RICKSON OUTLET ARCHITECT

LIGHT FACILITY ADDITION
2700 SWANSEA CRESCENT, OTTAWA, ON

SERVICING AND STORMWATER MANAGEMENT REPORT

OCTOBER 13, 2022

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RICKSON OUTLET ARCHITECT

1ST SUBMISSION

PROJECT NO.: 221-02216-00
DATE: OCTOBER 2022

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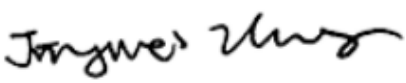

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1 GENERAL

1.1 INTRODUCTION AND BACKGROUND

WSP was retained by Rickson Outlet Architect to provide servicing, grading and stormwater management design services for a site development project located at 2700 Swansea Avenue. The project is to construct an addition to the existing 2-storey light manufacturing facility. The addition is approximately 1,532 square meters large and will be constructed above the parking lot and as an addition to the south side of second story of the existing facility as shown in **Figure 1-1**. The purpose of this addition is to provide more offices and mostly lab space to increase capacity with lab manufacturing stations.

A previous Servicing and Stormwater Management Report for this site was issued to the City of Ottawa and approved in 2011, and the report provided a detailed discussion of the water servicing, wastewater servicing, and stormwater servicing for the current site. This report outlines findings and calculations pertaining to the servicing of the existing building with an addition of 1,420 square metres.

Figure 1-1 Project Location

1.2 DATE AND REVISION NUMBER

This version of the report is the initial issue, dated October 13, 2022.

1.3 PRE-CONSULTATION MEETINGS

A pre-consultation meeting was held with the City of Ottawa on September 23, 2021. Notes from this meeting are provided in **Appendix A**.

1.4 APPLICABLE GUIDELINE AND DESIGN STANDARDS

The review for servicing has been undertaken in conformance with, and utilizing information from, the following documents:

- Ottawa Sewer Design Guidelines (October 2012) and Technical Bulletins PIEDTB-2016-01 and ISTB-2018-01.

- Ottawa Design Guidelines – Water Distribution, July 2010 (WDG001) and Technical Bulletins ISD-2010-2, ISDTB-2014-02 and ISTB-2018-01.

- Fire Underwriters Survey, Water Supply for Public Fire Protection (FUS), 2020.

- The Stormwater Management Criteria is based on the following (as established in the Servicing Report prepared by GENIVAR, dated June 6, 2011)

  - The allowable release rate for this site, as determined through the 2011 SPC application from the Servicing Report prepared by GENIVAR, dated June 6, 2011, is 87.4 L/s.
  - Flows to the storm sewer in excess of the 5-year storm release rate, up to and including the 100-year storm event, must be detained on site.
  - Ensure no overland flow for all storms up to and including 100-year event.

2 WATER DISTRIBUTION

2.1 EXISTING WATER SERVICE

There is an existing 305mm diameter municipal watermain located on Swansea Crescent. A 152mm on-site water service was installed to provide domestic water demand and supply water for the sprinkler system in the current building.

2.2 PROPOSED WATER SERVICE

The water service pipe for the proposed addition is to connect to the existing water service pipe in the existing building. No new on-site water connection will be required.

2.3 CALCULATIONS OF WATER DEMANDS AND FIRE FLOW

As described in Section 1.1, the purpose of this addition is to provide more offices and mostly lab space to increase capacity with lab manufacturing stations. Therefore, the continuous process water demand for the site for the current operation of 0.47 L/s remains the same. An emergency process use allowance of 0.67 L/s is also required but can be regarded similar to fire flow requirements. To the daily process amount, a demand of 35,000 L/gross ha should be provided as noted in Table 4.2 of the Ottawa Design Guidelines – Water Distribution. The area being developed is 0.8867 ha, and therefore is assigned an average water demand of 31,336 L/day, or 0.36 L/s excluding the process flow. Total average demand is therefore estimated as 0.47 + 0.36 = 0.83 L/s.

Maximum day demand is estimated as 1.24 L/s based on 1.5 x average demand.
Peak hour demand is estimated as 2.24 L/s based on 1.8 x maximum day demand.

The required fire flow for the existing building and the proposed addition has been calculated using the Fire Underwriters Survey (FUS) method. The method takes into account the type of building construction, the effective floor area, the building occupancy, the use of sprinklers and the exposures to adjacent structures. For the total effective floor area of the existing building and the proposed addition of 5498 m^2, the required fire flow demand of 8,000 L/min (133.3 L/s) has been calculated. Copy of the FUS calculations are included in **Appendix B.**

2.4 BOUNDARY CONDITIONS

Boundary conditions have been provided by the City of Ottawa at the location of the connection of the existing 150 mm water service pipe at the 305 mm watermain. A copy of boundary conditions is provided in **Appendix B** and listed in **Table 2-1.**

Table 2-1: Boundary Conditions

	BOUNDARY CONDITIONS AT SWANSEA CRESCENT	
SCENARIO	Water Demand (L/s)	Head (m) @ Connection
Basic Day (MAX HGL)	0.83	130.1
Peak Hour (MIN HGL)	2.24	123.8
Max Day + Fire Flow (ICI)	133.3	123.7

2.5 CONFIRMATION OF ADEQUATE FIRE FLOW PROTECTION

The demand of 8,000 L/min can be delivered through two existing municipal fire hydrants on Swansea Crescent. One is located on the east side of west entrance, which is within 45 m from the existing Siamese connection of the building. Another is located on the west side of east entrance.

Based on the boundary condition, the municipal water distribution system can provide the required fire flow of 133.3 L/s when water pressure drops to 42.20 m (water head 123.7 m – Ground elevation 81.50 m) at water service connection point. Available water pressure at the existing fire hydrant near west entrance is 41.03 m (water head 123.7 m – Ground elevation 82.67 m).

2.6 CONFIRMATION OF ADEQUATE DOMESTIC SUPPLY AND PRESSURE

Water demands are based on Table 4.2 of the Ottawa Design Guidelines – Water Distribution. A water demand calculation sheet is included in Appendix B, and the total water demands are summarized as follows:

Average Day	0.83 L/s
Maximum Day	1.24 L/s
Peak Hour	2.24 L/s

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

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

Water pressure at municipal connection check:

Min. HGL @ Connection 1 – Pavement elevation = 123.8m – 82.35m = 41.45m = 406.38 kPa

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

Max. HGL @ Connection 1 – Finished floor elevation = 130.1m – 83.21 = 46.89m = 459.72 kPa

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

Min. HGL @ Connection 1 – Finished floor elevation = 123.8m-83.21m = 47.72m = 397.95 kPa

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

(Max Day + Fire) HGL @ Connection 1 - Finished floor elevation = 123.7m-83.21m = 40.49m = 396.97 kPa

The minimum water pressure inside the building at the connection is determined with the minimum HGL condition, resulting in a pressure of 397.95 kPa which exceed the minimum requirement of 276 kPa per the guidelines.

2.7 CONFIRMATION OF ADEQUATE FIRE FLOW PROTECTION

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

The demand of 8,000 l/min can be delivered through two existing municipal fire hydrants. The existing two public hydrants are located at the west of the proposed building on Dagenham Street and south of the proposed building on Cope Drive. The one on Cope Drive is within 85 m of the FDC and is rated at 3800 l/min each. The one on Dagenham Street is within 45 m of the building FDC, and is rated at 5700 l/min. The two hydrants have a combined total of 9,500 l/min.

The demand of 8,000 L/min can be delivered through two existing municipal fire hydrants on Swansea Crescent. One is located on the east side of west entrance, which is within 45 m from the existing Siamese connection of the building. Another is located on the west side of east entrance.

The boundary condition for Maximum Day and Fire Flow results in a pressure of 396.97 kPa at the ground floor level. In the guidelines, a minimum residual pressure of 140 kPa must be maintained in the distribution system for a fire flow and maximum day event. As a pressure of 396.97 kPa is achieved, the fire flow requirement is exceeded.

3 WASTEWATER DISPOSAL

3.1 DESIGN CRITERIA

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

- Minimum Velocity 0.6 m/s
- Maximum Velocity 3.0 m/s
- Manning Roughness Coefficient 0.013
- Total est. hectares institutional use 0.89
- Average sanitary flow for light industrial use 35,000 L/Ha/day
- Commercial/Institutional Peaking Factor 1.5
- Infiltration Allowance (Total) 0.33 L/Ha/s
- Minimum Sewer Slopes – 200 mm diameter 0.32%

The area of 2.40 ha represents the lot area of the new building and immediate surrounding area to the sides of the new building. This is the sanitary collection area that is being considered to contribute to the new 200mm sanitary service extending from the existing 200mm sanitary sewer stub provided at the south side of the Kilbirnie Drive to the new building.

3.2 CONSISTENCY WITH MASTER SERVICING STUDY

The outlet for the sanitary service from the proposed building is the 200 mm diameter municipal sewer on Kilbirnie Drive.

The Ottawa Sewer Design Guidelines provide estimates of sewage flows based on institutional development.

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

- Light Industrial 35000 L/Ha/day = 0.405 L/Ha/s
- Peak flow = (0.405 L/Ha/s x 0.89 ha x 1.5 peaking factor) + 0.33 l/Ha/s x 0.89 ha = 0.83 L/s

The on-site sanitary sewer network has been designed in accordance with 0.83 L/s as described above.

3.3 REVIEW OF SOIL CONDITIONS

There are no specific local subsurface conditions that suggest the need for a higher extraneous flow allowance.

3.4 VERIFICATION OF AVAILABLE CAPACITY IN DOWNSTREAM SEWER

The capacity of the existing 150 mm diameter sanitary sewer at 8.0% slope is 32.63 L/s, which is adequate for the flow assumptions from the proposed site as noted above.

4 SITE STORM SERVICING

4.1 EXISTING CONDITION

The site currently drains via private piped networks and overland flow to Swansea Crescent. As noted in the pre-consultation meeting and associated notes from the City of Ottawa, stormwater quantity control is desired for the site modification. The rooftop attenuation is the be provided for the addition to result in peak flow rates under 5 year and 100 year conditions that do not exceed those generated under existing conditions. The city also requested that the allowable release rate for the rooftop be based on a maximum runoff coefficient of 0.50. The city wants demonstration that the existing outlet storm sewer in the parking lot has sufficient capacity to serve the proposed modification.

4.2 ANALYSIS OF AVAILABLE CAPACITY IN PUBLIC INFRASTRUCTURE

The allowable release rate for the 0.150 ha rooftop area was calculated as follows:

Q (total allowable)	= 2.78 x C x I_{100yr} x A where:
C	= 0.50 (Weighted average pre-development C, City Requirement)
I_{5yr}	= Intensity of 5-year storm event (mm/hr)
	= 998.071 x (T_c + 6.053)^0.814 = 104.19 mm/hr; where T_c = 10 mins (City Requirement)
A	= Area = 0.15 Ha

Therefore, the total allowable release rate can be determined as:

= 21.72 L/s

Detailed calculations are provided in Appendix C.

The receiving downstream sewers running west to east from existing CBMH1 to existing CBMH2 already accept flow from the south parking lot area including the proposed rooftop addition area at the 5-year peak release rate of 87.4 l/s. This maximum flow release rate will be maintained for the proposed development. No capacity issues with existing infrastructure have been noted.

4.3 DRAINAGE DRAWING

Drawing C02 shows the receiving storm sewer and site storm sewer network. Drawing C01 provides proposed grading and drainage and includes existing grading information. Drawing C04 provides a drainage sub-area plan, including both site and roof information. Site sub-area information is also provided on the storm sewer design sheet attached in Appendix C.

4.4 WATER QUANTITY CONTROL OBJECTIVE

The water quantity objective for the rooftop area only is to limit the flow release to 21.72 L/s. Excess flows above this limit up to those generated by the 100-year storm event are temporarily stored on roof top and the parking surface as per the existing condition.

No provision is required on the site to accommodate any flow from the adjacent lands. All flows exceeding the defined minor system capacity and on-site storage capability will enter the major system, with overflow to adjacent surface waterways. Detailed stormwater management calculations are provided in Appendix C.

4.5 WATER QUALITY CONTROL OBJECTIVE

As the proposed modification in use of the site will result in fewer asphalt parking areas, and drainage from within the proposed addition building rooftop will be attenuated and directed to the existing storm sewer, a conceptual net minor improvement in stormwater quality is anticipated. No water quality constraints have been identified that would require additional measures.

4.6 DESIGN CRITERIA

The stormwater system was designed following the principles of dual drainage, making accommodation for both major and minor flow.
Some of the key criteria include the following:

• Design Storm	1:5 year return (Ottawa)
• Rational Method Sewer Sizing	
• Initial Time of Concentration	10 minutes
• Runoff Coefficients	
Landscaped Areas	C = 0.25
Asphalt/Concrete	C = 0.90
Traditional Roof	C = 0.90
• Pipe Velocities	0.80 m/s to 6.0 m/s
• Minimum Pipe Size	250 mm diameter (min 200 mm CB Leads and service pipes)

4.7 PROPOSED MINOR SYSTEM

The detailed design for this site will maintain the existing storm sewer networks to Swansea Crescent. Existing uncontrolled surface flow will also enter the existing storm sewer network to Swansea Crescent consistent with existing conditions.

Using the above noted criteria, the existing on-site storm sewers were sized accordingly. A detailed storm sewer design sheet and the associated storm sewer drainage area plan is included in Appendix C.

4.8 STORMWATER MANAGEMENT

The existing 5-year peak flow rate for the subject site will be maintained. A conceptual net improvement in stormwater quantity is anticipated. The subject addition rooftop will be limited to a release rate established using the criteria described in section 4.2. This will be achieved through a combination of roof drains. No change to the existing pipe network.

Flows generated from the rooftop in excess of the allowable release rate will be detained on site by the use of surface storage and gradually released into the minor system so as not to exceed the site's allocation.

The maximum rooftop retention depth of the proposed addition will be limited to maximum 150mm during a 1:100 year event.

No surface ponding will occur during a 2-year event, and only minimal ponding will occur during a 5-year event.

Existing overland flow routes will be maintained in the grading to permit emergency overland flow from the site. The overflow routes will eliminate any increase in ponding depth for events exceeding 100 years, including under a stress test of 20% above 100 year flow rates. Please refer to the SWM Calculations in Appendix C.

4.9 INLET CONTROLS

The allowable release rate for the 0.15 ha rooftop has been calculated in Section 4.2, the total allowable release rate can be determined as:

= 21.72 L/s

The maximum allowable release rate from the rooftop can then be determined as:

$$Q_{(max\ allowable)} = Q_{(total\ allowable)} - Q_{(uncontrolled} = 21.72\ L/s - 0.00\ L/s = \mathbf{21.72\ L/s}$$

Based on the flow allowance at the various roof drains locations, a combination of various sizes of roof drain openings were chosen in the design. The design of the roof drain is unique to each roof drainage area and is determined based on a number of factors, including weir opening, ponding depth and allowable release rate. The roof drains are designed to be fully opened. The restrictions will cause the roof drains to surcharge, generating roof ponding in the rooftop areas.

4.10 ON-SITE DETENTION

Any excess storm water from the rooftop up to the 100-year event is to be stored on-site in order to not surcharge the downstream municipal storm sewer system. Detention will be provided on building rooftops. As previously noted, the volume of storage is dependent on the characteristics of each individual drainage area and the roof drains were chosen accordingly.

The proposed building will have roof inlet controls that help to control the amount of stormwater being released into the system.

the proposed addition uses new roof drains to restrict the 100-year storm event to the criteria approved by the City of Ottawa. Restricted stormwater will be contained onsite by utilizing rooftop storage. In the storm event up to 100-year, there will be no over land flow off-site from restricted areas.

The sum of design flow rates for the proposed areas, including building roof and parking lot areas is 87.40 L/s in 5-year peak flow taking the restricted flow rate from the rooftop area into account, which is same as the existing flow rate of 87.40 L/s for the 5-year peak flow. Refer to Appendix C for storm sewer design sheet.

5 SEDIMENT AND EROSION CONTROL

5.1 GENERAL

During construction, existing storm sewer system can be exposed to sediment loadings. A number of construction techniques designed to reduce unnecessary construction sediment loadings will be used including;

- Filter cloths will remain on open surface structures such as manholes and catchbasins until these structures are commissioned and put into use;
- Installation of silt fence, where applicable, around the perimeter of the proposed work area;
- The installation of straw bales within existing drainage features surround the site;
- Bulkhead barriers will be installed in the outlet pipes;

During construction of the services, any trench dewatering using pumps will be fitted with a "filter sock." Thus, any pumped groundwater will be filtered prior to release to the existing surface runoff. The contractor will inspect and maintain the filter sock as needed including sediment removal and disposal.

All catchbasins, and to a lesser degree, manholes, convey surface water to sewers. Consequently, until the surrounding surface has been completed, these structures will be covered to prevent sediment from entering the minor storm sewer system. These measures will stay in place and be maintained during construction and build-out until it is appropriate to remove them.

During construction of any development both imported and native soils are placed in stockpiles. Mitigative measures and proper management to prevent these materials entering the sewer system are needed.

During construction of the deeper watermains and sewers, imported granular bedding materials are temporarily stockpiled on site. These materials are however quickly used up and generally placed before any catchbasins are installed.

Refer to the Erosion and Sedimentation Control Plan C06 provided in Appendix D.

6 APPROVAL AND PERMIT REQUIREMENTS

6.1 GENERAL

The proposed development is subject to site plan approval and building permit approval.

No approvals related to municipal drains are required.

No permits or approvals are anticipated to be required from the Ontario Ministry of Transportation, National Capital Commission, Parks Canada, Public Works and Government Services Canada, or any other provincial or federal regulatory agency.

7 CONCLUSION CHECKLIST

7.1 CONCLUSIONS AND RECOMMENDATIONS

It is concluded that the proposed development can meet all provided servicing constraints and associated requirements. It is recommended that this report be submitted to the City of Ottawa in support of the application for site plan approval.

7.2 COMMENTS RECEIVED FROM REVIEW AGENCIES

This is a first submission; no comment is available.

APPENDIX

A

- PRE-CONSULTATION MEETING NOTES
- SURVEY TOPO
- EXISTING SERVICING REPORT BY GENIVAR

Zhang, Jingwei

From: Ezzio, Sarah <sarah.ezzio@ottawa.ca>
Sent: October 1, 2021 2:58 PM
To: Rickson Outhet
Cc: Mike Chenier; george.laframboise@iridian.ca; Modi, Urja; george.laframboise@iridian.ca; Cassidy, Tyler; McMahon, Patrick
Subject: 2700 Swansea Pre-Application Consultation Follow Up Notes
Attachments: 2700 Swansea Crescent Iridian Spectral Technologies Concept Site Plan, Plans, Elevations Sept 8, 2021.pdf; design_brief_submission requirements_2700 Swansea.pdf

Good morning Rickson,

Please refer to the below notes regarding the Pre-Application Consultation Meeting held on September 23, 2021 for the site at 2700 Swansea Crescent.

Project:

During the meeting, a proposal to construct two phased additions to the existing 2-storey light manufacturing facility at 2700 Swansea Crescent was discussed. The first phase is approximately 1,420 square metres large and will be constructed above the parking lot and as an addition to the south side of second storey of the existing facility. The second phase is approximately 780 square metres and will be constructed as an addition to the east side of the second storey to the existing building. The purposes of these additions are to provide more storage and office space and to expand current operations, and no change to the existing parking and site accesses is required.

Below are staff's preliminary comments:

Policies/Designations of the site

- Official Plan – designated Urban Employment Area
- Zoning – General Industrial, Subzone 3, IG3
    - Within Area C for Minimum Parking Requirements (Schedule 1A)

Engineering

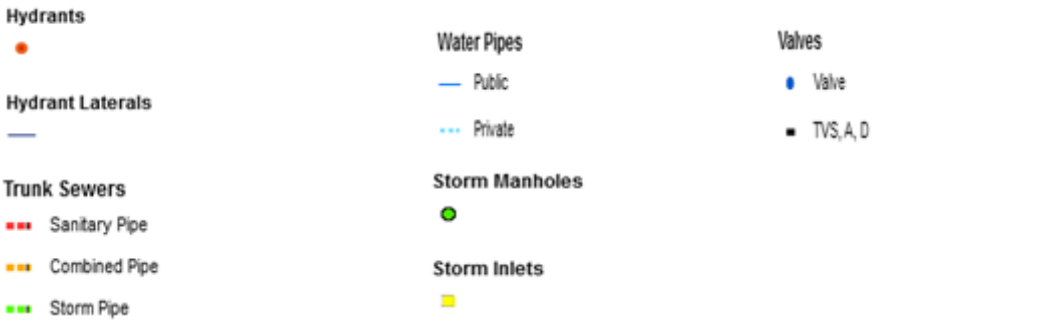
Please note the following information regarding the engineering design submissions for the above noted site:

1. The Servicing Study Guidelines for Development Applications are available at the following address: https://ottawa.ca/en/city-hall/planning-and-development/how-develop-property/development-application-review-process-2/guide-preparing-studies-and-plans
2. Servicing and site works shall be in accordance with the following documents:
    - Ottawa Sewer Design Guidelines (October 2012) and all the Technical Bulletins including, Technical Bulletin PIEDTB-2016-01 and ISTB-2018-01
    - Ottawa Design Guidelines – Water Distribution (2010) and Technical Bulletins ISD-2010-2, ISDTB-2014-02 and ISTB-2018-02
    - Geotechnical Investigation and Reporting Guidelines for Development Applications in the City of Ottawa (2007)
    - City of Ottawa Slope Stability Guidelines for Development Applications (revised 2012)
    - City of Ottawa Environmental Noise Control Guidelines (January, 2016)
    - City of Ottawa Park and Pathway Development Manual (2012)
    - City of Ottawa Accessibility Design Standards (2012)

- Ottawa Standard Tender Documents (latest version)
- Ontario Provincial Standards for Roads & Public Works (2013)

3. Record drawings and utility plans are also available for purchase from the City (Contact the City's Information Centre by email at InformationCentre@ottawa.ca or by phone at (613) 580-2424 x 44455
4. The Stormwater Management Criteria, for the subject site, is to be based on the following (as established in the Servicing Report prepared by GENIVAR, dated June 6, 2011):
    - The allowable release rate for this site, as determined through the 2011 SPC application from the Servicing Report prepared by GENIVAR, dated June 6, 2011, is 87.4 L/s.
    - Flows to the storm sewer in excess of the 5-year storm release rate, up to and including the 100-year storm event, must be detained on site
    - Ensure no overland flow for all storms up to and including the 100-year event.
    - The 2-yr storm or 5-yr storm event using the IDF information derived from the Meteorological Services of Canada rainfall data, taken from the MacDonald Cartier Airport, collected 1966 to 1997.
    - **A calculated time of concentration (Cannot be less than 10 minutes).**
    - Quality control requirements to be provided by Rideau Valley Conservation Authority (RVCA).

5. Deep Services:



i. *A plan view of the approximate services may be seen above. Services should ideally be grouped in a common trench to minimize the number of road cuts. The sizing of available future services is:*
    a. Connections (Swansea Crescent):
        i. Existing 900 mm dia. STM (Conc.)
        ii. Existing 305 mm dia. Watermain (PVC)
        iii. Existing 250 mm dia. SAN (PVC)

ii. *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.*

iii. *Provide information on the monitoring manhole requirements – should be located in an accessible location on private property near the property line (ie. Not in a parking area).*

iv. *Provide information on the type of connection permitted*

Sewer connections to be made above the springline of the sewermain as per:

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

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

c. Std Dwg S11.2 (for rigid main sewers using bell end insert method) – *for larger diameter laterals where manufactured inserts are not available; lateral must be less that 50% the diameter of the sewermain,*

d. Connections to manholes permitted when the connection is to rigid main sewers where the lateral exceeds 50% the diameter of the sewermain. – Connect obvert to obvert with the outlet pipe unless pipes are a similar size.

e. No submerged outlet connections.

6. Civil consultant must request boundary conditions from the City's assigned Project Manager prior to first submission. Water Boundary condition requests must include the location of the service and the expected loads required by the proposed development. Please provide the following information:
    i. Location of service(s)
    ii. Type of development and the amount of fire flow required (as per FUS, 1999).
    iii. Average daily demand: ___ l/s.
    iv. Maximum daily demand: ___l/s.
    v. Maximum hourly daily demand: ___ l/s.
    vi. Hydrant location and spacing to meet City's Water Design guidelines.
    vii. Water supply redundancy will be required for more than 50 m3/day water demand.
7. Phase 1 ESAs and Phase 2 ESAs must conform to clause 4.8.4 of the Official Plan that requires that development applications conform to Ontario Regulation 153/04.
8. If applicable, MECP ECA Requirements –
   All development applications should be considered for an Environmental Compliance Approval (ECA) by the Ministry of the Environment, Conservation, and Parks (MECP);
    a. Consultant determines if an approval for sewage works under Section 53 of OWRA is required. Consultant then determines what type of application is required and the City's project manager confirms. (If the consultant is not clear if an ECA is required, they will work with the City to determine what is required. If the consultant it is still unclear or there is a difference of opinion only then will the City PM approach the MECP.
    b. The project will be either transfer of review (standard), transfer of review (additional), direct submission, or exempt as per O. Reg. 525/98.

c. Standard Works ToR Draft ECA's are sent to the local MECP office (moeccottawasewage@ontario.ca) for information only
d. Additional ToR draft ECAs require a project summary/design brief and require a response from the local MECP (10 business day window)
e. Site plan Approval, or Draft Approval, is required before an application is sent to the MECP

Planning

- The project triggers a Complex Site Plan Control application with public consultation, the size threshold between standard and complex subtypes are 1,860 square metres.
- A planning cover letter will required rather than a planning rationale for this application.
- Warehouse and light industrial uses are permitted; Applicant must ensure that the uses on the site are represented correctly.
- Site is located along a bus route of the business park. All new development within the business park must include a sidewalk, along Swansea Crescent. City staff might ask the Applicant to upgrade the bus stop adjacent to the site depending on its condition and usage, further discussions will take place through the review of the site plan application.
- Incorporate pedestrian connections on site as well.
- Make property line on required submissions clear when coming in with an application.
- Ensure that the two accessible parking spaces meet the City's Accessibility Design Guidelines (must have ramp/depressed curb).
- Please show snow storage locations on the Site Plan.
- Retain trees where possible, we are pleased this can be done below the additions.
- We are pleased to see solar panels being incorporated into the development, and applaud your efforts towards sustainability!
- Consult with ward councilor, Diane Deans, and applicable community associations before application submission.

Urban Design

- A Design Brief will be required. Please see the attached terms of reference for requirements.
- Please ensure that the ground floor underneath the proposed additions is well-lit (for both daytime and nighttime uses), and that Crime Prevention through Environmental Design (CPTED) is well considered.
- As the proposal will likely result in the removal of some landscaping and vegetation, it is strongly recommended that the proposal incorporate sustainable design features and/or green infrastructure to make up for this loss. Please also consider opportunities to improve landscaping elsewhere on site.
- It is strongly recommended that improvements be made to the existing bus stop adjacent to this property. This area can benefit from additional seating and signage.
- Please ensure that pedestrian circulation is considered, and that sidewalks and bicycle parking are provided.
- etc.
- Should you have any questions on the Urban Design comments, please contact Adrian van Wyk at Adrian.vanwyk@ottawa.ca

Transportation

- As shown in the screening form, no Transportation Impact Assessment is required for this application.
- No noise impact study is required.
- On site plan:
    - Show all details of the roads abutting the site up to and including the opposite curb; include such items as pavement markings, accesses, throat length and/or sidewalks.
    - Turning templates will be required for all accesses showing the largest vehicle to access the site; required for internal movements to the loading zone and at all accesses (entering and exiting and going in both directions).

- Show all curb radii measurements; ensure that all curb radii are reduced as much as possible.
- Show lane/aisle widths.

- AODA legislation applies to any portion of the site accessible to the general public.
- Ensure that sufficient bicycle parking (1/1000m^2) is available on site, preferably in a covered and secure area.
- Correct the site plan, parking requirements of 0.8/100m^2 only apply for the first 5000m^2. Any amount over 5000m^2 requires 0.4/100m^2.
- Should you have any follow-up questions on the Transportation comments, please feel free to contact Patrick McMahon at Patrick.McMahon@ottawa.ca

Rideau Valley Conservation Authority

- Please contact the RVCA for their water quality targets for the site.

Parks & Facilities Planning

- Cash in lieu of parkland will be required at the rates set out in the City's Parkland Dedication by-law here.

Environmental Planning

- Please review the City's new Bird-Safe Design Guidelines: Bird-safe glass or integrated protection measures may be required through conditions of site plan approval for projects involving large expanses of glazing. However, it is important that the Bird-Safe Design Guidelines do not have a significant impact on the affordability or timelines of the respective project. Recognize that corporate standards or other design requirements may limit or preclude use of bird-safe glass or integrated protection measures in cases of small-scale commercial buildings (e.g. restaurant, retail pads).

Forestry & Trees

1. a Tree Conservation Report (TCR) must be supplied for review along with the suite of other plans/reports required by the City
    a. an approved TCR is a requirement of Site Plan approval.
    b. The TCR may be combined with the LP provided all information is suppled.
2. As of January 1 2021, any removal of privately-owned trees 10cm or larger in diameter, or publicly (City) owned trees of any diameter requires a tree permit issued under the Tree Protection Bylaw (Bylaw 2020 – 340); the permit will be based on an approved TCR and made available at or near plan approval.
3. The Planning Forester from Planning and Growth Management as well as foresters from Forestry Services will review the submitted TCR
    a. If tree removal is required, both municipal and privately-owned trees will be addressed in a single permit issued through the Planning Forester
    b. Compensation may be required for city owned trees – if so, it will need to be paid prior to the release of the tree permit
4. the TCR must list all trees on site by species, diameter and health condition
5. please identify trees by ownership – private onsite, private on adjoining site, city owned, co-owned (trees on a property line)
6. the TCR must list all trees on adjacent sites if they have a critical root zone that extends onto the development site
7. If trees are to be removed, the TCR must clearly show where they are, and document the reason they cannot be retained
8. All retained trees must be shown and all retained trees within the area impacted by the development process must be protected as per City guidelines available at Tree Protection Specification or by searching Ottawa.ca
    a. the location of tree protection fencing must be shown on a plan
    b. show the critical root zone of the retained trees
    c. if excavation will occur within the critical root zone, please show the limits of excavation
9. 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.

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

LP tree planting requirements:

- For additional information on the following please contact tracy.smith@Ottawa.ca
- Minimum Setbacks
  - Maintain 1.5m from sidewalk or MUP/cycle track.
  - Maintain 2.5m from curb
  - Coniferous species require a minimum 4.5m setback from curb, sidewalk or MUP/cycle track/pathway.
  - Maintain 7.5m between large growing trees, and 4m between small growing trees. Park or open space planting should consider 10m spacing.
  - Adhere to Ottawa Hydro's planting guidelines (species and setbacks) when planting around overhead primary conductors.
- Tree specifications
  - Minimum stock size: 50mm tree caliper for deciduous, 200cm height for coniferous.
  - Maximize the use of large deciduous species wherever possible to maximize future canopy coverage
  - Tree planting on city property shall be in accordance with the City of Ottawa's Tree Planting Specification; and include watering and warranty as described in the specification (can be provided by Forestry Services).
  - Plant native trees whenever possible
  - No root barriers, dead-man anchor systems, or planters are permitted.
  - No tree stakes unless necessary (and only 1 on the prevailing winds side of the tree)
- Hard surface planting
  - Curb style planter is highly recommended
  - No grates are to be used and if guards are required, City of Ottawa standard (which can be provided) shall be used.
  - Trees are to be planted at grade
- Soil Volume
  - Please ensure adequate soil volumes are met:

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

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

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

This proposal is subject to **Site Plan Control application** (Complex, Staff Approval). The required Plans & Study List is below. Please refer to the City's Site Plan Control By-Law to determine whether a site plan control application is required.

Required Plans and Studies:

1. Site Servicing Plan
2. Grading Plan
3. Erosion and Sediment Control Plan
4. Storm Drainage / Ponding Plan
5. Stormwater Management and Site Servicing Report
6. Geotechnical Investigation Report
7. Site Plan
8. Planning Cover Letter
9. Landscape Plan

10. TCR (Landscape Plan and TCR can be combined)
11. Design Brief (Terms of Reference attached)
12. Plan of Survey
13. Site Lighting Plan and letter (will be required as condition of approval, not a submission requirement)
14. Building Elevations
15. Phase I ESA

Please refer to the links to "Guide to preparing studies and plans" and fees for general information. Additional information is available related to building permits, development charges, and the Accessibility Design Standards. Be aware that other fees and permits may be required, outside of the development review process. You may obtain background drawings by contacting informationcentre@ottawa.ca.

These pre-con comments are valid for one year. If you submit a development application(s) after this time, you may be required to meet for another pre-consultation meeting and/or the submission requirements may change. You are as well encouraged to contact us for a follow-up meeting if the plan/concept will be further refined.

We are happy to discuss further or answer any follow-up questions.

Have a great weekend, and all the best,

Sarah Ezzio
Planner I **|** Urbaniste I
Development Review (South Services) **|** Examen des projets d'aménagement (services sud)
Planning, Infrastructure and Economic Development **|** Services de planification, d'infrastructure et de développement économique

City of Ottawa | Ville d'Ottawa
☎ 613.580.2400 ext./poste 23493
ottawa.ca/planning / ottawa.ca/urbanisme

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PLAN REVISED OCTOBER 25, 2012
TO ILLUSTRATE NEW TOPOGRAPHIC DATA
ALONG THE NORTHERLY AND WESTERLY
PROPERTY LIMITS.

PLAN REVISED MARCH 8, 2022
TO ILLUSTRATE NEW TOPOGRAPHIC DATA
ALONG THE NORTHERLY AND WESTERLY
PROPERTY LIMITS.

TOPOGRAPHICAL PLAN OF SURVEY OF

PART OF LOT 3
CONCESSION 5 (Rideau Front)
Geographic Township of Gloucester
CITY OF OTTAWA
Surveyed by Annis, O'Sullivan, Vollebekk Ltd.

Scale 1 : 150

6 4.5 3.0 1.5 0 3 6 Metres

Metric

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

Surveyor's Certificate

I CERTIFY THAT :

1. This survey and plan are correct and in accordance with the Surveys Act, the Surveyors Act and the Land Titles Act and the regulations made under them.
2. The survey was completed on the 7th day of March, 2022.

MARCH 21, 2022
Date

E. H. Herweyer
Ontario Land Surveyor

Notes & Legend

	Denotes	
—□—	"	Survey Monument Planted
—■—	"	Survey Monument Found
SIB	"	Standard Iron Bar
SSIB	"	Short Standard Iron Bar
(WIT)	"	Witness
(AOG)	"	Annis, O'Sullivan, Vollebekk Ltd.
○ MH–ST	"	Maintenance Hole (Storm Sewer)
○ MH-S	"	Maintenance Hole (Sanitary)
○ LS	"	Light Standard
○ FH	"	Fire Hydrant
T/G	"	Top of Grate
▭ GM	"	Gas Meter
○	"	Deciduous Tree
✳	"	Coniferous Tree
+ 65.00	"	Location of Elevations
+ 65.00*	"	Top of Curb Elevbations
—	"	Property Line
DC	"	Depressed Curb
○ B	"	Bollard
⊗ WV	"	Water Valve
C/L	"	Centre-line
+ 65.00	"	New Elevations Obtained October 24, 2012

Bearings are grid bearings, derived from the northerly limit of Part 2 on Plan 4R-25670, shown to be N67°53'40"E thereon and are referred to the Central Meridian of Zone 9 of the Ontario Coordinate System, Longitude 76°30' West (MTM NAD-83).

ELEVATION NOTES

1. Elevations shown are referred to geodetic datum, derived from City of Ottawa benchmark G-140 having an elevation of 78.296 (CGVD28).
2. It is the responsibility of the user of this information to verify that the job benchmark has not been altered or disturbed and that it's relative elevation and description agrees with the information shown on this drawing.

UTILITY NOTES

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

ASSOCIATION OF ONTARIO
LAND SURVEYORS
PLAN SUBMISSION FORM
V-25361

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

Ontario
Land Surveyors

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

Job No. 22674-22 Pt Lt3 C RF T F | ja

Servicing Report
Iridian Building
2700 Swansea Crescent
June 6, 2011
Revision 2 – September 28, 2011

1. GENERAL

1.1 Executive Summary

This report outlines servicing criteria and engineering calculations pertaining to the servicing of a proposed light industrial site located at 2700 Swansea Crescent in the Hawthorne Industrial Park.

The site was planned and serviced as part of the Hawthorne Industrial Park development.

The subject property is currently vacant, and has an area of 1.883 ha, and is situated on the northeast side of Swansea Crescent. The site has been identified for light industrial development since the area was developed.

The present proposal is to construct a single storey manufacturing facility and associated parking and landscaped features for Iridian Spectral Technologies. The developer is Canderel Realties Inc.

The proposed grading plan is shown on drawing C.01. Servicing is shown on Drawing C.02. A drainage area plan and construction notes are provided on Drawing C.03. The site plan, developed by the architect in coordination with the City planner, is shown on Drawing A.01.

The report was prepared utilizing servicing criteria obtained from the City of Ottawa, and outlines the design for water, sanitary wastewater, and stormwater facilities, including stormwater management.

The format of the report matches that of the development servicing study checklist found in section 4 of the city of Ottawa's Servicing Study Guidelines for Development Applications, November 2009. The report section headings therefore serve the purpose of a checklist.

The September 4, 2011 revision of this report provides changes arising from alterations to the site plan, including modification of the parking area, driveway location and a minor shift in the building location.

The September 28, 2011 revision accounts for the change in impervious area associated with a widening of the private sidewalk located along the building front. Other minor site plan changes for landscape planters and a change at the loading door are reflected on updated engineering

drawings (Revision 2 – September 26, 2011). A statement regarding downstream storm sewer routing has been added to Section 4.14 as requested by the Ontario Ministry of the Environment.

1.2 Date and Revision Number

This version of the report is the third issue, dated September 28, 2011.

1.3 Location Map and Plan

Drawings C.01 and C.02 provide the proposed development of the site, including municipal address, site boundary and layout for the portion of the site being developed. Drawings C.01, C.02 and C.03 include a location plan. Drawing C.03 shows the entire parcel of land, including the northern section that is not being developed at this time.

1.4 Adherence to Zoning and Related Requirements

The site zoning is IG3. The proposed use of the site for a manufacturing facility is in conformance with the zoning. Density statistics (site area, building area and percent lot coverage) are provided on Drawing A.01 (Site Plan) produced by Pye & Richards Architects Inc.

Water and sanitary services will be in accordance with City of Ottawa guidelines.

Stormwater quantity management will be provided on site as noted in Section 4. On-site quality treatment is not required as confirmed by the City of Ottawa.

1.5 Pre-Consultation Meetings

A pre-consultation meeting was held with representatives of the City of Ottawa, Owner and the consultant design team on May 16, 2011. Notes of the proceedings from this meeting are attached to this report.

1.6 Higher Level Studies

No higher level studies were found within after requests to the developer (Canderel) or the City of Ottawa. Sanitary and water servicing were therefore designed in accordance with the City of Ottawa Sewer Design Guidelines and Ottawa Design Guidelines - Water Distribution. Stormwater quantity management is designed as per instructions provided by the City at the pre-consultation meeting.

1.7 Statement of Objectives and Servicing Criteria

The objective of the site servicing is to meet the requirements for the proposed building while achieving the design objectives of the City of Ottawa.

1.8 Available Existing and Proposed Infrastructure

Site storm, sanitary and water connections will connect to the locations of existing infrastructure shown on plan and profile drawings provided by the City of Ottawa for Swansea Crescent. Reference to the specific existing infrastructure is provided in subsequent sections of this report. Water, sanitary and storm mains are available on Swansea Crescent.

The site entrances will be located off of Swansea Crescent which is presently fully developed to an urban cross section. The west entrance will be one-way in only. The east driveway will be two-way.

1.9 Environmentally Significant Areas, Watercourses and Municipal Drains

The development is not occurring in an Environmentally Significant Area. There are no watercourses or Municipal Drains on the subject property, and the site drains to existing City storm sewers.

1.10 Concept Level Master Grading Plan

As the design has been submitted for site plan approval, the grading plan has been developed to the final design level. The existing and proposed grading is shown on Drawing C.01 - Grading Plan. The grading plan confirms the feasibility of the proposed stormwater management, drainage, soil removal and fills. Site boundary proposed elevations match with existing elevations on the west, east and south boundaries. The north property boundary proposed elevations have been developed in consideration of possible severance of the north property parcel. A future property line has been noted dividing the south and north parcels.

Grading of the lot will take advantage of the general overland flow direction on the site, which is from north to south, and west to east. No overland flow presently enters from or exits to private properties to the north and east.

The south portion of the lot will continue to accept the existing drainage from the north portion of the lot until such time as the north lot is severed and developed.

1.11 Impacts on Private Services

There are no existing private services (septic systems and wells) on adjacent properties, as the entire area is on municipal services. The proposed pipe servicing system for the site will therefore not impact private services.

1.12 Development Phasing

No future development is currently anticipated for the south part of the site. An entirely separate development is possible on the north part of the site, if the area is severed. The stormwater management calculations have allowed for both interim and future conditions.

1.13 Geotechnical Study

A geotechnical study was prepared by Golder Associates, Report No. 021-2214, 2002. Supplementary memos were prepared in 2006 and 2007, under project numbers 06-1120-030-2000 and 07-1121-0135 respectively. Copies of these reports are submitted with the site plan application.

1.14 Drawing Requirement

The submitted Site Plan A.01 by Pye & Richards Architects provides a metric scale, north arrow, construction north arrow, key plan, name of Owner, contact information for owner's representative (Pye & Richards Architects Inc.), property limits including bearings and dimensions, existing and proposed structures and parking areas, easements, road widening (none noted as being required) rights of way (none noted), and adjacent street names.

2. WATER SERVICING

2.1 Consistency with Master Servicing Study and Availability of Public Infrastructure.

The site water service will draw from the 300 mm diameter watermain located on Swansea Crescent, which is part of a looped system constructed for the industrial park..

2.2 System Constraints and Boundary Conditions

There are no specific system constraints pertaining to the proposed development. Boundary conditions as prepared by the City of Ottawa are attached to this report. Available fire flows and pressures at adjacent hydrants are noted below.

2.3 Confirmation of Adequate Domestic Supply and Pressure

The continuous process water demand for the site has been estimated for the proposed operation as 0.47 L/s. An emergency process use allowance of 0.67 L/s is also required, but can be regarded similar to fire flow requirements. To the daily process amount, a demand of 35,000 L/gross ha should be provided as noted in Table 4.2 of the Ottawa Design Guidelines – Water Distribution. The area being developed is 0.8953 ha, and therefore is assigned an average water demand of 31,336 L/day, or 0.36 L/s excluding the process flow. Total average demand is therefore estimated as 0.47 + 0.36 = 0.83 L/s.

Maximum day demand is estimated as 1.25 L/s based on 1.5 x average demand.

Peak hour demand is estimated as 2.25 L/s based on 1.8 x maximum day demand.

Available supply pressure and flow is noted in the following section. As the supply can meet the larger fire flow requirement, it is therefore capable of supplying the much lower domestic flow requirement.

2.4 Confirmation of Adequate Fire flow Protection

The new building requires a 150 mm diameter water service based on anticipated domestic and fire flow demands established by the mechanical engineer.

Hydrant test results were obtained from the City of Ottawa for the hydrants west of the site on Swansea Crescent. Static pressures of 64 psi were noted, and dynamic pressures of 54 to 56 psi at flows of 950 Igpm (4313 L/min or 71.9 L/s). Available flow at a pressure of 20 psi was a minimum of 2114 Igpm.

The available flow was reviewed against the recommendations for required fire flow provided by the Fire Underwriters Survey in their manual "Water Supply for Public Fire Protection, 1999". Fire flows were based on a floor area of 3174 m2. An estimate of 6000 L/min or 1322 Igpm is determined assuming a building of non-combustible construction, with limited combustible contents, with complete supervised automatic sprinkler protection, and with an exposure charge of 15% (allowing for future buildings within 20 metres). The available flow of 2114 Igpm exceeds the recommended flow minimum for the proposed building.

The emergency process flow of 0.67 L/s (8.9 Igpm) can also be added to the fire flow demand, and still results in the required flow being less than the available.

2.5 Check of High Pressures

As noted in the previous section, current static and dynamic pressures are 64 psi, and 54 to 56 psi respectively. High pressure is therefore not of concern.

2.6 Phasing Constraints

The construction of the building will not be phased.

2.7 Reliability Requirements

A shut off valve will be provided for the building water service at the property line in accordance with city standards. The city watermain includes shutoff valves east and west of the site.

2.8 Need for Pressure Zone Boundary Modification

As proposed water related work consists of a single site service, there is no need for a pressure zone boundary modification.

2.9 Capability of Major Infrastructure to Supply Sufficient Water

This requirement was addressed in subsections .3 and .4 above.

2.10 Description of Proposed Water Distribution Network

A single water service will be provided to the single building on the site. As the fire department connection is within 45 metres from an existing hydrant, a new site hydrant is not a requirement.

2.11 Off-site Requirements

No off-site improvements to existing watermains, feedermains, pumping stations, or other water infrastructure are required to service the site.

2.12 Calculation of Water Demands

Water domestic demands were calculated using Ottawa Design Guidelines as noted in Section 2.3. The fire demand was estimated using the Fire Underwriters Survey's "Water Supply for Public Fire Protection".

2.13 Model Schematic

As the proposed water works consist of a single building service, a model schematic is not required.

3. WASTEWATER SERVICING

3.1 Design Criteria

The city of Ottawa Sewer Design Guidelines recommend a sanitary flow allowance of 35,000 L/ha/day for light industrial uses, with a peaking factor of 6.7 for an area of 0.89 hectares. The peak flow allowed for the site calculated using the guidelines is therefore 2.4 L/s. The extraneous flow allowance is 0.28 L/s/ha, raising the peak estimated allowable flow to 2.65 L/s.

3.2 Consistency with Master Servicing Study

A conservative reasonable estimate for the maximum sewage flow can be obtained from the peak water demand of 2.25 L/s estimated in Section 2.3, assuming that none of the water demand is used up in the process, and assuming that the sewage peak is equal to the water demand peak. Adding the extraneous flow allowance of 0.25 L/s, the estimated peak flow is 2.50 L/s, which is below the allowed flow, and well within the pipe capacity of the service being provided.

Based on a conversation with Eric Tousignant of the City of Ottawa, there is no requirement to assess the capacity of downstream sewers if the anticipated sewage flow from the site is within the guideline values for light industrial land.

3.3 Review of Soil Conditions

Based on the geotechnical report by Golder, there are no specific local subsurface conditions that suggest the need for a higher extraneous flow allowance. The site sewers will be new, and therefore will be less susceptible to leakage when compared with older networks.

3.4 Description of Existing Sanitary Sewer

The outlet storm sanitary sewer is a 250 mm diameter sewer located on Swansea Crescent. The connection point for the building sanitary service will near the proposed east driveway.

3.5 Verification of Available Capacity in Downstream Sewer

As noted in Section 3.2, the estimated sanitary flow from the site is less than the amount that would have been used for design purposes using the Ottawa Sewer Design Guidelines. The flow allocation for the site will therefore not be exceeded.

3.6 Calculations for Sanitary Sewers

The proposed 150 mm diameter sanitary service has a minimum slope of 1% and therefore a minimum capacity of 15 L/s. The maximum slope is 8% from the monitoring manhole to the receiving main, which would yield a velocity of 2.4 m/s if the sewer service was running full.

3.7 Description of Proposed Sewer Network

The sanitary sewer system proposed consists of 150 mm diameter piping and a single monitoring manhole to convey sewage from the building to the outlet City sewer. No pumping stations or forcemains are required specifically for this development.

3.8 Environmental Constraints

There are no previously identified environmental constraints that impact the sanitary servicing design in order to preserve the physical condition of watercourses, vegetation, or soil cover, or to manage water quantity or quality.

3.9 Pumping Requirements

The proposed development will have no impact on existing pumping stations and will not require new pumping facilities. .

3.10 Force-mains

No force-mains are required specifically for this development.

3.11 Emergency Overflows from Sanitary Pumping Stations

No pumping stations are required for this site.

3.12 Special Considerations

Site investigations have not yielded the need for special considerations for sanitary sewer design related to contamination, corrosive environments, or any other issue.

4. STORMWATER SERVICING

4.1 Description of Drainage Outlets and Downstream Constraints

The site currently drains overland towards Swansea Crescent. Some low areas exist in the east part of the site.

In the absence of site specific criteria, the flow constraint for the site is based on that produced using a runoff coefficient of 0.5, and a 5 year rainfall event with a time of concentration of 20 minutes (or lower if calculated). Estimated times of concentration from the limits of the drainage path to the entry point into the proposed storm sewer system exceed 20 minutes, and therefore the 20 minute rainfall intensity will be used.

4.2 Analysis of Available Capacity in Existing Public Infrastructure

The allowable release rate from the site has been established by the City of Ottawa using the criteria indicated above. No site specific studies are available to justify any higher allowable release rates.

4.3 Drainage Drawing

Drawing C.01 provides proposed grading and drainage, and includes existing grading information. Drawing C.02 shows the receiving storm sewer and proposed storm sewer network. A drainage sub-area plan is provided on Drawing C.03. Sub-area information is also provided on the storm sewer design sheet attached to this report.

4.4 Water Quantity Control Objective

The site must be examined under two scenarios. Under the interim scenario, the entire 1.883 ha will drain into the proposed storm sewer network to be established in the south part of the site. Under the future scenario, the north sector will be severed, and all runoff from the 0.9877 ha north sector will be handled independently of the south sector. Under the future scenario, the 0.8953 ha south area is treated independently from the north.

Both of these scenarios were examined to determine which resulted in the lowest allowable flow, and which provided the highest level of required storage.

It should be noted that sub-area 10 in the northwest part of the site drains uncontrolled towards the west, and therefore must be deducted from the allowed discharge in the interim calculations and storm sewer design for the south sector.

Sub-area 11 at the south end of the proposed east driveway is captured by a site catchbasin, but is discharged to the storm sewer downstream of the flow control location. The uncontrolled flow from subarea 11 therefore also has to be deducted from the allowable discharge in both the interim and ultimate calculations.

Flows are calculated using the Rational Method with the formula $Q = 2.78 \times C \times I \times A$, where

- Q = flow in litres per second
- C = runoff coefficient
- I = rainfall intensity (from City of Ottawa Sewer Design Guidelines)
- A = drainage area in hectares

The flow from subarea 11 is calculated assuming 100 year conditions, with a runoff coefficient of 1.0, an area of 0.0034 ha, and a 5 minute rainfall intensity of 242.6 mm/hour. The resulting flow from subarea 11 is 2.3 L/s.

Interim Condition

Allowable runoff for the whole site = 2.78 C I A = 2.78 x 0.5 x 70.25 x 1.883 = 183.9 L/s.

Uncontrolled runoff from subarea 10 under 100 year conditions is calculated using a runoff coefficient of 0.25 increased by 25%, a 20 minute rainfall intensity of 119.95 L/s, and an area of 0.2787 ha.

Runoff from subarea 10 = 2.78 x 0.25 x 1.25 x 119.95 x .2787 = 29.0 L/s.

Runoff from subarea 11 is 2.3 L/s

Allowable release rate to the City storm sewer = 183.9 – 29.0 – 2.3 = 152.6 L/s.

Future Condition

Under future conditions, flow contributions from the north sector do not need to be considered. The allowable flow release from the south sector of 0.8953 ha is therefore

Q = 2.78 x 0.5 x 70.25 x 0.8953 = 87.4 L/s

A deduction of 2.3 L/s is made from this amount to allow for the uncontrolled release from subarea 11. The net allowable release from the controlled portion of the site under future conditions is therefore 85.1 L/s

Storage requirements for interim and future conditions are provided in Section 4.10 of this report.

4.5 Water Quality Control Objective

The site is not required to achieve water quality objectives. Water quality objectives are achieved through downstream communal works providing quality treatment for the area. An e-mail noting this situation is attached to this report.

4.6 Description of Stormwater Management Concept

The proposed drainage system consists of a series of manholes, catchbasins and storm sewers leading to the existing 900 mm diameter City storm sewer on Swansea Crescent. A drainage area plan and a storm sewer calculation sheet are attached.

CBMH2 will be provided with a restricted outlet, limiting discharge to 85.1 L/s which is the lowest of the two release rates calculated in Section 4.4 above. Normally dry surface storage areas will be located in the south part of the site, and roof top storage will also be provided.

4.7 Set-Back from Private Sewage Disposal Systems, Water Courses, and Hazard Lands

As there are no adjacent or on-site private sewage disposal systems, watercourses or hazard lands, there are no required setbacks.

4.8 Pre-Consultation with Ontario Ministry of the Environment and Conservation Authority

Pre-consultation with the Ontario Ministry of the Environment has been undertaken, and the requirement for a Certificate of Approval for sewage works has been confirmed for the stormwater management components. A copy of the MOE response is attached. The Rideau Valley Conservation Authority was consulted, and their e-mail response is attached to this report.

4.9 Consistency with Higher Level Studies

As noted previously, the stormwater management design for the site is consistent with the requirements of the City of Ottawa.

4.10 Storage Requirements and Conveyance Capacity

Storage requirements must be estimated under both interim and future scenarios, with the largest calculated storage volume being carried forward for the design.

Interim Conditions

Total area (flow controlled) connected to the storm sewer consists of sub-areas 1 to 9, and equals 1.6009 ha. This area includes 0.6087 ha of impervious surface and 0.9922 ha of pervious surface. The weighted average runoff coefficient is 0.497 based on 0.9 for impervious areas and 0.25 for pervious areas. Under 100 year conditions, the pervious area coefficient is increased by 25%, and the impervious coefficient is increased to 1.0, yielding a weighted average coefficient of 0.574.

The required volume of storage is calculated using the modified Rational Method as indicated in the following tables.

Required storage is calculated by determining the difference between actual and allowable flow rates for the school site, and multiplying by the associated duration.

For 5 year storm event (C = 0.497 and area = 1.6009 ha)

Duration Minutes	Intensity mm/hr	Q L/s	Q allowable	Difference	Storage m3
5	140.2	310.1	152.6	157.5	47.3
10	104.4	230.9	152.6	78.3	47.0
15	85.6	189.3	152.6	36.7	33.0
20	70.25	155.4	152.6	2.8	0.3
25	60.9	134.7	152.6		
30	53.9	119.2	152.6		
35	48.52	107.3	152.6		
40	44.18	97.7	152.6		
60	32.0	70.8	152.6		

For 100 year storm event (C = 0.574 and area = 1.6009 ha)

Duration Minutes	Intensity mm/hr	Q L/s	Q allowable	Difference	Storage m3
5	242.6	619.7	152.6	467.1	140.1
10	179.0	457.3	152.6	304.7	182.8
15	146.8	375.0	152.6	222.4	200.2
20	119.95	306.4	152.6	153.8	184.6
25	103.85	265.3	152.6	112.7	169.1
30	91.9	234.8	152.6	82.2	148.0
35	82.58	211.0	152.6	58.4	122.6
40	75.15	192.0	152.6	39.4	94.6
60	53.2	135.9	152.6	0	0

Future Conditions

Under future conditions, parts of sub-areas 7 and 9 totaling 0.709 ha will remain with the north sector. Total area connected to the storm sewer in the south sector will be 0.8919 ha, consisting of 0.6087 ha of impervious surface and 0.2832 ha of pervious surface. The weighted average runoff coefficient is 0.694 based on 0.9 for impervious areas and 0.25 for pervious areas. Under 100 year conditions, the pervious area coefficient is increased by 25%, and the impervious coefficient is increased to 1.0, yielding a weighted average coefficient of 0.782.

For 5 year storm event (C = 0.694 and area = 0.8919 ha)

Duration Minutes	Intensity mm/hr	Q L/s	Q allowable	Difference	Storage m3
5	140.2	241.3	85.1	156.2	46.9
10	104.4	179.6	85.1	94.5	56.7
15	85.6	147.3	85.1	62.2	56.0
20	70.25	120.9	85.1	35.8	43.0
25	60.9	104.8	85.1	19.7	29.6
30	53.9	92.7	85.1	7.6	13.7
35	48.52	83.5	85.1		0
40	44.18	76.0	85.1		0
60	32.0	55.1	85.1		0

For 100 year storm event (C = 0.782 and area = 0.8919 ha)

Duration Minutes	Intensity mm/hr	Q L/s	Q allowable	Difference	Storage m3
5	242.6	470.4	85.1	385.3	115.6
10	179.0	347.1	85.1	262.0	157.2
15	146.8	284.6	85.1	199.5	179.6
20	119.95	232.6	85.1	147.5	177.0
25	103.85	201.4	85.1	116.3	174.5
30	91.9	178.2	85.1	93.1	167.6
35	82.58	160.1	85.1	75.0	157.5
40	75.15	145.7	85.1	60.6	145.4
60	53.2	103.2	85.1	18.1	65.2

The required storage based on the largest storage volume calculated in either of the two scenarios above is 56.7 m3 for the 5 year and 200.2 m3 for the 100 year event.

Roof Storage

Stormwater storage will be provided on the roof by employing flow control roof drains, with a maximum storage depth of 150 mm at the 8 drain locations. The flow at each drain is limited to 1.89 L/s at the maximum 150 mm depth. The proposed roof drains are Watts Drainage Model RD-100, equipped with an Accutrol single weir flow control insert.

The theoretical storage on the roof of 3174 m2 assuming a 150 mm depth at the drains and 0 mm depth at the perimeter would be 158.7 m3.

Actual storage on the roof can be estimated under 5 and 100 year conditions using the Modified Rational Method, assuming a fixed outflow of 15.1 L/s (8 drains x 1.89 L/s per drain). The runoff

coefficient for 5 year conditions is assumed to be 0.9, and for 100 year conditions is assumed to be 1.0.

For 5 year storm event on roof (C = 0.9 and area = 0.3174 ha)

Duration Minutes	Intensity mm/hr	Q L/s	Q allowable	Difference	Storage m3
5	140.2	111.3	15.1	96.2	28.9
10	104.4	82.9	15.1	67.8	40.7
15	85.6	68.0	15.1	52.9	47.6
20	70.25	55.8	15.1	40.7	48.8
25	60.9	48.4	15.1	33.3	50.0
30	53.9	42.8	15.1	27.7	49.9
35	48.52	38.5	15.1	23.4	49.1
40	44.18	35.1	15.1	20.0	48.0
60	32.0	25.4	15.1	10.3	37.1

For 100 year storm event on roof (C = 1.0 and area = 0.3174 ha)

Duration Minutes	Intensity mm/hr	Q L/s	Q allowable	Difference	Storage m3
5	242.6	214.1	15.1	199.0	59.7
10	179.0	157.9	15.1	142.8	85.7
15	146.8	129.5	15.1	114.4	103.0
20	119.95	105.8	15.1	90.7	108.8
25	103.85	91.6	15.1	76.5	114.8
30	91.9	81.1	15.1	66.0	118.8
35	82.58	72.9	15.1	57.8	121.4
40	75.15	66.3	15.1	51.2	122.9
60	53.2	46.9	15.1	31.8	114.5

Available roof storage is estimated as 50.0 m3 for 5 year conditions and 122.9 m3 for 100 year conditions.

The proposed four ground surface storage areas are shown on Drawing C.01. These areas will normally be dry, and water will be temporarily stored on the ground surface for storm events exceeding the allowable discharge to the City storm sewer. The maximum water surface elevation is defined by the overflow elevation of 81.55 m. The maximum ponding depth will be 250 mm in the parking areas, and 600 mm in the landscaped area. Five year storage depths are approximately 50 mm in the parking areas and 400 mm in the landscaped basin.

Available ground surface storage capacity under 100 year conditions is estimated as 110 m3. Under 5 year conditions, ground level surface storage is estimated as 26 m3.

Adding in the available roof storage, the total 100 year storage is 232.9 m3 for the 100 year event, and 76 m3 for the 5 year event. These values meet the required storage amounts.

Outflow from DCBMH3 will be regulated by a Hydrovex 250 VHV-2 flow regulator as noted on the drawings. A flow curve indicating the operating point is attached to this report.

The conveyance capacity of the minor storm sewer system is outlined in the attached storm sewer design sheet. The site major system allows for overland overflow out the southeast corner of the site via the driveway. The proposed building is located at the high point of the site, and is therefore above the overland flow route.

4.11 Watercourses

There are no watercourses on or adjacent to the site.

4.12 Pre and Post Development Peak Flow Rates

The pre-development condition of the site is undeveloped with no impervious areas. Peak flow rates can be calculated for the 1.883 hectare site using the Rational Method assuming a runoff coefficient of 0.25 and a time of concentration of 20 minutes. Rainfall intensities are provided in the Ottawa Sewer Design Guidelines, and are 70.25 mm/hour for the five year event, and 119.95 mm/hour for the 100 year event.

Pre-development 5 year peak flow = 2.78 x C x I x A = 2.78 x 0.25 x 70.25 x 1.883 = 91.9 L/s

Pre-development 100 year peak flow = 2.78 x C x I x A = 2.78 x 0.25 x 119.95 x 1.883 = 157 L/s

Post-development peak flow rates are provided in Section 4.10 above for several different return periods as part of the storage calculations.

The attached drainage area plan, and the storm sewer design sheet describe the post-development drainage areas and extent of imperviousness.

4.13 Diversion of Drainage Catchment Areas

There are no proposed diversions of drainage catchment areas from one outlet to another.

4.14 Minor and Major Systems

Proposed minor and major systems are shown on Drawing C.02, and have been described in previous sections of the report. The minor site storm sewer system is described on the attached storm sewer calculation sheet. The proposed stormwater management facility consists of four surface storage areas in the southeast corner of the site, roof top storage, and a flow regulator at DCBMH3.

The storm service from the site discharges to a 900 mm diameter City storm sewer on Swansea Crescent. The 900 mm sewer flows easterly, and connects into a 3600 mm diameter trunk sewer south of the intersection of Swansea Crescent and Stevenage Drive (west intersection).

The 3600 mm trunk sewer runs easterly, crosses under Hawthorne Road, turns southerly, and discharges to MacEwen Creek between Russell Road and Hawthorne Road. A communal stormwater management pond providing quality control is located at short distance downstream near Hunt Club Road.

4.15 Downstream Capacity Where Quantity Control Is Not Proposed

This checklist item is not applicable to this proposed development as quantity control is provided.

4.16 Impacts to Receiving Watercourses

No measurable impact is anticipated to downstream receiving watercourses due the separation of the site from the eventual receiving watercourse as a result of discharge through City owned storm sewers and stormwater management facilities.

4.17 Municipal Drains and Related Approvals

There are no municipal drains on the site or associated with the drainage from the site.

4.18 Means of Conveyance and Storage Capacity

The means of flow conveyance and storage capacity are described in Sections 4.10 and 4.14 above.

4.19 100 Year Flood Levels and Major Flow Routing

The maximum water ponding level on the site is El. 81.55 m prior to overflow. The proposed building finished floor of 83.20 m is higher than the area surrounding the building, and significantly higher than the maximum ponding level. The vestibule floor level at the staff entrance is at 82.30 m, and is therefore also well above the overflow water level of 81.55 m. All perimeter areas outside of the building slope away from the building.

4.20 Hydraulic Analysis

Hydraulic calculations for the site storm sewers are provided in the storm sewer design sheet. The maximum hydraulic grade line is defined by the maximum stormwater storage elevation of 81.55 m.

4.21 Erosion and Sediment Control Plan

This document addresses the City of Ottawa's requirement for an Erosion and Sediment Control Plan for the proposed construction.

The drawings include requirements for the Contractor to implement Best Management Practices to minimize erosion and sediment release during construction activities. Specific measures are dictated including a geotextile under catch basin grates, and a temporary silt fence on the down gradient property lines.

The Architect, as lead consultant, is responsible for ensuring contractual compliance with the construction specifications, including erosion and sediment control.

It is anticipated that the measures outlined above will prove adequate for erosion and sediment control. Site inspection personnel will have the authority based on the Contract Documents to require additional control measures as necessary should the contractor's operations result in soil tracking or other offsite transfer of sediment and soil.

4.22 Identification of Floodplains

There are no designated floodplains on the site of this development.

4.23 Fill Constraints

There are no fill constraints applicable to this site related to any floodplain or site soil conditions as identified in the geotechnical investigation results available to date.

5. APPROVAL AND PERMIT REQUIREMENTS

The proposed development is subject to site plan approval and building permit approval. There are no required approvals under the Ontario Environmental Protection Act, or Conservation Authorities Act. As noted earlier, a Certificate of Approval for Sewage Works is required under the Ontario Water Resources Act for the stormwater management works.

No approvals related to municipal drains are required.

No permits or approvals are required from the Ontario Ministry of Transportation, National Capital Commission, Parks Canada, Public Works and Government Services Canada, or any other provincial or federal regulatory agency except as noted above.

6. CONCLUSION CHECKLIST

6.1 Conclusions and Recommendations

It is concluded that the proposed development can meet all required servicing constraints and associated requirements. It is recommended that this report be re-submitted to the City of Ottawa in support of the application for site plan approval.

6.2 Comments Received from Review Agencies

Preliminary comments have been received from the Rideau Valley Conservation Authority, the Ministry of the Environment and the City of Ottawa, and copies are attached to this report.

6.3 Signature and Professional Stamp

Report prepared by: GENIVAR James C. Johnston, P.Eng. 15 Fitzgerald Road, Nepean, Ontario K2H 9G1	

P&R

PYE & RICHARDS ARCHITECTS INC.
824 MEATH STREET, OTTAWA, ONTARIO. CANADA. K1Z 6E8. TEL: 613-724-7700 FAX: 613-724-1289
E-MAIL: staff@pnrarch.com WEB: www.pyeandrichardsarchitects.com

PROJECT MEETING

The following text represents a fair recording of all matters discussed and shall be deemed official for project record purposes unless advised to the contrary within seven (7) days.

PROJECT - Iridean Site Plan - 2700 Swansea Crescent

PROJECT NO. - 11-48

PROJECT STAGE - Preliminary Design

MEETING NO. - Pre-consultation Meeting 1

DATE - 16 May 2011

PLACE - City of Ottawa

IN ATTENDANCE

Name	Firm	E-Mail
Jeff Kubacki	Canderel Realties.	jkubacki@canderel.com
Denis Charron	City of Ottawa	denis.charron@ottawa.ca
Abdul Mottalib	City of Ottawa - Infrastructure	abdul.mottalib@ottawa.ca
Marietta Ruhland	Landscape Architect	dalamr@magma.ca
Jim Johnston	Genivar	jim.johnston@genivar.com
Scott Hayward	Pye & Richards Architects Inc.	scott.hayward@pnrarch.com

1.1 Site Plan Design

Scott Hayward presented the preliminary Site plan design drawing for discussion. The following comments were noted:

- A minimum 5.0 m. wide landscape strip is provided along the property line facing Swansea Crescent. The building's south west corner, which projected into this landscape strip on the drawings which were reviewed, has now been shifted back to maintain the 5.0 m requirement.
- Zoning regulations require minimum 3.0 m front and side yard setback.
- Zoning regulations for loading dock requirements to be maintained.
- Possible extension of driveway at western site entry to be investigated to allow for greater visibility when exiting site.
- To avoid vehicular congestion at the western entry/exit, a dedicated barrier free and courier parking spot is to be planned.
- Ensure exterior garbage facilities are completely screened from the street by extensive landscaping.
- Make sidewalk connection from parking to office entrance. Landscape along sidewalk adjacent to building.
- Provide bicycle parking at perimeter of the Site.
- Loading dock area and door to be screened from Swansea Crescent by extensive landscaping. Landscaping at staff entry to help in screening loading area. Pye and Richards to forward perspectives to illustrate how building geometry screens loading area.
- Integrate loading bay door into overall building design. Downplay visual impact of door.
- Provide berms and planting as per Hawthorne Business Park Guidelines along street.
- No 30 cm reserve along Swansea Crescent exists.

1.2 Traffic and Access

- A traffic brief will be required for the Site.

1.3 Site Servicing

- MOE approval required for site development (SWM) due to the occupancy being a light industrial use. In order to avoid a two to three month approval period, a conditional permit allowing work to proceed on site before the winter season will be requested. This conditional permit would be issued before final Site Plan and MOE approval are issued.
- On site monitoring of MHs for sewers required.
- Consultant to investigate downstream sewer constraints.
- Required information for water boundry conditions include : location of service, type of development and fire flow, average daily demand, maximum daily demand, maximum hourly demand.
- Stormwater Management criteria for draining to the City separated storm sewer system, SWM criteria are required to prepare serviceability study (Quantity control criteria).
  - Allowable release rate will be 5 year pre-development rate.
  - C Coefficient of runoff will need to be determined as per existing conditions but in no case more than 0.5
  - TC =20 minutes or can be calculated , for calculation minimum inlet time will be 10 minutes
  - Any storm events greater than 5 year up to 100 year and including 100 year storm events need to be stored on site.
  - Consultant to check with RVCA for Quantity Control Issues.

1.4 Landscaping

- Consultants to provide existing plant inventory with proposed new planting plan.
- Provide 5.0m landscape buffer strip along street frontages. Hawthorne Business Park Design Guidelines to be implemented along Swansea Crescent landscaping.
- Develop pedestrian route from parking to main building entry.
- Develop landscape screening for loading dock and garbage container.
- Developed landscaped entry plaza and staff outdoor patio.

1.5 Approval Process

- Site Plan Application required; Consultant advised to check guidelines in Bylaw for full list of requirements.

  Reports required include the following:
  - Geotechnical Report
  - SWM report Plan
  - Phase 1 Environmental Report
  - Site Servicing Report
  - Planning Rationale
  - Traffic Study
  - Building Plans and Elevations
  - Site Plans: Architectural, Landscape and Civil
  - Erosion and Sediment Control Plan (can be combined with grading plan)
- Provide Composite Utility Plan.
- Municipal consent required for any required road cut permit.

1.6 Site Lighting

- Provide Site lighting letter to confirm fuel cut-off at property lines.

Meeting adjourned.

Scott Hayward
PYE & RICHARDS ARCHITECTS INC.

Distribution:
All present

FAX TRANSMISSION FORM - Supply Pressure/Flow Capacity

City of Ottawa
Transportation Utilities and Public Works
Customer Service & Operational Support
951 Clyde Avenue
Ottawa, On, K1Z 5A6
Joseph Hannewyk
Water Resources Analyst

email: joseph.hannewyk@ottawa.ca
phone 560-6065 x22617

fax 728-4183

Date/Time: 11/05/06-13:44:38
Our File: 49-01-2006
1 of 2 Page(s)

To: **Jim Johnston**
Company: **Genivar Consulting Group**
Tel: **829-2800 x349**
Fax: **829-8299**
Location: **Swansea @ Stevenage**
Request_dt: 11/05/06-13:34:42
Email: **james.johnston@genivar.com**

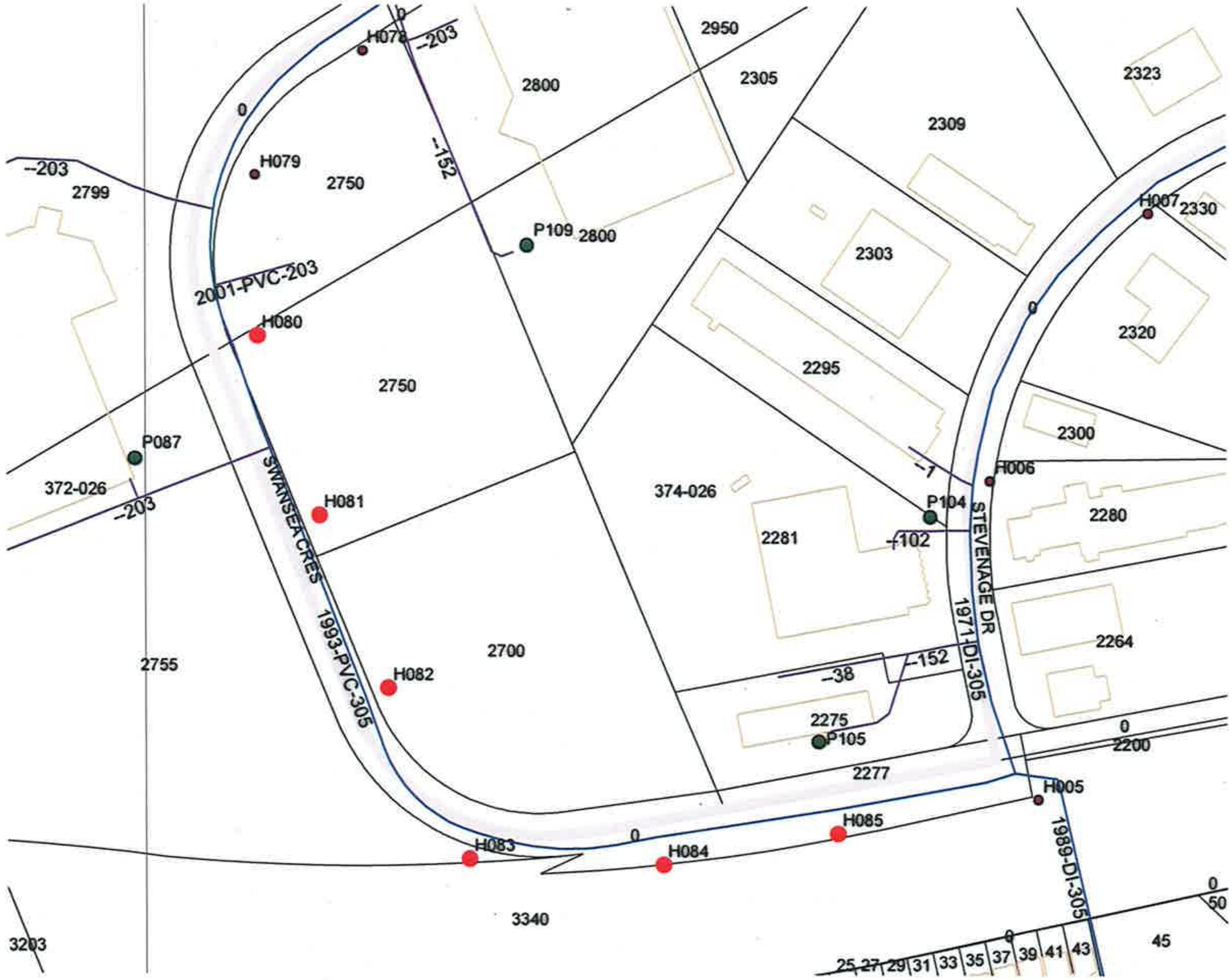
Pressure Only ? (Y):

Preferred Response Method:

Inspection	Flow	Residual	Pressure (psi)			Flow (igpm)	
Date	Hydrant	Hydrant	Static	Dynamic	Pitot	Actual	@ 20 psi
2010/06/08	7426080	7426083	64	54	46	950	2114
2010/06/08	7426081	7426083	64	56	46	950	2385

Note: the computed flows are approximate and performed for hydrant colour coding purposes, thus these values are not intended for design purposes.

5935



SWANSEA CRES
STEVENAGE DR
2001-PVC-203
1993-PVC-305
1971-DI-305
1989-DI-305
H078
H079
H080
H081
H082
H083
H084
H085
H005
H006
H007
P087
P104
P105
P109
2950
2305
2323
2800
2309
2799
2750
2303
2330
2320
2295
2300
372-026
374-026
2280
2281
2755
2700
2264
2275
2200
2277
3340
3203
45
50
25 27 29 31 33 35 37 39 41 43

STORM SEWER DESIGN TABLE

Local Drainage Area	From	To	Area with R=.25 (ha)	Area with R=.9 (ha)	Local 2.78 AR	Cumulative 2.78 AR	Time of Concentration (min)	Intensity (mm/hour)	Peak Flow (L/s)	Diameter (mm)	Slope (%)	Length (m)	Capacity (L/s) n=0.013	Velocity (m/s)	Time of Flow (min)	Upstream Invert (m)	Downstream Invert (m)
7	CB1	CB2	.1961	.0016	.1403	.1403	20	70.25	9.9	200	1.0	13.5	34.2	1.06	.25	80.58	80.44
6A	CB2	CBMH1		.0103	.0258	.1661	20	70.25	11.7	250	1.7	32.7	80.0	1.58	.34	80.39	79.83
8	BLDG	MAIN		.3174	.7941	.7941	10	104.4	82.9	200	6.0	13.5	83.8	2.58	.09	80.16	79.35
4	DICB3	DCB4	.0850		.0591	.0591	10	104.4	6.2	300	1.0	5.0	100.9	1.38	.06	79.64	79.59
5	DCB4	MAIN	.0124	.1047	.2706	.3297	10	104.4	34.4	300	1.0	7.2	100.9	1.38	.09	79.54	79.47
2	DCB7	MAIN	.0031	.0322	.0827	.0827	10	104.4	8.6	200	1.0	18.0	34.2	1.06	.28	79.49	79.31
6B	CBMH1	CBMH2	.0066	.0393	.1029	1.4755	20	70.25	103.7	300	1.1	64.0	105.1	1.44	.74	79.784	79.08
Part of 3	CB9	MAIN		.0182	.0455	.0455	10	104.4	4.8	200	1.0	8.0	34.2	1.06	.13	79.71	79.63
9	DICB5	CBMH2	.6340	.0095	.4644	.5099	20	70.25	35.8	200	2.0	56.0	48.4	1.49	.63	80.57	79.45
1	CB6	CBMH2	.0383		.0266	.0266	10	104.4	2.8	200	1.0	11.0	34.2	1.06	.17	78.31	79.20
11	CB8	MAIN		.0034	.0085	.0085	10	104.4	0.9	200	1.0	9.0	34.2	1.06	.14	79.40	79.31
Part of 3	CBMH2	STMH3	.0167	.0755	.2005	2.221	20	70.25	156.0*	375	0.74	31.0	157.3	1.38	.37	79.01	78.78
2	STMH3	CITY MAIN				2.221	20	70.25	156.0*	375	0.74	11.6	157.3	1.38	.14	78.77	78.68
		Totals	.9922	.6121	2.221												

*Outflow from CBMH2 restricted to 85.1 L/s.

Designed by: James Johnston

For sewer sizing purposes, no roof flow controls are assumed. Controlled flow roof drains will result in lower flow than indicated.

Rainfall intensities, sewer capacities and velocities from Ottawa Sewer Design Guidelines.

Revised September 28, 2011

James Johnston

From: James Johnston
Sent: Friday, June 03, 2011 10:44 AM
To: 'Mottalib, Abdul'
Cc: 'Taracha, Jacek'; Buchanan, Richard
Subject: FW: 2700 Swansea Crescent - SWM Quality Treatment

Abdul,
As per the message below, I have contacted Richard Buchanan regarding 2700 Swansea Crescent. Richard has confirmed today by telephone that quality treatment for this address is provided in a communal pond off-site, and that no no-site SWM quality treatment is required.

GENIVAR

James (Jim) Johnston, P.Eng., LEED® AP
GENIVAR | *Constructive people*
15 Fitzgerald Road, Nepean, Ontario K2H 9G1
T 613.829-2800 x349 | F 613.829-8299 | C 613.298-5960
www.genivar.com

From: Taracha, Jacek [mailto:Jacek.Taracha@ottawa.ca]
Sent: Tuesday, May 31, 2011 9:22 AM
To: James Johnston
Cc: Buchanan, Richard
Subject: RE: 2700 Swansea Crescent

Hi Jim,
Thanks for your message, I had a chance to talk to Richard Buchanan and I understand that there was an exchange between RVCA and him in respect to the quality treatment for the subject site. If you have not received the reply either from Abdul or Richard I would suggest to contact Richard directly at extension 27801.
Jacek

From: Jocelyn Chandler [mailto:jocelyn.chandler@rvca.ca]
Sent: Monday, May 09, 2011 4:29 PM
To: James Johnston
Subject: RE: 2700 Swansea Crescent

Hello James,
According to my October 200o 'McEwen Creek Water Quality and Erosion Control Study, Functional Design report (which is stamped DRAFT) prepared by CG & S, the property is identified as future/proposed industrial and outlets to the Eastern Community Trunk Sewer. The City of Ottawa is currently in the design process of preparing to construct a SWM pond just east of Hawthorn Road which will receive flows from the Eastern Community Trunk Sewer. I have no idea at this point what the function of this pond is…but I BELIEVE it was intended to provide quality controls for the receiver (McEwen Creek and ultimately Green's Creek). If this is the case, the RVCA will not require quality controls on the site. Please check with infrastructure at the City of Ottawa with respect to the intended pond function and the timing of its construction. Jocelyn.

Jocelyn Chandler M.Pl. MCIP, RPP.
Planner, RVCA
613.692.3571 x1137
jocelyn.chandler@rvca.ca

www.rvca.ca
mail: Box 599 3889 Rideau Valley Dr., Manotick, ON K4M 1A5
courier: 3889 Rideau Valley Dr., Nepean, ON K2C 3H1

James Johnston

From: Goulet, Charles (ENE) [Charles.Goulet@ontario.ca]
Sent: Wednesday, September 21, 2011 2:15 PM
To: James Johnston
Cc: Robertson, Syd
Subject: RE: Swansea Cr_2700 - Documents for the MOE Pre-submission meeting

James,

I briefly reviewed the servicing report.

Would you please provide more details about the sequence of events between the site and the receiving watercourse? In other words, the storm sewer servicing Swansea Crescent is connected to what other infrastructure before discharge to the newly commissioned McEwan Creek SWMF, just off the extension of Hunt Club Road?

It is my understanding that the SWM approach for this proposed industrial property will be through a combination of ponding on the roof and on a portion of the parking lot (southeast corner). Thus, an approval is required under Section 53 of the Ontario Water Resources Act.

Once you have amended your servicing report with the clarification requested just above, you may use this e-mail as a record of pre-application consultation.

Should you have any questions, please feel free to contact me.

Regards,
Charles Goulet, P. Eng.
District Engineer
MOE Ottawa District Office
2430 Don Reid Drive
Ottawa ON
K1H 1E1

DL (613) 521-3450 ext. 246
TF (800) 860-2195 ext. 246
F (613) 521-5437

From: Robertson, Syd [mailto:Syd.Robertson@ottawa.ca]
Sent: September 16, 2011 4:08 PM
To: Goulet, Charles (ENE)
Cc: james.johnston@genivar.com
Subject: Swansea Cr_2700 - Documents for the MOE Pre-submission meeting

Hi Charles:

Attached please find the engineering documents for the above noted site. Jim Johnston, P.Eng., Genivar will be contacting you regarding this in advance of his MOE submission for approval of municipal & private Sewage Works (Industrial)

Please call me if you have any questions.

<<Sweansea Cr_2700 - Drainage Area Plan.pdf>> <<Sweansea Cr_2700 - Grading Erosion & Sed Control Plan.pdf>> <<Swansea Cr_2700 - Servicing Report.pdf>> <<Sweansea Cr_2700 - Servicing Plan.pdf>>

Thanks,

Syd Robertson, C.E.T.

Project Manager, Infrastructure Approvals

DRP, Urban Services Branch, Outer Core

Planning & Growth Management Department

110 Laurier Ave. W., 4th Floor E

Ottawa, ON K1P 1J1

(613) 580-2424 ext/poste 27916

Syd.Robertson@ottawa.ca

www.ottawa.ca

File Number: **D07-12-11-0119**

24 Aug 2011

Genivar
15 Fitzgerald Rd, Suite 100
Ottawa, ON K2H 9G1
Attention: Jim Johnston, P.Eng.

Dear Jim:

Re: Preliminary Engineering Review – 2700 Swansea Cr., Ward 10, Ottawa, ON
Proposed two-storey office / industrial manufacturing building.

The following comments are provided in response to the engineering submission for your project number 111-16558-00 dated 06 June 2011 with the development application to the City of Ottawa:

General

1. Provide a Key Plan showing the location of the site with respect to the local street network.

2. List all the symbols in the Legend that are used in the drawing. What does the IP & SF symbol represent on Dwg C-02?

3. Delete the line 'SF' which runs along the Swansea Rd frontage – Dwg No. C-02 (requested by the Planner).

4. In the title block, include the name of Owner, full address including Postal Code; telephone no.
   2700 Swansea Crescent Property Inc.
   425 Leggett Dr., Ste 200
   Ottawa, ON K1G 6R8
   Phone: 613 287-3449

5. Clearly show the property lines using the same line intensity/thickness & line type as the one used for the landscape setback.

6. Provide a reference, on Dwg No. C-01 & C-02, to the General, Sewer & Water Notes listed on Dwg No. C-03.

7. Revise the leader note regarding the existing plywood fence, adjacent to the future parking area, stating, "Encroaching portion of the plywood fence to be removed from the subject site and reinstalled on the adjacent property to the west.

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Ville d'Ottawa
Planification et Gestion de la croissance
Examen de l'aménagement - Services d'urbanisme
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Ottawa, ON. K1P 1J1
Tél: (613) 580-2424
Téléc: (613) 560-6006
www.ottawa.ca

8. Consult with the architect to ensure that the Engineering Plans contain all the revisions made to the footprint of the site, including but not limited to the private approaches & the relocation of the fence at the southeast corner of the site.

Servicing Plan, Dwg No. C-02, Rev 0.

9. Provide the details of the SWM design for the roof of the proposed building (number of roof drains, restricted flows from the roof (per drain and total from all drains), maximum ponding volumes & depth for the 5-yr & 100-Yr storm events.

10. Confirm if there are weeping tiles and ensure that the foundation drain is connected downstream of any inlet control devices.

11. Show all existing and proposed public utilities both on-site & off-site. Information can be obtained from the City's Information Centre by phone at (613) 580-2424 x.44455 or by email @ informationcentre@ottawa.ca.

    The following information should be included:
    - Bell, Gas, Hydro, Cablevision
    - Pedestals, Transformers
    - Streetlighting

12. Provide a pipe conflict table which includes all proposed pipe crossings.

13. Hatch the area on the water service where thermal insulation will be required (ie. STA 0+000 to STA 0+004) *Based on the water service profile data.*

14. Specify a TVS connection for the proposed water service connection to the City watermain.

15. Revise the Water Service profile Table to include STA 0+020 & 0+040. List all stations in the correct format (eg. 0+000, 0+002.4 etc).

16. Show the water meter and remote on plan.

17. Address the last sentence of comment 35 below.

Grading Plan, Dwg No. C-01, Rev 0

18. Revise the name of this drawing to, Grading, Sediment & Erosion Control Plan.

19. Show the location of the sediment & erosion control measures to be implemented.

20. Relocate the Sediment & Erosion Control Notes from Dwg No. C-03 to C-01.

21. Ensure that the notes include the following wording:
    The contractor shall implement best management practices, to provide for protection of the area drainage system and the receiving watercourse, during construction activities. This includes limiting the amount of exposed soil, using filter cloth under the grates of catch basins and manholes and installing silt fences and other effective sediment traps. The contractor acknowledges that failure to

implement appropriate erosion and sediment control measures may be subject to penalties imposed by any applicable regulatory agency.

22. The General Notes on Dwg No. C-01 should be consistent with the General Notes on Dwg No. C03. Revise accordingly.

23. Consider extending the HD Pavement area along the access lane which connects the two private approaches.

24. Provide grading arrows with percent grade which clearly shows the drainage pattern throughout the site including the parking and landscaped areas and along the two private approaches (with the break point at the property line).

25. Include the elevation of the ponding limits for all of the 5-yr ponding areas.

Drainage Area Plan & Notes, Dwg No. C-03, Rev 0

26. Revise General Note 9, "Concrete barrier curbs as per Std Dwg SC1.1; Concrete barrier curb with sidewalk as per Std Dwg SC1.4.

27. Add General Note 12, "Road Cut Reinstatements as per Std Dwg R10.

28. Add General Note 13, "Refer to the Geotechnical Investigation, Report No. 021-2214, prepared by Golder Associates, for addition information regarding Pavement Design & Site Servicing."

29. Revise Sewer Note 1 to read, "... as per City of Ottawa & Ontario Provincial Standards & Specification (Delete Ministry of the Environment Standards).

30. Revise Sewer Note 8 to include, "Sanitary connection as per Std Dwg S11.1; Storm connection as per Std Dwg S11.2."

31. Add Sewer Note 13, "Provide a watertight MH cover for SAN MH 1 as per OPSD 401.030. (*This is required since the MH is partially located in a SWM Ponding area*).

32. Add Water Note 5, ""Water service connection, to City watermain, by City forces. Excavation, backfilling and reinstatement by contractor"

33. Add Water Note 6, "Provide a minimum clearance of 2.0 m between the proposed watermain and any tree or utility plant.

34. Provide the weighted 'C' value for each of the drainage areas and show these values on the Drainage Plan.

35. Revise the Fire Hydrant Note regarding the Unobstructed Path of Travel . It should be between the Fire Hydrant & the Fire Department Connection and not the principal entrance of the building. The distance scaled from Dwg C-03 is 39m, <u>not</u> 27m as per your note. The distance is unobstructed therefore is not a straight line distance between the two points (not over snow banks). Also this note should appear on the Servicing Plan, not the Drainage Plan.

Other Comments:

i. **MOE Approval**
- Required. Please contact Charles Goulet, MOE Ottawa District Engineer, & arrange a pre-submission meeting.

- Forward four-copies of the MOE Application for Approval of Sewage Works, to my attention, so I can process it as a Direct Submission. Also please include a cheque in the amount of $2,200.00, payable to the Minister of Finance to cover the related application fee.

ii. **Servicing Report**
- Include the Water Boundary Conditions, provided by the City in the Appendix of the Report.

iii. **Water Card**
- Complete a Water Data Card (using version 2-010)

iv. **Site Lighting Certificate**
- Provide a Site Lighting Certificate, sealed by a P.Eng. to satisfy the following condition:

  Prior to the Site Plan Approval, the applicant shall provide a certificate, from an acceptable professional engineer, that the site lighting has been designed to meet the following criteria:

  - It 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.

Your cover letter must indicate how each of the comments has been addressed on the resubmission. Any revisions or addendums to any studies must be accompanied by a pdf copy of the report (either by CD or e-mail).

Should you wish to contact me regarding any questions or a follow up meeting you may reach me at 580-2424 ext. **(27916)**.

Sincerely,

Syd Robertson, Project Manager, Infrastructure Approvals
Development Review Urban Services Branch
Planning & Growth Management Dept.
City of Ottawa

cc. Prescott McDonald, Planner
Scott Hayward, Applicant/Agent, Pye & Richards Architects Inc.

HYDROVEX®

VHV Vertical Vortex Flow Regulator

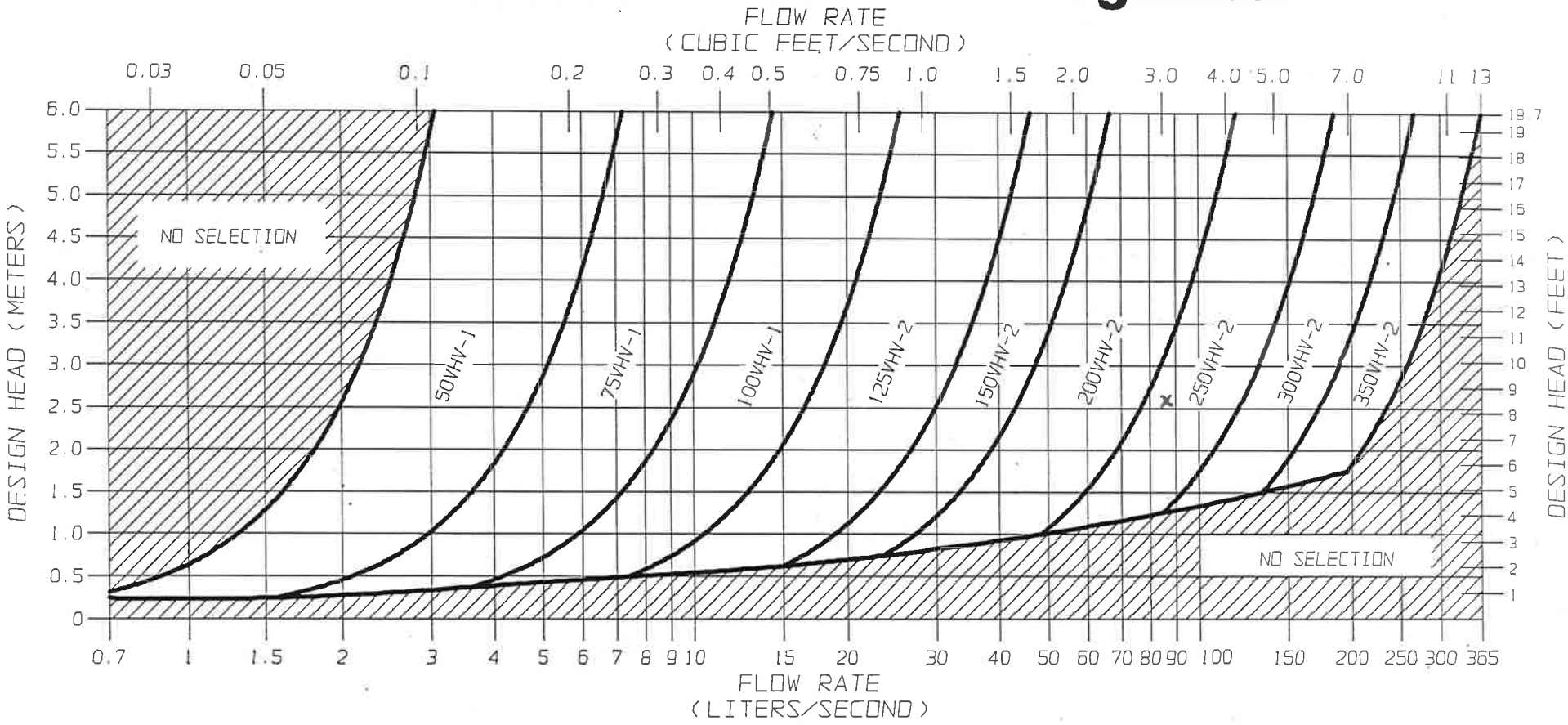


FIGURE 3 - VHV

JOHN MEUNIER

APPENDIX

B

- FIRE UNDERWRITERS SURVEY – FIRE FLOW CALCULATION FOR BUILDING
- WATER DEMAND CALCULATION
- UPDATED BOUNDARY CONDITION

Water Demand Calculation Sheet

Project: **Light Facility Addition** **Date:** **2022-10-13**

Location: **2700 Swansea Crescent , Ottawa, ON** **Design:** **JZ**

Proposed Buildings	Residential				Non-Residentail			Average Daily			Maximum Daily			Maximum Hourly			Fire
	Units			Beds	Industrial	Institutional	Commercial	Demand (l/s)			Demand (l/s)			Demand (l/s)			Demand
	SF	APT	ST		(ha)	(ha)	(ha)	Res.	Non-Res.	Total	Res.	Non-Res.	Total	Res.	Non-Res.	Total	(l/s)
Light Facility Existing and Addition					0.8867				0.36	0.36		0.54	0.54		0.97	0.97	133
									0.47	0.47		0.71	0.71		1.27	1.27	133
										0.83			1.24			2.24	

Population Densities

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

Average Daily Demand

Residentail	280	l/cap/day
Industrial	35000	l/ha/day
Institutional	28000	l/ha/day
Commercial	28000	l/ha/day

Maximum Daily Demand

Residential	2.5	x avg. day
Industrial	1.5	x avg. day
Institutional	1.5	x avg. day
Commercial	1.5	x avg. day

Maximum Hourly Demand

Residential	2.2	x max. day
Industrial	1.8	x max. day
Institutional	1.8	x max. day
Commercial	1.8	x max. day

Fire Flow Design Sheet (FUS)
Light Facility Addition
2700 Swansea Crescent , Ottawa, ON
WSP Project No. 221-02216-00

Date: 13-Oct-22

Light Facility Addition
Fire Flow Requirements Based on Fire Underwriters Survey (FUS) 2020

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

F = required fire flow in litres per minute
C = coefficient related to the type of construction
- 1.5 for wood construction (structure essentially combustible)
- 1.0 for ordinary construction (brick or other masonry walls, combustible floor and interior)
- 0.8 for noncombustible construction (unprotected metal structural components, masonry or metal walls)
- 0.6 for fire-resistive construction (fully protected frame, floors, roof)

A = total floor area in square metres (including all storeys, but excluding basements at least 50% below grade)

A = 5498 m^2
C = 0.8
F = 13050.1 L/min

rounded off to 14,000 L/min (min value of 2000 L/min)

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

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

Reduction due to low occupancy hazard -15% x 14,000 = 11,900 L/min

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

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

Reduction due to Sprinkler System -50% x 11,900 = -5,950 L/min

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

Separation	Charge
0 to 3 m	25%
3.1 to 10 m	20%
10.1 to 20 m	15%
20.1 to 30 m	10%
30.1 to 45 m	5%

Side 1	11	15%	north side
Side 2	36	5%	east side
Side 3	50	0%	south side
Side 4	50	0%	west side
		20%	(Total shall not exceed 75%)

Increase due to separation 20% x 11,900 = 2,380 L/min

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

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

Based on method described in:
"Water Supply for Public Fire Protection - A Guide to Recommended Practice", 1991
by Fire Underwriters Survey

Zhang, Jingwei

From: Cassidy, Tyler <tyler.cassidy@ottawa.ca>
Sent: Monday, June 13, 2022 2:52 PM
To: Zhang, Jingwei
Subject: RE: 221-02216-00 2700 Swansea Crescent - Water Boundary Condition Request
Attachments: 2700 Swansea Crescent June 2022.pdf

Follow Up Flag: Follow up
Flag Status: Flagged

Hi Jingwei,

Please find below the boundary conditions for the proposed addition at 2700 Swansea Crescent. Please note that two service connections, separated by an isolation valve, is required to avoid the creation of a vulnerable service area.

The following are boundary conditions, HGL, for hydraulic analysis at 2700 Swansea Crescent (zone 2W2C) assumed to connected to the 305 mm on Swansea Crescent (see attached PDF for location).

Minimum HGL: 123.8 m

Maximum HGL: 130.7 m

Max Day + Fire Flow (133.3 L/s): 123.7 m

These are for current conditions and are based on computer model simulation.

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.

Thank you,

Tyler Cassidy, EIT
Infrastructure Project Manager,
Planning, Real Estate and Economic Development Department / Direction générale de la planification, des biens immobiliers et du développement économique - South Branch
City of Ottawa | Ville d'Ottawa
110 Laurier Avenue West Ottawa, ON | 110, avenue. Laurier Ouest. Ottawa (Ontario) K1P 1J1
613.580.2424 ext./poste 12977, Tyler.Cassidy@ottawa.ca

From: Zhang, Jingwei <Jingwei.Zhang@wsp.com>
Sent: June 02, 2022 3:48 PM
To: Cassidy, Tyler <tyler.cassidy@ottawa.ca>
Subject: RE: 221-02216-00 2700 Swansea Crescent - Water Boundary Condition Request

Hi Tyler,

It is 133 L/s (8000 L/min). I also updated the table below. Thank you for asking.

Regards,

Jingwei Zhang, M.Eng., P.Eng.
Senior Project Engineer
Municipal Engineering - Ottawa

T+ 1 613-690-1245

WSP Canada Inc.
2611 Queensview Drive, Suite 300
Ottawa, Ontario,
K2B 8K2 Canada

wsp.com

From: Cassidy, Tyler <tyler.cassidy@ottawa.ca>
Sent: Thursday, June 2, 2022 3:40 PM
To: Zhang, Jingwei <Jingwei.Zhang@wsp.com>
Subject: RE: 221-02216-00 2700 Swansea Crescent - Water Boundary Condition Request

Hi Jingwei,

Can you confirm that the last column (Fire Demand (L/min)) in the table below should read **133 L/sec** and not 1333 L/min?

Thank you,

Tyler Cassidy, EIT
Infrastructure Project Manager,
Planning, Real Estate and Economic Development Department / Direction générale de la planification, des biens immobiliers et du développement économique - South Branch
City of Ottawa | Ville d'Ottawa
110 Laurier Avenue West Ottawa, ON | 110, avenue. Laurier Ouest. Ottawa (Ontario) K1P 1J1
613.580.2424 ext./poste 12977, Tyler.Cassidy@ottawa.ca

From: Zhang, Jingwei <Jingwei.Zhang@wsp.com>
Sent: June 02, 2022 11:00 AM
To: Cassidy, Tyler <tyler.cassidy@ottawa.ca>
Subject: RE: 221-02216-00 2700 Swansea Crescent - Water Boundary Condition Request

Good morning Tyler,

Could you please provide the boundary conditions with the updated following water demands?

Proposed Building	Average Daily Demand (l/s)	Maximum Daily Demand (l/s)	Maximum Hourly Demand (l/s)	Fire Demand (L/s)
Elementary School	0.83	1.24	2.24	133

Thanks,

Jingwei Zhang, M.Eng., P.Eng.
Senior Project Engineer
Municipal Engineering - Ottawa

T+ 1 613-690-1245

WSP Canada Inc.
2611 Queensview Drive, Suite 300
Ottawa, Ontario,
K2B 8K2 Canada

wsp.com

From: Cassidy, Tyler <tyler.cassidy@ottawa.ca>
Sent: Tuesday, March 29, 2022 2:40 PM
To: Zhang, Jingwei <Jingwei.Zhang@wsp.com>
Cc: Jafferjee, Ishaque <Ishaque.Jafferjee@wsp.com>; Ezzio, Sarah <sarah.ezzio@ottawa.ca>
Subject: RE: 221-02216-00 2700 Swansea Crescent - Water Boundary Condition Request

Hi Jingwei,

Please find below the boundary conditions for the proposed development at 2700 Swansea Crescent:

The following are boundary conditions, HGL, for hydraulic analysis at 2700 Swansea Crescent (zone 2W2C) assumed to connected to the 305 mm on Swansea Crescent (see attached PDF for location).

Minimum HGL: 123.8 m

Maximum HGL: 130.1 m

Max Day + Fire Flow (133.3 L/s): 123.7 m

These are for current conditions and are based on computer model simulation.

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.

Thank you,

Tyler Cassidy, EIT
Infrastructure Project Manager,
Planning, Real Estate and Economic Development Department / Direction générale de la planification, des biens immobiliers et du développement économique - South Branch
City of Ottawa | Ville d'Ottawa
110 Laurier Avenue West Ottawa, ON | 110, avenue. Laurier Ouest. Ottawa (Ontario) K1P 1J1
613.580.2424 ext./poste 12977, Tyler.Cassidy@ottawa.ca

From: Zhang, Jingwei <Jingwei.Zhang@wsp.com>
Sent: March 23, 2022 1:00 PM
To: Cassidy, Tyler <tyler.cassidy@ottawa.ca>

Cc: Jafferjee, Ishaque <ishaque.jafferjee@wsp.com>; Ezzio, Sarah <sarah.ezzio@ottawa.ca>
Subject: RE: 221-02216-00 2700 Swansea Crescent - Water Boundary Condition Request

Hi Tyler,

Thank you for your email. As requested, I attached the fire flow calculation spreadsheet for this site.

Please let me know if you need any further information.

Regards,

Jingwei Zhang, M.Eng., P.Eng.
Senior Project Engineer
Municipal Engineering - Ottawa

T+ 1 613-690-1245

WSP Canada Inc.
2611 Queensview Drive, Suite 300
Ottawa, Ontario,
K2B 8K2 Canada

wsp.com

From: Cassidy, Tyler <tyler.cassidy@ottawa.ca>
Sent: March 23, 2022 12:48 PM
To: Zhang, Jingwei <Jingwei.Zhang@wsp.com>
Cc: Jafferjee, Ishaque <Ishaque.Jafferjee@wsp.com>; Ezzio, Sarah <sarah.ezzio@ottawa.ca>
Subject: RE: 221-02216-00 2700 Swansea Crescent - Water Boundary Condition Request

Hi Jingwei,

I'll send the boundary condition request to our Water Resources group. Before I do that, do you mind submitting your calculations for the FUS fire flow?

Once I have the fire flow calculations, It usually takes the Water Resource group up to 10 business days to fulfill the request. I will forward the results as soon as they are available to me.

Please let me know if you have any additional questions.

Thank you,

Tyler Cassidy, EIT
Infrastructure Project Manager,
Planning, Real Estate and Economic Development Department / Direction générale de la planification, des biens immobiliers et du développement économique - South Branch
City of Ottawa | Ville d'Ottawa
110 Laurier Avenue West Ottawa, ON | 110, avenue. Laurier Ouest. Ottawa (Ontario) K1P 1J1
613.580.2424 ext./poste 12977, Tyler.Cassidy@ottawa.ca

From: Ezzio, Sarah <sarah.ezzio@ottawa.ca>
Sent: March 23, 2022 11:08 AM

To: Zhang, Jingwei <Jingwei.Zhang@wsp.com>
Cc: Jafferjee, Ishaque <ishaque.jafferjee@wsp.com>; Cassidy, Tyler <tyler.cassidy@ottawa.ca>
Subject: RE: 221-02216-00 2700 Swansea Crescent - Water Boundary Condition Request

Hi Jingwei,

Thank you for your email. I am copying Tyler Cassidy, who worked on the pre-consult with me, to this email here. He will help you with your boundary conditions request.

Best,

Sarah Ezzio
Planner II, Development Review (West Services)
Urbaniste II, Examen des projets d'aménagement (services ouest)

City of Ottawa | Ville d'Ottawa
613.580.2424 ext. | poste 23493
ottawa.ca/planning / ottawa.ca/urbanisme

From: Zhang, Jingwei <Jingwei.Zhang@wsp.com>
Sent: March 23, 2022 10:17 AM
To: Ezzio, Sarah <sarah.ezzio@ottawa.ca>
Cc: Jafferjee, Ishaque <ishaque.jafferjee@wsp.com>
Subject: 221-02216-00 2700 Swansea Crescent - Water Boundary Condition Request

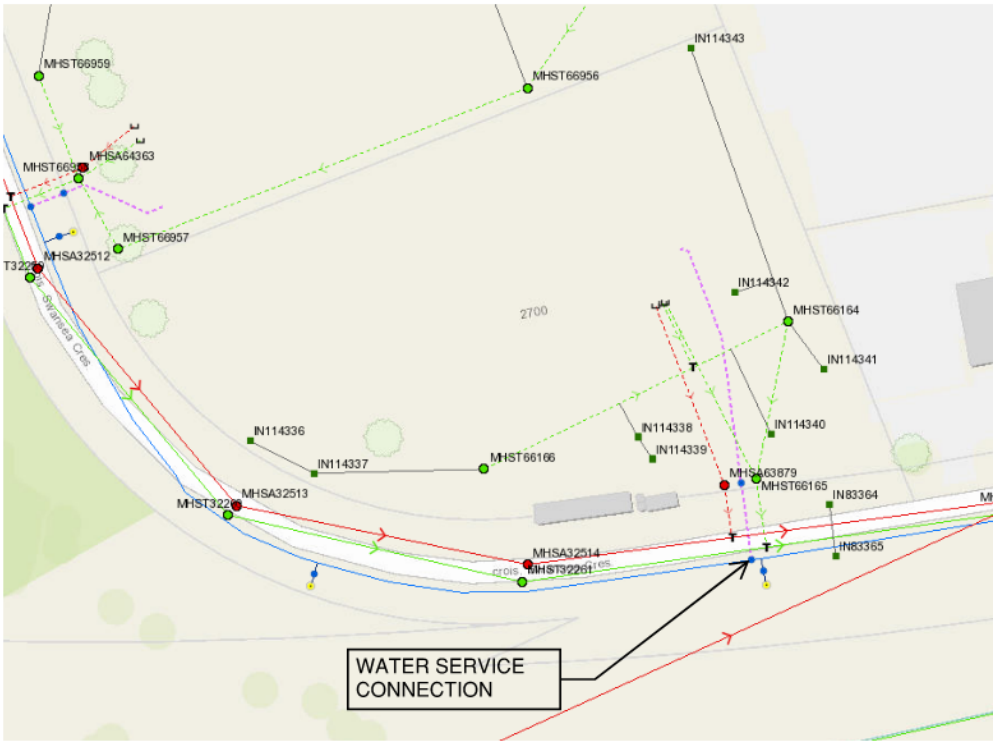
Hi Sarah,

We are currently working on grading design and servicing design for a site development project located at 2700 Swansea Crescent, Ottawa. The project is to construct an addition to the south side of second story of the existing 2-storey light manufacturing facility. I am sending this email to request the water boundary condition for this site. I do not know who is the City project manager for this project at this moment. Could you please forward this email to the right person?

The domestic water demands for this site were calculated using the City of Ottawa's Water Design Guidelines and fire demand were calculated using FUS 1999.
The results are summarized as follow:

Proposed Building	Average Daily Demand (l/s)	Maximum Daily Demand (l/s)	Maximum Hourly Demand (l/s)	Fire Demand (l/min)
Elementary School	0.36	0.54	0.97	8000

This site is currently serviced by an existing 150mm water service pipe at the location as shown on the screenshot below. We need the water boundary condition at this existing water service connection.



If you have any questions, please do not hesitate to contact me.

Thanks,

Jingwei Zhang, M.Eng., P.Eng.
Senior Project Engineer
Municipal Engineering - Ottawa

T+ 1 613-690-1245

WSP Canada Inc.
2611 Queensview Drive, Suite 300
Ottawa, Ontario,
K2B 8K2 Canada

wsp.com

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APPENDIX

C

- STORM SEWER DESIGN SHEET
- STORM DRAINAGE AREA PLAN C04
- STORMWATER MANAGEMENT CALCULATIONS
- DWG C01 – GRADING PLAN
- DWG C02 - SERVICING PLAN

EXISTING ON-SITE STORM SEWER CAPACITY CHECKING CALCULATION SPREADSHEET

Job Name: Light Facility Addition
2700 Swansea Crescent
Job Number: 221-02216-00
Date: 13-Oct-2022

Design Storm: City of Ottawa 2 year Design Storm
Calculation Method: Rational Method

U/S MH	D/S MH	Catchment ID	C=0.25 Catchment Area (m^2)	Grass C=0.25	C=0.5 Catchment Area (m^2)	Gravel C=0.5	C=0.9 Catchment Area (m^2)	Pavement C=0.9	C x Area (m^2)	U/S Total C x Area (m^2)	Time of Concentration (min)	Total Time (min)	Rainfall Intensity (mm/hr)	Peak Flow (m^3/s)	Pipe Diameter (mm)	Pipe Length (m)	Pipe Slope (%)	Manning's "n"	Capacity (m^3/s)	Velocity (m/s)	Travel Time (min)	Invert U/S MH (m)	Invert D/S MH (m)	Manhole Drop (m)	Ground U/S MH (m)	Bury Depth U/S MH (m)	Q/Q full Ratio %
EX CB1	EX CB2	S-7	784	0.25	86	0.5	46	0.90	280	280	10.00	20.00	52.03	0.0041	200	13.7	0.80%	0.013	0.0294	0.94	0.24	80.560	80.450	0.05	82.37	1.81	13.8%
EX CB2	EX CBMH1	S-6A	4	0.25	0	0.5	129	0.90	117	398	10.00	20.24	51.64	0.0057	250	33.0	1.79%	0.013	0.0795	1.62	0.34	80.400	79.810	0.06	82.60	2.20	7.2%
EX CBMH1	Main 1	S-6B	7	0.25	0	0.5	177	0.90	161	559	10.00	20.58	51.11	0.0079	300	29.0	1.20%	0.013	0.1060	1.50	0.32	79.750	79.402	0.00	82.08	2.33	7.5%
EX CB 3	EX CB4	S-4	710	0.25	0	0.5	0	0.90	178	178	10.00	10.00	76.81	0.0038	300	4.4	1.14%	0.013	0.1031	1.46	0.05	79.670	79.620	0.06	80.82	1.15	3.7%
EX CB 4	Main 1	S-6C	6	0.25	65	0.5	36	0.90	66	244	10.05	10.05	76.61	0.0052	300	7.2	2.20%	0.013	0.1434	2.03	0.06	79.560	79.402	0.00	81.27	1.71	3.6%
Main 1	New conn 1		0	0.25	0	0.5	0	0.90	0	802	0.00	0.00	167.22	0.0373	300	6.3	1.20%	0.013	0.1060	1.50	0.07	79.553	79.477	0.00	81.47	1.92	35.2%
RD Outlet 1	New conn 1	S-5A	0	0.25	0	0.5	1000	0.90	900	900	10.00	10.00	76.81	0.0192	200	6.4	1.10%	0.013	0.0344	1.10	0.10	79.610	79.540	0.00	81.27	1.66	55.8%
New conn 1	New conn 2		0	0.25	0	0.5	0	0.90	0	1702	20.24	20.24	51.64	0.0244	300	6.3	1.20%	0.013	0.1060	1.50	0.07	79.477	79.402	0.00	81.47	1.99	23.0%
RD Outlet 2	New conn 2	S-5B	0	0.25	0	0.5	500	0.90	450	450	10.00	10.00	76.81	0.0096	200	14.2	1.06%	0.013	0.0338	1.07	0.22	79.610	79.460	0.00	81.27	1.66	28.4%
New conn 2	Main 2		0	0.25	0	0.5	0	0.90	0	2152	20.91	20.91	50.62	0.0303	300	7.3	1.20%	0.013	0.1060	1.50	0.08	79.402	79.314	0.00	81.47	2.07	28.6%
Building	Main 2	S-8	0	0.25	0	0.5	3147	0.90	2,832	2832	10.00	10.00	76.81	0.0604	250	13.6	4.16%	0.013	0.1213	2.47	0.09	79.930	79.364	0.05	82.30	2.37	49.8%
Main 2	Main3		0	0.25	0	0.5	0	0.90	0	4985	20.99	20.99	50.50	0.0699	300	8.1	1.20%	0.013	0.1060	1.50	0.09	79.314	79.217	0.00	81.50	2.19	66.0%
EX CB7	Main3	S-3C	0	0.25	0	0.5	287	0.90	258	258	10.00	10.00	76.81	0.0055	200	18.0	1.00%	0.013	0.0328	1.04	0.29	79.510	79.330	0.11	81.37	1.86	16.8%
Main3	EX CBMH2		0	0.25	0	0.5	0	0.90	0	5243	21.08	21.08	50.36	0.0733	300	12.2	1.20%	0.013	0.1060	1.50	0.00	79.217	79.070	0.06	81.62	2.40	69.2%
EX CB5	Main4	S-9 & S-3A	95	0.25	0	0.5	493	0.90	467	467	10.00	10.00	76.81	0.0100	200	47.3	2.01%	0.013	0.0465	1.48	0.53	80.560	79.611	0.00	82.58	2.02	21.5%
EX CB9	Main4	S-3C	0	0.25	0	0.5	287.0	0.9	258	258	10.00	10.00	76.81	0.0055	200	8.0	1.00%	0.013	0.0328	1.04	0.13	79.691	79.611	0.00	81.80	2.11	16.8%
Main4	EX CBMH2		0	0.25	0	0.5	0	0.90	0	726	10.53	10.53	74.82	0.0151	200	8.5	2.01%	0.013	0.0465	1.48	0.10	79.611	79.440	0.09	82.00	2.39	32.5%
EX CB6	EX CBMH2	S-1	382	0.25	0	0.5	0	0.90	96	96	10.00	10.00	76.81	0.0020	200	11.0	1.45%	0.013	0.0396	1.26	0.15	79.350	79.190	0.18	80.97	1.62	5.2%
EX CBMH2	Main5	S-3B	198	0.25	0	0.5	309	0.90	328	6392	21.08	21.08	50.36	0.0894	375	28.3	0.81%	0.013	0.1580	1.43	0.00	79.010	78.780	0.00	81.72	2.71	56.6%
EX CB8	Main5	S-2	0	0.25	0	0.5	343	0.90	309	309	10.00	10.00	76.81	0.0066	200	9.0	1.00%	0.013	0.0328	1.04	0.14	79.410	79.320	0.54	82.20	2.79	20.1%
Main5	EX STMH3		0	0.25	0	0.5	0	0.90	0	6487	21.08	21.08	50.36	0.0908	375	2.5	0.81%	0.013	0.1580	1.43	0.03	78.780	78.760	0.01	81.50	2.72	57.5%
Drain	EX STMH3		0	0.25	0	0.5	0	0.90	0	96	10.00	10.00	76.81	0.0020	150	38.0	4.26%	0.013	0.0314	1.78	0.36	80.75	79.13	0.38	82.20	1.45	6.5%
EX STMH3	City Main		0	0.25	0	0.5	0	0.90	0	6583	21.11	21.11	50.32	0.0920	375	11.6	0.60%	0.013	0.1358	1.23	0.16	78.75	78.680	0.00	81.76	3.01	67.7%

Light Facility Addition
2700 Swansea Crescent , Ottawa, ON
Project: 221-02216-00
Date: March 15, 2022

Storage Required for Light Facility Addition

Maximum Allowable Release Rate to the Existing Storm System on Swansea Crescent:
87.40 l/s

Post Dev run-off Coefficient "C"

			2 & 5 Year Event		100 Year Event	
Area	Surface	Ha	"C"	C_{avg}	"C" x 1.25	$C_{100\ avg}$
Total	Roof	0.346	0.90	**0.72**	0.99	**0.80**
0.887	Pavement	0.287	0.90		0.99	
	Gravel	0.023	0.50		0.63	
	Grass	0.230	0.25		0.31	

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

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

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

QUANTITY STORAGE REQUIREMENTS - 5 Year

0.887 = Area(ha)
0.72 = C
87.4 l/s = max allowable release rate

Return Period	Time (min)	Intensity (mm/hr)	Flow Q (L/s)	Controlled Runoff (L/s)	Net Runoff To Be Stored (L/s)	Storage Req'd m^3	Storage Avail m^3
	10	**104.19**	**184.90**	**87.40**	**97.50**	**58.50**	**0.00**
	20	70.25	124.67	87.40	37.27	44.72	0.00
	30	53.93	95.70	87.40	8.30	14.94	0.00
5 YEAR	40	44.18	78.41	87.40	-8.99	-21.57	0.00
	50	37.65	66.82	87.40	-20.58	-61.74	0.00
	60	32.94	58.46	87.40	-28.94	-104.18	0.00

QUANTITY STORAGE REQUIREMENTS - 100 Year

0.887 = Area(ha)
0.80 = *C
87.4 l/s = max allowable release rate

Return Period	Time (min)	Intensity (mm/hr)	Flow Q (L/s)	Controlled Runoff (L/s)	Net Runoff To Be Stored (L/s)	Storage Req'd m^3	Storage Avail m^3
	10	178.56	352.08	87.40	264.68	158.81	0.00
	20	**119.95**	**236.52**	**87.40**	**149.12**	**178.94**	**0.00**
100 YEAR	30	91.87	181.15	87.40	93.75	168.74	0.00
	40	75.15	148.17	87.40	60.77	145.85	0.00
	50	63.95	126.10	87.40	38.70	116.11	0.00
	60	55.89	110.21	87.40	22.81	82.13	0.00
	70	49.79	98.18	87.40	10.78	45.26	0.00

Orifice Sizing
CBMH101

Event	Flow (L/s)	Head (m)	ORIFICE AREA(m^2)	SQUARE (1-side mm)	CIRC (mmØ)
5 Year	241.08	3.42	0.049	222	250
100 Year	248.04	3.61	0.049	222	250

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

Orifice Invert =	100.360	m	
Ponding Elevation =	104.100	m	
Top of CB Elevation =	103.900	m	3.740

Note: Orifice is located on the downstream invert of CBMH5

Equations:

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

Light Facility Addition
2700 Swansea Crescent , Ottawa, ON
Project: 221-02216-00
Date: March 15, 2022

Storage Required for Light Facility Addition Buidling Roof

Maximum Allowable Release Rate to the Existing Storm System on Swansea Crescent:
15.12 l/s

Post Dev run-off Coefficient "C"

			2 & 5 Year Event		100 Year Event	
Area	Surface	Ha	"C"	C_{avg}	"C" x 1.25	$C_{100\ avg}$
Total	Roof	0.317	0.90	**0.90**	0.99	**0.99**
0.317	Pavement		0.90		0.99	
	Gravel	0.000	0.50		0.63	
	Grass		0.25		0.31	

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

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

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

QUANTITY STORAGE REQUIREMENTS - 5 Year

0.317 = Area(ha)
0.90 = C
15.1 l/s = max allowable release rate

Return Period	Time (min)	Intensity (mm/hr)	Flow Q (L/s)	Controlled Runoff (L/s)	Net Runoff To Be Stored (L/s)	Storage Req'd m^3	Storage Avail m^3
	10	104.19	82.74	15.12	67.62	40.57	158.70
	20	70.25	55.79	15.12	40.67	48.80	158.70
	30	**53.93**	**42.83**	**15.12**	**27.71**	**49.87**	**158.70**
5 YEAR	40	44.18	35.09	15.12	19.97	47.92	158.70
	50	37.65	29.90	15.12	14.78	44.35	158.70
	60	32.94	26.16	15.12	11.04	39.75	158.70

Orifice Sizing
CBMH101

Event	Flow (L/s)	Head (m)	ORIFICE AREA(m^2)	SQUARE (1-side mm)	CIRC (mmØ)
5 Year	241.08	3.42	0.049	222	250
100 Year	248.04	3.61	0.049	222	250

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

QUANTITY STORAGE REQUIREMENTS - 100 Year

0.317 = Area(ha)
0.99 = *C
15.1 l/s = max allowable release rate

Return Period	Time (min)	Intensity (mm/hr)	Flow Q (L/s)	Controlled Runoff (L/s)	Net Runoff To Be Stored (L/s)	Storage Req'd m^3	Storage Avail m^3
	10	178.56	155.98	15.12	140.86	84.52	158.70
	20	119.95	104.78	15.12	89.66	107.59	158.70
100 YEAR	30	91.87	80.25	15.12	65.13	117.24	158.70
	40	75.15	65.64	15.12	50.52	121.26	158.70
	50	**63.95**	**55.87**	**15.12**	**40.75**	**122.24**	**158.70**
	60	55.89	48.83	15.12	33.71	121.34	158.70
	70	49.79	43.49	15.12	28.37	119.17	158.70

Orifice Invert =	100.360	m	
Ponding Elevation =	104.100	m	
Top of CB Elevation =	103.900	m	3.740

Note: Orifice is located on the downstream invert of CBMH5

Equations:

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

Light Facility Addition
2700 Swansea Crescent , Ottawa, ON
Project: 221-02216-00
Date: March 15, 2022

Storage Required for Light Facility Addition

Maximum Allowable Release Rate to the Existing Storm System on Swansea Crescent:
87.40 l/s

Post Dev run-off Coefficient "C"

			2 & 5 Year Event		100 Year Event	
Area	Surface	Ha	"C"	C_{avg}	"C" x 1.25	$C_{100\ avg}$
Total	Roof	0.346	0.90	**0.73**	0.99	**0.81**
0.889	Pavement	0.298	0.90		0.99	
	Gravel	0.016	0.50		0.63	
	Grass	0.229	0.25		0.31	

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

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

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

QUANTITY STORAGE REQUIREMENTS - 5 Year

0.889 = Area(ha)
0.73 = C
87.4 l/s = max allowable release rate

Return Period	Time (min)	Intensity (mm/hr)	Flow Q (L/s)	Controlled Runoff (L/s)	Net Runoff To Be Stored (L/s)	Storage Req'd m^3	Storage Avail m^3
	10	**104.19**	**187.89**	**87.40**	**100.49**	**60.30**	**237.65**
	20	70.25	126.69	87.40	39.29	47.14	237.65
	30	53.93	97.25	87.40	9.85	17.73	237.65
5 YEAR	40	44.18	79.68	87.40	-7.72	-18.53	237.65
	50	37.65	67.90	87.40	-19.50	-58.50	237.65
	60	32.94	59.41	87.40	-27.99	-100.77	237.65

Orifice Sizing
CBMH101

Event	Flow (L/s)	Head (m)	ORIFICE AREA(m^2)	SQUARE (1-side mm)	CIRC (mmØ)
5 Year	241.08	3.42	0.049	222	250
100 Year	248.04	3.61	0.049	222	250

QUANTITY STORAGE REQUIREMENTS - 100 Year

0.889 = Area(ha)
0.81 = *C
87.4 l/s = max allowable release rate

Return Period	Time (min)	Intensity (mm/hr)	Flow Q (L/s)	Controlled Runoff (L/s)	Net Runoff To Be Stored (L/s)	Storage Req'd m^3	Storage Avail m^3
	10	178.56	357.29	87.40	269.89	161.93	237.65
	20	**119.95**	**240.01**	**87.40**	**152.61**	**183.14**	**237.65**
100 YEAR	30	91.87	183.82	87.40	96.42	173.56	237.65
	40	75.15	150.36	87.40	62.96	151.11	237.65
	50	63.95	127.97	87.40	40.57	121.71	237.65
	60	55.89	111.84	87.40	24.44	87.99	237.65
	70	49.79	99.63	87.40	12.23	51.35	237.65

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

Orifice Invert =	100.360	m	
Ponding Elevation =	104.100	m	
Top of CB Elevation =	103.900	m	3.740

Note: Orifice is located on the downstream invert of CBMH5

Equations:

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

Barrhaven School Site
Kilbirnie Drive, Nepean, ON
Project: 219-00014-01
Date:March 4, 2022

Uncontrolled Surface Flow to Robin Easey Ave

Post Dev run-off Coefficient "C"

			2 & 5 Year Event		100 Year Event	
Area	Surface	Ha	"C"	C_{avg}	"C"+25%	$*C_{avg}$
Total	Asphalt	0.052	0.90	**0.47**	0.99	**0.54**
0.154	Roof	0.000	0.90		0.99	
	Grass	0.102	0.25		0.31	

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

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

Post Dev Free Flow
5 Year Event

Pre Dev.	C	Intensity	Area
5 Year	0.47	104.19	0.154
2.78CIA=	20.97		
21.00	L/S		

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

100 Year Event

Pre Dev.	C	Intensity	Area
100 Year	0.54	178.56	0.154
2.78CIA=	41.28		
41.30	L/S		

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

Uncontrolled Surface Flow to Kilbirnie Drive

Post Dev run-off Coefficient "C"

			2 & 5 Year Event		100 Year Event	
Area	Surface	Ha	"C"	C_{avg}	"C"+25%	$*C_{avg}$
Total	Asphalt	0.013	0.90	**0.33**	0.99	**0.40**
0.098	Roof	0.000	0.90		0.99	
	Grass	0.085	0.25		0.31	

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

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

Post Dev Free Flow
5 Year Event

Pre Dev.	C	Intensity	Area
5 Year	0.33	104.19	0.098
2.78CIA=	9.37		
9.40	L/S		

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

100 Year Event

Pre Dev.	C	Intensity	Area
100 Year	0.40	178.56	0.098
2.78CIA=	19.46		
19.50	L/S		

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

Uncontrolled Flow to Kilbirnie Drive from Roof

Post Dev run-off Coefficient "C"

			2 & 5 Year Event		100 Year Event	
Area	Surface	Ha	"C"	C_{avg}	"C"+25%	$*C_{avg}$
Total	Asphalt	0.000	0.90	**0.90**	0.99	**0.99**
0.389	Roof	0.389	0.90		0.99	
	Grass	0.000	0.25		0.31	

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

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

Post Dev Free Flow
5 Year Event

Pre Dev.	C	Intensity	Area
5 Year	0.90	104.19	0.389
2.78CIA=	101.41		
101.40	L/S		

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

100 Year Event

Pre Dev.	C	Intensity	Area
100 Year	0.99	178.56	0.389
2.78CIA=	191.17		
191.20	L/S		

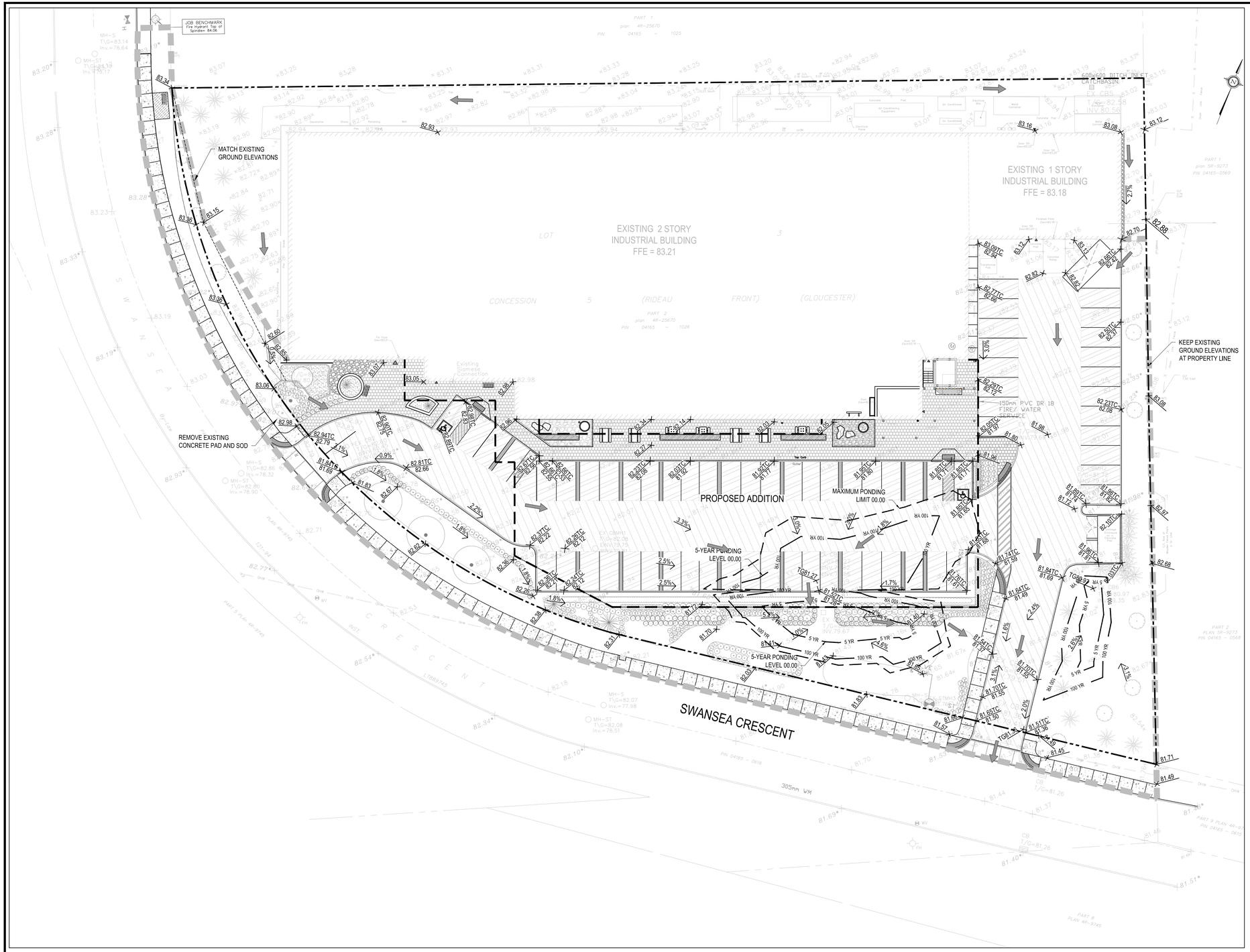
**Use a 10 minute time of concentration for 100 year

Equations:

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

Controlled Flow to Kilbirnie Drive Storm System

87.40	Total
41.30	Uncontrolled
19.50	Uncontrolled
191.20	Uncontrolled from Roof
-164.60	Controlled Onsite LDS



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GRADING PLAN

SCALE= 1:250

NOTES: GENERAL

1. DRAWINGS TO BE READ IN CONJUNCTION WITH ARCHITECTURAL AND LANDSCAPE DRAWINGS
2. ALL SERVICES, MATERIALS, CONSTRUCTION METHODS AND INSTALLATIONS SHALL BE IN ACCORDANCE WITH THE LATEST STANDARDS AND REGULATIONS OF THE: CITY OF OTTAWA STANDARD SPECIFICATIONS AND DRAWINGS, ONTARIO PROVINCIAL SPECIFICATION STANDARD SPECIFICATION (OPSS) AND ONTARIO PROVINCIAL STANDARD DRAWINGS (OPSD), UNLESS OTHERWISE SPECIFIED, TO THE SATISFACTION OF THE CITY AND THE CONSULTANT
3. THE POSITION OF EXISTING POLE LINES, CONDUITS, WATERMAINS, SEWERS AND OTHER UNDERGROUND AND ABOVEGROUND UTILITIES, STRUCTURES AND APPURTENANCES IS NOT NECESSARILY SHOWN ON THE CONTRACT DRAWING, AND WHERE SHOWN, THE ACCURACY OF THE POSITION OF SUCH UTILITIES AND STRUCTURES IS NOT GUARANTEED. PRIOR TO CONSTRUCTION, THE CONTRACTOR SHALL SATISFY HIMSELF OF THE EXACT LOCATION OF ALL SUCH UTILITIES AND STRUCTURES, AND SHALL ASSUME ALL LIABILITY FOR DAMAGE TO THEM DURING THE COURSE OF CONSTRUCTION. ANY RELOCATION OF EXISTING UTILITIES REQUIRED BY THE DEVELOPMENT OF SUBJECT LANDS IS TO BE UNDERTAKEN AT CONTRACTOR'S EXPENSE.
4. THE CONTRACTOR MUST NOTIFY ALL EXISTING UTILITY COMPANY OFFICIALS FIVE (5) BUSINESS DAYS PRIOR TO START OF CONSTRUCTION AND HAVE ALL EXISTING UTILITIES AND SERVICES LOCATED IN THE FIELD OR EXPOSED PRIOR TO THE START OF CONSTRUCTION, INCLUDING BUT NOT LIMITED TO POWER, COMMUNICATION AND GAS LINES.
5. ALL TRENCHING AND EXCAVATIONS TO BE IN ACCORDANCE WITH THE LATEST REVISIONS OF THE OCCUPATIONAL HEALTH AND SAFETY ACT AND REGULATIONS FOR CONSTRUCTION PROJECTS AND AS PER THE RECOMMENDATIONS INCLUDED IN THE GEOTECHNICAL REPORT.
6. REFER TO ARCHITECTS PLANS FOR BUILDING DIMENSIONS, LAYOUT AND REMOVALS. REFER TO LANDSCAPE PLAN FOR LANDSCAPED DETAILS AND OTHER RELEVANT INFORMATION. ALL INFORMATION SHALL BE CONFIRMED PRIOR TO COMMENCEMENT OF CONSTRUCTION.
7. TOPOGRAPHIC SURVEY COMPLETED AND PROVIDED BY ANNIS, O'SULLIVAN, VOLLEBEKK LTD. DATED ON JULY 16, 2021. CONTRACTOR TO VERIFY IN THE FIELD PRIOR TO CONSTRUCTION OF ANY WORK AND NOTIFY THE ENGINEER OF ANY DISCREPANCIES.
8. ALL ELEVATIONS ARE GEODETIC AND UTILIZE METRIC UNITS. VERIFY THAT JOB BENCHMARKS HAVE NOT BEEN ALTERED OR DISTURBED.
9. ALL GROUND SURFACES SHALL BE EVENLY GRADED WITHOUT PONDING AREAS AND WITHOUT LOW POINTS EXCEPT WHERE APPROVED SWALE OR CATCH BASIN OUTLETS ARE PROVIDED.
10. ALL EDGES OF DISTURBED PAVEMENT SHALL BE SAW CUT TO FORM A NEAT AND STRAIGHT LINE PRIOR TO PLACING NEW PAVEMENT. PAVEMENT REINSTATEMENT SHALL BE WITH STEP JOINTS OF 500MM WIDTH MINIMUM.
11. ALL DISTURBED AREAS OUTSIDE PROPOSED GRADING LIMITS TO BE RESTORED TO ORIGINAL ELEVATIONS AND CONDITIONS UNLESS OTHERWISE SPECIFIED. ALL RESTORATION SHALL BE COMPLETED WITH THE GEOTECHNICAL REQUIREMENTS FOR BACKFILL AND COMPACTION.
12. ABUTTING PROPERTY GRADES TO BE MATCHED UNLESS OTHERWISE SHOWN.
13. CONTRACTOR SHALL OBTAIN AND PAY FOR ALL NECESSARY PERMITS AND APPROVALS FROM THE MUNICIPAL AUTHORITIES PRIOR TO COMMENCING CONSTRUCTION, INCLUDING WATER PERMIT AND ROAD CUT PERMIT.
14. MINIMIZE DISTURBANCE TO EXISTING VEGETATION DURING THE EXECUTION OF ALL WORKS.
15. REMOVE FROM SITE ALL EXCESS EXCAVATED MATERIAL UNLESS OTHERWISE DIRECTED FROM THE ENGINEER. EXCAVATE AND REMOVE ALL ORGANIC MATERIAL AND DEBRIS LOCATED WITHIN THE PROPOSED BUILDING, PARKING AND ROADWAY LOCATIONS.
16. AT PROPOSED UTILITY CONNECTION POINTS AND CROSSINGS (I.E. STORM SEWER, SANITARY SEWER, WATER, ETC.) THE CONTRACTOR SHALL DETERMINE THE PRECISE LOCATION AND DEPTH OF EXISTING UTILITIES AND REPORT ANY DISCREPANCIES OR CONFLICTS TO THE ENGINEER BEFORE COMMENCING WORK.
17. CONTRACTOR TO OBTAIN POST-CONSTRUCTION TOPOGRAPHIC SURVEY, COMPLETED BY OLS OR P.ENG CONFIRMING COMPLIANCE WITH DESIGN GRADING AND SERVICING. SURVEY IS TO INCLUDE LOCATION AND INVERTS FOR BURIED UTILITIES.

PAVEMENT STRUCTURE LIGHT DUTY (PARKING AREAS) THICKNESS(mm)	MATERIAL DESCRIPTION (REFER TO SITE PLAN A-01 FOR LIMITS)
50 150 300	WEAR COURSE-HL3 OR SUPERPAVE 12.5 ASPHALTIC CONCRETE BASE-OPSS GRANULAR A CRUSHED STONE SUBBASE-OPSS GRANULAR B TYPE II SUBGRADE-EITHER FILL, IN-SITU SOIL OR OPSS GRANULAR B TYPE I OR II MATERIAL PLACED OVER IN-SITU SOIL OR FILL.

PAVEMENT STRUCTURE HEAVY DUTY THICKNESS(mm)	MATERIAL DESCRIPTION (REFER TO SITE PLAN A-01 FOR LIMITS)
40 50 150 450	WEAR COURSE-HL3 OR SUPERPAVE 12.5 ASPHALTIC CONCRETE BINDER COURSE-HL8 OR SUPERPAVE 19 ASPHALTIC CONCRETE BASE-OPSS GRANULAR A CRUSHED STONE SUBBASE-OPSS GRANULAR B TYPE II SUBGRADE-EITHER FILL, IN-SITU SOIL OR OPSS GRANULAR B TYPE I OR II MATERIAL PLACED OVER IN-SITU SOIL OR FILL.

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LEGEND

83.24×	EXISTING GRADE ELEVATION
CB☐	EXISTING CATCHBASIN
MH–ST○	EXISTING MANHOLE
WV ⊠	EXISTING VALUE AND BOX
FH–○–	EXISTING FIRE HYDRANT
— ST —	EXISTING STORM SEWER
— S —	EXISTING SANITARY SEWER
— W —	EXISTING WATERMAIN
×82.82	PROPOSED GRADE ELEVATION
×82.03TC 81.92	PROPOSED TOP AND BOTTOM OF CURB
×TG82.82	PROPOSED TOP OF GRATE
←1.8%	PROPOSED GRADE SLOPE
◇	PROPOSED CATCHBASIN
○	PROPOSED MANHOLE
◈	PROPOSED CATCHBASIN MANHOLE
— STM —	PROPOSED STORM SEWER
— SAN —	PROPOSED SANITARY SEWER
— W —	PROPOSED WATER SERVICE
⊕	PROPOSED FIRE HYDRANT
— SF —	LIGHT DUTY SILT FENCE
▩ ▩	FILTER CLOTH
	PROPOSED ROOF DRAIN
▬ ▬ ▬	PROJECT BOUNDARY
➡	OVERLAND FLOW

No.	Revision	Date
1	ISSUED FOR SPA	2022-10-13

seal estampe
LICENSED PROFESSIONAL ENGINEER
J. W. ZHANG
100155766
2022–10–13
PROVINCE OF ONTARIO

Project Title Projet

IRIDIAN
SPECTRAL TECHNOLOGIES
2700 SWANSEA
OTTAWA, ONTARIO.

Drawing Dessin

GRADING PLAN

Designed by : Conçu par
J.Z.
Date OCTOBER 11 2022

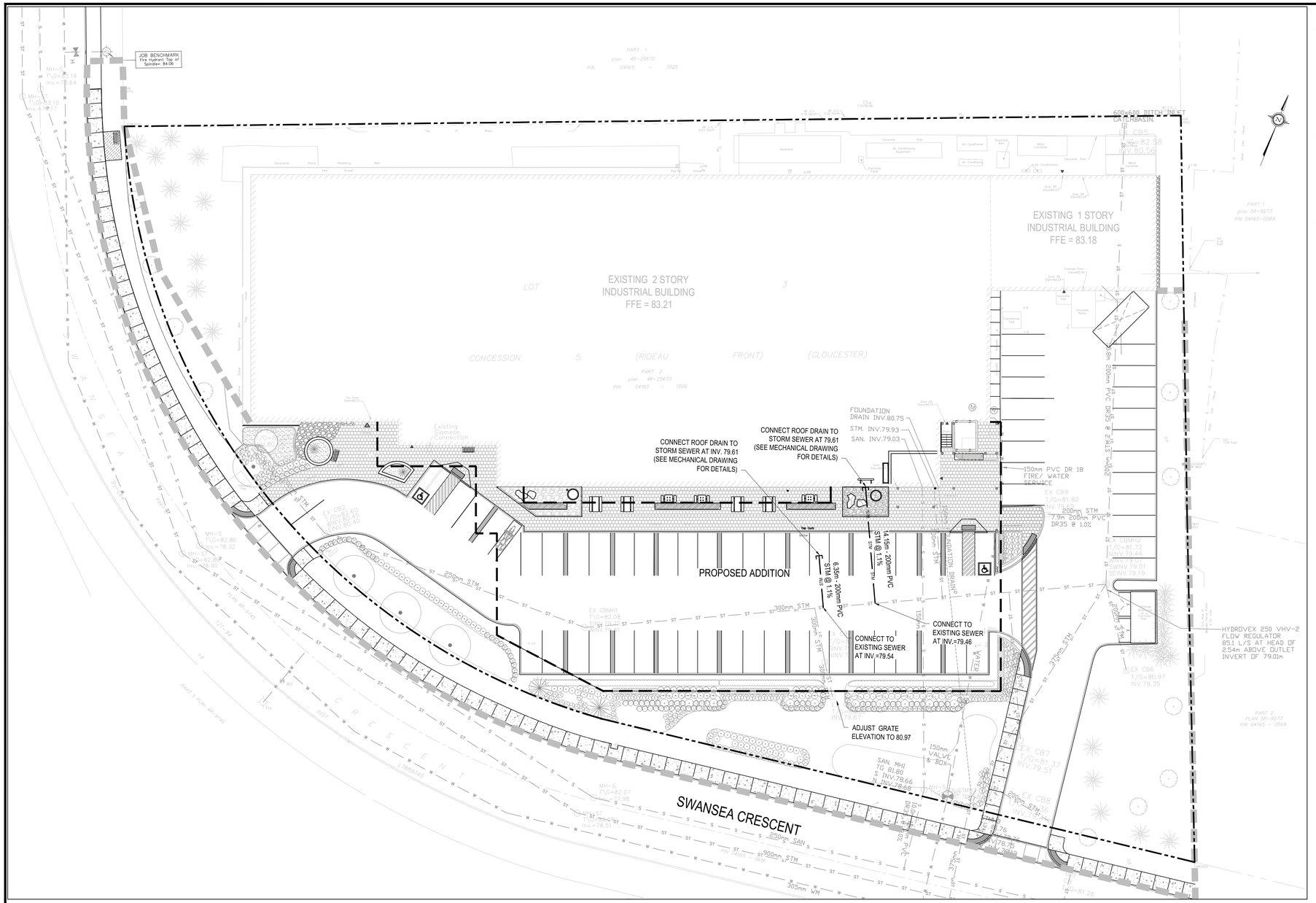
Drawn Dessiné
B.N
Date OCTOBER 11 2022

Approved Approuvé
J.Z.
Date OCTOBER 11 2022

Project no. No. du projet
221-02216-00

Scale Echelle
AS NOTED

Drawing no. No. du dessin
C001



1 C002 SERVICING PLAN
SCALE= 1:250

NOTES:

1 THE POSITION OF EXISTING POLE LINES, CONDUITS, WATERMAINS, SEWERS AND OTHER UNDERGROUND AND ABOVEGROUND UTILITIES, STRUCTURES AND APPURTENANCES IS NOT NECESSARILY SHOWN ON THE CONTRACT DRAWING, AND WHERE SHOWN, THE ACCURACY OF THE POSITION OF SUCH UTILITIES AND STRUCTURES IS NOT GUARANTEED. PRIOR TO CONSTRUCTION, THE CONTRACTOR SHALL SATISFY HIMSELF OF THE EXACT LOCATION OF ALL SUCH UTILITIES AND STRUCTURES, AND SHALL ASSUME ALL LIABILITY FOR DAMAGE TO THEM DURING THE COURSE OF CONSTRUCTION. ANY RELOCATION OF EXISTING UTILITIES REQUIRED BY THE DEVELOPMENT OF SUBJECT LANDS IS TO BE UNDERTAKEN AT CONTRACTOR'S EXPENSE.

2 ALL STORM SEWER MATERIALS AND CONSTRUCTION METHODS SHALL CONFORM TO THE CURRENT CITY OF OTTAWA STANDARDS AND SPECIFICATIONS. PROVIDE CCTV INSPECTION REPORTS FOR ALL NEW STORM SEWERS.

3 STORM SEWERS 200mm DIAMETER SHALL BE PVC SDR-35, WITH RUBBER GASKET PER CSA A-257.3.

4 SEWER BEDDING AS PER CITY OF OTTAWA DETAIL S6.

5 ANY NEW OR EXISTING STORM SEWER WITH LESS THAN 2.0M COVER REQUIRES THERMAL INSULATION AS PER CITY OF OTTAWA STANDARD W22, OR APPROVED BY THE ENGINEER. ADD INSULATION ABOVE EXISTING STORM SEWER BETWEEN CBMH109 AND CB114.

6 CB IN LANDSCAPE AREAS SHALL BE AS PER CITY OF OTTAWA STANDARD S29, S30 AND S31.

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LEGEND

- 83.24× EXISTING GRADE ELEVATION
- CB□ EXISTING CATCHBASIN
- MH-ST○ EXISTING MANHOLE
- WV EXISTING VALUE AND BOX
- FH EXISTING FIRE HYDRANT
- ST EXISTING STORM SEWER
- S EXISTING SANITARY SEWER
- W EXISTING WATERMAIN
- 82.82 PROPOSED GRADE ELEVATION
- 82.03TC 81.92 PROPOSED TOP AND BOTTOM OF CURB
- TG82.82 PROPOSED TOP OF GRATE
- 1.8% PROPOSED GRADE SLOPE
- PROPOSED CATCHBASIN
- PROPOSED MANHOLE
- PROPOSED CATCHBASIN MANHOLE
- STM PROPOSED STORM SEWER
- SAN PROPOSED SANITARY SEWER
- W PROPOSED WATER SERVICE
- PROPOSED FIRE HYDRANT
- SF LIGHT DUTY SILT FENCE
- FILTER CLOTH
- PROPOSED ROOF DRAIN
- PROJECT BOUNDARY
- OVERLAND FLOW

No.	Revision	Date
1	ISSUED FOR SPA	2022-10-13

seal / estampe
LICENCED PROFESSIONAL ENGINEER
J. W. ZHANG
100155766
2022-10-13
PROVINCE OF ONTARIO

Project Title / Projet
IRIDIAN
SPECTRAL TECHNOLOGIES
2700 SWANSEA
OTTAWA, ONTARIO.

Drawing / Dessin
SERVICING PLAN

Designed by : J.Z. — Conçu par
Date OCTOBER 11 2022
Drawn B.N. — Dessiné
Date OCTOBER 11 2022
Approved J.Z. — Approuvé
Date OCTOBER 11 2022
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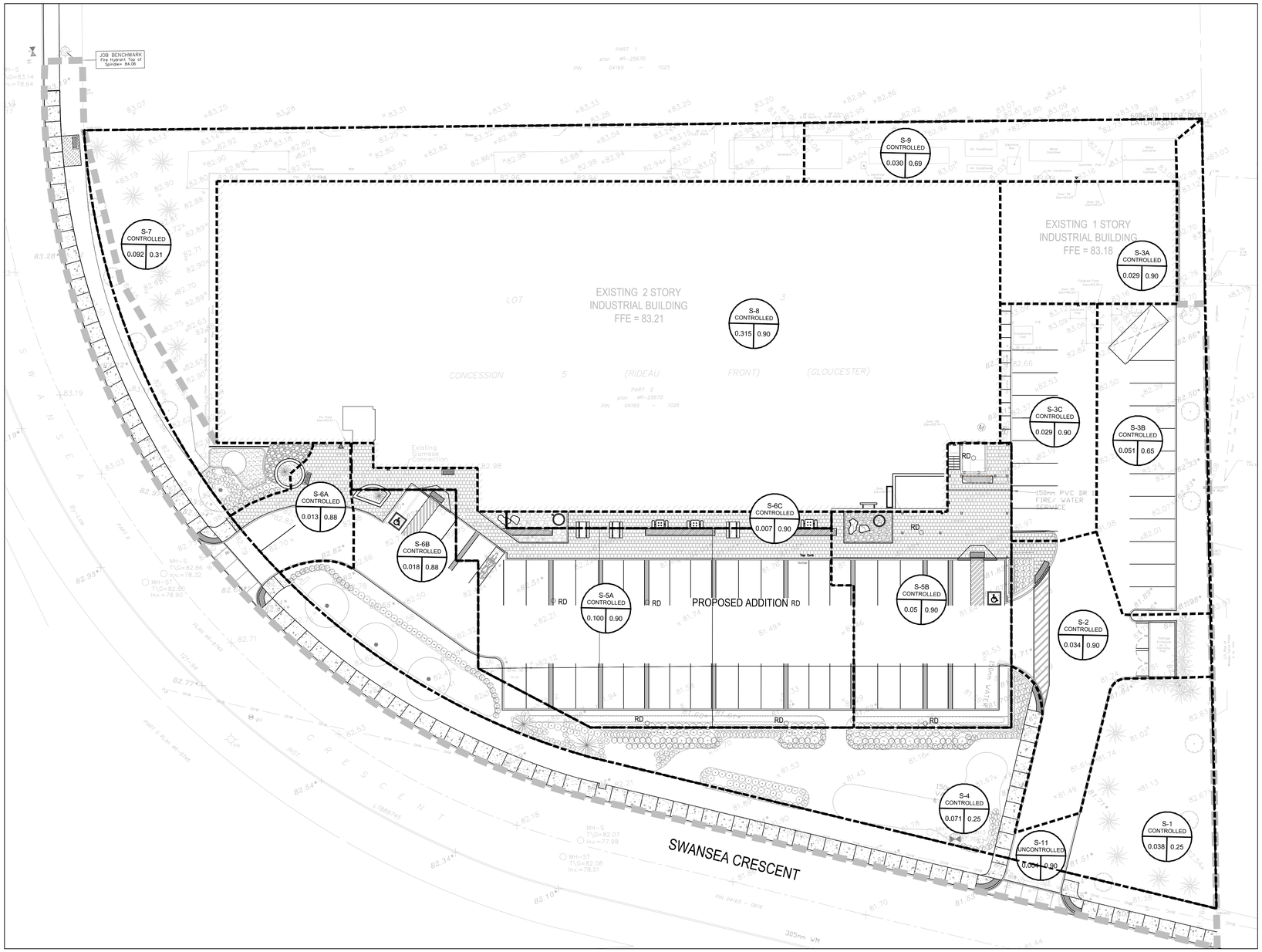
Scale / Echelle AS NOTED
Drawing no. / No. du dessin C002



1 C004 DRAINAGE PLAN
SCALE= 1:250

AREA No.
A0
0.000 .00
WEIGHTED RUNOFF COEFFICIENT
AREA (HECTARES)

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LICENSED PROFESSIONAL ENGINEER
J. W. ZHANG
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2022–10–13
PROVINCE OF ONTARIO

Project Title / Projet
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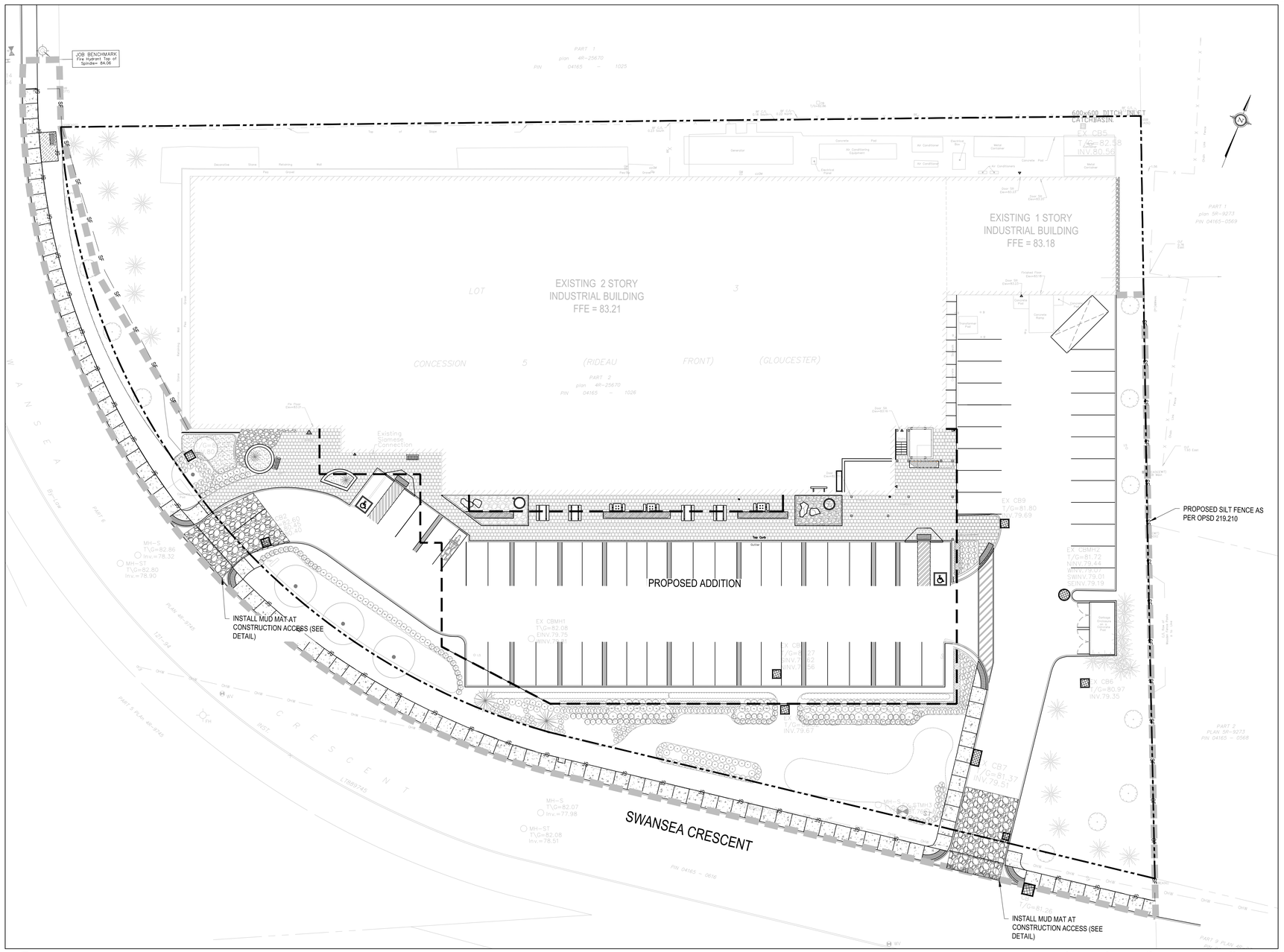
Drawing / Dessin
DRAINAGE PLAN

Designed by : / Conçu par	J.Z.
Date	OCTOBER 11 2022
Drawn / Dessiné	B.N.
Date	OCTOBER 11 2022
Approved / Approuvé	J.Z.
Date	OCTOBER 11 2022
Project no. / No. du projet	221-02216-00
Scale / Echelle	AS NOTED
Drawing no. / No. du dessin	C004

APPENDIX

D

- EROSION AND SEDIMENTATION CONTROL PLAN C03



3 C003 EROSION AND SEDIMENT CONTROL
SCALE= 1:250

SCALE: 1:250

NOTES: EROSION AND SEDIMENT CONTROL

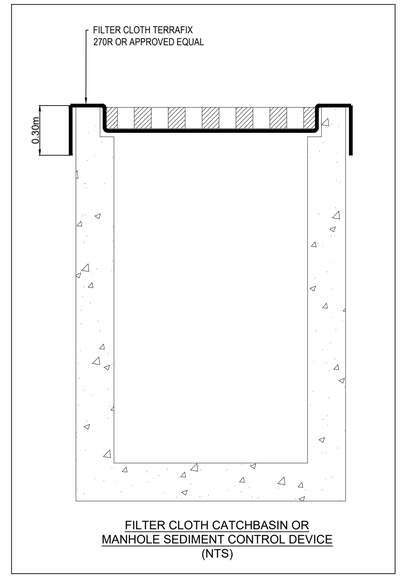
** CONTRACTOR IS RESPONSIBLE FOR ALL INSTALLATION, MONITORING, REPAIR AND REMOVAL OF ALL EROSION AND SEDIMENT CONTROL FEATURES. **

1. PRIOR TO START OF CONSTRUCTION:

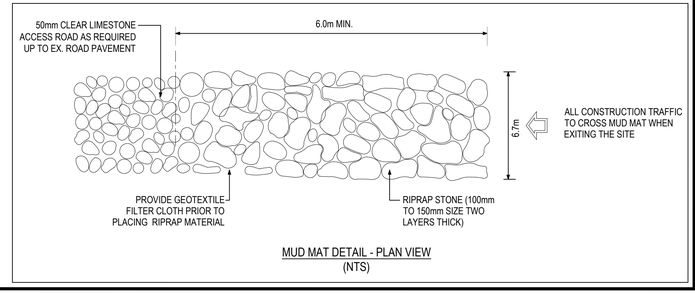
1.1. INSTALL SILT FENCE IN LOCATION SHOWN ON DWG C003.
1.2. INSTALL FILTER FABRIC OR SILT SACK FILTERS IN ALL THE CATCHBASINS AND MANHOLES TO REMAIN DURING CONSTRUCTION WITHIN THE SITE (SEE TYPICAL DETAIL).
1.3. INSPECT MEASURES IMMEDIATELY AFTER INSTALLATION.

2. DURING CONSTRUCTION:

2.1. MINIMIZE THE EXTENT OF DISTURBED AREAS AND THE DURATION OF EXPOSURE AND IMPACTS TO EXISTING GRADING.
2.2. PERIMETER VEGETATION TO REMAIN IN PLACE UNTIL PERMANENT STORM WATER MANAGEMENT IS IN PLACE. OTHERWISE, IMMEDIATELY INSTALL SILT FENCE WHEN THE EXISTING SITE IS DISTURBED AT THE PERIMETER.
2.3. PROTECT DISTURBED AREAS FROM OVERLAND FLOW BY PROVIDING TEMPORARY SWALES TO THE SATISFACTION OF THE FIELD ENGINEER. TIE-IN TEMPORARY SWALE TO EXISTING CBS AS REQUIRED.
2.4. PROVIDE TEMPORARY COVER SUCH AS SEEDING OR MULCHING IF DISTURBED AREA WILL NOT BE REHABILITATED WITHIN 30 DAYS.
2.5. INSPECT SILT FENCES, FILTER FABRIC FILTERS AND CATCH BASIN SUMPS WEEKLY AND WITHIN 24 HOURS AFTER A STORM EVENT. CLEAN AND REPAIR WHEN NECESSARY.
2.6. DRAWING TO BE REVIEWED AND REVISED AS REQUIRED DURING CONSTRUCTION.
2.7. EROSION CONTROL FENCING TO BE ALSO INSTALLED AROUND THE BASE OF ALL STOCKPILES.
2.8. DO NOT LOCATE TOPSOIL PILES AND EXCAVATION MATERIAL CLOSER THAN 2.5m FROM ANY PAVED SURFACE, OR ONE WHICH IS TO BE PAVED BEFORE THE PILE IS REMOVED. ALL TOPSOIL PILES ARE TO BE SEEDED IF THEY ARE TO REMAIN ON SITE LONG ENOUGH FOR SEEDS TO GROW (LONGER THAN 30 DAYS).
2.9. CONTROL WIND-BLOWN DUST OFF SITE BY SEEDING TOPSOIL PILES AND OTHER AREAS TEMPORARILY (PROVIDE WATERING AS REQUIRED AND TO THE SATISFACTION OF THE ENGINEER).
2.10. NO ALTERNATE METHODS OF EROSION PROTECTION SHALL BE PERMITTED UNLESS APPROVED BY THE FIELD ENGINEER.
2.11. CITY ROADWAY AND SIDEWALK TO BE CLEANED OF ALL SEDIMENT FROM VEHICULAR TRACKING AS REQUIRED.
2.12. DURING WET CONDITIONS, TIRES OF ALL VEHICLES/EQUIPMENT LEAVING THE SITE ARE TO BE SCRAPED.
2.13. ANY MUD/MATERIAL TRACKED ONTO THE ROAD SHALL BE REMOVED IMMEDIATELY BY HAND OR RUBBER TIRE LOADER.
2.14. TAKE ALL NECESSARY STEPS TO PREVENT BUILDING MATERIAL, CONSTRUCTION DEBRIS OR WASTE BEING SPILLED OR TRACKED ONTO ABUTTING PROPERTIES OR PUBLIC STREETS DURING CONSTRUCTION AND PROCEED IMMEDIATELY TO CLEAN UP ANY AREAS SO AFFECTED.
2.15. ALL EROSION CONTROL STRUCTURE TO REMAIN IN PLACE UNTIL ALL DISTURBED GROUND SURFACES HAVE BEEN STABILIZED EITHER BY PAVING OR RESTORATION OF VEGETATIVE GROUND COVER.
2.16. THE CONTRACTOR SHALL IMPLEMENT BEST MANAGEMENT PRACTICES, TO PROVIDE FOR PROTECTION OF THE AREA DRAINAGE SYSTEM AND THE RECEIVING WATERCOURSE, DURING CONSTRUCTION ACTIVITIES. THE CONTRACTOR ACKNOWLEDGES THAT FAILURE TO IMPLEMENT APPROPRIATE EROSION AND SEDIMENT CONTROL MEASURES MAY BE SUBJECT TO PENALTIES IMPOSED BY ANY APPLICABLE REGULATORY AGENCY.



FILTER CLOTH CATCHBASIN OR MANHOLE SEDIMENT CONTROL DEVICE
(NTS)



MUD MAT DETAIL - PLAN VIEW
(NTS)

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LEGEND

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- OVERLAND FLOW

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OTTAWA, ONTARIO.

Drawing / Dessin
EROSION AND SEDIMENT CONTROL

Designed by : / Conçu par	J.Z.
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Drawn / Dessiné	B.N.
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Approved / Approuvé	J.Z.
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