Servicing & Stormwater Management

Final

Fernbank Catholic Highschool
5431 Fernbank Road, Ottawa ON, K2S 0T7

December 2, 2025

Jp2g Project # 24-5050A

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ENGINEERS · PLANNERS · PROJECT MANAGERS

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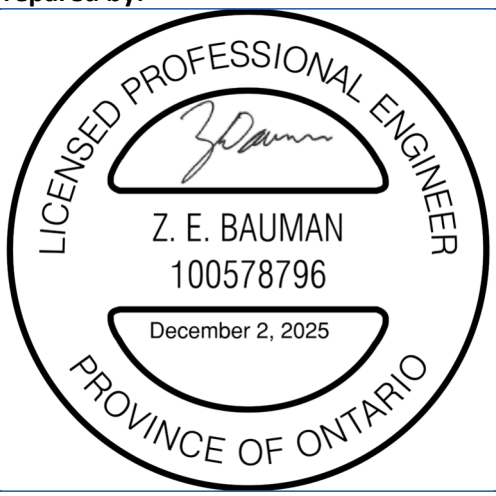

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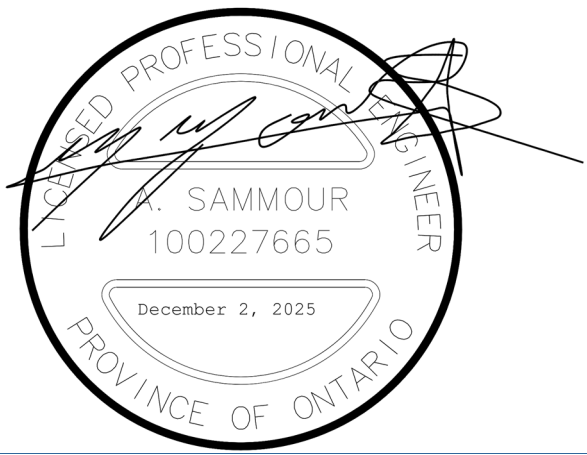

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1 Introduction

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 Catholic School Board Fernbank Catholic High School development located at 5431 Fernbank Road, hereafter referred to as the 'site'.

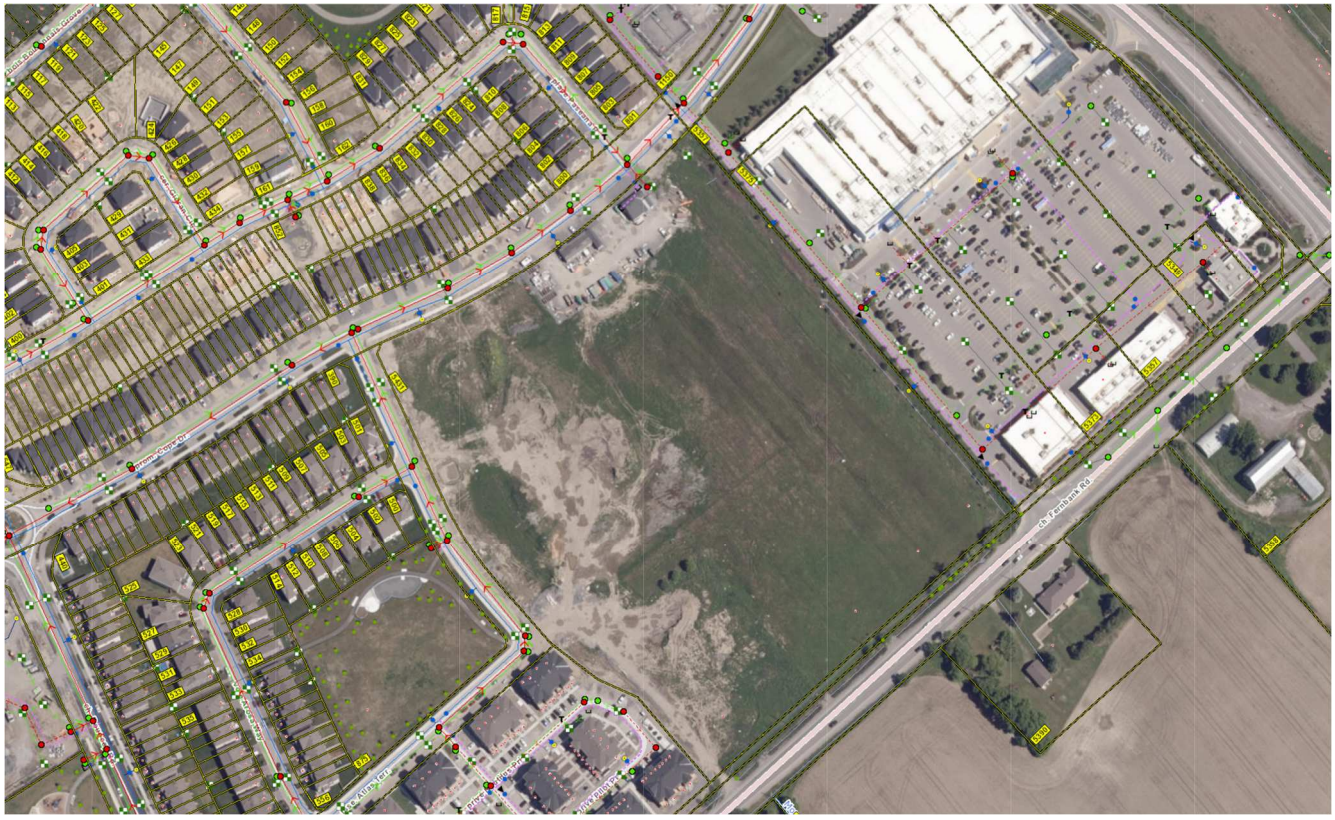


Figure 1: Site Location

The site is approximately 7.40 ha in size and is bound by residential developments off Cope Drive to the North and Atlas Terrace to the West, Fernbank Road to the South, and a private commercial block to the East. The proposed development includes the construction of a new three-storey high school, with no basements, parking areas, bus routes, a sports field and running track, a mini sports field, and landscaped areas. The building footprint is approximately 6,987m^2.

A pre-consultation meeting was held with City of Ottawa staff on March 14, 2025, 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 schoolboard, the school is estimated to service 1439 students and 100 staff. 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 203mm diameter PVC watermain stub was left at the property line near Cope Drive and Paseana Place. A 203mm PVC watermain is available on Atlas Terrace.

Sanitary

A 250mm PVC sanitary stub was left at the property line near Cope Drive and Paseana Place for connection to the school development.

Storm

A 1200mm diameter concrete storm stub was left at the property line near Cope Drive and Paseana Place for connection to the school development. There is an existing ditch inlet and 375mm PVC storm sewer at the north east corner of the property collecting drainage from a temporary on site ditch.

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)
- Fernbank Community Ultimate Pond 8 – Stormwater Management Facility Design Report
- Blackstone Community Phase 4-8 – Functional Servicing Report

1.5 Design Drawings

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

- C1 – Site Servicing Plan
- C2 – Site Grading, Erosion and Sediment Control 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 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 Blackstone Community Phase 4-8 Servicing and Stormwater Management Report, the quantity control criteria for this site is 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. Additionally, institutional blocks are to retain a minimum of 50m^3/ha per Pond 8 recommendations.

3.1.2 Quality Control

Per preconsultation with the City of Ottawa, and per the Servicing and Stormwater Management Report – Blackstone Community Phase 4-8, quality control is provided to an enhanced level at Pond 8, providing 80% TSS removal. No additional quality control measures are required for the site.

3.2 Pre-Development Conditions

The existing site contains is an undeveloped parcel of land. The site was previously used for the developer's site trailer and contains a flat gravel area near Cope Drive. The site is generally flat with grades ranging from 100.36 in the south west corner to 98.12 in the north east corner. There is an existing ditch running along the eastern property line of the site. A ditch inlet catch basin in the north east corner of the site collects drainage from the on site ditch and is conveyed to the 1200mm diameter concrete storm stub. Full service stubs including connections for water, sanitary, and storm were left on site for connection.

3.2.1 Predevelopment Allowable Flow Rates

Per the Blackstone Community Phase 4-8, the site was allocated a C-factor of C=0.70 for the 5 year storm event. For the 7.40 ha site, the allowable release rate is **1499.0 L/s**, refer to the excerpt of the storm sewer design sheet included in Appendix B. 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.

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, bus routes 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 6987m^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. Runoff coefficients were increased by 25% for the 100 year event, to a maximum valuea 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 area is shown in Appendix B.

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 out the outlet pipes of certain catchbasin and catchbasin-manhole structures, as follows:

- ICD-1 located in structure STMH-1, which controls subcatchments B1 through B5
- ICD-2 located in structure CBMH-4, which controls subcatchments B6 and B7
- ICD-3 located in structure CB-4, which controls subcatchment B8
- ICD-4 located in structure CBMH-5, which controls subcatchments B9 and B10
- ICD-5 located in structure CB-6, which controls subcatchment B11
- ICD-6 located in structure CB-7, which controls subcatchment B12
- Roof drains which control roof drainage from subcatchment B13.
- Subcatchments B14 through B19 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 30 gpm (1.89 L/s) at a maximum 6" / 152mm 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, to ensure each flow control roof drain will restrict flow to the 1.89 L/s maximum. Refer to the attached roof drain flow control product sheet in Appendix B. The modified rational method is used to determine peak storage requirements behind each control device. Based on the restricted flow rates, and the roof discharge curve, storage requirements for the roof area is calculated to be 202.48m^3 for the 100 year storm event whereas 232.9m^3 of storage is provided based on the roof area, 0.10m roof ponding depth and the total 100 year roof drain discharge at 0.10m of head.

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 is included in Appendix B for each ICD-1 through ICD-6, and proposed roof storage. Provided surface storage, as determined through civil 3D stage-storage analysis exceeds required storage for each restricted release rate.

The minimum orifice size proposed is 101mm, in in accordance with the City of Ottawa Sewer Design Guidelines. The maximum ponding depth proposed in a paved area is 0.27m 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 99.27, meeting the minimum 300mm clearance to any building opening or ramp as the building FFE is at an elevation of 99.65m. 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 summation of all 100 year flow controls and 100 year uncontrolled flow, is shown in Table 3-2 below. Evidently, the resultant post development site outflow is restricted to the allowable release rate of 1499.0 L/s identified in section 3.2.1 above, for all storms up to and including the 100 year storm event.

Additionally, a summary of total provided site storage for the 100 year storm event is included in Table 3-2 below. Per the higher level Blackstone Community Phase 4-8 Servicing and Stormwater Management Report, pond 8 recommendations, a minimum of 50m^3/ha is to be detained on all institutional blocks. For the subject site of 7.40ha, this is a total of 370m^3 of storage. The total provided 100 year storage is 679.11m^3, exceeding the

pond 8 recommendations. Full details including inflows, outflows, and storage calculations for each stormwater management control are included in **Appendix B**.

Table 3-2: 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	81.30	78.8
ICD-2	88.30	80.1
ICD-3	40.10	40.5
ICD-4	30.00	131.7
ICD-5	82.40	72.3
ICD-6	46.40	42.8
Roof	48.50	232.9
100 Year Uncontrolled	674.36	0.00
Total	**1091.36**	**679.11**
Allowable	**1499.00**	
Difference	**407.64**	

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. A Proline fittings backwater valve and inspection chamber 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.

3.4.1 Fernbank Proposed Culverts

Two paved site entrances are proposed to connect to Fernbank Road serving as access to the school parking lot and as a bus route. To accommodate the proposed entrances, two new 600mm diameter culverts are proposed under the proposed entrances. There are two existing 600mm diameter culverts underneath an existing temporary granular site entrance, and light standard grading. The existing 600mm diameter culverts are proposed to be removed to construct the two new paved site entrances. Two new 600mm culverts are proposed under the site entrances, matching like for like culvert sizes within the existing ditch. This additionally matches the downstream sizes of two existing culverts within the Fernbank ditch downstream of the proposed culverts. The 600mm culverts are proposed to be HDPE, with a 320 kPa stiffness rating in conjunction with CSA S6 CL-625 and the City of Ottawa MS-18.3. The culvert bedding will consist of 300mm OPSS Granular A and a non woven geotextile. Frost treatment will be provided per OPSD 803.030.

The culverts are proposed to tie into the existing centreline of the Fernbank ditch, matching the existing drainage conditions. Partial regrading of the Fernbank ditch is proposed to clean out local high points within the ditch to improve the drainage conditions. Grading from the property line will tie into the existing Fernbank Ditch centreline at a maximum of 3H:1V grades. From review with the City of Ottawa, and measurement of inverts on site, the ultimate outlet for the Fernbank ditch appears to be a 525mm concrete culvert / storm sewer connected to the Fernbank Storm sewer. The proposed culverts and grading of the Fernbank ditch will continue to drain to the 525mm CCP culvert at the end of the Fernbank Ditch near the Walmart plaza entrance. Refer to **Appendix A Drawings C5 and C6** for further details regarding proposed culverts and Fernbank Ditch details.

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 the touching any part of the building envelope. An overland flow route is presented in **Appendix A – Drawing C4**.

In the proposed parking lot on the west end of the school, drainage will be directed overtop of the curb at CB-1 and towards the Atlas Terrace ROW. In the bus lane and parking lot to the south of the school, drainage will be directed across the highpoints between the catch basins, through the school paved yard in the basketball courts areas, across the mini soccer field, and ultimately toward the ROW on Cope Drive in the north east corner of the site. The overland flow route is demonstrated in **Appendix A – Drawing C4**, as well as the site grading shown in **Appendix A – Drawing C2**.

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 = 1539 (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 250mm diameter sanitary sewer stub available on the property off Cope Drive near Paseana Place. As-built documentation has this sanitary stub recorded at a 2.67% 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 250mm sanitary sewer stub. 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 the Table 5-3 of the MOE Design Guidelines for Sewage Works, with an estimate 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 4.31 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 full calculations. The proposed sanitary servicing meets the velocity requirements and is satisfactory to the City of Ottawa Design Guidelines.

Per the Blackstone Community Phases 4-8 Functional Servicing Report, the subject site's sanitary flow was estimated to be 6.04 L/s, refer to the snippet of the sanitary design sheet from the servicing 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 Blackstone Community Report.

A backwater valve is not proposed to be installed on the proposed building 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 99.65. The fixtures are not subject to clause a) or b) above, as the buildings fixture elevations are above the adjoining street elevation, and above the upstream sanitary manhole cover elevation. The existing sanitary manhole on Atlas Terrace is at an elevation of 98.07. 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, per the City of Ottawa materials specifications, sanitary backwater valves are approved for 125mm sanitary service size. The proposed sanitary building service is 200mm in diameter, and there do 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.

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 to OBC 3.2.5.16
- Consumption rate of 70 L/student/d (Table 4.2 of City of Ottawa Design Guidelines Water Distribution)
- Estimated addition population of 325 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 203mm diameter PC water stub left at the property line off Cope Drive near Paseana Place for the subject site. A 203mm PVC watermain is available on Atlas Terrace. There are City of Ottawa fire hydrant along Cope Drive and Atlas Terrace 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 total population of the existing school and the proposed addition, to determine adequacy of the existing water service. 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 were discussed with OCSB staff and the architect, refer to section 1.2. The total population used to calculate the domestic water demand is 1539 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 6-1 below, the average daily rate of 70 L/student/day is equivalent to an average daily demand rate of 1.25 L/s for 1539 students and staff. The maximum daily factor of 1.5 results in a maximum daily demand of 1.87 L/s, and the maximum hourly factor of 1.8 results in a maximum hourly demand of 3.37 L/s. Refer to **Appendix D** for detailed calculations.

Table 6-1: Domestic Water Demand

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	1539	students	Site plan
Average Daily Demand	107730 1.25	L/d L/s	
Maximum Daily Factor	1.5		*Ottawa Design Guidelines - Water Distribution* Table 4.2
Maximum Daily Demand	1.87	L/s	
Maximum Hourly Factor	1.8		*Ottawa Design Guidelines - Water Distribution* Table 4.2
Maximum Hourly Demand	3.37	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 166.7 L/s. Refer to the attached calculation sheet in Appendix D for details. In accordance with the City of Ottawa preconsultation 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 Atlas Terrance, and two City of Ottawa fire hydrants on Cope Drive are within proximity of the proposed high school within 75m. An existing fire hydrant on Atlas Terrace is within 45m to the proposed building, and satisfies the requirements of OBC 3.2.5.16 stating that a fire department connections shall be located such that the distance from the fire department connection to a hydrant is not more than 45m, and is unobstructed. A private fire hydrant is proposed on site to provide coverage for the future portables.

Based on Table 1 of Appendix I of the City of Ottawa *Technical Bulletin ISTB-2018-02*, a class AA hydrant at a separation distance of less than 75m provides maximum contributing fire flow of 5,700 L/min (95 L/s). The two fire hydrants on Atlas Terrace, and the two hydrants on Cope Drive are within 75m of the proposed school building and are painted with a light blue cap, assumed to be Class AA rated fire hydrants. With the addition of the two new proposed fire hydrant, the total available fire flow from the five hydrants will be 475 L/s, which exceeds the fire flow demand of 166.7 L/s. Refer to Table 6-2 below for summary of available fire hydrant coverage.

Table 6-2: Fire Hydrant Coverage

Fire Hydrant	Distance to Building (m)	Contributing Fire Flow (L/s)
Atlas Terrace South	51	95
Atlas Terrace North	31	95
Cope Drive West	29	95
Cope Drive East	57	95
Private Firehydrant	64	95
	Total Fire Flow	475

5.5 Proposed Water Servicing

The average domestic demand for the proposed addition (1.25 L/s) exceeds 50 m^3 per day. As such, two water services will be required to service the existing school and proposed addition to avoid a vulnerable service area:

Connection 1 – Cope Drive: A connection to the existing 203mm PVC water stub at the property line on Cope Drive near Paseana Place will be provided for the school building.

Connection 2 – Atlas Terrace: A new 200mm water service is proposed to connect to the existing 203mm PVC watermain on Atlas terrace 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 future portables. Per recommendation of the city of Ottawa, the fire hydrant lead will be no more than 5m length to avoid stagnant water from circulating in the school's water servicing. A district meter area chamber will be provided for the proposed water service from Cope Drive in accordance with the City of Ottawa Design Guidelines. The proposed water servicing for the building and fire hydrants meet the City of Ottawa 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 for the max hour demand, and max day + fire demand for both connection 1 to Cope Drive and connection 2 to Atlas Terrace. Frictional loss calculations are included in **Appendix D**, calculating the head loss through the system using the Hazen Williams Formula. Operating pressures of the water supply system were between the 345-552 kPa pressure range for the municipal connection at the maximum hourly demand, above the 276 kPa requirement at the building connection for the maximum hour demand, as well as above the minimum 140 kPa requirement for the maximum daily + fire flow demand scenario at the building connections. Detailed calculations are shown in **Appendix D**. Both connections 1 and 2 from Cope Drive and Atlas Terrace are estimated to provide ~79.53 psi and ~79.55 psi, respectively, at the building connection during the max hour demand. Requirements 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 Cope Drive. Based on the provided boundary conditions for Cope Drive, a pressure check for the proposed private fire hydrant was conducted assuming the maximum 95 L/s of fire flow is drawn from the fire hydrant per Table 1 of Appendix I of the City of Ottawa Water Design Guidelines. Frictional losses were calculated using the Hazen Williams formula to determine pressure loss to the proposed new fire hydrants. It was determined that the proposed fire hydrant can provide 95 L/s of fire flow at a pressure of 68.89 psi, exceeding the minimum 20 psi requirement 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 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 in order to prevent sedimentation from leaving the site.
5. Installing and maintaining mudmats 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 complete.
7. Construction works to be scheduled at times which avoid flooding during seasonal rains

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

1. Inspection of 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 catch basins and catch basin manhole will be constructed with 600mm sumps, collecting sediments and suspended solids from the finished asphalt surface. The catch basin and manhole sumps will be required to be cleaned and maintained by the owner after construction completion in accordance with the manufacturers 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 City of Ottawa storm sewer stub located on the subject site property. Quantity control will be provided in accordance with the site's allocated release rate per the Blackstone Community Phase 4-8 Servicing and Stormwater Management Report. Provided site storage exceeds the 50m3/ha requirements per pond 8 recommendations.

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 250mm sanitary sewer stub left on the subject site. The estimated sanitary peak flows from the school development are within the allocated sanitary release rate per the Blackstone Community Phase 4-8 Servicing and Stormwater Management Report.

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 203mm PVC watermain on Atlas Terrace. A private fire hydrant will be constructed on site to provide coverage for the future portables. Boundary conditions provided by the City of Ottawa were analyzed to confirm 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 installing 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 the sumps chamber 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
- DEPRESSED CURB
- BREAK OF SLOPE - NEW
- EXISTING SANITARY SEWER
- EXISTING STORM SEWER
- EXISTING WATERMAIN
- NEW SANITARY SEWER
- NEW STORM SEWER
- NEW WATERMAIN
- NEW PERFORATED DRAIN PIPE
- NEW PERIMETER FOUNDATION DRAINAGE
- NEW DITCH
- 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

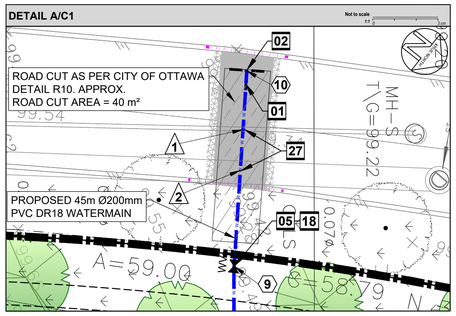
- EXISTING CONCRETE CURB
- NEW CONCRETE CURB
- EXISTING CATCHBASIN
- EXISTING DITCH INLET
- EXISTING STORM MANHOLE
- EXISTING SANITARY MANHOLE
- EXISTING STORM /SANITARY MANHOLE TO BE ADJUSTED
- EXISTING FIRE HYDRANT
- EXISTING WATER VALVE
- NEW CATCHBASIN
- NEW STORM MANHOLE / CATCHBASIN MANHOLE
- NEW 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
- 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

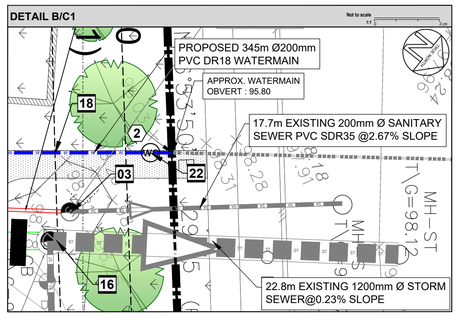
- EXISTING UTILITY POLE
- EXISTING LIGHT STANDARD
- EXISTING TREE
- PROPOSED TREE, SEE LANDSCAPE
- CLAY SEAL AS PER CITY OF OTTAWA DETAIL S8

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.



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



B C1 **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 200mmX203mm Ø PVC TO EXISTING MUNICIPAL WATERMAIN TO BE COMPLETED BY CITY OF OTTAWA FORCES. EXCAVATION, BACKFILL AND RE-INSTATEMENT BY CONTRACTOR.

03 EXISTING 1200mm DIAMETER SANITARY MANHOLE. EXISTING 250mm INVERT S. = 94.19. EXISTING 250mm INVERT N. = 94.14. CONTRACTOR TO CONFIRM INVERTS PRIOR TO CONSTRUCTION. REMOVE EXISTING 250mm SOUTH SANITARY SEWER. CONNECT NEW 250mm SANITARY SEWER TO EXISTING MANHOLE AT INVERT 94.19. PARGE AND PROVIDE WATER TIGHT CONNECTION.

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

05 SUPPLY AND INSTALL NEW 200mm WATER VALVE AT PROPERTY LINE. 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 WIR SETTINGS IN CLOSED POSITION. MAXIMUM DISCHARGE 15.80 l/s TOTAL. MAXIMUM ROOF PONDING DEPTH 150mm. 100 YEAR PONDING VOLUME = 349.4 m³.

07 SUPPLY AND INSTALL NEW INLET CONTROL DEVICE FLOW REGULATOR AT MANHOLE, STMH-1 OUTLET. MAXIMUM DISCHARGE 81.3 l/s AT 2.01m HEAD AND ORIFICE DIAMETER AT 164mm.

08 SUPPLY AND INSTALL NEW INLET CONTROL DEVICE FLOW REGULATOR AT CATCHBASIN, CBMH-4 OUTLET. MAXIMUM DISCHARGE 88.30 l/s AT 1.97m HEAD AND ORIFICE DIAMETER AT 172mm.

09 SUPPLY AND INSTALL NEW INLET CONTROL DEVICE FLOW REGULATOR AT CATCHBASIN, CB-4 OUTLET. MAXIMUM DISCHARGE 40.10 l/s AT 2.08m HEAD AND ORIFICE DIAMETER AT 115mm.

10 SUPPLY AND INSTALL NEW INLET CONTROL DEVICE FLOW REGULATOR AT CATCHBASIN, CBMH-5 OUTLET. MAXIMUM DISCHARGE 30.00 l/s AT 1.89m HEAD AND ORIFICE DIAMETER AT 101mm.

11 SUPPLY AND INSTALL NEW INLET CONTROL DEVICE FLOW REGULATOR AT CATCHBASIN, CB-6 OUTLET. MAXIMUM DISCHARGE 82.40 l/s AT 2.31m HEAD AND ORIFICE DIAMETER AT 160mm.

12 SUPPLY AND INSTALL NEW INLET CONTROL DEVICE FLOW REGULATOR AT CATCHBASIN, CB-7 OUTLET. MAXIMUM DISCHARGE 46.40 l/s AT 2.77m HEAD AND ORIFICE DIAMETER AT 115mm.

13 CONNECT NEW 100mm PERIMETER FOUNDATION DRAINAGE WITH FILTER SOCK TO 100mm STORM SERVICE AT INVERT 98.00 AT USF LEVEL.

14 INSTALL NEW REAR YARD CATCH BASIN AS PER CITY OF OTTAWA DETAIL S30.

15 NEW 150mm PERFORATED SUBDRAIN WITH FILTER SOCK. SUBDRAIN TO BE CONSTRUCTED IN CLEAR STONE EXTENDING 300mm X 300mm FROM EDGE OF PIPE.

16 EXISTING 2400 DIAMETER STORM MANHOLE. EXISTING 1200mm INVERT N. = 94.89. EXISTING 375mm INVERT EAST = 95.01. CONTRACTOR TO CONFIRM INVERTS PRIOR TO CONSTRUCTION AND ADVISE OF ANY DISCREPANCY. BREAK INTO EXISTING MANHOLE TO PROVIDE CONNECTION OF NEW 900mm STORM SEWER AT INVERT 95.19. PARGE AND PROVIDE WATER TIGHT CONNECTION.

17 SUPPLY AND INSTALL PROLINE FITTINGS INSPECTION CHAMBER AND BACKWATER VALVE. TOP OF INSPECTION CHAMBER LID TO BE FLUSH WITH FINISHED GRADE.

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

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

22 INSTALL NEW DISTRICT METER AREA (DMA) CHAMBER AND VALVE AS PER CITY OF OTTAWA STANDARD DETAIL DRAWING W3 AND W3.3.

23 WATER SERVICE ENTRY, TOP OF WATERMAIN AT 97.30 TO BE 0.70m UNDERNEATH USF ELEVATION. 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.

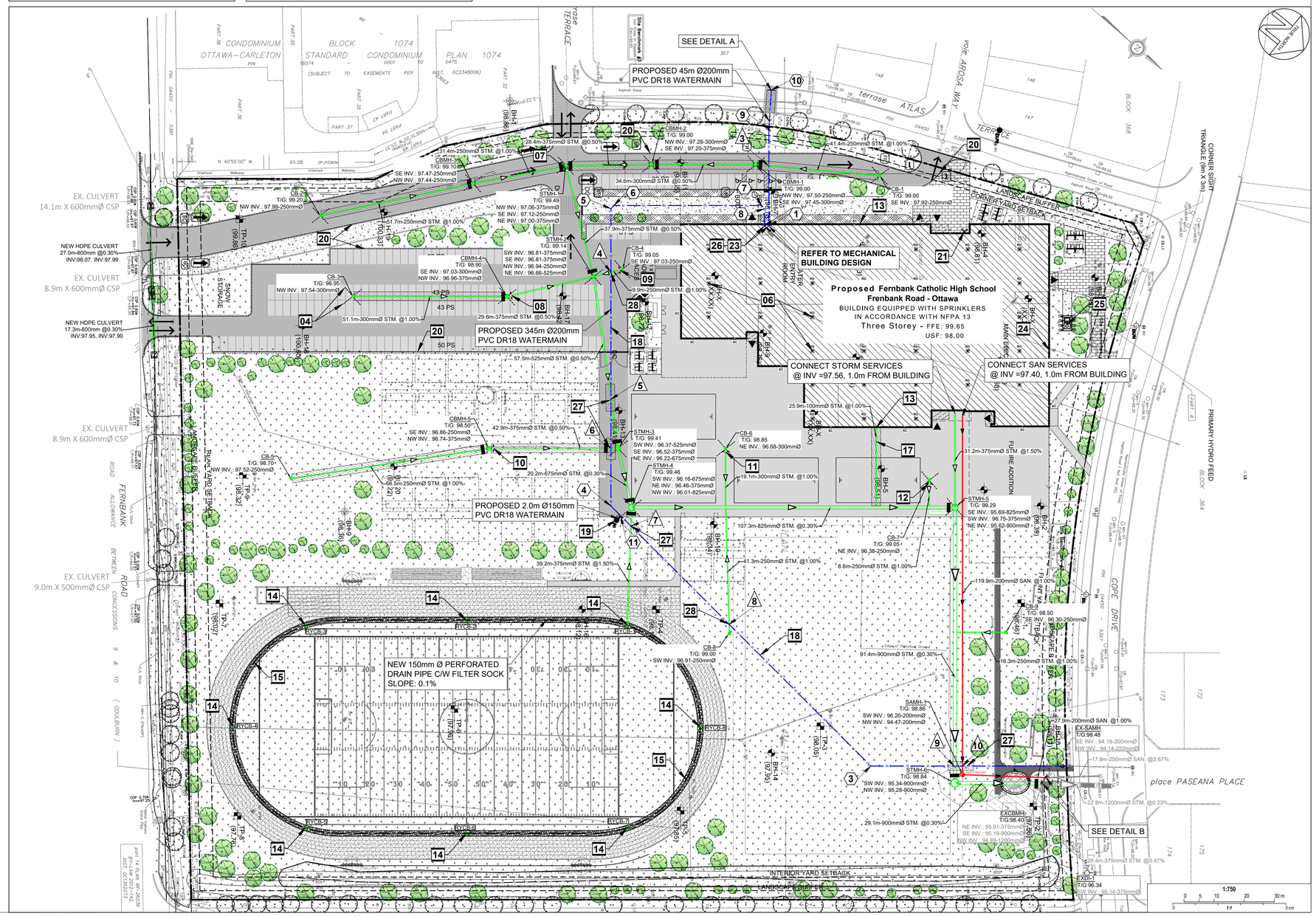
24 ROOF TOP SCUPPERS TO BE PROVIDED AT 150mm ABOVE LEVEL OF ROOF DRAINS.

25 NEW TRANSFORMER AND BOLLARDS.

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

27 CONSTRUCT WATERMAIN CROSSING 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 CONSTRUCT WATERMAIN CROSSING BENEATH SEWER AS PER CITY OF OTTAWA DETAIL W25 WITH MINIMUM 0.50m BARREL TO BARREL SEPARATION.



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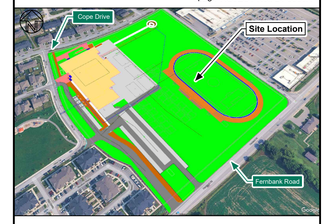
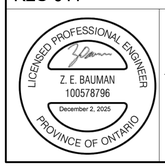


NOT FOR CONSTRUCTION

No.	DESCRIPTION	YYYY-MM-DD
4	ISSUED FOR SITE PLAN CONTROL R1	2025-12-02
3	ISSUED FOR 66% DESIGN DEVELOPMENT	2025-11-14
2	ISSUED FOR SITE PLAN CONTROL	2025-10-23
1	ISSUED FOR PHASE 2 PRE-CONSULTATION APPLICATION	2025-09-05

project
Fernbank Catholic High School
5431 Fernbank Road, Ottawa, ON K2S 0T7

seal



drawing title
Site Servicing Plan

scale	drawn by
As Shown	R.Ismail
date	checked by
Sept.2025	Z.Bauman / A.Sammour
project number	drawing number
24-835	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 #XXXX

Folder: J:\5-Civil\2024\24-5050A - N45 - New Fernbank Catholic High School\05 Drawings\1 Ongoing | *Drawing:* 24-5050A New Fernbank School_Issued For SPC R1 2025-12-02.dwg | *Layout:* C1_Site Servicing Plan | *Print date:* 11:53 AM December 2, 2025

LEGEND

- PROPERTY LINE
- NEW BUILDING
- DEPRESSED CURB
- BREAK OF SLOPE - NEW
- NEW DITCH
- LIMIT OF HIGH POINT
- CONCRETE CURB REMOVAL
- 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
- NEW TRANSFORMER PAD
- EXISTING STREET LIGHT
- EXISTING HYDRO POLE

LEGEND CONTINUED

- 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
- 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
- OVERLAND FLOW ROUTE

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 : GEOTECHNICAL INVESTIGATION FERNBANK CATHOLIC HIGH SCHOOL, 5431 FERNBANK 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.
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. 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

DRAWING NOTES

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 SC4 & 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 (WITH HDPE PERFORATED PIPE) .

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

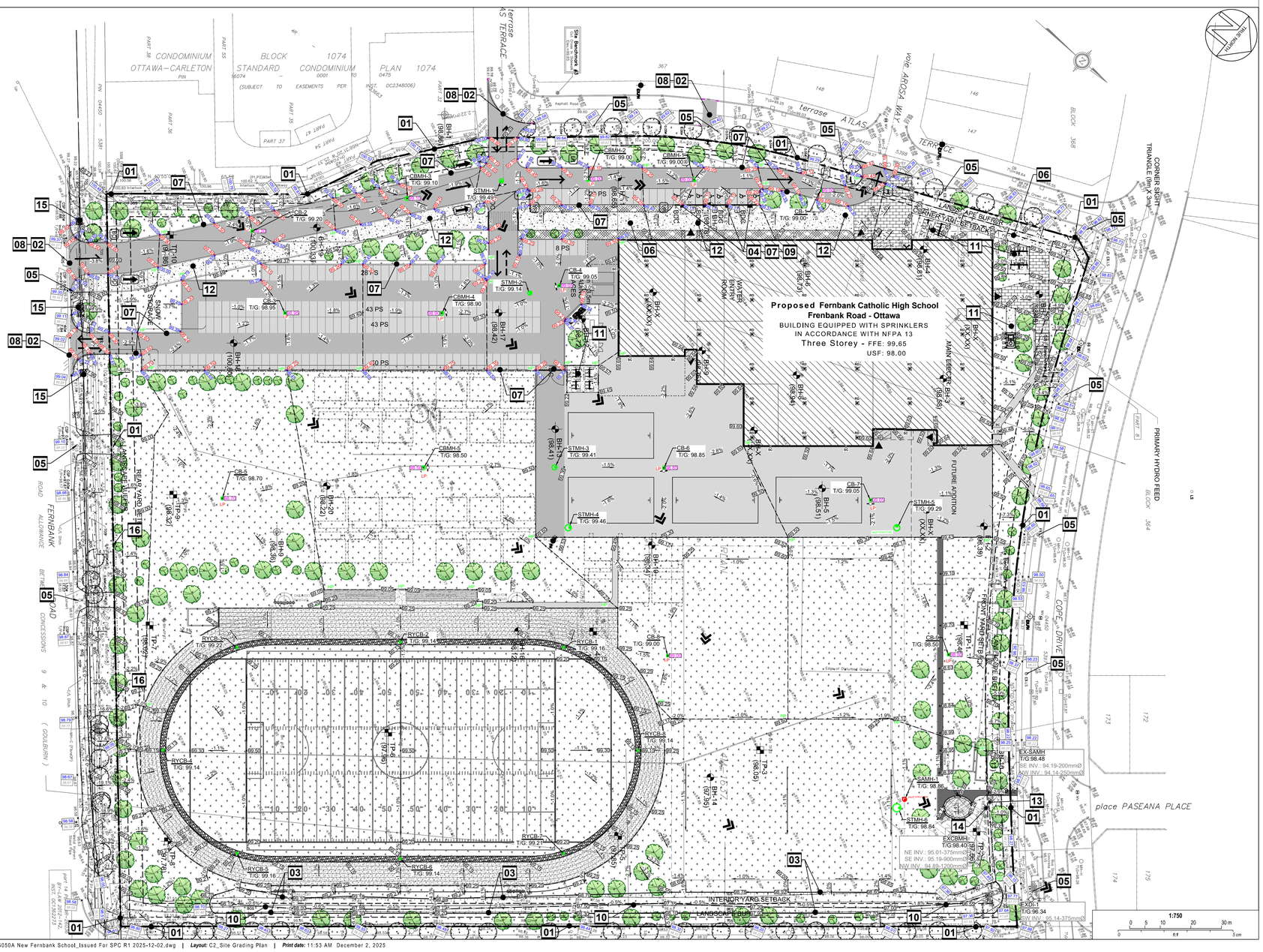
12 CONSTRUCT SIDEWALK AND CURB AS PER CITY OF OTTAWA DETAIL SC1.4 CONSTRUCT EXPANSION JOINTS AS PER CITY OF OTTAWA DETAIL SC5.

13 PROVIDE RISERS AND ADJUSTMENT UNITS OVER EXISTING 1200mm DIAMETER SANITARY MANHOLE TO BRING TO FINISHED GRADE. TOP OF STRUCTURE CONCRETE AT APPROXIMATELY 97.15. FINISHED GRADE AT 98.38. PROVIDE NEW FRAME AND GRATE AS PER CITY OF OTTAWA DETAIL S25 AND S24.1. PARGE AND PROVIDE WATER TIGHT CONNECTION.

14 PROVIDE RISERS AND ADJUSTMENT UNITS OVER EXISTING 2400mm DIAMETER STORM MANHOLE TO BRING TO FINISHED GRADE. TOP OF EXISTING STRUCTURE CONCRETE AT APPROXIMATELY 97.23. FINISHED GRADE AT 98.33. PROVIDE NEW FRAME AND GRATE AS PER CITY OF OTTAWA DETAIL S25 / S24.1 PARGE AND PROVIDE WATER TIGHT CONNECTION.

15 RIP-RAP PER OPSD 810.010, REFER TO DRAWING C5

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



OTTAWA CATHOLIC SCHOOL BOARD

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Jp2g PROJECT No.: 24-5050A

NOT FOR CONSTRUCTION

No.	DESCRIPTION	YYYY-MM-DD
4	ISSUED FOR SITE PLAN CONTROL R1	2025-12-02
3	ISSUED FOR 66% DESIGN DEVELOPMENT	2025-11-14
2	ISSUED FOR SITE PLAN CONTROL	2025-10-23
1	ISSUED FOR PHASE 2 PRE-CONSULTATION APPLICATION	2025-09-05

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

project
Fernbank Catholic High School
5431 Fernbank Road, Ottawa, ON K2S 0T7

LICENSED PROFESSIONAL ENGINEER — Z. E. BAUMAN — 100578796 — December 2, 2025 — PROVINCE OF ONTARIO

seal: LICENSED PROFESSIONAL ENGINEER — SAMMOUR — 100227665 — December 2, 2025 — PROVINCE OF ONTARIO

drawing title
Site Grading Plan

scale: As Shown	drawn by: R.Ismail
date: Sept.2025	checked by: Z.Bauman / A.Sammour
project number: 24-835	drawing number: C2

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 #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 ANNIS, O'SULLIVAN, VOLLEBEKK LTD. JOB NO.: 23493-23 OCSB BIK365 P4M-I637 O F, DATED JULY 13, 2023. 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

    FERNBANK CATHOLIC HIGH SCHOOL,
    5431 FERNBANK ROAD, OTTAWA, ONTARIO
    PREPARED BY EXP. PROJECT No; OTT-23004319-A0
    DATED JANUARY 24,2025.
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.

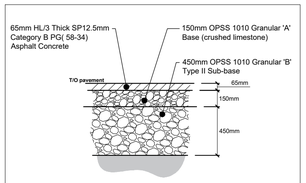
Parking Lot and Work in Public Rights of Way

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

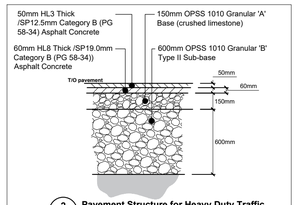
1. PRIOR TO START OF CONSTRUCTION:
   - 1.1. INSTALL SILT FENCE IN LOCATION SHOWN ON DWG C4.
   - 1.2. INSTALL FILTER FABRIC OR SILT SACK FILTERS IN ALL THE CATCHBASINS AND MANHOLES TO REMAIN DURING CONSTRUCTION WITHIN THE SITE (SEE TYPICAL DETAIL).
   - 1.3. INSPECT MEASURES IMMEDIATELY AFTER INSTALLATION.
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

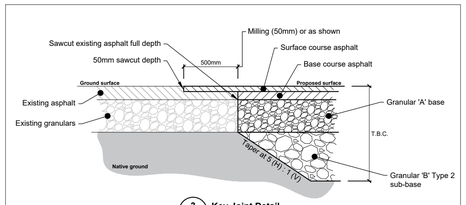
1. CONTRACTOR TO REINSTATE ROAD CUTS AS PER CITY OF OTTAWA DETAIL R10.
2. CONTRACTOR TO PREPARE SUBGRADE, INCLUDING PROOFROLLING, TO THE SATISFACTION OF THE GEOTECHNICAL CONSULTANT PRIOR TO THE COMMENCEMENT OF PLACEMENT OF GRANULAR B MATERIAL.
3. FILL TO BE PLACED AND COMPACTED PER THE GEOTECHNICAL REPORT 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**



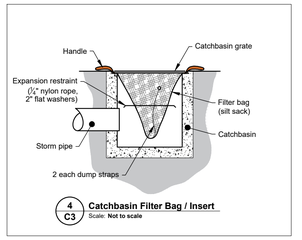
2 C3 **Pavement Structure for Heavy Duty Traffic**
Scale: **As shown**



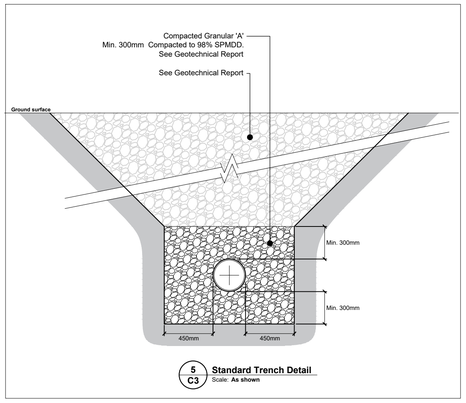
3 C3 **Key Joint Detail**
Scale: **As shown**

Notes: Protection of City Sewers

1. CONTRACTOR RESPONSIBLE TO:
   - 1.1. OBTAIN A VIDEO INSPECTION OF THE CITY SEWER SYSTEM WITHIN ATLAS TERRACE AND COPE DRIVE 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 ATLAS TERRACE AND COPE DRIVE 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**

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 IN 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	99.34	96.06 (SAN)	97.27 (WM)	1.21
2	NEW WATERMAIN - EXISTING STORM SEWER	99.31	97.28 (STM)	97.68 (WM)	0.40
3	NEW STORM SEWER - NEW WATERMAIN	99.05	96.60 (WM)	97.54 (STM)	0.94
4	NEW STORM SEWER - NEW WATERMAIN	99.10	96.49 (WM)	96.99 (STM)	0.50
5	NEW WATERMAIN - NEW STORM SEWER	99.35	96.99 (STM)	97.39 (WM)	0.40
6	NEW WATERMAIN - NEW STORM SEWER	99.45	96.92 (STM)	97.32 (WM)	0.40
7	NEW WATERMAIN - NEW STORM SEWER	99.50	96.94 (STM)	97.34 (WM)	0.40
8	NEW STORM SEWER - NEW WATERMAIN	99.02	96.37 (WM)	96.87 (STM)	0.50
9	NEW WATERMAIN - NEW STORM SEWER	98.96	96.38 (STM)	96.83 (WM)	0.45
10	NEW WATERMAIN - NEW SANITARY SEWER	98.92	96.43 (SAN)	96.83 (WM)	0.40

WATER SERVICE TABLE

ID	DESCRIPTION	FINISHED GRADE (m)	T/O WATERMAIN (m)
1	BUILDING CONNECTION	99.65	97.25
2	EXISTING WATERMAIN STUB CONNECTION	98.15	95.75
3	45° HORIZONTAL BEND	99.25	96.50
4	45° HORIZONTAL BEND	99.53	96.70
5	45° HORIZONTAL BEND	99.48	96.70
6	45° HORIZONTAL BEND	99.45	96.70
7	45° HORIZONTAL BEND	99.35	96.60
8	45° HORIZONTAL BEND	99.40	96.60
9	11.25° HORIZONTAL BEND	99.45	96.60
10	SERVICE TEE 200mmX203mm	99.30	96.90
11	CONNECTION TEE 200mmX150mm	99.54	96.70

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

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	99.00	SE INV.: 97.92 - 250mmØ	705.010	S19
CB-2	600x600mm Catchbasin	99.20	NW INV.: 97.99 - 250mmØ	705.010	S19
CB-3	600x600mm Catchbasin	98.95	NW INV.: 97.54 - 300mmØ	705.010	S19
CB-4	600x600mm Catchbasin	99.05	SE INV.: 97.03 - 250mmØ	705.010	S19
CB-5	600x600mm Catchbasin	98.70	NW INV.: 97.52 - 250mmØ	705.010	S19
CB-6	600x600mm Catchbasin	98.85	NE INV.: 96.68 - 300mmØ	705.010	S19
CB-7	600x600mm Catchbasin	99.05	NE INV.: 96.38 - 250mmØ	705.010	S19
CB-8	600x600mm Catchbasin	99.00	SW INV.: 96.91 - 250mmØ	705.010	S19
CB-9	600x600mm Catchbasin	98.50	SE INV.: 96.30 - 250mmØ	705.010	S19
CBMH-1	1,200mmØ Manhole	99.00	NW INV.: 97.50 - 250mmØ SE INV.: 97.45 - 300mmØ	701.010	S25 / S28.1
CBMH-2	1,200mmØ Manhole	99.00	NW INV.: 97.28 - 300mmØ SE INV.: 97.20 - 375mmØ	701.010	S25 / S28.1
CBMH-3	1,200mmØ Manhole	99.10	SE INV.: 97.47 - 250mmØ NW INV.: 97.44 - 250mmØ	701.010	S25 / S28.1
CBMH-4	1,200mmØ Manhole	98.90	SE INV.: 97.03 - 300mmØ NW INV.: 96.96 - 375mmØ	701.010	S25 / S28.1
CBMH-5	1,200mmØ Manhole	98.50	SE INV.: 96.86 - 250mmØ NW INV.: 96.74 - 375mmØ	701.010	S25 / S28.1
STMH-1	1,200mmØ Manhole	99.49	NW INV.: 97.06 - 375mmØ SE INV.: 97.12 - 250mmØ NE INV.: 97.00 - 375mmØ	701.010	S25 / S24.1
STMH-2	1,200mmØ Manhole	99.14	SW INV.: 96.81 - 375mmØ SE INV.: 96.81 - 375mmØ NW INV.: 96.94 - 250mmØ NE INV.: 96.66 - 525mmØ	701.010	S25 / S24.1
STMH-3	1,500mmØ Manhole	99.41	SW INV.: 96.37 - 525mmØ SE INV.: 96.52 - 375mmØ NE INV.: 96.22 - 675mmØ	701.011	S25 / S24.1
STMH-4	1,800mmØ Manhole	99.46	SW INV.: 96.16 - 675mmØ NE INV.: 96.46 - 375mmØ NW INV.: 96.01 - 825mmØ	701.012	S25 / S24.1
STMH-5	1,800mmØ Manhole	99.29	SE INV.: 95.69 - 825mmØ SW INV.: 96.75 - 375mmØ NE INV.: 95.62 - 900mmØ	701.012 / 1003.010 DROP STRUCTURE TEE	S25 / S24.1
STMH-6	2,400mmØ Manhole	98.84	SW INV.: 95.34 - 900mmØ NW INV.: 95.28 - 900mmØ	701.013	S25 / S24.1

NEW SANITARY SEWER STRUCTURE SCHEDULE

MANHOLE NO.	DESCRIPTION	T/GRATE ELEVATION	INVERT ELEVATION / PIPE DIAMETER	OPSD No.	FRAME (CITY OF OTTAWA)
SAMH-1	1,200mmØ Manhole	98.86	SW INV.: 96.20 - 200mmØ NW INV.: 94.47 - 200mmØ	701.010 / 1003.010 DROP STRUCTURE TEE	S25 / S24

OTTAWA CATHOLIC SCHOOL BOARD

Jp2g Consultants Inc.
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Jp2g PROJECT No.: 24-5050A

NOT FOR CONSTRUCTION

No.	DESCRIPTION	YYYY-MM-DD
4	ISSUED FOR SITE PLAN CONTROL R1	2025-12-02
3	ISSUED FOR 66% DESIGN DEVELOPMENT	2025-11-14
2	ISSUED FOR SITE PLAN CONTROL	2025-10-23
1	ISSUED FOR PHASE 2 PRE-CONSULTATION APPLICATION	2025-09-05

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

project
Fernbank Catholic High School
5431 Fernbank Road, Ottawa, ON K2S 0T7

seal

drawing title
Details, Notes and Schedules

scale: As Shown	drawn by: R.Ismail
date: June 2025	checked by: Z.Bauman / A.Sammour
project number: 24-835	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 #XXXX

Folder: J:\5-Civil\2024\24-5050A - N45 - New Fernbank Catholic High School\05 Drawings\1 Ongoing | **Drawing:** 24-5050A New Fernbank School_Issued For SPC R1 2025-12-02.dwg | **Layout:** C3_Details_Notes & Schedules | **Print date:** 11:53 AM December 2, 2025

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 DITCH
- 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
- Concrete Sidewalk — EXISTING SIDEWALK
- EXISTING CONCRETE CURB
- NEW CONCRETE CURB
- PROPOSED TWSI
- PONDING LIMIT
- MUD MAT

LEGEND CONTINUED

- EXISTING CATCHBASIN
- EXISTING DITCH INLET
- D — EXISTING STORM MANHOLE
- S — EXISTING SANITARY MANHOLE
- EXISTING STORM /SANITARY MANHOLE TO BE ADJUSTED
- NEW CATCHBASIN
- NEW STORM MANHOLE / CATCHBASIN MANHOLE
- 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

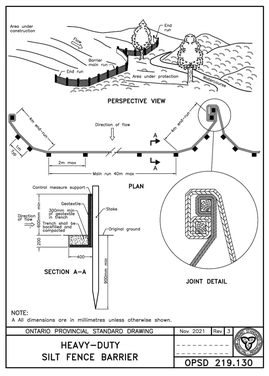
ICD	LOCATION	PIPE SIZE (mm)	ICD SIZE (mm)	100 YEAR HEAD (m)	100 YEAR FLOW RATE (lps)
ICD-1	STMH-1	375	164	2.01	81.3
ICD-2	CBMH-4	375	172	1.97	88.3
ICD-3	CB-4	250	115	2.08	40.1
ICD-4	CBMH-5	375	101	1.89	30.0
ICD-5	CB-6	250	160	2.31	82.4
ICD-6	CB-7	250	115	2.77	46.4

DRAWING NOTES

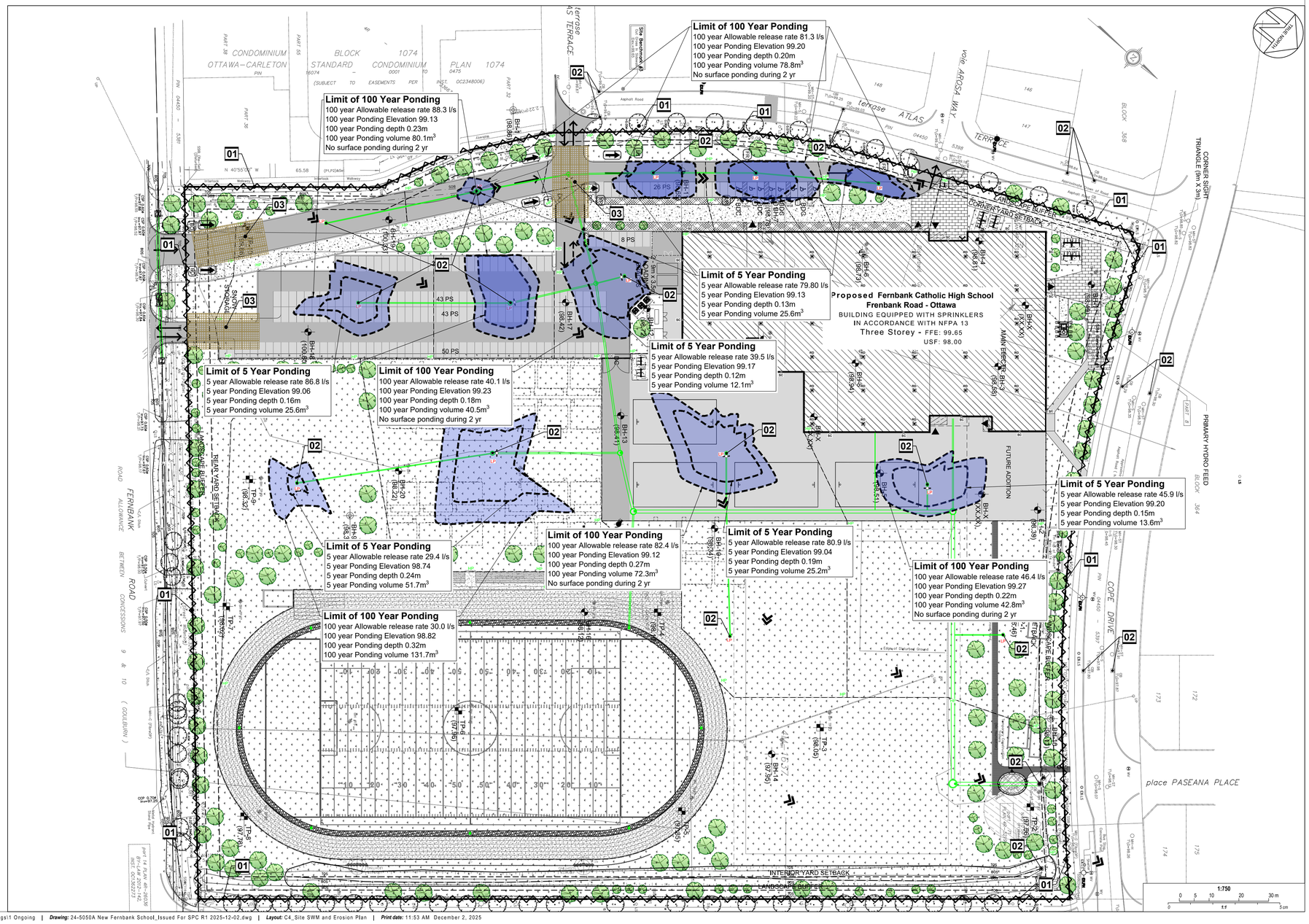
- 01 INSTALL SILT FENCE IN ACCORDANCE WITH OPSD 219.130.
- 02 INSTALL FILTER BAG (SILT SACK) TO PROTECT EXISTING CATCHBASINS & CATCHBASIN MANHOLES AS PER DETAIL 4/C3.
- 03 PROPOSE MUD MAT DURING CONSTRUCTION.

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**


Limit of 100 Year Ponding
100 year Allowable release rate 81.3 l/s
100 year Ponding Elevation 99.20
100 year Ponding depth 0.20m
100 year Ponding volume 78.8m³
No surface ponding during 2 yr
Limit of 100 Year Ponding
100 year Allowable release rate 88.3 l/s
100 year Ponding Elevation 99.13
100 year Ponding depth 0.23m
100 year Ponding volume 80.1m³
No surface ponding during 2 yr
Limit of 5 Year Ponding
5 year Allowable release rate 79.80 l/s
5 year Ponding Elevation 99.13
5 year Ponding depth 0.13m
5 year Ponding volume 25.6m³
Proposed Fernbank Catholic High School
Frenbank Road - Ottawa
BUILDING EQUIPPED WITH SPRINKLERS
IN ACCORDANCE WITH NFPA 13
Three Storey - FFE: 99.65
USF: 98.00
Limit of 5 Year Ponding
5 year Allowable release rate 39.5 l/s
5 year Ponding Elevation 99.17
5 year Ponding depth 0.12m
5 year Ponding volume 12.1m³
Limit of 5 Year Ponding
5 year Allowable release rate 86.8 l/s
5 year Ponding Elevation 99.06
5 year Ponding depth 0.16m
5 year Ponding volume 25.6m³
Limit of 100 Year Ponding
100 year Allowable release rate 40.1 l/s
100 year Ponding Elevation 99.23
100 year Ponding depth 0.18m
100 year Ponding volume 40.5m³
No surface ponding during 2 yr
Limit of 5 Year Ponding
5 year Allowable release rate 29.4 l/s
5 year Ponding Elevation 98.74
5 year Ponding depth 0.24m
5 year Ponding volume 51.7m³
Limit of 100 Year Ponding
100 year Allowable release rate 82.4 l/s
100 year Ponding Elevation 99.12
100 year Ponding depth 0.27m
100 year Ponding volume 72.3m³
No surface ponding during 2 yr
Limit of 5 Year Ponding
5 year Allowable release rate 80.9 l/s
5 year Ponding Elevation 99.04
5 year Ponding depth 0.19m
5 year Ponding volume 25.2m³
Limit of 100 Year Ponding
100 year Allowable release rate 46.4 l/s
100 year Ponding Elevation 99.27
100 year Ponding depth 0.22m
100 year Ponding volume 42.8m³
No surface ponding during 2 yr
Limit of 5 Year Ponding
5 year Allowable release rate 45.9 l/s
5 year Ponding Elevation 99.20
5 year Ponding depth 0.15m
5 year Ponding volume 13.6m³
Limit of 100 Year Ponding
100 year Allowable release rate 30.0 l/s
100 year Ponding Elevation 98.82
100 year Ponding depth 0.32m
100 year Ponding volume 131.7m³
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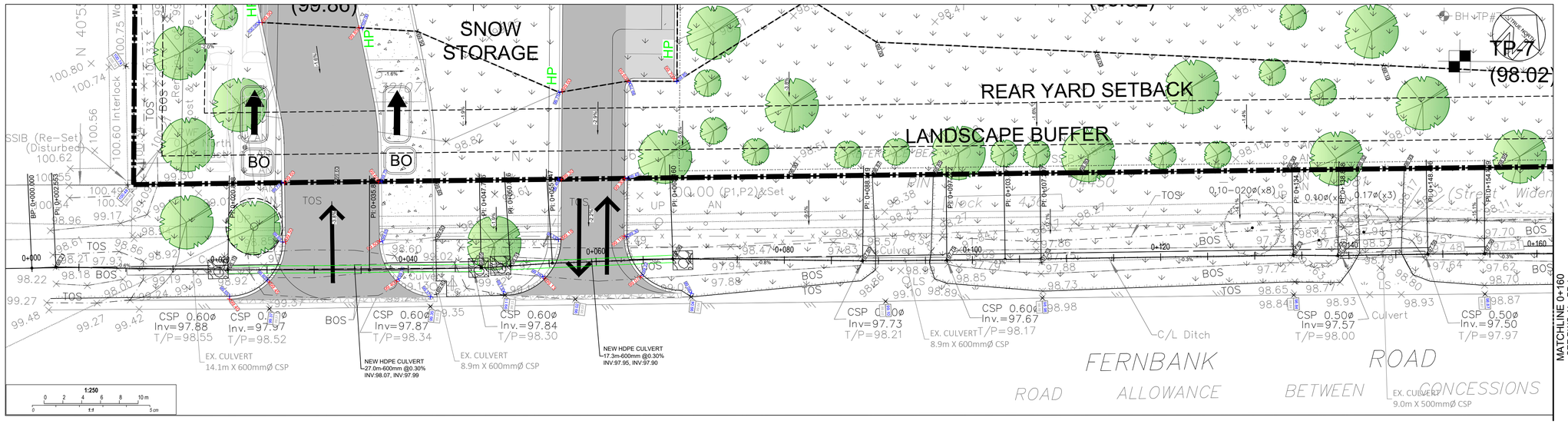
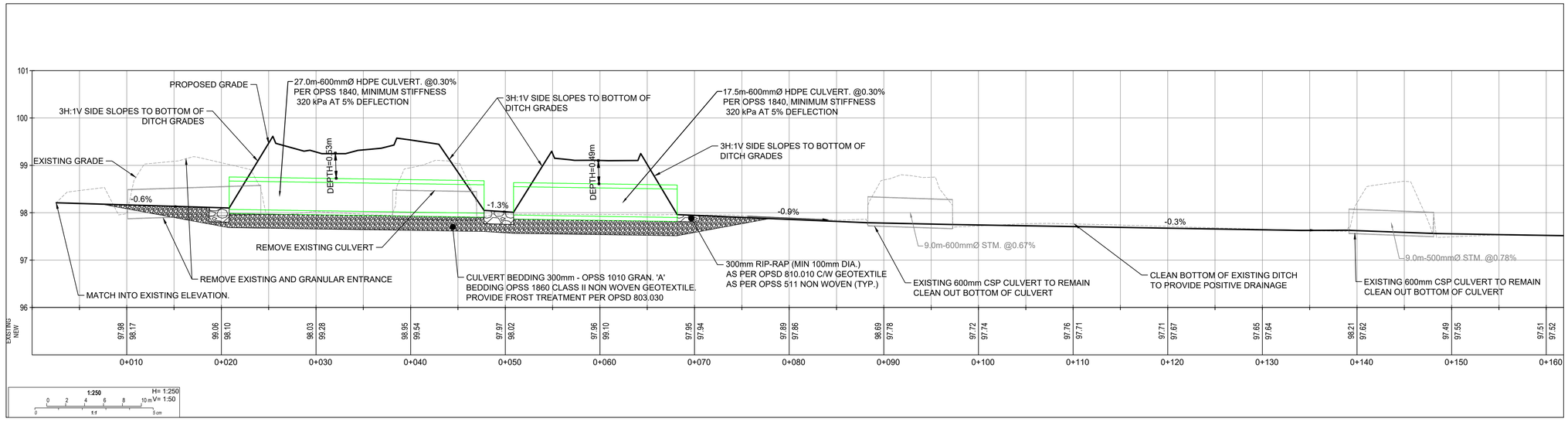
100 year Ponding depth 0.20m
100 year Ponding volume 78.8m³
No surface ponding during 2 yr
Proposed Fernbank Catholic High School
Frenbank Road - Ottawa
BUILDING EQUIPPED WITH SPRINKLERS
IN ACCORDANCE WITH NFPA 13
Three Storey - FFE: 99.65
USF: 98.00
FERNBANK ROAD
ALLOWANCE BETWEEN CONCESSIONS 9 & 10 (GOULBURN)
terrace ATLAS TERRACE
voie AROSA WAY
TERRACE
BLOCK 368
CORNER SIGHT TRIANGLE (9m X 9m)
CORNER SETBACK
LANDSCAPE BUFFER
REAR YARD SETBACK
LANDSCAPE BUFFER
FUTURE ADDITION
PRIMARY HYDRO FEED
COPE DRIVE
place PASEANA PLACE
INTERIOR YARD SETBACK
LANDSCAPE BUFFER
Asphalt Road
Concrete Sidewalk
Asphalt Walkway
Asphalt Parking Area
Asphalt Access Road
Concrete Curb
Concrete Parking Area
Asphalt Running Track
Concrete Pad
Concrete Walkway
Concrete Ramp
Concrete Stairs
Concrete Retaining Wall
Concrete Pad for Bicycle Parking
Concrete Pad for Transformer
Concrete Pad for Generator
Concrete Pad for Air Conditioning Unit
Concrete Pad for Garbage Bin
Concrete Pad for Recycling Bin
Concrete Pad for Compost Bin
Concrete Pad for Mailbox
Concrete Pad for Flagpole
Concrete Pad for Bench
Concrete Pad for Picnic Table
Concrete Pad for Shelter
Concrete Pad for Gazebo
Concrete Pad for Pergola
Concrete Pad for Trellis
Concrete Pad for Arbour
Concrete Pad for Fence
Concrete Pad for Gate
Concrete Pad for Retaining Wall
Concrete Pad for Steps
Concrete Pad for Ramp
Concrete Pad for Stairs
Concrete Pad for Walkway
Concrete Pad for Parking Area
Concrete Pad for Running Track
Concrete Pad for Pad
Concrete Pad for Curb
Concrete Pad for Sidewalk
Concrete Pad for Grass
Concrete Pad for Mulch
Concrete Pad for Clear Stone Subdrain Trench
Concrete Pad for Rubberized Asphalt Track
Concrete Pad for Stone Dust Path
Concrete Pad for Existing Sidewalk
Concrete Pad for Existing Concrete Curb
Concrete Pad for New Concrete Curb
Concrete Pad for Proposed TWSI
Concrete Pad for Ponding Limit
Concrete Pad for Mud Mat
Concrete Pad for Property Line
Concrete Pad for New Building
Concrete Pad for Depressed Curb
Concrete Pad for Break of Slope - New
Concrete Pad for New Ditch
Concrete Pad for New Silt Fence
Concrete Pad for Limit of High Point
Concrete Pad for New Light Duty Asphalt as per Detail 1 / C3
Concrete Pad for New Heavy Duty Asphalt as per Detail 2 / C3
Concrete Pad for New Concrete Sidewalk
Concrete Pad for New Grass
Concrete Pad for Milling & Overlay 50mm Thick Heavy Duty Asphalt as per Detail 3 / C3
Concrete Pad for New Precast Pavers
Concrete Pad for New EWF / Mulch
Concrete Pad for New Clear Stone Subdrain Trench
Concrete Pad for New Rubberized Asphalt Track
Concrete Pad for New





OTTAWA CATHOLIC SCHOOL BOARD

Jp2g Consultants Inc.
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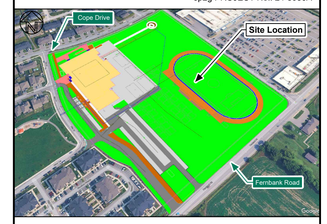
Jp2g PROJECT No.: 24-5050A



NOT FOR CONSTRUCTION

No.	DESCRIPTION	YYYY-MM-DD
4	ISSUED FOR SITE PLAN CONTROL R1	2025-12-02
3	ISSUED FOR 66% DESIGN DEVELOPMENT	2025-11-14
2	ISSUED FOR SITE PLAN CONTROL	2025-10-23
1	ISSUED FOR PHASE 2 PRE-CONSULTATION APPLICATION	2025-09-05

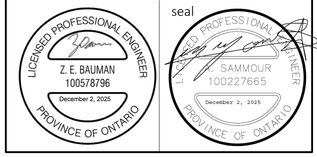
N45 ARCHITECTURE INC.
71 Bank Street, 7th Floor - Ottawa, Ontario K1P 5N2
tel. 613.224.0095 fax 613.224.9811

project

Fernbank Catholic High School

5431 Fernbank Road, Ottawa, ON K2S 0T7

seal



drawing title

Fernbank Ditch Sta 0+000 to 0+160

scale: As Shown	drawn by: R.Ismail
date: Sept.2025	checked by: Z.Bauman / A.Sammour
project number: 24-835	drawing number: C5

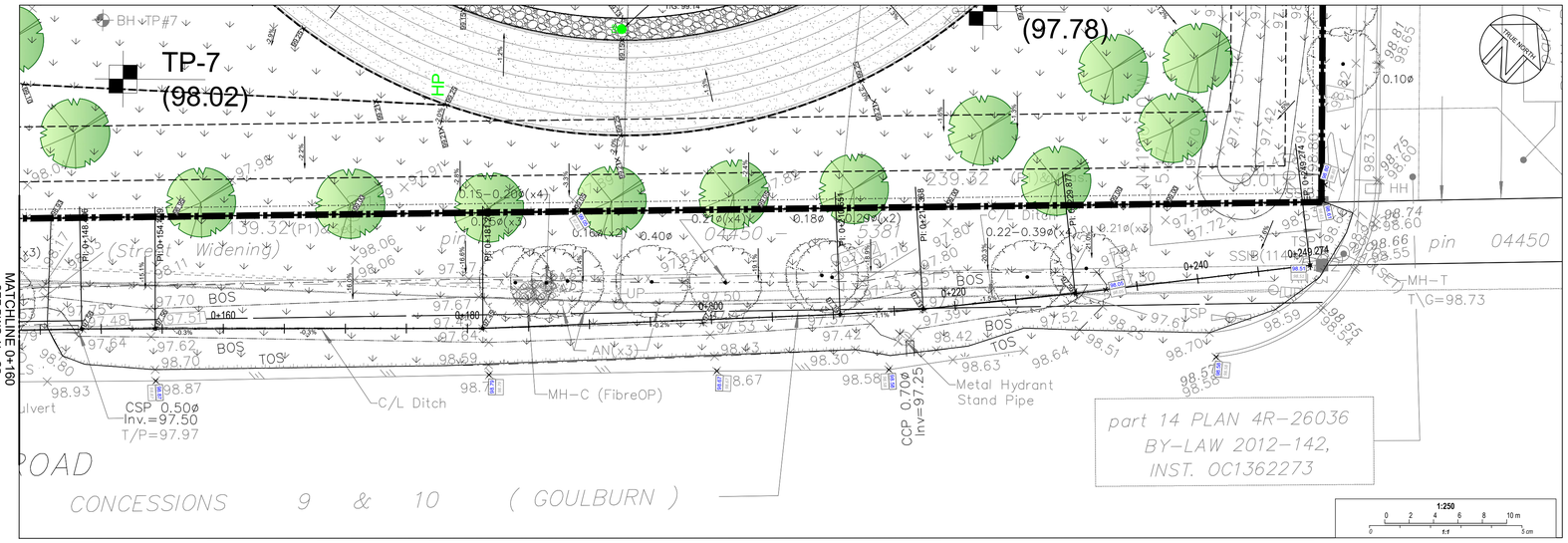
CONTRACTOR TO VERIFY ALL DIMENSIONS AND NOTIFY THE ARCHITECT OF ANY DISCREPANCIES BEFORE WORK COMMENCES.

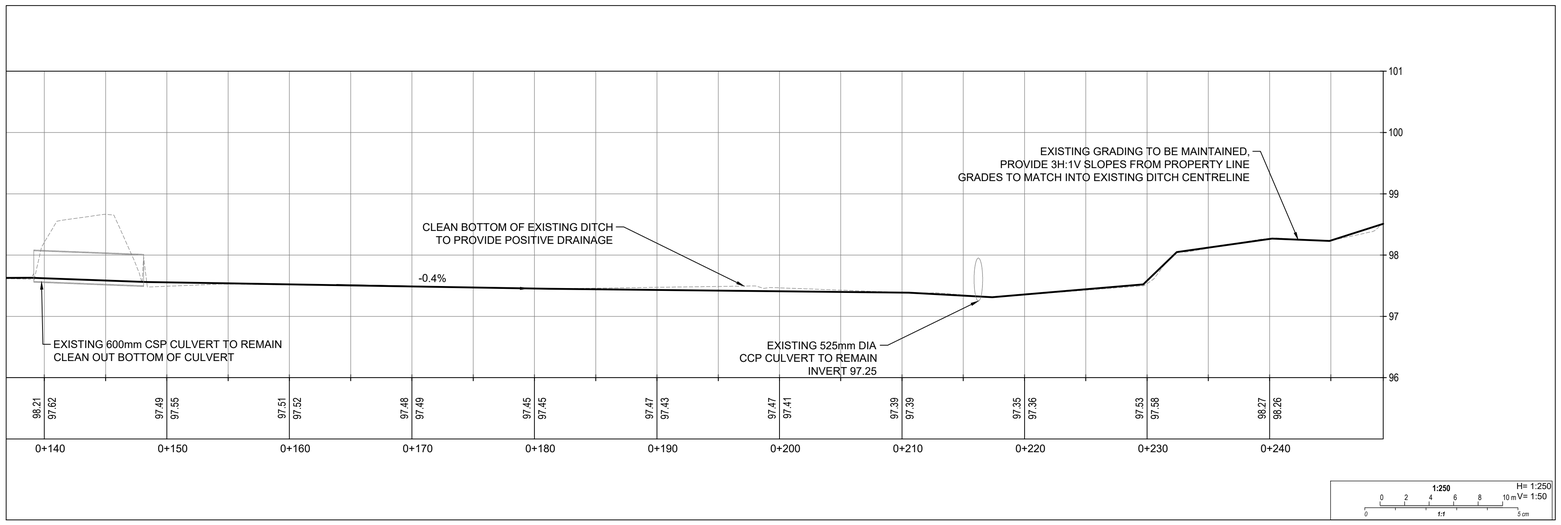
DO NOT SCALE DRAWINGS.

revision

DXX–XX–XX–XXXX

PLAN #XXXX





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Jp2g PROJECT No.: 24-5050A

NOT FOR CONSTRUCTION

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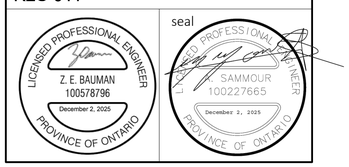
project

Fernbank Catholic High School

5431 Fernbank Road, Ottawa, ON K2S 0T7

seal



drawing title

Fernbank Ditch Sta 0+160 to 0+210

scale: As Shown	drawn by: R.Ismail
date: Sept.2025	checked by: Z.Bauman / A.Sammour
project number: 24-835	drawing number: **C6**

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

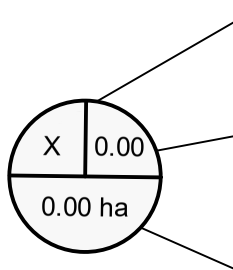
DO NOT SCALE DRAWINGS.

revision

DXX-XX-XX-XXXX

PLAN #XXXX

LEGEND



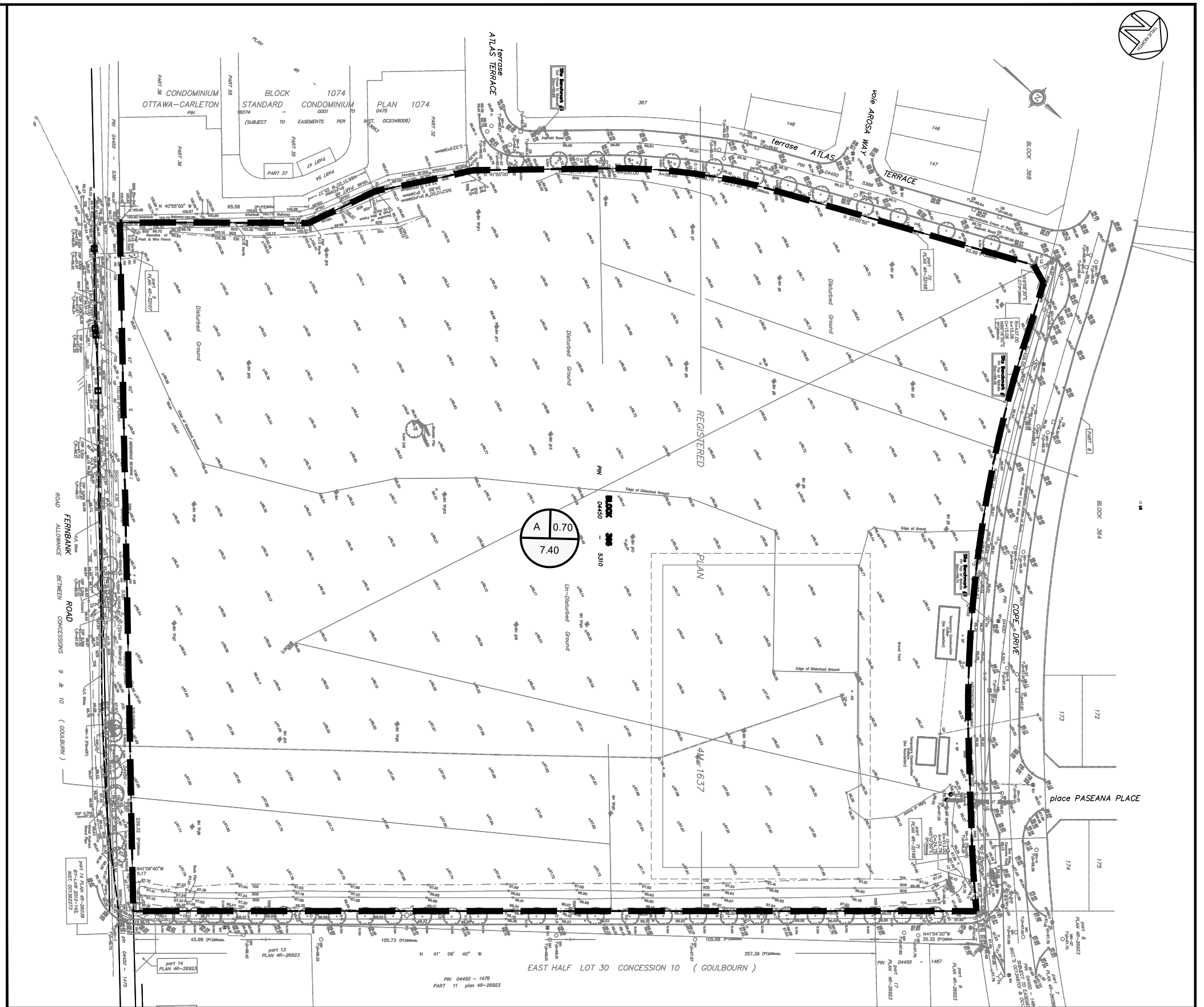
DRAINAGE AREA ID

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
3	2025-12-02	R.I / Z.B.	ISSUED FOR SITE PLAN CONTROL R1
2	2025-10-23	R.I. / Z.B.	ISSUED FOR SITE PLAN CONTROL
1	2025-09-05	R.I. / Z.B.	ISSUED FOR PHASE 2 PRE-CONSULTATION APPLICATION

Jp2g PROJECT No.: 24-5050A

PROJECT
FERNBANK CATHOLIC HIGH SCHOOL
5431 FERNBANK ROAD, OTTAWA, ON K2S 0T7

DRAWING
FIGURE-1
PRE-DEVELOPMENT DRAINAGE AREAS

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

NORTH

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

SHEET#
FIG.1

DWG NAME: J:\5-CIVIL\2024\24-5050A - N45 - NEW FERNBANK CATHOLIC HIGH SCHOOL\05 DRAWINGS\1 ONGOING\24-5050A NEW FERNBANK SCHOOL_ISSUED FOR SPC R1 2025-12-02.DWG LAYOUT: FIG.1_PRE_DEVELOPMENT_AREA SAVED ON 2025-12-02

LEGEND

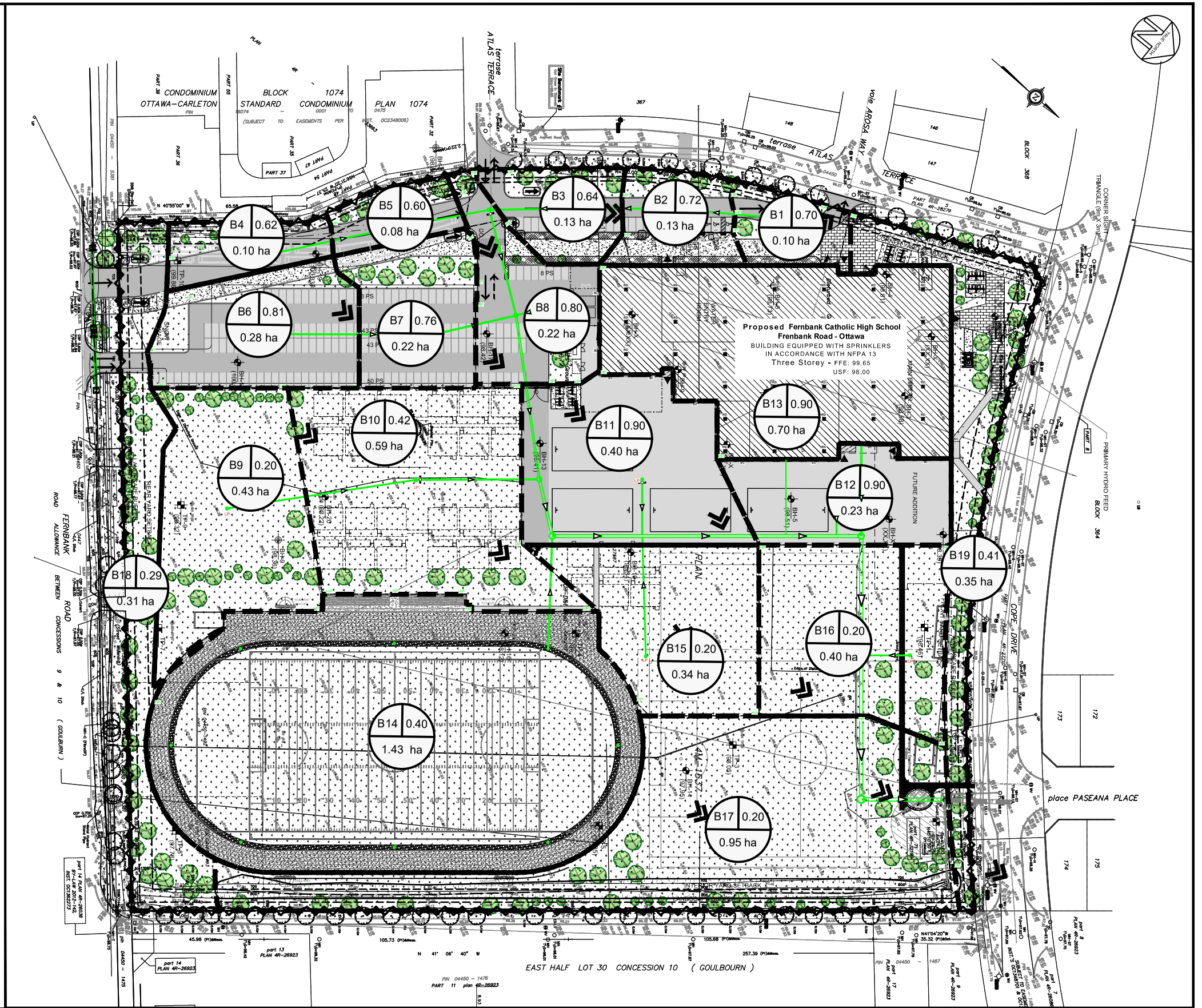
X | 0.00
0.00 ha

DRAINAGE AREA ID

WEIGHTED RUNOFF COEFFICIENT

DRAINAGE AREA HECTARES

- 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
3	2025-12-02	R.I / Z.B.	ISSUED FOR SITE PLAN CONTROL R1
2	2025-10-23	R.I. / Z.B.	ISSUED FOR SITE PLAN CONTROL
1	2025-09-05	R.I. / Z.B.	ISSUED FOR PHASE 2 PRE-CONSULTATION APPLICATION

Jp2g PROJECT No.: 24-5050A

PROJECT
FERNBANK CATHOLIC HIGH SCHOOL
5431 FERNBANK ROAD OTTAWA, ON K2S 0T7

DRAWING
FIGURE-2
POST-DEVELOPMENT DRAINAGE AREAS

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

NORTH

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

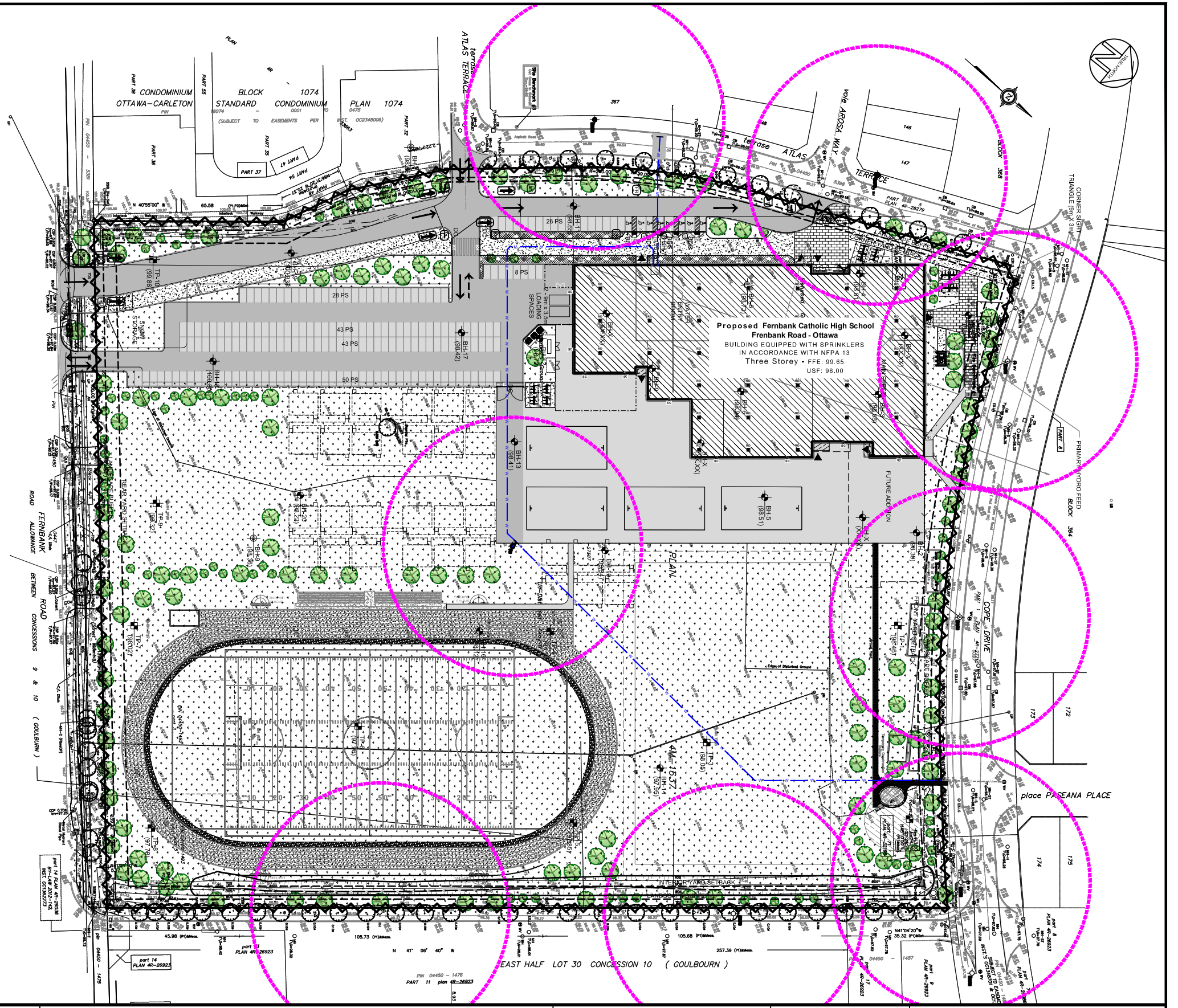
SHEET#
FIG.2

DWG NAME: J:\5-CIVIL\2024\24-5050A - N45 - NEW FERNBANK CATHOLIC HIGH SCHOOL\05 DRAWINGS\1 ONGOING\24-5050A NEW FERNBANK SCHOOL_ISSUED FOR SPC R1 2025-12-02.DWG LAYOUT: FIG.2_POST_DEVELOPMENT_AREA SAVED ON 2025-12-02

LEGEND

45m RADIUS - FIRE HYDRANT COVERAGE

- EXISTING FIRE HYDRANT
- EXISTING WATER VALVE
- EXISTING WATER VALVE
- NEW FIRE HYDRANT
- NEW WATER VALVE
- NEW WATERMAIN
- NEW SIAMESE CONNECTION
- NEW WATER CHAMBER



No.	YYYY-MM-DD	BY	DESCRIPTION
3	2025-12-02	R.I / Z.B.	ISSUED FOR SITE PLAN CONTROL R1
2	2025-10-23	R.I. / Z.B.	ISSUED FOR SITE PLAN CONTROL
1	2025-09-05	R.I. / Z.B.	ISSUED FOR PHASE 2 PRE-CONSULTATION APPLICATION

Jp2g PROJECT No.: 24-5050A

PROJECT
FERNBANK CATHOLIC HIGH SCHOOL
5431 FERNBANK ROAD OTTAWA, ON K2S 0T7

DRAWING
FIGURE-3
FIRE HYDRANT COVERAGE 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.3

DWG NAME: J:\5-CIVIL\2024\24-5050A - N45 - NEW FERNBANK CATHOLIC HIGH SCHOOL\05 DRAWINGS\1 ONGOING\24-5050A NEW FERNBANK SCHOOL_ISSUED FOR SPC R1 2025-12-02.DWG LAYOUT: FIG.3_HYDRANT SAVED ON 2025-12-02

Appendix B
Stormwater Management

24-5050A - Fernbank Catholic Highschool
PreDevelopment Allocated Area

Appendix B-1: Predevelopment Allowable Release Rate					5 Year		
Receiving Structure	Subcatchment	Area (ha)	PreAllocated Area (C = 0.70) (m^2)	(ha)	C <=10yr	Rainfall Intensity (mm/hr)	Runoff (L/s)
Controlled							
	A1	7.40	74000	7.400	0.70	104.2	1499.00
Total Controlled		7.40			0.70		1499.0
Total Assuming No Control		7.40					1499.0

24-5050A - Fernbank Catholic Highschool
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**	0.10	700	0.070	273	0.027	0.70	104.2	19.83	0.79	178.6	38.14	99.00
CBMH-1	**B2**	0.13	969	0.097	342	0.034	0.72	104.2	27.24	0.80	178.6	52.34	99.00
CBMH-2	**B3**	0.13	833	0.083	486	0.049	0.64	104.2	24.53	0.72	178.6	47.38	99.00
CB-2	**B4**	0.10	614	0.061	418	0.042	0.62	104.2	18.43	0.70	178.6	35.67	99.20
CBMH-3	**B5**	0.08	479	0.048	360	0.036	0.60	104.2	14.57	0.68	178.6	28.24	99.10
CB-3	**B6**	0.28	2415	0.242	352	0.035	0.81	104.2	65.00	0.90	178.6	124.25	98.95
CBMH-4	**B7**	0.22	1730	0.173	446	0.045	0.76	104.2	47.68	0.85	178.6	91.41	98.90
CB-4	**B8**	0.22	1927	0.193	310	0.031	0.80	104.2	52.03	0.90	178.6	99.50	99.05
CB-5	**B9**	0.43	0	0.000	4268	0.427	0.20	104.2	24.73	0.25	178.6	52.97	98.70
CBMH-5	**B10**	0.59	1895	0.190	4006	0.401	0.42	104.2	72.61	0.49	178.6	143.78	98.50
CB-6	**B11**	0.40	4027	0.403	0	0.000	0.90	104.2	104.98	1.00	178.6	199.90	98.85
CB-7	**B12**	0.23	2319	0.232	0	0.000	0.90	104.2	60.45	1.00	178.6	115.11	99.05
Roof	**B13**	0.70	6987	0.699	0	0.000	0.90	104.2	182.14	1.00	178.6	346.83	
Total Controlled		**3.62**					**0.68**		**714.2**	**0.77**		**1375.5**	
Field	**B14**	1.43	4051	0.405	10237	1.024	0.40	104.2	164.91	0.46	178.6	328.13	
CB-8	**B15**	0.34	0	0.000	3386	0.339	0.20	104.2	19.62	0.25	178.6	42.02	99.00
CB-9	**B16**	0.40	0	0.000	4000	0.400	0.20	104.2	23.17	0.25	178.6	49.64	98.50
DI-1	**B17**	0.95	0	0.000	9497	0.950	0.20	104.2	55.02	0.25	178.6	117.86	96.34
Fernbank Road	**B18**	0.31	390	0.039	2710	0.271	0.29	104.2	25.87	0.34	178.6	52.99	
Cope Drive.	**B19**	0.35	1074	0.107	2451	0.245	0.41	104.2	42.20	0.48	178.6	83.73	
Total Uncontrolled		**3.78**					**0.30**		**330.8**	**0.36**		**674.4**	
Total Assuming No Control		**7.40**							**1045.0**			**2049.9**	

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	81.3	72.28	99.00	99.29	99.20	0.20	97.00	375	2.01	0.61	164
ICD-2	88.3	76.42	98.90	99.25	99.14	0.24	96.96	375	1.97	0.61	172
ICD-3	40.1	35.64	99.05	99.30	99.23	0.18	97.03	250	2.08	0.61	115
ICD-4	30.0	128.21	98.50	98.99	98.82	0.32	96.74	375	1.89	0.61	101
ICD-5	82.4	70.50	98.85	99.30	99.12	0.27	96.69	300	2.28	0.61	160
ICD-6	46.4	41.23	99.05	99.30	99.27	0.22	96.38	250	2.77	0.61	115
Roof	48.50	202.48	0.00	Na	0.15	0.15	n/a - roof drain control				
Total	**417.00**	**626.76**									

Total Site Outflow Summary

Source	100 Yr Release Rate *(L/s)*	100 Yr Provided Storage *(m^3)*
ICD-1	81.30	78.8
ICD-2	88.30	80.1
ICD-3	40.10	40.5
ICD-4	30.00	131.7
ICD-5	82.40	72.3
ICD-6	46.40	42.8
Roof	48.50	232.9
100 Year Uncontrolled	674.36	0.00
Total	**1091.36**	**679.11**
Allowable	**1499.00**	
Difference	**407.64**	

24-5050A - Fernbank Catholic Highschool
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	0.097	0.70	0.79	99.00									
CBMH-1	B2	0.131	0.72	0.80	99.00									
CBMH-2	B3	0.132	0.64	0.72	99.00									
CB-2	B4	0.103	0.62	0.70	99.20									
CBMH-3	B5	0.084	0.60	0.68	99.10									
ICD-1 Total		0.547	0.66	0.74	99.00	77.1	79.8	81.3	0.0	22.8	72.3	99.20	99.290	0.20

Stage below ponding (m)
99.19

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	77.11	77.11	0.00	0.0
15	61.8	62.01	77.11	-15.10	-13.6
20	52.0	52.24	77.11	-24.87	-29.8
25	45.2	45.34	77.11	-31.77	-47.6
30	40.0	40.20	77.11	-36.91	-66.4
35	36.1	36.20	77.11	-40.91	-85.9
40	32.9	32.99	77.11	-44.12	-105.9
45	30.2	30.36	77.11	-46.75	-126.2
50	28.0	28.15	77.11	-48.96	-146.9
55	26.2	26.27	77.11	-50.84	-167.8
60	24.6	24.65	77.11	-52.46	-188.8

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	117.74	79.80	37.94	22.8
15	83.6	94.42	79.80	14.62	13.2
20	70.3	79.38	79.80	-0.42	-0.5
25	60.9	68.81	79.80	-10.99	-16.5
30	53.9	60.94	79.80	-18.86	-34.0
35	48.5	54.82	79.80	-24.98	-52.4
40	44.2	49.93	79.80	-29.87	-71.7
45	40.6	45.91	79.80	-33.89	-91.5
50	37.7	42.55	79.80	-37.25	-111.8
55	35.1	39.69	79.80	-40.11	-132.4
60	32.9	37.23	79.80	-42.57	-153.3

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	201.77	81.30	120.47	72.3
15	142.9	161.47	81.30	80.17	72.2
20	120.0	135.54	81.30	54.24	65.1
25	103.8	117.35	81.30	36.05	54.1
30	91.9	103.81	81.30	22.51	40.5
35	82.6	93.31	81.30	12.01	25.2
40	75.1	84.91	81.30	3.61	8.7
45	69.1	78.03	81.30	-3.27	-8.8
50	64.0	72.27	81.30	-9.03	-27.1
55	59.6	67.37	81.30	-13.93	-46.0
60	55.9	63.16	81.30	-18.14	-65.3

ICD-1 - Stage-Storage Table

Elevation (m)	Incremental Depth (m)	Total Depth (m)	Cumulative Volume CB-1 (m^3)	CBMH-1 (m^3)	CBMH-2 (m^3)	CB-2 (m^3)	CBMH-3 (m^3)	Total Volume (m^3)	Orifice Head (m)	Orifice Flow (L/s)	Rainfall Event
99.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.0	1.81	77.1	2 Yr
99.01	0.01	0.01	0.00	0.00	0.00	0.00	0.00	0.0	1.82	77.3	
99.02	0.01	0.02	0.03	0.04	0.03	0.00	0.00	0.1	1.83	77.5	
99.03	0.01	0.03	0.09	0.15	0.10	0.00	0.00	0.3	1.84	77.7	
99.04	0.01	0.04	0.23	0.37	0.24	0.00	0.00	0.8	1.85	78.0	
99.05	0.01	0.05	0.45	0.73	0.47	0.00	0.00	1.7	1.86	78.2	
99.06	0.01	0.06	0.77	1.25	0.82	0.00	0.00	2.8	1.87	78.4	
99.07	0.01	0.07	1.20	1.96	1.30	0.00	0.00	4.5	1.88	78.6	
99.08	0.01	0.08	1.74	2.89	1.95	0.00	0.00	6.6	1.89	78.8	
99.09	0.01	0.09	2.40	4.04	2.78	0.00	0.00	9.2	1.90	79.0	
99.10	0.01	0.10	3.18	5.46	3.81	0.00	0.00	12.5	1.91	79.2	
99.11	0.01	0.11	4.07	7.13	5.04	0.00	0.00	16.2	1.92	79.4	
99.12	0.01	0.12	5.07	9.06	6.46	0.00	0.02	20.6	1.93	79.6	
99.13	0.01	0.13	6.18	11.25	8.10	0.00	0.07	25.6	1.94	79.8	5 Yr
99.14	0.01	0.14	7.40	13.72	9.95	0.00	0.16	31.2	1.95	80.0	
99.15	0.01	0.15	8.73	16.45	11.99	0.00	0.32	37.5	1.96	80.2	
99.16	0.01	0.16	10.17	19.46	14.24	0.00	0.56	44.4	1.97	80.4	
99.17	0.01	0.17	11.71	22.74	16.67	0.00	0.89	52.0	1.98	80.6	
99.18	0.01	0.18	13.35	26.29	19.29	0.00	1.33	60.3	1.99	80.8	
99.19	0.01	0.19	15.09	30.11	22.10	0.00	1.90	69.2	2.00	81.1	
99.20	0.01	0.20	16.94	34.21	25.09	0.00	2.60	78.8	2.01	81.3	100 Yr
99.21	0.01	0.21	18.89	38.58	28.26	0.00	3.44	89.2	2.02	81.5	
99.22	0.01	0.22	18.89	44.20	31.60	0.02	4.42	99.1	2.03	81.7	
99.23	0.01	0.23	18.89	51.21	35.12	0.09	5.55	110.9	2.04	81.9	
99.24	0.01	0.24	18.89	58.59	38.81	0.22	6.81	123.3	2.05	82.1	
99.25	0.01	0.25	18.89	58.89	46.24	0.43	8.22	132.7	2.06	82.3	
99.26	0.01	0.26	18.89	58.89	58.27	0.75	9.76	146.6	2.07	82.5	
99.27	0.01	0.27	18.89	58.89	58.27	1.19	11.44	148.7	2.08	82.7	
99.28	0.01	0.28	18.89	58.89	58.27	1.78	13.25	151.1	2.09	82.9	
99.29	0.01	0.29	18.89	58.89	58.27	2.54	15.21	153.8	2.10	83.1	
99.30	0.01	0.30	18.89	58.89	58.27	3.48	17.30	156.8	2.11	83.2	
99.31	0.01	0.31	18.89	58.89	58.27	4.61	19.54	160.2	2.12	83.4	
99.32	0.01	0.32	18.89	58.89	58.27	5.92	21.91	163.9	2.13	83.6	
99.33	0.01	0.33	18.89	58.89	58.27	7.43	24.42	167.9	2.14	83.8	
99.34	0.01	0.34	18.89	58.89	58.27	9.13	27.07	172.3	2.15	84.0	
99.35	0.01	0.35	18.89	58.59	58.27	8.59	28.59	172.93	2.16	84.2	

Orifice Sizing

Elevation (m)	Outlet Structure	Pipe Diameter (mm)	Pipe Invert (m)	Area (m2)	Area (mm2)	Orifice Diameter (mm)	100 Yr Orifice Head (m)
	STMH-1	375.00	97.00	0.02	21197.88	164	2.01
99.00							
99.01							
99.02							
99.03							
99.04							
99.05							
99.06							
99.07							
99.08							
99.09							
99.10							
99.11							
99.12							
99.13							
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99.22							
99.23							
99.24							
99.25							
99.26							
99.27							
99.28							
99.29							
99.30							
99.31							
99.32							
99.33							
99.34							
99.35							

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.

24-5050A - Fernbank Catholic Highschool
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-3	B6	0.277	0.81	0.90	98.95									
CBMH-4	B7	0.218	0.76	0.85	98.90									
ICD-2 Total		0.494	0.79	0.88	98.90	83.1	86.8	88.3	0.0	23.4	76.4	99.14	99.250	0.24

Stage below ponding (m)
99.12

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	83.06	83.06	0.00	0.0
15	61.8	66.80	83.06	-16.26	-14.6
20	52.0	56.27	83.06	-26.79	-32.1
25	45.2	48.85	83.06	-34.21	-51.3
30	40.0	43.30	83.06	-39.76	-71.6
35	36.1	39.00	83.06	-44.06	-92.5
40	32.9	35.54	83.06	-47.52	-114.0
45	30.2	32.70	83.06	-50.36	-136.0
50	28.0	30.32	83.06	-52.74	-158.2
55	26.2	28.30	83.06	-54.76	-180.7
60	24.6	26.56	83.06	-56.50	-203.4

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	125.84	86.80	39.04	23.4
15	83.6	100.92	86.80	14.12	12.7
20	70.3	84.85	86.80	-1.95	-2.3
25	60.9	73.55	86.80	-13.25	-19.9
30	53.9	65.13	86.80	-21.67	-39.0
35	48.5	58.60	86.80	-28.20	-59.2
40	44.2	53.36	86.80	-33.44	-80.2
45	40.6	49.07	86.80	-37.73	-101.9
50	37.7	45.48	86.80	-41.32	-124.0
55	35.1	42.42	86.80	-44.38	-146.5
60	32.9	39.79	86.80	-47.01	-169.2

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	215.66	88.30	127.36	76.4
15	142.9	172.58	88.30	84.28	75.9
20	120.0	144.87	88.30	56.57	67.9
25	103.8	125.42	88.30	37.12	55.7
30	91.9	110.96	88.30	22.66	40.8
35	82.6	99.74	88.30	11.44	24.0
40	75.1	90.76	88.30	2.46	5.9
45	69.1	83.40	88.30	-4.90	-13.2
50	64.0	77.24	88.30	-11.06	-33.2
55	59.6	72.01	88.30	-16.29	-53.8
60	55.9	67.51	88.30	-20.79	-74.9

ICD-2 - Stage-Storage Table

Elevation (m)	Incremental Depth (m)	Total Depth (m)	Cumulative Volume CB-3 (m^3)	CBMH-4			Total Volume (m^3)	Orifice Head (m)	Orifice Flow (L/s)	Rainfall Event
98.90	0.00	0.00	0.00	0.00			0.0	1.75	83.1	2 Yr
98.91	0.01	0.01	0.00	0.00			0.0	1.76	83.3	
98.92	0.01	0.02	0.00	0.00			0.0	1.77	83.5	
98.93	0.01	0.03	0.00	0.00			0.0	1.78	83.8	
98.94	0.01	0.04	0.00	0.00			0.0	1.79	84.0	
98.95	0.01	0.05	0.00	0.00			0.0	1.80	84.2	
98.96	0.01	0.06	0.00	0.99			1.0	1.81	84.5	
98.97	0.01	0.07	0.04	1.58			1.6	1.82	84.7	
98.98	0.01	0.08	0.13	2.36			2.5	1.83	84.9	
98.99	0.01	0.09	0.32	3.36			3.7	1.84	85.2	
99.00	0.01	0.10	0.63	4.61			5.2	1.85	85.4	
99.01	0.01	0.11	1.10	6.13			7.2	1.86	85.6	
99.02	0.01	0.12	1.75	7.97			9.7	1.87	85.9	
99.03	0.01	0.13	2.62	10.13			12.8	1.88	86.1	
99.04	0.01	0.14	3.73	12.65			16.4	1.89	86.3	
99.05	0.01	0.15	5.12	15.57			20.7	1.90	86.5	
99.06	0.01	0.16	6.81	18.78			25.6	1.91	86.8	5 Yr
99.07	0.01	0.17	8.84	22.26			31.1	1.92	87.0	
99.08	0.01	0.18	11.25	26.07			37.3	1.93	87.2	
99.09	0.01	0.19	14.05	30.21			44.3	1.94	87.4	
99.10	0.01	0.20	17.28	34.70			52.0	1.95	87.7	
99.11	0.01	0.21	20.97	39.53			60.5	1.96	87.9	
99.12	0.01	0.22	25.14	44.71			69.9	1.97	88.1	
99.13	0.01	0.23	29.80	50.26			80.1	1.98	88.3	100 Yr
99.14	0.01	0.24	34.99	56.17			91.2	1.99	88.6	
99.15	0.01	0.25	40.75	62.45			103.2	2.00	88.8	
99.16	0.01	0.26	47.08	69.12			116.2	2.01	89.0	
99.17	0.01	0.27	53.96	76.17			130.1	2.02	89.2	
99.18	0.01	0.28	61.44	83.61			145.1	2.03	89.4	
99.19	0.01	0.29	69.52	91.44			161.0	2.04	89.7	
99.20	0.01	0.30	78.21	99.67			177.9	2.05	89.9	
99.21	0.01	0.31	87.52	91.96			179.5	2.06	90.1	
99.22	0.01	0.32	97.45	91.96			189.4	2.07	90.3	
99.23	0.01	0.33	107.99	91.96			199.95	2.08	90.5	

Elevation (m)
98.90
98.91
98.92
98.93
98.94
98.95
98.96
98.97
98.98
98.99
99.00
99.01
99.02
99.03
99.04
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99.12
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99.14
99.15
99.16
99.17
99.18
99.19
99.20
99.21
99.22
99.23

Orifice Sizing

Outlet Structure	Pipe Diameter (mm)	Invert (m)	Area (m2)	Area (mm2)	Orifice Diameter (mm)	100 Yr Orifice Head (m)
CBMH-4	375.00	96.96	0.02	23221.14	172	1.97

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.

24-5050A - Fernbank Catholic Highschool
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)
CB-4	B8	0.224	0.80	0.90	99.05									
ICD-3 Total		0.224	0.80	0.90	99.05	38.4	39.5	40.1	0.0	11.1	35.6	99.23	99.300	0.18

Stage below ponding (m)
99.22

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	38.35	38.35	0.00	0.0
15	61.8	30.84	38.35	-7.51	-6.8
20	52.0	25.98	38.35	-12.37	-14.8
25	45.2	22.56	38.35	-15.79	-23.7
30	40.0	20.00	38.35	-18.35	-33.0
35	36.1	18.01	38.35	-20.34	-42.7
40	32.9	16.41	38.35	-21.94	-52.7
45	30.2	15.10	38.35	-23.25	-62.8
50	28.0	14.00	38.35	-24.35	-73.0
55	26.2	13.07	38.35	-25.28	-83.4
60	24.6	12.26	38.35	-26.09	-93.9

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	58.06	39.50	18.56	11.1
15	83.6	46.56	39.50	7.06	6.4
20	70.3	39.15	39.50	-0.35	-0.4
25	60.9	33.93	39.50	-5.57	-8.3
30	53.9	30.05	39.50	-9.45	-17.0
35	48.5	27.04	39.50	-12.46	-26.2
40	44.2	24.62	39.50	-14.88	-35.7
45	40.6	22.64	39.50	-16.86	-45.5
50	37.7	20.98	39.50	-18.52	-55.6
55	35.1	19.57	39.50	-19.93	-65.8
60	32.9	18.36	39.50	-21.14	-76.1

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	99.50	40.10	59.40	35.6
15	142.9	79.63	40.10	39.53	35.6
20	120.0	66.84	40.10	26.74	32.1
25	103.8	57.87	40.10	17.77	26.7
30	91.9	51.19	40.10	11.09	20.0
35	82.6	46.02	40.10	5.92	12.4
40	75.1	41.87	40.10	1.77	4.3
45	69.1	38.48	40.10	-1.62	-4.4
50	64.0	35.64	40.10	-4.46	-13.4
55	59.6	33.23	40.10	-6.87	-22.7
60	55.9	31.15	40.10	-8.95	-32.2

ICD-3 - 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
99.05	0.00	0.00	0.00				0.0	1.90	38.4	2 Yr
99.06	0.01	0.01	0.00				0.0	1.91	38.5	
99.07	0.01	0.02	0.05				0.1	1.92	38.6	
99.08	0.01	0.03	0.18				0.2	1.93	38.7	
99.09	0.01	0.04	0.44				0.4	1.94	38.8	
99.10	0.01	0.05	0.87				0.9	1.95	38.9	
99.11	0.01	0.06	1.51				1.5	1.96	39.0	
99.12	0.01	0.07	2.40				2.4	1.97	39.1	
99.13	0.01	0.08	3.59				3.6	1.98	39.2	
99.14	0.01	0.09	5.11				5.1	1.99	39.3	
99.15	0.01	0.10	7.01				7.0	2.00	39.3	
99.16	0.01	0.11	9.34				9.3	2.01	39.4	
99.17	0.01	0.12	12.12				12.1	2.02	39.5	5 Yr
99.18	0.01	0.13	15.42				15.4	2.03	39.6	
99.19	0.01	0.14	19.25				19.3	2.04	39.7	
99.20	0.01	0.15	23.65				23.7	2.05	39.8	
99.21	0.01	0.16	28.64				28.6	2.06	39.9	
99.22	0.01	0.17	34.26				34.3	2.07	40.0	
99.23	0.01	0.18	40.51				40.5	2.08	40.1	100 Yr
99.24	0.01	0.19	47.43				47.4	2.09	40.2	
99.25	0.01	0.20	55.04				55.04	2.10	40.3	

Elevation (m)
99.05
99.06
99.07
99.08
99.09
99.10
99.11
99.12
99.13
99.14
99.15
99.16
99.17
99.18
99.19
99.20
99.21
99.22
99.23
99.24
99.25

Orifice Sizing

Outlet Structure	Pipe Diameter (mm)	Invert (m)	Area (m2)	Area (mm2)	Orifice Diameter (mm)	100 Yr Orifice Head (m)
CB-4	250.00	97.03	0.01	10310.54	115	2.08

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

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.

24-5050A - Fernbank Catholic Highschool
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-5	B9	0.427	0.20	0.25	98.70									
CBMH-5	B10	0.590	0.42	0.49	98.50									
ICD-4 Total		1.017	0.33	0.39	98.50	29.0	29.4	30.0	25.8	57.6	128.2	98.82	98.990	0.32

Stage below ponding (m)
98.81

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	71.75	29.00	42.75	25.6
15	61.8	57.70	29.00	28.70	25.8
20	52.0	48.61	29.00	19.61	23.5
25	45.2	42.19	29.00	13.19	19.8
30	40.0	37.41	29.00	8.41	15.1
35	36.1	33.69	29.00	4.69	9.8
40	32.9	30.70	29.00	1.70	4.1
45	30.2	28.25	29.00	-0.75	-2.0
50	28.0	26.19	29.00	-2.81	-8.4
55	26.2	24.45	29.00	-4.55	-15.0
60	24.6	22.94	29.00	-6.06	-21.8

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	114.81	29.40	85.41	51.2
15	83.6	92.07	29.40	62.67	56.4
20	70.3	77.41	29.40	48.01	57.6
25	60.9	67.10	29.40	37.70	56.5
30	53.9	59.42	29.40	30.02	54.0
35	48.5	53.46	29.40	24.06	50.5
40	44.2	48.68	29.40	19.28	46.3
45	40.6	44.77	29.40	15.37	41.5
50	37.7	41.49	29.40	12.09	36.3
55	35.1	38.70	29.40	9.30	30.7
60	32.9	36.30	29.40	6.90	24.8

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	196.75	30.00	166.75	100.0
15	142.9	157.45	30.00	127.45	114.7
20	120.0	132.17	30.00	102.17	122.6
25	103.8	114.42	30.00	84.42	126.6
30	91.9	101.23	30.00	71.23	128.2
35	82.6	90.99	30.00	60.99	128.1
40	75.1	82.80	30.00	52.80	126.7
45	69.1	76.08	30.00	46.08	124.4
50	64.0	70.47	30.00	40.47	121.4
55	59.6	65.70	30.00	35.70	117.8
60	55.9	61.59	30.00	31.59	113.7

ICD-4 - Stage-Storage Table

Elevation (m)	Incremental Depth (m)	Total Depth (m)	Cumulative Volume CB-5 (m^3)	CBMH-5			Total Volume (m^3)	Orifice Head (m)	Orifice Flow (L/s)	Rainfall Event
98.50	0.00	0.00	0.00	0.00			0.0	1.57	27.3	
98.51	0.01	0.01	0.00	0.00			0.0	1.58	27.4	
98.52	0.01	0.02	0.00	0.03			0.0	1.59	27.5	
98.53	0.01	0.03	0.00	0.10			0.1	1.60	27.6	
98.54	0.01	0.04	0.00	0.23			0.2	1.61	27.7	
98.55	0.01	0.05	0.00	0.46			0.5	1.62	27.8	
98.56	0.01	0.06	0.00	0.80			0.8	1.63	27.9	
98.57	0.01	0.07	0.00	1.27			1.3	1.64	27.9	
98.58	0.01	0.08	0.00	1.90			1.9	1.65	28.0	
98.59	0.01	0.09	0.00	2.70			2.7	1.66	28.1	
98.60	0.01	0.10	0.00	3.71			3.7	1.67	28.2	
98.61	0.01	0.11	0.00	4.94			4.9	1.68	28.3	
98.62	0.01	0.12	0.00	6.41			6.4	1.69	28.4	
98.63	0.01	0.13	0.00	8.16			8.2	1.70	28.5	
98.64	0.01	0.14	0.00	10.19			10.2	1.71	28.5	
98.65	0.01	0.15	0.00	12.53			12.5	1.72	28.6	
98.66	0.01	0.16	0.00	15.21			15.2	1.73	28.7	
98.67	0.01	0.17	0.00	18.24			18.2	1.74	28.8	
98.68	0.01	0.18	0.00	21.66			21.7	1.75	28.9	
98.69	0.01	0.19	0.00	25.47			25.5	1.76	29.0	2 Yr
98.70	0.01	0.20	0.00	29.71			29.7	1.77	29.0	
98.71	0.01	0.21	0.00	34.39			34.4	1.78	29.1	
98.72	0.01	0.22	0.04	39.54			39.6	1.79	29.2	
98.73	0.01	0.23	0.15	45.18			45.3	1.80	29.3	
98.74	0.01	0.24	0.37	51.32			51.7	1.81	29.4	5 Yr
98.75	0.01	0.25	0.74	58.00			58.7	1.82	29.4	
98.76	0.01	0.26	1.28	65.23			66.5	1.83	29.5	
98.77	0.01	0.27	2.04	73.03			75.1	1.84	29.6	
98.78	0.01	0.28	3.04	81.43			84.5	1.85	29.7	
98.79	0.01	0.29	4.34	90.45			94.8	1.86	29.8	
98.80	0.01	0.30	5.95	100.11			106.1	1.87	29.8	
98.81	0.01	0.31	7.92	110.43			118.4	1.88	29.9	
98.82	0.01	0.32	10.29	121.43			131.7	1.89	30.0	100 Yr
98.83	0.01	0.33	13.08	133.14			146.2	1.90	30.1	
98.84	0.01	0.34	16.34	145.58			161.9	1.91	30.2	
98.85	0.01	0.35	20.09	158.76			178.9	1.92	30.2	
98.74	0.01	0.24	0.37	51.32			51.69	1.81	29.4	

Elevation (m)
98.50
98.51
98.52
98.53
98.54
98.55
98.56
98.57
98.58
98.59
98.60
98.61
98.62
98.63
98.64
98.65
98.66
98.67
98.68
98.69
98.70
98.71
98.72
98.73
98.74
98.75
98.76
98.77
98.78
98.79
98.80
98.81
98.82
98.83
98.84
98.85
98.74

Orifice Sizing

Outlet Structure	Pipe Diameter (mm)	Invert (m)	Area (m2)	Area (mm2)	Orifice Diameter (mm)	100 Yr Orifice Head (m)
CBMH-5	375.00	96.74	0.01	8070.94	101	1.89

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.

24-5050A - Fernbank Catholic Highschool
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-6	B11	0.403	0.90	1.00	98.85									
ICD-5 Total		0.403	0.90	1.00	98.85	77.4	80.9	82.4	0.0	21.4	70.5	99.12	99.300	0.27

Stage below ponding (m)
99.11

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	77.39	77.39	0.00	0.0
15	61.8	62.23	77.39	-15.16	-13.6
20	52.0	52.42	77.39	-24.97	-30.0
25	45.2	45.51	77.39	-31.88	-47.8
30	40.0	40.35	77.39	-37.04	-66.7
35	36.1	36.33	77.39	-41.06	-86.2
40	32.9	33.11	77.39	-44.28	-106.3
45	30.2	30.47	77.39	-46.92	-126.7
50	28.0	28.25	77.39	-49.14	-147.4
55	26.2	26.37	77.39	-51.02	-168.4
60	24.6	24.74	77.39	-52.65	-189.5

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	116.64	80.90	35.74	21.4
15	83.6	93.54	80.90	12.64	11.4
20	70.3	78.65	80.90	-2.25	-2.7
25	60.9	68.17	80.90	-12.73	-19.1
30	53.9	60.37	80.90	-20.53	-36.9
35	48.5	54.32	80.90	-26.58	-55.8
40	44.2	49.46	80.90	-31.44	-75.4
45	40.6	45.48	80.90	-35.42	-95.6
50	37.7	42.15	80.90	-38.75	-116.2
55	35.1	39.32	80.90	-41.58	-137.2
60	32.9	36.88	80.90	-44.02	-158.5

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	199.90	82.40	117.50	70.5
15	142.9	159.97	82.40	77.57	69.8
20	120.0	134.29	82.40	51.89	62.3
25	103.8	116.26	82.40	33.86	50.8
30	91.9	102.85	82.40	20.45	36.8
35	82.6	92.45	82.40	10.05	21.1
40	75.1	84.13	82.40	1.73	4.1
45	69.1	77.30	82.40	-5.10	-13.8
50	64.0	71.60	82.40	-10.80	-32.4
55	59.6	66.75	82.40	-15.65	-51.6
60	55.9	62.57	82.40	-19.83	-71.4

ICD-5 - 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
98.85	0.00	0.00	0.00				0.0	2.04	77.4	2 Yr
98.86	0.01	0.01	0.00				0.0	2.05	77.6	
98.87	0.01	0.02	0.03				0.0	2.06	77.8	
98.88	0.01	0.03	0.10				0.1	2.07	78.0	
98.89	0.01	0.04	0.23				0.2	2.08	78.1	
98.90	0.01	0.05	0.46				0.5	2.09	78.3	
98.91	0.01	0.06	0.79				0.8	2.10	78.5	
98.92	0.01	0.07	1.26				1.3	2.11	78.7	
98.93	0.01	0.08	1.88				1.9	2.12	78.9	
98.94	0.01	0.09	2.67				2.7	2.13	79.1	
98.95	0.01	0.10	3.67				3.7	2.14	79.3	
98.96	0.01	0.11	4.89				4.9	2.15	79.5	
98.97	0.01	0.12	6.35				6.4	2.16	79.6	
98.98	0.01	0.13	8.07				8.1	2.17	79.8	
98.99	0.01	0.14	10.08				10.1	2.18	80.0	
99.00	0.01	0.15	12.40				12.4	2.19	80.2	
99.01	0.01	0.16	15.05				15.1	2.20	80.4	
99.02	0.01	0.17	18.06				18.1	2.21	80.6	
99.03	0.01	0.18	21.43				21.4	2.22	80.7	
99.04	0.01	0.19	25.21				25.2	2.23	80.9	5 Yr
99.05	0.01	0.20	29.40				29.4	2.24	81.1	
99.06	0.01	0.21	34.03				34.0	2.25	81.3	
99.07	0.01	0.22	39.12				39.1	2.26	81.5	
99.08	0.01	0.23	44.69				44.7	2.27	81.6	
99.09	0.01	0.24	50.77				50.8	2.28	81.8	
99.10	0.01	0.25	57.38				57.4	2.29	82.0	
99.11	0.01	0.26	64.53				64.5	2.30	82.2	
99.12	0.01	0.27	72.26				72.3	2.31	82.4	100 Yr
99.13	0.01	0.28	80.58				80.6	2.32	82.5	
99.14	0.01	0.29	89.51				89.5	2.33	82.7	
99.15	0.01	0.30	99.08				99.1	2.34	82.9	
99.16	0.01	0.31	109.31				109.3	2.35	83.1	
99.17	0.01	0.32	120.21				120.2	2.36	83.3	
99.18	0.01	0.33	131.82				131.8	2.37	83.4	
99.19	0.01	0.34	144.15				144.2	2.38	83.6	
99.20	0.01	0.35	157.22				157.22	2.39	83.8	

Elevation (m)
98.85
98.86
98.87
98.88
98.89
98.90
98.91
98.92
98.93
98.94
98.95
98.96
98.97
98.98
98.99
99.00
99.01
99.02
99.03
99.04
99.05
99.06
99.07
99.08
99.09
99.10
99.11
99.12
99.13
99.14
99.15
99.16
99.17
99.18
99.19
99.20

Orifice Sizing

Outlet Structure	Pipe Diameter (mm)	Invert (m)	Area (m2)	Area (mm2)	Orifice Diameter (mm)	100 Yr Orifice Head (m)
CB-6	250.00	96.69	0.02	20078.13	160	2.31

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.

24-5050A - Fernbank Catholic Highschool
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-7	B12	0.232	0.90	1.00	99.05									
ICD-6 Total		0.232	0.90	1.00	99.05	44.6	45.9	46.4	0.0	12.8	41.2	99.27	99.300	0.22

Stage below ponding (m)
99.26

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	44.56	44.56	0.00	0.0
15	61.8	35.84	44.56	-8.72	-7.8
20	52.0	30.19	44.56	-14.37	-17.2
25	45.2	26.21	44.56	-18.35	-27.5
30	40.0	23.23	44.56	-21.33	-38.4
35	36.1	20.92	44.56	-23.64	-49.6
40	32.9	19.07	44.56	-25.49	-61.2
45	30.2	17.55	44.56	-27.01	-72.9
50	28.0	16.27	44.56	-28.29	-84.9
55	26.2	15.18	44.56	-29.38	-96.9
60	24.6	14.25	44.56	-30.31	-109.1

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	67.17	45.90	21.27	12.8
15	83.6	53.87	45.90	7.97	7.2
20	70.3	45.29	45.90	-0.61	-0.7
25	60.9	39.26	45.90	-6.64	-10.0
30	53.9	34.77	45.90	-11.13	-20.0
35	48.5	31.28	45.90	-14.62	-30.7
40	44.2	28.48	45.90	-17.42	-41.8
45	40.6	26.19	45.90	-19.71	-53.2
50	37.7	24.27	45.90	-21.63	-64.9
55	35.1	22.64	45.90	-23.26	-76.7
60	32.9	21.24	45.90	-24.66	-88.8

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	115.11	46.40	68.71	41.2
15	142.9	92.12	46.40	45.72	41.1
20	120.0	77.33	46.40	30.93	37.1
25	103.8	66.95	46.40	20.55	30.8
30	91.9	59.23	46.40	12.83	23.1
35	82.6	53.24	46.40	6.84	14.4
40	75.1	48.44	46.40	2.04	4.9
45	69.1	44.52	46.40	-1.88	-5.1
50	64.0	41.23	46.40	-5.17	-15.5
55	59.6	38.44	46.40	-7.96	-26.3
60	55.9	36.03	46.40	-10.37	-37.3

ICD-6 - 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
99.05	0.00	0.00	0.00			0.0	2.55	44.6	2 Yr
99.06	0.01	0.01	0.00			0.0	2.56	44.6	
99.07	0.01	0.02	0.03			0.0	2.57	44.7	
99.08	0.01	0.03	0.10			0.1	2.58	44.8	
99.09	0.01	0.04	0.25			0.3	2.59	44.9	
99.10	0.01	0.05	0.50			0.5	2.60	45.0	
99.11	0.01	0.06	0.86			0.9	2.61	45.1	
99.12	0.01	0.07	1.37			1.4	2.62	45.2	
99.13	0.01	0.08	2.05			2.1	2.63	45.3	
99.14	0.01	0.09	2.93			2.9	2.64	45.3	
99.15	0.01	0.10	4.02			4.0	2.65	45.4	
99.16	0.01	0.11	5.35			5.4	2.66	45.5	
99.17	0.01	0.12	6.95			7.0	2.67	45.6	
99.18	0.01	0.13	8.84			8.8	2.68	45.7	
99.19	0.01	0.14	11.04			11.0	2.69	45.8	
99.20	0.01	0.15	13.58			13.6	2.70	45.9	5 Yr
99.21	0.01	0.16	16.48			16.5	2.71	45.9	
99.22	0.01	0.17	19.77			19.8	2.72	46.0	
99.23	0.01	0.18	23.47			23.5	2.73	46.1	
99.24	0.01	0.19	27.59			27.6	2.74	46.2	
99.25	0.01	0.20	32.18			32.2	2.75	46.3	
99.26	0.01	0.21	37.25			37.3	2.76	46.4	
99.27	0.01	0.22	42.82			42.8	2.77	46.4	100 Yr
99.28	0.01	0.23	48.91			48.9	2.78	46.5	
99.29	0.01	0.24	55.56			55.56	2.79	46.6	

Elevation (m)
99.05
99.06
99.07
99.08
99.09
99.10
99.11
99.12
99.13
99.14
99.15
99.16
99.17
99.18
99.19
99.20
99.21
99.22
99.23
99.24
99.25
99.26
99.27
99.28
99.29

Orifice Sizing

Outlet Structure	Pipe Diameter (mm)	Invert (m)	Area (m2)	Area (mm2)	Orifice Diameter (mm)	100 Yr Orifice Head (m)
CB-7	250.00	96.38	0.01	10337.65	115	2.77

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.

24-5050A - Fernbank Catholic Highschool
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)	Ponding Elev. (m)	Spill Elev. (m)	Storage Depth (m)
Roof	B13	0.699	0.90	1.00	0.00									
Roof Total		0.699	0.90	1.00	0.00	20.4	30.6	48.5	89.54	130.45	202.48	0.15	0.150	0.15

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)
30	40.0	70.00	20.40	49.60	89.28
35	36.1	63.04	20.40	42.64	89.54
40	32.9	57.45	20.40	37.05	88.92
45	30.2	52.86	20.40	32.46	87.65
50	28.0	49.02	20.40	28.62	85.86
55	26.2	45.75	20.40	25.35	83.65
60	24.6	42.93	20.40	22.53	81.11
65	23.2	40.47	20.40	20.07	78.28
70	21.9	38.31	20.40	17.91	75.21
75	20.8	36.38	20.40	15.98	71.93
80	19.8	34.67	20.40	14.27	68.47

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)
45	40.6	78.92	30.60	48.32	130.45
50	37.7	73.14	30.60	42.54	127.61
55	35.1	68.22	30.60	37.62	124.16
60	32.9	63.99	30.60	33.39	120.20
65	31.0	60.30	30.60	29.70	115.83
70	29.4	57.05	30.60	26.45	111.10
75	27.9	54.17	30.60	23.57	106.07
80	26.6	51.59	30.60	20.99	100.77
85	25.4	49.28	30.60	18.68	95.25
90	24.3	47.18	30.60	16.58	89.52
95	23.3	45.27	30.60	14.67	83.61

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)
70	49.8	96.71	48.50	48.21	202.48
75	47.3	91.79	48.50	43.29	194.80
80	45.0	87.39	48.50	38.89	186.67
85	43.0	83.43	48.50	34.93	178.16
90	41.1	79.85	48.50	31.35	169.31
95	39.4	76.60	48.50	28.10	160.16
100	37.9	73.62	48.50	25.12	150.73
105	36.5	70.89	48.50	22.39	141.07
110	35.2	68.38	48.50	19.88	131.19
115	34.0	66.05	48.50	17.55	121.10
120	32.9	63.89	48.50	15.39	110.84

Roof - Stage-Storage Table **No. of Drain** **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	6987.00				0.0	0.00	0.0	
0.02	0.02	0.02	6987.00				46.6	0.02	10.3	
0.04	0.02	0.04	6987.00				93.2	0.04	20.4	2 Yr
0.06	0.02	0.06	6987.00				139.7	0.06	30.6	5 Yr
0.08	0.02	0.08	6987.00				186.3	0.08	40.5	
0.10	0.02	0.10	6987.00				232.9	0.10	48.5	100 Yr
0.12	0.02	0.12	6987.00				279.5	0.12	61.2	
0.14	0.02	0.14	6987.00				326.1	0.14	71.2	
0.15	0.01	0.15	6987.00				349.4	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

Interpolated Roof Drain Flow Rates (Per Roof Drain)

Head (mm)	Flow
0	0.00
10	0.13
20	0.25
25.4	**0.32**
30	0.38
40	0.50
50	0.62
50.8	**0.63**
60	0.75
70	0.87
76.2	**0.95**
80	0.99
90	1.09
100	1.18
101.6	**1.26**
110	1.37
120	1.49
127	**1.58**
130	1.62
140	1.74
150	1.86
152.8	**1.89**

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-1	CBMH-1	Lateral	B1	0.10	0.70	0.068	0.068	10.00	104.193	19.83	19.83	41.4	1.00%	250	59.47	33%	1.21	0.57	10.57	
	CBMH-1	CBMH-2	Trunk	B2	0.13	0.72	0.094	0.163	10.57	101.278	45.75	45.75	34.6	0.50%	300	68.38	67%	0.97	0.60	11.17	
	CBMH-2	STMH-1	Trunk	B3	0.13	0.64	0.085	0.247	11.17	98.414	67.63	67.63	28.4	0.50%	375	123.98	55%	1.12	0.42	11.59	
	CB-2	CBMH-3	Lateral	B4	0.10	0.62	0.064	0.064	10.00	104.193	18.43	18.43	51.7	1.00%	250	59.47	31%	1.21	0.71	10.71	
	CBMH-3	STMH-1	Trunk	B5	0.08	0.60	0.050	0.114	10.71	100.580	31.86	31.86	31.4	1.00%	250	59.47	54%	1.21	0.43	11.14	
	STMH-1	STMH-2	Trunk	N/A	0.00	0.00	0.000	0.361	11.17	98.414	98.80	81.30	37.9	0.50%	375	123.98	66%	1.12	0.56	11.73	ICD-1
	CB-3	CBMH-4	Lateral	B6	0.28	0.81	0.224	0.224	10.00	104.193	65.00	65.00	51.1	1.00%	300	96.70	67%	1.37	0.62	10.62	
	CBMH-4	STMH-02	Trunk	B7	0.22	0.76	0.165	0.389	10.62	101.016	109.24	88.30	29.6	0.50%	375	123.98	71%	1.12	0.44	11.06	ICD-2
	CB-4	STMH-02	Lateral	B8	0.22	0.80	0.180	0.180	10.00	104.193	52.03	40.10	9.9	1.00%	250	59.47	67%	1.21	0.14	10.14	ICD-3
	STMH-02	STMH-03	Trunk	N/A	0.00	0.00	0.000	0.930	11.73	95.871	247.80	247.80	57.5	0.50%	525	304.10	81%	1.40	0.68	12.41	
	CB-5	CBMH-5	Lateral	B9	0.43	0.20	0.085	0.085	10.00	104.193	24.73	24.73	66.5	1.00%	250	59.47	42%	1.21	0.91	10.91	
	CBMH-5	STMH-3	Trunk	B10	0.59	0.42	0.251	0.336	10.91	99.597	93.04	30.00	42.9	0.50%	375	123.98	24%	1.12	0.64	11.55	ICD-4
	STMH-3	STMH-4	Trunk	N/A	0.00	0.00	0.000	1.266	12.41	92.978	327.18	327.18	20.2	0.30%	675	460.41	71%	1.29	0.26	12.67	
	CB-6	STMH-5	Lateral	B11	0.40	0.90	0.362	0.362	10.00	104.193	104.98	82.40	19.1	1.00%	300	96.70	85%	1.37	0.23	10.23	ICD-5
	CB-7	STMH-5	Lateral	B12	0.23	0.90	0.209	0.209	10.00	104.193	60.45	46.40	8.6	1.00%	250	59.47	78%	1.21	0.12	10.12	ICD-6
	CB-8	STMH-5	Lateral	B15	0.34	0.20	0.068	0.068	10.00	104.193	19.62	19.62	41.3	1.00%	250	59.47	33%	1.21	0.57	10.57	
	Field	STMH-4	Lateral	B14	1.43	0.40	0.569	0.569	10.00	104.193	164.91	164.91	39.2	1.50%	375	214.73	77%	1.94	0.34	10.34	
	STMH-4	STMH-5	Trunk	N/A	0.00	0.00	0.000	2.474	12.67	91.919	632.19	632.19	107.3	0.30%	825	786.22	80%	1.47	1.22	13.89	
	Roof	STMH-5	Trunk	B13	0.70	0.90	0.629	0.629	10.00	104.193	182.14	48.50	31.2	1.50%	375	214.73	23%	1.94	0.27	10.27	Roof Drains
	CB-9	STMH-6	Lateral	B16	0.40	0.20	0.080	0.080	10.00	104.193	23.17	23.17	16.3	1.00%	250	59.47	39%	1.21	0.22	10.22	
	STMH-5	STMH-6	Trunk	N/A	0.00	0.00	0.000	3.183	13.89	87.330	772.72	772.72	91.4	0.30%	900	991.55	78%	1.56	0.98	14.87	
	STMH-6	EXCBMH	Trunk	N/A	0.00	0.00	0.000	3.183	14.87	83.994	743.20	743.20	29.1	0.30%	900	991.55	75%	1.56	0.31	15.18	
	DI-1	EXCBMH	Trunk	B17	0.95	0.20	0.190	0.190	10.00	104.193	55.02	55.02	28.4	0.47%	375	120.20	46%	1.09	0.43	10.43	
	EXCBMH	Cope Drive	Trunk	N/A	0.00	0.00	0.000	3.373	15.18	82.991	778.14	778.14	22.8	0.23%	1200	1869.77	42%	1.65	0.23	15.41	

Notes:

Project Name:	Fernbank Catcholic Highschool
Jp2g Project No.:	24-5050A
Client Ref No.:	

Prepared By:	Zach B
Reviewed By:	Ali S
Approved By:	Ali S
Date:	10/20/2025
Revision:	2

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)

Stantec

Blackstone Phases 4-8

DATE: 2018-10-03
REVISION: 3
DESIGNED BY: DT
CHECKED BY: SG

FILE NUMBER: 160401130

STORM SEWER DESIGN SHEET
(City of Ottawa)

DESIGN PARAMETERS

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

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

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

LOCATION			DRAINAGE AREA																				PIPE SELECTION										
AREA ID	FROM	TO	AREA	AREA	AREA	AREA	AREA	C	C	C	C	A x C	ACCUM	A x C	ACCUM.	A x C	ACCUM.	A x C	ACCUM.	T of C	I_{2-YEAR}	I_{5-YEAR}	$I_{10-YEAR}$	$I_{100-YEAR}$	$Q_{CONTROL}$	ACCUM. $Q_{CONTROL}$	Q_{ACT}	LENGTH	PIPE WIDTH	PIPE	PIPE	MATERIAL	CLASS	SLOPE	Q_{CAP}	% FULL	VEL.	VEL.	TIME OF
NUMBER	M.H.	M.H.	(2-YEAR)	(5-YEAR)	(10-YEAR)	(100-YEAR)	(ROOF)	(2-YEAR)	(5-YEAR)	(10-YEAR)	(100-YEAR)	(2-YEAR)	AxC (2YR)	(5-YEAR)	AxC (5YR)	(10-YEAR)	AxC (10YR)	(100-YEAR)	AxC (100YR)									OR DIAMETEI	HEIGHT	SHAPE				(FULL)		(FULL)	(ACT)	FLOW
			(ha)	(ha)	(ha)	(ha)	(ha)	(-)	(-)	(-)	(-)	(ha)	(ha)	(ha)	(ha)	(ha)	(ha)	(ha)	(ha)	(min)	(mm/h)	(mm/h)	(mm/h)	(mm/h)	(L/s)	(L/s)	(CIA/360)	(m)	(mm)	(mm)	(-)	(-)	(-)	%	(L/s)	(-)	(m/s)	(m/s)	(min)
L1054A	1054	1052	1.07	0.00	0.00	0.00	0.00	0.59	0.00	0.00	0.00	0.631	0.631	0.000	0.000	0.000	0.000	0.000	0.000	10.00	76.81	104.19	122.14	178.56	0.0	0.0	134.7	13.5	525	525	CIRCULAR	CONCRETE	-	0.20	200.6	**67.13%**	0.90	0.84	0.27
C1052A, C1052B	1052	1050	0.00	0.87	0.00	0.00	0.00	0.00	0.70	0.00	0.00	0.000	0.631	0.609	0.609	0.000	0.000	0.000	0.000	10.27	75.79	102.80	120.50	176.15	0.0	0.0	306.8	114.5	750	750	CIRCULAR	CONCRETE	-	0.15	449.8	**68.20%**	0.99	0.92	2.07
																				12.33																	
L1053A, L1053B	1053	1050	1.48	0.00	0.00	0.00	0.00	0.58	0.00	0.00	0.00	0.852	0.852	0.000	0.000	0.000	0.000	0.000	0.000	10.00	76.81	104.19	122.14	178.56	0.0	0.0	181.8	42.6	600	600	CIRCULAR	CONCRETE	-	0.15	248.1	**73.26%**	0.85	0.82	0.87
																				10.87																	
L1051B, C1051A	1051	1050	0.49	0.18	0.00	0.00	0.00	0.47	0.71	0.00	0.00	0.230	0.230	0.127	0.127	0.000	0.000	0.000	0.000	10.00	76.81	104.19	122.14	178.56	0.0	0.0	85.8	58.5	375	375	CIRCULAR	PVC	-	0.65	132.9	**64.60%**	1.26	1.16	0.84
																				10.84																	
L1050B	1050	1049	0.17	0.00	0.00	0.00	0.00	0.47	0.00	0.00	0.00	0.080	1.794	0.000	0.736	0.000	0.000	0.000	0.000	12.33	68.87	93.29	109.31	159.71	0.0	0.0	533.8	70.0	900	900	CIRCULAR	CONCRETE	-	0.15	731.4	**72.98%**	1.11	1.06	1.10
																				13.43								900	900								
C1009A	1009	1008	0.00	0.50	0.00	0.00	0.00	0.00	0.72	0.00	0.00	0.000	0.000	0.361	0.361	0.000	0.000	0.000	0.000	10.00	76.81	104.19	122.14	178.56	0.0	0.0	104.5	51.8	375	375	CIRCULAR	PVC	-	1.00	164.8	**63.38%**	1.56	1.43	0.60
C1008A	1008	1007	0.00	0.64	0.00	0.00	0.00	0.00	0.72	0.00	0.00	0.000	0.000	0.462	0.823	0.000	0.000	0.000	0.000	10.60	74.56	101.11	118.51	173.22	0.0	0.0	231.2	110.1	525	525	CIRCULAR	CONCRETE	-	0.80	401.3	**57.62%**	1.80	1.61	1.14
L1007A	1007	1006	0.34	0.00	0.00	0.00	0.00	0.47	0.00	0.00	0.00	0.158	0.158	0.000	0.823	0.000	0.000	0.000	0.000	11.75	70.69	95.79	112.25	164.03	0.0	0.0	250.1	43.1	600	600	CIRCULAR	CONCRETE	-	0.35	379.0	**66.00%**	1.30	1.21	0.60
																				12.34																	
L1015A	1015	1020	0.11	0.00	0.00	0.00	0.00	0.57	0.00	0.00	0.00	0.065	0.065	0.000	0.000	0.000	0.000	0.000	0.000	10.00	76.81	104.19	122.14	178.56	0.0	0.0	13.9	52.8	300	300	CIRCULAR	PVC	-	0.65	77.5	**17.91%**	1.10	0.69	1.27
																				11.27																	
L1022A	1022	1014	3.14	0.00	0.00	0.00	0.00	0.70	0.00	0.00	0.00	2.197	2.197	0.000	0.000	0.000	0.000	0.000	0.000	10.00	76.81	104.19	122.14	178.56	0.0	0.0	468.8	9.5	675	675	CIRCULAR	CONCRETE	-	0.50	620.1	**75.60%**	1.68	1.62	0.10
																				10.10																	
L1020B, L1020C	1020	1014	0.26	0.00	0.00	0.00	0.00	0.57	0.00	0.00	0.00	0.148	0.213	0.000	0.000	0.000	0.000	0.000	0.000	11.27	72.24	97.91	114.74	167.69	0.0	0.0	42.7	102.3	300	300	CIRCULAR	CONCRETE	-	0.65	77.5	**55.06%**	1.10	0.97	1.76
	1014	1013	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.000	2.410	0.000	0.000	0.000	0.000	0.000	0.000	13.04	66.83	90.49	106.01	154.87	0.0	0.0	447.4	64.2	675	675	CIRCULAR	CONCRETE	-	0.65	707.0	**63.28%**	1.91	1.75	0.61
	1013	1012	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.000	2.410	0.000	0.000	0.000	0.000	0.000	0.000	13.65	65.16	88.20	103.31	150.91	0.0	0.0	436.2	8.9	750	750	CIRCULAR	CONCRETE	-	0.40	734.5	**59.39%**	1.61	1.45	0.10
L1012A	1012	1011	0.15	0.00	0.00	0.00	0.00	0.57	0.00	0.00	0.00	0.087	2.497	0.000	0.000	0.000	0.000	0.000	0.000	13.75	64.89	87.83	102.88	150.27	0.0	0.0	450.1	75.8	825	825	CIRCULAR	CONCRETE	-	0.40	947.1	**47.52%**	1.72	1.44	0.88
																				14.63																	
F1021A	1021	1011	0.00	0.00	0.00	0.92	0.00	0.00	0.00	0.00	0.40	0.000	0.000	0.000	0.000	0.000	0.000	0.370	0.370	10.00	76.81	104.19	122.14	178.56	0.0	0.0	183.4	12.5	525	525	CIRCULAR	CONCRETE	-	0.25	224.3	**81.77%**	1.00	0.99	0.21
																				10.21																	
L1011B, L1011A	1011	1010	0.39	0.00	0.00	0.00	0.00	0.51	0.00	0.00	0.00	0.200	2.697	0.000	0.000	0.000	0.000	0.000	0.370	14.63	62.66	84.79	99.30	145.01	0.0	0.0	618.4	47.2	900	900	CIRCULAR	CONCRETE	-	0.30	1034.4	**59.78%**	1.58	1.42	0.55
																				15.18																	
L1020A	1020	1019	0.27	0.00	0.00	0.00	0.00	0.70	0.00	0.00	0.00	0.187	0.187	0.000	0.000	0.000	0.000	0.000	0.000	10.00	76.81	104.19	122.14	178.56	0.0	0.0	39.9	44.2	300	300	CIRCULAR	PVC	-	0.65	77.5	**51.52%**	1.10	0.95	0.78
L1019A, L1019C, L1019B	1019	1018	1.11	0.00	0.00	0.00	0.00	0.48	0.00	0.00	0.00	0.533	0.721	0.000	0.000	0.000	0.000	0.000	0.000	10.78	73.95	100.27	117.52	171.76	0.0	0.0	148.0	108.0	525	525	CIRCULAR	CONCRETE	-	0.45	301.0	**49.19%**	1.35	1.14	1.58
	1018	1017	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.000	0.721	0.000	0.000	0.000	0.000	0.000	0.000	12.35	68.81	93.21	109.21	159.57	0.0	0.0	137.7	8.8	525	525	CIRCULAR	CONCRETE	-	0.45	301.0	**45.77%**	1.35	1.12	0.13
L1017A	1017	1016	0.35	0.00	0.00	0.00	0.00	0.70	0.00	0.00	0.00	0.245	0.966	0.000	0.000	0.000	0.000	0.000	0.000	12.48	68.42	92.67	108.58	158.64	0.0	0.0	183.6	104.3	600	600	CIRCULAR	CONCRETE	-	0.45	429.7	**42.72%**	1.47	1.20	1.45
L1016A	1016	1010	0.45	0.00	0.00	0.00	0.00	0.70	0.00	0.00	0.00	0.315	1.280	0.000	0.000	0.000	0.000	0.000	0.000	13.94	64.40	87.16	102.09	149.11	0.0	0.0	229.0	39.7	675	675	CIRCULAR	CONCRETE	-	0.20	392.2	**58.40%**	1.06	0.95	0.70
																				14.63																	
L1010A, L1010B	1010	1006	0.76	0.00	0.00	0.00	0.00	0.44	0.00	0.00	0.00	0.333	4.310	0.000	0.000	0.000	0.000	0.000	0.370	15.18	61.34	82.98	97.17	141.90	0.0	0.0	880.1	86.6	1200	1200	CIRCULAR	CONCRETE	-	0.20	1819.0	**48.39%**	1.56	1.32	1.09
																				16.27																	
C1006A	1006	1005	0.00	0.39	0.00	0.00	0.00	0.00	0.70	0.00	0.00	0.000	4.468	0.271	1.094	0.000	0.000	0.000	0.370	16.27	58.91	79.65	93.26	136.16	0.0	0.0	1113.1	61.7	1350	1350	CIRCULAR	CONCRETE	-	0.20	2490.2	**44.70%**	1.69	1.40	0.74
	1005	1004	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.000	4.468	0.000	1.094	0.000	0.000	0.000	0.370	17.01	57.40	77.58	90.82	132.58	0.0	0.0	1084.4	42.5	1500	1500	CIRCULAR	CONCRETE	-	0.10	2332.0	**46.50%**	1.28	1.07	0.66
	1004	1003	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.000	4.468	0.000	1.094	0.000	0.000	0.000	0.370	17.67	56.11	75.82	88.75	129.55	0.0	0.0	1059.9	42.5	1650	1650	CIRCULAR	CONCRETE	-	0.10	3006.9	**35.25%**	1.36	1.05	0.68
C1003A	1003	1002	0.00	0.36	0.00	0.00	0.00	0.00	0.65	0.00	0.00	0.000	4.468	0.231	1.325	0.000	0.000	0.000	0.370	18.35	54.85	74.10	86.74	126.59	0.0	0.0	1083.6	43.7	1650	1650	CIRCULAR	CONCRETE	-	0.10	3006.9	**36.04%**	1.36	1.06	0.69
																				19.03																	
C1023A	1023	1002	0.00	7.40	0.00	0.00	0.00	0.00	0.70	0.00	0.00	0.000	0.000	5.179	5.179	0.000	0.000	0.000	0.000	10.00	76.81	104.19	122.14	178.56	0.0	0.0	1499.0	21.8	1200	1200	CIRCULAR	CONCRETE	-	0.20	1819.0	**82.41%**	1.56	1.55	0.23
																				10.23																	
	1002	1001	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.000	4.468	0.000	6.505	0.000	0.000	0.000	0.370	19.03	53.64	72.45	84.79	123.73	0.0	0.0	2101.8	94.7	1650	1650	CIRCULAR	CONCRETE	-	0.10	3006.9	**69.90%**	1.36	1.29	1.22
	1001	1000	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.000	4.468	0.000	6.505	0.000	0.000	0.000	0.370	20.25	51.63	69.70	81.56	119.00	0.0	0.0	2022.3	6.3	1650	1650	CIRCULAR	CONCRETE	-	0.10	3006.9	**67.26%**	1.36	1.28	0.08
																				20.34																	
L1000A	1000	P3	8.33	0.00	0.00	0.00	0.00	0.59	0.00	0.00	0.00	4.912	11.174	0.000	7.240	0.000	0.000	0.000	0.370	20.34	51.50	69.52	81.36	118.70	0.0	0.0	3118.6	43.9	1800	1800	CIRCULAR	CONCRETE	-	0.10	3792.1	**82.24%**	1.44	1.43	0.51
	P3	P2	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.000	11.174	0.000	7.240	0.000	0.000	0.000	0.370	20.85	50.71	68.45	80.09	116.84	0.0	0.0	3070.4	14.0	1800	1800	CIRCULAR	CONCRETE	-	0.10	3792.1	**80.97%**	1.44	1.43	0.16
	P2	P1	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.000	11.174	0.000	7.240	0.000	0.000	0.000	0.370	21.01	50.46	68.11	79.70	116.26	0.0	0.0	3055.5	6.5	1800	1800	CIRCULAR	CONCRETE	-	0.10	3792.1	**80.57%**	1.44	1.42	0.08
																				21.09																	
	P1	HW	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.000	11.174	0.000	7.287	0.000	0.000	0.000	0.370	21.09	50.35	67.95	79.51	115.99	0.0	0.0	3057.2	9.4	2100	2100	CIRCULAR	CONCRETE	-	1.00	18088.7	**16.90%**	5.06	3.12	0.05
																				21.14								2100	2100								

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

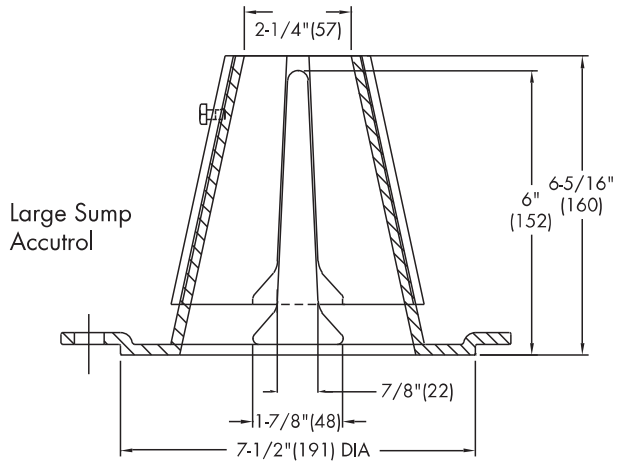
ADJUSTABLE ACCUTROL (for Large Sump Roof Drains only)

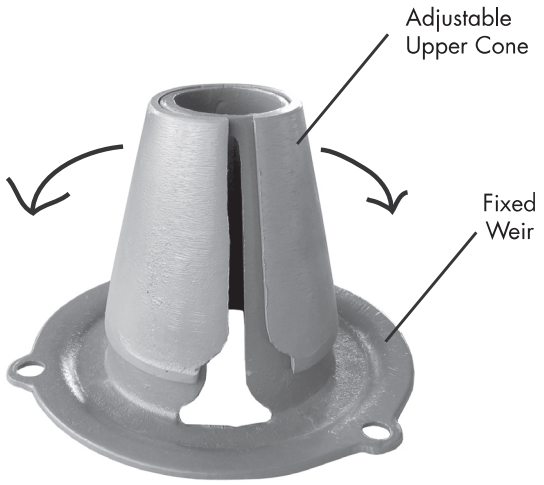
For more flexibility in controlling flow with heads deeper than 2", Watts Drainage offers the Adjustable Accutrol. The Adjustable Accutrol Weir is designed with a single parabolic opening that can be covered to restrict flow above 2" of head to less than 5 gpm per inch, up to 6" of head. To adjust the 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

24-5050A - Fernbank Catholic Highschool
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	SAMH-1	119.9	200	1.00%	32.8	1.0	13.1	0.00	0	0	0.00	0	0.00	0.00	1539	0.00	0.00	1.25	1.87	7.40	7.40	2.44	3.69	4.31
School	SAMH-1	EX-SAMH	27.9	200	1.00%	32.8	1.0	13.1	0.00	0	0	0.00	0	0.00	0.00	1539	0.00	0.00	1.25	1.87	7.40	7.40	2.44	3.69	4.31
Municipal Connection	EX-SAMH	Cope Drive	17.8	250	2.67%	97.2	2.0	4.4	0.00	0	0	0.00	0	0.00	0.00	1539	0.00	0.00	1.25	1.87	7.40	7.40	2.44	3.69	4.31

Parameter	Value	Unit	Source
Manning's Roughness (n)	0.013		City of Ottawa *Sewer Design Guidelines* , October 2012, Table 6
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

Stantec

SUBDIVISION:

Blackstone Community Phases 4-8

DATE: 3/10/2018
REVISION: 3
DESIGNED BY: MJS
CHECKED BY: DT

SANITARY SEWER DESIGN SHEET
(City of Ottawa)

FILE NUMBER: 160401130

DESIGN PARAMETERS

MAX PEAK FACTOR (RES.)=	4.0	AVG. DAILY FLOW / PERSON	280 l/p/day	MINIMUM VELOCITY	0.60 m/s
MIN PEAK FACTOR (RES.)=	2.0	COMMERCIAL	28,000 l/ha/day	MAXIMUM VELOCITY	3.00 m/s
PEAKING FACTOR (INDUSTRIAL):	2.4	INDUSTRIAL (HEAVY)	55,000 l/ha/day	MANNINGS n	0.013
PEAKING FACTOR (ICI >20%):	1.5	INDUSTRIAL (LIGHT)	35,000 l/ha/day	BEDDING CLASS	B
PERSONS / SINGLE	3.4	INSTITUTIONAL	28,000 l/ha/day	MINIMUM COVER	2.50 m
PERSONS / TOWNHOME	2.7	INFILTRATION	0.33 l/s/Ha	HARMON CORRECTION FACTOR	0.8
PERSONS / APARTMENT	1.8				

LOCATION			RESIDENTIAL AREA AND POPULATION									COMMERCIAL		INDUSTRIAL (L)		INDUSTRIAL (H)		INSTITUTIONAL		GREEN / UNUSED		C+I+I	INFILTRATION			TOTAL	PIPE							
AREA ID NUMBER	FROM M.H.	TO M.H.	AREA	SINGLE	UNITS TOWN	APT	POP.	CUMULATIVE AREA	CUMULATIVE POP.	PEAK FACT.	PEAK FLOW	AREA	ACCU. AREA	AREA	ACCU. AREA	AREA	ACCU. AREA	AREA	ACCU. AREA	AREA	ACCU. AREA	PEAK FLOW	TOTAL AREA	ACCU. AREA	INFILT. FLOW	FLOW	LENGTH	DIA	MATERIAL	CLASS	SLOPE	CAP. (FULL)	CAP. V PEAK FLOW	VEL. (FULL)	VEL. (ACT.)
			(ha)					(ha)			(l/s)	(ha)	(ha)	(ha)	(ha)	(ha)	(ha)	(ha)	(ha)	(ha)	(ha)	(l/s)	(ha)	(ha)	(l/s)	(l/s)	(m)	(mm)			(%)	(l/s)	(%)	(m/s)	(m/s)
R104A	104	103	0.27	0	11	0	30	0.27	30	3.68	0.4	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.0	0.27	0.27	0.1	0.44	39.6	200	PVC	SDR 35	0.80	29.9	**1.48%**	0.94	0.29
R103A	103	102	0.25	0	6	0	16	0.52	46	3.66	0.5	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.0	0.25	0.52	0.2	0.71	42.7	200	PVC	SDR 35	0.80	29.9	**2.39%**	0.94	0.32
R102A	102	101	0.26	0	6	0	16	0.78	62	3.64	0.7	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.0	0.26	0.78	0.3	0.99	42.7	200	PVC	SDR 35	0.80	29.9	**3.31%**	0.94	0.36
R101A	101	100	0.10	0	0	0	0	0.88	62	3.64	0.7	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.0	0.10	0.88	0.3	1.02	42.8	200	PVC	SDR 35	0.80	29.9	**3.42%**	0.94	0.37
R106A	106	100	7.72	107	35	0	458	7.72	458	3.39	5.0	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.0	7.72	7.72	2.5	7.59	20.8	200	PVC	SDR 35	0.40	21.1	**35.88%**	0.67	0.51
I105A	105	100	0.00	0	0	0	0	0.00	0	3.80	0.0	0.00	0.00	0.00	0.00	0.00	0.00	7.40	7.40	0.00	0.00	3.6	7.40	7.40	2.4	6.04	17.6	250	PVC	SDR 35	0.50	42.9	**14.09%**	0.86	0.50
R100A	100	10	0.10	0	0	0	0	8.69	520	3.37	5.7	0.00	0.00	0.00	0.00	0.00	0.00	0.00	7.40	0.00	0.00	3.6	0.10	16.09	5.3	14.59	37.8	300	PVC	SDR 35	0.20	42.9	**33.99%**	0.61	0.46
	10	4	0.00	0	0	0	0	8.69	520	3.37	5.7	0.00	0.00	0.00	0.00	0.00	0.00	0.00	7.40	0.00	0.00	3.6	0.00	16.09	5.3	14.59	11.1	300	PVC	SDR 35	0.20	42.9	**33.99%**	0.61	0.46
Fernbank Commercial	4	3	4.24	0	0	0	0	12.93	520	3.37	5.7	3.44	3.44	0.00	0.00	0.00	0.00	0.00	7.40	0.00	0.00	5.3	7.68	23.77	7.8	18.80	62.5	300	PVC	SDR 35	0.20	42.9	**43.79%**	0.61	0.50
EXTR 10	3	2	0.20	0	0	0	0	13.13	520	3.37	5.7	0.00	3.44	0.00	0.00	0.00	0.00	0.00	7.40	0.00	0.00	5.3	0.20	23.97	7.9	18.87	70.7	300	PVC	SDR 35	0.20	42.9	**43.94%**	0.61	0.50
EXTR 11	2	1	0.28	0	0	0	0	13.41	520	3.37	5.7	0.00	3.44	0.00	0.00	0.00	0.00	0.00	7.40	0.00	0.00	5.3	0.28	24.25	8.0	18.96	70.5	300 525	PVC	SDR 35	0.20	42.9	**44.16%**	0.61	0.50
R207A	207	206	0.37	0	8	0	22	0.37	22	3.70	0.3	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.0	0.37	0.37	0.1	0.38	61.0	200	PVC	SDR 35	0.65	27.0	**1.41%**	0.85	0.26
R206A	206	205	0.41	7	0	0	24	0.78	45	3.66	0.5	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.0	0.41	0.78	0.3	0.79	65.0	200	PVC	SDR 35	0.40	21.1	**3.76%**	0.67	0.26
R205A, R205B	205	204	0.46	0	4	0	11	1.24	56	3.64	0.7	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.0	0.46	1.24	0.4	1.07	49.4	200	PVC	SDR 35	0.40	21.1	**5.07%**	0.67	0.29
R204A	204	203	0.52	0	10	0	27	1.76	83	3.61	1.0	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.0	0.52	1.76	0.6	1.55	91.7	200	PVC	SDR 35	0.40	21.2	**7.34%**	0.67	0.32
I275A	275	203	0.00	0	0	0	0	0.00	0	3.80	0.0	0.00	0.00	0.00	0.00	0.00	0.00	2.85	2.85	0.00	0.00	1.4	2.85	2.85	0.9	2.32	15.0	200	PVC	SDR 35	0.50	23.6	**9.83%**	0.74	0.39
R203A	203	202	0.52	0	11	0	30	2.28	113	3.58	1.3	0.00	0.00	0.00	0.00	0.00	0.00	0.00	2.85	0.00	0.00	1.4	0.52	5.12	1.7	4.39	120.0	200	PVC	SDR 35	0.40	21.1	**20.74%**	0.67	0.44
R900A, External Fernbank	900	212A	8.65	0	10	0	531	8.65	531	3.37	5.8	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.0	8.65	8.65	2.9	8.65	29.8	250	PVC	SDR 35	0.27	31.5	**27.46%**	0.63	0.45
	212A	212	0.00	0	0	0	0	8.65	531	3.37	5.8	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.0	0.00	8.65	2.9	8.65	82.1	250	PVC	SDR 35	0.27	31.5	**27.46%**	0.63	0.45
R212A	212	211	0.89	0	24	0	65	9.54	596	3.35	6.5	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.0	0.89	9.54	3.1	9.61	118.1	250	PVC	SDR 35	0.40	38.3	**25.06%**	0.77	0.53
R211A	211	210	0.50	0	14	0	38	10.05	634	3.34	6.8	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.0	0.50	10.05	3.3	10.16	61.1	250	PVC	SDR 35	0.40	38.3	**26.50%**	0.77	0.54
R272A	272	271	0.43	4	8	0	35	0.43	35	3.67	0.4	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.0	0.43	0.43	0.1	0.56	51.9	200	PVC	SDR 35	0.50	23.6	**2.37%**	0.74	0.26
R271A	271	270	0.40	5	5	0	31	0.83	66	3.63	0.8	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.0	0.40	0.83	0.3	1.05	45.2	200	PVC	SDR 35	0.50	23.6	**4.42%**	0.74	0.32
R270A	270	269	0.38	4	6	0	30	1.21	96	3.60	1.1	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.0	0.38	1.21	0.4	1.51	45.2	200	PVC	SDR 35	1.00	33.4	**4.52%**	1.05	0.45
R269A	269	210	0.07	0	0	0	0	1.28	96	3.60	1.1	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.0	0.07	1.28	0.4	1.53	49.4	200	PVC	SDR 35	0.50	23.6	**6.49%**	0.74	0.35
R261A	261	260	0.22	0	6	0	16	0.22	16	3.71	0.2	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.0	0.22	0.22	0.1	0.27	43.6	200	PVC	SDR 35	0.65	27.0	**1.00%**	0.85	0.23
R260A	260	249	0.39	6	2	0	26	0.62	42	3.66	0.5	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.0	0.39	0.62	0.2	0.70	82.0	200	PVC	SDR 35	0.40	21.1	**3.32%**	0.67	0.25
R249A	249	239	0.79	19	0	0	65	1.41	107	3.59	1.2	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.0	0.79	1.41	0.5	1.70	96.9	200	PVC	SDR 35	0.40	21.1	**8.06%**	0.67	0.33
R239A	239	238	0.84	15	0	0	51	2.25	158	3.55	1.8	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.0	0.84	2.25	0.7	2.55	96.9	200	PVC	SDR 35	0.40	21.1	**12.08%**	0.67	0.37
R238A	238	237	0.71	15	0	0	51	2.97	209	3.51	2.4	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.0	0.71	2.97	1.0	3.35	92.3	200	PVC	SDR 35	0.40	21.1	**15.86%**	0.67	0.40
R237A	237	236	0.23	2	0	0	7	3.20	215	3.51	2.4	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.0	0.23	3.20	1.1	3.51	14.8	200	PVC	SDR 35	0.40	21.1	**16.58%**	0.67	0.41
R236A	236	235	0.69	12	0	0	41	3.89	256	3.49	2.9	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.0	0.69	3.89	1.3	4.18	92.2	200	PVC	SDR 35	0.40	21.1	**19.75%**	0.67	0.43
R235A	235	234	0.43	8	0	0	27	4.31	283	3.47	3.2	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.0	0.43	4.31	1.4	4.61	44.3	200	PVC	SDR 35	0.40	21.1	**21.80%**	0.67	0.45
R234A	234	233	0.27	5	0	0	17	4.58	300	3.46	3.4	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.0	0.27	4.58	1.5	4.88	43.0	200	PVC	SDR 35	0.40	21.1	**23.09%**	0.67	0.45
R266A	266	263	0.33	0	13	0	35	0.33	35	3.67	0.4	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.0	0.33	0.33	0.1	0.53	103.7	200	PVC	SDR 35	0.40	21.1	**2.49%**	0.67	0.24
R265A	265	264	0.22	0	10	0	27	0.22	27	3.69	0.3	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.0	0.22	0.22	0.1	0.40	70.3	200	PVC	SDR 35	0.65	27.0	**1.47%**	0.85	0.26
R264A	264	263	0.22	0	10	0	27	0.44	54	3.65	0.6	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.0	0.22	0.44	0.1	0.78	83.6	200	PVC	SDR 35	1.00	33.4	**2.35%**	1.05	0.36
	263	258	0.00	0	0	0	0	0.77	89	3.61	1.0	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.0	0.00	0.77	0.3	1.30	44.3	200	PVC	SDR 35	0.40	21.1	**6.13%**	0.67	0.30
R262A	262	258	0.51	0	26	0	70	0.51	70	3.63	0.8	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.0	0.51	0.51	0.2	0.99	104.2	200	PVC	SDR 35	0.40	21.1	**4.69%**	0.67	0.28
R260B	260	259	0.48	0	20	0	54	0.48	54	3.65	0.6	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.0	0.48	0.48	0.2	0.80	83.3	200	PVC	SDR 35	0.90	31.7	**2.52%**	1.00	0.36
R259A	259	258	0.48	0	20	0	54	0.96	108	3.59	1.3	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.0	0.48	0.96	0.3	1.57	83.4	200	PVC	SDR 35	0.90	31.7	**4.96%**	1.00	0.43
	258	254	0.00	0	0	0	0	2.24	267	3.48	3.0	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.0	0.00	2.24	0.7	3.75	45.0	200	PVC	SDR 35	0.40	21.1	**17.74%**	0.67	0.42
R257A	257	256	0.46	0	13	0	35	0.46	35	3.67	0.4	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.0	0.46	0.46	0.2	0.57	82.4	200	PVC	SDR 35	0.40	21.1	**2.70%**	0.67	0.24
R256A	256	255	0.16	0	3	0	8	0.62	43	3.66	0.5	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.0	0.16	0.62	0.2	0.72	11.8	200	PVC	SDR 35	0.40	21.1	**3.39%**	0.67	0.26
R255A	255	254	0.71	0	27	0	73	1.33	116	3.58	1.3	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.0	0.71	1.33	0.4	1.79	109.7	200	PVC	SDR 35	0.40	21.1	**8.44%**	0.67	0.34
R254A	254	251	0.44	8	0	0	27	4.01	411	3.41	4.5	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.0	0.44	4.01	1.3	5.86	82.0	200	PVC	SDR 35	0.40	21.1	**27.73%**	0.67	0.47
R253A	253	252	0.45	0	7	0	19	0.45	19	3.71	0.2	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.0	0.45	0.45	0.1	0.38	81.0	200	PVC	SDR 35	0.65	27.0	**1.40%**	0.85	0.26
G273A	273	252	0.00	0	0	0	0	0.00	0	3.80	0.0	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	1.35	1.35	0.0	1.35	1.35	0.4	0.45	11.0	200	PVC	SDR 35	0.50	23.6	**1.89%**	0.74	0.24
R252A	252	251	0.48	8	0	0	27	0.93	46	3.66	0.5	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	1.35	0.0	0.48	2.28	0.8	1.30	102.4	200	PVC	SDR 35	0.40	21.1	**6.15%**	0.67	0.30
R251A	251	250	0.85	16	0	0	54	5.79	511	3.38	5.6	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	1.35	0.0	0.85	7.14	2.4	7.95	100.0	200	PVC	SDR 35	0.40	21.1	**37.58%**	0.67	0.52
	250	241	0.00	0	0	0	0	5.79	511	3.38	5.6	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	1.35	0.0	0.00	7.14	2.4	7.95	17.4	200	PVC	SDR 35	0.40	21.1	**37.58%**	0.67	0.52

Appendix D
Water Servicing Calculations

Fernbank Catholic High School - 5431 Fernbank Road
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	1539	students	Site plan
Average Daily Demand	107730 1.25	L/d L/s	
Maximum Daily Factor	1.5		*Ottawa Design Guidelines - Water Distribution* Table 4.2
Maximum Daily Demand	1.87	L/s	
Maximum Hourly Factor	1.8		*Ottawa Design Guidelines - Water Distribution* Table 4.2
Maximum Hourly Demand	3.37	L/s	

Fernbank Catholic Highschool - 5431 Fernbank Road

Jp2g Consultants Inc.
ENGINEERS · PLANNERS · PROJECT MANAGERS

Appendix D- Fire Flow Demand Requirements

D.1.1 - 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 24-5050A

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

New School Building

Design Parameters*

Type of Building Construction = Type II (Noncombustible)
Floor Area*** = 6987.0 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	
Separation Distance =	over 30m	over 30m	over 30m	over 30m	m
Length of Exposed Wall =	NA	NA	NA	NA	m
Length-Height Factor =	NA	NA	NA	NA	m-storeys (up to a maximum of 5-storeys)

Building Construction	Floor Area***	Coefficient	A	Adjustments (increases or decreases)										Final Adjusted Fire Flow	Final Adjusted Fire Flow
			Fire Flow (F)	B = A +/- %		C = B x %		D = B x %							
				Occupancy		Sprinkler		Exposure***							
	(m^2)		(L/min)	%	Adjusted Fire Flow(s) (L/min)	%	Fire Adjustment Flow(s) (L/min)	West	North	East	South	Total Exposure	Fire Adjustment Flow(s) (L/min)	E = B - C + D (L/min)"	(L/s)
Type II (Noncombustible)	17,467.5	0.8	23,000.0	-0.15	19,550.0	50%	9,775.0	0%	0%	0%	0%	0%	0.0	10,000.0	166.7

*Water Supply for Public Protection (Fire Underwriters Survey, 2020).
***Considering two largest adjoining floor areas plus 50% of all floor areas immediately above

Appendix D- Fire Flow Demand Requirements OBC

Project Number	24-5050A
Date	5-Aug-25
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.)	6987	**COMMENT ON BUILDING HEIGHT**
Building Height (m)	12.5	To u/s of roof decking.
Stories	3	

VOLUME (cu.m.)	**87,338**

MINIMUM WATER SUPPLY (Q)

Calculate Minimum Water Supply (Q) from formula

$$Q = KVS_{tot}$$

K	10
V	87,338
S_{tot}	1.00

Q	**873,375**	**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**

Boundary Conditions
5431 Fernbank Road

Provided Information

Scenario	Demand	
	L/min	L/s
Average Daily Demand	75	1.25
Maximum Daily Demand	112	1.87
Peak Hour	202	3.37
Fire Flow Demand #1	10,000	166.67

Location

Results

Connection 1 – Cope Drive

Demand Scenario	Head (m)	Pressure[1] (psi)
Maximum HGL	161.9	90.8
Peak Hour	155.6	81.8
Max Day plus Fire Flow #1	153.3	78.5

[1] Ground Elevation = 97.6 m

Connection 2 – Atlas Terrace

Demand Scenario	Head (m)	Pressure[1] (psi)
Maximum HGL	161.8	88.8
Maximum HGL	155.6	79.9
Max Day plus Fire Flow #1	144.9	64.7

[1] Ground Elevation = 99.4 m

Notes

1. The IWSD has recently updated their water modelling software. Any significant difference between previously received BC results and newly received BC results could be attributed to this update.
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.

From: Vladimir Popovic <vladimirp@n45.ca>
Sent: Wednesday, August 6, 2025 8:42 AM
To: Zachary Bauman; Jordan Cuff
Cc: Ali Sammour; jcuff@cunliffe.ca; Nathan Farncombe; Isabelle Lafond; Erwin Cariaga
Subject: RE: Fernbank CHS Boreholes

Students: 1439
Staff: 100 (maximum)

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: Zachary Bauman <zach.bauman@jp2g.com>
Sent: August 5, 2025 2:18 PM
To: Vladimir Popovic <vladimirp@n45.ca>; Jordan Cuff <jcuff@cunliffe.ca>
Cc: Ali Sammour <ali.sammour@jp2g.com>; jcuff@cunliffe.ca; Nathan Farncombe <nathanf@n45.ca>; Isabelle Lafond <isabellel@n45.ca>; Erwin Cariaga <erwinc@n45.ca>
Subject: RE: Fernbank CHS Boreholes

Hi Vlad,

These should be enough boreholes for us.

Do you have a student and staff count we can use for our water servicing demands?

Zachary Bauman B.Eng., EIT
Civil Intern
Jp2g Consultants Inc.

1150 Morrison Drive, Suite 410, Ottawa | K2H 8S9, Ontario, Canada
e: zach.bauman@jp2g.com | **w:** www.jp2g.com
m: 519-572-0196 | **p:** 613-828-7800

CONFIDENTIALITY NOTICE

D.1.2 - Existing Water Boundary Conditions - Connection 1 - Cope Drive

Water Demands			Design Parameters			Boundary Conditions		
Average Daily Demand:	1.25	l/s	Pipe Diameter:	200	mm	Max. HGL:	161.9	m
Maximum Daily Demand:	1.87	l/s	Pipe Material:	PVC		Min HGL:	155.6	m
Maximum Hour Demand:	3.37	l/s	Pipe Length (total network):	343.0	m	Max. Day + Fire:	155.3	m
Fire Flow Demand:	166.67	l/s	Finished Floor Elevation:	99.65				
Maximum Daily + Fire Flow Demand:	168.54	l/s	Pavement (R.O.W.) Elevation:	97.60				

Boundary Condition Check

Check water pressure at municipal connection:

Min. HGL - Pavement elevation =	58.00	m	
=	82.47	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)**
=	568.64	kPa*	

Pressure at municipal connection NOT OK - OVER 80 PSI

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

Min. HGL - Finished floor elevation - Friction Loss** =	55.93	m	****Friction loss calculated using the Hazen-Williams Equation**
=	79.53	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)**
=	548.31	kPa***	

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

Check water pressure at building connection (at max. day + fire demand):

Min. HGL - Finished floor elevation - Friction Loss** =	23.01	m	****Friction loss calculated using the Hazen-Williams Equation**
=	32.72	psi****	******Under maximum day and fire flow demand conditions the residual pressure at any point in the system shall not be less than 140 kPa (20 psi) as per City of Ottawa Design Guidelines - Water Distribution (Section 4.2.2)**
=	225.63	kPa****	

Pressure at municipal connection (at max. day + fire demand) OK

Cope Drive Connection Max Hour
Hazen-Williams Equation for Pressure Loss in Pipes
SI Units

Specified Data

l = length of pipe (m)	343	
c = Hazen-Williams roughness constant	150	
q = volume flow (liter/sec)	3.37	0.00337 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	6.79	
f = friction head loss in kPa per 100 m of pipe (kPa per 100 m pipe)	0.07	
Head loss (mm H20)	23.28	**0.023283 METERS**
Head loss (kPa)	0.23	

Calculated Flow Velocity

v = flow velocity (m/s)	0.11	

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

Cope Drive Connection Max Day + FF
Hazen-Williams Equation for Pressure Loss in Pipes
SI Units

Specified Data

l = length of pipe (m)	343	
c = Hazen-Williams roughness constant	150	
q = volume flow (liter/sec)	168.54	0.168537 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	9515.07	
f = friction head loss in kPa per 100 m of pipe (kPa per 100 m pipe)	93.34	
Head loss (mm H20)	32636.69	**32.63669 METERS**
Head loss (kPa)	320.17	

Calculated Flow Velocity

v = flow velocity (m/s)	5.36	

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

Water Demands

Average Daily Demand:	1.25	l/s
Maximum Daily Demand:	1.87	l/s
Maximum Hour Demand:	3.37	l/s
Fire Flow Demand:	166.67	l/s
Maximum Daily + Fire Flow Demand:	168.54	l/s

Design Parameters

Pipe Diameter:	200	mm
Pipe Material:	PVC	
Pipe Length (total network):	45.0	m
Finished Floor Elevation:	99.65	
Pavement (R.O.W.) Elevation:	99.40	

Boundary Conditions

Max. HGL:	161.8	m
Min HGL:	155.6	m
Max. Day + Fire:	144.9	m

Boundary Condition Check

Check water pressure at municipal connection:

Min. HGL - Pavement elevation =	56.20	m	
=	79.91	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)**
=	550.99	kPa*	

Pressure at municipal connection OK

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

Min. HGL - Finished floor elevation - Friction Loss** =	55.95	m	****Friction loss calculated using the Hazen-Williams Equation**
=	79.55	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)**
=	548.51	kPa***	

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

Check water pressure at building connection (at max. day + fire demand):

Min. HGL - Finished floor elevation - Friction Loss** =	40.97	m	****Friction loss calculated using the Hazen-Williams Equation**
=	58.26	psi****	******Under maximum day and fire flow demand conditions the residual pressure at any point in the system shall not be less than 140 kPa (20 psi) as per City of Ottawa Design Guidelines - Water Distribution (Section 4.2.2)**
=	401.66	kPa****	

Pressure at municipal connection (at max. day + fire demand) OK

Atlas Terrace Max Hour
Hazen-Williams Equation for Pressure Loss in Pipes
SI Units

Specified Data

l = length of pipe (m)	45	
c = Hazen-Williams roughness constant	150	
q = volume flow (liter/sec)	3.37	0.00337 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)	6.79	
f = friction head loss in kPa per 100 m of pipe (kPa per 100 m pipe)	0.07	
Head loss (mm H20)	3.05	**0.003055 METERS**
Head loss (kPa)	0.03	

Calculated Flow Velocity

v = flow velocity (m/s)	0.11

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

Atlas Terrace Max Day + FF
Hazen-Williams Equation for Pressure Loss in Pipes
SI Units

Specified Data

l = length of pipe (m)	45	
c = Hazen-Williams roughness constant	150	
q = volume flow (liter/sec)	168.54	0.168537 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)	9515.07	
f = friction head loss in kPa per 100 m of pipe (kPa per 100 m pipe)	93.34	
Head loss (mm H20)	4281.78	**4.281782 METERS**
Head loss (kPa)	42.00	

Calculated Flow Velocity

v = flow velocity (m/s)	5.36

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

D.1.2 - Existing Water Boundary Conditions - Private Hydrant Check - Cope Drive

Water Demands

Average Daily Demand:	1.25	l/s
Maximum Daily Demand:	1.87	l/s
Maximum Hour Demand:	3.37	l/s
Fire Flow Demand at hydrant	166.67	l/s
Maximum Daily + Fire Flow Demand:	168.54	l/s

Design Parameters

Pipe Diameter:	200	mm
Pipe Material:	PVC	
Pipe Length (total network):	231.0	m
Finished Floor Elevation:	99.65	
Pavement elevation at hydrant:	99.55	

Boundary Conditions

Max. HGL:	161.90	m
Min HGL:	155.60	m
Max. Day + Fire:	155.30	m

Boundary Condition Check

Check water pressure at fire hydrant

Min. HGL - elevation at hydrant- Friction Loss** =	48.45	m
=	68.89	psi****
=	474.99	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**

Check at Private Fire Hydrant - Cope Drive
Hazen-Williams Equation for Pressure Loss in Pipes
SI Units

Specified Data

l = length of pipe (m)	231	
c = Hazen-Williams roughness constant	150	
q = volume flow (liter/sec)	95	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)	7602.04	**7.602039 METERS**
Head loss (kPa)	74.58	

Calculated Flow Velocity

v = flow velocity (m/s)	3.02	

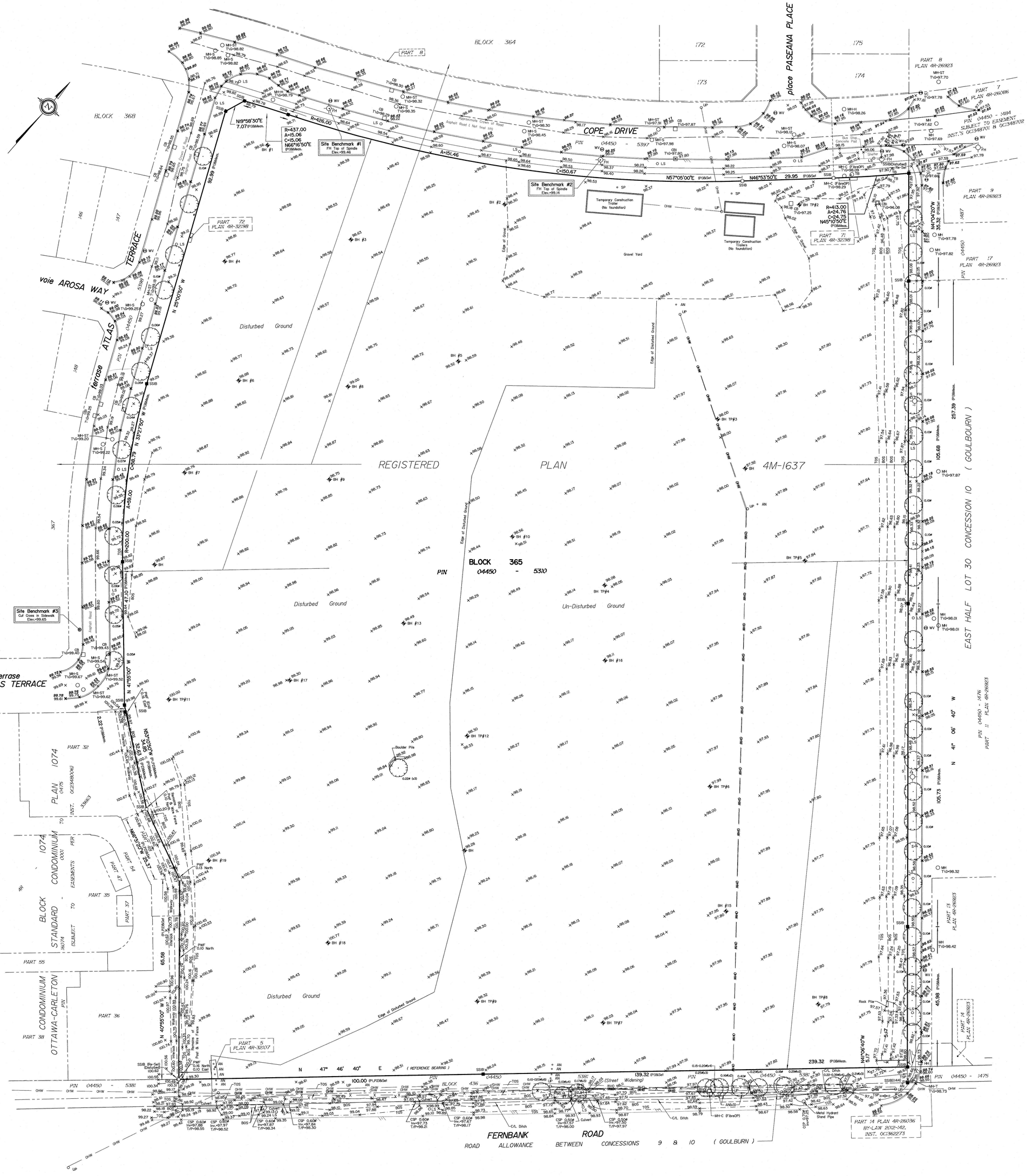
Material	Hazen-Williams Coefficient - c -
ABS - Acrylonite Butadiene Styrene	130
Aluminum	130 - 150
Asbestos Cement	140
Asphalt Lining	130 - 140
Brass	130 - 140
Brick sewer	90 - 100
Cast-Iron - new unlined (CIP)	130
Cast-Iron 10 years old	107 - 113
Cast-Iron 20 years old	89 - 100
Cast-Iron 30 years old	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 E
Additional Documents

TOPOGRAPHIC PLAN OF SURVEY OF

BLOCK 365
REGISTERED PLAN 4M-1637
CITY OF OTTAWA

Surveyed by Annis, O'Sullivan, Vollebekk Ltd.


BLOCK 364
BLOCK 368
BLOCK 365
PIN 04450 - 5310
COPE DRIVE
place PASEANA PLACE
terrace ATLAS TERRACE
voie AROSA WAY
REGISTERED PLAN 4M-1637
PART 8
PART 7 PLAN 4R-26086
PART 9 PLAN 4R-26923
PART 17 PLAN 4R-26923
PART 72 PLAN 4R-32198
PART 73 PLAN 4R-32198
PART 5 PLAN 4R-32107
PART 32
PART 35
PART 36
PART 38
PART 54
PART 55
PART 57
PART 13 PLAN 4R-26923
PART 14 PLAN 4R-26923
PART 14 PLAN 4R-26036 BY-LAW 2012-142, INST. OC1362273
BLOCK 1074 PLAN 04750 (OC2348306) TO BLOCK 1074 CONDOMINIUM PLAN 04750 (OC348701) AND EASEMENTS AS IN INST. 536103
BLOCK 1074 CONDOMINIUM PLAN 04750 (OC348701) AND EASEMENTS AS IN INST. OC1348702
OTTAWA-CARLETON CONDOMINIUM PLAN 04750 (OC348701) AND EASEMENTS AS IN INST. OC1348702
PIN 04450 - 1484 SUBJECT TO EASEMENT INST.'S OC1348701 & OC1348702
PIN 04450 - 1475
PIN 04450 - 5381
PIN 04450 - 5397
PIN 04450 - 1487
EAST HALF LOT 30 CONCESSION 10 (GOULBOURN)
FERNBANK ROAD
ROAD ALLOWANCE BETWEEN CONCESSIONS 9 & 10 (GOULBOURN)
Site Benchmark #1 FH Top of Spindle Elev.=99.46
Site Benchmark #2 FH Top of Spindle Elev.=99.14
Site Benchmark #3 Cut Cross in Sidewalk Elev.=99.65
Temporary Construction Trailer (No foundation)
Gravel Yard
Disturbed Ground
Un-Disturbed Ground
Edge of Disturbed Ground
Edge of Gravel
Boulder Pile
Rock Pile
Bus Stop Concrete Pad
Bus Stop Shelter
Asphalt Road (Not Year Inv)
Pavement Crown of Road
Gravel Road
Water Line with Fence
Water Line with Post & Wire Fence
Water Line with Hedge
Water Line with Post & Rail Fence
R=426.00
R=437.00 A=15.06 C=15.06 N66°16'50"E (P1&Meas.)
A=151.46
C=150.67
N19°59'30"E 7.07 (P1&Meas.)
N57°05'00"E (P1&Set)
N46°53'50"E 29.95 (P1&Set)
R=413.00 A=24.76 C=24.76 N45°10'50"E (P1&Meas.)
N41°04'20"W 35.32 (P1&Set)
N 25°05'50" W 92.59 (P1&Meas.)
N 33°27'30" W (P1&Meas.) C=82.79 A=89.00 R=200.00
N 41°55'00" W 2.22 (P1&Meas.)
N53°04'30"W 32.63 (P1&Meas.)
N 40°55'00" W 65.58
N66°31'20"W 29.37
N 47° 46' 40" E (REFERENCE BEARING)
100.00 (P1,P2&Set)
139.32 (P1&Set)
239.32 (P1&Meas.)
N41°06'40"W 5.17
105.68 (P1&Meas.)
257.39 (P1&Meas.)
105.73 (P1&Meas.)
45.98 (P1&Meas.)
N 41° 06' 40" W
Ø 65.00
+ 65.00
+ 65.00
BH #1 … BH #19
BH TP#1 … BH TP#12
BH TP#2 … BH TP#8
Boulder Pile 98.90 98.98 0.22ø (x3)
Rock Pile 97.57 97.74 0.30ø (x3)
Culvert Inv=97.97 T/P=98.55
Culvert Inv=97.87 T/P=98.34
Culvert Inv=97.84 T/P=98.30
Culvert Inv=97.73 T/P=98.21
Culvert Inv=97.93 T/P=98.17
Culvert Inv=97.67 T/P=98.00
Culvert Inv=97.57 T/P=97.97
C/L Ditch 0.25-0.29x(4)+0.21x(3)
Metal Hydrant Stand Pipe
Pwr 0.15 North
Pwr 0.10 North
Pwr 0.8 North 0.10 East
Pwr 0.8 North 0.8 Wire Fence
Pwr 0.8 North 0.8 Post & Wire Fence
Pwr 0.8 North 0.8 Hedge
Pwr 0.8 North 0.8 Post & Rail Fence
Pwr 0.8 North 0.8 Water Line with Fence
Pwr 0.8 North 0.8 Water Line with Post & Wire Fence
Pwr 0.8 North 0.8 Water Line with Hedge
Pwr 0.8 North 0.8 Water Line with Post & Rail Fence
SSIB (Re-Set) Disturbed 100.62
SSIB (Re-Set) Disturbed 97.90
SSIB (Re-Set) Disturbed 97.59
SSIB (Re-Set) Disturbed 97.53
SSIB (Re-Set) Disturbed 97.66
SSIB (Re-Set) Disturbed 97.67
SSIB (Re-Set) Disturbed 97.70
SSIB (Re-Set) Disturbed 97.62
SSIB (Re-Set) Disturbed 97.65
SSIB (Re-Set) Disturbed 97.78
SSIB (Re-Set) Disturbed 97.79
SSIB (Re-Set) Disturbed 97.80
SSIB (Re-Set) Disturbed 97.82
SSIB (Re-Set) Disturbed 97.83
SSIB (Re-Set) Disturbed 97.84
SSIB (Re-Set) Disturbed 97.85
SSIB (Re-Set) Disturbed 97.86
SSIB (Re-Set) Disturbed 97.87
SSIB (Re-Set) Disturbed 97.88
SSIB (Re-Set) Disturbed 97.89
SSIB (Re-Set) Disturbed 97.90
SSIB (Re-Set) Disturbed 97.91
SSIB (Re-Set) Disturbed

File No.: PC2025-0021

March 14, 2025

Randy Leafloor
Ottawa Catholic School Board
Via email: randy.leafloor@ocsb.ca

Subject: Pre-Consultation: Meeting Feedback
Proposed Site Plan Control Application – 5431 Fernbank Road

Please find below information regarding next steps as well as consolidated comments from the above-noted pre-consultation meeting held on March 3, 2025.

Pre-Consultation Preliminary Assessment

1 ☐	**2** ☒	**3** ☐	**4** ☐	**5** ☐

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

Next Steps

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

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

3. Please note, if your development proposal changes significantly in scope, design, or density it is recommended that a subsequent pre-consultation application be submitted.

Supporting Information and Material Requirements

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

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

Consultation with Technical Agencies

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

Planning

Comments:

1. Policies and provisions, PPS, OP, CDP

    a. The site is within the Neighbourhood designation and abuts Fernbank Road which is designated Corridor (minor) in the Official Plan.

    b. The site is within the Fernbank Community Design Plan. Please consider the guidelines for schools found on Section 6.6.5.

2. It is advised, the building should be located closer to Cope Drive, with vehicular access diverted towards Fernbank. An active layby for parents on Cope is acceptable. Perhaps consider having the building turned 90 degrees, for example, but have it touch Cope and also be close to Fernbank.

3. All indicators point that Cope Drive is the interface where the building facade ought to be located, for the local community's modal split of walkers, bikers, and local car drop-offs. Most vehicular access ought to be designed as far away from Cope as possible. The lay-by on Cope ought to remain active.

4. The concern for the community's opposition to a morning and afternoon gridlock that this additional school on Cope would be exacerbating, is a valid concern but the siphoning of most vehicular traffic to Fernbank will divert a lot of the congestion created by this school.

5. The current concept/site plan will inadvertently cause light and noise pollution on Cope Drive and onto the local residential community.

6. A thought: could the drop off be located on Atlas Terrasse to avoid increasing the traffic on Cope Drive?

Urban Design

Submission requirements:

- Urban Design Brief
- Site Plan
- Landscape Plan
- Elevations
- Floor plans (conceptual)

Preliminary Design comments:

7. Please provide site planning options. There is merit to locating the school on Cope Drive to reduce walking distance for students in the neighbourhood, and maintaining vehicular access from Fernbank, please explore this configuration.

8. Please consider the impact of lighting the Football field on surrounding residences, please consider relocating the football field closer to Fernbank or towards Walmart.

9. Please provide clear direct pedestrian/bike connections to the building which reduce walking distance for students – provide a secondary access for pedestrians on the west or north elevation. Please ensure that the landscaping of the pathways are designed with paving and shade tree plantings to provide pedestrian comfort and highlight these connections.

10. Provide bicycle parking close to pedestrian entrances to the building.

11. Please ensure that significant tree planting is provided on site and tree plantings are provided in the ROW.

Engineering

Comments:

12. 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. The following studies apply: **(Fernbank Community Ultimate Pond 8 – Stormwater Management Facility Design Report; Blackstone Community Phase 4-8 – Functional Servicing Report).**

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. **Water Quality Control**: provided at Ultimate Pond 8 – Stormwater Management Facility.

e. Water Quantity Control: Based on the Fernbank Community Ultimate Pond 8 – Stormwater Management Facility Design Report; Blackstone Community Phase 4-8 – Functional Servicing Report. Please control post-development runoff from the subject site, for the 5-year storm event up to and including the 100-year storm event.

f. 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.

g. 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

h. 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.

i. 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.

j. 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.

k. 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.

l. **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.

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

c. It is the sole responsibility of the consultant to investigate the location of existing underground utilities in the proposed servicing area and submit a request for locates to avoid conflict(s). The location of existing utilities and services shall be documented on an Existing Conditions Plan.

d. Any easements on the subject site shall be identified and respected by any development proposal and shall adhere to the conditions identified in the easement agreement. A legal survey plan shall be provided, and all easements shall be shown on the engineering plans.

e. All underground and above ground building footprints and permanent walls need to be shown on the plans to confirm that any permanent structure does not extend either above or below into the existing property lines and sight triangles.

14. Storm Sewer

a. A 1200mm dia. concrete storm sewer stub is available on 5431 Fernbank property off the intersection at Cope Drive and Paseana Place.

b. 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.

15. Sanitary Sewer

a. A 250 mm dia. PVC Sanitary sewer stub is available on 5431 Fernbank property off the intersection at Cope Drive and Paseana Place.

b. Please provide the new Sanitary sewer discharge and we will confirm if sanitary sewer main has the capacity. The allowable sanitary release rate based on the **Blackstone Community Phase 4-8 – Functional Servicing Report**.

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. The proposed wastewater servicing design shall be consistent with higher-level studies and plans (**Blackstone Community Phase 4-8 – Functional Servicing Report**).

16. Water:

a. A 200 mm dia. PVC watermain (2021) stub is available at 5431 Fernbank property of Cope Drive at the intersection with Paseana Place.

i. Given the distance of the watermain from the existing stub to the entrance of the building a District Metering Area chamber is required as per Water Design Guidelines – Clause 4.4.7.2

b. 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.

c. 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.

d. 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.

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

f. Any proposed fire (emergency) route is to be to the satisfaction of Fire Services. Please note that a siamese connection needs to be within 45m from an existing fire hydrant as per (OBC – 3.2.5.16 Fire Department Connections).

17. 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.

18. Environmental

a. A Phase I ESA was completed in 2022; therefore a Phase I ESA update is 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)

19. 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

20. 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)

21. 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.

22. For any proposed exterior light fixtures, please provide certification from a licensed professional engineer confirming lighting has been designed only using fixtures that meet the criteria for full cut-off classification as recognized by the Illuminating Engineering Society of North America and result in minimal light spillage onto adjacent properties (maximum allowable spillage is 0.5 fc). Additionally, include in the submission the location of the fixtures, fixture type (make, model, part number and mounting height).

23. Gas pressure regulating stations: A gas pressure regulating station may be required depending on HVAC needs. Be sure to include this on the Grading, Site Servicing, SWM and Landscape plans. This is to ensure that there are no barriers for overland flow routes (SWM) or conflicts with any proposed grading or landscape features with installed structures and has nothing to do with supply and demand of any product.

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 Anton Chetrar, Project Manager, for follow-up questions at anton.chetrar@ottawa.ca

Noise

Comments:

24. A road noise study is required.

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

Transportation

Comments:

25. Right-of-way protection (Fernbank, Cope).
    a. See Schedule C16 of the Official Plan.
    b. Any requests for exceptions to ROW protection requirements must be discussed with Transportation Planning and concurrence provided by Transportation Planning management.
26. Corner Sight Triangle (Cope/Atlus): 3 x 9 m
27. TIA submission required. Please proceed to Step 2 scoping.
28. The Atlus egress should be perpendicular to the public road.
29. Narrow the Fernbank layby accesses to ensure they are used unidirectionally.

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

Environment

Comments:

30. There are no triggers for an Environmental Impact Study.
31. Bird-Safe Design Guidelines - Please review and incorporate bird safe design elements. Some of the risk factors include glass and related design traps such as corner glass and fly-through conditions, ventilation grates and open pipes, landscaping, light pollution. More guidance and solutions are available in the guidelines which can be found here: https://documents.ottawa.ca/sites/documents/files/birdsafedesign_guidelines_en.pdf
32. Please consider if there are features that can be added reduce the urban heat island effect (see OP 10.3.3). For example, this impact can be reduced by adding large canopy trees, green roofs or vegetation walls, or incorporating building with low heat absorbing materials.

Feel free to contact Matthew Hayley, Environmental Planner, for follow-up questions.

Forestry

Comments:

33. **Tree Conservation Report (TCR) requirements –** there may be trees present on site. If there are, a Tree Conservation Report will be required.

    a. An approved TCR is a requirement of Site Plan approval.

    b. Any removal of privately-owned trees 10cm or larger in diameter, or city-owned trees of any diameter requires a tree permit issued under the Tree Protection Bylaw (Bylaw 2020 – 340); the permit will be based on an approved TCR and made available at or near plan approval.

    c. The TCR must contain 2 separate plans:

        i. Plan/Map 1 - show existing conditions with tree cover information

        ii. Plan/Map 2 - show proposed development with tree cover information.

    d. The TCR must list all trees on site, as well as off-site trees if the CRZ (critical root zone) extends into the developed area, by species, diameter and health condition.

        i. For ease of review, the Planning Forester suggests that all trees be numbered and referenced in an inventory table.

        ii. If there are stands of similar trees, please contact the planning forester to determine the most appropriate way of documenting the information

    e. Please identify trees by ownership – private onsite, private on adjoining site, city owned, co-owned (trees on a property line)

    f. If trees are to be removed, the TCR must clearly show where they are, and document the reason they cannot be retained.

        i. Compensation may be required for the removal of city owned trees.

    g. The removal of trees on a property line will require the permission of both property owners.

    h. All retained trees must be shown, and all retained trees within the area impacted by the development process must be protected as per City guidelines available at Tree Protection Specification or by searching Ottawa.ca

        i. The location of tree protection fencing must be shown on the plan.

        ii. Show the critical root zone of the retained trees.

i. The city encourages the retention of healthy trees; if possible, please seek opportunities for retention of trees that will contribute to the design/function of the site.

34. **Landscape Plan tree planting requirements**

a. Please ensure all retained trees are shown on the LP

b. Minimum Setbacks

i. Maintain 1.5m from sidewalk, MUP/cycle track, 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.

b. 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.

c. Adhere to Ottawa Hydro's planting guidelines (species and setbacks) when planting around overhead primary conductors.

d. 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.

e. Tree planting on city property shall be in accordance with the City of Ottawa's Tree Planting Specification; if possible, include watering and warranty as described in the specification.

f. No root barriers, dead-man anchor systems, or planters are permitted.

g. No tree stakes unless necessary

h. Hard surface planting

i. If there are hard surface plantings, a planting detail must be provided.

ii. Curb style planter 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.

iv. Trees are to be planted at grade.

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

j. For Sensitive Marine Clay soils, please follow the City's 2017 Tree Planting in Sensitive Marine Clay guidelines.

k. The city requests that consideration be given to planting native species wherever there is a high probability of survival to maturity.

l. 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.

m. Page 7 of the Landscape Plan Terms of Reference requires applicants to submit a digital, georeferenced CAD or GIS file of the final approved LP. Please follow this link to review the submission requirements: https://documents.ottawa.ca/sites/documents/files/landscape_tor_en.pdf . The file can be sent to the Planning Forester or Planning File Lead.

Feel free to contact Mark Richardson, Planning Forester, for follow-up questions.

Parkland

Comments:

Please find below Parks & Facilities Planning comments on the above-noted development application.

Parkland Dedication and Recreation Amenities:

35. Given that schools are exempt from parkland dedication, there are no parkland requirements on this application.

36. City parks planning staff are encouraged to see that the school board is proposing a variety of outdoor recreation amenities on this site. The inclusion of a full-sized track and soccer field as well as a full-sized football field are needed recreation amenities in the community. It is suggested that consideration be

given for a second intermediate sized field rather than a mini field as this might provide options for tournament play.

37. In 2025 we will be undertaking the design process for the Fernbank District Park. This district park is located fronting on Abbott Street north of the high school site. The preliminary amenities list for this park includes a full-sized football field possibly with lights and artificial turf as well as full sized soccer and cricket fields. If the school board is considering a lite football field with artificial turf on their site, it may be advantageous to consider a joint use agreement and cost sharing for the football facility.

Please contact me if you wish to discuss this idea further.

Regards,

Diane Emmerson

Parks Planner OALA, CSLA

Diane.emmerson@ottawa.com

Other

38. The High Performance Development Standard (HPDS) is a collection of voluntary and required standards that raise the performance of new building projects to achieve sustainable and resilient design and will be applicable to Site Plan Control and Plan of Subdivision applications.

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

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

Submission Requirements and Fees

1. Outlines the application type/subtype required and the associated fees
    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.

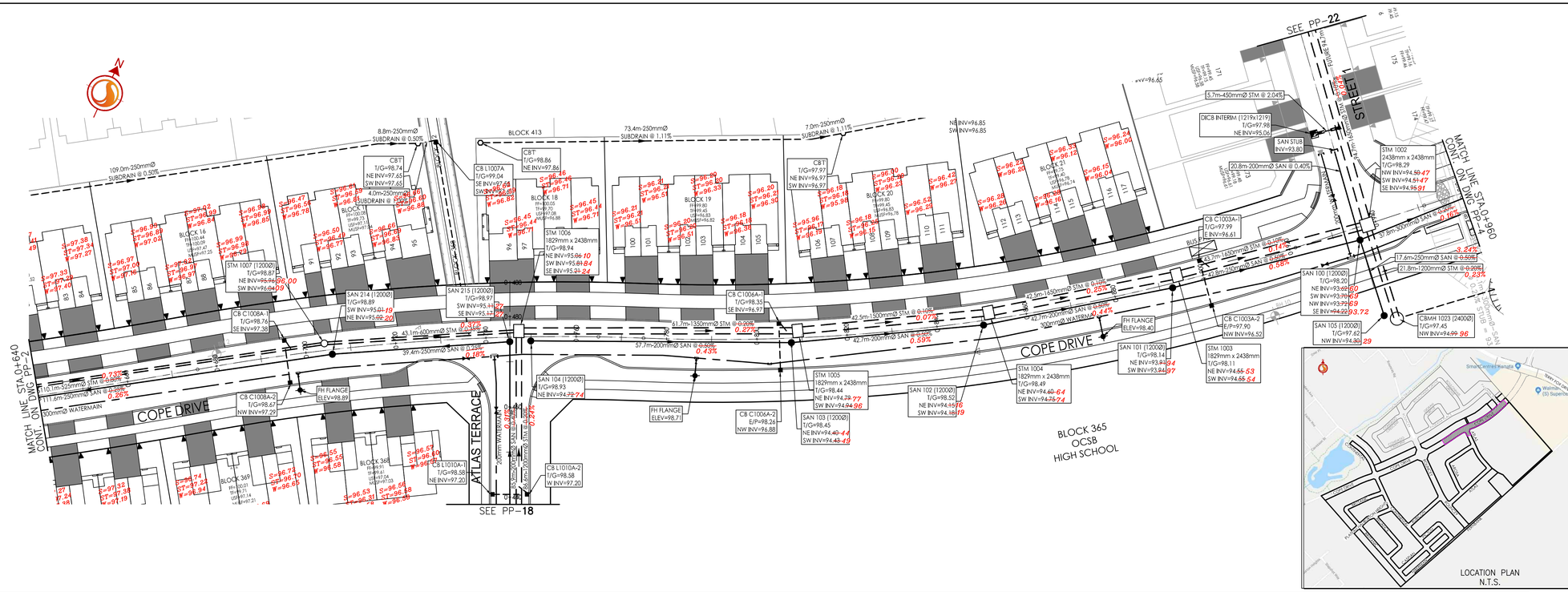
a. The required plans and studies must meet the City's Terms of Reference (ToR) and/or Guidelines, as available on Ottawa.ca. These ToR and Guidelines outline the specific requirements that must be met for each plan or study to be deemed adequate.

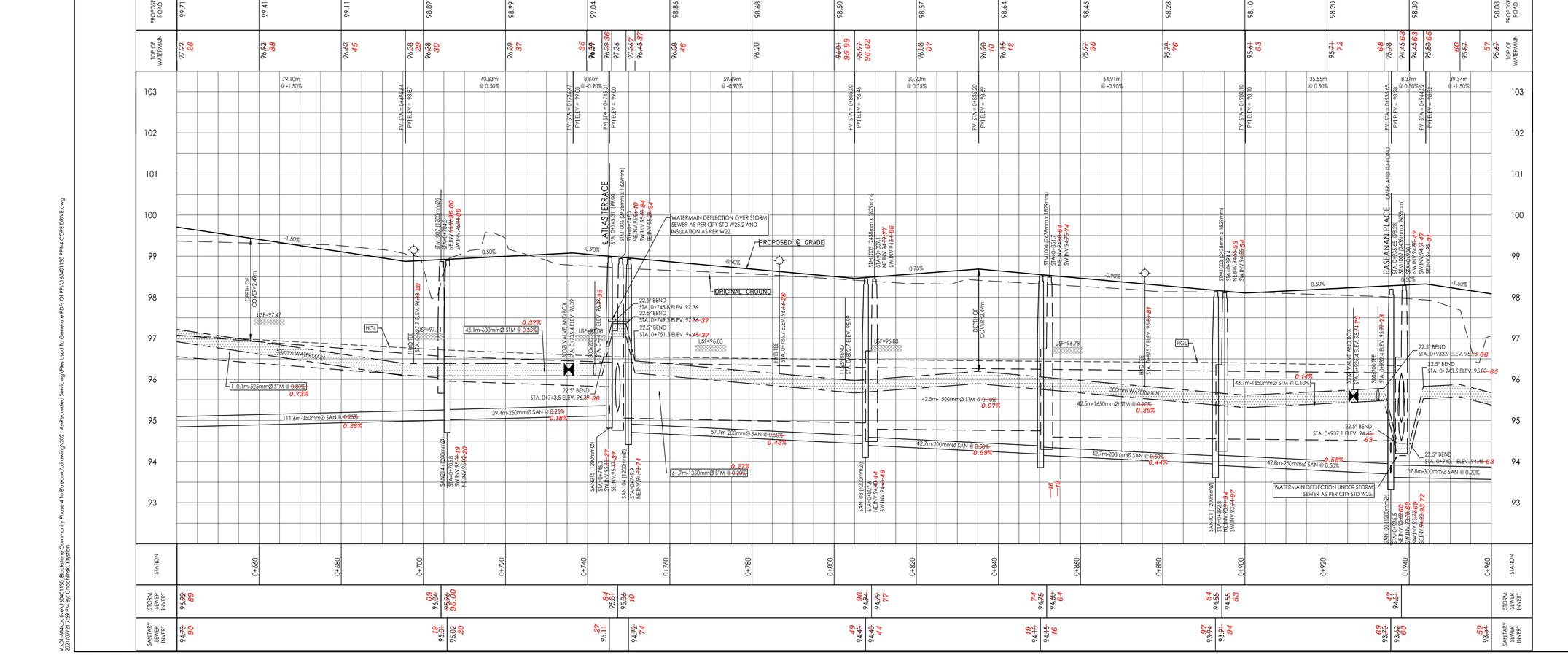
3. All of the above comments or issues should be addressed to ensure the effectiveness of the application submission review.

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

Yours Truly,
Solé Soyak

c.c. Shoma Murshid
Anton Chetrar
Mike Giampa
Lisa Stern
Mark Richardson
Matthew Hayley
Diane Emmerson





STATION	PROPOSED ROAD	TOP OF WATERMAIN	STORM SEWER INVERT	SANITARY SEWER INVERT
0+640	99.71	97.22 28	94.92 89	94.79 90
0+660	99.41	96.92 88		
0+680	99.11	96.62 45		
0+700	98.89	96.39 30	94.84 00	95.61 19
0+720	98.99	96.38 37	95.96 96.00	95.62 20
0+740	99.04	96.39 36 96.36	95.81 84	95.11 27
0+760	98.86	96.38 46 96.37	95.86 10	94.72 74
0+780	98.68	96.20 96.19	94.94 96	94.45 49
0+800	98.50	96.01 95.99 96.02	94.78 77	94.40 44
0+820	98.57	96.08 07	94.80 84	94.15 16
0+840	98.64	96.20 10 96.19 12	94.85 53	94.18 19
0+860	98.46	95.97 90	94.55 54	93.94 97
0+880	98.28	95.79 78	94.55 53	93.84 94
0+900	98.10	95.61 63		
0+920	98.20	95.71 72	94.45 63	93.70 69
0+940	98.30	95.78 68	94.45 63	93.60 60
0+960	98.08	95.57 57	95.83 65	93.42 50

Stantec

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www.stantec.com

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Legend

GENERAL NOTES

1. ALL MATERIALS AND CONSTRUCTION METHODS TO BE IN ACCORDANCE WITH OPS AND CITY OF OTTAWA STANDARD SPECIFICATIONS AND DRAWINGS AND OPSD SUPPLEMENT. ONTARIO PROVINCIAL STANDARDS WILL APPLY WHERE NO CITY STANDARDS ARE AVAILABLE.
2. THE CONTRACTOR IS RESPONSIBLE FOR OBTAINING ALL PERMITS REQUIRED AND BEAR COST OF SAME INCLUDING WATER PERMIT AND ASSOCIATED COSTS.
3. SERVICE AND UTILITY LOCATIONS ARE APPROXIMATE. CONTRACTOR TO VERIFY LOCATION AND ELEVATION OF EXISTING SERVICES AND UTILITIES PRIOR TO ANY CONSTRUCTION. CONTRACTOR SHALL BE RESPONSIBLE FOR OBTAINING LOCATES FROM ALL UTILITY COMPANIES TO LOCATE EXISTING UTILITIES PRIOR TO EXCAVATION. THE CONTRACTOR IS RESPONSIBLE FOR PROTECTION AND REINSTATEMENT.
4. ALL DISTURBED AREAS SHALL BE REINSTATED TO EQUAL OR BETTER CONDITION TO THE SATISFACTION OF THE ENGINEER & THE CITY. PAVEMENT REINSTATEMENT FOR SERVICE AND UTILITY CUTS SHALL BE IN ACCORDANCE WITH OPSD 509.010 AND OPSD 310.
5. THE CONTRACTOR SHALL SUBMIT AN EROSION AND SEDIMENTATION CONTROL PLAN WHICH WILL IMPLEMENT BEST MANAGEMENT PRACTICES TO PROVIDE PROTECTION FOR RECEIVING STORM SEWERS OR DRAINAGE DURING CONSTRUCTION ACTIVITIES. THIS PLAN SHALL INCLUDE BUT NOT LIMITED TO TERRAFIX SILTSACKS ON CATCH BASINS, STRAW BALE CHECK DAMS AND SEDIMENT CONTROLS AROUND ALL DISTURBED AREAS. DEWATERING SHALL BE PUMPED INTO SEDIMENT TRAPS.
6. ALL NECESSARY CLEARING AND GRUBBING SHALL BE COMPLETED BY THE CONTRACTOR. REVIEW WITH ARCHITECT AND THE CITY OF OTTAWA PRIOR TO TREE CUTTING.
7. FOR ALL LANDSCAPING FEATURES (ie. TREES, WALKWAYS, PARK DETAILS, NOISE BARRIERS, FENCES etc.) REFER TO LANDSCAPE ARCHITECT PLAN.
8. STREET LIGHTING TO CITY OF OTTAWA STANDARDS. REFER TO COMPOSITE UTILITY PLANS.
9. EXCESS EXCAVATED MATERIAL SHALL BE REMOVED FROM THE SITE.
10. ALL DIMENSIONS ARE IN METRES UNLESS OTHERWISE STATED.

ROADWORKS

11. ALL GRANULAR FOR ROADS SHALL BE COMPACTED TO A MINIMUM OF 98% STANDARD PROCTOR DENSITY.
12. ASPHALT WEAR COURSE SHALL NOT BE PLACED UNTIL THE VIDEO INSPECTION OF SEWERS & NECESSARY REPAIRS HAVE BEEN CARRIED OUT TO THE SATISFACTION OF THE CONSULTANT.
13. SUB-EXCAVATE SOFT AREAS & FILL WITH GRANULAR 'B' COMPACTED IN 0.15m LAYERS.
14. CONCRETE CURBS SHALL BE CONSTRUCTED AS PER CITY STANDARD SC1.1 AND SC1.3 (BARRIER OR MOUNTABLE CURB AS SHOWN ON DRAWINGS).

WATERMAIN

15. THE CONTRACTOR SHALL CONSTRUCT WATERMAIN, WATER SERVICES, CONNECTIONS & APPURTENANCES AS PER CITY OF OTTAWA SPECIFICATIONS & SHALL CO-ORDINATE AND PAY ALL RELATED COSTS INCLUDING THE COST OF CONNECTION, INSPECTION & DISINFECTION BY CITY PERSONNEL.
16. WATERMAIN PIPE MATERIAL SHALL BE PVC CL.150 DR18. DEFLECTION OF WATERMAIN PIPE IS NOT TO EXCEED 1/2 OF THAT SPECIFIED BY THE MANUFACTURER.
17. SERVICE CONNECTIONS SHALL BE INSTALLED A MINIMUM OF 2400mm FROM ANY CATCHBASIN, MANHOLE, OR OBJECT THAT MAY CONTRIBUTE TO FREEZING. THERMAL INSULATION SHALL BE INSTALLED ON ALL PROPOSED CBS ON THE W.M STREET SIDE WHERE 2400mm SEPARATION CANNOT BE ACHIEVED (AS PER CITY OF OTTAWA W22 & W23)(CATHODIC PROTECTION AS PER CITY OF OTTAWA W40 AND W42).

STORM AND SANITARY SEWERS

18. SANITARY AND STORM SEWERS 375mm DIA. OR SMALLER SHALL BE PVC SDR 35 INSTALLED AS PER CITY OF OTTAWA STANDARD SS.4 AND S7. UNLESS OTHERWISE NOTED. SANITARY AND STORM SEWERS LARGER THAN 375mm DIA. SHALL BE CONCRETE CSA A 257 CLASS 100-D AS PER OPSD 807.010 CLASS B BEDDING, UNLESS OTHERWISE NOTED.
19. STORM AND SANITARY MANHOLES SHALL BE 1200mm DIAMETER IN ACCORDANCE WITH OPSD-701.01 (UNLESS OTHERWISE NOTED) c/w FRAME AND COVER AS PER CITY OF OTTAWA S24, S24.1 AND S25. ALL STORM MANHOLES WITH SEWERS 900mm DIA SEWERS AND OVER IN SIZE SHALL BE BENCHED. ALL OTHERS SHALL BE COMPLETED WITH 300mm SUMPS AS PER CITY STANDARDS.
20. CATCH BASINS SHALL BE IN ACCORDANCE WITH CITY STANDARDS c/w FRAME AND GRATE AS PER S20 AND S21 FOR REAR YARDS AND S3 FOR STREET CB'S. PROVIDE 150mm ADJUSTED SPACERS. ALL CATCH BASINS SHALL HAVE SUMPS (600mm DEEP). STREET CATCH BASIN LEADS SHALL BE 200mm DIA.(MIN) PVC SDR 35 AT 1.0% OR WHERE NOT OTHERWISE SHOWN ON PLAN. CATCH BASINS WILL BE INSTALLED WITH INLET CONTROL DEVICES (ICD) AS PER ICD SCHEDULE ON SITE SERVICING DRAWINGS. WHERE CATCH BASINS REQUIRE ICD OF IPEX TYPE 'D' OR LARGER, CATCH BASIN LEADS SHALL BE 250mm DIA. PVC SDR 35.
21. CLAY SEALS TO BE INSTALLED AS PER CITY STANDARD DRAWING NO. S8. THE SEALS SHOULD BE AT LEAST 1.5m LONG (IN THE TRENCH DIRECTION) AND SHOULD EXTEND FROM TRENCH WALL TO TRENCH WALL. GENERALLY, THE SEALS SHOULD EXTEND FROM THE FROST LINE AND FULLY PENETRATE THE BEDDING, SUBBEDDING AND COVER MATERIAL. THE BARRIERS SHOULD CONSIST OF RELATIVELY DRY AND COMPACTABLE BROWN SILTY CLAY PLACED IN MAXIMUM 225mm THICK LOOSE LAYERS COMPACTED TO A MINIMUM OF 95% OF THE MATERIAL'S SPMDD. THE CLAY SEALS SHOULD BE PLACED AT THE SITE BOUNDARIES AND AT STRATEGIC LOCATIONS AT NO MORE THAN 60m INTERVALS IN THE SERVICE TRENCHES. REFER TO GEOTECH REPORT PREPARED BY PATERSON GROUP INC. FOR MONARCH CORPORATION. REPORT No. PG2233-2 REVISION 2, DATED FEBRUARY 9, 2016.
22. GRANULAR "A" SHALL BE PLACED TO A MINIMUM THICKNESS OF 300 mm AROUND ALL STRUCTURES WITHIN PAVEMENT AREA AND COMPACTED TO A MINIMUM OF 98% STANDARD PROCTOR DENSITY.
23. SEWER TRENCH SHALL CONSIST OF A CLASS 'B' BEDDING AS PER CITY OF OTTAWA STANDARDS S6 AND S7. COMPACTION SHALL BE A MINIMUM OF 98% STANDARD PROCTOR DENSITY.
24. CONTRACTOR SHALL PERFORM LEAKAGE TESTING, IN THE PRESENCE OF THE CONSULTANT, FOR SANITARY SEWERS IN ACCORDANCE WITH OPSS 410 AND OPSS 407. CONTRACTOR SHALL PERFORM VIDEO INSPECTION OF ALL STORM AND SANITARY SEWERS. A COPY OF THE VIDEO AND INSPECTION REPORT SHALL BE SUBMITTED TO THE CONSULTANT FOR REVIEW.
25. REFER TO DWG DS-1 FOR TYPICAL SERVICE CONNECTIONS

	Revision	By	Appd.	YY.MM.DD
12	AS RECORDED	KDC	GR	21.07.21
11	REVISED AS PER NEW DRAFT PLAN	MJS	DT	19.04.11
10	REVISED AS PER CITY COMMENTS	AJ	DT	19.03.04
9	ISSUED FOR GRADING APPROVAL	AJ	DT	19.01.09
8	ISSUED FOR TENDER	AJ	DT	18.12.12
7	REVISED HYDRANT LOCATION @ BLOCK 450	AJ	DT	18.11.23
6	REVISED AS PER UTILITY COORDINATION	MJS	DT	18.11.07
5	REVISED AS PER CITY COMMENTS	AJ	DT	18.11.01
4	ISSUED FOR 3RD SUBMISSION	MJS	DT	18.10.02
3	ISSUED FOR COORDINATION	SG	SG	18.09.17
2	ISSUED FOR 2ND SUBMISSION	MJS	DT	18.08.01
1	ISSUED FOR 1ST SUBMISSION	MJS	DT	18.04.25

File Name: 160401130-PP1-4 COPE DRIVE	MJS	DT	DT	18.01.10
	Dwn.	Chkd.	Dsgn.	YY.MM.DD

Permit-Seal

AS RECORDED

RECORD DRAWING

DATE JULY 21, 2021

Client/Project

2129786 ONTARIO INC.
MATTAMY (MONARCH) LTD.

BLACKSTONE COMMUNITY
PHASE 4-8

OTTAWA, ON, CANADA

Title

PLAN AND PROFILE
COPE DRIVE
STA. 0+640 TO STA. 0+960

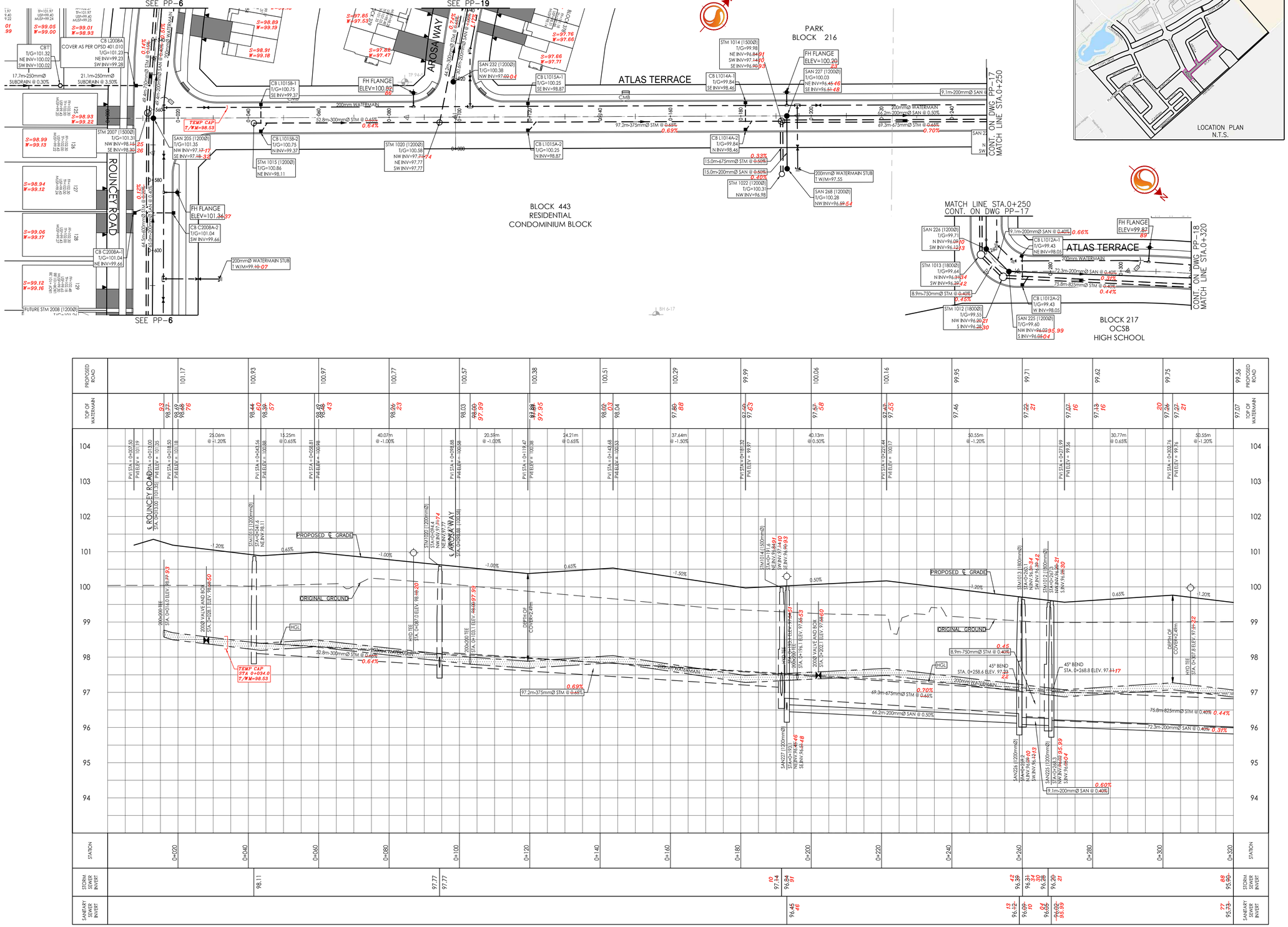
Project No.	Scale						
160401130	1:500H	0	5	15	25m		
	1:500V	0	0.5	1.5	2.5m		
Drawing No.	Sheet			Revision			
PP-3	12 of 66			12			

DWG# 17625

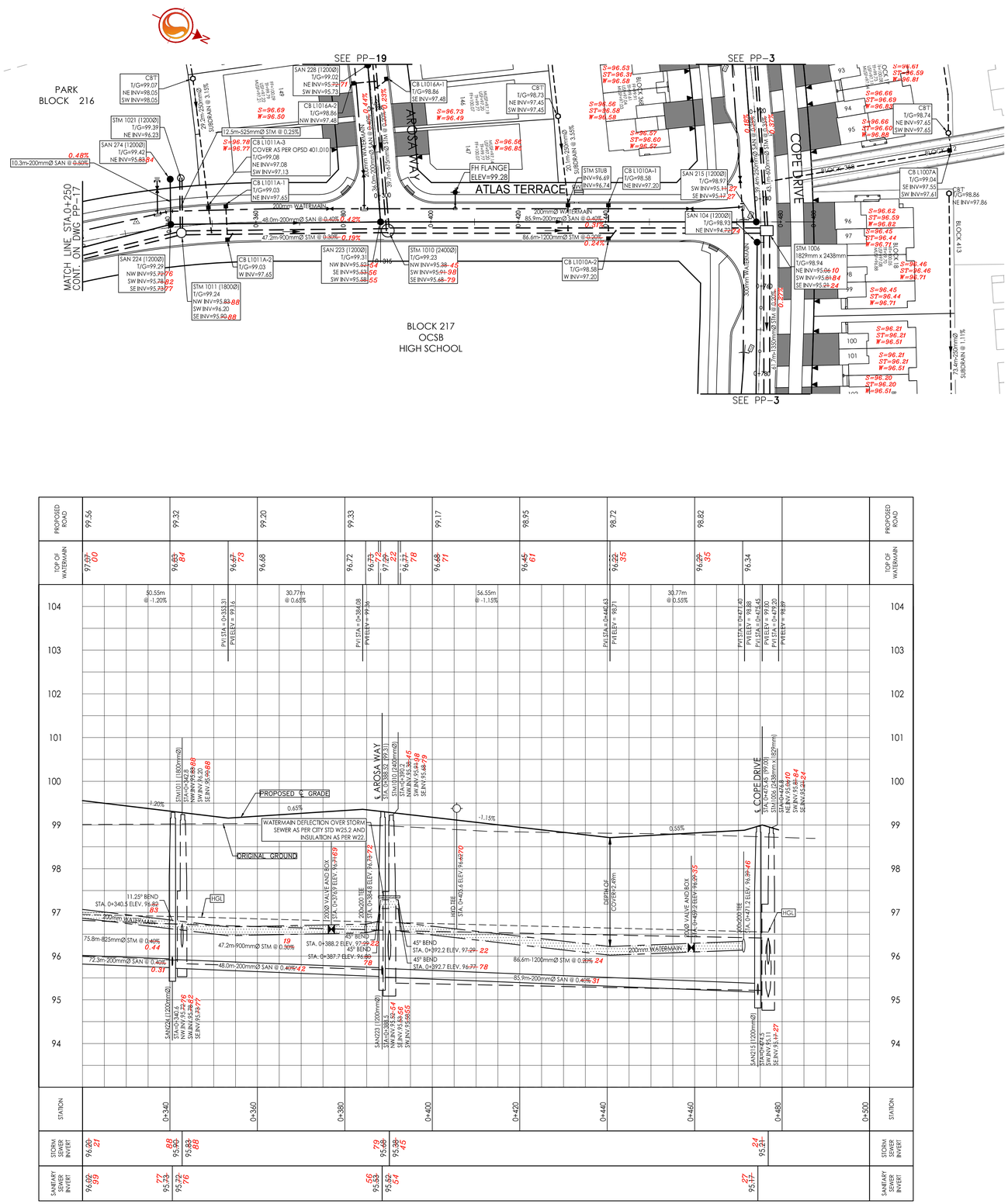
D07-16-17-0014

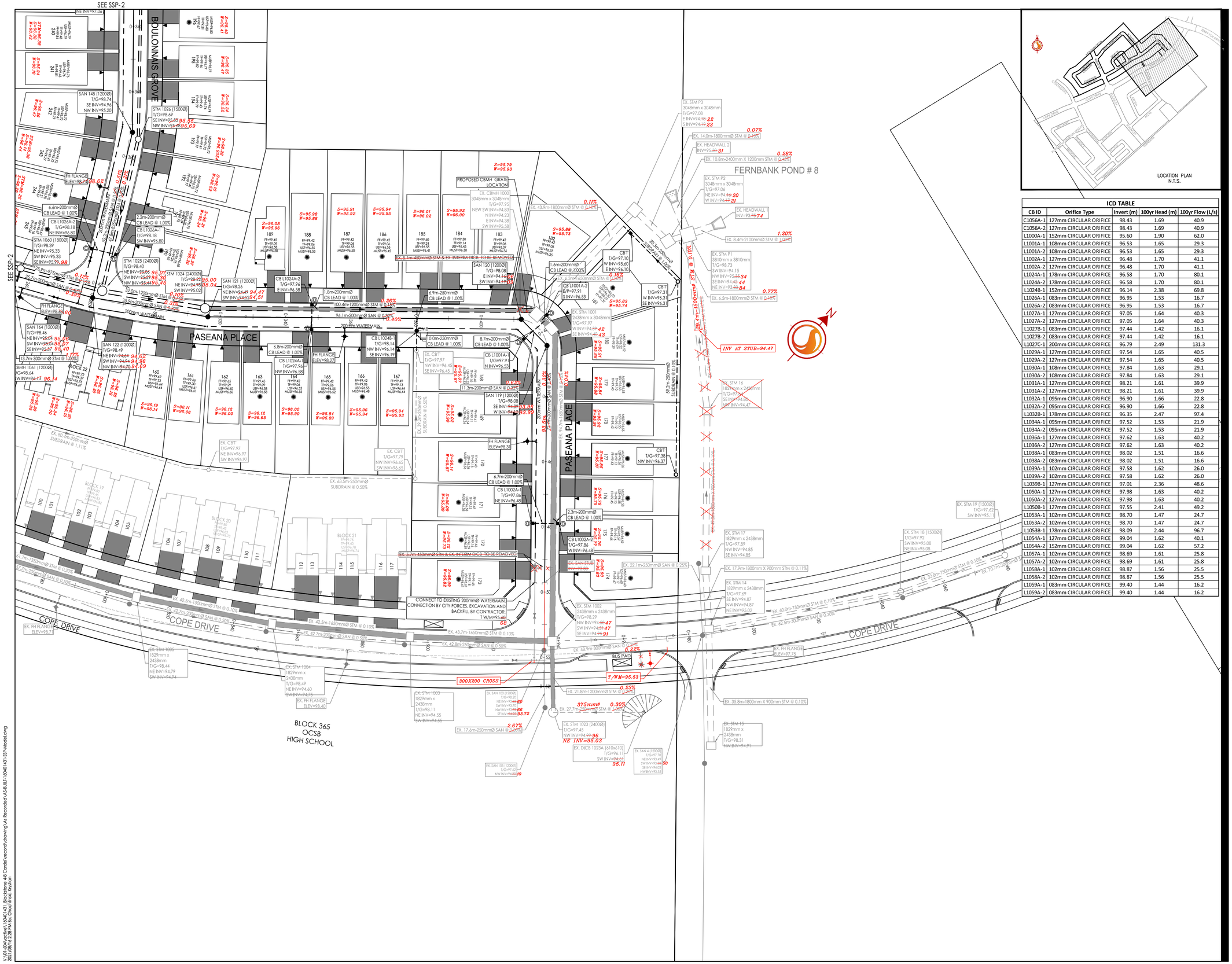
V:\01-ISPC-ottdev\160401130 Blackstone Community Phase 4 to 8\record\drawing\2021 As-Recorded Servicing Files Used To Generate PDFs Of PPs \160401130 PP1-4 COPE DRIVE.dwg
2021/07/21 7:39 PM By: Chodchinak, Kyndon

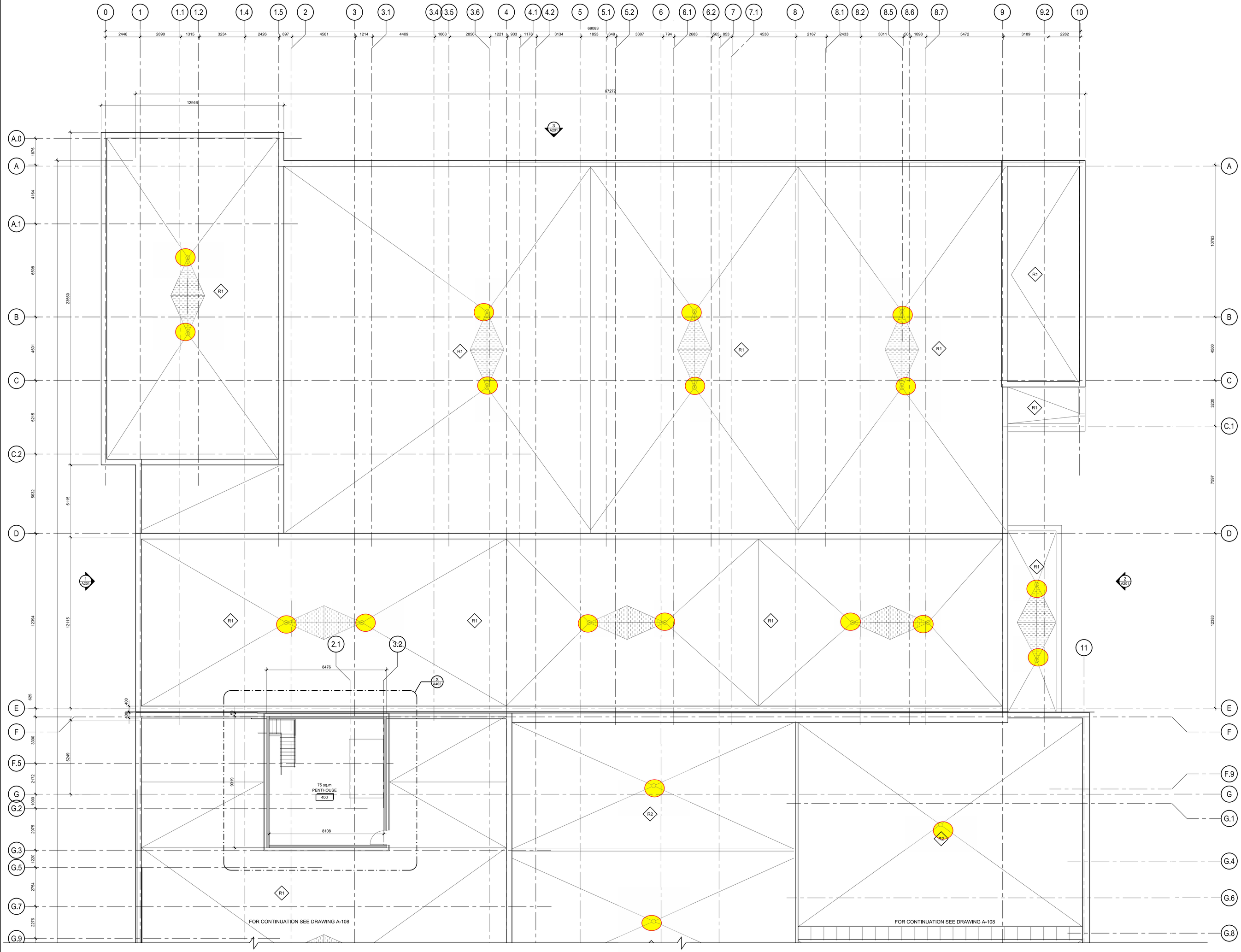
ORIGINAL SHEET - ARCH D


SEE PP–6
SEE PP–19
SEE PP–6
ROUNCEY ROAD
AROSA WAY
ATLAS TERRACE
PARK
BLOCK 216
BLOCK 443
RESIDENTIAL
CONDOMINIUM BLOCK
BLOCK 217
OCSB
HIGH SCHOOL
MATCH LINE STA.0+250
CONT. ON DWG PP–17
MATCH LINE STA.0+250
CONT. ON DWG PP–18
MATCH LINE STA.0+320
CB L1018B-1
T/G=100.75
SE INV=99.37
CB L1018A-2
T/G=100.75
N INV=99.37
CB L1015B-2
T/G=100.75
N INV=99.37
CB L1015A-2
T/G=100.25
N INV=98.87
CB L1015A-1
T/G=100.25
SE INV=98.87
CB L1014A-2
T/G=99.84
N INV=98.46
CB L1014A-1
T/G=99.84
SE INV=98.46
CB L1012A-2
T/G=99.43
W INV=98.05
CB L1012A-1
T/G=99.43
NE INV=98.05
CB C2008A-2
T/G=101.04
SW INV=99.66
CB C2008A-1
T/G=101.04
NE INV=99.66
CBT
T/G=101.32
NE INV=100.02
SW INV=100.02
CB L2008A
COVER AS PER OPSD 401.010
T/G=101.23
NE INV=99.23
SW INV=99.28
FH FLANGE
ELEV=100.82
FH FLANGE
ELEV=101.36
FH FLANGE
ELEV=100.20
FH FLANGE
ELEV=99.87
TEMP CAP
STA 0+024.0
T/WM=98.53
200mmØ WATERMAIN STUB
T W/M=99.16
200mmØ WATERMAIN STUB
T W/M=97.55
SAN 205 (1200Ø)
T/G=101.35
NW INV=97.17
SE INV=97.13
STM 2007 (1500Ø)
T/G=101.31
NW INV=98.14
SE INV=98.30
STM 1015 (1200Ø)
T/G=100.86
NE INV=98.11
STM 1020 (1200Ø)
T/G=100.58
NE INV=97.77
SW INV=97.77
SAN 232 (1200Ø)
T/G=100.38
NW INV=97.04
STM 1014 (1500Ø)
T/G=99.98
NE INV=96.84
SW INV=97.14
SE INV=96.90
SAN 227 (1200Ø)
T/G=100.03
NE INV=94.45
SE INV=96.51
SAN 268 (1200Ø)
T/G=100.28
NW INV=96.99
STM 1022 (1200Ø)
T/G=100.31
NW INV=96.98
SAN 226 (1200Ø)
T/G=99.71
N INV=96.09
SW INV=96.13
STM 1013 (1800Ø)
T/G=99.64
N INV=96.31
SW INV=96.39
STM 1012 (1800Ø)
T/G=99.55
NW INV=96.00
S INV=96.28
SAN 225 (1200Ø)
T/G=99.60
NW INV=96.03
S INV=96.66
FUTURE STM 2008 (1200Ø)
52.8m-300mmØ STM @ 0.65%
0.64%
97.2m-375mmØ STM @ 0.65%
0.69%
15.0m-675mmØ STM @ 0.50%
0.40%
15.0m-200mmØ SAN @ 0.50%
0.40%
69.3m-675mmØ STM @ 0.65%
0.70%
66.2m-200mmØ SAN @ 0.50%
8.9m-750mmØ STM @ 0.40%
0.45%
75.8m-825mmØ STM @ 0.40%
0.44%
72.3m-200mmØ SAN @ 0.40%
0.31%
9.1m-200mmØ SAN @ 0.40%
0.60%
LOCATION PLAN
N.T.S.

| | | |


SEE PP-19
SEE PP-3
SEE PP-3
PARK
BLOCK 216
MATCH LINE STA.0+250
CONT. ON DWG PPP-17
ATLAS TERRACE
ELEV=99.28
AROSA WAY
COPE DRIVE
BLOCK 413
BLOCK 414
BLOCK 415
BLOCK 416
BLOCK 417
BLOCK 418
BLOCK 419
BLOCK 420
BLOCK 421
BLOCK 422
BLOCK 423
BLOCK 424
BLOCK 425
BLOCK 426
BLOCK 427
BLOCK 428
BLOCK 429
BLOCK 430
BLOCK 431
BLOCK 432
BLOCK


SEE SSP-2
NE INV=97.08
BOULONNAIS GROVE
PASEANA PLACE
COPE DRIVE
FERNBANK POND # 8
PROPOSED CBMH GRATE LOCATION
EX. CBMH 1000
3048mm x 3048mm
T/G=97.93
NEW SW INV=94.83
N INV=94.23
E INV=94.38
SW INV=95.58
EX. 5.1m-450mmØ STM & EX. INTERIM DICB TO BE REMOVED
EX. 5.7m-450mmØ STM & EX. INTERIM DICB TO BE REMOVED
CONNECT TO EXISTING 200mmØ WATERMAIN CONNECTION BY CITY FORCES, EXCAVATION AND BACKFILL BY CONTRACTOR
T/W/M=95.40
68
300X200 CROSS
T/W/M=95.53
BUS PAD
375mmø
0.30%
NE INV=95.03
95.11
BLOCK 365
OCSB
HIGH SCHOOL
BLOCK 22
SAN 145 (1200Ø)
T/G=98.74
SE INV=94.96
NW INV=95.20
STM 1024 (1500Ø)
T/G=98.69
SE INV=95.88 95.73
NW INV=95.88 95.69
SAN 121 (1200Ø)
NE INV=94.49 94.47
SW INV=94.55 94.51
STM 1024 (2400Ø)
T/G=98.25
NE INV=94.80 95.00
SW INV=95.02
SAN 122 (1200Ø)
SW INV=94.94 94.96
NW INV=94.90 94.79
SAN 164 (1200Ø)
T/G=98.46
NE INV=95.04 95.06
SW INV=94.94 94.97
SE INV=94.97 95.40
SAN 119 (1200Ø)
T/G=98.08
SE INV=94.09 93.99
W INV=94.23 93.93
SAN 120 (1200Ø)
T/G=98.08
E INV=94.14 94.06
SW INV=94.19 94.05
SAN 100 (1200Ø)
T/G=98.20
NE INV=93.40 93.69
SW INV=93.75 93.66
NW INV=93.79 93.72
SE INV=94.05
SAN 105 (1200Ø)
T/G=97.67
NW INV=94.80 93
SAN 4 (1200Ø)
T/G=97.70
NE INV=93.49 93.50
SW INV=93.54 93.50
SE INV=94.02
NW INV=93.55
EX. SAN STUB
INV=93.90
EX. STM P3
3048mm x 3048mm
T/G=97.08
E INV=94.18 94.22
S INV=94.18 94.23
EX. HEADWALL 2
INV=95.30 95.31
EX. STM P2
3048mm x 3048mm
T/G=97.06
NE INV=94.10 94.20
W INV=94.10 94.21
EX. HEADWALL 1
INV=93.35 93.74
EX. STM P1
3810mm x 3810mm
T/G=98.73
SW INV=94.15
NW INV=95.35 95.34
SE INV=94.42 94.44
NE INV=93.80 93.84
EX. STM 1001
2438mm x 3048mm
T/G=97.97
W INV=94.30 94.42
SE INV=94.40 94.43
EX. STM 1002
2438mm x 2438mm
T/G=98.29
NW INV=94.50 94.47
SW INV=94.51 94.47
SE INV=94.55 94.91
EX. STM 1003
1829mm x
2438mm
T/G=98.11
NE INV=94.55
SW INV=94.55
EX. STM 1004
1829mm x
2438mm
T/G=98.49
NE INV=94.60
SW INV=94.75
EX. STM 1005
1829mm x
2438mm
T/G=98.44
NE INV=94.79
SW INV=94.94
EX. STM 1023 (2400Ø)
T/G=97.45
NW INV=94.50 94.96
EX. STM 16
1829mm x 2438mm
T/G=97.71
SE INV=94.26
NW INV=94.47
EX. STM 17
1829mm x 2438mm
T/G=97.69
NW INV=94.85
SE INV=94.85
EX. STM 14
1829mm x 2438mm
T/G=97.69
SE INV=94.87
NW INV=94.87
NE INV=95.02
EX. STM 15
1829mm x
2438mm
T/G=98.31
NW INV=94.91
EX. STM 18 (1500Ø)
T/G=97.92
SW INV=95.08
NE INV=95.08
EX. STM 19 (1500Ø)
T/G=97.62
SW INV=95.11
EX. 14.0m-1800mmØ STM @ 0.10%
EX. 10.8m-2400mm X 1200mm STM @ 0.10%
EX. 8.4m-2100mmØ STM @ 1.00%
EX. 6.5m-1800mmØ STM @ 0.10%
EX. 43.9m-1800mmØ STM @ 0.10%
EX. 1.6m-600mmØ STM @ 1.00%
EX. 6.5m-1500mmØ STM @ 0.10%
EX. 59.4m-1500mmØ STM @ 0.10%
EX. 17.9m-1800mm X 900mm STM @ 0.11%
EX. 60.0m-750mmØ STM @ 0.10%
EX. 62.5m-300mmØ SAN @ 0.20%
EX. 33.8m-750mmØ STM @ 0.10%
EX. 70.7m-300mmØ SAN @ 0.20%
EX. 48.9m-300mmØ SAN @ 0.20%
EX. 35.8m-1800mm X 900mm STM @ 0.10%
EX. 42.5m-1650mmØ STM @ 0.10%
EX. 42.7m-200mmØ SAN @ 0.50%
EX. 43.7m-1650mmØ STM @ 0.10%
EX. 42.8m-250mmØ SAN @ 0.50%
EX. 42.5m-1500mmØ STM @ 0.10%
EX. 42.7m-200mmØ SAN @ 0.50%
EX. 86.8m-250mmØ SUBDRAIN @ 1.11%
EX. 63.5m-250mmØ SUBDRAIN @ 0.50%
EX. 59.2m-250mmØ SUBDRAIN @ 0.10%
EX. 11.3m-200mmØ SAN @ 0.25%
EX. 22.1m-250mmØ SAN @ 0.25%
EX. 27.7m-250mmØ STM @ 1.00%
EX. 21.8m-1200mmØ STM @ 0.20%
EX. 17.6m-250mmØ SAN @ 0.50%
EX. 96.1m-200mmØ SAN @ 0.50%
EX. 100.4m-1200mmØ STM @ 0.18%
EX. 35.2m-200mmØ SAN @ 0.50%
EX. 32.0m-1200mmØ STM @ 0.18%
EX. 15.7m-300mmØ STM @ 0.40%
EX. 86.4m-250mmØ SUBDRAIN @ 1.11%
EX. 81.7m-1350mmØ STM @ 0.20%
EX. 80.7m-200mmØ SAN @ 0.50%
EX. 86.6m-250mmØ SUBDRAIN @ 0.50%
EX. FH FLANGE ELEV=98.71
EX. FH FLANGE ELEV=98.40
EX. FH FLANGE ELEV=97.75
FH FLANGE ELEV=98.86
FH FLANGE ELEV=98.27
FH FLANGE ELEV=98.33
FH FLANGE ELEV=98.29
6.6m-200mmØ CB LEAD @ 1.00%
2.2m-200mmØ CB LEAD @ 1.00%
1.8m-200mmØ CB LEAD @ 1.00%
6.9m-250mmØ CB LEAD @ 1.00%
6.8m-200mmØ CB LEAD @ 1.00%
10.0m-250mmØ CB LEAD @ 1.00%
8.7m-200mmØ CB LEAD @ 1.00%
6.7m-200mmØ CB LEAD @ 1.00%
2.3m-200mmØ CB LEAD @ 1.00%
CB L1024A-1 T/G=98.18 NE INV=96.80
CB L1024A-2 T/G=98.18 NE INV=96.80
CB L1024A-2 T/G=97.96 E INV=96.58
CB L1024B-1 T/G=98.14 NW INV=96.14 SE INV=96.19
CB L1024A-1 T/G=97.96 NW INV=96.58
CB L1002A-1 T/G=97.86 NE INV=96.48
CB L1002A-2 T/G=97.86 W INV=96.48
CB L1001A-1 T/G=97.91 N INV=96.53
CBT T/G=97.10 W INV=95.60 E INV=96.10
CBT T/G=97.31 W INV=96.31 SE INV=96.31
CBT T/G=97.38 NW INV=96.37
EX. CBT T/G=97.97 NE INV=96.97 SW INV=96.97
EX. CBT T/G=97.97 NW INV=96.47 SE INV=96.45
EX. CBT T/G=97.79 NW INV=96.65 SW INV=96.65
EX. CBT T/G=97.75 NW INV=96.65 SW INV=96.65
SMH 1061 (1200Ø) T/G=98.64 W INV=96.15 96.14
STM 1060 (1800Ø) T/G=98.39 NE INV=95.33 SW INV=95.33 SW INV=95.9k 95.98
STM 1025 (2400Ø) T/G=98.40 NE INV=95.05 95.07 SW INV=95.09 95.20 NW INV=95.45 95.45
0.12%
0.39%
0.26%
0.40%
0.12%
0.42%
0.40%
0.42%
0.40%
0.40%
0.40



1 A107 ROOF PARTIAL PLAN
SCALE 1:100

19 RDs

OTTAWA CATHOLIC SCHOOL BOARD

ROOF LEGEND

	HATCHED AREA INDICATES TAPERED INSULATION 2% MINIMUM FINISHED ROOF SLOPE
RD	ROOF DRAIN EQUIPPED WITH FLOW CONTROL REFER TO MECHANICAL
	ROOF TOP UNIT REFER TO MECHANICAL
1 A205 / 102.1 TOP	ELEVATION MARKER
R#	ROOF TYPE, REFER TO DRAWING A005 FOR ROOF ASSEMBLIES
HP	HIGH PONT
OVERFLOW SCUPPER	FOR TYPICAL OVERFLOW SCUPPER DETAILS REFER TO DETAILS 14 AND 14A/A351
EJ	EXPANSION JOINT

SPECIFIC DRAWING NOTES

1. TYPICAL DOGHOUSE, SEE DETAIL 9/A109, REFER TO MECHANICAL.
2. 600 x 600 CONCRETE PAVERS, 24 TOTAL.
3. KITCHEN CONDENSERS C/W ONE ROOF ANCHOR EACH, REFER TO MECHANICAL AND DRAWINGS FS-01 AND FS-02, SEE DETAIL 9/A109 FOR SLEEPER ROOFING DETAIL.

no.	revision	date
	ISSUED FOR 33% REVIEW	2025-09-19

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

L'ENTREPRENEUR EST TENU DE VÉRIFIER TOUTES LES DIMENSIONS DE CE DESSIN. TOUTE ERREUR OU OMISSION DOIT ÊTRE SIGNALÉE AVANT DE PROCÉDER AU TRAVAIL. AUCUNE DIMENSION NE DOIT ÊTRE MESURÉE DIRECTEMENT SUR CE DESSIN.

DO NOT SCALE DRAWINGS. REFER ANY DIMENSIONAL ERRORS AND/OR POSSIBLE TRADE INTERFERENCE/CONFLICT TO THE ARCHITECT FOR CLARIFICATION PRIOR TO COMMENCEMENT OF THE WORK. CONDITIONS OF THE CONTRACT APPLY.

project
FERNBANK CATHOLIC HIGH SCHOOL

5431 FERNBANK ROAD
OTTAWA, ONTARIO
K2S 0T7

project north | seal

drawing title
ROOF PLAN
PARTIAL PLAN

scale 1:100	drawn by -
date SEPT 2025	checked by VP
project number 24-835	drawing number A107

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

revision

FOR CONTINUATION SEE DRAWING A-107

FOR CONTINUATION SEE DRAWING A-107

R1 R2

26661 21023 20463 24832 26458 10819

22 RDs

1 A107 2 A107 3 A107

1 A108 ROOF PLAN - PARTIAL PLAN
SCALE 1:100

OTTAWA CATHOLIC SCHOOL BOARD

ROOF LEGEND

	HATCHED AREA INDICATES TAPERED INSULATION 2% MINIMUM FINISHED ROOF SLOPE
RD	ROOF DRAIN EQUIPPED WITH FLOW CONTROL REFER TO MECHANICAL
	ROOF TOP UNIT REFER TO MECHANICAL
1 A306 TOP ITEM	ELEVATION MARKER
R1	ROOF TYPE, REFER TO DRAWING A005 FOR ROOF ASSEMBLIES
HP	HIGH PONT
OVERFLOW SCUPPER	FOR TYPICAL OVERFLOW SCUPPER DETAILS REFER TO DETAILS 14 AND 14a/A351
EJ	EXPANSION JOINT

SPECIFIC DRAWING NOTES

1. TYPICAL DOGHOUSE, SEE DETAIL 9/A109, REFER TO MECHANICAL.
2. 600 x 600 CONCRETE PAVERS, 24 TOTAL.
3. KITCHEN CONDENSERS C/W ONE ROOF ANCHOR EACH, REFER TO MECHANICAL AND DRAWINGS FS-01 AND FS-02, SEE DETAIL 8/A109 FOR SLEEPER ROOFING DETAIL.

no.	revision	date
	ISSUED FOR 33% REVIEW	2025-09-19

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DO NOT SCALE DRAWINGS. REFER ANY DIMENSIONAL ERRORS AND/OR POSSIBLE TRADE INTERFERENCE/CONFLICT TO THE ARCHITECT FOR CLARIFICATION PRIOR TO COMMENCEMENT OF THE WORK. CONDITIONS OF THE CONTRACT APPLY.

project
FERNBANK CATHOLIC HIGH SCHOOL

5431 FERNBANK ROAD
OTTAWA, ONTARIO
K2S 0T7

project north | seal

drawing title
ROOF PLAN
PARTIAL PLAN

scale 1:100	drawn by -
date SEPT 2025	checked by VP
project number 24-835	drawing number A108

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

revision