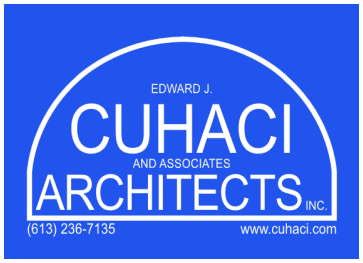
EDWARD J. CUHACI AND ASSOCIATES ARCHITECTS INC.

AVALON III FRENCH CATHOLIC ELEMENTARY SCHOOL, ORLEANS, ON

FUNCTIONAL SERVICING STUDY

MARCH 31, 2023



AVALON III FRENCH CATHOLIC ELEMENTARY SCHOOL, ORLEANS, ON

FUNCTIONAL SERVICING STUDY

EDWARD J. CUHACI AND ASSOCIATES ARCHITECTS INC.

ZONING BY-LAW AMENDMENT

PROJECT NO.: 221-12984-00
DATE: MARCH 31, 2023

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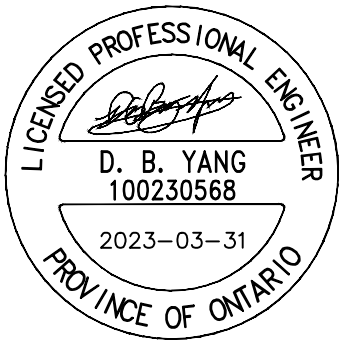

Mar 31, 2023

Winston Yang, P.Eng., PMP
Senior Project Engineer

Date

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1 INTRODUCTION

WSP was retained by Edward J. Cuhaci and Associates Architects Inc to provide engineering services for the functional servicing study for the Avalon III French Catholic Elementary School zoning by-law amendment (ZBLA) in Ottawa, ON. The services investigated are water supply servicing, wastewater servicing, and stormwater servicing.

1.1 SITE DESCRIPTION

This Avalon III French Catholic Elementary School site is an undeveloped plot of land approximately 1.765 ha located along the south side intersection of Sweet Valley Drive and Pewee Place (see Figure 1-1). The proposed development is a two-storey elementary school with a parking lot, a soccer field and 8 future portable classrooms. The school building will have a gross floor area of approximately 2,322 m^2. See Appendix A for the architectural conceptual design upon which this report is based.

Figure 1-1 Avalon French Catholic Elementary School Site Location

1.2 EXISTING INFRASTRUCTURE

The existing civil infrastructure near the site is located along promenade Sweet Valley Drive to the north of the site. The civil infrastructure includes, in nominal dimensions: a 300mm PVC Watermain; a 200mm PVC Sanitary sewer; and a 900mm concrete storm sewer. The nearest fire hydrant is located immediately outside the site at the proposed main school entrance, with another hydrant located on the intersection of Tenth line Road and promenade Sweet Valley Drive. See Figure 1-2 for schematic of nearby civil infrastructure captured from the GeoOttawa website. There are no on-site services.

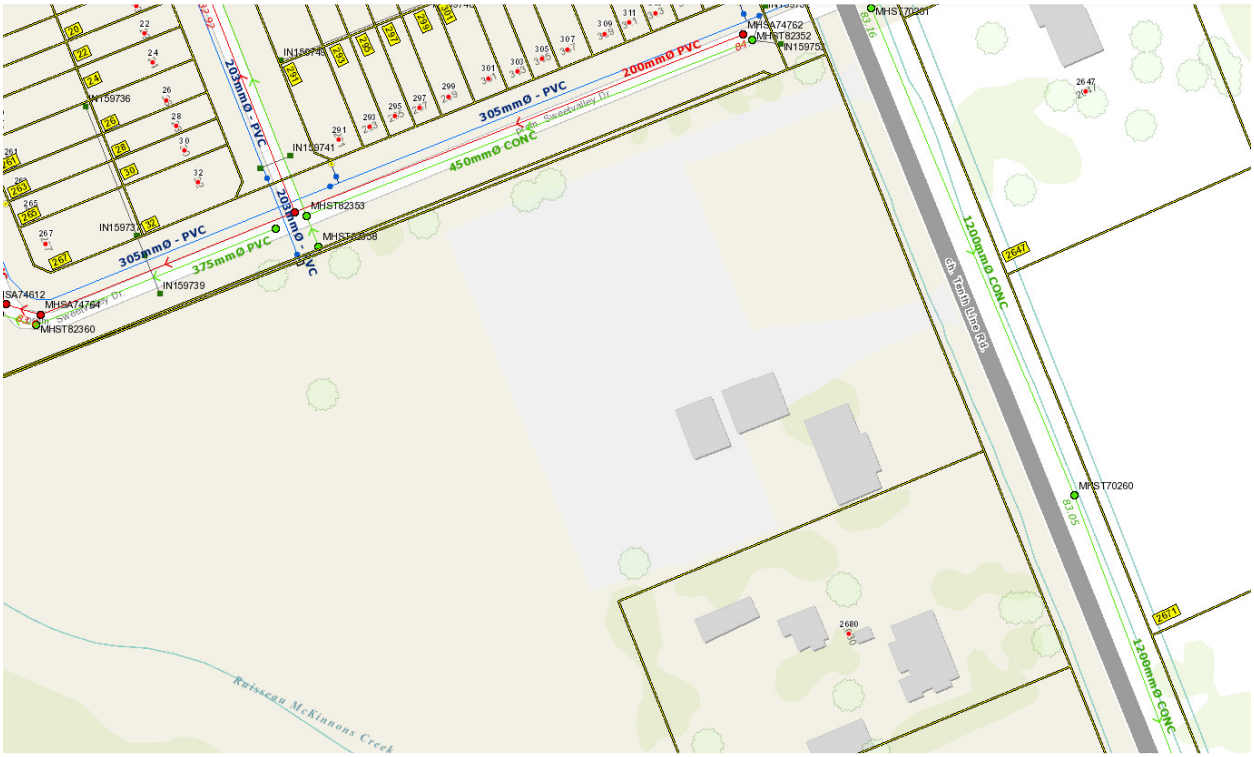


Figure 1-2 Civil Infrastructure around Site (GeoOttawa)

1.3 REFERENCES

This functional servicing study was undertaken in conformance with, and utilizing information from, the following documents:

- Ottawa Sewer Design Guidelines, Second Edition, Document SDG002, October 2012, City of Ottawa including:
    - Technical Bulletin ISDTB-2012-4 (June 20, 2012)
    - Technical Bulletin ISDTB-2014-01 (February 5, 2014)
    - Technical Bulletin PIEDTB-2016-01 (September 6, 2018)
    - Technical Bulletin ISDTB-2018-01 (March 21,2018)
    - Technical Bulletin ISDTB-2018-04 (June 27, 2018)
- Ottawa Design Guidelines – Water Distribution, July 2010 (WDG001), including:
    - Technical Bulletin ISDTB-2014-02 (May 27, 2014)
    - Technical Bulletin ISTB-2018-02 (March 21, 2018)
- Fire Underwriters Survey, Water Supply for Public Fire Protection (FUS), 2020.

In addition, the minutes for the Pre-Application Consultation Meeting for this Zoning By Law Amendment is provided for reference in Appendix B.

2 WATER SUPPLY SERVICING

2.1 EXISTING WATER SUPPLY SERVICES

The site is bounded to the Summerside South Subdivision Phase 1. SSS Phase 1 is located within Zone 2E of the City's water distribution system, which is fed by two booster pumping stations and the Innes Rod elevated storage tank at Belcourt Boulevard, providing balancing, fire and emergency storage. The development will be fed from the existing SSS Phase 1 development at Sweetvally Drive at the following location.

- Existing 200mm PVC watermain at Sweetvally Drive and Pewee Place intersection to the south.

2.2 PROPOSED WATER SUPPLY

The site will connect to the existing 200mm PVC watermain stub at the intersection of Sweetvall Drive and Pewee Place to the south.

- 200mm diameter watermain will be extended south from its current termination at the Phase 1 limit.

The proposed development will be serviced internally by 200mm diameter watermain to the building mechanical room.

2.3 BOUNDARY CONDITIONS

Boundary conditions have been provided by the City of Ottawa at the connection at Sweetvally Drive. The fire flow of 133.3 l/s (8,000 l/min) was estimated for the proposed school with using the FUS calculation method and is included in Appendix B.

Table 2-1 Boundary Condition

BOUNDARY CONDITIONS AT COPE DRIVE		
SCENARIO	Head (m)	Pressure (psi)
Basic Day (MAX HGL)	130.3	62.9
Peak Hour (MIN HGL)	126.0	56.9
Max Day + Fire Flow (ICI)	126.3	57.3

2.4 DOMESTIC SUPPLY AND PRESSURE

Water demands are based on Table 4.2 of the Ottawa Design Guidelines – Water Distribution. As previously noted, the development is considered as institutional development, consisting of classroom, gymnasium and kitchen. A water demand calculation sheet is included in Appendix B, and the total water demands are summarized as follows:

	WSP
Average Day	0.57 l/s
Maximum Day	0.86 l/s
Peak Hour	1.55 l/s

The 2010 City of Ottawa Water Distribution Guidelines stated that the preferred practice for design of a new distribution system is to have normal operating pressures range between 345 kPa (50 psi) and 552 kPa (80 psi) under maximum daily flow conditions. Other pressure criteria identified in the guidelines are as follows:

Minimum Pressure	Minimum system pressure under peak hour demand conditions shall not be less than 276 kPa (40 psi)
Fire Flow	During the period of maximum day demand, the system pressure shall not be less than 140 kPa (20 psi) during a fire flow event.
Maximum Pressure	Maximum pressure at any point the distribution system shall not exceed 689 kPa (100 psi). In accordance with the Ontario Building/Plumbing Code, the maximum pressure should not exceed 552 kPa (80 psi). Pressure reduction controls may be required for buildings where it is not possible/feasible to maintain the system pressure below 552 kPa.

Water pressure at municipal connections check:

Min. HGL @ Connection 1 – Pavement elevation = 126.0m – 87.08m = 38.92m = 381.58 kPa

Water pressure at building connection (at average day) check:

Max. HGL @ Connection 1 – Finished floor elevation = 130.3m – 87.85 = 53.04m = 146.19 kPa

Water pressure at building connection (at max. hour demand) check:

Min. HGL @ Connection 1 – Finished floor elevation = 126.0m-87.85m = 38.15m = 374.03 kPa

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

(Max Day + Fire) HGL @ Connection 1 - Finished floor elevation = 126.3m-87.85m = 38.45m = 376.97 kPa

The minimum water pressure inside the building at the connection is determined with the minimum HGL condition, resulting in a pressure of 374.03 kPa which exceed the minimum requirement of 276 kPa per the guidelines.

2.5 FIRE FLOW PROTECTION

The fire flow rate has been calculated using the Fire Underwriters Survey (FUS) method. The method takes into account the type of building construction, the building occupancy, the use of sprinklers and the exposures to adjacent structures. Assuming fire resistive construction and a fully supervised sprinkler system, a fire flow demand of 8,000 l/min for the new high school. The fire flow rate of 6,000 l/min (100 l/s) is calculated for the future portable classrooms. Copy of the FUS calculations are included in Appendix D.

The demand of 8,000 l/min can be delivered through two fire hydrants. The existing two public hydrants are located at the northside of Sweetvalley Drive, one of them is within 45 m to the building Siamese, and is rated at 5,700 l/min., the other one is within 75 m to the building and is rated at 5,700 l/min. The two hydrants have a combined total of 11,400 l/min.

The demand of 6,000 l/min from the future portable classrooms can also be met through the combination of two fire hydrants from Sweetvalley Drive, they are within 100m to the future portable classrooms, and are rated at 3,800 l/min each. The combined total of 7,600 l/min. And there is will be future fire hydrants along Tenth Line Road to the east when the watermain system, expansion is completed.

The proposed building on site will be serviced by a single 203 mm service off the existing 203 mm watermain extended from the Sweetvalley Drive and Pewee Place intersection. The service will run into the water entry room. The proposed building will be fully sprinklered and fire protection will be provided with the fire department Siamese

connection within 45 m of the existing municipal fire hydrant at Sweetvalley Drive. The Siamese connection is located on the north side of the building.

The boundary condition for Maximum Day and Fire Flow results in a pressure of 376.97 kPa at the ground floor level. In the guidelines, a minimum residual pressure of 140 kPa must be maintained in the distribution system for a fire flow and maximum day event. As a pressure of 376.97 kPa is achieved, the fire flow requirement is exceeded.

2.6 CHECK OF HIGH PRESSURE

High pressure is not a concern. The maximum water pressure inside the building at the connection is determined with the maximum HGL condition, resulting in a pressure of 381.58 kPa which is less than the 552 kPa threshold in the guideline in which pressure control is required. Based on this result, pressure control is not required for this building.

2.7 WATER SUPPLY CONCLUSION

The proposed school will be serviced internally by 200 mm watermains, which will be connected to the existing 200 mm watermain stub from Sweetvally Drive. A detailed hydraulic calculation has been completed above to confirm that the proposed water network can deliver all domestic and fire flows as per the Ministry of the Environment, City of Ottawa and Fire Underwriters criteria.

The proposed water supply design conforms to all relevant City guidelines and policies.

3 WASTEWATER SERVICING

3.1 DESIGN CRITERIA

In accordance with the City of Ottawa's Sewer Design Guidelines, the following design criteria have been utilized in order to predict wastewater flows generated by the subject site and complete the sewer design.

- Minimum Velocity 0.6 m/s
- Maximum Velocity 3.0 m/s
- Manning Roughness Coefficient 0.013
- Total est. hectares institutional use 1.765
- Average sanitary flow for institutional use 28,000 L/Ha/day
- Commercial/Institutional Peaking Factor 1.5
- Infiltration Allowance (Total) 0.33 L/Ha/s
- Minimum Sewer Slopes – 200 mm diameter 0.32%

The area of 1.765 ha represents the lot area of the new building and immediate surrounding area to the sides of the new building. This is the sanitary collection area that is being considered to contribute to the new 200mm sanitary service extending from the existing 200mm sanitary sewer from Sweetvalley Drive and Pewee Place intersection to the new building.

3.2 DEMAND ESTIMATION

The outlet for the sanitary service from the proposed building is the 200 mm diameter municipal sewer at Sweetvalley Drive and Pewee Place intersection. The Ottawa Sewer Design Guidelines provide estimates of sewage flows based on institutional development.

The criteria to determine anticipated actual peak flow based on site used as described in Ottawa Sewer Design Guidelines Appendix 4-A are as follows.

- Institutional 28000 L/Ha/day = 0.324 L/Ha/s
- Peak flow = (0.324 L/Ha/s x 1.765 ha x 1.5 peaking factor) + 0.33 l/Ha/s x 1.765 ha = 1.01 L/s

The on-site sanitary sewer network has been designed in accordance with 5.35 L/s as described above.

3.3 EXISTING WASTEWATER SERVICES

The existing sanitary outlet for Summerside South Phase 1 is the Tenth Line Road Pump Station (TLPS), which in turn outlets by forcemain to the Esprit Drive Collector. The TLPS is located above the north east corner of SSS Phase 1, at Tenth Line Road.

3.4 EXISTING CAPACITY

The capacity of the downstream 250 mm diameter sewer to existing sanitary manhole 110A has 34% left capacity base on DSEL sanitary sewer design sheet, which is adequate for the flow assumptions from the proposed site as noted above. The servicing pipe capacity is capable to handle the estimated peak sanitary flow rate of 1.01 L/s for the proposed development site. Please refer to sanitary sewer design sheet in Appendix C.

4 STORMWATER CONVEYANCE

4.1 EXISTING CONDITIONS

The subject site is located within the McKinnon's Creek Watershed and is subject to regulations of the South Nation Conservation (SNC).

The site is currently undeveloped, consisting of grass covered partially agricultural lands and storage warehouse with McKinnon's Creek to the west of the property. The site is sloping from north to south and slightly below the grade of Sweetvalley Drive.

The existing Avalon West SWM Facility, originally designed to service Avalon West Neighbourhood 5, north of Summerside Lands, was revised to accommodate SSW Phases 1, 2 and 3. An expansion of the existing Avalon West SWM Facility is proposed to service SSS Phase 1 and the subject site.

4.2 MINOR SYSTEM

The subject site will be serviced by a storm sewer system designed in accordance with the amendment to the storm sewer and stormwater management elements of the Ottawa Design Guidelines.

The storm sewers will outlet to the existing 900 mm diameter concrete storm at the south intersection of Sweetvalley Drive and Pewee Place within the SSS Lands and will be discharged to the Avalon West (N5) SWM Facility via pipes, then discharging from the pond to McKinnon's Creek. The proposed storm sewer layout is depicted on Figure 2 – Conceptual Servicing Plan.

The allowable release rate to the existing storm control manhole 1 is 567 l/s for the area of 3.32 ha. The receiving 900 mm diameter storm sewer has been designed with the capacity to accept 810.41 l/s from the school site. Using the Rational Method, with coefficient of 0.25 for pervious areas, 0.75 for gravel areas and 0.90 for impervious areas, and a 10-minute time of concentration, results in an estimated 2-year flow of 170.21 l/s from this area. Capacity in the minor system is not a concern.

4.3 MAJOR SYSTEM

The major system flows will be conveyed through the internal network, outletting to Sweetvalley Drive, and ultimately outlet to the Expanded Avalon SWM Pond Facility, where they are treated for an Enhanced Level of Protection (80% TSS removal) prior to release to McKinnon's Creek.

Quantity control on site will be limited to the pre-development levels. Inlet control device has been sized such that they do not create surface ponding on site during the 2-year design storm. The maximum depth of flow on site is 0.35 m during the 100-year event. Excess major system flows are assumed to drain overland into the SSS Phase 1 subdivision from the proposed development. The proposed storm sewer layout is depicted on Figure 1 – Conceptual Grading Plan.

4.4 QUANTITY CONTROL OBJECTIVE

The water quantity objective for the site is to limit the flow release to 255.62 l/s. Excess flows above this limit for the school site up to those generated by the 100 year storm event from drainage on the school site are temporarily stored on site.

No provision is required on the school's site to accommodate any flow from the adjacent lands. All flows exceeding the defined minor system capacity and on-site storage capability will enter the major system, with overflow to the City right of way, on the east, north and south boundaries of the site.

The maximum overland runoff spill elevation for this site is 87.26, and one 230mm dia. circular plate ICD is proposed to be used on the outlet inside CBMH01 to restrict the flow rate leaving the site to 195.82 l/s at 3.15m head, based on the maximum spill elevation of 87.26. In theory, the runoff water will be detained on site up to the 100-yr rainfall event, and for those scenarios exceeding 100-yr rainfall event, the runoff water will be discharged offsite once all the available storage areas have reached their maximum capacities. The school site can provide a total of 500.00 m³ of surface storage volume, but the required storage for 100-yr will be only 187.62 m³. The ponded water will not reach the spill elevation under 100 year and lesser events. The site has more storage capacity than required as a result of the grading design. This will allow extra detention of water on the site during extreme events, and will reduce stress on the downstream stormwater management pond. If rain falls at a rate higher than the soccer field soil can absorb, then there will be surface ponding. If the soccer field and landscaped areas allow for infiltration, the available surface storage volume will be further increased. In theory, the use of lower runoff coefficients for landscaped surfaces already accounts for a certain degree of absorption in these areas.

4.1 ON-SITE DETENTION

Any excess storm water up to the 100-year event is to be stored on-site in order to not surcharge the downstream municipal storm sewer system. Detention will be provided in parking and landscape areas and building rooftops, where feasible. As previously noted, the volume of storage is dependent on the characteristics of each individual drainage area. It should be noted that greater than 0.30 m of vertical separation has been provided from all maximum ponding elevations to lowest building openings.

The following Table summarizes the on site storage requirements during the 1:100-year events.

Table 4-1: On-Site Storage Requirements

Total Area (Ha)	Location	Controlled/ Uncontrolled	Runoff Coefficient		Outlet Location	Total Storage Provided (m³)	100-Year Controlled	
			2 & 5 Year	100 Year			Restricted Flow (L/s)	Required Storage (m³)
1.297	Surface	Controlled	0.61	0.67	CBMH01	500	195.82	187.62
0.232	Building Roof	Controlled	1.00	1.00	STMH01	93	17.64	73.98
0.236		Uncontrolled	0.26	0.32	R.O.W.	0	37.50	0
TOTAL						**593**	**250.96**	**261.60**

In all instances the required storage is met with surface ponds which retain the stormwater and discharge at the restricted flow rate to the sewer system.

The following Table summarizes the inlet control devices to be utilized on the site. ICD pre-set flow curves can be found in Appendix D.

Table 4-2: ICD Type

Structure ID	PROPOSED ICD			
	100-YR Head	Flow (L/s)	Type	OUTLET DIA.
CBMH101	3.15	195.82	230 mm Dia. Circular ICD	525 mm Dia. CONC.

As demonstrated above, the site uses new inlet control device to restrict the 100 year storm event to the criteria approved by the City of Ottawa. Restricted stormwater will be contained onsite by utilizing surface ponding storage. In the 100 year event, there will be no overflow off-site from restricted areas.

The sum of restrictions on the site is 250.96 L/s, which is less than the maximum allowable release of 255.62 L/s. Detail calculation is included in Appendix D

5 CONCLUSION

WSP was retained by Edward J. Cuhaci and Associates Architects Inc. to provide this Functional Servicing Study in support of the Zoning By-Law Amendment Application for the subject site Avalon III French Catholic Elementary School and planned two storey school building therein. The services investigated were water supply, wastewater servicing, and stormwater conveyance.

The preliminary water demand was calculated as 1.55 L/s peak hour domestic demand and 133 L/s max day plus fire flow. Per coordination with the City for the supply watermain boundary conditions, a 203mm watermain stub from Sweetvalley Drive, it was confirmed the existing system has sufficient capacity to supply the domestic and fire demands within system pressure limits.

The preliminary sanitary sewer demand was calculated as 0.86 L/s peak demand. A downstream capacity check has been completed, the downstream system has sufficient capacity to receive the proposed demand.

The site will be required by the City to limit the discharge rate of the stormwater to the pre-development 5yr storm rate, storing the stormwater up to the post-development 100yr storm. Preliminary estimates of the runoff rates lead to an approximate maximum site discharge rate of 250.96 L/s, with a required storage for approximately 261.60 m^3.

Therefore, it is confirmed the existing infrastructure is sufficient to support the proposed development. It should be noted that all demand calculations are estimates based on conceptual architectural plans and are subject to change during the design phase.

APPENDIX

A

- PRE-CONSULTATION MEETING NOTES
- CONCEPTUAL ARCHITECTUAL PLAN
- TOPO SURVEY

From: Murshid, Shoma
Sent: September 06, 2022 10:50 AM
To: Zofia Jurewicz <zofiaj@cuhaci.com>; Paquette Planning Associates Ltd. <paquetteplanning@sympatico.ca>
Cc: Rasool, Rubina <Rubina.Rasool@ottawa.ca>; Giampa, Mike <Mike.Giampa@ottawa.ca>; McAlpine, Anissa <anissa.mcalpine@ottawa.ca>; Ippersiel, Matthew <Matthew.Ippersiel@ottawa.ca>; Richardson, Mark <Mark.Richardson@ottawa.ca>; James Holland <jholland@nation.on.ca>; Rehman, Sami <Sami.Rehman@ottawa.ca>; Luc Poulin <Poulil@ecolecatholique.ca>; Denis Chabot <chabod@ecolecatholique.ca>; Sclauzero, Cass <cass.sclauzero@ottawa.ca>
Subject: 2666 Tenth Line Road - CECCE Elementary School on Claridge Lands in Mer Bleue Expansion Urban Expansion Area 10

Good morning Dan and Zofia,

Thank you for meeting with us on August 23, 2022 to review your concept plan (2 attachments) for a one-storey elementary school for CECCE.

This proposal triggers a Zoning By-law Amendment (Major) and a New, Complex Site Plan Control development review applications.

If you do end up submitting both development applications concurrently, there will be a 10% deduction in the planning fee component for both applications.

The **Zoning By-law Amendment** category being triggered is Major and is public-consultation based. The submission fee for this application is $22,472.80 + an initial Conservation Authority Fee of $400.00. For the Zoning By-law Amendment to be deemed complete at the time of submission, a complete application form, fees and the following plans, studies and documentation will be required (all in PDF format):

Concept Plan, showing proposed uses and landscaping and/or Site Plan

Planning Rationale, including Design Statement

Survey Plan

Topographical Survey Plan

Elevations

Geotechnical Report

Servicing & Stormwater Management Reports

Phase 1 ESA (Phase 2 ESA if required)
Tree Conservation Report
EIS
Transportation Impact Assessment

Noise Study

For the **Site Plan Control application**, the category being triggered is 'Complex (Manager Approval, Public Consultation) and the submission fee for this is $49,964.88 + Initial Engineering Design Review and Inspection Fee (based on a sliding scale for the value of the Infrastructure and Landscaping) and an initial Conservation Authority Fee of $1,065.00. For the Site Plan Control application to be deemed complete at the time of submission, a complete application form, fees and the following plans and studies will be required (all in PDF format):

Site Plan

Landscape Plan/Tree Conservation Report (can be combined)

Site Servicing Plan

Survey Plan

Topographical Survey Plan

Planning Rationale, including design statement

Erosion and Sediment Control Plan (can be combined with the Grade Control and Drainage Plan

Stormwater Management Report (can be combined with the Site Servicing Report)

Grade Control and Drainage Plan

Site Servicing Report

Stormwater Management Report

Geotechnical Report

Phase 1 ESA (Phase 2 if required)

TIA

Noise Study

EIS

Floor Plans

Elevations

City's General Urban Planning Comments:

There is a Landowner's Agreement and Cost-Sharing Agreement in place, "Area 10 Funding Agreement & CSA". The trustee is Soloway Wright's Ursula Melinz. The landowners within this agreement must provide a clearance letter for this zoning by-law amendment application and site plan control application prior to their approvals.

Zoning By-law Amendments

If a complete application is received by no later than the day before the new Official Plan is adopted (October 27, 2021), it will be processed on the basis of existing Official Plan policy provided it is consistent with the 2020 Provincial Policy Statement.

For complete applications received after the day before the new Official Plan is adopted on October 27, 2021), but before Ministry approval of the Official Plan, any reports going forward to Committee and Council under this circumstance must be evaluated against the

existing Official Plan and must also include an evaluation of the application against the Council approved new Official Plan (and the new Secondary Plan, where applicable). In the period between Council approval of the New OP and the Minister's approval of the New OP, City staff will apply whichever provision, as between the Current and New OP, is more restrictive.

Zoning By-law amendments that conform to the new Official Plan but not the current Official Plan

Council can pass the by-law after the new Official Plan is adopted but it only comes into force if the relevant policies authorizing it are approved by the Minister. Pursuant to the Planning Act, section 24, subsections (2) and (2.1) Council may pass a by-law that does not conform with the official plan but will conform to the new Official Plan once it comes into effect. If the new Official Plan does not come into effect the by-law has no force and effect.

Please note there is an approved Mer Bleue Urban Expansion Area 10 Community Design Plan (CDP). The Mer Bleue Urban Expansion Area 10 Community Design Plan (CDP) has been prepared by the Mer Bleue Land Owners Group (MBLOG), in collaboration with the City of Ottawa. The CDP is intended to demonstrate how development of the Mer Bleue Urban Expansion Area 10 (MBUEA) will achieve the requirements of the Official Plan. The CDP also provides a planning framework for the implementation of Official Plan policy through the subsequent development approvals process and will therefore be used as a guide for the preparation and review of future applications for development. N.B. There is also an EMP and MSS for this same area.

City Urban Design Comments:

- PRUD Staff support the decision to highlight the corner of the site with a prominent architectural feature.
- Explore the possibility of eliminating the need for the small parking lot on Sweet Valley Drive. This would reduce the amount of paving along the public frontage and would free up more space for landscaping adjacent to the main entrance.

- Please line the two public frontages with trees.
- Ensure that sidewalks are continuous and uninterrupted across vehicular apertures.
- If possible, please narrow the widths of the vehicular apertures and reduce the turning radii as much and possible. As designed, they may encourage higher speeds.
- If possible, please look to move the bicycle parking (4) closer to an entrance.
- Include a bicycle parking rack near the main entrance on Sweet Valley Drive.
- Please continue to study what the best approach for the interface between the schoolyard and McKinnon's Creek would be. Should the edge be fenced or not? Please be mindful of linking in to the community active transportation network and impacts on adjacencies to the soccer field.
- The full-size soccer field appears very tight where it is located. Consider that part of the game is played outside the boundaries (corner kicks, throw-ins), balls are often kicked out of bounds, and there is space needed for team benches and spectators. Whether fenced or not, consider a landscape buffer where the property abuts the creek to prevent balls from rolling away.
- Consider a formal pathway connecting to the gardens. Otherwise a goat trail will likely form, cutting across the soccer field.
- PRUD staff support the on-street laybys from an urban design perspective.
- An Urban Design Brief is required as a part of your submission. This may be combined with your Planning Rationale report. Please refer to the attached Urban Design Brief Terms of Reference to inform the content of the brief.
- Please reference any design direction in the CDP in the brief and demonstrate how the proposal conforms to its policies.
- This application is not subject to review by the Urban Design Review Panel.

City Engineering Comments:

As mentioned, the applicant may be required to pay into the N5 Pond separately as there are no SWM DC charges. Gary Baker has confirmed the site is not subject to SWM DC charges.

Otherwise, please see attached for engineering comments.

Note, there is a moratorium on newly paved roads. Check attached engineering comments for further information.

City Transportation and Noise Comments:

*A 0.5 metre conveyance from the northern perimeter of the lot line is required in order to add it to the already conveyed 2.5 metre MUP land obtained directly north from Mattamy.

A TIA is warranted- please proceed to scoping.

The application will not be deemed complete until the submission of the draft step 2-4, including the functional draft RMA package (if applicable) and/or monitoring report (if applicable).

Although a full review of the TIA Strategy report (Step 4) is not required prior to an application, it is strongly recommended.

Synchro files are required at Step 4.

ROW protection on Tenth Line Road is 37.5 m.

A Noise Impact Study is required

Clear throat requirements as per TAC guidelines.

Please note that all new applications (pre-consultation meetings dated after March 3, 2021) must use the NEW TRANS Trip Generation Manual when forecasting site generated trips using this manual.

The TRANS committee (a joint transportation planning committee serving the National Capital region) finalized a new manual early in March 2021. The document will be available in French and English on the TRANS website http://www.ncr-trans-rcn.ca/surveys/2009-trip-generation.

The new manual has simplified the conversion from vehicle trips to person trips and then trips by modal share. The City has also developed a spreadsheet that will apply the factors of location and building type to quickly provide the existing trip numbers by mode share. This spreadsheet has been attached.

*Latest construction plans for ROW of Tenth Line Road and ROW of Sweet Valley Drive - Please contact Bill Harper, Program Manager (SAM) / City Surveyor at bill.harper@ottawa.ca, or call 613-580-2424, ext. 21083.

A layby on Sweet Valley is possible but I'll need a design (RMA report, design submission, municipal consent). A layby on Tenth Line will not be supported.

A MUP should be at least 3m will be required along Sweet Valley Drive.

City Forestry Comments:

Planning Forester - TCR requirements:

1. A Tree Conservation Report (TCR) must be supplied for review along with the suite of other plans/reports required by the City

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

    b. The TCR may be combined with the EIS provided all information is supplied

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

3. The TCR must contain 2 separate plans:

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

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

    c. Please ensure retained trees are shown on the landscape plan

4. the TCR must list all trees on site, as well as off-site trees if the CRZ extends into the developed area, by species, diameter and health condition

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

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

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

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

    b. show the critical root zone of the retained trees

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

9. For more information on the process or help with tree retention options, contact Mark Richardson mark.richardson@ottawa.ca or on City of Ottawa

LP tree planting requirements:

For additional information on the following please contact tracy.smith@Ottawa.ca

Minimum Setbacks

- Maintain 1.5m from sidewalk or MUP/cycle track or water service laterals.
- Maintain 2.5m from curb
- Coniferous species require a minimum 4.5m setback from curb, sidewalk or MUP/cycle track/pathway.
- Maintain 7.5m between large growing trees, and 4m between small growing trees. Park or open space planting should consider 10m spacing, except where otherwise approved in naturalization / afforestation areas. Adhere to Ottawa

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

Tree specifications

- Minimum stock size: 50mm tree caliper for deciduous, 200cm height for coniferous.

- Maximize the use of large deciduous species wherever possible to maximize future canopy coverage

- Tree planting on city property shall be in accordance with the City of Ottawa's Tree Planting Specification; and include watering and warranty as described in the specification (can be provided by Forestry Services).

- Plant native trees whenever possible

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

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

Hard surface planting

- Curb style planter is highly recommended

- No grates are to be used and if guards are required, City of Ottawa standard (which can be provided) shall be used.

- Trees are to be planted at grade

Soil Volume

- Please document on the LP that adequate soil volumes can be met:

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

Please note that these soil volumes are not applicable in cases with Sensitive Marine Clay.

Sensitive Marine Clay

- Please follow the City's 2017 Tree Planting in Sensitive Marine Clay guidelines

Tree Canopy Cover

- The landscape plan shall show how the proposed tree planting will replace and increase canopy cover on the site over time, to support the City's 40% urban forest canopy cover target.

- At a site level, efforts shall be made to provide as much canopy cover as possible, through tree planting and tree retention, with an aim of 40% canopy cover at 40 years, as appropriate.

- Indicate on the plan the projected future canopy cover at 40 years for the site.

City Environmental Policy Comments (these comments have not been updated since October 2021):

The proposed development should confirm the servicing requirements and development approvals established as part of the subdivision approval and the master servicing study to the north.

If the proposal is permitted to proceed (as part of the subdivision to the north), then an EIS will be required for either a zoning amendment or a site plan control application. This stretch of McKinnon's creek is identified as part of the NHS, as per OP Schedule L.

The EIS will address the following items:

-explore the hazard lands and floodplain required for that stretch of the McKinnon's Creek.

-draw recommendations from the EMP (Mer Bleue Urban Expansion Study Area – Environmental Management Plan, Morrison-Hershfield Ltd, Dec2017)

-draw recommendations from the CDP (Mer Bleue Expansion Area – Community Design Plan, IBI Group, Jun 2017)

-provide recommendations for revegetation and enhancements to the riparian areas along McKinnon's Creek

-potential significant habitat for threatened or endangered species

-provide recommendations to increase energy and water efficiency based on landscaping and layout, as per OP 4.9

-if there is substantial glass proposed on the design, recommend drawing design elements from the City's bird-safe design guidelines (Sept 2020)

I would encourage the applicant to consult with South Nation Conservation Authority to determine if any permits or approvals are required under their regulations.

I would also recommend consulting with the engineer's report for the municipal drain because there are concerns about how the stormwater management for this area will impact and potentially contribute to flooding downstream.

City Parks Comments:

- The applicant and land owners should be aware that parkland dedication will continue to be tracked through the development application process. Parkland dedication requirements remain unchanged from that detailed in the Community Design Plan.
- Please note, a school is exempted from parkland dedication as per our Parkland dedication by-law (as approved by Council Aug 31, 2022) "where the school provides for the students' outdoor recreational needs on-site at the time of development and maintains sufficient outdoor recreational space on-site at the time of redevelopment"
- The Demonstration Plan in the Secondary plan, and the CDP show the Ecole Catholique being co-located with a neighbourhood park, south of Wall Road. It is unknow at this time, if there would be further opportunities to co-locate a school with the park block south of Wall Road. Please keep Park staff informed as development applications proceed in order for staff to comment on the location of the neighbourhood park block south of Wall Road.
- The opportunity to co-location school blocks and park blocks should continue to be sought by development applications within the Mer Bleue community expansion.

South Nation Conservation Authority Comments:

Here are my comments for the August 23rd meeting concerning the French Catholic school proposal. They should be read in conjunction with our previous comments from October 2021 (FOUND below this section).

Natural Heritage

- The Environmental Management Plan (EMP) indicates (8.1.2) that : For the protection of the common aquatic habitat observed in McKinnon's Creek, a setback consisting of the greater of 15 m from the top-of-slope or 30 m from the normal high water mark in the urban area (which may be refined through further study during preparation and review of the draft plan of subdivision), as recommended in the Official Plan, Section 4.7.3.2 and 4.7.3.6, and is identified on Figure 4.4.
- It is our understanding that this area will become a separate parcel (ie., separated from the school parcel) and placed in a restrictive Zone, as done for the subdivision to the north of this property. It is our understanding that the setback will include a Mixed Use Path (MUP) but that access to the creek will be limited to allow the riparian buffer to function.
- A landscaping plan for the full McKinnon's Creek corridor is required by the EMP; however, should this development proceed prior to the completion of this plan, a landscaping plan that meets the objectives of the EMP will be required for this property.
- An Environmental Impact Assessment is required for development adjacent to fish habitat. In addition, a headwater feature has been identified (Drain 14) along the north property boundary. The management recommendations for the headwater feature (outlined as an appendix to the EMP) should be addressed in the EIS. The Conservation Partners will provide a review of the EIS.
- The Conservation Partners support the development of a resource (similar to a Homeowner's Guide) that outlines the ecological significance, restoration and enhancement works and best management practices for the McKinnon's Creek Corridor. This could help to use raise awareness amongst school studies/staff in the future. The Conservation Partners can provide similar resources and background studies and can assist in the review of the resource.

Stormwater Management

- The Conservation Partners do not object to an additional outlet to McKinnon's Creek in place of directing stormwater into existing infrastructure and ultimately to the existing stormwater pond if it can be shown to not have negative impacts on flooding and erosion, upstream and downstream of the outlet.
- Should the option for a new outlet be pursued, it may necessitate a revision to the McKinnon's Creek 100-year floodplain study, which will require review and approval from South Nation Conservation. The applicant may submit a scaled site plan and request a preliminary review to assess whether the change in land use differs from the SNC model, requiring further analyses.

- Should the option for a new outlet be pursued, the applicant will be responsible for stormwater treatment of runoff quality and quantity. The design must demonstrate a 80% TSS removal. The quantity must meet City of Ottawa requirements. The design package should include at a minimum, a report demonstrating how the quality/quantity targets will be achieved, a grading and drainage plan, and a sediment and erosion control plan. The Conservation Partners will provide a technical review.

Conservation Authority Regulation 170/06

- Any interference with a watercourse/headwater feature, including an outlet to McKinnon's Creek, will require a permit and restrictions may apply.
- There is a 100-year floodplain contained within the banks of McKinnon's Creek. The elevation of the floodplain at the north end of the property is 84.38 meters above sea level. Any development within or 15m adjacent to this elevation will require a permit and restrictions may apply. It is anticipated that this area will fall within the McKinnon's Creek Corridor and a restrictive Zone.

SNCA – October 2021 follow-up notes:

- The development should implement the direction approved though the Council-approved Master Servicing Study (MSS) and Environmental Impact Statement, prepared for the Mer Bleue Expansion Lands.

Environmental

- The EMP Section 8.1.1 requires a Planting Plan at the subdivision stage to enhance the woody vegetation cover in McKinnon's Creek corridor where needed. Section 8.1.1 (final point, pg98) also indicates that a detailed design of the McKinnon's Creek will be undertaken as a single integrated design from the Avalon South pond outlet to the downstream extent of the proposed lowering just upstream of Navan Road. The planting plan for the subject property should be integrated with the detail design for the corridor.
- For the protection of aquatic habitat in McKinnon's Creek, the EMP Section 8.1.2 recommends a setback consisting of 15m from the top-of-slope or 30m from the normal high water mark, as identified on Figure 4.4 of the EMP. This setback should be clearly delineated on all plans.
- Figure 3-6 and Table 3.3 identify the drainage features along the north boundary of the parcel as Drain 14, and provides a management recommendation of 'mitigation'. The

feature should be discussed within the Environmental Impact statement, including how the management recommendation will be implemented.
- An Environmental Impact Statement and Landscaping Plan are recommended for the subject property to demonstrate how the recommendations of the EMP will be satisfied.

Stormwater Management

- Should stormwater be directed towards the Neighbourhood 5 stormwater pond, it must be demonstrated that the pond has capacity.
- The stormwater design should include at a minimum, a report demonstrating how water quality and quantity treatment standards will be achieved, a grading and drainage plan, and a sediment and erosion control plan.
- Note that when stormwater outlets to approved municipal infrastructure, the Conservation Partners do not undertake a technical review; however, we request to be included in the circulation of the stormwater design to confirm.
- Any modifications to the stormwater pond, including an alteration to the outlet or a change in outflows, will require a technical review by South Nation Conservation.
- Any changes to the outflow may require a revision to the McKinnon's Creek 100-year floodplain analysis, along with a technical review of the revision by South Nation Conservation.
- Likewise, should drainage be directed towards McKinnon's Creek directly via uncontrolled flow, a revision to the McKinnon's Creek 100-year analysis and a technical review by South Nation Conservation may be necessary.
- Any drainage from the subject site must demonstrate that there is legal and sufficient outlet for the additional flows. A Municipal Drain petition is currently underway to designate McKinnon's Creek a municipal drain.

Conservation Authority Regulations

- Any interference with a watercourse, including a headwater drainage feature (Drain 14, noted above) and an alteration to a stormwater outlet, may require a permit under O. Reg. 170/06 and restrictions may apply.

Further items to consider for both site plan control and zoning amendment are:

- Bird-safe safety design guidelines are now in effect.

https://ottawa.ca/en/city-hall/public-engagement/projects/bird-friendly-design-guidelines

https://ottawa.ca/en/city-hall/public-engagement/projects/bird-friendly-design-guidelines#bird-friendly-design-guidelines

- Consider the reduction of energy and water demands within your development proposal through lot layout and landscaping, as outlined in the OP Section 4.9.

- Plant locally appropriate native species along the southern and western boundaries of the property and along the parking lots. This will offer shaded parking spots and reduce the urban heat island effect.

- Staff would caution a reduction in the setbacks abutting the public realm. It still needs to be demonstrated that street tree planting **of canopy shade trees** can be accommodated through the site and particularly and along the public RoWs (Sweetvalley Drive and Tenth Line Road).

Minimum Drawing and File Requirements - All Plans:

Plans are to be submitted on standard **A1 size** (594mm x 841mm) sheets, utilizing an appropriate Metric scale (1:200, 1:250, 1:300, 1:400, or 1:500).

With all submitted hard copies provide **individual** PDF of the DWGs and for reports please provide one PDF file of each report. **All PDF documents are to be unlocked and flattened.**

Closing comments:

In order to sever the lands, please seek a pre-consultation with a Committee of Adjustment Planner, Cass Sclauzero at cass.slauzero@ottawa.ca or at 613-580-2424-27597.

Best wishes,

Shoma Murshid, MCIP, RPP

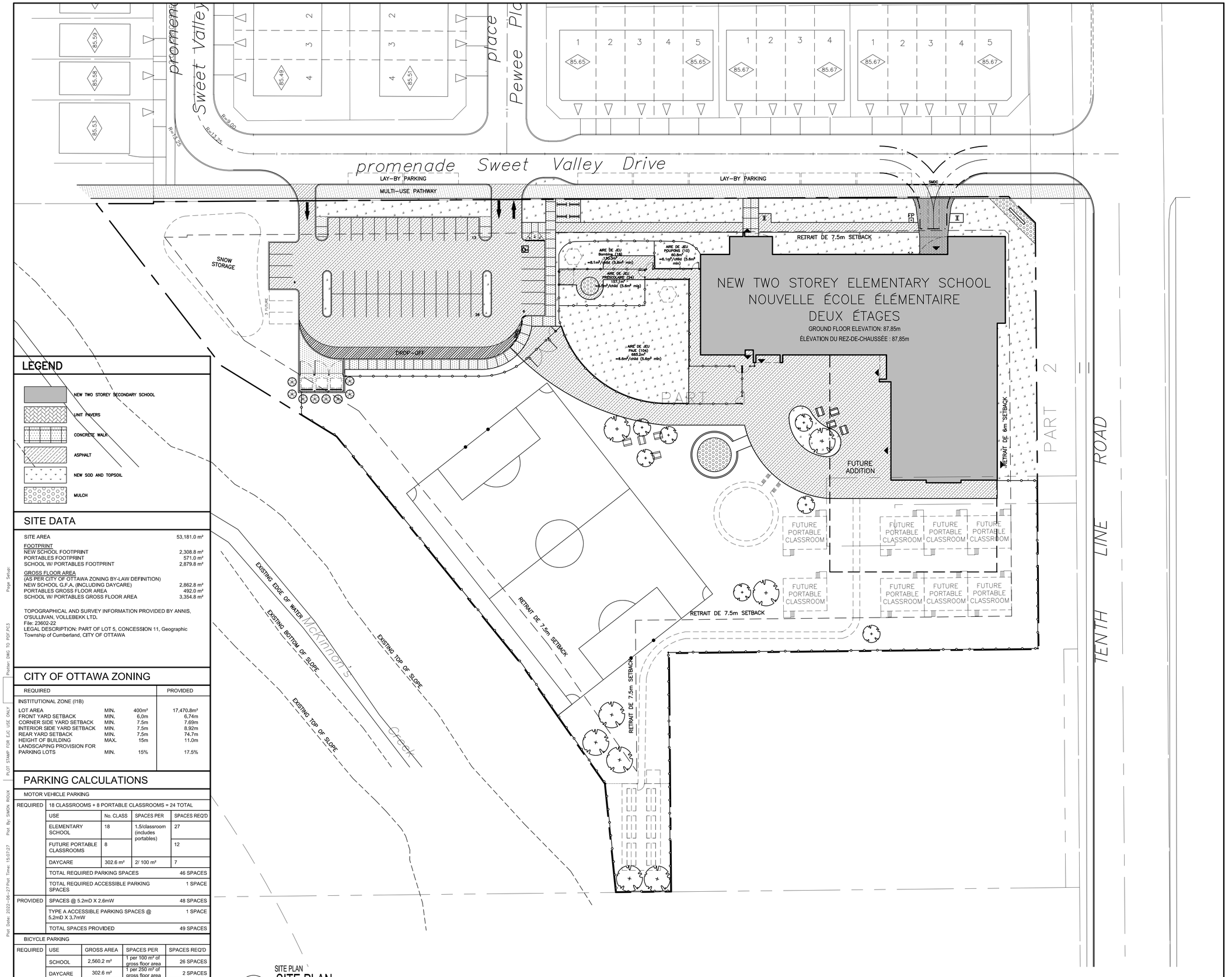
(she/ her/ elle)
File Lead, Planner II

Responsable de dossier, urbaniste II
City of Ottawa/ Ville d'Ottawa
Development Review (Suburban Services, East)/ Examen des projets d'aménagement (Services suburbains Est)
Planning, Real Estate and Economic Development Department / Direction générale de la planification, des biens immobiliers et du développement économique

110 Laurier Avenue West, 4th Floor, Ottawa ON K1P 1J1/ 110, avenue Laurier Ouest, 4e étage, Ottawa (Ontario) K1P 1J1
Mail Code/ Code de courrier : 01-14
Tel/ Tél: (613) 580-2424 ext. 15430
Fax/ Téléc. : (613) 580-4751

e-mail/ courriel : shoma.murshid@ottawa.ca

www.ottawa.ca



LEGEND

- NEW TWO STOREY SECONDARY SCHOOL
- UNIT PAVERS
- CONCRETE WALK
- ASPHALT
- NEW SOD AND TOPSOIL
- MULCH

SITE DATA

SITE AREA	53,181.0 m²
FOOTPRINT	
NEW SCHOOL FOOTPRINT	2,308.8 m²
PORTABLES FOOTPRINT	571.0 m²
SCHOOL W/ PORTABLES FOOTPRINT	2,879.8 m²
GROSS FLOOR AREA (AS PER CITY OF OTTAWA ZONING BY-LAW DEFINITION)	
NEW SCHOOL G.F.A. (INCLUDING DAYCARE)	2,862.8 m²
PORTABLES GROSS FLOOR AREA	492.0 m²
SCHOOL W/ PORTABLES GROSS FLOOR AREA	3,354.8 m²

TOPOGRAPHICAL AND SURVEY INFORMATION PROVIDED BY ANNIS, O'SULLIVAN, VOLLEBEKK LTD.
File: 23602-22
LEGAL DESCRIPTION: PART OF LOT 5, CONCESSION 11, Geographic Township of Cumberland, CITY OF OTTAWA

CITY OF OTTAWA ZONING

REQUIRED			PROVIDED
INSTITUTIONAL ZONE (I1B)			
LOT AREA	MIN.	400m²	17,470.8m²
FRONT YARD SETBACK	MIN.	6,0m	6,74m
CORNER SIDE YARD SETBACK	MIN.	7.5m	7.69m
INTERIOR SIDE YARD SETBACK	MIN.	7.5m	8.92m
REAR YARD SETBACK	MIN.	7.5m	74.7m
HEIGHT OF BUILDING	MAX.	15m	11.0m
LANDSCAPING PROVISION FOR PARKING LOTS	MIN.	15%	17.5%

PARKING CALCULATIONS

MOTOR VEHICLE PARKING

REQUIRED	18 CLASSROOMS + 8 PORTABLE CLASSROOMS = 24 TOTAL				
	USE	No. CLASS	SPACES PER	SPACES REQ'D	
	ELEMENTARY SCHOOL	18	1.5/classroom (includes portables)	27	
	FUTURE PORTABLE CLASSROOMS	8		12	
	DAYCARE	302.6 m²	2/ 100 m²	7	
	TOTAL REQUIRED PARKING SPACES				46 SPACES
	TOTAL REQUIRED ACCESSIBLE PARKING SPACES				1 SPACE
PROVIDED	SPACES @ 5.2mD X 2.6mW				48 SPACES
	TYPE A ACCESSIBLE PARKING SPACES @ 5.2mD X 3.7mW				1 SPACE
	TOTAL SPACES PROVIDED				49 SPACES

BICYCLE PARKING

REQUIRED	USE	GROSS AREA	SPACES PER	SPACES REQ'D
	SCHOOL	2,560.2 m²	1 per 100 m² of gross floor area	26 SPACES
	DAYCARE	302.6 m²	1 per 250 m² of gross floor area	2 SPACES
	PORTABLES	492 m²	1 per 100 m² of gross floor area	5 SPACES
	TOTAL REQUIRED BICYCLE PARKING SPACES			33 SPACES
PROVIDED	TOTAL BICYCLE SPACES PROVIDED			62 SPACES

1 A001 SITE PLAN
SITE PLAN
1:400

Plot Date: 2022-06-27 Plot Time: 15:07:27 Plot By: SIMON PROVA PLOT STAMP FOR EXT. USE ONLY Plotter: DWG TO PDF.PC3 Page Setup:

Écoles catholiques Centre-Est

ISSUE NO.	REV. NO.	DATE YYMMDD	ISSUE
0	0	2023/03/30	ISSUED FOR INFORMATION

TRUE NORTH | PLAN NORTH

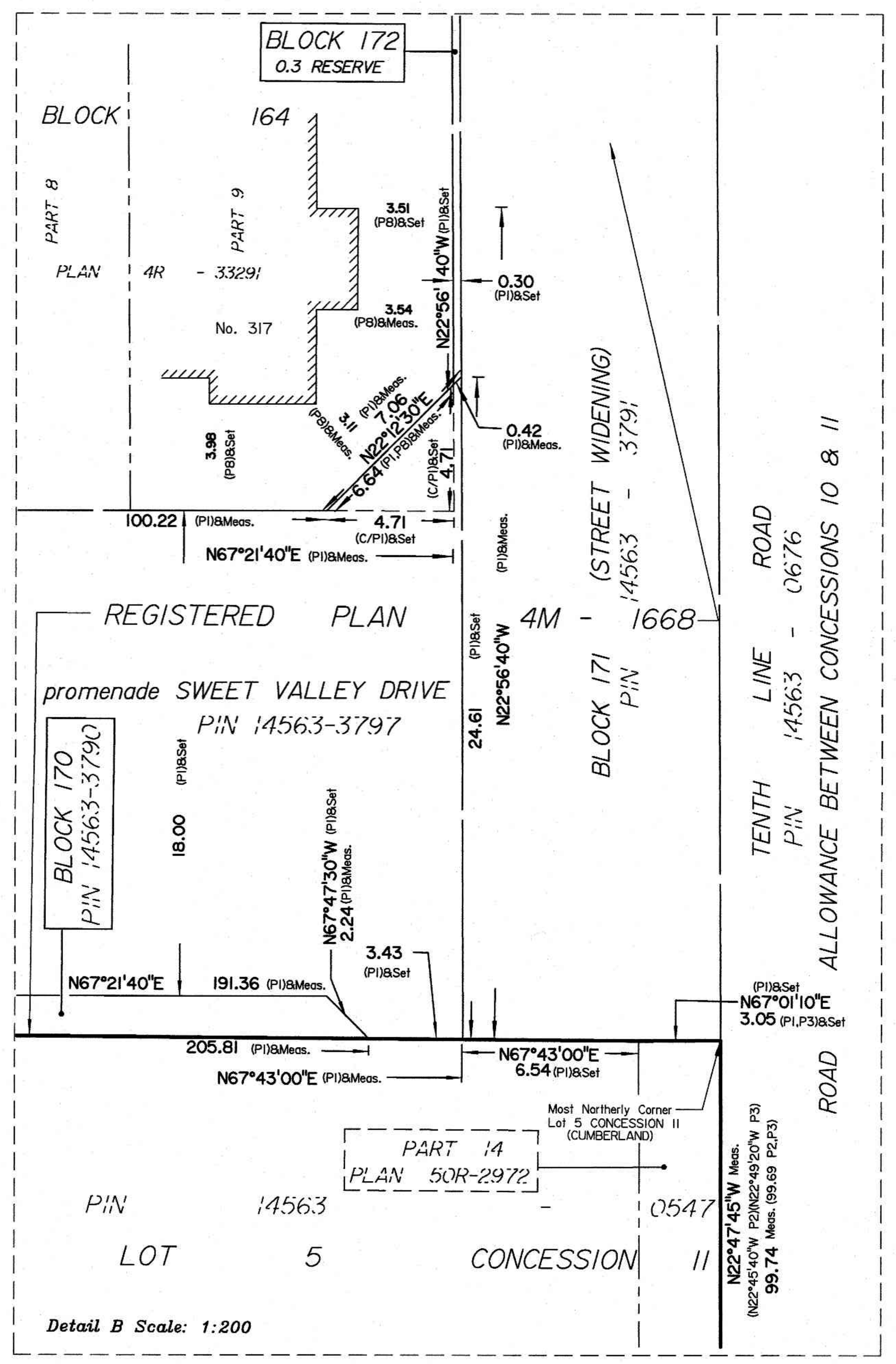
EDWARD J. CUHACI & ASSOCIATES ARCHITECTS Inc.
171 Slater St, Suite 100, Ottawa, Ontario, K1P 5H7
Fax: (613) 236-1944 Telephone: (613) 236-7135 E-mail: info@cuhaci.com

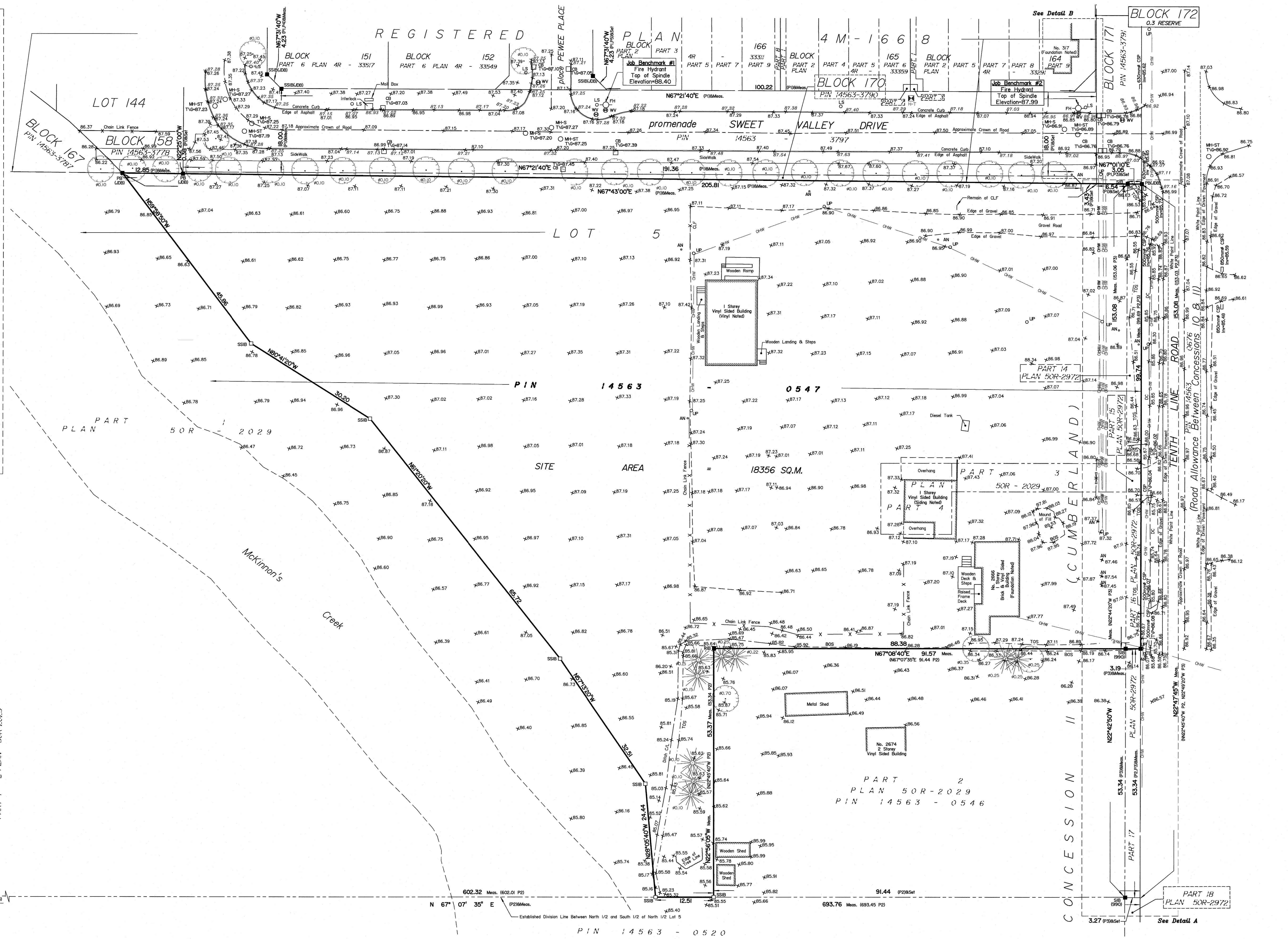
PROJECT TITLE/TITRE DU PROJET
ÉCOLE ÉLÉMENTAIRE CATHOLIQUE
AVALON III
TENTH LINE ROAD
OTTAWA, ON

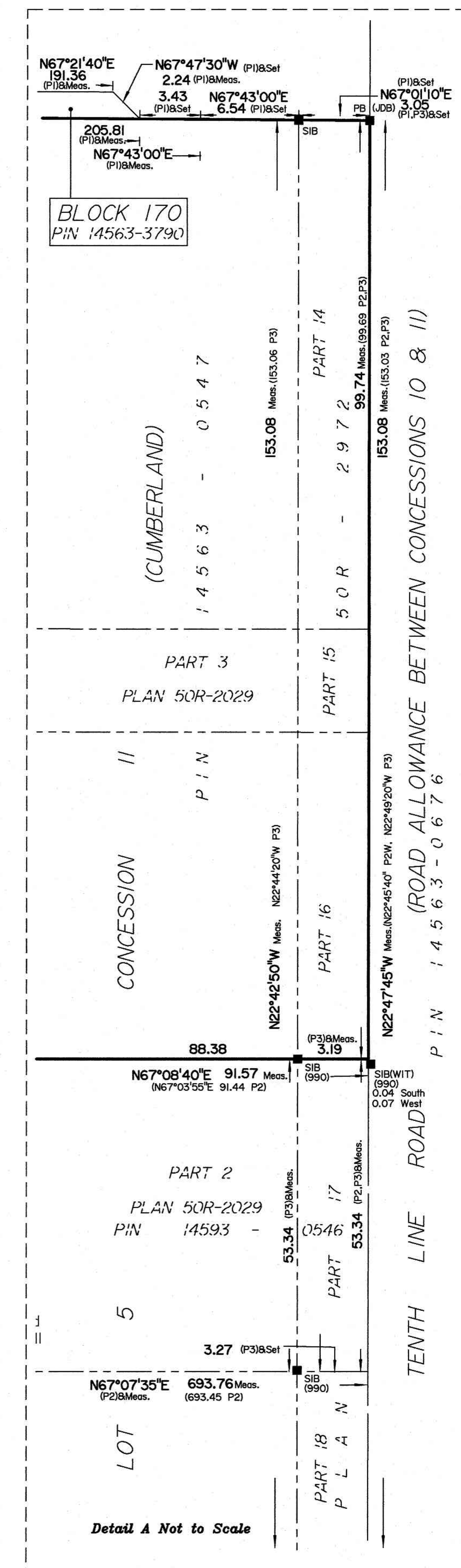
CONSEIL DES ÉCOLES CATHOLIQUES
DU CENTRE-EST
4000, RUE LABELLE, OTTAWA, ON K1J 1A1

DRAWING TITLE/TITRE DU DESSIN
SITE PLAN

		PROJ. No	ISSUE No	REV. No
SCALE ÉCHELLE	1:400	2215	0	0
DRAWN BY DESSINÉ PAR	S.P.	DRAWING/DESSIN		
CHECKED BY VÉRIFIÉ PAR	S.R./Z.O.J.	**A001**		
DATE	SEPTEMBER 2022	FICHIER ACAD FILE: 2215-A001.dwg		







TOPOGRAPHIC PLAN OF SURVEY OF

PART OF LOT 5
CONCESSION 11
Geographic Township of Cumberland
CITY OF OTTAWA

Surveyed by Annis, O'Sullivan, Vollebekk Ltd.

Scale 1 : 400

16 12 8 4 0 8 16 Metres

Metric

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

Surveyor's Certificate

I CERTIFY THAT :

1. This survey and plan are correct and in accordance with the Surveys Act, the Surveyors Act and the regulations made under them.
2. The survey was completed on the 10th day of February, 2023.

Feb 14, 2023
Date

T. Hartwick
Ontario Land Surveyor

Notes & Legend

	Denotes	
(monument symbol, open)	"	Survey Monument Planted
(monument symbol, solid)	"	Survey Monument Found
SIB	"	Standard Iron Bar
PB	"	Plastic Bar
Meas.	"	Measured
C/	"	Calculation per
(AOG)	"	Annis, O'Sullivan, Vollebekk Ltd.
(P1)	"	Registered Plan 4M-1668
(P2)	"	Plan 50R-2029
(P3)	"	Plan 50R-2972
(P4)	"	Plan 4R-33517
(P5)	"	Plan 4R-33311
(P6)	"	Plan 4R-32601
(P7)	"	Plan 4R-31218
(P8)	"	Plan 4R-33291
(tree symbol)	"	Deciduous Tree
(tree symbol)	"	Coniferous Tree
FH	"	Fire Hydrant
WV	"	Water Valve
MH-ST	"	Maintenance Hole (Storm Sewer)
MH-S	"	Maintenance Hole (Sanitary)
OHW	"	Overhead Wires
CB	"	Catch Basin
TB	"	Unidentified Terminal Box
CLF	"	Chain Link Fence
TOS	"	Top of Slope
BOS	"	Bottom of Slope
CSP	"	Corrugated Steel Pipe
DC	"	Ditch Centre
T/G	"	Top of Grate
Inv	"	Invert
(gate symbol)	"	Gate
UP	"	Utility Pole
AN	"	Anchor
Ø	"	Diameter
+ 65.00	"	Location of Elevations
+ 65.00	"	Top of Concrete Curb Elevation
(line)	"	Property Line

Bearings are grid, derived from Can-Net 2016 Real Time Network GPS observations, referenced to Specified Control Points 01919680184 and 019198434761, MTM Zone 9 (76°30' West Longitude) NAD-83 (original).

For bearing comparisons, a rotation of 0°42'10" counter-clockwise was applied to bearings on plan (P2).

Topographic data was collected under Winter Conditions. Snow cover and ice preclude determining location and elevation of some topographical data that is otherwise visible.

ELEVATION NOTES

1. Elevations shown are geodetic and are referred to the CGVD28 geodetic datum.
2. It is the responsibility of the user of this information to verify that the job benchmark has not been altered or disturbed and that it's relative elevation and description agrees with the information shown on this drawing.

UTILITY NOTES

1. This drawing cannot be accepted as acknowledging all of the utilities and it will be the responsibility of the user to contact the respective utility authorities for confirmation.
2. Only visible surface utilities were located.
3. A field location of underground plant by the pertinent utility authority is mandatory before any work involving breaking ground, probing, excavating etc.

ASSOCIATION OF ONTARIO LAND SURVEYORS
PLAN SUBMISSION FORM
V-44962

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

Ontario Land Surveyors
ANNIS, O'SULLIVAN, VOLLEBEKK LTD.
14 Concourse Gate, Suite 500
Nepean, Ont. K2E 7S6
Phone: (613) 727-0850 / Fax: (613) 727-1079
Email: Nepean@aovltd.com

Job No. 23602-22 ECCE PtLt5 CII CU T D2 | FL

Y:\2022\23602-22 Ecoles Catholiques Centre-Est_ Beside 2680 Tenth Line_TOPO_MA\Drawings\23602-22 ECCE PtLt5 C11 CU T D2.dwg

APPENDIX

B

- FIRE FLOW CALCULATION FOR BUILDING
- FIRE FLOW CALCULATION FOR PORTABLE CLASSROOM
- WATER DEMAND CALCULATION
- BOUNDARY CONDITION

Fire Flow Design Sheet (FUS)

2666 Tenth Line Road, City of Ottawa, Ontario

City of Ottawa

WSP Project No. 221-12984-00

Date: 16-Mar-23

Proposed Avalon III (2-Storey school block)Elementary school
Fire Flow Requirements Based on Fire Underwriters Survey (FUS) 2020

1. An estimate of the Fire Flow required for a given fire area may be estimated by: $F = 220\ C\ w\ A$

F = required fire flow in litres per minute
C = coefficient related to the type of construction
- 1.5 for **Type V** Wood Frame Construction
- 0.8 for **Type IV-A** Mass Timber Construction
- 0.9 for **Type IV-B** Mass Timber Construction
- 1.0 for **Type IV-C** Mass Timber Construction
- 1.5 for **Type IV-D** Mass Timber Construction
- 1.0 for **Type III** Ordinary Construction
- 0.8 for **Type II** Noncombustible Construction
- 0.6 for **Type I** Fire resistive Construction

A =2-b) The single largest Floor Area plus 25% of each of the two immediately adjoining floors

A = 2914 m^2
C = 0.8
F = 9500.3 L/min

rounded off to 10,000 L/min (min value of 2000 L/min)

2. The value obtained in 1. may be reduced by as much as 25% for occupancies having a low contents fire hazard.

Non-combustible	-25%
Limited Combustible	-15%
Combustible	0%
Free Burning	15%
Rapid Burning	25%

Reduction due to low occupancy hazard -15% x 10,000 = 8,500 L/min

3. The value obtained in 2. may be reduced by as much as 50% for buildings equipped with automatic sprinkler protection.

Adequate Sprinkler confirms to NFPA13	-30%
Water supply common for sprinklers & fire hoses	-10%
Fully supervised system	-10%
No Automatic Sprinkler System	0%

Reduction due to Sprinkler System -40% x 8,500 = -3,400 L/min

4. The value obtained in 2. is increased for structures exposed within 45 metres by the fire area under consideration.

Separation	Charge
0 to 3 m	25%
3.1 to 10 m	20%
10.1 to 20 m	15%
20.1 to 30 m	10%
30.1 to 45 m	0%

Side 1	30	10%	north side
Side 2	75	0%	east side
Side 3	7.5	20%	south side
Side 4	99	0%	west side
		30%	(Total shall not exceed 75%)

Increase due to separation 30% x 8,500 = 2,550 L/min

5. The flow requirement is the value obtained in 2., minus the reduction in 3., plus the addition in 4.

The fire flow requirement is 8,000 L/min (Rounded to nearest 1000 L/min)
or **133 L/sec**
or 2,113 gpm (us)
or 1,760 gpm (uk)

Based on method described in:
"Water Supply for Public Fire Protection - A Guide to Recommended Practice", 2020
by Fire Underwriters Survey

Fire Flow Design Sheet (FUS)
2666 Tenth Line Road, City of Ottawa, Ontario
City of Ottawa
WSP Project No. 221-12984-00
Date: 16-Mar-23

Proposed Avalon III (Portable Building)
Elementary school
Fire Flow Requirements Based on Fire Underwriters Survey (FUS) 2020

1. An estimate of the Fire Flow required for a given fire area may be estimated by: $F = 220\ C\ w\ A$

F = required fire flow in litres per minute
C = coefficient related to the type of construction
- 1.5 for **Type V** Wood Frame Construction
- 0.8 for **Type IV-A** Mass Timber Construction
- 0.9 for **Type IV-B** Mass Timber Construction
- 1.0 for **Type IV-C** Mass Timber Construction
- 1.5 for **Type IV-D** Mass Timber Construction
- 1.0 for **Type III** Ordinary Construction
- 0.8 for **Type II** Noncombustible Construction
- 0.6 for **Type I** Fire resistive Construction

A =2-b) The single largest Floor Area plus 25% of each of the two immediately adjoining floors

A = 214 m^2
C = 1.5
F = 4828.7 L/min

rounded off to 5,000 L/min (min value of 2000 L/min)

2. The value obtained in 1. may be reduced by as much as 25% for occupancies having a low contents fire hazard.

Non-combustible	-25%
Limited Combustible	-15%
Combustible	0%
Free Burning	15%
Rapid Burning	25%

Reduction due to low occupancy hazard -15% x 5,000 = 4,250 L/min

3. The value obtained in 2. may be reduced by as much as 50% for buildings equipped with automatic sprinkler protection.

Adequate Sprinkler confirms to NFPA13	-30%
Water supply common for sprinklers & fire hoses	-10%
Fully supervised system	-10%
No Automatic Sprinkler System	0%

Reduction due to Sprinkler System -10% x 4,250 = -425 L/min

4. The value obtained in 2. is increased for structures exposed within 45 metres by the fire area under consideration.

Separation	Charge
0 to 3 m	25%
3.1 to 10 m	20%
10.1 to 20 m	15%
20.1 to 30 m	10%
30.1 to 45 m	0%

Side 1	6	20%	north side
Side 2	75	0%	east side
Side 3	3.6	20%	south side
Side 4	99	0%	west side
		40%	(Total shall not exceed 75%)

Increase due to separation 40% x 4,250 = 1,700 L/min

5. The flow requirement is the value obtained in 2., minus the reduction in 3., plus the addition in 4.

The fire flow requirement is 6,000 L/min (Rounded to nearest 1000 L/min)
or **100 L/sec**
or 1,585 gpm (us)
or 1,320 gpm (uk)

Based on method described in:
"Water Supply for Public Fire Protection - A Guide to Recommended Practice", 2020
by Fire Underwriters Survey

Water Demand Calculation Sheet

Project:	**Avalon III Elementary school**	**Date:**	**2023-03-16**
Location:	**2666 Tenth Line Road, City of Ottawa, ON**	**Design:**	**N.N.**
WSP Project No.	**221-12984-00**	**Checked:**	**D.B.Y**
		Page:	**1 of 1**

Proposed Buildings	Residential				Non-Residential			Average Daily			Maximum Daily			Maximum Hourly			Fire
	Units			Beds	Industrial	Institutional	Commercial	Demand (l/s)			Demand (l/s)			Demand (l/s)			Demand
	SF	APT	ST		(ha)	(ha)	(ha)	Res.	Non-Res.	Total	Res.	Non-Res.	Total	Res.	Non-Res.	Total	(l/min)
Proposed Two Storey Elementary Schoool Bldg.						1.77			0.57	0.57		0.86	0.86		1.55	1.55	8,000

Population Densities	
Single Family	3.4 person/unit
Semi-Detached	2.7 person/unit
Duplex	2.3 person/unit
Townhome (Row)	2.7 person/unit
Bachelor Apartment	1.4 person/unit
1 Bedroom Apartment	1.4 person/unit
2 Bedroom Apartment	2.1 person/unit
3 Bedroom Apartment	3.1 person/unit
4 Bedroom Apartment	4.1 person/unit
Avg. Apartment	1.8 person/unit

Average Daily Demand	
Residential	280 l/cap/day
Industrial	35000 l/ha/day
Institutional	28000 l/ha/day
Commercial	28000 l/ha/day

Maximum Daily Demand	
Residential	2.5 x avg. day
Industrial	1.5 x avg. day
Institutional	1.5 x avg. day
Commercial	1.5 x avg. day

Maximum Hourly Demand	
Residential	2.2 x max. day
Industrial	1.8 x max. day
Institutional	1.8 x max. day
Commercial	1.8 x max. day

Boundary Conditions
2666 Tenth Line Rd

Provided Information

Scenario	Demand	
	L/min	L/s
Average Daily Demand	34	0.57
Maximum Daily Demand	52	0.86
Peak Hour	93	1.55
Fire Flow Demand #1	8,000	133.33

Location

Results

Connection 1 – Sweetvalley Dr.

Demand Scenario	Head (m)	Pressure[1] (psi)
Maximum HGL	130.3	62.9
Peak Hour	126.0	56.9
Max Day plus Fire 1	126.3	57.3

[1] Ground Elevation = 86.1 m

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.

Yang, Winston

From: Rasool, Rubina <Rubina.Rasool@ottawa.ca>
Sent: March 22, 2023 8:04 AM
To: Yang, Winston; Murshid, Shoma
Cc: Zofia Jurewicz; Nwanise, Nwanise
Subject: RE: Boundary condition request for 2666 Tenth Line Rd - CECCE Elementary School on Claridge Lands in Mer Bleue Expansion Urban Expansion Area 10
Attachments: 2666 Tenth Line Rd_Boundary_Condition(17March2023).docx

Hello Winston,

Please find attached the water boundary conditions,

Best,

Rubina

Rubina Rasool
Project Manager
Planning, Infrastructure and Economic Development Department
Development Review – East Branch
City of Ottawa
110 Laurier Avenue West Ottawa, ON K1P 1J1
rubina.rasool@ottawa.ca

From: Yang, Winston <Winston.Yang@wsp.com>
Sent: March 17, 2023 12:49 AM
To: Murshid, Shoma <Shoma.Murshid@ottawa.ca>; Rasool, Rubina <Rubina.Rasool@ottawa.ca>
Cc: Zofia Jurewicz <zofiaj@cuhaci.com>; Nwanise, Nwanise <Nwanise.Nwanise@wsp.com>; Baird, Natasha <Natasha.Baird@ottawa.ca>
Subject: Re: Boundary condition request for 2666 Tenth Line Rd - CECCE Elementary School on Claridge Lands in Mer Bleue Expansion Urban Expansion Area 10
Importance: High

Hi Shoma,

As per the pre-consultation meeting direction, here is the water supply boundary condition request for the proposed Avalon III Elementary School Development at 2666 Tenth Line Road in Orleans.
The site is proposed to be serviced from the existing 203mm diameter watermain stub from Sweetvalley Drive.

The proposed 2- storey elementary school block has the highest fire flow demand on the site and has been adopted as the worst case scenario. This building will be equipped with an automatic fire protection sprinkler system that complies with NFPA 13. There are two existing public fire hydrants on Sweetvalley Drive next to the subject site, both of which are within 45m of the building.

The domestic water demands were calculated using the City of Ottawa's Water Design Guidelines while fire demands were calculated using FUS 2020.
The results are summarized below:

Proposed Building	Average Daily Demand (l/s)	Maximum Daily Demand (l/s)	Maximum Hourly Demand (l/s)	Fire Demand (l/min)
Elementary School	0.57	0.86	1.55	8000

I have attached the Water demand, FUS calculation spreadsheet and Map showing conceptual water service connection for your review.

Thank you,

Winston Ding Bang Yang, P.Eng., PMP
Senior Civil Engineer
Land Development and Municipal Engineering - Ottawa

T+ 1 613-690-0538
M+ 1 647-628-8108

WSP Canada Inc.
2611 Queensview Drive Suite 300

Ottawa, Ontario
K2B 8K2

wsp.com

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APPENDIX

C

- SANITARY SEWER DESIGN SHEET

SANITARY SEWER DESIGN SHEET
New Orleans Catholic ES
Avalon III - Institutional Development
Ottawa, ON
Project: 221-12984-00
Date: March 31, 2023

LOCATION			RESIDENTIAL AREA AND POPULATION												INDUSTRIAL				COMMERCIAL		INSTITUTIONAL		I+C+I	INFILTRATION			TOTAL	PIPE					
LOCATION	FROM M.H.	TO M.H.	INDV AREA (ha)	ACCU AREA (ha)	NUMBER OF UNITS						POPULATION		PEAK FACT.	PEAK FLOW (l/s)	GROSS AREA (ha)	DEVEL. AREA (ha)	ACCU. AREA (ha)	PEAK FACTOR	INDIV AREA (ha)	ACCU. AREA (ha)	INDIV AREA (ha)	ACCU. AREA (ha)	PEAK FLOW (l/s)	INDIV AREA (ha)	ACCU. AREA (ha)	INFILT. FLOW (l/s)	**TOTAL FLOW (l/s)**	LENGTH (m)	DIA. (mm)	SLOPE (%)	CAP. (FULL) (l/s)	VEL. (FULL) (m/s)	AVAIL. CAP. (%)
					SINGLES	SEMIS	AVG TOWNS	STACKED TOWNS	2-BED APT.	3-BED APT.	INDIV POP.	ACCU POP.																					
CONTRIBUTION From place Pewee Place, Pipe 404A - 406 A																																	
CONTRIBUTION From place Pewee Place, Pipe 404A - 406 A				1.530								142		0.00										1.530	2.21							
	406A	408A	0.270	2.480			8.00				22	240	3.49	2.72										0.270	2.48	0.82	**3.54**	70.00	200	0.35	19.40	0.62	**81.78%**
promenade Sweetvalley Drive				2.480								240													2.48							
To promenade Sweetvalley Drive, Pipe 408A - 413A																																	
	401A	402A	0.490	0.490			14.00				38	38	3.67	0.45										0.490	0.49	0.16	**0.61**	110.50	200	0.70	27.44	0.87	**97.77%**
Contribution From Proposed school to EX. SANMH402A																																	
	School	*EX. SANMH402A*																			1.77	1.77	0.86	1.770	0.46	0.15	**1.01**	91.38	200	1.50	40.17	1.28	**97.48%**
	402A	4070A	0.110	0.110								0										1.77	0.86	0.110	0.57	0.19	**1.05**	63.00	200	0.65	26.44	0.84	**96.04%**
	4070A	407A	0.040	0.150								0										1.77	0.86	0.040	0.61	0.20	**1.06**	8.50	200	2.85	55.37	1.76	**98.08%**
			0.340	0.490			12.00				33	33										1.77	0.86	0.340	0.95								
	407A	408A	0.410	0.900	9						31	64	3.63	0.75								1.77	0.86	0.410	1.36	0.45	**2.06**	108.50	200	0.70	27.44	0.87	**92.48%**
Contribution From rang Catleaf Row, Pipe 406A - 408A			2.480	2.480								240										1.77	0.86	2.480	3.84							
	408A	413A	0.310	3.690	7						24	328	3.45	3.67								1.77	0.86	0.310	4.15	1.37	**5.90**	71.00	200	0.35	19.40	0.62	**69.61%**
Contribution From croissant Mudminnow Crescent, Pipe 412A - 413A			1.120	1.120								96										1.77	0.86	1.120	5.27							
	413A	426A	0.230	5.040	4						14	438	3.40	4.83								1.77	0.86	0.230	5.50	1.82	**7.50**	74.50	200	0.35	19.40	0.62	**61.32%**
Contribution From croissant Mudminnow Crescent, Pipe 415A - 426A			9.830	9.830								681										1.77	0.86	9.830	15.33							
Contribution From cercle Henslow's Circle, Pipe 425A - 426A			3.060	3.060								211										1.77	0.86	3.060	18.39							
	426A	*EX. 110A*	0.06	17.99								1330	3.17	13.68								1.77	0.86	0.060	18.45	6.09	**20.63**	39.50	250	0.25	29.73	0.61	**30.63%**

DESIGN PARAMETERS

RESIDENTIAL AVG. DAILY FLOW =	280	COMMERCIAL PEAK FACTOR =	1.5	(WHEN AREA > 20%)	PEAK POPULATION FLOW, (l/s) =	P*q*M/86400	UNIT TYPE / PERSONS/UNIT
COMMERCIAL AVG. DAILY FLOW =	28,000		1.0	(WHEN AREA < 20%)	PEAK EXTRANEOUS FLOW, (l/s) =	I*Ac	SINGLES 3.4
	0.324				RESIDENTIAL PEAKING FACTOR, M =	1+(14/(4+P^0.5))*K	SEMI-DETACHED 2.7
INSTITUTIONAL AVG. DAILY FLOW =	28,000	INSTITUTIONAL PEAK FACTOR =	1.5	(WHEN AREA > 20%)	Ac = CUMULATIVE AREA (ha)		TOWNHOMES 2.7
	0.324		1.0	(WHEN AREA < 20%)	P = POPULATION (THOUSANDS)		WALK UP TOWNS 1.8
LIGHT INDUSTRIAL FLOW =	35,000						2-BED APT. UNIT 2.1
	0.405	RESIDENTIAL CORRECTION FACTOR, K =	0.80		SEWER CAPACITY, Qcap (l/s) =	1/N S^(1/2) R^(2/3) Ac	3-BED APT. UNIT 3.1
HEAVY INDUSTRIAL FLOW =	55,000	MANNING N =	0.013		(MANNING'S EQUATION)		
	0.637	PEAK EXTRANEOUS FLOW, I (l/s/ha) =	0.33				

DESIGNED:	NO.	REVISION	DATE
M.S.	1.	City Submission No.1	2023-03-31
CHECKED:			
D.B.Y			
PROJECT:			
Avalon III Elementary School			
Institutional Development			
LOCATION:			
Ottawa, Ontario			
PAGE NO:	**FILE & DWG. REFERENCE:**		
1 of 1	F2		

AVALON WEST
(NEIGHBOURHOOD 5)
SWM FACILITY
REFER TO
IBI GROUP
PROJECT No. 30113

SUMMERSIDE WEST PHASE I
REFER TO
DAVID SCHAEFFER ENGINEERING LIMITED
PROJECT No. 12-609

AVALON - STAGE 11
(REG. PLAN 4M-1352)

TENTH LINE

TENTH LINE ROAD

McKinnon's Creek

SWM POND
PERMANENT W/L 83.15m
100 YEAR W/L 84.54m

cercle Henslow's Circle

croissant Mudminnow Crescent

cours Cottontail Walk

promenade Sweetvalley Drive

rang Catleaf Row

place Newer Place

rue Mandalay Street

150A- 15A
0.08 | INF.

150A- 15A
1.19

TOTAL Q=5.52 L/S
FROM PARK

150A- 15A
0.47

421A-422A
0.07 | 4

422A-425A
0.26 | 17

425A-426A
0.27 | 17

426A- 110A
0.06 | INF.

420A-421A
0.60 | 51

419A- 420A
0.20 | 11

418A-419A
0.32 | 17

417A-418A
0.36 | 21

416A-417A
0.10 | 4

424A-425A
0.50 | 41

423A-424A
0.38 | 28

413A-426A
0.23 | 14

408A-413A
0.31 | 24

407A- 408A
0.41 | 31

11A -150A
0.03 | INF.

110A- 11A
0.06 | INF.

10A - 11A
0.43 | 38

9A - 10A
0.03 | 3

9A - 10A
0.34 | 31

6A - 9A
0.34 | 44

8A - 9A
0.18 | 17

1A - 7A
0.24 | 33

7A - 8A
0.05 | 3

415A-426A
0.34 | 28

414A-415A
0.80 | 68

410A-409A
0.23 | 17

412A-413A
0.57 | 48

411A-412A
0.55 | 48

411A-410A
0.06 | 4

409A-414A
0.06 | 4

406A-408A
0.27 | 22

405A-406A
0.68 | 76

404A-406A
0.16 | 17

407A-408A
0.34 | 33

402A-404A
0.27 | 22

403A-404A
0.61 | 71

401A-402A
0.49 | 38

4070A 407A
0.04 | INF.

402A-4070A
0.11 | INF.

3.32 | 366

A=0.92Ha
INFILTRATION

A=47.51Ha
POP=3558
RESIDENTIAL

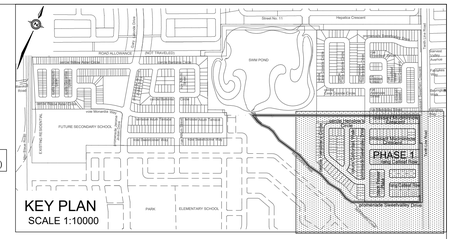
A=3.83Ha
COMMERCIAL

A=2.54Ha
INSTITUTIONAL

A=8.35Ha
PARK

A=8.34Ha
67 | POP=560
RESIDENTIAL

Q = 147.37 L/S
FROM PUMP STATION
VIA FORCEMAIN



LEGEND

- SANITARY DRAINAGE BOUNDARY
- SANITARY SUB-DRAINAGE BOUNDARY
- SANITARY DRAINAGE BOUNDARY (OTHER PHASES)
- UPSTREAM MH TO DOWNSTREAM MH — 43A - 44A
- AREA IN HECTARES — 0.78 | 61
- POPULATION
- UPSTREAM MH TO DOWNSTREAM MH — 43A-44A
- AREA IN OTHER PHASES IN HECTARES — 0.78 | 61
- POPULATION
- EXTERNAL AREA IN HECTARES — A=18.99Ha
- EXTERNAL POPULATION — 65 | POP=1242
- DENSITY (PERSONS/HECTARE)
- EXTERNAL LAND USE — RESIDENTIAL
- 200mmø SAN — MH202A
- MAINTENANCE HOLE
- CAP

TOPOGRAPHIC INFORMATION

TOPOGRAPHIC INFORMATION PROVIDED BY J.D. BARNES LIMITED,
PROJECT No. 17-10-025-01, SURVEY DATED AUGUST 01, 2018.
CITY OF OTTAWA 2K MAPPING, RECEIVED ON MARCH 04, 2013.

LEGAL INFORMATION

CALCULATED M-PLAN PROVIDED BY J.D. BARNES LIMITED,
PROJECT No. 17-10-025-00 MP1, RECEIVED ON JUNE 04, 2019.

2nd SUBMISSION 19-06-21

NOT FOR CONSTRUCTION

BENCH MARK No. 01919680229 ELEVATION = 86.120 m

ELEVATIONS SHOWN ON THIS PLAN ARE RELATED TO GEODETIC DATUM AND ARE DERIVED FROM THE NCC BENCH MARK No. 01919680229 HAVING A PUBLISHED ELEVATION OF 86.120 METRES.

TOWNSHIP: CUMBERLAND

CONCRETE MONUMENT ON THE EAST SIDE OF MER BLEUE ROAD, 0.15KM NORTH OF ROAD INTERSECTION WITH NAVAN ROAD.

No.	DATE	BY	DESCRIPTION
2.	19-06-21	W.L.	2nd SUBMISSION
1.	18-11-15	W.L.	1st SUBMISSION

Ottawa CITY OF OTTAWA

PROJECT No. 15-766

LICENSED PROFESSIONAL ENGINEER
W. LIU
100167932
19-06-21
PROVINCE OF ONTARIO

SANITARY DRAINAGE PLAN

MATTAMY (MER BLEUE 2) LIMITED

SUMMERSIDE SOUTH
PHASE 1

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

DRAWN BY:	V.W./S.L.	CHECKED BY:	P.P./C.M.	DRAWING NO.	SHEET NO.
DESIGNED BY:	P.P./W.L	CHECKED BY:	K.M.		33
SCALE:	1:1000	DATE:	NOVEMBER 2018		

CITY FILE No. D07-16-17-0028 CITY PLAN No. 17857

SANITARY SEWER CALCULATION SHEET

Manning's n=0.013

LOCATION			RESIDENTIAL AREA AND POPULATION									COMM		INSTIT		PARK				I+C+I+P	INFILTRATION				PIPE						
STREET	FROM M.H.	TO M.H.	AREA (ha)	UNITS	UNITS Singles	UNITS Townhouse	POP.	CUMULATIVE AREA (ha)	CUMULATIVE POP.	PEAK FACT.	PEAK FLOW (l/s)	AREA (ha)	ACCU. AREA (ha)	AREA (ha)	ACCU. AREA (ha)	AREA (ha)	ACCU. AREA (ha)	ICI Ratio	ICI Peaking Factor	PEAK FLOW (l/s)	TOTAL AREA (ha)	ACCU. AREA (ha)	INFILT. FLOW (l/s)	TOTAL FLOW (l/s)	DIST (m)	DIA (mm)	SLOPE (%)	CAP. (FULL) (l/s)	RATIO Q act/Q cap	VEL. (FULL.) (m/s)	VEL. (ACT.) (m/s)
Contribution From place Pewee Place, Pipe 404A - 406A								1.53	142												1.53	2.21									
	406A	408A	0.27	8		8	22	2.48	240	3.49	2.72										0.27	2.48	0.82	3.54	70.0	200	0.35	19.40	0.18	0.62	0.47
To promenade Sweetvalley Drive, Pipe 408A - 413A								2.48	240													2.48									
promenade Sweetvalley Drive																															
	401A	402A	0.49	14		14	38	0.49	38	3.67	0.45										0.49	0.49	0.16	0.61	110.5	200	0.70	27.44	0.02	0.87	0.35
To place Pewee Place, Pipe 402A - 404A								0.49	38													0.49									
	402A	4070A	0.11					0.11	0												0.11	0.11	0.04	0.04	63.0	200	0.65	26.44	0.00	0.84	0.14
	4070A	407A	0.04					0.15	0												0.04	0.15	0.05	0.05	8.5	200	2.85	55.37	0.00	1.76	0.25
			0.34	12		12	33	0.49	33												0.34	0.49									
	407A	408A	0.41	9	9		31	0.90	64	3.63	0.75										0.41	0.90	0.30	1.05	108.5	200	0.70	27.44	0.04	0.87	0.41
Contribution From rang Catleaf Row, Pipe 406A - 408A								2.48	240												2.48	3.38									
	408A	413A	0.31	7	7		24	3.69	328	3.45	3.67										0.31	3.69	1.22	4.88	71.0	200	0.35	19.40	0.25	0.62	0.51
Contribution From croissant Mudminnow Crescent, Pipe 412A - 413A								1.12	96												1.12	4.81									
	413A	426A	0.23	4	4		14	5.04	438	3.40	4.83										0.23	5.04	1.66	6.49	74.5	200	0.35	19.40	0.33	0.62	0.55
Contribution From croissant Mudminnow Crescent, Pipe 415A - 426A								9.83	681												9.83	14.87									
Contribution From cercle Henslow's Circle, Pipe 425A - 426A								3.06	211												3.06	17.93									
	426A	*Ex. 110A*	0.06					17.99	1330	3.17	13.68										0.06	17.99	5.94	19.61	39.5	250	0.25	29.73	0.66	0.61	0.65

Add a row for the proposed school site here

Copy these runs to our sanitary sewer design sheet template

LICENSED PROFESSIONAL ENGINEER
P.E. MORENO PICKART
100215995
PROVINCE OF ONTARIO

DESIGN PARAMETERS

Park Flow =	9300	L/ha/da
Average Daily Flow =	280	l/p/day
Comm/Inst Flow =	28000	L/ha/da
Industrial Flow =	35000	L/ha/da
Max Res. Peak Factor =	4.00	
Park Peak Factor =	1.50	

Industrial Peak Factor = as per MOE Graph

Extraneous Flow =	0.330	L/s/ha	
Minimum Velocity =	0.600	m/s	
Manning's n = (Conc)	0.013	(Pvc)	0.013
Townhouse coeff=	2.7		
Single house coeff=	3.4		

Designed: C.M.K.

Checked: P.P.

Dwg. Reference: Sanitary Drainage Plan, Dwg. No. 34

PROJECT: **SUMMERSIDE SOUTH PHASE 1**

LOCATION: **City of Ottawa**

File Ref: 15-766 | Date: **June, 2019** | Sheet No. 2 of 2

766_SAN_2_Updated.xlsx

APPENDIX

D

- STORM SEWER DESIGN SHEET
- STORMWATER MANAGEMENT CALCULATIONS
- FIGURE 1 – CONCEPTUAL GRADING PLAN
- FIGURE 2 – CONCEPTUAL SERVICING PLAN
- FIGURE 3 – CONCEPTUAL DRAINAGE AREA PLAN

STORM SEWER DESIGN SHEET
New Orleans Catholic ES
Avalon III - Institutional Development
Ottawa, ON
Project: 221-12984-00
Date: March 31, 2023

LOCATION				AREA (Ha)						RATIONAL DESIGN FLOW												PROPSOED SEWER DATA								
STREET	AREA ID	FROM	TO	C= 0.25	C= 0.50	C= 0.70	C= 0.80	C= 0.90	C= 1.00	IND 2.78AC	CUM 2.78 AC	INLET (min)	TOTAL (min)	i (2) (mm/hr)	i (5) (mm/hr)	i (100) (mm/hr)	BLDG FLOW (L/s)	2yr PEAK FLOW (L/s)	5yr PEAK FLOW (L/s)	100yr PEAK FLOW (L/s)	ICD FIXED FLOW (L/s)	DESIGN FLOW (L/s)	MODIFIED DESIGN FLOW (L/s)	MATERIAL PIPE	SIZE (mm)	SLOPE (%)	LENGTH (m)	CAPACITY (l/s)	VELOCITY (m/s)	TIME IN PIPE	AVAIL CAP (2yr) (L/s)	AVAIL CAP (2yr) (%)
To Sweetvalley Drive																															
	BLOCK 18	CB04	CBMH04	0.057				0.047		0.157	0.157	10.00	10.44	76.81	104.19	178.56		12.07				12.07		PVC DR-35	200.0	1.00	27.80	32.83	1.04	0.44	20.76	63.22%
	BLOCK 17	CBMH04	CBMH03	0.058				0.023		0.098	0.255	10.44	10.75	75.14	101.91	174.60		19.17				19.17		PVC DR-35	300.0	1.00	25.50	96.80	1.37	0.31	77.63	80.20%
	BLOCK 10 & 13	CB03	CBMH03	0.121				0.001		0.087	0.087	10.00	11.76	76.81	104.19	178.56		6.65				6.65		PVC DR-35	200.0	1.00	110.00	32.83	1.04	1.76	26.18	79.74%
	BLOCK 9 & 14	CBMH03	CBMH02	0.122				0.108		0.355	0.697	11.76	12.84	70.66	95.75	163.96		49.23				49.23		PVC DR-35	300.0	0.50	63.01	68.45	0.97	1.09	19.22	28.08%
	BLOCK 7 & 11	CB02	CBMH02	0.134						0.093	0.093	10.00	10.47	76.81	104.19	178.56		7.15				7.15		PVC DR-35	200.0	1.00	29.21	32.83	1.04	0.47	25.68	78.21%
	BLOCK 8 & 12	CBMH02	CBMH01	0.088				0.097		0.304	1.094	12.84	13.20	67.38	91.25	156.17		73.69				73.69		PVC DR-35	375.0	0.40	21.61	111.00	1.00	0.36	37.31	33.61%
	BLOCK 1 & 2	CB01	CBMH01	0.118				0.105		0.345	0.345	10.00	10.75	76.81	104.19	178.56		26.48				26.48		PVC DR-35	200.0	1.00	47.01	32.83	1.04	0.75	6.36	19.36%
	BLOCK 3 & 4	CBMH01	STMH01	0.021				0.197		0.507	1.946	13.20	13.24	66.37	89.86	153.78		129.15				129.15		PVC DR-35	450.0	0.40	2.37	180.50	1.13	0.03	51.35	28.45%
	BLOCK 6	BLDG	STMH01						0.232	0.645	0.645	10.00	10.50	76.81	104.19	178.56		49.54				49.54		PVC DR-35	300.0	1.00	41.17	96.80	1.37	0.50	47.26	48.83%
	SCHOOL ENTRANCE	STMH01	*EX. STM CONTROL MH1*							0.000	2.591	13.24	13.45	66.27	89.73	153.55		171.70				171.70		PVC DR-35	525.0	0.30	13.72	235.79	1.09	0.21	64.09	27.18%
		EX. STM CONTROL MH1	*EX.STMH402A*							0.000	2.591	13.45	13.54	65.70	88.94	152.19		170.21				170.21		CONC	900.0	0.20	7.50	810.41	1.27	0.10	640.20	79.00%

Definition:
Q=2.78CiA, where:
Q = Peak Flow in Litres per Second (L/s)
A = Area in Hectares (Ha)
i = Rainfall Intensity in millimeters per hour (mm/hr)
i = 732.951/(TC+6.199)^0.810 — 2 Year
i = 1174.184/(TC+6.014)^0.816 — 5 Year
i = 1735.688/(TC+6.014)^0.820 — 100 Year

Notes:
1. Mannings coefficient (n) = 0.013

Time-of-Concentration in the Swale
FAA Equation: t (min) = 3.258 [(1.1 - C) L^0.5 / S^.33]
Where: Longest Watercourse Length, L (m). S (%)
Runoff Coef.C = Impervious

No.	L (m)	S %	Tc (min)
			#DIV/0!

Designed: M.S.
Checked: W.Y
Dwg. Reference: F03

No.	Revision	Date
1.	City Submission No. 1	2023-03-31

File Reference: 221-12984-00 | **Date:** 2023-03-31 | **Sheet No:** 1 of 1

New Orleans Catholic ES
Avalon III - Institutional Development
Ottawa, ON
Project: 221-12984-00

Stormwater Management Summary

Drainage Area I.D.	Location	Sub Area (ha)	Avg. Composite 'C' 5 yr	Avg. Composite 'C' 100 yr	Outlet Location	5 Year Uncontrolled/ Controlled Release (L/s)	5 year Storage Required (m^3)	100 Year Uncontrolled/ Controlled Release (L/s)	100 year Storage Required (m^3)	Total Storage Provided (m^3)
					Total Allowable Release Rate			**255.62**		
CONTROLLED										
S1 - S18	CB01	1.297	0.61	0.67	Sweet Valley Drive	190.45	47.82	195.82	187.62	500.00
S6	STMH01	0.232	1.00	1.00	Sweet Valley Drive	17.64	33.20	17.64	73.98	93.00
UNCONTROLLED										
UC (S5,S6 S15)		0.236	0.260	0.32		17.80		37.50		
					Maximum Release Rate (WSP, 2023)			**250.96**		
Total		1.765				225.89	81.03	250.96	261.60	593.00

New Orleans Catholic ES
Avalon III - Institutional Development
Ottawa, ON
Project: 221-12984-00

Table 1a - Allowable Release Rate (Pre-Development)

Runoff Coefficient Equation

$C = (A_{hard} \times 0.9 + A_{soft} \times 0.25)/A_{tot}$

5 Year Event

	C	Intensity	Area
5 Year	0.50	104.19	1.765
2.78CIA=	255.62		
	255.62	L/s	

*Use a 10.00 minute time of concentration for 5 year

Design Parameters (DSEL & JFSA, June 2019)

Area ID	Area (HA)	MH	D/S Segment	IMP Ratio	Storage Use (m^3)	2 Year Simulated Flow (L/s)
402 - 404	3.32	CTRL MH1	402	0.80	447.13	567

Note: *Assumed ponding volume.
Assumes that on-site storage will be provided up to the 100 year 3 hour Chicago event

Equations:

Flow Equation

Q = 2.78 x C x I x A

Where:

C is the runoff coefficient

I is the intensity of rainfall, City of Ottawa IDF

Rainfall Intensity = $998.071/(T+6.053)^{\wedge -0.814}$ T= time in minutes

A is the total drainage area

New Orleans Catholic ES
Avalon III - Institutional Development
Ottawa, ON
Project: 221-12984-00

TABLE 2 - Uncontrolled Flow to Tenth Line and Sweetvally Drive

Post Dev run-off Coefficient "C"

			2 & 5 Year Event		100 Year Event	
Area	**Surface**	**Ha**	**"C"**	**C_{avg}**	**"C"+25%**	***C_{avg}**
Total	Asphalt	0.004	0.90	**0.26**	0.99	**0.32**
0.236	Roof	0.000	1.00		1.00	
	Grass	0.232	0.25		0.31	

Runoff Coefficient Equation

$C = (A_{hard} \times 0.9 + A_{soft} \times 0.2)/A_{tot}$

$*C = (A_{hard} \times 1.0 + A_{soft} \times 0.25)/A_{tot}$

*Runoff coefficients increased by 25% up to a maximum value of 0.99 for the 100-Year event

Post Dev Free Flow

2 Year Event

Pre Dev.	**C**	**Intensity**	**Area**
5 Year	0.26	104.19	0.236
2.78CIA=	17.77		
17.80	L/S		

**Use a 10 minute time of concentration for 5 year

100 Year Event

Pre Dev.	**C**	**Intensity**	**Area**
100 Year	0.32	178.56	0.236
2.78CIA=	37.49		
37.50	L/S		

**Use a 10 minute time of concentration for 100 year

Equations:

Flow Equation

Q = 2.78 x C x I x A

Where:

C is the runoff coefficient

I is the intensity of rainfall, City of Ottawa IDF

A is the total drainage area

New Orleans Catholic ES
Avalon III - Institutional Development
Ottawa, ON
Project: 221-12984-00

TABLE 3 - Storage Required for New Avalon III ES

Maximum Allowable Release Rate to Ex. CTRL MH1:
200.48 l/s

Post Dev run-off Coefficient "C"

			2 & 5 Year Event		100 Year Event	
Area	Surface	Ha	"C"	C_{avg}	"C" x 1.25	$C_{100\ avg}$
Total	Asphalt	0.578	0.90	**0.61**	0.99	**0.67**
1.529	Roof	0.232	1.00		1.00	
	Grass	0.719	0.25		0.31	

*Areas are approximate based on Architectural site plan and Storm Draiange Area Plan

Runoff Coefficient Equation
$C = (A_{hard} \times 0.9 + A_{soft} \times 0.2)/A_{tot}$
$*C = (A_{hard} \times 1.0 + A_{soft} \times 0.25)/A_{tot}$

*Runoff coefficients increased by 25% up to a maximum value of 0.99 for the 100-Year event

QUANTITY STORAGE REQUIREMENTS - 5 Year

1.529 = Area(ha)
0.61 = C
200.5 l/s = max allowable release rate

Return Period	Time (min)	Intensity (mm/hr)	Flow Q (L/s)	Controlled Runoff (L/s)	Net Runoff To Be Stored (L/s)	Storage Req'd m^3	Storage Avail m^3
	10	**104.19**	**270.16**	**190.45**	**79.71**	**47.82**	**500.00**
	20	70.25	182.15	190.45	-8.30	-9.96	500.00
	30	53.93	139.83	190.45	-50.63	-91.13	500.00
5 YEAR	40	44.18	114.56	190.45	-75.89	-182.13	500.00
	50	37.65	97.63	190.45	-92.82	-278.47	500.00
	60	32.94	85.42	190.45	-105.04	-378.13	500.00

Orifice #1 Sizing
CBMH01

Event	Flow (L/s)	Head (m)	ORIFICE AREA(m^2)	SQUARE (1-side mm)	CIRC (mmØ)
5 Year	190.45	2.98	0.042	204	230
100 Year	195.82	3.15	0.042	204	230

Orifice Control Sizing
$Q = 0.6 \times A \times (2gh)1/2$
Where:
Q is the release rate in m^3/s
A is the orifice area in m^2
g is the acceleration due to gravity, $9.81 m/s^2$
h is the head of water above the orifice centre in m
d is the diameter of the orifice in m

QUANTITY STORAGE REQUIREMENTS - 100 Year

1.529 = Area(ha)
0.67 = *C
200.5 l/s = max allowable release rate

Return Period	Time (min)	Intensity (mm/hr)	Flow Q (L/s)	Controlled Runoff (L/s)	Net Runoff To Be Stored (L/s)	Storage Req'd m^3	Storage Avail m^3
	10	**178.56**	**508.52**	**195.82**	**312.70**	**187.62**	**500.00**
	20	119.95	341.61	195.82	145.79	174.95	500.00
100 YEAR	30	91.87	261.63	195.82	65.81	118.46	500.00
	40	75.15	214.01	195.82	18.19	43.65	500.00
	50	63.95	182.14	195.82	-13.68	-41.05	500.00
	60	55.89	159.18	195.82	-36.64	-131.89	500.00
	70	49.79	141.80	195.82	-54.02	-226.90	500.00

Orifice Invert =	84.000	m
Ponding Elevation =	87.260	m
Top of CB Elevation =	87.090	m

Note: Orifice #1 is located on the downstream invert of CBMH01

Equations:

Flow Equation
$Q = 2.78 \times C \times I \times A$
Where:
C is the runoff coefficient
I is the intensity of rainfall, City of Ottawa IDF
A is the total drainage area

New Orleans Catholic ES
Avalon III - Institutional Development
Ottawa, ON
Project: 221-12984-00

TABLE 4 - Proposed Roof Drains

Roof Drains Release Rate

Total Roof Area =	0.232	Ha
Total Roof Ponding Area =	0.186	Ha
Ponding Depth =	0.07 ~ 0.15	m
The flow rate through each Roof Drain will be =	5 ~ 25.0	gpm
	0.32 ~ 1.58	L/s
Estimated Number of Roof Drains =	14.00	
Estimated Total flow rate =	17.64	

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

Post Dev run-off Coefficient "C"

			2 & 5 Year Event		100 Year Event	
Area	Surface	Ha	"C"	C_{avg}	"C" x 1.25	$C_{100\ avg}$
Total	Asphalt		0.90	**1.00**	0.99	**1.00**
0.232	Roof	0.232	1.00		1.00	
	Grass		0.25		0.31	

*Areas are approximate based on Architectural site plan

Runoff Coefficient Equation
$C = (A_{hard} \times 0.9 + A_{soft} \times 0.2)/A_{tot}$
$*C = (A_{hard} \times 1.0 + A_{soft} \times 0.25)/A_{tot}$

*Runoff coefficients increased by 25% up to a maximum value of 0.99 for the 100-Year event

QUANTITY STORAGE REQUIREMENTS - 5 Year

0.232 = Area(ha)
1.00 = C

Return Period	Time (min)	Intensity (mm/hr)	Flow Q (L/s)	Allowable Runoff (L/s)	Net Runoff To Be Stored (L/s)	Storage Req'd (m^3)	Storage Available* (m^3)
	10	104.19	67.20	17.64	49.56	29.74	93.00
	20	70.25	45.31	17.64	27.67	33.20	93.00
5 YEAR	**30**	**53.93**	**34.78**	**17.64**	**17.14**	**30.85**	**93.00**
	40	44.18	28.50	17.64	10.86	26.06	93.00
	50	37.65	24.28	17.64	6.64	19.93	93.00

257.340 40
345 54.1752

QUANTITY STORAGE REQUIREMENTS - 100 Year

0.232 = Area(ha)
1.00 = *C

Return Period	Time (min)	Intensity (mm/hr)	Flow Q (L/s)	Allowable Runoff (L/s)	Net Runoff To Be Stored (L/s)	Storage Req'd (m^3)	Storage Available (m^3)
	10	178.56	115.16	17.64	97.52	58.51	93.00
	20	119.95	77.36	17.64	59.72	71.67	93.00
100 YEAR	**30**	**91.87**	**59.25**	**17.64**	**41.61**	**74.90**	**93.00**
	40	75.15	48.47	17.64	30.83	73.98	93.00
	50	63.95	41.25	17.64	23.61	70.82	93.00
	60	55.89	36.05	17.64	18.41	66.28	93.00
	70	49.79	32.11	17.64	14.47	60.78	93.00

*Storage available is calculated using roof ponding area mulitplied by the maximum ponding depth, and divided by 3 for a conical pond.

Equations:

Flow Equation
Q = 2.78 x C x I x A
Where:
C is the runoff coefficient
I is the intensity of rainfall, City of Ottawa IDF
A is the total drainage area

AVALON WEST (NEIGHBOURHOOD 5) SWM FACILITY REFER TO IBI GROUP PROJECT No. 30113

SUMMERSIDE WEST PHASE I REFER TO DAVID SCHAEFFER ENGINEERING LIMITED PROJECT No. 12-609

Q_{MAX} = 50 L/S (5 YR)

SWM POND
PERMANENT W/L 83.15m
100 YEAR W/L 84.54m

McKinnon's Creek

cercle Casa Grande Circle

rue Astervale Street

rue Wandalay Street

croissant Sweetfern

croissant Sweetfern

TENTH LINE ROAD

AVALON - STAGE 11 (REG. PLAN 4M-1352)

FAIRLAKES WAY

cercle Henslow's Circle

croissant Mudminnow Crescent

cours Cottontail Walk

promenade Sweetvalley Drive

croissant Mudminnow Crescent

rang Catleaf Row

place Pewee Place

promenade Sweetvalley Drive

TENTH LINE ROAD

Q_{MAX} = 733 L/S (10 YR)

Q_{MAX} = 567 L/S (2 YR)

KEY PLAN
SCALE 1:10000

PHASE 1

LEGEND

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

TOPOGRAPHIC INFORMATION

TOPOGRAPHIC INFORMATION PROVIDED BY J.D. BARNES LIMITED, PROJECT No. 17-10-025-01. SURVEY DATED AUGUST 01, 2018. CITY OF OTTAWA 2K MAPPING, RECEIVED ON MARCH 04, 2013.

LEGAL INFORMATION

CALCULATED M-PLAN PROVIDED BY J.D. BARNES LIMITED, PROJECT No. 17-10-025-00 MP1, RECEIVED ON JUNE 04, 2019.

2nd SUBMISSION 19-06-21

NOT FOR CONSTRUCTION

BENCH MARK No. 01919680229 ELEVATION = 86.120 m

ELEVATIONS SHOWN ON THIS PLAN ARE RELATED TO GEODETIC DATUM AND ARE DERIVED FROM THE NCC BENCH MARK No. 01919680229 HAVING A PUBLISHED ELEVATION OF 86.120 METRES.

TOWNSHIP: CUMBERLAND

CONCRETE MONUMENT ON THE EAST SIDE OF MER BLEUE ROAD, 0.15KM NORTH OF ROAD INTERSECTION WITH NAVAN ROAD.

No.	DATE	BY	DESCRIPTION
2.	19-06-21	W.L.	2nd SUBMISSION
1.	18-11-15	W.L.	1st SUBMISSION

CITY OF OTTAWA

PROJECT No. 15-766

LICENSED PROFESSIONAL ENGINEER W. LIU 100167932 19-06-21 PROVINCE OF ONTARIO

STORM DRAINAGE PLAN

MATTAMY (MER BLEUE 2) LIMITED

SUMMERSIDE SOUTH PHASE 1

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

DRAWN BY:	V.W./S.L.	CHECKED BY:	P.P./C.M.	DRAWING NO.	SHEET NO.
DESIGNED BY:	P.P./W.L	CHECKED BY:	K.M.		34
SCALE:	1:1000	DATE:	NOVEMBER 2018		

EXTERNAL PRE-DEVELOPMENT STORM DRAINAGE PLAN

SCALE: 1:3000

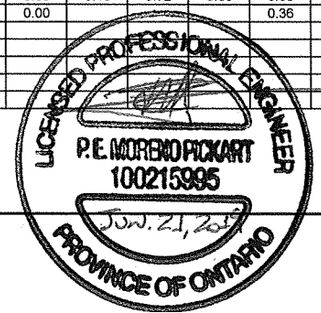
CITY FILE No. D07-16-17-0028 CITY PLAN No. 17857

STORM SEWER CALCULATION SHEET (RATIONAL METHOD)

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

Ottawa

Location	LOCATION From Node	To Node	AREA (Ha) 2 YEAR AREA (Ha)	R	Indiv. 2.78 AC	Accum. 2.78 AC	5 YEAR AREA (Ha)	R	Indiv. 2.78 AC	Accum. 2.78 AC	10 YEAR AREA (Ha)	R	Indiv. 2.78 AC	Accum. 2.78 AC	100 YEAR AREA (Ha)	R	Indiv. 2.78 AC	Accum. 2.78 AC	FLOW Time of Conc. (min)	Intensity 2 Year (mm/h)	Intensity 5 Year (mm/h)	Intensity 10 Year (mm/h)	Intensity 100 Year (mm/h)	Peak Flow Q (l/s)	SEWER DATA DIA. (mm) (actual)	DIA. (mm) (nominal)	TYPE	SLOPE (%)	LENGTH (m)	CAPACITY (l/s)	VELOCITY (m/s)	TIME OF FLOW (min.)	RATIO Q/Q full
cours Cottontail Walk																																	
	Ctrl MH 2	420			0.00	0.00	0.43	0.40	0.48	0.48			0.00	0.00			0.00	0.00	10.00	76.81	104.19	122.14	178.56	50	300	300	PVC	0.50	9.0	68	0.97	0.16	0.73
To cercle Henslow's Circle, Pipe 420 - 421						0.00				0.48				0.00				0.00	10.16														
			0.36	0.70	0.70	0.70			0.00	0.00			0.00	0.00			0.00	0.00															
	418	419	0.47	0.57	0.74	1.45			0.00	0.00			0.00	0.00			0.00	0.00	10.00	76.81	104.19	122.14	178.56	111	450	450	CONC	0.30	42.0	156	0.98	0.71	0.71
	419	420	0.35	0.70	0.68	2.13			0.00	0.00			0.00	0.00			0.00	0.00	10.71	74.17	100.57	117.88	172.29	158	525	525	CONC	0.35	100.0	254	1.18	1.42	0.62
To cercle Henslow's Circle, Pipe 420 - 421						2.13				0.00				0.00				0.00	12.13														
croissant Mudminnow Crescent																																	
			0.10	0.63	0.18	0.18			0.00	0.00			0.00	0.00			0.00	0.00															
			0.11	0.57	0.17	0.35			0.00	0.00			0.00	0.00			0.00	0.00															
	413	414	0.57	0.70	1.11	1.46			0.00	0.00			0.00	0.00			0.00	0.00	10.00	76.81	104.19	122.14	178.56	112	450	450	CONC	0.25	87.5	143	0.90	1.63	0.79
					0.00	1.46	0.06	0.70	0.12	0.12			0.00	0.00			0.00	0.00															
	414	415	0.31	0.70	0.60	2.06			0.00	0.12			0.00	0.00			0.00	0.00	11.63	71.08	96.32	112.87	164.94	158	525	525	CONC	0.25	85.5	215	0.99	1.43	0.73
To promenade Sweetvalley Drive, Pipe 415 - 417						2.06				0.12				0.00				0.00	13.06														
	413	412			0.00	0.00			0.00	0.00			0.00	0.00			0.00	0.00	10.00	76.81	104.19	122.14	178.56	0	300	300	PVC	0.35	14.5	57	0.81	0.30	0.00
	412	411			0.00	0.00			0.00	0.00			0.00	0.00			0.00	0.00	10.30	75.68	102.64	120.31	175.87	0	300	300	PVC	0.35	67.0	57	0.81	1.38	0.00
					0.00	0.00			0.00	0.00	2.84	0.76	6.00	6.00			0.00	0.00															
	411	416	0.43	0.70	0.84	0.84			0.00	0.00			0.00	6.00			0.00	0.00	11.68	70.91	96.09	112.60	164.55	735	1050	1050	CONC	0.15	116.0	1058	1.22	1.58	0.69
					0.00	0.84	0.04	0.70	0.08	0.08			0.00	6.00			0.00	0.00															
			0.33	0.70	0.64	1.48			0.00	0.08			0.00	6.00			0.00	0.00															
	416	417	0.43	0.57	0.68	2.16			0.00	0.08			0.00	6.00			0.00	0.00	13.26	66.20	89.63	105.00	153.38	780	1050	1050	CONC	0.15	67.0	1058	1.22	0.91	0.74
To cercle Henslow's Circle, Pipe 417 - 420						2.16				0.08				6.00				0.00	14.18														
place Pewee Place																																	
	Ctrl MH 1	402	3.32	0.80	7.38	7.38			0.00	0.00			0.00	0.00			0.00	0.00	10.00	76.81	104.19	122.14	178.56	567	900	900	CONC	0.20	7.5	810	1.27	0.10	0.70
Contribution From promenade Sweetvalley Drive, Pipe 401 - 402						0.00				0.10				0.00				0.36	12.05														
					0.00	7.38	0.11	0.72	0.22	0.32			0.00	0.00			0.00	0.36															
	402	404	0.17	0.72	0.34	7.72			0.00	0.32			0.00	0.00			0.00	0.36	12.05	69.72	94.46	110.68	161.73	627	975	975	CONC	0.15	66.5	868	1.16	0.95	0.72
Contribution From rang Catleaf Row, Pipe 403 - 404						1.43				0.00				0.00				0.00	11.87														
			0.09	0.72	0.18	9.33			0.00	0.32			0.00	0.00			0.00	0.36															
	404	406	0.10	0.75	0.21	9.54			0.00	0.32			0.00	0.00			0.00	0.36	13.01	66.91	90.60	106.14	155.05	723	975	975	CONC	0.20	47.0	1002	1.34	0.58	0.72
To rang Catleaf Row, Pipe 406 - 410						9.54				0.32				0.00				0.36	13.59														
rang Catleaf Row																																	
			0.22	0.72	0.44	0.44			0.00	0.00			0.00	0.00			0.00	0.00															
			0.23	0.75	0.48	0.92			0.00	0.00			0.00	0.00			0.00	0.00															
	403	404	0.29	0.63	0.51	1.43			0.00	0.00			0.00	0.00			0.00	0.00	10.00	76.81	104.19	122.14	178.56	110	450	450	CONC	0.30	110.0	156	0.98	1.87	0.70
To place Pewee Place, Pipe 404 - 406						1.43				0.00				0.00				0.00	11.87														
			0.18	0.72	0.36	0.36			0.00	0.00			0.00	0.00			0.00	0.00															
	405	406	0.22	0.75	0.46	0.82			0.00	0.00			0.00	0.00			0.00	0.00	10.00	76.81	104.19	122.14	178.56	63	375	375	PVC	0.30	112.0	96	0.87	2.15	0.66
Contribution From place Pewee Place, Pipe 404 - 406						9.54				0.32				0.00				0.36	13.59														
			0.13	0.63	0.23	10.59			0.00	0.32			0.00	0.00			0.00	0.36															
	406	410	0.27	0.72	0.54	11.13			0.00	0.32			0.00	0.00			0.00	0.36	13.59	65.30	88.40	103.55	151.26	809	1050	1050	CONC	0.20	74.5	1221	1.41	0.88	0.66
To promenade Sweetvalley Drive, Pipe 410 - 415						11.13				0.32				0.00				0.36	14.47														
promenade Sweetvalley Drive																																	
					0.00	0.00	0.05	0.72	0.10	0.10			0.00	0.00			0.00	0.00															
	401	402			0.00	0.00			0.00	0.10			0.00	0.00	0.18	0.72	0.36	0.36	10.00	76.81	104.19	122.14	178.56	75	450	450	CONC	0.25	110.5	143	0.90	2.05	0.52
To place Pewee Place, Pipe 402 - 404						0.00				0.10				0.00				0.36	12.05														



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

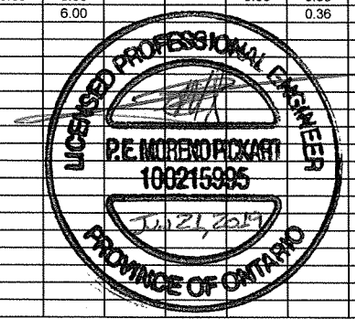
Notes:
1) Ottawa Rainfall-Intensity Curve
2) Min. Velocity = 0.80 m/s

Designed: C.M.K.	PROJECT: SUMMERSIDE SOUTH PHASE 1		
Checked: P.P	LOCATION: City of Ottawa		
Dwg. Reference: Storm Drainage Plan, Dwg. No. 35	File Ref: 15-766	Date: Jun 2019	Sheet No. SHEET 1 OF 2

STORM SEWER CALCULATION SHEET (RATIONAL METHOD)

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

	LOCATION		AREA (Ha) 2 YEAR				AREA (Ha) 5 YEAR				AREA (Ha) 10 YEAR				AREA (Ha) 100 YEAR				FLOW						SEWER DATA								
			AREA	R	Indiv.	Accum.	AREA	R	Indiv.	Accum.	AREA	R	Indiv.	Accum.	AREA	R	Indiv.	Accum.	Time of	Intensity	Intensity	Intensity	Intensity	Peak Flow	DIA. (mm)	DIA. (mm)	TYPE	SLOPE	LENGTH	CAPACITY	VELOCITY	TIME OF	RATIO
Location	From Node	To Node	(Ha)		2.78 AC	2.78 AC	(Ha)		2.78 AC	2.78 AC	(Ha)		2.78 AC	2.78 AC	(Ha)		2.78 AC	2.78 AC	Conc. (min)	2 Year (mm/h)	5 Year (mm/h)	10 Year (mm/h)	100 Year (mm/h)	Q (l/s)	(actual)	(nominal)		(%)	(m)	(l/s)	(m/s)	FLOW (min.)	Q/Q full
					0.00	0.00	0.09	0.70	0.18	0.18			0.00	0.00			0.00	0.00															
			0.12	0.63	0.21	0.21			0.00	0.18			0.00	0.00			0.00	0.00															
	407	408			0.00	0.21	0.19	0.72	0.38	0.56			0.00	0.00			0.00	0.00	10.00	76.81	104.19	122.14	178.56	74	375	375	PVC	0.45	67.5	118	1.06	1.06	0.63
	408	409	0.08	0.57	0.13	0.34			0.00	0.56			0.00	0.00			0.00	0.00	11.06	72.97	98.93	115.94	169.45	80	450	450	CONC	0.30	8.5	156	0.98	0.14	0.51
					0.00	0.34			0.00	0.56			0.00	0.00			0.00	0.00															
					0.00	0.34	0.16	0.72	0.32	0.88			0.00	0.00			0.00	0.00															
	409	410			0.00	0.34	0.29	0.70	0.56	1.44			0.00	0.00			0.00	0.00	11.20	72.48	98.25	115.14	168.28	166	600	600	CONC	0.15	108.0	238	0.84	2.14	0.70
Contribution From rang Catleaf Row, Pipe 406 - 410						11.13				0.32				0.00				0.36	14.47														
			0.14	0.63	0.25	11.71			0.00	1.76			0.00	0.00			0.00	0.36															
	410	415	0.15	0.57	0.24	11.95			0.00	1.76			0.00	0.00			0.00	0.36	14.47	63.04	85.30	99.90	145.91	956	1200	1200	CONC	0.15	71.0	1510	1.34	0.89	0.63
Contribution From croissant Mudminnow Crescent, Pipe 414 - 415						2.06				0.12				0.00				0.00	13.06														
	415	417			0.00	14.01	0.34	0.70	0.66	2.54			0.00	0.00			0.00	0.36	15.36	60.93	82.42	96.51	140.93	1114	1200	1200	CONC	0.15	78.5	1510	1.34	0.98	0.74
To cercle Henslow's Circle, Pipe 417 - 420						14.01				2.54				0.00				0.36	16.34														
cercle Henslow's Circle																																	
	422	423			0.00	0.00			0.00	0.00			0.00	0.00			0.00	0.00	10.00	76.81	104.19	122.14	178.56	0	300	300	PVC	0.35	16.0	57	0.81	0.33	0.00
	423	424	0.35	0.70	0.68	0.68			0.00	0.00			0.00	0.00			0.00	0.00	10.33	75.56	102.48	120.13	175.60	51	375	375	PVC	0.50	119.0	124	1.12	1.77	0.42
	424	425			0.00	0.68			0.00	0.00			0.00	0.00			0.00	0.00	12.10	69.60	94.29	110.48	161.43	47	375	375	PVC	0.30	15.0	96	0.87	0.29	0.49
			0.30	0.57	0.48	1.16			0.00	0.00			0.00	0.00			0.00	0.00															
	425	426	0.40	0.70	0.78	1.93			0.00	0.00			0.00	0.00			0.00	0.00	12.38	68.72	93.09	109.07	159.35	133	525	525	CONC	0.20	95.5	192	0.89	1.79	0.69
	426	427			0.00	1.93			0.00	0.00			0.00	0.00			0.00	0.00	14.18	63.78	86.32	101.10	147.66	123	525	525	CONC	0.20	13.5	192	0.89	0.25	0.64
To Servicing Block, Pipe 427 - 428						1.93				0.00				0.00				0.00	14.43														
Contribution From promenade Sweetvalley Drive, Pipe 415 - 417						14.01				2.54				0.00				0.36	16.34														
Contribution From croissant Mudminnow Crescent, Pipe 416 - 417						2.16				0.08				6.00				0.00	14.18														
					0.00	16.17	0.03	0.70	0.06	2.67			0.00	6.00			0.00	0.36															
	417	420	0.21	0.70	0.41	16.58			0.00	2.67			0.00	6.00			0.00	0.36	16.34	58.78	79.47	93.04	135.84	1794	1500	1500	CONC	0.15	72.0	2738	1.55	0.77	0.66
Contribution From cours Cottontail Walk, Pipe 419 - 420						2.13				0.00				0.00				0.00	12.13														
Contribution From Park, Pipe Ctrl MH 2 - 420						0.00				0.48				0.00				0.00	10.16														
	420	421			0.00	18.70			0.00	3.15			0.00	6.00			0.00	0.36	17.11	57.19	77.30	90.49	132.10	1904	1500	1500	CONC	0.11	51.5	2344	1.33	0.65	0.81
	421	428	0.24	0.70	0.47	19.17			0.00	3.15			0.00	6.00			0.00	0.36	17.76	55.94	75.59	88.48	129.14	1888	1500	1500	CONC	0.11	14.5	2344	1.33	0.18	0.81
To Servicing Block, Pipe 428 - 429						19.17				3.15				6.00				0.36	17.94														
Servicing Block																																	
Contribution From cercle Henslow's Circle, Pipe 426 - 427						1.93				0.00				0.00				0.00	14.43														
	427	428			0.00	1.93			0.00	0.00			0.00	0.00			0.00	0.00	14.43	63.15	85.45	100.08	146.16	122	600	600	CONC	0.40	10.0	388	1.37	0.12	0.31
Contribution From cercle Henslow's Circle, Pipe 421 - 428						19.17				3.15				6.00				0.36	17.94														
	428	429			0.00	21.11			0.00	3.15			0.00	6.00			0.00	0.36	17.94	55.60	75.12	87.93	128.34	1984	1800	1800	CONC	0.11	73.0	3812	1.50	0.81	0.52
	429	Headwall			0.00	21.11			0.00	3.15			0.00	6.00			0.00	0.36	18.75	54.13	73.11	85.57	124.88	1931	1800	1800	CONC	0.11	4.5	3812	1.50	0.05	0.51
To SWM Pond						21.11				3.15				6.00				0.36	18.80														



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Notes:
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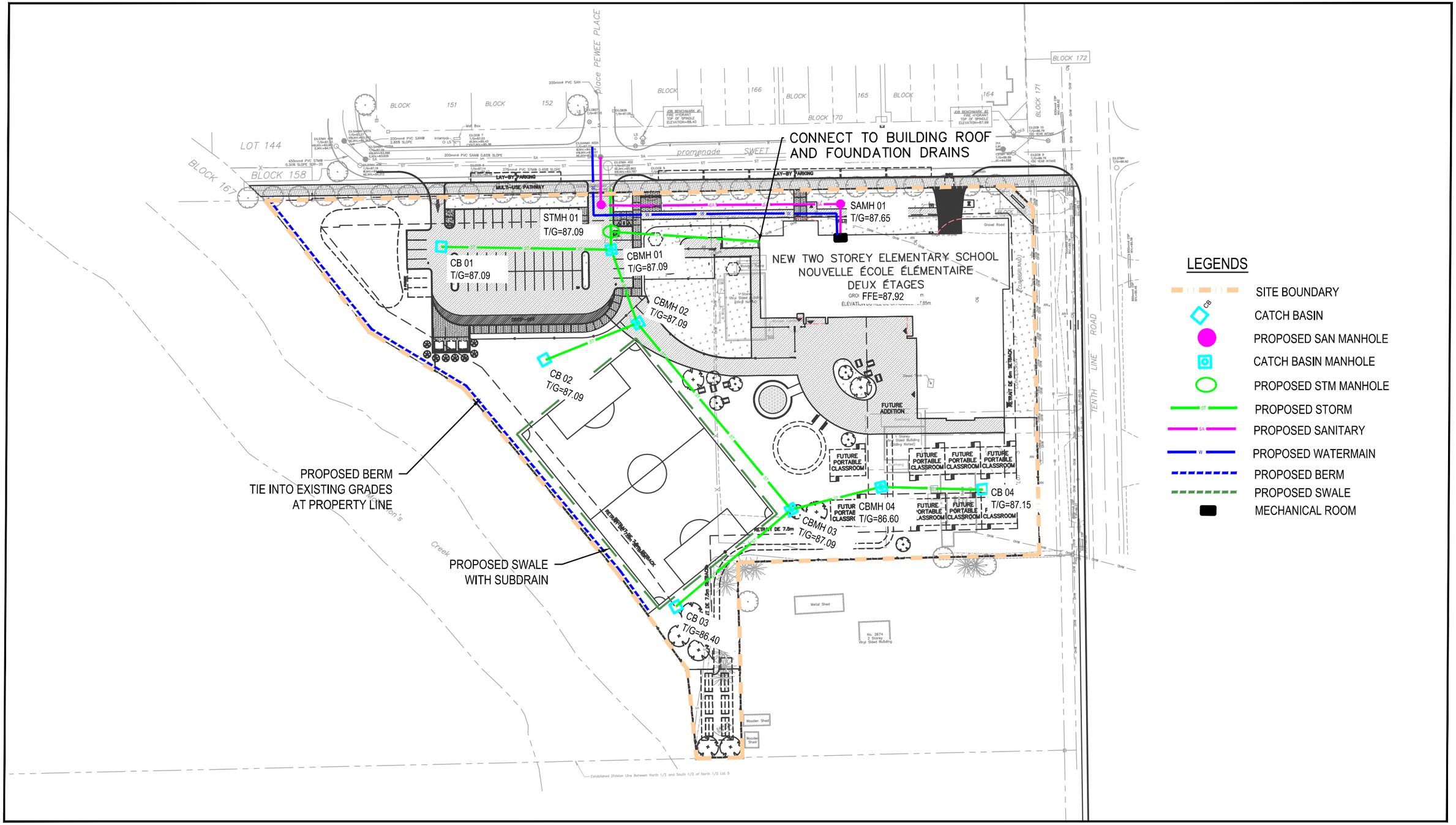
Designed: C.M.K.	PROJECT: SUMMERSIDE SOUTH PHASE 1		
Checked: P.P	LOCATION: City of Ottawa		
Dwg. Reference: Storm Drainage Plan, Dwg. No. 35	File Ref: 15-766	Date: Jun 2019	Sheet No. SHEET 2 OF 2



LEGENDS

- SITE BOUNDARY
- CATCH BASIN
- PROPOSED SAN MANHOLE
- CATCH BASIN MANHOLE
- PROPOSED STM MANHOLE
- PROPOSED STORM
- PROPOSED SANITARY
- PROPOSED WATERMAIN
- PROPOSED BERM
- PROPOSED SWALE
- MECHANICAL ROOM

CLIENT:

Écoles catholiques Centre-Est

ARCHITECT:

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PROJECT NO: 221-12984-00

SCALE: 1:1000

DATE: MAR-17-2023

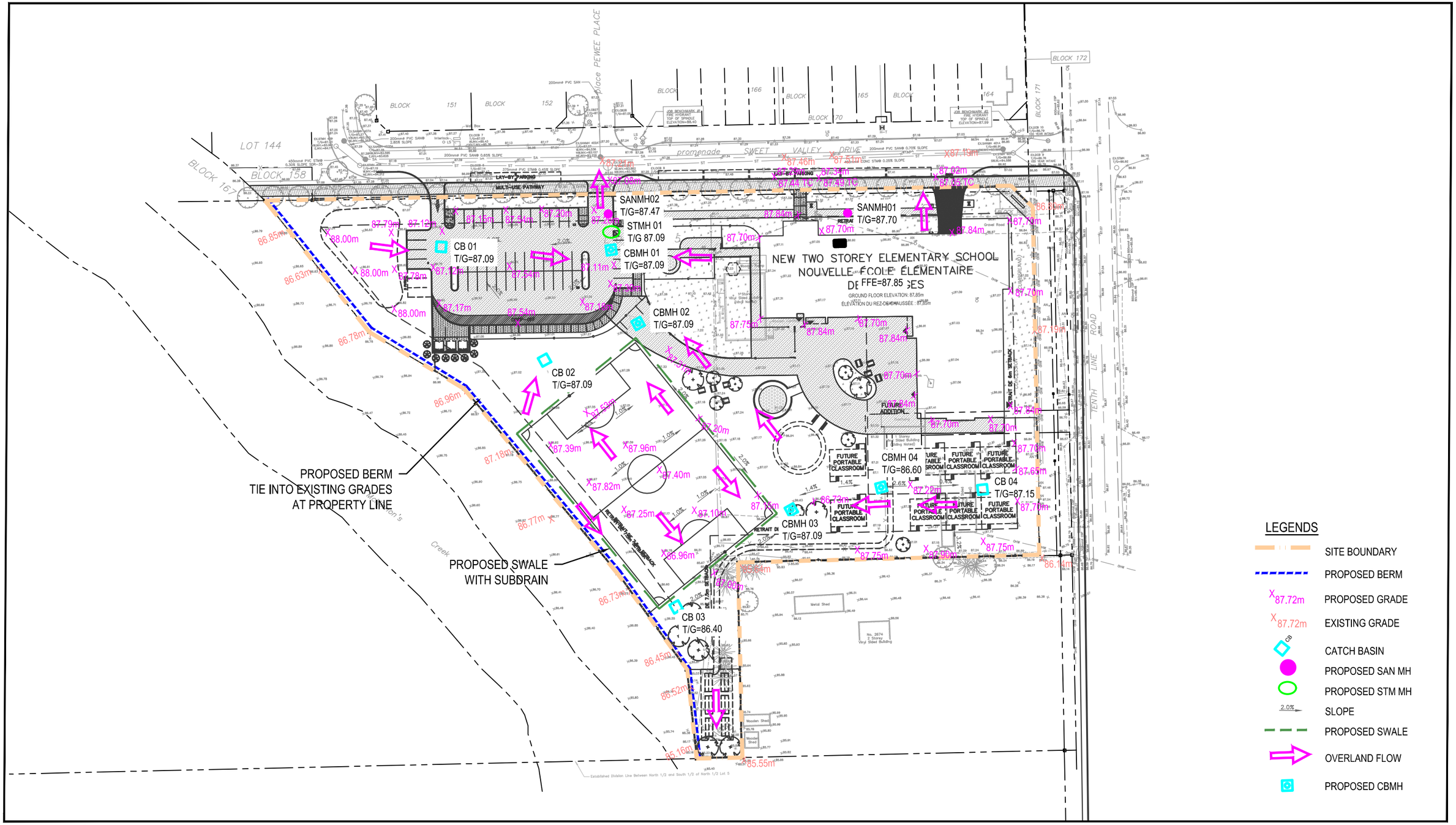
DRAWN BY: J.T.

APPROVED BY: D.Y.

PROJECT: NEW CATHOLIC ELEMENTARY SCHOOL - ORLEANS

TITLE: CONCEPTUAL SERVICING DESIGN

DRAWING: F2



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DATE: MAR-17-2023

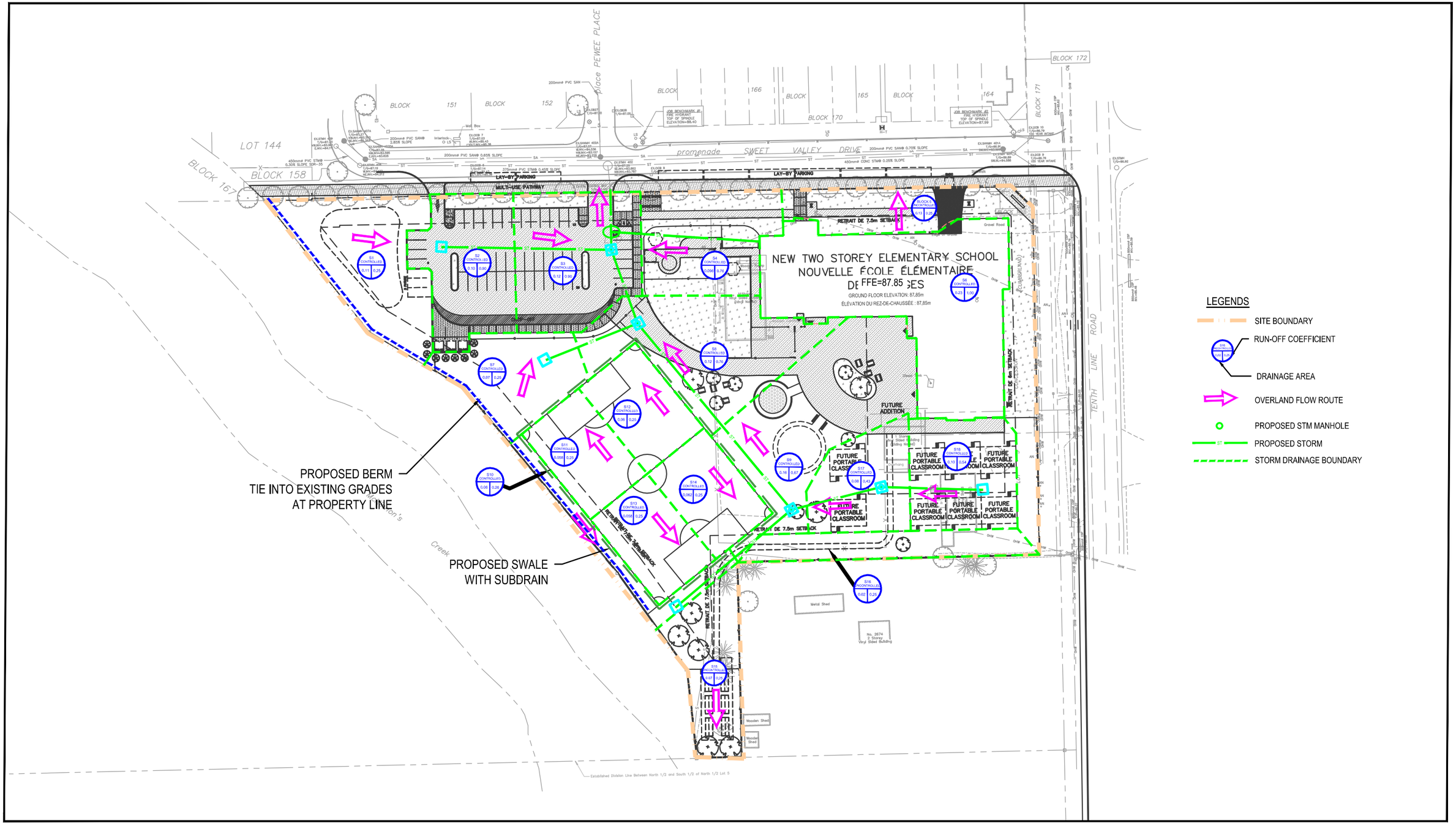
DRAWN BY: J.T.

APPROVED BY: D.Y.

PROJECT: NEW CATHOLIC ELEMENTARY SCHOOL - ORLEANS

TITLE: CONCEPTUAL GRADING DESIGN

DRAWING: F1



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DRAWN BY:	J.T.
APPROVED BY:	D.Y.

PROJECT: NEW CATHOLIC ELEMENTARY SCHOOL - ORLEANS

TITLE: STORM DRAINAGE AREA PLAN

DRAWING: F3