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SITE SERVICING & STORMWATER MANAGEMENT REPORT

1001 NOELLA LECLAIR WAY
OTTAWA, ONTARIO

REPORT NO. 22068

DECEMBER 15, 2023

CONTENTS

LIST OF APPENDICES

1.0 INTRODUCTION

This report has been prepared in support of the Site Plan Control application for the proposed 6-storey apartment buildings located at 1001 Noella Leclair Way in Ottawa, Ontario. The property is currently vacant. Refer to Pre-Application Consultation meeting notes in Appendix A.

This report forms part of the site servicing and stormwater management design for the proposed development. Also refer to drawings C-1 to C-6 prepared by D.B. Gray Engineering Inc.

2.0 WATER SERVICING

2.1 WATER SUPPLY FOR FIREFIGHTING

Building A will have a sprinkler system with the fire department connection located at the main entrance on the north side of the building. The sprinkler system is to be designed, installed and maintained in accordance with NFPA standards and the Fire Underwriters Survey. Refer to Appendix B. There is an existing municipal Class AA fire hydrant located in front of the subject property in the Lady Pellatt Street municipal right-of-way (FH-A). It is ±15 m unobstructed distance to the proposed fire department connection, which is less than the maximum 45 m permitted by the Ontario Building Code; therefore, a private fire hydrant is not required.

Building B will have a sprinkler system with the fire department connection located at the west entrance on the north side of the building. The sprinkler system is to be designed, installed and maintained in accordance with NFPA standards and the Fire Underwriters Survey. Refer to Appendix B. There is an existing municipal Class AA fire hydrant located in the Noella Leclair Way municipal right-of-way (FH-B). It is ±40 m unobstructed distance to the proposed fire department connection, which is less than the maximum 45 m permitted by the Ontario Building Code; therefore, a private fire hydrant is not required.

In accordance with City of Ottawa Technical Bulletin ISTB-2021-03, when calculating the required fire flow where pipe sizing is not affected, the Ontario Building Code Method is to be used. Using the Ontario Building Code Method, the required fire flow for Building A was calculated to be 9,000 L/min (150 L/s). In accordance with City of Ottawa Technical Bulletin ISTB-2021-03, when the Ontario Building Code Method yields a required fire flow of 9,000 L/min (150 L/s), the Fire Underwriters Survey Method is to be used instead. Using the Fire Underwriters Survey Method, the required fire flow for Building A was subsequently calculated to be 15,000 L/min (250 L/s). Refer to calculations in Appendix B.

In accordance with City of Ottawa Technical Bulletin ISTB-2021-03, when calculating the required fire flow where pipe sizing is not affected, the Ontario Building Code Method is to be used. Using the Ontario Building Code Method, the required fire flow for Building B was calculated to be 9,000 L/min (150 L/s). In accordance with City of Ottawa Technical Bulletin ISTB-2021-03, when the Ontario Building Code Method yields a required fire flow of 9,000 L/min (150 L/s), the Fire Underwriters Survey Method is to be used instead. Using the Fire Underwriters Survey Method, the required fire flow for Building B was subsequently calculated to be 15,000 L/min (250 L/s). Refer to calculations in Appendix B.

The boundary conditions in the 300 mm municipal watermain at the intersection of Noella Leclair Way and Lady Pellatt Street provided by the City of Ottawa for the 250 L/s fire flow indicate a hydraulic grade line (HGL) of 123.4 m. Refer to Appendix B. This HGL calculates to 342 kPa (50 psi). Since the pressure

is above the Ontario Building Code's minimum required pressure of 140 kPa (20 psi), there is an adequate water supply for firefighting from the existing municipal water distribution system.

In accordance with City of Ottawa Technical Bulletin ISTB-2018-02, the aggregate flow of all contributing fire hydrants within 150 m of the building shall not be less than the required fire flow. In accordance with City of Ottawa Technical Bulletin ISTB-2018-02 Appendix I:

Class	Distance (m)	Contribution (L/min)
AA	≤ 75	5,700
	> 75 and ≤ 150	3,800

The existing municipal Class AA fire hydrant serving Building A's fire department connection discussed above (FH-A) can contribute 5,700 L/min (95 L/s). There are two other existing municipal Class AA fire hydrants within 75 m of Building A; one is located in the Noella Leclair Way municipal right-of-way (FH-B); and the other is located at the intersection of Noella Leclair Way and Lady Pellatt Street (FH-C). Each can also contribute 5,700 L/min (95 L/s). The aggregate flow of the three contributing fire hydrants is 17,100 L/min (285 L/s), which is greater than Building A's required fire flow of 15,000 L/min (250 L/s).

The existing municipal Class AA fire hydrant serving Building B's fire department connection discussed above (FH-B) can contribute 5,700 L/min (95 L/s). There are also three existing municipal Class AA fire hydrants within between 75 m and 150 m of Building B; one is located at the intersection of Noella Leclair Way and Lady Pellatt Street (FH-C); one is located in front of the subject property in the Lady Pellatt Street municipal right-of-way (FH-A); and one is located ±35 m NE of the subject property in the Lady Pellatt Street municipal right-of-way (FH-D). Each can contribute 3,800 L/min (63.3 L/s). The aggregate flow of the four contributing fire hydrants is 17,100 L/min (285 L/s), which is greater than Building B's required fire flow of 15,000 L/min (250 L/s).

2.2 DOMESTIC WATER SUPPLY

In accordance with

i. the City of Ottawa Water Design Guidelines for the populations
ii. City of Ottawa Technical Bulletin ISTB-2021-03 for the consumption rate
iii. the Ministry of the Environment Water Design Guidelines for the peaking factors

Based on Building A's 25 – 1 bedroom apartment units, 27 – 2 bedroom apartment units and 22 – 3 bedroom apartment units, the average daily demand was calculated to be 0.5 L/s, the maximum daily demand was calculated to be 2.5 L/s and the maximum hourly demand was calculated to be 3.8 L/s. Refer to calculations in Appendix B.

Based on Building B's 35 – 1 bedroom apartment units and 48 – 2 bedroom apartment units, the average daily demand was calculated to be 0.5 L/s, the maximum daily demand was calculated to be 2.4 L/s and the maximum hourly demand was calculated to be 3.6 L/s. Refer to calculations in Appendix B.

The boundary conditions in the 300 mm municipal watermain at the intersection of Noella Leclair Way and Lady Pellatt Street provided by the City of Ottawa indicate a minimum HGL of 126.4 m and a

maximum HGL of 130.3 m. Refer to Appendix B. Using EPANET, a model was created to analyze the hydraulics of the dead-end Noella Leclair Way municipal watermain. Based on Building A's maximum domestic daily demand of 2.5 L/s, FH-B's contribution of 95 L/s, Building B's maximum domestic daily demand of 2.4 L/s, Building B's assumed maximum sprinkler demand of 38 L/s, and the 123.4 m HGL provided by the City of Ottawa for the 250 L/s fire flow at the intersection of Noella Leclair Way and Lady Pellatt Street, the HGL at Building A's point of connection to the Noella Leclair Way municipal watermain was determined to be 123.1 m, and the HGL at Building B's point of connection to the Noella Leclair Way municipal watermain was determined to be 117.3 m. Based on these boundary conditions, the pressure at Building A's water meter is calculated to vary between 351 kPa (51 psi) and 421 kPa (61 psi), and the pressure at Building B's water meter is calculated to vary between 294 kPa (43 psi) and 421 kPa (61 psi). This is an acceptable range for the proposed development.

A 150 mm water service connecting to the existing 300 mm Noella Leclair Way municipal watermain is proposed to service Building A's sprinkler system. The same 150 mm water service will provide an adequate domestic water supply.

A 150 mm water service connecting to the existing 200 mm Noella Leclair Way municipal watermain is proposed to service Building B's sprinkler system. The same 150 mm water service will provide an adequate domestic water supply.

3.0 SANITARY SERVICING

In accordance with

i. the City of Ottawa Sewer Design Guidelines for the populations
ii. City of Ottawa Technical Bulletin ISTB-2018-01 for the average daily flow, Harmon Formula correction factor and infiltration allowance
iii. the Harmon Formula for the peaking factor

Based on Building A's 25 – 1 bedroom apartment units, 27 – 2 bedroom apartment units and 22 – 3 bedroom apartment units, Building A's sanitary flow rate was calculated to be 1.81 L/s. A 150 mm sanitary sewer service at 1% slope (15.23 L/s capacity) is proposed to service the building. At the design flow rate Building A's sanitary sewer service will only be at 12% of its capacity. Refer to calculations in Appendix C. The proposed 150 mm sanitary sewer service will connect to the proposed private sanitary sewer system.

Based on Building B's 35 – 1 bedroom apartment units and 48 – 2 bedroom apartment units, Building B's sanitary flow rate was calculated to be 1.71 L/s. A 150 mm sanitary sewer service at 1% slope (15.23 L/s capacity) is proposed to service the building. At the design flow rate Building B's sanitary sewer service will only be at 11% of its capacity. Refer to calculations in Appendix C. The proposed 150 mm sanitary sewer service will connect to the proposed private sanitary sewer system.

A 200 mm private sanitary sewer at 0.32% slope (18.55 L/s capacity) and 1.11% slope (34.56 L/s capacity) is proposed to service the development. At the design flow rate the 200 mm sanitary sewer will only be at up to 10% of its capacity. The proposed 200 mm sanitary sewer will connect to the existing 375 mm Lady Pellatt Street municipal sanitary sewer, which at 0.21% slope has a capacity of 80.35 L/s. Refer to calculations in Appendix C. The proposed development is expected to have an acceptable impact on the 375 mm Lady Pellatt Street municipal sanitary sewer.

The basement plumbing fixtures will drain to a sanitary sump and be pumped to the sanitary building drain. The point of connection to the sanitary building drain is to be at high level in the basement. Refer to mechanical.

4.0 STORMWATER MANAGEMENT

4.1 QUANTITY CONTROL

The stormwater quantity control criterion is to control the post-development peak flows to 50 L/s/ha. The maximum allowable release rate for the 9,254 sq.m property was calculated to be 46.27 L/s. The Rational and Modified Rational Methods were used to calculate the post-development flow rates and corresponding storage volumes. Refer to calculations in Appendix D.

Drainage Area I (Uncontrolled Flow Off Site – 279 sq.m)
Areas along the perimeter of the property will drain uncontrolled off site. The flow rates are calculated at a time of concentration of 10 minutes.

	100-Year Event	5-Year Event
Maximum Flow Rate	8.49 L/s	4.35 L/s

Drainage Area II (8,975 sq.m)
An inlet control device (ICD) located in the outlet pipe of MH-23 will restrict the flow of stormwater and cause it to backup into the upstream infrastructure and pond above CB-11, CB-14, and CB-19. The ICD will be a plug style with a round orifice located at the bottom of the plug manufactured by Pedro Plastics or approved equivalent sized by the manufacturer for a release rate of 37.78 L/s at 2.23 m. It was calculated that an orifice area of 9,360 sq.mm (109 mm dia) with a discharge coefficient of 0.61 will achieve the required release rate. Since some of the restricted stormwater is proposed to be stored using underground infrastructure, an average release rate equal to 50% of the maximum release rate was used to calculate the required storage volumes. The underground infrastructure will consist of 54 – HydroStor HS180 open bottom chambers or approved equivalent surrounded by clear stone wrapped in a waterproof membrane.

	100-Year Event	5-Year Event
Maximum Release Rate	37.78 L/s	27.19 L/s
Maximum Water Elevation	88.58 m	87.50 m
Maximum Volume Stored	382.70 cu.m	183.89 cu.m

Summary

The maximum post-development release rate during the 100-year event was calculated to be 46.27 L/s, which is equal to the maximum allowable release rate. To achieve the maximum allowable release rate, a maximum storage volume of 382.70 cu.m is required and provided during the 100-year event. The maximum post-development release rate during the 5-year event was calculated to be 31.54 L/s, which is 32% less than the maximum allowable release rate. A maximum storage volume of 183.89 cu.m is required and provided during the 5-year event. The proposed development is expected to have an acceptable impact on the 1,050 mm Lady Pellatt Street municipal storm sewer.

	100-Year Event	5-Year Event
Maximum Allowable Release Rate	46.27 L/s	46.27 L/s
Maximum Release Rate	46.27 L/s	31.54 L/s
Maximum Volume Required	382.70 cu.m	183.89 cu.m
Maximum Volume Stored	382.70 cu.m	183.89 cu.m

4.2 QUALITY CONTROL

An oil grit separator (OGS) manhole is proposed to be located downstream of the inlet control device. Calculations by the manufacturer indicate that the CDS PMSU2015-4 OGS will remove 81.3% of total suspended solids (TSS). Refer to calculations in Appendix D. The CDS PMSU2015-4 OGS has an oil capacity of 232 L and a grit capacity of 0.84 cu.m.

An Erosion & Sediment Control Plan has been developed to be implemented during construction. Refer to drawing C-3 and notes 4.1 to 4.10 on drawing C-4.

i. Sediment capture filter sock inserts are to be installed in all existing and proposed catch-basins and catch-basin/manholes adjacent to and within the site.
ii. A silt fence barrier is to be installed along the perimeter of the site.
iii. Any material deposited on the public road is to be removed.

4.3 STORM SERVICING

The peak restricted flow rate draining into the private storm sewer system during the 5-year event was calculated to be 27.19 L/s. A 250 mm storm sewer at 6.15% slope (147.47 L/s capacity) is proposed to connect to the existing 1,050 mm Lady Pellatt Street municipal storm sewer, which at 0.15% slope has a capacity of 1,107 L/s. At the peak restricted 5-year flow rate the proposed 250 mm storm sewer will only be at 18% of its capacity. Refer to calculations in Appendix D.

The foundation and trench drains will drain to a storm sump and be pumped to an outlet 0.30 m above grade. Refer to mechanical.

5.0 CONCLUSIONS

1. A private fire hydrant is not required.
2. There is an adequate water supply for firefighting from the existing municipal water distribution system.
3. There is an acceptable range of water pressures in the existing municipal water distribution system.
4. The post-development sanitary flow rates will be adequately handled by the proposed sanitary sewer services and private sanitary sewer system.
5. The proposed development is expected to have an acceptable impact on the existing municipal sanitary sewer.
6. The proposed OGS will achieve an enhanced (80% TSS removal) level of protection.
7. An Erosion & Sediment Control Plan has been developed to be implemented during construction.
8. The maximum post-development release rate during the 100-year event will be equal to the maximum allowable release rate.
9. The proposed development is expected to have an acceptable impact on the existing municipal storm sewer.
10. The peak restricted flow rates during the 5-year event will be adequately handled by the proposed private storm sewer system.

Prepared by D.B. Gray Engineering Inc.

APPENDIX A

PRE-APPLICATION CONSULTATION MEETING NOTES

Pre-Application Consultation – Preliminary Comments

1001 Noella Leclair Way| File No. PC2022-0259 | Meeting held on 25 October 2022

Contents

Summary of Application

The following summary notes and attachments are provided as a follow-up to the pre-application consultation meeting held on 25 October 2022. They are regarding a future proposed site plan control application for the vacant site addressed 1001 Noella Leclair Way. The proposed application is to enable the applicant to implement two six-storey buildings, containing a total of 174 residential units. Building one will be aligned north-south along Noella Leclair Way and will include 2690 m2 of ground floor amenity space, facing the intersection at the northwest corner of the property. Building two will be parallel to building one along the east property line. A total of 252 parking spaces are proposed, 135 at-grade parking spaces and 118 underground parking spaces. Underground parking will be located below each building and between the two buildings. Surface parking will be located in the plaza between the two building and along the rear yard at the south of the property.

Also attached is the list of required plans and studies in support of applications for site plan control approval should your client choose to formally submit them.

The following City staff preliminary comments are based upon the attached information that was made available at the time of the pre-application consultation.

Planning

Contact: Steve Belan – Planner II| Steve.Belan@ottawa.ca

The site is in an AM zone and is just within 600m of a future Transit Station

- The use is consistent with the zoning and OP.
- The proposal also on preliminary review complies with the Zoning Bylaw provisions.
- Happy to see the inclusion of the pathway that was shown in the Subdivision concept plan
- Still would like to see some kind of commercial in the north west corner of the property. Please provide details of the purchase and sale agreement. Two other sites in this subdivision have agreed in principle to provide some small commercial uses at the corners.
- Two ramps are unnecessary the space can be better used for outdoor amenity and tree canopy.
- Fire route over underground parking needs to reinforced to allow for Fire services to accept the route.
- Clear route to front doors required by Fire Services
- Garbage rooms need clear access to pick up areas in drive isles.
- Despite meeting the interior side yard setbacks. The east building should be moved west to provide a shared separation from future buildings to the east.
- Be aware that the new OP has a goal for Urban Forest canopy. See section 4.8.2. I believe that room for additional trees can be provide on the eastern property line and over the underground park by using berms to provide more soil volume.
- High performance standards were not raised at the meeting however, you are strong urged to review an implement what you can to improve the proposal.

Planning will need the following Plans and studies to be included in the application package

- Site Plan
- Landscape Plan
- Topographic Surrey
- Architectural Elevations
- Wind Analysis
- Parking Garage Layout
- Planning Rational
- Design Brief (ask Randolph for terms)
- Phase 1 ESA (Phase 2 if required)
- Tree Conservation Report
- Site Lighting Plan

Urban Design

Randolph Wang | Randolph.Wang@ottawa.ca

1. A Design Brief is required as part of the submission. The Terms of Reference is attached for convenience.
2. The site is zoned AM and within a Design Priority Area in the new OP. Formal review by the City's Urban Design Review Panel is required. Please contact udrp@ottawa.ca for scheduling details and visit the UDRP website on Ottawa.ca for information about submission requirements.
3. With respect to the preliminary design presented, the applicant should be mindful of the surrounding planned context. The site and the surrounding area are designated a Hub in the new OP and in close proximity to a planned rapid transit station. The property is currently zone AM H(40), which permits a high-rise building. There is a relatively high probability that lands in the vicinities may be rezoned to allow for similar high density development in the fullness of time. The design of the site should be "future proof" to ensure the livability and wellbeing of future residents are protected. The preliminary site plan layout is not "future-proofing". The close proximity of the easterly building to the interior lot line will create an undesirable condition if the neighbouring property to the east is also developed in a similar fashion. Even if the neighbouring property is developed in accordance with the current zoning, it is still not ideal to have numerous residential units facing an industrial operation.
4. Considerations should be given to alternative site plan options. In general, the buildings should be placed to frame streets and other public spaces. For illustration purpose, the attached diagrams show two potential alternatives. The site plan should also clarify the overall plan of the linear green space, which can potentially be a very useful and attractive feature in this emerging neighbourhood.
5. With respect to the conceptual building design, some simplification of the roof design will be appropriate. It is unconvincing that the proposed sloping of the roof is a requirement of the storm water management strategy.

Infrastructure Engineering

Alex Polyak – Infrastructure Project Manager | Alex.Polyak@ottawa.ca

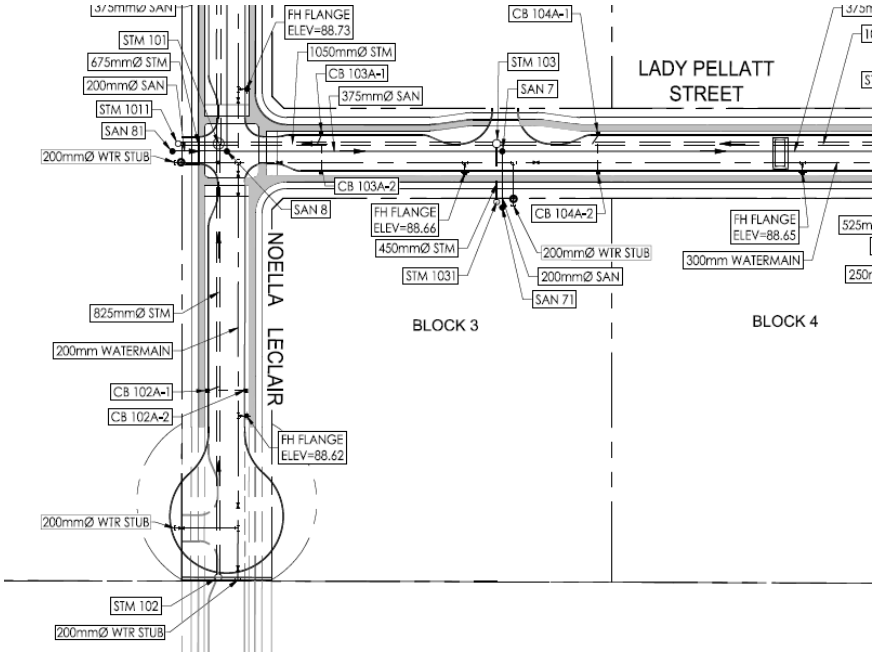
- **Note the following Development charges which are applicable to the site:**
    - Outer Greenbelt development charge
- ***List of Reports and Plans (Site Plan Control):***
    1. Site Plan
    2. Topographical Plan of Survey Plan with a published Bench Mark
    3. Removals Plan
    4. Site Servicing Plan
    5. Grading and Drainage Plan
    6. Erosion and Sediment Control Plan
    7. Storm Drainage / Ponding Plan
    8. Stormwater Management and Site Servicing Report
    9. Geotechnical Investigation Report

- **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, Second Edition, (October 2012), including Technical Bulletins, ISDTB-2014-01, PIEDTB-2016-01, ISTB 2018-01, ISTB-2018-04, and ISTB-2019-02
     - Ottawa Design Guidelines – Water Distribution, First Edition, (July 2010), including Technical Bulletins ISD-2010-2, ISDTB-2014-02, ISTB-2018-02, and ISTB-2021-03
     - Geotechnical Investigation and Reporting Guidelines for Development Applications in the City of Ottawa (Revised 2008)
     - City of Ottawa Slope Stability Guidelines for Development Applications (Revised 2012)
     - City of Ottawa Environmental Noise Control Guidelines (January, 2016)
     - City of Ottawa Hydrogeological and Terrain Analysis Guidelines (March 2021)
     - 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 approved detailed subdivision design for allowable release rates
     - Minor system inflow to be restricted for all contributing areas to 50L/s/ha.
     - Ensure no overland flow for all storms up to and including the 100-year event. Provide adequate emergency overflow conveyance off-site
     - Ensure that the proposed drive ramp entrance to the underground parking garage is protected from the major overland flow route.
       i. A minimum freeboard elevation of 350mm from highpoint of the ramp to the street spill elevation
       ii. A minimum freeboard elevation of 300mm from the invert of the ramp drain to the 100 year HGL of the storm sewer.
       iii. In general conformity of City of Ottawa Standard S17.
     - Quality control requirements to be provided by Rideau Valley Conservation Authority (RVCA).

- This property is located within the Bilberry Creek sub watershed. Please verify any sub watershed specific SWM criteria with the RVCA.

5. Deep Services:



i. A plan view of the approximate services may be seen above from the future services to be installed as part of the subdivision plan. 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 (Lady Pellatt):

i. 200 mm dia. future water service stub to be dropped at the North of the property.
ii. 200 mm dia. future sanitary service stub to be dropped at the North of the property.
iii. 450 mm dia. future storm service stub to be dropped at the North of the property

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 spring line of the sewer main 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 sewer main,*

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 sewer main,*

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

e. *No submerged outlet connections.*

v. *The capacity of the existing system should be evaluated when estimating the peak sanitary flow rates.*

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, 2020).

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.

Please note that a boundary condition request should be made to the City as early as possible, in order to identify any water supply constraints (if any exist). Please also provide the

estimated sanitary flows with the design, so the City can confirm that there aren't any capacity constraints downstream.

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. All development applications should be considered for an Environmental Compliance Approval (ECA) by the Ministry of the Environment, Conservation, and Parks (MECP);

    a. The consultants determine if an approval for sewage works under Section 53 of OWRA is required and determines what type of application. The City's project manager may help confirm and coordinate with the MECP as required.

    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. Pre-consultation is not required if applying for standard or additional works (Schedule A of the Agreement) under Transfer Review.

    d. Pre-consultation with local District office of MECP is recommended for direct submission.

    e. Consultant completes an MECP request form for a pre-consultation. Send request to moeccottawasewage@ontario.ca

    f. ECA applications are required to be submitted online through the MECP portal. A business account required to submit ECA application. For more information visit https://www.ontario.ca/page/environmental-compliance-approval

NOTE: Site Plan Approval, or Draft Approval, is required before an application is sent to the MECP.

9. General Engineering Submission requirements:

    a. As per section 53 of the Professional Engineers Act, O. Reg 941/40, R.S.O. 1990, all documents prepared by engineers must be signed and dated on the seal.

    b. All required plans are to be submitted on standard A1 size sheets (594mm x 841mm) sheets, utilizing a reasonable and appropriate metric scale as per City of Ottawa Servicing and Grading Plan Requirements: title blocks are to be placed on the right of the sheets and not along the bottom. Engineering plans may be combined, but the Site Plans must be provided separately. Plans shall include the survey monument

used to confirm datum. Information shall be provided to enable a non-surveyor to locate the survey monument presented by the consultant.

c. All required plans & reports are to be provided in *.pdf format (at application submission and for any, and all, re-submissions)

Should you have any questions or require additional information, please contact me directly at alex.polyak@ottawa.ca

- **Minimum Drawing and File Requirements- All Plans**

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

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

Transportation Engineering

Mike Giampa – Senior Transportation Engineer | Mike.Giampa@ottawa.ca

- A TIA is warranted, please proceed to scoping to determine the required TIA modules.
  - The guidelines are available on the City website: https://ottawa.ca/en/transportation-impact-assessment-guidelines
- The application will not be deemed complete until the submission of the draft step 2-4, including the functional draft RMA package (if applicable) and/or monitoring report (if applicable).
- Although a full review of the TIA Strategy report (Step 4) is not required prior to an application, it is strongly recommended.
- Synchro files are required at Step 4.
- Corner sight triangle: 5m x 5m
- A Noise Impact Study is required

Forestry

Mark Richardson - Forester | Mark.Richardson@ottawa.ca

- **A TCR is not required**
- **LP tree planting requirements:**

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

Minimum Setbacks

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

- Maintain 7.5m between large growing trees, and 4m between small growing trees. Park or open space planting should consider 10m spacing, except where otherwise approved in naturalization / afforestation areas. Adhere to Ottawa Hydro's planting guidelines (species and setbacks) when planting around overhead primary conductors.

Tree specifications

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

Hard surface planting

- Curb style planter is highly recommended
- No grates are to be used and if guards are required, City of Ottawa standard (which can be provided) shall be used.
- Trees are to be planted at grade

Soil Volume

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

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

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

Sensitive Marine Clay

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

Tree Canopy Cover

- The landscape plan shall show how the proposed tree planting will replace and increase canopy cover on the site over time, to support the City's 40% urban forest canopy cover target.
- At a site level, efforts shall be made to provide as much canopy cover as possible, through tree planting and tree retention, with an aim of 40% canopy cover at 40 years, as appropriate.
- Indicate on the plan the projected future canopy cover at 40 years for the site.

Environmental Planning

Sami Rehman – Environmental Planner II | Sami.Rehamn@ottawa.ca

- Please review and incorporate design elements from the City's Bird Safe Design Guidelines to eliminate bird collisions.
    - Bird-Safe Design Guidelines | City of Ottawa

Parkland

Phil Castro – Parks & Facilities Planner II | Phil.Castro@ottawa.ca

- No comment

**It is anticipated that, as a result of the More Homes for Everyone Act, 2022, for applications for site plan approval and zoning by-law amendments, new processes in respect of pre-application consultation will be in place as of January 1, 2023. The new processes are anticipated to require a multiple phase pre-application consultation approach before an application will be deemed complete. Applicants who have not filed a complete application by the effective date may be required to undertake further pre-application consultation(s) consistent with the provincial changes. The by-laws to be amended include By-law 2009-320, the Pre-Consultation By-law, By-law 2022-239, the planning fees by-law and By-law 2022-254, the Information and Materials for Planning Application By-law. The revisions are anticipated to be before Council in the period after the new Council takes office and the end of the year.

APPENDIX B

WATER SERVICING

D.B. Gray Engineering Inc.

Stormwater Management - Grading & Drainage - Storm & Sanitary Sewers - Watermains

700 Long Point Circle
Ottawa, Ontario K1T 4E9

613-425-8044
d.gray@dbgrayengineering.com

December 1, 2023

1001 Noella Leclair Way

6-Storey Apartment Building A

Ottawa, Ontario

FIRE FLOW CALCULATIONS

FUS Method

RFF = Required Fire Flow in litres per minute

= $220CA^{0.5}$

C = Construction Coefficient related to the type of construction of the building

= 1.5 Tyoe V Wood Frame Construction

A = Total Effectice Floor Area in square meters of the building

6th Floor:	1,250.85	sq.m
5th Floor:	1,250.85	sq.m
4th Floor:	1,250.85	sq.m
3rd Floor:	1,250.85	sq.m
2nd Floor:	1,250.85	sq.m
1st Floor:	1,250.85	sq.m
	7,505	sq.m

RFF = 28,589 L/min

= 29,000 L/min (rounded to nearest 1,000 L/min)

Occupancy and Contents Adjustment Factor

-15% Limited Combustible Contents

= -4,350 L/min Occupancy and Contents Adjustment Factor

RFF = 24,650 L/min

Automatic Sprinkler Protection Credit

30% Sprinkler system designed, installed and maintained in accordance with NFPA standards

10% Standard water supply for both the sprinkler system and fire department hose lines

= 9,860 L/min Automatic Sprinkler Protection Credit

Exposure Adjustment Charge

Side	Charge	Distance	Construction	Length	Storeys	Factor
North	0%	over 30 m				
East	0%	over 30 m				
South	0%	over 30 m				
West	0%	over 30 m				

0% Exposure Adjustment Charge

= 0 L/min Exposure Adjustment Charge

RFF = 14,790 L/min

= 15,000 L/min (rounded to nearest 1,000 L/min)

= 250 L/s

---

250 L/s Fire Flow HGL: 123.4 m

Elevation at Fire Hydrant: 88.5 m

Static Pressure at Fire Hydrant: 34.9 m 342 kPa 50 psi

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December 1, 2023

1001 Noella Leclair Way

6-Storey Apartment Building B

Ottawa, Ontario

FIRE FLOW CALCULATIONS

FUS Method

RFF = Required Fire Flow in litres per minute

= $220CA^{0.5}$

C = Construction Coefficient related to the type of construction of the building

= 1.5 Tyoe V Wood Frame Construction

A = Total Effectice Floor Area in square meters of the building

6th Floor:	1,250.01	sq.m
5th Floor:	1,250.01	sq.m
4th Floor:	1,250.01	sq.m
3rd Floor:	1,250.01	sq.m
2nd Floor:	1,250.01	sq.m
1st Floor:	1,254.28	sq.m
	7,504	sq.m

RFF = 28,587 L/min

= 29,000 L/min (rounded to nearest 1,000 L/min)

Occupancy and Contents Adjustment Factor

-15% Limited Combustible Contents

= -4,350 L/min Occupancy and Contents Adjustment Factor

RFF = 24,650 L/min

Automatic Sprinkler Protection Credit

30% Sprinkler system designed, installed and maintained in accordance with NFPA standards

10% Standard water supply for both the sprinkler system and fire department hose lines

= 9,860 L/min Automatic Sprinkler Protection Credit

Exposure Adjustment Charge

Side	Charge	Distance	Construction	Length	Storeys	Factor
North	0%	over 30 m				
East	0%	over 30 m				
South	0%	over 30 m				
West	0%	over 30 m				

0% Exposure Adjustment Charge

= 0 L/min Exposure Adjustment Charge

RFF = 14,790 L/min

= 15,000 L/min (rounded to nearest 1,000 L/min)

= 250 L/s

---

250 L/s Fire Flow HGL: 123.4 m

Elevation at Fire Hydrant: 88.5 m

Static Pressure at Fire Hydrant: 34.9 m 342 kPa 50 psi

WATER SUPPLY
FOR
PUBLIC FIRE PROTECTION

A Guide to Recommended Practice in Canada

2020

Fire Underwriters Survey

Automatic Sprinkler Protection

The required fire flow may be reduced by up to 50 percent for complete Automatic Sprinkler Protection depending upon adequacy of the system. Where only part of a building is protected by Automatic Sprinkler Protection, credit should be interpolated by determining the percentage of the Total Floor Area being protected by the automatic sprinkler system.

To be able to apply the full 50 percent reduction, the following areas should be reviewed to determine the appropriate level of credit for having Automatic Sprinkler Protection as per the table below:

Table 4 Sprinkler Credits

Automatic Sprinkler System Design	Credit	
	With complete building coverage	With partial building coverage of X%
Automatic sprinkler protection designed and installed in accordance with NFPA 13	30%	30% × Percentage of Total Floor Area Serviced by Sprinkler System
Water supply is standard for both the system and Fire Department hose lines	10%	10% × Percentage of Total Floor Area Serviced by Sprinkler System
Fully supervised system	10%	10% × Percentage of Total Floor Area Serviced by Sprinkler System

Automatic Sprinkler Protection Designed and Installed in Accordance with Applicable NFPA Standards (30%)

The initial credit for Automatic Sprinkler Protection is a maximum of 30% based on the system being designed and installed in accordance with the applicable criteria of NFPA 13, *Standard for Installation of Sprinkler Systems,* NFPA 13R, *Standard for the Installation of Sprinkler Systems in Low-Rise Residential* Occupancies, or NFPA 13D, *Standard for the Installation of Sprinkler Systems in One- and Two-Family Dwellings and Manufactured Homes* and being maintained in accordance with the applicable criteria of NFPA 25, *Standard for the Inspections, Testing and Maintenance of Water-Based Fire* (see Recognition of Automatic Sprinkler Protection).

Water Supply is Standard for both the Sprinkler System and Fire Department Hose Lines (10%)

To qualify to apply an additional 10% reduction, a water supply that is standard for both the sprinkler system and fire department hose lines is required, to qualify the following conditions should be satisfied:

a) Sprinkler system is supplied by a pressurized water supply system (public or private) that is designed and built with no major non-conformance issues (i.e. water supply system is designed in accordance with Part 1 of the Water Supply for Public Fire Protection to qualify for fire insurance grading recognition).

b) Calculated demand for maximum sprinkler design area operation in addition to hose stream requirements are below the available water supply curve (at the corresponding flow rate and pressure). An appropriate safety margin is used to take into account the difference between the available water supply curve at the time of hydrant flow testing as compared to the available water supply curve during Maximum Day Demand.

c) Volume of water available is adequate for the total flow rate including the maximum sprinkler design area operation plus required hose streams plus Maximum Day Demand for the full duration of the design fire event.
d) Residual pressure at all points in the water supply system can be maintained at not less than 150 kPa during the flowing of the sprinkler and required hose streams (plus Maximum Day Demand).

Fully Supervised System (10%)

To qualify to apply an additional 10% reduction, an automatic sprinkler system should be fully supervised. The purpose of the supervisory signal is to ensure that malfunctions of the automatic sprinkler system will be discovered and corrected promptly, while the water flow alarm serves to notify emergency services of the fire as soon as the automatic sprinkler system activates.

- a distinctive supervisory signal to indicate conditions that could impair the satisfactory operation of the sprinkler system (a fault alarm), which is to sound and be displayed, either at a location within the building that is constantly attended by qualified personnel (such as a security room), or at an approved remotely located receiving facility (such as a monitoring facility of the sprinkler system manufacturer); and
- a water flow alarm to indicate that the sprinkler system has been activated, which is to be transmitted to an approved, proprietary alarm-receiving facility, a remote station, a central station or the fire department.

Additional Reductions for Community Level Automatic Sprinkler Protection of Area

Buildings located within communities or subdivisions that are completely sprinkler protected may apply up to a maximum additional 25% reduction in required fire flows beyond the normal maximum of 50% reduction for sprinkler protection of an individual building.
This additional reduction may be applied where all the following conditions are met:

a) the community has a bylaw requiring all buildings that may be built within 30 m of the subject building to be fully sprinkler protected. I.e. future development will not create unsprinklered buildings within 30 m of the subject building, and
b) all buildings within 30 meters of the subject building are fully sprinkler protected with systems that are designed and installed in accordance with the applicable criteria of NFPA 13, *Standard for Installation of Sprinkler Systems,* NFPA 13R, *Standard for the Installation of Sprinkler Systems in Low-Rise Residential* Occupancies, or NFPA 13D, *Standard for the Installation of Sprinkler Systems in One- and Two-Family Dwellings and Manufactured Homes,* and
c) the community has in place a Fire Prevention Program that provides a system of ensuring that installed fire sprinkler systems are inspected, tested, and maintained in accordance with NFPA 25: *Standard for the Inspection, Testing, and Maintenance of Water-Based Fire Protection Systems*, and
d) the community maintains the pressure and flow rate requirements for fire sprinkler installations. I.e. the community does not make significant reductions to the operating pressures or flows across the distribution network.

Adjustment of Sprinkler Reductions for Community Level Oversight of Sprinkler Maintenance, Testing and Water Supply Requirements

The reduction in required fire flows for sprinkler protection may be reduced or eliminated if

a) the community does not have a Fire Prevention Program that provides a system of ensuring that installed fire sprinkler systems are inspected, tested, and maintained in accordance with NFPA 25: *Standard for the Inspection, Testing, and Maintenance of Water-Based Fire Protection Systems*, or
b) the community does not maintain the pressure and flow rate requirements for fire sprinkler installations, or otherwise allows the flow rates and pressure levels that were available during sprinkler system design to significantly degrade, increasing the probability of inadequate water supply for effective sprinkler operation.

Recognition of Automatic Sprinkler Protection

A property should be considered as "sprinkler protected" for the purposes of determining required fire flows, if the building has an automatic fire sprinkler system:

- designed and installed throughout all areas in accordance with NFPA 13, *Standard for Installation of Sprinkler Systems*, and maintained in accordance with the NFPA 25, *Standard for the Inspections, Testing and Maintenance of Water-Based Fire Protection Systems*, and
- supplied by water infrastructure capable of meeting all pressure and flow requirements of the sprinkler system concurrently with Max Day Demand (if connected to a domestic system)

Evidence of the sprinkler system design, installation should be acquired from the party responsible for the building (the owner, building engineer or property manager) or the municipal fire prevention office.

On site, the sprinkler system should carry test tags verifying that a qualified person has conducted tests including:

- flushing and hydrostatic tests of both the underground and overhead piping in accordance with NFPA 13;
- full-flow main drain test within the previous 48 months.
- dry-pipe trip test (if applicable) conducted within the last 48 months
- fire-pump test (if applicable) conducted within the last 48 months

Items of Note for Sprinkler Systems

i. It is important to note that installation of automatic sprinkler systems provides a highly effective and reliable system of fire protection however, this does not preclude the need for manual fire flows entirely as some fires, for various reasons, grow beyond the capability of sprinkler protection to be effective, and in these cases, manual fire fighting intervention is required.

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December 1, 2023

1001 Noella Leclair Way

6-Storey Apartment Building A

Ottawa, Ontario

WATER DEMAND CALCULATIONS

	Number of Units	Persons per Unit	Population
1 Bedroom:	25	1.4	35.0
2 Bedroom:	27	2.1	56.7
3 Bedroom:	22	3.1	68.2
Average:	0	1.8	0.0
Total:	74		159.9

Average Daily Demand:	280	L/capita/day				
	31.1	L/min	0.5	L/s	8.2	USgpm
Maximum Daily Demand:	4.8	(Peaking factor for a population of 159.9 interpolated from MOE Design Guidelines for Drinking Water Systems Table 3-3)				
	149.7	L/min	2.5	L/s	39.5	USgpm
Maximum Hourly Demand:	7.3	(Peaking factor for a population of 159.9 interpolated from MOE Design Guidelines for Drinking Water Systems Table 3-3)				
	226.0	L/min	3.8	L/s	59.7	USgpm

Elevation of Water Meter:	87.31	m				
Basement Floor Elevation:	86.41	m				
137.9 L/s HGL:	123.1	m				
Static Pressure at Water Meter:	35.8	m	351	kPa	51	psi
Maximum HGL:	130.3	m				
Static Pressure at Water Meter:	43.0	m	421	kPa	61	psi

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December 1, 2023

1001 Noella Leclair Way

6-Storey Apartment Building B

Ottawa, Ontario

WATER DEMAND CALCULATIONS

	Number of Units	Persons per Unit	Population
1 Bedroom:	35	1.4	49.0
2 Bedroom:	48	2.1	100.8
3 Bedroom:	0	3.1	0.0
Average:	0	1.8	0.0
Total:	83		149.8

Average Daily Demand:	280	L/capita/day				
	29.1	L/min	0.5	L/s	7.7	USgpm
Maximum Daily Demand:	4.9	(Peaking factor for a population of 149.8 interpolated from MOE Design Guidelines for Drinking Water Systems Table 3-3)				
	142.9	L/min	2.4	L/s	37.8	USgpm
Maximum Hourly Demand:	7.4	(Peaking factor for a population of 149.8 interpolated from MOE Design Guidelines for Drinking Water Systems Table 3-3)				
	215.9	L/min	3.6	L/s	57.0	USgpm

Elevation of Water Meter:	87.31	m				
Basement Floor Elevation:	86.41	m				
137.9 L/s HGL:	117.3	m				
Static Pressure at Water Meter:	30.0	m	294	kPa	43	psi
Maximum HGL:	130.3	m				
Static Pressure at Water Meter:	43.0	m	421	kPa	61	psi

Boundary Conditions
1001 Noella Leclair

Provided Information

Scenario	Demand	
	L/min	L/s
Average Daily Demand	60	1.00
Maximum Daily Demand	216	3.60
Peak Hour	324	5.40
Fire Flow Demand #1	15,000	250.00

Location

Results

Demand Scenario	Head (m)	Pressure[1] (psi)
Maximum HGL	130.3	59.4
Peak Hour	126.4	53.9
Max Day plus Fire Flow	123.4	49.6

[1] Ground Elevation = 88.5 m

Results

1. Two feeds are required to avoid the creation of a vulnerable service area.
2. Head loss calculations on the dead-end watermain is required. The City does not provide BCs off dead-end watermains.

Disclaimer

The boundary condition information is based on current operation of the city water distribution system. The computer model simulation is based on the best information available at the time. The operation of the water distribution system can change on a regular basis, resulting in a variation in boundary conditions. The physical properties of watermains deteriorate over time, as such must be assumed in the absence of actual field test data. The variation in physical watermain properties can therefore alter the results of the computer model simulation. Fire Flow analysis is a reflection of available flow in the watermain; there may be additional restrictions that occur between the watermain and the hydrant that the model cannot take into account.

December 1, 2023

1001 Noella Leclair Way

Ottawa, Ontario

EPANET RESULTS

Node ID	Demand (L/s)	HGL (m)	Elevation (m)	Pressure (m)	Pressure (kPa)	Pressure (psi)
1 - Reservoir	-137.9	123.4	88.5	34.9	342	50
2 - Building A	2.5	123.1	88.7	34.4	337	49
3 - Fire Hydrant (FH-B)	95	117.8	88.3	29.5	289	42
4 - Building B	40.4	117.3	88.8	28.5	279	41

Link ID	Length (m)	Diameter (mm)	Roughness Coefficient	Minor Loss Coefficient	Flow (L/s)	Velocity (m/s)
1 - Reservoir to Building A	17.5	300	120	0.20	137.9	2.0
2 - Building A to FH-B	40.5	200	110	0.85	135.4	4.3
3 - FH-B to Building B	45	200	110	0.60	40.4	1.3

APPENDIX C

SANITARY SERVICING

D.B. Gray Engineering Inc.

Stormwater Management - Grading & Drainage - Storm & Sanitary Sewers - Watermains

700 Long Point Circle
Ottawa, Ontario K1T 4E9

613-425-8044
d.gray@dbgrayengineering.com

SANITARY SEWER CALCULATIONS

Project: 1001 Noella Leclair Way
6-Storey Apartment Buildings
Ottawa, Ontario

Date: December 1, 2023

Residential Average Daily Flow:	280	L/capita/day	Residential Peaking Factor:	Harmon Formula
Commercial Average Daily Flow:	28,000	L/ha/day	Harmon Formula Correction Factor:	0.8
Institutional Average Daily Flow:	28,000	L/ha/day	Commercial Peaking Factor:	1.5
Light Industrial Average Daily Flow:	35,000	L/ha/day	Institutional Peaking Factor:	1.5
Heavy Industrial Average Daily Flow:	55,000	L/ha/day	Industrial Peaking Factor:	Ministry of the Environment
Infiltration Allowance:	0.33	L/s/ha	Manning's Roughness Coefficient:	0.013

		Residential													Commercial				Infiltration			Q	Sewer Data						
		Individual									Cumulative				Individual	Cumulative			Individual	Cumulative									
Location		Single	Semi	Duplex	Apartment	Apartment	Apartment	Apartment	Area	Population	Area	Population	Peaking	Flow Rate	Area	Area	Peaking	Flow Rate	Area	Area	Flow Rate	Total	Length	Nominal	Actual	Slope	Velocity	Q_{Full}	
From	To	Family	Detached		(1 Bed)	(2 Bed)	(3 Bed)	(Average)	(ha)		(ha)		Factor	(L/s)	(ha)	(ha)	Factor	(L/s)	(ha)	(ha)	(L/s)	Flow Rate (L/s)	(m)	Diameter (mm)	Diameter (mm)	(%)	(m/s)	Capacity (L/s)	Q / Q_{Full}
		ppu = 3.4	ppu = 2.7	ppu = 2.3	ppu = 1.4	ppu = 2.1	ppu = 3.1	ppu = 1.8																					
Building B	MH-SA.1				35	48			0.4627	149.8	0.4627	149.8	3.2	1.55					0.4627	0.4627	0.15	1.71	14.2	150	150	1	0.86	15.23	11%
MH-SA.1	MH-SA.2								0.0000	0.0	0.4627	149.8	3.2	1.55					0.0000	0.4627	0.15	1.71	93.5	200	200	0.32	0.59	18.55	9%
Building A	MH-SA.2				25	27	22		0.4627	159.9	0.4627	159.9	3.2	1.66					0.4627	0.4627	0.15	1.81	15.2	150	150	1	0.86	15.23	12%
MH-SA.2	375 SAN								0.0000	0.0	0.9254	309.7	3.2	3.21					0.0000	0.9254	0.31	3.52	16.5	200	200	1.11	1.10	34.56	10%
																						Existing 375 mm Lady Pellatt Street Municipal Sanitary Sewer:	375	375	0.21	0.73	80.35	

APPENDIX D

STORMWATER MANAGEMENT

SUMMARY TABLES

100-YEAR EVENT				
Drainage Area	Maximum Allowable Release Rate (L/s)	Maximum Release Rate (L/s)	Maximum Volume Required (cu.m)	Maximum Volume Stored (cu.m)
AREA I (Uncontrolled Flow Off Site)	-	8.49	-	-
AREA II	-	37.78	382.70	382.70
TOTAL	46.27	46.27	382.70	382.70

5-YEAR EVENT				
Drainage Area	Maximum Allowable Release Rate (L/s)	Maximum Release Rate (L/s)	Maximum Volume Required (cu.m)	Maximum Volume Stored (cu.m)
AREA I (Uncontrolled Flow Off Site)	-	4.35	-	-
AREA II	-	27.19	183.89	183.89
TOTAL	46.27	31.54	183.89	183.89

December 1, 2023

1001 Noella Leclair Way

Ottawa, Ontario

STORMWATER MANAGEMENT CALCULATIONS

Modified Rational Method

MAXIMUM ALLOWABLE RELEASE RATE

Area (A):	9,254	sq.m
Criterion	50	L/s/ha
Maximum Allowable Release Rate:	46.27	L/s

100-YEAR EVENT

DRAINAGE AREA I (Uncontrolled Flow Off Site)

(100-YEAR EVENT)

			C
Roof Area:	0	sq.m	1.00
Hard Area:	135	sq.m	1.00
Gravel Area:	0	sq.m	0.875
Soft Area:	144	sq.m	0.25
Total Catchment Area:	279	sq.m	0.61
Area (A):	279	sq.m	
Time of Concentration:	10	min	
Rainfall Intensity (i):	179	mm/hr	
Runoff Coeficient (C):	0.61		
Flow Rate (2.78AiC):	8.49	L/s	

DRAINAGE AREA II

(100-YEAR EVENT)

			C
Roof Area:	2,720	sq.m	1.00
Hard Area:	4,750	sq.m	1.00
Gravel Area:	0	sq.m	0.875
Soft Area:	1,505	sq.m	0.25
Total Catchment Area:	8,975	sq.m	0.87

Water Elevation:	88.58	m
Head:	2.23	m
Centroid of ICD Orifice:	86.34	m
Invert of Outlet Pipe of MH-23:	86.29	m
Orifice Diameter:	109	mm
Orifice Area:	9,360	sq.mm
Discharge Coefficient:	0.61	
Maximum Release Rate:	37.78	L/s

Surface Storage

CB/MH	Top Area	Depth	Volume	
CB-11	336	0.18	19.74	cu.m
CB-14	226	0.15	11.01	cu.m
CB-19	294	0.18	17.31	cu.m

Chamber Storage

No. of Chambers	Volume Per Chamber	No. of Rows	No. of End Caps	Volume Per End Cap	Volume	
54	3.22	2	4	0.43	175.60	cu.m

Clear Stone Storage

Length	Width	Depth	Volume	40% Voids	
60.231	4.852	1.46	251.07	100.43	cu.m

DRAINAGE AREA II (Continued)

(100-YEAR EVENT)

CB/MH Storage

CB/MH	Invert	Size	Volume	
CB-1	87.53	0.61	0.39	cu.m
CB-2	87.77	0.61	0.30	cu.m
CB-3	87.73	0.61	0.31	cu.m
CB-4	87.71	0.61	0.32	cu.m
CB-5	87.68	0.61	0.33	cu.m
CB-6	87.65	0.61	0.34	cu.m
CB-7	87.64	0.61	0.35	cu.m
CB-8	87.53	0.61	0.39	cu.m
MH-9	87.52	1.219	1.23	cu.m
CB-10	87.53	0.61	0.39	cu.m
CB-11	87.35	0.61	0.46	cu.m
MH-12	87.32	1.219	1.47	cu.m
CB/MH-13	86.43	1.219	2.51	cu.m
CB-14	87.38	0.61	0.45	cu.m
CB/MH-15	86.42	1.219	2.52	cu.m
CB-16	87.53	0.61	0.39	cu.m
CB/MH-17	87.46	1.219	1.30	cu.m
CB/MH-18	87.39	1.219	1.38	cu.m
CB-19	87.35	0.61	0.46	cu.m
CB/MH-20	86.37	1.219	2.58	cu.m
CB/MH-21	87.53	1.219	1.22	cu.m
CB/MH-22	87.30	1.219	1.49	cu.m
MH-23	86.29	1.219	2.67	cu.m

Pipe Storage

From	Invert	To	Invert	Length	Diameter	Volume	
CB-1	87.53	MH-9	87.52	2.1	250	0.10	cu.m
MH-9	87.52	MH-12	87.33	76.8	375	8.48	cu.m
CB-10	87.53	MH-12	87.48	12	250	0.59	cu.m
MH-12	87.32	CB/MH-13	87.22	39.2	375	4.33	cu.m
CB/MH-13	86.43	CB/MH-15	86.42	2.3	375	0.25	cu.m
CB/MH-15	86.42	CB/MH-20	86.37	18.7	375	2.07	cu.m
CB-16	87.53	CB/MH-17	87.46	16.1	250	0.79	cu.m
CB/MH-17	87.46	CB/MH-18	87.39	19.8	300	1.40	cu.m
CB/MH-18	87.39	CB/MH-20	87.22	68	375	7.51	cu.m
CB/MH-20	86.37	MH-23	86.29	37.9	456	6.19	cu.m
CB/MH-21	87.53	CB/MH-22	87.30	51.7	250	2.54	cu.m
CB/MH-22	87.30	MH-23	87.20	22.7	250	1.11	cu.m

Maximum Volume Stored: 382.70 cu.m

Maximum Volume Required: 382.70 cu.m

DRAINAGE AREA II (Continued)

(100-YEAR EVENT)

Time (min)	i (mm/hr)	2.78AiC (L/s)	50% Release Rate (L/s)	Stored Rate (L/s)	Required Storage Volume (cu.m)
10	179	389.48	18.89	370.59	222.35
15	143	311.69	18.89	292.80	263.52
20	120	261.64	18.89	242.75	291.30
25	104	226.52	18.89	207.62	311.44
30	92	200.39	18.89	181.50	326.69
35	83	180.13	18.89	161.23	338.59
40	75	163.91	18.89	145.02	348.05
45	69	150.62	18.89	131.72	355.66
50	64	139.50	18.89	120.61	361.82
55	60	130.05	18.89	111.16	366.84
60	56	121.92	18.89	103.03	370.90
65	53	114.84	18.89	95.94	374.18
70	50	108.60	18.89	89.71	376.79
75	47	103.08	18.89	84.18	378.83
80	45	98.14	18.89	79.24	380.37
85	43	93.69	18.89	74.80	381.49
90	41	89.67	18.89	70.78	382.22
95	39	86.02	18.89	67.13	382.61
100	38	82.68	18.89	63.78	382.70
105	36	79.61	18.89	60.72	382.52
110	35	76.79	18.89	57.89	382.10
115	34	74.17	18.89	55.28	381.45
120	33	71.75	18.89	52.86	380.59
125	32	69.50	18.89	50.61	379.55
130	31	67.40	18.89	48.50	378.34
135	30	65.43	18.89	46.54	376.96
140	29	63.59	18.89	44.70	375.44
145	28	61.86	18.89	42.96	373.79
150	28	60.23	18.89	41.33	372.00
180	24	52.14	18.89	33.25	359.05
210	21	46.12	18.89	27.23	343.09
240	19	41.46	18.89	22.56	324.92
270	17	37.72	18.89	18.83	305.07
300	16	34.66	18.89	15.77	283.88

STRESS TEST EVENT

DRAINAGE AREA I (Uncontrolled Flow Off Site)

(STRESS TEST EVENT)

			C
Roof Area:	0	sq.m	1.00
Hard Area:	135	sq.m	1.00
Gravel Area:	0	sq.m	0.875
Soft Area:	144	sq.m	0.25
Total Catchment Area:	279	sq.m	0.61
Area (A):	279	sq.m	
Time of Concentration:	10	min	
Rainfall Intensity (i):	214	mm/hr	
Runoff Coeficient (C):	0.61		
Flow Rate (2.78AiC):	10.19	L/s	

DRAINAGE AREA II

(STRESS TEST EVENT)

			C
Roof Area:	2,720	sq.m	1.00
Hard Area:	4,750	sq.m	1.00
Gravel Area:	0	sq.m	0.875
Soft Area:	1,505	sq.m	0.25
Total Catchment Area:	8,975	sq.m	0.87

Water Elevation:	88.58	m
Head:	2.24	m
Centroid of ICD Orifice:	86.34	m
Invert of Outlet Pipe of MH-23:	86.29	m
Orifice Diameter:	109	mm
Orifice Area:	9,360	sq.mm
Discharge Coefficient:	0.61	
Maximum ICD Release Rate:	37.81	L/s
Maximum Overflow Release Rate:	20.24	L/s
Total Maximum Release Rate:	58.06	

Surface Storage

CB/MH	Top Area	Depth	Volume	
CB-11	349	0.18	20.94	cu.m
CB-14	237	0.15	11.83	cu.m
CB-19	306	0.18	18.36	cu.m

Chamber Storage

No. of Chambers	Volume Per Chamber	No. of Rows	No. of End Caps	Volume Per End Cap	Volume	
54	3.22	2	4	0.43	175.60	cu.m

Clear Stone Storage

Length	Width	Depth	Volume	40% Voids	
60.231	4.852	1.46	251.07	100.43	cu.m

DRAINAGE AREA II (Continued)

(STRESS TEST EVENT)

CB/MH Storage

CB/MH	Invert	Size	Volume	
CB-1	87.53	0.61	0.39	cu.m
CB-2	87.77	0.61	0.30	cu.m
CB-3	87.73	0.61	0.32	cu.m
CB-4	87.71	0.61	0.32	cu.m
CB-5	87.68	0.61	0.33	cu.m
CB-6	87.65	0.61	0.35	cu.m
CB-7	87.64	0.61	0.35	cu.m
CB-8	87.53	0.61	0.39	cu.m
MH-9	87.52	1.219	1.24	cu.m
CB-10	87.53	0.61	0.39	cu.m
CB-11	87.35	0.61	0.46	cu.m
MH-12	87.32	1.219	1.47	cu.m
CB/MH-13	86.43	1.219	2.51	cu.m
CB-14	87.38	0.61	0.45	cu.m
CB/MH-15	86.42	1.219	2.52	cu.m
CB-16	87.53	0.61	0.39	cu.m
CB/MH-17	87.46	1.219	1.31	cu.m
CB/MH-18	87.39	1.219	1.39	cu.m
CB-19	87.35	0.61	0.46	cu.m
CB/MH-20	86.37	1.219	2.58	cu.m
CB/MH-21	87.53	1.219	1.23	cu.m
CB/MH-22	87.30	1.219	1.49	cu.m
MH-23	86.29	1.219	2.67	cu.m

Pipe Storage

From	Invert	To	Invert	Length	Diameter	Volume	
CB-1	87.53	MH-9	87.52	2.1	250	0.10	cu.m
MH-9	87.52	MH-12	87.33	76.8	375	8.48	cu.m
CB-10	87.53	MH-12	87.48	12.0	250	0.59	cu.m
MH-12	87.32	CB/MH-13	87.22	39	375	4.33	cu.m
CB/MH-13	86.43	CB/MH-15	86.42	2.3	375	0.25	cu.m
CB/MH-15	86.42	CB/MH-20	86.37	18.7	375	2.07	cu.m
CB-16	87.53	CB/MH-17	87.46	16.1	250	0.79	cu.m
CB/MH-17	87.46	CB/MH-18	87.39	19.8	300	1.40	cu.m
CB/MH-18	87.39	CB/MH-20	87.22	68.0	375	7.51	cu.m
CB/MH-20	86.37	MH-23	86.29	37.9	456	6.19	cu.m
CB/MH-21	87.53	CB/MH-22	87.30	51.7	250	2.54	cu.m
CB/MH-22	87.30	MH-23	87.20	22.7	250	1.11	cu.m

Maximum Volume Stored: 385.82 cu.m

Maximum Volume Required: 385.82 cu.m

DRAINAGE AREA II (Continued)

(STRESS TEST EVENT)

Time (min)	i (mm/hr)	2.78AiC (L/s)	50% Release Rate (L/s)	Overflow Release Rate (L/s)	Total Release Rate (L/s)	Stored Rate (L/s)	Required Storage Volume (cu.m)
10	214	467.38	18.91	0.00	18.91	448.47	269.08
15	171	374.03	18.91	0.00	18.91	355.12	319.61
20	144	313.97	18.91	0.00	18.91	295.06	354.08
25	125	271.82	18.91	0.00	18.91	252.91	379.37
30	110	240.47	18.91	7.21	26.12	214.34	385.82
35	99	216.15	18.91	13.52	32.43	183.72	385.82
40	90	196.69	18.91	17.03	35.94	160.76	385.82
45	83	180.74	18.91	18.94	37.84	142.90	385.82
50	77	167.40	18.91	19.89	38.79	128.61	385.82
55	72	156.07	18.91	20.24	39.15	116.92	385.82
60	67	146.30	18.91	20.23	39.13	107.17	385.82
65	63	137.80	18.91	19.97	38.87	98.93	385.82
70	60	130.32	18.91	19.56	38.46	91.86	385.82
75	57	123.69	18.91	19.05	37.95	85.74	385.82
80	54	117.76	18.91	18.48	37.38	80.38	385.82
85	52	112.43	18.91	17.87	36.78	75.65	385.82
90	49	107.61	18.91	17.25	36.16	71.45	385.82
95	47	103.22	18.91	16.63	35.53	67.69	385.82
100	45	99.21	18.91	16.00	34.91	64.30	385.82
105	44	95.53	18.91	15.38	34.29	61.24	385.82
110	42	92.14	18.91	14.78	33.69	58.46	385.82
115	41	89.01	18.91	14.19	33.09	55.92	385.82
120	39	86.10	18.91	13.61	32.52	53.59	385.82
125	38	83.40	18.91	13.05	31.96	51.44	385.82
130	37	80.88	18.91	12.51	31.41	49.46	385.82
135	36	78.52	18.91	11.98	30.89	47.63	385.82
140	35	76.31	18.91	11.47	30.37	45.93	385.82
145	34	74.23	18.91	10.97	29.88	44.35	385.82
150	33	72.27	18.91	10.50	29.40	42.87	385.82
180	29	62.57	18.91	7.93	26.84	35.72	385.82
210	25	55.35	18.91	5.82	24.73	30.62	385.82
240	23	49.75	18.91	4.05	22.95	26.79	385.82
270	21	45.27	18.91	2.55	21.45	23.82	385.82
300	19	41.60	18.91	1.25	20.16	21.43	385.82
330	18	38.53	18.91	0.13	19.04	19.49	385.82
360	16	35.92	18.91	0.00	18.91	17.01	367.40

5-YEAR EVENT

DRAINAGE AREA I (Uncontrolled Flow Off Site)

(5-YEAR EVENT)

			C
Roof Area:	0	sq.m	0.90
Hard Area:	135	sq.m	0.90
Gravel Area:	0	sq.m	0.70
Soft Area:	144	sq.m	0.20
Total Catchment Area:	279	sq.m	0.54
Area (A):	279	sq.m	
Time of Concentration:	10	min	
Rainfall Intensity (i):	104	mm/hr	
Runoff Coeficient (C):	0.54		
Flow Rate (2.78AiC):	4.35	L/s	

DRAINAGE AREA II

(5-YEAR EVENT)

			C
Roof Area:	2,720	sq.m	0.90
Hard Area:	4,750	sq.m	0.90
Gravel Area:	0	sq.m	0.70
Soft Area:	1,505	sq.m	0.20
Total Catchment Area:	8,975	sq.m	0.78

Water Elevation:	87.50	m
Head:	1.16	m
Centroid of ICD Orifice:	86.34	m
Invert of Outlet Pipe of MH-23:	86.29	m
Orifice Diameter:	109	mm
Orifice Area:	9,360	sq.mm
Discharge Coefficient:	0.61	
Maximum Release Rate:	27.19	L/s

Surface Storage

CB/MH	Top Area	Depth	Volume	
CB-11	0	-0.90	0.00	cu.m
CB-14	0	-0.93	0.00	cu.m
CB-19	0	-0.90	0.00	cu.m

Chamber Storage

No. of Chambers	Stage Volume	No. of Rows	No. of End Caps	Stage Volume	Volume	
54	2.400	2	4	0.361	131.04	cu.m

Clear Stone Storage

Length	Width	Depth	Volume	40% Voids	
60.231	4.852	0.69	70.62	28.25	cu.m

DRAINAGE AREA II (Continued)

(5-YEAR EVENT)

CB/MH Storage

CB/MH	Invert	Size	Volume	
CB-1	87.53	0.61	0.00	cu.m
CB-2	87.77	0.61	0.00	cu.m
CB-3	87.73	0.61	0.00	cu.m
CB-4	87.71	0.61	0.00	cu.m
CB-5	87.68	0.61	0.00	cu.m
CB-6	87.65	0.61	0.00	cu.m
CB-7	87.64	0.61	0.00	cu.m
CB-8	87.53	0.61	0.00	cu.m
MH-9	87.52	1.219	0.00	cu.m
CB-10	87.53	0.61	0.00	cu.m
CB-11	87.35	0.61	0.06	cu.m
MH-12	87.32	1.219	0.21	cu.m
CB/MH-13	86.43	1.219	1.25	cu.m
CB-14	87.38	0.61	0.04	cu.m
CB/MH-15	86.42	1.219	1.26	cu.m
CB-16	87.53	0.61	0.00	cu.m
CB/MH-17	87.46	1.219	0.05	cu.m
CB/MH-18	87.39	1.219	0.13	cu.m
CB-19	87.35	0.61	0.06	cu.m
CB/MH-20	86.37	1.219	1.32	cu.m
CB/MH-21	87.53	1.219	0.00	cu.m
CB/MH-22	87.30	1.219	0.23	cu.m
MH-23	86.29	1.219	1.41	cu.m

Pipe Storage

From	Invert	To	Invert	Length	Diameter	Volume	
CB-1	87.53	MH-9	87.52	2.1	250	0.00	cu.m
MH-9	87.52	MH-12	87.33	76.8	375	1.21	cu.m
CB-10	87.53	MH-12	87.48	12.0	250	0.00	cu.m
MH-12	87.32	CB/MH-13	87.22	39	375	2.77	cu.m
CB/MH-13	86.43	CB/MH-15	86.42	2.3	375	0.25	cu.m
CB/MH-15	86.42	CB/MH-20	86.37	18.7	375	2.07	cu.m
CB-16	87.53	CB/MH-17	87.46	16.1	250	0.00	cu.m
CB/MH-17	87.46	CB/MH-18	87.39	19.8	300	0.27	cu.m
CB/MH-18	87.39	CB/MH-20	87.22	68.0	375	3.95	cu.m
CB/MH-20	86.37	MH-23	86.29	37.9	456	6.19	cu.m
CB/MH-21	87.53	CB/MH-22	87.30	51.7	250	0.76	cu.m
CB/MH-22	87.30	MH-23	87.20	22.7	250	1.11	cu.m

Maximum Volume Stored: 183.89 cu.m

Maximum Volume Required: 183.89 cu.m

DRAINAGE AREA II (Continued)

(5-YEAR EVENT)

Time (min)	i (mm/hr)	2.78AiC (L/s)	50% Release Rate (L/s)	Stored Rate (L/s)	Required Storage Volume (cu.m)
10	104	203.45	13.59	189.86	113.92
15	84	163.16	13.59	149.57	134.61
20	70	137.18	13.59	123.58	148.30
25	61	118.91	13.59	105.32	157.98
30	54	105.30	13.59	91.71	165.08
35	49	94.74	13.59	81.15	170.41
40	44	86.28	13.59	72.68	174.44
45	41	79.33	13.59	65.74	177.50
50	38	73.52	13.59	59.93	179.79
55	35	68.58	13.59	54.99	181.47
60	33	64.33	13.59	50.73	182.64
65	31	60.62	13.59	47.02	183.40
70	29	57.35	13.59	43.76	183.79
75	28	54.46	13.59	40.86	183.89
80	27	51.87	13.59	38.27	183.71
85	25	49.54	13.59	35.94	183.31
90	24	47.43	13.59	33.83	182.70
95	23	45.51	13.59	31.91	181.91
100	22	43.75	13.59	30.16	180.96
105	22	42.14	13.59	28.55	179.87
110	21	40.66	13.59	27.07	178.64
115	20	39.29	13.59	25.69	177.29
120	19	38.01	13.59	24.42	175.83
125	19	36.83	13.59	23.24	174.27
130	18	35.72	13.59	22.13	172.61
135	18	34.69	13.59	21.10	170.88
140	17	33.72	13.59	20.13	169.06
145	17	32.81	13.59	19.21	167.17
150	16	31.95	13.59	18.36	165.21
180	14	27.69	13.59	14.10	152.23
210	13	24.52	13.59	10.92	137.63
240	11	22.05	13.59	8.46	121.84
270	10	20.08	13.59	6.49	105.13
300	9	18.47	13.59	4.87	87.69

CDS ESTIMATED NET ANNUAL SOLIDS LOAD REDUCTION
BASED ON THE RATIONAL RAINFALL METHOD
BASED ON A FINE PARTICLE SIZE DISTRIBUTION

Project Name:	1001 Noella Leclair Way	**Engineer:**	**D.B Gray Engineering Inc.**
Location:	Ottawa, ON	**Contact:**	Ryan Faith
OGS #:	OGS	**Report Date:**	21-Jun-23

Area	0.6255	ha	**Rainfall Station #**	215	
Weighted C	0.73		**Particle Size Distribution**	FINE	
CDS Model	2015-4		**CDS Treatment Capacity**	20	l/s

Rainfall Intensity[1] (mm/hr)	Percent Rainfall Volume[1]	Cumulative Rainfall Volume	Total Flowrate (l/s)	Treated Flowrate (l/s)	Operating Rate (%)	Removal Efficiency (%)	Incremental Removal (%)
0.5	9.2%	9.2%	0.6	0.6	3.2	97.9	9.0
1.0	10.6%	19.8%	1.3	1.3	6.4	97.0	10.3
1.5	9.9%	29.7%	1.9	1.9	9.6	96.1	9.5
2.0	8.4%	38.1%	2.5	2.5	12.8	95.2	8.0
2.5	7.7%	45.8%	3.2	3.2	16.0	94.3	7.2
3.0	5.9%	51.7%	3.8	3.8	19.2	93.4	5.5
3.5	4.4%	56.1%	4.4	4.4	22.4	92.4	4.0
4.0	4.7%	60.7%	5.1	5.1	25.6	91.5	4.3
4.5	3.3%	64.0%	5.7	5.7	28.8	90.6	3.0
5.0	3.0%	67.1%	6.3	6.3	32.0	89.7	2.7
6.0	5.4%	72.4%	7.6	7.6	38.4	87.8	4.7
7.0	4.4%	76.8%	8.9	8.9	44.8	86.0	3.7
8.0	3.5%	80.3%	10.2	10.2	51.2	84.2	3.0
9.0	2.8%	83.2%	11.4	11.4	57.6	82.3	2.3
10.0	2.2%	85.3%	12.7	12.7	64.0	80.5	1.8
15.0	7.0%	92.3%	19.0	19.0	96.0	71.3	5.0
20.0	4.5%	96.9%	25.4	19.8	100.0	54.8	2.5
25.0	1.4%	98.3%	31.7	19.8	100.0	43.8	0.6
30.0	0.7%	99.0%	38.1	19.8	100.0	36.5	0.2
35.0	0.5%	99.5%	44.4	19.8	100.0	31.3	0.1
40.0	0.5%	100.0%	50.8	19.8	100.0	27.4	0.1
45.0	0.0%	100.0%	57.1	19.8	100.0	24.4	0.0
50.0	0.0%	100.0%	63.5	19.8	100.0	21.9	0.0
							87.8

Removal Efficiency Adjustment[2] = 6.5%

Predicted Net Annual Load Removal Efficiency = 81.3%

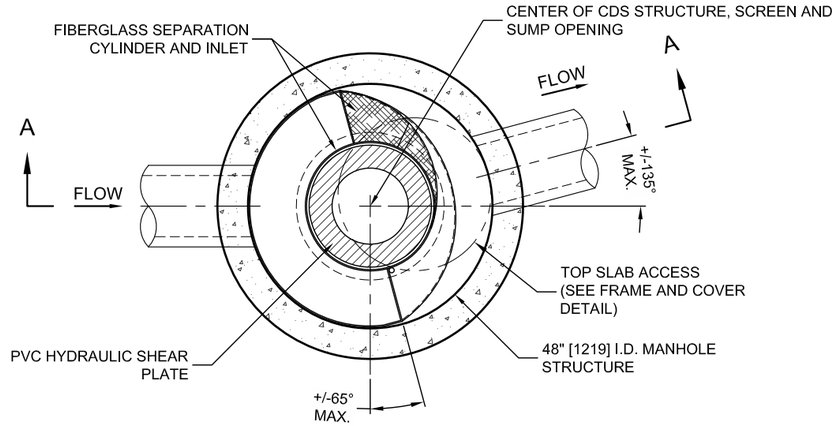
Predicted % Annual Rainfall Treated = 97.5%

1 - Based on 42 years of hourly rainfall data from Canadian Station 6105976, Ottawa ON

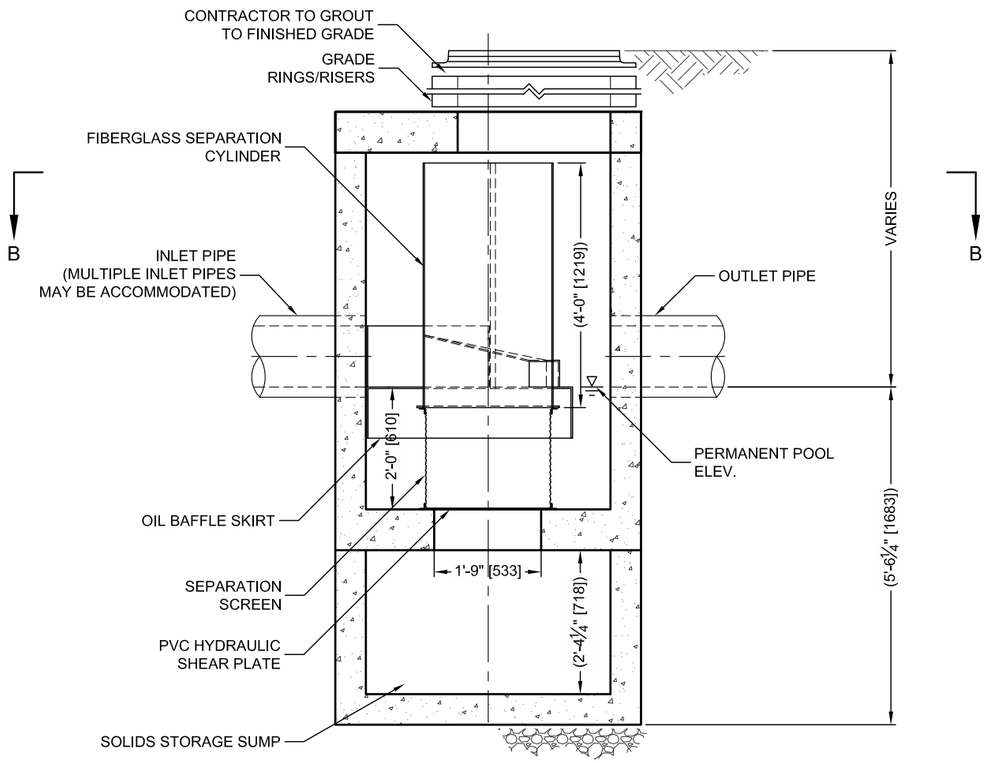
2 - Reduction due to use of 60-minute data for a site that has a time of concentration less than 30-minutes.

3 - CDS Efficiency based on testing conducted at the University of Central Florida

4 - CDS design flowrate and scaling based on standard manufacturer model & product specifications



PLAN VIEW B-B
N.T.S.



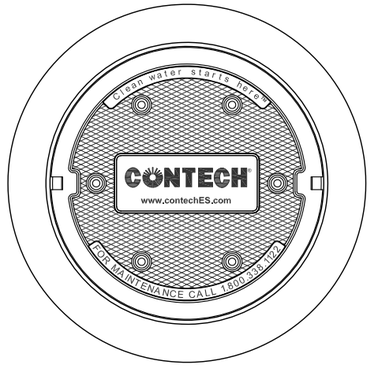
ELEVATION A-A
N.T.S.

THIS PRODUCT MAY BE PROTECTED BY ONE OR MORE OF THE FOLLOWING U.S. PATENTS: 5,788,848; 6,641,720; 8,511,500; 6,581,783; RELATED FOREIGN PATENTS, OR OTHER PATENTS PENDING.

CDS PMSU2015-4-C DESIGN NOTES

THE STANDARD CDS PMSU2015-4-C CONFIGURATION IS SHOWN. ALTERNATE CONFIGURATIONS ARE AVAILABLE AND ARE LISTED BELOW. SOME CONFIGURATIONS MAY BE COMBINED TO SUIT SITE REQUIREMENTS.

CONFIGURATION DESCRIPTION
GRATED INLET ONLY (NO INLET PIPE)
GRATED INLET WITH INLET PIPE OR PIPES
CURB INLET ONLY (NO INLET PIPE)
CURB INLET WITH INLET PIPE OR PIPES
CUSTOMIZABLE SUMP DEPTH AVAILABLE
ANTI-FLOTATION DESIGN AVAILABLE UPON REQUEST



FRAME AND COVER
(DIAMETER VARIES)
N.T.S.

SITE SPECIFIC DATA REQUIREMENTS

STRUCTURE ID	
WATER QUALITY FLOW RATE (CFS OR L/s)	*
PEAK FLOW RATE (CFS OR L/s)	*
RETURN PERIOD OF PEAK FLOW (YRS)	*
SCREEN APERTURE (2400 OR 4700)	*

PIPE DATA:	I.E.	MATERIAL	DIAMETER
INLET PIPE 1	*	*	*
INLET PIPE 2	*	*	*
OUTLET PIPE	*	*	*

RIM ELEVATION	*

ANTI-FLOTATION BALLAST	WIDTH	HEIGHT
	*	*

NOTES/SPECIAL REQUIREMENTS:

* PER ENGINEER OF RECORD

GENERAL NOTES
1. CONTECH TO PROVIDE ALL MATERIALS UNLESS NOTED OTHERWISE.
2. DIMENSIONS MARKED WITH ( ) ARE REFERENCE DIMENSIONS. ACTUAL DIMENSIONS MAY VARY.
3. FOR FABRICATION DRAWINGS WITH DETAILED STRUCTURE DIMENSIONS AND WEIGHTS, PLEASE CONTACT YOUR CONTECH ENGINEERED SOLUTIONS LLC REPRESENTATIVE. www.contechES.com
4. CDS WATER QUALITY STRUCTURE SHALL BE IN ACCORDANCE WITH ALL DESIGN DATA AND INFORMATION CONTAINED IN THIS DRAWING.
5. STRUCTURE SHALL MEET AASHTO HS20 AND CASTINGS SHALL MEET HS20 (AASHTO M 306) LOAD RATING, ASSUMING GROUNDWATER ELEVATION AT, OR BELOW, THE OUTLET PIPE INVERT ELEVATION. ENGINEER OF RECORD TO CONFIRM ACTUAL GROUNDWATER ELEVATION.
6. PVC HYDRAULIC SHEAR PLATE IS PLACED ON SHELF AT BOTTOM OF SCREEN CYLINDER. REMOVE AND REPLACE AS NECESSARY DURING MAINTENANCE CLEANING.

INSTALLATION NOTES
A. ANY SUB-BASE, BACKFILL DEPTH, AND/OR ANTI-FLOTATION PROVISIONS ARE SITE-SPECIFIC DESIGN CONSIDERATIONS AND SHALL BE SPECIFIED BY ENGINEER OF RECORD.
B. CONTRACTOR TO PROVIDE EQUIPMENT WITH SUFFICIENT LIFTING AND REACH CAPACITY TO LIFT AND SET THE CDS MANHOLE STRUCTURE (LIFTING CLUTCHES PROVIDED).
C. CONTRACTOR TO ADD JOINT SEALANT BETWEEN ALL STRUCTURE SECTIONS, AND ASSEMBLE STRUCTURE.
D. CONTRACTOR TO PROVIDE, INSTALL, AND GROUT PIPES. MATCH PIPE INVERTS WITH ELEVATIONS SHOWN.
E. CONTRACTOR TO TAKE APPROPRIATE MEASURES TO ASSURE UNIT IS WATER TIGHT, HOLDING WATER TO FLOWLINE INVERT MINIMUM. IT IS SUGGESTED THAT ALL JOINTS BELOW PIPE INVERTS ARE GROUTED.

CONTECH® ENGINEERED SOLUTIONS LLC
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9025 Centre Pointe Dr., Suite 400, West Chester, OH 45069
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CDS PMSU2015-4-C INLINE CDS STANDARD DETAIL

D.B. Gray Engineering Inc.

Stormwater Management - Grading & Drainage - Storm & Sanitary Sewers - Watermains

700 Long Point Circle
Ottawa, Ontario K1T 4E9

613-425-8044
d.gray@dbgrayengineering.com

STORM SEWER CALCULATIONS

Rational Method

2-YEAR EVENT

Project: 1001 Noella Leclair Way
6-Storey Apartment Buildings
Ottawa, Ontario

Date: December 1, 2023

Manning's Roughness Coefficient: 0.013

Location		Individual					Cumulative				Sewer Data							
From	To	Roof C = 0.90 (ha)	Hard C = 0.90 (ha)	Gravel C = 0.70 (ha)	Soft C = 0.20 (ha)	2.78AC	2.78AC	Time (min)	Rainfall Intensity (mm/hr)	Q Flow Rate (L/s)	Length (m)	Nominal Diameter (mm)	Actual Diameter (mm)	Slope (%)	Velocity (m/s)	Q_{Full} Capacity (L/s)	Time (min)	Q / Q_{Full}
CB-1	MH-9	0.0110			0.0120	0.0342	0.0342	10.00	77	2.63	2.1	250	250	0.432	0.80	39.09	0.04	7%
CB-2	MH-9	0.0110			0.0020	0.0286	0.0286	10.00	77	2.20	2.1	250	250	0.432	0.80	39.09	0.04	6%
CB-3	MH-9	0.0110			0.0035	0.0295	0.0295	10.00	77	2.26	2.1	250	250	0.432	0.80	39.09	0.04	6%
CB-4	MH-9	0.0110			0.0030	0.0292	0.0292	10.00	77	2.24	2.1	250	250	0.432	0.80	39.09	0.04	6%
CB-5	MH-9	0.0110			0.0030	0.0292	0.0292	10.00	77	2.24	2.1	250	250	0.432	0.80	39.09	0.04	6%
CB-6	MH-9	0.0110			0.0030	0.0292	0.0292	10.00	77	2.24	2.1	250	250	0.432	0.80	39.09	0.04	6%
CB-7	MH-9	0.0110			0.0010	0.0281	0.0281	10.00	77	2.16	2.1	250	250	0.432	0.80	39.09	0.04	6%
CB-8	MH-9	0.0110			0.0050	0.0303	0.0303	10.00	77	2.33	2.1	250	250	6	2.97	145.67	0.01	2%
MH-9	MH-12					0.0000	0.2382	10.04	77	18.26	76.8	375	375	0.25	0.79	87.67	1.61	21%
CB-10	MH-12		0.0195		0.0250	0.0627	0.0627	10.00	77	4.81	12	250	250	0.432	0.80	39.09	0.25	12%
CB-11	MH-12	0.0110	0.0615		0.0100	0.1870	0.1870	10.00	77	14.36	3.9	250	250	0.432	0.80	39.09	0.08	37%
MH-12	CB/MH-13					0.0000	0.4879	11.66	71	34.63	39.2	375	375	0.25	0.79	87.67	0.82	40%
CB/MH-13	CB/MH-15					0.0000	0.4879	12.48	68	33.39	2.3	375	375	0.25	0.79	87.67	0.05	38%
CB-14	CB/MH-15	0.0390	0.1635		0.0210	0.5183	0.5183	10.00	77	39.81	3	250	250	0.45	0.81	39.89	0.06	100%
CB/MH-15	CB/MH-20					0.0000	1.0062	12.53	68	68.72	18.7	375	375	0.25	0.79	87.67	0.39	78%
CB-16	CB/MH-17	0.0110			0.0090	0.0325	0.0325	10.00	77	2.50	16.1	250	250	0.432	0.80	39.09	0.34	6%
CB/MH-17	CB/MH-18	0.0110	0.0840		0.0060	0.2410	0.2736	10.34	76	20.66	19.8	300	300	0.34	0.80	56.39	0.41	37%
CB/MH-18	CB/MH-20	0.0280	0.0835		0.0070	0.2829	0.5564	10.75	74	41.20	68	375	375	0.25	0.79	87.67	1.43	47%
CB-19	CB/MH-20	0.0280	0.0550		0.0115	0.2141	0.2141	10.00	77	16.44	4	250	250	0.432	0.80	39.09	0.08	42%
CB/MH-20	MH-23					0.0000	1.7767	12.92	67	119.31	37.9	450	456	0.195	0.80	130.43	0.79	91%
CB/MH-21	CB/MH-22	0.0280			0.0200	0.0812	0.0812	10.00	77	6.23	51.7	250	250	0.432	0.80	39.09	1.08	16%
CB/MH-22	MH-23	0.0280	0.0080		0.0085	0.0948	0.1760	11.08	73	12.83	22.7	250	250	0.432	0.80	39.09	0.48	33%
MH-23	MH-24					0.0000	1.9527	13.71	65	126.90	4.2	250	250	6.15	3.00	147.47	0.02	86%
						5-year event flow through inlet control device:				27.19	4.2	250	250	6.15	3.00	147.47	0.02	18%
MH-24	1,050 ST					0.0000	1.9527	13.73	65	126.78	15.5	250	250	6.15	3.00	147.47	0.09	86%
						5-year event flow through inlet control device:				27.19	15.5	250	250	6.15	3.00	147.47	0.09	18%
										Existing 1,050 mm Lady Pellatt Street Municipal Storm Sewer:		1,050	1,068	0.15	1.24	1,107		