Site Servicing & Stormwater Management Report
CECCE Secondary School – Riverside South – 675 Borbridge Avenue, Manotick, Ontario

Client:
Provencher Roy Associés Architectes Inc.

Project Number:
OTT-24005530-A0

Application Stage:
Site Plan Control

EXP Services Inc.
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Ottawa, ON K2B 8H6

Date Submitted:

April 4, 2025
Revised: June 18, 2025
Revised: September 11, 2025

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Date Submitted:

April 4, 2025
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1 Introduction

EXP Services Inc. (EXP) was retained by Provencher Roy Associés Architectes Inc. to provide Site Servicing and Stormwater Management report for the proposed Conseil des écoles catholiques du Centre-Est (CECCE) Secondary School.

The site is 6.01 hectares and located at 675 Borbridge Avenue in Manotick, Ontario. The site is bound by Borbridge Avenue along the north property line, by Brian Good Avenue along the west property line, and by existing residential streets Elder Street and Atrium Ridge along the east and south property lines respectively. Refer to **Figure A1** in **Appendix A** for the site location.

This servicing design report will address the Servicing requirements for the proposed development including the domestic and fire water, sanitary and storm servicing. The report will also cover the storm water management requirements and proposed methods to meet those requirements.

2 Existing Conditions

The subject property is currently vacant with dense vegetation cover throughout. The topography of the site generally slopes from its highpoint located at the southeast property corner and tapers down to each of Borbridge Avenue and Brian Good Avenue with a low point at their intersection corresponding to the northwest property corner.

There is no known services or infrastructure within the property. The existing municipal infrastructure near the property within Borbridge Avenue and Brian Good Avenue are noted below:

- Borbridge Avenue:
  - Storm:
    - 2400mm Ø Concrete CL 65-D Storm Sewer
    - 2550mm Ø Concrete CL 65-D Storm Sewer
  - Sanitary:
    - 525mm Ø Concrete CL 100-D Sanitary Sewer
  - Water:
    - 300mm Ø PVC DR18 CL-150 Watermain
- Brian Good Avenue:
  - Storm:
    - 2700mm Ø Concrete CL 65-D Storm Sewer
  - Sanitary:
    - 525mm Ø Concrete CL 100-D Sanitary Sewer
  - Water:
    - 300mm Ø PVC DR18 CL-150 Watermain

3 References

Various documents were referred to in preparing the current report including:

- Sewer Design Guidelines, Second Edition, Document SDG002, October 2012, City of Ottawa (Guidelines) including:
  - Technical Bulletin ISDTB-2012-4 (20 June 2012)
  - Technical Bulletin ISDTB-2014-01 (05 February 2014)
  - Technical Bulletin PIEDTB-2016-01 (September 6, 2016)
  - Technical Bulletin ISDTB-2018-01 (21 March 2018)
  - Technical Bulletin ISDTB-2018-04 (27 June 2018)
  - Technical Bulletin ISDTB-2019-02 (08 July 2019)
- Ottawa Design Guidelines – Water Distribution, July 2010 (WDG001), including:
  - Technical Bulletin ISDTB-2014-02 (May 27, 2014)
  - Technical Bulletin ISTB-2018-02 (21 March 2018)
  - Technical Bulletin ISTB-2021-03 (18 August 2021)
- Stormwater Management Planning and Design Manual, Ontario Ministry of the Environment and Climate Change, March 2003 (SMPDM).
- Design Guidelines for Drinking-Water Systems, Ontario Ministry of the Environment and Climate Change, 2008 (GDWS).
- Fire Underwriters Survey, Water Supply for Public Fire Protection (FUS), 2020
- Ontario Building Code 2012, Ministry of Municipal Affairs and Housing
- Geotechnical Investigation Report – Prepared by Exp. Services Inc, Dated Jan 20, 2025.
- Riverside South Community Infrastructure Servicing Study Update - Rideau River Area – Prepared by Stantec dated June 21, 2017 (Stantec 2017)
- Design Brief Riverside South Phase 15-2, 4 & Spratt Road Riverside South Community - Prepared by IBI dated August 2019 (IBI 2019)

4 Watermain Design

4.1 Required Fire Flow

The fire flow demand calculations were prepared based on the Fire Underwriters Survey (FUS, 2020) criteria. The construction type for the proposed school is classified as non-combustible based on the response received from the Architect (Included in **Appendix B**). The building will have a fully supervised sprinkler system based on the correspondence with the Architect and limited combustible contents based

on the occupancy type specified by the architect. The required fire flow was determined to be 116.7 L/s (7,000 L/min). Refer to **Table B2** in **Appendix B** for detailed fire flow demand calculations.

As per Section 2.3.3 of Design Brief (IBI 2010), school blocks within phase 15-2 Riverside South were assigned a fire demands allowance of 15,000 L/min (250 L/sec). The calculated fire demands for the proposed school is within this allowance.

4.2 Watermain Design

The domestic water demands for the proposed building were calculated per the City of Ottawa Water Design Guidelines (July 2010). Table 4.2 of the City of Ottawa Water Design Guidelines (July 2010) notes schools as having a consumption rate of 70 L/student/day. Since the expected population is known, the per capita method was used rather than the gross area method. Staff were included in the total population. The demands are inclusive of the currently proposed development and future expansion. The peaking factors were considered as 1.5 and 1.8 for the max. day and peak hour demands, respectively. Refer to **Table B1** in **Appendix B** for detailed calculations. The proposed building's domestic demands based on 1286 students + staff, were calculated as follows:

Water Demands:

Average daily demand = 1.04 L/s

Maximum daily demand = 1.56 L/s

Maximum hourly daily demand = 2.81 L/s

Section 2.3.1 of Design Brief - Riverside South Phase 15-2, 4 & Spratt Road Riverside South Community Prepared by IBI notes:

"RSS Phase 15-2,4 will be a residential site consisting of single family lots and street townhouses and two school blocks. Unit population density and consumption rates are taken from Tables 4.1 and 4.2 of the Ottawa Design Guidelines – Water Distribution"

In this design brief (IBI 2019), demands for average day, max day and peak hour demands for ICI were used as 50,000 L/gross ha/day, 75,000 L/gross ha/day and 135,000 L/gross ha/day, respectively. Which would result in domestic demands for the subject parcel as 3.47 L/sec, 5.32 L/sec and 9.57 L/sec for avg. day, max day and peak hour demands, respectively. Which is reflected in Appendix B of the design brief (IBI 2019). The calculated demands for the proposed development above is within the assigned capacity as per the design brief (IBI 2019). Applicable excerpts from the design brief (IBI 2019) are included in **Appendix B.**

There is an existing 300mm diameter municipal watermain on Borbridge Avenue. The estimated average daily demand of the proposed development is greater than 50 m^3/day. Therefore, two 150mm diameter water services separated by an isolation valve are proposed for domestic and sprinkler demands to avoid creating a vulnerable service zone as per the City of Ottawa WDG 2010. The proposed water services are to be connected to the 300mm diameter municipal watermain on Borbridge Avenue.

4.3 Pressure Check

The City of Ottawa provided boundary conditions based on the domestic and fire flow demands, calculated during early design stages as shown in the table below:

Scenario	Demand	
	L/min	L/s
Average Daily Demand	71	1.19
Maximum Daily Demand	107	1.79
Peak Hour	193	3.22
Fire Flow Demand #1	7,000	116.67

The boundary conditions provided by the City are as follows:

Existing Condition		
Connection 1 - Borbridge Ave		
Demand Scenario	**Head (m)**	**Pressure[1] (psi)**
Maximum HGL	132.3	58.4
Peak Hour	124.9	47.9
Max Day plus Fire Flow #1	124.9	47.9
[1] Ground Elevation =	91.2	m

Future Condition		
Connection 1 - Borbridge Ave		
Demand Scenario	**Head (m)**	**Pressure[1] (psi)**
Maximum HGL	146.8	79
Peak Hour	143.7	74.6
Max Day plus Fire Flow #1	144.1	75.1
[1] Ground Elevation =	91.2	m

As the design progressed, occupancy numbers were confirmed by the client and domestic demands were adjusted accordingly as noted in Section 4.2 above. The revised demands are similar to the original demands submitted to request the water boundary conditions. Therefore, the water boundary conditions noted above should still suffice. The fire flow demands remain unchanged.

Based on these boundary conditions the residual pressure at the building FFE during existing conditions will be 57.2 psi during average day demand, 46.7 psi during max. daily demand, and 46.7 psi during peak hour demands.

During future conditions the residual pressure at the building FFE will be 77.8 psi during average day demands, 73.4 psi during max. daily demands, and 73.4 psi during peak hour demands.

During existing and future conditions, the residual pressures at building FFE will be between 40 psi and 80 psi, as required by the City of Ottawa Water Design Guidelines. Therefore, no pressure reducing or boosting measures will be required.

The residual pressure in the municipal watermain along Borbridge Avenue during max Day + Fire Flow demands was noted as 47.9 psi during existing conditions and 75.1 psi during future conditions. Which are more than the minimum required pressure of 20 psi.

Based on the above noted analysis, the existing water supply system and the proposed services will have adequate capacity to meet the domestic and fire demands for the proposed building. Refer to **Table B3** and **Table B4** in **Appendix B** for detailed pressure calculations.

4.4 Review of Hydrant Spacing

A review of the hydrant spacing was completed to ensure compliance with Appendix I of Technical Bulletin ISTB-2018-02. As per Section 3 of Appendix I all hydrants within 150 meters were reviewed to assess the total possible contribution of flow from these contributing hydrants. For each hydrant, the distance along a fire route was measured and assigned contributing flows. A review of the available fire hydrant within 150m distance along the fire route from the building was carried out which is summarized in the table below. A new hydrant will be added within the school parking lot as part of the proposed work to comply with the minimum distance required between a hydrant and the building Siamese connection.

Table 4-1: Summary of Nearby Municipal Hydrants

Hydrant #	Location	City / Private	Color Code	Distance from the Building (m)	Fire Flow Contribution for Class AA Hydrant (L/min)
368013H014	Borbridge Avenue	City	Blue	84.5	3,800
368013H015	Borbridge Avenue	City	Blue	56.0	5,700
368013H034	Brian Good Avenue	City	Blue	51.7	5,700
368013H033	Brian Good Avenue	City	Blue	85.4	3,800
New Hydrant	New Parking Lot	Private	Blue	40	5,700
				Total:	24,700

As noted in the table above, there are total four (4) existing municipal fire hydrants within 150m distance along a fire route and a new private hydrant within the school parking lot; which equates to a total accessible fire flow of 24,700 L/min. This is well above the required fire flow of 7,000 L/min. Refer to **Figure A2** in **Appendix A** for the hydrant location plan.

Based on the boundary conditions received from the city and review of the available municipal hydrants as noted above, the proposed development can be serviced for the required fire flow.

5 Sanitary Sewer Design

5.1 Peak Design Flow

There is an existing municipal 525mm diameter sanitary sewer on Borbridge Avenue flowing west towards Spratt Road.

The anticipated peak sanitary flows from the proposed school site have been calculated as per the City of Ottawa Sewer Design Guidelines (October 2012). Appendix 4-A of the City of Ottawa Sewer Design Guidelines (2012) notes schools as having a daily sewage flow rate of 90 L/person/day. Since the expected population is known, the per capita method was used rather than the gross area method.

The anticipated peak sanitary flows for currently proposed development and future expansion are calculated as follows:

Design Flows (Proposed + Future)

Institutional Design Flow:		90 L/person/day
Development Area:		6.01 hectares
Peak Factor:		1.5
Extraneous Flow:		0.33 L/s/ha
Total Flow:	=	(90L/person/day)*(1286 persons)*(1/86400)*(1.5)+(6.01ha)*(0.33L/s/ha)
	=	**3.99 L/s**

As per Section 3.3 of Design Brief - Riverside South Phase 15-2, 4 & Spratt Road Riverside South Community Prepared by IBI notes:

The subject school parcel was considered as Institutional development and was assigned average daily sanitary flow of 28,000 L/gross ha/day with a peaking factor of 1.5 and an infiltration allowance of 0.33 L/sec/gross ha. This would result in average sanitary flow of 4.96 L/sec for the subject parcel. The calculated sanitary demands for the proposed development is less than the sanitary flows included in the design brief (IBI 2019). Applicable excerpts from the design brief (IBI 2019) are included in **Appendix C.**

The proposed high school will be serviced by a new 150mm diameter sanitary service installed at a minimum slope of 2.0%. At this slope, the 150mm diameter sanitary services will have a capacity of 23.5 L/s and a full flow velocity of 1.7 m/s, which will be sufficient to service proposed development. The proposed sanitary service will connect to 525mm dia. municipal sanitary sewer on Borbridge Ave. City had confirmed that the municipal sanitary sewer has sufficient capacity to accommodate the sanitary flows from the proposed development. Refer to Site Servicing plan and the sanitary sewer design sheet **Table C1** and email correspondence with the City in **Appendix C**.

6 Stormwater Management

6.1 Storm Design Criteria

The storm sewer system and stormwater management for the proposed development were designed in conformance with the City of Ottawa Sewer Design Guidelines (October 2012). The stormwater servicing design criteria for the proposed development are as follows:

- The proposed on-site storm sewer network / minor system is designed using Rational Method and Manning's Equation to convey runoff under free flow conditions for the 5-year return period.
- Post-development peak run-off during 100-year storm event to be controlled to 915 L/sec as identified in the "*Design Brief - Riverside South phase 15-2, 4 & Spratt Road*", prepared by IBI Group dated August 2019. See excerpt from Table 5-3 of the design brief indicating 100-year capture rate in **Appendix E.** See correspondence with city staff indicating alignment with the IBI Design Brief in **Appendix E.**

- Maximum allowable ponding depth is 300 mm for surface ponding and 150mm for roof ponding.
- Flows from storm events greater than 100-year return period to be directed overland, away from the building towards Borbridge Avenue and Brian Good Avenue.
- Minimum freeboard of 300mm between the 100-year overland spill elevation and finished floor elevation. Minimum freeboard of 150mm between the 100-year overland spill elevation and lowest grades against the building foundation.
- Quality control measures are not required on site as downstream quality treatment is provided by an end-of-pipe stormwater management wet pond per the reports "*Riverside South Community Infrastructure Servicing Study Update*", prepared by Stantec dated June 21, 2017 and "*Design Brief - Riverside South phase 15-2, 4 & Spratt Road*", prepared by IBI Group dated August, 2019. It is noted that Pond 5 (end of pipe wet pond facility) was designed to provide enhanced level of quality control for the upstream catchments. See excerpt from section 4.2 of the design brief in **Appendix E.** Also See correspondence with city staff confirming end of pipe quality control within pond 5 in **Appendix E.**

6.2 Pre-Development Conditions

The 6.01-hectare site at 675 Borbridge Avenue The subject property is currently vacant with dense vegetation cover throughout. The topography of the site generally slopes from its highpoint located at the southeast property corner and tapers down to each of Borbridge Avenue and Brian Good Avenue with a low point at their intersection corresponding to the northwest property corner.

Since the subject property is currently a vacant, undeveloped lot and the allowable release rates for post-development conditions are governed by previously completed Master Servicing Studies for the Riverside South subdivision, pre-development runoff coefficient, time of concentration and release rates are not calculated.

Under post development conditions, changes are proposed in the city right of way. The changes consist of additional curb line for the proposed bus lay-by and student drop off areas and their associated concrete areas. Therefore, the pre-development conditions of this off-site area denoted POS-1 have been considered. The pre-development runoff coefficient of the catchment is 0.44. The Pre-development runoff rate for this catchment for the 100-year storm event is 84.4 L/s. Refer to **Tables D2** and **D3** in **Appendix D** for detailed calculation of pre-development conditions within the City ROW where the changes are proposed as part of this development.

6.3 Allowable Release Rate

The allowable release rate for the site was identified in the report "*Design Brief - Riverside South phase 15-2, 4 & Spratt Road*", prepared by IBI Group dated August 2019 in Table 5-3 Minor Flow Capture for Riverside South Phase 15-2/15-4. In this table, the subject property (catchment SC 472) was assigned a minor system capture rate during 100-year storm event of 915 L/sec. Therefore, the allowable release rate for up-to 100-year storm for the proposed development is considered as 915 L/sec in the proposed design.

6.4 Post-Development Conditions

Stormwater from the 6.01 ha drainage area will be controlled and released at a rate less than the allowable release rate for storms up to and including the 100-year storm event. An overland flow route is provided for storms greater than the 100-year event. In the post-development conditions, the stormwater run-off coefficients for the hard surfaces (concrete, asphalt, roof, pavers etc.), gravel, and soft landscaping (grass etc.) are considered as 0.9, 0.7 and 0.2, respectively. The estimated post-development average run-off

coefficient for the proposed development is 0.37. Time of concentration of 10 mins was used for the post-development storm calculations as per the City of Ottawa Sewer Design Guidelines.

During post-development conditions, the uncontrolled flowrates during 2-year, 5-year and 100-year storm events were calculated as 474.3 L/sec, 643.4 L/sec and 1330.2 L/sec, respectively. With the proposed flow control and on-site storage included in the stormwater management design, the controlled flowrates from the subject development during 2-year, 5-year and 100-year storm events will be 395.10 L/sec, 529.80 L/sec and 884.70 L/sec, respectively. Refer to **Tables D6 – D7** in **Appendix D** for detailed post development runoff coefficient and runoff calculations.

As noted previously changes within the City right of way are proposed. The post-development runoff coefficient of the catchment is 0.51. The post-development runoff rate for this catchment for the 100-year storm event is 98.4 L/s. Refer to **Tables D4** and **D5** in **Appendix D** for the detailed post development runoff coefficient and runoff calculations for the City ROW.

6.4.1 Storage Requirements and Allocation

Post development runoff will be detained on-site for storms up to and including the 100-year storm events. The required SWM storage volumes will be achieved using surface ponding in the landscaped areas, parking area, and ponding on the roof of the new building for up to 100-year storm event.

Surface ponding volumes over catch basins and roof drains were determined by the conic volume method. Ponding depths for the subject site must be equal to or less than 300 mm for the landscape and parking surfaces and 150mm for the roof during a 100-year storm event.

Flow control measures and storage are proposed within sub catchments P-1, P-2, P-3, P-4 and P-R. Remaining sub catchments mainly consisting of the courtyard and landscaped fields are proposed to be uncontrolled. The required storage volume for these catchments were calculated using the Modified Rational Method. Refer to **Tables D8 – D12** in **Appendix D** for detailed required storage calculations for these catchments.

Refer to drawing #C500 in **Appendix F** for post development drainage areas, associated ponding limits, ponding depth and control methods. **Table 6-1** in the following section summarizes the release rates and storage requirements for the proposed drainage areas within the subject site.

The proposed 100-year controlled release rate is 884.70 L/sec, which complies with the allowable release rate of 915 L/s noted in section 6.1 above. The total available storage volume within the site will be 966.70 m^3 which is more than the required volume of 302.3 m^3, as summarized in **Table D1** in **Appendix D**.

6.4.2 Flow Control Device Sizing

Stormwater runoff from the proposed development will be detained using inlet control devices (ICDs) and flow control roof drains. ICDs in the catchbasins were sized based on the required storage volume and associated head of water during 100-year storm events, using the orifice equation shown below:

$$Q_{ORIFICE} = CA\sqrt{2gH}$$

Where,

$Q_{ORIFICE}$ = Flow Through the Orifice

C = Orifice Coefficient = 0.61

A = Area of the Orifice

g = Gravitational Acceleration = 9.81 m/s^2

H = Head of Water over the Center of the Orifice

The proposed ICD size and/or models are summarized in Table 6-1 below. The required flow control from the roof will be achieved by mounting Watts Accutrol flow control weirs on the roof drains. The required flow control from parking lot cathbasins and landscape area catchbasins will be achieved by mounting circular orifice plates on the outlets. Further details regarding the ICDs and roof drains are provided on **Table D14 – D17** in **Appendix D**. 5-year and 100-year ponding limits, total ponding depth and location of the flow control measures are provided on drawing #C500 in **Appendix F**.

Table 6-1: Summary of SWM Storage Requirements

Area ID	Outlet Location	Area (ha)	Runoff Coefficient 'C'	100 Year Release (L/s)	100 Year Storage Required (m3)	Max. Surface Storage Provided (m3)	Control Method	Storage Method
P-1	CB 307	0.126	0.59	**24.0**	13.1	30.2	80mmØ Orifice Plate	Surface Ponding
P-2	CB 305	0.203	0.84	**69.3**	20.3	160.40	140mmØ Orifice Plate	Surface Ponding
P-3	CB 304	0.179	0.84	**59.0**	18.6		130mmØ Orifice Plate	Surface Ponding
P-4	DCB 306	1.903	0.24	**175.0**	68.1	532.82	226mmØ Orifice Plate	Surface Ponding
P-5	DCB 309	0.804	0.28	138.7	-	-	Uncontrolled	-
P-6	DCB 303	0.859	0.25	128.1	-	-	Uncontrolled	-
P-7	DCB 308	0.730	0.21	99.4	-	-	Uncontrolled	-
P-8	CB 301, 302	0.150	0.65	58.2	-	-	Uncontrolled	-
P-9	ROW	0.420	0.25	68.2	-	-	Uncontrolled	-
P-R	STMMH 106	0.634	0.90	**64.7**	182.2	243.3	WATTS Accutrol Roof Drains	Surface Ponding
675 Borbridge Totals		***6.007***		***884.70***	***302.3***	***966.70***		

*__Bold__ flows are controlled.

6.5 Storm Sewer Design

Proposed building foundation drain will discharge into a 150mm dia. storm service lateral at 2.0% slope, having the Manning's full flow capacity of 23.5 L/sec. Proposed building roof drains will discharge into a separate 375mm dia. storm service lateral at 3.5%, having Manning's full flow

capacity of 308.4 L/sec. All stormwater runoff captured by the minor system on-site and storm service lateral from the proposed building will ultimately discharge to the 2550 mm diameter municipal storm sewer on Borbridge Avenue from a 525mm diameter storm service lateral at 2.5% slope. All storm sewers were sized for the 5-year peak flow with no overcapacity. Refer to **Table D13** in **Appendix D** for detailed storm sewer sizing calculations.

6.6 Emergency Flow routes

The highest spill point elevation within the proposed grading corresponds to the courtyard area (P-8) with a spill point elevation of 91.80. The minimum surrounding building elevation in this area is 91.95 and the finished floor elevation is 92.10. Therefore, freeboard of 0.15m and 0.30m, respectively are provided. All the remaining catchments will have minimum free board as per the design criteria noted in Section 6.1 above, before it spills towards the nearest City ROW i.e., Borbridge Ave and Brian Good Ave. Refer to dwg #C500 in **Appendix F**, which shows the max ponding limits and also provide free board information for each catchment. It is not expected that ponding associated with the 100-year + 20% storm event will exceed spill point elevations and that minimum freeboard to surrounding building elevations and the finished floor elevations will exceed 150mm and 300mm respectively for all storm events.

The roof area over the gymnasium has a roof drain depth of 200mm owing to structural considerations. Overflow roof drains are provided. The remainder of the roof has maximum drain depths of 150mm, and overflow scuppers are provided. See dwg #C-500 in **Appendix F**.

7 Erosion and Sediment Control

During all construction activities, erosion and sedimentation shall be controlled by the following techniques:

- Extent of exposed soils shall be limited at any given time;
- Exposed areas shall be re-vegetated as soon as possible;
- Minimize the area to be cleared and disruption of adjacent areas;
- Siltsack or approved equivalent shall be installed inside all catch basins, catch basin manholes, and storm manholes as identified on the erosion and sediment control plan;
- Visual inspection shall be completed daily on sediment control barriers and any damage will be repaired immediately. Care will be taken to prevent damage during construction operations;
- In some cases, barriers may be removed temporarily to accommodate the construction operations. The affected barriers will be reinstated at night when construction is completed;
- Sediment control devices will be cleaned of accumulated silt as required. The deposits will be disposed of as per the requirements of the contract;
- During construction, if the engineer believes that additional prevention methods are required to control erosion and sedimentation, the contractor will install additional silt fences or other methods as required to the satisfaction of the engineer; and,

- Construction and maintenance requirements for erosion and sediment controls are to comply with Ontario Provincial Standard Specification (OPSS) 805.

8 Conclusions

This report addresses the site servicing and stormwater management requirements for the site plan control application for the proposed development. Based on the analysis provided in this report, the conclusions are as follows:

- The proposed highschool building will be serviced by 150mm diameter dual watermains, which will adequately service the proposed development for the domestic and fire flow demands. Additionally, water boundary conditions from the City suggests sufficient flow and pressure availability in the municipal watermain on Borbridge Ave. to service the new highschool building for domestic and fire demands.
- The proposed building will be serviced by a 150mm diameter sanitary sewer, which will have adequate capacity to service the new building for the sanitary flows. No capacity constraints were noted in the municipal sanitary sewer on Borbridge Ave by the City.
- Stormwater Management criteria for the proposed development will be achieved by restricting the post-development stormwater discharge rates up to and including the 100-year to the allowable release rates.
- Required on-site SWM storage volumes will be achieved using the surface storage in the landscaped areas, parking areas and roof storage using the flow control orifice plate ICD's and flow control roof drains.
- The stormwater quality control for the proposed site is provided by the existing end-of-pipe stormwater management facility (wet pond). Therefore, no additional quality control measures are proposed.
- Temporary erosion and sediment control measures for the subject site have been identified.

Appendix A – Figures

Figure A1 – Site Location Plan

Figure A2 – Hydrant Location Plan

Figure A1: Site Location Plan

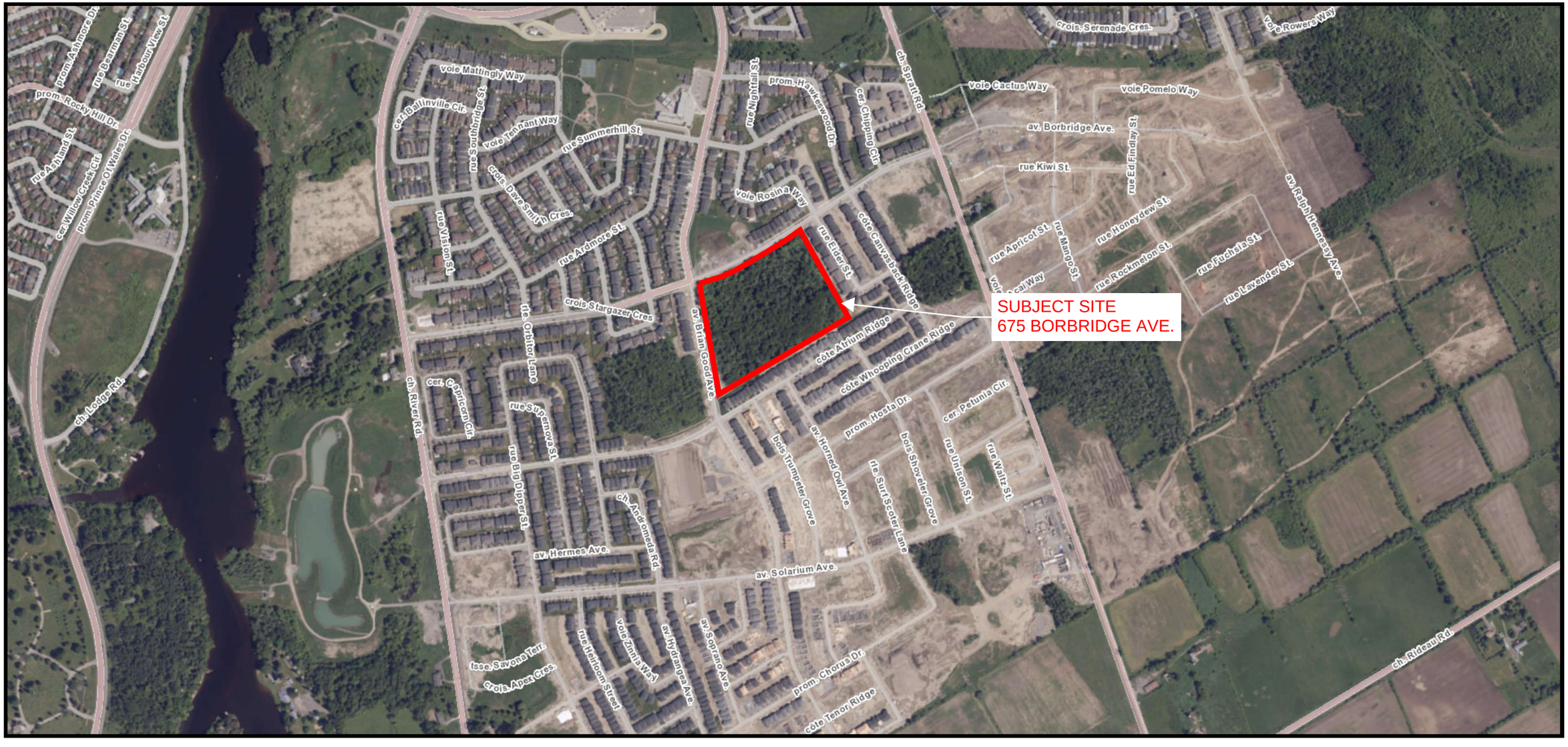


Figure A2: Hydrant Location Plan



Appendix B – Water Servicing

Table B1 - Water Demand Chart

Table B2 - FUS Fire Flow Demand Calculations

Table B3 - Estimated Water Pressure at Proposed Building FFE (Existing)

Table B4 - Estimated Water Pressure at Proposed Building FFE (Future Scenario)

Correspondence from Architect Re Fire Flow Requirements

Water Boundary Conditions from the City

Excerpts from IBI 2019 Design Brief Related to Water Demands for the Subject Parcel

TABLE B1: Water Demand Chart

Location: CECCE Riverside South - New Secondary School
Project No: OTT-24005530-A0
Designed by: A. Jariwala
Checked By: A. Jariwala
Date Revised: March 2025

Water Consumption

School	=	**70**	L/Student/day
Max. Day Peaking Factor	=	**1.50**	x Avg. Day
Peak Hour Peaking Factor	=	**1.80**	x Max. Day

Proposed	No. of Residential Units						Total Demands (L/sec)		
	Population	Avg. Day Demands (L/day)	Max. Day Peaking Factor	Max. Day Demands (L/day)	Peak Hour Peaking Factor	Peak Hour Deamnds (L/day)	Avg Day (L/s)	Max Day (L/s)	Peak Hour (L/s)
New CECCE School	906	63420	1.50	95130	1.80	171234	0.73	1.10	1.98
Future Expansion	380	26600	1.50	39900	1.80	71820	0.31	0.46	0.83
	1,286	90,020		135,030		243,054	***1.04***	***1.56***	***2.81***

Note: per capita water consuption and peaking factors from Ottawa Design Guidelines - Water Distribution - 2010 - ISD-2010-02

TABLE B2: FIRE FLOW REQURIEMENTS BASED ON FIRE UNDERWRITERS SURVEY(FUS) 2020
PROJECT: OTT-24005530-A0
Building: **CECCE Riverside South - New Secorndary School**

An estimate of the Fire Flow required for a given fire area may be estimated by:

F = 220 * C * SQRT(A)

where: F = required fire flow in litres per minute
A = total floor area in m^2 (including all storeys, but excluding basements at least 50% below grade)
C = coefficient related to the type of construction

Task	Options	Multiplier	Input	Value Used	Fire Flow Total (L/min)
Choose Building Frame (C)	Wood Frame	1.5	Non-combustible Construction	0.8	
	Ordinary Construction	1			
	Non-combustible Construction	0.8			
	Fire Resistive Construction	0.6			
	Second Floor		3163	9531.0 m²	
	First Floor		6368		
	Basement (At least 50% below grade, not included)		0		
Fire Flow (F)	F = 220 * C * SQRT(A)				17,182
Fire Flow (F)	Rounded to nearest 1,000				**17,000**

Reductions/Increases Due to Factors Effecting Burning

Task	Options	Multiplier	Input	Value Used	Fire Flow Change (L/min)	Fire Flow Total (L/min)
Choose Combustibility of Building Contents	Non-combustible	-25%	Limited Combustible	-15%	-2,550	14,450
	Limited Combustible	-15%				
	Combustible	0%				
	Free Burning	15%				
	Rapid Burning	25%				
Choose Reduction Due to Sprinkler System	**Adequate** Sprinkler Conforms to NFPA13	-30%	Adequate Sprinkler Conforms to NFPA13	-30%	-4,335	10,115
	No Sprinkler	0%				
	Standard Water Supply for Fire Department Hose Line and for Sprinkler System	-10%	Standard Water Supply for Fire Department Hose Line and for Sprinkler System	-10%	-1,445	8,670
	Not Standard Water Supply or Unavailable	0%				
	Fully Supervised Sprinkler System	-10%	Fully Supervised Sprinkler System	-10%	-1,445	7,225
	Not Fully Supervised or N/A	0%				

Choose Structure Exposure Distance	Exposures	Separ-ation Dist (m)	Cond	Separation Conditon	Exposed Wall type	Exposed Wall Length: Length (m)	No of Storeys	Length-Height Factor	Sub-Conditon	Charge (%)	Total Charge (%)	Total Exposure Charge (L/min)	
	West	40	5	30.1 to 45	Type V	123	2	246	6	0%	0%	0	7,225
	East	170	5	30.1 to 45	Type V	200	2	400	6	0%			
	South	116	5	30.1 to 45	Type V	323	2	646	6	0%			
	North	66	5	30.1 to 45	Type V	134	2	268	6	0%			
Obtain Required Fire Flow										Total Required Fire Flow, Rounded to the Nearest 1,000 L/min =			**7,000**
										Total Required Fire Flow, L/s =			**116.7**

Exposure Charges for Exposing Walls of Wood Frame Construciton (from Table G5)

Type V	Wood Frame
Type IV-III (U)	Mass Timber or Ordinary with Unprotected Openings
Type IV-III (P)	Mass Timber or Ordinary with Protected Openings
Type II-I (U)	Noncombustible or Fire Resistive with Unprotected Openings
Type II-I (P)	Noncombustible or Fire Resistive with Protected Openings

Conditons for Separation

Separation Dist	Condition
0m to 3m	1
3.1m to 10m	2
10.1m to 20m	3
20.1m to 30m	4
> 30.1m	5

TABLE B3

ESTIMATED WATER PRESSURE AT PROPOSED BUILDING FFE (EXISTING)

Description	From	To	Demand (L/sec)	Pipe Length (m)	Pipe Dia (mm)	Dia (m)	Q (m3/sec)	Area (m2)	C	Vel (m/s)	Slope of HGL (m/m)	Head Loss (m)	Elev From (m)	Elev To (m)	*Elev Diff (m)	Pressure From kPa	(psi)	Pressure To kPa	(psi)	Pressure Drop (psi)
Avg Day Conditons																				
Single 150mm water service	Main	Building	1.04	24 m	150	0.150	0.0010	0.017671	110	0.059	5.5E-05	0.0013	91.20	92.10	-0.9	403.2	(58.5)	394.3	(57.2)	1.3
Max Day Conditons																				
Single 150mm watermain	Main	Building	1.56	24 m	150	0.150	0.0016	0.017671	110	0.0884	0.00012	0.0028	91.20	92.10	-0.9	330.6	(47.9)	321.7	(46.7)	1.3
Peak Hour Conditons																				
Single 150mm watermain	Main	Building	2.81	24 m	150	0.150	0.0028	0.017671	110	0.1592	0.00034	0.0084	91.20	92.10	-0.9	330.6	(47.9)	321.7	(46.7)	1.3
Max Day plus Sprinkler Demands																				
Single 150mm watermain	Main	Building	31.56	24 m	150	0.150	0.0316	0.017671	110	1.7861	0.03022	0.7374	91.20	92.10	-0.9	330.6	(47.9)	314.5	(45.6)	2.3

Water Demand Info

Average Demand =	1.04	L/sec
Max Day Demand =	1.56	L/sec
Peak Hr Deamand =	2.81	L/sec
Fireflow Requriement =	116.7	L/sec
Max Day Plus FF Demand =	118.2	L/sec
Assumed Sprinkler Demands =	30.0	L/sec

Pipe Lengths

From watermain to building =	24 m
Hazen Williams C Factor for Friction Loss in Pipe, C=	110

Boundary Conditon

	Min HGL	Max HGL	Max Day + Fireflow	Max Day + FireFlow (OBC)	
HGL (m)	124.9	132.3	124.9	124.9	(From City of Ottawa)
Approx Ground Elev (m) =	91.20	91.20	91.20	91.20	
Approx Bldg FF Elev (m) =	92.10	92.10	92.10	92.10	
Pressure (m) =	33.7	41.1	33.7	33.7	
Pressure (Pa) =	330,597	403,191	330,597	330,597	
Pressure (psi) =	47.9	58.5	47.9	47.9	

TABLE B4

ESTIMATED WATER PRESSURE AT PROPOSED BUILDING FFE (FUTURE SCENARIO)

Description	From	To	Demand (L/sec)	Pipe Length (m)	Pipe Dia (mm)	Dia (m)	Q (m3/sec)	Area (m2)	C	Vel (m/s)	Slope of HGL (m/m)	Head Loss (m)	Elev From (m)	Elev To (m)	*Elev Diff (m)	Pressure From kPa	(psi)	Pressure To kPa	(psi)	Pressure Drop (psi)
Avg Day Conditons																				
Single 150mm water service	Main	Building	1.04	24 m	150	0.150	0.0010	0.017671	110	0.059	5.5E-05	0.0013	91.20	92.10	-0.9	545.4	(79.1)	536.6	(77.8)	1.3
Max Day Conditons																				
Single 150mm watermain	Main	Building	1.56	24 m	150	0.150	0.0016	0.017671	110	0.0884	0.00012	0.0028	91.20	92.10	-0.9	515.0	(74.7)	506.2	(73.4)	1.3
Peak Hour Conditons																				
Single 150mm watermain	Main	Building	2.81	24 m	150	0.150	0.0028	0.017671	110	0.1592	0.00034	0.0084	91.20	92.10	-0.9	515.0	(74.7)	506.1	(73.4)	1.3
Max Day plus Sprinkler Demands																				
Single 150mm watermain	Main	Building	31.56	24 m	150	0.150	0.0316	0.017671	110	1.7861	0.03022	0.7374	91.20	92.10	-0.9	518.9	(75.3)	502.9	(72.9)	2.3

Water Demand Info

Average Demand =	1.04	L/sec
Max Day Demand =	1.56	L/sec
Peak Hr Deamand =	2.81	L/sec
Fireflow Requriement =	116.7	L/sec
Max Day Plus FF Demand =	118.2	L/sec
Assumed Sprinkler Demands =	30.0	L/sec

Pipe Lengths

From watermain to building =	24 m
Hazen Williams C Factor for Friction Loss in Pipe, C=	110

Boundary Conditon

	Min HGL	Max HGL	Max Day + Fireflow	Max Day + FireFlow (OBC)	
HGL (m)	143.7	146.8	144.1	144.1	(From City of Ottawa)
Approx Ground Elev (m) =	91.20	91.20	91.20	91.20	
Approx Bldg FF Elev (m) =	92.10	92.10	92.10	92.10	
Pressure (m) =	52.5	55.6	52.9	52.9	
Pressure (Pa) =	515,025	545,436	518,949	518,949	
Pressure (psi) =	74.7	79.1	75.3	75.3	

Alexander Johnson

From: Pamela Reid <preid@provencherroy.ca>
Sent: Thursday, November 7, 2024 5:21 PM
To: Aaditya Jariwala
Subject: RE: CECCE Riverside South: FUS Calculations

CAUTION: This email originated from outside of the organization. Do not click links or open attachments unless you recognize the sender and know the content is safe.

Hi Aaditya,

Please see my responses below.

Thank you,

PAMELA REID
CANDIDATE À LA PROFESSION D'ARCHITECTE / INTERN ARCHITECT
613-686-6339,2284 | C 438-492-6781

PROVENCHER_ROY

47 RUE CLARENCE, BUREAU 440
OTTAWA, ONTARIO, CANADA K1N 9K1

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From: Aaditya Jariwala <Aaditya.Jariwala@exp.com>
Sent: 7 novembre 2024 16:29
To: Pamela Reid <preid@provencherroy.ca>
Subject: CECCE Riverside South: FUS Calculations

Hi Pam,

To calculate the Required Fire Flow based on Fire Underwriter's Survey, can you please provide answers for the following items:

1. What will be the GFA for each storey.

With the latest plans, here are the areas.

GROSS BUILDING AREA		
LEVEL	**AREA (m²)**	**Level**
RDC	6368 m²	T/O GROUND FLOOR
NIVEAU 02	3163 m²	T/O 2nd FLOOR
Total GFA	9531 m²	

2. What will be the construction type of the building. See the list of construction type below. I can elaborate more as per FUS 2020, if needed.

None apply. I would say this: Non-Combustible Construction, where floors, mezzanines and structural elements have min. 1-hour fire rating.

- Wood Frame Construction
- Mass Timber Construction
- Ordinary or Joisted Masonry Construction, where exterior wall have min. 1-hour fire rating but interior partitions do not have min. 1-hour fire rating.
- Non-Combustible Construction, where and interior walls, arches, floors, roofs and structural elements have min. 1-hour fire rating.
- Fire Resistive Construction, where exterior and interior walls, arches, floors, roofs and structural elements have min. 2-hour fire rating.

3. Will the vertical and horizontal (if any) opening be protected as per NBC?

No

4. Will there be any fire separations with min. 2-hour fire rating?

No. Only 1hr.

5. What is the building occupancy group and division based on OBC.

3.2.2.24. Group A, Division 2, up to 6 Storeys, Any Area, Sprinklered

6. Will the building be fully equipped with an automatic sprinkler system?

Yes, as required by code.

Let me know if you need further clarification or information.

Thanks,

Aaditya Jariwala, M.Eng, P.Eng.
EXP | Project Manager
t : +1.613.688.1899, 63240 | m : +1.613.816.5961 | e : aaditya.jariwala@exp.com
2650 Queensview Drive
Suite 100
Ottawa, ON K2B 8H6
CANADA
exp.com | legal disclaimer
keep it green, read from the screen

Boundary Conditions
675 Borbridge Ave.

Provided Information

Scenario	Demand	
	L/min	L/s
Average Daily Demand	71	1.19
Maximum Daily Demand	107	1.79
Peak Hour	193	3.22
Fire Flow Demand #1	7,000	116.67

Location



Results

Existing Condition
Connection 1 – Borbridge Ave.

Demand Scenario	Head (m)	Pressure[1] (psi)
Maximum HGL	132.3	58.4
Peak Hour	124.9	47.9
Max Day plus Fire Flow #1	124.9	47.9

[1] Ground Elevation = 91.2 m

Future SUC
Connection 1 – Borbridge Ave.

Demand Scenario	Head (m)	Pressure[1] (psi)
Maximum HGL	146.8	79.0
Peak Hour	143.7	74.6
Max Day plus Fire Flow #1	144.1	75.1

[1] Ground Elevation = 91.2 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.

2 WATER SUPPLY

2.1 Existing Conditions

As noted in Section 1.7, there are existing watermains in the existing Riverside South Development to the north. A 305 mm watermain is stubbed on Spratt Road at the Bus Rapid Transit corridor. A 305mm watermain is on Atrium Ridge which will be extended as part of Phase 15-1B, there are two 203mm watermains on Rosina Avenue and Hawkeswood Drive and there is a 406 mm watermain on Borbridge Street at Brian Good Avenue. **Figure 1.3** shows the location of the existing watermains.

2.2 Riverside South Community Infrastructure Servicing Study Update – Rideau River Area (2017 ISSU)

The report provided trunk watermain servicing for the Rideau River Area, the location and size of the proposed watermains is shown on Drawing WAT-1 in **Appendix B**. The ISSU shows 305 mm watermains on Borbridge Avenue, Brian Good Avenue and Spratt Road adjacent to the Phase 15-2,4 development. Figure 2.1 from the Assessment of Adequacy of Public Services for the Phase 15 Lands is also included in **Appendix B** which shows the major watermains proposed for this area.

2.3 Design Criteria

2.3.1 Water Demands

RSS Phase 15-2,4 will be a residential site consisting of single family lots and street townhouses and two school blocks. Unit population density and consumption rates are taken from Tables 4.1 and 4.2 of the Ottawa Design Guidelines – Water Distribution and are summarized as follows:

- Single Family 3.4 person per unit
- Townhouse and Semi-Detached 2.7 person per unit
- Average Apartment 1.8 person per unit
- Medium Density Area 130 person per ha
- Residential Average Day Demand 350 l/cap/day
- Residential Peak Daily Demand 875 l/cap/day
- Residential Peak Hour Demand 1,925 l/cap/day
- ICI Average Day Demand 50,000 l/gross ha/day
- ICI Peak Daily Demand 75,000 l/gross ha/day
- ICI Peak Hour Demand 135,000 l/gross ha/day

A water demand calculation sheet is included in **Appendix B** for the Phase 15-2,4 development.

2.3.2 System Pressures

The 2010 City of Ottawa Water Distribution Guidelines states 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 in the distribution system in unoccupied areas shall not exceed 689 kPa (100 psi). In accordance with the Ontario Building/Plumbing Code the maximum pressure at any point in the distribution system in occupied areas outside of the public right-of-way shall 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 Age	A total travel time of 5 days or less during basic day demand is reasonable. A residence time of 8 days should not be exceeded.

2.3.3 Fire Flow Rate

The residential units in the subject site will be single family homes and traditional on street town houses. The majority of these units will meet the requirements of Item 4.1 and 4.2 of Technical Bulletin ISD7B-20.4-02 revision to Ottawa Design Guidelines – Water, in which the fire flow requirement is capped at 10,000 l/min. There are several locations where the rear of the house or townhouse block faces the side of an adjacent unit. At these locations the distance between the rear and side of the adjacent building is less than 10 meters which appears to violate item 4.1 of Technical Bulletin ISDTB-2014-02 which requires a 10 meter separation between the backs of the adjacent units. Without the 10,000 l/min cap the Fire Underwriters Survey (FUS) method of determining fire flow rates cannot be used as wood frame buildings separated by less than 3 meters is considered one fire unit. As the side yard distances between houses are usually less than 3 meters then all adjacent houses are considered one fire unit which results in a very large fire flow which is impractical to achieve. This situation occurs for lots 52 to 55 and lots 108 to 112 on Canvasback Ridge as these lots back onto the site yards of lots 51, 56, 107 and 113. In order to calculate a FUS fire flow for these units, it has been agreed to ensure that the buildings for lots 53 and 54 and for lots 109 and 110 be separated by a minimum of 3 meters. With this separation, lots 52 and 53 will become one fire unit under the FUS as well as lots 54 and 55, lots 108 and 109 and lots 110 to 112. FUS calculations for these fire units result in a fire flow of 12,000 l/min (200 l/s) which is used in the analysis to evaluate the fire flows for these lots. For the school blocks a rate of 15,000 l/min (250 l/s) is used.

2.3.4 Hydraulic Model

A computer model for Phase 15-2,4 has been created using the InfoWater SA program. The model includes the adjacent Phase 15-1A and 1B, the Claridge Rivers Edge Phase 1 project and River Road watermains which were recently constructed last year. The water model also incorporates boundary conditions supplied by the City of Ottawa.

Boundary conditions have been supplied at four locations that are included in the hydraulic model. Locations are at River Road at Summerhill Street, Borbridge Avenue at Southbridge Street, Borbridge Avenue at Brian Good Avenue and at Spratt Road near the BRT corridor. The City has

IBI GROUP
333 PRESTON STREET
OTTAWA, ON
K1S 5N4

WATERMAIN DEMAND CALCULATION SHEET

PROJECT : RSS PHASE 15-2, 4 & Spratt Road
LOCATION : CITY OF OTTAWA
DEVELOPER : RIVERSIDE SOUTH DEVELOPMENT CORPORATION

FILE: 103291.5.7
DATE PRINTED: 01-Apr-19
DESIGN: LE
PAGE : 1 OF 1

NODE	RESIDENTIAL				NON-RESIDENTIAL			AVERAGE DAILY DEMAND (l/s)			MAXIMUM DAILY DEMAND (l/s)			MAXIMUM HOURLY DEMAND (l/s)			FIRE DEMAND
	UNITS			POP'N	INDTRL	COMM.	INST.										
	SF	SD & TH	APT		(ha.)	(ha.)	(ha.)	Res.	Non-res.	Total	Res.	Non-res.	Total	Res.	Non-res.	Total	(l/min)
RSS Phase 2																	
2-05	3	6		26				0.11	0.00	0.11	0.27	0.00	0.27	0.59	0.00	0.59	15,000
2-10		10		27				0.11	0.00	0.11	0.27	0.00	0.27	0.60	0.00	0.60	10,000
2-15	5	12		49				0.20	0.00	0.20	0.50	0.00	0.50	1.10	0.00	1.10	10,000
2-20		19		51				0.21	0.00	0.21	0.52	0.00	0.52	1.14	0.00	1.14	10,000
2-25	11	5		51				0.21	0.00	0.21	0.52	0.00	0.52	1.13	0.00	1.13	10,000
2-28	12			41				0.17	0.00	0.17	0.41	0.00	0.41	0.91	0.00	0.91	10,000
2-30	8	7		46				0.19	0.00	0.19	0.47	0.00	0.47	1.03	0.00	1.03	10,000
2-35		3		8				0.03	0.00	0.03	0.08	0.00	0.08	0.18	0.00	0.18	10,000
2-38	13			44				0.18	0.00	0.18	0.45	0.00	0.45	0.98	0.00	0.98	10,000
2-40	11			37				0.15	0.00	0.15	0.38	0.00	0.38	0.83	0.00	0.83	10,000
2-45	10			34				0.14	0.00	0.14	0.34	0.00	0.34	0.76	0.00	0.76	10,000
2-48	10			34				0.14	0.00	0.14	0.34	0.00	0.34	0.76	0.00	0.76	10,000
2-50				0				0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	10,000
2-55	5			17				0.07	0.00	0.07	0.17	0.00	0.17	0.38	0.00	0.38	10,000
2-58	9			31				0.12	0.00	0.12	0.31	0.00	0.31	0.68	0.00	0.68	10,000
2-60	8			27				0.11	0.00	0.11	0.28	0.00	0.28	0.61	0.00	0.61	10,000
2-65	3			10				0.04	0.00	0.04	0.10	0.00	0.10	0.23	0.00	0.23	10,000
2-70	2	13		42				0.17	0.00	0.17	0.42	0.00	0.42	0.93	0.00	0.93	10,000
2-75	7	13		59				0.24	0.00	0.24	0.60	0.00	0.60	1.31	0.00	1.31	10,000
2-80		22		59				0.24	0.00	0.24	0.60	0.00	0.60	1.32	0.00	1.32	10,000
2-85		24		65				0.26	0.00	0.26	0.66	0.00	0.66	1.44	0.00	1.44	10,000
2-100		8		22			3.80	0.09	2.20	2.29	0.22	3.30	3.52	0.48	5.94	6.42	15,000
2-105		4		11				0.04	0.00	0.04	0.11	0.00	0.11	0.24	0.00	0.24	10,000
2-110	7			24			6.00	0.10	3.47	3.57	0.24	5.21	5.45	0.53	9.38	9.91	15,000
2-115	3	10		37				0.15	0.00	0.15	0.38	0.00	0.38	0.83	0.00	0.83	10,000
2-120		10		27				0.11	0.00	0.11	0.27	0.00	0.27	0.60	0.00	0.60	10,000
2-125			274	493				2.00	0.00	2.00	4.99	0.00	4.99	10.99	0.00	10.99	10,000
RSS Phase 4																	
4-10	7			24				0.10	0.00	0.10	0.24	0.00	0.24	0.53	0.00	0.53	10,000
4-20		12		32				0.13	0.00	0.13	0.33	0.00	0.33	0.72	0.00	0.72	10,000
4-30	5	10		44				0.18	0.00	0.18	0.45	0.00	0.45	0.98	0.00	0.98	10,000
4-40		25		68				0.27	0.00	0.27	0.68	0.00	0.68	1.50	0.00	1.50	10,000
4-50	27			92				0.37	0.00	0.37	0.93	0.00	0.93	2.05	0.00	2.05	10,000
4-60	11			37				0.15	0.00	0.15	0.38	0.00	0.38	0.83	0.00	0.83	10,000
4-80	12			41				0.17	0.00	0.17	0.41	0.00	0.41	0.91	0.00	0.91	10,000
Totals										**12.62**			**25.83**			**53.42**	

ASSUMPTIONS

RESIDENTIAL DENSITIES

- Single Family (SF) 3.4 p / p / u
- Semi Detached (SD) & Townhouse (TI 2.7 p / p / u
- Apartment (APT) 1.8 p / p / u
- Medium Density Area 130 p / p / ha

AVG. DAILY DEMAND

- Residential 350 l / cap / day
- ICI 50,000 l / ha / day

MAX. DAILY DEMAND

- Residential 875 l / cap / day
- ICI 75,000 l / ha / day

MAX. HOURLY DEMAND

- Residential 1,925 l / cap / day
- ICI 135,000 l / ha / day

FIRE FLOW

- SF, SD, TH & ST 10,000 l / min
- Back to Back TH 12,000 l / min
- ICI 15,000 l / min

Water Model Phase 15 - 2, 4 & Spratt

CONN-4
SP-01
4-50
4-60
4-20
4-80
4-40
SP-03
Phase 15 - 4
4-30
2-125
4-10
Spratt Road
2-120
SP-04
2-115
2-85
CONN-1
RR01
Borbridge Avenue
2-110
2-80
CONN-3
2-70
2-105
2-75
RR05
2-55
CONN-2
Phase 15 - 2
2-48
1A-15
1A-10
2-62
2-65
1A-05
2-60
2-100
2-40
RR10
2-58
Brian Good Avenue
2-28
1A-20
1B-05
2-45
1A-25
2-25
1A-45
2-50
2-38
1B-10
Atrium Ridge
2-15
RR15
1A-30
1B-15
2-30
2-05
1A-35
2-35
Rivers Edge Phase 2
2-12
1A-55
1A-40
2-08
2-20
Phase 15 - 1A
1B-30
1B-25
1B-20
1A-60
2-10
1A-65
Phase 15 - 1B
RR25
1B-50
1B-55
1A-70
1B-35
1A-75

Appendix C – Sanitary Sewer Design Sheet

C1 - Sanitary Sewer Design Sheet

Email Confirmation from the City on Municipal Sanitary Sewer Capacity

Excerpts from IBI 2019 Design Brief Related to Sanitary Flows for the Subject Parcel

TABLE C1 - SANITARY SEWER CALCULATION SHEET

LOCATION				INSTITUTIONAL					INFILTRATION				SEWER DATA						
									AREA (ha)										
Street	U/S MH	D/S MH	Desc	STUDENT POPULATION	STAFF POPULATION	TOTAL POPULATION (Persons)	ACCU POPULATION (Persons)	Peak Flow (L/sec)	INDIV	ACCU	INFILT FLOW (L/s)	TOTAL FLOW (L/s)	Nom Dia (mm)	Actual Dia (mm)	Slope (%)	Length (m)	Capacity (L/sec)	Q/Q_{CAP} (%)	Full Velocity (m/s)
Borbridge Ave	BLDG	SANMH 201	Proposed	826	80	906	906	1.42	6.01	6.01	1.98	3.40	150	155.00	2.00	3.80	23.5	14.5%	1.7
			Future	360	20	380	1286	2.01	6.01	6.01	1.98	3.99	150	155.00	2.00	3.80	23.5	17.0%	1.7
	SANMH 201	SANMH 202										3.99	150	155.00	2.00	9.74	23.5	17.0%	1.7
	SANMH 202	525 MUNI SAN										3.99	150	155.00	2.00	14.46	23.5	17.0%	1.7
Totals							**1286**			**6.01**		**3.99**							

Notes:

gross site area (ha)	6.07
population - new school	906
population - future expansion	380
Total population post future expansion	1,286
Manning N =	0.013
per City of Ottawa Sewer Design Guidelines - 2012:	
Avg. Daily Flow (School) (L/person/day) =	90.00
Institutional Peak Factor =	1.50
Peak extraneous flow, I (L/s/ha) =	0.33

Designed:	Project:
A. Jariwala., M.Eng., P.Eng.	CECCE Riverside South - New Secondary School
Checked:	Location:
A. Jariwala., M.Eng., P.Eng.	675 Borbridge Ave., Ottawa, ON.
File Reference:	Page No:
24005530 - SAN - Sanitary Design Sheet.xlsx	**1 of 1**

From: Giovannitti, Terenzo <terenzo.giovannitti@ottawa.ca>
Sent: Friday, November 22, 2024 9:21 AM
To: Aaditya Jariwala
Cc: Pamela Reid
Subject: RE: 675 Borbridge Ave - Water Boundary Conditions and Sanitary Capacity Check

CAUTION: This email originated from outside of the organization. Do not click links or open attachments unless you recognize the sender and know the content is safe.

Hi Aaditya,

This is just a brief follow up for the downstream sanitary check.
The proposed peak flow you provided seems to be in line with what was allocated in the subdivision design and is therefore acceptable.
There are no downstream capacity concerns for this proposed design at this time.

Regards,
Terenzo Giovannitti
Project Manager
Development Review – All Wards (DRAW)
Planning, Development and Building Services Department
City of Ottawa
110 Laurier Ave W. Ottawa, ON
613-580-2424 (ext. 23436)
terenzo.giovannitti@ottawa.ca

From: Giovannitti, Terenzo
Sent: November 14, 2024 9:27 AM
To: Aaditya Jariwala <Aaditya.Jariwala@exp.com>
Cc: Pamela Reid <preid@provencherroy.ca>
Subject: RE: 675 Borbridge Ave - Water Boundary Conditions and Sanitary Capacity Check

Good morning Aaditya,

Please see attached Boundary conditions result.

I am still waiting for a response about the downstream sanitary capacity. I will provide you with a response as soon as I get it.

If you have any questions, let me know.
Thanks,

Terenzo Giovannitti
Project Manager
Development Review – All Wards (DRAW)
Planning, Development and Building Services Department
City of Ottawa
110 Laurier Ave W. Ottawa, ON
613-580-2424 (ext. 23436)

terenzo.giovannitti@ottawa.ca

From: Aaditya Jariwala <Aaditya.Jariwala@exp.com>
Sent: November 11, 2024 3:27 PM
To: Giovannitti, Terenzo <terenzo.giovannitti@ottawa.ca>
Cc: Pamela Reid <preid@provencherroy.ca>
Subject: 675 Borbridge Ave - Water Boundary Conditions and Sanitary Capacity Check
Importance: High

CAUTION: This email originated from an External Sender. Please do not click links or open attachments unless you recognize the source.

ATTENTION : Ce courriel provient d'un expéditeur externe. Ne cliquez sur aucun lien et n'ouvrez pas de pièce jointe, excepté si vous connaissez l'expéditeur.

Hi Terenzo,

Sending the request for water boundary condition and sanitary sewer capacity check as per the notes from PH1 feedback form on the above mentioned SPA.

Please see attached figure for the location of anticipated new water connection. Domestic and fire demands are as follows:

Avg. Day Demands: 1.19 L/sec
Max. Day Demands: 1.79 L/sec
Peak Hour Demands: 3.22 L/sec
RFF as per FUS (2020): 116.7 L/sec

Associated calculation sheets are attached to the email for your reference.

Additionally, the anticipated sanitary flows including infiltration allowances will be 4.9 L/sec. Please confirm if there are any capacity constraints in the receiving sanitary sewer on Borbridge Ave.

Let me know if you have any questions or concerns regarding this.

Best regards,

Aaditya Jariwala, M.Eng, P.Eng.
EXP | Project Manager
t : +1.613.688.1899, 63240 | m : +1.613.816.5961 | e : aaditya.jariwala@exp.com
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CANADA

exp.com | legal disclaimer

keep it green, read from the screen

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'

3 WASTEWATER DISPOSAL

3.1 Existing Conditions

As noted earlier in Section 1.7, sanitary flows from the subject site will be routed to the 525 mm diameter sub-trunk sanitary sewer on Spratt Road north of the BRT corridor. **Figure 1.3,** in **Appendix A**, shows the current location of the sewer.

3.2 Riverside South Community Infrastructure Servicing Study Update – Rideau River Area (2017 ISSU)

The 2017 ISSU Report recommended that wastewater flows from the study area be routed to either the River Road or Spratt Road sewer. For reference, a copy of Drawing SAN-1, Sanitary Drainage Plan from the 2017 study is included in **Appendix C**. The 2017 ISSU study recommended that drainage area 2a be tributary to the River Road sanitary sewer and areas 2c and 2d be tributary to the Spratt Road sewer. A copy of Figure 4.2, Recommended Sanitary Servicing (2017 Update), from the 2017 ISSU Report, together with a related design sheet are both included in **Appendix C**.

However, subsequent to completion of the 2017 ISSU Report, it was recommended to move the drainage limit between the two sewers eastward. It is proposed to switch about 33 ha from Drainage Area 2c and 8 ha from Drainage Area 2d away from the Spratt Road sewer to Drainage Area 2a which is tributary to the River Road sewer. This drainage limit shift is supported by the impacted landowners including RSDC, Claridge and Cardel. A copy of the relevant July 20, 2017 e-mail string is included in **Appendix C**.

Therefore, it is proposed to increase the 2a sub-catchment area by about 41 ha and decrease the 2c and 2d areas by an equal amount. A Deviation Report Memorandum detailing these changes was completed by IBI Group July 25, 2017 and is included in **Appendix C**. Similarly, further analysis was conducted on the Spratt Road Collector and Shoreline Drive Collector sewers, the resulting design sheet and Figure A-3 has also been provided in **Appendix C**.

Figure 3.1 from the 2018 Assessment of Adequacy of Public Services is also included in **Appendix C** which shows the proposed sanitary sewer servicing for the Phase 15 lands.

3.3 Design Criteria

The estimated wastewater flows from the subject site are based on the revised City of Ottawa design criteria. Among other items, these include:

- Average residential flow = 280 l/c/d
- Peak residential flow factor = (Harmon Formula) x 0.80
- Average commercial flow = 28,000 l/s/ha
- Average institutional flow = 28,000 l/s/ha
- Peak ICI flow factor = 1.5 if ICI area is ≤ 20% total area
  1.0 if ICI area is > 20% total area
- Inflow and Infiltration Rate = 0.33 l/s/ha
- Minimum Full Flow Velocity = 0.60 m/s

Stantec

Riverside South Community
Infrastructure Servicing Study

Revision Date: June 5, 2017
Revison : 3
Designed by: Megan Young
Checked By: Amanda Lynch

SANITARY SEWER DESIGN SHEET

CITY CRITERIA & DENSITIES
Approved area

File Number: 1634-01101

DESIGN PARAMETERS

Average Daily Flow / Person:	350	l/p/day	Commercial:	0.579	l/s/ha
Minimum Velocity:	0.60	m/s	Employment	0.579	l/s/ha
n =	0.013		Institutional:	0.579	l/s/ha
Max Peaking Factor:	4.0		Infiltration:	0.280	l/s/ha
Min. Peaking Factor:	2.0				
Peaking Factor Industrial:	Based on Appendix 4-B		Low Density:	@ 3.2	pers/unit
Peaking Factor Comm. / Inst.:	1.5		Medium Density:	@ 2.4	pers/unit
			High Density:	@ 1.9	pers/unit

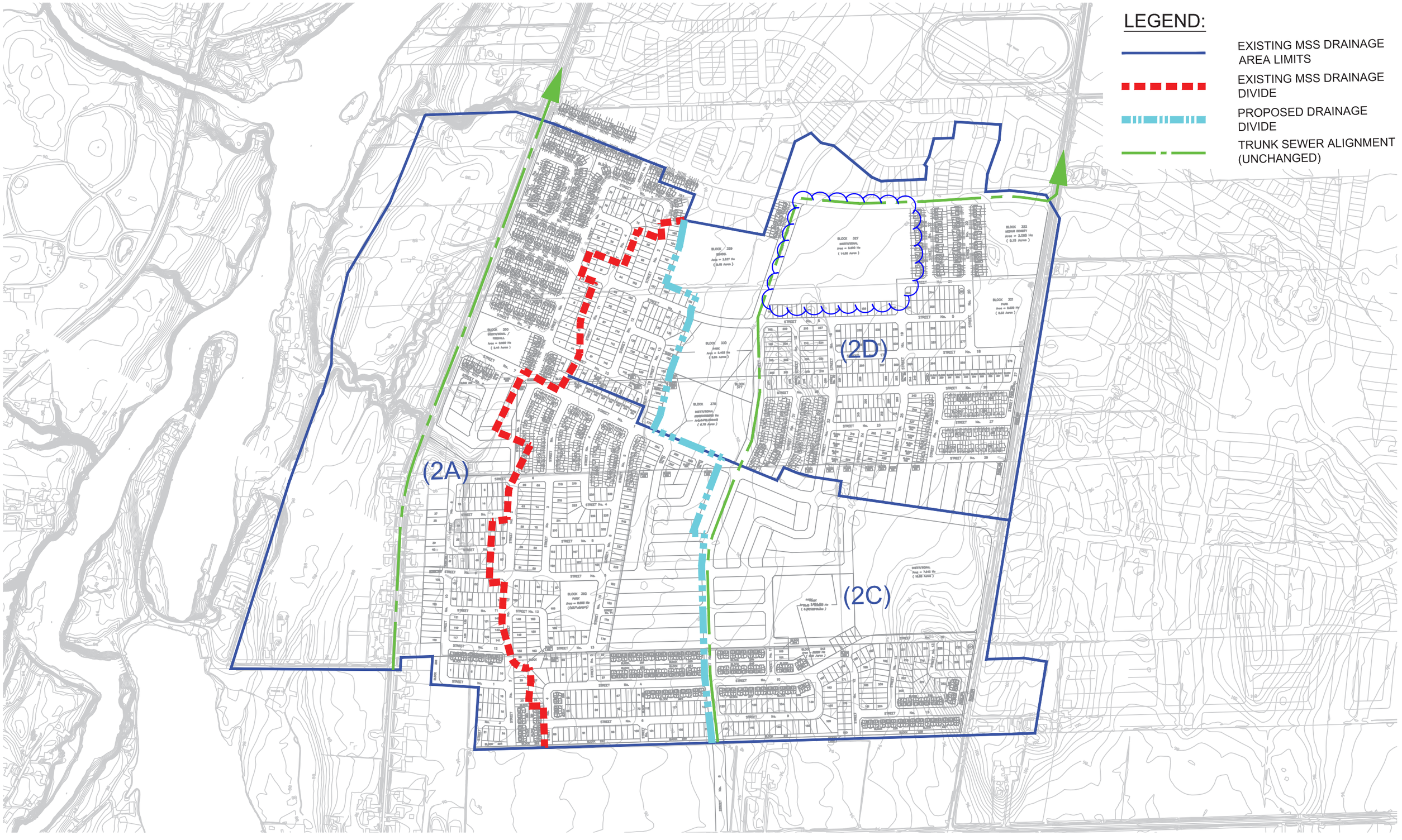
Existing Sanitary Sewer flows estimated by existing land use. Existing Phase 9 area contribution based on JLR 2011 report

STREET	ID Area	From MH	To MH	RESIDENTIAL AREA (ha)	RESIDENTIAL LOW Area (ha)	RESIDENTIAL LOW Pop.	RESIDENTIAL LOW Accum. Pop.	RESIDENTIAL MED Area (ha)	RESIDENTIAL MED Pop.	RESIDENTIAL MED Accum. Pop.	RESIDENTIAL HIGH Area (ha)	RESIDENTIAL HIGH Pop.	RESIDENTIAL HIGH Accum. Pop.	Units	Accum. Units	Total Accum. Pop.	Peak Factor	Peak Flow (l/s)	COMMERCIAL Area (ha)	COMMERCIAL Accum. Area (ha)	EMPLOYMENT Area (ha)	EMPLOYMENT Accum. Area (ha)	INSTITUTIONAL Area (ha)	INSTITUTIONAL Accum. Area (ha)	C+I+I Peak Flow (l/s)	ROAD Area (ha)	ROAD Accum. Area (ha)	INFILTRATION Total Area (ha)	INFILTRATION Accum. Area (ha)	INFILTRATION Infilt. Flow (l/s)	Total Flow (l/s)	PIPE Distance (m)	PIPE Diameter (mm)	PIPE Slope (%)	PIPE Qa/Qc	PIPE Capacity (Full) (l/s)	PIPE Velocity (Full) (m/s)	PIPE Velocity (Actual) (m/s)
RIVER ROAD	**2a**	108	107	50.51	44.40	2189	2189	6.11	389	389	0.00	0	0	846	846	2578	3.5	36.5	1.19	1.19	0.00	0.00	1.01	1.01	1.9	4.48	4.48	57.18	57.18	16.0	54.4	1255	450	0.12	0.53	103.0	0.63	0.63
RIVER ROAD	**2b Future**	107	107a	12.21	10.22	502	2691	1.99	127	516	0.00	0	0	210	1056	3207	3.4	44.4	0.00	1.19	0.00	0.00	0.00	1.01	1.9	2.64	7.12	14.85	72.03	20.2	66.5	254	525	0.12	0.43	155.4	0.70	0.66
RIVER ROAD	**2b Existing (Phase 9)**	107a	107b	43.20	43.20	2351	5042	0.00	0	516	0.00	0	0	N/A	1056	5558	3.2	72.1	0.00	1.19	0.00	0.00	2.46	3.47	4.0	0.00	7.12	45.66	117.69	33.0	109.1	**405**	**525**	**0.10**	**0.76**	**144.5**	**0.65**	**0.71**
RIVER ROAD		107b	107c	0.00	0.00	0	5042	0.00	0	516	0.00	0	0	0	1056	5558	3.2	72.1	0.00	1.19	0.00	0.00	0.00	3.47	4.0	0.00	7.12	0.00	117.69	33.0	109.1	**217**	**525**	**0.12**	**0.72**	**152.3**	**0.68**	**0.74**
RIVER ROAD		107c	107d	0.00	0.00	0	5042	0.00	0	516	0.00	0	0	0	1056	5558	3.2	72.1	0.00	1.19	0.00	0.00	0.00	3.47	4.0	4.70	11.82	4.70	122.39	34.3	110.4	**107**	**525**	**0.10**	**0.77**	**143.9**	**0.64**	**0.71**
		107d	106	0.00	0.00	0	5042	0.00	0	516	0.00	0	0	0	1056	5558	3.2	72.1	0.00	1.19	0.00	0.00	0.00	3.47	4.0	0.00	11.82	0.00	122.39	34.3	110.4	**278**	**525**	**0.08**	**0.90**	**123.3**	**0.55**	**0.63**
	Ex3	106	103	17.90	10.04	413	5455	7.86	564	1080	0.00	0	0	364	1420	6535	3.1	83.0	5.35	6.54	0.00	0.00	0.00	3.47	8.7	0.00	11.82	23.25	145.64	40.8	132.5	**835**	**525**	**0.10**	**0.93**	**141.9**	**0.63**	**0.73**
	Ex2	103	102	16.42	16.42	573	6028	0.00	0	1080	0.00	0	0	179	1599	7108	3.1	89.3	0.00	6.54	0.00	0.00	0.00	3.47	8.7	5.11	16.93	21.53	167.17	46.8	144.8	**1100**	**525**	**0.10**	**1.02**	**141.9**	**0.63**	**0.74**
SPRATT SOUTH	**2d**	113	112	39.28	28.89	1424	3978	10.40	665	790	0.00	0	0	722	1572	4768	3.3	63.0	0.00	0.00	0.00	0.00	14.95	22.63	19.7	5.45	11.38	59.69	127.09	35.6	118.3	1155	525	0.11	0.79	148.8	0.67	0.74
SPRATT SOUTH		111-a	111	0.00	0.00	0	3978	0.00	0	1637	0.00	0	479	0	2177	6094	3.2	78.1	0.00	2.55	0.00	0.00	0.00	22.63	21.9	0.00	17.52	0.00	153.26	42.9	142.9	215	525	0.11	0.96	148.8	0.67	0.77
SPRATT SOUTH	**Ex4**	111	110	14.93	13.31	90	4068	1.62	468	2105	0.00	0	479	223	2400	6652	3.1	84.3	0.91	3.46	0.00	0.00	0.00	22.63	22.7	0.00	17.52	15.84	169.10	47.3	154.3	**600**	**525**	**0.12**	**0.99**	**155.4**	**0.70**	**0.81**
SHORELINE DRIVE	**3b**	117	116	48.13	43.40	2138	2138	4.73	302	302	0.00	0	0	794	794	2440	3.5	34.8	0.66	0.66	0.00	0.00	0.05	0.05	0.6	2.77	2.77	51.60	51.60	14.4	49.8	1270	450	0.11	0.51	98.6	0.60	0.60
SHORELINE DRIVE	**3c**	116	115	47.51	27.40	1350	3488	15.47	989	1291	4.64	530	530	1113	1907	5309	3.2	69.3	0.00	0.66	0.00	0.00	11.13	11.17	10.3	10.02	12.79	68.67	120.26	33.7	113.2	990	450	0.17	0.92	122.6	0.75	0.86
SHORELINE DRIVE	**Ex5**	115	110	20.60	14.47	480	3968	6.13	302	1593	0.00	0	530	276	2183	6091	3.2	78.1	0.80	1.46	0.00	0.00	3.16	14.33	13.7	0.00	12.79	24.56	144.82	40.6	132.3	**480**	**450**	**0.20**	**0.99**	**133.0**	**0.81**	**0.94**
SPRATT SOUTH	**Ex6**	110	109	25.47	20.32	822	8858	5.15	288	3986	0.00	0	1009	377	4960	13853	2.8	157.9	0.00	4.92	0.00	0.00	2.39	39.36	38.5	0.00	30.31	27.86	341.78	95.7	292.0	**675**	**675**	**0.12**	**0.96**	**303.8**	**0.82**	**0.95**
CANYON WALK DRIVE	**3d**	121	120	46.05	35.39	1744	1744	10.66	679	679	0.00	0	0	828	828	2423	3.5	34.5	0.60	0.60	0.00	0.00	3.72	3.72	3.8	5.41	5.41	55.78	55.78	15.6	53.9	820	450	0.15	0.47	115.2	0.70	0.69
CANYON WALK DRIVE	**3e**	120	119	54.06	40.27	1984	3728	13.79	881	1560	0.00	0	0	987	1815	5288	3.2	69.0	0.00	0.60	0.00	0.00	3.91	7.63	7.2	9.21	14.62	67.19	122.97	34.4	110.6	925	525	0.18	0.58	190.3	0.85	0.89
CANYON WALK DRIVE	**3f-4a**	119	118	17.44	0.00	0	3728	3.06	194	1754	14.38	1007	1007	577	2392	6489	3.1	82.5	6.01	6.61	0.00	0.00	5.28	12.92	17.0	16.75	31.37	45.49	168.46	47.2	146.6	880	525	0.19	0.75	195.6	0.88	0.97
internal south	**6a**	123	122	49.84	31.53	1555	1555	18.31	1169	1169	0.00	0	0	973	973	2724	3.5	38.4	1.18	1.18	0.00	0.00	5.33	5.33	5.7	6.44	6.44	62.80	62.80	17.6	61.6	600	525	0.14	0.37	167.9	0.75	0.68
ARMSTRONG ROAD	**4b**	122	118	58.24	0.00	0	1555	0.00	0	1169	58.24	4070	4070	2005	2978	6794	3.1	85.8	24.34	25.53	0.00	0.00	0.00	5.33	26.8	24.91	31.35	107.49	170.29	47.7	160.3	1810	600	0.13	0.69	231.0	0.79	0.86
CANYON WALK DRIVE	**Ex1**	118	124	45.64	22.12	896	6179	23.52	1687	4610	0.00	0	5077	983	6353	15866	2.8	177.0	1.55	33.69	0.00	0.00	0.00	18.25	45.1	0.00	62.72	47.19	385.94	108.1	330.2	**860**	**750**	**0.15**	**0.73**	**449.8**	**0.99**	**1.08**
SPRATT ROAD	**5c**	130	129	25.52	20.06	989	989	5.46	348	348	0.00	0	0	454	454	1337	3.7	20.1	0.00	0.00	0.00	0.00	2.38	2.38	2.1	4.86	4.86	32.77	32.77	9.2	31.4	420	600	0.15	0.13	248.1	0.85	0.56
SPRATT ROAD	**1a**	129	128	10.26	7.00	346	1335	3.26	209	557	0.00	0	0	195	649	1892	3.6	27.6	0.00	0.00	0.00	0.00	0.00	2.38	2.1	7.76	12.63	18.02	50.79	14.2	43.9	450	675	0.15	0.13	339.6	0.92	0.61
SPRATT ROAD	**1b**	128	127	18.80	4.11	202	1537	13.56	866	1423	1.13	129	129	492	1141	3089	3.4	42.9	0.00	0.00	0.00	0.00	2.82	5.20	4.5	5.34	17.97	26.97	77.76	21.8	69.2	490	675	0.15	0.20	339.6	0.92	0.70
internal north	**5b**	135	134	17.31	10.06	496	496	7.25	463	463	0.00	0	0	348	348	959	3.8	14.8	0.00	0.00	0.00	0.00	0.03	0.03	0.0	1.32	1.32	18.66	18.66	5.2	20.1	385	375	0.15	0.28	70.8	0.62	0.53
internal north	**1d**	134	127	21.95	12.43	611	1107	9.52	607	1070	0.00	0	0	444	792	2177	3.6	31.4	2.66	2.66	0.00	0.00	0.01	0.04	2.3	4.33	5.66	28.95	47.61	13.3	47.0	550	375	0.15	0.66	70.8	0.62	0.67
	BP-1	137	127	39.70	20.70	1173	1173	17.00	1019	1019	2.00	398	398	891	891	2590	3.5	36.7	0.00	0.00	16.18	16.18	0.00	0.00	9.4	6.81	6.81	62.69	62.69	17.6	63.6	725	375	0.15	0.90	70.8	0.62	0.71
SPRATT ROAD	**1c**	127	126	14.01	0.00	0	3817	8.98	574	4086	5.03	574	1101	541	3365	9004	3.0	109.4	0.74	3.40	0.00	16.18	6.60	11.84	22.6	6.42	36.86	27.77	215.82	60.4	192.4	795	750	0.15	0.43	449.8	0.99	0.94
internal north	**5a**	133	132	11.48	4.65	230	230	6.83	437	437	0.00	0	0	254	254	667	3.9	10.6	1.02	1.02	0.00	0.00	1.15	1.15	1.9	4.02	4.02	17.68	17.68	5.0	17.4	410	375	0.15	0.25	70.8	0.62	0.50
internal north	**1e**	132	126	34.06	22.08	1088	1318	11.98	766	1203	0.00	0	0	659	913	2521	3.5	35.8	0.00	1.02	0.00	0.00	1.37	2.52	3.1	6.18	10.21	41.61	59.29	16.6	55.5	810	450	0.15	0.48	115.2	0.70	0.69
	BP-2	138	126	0.11	0.00	0	0	0.11	7	7	0.00	0	0	3	3	7	4.0	0.1	0.00	0.00	15.00	15.00	0.00	0.00	8.7	1.48	1.48	16.59	16.59	4.6	13.4	440	375	0.15	0.19	70.8	0.62	0.46
SPRATT ROAD	**1g**	126	125	14.19	1.66	83	5218	9.47	605	5901	3.05	348	1449	461	4742	12568	2.9	145.4	0.98	5.40	0.00	31.18	10.12	24.48	44.0	3.45	52.00	28.74	320.44	89.7	279.1	710	750	0.17	0.58	478.9	1.05	1.09
SPRATT ROAD	**1f**	131	125	9.29	5.05	250	250	4.24	271	271	0.00	0	0	191	191	521	4.0	8.4	0.00	0.00	0.00	0.00	0.00	0.00	0.0	3.48	3.48	12.77	12.77	3.6	11.9	420	300	0.20	0.26	45.1	0.62	0.51
	BP3	136	125	0.00	0.00	0	0	0.00	0	0	0.00	0	0	0	0	0	0.0	0.0	0.00	0.00	38.46	38.46	0.00	0.00	22.3	5.69	5.69	44.15	44.15	12.4	34.6	986	375	0.14	0.51	68.4	0.60	0.60
SPRATT ROAD	**1h**	125	124	1.69	0.00	0	5468	1.69	108	6280	0.00	0	1449	45	4978	13197	2.8	151.5	2.20	7.60	0.00	69.64	1.66	26.14	69.6	3.04	64.20	8.59	385.95	108.1	329.2	**830**	**900**	**0.15**	**0.45**	**731.4**	**1.11**	**1.07**
SPRATT ROAD	**Ex7**	124	109	17.26	11.40	768	12415	3.00	250	11140	2.86	327	6853	516	11847	30408	2.5	304.4	0.64	41.93	0.00	69.64	0.00	44.39	115.3	0.00	126.93	17.90	789.79	221.1	640.9	**515**	**1050**	**0.15**	**0.58**	**1103.3**	**1.23**	**1.28**
CANYON WALK DRIVE	**Ex8**	109	102	56.40	54.40	2150	23423	2.00	134	15260	0.00	0	7862	728	17535	46545	2.3	432.5	0.00	46.85	0.00	69.64	0.00	83.75	153.7	5.45	162.68	61.85	1193.42	334.2	920.4	**1100**	**1050**	**0.15**	**0.83**	**1103.3**	**1.23**	**1.39**
SPRATT ROAD	**BP-4**	139	102	0.00	0.00	0	0	0.00	0	0	0.00	0	0	0	0	0	0.0	0.0	0.00	0.00	127.52	127.52	0.00	0.00	169.8	19.76	19.76	147.28	147.28	41.2	211.1	2790	675	0.15	0.62	339.6	0.92	0.97
CROSSING		102	101	0			29451			16340			7862		**19134**	**53653**	2.2	486.0		53.39		197.16		87.21	384.7		199.37	0	1507.87	422.2	1292.9	**145**	**1200**	**0.11**	**0.96**	**1349.0**	**1.16**	**1.33**

CROSSING

***Note:**
Area BP-4 also accounts for additional 39ha area outside the CDP that was accounted for in calculation of Employment Area
PIPE Capacity (Full) calculated using ACTUAL PIPE SIZE
Limiting Capacity Calculated based on 1200 mm pipe @ 0.11% between Rideau Road and River
Additional sanitary flow of 29.21 L/s from Rideau Carleton Raceway (RCR) is not included in the above calculation, as it is proposed that flow from this area be pumped into the system at off-peak times

J:\103291_RvrsideSPh15\5.9 Drawings\59civil\current\FIGURES\FIGURE S-1.dwg Layout Name: FIGURE S-1 Plot Scale: 1:5.13 Plotted At: 6/29/2017 Last Saved By: chris.cormier Last Saved At: Jun. 29, 17



Scale	Project Title	Drawing Title	Sheet No.
IBI N.T.S.	RIVERSIDE SOUTH RIDEAU RIVER POND 5 DRAINAGE AREA	ALTERNATIVE SANITARY DRAINAGE LIMIT	FIGURE S-1

Appendix D – Stormwater Management Design Sheet

Table D1 - Stormwater Management Summary

Table D2 - Calculation of Average Runoff Coefficient City Row (Pre-Development)

Table D3 - Pre-Development Runoff City Row

Table D4 - Calculation of Average Runoff Coefficient City Row (Post-Development)

Table D5 - Post-Development Runoff City Row

Table D6 - Calculation of Average Runoff Coefficients 675 Borbridge (Post-Development)

Table D7 - SWM Post-Development Runoff 675 Borbridge (Uncontrolled And Controlled)

Table D8 - 2-Year, 5-Year & 100-Year Roof Drains Design Sheet - Using Flow Controlled Roof Drains

Table D9 - P-1 Storage Volumes for 2-year, 5-Year and 100-Year Storms (MRM)

Table D10 - P-2 Storage Volumes for 2-year, 5-Year and 100-Year Storms (MRM)

Table D11 - P-3 Storage Volumes for 2-year, 5-Year and 100-Year Storms (MRM)

Table D12 - P-4 Storage Volumes for 2-year, 5-Year and 100-Year Storms (MRM)

Table D13 - 5-Year Storm Sewer Calculation Sheet

Table D14 – Flow Through Inlet Control Device – CB 307 (Catchment P-1)

Table D15 – Flow Through Inlet Control Device – CB 305 (Catchment P-2)

Table D16 – Flow Through Inlet Control Device – CB 304 (Catchment P-3)

Table D17 – Flow Through Inlet Control Device – CB 306 (Catchment P-4)

TABLE D1: Stormwater Management Summary

Area ID	Outlet Location	Area (ha)	Runoff Coefficient 'C'	100 Year Release (L/s)	100 Year Storage Required (m^3)	Max. Surface Storage Provided (m3)	Control Method	Storage Method
P-1	CB 307	0.126	0.59	**24.0**	13.1	30.2	**ICD - 80mmØ Orifice Plate**	Surface Ponding
P-2	CB 305	0.203	0.84	**69.3**	20.3	160.4	**ICD - 140mmØ Orifice Plate**	Surface Ponding
P-3	CB 304	0.179	0.84	**59.0**	18.6		**ICD - 130mmØ Orifice Plate**	Surface Ponding
P-4	DCB 306	1.903	0.24	**175.0**	68.1	532.82	**ICD - 226mmØ Orifice Plate**	Surface Ponding
P-5	DCB 309	0.804	0.28	138.7	-	-	Uncontrolled	-
P-6	DCB 303	0.804	0.26	128.1	-	-	Uncontrolled	-
P-7	DCB 308	0.785	0.20	99.4	-	-	Uncontrolled	-
P-8	CB 301, 302	0.150	0.63	58.2	-	-	Uncontrolled	-
P-9	Brian Good/Borebridge	0.420	0.26	68.2	-	-	Uncontrolled	-
P-R	STMMH 106	0.634	0.90	**64.7**	182.2	243.3	**Flow Control Roof Drains**	Surface Ponding
675 Borbridge Totals		**6.007**		**884.7**	**302.3**	**966.7**		
POS-1	Brian Good/Borebridge ROW	0.309	0.51	98.4	-	-	Uncontrolled	-

Total Allowable Release Rate for 675 Borbridge (L/s): **915.0** (*From Design Brief - Riverside South phase 15-2, 4 & Spratt Road, prepared by IBI Group dated August, 2019*)

TABLE D2 - CALCULATION OF AVERAGE RUNOFF COEFFICIENT CITY ROW (PRE-DEVELOPMENT)

Area No.	Outlet Location	Asphalt/Concrete		Roof		Pavers		Gravel		Soft Landscaping		Sum AC	Total Area (m^2)	C_{AVG}
		Area (m^2)	A * C	Area (m^2)	A * C	Area (m^2)	A * C	Area (m^2)	A * C	Area (m^2)	A * C			
		C=0.90		C=0.90		C=0.90		C=0.70		C=0.20				
POS-1	Brian Good/Borebridge ROW	1060.57	954.5	0.00	0.0	0.00	0.0	0.00	0.00	2029.95	405.99	1360.5	3090.52	0.44

TABLE D3 PRE-DEVELOPMENT RUNOFF CITY ROW

Area No	Outlet Location	Area (ha)	Time of Conc. T_c (min)	Storm = 2-year				Storm = 5-year				Storm = 100-year			
				C_{AVG}	I_2 (mm/hr)	Q (L/sec)	Q_{CAP} (L/sec)	C_{AVG}	I_5 (mm/hr)	Q (L/sec)	Q_{CAP} (L/sec)	$C_{AVG-100Yr}$	I_{100} (mm/hr)	Q (L/sec)	Q_{CAP} (L/sec)
POS-1	Brian Good/Borebridge ROW	0.309	10	0.44	76.81	29.0	29.0	0.44	104.19	39.4	39.4	0.55	178.56	84.4	84.4

Notes

1) Intensity, $I_2 = 732.951/(Tc+6.199)^{0.810}$ (2-year, City of Ottawa)

2) Intensity, $I_5 = 998.071/(Tc+6.035)^{0.814}$ (5-year, City of Ottawa)

3) Intensity, $I_{100} = 1735.688/(Tc+6.014)^{0.820}$ (100-year, City of Ottawa)

4) Time of Concentration: T_c=10min

TABLE D4 - CALCULATION OF AVERAGE RUNOFF COEFFICIENT CITY ROW (POST-DEVELOPMENT)

Area No.	Outlet Location	Asphalt/Concrete		Roof		Pavers		Gravel		Soft Landscaping		Sum AC	Total Area (m^2)	C_{AVG}
		Area (m^2)	A * C	Area (m^2)	A * C	Area (m^2)	A * C	Area (m^2)	A * C	Area (m^2)	A * C			
		C=0.90		C=0.90		C=0.90		C=0.70		C=0.20				
POS-1	Brian Good/Borebridge ROW	1381.75	1243.6	0.00	0.0	0.00	0.0	0.00	0.00	1708.77	341.75	1585.3	3090.52	0.51

TABLE D5 - POST-DEVELOPMENT RUNOFF CITY ROW

Area No	Outlet Location	Area (ha)	Time of Conc. T_c (min)	Storm = 2-year				Storm = 5-year				Storm = 100-year			
				C_{AVG}	I_2 (mm/hr)	Q (L/sec)	Q_{CAP} (L/sec)	C_{AVG}	I_5 (mm/hr)	Q (L/sec)	Q_{CAP} (L/sec)	$C_{AVG-100Yr}$	I_{100} (mm/hr)	Q (L/sec)	Q_{CAP} (L/sec)
POS-1	Brian Good/Borebridge ROW	0.309	10	0.51	76.81	33.8	33.8	0.51	104.19	45.9	45.9	0.64	178.56	98.4	98.4

Notes

1) Intensity, $I_2 = 732.951/(Tc+6.199)^{0.810}$ (2-year, City of Ottawa)

2) Intensity, $I_5 = 998.071/(Tc+6.035)^{0.814}$ (5-year, City of Ottawa)

3) Intensity, $I_{100} = 1735.688/(Tc+6.014)^{0.820}$ (100-year, City of Ottawa)

4) Time of Concentration: T_c=10min

TABLE D6 - CALCULATION OF AVERAGE RUNOFF COEFFICIENTS 675 BORBRIDGE (POST-DEVELOPMENT)

Area No.	Outlet Location	Asphalt/Concrete		Roof		Pavers		Gravel		Soft Landscaping		Sum AC	Total Area (m^2)	C_{AVG}
		Area (m^2)	A * C	Area (m^2)	A * C	Area (m^2)	A * C	Area (m^2)	A * C	Area (m^2)	A * C			
		C=0.90		C=0.90		C=0.90		C=0.70		C=0.20				
P-1	CB 307	696.71	627.0	0.00	0.0	0.00	0.0	0.00	0.00	560.57	112.11	739.2	1257.28	0.59
P-2	CB 305	1469.66	1322.7	0.00	0.0	380.28	342.3	0.00	0.00	181.85	36.37	1701.3	2031.79	0.84
P-3	CB 304	1613.45	1452.1	0.00	0.0	23.95	21.6	0.00	0.00	154.21	30.84	1504.5	1791.61	0.84
P-4	DCB 306	4.63	4.2	0.00	0.0	0.00	0.0	1682.04	1177.43	17342.32	3468.46	4650.1	19028.98	0.24
P-5	DCB 309	360.96	324.9	0.00	0.0	0.00	0.0	750.81	525.57	6924.97	1384.99	2235.4	8036.74	0.28
P-6	DCB 303	651.79	586.6	0.00	0.0	0.00	0.0	0.00	0.00	7391.38	1478.28	2064.9	8043.17	0.26
P-7	DCB 308	24.57	22.1	0.00	0.0	21.50	19.3	0.00	0.00	7806.32	1561.26	1602.7	7852.39	0.20
P-8	CB 301, 302	9.20	8.3	0.00	0.0	903.53	813.2	0.00	0.00	584.18	116.84	938.3	1496.91	0.63
P-9	Brian Good/Borebridge	158.37	142.5	0.00	0.0	212.49	191.2	0.00	0.00	3827.02	765.40	1099.2	4197.88	0.26
P-R	STMMH 106	0.00	0.0	6335.69	5702.1	0.00	0.0	0.00	0.00	0.00	0.00	5702.1	6335.69	0.90

Average Runoff Coeff for 675 Borbridge = $C_{AVG} = \frac{22,238}{60,072}$ **= 0.37**

TABLE D7

SWM POST-DEVELOPMENT RUNOFF 675 BORBRIDGE (UNCONTROLLED AND CONTROLLED)

Area No	Outlet Location	Area (ha)	Time of Conc. T_c (min)	Storm = 2-year				Storm = 5-year				Storm = 100-year			
				C_{AVG}	I_2 (mm/hr)	Q (L/sec)	Q_{CAP} (L/sec)	C_{AVG}	I_5 (mm/hr)	Q (L/sec)	Q_{CAP} (L/sec)	$C_{AVG-100Yr}$	I_{100} (mm/hr)	Q (L/sec)	Q_{CAP} (L/sec)
P-1	CB 307	0.126	10	0.59	76.81	15.8	**15.8**	0.59	104.19	21.4	**21.4**	0.73	178.56	45.9	**24.0**
P-2	CB 305	0.203	10	0.84	76.81	36.3	**36.3**	0.84	104.19	49.3	**49.3**	1.00	178.56	100.9	**69.3**
P-3	CB 304	0.179	10	0.84	76.81	32.1	**32.1**	0.84	104.19	43.6	**43.6**	1.00	178.56	88.9	**59.0**
P-4	DCB 306	1.903	10	0.24	76.81	99.3	**99.3**	0.24	104.19	134.7	**134.7**	0.31	178.56	288.5	**175.0**
P-5	DCB 309	0.804	10	0.28	76.81	47.7	47.7	0.28	104.19	64.8	64.8	0.35	178.56	138.7	138.7
P-6	DCB 303	0.804	10	0.26	76.81	44.1	44.1	0.26	104.19	59.8	59.8	0.32	178.56	128.1	128.1
P-7	DCB 308	0.785	10	0.20	76.81	34.2	34.2	0.20	104.19	46.4	46.4	0.26	178.56	99.4	99.4
P-8	CB 301, 302	0.150	10	0.63	76.81	20.0	20.0	0.63	104.19	27.2	27.2	0.78	178.56	58.2	58.2
P-9	Brian Good/Borebridge	0.420	10	0.26	76.81	23.5	23.5	0.26	104.19	31.8	31.8	0.33	178.56	68.2	68.2
P-R	STMMH 106	0.634	10	0.90	76.81	121.8	**42.1**	0.90	104.19	165.2	**50.9**	1.00	178.56	314.5	**64.7**
Total for 675 Borbridge		**6.007**				474.8	**395.1**			644.1	**529.8**			1331.4	**884.7**

Notes

1) Intensity, $I_2 = 732.951/(Tc+6.199)^{0.810}$ (2-year, City of Ottawa)

2) Intensity, $I_5 = 998.071/(Tc+6.035)^{0.814}$ (5-year, City of Ottawa)

3) Intensity, $I_{100} = 1735.688/(Tc+6.014)^{0.820}$ (100-year, City of Ottawa)

4) Time of Concentration: T_c=10min

5) Flows under column $Q_{CAP\ that\ denotes}$ controlled: **100.00**

TABLE D8: 2-year, 5-year & 100-year Roof Drains Design Sheet - Using Flow Controlled Roof Drains

Project: 675 Borbridge

Location: City of Ottawa

Date: April 2025

Area #	Roof Drain Type	No Drains per Area	Total No of Weirs	Weir Position	Runoff Coeff (Cavg)		Drainage Area		2-year Event						5-year Event						100-year Event						Storage Required *(MRM)*			Maximium Storage Provided at Spill Elevation					
					2-year & 5-year	100-year	m^2	ha	Runoff Rate (L/sec)	2yr Ponding Depth (mm)	Roof Drain Capacity Per Weir (gpm)	Roof Drain Capacity Per Drain per weir (gpm)	Roof Drain Capacity Per Drain (L/sec)	Total Flow From Roof Drains (L/sec)	Runoff Rate (L/sec)	5yr Ponding Depth (mm)	Roof Drain Capacity Per Weir (gpm)	Roof Drain Capacity Per Drain per weir (gpm)	Roof Drain Capacity Per Drain (L/sec)	Total Flow From Roof Drains (L/sec)	Runoff Rate (L/sec)	100yr Ponding Depth (mm)	Roof Drain Capacity Per Weir (gpm)	Roof Drain Capacity Per Drain per weir (gpm)	Roof Drain Capacity Per Drain (L/sec)	Total Flow From Roof Drains (L/sec)	2-year (m^3)	5-year (m^3)	100-year (m^3)	Area Available for Storage (m^2)	Max Prism Depth (mm)	Max Prisim Volume (m^3)	% Volume Used for Ponding		
																																2-year	5-year	100-year
P-R-1	RD2	1	2	6-Full	0.90	1.00	422	0.0422	8.111	90	18.0	36.0	2.271	2.271	11.003	108	21.6	43.2	2.725	2.725	20.952	136	27.2	54.4	3.432	3.432	3.87	6.63	13.23	358.8	150	17.9	22%	37%	74%
P-R-2	RD1	2	2	6-Full	0.90	1.00	532	0.0532	10.229	94	18.8	37.6	2.372	2.372	13.876	112	22.4	44.8	2.826	2.826	26.422	140	28.0	56.0	3.533	3.533	5.47	9.28	18.24	452.4	150	22.6	24%	41%	81%
P-R-3	RD2	1	2	6-Full	0.90	1.00	453	0.0453	8.703	91	18.2	36.4	2.296	2.296	11.806	109	21.8	43.6	2.751	2.751	22.480	137	27.4	54.8	3.457	3.457	4.32	7.37	14.60	384.9	150	19.2	22%	38%	76%
P-R-4	RD1	2	2	6-Full	0.90	1.00	591	0.0591	11.365	95	19.0	38.0	2.397	2.397	15.416	113	22.6	45.2	2.852	2.852	29.354	142	28.4	56.8	3.584	3.584	6.43	10.82	21.05	502.6	150	25.1	26%	43%	84%
P-R-5	RD2	1	2	6-Full	0.90	1.00	267	0.0267	5.126	82	16.4	32.8	2.069	2.069	6.953	100	20.0	40.0	2.524	2.524	13.240	127	25.4	50.8	3.205	3.205	1.85	3.30	6.83	226.7	150	11.3	16%	29%	60%
P-R-6	RD2	1	2	6-Full	0.90	1.00	480	0.0480	9.217	92	18.4	36.8	2.322	2.322	12.503	110	22.0	44.0	2.776	2.776	23.807	138	27.6	55.2	3.483	3.483	4.71	8.01	15.81	407.7	150	20.4	23%	39%	78%
P-R-7	RD2	1	2	6-Full	0.90	1.00	282	0.0282	5.426	83	16.6	33.2	2.095	2.095	7.360	101	20.2	40.4	2.549	2.549	14.015	128	25.6	51.2	3.230	3.230	2.04	3.61	7.42	240.0	150	12.0	17%	30%	62%
P-R-8	RD2	1	2	6-Full	0.90	1.00	285	0.0285	5.476	83	16.6	33.2	2.095	2.095	7.429	101	20.2	40.4	2.549	2.549	14.145	128	25.6	51.2	3.230	3.230	2.08	3.66	7.53	242.2	150	12.1	17%	30%	62%
P-R-9	RD2	1	2	6-Full	0.90	1.00	412	0.0412	7.912	90	18.0	36.0	2.271	2.271	10.733	107	21.4	42.8	2.700	2.700	20.438	135	27.0	54.0	3.407	3.407	3.71	6.41	12.79	350.0	150	17.5	21%	37%	73%
P-R-10	RD2	1	2	6-Full	0.90	1.00	411	0.0411	7.894	90	18.0	36.0	2.271	2.271	10.708	107	21.4	42.8	2.700	2.700	20.390	135	27.0	54.0	3.407	3.407	3.69	6.39	12.75	349.2	150	17.5	21%	37%	73%
P-R-11	RD2	1	2	6-Full	0.90	1.00	128	0.0128	2.464	68	13.6	27.2	1.716	1.716	3.343	84	16.8	33.6	2.120	2.120	6.365	110	22.0	44.0	2.776	2.776	0.48	0.96	2.15	109.0	150	5.4	9%	18%	40%
P-R-12	RD2	1	2	6-Full	0.90	1.00	128	0.0128	2.464	68	13.6	27.2	1.716	1.716	3.343	84	16.8	33.6	2.120	2.120	6.365	110	22.0	44.0	2.776	2.776	0.48	0.96	2.15	109.0	150	5.4	9%	18%	40%
P-R-13	RD2	1	2	6-Full	0.90	1.00	261	0.0261	5.019	82	16.4	32.8	2.069	2.069	6.808	99	19.8	39.6	2.498	2.498	12.963	126	25.2	50.4	3.180	3.180	1.77	3.21	6.63	222.0	150	11.1	16%	29%	60%
P-R-14	RD3	1	3	6-Full	0.90	1.00	390	0.0390	7.490	92	18.4	55.2	3.483	3.483	10.160	112	22.4	67.2	4.240	4.240	19.346	144	28.8	86.4	5.451	5.451	2.40	4.33	9.05	210.9	150	10.5	23%	41%	86%
P-R-15	RD3	1	3	6-Full	0.90	1.00	390	0.0390	7.498	92	18.4	55.2	3.483	3.483	10.172	112	22.4	67.2	4.240	4.240	19.368	144	28.8	86.4	5.451	5.451	2.41	4.34	9.07	211.1	150	10.6	23%	41%	86%
P-R-16	RD3	1	3	6-Full	0.90	1.00	402	0.0402	7.721	92	18.4	55.2	3.483	3.483	10.473	112	22.4	67.2	4.240	4.240	19.942	144	28.8	86.4	5.451	5.451	2.54	4.58	9.53	217.4	150	10.9	23%	42%	88%
P-R-17	RD3	1	3	6-Full	0.90	1.00	502	0.0502	9.644	97	19.4	58.2	3.672	3.672	13.082	118	23.6	70.8	4.467	4.467	24.910	149	29.8	89.4	5.640	5.640	3.67	6.47	13.31	271.5	150	13.6	27%	48%	98%
Totals					0.9	0.9	**6,335.8**	**0.6336**	**121.76**		**296.20**		**42.08**	**42.08**	**165.17**		**357.80**		**50.88**	**50.88**	**314.50**		**454.60**		**64.69**	**64.69**	**51.92**	**90.34**	**182.15**	**4865.3**		**243.3**			
Min										**68**						**84**						**110**													
Max										**97**						**118**						**149**													

Runoff Based on the Following:

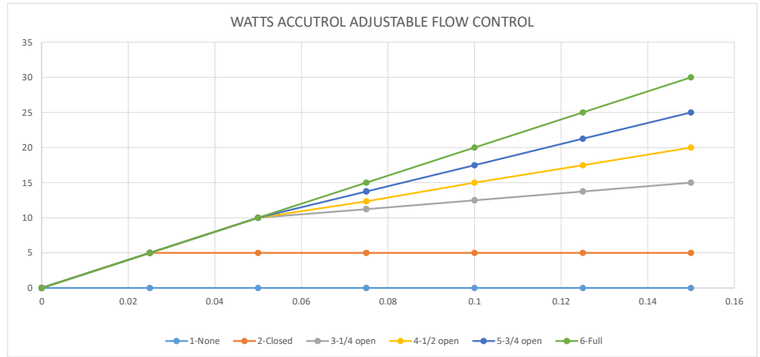
Storm Frequency (years) =	2	5	100
Time of Conc (mins) =	10	10	10
Storm Intensity (mm/hr) =	76.8	104.2	178.6

Roof Drains have Following Flow Rates per weir: WATTS Flow Controlled Drain

Weir Position	Flow (gpm) per depth							Max Flow Rate per Weir @150mm (L/s)
	0	25	50	75	100	125	150	
	0	0.025	0.05	0.075	0.1	0.125	0.15	
1-None	0	0	0	0	0	0	0	0.000
2-Closed	0	5	5	5	5	5	5	0.315
3-1/4 open	0	5	10	11	13	14	15	0.946
4-1/2 open	0	5	10	12	15	18	20	1.262
5-3/4 open	0	5	10	14	18	21	25	1.577
6-Full	0	5	10	15	20	25	30	1.890

Roof Drain Types

Drain Type =	RD1	RD2	RD3
Max Overflow Depth (mm)	150 mm	150 mm	150 mm
Flow Controlled (Yes/No)	Yes	Yes	Yes
Ponding	Yes	Yes	Yes
Weir Desc	Accutrol	Accutrol	Accutrol
No. Weirs	1	2	3



Storage Volumes Roof Area P-R-1 (2 Year, 5 Year and 100 Year Storms)

C_{AVG} = 0.90 (dimmensionless)
C_{AVG} = 1.00
Time Interval = 5 (mins)
Drainage Area = 0.04221 (hectares)

	Release Rate = 2.271 (L/sec) Return Period = 2 (years) IDF Parameters, A = 732.951, B = 0.810, C = 6.199 (I = A/(T_c+C))					Release Rate = 2.7255 (L/sec) Return Period = 5 (years) IDF Parameters, A = 998.071, B = 0.814, C = 6.053 (I = A/(T_c+C))					Release Rate = 3.4321 (L/sec) Return Period = 100 (years) IDF Parameters, A = 1735.69, B = 0.820, C = 6.014 (I = A/(T_c+C))				
Duration (min)	Rainfall Intensity, I (mm/hr)	Peak Flow (L/sec)	Release Rate (L/sec)	Storage Rate (L/sec)	Storage (m^3)	Rainfall Intensity, I (mm/hr)	Peak Flow (L/sec)	Release Rate (L/sec)	Storage Rate (L/sec)	Storage (m^3)	Rainfall Intensity, I (mm/hr)	Peak Flow (L/sec)	Release Rate (L/sec)	Storage Rate (L/sec)	Storage (m^3)
0	167.2	17.7	2.27	15.4	0.00	230.5	27.0	2.725	24.3	0.00	398.6	46.8	3.4	43.3	0.00
5	103.6	10.9	2.27	8.7	2.60	141.2	16.6	2.725	13.8	4.15	242.7	28.5	3.4	25.0	7.51
10	76.8	8.1	2.27	5.8	3.50	104.2	12.2	2.725	9.5	5.70	178.6	21.0	3.4	17.5	10.51
15	61.8	6.5	2.27	4.3	3.83	83.6	9.8	2.725	7.1	6.37	142.9	16.8	3.4	13.3	12.00
20	52.0	5.5	2.27	3.2	3.87	70.3	8.2	2.725	5.5	6.62	120.0	14.1	3.4	10.6	12.77
25	45.2	4.8	2.27	2.5	3.75	60.9	7.1	2.725	4.4	6.63	103.8	12.2	3.4	8.8	13.13
30	40.0	4.2	2.27	2.0	3.52	53.9	6.3	2.725	3.6	6.48	91.9	10.8	3.4	7.3	13.23
35	36.1	3.8	2.27	1.5	3.23	48.5	5.7	2.725	3.0	6.23	82.6	9.7	3.4	6.3	13.14
40	32.9	3.5	2.27	1.2	2.88	44.2	5.2	2.725	2.5	5.90	75.1	8.8	3.4	5.4	12.92
45	30.2	3.2	2.27	0.9	2.49	40.6	4.8	2.725	2.0	5.51	69.1	8.1	3.4	4.7	12.61
50	28.0	3.0	2.27	0.7	2.07	37.7	4.4	2.725	1.7	5.08	64.0	7.5	3.4	4.1	12.22
55	26.2	2.8	2.27	0.5	1.63	35.1	4.1	2.725	1.4	4.61	59.6	7.0	3.4	3.6	11.76
60	24.6	2.6	2.27	0.3	1.16	32.9	3.9	2.725	1.1	4.10	55.9	6.6	3.4	3.1	11.26
65	23.2	2.4	2.27	0.2	0.68	31.0	3.6	2.725	0.9	3.58	52.6	6.2	3.4	2.7	10.71
70	21.9	2.3	2.27	0.0	0.18	29.4	3.4	2.725	0.7	3.03	49.8	5.8	3.4	2.4	10.12
75	20.8	2.2	2.27	-0.1	-0.33	27.9	3.3	2.725	0.5	2.46	47.3	5.5	3.4	2.1	9.51
80	19.8	2.1	2.27	-0.2	-0.85	26.6	3.1	2.725	0.4	1.88	45.0	5.3	3.4	1.8	8.87
85	18.9	2.0	2.27	-0.3	-1.38	25.4	3.0	2.725	0.3	1.28	43.0	5.0	3.4	1.6	8.20
90	18.1	1.9	2.27	-0.4	-1.92	24.3	2.8	2.725	0.1	0.67	41.1	4.8	3.4	1.4	7.52
95	17.4	1.8	2.27	-0.4	-2.46	23.3	2.7	2.725	0.0	0.05	39.4	4.6	3.4	1.2	6.81
100	16.7	1.8	2.27	-0.5	-3.02	22.4	2.6	2.725	-0.1	-0.58	37.9	4.4	3.4	1.0	6.09
105	16.1	1.7	2.27	-0.6	-3.58	21.6	2.5	2.725	-0.2	-1.22	36.5	4.3	3.4	0.9	5.36
110	15.6	1.6	2.27	-0.6	-4.14	20.8	2.4	2.725	-0.3	-1.86	35.2	4.1	3.4	0.7	4.61
115	15.0	1.6	2.27	-0.7	-4.71	20.1	2.4	2.725	-0.4	-2.52	34.0	4.0	3.4	0.6	3.85
120	14.6	1.5	2.27	-0.7	-5.28	19.5	2.3	2.725	-0.4	-3.18	32.9	3.9	3.4	0.4	3.08
Max =					**3.87**					**6.63**					**13.23**

Notes

1) Peak flow is equal to the product of 2.78 x C x I x A
2) Rainfall Intensity, $I = A/(Tc+C)^B$
3) Release Rate = Min (Release Rate, Peak Flow)
4) Storage Rate = Peak Flow - Release Rate
5) Storage = Duration x Storage Rate
6) Maximium Storage = Max Storage Over Duration

Storage Volumes Roof Area P-R-2 (2 Year, 5 Year and 100 Year Storms)

C_{AVG} = 0.90 (dimmensionless)
C_{AVG} = 1.00
Time Interval = 5 (mins)
Drainage Area = 0.05323 (hectares)

	Release Rate = 2.372 (L/sec) Return Period = 2 (years) IDF Parameters, A = 732.951 , B = 0.810 (I = A/(T_c+C) , C = 6.199					Release Rate = 2.8264 (L/sec) Return Period = 5 (years) IDF Parameters, A = 998.071 , B = 0.814 (I = A/(T_c+C) , C = 6.053					Release Rate = 3.5331 (L/sec) Return Period = 100 (years) IDF Parameters, A = 1735.688 , B = 0.820 (I = A/(T_c+C) , C = 6.014				
Duration (min)	Rainfall Intensity, I (mm/hr)	Peak Flow (L/sec)	Release Rate (L/sec)	Storage Rate (L/sec)	Storage (m^3)	Rainfall Intensity, I (mm/hr)	Peak Flow (L/sec)	Release Rate (L/sec)	Storage Rate (L/sec)	Storage (m^3)	Rainfall Intensity, I (mm/hr)	Peak Flow (L/sec)	Release Rate (L/sec)	Storage Rate (L/sec)	Storage (m^3)
0	167.2	22.3	2.37	19.9	0.00	230.5	34.1	2.826	31.3	0.00	398.6	59.0	3.5	55.5	0.00
5	103.6	13.8	2.37	11.4	3.43	141.2	20.9	2.826	18.1	5.42	242.7	35.9	3.5	32.4	9.71
10	76.8	10.2	2.37	7.9	4.71	104.2	15.4	2.826	12.6	7.55	178.6	26.4	3.5	22.9	13.73
15	61.8	8.2	2.37	5.9	5.27	83.6	12.4	2.826	9.5	8.58	142.9	21.1	3.5	17.6	15.85
20	52.0	6.9	2.37	4.6	5.47	70.3	10.4	2.826	7.6	9.08	120.0	17.7	3.5	14.2	17.06
25	45.2	6.0	2.37	3.6	5.46	60.9	9.0	2.826	6.2	9.28	103.8	15.4	3.5	11.8	17.75
30	40.0	5.3	2.37	3.0	5.33	53.9	8.0	2.826	5.2	9.28	91.9	13.6	3.5	10.1	18.11
35	36.1	4.8	2.37	2.4	5.10	48.5	7.2	2.826	4.4	9.14	82.6	12.2	3.5	8.7	18.24
40	32.9	4.4	2.37	2.0	4.81	44.2	6.5	2.826	3.7	8.91	75.1	11.1	3.5	7.6	18.21
45	30.2	4.0	2.37	1.7	4.47	40.6	6.0	2.826	3.2	8.60	69.1	10.2	3.5	6.7	18.05
50	28.0	3.7	2.37	1.4	4.09	37.7	5.6	2.826	2.7	8.24	64.0	9.5	3.5	5.9	17.79
55	26.2	3.5	2.37	1.1	3.67	35.1	5.2	2.826	2.4	7.82	59.6	8.8	3.5	5.3	17.46
60	24.6	3.3	2.37	0.9	3.23	32.9	4.9	2.826	2.0	7.37	55.9	8.3	3.5	4.7	17.06
65	23.2	3.1	2.37	0.7	2.77	31.0	4.6	2.826	1.8	6.89	52.6	7.8	3.5	4.3	16.60
70	21.9	2.9	2.37	0.5	2.29	29.4	4.3	2.826	1.5	6.38	49.8	7.4	3.5	3.8	16.10
75	20.8	2.8	2.37	0.4	1.80	27.9	4.1	2.826	1.3	5.85	47.3	7.0	3.5	3.5	15.57
80	19.8	2.6	2.37	0.3	1.29	26.6	3.9	2.826	1.1	5.30	45.0	6.7	3.5	3.1	15.00
85	18.9	2.5	2.37	0.2	0.77	25.4	3.8	2.826	0.9	4.73	43.0	6.4	3.5	2.8	14.40
90	18.1	2.4	2.37	0.0	0.24	24.3	3.6	2.826	0.8	4.14	41.1	6.1	3.5	2.6	13.77
95	17.4	2.3	2.37	-0.1	-0.30	23.3	3.4	2.826	0.6	3.55	39.4	5.8	3.5	2.3	13.12
100	16.7	2.2	2.37	-0.1	-0.85	22.4	3.3	2.826	0.5	2.94	37.9	5.6	3.5	2.1	12.45
105	16.1	2.1	2.37	-0.2	-1.41	21.6	3.2	2.826	0.4	2.31	36.5	5.4	3.5	1.9	11.77
110	15.6	2.1	2.37	-0.3	-1.97	20.8	3.1	2.826	0.3	1.68	35.2	5.2	3.5	1.7	11.06
115	15.0	2.0	2.37	-0.4	-2.54	20.1	3.0	2.826	0.2	1.04	34.0	5.0	3.5	1.5	10.34
120	14.6	1.9	2.37	-0.4	-3.12	19.5	2.9	2.826	0.1	0.39	32.9	4.9	3.5	1.3	9.61
Max =					**5.47**					**9.28**					**18.24**

Notes

1) Peak flow is equal to the product of 2.78 x C x I x A
2) Rainfall Intensity, $I = A/(Tc+C)^B$
3) Release Rate = Min (Release Rate, Peak Flow)
4) Storage Rate = Peak Flow - Release Rate
5) Storage = Duration x Storage Rate
6) Maximium Storage = Max Storage Over Duration

Storage Volumes Roof Area P-R-3 (2 Year, 5 Year and 100 Year Storms)

C_{AVG} = 0.90 (dimmensionless)
C_{AVG} = 1.00
Time Interval = 5 (mins)
Drainage Area = 0.04529 (hectares)

	Release Rate = 2.296 (L/sec)					Release Rate = 2.7507 (L/sec)					Release Rate = 3.4573 (L/sec)				
	Return Period = 2 (years)					Return Period = 5 (years)					Return Period = 100 (years)				
	IDF Parameters, A = 732.951, B = 0.810					IDF Parameters, A = 998.071, B = 0.814					IDF Parameters, A = 1735.69, B = 0.820				
	(I = A/(T_c+C) , C = 6.199					(I = A/(T_c+C) , C = 6.053					(I = A/(T_c+C) , C = 6.014				
Duration (min)	Rainfall Intensity, I (mm/hr)	Peak Flow (L/sec)	Release Rate (L/sec)	Storage Rate (L/sec)	Storage (m^3)	Rainfall Intensity, I (mm/hr)	Peak Flow (L/sec)	Release Rate (L/sec)	Storage Rate (L/sec)	Storage (m^3)	Rainfall Intensity, I (mm/hr)	Peak Flow (L/sec)	Release Rate (L/sec)	Storage Rate (L/sec)	Storage (m^3)
0	167.2	18.9	2.30	16.7	0.00	230.5	29.0	2.751	26.3	0.00	398.6	50.2	3.5	46.7	0.00
5	103.6	11.7	2.30	9.4	2.83	141.2	17.8	2.751	15.0	4.51	242.7	30.6	3.5	27.1	8.13
10	76.8	8.7	2.30	6.4	3.84	104.2	13.1	2.751	10.4	6.22	178.6	22.5	3.5	19.0	11.41
15	61.8	7.0	2.30	4.7	4.23	83.6	10.5	2.751	7.8	6.99	142.9	18.0	3.5	14.5	13.08
20	52.0	5.9	2.30	3.6	4.32	70.3	8.8	2.751	6.1	7.31	120.0	15.1	3.5	11.6	13.97
25	45.2	5.1	2.30	2.8	4.23	60.9	7.7	2.751	4.9	7.37	103.8	13.1	3.5	9.6	14.42
30	40.0	4.5	2.30	2.2	4.03	53.9	6.8	2.751	4.0	7.27	91.9	11.6	3.5	8.1	14.60
35	36.1	4.1	2.30	1.8	3.76	48.5	6.1	2.751	3.4	7.05	82.6	10.4	3.5	6.9	14.57
40	32.9	3.7	2.30	1.4	3.43	44.2	5.6	2.751	2.8	6.75	75.1	9.5	3.5	6.0	14.41
45	30.2	3.4	2.30	1.1	3.05	40.6	5.1	2.751	2.4	6.38	69.1	8.7	3.5	5.2	14.14
50	28.0	3.2	2.30	0.9	2.64	37.7	4.7	2.751	2.0	5.97	64.0	8.1	3.5	4.6	13.78
55	26.2	3.0	2.30	0.7	2.21	35.1	4.4	2.751	1.7	5.51	59.6	7.5	3.5	4.0	13.36
60	24.6	2.8	2.30	0.5	1.75	32.9	4.1	2.751	1.4	5.03	55.9	7.0	3.5	3.6	12.89
65	23.2	2.6	2.30	0.3	1.27	31.0	3.9	2.751	1.2	4.51	52.6	6.6	3.5	3.2	12.37
70	21.9	2.5	2.30	0.2	0.78	29.4	3.7	2.751	0.9	3.98	49.8	6.3	3.5	2.8	11.81
75	20.8	2.4	2.30	0.1	0.28	27.9	3.5	2.751	0.8	3.42	47.3	5.9	3.5	2.5	11.21
80	19.8	2.2	2.30	0.0	-0.24	26.6	3.3	2.751	0.6	2.85	45.0	5.7	3.5	2.2	10.59
85	18.9	2.1	2.30	-0.1	-0.76	25.4	3.2	2.751	0.4	2.26	43.0	5.4	3.5	2.0	9.95
90	18.1	2.1	2.30	-0.2	-1.30	24.3	3.1	2.751	0.3	1.66	41.1	5.2	3.5	1.7	9.28
95	17.4	2.0	2.30	-0.3	-1.84	23.3	2.9	2.751	0.2	1.05	39.4	5.0	3.5	1.5	8.59
100	16.7	1.9	2.30	-0.4	-2.39	22.4	2.8	2.751	0.1	0.42	37.9	4.8	3.5	1.3	7.89
105	16.1	1.8	2.30	-0.5	-2.95	21.6	2.7	2.751	0.0	-0.21	36.5	4.6	3.5	1.1	7.17
110	15.6	1.8	2.30	-0.5	-3.51	20.8	2.6	2.751	-0.1	-0.85	35.2	4.4	3.5	1.0	6.43
115	15.0	1.7	2.30	-0.6	-4.08	20.1	2.5	2.751	-0.2	-1.50	34.0	4.3	3.5	0.8	5.68
120	14.6	1.6	2.30	-0.6	-4.65	19.5	2.5	2.751	-0.3	-2.16	32.9	4.1	3.5	0.7	4.92
Max =					**4.32**					**7.37**					**14.60**

Notes

1) Peak flow is equal to the product of 2.78 x C x I x A
2) Rainfall Intensity, $I = A/(Tc+C)^B$
3) Release Rate = Min (Release Rate, Peak Flow)
4) Storage Rate = Peak Flow - Release Rate
5) Storage = Duration x Storage Rate
6) Maximium Storage = Max Storage Over Duration

Storage Volumes Roof Area P-R-4 (2 Year, 5 Year and 100 Year Storms)

C_{AVG} = 0.90 (dimmensionless)
C_{AVG} = 1.00
Time Interval = 5 (mins)
Drainage Area = 0.05914 (hectares)

	Release Rate = 2.397 (L/sec) Return Period = 2 (years) IDF Parameters, A = 732.951 , B = 0.810 (I = A/(T_c+C) , C = 6.199					Release Rate = 2.8517 (L/sec) Return Period = 5 (years) IDF Parameters, A = 998.071 , B = 0.814 (I = A/(T_c+C) , C = 6.053					Release Rate = 3.5835 (L/sec) Return Period = 100 (years) IDF Parameters, A = 1735.688 , B = 0.820 (I = A/(T_c+C) , C = 6.014				
Duration (min)	Rainfall Intensity, I (mm/hr)	Peak Flow (L/sec)	Release Rate (L/sec)	Storage Rate (L/sec)	Storage (m^3)	Rainfall Intensity, I (mm/hr)	Peak Flow (L/sec)	Release Rate (L/sec)	Storage Rate (L/sec)	Storage (m^3)	Rainfall Intensity, I (mm/hr)	Peak Flow (L/sec)	Release Rate (L/sec)	Storage Rate (L/sec)	Storage (m^3)
0	167.2	24.7	2.40	22.3	0.00	230.5	37.9	2.852	35.0	0.00	398.6	65.5	3.6	61.9	0.00
5	103.6	15.3	2.40	12.9	3.88	141.2	23.2	2.852	20.4	6.11	242.7	39.9	3.6	36.3	10.89
10	76.8	11.4	2.40	9.0	5.38	104.2	17.1	2.852	14.3	8.57	178.6	29.4	3.6	25.8	15.46
15	61.8	9.1	2.40	6.7	6.07	83.6	13.7	2.852	10.9	9.80	142.9	23.5	3.6	19.9	17.92
20	52.0	7.7	2.40	5.3	6.36	70.3	11.5	2.852	8.7	10.44	120.0	19.7	3.6	16.1	19.36
25	45.2	6.7	2.40	4.3	6.43	60.9	10.0	2.852	7.2	10.74	103.8	17.1	3.6	13.5	20.23
30	40.0	5.9	2.40	3.5	6.35	53.9	8.9	2.852	6.0	10.82	91.9	15.1	3.6	11.5	20.73
35	36.1	5.3	2.40	2.9	6.17	48.5	8.0	2.852	5.1	10.76	82.6	13.6	3.6	10.0	20.98
40	32.9	4.9	2.40	2.5	5.92	44.2	7.3	2.852	4.4	10.59	75.1	12.4	3.6	8.8	21.05
45	30.2	4.5	2.40	2.1	5.61	40.6	6.7	2.852	3.8	10.33	69.1	11.4	3.6	7.8	20.97
50	28.0	4.1	2.40	1.8	5.25	37.7	6.2	2.852	3.3	10.02	64.0	10.5	3.6	6.9	20.79
55	26.2	3.9	2.40	1.5	4.87	35.1	5.8	2.852	2.9	9.64	59.6	9.8	3.6	6.2	20.52
60	24.6	3.6	2.40	1.2	4.45	32.9	5.4	2.852	2.6	9.23	55.9	9.2	3.6	5.6	20.18
65	23.2	3.4	2.40	1.0	4.01	31.0	5.1	2.852	2.3	8.78	52.6	8.7	3.6	5.1	19.78
70	21.9	3.2	2.40	0.8	3.55	29.4	4.8	2.852	2.0	8.30	49.8	8.2	3.6	4.6	19.33
75	20.8	3.1	2.40	0.7	3.07	27.9	4.6	2.852	1.7	7.80	47.3	7.8	3.6	4.2	18.83
80	19.8	2.9	2.40	0.5	2.58	26.6	4.4	2.852	1.5	7.27	45.0	7.4	3.6	3.8	18.30
85	18.9	2.8	2.40	0.4	2.07	25.4	4.2	2.852	1.3	6.73	43.0	7.1	3.6	3.5	17.74
90	18.1	2.7	2.40	0.3	1.55	24.3	4.0	2.852	1.1	6.16	41.1	6.8	3.6	3.2	17.14
95	17.4	2.6	2.40	0.2	1.02	23.3	3.8	2.852	1.0	5.58	39.4	6.5	3.6	2.9	16.53
100	16.7	2.5	2.40	0.1	0.48	22.4	3.7	2.852	0.8	4.99	37.9	6.2	3.6	2.6	15.89
105	16.1	2.4	2.40	0.0	-0.07	21.6	3.5	2.852	0.7	4.39	36.5	6.0	3.6	2.4	15.22
110	15.6	2.3	2.40	-0.1	-0.62	20.8	3.4	2.852	0.6	3.77	35.2	5.8	3.6	2.2	14.54
115	15.0	2.2	2.40	-0.2	-1.18	20.1	3.3	2.852	0.5	3.15	34.0	5.6	3.6	2.0	13.85
120	14.6	2.2	2.40	-0.2	-1.75	19.5	3.2	2.852	0.3	2.51	32.9	5.4	3.6	1.8	13.13
Max =					**6.43**					**10.82**					**21.05**

Notes

1) Peak flow is equal to the product of 2.78 x C x I x A
2) Rainfall Intensity, $I = A/(Tc+C)^B$
3) Release Rate = Min (Release Rate, Peak Flow)
4) Storage Rate = Peak Flow - Release Rate
5) Storage = Duration x Storage Rate
6) Maximium Storage = Max Storage Over Duration

Storage Volumes Roof Area P-R-5 (2 Year, 5 Year and 100 Year Storms)

C_{AVG} = 0.90 (dimmensionless)
C_{AVG} = 1.00
Time Interval = 5 (mins)
Drainage Area = 0.02667 (hectares)

	Release Rate = 2.069 (L/sec) Return Period = 2 (years) IDF Parameters, A = 732.951 , B = 0.810 (I = A/(T_c+C) , C = 6.199					Release Rate = 2.5236 (L/sec) Return Period = 5 (years) IDF Parameters, A = 998.071 , B = 0.814 (I = A/(T_c+C) , C = 6.053					Release Rate = 3.2050 (L/sec) Return Period = 100 (years) IDF Parameters, A = 1735.688 , B = 0.820 (I = A/(T_c+C) , C = 6.014				
Duration (min)	Rainfall Intensity, I (mm/hr)	Peak Flow (L/sec)	Release Rate (L/sec)	Storage Rate (L/sec)	Storage (m^3)	Rainfall Intensity, I (mm/hr)	Peak Flow (L/sec)	Release Rate (L/sec)	Storage Rate (L/sec)	Storage (m^3)	Rainfall Intensity, I (mm/hr)	Peak Flow (L/sec)	Release Rate (L/sec)	Storage Rate (L/sec)	Storage (m^3)
0	167.2	11.2	2.07	9.1	0.00	230.5	17.1	2.524	14.6	0.00	398.6	29.6	3.2	26.4	0.00
5	103.6	6.9	2.07	4.8	1.45	141.2	10.5	2.524	7.9	2.38	242.7	18.0	3.2	14.8	4.44
10	76.8	5.1	2.07	3.1	1.83	104.2	7.7	2.524	5.2	3.12	178.6	13.2	3.2	10.0	6.02
15	61.8	4.1	2.07	2.1	1.85	83.6	6.2	2.524	3.7	3.30	142.9	10.6	3.2	7.4	6.65
20	52.0	3.5	2.07	1.4	1.68	70.3	5.2	2.524	2.7	3.22	120.0	8.9	3.2	5.7	6.83
25	45.2	3.0	2.07	0.9	1.42	60.9	4.5	2.524	2.0	2.99	103.8	7.7	3.2	4.5	6.74
30	40.0	2.7	2.07	0.6	1.09	53.9	4.0	2.524	1.5	2.65	91.9	6.8	3.2	3.6	6.49
35	36.1	2.4	2.07	0.3	0.71	48.5	3.6	2.524	1.1	2.26	82.6	6.1	3.2	2.9	6.13
40	32.9	2.2	2.07	0.1	0.30	44.2	3.3	2.524	0.8	1.81	75.1	5.6	3.2	2.4	5.68
45	30.2	2.0	2.07	-0.1	-0.14	40.6	3.0	2.524	0.5	1.32	69.1	5.1	3.2	1.9	5.17
50	28.0	1.9	2.07	-0.2	-0.59	37.7	2.8	2.524	0.3	0.80	64.0	4.7	3.2	1.5	4.61
55	26.2	1.7	2.07	-0.3	-1.07	35.1	2.6	2.524	0.1	0.27	59.6	4.4	3.2	1.2	4.01
60	24.6	1.6	2.07	-0.4	-1.55	32.9	2.4	2.524	-0.1	-0.29	55.9	4.1	3.2	0.9	3.38
65	23.2	1.5	2.07	-0.5	-2.05	31.0	2.3	2.524	-0.2	-0.87	52.6	3.9	3.2	0.7	2.72
70	21.9	1.5	2.07	-0.6	-2.55	29.4	2.2	2.524	-0.3	-1.45	49.8	3.7	3.2	0.5	2.04
75	20.8	1.4	2.07	-0.7	-3.06	27.9	2.1	2.524	-0.5	-2.05	47.3	3.5	3.2	0.3	1.34
80	19.8	1.3	2.07	-0.7	-3.58	26.6	2.0	2.524	-0.6	-2.66	45.0	3.3	3.2	0.1	0.63
85	18.9	1.3	2.07	-0.8	-4.11	25.4	1.9	2.524	-0.6	-3.28	43.0	3.2	3.2	0.0	-0.10
90	18.1	1.2	2.07	-0.9	-4.64	24.3	1.8	2.524	-0.7	-3.90	41.1	3.0	3.2	-0.2	-0.85
95	17.4	1.2	2.07	-0.9	-5.17	23.3	1.7	2.524	-0.8	-4.53	39.4	2.9	3.2	-0.3	-1.60
100	16.7	1.1	2.07	-1.0	-5.71	22.4	1.7	2.524	-0.9	-5.17	37.9	2.8	3.2	-0.4	-2.37
105	16.1	1.1	2.07	-1.0	-6.25	21.6	1.6	2.524	-0.9	-5.82	36.5	2.7	3.2	-0.5	-3.14
110	15.6	1.0	2.07	-1.0	-6.80	20.8	1.5	2.524	-1.0	-6.47	35.2	2.6	3.2	-0.6	-3.93
115	15.0	1.0	2.07	-1.1	-7.35	20.1	1.5	2.524	-1.0	-7.12	34.0	2.5	3.2	-0.7	-4.72
120	14.6	1.0	2.07	-1.1	-7.90	19.5	1.4	2.524	-1.1	-7.78	32.9	2.4	3.2	-0.8	-5.51
Max =					**1.85**					**3.30**					**6.83**

Notes

1) Peak flow is equal to the product of 2.78 x C x I x A
2) Rainfall Intensity, $I = A/(Tc+C)^B$
3) Release Rate = Min (Release Rate, Peak Flow)
4) Storage Rate = Peak Flow - Release Rate
5) Storage = Duration x Storage Rate
6) Maximium Storage = Max Storage Over Duration

Storage Volumes Roof Area P-R-6 (2 Year, 5 Year and 100 Year Storms)

C_{AVG} = 0.90 (dimmensionless)

C_{AVG} = 1.00

Time Interval = 5 (mins)

Drainage Area = 0.04796 (hectares)

	Release Rate = 2.322 (L/sec) Return Period = 2 (years) IDF Parameters, A = 732.951 , B = 0.810 (I = A/(T_c+C) , C = 6.199					Release Rate = 2.7760 (L/sec) Return Period = 5 (years) IDF Parameters, A = 998.071 , B = 0.814 (I = A/(T_c+C) , C = 6.053					Release Rate = 3.4826 (L/sec) Return Period = 100 (years) IDF Parameters, A = 1735.688 , B = 0.820 (I = A/(T_c+C) , C = 6.014				
Duration (min)	Rainfall Intensity, I (mm/hr)	Peak Flow (L/sec)	Release Rate (L/sec)	Storage Rate (L/sec)	Storage (m^3)	Rainfall Intensity, I (mm/hr)	Peak Flow (L/sec)	Release Rate (L/sec)	Storage Rate (L/sec)	Storage (m^3)	Rainfall Intensity, I (mm/hr)	Peak Flow (L/sec)	Release Rate (L/sec)	Storage Rate (L/sec)	Storage (m^3)
0	167.2	20.1	2.32	17.7	0.00	230.5	30.7	2.776	28.0	0.00	398.6	53.1	3.5	49.7	0.00
5	103.6	12.4	2.32	10.1	3.03	141.2	18.8	2.776	16.0	4.81	242.7	32.4	3.5	28.9	8.66
10	76.8	9.2	2.32	6.9	4.14	104.2	13.9	2.776	11.1	6.67	178.6	23.8	3.5	20.3	12.19
15	61.8	7.4	2.32	5.1	4.58	83.6	11.1	2.776	8.4	7.53	142.9	19.1	3.5	15.6	14.01
20	52.0	6.2	2.32	3.9	4.71	70.3	9.4	2.776	6.6	7.91	120.0	16.0	3.5	12.5	15.01
25	45.2	5.4	2.32	3.1	4.65	60.9	8.1	2.776	5.3	8.01	103.8	13.8	3.5	10.4	15.55
30	40.0	4.8	2.32	2.5	4.47	53.9	7.2	2.776	4.4	7.95	91.9	12.2	3.5	8.8	15.78
35	36.1	4.3	2.32	2.0	4.21	48.5	6.5	2.776	3.7	7.76	82.6	11.0	3.5	7.5	15.81
40	32.9	3.9	2.32	1.6	3.89	44.2	5.9	2.776	3.1	7.48	75.1	10.0	3.5	6.5	15.69
45	30.2	3.6	2.32	1.3	3.53	40.6	5.4	2.776	2.6	7.13	69.1	9.2	3.5	5.7	15.45
50	28.0	3.4	2.32	1.0	3.13	37.7	5.0	2.776	2.2	6.73	64.0	8.5	3.5	5.0	15.13
55	26.2	3.1	2.32	0.8	2.70	35.1	4.7	2.776	1.9	6.29	59.6	7.9	3.5	4.5	14.74
60	24.6	2.9	2.32	0.6	2.25	32.9	4.4	2.776	1.6	5.82	55.9	7.5	3.5	4.0	14.29
65	23.2	2.8	2.32	0.5	1.78	31.0	4.1	2.776	1.4	5.32	52.6	7.0	3.5	3.5	13.79
70	21.9	2.6	2.32	0.3	1.29	29.4	3.9	2.776	1.1	4.79	49.8	6.6	3.5	3.2	13.25
75	20.8	2.5	2.32	0.2	0.79	27.9	3.7	2.776	0.9	4.24	47.3	6.3	3.5	2.8	12.68
80	19.8	2.4	2.32	0.1	0.28	26.6	3.5	2.776	0.8	3.67	45.0	6.0	3.5	2.5	12.08
85	18.9	2.3	2.32	0.0	-0.25	25.4	3.4	2.776	0.6	3.09	43.0	5.7	3.5	2.2	11.45
90	18.1	2.2	2.32	-0.1	-0.78	24.3	3.2	2.776	0.5	2.50	41.1	5.5	3.5	2.0	10.79
95	17.4	2.1	2.32	-0.2	-1.32	23.3	3.1	2.776	0.3	1.89	39.4	5.3	3.5	1.8	10.12
100	16.7	2.0	2.32	-0.3	-1.87	22.4	3.0	2.776	0.2	1.27	37.9	5.1	3.5	1.6	9.43
105	16.1	1.9	2.32	-0.4	-2.43	21.6	2.9	2.776	0.1	0.64	36.5	4.9	3.5	1.4	8.72
110	15.6	1.9	2.32	-0.5	-2.99	20.8	2.8	2.776	0.0	0.00	35.2	4.7	3.5	1.2	7.99
115	15.0	1.8	2.32	-0.5	-3.56	20.1	2.7	2.776	-0.1	-0.64	34.0	4.5	3.5	1.1	7.25
120	14.6	1.7	2.32	-0.6	-4.14	19.5	2.6	2.776	-0.2	-1.30	32.9	4.4	3.5	0.9	6.50
Max =					**4.71**					**8.01**					**15.81**

Notes

1) Peak flow is equal to the product of 2.78 x C x I x A

2) Rainfall Intensity, $I = A/(Tc+C)^B$

3) Release Rate = Min (Release Rate, Peak Flow)

4) Storage Rate = Peak Flow - Release Rate

5) Storage = Duration x Storage Rate

6) Maximium Storage = Max Storage Over Duration

Storage Volumes Roof Area P-R-7 (2 Year, 5 Year and 100 Year Storms)

C_{AVG} = 0.90 (dimmensionless)
C_{AVG} = 1.00
Time Interval = 5 (mins)
Drainage Area = 0.02823 (hectares)

	Release Rate = 2.095 (L/sec) Return Period = 2 (years) IDF Parameters, A = 732.951 , B = 0.810 (I = A/(T_c+C) , C = 6.199					Release Rate = 2.5488 (L/sec) Return Period = 5 (years) IDF Parameters, A = 998.071 , B = 0.814 (I = A/(T_c+C) , C = 6.053					Release Rate = 3.2302 (L/sec) Return Period = 100 (years) IDF Parameters, A = 1735.688 , B = 0.820 (I = A/(T_c+C) , C = 6.014				
Duration (min)	Rainfall Intensity, I (mm/hr)	Peak Flow (L/sec)	Release Rate (L/sec)	Storage Rate (L/sec)	Storage (m^3)	Rainfall Intensity, I (mm/hr)	Peak Flow (L/sec)	Release Rate (L/sec)	Storage Rate (L/sec)	Storage (m^3)	Rainfall Intensity, I (mm/hr)	Peak Flow (L/sec)	Release Rate (L/sec)	Storage Rate (L/sec)	Storage (m^3)
0	167.2	11.8	2.09	9.7	0.00	230.5	18.1	2.549	15.5	0.00	398.6	31.3	3.2	28.1	0.00
5	103.6	7.3	2.09	5.2	1.57	141.2	11.1	2.549	8.5	2.56	242.7	19.1	3.2	15.8	4.75
10	76.8	5.4	2.09	3.3	2.00	104.2	8.2	2.549	5.6	3.38	178.6	14.0	3.2	10.8	6.47
15	61.8	4.4	2.09	2.3	2.04	83.6	6.6	2.549	4.0	3.61	142.9	11.2	3.2	8.0	7.19
20	52.0	3.7	2.09	1.6	1.90	70.3	5.5	2.549	3.0	3.56	120.0	9.4	3.2	6.2	7.42
25	45.2	3.2	2.09	1.1	1.64	60.9	4.8	2.549	2.2	3.35	103.8	8.2	3.2	4.9	7.38
30	40.0	2.8	2.09	0.7	1.32	53.9	4.2	2.549	1.7	3.03	91.9	7.2	3.2	4.0	7.17
35	36.1	2.5	2.09	0.5	0.95	48.5	3.8	2.549	1.3	2.64	82.6	6.5	3.2	3.3	6.83
40	32.9	2.3	2.09	0.2	0.54	44.2	3.5	2.549	0.9	2.21	75.1	5.9	3.2	2.7	6.40
45	30.2	2.1	2.09	0.0	0.11	40.6	3.2	2.549	0.6	1.73	69.1	5.4	3.2	2.2	5.91
50	28.0	2.0	2.09	-0.1	-0.34	37.7	3.0	2.549	0.4	1.22	64.0	5.0	3.2	1.8	5.37
55	26.2	1.8	2.09	-0.2	-0.81	35.1	2.8	2.549	0.2	0.69	59.6	4.7	3.2	1.4	4.78
60	24.6	1.7	2.09	-0.4	-1.30	32.9	2.6	2.549	0.0	0.13	55.9	4.4	3.2	1.2	4.17
65	23.2	1.6	2.09	-0.5	-1.79	31.0	2.4	2.549	-0.1	-0.44	52.6	4.1	3.2	0.9	3.52
70	21.9	1.5	2.09	-0.5	-2.30	29.4	2.3	2.549	-0.2	-1.02	49.8	3.9	3.2	0.7	2.85
75	20.8	1.5	2.09	-0.6	-2.81	27.9	2.2	2.549	-0.4	-1.62	47.3	3.7	3.2	0.5	2.16
80	19.8	1.4	2.09	-0.7	-3.33	26.6	2.1	2.549	-0.5	-2.23	45.0	3.5	3.2	0.3	1.45
85	18.9	1.3	2.09	-0.8	-3.86	25.4	2.0	2.549	-0.6	-2.84	43.0	3.4	3.2	0.1	0.72
90	18.1	1.3	2.09	-0.8	-4.39	24.3	1.9	2.549	-0.6	-3.47	41.1	3.2	3.2	0.0	-0.02
95	17.4	1.2	2.09	-0.9	-4.93	23.3	1.8	2.549	-0.7	-4.10	39.4	3.1	3.2	-0.1	-0.77
100	16.7	1.2	2.09	-0.9	-5.47	22.4	1.8	2.549	-0.8	-4.74	37.9	3.0	3.2	-0.3	-1.53
105	16.1	1.1	2.09	-1.0	-6.02	21.6	1.7	2.549	-0.9	-5.39	36.5	2.9	3.2	-0.4	-2.30
110	15.6	1.1	2.09	-1.0	-6.57	20.8	1.6	2.549	-0.9	-6.04	35.2	2.8	3.2	-0.5	-3.08
115	15.0	1.1	2.09	-1.0	-7.12	20.1	1.6	2.549	-1.0	-6.69	34.0	2.7	3.2	-0.6	-3.87
120	14.6	1.0	2.09	-1.1	-7.67	19.5	1.5	2.549	-1.0	-7.35	32.9	2.6	3.2	-0.6	-4.67
Max =					**2.04**					**3.61**					**7.42**

Notes

1) Peak flow is equal to the product of 2.78 x C x I x A
2) Rainfall Intensity, I = $A/(Tc+C)^B$
3) Release Rate = Min (Release Rate, Peak Flow)
4) Storage Rate = Peak Flow - Release Rate
5) Storage = Duration x Storage Rate
6) Maximium Storage = Max Storage Over Duration

Storage Volumes Roof Area P-R-8 (2 Year, 5 Year and 100 Year Storms)

C_{AVG} = 0.90 (dimmensionless)
C_{AVG} = 1.00
Time Interval = 5 (mins)
Drainage Area = 0.02850 (hectares)

	Release Rate = 2.095 (L/sec) Return Period = 2 (years) IDF Parameters, A = 732.951 , B = 0.810 (I = A/(T_c+C) , C = 6.199					Release Rate = 2.5488 (L/sec) Return Period = 5 (years) IDF Parameters, A = 998.071 , B = 0.814 (I = A/(T_c+C) , C = 6.053					Release Rate = 3.2302 (L/sec) Return Period = 100 (years) IDF Parameters, A = 1735.688 , B = 0.820 (I = A/(T_c+C) , C = 6.014				
Duration (min)	Rainfall Intensity, I (mm/hr)	Peak Flow (L/sec)	Release Rate (L/sec)	Storage Rate (L/sec)	Storage (m^3)	Rainfall Intensity, I (mm/hr)	Peak Flow (L/sec)	Release Rate (L/sec)	Storage Rate (L/sec)	Storage (m^3)	Rainfall Intensity, I (mm/hr)	Peak Flow (L/sec)	Release Rate (L/sec)	Storage Rate (L/sec)	Storage (m^3)
0	167.2	11.9	2.09	9.8	0.00	230.5	18.3	2.549	15.7	0.00	398.6	31.6	3.2	28.3	0.00
5	103.6	7.4	2.09	5.3	1.59	141.2	11.2	2.549	8.6	2.59	242.7	19.2	3.2	16.0	4.80
10	76.8	5.5	2.09	3.4	2.03	104.2	8.3	2.549	5.7	3.42	178.6	14.1	3.2	10.9	6.55
15	61.8	4.4	2.09	2.3	2.08	83.6	6.6	2.549	4.1	3.66	142.9	11.3	3.2	8.1	7.28
20	52.0	3.7	2.09	1.6	1.94	70.3	5.6	2.549	3.0	3.62	120.0	9.5	3.2	6.3	7.53
25	45.2	3.2	2.09	1.1	1.69	60.9	4.8	2.549	2.3	3.41	103.8	8.2	3.2	5.0	7.49
30	40.0	2.9	2.09	0.8	1.37	53.9	4.3	2.549	1.7	3.10	91.9	7.3	3.2	4.0	7.29
35	36.1	2.6	2.09	0.5	1.00	48.5	3.8	2.549	1.3	2.72	82.6	6.5	3.2	3.3	6.95
40	32.9	2.3	2.09	0.2	0.60	44.2	3.5	2.549	1.0	2.28	75.1	6.0	3.2	2.7	6.53
45	30.2	2.2	2.09	0.1	0.17	40.6	3.2	2.549	0.7	1.81	69.1	5.5	3.2	2.2	6.05
50	28.0	2.0	2.09	-0.1	-0.29	37.7	3.0	2.549	0.4	1.30	64.0	5.1	3.2	1.8	5.51
55	26.2	1.9	2.09	-0.2	-0.75	35.1	2.8	2.549	0.2	0.77	59.6	4.7	3.2	1.5	4.93
60	24.6	1.8	2.09	-0.3	-1.24	32.9	2.6	2.549	0.1	0.22	55.9	4.4	3.2	1.2	4.31
65	23.2	1.7	2.09	-0.4	-1.73	31.0	2.5	2.549	-0.1	-0.35	52.6	4.2	3.2	0.9	3.67
70	21.9	1.6	2.09	-0.5	-2.24	29.4	2.3	2.549	-0.2	-0.93	49.8	3.9	3.2	0.7	3.00
75	20.8	1.5	2.09	-0.6	-2.75	27.9	2.2	2.549	-0.3	-1.53	47.3	3.7	3.2	0.5	2.31
80	19.8	1.4	2.09	-0.7	-3.27	26.6	2.1	2.549	-0.4	-2.13	45.0	3.6	3.2	0.3	1.60
85	18.9	1.4	2.09	-0.7	-3.79	25.4	2.0	2.549	-0.5	-2.75	43.0	3.4	3.2	0.2	0.88
90	18.1	1.3	2.09	-0.8	-4.33	24.3	1.9	2.549	-0.6	-3.37	41.1	3.3	3.2	0.0	0.14
95	17.4	1.2	2.09	-0.9	-4.86	23.3	1.8	2.549	-0.7	-4.00	39.4	3.1	3.2	-0.1	-0.61
100	16.7	1.2	2.09	-0.9	-5.40	22.4	1.8	2.549	-0.8	-4.64	37.9	3.0	3.2	-0.2	-1.37
105	16.1	1.2	2.09	-0.9	-5.95	21.6	1.7	2.549	-0.8	-5.29	36.5	2.9	3.2	-0.3	-2.14
110	15.6	1.1	2.09	-1.0	-6.50	20.8	1.6	2.549	-0.9	-5.94	35.2	2.8	3.2	-0.4	-2.91
115	15.0	1.1	2.09	-1.0	-7.05	20.1	1.6	2.549	-1.0	-6.59	34.0	2.7	3.2	-0.5	-3.70
120	14.6	1.0	2.09	-1.1	-7.61	19.5	1.5	2.549	-1.0	-7.25	32.9	2.6	3.2	-0.6	-4.49
Max =					**2.08**					**3.66**					**7.53**

Notes

1) Peak flow is equal to the product of 2.78 x C x I x A
2) Rainfall Intensity, $I = A/(Tc+C)^B$
3) Release Rate = Min (Release Rate, Peak Flow)
4) Storage Rate = Peak Flow - Release Rate
5) Storage = Duration x Storage Rate
6) Maximium Storage = Max Storage Over Duration

Storage Volumes Roof Area P-R-9 (2 Year, 5 Year and 100 Year Storms)

C_{AVG} = 0.90 (dimmensionless)
C_{AVG} = 1.00
Time Interval = 5 (mins)
Drainage Area = 0.04117 (hectares)

	Release Rate = 2.271 (L/sec) Return Period = 2 (years) IDF Parameters, A = 732.951 , B = 0.810 (I = A/(T_c+C) , C = 6.199					Release Rate = 2.7003 (L/sec) Return Period = 5 (years) IDF Parameters, A = 998.071 , B = 0.814 (I = A/(T_c+C) , C = 6.053					Release Rate = 3.4069 (L/sec) Return Period = 100 (years) IDF Parameters, A = 1735.688 , B = 0.820 (I = A/(T_c+C) , C = 6.014				
Duration (min)	Rainfall Intensity, I (mm/hr)	Peak Flow (L/sec)	Release Rate (L/sec)	Storage Rate (L/sec)	Storage (m^3)	Rainfall Intensity, I (mm/hr)	Peak Flow (L/sec)	Release Rate (L/sec)	Storage Rate (L/sec)	Storage (m^3)	Rainfall Intensity, I (mm/hr)	Peak Flow (L/sec)	Release Rate (L/sec)	Storage Rate (L/sec)	Storage (m^3)
0	167.2	17.2	2.27	15.0	0.00	230.5	26.4	2.700	23.7	0.00	398.6	45.6	3.4	42.2	0.00
5	103.6	10.7	2.27	8.4	2.52	141.2	16.2	2.700	13.5	4.04	242.7	27.8	3.4	24.4	7.31
10	76.8	7.9	2.27	5.6	3.38	104.2	11.9	2.700	9.2	5.54	178.6	20.4	3.4	17.0	10.22
15	61.8	6.4	2.27	4.1	3.68	83.6	9.6	2.700	6.9	6.18	142.9	16.4	3.4	12.9	11.65
20	52.0	5.4	2.27	3.1	3.71	70.3	8.0	2.700	5.3	6.41	120.0	13.7	3.4	10.3	12.39
25	45.2	4.7	2.27	2.4	3.57	60.9	7.0	2.700	4.3	6.40	103.8	11.9	3.4	8.5	12.72
30	40.0	4.1	2.27	1.9	3.34	53.9	6.2	2.700	3.5	6.25	91.9	10.5	3.4	7.1	12.79
35	36.1	3.7	2.27	1.4	3.03	48.5	5.6	2.700	2.9	5.99	82.6	9.5	3.4	6.0	12.69
40	32.9	3.4	2.27	1.1	2.67	44.2	5.1	2.700	2.4	5.66	75.1	8.6	3.4	5.2	12.47
45	30.2	3.1	2.27	0.8	2.28	40.6	4.7	2.700	2.0	5.27	69.1	7.9	3.4	4.5	12.14
50	28.0	2.9	2.27	0.6	1.85	37.7	4.3	2.700	1.6	4.83	64.0	7.3	3.4	3.9	11.74
55	26.2	2.7	2.27	0.4	1.40	35.1	4.0	2.700	1.3	4.36	59.6	6.8	3.4	3.4	11.28
60	24.6	2.5	2.27	0.3	0.93	32.9	3.8	2.700	1.1	3.85	55.9	6.4	3.4	3.0	10.77
65	23.2	2.4	2.27	0.1	0.44	31.0	3.6	2.700	0.9	3.33	52.6	6.0	3.4	2.6	10.21
70	21.9	2.3	2.27	0.0	-0.06	29.4	3.4	2.700	0.7	2.78	49.8	5.7	3.4	2.3	9.63
75	20.8	2.1	2.27	-0.1	-0.57	27.9	3.2	2.700	0.5	2.21	47.3	5.4	3.4	2.0	9.01
80	19.8	2.0	2.27	-0.2	-1.10	26.6	3.0	2.700	0.3	1.63	45.0	5.1	3.4	1.7	8.37
85	18.9	2.0	2.27	-0.3	-1.63	25.4	2.9	2.700	0.2	1.04	43.0	4.9	3.4	1.5	7.70
90	18.1	1.9	2.27	-0.4	-2.17	24.3	2.8	2.700	0.1	0.43	41.1	4.7	3.4	1.3	7.01
95	17.4	1.8	2.27	-0.5	-2.72	23.3	2.7	2.700	0.0	-0.19	39.4	4.5	3.4	1.1	6.31
100	16.7	1.7	2.27	-0.5	-3.28	22.4	2.6	2.700	-0.1	-0.81	37.9	4.3	3.4	0.9	5.59
105	16.1	1.7	2.27	-0.6	-3.84	21.6	2.5	2.700	-0.2	-1.45	36.5	4.2	3.4	0.8	4.85
110	15.6	1.6	2.27	-0.7	-4.41	20.8	2.4	2.700	-0.3	-2.09	35.2	4.0	3.4	0.6	4.11
115	15.0	1.6	2.27	-0.7	-4.98	20.1	2.3	2.700	-0.4	-2.74	34.0	3.9	3.4	0.5	3.35
120	14.6	1.5	2.27	-0.8	-5.55	19.5	2.2	2.700	-0.5	-3.40	32.9	3.8	3.4	0.4	2.58
Max =					**3.71**					**6.41**					**12.79**

Notes

1) Peak flow is equal to the product of 2.78 x C x I x A
2) Rainfall Intensity, $I = A/(Tc+C)^B$
3) Release Rate = Min (Release Rate, Peak Flow)
4) Storage Rate = Peak Flow - Release Rate
5) Storage = Duration x Storage Rate
6) Maximium Storage = Max Storage Over Duration

Storage Volumes Roof Area P-R-10 (2 Year, 5 Year and 100 Year Storms)

C_{AVG} = 0.90 (dimmensionless)
C_{AVG} = 1.00
Time Interval = 5 (mins)
Drainage Area = 0.04108 (hectares)

	Release Rate = 2.271 (L/sec) Return Period = 2 (years) IDF Parameters, A = 732.951 , B = 0.810 (I = A/(T_c+C) , C = 6.199					Release Rate = 2.7003 (L/sec) Return Period = 5 (years) IDF Parameters, A = 998.071 , B = 0.814 (I = A/(T_c+C) , C = 6.053					Release Rate = 3.4069 (L/sec) Return Period = 100 (years) IDF Parameters, A = 1735.688 , B = 0.820 (I = A/(T_c+C) , C = 6.014				
Duration (min)	Rainfall Intensity, I (mm/hr)	Peak Flow (L/sec)	Release Rate (L/sec)	Storage Rate (L/sec)	Storage (m^3)	Rainfall Intensity, I (mm/hr)	Peak Flow (L/sec)	Release Rate (L/sec)	Storage Rate (L/sec)	Storage (m^3)	Rainfall Intensity, I (mm/hr)	Peak Flow (L/sec)	Release Rate (L/sec)	Storage Rate (L/sec)	Storage (m^3)
0	167.2	17.2	2.27	14.9	0.00	230.5	26.3	2.700	23.6	0.00	398.6	45.5	3.4	42.1	0.00
5	103.6	10.6	2.27	8.4	2.51	141.2	16.1	2.700	13.4	4.03	242.7	27.7	3.4	24.3	7.29
10	76.8	7.9	2.27	5.6	3.37	104.2	11.9	2.700	9.2	5.52	178.6	20.4	3.4	17.0	10.19
15	61.8	6.3	2.27	4.1	3.67	83.6	9.5	2.700	6.8	6.16	142.9	16.3	3.4	12.9	11.62
20	52.0	5.3	2.27	3.1	3.69	70.3	8.0	2.700	5.3	6.39	120.0	13.7	3.4	10.3	12.35
25	45.2	4.6	2.27	2.4	3.56	60.9	7.0	2.700	4.3	6.38	103.8	11.9	3.4	8.5	12.68
30	40.0	4.1	2.27	1.8	3.32	53.9	6.2	2.700	3.5	6.22	91.9	10.5	3.4	7.1	12.75
35	36.1	3.7	2.27	1.4	3.01	48.5	5.5	2.700	2.8	5.96	82.6	9.4	3.4	6.0	12.65
40	32.9	3.4	2.27	1.1	2.66	44.2	5.0	2.700	2.3	5.63	75.1	8.6	3.4	5.2	12.42
45	30.2	3.1	2.27	0.8	2.26	40.6	4.6	2.700	1.9	5.24	69.1	7.9	3.4	4.5	12.09
50	28.0	2.9	2.27	0.6	1.83	37.7	4.3	2.700	1.6	4.80	64.0	7.3	3.4	3.9	11.69
55	26.2	2.7	2.27	0.4	1.38	35.1	4.0	2.700	1.3	4.32	59.6	6.8	3.4	3.4	11.23
60	24.6	2.5	2.27	0.3	0.91	32.9	3.8	2.700	1.1	3.82	55.9	6.4	3.4	3.0	10.71
65	23.2	2.4	2.27	0.1	0.42	31.0	3.5	2.700	0.8	3.29	52.6	6.0	3.4	2.6	10.16
70	21.9	2.3	2.27	0.0	-0.08	29.4	3.4	2.700	0.7	2.75	49.8	5.7	3.4	2.3	9.57
75	20.8	2.1	2.27	-0.1	-0.59	27.9	3.2	2.700	0.5	2.18	47.3	5.4	3.4	2.0	8.95
80	19.8	2.0	2.27	-0.2	-1.12	26.6	3.0	2.700	0.3	1.60	45.0	5.1	3.4	1.7	8.31
85	18.9	1.9	2.27	-0.3	-1.65	25.4	2.9	2.700	0.2	1.00	43.0	4.9	3.4	1.5	7.64
90	18.1	1.9	2.27	-0.4	-2.20	24.3	2.8	2.700	0.1	0.40	41.1	4.7	3.4	1.3	6.95
95	17.4	1.8	2.27	-0.5	-2.75	23.3	2.7	2.700	0.0	-0.22	39.4	4.5	3.4	1.1	6.25
100	16.7	1.7	2.27	-0.6	-3.30	22.4	2.6	2.700	-0.1	-0.85	37.9	4.3	3.4	0.9	5.53
105	16.1	1.7	2.27	-0.6	-3.86	21.6	2.5	2.700	-0.2	-1.48	36.5	4.2	3.4	0.8	4.79
110	15.6	1.6	2.27	-0.7	-4.43	20.8	2.4	2.700	-0.3	-2.13	35.2	4.0	3.4	0.6	4.05
115	15.0	1.5	2.27	-0.7	-5.00	20.1	2.3	2.700	-0.4	-2.78	34.0	3.9	3.4	0.5	3.29
120	14.6	1.5	2.27	-0.8	-5.58	19.5	2.2	2.700	-0.5	-3.44	32.9	3.8	3.4	0.3	2.52
Max =					**3.69**					**6.39**					**12.75**

Notes

1) Peak flow is equal to the product of 2.78 x C x I x A
2) Rainfall Intensity, $I = A/(Tc+C)^B$
3) Release Rate = Min (Release Rate, Peak Flow)
4) Storage Rate = Peak Flow - Release Rate
5) Storage = Duration x Storage Rate
6) Maximium Storage = Max Storage Over Duration

Storage Volumes Roof Area P-R-11 (2 Year, 5 Year and 100 Year Storms)

C_{AVG} = 0.90 (dimmensionless)

C_{AVG} = 1.00

Time Interval = 5 (mins)

Drainage Area = 0.01282 (hectares)

	Release Rate = 1.716 (L/sec) Return Period = 2 (years) IDF Parameters, A = 732.951 , B = 0.810 (I = A/(T_c+C) , C = 6.199					Release Rate = 2.1198 (L/sec) Return Period = 5 (years) IDF Parameters, A = 998.071 , B = 0.814 (I = A/(T_c+C) , C = 6.053					Release Rate = 2.7760 (L/sec) Return Period = 100 (years) IDF Parameters, A = 1735.688 , B = 0.820 (I = A/(T_c+C) , C = 6.014				
Duration (min)	Rainfall Intensity, I (mm/hr)	Peak Flow (L/sec)	Release Rate (L/sec)	Storage Rate (L/sec)	Storage (m^3)	Rainfall Intensity, I (mm/hr)	Peak Flow (L/sec)	Release Rate (L/sec)	Storage Rate (L/sec)	Storage (m^3)	Rainfall Intensity, I (mm/hr)	Peak Flow (L/sec)	Release Rate (L/sec)	Storage Rate (L/sec)	Storage (m^3)
0	167.2	5.4	1.72	3.6	0.00	230.5	8.2	2.120	6.1	0.00	398.6	14.2	2.8	11.4	0.00
5	103.6	3.3	1.72	1.6	0.48	141.2	5.0	2.120	2.9	0.87	242.7	8.7	2.8	5.9	1.76
10	76.8	2.5	1.72	0.7	0.45	104.2	3.7	2.120	1.6	0.96	178.6	6.4	2.8	3.6	2.15
15	61.8	2.0	1.72	0.3	0.24	83.6	3.0	2.120	0.9	0.77	142.9	5.1	2.8	2.3	2.09
20	52.0	1.7	1.72	0.0	-0.06	70.3	2.5	2.120	0.4	0.46	120.0	4.3	2.8	1.5	1.80
25	45.2	1.4	1.72	-0.3	-0.40	60.9	2.2	2.120	0.1	0.08	103.8	3.7	2.8	0.9	1.39
30	40.0	1.3	1.72	-0.4	-0.78	53.9	1.9	2.120	-0.2	-0.36	91.9	3.3	2.8	0.5	0.90
35	36.1	1.2	1.72	-0.6	-1.17	48.5	1.7	2.120	-0.4	-0.82	82.6	2.9	2.8	0.2	0.35
40	32.9	1.1	1.72	-0.7	-1.59	44.2	1.6	2.120	-0.5	-1.31	75.1	2.7	2.8	-0.1	-0.23
45	30.2	1.0	1.72	-0.7	-2.01	40.6	1.4	2.120	-0.7	-1.81	69.1	2.5	2.8	-0.3	-0.85
50	28.0	0.9	1.72	-0.8	-2.45	37.7	1.3	2.120	-0.8	-2.33	64.0	2.3	2.8	-0.5	-1.49
55	26.2	0.8	1.72	-0.9	-2.89	35.1	1.3	2.120	-0.9	-2.86	59.6	2.1	2.8	-0.7	-2.15
60	24.6	0.8	1.72	-0.9	-3.34	32.9	1.2	2.120	-0.9	-3.40	55.9	2.0	2.8	-0.8	-2.82
65	23.2	0.7	1.72	-1.0	-3.80	31.0	1.1	2.120	-1.0	-3.95	52.6	1.9	2.8	-0.9	-3.51
70	21.9	0.7	1.72	-1.0	-4.25	29.4	1.0	2.120	-1.1	-4.51	49.8	1.8	2.8	-1.0	-4.20
75	20.8	0.7	1.72	-1.0	-4.72	27.9	1.0	2.120	-1.1	-5.07	47.3	1.7	2.8	-1.1	-4.91
80	19.8	0.6	1.72	-1.1	-5.18	26.6	0.9	2.120	-1.2	-5.63	45.0	1.6	2.8	-1.2	-5.63
85	18.9	0.6	1.72	-1.1	-5.65	25.4	0.9	2.120	-1.2	-6.20	43.0	1.5	2.8	-1.2	-6.35
90	18.1	0.6	1.72	-1.1	-6.12	24.3	0.9	2.120	-1.3	-6.77	41.1	1.5	2.8	-1.3	-7.08
95	17.4	0.6	1.72	-1.2	-6.60	23.3	0.8	2.120	-1.3	-7.35	39.4	1.4	2.8	-1.4	-7.81
100	16.7	0.5	1.72	-1.2	-7.07	22.4	0.8	2.120	-1.3	-7.93	37.9	1.4	2.8	-1.4	-8.55
105	16.1	0.5	1.72	-1.2	-7.55	21.6	0.8	2.120	-1.4	-8.51	36.5	1.3	2.8	-1.5	-9.29
110	15.6	0.5	1.72	-1.2	-8.03	20.8	0.7	2.120	-1.4	-9.09	35.2	1.3	2.8	-1.5	-10.04
115	15.0	0.5	1.72	-1.2	-8.51	20.1	0.7	2.120	-1.4	-9.68	34.0	1.2	2.8	-1.6	-10.79
120	14.6	0.5	1.72	-1.2	-8.99	19.5	0.7	2.120	-1.4	-10.27	32.9	1.2	2.8	-1.6	-11.54
Max =					**0.48**					**0.96**					**2.15**

Notes

1) Peak flow is equal to the product of 2.78 x C x I x A

2) Rainfall Intensity, $I = A/(Tc+C)^B$

3) Release Rate = Min (Release Rate, Peak Flow)

4) Storage Rate = Peak Flow - Release Rate

5) Storage = Duration x Storage Rate

6) Maximium Storage = Max Storage Over Duration

Storage Volumes Roof Area P-R-12 (2 Year, 5 Year and 100 Year Storms)

C_{AVG} = 0.90 (dimmensionless)
C_{AVG} = 1.00
Time Interval = 5 (mins)
Drainage Area = 0.01282 (hectares)

	Release Rate = 1.716 (L/sec) Return Period = 2 (years) IDF Parameters, A = 732.951 , B = 0.810 (I = A/(T_c+C) , C = 6.199					Release Rate = 2.1198 (L/sec) Return Period = 5 (years) IDF Parameters, A = 998.071 , B = 0.814 (I = A/(T_c+C) , C = 6.053					Release Rate = 2.7760 (L/sec) Return Period = 100 (years) IDF Parameters, A = 1735.688 , B = 0.820 (I = A/(T_c+C) , C = 6.014				
Duration (min)	Rainfall Intensity, I (mm/hr)	Peak Flow (L/sec)	Release Rate (L/sec)	Storage Rate (L/sec)	Storage (m^3)	Rainfall Intensity, I (mm/hr)	Peak Flow (L/sec)	Release Rate (L/sec)	Storage Rate (L/sec)	Storage (m^3)	Rainfall Intensity, I (mm/hr)	Peak Flow (L/sec)	Release Rate (L/sec)	Storage Rate (L/sec)	Storage (m^3)
0	167.2	5.4	1.72	3.6	0.00	230.5	8.2	2.120	6.1	0.00	398.6	14.2	2.8	11.4	0.00
5	103.6	3.3	1.72	1.6	0.48	141.2	5.0	2.120	2.9	0.87	242.7	8.7	2.8	5.9	1.76
10	76.8	2.5	1.72	0.7	0.45	104.2	3.7	2.120	1.6	0.96	178.6	6.4	2.8	3.6	2.15
15	61.8	2.0	1.72	0.3	0.24	83.6	3.0	2.120	0.9	0.77	142.9	5.1	2.8	2.3	2.09
20	52.0	1.7	1.72	0.0	-0.06	70.3	2.5	2.120	0.4	0.46	120.0	4.3	2.8	1.5	1.80
25	45.2	1.4	1.72	-0.3	-0.40	60.9	2.2	2.120	0.1	0.08	103.8	3.7	2.8	0.9	1.39
30	40.0	1.3	1.72	-0.4	-0.78	53.9	1.9	2.120	-0.2	-0.36	91.9	3.3	2.8	0.5	0.90
35	36.1	1.2	1.72	-0.6	-1.17	48.5	1.7	2.120	-0.4	-0.82	82.6	2.9	2.8	0.2	0.35
40	32.9	1.1	1.72	-0.7	-1.59	44.2	1.6	2.120	-0.5	-1.31	75.1	2.7	2.8	-0.1	-0.23
45	30.2	1.0	1.72	-0.7	-2.01	40.6	1.4	2.120	-0.7	-1.81	69.1	2.5	2.8	-0.3	-0.85
50	28.0	0.9	1.72	-0.8	-2.45	37.7	1.3	2.120	-0.8	-2.33	64.0	2.3	2.8	-0.5	-1.49
55	26.2	0.8	1.72	-0.9	-2.89	35.1	1.3	2.120	-0.9	-2.86	59.6	2.1	2.8	-0.7	-2.15
60	24.6	0.8	1.72	-0.9	-3.34	32.9	1.2	2.120	-0.9	-3.40	55.9	2.0	2.8	-0.8	-2.82
65	23.2	0.7	1.72	-1.0	-3.80	31.0	1.1	2.120	-1.0	-3.95	52.6	1.9	2.8	-0.9	-3.51
70	21.9	0.7	1.72	-1.0	-4.25	29.4	1.0	2.120	-1.1	-4.51	49.8	1.8	2.8	-1.0	-4.20
75	20.8	0.7	1.72	-1.0	-4.72	27.9	1.0	2.120	-1.1	-5.07	47.3	1.7	2.8	-1.1	-4.91
80	19.8	0.6	1.72	-1.1	-5.18	26.6	0.9	2.120	-1.2	-5.63	45.0	1.6	2.8	-1.2	-5.63
85	18.9	0.6	1.72	-1.1	-5.65	25.4	0.9	2.120	-1.2	-6.20	43.0	1.5	2.8	-1.2	-6.35
90	18.1	0.6	1.72	-1.1	-6.12	24.3	0.9	2.120	-1.3	-6.77	41.1	1.5	2.8	-1.3	-7.08
95	17.4	0.6	1.72	-1.2	-6.60	23.3	0.8	2.120	-1.3	-7.35	39.4	1.4	2.8	-1.4	-7.81
100	16.7	0.5	1.72	-1.2	-7.07	22.4	0.8	2.120	-1.3	-7.93	37.9	1.4	2.8	-1.4	-8.55
105	16.1	0.5	1.72	-1.2	-7.55	21.6	0.8	2.120	-1.4	-8.51	36.5	1.3	2.8	-1.5	-9.29
110	15.6	0.5	1.72	-1.2	-8.03	20.8	0.7	2.120	-1.4	-9.09	35.2	1.3	2.8	-1.5	-10.04
115	15.0	0.5	1.72	-1.2	-8.51	20.1	0.7	2.120	-1.4	-9.68	34.0	1.2	2.8	-1.6	-10.79
120	14.6	0.5	1.72	-1.2	-8.99	19.5	0.7	2.120	-1.4	-10.27	32.9	1.2	2.8	-1.6	-11.54
Max =					**0.48**					**0.96**					**2.15**

Notes

1) Peak flow is equal to the product of 2.78 x C x I x A
2) Rainfall Intensity, $I = A/(Tc+C)^B$
3) Release Rate = Min (Release Rate, Peak Flow)
4) Storage Rate = Peak Flow - Release Rate
5) Storage = Duration x Storage Rate
6) Maximium Storage = Max Storage Over Duration

Storage Volumes Roof Area P-R-13 (2 Year, 5 Year and 100 Year Storms)

C_{AVG} = 0.90 (dimmensionless)
C_{AVG} = 1.00
Time Interval = 5 (mins)
Drainage Area = 0.02612 (hectares)

	Release Rate = 2.069 (L/sec) Return Period = 2 (years) IDF Parameters, A = 732.951 , B = 0.810 (I = A/(T_c+C) , C = 6.199					Release Rate = 2.4984 (L/sec) Return Period = 5 (years) IDF Parameters, A = 998.071 , B = 0.814 (I = A/(T_c+C) , C = 6.053					Release Rate = 3.1797 (L/sec) Return Period = 100 (years) IDF Parameters, A = 1735.688 , B = 0.820 (I = A/(T_c+C) , C = 6.014				
Duration (min)	Rainfall Intensity, I (mm/hr)	Peak Flow (L/sec)	Release Rate (L/sec)	Storage Rate (L/sec)	Storage (m^3)	Rainfall Intensity, I (mm/hr)	Peak Flow (L/sec)	Release Rate (L/sec)	Storage Rate (L/sec)	Storage (m^3)	Rainfall Intensity, I (mm/hr)	Peak Flow (L/sec)	Release Rate (L/sec)	Storage Rate (L/sec)	Storage (m^3)
0	167.2	10.9	2.07	8.9	0.00	230.5	16.7	2.498	14.2	0.00	398.6	28.9	3.2	25.8	0.00
5	103.6	6.8	2.07	4.7	1.41	141.2	10.2	2.498	7.8	2.33	242.7	17.6	3.2	14.4	4.33
10	76.8	5.0	2.07	2.9	1.77	104.2	7.6	2.498	5.1	3.04	178.6	13.0	3.2	9.8	5.87
15	61.8	4.0	2.07	2.0	1.77	83.6	6.1	2.498	3.6	3.21	142.9	10.4	3.2	7.2	6.47
20	52.0	3.4	2.07	1.3	1.60	70.3	5.1	2.498	2.6	3.12	120.0	8.7	3.2	5.5	6.63
25	45.2	3.0	2.07	0.9	1.32	60.9	4.4	2.498	1.9	2.88	103.8	7.5	3.2	4.4	6.54
30	40.0	2.6	2.07	0.5	0.98	53.9	3.9	2.498	1.4	2.55	91.9	6.7	3.2	3.5	6.28
35	36.1	2.4	2.07	0.3	0.60	48.5	3.5	2.498	1.0	2.15	82.6	6.0	3.2	2.8	5.91
40	32.9	2.1	2.07	0.1	0.19	44.2	3.2	2.498	0.7	1.70	75.1	5.5	3.2	2.3	5.46
45	30.2	2.0	2.07	-0.1	-0.25	40.6	2.9	2.498	0.5	1.22	69.1	5.0	3.2	1.8	4.95
50	28.0	1.8	2.07	-0.2	-0.71	37.7	2.7	2.498	0.2	0.71	64.0	4.6	3.2	1.5	4.39
55	26.2	1.7	2.07	-0.4	-1.19	35.1	2.5	2.498	0.1	0.17	59.6	4.3	3.2	1.1	3.79
60	24.6	1.6	2.07	-0.5	-1.67	32.9	2.4	2.498	-0.1	-0.38	55.9	4.1	3.2	0.9	3.16
65	23.2	1.5	2.07	-0.6	-2.17	31.0	2.3	2.498	-0.2	-0.95	52.6	3.8	3.2	0.6	2.51
70	21.9	1.4	2.07	-0.6	-2.68	29.4	2.1	2.498	-0.4	-1.54	49.8	3.6	3.2	0.4	1.83
75	20.8	1.4	2.07	-0.7	-3.19	27.9	2.0	2.498	-0.5	-2.13	47.3	3.4	3.2	0.3	1.13
80	19.8	1.3	2.07	-0.8	-3.71	26.6	1.9	2.498	-0.6	-2.74	45.0	3.3	3.2	0.1	0.42
85	18.9	1.2	2.07	-0.8	-4.24	25.4	1.8	2.498	-0.7	-3.35	43.0	3.1	3.2	-0.1	-0.31
90	18.1	1.2	2.07	-0.9	-4.77	24.3	1.8	2.498	-0.7	-3.97	41.1	3.0	3.2	-0.2	-1.05
95	17.4	1.1	2.07	-0.9	-5.31	23.3	1.7	2.498	-0.8	-4.60	39.4	2.9	3.2	-0.3	-1.81
100	16.7	1.1	2.07	-1.0	-5.85	22.4	1.6	2.498	-0.9	-5.23	37.9	2.8	3.2	-0.4	-2.57
105	16.1	1.1	2.07	-1.0	-6.40	21.6	1.6	2.498	-0.9	-5.87	36.5	2.6	3.2	-0.5	-3.34
110	15.6	1.0	2.07	-1.1	-6.94	20.8	1.5	2.498	-1.0	-6.51	35.2	2.6	3.2	-0.6	-4.12
115	15.0	1.0	2.07	-1.1	-7.49	20.1	1.5	2.498	-1.0	-7.16	34.0	2.5	3.2	-0.7	-4.91
120	14.6	1.0	2.07	-1.1	-8.05	19.5	1.4	2.498	-1.1	-7.81	32.9	2.4	3.2	-0.8	-5.70
Max =					**1.77**					**3.21**					**6.63**

Notes

1) Peak flow is equal to the product of 2.78 x C x I x A
2) Rainfall Intensity, $I = A/(Tc+C)^B$
3) Release Rate = Min (Release Rate, Peak Flow)
4) Storage Rate = Peak Flow - Release Rate
5) Storage = Duration x Storage Rate
6) Maximium Storage = Max Storage Over Duration

Storage Volumes Roof Area P-R-14 (2 Year, 5 Year and 100 Year Storms)

C_{AVG} = 0.90 (dimmensionless)
C_{AVG} = 1.00
Time Interval = 5 (mins)
Drainage Area = 0.03897 (hectares)

	Release Rate = 3.483 (L/sec) Return Period = 2 (years) IDF Parameters, A = 732.951 , B = 0.810 (I = A/(T_c+C) , C = 6.199					Release Rate = 4.2397 (L/sec) Return Period = 5 (years) IDF Parameters, A = 998.071 , B = 0.814 (I = A/(T_c+C) , C = 6.053					Release Rate = 5.4510 (L/sec) Return Period = 100 (years) IDF Parameters, A = 1735.688 , B = 0.820 (I = A/(T_c+C) , C = 6.014				
Duration (min)	Rainfall Intensity, I (mm/hr)	Peak Flow (L/sec)	Release Rate (L/sec)	Storage Rate (L/sec)	Storage (m^3)	Rainfall Intensity, I (mm/hr)	Peak Flow (L/sec)	Release Rate (L/sec)	Storage Rate (L/sec)	Storage (m^3)	Rainfall Intensity, I (mm/hr)	Peak Flow (L/sec)	Release Rate (L/sec)	Storage Rate (L/sec)	Storage (m^3)
0	167.2	16.3	3.48	12.8	0.00	230.5	25.0	4.240	20.7	0.00	398.6	43.2	5.5	37.7	0.00
5	103.6	10.1	3.48	6.6	1.99	141.2	15.3	4.240	11.1	3.32	242.7	26.3	5.5	20.8	6.25
10	76.8	7.5	3.48	4.0	2.40	104.2	11.3	4.240	7.0	4.23	178.6	19.3	5.5	13.9	8.34
15	61.8	6.0	3.48	2.5	2.29	83.6	9.1	4.240	4.8	4.33	142.9	15.5	5.5	10.0	9.03
20	52.0	5.1	3.48	1.6	1.91	70.3	7.6	4.240	3.4	4.05	120.0	13.0	5.5	7.5	9.05
25	45.2	4.4	3.48	0.9	1.38	60.9	6.6	4.240	2.4	3.54	103.8	11.3	5.5	5.8	8.70
30	40.0	3.9	3.48	0.4	0.76	53.9	5.8	4.240	1.6	2.89	91.9	10.0	5.5	4.5	8.10
35	36.1	3.5	3.48	0.0	0.07	48.5	5.3	4.240	1.0	2.14	82.6	8.9	5.5	3.5	7.34
40	32.9	3.2	3.48	-0.3	-0.67	44.2	4.8	4.240	0.5	1.31	75.1	8.1	5.5	2.7	6.46
45	30.2	2.9	3.48	-0.5	-1.44	40.6	4.4	4.240	0.2	0.44	69.1	7.5	5.5	2.0	5.48
50	28.0	2.7	3.48	-0.7	-2.24	37.7	4.1	4.240	-0.2	-0.48	64.0	6.9	5.5	1.5	4.43
55	26.2	2.6	3.48	-0.9	-3.07	35.1	3.8	4.240	-0.4	-1.43	59.6	6.5	5.5	1.0	3.33
60	24.6	2.4	3.48	-1.1	-3.92	32.9	3.6	4.240	-0.7	-2.41	55.9	6.1	5.5	0.6	2.18
65	23.2	2.3	3.48	-1.2	-4.78	31.0	3.4	4.240	-0.9	-3.42	52.6	5.7	5.5	0.3	0.99
70	21.9	2.1	3.48	-1.3	-5.65	29.4	3.2	4.240	-1.1	-4.44	49.8	5.4	5.5	-0.1	-0.24
75	20.8	2.0	3.48	-1.5	-6.54	27.9	3.0	4.240	-1.2	-5.48	47.3	5.1	5.5	-0.3	-1.49
80	19.8	1.9	3.48	-1.5	-7.43	26.6	2.9	4.240	-1.4	-6.54	45.0	4.9	5.5	-0.6	-2.77
85	18.9	1.8	3.48	-1.6	-8.34	25.4	2.7	4.240	-1.5	-7.60	43.0	4.7	5.5	-0.8	-4.07
90	18.1	1.8	3.48	-1.7	-9.25	24.3	2.6	4.240	-1.6	-8.68	41.1	4.5	5.5	-1.0	-5.38
95	17.4	1.7	3.48	-1.8	-10.17	23.3	2.5	4.240	-1.7	-9.77	39.4	4.3	5.5	-1.2	-6.72
100	16.7	1.6	3.48	-1.8	-11.10	22.4	2.4	4.240	-1.8	-10.87	37.9	4.1	5.5	-1.3	-8.07
105	16.1	1.6	3.48	-1.9	-12.03	21.6	2.3	4.240	-1.9	-11.98	36.5	4.0	5.5	-1.5	-9.43
110	15.6	1.5	3.48	-2.0	-12.97	20.8	2.3	4.240	-2.0	-13.09	35.2	3.8	5.5	-1.6	-10.80
115	15.0	1.5	3.48	-2.0	-13.91	20.1	2.2	4.240	-2.1	-14.21	34.0	3.7	5.5	-1.8	-12.19
120	14.6	1.4	3.48	-2.1	-14.85	19.5	2.1	4.240	-2.1	-15.34	32.9	3.6	5.5	-1.9	-13.59
Max =					**2.40**					**4.33**					**9.05**

Notes

1) Peak flow is equal to the product of 2.78 x C x I x A
2) Rainfall Intensity, $I = A/(Tc+C)^B$
3) Release Rate = Min (Release Rate, Peak Flow)
4) Storage Rate = Peak Flow - Release Rate
5) Storage = Duration x Storage Rate
6) Maximium Storage = Max Storage Over Duration

Storage Volumes Roof Area P-R-15 (2 Year, 5 Year and 100 Year Storms)

C_{AVG} = 0.90 (dimmensionless)
C_{AVG} = 1.00
Time Interval = 5 (mins)
Drainage Area = 0.03902 (hectares)

	Release Rate = 3.483 (L/sec) Return Period = 2 (years) IDF Parameters, A = 732.951 , B = 0.810 (I = A/(T_c+C) , C = 6.199					Release Rate = 4.2397 (L/sec) Return Period = 5 (years) IDF Parameters, A = 998.071 , B = 0.814 (I = A/(T_c+C) , C = 6.053					Release Rate = 5.4510 (L/sec) Return Period = 100 (years) IDF Parameters, A = 1735.688 , B = 0.820 (I = A/(T_c+C) , C = 6.014				
Duration (min)	Rainfall Intensity, I (mm/hr)	Peak Flow (L/sec)	Release Rate (L/sec)	Storage Rate (L/sec)	Storage (m^3)	Rainfall Intensity, I (mm/hr)	Peak Flow (L/sec)	Release Rate (L/sec)	Storage Rate (L/sec)	Storage (m^3)	Rainfall Intensity, I (mm/hr)	Peak Flow (L/sec)	Release Rate (L/sec)	Storage Rate (L/sec)	Storage (m^3)
0	167.2	16.3	3.48	12.8	0.00	230.5	25.0	4.240	20.8	0.00	398.6	43.2	5.5	37.8	0.00
5	103.6	10.1	3.48	6.6	1.99	141.2	15.3	4.240	11.1	3.32	242.7	26.3	5.5	20.9	6.26
10	76.8	7.5	3.48	4.0	2.41	104.2	11.3	4.240	7.1	4.24	178.6	19.4	5.5	13.9	8.35
15	61.8	6.0	3.48	2.5	2.29	83.6	9.1	4.240	4.8	4.34	142.9	15.5	5.5	10.0	9.04
20	52.0	5.1	3.48	1.6	1.92	70.3	7.6	4.240	3.4	4.06	120.0	13.0	5.5	7.6	9.07
25	45.2	4.4	3.48	0.9	1.39	60.9	6.6	4.240	2.4	3.55	103.8	11.3	5.5	5.8	8.72
30	40.0	3.9	3.48	0.4	0.77	53.9	5.8	4.240	1.6	2.90	91.9	10.0	5.5	4.5	8.13
35	36.1	3.5	3.48	0.0	0.08	48.5	5.3	4.240	1.0	2.15	82.6	9.0	5.5	3.5	7.36
40	32.9	3.2	3.48	-0.3	-0.66	44.2	4.8	4.240	0.6	1.33	75.1	8.2	5.5	2.7	6.48
45	30.2	3.0	3.48	-0.5	-1.43	40.6	4.4	4.240	0.2	0.45	69.1	7.5	5.5	2.0	5.51
50	28.0	2.7	3.48	-0.7	-2.24	37.7	4.1	4.240	-0.2	-0.47	64.0	6.9	5.5	1.5	4.46
55	26.2	2.6	3.48	-0.9	-3.06	35.1	3.8	4.240	-0.4	-1.42	59.6	6.5	5.5	1.0	3.35
60	24.6	2.4	3.48	-1.1	-3.91	32.9	3.6	4.240	-0.7	-2.40	55.9	6.1	5.5	0.6	2.20
65	23.2	2.3	3.48	-1.2	-4.77	31.0	3.4	4.240	-0.9	-3.40	52.6	5.7	5.5	0.3	1.01
70	21.9	2.1	3.48	-1.3	-5.64	29.4	3.2	4.240	-1.1	-4.43	49.8	5.4	5.5	-0.1	-0.21
75	20.8	2.0	3.48	-1.5	-6.53	27.9	3.0	4.240	-1.2	-5.47	47.3	5.1	5.5	-0.3	-1.46
80	19.8	1.9	3.48	-1.5	-7.42	26.6	2.9	4.240	-1.4	-6.52	45.0	4.9	5.5	-0.6	-2.74
85	18.9	1.8	3.48	-1.6	-8.33	25.4	2.8	4.240	-1.5	-7.59	43.0	4.7	5.5	-0.8	-4.04
90	18.1	1.8	3.48	-1.7	-9.24	24.3	2.6	4.240	-1.6	-8.67	41.1	4.5	5.5	-1.0	-5.36
95	17.4	1.7	3.48	-1.8	-10.16	23.3	2.5	4.240	-1.7	-9.76	39.4	4.3	5.5	-1.2	-6.69
100	16.7	1.6	3.48	-1.8	-11.09	22.4	2.4	4.240	-1.8	-10.85	37.9	4.1	5.5	-1.3	-8.04
105	16.1	1.6	3.48	-1.9	-12.02	21.6	2.3	4.240	-1.9	-11.96	36.5	4.0	5.5	-1.5	-9.40
110	15.6	1.5	3.48	-2.0	-12.95	20.8	2.3	4.240	-2.0	-13.07	35.2	3.8	5.5	-1.6	-10.78
115	15.0	1.5	3.48	-2.0	-13.89	20.1	2.2	4.240	-2.1	-14.20	34.0	3.7	5.5	-1.8	-12.16
120	14.6	1.4	3.48	-2.1	-14.84	19.5	2.1	4.240	-2.1	-15.32	32.9	3.6	5.5	-1.9	-13.56
Max =					**2.41**					**4.34**					**9.07**

Notes

1) Peak flow is equal to the product of 2.78 x C x I x A
2) Rainfall Intensity, $I = A/(Tc+C)^B$
3) Release Rate = Min (Release Rate, Peak Flow)
4) Storage Rate = Peak Flow - Release Rate
5) Storage = Duration x Storage Rate
6) Maximium Storage = Max Storage Over Duration

Storage Volumes Roof Area P-R-16 (2 Year, 5 Year and 100 Year Storms)

C_{AVG} = 0.90 (dimmensionless)
C_{AVG} = 1.00
Time Interval = 5 (mins)
Drainage Area = 0.04017 (hectares)

	Release Rate = 3.483 (L/sec) Return Period = 2 (years) IDF Parameters, A = 732.951 , B = 0.810 (I = A/(T_c+C) , C = 6.199					Release Rate = 4.2397 (L/sec) Return Period = 5 (years) IDF Parameters, A = 998.071 , B = 0.814 (I = A/(T_c+C) , C = 6.053					Release Rate = 5.4510 (L/sec) Return Period = 100 (years) IDF Parameters, A = 1735.688 , B = 0.820 (I = A/(T_c+C) , C = 6.014				
Duration (min)	Rainfall Intensity, I (mm/hr)	Peak Flow (L/sec)	Release Rate (L/sec)	Storage Rate (L/sec)	Storage (m^3)	Rainfall Intensity, I (mm/hr)	Peak Flow (L/sec)	Release Rate (L/sec)	Storage Rate (L/sec)	Storage (m^3)	Rainfall Intensity, I (mm/hr)	Peak Flow (L/sec)	Release Rate (L/sec)	Storage Rate (L/sec)	Storage (m^3)
0	167.2	16.8	3.48	13.3	0.00	230.5	25.7	4.240	21.5	0.00	398.6	44.5	5.5	39.1	0.00
5	103.6	10.4	3.48	6.9	2.08	141.2	15.8	4.240	11.5	3.46	242.7	27.1	5.5	21.7	6.50
10	76.8	7.7	3.48	4.2	2.54	104.2	11.6	4.240	7.4	4.44	178.6	19.9	5.5	14.5	8.69
15	61.8	6.2	3.48	2.7	2.45	83.6	9.3	4.240	5.1	4.58	142.9	16.0	5.5	10.5	9.46
20	52.0	5.2	3.48	1.7	2.10	70.3	7.8	4.240	3.6	4.33	120.0	13.4	5.5	7.9	9.53
25	45.2	4.5	3.48	1.1	1.59	60.9	6.8	4.240	2.6	3.84	103.8	11.6	5.5	6.1	9.22
30	40.0	4.0	3.48	0.5	0.98	53.9	6.0	4.240	1.8	3.21	91.9	10.3	5.5	4.8	8.66
35	36.1	3.6	3.48	0.1	0.30	48.5	5.4	4.240	1.2	2.48	82.6	9.2	5.5	3.8	7.92
40	32.9	3.3	3.48	-0.2	-0.43	44.2	4.9	4.240	0.7	1.67	75.1	8.4	5.5	2.9	7.06
45	30.2	3.0	3.48	-0.4	-1.20	40.6	4.5	4.240	0.3	0.80	69.1	7.7	5.5	2.3	6.10
50	28.0	2.8	3.48	-0.7	-1.99	37.7	4.2	4.240	0.0	-0.10	64.0	7.1	5.5	1.7	5.08
55	26.2	2.6	3.48	-0.9	-2.81	35.1	3.9	4.240	-0.3	-1.05	59.6	6.7	5.5	1.2	3.99
60	24.6	2.5	3.48	-1.0	-3.65	32.9	3.7	4.240	-0.6	-2.02	55.9	6.2	5.5	0.8	2.85
65	23.2	2.3	3.48	-1.2	-4.51	31.0	3.5	4.240	-0.8	-3.01	52.6	5.9	5.5	0.4	1.67
70	21.9	2.2	3.48	-1.3	-5.38	29.4	3.3	4.240	-1.0	-4.03	49.8	5.6	5.5	0.1	0.46
75	20.8	2.1	3.48	-1.4	-6.26	27.9	3.1	4.240	-1.1	-5.06	47.3	5.3	5.5	-0.2	-0.78
80	19.8	2.0	3.48	-1.5	-7.15	26.6	3.0	4.240	-1.3	-6.11	45.0	5.0	5.5	-0.4	-2.05
85	18.9	1.9	3.48	-1.6	-8.05	25.4	2.8	4.240	-1.4	-7.17	43.0	4.8	5.5	-0.7	-3.33
90	18.1	1.8	3.48	-1.7	-8.96	24.3	2.7	4.240	-1.5	-8.25	41.1	4.6	5.5	-0.9	-4.64
95	17.4	1.8	3.48	-1.7	-9.87	23.3	2.6	4.240	-1.6	-9.33	39.4	4.4	5.5	-1.0	-5.97
100	16.7	1.7	3.48	-1.8	-10.80	22.4	2.5	4.240	-1.7	-10.42	37.9	4.2	5.5	-1.2	-7.31
105	16.1	1.6	3.48	-1.9	-11.72	21.6	2.4	4.240	-1.8	-11.52	36.5	4.1	5.5	-1.4	-8.66
110	15.6	1.6	3.48	-1.9	-12.66	20.8	2.3	4.240	-1.9	-12.63	35.2	3.9	5.5	-1.5	-10.03
115	15.0	1.5	3.48	-2.0	-13.59	20.1	2.2	4.240	-2.0	-13.75	34.0	3.8	5.5	-1.7	-11.41
120	14.6	1.5	3.48	-2.0	-14.54	19.5	2.2	4.240	-2.1	-14.87	32.9	3.7	5.5	-1.8	-12.80
Max =					**2.54**					**4.58**					**9.53**

Notes

1) Peak flow is equal to the product of 2.78 x C x I x A
2) Rainfall Intensity, $I = A/(Tc+C)^B$
3) Release Rate = Min (Release Rate, Peak Flow)
4) Storage Rate = Peak Flow - Release Rate
5) Storage = Duration x Storage Rate
6) Maximium Storage = Max Storage Over Duration

Storage Volumes Roof Area P-R-17 (2 Year, 5 Year and 100 Year Storms)

C_{AVG} = 0.90 (dimmensionless)

C_{AVG} = 1.00

Time Interval = 5 (mins)

Drainage Area = 0.05018 (hectares)

	Release Rate = 3.672 (L/sec) Return Period = 2 (years) IDF Parameters, A = 732.951 , B = 0.810 (I = A/(T_c+C) , C = 6.199					Release Rate = 4.4668 (L/sec) Return Period = 5 (years) IDF Parameters, A = 998.071 , B = 0.814 (I = A/(T_c+C) , C = 6.053					Release Rate = 5.6403 (L/sec) Return Period = 100 (years) IDF Parameters, A = 1735.688 , B = 0.820 (I = A/(T_c+C) , C = 6.014				
Duration (min)	Rainfall Intensity, I (mm/hr)	Peak Flow (L/sec)	Release Rate (L/sec)	Storage Rate (L/sec)	Storage (m^3)	Rainfall Intensity, I (mm/hr)	Peak Flow (L/sec)	Release Rate (L/sec)	Storage Rate (L/sec)	Storage (m^3)	Rainfall Intensity, I (mm/hr)	Peak Flow (L/sec)	Release Rate (L/sec)	Storage Rate (L/sec)	Storage (m^3)
0	167.2	21.0	3.67	17.3	0.00	230.5	32.2	4.467	27.7	0.00	398.6	55.6	5.6	50.0	0.00
5	103.6	13.0	3.67	9.3	2.80	141.2	19.7	4.467	15.2	4.57	242.7	33.9	5.6	28.2	8.47
10	76.8	9.6	3.67	6.0	3.58	104.2	14.5	4.467	10.1	6.04	178.6	24.9	5.6	19.3	11.56
15	61.8	7.8	3.67	4.1	3.67	83.6	11.7	4.467	7.2	6.47	142.9	19.9	5.6	14.3	12.86
20	52.0	6.5	3.67	2.9	3.43	70.3	9.8	4.467	5.3	6.40	120.0	16.7	5.6	11.1	13.31
25	45.2	5.7	3.67	2.0	3.00	60.9	8.5	4.467	4.0	6.04	103.8	14.5	5.6	8.8	13.27
30	40.0	5.0	3.67	1.4	2.44	53.9	7.5	4.467	3.1	5.50	91.9	12.8	5.6	7.2	12.92
35	36.1	4.5	3.67	0.9	1.80	48.5	6.8	4.467	2.3	4.83	82.6	11.5	5.6	5.9	12.35
40	32.9	4.1	3.67	0.5	1.09	44.2	6.2	4.467	1.7	4.07	75.1	10.5	5.6	4.8	11.62
45	30.2	3.8	3.67	0.1	0.34	40.6	5.7	4.467	1.2	3.24	69.1	9.6	5.6	4.0	10.78
50	28.0	3.5	3.67	-0.2	-0.45	37.7	5.3	4.467	0.8	2.36	64.0	8.9	5.6	3.3	9.84
55	26.2	3.3	3.67	-0.4	-1.27	35.1	4.9	4.467	0.4	1.43	59.6	8.3	5.6	2.7	8.84
60	24.6	3.1	3.67	-0.6	-2.12	32.9	4.6	4.467	0.1	0.46	55.9	7.8	5.6	2.2	7.77
65	23.2	2.9	3.67	-0.8	-2.98	31.0	4.3	4.467	-0.1	-0.53	52.6	7.3	5.6	1.7	6.65
70	21.9	2.8	3.67	-0.9	-3.87	29.4	4.1	4.467	-0.4	-1.55	49.8	6.9	5.6	1.3	5.48
75	20.8	2.6	3.67	-1.1	-4.76	27.9	3.9	4.467	-0.6	-2.59	47.3	6.6	5.6	1.0	4.28
80	19.8	2.5	3.67	-1.2	-5.67	26.6	3.7	4.467	-0.8	-3.65	45.0	6.3	5.6	0.6	3.05
85	18.9	2.4	3.67	-1.3	-6.60	25.4	3.5	4.467	-0.9	-4.73	43.0	6.0	5.6	0.4	1.80
90	18.1	2.3	3.67	-1.4	-7.53	24.3	3.4	4.467	-1.1	-5.82	41.1	5.7	5.6	0.1	0.51
95	17.4	2.2	3.67	-1.5	-8.47	23.3	3.3	4.467	-1.2	-6.93	39.4	5.5	5.6	-0.1	-0.79
100	16.7	2.1	3.67	-1.6	-9.42	22.4	3.1	4.467	-1.3	-8.05	37.9	5.3	5.6	-0.4	-2.12
105	16.1	2.0	3.67	-1.6	-10.37	21.6	3.0	4.467	-1.5	-9.17	36.5	5.1	5.6	-0.5	-3.46
110	15.6	2.0	3.67	-1.7	-11.33	20.8	2.9	4.467	-1.6	-10.31	35.2	4.9	5.6	-0.7	-4.81
115	15.0	1.9	3.67	-1.8	-12.30	20.1	2.8	4.467	-1.7	-11.45	34.0	4.7	5.6	-0.9	-6.19
120	14.6	1.8	3.67	-1.8	-13.27	19.5	2.7	4.467	-1.8	-12.61	32.9	4.6	5.6	-1.1	-7.57
Max =					**3.67**					**6.47**					**13.31**

Notes

1) Peak flow is equal to the product of 2.78 x C x I x A

2) Rainfall Intensity, $I = A/(Tc+C)^B$

3) Release Rate = Min (Release Rate, Peak Flow)

4) Storage Rate = Peak Flow - Release Rate

5) Storage = Duration x Storage Rate

6) Maximium Storage = Max Storage Over Duration

TABLE D9 P-1 Storage Volumes for 2-year, 5-Year and 100-Year Storms (MRM)

Area No: P-1
C_{AVG} = 0.59 (2-yr)
C_{AVG} = 0.59 (5-yr)
C_{AVG} = 0.73 (100-yr, Max 1.0)
Time Interval = 5.00 (mins)
Drainage Area = 0.1257 (hectares)

Actual Release Rate (L/sec) = 24.00
Percentage of Actual Rate (City of Ottawa requirement) = 100% (Set to 50% when U/G storage used)
Release Rate Used for Estimation of 100-year Storage (L/sec) = 24.00

Intensity Incr (%) = 20% Use 20% for Climate Change

Duration (mins)	Release Rate = 15.78 (L/sec), Return Period = (years), IDF Parameters, A = 733.0, B = 0.810, C = 6.199 (I = A/(T_c+C))					Release Rate = 21.41 (L/sec), Return Period = 5 (years), IDF Parameters, A = 998.1, B = 0.814, C = 6.053 (I = A/(T_c+C))					Release Rate = 24.00 (L/sec), Return Period = 100 (years), IDF Parameters, A = 1735.7, B = 0.820, C = 6.014 (I = A/(T_c+C))					Release Rate = 24.00 (L/sec), Return Period = 100+20% (years), IDF Parameters, A = 1735.7, B = 0.820, C = 6.014 (I = A/(T_c+C))				
	Rainfall Intensity, I (mm/hr)	Peak Flow (L/sec)	Release Rate (L/sec)	Storage Rate (L/sec)	Storage (m^3)	Rainfall Intensity, I (mm/hr)	Peak Flow (L/sec)	Release Rate (L/sec)	Storage Rate (L/sec)	Storage (m^3)	Rainfall Intensity, I (mm/hr)	Peak Flow (L/sec)	Release Rate (L/sec)	Storage Rate (L/sec)	Storage (m^3)	Rainfall Intensity, I (mm/hr)	Peak Flow (L/sec)	Release Rate (L/sec)	Storage Rate (L/sec)	Storage (m^3)
0	167.2	34.4	15.8	18.6	0.0	230.5	47.4	21.4	26.0	0.0	398.6	102.4	24.0	78.4	0.0	478.3	122.9	24.0	98.9	0.0
5	103.6	21.3	15.8	5.5	1.7	141.2	29.0	21.4	7.6	2.3	242.7	62.3	24.0	38.3	11.5	291.2	74.8	24.0	50.8	15.2
10	76.8	15.8	15.8	0.0	0.0	104.2	21.4	21.4	0.0	0.0	178.6	45.9	24.0	21.9	13.1	214.3	55.0	24.0	31.0	18.6
15	61.8	12.7	15.8	-3.1	-2.8	83.6	17.2	21.4	-4.2	-3.8	142.9	36.7	24.0	12.7	11.4	171.5	44.0	24.0	20.0	18.0
20	52.0	10.7	15.8	-5.1	-6.1	70.3	14.4	21.4	-7.0	-8.4	120.0	30.8	24.0	6.8	8.2	143.9	37.0	24.0	13.0	15.6
25	45.2	9.3	15.8	-6.5	-9.8	60.9	12.5	21.4	-8.9	-13.3	103.8	26.7	24.0	2.7	4.0	124.6	32.0	24.0	8.0	12.0
30	40.0	8.2	15.8	-7.6	-13.6	53.9	11.1	21.4	-10.3	-18.6	91.9	23.6	24.0	-0.4	-0.7	110.2	28.3	24.0	4.3	7.8
35	36.1	7.4	15.8	-8.4	-17.6	48.5	10.0	21.4	-11.4	-24.0	82.6	21.2	24.0	-2.8	-5.9	99.1	25.5	24.0	1.5	3.1
40	32.9	6.8	15.8	-9.0	-21.7	44.2	9.1	21.4	-12.3	-29.6	75.1	19.3	24.0	-4.7	-11.3	90.2	23.2	24.0	-0.8	-2.0
45	30.2	6.2	15.8	-9.6	-25.8	40.6	8.3	21.4	-13.1	-35.3	69.1	17.7	24.0	-6.3	-16.9	82.9	21.3	24.0	-2.7	-7.3
50	28.0	5.8	15.8	-10.0	-30.1	37.7	7.7	21.4	-13.7	-41.0	64.0	16.4	24.0	-7.6	-22.7	76.7	19.7	24.0	-4.3	-12.9
55	26.2	5.4	15.8	-10.4	-34.3	35.1	7.2	21.4	-14.2	-46.8	59.6	15.3	24.0	-8.7	-28.7	71.5	18.4	24.0	-5.6	-18.6
60	24.6	5.0	15.8	-10.7	-38.6	32.9	6.8	21.4	-14.6	-52.7	55.9	14.4	24.0	-9.6	-34.7	67.1	17.2	24.0	-6.8	-24.4
65	23.2	4.8	15.8	-11.0	-43.0	31.0	6.4	21.4	-15.0	-58.6	52.6	13.5	24.0	-10.5	-40.9	63.2	16.2	24.0	-7.8	-30.3
70	21.9	4.5	15.8	-11.3	-47.4	29.4	6.0	21.4	-15.4	-64.6	49.8	12.8	24.0	-11.2	-47.1	59.7	15.3	24.0	-8.7	-36.3
75	20.8	4.3	15.8	-11.5	-51.8	27.9	5.7	21.4	-15.7	-70.6	47.3	12.1	24.0	-11.9	-53.4	56.7	14.6	24.0	-9.4	-42.5
80	19.8	4.1	15.8	-11.7	-56.2	26.6	5.5	21.4	-16.0	-76.6	45.0	11.6	24.0	-12.4	-59.7	54.0	13.9	24.0	-10.1	-48.6
85	18.9	3.9	15.8	-11.9	-60.6	25.4	5.2	21.4	-16.2	-82.6	43.0	11.0	24.0	-13.0	-66.1	51.5	13.2	24.0	-10.8	-54.9
90	18.1	3.7	15.8	-12.1	-65.1	24.3	5.0	21.4	-16.4	-88.7	41.1	10.6	24.0	-13.4	-72.6	49.3	12.7	24.0	-11.3	-61.2
95	17.4	3.6	15.8	-12.2	-69.6	23.3	4.8	21.4	-16.6	-94.7	39.4	10.1	24.0	-13.9	-79.1	47.3	12.2	24.0	-11.8	-67.5
100	16.7	3.4	15.8	-12.3	-74.0	22.4	4.6	21.4	-16.8	-100.8	37.9	9.7	24.0	-14.3	-85.6	45.5	11.7	24.0	-12.3	-73.9
Max =					1.7					2.3					13.1					18.6

Notes
1) Peak flow is equal to the product of 2.78 x C x I x A
2) Rainfall Intensity, I = $A/(Tc+C)^B$
3) Release Rate = Min (Release Rate, Peak Flow)
4) Storage Rate = Peak Flow - Release Rate
5) Storage = Duration x Storage Rate
6) Maximum Storage = Max Storage Over Duration
7) Parameters a,b,c are for City of Ottawa

City of Ottawa IDF Data (from SDG002)

IDF curve equations (Intensity in mm/hr)

100 year Intensity	$= 1735.688 / (\text{Time in min} + 6.014)^{0.820}$
50 year Intensity	$= 1569.580 / (\text{Time in min} + 6.014)^{0.820}$
25 year Intensity	$= 1402.884 / (\text{Time in min} + 6.018)^{0.819}$
10 year Intensity	$= 1174.184 / (\text{Time in min} + 6.014)^{0.816}$
5 year Intensity	$= 998.071 / (\text{Time in min} + 6.053)^{0.814}$
2 year Intensity	$= 732.951 / (\text{Time in min} + 6.199)^{0.810}$

TABLE D10 P-2 Storage Volumes for 2-year, 5-Year and 100-Year Storms (MRM)

Area No: P-2
C_{AVG} = 0.84 (2-yr)
C_{AVG} = 0.84 (5-yr)
C_{AVG} = 1.00 (100-yr, Max 1.0)
Time Interval = 5.00 (mins)
Drainage Area = 0.2032 (hectares)

Actual Release Rate (L/sec) = 69.30
Percentage of Actual Rate (City of Ottawa requirement) = 100% (Set to 50% when U/G storage used)
Release Rate Used for Estimation of 100-year Storage (L/sec) = 69.30

Intensity Incr (%) = 20% Use 20% for Climate Change

Duration (mins)	Release Rate = 36.33 (L/sec), Return Period = (years), IDF Parameters, A = 733.0, B = 0.810, (I = A/(T_c+C)), C = 6.199					Release Rate = 49.28 (L/sec), Return Period = 5 (years), IDF Parameters, A = 998.1, B = 0.814, (I = A/(T_c+C)), C = 6.053					Release Rate = 69.30 (L/sec), Return Period = 100 (years), IDF Parameters, A = 1735.7, B = 0.820, (I = A/(T_c+C)), C = 6.014					Release Rate = 69.30 (L/sec), Return Period = 100+20% (years), IDF Parameters, A = 1735.7, B = 0.820, (I = A/(T_c+C)), C = 6.014				
	Rainfall Intensity, I (mm/hr)	Peak Flow (L/sec)	Release Rate (L/sec)	Storage Rate (L/sec)	Storage (m^3)	Rainfall Intensity, I (mm/hr)	Peak Flow (L/sec)	Release Rate (L/sec)	Storage Rate (L/sec)	Storage (m^3)	Rainfall Intensity, I (mm/hr)	Peak Flow (L/sec)	Release Rate (L/sec)	Storage Rate (L/sec)	Storage (m^3)	Rainfall Intensity, I (mm/hr)	Peak Flow (L/sec)	Release Rate (L/sec)	Storage Rate (L/sec)	Storage (m^3)
0	167.2	79.1	36.3	42.8	0.0	230.5	109.0	49.3	59.7	0.0	398.6	225.2	69.3	155.9	0.0	478.3	270.2	69.3	200.9	0.0
5	103.6	49.0	36.3	12.7	3.8	141.2	66.8	49.3	17.5	5.2	242.7	137.1	69.3	67.8	20.3	291.2	164.5	69.3	95.2	28.6
10	76.8	36.3	36.3	0.0	0.0	104.2	49.3	49.3	0.0	0.0	178.6	100.9	69.3	31.6	18.9	214.3	121.0	69.3	51.7	31.0
15	61.8	29.2	36.3	-7.1	-6.4	83.6	39.5	49.3	-9.8	-8.8	142.9	80.7	69.3	11.4	10.3	171.5	96.9	69.3	27.6	24.8
20	52.0	24.6	36.3	-11.7	-14.1	70.3	33.2	49.3	-16.1	-19.3	120.0	67.8	69.3	-1.5	-1.9	143.9	81.3	69.3	12.0	14.4
25	45.2	21.4	36.3	-15.0	-22.4	60.9	28.8	49.3	-20.5	-30.7	103.8	58.7	69.3	-10.6	-16.0	124.6	70.4	69.3	1.1	1.6
30	40.0	18.9	36.3	-17.4	-31.3	53.9	25.5	49.3	-23.8	-42.8	91.9	51.9	69.3	-17.4	-31.3	110.2	62.3	69.3	-7.0	-12.7
35	36.1	17.1	36.3	-19.3	-40.5	48.5	22.9	49.3	-26.3	-55.3	82.6	46.6	69.3	-22.7	-47.6	99.1	56.0	69.3	-13.3	-28.0
40	32.9	15.5	36.3	-20.8	-49.9	44.2	20.9	49.3	-28.4	-68.1	75.1	42.4	69.3	-26.9	-64.5	90.2	50.9	69.3	-18.4	-44.1
45	30.2	14.3	36.3	-22.0	-59.5	40.6	19.2	49.3	-30.1	-81.2	69.1	39.0	69.3	-30.3	-81.8	82.9	46.8	69.3	-22.5	-60.7
50	28.0	13.3	36.3	-23.1	-69.2	37.7	17.8	49.3	-31.5	-94.4	64.0	36.1	69.3	-33.2	-99.5	76.7	43.3	69.3	-26.0	-77.9
55	26.2	12.4	36.3	-23.9	-79.0	35.1	16.6	49.3	-32.7	-107.8	59.6	33.7	69.3	-35.6	-117.6	71.5	40.4	69.3	-28.9	-95.3
60	24.6	11.6	36.3	-24.7	-89.0	32.9	15.6	49.3	-33.7	-121.3	55.9	31.6	69.3	-37.7	-135.8	67.1	37.9	69.3	-31.4	-113.1
65	23.2	10.9	36.3	-25.4	-99.0	31.0	14.7	49.3	-34.6	-134.9	52.6	29.7	69.3	-39.6	-154.3	63.2	35.7	69.3	-33.6	-131.1
70	21.9	10.4	36.3	-26.0	-109.0	29.4	13.9	49.3	-35.4	-148.6	49.8	28.1	69.3	-41.2	-172.9	59.7	33.7	69.3	-35.6	-149.3
75	20.8	9.8	36.3	-26.5	-119.2	27.9	13.2	49.3	-36.1	-162.4	47.3	26.7	69.3	-42.6	-191.7	56.7	32.0	69.3	-37.3	-167.7
80	19.8	9.4	36.3	-26.9	-129.3	26.6	12.6	49.3	-36.7	-176.2	45.0	25.4	69.3	-43.9	-210.7	54.0	30.5	69.3	-38.8	-186.3
85	18.9	9.0	36.3	-27.4	-139.6	25.4	12.0	49.3	-37.3	-190.1	43.0	24.3	69.3	-45.0	-229.7	51.5	29.1	69.3	-40.2	-204.9
90	18.1	8.6	36.3	-27.7	-149.8	24.3	11.5	49.3	-37.8	-204.1	41.1	23.2	69.3	-46.1	-248.8	49.3	27.9	69.3	-41.4	-223.7
95	17.4	8.2	36.3	-28.1	-160.1	23.3	11.0	49.3	-38.3	-218.1	39.4	22.3	69.3	-47.0	-268.0	47.3	26.7	69.3	-42.6	-242.7
100	16.7	7.9	36.3	-28.4	-170.4	22.4	10.6	49.3	-38.7	-232.1	37.9	21.4	69.3	-47.9	-287.3	45.5	25.7	69.3	-43.6	-261.7
Max =					**3.8**					**5.2**					**20.3**					**31.0**

Notes
1) Peak flow is equal to the product of 2.78 x C x I x A
2) Rainfall Intensity, I = $A/(Tc+C)^B$
3) Release Rate = Min (Release Rate, Peak Flow)
4) Storage Rate = Peak Flow - Release Rate
5) Storage = Duration x Storage Rate
6) Maximum Storage = Max Storage Over Duration
7) Parameters a,b,c are for City of Ottawa

City of Ottawa IDF Data (from SDG002)

IDF curve equations (Intensity in mm/hr)

100 year Intensity	$= 1735.688 / (\text{Time in min} + 6.014)^{0.820}$
50 year Intensity	$= 1569.580 / (\text{Time in min} + 6.014)^{0.820}$
25 year Intensity	$= 1402.884 / (\text{Time in min} + 6.018)^{0.819}$
10 year Intensity	$= 1174.184 / (\text{Time in min} + 6.014)^{0.816}$
5 year Intensity	$= 998.071 / (\text{Time in min} + 6.053)^{0.814}$
2 year Intensity	$= 732.951 / (\text{Time in min} + 6.199)^{0.810}$

TABLE D11 P-3 Storage Volumes for 2-year, 5-Year and 100-Year Storms (MRM)

Area No: P-3
C_{AVG} = 0.84 (2-yr)
C_{AVG} = 0.84 (5-yr)
C_{AVG} = 1.00 (100-yr, Max 1.0)
Time Interval = 5.00 (mins)
Drainage Area = 0.1792 (hectares)

Actual Release Rate (L/sec) = 59.00
Percentage of Actual Rate (City of Ottawa requirement) = 100% (Set to 50% when U/G storage used)
Release Rate Used for Estimation of 100-year Storage (L/sec) = 59.00

Intensity Incr (%) = 20% Use 20% for Climate Change

Duration (mins)	Release Rate = 32.12 (L/sec), Return Period = (years), IDF Parameters, A = 733.0, B = 0.810, (I = A/(T_c+C)), C = 6.199					Release Rate = 43.58 (L/sec), Return Period = 5 (years), IDF Parameters, A = 998.1, B = 0.814, (I = A/(T_c+C)), C = 6.053					Release Rate = 59.00 (L/sec), Return Period = 100 (years), IDF Parameters, A = 1735.7, B = 0.820, (I = A/(T_c+C)), C = 6.014					Release Rate = 59.00 (L/sec), Return Period = 100+20% (years), IDF Parameters, A = 1735.7, B = 0.820, (I = A/(T_c+C)), C = 6.014				
	Rainfall Intensity, I (mm/hr)	Peak Flow (L/sec)	Release Rate (L/sec)	Storage Rate (L/sec)	Storage (m^3)	Rainfall Intensity, I (mm/hr)	Peak Flow (L/sec)	Release Rate (L/sec)	Storage Rate (L/sec)	Storage (m^3)	Rainfall Intensity, I (mm/hr)	Peak Flow (L/sec)	Release Rate (L/sec)	Storage Rate (L/sec)	Storage (m^3)	Rainfall Intensity, I (mm/hr)	Peak Flow (L/sec)	Release Rate (L/sec)	Storage Rate (L/sec)	Storage (m^3)
0	167.2	69.9	32.1	37.8	0.0	230.5	96.4	43.6	52.8	0.0	398.6	198.5	59.0	139.5	0.0	478.3	238.2	59.0	179.2	0.0
5	103.6	43.3	32.1	11.2	3.4	141.2	59.0	43.6	15.5	4.6	242.7	120.9	59.0	61.9	18.6	291.2	145.1	59.0	86.1	25.8
10	76.8	32.1	32.1	0.0	0.0	104.2	43.6	43.6	0.0	0.0	178.6	88.9	59.0	29.9	18.0	214.3	106.7	59.0	47.7	28.6
15	61.8	25.8	32.1	-6.3	-5.7	83.6	34.9	43.6	-8.6	-7.8	142.9	71.2	59.0	12.2	11.0	171.5	85.4	59.0	26.4	23.8
20	52.0	21.8	32.1	-10.4	-12.4	70.3	29.4	43.6	-14.2	-17.0	120.0	59.7	59.0	0.7	0.9	143.9	71.7	59.0	12.7	15.2
25	45.2	18.9	32.1	-13.2	-19.8	60.9	25.5	43.6	-18.1	-27.2	103.8	51.7	59.0	-7.3	-10.9	124.6	62.1	59.0	3.1	4.6
30	40.0	16.7	32.1	-15.4	-27.7	53.9	22.6	43.6	-21.0	-37.8	91.9	45.8	59.0	-13.2	-23.8	110.2	54.9	59.0	-4.1	-7.4
35	36.1	15.1	32.1	-17.0	-35.8	48.5	20.3	43.6	-23.3	-48.9	82.6	41.1	59.0	-17.9	-37.5	99.1	49.4	59.0	-9.6	-20.3
40	32.9	13.7	32.1	-18.4	-44.1	44.2	18.5	43.6	-25.1	-60.2	75.1	37.4	59.0	-21.6	-51.8	90.2	44.9	59.0	-14.1	-33.8
45	30.2	12.6	32.1	-19.5	-52.6	40.6	17.0	43.6	-26.6	-71.8	69.1	34.4	59.0	-24.6	-66.4	82.9	41.3	59.0	-17.7	-47.9
50	28.0	11.7	32.1	-20.4	-61.2	37.7	15.7	43.6	-27.8	-83.5	64.0	31.9	59.0	-27.1	-81.4	76.7	38.2	59.0	-20.8	-62.3
55	26.2	10.9	32.1	-21.2	-69.9	35.1	14.7	43.6	-28.9	-95.3	59.6	29.7	59.0	-29.3	-96.7	71.5	35.6	59.0	-23.4	-77.1
60	24.6	10.3	32.1	-21.9	-78.7	32.9	13.8	43.6	-29.8	-107.3	55.9	27.8	59.0	-31.2	-112.2	67.1	33.4	59.0	-25.6	-92.1
65	23.2	9.7	32.1	-22.4	-87.5	31.0	13.0	43.6	-30.6	-119.3	52.6	26.2	59.0	-32.8	-127.8	63.2	31.5	59.0	-27.5	-107.4
70	21.9	9.2	32.1	-23.0	-96.4	29.4	12.3	43.6	-31.3	-131.4	49.8	24.8	59.0	-34.2	-143.6	59.7	29.8	59.0	-29.2	-122.8
75	20.8	8.7	32.1	-23.4	-105.4	27.9	11.7	43.6	-31.9	-143.6	47.3	23.5	59.0	-35.5	-159.6	56.7	28.2	59.0	-30.8	-138.4
80	19.8	8.3	32.1	-23.8	-114.4	26.6	11.1	43.6	-32.5	-155.9	45.0	22.4	59.0	-36.6	-175.6	54.0	26.9	59.0	-32.1	-154.1
85	18.9	7.9	32.1	-24.2	-123.4	25.4	10.6	43.6	-33.0	-168.1	43.0	21.4	59.0	-37.6	-191.8	51.5	25.7	59.0	-33.3	-170.0
90	18.1	7.6	32.1	-24.5	-132.5	24.3	10.2	43.6	-33.4	-180.5	41.1	20.5	59.0	-38.5	-208.0	49.3	24.6	59.0	-34.4	-185.9
95	17.4	7.3	32.1	-24.8	-141.6	23.3	9.7	43.6	-33.8	-192.8	39.4	19.6	59.0	-39.4	-224.3	47.3	23.6	59.0	-35.4	-202.0
100	16.7	7.0	32.1	-25.1	-150.7	22.4	9.4	43.6	-34.2	-205.2	37.9	18.9	59.0	-40.1	-240.7	45.5	22.7	59.0	-36.3	-218.1
Max =					**3.4**					**4.6**					**18.6**					**28.6**

Notes
1) Peak flow is equal to the product of 2.78 x C x I x A
2) Rainfall Intensity, I = A/(Tc+C)^B
3) Release Rate = Min (Release Rate, Peak Flow)
4) Storage Rate = Peak Flow - Release Rate
5) Storage = Duration x Storage Rate
6) Maximum Storage = Max Storage Over Duration
7) Parameters a,b,c are for City of Ottawa

City of Ottawa IDF Data (from SDG002)

IDF curve equations (Intensity in mm/hr)

100 year Intensity = 1735.688 / (Time in min + 6.014) $^{0.820}$
50 year Intensity = 1569.580 / (Time in min + 6.014) $^{0.820}$
25 year Intensity = 1402.884 / (Time in min + 6.018) $^{0.819}$
10 year Intensity = 1174.184 / (Time in min + 6.014) $^{0.816}$
5 year Intensity = 998.071 / (Time in min + 6.053) $^{0.814}$
2 year Intensity = 732.951 / (Time in min + 6.199) $^{0.810}$

TABLE D12 P-4 Storage Volumes for 2-year, 5-Year and 100-Year Storms (MRM)

Area No: P-4
C_{AVG} = 0.24 (2-yr)
C_{AVG} = 0.24 (5-yr)
C_{AVG} = 0.31 (100-yr, Max 1.0)
Time Interval = 5.00 (mins)
Drainage Area = 1.9029 (hectares)

Actual Release Rate (L/sec) = 175.00
Percentage of Actual Rate (City of Ottawa requirement) = 100% (Set to 50% when U/G storage used)
Release Rate Used for Estimation of 100-year Storage (L/sec) = 175.00

Intensity Incr (%) = 20% Use 20% for Climate Change

Duration (mins)	Release Rate = 99.29 (L/sec), Return Period = (years), IDF Parameters, A = 733.0, B = 0.810, (I = A/(T_c+C)), C = 6.199					Release Rate = 134.69 (L/sec), Return Period = 5 (years), IDF Parameters, A = 998.1, B = 0.814, (I = A/(T_c+C)), C = 6.053					Release Rate = 175.00 (L/sec), Return Period = 100 (years), IDF Parameters, A = 1735.7, B = 0.820, (I = A/(T_c+C)), C = 6.014					Release Rate = 175.00 (L/sec), Return Period = 100+20% (years), IDF Parameters, A = 1735.7, B = 0.820, (I = A/(T_c+C)), C = 6.014				
	Rainfall Intensity, I (mm/hr)	Peak Flow (L/sec)	Release Rate (L/sec)	Storage Rate (L/sec)	Storage (m^3)	Rainfall Intensity, I (mm/hr)	Peak Flow (L/sec)	Release Rate (L/sec)	Storage Rate (L/sec)	Storage (m^3)	Rainfall Intensity, I (mm/hr)	Peak Flow (L/sec)	Release Rate (L/sec)	Storage Rate (L/sec)	Storage (m^3)	Rainfall Intensity, I (mm/hr)	Peak Flow (L/sec)	Release Rate (L/sec)	Storage Rate (L/sec)	Storage (m^3)
0	167.2	216.2	99.3	116.9	0.0	230.5	297.9	134.7	163.3	0.0	398.6	644.1	175.0	469.1	0.0	478.3	773.0	175.0	598.0	0.0
5	103.6	133.9	99.3	34.6	10.4	141.2	182.5	134.7	47.8	14.3	242.7	392.2	175.0	217.2	65.2	291.2	470.6	175.0	295.6	88.7
10	76.8	99.3	99.3	0.0	0.0	104.2	134.7	134.7	0.0	0.0	178.6	288.5	175.0	113.5	68.1	214.3	346.2	175.0	171.2	102.7
15	61.8	79.8	99.3	-19.4	-17.5	83.6	108.0	134.7	-26.7	-24.0	142.9	230.9	175.0	55.9	50.3	171.5	277.1	175.0	102.1	91.9
20	52.0	67.3	99.3	-32.0	-38.4	70.3	90.8	134.7	-43.9	-52.7	120.0	193.8	175.0	18.8	22.6	143.9	232.6	175.0	57.6	69.1
25	45.2	58.4	99.3	-40.9	-61.3	60.9	78.7	134.7	-56.0	-84.0	103.8	167.8	175.0	-7.2	-10.8	124.6	201.4	175.0	26.4	39.6
30	40.0	51.8	99.3	-47.5	-85.5	53.9	69.7	134.7	-65.0	-117.0	91.9	148.4	175.0	-26.6	-47.8	110.2	178.1	175.0	3.1	5.7
35	36.1	46.6	99.3	-52.7	-110.6	48.5	62.7	134.7	-72.0	-151.1	82.6	133.4	175.0	-41.6	-87.3	99.1	160.1	175.0	-14.9	-31.2
40	32.9	42.5	99.3	-56.8	-136.3	44.2	57.1	134.7	-77.6	-186.2	75.1	121.4	175.0	-53.6	-128.6	90.2	145.7	175.0	-29.3	-70.3
45	30.2	39.1	99.3	-60.2	-162.5	40.6	52.5	134.7	-82.2	-221.9	69.1	111.6	175.0	-63.4	-171.2	82.9	133.9	175.0	-41.1	-111.0
50	28.0	36.2	99.3	-63.0	-189.1	37.7	48.7	134.7	-86.0	-258.1	64.0	103.3	175.0	-71.7	-215.0	76.7	124.0	175.0	-51.0	-153.0
55	26.2	33.8	99.3	-65.5	-216.0	35.1	45.4	134.7	-89.3	-294.6	59.6	96.3	175.0	-78.7	-259.6	71.5	115.6	175.0	-59.4	-196.0
60	24.6	31.7	99.3	-67.5	-243.1	32.9	42.6	134.7	-92.1	-331.6	55.9	90.3	175.0	-84.7	-304.8	67.1	108.4	175.0	-66.6	-239.8
65	23.2	29.9	99.3	-69.4	-270.5	31.0	40.1	134.7	-94.6	-368.8	52.6	85.1	175.0	-89.9	-350.7	63.2	102.1	175.0	-72.9	-284.4
70	21.9	28.3	99.3	-71.0	-298.0	29.4	38.0	134.7	-96.7	-406.2	49.8	80.5	175.0	-94.5	-397.1	59.7	96.5	175.0	-78.5	-329.5
75	20.8	26.9	99.3	-72.4	-325.7	27.9	36.1	134.7	-98.6	-443.9	47.3	76.4	175.0	-98.6	-443.9	56.7	91.6	175.0	-83.4	-375.2
80	19.8	25.6	99.3	-73.7	-353.5	26.6	34.3	134.7	-100.4	-481.7	45.0	72.7	175.0	-102.3	-491.0	54.0	87.2	175.0	-87.8	-421.2
85	18.9	24.5	99.3	-74.8	-381.5	25.4	32.8	134.7	-101.9	-519.7	43.0	69.4	175.0	-105.6	-538.5	51.5	83.3	175.0	-91.7	-467.7
90	18.1	23.5	99.3	-75.8	-409.5	24.3	31.4	134.7	-103.3	-557.8	41.1	66.4	175.0	-108.6	-586.3	49.3	79.7	175.0	-95.3	-514.5
95	17.4	22.5	99.3	-76.8	-437.6	23.3	30.1	134.7	-104.6	-596.0	39.4	63.7	175.0	-111.3	-634.3	47.3	76.5	175.0	-98.5	-561.6
100	16.7	21.6	99.3	-77.6	-465.8	22.4	29.0	134.7	-105.7	-634.4	37.9	61.2	175.0	-113.8	-682.5	45.5	73.5	175.0	-101.5	-609.0
Max =					**10.4**					**14.3**					**68.1**					**102.7**

Notes
1) Peak flow is equal to the product of 2.78 x C x I x A
2) Rainfall Intensity, I = $A/(Tc+C)^B$
3) Release Rate = Min (Release Rate, Peak Flow)
4) Storage Rate = Peak Flow - Release Rate
5) Storage = Duration x Storage Rate
6) Maximum Storage = Max Storage Over Duration
7) Parameters a,b,c are for City of Ottawa

City of Ottawa IDF Data (from SDG002)

IDF curve equations (Intensity in mm/hr)

100 year Intensity	$= 1735.688 / (\text{Time in min} + 6.014)^{0.820}$
50 year Intensity	$= 1569.580 / (\text{Time in min} + 6.014)^{0.820}$
25 year Intensity	$= 1402.884 / (\text{Time in min} + 6.018)^{0.819}$
10 year Intensity	$= 1174.184 / (\text{Time in min} + 6.014)^{0.816}$
5 year Intensity	$= 998.071 / (\text{Time in min} + 6.053)^{0.814}$
2 year Intensity	$= 732.951 / (\text{Time in min} + 6.199)^{0.810}$

Table D13 - 5-YEAR STORM SEWER CALCULATION SHEET

Return Period Storm = **5** (5-years, 100-years)
Default Inlet Time= 10 (minutes)
Manning Coefficient = 0.013 (dimensionless)

LOCATION			AREA (hectares)				FLOW (UNRESTRICTED - RATIONAL METHOD)							SEWER DATA									
Location	From Node	To Node	Area No.	Area (ha)	∑ Area (ha)	Average R	Indiv. 2.78*A*R	Accum. 2.78*A*R	Tc (mins)	I (mm/h)	Indiv. Flow (L/sec)	Return Period	Q (L/sec)	Dia (mm) Actual	Dia (mm) Nominal	Type	Slope (%)	Length (m)	Capacity (L/sec)	Velocity (m/s) Vf	Velocity (m/s) Va	Time in Pipe, Tt (min)	Hydraulic Ratios Qa/Qf	Hydraulic Ratios Va/Vf
675 Borbridge Ave.	CB 301	CB 302	P-8	0.15	0.150	0.63	0.26	0.26	10.00	104.19	27.18	5.00	27.2	299.36	300	PVC	0.35	33.09	56.9	0.81	0.57	0.96	0.48	0.71
	CB 302	STMMH 101			0.150			0.26	10.96	99.36		5.00	25.9	299.36	300	PVC	0.50	30.57	68.0	0.97	0.68	0.74	0.38	0.71
	DCB 308	STMMH 101	P-7	0.7852	0.785	0.20	0.45	0.45	10.00	104.19	46.42	5.00	46.4	299.36	300	PVC	1.00	29.77	96.2	1.37	0.97	0.51	0.48	0.71
	DCB 303	STMMH 101	P-6	0.8043	0.804	0.26	0.57	0.57	10.00	104.19	59.81	5.00	59.8	299.36	300	PVC	1.00	2.72	96.2	1.37	1.24	0.04	0.62	0.91
	STMMH 101	STMMH 102			1.739			1.28	11.71	95.96		5.00	122.9	533	525	CONC	0.30	88.53	245.2	1.09	0.77	1.92	0.50	0.71
	DCB 309	STMMH 102	P-5	0.804	0.804	0.28	0.62	0.62	10.00	104.19	64.75	5.00	64.8	299.36	300	PVC	1.00	2.43	96.2	1.37	1.15	0.04	0.67	0.84
	STMMH 102	STMMH 103			2.543			1.90	13.63	88.27		5.00	167.9	533	525	CONC	0.30	37.79	245.2	1.09	1.02	0.62	0.68	0.94
	CB 304	STMMH 103	P-3	0.179	0.179	0.84	0.42	0.42	10.00	104.19	43.58	5.00	43.6	299.36	300	PVC	1.00	12.13	96.2	1.37	0.97	0.21	0.45	0.71
	CB 305	STMMH 103	P-2	0.2032	0.203	0.84	0.47	0.47	10.00	104.19	49.28	5.00	49.3	299.36	300	PVC	1.00	11.88	96.2	1.37	0.97	0.20	0.51	0.71
	STMMH 103	STMMH 104			2.925			2.79	14.24	86.09		5.00	240.5	610	600	CONC	0.30	55.67	351.5	1.19	1.12	0.83	0.68	0.94
	DCB 306	STMMH 104	P-4	1.903	1.903	0.24	1.29	1.29	10.00	104.19	134.69	5.00	134.7	366.42	375	PVC	1.00	24.98	164.8	1.59	1.56	0.27	0.82	0.98
	CB 307	STMMH 104	P-1	0.126	0.126	0.59	0.21	0.21	10.00	104.19	21.41	5.00	21.4	251.46	250	PVC	1.00	3.65	60.4	1.21	0.85	0.07	0.35	0.70
	STMMH 104	STMMH 105			4.954			4.29	15.07	83.32		5.00	357.6	610	600	CONC	0.50	37.93	453.7	1.54	1.50	0.42	0.79	0.98
	STMMH 105	STMMH 107			4.954			4.29	15.49	82.00		5.00	351.9	610	600	CONC	0.50	86.80	453.7	1.54	1.50	0.96	0.78	0.98
	BLDG	STMMH 106	P-R	0.634	0.634	0.90	1.59	1.59	10.00	104.19	165.17	5.00	165.2	366.42	375	PVC	3.50	3.80	308.4	2.97	2.10	0.03	0.54	0.71
	STMMH 106	STMMH 107			0.634			1.59	10.03	104.03		5.00	164.9	366.42	375	PVC	3.00	9.50	285.5	2.75	1.95	0.08	0.58	0.71
	STMMH 107	MUNI STM			5.587			5.88	16.45	79.14		5.00	465.0	533	525	CONC	2.50	21.32	708.0	3.14	2.89	0.12	0.66	0.92

Definitions:
Q = 2.78*AIR, where
Q = Peak Flow in Litres per second (L/s)
A = Watershed Area (hectares)
I = Rainfall Intensity (mm/h)
R = Runoff Coefficients (dimensionless)

Notes:
Ottawa Rainfall Intensity Values:
From Sewer Desing Guidelines, 2004

	5yr	100yr
a =	998.071	1735.688
b=	0.814	0.820
c =	6.053	6.014

Designed: **Aaditya Jariwala, M.Eng, P.Eng.**
Checked: **Aaditya Jariwala, M.Eng, P.Eng.**
Dwg Reference: **C100**

Project: **675 Borbridge Ave**
Location: **Ottawa, Ontario**
File Ref: **24005530 - STM Design Sheet**
Sheet No: **1 of 1**

TABLE D14 - Flow Through Inlet Control Device - CB 307 (Catchment P-1)

Elev (m)	Head Over Orifice (m)	Orifice Flow (l/s)
88.37	0.00	0.0
91.33	2.96	23.4
91.38	3.01	23.6
91.43	3.06	23.7
91.48	3.11	23.9
91.50	3.13	24.0
91.55	3.18	24.2
91.62	3.25	24.5

$Q_{ORIFICE} = C\ A\ (2\ g\ H)^{0.5}$

Size (mm) =	80.00
C/L Orifice Elev =	88.37
Max. Ponding Elev=	91.62
C = Discharge Coeff =	0.61
A = Orifice Area (mm^2) =	5,024
A = Orifice Area (m^2) =	0.0050
Max head over Orifice =	3.25

TABLE D15 - Flow Through Inlet Control Device - CB 305 (Catchment P-2)

Elev (m)	Head Over Orifice (m)	Orifice Flow (l/s)
88.66	0.00	0.0
91.25	2.59	66.9
91.30	2.64	67.5
91.35	2.69	68.2
91.40	2.74	68.8
91.44	2.78	69.3
91.49	2.83	69.9
91.54	2.88	70.6
91.62	2.96	71.5

$Q_{ORIFICE} = C\ A\ (2\ g\ H)^{0.5}$

Size (mm) =	140.00
C/L Orifice Elev =	88.66
Max. Ponding Elev=	91.62
C = Discharge Coeff =	0.61
A = Orifice Area (mm^2) =	15,386
A = Orifice Area (m^2) =	0.0154
Max head over Orifice =	2.96

TABLE D16 - Flow Through Inlet Control Device - CB 304 (Catchment P-3)

Elev (m)	Head Over Orifice (m)	Orifice Flow (l/s)
88.73	0.00	0.0
91.26	2.53	57.0
91.31	2.58	57.6
91.36	2.63	58.1
91.41	2.68	58.7
91.44	2.71	59.0
91.49	2.76	59.6
91.54	2.81	60.1
91.62	2.89	60.9

$Q_{ORIFICE} = C\ A\ (2\ g\ H)^{0.5}$

Size (mm) =	130.00
C/L Orifice Elev =	88.73
Max. Ponding Elev=	91.62
C = Discharge Coeff =	0.61
A = Orifice Area (mm^2) =	13,267
A = Orifice Area (m^2) =	0.0133
Max head over Orifice =	2.90

TABLE D17 - Flow Through Inlet Control Device - DCB 306 (Catchment P-4)

Elev (m)	Head Over Orifice (m)	Orifice Flow (l/s)
88.74	0.00	0.0
91.05	2.31	164.7
91.10	2.36	166.4
91.15	2.41	168.2
91.20	2.46	169.9
91.25	2.51	171.6
91.30	2.56	173.3
91.35	2.61	175.0
91.40	2.66	176.7
91.45	2.71	178.3
91.50	2.76	180.0
91.55	2.81	181.6
91.60	2.86	183.2

$Q_{ORIFICE} = C\ A\ (2\ g\ H)^{0.5}$

Size (mm) =	226.00
C/L Orifice Elev =	88.74
Max. Ponding Elev=	91.60
C = Discharge Coeff =	0.61
A = Orifice Area (mm^2) =	40,095
A = Orifice Area (m^2) =	0.0401
Max head over Orifice =	2.86

Appendix E – Additional Information

Pre-Consultation: Meeting Feedback

Pre-Consultation: Meeting Feedback - Proposed Site Plan Control Application – 675 Borbridge Ave.

Correspondence with City staff indicating quantity and quality control criteria aligning with master study "Design Brief - Riverside South Phase 15-2, 4 & Spratt Road Riverside South Community" Prepared by IBI

Excerpt – Section 4.2 of "Design Brief - Riverside South Phase 15-2, 4 & Spratt Road Riverside South Community" Prepared by IBI Indicating End of Pipe Quality Treatment within Pond 5

Excerpt from Table 5-3 of "Design Brief - Riverside South Phase 15-2, 4 & Spratt Road Riverside South Community" Prepared by IBI Indicating 100 Year Capture Rate

File No.: **PC2024-0387**

October 15, 2024

Carolyn Jones
GRC Architects
Via email: cjones@grcarchitects.com

Subject: **Pre-Consultation: Meeting Feedback**
Proposed Site Plan Control Application – 675 Borbridge Ave.

Please find below information regarding next steps as well as consolidated comments from the above-noted pre-consultation meeting held on September 27, 2024.

Pre-Consultation Preliminary Assessment

1 ☐	**2** ☐	**3** ☐	**4** ☒	**5** ☐

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

Next Steps

1. A review of the proposal and materials submitted for the above-noted pre-consultation has been undertaken. Please proceed to complete a Phase 2 / Phase 3 Pre-consultation Application Form and submit it together with the necessary studies and/or plans to planningcirculations@ottawa.ca.

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

3. Please note, if your development proposal changes significantly in scope, design, or density before the Phase 3 pre-consultation, you may be required to complete or repeat the Phase 2 pre-consultation process.

Supporting Information and Material Requirements

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

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

Consultation with Technical Agencies

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

Planning

It is our understanding the proposal is for a new two storey high school, to be constructed by Conseil des écoles catholiques du Centre-Est, with a day care at 675 Borbridge Avenue. It is anticipated that the formal site plan approval application may be submitted in November 2024, with construction beginning in 2025 and an anticipated school opening of September 2027.

Comments:

1. The site is located within the Suburban (Southwest) Transect and designated Neighbourhood in the Official Plan. Section 4.10 specifically relates to schools, however, these policies are to be read in the context of the Official Plan as a whole.

2. The site is located within the Riverside South Secondary Plan.

3. The site is currently zoned I1A/R4Z, Minor Institutional Subzone A/Residential Fourth Density Subzone Z.

4. Relevant Urban Design guidelines include the Building Better and Smarter Suburbs, Bird Safe Guidelines.

5. Parking requirements: 2 per classroom, including portables

6. Site Plan comments:

   a. Concern with respect to configuration of interior courtyard which may be an entrapment area outside of school hours, further concerns when addition and portables are constructed as the area will become less visible. Please provide information to address this. Also, please provide details on landscaping plan with respect to any amenities to be provided to ensure this is a space that is used.

   b. If the soccer field/track is to include lighting, please locate and design so that it will not affect the adjacent residents.

   c. Please indicate the snow storage and garbage areas.

d. Consider providing a formal walkway between building and soccer field/track.

e. Consider providing bike parking at the employee entrance, covered, if possible. Is there another location for the bike parking that is more secure, interior to the site? Are there office windows at that location to provide natural surveillance? Consider covered bike parking, if possible.

f. If bleachers will be provided at the soccer field, please indicate.

g. It is recommended a 'heads-up' of the proposed development is provided to the area councillor, Councillor Steve Desroches.

Urban Design

Comments:

1. Please prepare a short design brief to provide a description of the existing features of the site, proposed building, and landscape program

2. The design of the building that addresses public roadways is appreciated.

3. Please provide direct walkway connections from the building to sidewalks in the ROW

4. Please ensure that 'street trees' are provided either in the ROW or between the building and the sidewalk on private property if they can't be accommodated in the ROW.

5. Please ensure that parking is screened from the ROW by landscaping, look for opportunities for additional on-site tree planting.

6. Please consider landscape programming and lighting in the courtyard that ensures that after hours safety concerns are minimized as this area is not visible from the street.

7. Submission Requirements:

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

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

b. Additional drawings and studies are required as shown on the SPIL. Please follow the terms of references (Planning application submission information and materials | City of Ottawa) to prepare these drawings and studies. These include:

    i. Design Brief

ii. Site Plan
iii. Landscape Plan
iv. Elevations

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

Engineering

Comments:

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

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

    b. Please request access to the following higher-level subdivision studies for reference through geoinformation@ottawa.ca (additional studies and reports may be required):

        i. DESIGN BRIEF RIVERSIDE SOUTH PHASE 15-2, 4 & SPRATT ROAD RIVERSIDE SOUTH COMMUNITY, prepared by IBI Group, revision date August 2019.

        ii. Geotechnical Investigation Proposed Residential Development Riverside South Development (Phase 15) Ottawa, Ontario, prepared by Golder Associates LTD, revision 3, dated June 2019.

        iii. Riverside South Community Infrastructure Servicing Study Update – Rideau River Area, prepared by Stantec, dated June 21, 2017.

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

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

    e. **Water Quality Control**: Provide enhanced levels of protection of 80% for total suspended solids removal, as per DESIGN BRIEF RIVERSIDE SOUTH PHASE 15-2, 4 & SPRATT ROAD RIVERSIDE SOUTH COMMUNITY, prepared by IBI Group, revision date August 2019.

i. ISO 14034 Environmental Technology Verification (ETV) protocol for sizing OGS units.

f. **Water Quantity Control**: As per the SWM model for the subdivision, school sites are to control post-development runoff from the subject site, up to and including the 100-year storm event, to a **2 year pre-development level.** This is as per DESIGN BRIEF RIVERSIDE SOUTH PHASE 15-2, 4 & SPRATT ROAD RIVERSIDE SOUTH COMMUNITY, prepared by IBI Group, revision date August 2019

   i. The allowable post development runoff for the site shall be consistent with values presented in the master study for the subdivision and Sewer Design Guidelines.

   ii. The time of concentration (Tc) used to determine the pre-development condition should be calculated. Tc should not be less than 10 min. since IDF curves become unrealistic at less than 10 min; **Tc of 10 minutes shall be used for all post-development calculations.**

   iii. All storm events greater than the established 2-year allowable release rate, up to and including the 100-year storm event, shall be detained on-site. For events greater than 100 years, spillage must be directed to a public ROW and not to neighboring private property.

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

h. Ponding Notes:

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

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

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

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

v. Ensure all ponding criteria noted in the subdivision master study is respected.

i. There must be at least **15cm of vertical clearance** between the spill elevation and the ground elevation at the building envelope that is in proximity of the flow route or ponding area.

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

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

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

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

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

    i. When underground storage is used, the release rate fluctuates from a maximum peak flow based on maximum head down to a release rate of zero. This difference is large and has a significant impact on storage requirements. We therefore require that an average release rate equal to 50% of the peak allowable rate shall be

applied to estimate the required volume. Alternatively, the consultant may choose to use a submersible pump in the design to ensure a constant release rate. In the event that there is a disagreement from the designer regarding the required storage, The City will require that the designer demonstrate their rationale utilizing dynamic modelling, that will then be reviewed by City modelers in the Water Resources Group. Regarding all proposed UG storage, ground water levels (and in particular HGW levels) will need to be reviewed to ensure that the proposed system does not become surcharged and thereby ineffective.

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

2. Storm Sewer

    a. A 2550mm dia. concrete storm sewer (2019) is available within Borbridge Avenue.

    b. A 2700mm dia. concrete storm sewer (2019) is available within Brian Good Avenue.

    c. The proposed SWM design shall be consistent with higher-level studies and plans.

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

3. Sanitary Sewer

    a. A 525mm dia. PVC Sanitary sewer (2020) is available within Brian Good Avenue and Borbridge Avenue.

    b. Please provide the proposed peak Sanitary wastewater flow and we will confirm if the sanitary sewer system has the capacity.

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

    d. If the proposed sanitary servicing strategy deviates from the Master servicing study for the subdivision, a block specific update memo will be required to support the design.

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

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

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

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

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

4. Water:

a. A 305 mm dia. PVC watermain (2020) is available within Borbridge Avenue and Brian Good Avenue.

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

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

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

ii. Type of development and the amount of fire flow required (L/min). Note: A maximum of 15000 L/min (250 L/s) fire flow was allocated for this school site as per the master servicing study.

iii. Average daily demand: __L/s.

iv. Maximum daily demand: __L/s.

v. Maximum hourly daily demand: __L/s.

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

d. Please review Technical Bulletin ISTB-2018-02, maximum fire flow hydrant capacity is provided in Section 3 Table 1 of Appendix I. A hydrant coverage figure shall be provided and demonstrate there is adequate fire protection for the proposal.

e. Anticipated water demand and fire flow capacity must be consistent with DESIGN BRIEF RIVERSIDE SOUTH PHASE 15-2, 4 & SPRATT ROAD RIVERSIDE SOUTH COMMUNITY, prepared by IBI Group, revision date August 2019.

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

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

5. General Servicing

a. Additional site-specific servicing criteria not mentioned in this feedback form may be required as per the subdivision level master studies. Please review and reference the master studies.

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

c. If multiple buildings are proposed within one parcel of land, only one set of services (Storm, Sanitary and Water) will be allowed to connect to city infrastructure. Each building will have to be serviced from this one set of services. The one exception to this rule is for sites requiring water supply redundancy, where we will allow a second water connection to city watermain to meet this requirement.

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

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

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

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

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

i. If severance is planned, this needs to be addressed in servicing to satisfy severance requirements. Where a large parcel with multiple buildings is planned, City will require an ultimate servicing plan so as to appropriately understand how severance requirements are being met.

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

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

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

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

    iv. No submerged outlet connections.

6. Grading and Erosion

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

    b. Erosion and sediment control plan must be provided.

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

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

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

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

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

7. Environmental

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

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

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

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

8. Geotechnical

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

b. Geotechnical recommendation and restrictions shall be respected as per the Geotechnical Investigation Proposed Residential Development Riverside South Development (Phase 15) Ottawa, Ontario, prepared by Golder Associates LTD, revision 3, dated June 2019.

c. There is grade raise restriction noted for this site within the subdivision master studies noted above. Ensure the grade raise limit is respected.

d. Reducing the groundwater level in this area can lead to potential damages to surrounding structures due to excessive differential settlements of the ground. The impact of groundwater lowering on adjacent properties needs to be discussed and investigated to ensure there will be no short term and long-term damages associated with lowering the groundwater in this area.

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

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

9. Slope Stability Assessment Reports

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

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

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

10. Exterior Site Lighting

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

11. Regarding Quantity Estimates

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

    b. Quantity estimates dollar values are to be consistent with the most up to date Master Spec Code List provided by the City of Ottawa.

12. General

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

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

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

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

    e. If information provided in this feedback contradicts the information within the subdivision master studies, please contact the undersigned to clarify which requirement shall govern.

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

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

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

Noise

Comments:

1. A road noise study is required.

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

Transportation

Comments:

1. Laybys on existing roads require a road modification approval.

2. Right-of-way protection/corner triangles

    a. See Schedule C16 of the Official Plan.

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

    The new required corner triangle dimensions will be embedded within Schedule C16 of the OP – hopefully sometime this year. For now, here is the requirements at all intersection types:

    Arterial/Arterial: overlapping 5m x 15m triangles
    Arterial/Collector: overlapping 5m x 15m triangles
    Collector/Collector: overlapping 5m x 15m triangles
    Arterial/Local: 3m x 9m with the longer dimension along the arterial road
    Collector/Local: 3m x 9m with the longer dimension along the collector road

If an exception to the above is being requested, please provide a rationale.

Any exceptions must be approved by Transportation Engineering Services, specifically Max Walker, Transportation Policy & Networks and Emmett Proulx, Development Review and Roadway Modifications as well as Mike Giampa.

3. The application will not be deemed complete until the submission of the draft step 2-3, including the functional draft RMA package (if applicable) and/or monitoring report (if applicable). Although a full review of the TIA Strategy report (Step 3) is not required prior to an application, it is strongly recommended.

4. Synchro files are required at Step 3.

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

Environment

Comments:

1. An Environmental Impact Statement will be required for this submission.

   There are several threatened or endangered species that may be present on site. The bobolink and eastern meadowlark field birds and the butternut and black ash trees.

   Most of this site was previous mapped as wetland. Subsequent development has altered the hydrology and it is likely that the previous wetlands are either notably reduced or eliminated altogether. However, the applicant has noted black ash habitat on site, which is in indicator that wetlands may remain. The ecological land classification portion of the EIS should note the potential presence on any wetlands, especially in the northeastern section. A full wetland evaluation *may* be required if potentially significant wetland habitat is found, but is not requested at this time.

2. Please note that the City has strong tree protection and planting guidelines. Additional plantings to help meet the City's urban forest canopy goals, as well as to reduce the impacts of climate change and the urban heat island effect, would be appreciated. The City prefers that all plantings be of native and non-invasive species.

3. The Bird Safe Design Guidelines will apply to this development. Please indicate which glazing will use bird-safe glass in the building elevations.

4. The forest on the eastern half of the site appears to be higher quality habitat than the forest on the west. Any revisions to the site plan that preserve more forest on that side of the parcel would be appreciated, but are not required.

Feel free to contact Mark Elliott, Environmental Planner, for follow-up questions.

Forestry

Comments:

1. A Tree Conservation Report and Landscape Plan are submission requirements. The Environmental Impact Statement should identify tree retention priorities with the intent of maximizing longevity of existing healthy trees. Maintaining interior forest core habitat over creating more edge environments is desirable from a tree health and retention success stand points.

2. There is strong policy in section 4.8.2 of the Official Plan including the prioritization of tree retention over removal and replacement where feasible (3d).

3. The Official Plan has a policy, 4.10.3, titled "Make trees an important component of school's outdoor space". Provide large canopy shade trees, a diversity of species, and regular groupings of trees throughout the school yard.

4. The Riverside South Community Design Plan speaks strongly to trees and landscaping including:

    a. Incorporating street trees

    b. Focal areas such as schools, should support significant mature trees

5. Follow the Community Design Plans direction on tree planting.

6. Make sure engineering is working closely with the forestry consultant to allow for retention while still meeting site drainage and grading requirements.

7. Orient buildings and infrastructure to maximize retention. What options were explored and why is the soccer field/track oriented in this fashion?

8. Planning forestry is interested in walking the site with the applicants environmental/forestry consultant to discuss retention priorities.

9. A tree removal permit is required prior to any tree removal on site. The permit will be released upon site plan approval. Early release of a permit will be considered if justified. Note the implications of the Migratory Bird Convention Act on tree removal. A permit will not be released for this treed site during the breeding bird season as there is no way to effectively assess the bird impacts in this environment. For more information on the process, contact the Planning Forester.

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

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

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

    c. The TCR must contain 2 separate plans/maps:

        i. Plan/Map 1 - show existing conditions with tree cover information.
        ii. Plan/Map 2 - show proposed development with tree cover information.

d. The TCR must list all trees on site, as well as off-site trees if the CRZ (critical root zone) extends into the developed area, by species, diameter, and health condition. Please note that averages can be used if there are forested areas.

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

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

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

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

i. The 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.

j. Removal of a City tree is not permitted unless justified. If justified, monetary compensation for the value of the tree must be paid before a tree removal permit is issued.

11. **Landscape Plan (LP) requirements.**

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

12. **Additional Elements for Tree Planting in the Right of Way:**

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

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

c. Soil Volume - Please demonstrate as per the Landscape Plan Terms of Reference that the available soil volumes for new plantings will meet or exceed the minimum soil volumes requested.

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

e. Efforts shall be made to provide as much future canopy cover as possible at a site level, through tree planting and tree retention. The Landscape Plan shall show/document that the proposed tree planting and retention will contribute to the City's overall canopy cover over time. Please provide a projection of the future canopy cover for the site to 40 years

f. Minimum Setbacks

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

g. Tree specifications

    i. Minimum stock size: 50mm tree caliper for deciduous, 200cm height for coniferous.
    ii. Maximize the use of large deciduous species wherever possible to maximize future canopy coverage.
    iii. Tree planting on city property shall be in accordance with the City of Ottawa's Tree Planting Specification; and if possible, include watering and warranty as described in the specification.
    iv. No root barriers, dead-man anchor systems, or planters are permitted.
    v. No tree stakes unless necessary (and only 1 on the prevailing winds side of the tree)

h. Hard surface planting

    i. If there are hard surface plantings, a planting detail must be provided.
    ii. Curb style planters are highly recommended.
    iii. No grates are to be used and if guards are required, City of Ottawa standard (which can be provided) shall be used.
    iv. Trees are to be planted at grade.

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

Parkland

Comments:

1. The proposed site plan application is exempt from parkland dedication as per subsection 14(2)(f) of Parkland Dedication By-law No. 2022-280. This subsection exempts a school from parkland dedication where the school provides for the students' outdoor recreational needs on-site at the time of development.

Feel free to contact Burl Walker, Parks Planner, for follow-up questions.

Other

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

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

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

Submission Requirements and Fees

1. Outlines the application type/subtype required and the associated fees
    a. Additional information regarding fees related to planning applications can be found here.
2. The attached **Study and Plan Identification List** outlines the information and material that has been identified as either required (R) or advised (A) as part of a future complete application submission.
    a. The required plans and studies must meet the City's Terms of Reference (ToR) and/or Guidelines, as available on Ottawa.ca. These ToR and Guidelines outline the specific requirements that must be met for each plan or study to be deemed adequate.
3. All of the above comments or issues should be addressed to ensure the effectiveness of the application submission review.

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

Yours Truly,

Wendy Tse, Planner

Encl. SPIL

c.c. Lisa Stern, Urban Design, lisa.stern@ottawa.ca
Terenzo Giovannitti, Infrastructure, Terenzo.Giovannitti@ottawa.ca
Mike Giampa, Transportation, Mike.Giampa@ottawa.ca
Mark Elliott, Environment, Mark.Elliott@ottawa.ca
Hayley Murray, Forestry, Hayley.Murray@ottawa.ca
Burl Walker, Parks, Burl.Walker@ottawa.ca

Alexander Johnson

From: Giovannitti, Terenzo <terenzo.giovannitti@ottawa.ca>
Sent: Thursday, November 7, 2024 1:00 PM
To: Aaditya Jariwala
Cc: Tse, Wendy; cjones@grcarchitects.com; preid@provencherroy.ca; Mottalib, Abdul
Subject: RE: CECCE Riverside South - New Secondary School

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Hi Aaditya,

I agree with both your proposals.

- The quantity criteria for this site can be to control to a 2-year storm event using a runoff coefficient of 0.7. This is aligned with the Design Brief by IBI. Please ensure all other requirements are in the feedback form and Design Brief are respected and the maximum 100-year capture rate does not exceed what is shown in the Design Brief (915 L/s as per Table 5-3 on page 32 of the IBI report).

- The quality control criteria for the site can be removed due to the enhanced level of protection provided by Pond 5. Please include excerpts from the applicable studies within your report to support this design.

If you have any other questions, please let us know.

Regards,
Terenzo Giovannitti
Project Manager
Development Review – All Wards (DRAW)
Planning, Development and Building Services Department
City of Ottawa
110 Laurier Ave W. Ottawa, ON
613-580-2424 (ext. 23436)
terenzo.giovannitti@ottawa.ca

From: Aaditya Jariwala <Aaditya.Jariwala@exp.com>
Sent: November 07, 2024 9:52 AM
To: Tse, Wendy <Wendy.Tse@ottawa.ca>
Cc: Carolyn Jones <cjones@grcarchitects.com>; Pamela Reid <preid@provencherroy.ca>
Subject: CECCE Riverside South - New Secondary School

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Good Morning Wendy,

I am reaching out regarding the above mentioned project (City File No.: PC2024-0387). I am the Civil Engineer on the consultant team working on this project.

After reviewing the background studies received from the City and the pre-consultation feedback form from the City dated, October 15,2024; I have following requests for the City infrastructure engineer on file:

- The pre-consultation feedback form states to control stormwater flows to 2-year pre-development level. However, the Design Brief – Riverside South Phase 15-2,4 & Spratt Road, prepared by IBI, dated August, 2019 notes that the flows assigned to the institutional lots were 2-year modelled flows. The report does not include any modelling files or a summary table with the assigned release rates to each sub catchments. The assigned runoff coefficient to the subject site was 0.70. We request to revise the quantity control criteria to be 2-year storm with 0.7 runoff coefficient instead of 2-year - pre-development. Excerpt from the IBI report:

- School Site (PCSWMM ID: SC475, SC472): The institutional sites were assumed to be restricted to the 2 year modeled flow. It was also assumed that full on-site storage will be provided on-site (all major flow contained on-site up to and including the 100 year event). Emergency overflow will be routed to adjacent streets.

- Regarding the quality control, it was noted in the pre-consultation feedback form to provide an enhanced level of TSS removal (80%) for the subject site. However, in the Riverside South Community Infrastructure Servicing Study Update, prepared by Stantec dated June 21, 2017; it is noted that Pond 5 (end of pipe wet pond facility) was designed to provide enhanced level of quality control for the upstream catchments. We request to remove the quality control criteria for the subject site given that the enhanced level of TSS removal will be provided by the end of pipe wet pond facility, servicing the subdivision.

Please let me know if you need further explanation or clarification on any of the items above. A prompt response will be greatly appreciated!

Best regards,

Aaditya Jariwala, M.Eng, P.Eng.
EXP | Project Manager
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4 STORMWATER SYSTEM

4.1 Existing Conditions

As noted in Section 1.4, there is an existing storm sewer on River Road stubbed approximately 50 meters south of Summerhill Street. This storm sewer will drain future development on the west side of River Road south of Summerhill Drive and will be extended to future Pond 5 as part of this project. All storm sewers for this project will outlet to the future Pond 5 which is currently in the approval process.

River Road in this area is currently a two lane rural arterial roadway with roadside ditches and culverts which conveys the roadway drainage and existing drainage from the undeveloped lands east of the roadway to existing ditches west of the roadway.

4.2 Comparison with Master Servicing Study

In June 2017, Stantec prepared an update to the Riverside South Infrastructure Servicing Study Update (ISSU). The report provides a macro-level servicing plan for the portion of the Riverside South Community that is tributary to Pond 5 and referred to as the Rideau River Study Area. The study area is on the south west portion of the Riverside South Community generally bound by Earl Armstrong Road to the North, Rideau River to the West, Rideau Road to the South and the Thomas Gamble Municipal Drain to the East.

The stormwater collection system includes three (3) main trunk sewers to convey storm water to Pond 5. Two (2) inlets to Pond 5 (north and south inlet) is recommended to accommodate the trunk sewer layout. The sewer layout is shown on the ISSU storm sewers (drawing STM-2), enclosed in **Appendix C**. Pond 5 is located west of River Road and is designed as a wet pond to provide an Enhanced Level of Protection corresponding to 80% long-term suspended sediment removal for approximately 300ha drainage area. The facility discharges directly to Rideau River. The PCSWMM model was used to evaluate the performance of Pond 5 as well as the internal storm servicing infrastructures. **Figure 4.1** shows the ISSU storm drainage area tributary to each pond inlet. A copy of the ISSU drainage area plan (drawing STM-1) is also included in **Appendix C**.

Based on detailed review of the topography of the site and through discussions with the City of Ottawa and RVCA, some minor variations have been made to the ISSU storm servicing. In updating the ISSU model, the model parameters were also reviewed and some were updated. Detailed discussion is included in **Section 4.2.1**. Through the discussion with the City of Ottawa and to facilitate ease of servicing, some of the storm sewer alignments were modified. For example, the storm trunk sewer servicing Cardel Homes is now connected to the south trunk instead of the River Road trunk. However, in both models, the total flow is conveyed to the south inlet. Further discussion on the revised storm sewer alignment, including the southerly trunk storm sewer design, is provided in **Section 4.2.2**. To maintain the baseflows to the ravines, the stormwater servicing for River Road has also been adjusted. Detailed discussion is included in **Section 4.2.3**.

Figure 4.2 shows the updated drainage area tributary to each pond inlet and the revised sewer alignments.

4.2.1 Updated Modeling Parameters

To support the River Road design, IBI updated the ISSU model, provided by Stantec on June 09, 2017, as per the revised minor flow connectivity (see **Figure 4.2**). As part of the Pond 5 detailed design by Stantec, which is currently underway, the pond configuration has been revised since

DRAINAGE AREA ID	CONTINUOUS/SAG (1)	ROAD TYPE	MINOR SYSTEM DESIGN TARGET (BASED ON ROAD TYPE)		100 YEAR CAPTURE RATE (L/S)(2)	ICD ORIFICE SIZE (mm dia.)	NOTES
			MINOR SYSTEM DESIGN STORM	GENERATED FLOW ON INDIVIDUAL SEGMENT SIMULATED (L/S)			
R468B	Rear Yard	Rear Yard	2	15	19	83	
R470A	Rear Yard	Rear Yard	2	20	24	94	
R471B	Rear Yard	Rear Yard	2	30	63	152	Increased to 5yr level of service to avoide OVF to existing lands
R472	Rear Yard	Rear Yard	2	15	148	Norestriction-300	100yr level of service - CB lead restricts inflow
R680A	Rear Yard	Rear Yard	2	4	33	127	100yr level of service - CB lead restricts inflow
Non-Residential Lands							
SC472	School	School	2	915	915	n/a	2yr level of service
SC475	School	School	2	586	606	n/a	2yr level of service
P477	Park	Park	2	70	78	n/a	2yr level of service
P251	Park	Park	2	38	42	n/a	2yr level of service
Woodlot	Wood lot	Wood lot	n/a	n/a	n/a	n/a	n/a
P272	Park	Park	2	13	14	n/a	2yr level of service
P220	Parking Lot	Parking lot/Park	2	28	25	n/a	

(1) The minor flow restriction has been increased in sags to allow full capture of overflow from upstream segments on continuous grade during the design storm event without ponding.
(2) From PCSWMM Output "103291-Ph15-2_4 –REV3-100CH.pcz" presented on the CD in Appendix E.

The storage available on-site and its maximum depth and the results of the PCSWMM evaluation for the subject site are presented in **Table 5-4**. The ponding plan for the subject site is presented through **Drawings 103291-606 to 613**.

Table 5-4 Summary of On-Site Storage during the Target Minor System Design Storm

DRAINAGE AREA ID	MINOR SYSTEM DESIGN STORM	AVAILABLE STATIC STORAGE (CU-M)(1)	AVAILABLE STATIC Depth (M)(2)	TOTAL STORAGE USED (CU-M)(2)	OVERFLOW (L/S)
220A	Continuous	n/a	n/a	0	38.01
S220B	Sag	8.0	0.13	0	0
S230	Continuous	n/a	n/a	0	10.66
S230B	Sag	7.1	0.18	0	0
S240	Sag	20.1	0.19	0	0
S241	Sag	35.8	0.25	0	0

LEGEND:

- PHASE 15-2, -4 BOUNDARY
- DRAINAGE AREAS
- BOUNDARY BETWEEN PHASES 15-2 AND 15-4
- R480 | 0.10 | 47 — AREA ID / IMPERVIOUS VALUE / AREA (ha)
- MAJOR FLOW
- EXTERNAL MAJOR FLOW

PHASE 15-4

PHASE 15-2

RUE SPRATT ROAD

AVENUE BORBRIDGE AVENUE

AVENUE CHIPPING AVENUE

COTE CANVASBACK RIDGE

COTE ATRIUM RIDGE

COTE WHOOPING CRANE RIDGE

BOIS SHOVELER GROVE

AVENUE HORNED OWL AVENUE

BOIS TRUMPETER GROVE

BRIAN GOOD AVENUE

ARDMORE STREET

KOSINA AVENUE

RUE EIDER STREET

croissant Stargazer Crescent

FUTURE ROADWAY

KEY PLAN NTS

No.	REVISIONS	By	Date
3	REVISED PER CITY COMMENTS	P.S.	19/07/18
2	REVISED PER CITY COMMENTS	P.S.	19/06/21
1	SUBMISSION No.1 FOR CITY REVIEW	P.S.	19/05/16

Riverside South

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Project Title
RIVERSIDE SOUTH
PHASES 15-2, 4 & SPRATT ROAD

LICENSED PROFESSIONAL ENGINEER
P. SPAL
2019-07-18
PROVINCE OF ONTARIO

Drawing Title
PCSWMM
STORM DRAINAGE
AREA PLAN

Scale
1:1250

Design	Date
S.A.	MAR. 2019
Drawn	Checked
S.V.	P.S.
Project No.	Drawing No.
103291	701

D07-16-17-0023 PH2

#17743

J:\103291_Barrie\pl\Ph15\3.9 Drawings\39civil\wm\ layouts Ph2\103291wm15ld-701 Ph2.dwg Layout Name: 701 Plot Style: ------ Plot Scale: 1:2.5849 Plotted At: 7/19/2019 12:27 PM Last Saved By: pvakil Last Saved At: Jul 19, 19

Appendix F – Drawings

Topographical Survey prepared by Stantec Geomatics

City of Ottawa UCC Drawings

Architectural Plans

C000 - Notes & Details

C001 - Existing Conditions and Removals Plan

C100 - Site Servicing Plan

C200-1 - Site Grading Plan – Interim

C200-2 - Site Grading Plan – Ultimate

C300 - Erosion and Sediment Control Plan

C500 - Post-Development Site Catchments

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TOPOGRAPHIC PLAN OF SURVEY OF
BLOCK 220
REGISTERED PLAN 4M-1641
CITY OF OTTAWA

Scale 1:500

10 0 10 20 30 METRES

METRIC CONVERSION

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

BEARING NOTE

BEARINGS ARE GRID, DERIVED FROM CAN-NET VRS NETWORK GPS OBSERVATIONS ON NCC HORIZONTAL CONTROL MONUMENTS 19773035 AND 19680191, CENTRAL MERIDIAN, 76° 30' WEST LONGITUDE MTM ZONE 9, NAD83 (ORIGINAL).

19773035 N:5006060.42 E:324888.04
19680191 N:5033564.26 E:388064.94

ELEVATION NOTE

ELEVATIONS SHOWN HEREON ARE GEODETIC (CGVD-1928:1978) AND ARE DERIVED FROM VERTICAL CONTROL MONUMENT No.00119653010 HAVING AN ELEVATION OF 115.813.

LEGEND

■	DENOTES	FOUND MONUMENTS
□	"	SET MONUMENTS
IB	"	IRON BAR
PB	"	PLASTIC BAR
SIB	"	STANDARD IRON BAR
SSIB	"	SHORT STANDARD IRON BAR
CC	"	CUT CROSS
CP	"	CONCRETE PIN
WIT	"	WITNESS
PIN	"	PROPERTY IDENTIFICATION NUMBER
MEAS, M	"	MEASURED
INST	"	INSTRUMENT
S	"	SET
OU	"	ORIGIN UNKNOWN
SG	"	STANTEC GEOMATICS LTD.
AOD/AOV	"	ANNIS, O'SULLIVAN, VOLLEBEKK LTD.
P1	"	REGISTERED PLAN 4M-1641
P2	"	REGISTERED PLAN 4M-1663
P3	"	SRPR BY AOV DATED DECEMBER 9, 2020
P4	"	SRPR BY AOV DATED DECEMBER 1, 2020
P5	"	SRPR BY AOV DATED MARCH 24, 2021
P6	"	SRPR BY AOV DATED JUNE 29, 2021
P7	"	SRPR BY AOV DATED MARCH 16, 2022
P8	"	PLAN 4R-33963
EP	"	EDGE OF PAVEMENT
AN	"	ANCHOR
BF	"	BOARD FENCE
CLF	"	CHAIN LINK FENCE
CB	"	CATCH BASIN
CMB	"	COMMUNITY MAIL BOXES
SICB	"	SIDE INLET CB
DRN	"	DRAIN
FP	"	FLAG POLE
HYD	"	FIRE HYDRANT
LS	"	LIGHT STANDARD
MHSAN	"	MAINTENANCE HOLE SANITARY
MHSTM	"	MAINTENANCE HOLE STORM
SN	"	SIGN
PLBX	"	PULL BOX
VB	"	VALVE BOX
VC	"	VALVE CHAMBER
WV	"	WATER VALVE
TB BELL	"	TERMINAL BOX - BELL
	"	TREE STUMP
	"	TREE CONIFEROUS (D.B.H. SHOWN)
	"	TREE DECIDUOUS (D.B.H. SHOWN)

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 DAY OF , 2024.

DATE

FRANCIS LAU
ONTARIO LAND SURVEYOR

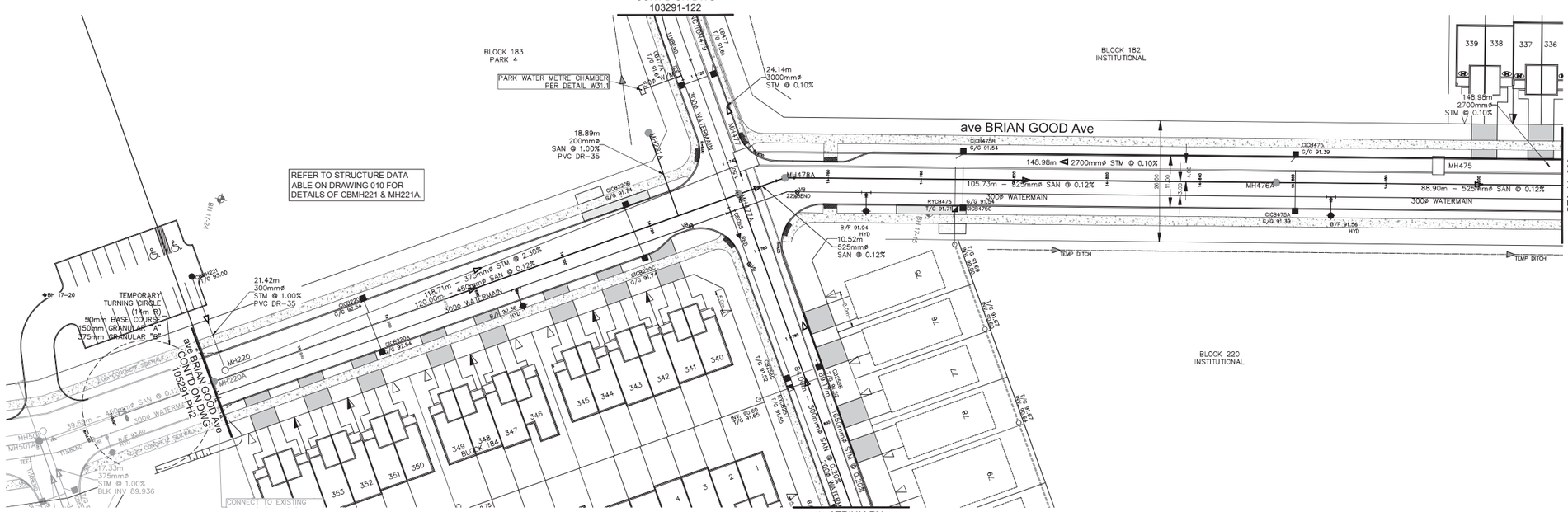
THIS PLAN OF SURVEY RELATES TO AOLS PLAN SUBMISSION FORM NUMBER V-75687.

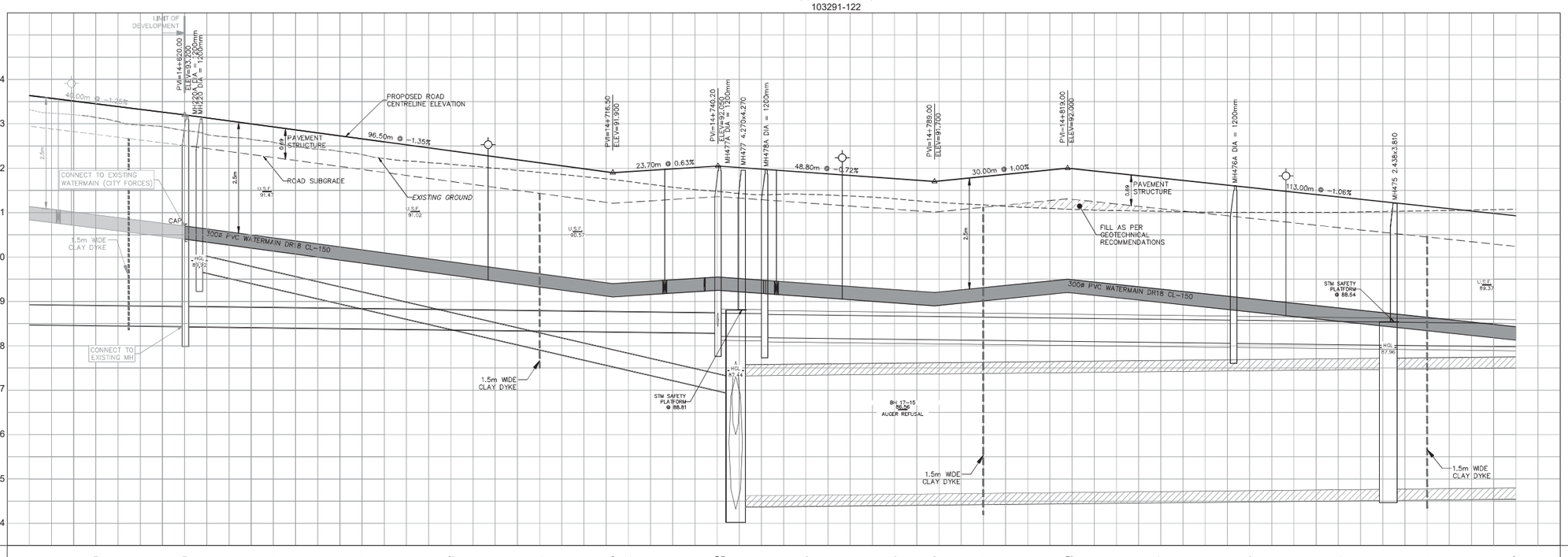
Stantec Geomatics Ltd.
CANADA LANDS SURVEYORS
ONTARIO LAND SURVEYORS
1331 CLYDE AVENUE, SUITE 300
OTTAWA, ONTARIO, K2C 3G4
TEL 613.722.4420
stantec.com

DRAWN: ME	CHECKED: CK	PM: FL	FIELD: CA	PROJECT No.: 161614822-111

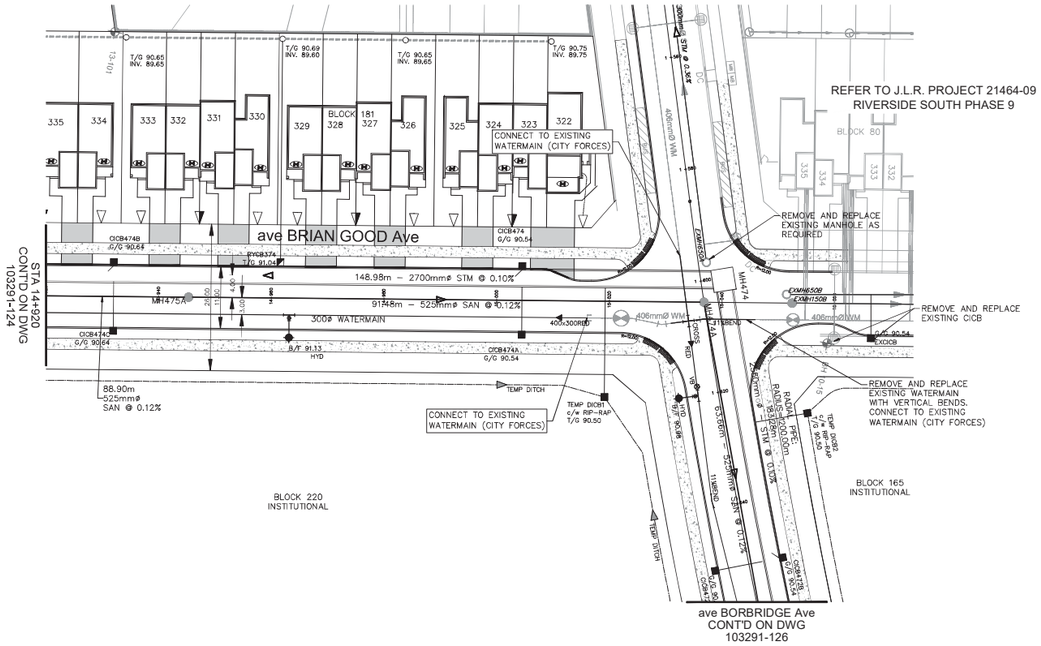
September 19, 2024

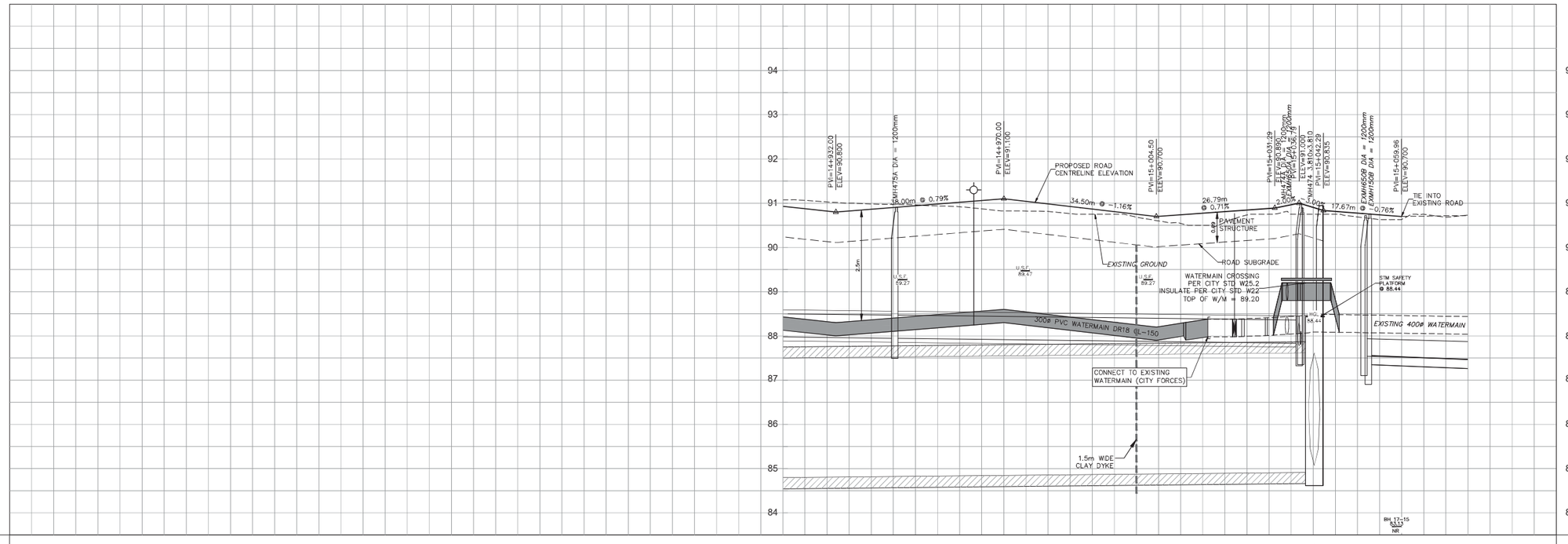
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cote ATRIUM Ridge
CONT'D ON DWG
103291-122
BLOCK 183
PARK 4
PARK WATER METRE CHAMBER
PER DETAIL W31.1
24.14m
3000mmø
STM @ 0.10%
BLOCK 182
INSTITUTIONAL
339
338
337
336
148.98m
2700mmø
STM @ 0.10%
ave BRIAN GOOD Ave
REFER TO STRUCTURE DATA
ABLE ON DRAWING 010 FOR
DETAILS OF CBMH221 & MH221A.
18.89m
200mmø
SAN @ 1.00%
PVC DR-35
MH221A
MH478A
148.98m 2700mmø STM @ 0.10%
MH475
105.73m – 525mmø SAN @ 0.12%
MH476A
88.90m – 525mmø SAN @ 0.12%
300ø WATERMAIN
STA 14+920
CONT'D ON DWG
103291-125
TEMPORARY
TURNING CIRCLE
(14m R)
50mm BASE COURSE
150mm GRANULAR "A"
375mm GRANULAR "B"
21.42m
300mmø
STM @ 1.00%
PVC DR-35
MH220
MH220A
118.71m – 375mmø STM @ 2.30%
120.00m – 450mmø SAN @ 0.12%
300ø WATERMAIN
ave BRIAN GOOD Ave
CONT'D ON DWG
103291-PH2
10.52m
525mmø
SAN @ 0.12%
TEMP DITCH
BLOCK 220
INSTITUTIONAL
CONNECT TO EXISTING
cote ATRIUM Ridge
CONT'D ON DWG
103291-122

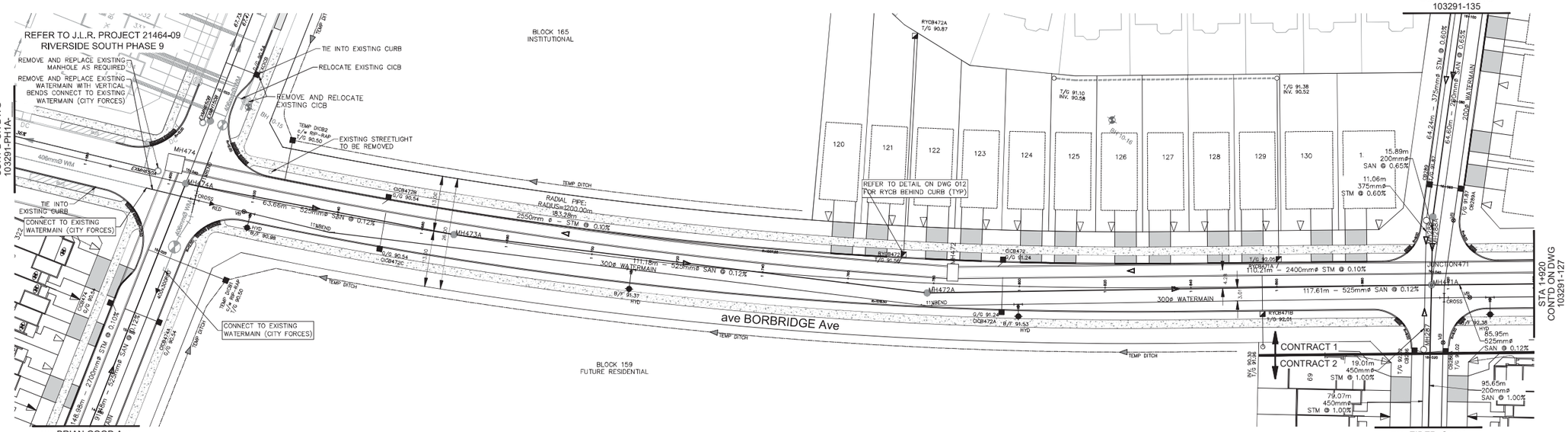

LIMIT OF DEVELOPMENT
PVI=14+620.00
ELEV=93.200
MH220 DIA = 1200mm
MH220A DIA = 1200mm
40.00m @ -1.25%
PROPOSED ROAD
CENTRELINE ELEVATION
96.50m @ -1.35%
PAVEMENT STRUCTURE
0.69
ROAD SUBGRADE
EXISTING GROUND
2.5m
U.S.F. 91.41
U.S.F. 91.02
CONNECT TO EXISTING
WATERMAIN (CITY FORCES)
CAP
300ø PVC WATERMAIN DR18 CL-150
HGL 90.70
1.5m WIDE
CLAY DYKE
CONNECT TO
EXISTING MH
PVI=14+716.50
ELEV=91.900
23.70m @ 0.63%
PVI=14+740.20
ELEV=92.050
MH477A DIA = 1200mm
MH477 4.270x4.270
MH478A DIA = 1200mm
48.80m @ -0.72%
PVI=14+789.00
ELEV=91.760
30.00m @ 1.00%
PVI=14+819.00
ELEV=92.060
MH476A DIA = 1200mm
113.00m @ -1.06%
MH475 2.438x3.810
PAVEMENT STRUCTURE
FILL AS PER
GEOTECHNICAL
RECOMMENDATIONS
U.S.F. 90.57
HGL 89.54
STM SAFETY
PLATFORM
@ 88.81
Bh 17-15
REFUSAL
AUGER REFUSAL
STM SAFETY
PLATFORM
@ 88.54
HGL 87.96
U.S.F. 89.37
1.5m WIDE
CLAY DYKE
1.5m WIDE
CLAY DYKE
1.5m WIDE
CLAY DYKE
94
93
92
91
90
89
88
87
86
85
84

| | | |


ave BRIAN GOOD Ave
CONT'D ON DWG 103291-124
STA 14+920
CONNECT TO EXISTING WATERMAIN (CITY FORCES)
REFER TO J.L.R. PROJECT 21464-09
RIVERSIDE SOUTH PHASE 9
BLOCK 80
REMOVE AND REPLACE EXISTING MANHOLE AS REQUIRED
REMOVE AND REPLACE EXISTING CICB
REMOVE AND REPLACE EXISTING WATERMAIN WITH VERTICAL BENDS. CONNECT TO EXISTING WATERMAIN (CITY FORCES)
148.98m – 2700mmø STM @ 0.10%
91.48m – 525mmø SAN @ 0.12%
300ø WATERMAIN
88.90m 525mmø SAN @ 0.12%
63.90m – 525mmø SAN @ 0.12%
TEMP DITCH
TEMP DICB1 c/w RIP-RAP T/G 90.50
TEMP DICB2 c/w RIP-RAP T/G 90.50
BLOCK 220 INSTITUTIONAL
BLOCK 165 INSTITUTIONAL
ave BORBRIDGE Ave
CONT'D ON DWG 103291-126


PVI=14+932.00
ELEV=90.800
MH475A DIA = 1200mm
18.00m @ 0.79%
PVI=14+970.00
ELEV=91.100
PROPOSED ROAD CENTRELINE ELEVATION
34.50m @ -7.16%
PVI=15+004.50
ELEV=90.700
26.79m @ 0.71%
PVI=15+031.29
ELEV=90.890
EXMH650B DIA = 1200mm
2.00m
PVI=15+042.29
ELEV=90.835
3.00m
17.67m @ 0.76%
EXMH650B DIA = 1200mm
PVI=15+059.96
ELEV=90.700
TIE INTO EXISTING ROAD
2.5m
PAVEMENT STRUCTURE
EXISTING GROUND
ROAD SUBGRADE
WATERMAIN CROSSING PER CITY STD W25.2
INSULATE PER CITY STD W22
TOP OF W/M = 89.20
STM SAFETY PLATFORM @ 88.44
300ø PVC WATERMAIN DR18 CL-150
EXISTING 400ø WATERMAIN
CONNECT TO EXISTING WATERMAIN (CITY FORCES)
1.5m WIDE CLAY DYKE
BH 17-15
SILTY SAND
NR

| | | |


REFER TO J.L.R. PROJECT 21464-09
RIVERSIDE SOUTH PHASE 9
REMOVE AND REPLACE EXISTING MANHOLE AS REQUIRED
REMOVE AND REPLACE EXISTING WATERMAIN WITH VERTICAL BENDS CONNECT TO EXISTING WATERMAIN (CITY FORCES)
TIE INTO EXISTING CURB
RELOCATE EXISTING CICB
REMOVE AND RELOCATE EXISTING CICB
EXISTING STREETLIGHT TO BE REMOVED
TIE INTO EXISTING CURB
CONNECT TO EXISTING WATERMAIN (CITY FORCES)
CONNECT TO EXISTING WATERMAIN (CITY FORCES)
ave Borbridge Ave CONT'D ON DWG 103291-PH1A-
ave BRIAN GOOD Ave CONT'D ON DWG 103291-125
voie ROSINA Way CONT'D ON DWG 103291-135
rue EIDER Street CONT'D ON DWG 103291-134
STA 1+920 CONT'D ON DWG 103291-127
ave BORBRIDGE Ave
BLOCK 165 INSTITUTIONAL
BLOCK 159 FUTURE RESIDENTIAL
REFER TO DETAIL ON DWG 012 FOR RYCB BEHIND CURB (TYP)
TEMP DITCH
RADIAL PIPE RADIUS=1200.00m
183.28m – 2550mmø STM @ 0.10%
111.18m – 525mmø SAN @ 0.12%
300ø WATERMAIN
110.21m – 2400mmø STM @ 0.10%
117.61m – 525mmø SAN @ 0.12%
63.66m – 525mmø SAN @ 0.12%
148.98m – 2700mmø STM @ 0.10%
97.86m – 525mmø SAN @ 0.12%
CONTRACT 1
CONTRACT 2
15.89m 200mmø SAN @ 0.65%
11.06m 375mmø STM @ 0.60%
64.24m – 375mmø STM @ 0.60%
64.60m – 200mmø SAN @ 0.65%
200ø WATERMAIN
19.01m 450mmø STM @ 1.00%
79.07m 450mmø STM @ 1.00%
95.65m 200mmø SAN @ 1.00%
65.95m 525mmø SAN @ 0.12%
MH474
MH474A
MH472A
MH473A
JUNCTION471
MH471A
RYCB472A T/G 90.87
T/G 91.10 INV. 90.58
T/G 91.38 INV. 90.52
OCB472A T/G 90.54
OCB472 T/G 91.24
RYCB472 T/G 91.56
RYCB471B T/G 92.01
OCB471 T/G 90.54
OCB473A T/G 90.54
DICB2 T/G 89.82
OCB469A T/G 91.87
OCB471A T/G 91.87
T/G 91.87
T/G 92.38
T/G 92.38
INV. 90.38
INV. 90.38
INV. 90.27
INV. 90.02
INV. 90.02
INV. 90.27
INV. 90.17
INV. 90.27
INV. 89.82
INV. 89.82
INV. 89.97
INV. 89.97
INV. 89.67
INV. 89.67
INV. 89.57
INV. 89.57
INV. 89.52
INV. 89.52
INV. 89.57
INV. 89.57
406mmø WM
450mmø WM
600mmø WM
CROSS
TEE
HYD
11½BEND
22½BEND
45°BEND
B/F 90.98
B/F 91.37
B/F 91.53
B/F 92.38
B/F 92.38
B/F 92.38

NEW CATHOLIC HIGH SCHOOL RIVERSIDE SOUTH

675 Borbridge Ave, Manotick, ON K4M 0E2
GRC Project # : 240097

CIVIL DRAWINGS

	COVER SHEET
C000	NOTES AND DETAILS
C001	EXISTING CONDITIONS & REMOVALS PLAN
C100	SITE SERVICING PLAN
C200-1	SITE GRADING PLAN - INTERIM
C200-2	SITE GRANDING PLAN - ULTIMATE
C300	EROSION & SEDIMENT CONTROL PLAN
C500	POST-DEVELOPMENT SITE CATCHMENTS

LANDSCAPE DRAWINGS

L.1	LANDSCAPE PLAN

ARCHITECTURAL DRAWINGS

A001	SITE PLAN
A101	GROUND FLOOR - OVERALL
A102	SECOND FLOOR - OVERALL
A103	ROOF PLAN - OVERALL
A201	BUILDING ELEVATIONS
A201.1	COLOURED BUILDING ELEVATIONS
A202	BUILDING ELEVATIONS
A202.1	COLOURED BUILDING ELEVATIONS



ARTIST RENDERING FOR REFERENCE PURPOSES ONLY



ARTIST RENDERING FOR REFERENCE PURPOSES ONLY

Issued for Site Plan Control R1
June 17th 2025

CIVIL/SITE SERVICES

EXP
2650 QUEENSVIEW DR.,
SUITE 100
OTTAWA, ON K2B 8H6

LANDSCAPE

JAMES B LENNOX
3332 CARLING AVE.,
OTTAWA, ON K2H 5A8
T: 613-722-5168

STRUCTURAL

BPA
1960 RUE ROBERTSON
NEPEAN, ON K2H 5H9
T: 613-591-1533

ARCHITECTURAL

GRC ARCHITECTS - A PROVENCHER ROY COMPANY
401-47 CLARENCE STREET
OTTAWA, ONTARIO K1N 9K1
T: 613-241-8203 F: 613-241-4180

MECHANICAL / ELECTRICAL

LCA
940 BELFAST ROAD, SUITE 203
OTTAWA, ON K1G 4A2
T: 819-243-8383

THEATRE SONSULTANT

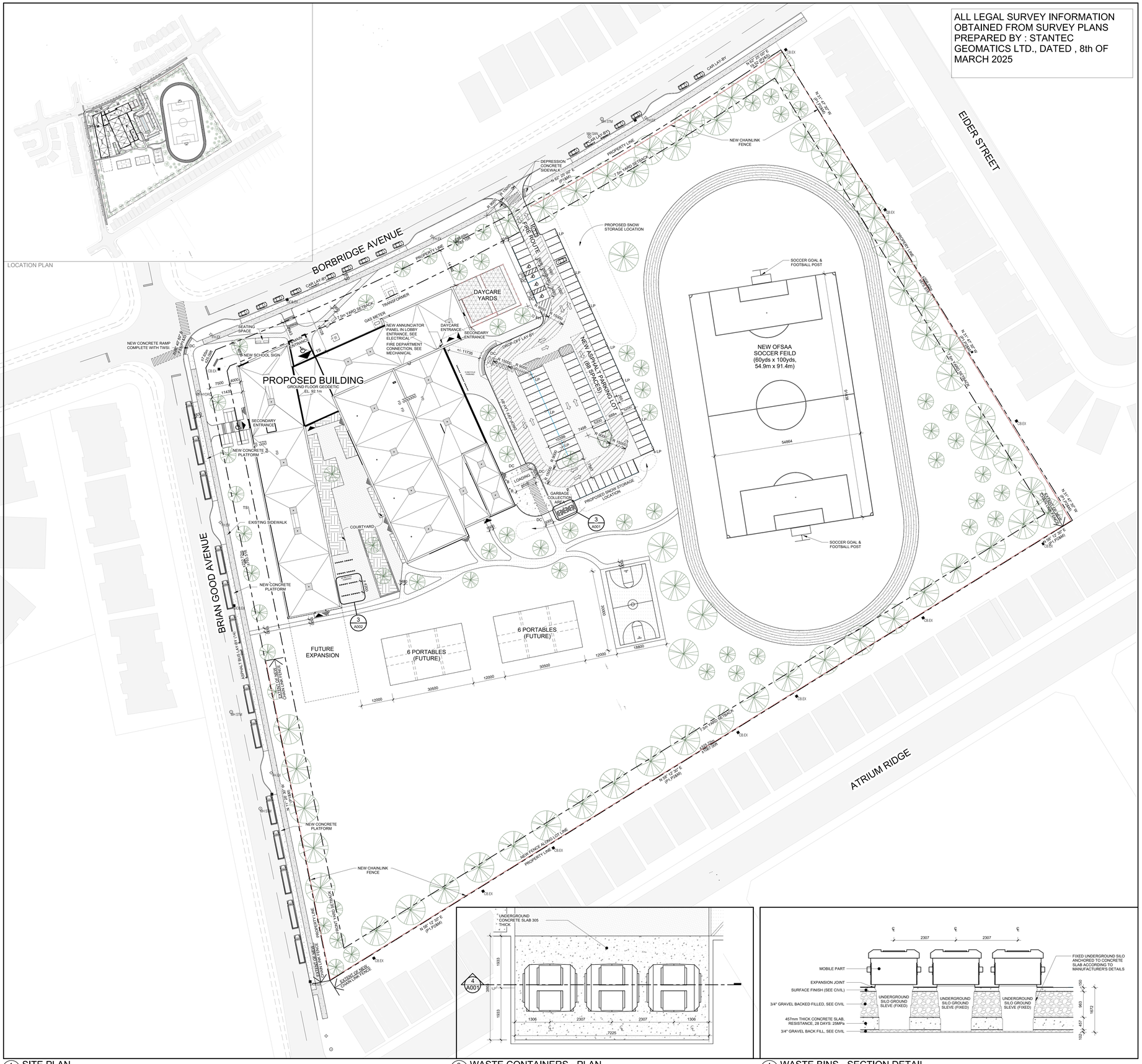
MARTIN CONBOY LIGHT DESGIN
95 GOULBURN AVE,
OTTAWA, ON K1N 8C9
T: 613-371-1585

FOODSERVICE CONSULTANT

SOCIETY INTERNATIONAL
1671 ORFORD CRESCENT
OTTAWA, ON K4V 1V3

ALL LEGAL SURVEY INFORMATION OBTAINED FROM SURVEY PLANS PREPARED BY : STANTEC GEOMATICS LTD., DATED , 8th OF MARCH 2025

LOCATION PLAN



1 A001 SITE PLAN 1 : 500

3 A001 WASTE CONTAINERS - PLAN 1 : 50

4 A001 WASTE BINS - SECTION DETAIL 1 : 50

GENERAL NOTES

1. ALL DIMENSIONS ARE IN MILLIMETERS EXCEPT GRADE, FLOOR ELEVATIONS AND PROPERTY LINE DIMENSIONS (SHOWN IN METERS).
2. ALL LEGAL SURVEY INFORMATION OBTAINED FROM SURVEY PLANS PREPARED BY : STANTEC GEOMATICS LTD. - FRANCIS LAU., DATED , 8th OF MARCH, 2025
3. REFER TO LANDSCAPE DRAWINGS FOR SIDEWALK, CONCRETE CURBS, SOFT/HARD LANDSCAPING, AND PAVEMENT MATERIAL PATTERN LAYOUT.
4. REFER TO CIVIL DRAWING FOR CATCH BASINS, MANHOLES, SITE SERVICES, SITE GRADING, SURFACE DRAINAGE, ROAD WORK, PAVEMENT, SIDEWALK AND CONCRETE CURBS.
5. ELEVATIONS SHOWN ARE REFERRED TO GEODETIC DATUM
6. ALL PARKING SPACES TO HAVE 100mm WIDE PAINTED LINES ON ASPHALT, INCLUDING ACCESSIBLE PARKING SPACE LOGO AND ELECTRIC CAR CHARGING LOGO AS ILLUSTRATED.
7. REFER TO CIVIL DRAWING FOR CATCH BASINS, MANHOLES, SITE SERVICES, SITE GRADING, SURFACE DRAINAGE, AND ROAD WORK.
8. REFER TO LANDSCAPE DRAWINGS FOR SIDEWALK, CONCRETE CURBS, SOFT/HARD LANDSCAPING, AND PAVEMENT MATERIAL PATTERN, LAYOUT.
9. REFER TO ELECTRICAL SITE PLAN FOR ALL ELECTRICAL WORK.
10. ALL PARKING SPACES TO BE PAINTED LINES ON ASPHALT, INCLUDING ACCESSIBLE PARKING SPACE LOGO AS ILLUSTRATED AND ACCESS AISLES

FULL COURT BASKETBALL

- ALL GAME LINES FOR FULL COURT BASKETBALL TO BE PAINTED WHITE, UNLESS NOTED OTHERWISE
- LANE SPACE MARKS & NEUTRAL ZONE MARKS TO BE PAINTED A CONTRASTING COLOR TO THE BOUNDING LINES
- ALL GAME LINES FOR BASKETBALL TO BE 50mm WIDE, UNLESS NOTED OTHERWISE

SITE PLAN LEGEND	
	PROPERTY LINE
	BUILDING SETBACK
	NEW CHAIN LINK FENCE
	MAIN ENTRANCE
	SECONDARY ENTRANCE
	EXIT ONLY
	VEHICULAR DIRECTION
	BARRIER FREE PARKING STALL
	ELECTRIC CHARGING PARKING STALL
	PROPOSED SHRUBS & PERENNIALS, SEE LANDSCAPE
	PROPOSED TREE, SEE LANDSCAPE
	PROPOSED SNOW STORAGE
FH.EX	EXISTING FIRE HYDRANT
FH	FIRE HYDRANT, SEE CIVIL
CB.EX	EXISTING CATCH BASIN
SIBC.EX	EXISTING SIDE INLET CATCH BASIN
MH SAN	EXISTING MAINTENANCE HOLE SANITARY
MH STM	EXISTING MAINTENANCE HOLE STORM
MH HYDRO	EXISTING MAINTENANCE HYDRO
	BICYCLE PARKING
	PEDESTRIAN CROSS WALK
DC	DEPRESSED CURB WITH TACTILE INDICATOR
	NEW FLAG POLE C/W CONCRETE BASE, SEE DETAIL SI/A002
LP	NEW LIGHT POST C/W CONCRETE BASE REFER TO ELECTRICAL.

SITE PLAN LEGEND	
	NEW GALVANIZED STEEL BOLLARDS, PAINTED. SEE DETAIL 6/A002
TS	NEW SCHOOL TITLE SIGNAGE, SEE DETAIL 8/A002. REFER TO ELECTRICAL.
	PROPOSED ROOF DRAIN C/W TAPERED INSULATION SUMP

SITE PLAN LEGEND - HATCH PATTERN	
	PROPOSED PRECAST CONCRETE PAVERS, REFER TO LANDSCAPE DRAWINGS
	PROPOSED CONCRETE, REFER TO CIVIL DRAWINGS
	EXISTING CONCRETE SIDEWALK
	PROPOSED GARDEN BEDS, REFER TO LANDSCAPE DRAWINGS
	PROPOSED HEAVY DUTY ASPHALT, REFER TO CIVIL DRAWINGS
	PROPOSED LIGHT DUTY ASPHALT, REFER TO CIVIL DRAWINGS
	PROPOSED ARTIFICAL GRASS
	PROPOSED LANDSCAPE WALL WITH SEATING
	FIRE ROUTE, SEE CIVIL
	EXISTING ASPHALT
	COMPACTED STONE DUST FOR RUNNING TRACK

PROJECT NAME: **NOUVELLE ÉCOLE SECONDAIRE CATHOLIQUE RIVERSIDE SUD**

OWNER: LES CONSEIL DES ÉCOLES CATHOLIQUES DU CENTRE-EST ONTARIO (CECCE)
4000, RUE LABELLE,
OTTAWA, ON K1J 1A1
T: 613.371.2031

ARCHITECT: GRC ARCHITECTS - A PROVENCHER ROY COMPANY
401-47 CLARENCE STREET
OTTAWA, ONTARIO K1N 9K1
T: 613.241.8203 F: 613.241.4180

LANDSCAPE ARCHITECT: JAMES B LENNOX & ASSOCIATED INC.
3332 CARLING AVE,
OTTAWA, ON K2H 5A8
T: 613.722.5168

CIVIL & SITE SERVICE: EXP
2650 QUEENSVIEW DR., SUITE 100
OTTAWA, ON K2B 8H6

SURVEYOR: STANTEC GEOMATICS LTD.,
1331 CLYDE AVENUE, SUITE 300
OTTAWA, ON K2C 3G4
T: 613.722.4420

LEGAL DESCRIPTION	BLOCK 220 REGISTERED PLAN 4M-1641 (CITY OF OTTAWA) PIN: 04330 - 3031
ADDRESS	675 BORBRIDGE AVE, MANOTICK, ON K4M 0E2
AREA OF SITE	60 070m² (646 588ft²)
TOTAL GROSS FLOOR AREA:	9,391m² (101 084ft²)
GROSS GROUND FLOOR AREA:	6,266m² (67 448ft²)
GROSS SECOND FLOOR AREA:	3,125m² (33 636ft²)
LOT COVERAGE:	10.43%

ZONING PROVISION	REQUIRED		PROVIDED
PARKING, QUEUING AND LOADING PROVISIONS:			
PARKING RATES	School: 68 Spaces (2Classroom x 18 current + 16 future) Daycare: 8 Spaces (1/100m2) - 415 m² Table 101, Row N80 (By-Law 2017-303)		*84 Standard Spaces* *2 Type A' Accessible Spaces* *2 Type B' Accessible Spaces* **88 Total Spaces**
PARKING SPACE DIMENSIONS	106 (1)	(a): min 2.6m width (b): 5.2m length	2.6m width 5.2m length
AISLE & DRIVEWAY	107 (1) 107 (1)	(a)(i): 6.0m driveway lane (c)(i): 6.7m aisle width	>6.0m driveway >6.7m aisle width
LANDSCAPING	110 (1) Table 110 (a), (b)	(a),(b): min. 15% of parking lot 3m buffer width	>15% 20m
REFUSE COLLECTION	110 (3)	(a): min. 9m from lot line abutting public street (b): min.3m from other lot line (d): in-ground refus	yes yes waste stored below grade screened with soft landscaping
BICYCLE PARKING RATES	Table 111A(d):	1 space per 100m²	93 spaces
LOCATION OF BICYCLE SPACES	111.(3),(4),(6),(7),(9)		yes
BICYCLE SPACE DIMENSIONS	Table 111B(a): 111.(9)	0.6m x 1.8m 1.5m access aisle	0.6m x 1.8m 1.5m access aisle
LOADING SPACE RATES	Table 113A(a):	1 space	1 space
LOADING SPACE DIMENSIONS	Table 113B(a)(i): Table 113B(b)(i): Table 113B(c): Table 113B(d)(ii): Table 113B(f):	6.0m driveway width 5.0m access width 3.5m min width 7.0m min length	6.0m driveway width 5.0m access width 3.5m width 7.0m length yes
ZONING PROVISIONS:	INSTITUTIONAL ZONE I1A/R4Z , Schedule I 1A - Subzone provisions - Area C		
ZONE REGULATIONS	Table 170A (a): (b): (c): (d): (e): (f): (g):	15m min lot width 400m² min lot area 7.5m front yard setback 7.5m rear yard setback 7.5m side yard setback 4.5m corner side yard setback 15m max	238.69 m 60 068.61m² >7.5m setback >7.5m setback >7.5m setback >4.5m setback 10.5m max height (2 storeys)

KEYNOTE LEGEND

Écoles catholiques Centre-Est

no.	date	revision / issue	by
4	June 17th 2025	Issued for Site Plan Control R1	
3	May 9th 2025	Issued for 66% Client Review	
2	April 4th 2025	Issued for Site Plan Control	
1	March 14th 2025	Issued for 33% Client Review	

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consultant

northpoint

professional stamp

project title
NEW CATHOLIC HIGH SCHOOL RIVERSIDE SOUTH
Manotick Ontario

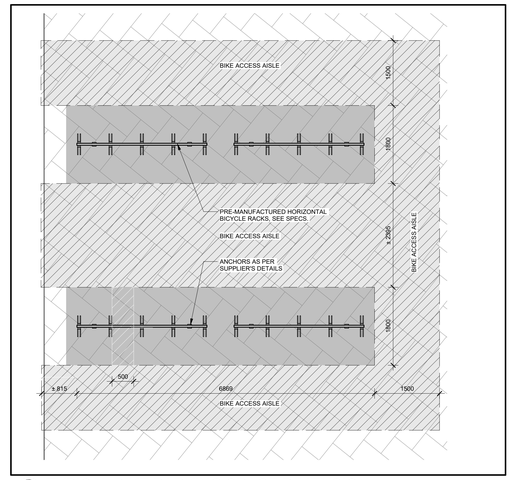
drawing title
SITE PLAN

date	MAY 28 2025
scale	Comme indiqué
drawn	JG
approved	CJ/PD/PR
plot date	03/19/13

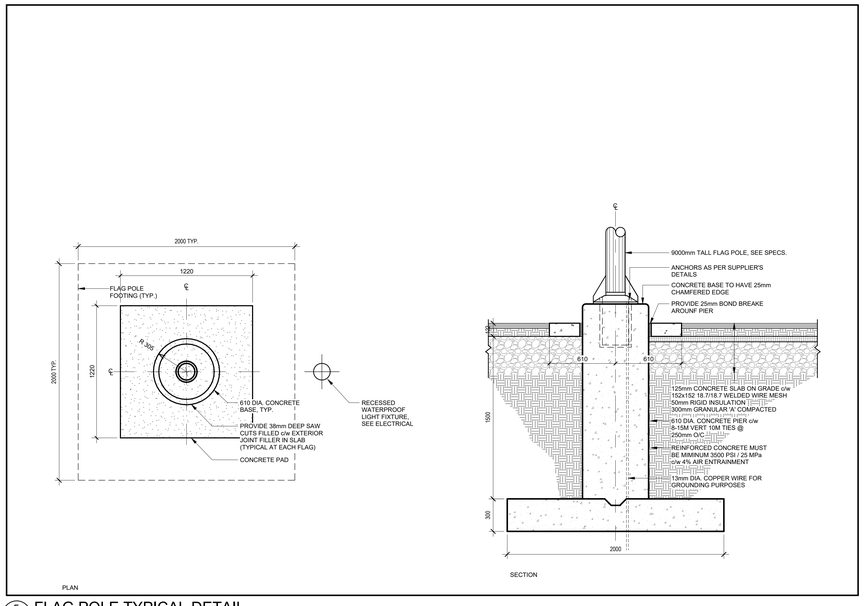
job. no. **240097**

drawing no. **A001**

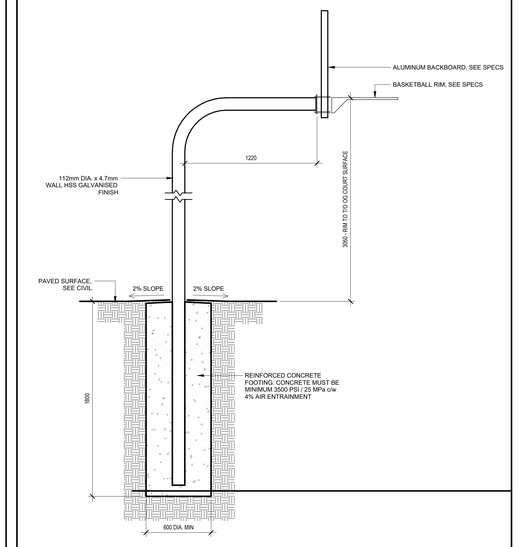
1. DO NOT SCALE FROM THIS DRAWING.
2. CONTRACTOR TO VERIFY ALL DIMENSIONS AND NOTIFY THE ARCHITECT OF ANY DISCREPANCIES BEFORE WORK COMMENCES
3. THIS DRAWING TO BE READ IN CONJUNCTION WITH THE FOLLOWING DRAWINGS: STRUCTURAL, MECHANICAL, ELECTRICAL



3 A002 TYPICAL BIKE PARKING SPACE DIMENSION
1 : 50

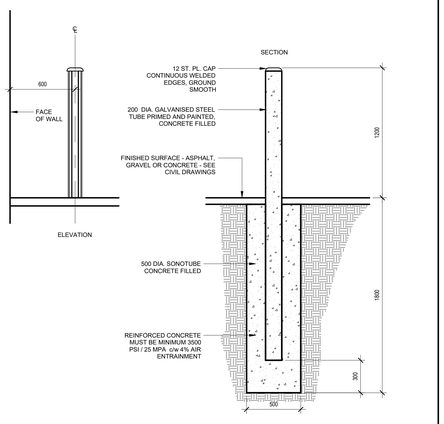


5 A002 FLAG POLE TYPICAL DETAIL
1 : 20

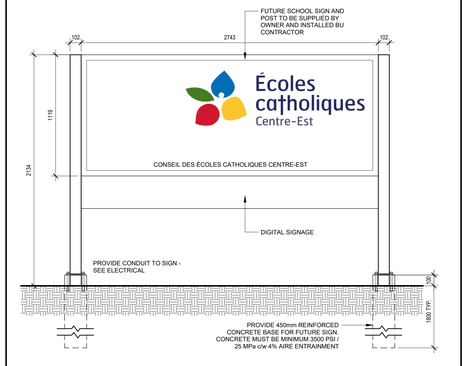


2 A002 BASKETBALL HOOP BASE TYPICAL DETAIL
1 : 20

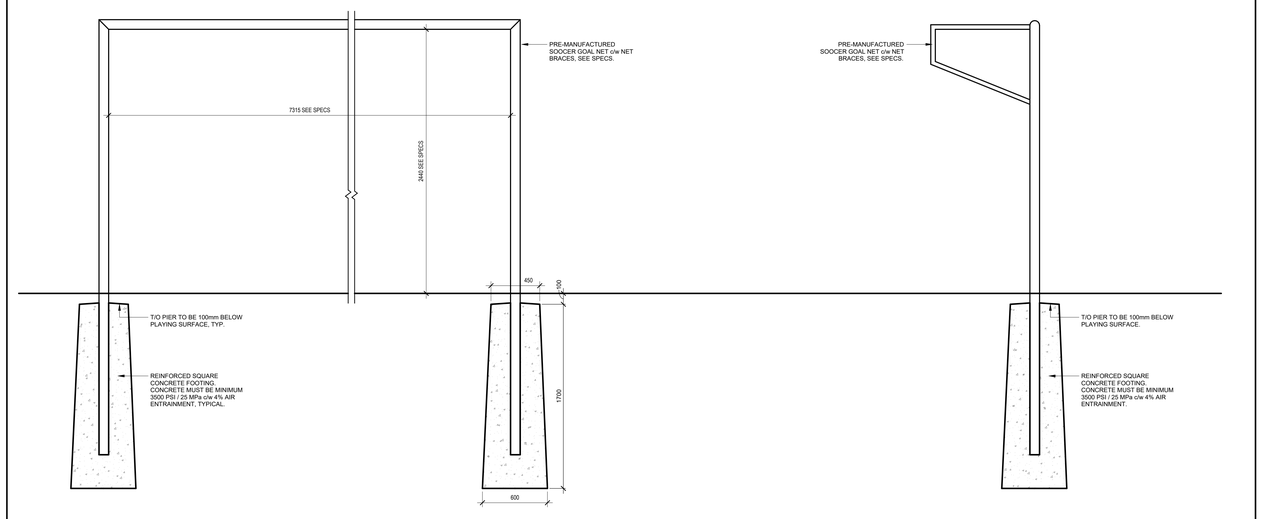
NOTE:
REFER TO FLOOR PLANS AND SITE FOR LOCATION OF BOLLARDS.



6 A002 BOLLARDS TYPICAL DETAIL
1 : 20



4 A002 SCHOOL TITLE SIGNAGE TYPICAL DETAIL
1 : 20



1 A002 IN-GROUND SOCCER GOAL POST
1 : 20

no.	date	revision / issue	by
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professional stamp

project title
NEW CATHOLIC HIGH SCHOOL RIVERSIDE SOUTH
Manotick Ontario

drawing title
SITE PLAN DETAILS

date	MAY 28 2025
scale	Comme indiqué
drawn	JG
approved	CJ/PD/PR
plot date	03/19/13

job. no. **240097**
drawing no. **A002**

1. DO NOT SCALE FROM THIS DRAWING
2. CONTRACTOR TO VERIFY ALL DIMENSIONS AND NOTIFY THE ARCHITECT OF ANY DISCREPANCIES BEFORE WORK COMMENCES
3. THIS DRAWING TO BE READ IN CONJUNCTION WITH THE FOLLOWING DRAWINGS: STRUCTURAL, MECHANICAL, ELECTRICAL

GENERAL NOTES

1. DO NOT SCALE THIS DRAWING.
2. ALL DIMENSIONS ARE IN MILLIMETERS EXCEPT GRADE, FLOOR ELEVATIONS AND PROPERTY LINE DIMENSIONS (SHOWN IN METERS).
3. ALL DIMENSIONS ARE TO FACE OF METAL STUDS, CONCRETE BLOCK, CONCRETE, OR GRIDLINE, UNLESS NOTED OTHERWISE.
4. EXTEND ALL INTERIOR PARTITIONS TO UNDERSIDE OF STEEL DECK, UNLESS OTHERWISE NOTED.
5. REFER TO TYPICAL TOP-OF-WALL DETAILS FOR CLOSURES TO SUIT PARTITION-TO-STRUCTURE RELATIONSHIPS.
6. REFER TO LIFE SAFETY PLANS FOR LOCATION OF FIRE RATED INTERIOR WALLS. USE TYPE "X" GYPSUM BOARD FOR ALL FIRE-RATED PARTITIONS.
7. NON-RATED FIRE SEPARATIONS - EXTEND ENTIRE ASSEMBLY TO U/S OF FLOOR / ROOF DECK, SEAL PERIMETER AND ALL PENETRATIONS.
8. PROVIDE CONTINUOUS FIRESTOP SEALANT AT ALL JUNCTIONS BETWEEN RATED PARTITIONS, BULKHEADS, AND ALL OTHER BUILDING ASSEMBLIES.
9. REFER TO THE PARTITION TYPE LEGEND TO IDENTIFY ACOUSTIC PARTITIONS (NOTED WITH STC RATINGS). TOP-OF-WALL CLOSURES FOR THESE PARTITIONS INCLUDE ACOUSTIC INSULATION.
10. CONFIRM LOCATIONS OF BEAMS, JOISTS, AND BRACES WITH STRUCTURAL DRAWINGS.
11. PROVIDE SPRAY APPLIED FIREPROOFING TO PROTECT ALL HORIZONTAL STRUCTURAL ELEMENTS SUPPORTING LEVEL 2 AND LEVEL 3 FLOOR ASSEMBLIES TO ACHIEVE A FIRE RESISTANCE RATING, UNLESS NOTED OTHERWISE. REFER TO LIFE SAFETY PLANS FOR LOCATIONS AND RATINGS.
12. ENSURE THE INTEGRITY OF THE SPECIFIED FIRE RESISTANCE RATING AT JUNCTIONS / INTERSECTIONS OF ALL PARTITIONS WITH A FIRE RESISTANCE RATING. PROVIDE FIRESTOP MATERIAL AT JUNCTIONS AS REQUIRED.
13. WHERE RATED DEFLECTION ASSEMBLIES ARE REQUIRED, ULC NUMBERS OR EJa (ENGINEERING JUDGEMENTS) MUST BE PROVIDED FOR REVIEW, PER THE PROJECT SPECIFICATIONS.
14. INSTALL WATER RESISTANT GYPSUM BOARD THROUGHOUT ON ALL METAL STUD PARTITIONS IN WASHROOMS, SHOWERS, AND JANITOR'S CLOSETS.
15. ALIGN WALL SURFACES AT ALL JUNCTIONS BETWEEN GYPSUM WALL PARTITIONS AND ALL OTHER WALL ASSEMBLIES. ALIGN SURFACES ON CORRIDOR, ROOM, OR LOBBY SIDE AS PER THE CONTRACT DOCUMENTS. CONSULT WITH ARCHITECT PRIOR TO INSTALLATION IN EVENT OF DISCREPANCY.
16. PROVIDE ACOUSTIC CAULKING AT ALL JOINTS, JUNCTIONS AND PENETRATIONS, INCLUDING MECHANICAL AND ELECTRICAL, TO WALL ASSEMBLIES WITH STC RATING (WITH SOUND ATTENUATION INSULATION IN CAVITIES).
17. METAL STUD PARTITIONS: INSTALL CONCEALED SOLID WOOD BLOCKING FOR ANCHORAGE OF GUARD RAILS, RECESSED OR SEMI-RECESSED WALL MOUNTED EQUIPMENT, FIXTURES, SMART BOARDS, WHITE BOARDS, MILLWORK, AND WASHROOM ACCESSORIES.
18. WALL TAG DENOTES WALL TYPE INCLUDING WALL PORTIONS ON ALL SIDES OF, ABOVE, AND BELOW DOORS (WHERE APPLICABLE). WINDOWS, LOUVERS, GLAZED SCREENS, CURTAINWALL AND ALL FRAMED ELEMENTS WITHIN WALL, UNLESS NOTED OTHERWISE.
19. PROVIDE GYPSUM BOARD CONTROL JOINTS AT ALL GYPSUM ASSEMBLIES PER SPECIFICATIONS. ALIGN MASONRY AND GYPSUM BOARD PARTITION JOINTS VERTICALLY.
20. MECHANICAL AND ELECTRICAL ELEMENTS SHOWN ON ARCHITECTURAL PLANS ARE FOR COORDINATION PURPOSES ONLY. REFER TO CONTRACT DOCUMENTS PER EACH DISCIPLINE FOR SPECIFICATIONS AND EXACT LOCATIONS. IN EVENT OF DISCREPANCY, CONTACT ARCHITECT PRIOR TO INSTALLATION.
21. ALL LOOSE FURNISHINGS INDICATED ARE N.I.C. (NOT IN CONTRACT).
22. OVERHEAD DOORS TO EMPLOY MAXIMUM LIFT WITHIN HEADROOM AVAILABLE, UNLESS OTHERWISE NOTED. PROVIDE 4 BOLLARDS PER OVERHEAD DOOR, 2 INSIDE AND 2 OUTSIDE.
23. AT ALL LOCATIONS WHERE FLOOR SLOPES TO DRAINS ARE INDICATED, DRAINS SHALL BE LOCATED AT ELEVATION -25mm.
24. ALL SHOP EQUIPMENT INDICATED ARE N.I.C. (NOT IN CONTRACT).
25. ALL MECHANICAL CHASES ARE TO BE WALL TYPE P1b EXCEPT NOTED OTHERWISE.
26. ALL EXPOSED BLOCK EDGES TO BE BULLNOSE BLOCK UNLESS OTHERWISE NOTED.
27. FOR GROUT FILLING AND REINFORCEMENT DETAILS OF CONCRETE BLOCK WALLS, REFER TO STRUCTURAL DRAWINGS.
28. PROVIDE AND INSTALL EXPANSION JOINT COVER AT FLOORS, INTERIOR PARTITIONS AND GYPSUM BOARD CEILING WHERE APPLICABLE, COLOR TO MATCH ADJACENT FINISHED SURFACES.
29. PROVIDE REQUIRED FIRE PROTECTION TO ALL COLUMNS AT LEVEL 1 AND LEVEL 2 AS INDICATED ON THE FLOOR PLANS. MINIMUM FIRE PROTECTION OF 1HR AS PRESCRIBED BY OBC 2012.
30. BLOCK WALL START CORNERS ARE INDENTIFIED ON THE PLAN. INFORM THE ARCHITECT BEFORE CHANGING ANY START CORNER.
31. REFER TO PARTIAL PLANS AND/OR BLOW-UPS FOR MORE GENERAL ANNOTATION AND DIMENSIONS.

ASSEMBLY TYPE NOTES

1. DIMENSION LINES ARE TAKEN FROM GRIDLINES, FACE OF STUDS, AND FACE OF BLOCK WALLS, UNLESS OTHERWISE NOTED.
2. REFER TO LIFE SAFETY PLANS FOR LOCATION AND RATING OF FIRE RATED WALLS. USE FIRE-RATED GYPSUM BOARD FOR ALL FIRE RATED WALLS.
3. IN ALL CORRIDORS WITH EXPOSED GYPSUM WALL BOARD ASSEMBLY (NOT REQUIRED BEHIND LOCKERS), INSTALL ABUSE-RESISTANT TYPE X GYPSUM BOARD FROM TOP OF SLAB TO 2400mm AFF ON CORRIDOR SIDE. COMPLETE ASSEMBLY ABOVE 2400mm AFF WITH TYPE X GWB OF EQUAL THICKNESS TO UNDERSIDE OF SLAB.
4. INSTALL ABUSE-RESISTANT GYPSUM BOARD ON ALL GYPSUM BOARD CLAD COLUMNS.
5. REFER TO ROOM FINISH SCHEDULE FOR FINISHES OF WALLS AND FLOORS.
6. INSTALL WATER RESISTANT GYPSUM BOARD THROUGHOUT ON ALL METAL STUD PARTITIONS IN WASHROOMS, SHOWERS, AND JANITOR'S CLOSETS.
7. FOR GROUT FILLING AND REINFORCEMENT DETAILS OF CONCRETE BLOCK WALLS, REFER TO STRUCTURAL DRAWINGS.
8. ALL EXPOSED BLOCK EDGES TO BE BULLNOSE BLOCK UNLESS OTHERWISE NOTED.
9. ALL MECHANICAL CHASES ARE TO BE WALL TYPE P1b EXCEPT NOTED OTHERWISE.
10. PROVIDE 152mm METAL STUDS AT RECESSED FIRE EXTINGUISHER CABINETS UNLESS NOTED OTHERWISE.
11. INSTALL BATT INSULATION IN ACOUSTIC PARTITIONS ON THE OPPOSITE SIDE OF PLUMBING PENETRATIONS AND ON THE OPPOSITE SIDE OF ELECTRICAL PENETRATION WHERE APPLICABLE, UNLESS NOTED OTHERWISE.
12. PROVIDE A 610x1220mm 19mm THICK PLYWOOD BACKING BETWEEN METAL STUDS BEHIND SMART BOARDS, TELEVISIONS, WHITE BOARDS AND TACKBOARDS AND INSTALLED IN THE SAME ORIENTATION AS THE EQUIPMENT. EXACT LOCATION TO BE CONFIRMED ON SITE WITH THE OWNER.

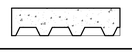
FLOOR ASSEMBLIES

F1



SLAB ON GRADE
FINISH AS PER ROOM SCHEDULE
CONCRETE SLAB ON GRADE (SEE STRUCTURAL FOR THICKNESS & REINFORCEMENT).
GRANULAR "A," MIN. 200mm WHEN COMPACTED.
GRANULAR "B," AS REQUIRED TO REMEDIATE NATIVE DEPOSITS. ADD IN 200mm LOOSE LIFTS AND THEN COMPACT. TOTAL DEPTH VARIES TO SUIT SITE CONDITIONS.
WOVEN GEOTEXTILE SEPARATOR OVER NATIVE DEPOSITS.

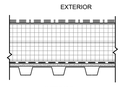
F2



2nd FLOOR
1HR FRR - ULC: F818
FINISH AS PER ROOM SCHEDULE
CONCRETE SLAB OVER STEEL DECK (SEE STRUCTURAL FOR THICKNESS & REINFORCEMENT).
OWSJs (SEE STRUCTURAL)
SPRAY APPLIED FIREPROOFING OVER ALL STRUCTURAL STEEL, INCLUDING STEEL DECK

ROOF ASSEMBLIES

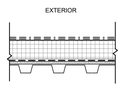
R1



MAIN ROOF - SLOPED ROOF STRUCTURE

2-PLY SBS MODIFIED BITUMEN ROOFING MEMBRANE
6mm INSULTATION PROTECTION BOARD
SLOPED POLYISOCYANURATE INSULATION CRICKETS TO ROOF DRAIN
168mm (2 LAYERS 84mm) POLYISOCYANURATE, STRAGGERED ROOF INSULATION (R40)
AIR/VAPOUR BARRIER MEMBRANE
13mm DECK SHEATHING BOARD
STEEL DECK ON STRUCTURAL FRAMING (SEE STRUCTURAL)

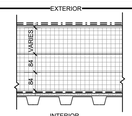
R2



CANOPY ROOF

2-PLY SBS MODIFIED BITUMEN ROOFING MEMBRANE
6mm INSULTATION PROTECTION BOARD
SLOPED POLYISOCYANURATE INSULATION TO SCUPPERS
STEEL DECK ON STRUCTURAL FRAMING (SEE STRUCTURAL)

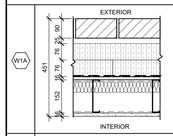
R3



FLAT ROOF STRUCTURE
2-PLY SBS MODIFIED BITUMEN ROOFING MEMBRANE
3mm INSULTATION PROTECTION BOARD
SLOPED POLYISOCYANURATE INSULATION CRICKETS TO ROOF DRAIN
168mm (2 LAYERS 84mm) POLYISOCYANURATE, STRAGGERED ROOF INSULATION (R40)
AIR/VAPOUR BARRIER MEMBRANE
62mm CONCRETE TOPPING @ MECHANICAL UNIT, REFER TO STRUCTURE FOR EXTENT
13mm DECK SHEATHING BOARD
STEEL DECK ON STRUCTURAL FRAMING (SEE STRUCTURAL)

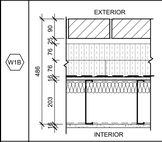
EXTERIOR WALL ASSEMBLIES

W1A



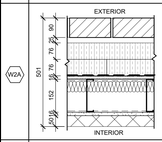
90mm MASONRY
25mm AIR SPACE
152mm (2 X 76mm) SEMI-RIGID INSULATION (R24 MIN.)
SELF ADHERED AIR/VAPOUR BARRIER ME20
16mm EXTERIOR SHEATHING
152mm STRUCTURAL STEEL STUDS (SPACING AND SIZE ACCORDING TO CALCULATIONS, SEE SPECIFICATIONS)
W: 50mm SEMI-RIGID ROCK WOOL INSULATION (R8)
16mm GYPSUM BOARD

W1B



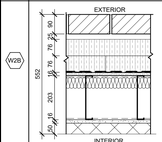
90mm MASONRY
25mm AIR SPACE
152mm (2 X 76mm) SEMI-RIGID INSULATION (R24 MIN.)
SELF ADHERED AIR/VAPOUR BARRIER ME20
16mm EXTERIOR SHEATHING
203mm STRUCTURAL STEEL STUDS (SPACING AND SIZE ACCORDING TO CALCULATIONS, SEE SPECIFICATIONS)
W: 50mm SEMI-RIGID ROCK WOOL INSULATION (R8)
16mm GYPSUM BOARD

W2A



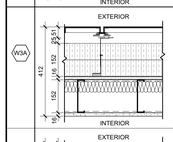
90mm MASONRY
25mm AIR SPACE
152mm (2 X 76mm) SEMI-RIGID INSULATION (R24 MIN.)
SELF ADHERED AIR/VAPOUR BARRIER ME20
16mm EXTERIOR SHEATHING
152mm STRUCTURAL STEEL STUDS (SPACING AND SIZE ACCORDING TO CALCULATIONS, SEE SPECIFICATIONS)
50mm SEMI-RIGID ROCK WOOL INSULATION (MAX R8)
16mm GYPSUM BOARD
50mm CONCRETE MASONRY BLOCK

W2B



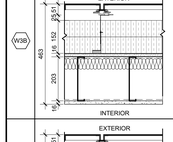
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SELF ADHERED AIR/VAPOUR BARRIER ME20
16mm EXTERIOR SHEATHING
203mm STRUCTURAL STEEL STUDS (SPACING AND SIZE ACCORDING TO CALCULATIONS, SEE SPECIFICATIONS)
50mm SEMI-RIGID ROCK WOOL INSULATION (MAX R8)
16mm GYPSUM BOARD
50mm CONCRETE MASONRY BLOCK

W3A



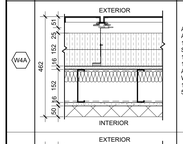
ALUMINUM COMPOSITE PANEL SYSTEM
ADJUSTABLE THERMAL CLIP
152mm (2 X 76mm) SEMI-RIGID INSULATION (R24 MIN.)
SELF ADHERED AIR/VAPOUR BARRIER ME20
16mm EXTERIOR SHEATHING
152mm STRUCTURAL STEEL STUDS (SPACING AND SIZE ACCORDING TO CALCULATIONS, SEE SPECIFICATIONS)
W: 50mm SEMI-RIGID ROCK WOOL INSULATION (R8)
16mm GYPSUM BOARD

W3B



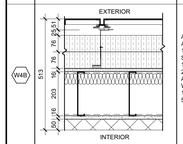
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ADJUSTABLE THERMAL CLIP
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SELF ADHERED AIR/VAPOUR BARRIER ME20
16mm EXTERIOR SHEATHING
203mm STRUCTURAL STEEL STUDS (SPACING AND SIZE ACCORDING TO CALCULATIONS, SEE SPECIFICATIONS)
W: 50mm SEMI-RIGID ROCK WOOL INSULATION (R8)
16mm GYPSUM BOARD
50mm CONCRETE MASONRY BLOCK

W4A



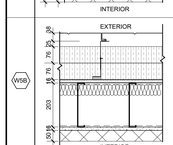
ALUMINUM COMPOSITE PANEL SYSTEM
ADJUSTABLE THERMAL CLIP
152mm (2 X 76mm) SEMI-RIGID INSULATION (R24 MIN.)
SELF ADHERED AIR/VAPOUR BARRIER ME20
16mm EXTERIOR SHEATHING
152mm STRUCTURAL STEEL STUDS (SPACING AND SIZE ACCORDING TO CALCULATIONS, SEE SPECIFICATIONS)
W: 50mm SEMI-RIGID ROCK WOOL INSULATION (R8)
16mm GYPSUM BOARD
50mm CONCRETE MASONRY BLOCK

W4B



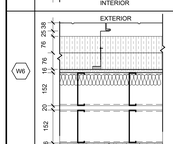
ALUMINUM COMPOSITE PANEL SYSTEM
ADJUSTABLE THERMAL CLIP
152mm (2 X 76mm) SEMI-RIGID INSULATION (R24 MIN.)
SELF ADHERED AIR/VAPOUR BARRIER ME20
16mm EXTERIOR SHEATHING
203mm STRUCTURAL STEEL STUDS (SPACING AND SIZE ACCORDING TO CALCULATIONS, SEE SPECIFICATIONS)
W: 50mm SEMI-RIGID ROCK WOOL INSULATION (R8)
16mm GYPSUM BOARD
50mm CONCRETE MASONRY BLOCK

W5B



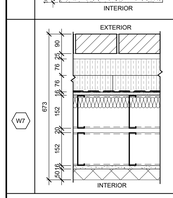
38mm PREFINISHED VERTICAL METAL SIDING
WEATHER BARRIER
ADJUSTABLE THERMAL CLIP
152mm (2 X 76mm) SEMI-RIGID INSULATION (R24 MIN.)
SELF ADHERED AIR/VAPOUR BARRIER ME20
16mm EXTERIOR SHEATHING
203mm STRUCTURAL STEEL STUDS (SPACING AND SIZE ACCORDING TO CALCULATIONS, SEE SPECIFICATIONS)
W: 50mm SEMI-RIGID ROCK WOOL INSULATION (R8)
16mm GYPSUM BOARD
50mm CONCRETE MASONRY BLOCK

W6



38mm PREFINISHED VERTICAL METAL SIDING
WEATHER BARRIER
ADJUSTABLE THERMAL CLIP
152mm (2 X 76mm) SEMI-RIGID INSULATION (R24 MIN.)
SELF ADHERED AIR/VAPOUR BARRIER ME20
16mm EXTERIOR SHEATHING
16mm GYPSUM BOARD
152mm STEEL STUDS @ 400mm O.C.
W: 50mm SEMI-RIGID ROCK WOOL INSULATION (R8)
20mm AIR SPACE
152mm STEEL STUDS @ 400mm O.C
16mm GYPSUM BOARD

W7

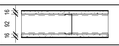


90mm MASONRY
25mm AIR SPACE
152mm (2 X 76mm) SEMI-RIGID INSULATION (R24 MIN.)
SELF ADHERED AIR/VAPOUR BARRIER ME20
16mm EXTERIOR SHEATHING
152mm STEEL STUDS @ 400mm O.C.
W: 50mm SEMI-RIGID ROCK WOOL INSULATION (R8)
20mm AIR SPACE
152mm STEEL STUDS @ 400mm O.C
16mm GYPSUM BOARD
50mm CONCRETE MASONRY BLOCK

INTERIOR WALL ASSEMBLIES

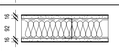
NOTE: FIRE RESISTANCE RATINGS INDICATED BELOW REFLECT ULC DESIGN RATING. FOR MINIMUM FRR REQUIREMENT OF INDIVIDUAL WALLS, REFER TO LIFE SAFETY PLANS (A004).

P1



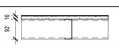
FRR: 1 HR ULC: W453 STC:40
16mm GYPSUM BOARD
92mm STEEL STUDS @ 400mm O.C.
16mm GYPSUM BOARD

P1a



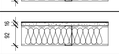
FRR: 1 HR ULC: W407 STC:51
16mm GYPSUM BOARD
92mm STEEL STUDS @ 400mm O.C.
76mm SOUND ATTENUATION FIBRE BATTS
16mm GYPSUM BOARD

P1b



16mm GYPSUM BOARD
92mm STEEL STUDS @ 400mm O.C.

P1c



16mm GYPSUM BOARD
92mm STEEL STUDS @ 400mm O.C
76mm SOUND ATTENUATION FIBRE BATTS

P2



FRR: 1 HR ULC: W407 STC:40
16mm GYPSUM BOARD
152mm STEEL STUDS @ 400mm O.C.
16mm GYPSUM BOARD

P2a



FRR: 1 HR ULC: W407 STC:51
16mm GYPSUM BOARD
152mm STEEL STUDS @ 400mm O.C
76mm SOUND ATTENUATION FIBRE BATTS
16mm GYPSUM BOARD

P2b



16mm GYPSUM BOARD
152mm STEEL STUDS @ 400mm O.C.

P2c



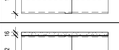
16mm GYPSUM BOARD
152mm STEEL STUDS @ 400mm O.C.
76mm SOUND ATTENUATION FIBRE BATTS

P2x



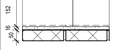
FRR: 1 HR
16mm GYPSUM BOARD
152mm STEEL STUDS @ 400mm O.C.
16mm GYPSUM BOARD
50mm CONCRETE BLOCK

P2f



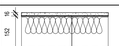
FRR: 1 HR
16mm GYPSUM BOARD
152mm STEEL STUDS @ 400mm O.C.
76mm SOUND ATTENUATION FIBRE BATTS
16mm GYPSUM BOARD
50mm CONCRETE BLOCK

P3



FRR: 1 HR
16mm GYPSUM BOARD
203mm STEEL STUDS @ 400mm O.C.
16mm GYPSUM BOARD

P3a



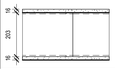
FRR: 1 HR ULC: W407 STC: 56
16mm GYPSUM BOARD
203mm STEEL STUDS @ 400mm O.C.
76mm SOUND ATTENUATION FIBRE BATTS
16mm GYPSUM BOARD

P3x



FRR: 1 HR
16mm GYPSUM BOARD
203mm STEEL STUDS @ 400mm O.C.
16mm GYPSUM BOARD
50mm CONCRETE BLOCK

P4



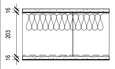
16mm GYPSUM BOARD
64mm STEEL STUDS @ 400mm O.C.

P5



16mm GYPSUM BOARD
152mm STEEL STUDS @ 400mm O.C.
76 SOUND ATTENUATION FIBRE BATTS
20mm AIR SPACE
152mm STEEL STUDS @ 400mm O.C.
76 SOUND ATTENUATION FIBRE BATTS
16mm GYPSUM BOARD
50mm CONCRETE BLOCK

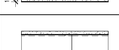
P6



FRR: 1 HR STC: 48 (OBC2024 SB-3 : Design B1a)

140mm CONCRETE BLOCK

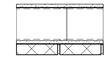
P7



FRR: 1.5 HR STC: 50 (OBC2024 SB-3 : Design B1b)

190mm CONCRETE BLOCK

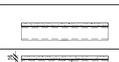
P8



FRR: 2 HR STC: 51 (ULC: U906)

240mm CONCRETE BLOCK

P9



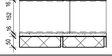
16mm GYPSUM BOARD
92mm STEEL STUDS @ 400mm O.C.
200mm AIR SPACE
92mm STEEL STUDS @ 400mm O.C.
16mm GYPSUM BOARD

P10



16mm GYPSUM BOARD
41mm STEEL STUDS @ 400mm O.C.

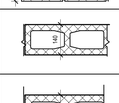
P11



FRR: 1 HR ULC: W452, SYSTEM A
SHAFT WALL SYSTEM:

16mm GYPSUM BOARD
64mm CH STUD FRAMING @ 400mm O.C.
64mm SOUND ATTENUATION FIBRE BATTS
25mm GYPSUM LINER PANELS

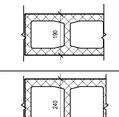
P20



ACOUSTIC PARTITION - STC 68

16mm GYPSUM BOARD
16mm GYPSUM BOARD
102mm METAL STUD @ 610mm O.C.
R-12 SOUND ATTENUATION FIBRE BATTS
25mm AIR SPACE
R-12 SOUND ATTENUATION FIBRE BATTS
102mm METAL STUD @ 610mm O.C.
19mm SOUNDPROOFING WOOD FIBER BOARD
16mm GYPSUM BOARD

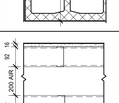
P21



ACOUSTIC PARTITION - STC 64 (TL-93-302)
FIRE -1HR

16mm GYPSUM BOARD
16mm GYPSUM BOARD
92mm METAL STUD @ 400mm O.C.
75mm SOUND ATTENUATION FIBRE BATTS
13mm (min) AIR SPACE
75mm SOUND ATTENUATION FIBRE BATTS
92mm METAL STUD @ 400mm O.C.
16mm GYPSUM BOARD
16mm GYPSUM BOARD

P22



ACOUSTIC PARTITION - STC 60 (TL-94-020)
FIRE -1HR

16mm GYPSUM BOARD
16mm GYPSUM BOARD
92mm METAL STUD @ 400mm O.C.
75mm SOUND ATTENUATION FIBRE BATTS
13mm RESILIENT CHANNEL @610mm O.C.
16mm GYPSUM BOARD
16mm GYPSUM BOARD

Écoles catholiques Centre-Est

no.	date	revision / issue	by
3	May 9th 2025	Issued for 66% Client Review	
1	March 14th 2025	Issued for 33% Client Review	

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consultant

northpoint

professional stamp

project title
NEW CATHOLIC HIGH SCHOOL RIVERSIDE SOUTH
Manotick Ontario

drawing title
TYPICAL ASSEMBLES AND GENERAL NOTES

date	MAY 28 2025
scale	Comme indiqué
drawn	JG
approved	CJ/PD/PR
plot date	03/19/13

job. no. **240097**
drawing no. **A010**

1. DO NOT SCALE FROM THIS DRAWING.
2. CONTRACTOR TO VERIFY ALL DIMENSIONS AND NOTIFY THE ARCHITECT OF ANY DISCREPANCIES BEFORE WORK COMMENCES
3. THIS DRAWING TO BE READ IN CONJUNCTION WITH THE FOLLOWING DRAWINGS: STRUCTURAL, MECHANICAL, ELECTRICAL

Name of Practice:
grc architects
a Provencher_Roy Company

Name of Project:
NEW CATHOLIC HIGH SCHOOL RIVERSIDE SOUTH

Location:
675 Borbridge Ave, Manotick, ON K4M 0E2

Date: April 15, 2025

2024 Ontario Building Code Data Matrix
Part 3 – Fire Protection, Occupant Safety and Accessibility

			Building Code Reference[1]
3.00	Building Code Version:	O. Reg. 163/24 Last Amendment O. Reg. 447/24	
3.01	Project Type:	■ New construction ☐ Addition ☐ Renovation ☐ Change of use ☐ Addition and renovation Description: _____	[A] 1.3.3.2.
3.02	Major Occupancy Classification:	Occupancy: Group A2 — Use: Assembly Occupancy	3.1.2
3.03	Superimposed Major Occupancies:	■ No ☐ Yes Description: _____	3.2.2.7.
3.04	Building Area (m²)	Description: Ground Floor — Existing: 0 — New: 6266 m² — Total: 6266 m² Total — Existing: 0 — New: 3126 m² — Total: 3195 m²	[A] 1.4.1.2.
3.05	Gross Area (m²)	Description: Ground Floor — Existing: 0 — New: 6266 m² — Total: 6266 m² Second Floor — Existing: 0 — New: 3126 m² — Total: 3195 m² Total — Existing: 0 — New: 9392 m² — Total: 9093 m²	[A] 1.4.1.2.
3.06	Mezzanine Area (m²)	Description: N/A — Existing: — New: — Total: — Total	3.2.1.1.
3.07	Building Height	2 Storeys above grade — 10.4 (m) Above grade Storeys below grade	[A] 1.4.1.2. & 3.2.1.1.
3.08	High Building	■ No ☐ Yes	3.2.6.
3.09	Number of Streets/ Firefighter access	2 street(s)	3.2.2.10. & 3.2.5.
3.10	Building Classification: (Date and Construction Relative to Occupancy)	3.2.2. Group/Div 3.2.2.24 A2	3.2.2.20. - 93
3.11	Sprinkler System	■ Required ☐ Not required Provided: ■ entire building ☐ selected compartments ☐ selected floor areas ☐ basement ☐ in lieu of roof rating ☐ none Description: _____	3.2.1.5. & 3.2.2.18., .21., .22., .29., 3.2.4.1., 3.2.4.9., 3.2.4.15., and 3.2.5.12. to .14.
3.12	Standpipe System	■ Not required ☐ Required	3.2.5.8 - 11.
3.13	Fire Alarm System	☐ Not required ■ Required Type provided: ■ Single stage ☐ Two stage ☐ None	3.2.4.
3.14	Water Service / Supply is Adequate	☐ No ■ Yes	3.2.5.7.
3.15	Construction Type:	Restriction: ☐ Combustible permitted ■ Non-combustible required ☐ Encapsulated mass timber permitted Actual: ☐ Combustible ■ Non-combustible ☐ Combination of combustible and non-combustible ☐ Encapsulated mass timber ☐ Combination of encapsulated mass timber and non -combustible Heavy Timber Construction: ■ No ☐ Yes	3.2.2.20.- 93. & 3.1.6. 3.1.4.6., 7., 3.2.2.16.

2024 Ontario Building Code Data Matrix
Part 3 – Fire Protection, Occupant Safety and Accessibility (Continued)

			Building Code Reference[1]
3.16	Importance Category:	☐ Low ☐ Low human occupancy ☐ Post-disaster shelter ☐ Normal ■ High ☐ Minor storage building ☐ Explosive or hazardous substances ☐ Post-disaster	4.1.2.1.(3) & T4.1.2.1.
3.17	Seismic Category:	Seismic Category: Class C Site Class: X_v, V_{s30} = 479 m/s Seismic design for Table 4.1.8.18. items 6 to 22: ■ Required ☐ Not Required Reasons: Seismic Category is C	4.1.8.4.(1) T-4.1.8.5.-B 4.1.8.18.
3.18	Occupant Load	Ground Floor: Occupancy Type A2 — Based On Design/m² 1013 — Occupant Load (Persons) — Posted Limit Required Second Floor: A2 — Design/m² 470 Total: Design/m² 1489	3.1.17.
3.19	Barrier-free Design:	■ Yes ☐ No Barrier-free Entrances: Number 7 — All entrances are barrier-free	3.8. 3.8.1.2
3.20	Hazardous Substances:	■ Yes ☐ No There is a wood shop on the ground floor.	3.3.1.2.
3.21	Required Fire Resistance Ratings	Floors over basement: Rating (Rt) 0 — Supporting Assembly (Rt) 0 — Noncombustible in lieu of rating? ☐ No ☐ Yes ■ N/A Floors: 1 HR — 1 HR — ■ No ☐ Yes ☐ N/A Mezzanine: N/A — N/A — ☐ No ☐ Yes ■ N/A Roof: 0 — 0 — ☐ No ☐ Yes ■ N/A	3.2.2.20.- 93, 3.2.1.2, 3.2.1.4., 3.2.2.15., 3.3.2.1.
3.22	Spatial Separation	Exposing Building Face: N/A — EBF Area (m²) — L.D. (m) — L/H or H/L — Required FRR (H) — % Unprotected Openings Permitted — % Unprotected Openings Provided	3.2.3.
3.23	Plumbing Fixture Requirements	Ratio: Male:Female = 50:50 Except as noted otherwise Floor Level/Area: Ground Floor (+Portables) — Occupant Load 650M / 650F — OBC Reference 3.7.4.3.(14) — WCs. Required 9M / 16F — WCs. Provided 29U Second Floor — 235M / 235F — 3.7.4.3.(14) — 5/ 9F — 14U	3.7.4. , 3.8.2.3
3.24	Energy Efficiency:	Compliance Path: Prescriptive Climatic Zone: Climate Zone 6 Degree Days Below 18 C: 4600	12.2.1.2 SB-1 Table 2
3.25	Sound Transmission Design:	Is there more than 1 dwelling unit per building?: ☐ Yes ■ No Option Implemented: _____ Notes: _____	SB-3, 5.8.1.2.(2), 5.8.1.4., & 5.8.1.5.
3.26	Alternative Solution	_____	SB-3, 5.8.1.2.(2), 5.8.1.4., & 5.8.1.5.
3.27	Notes:	_____	

1. *All references are to Division B of the OBC, unless preceded by [A] for Division A and [C] for Division C.*

FIRE RESISTANCE RATING (FRR) LEGEND

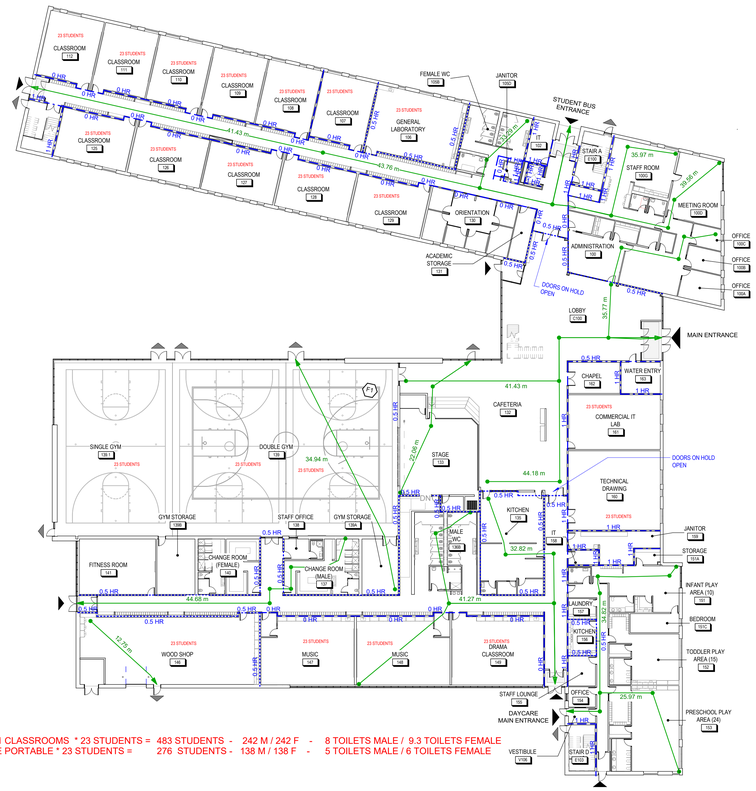
- NON-RATED FIRE SEPARATION (0 HR)
- 0.5 HR FIRE SEPARATION
- 1 HR FIRE SEPARATION
- XX m — TRAVEL DISTANCE

REQUIRED FIRE SEPARATIONS

JANITOR	0 HR
IT	1 HR
HAZARDOUS CLASSROOMS	0.5 HR
INTERCONNECTED SPACES	0.5 HR
EXIT STAIRS	1 HR
MECHANICAL ROOM	1 HR
ELECTRICAL ROOM	1 HR

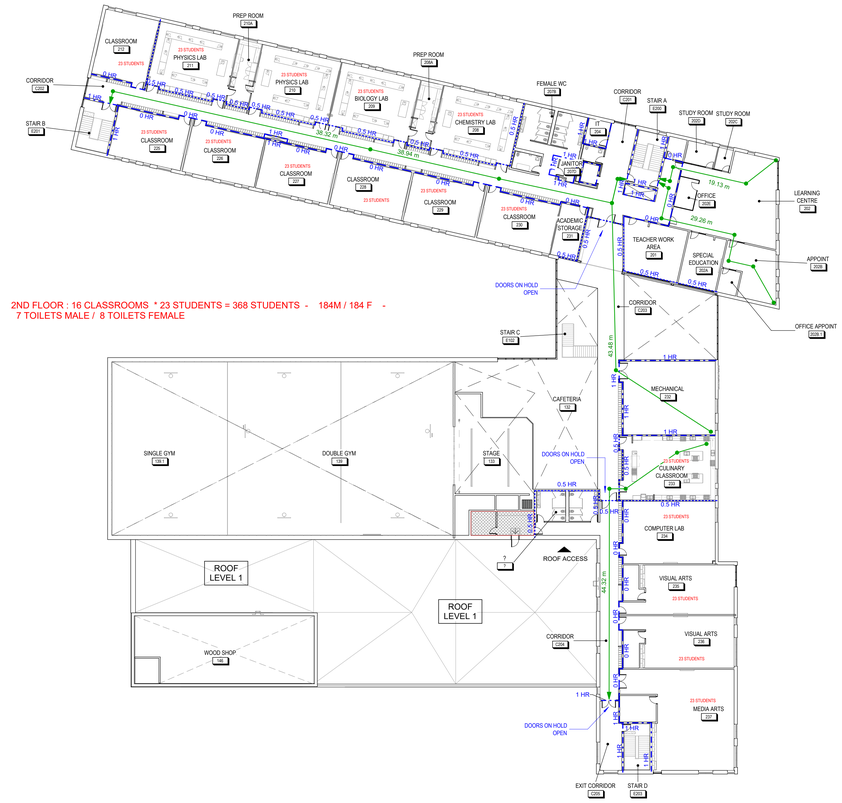
NOTES:

1. ALL FLOOR ASSEMBLIES TO HAVE A FRR OF 1 HR.
2. ALL LOADBEARING STRUCTURAL ELEMENTS TO HAVE A FRR OF 1 HR.
3. REFER TO TYPICAL DETAILS FOR 1HR FRR PROTECTION OF TYPICAL HSS COLUMNS.
4. USE FIRE RATED GYPSUM BOARD FOR ALL FIRE RATED WALLS.
5. FIRE SEPARATION WALLS TO EXTEND TO U/S OF FLOOR / ROOF DECK. SEAL PERIMETER, AND ALL PENETRATIONS.
6. NO PENETRATION OR FIXTURE INSTALLATION ALLOWED INTO THE FIRE RATED WALLS OF EXITS UNO



GROUND FLOOR : 21 CLASSROOMS * 23 STUDENTS = 483 STUDENTS - 242 M / 242 F - 8 TOILETS MALE / 9.3 TOILETS FEMALE
12 FUTURE PORTABLE * 23 STUDENTS = 276 STUDENTS - 138 M / 138 F - 5 TOILETS MALE / 6 TOILETS FEMALE

1 / A015 LEVEL 1 LIFE SAFETY
1 : 300



2ND FLOOR : 16 CLASSROOMS * 23 STUDENTS = 368 STUDENTS - 184M / 184 F -
7 TOILETS MALE / 8 TOILETS FEMALE

2 / A015 LEVEL 2 LIFE SAFETY
1 : 300

Écoles catholiques Centre-Est

no.	date	revision / issue	by
3	May 9th 2025	Issued for 66% Client Review	
1	March 14th 2025	Issued for 33% Client Review	

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consultant

northpoint

professional stamp

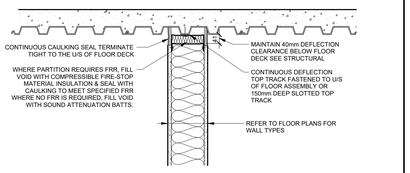
project title
NEW CATHOLIC HIGH SCHOOL RIVERSIDE SOUTH
Manotick — Ontario

drawing title
LIFE SAFETY PLANS

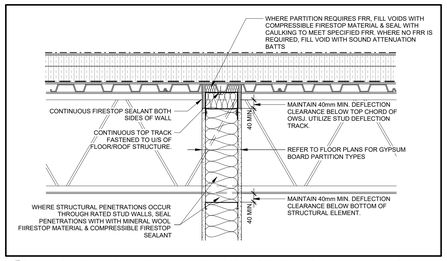
date	MAY 28 2025
scale	Comme indiqué
drawn	DH
approved	CJ/PD/PR
plot date	03/19/13

job. no. **240097**
drawing no. **A015**

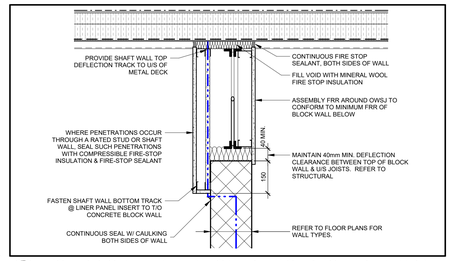
1. DO NOT SCALE FROM THIS DRAWING
2. CONTRACTOR TO VERIFY ALL DIMENSIONS AND NOTIFY THE ARCHITECT OF ANY DISCREPANCIES BEFORE WORK COMMENCES
3. THIS DRAWING TO BE READ IN CONJUNCTION WITH THE FOLLOWING DRAWINGS: STRUCTURAL, MECHANICAL, ELECTRICAL



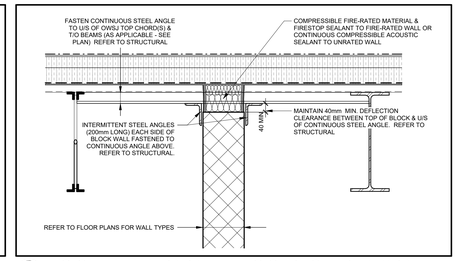
1 A020 1 : 10 STUD PARTITION TO U/SD STRUCTURE



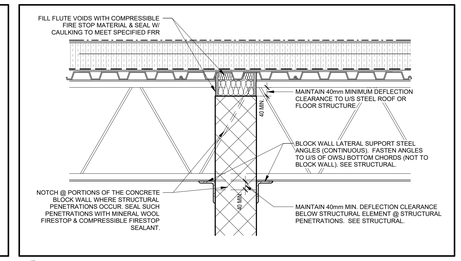
2 A020 1 : 10 STRUCTURAL PENETRATION @ STUD WALL (TYP.)



3 A020 1 : 10 T/O FRR CMU WALL ALIGNED W/ STRUCTURE (TYP.)



4 A020 1 : 10 T/O CMU WALL PARALLEL TO STRUCTURE (TYP.)



5 A020 1 : 10 STRUCTURAL PENETRATION @ FRR CMU WALL (TYP.)

6 A020 1 : 10 T/O STUD PARTITION ALIGNED W/ STRUCTURE (TYP.)

7 A020 1 : 10 STRUCTURAL PENETRATION @ STUD WALL (TYP)

8 A020 1 : 10 T/O CMU WALL ALIGNED W/ STRUCTURE (TYP.)

9 A020 1 : 10 T/O CMU WALL ADJACENT TO STRUCTURE (TYP.)

10 A020 1 : 10 STRUCTURAL PENETRARION @ FRR CMU WALL (TYP.)

ULC DESIGN # X-528 1HR

GROUND FLOOR: 37
LOCATIONS REQUIRED
SECOND FLOOR: 34
LOCATIONS REQUIRED

GRIDLINES INTERSECTIONS:
D/3 - D/5 - D/6 - D/7 - D/8 - D/9 - D/10 - D/12 - D/13 - D/14 - D/15 - D/17 - D/18 - D/21 - D/22

E/2 - E/4 - E/5 - E/6 - E/7 - E/8 - E/9 - E/10 - E/11 - E/13 - E/14 - E/15 - E/16 - E/18 - E/20 - E/22 - E/23 - E/24 - E/25

11 A020 1 : 10 TYP. FRR ENCLOSURE - INTERIOR COLUMN

ULC DESIGN # X-528 1HR

GROUND FLOOR: 8
LOCATIONS REQUIRED

GRIDLINES INTERSECTIONS:
A/24x - A/26x - A/27 - Ax/27 - B/27 - Dx/27 - Ex/27 - F/27

12 A020 1 : 10 FRR ENCLOSURE - EXTERIOR COLUMNS @ ADMIN

Écoles catholiques Centre-Est

no.	date	revision / issue	by
3	May 9th 2025	Issued for 66% Client Review	

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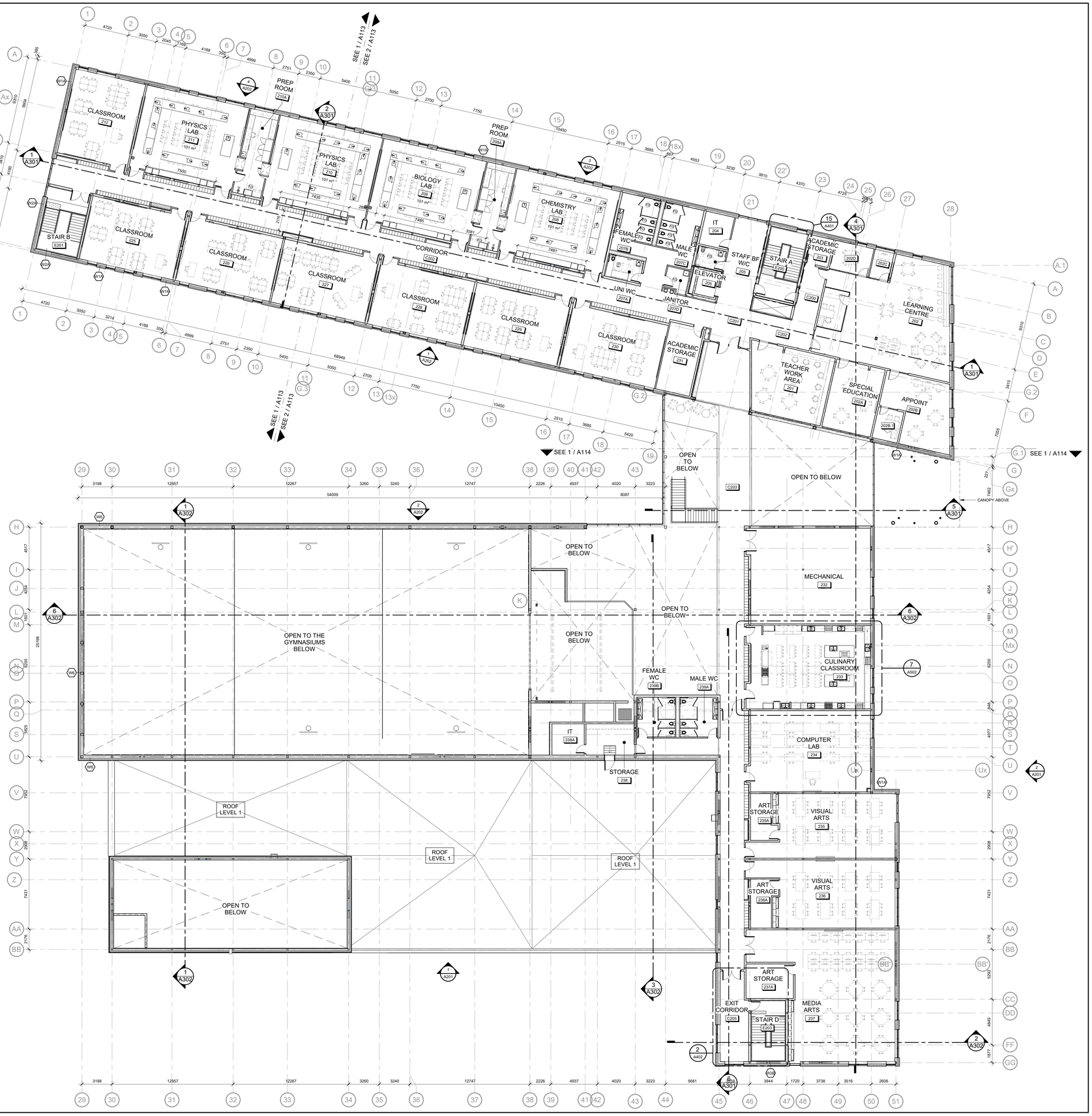
professional stamp

project title
NEW CATHOLIC HIGH SCHOOL RIVERSIDE SOUTH
Manotick Ontario

drawing title
TYPICAL DETAILS

date MAY 28 2025	job. no. 240097
scale 1 : 10	
drawn JG	drawing no. A020
approved CJ/PD/PR	
plot date 03/19/13	

1. DO NOT SCALE FROM THIS DRAWING
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1 / A102 SECOND FLOOR PLAN - OVERALL
1 : 150

GENERAL NOTES

1. DO NOT SCALE THIS DRAWING.
2. ALL DIMENSIONS ARE IN MILLIMETERS EXCEPT GRADE, FLOOR ELEVATIONS AND PROPERTY LINE DIMENSIONS (SHOWN IN METERS).
3. ALL DIMENSIONS ARE TO FACE OF METAL STUDS, CONCRETE BLOCK, CONCRETE, OR GRIDLINE, UNLESS NOTED OTHERWISE.
4. EXTEND ALL INTERIOR PARTITIONS TO UNDERSIDE OF STEEL DECK, UNLESS OTHERWISE NOTED.
5. REFER TO TYPICAL TOP-OF-WALL DETAILS FOR CLOSURES TO SUIT PARTITION-TO-STRUCTURE RELATIONSHIPS.
6. REFER TO LIFE SAFETY PLANS FOR LOCATION OF FIRE RATED INTERIOR WALLS. USE TYPE "X" GYPSUM BOARD FOR ALL FIRE-RATED PARTITIONS.
7. NON-RATED FIRE SEPARATIONS - EXTEND ENTIRE ASSEMBLY TO U/S OF FLOOR / ROOF DECK, SEAL PERIMETER AND ALL PENETRATIONS.
8. PROVIDE CONTINUOUS FIRESTOP SEALANT AT ALL JUNCTIONS BETWEEN RATED PARTITIONS, BULKHEADS, AND ALL OTHER BUILDING ASSEMBLIES.
9. REFER TO THE PARTITION TYPE LEGEND TO IDENTIFY ACOUSTIC PARTITIONS (NOTED WITH STC RATINGS). TOP-OF-WALL CLOSURES FOR THESE PARTITIONS INCLUDE ACOUSTIC INSULATION.
10. CONFIRM LOCATIONS OF BEAMS, JOISTS, AND BRACES WITH STRUCTURAL DRAWINGS.
11. PROVIDE SPRAY APPLIED FIREPROOFING TO PROTECT ALL HORIZONTAL STRUCTURAL ELEMENTS SUPPORTING LEVEL 2 AND LEVEL 3 FLOOR ASSEMBLIES TO ACHIEVE A FIRE RESISTANCE RATING, UNLESS NOTED OTHERWISE. REFER TO LIFE SAFETY PLANS FOR LOCATIONS AND RATINGS.
12. ENSURE THE INTEGRITY OF THE SPECIFIED FIRE RESISTANCE RATING AT JUNCTIONS / INTERSECTIONS OF ALL PARTITIONS WITH A FIRE RESISTANCE RATING. PROVIDE FIRESTOP MATERIAL AT JUNCTIONS AS REQUIRED.
13. WHERE RATED DEFLECTION ASSEMBLIES ARE REQUIRED, ULC NUMBERS OR EJ# (ENGINEERING JUDGEMENTS) MUST BE PROVIDED FOR REVIEW, PER THE PROJECT SPECIFICATIONS.
14. INSTALL WATER RESISTANT GYPSUM BOARD THROUGHOUT ON ALL METAL STUD PARTITIONS IN WASHROOMS, SHOWERS, AND JANITOR'S CLOSETS.
15. ALIGN WALL SURFACES AT ALL JUNCTIONS BETWEEN GYPSUM WALL PARTITIONS AND ALL OTHER WALL ASSEMBLIES. ALIGN SURFACES ON CORRIDOR, ROOM, OR LOBBY SIDE AS PER THE CONTRACT DOCUMENTS. CONSULT WITH ARCHITECT PRIOR TO INSTALLATION IN EVENT OF DISCREPANCY.
16. PROVIDE ACOUSTIC CAULKING AT ALL JOINTS, JUNCTIONS AND PENETRATIONS, INCLUDING MECHANICAL AND ELECTRICAL, TO WALL ASSEMBLIES WITH STC RATING (WITH SOUND ATTENUATION INSULATION IN CAVITIES).
17. METAL STUD PARTITIONS: INSTALL CONCEALED SOLID WOOD BLOCKING FOR ANCHORAGE OF GUARD RAILS, RECESSED OR SEMI-RECESSED WALL MOUNTED EQUIPMENT, FIXTURES, SMART BOARDS, WHITE BOARDS, MILLWORK AND WASHROOM ACCESSORIES.
18. WALL TAG DENOTES WALL TYPE INCLUDING WALL PORTIONS ON ALL SIDES OF, ABOVE, AND BELOW DOORS (WHERE APPLICABLE), WINDOWS, LOUVERS, GLAZED SCREENS, CURTAINWALL AND ALL FRAMED ELEMENTS WITHIN WALL, UNLESS NOTED OTHERWISE.
19. PROVIDE GYPSUM BOARD CONTROL JOINTS AT ALL GYPSUM ASSEMBLIES PER SPECIFICATIONS. ALIGN MASONRY AND GYPSUM BOARD PARTITION JOINTS VERTICALLY.
20. MECHANICAL AND ELECTRICAL ELEMENTS SHOWN ON ARCHITECTURAL PLANS ARE FOR COORDINATION PURPOSES ONLY. REFER TO CONTRACT DOCUMENTS PER EACH DISCIPLINE FOR SPECIFICATIONS AND EXACT LOCATIONS. IN EVENT OF DISCREPANCY, CONTACT ARCHITECT PRIOR TO INSTALLATION.
21. ALL LOOSE FURNISHINGS INDICATED ARE N.I.C. (NOT IN CONTRACT).
22. OVERHEAD DOORS TO EMPLOY MAXIMUM LIFT WITHIN HEADROOM AVAILABLE, UNLESS OTHERWISE NOTED. PROVIDE 4 BOLLARDS PER OVERHEAD DOOR, 2 INSIDE AND 2 OUTSIDE.
23. AT ALL LOCATIONS WHERE FLOOR SLOPES TO DRAINS ARE INDICATED, DRAINS SHALL BE LOCATED AT ELEVATION -25mm
24. ALL SHOP EQUIPMENT INDICATED ARE N.I.C. (NOT IN CONTRACT).
25. ALL MECHANICAL CHASES ARE TO BE WALL TYPE P1b EXCEPT NOTED OTHERWISE.
26. ALL EXPOSED BLOCK EDGES TO BE BULLNOSE BLOCK UNLESS OTHERWISE NOTED.
27. FOR GROUT FILLING AND REINFORCEMENT DETAILS OF CONCRETE BLOCK WALLS, REFER TO STRUCTURAL DRAWINGS.
28. PROVIDE AND INSTALL EXPANSION JOINT COVER AT FLOORS, INTERIOR PARTITIONS AND GYPSUM BOARD CEILING WHERE APPLICABLE, COLOR TO MATCH ADJACENT FINISHED SURFACES.
29. PROVIDE REQUIRED FIRE PROTECTION TO ALL COLUMNS AT LEVEL 1 AND LEVEL 2 AS INDICATED ON THE FLOOR PLANS. MINIMUM FIRE PROTECTION OF 1HR AS PRESCRIBED BY OBC 2012.
30. BLOCK WALL START CORNERS ARE INDENTIFIED ON THE PLAN. INFORM THE ARCHITECT BEFORE CHANGING ANY START CORNER.
31. REFER TO PARTIAL PLANS AND/OR BLOW-UPS FOR MORE GENERAL ANNOTATION AND DIMENSIONS.

ASSEMBLY TYPE NOTES

1. DIMENSION LINES ARE TAKEN FROM GRIDLINES, FACE OF STUDS, AND FACE OF BLOCK WALLS, UNLESS OTHERWISE NOTED.
2. REFER TO LIFE SAFETY PLANS FOR LOCATION AND RATING OF FIRE RATED WALLS. USE FIRE-RATED GYPSUM BOARD FOR ALL FIRE RATED WALLS.
3. IN ALL CORRIDORS WITH EXPOSED GYPSUM WALL BOARD ASSEMBLY (NOT REQUIRED BEHIND LOCKERS), INSTALL ABUSE-RESISTANT TYPE X GYPSUM BOARD FROM TOP OF SLAB TO 2400mm AFF ON CORRIDOR SIDE. COMPLETE ASSEMBLY ABOVE 2400mm AFF WITH TYPE X GWB OF EQUAL THICKNESS TO UNDERSIDE OF SLAB.
4. INSTALL ABUSE-RESISTANT GYPSUM BOARD ON ALL GYPSUM BOARD CLAD COLUMNS.
5. REFER TO ROOM FINISH SCHEDULE FOR FINISHES OF WALLS AND FLOORS.
6. INSTALL WATER RESISTANT GYPSUM BOARD THROUGHOUT ON ALL METAL STUD PARTITIONS IN WASHROOMS, SHOWERS, AND JANITOR'S CLOSETS.
7. FOR GROUT FILLING AND REINFORCEMENT DETAILS OF CONCRETE BLOCK WALLS, REFER TO STRUCTURAL DRAWINGS.
8. ALL EXPOSED BLOCK EDGES TO BE BULLNOSE BLOCK UNLESS OTHERWISE NOTED.
9. ALL MECHANICAL CHASES ARE TO BE WALL TYPE P1b EXCEPT NOTED OTHERWISE.
10. PROVIDE 152mm METAL STUDS AT RECESSED FIRE EXTINGUISHER CABINETS UNLESS NOTED OTHERWISE.
11. INSTALL BATT INSULATION IN ACOUSTIC PARTITIONS ON THE OPPOSITE SIDE OF PLUMBING PENETRATIONS AND ON THE OPPOSITE SIDE OF ELECTRICAL PENETRATION WHERE APPLICABLE, UNLESS NOTED OTHERWISE.
12. PROVIDE A 610x1220mm 19mm THICK PLYWOOD BACKING BETWEEN METAL STUDS BEHIND SMART BOARDS, TELEVISIONS, WHITE BOARDS AND TACKBOARDS AND INSTALLED IN THE SAME ORIENTATION AS THE EQUIPMENT. EXACT LOCATION TO BE CONFIRMED ON SITE WITH THE OWNER.

EXTERIOR WALL ASSEMBLIES

W1A
90mm MASONRY
25mm AIR SPACE
152mm (2 X 76mm) SEMI-RIGID INSULATION (R24 MIN.)
SELF ADHERED AIR/VAPOUR BARRIER ME20
16mm EXTERIOR SHEATHING
152mm STRUCTURAL STEEL STUDS (SPACING AND SIZE ACCORDING TO CALCULATIONS, SEE SPECIFICATIONS) W/ 50mm SEMI-RIGID ROCK WOOL INSULATION (MAX R8)
16mm GYPSUM BOARD

W1B
90mm MASONRY
25mm AIR SPACE
152mm (2 X 76mm) SEMI-RIGID INSULATION (R24 MIN.)
SELF ADHERED AIR/VAPOUR BARRIER ME20
16mm EXTERIOR SHEATHING
203mm STRUCTURAL STEEL STUDS (SPACING AND SIZE ACCORDING TO CALCULATIONS, SEE SPECIFICATIONS)
50mm SEMI-RIGID ROCK WOOL INSULATION (MAX R8)
16mm GYPSUM BOARD

W2A
90mm MASONRY
25mm AIR SPACE
152mm (2 X 76mm) SEMI-RIGID INSULATION (R24 MIN.)
SELF ADHERED AIR/VAPOUR BARRIER ME20
16mm EXTERIOR SHEATHING
152mm STRUCTURAL STEEL STUDS (SPACING AND SIZE ACCORDING TO CALCULATIONS, SEE SPECIFICATIONS) 50mm SEMI-RIGID ROCK WOOL INSULATION (MAX R8)
16mm GYPSUM BOARD
50mm CONCRETE MASONRY BLOCK

W2B
90mm MASONRY
25mm AIR SPACE
152mm (2 X 76mm) SEMI-RIGID INSULATION (R24 MIN.)
SELF ADHERED AIR/VAPOUR BARRIER ME20
16mm EXTERIOR SHEATHING
203mm STRUCTURAL STEEL STUDS (SPACING AND SIZE ACCORDING TO CALCULATIONS, SEE SPECIFICATIONS)
50mm SEMI-RIGID ROCK WOOL INSULATION (MAX R8)
16mm GYPSUM BOARD
50mm CONCRETE MASONRY BLOCK

W3A
ALUMINUM COMPOSITE PANEL SYSTEM
ADJUSTABLE THERMAL CLIP
152mm (2 X 76mm) SEMI-RIGID INSULATION (R24 MIN.)
SELF ADHERED AIR/VAPOUR BARRIER ME20
16mm EXTERIOR SHEATHING
152mm STRUCTURAL STEEL STUDS (SPACING AND SIZE ACCORDING TO CALCULATIONS, SEE SPECIFICATIONS)
W/ 50mm SEMI-RIGID ROCK WOOL INSULATION (R8)
16mm GYPSUM BOARD

W3B
ALUMINUM COMPOSITE PANEL SYSTEM
ADJUSTABLE THERMAL CLIP
152mm (2 X 76mm) SEMI-RIGID INSULATION (R24 MIN.)
SELF ADHERED AIR/VAPOUR BARRIER ME20
16mm EXTERIOR SHEATHING
203mm STRUCTURAL STEEL STUDS (SPACING AND SIZE ACCORDING TO CALCULATIONS, SEE SPECIFICATIONS)
W/ 50mm SEMI-RIGID ROCK WOOL INSULATION (R8)
16mm GYPSUM BOARD

W4A
ALUMINUM COMPOSITE PANEL SYSTEM
ADJUSTABLE THERMAL CLIP
152mm (2 X 76mm) SEMI-RIGID INSULATION (R24 MIN.)
SELF ADHERED AIR/VAPOUR BARRIER ME20
16mm EXTERIOR SHEATHING
152mm STRUCTURAL STEEL STUDS (SPACING AND SIZE ACCORDING TO CALCULATIONS, SEE SPECIFICATIONS)
W/ 50mm SEMI-RIGID ROCK WOOL INSULATION (R8)
16mm GYPSUM BOARD
50mm CONCRETE MASONRY BLOCK

W4B
ALUMINUM COMPOSITE PANEL SYSTEM
ADJUSTABLE THERMAL CLIP
152mm (2 X 76mm) SEMI-RIGID INSULATION (R24 MIN.)
SELF ADHERED AIR/VAPOUR BARRIER ME20
16mm EXTERIOR SHEATHING
203mm STRUCTURAL STEEL STUDS (SPACING AND SIZE ACCORDING TO CALCULATIONS, SEE SPECIFICATIONS)
W/ 50mm SEMI-RIGID ROCK WOOL INSULATION (R8)
16mm GYPSUM BOARD
50mm CONCRETE MASONRY BLOCK

W5B
38mm PREFINISHED VERTICAL METAL SIDING
WEATHER BARRIER
ADJUSTABLE THERMAL CLIP
152mm (2 X 76mm) SEMI-RIGID INSULATION (R24 MIN.)
SELF ADHERED AIR/VAPOUR BARRIER ME20
16mm EXTERIOR SHEATHING
203mm STRUCTURAL STEEL STUDS (SPACING AND SIZE ACCORDING TO CALCULATIONS, SEE SPECIFICATIONS) W/ 50mm SEMI-RIGID ROCK WOOL INSULATION (R8)
16mm GYPSUM BOARD
50mm CONCRETE MASONRY BLOCK

W6
38mm PREFINISHED VERTICAL METAL SIDING
WEATHER BARRIER
ADJUSTABLE THERMAL CLIP
152mm (2 X 76mm) SEMI-RIGID INSULATION (R24 MIN.)
SELF ADHERED AIR/VAPOUR BARRIER ME20
16mm EXTERIOR SHEATHING
16mm GYPSUM BOARD
152mm STEEL STUDS @ 400mm O.C.
W/ 50mm SEMI-RIGID ROCK WOOL INSULATION (R8)
20mm AIR SPACE
152mm STEEL STUDS @ 400mm O.C
16mm GYPSUM BOARD

W7
90mm MASONRY
25mm AIR SPACE
152mm (2 X 76mm) SEMI-RIGID INSULATION (R24 MIN.)
SELF ADHERED AIR/VAPOUR BARRIER ME20
16mm EXTERIOR SHEATHING
152mm STEEL STUDS @ 400mm O.C.
W/ 50mm SEMI-RIGID ROCK WOOL INSULATION (R8)
20mm AIR SPACE
152mm STEEL STUDS @ 400mm O.C
16mm GYPSUM BOARD
50mm CONCRETE MASONRY BLOCK

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no.	date	revision / issue	by
4	June 17th 2025	Issued for Site Plan Control R1	
3	May 9th 2025	Issued for 66% Client Review	
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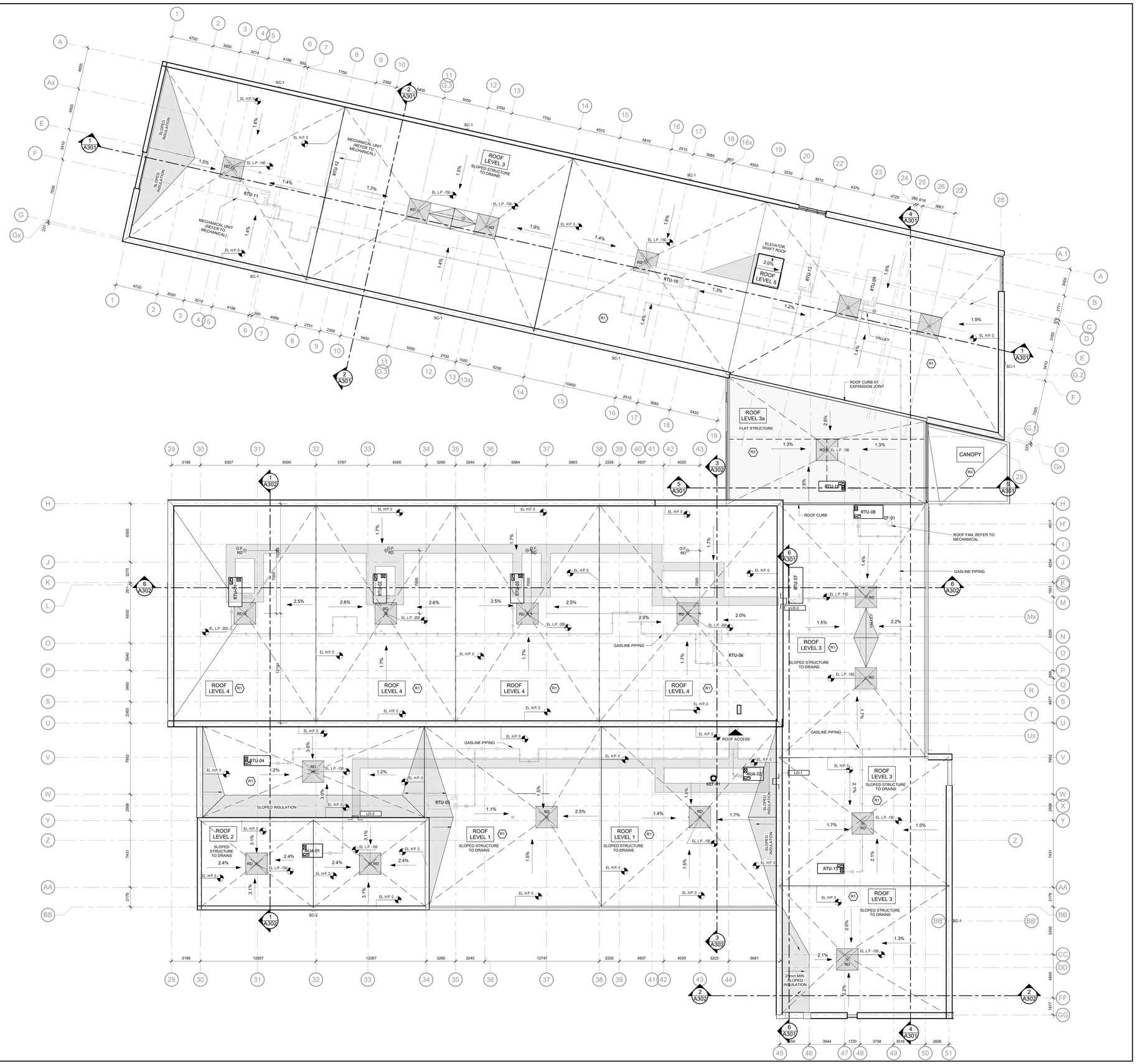
professional stamp

project title
NEW CATHOLIC HIGH SCHOOL RIVERSIDE SOUTH
Manotick Ontario

drawing title
SECOND FLOOR - OVERALL

date	MAY 28 2025	job. no.	240097
scale	Comme indiqué		
drawn	JG	drawing no.	A102
approved	CJ/PD/PR		
plot date	01/09/25		

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1 ROOF PLAN
A103 1 : 150

GENERAL NOTES:

1. MECHANICAL AND ELECTRICAL EQUIPMENT IS SHOWN FOR COORDINATION PURPOSES ONLY. REFER TO CONTRACT DOCUMENTS FOR EACH DISCIPLINE FOR SPECIFICATIONS AND EXACT LOCATIONS.
2. COORDINATE WITH MECHANICAL DRAWINGS FOR LOCATION AND SIZE OF ALL OPENINGS THROUGH ROOF DECK.
3. FOR ROOF DETAILS REFEREE TO DRAWING A310

LEGEND

- RD — ROOF DRAIN IN 2400mm SUMP (25mm DEPRESSION IN INSULATION)
- 1m WIDE WALKWAY TRAFFIC MEMBRANE ON TPOP OF ROOF ASSEMBLY - CONTRASTING COLOUR
- LD-# — ROOF LADDER
- SCUPPER, REFER TO SHEET A310
- EF - # — EXHAUST FAN
- FCU-# / RTU-# — ROOF TOP UNIT, MECHANICAL TO PROVIDE SUPPORT TYPE, CONCRETE TOPPING TO BE PROVIDED BELLOW ALL ROOF TOP UNITS (RTUs & FCUs) AS INDICATED ON STRUCTURAL DRAWINGS.
- SLOPED TOP INSULATION
- # % — SLOPE TO ROOF DRAIN. PERCENTAGES INDICATED ARE FROM HORIZONTAL PLANE.
- 450x450x65 PRECAST CONCRETE PAVER
- R.A. — WINDOW WASHING ROOF ANCHORS. QUANTITY & LOCATION OF ROOF ANCHORS TO MEET CAN/CSA-Z91 "HEALTH AND SAFETY CODE FOR SUSPENDED EQUIPMENT OPERATIONS" SEE DETAIL 18 / A310 FOR DETAILS.
- ROOF CRICKET

ROOF ASSEMBLIES

R1 — MAIN ROOF - SLOPED ROOF STRUCTURE

EXTERIOR

2-PLY SBS MODIFIED BITUMEN ROOFING MEMBRANE
6mm INSULATION PROTECTION BOARD
SLOPED POLYISOCYANURATE INSULATION CRICKETS TO ROOF DRAIN
168mm (2 LAYERS 84mm) POLYISOCYANURATE, STRAGGERED ROOF INSULATION (R40)
AIR/VAPOUR BARRIER MEMBRANE
13mm DECK SHEATHING BOARD
STEEL DECK ON STRUCTURAL FRAMING (SEE STRUCTURAL)

INTERIOR

R2 — CANOPY ROOF

EXTERIOR

2-PLY SBS MODIFIED BITUMEN ROOFING MEMBRANE
6mm INSULATION PROTECTION BOARD
SLOPED POLYISOCYANURATE INSULATION TO SCUPPERS
STEEL DECK ON STRUCTURAL FRAMING (SEE STRUCTURAL)

INTERIOR

R3 — FLAT ROOF STRUCTURE

EXTERIOR

3-PLY SBS MODIFIED BITUMEN ROOFING MEMBRANE
3mm INSULATION PROTECTION BOARD
SLOPED POLYISOCYANURATE INSULATION CRICKETS TO ROOF DRAIN
168mm (2 LAYERS 84mm) POLYISOCYANURATE, STRAGGERED ROOF INSULATION (R40)
AIR/VAPOUR BARRIER MEMBRANE
62mm CONCRETE TOPPING @ MECHANICAL UNIT, REFER TO STRUCTURE FOR EXTENT
13mm DECK SHEATHING BOARD
STEEL DECK ON STRUCTURAL FRAMING (SEE STRUCTURAL)

INTERIOR

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NEW CATHOLIC HIGH SCHOOL RIVERSIDE SOUTH

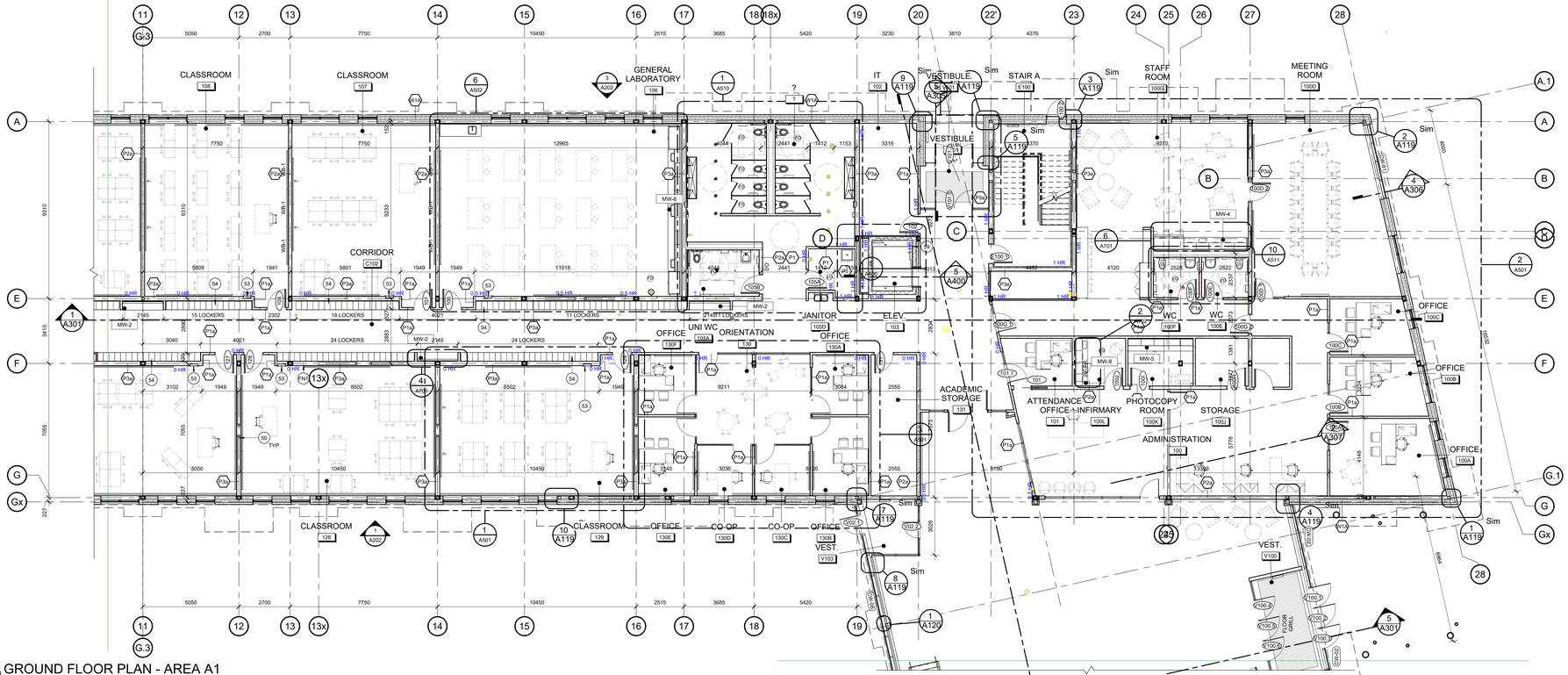
Manotick Ontario

drawing title

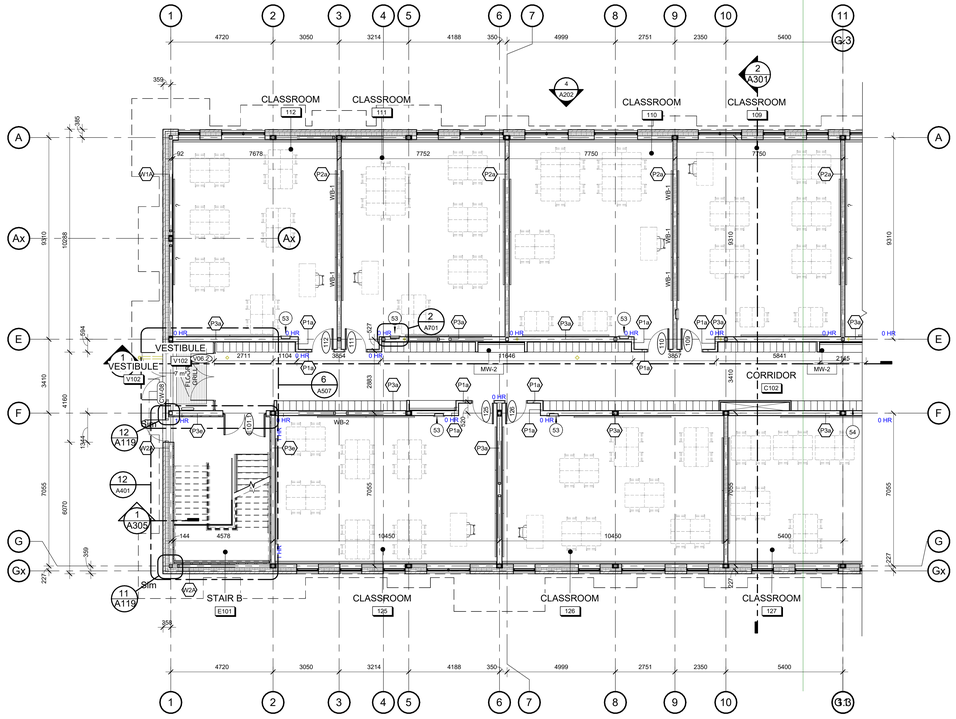
ROOF PLAN - OVERALL

date	MAY 28 2025	job. no.	240097
scale	Comme indiqué	drawing no.	A103
drawn	JG		
approved	CJ/PD/PR		
plot date	03/19/13		

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2 GROUND FLOOR PLAN - AREA A1
A111 1 : 100



1 GROUND FLOOR PLAN - AREA A2
A111 1 : 100

ASSEMBLY TYPE NOTES

1. DIMENSIONS ARE TAKEN FROM GRIDLINES, FACE OF STUDS, AND FACE OF BLOCK WALLS, UNLESS OTHERWISE NOTED.
2. REFER TO LIFE SAFETY PLANS FOR LOCATION AND RATING OF FIRE RATED WALLS. USE FIRE-RATED GYPSUM BOARD FOR ALL FIRE RATED WALLS.
3. IN ALL CORRIDORS WITH EXPOSED GYPSUM WALL BOARD ASSEMBLY (NOT REQUIRED BEHIND LOCKERS), INSTALL ABUSE-RESISTANT TYPE X GYPSUM BOARD FROM TOP OF SLAB TO 2400mm AFF ON CORRIDOR SIDE. COMPLETE ASSEMBLY ABOVE 2400mm AFF WITH TYPE X GWB OF EQUAL THICKNESS TO UNDERSIDE OF SLAB.
4. INSTALL ABUSE-RESISTANT GYPSUM BOARD ON ALL GYPSUM BOARD CLAD COLUMNS.
5. REFER TO ROOM FINISH SCHEDULE FOR FINISHES OF WALLS AND FLOORS.
6. INSTALL WATER RESISTANT GYPSUM BOARD THROUGHOUT ON ALL METAL STUD PARTITIONS IN WASHROOMS, SHOWERS, AND JANITOR'S CLOSETS.
7. FOR GROUT FILLING AND REINFORCEMENT DETAILS OF CONCRETE BLOCK WALLS, REFER TO STRUCTURAL DRAWINGS.
8. ALL EXPOSED BLOCK EDGES TO BE BULLNOSE BLOCK UNLESS OTHERWISE NOTED.
9. ALL MECHANICAL CHASES ARE TO BE WALL TYPE P1a EXCEPT NOTED OTHERWISE.
10. PROVIDE 152mm METAL STUDS AT RECESSED FIRE EXTINGUISHER CABINETS UNLESS NOTED OTHERWISE.
11. INSTALL BATT INSULATION IN ACOUSTIC PARTITIONS ON THE OPPOSITE SIDE OF PLUMBING PENETRATIONS AND ON THE OPPOSITE SIDE OF ELECTRICAL PENETRATION WHERE APPLICABLE, UNLESS NOTED OTHERWISE.
12. PROVIDE A 610x1220mm 19mm THICK PLYWOOD BACKING BETWEEN METAL STUDS BEHIND SMART BOARDS, TELEVISIONS, WHITE BOARDS AND TACKBOARDS AND INSTALLED IN THE SAME ORIENTATION AS THE EQUIPMENT. EXACT LOCATION TO BE CONFIRMED ON SITE WITH THE OWNER

LEGEND

NOTE: SOME OF THE SYMBOLS LISTED BELOW MAY NOT APPLY TO THIS DRAWING.

- DOOR, FRAME, AND HARDWARE, SEE DOOR SCHEDULE
- CONCRETE BLOCK WALLS
- STUD AND GYPSUM BOARD WALL
- W# — ASSEMBLY TYPE - REFER TO ASSEMBLIES
- V100 1 — DOOR NUMBER - REFER TO DOOR SCHEDULE
- Room Name 101 — ROOM NAME AND NUMBER
- GSXX X — CURTAINWALL / GLAZED SCREEN - SEE A210 SERIES FOR CURTAIN WALL ELEVATIONS AND DOOR SCHEDULE FOR GLAZED SCREEN
- MW-## — MILLWORK NUMBER - SEE A700 SERIES
- ## — KEYNOTE - SEE KEYNOTE LEGEND
- FS — FLOOR SOCKET
- DO — POWER DOOR OPERATOR - SEE DOOR SCHEDULE & ELECTRICAL
- FLOOR DRAIN - SEE MECHANICAL
- DRINKING FOUNTAIN - SEE MECHANICAL
- WB-# — WALL MOUNTED WHITEBOARD
- TV-# — WALL MOUNTED TELEVISION (N.I.C.)
- TB-# — WALL MOUNTED TACKBOARD
- AP-# — WALL MOUNTED ACOUSTIC PANEL
- MIR — WALL MOUNTED MIRROR
- EEW — EYEWASH STATION - SEE MECHANICAL
- EESH — EMERGENCY SHOWER & EYEWASH - SEE MECHANICAL
- FURNITURE N.I.C. (TYP)
- EPO — EMERGENCY POWER OFF - SEE ELEC.
- FEC — SEMI-RECESSED FIRE EXTINGUISHER CABINET, SEE MECHANICAL
- PA — PUBLIC ADDRESS SYSTEM (PA), SEE ELECTRICAL

KEYNOTE LEGEND

50
53
54
59
FN1 GYPSUM BOARD WALL, SEE FINISH PLANS & SCHEDULE

INTERIOR WALL ASSEMBLIES

NOTE: FIRE RESISTANCE RATINGS INDICATED BELOW REFLECT ULC DESIGN RATING. FOR MINIMUM FRR REQUIREMENT OF INDIVIDUAL WALLS, REFER TO LIFE SAFETY PLANS (A004).

P1		FRR: 1 HR ULC W453 STC:40 16mm GYPSUM BOARD 92mm STEEL STUDS @ 400mm O.C. 16mm GYPSUM BOARD
P1a		FRR: 1 HR ULC W407 STC:51 16mm GYPSUM BOARD 92mm STEEL STUDS @ 400mm O.C. 76mm SOUND ATTENUATION FIBRE BATTS 16mm GYPSUM BOARD
P1b		16mm GYPSUM BOARD 92mm STEEL STUDS @ 400mm O.C.
P1c		16mm GYPSUM BOARD 92mm STEEL STUDS @ 400mm O.C. 76mm SOUND ATTENUATION FIBRE BATTS
P2		FRR: 1 HR ULC W407 STC:40 16mm GYPSUM BOARD 152mm STEEL STUDS @ 400mm O.C. 16mm GYPSUM BOARD
P2a		FRR: 1 HR ULC W407 STC:51 16mm GYPSUM BOARD 152mm STEEL STUDS @ 400mm O.C. 76mm SOUND ATTENUATION FIBRE BATTS 16mm GYPSUM BOARD
P2b		16mm GYPSUM BOARD 152mm STEEL STUDS @ 400mm O.C.
P2c		16mm GYPSUM BOARD 152mm STEEL STUDS @ 400mm O.C. 76mm SOUND ATTENUATION FIBRE BATTS
P2e		FRR: 1 HR 16mm GYPSUM BOARD 152mm STEEL STUDS @ 400mm O.C. 16mm GYPSUM BOARD 50mm CONCRETE BLOCK
P2f		FRR: 1 HR 16mm GYPSUM BOARD 152mm STEEL STUDS @ 400mm O.C. 76mm SOUND ATTENUATION FIBRE BATTS 16mm GYPSUM BOARD 50mm CONCRETE BLOCK
P3		FRR: 1 HR 16mm GYPSUM BOARD 203mm STEEL STUDS @ 400mm O.C. 16mm GYPSUM BOARD
P3a		FRR: 1 HR ULC W407 STC: 56 16mm GYPSUM BOARD 203mm STEEL STUDS @ 400mm O.C. 76mm SOUND ATTENUATION FIBRE BATTS 16mm GYPSUM BOARD
P3e		FRR: 1 HR 16mm GYPSUM BOARD 203mm STEEL STUDS @ 400mm O.C. 16mm GYPSUM BOARD 50mm CONCRETE BLOCK
P4		16mm GYPSUM BOARD 64mm STEEL STUDS @ 400mm O.C.
P5		16mm GYPSUM BOARD 152mm STEEL STUDS @ 400mm O.C. 76 SOUND ATTENUATION FIBRE BATTS 25mm AIR SPACE 152mm STEEL STUDS @ 400mm O.C. 76 SOUND ATTENUATION FIBRE BATTS 16mm GYPSUM BOARD 50mm CONCRETE BLOCK
P6		FRR: 1 HR STC: 48 (OBC2024,SB-3 : Design B1a) 140mm CONCRETE BLOCK
P7		FRR: 1.5 HR STC: 50 (OBC2024,SB-3 : Design B1b) 190mm CONCRETE BLOCK
P8		FRR: 2 HR STC: 51 (ULC: U906) 240mm CONCRETE BLOCK
P9		16mm GYPSUM BOARD 92mm STEEL STUDS @ 400mm O.C. 200mm AIR SPACE 92mm STEEL STUDS @ 400mm O.C. 16mm GYPSUM BOARD
P10		16mm GYPSUM BOARD 41mm STEEL STUDS @ 400mm O.C.
P11		FRR: 1 HR ULC: W452 SYSTEM A SHAFT WALL SYSTEM 16mm GYPSUM BOARD 64mm CH STUD FRAMING @ 400mm O.C. 64mm SOUND ATTENUATION FIBRE BATTS 25mm GYPSUM LINER PANELS
P20		ACOUSTIC PARTITION - STC 68 16mm GYPSUM BOARD 16mm GYPSUM BOARD 102mm METAL STUD @ 610mm O.C. R-12 SOUND ATTENUATION FIBRE BATTS 25mm AIR SPACE R-12 SOUND ATTENUATION FIBRE BATTS 102mm METAL STUD @ 610mm O.C. 19mm SOUNDPROOFING WOOD FIBER BOARD 16mm GYPSUM BOARD
P21		ACOUSTIC PARTITION - STC 64 (TL-93-302) FRR: 1HR 16mm GYPSUM BOARD 16mm GYPSUM BOARD 92mm METAL STUD @ 400mm O.C. 75mm SOUND ATTENUATION FIBRE BATTS 13mm (min) AIR SPACE 75mm SOUND ATTENUATION FIBRE BATTS 92mm METAL STUD @ 400mm O.C. 16mm GYPSUM BOARD 16mm GYPSUM BOARD
P22		ACOUSTIC PARTITION - STC 60 (TL-94-020) FRR: 1HR 16mm GYPSUM BOARD 16mm GYPSUM BOARD 92mm METAL STUD @ 400mm O.C. 75mm SOUND ATTENUATION FIBRE BATTS 13mm RESILIENT CHANNEL @610mm O.C. 16mm GYPSUM BOARD 16mm GYPSUM BOARD

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project title

NEW CATHOLIC HIGH SCHOOL RIVERSIDE SOUTH

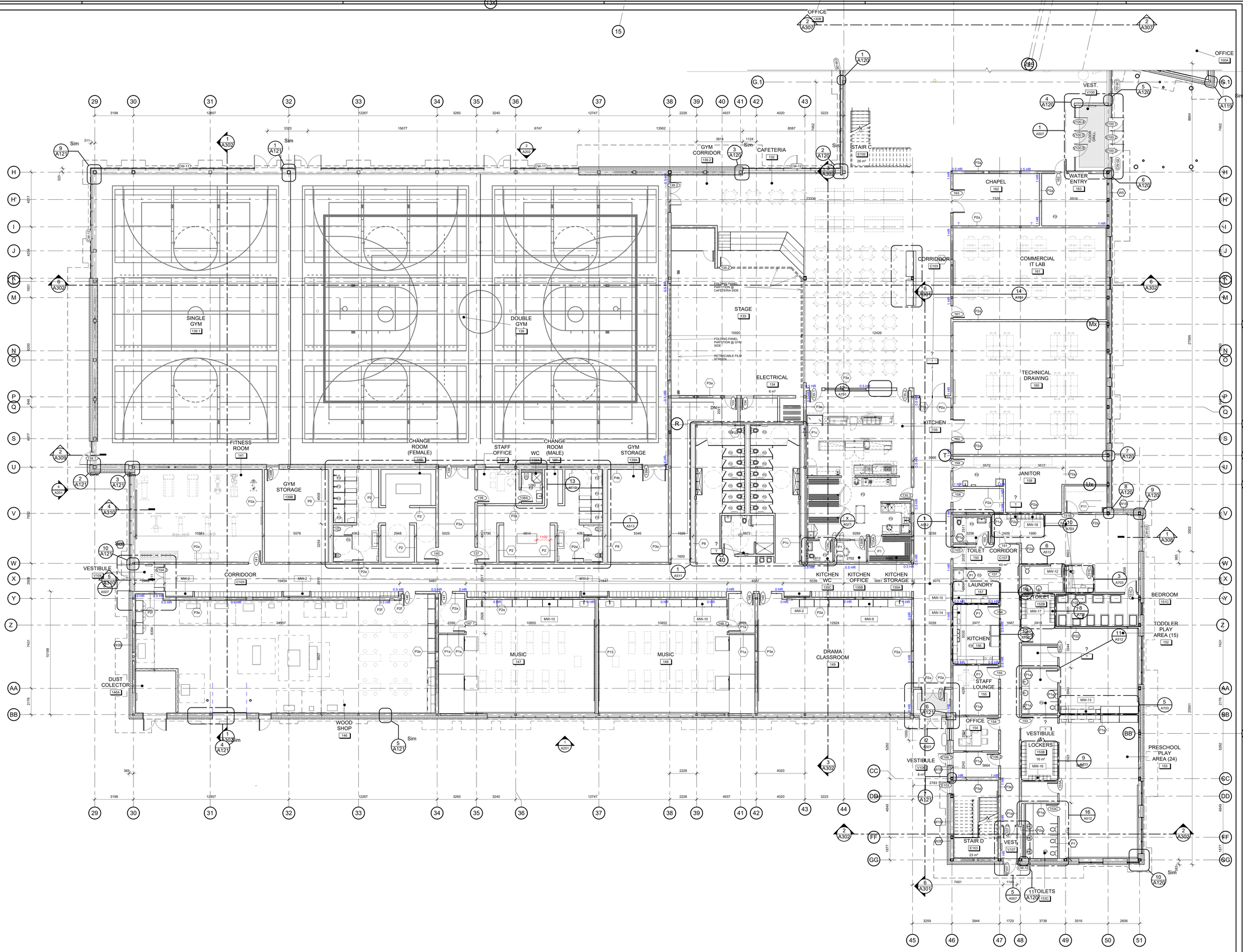
Manotick Ontario

drawing title

GROUND FLOOR PLAN - AREA A

date	MAY 28 2025
scale	Comme indiqué
drawn	JG
approved	CJ/PD/PR
plot date	01/09/25
job. no.	240097
drawing no.	A111

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1 A112 GROUND FLOOR PLAN - AREA B
1 : 100

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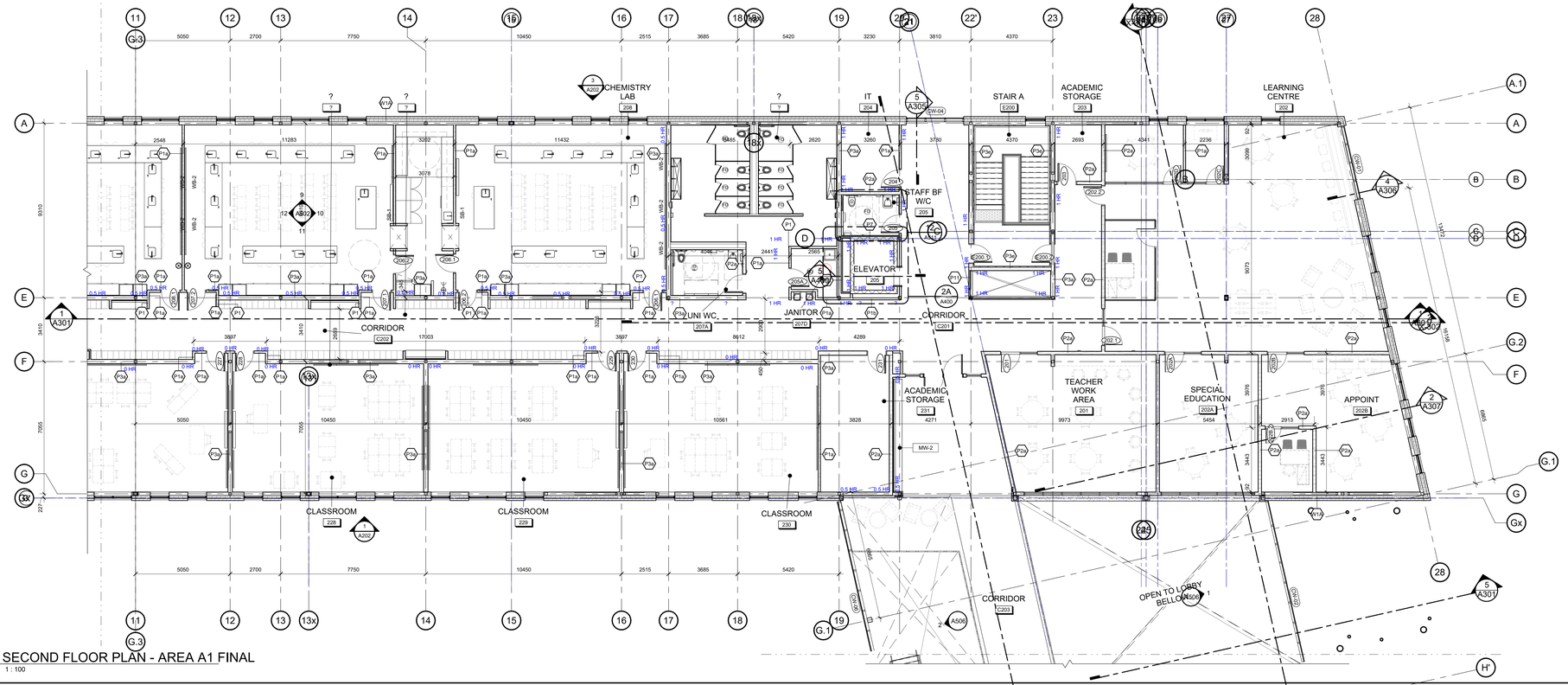
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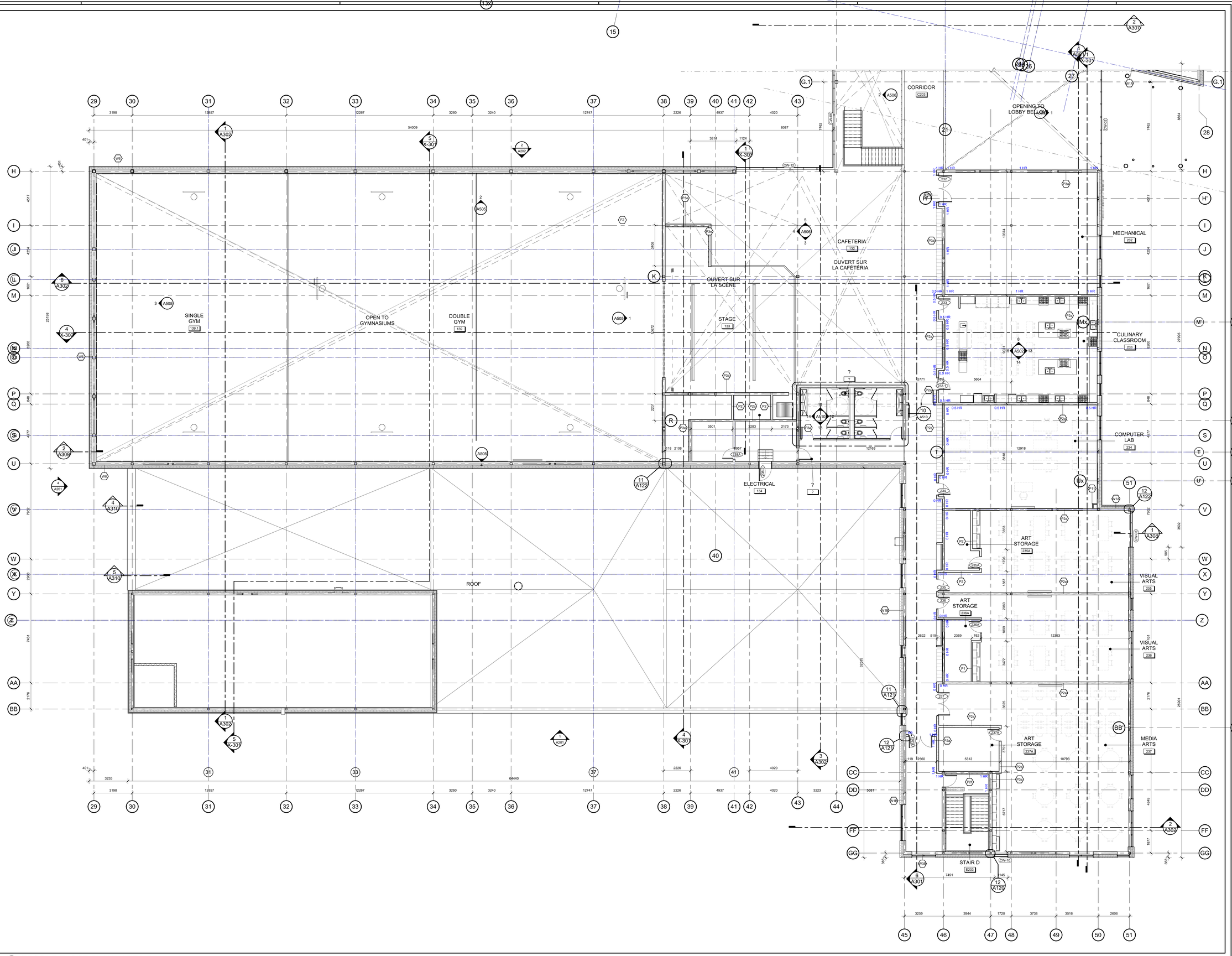
project title
NEW CATHOLIC HIGH SCHOOL RIVERSIDE SOUTH
Manotick Ontario

drawing title
GROUND FLOOR PLAN - AREA B

date	MAY 28 2025
scale	1 : 100
drawn	JG
approved	CJ/PD/PR
plot date	01/09/25
job. no.	240097
drawing no.	A112

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3. ALL WORK TO BE IN ACCORDANCE WITH THE FOLLOWING DRAWINGS: STRUCTURAL, MECHANICAL, ELECTRICAL


CHEMISTRY LAB 208
IT 204
STAIR A E200
ACADEMIC STORAGE 203
LEARNING CENTRE 202
STAFF BF W/C 205
ELEVATOR 206
UNI WC. 201A
JANITOR 201D
CORRIDOR C202
CORRIDOR E201
ACADEMIC STORAGE 231 4271
TEACHER WORK AREA 201 9973
SPECIAL EDUCATION 202A 5454
APPOINT 202B 2913
CLASSROOM 228
CLASSROOM 229
CLASSROOM 230
CORRIDOR C203
OPEN TO LOWER BELLOW
MW-2
5050
10450
2700
7750
2515
3685
5420
3230
3810
4370
11283
11432
3078
3202
2548
8310
7055
6070
3410
4100
3897
17003
8612
4289
3828
10561
9973
3443
3076
2913
5454
6989
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2390
2400



1 A114 SECOND FLOOR PLAN - AREA B
1 : 100

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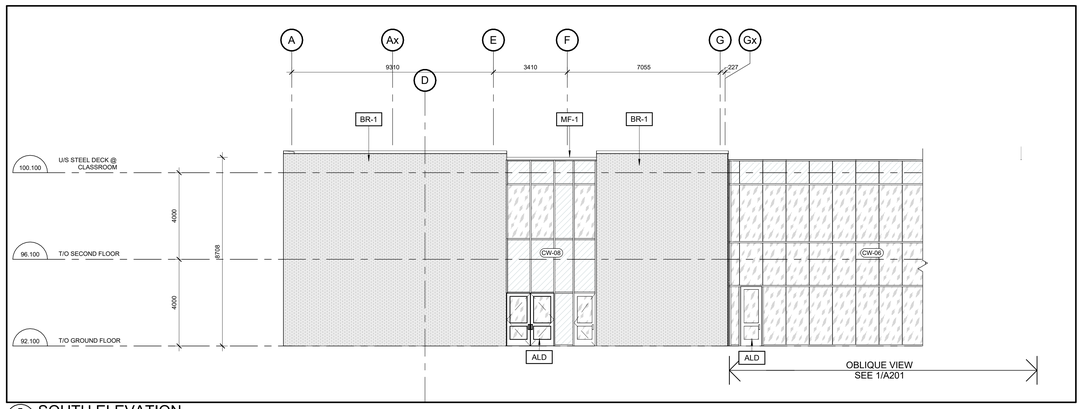
project title
NEW CATHOLIC HIGH SCHOOL RIVERSIDE SOUTH
Manotick Ontario

drawing title
SECOND FLOOR PLAN - AREA B

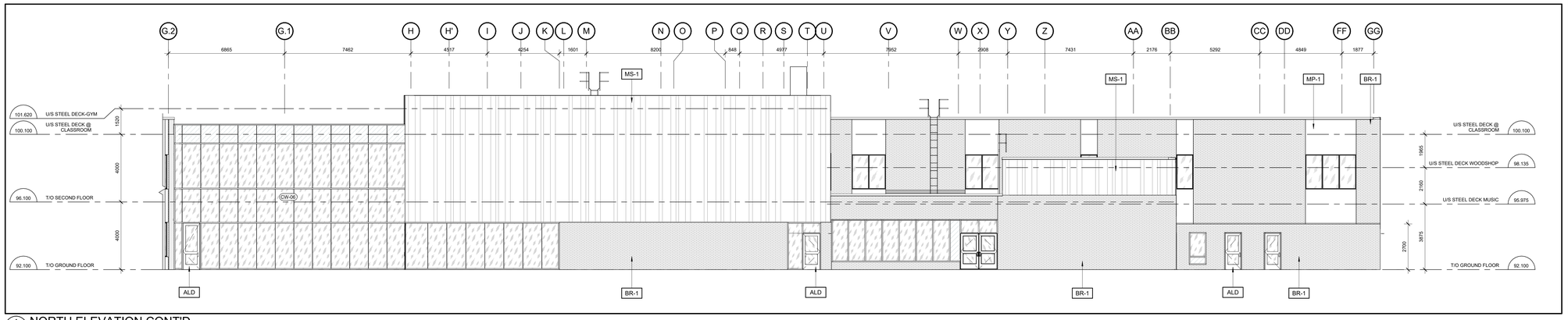
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drawn	JG
approved	CJ/PD/PR
plot date	01/09/25

job. no. **240097**
drawing no. **A114**

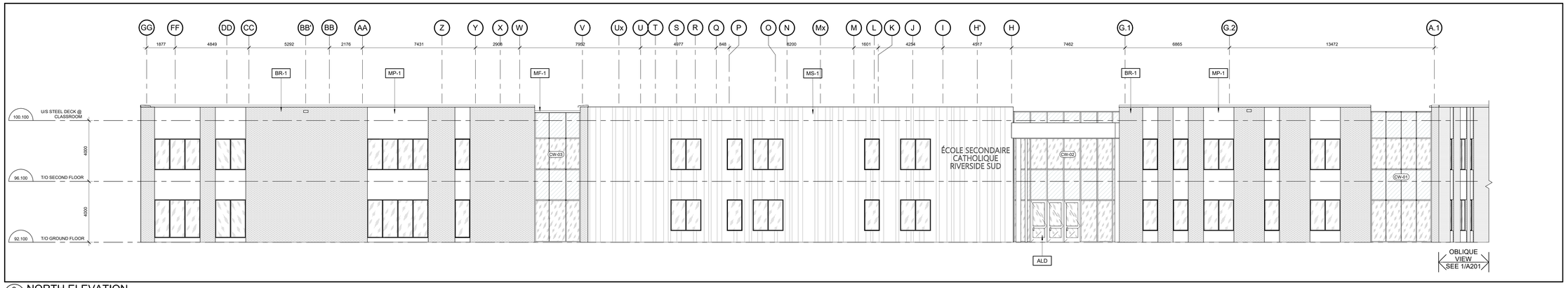
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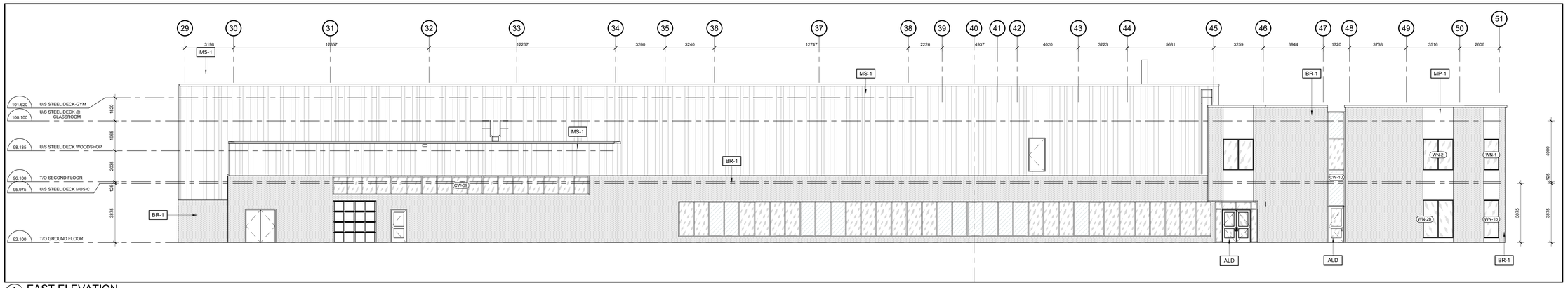
5 A201 SOUTH ELEVATION
1 : 100



4 A201 NORTH ELEVATION CONT'D
1 : 100



2 A201 NORTH ELEVATION
1 : 100



1 A201 EAST ELEVATION
1 : 100

KEYNOTE LEGENDSS

ALD	PREFINISHED ALUMINUM ENTRANCE DOOR
BR-1	BRICK TYPE 1 (HOMOGENEOUS BRICK)
MF-1	PREFINISHED METAL CAP FLASHING
MP-1	PREFINISHED METAL PANELS
MS-1	PREFINISHED METAL SIDING WITH FINS

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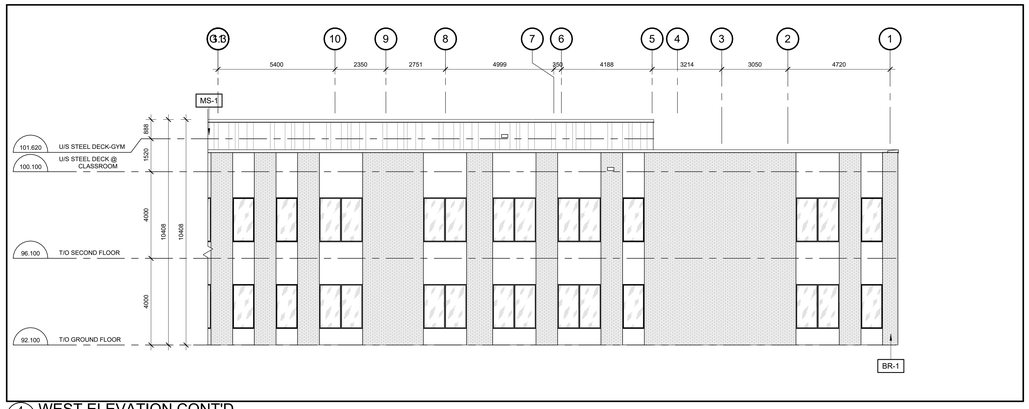
project title
NEW CATHOLIC HIGH SCHOOL RIVERSIDE SOUTH
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drawing title
BUILDING ELEVATIONS

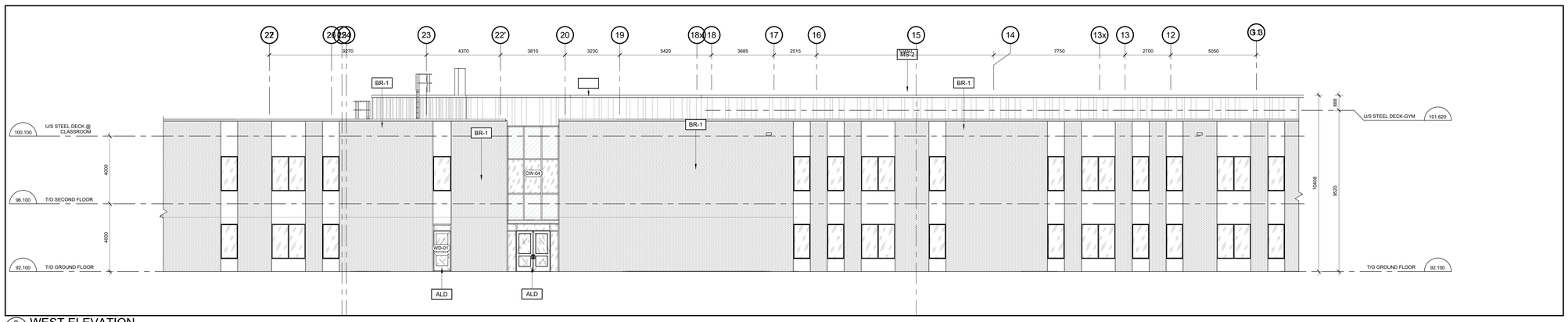
date	MAY 28 2025
scale	1 : 100
drawn	JG
approved	CJ/PD/PR
plot date	03/19/13

job. no. **240097**
drawing no. **A201**

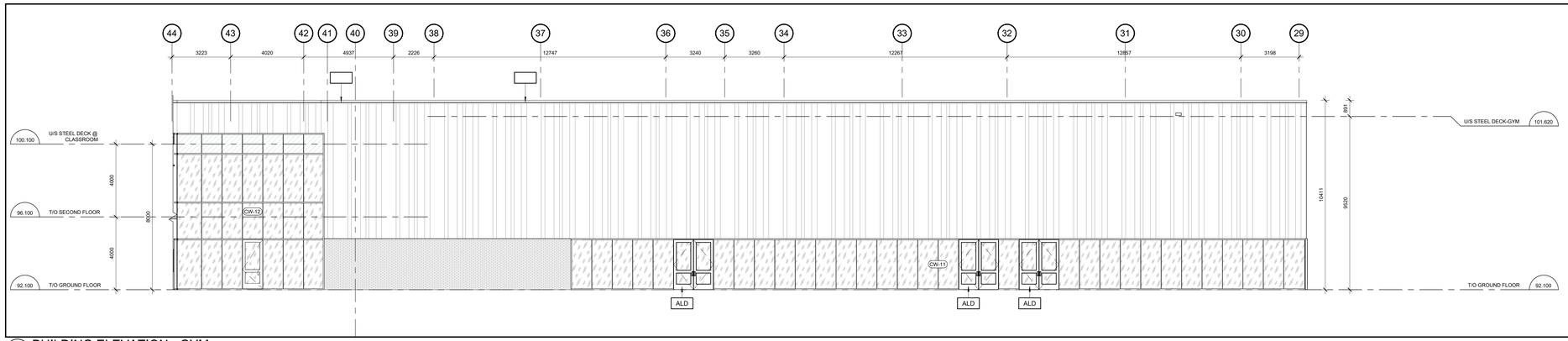
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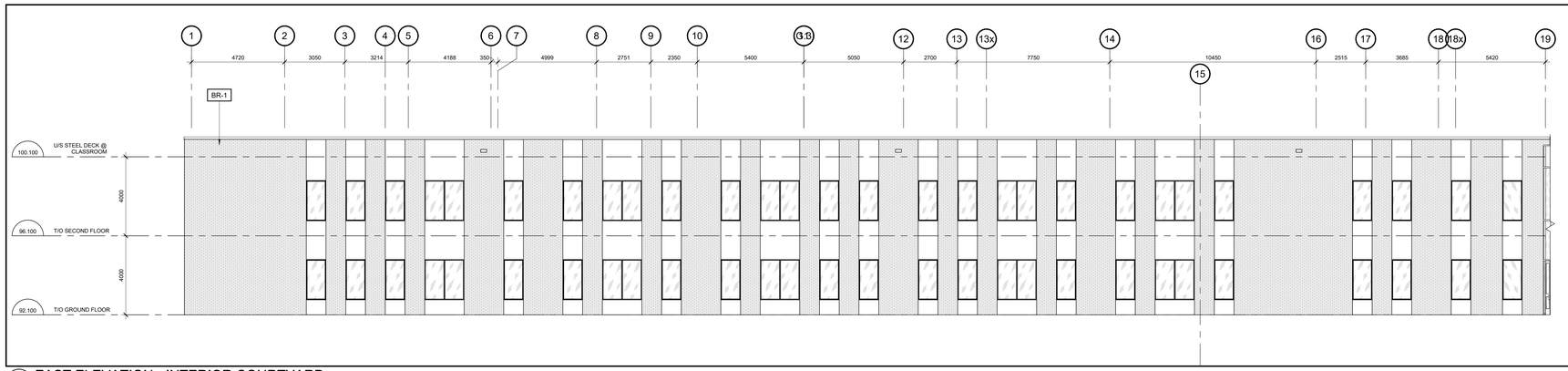
4 A202 WEST ELEVATION CONT'D
1 : 100



3 A202 WEST ELEVATION
1 : 100



2 A202 BUILDING ELEVATION - GYM
1 : 100



1 A202 EAST ELEVATION - INTERIOR COURTYARD
1 : 100

KEYNOTE LEGENDSS

ALD	PREFINISHED ALUMINUM ENTRANCE DOOR
BR-1	BRICK TYPE 1 (HOMOGENEOUS BRICK)
MS-1	PREFINISHED METAL SIDING WITH FINS
MS-2	

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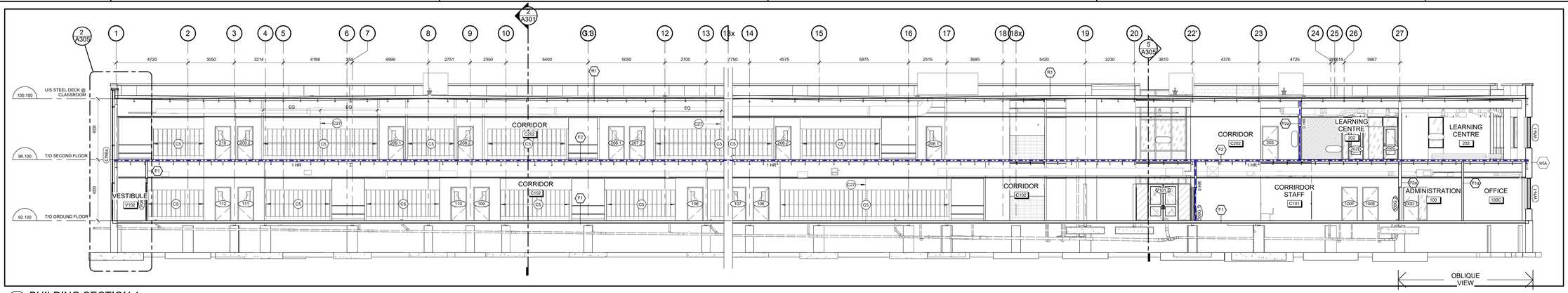
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project title
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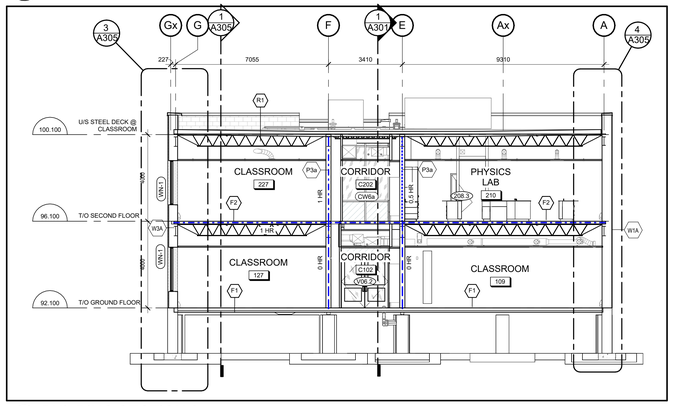
drawing title
BUILDING ELEVATIONS

date	MAY 28 2025	job. no.	240097
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drawn	JG	drawing no.	A202
approved	CJ/PD/PR		
plot date	03/19/13		

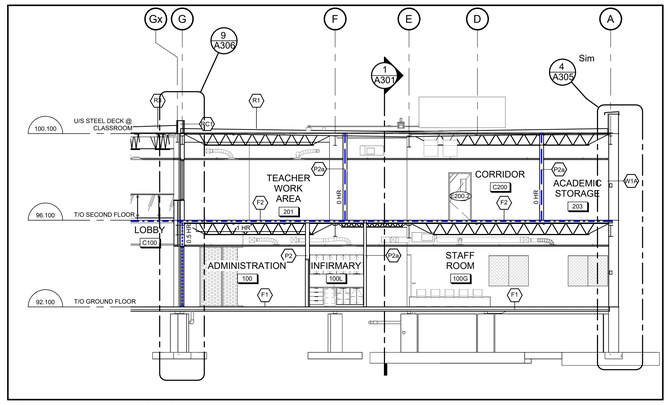
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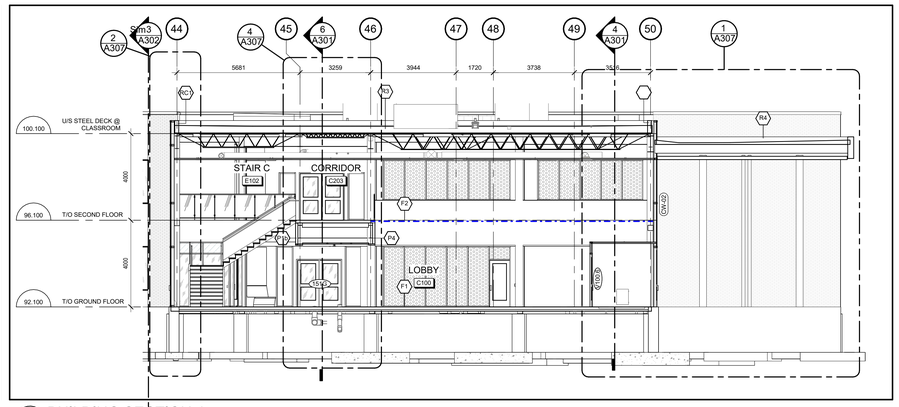
1 A301 BUILDING SECTION 1
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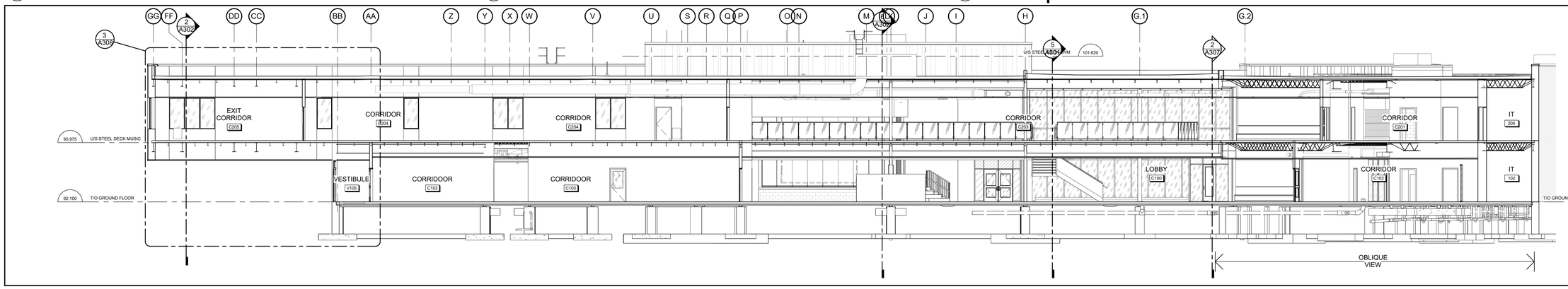
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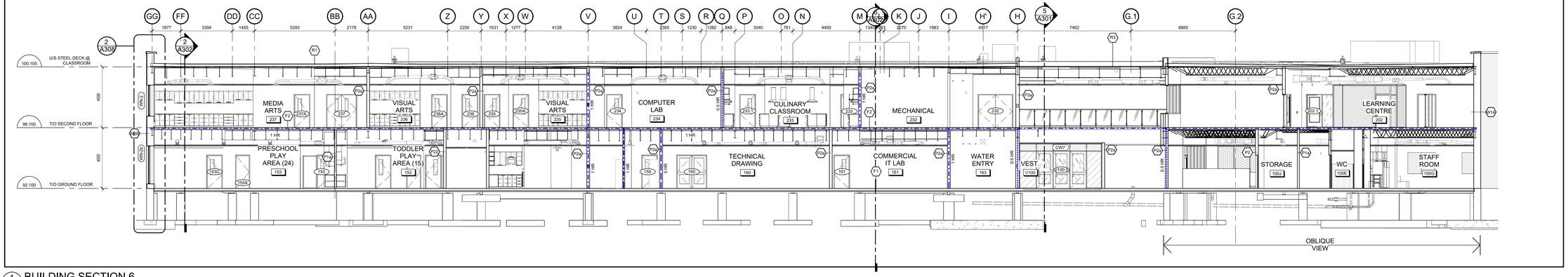
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5 A301 BUILDING SECTION 4
1 : 100



6 A301 BUILDING SECTION 5
1 : 100



4 A301 BUILDING SECTION 6
1 : 100

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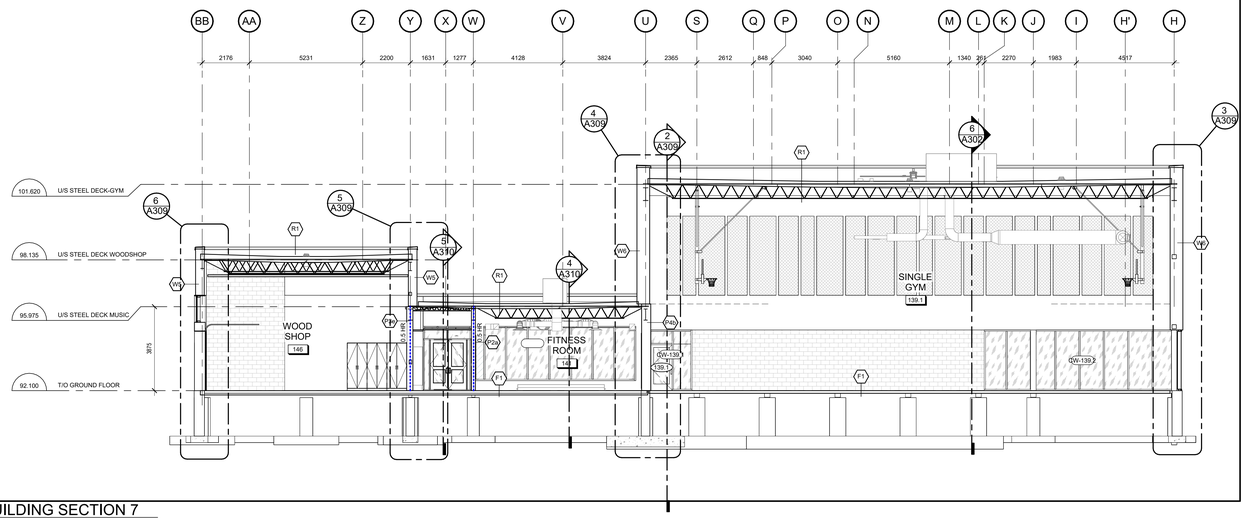
project title
NEW CATHOLIC HIGH SCHOOL RIVERSIDE SOUTH
Manotick Ontario

drawing title
BUILDING SECTIONS

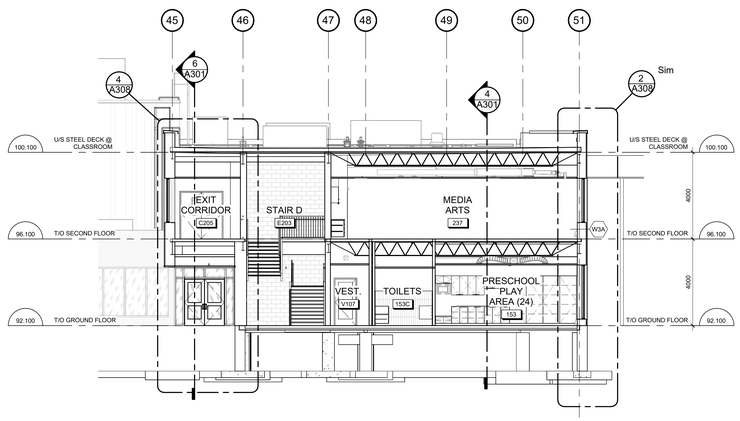
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job. no. **240097**
drawing no. **A301**

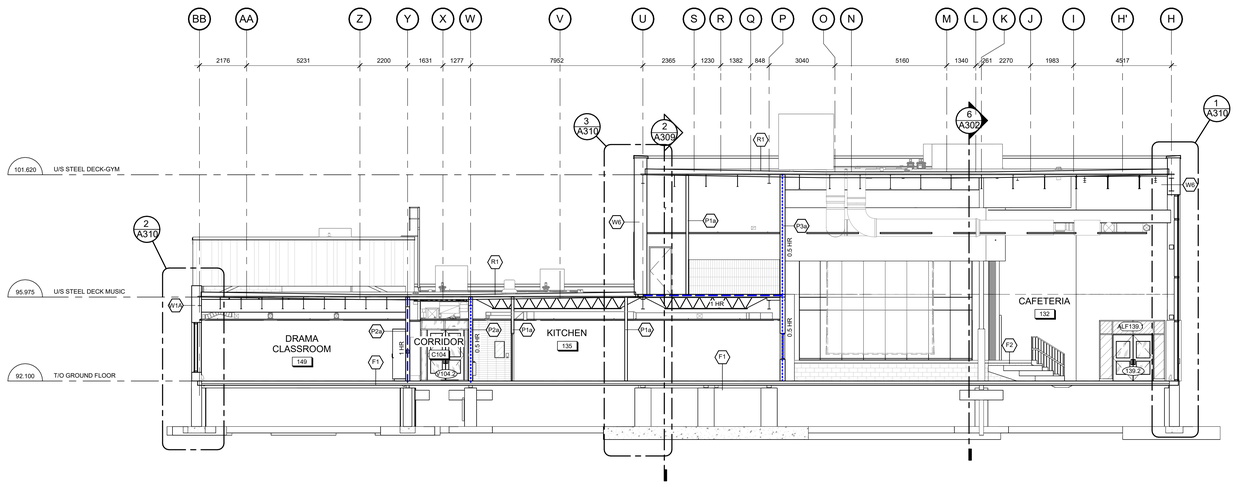
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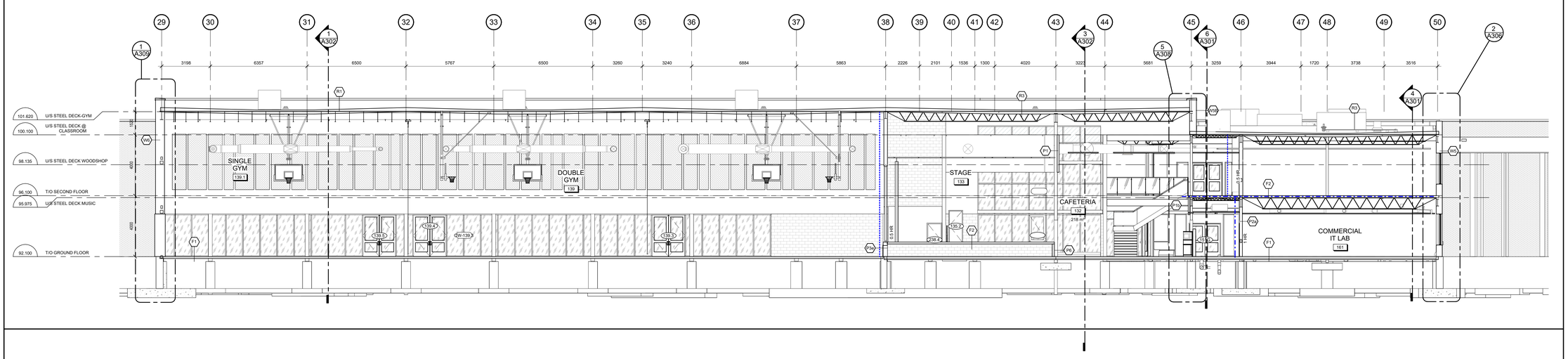
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1 : 100



2 A302 BUILDING SECTION 8
1 : 100



3 A302 BUILDING SECTION 9
1 : 100



6 A302 BUILDING SECTION 10
1 : 100

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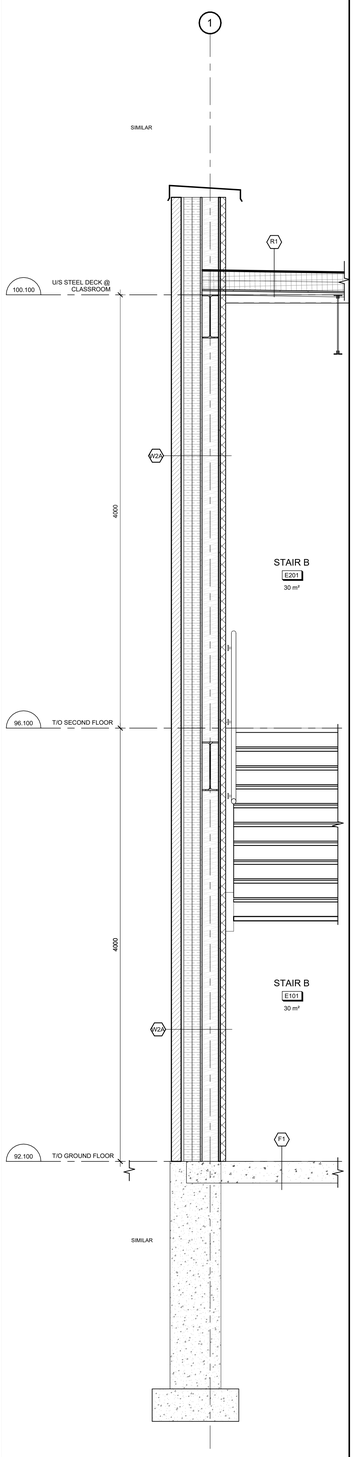
project title
NEW CATHOLIC HIGH SCHOOL RIVERSIDE SOUTH
Manotick Ontario

drawing title
BUILDING SECTIONS

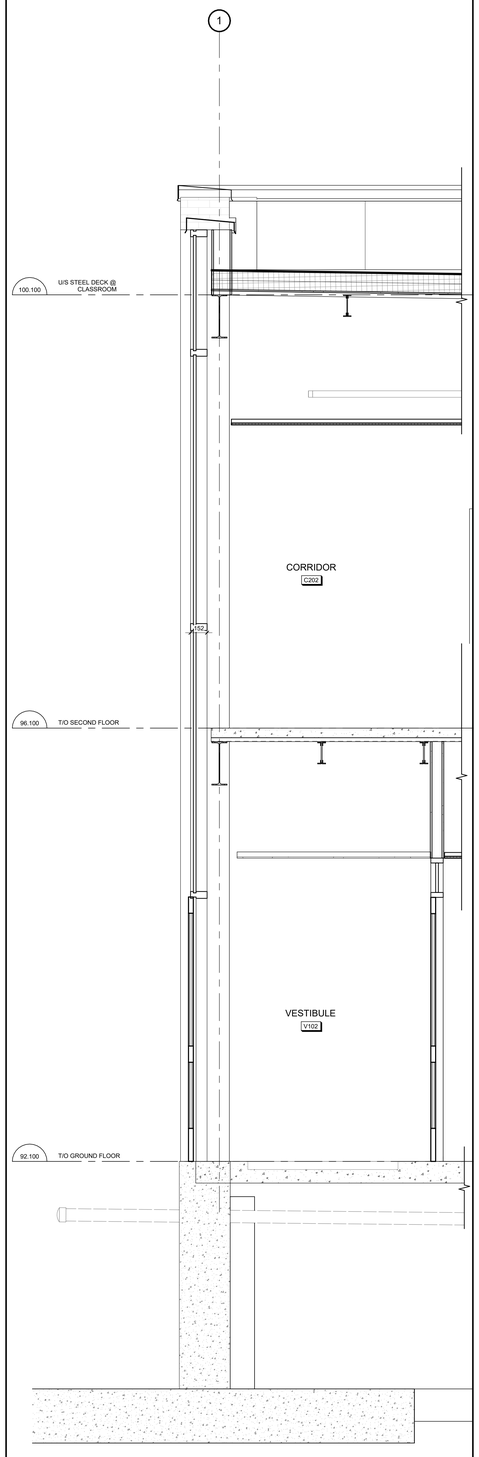
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plot date	01/09/25

job. no. **240097**
drawing no. **A302**

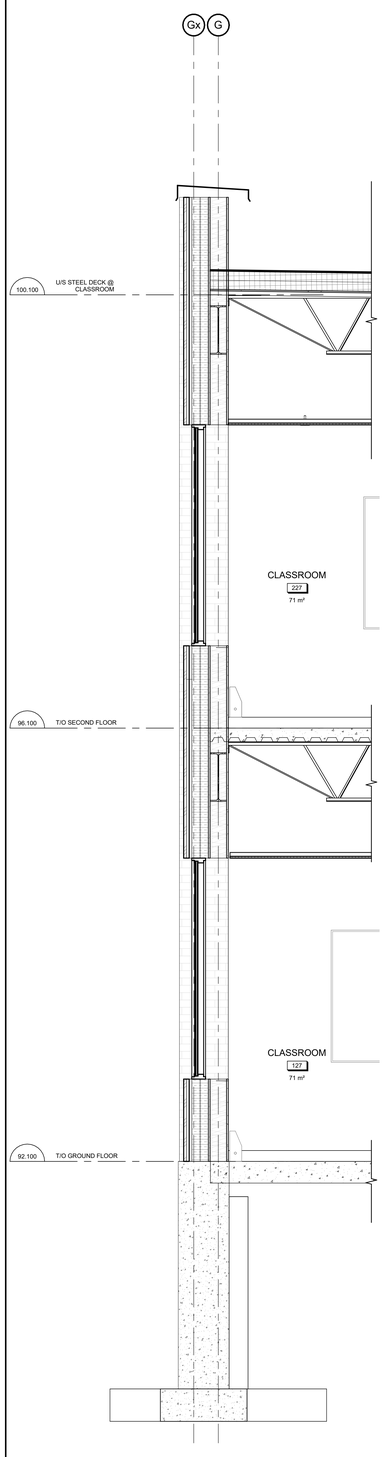
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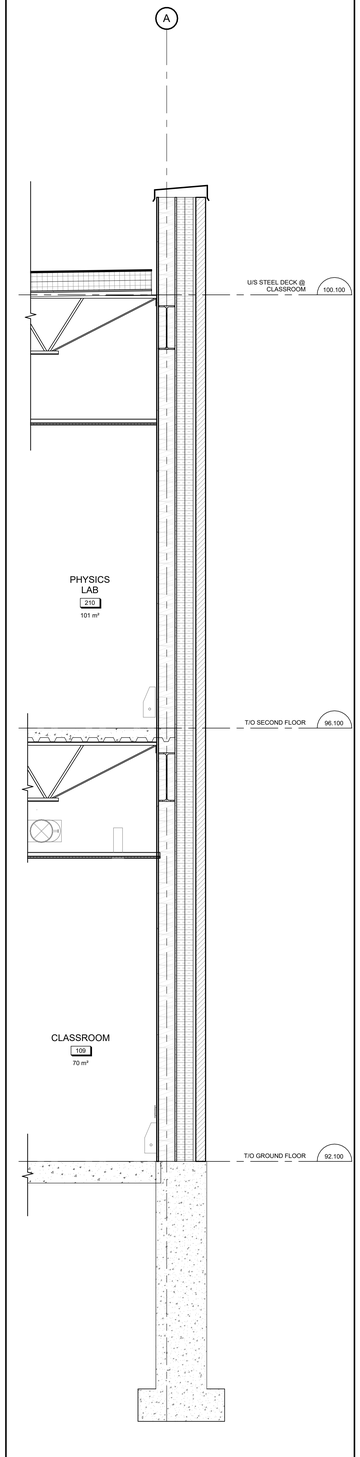
1 A305 WALL SECTION - BRICK WALL @ STAIRS
1 : 20



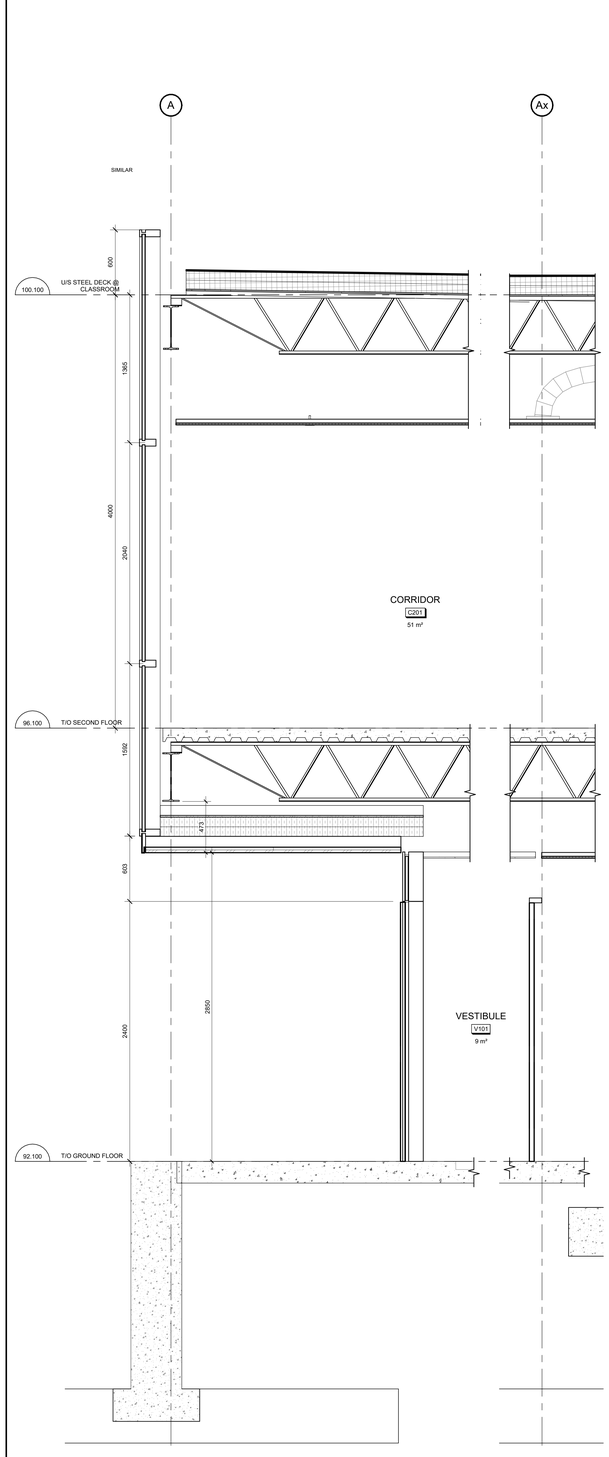
2 A305 WALL SECTION - CURTAIN WALL - GRID 1
1 : 20



3 A305 WALL SECTION - WINDOWS/ACM
1 : 20



4 A305 WALL SECTION - TYP. BRICK WALL
1 : 20



5 A305 WALL SECTION - OVERHANG ENTRY
1 : 20

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3	May 9th 2025	Issued for 66% Client Review	

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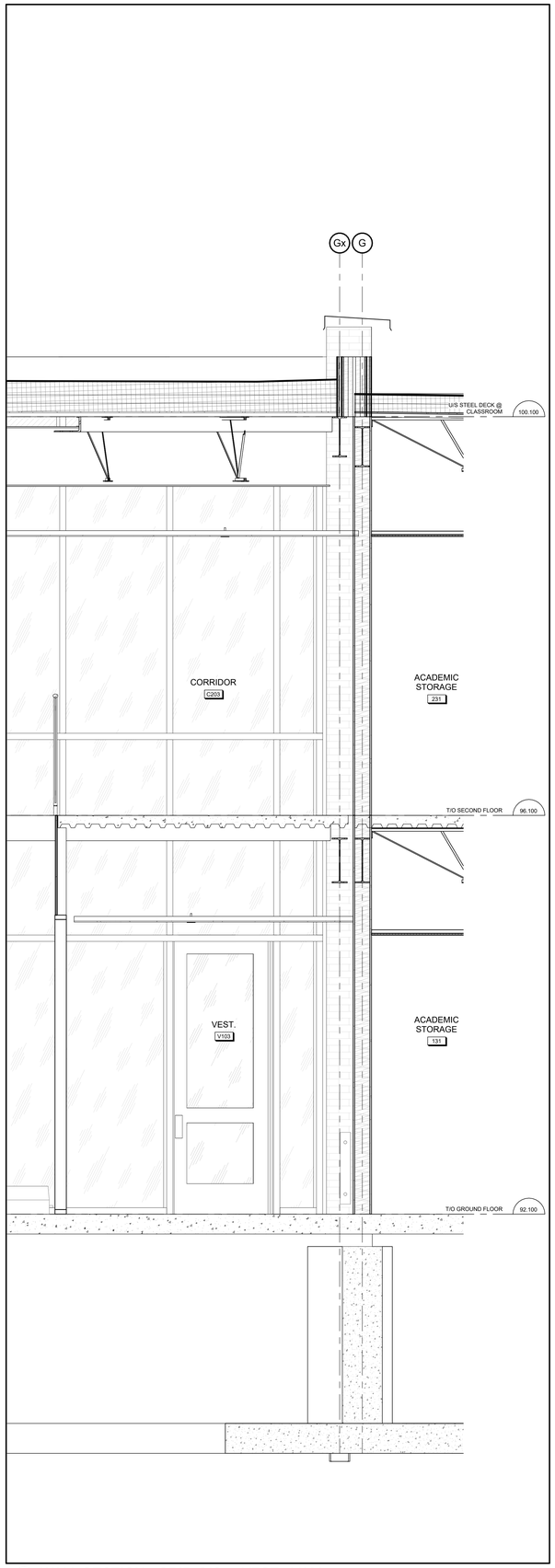
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project title
NEW CATHOLIC HIGH SCHOOL RIVERSIDE SOUTH
Manotick Ontario

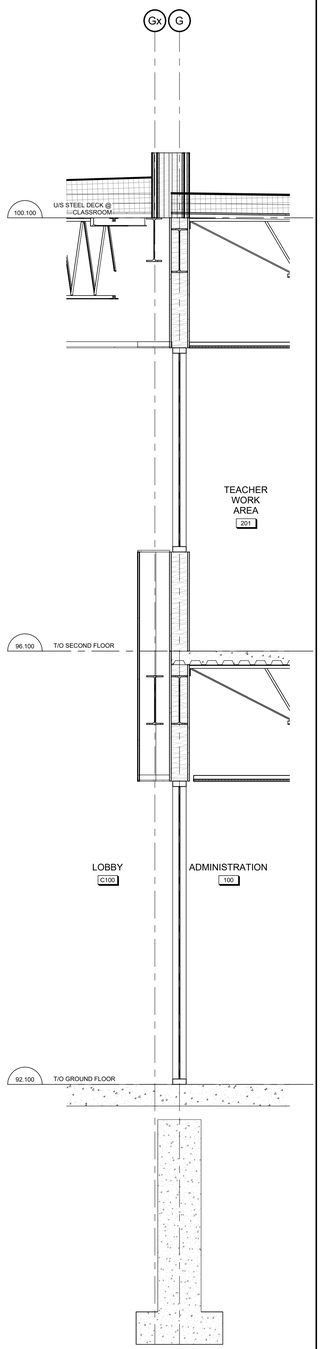
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WALL SECTIONS - AREA A

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drawn	MW/SB	drawing no.	A305
approved	CJ/PD/PR		
plot date	01/09/25		

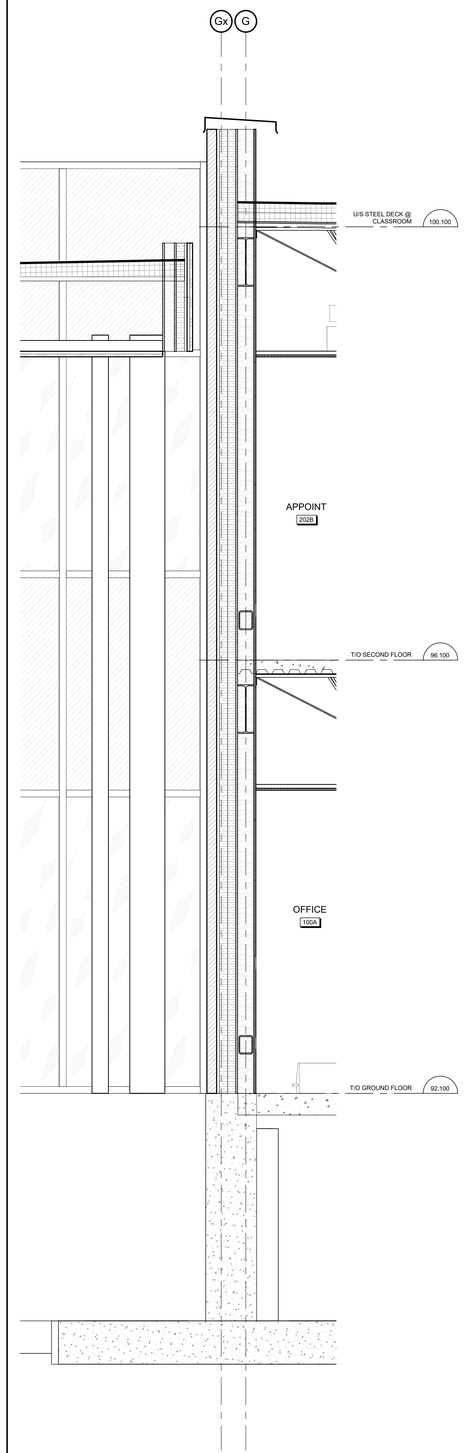
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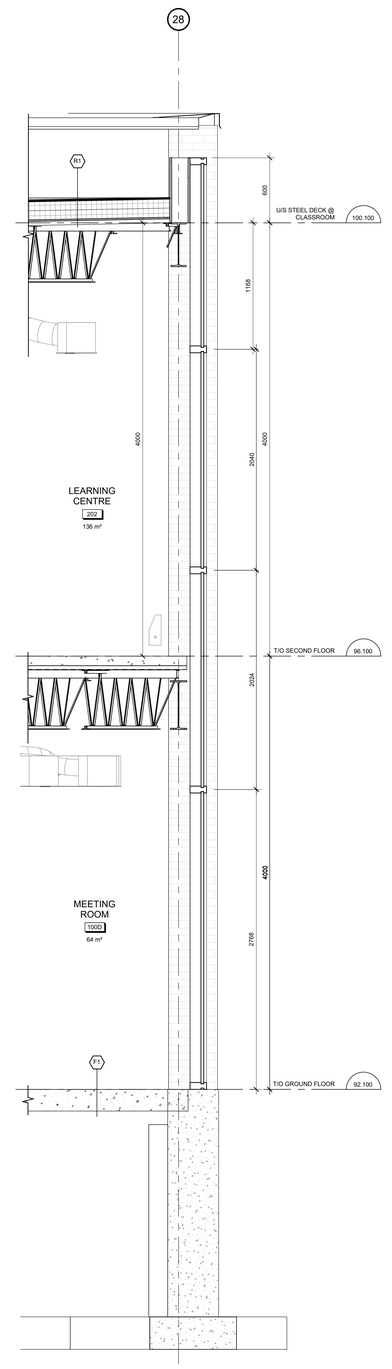
3 A306 WALL SECTION - GRID G/Gx - VEST - V103
1 : 20



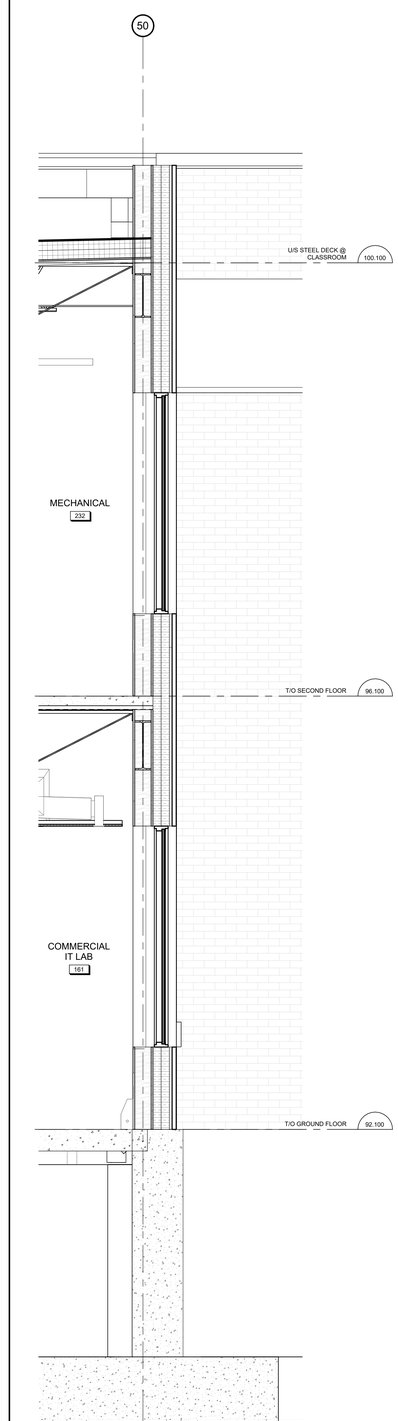
9 A306 WALL SECTION - GRID G/GX
1 : 20



1 A306 WALL SECTION - MAIN CANOPY - GRID G/Gx
1 : 20



4 A306 WALL SECTION - CURTAIN WALL @ GRID 28
1 : 20



2 A306 WALL SECTION - METAL SIDING / WINDOWS @ GRID 50
1 : 20

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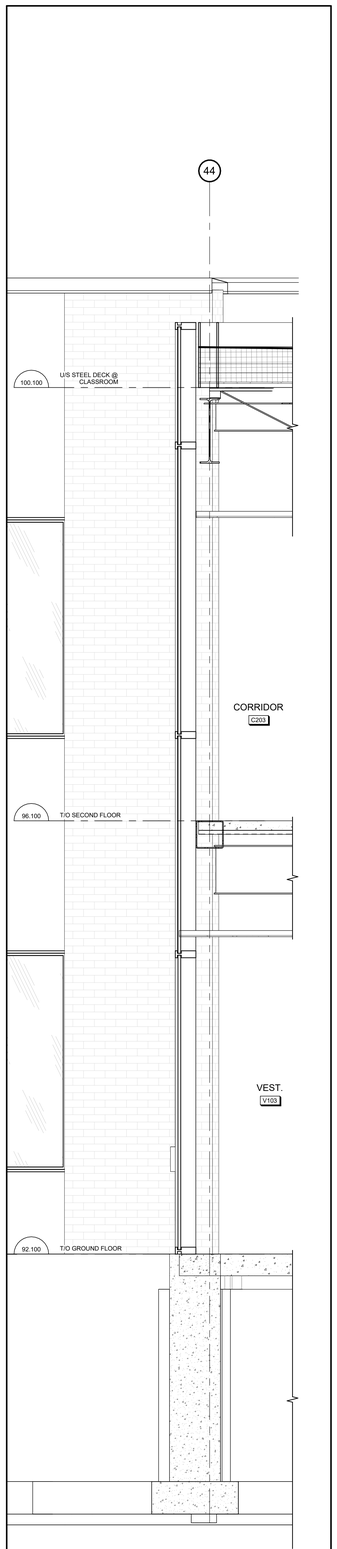
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NEW CATHOLIC HIGH SCHOOL RIVERSIDE SOUTH
Manotick Ontario

drawing title
WALL SECTIONS - AREA A

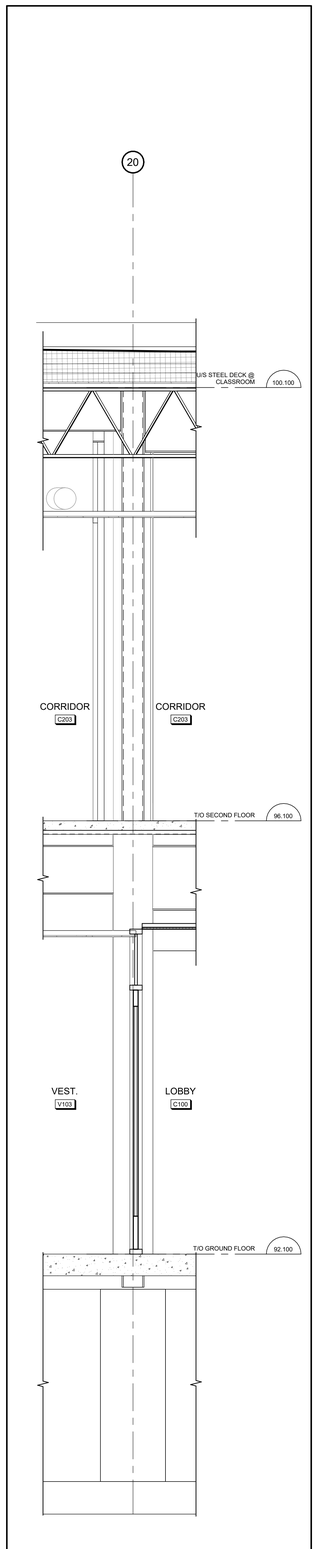
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approved	CJ/PD/PR
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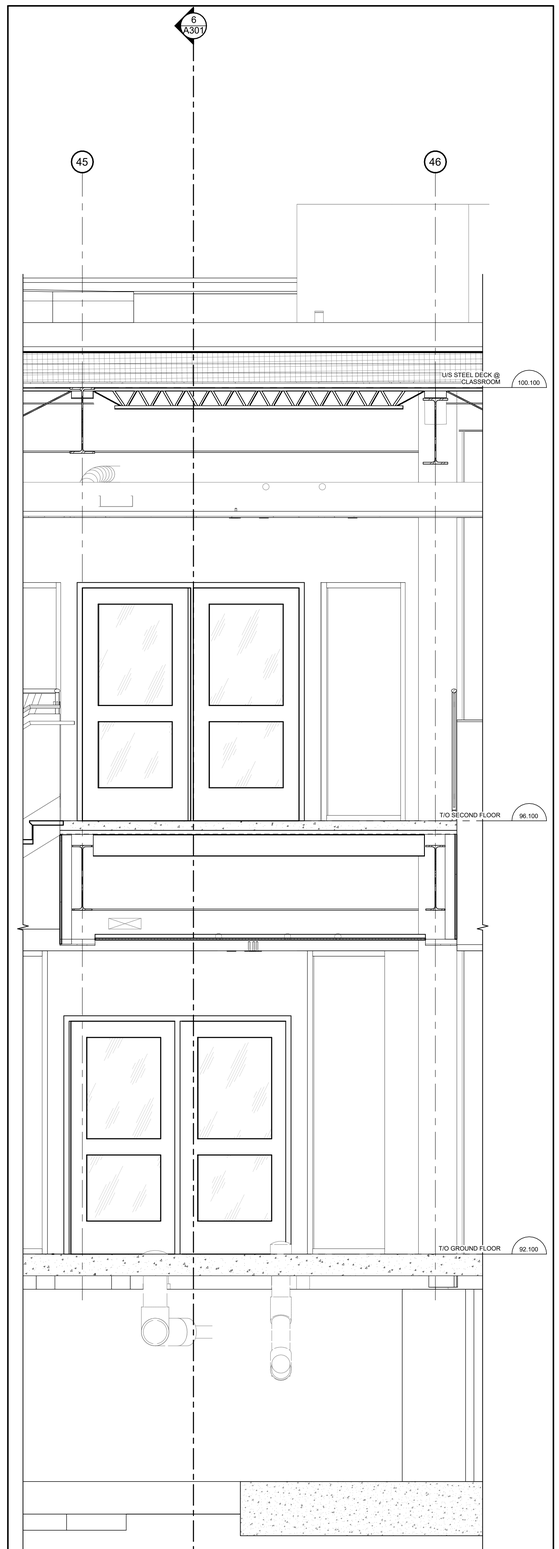
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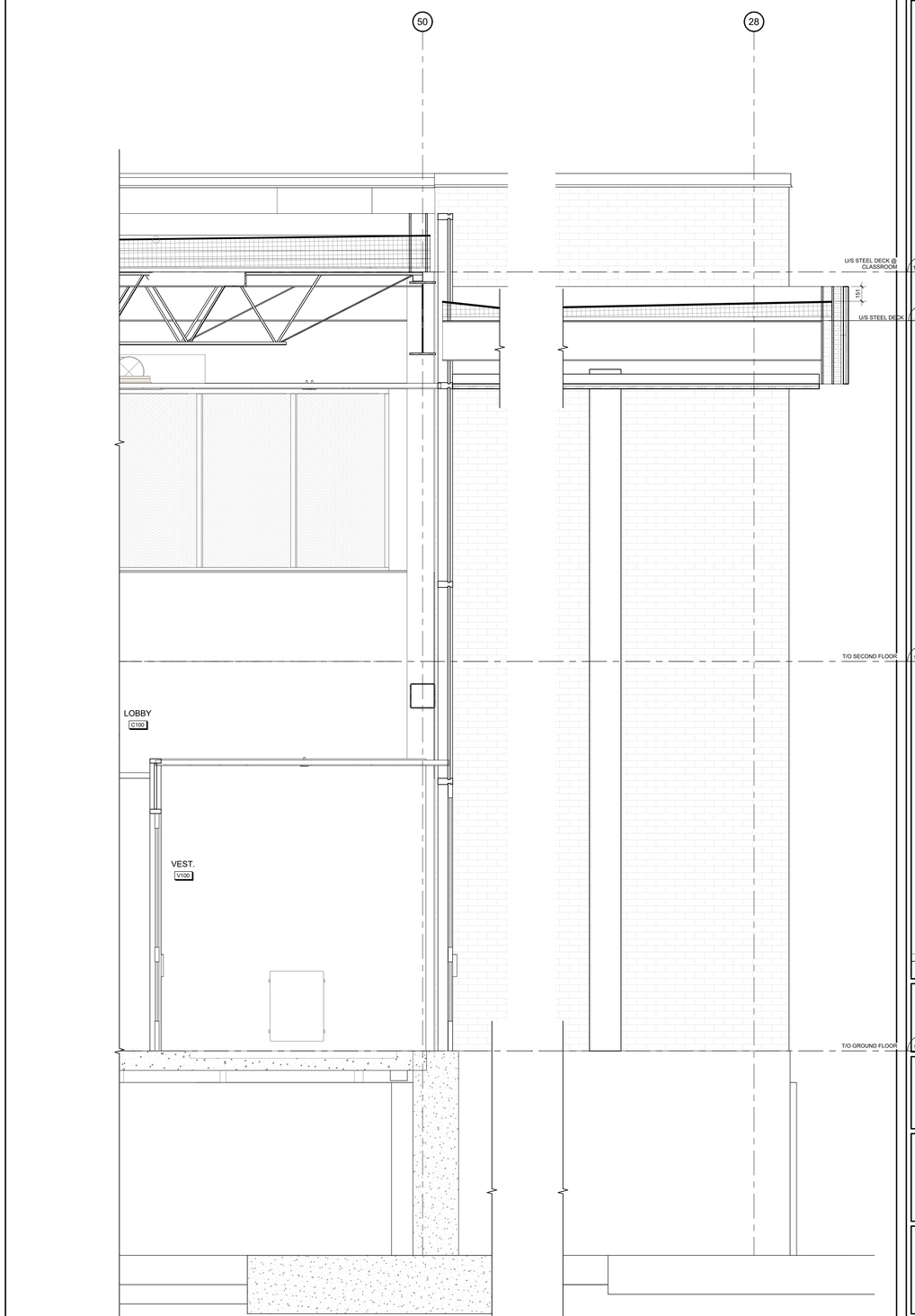
2 A307 WALL SECTION - V103
1 : 20



3 A307 WALL SECTION - V103
1 : 20



4 A307 WALL SECTION 4 AT BRIDGE
1 : 20



1 A307 WALL SECTION - MAIN ENTRANCE
1 : 20

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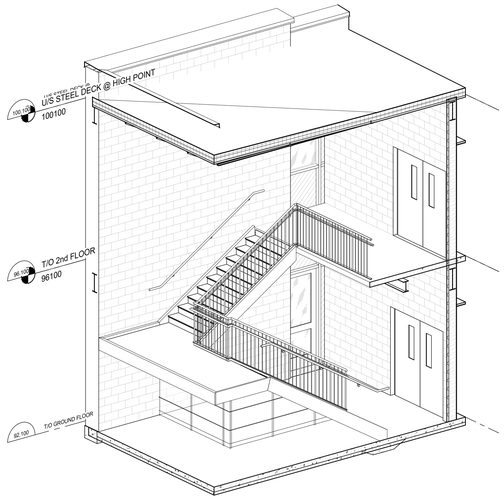
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NEW CATHOLIC HIGH SCHOOL RIVERSIDE SOUTH
Manotick Ontario

drawing title
WALL SECTIONS - LOBBY

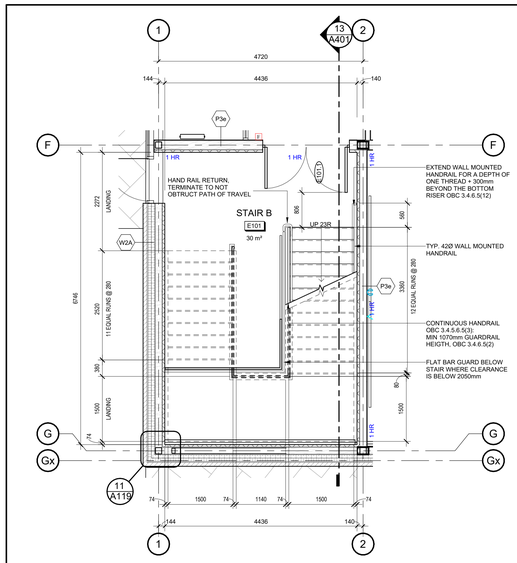
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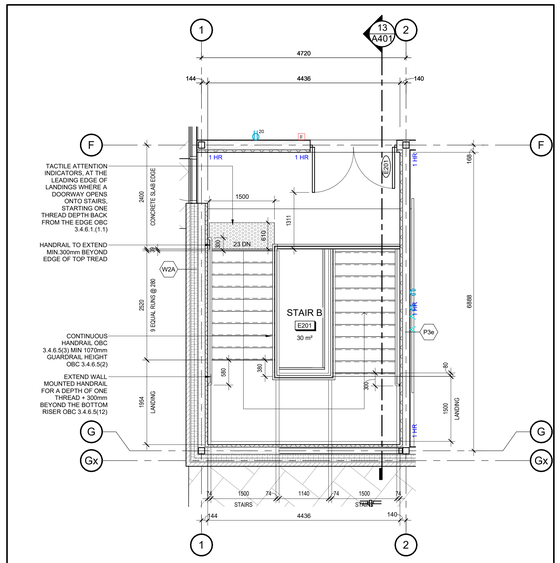
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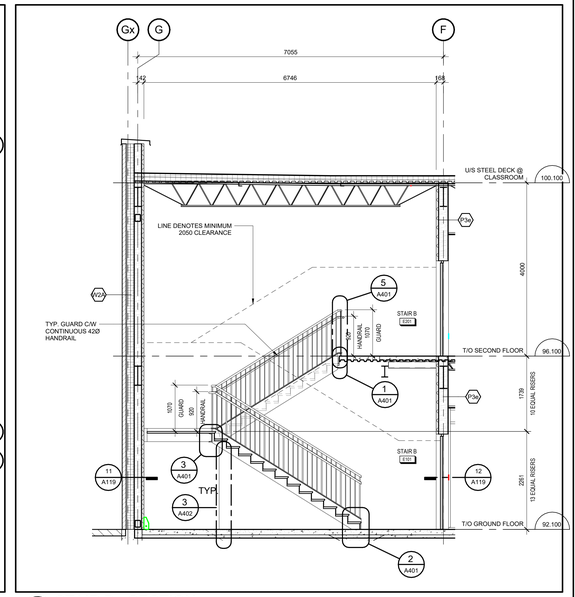
9 A401 3D VIEW - STAIRS B



12 A401 STAIR B PLAN - LEVEL 1
1 : 50



11 A401 STAIR B PLAN - LEVEL 2
1 : 50



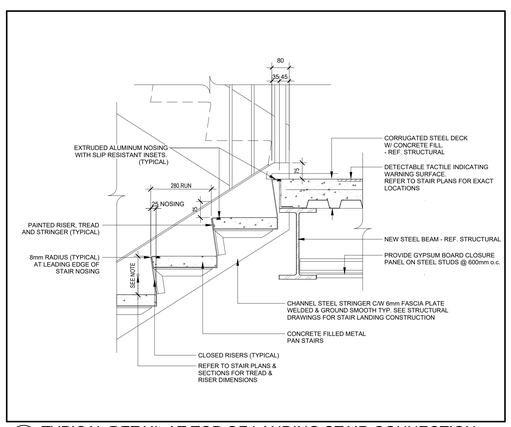
13 A401 STAIR B - SECTION
1 : 50

10 A401 3D VIEW - STAIRS A

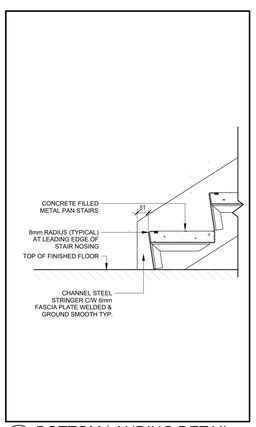
14 A401 STAIR A PLAN - LEVEL 1
1 : 50

15 A401 STAIR A PLAN - LEVEL 2
1 : 50

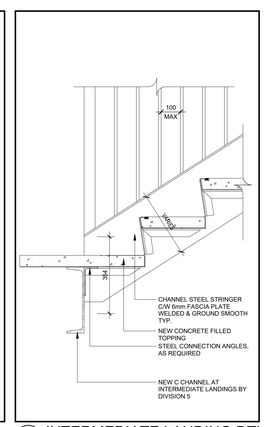
16 A401 STAIR A - SECTION
1 : 50



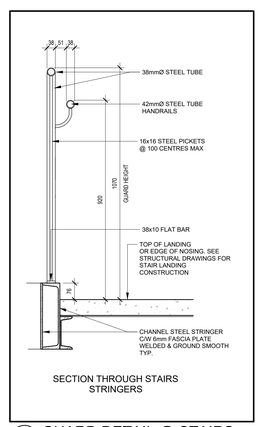
1 A401 TYPICAL DETAIL AT TOP OF LANDING STAIR CONNECTION
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2 A401 BOTTOM LANDING DETAIL
1 : 10

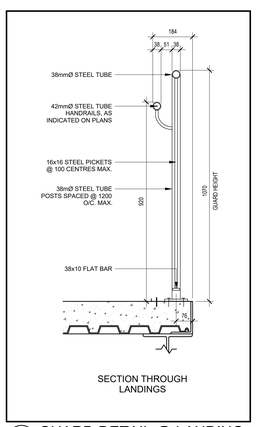


3 A401 INTERMEDIATE LANDING DTL
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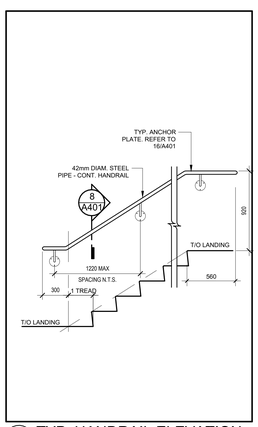
SECTION THROUGH STAIRS STRINGERS

4 A401 GUARD DETAIL @ STAIRS
1 : 10

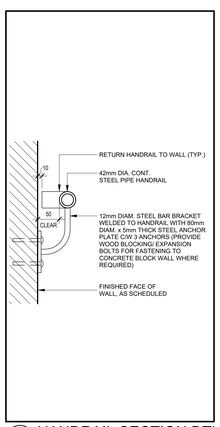


SECTION THROUGH LANDINGS

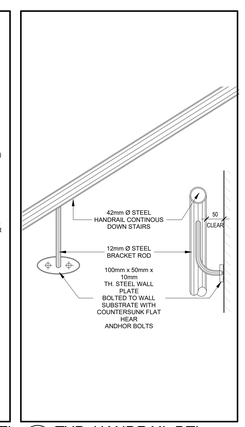
5 A401 GUARD DETAIL @ LANDING
1 : 10



7 A401 TYP. HANDRAIL ELEVATION
1 : 25



8 A401 HANDRAIL SECTION DTL
1 : 5



6 A401 TYP. HANDRAIL DTL
1 : 5

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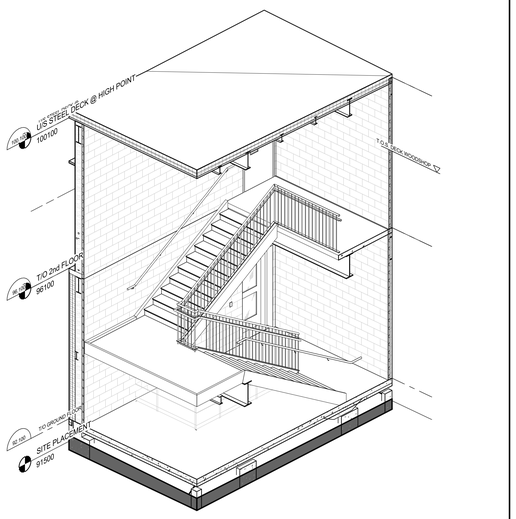
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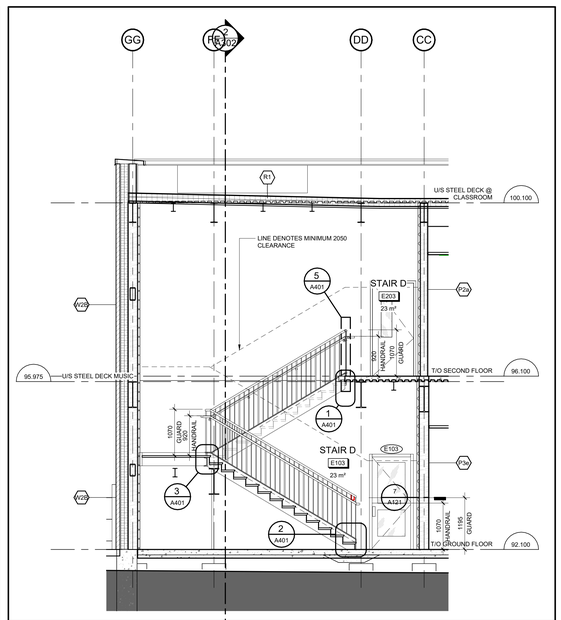
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scale	Comme indiqué		
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approved	CJ/PD/PR		
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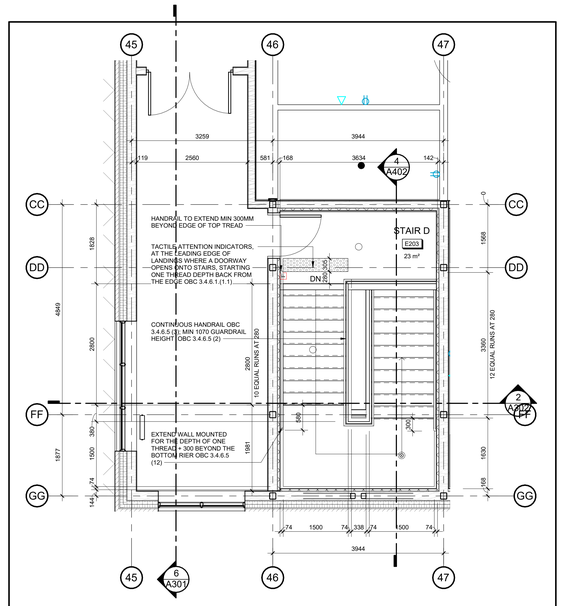
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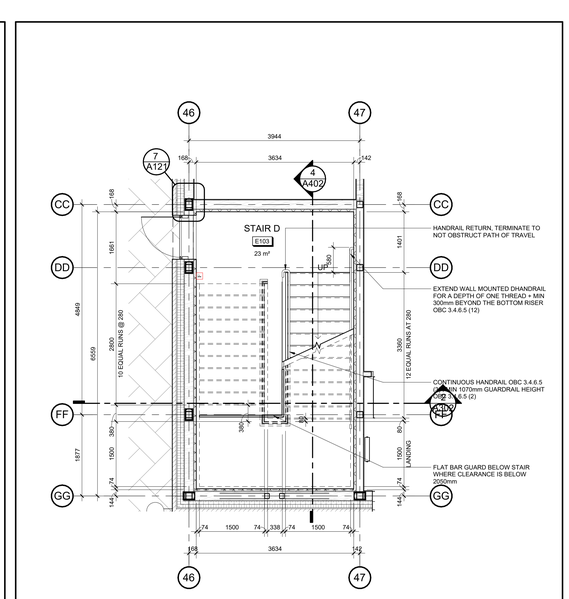
5 A402 3D VIEW - STAIR D



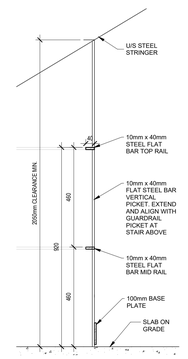
4 A402 STAIR D SECTION
1 : 50



2 A402 STAIR D PLAN - LEVEL 2
1 : 50



1 A402 STAIR D PLAN - LEVEL 1
1 : 50



3 A402 RAIL BELOW STAIR
1 : 10

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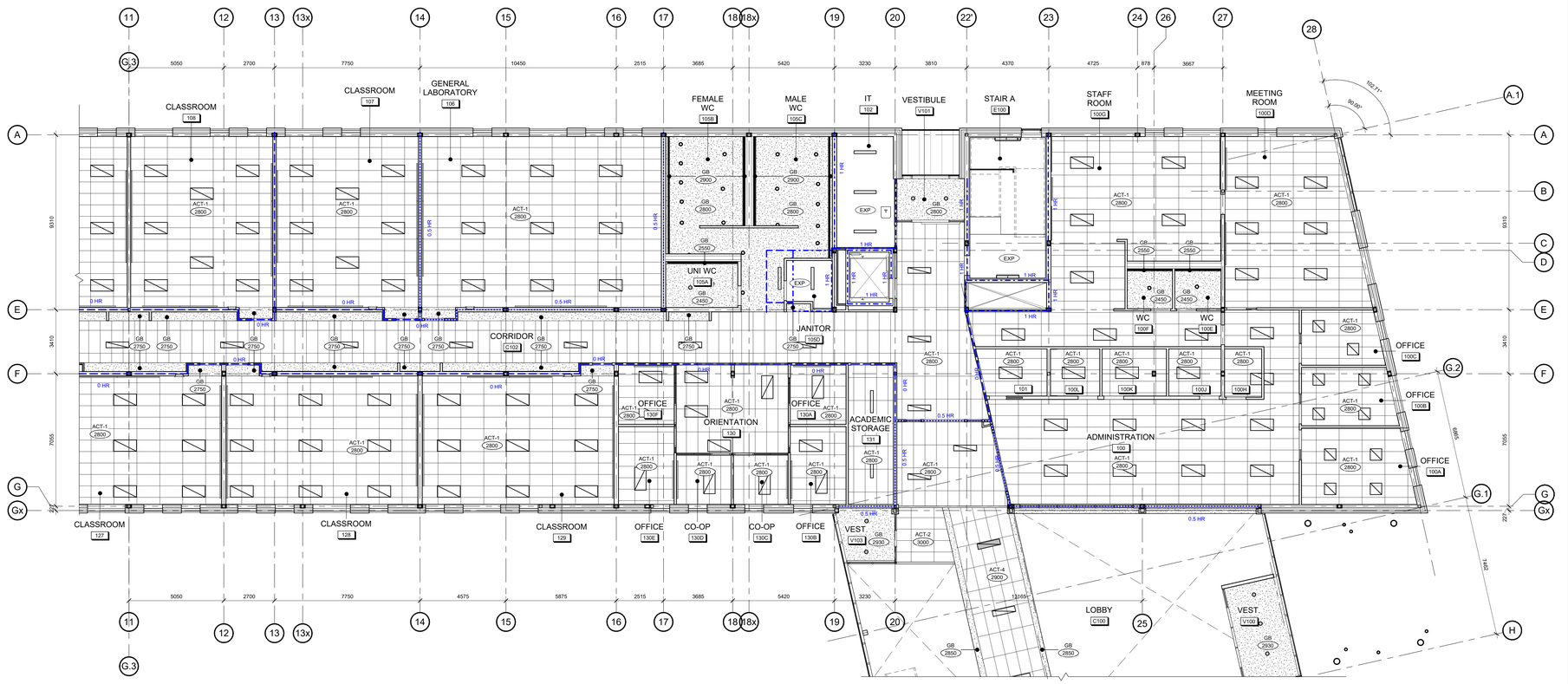
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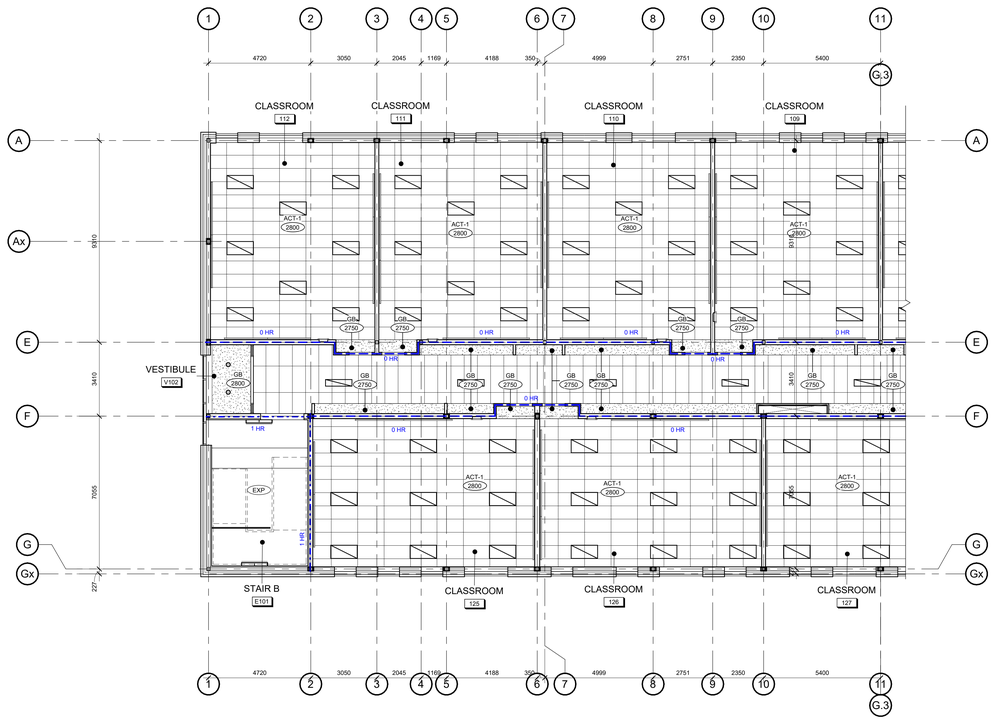
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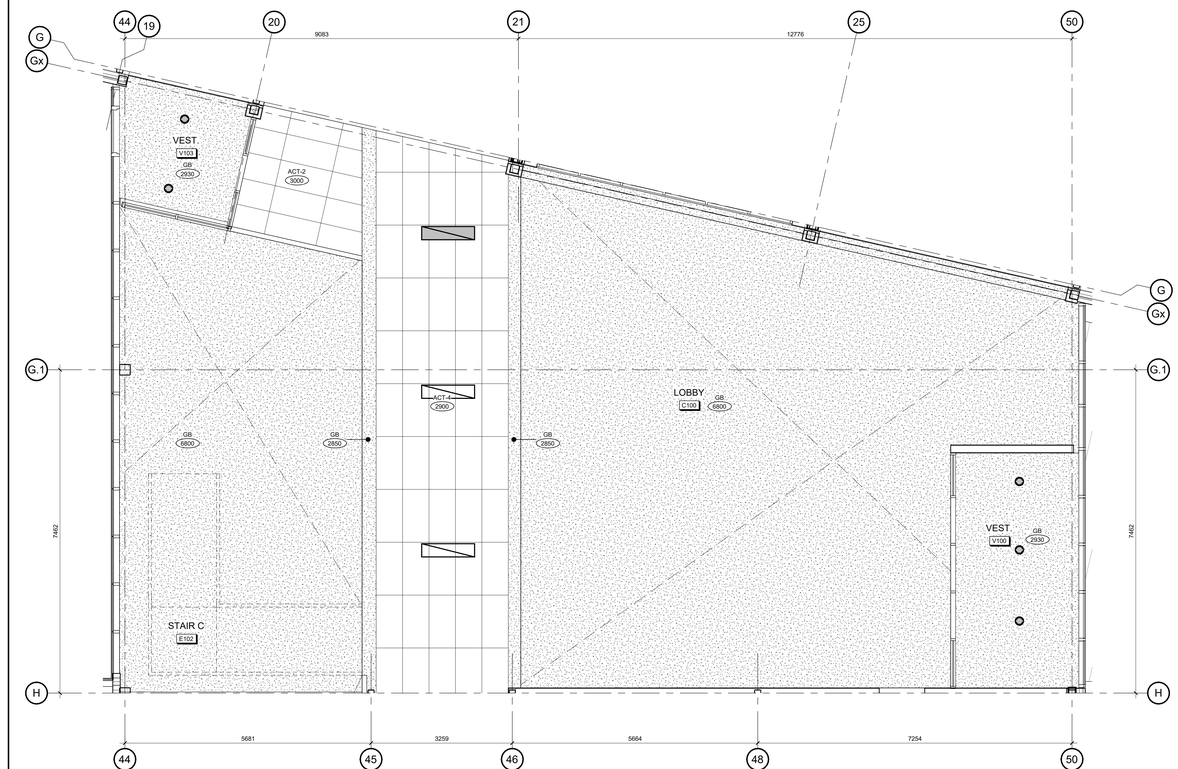
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1 GROUND FLOOR REFLECTIVE CEILING PLAN - AREA A1
A601 1 : 100



2 GROUND FLOOR REFLECTIVE CEILING PLAN - AREA A2
A601 1 : 100



3 GROUND FLOOR REFLECTIVE CEILING PLAN - LOBBY
A601 1 : 50

GENERAL NOTES - RCP

1. MECHANICAL AND ELECTRICAL EQUIPMENT IS SHOWN FOR COORDINATION PURPOSES ONLY. REFER TO CONTRACT DOCUMENTS FOR EACH DISCIPLINE FOR SPECIFICATIONS AND EXACT LOCATIONS.

CEILING LEGEND

- GYPSUM BOARD (GB)
- ACT TILE (ACOUSTIC CEILING TILE) 610 X 610
- ACT TILE (ACOUSTIC CEILING TILE) 1220 X 610
- BH — BULKHEAD
- MP — METAL PANEL
- MAT. / 2700 — CEILING MATERIAL / CEILING HEIGHT AFF
  - GB = GYPSUM BOARD
  - ACT = ACCOUSTIC CEILING TILE
  - EXP = EXPOSED STRUCTURE
  - MTL = METAL CEILING TILE
- LED LUMINAIRE, 610mm x 1220mm, SEE ELECTRICAL
- LED LUMINAIRE, 305mm x 1220mm, SEE ELECTRICAL
- STRIP LUMINAIRE, 1220mm, SEE ELECTRICAL
- RECESSED DOWNLIGHT, SEE ELCTRICAL
- SUPPLY AIR DIFFUSER, SEE MECHANICAL
- RETURN AIR GRILL, SEE MECHANICAL

FIRE RESISTANCE RATING (FRR) LEGEND

- NON-RATED FIRE SEPARATION (0 HR)
- 0.5 HR FIRE SEPARATION
- 1 HR FIRE SEPERATION
- XX m — TRAVEL DISTANCE

REQUIRED FIRE SEPARATIONS

JANITOR	0 HR
IT	1 HR
HAZARDOUS CLASSROOMS	0.5 HR
INTERCONNECTED SPACES	0.5 HR
EXIT STAIRS	1 HR
MECHANICAL ROOM	1 HR
ELECTRICAL ROOM	1 HR

NOTES:

1. ALL FLOOR ASSEMBLIES TO HAVE A FRR OF 1 HR.
2. ALL LOADBEARING STRUCTURAL ELEMENTS TO HAVE A FRR OF 1 HR.
3. REFER TO TYPICAL DETAILS FOR 1HR FIR PROTECTION OF TYPICAL HSS COLUMNS.
4. USE FIRE RATED GYPSUM BOARD FOR ALL FIRE RATED WALLS.
5. FIRE SEPARATION WALLS TO EXTEND TO U/S OF FLOOR / ROOF DECK. SEAL PERIMETER, AND ALL PENETRATIONS.
6. NO PENETRATION OR FIXTURE INSTALLATION ALLOWED INTO THE FIRE RATED WALLS OF EXITS UNO

HORIZONTAL ROLLER BLINDS (HRB)

AS INDICATED ON PLANS

- HRB-1 **TYPE 1** - SOLAR ROLLER BLINDS
- HRB-2 **TYPE 2** - SOLAR ROLLER BLINDS w/ BLACKOUT OPTION
- HRB-3 **TYPE 3** - MOTORIZED SOLAR ROLLER BLINDS

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KEYNOTE LEGENDS

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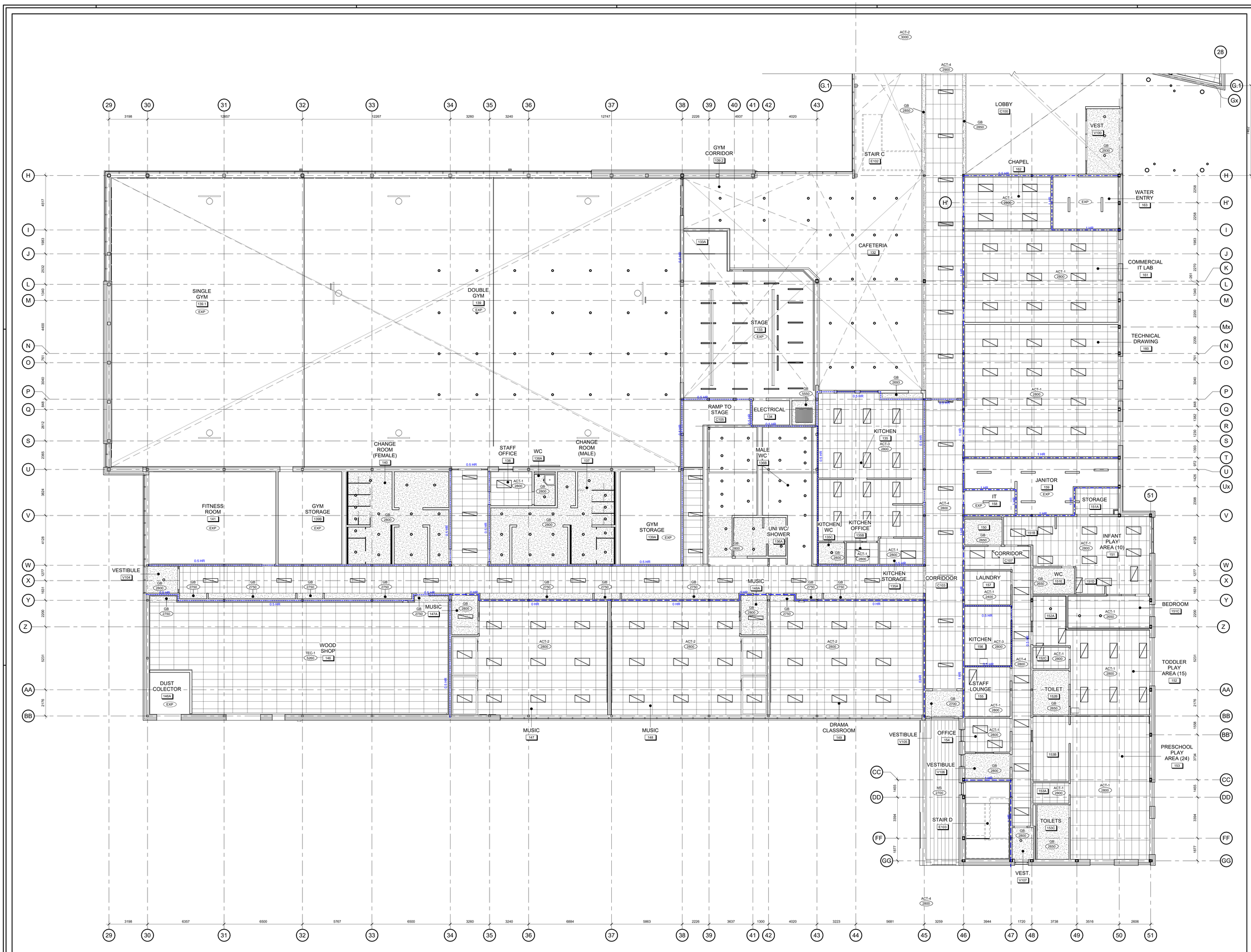
project title
NEW CATHOLIC HIGH SCHOOL RIVERSIDE SOUTH
Manotick Ontario

drawing title
GROUND FLOOR REFLECTED CEILING PLAN- AREA A

date	MAY 28 2025
scale	Comme indiqué
drawn	JG
approved	CJ/PD/PR
plot date	01/09/25

job. no. **240097**
drawing no. **A601**

1. DO NOT SCALE FROM THIS DRAWING
2. CONTRACTOR TO VERIFY ALL DIMENSIONS AND NOTIFY THE ARCHITECT OF ANY DISCREPANCIES BEFORE WORK COMMENCES
3. THIS DRAWING TO BE READ IN CONJUNCTION WITH THE FOLLOWING DRAWINGS: STRUCTURAL, MECHANICAL, ELECTRICAL



1 / A602 GROUND FLOOR REFLECTIVE CEILING PLAN - AREA B
1 : 100

Écoles catholiques Centre-Est

no.	date	revision / issue	by
3	May 9th 2025	Issued for 66% Client Review	
1	March 14th 2025	Issued for 33% Client Review	

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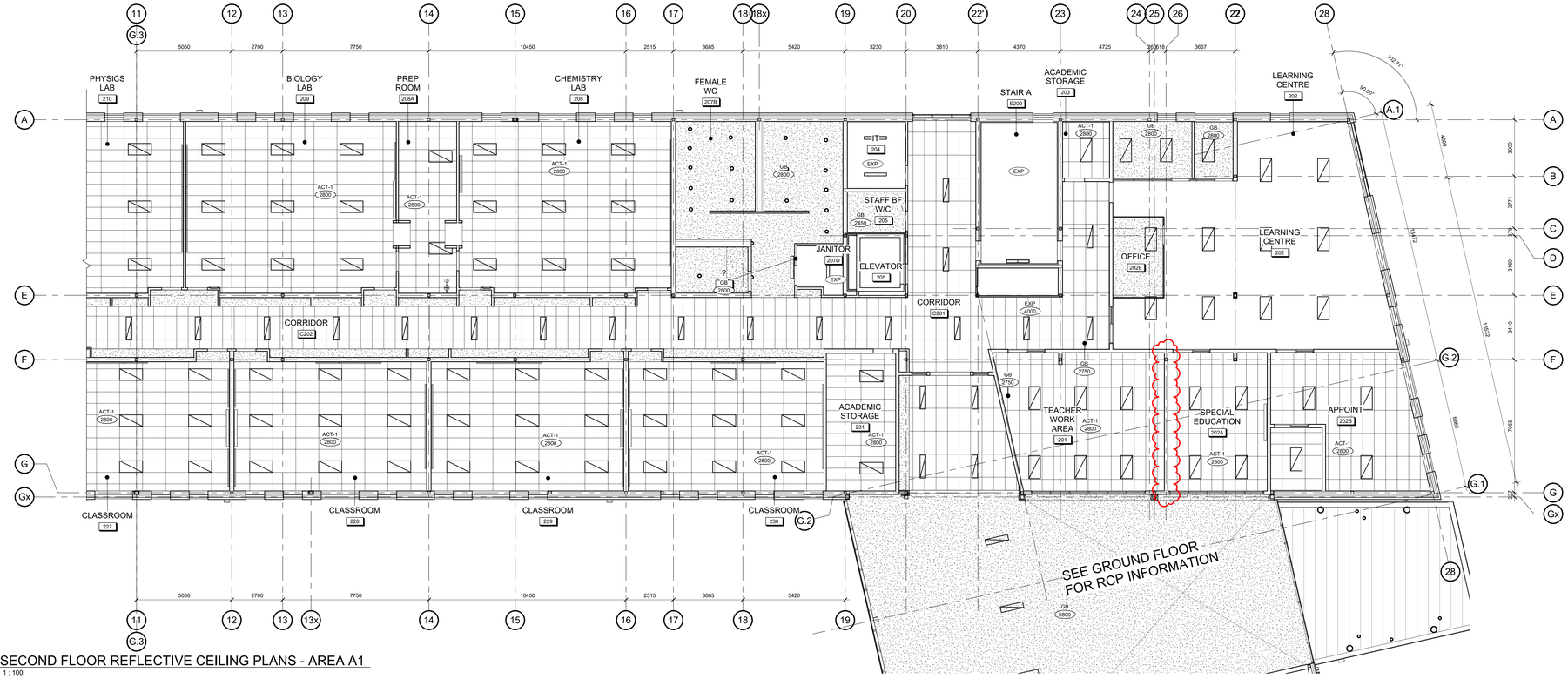
professional stamp

project title
NEW CATHOLIC HIGH SCHOOL RIVERSIDE SOUTH
Manotick Ontario

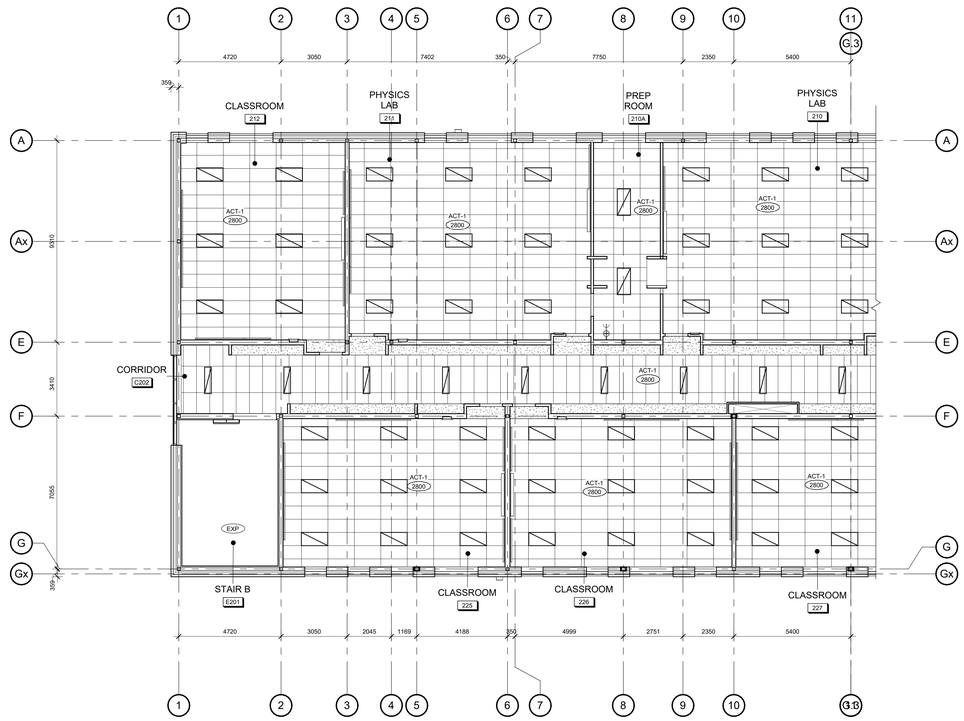
drawing title
GROUND FLOOR REFLECTED CEILING PLAN- AREA B

date	MAY 28 2025
scale	1 : 100
drawn	JG
approved	CJ/PD/PR
plot date	01/09/25
job. no.	240097
drawing no.	A602

1. DO NOT SCALE FROM THIS DRAWING
2. CONTRACTOR TO VERIFY ALL DIMENSIONS AND NOTIFY THE ARCHITECT OF ANY DISCREPANCIES BEFORE WORK COMMENCES
3. THIS DRAWING TO BE READ IN CONJUNCTION WITH THE FOLLOWING DRAWINGS: STRUCTURAL, MECHANICAL, ELECTRICAL



1 / A603 SECOND FLOOR REFLECTIVE CEILING PLANS - AREA A1
1 : 100



2 / A603 SECOND FLOOR REFLECTIVE CEILING PLANS - AREA A2
1 : 100

GENERAL NOTES - RCP

1. MECHANICAL AND ELECTRICAL EQUIPMENT IS SHOWN FOR COORDINATION PURPOSES ONLY. REFER TO CONTRACT DOCUMENTS FOR EACH DISCIPLINE FOR SPECIFICATIONS AND EXACT LOCATIONS.

CEILING LEGEND

- GYPSUM BOARD (GB)
- ACT TILE (ACOUSTIC CEILING TILE) 610 X 610
- ACT TILE (ACOUSTIC CEILING TILE) 1220 X 610
- BH BULKHEAD
- MP METAL PANEL
- MAT. CEILING MATERIAL
- (2700) CEILING HEIGHT AFF
- GB = GYPSUM BOARD
  ACT = ACCOUSTIC CEILING TILE
  EXP = EXPOSED STRUCTURE
  MTL = METAL CEILING TILE
- LED LUMINAIRE, 610mm x 1220mm, SEE ELECTRICAL
- LED LUMINAIRE, 305mm x 1220mm, SEE ELECTRICAL
- STRIP LUMINAIRE, 1220mm, SEE ELECTRICAL
- RECESSED DOWNLIGHT, SEE ELCTRICAL
- SUPPLY AIR DIFFUSER, SEE MECHANICAL
- RETURN AIR GRILL, SEE MECHANICAL

FIRE RESISTANCE RATING (FRR) LEGEND

- NON-RATED FIRE SEPARATION (0 HR)
- 0.5 HR FIRE SEPARATION
- 1 HR FIRE SEPARATION
- XX m TRAVEL DISTANCE

REQUIRED FIRE SEPARATIONS

JANITOR	0 HR
IT	1 HR
HAZARDOUS CLASSROOMS	0.5 HR
INTERCONNECTED SPACES	0.5 HR
EXIT STAIRS	1 HR
MECHANICAL ROOM	1 HR
ELECTRICAL ROOM	1 HR

NOTES:

1. ALL FLOOR ASSEMBLIES TO HAVE A FRR OF 1 HR.
2. ALL LOADBEARING STRUCTURAL ELEMENTS TO HAVE A FRR OF 1 HR.
3. REFER TO TYPICAL DETAILS FOR 1HR FRR PROTECTION OF TYPICAL HSS COLUMNS.
4. USE FIRE RATED GYPSUM BOARD FOR ALL FIRE RATED WALLS.
5. FIRE SEPARATION WALLS TO EXTEND TO U/S OF FLOOR / ROOF DECK. SEAL PERIMETER, AND ALL PENETRATIONS.
6. NO PENETRATION OR FIXTURE INSTALLATION ALLOWED INTO THE FIRE RATED WALLS OF EXITS UNO

HORIZONTAL ROLLER BLINDS (HRB)

AS INDICATED ON PLANS

- HRB-1 **TYPE 1** - SOLAR ROLLER BLINDS
- HRB-2 **TYPE 2** - SOLAR ROLLER BLINDS w/ BLACKOUT OPTION
- HRB-3 **TYPE 3** - MOTORIZED SOLAR ROLLER BLINDS

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KEYNOTE LEGENDS

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3	May 9th 2025	Issued for 66% Client Review	
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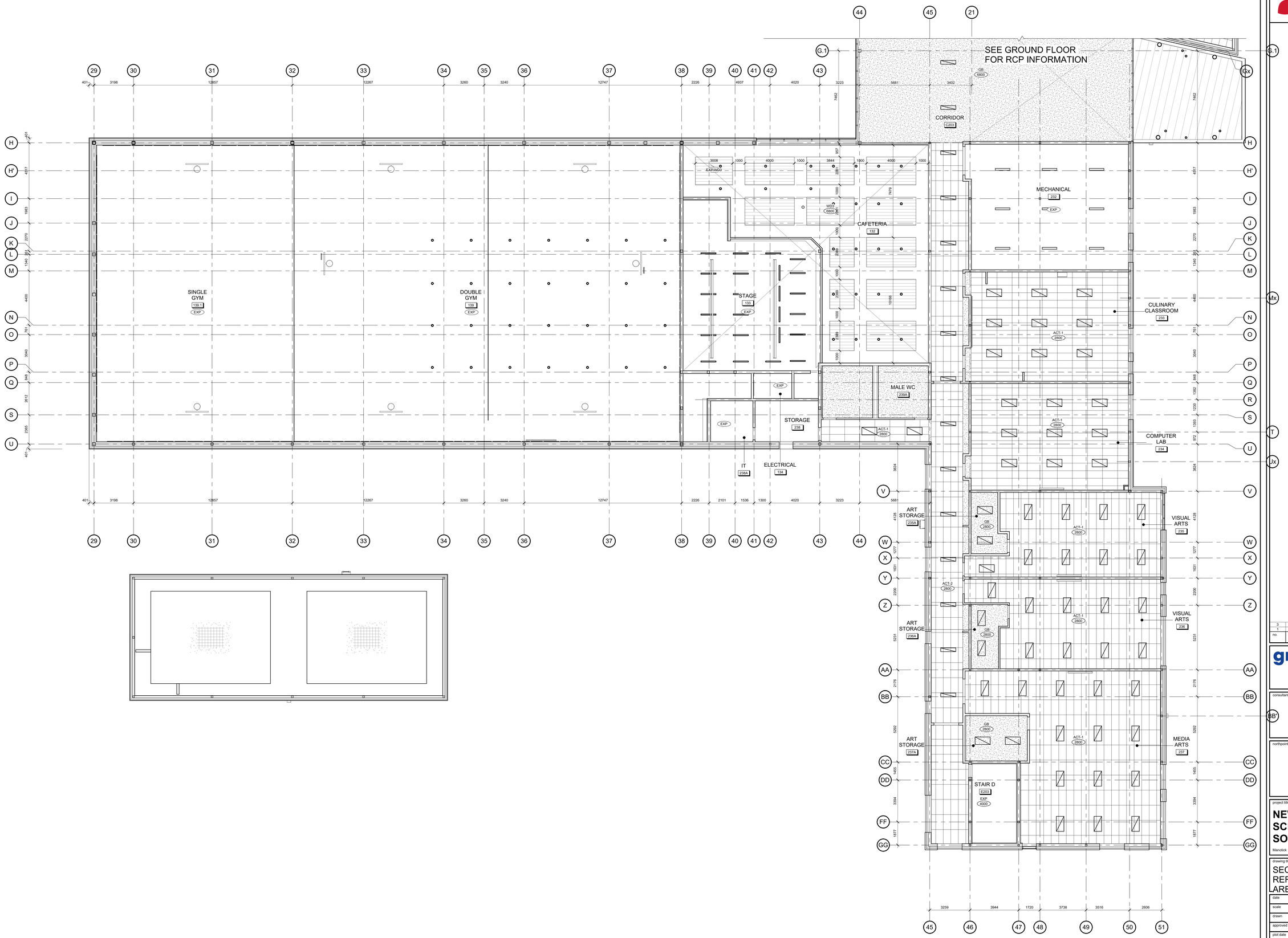
professional stamp

project title
NEW CATHOLIC HIGH SCHOOL RIVERSIDE SOUTH
Manotick Ontario

drawing title
SECOND FLOOR REFLECTED CEILING PLAN- AREA A

date	MAY 28 2025	job. no.	240097
scale	Comme indiqué		
drawn	JG	drawing no.	A603
approved	CJ/PD/PR		
plot date	01/09/25		

1. DO NOT SCALE FROM THIS DRAWING
2. CONTRACTOR TO VERIFY ALL DIMENSIONS AND NOTIFY THE ARCHITECT OF ANY DISCREPANCIES BEFORE WORK COMMENCES
3. THIS DRAWING TO BE READ IN CONJUNCTION WITH THE FOLLOWING DRAWINGS: STRUCTURAL, MECHANICAL, ELECTRICAL



1 / A604 SECOND FLOOR REFLECTIVE CEILING PLANS - AREA B
1 : 100

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no.	date	revision / issue	by
3	May 9th 2025	Issued for 66% Client Review	
1	March 14th 2025	Issued for 33% Client Review	

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project title
NEW CATHOLIC HIGH SCHOOL RIVERSIDE SOUTH
Manotick Ontario

drawing title
SECOND FLOOR REFLECTED CEILING PLAN- AREA B

date	MAY 28 2025	job. no.	240097
scale	1 : 100	drawing no.	A604
drawn	JG		
approved	CJ/PD/PR		
plot date	01/09/25		

1. DO NOT SCALE FROM THIS DRAWING
2. CONTRACTOR TO VERIFY ALL DIMENSIONS AND NOTIFY THE ARCHITECT OF ANY DISCREPANCIES BEFORE WORK COMMENCES
3. THIS DRAWING TO BE READ IN CONJUNCTION WITH THE FOLLOWING DRAWINGS: STRUCTURAL, MECHANICAL, ELECTRICAL

BEARING NOTE

BEARINGS ARE GRID, DERIVED FROM CAN-NET VRS NETWORK GPS OBSERVATIONS ON NCC HORIZONTAL CONTROL MONUMENTS 19773035 AND 19680191, CENTRAL MERIDIAN, 76° 30' WEST LONGITUDE MTM ZONE 9, NAD83 (ORIGINAL).

19773035 N:5006060.42 E:324888.04
19680191 N:5033564.26 E:388064.94

ELEVATION NOTE

ELEVATIONS SHOWN HEREON ARE GEODETIC (CGVD-1928:1978) AND ARE DERIVED FROM VERTICAL CONTROL MONUMENT No.001196530101 HAVING AN ELEVATION OF 115.813.

NEW CATHOLIC HIGH SCHOOL
RIVERSIDE SOUTH
675 BORBRIDGE AVE,
MANOTICK, ON K4M 0E2



LIST OF DRAWINGS

DWG NO.	DWG TITLE	DATE
	COVER SHEET	2025-09-11
C000	NOTES & DETAILS	2025-09-11
C001	EXISTING CONDITIONS AND REMOVALS PLAN	2025-09-11
C100	SITE SERVICING PLAN	2025-09-11
C200-1	SITE GRADING PLAN - INTERIM	2025-09-11
C200-2	SITE GRADING PLAN - ULTIMATE	2025-09-11
C300	EROSION AND SEDIMENT CONTROL PLAN	2025-09-11
C500	POST-DEVELOPMENT SITE CATCHMENTS	2025-09-11

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PROJECT No.OTT-24005530-AO

SEPTEMBER 2025

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no.	date	revision / issue	by
7	2025-09-11	RE-ISSUED FOR SITE PLAN CONTROL	AKJ
6	2025-07-31	ISSUED FOR TENDER	AKJ
5	2025-07-07	ISSUED FOR BUILDING PERMIT	AKJ
4	2025-07-02	ISSUED FOR 99% SUBMISSION	AKJ
3	2025-06-17	RE-ISSUED FOR SITE PLAN CONTROL	AGJ
2	2025-05-09	ISSUED FOR 66% CLIENT REVIEW	AKJ
1	2025-04-04	ISSUED FOR SITE PLAN CONTROL	AKJ
0	2025-03-14	ISSUED FOR 33% CLIENT REVIEW	AKJ

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project title
NEW CATHOLIC HIGH SCHOOL RIVERSIDE SOUTH
Manotick Ontario

drawing title
COVER

date	MARCH 14, 2025	job. no.	OTT-24005530-A0
scale	N.T.S		
drawn	AGJ	drawing no.	
approved	AKJ		
plot date	9/11/2025 9:42:04 AM		

1. DO NOT SCALE FROM THIS DRAWING
2. CONTRACTOR TO VERIFY ALL DIMENSIONS AND NOTIFY THE ARCHITECT OF ANY DISCREPANCIES BEFORE WORK COMMENCES
3. THIS DRAWING TO BE READ IN CONJUNCTION WITH THE FOLLOWING DRAWINGS: ARCHITECTURAL STRUCTURAL, MECHANICAL, ELECTRICAL, LANDSCAPE

D07-12-25-0045

PLAN #19337

I:\projects\ott-24005530-ao\02 execution\05 drawing\ott-24005530-ao - civil.dwg
Plotted: 11 Sep 2025 - 9:42:04 AM
Plot Scale: 1:1
Plot Device: DWG To PDF.pc3
Login: KMIT - Kyle Mitchell

GENERAL NOTES:

1. ALL WORKS AND MATERIALS SHALL CONFORM TO THE LATEST REVISIONS OF THE STANDARDS AND SPECIFICATIONS OF THE CITY OF OTTAWA, ONTARIO PROVINCIAL STANDARD DRAWINGS (OPSD) AND SPECIFICATIONS (OPSS), WHERE APPLICABLE.
2. THE LOCATION OF UTILITIES IS APPROXIMATE ONLY, AND THE EXACT LOCATION SHOULD BE DETERMINED BY CONSULTING THE MUNICIPAL AUTHORITIES AND UTILITY COMPANIES CONCERNED. THE CONTRACTOR IS RESPONSIBLE TO PROVIDE THE LOCATION AND STATUS OF UTILITIES AND SHALL BE RESPONSIBLE FOR ADEQUATE PROTECTION OF PLANT AND EQUIPMENT FROM DAMAGE. THE CONTRACTOR SHALL BE RESPONSIBLE FOR REPAIR OR REPLACEMENT OF ANY SERVICES OR UTILITIES DISTURBED DURING CONSTRUCTION, TO THE SATISFACTION OF THE AUTHORITY HAVING JURISDICTION.
3. THE CONTRACTOR SHALL VERIFY THE LOCATION AND ELEVATION OF EXISTING SERVICES PRIOR TO ANY CONSTRUCTION. THE CONTRACTOR SHALL CONFIRM LOCATIONS AND ELEVATIONS OF EXISTING SERVICES AND STRUCTURES TO BE CONNECTED TO AND EXISTING SERVICES THAT MAY BE DAMAGED OR CAUSE CONFLICTS PRIOR TO CONSTRUCTION OF ANY NEW SEWER, WATER AND/OR STORM WATER WORKS. ALL DIMENSIONS SHALL BE CHECKED AND VERIFIED IN THE FIELD BY THE CONTRACTOR PRIOR TO THE START OF CONSTRUCTION. ANY DISCREPANCIES, INTERPRETATIONS, CHANGES AND ADDITIONS TO THESE DRAWINGS MUST BE BROUGHT TO THE ATTENTION OF THE ENGINEER, WHEN NOTED AND BEFORE PROCEEDING WITH CONSTRUCTION WORKS. DO NOT CONTINUE CONSTRUCTION IN AREAS WHERE DISCREPANCIES APPEAR UNTIL SUCH DISCREPANCIES HAVE BEEN RESOLVED.
4. ALL ELEVATIONS ARE GEODETIC AND UTILIZE METRIC UNITS. ALL DIMENSIONS ARE IN METRES UNLESS OTHERWISE SPECIFIED. ALL DRAWINGS SHOULD NOT BE SCALED BY THE CONTRACTOR. ANY MISSING OR QUESTIONABLE DIMENSIONS ARE TO BE CONFIRMED WITH THE ENGINEER IN WRITING.
5. THE CONTRACTOR SHALL BE RESPONSIBLE FOR OBTAINING ALL PERMITS REQUIRED AND BEAR COST OF THE SAME.
6. ALL WORK SHALL BE COMPLETED IN ACCORDANCE WITH THE "OCCUPATIONAL HEALTH AND SAFETY ACT AND REGULATIONS FOR CONSTRUCTION PROJECTS". THE GENERAL CONTRACTOR SHALL BE DEEMED TO BE THE CONSTRUCTOR AS DEFINED IN THE ACT.
7. CONTRACTOR SHALL BE RESPONSIBLE FOR ALL EXCAVATION, BACKFILL AND REINSTATEMENT OF ALL AREAS DISTURBED DURING CONSTRUCTION TO THE SATISFACTION OF THE ENGINEER, THE CITY OF OTTAWA AND THE AUTHORITY HAVING JURISDICTION.
8. ANY AREAS BEYOND THE LIMIT OF THE SITE DISTURBED DURING CONSTRUCTION SHALL BE RESTORED TO ORIGINAL CONDITION OR BETTER TO THE SATISFACTION OF THE AUTHORITY HAVING JURISDICTION AT THE CONTRACTOR'S EXPENSE.
9. THE CONTRACTOR SHALL COMPLY WITH THE CITY OF OTTAWA REQUIREMENTS FOR TRAFFIC CONTROL WHEN WORKING ON CITY STREETS. ALL CONSTRUCTION SIGNAGE MUST CONFORM TO THE M.T.O. BOOK 7 AND T.A.C MANUAL OF UNIFORM TRAFFIC CONTROL DEVICES (LATEST AMENDMENT).
10. THE SUPPORT OF ALL UTILITIES SHALL BE IN ACCORDANCE WITH THE REQUIREMENTS OF THE AUTHORITY HAVING JURISDICTION.
11. THERE WILL BE NO SUBSTITUTION OF MATERIALS UNLESS WRITTEN APPROVAL BY THE ENGINEER HAS BEEN OBTAINED.
12. EXCESS EXCAVATED MATERIAL SHALL BE REMOVED FROM THE SITE. REMOVALS MUST BE DONE AS PER THE EXCESS SOIL REGULATIONS.
13. THE SITE LAYOUT IS THE RESPONSIBILITY OF THE CONTRACTOR. AS-BUILT SITE SERVICING & GRADING DRAWINGS SHALL BE MAINTAINED ON SITE BY THE CONTRACTOR.
14. THE CONTRACTOR WILL BE RESPONSIBLE FOR ADDITIONAL BEDDING OR ADDITIONAL STRENGTH PIPE IF THE MAXIMUM TRENCH WIDTH, AS SPECIFIED BY OPSD, IS EXCEEDED.
15. ALL NECESSARY CLEARING AND GRUBBING SHALL BE COMPLETED BY THE CONTRACTOR. REVIEW WITH ENGINEER AND THE CITY OF OTTAWA PRIOR TO ANY TREE CUTTING.
16. ALL EDGES OF DISTURBED PAVEMENT SHALL BE SAW CUT TO FORM A NEAT AND STRAIGHT LINE PRIOR TO PLACING NEW PAVEMENT.
17. ALL BOREHOLES SHOWN ON THE DRAWINGS ARE FOR INFORMATION ONLY. FOR GEOTECHNICAL INFORMATION REFER TO GEOTECHNICAL INVESTIGATION REPORT PREPARED BY EXP. SERVICES INC, DATED JUNE 27, 2025.
18. THE CONTRACTOR SHALL APPRAISE HIS/HER SELF OF ALL SURFACE AND SUBSURFACE CONDITIONS TO BE ENCOUNTERED AND SHALL CARRY OUT THEIR OWN TEST PITS AS REQUIRED TO MAKE THEIR OWN INDEPENDENT ASSESSMENT OF GROUND CONDITIONS. THE CONTRACTOR SHALL NOT MAKE ANY CLAIM FOR ANY EXTRA COST DUE TO ANY SUCH GROUND CONDITIONS VARYING FROM THOSE ANTICIPATED BY THE CONTRACTOR.
19. DO NOT CONSTRUCT USING DRAWINGS THAT ARE NOT MARKED "ISSUED FOR CONSTRUCTION".
20. FOR TOPOGRAPHICAL INFORMATION REFER TO PLAN PREPARED BY STANTEC GEOMATICS LIMITED. DATED MARCH 10, 2025.
21. CIVIL DRAWINGS TO BE READ IN CONJUNCTION WITH ARCHITECTURAL, LANDSCAPE AND LEGAL DRAWINGS.
22. ALL NECESSARY CLEARING AND GRUBBING SHALL BE COMPLETED BY THE CONTRACTOR. REVIEW WITH CONTRACT ADMINISTRATOR AND THE CITY OF OTTAWA PRIOR TO ANY TREE CUTTING.
23. STREET LIGHTING SHALL BE TO CITY OF OTTAWA STANDARDS.

SANITARY SEWER NOTES

1. ALL SANITARY SEWER MATERIALS AND INSTALLATION SHALL CONFORM TO THE LATEST REVISIONS OF THE STANDARDS AND SPECIFICATIONS OF THE CITY OF OTTAWA, ONTARIO PROVINCIAL STANDARD DRAWINGS (OPSD) AND SPECIFICATIONS (OPSS).
2. ALL SANITARY SEWERS SHALL BE PVC SDR 35, IPEX "RING-TITE" (OR EQUIVALENT), AS PER CSA STANDARD B182.2 OR LATEST AMENDMENT, UNLESS OTHERWISE NOTED.
3. SANITARY SEWER TRENCH AND BEDDING SHALL BE AS PER CITY OF OTTAWA STD. S6 AND S7, CLASS 'B BEDDING UNLESS OTHERWISE NOTED.
4. ALL SANITARY LATERALS ARE TO BE PVC SDR 28, IPEX "RING-TITE" (OR EQUIVALENT), ANY COLOR EXCEPT WHITE AND MARKED WITH A 50MM X 100MM WOODEN MARKER, EXTENDING FROM THE INVERT TO 1.0 M ABOVE GRADE PAINTED RED.
5. SEWER BEDDING AS PER CITY STANDARD S6 & S7. GRANULAR 'A' BEDDING TO BE INCREASED TO 300MM WHERE SEWERS ARE BELOW THE GROUNDWATER TABLE.
6. SANITARY SEWER MANHOLES SHALL BE BENCHED AS PER OPSD 701.021. SANITARY MANHOLE FRAME AND COVERS SHALL BE AS PER CITY OF OTTAWA STD. S24 AND S25. SAFETY PLATFORMS SHALL BE AS PER OPSD 404.02. DROP STRUCTURES SHALL BE IN ACCORDANCE WITH CITY OF OTTAWA SPECIFICATIONS AND OPSD 1003.01.
7. THE CONTRACTOR SHALL CONDUCT INFILTRATION/EXFILTRATION (AS PER CURRENT OPSS) TESTING ON ALL NEWLY INSTALLED SANITARY SEWERS. THE TEST SHALL BE PERFORMED IMMEDIATELY AFTER SEWER INSTALLATION AND VIEWED BY THE ENGINEER.
8. THE CONTRACTOR SHALL CONDUCT CCTV INSPECTION OF ALL NEWLY INSTALLED SANITARY SEWERS AND EXISTING SEWERS CONNECTED TO. THE TEST SHALL BE PERFORMED IMMEDIATELY AFTER SEWERS INSTALLED.
9. ALL SERVICE CONNECTIONS TO BE CONSTRUCTED AS PER CITY STANDARD S11 & S11.1.
10. THE CONTRACTOR SHALL CONSTRUCT FLEXIBLE SANITARY SEWERS IN ACCORDANCE WITH OPSD 802.010 AND 802.013. DURING CONSTRUCTION, THE CONTRACTOR SHALL PROTECT THE PIPES FROM HEAVY CONSTRUCTION EQUIPMENT. BEDDING AND BACKFILL SHALL BE COMPACTED TO A MINIMUM OF 95% SPMDD.
11. ALL SANITARY BUILDING DRAINS TO BE EQUIPPED WITH SANITARY BACKWATER VALVES INSTALLED PER CITY OF OTTAWA STANDARD DRAWING S14.1.
12. WITHIN THE FROST ZONE, THE BACKFILL IN THE SERVICE TRENCHES SHOULD MATCH THE SOIL ON SIDES TO MINIMIZE DIFFERENTIAL FROST HEAVING IN THE SUBGRADE.
13. MINIMUM SOIL COVER TO BE 2.1m TO PROTECT SEWERS FROM FROST DAMAGE. IN AREAS WHERE ADEQUATE FROST COVER CANNOT BE ACHIEVED, EQUIVALENT THERMAL INSULATION TO BE INSTALLED AS PER OPSD 514.010

STORM SEWER NOTES

1. ALL STORM SEWER MATERIALS AND INSTALLATION SHALL CONFORM TO THE LATEST REVISIONS OF THE STANDARDS AND SPECIFICATIONS OF THE CITY OF OTTAWA, ONTARIO PROVINCIAL STANDARD DRAWINGS (OPSD) AND SPECIFICATIONS (OPSS).
2. ALL REINFORCED CONCRETE STORM SEWER PIPE SHALL BE IN ACCORDANCE WITH CSA A257.2 (LATEST AMENDMENT). ALL NON-REINFORCED CONCRETE STORM SEWER PIPE SHALL BE IN ACCORDANCE WITH CSA A257.L (LATEST AMENDMENT). PIPE SHALL BE JOINTED WITH STD. RUBBER GASKETS AS PER CSA A257.3 (LATEST AMENDMENT).
3. ALL PVC STORM SEWERS ARE TO BE SDR 35 APPROVED PER C.S.A. 8182.2 OR LATEST AMENDMENT, UNLESS OTHERWISE SPECIFIED.
4. THE CONTRACTOR SHALL CONSTRUCT FLEXIBLE STORM SEWERS IN ACCORDANCE WITH OPSD 802.010 AND 802.013. RIGID STORM PIPE SHALL BE CONSTRUCTED IN ACCORDANCE WITH OPSD 802.030. DURING CONSTRUCTION THE CONTRACTOR SHALL PROTECT THE PIPES FROM HEAVY CONSTRUCTION EQUIPMENT. BEDDING AND BACKFILL SHALL BE COMPACTED TO A MINIMUM OF 95% SPMDD.
5. SEWER BEDDING AS PER CITY STANDARD S6 & S7.
6. ALL STORM LATERALS SHALL BE PVC SDR 28, WHITE IN COLOR AND MARKED WITH A 50mm X 100mm WOODEN MARKER EXTENDING FROM THE INVERT TO 1.0M ABOVE GRADE PAINTED GREEN.
7. ALL SERVICE CONNECTIONS TO BE CONSTRUCTED AS PER CITY STANDARD S11 & S11.1.
8. WITHIN THE FROST ZONE, THE BACKFILL IN THE SERVICE TRENCHES SHOULD MATCH THE SOIL ON SIDES TO MINIMIZE DIFFERENTIAL FROST HEAVING IN THE SUBGRADE
9. MINIMUM SOIL COVER TO BE 2.1m TO PROTECT SEWERS FROM FROST DAMAGE. IN AREAS WHERE ADEQUATE FROST COVER CANNOT BE ACHIEVED, EQUIVALENT THERMAL INSULATION TO BE INSTALLED AS PER OPSD 514.010
10. ALL STORM SERVICES TO BE EQUIPPED WITH APPROVED BACKWATER VALVES.
11. STORM MANHOLE FRAME AND COVERS SHALL BE AS PER CITY OF OTTAWA STD. S24.1 AND S25.
12. SAFETY PLATFORMS SHALL BE IN ACCORDANCE WITH OPSD 404.02.
13. DROP STRUCTURES SHALL BE IN ACCORDANCE WITH CITY OF OTTAWA SPECIFICATIONS AND OPSD 1003.01.
14. STORM SEWER MANHOLES SERVING LOCAL SEWERS LESS THAN 900mm SHALL BE CONSTRUCTED WITH A 300mm SUMP. FOR STORM SEWERS 900mm AND OVER USE BENCHING IN ACCORDANCE WITH OPSD 701 .021.
15. SINGLE AND DOUBLE CATCHBASINS SHALL BE IN ACCORDANCE WITH CITY OF OTTAWA STD. S1. AND OPSD 705.020, RESPECTIVELY. FRAMES AND GRATE SHALL BE AS PER CITY OF OTTAWA STD. S19 FOR REAR LOT CATCHBASINS, AND STREET CATCHBASINS.
16. CURB INLET TYPE CATCH BASIN (CICB) SHALL BE IN ACCORDANCE WITH CITY OF OTTAWA STD. S3. AND GRATE SHALL BE AS PER CITY OF OTTAWA STD. S22 AND S23, UNLESS OTHERWISE NOTED.
17. SINGLE AND DOUBLE CATCHBASIN LEADS SHALL BE 200mm⌀ AND 250mm⌀ (MIN) RESPECTIVELY, 1.0% SLOPE (MIN.) UNLESS OTHERWISE NOTED.
18. ALL CATCHBASINS AND CATCHBASIN MANHOLES SHALL HAVE SUMPS WITH 300m DEPTH, UNLESS OTHERWISE NOTED.
19. CONTRACTOR SHALL ENSURE THAT CATCHBASINS ARE INSTALLED AT THE LOW POINT OF SAG CURB WORKS.
20. THE STORM SEWER CLASSES HAVE BEEN DESIGNED BASED ON BEDDING CONDITIONS SPECIFIED, WHERE THE SPECIFIED TRENCH WIDTH IS EXCEEDED, THE CONTRACTOR SHALL BE REQUIRED TO PROVIDE ADDITIONAL BEDDING, A DIFFERENT TYPE OF BEDDING OR A HIGHER PIPE STRENGTH AT HIS OWN EXPENSE AND SHALL ALSO BE RESPONSIBLE FOR EXTRA TEMPORARY AND/OR PERMANENT REPAIRS MADE NECESSARY BY THE WIDENED TRENCH.
21. THE CONTRACTOR SHALL CONDUCT CCTV INSPECTION OF ALL NEWLY INSTALLED STORM SEWERS AND EXISTING SEWERS CONNECTED TO. THE TEST SHALL BE PERFORMED IMMEDIATELY AFTER SEWERS INSTALLED.

WATERMAIN NOTES

1. ALL WATERMAIN MATERIALS AND INSTALLATION SHALL CONFORM TO THE LATEST REVISIONS OF THE STANDARDS AND SPECIFICATIONS OF THE CITY OF OTTAWA, ONTARIO PROVINCIAL STANDARD DRAWINGS (OPSD) AND SPECIFICATIONS (OPSS).
2. NO WORK SHALL COMMENCE UNLESS A CITY WATER WORKS INSPECTOR IS ON SITE. WATERMAIN CONNECTIONS BY CITY OF OTTAWA FORCES WITH ALL EXCAVATION BACKFILL AND ROAD REINSTATEMENT BY CONTRACTOR.
3. ALL PVC WATERMAINS SHALL BE EQUAL TO AWWA C-900 CLASS 150, SDR 18, OR APPROVED EQUAL.
4. WATERMAINS TRENCH AND BEDDING SHALL BE IN ACCORDANCE WITH CITY OF OTTAWA STANDARD W17, UNLESS OTHERWISE SPECIFIED. BEDDING AND COVER MATERIAL SHALL BE SPECIFIED BY PROJECT GEOTECHNICAL ENGINEER.
5. ALL PVC WATERMAINS SHALL BE INSTALLED WITH A 10 GAUGE STRANDED COPPER TWU OR RWU TRACER WIRE IN ACCORDANCE WITH CITY OF OTTAWA STD. W36.
6. WATER SERVICES ARE TO BE TYPE K SOFT COPPER AS PER CITY OF OTTAWA STD. W26 UNLESS OTHERWISE SPECIFIED. ALL WATER SERVICES CROSSING SEWERS ARE TO BE INSTALLED AS PER CITY OF OTTAWA STD. W38. WATER SERVICES SHALL BE MARKED WITH A "50mm X 100mm", EXTENDING FROM THE INVERT TO 1.0m ABOVE GRADE PAINTED BLUE. STAND POSTS/SHUT-OFFS SHALL BE INSTALLED AT THE PROPERTY LINE.
7. CATHODIC PROTECTION IS REQUIRED ON ALL METALLIC FITTINGS AS PER CITY OF OTTAWA STD. W40 AND W42.
8. VALVE BOXES SHALL BE INSTALLED AS PER CITY OF OTTAWA DETAIL W24.
9. ALL FIRE HYDRANTS TO BE INSTALLED AS PER CITY STANDARD W19 AND LOCATED AS PER CITY STANDARD W18 AND/OR CITY STANDARD CROSS SECTIONS.
10. ALL WATERMAINS TO BE INSTALLED AT MINIMUM COVER OF 2.4m.
11. THRUST BLOCKS AND RESTRAINT AS PER CITY OF OTTAWA DWGS: W25.3 AND W25.4, W25.5 AND W25.6.
12. IF WATERMAIN MUST BE DEFLECTED TO MEET ALIGNMENT, ENSURE THAT THE AMOUNT OF DEFLECTION USED IS LESS THAN HALF THAT RECOMMENDED BY THE MANUFACTURER.
13. DISINFECTION AND TESTING OF WATERMAIN TO BE IN ACCORDANCE WITH CITY OF OTTAWA STANDARDS.
14. WATER METERS TO BE INSTALLED AS PER W30 FOR WATER SERVICES.
15. THE CONTRACTOR SHALL PROVIDE ALL TEMPORARY CAPS, PLUGS AND BLOW-OFFS AND NOZZLES REQUIRED FOR TESTING AND DISINFECTION OF THE WATERMAN.
16. INSULATION FOR WATERMAIN CROSSING OVER AND BELOW SEWER SHALL BE IN ACCORDANCE WITH CITY OF OTTAWA STD. W25.2 AND W25, RESPECTIVELY, WHERE WATERMAN COVER IS LESS THAN 2.4m.
17. WHERE THE SEPARATION BETWEEN SERVICES AND MANHOLES IS LESS THAN 2.4m, WATER SERVICES ARE TO BE INSULATED AS PER CITY OF OTTAWA STD. W23.
18. AS PER CITY GUIDELINE, THE MINIMUM VERTICAL CLEARANCE BETWEEN WATERMAIN AND SEWER / UTILITY IS 0.25M FOR CROSSING OVER THE SEWER, AS PER CITY STD W25.2. FOR CROSSING UNDER SEWER, THE MINIMUM VERTICAL CLEARANCE IS 0.50M AS PER CITY STD. W25. FOR CROSSING UNDER SEWER, ADEQUATE STRUCTURAL SUPPORT FOR THE SEWERS IS REQUIRED TO PREVENT EXCESSIVE DEFLECTION OF JOINTS AND SETTLING. THE LENGTH OF WATER PIPE SHALL BE CENTERED AT THE POINT OF CROSSING SO THAT THE JOINTS WILL BE EQUIDISTANT AND AS FAR AS POSSIBLE FROM THE SEWER.

ROADWAY SPECIFICATIONS

1. ALL TOPSOIL AND ORGANIC MATERIAL SHALL BE STRIPPED WITHIN THE ROAD ALLOWANCE PRIOR TO THE COMMENCEMENT OF CONSTRUCTION.
2. CONCRETE CURB SHALL BE IN ACCORDANCE WITH CITY OF OTTAWA STD. SC1.1(BARRIER CURB) AND SC1.3 (MOUNTABLE CURB), AS NOTED. PROVISION SHALL BE MADE FOR CURB DEPRESSIONS AT SIDEWALKS AND DRIVEWAYS.
3. ROAD SUBDRAINS SHALL BE IN ACCORDANCE WITH CITY OF OTTAWA STD. R1. SUBDRAINS SHALL BE 6m IN LENGTH AT CATCHBASINS. SUBDRAINS SHALL BE INSTALLED BOTH SIDES AT LOWPOINTS AND ON THE HIGH SIDE AT FLOWBY CATCHBASINS.
4. PAVEMENT REINSTATEMENT FOR SERVICE AND UTILITY CUTS SHALL BE IN ACCORDANCE WITH CITY OF OTTAWA STD. R10 AND OPSD 509.010, OPSS 310.
5. GRANULAR "A" SHALL BE PLACED TO A MINIMUM THICKNESS OF 300mm AROUND ALL STRUCTURES WITHIN PAVEMENT AREA.
6. ALL GRANULAR FOR ROADS SHALL BE COMPACTED TO A MINIMUM OF 98% STANDARD PROCTOR DENSITY.
7. ASPHALT WEAR COURSE SHALL NOT BE PLACED UNTIL THE VIDEO INSPECTION OF SEWERS & NECESSARY REPAIRS HAVE BEEN CARRIED OUT TO THE SATISFACTION OF THE ENGINEER.
8. SUB- EXCAVATE SOFT AREAS AND FILL WITH GRANULAR 'B' COMPACTED IN MAXIMUM 300mm LIFTS.
9. PAVEMENT STRUCTURE: AS PER GEOTECH INVESTIGATION REPORT PREPARED BY EXP SERVICES INC DATED JANUARY 20, 2025, ALSO SHOWN IN TABLE BELOW.

Recommended Pavement Structure Thicknesses

Pavement Layer	Compaction Requirements	Computed Pavement Structure	
		Light Duty Traffic (Cars Only)	Heavy Duty Traffic (Bus areas, Garbage Trucks, Emergency Vehicles)
Asphaltic Concrete	92-97 percent MRD	65 mm HL3/SP12.5 mm/ Cat. 8 (PG 58-34)	50 mm HL3/SP12.5 Cat. 8 60 mm HL8/SP 19 Cat. 8 (PG 58-34)
OPSS 1010 Granular A Base (crushed limestone)	100% percent SPMDD	150 mm	150 mm
OPSS 1010 Granular B Type II Sub-base	100 percent SPMDD	450 mm	600 mm

Notes:
1. SPMDD denotes standard Proctor maximum dry density, ASTM, D-698.12e2.
2. MRD denotes Maximum Relative Density, ASTM D2041.
3. The upper 300 mm of the subgrade fill must be compacted to 98% SPMDD.
4. The approved subgrade should be covered with a woven geotextile prior to placement of granular sub-base of the pavement structure.

GENERAL NOTES FOR GRADING

1. IT SHALL BE THE BUILDER'S RESPONSIBILITY TO ENSURE THAT GRADING AROUND HYDRANTS, TRANSFORMERS, AND UTILITY PEDESTALS, ETC., MEET CURRENT CITY OF OTTAWA, HYDRO AND UTILITY COMPANY REQUIREMENTS.
2. ALL GROUND SURFACES SHALL BE EVENLY GRADED WITHOUT PONDING AREAS AND WITHOUT LOW POINTS EXCEPT WHERE APPROVED SWALE OR CATCH BASIN OUTLETS ARE PROVIDED.
3. CONTRACTOR TO ADJUST EXISTING CATCH BASINS, MANHOLES, FIRE HYDRANTS, VALVE CHAMBERS AND VALVE BOXES TO FINAL GRADE AS REQUIRED.
4. CONTRACTOR SHALL TAKE ALL NECESSARY PRECAUTIONS TO PROTECT EXISTING FOUNDATIONS OF ADJACENT BUILDINGS DURING EXCAVATION AND CONSTRUCTION PERIOD.
5. GRADING IN GRASSED AREAS WILL BE BETWEEN 2% TO 7%. GRADES IN EXCESS OF 7% WILL REQUIRE A MAXIMUM 3:1 TERRACING.
6. FINAL EXTERIOR ELEVATION ADJACENT TO BUILING FOUNDATION TO BE MINIMUM 200mm BELOW FFE(92.10) EXCEPT AS INDICATED AND AS REQUIRED FOR TAPERING AT ACCESSIBLE ENTRANCES.

BEARING NOTE

BEARINGS ARE GRID, DERIVED FROM CAN-NET VRS NETWORK GPS OBSERVATIONS ON MTM HORIZONTAL CONTROL MONUMENTS 19773035 AND 19680191, CENTRAL MERIDIAN, 76° 30' WEST LONGITUDE MTM ZONE 9, NAD83 (ORIGINAL).

19773035 N:5006060.42 E:324888.04
19680191 N:5033564.26 E:388064.94

ELEVATION NOTE

ELEVATIONS SHOWN HEREON ARE GEODETIC (CGVD-1928:1978) AND ARE DERIVED FROM VERTICAL CONTROL MONUMENT No.001196530101 HAVING AN ELEVATION OF 115.813.

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no.	date	revision / issue	by
7	2025-09-11	RE-ISSUED FOR SITE PLAN CONTROL	AKJ
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northpoint

professional stamp

project title
NEW CATHOLIC HIGH SCHOOL RIVERSIDE SOUTH
Manotick Ontario

drawing title
NOTES AND DETAILS

date	MARCH 14, 2025	job. no.	OTT-24005530-A0
scale	N.T.S	drawing no.	C000
drawn	AGJ		
approved	AKJ		
plot date	9/11/2025 9:42:14 AM		

1. DO NOT SCALE FROM THIS DRAWING
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3. THIS DRAWING TO BE READ IN CONJUNCTION WITH THE FOLLOWING DRAWINGS: ARCHITECTURAL STRUCTURAL, MECHANICAL, ELECTRICAL, LANDSCAPE

D07-12-25-0045

PLAN #19337

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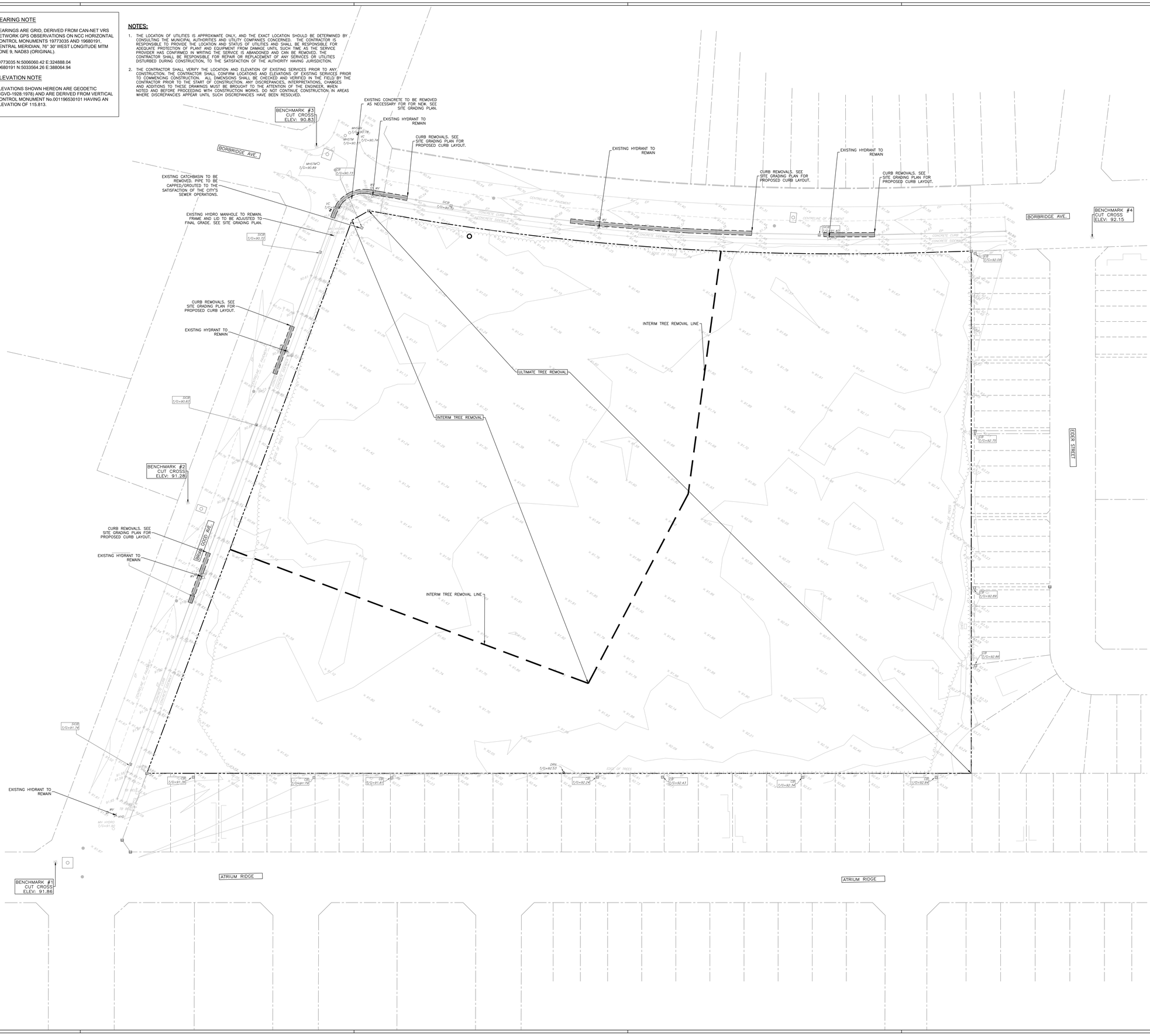
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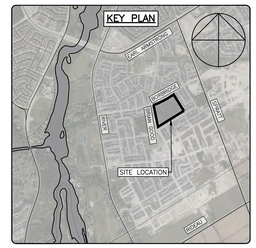
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NOTES:

1. THE LOCATION OF UTILITIES IS APPROXIMATE ONLY, AND THE EXACT LOCATION SHOULD BE DETERMINED BY CONSULTING THE MUNICIPAL AUTHORITIES AND UTILITY COMPANIES CONCERNED. THE CONTRACTOR IS RESPONSIBLE TO PROVIDE THE LOCATION AND STATUS OF UTILITIES AND SHALL BE RESPONSIBLE FOR ADEQUATE PROTECTION OF PLANT AND EQUIPMENT FROM DAMAGE UNTIL SUCH TIME AS THE SERVICE PROVIDER HAS CONFIRMED IN WRITING THE SERVICE IS ABANDONED AND CAN BE REMOVED. THE CONTRACTOR SHALL BE RESPONSIBLE FOR REPAIR OR REPLACEMENT OF ANY SERVICES OR UTILITIES DISTURBED DURING CONSTRUCTION, TO THE SATISFACTION OF THE AUTHORITY HAVING JURISDICTION.
2. THE CONTRACTOR SHALL VERIFY THE LOCATION AND ELEVATION OF EXISTING SERVICES PRIOR TO ANY CONSTRUCTION. THE CONTRACTOR SHALL CONFIRM LOCATIONS AND ELEVATIONS OF EXISTING SERVICES PRIOR TO COMMENCING CONSTRUCTION. ALL DIMENSIONS SHALL BE CHECKED AND VERIFIED IN THE FIELD BY THE CONTRACTOR PRIOR TO THE START OF CONSTRUCTION. ANY DISCREPANCIES, INTERPRETATIONS, CHANGES AND ADDITIONS TO THESE DRAWINGS MUST BE BROUGHT TO THE ATTENTION OF THE ENGINEER, WHEN NOTED AND BEFORE PROCEEDING WITH CONSTRUCTION WORKS. DO NOT CONTINUE CONSTRUCTION IN AREAS WHERE DISCREPANCIES APPEAR UNTIL SUCH DISCREPANCIES HAVE BEEN RESOLVED.





LEGEND

- PROPERTY LINE
- ABUTTING PL
- EX. C.L. ROAD
- EX. FEATURE
- EX. CURB
- SITE BENCHMARK
- WV — EX. WATER VALVE
- VC — EX. VALVE CHAMBER
- CB — EX. CATCHBASIN
- SICB — EX. SIDEWALK(CURB INLET) CATCHBASIN
- HYD — EX. HYDRANT
- EX. STORM MANHOLE
- EX. SANITARY MANHOLE
- EX. MUNI. WATERMAIN
- EX. MUNI. STORM SEWER
- EX. MUNI. SAN SEWER
- INTERIM GRADING TREE LINE
- CURB & BOULEVARD REMOVALS

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EXISTING CONDITIONS & REMOVALS PLAN

date	MARCH 14, 2025	job. no.	OTT-24005530-A0
scale	1 : 500		
drawn	AGJ	drawing no.	C001
approved	AKJ		
plot date	9/11/2025 9:42:26 AM		

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D07-12-25-0045

PLAN #19337

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Plot time: 2025-09-11 9:42:26 AM
Plot by: AKJ
Plot scale: 1:1
Plot device: DWG To PDF.pc3

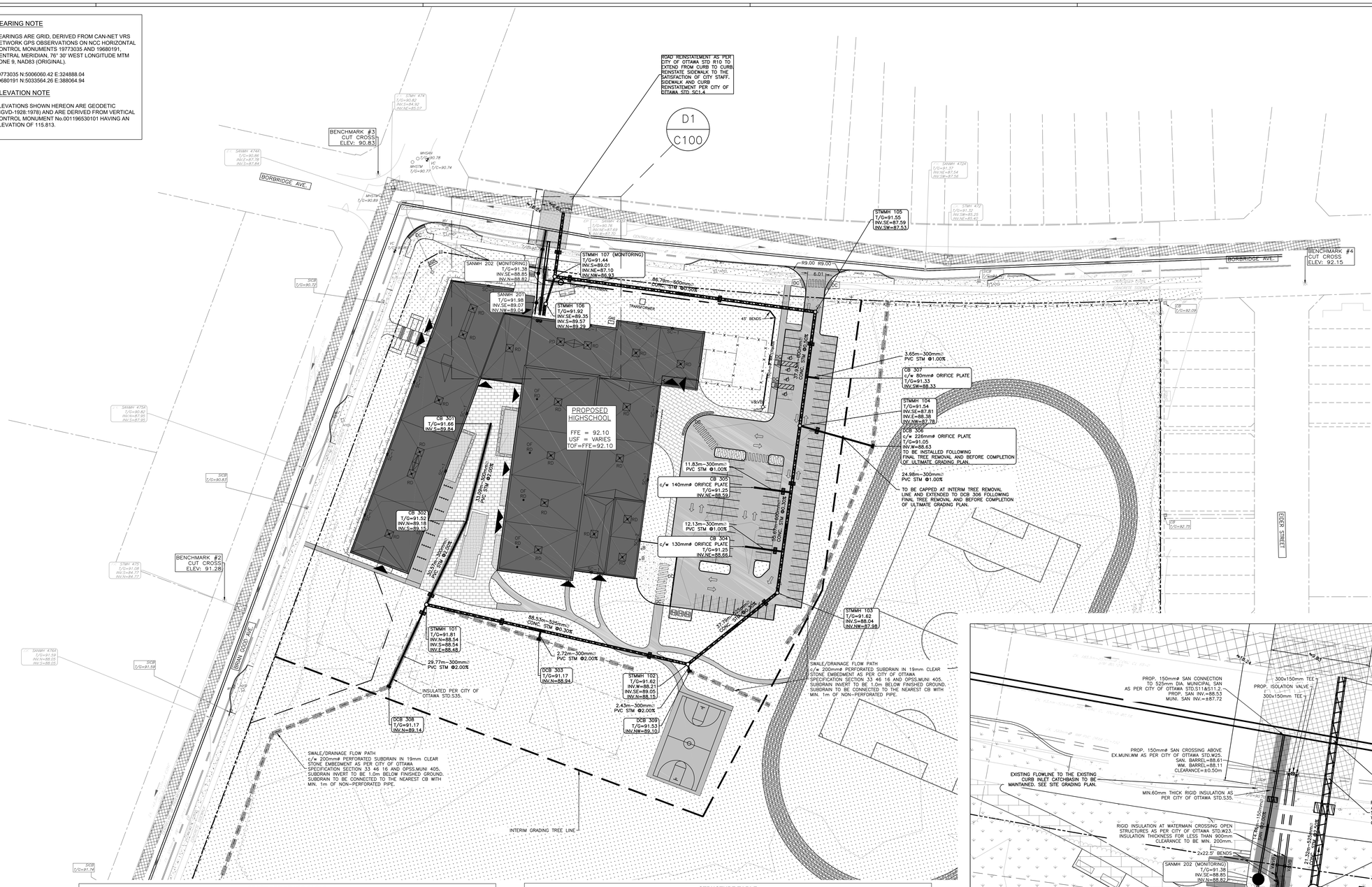
BEARING NOTE

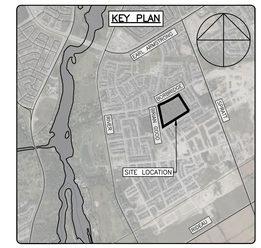
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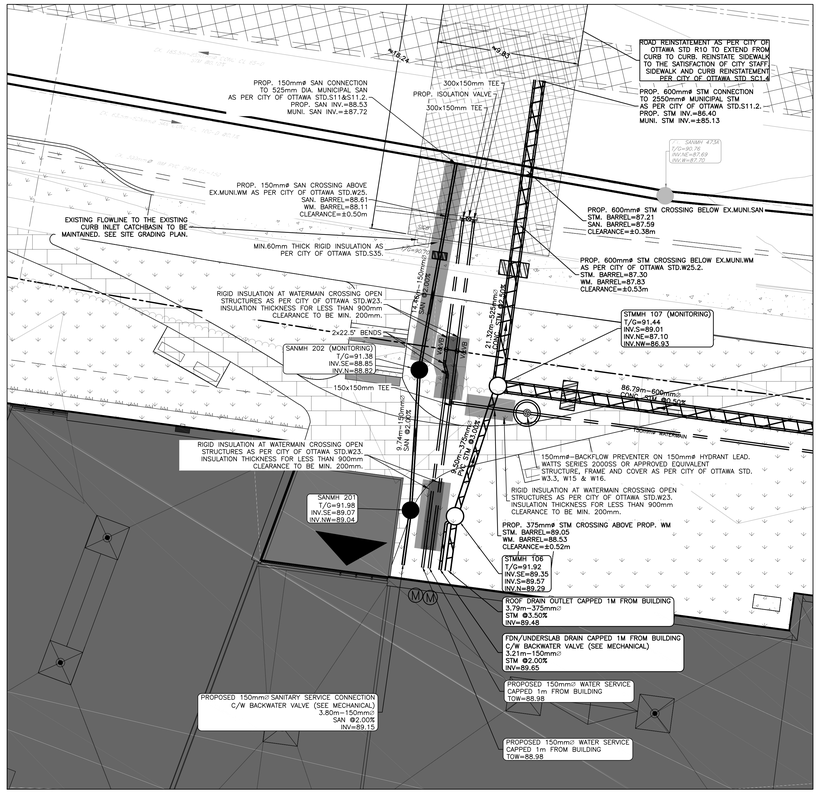
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- EX. SIDEWALK(CURB INLET) CATCHBASIN
- EX. HYDRANT
- EX. STORM MANHOLE
- EX. SANITARY MANHOLE
- EX. MUNI. WATERMAIN
- EX. MUNI. STORM SEWER
- EX. MUNI. SAN SEWER
- PROP. STORM PIPE
- PROP. SANITARY SERVICE
- PROP. WATER SERVICE
- PROP. STORM MANHOLE
- PROP. DOUBLE CATCHBASIN
- PROP. CATCHBASIN
- PROP. SANITARY MANHOLE
- PROP. WATER SERVICE CONNECTION TO MUNI. WATERMAIN.
- PROP. VALVE & VALVE BOX
- PROP. ELBOW (22.5°)
- PROP. MUNI. WATERMAIN ISOLATION VALVE
- PROPOSED ROOF DRAIN
- INSULATION INSULATION PER CITY OF OTTAWA STD.S35 & W22 AS APPLICABLE
- INTERIM GRADING TREE LINE
- PROP. TOP OF SLOPE
- PROP. SWALE
- PROP. SWALE C/W 200mmø SUBDRAIN PIPING AS PER CITY OF OTTAWA SPEC SECTION 33 46 16
- PROP. TERRACING (MAX 3:1)
- PROP. BOTTOM OF TERRACING
- PROP. SIAMESE CONNECTION
- PROP. WATER METER
- PROP. HYDRANT
- PROP. ROOF OVERFLOW SCUPPER
- PROPOSED OVERFLOW ROOF DRAIN
- CLAY SEAL PER CITY OF OTTAWA STD. S8



D1
C100
SITE SERVICING
SCALE 1:150

PROPOSED SEWER TABLE

STRUCTURE U/S	STRUCTURE D/S	TYPE	INVERT ELEV (m) U/S	INVERT ELEV (m) D/S	NOMINAL DIA. (mm)	LENGTH (m)	Type	Class	Slope (%)
BLDG	STMH 106	STM	89.48	89.35	375.000000	3.79	PVC	SDR 28	3.50%
BLDG	ELBOW	STM	89.65	89.59	150.000000	3.21	PVC	SDR 28	2.00%
ELBOW	STMH 106	STM	89.59	89.57	150.000000	0.79	PVC	SDR 28	2.00%
STMH 106	STMH 107	STM	89.29	89.01	375.000000	9.50	PVC	SDR 28	3.00%
STMH 107	MUNI. STORM	STM	86.93000 00	86.40	525.000000	21.32	CONC.	65-D	2.50%
STMH 105	STMH 107	STM	87.53	87.10	600.000000	86.79	CONC.	65-D	0.50%
STMH 104	STMH 105	STM	87.78	87.59	600.000000	37.93	CONC.	65-D	0.50%
STMH 103	STMH 104	STM	87.98	87.81	600.000000	55.67	CONC.	65-D	0.30%
STMH 102	STMH 103	STM	88.15	88.04	525.000000	37.79	CONC.	65-D	0.30%
STMH 101	STMH 102	STM	88.48	88.21	525.000000	88.53	CONC.	65-D	0.30%
CB 301	CB 302	STM	89.84	89.18	300.000000	33.09	PVC	SDR 35	2.00%
CB 302	STMH 101	STM	89.15	88.54	300.000000	30.57	PVC	SDR 35	2.00%
DCB 303	STM	STM	88.94	88.88	300.000000	2.72	PVC	SDR 35	2.00%
CB 304	STM	STM	88.66	88.53	300.000000	12.13	PVC	SDR 35	1.00%
CB 305	STM	STM	88.59	88.48	300.000000	11.83	PVC	SDR 35	1.00%
DCB 306	STMMH 104	STM	88.63	88.38	300.000000	24.98	PVC	SDR 35	1.00%
CB 307	STM	STM	88.33	88.30	300.000000	3.65	PVC	SDR 35	1.00%
DCB 308	STMH 101	STM	89.14	88.54	300.000000	29.77	PVC	SDR 35	2.00%
DCB 309	STMMH 102	STM	89.10	89.05	300.000000	2.43	PVC	SDR 35	2.00%
BLDG	SANMH 201	SAN	89.15	89.07	150.000000	3.80	PVC	SDR 28	2.00%
SANMH 201	SANMH 202	SAN	89.04	88.85	150.000000	9.74	PVC	SDR 35	2.00%
SANMH 202	MUNI. SAN	SAN	88.82	88.53	150.000000	14.46	PVC	SDR 35	2.00%

STRUCTURE TABLE

STRUCTURE NUMBER	TYPE	LID ELEV (m)	INVERT IN (m) and DIA (mm)		INVERT OUT (m) and DIA (mm)		STRUCTURE SIZE	STRUCTURE REFERENCE	STRUCTURE FRAME	STRUCTURE COVER
STMMH 101	STM	91.81	88.54	(300)	88.48	(525)	1200mmØ	OPSD 701.010	S25	S24.1
			88.54	(300)						
STMMH 102	STM	91.62	88.21	(525)	88.15	(525)	1500mmØ	OPSD 701.011	S25	S24.1
			89.05	(300)						
STMMH 103	STM	91.62	88.04	(525)	87.98	(600)	1500mmØ	OPSD 701.011	S25	S24.1
STMMH 104	STM	91.54	87.81	(600)	87.78	(600)	1500mmØ	OPSD 701.011	S25	S24.1
			88.38	(300)						
STMMH 105	STM	91.55	87.59	(600)	87.53	(600)	1500mmØ	OPSD 701.011	S25	S24.1
STMMH 106	STM	91.92	89.35	(375)	89.29	(375)	1200mmØ	OPSD 701.010	S25	S24.1
			89.57	(150)						
STMMH 107	STM	91.44	89.01	(375)	86.93	(525)	1500mmØ	OPSD 701.011	S25	S24.1
			87.10	(600)						
CB 301	STM	91.66			89.84	(300)	600X600mm	OPSD 705.010	OPSD 400.020	S19.1
CB 302	STM	91.52	89.18	(300)	89.15	(300)	600X600mm	OPSD 705.010	OPSD 400.020	S19.1
DCB 303	STM	91.17			88.94	(300)	600X1450mm	OPSD 705.020	OPSD 400.020 (x2)	S19.1 (x2)
CB 304	STM	91.25			88.66	(300)	600X600mm	OPSD 705.010	OPSD 400.020	S19.1
CB 305	STM	91.25			88.59	(300)	600X600mm	OPSD 705.010	OPSD 400.020	S19.1
DCB 306	STM	91.05			88.63	(300)	600X1450mm	OPSD 705.020	OPSD 400.020 (x2)	S19.1 (x2)
CB 307	STM	91.33			88.33	(300)	600X600mm	OPSD 705.010	OPSD 400.020	S19.1
DCB 308	STM	91.17			89.14	(300)	600X1450mm	OPSD 705.020	OPSD 400.020 (x2)	S19.1 (x2)
DCB 309	STM	91.53			89.10	(300)	600X1450mm	OPSD 705.020	OPSD 400.020 (x2)	S19.1 (x2)
SANMH 201	SAN	91.98	89.07	(150)	89.04	(150)	1200mmØ	OPSD 701.010	S25	S24
SANMH 202	SAN	91.38	88.85	(150)	88.82	(150)	1200mmØ	OPSD 701.010	S25	S24

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project title
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drawing title
SITE SERVICING PLAN

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PLAN #19337

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Plotted: 9/11/2025 9:42 AM
By: AGJ

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19680191 N:5033564.26 E:388064.94

ELEVATION NOTE

ELEVATIONS SHOWN HEREON ARE GEODETIC (CGVD-1928:1978) AND ARE DERIVED FROM VERTICAL CONTROL MONUMENT No.001196530101 HAVING AN ELEVATION OF 115.813.

BENCHMARK #3
CUT CROSS
ELEV: 90.83

BENCHMARK #2
CUT CROSS
ELEV: 91.28

BENCHMARK #1
CUT CROSS
ELEV: 91.86

BENCHMARK #4
CUT CROSS
ELEV: 92.15

BORBRIDGE AVE.

FINAL EXTERIOR ELEVATION ADJACENT TO BUILING FOUNDATION TO BE MINIMUM 200mm BELOW FFE(92.10) EXCEPT AS INDICATED AND AS REQUIRED FOR TAPERING AT ACCESSIBLE ENTRANCES.

TWSI PER CITY OF OTTAWA STD. SC7

TWSI EACH SIDE PER CITY OF OTTAWA STD. SC7.4

EXISTING HYDRO MANHOLE TO REMAIN. FRAME AND LID TO BE ADJUSTED TO FINAL GRADE.

ENTRANCE STAIRS C/W ACCESSIBLE RAMP (SEE ARCHITECTURAL)

SANMH 202 (MONITORING)
T/G=91.38

STMMH 107 (MONITORING)
T/G=91.44

SANMH 201
T/G=91.98

STMMH 106
T/G=91.92

STMMH 105
T/G=91.55

STMMH 104
T/G=91.54

STMMH 103
T/G=91.62

PROPOSED HIGHSCHOOL

FFE = 92.10
USF = VARIES
TOF=FFE=92.10

CB 301
T/G=91.66

CB 302
T/G=91.52

CB 303
T/G=91.33

CB 304
T/G=91.25

CB 305
T/G=91.25

DCB 306 TO BE INSTALLED FOLLOWING FINAL TREE REMOVAL AND BEFORE COMPLETION OF ULTIMATE GRADING PLAN.

DCB 306
T/G=91.05

DCB 307
T/G=91.53

DCB 308
T/G=91.17

DCB 309
T/G=91.53

DCB 310
T/G=91.81

DCB 311
T/G=91.81

DCB 312
T/G=92.24

DCB 313
T/G=92.43

DCB 314
T/G=92.74

DCB 315
T/G=92.84

DCB 316
T/G=91.59

DCB 317
T/G=91.76

DCB 318
T/G=91.76

DCB 319
T/G=91.75

DCB 320
T/G=92.09

DCB 321
T/G=92.25

DCB 322
T/G=92.89

DCB 323
T/G=92.86

INTERIM TREE REMOVAL LINE, GRADE TO EXISTING GROUND.

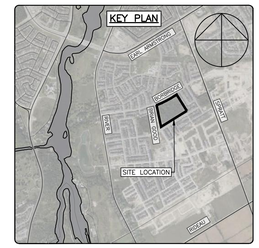
SEE LANDSCAPE FOR TREE PLANTINGS

EDGER STREET

ATRIUM RIDGE

ATRIUM RIDGE

KEY PLAN



LEGEND

- PROPERTY LINE
- ABUTTING PL
- EX. C.L. ROAD
- EX. FEATURE
- EX. CURB
- 91.71 EX. ELEV
- SITE BENCHMARK
- WV EX. WATER VALVE
- VC EX. VALVE CHAMBER
- CB EX. CATCHBASIN
- SICB EX. SIDEWALK(CURB INLET) CATCHBASIN
- HYD EX. HYDRANT
- EX. STORM MANHOLE
- EX. SANITARY MANHOLE
- EX. TREE LINE
- EX. FENCE
- 0.1% PROP. GRADE (%)
- 92.39 PROP. ELEVATION
- 92.39TC PROP. ELEVATION (TOP OF CURB)
- 92.39BC PROP. ELEVATION (BOTTOM OF CURB)
- 92.39ME PROP. ELEVATION (MATCH EX. ELEV.)
- 92.10FFE PROP. FINISHED FLOOR ELEVATION
- PROP. FENCE
- PROP. TOP OF SLOPE
- PROP. SWALE C/W SUBDRAIN
- PROP. TERRACING (MAX 3:1)
- PROP. BOTTOM OF TERRACING
- PROP. CURB
- DC PROP. DEPRESSED CURB
- PROP. GRASS
- PROP. GRAVEL
- PROP. CONCRETE
- PROP. SAND
- PROP. ROOF
- PROP. HEAVY DUTY ASPHALT
- PROP. LIGHT DUTY ASPHALT
- PROP. STORM MANHOLE
- PROP. DOUBLE CATCHBASIN
- PROP. CATCHBASIN
- INTERIM TREE REMOVAL LINE CUT GRADING TO MATCH EX. (MAX 3:1)
- INTERIM TREE REMOVAL LINE FILL GRADING TO MATCH EX. (MAX 3:1)
- PROP. SIAMESE CONNECTION
- PROP. HYDRANT

Écoles catholiques Centre-Est

no.	date	revision / issue	by
7	2025-09-11	RE-ISSUED FOR SITE PLAN CONTROL	AKJ
6	2025-07-31	ISSUED FOR TENDER	AKJ
5	2025-07-07	ISSUED FOR BUILDING PERMIT	AKJ
4	2025-07-02	ISSUED FOR 99% SUBMISSION	AKJ
3	2025-06-17	RE-ISSUED FOR SITE PLAN CONTROL	AGJ
2	2025-05-09	ISSUED FOR 66% CLIENT REVIEW	AKJ
1	2025-04-04	ISSUED FOR SITE PLAN CONTROL	AKJ
0	2025-03-14	ISSUED FOR 33% CLIENT REVIEW	AKJ

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Ottawa, ON K2B 8H6
www.exp.com

northpoint

professional stamp

project title

NEW CATHOLIC HIGH SCHOOL RIVERSIDE SOUTH

Manotick Ontario

drawing title

SITE GRADING PLAN - INTERIM

date	MARCH 14, 2025	job. no.	OTT-24005530-A0
scale	1 : 500		
drawn	AGJ	drawing no.	C200-1
approved	AKJ		
plot date	9/11/2025 9:42:54 AM		

1. DO NOT SCALE FROM THIS DRAWING
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D07-12-25-0045

PLAN #19337

I:\active\ott-24005530-a0\dwg\ c200-1 - civil.dwg
Plotted: 11 SEP 2025 - 9:42AM
Plotted By: AKJ
Plot Scale: 1:1
Plot Device: DWG To PDF.pc3

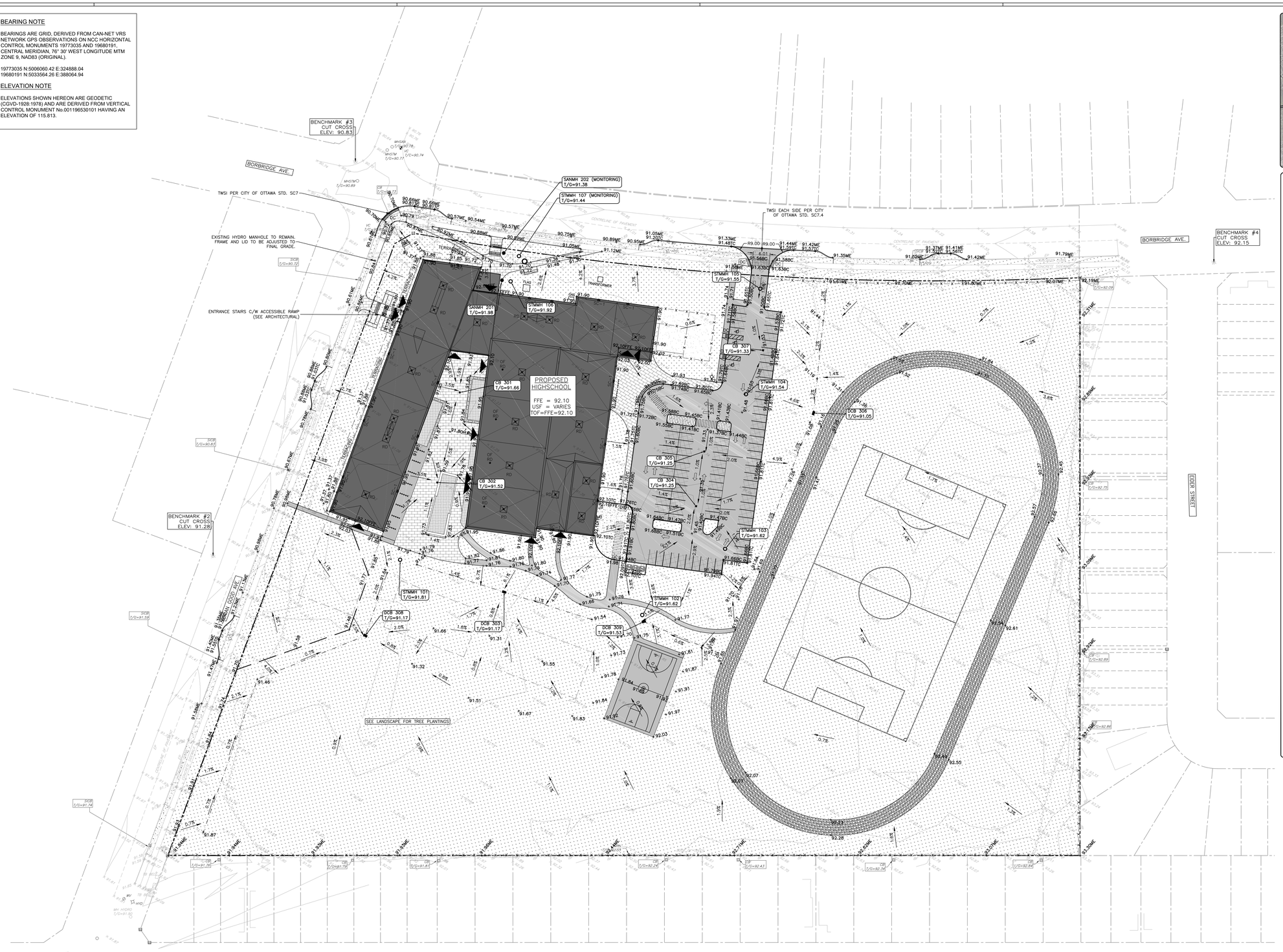
BEARING NOTE

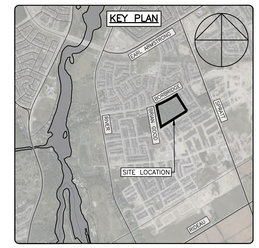
BEARINGS ARE GRID, DERIVED FROM CAN-NET VRS NETWORK GPS OBSERVATIONS ON NCC HORIZONTAL CONTROL MONUMENTS 19773035 AND 19680191, CENTRAL MERIDIAN, 76° 30' WEST LONGITUDE MTM ZONE 9, NAD83 (ORIGINAL).

19773035 N:5006060.42 E:324888.04
19680191 N:5033564.26 E:388064.94

ELEVATION NOTE

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LEGEND

- PROPERTY LINE
- ABUTTING PL
- EX. C.L. ROAD
- EX. FEATURE
- EX. CURB
- 91.71 EX. ELEV
- EX. SITE BENCHMARK
- WV EX. WATER VALVE
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Manotick Ontario

drawing title

SITE GRADING PLAN - ULTIMATE

date	MARCH 14, 2025	job. no.	OTT-24005530-A0
scale	1 : 500		
drawn	AGJ	drawing no.	C200-2
approved	AKJ		
plot date	9/11/2025 9:43:07 AM		

1. DO NOT SCALE FROM THIS DRAWING
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D07-12-25-0045

PLAN #19337

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Layout: C200-2 Model: Default
Plotted: 25-Jun-2025 11:44
By: Andrew Kelly
Xrefs: xref-24005530-topo.dwg xref-24005530-survey.dwg

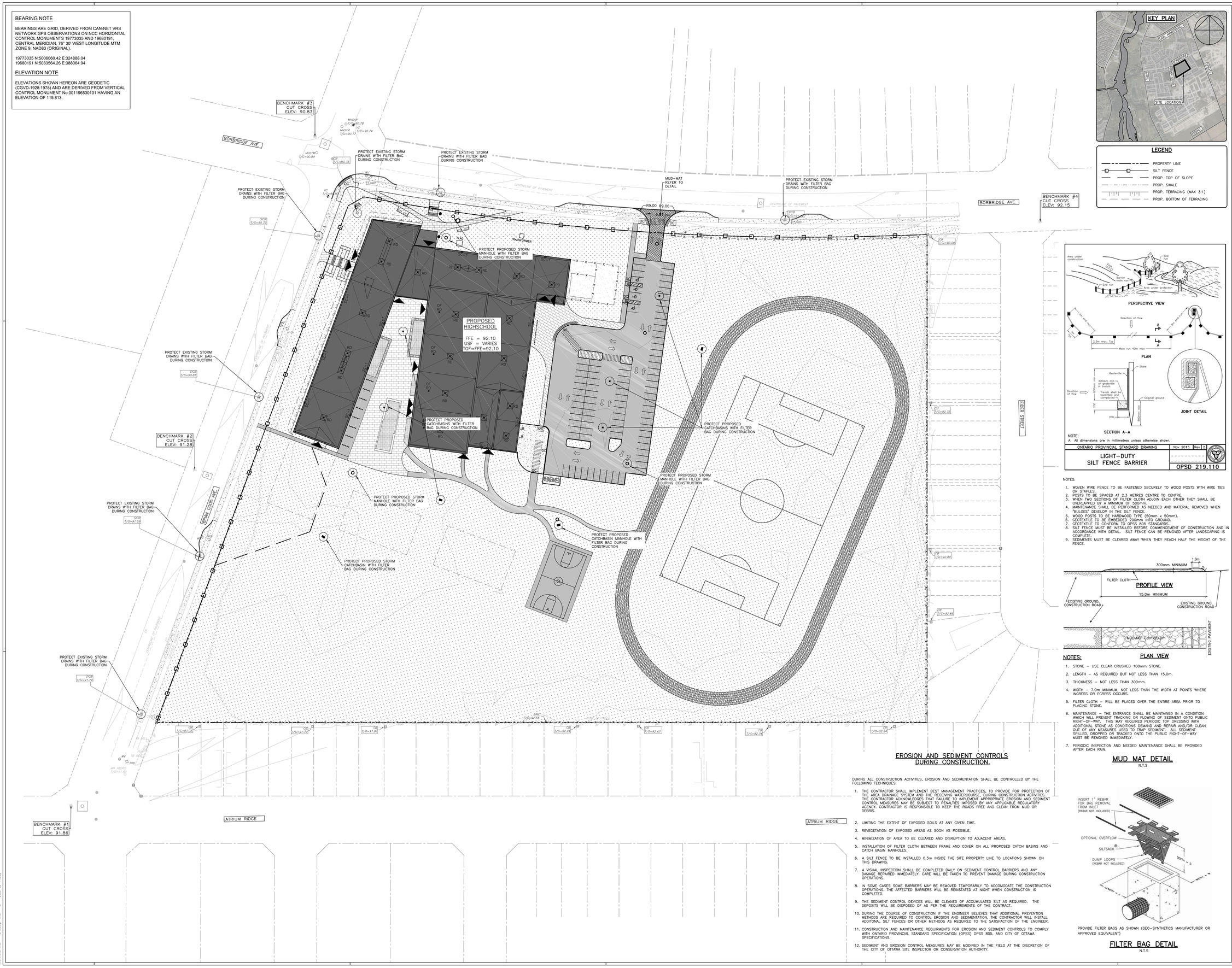
BEARING NOTE

BEARINGS ARE GRID, DERIVED FROM CAN-NET VRS NETWORK GPS OBSERVATIONS ON NCC HORIZONTAL CONTROL MONUMENTS 19773035 AND 19680191, CENTRAL MERIDIAN, 76° 30' WEST LONGITUDE MTM ZONE 9, NAD83 (ORIGINAL).

19773035 N:5006060.42 E:324888.04
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LEGEND

- PROPERTY LINE
- SILT FENCE
- PROP. TOP OF SLOPE
- PROP. SWALE
- PROP. TERRACING (MAX 3:1)
- PROP. BOTTOM OF TERRACING

NOTE:
A All dimensions are in millimetres unless otherwise shown.

ONTARIO PROVINCIAL STANDARD DRAWING	Nov 2015	Rev. 2
LIGHT-DUTY SILT FENCE BARRIER		OPSD 219.110

NOTES:

1. WOVEN WIRE FENCE TO BE FASTENED SECURELY TO WOOD POSTS WITH WIRE TIES OR STAPLES.
2. POSTS TO BE SPACED AT 2.3 METRES CENTRE TO CENTRE.
3. WHEN TWO SECTIONS OF FILTER CLOTH ADJOIN EACH OTHER THEY SHALL BE OVERLAPPED BY A MINIMUM OF 500mm.
4. MAINTENANCE SHALL BE PERFORMED AS NEEDED AND MATERIAL REMOVED WHEN "BULGES" DEVELOP IN THE SILT FENCE.
5. WOOD POSTS TO BE HARDWOOD TYPE (50mm x 50mm).
6. GEOTEXTILE TO BE EMBEDDED 200mm INTO GROUND.
7. GEOTEXTILE TO CONFORM TO OPSS 805 STANDARDS.
8. SILT FENCE MUST BE INSTALLED BEFORE COMMENCEMENT OF CONSTRUCTION AND IN ACCORDANCE WITH DETAIL. SILT FENCE CAN BE REMOVED AFTER LANDSCAPING IS COMPLETE.
9. SEDIMENTS MUST BE CLEARED AWAY WHEN THEY REACH HALF THE HEIGHT OF THE FENCE.

PLAN VIEW

NOTES:

1. STONE – USE CLEAR CRUSHED 100mm STONE.
2. LENGTH – AS REQUIRED BUT NOT LESS THAN 15.0m.
3. THICKNESS – NOT LESS THAN 300mm.
4. WIDTH – 7.0m MINIMUM, NOT LESS THAN THE WIDTH AT POINTS WHERE INGRESS OR EGRESS OCCURS.
5. FILTER CLOTH – WILL BE PLACED OVER THE ENTIRE AREA PRIOR TO PLACING STONE.
6. MAINTENANCE – THE ENTRANCE SHALL BE MAINTAINED IN A CONDITION WHICH WILL PREVENT TRACKING OR FLOWING OF SEDIMENT ONTO PUBLIC RIGHT-OF-WAY. THIS MAY REQUIRED PERIODIC TOP DRESSING WITH ADDITIONAL STONE AS CONDITIONS DEMAND AND REPAIR AND/OR CLEAN OUT OF ANY MEASURES USED TO TRAP SEDIMENT. ALL SEDIMENT SPILLED, DROPPED OR TRACKED ONTO THE PUBLIC RIGHT-OF-WAY MUST BE REMOVED IMMEDIATELY.
7. PERIODIC INSPECTION AND NEEDED MAINTENANCE SHALL BE PROVIDED AFTER EACH RAIN.

MUD MAT DETAIL
N.T.S

EROSION AND SEDIMENT CONTROLS DURING CONSTRUCTION.

DURING ALL CONSTRUCTION ACTIVITIES, EROSION AND SEDIMENTATION SHALL BE CONTROLLED BY THE FOLLOWING TECHNIQUES:

1. THE CONTRACTOR SHALL IMPLEMENT BEST MANAGEMENT PRACTICES, TO PROVIDE FOR PROTECTION OF THE AREA DRAINAGE SYSTEM AND THE RECEIVING WATERCOURSE, DURING CONSTRUCTION ACTIVITIES. THE CONTRACTOR ACKNOWLEDGES THAT FAILURE TO IMPLEMENT APPROPRIATE EROSION AND SEDIMENT CONTROL MEASURES MAY BE SUBJECT TO PENALTIES IMPOSED BY ANY APPLICABLE REGULATORY AGENCY. CONTRACTOR IS RESPONSIBLE TO KEEP THE ROADS FREE AND CLEAN FROM MUD OR DEBRIS.
2. LIMITING THE EXTENT OF EXPOSED SOILS AT ANY GIVEN TIME.
3. REVEGETATION OF EXPOSED AREAS AS SOON AS POSSIBLE.
4. MINIMIZATION OF AREA TO BE CLEARED AND DISRUPTION TO ADJACENT AREAS.
5. INSTALLATION OF FILTER CLOTH BETWEEN FRAME AND COVER ON ALL PROPOSED CATCH BASINS AND CATCH BASIN MANHOLES.
6. A SILT FENCE TO BE INSTALLED 0.3m INSIDE THE SITE PROPERTY LINE TO LOCATIONS SHOWN ON THIS DRAWING.
7. A VISUAL INSPECTION SHALL BE COMPLETED DAILY ON SEDIMENT CONTROL BARRIERS AND ANY DAMAGE REPAIRED IMMEDIATELY. CARE WILL BE TAKEN TO PREVENT DAMAGE DURING CONSTRUCTION OPERATIONS.
8. IN SOME CASES SOME BARRIERS MAY BE REMOVED TEMPORARILY TO ACCOMODATE THE CONSTRUCTION OPERATIONS. THE AFFECTED BARRIERS WILL BE REINSTATED AT NIGHT WHEN CONSTRUCTION IS COMPLETED.
9. THE SEDIMENT CONTROL DEVICES WILL BE CLEANED OF ACCUMULATED SILT AS REQUIRED. THE DEPOSITS WILL BE DISPOSED OF AS PER THE REQUIREMENTS OF THE CONTRACT.
10. DURING THE COURSE OF CONSTRUCTION IF THE ENGINEER BELIEVES THAT ADDITIONAL PREVENTION METHODS ARE REQUIRED TO CONTROL EROSION AND SEDIMENTATION, THE CONTRACTOR WILL INSTALL ADDITONAL SILT FENCES OR OTHER METHODS AS REQUIRED TO THE SATISFACTION OF THE ENGINEER.
11. CONSTRUCTION AND MAINTENANCE REQUIRMENTS FOR EROSION AND SEDIMENT CONTROLS TO COMPLY WITH ONTARIO PROVINCIAL STANDARD SPECIFICATION (OPSS) OPSS 805, AND CITY OF OTTAWA SPECIFICATIONS.
12. SEDIMENT AND EROSION CONTROL MEASURES MAY BE MODIFIED IN THE FIELD AT THE DISCRETION OF THE CITY OF OTTAWA SITE INSPECTOR OR CONSERVATION AUTHORITY.

PROVIDE FILTER BAGS AS SHOWN (GEO-SYNTHETICS MANUFACTURER OR APPROVED EQUIVALENT)

FILTER BAG DETAIL
N.T.S

no.	date	revision / issue	by
7	2025-09-11	RE-ISSUED FOR SITE PLAN CONTROL	AKJ
6	2025-07-31	ISSUED FOR TENDER	AKJ
5	2025-07-07	ISSUED FOR BUILDING PERMIT	AKJ
4	2025-07-02	ISSUED FOR 95% SUBMISSION	AKJ
3	2025-06-17	RE-ISSUED FOR SITE PLAN CONTROL	AGJ
2	2025-05-09	ISSUED FOR 66% CLIENT REVIEW	AKJ
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professional stamp

project title

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Manotick Ontario

drawing title

SEDIMENT & EROSION CONTROL PLAN

date MARCH 14, 2025	job. no. OTT-24005530-A0
scale 1 : 500	
drawn AGJ	drawing no. C300
approved AKJ	
plot date 9/11/2025 9:43:16 AM	

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D07-12-25-0045

PLAN #19337

Filename: \\Vmfs1\data\grc-24005530-A0\00 exercise\05 planning\ott-24005530-a0 - civil.dwg
Plot Date: 9/11/2025 9:43:16 AM Plotted By: Andrew Jackson
Plot Scale: 1:1 Plot Device: DWG To PDF.pc3
Pen Table: MEP2017.ctb Paper Size: ARCH D

BEARING NOTE

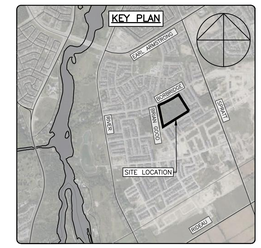
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LEGEND

- PROPERTY LINE
- SILT FENCE
- ONSITE OVERLAND FLOW ROUTE
- OFFSITE OVERLAND FLOW ROUTE
- S01 0.184 0.79 — AREA NO. AREA IN HECTARES RUNOFF COEFFICIENT
- CATCHMENT AREA
- PROPOSED ROOF DRAIN
- 5-YEAR ROOF PONDING
- 100-YEAR ROOF PONDING
- EX. MUNI. STORM SEWER
- EX. STORM MANHOLE
- CF — EX. CATCHBASIN
- SICB — EX. SIDEWALK(CURB INLET) CATCHBASIN
- PROP. STORM PIPE
- PROP. STORM MANHOLE
- PROP. DOUBLE CATCHBASIN
- PROP. CATCHBASIN
- PROP. GRASS
- PROP. GRAVEL
- PROP. CONCRETE
- PROP. SAND
- PROP. ROOF
- PROP. ASPHALT
- PROP. TOP OF SLOPE
- PROP. SWALE C/W SUBDRAIN
- PROP. TERRACING (MAX 3:1)
- PROP. BOTTOM OF TERRACING
- SCUPPER — PROP. ROOF OVERFLOW SCUPPER
- OF RD — PROPOSED OVERFLOW ROOF DRAIN

STORMWATER STORAGE AND CONTROL TABLE

AREA NO.	CONTROL METHOD (LOCATION)	CONTROL PRODUCT	C/L OF ORIFICE ELEVATION (m)	HEAD OVER ORIFICE - 100-Yr (m) (PONDING ELEVATION)	MAX. PONDING ELEVATION (m)	FREE BOARD FROM BUILDING FFE (m)
P-1	ICD (CB 307)	80mmØ Orifice Plate	88.37	3.18 (91.50)	91.63	0.47
P-2	ICD (CB 305)	140mmØ Orifice Plate	88.66	2.78 (91.44)		
P-3	ICD (CB 304)	130mmØ Orifice Plate	88.73	2.71 (91.44)		
P-4	ICD (DCB 306)	226mmØ Orifice Plate	88.74	2.61 (91.35)	91.61	0.49
P-5	Uncontrolled	NA	NA	NA	91.73	0.37
P-6	Uncontrolled	NA	NA	NA	91.50	0.60
P-7	Uncontrolled	NA	NA	NA	91.46	0.64
P-8	Uncontrolled	NA	NA	NA	91.80	0.30
P-9	Uncontrolled	NA	NA	NA	NA	NA

ROOF PONDING TABLE

AREA NO.	2-YEAR PONDING DEPTH (mm)	5-YEAR PONDING DEPTH (mm)	100-YEAR PONDING DEPTH (mm)	WEIR TYPE	NO. OF ROOF DRAINS	NO. OF WEIRS PER ROOF DRAIN	Roof Drain Type	WEIR POSITION
P-R-1	90	108	136	WATTS Accutrol Adjustable Flow Control	1	2	RD2	Fully Open
P-R-2	94	112	140	WATTS Accutrol Adjustable Flow Control	2	1	RD1	Fully Open
P-R-3	91	109	137	WATTS Accutrol Adjustable Flow Control	1	2	RD2	Fully Open
P-R-4	95	113	142	WATTS Accutrol Adjustable Flow Control	2	1	RD1	Fully Open
P-R-5	82	100	127	WATTS Accutrol Adjustable Flow Control	1	2	RD2	Fully Open
P-R-6	92	110	138	WATTS Accutrol Adjustable Flow Control	1	2	RD2	Fully Open
P-R-7	83	101	128	WATTS Accutrol Adjustable Flow Control	1	2	RD2	Fully Open
P-R-8	83	101	128	WATTS Accutrol Adjustable Flow Control	1	2	RD2	Fully Open
P-R-9	90	107	135	WATTS Accutrol Adjustable Flow Control	1	2	RD2	Fully Open
P-R-10	90	107	135	WATTS Accutrol Adjustable Flow Control	1	2	RD2	Fully Open
P-R-11	68	84	110	WATTS Accutrol Adjustable Flow Control	1	2	RD2	Fully Open
P-R-12	68	84	110	WATTS Accutrol Adjustable Flow Control	1	2	RD2	Fully Open
P-R-13	82	99	126	WATTS Accutrol Adjustable Flow Control	1	2	RD2	Fully Open
P-R-14	92	112	144	WATTS Accutrol Adjustable Flow Control	1	3	RD3	Fully Open
P-R-15	92	112	144	WATTS Accutrol Adjustable Flow Control	1	3	RD3	Fully Open
P-R-16	92	112	144	WATTS Accutrol Adjustable Flow Control	1	3	RD3	Fully Open
P-R-17	97	118	149	WATTS Accutrol Adjustable Flow Control	1	3	RD3	Fully Open

Roof Drain Types

Drain Type =	RD1	RD2	RD3
Max Overflow Depth (mm)	150 mm	150 mm	150 mm
Flow Controlled (Yes/No)	Yes	Yes	Yes
Ponding	Yes	Yes	Yes
Weir Desc	Accutrol	Accutrol	Accutrol
No. Weirs	1	2	3

Écoles catholiques Centre-Est

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6	2025-07-31	ISSUED FOR TENDER	AKJ
5	2025-07-07	ISSUED FOR BUILDING PERMIT	AKJ
4	2025-07-02	ISSUED FOR 99% SUBMISSION	AKJ
3	2025-06-17	RE-ISSUED FOR SITE PLAN CONTROL	AGJ
2	2025-05-09	ISSUED FOR 66% CLIENT REVIEW	AKJ
1	2025-04-04	ISSUED FOR SITE PLAN CONTROL	AKJ
0	2025-03-14	ISSUED FOR 33% CLIENT REVIEW	AKJ

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northpoint

professional stamp

project title
NEW CATHOLIC HIGH SCHOOL RIVERSIDE SOUTH
Manotick Ontario

drawing title
POST-DEVELOPMENT SITE CATCHMENTS

date	MARCH 14, 2025	job. no.	OTT-24005530-A0
scale	1 : 500		
drawn	AGJ	drawing no.	C500
approved	AKJ		
plot date	9/11/2025 9:43:28 AM		

1. DO NOT SCALE FROM THIS DRAWING
2. CONTRACTOR TO VERIFY ALL DIMENSIONS AND NOTIFY THE ARCHITECT OF ANY DISCREPANCIES BEFORE WORK COMMENCES
3. THIS DRAWING TO BE READ IN CONJUNCTION WITH THE FOLLOWING DRAWINGS: ARCHITECTURAL, STRUCTURAL, MECHANICAL, ELECTRICAL, LANDSCAPE

D07-12-25-0045

PLAN #19337

I:\projects\ott-24005530-a0\04 execution\05 cad\ott-24005530-a0 - civil.dwg
Layout: C500 - POST-DEVELOPMENT SITE CATCHMENTS
Plotted: 9/11/2025 9:43:28 AM
By: AKJ