRADE CONTROL SWALE
N.T.S.

PLAN OF SURVEY OF

BLOCK 173
REGISTERED PLAN 4M-1635
CITY OF OTTAWA

FARLEY, SMITH & DENIS SURVEYING LTD. 2025

Scale 1: 500

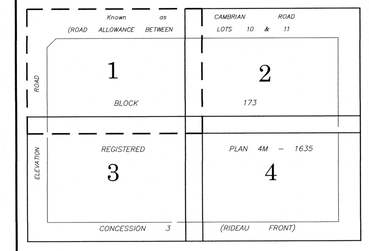
0 5 10 20 30 40 50 metres

Metric Note
Distances and/or coordinates on this plan are in metres and can be converted to feet by dividing by 0.3048.

Distance Note
Distances shown on this plan are ground distances and can be converted to grid distances by multiplying by the combined scale factor of 0.99993.

Bearing Note
Bearings hereon are grid bearings derived from the Can-Net Real Time Network and are referred to the Central Meridian of MTM Zone 9 (76°30' West Longitude) Nad-83 (Original).

TOPOGRAPHIC SKETCH SHEETS 1 TO 4



KEYMAP SCALE 1:3000

Notes & Legend

—□—	Denotes	Survey Monument Planted
—■—	"	Survey Monument Found
SIB	"	Standard Iron Bar
SSIB	"	Short Standard Iron Bar
PB	"	Plastik Bar
Meas	"	Measured
(P1)	"	Registered Plan 4M-1635
(P2)	"	Registered Plan 4M-1755
———	"	Property Line

Site Area=6.0508 Hectares

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Surveyor's Certificate

I certify that :

1. This survey and plan are correct and in accordance with the Surveys Act, the Surveyors Act and the Regulations made under them.
2. The survey was completed on the 7tn day of July, 2025.

July 25/25
Date

Daniel Robinson
Ontario Land Surveyor

This plan of survey relates to AOLS Plan Submission Form Number V-109466

FARLEY, SMITH & DENIS SURVEYING LTD.

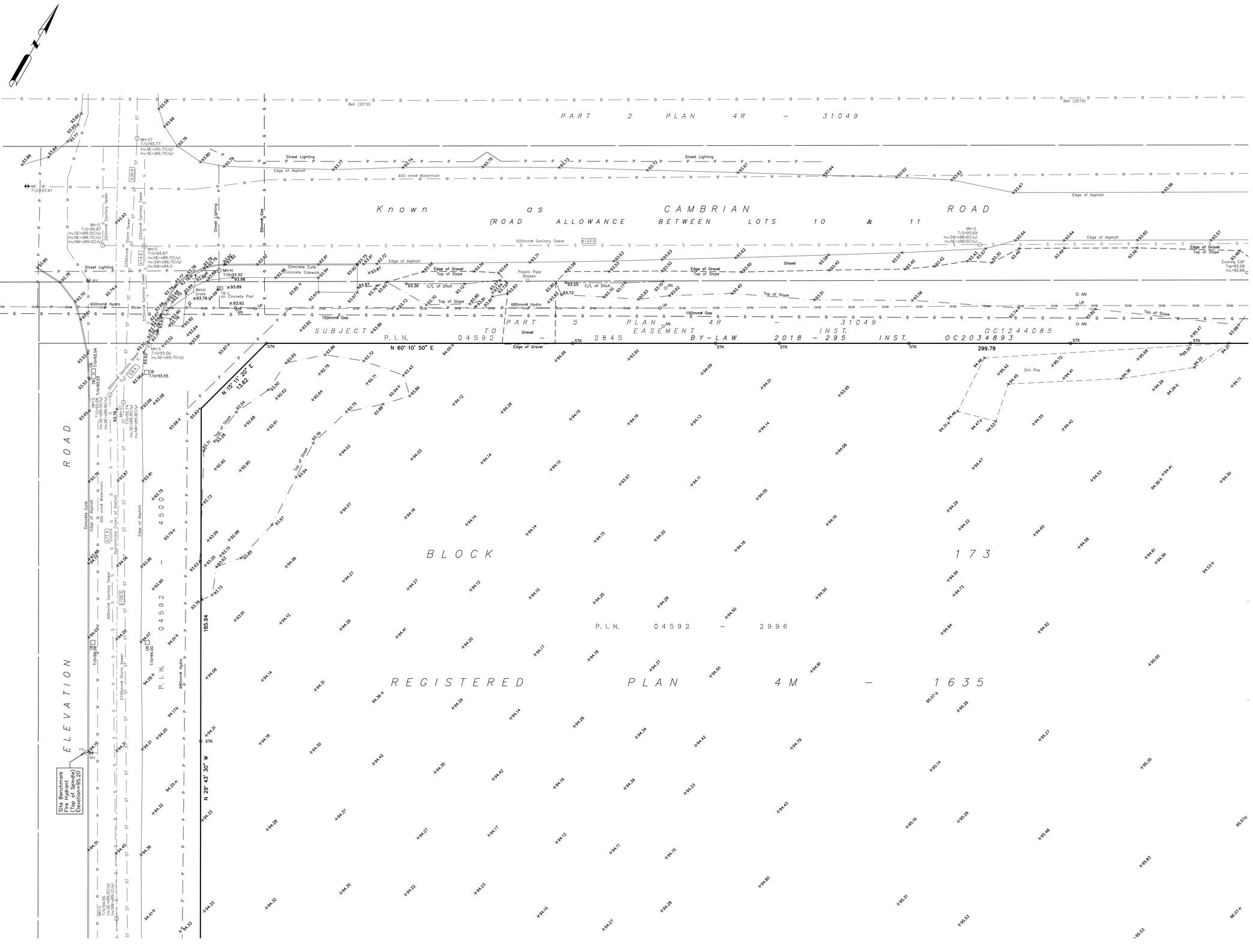
ONTARIO LAND SURVEYORS
CANADA LAND SURVEYORS

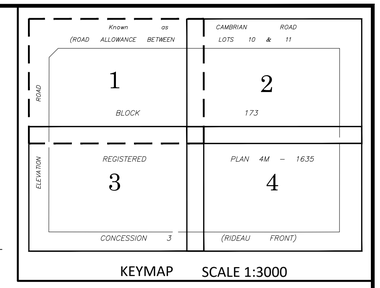
Unit 275, 30 COLONNADE ROAD, OTTAWA, ONTARIO K2E 7J6
TEL. (613) 727-8226 E-mail: info@fsdsurveys.ca

FILE No.: 335-24

POS 24X36

J:\2024\335-24_3853 Cambrian rd_Half Moon Bay SS_topo\02 - topo update\Final\335-24 3853 Cambrian Rd_Bl173 RP4M-1635_SRPR & Topo_PH2_F.dwg





KEYMAP SCALE 1:3000

SHEET 1 OF 4

TOPOGRAPHIC SKETCH OF

No. 3853 Cambrian Road
CITY OF OTTAWA

FARLEY, SMITH & DENIS SURVEYING LTD. 2025

Scale 1: 250

0 2.5 5 7.5 10 12.5 15 20 25 metres

Metric Note

Distances and/or coordinates on this plan are in metres and can be converted to feet by dividing by 0.3048.

Boundary Note

This Sketch is to be read in conjunction with a Plan of Survey dated July 25, 2025 (FSD Ref. 335-24)

Elevation Notes

1. Elevations shown are geodetic and are referred to Geodetic Datum CGVD-1928 :1978. (Monument No. 19680071)
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: Sheets No. CC-B-19, CC-B-20, CC-B-21, CC-C-30, DD-C- 6, Dwg No. 17586 p25, 17586 p26 & 15776PH7-8 p16.
4. Sanitary and storm sewer grades and inverts were compiled from: Field measurement & City of Ottawa Utility Sheets.
5. A field location of underground plant by the pertinent utility authority is mandatory before any work involving breaking ground, probing, excavating etc.

Geographic Location

BLOCK 173
REGISTERED PLAN 4M-1635
CITY OF OTTAWA

Fieldwork completed on the 7th day of July, 2025.

Notes & Legend

STK	Denotes	Location of Stake Out Proposed Borehole
MH-ST	"	Maintenance Hole (Storm)
MH-S	"	Maintenance Hole (Sanitary)
MH-T	"	Maintenance Hole (Traffic)
VC	"	Valve Chamber (Watermain)
ST	"	Underground Storm Sewer
S	"	Underground Sanitary Sewer
W	"	Underground Water
P	"	Underground Power
G	"	Underground Gas
B	"	Underground Bell
OHW	"	Overhead Wires
UP	"	Utility Pole
AN	"	Anchor
CB	"	Catch Basin
CPP	"	Corrugated Plastic Pipe
FH	"	Fire Hydrant
WV	"	Water Valve
TB-B	"	Bell Terminal Box
TB-C	"	Cable Terminal Box
C/L	"	Centreline
+65.00	"	Location of Elevations
+65.00	"	Top of Concrete Curb/Retaining Wall Elevation
	"	Property Line

Caution

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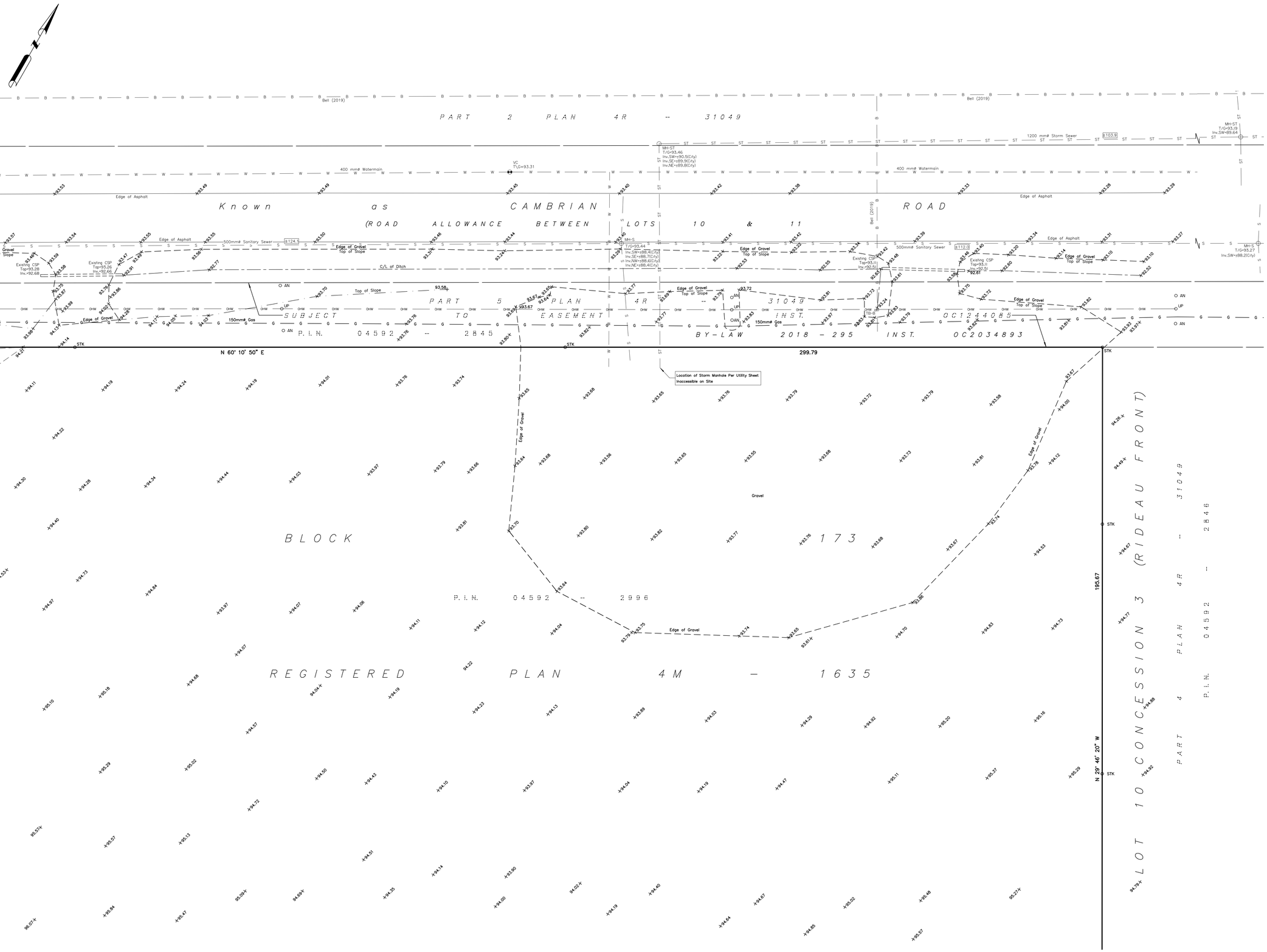
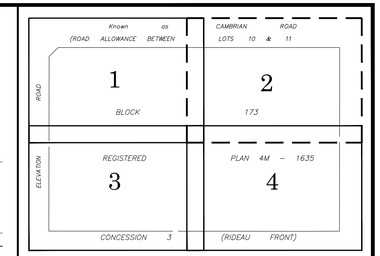
TEL. (613) 727-8226 E-mail: info@fsdsurveys.ca

FILE No.: 335-24

Sheet 1 24X36

J:\2024\335-24_3853 Cambrian rd_Half Moon Bay SS_topo\02 - topo update\Final\335-24 3853 Cambrian Rd_Bl173 RP4M-1635_SRPR & Topo_PH2_F.dwg





KEYMAP SCALE 1:3000

SHEET 2 OF 4

TOPOGRAPHIC SKETCH OF

No. 3853 Cambrian Road CITY OF OTTAWA

FARLEY, SMITH & DENIS SURVEYING LTD. 2025

Scale 1: 250

0 2.5 5 7.5 10 12.5 15 20 25 metres

Metric Note

Distances and/or coordinates on this plan are in metres and can be converted to feet by dividing by 0.3048.

Boundary Note

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5. A field location of underground plant by the pertinent utility authority is mandatory before any work involving breaking ground, probing, excavating etc.

Geographic Location

BLOCK 173
REGISTERED PLAN 4M-1635
CITY OF OTTAWA

Fieldwork completed on the 7th day of July, 2025.

Notes & Legend

STK	Denotes	Location of Stake Out Proposed Borehole
MH-ST	"	Maintenance Hole (Storm)
MH-S	"	Maintenance Hole (Sanitary)
MH-T	"	Maintenance Hole (Traffic)
VC	"	Valve Chamber (Watermain)
ST	"	Underground Storm Sewer
S	"	Underground Sanitary Sewer
W	"	Underground Water
P	"	Underground Power
G	"	Underground Gas
B	"	Underground Bell
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TB-B	"	Bell Terminal Box
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+65.00	"	Location of Elevations
+65.00	"	Top of Concrete Curb/Retaining Wall Elevation
	"	Property Line

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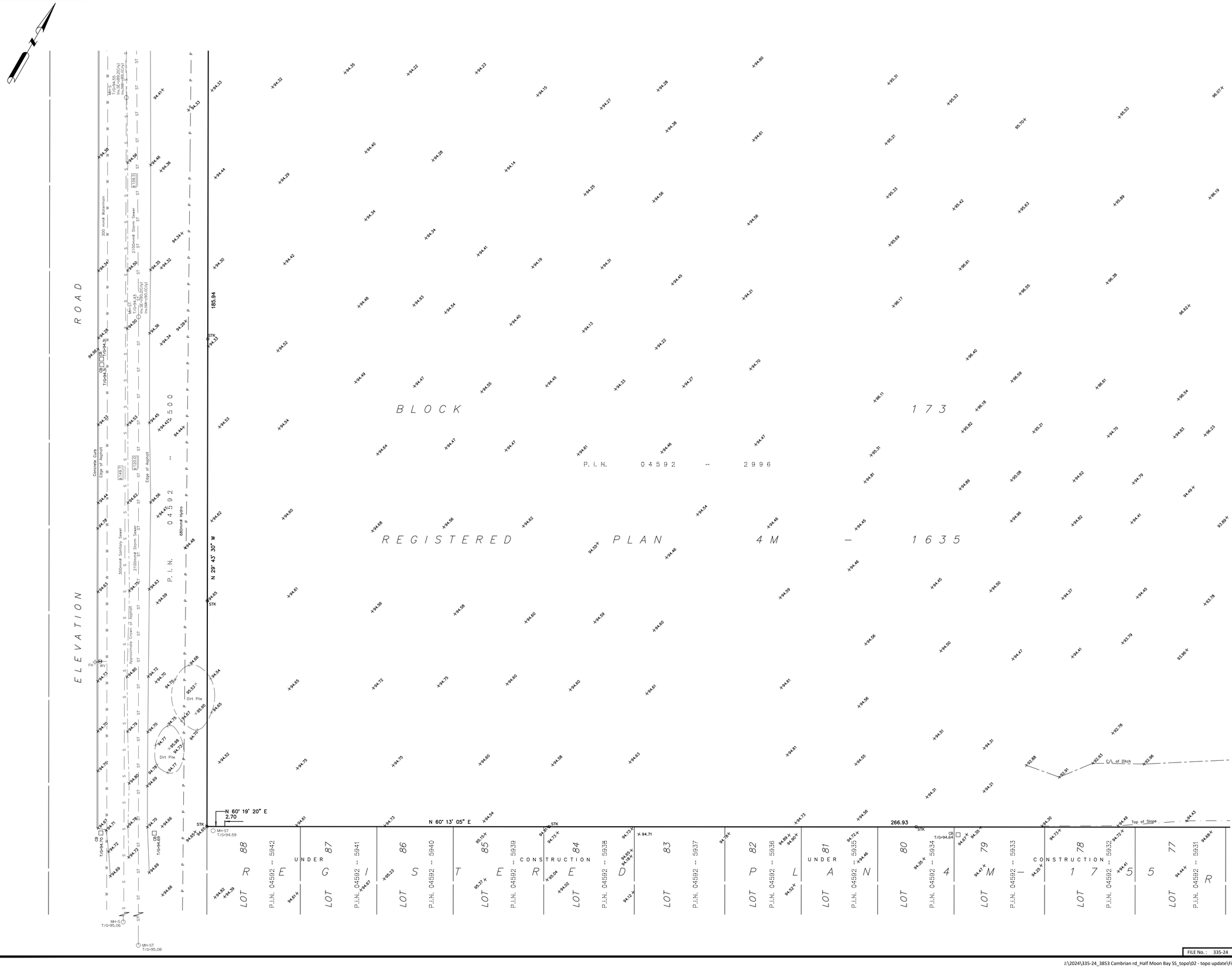
FILE No.: 335-24

J:\2024\335-24_3853 Cambrian rd_Half Moon Bay SS_topo\02 - topo update\Final\335-24 3853 Cambrian Rd_Bl173 RP4M-1635_SRPR & Topo_PH2_F.dwg

Sheet 2 24X36



SHEET 3 OF 4

TOPOGRAPHIC SKETCH OF

No. 3853 Cambrian Road
CITY OF OTTAWA

FARLEY, SMITH & DENIS SURVEYING LTD. 2025

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CITY OF OTTAWA

Fieldwork completed on the 7th day of July, 2025.

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FILE No. : 335-24

Sheet 3 24X36

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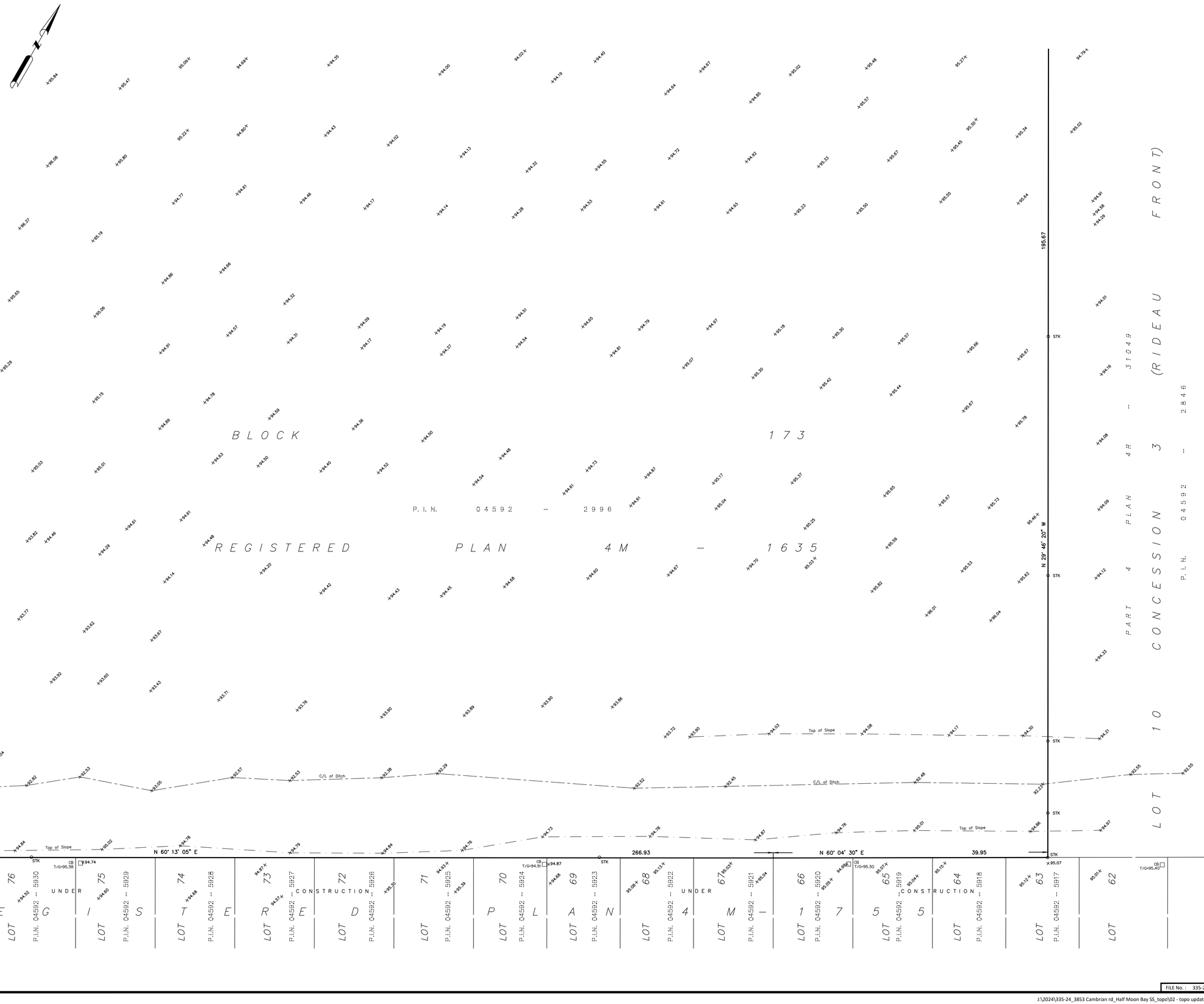

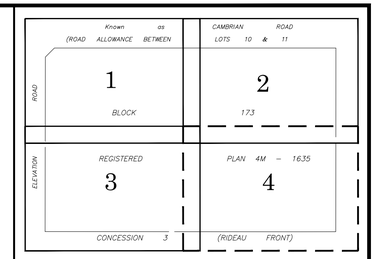

KEYMAP SCALE 1:3000

SHEET 4 OF 4

TOPOGRAPHIC SKETCH OF

No. 3853 Cambrian Road
CITY OF OTTAWA

FARLEY, SMITH & DENIS SURVEYING LTD. 2025

Scale 1: 250

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CITY OF OTTAWA

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TB-C		=	Cable Terminal Box
C/L		=	Centreline
+65.00		=	Location of Elevations
+65.00		=	Top of Concrete Curb/Retaining Wall Elevation
		=	Property Line

Caution

1. This is not a plan of survey and shall not be used except for the purpose indicated in the title block.
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TEL (613) 727-8226 E-mail: info@fsdsurveys.ca

FILE No. : 335-24

Sheet 4 24X36

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File No.: PC2026-0052

March 19, 2026

Vladimir Popovic
N45 Architecture
Via email: vladimirp@n45.ca

Subject: Pre-Consultation: Meeting Feedback
Proposed Site Plan Control Application – 3853 Cambrian Road

Please find below information regarding next steps as well as consolidated comments from the above-noted pre-consultation meeting held on March 11, 2026.

Planning

Comments:

1. The site is designated Neighbourhood within the Evolving Neighbourhood Overlay in the Official Plan.

2. The site is withing the Barrhaven South Community Design Plan

    a. Supportive studies done for the area as part of the CDP – Master Servicving Study, Transportation Master Plan, Jock River Reach 1 Subwatershed Study, Conceptual Fisheries Compensation Plan

    b. Chapter 6 Community Design Guidelines Section 6.8 Institutional Uses should be considered.

3. The new Zoning By-law 2026-50 was enacted on March 11, 2026, and it is in effect. However, until the Ontario Land Tribunal (OLT) deems the new zoning in force, both Zoning By-law 2008-250 and 2026-50 apply. If any applicable zoning provisions differ between the two zoning by-laws whilst both are in effect (i.e., whilst any appeals filed are being resolved), the most restrictive of the two provisions applies.

4. The table below shows the zoning requirements for both the Zoning By-law 2026-50 and the Zoning By-law 2008-250.

	By-law 2008-250 I1A	**By-law 2026-50 INZ**
Minimum lot width	15m	15m
Minimum lot area	400m^2	400m^2

Minimum front yard setback (Elevation Road)	6m	3m
Minimum rear yard setback	7.5m	All other cases: 4.5m
Minimum interior yard setback	3m	Abutting an N1, N2, N3, N4, N5 or N6 Zone: 7.5m
Minimum corner yard setback (Cambrian Road)	4.5m	4.5m
Maximum building height	15m	15m

5. Please note that By-law 2008-250 has the following provision.

> Despite any provisions to the contrary the minimum required front yard setback or minimum corner side yard setback for a school may be reduced in the following instances:
>
> (i) Where located on a lot that abuts a residential zone on the same street, the minimum front yard setback of the abutting residential zone may be used as the minimum front yard or minimum corner side yard setback of the school, where the school is facing the same street as that abutting residential zone; (Section 169 (5)(a)(1))

   a. In this case, the front yard setback can be reduced to 3 metres.

6. Parking requirements

   a. Zoning By-law 2008-250 requires a minimum number of parking spaces at the rate of 2 per classroom (if entrance of school within 300 metres of a Rapid Transit station then the rate is as Area X which is 1.5 per classroom)

   b. By-law 2026-50 does not require a minimum or maximum number of parking spaces

7. Consider relocating the loading spaces as to minimize conflict between pedestrians and bicycles. Please also note that the minimum width of an aisle accessing a loading space by angle 60 to 90 degrees is:

   a. 9 metre for standard size and;

   b. 17 metres for an oversized loading space.

8. Parking lot requirements

By-law 2008-250	By-law 2026-50
3-metre soft landscape buffer between a parking lot and a lot line and between a parking lot and a lot line not abutting a street.	5-metre soft landscape buffer between a parking lot and a lot line
15 percent of the parking lot area to be soft landscaping	20 percent of the parking lot area to be soft landscaping
	One soft landscaped median or peninsula of 3.5m wide to be provided within the parking lot

9. Please ensure that the proposed refuse collection complies with Section 217 (6) of By-law 2026-50 and with Section 110(3) of By-law 2008-250.

10. Construction of the intersection of the realigned Greenbank Road and Cambrian Road east of the subject property is scheduled for 2027-8. It will include a MUP and sidewalk along part of the frontage of the subject property. Ensure that the internal pedestrian network connects to these. For further details:

    https://ottawa.ca/en/city-hall/public-engagement/public-engagement-project-search/greenbank-road-realignment-and-southwest-transitway-extension#section-91fcfd1b-428a-4b3b-9500-bda7ba1ecb8d

    Please reach out to Mike Sexton at mike.sexton@ottawa.ca to obtain the CAD drawings.

Feel free to contact Solé Soyak, Planner II, for follow-up questions.

Urban Design

11. Submission requirements:

    a. Site plan

    b. Landscape Plan

    c. Elevations

    d. Floor plans (conceptual)

Preliminary design comments:

12. Look for opportunities to orient the track in a N-S direction to avoid noise/lighting impacts on homes to the rear. If this is not possible, consider a double row of trees including coniferous trees to provide privacy, any bleachers should be located away from homes.

13. In addition to tree plantings along the public roadways, please ensure that soft landscaping is provided to screen parking areas and drop offs from surrounding roads.

Feel free to contact Lisa Stern, Planner III, Urban Design, for follow-up questions.

Engineering

Comments:

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

    a. Demonstrate the servicing strategy is consistent with higher-level studies and plans. Excerpts from relevant higher level studies and plans will need to be discussed and provided in the Appendix of the Site Servicing and SWM report as supporting documentation to the design. Any deviations will require an update or addendum to the subdivision level MSS to support any changes at the discretion of the City.

    b. Approved drainage patterns shall be respected as part of the proposed SWM solution otherwise an update or addendum to the subdivision level MSS will be required to support the project.

    c. HGL Analysis to be completed and included as part of the Site Servicing and SWM report if basement levels are contemplated.

    d. Demonstrate the proposed servicing and stormwater management strategy is consistent with the applicable higher-level studies and plans, including the Half Moon Bay West Phase 1 Design Brief and SWM Report, and identify any deviations from the subdivision-level MSS/addendum, if any.

    e. The storm servicing design for the secondary school block (Block 173) shall be based on the approved block criteria of 6.05 ha area, runoff coefficient of 0.65, 5-year return period, and release rate of 1139 L/s. Storage requirements for the institutional/commercial lands are to be designed up to the 100-year water level.

f. As the subject site fronts Cambrian Road, the adjacent arterial road storm sewer system shall account for 10-year inflows without ponding, in accordance with the approved subdivision criteria.

g. Excess major system flows, up to and including the 100-year storm event, are to be retained on-site for development blocks such as schools. Safe overland flow routing and spill control shall be demonstrated.

h. Water quality control for runoff from the subject site is to be provided through the Clarke SWM Pond, which is designed to achieve MECP Enhanced Level of Protection (80% TSS removal).

i. Please provide a Pre-Development Drainage Area Plan to define the pre-development drainage areas/patterns. Existing drainage patterns shall be maintained and discussed as part of the proposed SWM solution.

j. The approved higher-level stormwater documents contemplate that the subject school block drains as part of the Half Moon Bay West – Phase 1 storm sewer on Cambrian Road to the Clarke SWM Pond.

k. Ponding Notes:

    i. 100-year spill elevation must be 300mm lower than any building opening or ramp.

    ii. Demonstrate that the stress test spill elevation (100-year +20% event) does not spill onto any permanent structures.

    iii. The maximum permissible ponding depth for the 100-year storm event is 350mm. No spilling to adjacent sites.

    iv. Please note that as per Technical Bulletin PIEDTB-2016-01 section 8.3.11.1 (p.12 of 14) there shall be no surface ponding on private parking areas during the 2-year storm rainfall event. 100-year spill elevation must be 300mm lower than any building opening or ramp

l. Document how any foundation drainage system will be integrated into the servicing design and show the positive outlet on the plan. Foundation drainage is to be independently connected to sewer main unless being pumped with appropriate back up power, sufficient sized pump and back flow prevention. It is recommended that the foundation drainage system be drained by a sump pump connection to the storm sewer to minimize risk of basement flooding as it will provide the best protection from the uncontrolled sewer system compared to relying on the backwater valve.

m. Please note that the minimum orifice dia. for a plug style ICD is 83mm and the minimum flow rate from a vortex ICD is 6 L/s in order to reduce the likelihood of plugging.

n. If rooftop control and storage is proposed as part of the SWM solutions, sufficient details (Cl. 8.3.8.4) shall be discussed and documented in the report and on the plans. Roof drains are to be connected downstream of any incorporated ICDs within the SWM system and not to the foundation drain system. Provide a Roof Drain Plan as part of the submission.

o. Dry ponds are only to be functional for events that are greater than the 2-year storm event, a freeboard of 0.3m between the 100-year HWL elevation and the emergency overflow elevation and to be designed with a maximum depth of 1.5m with 3:1 side slopes. An emergency overland flow route to an appropriate outlet (Rideau River) from the SWM facility needs to be designed.

p. **Underground Storage**: Please note that the Modified Rational Method for storage computation in the Sewer Design Guidelines was originally intended to be used for above ground storage (i.e. parking lot) where the change in head over the orifice varied from 1.5 m to 1.2 m (assuming a 1.2 m deep CB and a max ponding depth of 0.3 m). This change in head was small and hence the release rate fluctuated little, therefore there was no need to use an average release rate.

    i. When underground storage is used, the release rate fluctuates from a maximum peak flow based on maximum head down to a release rate of zero. This difference is large and has a significant impact on storage requirements. We therefore require that an average release rate equal to 50% of the peak allowable rate shall be applied to estimate the required volume. Alternatively, the consultant may choose to use a submersible pump in the design to ensure a constant release rate. In the event that there is a disagreement from the designer regarding the required storage, The City will require that the designer demonstrate their rationale utilizing dynamic modelling, that will then be reviewed by City modelers in the Water Resources Group. Regarding all proposed UG storage, ground water levels (and in particular HGW levels) will need to be reviewed to ensure that the proposed system does not become surcharged and thereby ineffective.

    ii. Provide information on type of underground storage system including product name and model, number of chambers, chamber configuration, confirm invert of chamber system, top of chamber system, required cover over system and details, interior bottom slope (for self-cleansing), chart of storage values, length, width and height, capacity, entry ports (maintenance) etc. UG storage to provide actual 5- and 100-year event storage requirements.

15. General Servicing

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

b. Where servicing involves three or more service trenches, either a full road width or full lane width 40 mm asphalt overlay will be required, as per amended Road Activity By-Law 2003-445 and City Standard Detail Drawing R10. The extent of the overlay must be shown on the grading plan or a road reinstatement plan.

c. CCTV sewer inspection of city infrastructure is required to record pre and post construction conditions and ensure there is no damage to City Assets.

d. Existing buildings sewer laterals require a CCTV inspection and report to ensure existing services to be re-used are in good working order and meet current minimum size requirements.

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

f. Sewer connections to be made above the springline of the sewer main 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 (For rigid main sewers) – lateral must be less that 50% the diameter of the sewermain.

    iv. No submerged outlet connections.

16. Storm Sewer

    a. A 1200mm dia. concrete storm sewer (2019) is available within Cambrian Road.

    b. Please confirm the proposed storm sewer discharge point and provide supporting calculations demonstrating consistency with the approved school block stormwater criteria of 5-year release = 1139 L/s for Block 173.

    c. A storm sewer monitoring maintenance hole is required to be installed at the property line (on the private side of the property) as per City of Ottawa Sewer-Use By-Law 2003-514 (14) Monitoring Devices.

17. Sanitary Sewer

a. A 500 mm dia. Concrete Sanitary sewer (2019) is available within Cambrian Road.

b. The proposed wastewater servicing design shall be consistent with the approved higher-level studies and plans for Half Moon Bay West – Phase 1

c. Include correspondence from the Architect within the Appendix of the report confirming the number of residential units per building and a unit type breakdown for each of the buildings to support the calculated building populations.

d. Please apply the wastewater design flow parameters in Technical Bulletin PIEDTB-2018-01.

e. Sanitary sewer monitoring maintenance hole is required to be installed at the property line (on the private side of the property) as per City of Ottawa Sewer-Use By-Law 2003-514 (14) Monitoring Devices.

f. A backwater valve is required on the sanitary service for protection.

g. The proposed wastewater servicing design shall be consistent with higher-level studies and plans..

h. Please provide confirmation and documentation of available capacity in the receiving and downstream sewer system. If the estimated wastewater flow is determined to be in excess of the allowable (as defined in the subdivision level MSS) for the site it shall be demonstrated that the receiving and downstream wastewater system has adequate residual capacity to support and accommodate any increase in wastewater flow.

i. The approved higher-level servicing documents contemplate sanitary discharge from the subject lands to the Cambrian Road sanitary sewer.

j. For the subject school block (Block 173 – MH502A to MH503A, Cambrian Road), the approved sanitary design flow is based on Area = 6.05 ha, Population Flow = 5.25 L/s, Infiltration Flow = 1.69 L/s, and Total Peak Flow = 6.94 L/s. Please confirm the proposed design is consistent with these block-level assumptions or provide updated justification.

18. Water:

a. A 400 mm dia. PVC watermain (2019) is available within Cambrian Road.

b. The proposed water servicing design shall be consistent with the approved higher-level studies and plans for Half Moon Bay West – Phase 1

c. The approved higher-level servicing documents contemplate water servicing through the Phase 1 water distribution system, with one of the modeled

connection points at Cambrian Road. The Design Brief concludes that the proposed watermains connect east to existing watermains in Half Moon Bay North at Cambrian Road and River Run Avenue. Any deviation from this assumed servicing strategy should be supported by updated boundary condition / hydraulic confirmation.

d. For the secondary school block, the approved block-level water demands are Area = 6.07 ha, Average Day Demand = 3.51 L/s, Maximum Day Demand = 5.27 L/s, Peak Hour Demand = 9.48 L/s, and Minimum Hour Demand = 1.76 L/s. Please confirm the proposed design is consistent with these block-level assumptions or provide updated justification.

e. The higher-level water analysis assumed a required fire flow of 250 L/s for the secondary school / commercial / apartment block land uses due to limited building-specific information at the time. Please provide the required fire flow for the proposed development and demonstrate that the proposed servicing arrangement can satisfy the required fire flow condition.

f. Existing residential services are to be blanked at the main.

g. Water Supply Redundancy: Residential buildings with a basic day demand greater than 50m3/day (0.57 L/s) or with 50+ units are required to be connected to a minimum of two water services, with each their own meter, separated by an isolation valve to avoid a vulnerable service area.

h. 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. Plan showing the proposed location of service(s).

    ii. Type of development and the amount of fire flow required (L/min). Note: The OBC method can be used if the fire demand for the private property is less than 9,000 L/min. If the OBC fire demand reaches 9000 L/min, then the FUS method is to be used.

    iii. Average daily demand: __L/s.

    iv. Maximum daily demand: __L/s.

    v. Maximum hourly daily demand: __L/s.

    vi. Note: Use Table 3-3 of the MOE Design Guidelines for Drinking-Water System to determine Maximum Day and Maximum Hour peaking factors for 0 to 500 persons and use Table 4.2 of the Ottawa Design Guidelines, Water Distribution for 501 to 3,000 persons.

i. Please review Technical Bulletin ISTB-2018-02, maximum fire flow hydrant capacity is provided in Section 3 Table 1 of Appendix I. A hydrant coverage figure shall be provided and demonstrate there is adequate fire protection for the proposal. Two or more public hydrants are anticipated to be required to handle fire flow.

j. A Water Data Card will have to be submitted to size the water meter.

k. Any proposed emergency route is to be to the satisfaction of Fire Services.

l. Frontage Charges

19. Grading and Erosion

a. Post-development site grading shall match existing property line grades in order to minimize disruption to the adjacent residential properties. A topographical plan of survey shall be provided as part of the submission and a note provided on the plans.

b. Erosion and sediment control plan must be provided.

c. Any portion of the subject property which is intended to be used for permanent or temporary snow storage shall be as shown on the approved site plan and grading plan. Snow storage shall not interfere with approved grading and drainage patters or servicing. Snow storage areas shall be setback from the property lines, foundations, fencing or landscaping a minimum of 1.5m. Snow storage areas shall not occupy driveways, aisles, required parking spaces or any portion of a road allowance. If snow is to be removed from the site, please indicate this on the plan(s).

d. Street catch basins are not to be located at any proposed entrances.

e. Depressed driveways are discouraged and are not allowed in sag locations. For other locations, the builder must ensure that the maximum depth of flow on the street during the 100-year and stress test events will not spill onto the depressed driveway.

f. If Window wells are proposed, they are to be indirectly connected to the footing drains. A detail of window well with indirect connection is required, as is a note at window well location speaking to indirect connection.

g. Rear yard at grade parking to be permeable pavement. Refer to City Standard Detail Drawings SC26 (maintenance/temp parking areas), SC27 or permeable asphalt materials. No gravel or stone dust parking areas permitted.

20. Environmental

a. A Phase I ESA is required to be completed in accordance with Ontario Regulation 153/04 in support of this development proposal to determine the potential for site contamination. Depending on the Phase I recommendations a Phase II ESA may be required.

b. The Phase I ESA shall provide all the required Environmental Source Information as required by O. Reg. 153/04. ERIS records are available to public at a reasonable cost and need to be included in the ESA report to comply with O.Reg. 153/04 and the Official Plan. The City will not be in a position to approve the Phase I ESA without the inclusion of the ERIS reports.

c. Official Plan: Section 10. Protection of Health and Safety (ottawa.ca)

21. Environmental Compliance Approval

a. The consultant shall determine if this project will be subject to an Environmental Compliance Approval (ECA) for Private Sewage Works. It shall be determined if the exemptions set out under Ontario Regulation 525/98: *Approval Exemptions* are satisfied. All regulatory approvals shall be documented and discussed in the report.

b. Please note that an ECA is required for:

   i. Stormwater management works servicing more than one parcel of land

   ii. Stormwater management works discharging to a combined sewer.

   iii. A storm or sanitary sewer servicing multiple parcels.

c. An MECP ECA [Industrial Sewage Works or Municipal/Private Sewage Works] will be required for the proposed development. Please contact the Ministry of the Environment, Conservation and Parks, Ottawa District Office to arrange a pre-submission consultation.

   i. Emily Diamond at (613) 521-3450, ext. 238 or Emily.Diamond@ontario.ca

d. Environmental Compliance Approval | Ontario.ca

22. Geotechnical

a. A Geotechnical Study/Investigation shall be prepared in support of this development proposal.

b. Reducing the groundwater level in this area can lead to potential damages to surrounding structures due to excessive differential settlements of the ground. The impact of groundwater lowering on adjacent properties needs

to be discussed and investigated to ensure there will be no short term and long-term damages associated with lowering the groundwater in this area.

c. Geotechnical Study shall be consistent with the Geotechnical Investigation and Reporting Guidelines for Development Applications. Geotechnical Investigation and Reporting (ottawa.ca)

d. If Sensitive marine clay soils are present in this area that are susceptible to soil shrinkage that can lead to foundation and building damages. All six (6) conditions listed in the Tree Planting in Sensitive Marine Clay Soils-2017 Guidelines are required to be satisfied. Note that if the plasticity index of the soil is determined to be less than 40% a minimum separation between a street tree and the proposed building foundations of 4.5m will need to be achieved. A memorandum addressing the Tree in Clay Soil Guidelines prepared by a geotechnical engineer is required to be provided to the City. Tree Planting in Sensitive Marine Clay Soils - 2017 Guidelines (ottawa.ca)

23. Pre-Construction Survey

    a. Pre-Construction (Piling/Hoe Ramming or close proximity to City Assets) and/or Pre-Blasting (if applicable) Survey required for any buildings/dwellings in proximity of 75m of site and circulation of notice of vibration/noise to residents within 150 m of site. Conditions for Pre-Construction/ Pre-Blast Survey & Use of Explosives will be applied to agreements. Refer to City's Standard S.P. No. F-1201 entitled Use of Explosives, as amended.

24. Regarding Quantity Estimates

    a. Please note that external Garbage and/or bicycle storage structures are to be added to QE under Landscaping as it is subject to securities. In addition, sump pumps for Sanitary and Storm laterals and/or cisterns are to be added to QE under Hard items as it is subject to securities, even though it is internal and is spoken to under SWM and Site Servicing Report and Plan.

25. Capital Works Projects Scheduled

    a. New Road renewal project scheduled to start on Cambrian 2026.

    b. Construction approach – Please contact the Right-of-Ways Permit Office TMconstruction@ottawa.ca early in the planning process to determine the ability to construct site.

Please refer to the City of Ottawa Guide to Preparing Studies and Plans [Engineering]: Planning application submission information and materials. The guide outlines the requirement for a statement to be provided on the plan about where the property boundaries have been derived from.

Feel free to contact Yasser Abdulkarim Project Manager, for follow-up questions.

Transportation

Comments:

26. Follow Transportation Impact Assessment Guidelines:

    a. Note that the TIA Guidelines have been updated, the changes are available on the City's website.

    b. A Transportation Impact Assessment is required. Please submit the Scoping/Forecasting report to josiane.gervais@ottawa.ca at your earliest convenience. The applicant is responsible to submit the Scoping Report prior to application and must allow for a 14 day circulation period.

    c. The Strategy Report (including Synchro files) must be submitted with the formal submission to deem complete. The applicant is strongly encouraged to submit the Strategy Report to the TPM prior to formal submission and allow for a 14 day circulation period.

    d. If an RMA is required to support the proposed development, the functional plan and/or RMA plans must be submitted with the formal submission to deem complete. Request base mapping asap if RMA is required, contact Engineering Services

27. ROW Protection:

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

    b. Corner triangles are required (measure on the property line/ROW protected line; no structure above or below this triangle): Arterial to collector: two overlapping 5 metre x 15 metre triangles.

    c. There is ROW protection on Cambrian of 37.5m. Confirm this ROW dedication has already been provided by showing the dimension of the ROW from the centerline.

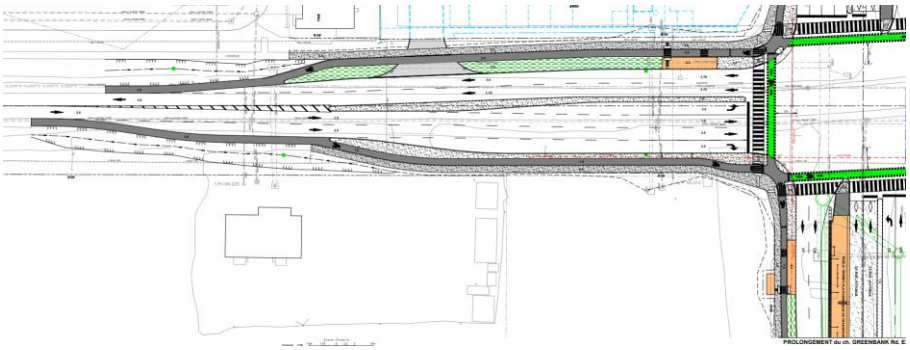
    d. Any requests for exceptions to ROW protection requirements must be discussed with Transportation Planning and concurrence provided by Transportation Planning management.

    e. ROW and corner triangles must be unincumbered and conveyed at no cost to the City. Note that conveyance of the corner triangle will be required prior

to registration of the SP agreement. Additional information on the conveyance process can be provided upon request.

28. The *Cambrian Road Widening Environmental Assessment Study* study was completed in 2014. The study includes an interim 2-lane and an ultimate 4-lane cross-section for Cambrian Road. Note that the study area falls outside of the site's frontage, from the new Greenbank to Jockvale.

29. The *Greenbank Road Realignment and Southwest Transitway Extension* detailed design is underway. The design includes a new signalized intersection at new Greenbank and Cambrian Road. Note that the preliminary design drawings show a segment of cycle track and sidewalk along the site's frontage. CAD files can be provided upon demand.



30. The Cambrian Rd at Apolune St/Elevation Rd intersection is identified in the City's DC intersections list. The City has initiated the functional design for traffic control at this intersection, this design can be shared once it is complete.

31. The applicant is encouraged to coordinate pedestrian movements with the capital projects and to show how the site's pedestrian pathways will tie into the future City sidewalks. Pedestrian connections directing pedestrians to the shoulder on Cambrian are discouraged.

32. TIA should review required clear throat length requirements for accesses from the arterial and collector. At a minimum, 15m should be provided on the collector and 25m on the arterial.

33. A Surface Transportation Noise Study is required to address roadway noise from Cambrian, new Greenbank, Apolune and Elevation.

34. As the proposed site is institutional and for general public use, AODA legislation applies.

    a. Ensure all crosswalks located internally on the site provide a TWSI at the depressed curb, per requirements of the Integrated Accessibility Standards Regulation under the AODA.

    b. Clearly define accessible parking stalls and ensure they meet AODA standards (include an access aisle next to the parking stall and a pedestrian curb ramp at the end of the access aisle, as required).

    c. Please consider using the City's Accessibility Design Standards, which provide a summary of AODA requirements.

35. On site plan:

    a. Ensure site access meets the City's Private Approach Bylaw.

    b. Show all details of the roads abutting the site; include such items as pavement markings, signage, accesses, on-street parking, and/or sidewalks.

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

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

    e. It is understood that school buses must be accommodated on this site. Ensure curb radii are designed to accommodate turning movements.

    f. Show all curb radii measurements; ensure that all curb radii are reduced as much as possible and fall within TAC guidelines (Figure 8.5.1).

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

    h. Sidewalk along Elevation Rd is required and must be continuous across access as per City Specification 7.1.

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

Environment

Comments:

36. There is an Urban Natural Feature, Cambrian Woods, on the parcel of land immediately to the West of the subject site. This would trigger the need for an Environmental Impact Statement.

    However, the impacts of development on these protected features have been thoroughly investigated during the subdivision application for Half Moon Bay, with both an Environmental Impact Statement (submitted in 2017, revised in 2019) and an Integrated Environmental Review (2020) having been provided.

    As the issue of potential impacts to Cambrian Woods has been already discussed, there is no need for further environmental review, so long as the development on this property proceeds in accordance with the requirements stipulated in the above-noted documents.

    Staff have reviewed these documents and do not note any conflicts with the current plans.

37. The applicant is encouraged to find space for additional plantings wherever possible. A good site for more trees may be the open area on the eastern edge of the property. Not only would this help to reduce the impacts of climate change and the urban heat island effect, trees there would also provide a visual and auditory screen against the traffic on the soon-to-be-created Greenbank Road expansion. Please note that the City prefers that all plantings be of native and non-invasive species.

38. Consider adding mitigation measures from the City's Bird Safe Design Guidelines. Of particular value would be Guideline 2, which discusses visual markers and other glazing treatments to reduce bird mortality from collisions with clear glass.

39. Note that City mapping shows a watercourse running through the neighbouring property on 3845 Cambrian Road. This is out-of-date information. That watercourse no longer exists and there are no requirements for any riparian protection associated with it.

Feel free to contact Mark Elliott, Environmental Planner, for follow-up questions.

Forestry

Comments:

40. As discussed, if any trees over 10 cm DBH remain on site, tree information must be provided in the Landscape Plan, to support permit issuance.

41. A Landscape Plan is required, showing new trees and plantings on site. Detailed LP guidelines are provided below.

42. Given the proximity of the Cambrian Woods site to the West, new trees must not include any species with invasive potential. The planting of native tree species is encouraged.

43. The applicant is strongly encouraged to plant large-growing trees in the Elevation Rd. right-of-way.

44. A double row of trees, including coniferous and deciduous trees, should be provided along the southern property line, to provide screening between the school & residential properties.

45. The proposed row of trees along the eastern property line should be designed to provide visual screening of the adjacent commercial site.

46. In order to mitigate the heat island effect, landscape islands, buffers, and hardscape planting infrastructure should be provided to support tree planting around & in the parking lot. Planting large trees should be prioritized wherever pedestrians or vehicles might be queuing or waiting for pick-up, drop-off, etc.

47. Please avoid the planting of allergenic species and fruit-bearing trees, around the outdoor classrooms.

48. The following Landscape Plan (LP) guidelines have been adapted from Schedule E of the Tree Protection By-law – for more information on these requirements please contact julian.alvarez-barkham@ottawa.ca.

    a. Please ensure any retained trees are shown on the LP.
    b. Minimum Setbacks
        i. Maintain 1.5m from sidewalk or MUP/cycle track or water service laterals.
        ii. Maintain 2.5m from curb.
        iii. Coniferous species require a minimum 4.5m setback from curb, sidewalk, or MUP/cycle track/pathway.
        iv. Maintain 7.5m between large growing trees, and 4m between small growing trees. Park or open space planting should consider 10m spacing, except where otherwise approved in naturalization / afforestation areas.
        v. Adhere to Ottawa Hydro's planting guidelines (species and setbacks) when planting around overhead primary conductors.
    b. Tree specifications

i. Minimum stock size: 50mm tree caliper for deciduous, 200cm height for coniferous.

ii. Maximize the use of large deciduous species wherever possible to maximize future canopy coverage.

c. 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.

d. No root barriers, dead-man anchor systems, or planters are permitted.

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

f. Hard surface planting

i. If there are hard surface plantings, a planting detail must be provided.

ii. Curb style planter design is highly recommended.

iii. No grates are to be used and if guards are required, City of Ottawa standard (which can be provided) shall be used.

c. Trees are to be planted at grade.

d. 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 following:

Tree Type/Size	Single Tree Soil Volume (m^3)	Multiple Tree Soil Volume (m^3/tree)
Ornamental	15	9
Columnar	15	9
Small	20	12
Medium	25	15
Large	30	18
Conifer	25	15

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

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

f. The City requests that consideration be given to planting native species wherever there is a high probability of survival to maturity.

g. 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.**

Feel free to contact Julian Alvarez-Barkham, Forester, for follow-up questions.

Parkland

Comments:

49. Parkland Conveyance is not required in accordance with By-law No. 2022-280 https://ottawa.ca/en/living-ottawa/laws-licences-and-permits/laws/laws-z/parkland-dedication-law-no-2022-280Section 11, Item 2. f.:

    2. No conveyance of land or payment of cash-in-lieu under this by-law is required in the case of the development or redevelopment of:

    f. a college or university or a school as defined by subsection 1(1) of the Education Act, where the school provides for the students' outdoor recreational needs on-site at the time of development and maintains sufficient outdoor recreational space on-site at the time of redevelopment, all to the satisfaction of the General Manager;

Feel free to contact Lorraine Stevens, lorraine.stevens@ottawa.ca Parks Planner, for follow-up questions.

Other

50. 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.

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

Commented [MA1]: Applicable only to SPC and Subdivision applications.

Submission Requirements and Fees

1. Site Plan Control application (Complex)
    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.
    a. The required plans and studies must meet the City's Terms of Reference (ToR) and/or Guidelines, as available on Ottawa.ca. These ToR and Guidelines outline the specific requirements that must be met for each plan or study to be deemed adequate.
3. All of the above comments or issues should be addressed to ensure the effectiveness of the application submission review.

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

Sincerely

Solé Soyak

Encl. Study and Plan Identification List (SPIL)

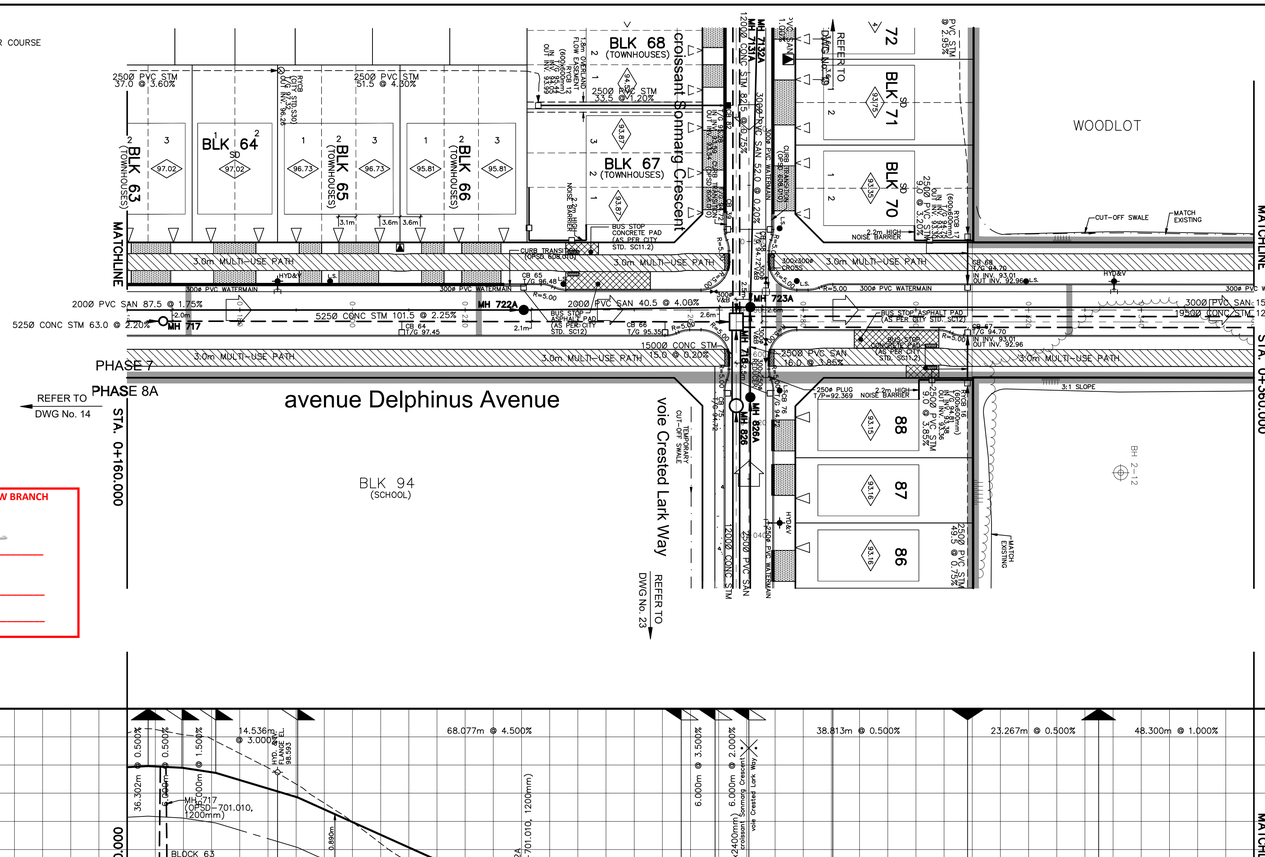
List of Technical Agencies to Consult

c.c. James Ireland, Planner III, Development Review All Wards
Lisa Stern, Planner III, Urban Design
Yasser Abdulkarim, Infrastructure Project Manager
Abdul Mottalib, Senior Infrastructure Project Manager
Josiane Gervais, Transportation Project Manager
Mark Elliott, Environmental Planner
Julian Alvarez-Barkham, Forester
Lorraine Stevens, Parks Planner

PAVEMENT DESIGN

40mm SUPERPAVE 12.5 ASPHALTIC CONCRETE
100mm SUPERPAVE 19.0 ASPHALTIC CONCRETE BINDER COURSE
150mm OPSS GRANULAR A CRUSHED STONE
600mm OPSS GRANULAR B TYPE II

NOTE RE: TEST PIT/BOREHOLE EXCAVATIONS
ANY DISTURBED MATERIAL ENCOUNTERED BELOW THE SUBGRADE LEVEL WITHIN A BUILDING FOOTPRINT TO BE SUB-EXCAVATED AND BACKFILLED WITH COMPACTED ENGINEERED FILL AS PER GEOTECHNICAL ENGINEERS RECOMMENDATION.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BLK 64 SD
BLK 65 (TOWNHOUSES)
BLK 66 (TOWNHOUSES)
BLK 67 (TOWNHOUSES)
BLK 68 (TOWNHOUSES)
BLK 70
BLK 71
BLK 72
BLK 87
BLK 88
BLK 94 (SCHOOL)
WOODLOT
croissant Sonnerg Crescent
avenue Delphinus Avenue
voie Crested Lark Way
MATCHLINE STA. 0+160.000
MATCHLINE STA. 0+360.000
PHASE 7
PHASE 8A
REFER TO DWG No. 14
REFER TO DWG No. 23
REFER TO DWG No. 16
3.0m MULTI-USE PATH
300ø PVC WATERMAIN
2.4m HIGH NOISE BARRIER
CUT-OFF SWALE
MATCH EXISTING
MH 717
MH 722A
MH 723A
MH 718
MH 826A
MH 826
200ø PVC SAN 87.5 @ 1.75%
5250 CONC STM 101.5 @ 2.25%
5250ø CONC STM 63.0 @ 2.20%
200ø PVC SAN 40.5 @ 4.00%
15000 CONC STM 15.0 @ 0.20%
3000 PVC SAN 150.0 @ 0.20%
1200ø CONC STM 120.0 @ 0.15%
2500 PVC STM 37.0 @ 3.60%
2500 PVC STM 51.5 @ 4.00%
2500 PVC STM 23.5 @ 1.50%
2500 PVC STM 49.5 @ 0.75%
2500 PVC STM 49.5 @ 0.75%
2500 PVC STM 49.5 @ 0.75

PAVEMENT DESIGN

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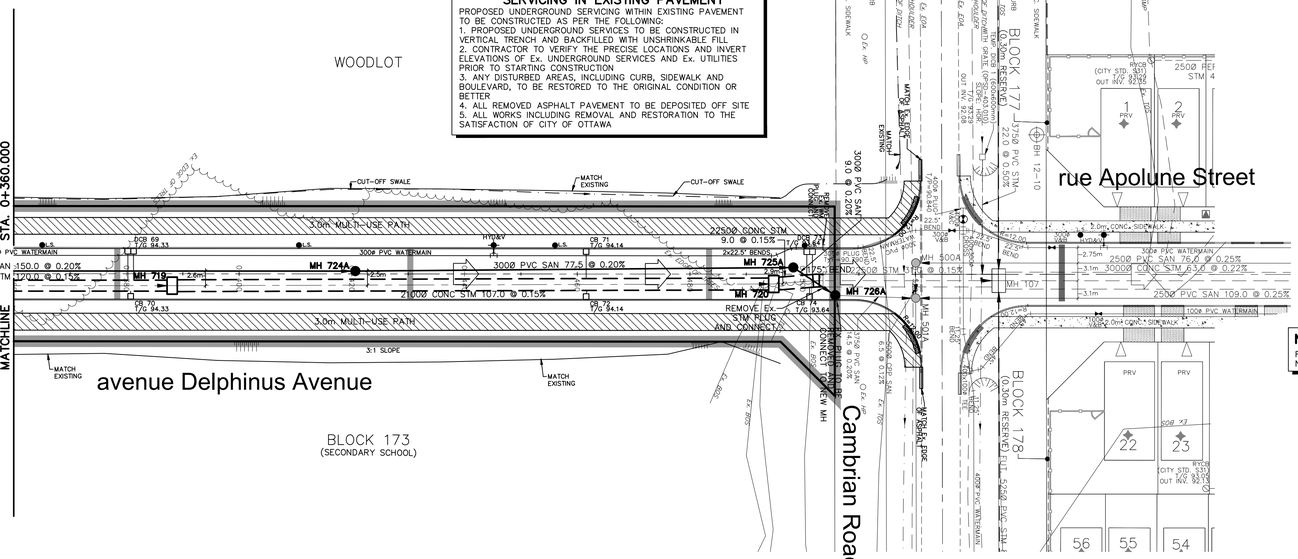
3. ANY DISTURBED AREAS, INCLUDING CURB, SIDEWALK AND BOULEVARD, TO BE RESTORED TO THE ORIGINAL CONDITION OR BETTER
4. ALL REMOVED ASPHALT PAVEMENT TO BE DEPOSITED OFF SITE
5. ALL WORKS INCLUDING REMOVAL AND RESTORATION TO THE SATISFACTION OF CITY OF OTTAWA



REVIEWED BY DEVELOPMENT REVIEW BRANCH
Signed
Date June 4, 2024
Plan Number 15776

NOTE: ICD
FOR ICD APPLICATION, REFER TO DRAWING No. 3 FOR DETAIL.

PERMISSION REQUIRED FOR WORK ON ADJACENT LANDS

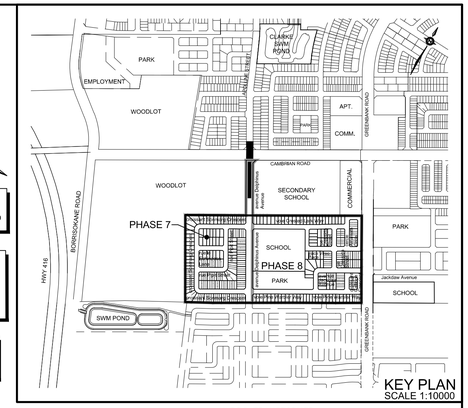
CONTRACTOR TO VERIFY THE PRECISE LOCATIONS AND INVERT ELEVATIONS OF Ex. UNDERGROUND SERVICES AND Ex. UTILITIES PRIOR TO STARTING CONSTRUCTION

ANY DISTURBED AREA DURING CONSTRUCTION TO BE RESTORED TO THE ORIGINAL CONDITION OR BETTER TO THE SATISFACTION OF THE AUTHORITIES HAVING JURISDICTION

HALF MOON BAY WEST PHASE 1 REFER TO DAVID SCHAEFFER ENGINEERING LIMITED PROJECT No. 16-888

NOTE:
ALL EXISTING TREES, SHRUBS ETC. WITHIN LOTS, BLOCKS AND ROADS TO BE REMOVED, UNLESS OTHERWISE NOTED

NOTE
FOR WATERMAIN STUBS, 2.4m MIN. COVER TO BE PROVIDED

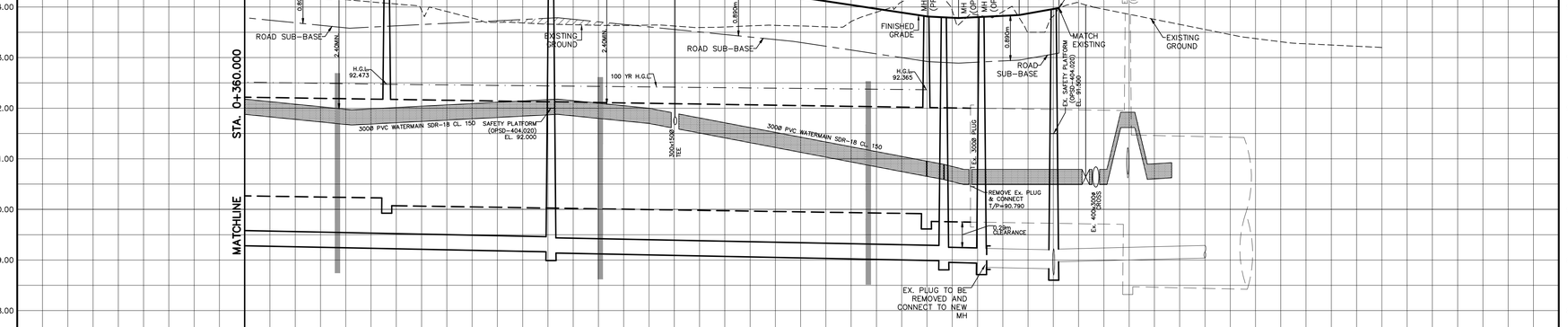


KEY PLAN
SCALE 1:10000

LEGEND

CROSS
45° BEND
LATERAL
HYDRANT, VALVE & VB
TEE
VALVE & VC
VALVE & VB
22.5° BEND
11.25° BEND
REDUCER
CAP
SANITARY MAINTENANCE HOLE
CAP
STREET CATCHBASIN & LEAD
STREET CATCHBASIN WITH CLOSED LID & LEAD
STORM MAINTENANCE HOLE
CURB INLET CATCHBASIN & LEAD
CATCHBASIN/ MAINTENANCE HOLE
INTERCONNECTED CATCH BASIN & LEADS
CAP
SINGLE SERVICE LOCATION (ST, SAN & WM)
SINGLE SERVICE LOCATION (SAN & WM)
SINGLE SERVICE LOCATION (ST, SAN & WM)
TEE CATCHBASIN
PERFORATED PIPE
ELBOW CATCHBASIN
DITCH AND CULVERT

HYDRO TRANSFORMER
STREET LIGHT STANDARD
CONCRETE SIDEWALK
CURB & DEPRESSED CURB
ASPHALT SIDEWALK
CHAINLINK FENCE (1.5m UNLESS OTHERWISE NOTED)
NOISE BARRIER (2.5m UNLESS OTHERWISE NOTED)
DECORATIVE FENCE (SEE LANDSCAPE DWGS FOR DETAIL)
CONSTRUCTION FENCE
POST AND RAIL FENCE
PHASING LIMITS
PROPERTY BOUNDARY
BOREHOLE (BH)
TEST PIT (TP)
AUGER HOLE (AH)
MONITORING WELL LOCATION
CONCEPTUAL WELL LOCATION
AS PER GEOTECHNICAL REPORT
LOT NUMBER
UNDERSIDE OF FOOTING ELEVATION
UNITS REQUIRING PRESSURE REDUCING VALVES
WALKOUT UNITS
SLAB ON GRADE
OVERLAND FLOW DIRECTION
EXTERNAL OVERLAND FLOW DIRECTION
EMERGENCY OVERLAND FLOW DIRECTION
TACTILE WALKING SURFACE INDICATOR (AS PER CITY OF OTTAWA STD. SC6, SC7, SC7.1, SC7.2, SC7.3)
PREVIOUS PHASES
CLAY SEAL (REFER TO GENERAL NOTES, No. 18. ON DWG. No. 1, AND GEOTECHNICAL CONSULTANT'S SPECIFICATIONS)
MIN. USF AS PER GEOTECHNICAL CONSULTANT'S RECOMMENDATION



NOTE RE: SEWER BEDDING
SEWER TRENCH AND BEDDING SHALL BE AS PER CITY OF OTTAWA STD. S6 AND S7, CLASS "B" BEDDING UNLESS OTHERWISE NOTED.

| | | |

PAVEMENT DESIGN

40mm HL-3 OR SUPERPAVE 12.5 ASPHALT CONCRETE
100mm HL-8 OR SUPERPAVE 19.0 ASPHALT CONCRETE
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NOTE: WATER SERVICE CONNECTIONS
WHERE WATER SERVICE CONNECTIONS NEED TO CROSS ABOVE THE STORM SEWER AND 2.4m COVER CANNOT BE ACHIEVED, INSULATION IS TO BE PROVIDED. FOR TYPICAL DETAIL REFER TO DWG 4. ALL WORKS TO BE COMPLETED TO THE SATISFACTION OF THE CITY OF OTTAWA.

NOTE:
ALL WATERMAIN CONNECTIONS AND DECOMMISSIONING OF EXISTING WATERMAINS TO BE COMPLETED BY CITY FORCES. TRENCH BACKFILL/REINSTATEMENT TO BE COMPLETED BY THE CONTRACTOR TO THE SATISFACTION OF THE CITY OF OTTAWA.

NOTE
FOR WATERMAIN STUBS, 2.4m MIN. COVER TO BE PROVIDED

NOTE: ICD
FOR ICD APPLICATION, REFER TO DRAWINGS No. 7 TO 8 & 43 TO 45 FOR DETAIL.

NOTE RE: PROPOSED UNDERGROUND SERVICING IN EXISTING PAVEMENT
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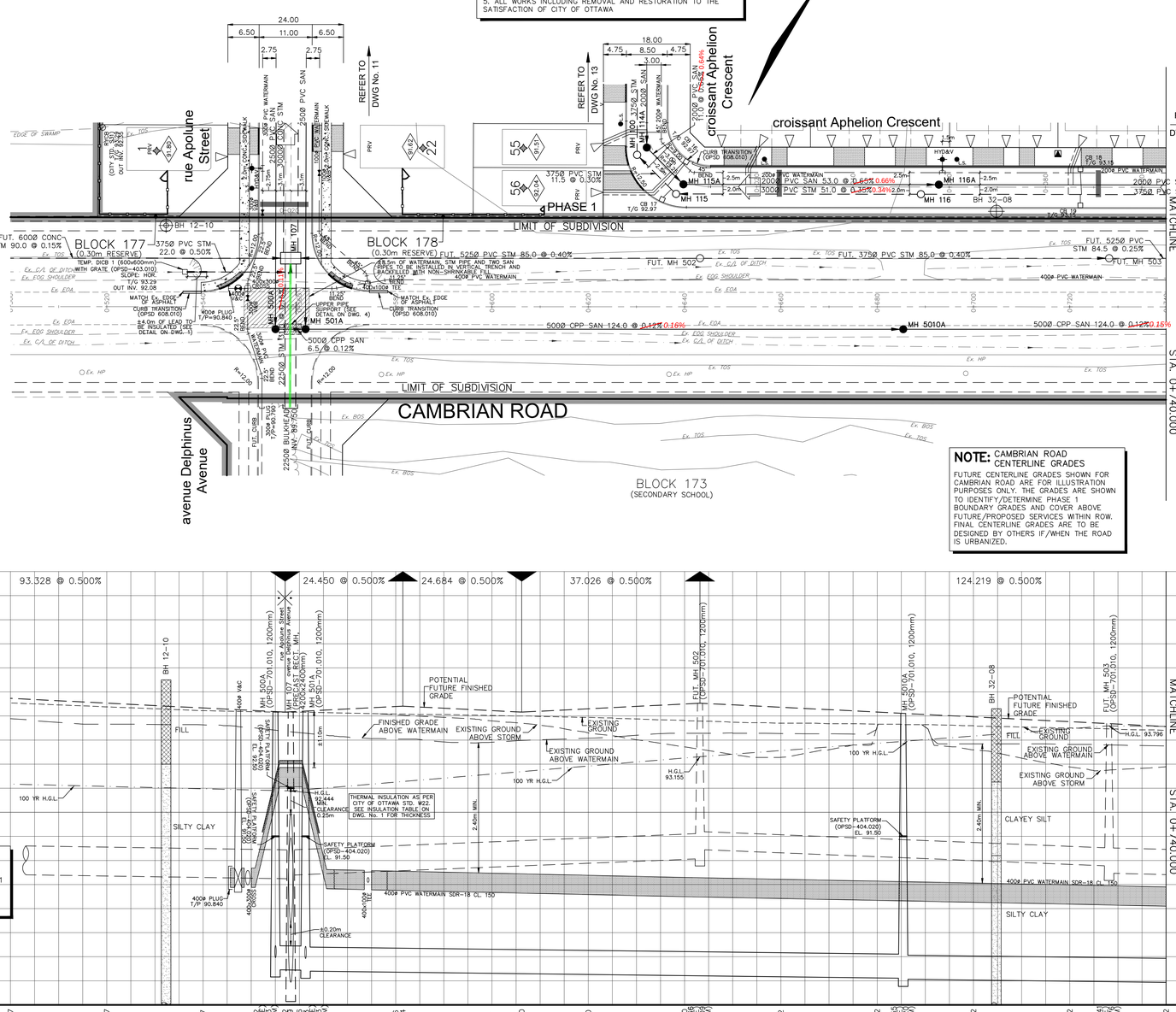
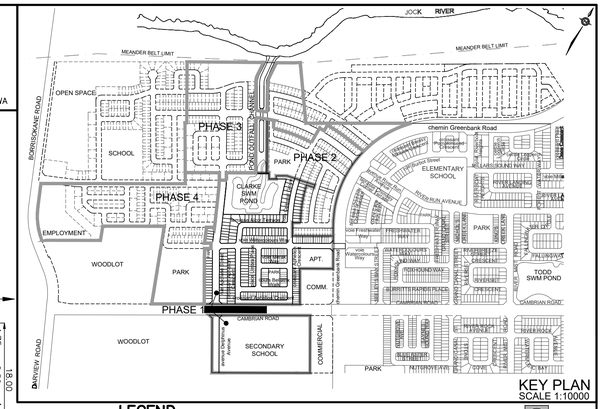
HALF MOON BAY WEST
REFER TO
DAVID SCHAEFFER ENGINEERING LIMITED
PROJECT No. 16-888

APPROVED ☐ REFUSED ☐
THIS ____ DAY OF_____, 20____
JEFF SHILLINGTON, P.ENG
PROJECT MANAGER – SOUTH BRANCH
PLANNING, INFRASTRUCTURE & ECONOMIC DEVELOPMENT DEPARTMENT, CITY OF OTTAWA





KEY PLAN
SCALE 1:10000

LEGEND

CROSS
45° BEND
LATERAL
HYDRANT, VALVE & VB
TEE
VALVE & VC
VALVE & VB
22.5° BEND
11.25° BEND
REDUCER
CAP
SANITARY MAINTENANCE HOLE
CAP
STREET CATCHBASIN & LEAD
STREET CATCHBASIN WITH CLOSED LID & LEAD
STORM MAINTENANCE HOLE
CURB INLET CATCHBASIN & LEAD
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SINGLE SERVICE LOCATION (ST, SAN & WM)
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HYDRO SWITCHGEAR
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DECORATIVE FENCE (SEE LANDSCAPE DWGS FOR DETAIL)
CONSTRUCTION FENCE
POST AND RAIL FENCE
PHASING LIMITS
PROPERTY BOUNDARY
BOREHOLE (BH)
TEST PIT (TP)
MONITORING WELL LOCATION
CONCEPTUAL WELL LOCATION
AS PER GEOTECHNICAL REPORT
TOP OF FOUNDATION ELEVATION
FINISHED FLOOR ELEVATION
UNDERSIDE OF FOOTING ELEVATION
NUMBER OF RISERS
LOTS EQUIPPED WITH SUMP PUMP (REFER TO DETAIL ON DWG. 4)
UNITS REQUIRING PRESSURE REDUCING VALVES
WALKOUT UNITS
SLAB ON GRADE
OVERLAND FLOW DIRECTION
EXTERNAL OVERLAND FLOW DIRECTION
EMERGENCY OVERLAND FLOW DIRECTION
TACTILE WALKING SURFACE INDICATOR (AS PER CITY OF OTTAWA STD. SC6, SC7, SC7.1, SC7.2, SC7.3)
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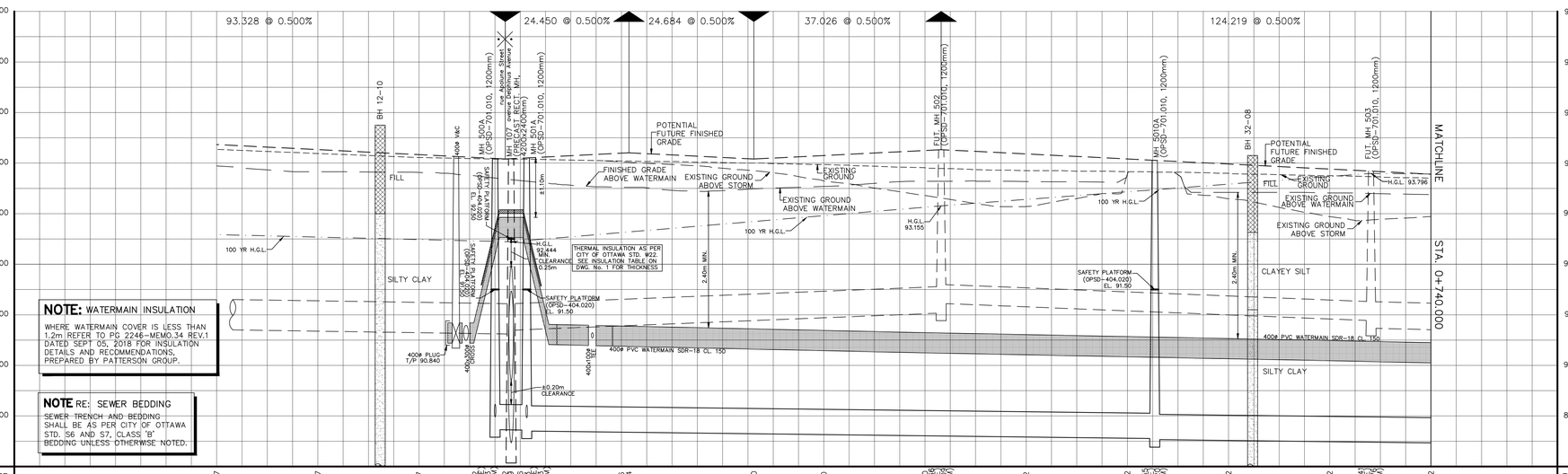

NOTE: WATERMAIN INSULATION
WHERE WATERMAIN COVER IS LESS THAN 1.2m REFER TO PG 2246-MEMO.34 REV.1 DATED SEPT 05, 2018 FOR INSULATION DETAILS AND RECOMMENDATIONS, PREPARED BY PATTERSON GROUP.

NOTE RE: SEWER BEDDING
SEWER TRENCH AND BEDDING SHALL BE AS PER CITY OF OTTAWA STD. S6 AND S7, CLASS "B" BEDDING UNLESS OTHERWISE NOTED.

NOTE: CAMBRIAN ROAD CENTERLINE GRADES
FUTURE CENTERLINE GRADES SHOWN FOR CAMBRIAN ROAD ARE FOR ILLUSTRATION PURPOSES ONLY. THE GRADES ARE SHOWN TO IDENTIFY/DETERMINE PHASE 1 BOUNDARY GRADES AND COVER ABOVE FUTURE/PROPOSED SERVICES WITHIN ROW. FINAL CENTERLINE GRADES ARE TO BE DESIGNED BY OTHERS IF/WHEN THE ROAD IS URBANIZED.

| | | |

PAVEMENT DESIGN

40mm HL-3 OR SUPERPAVE 12.5 ASPHALT CONCRETE
100mm HL-8 OR SUPERPAVE 19.0 ASPHALT CONCRETE
150mm OPSS GRANULAR A CRUSHED STONE
600mm OPSS GRANULAR B TYPE II

NOTE: ICD
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NOTE:
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CONTRACTOR TO VERIFY THE PRECISE LOCATIONS AND INVERT ELEVATIONS OF Ex. UNDERGROUND SERVICES AND Ex. UTILITIES PRIOR TO STARTING CONSTRUCTION

NOTE
FOR WATERMAIN STUBS, 2.4m MIN. COVER TO BE PROVIDED

NOTE:
THE COVER OF EX. MH, CB, CHAMBER AND OTHER ABOVEGROUND FEATURES TO BE ADJUSTED TO SUIT THE NEW FINISHED GRADE, WHERE APPLICABLE

NOTE RE: PROPOSED UNDERGROUND SERVICING IN EXISTING PAVEMENT
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PRELIMINARY DESIGN FOR FUTURE chemin Greenbank Road
REFER TO STANTEC PROJECT No. 163600994

NOTE RE: GREENBANK ROAD FUTURE SERVICING
THE LOCATION OF DENOTED FUTURE STORM/SANITARY MANHOLES, AND STREET CATCHBASINS AS SHOWN ON DRAWINGS, IS FOR ILLUSTRATION PURPOSES ONLY TO IDENTIFY ASSUMED DRAINAGE BOUNDARY AREAS. THE FINAL LOCATION OF SAID SERVICES ARE TO BE FINALIZED AT THE DETAILED DESIGN STAGE.

APPROVED ☐ REFUSED ☐
THIS ____ DAY OF _____, 20____
JEFF SHILLINGTON, P.ENG
PROJECT MANAGER – SOUTH BRANCH
PLANNING, INFRASTRUCTURE & ECONOMIC DEVELOPMENT DEPARTMENT, CITY OF OTTAWA

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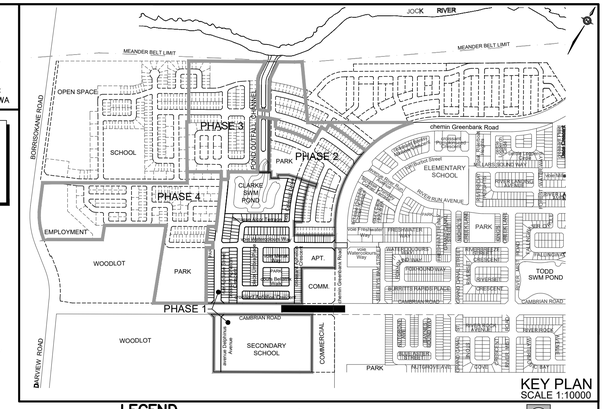
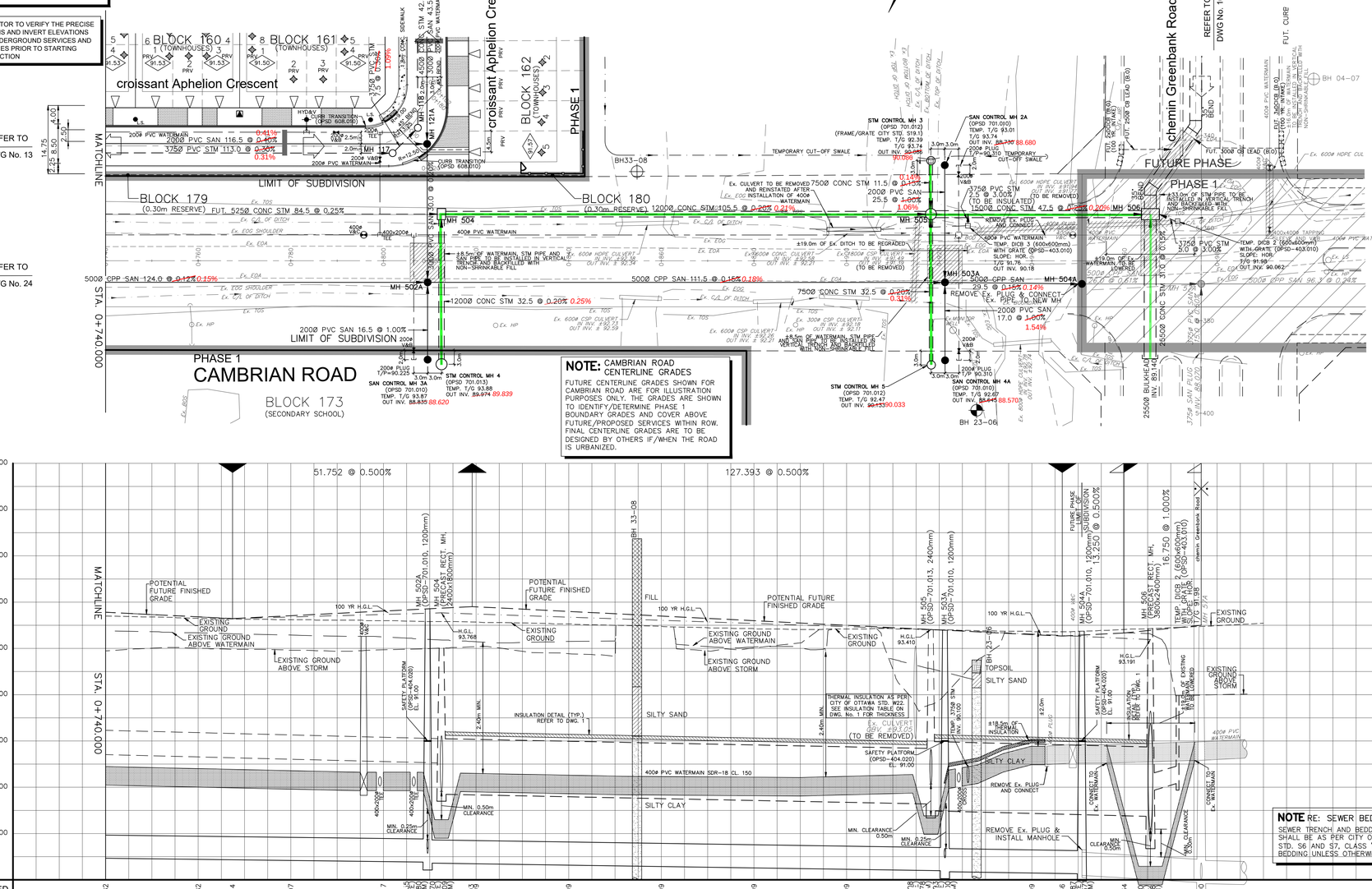


KEY PLAN
SCALE 1:10000



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LEGEND

- CROSS
- 45° BEND
- LATERAL
- HYDRANT, VALVE & VB
- TEE
- VALVE & VC
- VALVE & VB
- 22.5° BEND
- 11.25° BEND
- REDUCER
- CAP
- SANITARY MAINTENANCE HOLE
- CAP
- STREET CATCHBASIN & LEAD
- STREET CATCHBASIN WITH CLOSED LID & LEAD
- STORM MAINTENANCE HOLE
- CURB INLET CATCHBASIN & LEAD
- CATCHBASIN/ MAINTENANCE HOLE INTERCONNECTED CATCH BASIN & LEADS
- CAP
- SINGLE SERVICE LOCATION (ST, SAN & WM)
- SINGLE SERVICE LOCATION (ST, SAN & WM)
- TEE CATCHBASIN
- PERFORATED PIPE
- ELBOW CATCHBASIN
- DITCH AND CULVERT
- AS-BUILT ELEVATIONS

- HYDRO SWITCHGEAR
- HYDRO TRANSFORMER
- STREET LIGHT STANDARD
- CONCRETE SIDEWALK
- CURB & DEPRESSED CURB
- ASPHALT SIDEWALK
- CHAINLINK FENCE (1.5m UNLESS OTHERWISE NOTED)
- NOISE BARRIER (2.5m UNLESS OTHERWISE NOTED)
- DECORATIVE FENCE (SEE LANDSCAPE DWGS FOR DETAIL)
- CONSTRUCTION FENCE
- POST AND RAIL FENCE
- PHASING LIMITS
- PROPERTY BOUNDARY
- BOREHOLE (BH)
- TEST PIT (TP)
- MONITORING WELL LOCATION
- CONCEPTUAL WELL LOCATION
- TOP OF FOUNDATION ELEVATION
- FINISHED FLOOR ELEVATION
- UNDERSIDE OF FOOTING ELEVATION
- NUMBER OF RISERS
- LOTS EQUIPPED WITH SUMP PUMP (REFER TO DETAIL ON DWG. 3)
- UNITS REQUIRING PRESSURE REDUCING VALVES
- WALKOUT UNITS
- SLAB ON GRADE
- OVERLAND FLOW DIRECTION
- EXTERNAL OVERLAND FLOW DIRECTION
- EMERGENCY OVERLAND FLOW DIRECTION
- TACTILE WALKING SURFACE INDICATOR (AS PER CITY OF OTTAWA STD. SC6, SC7.1, SC7.2, SC7.3)
- PREVIOUS PHASES
- CLAY SEAL (REFER TO GENERAL NOTES. No.18. ON DWG. No. 1, AND GEOTECHNICAL CONSULTANT'S SPECIFICATIONS)

1.5m CONC. SIDEWALK
SURFACE COURSE
1.5m ASPHALT SIDEWALK

AS PER GEOTECHNICAL REPORT

91.54 ~~XX.XXX~~

TOPOGRAPHIC INFORMATION

TOPOGRAPHIC INFORMATION PROVIDED BY J.D. BARNES LIMITED, PROJECT No. 16-10-100-00. SURVEY DATED FEBRUARY 22, 2017. CITY OF OTTAWA 2K MAPPING, RECEIVED ON JANUARY 18, 2016.

LEGAL INFORMATION

CALCULATED DRAFT PLAN PROVIDED BY J.D. BARNES LIMITED, PROJECT No. 16-10-100-00-ph1 (HALF MOON BAY WEST PHASE 1), RECEIVED ON DECEMBER 04, 2018.

5th SUBMISSION 19-01-29

BENCH MARK No. 00820010126
POINT IS LOCATED 1.65km NORTH OF BARNSDALE ROAD AND 5km SOUTH OF FALLOWFIELD ROAD ON HIGHWAY 416 NORTH OF KEMPTVILLE. THE POINT IS SET EAST OF THE NORTHBOUND LANE IN THE GRASSY SHOULDER.
ELEVATION = 96.923 m

No.	BY	DATE	DESCRIPTION	BY
7	C.M.S.	22-01-12	AS-BUILT SERVICING INFORMATION ADDED	
6	W.L.	19-01-29	5th SUBMISSION	
5	W.L.	18-10-29	4th SUBMISSION	
4	W.L.	18-10-19	ISSUED FOR REVIEW	
3	W.L.	18-09-05	3rd SUBMISSION	
2	W.L.	18-07-13	2nd SUBMISSION	
1	W.L.	18-03-09	1st SUBMISSION	

CITY OF OTTAWA

NOTE RE: SEWER BEDDING
SEWER TRENCH AND BEDDING SHALL BE AS PER CITY OF OTTAWA STD. S6 AND S7, CLASS 'B' BEDDING UNLESS OTHERWISE NOTED.

PROJECT No. 16-888

AS-BUILT

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© DSEL

PLAN AND PROFILE OF
CAMBRIAN ROAD
(STA. 0+740.000 TO STA. 0+976.561)

MATTAMY (HALF MOON BAY) LIMITED

HALF MOON BAY WEST SUBDIVISION
PHASE 1

david schaeffer engineering ltd
120 Iber Road, Unit 103
Stittsville, ON K2S 1E9
Tel. (613) 836-0856
Fax. (613) 836-7183
www.DSEL.ca

DRAWN BY: V.W./S.L.	CHECKED BY: P.P./C.M.	DRAWING NO.	SHEET NO.
DESIGNED BY: W.L./C.M.	CHECKED BY: K.M.		26
SCALE: H 1:500 , V 1:50	DATE: MARCH 2018		

CITY FILE No. D07-16-16-0023 P1 CITY PLAN No. 17586

| | | |

NOTE RE: TEST PIT/BOREHOLE EXCAVATIONS
ANY DISTURBED MATERIAL ENCOUNTERED BELOW THE SUBGRADE LEVEL WITHIN A BUILDING FOOTPRINT TO BE SUB-EXCAVATED AND BACKFILLED WITH COMPACTED ENGINEERED FILL AS PER GEOTECHNICAL ENGINEERS RECOMMENDATION.

NOTE
FOR WATERMAIN STUBS, 2.4m MIN. COVER TO BE PROVIDED

NOTE: ICD
FOR ICD APPLICATION, REFER TO DRAWINGS No. 7 TO 8 & 43 TO 45 FOR DETAIL.

CONTRACTOR TO VERIFY THE PRECISE LOCATIONS AND INVERT ELEVATIONS OF Ex. UNDERGROUND SERVICES AND Ex. UTILITIES PRIOR TO STARTING CONSTRUCTION

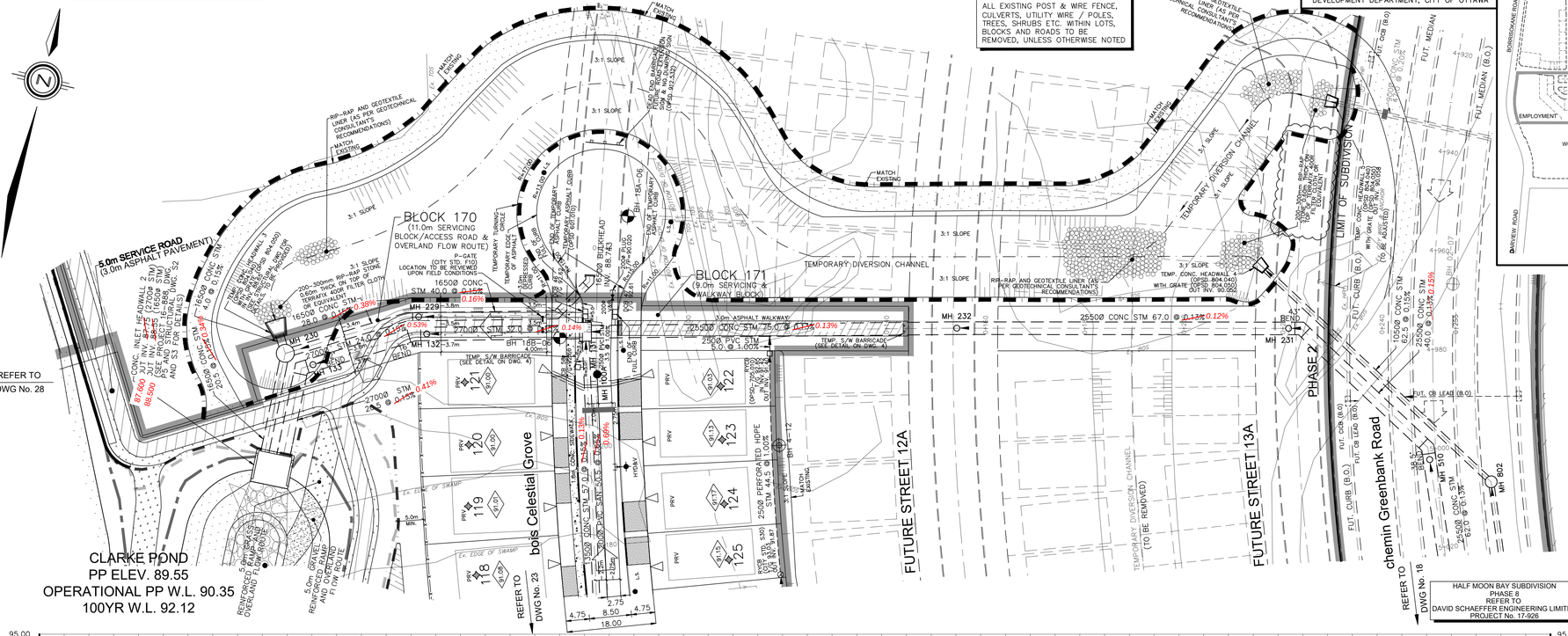
ANY DISTURBED AREA DURING CONSTRUCTION TO BE RESTORED TO THE ORIGINAL CONDITION OR BETTER TO THE SATISFACTION OF THE AUTHORITIES HAVING JURISDICTION

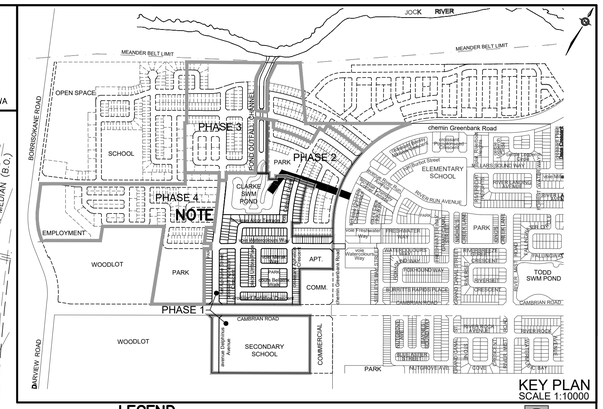
PERMISSION REQUIRED FOR WORK ON ADJACENT LANDS

PRELIMINARY DESIGN FOR FUTURE chemin Greenbank Road
REFER TO STANTEC PROJECT No. 163600994

NOTE:
ALL EXISTING POST & WIRE FENCE, CULVERTS, UTILITY WIRE / POLES, TREES, SHRUBS ETC. WITHIN LOTS, BLOCKS AND ROADS TO BE REMOVED, UNLESS OTHERWISE NOTED

APPROVED ☐ REFUSED ☐
THIS ____ DAY OF _____, 20____
JEFF SHILLINGTON, P.ENG
PROJECT MANAGER – SOUTH BRANCH
PLANNING, INFRASTRUCTURE & ECONOMIC DEVELOPMENT DEPARTMENT, CITY OF OTTAWA





LEGEND

- CROSS
- 45° BEND
- LATERAL
- HYDRANT, VALVE & VB
- TEE
- VALVE & VC
- VALVE & VB
- 22.5° BEND
- 11.25° BEND
- REDUCER
- CAP
- SANITARY MAINTENANCE HOLE
- CAP
- STREET CATCHBASIN & LEAD
- STREET CATCHBASIN WITH CLOSED LID & LEAD
- STORM MAINTENANCE HOLE
- CURB INLET CATCHBASIN & LEAD
- CATCHBASIN/ MAINTENANCE HOLE INTERCONNECTED CATCH BASIN & LEADS
- CAP
- SINGLE SERVICE LOCATION (ST, SAN & WM)
- SINGLE SERVICE LOCATION (ST, SAN & WM)
- TEE CATCHBASIN
- PERFORATED PIPE
- ELBOW CATCHBASIN
- DITCH AND CULVERT
- AS-BUILT ELEVATIONS 91.54 XX.XXX

- HYDRO SWITCHGEAR
- HYDRO TRANSFORMER
- STREET LIGHT STANDARD
- CONCRETE SIDEWALK
- CURB & DEPRESSED CURB
- ASPHALT SIDEWALK
- CHAINLINK FENCE (1.5m UNLESS OTHERWISE NOTED)
- NOISE BARRIER (2.5m UNLESS OTHERWISE NOTED)
- DECORATIVE FENCE (SEE LANDSCAPE DWGS FOR DETAIL)
- CONSTRUCTION FENCE
- POST AND RAIL FENCE
- PHASING LIMITS
- PROPERTY BOUNDARY
- BOREHOLE (BH)
- TEST PIT (TP)
- MONITORING WELL LOCATION
- CONCEPTUAL WELL LOCATION

AS PER GEOTECHNICAL REPORT

- TOP OF FOUNDATION ELEVATION
- FINISHED FLOOR ELEVATION
- UNDERSIDE OF FOOTING ELEVATION
- NUMBER OF RISERS
- LOTS EQUIPPED WITH SUMP PUMP (REFER TO DETAIL ON DWG. 4)
- UNITS REQUIRING PRESSURE REDUCING VALVES
- WALKOUT UNITS
- SLAB ON GRADE
- OVERLAND FLOW DIRECTION
- EXTERNAL OVERLAND FLOW DIRECTION
- EMERGENCY OVERLAND FLOW DIRECTION
- TACTILE WALKING SURFACE INDICATOR (AS PER CITY OF OTTAWA STD. SC6, SC7, SC7.1, SC7.2, SC7.3)
- PREVIOUS PHASES
- CLAY SEAL (REFER TO GENERAL NOTES. No.18. ON DWG. No. 1, AND GEOTECHNICAL CONSULTANT'S SPECIFICATIONS)

TOPOGRAPHIC INFORMATION

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Ottawa CITY OF OTTAWA

PROJECT No. 16-888

AS-BUILT

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© DSEL

PLAN AND PROFILE OF
SWM POND INLET HW 2 & SERVICING BLOCK
(STA. 0+000.000 TO STA. 0+250.250)

MATTAMY (HALF MOON BAY) LIMITED

HALF MOON BAY WEST SUBDIVISION
PHASE 1

david schaeffer engineering ltd
120 Iber Road, Unit 103
Stittsville, ON K2S 1E9
Tel. (613) 836-0856
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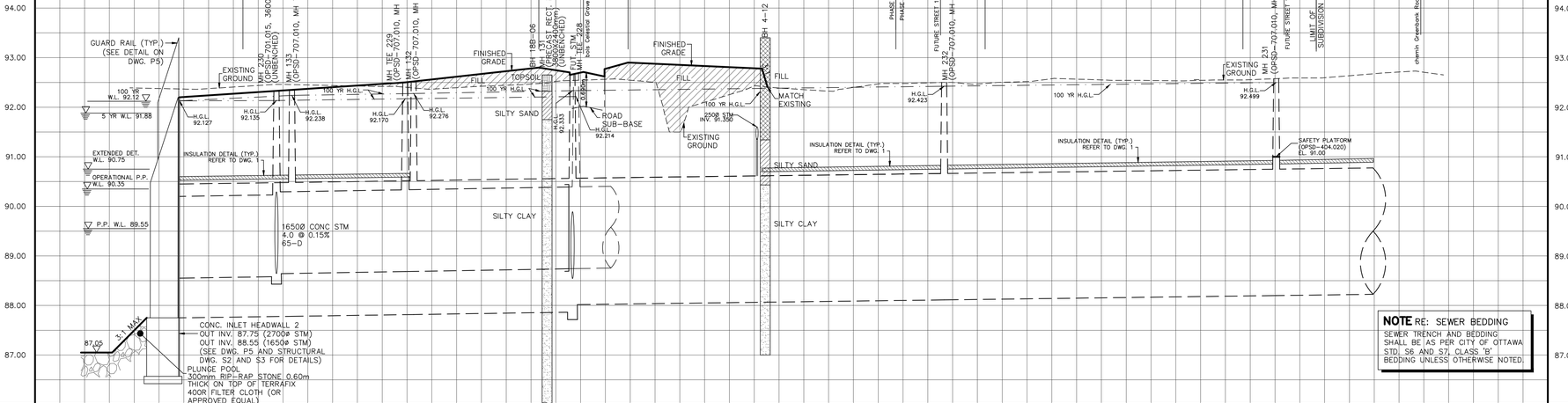
CITY FILE No. D07-16-16-0023 P1 CITY PLAN No. 17586



NOTE RE: SEWER BEDDING
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PROPOSED GRADES	92.328 92.349 92.500 92.519 92.749 92.749 92.500 92.576
TOP OF WATERMAIN	
NORTH STORM INVERT	16500ø CONC STM 20.5 @ 0.15% 65-D 0.34% (TO BE INSULATED) N 88.550 W 88.550 16500ø CONC STM 28.0 @ 0.15% 65-D 0.38% (TO BE INSULATED) W 88.643 E 88.693 16500ø CONC STM 40.0 @ 0.15% 0.16% 65-D W 88.745 E 88.743 (BULKHEAD) N 88.743 FUT. 16500ø CONC STM 31.5 @ 0.15%
SOUTH STORM INVERT	27000ø CONC STM 20.5 @ 0.15% 65-D 0.41% (TO BE INSULATED) N 87.750 N 87.750 27000ø CONC STM 24.0 @ 0.15% 65-D 0.53% (TO BE INSULATED) W 87.817 E 87.817 27000ø CONC STM 32.0 @ 0.15% 0.14% 65-D W 87.860 W 87.860 2500ø PERFORATED HDPE STM 44.5 @ 1.00% 0.98% S 88.535 E 88.610 2550ø CONC STM 75.0 @ 0.13% 65-D 0.13% (TO BE INSULATED) W 88.110 E 88.110 2550ø CONC STM 67.0 @ 0.13% 65-D 0.12% (TO BE INSULATED) W 88.189 E 88.189 2550ø CONC STM 40.0 @ 0.13% 65-D 0.15% (TO BE INSULATED)
CENTERLINE CHAINAGE	0-020.000 P.I. 0-010.000 0+000.000 0+010.000 0+018.551 0+022.684 0+040.000 0+045.518 0+047.215 0+060.000 0+079.388 0+080.000 0+100.000 0+120.000 0+140.000 0+154.168 0+160.000 0+180.000 0+200.000 0+220.102 0+221.014 0+240.000 0+260.000