Servicing & Stormwater Management

Final

AY Jackson Secondary School Addition
150 Abbeyhill Drive, Ottawa, Ontario

April 3, 2025

Jp2g Project # 24-5053A

City of Ottawa File No. P2024-0511

Jp2g Consultants Inc.
ENGINEERS · PLANNERS · PROJECT MANAGERS

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1 Introduction

1.1 Site Description and Proposed Development

Jp2g Consultants Inc. (Jp2g) was retained by Edward J. Cuhaci and Associates Architects Inc. to complete a Servicing & Stormwater Management Report suitable for the City of Ottawa Site Plan Control Application, for the Ottawa Carleton District School Board (OCDSB) AY Jackson SS Addition located at 150 Abbeyhill Drive, hereafter referred to as the 'site'.

Figure 1: Site Location

The site is approximately 8.08 ha in size and is bound by Abbeyhill Drive to the west, residential developments to the north and south, and Hope Cloutier Park to the east. The proposed development includes the construction of a new two-story school addition, with no basements, expanded parking areas and fire routes, and future portables. The building footprint is approximately 2,300 m^2.

A pre-consultation meeting was held with City of Ottawa staff on July 17, 2024, 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 Existing School and Proposed Addition Population

Population estimates for the existing and proposed addition were based on correspondence with OCDSB staff. The capacity of the school is estimated at a student load of 23 students/classroom. The existing school has 34 classrooms, and 16 portables. The new addition is proposing 13 classrooms total. The existing and proposed population breakdown is as follows:

Table 1.1: Estimated School Addition Population

Estimated Population	Existing	Addition	Total
Students	1150	299	1449
Staff	79	26	105
Total	1229	325	1554

The population estimate shown in the above table 1.1 will serve as the basis for estimating peak water and sanitary servicing demands.

1.3 Existing Infrastructure

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

Water

There is an existing 152mm diameter watermain on Paddock Way, and a 305mm diameter watermain on Abbeyhill Drive. The existing school building is serviced with a 100mm diameter water service connected to Paddock Way.

Sanitary

There is a 250mm diameter sanitary sewer available on Abbeyhill Drive, and a 200mm diameter sanitary sewer on Paddock Way. The existing school building is service with a 150mm diameter sanitary service connected to Abbeyhill Drive.

Storm

There is a 450mm diameter storm sewer, and a 900mm diameter storm sewer available on Abbeyhill Drive. There is a 250mm diameter storm sewer on Paddock, however this storm sewer is unavailable for connection due to current flow restriction as per pre-consultation with the City of Ottawa. The existing school development is serviced with a private storm sewer system connected to the 450mm storm sewer on Abbeyhill Drive.

The 900mm diameter storm sewer continues along the southwest property on the adjacent neighbouring property. Connection over the property line will require an easement with the neighbouring property.

1.4 List of Relevant Guidelines

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)

1.5 Design Drawings

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

- R1 – Removals Plan
- 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 Geotechnical Considerations

A geotechnical investigation was complete by EXP Services Inc. refer to *Geotechnical Investigation Proposed Addition AY Jackson High School Project Number OTT-23012778-D0.*

In conjunction with the geotechnical investigation the recommended pipe bedding and cover should consist of minimum 300mm of OPSS Granular 'A' compacted to a minimum of 98% SPMDD. The pavement structure for the light duty traffic should consist of 65mm HL3/SP12.5, 150mm of OPSS 1010 Granular A, and 450mm OPSS 1010 Granular B. The pavement structure for heavy duty traffic should consist of 50mm HL3/SP12.5, 60mm HL8/SP19.0, 150 mm OPSS 1010 Granular A, and 600mm OPSS 1010 Granular B. A grade raise restriction of 1.1m is considered to be permissible based on the FFE of the proposed addition matching the existing building FFE of 106.20. These geotechnical considerations have been considered and included where applicable on the site grading, servicing, and civil details drawings.

3 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.

4 Stormwater Management

4.1 Stormwater Management Criteria

4.1.1 Quantity Control

The quantity control criteria for this site is to control the 100-year post-development release rate to a 5-year pre-development level. Per consultation with the City of Ottawa, the pre-development runoff coefficient will need to be determined as per existing conditions, but in no case more than 0.5. Additionally, the pre-development time of concentration shall be calculated, but in no case less than 10 minutes, as IDF curves become unrealistic at less than 10 minutes. Any storm greater than the established 5-year allowable release rate, up to and including the 100 year storm event, shall 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.

4.1.2 Quality Control

Per preconsultation with the City of Ottawa, an 80% TSS removal to the ETV standard is to be incorporated in the proposed stormwater management design.

4.2 Pre-Development Conditions

The existing site contains an existing two storey high school, parking lot and paved areas, portables, baseball diamond, soccer field, and running track. Pre-development drainage areas were determined from the limits of the modifications that will result from the school addition. Therefore, the comparison of the post development flows will be controlled to the respective pre-development 5-year requirements as discussed in section 4.1.1 above where post development flows are increased.

Under pre-development conditions, three predevelopment drainage areas were identified, refer to Appendix A – Fig. 1 Predevelopment Drainage Plan.

Outlet 1: Predevelopment Drainage Area A1

Predevelopment drainage area A1 consists of the existing parking lot and fire route paved area. Under predevelopment conditions, stormwater is collected through on site catch basins within the paved areas and is conveyed through on site private storm sewers to the city owned 450mm diameter storm sewer on Abbeyhill Drive. From review of storm sewer infrastructure on GeoOttawa, the 450mm diameter storm sewer is ultimately conveyed through to the Carp River near the Castlefrank Road and Sheldrake Drive outlet. Predevelopment drainage area A1 was determined to be 0.37 ha in size, with a runoff coefficient of C = 0.83.

Outlet 2: Predevelopment Drainage Area B1

Predevelopment drainage area B1 consists of the school field, including the existing baseball diamond, portables and grassed area. Runoff from drainage area B1 is conveyed overland to the south property line. From review of Geoottawa, it appears that the runoff from area B1 is collected by the private catch basins in the low lying areas along the property line of the adjacent private development and conveyed through the adjacent private storm system to the City of Ottawa Storm Sewers on Castle Frank Road. The ultimate outlet for drainage area B1 is to the Carp River Outlet near Castlefrank Road and Sheldrake Drive. Predevelopment drainage area B1 was determined to be 0.71 ha in size, with a runoff Coefficient of C = 0.27.

Outlet 3: Predevelopment Drainage Area C1

Predevelopment drainage area C1 also consists of a portion of the school field, baseball diamond, portables and grassed area. Predevelopment drainage area C1 represents the existing area that will be turned into the proposed building, parking lot, fire route, and has the most post development increase in runoff coefficient., Runoff from predevelopment area C1 is conveyed overland to the southern private catch basins and thus has the same ultimate outlet as area B1. Predevelopment area C1 was determined to be 0.60 ha in size with a runoff coefficient of C=0.39.

Summary Predevelopment Drainage Areas

Table 4-1: Overall Predevelopment Drainage Area Parameters

Drainage Area	Area (ha)	Runoff Coefficient
A1	0.37	0.83
B1	0.71	0.27
C1	0.60	0.39
Overall	1.68	0.44

Thus, the predevelopment drainage area for the subject site has an overall runoff coefficient of C<0.5, in accordance with the requirements from preconsultation with the City of Ottawa

Predevelopment Allowable Flow Rates

The time of concentration for predevelopment drainage areas A1 and B1 were determined, using the Airport Formula, or Bransby Williams Formula. A predevelopment time of concentration of 10 minutes was assumed for drainage area C1. Watershed slope was approximated using the 85/10 method for use in the time of

concentration calculations. Refer to Appendix B, Table B-3 and B-4 for detailed calculations. Using the City of Ottawa IDF curves, rainfall intensities were calculated to determine the allowable pre-development flow rates for each outlet. Detailed calculations can be seen in Appendix B – Stormwater Management Calculations.

Table 4-2: Predevelopment Flow Rates

Drainage Area	5 Yr Flow Rate (Lps)	100 Yr Flow Rate (Lps)
Outlet 1: Predevelopment A1	90.1	154.5
Outlet 2: Predevelopment B1	29.4	50.1
Outlet 3: Predevelopment C1	68.6	117.5

4.3 Post-Development Conditions

The proposed site development includes a new two storey addition, expansion of asphalt parking, hard surface walkways, fire route, future portables and landscaped areas. Additionally, the existing baseball diamond will be removed to accommodate the building addition and parking lot expansion.

Per the preconsultation with the City of Ottawa, existing drainage patterns shall be maintained as part of the post development stormwater solution. Under post development conditions, post development drainage areas were separated into subcatchments, matching the outlets identified from the predevelopment conditions in section 3.2 above. Refer to Appendix A – Figure 2 Post Development Drainage Plan.

Outlet 1 Existing Onsite Storm System: Post Development Drainage Areas A1 and A2

Post development drainage areas A1 and A2 consist of the existing parking lot area and existing fire route that is captured in the existing catch basins and private storm sewer system. Under post development conditions, a portion of the existing fire route will be removed and replaced with a concrete walkway serving as access for the proposed addition. As the drainage area to the predevelopment area outlet A1 is reduced in size, post development flows from area A1 and A2 will be decreased. No stormwater management controls are proposed for area A1 and A2.

Outlet 2: Post Development Drainage Area B1

Post development drainage area B1 consists of the removed baseball diamond area where existing gravel will be replaced with new sod, the existing grassed field, and part of the future portables area. Under post development conditions, part of the predevelopment drainage area B1 will be turned into hardscaped areas and redirected towards post development areas C1 through C7. Post development drainage area B1 continues to surface drain across the southern property line and collect in the private catch basins on the adjacent property. Under post development conditions, the runoff coefficient for drainage area B1 is reduced due to the removal of gravel surfaces and replacement with sod, and thus post development flows from area B1 are decreased under post development conditions. No stormwater management controls are proposed for post development area B1.

Outlet 3: Post Development Drainage Areas C1-C7

Post development drainage areas C1 through C7 consist of the majority of the proposed changes, including the footprint of the proposed addition, concrete walkways, expanded parking lot, and fire route lane. Post development drainage areas C1-C7 have the largest increase in impervious areas and result in an increase in post development flows. A new private storm sewer system, including catch basins, catch basin manholes and storm sewers will convey the runoff from areas C1-C7 to a new proposed connection to the 900mm diameter concrete storm sewer over the south property line. It is understood that the OCDSB is approaching the private landowners to discuss the proposed connection and legal requirements for any potential easements required for the connection.

Post Development Outlet Controls

Post development flows were compared to predevelopment levels, for each outlet. Under post development conditions, flow controls will be proposed where the post development flow rates are increasing compared to the predevelopment flow rates.

Table 4-3: Post Development vs. Predevelopment Flow Comparison

Outlet	Drainage Area	5 Year Flow Rate	100 Year Flow Rate
Outlet 1: Existing On Site Storm Sewer	A1, Predevelopment	90.1	154.5
	A1-A2, Post Development	35.4	60.7
	Difference	-54.7	-93.8
Outlet 2: Sheet Drainage over South Property Line	B1, Pre Development	29.4	50.1
	B1, Post Development	27.2	46.3
	Difference	-2.2	-3.8
Outlet 3: 900mm diameter Storm Sewer	C1, Pre Development	68.6	117.5
	C1-C7, Post Development	191.0	365.6
	Difference	122.5	248.1

Evidently, post development flows for outlet 3, drainage areas C1 through C7 are increasing as compared to the predevelopment conditions. Thus, post development flow controls for drainage areas C1 through C7 will be required. In conjunction with the City of Ottawa preconsultation requirements, post development flows will be limited to the existing conditions predevelopment 5 year release rate, or 68.6 Lps, for drainage areas C1 through C7, for all storms up to and including the 100 year event.

Post development flows from drainage areas A1 and A2 are decreased as compared to the predevelopment area A1. No stormwater management flow controls are proposed. Post development drainage area B1 is reduced in size and runoff coefficient, post development flows are decreased as compared to the predevelopment B1. Therefore, no stormwater management flow controls are proposed.

4.3.1 Stormwater Management Controls

For post development drainage areas C1 through C7, flow controls will be provided to restrict the post development flow rates to the pre development existing conditions 5 year release rate. As calculated in section 4.2 above, the predevelopment 5 year allowable release rate for predevelopment area C1 is 68.6 L/s. Therefore, all post development release rates for post development areas C1 to C7 are to be controlled to 68.6 L/s for all storms up to and including the 100 year. Post development flow control is provided through a combination of roof drain controls and rooftop stormwater storage, as well as within a proposed underground storage chamber and an orifice plate at the ultimate storm sewer outlet to the 900mm diameter storm sewer.

For roof drainage, parabolic weirs (Watts Drainage Adjustable Flow Control Roof Drains, or equivalent approved product) will be used to control flow. 19 roof drains are proposed in the “closed” position, which each deliver a flow rate of 5 gpm (0.32 L/s), for a total roof outflow of 6.0 L/s. 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 0.32 L/s. Refer to the attached roof drain flow control product sheet in Appendix B.

A Stormtech SC-800 chamber (or equivalent product) is proposed for end of pipe stormwater storage before the final outlet to the proposed connection to the 900mm diameter concrete storm sewer. A 172mm diameter orifice plate will provide flow control at STMH-3. From review of the Geotech report: “*Borehole Nos. 5 and 11 to 14 were found to be dry to 3.4 m to 4.0 m depths (Elevation 102.3 m to Elevation 100.7 m).”* The borehole closest to the proposed underground chambers is located at borehole 11, which was found to be dry at a borehole termination elevation of 100.7. The proposed stormtech chamber stone base elevation is at an elevation of

103.18, and thus the underground storage system is expected to be above the groundwater elevation with sufficient clearance in the proposed area.

PCSWMM modelling was conducted to verify required storages and outflow rates from the combined flow control roof drains and roof storage, as well as the ultimate 172mm diameter orifice at STMH-3 for the 2 through 100 year storm events based on a Chicago 6 Hour Storm utilizing the City of Ottawa IDF curves and parameters. Summary results of the post development storages and site outflow is included in Appendix B as Table B-14. A summary of the 5 year and 100 year storage requirements and controlled flow rates are shown in table 4-4 below:

Table 4-4: PCSWMM Peak Outflow and Storage Requirements for 5 Year and 100 Year Storms

Storage ID	100 Year		5 Year	
	Peak Outflow (m3/s)	Peak Storage Requirements (m3)	Peak Outflow (m3/s)	Peak Storage Requirements (m3)
Roof	0.006	101.0	0.006	48.0
Stormtech SC-800	0.059	193.0	0.042	107.0

A detailed stage-storage chart for the proposed Stormtech SC-800 is included in Appendix B. The proposed chambers provide a total available storage volume of 219.12m^3. The maximum available roof storage is 115.3m^3. The provided storages within the proposed roof storage and underground storage chambers exceed the required storages for the 2 through 100 year events. No surface ponding is proposed.

4.3.2 Post-Development Site Outflow

The resulting post development site outflow summary for each 2 through 100 year City of Ottawa IDF event is shown in Table 4-5 below. Proposed stormwater controls are able to restrict the post-development site outflow to the predevelopment 5-Year allowable release rate of 68.6 Lps. PCSWMM summary results including inflows, outflows, and peak storages for the proposed rooftop storage and proposed underground storage are included in Appendix B.

Table 4-5: Post-Development Stormwater Outflow Summary vs. 5 Year Allowable Release Rate

		Peak Flow (Chicago Storm - 6 Hour) City of Ottawa IDF					
		2-year	5-year	10-year	25-year	50-year	100-year
Reference Point	5 Year Allowable* (L/s)	Post (L/s)	Post (L/s)	Post (L/s)	Post (L/s)	Post (L/s)	Post (L/s)
OF1	68.6	35.0	42.0	46.0	51.0	55.0	59.0
Total	**68.6**	**35.0**	**42.0**	**46.0**	**51.0**	**55.0**	**59.0**

* Per consultation with City of Ottawa allowalbe release rate for all storms up to and including the 100 year even is the predevelopment existing conditions 5 year

4.3.3 Quality Control

Per consultation with the City of Ottawa, quality control for this site is required to provide 80% removal of total suspended solids for the parking lot extension to the ETV particle size distribution. Quality control will be provided for drainage areas C1 through C7 within the proposed underground storage chambers. The “isolator row” of the proposed stormtech chambers is designed to capture the “first flush” runoff. The design includes an elevated bypass outlet, allowing for settlement of suspended solids within the isolated stormchamber. The proposed technology has been verified to provide 82% +/- 1% removal efficiency of suspended sediment

concentration at a 95% confidence interval basd on the ETV particle size distribution. A verification statement and product literature have been included in Appendix B.

4.4 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 terminal backwater valve will be installed on the outlet end of the foundation drain service at CBMH-3. The building storm service for the roof drains will be connected independently, downstream of the proposed foundation drain backwater valve.

4.5 Overland Flow Route

Per the City of Ottawa Technical Bulletin PIEDTB-2016-01 SWM Revisions, an overland flow route must be provided to convey the 100 year + 20% stress test event, providing a minimum of 15cm of vertical clearance between the flow spill elevation and the ground elevation at the nearest building envelope in proximity of the flow route. The overland flow route is demonstrated in Appendix A – C4 Stormwater Management, Erosion and Sediment Control Plan.

The overland flow route was analyzed for the critical path adjacent to the proposed addition to ensure that the requirements of the PIEDTB-2016-01 are satisfied. As seen in Appendix A – Drawing C4, overland flow spills from CB-2 catchment to CBMH-4, from CBMH-4 to CBMH-3, and from CBMH-3 to CBMH-1 within proximity of the proposed addition. The depth of the overland flow was analyzed through this critical flow path by accounting for the 100 year flow from the upstream drainage areas, and multiplying by a factor of 1.2 (thus resulting in the 100 year + 20% stress test event). This analysis includes a conservative assumption that all of the upstream catch basin inlets are blocked, and no runoff is entering the storm sewer system.

For example, the overflow path from drainage area C4 accounts for the upstream drainage in areas C4, C5, and C6. This 100 year flow is 135.6 L/s, and thus the 100 + 20% is 162.72 L/s. The overflow route from drainage area C4 is defined by the 7.0m rectangular channel within the fire route drive aisle and a 15cm raised curb at a highpoint elevation of 105.82, refer to Drawing C2 Site Grading Plan. At an elevation of 105.88, this flow path is able to convey approximately 189 L/s, thus providing sufficient capacity for the stress test event. The lowest elevation at the adjacent building envelope is 106.03, satisfying the 15cm vertical clearance requirement. Additionally, the normal depth of flow was analyzed based on the downstream channel at a gradient of 1.0% (refer to drawing C2). The normal depth of flow was calculated to be 0.03m, and thus the governing criteria is the capacity of the high point acting as a weir. Refer to Appendix B for detailed calculations.

The overland flow path from the proposed building addition, parking lot, and fire route is over the top of the curb adjacent to the CBMH-1 low point in the fire route within drainage area C2. Using the same process as described above, the upstream drainage areas result in a 100+20% stress test event of 438.72 L/s. Based on the Weir channel defined by the top of the curb profile adjacent to CBMH-2, an overflow elevation of 105.50 provides sufficient capacity to convey the stress test event flow from the upstream drainage areas without touching the lowest building envelope elevation.

The ultimate overland flow path for the proposed development is through the low laying area in the school field along the adjacent property line, through to the carp river. A sketch is included in Appendix B demonstrating the existing grades of the school field, and a sample cross section through the existing overland flow path. Based on the highpoint of the longitudinal profile of 104.21, and the cross section at this highpoint, the overland flow path capacity is estimated at 7.2 m3/s. The total overland flow from the proposed development during the stress test

event described above is 438.72 L/s (0.43 m3/s). The total overland flow from the stress test event from the proposed development is not anticipated to have an adverse impact on the existing overland flow route.

5 Sanitary Servicing

5.1 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)
- Estimated student population of 325 for the addition (See section 1.2)
- Peak Factor of 1.5 (City of Ottawa Institutional Peak Factor)
- Infiltration allowance of 0.33 L/s/ha.

5.2 Existing Sanitary Servicing

There is an existing 250mm diameter sanitary sewer on Abbeyhill Drive, and an existing 200mm diameter sanitary sewer available on Paddock Way. The existing school's sanitary flows are conveyed to the 250mm diameter sanitary sewer on Abbey hill Drive. The exact location of the existing schools sanitary service are unknown. As-built documentation from 1976 show a 6" or 150mm diameter sanitary sewer from the south west corner of the building connected to the 250mm diameter sanitary sewer on Abbeyhill Drive, refer to Appendix E Additional Documents for 1976 as-built drawing.

5.3 Proposed Sanitary Servicing and Calculations

A new sanitary service will connect to the proposed building addition, conveying sanitary flows from the addition to the existing 200mm diameter sanitary sewer on Paddock Way. 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 addition population described in section 1.1. As per preconsultation with the City of Ottawa, the peak sanitary flows are to be estimated from the population of the addition only to accurately represent the new sanitary flows from to the existing sanitary sewer. 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.

As such, peak flows from the proposed addition were estimated to be 0.57 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 addition, 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.

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 106.20. 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 Paddock is at an elevation of 106.07, and the proposed SAMH-1 on site is at an elevation of 106.13. 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.

6 Water Servicing

6.1 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

6.2 Existing Water Servicing

The existing school is serviced with a 100mm (4") diameter water service connected to the 150mm diameter watermain on Paddock Way. A 305mm diameter watermain is available for connection on Abbeyhill Drive. There are no existing on site private fire hydrants.

6.3 Domestic Water Demand

The domestic water demands for the new school addition 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 existing school and proposed addition to avoid a vulnerable service area.

Population estimates of the existing school and proposed addition were discussed with OCDSB staff, refer to section 1.2. The total population used to calculate the domestic water demand is 1554 students and staff including the existing building, proposed addition, and future portables.

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 1.26 L/s for 1554 students and staff.

The maximum daily factor of 1.5 results in a maximum daily demand of 1.89 L/s, and the maximum hourly factor of 1.8 results in a maximum hourly demand of 3.40 L/s.

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	1000	students	Site plan
Average Daily Demand	70000 1.26	L/d L/s	
Maximum Daily Factor	1.5		*Ottawa Design Guidelines - Water Distribution* Table 4.2
Maximum Daily Demand	1.89	L/s	
Maximum Hourly Factor	1.8		*Ottawa Design Guidelines - Water Distribution* Table 4.2
Maximum Hourly Demand	3.40	L/s	

6.4 Fire Flow Demand

Fire flow demands accounting for the existing building, existing portables, proposed addition, and future portables were calculated using the OBC and FUS 2020 method for fire flow demands.

Based on the OBC fire flow demand, the fire flow demand is calculated to be 150 L/s. Refer to the attached calculation sheet in Appendix D for details. Based on the 2020 Fire Underwriters Survey (FUS) Method, the fire flow demand for the school is calculated to be 250.0 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.

6.4.1 Fire Hydrant Coverage

There are three fire hydrants within proximity of the subject development property (two on Abbeyhill Drive, and one on Paddock Way).

The existing building is equipped with 2 fire department connections. One at the North west end of the building, and the other at the south west end of the building. Per the OBC section 3.2.5.16, 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. Per the existing locations of fire department connections and existing fire hydrants, the existing fire department connections do not meet the requirements of OBC 3.2.5.16. Two new private fire hydrants are proposed on the school property, located to suit the provisions of the OBC for fire department connections.

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 existing hydrants along Abbey hill Drive, and the existing fire hydrant on Paddock Way are within 75m and will therefore provide an aggregate flow of 285 L/s. 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 250.0 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)
Abbeyhill Drive North	67	95
Abbeyhill Drive South	55	95
Paddock Way	41	95
Proposed FH01	7	95
Proposed FH02	3.5	95
	Total Fire Flow	475

6.5 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, condition 1, pressure checks within the system were conducted for the max hour demand, and max day + fire demand for the existing 100mm water service to the existing building from Paddock, and for the proposed 150mm water service to the addition from Abbeyhill. 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.

6.5.1 Hydrant Pressure

Based on the provided boundary conditions, condition 2, A pressure check for each proposed private fire hydrant was conducted. Frictional losses were calculated using the Hazen Williams formula to determine pressure loss to the proposed new fire hydrants based on the boundary conditions and available pressures provided by the City of Ottawa. It was determined that each of the proposed fire hydrants can provide 95 L/s of fire flow at a pressure of 48.76 psi at the Fire Hydrant 01, and 26.76 psi is available at Fire Hydrant 02, exceeding the minimum 20 psi requirement for a Class AA fire hydrant.

6.6 Proposed Water Servicing

The average domestic demand for the proposed addition (1.26 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 – Paddock Way: The existing 100mm diameter water service from Paddock Street will remain. The existing water service is connected to the existing school building, complete with a water meter.

Connection 2 – Abbeyhill Drive: A new 150mm diameter water service will connect to the 305mm diameter water main on Abbeyhill Drive to introduce a secondary water service to the proposed addition. The new 150mm water service will connect to the proposed addition's water entry room, complete with a new water meter. The building's water servicing will be looped internally within the building, refer to ground floor plumbing drawings included in Appendix E.

Two new private fire hydrants will be provided on site, in order to satisfy the requirements of OBC Section 3.2.5.16, providing fire hydrants within 45m of the existing and new proposed fire department connections. Boundary condition results, provided by the City of Ottawa, were analyzed to determine the adequacy of the existing water service and proposed 150mm water servicing. The proposed water servicing for the building and

fire hydrants meet the City of Ottawa normal operating pressure requirements as mentioned in sections 6.5 and 6.5.1 above.

7 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 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. Additionally, for quality control and TSS removal, the proposed stormwater management scheme includes an underground stormwater retention tank. The ADS Stormtech (or equivalent product) is equipped with an 'Isolator Row' with an elevated bypass manifold. The Isolator Row is sized to capture the first flush, and demonstrated to provide 80% TSS removal to the ETV standard based on the upstream drainage areas. TSS removal will be provided from the stormtech isolator row chambers. The catch basin sumps and storage chambers will be required to be cleaned and maintained by the owner after construction completion in accordance with the manufacturers instructions.

8 Conclusions

The proposed addition to AY Jackson 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 900mm diameter City of Ottawa storm sewer across the south neighbouring property line. It is understood that the OCDSB are in discussions with the adjacent property owner regarding the proposed connection and are sorting out the legal work required to register a new easement to allow the connection. Quantity control will be provided through an underground storage chamber to restrict post development flows to a 5 year predevelopment level. Quality control will be provided through the isolator row in the proposed storage chambers, meeting an 80% TSS removal to the ETV standard.

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. The ultimate overland flow for the site will continue to be directed towards the carp river, through the school field along the low laying area near the south property line.

A new 200mm diameter sanitary sewer connected to the 250mm diameter sanitary sewer on Paddock St will provide sanitary servicing for the proposed addition. There is an existing 150mm diameter sanitary service connected to Abbeyhill Dr. for the existing building.

The existing 100mm diameter water service, complete with water meter, servicing the existing school will be maintained. A new 150mm water service connected to the 305mm diameter watermain on Abbeyhill Dr. will be provided to the new addition, complete with a new water meter, to satisfy the City of Ottawa requirements for two independent water services as the domestic demand exceeds 50m^3/d. 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, and the isolator row of the proposed underground storage chambers. The owner will be responsible for the regular maintenance of the sumps and underground 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

Symbol	Description
— W — W —	EXISTING WATERMAIN
— // · // —	REMOVAL ITEM
+	REMOVAL ITEM
	TOP SOIL STRIPPING / TRENCH REMOVAL
	FULL DEPTH ASPHALT REMOVAL
	MILLING PER DETAIL 3/C3
	PORTABLES TO BE RELOCATED BY OCDSB
	FULL DEPTH GRAVEL REMOVAL

GENERAL NOTES

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2. THE CONTRACTOR IS RESPONSIBLE FOR CHECKING AND VERIFYING ALL DIMENSIONS WITH RESPECT TO SITE CONDITIONS AND ALL MATERIALS TO THE PROJECT. ANY DISCREPANCY SHALL BE REPORTED TO THE ENGINEER.
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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.

DRAWING NOTES

01 EXISTING 100mm WATER SERVICE TO REMAIN

02 EXISTING CATCH BASIN TO BE REMOVED

03 EXISTING STORM SEWER TO BE REMOVED

04 FULL DEPTH ASPHALT REMOVAL

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

06 EXISTING FENCE SURROUNDING EXISTING BASEBALL DIAMOND TO BE REMOVED

07 EXISTING BLEACHER TO BE REMOVED

08 EXISTING GRANULAR/GRAVEL SURFACE WITHIN EXISTING BASEBALL DIAMOND TO BE REMOVED

09 EXISTING PORTABLES TO BE RELOCATED BY OCDSB

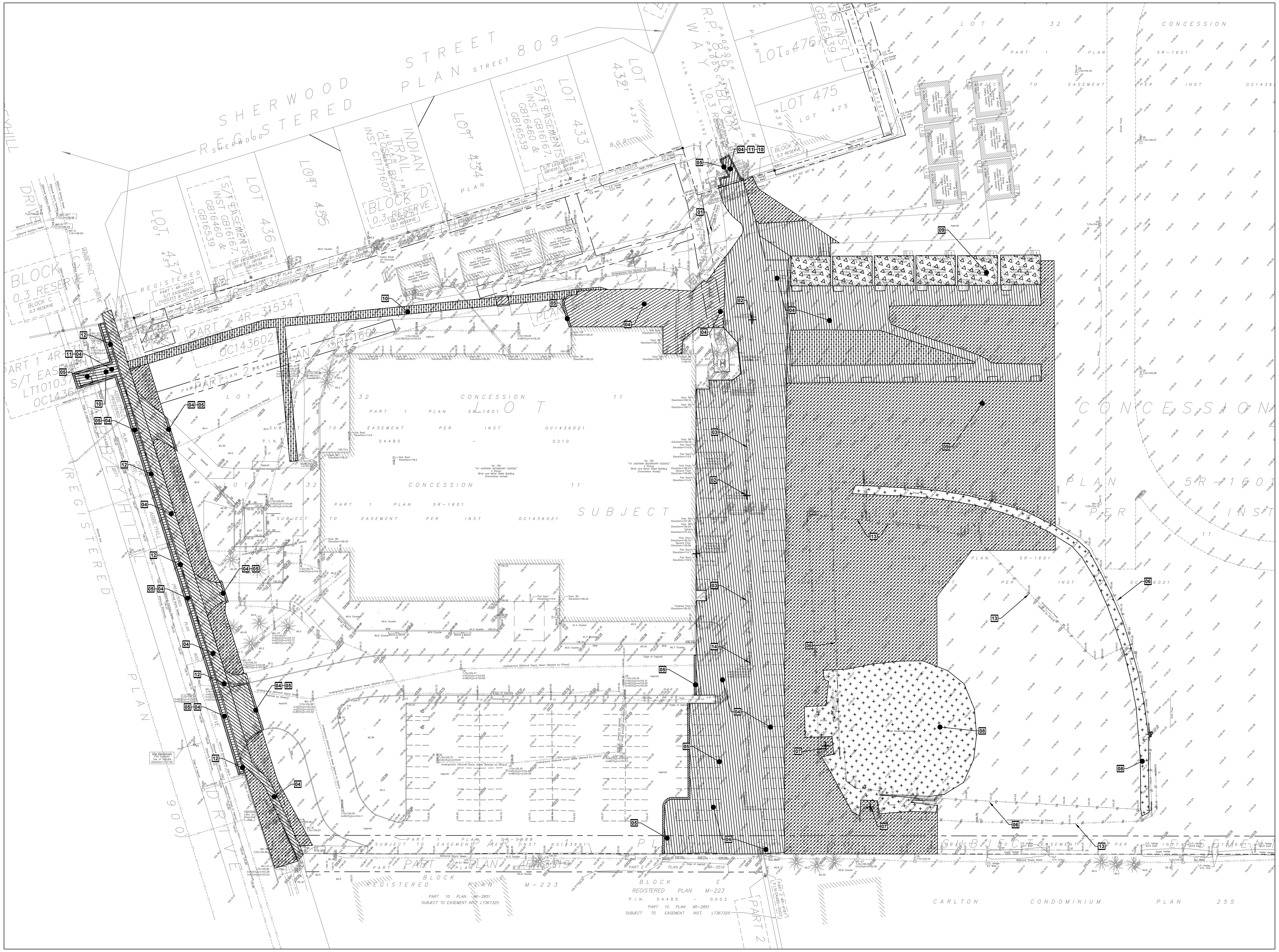
10 CONTRACTOR TO PROVIDE TRENCH BOX FOR SERVICE TRENCHING EXCAVATION

11 ROAD CUT TO FACILITATE NEW SERVICES AS PER CITY OF OTTAWA STANDARD DETAIL R10. CONTRACTOR SHALL BE RESPONSIBLE FOR OBTAINING AND PAYING FOR A ROAD CUT PERMIT FROM THE CITY OF OTTAWA

12 REMOVE EXISTING CURB ADJACENT TO EXISTING ASPHALT PATHWAY TO FACILITATE REPLACEMENT WITH NEW MONOLITHIC CONCRETE SIDEWALK AND CURB

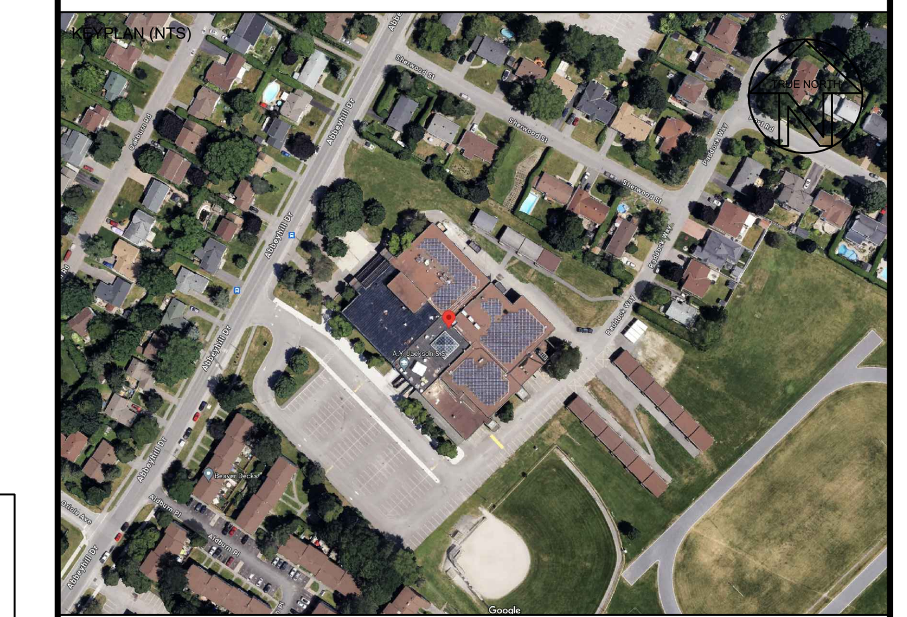
13 EXISTING UNDERGROUND POWER TO BE REMOVED. REFER TO ELECTRICAL

14 PARGE REMOVED STORM SEWER PIPE AT MANHOLE. PROVIDE WATER TIGHT CONNECTION



CLIENT LOGO

OTTAWA-CARLETON DISTRICT SCHOOL BOARD



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2	2024-12-17	ZB/AS	ISSUED FOR BUILDING PERMIT
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STAMP

LICENSED PROFESSIONAL ENGINEER
A. SAMMOUR
100227665
April 3, 2025
PROVINCE OF ONTARIO

STAMP

PROJECT

AY JACKSON SECONDARY SCHOOL ADDITION

150 ABBEYHILL DRIVE,
KANATA ON,
K2L 1H7

DRAWING

REMOVALS PLAN

Jp2g Consultants Inc.
ENGINEERS · PLANNERS · PROJECT MANAGERS

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Jp2g PROJECT No.: 24-5053A

NORTH

TRUE NORTH

CLIENT No.:

DRAFTED: ZB

DESIGNED: ZB

REVIEWED: AS

APPROVED: AS

SCALE

1:500

0 m, 5, 10, 15, 20, 25 m

SHEET #

R1

LEGEND

- PROPERTY LINE
- EXISTING WATERMAIN
- EXISTING SANITARY SEWER
- EXISTING STORM SEWER
- EXISTING FORCEMAIN
- EXISTING FIRE HYDRANT
- EXISTING SANITARY MANHOLE
- EXISTING STORM MANHOLE
- EXISTING CATCH BASIN
- NEW BUILDING
- NEW FOUNDATION DRAIN
- NEW WATERMAIN
- NEW FIRE HYDRANT
- NEW WATER VALVE
- NEW SANITARY SEWER
- NEW SANITARY MANHOLE
- NEW STORM SEWER
- NEW STORM MANHOLE
- NEW CATCH BASIN
- NEW INLET CONTROL DEVICE
- RD — NEW ROOF DRAIN
- SC — NEW SCUPPER AT 150mm ABOVE ROOF DRAIN LEVEL
- NEW CONCRETE SIDEWALK
- NEW ASPHALT
- NEW GRASS
- INSULATION PER CITY OF OTTAWA W22
- TOP OF BANK
- LIMIT OF FILL
- DCC — DEPRESSED CURB
- NCC — CONCRETE BARRIER CURB
- NEW TREE, REFER TO LANDSCAPE
- NEW TWSI
- NEW SIAMESE CONNECTION
- SERVICE CROSSING ID, REFER TO DRAWING C3
- WATER PROFILE ID, REFER TO DRAWING C3
- BUILDING ENTRY

DRAWING NOTES

01 SUPPLY AND INSTALL NEW 150mm Ø PVC DR18 WATER MAIN SERVICE, MINIMUM 2.4m COVER, OTHERWISE PROVIDE HL40 THERMAL INSULATION IN ACCORDANCE WITH CITY OF OTTAWA STANDARD DETAIL DRAWING W22. CONTRACTOR SHALL BE RESPONSIBLE FOR OBTAINING AND PAYING FOR A WATER PERMIT FROM THE CITY OF OTTAWA FOR INSPECTION, DISINFECTION (CHLORINATION) AND TESTING. COORDINATE NEW WATER SERVICE CONNECTION WITH MECHANICAL PLANS.THRUST BLOCKS SHALL BE AS PER OPSD 1103.010 & 1103.020.

02 INSTALLATION OF NEW SERVICE CONNECTION TEE 300mmX150mm Ø PVC TO EXISTING MUNICIPAL WATERMAIN TO BE COMPLETED BY CITY OF OTTAWA FORCES. EXCAVATION, BACKFILL AND RE-INSTATEMENT BY CONTRACTOR.

03 BREAK IN AND CONNECT TO EXISTING SANITARY MANHOLE WITH NEW 200mm PIPE, INVERT CONNECTION TO BE PROVIDED AT 103.90. PROVIDE WATERTIGHT CONNECTION. EXISTING SANITARY MANHOLE INVERT AT 103.73. CONTRACTOR TO CONFIRM MUNICIPAL SANITARY SEWER INVERTS PRIOR TO CONSTRUCTION. CONNECTIONS SHALL BE MADE WITH CORE DRILLING.

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

05 SUPPLY AND INSTALL NEW 150mm WATER VALVE. VALVEBOX ASSEMBLY AS PER CITY OF OTTAWA STANDARD DETAIL DRAWING W24 AND W50.

06 SUPPLY AND INSTALL WATTS ROOF DRAIN CONTROLS TO BE INSTALLED ON ROOF DRAINS. SPECIFIC WEIR SETTINGS IN CLOSED POSITION. MAXIMUM DISCHARGE 6.0l/s TOTAL. MAXIMUM ROOF PONDING DEPTH 150mm. 100 YEAR PONDING VOLUME: 109.9m^3.

07 SUPPLY AND INSTALL NEW INLET CONTROL DEVICE FLOW REGULATOR AT STORM MANHOLE, STMH-3 OUTLET. MAXIMUM DISCHARGE 59 l/s AT 0.99m HEAD AND ORIFICE DIAMETER AT 172mm.

08 NEW MONITORING STORM MANHOLE STMH-3 AND 375mm Ø STORM SEWER PIPE FROM UNDERGROUND STORAGE TANK TO 900mmØ STORM SEWER. PROVIDE WATERTIGHT CONNECTION.

09 NEW MONITORING SANITARY MANHOLE SAMH-1 AND 200mm Ø SAINTARY SEWER PIPE FROM BUILDING CONNECT NEW 200mm Ø SANITARY PIPE TO THE EXISTING SANITARY MANHOLE ON PADDOCK ST. PROVIDE WATERTIGHT CONNECTION.

10 CONNECT STORM AT APPROXIMATE INVERT LEVEL = 104.05 TO BUILDING 1.0m AWAY FROM BUILDING FOUNDATION.

11 CONNECT SANITARY AT APPROXIMATE INVERT LEVEL = 104.78 TO BUILDING 1.0m AWAY FROM BUILDING FOUNDATION.

12 CONNECT NEW 100mm PERFORATED PERIMETER FOUNDATION DRAINAGE (REFER TO ARCHITECTURAL) TO NEW 100mm PVC STORM SEWER PIPE TO CBMH-3. PROVIDE WATERTIGHT CONNECTION

13 CORE IN AND CONNECT TO EXISTING 900mm DIAMETER CONCRETE STORM PIPE AS PER CITY OF OTTAWA STANDARD DETAIL S11 AND S11.2. INVERT CONNECTION OF NEW 375mm PVC PIPE TO BE PROVIDED AT ELEVATION = 102.96. CONTRACTOR TO CONFIRM STORM SEWER INVERTS PRIOR TO CONSTRUCTION AND REPORT ANY DISCREPANCY TO ENGINEER. CONNECTIONS SHALL BE MADE WITH CORE DRILLING.

14 SUPPLY AND INSTALL PRO-LINE FITTINGS TERMINAL BACKWATER VALVE (4" SIZE) ON 100mm FOUNDATION DRAIN SERVICE. CONTRACTOR TO SUBMIT SHOP DRAWINGS FOR APPROVAL

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

16 FIRE HYDRANT AS PER CITY OF OTTAWA STANDARD DETAIL DRAWING W19

17 SUBDRAINS SHOULD BE INSTALLED UNDER CURBS ON THE SIDES OF THE ACCESS ROAD AND PARKING AREA AND TO CONNECT TO STORM SEWER NETWORK PER CITY OF OTTAWA DETAIL R1. SEE GEOTECHNICAL NOTES AND REFER TO GEOTECHNICAL REPORT.

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

19 WATER SERVICE ENTRY TO BE SLEEVED THROUGH FOUNDATION WALL ON TOP OF FOOTING AT 103.61. INVERT LEVELS TO BE COORDINATED AND MATCHING WITH STRUCTURAL AND MECHANICAL DRAWINGS. INSULATE PER CITY OF OTTAWA W22 WHERE LESS THAN 2.4m OF COVER IS PROVIDED.

20 CONSTRUCT NEW WATER SERVICE CROSSING OVER EXISTING SEWERS AS PER CITY OF OTTAWA STANDARD DETAIL W25.2. PROVIDE INSULATION AS PER CITY OF OTTAWA STANDARD DETAIL W22 WHERE COVER IS LESS THAN 2.4m

21 INSTALL NEW STORMTECH SC-800 CHAMBERS (OR EQUIVALENT PRODUCT). TOTAL SYSTEM STORAGE VOLUME = 219.12m3. BOTTOM OF STONE ELEVATION = 103.18. TOP OF STONE ELEVATION = 104.37. BOTTOM OF CHAMBER ELEVATION = 103.33. TOP OF CHAMBER ELEVATION = 104.17. PROVIDE MINIMUM OF 200mm STONE ABOVE AND 152mm STONE BELOW CHAMBER. CONTRACTOR TO PROVIDE SHOP DRAWINGS AND STAGE ELEVATION CHART FOR APPROVAL.

22 NEW SIAMESE CONNECTION, REFER TO MECHANICAL DRAWINGS

23 ANY EXCAVATION WITHIN CLOSE PROXIMITY OF THE EXISTING 400mm FORCEMAIN WILL REQUIRE CITY PRESENCE. CONTRACTOR TO FOLLOW RECOMMENDATIONS INCLUDED IN EXCAVATION AND CONTINGENCY PLAN FOR SANITARY FORCEMAIN PROXIMITY MEMO BY JP2G CONSULTANTS.

24 CONTRACTOR TO PROVIDE CCTV OF EXISTING BUILDING STORM AND SANITARY SERVICES

25 PORTABLE SERVICE MANHOLE FOR POWER AND SECURITY, REFER TO ELECTRICAL DRAWINGS

26 APPROXIMATE LOCATION OF EXISTING 150mm DIAMETER CONCRETE SANITARY SERVICE FOR EXISTING BUILDING BASED ON CRAIG AND KOHLER AS-BUILT DATED 1976. CONTRACTOR TO INFORM ENGINEER OF ANY DISCREPANCY FOUND IN THE FIELD.

27 PROVIDE 100mm HIGH LOAD RIGID INSULATION PLACED WITHIN SUBGRADE. INSULATION AS PER CITY OF OTTAWA DETAIL W22.

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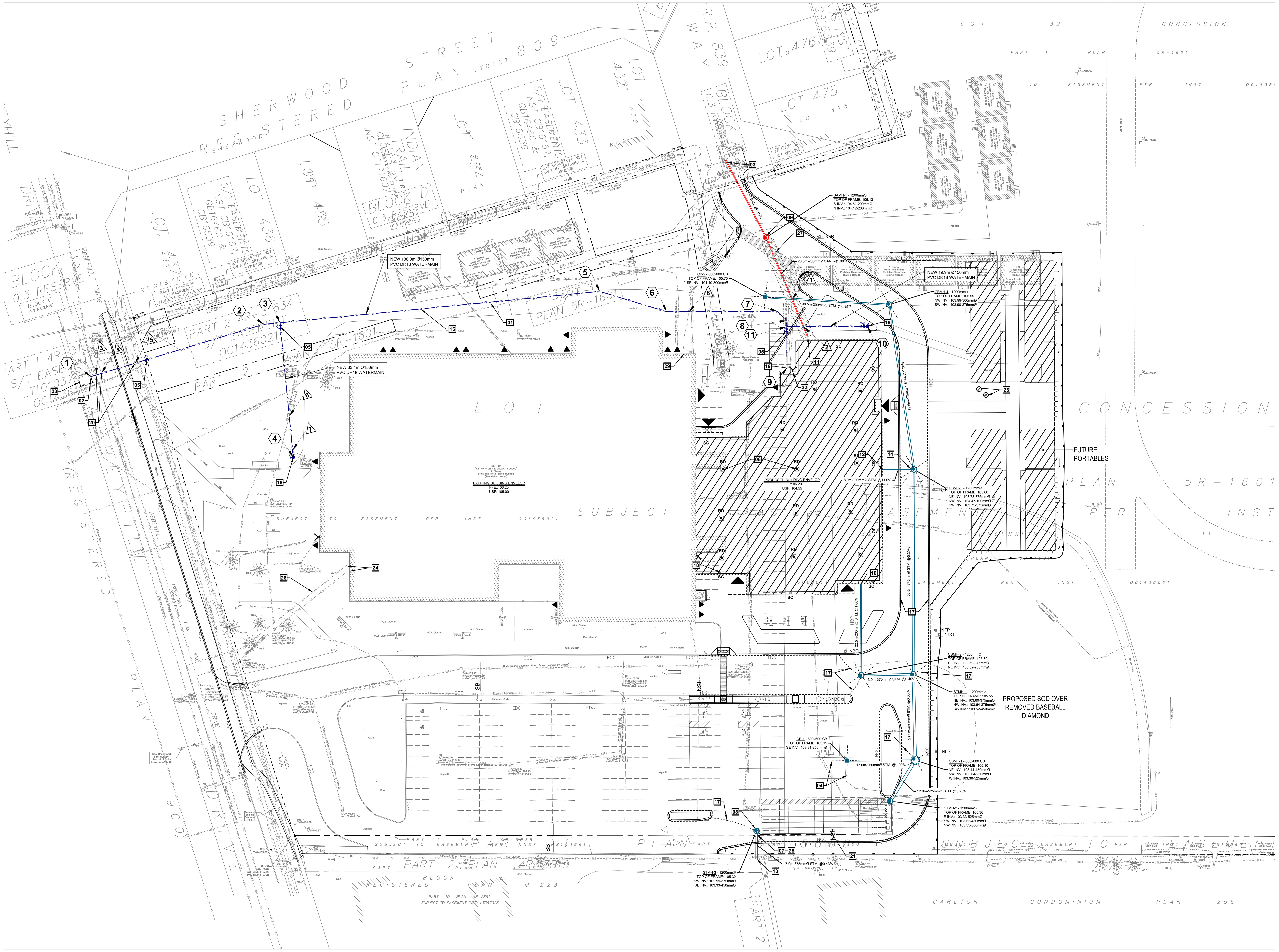
DRAWING NOTES

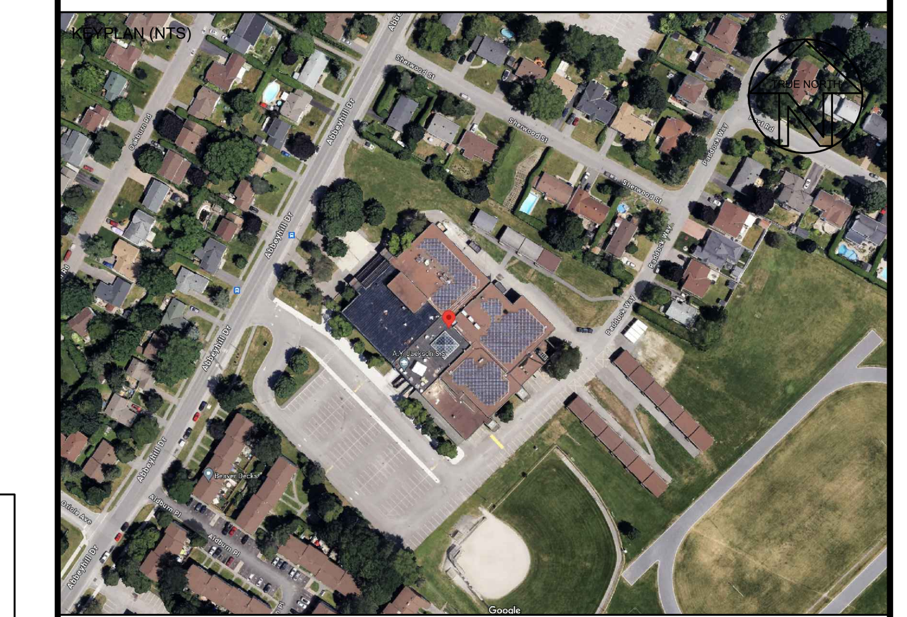
28 SUPPLY AND INSTALL BACKFLOW VALVE ON STMH-3 OUTLET .CONTRACTOR TO PROVIDE SHOP DRAWINGS FOR PROFLEX PROCO 790 DUCK BILL TYPE FOR 15" SIZE (375mm). VALVE CLAMP LOCATION AT DISCHARGE.

29 EXISTING 100mm WATER SERVICE FOR EXISTING SCHOOL BUILDING TO REMAIN



CLIENT LOGO

OTTAWA-CARLETON DISTRICT SCHOOL BOARD



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STAMP

LICENSED PROFESSIONAL ENGINEER
A. SAMMOUR
100227665
April 3, 2025
PROVINCE OF ONTARIO

STAMP

PROJECT

AY JACKSON SECONDARY SCHOOL ADDITION

150 ABBEYHILL DRIVE,
KANATA ON,
K2L 1H7

DRAWING

SITE SERVICING PLAN

Jp2g Consultants Inc.
ENGINEERS · PLANNERS · PROJECT MANAGERS

12 INTERNATIONAL DR.
PEMBROKE, ON, K8A 6W5
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Jp2g PROJECT No.: 24-5053A

NORTH

TRUE NORTH

CLIENT No.:
DRAFTED: ZB
DESIGNED: ZB
REVIEWED: AS
APPROVED: AS

SCALE
1:500
0 m 5 10 15 20 25 m

SHEET #
C1

DWG NAME: J:\5-CIVIL\2024\24-5053A - CUHACI - AY JACKSON ADDITION\05 DRAWINGS\1 ONGOING\24-5053A AY JACKSON ISSUED FOR SITE PLAN CONTROL XX 2025.DWG LAYOUT: C1 SITE SERVICING PLAN SAVED ON 2025-04-01

LEGEND

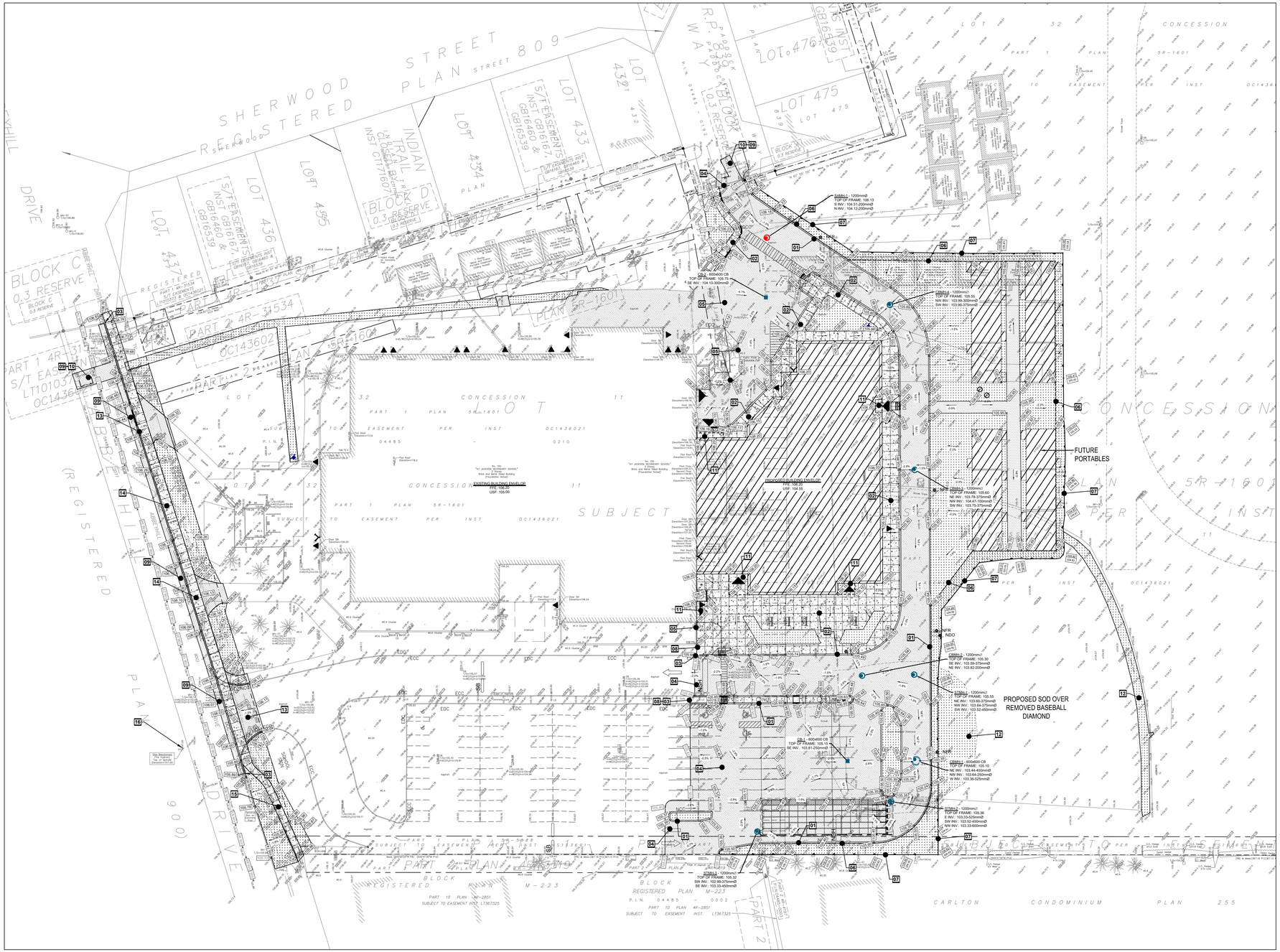
- PROPERTY LINE
- EXISTING WATERMAIN
- EXISTING SANITARY SEWER
- EXISTING STORM SEWER
- EXISTING FIRE HYDRANT
- EXISTING SANITARY MANHOLE
- EXISTING STORM MANHOLE
- EXISTING CATCH BASIN
- NEW BUILDING
- NEW FIRE HYDRANT
- NEW WATER VALVE
- NEW SANITARY MANHOLE
- NEW STORM MANHOLE
- NEW CATCH BASIN
- RD NEW ROOF DRAIN
- SC NEW SCUPPER AT 150mm ABOVE ROOF DRAIN LEVEL
- NEW CONCRETE SIDEWALK
- NEW ASPHALT
- NEW GRASS
- TOP OF BANK
- LIMIT OF FILL
- DEPRESSED CURB
- NCC CONCRETE BARRIER CURB
- NEW TREE, REFER TO LANDSCAPE
- NEW TWSI
- NEW SIAMESE CONNECTION
- BUILDING ENTRY
- 106.96 PROPOSED ELEVATION
- -2.0% PROPOSED SLOPE
- 104.65 / 104.65 PROPOSED ELEVATION / EXISTING ELEVATION
- 105.53 EXISTING ELEVATION

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. ELEVATIONS SHOWN ARE GEODETIC AND ARE REFERRED TO GEODETIC DATUM CGVD-1928:1978. (MONUMENT NO. 19770882). REFER TO TOPOGRAPHIC SURVEY COMPLETE BY FARLEY SMITH AND DENIS SURVEYING LTD FILE NO. 110-24

DRAWING NOTES

- G1 CONSTRUCT CONCRETE BARRIER CURB / DEPRESSED CURB AS PER CITY OF OTTAWA DETAIL SC1.1
- G2 CONSTRUCT MONOLITHIC SIDEWALK AND CURB AS PER CITY OF OTTAWA DETAIL SC2, EXPANSION JOINTS AS PER CITY OF OTTAWA SC5
- G3 MATCH NEW CURB INTO EXISTING CURB ELEVATION
- G4 MATCH NEW ASPHALT INTO EXISTING ASPHALT ELEVATION
- G5 EXISTING RETAINING WALL TO REMAIN
- G6 TOP OF BANK, PROVIDE MAXIMUM 3H:1V SLOPE TO TIE INTO EXISTING GRADES
- G7 MATCH EXISTING GRADES AT PROPERTY LINE AND LIMITS OF WORK
- G8 NEW EXTENSION OF EXISTING SIDEWALK . PROVIDE DOWELS AND JOINTS BETWEEN EXISTING AND NEW SIDEWALK EXTENSION AS APPLICABLE PER CITY OF OTTAWA STANDARD DETAILS R4 , R5 AND R6. CONTRACTOR SHALL ENSURE THE STRUCTURAL INTEGRITY OF EXISTING CONCRETE SIDEWALK THAT WILL REMAIN IN PLACE AND ITS UNDERLYING GRANULAR BASE WHEN COMPACTING THE SUBGRADE AND GRANULAR BASE OF THE NEW SIDEWALK EXTENSION. INSTALL REINFORCING MESH 150X150mm MW9.1XMW9.1 THROUGHOUT NEW EXTENSION. STOP WIRE MESH AT EXPANSION JOINTS.
- G9 ANY DISTURBED AREA WITHIN THE RIGHT-OF-WAY SHALL BE REINSTATED TO EQUAL OR BETTER CONDITION TO THE SATISFACTION OF THE CITY OF OTTAWA.
- G10 REINSTATE ROAD CUT TO FACILITATE NEW SERVICES AS PER CITY OF OTTAWA STANDARD DETAIL R10.
- G11 CONCRETE TO BE WITHIN 12mm OF DOOR
- G12 REPLACE EXISTING GRAVEL AREA WITHIN EXISTING BASEBALL DIAMOND AREA WITH 100mm TOPSOIL AND SOD. REINSTATE TOP OF SOD AT EXISTING GRADES.
- G13 MODIFY EXISTING ENTRANCE AS PER CITY OF OTTAWA DETAIL SC7.1
- G14 NEW MONOLITHIC CONCRETE CURB AND SIDEWALK AS PER CITY OF OTTAWA DETAIL SC2, MATCH BOTTOM OF CURB ELEVATION INTO EXISTING EDGE OF ROAD ELEVATION
- G15 NEW CONCRETE SIDEWALK IN BOULEVARD AS PER CITY OF OTTAWA STANDARD DETAIL SC4
- G16 SITE BENCHMARK, REFER TO TOPOGRAPHIC SKETCH OF #150 ABBEYHILL DRIVE CITY OF OTTAWA COMPLETE BY FARLEY SMITH AND DENIS SURVEYN LTD. FILE NO. 110-24.



DISCLAIMER NOTES

1. THE CONTRACTOR SHALL BE SOLELY RESPONSIBLE FOR ISSUES/PROBLEMS WHICH MAY OCCUR AS A RESULT OF A FAILURE TO FOLLOW THESE PLANS, SPECIFICATIONS AND THE DESIGN INTENT THEY CONVEY.
2. WHERE THERE ARE ALLEGED ERRORS, OMISSIONS, INCONSISTENCIES OR AMBIGUITIES PRESENT IN THE CONTRACT DOCUMENTS, THE CONTRACTOR MUST SEEK CLARIFICATION FROM JP2G . ANY COSTS OR SCHEDULE DELAYS WHICH RESULT AS A FAILURE TO CONTACT JP2G FOR DIRECTION SHALL BE SOLELY THE RESPONSIBILITY OF THE CONTRACTOR.
3. DO NOT SCALE DRAWINGS. REFER ANY DIMENSIONAL CLARIFICATIONS AND/OR POSSIBLE TRADE INTERFERENCE/CONFLICTS TO JP2G FOR CLARIFICATION PRIOR TO COMMENCEMENT OF THE WORK.
4. THE CONTRACTOR SHALL BE RESPONSIBLE FOR ALL COORDINATION WITH SUBTRADES AND SHALL ADDRESS CONSTRUCTION TEAM COORDINATION ITEMS PRIOR TO ISSUING REQUESTS FOR INFORMATION FROM JP2G.
5. THE POSITION OF POLE LINES, CONDUITS, WATERMAINS, SEWERS AND OTHER UNDERGROUND AND OVERGROUND UTILITIES AND STRUCTURES IS NOT NECESSARILY SHOWN ON THE CONTRACT DRAWING, AND, WHERE SHOWN, THE ACCURACY OF THE POSITION OF SUCH UTILITIES AND STRUCTURES IS NOT GUARANTEED. BEFORE STARTING WORK, THE CONTRACTOR SHALL INFORM THEMSELVES OF THE EXACT LOCATION OF ALL SUCH UTILITIES AND STRUCTURES, AND SHALL ASSUME ALL LIABILITY FOR DAMAGE TO THEM.

No.	YYYY-MM-DD	BY	DESCRIPTION
3	2025-04-03	ZB/AS	ISSUED FOR SITE PLAN CONTROL
2	2024-12-17	ZB/AS	ISSUED FOR BUILDING PERMIT
1	2024-11-21	ZB/AS	ISSUED FOR PHASE 3 PRECONSULT

STAMP

PROFESSIONAL ENGINEER SAMMOUR 100227665 April 3, 2025 PROVINCE OF ONTARIO

STAMP

PROJECT

AY JACKSON SECONDARY SCHOOL ADDITION

150 ABBEYHILL DRIVE,
KANATA ON,
K2L 1H7

DRAWING

SITE GRADING PLAN

Jp2g Consultants Inc.
ENGINEERS • PLANNERS • PROJECT MANAGERS

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Jp2g PROJECT No.: 24-5053A

NORTH — TRUE NORTH

CLIENT No.:	
DRAFTED:	ZB
DESIGNED:	ZB
REVIEWED:	AS
APPROVED:	AS

SCALE 1:500
0 m 5 10 15 20 25 m

SHEET # C2

DWG NAME: J:\CIVIL\2024\24-5053A - CLIENC\ - AY JACKSON ADDITION\DS DRAWINGS \ PACKING\24-5053A AY JACKSON ISSUED FOR SITE PLAN CONTROL XX 2025.DWG LAYOUT: C2 SITE GRADING PLAN SAVED ON 2025-04-01

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 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 COMPLETED AND PROVIDED BY FARLEY, SMITH AND DENIS SURVEYING LTD., FILE NO.:110-24, DATED JUNE 28,2024. 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;
    i. GEOTECHNICAL INVESTIGATION PREPARED BY EXP SERVICES INC., PROJECT NO.: OTT-23012778-D0 , DATED AUGUST 26, 2024.
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 W22, 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 W22, 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.

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 - PROPOSED ADDITION AY JACKSON HIGH SCHOOL, 150 ABBEYHILL DRIVE, 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 300mm 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 300mm. 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).
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.
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 1 M 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 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.

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 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.

Notes: Watermain

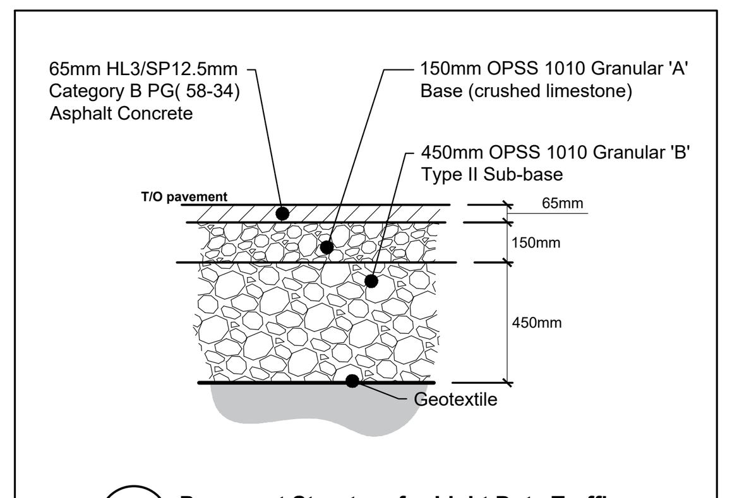
1. ALL WATERMAIN AND WATERMAIN APPURTANANCES, MATERIALS, CONSTRUCTION AND TESTING METHODS SHALL CONFORM TO THE CURRENT CITY OF OTTAWA AND MINISTRY OF ENVIRONMENT STANDARDS AND SPECIFICATIONS.
2. ALL WATERMAIN 300mm DIAMETER AND SMALLER TO BE POLY VINYL CHLORIDE (PVC) CLASS 150 DR 18 MEETING AWWA SPECIFICATION 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

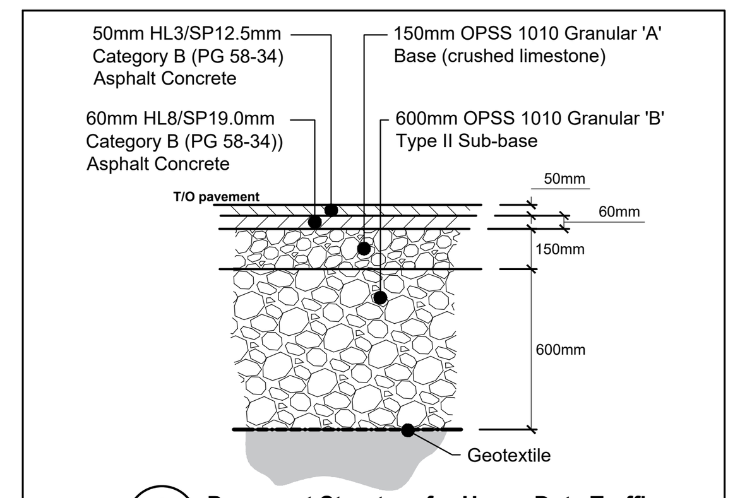
1. EXCAVATE AND REMOVE ALL ORGANIC MATERIAL AND DEBRIS LOCATED WITHIN THE PROPOSED BUILDING, FOUNDATION, PAVED AREAS, SUBDRAINS AND SERVICE TRENCHES. EXCESS MATERIAL REMOVAL FROM SITE SHALL FOLLOW THE GEOTECHNICAL AND ENVIRONMENTAL ENGINEER'S RECOMMENDATION.
2. CONTRACTOR TO STOCKPILE UN-USABLE FILL 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 .

Parking Lot and Work in Public Rights of Way

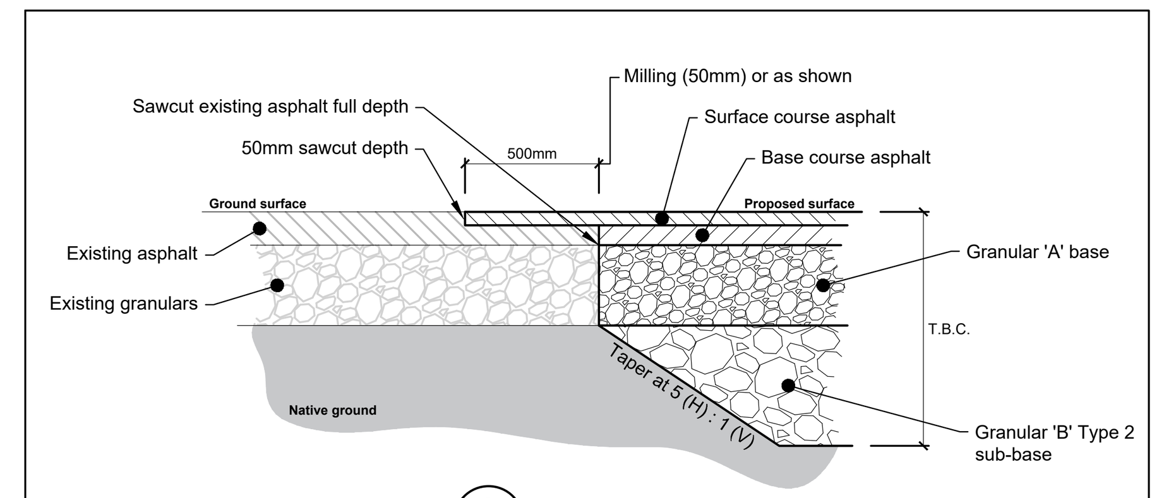
1. CONTRACTOR TO REINSTATE ROAD CUTS AS PER CITY OF OTTAWA DETAIL R10.
2. CONTRACTOR TO PREPARE SUBGRADE, INCLUDING PROOFROLLING, TO THE SATISFACTION OF THE GEOTECHNICAL CONSULTANT PRIOR TO THE COMMENCEMENT OF PLACEMENT OF GRANULAR B MATERIAL.
3. FILL TO BE PLACED AND COMPACTED PER THE GEOTECHNICAL REPORT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



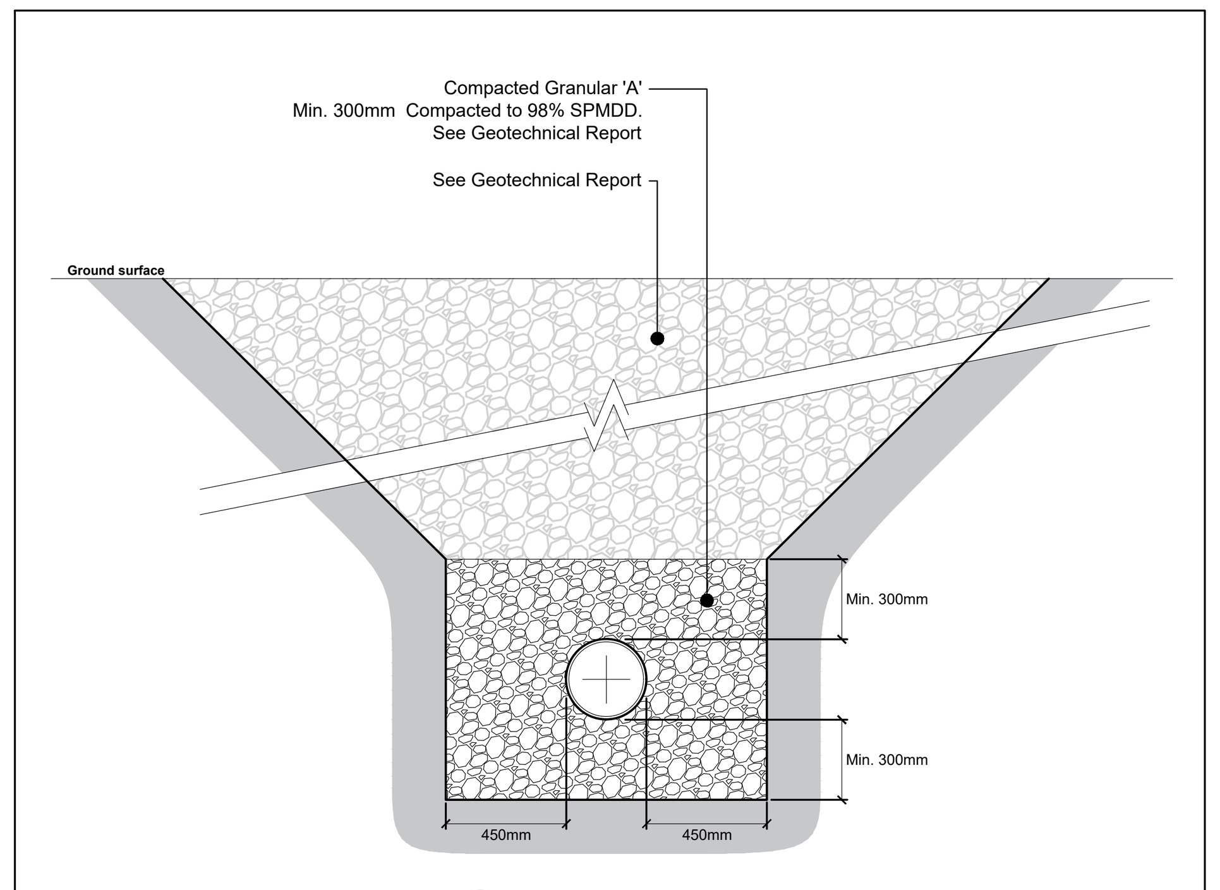
1/C3 **Pavement Structure for Light Duty Traffic**
Scale: **As shown**



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



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



4/C3 **Standard Trench Detail**
Scale: **As shown**

NEW STRUCTURE SCHEDULE

MANHOLE NO.	DESCRIPTION	T/GRATE ELEVATION	INVERT ELEVATION / PIPE DIAMETER
CB-1	600x600mm Catchbasin	105.15	SE INV.: 103.81 - 250mmØ
CB-2	600x600mm Catchbasin	105.75	SE INV.: 104.10 - 300mmØ
CBMH-1	1,800mmØ Manhole	105.10	NE INV.: 103.44 - 450mmØ NW INV.: 103.64 - 250mmØ W INV.: 103.36 - 525mmØ
CBMH-2	1,200mmØ Manhole	105.30	SE INV.: 103.59 - 375mmØ NE INV.: 103.82 - 200mmØ
CBMH-3	1,200mmØ Manhole	105.60	NE INV.: 103.78 - 375mmØ NW INV.: 104.47 - 100mmØ SW INV.: 103.75 - 375mmØ
CBMH-4	1,200mmØ Manhole	105.55	NW INV.: 103.99 - 300mmØ SW INV.: 103.90 - 375mmØ
SAMH-1	1,200mmØ Manhole	106.13	S INV.: 104.51 - 200mmØ N INV.: 104.12 - 200mmØ
STMH-1	1,200mmØ Manhole	105.55	NE INV.: 103.60 - 375mmØ NW INV.: 103.64 - 375mmØ SW INV.: 103.52 - 450mmØ
STMH-2	1,200mmØ Manhole	105.36	E INV.: 103.33 - 525mmØ SW INV.: 103.52 - 450mmØ [illegible]

CROSSING TABLE

LOCATION	OVER / UNDER	T/G	OBVERT	INVERT	CLEARANCE (m)
1	NEW SANITARY / NEW STORM	105.90	104.38 (STM)	104.68 (STM)	0.30
2	NEW SANITARY / NEW WATERMAIN	106.17	103.77 (WM)	104.75 (SAN)	0.98
3	NEW WATER MAIN / EXISTING SANITARY	106.60	103.47 (SAN)	104.05 (WM)	0.58
4	NEW WATER MAIN / EXISTING STORM	106.57	104.23 (STM)	104.58 (WM)	0.35
5	NEW WATER MAIN / EXISTING STORM	106.63	104.84 (STM)	105.14 (WM)	0.30
6	EXISTING STORM / NEW WATER MAIN	106.05	103.80 (WM)	105.03 (STM)	1.23
7	EXISTING STORM / NEW WATER MAIN	105.91	103.65 (WM)	104.98 (STM)	1.33
8	NEW WATER / EXISTING WATER	106.14	103.74 (WM)	104.04 (WAT)	0.30

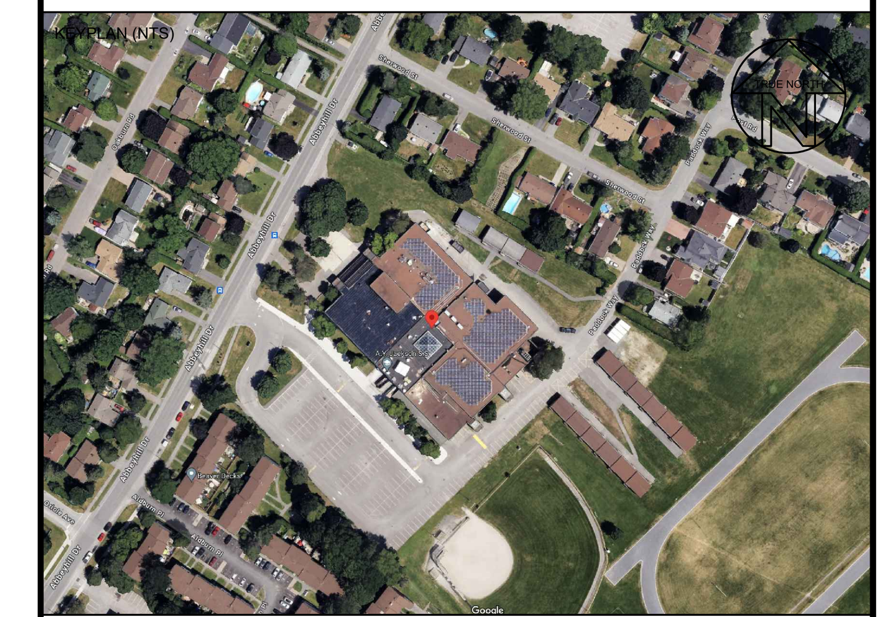
WATER SERVICE TABLE

ID	DESCRIPTION	FINISHED GRADE (m)	T/O WATERMAIN (m)
1	TEE 300X150mm C/W CONCRETE THRUST BLOCK	106.560	104.160
2	11.25° HORIZONTAL BEND C/W CONCRETE THRUST BLOCK	107.08	104.68
3	TEE 150X150mm C/W CONCRETE THRUST BLOCK	107.02	104.62
4	FIRE HYDRANT 01	105.93	103.53
5	22.5° HORIZONTAL BEND C/W CONCRETE THRUST BLOCK	106.22	103.82
6	11.25° HORIZONTAL BEND C/W CONCRETE THRUST BLOCK	106.18	103.78
7	45° HORIZONTAL BEND C/W CONCRETE THRUST BLOCK	105.83	103.43
8	45° HORIZONTAL BEND C/W CONCRETE THRUST BLOCK	105.89	103.49
9	BUILDING CONNECTION	106.16	103.76
10	FIRE HYDRANT 02	105.92	103.52
11	TEE 150X150mm C/W CONCRETE THRUST BLOCK	105.89	103.49

NOTE: PROVIDE MINIMUM 2.4m COVER OVER T/O WATERMAIN TO FINISHED GRADE, OTHERWISE PROVIDE THERMAL INSULATION HL40 AS PER CITY OF OTTAWA DETAIL W22

CLIENT LOGO

OTTAWA-CARLETON DISTRICT SCHOOL BOARD



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1	2024-11-21	ZB/AS	ISSUED FOR PHASE 3 PRECONSULT

STAMP

LICENSED PROFESSIONAL ENGINEER
K. SAMMOUR
100227665
April 3, 2025
PROVINCE OF ONTARIO

STAMP

PROJECT

AY JACKSON SECONDARY SCHOOL ADDITION

150 ABBEYHILL DRIVE,
KANATA ON,
K2L 1H7

DRAWING

DETAILS AND NOTES

Jp2g Consultants Inc.
ENGINEERS · PLANNERS · PROJECT MANAGERS

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Jp2g PROJECT No.: 24-5053A

NORTH

TRUE NORTH

CLIENT No.:	
DRAFTED:	ZB
DESIGNED:	ZB
REVIEWED:	AS
APPROVED:	AS

SCALE 1:500
0 m 5 10 15 20 25 m

SHEET # C3

LEGEND

- PROPERTY LINE
- EXISTING WATERMAIN
- EXISTING SANITARY SEWER
- EXISTING STORM SEWER
- EXISTING FIRE HYDRANT
- EXISTING SANITARY MANHOLE
- EXISTING STORM MANHOLE
- EXISTING CATCH BASIN
- NEW BUILDING
- NEW FOUNDATION DRAIN
- NEW WATERMAIN
- NEW FIRE HYDRANT
- NEW WATER VALVE
- NEW SANITARY SEWER
- NEW SANITARY MANHOLE
- NEW STORM SEWER
- NEW STORM MANHOLE
- NEW CATCH BASIN
- NEW INLET CONTROL DEVICE
- RD NEW ROOF DRAIN
- SC NEW SCUPPER AT 150mm ABOVE ROOF DRAIN LEVEL
- NEW CONCRETE SIDEWALK
- NEW ASPHALT
- NEW GRASS
- TOP OF BANK
- LIMIT OF FILL
- DEPRESSED CURB
- CONCRETE BARRIER CURB
- NEW TREE, REFER TO LANDSCAPE
- PROPOSED OVERLAND FLOW ROUTE
- SILT FENCE IN ACCORDANCE WITH OPSD 219.130

DRAWING NOTES

01 INSTALL SILT FENCE IN ACCORDANCE WITH OPSD 219.13 PRIOR TO START OF CONSTRUCTION. SILT FENCE TO BE REMOVED UPON CONSTRUCTION COMPLETION.

02 INSTALL FILTER SOCK OR FILTER BASE IN ACCORDANCE WITH DETAIL 1/C4 PRIOR TO START OF CONSTRUCTION. FILTER SOCK OF FILTER BASE TO BE REMOVED AT END OF CONSTRUCTION

03 PROPOSED MUD MAT LOCATION DURING CONSTRUCTION

GENERAL NOTES

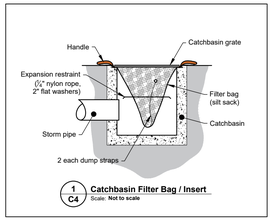
1. DESIGN AND CONSTRUCTION IS TO BE IN ACCORDANCE WITH MOST RECENT ONTARIO BUILDING CODE.
2. THE CONTRACTOR IS RESPONSIBLE FOR CHECKING AND VERIFYING ALL DIMENSIONS WITH RESPECT TO SITE CONDITIONS AND ALL MATERIALS TO THE PROJECT. ANY DISCREPANCY SHALL BE REPORTED TO THE ENGINEER.
3. THIS DRAWING IS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

EROSION AND SEDIMENT CONTROL NOTES

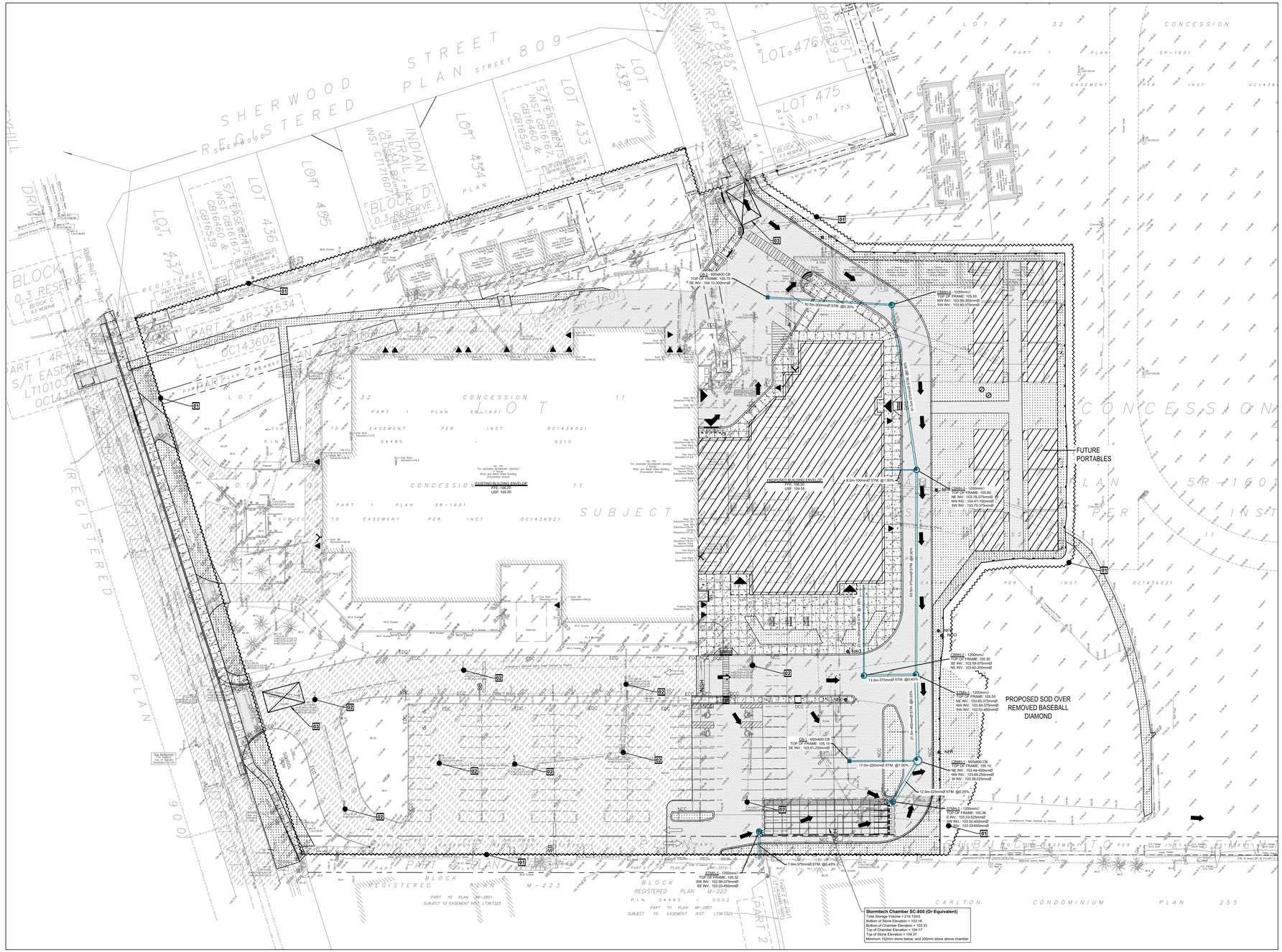
1. THE CONTRACTOR SHALL IMPLEMENT BEST MANAGEMENT PRACTICES TO PROVIDE FOR PROTECTION OF THE AREA DRAINAGE SYSTEM AND THE RECEIVING WATER COURSE, DURING CONSTRUCTION ACTIVITIES; THIS INCLUDES LIMITING THE AMOUNT OF EXPOSED SOIL, INSTALLING SILT FENCES AND OTHER EFFECTIVE SEDIMENT TRAPS, AND INSTALLING 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 CITY 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.

ICD SCHEDULE

LOCATION	PIPE SIZE (mm)	ICD SIZE (mm)	INVERT ELEVATION (m)	FLOW RATE (l/ps)
CB-3	250	78	104.24	13.2
CBMH-1	300	103	104.47	26.5
EXCB	200	83	104.18	15.1



1 / C4 **Catchbasin Filter Bag / Insert**
Scale: **Not to scale**



CLIENT LOGO

OTTAWA-CARLETON DISTRICT SCHOOL BOARD

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AY JACKSON SECONDARY SCHOOL ADDITION

150 ABBEYHILL DRIVE,
KANATA ON,
K2L 1H7

DRAWING

STORMWATER MANAGEMENT, EROSION AND SEDIMENT CONTROL PLAN

Jp2g Consultants Inc.
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Jp2g PROJECT No.: 24-5053A

NORTH

TRUE NORTH

SCALE

1:500
0 m 10 20
5 15 25 m

CLIENT No.:	
DRAFTED:	ZB
DESIGNED:	ZB
REVIEWED:	AS
APPROVED:	AS

SHEET #

C4

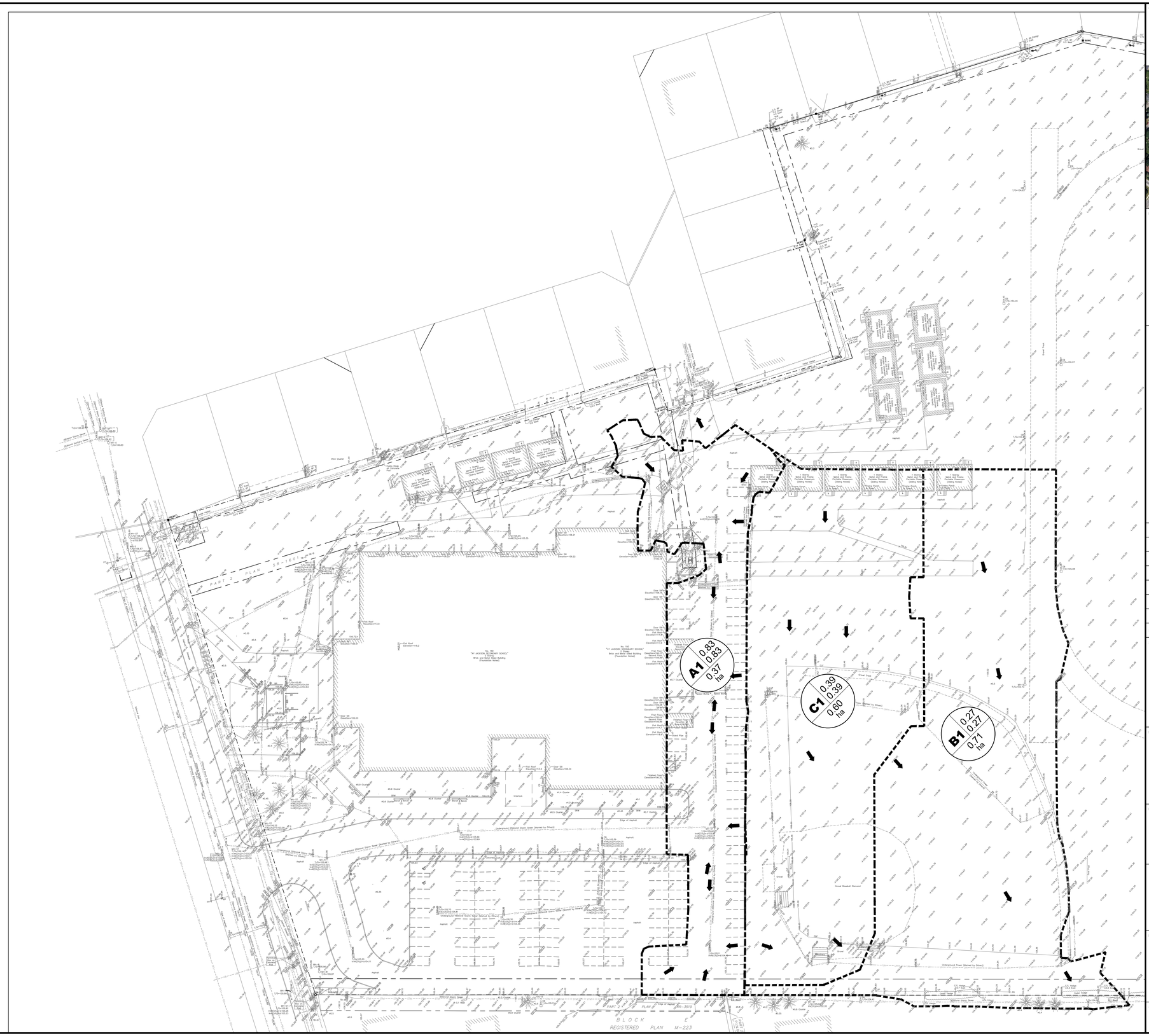
DWG NAME: J:\5-CIVIL\2053A-5053A - CLIHAC\1 - AY JACKSON ADDITIONS\DRAWINGS\1 CIVIL\ONCIVIL\2053A AY JACKSON ISSUED FOR SITE PLAN CONTROL APRIL 3 2025.DWG, LAYOUT: C4 (PAPA AND ESC PLAN SAVED ON 2025-04-02

LEGEND

ID | 5YR / 100YR
0.00 ha

DRAINAGE AREA LIMIT

EXISTING SURFACE DRAINAGE / OVERLAND FLOW ROUTE



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3	2025-04-03	ZB/AS	ISSUED FOR SITE PLAN CONTROL
2	2024-12-17	ZB/AS	ISSUED FOR BUILDING PERMIT
1	2024-11-21	ZB/AS	ISSUED FOR PHASE 3 PRECONSULT

STAMP

PROFESSIONAL ENGINEERS PROVINCE OF ONTARIO
SAMMOUR
100227665
April 3, 2025

STAMP

PROJECT

AY JACKSON SECONDARY SCHOOL ADDITION

150 ABBEYHILL DRIVE,
KANATA ON,
K2L 1H7

DRAWING

PREDEVELOPMENT DRAINAGE PLAN

Jp2g Consultants Inc.
ENGINEERS · PLANNERS · PROJECT MANAGERS

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

Jp2g PROJECT No.: 24-5053A

NORTH

TRUE NORTH

CLIENT No.:

DRAFTED: ZB

DESIGNED: ZB

REVIEWED: AS

APPROVED: AS

SCALE

1:500
0 m 5 10 15 20 25 m

SHEET #

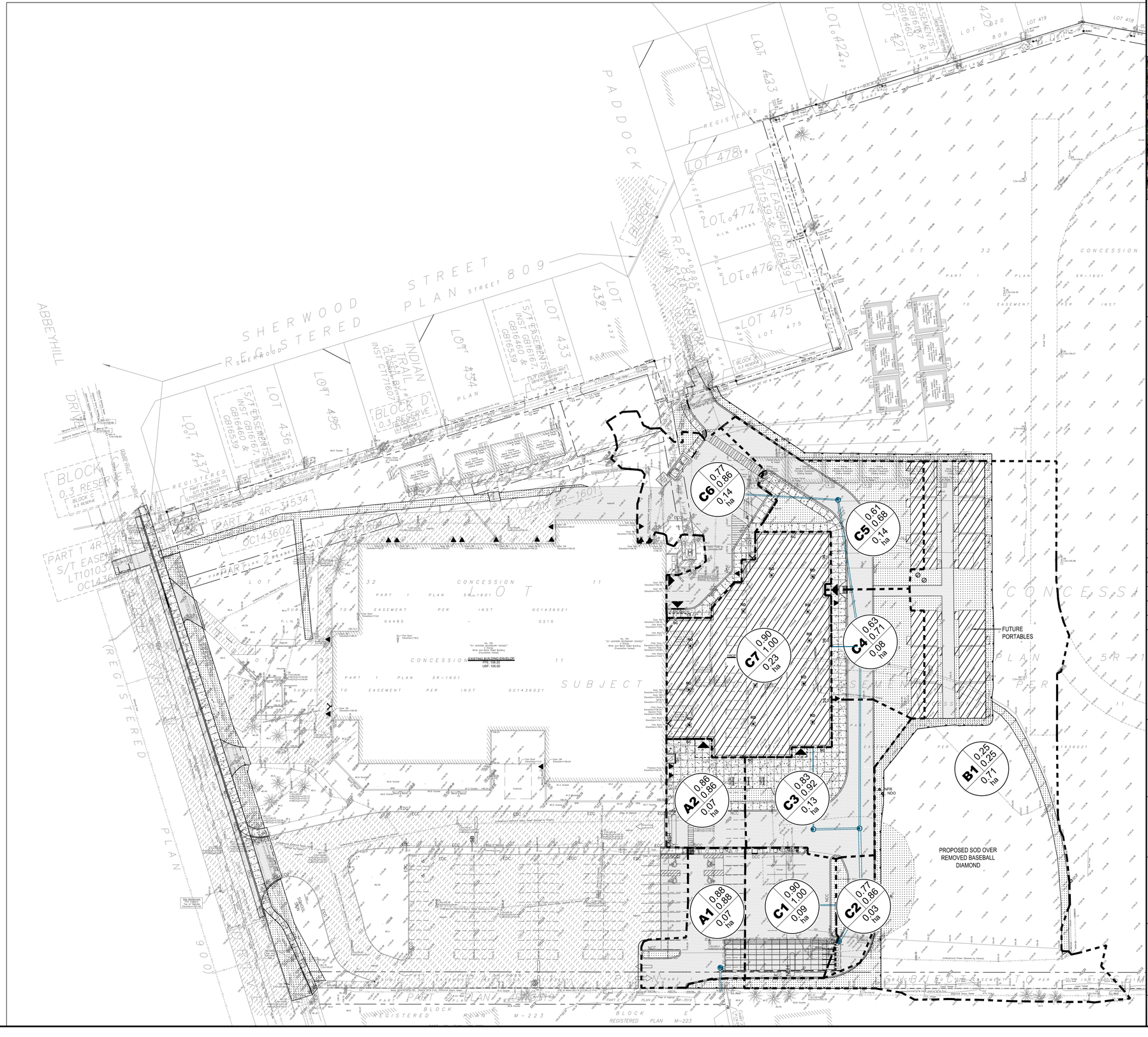
Fig. 1

DWG NAME: I:\CIVIL\2024\24-5053A - CJ HAC\ - AY JACKSON ADDITION\DRAWINGS 1 ONGOING\24-5053A AY JACKSON ISSUED FOR SITE PLAN CONTROL XX 2025.DWG, LAYOUT: FIG 1 PRE DEVELOPMENT SAVED ON 2025-04-01

LEGEND

ID 5YR 100YR 0.00 ha

- DRAINAGE AREA LIMIT
- NEW BUILDING
- NEW CONCRETE SIDEWALK
- NEW ASPHALT
- NEW GRASS



CLIENT LOGO

OTTAWA-CARLETON DISTRICT SCHOOL BOARD

DISCLAIMER NOTES

1. THE CONTRACTOR SHALL BE SOLELY RESPONSIBLE FOR ISSUES/PROBLEMS WHICH MAY OCCUR AS A RESULT OF A FAILURE TO FOLLOW THESE PLANS, SPECIFICATIONS AND THE DESIGN INTENT THEY CONVEY.
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3. DO NOT SCALE DRAWINGS. REFER ANY DIMENSIONAL CLARIFICATIONS AND/OR POSSIBLE TRADE INTERFERENCE/CONFLICTS TO JP2G FOR CLARIFICATION PRIOR TO COMMENCEMENT OF THE WORK.
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2	2024-12-17	ZB/AS	ISSUED FOR BUILDING PERMIT
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STAMP

PROFESSIONAL ENGINEER PROVINCE OF ONTARIO ANDREW SAMMOUR 100227665 April 3, 2025

STAMP

PROJECT

AY JACKSON SECONDARY SCHOOL ADDITION

150 ABBEYHILL DRIVE,
KANATA ON,
K2L 1H7

DRAWING

POST DEVELOPMENT DRAINAGE PLAN

Jp2g Consultants Inc.
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ARNPRIOR@JP2G.COM

Jp2g PROJECT No.: 24-5053A

NORTH — TRUE NORTH

CLIENT No.:	
DRAFTED:	ZB
DESIGNED:	ZB
REVIEWED:	AS
APPROVED:	AS

SCALE 1:500
0 m 5 10 15 20 25 m

SHEET # **Fig. 2**

DWG NAME: J:\LCV\L\2024\24-5053A - CI\HACI - AY JACKSON ADDITION\05 DRAWINGS\1 DWG\NG24-5053A AY JACKSON ISSUED FOR SITE PLAN CONTROL V4 2025.DWG LAYOUT: FIG 2-POST DEVELOPMENT SAVED ON 2025-04-01

LEGEND

45m RADIUS - FIRE HYDRANT COVERAGE

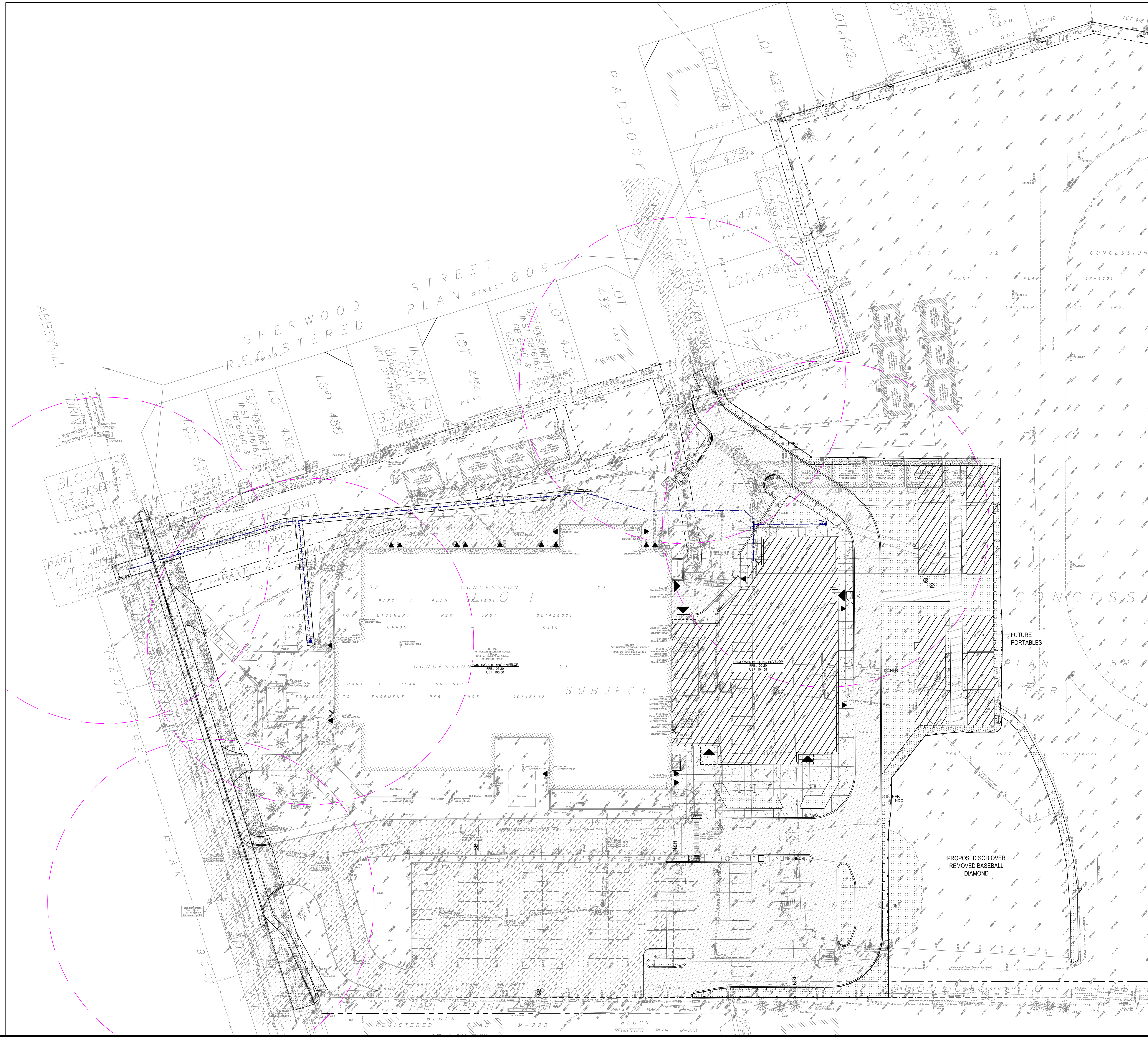
EXISTING WATERMAIN

EXISTING FIRE HYDRANT

NEW WATERMAIN

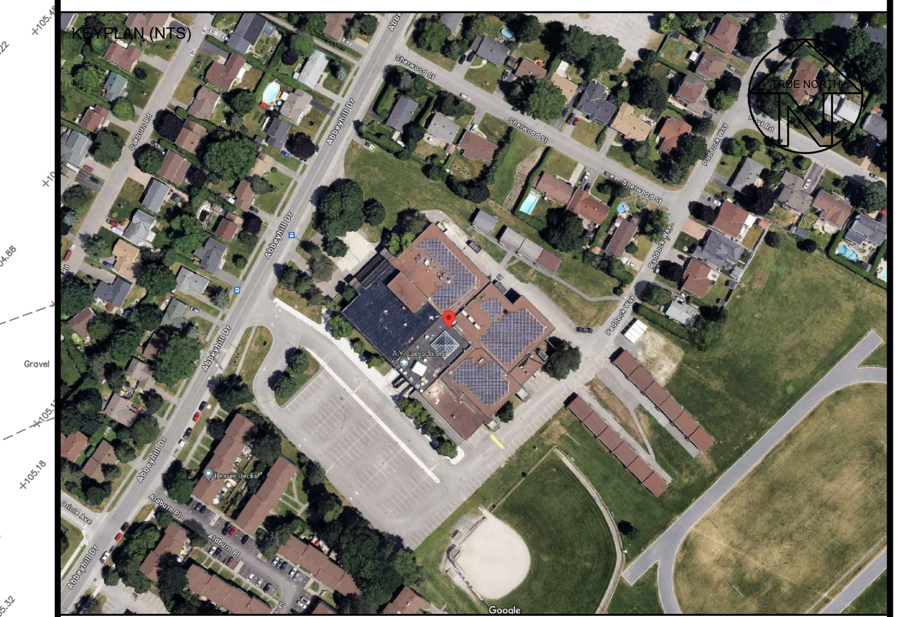
NEW FIRE HYDRANT

NEW WATER VALVE



CLIENT LOGO

OTTAWA-CARLETON DISTRICT SCHOOL BOARD



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STAMP

PROFESSIONAL ENGINEER
SAMMOUR
100227665
April 3, 2025
PROVINCE OF ONTARIO

STAMP

PROJECT

AY JACKSON SECONDARY SCHOOL ADDITION

150 ABBEYHILL DRIVE,
KANATA ON,
K2L 1H7

DRAWING

FIRE HYDRANT COVERAGE AREAS

Jp2g Consultants Inc.
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Jp2g PROJECT No.: 24-5053A

NORTH

TRUE NORTH

CLIENT No.:

DRAFTED: ZB

DESIGNED: ZB

REVIEWED: AS

APPROVED: AS

SCALE 1:500

0 m 5 10 15 20 25 m

SHEET #

Fig. 3

DWG NAME: J:\5-CIVIL\2024\24-5053A - OCWD - AY JACKSON ADDITION\05 DRAWINGS\01 ONGOING\24-5053A AY JACKSON ISSUED FOR SITE PLAN CONTROL XX 2025.DWG LAYOUT: FIGURE 3 HYDRANT SAVED ON 2025-04-01

Appendix B.1

Stormwater Management Pre Development

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TABLE B-1: SOIL AND RUNOFF COEFFICIENT DATA

User Input: Land Use Name	Runoff Coefficient	
	Vegetation: Topography	RC
Hard Surface Impervious	Paved or Roofs	0.90
Grassed	Grassed area, parkland - 5 year event	0.20
Gravel	Gravel	0.50

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TABLE B-2: PRE DEVELOPMENT DRAINAGE AREA PARAMETERS AND DATA

Drainage Area ID	Comment	Area (ha)	Weighted Runoff Coefficient				Land Use	Land Use Area (ha)	Runoff Coefficient			
			<= 10-Year	25-Year Increase	50-Year Increase	100-Year Increase			<= 10-Year	25-Year	50-Year	100-Year
Pre Development												
A1	Parking Lot	0.37	0.83	0.83	0.83	0.83	Hard Surface Impervious	0.34	0.90	0.90	0.90	0.90
							Gravel	0.00	0.50	0.50	0.50	0.50
							Grassed	0.04	0.20	0.20	0.20	0.20
B1	Baseball Diamond and Field	0.71	0.27	0.27	0.27	0.27	Hard Surface Impervious	0.03	0.90	0.90	0.90	0.90
							Gravel	0.08	0.50	0.50	0.50	0.50
							Grassed	0.59	0.20	0.20	0.20	0.20
C1	900 Dia Storm Outlet	0.60	0.39	0.39	0.39	0.39	Hard Surface Impervious	0.12	0.90	0.90	0.90	0.90
							Gravel	0.10	0.50	0.50	0.50	0.50
							Grassed	0.38	0.20	0.20	0.20	0.20

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TABLE B-3: PRE-DEVELOPMENT WATERSHED SLOPE - 85/10 METHOD

$$S_w = \frac{100 * (\Delta h - h_f)}{0.75L - L_f}$$

Where:

S_w = watershed slope, %

Δh = difference in elevation, m, between the 85% point and the 10% point obtained from contours, airphotos, etc.

h_f = sum of heights of rapids and waterfalls between 10% and 85% points, m.

L = the total length of the main channel, includes the undefined flow path, to head of basin, m.

L_f = the sum of lengths of rapids and waterfalls, up to 10% of L, m.

Drainage Area ID	85% Elevation (m)	10% Elevation (m)	Total Height Difference (m)	Waterfalls Height	Main Channel Length (m)	Waterfalls Length	Slope, S_w (%)	Drainage Area Topography
A1	106.26	105.69	0.57	0	116.00	0	0.66	Flat
B1	106.00	104.20	1.80	0	152.00	0	1.58	Flat

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TABLE B-4: PRE DEVELOPMENT TIME OF CONCENTRATION

The Airport Formula

$$t_c = \frac{3.26\ (1.1-C)\ L^{0.5}}{S_w^{0.33}}$$

where:
- t_c = time of concentration, min.
- C = runoff coefficient
- S_w = watershed slope, %
- L = watershed length, m.

The Bransby Williams Formula

$$t_c = \frac{0.057*L}{(S_w^{0.2} * A^{0.1})}$$

where
- t_c = time of concentration, min.
- C = runoff coefficient
- S_w = watershed slope, %
- L = watershed length, m.

Drainage Area ID	Total Area (ha)	Weighted Runoff Coefficient				Physical Parameters		Airport/Bransby Williams Tc (minutes)			
		<=10-Year	25-Year	50-Year	100-Year	85/10 S_w (%)	Total Length (m)	<=10-Year	25-Year	50-Year	100-Year
A1	0.37	0.83	0.83	0.83	0.83	0.66	116	10	10	10	10
B1	0.71	0.27	0.27	0.27	0.27	1.58	152	29	29	29	29

*if Tc<10 use Tc=10 min as a minimum for the Rational Method.

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TABLE B-5: PRE DEVELOPMENT DRAINAGE AREA AND FLOWS

STORM INFORMATION											
Area	Time of concentration (min.)					City of Ottawa IDF Curve					
	<=10-Year	25-Year	50-Year	100-Year		2-Year (mm/hr)	5-Year (mm/hr)	10-Year (mm/hr)	25-Year (mm/hr)	50-Year (mm/hr)	100-Year (mm/hr)
A1	10	10	10	10		76.8	104.2	122.1	144.7	161.5	178.6
B1	29	29	29	29		41.2	55.5	64.9	76.7	85.6	94.6
C1	10	10	10	10		76.8	104.2	122.1	144.7	161.5	178.6
IDF Curve- City of Ottawa											

PRE-DEVELOPMENT RUNOFF COEFFICIENT CALCULATIONS, RATIONAL METHOD											
Drainage Area ID	Drainage Area (ha)	Weighted R_O Coeff. (C) <=10-yr	Weighted R_O Coeff. (C) 25-yr	Weighted R_O Coeff. (C) 50-yr	Weighted R_O Coeff. (C) 100-yr	2-Year Flow Rate (L/s)	5-Year Flow Rate (L/s)	10-Year Flow Rate (L/s)	25-Year Flow Rate (L/s)	50-Year Flow Rate (L/s)	100-Year Flow Rate (L/s)
A1	0.37	0.83	0.83	0.83	0.83	66.4	90.1	105.7	125.2	139.7	154.5
B1	0.71	0.27	0.27	0.27	0.27	21.8	29.4	34.4	40.6	45.3	50.1
C1	0.60	0.39	0.39	0.39	0.39	50.5	68.6	80.4	95.2	106.3	117.5

Appendix B.2

Stormwater Management Post Development

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TABLE B-6: POST-DEVELOPMENT DRAINAGE AREA PARAMETERS AND DATA

Drainage Area ID	Comment	Area (ha)	Weighted Runoff Coefficient				Land Use	Land Use Area (ha)	Runoff Coefficient			
			<= 10-Year	25-Year	50-Year	100-Year			<= 10-Year	25-Year	50-Year	100-Year
							Post Development					
A1	**Existing Parking Lot**	0.07	0.88	0.88	0.88	0.88	**Hard Surface Impervious**	0.07	0.90	0.90	0.90	0.90
							Grassed	0.00	0.20	0.20	0.20	0.20
							Gravel	0.00	0.50	0.50	0.50	0.50
A2	**Existing Parking Lot**	0.07	0.86	0.86	0.86	0.86	**Hard Surface Impervious**	0.06	0.90	0.90	0.90	0.90
							Grassed	0.00	0.20	0.20	0.20	0.20
							Gravel	0.00	0.50	0.50	0.50	0.50
B1	**Baseball Diamond and Field**	0.71	0.25	0.25	0.25	0.25	**Hard Surface Impervious**	0.03	0.90	0.90	0.90	0.90
							Grassed	0.62	0.20	0.20	0.20	0.20
							Gravel	0.06	0.50	0.50	0.50	0.50

Drainage Area ID	Comment	Area (ha)	Weighted Runoff Coefficient				Land Use	Land Use Area (ha)	Runoff Coefficient			
			<= 10-Year	25-Year Increase (10%)	50-Year Increase (20%)	100-Year Increase (25%)			<= 10-Year	25-Year Increase (10%)	50-Year Increase (20%)	100-Year Increase (25%)
							Post Development					
C1	**New Parking Lot**	0.09	0.90	0.99	1.00	1.00	**Hard Surface Impervious**	0.09	0.90	0.99	1.00	1.00
							Grassed	0.00	0.20	0.22	0.24	0.25
							Gravel	0.00	0.50	0.55	0.60	0.63
C2	**New Parking Lot**	0.03	0.77	0.84	0.86	0.86	**Hard Surface Impervious**	0.03	0.90	0.99	1.00	1.00
							Grassed	0.01	0.20	0.22	0.24	0.25
							Gravel	0.00	0.50	0.55	0.60	0.63
C3	**Main Entrance**	0.13	0.83	0.91	0.92	0.92	**Hard Surface Impervious**	0.11	0.90	0.99	1.00	1.00
							Grassed	0.01	0.20	0.22	0.24	0.25
							Gravel	0.00	0.50	0.55	0.60	0.63
C4	**Fire Route**	0.08	0.63	0.69	0.71	0.71	**Hard Surface Impervious**	0.05	0.90	0.99	1.00	1.00
							Grassed	0.03	0.20	0.22	0.24	0.25
							Gravel	0.00	0.50	0.55	0.60	0.63
C5	**Fire Route**	0.14	0.61	0.67	0.68	0.68	**Hard Surface Impervious**	0.08	0.90	0.99	1.00	1.00
							Grassed	0.06	0.20	0.22	0.24	0.25
							Gravel	0.00	0.50	0.55	0.60	0.63
C6	**Rear Courtyard**	0.14	0.77	0.84	0.85	0.86	**Hard Surface Impervious**	0.11	0.90	0.99	1.00	1.00
							Grassed	0.03	0.20	0.22	0.24	0.25
							Gravel	0.00	0.50	0.55	0.60	0.63
C7	**Building Roof**	0.23	0.90	0.99	1.00	1.00	**Hard Surface Impervious**	0.23	0.90	0.99	1.00	1.00
							Grassed	0.00	0.20	0.22	0.24	0.25
							Gravel	0.00	0.50	0.55	0.60	0.63

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TABLE B-7: Post DEVELOPMENT WATERSHED SLOPE - 85/10 METHOD

$$S_w = \frac{100 * (\Delta h - h_f)}{0.75L - L_f}$$

Where:

S_w = watershed slope, %

Δh = difference in elevation, m, between the 85% point and the 10% point obtained from contours, airphotos, etc.

h_f = sum of heights of rapids and waterfalls between 10% and 85% points, m.

L = the total length of the main channel, includes the undefined flow path, to head of basin, m.

L_f = the sum of lengths of rapids and waterfalls, up to 10% of L, m.

Drainage Area ID	85% Elevation (m)	10% Elevation (m)	Total Height Difference (m)	Waterfalls Height	Main Channel Length (m)	Waterfalls Length	Slope, S_w (%)	Drainage Area Topography
B1	106.00	104.20	1.80	0.00	152.00	0.00	1.58	Flat

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TABLE B-8: POST DEVELOPMENT TIME OF CONCENTRATION

The Airport Formula

$$t_c = \frac{3.26\,(1.1-C)\,L^{0.5}}{S_w^{0.33}}$$

where:
- t_c = time of concentration, min.
- C = runoff coefficient
- S_w = watershed slope, %
- L = watershed length, m.

The Bransby Williams Formula

$$t_c = \frac{0.057*L}{(S_w^{0.2} * A^{0.1})}$$

where
- t_c = time of concentration, min.
- C = runoff coefficient
- S_w = watershed slope, %
- L = watershed length, m.

Drainage Area ID	Total Area (ha)	Weighted Runoff Coefficient				Physical Parameters		Airport/Bransby Williams Tc (minutes)			
		<=10-Year	25-Year	50-Year	100-Year	85/10 S_w (%)	Total Length (m)	<=10-Year	25-Year	50-Year	100-Year
B1	0.71	0.25	0.25	0.25	0.25	1.58	152	29	29	29	29

*if Tc<10 use Tc=10 min as a minimum for the Rational Method.

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TABLE B-9: POST-DEVELOPMENT DRAINAGE AREA AND FLOWS

STORM INFORMATION											
Area	Time of concentration (min.)					City of Ottawa IDF Curve					
	<=10-Year	25-Year	50-Year	100-Year		2-Year (mm/hr)	5-Year (mm/hr)	10-Year (mm/hr)	25-Year (mm/hr)	50-Year (mm/hr)	100-Year (mm/hr)
A1	10	10	10	10		76.8	104.2	122.1	144.7	161.5	178.6
A2	10	10	10	10		76.8	104.2	122.1	144.7	161.5	178.6
B1	29	29	29	29		40.7	54.8	64.0	75.7	84.4	93.3
C1	10	10	10	10		76.8	104.2	122.1	144.7	161.5	178.6
C2	10	10	10	10		76.8	104.2	122.1	144.7	161.5	178.6
C3	10	10	10	10		76.8	104.2	122.1	144.7	161.5	178.6
C4	10	10	10	10		76.8	104.2	122.1	144.7	161.5	178.6
C5	10	10	10	10		76.8	104.2	122.1	144.7	161.5	178.6
C6	10	10	10	10		76.8	104.2	122.1	144.7	161.5	178.6
C7	10	10	10	10		76.8	104.2	122.1	144.7	161.5	178.6
City of Ottawa IDF Curves											

POST-DEVELOPMENT RUNOFF COEFFICIENT CALCULATIONS, RATIONAL METHOD											
Drainage Area ID	Drainage Area (ha)	Weighted R_O Coeff. (C) <=10-yr	Weighted R_O Coeff. (C) 25-yr	Weighted R_O Coeff. (C) 50-yr	Weighted R_O Coeff. (C) 100-yr	2-Year Flow Rate (L/s)	5-Year Flow Rate (L/s)	10-Year Flow Rate (L/s)	25-Year Flow Rate (L/s)	50-Year Flow Rate (L/s)	100-Year Flow Rate (L/s)
A1	0.07	0.88	0.88	0.88	0.88	14	19	22	27	30	33
A2	0.07	0.86	0.86	0.86	0.86	12	16	19	23	25	28
B1	0.71	0.25	0.25	0.25	0.25	20	27	32	38	42	46
C1	0.09	0.90	0.99	1.00	1.00	17	23	27	35	40	44
C2	0.03	0.77	0.84	0.86	0.86	5	7	8	11	12	14
C3	0.13	0.83	0.91	0.92	0.92	22	30	36	46	52	58
C4	0.08	0.63	0.69	0.71	0.71	11	15	18	23	26	29
C5	0.14	0.61	0.67	0.68	0.68	18	24	28	37	42	47
C6	0.14	0.77	0.84	0.85	0.86	23	31	37	48	54	60
C7	0.23	0.90	0.99	1.00	1.00	44	60	70	92	103	114

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TABLE B-10: PRE TO POST DEVELOPMENT FLOW COMPARISON

PRE DEVELOPMENT

Drainage Area ID	Drainage Area (ha)	Weighted R_O Coeff. (C) <=10-yr	Weighted R_O Coeff. (C) 25-yr	Weighted R_O Coeff. (C) 50-yr	Weighted R_O Coeff. (C) 100-yr	2-Year Flow Rate (L/s)	5-Year Flow Rate (L/s)	10-Year Flow Rate (L/s)	25-Year Flow Rate (L/s)	50-Year Flow Rate (L/s)	100-Year Flow Rate (L/s)
A1	0.37	0.83	0.83	0.83	0.83	66.4	90.1	105.7	125.2	139.7	154.5
B1	0.71	0.27	0.27	0.27	0.27	21.8	29.4	34.4	40.6	45.3	50.1
C1	0.60	0.39	0.39	0.39	0.39	50.5	68.6	80.4	95.2	106.3	117.5

POST DEVELOPMENT

Drainage Area ID	Drainage Area (ha)	Weighted R_O Coeff. (C) <=10-yr	Weighted R_O Coeff. (C) 25-yr	Weighted R_O Coeff. (C) 50-yr	Weighted R_O Coeff. (C) 100-yr	2-Year Flow Rate (L/s)	5-Year Flow Rate (L/s)	10-Year Flow Rate (L/s)	25-Year Flow Rate (L/s)	50-Year Flow Rate (L/s)	100-Year Flow Rate (L/s)
A1	0.07	0.88	0.88	0.88	0.88	14.1	19.1	22.4	26.5	29.6	32.7
A2	0.07	0.86	0.86	0.86	0.86	12.0	16.3	19.1	22.7	25.3	28.0
B1	0.71	0.25	0.25	0.25	0.25	20.2	27.2	31.7	37.5	41.8	46.3
C1	0.09	0.90	0.99	1.00	1.00	17.0	23.1	27.0	35.2	39.7	43.9
C2	0.03	0.77	0.84	0.86	0.86	5.3	7.1	8.4	10.9	12.3	13.7
C3	0.13	0.83	0.91	0.92	0.92	22.4	30.4	35.6	46.4	52.4	58.0
C4	0.08	0.63	0.69	0.71	0.71	11.1	15.0	17.6	22.9	26.1	29.0
C5	0.14	0.61	0.67	0.68	0.68	17.8	24.2	28.4	37.0	42.1	46.9
C6	0.14	0.77	0.84	0.85	0.86	23.0	31.2	36.5	47.6	53.9	59.7
C7	0.23	0.90	0.99	1.00	1.00	44.3	60.1	70.4	91.8	103.5	114.4

POST DEVELOPMENT VS PREDEVELOPMENT OUTLET

	Control Description	Drainage Area	2-Year Flow Rate (L/S)	5-Year Flow Rate (L/s)	10-Year Flow Rate (L/s)	25-Year Flow Rate (L/s)	50-Year Flow Rate (L/s)	100-Year Flow Rate (L/s)	Comment
A1 Outlet 1: Exisitng Storm Sewer System	Uncontrolled	A1, Predevelopment	66.4	90.1	105.7	125.2	139.7	154.5	Flows are decreased under post development conditions assuming no controls. No stormwater management controls are proposed
	Uncontrolled	A1-A2, Post development	26.1	35.4	41.5	49.2	54.9	60.7	
		Difference	-40.3	-54.7	-64.2	-76.0	-84.8	-93.8	
B1 Outlet 2: Baseball Diamon and Spports Field	Uncontrolled	B1, Pre development	21.8	29.4	34.4	40.6	45.3	50.1	Flows are decreased under post development conditions assuming no controls. No stormwater management controls are proposed
	Uncontrolled	B1, Post Development	20.2	27.2	31.7	37.5	41.8	46.3	
		Difference	-1.7	-2.2	-2.6	-3.1	-3.5	-3.8	
C1 Outlet 3: 900 Dia Storm Sewer	Uncontrolled	C1, Pre development	50.5	68.6	80.4	95.2	106.3	117.5	Post Development flows are increased. Refer to Post Development calculations for proposed stormwater controls. Per preconsultation with City of Ottawa, post development flows for all storms up to and including the 100 year storm must be controlled to the 5 year predevelopment level.
	Uncontrolled	C1-C7, Post Development	140.8	191.0	223.9	291.8	330.0	365.6	
		Difference	90.3	122.5	143.6	196.6	223.8	248.1	

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-2	CBMH-4	Lateral	C6	0.14	0.77	0.108	0.108	10.00	104.193	31.18	31.18	30.5	0.35%	300	57.21	54%	0.81	0.63	10.63	
	CBMH-4	CBMH-3	Trunk	C5	0.14	0.61	0.084	0.191	10.63	100.988	53.66	53.66	41.5	0.30%	375	96.03	56%	0.87	0.80	11.42	
	CBMH-3	STMH-1	Trunk	C4	0.08	0.63	0.052	0.243	11.42	97.230	65.67	65.67	50.5	0.30%	375	96.03	68%	0.87	0.97	12.39	
	Roof	STMH-1	Lateral	C7	0.23	0.90	0.207	0.207	10.00	104.193	60.09	6.00	22.5	1.00%	200	32.80	18%	1.04	0.36	10.36	
	CBMH-2	STMH-1	Trunk	C3	0.13	0.83	0.105	0.312	10.36	102.333	88.84	88.84	13.0	0.40%	375	110.89	80%	1.00	0.22	10.57	
	STMH-1	CBMH-1	Trunk	NA	0.00	0.00	0.000	0.555	12.39	93.056	143.64	143.64	21.5	0.35%	450	168.67	85%	1.06	0.34	12.73	
	CB-1	CBMH-1	Lateral	C1	0.09	0.90	0.080	0.080	10.00	104.193	23.07	6.00	17.0	1.00%	250	59.47	10%	1.21	0.23	10.23	
	CBMH-1	STMH-2	Trunk	C2	0.03	0.77	0.025	0.660	12.73	91.691	168.11	168.11	12.0	0.25%	525	215.03	78%	0.99	0.20	12.93	
	STMH-3	900 Conection	Trunk	NA	0.00	0.00	0.000	0.660	12.93	90.899	166.66	68.60	7.0	0.43%	375	114.97	60%	1.04	0.11	13.04	

Notes:

Project Name:	AY Jackson SS Addition
Jp2g Project No.:	24-5053A
Client Ref No.:	

Prepared By:	Zach B
Reviewed By:	Ali S
Approved By:	Ali S
Date:	3/19/2025
Revision:	1

Storm Event:	1:5 Year
Rainfall Intensity Formula:	Ottawa IDF

Mannings, n = 0.013

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

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

24-5053A - AY Jackson SS Addition
Table B-12 SWM Calculations - Underground Storage Tank
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)	Ponding Elev. (m)	Spill Elev. (m)	Storage Depth (m)
CBMH-1	C2	0.032	0.77	0.86	0.00									
CB-1	C1	0.089	0.90	1.00	0.00									
CBMH-2	C3	0.127	0.83	0.92	0.00									
CBMH-3	C4	0.082	0.63	0.71	0.00									
CBMH-4	C5	0.138	0.61	0.68	0.00									
CB-2	C6	0.141	0.77	0.86	0.00									
Roof	C7	0.231	0.90	1.00	0.00									
ICD-1 Total		0.839	0.79	0.88	0.00	38.8	48.0	68.6	67.9	115.0	216.1	104.349	105.350	104.349

Stage below ponding (m)
104.35

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	140.82	38.80	102.02	61.2
15	61.8	113.25	38.80	74.45	67.0
20	52.0	95.40	38.80	56.60	67.9
25	45.2	82.81	38.80	44.01	66.0
30	40.0	73.42	38.80	34.62	62.3
35	36.1	66.11	38.80	27.31	57.4
40	32.9	60.25	38.80	21.45	51.5
45	30.2	55.44	38.80	16.64	44.9
50	28.0	51.41	38.80	12.61	37.8
55	26.2	47.98	38.80	9.18	30.3
60	24.6	45.02	38.80	6.22	22.4

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	213.35	48.00	165.35	99.2
15	83.6	171.10	48.00	123.10	110.8
20	70.3	143.85	48.00	95.85	115.0
25	60.9	124.70	48.00	76.70	115.0
30	53.9	110.43	48.00	62.43	112.4
35	48.5	99.35	48.00	51.35	107.8
40	44.2	90.48	48.00	42.48	101.9
45	40.6	83.19	48.00	35.19	95.0
50	37.7	77.10	48.00	29.10	87.3
55	35.1	71.92	48.00	23.92	78.9
60	32.9	67.46	48.00	19.46	70.0

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	365.63	68.60	297.03	178.2
15	142.9	292.60	68.60	224.00	201.6
20	120.0	245.62	68.60	177.02	212.4
25	103.8	212.65	68.60	144.05	216.1
30	91.9	188.12	68.60	119.52	215.1
35	82.6	169.09	68.60	100.49	211.0
40	75.1	153.87	68.60	85.27	204.7
45	69.1	141.39	68.60	72.79	196.5
50	64.0	130.96	68.60	62.36	187.1
55	59.6	122.09	68.60	53.49	176.5
60	55.9	114.45	68.60	45.85	165.1

ICD-1 - Stage-Storage Table

Elevation (m)	Incremental Depth (m)	Total Depth (m)	Cumulative Volume Stomtech Chamber (m^3)				Total Volume (m^3)	Orifice Head (m)	Orifice Flow (L/s)	Rainfall Event
103.21	0.00	0.00	3.11				3.1	0.03	10.5	
103.23	0.03	0.03	6.22				6.2	0.05	14.5	
103.26	0.03	0.05	9.33				9.3	0.08	17.6	
103.28	0.03	0.08	12.44				12.4	0.10	20.2	
103.31	0.03	0.10	15.55				15.6	0.13	22.6	
103.33	0.03	0.13	18.66				18.7	0.15	24.7	
103.36	0.03	0.15	24.97				25.0	0.18	26.6	
103.38	0.03	0.18	31.26				31.3	0.21	28.4	
103.41	0.03	0.20	37.52				37.5	0.23	30.2	
103.43	0.03	0.23	43.74				43.7	0.26	31.8	
103.46	0.03	0.25	49.93				49.9	0.28	33.3	
103.48	0.03	0.28	56.09				56.1	0.31	34.8	
103.51	0.03	0.30	62.21				62.2	0.33	36.2	
103.54	0.03	0.33	68.29				68.3	0.36	37.5	
103.56	0.03	0.36	74.32				74.3	0.38	38.8	2 Yr
103.59	0.03	0.38	80.31				80.3	0.41	40.1	
103.61	0.03	0.41	86.26				86.3	0.43	41.3	
103.64	0.03	0.43	92.15				92.1	0.46	42.5	
103.66	0.03	0.46	97.99				98.0	0.49	43.7	
103.69	0.03	0.48	103.77				103.8	0.51	44.8	
103.71	0.03	0.51	109.49				109.5	0.54	45.9	
103.74	0.03	0.53	115.15				115.2	0.56	47.0	
103.76	0.03	0.56	120.74				120.7	0.59	48.0	5 Yr
103.79	0.03	0.58	126.26				126.3	0.61	49.1	
103.82	0.03	0.61	131.71				131.7	0.64	50.1	
103.84	0.03	0.63	137.07				137.1	0.66	51.1	
103.87	0.03	0.66	142.35				142.3	0.69	52.0	
103.89	0.03	0.69	147.53				147.5	0.71	53.0	
103.92	0.03	0.71	152.61				152.6	0.74	53.9	
103.94	0.03	0.74	157.59				157.6	0.76	54.8	
103.97	0.03	0.76	162.44				162.4	0.79	55.7	
103.99	0.03	0.79	167.16				167.2	0.82	56.6	
104.02	0.03	0.81	171.72				171.7	0.84	57.5	
104.04	0.03	0.84	176.11				176.1	0.87	58.4	
104.07	0.03	0.86	180.28				180.3	0.89	59.2	
104.09	0.03	0.89	184.11				184.1	0.92	60.1	
104.12	0.03	0.91	187.63				187.6	0.94	60.9	
104.15	0.03	0.94	191.02				191.0	0.97	61.7	
104.17	0.03	0.97	194.24				194.2	0.99	62.5	
104.20	0.03	0.99	197.35				197.3	1.02	63.3	
104.22	0.03	1.02	200.46				200.5	1.04	64.1	
104.25	0.03	1.04	203.57				203.6	1.07	64.9	
104.27	0.03	1.07	206.68				206.7	1.09	65.6	
104.30	0.03	1.09	209.79				209.8	1.12	66.4	
104.32	0.03	1.12	212.90				212.9	1.15	67.1	
104.35	0.03	1.14	216.01				216.0	1.17	67.9	
104.37	0.03	1.17	219.12				219.12	1.20	68.6	100 Yr

Elevation (m)
103.21
103.23
103.26
103.28
103.31
103.33
103.36
103.38
103.41
103.43
103.46
103.48
103.51
103.54
103.56
103.59
103.61
103.64
103.66
103.69
103.71
103.74
103.76
103.79
103.82
103.84
103.87
103.89
103.92
103.94
103.97
103.99
104.02
104.04
104.07
104.09
104.12
104.15
104.17
104.20
104.22
104.25
104.27
104.30
104.32
104.35
104.37

Orifice Sizing

Outlet Structure	Pipe Diameter (mm)	Invert (m)	Area (m2)	Area (mm2)	Orifice Diameter (mm)
STMH-3	375.00	102.99	0.02	23212.65	172

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

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.

24-5053A - AY Jackson SS Addition
Table B-13 SWM Calculations - Roof Storage
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	C7	0.231	0.90	1.00	0.00									
Roof Total		0.231	0.90	1.00	0.00	6.0	6.0	6.0	31.09	54.47	109.85	0.15	0.150	0.15

Stage below ponding (m)
0.14

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	23.09	6.00	17.09	30.77
35	36.1	20.80	6.00	14.80	31.07
40	32.9	18.95	6.00	12.95	31.09
45	30.2	17.44	6.00	11.44	30.89
50	28.0	16.17	6.00	10.17	30.51
55	26.2	15.09	6.00	9.09	30.01
60	24.6	14.16	6.00	8.16	29.39
65	23.2	13.35	6.00	7.35	28.67
70	21.9	12.64	6.00	6.64	27.88
75	20.8	12.00	6.00	6.00	27.01
80	19.8	11.44	6.00	5.44	26.09

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	26.03	6.00	20.03	54.09
50	37.7	24.13	6.00	18.13	54.38
55	35.1	22.51	6.00	16.51	54.47
60	32.9	21.11	6.00	15.11	54.40
65	31.0	19.89	6.00	13.89	54.18
70	29.4	18.82	6.00	12.82	53.85
75	27.9	17.87	6.00	11.87	53.42
80	26.6	17.02	6.00	11.02	52.90
85	25.4	16.26	6.00	10.26	52.31
90	24.3	15.56	6.00	9.56	51.64
95	23.3	14.93	6.00	8.93	50.92

Roof - Rational Method 100 Year Storage Requirements Calculation

Time (min.)	Intensity (mm/hr)	Q_{actual} (L/s)	$Q_{allowable}$ (L/s)	Q_{stored} (L/s)	V_{stored} (m^3)
70	49.8	31.90	6.00	25.90	108.80
75	47.3	30.28	6.00	24.28	109.26
80	45.0	28.83	6.00	22.83	109.58
85	43.0	27.52	6.00	21.52	109.77
90	41.1	26.34	6.00	20.34	109.85
95	39.4	25.27	6.00	19.27	109.84
100	37.9	24.29	6.00	18.29	109.73
105	36.5	23.39	6.00	17.39	109.54
110	35.2	22.56	6.00	16.56	109.28
115	34.0	21.79	6.00	15.79	108.95
120	32.9	21.08	6.00	15.08	108.57

Roof - Stage-Storage Table **No. of Drain** 19

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	2305.00				0.0	0.00	6.0	
0.02	0.02	0.02	2305.00				15.4	0.02	6.0	
0.04	0.02	0.04	2305.00				30.7	0.04	6.0	
0.06	0.02	0.06	2305.00				46.1	0.06	6.0	2 Yr
0.08	0.02	0.08	2305.00				61.5	0.08	6.0	5 Yr
0.10	0.02	0.10	2305.00				76.8	0.10	6.0	
0.12	0.02	0.12	2305.00				92.2	0.12	6.0	
0.14	0.02	0.14	2305.00				107.6	0.14	6.0	
0.15	0.01	0.15	2305.00				115.3	0.15	6.0	100 Yr

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

Table B-14 POST-DEVELOPMENT PCSWMM MODEL RESULTS SUMMARY

Subcatchment	Area (ha)	Imp. (%)	CN	Chicago 6 Hour						Chicago 6 Hour					
				2-year						5-year					
				Peak Runoff (m^3/s)	Cumulative Runoff (m^3/s)	Rainfall Depth (mm)	Runoff Depth (mm)	Runoff Volume (m^3)	C	Peak Runoff (m^3/s)	Cumulative Runoff (m^3/s)	Rainfall Depth (mm)	Runoff Depth (mm)	Runoff Volume (m^3)	C
C1	0.089	100.00	76	0.020	0.020	36.87	35.9	31.7	0.97	0.030	0.030	49.04	48.1	42.5	0.98
C2	0.032	81.10	76	0.010	0.030	36.87	30.3	9.8	0.82	0.010	0.040	49.04	41.7	13.4	0.85
C3	0.127	89.40	76	0.020	0.050	36.87	32.8	41.7	0.89	0.030	0.070	49.04	44.6	56.6	0.91
C4	0.082	61.40	76	0.010	0.040	36.87	24.6	20.2	0.67	0.020	0.060	49.04	34.9	28.7	0.71
C5	0.138	57.90	76	0.020	0.060	36.87	23.5	32.4	0.64	0.020	0.080	49.04	33.6	46.3	0.69
C6	0.141	100.00	76	0.030	0.090	36.87	35.9	50.5	0.97	0.040	0.120	49.04	48.2	67.7	0.98
C7	0.231	88.30	76	0.040	0.100	36.87	32.4	74.7	0.88	0.060	0.140	49.04	44.1	101.7	0.90
Total	**0.839**	**83.76**						**261.0**						**356.9**	
Outfall Totals:															
OF1	0.839			0.035				300.0		0.042				379.0	
Total:	0.839			0.035				300.0		0.042				379.0	
Storage Totals:	**Area (ha)**	**Imp. (%)**	**Permanent Pool (m^3)**	**Peak Inflow (m^3/s)**		**Peak Outflow (m^3/s)**	**Peak Storage (m^3)**	**Inflow Volume (m^3)**	**Max Level (m)**	**Peak Inflow (m^3/s)**		**Peak Outflow (m^3/s)**	**Peak Storage (m^3)**	**Inflow Volume (m^3)**	**Max Level (m)**
Roof	0.230	88.70		0.043		0.006	31.0	75.0	106.220	0.062		0.006	48.0	102.0	106.230
Tank	0.839	83.79		0.111		0.035	77.0	300.0	103.580	0.153		0.042	107.0	378.0	103.710

Subcatchment	Chicago 6 Hour						Chicago 6 Hour					
	10-year						25-year					
	Peak Runoff (m^3/s)	Cumulative Runoff (m^3/s)	Rainfall Depth (mm)	Runoff Depth (mm)	Runoff Volume (m^3)	C	Peak Runoff (m^3/s)	Cumulative Runoff (m^3/s)	Rainfall Depth (mm)	Runoff Depth (mm)	Runoff Volume (m^3)	C
C1	0.030	0.030	57.03	56.1	49.6	0.98	0.040	0.040	66.94	66.0	58.4	0.99
C2	0.010	0.040	57.03	49.0	15.8	0.86	0.010	0.050	66.94	58.5	18.8	0.87
C3	0.040	0.080	57.03	52.2	66.4	0.92	0.050	0.100	66.94	61.9	78.7	0.93
C4	0.020	0.060	57.03	41.7	34.3	0.73	0.030	0.080	66.94	50.5	41.5	0.76
C5	0.030	0.090	57.03	40.4	55.6	0.71	0.040	0.120	66.94	49.0	67.6	0.73
C6	0.050	0.140	57.03	56.2	79.0	0.99	0.060	0.180	66.94	66.1	93.0	0.99
C7	0.070	0.160	57.03	51.6	119.0	0.91	0.090	0.210	66.94	61.3	141.4	0.92
Total					**419.7**						**499.3**	
Outfall Totals:												
OF1	0.046				438.0		0.051				516.0	
Total:	0.046				438.0		0.051				516.0	
Storage Totals:	**Peak Inflow (m^3/s)**		**Peak Outflow (m^3/s)**	**Peak Storage (m^3)**	**Inflow Volume (m^3)**	**Max Level (m)**	**Peak Inflow (m^3/s)**		**Peak Outflow (m^3/s)**	**Peak Storage (m^3)**	**Inflow Volume (m^3)**	**Max Level (m)**
Roof	0.073		0.006	60.0	119.0	106.230	0.087		0.006	76.0	141.0	106.240
Tank	0.181		0.046	127.0	438.0	103.800	0.215		0.051	152.0	516.0	103.920

Subcatchment	Chicago 6 Hour						Chicago 6 Hour					
	50-year						100-year					
	Peak Runoff (m^3/s)	Cumulative Runoff (m^3/s)	Rainfall Depth (mm)	Runoff Depth (mm)	Runoff Volume (m^3)	C	Peak Runoff (m^3/s)	Cumulative Runoff (m^3/s)	Rainfall Depth (mm)	Runoff Depth (mm)	Runoff Volume (m^3)	C
C1	0.040	0.040	74.45	73.5	65.0	0.99	0.040	0.040	82.33	81.4	72.0	0.99
C2	0.010	0.050	74.45	65.6	21.1	0.88	0.010	0.050	82.33	73.2	23.6	0.89
C3	0.050	0.100	74.45	69.2	88.0	0.93	0.060	0.110	82.33	76.9	97.8	0.93
C4	0.030	0.080	74.45	57.3	47.1	0.77	0.030	0.080	82.33	64.5	53.0	0.78
C5	0.050	0.130	74.45	55.7	76.8	0.75	0.050	0.130	82.33	62.8	86.5	0.76
C6	0.060	0.190	74.45	73.7	103.6	0.99	0.070	0.200	82.33	81.6	114.7	0.99
C7	0.100	0.230	74.45	68.6	158.1	0.92	0.110	0.240	82.33	76.2	175.7	0.93
Total					**559.7**						**623.2**	
Outfall Totals:												
OF1	0.055				577.0		0.059				640.0	
Total:	0.055				577.0		0.059				640.0	
Storage Totals:	**Peak Inflow (m^3/s)**		**Peak Outflow (m^3/s)**	**Peak Storage (m^3)**	**Inflow Volume (m^3)**	**Max Level (m)**	**Peak Inflow (m^3/s)**		**Peak Outflow (m^3/s)**	**Peak Storage (m^3)**	**Inflow Volume (m^3)**	**Max Level (m)**
Roof	0.098		0.006	88.0	158.0	106.240	0.108		0.006	101.0	176.0	106.250
Tank	0.244		0.055	172.0	576.0	104.020	0.276		0.059	193.0	639.0	104.160

Table B-15 PCSWMM Post Development Outflow Summary

		Peak Flow (Chicago Storm - 6 Hour) City of Ottawa IDF					
		2-year	5-year	10-year	25-year	50-year	100-year
Reference Point	5 Year Allowable* (L/s)	Post (L/s)	Post (L/s)	Post (L/s)	Post (L/s)	Post (L/s)	Post (L/s)
OF1	68.6	35.0	42.0	46.0	51.0	55.0	59.0
Total	**68.6**	**35.0**	**42.0**	**46.0**	**51.0**	**55.0**	**59.0**

* Per consultation with City of Ottawa allowalbe release rate for all storms up to and including the 100 year even is the predevelopment existing conditions 5 year

PROJECT INFORMATION	
ENGINEERED PRODUCT MANAGER	
ADS SALES REP	
PROJECT NO.	

Advanced Drainage Systems, Inc.

SiteAssist™
FOR STORMTECH
INSTALLATION INSTRUCTIONS
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24-5053A AY JACKSON

OTTAWA, ON, CANADA

SC-800 STORMTECH CHAMBER SPECIFICATIONS

1. CHAMBERS SHALL BE STORMTECH SC-800.
2. CHAMBERS SHALL BE ARCH-SHAPED AND SHALL BE MANUFACTURED FROM VIRGIN, IMPACT-MODIFIED POLYPROPYLENE COPOLYMERS.
3. CHAMBERS SHALL BE CERTIFIED TO CSA B184, "POLYMERIC SUB-SURFACE STORMWATER MANAGEMENT STRUCTURES", AND MEET THE REQUIREMENTS OF ASTM F2418, "STANDARD SPECIFICATION FOR POLYPROPYLENE (PP) CORRUGATED WALL STORMWATER COLLECTION CHAMBERS".
4. CHAMBER ROWS SHALL PROVIDE CONTINUOUS, UNOBSTRUCTED INTERNAL SPACE WITH NO INTERNAL SUPPORTS THAT WOULD IMPEDE FLOW OR LIMIT ACCESS FOR INSPECTION.
5. THE STRUCTURAL DESIGN OF THE CHAMBERS, THE STRUCTURAL BACKFILL, AND THE INSTALLATION REQUIREMENTS SHALL ENSURE THAT THE LOAD FACTORS SPECIFIED IN THE AASHTO LRFD BRIDGE DESIGN SPECIFICATIONS, SECTION 12.12, ARE MET FOR: 1) LONG-DURATION DEAD LOADS AND 2) SHORT-DURATION LIVE LOADS, BASED ON THE CSA S6 CL-625 TRUCK AND THE AASHTO DESIGN TRUCK WITH CONSIDERATION FOR IMPACT AND MULTIPLE VEHICLE PRESENCES.
6. CHAMBERS SHALL BE DESIGNED AND ALLOWABLE LOAD CONFIGURATIONS DETERMINED IN ACCORDANCE WITH ASTM F2787, "STANDARD PRACTICE FOR STRUCTURAL DESIGN OF THERMOPLASTIC CORRUGATED WALL STORMWATER COLLECTION CHAMBERS". LOAD CONFIGURATIONS SHALL INCLUDE: 1) INSTANTANEOUS (<1 MIN) AASHTO DESIGN TRUCK LIVE LOAD ON MINIMUM COVER 2) MAXIMUM PERMANENT (75-YR) COVER LOAD AND 3) ALLOWABLE COVER WITH PARKED (1-WEEK) AASHTO DESIGN TRUCK.
7. REQUIREMENTS FOR HANDLING AND INSTALLATION:
   - TO MAINTAIN THE WIDTH OF CHAMBERS DURING SHIPPING AND HANDLING, CHAMBERS SHALL HAVE INTEGRAL, INTERLOCKING STACKING LUGS.
   - TO ENSURE A SECURE JOINT DURING INSTALLATION AND BACKFILL, THE HEIGHT OF THE CHAMBER JOINT SHALL NOT BE LESS THAN 50 mm (2").
   - TO ENSURE THE INTEGRITY OF THE ARCH SHAPE DURING INSTALLATION, a) THE ARCH STIFFNESS CONSTANT SHALL BE GREATER THAN OR EQUAL TO 550 LBS/FT/%. THE ASC IS DEFINED IN SECTION 6.2.8 OF ASTM F2418. AND b) TO RESIST CHAMBER DEFORMATION DURING INSTALLATION AT ELEVATED TEMPERATURES (ABOVE 23° C / 73° F), CHAMBERS SHALL BE PRODUCED FROM REFLECTIVE GOLD OR YELLOW COLORS.
8. ONLY CHAMBERS THAT ARE APPROVED BY THE SITE DESIGN ENGINEER WILL BE ALLOWED. UPON REQUEST BY THE SITE DESIGN ENGINEER OR OWNER, THE CHAMBER MANUFACTURER SHALL SUBMIT A STRUCTURAL EVALUATION FOR APPROVAL BEFORE DELIVERING CHAMBERS TO THE PROJECT SITE AS FOLLOWS:
   - THE STRUCTURAL EVALUATION SHALL BE SEALED BY A REGISTERED PROFESSIONAL ENGINEER.
   - THE STRUCTURAL EVALUATION SHALL DEMONSTRATE THAT THE SAFETY FACTORS ARE GREATER THAN OR EQUAL TO 1.95 FOR DEAD LOAD AND 1.75 FOR LIVE LOAD, THE MINIMUM REQUIRED BY ASTM F2787 AND BY SECTIONS 3 AND 12.12 OF THE AASHTO LRFD BRIDGE DESIGN SPECIFICATIONS FOR THERMOPLASTIC PIPE.
   - THE TEST DERIVED CREEP MODULUS AS SPECIFIED IN ASTM F2418 SHALL BE USED FOR PERMANENT DEAD LOAD DESIGN EXCEPT THAT IT SHALL BE THE 75-YEAR MODULUS USED FOR DESIGN.
9. CHAMBERS AND END CAPS SHALL BE PRODUCED AT AN ISO 9001 CERTIFIED MANUFACTURING FACILITY.
10. MANIFOLD SIZE TO BE DETERMINED BY SITE DESIGN ENGINEER. SEE TECH NOTE #6.32 FOR MANIFOLD SIZING GUIDANCE. DUE TO THE ADAPTATION OF THIS CHAMBER SYSTEM TO SPECIFIC SITE AND DESIGN CONSTRAINTS, IT MAY BE NECESSARY TO CUT AND COUPLE ADDITIONAL PIPE TO STANDARD MANIFOLD COMPONENTS IN THE FIELD.
11. ADS DOES NOT DESIGN OR PROVIDE MEMBRANE LINER SYSTEMS. TO MINIMIZE THE LEAKAGE POTENTIAL OF LINER SYSTEMS, THE MEMBRANE LINER SYSTEM SHOULD BE DESIGNED BY A KNOWLEDGEABLE GEOTEXTILE PROFESSIONAL AND INSTALLED BY A QUALIFIED CONTRACTOR.

IMPORTANT - NOTES FOR THE BIDDING AND INSTALLATION OF THE SC-800 SYSTEM

1. STORMTECH SC-800 CHAMBERS SHALL NOT BE INSTALLED UNTIL THE MANUFACTURER'S REPRESENTATIVE HAS COMPLETED A PRE-CONSTRUCTION MEETING WITH THE INSTALLERS.
2. STORMTECH SC-800 CHAMBERS SHALL BE INSTALLED IN ACCORDANCE WITH THE "STORMTECH SC-310/SC-740/SC-800/DC-780 CONSTRUCTION GUIDE".
3. CHAMBERS ARE NOT TO BE BACKFILLED WITH A DOZER OR AN EXCAVATOR SITUATED OVER THE CHAMBERS. STORMTECH RECOMMENDS 3 BACKFILL METHODS:
   - STONESHOOTER LOCATED OFF THE CHAMBER BED.
   - BACKFILL AS ROWS ARE BUILT USING AN EXCAVATOR ON THE FOUNDATION STONE OR SUBGRADE.
   - BACKFILL FROM OUTSIDE THE EXCAVATION USING A LONG BOOM HOE OR EXCAVATOR.
4. THE FOUNDATION STONE SHALL BE LEVELED AND COMPACTED PRIOR TO PLACING CHAMBERS.
5. JOINTS BETWEEN CHAMBERS SHALL BE PROPERLY SEATED PRIOR TO PLACING STONE.
6. MAINTAIN MINIMUM - 150 mm (6") SPACING BETWEEN THE CHAMBER ROWS.
7. EMBEDMENT STONE SURROUNDING CHAMBERS MUST BE A CLEAN, CRUSHED, ANGULAR STONE OR RECYCLED CONCRETE; AASHTO M43 #3, 357, 4, 467, 5, 56, OR 57.
8. THE CONTRACTOR MUST REPORT ANY DISCREPANCIES WITH CHAMBER FOUNDATION MATERIALS BEARING CAPACITIES TO THE SITE DESIGN ENGINEER.
9. ADS RECOMMENDS THE USE OF "FLEXSTORM CATCH IT" INSERTS DURING CONSTRUCTION FOR ALL INLETS TO PROTECT THE SUBSURFACE STORMWATER MANAGEMENT SYSTEM FROM CONSTRUCTION SITE RUNOFF.

NOTES FOR CONSTRUCTION EQUIPMENT

1. STORMTECH SC-800 CHAMBERS SHALL BE INSTALLED IN ACCORDANCE WITH THE "STORMTECH SC-310/SC-740/SC-800/DC-780 CONSTRUCTION GUIDE".
2. THE USE OF CONSTRUCTION EQUIPMENT OVER SC-800 CHAMBERS IS LIMITED:
   - NO EQUIPMENT IS ALLOWED ON BARE CHAMBERS.
   - NO RUBBER TIRED LOADERS, DUMP TRUCKS, OR EXCAVATORS ARE ALLOWED UNTIL PROPER FILL DEPTHS ARE REACHED IN ACCORDANCE WITH THE "STORMTECH SC-310/SC-740/SC-800/DC-780 CONSTRUCTION GUIDE".
   - WEIGHT LIMITS FOR CONSTRUCTION EQUIPMENT CAN BE FOUND IN THE "STORMTECH SC-310/SC-740/SC-800/DC-780 CONSTRUCTION GUIDE".
3. FULL 900 mm (36") OF STABILIZED COVER MATERIALS OVER THE CHAMBERS IS REQUIRED FOR DUMP TRUCK TRAVEL OR DUMPING.

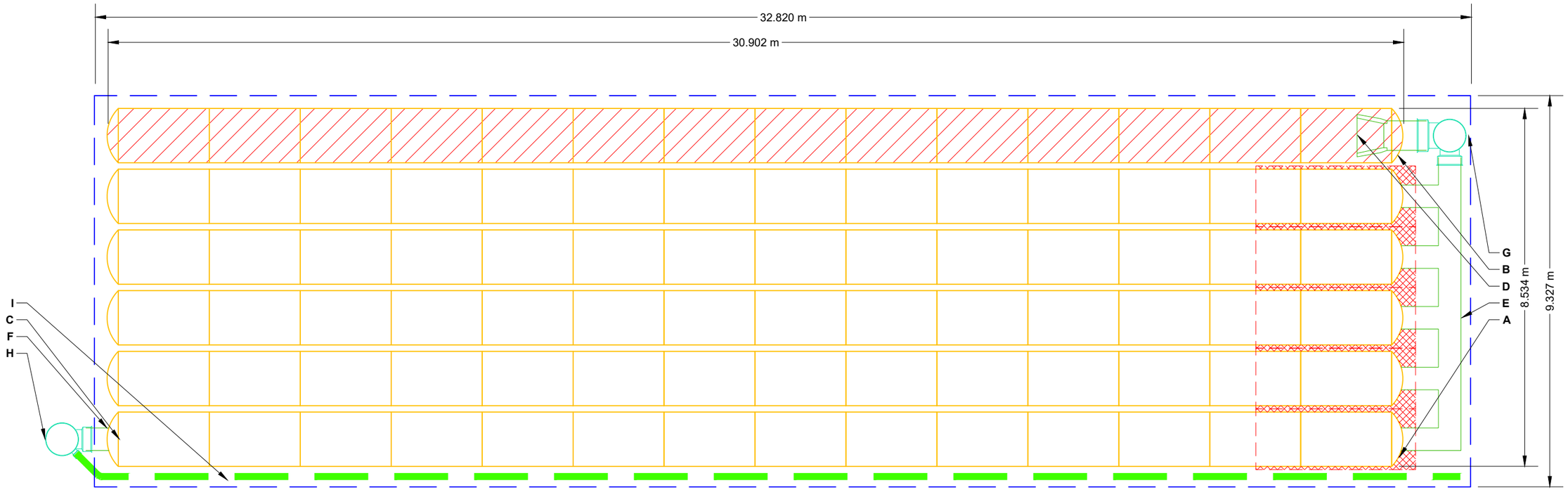
USE OF A DOZER TO PUSH EMBEDMENT STONE BETWEEN THE ROWS OF CHAMBERS MAY CAUSE DAMAGE TO THE CHAMBERS AND IS NOT AN ACCEPTABLE BACKFILL METHOD. ANY CHAMBERS DAMAGED BY THE "DUMP AND PUSH" METHOD ARE NOT COVERED UNDER THE STORMTECH STANDARD WARRANTY.

CONTACT STORMTECH AT 1-800-821-6710 WITH ANY QUESTIONS ON INSTALLATION REQUIREMENTS OR WEIGHT LIMITS FOR CONSTRUCTION EQUIPMENT.

PROPOSED LAYOUT		CONCEPTUAL ELEVATIONS:	
84	STORMTECH SC-800 CHAMBERS	MAXIMUM ALLOWABLE GRADE (TOP OF PAVEMENT/UNPAVED):	3.429
12	STORMTECH SC-800 END CAPS	MINIMUM ALLOWABLE GRADE (UNPAVED WITH TRAFFIC):	1.524
152	STONE ABOVE (mm)	MINIMUM ALLOWABLE GRADE (UNPAVED NO TRAFFIC):	1.372
152	STONE BELOW (mm)	MINIMUM ALLOWABLE GRADE (TOP OF RIGID CONCRETE PAVEMENT):	1.372
40	STONE VOID	MINIMUM ALLOWABLE GRADE (BASE OF FLEXIBLE PAVEMENT):	1.372
212.9	INSTALLED SYSTEM VOLUME (m^3) (PERIMETER STONE INCLUDED) (COVER STONE INCLUDED) (BASE STONE INCLUDED)	TOP OF STONE:	1.143
		TOP OF SC-800 CHAMBER:	0.991
		450 mm x 450 mm TOP MANIFOLD INVERT:	0.356
		600 mm ISOLATOR ROW PLUS INVERT:	0.211
306.1	SYSTEM AREA (m^2)	450 mm BOTTOM CONNECTION INVERT:	0.203
84.3	SYSTEM PERIMETER (m)	BOTTOM OF SC-800 CHAMBER:	0.152
		UNDERDRAIN INVERT:	0.000
		BOTTOM OF STONE:	0.000

*INVERT ABOVE BASE OF CHAMBER

PART TYPE	ITEM ON LAYOUT	DESCRIPTION	INVERT*	MAX FLOW
PRE-CORED END CAP	A	450 mm TOP PRE-CORED END CAP, PART#: SC800EPE18TPC / TYP OF ALL 450 mm TOP CONNECTIONS	203 mm	
PRE-CORED END CAP	B	600 mm BOTTOM PRE-CORED END CAP, PART#: SC800EPE24BPC / TYP OF ALL 600 mm BOTTOM CONNECTIONS AND ISOLATOR PLUS ROWS	58 mm	
PRE-CORED END CAP	C	450 mm BOTTOM PRE-CORED END CAP, PART#: SC800EPE18BPC / TYP OF ALL 450 mm BOTTOM CONNECTIONS	51 mm	
FLAMP	D	INSTALL FLAMP ON 600 mm ACCESS PIPE / PART#: SC74024RAMP		
MANIFOLD	E	450 mm x 450 mm TOP MANIFOLD, ADS N-12	203 mm	
PIPE CONNECTION	F	450 mm BOTTOM CONNECTION	51 mm	
NYLOPLAST (INLET W/ ISO PLUS ROW)	G	750 mm DIAMETER (610 mm SUMP MIN)		396 L/s IN
NYLOPLAST (OUTLET)	H	750 mm DIAMETER (DESIGN BY ENGINEER)		113 L/s OUT
UNDERDRAIN	I	150 mm ADS N-12 DUAL WALL PERFORATED HDPE UNDERDRAIN		



ISOLATOR ROW PLUS
(SEE DETAIL)

PLACE MINIMUM 3.810 m OF ADSPLUS625 WOVEN GEOTEXTILE OVER BEDDING STONE AND UNDERNEATH CHAMBER FEET FOR SCOUR PROTECTION AT ALL CHAMBER INLET ROWS

BED LIMITS

NOTES

- THE SITE DESIGN ENGINEER MUST REVIEW ELEVATIONS AND IF NECESSARY ADJUST GRADING TO ENSURE THE CHAMBER COVER REQUIREMENTS ARE MET.
- **NOT FOR CONSTRUCTION**: THIS LAYOUT IS FOR DIMENSIONAL PURPOSES ONLY TO PROVE CONCEPT & THE REQUIRED STORAGE VOLUME CAN BE ACHIEVED ON SITE.

24-5053A AY JACKSON
OTTAWA, ON, CANADA
DATE: 02/21/2025 | DRAWN: ZB | CHECKED: N/A
PROJECT #:

DATE	DRW	CHK	DESCRIPTION

4640 TRUEMAN BLVD
HILLIARD, OH 43026
1-800-733-7473

SCALE = 1 : 100

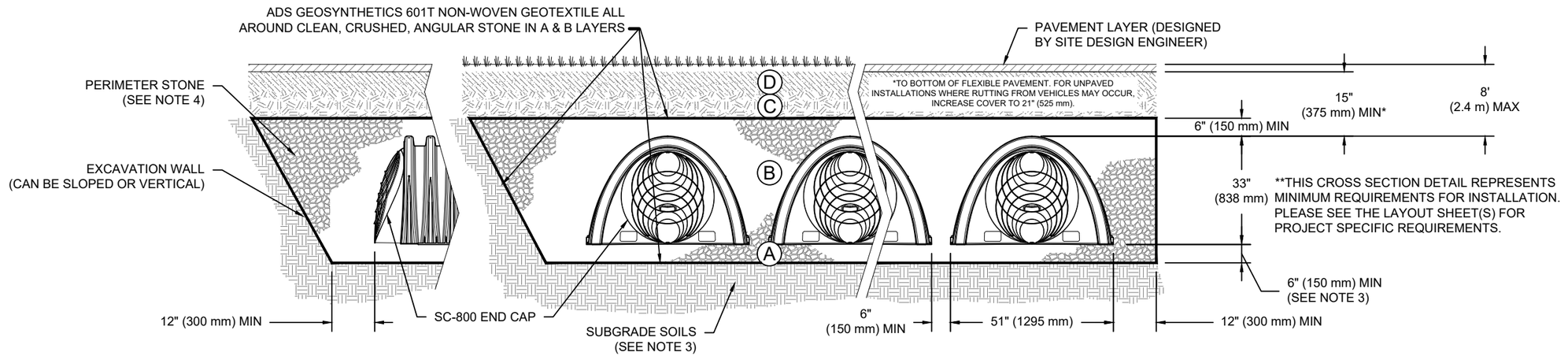
StormTech® Chamber System

1-800-821-6710 | WWW.STORMTECH.COM

ACCEPTABLE FILL MATERIALS: STORMTECH SC-800 CHAMBER SYSTEMS

MATERIAL LOCATION		DESCRIPTION	AASHTO MATERIAL CLASSIFICATIONS	COMPACTION / DENSITY REQUIREMENT
D	**FINAL FILL:** FILL MATERIAL FOR LAYER 'D' STARTS FROM THE TOP OF THE 'C' LAYER TO THE BOTTOM OF FLEXIBLE PAVEMENT OR UNPAVED FINISHED GRADE ABOVE. NOTE THAT PAVEMENT SUBBASE MAY BE PART OF THE 'D' LAYER.	ANY SOIL/ROCK MATERIALS, NATIVE SOILS, OR PER ENGINEER'S PLANS. CHECK PLANS FOR PAVEMENT SUBGRADE REQUIREMENTS.	N/A	PREPARE PER SITE DESIGN ENGINEER'S PLANS. PAVED INSTALLATIONS MAY HAVE STRINGENT MATERIAL AND PREPARATION REQUIREMENTS.
C	**INITIAL FILL:** FILL MATERIAL FOR LAYER 'C' STARTS FROM THE TOP OF THE EMBEDMENT STONE ('B' LAYER) TO 15" (375 mm) ABOVE THE TOP OF THE CHAMBER. NOTE THAT PAVEMENT SUBBASE MAY BE A PART OF THE 'C' LAYER.	GRANULAR WELL-GRADED SOIL/AGGREGATE MIXTURES, <35% FINES OR PROCESSED AGGREGATE. MOST PAVEMENT SUBBASE MATERIALS CAN BE USED IN LIEU OF THIS LAYER.	AASHTO M145[1] A-1, A-2-4, A-3 OR AASHTO M43[1] 3, 357, 4, 467, 5, 56, 57, 6, 67, 68, 7, 78, 8, 89, 9, 10	BEGIN COMPACTIONS AFTER 12" (300 mm) OF MATERIAL OVER THE CHAMBERS IS REACHED. COMPACT ADDITIONAL LAYERS IN 6" (150 mm) MAX LIFTS TO A MIN. 95% PROCTOR DENSITY FOR WELL GRADED MATERIAL AND 95% RELATIVE DENSITY FOR PROCESSED AGGREGATE MATERIALS. ROLLER GROSS VEHICLE WEIGHT NOT TO EXCEED 12,000 lbs (53 kN). DYNAMIC FORCE NOT TO EXCEED 20,000 lbs (89 kN).
B	**EMBEDMENT STONE:** FILL SURROUNDING THE CHAMBERS FROM THE FOUNDATION STONE ('A' LAYER) TO THE 'C' LAYER ABOVE.	CLEAN, CRUSHED, ANGULAR STONE OR RECYCLED CONCRETE[5]	AASHTO M43[1] 3, 357, 4, 467, 5, 56, 57	NO COMPACTION REQUIRED.
A	**FOUNDATION STONE:** FILL BELOW CHAMBERS FROM THE SUBGRADE UP TO THE FOOT (BOTTOM) OF THE CHAMBER.	CLEAN, CRUSHED, ANGULAR STONE OR RECYCLED CONCRETE[5]	AASHTO M43[1] 3, 357, 4, 467, 5, 56, 57	PLATE COMPACT OR ROLL TO ACHIEVE A FLAT SURFACE.[2,3]

PLEASE NOTE:
1. THE LISTED AASHTO DESIGNATIONS ARE FOR GRADATIONS ONLY. THE STONE MUST ALSO BE CLEAN, CRUSHED, ANGULAR. FOR EXAMPLE, A SPECIFICATION FOR #4 STONE WOULD STATE: "CLEAN, CRUSHED, ANGULAR NO. 4 (AASHTO M43) STONE".
2. STORMTECH COMPACTION REQUIREMENTS ARE MET FOR 'A' LOCATION MATERIALS WHEN PLACED AND COMPACTED IN 6" (150 mm) (MAX) LIFTS USING TWO FULL COVERAGES WITH A VIBRATORY COMPACTOR.
3. WHERE INFILTRATION SURFACES MAY BE COMPROMISED BY COMPACTION, FOR STANDARD DESIGN LOAD CONDITIONS, A FLAT SURFACE MAY BE ACHIEVED BY RAKING OR DRAGGING WITHOUT COMPACTION EQUIPMENT. FOR SPECIAL LOAD DESIGNS, CONTACT STORMTECH FOR COMPACTION REQUIREMENTS.
4. ONCE LAYER 'C' IS PLACED, ANY SOIL/MATERIAL CAN BE PLACED IN LAYER 'D' UP TO THE FINISHED GRADE. MOST PAVEMENT SUBBASE SOILS CAN BE USED TO REPLACE THE MATERIAL REQUIREMENTS OF LAYER 'C' OR 'D' AT THE SITE DESIGN ENGINEER'S DISCRETION.
5. WHERE RECYCLED CONCRETE AGGREGATE IS USED IN LAYERS 'A' OR 'B' THE MATERIAL SHOULD ALSO MEET THE ACCEPTABILITY CRITERIA OUTLINED IN TECHNICAL NOTE 6.20 "RECYCLED CONCRETE STRUCTURAL BACKFILL".



NOTES:

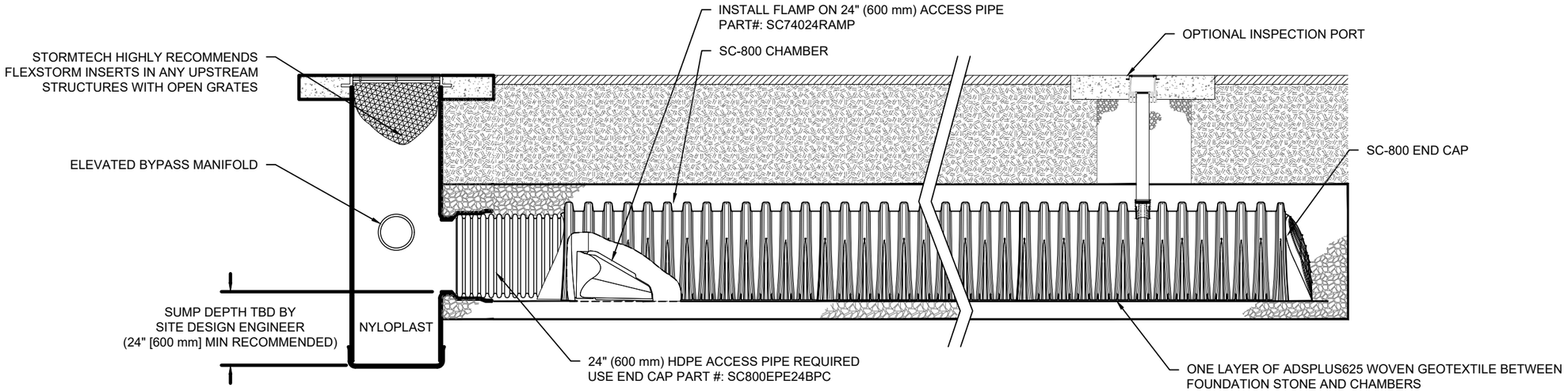
1. CHAMBERS SHALL MEET THE REQUIREMENTS OF ASTM F2418, "STANDARD SPECIFICATION FOR POLYPROPYLENE (PP) CORRUGATED WALL STORMWATER COLLECTION CHAMBERS".
2. SC-800 CHAMBERS SHALL BE DESIGNED IN ACCORDANCE WITH ASTM F2787 "STANDARD PRACTICE FOR STRUCTURAL DESIGN OF THERMOPLASTIC CORRUGATED WALL STORMWATER COLLECTION CHAMBERS".
3. THE SITE DESIGN ENGINEER IS RESPONSIBLE FOR ASSESSING THE BEARING RESISTANCE (ALLOWABLE BEARING CAPACITY) OF THE SUBGRADE SOILS AND THE DEPTH OF FOUNDATION STONE WITH CONSIDERATION FOR THE RANGE OF EXPECTED SOIL MOISTURE CONDITIONS. REFERENCE STORMTECH DESIGN MANUAL FOR BEARING CAPACITY GUIDANCE.
4. PERIMETER STONE MUST BE EXTENDED HORIZONTALLY TO THE EXCAVATION WALL FOR BOTH VERTICAL AND SLOPED EXCAVATION WALLS.
5. REQUIREMENTS FOR HANDLING AND INSTALLATION:
   - TO MAINTAIN THE WIDTH OF CHAMBERS DURING SHIPPING AND HANDLING, CHAMBERS SHALL HAVE INTEGRAL, INTERLOCKING STACKING LUGS.
   - TO ENSURE A SECURE JOINT DURING INSTALLATION AND BACKFILL, THE HEIGHT OF THE CHAMBER JOINT SHALL NOT BE LESS THAN 2".
   - TO ENSURE THE INTEGRITY OF THE ARCH SHAPE DURING INSTALLATION, a) THE ARCH STIFFNESS CONSTANT AS DEFINED IN SECTION 6.2.8 OF ASTM F2418 SHALL BE GREATER THAN OR EQUAL TO 550 LBS/FT/%. AND b) TO RESIST CHAMBER DEFORMATION DURING INSTALLATION AT ELEVATED TEMPERATURES (ABOVE 73° F / 23° C), CHAMBERS SHALL BE PRODUCED FROM REFLECTIVE GOLD OR YELLOW COLORS.

24-5053A AY JACKSON
OTTAWA, ON, CANADA
DATE: 02/21/2025 | DRAWN: ZB | CHECKED: N/A
PROJECT #:

DATE	DRW	CHK	DESCRIPTION

StormTech® Chamber System
1-800-821-6710 | WWW.STORMTECH.COM

4640 TRUEMAN BLVD
HILLIARD, OH 43026
1-800-733-7473



SC-800 ISOLATOR ROW PLUS DETAIL
NTS

INSPECTION & MAINTENANCE

STEP 1) INSPECT ISOLATOR ROW PLUS FOR SEDIMENT
- A. INSPECTION PORTS (IF PRESENT)
  - A.1. REMOVE/OPEN LID ON NYLOPLAST INLINE DRAIN
  - A.2. REMOVE AND CLEAN FLEXSTORM FILTER IF INSTALLED
  - A.3. USING A FLASHLIGHT AND STADIA ROD, MEASURE DEPTH OF SEDIMENT AND RECORD ON MAINTENANCE LOG
  - A.4. LOWER A CAMERA INTO ISOLATOR ROW PLUS FOR VISUAL INSPECTION OF SEDIMENT LEVELS (OPTIONAL)
  - A.5. IF SEDIMENT IS AT, OR ABOVE, 3" (80 mm) PROCEED TO STEP 2. IF NOT, PROCEED TO STEP 3.
- B. ALL ISOLATOR PLUS ROWS
  - B.1. REMOVE COVER FROM STRUCTURE AT UPSTREAM END OF ISOLATOR ROW PLUS
  - B.2. USING A FLASHLIGHT, INSPECT DOWN THE ISOLATOR ROW PLUS THROUGH OUTLET PIPE
    - i) MIRRORS ON POLES OR CAMERAS MAY BE USED TO AVOID A CONFINED SPACE ENTRY
    - ii) FOLLOW OSHA REGULATIONS FOR CONFINED SPACE ENTRY IF ENTERING MANHOLE
  - B.3. IF SEDIMENT IS AT, OR ABOVE, 3" (80 mm) PROCEED TO STEP 2. IF NOT, PROCEED TO STEP 3.

STEP 2) CLEAN OUT ISOLATOR ROW PLUS USING THE JETVAC PROCESS
- A. A FIXED CULVERT CLEANING NOZZLE WITH REAR FACING SPREAD OF 45" (1.1 m) OR MORE IS PREFERRED
- B. APPLY MULTIPLE PASSES OF JETVAC UNTIL BACKFLUSH WATER IS CLEAN
- C. VACUUM STRUCTURE SUMP AS REQUIRED

STEP 3) REPLACE ALL COVERS, GRATES, FILTERS, AND LIDS; RECORD OBSERVATIONS AND ACTIONS.

STEP 4) INSPECT AND CLEAN BASINS AND MANHOLES UPSTREAM OF THE STORMTECH SYSTEM.

NOTES

1. INSPECT EVERY 6 MONTHS DURING THE FIRST YEAR OF OPERATION. ADJUST THE INSPECTION INTERVAL BASED ON PREVIOUS OBSERVATIONS OF SEDIMENT ACCUMULATION AND HIGH WATER ELEVATIONS.

2. CONDUCT JETTING AND VACTORING ANNUALLY OR WHEN INSPECTION SHOWS THAT MAINTENANCE IS NECESSARY.

24-5053A AY JACKSON
OTTAWA, ON, CANADA
DATE: 02/21/2025 | DRAWN: ZB
PROJECT #: | CHECKED: N/A

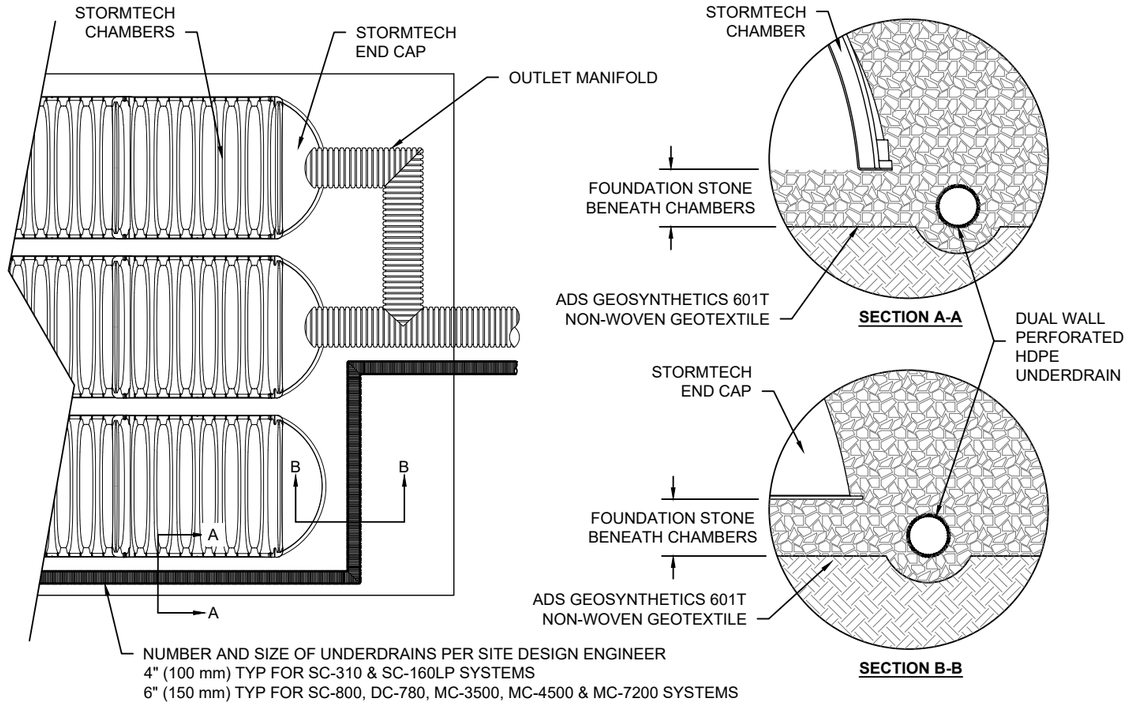
DATE	DRW	CHK	DESCRIPTION

StormTech®
Chamber System
1-800-821-6710 | WWW.STORMTECH.COM

ADS
4640 TRUEMAN BLVD
HILLIARD, OH 43026
1-800-733-7473

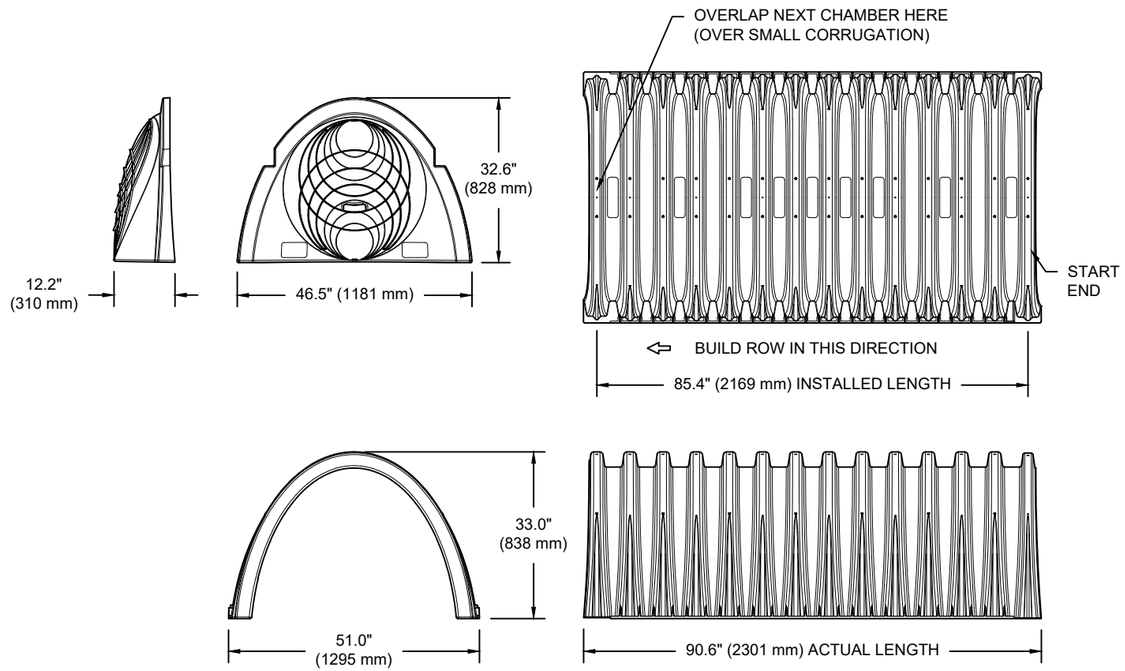
UNDERDRAIN DETAIL

NTS



SC-800 TECHNICAL SPECIFICATION

NTS



NOMINAL CHAMBER SPECIFICATIONS

SIZE (W X H X INSTALLED LENGTH)	51.0" X 33.0" X 85.4"	(1295 mm X 838 mm X 2169 mm)
CHAMBER STORAGE	50.6 CUBIC FEET	(1.43 m³)
MINIMUM INSTALLED STORAGE*	81.0 CUBIC FEET	(2.29 m³)
WEIGHT	81.8 lbs.	(37.1 kg)

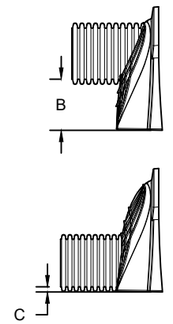
NOMINAL END CAP SPECIFICATIONS

SIZE (W X H X INSTALLED LENGTH)	46.5" X 32.6" X 10.5"	(1181 mm X 828 mm X 267 mm)
END CAP STORAGE	3.4 CUBIC FEET	(0.09 m³)
MINIMUM INSTALLED STORAGE**	15.4 CUBIC FEET	(0.43 m³)
WEIGHT	15.7 lbs.	(7.1 kg)

* ASSUMES 6" (152 mm) STONE ABOVE, BELOW, AND BETWEEN CHAMBERS
**ASSUMES 6" (152 mm) STONE ABOVE AND BELOW END CAPS, 6" (152 mm) BETWEEN ROWS, 12" (305 mm) BEYOND END CAPS

PRE-CORED HOLES AT BOTTOM OF END CAP FOR PART NUMBERS ENDING WITH "BPC"
PRE-CORED HOLES AT TOP OF END CAP FOR PART NUMBERS ENDING WITH "TPC"

PART #	STUB	B	C
SC800EPE06TPC	6" (150 mm)	21.4" (544 mm)	---
SC800EPE06BPC		---	0.9" (23 mm)
SC800EPE08TPC	8" (200 mm)	19.2" (488 mm)	---
SC800EPE08BPC		---	1.0" (25 mm)
SC800EPE10TPC	10" (250 mm)	17.0" (432 mm)	---
SC800EPE10BPC		---	1.2" (30 mm)
SC800EPE12TPC	12" (300 mm)	14.4" (366 mm)	---
SC800EPE12BPC		---	1.6" (41 mm)
SC800EPE15TPC	15" (375 mm)	11.3" (287 mm)	---
SC800EPE15BPC		---	1.7" (43 mm)
SC800EPE18TPC	18" (450 mm)	8.0" (203 mm)	---
SC800EPE18BPC		---	2.0" (51 mm)
SC800EPE24BPC	24" (600 mm)	---	2.3" (58 mm)
SC800EPE	NONE	SOLID END CAP	



NOTE: ALL DIMENSIONS ARE NOMINAL

24-5053A AY JACKSON
OTTAWA, ON, CANADA
DATE: 02/21/2025 | PROJECT #: | DRAWN: ZB | CHECKED: N/A

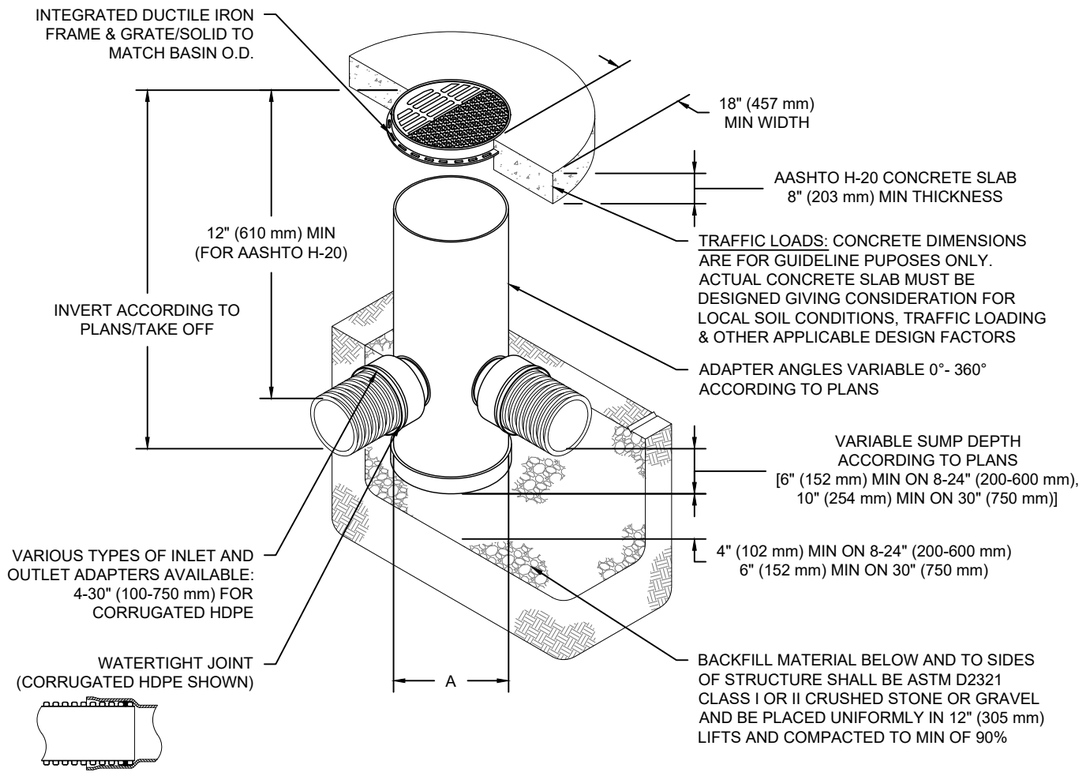
DATE	DRW	CHK	DESCRIPTION

StormTech® Chamber System
1-800-821-6710 | WWW.STORMTECH.COM

ADS
4640 TRUEMAN BLVD
HILLIARD, OH 43026
1-800-733-7473

NYLOPLAST DRAIN BASIN

NTS



NOTES

1. 8-30" (200-750 mm) GRATES/SOLID COVERS SHALL BE DUCTILE IRON PER ASTM A536 GRADE 70-50-05
2. 12-30" (300-750 mm) FRAMES SHALL BE DUCTILE IRON PER ASTM A536 GRADE 70-50-05
3. DRAIN BASIN TO BE CUSTOM MANUFACTURED ACCORDING TO PLAN DETAILS
4. DRAINAGE CONNECTION STUB JOINT TIGHTNESS SHALL CONFORM TO ASTM D3212 FOR CORRUGATED HDPE (ADS & HANCOR DUAL WALL) & SDR 35 PVC
5. FOR COMPLETE DESIGN AND PRODUCT INFORMATION: **WWW.NYLOPLAST-US.COM**
6. TO ORDER CALL: **800-821-6710**

A	PART #	GRATE/SOLID COVER OPTIONS		
8" (200 mm)	2808AG	PEDESTRIAN LIGHT DUTY	STANDARD LIGHT DUTY	SOLID LIGHT DUTY
10" (250 mm)	2810AG	PEDESTRIAN LIGHT DUTY	STANDARD LIGHT DUTY	SOLID LIGHT DUTY
12" (300 mm)	2812AG	PEDESTRIAN AASHTO H-10	STANDARD AASHTO H-20	SOLID AASHTO H-20
15" (375 mm)	2815AG	PEDESTRIAN AASHTO H-10	STANDARD AASHTO H-20	SOLID AASHTO H-20
18" (450 mm)	2818AG	PEDESTRIAN AASHTO H-10	STANDARD AASHTO H-20	SOLID AASHTO H-20
24" (600 mm)	2824AG	PEDESTRIAN AASHTO H-10	STANDARD AASHTO H-20	SOLID AASHTO H-20
30" (750 mm)	2830AG	PEDESTRIAN AASHTO H-20	STANDARD AASHTO H-20	SOLID AASHTO H-20

24-5053A AY JACKSON
OTTAWA, ON, CANADA
DATE: 02/21/2025 | DRAWN: ZB | CHECKED: N/A
PROJECT #:

DATE	DRW	CHK	DESCRIPTION

Nyloplast®
770-932-2443 | WWW.NYLOPLAST-US.COM
4640 TRUEMAN BLVD
HILLIARD, OH 43026
1-800-733-7473

Project: 24-5053A AY JACKSON

Chamber Model -	SC-800	
Units -	Metric	
Number of Chambers -	84	
Number of End Caps -	12	
Voids in the stone (porosity) -	40	%
Base of Stone Elevation -	103.18	m
Amount of Stone Above Chambers -	200	mm
Amount of Stone Below Chambers -	152	mm

Area of System- 306.1115221 sq.meters Min. Area - 273.71 sq.meters

☑ Include Perimeter Stone in Calculations

☑ Click for Stage Area Data

☑ Click to Invert Stage Area Data

Click Here for Imperial

StormTech SC-800 Cumulative Storage Volumes

Height of System (mm)	Incremental Single Chamber (cubic meters)	Incremental Single End Cap (cubic meters)	Incremental Chambers (cubic meters)	Incremental End Cap (cubic meters)	Incremental Stone (cubic meters)	Incremental Ch, EC and Stone (cubic meters)	Cumulative System (cubic meters)	Elevation (meters)
1194	0.000	0.000	0.00	0.00	3.11	3.11	219.12	104.37
1168	0.000	0.000	0.00	0.00	3.11	3.11	216.01	104.35
1143	0.000	0.000	0.00	0.00	3.11	3.11	212.90	104.32
1118	0.000	0.000	0.00	0.00	3.11	3.11	209.79	104.30
1092	0.000	0.000	0.00	0.00	3.11	3.11	206.68	104.27
1067	0.000	0.000	0.00	0.00	3.11	3.11	203.57	104.25
1041	0.000	0.000	0.00	0.00	3.11	3.11	200.46	104.22
1016	0.000	0.000	0.00	0.00	3.11	3.11	197.35	104.20
991	0.002	0.000	0.18	0.00	3.04	3.22	194.24	104.17
965	0.006	0.000	0.47	0.00	2.92	3.39	191.02	104.15
940	0.008	0.000	0.68	0.00	2.84	3.52	187.63	104.12
914	0.014	0.000	1.20	0.00	2.63	3.83	184.11	104.09
889	0.021	0.000	1.76	0.00	2.40	4.17	180.28	104.07
864	0.025	0.001	2.12	0.01	2.26	4.39	176.11	104.04
838	0.029	0.001	2.41	0.01	2.14	4.57	171.72	104.02
813	0.032	0.001	2.66	0.01	2.04	4.72	167.16	103.99
787	0.034	0.001	2.88	0.02	1.95	4.85	162.44	103.97
762	0.037	0.002	3.08	0.02	1.87	4.97	157.59	103.94
737	0.039	0.002	3.26	0.02	1.79	5.08	152.61	103.92
711	0.041	0.002	3.43	0.03	1.73	5.18	147.53	103.89
686	0.043	0.002	3.58	0.03	1.67	5.28	142.35	103.87
660	0.044	0.003	3.72	0.03	1.61	5.36	137.07	103.84
635	0.046	0.003	3.86	0.03	1.55	5.44	131.71	103.82
610	0.047	0.003	3.98	0.04	1.50	5.52	126.26	103.79
584	0.049	0.003	4.10	0.04	1.46	5.59	120.74	103.76
559	0.050	0.004	4.21	0.04	1.41	5.66	115.15	103.74
533	0.051	0.004	4.31	0.04	1.37	5.72	109.49	103.71
508	0.052	0.004	4.41	0.05	1.33	5.78	103.77	103.69
483	0.054	0.004	4.50	0.05	1.29	5.84	97.99	103.66
457	0.055	0.004	4.59	0.05	1.26	5.89	92.15	103.64
432	0.056	0.004	4.67	0.05	1.22	5.94	86.26	103.61
406	0.057	0.004	4.75	0.05	1.19	5.99	80.31	103.59
381	0.057	0.005	4.82	0.06	1.16	6.04	74.32	103.56
356	0.058	0.005	4.89	0.06	1.13	6.08	68.29	103.54
330	0.059	0.005	4.96	0.06	1.10	6.12	62.21	103.51
305	0.060	0.005	5.02	0.06	1.08	6.16	56.09	103.48
279	0.060	0.005	5.08	0.06	1.06	6.19	49.93	103.46
254	0.061	0.005	5.13	0.06	1.03	6.23	43.74	103.43
229	0.062	0.005	5.18	0.06	1.01	6.26	37.52	103.41
203	0.062	0.005	5.23	0.06	0.99	6.29	31.26	103.38
178	0.063	0.004	5.29	0.04	0.98	6.31	24.97	103.36
152	0.000	0.000	0.00	0.00	3.11	3.11	18.66	103.33
127	0.000	0.000	0.00	0.00	3.11	3.11	15.55	103.31
102	0.000	0.000	0.00	0.00	3.11	3.11	12.44	103.28
76	0.000	0.000	0.00	0.00	3.11	3.11	9.33	103.26
51	0.000	0.000	0.00	0.00	3.11	3.11	6.22	103.23
25	0.000	0.000	0.00	0.00	3.11	3.11	3.11	103.21

Stage Area Data

Depth (meter)	Elevation (meter)	Area (m^2)	Area (hectare)
1.19	104.37	122.44	0.0122
1.17	104.35	122.44	0.0122
1.14	104.32	122.44	0.0122
1.12	104.30	122.44	0.0122
1.09	104.27	122.44	0.0122
1.07	104.25	122.44	0.0122
1.04	104.22	122.44	0.0122
1.02	104.20	122.44	0.0122
0.99	104.17	126.63	0.0127
0.97	104.15	133.53	0.0134
0.94	104.12	138.53	0.0139
0.91	104.09	150.89	0.0151
0.89	104.07	164.17	0.0164
0.86	104.04	172.77	0.0173
0.84	104.02	179.74	0.0180
0.81	103.99	185.73	0.0186
0.79	103.97	191.01	0.0191
0.76	103.94	195.78	0.0196
0.74	103.92	200.11	0.0200
0.71	103.89	204.07	0.0204
0.69	103.87	207.73	0.0208
0.66	103.84	211.15	0.0211
0.64	103.82	214.35	0.0214
0.61	103.79	217.35	0.0217
0.58	103.76	220.17	0.0220
0.56	103.74	222.81	0.0223
0.53	103.71	225.29	0.0225
0.51	103.69	227.66	0.0228
0.48	103.66	229.89	0.0230
0.46	103.64	231.96	0.0232
0.43	103.61	233.94	0.0234
0.41	103.59	235.83	0.0236
0.38	103.56	237.63	0.0238
0.36	103.54	239.31	0.0239
0.33	103.51	240.89	0.0241
0.30	103.48	242.39	0.0242
0.28	103.46	243.76	0.0244
0.25	103.43	245.13	0.0245
0.23	103.41	246.38	0.0246
0.20	103.38	247.56	0.0248
0.18	103.36	248.40	0.0248
0.15	103.33	122.44	0.0122
0.13	103.31	122.44	0.0122
0.10	103.28	122.44	0.0122
0.08	103.26	122.44	0.0122
0.05	103.23	122.44	0.0122
0.03	103.21	122.44	0.0122

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

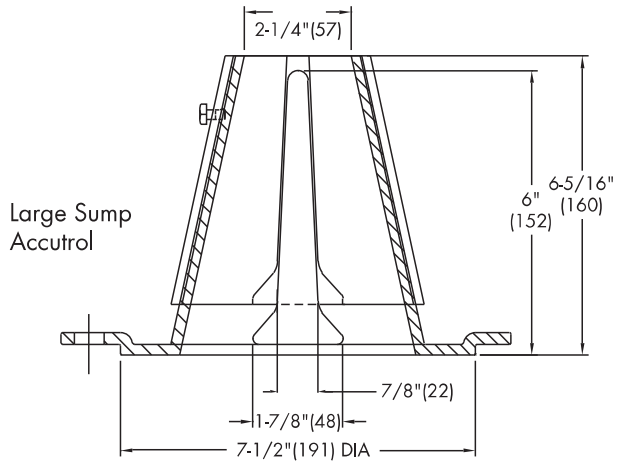
ADJUSTABLE ACCUTROL (for Large Sump Roof Drains only)

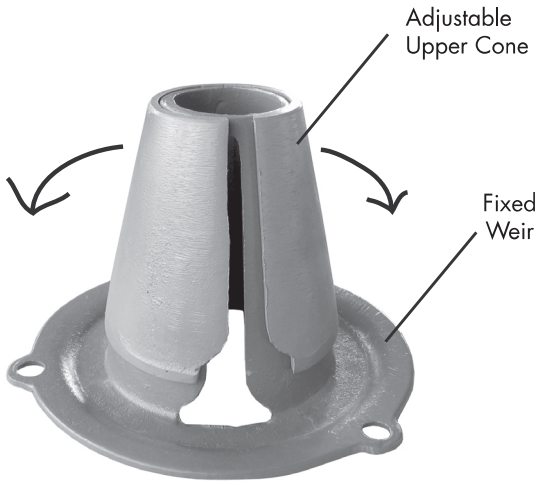
For more flexibility in controlling flow with heads deeper than 2", Watts Drainage offers the Adjustable Accutrol. The Adjustable Accutrol Weir is designed with a single parabolic opening that can be covered to restrict flow above 2" of head to less than 5 gpm per inch, up to 6" of head. To adjust the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

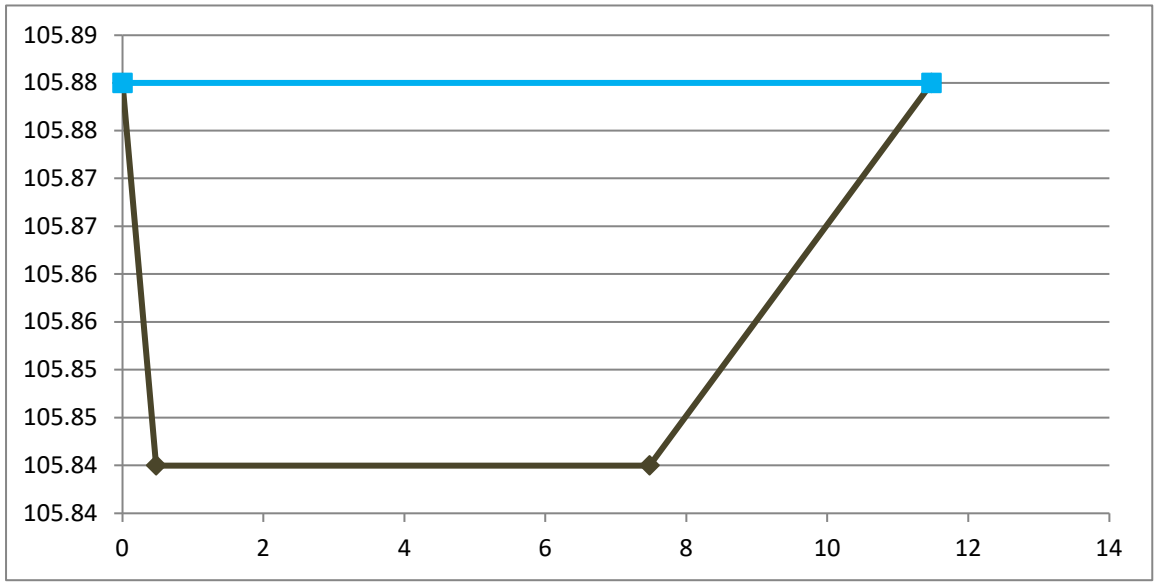
USA: Tel: (800) 338-2581 • Fax: (828) 248-3929 • Watts.com
Canada: Tel: (905) 332-4090 • Fax: (905) 332-7068 • Watts.ca
Latin America: Tel: (52) 81-1001-8600 • Fax: (52) 81-8000-7091 • Watts.com

WATTS®
A Watts Water Technologies Company

Appendix B.3
Stormwater Management Overland Flow

AY Jackson SS Addition
Jp2g Project No.: 24-5053A
Date: Feb 26 2025
Contact: Zach Bauman
Drainage Area C5 Overland Flow Check

Upstream Drainage Area
C5, C6
100 Year Flow
106.6
100 Year + 20% Stress Test
127.92

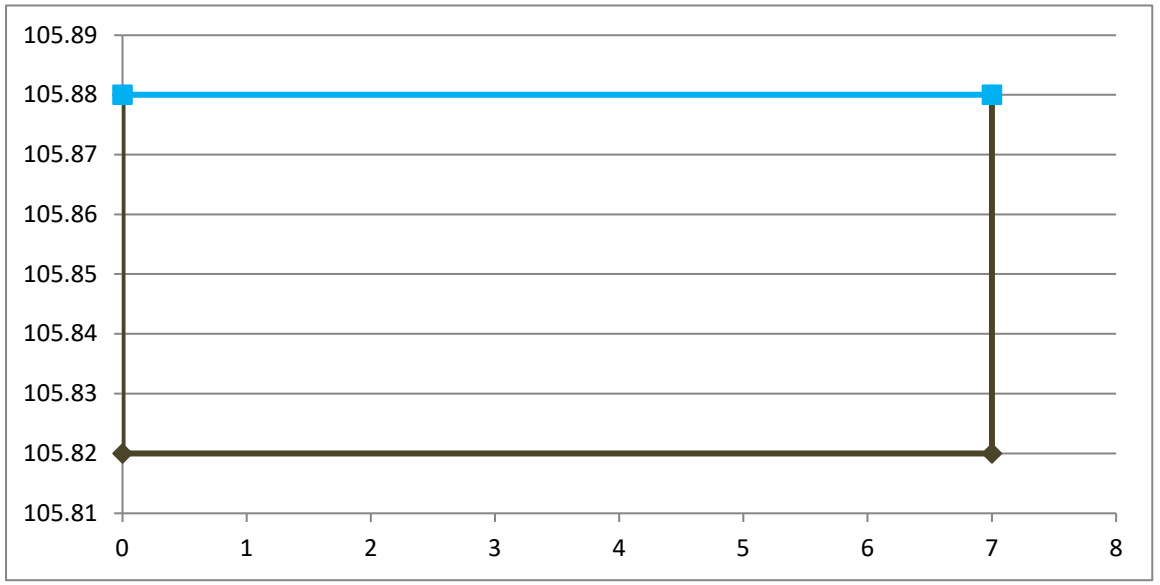


Overland Flow Check - Weir Representing Spill Over Fire Route

Parameter	Value	Unit	Source
Trapezoidal Weir			
Weir Coefficient (C_W)	1.84		*Weir characteristics.*
Crest Length (L)	7	m	*Length of spill crest from Grading Plan.*
Left Side Slope (Z_1)	12	:1	*horizontal ratio = distance / (top elevation - crest elevation)*
Right Side Slope (Z_2)	100	:1	*horizontal ratio = distance / (top elevation - crest elevation)*
Crest Elevation	105.84	m	*Spill elevation from Grading Plan.*
Water Surface Elevation	105.88	m	*just below FFE - elevation of "spill" into permanent school building*
Lowest Building Elevation Within Drainage Area	106.04	m	*See Grading Plan*
Clearance From Spill Elevation	0.16	m	*City of Ottawa PIEDTB 2016-01 SWM Revisions Clause 5.33*
Head Above Crest Elevation (H)	0.04	m	*Head = Water Surface Elevation - Crest Elevation*
Discharge Over Weir Crest	0.10304	m^3/s	$Q = C_W * L * H^{3/2}$
Discharge Over Left Side Slope	0.00282624	m^3/s	$Q = \frac{2}{5} * C_W * Z_1 * H^{5/2}$
Discharge Over Right Side Slope	0.023552	m^3/s	$Q = \frac{2}{5} * C_W * Z_2 * H^{5/2}$
Weir Discharge (Q)	**0.12941824**	**m^3/s**	

AY Jackson SS Addition
Jp2g Project No.: 24-5053A
Date: Feb 26 2025
Contact: Zach Bauman
Drainage Area C4 Overland Flow Check

Upstream Drainage Area
C4, C5, C6
100 Year Flow
135.6
100 Year + 20% Stress Test
162.72



Overland Flow Check - Weir Representing Spill Over Fire Route

Parameter	Value	Unit	Source
Trapezoidal Weir			
Weir Coefficient (C_W)	1.84		*Weir characteristics.*
Crest Length (L)	7	m	*Length of spill crest from Grading Plan.*
Left Side Slope (Z_1)	0	:1	*horizontal ratio = distance / (top elevation - crest elevation)*
Right Side Slope (Z_2)	0	:1	*horizontal ratio = distance / (top elevation - crest elevation)*
Crest Elevation	105.82	m	*Spill elevation from Grading Plan.*
Water Surface Elevation	105.88	m	*just below FFE - elevation of "spill" into permanent school building*
Lowest Building Elevation Within Drainage Area	106.03	m	*See Grading Plan*
Clearance From Spill Elevation	0.15	m	*City of Ottawa PIEDTB 2016-01 SWM Revisions Clause 5.33*
Head Above Crest Elevation (H)	0.06	m	*Head = Water Surface Elevation - Crest Elevation*
Discharge Over Weir Crest	0.18929657	m^3/s	$Q = C_W * L * H^{3/2}$
Discharge Over Left Side Slope	0	m^3/s	$Q = \frac{2}{5} * C_W * Z_1 * H^{5/2}$
Discharge Over Right Side Slope	0	m^3/s	$Q = \frac{2}{5} * C_W * Z_2 * H^{5/2}$
Weir Discharge (Q)	**0.18929657**	**m^3/s**	

AY Jackson SS Addition

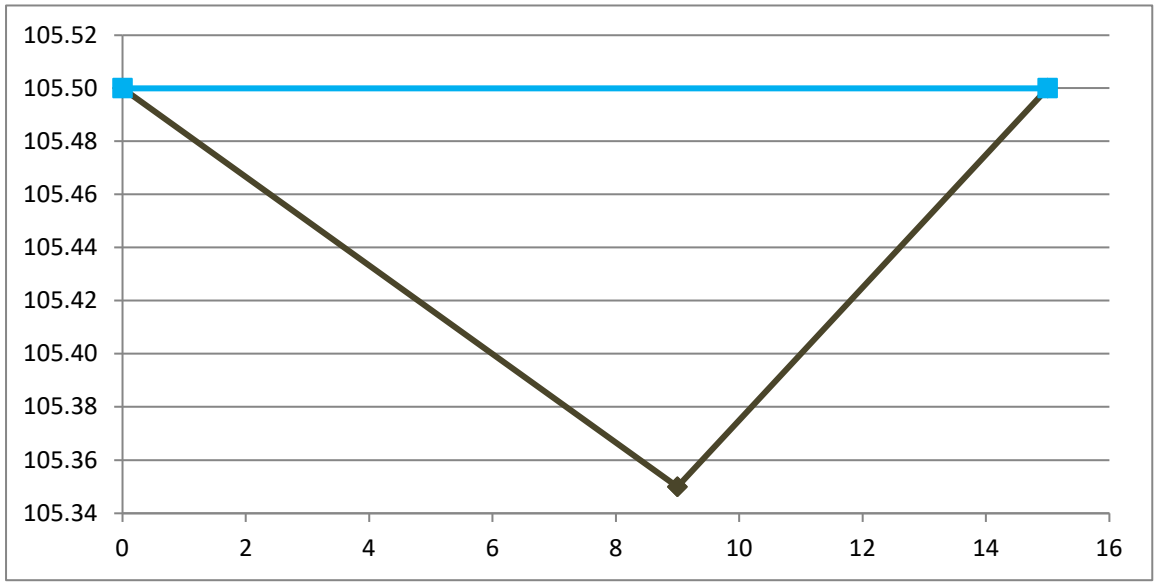
Jp2g Project No.: 24-5053A

Date: Feb 26 2025

Contact: Zach Bauman

Drainage Area C2 Overland Flow Check

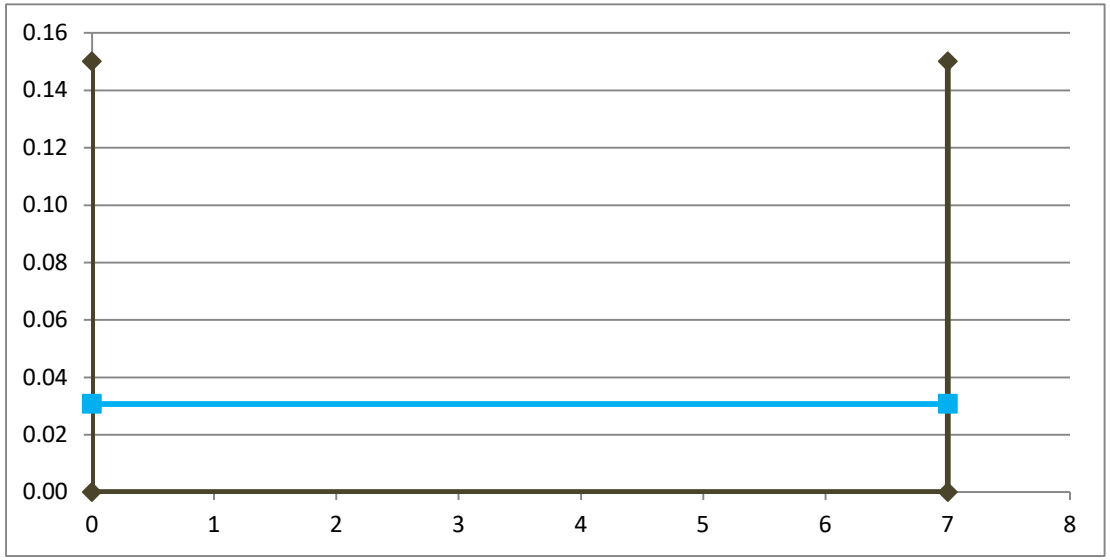
Upstream Drainage Area
A1,A2, C1-C7
100 Year Flow
365.6
100 Year + 20% Stress Test
438.72



Overland Flow Check - Weir Representing Spill Over Fire Route

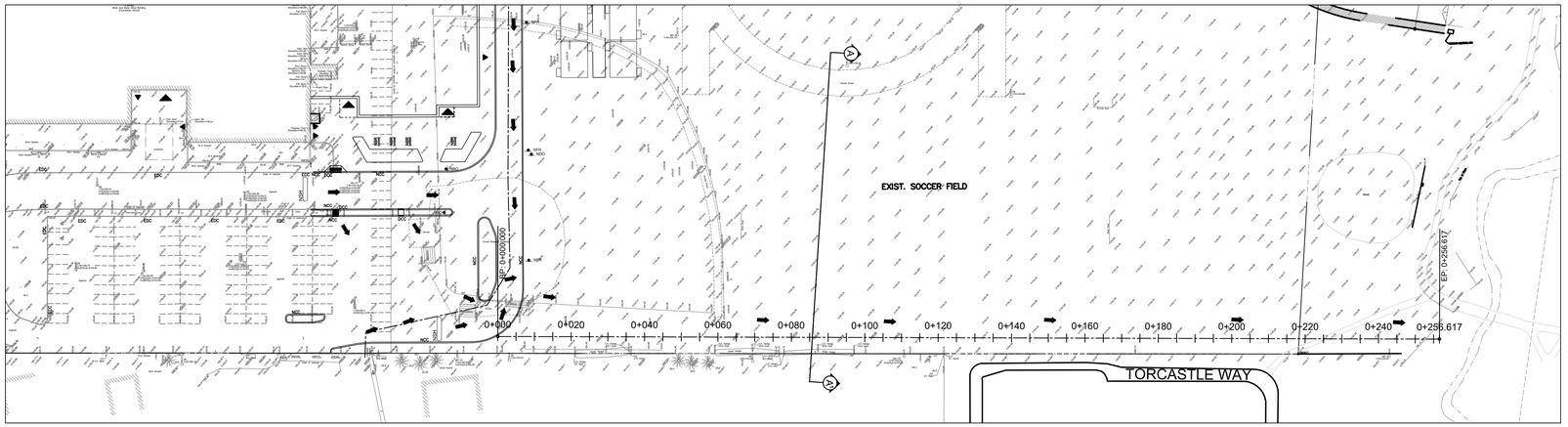
Parameter	Value	Unit	Source
Trapezoidal Weir			
Weir Coefficient (C_W)	1.84		*Weir characteristics.*
Crest Length (L)	0	m	*Length of spill crest from Grading Plan.*
Left Side Slope (Z_1)	60	:1	*horizontal ratio = distance / (top elevation - crest elevation)*
Right Side Slope (Z_2)	40	:1	*horizontal ratio = distance / (top elevation - crest elevation)*
Crest Elevation	105.35	m	*Spill elevation from Grading Plan.*
Water Surface Elevation	105.5	m	*just below FFE - elevation of "spill" into permanent school building*
Lowest Building Elevation Within Drainage Area	106.04	m	*See Grading Plan*
Clearance From Spill Elevation	0.54	m	*City of Ottawa PIEDTB 2016-01 SWM Revisions Clause 5.33*
Head Above Crest Elevation (H)	0.15	m	*Head = Water Surface Elevation - Crest Elevation*
Discharge Over Weir Crest	0	m^3/s	$Q = C_W * L * H^{3/2}$
Discharge Over Left Side Slope	0.38481963	m^3/s	$Q = \frac{2}{5} * C_W * Z_1 * H^{5/2}$
Discharge Over Right Side Slope	0.25654642	m^3/s	$Q = \frac{2}{5} * C_W * Z_2 * H^{5/2}$
Weir Discharge (Q)	**0.64136604**	**m^3/s**	

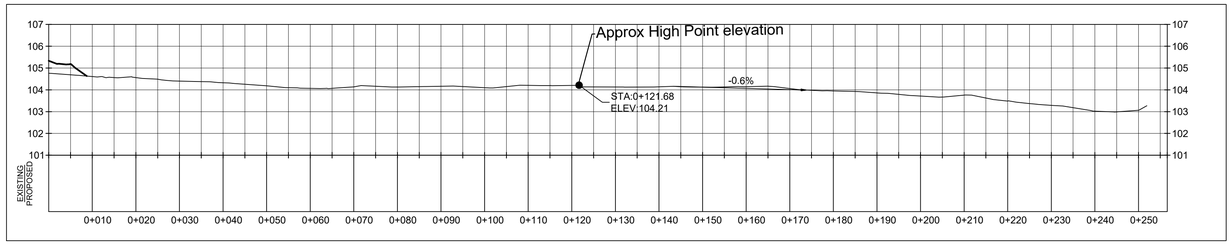
Ay Jackson SS Addition
Jp2g Project No.: 24-5053A
Date: Feb 26 2025
Contact: Zach Bauman

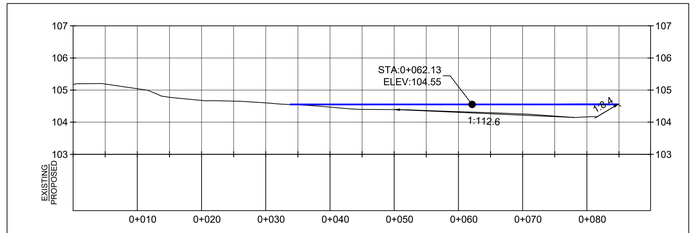


Overland Flow Check - Rectangular Channel Representing Overland Flow Path

Parameter	Value	Unit	Source
Trapezoidal Channel			
Manning's "n" (n)	0.013		*Land cover / material characteristics from site visits / site photographs / orthophotography.*
Channel Depth (D)	0.15	m	*Site design.*
Bottom Width (W)	7	m	*Length of spill crest from Grading Plan.*
Left Side Slope (Z_1)	0	:1	*horizontal ratio = distance / (top elevation - crest elevation)*
Right Side Slope (Z_2)	0	:1	*horizontal ratio = distance / (top elevation - crest elevation)*
Channel Slope (S)	1	%	*Slope of downstream land from Grading Plan.*
Flow (Q)	0.162	m^3/s	*100 Year flow + 20% for drainage areas C4,C5,C6*
$\frac{Q*n}{S^{1/2}} = A*R^{2/3} =$	0.02		$Q = \frac{1}{n} * A * R^{2/3} * S^{1/2}$
Depth of Flow (y)	0.03	m	*Iterative solving of the following equation for "y" using a table:* $\frac{Q*n}{S^{1/2}} = A*R^{2/3} = \frac{A^{5/3}}{P^{2/3}} = \left(\mathrm{y}\left(\mathrm{W}+\mathrm{y}\left(\frac{Z_1+Z_2}{2}\right)\right)\right)^{5/3} / \left(W+\sqrt{y^2+(Z_1 y)^2}+\sqrt{y^2+(Z_2 y)^2}\right)^{2/3}$
Wetted Perimeter (P)	7.18	m	$P = W + \sqrt{y^2+(Z_1 y)^2} + \sqrt{y^2+(Z_2 y)^2}$
Area (A)	0.22	m^2	$A = \mathrm{y}\left(\mathrm{W}+\mathrm{y}\left(\frac{Z_1+Z_2}{2}\right)\right)$
Velocity (V)	0.75	m/s	$V = Q/A$
Hydraulic Radius (R)	0.03	m	$R = A/P$



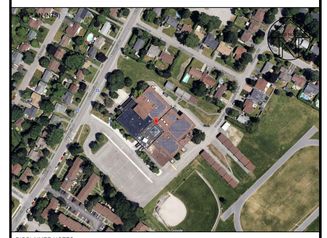




Section A-A Cross Section of Existing Overland Flow Route Through Field

CLIENT LOGO

OTTAWA-CARLETON DISTRICT SCHOOL BOARD



DISCLAIMER NOTES

1. THE CONTRACTOR SHALL BE SOLELY RESPONSIBLE FOR ISSUES/PROBLEMS WHICH MAY OCCUR AS A RESULT OF A FAILURE TO FOLLOW THESE PLANS, SPECIFICATIONS AND THE DESIGN INTENT THEY CONVEY.
2. WHERE THERE ARE ALLEGED ERRORS, OMISSIONS, INCONSISTENCIES OR AMBIGUITIES PRESENT IN THE CONTRACT DOCUMENTS, THE CONTRACTOR MUST SEEK CLARIFICATION FROM JP2G. ANY COSTS OR SCHEDULE DELAYS WHICH RESULT AS A FAILURE TO CONTACT JP2G FOR DIRECTION SHALL BE SOLELY THE RESPONSIBILITY OF THE CONTRACTOR.
3. DO NOT SCALE DRAWINGS. REFER ANY DIMENSIONAL CLARIFICATIONS AND/OR POSSIBLE TRADE INTERFERENCE/CONFLICTS TO JP2G FOR CLARIFICATION PRIOR TO COMMENCEMENT OF THE WORK.
4. THE CONTRACTOR SHALL BE RESPONSIBLE FOR ALL COORDINATION WITH SUBTRADES AND SHALL ADDRESS CONSTRUCTION TEAM COORDINATION ITEMS PRIOR TO ISSUING REQUESTS FOR INFORMATION FROM JP2G.
5. THE POSITION OF POLE LINES, CONDUITS, WATERMAINS, SEWERS AND OTHER UNDERGROUND AND OVERGROUND UTILITIES AND STRUCTURES IS NOT NECESSARILY SHOWN ON THE CONTRACT DRAWING, AND, WHERE SHOWN, THE ACCURACY OF THE POSITION OF SUCH UTILITIES AND STRUCTURES IS NOT GUARANTEED. BEFORE STARTING WORK, THE CONTRACTOR SHALL INFORM THEMSELVES OF THE EXACT LOCATION OF ALL SUCH UTILITIES AND STRUCTURES, AND SHALL ASSUME ALL LIABILITY FOR DAMAGE TO THEM.

No.	YYYY-MM-DD	BY	DESCRIPTION

STAMP

STAMP

PROJECT

AY JACKSON SECONDARY SCHOOL ADDITION

150 ABBEYHILL DRIVE,
KANATA ON,
K2L 1H7

DRAWING

OVERFLOW ROUTE SKETCH (SCHEMATIC)

Jp2g Consultants Inc.
ENGINEERS · PLANNERS · PROJECT MANAGERS

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Jp2g PROJECT No.: 24-5053A

NORTH

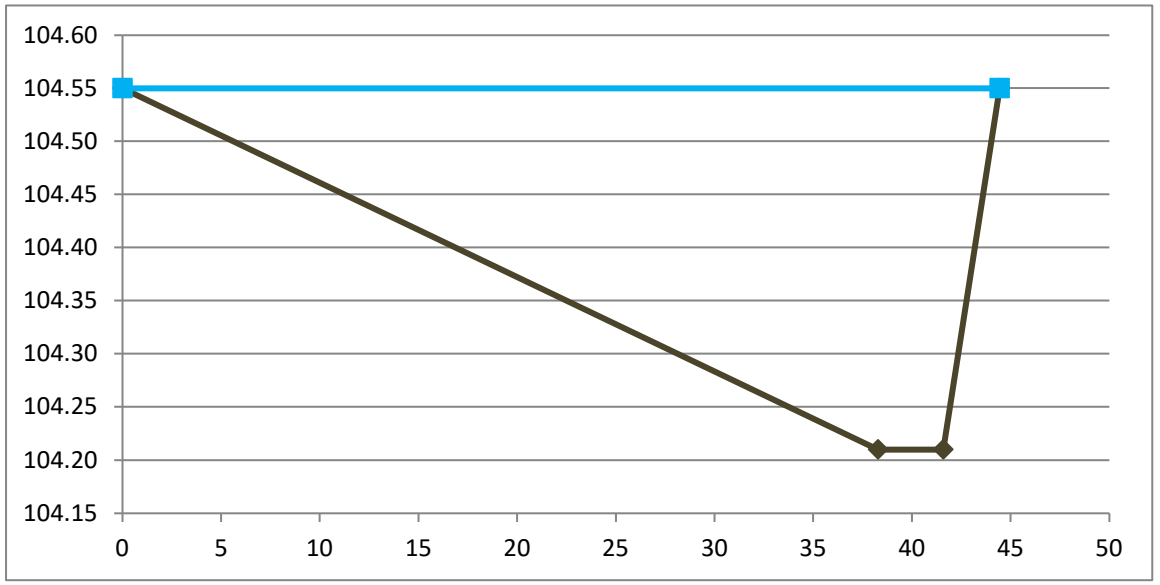
CLIENT No.:	
DRAFTED:	ZB
DESIGNED:	ZB
REVIEWED:	AS
APPROVED:	AS

SCALE

NOT TO SCALE

SHEET #

AY Jackson SS Addition
Jp2g Project No.: 24-5053A
Date: Feb 26 2025
Contact: Zach Bauman
Exiting Field Overland Flow Check



Overland Flow Check - Weir Representing Spill Over Fire Route

Parameter	Value	Unit	Source
Trapezoidal Weir			
Weir Coefficient (C_W)	1.84		*Weir characteristics.*
Crest Length (L)	3.3	m	*Length of spill crest from Grading Plan.*
Left Side Slope (Z_1)	113	:1	*horizontal ratio = distance / (top elevation - crest elevation)*
Right Side Slope (Z_2)	8	:1	*horizontal ratio = distance / (top elevation - crest elevation)*
Crest Elevation	104.21	m	*Spill elevation along existing overland flow longitudinal profile*
Water Surface Elevation	104.55	m	*Maximum cross section conveyance elevation*
Head Above Crest Elevation (H)	0.34	m	*Head = Water Surface Elevation - Crest Elevation*
Discharge Over Weir Crest	1.20378836	m^3/s	$Q = C_W * L * H^{3/2}$
Discharge Over Left Side Slope	5.58616163	m^3/s	$Q = \frac{2}{5} * C_W * Z_1 * H^{5/2}$
Discharge Over Right Side Slope	0.41672964	m^3/s	$Q = \frac{2}{5} * C_W * Z_2 * H^{5/2}$
Weir Discharge (Q)	**7.20667963**	**m^3/s**	

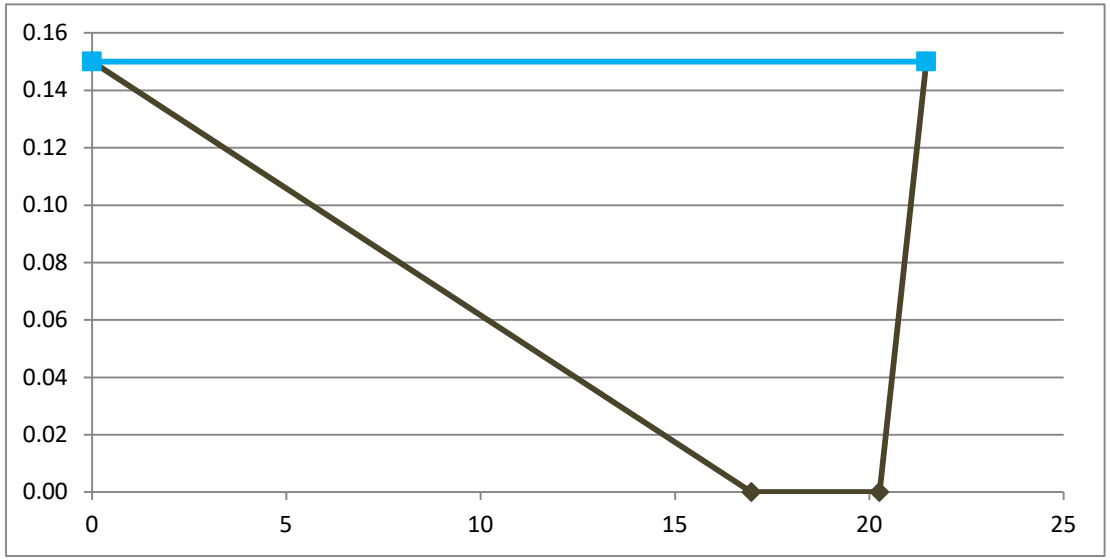
Ay Jackson SS Addition

Jp2g Project No.: 24-5053A

Date: Feb 26 2025

Contact: Zach Bauman

Existing Field Overland Flow Depth



Overland Flow Check - Rectangular Channel Representing Overland Flow Path

Parameter	Value	Unit	Source
Trapezoidal Channel			
Manning's "n" (n)	0.013		*Land cover / material characteristics from site visits / site photographs / orthophotography.*
Channel Depth (D)	0.15	m	*Site design.*
Bottom Width (W)	3.3	m	*Length of spill crest from Grading Plan.*
Left Side Slope (Z_1)	113	:1	*horizontal ratio = distance / (top elevation - crest elevation)*
Right Side Slope (Z_2)	8	:1	*horizontal ratio = distance / (top elevation - crest elevation)*
Channel Slope (S)	0.6	%	*Slope of downstream land from Grading Plan.*
Flow (Q)	7.2066796	m^3/s	
$\frac{Q*n}{S^{1/2}} = A*R^{2/3} =$	1.21		$Q = \frac{1}{n} * A * R^{2/3} * S^{1/2}$
Depth of Flow (y)	0.15	m	*Iterative solving of the following equation for "y" using a table:* $\frac{Q*n}{S^{1/2}} = A*R^{2/3} = \frac{A^{5/3}}{P^{2/3}} = \left(y\left(W + y\left(\frac{Z_1+Z_2}{2}\right)\right)\right)^{5/3} / \left(W + \sqrt{y^2+(Z_1 y)^2} + \sqrt{y^2+(Z_2 y)^2}\right)^{2/3}$
Wetted Perimeter (P)	5.04	m	$P = W + \sqrt{y^2+(Z_1 y)^2} + \sqrt{y^2+(Z_2 y)^2}$
Area (A)	1.86	m^2	$A = y\left(W + y\left(\frac{Z_1+Z_2}{2}\right)\right)$
Velocity (V)	3.88	m/s	$V = Q/A$
Hydraulic Radius (R)	0.37	m	$R = A/P$

Appendix B.4
Quality Control

Verification Statement

StormTech Isolator® Row PLUS
Registration number: (V-2020-10-01)
Date of issue: (2020-October-27)

Technology type	Stormwater Filtration Device
Application	Stormwater filtration technology to remove sediments, nutrients, heavy metals, and organic contaminants from stormwater runoff
Company	StormTech, LLC.
Address	520 Cromwell Avenue, Rocky Hill, CT 06067 USA **Phone** +1-888-892-2694
Website	www.stormtech.com
E-mail	info@stormtech.com

Verified Performance Claims

The StormTech Isolator® Row PLUS technology was tested at the Mid-Atlantic Storm Water Research Center (MASWRC), under the supervision of Boggs Environmental Consultants, Inc. The performance test results for two overlapping StormTech Isolator® Row PLUS chambers (commercial unit model SC-740) were verified by Good Harbour Laboratories Inc. (GHL), following the requirements of ISO 14034:2016 and the VerifiGlobal Performance Verification Protocol. Based on the laboratory testing conducted, the verified performance claims are as follows:

Total Suspended Solids (TSS) Removal Efficiency - The StormTech Isolator® Row PLUS achieved 82% ± 1% removal efficiency of suspended sediment concentration (SCC) at a 95% confidence level.

Average Loading Rate - Based on the reported flow rate data and the effective sedimentation and filtration treatment area of the test unit, the average loading rate of the test unit was 4.15 ± 0.03 GPM/ft^2 at a 95% confidence level.

Maximum Treatment Flow Rate (MTFR) - Although the MTFR varies among the StormTech Isolator® Row PLUS model sizes and the number of chambers, the design surface loading rate remains the same (4.13 gpm/ ft^2 of treatment surface area). The test unit consisted of two overlapping StormTech SC-740 chambers with a nominal MTFR of 225 GPM (0.501 CFS) and an effective filtration treatment area (EFTA) of approximately 54.5 ft^2.

Detention Time and Volume - The StormTech Isolator Row PLUS detention time and wet volume varies with model size. The unit tested had a wet volume of approximately 65.1 ft^3 and a detention time of 2.2 minutes.

Maximum Sediment Storage Depth and Volume - The sediment storage volume and depth vary according to the StormTech Isolator® Row PLUS model sizes and system configuration. For the two overlapping StormTech SC-740 chambers tested, the maximum sediment storage volume is 2.3 ft^3 at a sediment depth of 0.5 inches.

Effective Sedimentation/Filtration Treatment Areas - The Effective Sedimentation Area (ESA) and the Effective Filtration Treatment Area (EFTA) increase as the size of the system increases. For the two overlapping StormTech SC-740 chambers tested, the ESA and the ratio of ESA/EFTA were 54.5 ft^2 and 1.0, respectively.

Sediment Mass Load Capacity - The sediment mass load capacity varies according to the StormTech Isolator® Row PLUS model sizes and system configuration. For the two overlapping StormTech SC-740 chambers tested, the mass loading capture was 158.4 lbs ± 0.8 lbs (2.91 ±0.01 lbs/ ft^2) following a total sediment loading of 195.2 lbs.

Technology Application

The StormTech "Isolator® Row PLUS" is a stormwater treatment technology designed for use under parking lots, roadways and heavy earth loads while providing a superior and durable structural system. The technology comprises a row of chambers covered in a non-woven geotextile fabric with a single layer of proprietary woven fabric at the bottom that serves as a filter strip, providing surface area for infiltration and runoff reduction with enhanced suspended solids and pollutant removal. The following features make the Isolator® Row PLUS effective as a water quality solution:

- Enhanced infiltration Surface Area
- Runoff Volume Reduction
- Peak Flow Reduction
- Sediment/Pollutant Removal
- Internal Water Storage (IWS)
- Water Temperature Cooling (Thermal Buffer).

Technology Description

The Isolator® Row PLUS (shown in Figures 1 and 2) is the first row of StormTech chambers that is surrounded with filter fabric and connected to a closely located manhole for easy access. The Isolator® Row PLUS provides for settling and filtration of sediment as stormwater rises in the chamber and ultimately passes through the filter fabric. The open-bottom chambers allow stormwater to flow out of the chambers, while sediment is captured in the Isolator® Row PLUS.

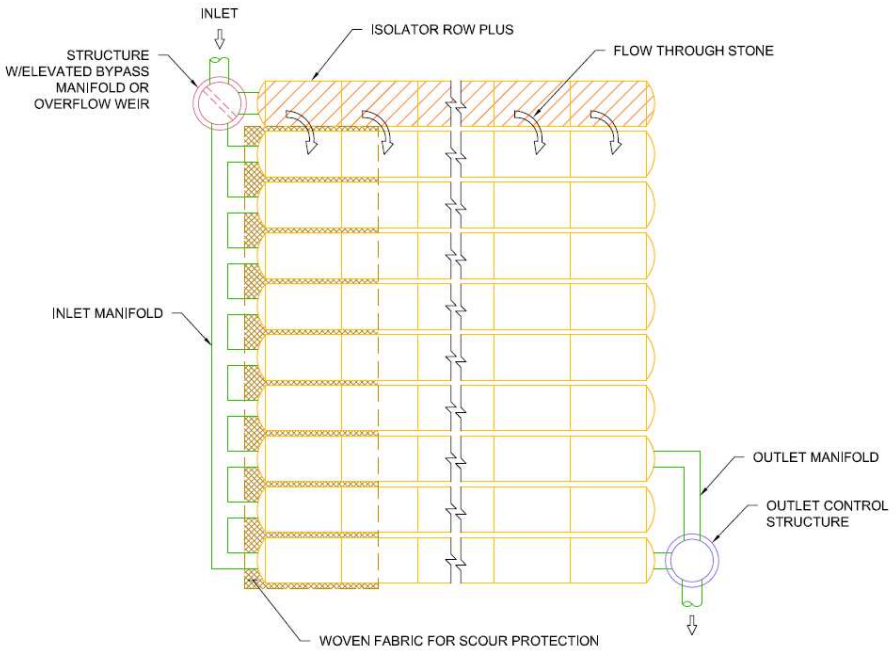


Figure 1: Schematic of the StormTech Isolator® Row PLUS System

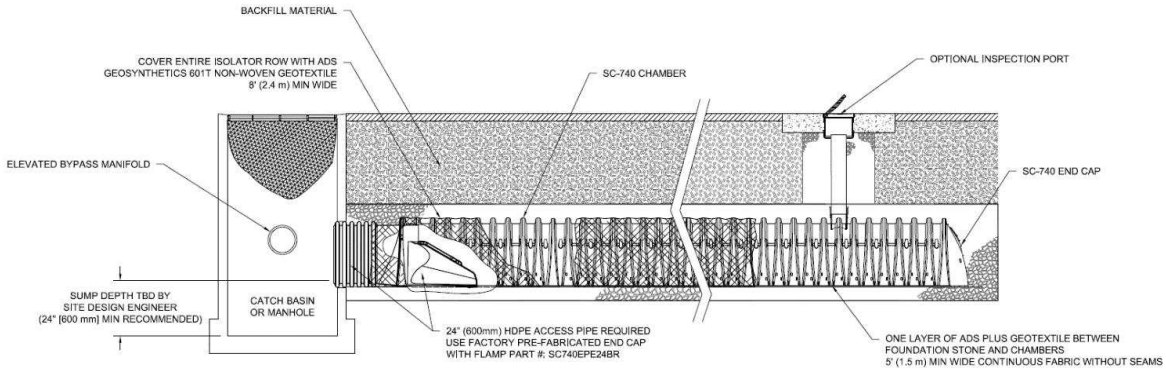


Figure 2: Isolator® Row PLUS Detail

A single layer of proprietary Advanced Drainage Systems (ADS) PLUS fabric is placed between the angular base stone and the Isolator Row PLUS chamber. The geotextile provides the means for stormwater filtration and provides a durable surface for maintenance operations. A 6 oz. non-woven fabric is placed over the chambers.

The Isolator® Row PLUS is designed to capture the “first flush” and offers the versatility to be sized on a volume basis or a flow-rate basis. An upstream manhole not only provides access to the Isolator® Row PLUS but includes a high low/concept such that stormwater flow rates or volumes that exceed the capacity of the Isolator® Row PLUS bypass through a manifold to the other chambers. This is achieved with either a high-flow weir or an elevated manifold. This creates a differential between the Isolator® Row PLUS and the manifold, thus allowing for settlement time in the Isolator® Row PLUS. After Stormwater flows through the Isolator® Row PLUS and into the rest of the StormTech chamber system it is either infiltrated into the soils below or passed at a controlled rate through an outlet manifold and outlet control structure.

StormTech developed and owns the Isolator® Row PLUS technology and has filed a number of patent applications relating to the Isolator® Row PLUS system.[1]

Description of Test Procedure for the StormTech Isolator® Row PLUS

In January 2020, two overlapping StormTech SC-740 Isolator® Row PLUS commercial size chambers were installed at the Mid-Atlantic Storm Water Research Center (MASWRC, a subsidiary of BaySaver), in Mount Airy, Maryland, to evaluate the performance of the Isolator® Row PLUS system for Total Suspended Solid (TSS) removal (Figure 3) All testing and data collection procedures were supervised by Boggs Environmental Consultants, Inc. (BEC), who was hired by ADS for third party oversight, and were in accordance with the *New Jersey Department of Environmental Protection Laboratory Protocol to Assess Total Suspended Solids Removal by a Filtration Manufactured Treatment Device (January 2013)*.

Prior to the start of testing, a Quality Assurance Project Plan (QAPP), revision dated January 09, 2020, was submitted and approved by the New Jersey Corporation for Advanced Technology (NJCAT), c/o Center for Environmental Systems, Stevens Institute of Technology, Castle Point on Hudson, Hoboken, NJ 07030.

[1] (U.S. Provisional Application No. 62/753,050, filed October 30, 2018; U.S. Non-Provisional Application No. 16/670,628, filed October 31, 2019; International Application No. PCT/US2019/059283, filed October 31, 2019; U.S. Application No. 16/938,482, filed July 24, 2020; U.S. Application No. 16/938,657, filed July 24, 2020; PCT International Application No. PCT/US2020/043543, filed July 24, 2020; PCT International Application No. PCT/US2020/043557, filed July 24, 2020.

Figure 3: StormTech "Isolator® Row PLUS" Test Set-up at MASWRC

Verification Results

The verification process for the StormTech Isolator® Row PLUS technology was conducted by GHL in accordance with the VerifiGlobal Verification Plan for the StormTech "Isolator® Row PLUS" Technology – 2020-09-09. The technology performance claims verified by GHL are summarized at the front of this Verification Statement and in Table 6 on Page 8 under the heading "Verification Summary".

Particle size distribution analysis was performed by ECS Mid-Atlantic, LLC of Frederick, MD in accordance with ASTM D422-63(2007). ECS is accredited by the American Association of State Highways and Transportation Officials (AASHTO).

ASTM D422-63(2007) is a sieve and hydrometer method where the larger particles, > 75 microns, are measured using a standard sieve stack while the smaller particles are measured based on their settling time using a hydrometer.

The PSD meets the requirements of NJDEP, which is generally accepted as representative of the type of particle sizes an OGS would be designed to treat. Actual PSD is site and rainfall event specific, so it was necessary to choose a standard PSD to make testing and comparison manageable.

Table 1 shows the NJDEP PSD specification. Table 2 and Figure 4 show the incoming material PSD as determined by ECS Mid-Atlantic and confirmed by the verifier.

Table 1: NJDEP PSD Specification

Particle Size (µm)	NJDEP Minimum Specification
1000	98
500	93
250	88
150	73
100	58
75	48
50	43
20	33
8	18
5	8
2	3
d_{50}	< 75 µm

Table 2 – Particle Size Distribution (PSD) of Test Sediment

Mesh (mm)	US Sieve Size	Sample ID		
		PSD A	PSD B	PSD C
		Percent Finer		
9.525	0.375	100.0	100.0	100.0
4.750	#4	100.0	100.0	100.0
4.000	#5	100.0	100.0	100.0
2.360	#8	100.0	100.0	100.0
2.000	#10	100.0	100.0	100.0
1.180	#16	100.0	100.0	100.0
1.000	#18	100.0	100.0	100.0
0.500	#35	100.0	100.0	100.0
0.425	#40	93.3	93.0	93.6
0.250	#60	90.3	89.8	90.2
0.150	#100	79.3	78.1	78.1
0.125	#120	73.6	71.7	71.7
0.106	#140	68.4	65.2	64.8
0.090	#170	60.2	58.3	57.5
0.075	#200	52.0	50.9	50.3
0.053	#270	48.0	48.3	47.8
0.045	Hydrometer	46.6	46.7	46.7
0.032		42.8	42.9	41.0
0.021		37.1	37.2	35.3
0.0125		25.7	25.7	25.8
0.0090		20.1	20.1	19.2
0.0064		16.3	16.4	14.5
0.0032		8.8	8.7	7.8
0.0014		3.8	3.7	3.8

The suspended sediment concentration analysis was completed by Fredericktowne Labs Inc., Meyersville, MD. Fredericktown Labs is accredited by the Maryland Department of Environment as Maryland Certified Water Quality Laboratory. The analysis procedure was ASTM D3977-97, Suspended Sediment Concentration. The sampling procedure and submission of samples to the test lab were overseen by the independent observer, Boggs Environmental Consultants, Inc.

All test data and calculations were detailed in the report “NJCAT TECHNOLOGY VERIFICATION Isolator® Row PLUS StormTech, LLC”, July 2020, which was submitted to and verified by the New Jersey Corporation for Advanced Technology (NJCAT).

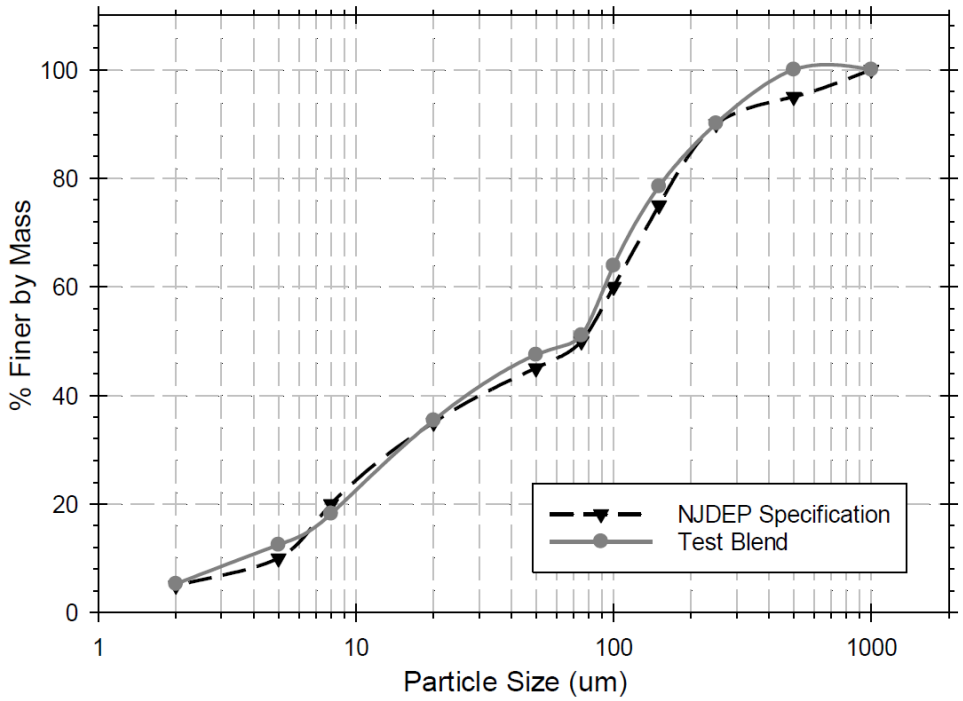


Figure 4– Particle Size Distribution (PSD)

The data in Table 3 (Flow Rate and Temperature) and Table 4 (Removal Efficiency) form the basis for the verified technology performance claim, specifically, flow rate, sediment captured and removal efficiency.

Table 3: Flow Rate and Temperature Summary

Run	Max Flow (gpm)	Min Flow (gpm)	Average Flow (gpm)	Flow COV	Flow Compliance (COV< 0.1)	Maximum Temperature (Fahrenheit)	NJDEP Temperature Compliance (< 80 F)
1	232.8	223.9	226.3	0.0078	Y	48.2	Y
2	228.9	218.6	220.8	0.0104	Y	51.5	Y
3	229.4	220.0	227.2	0.0094	Y	44.7	Y
4	230.2	218.7	223.2	0.0138	Y	40.5	Y
5	228.7	216.9	222.2	0.0103	Y	44.7	Y
6	227.6	217.0	224.2	0.0115	Y	46.7	Y
7	229.7	221.9	226.4	0.0092	Y	44.6	Y
8	230.3	222.2	226.8	0.0089	Y	43.5	Y
9	233.2	218.4	225.6	0.0136	Y	45.5	Y
10	232.2	219.7	228.4	0.0126	Y	44.7	Y
11	226.9	219.2	224.1	0.0088	Y	52.4	Y
12	232.2	222.1	226.9	0.0107	Y	48.5	Y
13	234.7	221.2	226.1	0.0109	Y	48.5	Y
14	231.9	223.4	228.7	0.0103	Y	45.6	Y
15	236.8	224.1	231.4	0.0131	Y	52.2	Y
16	232.5	221.3	229.0	0.0137	Y	47.8	Y

Table 4: Removal Efficiency Results

Run	Average Influent TSS (mg/L)	Influent Water Volume (gal)	Adjusted Average Effluent TSS (mg/L)	Effluent Water Volume (gal)	Adjusted Average Drain Down TSS (mg/L)	Drain Down Water Volume (gal)	Single Run Removal Efficiency (%)	Mass of Captured Sediment (g)	Cumulative Removal Efficiency (%)
1	203	7166	46	6881	34	285	77.8	4282	77.8
2	199	6993	32	6639	27	354	84.0	4415	80.8
3	207	7197	37	6793	27	403	82.6	4654	81.4
4	217	7068	33	6635	29	433	84.9	4923	82.3
5	215	7037	39	6593	29	444	82.2	4705	82.3
6	207	7097	40	6643	31	454	81.2	4504	82.1
7	198	7169	37	6693	30	476	81.6	4386	82.0
8	201	7184	37	6716	32	468	81.6	4473	82.0
9	205	7147	38	6675	30	472	81.8	4539	82.0
10	203	7235	38	6759	31	476	81.4	4523	81.9
11	208	7096	38	6624	30	472	81.8	4567	81.9
12	209	7185	41	6709	30	476	80.7	4584	81.8
13	198	7162	41	6680	32	482	79.7	4277	81.6
14	200	7242	43	6757	34	485	78.8	4318	81.4
15	196	7329	41	6842	32	487	79.5	4320	81.3
16	202	7254	44	6769	31	485	78.9	4384	81.2
Avg.	**204.2**	**7160**	**39**	**6713**	**31**	**447**	**81.2**	**4491**	**N/A**
Cumulative Mass Removed (g)							**71854**		
Cumulative Mass Removed (lb)							**158.4**		
Total Mass Loaded (lb)							**195.2**		
Cumulative Removal Efficiency (%)							**81.2**		

Quality Assurance

Performance verification of the StormTech Isolator® Row PLUS technology was performed in accordance with the requirements of ISO 14034:2016 and the VerifiGlobal Performance Verification Protocol. This included reviewing all data sheets and calculated values, as well as overall management of the test system, quality control and data integrity.

Additional information on quality control measures taken can be found in section 5 of the QAPP for StormTech Isolator Row New Jersey Department of Environmental Protection Testing, Rev. 1/9/2020.

Specific QA/QC measures reviewed by the verifier are summarized in Table 5 below.

Table 5. Validation of QA/QC Procedures

QC Parameter	Acceptance Criteria
Independence of observer	Confirmed in letter from Boggs Environmental Consultants, Inc. to NJCAT
Consistency of procedure	Daily logs confirm proper procedure
Existence of QAPP	Confirmed. “QAPP For StormTech Isolator Row New Jersey Department of Environmental Protection Testing”, Rev. 1/9/2020*)*
Use of appropriate sample analysis method – ASTM D3799	Confirmed by method reference on lab reports from Fredericktowne Labs Inc.
Test method appropriate for the technology	Used industry stakeholder approved protocol: *New Jersey Department of Environmental Protection Laboratory Protocol to Assess Total Suspended Solids*

	Removal by a Filtration Manufactured Treatment Device (January 2013)
Test parameters stayed within required limits	Confirmed in report "NJCAT TECHNOLOGY VERIFICATION Isolator® Row PLUS StormTech, LLC", July 2020
Third party verified data	All testing was observed and reviewed by Boggs Environmental Consultants, Inc.

Variance

Performance claims regarding structural load limitations were not verified as they are outside the scope of the performance testing that was conducted in accordance with the 'Quality Assurance Project Plan (QAPP) for StormTech Isolator Row, New Jersey Department of Environmental Protection Testing', revision dated January 09, 2020.

Verification Summary

The StormTech "Isolator® Row PLUS" is a stormwater treatment technology designed for use under parking lots, roadways and heavy earth loads while providing a superior and durable structural system. The technology comprises a row of chambers wrapped in woven geotextile fabric with two layers at the bottom that serve as a filter strip, providing surface area for infiltration and runoff reduction with enhanced suspended solids and pollutant removal.

The StormTech Isolator® Row PLUS technology was tested at the Mid-Atlantic Storm Water Research Center (MASWRC), under the supervision of Boggs Environmental Consultants, Inc. The performance test results for two overlapping StormTech Isolator® Row PLUS chambers (commercial unit model SC-740) were verified by Good Harbour Laboratories Inc. (GHL), following the requirements of ISO 14034:2016 and the VerifiGlobal Performance Verification Protocol. Table 6 summarizes the verification results in relation to the technology performance parameters that were identified in the Verification Plan to determine the efficacy of the StormTech Isolator® Row PLUS technology.

Table 6 - Summary of Verification Results Against Performance Parameters

Parameters	Verified Claims	Accuracy
Total Suspended Solids (TSS) Removal Efficiency	Based on the laboratory testing conducted, the StormTech Isolator® Row PLUS achieved an average 82% removal efficiency of SSC	± 1% (95% confidence level)
Average Loading Rate	Based on the laboratory testing parameters, the StormTech Isolator® Row PLUS maintained a loading rate of 4.15 GPM/sf	±0.03 GPM/sf (95% confidence level)
Maximum Treatment Flow Rate (MTFR)	Although the MTFR varies among the StormTech Isolator® Row PLUS model sizes and the number of chambers, the design surface loading rate remains the same (4.13 GPM/ft^2 of treatment surface area). The test unit consisted of two overlapping StormTech SC-740 chambers with a nominal MTFR of 225 GPM (0.501 CFS) and an effective filtration treatment area (EFTA) of approximately 54.5 ft^2.	± 1.4 GPM (95% confidence level)
Detention Time and Volume	Detention time and wet volume varies with model size. The unit tested had a wet volume of approximately 65.1 ft^3 (based on	N/A

	physical measurement) and a detention time of 2.2 minutes.	
Maximum Sediment Storage Depth and Volume	The sediment storage volume and depth vary according to the StormTech Isolator® Row PLUS model sizes and system configuration. For the two overlapping StormTech SC-740 chambers tested, the maximum sediment storage volume is 2.3 ft^3 at a sediment depth of 0.5 inches.	N/A
Effective Sedimentation/ Filtration Treatment Area	The effective sedimentation and filtration treatment area increases as the size of the chamber increases. Under the tested conditions using 2 overlapping chambers, the treatment area was 54.5 ft^2	The sedimentation /filtration area was determined from the actual physical dimensions of the test unit*
Sediment Mass Load Capacity	The sediment mass load capacity varies according to the StormTech Isolator® Row PLUS model sizes and system configuration. For the two overlapping StormTech SC-740 chambers tested, the mass loading capture was 158.4 lbs (2.91 lbs/ ft^2) following a total sediment loading of 195.2 lbs	± 0.8 lbs (±0.01 lbs/ft^2) (95% confidence level)

*Note: These numbers are determined based on physical measurement or a dimensional drawing, which is standard practice. Highly accurate measurements are not practical.

In conclusion, the StormTech Isolator® Row PLUS is a viable technology that can be used to remove contaminants from stormwater runoff via filtration. This technology has proven effective at removing suspended sediment from stormwater through in-lab testing using an industry recognized laboratory protocol.

By extension of sediment removal, this technology should also remove particle bound nutrients, heavy metals, and a wide variety of organic contaminants. Performance is a function of pollutant properties, hydraulic retention time, filter media, pre-treatment, and flow rate, such that proper design of the system is critical to achieving the desired results.

What is ISO 14034?

The purpose of environmental technology verification is to provide a credible and impartial account of the performance of environmental technologies. Environmental technology verification is based on a number of principles to ensure that verifications are performed and reported accurately, clearly, unambiguously and objectively. The International Organization for Standardization (ISO) standard for environmental technology verification (ETV) is ISO 14034, which was published in November 2016.

Benefits of ETV

ETV contributes to protection and conservation of the environment by promoting and facilitating market uptake of innovative environmental technologies, especially those that perform better than relevant alternatives. ETV is particularly applicable to those environmental technologies whose innovative features or performance cannot be fully assessed using existing standards. Through the provision of objective evidence, ETV provides an independent and impartial confirmation of the performance of an environmental technology based on reliable test data. ETV aims to strengthen the credibility of new, innovative technologies by supporting informed decision-making among interested parties.

For more information on the StormTech "Isolator® Row PLUS" technology, contact:	For more information on VerifiGlobal, contact:
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Signed for StormTech: *Original signed by:* *Greg Spires* Greg Spires, P.E. General Manager	Signed for VerifiGlobal: *Original signed by:* *Thomas Bruun* Thomas Bruun, Managing Director *Original signed by:* *John Neate* John Neate, Managing Director

Appendix C
Sanitary

24-5053A - AY Jackson SS Addition

Sanitary Sewer Design Sheet

Peak Flow Design Based on Estimated School Addition Population

Location			Sewer Data								Residential Flow							Commercial / Institutional Flow					Infiltration Flow			Total Flow	
Note	From	To	Length	Dia.	U.S. Inv.	D.S. Inv.	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)*	*(m)*	*(m)*		*(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	26.5	200	104.42	104.15	1.00%	32.8	1.0	1.7	0.00	0	0	0.00	0	0.00	0.00	325	0.00	0.00	0.26	0.39	0.54	0.54	0.18	0.44	0.57
Municipal Connection	SAMH-1	Paddock St.	21.5	200	104.12	103.90	1.00%	32.8	1.0	1.7	0.00	0	0	0.00	0	0.00	0.00	325	0.00	0.00	0.26	0.39	0.00	0.54	0.18	0.44	0.57

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

Table 6.2 Sanitary Sewer Dia vs. Minimum Slope

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

Table 6.3 Material vs. Roughness Coefficient "n"

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

Table 4.2 Per Unit Populations

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

Appendix D
Water

AY Jackson SS Addition - 150 Abbeyhill Drive
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	1554	students	Site plan
Average Daily Demand	108780 1.26	L/d L/s	
Maximum Daily Factor	1.5		*Ottawa Design Guidelines - Water Distribution* Table 4.2
Maximum Daily Demand	1.89	L/s	
Maximum Hourly Factor	1.8		*Ottawa Design Guidelines - Water Distribution* Table 4.2
Maximum Hourly Demand	3.40	L/s	

Appendix D- Fire Flow Demand Requirements OBC

Project Number	24-5053A
Date	24-Jul-24
Designed By	ZB
Checked By	AS

Table D-3 OBC 3.2.5.7 CALCULATIONS: AY Jackson Secondary School Addition

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)	**16**
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.)	8038	**COMMENT ON BUILDING HEIGHT**
Building Height (m)	12	To u/s of roof decking.
Stories	2	

VOLUME (cu.m.)	**96,456**

MINIMUM WATER SUPPLY (Q)

Calculate Minimum Water Supply (Q) from formula

$$Q = KVS_{tot}$$

K	16
V	96,456
S_{tot}	1.00

Q	**1,543,296**	**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**

$$Q = KVS_{tot} \quad tot$$

AY Jackson Secondary School Addition

Jp2g Consultants Inc.
ENGINEERS · PLANNERS · PROJECT MANAGERS

Appendix D- Fire Flow Demand Requirements

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

Designed ZB
Checked AS
Dwg. Reference
Jp2g project No 24-5053A

Fire Flow Formula

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

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

Design Parameters*

Existing Building Construction = Type II (Noncombustible)
Floor Area*** = 5683.0 m^2
Number of Storeys = 2
Proposed Addition Construction = Type II (Noncombustible)
Floor Area*** = 2311.0 m^2
Number of Storeys = 2
Occupany and Contents Class Limited combustible
Sprinkler System = Automatic sprinkler system conforming to NFPA standards
Sprinkler Building Coverage = Partial building coverage of X%
Area of Sprinkler Coverage 2311.0 m^2
Factor of Building Coverage X = 0.32

Exposure Parameters*

	West	North (Portables)****	East (Portables)****	South	
Separation Distance =	over 30.0m	14.1	21.3	over 30.0m	m
Length of Exposed Wall =	NA	45.5	49.8	57.0	m
Length-Height Factor =	0.0	1.0	1	4	m-storeys (up to a maximum of 5-storeys)

Building Construction	Existing Building Floor Area**	Existing Building Coefficient*****	Proposed Addition Floor Area**	Coefficient*****	Total Floor Area**	Overall Coefficient*****	A	Adjustments (increases or decreases)										Final Adjusted Fire Flow	Final Adjusted Fire Flow
							Fire Flow (F)	B = A +/- % Occupancy		C = B x % Sprinkler		D = B x % Exposure***							
	(m^2)		(m^2)		(m^2)		(L/min)	%	Adjusted Fire Flow(s) (L/min)	%	Fire Adjustment Flow(s) (L/min)	West	North (Portables)****	East (Portables)****	South	Total Exposure	Fire Adjustment Flow(s) (L/min)	E = B - C + D (L/min)*	(L/s)
Type II (Noncombustible)	8,148.0	0.8	2,837.0	0.8	10,985.0	0.8	18,000.0	-0.15	15,300.0	16%	2,448.0	0% ****	12%	4%	0%	16%	2,448.0	15,000.0	250.0

Boundary Conditions
A. Y. Jackson Secondary School

Provided Information

Scenario	Demand	
	L/min	L/s
Average Daily Demand	76	1.26
Maximum Daily Demand	113	1.89
Peak Hour	204	3.40
Fire Flow Demand #1	10,000	166.67
Fire Flow Demand #2 (15,000 L/min split at 5,000 L/min per hydrant)	5,000	83.33

Location

Figure 1: Existing hydrant configuration & connections

Figure 2: Existing hydrant configuration & connections with future 150mm private water service

Results

1. Regular BC Results (Connections 1 & 2 Only)

Connection 1 – Abbeyhill

Demand Scenario	Head (m)	Pressure[1] (psi)
Maximum HGL	161.4	78.2
Peak Hour	156.6	71.4
Max Day plus Fire Flow #1	153.8	67.3
[1] Ground Elevation =	106.4	m

Connection 2 – Sherwood

Demand Scenario	Head (m)	Pressure[1] (psi)
Maximum HGL	161.4	77.8
Peak Hour	156.6	70.9
Max Day plus Fire Flow #1	130.7	34.0
[1] Ground Elevation =	106.8	m

2. BC: Max Day + FF #2 Split to 3 existing hydrants (5,000 L/min each) – Existing conditions (no private looping) (refer to Figure 1)

Connection	Head (m)	Pressure[1] (psi)	Ground Elevation (m)
Connection & hydrant 1 - Abbeyhill	151.5	64.0	106.4
Paddock Way dead-end hydrant	136.4	42.7	106.3
Abbeyhill south hydrant	151.7	65.2	105.9

3. BC: Max Day + FF #2 Split to 3 existing hydrants (5,000 L/min each) – Future conditions (with private looping) (refer to Figure 2)

Connection	Head (m)	Pressure[1] (psi)	Ground Elevation (m)
Connection & hydrant 1 - Abbeyhill	151.2	63.6	106.4
Paddock Way hydrant	145.5	55.7	106.3
Abbeyhill south hydrant	151.5	64.8	105.9

Notes

1. *Under boundary condition 1, demands for proposed Connection 2 at existing water main along Paddock Way were assigned to upstream junction at Sherwood St. & Paddock Way, off the public looped watermains. The engineer must calculate head loss for the site with looped new 150 mm diameter water service line.*

2. *Boundary conditions 2 & 3 were configured as follows: Max Day demands were assigned to hydrants 1 (Abbeyhill) & 2 (Paddock Way). The RFF of 15,000 L/min was split between the 3 existing hydrants near the school (Abbeyhill, Paddock Way, and Abbeyhill south). Each hydrant was assigned 5,000 L/min. These boundary conditions were provided to represent more accurately the real fire responses to be expected under 15,000 L/min FFs. This multi varied approach is not typically conducted for boundary conditions.*

3. *Boundary condition 3 is strictly presented for demonstration purposes of the expected head gain at the Paddock Way hydrant after private looping is introduced. As such, please use boundary condition 2 for modelling purposes. As noted in Note 1, the engineer must calculate head loss for the site with looped new 150 mm diameter water service line.*

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.

D.1.2 - Existing Water Boundary Conditions - Connection 2 Paddock

Water Demands

Average Daily Demand:	1.26	l/s
Maximum Daily Demand:	1.89	l/s
Maximum Hour Demand:	3.40	l/s
Fire Flow Demand:	250.00	l/s
Maximum Daily + Fire Flow Demand:	251.89	l/s

Design Parameters

Pipe Diameter:	150	mm
Pipe Material:	PVC	
Pipe Length (total network):	43.0	m
Finished Floor Elevation:	106.20	
Pavement (R.O.W.) Elevation:	106.40	

Boundary Conditions

Max. HGL:	161.4	m
Min HGL:	156.6	m
Max. Day + Fire:	130.7	m

Boundary Condition Check

Check water pressure at municipal connection:

Min. HGL - Pavement elevation =	50.20	m	
=	71.38	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)**
=	492.17	kPa*	

Pressure at municipal connection OK

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

Min. HGL - Finished floor elevation - Friction Loss** =	50.37	m	****Friction loss calculated using the Hazen-Williams Equation**
=	71.63	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)**
=	493.88	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** =	24.47	m	****Friction loss calculated using the Hazen-Williams Equation**
=	34.80	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)**
=	239.95	kPa****	

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

Hazen-Williams Equation for Pressure Loss in Pipes

Connection 1 - Abbeyhill

SI Units

Specified Data

l = length of pipe (m)	43			
c = Hazen-Williams roughness constant	100			
q = volume flow (liter/sec)	3.40	0.0034 m3/s		
dh = inside or hydraulic diameter (mm)	150			

Calculated Pressure Loss

f = friction head loss in mm of water per 100 m of pipe (mm H20 per 100 m pipe)	59.28			
f = friction head loss in kPa per 100 m of pipe (kPa per 100 m pipe)	0.58			
Head loss (mm H20)	25.49	**0.025489 METERS**	0.025489	0.010681
Head loss (kPa)	0.25			

Calculated Flow Velocity

v = flow velocity (m/s)	0.19			

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 - Connection 1 Abbeyhill

Water Demands			Design Parameters			Boundary Conditions		
Average Daily Demand:	1.26	l/s	Pipe Diameter:	150	mm	Max. HGL:	161.4	m
Maximum Daily Demand:	1.89	l/s	Pipe Material:	PVC		Min HGL:	156.6	m
Maximum Hour Demand:	3.40	l/s	Pipe Length (total network):	188.0	m	Max. Day + Fire:	153.8	m
Fire Flow Demand:	250.00	l/s	Finished Floor Elevation:	106.20				
Maximum Daily + Fire Flow Demand:	251.89	l/s	Pavement (R.O.W.) Elevation:	106.40				

Boundary Condition Check

Check water pressure at municipal connection:

Min. HGL - Pavement elevation =	50.20	m	
=	71.38	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)**
=	492.17	kPa*	

Pressure at municipal connection OK

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

Min. HGL - Finished floor elevation - Friction Loss** =	50.35	m	****Friction loss calculated using the Hazen-Williams Equation**
=	71.59	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)**
=	493.61	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** =	47.55	m	****Friction loss calculated using the Hazen-Williams Equation**
=	67.61	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)**
=	466.16	kPa****	

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

Hazen-Williams Equation for Pressure Loss in Pipes

Connection 1 - Abbeyhill

SI Units

Specified Data

l = length of pipe (m)	188			
c = Hazen-Williams roughness constant	150			
q = volume flow (liter/sec)	3.40	0.0034 m3/s		
dh = inside or hydraulic diameter (mm)	150			

Calculated Pressure Loss

f = friction head loss in mm of water per 100 m of pipe (mm H20 per 100 m pipe)	27.97			
f = friction head loss in kPa per 100 m of pipe (kPa per 100 m pipe)	0.27			
Head loss (mm H20)	52.59	**0.052592 METERS**	0.052592	0.010681
Head loss (kPa)	0.52			

Calculated Flow Velocity

v = flow velocity (m/s)	0.19			

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
Fire Hydrant 01 Check - Connection 1 Abbeyhill Drive

Water Demands

Average Daily Demand:	1.26	l/s
Maximum Daily Demand:	1.89	l/s
Maximum Hour Demand:	3.40	l/s
Fire Flow Demand at hydrant	95.00	l/s
Maximum Daily + Fire Flow Demand:	251.89	l/s

Design Parameters

Pipe Diameter:	150	mm
Pipe Material:	PVC	
Pipe Length (total network):	81.0	m
Finished Floor Elevation:	106.20	
Pavement elevation at hydrant:	106.40	

Boundary Conditions

Max. HGL:	161.4	m
Min HGL:	156.6	m
Max. Day + Fire:	151.5	m

Boundary Condition Check

Check water pressure at fire hydrant

Min. HGL - elevation at hydrant- Friction Loss** =	34.29	m	
=	48.76	psi****	
=	336.22	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**

Hazen-Williams Equation for Pressure Loss in Pipes

SI Units

Specified Data

l = length of pipe (m)	81	
c = Hazen-Williams roughness constant	150	
q = volume flow (liter/sec)	95.00	0.095 m3/s
dh = inside or hydraulic diameter (mm)	150	

Calculated Pressure Loss

f = friction head loss in mm of water per 100 m of pipe (mm H20 per 100 m pipe	13341.59	
f = friction head loss in kPa per 100 m of pipe (kPa per 100 m pipe)	130.88	
Head loss (mm H20)	10806.69	**10.80669 METERS**
Head loss (kPa)	106.01	

Calculated Flow Velocity

v = flow velocity (m/s)	5.38	

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
Fire Hydrant 02 Check - Connection 1 Abbeyhill Drive

Water Demands

Average Daily Demand:	1.26	l/s
Maximum Daily Demand:	1.89	l/s
Maximum Hour Demand:	3.40	l/s
Fire Flow Demand at hydrant	95.00	l/s
Maximum Daily + Fire Flow Demand:	251.89	l/s

Design Parameters

Pipe Diameter:	150	mm
Pipe Material:	PVC	
Pipe Length (total network):	197.0	m
Finished Floor Elevation:	106.20	
Pavement elevation at hydrant:	106.40	

Boundary Conditions

Max. HGL:	161.4	m
Min HGL:	156.6	m
Max. Day + Fire:	151.5	m

Boundary Condition Check

Check water pressure at fire hydrant

Min. HGL - elevation at hydrant- Friction Loss** =	18.82	m	
=	26.76	psi****	
=	184.49	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**

Hazen-Williams Equation for Pressure Loss in Pipes

SI Units

Specified Data

l = length of pipe (m)	197	
c = Hazen-Williams roughness constant	150	
q = volume flow (liter/sec)	95.00	0.095 m3/s
dh = inside or hydraulic diameter (mm)	150	

Calculated Pressure Loss

f = friction head loss in mm of water per 100 m of pipe (mm H20 per 100 m pipe	13341.59	
f = friction head loss in kPa per 100 m of pipe (kPa per 100 m pipe)	130.88	
Head loss (mm H20)	26282.93	**26.28293 METERS**
Head loss (kPa)	257.84	

Calculated Flow Velocity

v = flow velocity (m/s)	5.38	

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
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Cast-Iron 30 years old	75 - 90
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Cast-Iron, bituminous lined	140
Cast-Iron, sea-coated	120
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Concrete lined, wooden forms	120
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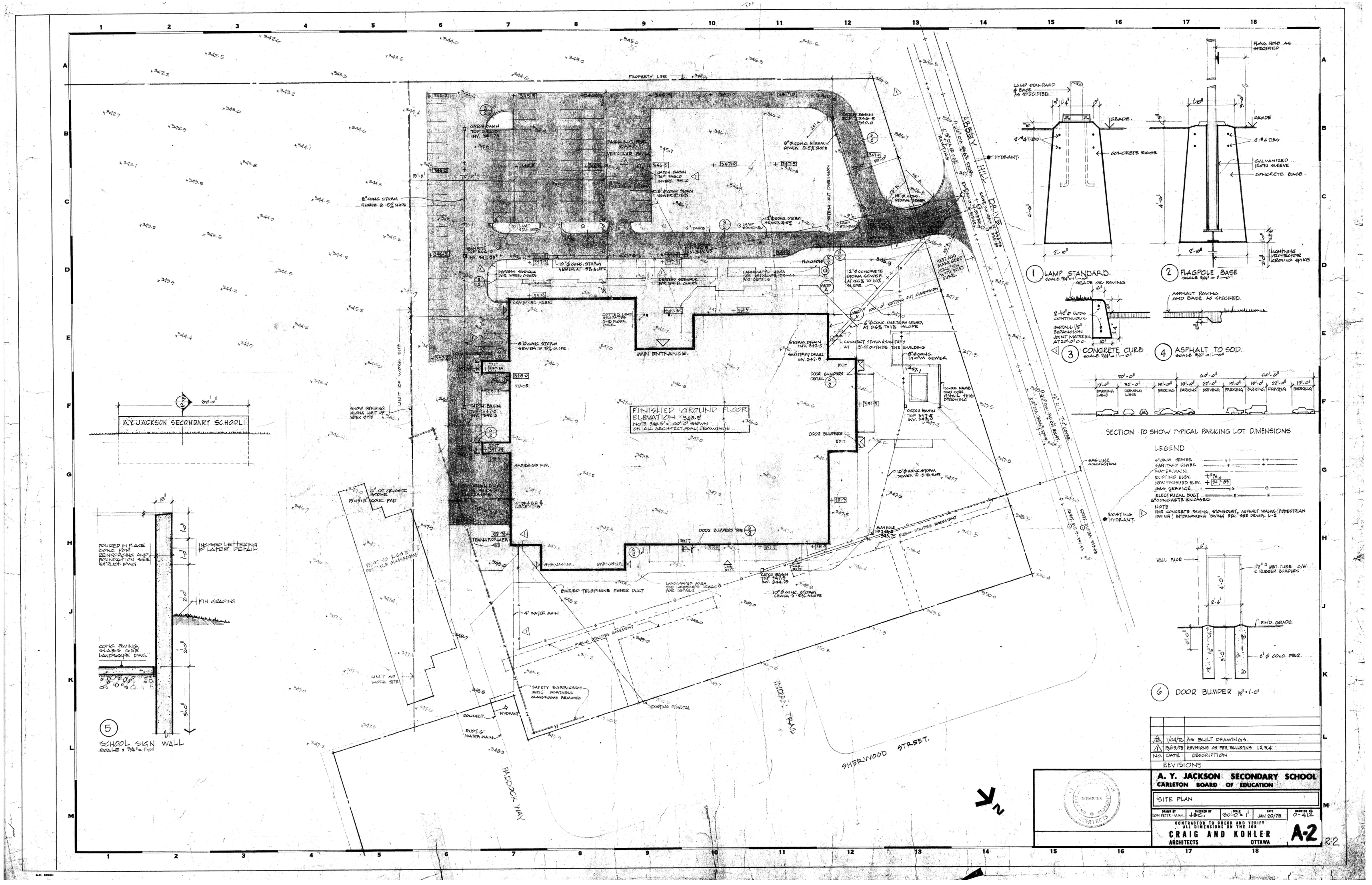
Ductile Iron Pipe (DIP)	140
Ductile Iron, cement lined	120
Fiber	140
Fiber Glass Pipe - FRP	150
Galvanized iron	120
Glass	130
Lead	130 - 140
Metal Pipes - Very to extremely smooth	130 - 140
Plastic	130 - 150
Polyethylene, PE, PEH	140
Polyvinyl chloride, PVC, CPVC	150
Smooth Pipes	140
Steel new unlined	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



NO.	DATE	DESCRIPTION
2	1/04/76	AS BUILT DRAWINGS.
1	13/05/75	REVISIONS AS PER BULLETINS 1, 2, 3, 4

REVISIONS

A. Y. JACKSON SECONDARY SCHOOL
CARLETON BOARD OF EDUCATION

SITE PLAN

DRAWN BY	CHECKED BY	SCALE	DATE	DRAWING NO.
DON PETTE-MAN	[illegible]	80'-0" = 1"	JAN 20/75	0-412

CONTRACTOR TO CHECK AND VERIFY ALL DIMENSIONS ON THE JOB

CRAIG AND KOHLER
ARCHITECTS OTTAWA

A-2

R-2

AYJ75A02

File No.: PC2024-0245

July 17, 2024

Xu Feng
Edward J. Cuhaci and Associates Architects Inc.
Via email: xuf@cuhaci.com

Subject: Pre-Consultation: Meeting Feedback
Proposed Sit Plan Control Application – 150 Abbeyhill Drive

Please find below information regarding next steps as well as consolidated comments from the above-noted pre-consultation meeting held on July 3, 2024.

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.

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. Relevant Official Plan Policies

a. 5.4 – Suburban Transect – generally characterized by Low- to Mid-density development. Provides an emphasis on regulating the maximum built form envelope, based on the context, that frames the public right of way.

b. 3.4 – Designated Neighbourhood - low-rise development which is predominantly ground oriented.

2. Zoning – the property is currently zoned I1A. The I1A Zone permits the School use and the proposed addition appears to meet most zoning minimums.

    a. Section 110 of the By-law requires a minimum landscape buffer between the parking lot and side lot line. It appears there may be room to add this but if not, a variance will need to be sought.

3. A Site Plan detailing all relevant Zoning provisions (zoning table showing required and proposed), requested amendments and proposal details will be required to support the Site Plan Amendment Application. The City of Ottawa Terms of Reference for a Site Plan can be found at Site Plan (ottawa.ca). Please ensure your plan includes all the required components. These details will be reviewed to determine whether the submission can proceed to formal application.

4. We would like to see some vegetation added to screen the new parking area from the existing residential area along Stokes Cres.

Urban Design

Comments:

1. Urban Design Brief is required. Please see attached customized Terms of Reference to guide the preparation.

    a. The Urban Design Brief should be structured by generally following the headings highlighted under Section 3 – Contents of these Terms of Reference.

2. Additional drawings and studies are required as shown on the ASPIL. Please follow the terms of references for the preparation of these drawings and studies. These include:

    a. Design Brief
    b. Site Plan
    c. Landscape Plan
    d. Elevations

Comments on Preliminary Design:

1. Please prepare a short design brief to provide a description of the existing features of the site and the proposed addition.

2. Please provide the dimensions of the sidewalk proposed for the new building to ensure appropriate walkable space.

3. Please discuss the “hierarchy” of building entrances. Will the new entrance facing Paddock Way act as a secondary entrance to the school from the neighbourhood? Function of the entrances should be defined by the architecture proposed.

4. Please confirm if bus/drop-off laybys are required at the entrance of the proposed building.

5. Please ensure that direct pedestrian walkways are provided to each building entrance and the portable classrooms. Additional connection from Paddock Way appears to be required.

6. Please ensure that substantial tree planting is provided around the perimeter of the site.

7. Masonry exterior is appreciated.

Engineering

Comments:

1. The Stormwater Management Criteria, for the subject site, is to be based on the following:
    a. **Water Quality Control**: provide enhanced levels of protection of 80% for total suspended solids removal for the parking lot extension.
    b. **Water Quantity Control**: In the absence of area specific SWM criteria please control post-development runoff from the subject site, up to and including the **100-year storm event**, to **a 5-year pre-development level**.
        i. The pre-development runoff coefficient will need to be determined as per existing conditions but in no case more than 0.5. **[If 0.5 applies it needs to be clearly demonstrated in the report that the pre-development runoff coefficient is greater than 0.5].**
        ii. The time of concentration (Tc) used to determine the pre-development condition should be calculated. Tc should not be less

than 10 min. since IDF curves become unrealistic at less than 10 min; **Tc of 10 minutes shall be used for all post-development calculations.**

iii. Any storm events greater than the established 5-year allowable release rate, up to and including the 100-year storm event, shall be detained on-site. For events greater than 100 years, spillage must be directed to a public ROW and not to neighboring private property.

c. 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.

d. 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

e. 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.

f. 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.

g. 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.

h. 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.

i. **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.

2. Storm Sewer

    a. A 900mm dia. concrete storm sewer is available within Abbeyhill Drive and along the South-West property line. Connection will require an easement with the neighbouring property if connecting over the property boundary to the South-West.

b. The 250mm storm sewer in Paddock Way is not available to connect to due to current flow restriction.

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

3. Water:

a. A 152 mm dia. watermain within Paddock Way is available, and the 305mm dia. Watermain in Abbeyhill Drive is available.

b. Domestic water from the existing building can be extended into the addition with sufficient proof of demand capacity.

c. 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.

d. 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.

e. 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.

f. A Water Data Card will have to be submitted to size the water meter (if applicable).

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

4. Excavation and Contingency Plan for Sanitary Forcemain Proximity.

    a. A 400mm diameter sanitary forcemain is located within Abbeyhill Drive. Please note any proposed excavation within 3m of a sanitary forcemain must be approved by the City, and a contingency plan for possible damage to the forcemain must be provided depending on the severity of the situation.

5. Sanitary Sewer

    a. A 250 mm dia. AC Sanitary sewer is available within Abbeyhill Drive.

    b. A 200 mm dia. AC sanitary sewer is available within Paddock Way.

    c. Please review the sanitary flow calculations for just the addition to accurately represent the new flow to the sanitary sewer.

    d. Existing services must be shown on the plan.

    e. 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.

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

    g. 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.

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

6. General Servicing

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

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

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

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

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

f. Sewer connections to be made above the springline of the sewer main as per:

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

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

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

    iv. No submerged outlet connections.

7. Grading and Erosion

    a. Post-development site grading shall match existing property line grades in order to minimize disruption to the adjacent 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.

8. Environmental

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

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

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

   d. A remediation plan may be required as per the outcome of the Phase one study. If required, a complete Phase Two study with the remediation activities will need to be submitted for our review.

9. Environmental Compliance Approval

   a. The consultant shall determine if Environmental Compliance Approval (ECA) is required for any proposed work.

   b. Environmental Compliance Approval | Ontario.ca

10. Geotechnical

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

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

   c. 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.

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)

11. Slope Stability Assessment Reports

a. A report addressing the stability of slopes, prepared by a qualified geotechnical engineer licensed in the Province of Ontario, should be provided wherever a site has slopes (existing or proposed) steeper than 5 horizontal to 1 vertical (i.e., 11 degree inclination from horizontal) and/or more than 2 meter in height.

b. A report is also required for sites having retaining walls greater than 1 meter high, that addresses the global stability of the proposed retaining walls.

c. Slope Stability Guidelines for Development Applications (ottawa.ca)

12. Exterior Site Lighting

a. Any proposed light fixtures (both pole-mounted and wall mounted) must be part of the approved Site Plan. All external light fixtures must be designed using only fixtures that meet the criteria for full cut-off (sharp cut-off) classification, as recognized by the Illuminating Engineering Society of North America (IESNA or IES); and it must result in minimal light spillage onto adjacent properties. As a guideline, 0.5 fc is normally the maximum allowable spillage. In order to satisfy these criteria, the please provide the City with a **Certification (Statement) Letter** from an acceptable professional engineer stating that the design is compliant.

13. General

a. 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**.

b. 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.

c. As-built plans (if available) can be requested for a fee by contacting geoinformation@ottawa.ca.

d. 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.

e. **Construction approach** – Please contact the Right-of-Ways Permit Office TMconstruction@ottawa.ca early in the Site Plan process to determine the ability to construct site and copy File Lead on this request.

Please refer to the City of Ottawa Guide to Preparing Studies and Plans [Engineering]: Planning application submission information and materials. The guides on the City website specify all required information to be presented within the required documents.

Feel free to contact Terenzo Giovannitti, Infrastructure Project Manager, for follow-up questions.

Noise

Comments:

1. Stationary Noise Assessment is required to assess the noise impact of the proposed sources of stationary noise (mechanical HVAC system/equipment) of the development onto the surrounding residential area to ensure the noise levels do not exceed allowable limits specified in the City Environmental Noise Control Guidelines.

Feel free to contact Rochelle Fortier, TMP, for follow-up questions.

Transportation

Comments:

2. Follow Transportation Impact Assessment Guidelines:

    a. A Transportation Impact Assessment is required. Feel free to reach out to the TPM (rochelle.fortier@ottawa.ca) to discuss the scope of the report prior to any submissions.

    b. Submit the Scoping report to rochelle.fortier@ottawa.ca at your earliest convenience. The applicant is responsible to submit the Scoping Report and must allow for a 14 day circulation period and sign-off prior to the Strategy Report submission.

c. The Strategy Report must be submitted for review at the latest with the formal submission package. The applicant is strongly encouraged to submit the Strategy Report to the TMP before formal submission and allow for a 14 day circulation period.

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

3. Ensure that the development proposal complies with the Right-of-Way protection requirements - See Schedule C16 of the Official Plan.

4. Provide a new concrete sidewalk along the Abbeyhill Drive frontage of the site. This sidewalk is to be continuous across the access as per City Specification 7.1.

5. Upgrade existing transit stop #0572 to include a paved transit shelter/standing area/shelter pad to the specifications of the City.

6. Opportunities for pedestrian connectivity and safety through the site should be explored.

   a. Consider extending the proposed access path (#12) northerly along the east edge of the new drive aisle (#3), towards the future portables (#4), with a new pedestrian crossing lined up with the proposed addition's entrance. See markup below in blue for reference.

   b. Based on aerials, there appears to be a desire line forming from the City-owned park and pathway to the south. Please consider opportunities to formalize this connection and to avoid pedestrians cutting through the sports field. See aerial screenshot below for reference.

7. As the proposed site is institutional and for general public use, AODA legislation applies.

    a. Ensure all crosswalks located internally on the site provide a TWSI at the depressed curb, per requirements of the Integrated Accessibility Standards Regulation under the AODA.

    b. Clearly define accessible parking stalls and ensure they meet AODA standards (include an access aisle next to the parking stall and a pedestrian curb ramp at the end of the access aisle, as required).

    c. Please consider using the City's Accessibility Design Standards, which provide a summary of AODA requirements.

8. On site plan:

    a. Ensure site accesses meet the City's Private Approach Bylaw and all driveways/aisles meet the requirements outlined in Section 107 of the Zoning By-law.

    b. Show location of existing and planned bicycle parking spaces.

    c. Show location of existing and planned crosswalks on-site.

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

e. Show turning movements on-site.

f. Show all curb radii measurements; ensure that all curb radii are reduced as much as possible and fall within TAC guidelines (Figure 8.5.1).

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

h. Parking stalls at the end of dead-end parking aisles require adequate turning around space

Feel free to contact Rochelle Fortier, Transportation Project Manager, for follow-up questions.

Environment

Comments:

9. Proposal will include the improvement of a baseball diamond on City property and adjacent to the Carp River. Development within 30 m of a watercourse is a trigger for an environmental impact study (EIS) as per the OP Section 4.8.1 (3k) and OP Section 5.6.4.1 (4).

    a. If the development cannot be removed from the setback, we can look at a reduced setback as per OP Section 4.9.3 (7).

    b. Please confirm if there is any development associated with the redevelopment of the baseball diamond is within 30 m from the top of bank of the Carp River.

    c. If there is new development within the setback, please reach out and contact the Environmental Planner and Parks to see if an EIS can be waived through the requirements of the EIS Guidelines https://documents.ottawa.ca/sites/documents/files/eis_guidelines_tor_en.pdf

    d. Any waiving of the EIS requirement will be based on an ecological improvement to the condition of the watercourse as per OP Section 4.9.3 policy 7, that is acceptable to Parks, DRS and the School Board (proponent).

10. Urban Heat Island - Please add features that reduce the urban heat island effect (see OP 10.3.3) produced by the parking lot and a building footprint. For example, this impact can be reduced by adding large canopy trees, green roofs or vegetation walls, or constructing the parking lot or building with low heat absorbing materials.

11. Bird Safe Design - 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\

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

Forestry

Comments:

12. Tree removal/retention requirements

    a. A TCR is required if there are trees greater than 10cm in diameter on site that will be impacted by construction.

    b. Contact Mark.Richardson@Ottawa.ca for more information on TCR requirements

    c. Please show any tree protection fencing on the Landscape Plan

13. Landscape Plan tree planting requirements

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

    b. 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.

    c. Minimum Setbacks

        i. Maintain 1.5m from sidewalk or MUP/cycle track or water service laterals.
        ii. Maintain 2.5m from curb
        iii. Coniferous species require a minimum 4.5m setback from curb, sidewalk, or MUP/cycle track/pathway.

    d. 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.

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

f. 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

g. 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.

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

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

j. 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

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

j. Sensitive Marine Clay - 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 where ever there is a high probability of survival to maturity.

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

Parkland

Comments:

14. Parkland dedication:

    a. The amount of parkland dedication that will be required is to be calculated as per the City of Ottawa Parkland Dedication By-law (currently By-law 2022-280).

    b. Section 11(2)(f) of the By-law states that no conveyance of land or payment of cash-in-lieu is required in the case of development or redevelopment of a school as defined by subsection 1(1) of the Education Act, where the school provides for the students' outdoor recreational needs on-sit at the time of development and maintains sufficient outdoor recreational space on-site at the time redevelopment.

    c. The proposed school development demonstrates the following students' outdoor recreation amenities:

        i. 2x full-sized soccer/sports fields

        ii. 1x running track

        iii. 1x baseball/softball diamond (shared on both City and school property)

    d. Therefore, this proposal would be considered exempt from a parkland dedication requirement (particularly with the proposed revision in sportsfield layout as per the comment below).

15. Layout of the sportsfields:

    a. If possible, please consider shifting the existing western soccer field (the one outside of the track area) to the north. This will help accommodate the relocation of one of the existing small-mid-sized soccer fields and help retain existing amenities on site; see the image below for a very preliminary suggested layout:

16. Requirements for the work related to the relocated ball diamond:

    a. The location of the ball diamond, and all related structures and amenities, must meet the requirements as provided by the City's Environmental Planner, Matthew Hayley; please refer to the notes provided by him.

    b. The ball diamond, and any other related works on the City property shall be designed, and the work overseen, by a registered professional landscape architect.

    c. Lighting shall be provided as per the City's standard requirements for ball diamonds. The design of the lighting is to be completed by professional lighting engineer in consultation with the landscape architect.

    d. A new electrical service will be required to power the reconstructed ball diamond. The service shall:

        i. be located on City park property;

        ii. enter from the Old Colony Road right-of-way

        iii. provide 120/240 volt, 200 amperes single phase hydro service at 2m inside the park property line complete with electrical kiosk for park services as per city standard details. The exact location of the electrical kiosk is to be determined through consultation with Parks & Facilities Planning

    e. The ball diamond is to be constructed as per current standard City detailing and specifications (as provided by the City), or as approved by Parks & Facilities Planning.

        i. Please note that conversations are on-going regarding the exact detailing and specifications of the ball diamond to be shared on City

and school properties. The information will be forwarded to the school board as soon as possible.

f. There should be minimal disturbance to existing trees (including during the installation of the electrical kiosk / service, conduits, and lighting.

g. The play structure, and surrounding hard surfacing, is not to be disturbed and shall remain open to the public, if possible.

h. A public information session will need to be held to inform the neighbouring residents and Councillor of the work that is being proposed. The requirements of the session can be discussed in a separate meeting.

i. A Consent to Enter (or License of Occupation) will be required in order to do work on the City-owned lands. Please consult with the City's Corporate Real Estate Office to discuss further.

    i. Parks & Facilities Planning will provide a letter, if required, supporting the work to be completed.

Please note that the park comments are subject to revision as the application process proceeds. If the proposed development, including land use, changes then the parkland dedication requirement will be re-evaluated accordingly.

Please don't hesitate to contact me if you have any questions or would like to discuss any of the above further.

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

Other

17. 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. Please be advised that this is expected to occur in Q3 2024.

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

Submission Requirements and Fees

1. This application for Site Plan Control will be considered a Revision – Standard.

a. Additional information regarding fees related to planning applications can be found here.

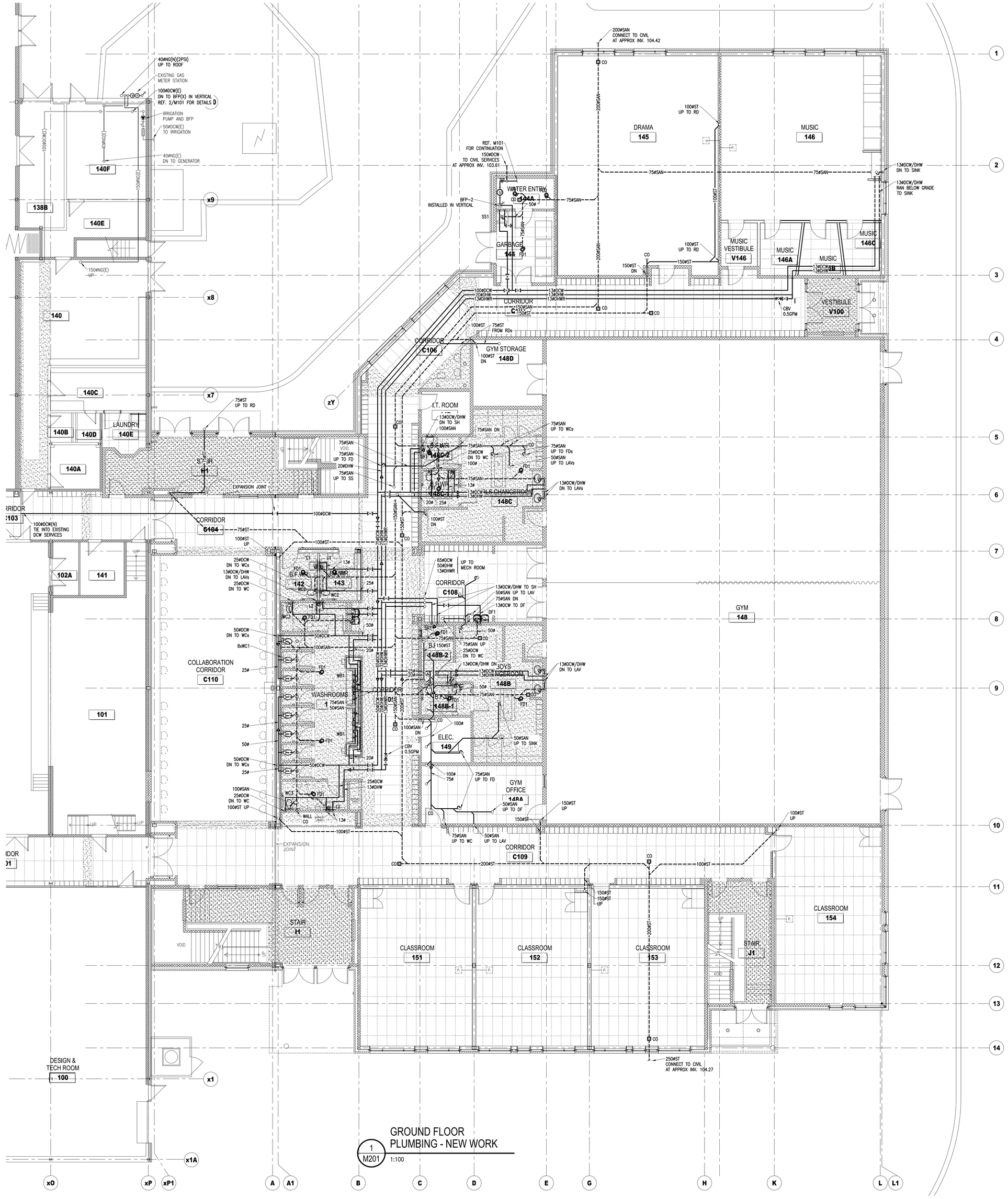
2. The attached **Study and Plan Identification List** outlines the information and material that has been identified as either required (R) or advised (A) as part of a future complete application submission.
    a. The required plans and studies must meet the City's Terms of Reference (ToR) and/or Guidelines, 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,
Katie Turk

Encl. Urban Design Brief ToR
ADS Site Plan Checklist
List of Technical Agencies

c.c. Penelope Horn
Terenzo Giovannitti
Abdul Mottalib
Lisa Stern
Jeannette Krabicka
Matthew Hayley
Mark Richardson



GENERAL NOTES

1. COORDINATE WITH ALL OTHER TRADES.
2. CONTRACTOR TO PROVIDE INTERFERENCE DRAWINGS FOR PIPING IN CORRIDORS, OR WHERE CONGESTED.
3. COORDINATE INTERFERENCES WITH ALL OTHER TRADES.
4. PROVIDE FIRE STOPPING WHERE PIPE PENETRATES FIRE SEPARATIONS. COORDINATE WITH ARCHITECTURAL.
5. ALLOW FOR PIPE OFFSETS AS REQUIRED TO SUIT INTERFERENCES.
6. PROVIDE HOSE END VALVE WITH CHAIN AND CAP AT ALL LOW POINTS TO ALLOW FOR DRAINAGE.
7. REFERENCE ARCHITECTURAL DRAWING FOR PLUMBING FIXTURE MOUNTING HEIGHTS.
8. ALL STORM DRAINS SHALL BE A MINIMUM OF 75 MM DIAMETER UNLESS OTHERWISE INDICATED.
9. OFFSET PLUMBING PIPING TO AVOID STRUCTURAL MEMBERS AND OTHER INTERFERENCES.
10. MAINTAIN VENTING CLEARANCES TO INTAKES ON ROOF AS PER OBC.
11. CONTRACTOR SHALL BE RESPONSIBLE TO COORDINATE UNDERGROUND PLUMBING SERVICES CIVIL CONTRACTOR AND WITH STRUCTURAL FOOTINGS AND FOUNDATIONS.
12. ALL PLUMBING VENTS SHALL TERMINATE MINIMUM 3500 MM AWAY FROM AIR INTAKES AS PER OBC.
13. COORDINATE PLUMBING PIPE & EQUIPMENT WITH ALL OTHER TRADES. CONTRACTOR TO PROVIDE INTERFERENCE DRAWINGS IN CORRIDORS, SERVICE ROOMS OR WHERE CONGESTED.
14. PROVIDE QUARTER TURN BALL ISOLATION VALVES AT ALL PLUMBING FIXTURES.
15. PROVIDE WATER HAMMER ARRESTORS ON DCW AND DHW ON ALL PLUMBING FIXTURE GROUPS OR END OF LINES.
16. ALL STORM PIPES SHALL BE INSULATED (EXPOSED AND CONCEALED) AND JACKETED WHERE EXPOSED AS PER SPECIFICATION.
17. ROUGH-IN TO PLUMBING FIXTURES SHALL BE COORDINATED WITH ARCHITECTURAL DRAWINGS & EXACT PLUMBING FIXTURE.
18. REFER TO ROOF DRAWING FOR ALL ROOF RELATED PLUMBING WORK.
19. ADJUST ALL METERING FAUCETS TO CLOSE AFTER 10 SECONDS
20. EXTEND PLUMBING PIPING TO EACH INDIVIDUAL PLUMBING FIXTURE WHERE SHOWN IN CHASE OR A GROUP OF FIXTURES.
21. THERMALLY INSULATE ALL DHW & DCW PIPING TO EACH PLUMBING FIXTURE INCLUDING WITHIN PARTITIONS & CHASE.
22. REFERENCE ARCHITECTURAL DRAWINGS FOR CEILING TYPES & ELEVATIONS.
23. PROVIDE NEW PLUMBING FIXTURES AS INDICATED C/W ASSOCIATED PLUMBING SERVICES AND ACCESSORIES.
24. COORDINATE ALL EQUIPMENT AND PIPE SUPPORTS WITH OTHER TRADES TO MINIMIZE ATTACHMENTS TO STRUCTURE. REFER TO ARCHITECTURAL AND STRUCTURAL DRAWINGS FOR DETAILS.
25. DRAINAGE TILE INDICATED IS TO BE INSTALLED BY PLUMBING CONTRACTOR DIRECTLY UNDER SLAB AND STUBBED UP WHERE INDICATED. NO FURTHER RADON MITIGATION MEASURES ARE REQUIRED AS PART OF CONTRACT.

DRAWING NOTES

1 –

OTTAWA-CARLETON
DISTRICT SCHOOL BOARD

ISSUE NO.	REV. NO.	DATE YYYY-MM-DD	ISSUE
3	0	2024-12-17	ISSUED FOR BUILDING PERMIT
2	0	2024-11-21	ISSUED FOR PHASE 3 SITE PLAN CONSULTATION
1	0	2024-10-30	ISSUED FOR 60% REVIEW

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EDWARD J CUHACI
& ASSOCIATES ARCHITECTS Inc.
171 Slater St, Suite 100, Ottawa, Ontario, K1P 5H7
Fax: (613) 236-1944 Telephone: (613) 236-7135 E-mail: info@cuhaci.com

PROJECT TITLE/TITRE DU PROJET
A.Y. JACKSON SECONDARY SCHOOL
ADDITION 2024
150 ABBEYHILL DRIVE
OTTAWA, ON. K2L 1H7

OTTAWA-CARLETON DISTRICT SCHOOL BOARD

DRAWING TITLE/TITRE DU DESSIN
GROUND FLOOR
PLUMBING
NEW WORK

SCALE / ECHELLE	AS NOTED	PROJ. No 2024-300	ISSUE No 1 / REV. No 0
DRAWN BY / DESSINÉ PAR	K.NANEFF	DRAWING/DESSIN	M201
CHECKED BY / VERIFIÉ PAR	R.LEONARD		
DATE	SEPTEMBER 2024	ACAD FILE/FICHIER: -	