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Assessment of Adequacy of Public Services

2983, 3053 and 3079 Navan Road & 2690 Pagé Road

J.L.Richards
ENGINEERS · ARCHITECTS · PLANNERS

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1.0 Introduction

1.1 Background

In 2021, J.L. Richards & Associates Limited (JLR) was retained by 12714001 Canada Inc. (the Owner) to prepare a Report that would assess the adequacy of public services in support of a Draft Plan of Subdivision Application for their properties sited at 2983, 3053 and 3079 Navan Road and 2690 Pagé Road.

This Assessment of Adequacy of Public Services Report has been prepared to outline the design objectives and criteria, servicing constraints and high-level strategies for developing the subject lands with water, wastewater, storm, and stormwater management services in accordance with the following:

- the November 2009 Servicing Study Guidelines for Development Applications in the City of Ottawa (City);
- the Ottawa Sewer Design Guidelines (2012) and associated Technical Bulletins;
- the 2005 Gloucester East Urban Community (EUC) Infrastructure Servicing Study Update (ISSU) prepared by Stantec Consulting Ltd.; and
- Response E-Mail (dated January 18, 2021) on servicing requirements.

A copy of the pre-consultation meeting notes is included in Appendix A.

1.2 Site Description and Condition

The subject properties are located in the former Gloucester area within the urban limits of the City of Ottawa. The subject site comprises of four (4) properties; 2983, 3053 and 3079 Navan Road and 2690 Pagé Road, which are located west of Pagé Road, east of Brian Coburn Boulevard and north of Navan Road. As illustrated on Figure 1A below, the property is entirely vegetated. Current zoning for this ±5.34 ha parcels is GM[2546] H(14.5).

Figure 1A: Site Aerial

The Owner proposes to develop the subject properties with 69 townhouse units in 11 blocks, as well as three (3) future Blocks denoted as Blocks 1-3, and a gas station located at the Navan Road and Brian Coburn Boulevard intersection refer to location plan Figure 1. The Draft Plan of Subdivision and Conceptual Plan for the proposed development (prepared by PMA Architectes) is included in Appendix B. The topographical survey for the properties prepared by Stantec Geomatics Ltd. is also included in Appendix B.

1.3 Existing Conditions and Infrastructure

A review of existing services was carried out along the frontages of the subject properties to identify existing sewers and watermains. Based on the review of the Drawings for Pagé Road, Navan Road and Brian Coburn Boulevard obtained from the City of Ottawa (Appendix C), the following infrastructure has been identified to exist within municipal right-of-way (R.O.W.):

Watermains:

- 305 mm diameter Ductile Iron watermain along Navan Road (circ. 1976)
- 305 mm diameter Ductile Iron watermain along Pagé Road (circ. 1974)

Sanitary Sewers:

- 250 mm diameter PVC sanitary sewer along Pagé Road (circ. 2005)
- 300 mm diameter PVC sanitary forcemain along Pagé Road (circ. 2005)
- 400 mm diameter PVC sanitary forcemain along Pagé Road (circ. 2007)

Storm Sewers:

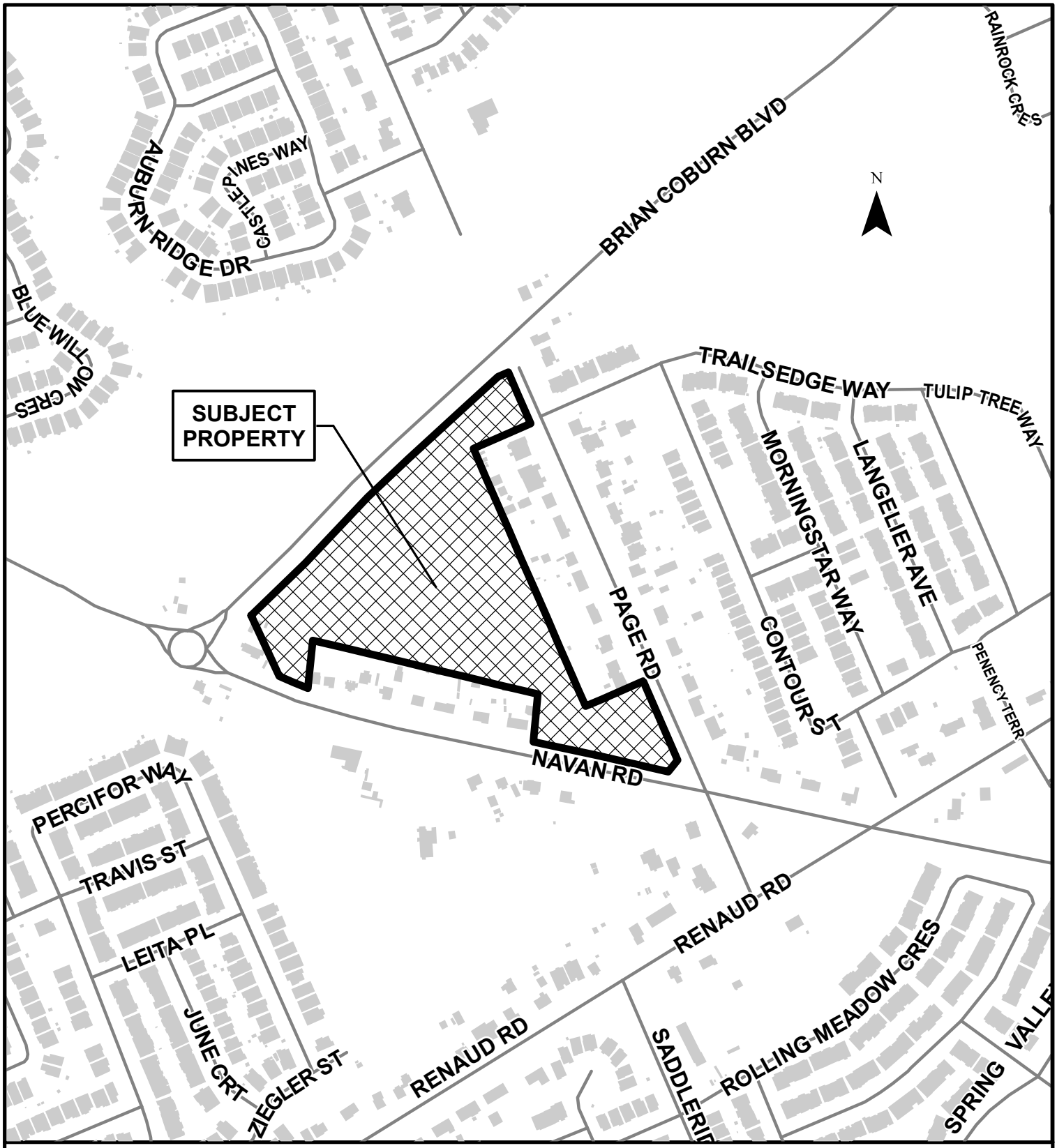
- Short section of 750 mm diameter PVC storm sewer along Navan Road (circ. 2016)
- Short section of 525 mm diameter PVC storm sewer along Brian Cobourn Boulevard (circ. 2016)

1.4 Pre-Consultation, Permits and Approvals

The pre-consultation meeting that was held on January 18, 2021 (Appendix A) summarizes the planning process and design criteria and servicing constraints. From a storm perspective, the storm discharge criteria and allowable peak flow used for the preparation of this Report is presented in Section 4.1 (below).

Once the Assessment of Adequacy of Public Services Report is approved the development of the above-referenced properties will first be subject to a Draft Plan of Subdivision. Once rezoning is approved, the subdivision will proceed into detailed design where servicing constraints would be developed for Blocks 1-3 and the gas station. Following the approval of the Subdivision, then Blocks 1-3 and the gas station could proceed under Site Plan control.

In terms of the Ministry of the Environment, Conservation and Parks (MECP) requirements, an Application for an Environmental Compliance Approval (ECA) is expected to be required for the sanitary, storm and SWM works for the subdivision including works along Navan Road. However, an Application for an ECA is not anticipated for the individual site plans blocks.



PROJECT:

12714001 CANADA INC.
2983, 3053, 3079 NAVAN ROAD
OTTAWA, ONTARIO

DRAWING:

LOCATION PLAN

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DESIGN:	TB
DRAWN:	TB
CHECKED:	LJ
JLR #:	29899

DRAWING #:

FIGURE 1

File Location: P:\29000\29899-000 - Gas Bar 3079 Navan\5-Production\1-Civil\FIGURE\29899-LocationPlan.mxd

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2.0 Water Servicing

2.1 Water Supply Design Criteria

Any additions to the City of Ottawa water distribution system must be designed in accordance with the Ottawa Design Guidelines for Water Distribution (July 2010) and Technical Bulletins ISDTB-2014-02, ISTB-2018-02 and ISTB-2021-03. The Design Guidelines require that the proposed water distribution system will satisfy the pressure constraints for the peak hour demand, maximum day demand plus fire flow, and maximum pressure in the system.

Section 4.2.2 of the Design Guidelines require that all new development additions to the public water distribution system be designed such that the minimum and maximum water pressure, as well as the fire flow rates, conform to the following:

- Under maximum hourly demand conditions (peak hour), the pressures shall not be less than 276 kPa;
- During periods of maximum day and fire flow demand, the residual pressure at any point in the distribution system shall not be less than 140 kPa (20 psi);
- In accordance with the Ontario Building Code in areas that may be occupied, the static pressure at any fixture shall not exceed 552 kPa (80 psi);
- The maximum pressure at any point in the distribution system in unoccupied areas shall not exceed 689 kPa (100 psi); and
- Feedermains, which have been provided primarily for the purpose of redundancy, shall meet, at a minimum, the basic day plus fire flow demand.

Table 2-1 summarizes the design criteria for water distribution systems, which will serve as the basis for the detailed design of the proposed watermains for the site.

Table 2-1: Water Design Criteria

Design Criteria	Design Value
Average demand	280 L/cap/day
Maximum demand	2.5 x Avg
Peak hour	2.2 x Max Day
Density Townhouse	2.7
Density Average Apt (used for Condo Units)	1.8
Commercial	
Average demand	28,000 L/gross ha/day
Fire Flow Requirements	
Municipal ROW	FUS
Private Site	OBC & NFPA 13
Pressure/Flow	
Peak hour	>276 kPa (40 psi)
Maximum day plus fire flow	>140 kPa (20 psi)
Minimum hour (maximum HGL)	<552 kPa (80 psi)

2.2 Domestic Water Demands

The estimated domestic water demands presented in this section are based on the site layout and unit count proposed in the Draft Plan (Appendix B). The proposed development consists of 69 row townhouse units, six (6) condominium buildings, and 0.27 hectares of commercial space. In total, the condominium buildings contain 263 residential units and approximately 0.19 hectares of retail space. The estimated domestic water demand distribution is presented in Appendix D1.

The residential consumption rate for average day demand was set in accordance with the City's Technical Bulletin ISTB-2021-03. Since receiving the boundary conditions from the City (see Appendix D3), a portion of the residential units in the condominium buildings have been converted into retail space. Additionally, the number of row townhouse units within the proposed development has reduced. As a result of these changes, the boundary conditions provided by the City are expected to remain applicable while providing a more conservative design. The water demand calculations for the latest site layout and unit count can be found in Appendix D1. Table 2-2 summarizes the theoretical water demand results based on the proposed site details and the Design Guidelines.

Table 2-2: Theoretical Water Demands

Demand Scenario	Residential Water Demand (L/s)	Commercial Water Demand (L/s)	Total Water Demand (L/s)
Average Day	2.14	0.09	2.23
Maximum Day	5.34	0.13	5.47
Peak Hour	11.76	0.23	11.99

2.3 Proposed Watermain Sizing and Roughness

The overall watermain layout for 2983, 3053, and 3079 Navan Road and 2690 Pagé Road is shown in Appendix D2 (Model Schematic). Table 2-3 summarizes the watermain roughness coefficients that were determined using friction factors presented in Section 4.2.12. of the Design Guidelines. The internal pipe diameters were modelled based on Section 4.3.5 of the Design Guidelines and is summarized in Table 2-4.

Table 2-3: Watermain Roughness Coefficients

Watermain Diameter	C-Factor
150 mm	100
200 to 250 mm	110
300 to 600 mm	120

Table 2-4: Watermain Internal Diameters

Nominal Diameter	Inside Diameter
150 mm	155 mm
200 mm	204 mm
300 mm	297 mm

2.4 Fire Flow Requirements

2.4.1 General

In terms of required fire flow (RFF), water supply within the municipal right-of-way (ROW) must achieve the guidance of the Fire Underwriters Survey (FUS). However, based on the most recent Technical Bulletin ISTB-2021-03, fire protection on private property in urban areas is governed by the Ontario Building Code (OBC). More specifically, NFPA 24 is the standard for the Installation of Private Fire Service Watermains and their Appurtenances. The sizing of private service fire mains for fire protection is detailed in Chapter 13 of NFPA 13. The design should consider the type of construction for the given occupancy type, fire and pressure, and the adequacy of the water supply.

The RFF for the townhouse units will be governed by the FUS since they are proposed along the future municipal ROW (see Draft Plan in Appendix B). However, the six (6) condominium buildings will be designed separately as private sites and the buildings will incorporate a fire pump and sprinkler system that will be designed to meet the OBC requirements, as outlined in the latest Technical Bulletin ISTB-2021-03.

2.4.2 Required Fire Flow

The RFF per the FUS for the residential townhouse units along the municipal ROW were calculated based on the type of unit, exposure to adjacent units, building material, etc. In addition, the RFF for the townhouses must also be calculated based on the maximum number of consecutive units should the distance between wood frame structures be less than 3.0 m (as per the FUS).

Based on the proposed layout for the Navan residential development, the critical RFF on the municipal ROW (per the FUS) was calculated at two (2) locations as presented in Appendix D1:

- Critical Fire Area 1: One (1) proposed block of seven (7) townhouse units located in the centre of the development.
- Critical Fire Area 2: One (1) proposed block of six (6) townhouse units adjacent to the backs of the existing properties on Pagé Road.

Appendix D1 also includes the RFF calculations in accordance with the Design Guidelines, ISDTB-2014-02 and ISTB-2018-02. According to ISDTB-2014-02, required fire flows for

townhouse units calculated by means of the FUS may be capped to 10,000 L/min (167 L/s) under the following two (2) conditions:

1. Townhouses are constructed to separate a town or row house block into fire areas of no more than the lesser of 7 dwellings, or 600 m^2 in building footprint; and

2. There is a minimum separation of 10 m between the backs of adjacent units.

Therefore, based on ISDTB-2014-02 and the calculated exposure distances for this site, the RFF for all row townhouse units within this development can be capped at 10,000 L/min (167 L/s) since they all meet the criteria.

Given that the six (6) condominium buildings are located outside of the municipal ROW and on private property, fire protection will be governed by the OBC as stated in Technical Bulletin ISTB-2021-03. Since the condominium buildings are sprinklered, the RFF per the OBC for the buildings is 4150 L/min (69.2 L/s), which is based on NFPA 13. As per NFPA 13, the RFF of 4150 L/min (69.2 L/s) consists of the hose stream allowance (per Table 11.2.3.1.2 of NFPA) and sprinkler system allowance (per Table 11.2.2.1 of NFPA). Both Tables are included at the end of Appendix D1.

Fire protection for the commercial unit situated adjacent to the intersection of Brian Coburn Boulevard and Navan Road will also be governed by the OBC since it is located on private property. The commercial unit (Critical Fire Area 3) consists of a gas retail and drive-thru and it is not sprinklered. Based on the OBC guidelines for calculating RFF for non-sprinklered buildings and the measured exposure distances, the RFF for the commercial unit is 2700 L/min (45 L/s). The detailed RFF calculations per the OBC for this area are presented in Appendix D1.

2.5 Water Servicing and Boundary Conditions

2.5.1 Water Servicing

The proposed water service for the Navan Road development will consist of a local 203 mm diameter watermain loop. This watermain is located within the municipal ROW and it will service the residential units. The 203 mm diameter loop will connect to the existing 305 mm diameter watermains at the two (2) proposed locations:

- the existing Pagé Road 305 mm diameter watermain, located adjacent to the Pagé Road and Trailsedge Way intersection; and
- the existing Navan Road 305 mm diameter watermain, located west of the intersection between Navan Road and Pagé Road.

In addition to these connections that will supply the residential units, there is a proposed 203 mm diameter water service which will service a gas station, drive-thru, and car wash. This watermain will have its own connection to the 305 mm diameter watermain on Navan Road, located adjacent to the intersection of Navan Road and Brian Colburn Boulevard. The water service to the commercial site is not proposed to connect to the residential watermain loop. Appendix D2 (Model Schematic) illustrates the overall layout of the watermains for 2983, 3053, and 3079 Navan Road and 2690 Pagé Road.

Currently, the proposed 203 mm watermain linking the Pagé Road connection to the future municipal ROW will travel west, fronting the eight (8) proposed townhouse units, then run south behind the two (2) existing lots on Pagé Road (refer to Model Schematic in Appendix D2). However, a future detailed design may allow for this watermain to be routed west from the Pagé Road connection to the street intersection proposed on Brian Coburn Boulevard. This future modification may enhance the network's overall hydraulic capacity and is expected to be reviewed at the detailed design stage.

2.5.2 Boundary Conditions

The performance of the proposed water distribution system at 2983, 3053 and 3079 Navan Road and 2690 Pagé Road was evaluated under various domestic demands and fire flow conditions using the hydraulic boundary conditions provided by the City (refer to Appendix D3 for a copy of the City correspondence). The boundary conditions provided by the City were located down the street from the proposed connections to the site (refer to Appendix D1 for the proposed connection locations). In order to model the proposed connection on Pagé Road, Connection-1 from the City's boundary condition was used. Similarly, in order to model both proposed connections on Navan Road, Connection-3 from the City's boundary condition was used. The existing watermains on Navan Road and Pagé Road were modelled as required. Tables 2-5 and 2-6 summarize the hydraulic boundary conditions received from the City that were used in the HNA.

Table 2-5: Hydraulic Boundary Conditions at Connection-1 on Pagé Road

Demand Scenarios	Head (m)
Peak Hour	126.6
Maximum Day + Fire Flow 1 10,000 L/min (167 L/s)	126.2
Maximum Day + Fire Flow 2 15,000 L/min (250 L/s)	123.0
Maximum Pressure Check	130.7

Table 2-6: Hydraulic Boundary Conditions at Connection-3 on Navan Road

Demand Scenarios	Head (m)
Peak Hour	126.6
Maximum Day + Fire Flow 1 10,000 L/min (167 L/s)	125.8
Maximum Day + Fire Flow 2 15,000 L/min (250 L/s)	122.3
Maximum Pressure Check	130.7

2.6 Simulation Results

A Hydraulic Network Analysis (HNA) was carried out to confirm preliminary water servicing. Boundary conditions were provided by the City (Appendix D3) and used in this HNA. Simulations were carried out under peak hour, maximum day demand plus fire flow, and maximum HGL conditions.

2.6.1 Peak Hour

The peak hour demand shown in Table 2-2 was distributed throughout the nodes within the site. Using the boundary conditions shown in Table 2-5 and Table 2-6, the simulation results found the pressures to range between 399 kPa (57.9 psi) at Junction J-6 and 439 kPa (63.7 psi) at Junction J-10, as shown in Appendix D4. Based on the above simulation results, the minimum pressure criterion of 276 kPa (40 psi) is expected to be exceeded everywhere on this site.

2.6.2 Maximum Day Plus Fire Flow

To ensure adequate fire protection, the maximum day demand shown in Table 2-2 was analyzed simultaneously with the fire flow. The simulation was conducted using the boundary conditions presented in Table 2-5 and Table 2-6.

The fire flow simulation was carried out by allowing WaterCAD® to calculate the maximum fire flow that can be drawn from each node without allowing any part of the system to experience pressures less than 140 kPa (20 psi). Using the boundary condition based on the fire flow requirement of 167 L/s, the simulation results (Appendix D5) found that the proposed water distribution system is anticipated to deliver fire flows in excess of 15,360 L/min (256 L/s) within the proposed residential watermain loop between J-1 and J-11. This demonstrates that the fire flow requirement per the FUS and City technical bulletins of 10,000 L/min (167 L/s) for the residential townhouse blocks can be met.

The requirements of fire protection for the six (6) condominium buildings must follow the latest Technical Bulletin ISTB-2021-03 since the buildings are located on private property. Technical Bulletin ISTB-2021-03 states that the OBC will govern the analysis for fire protection. Therefore, in order to meet fire flow requirements for the condominium buildings, flows of 4150 L/min (69.2 L/s) must be supplied to each condo while maintaining a system pressure of at least 140 kPa (20 psi). Using the boundary condition of 167 L/s, the anticipated minimum fire flow that the water distribution system can deliver in the vicinity of the condo buildings is 256 L/s (see Appendix D5). Thus, the fire flow requirement per the OBC is expected to be exceeded for all six (6) condominium buildings. Domestic and fire pumps as well as the sprinkler system for the six (6) condominium units will be designed at the detailed design stage by the Owner's mechanical engineer.

The simulation results (Appendix D5) show that the commercial section will deliver fire flows in excess of 179 L/s, which is above the calculated RFF per the OBC of 45 L/s for the commercial portion. Hence, the RFF can be fulfilled everywhere within the site.

2.6.3 Maximum HGL

The Design Guidelines require that a high-pressure check (maximum hydraulic grade elevation) be performed on the proposed system to ensure that the maximum pressure constraint of 552 kPa (80 psi) is not exceeded. Based on a zero (0 L/s) demand condition and corresponding boundary conditions (refer to Table 2-5 and Table 2-6), a maximum pressure of 479 kPa (69.4 psi) and a minimum pressure of 440 kPa (63.8 psi) are expected at nodes J-10 and J-6, respectively (refer to Appendix D6 model output results). These values are below the maximum pressure constraint of 552 kPa (80 psi), therefore pressure reducing valves (PRVs) are not expected to be required.

2.7 Water Servicing Conclusions

Based on the water simulation results, the proposed subdivision can be serviced by the 203 mm diameter watermains. Simulation results under peak hour demand and maximum hydraulic grade line (HGL) showed that the pressure requirements listed in Table 2-1 were achieved. Furthermore, fire flow requirements can be met for the units on the Municipal ROW per the FUS method. Fire protection can also be met for the six (6) condominium units per the OBC recognizing that the domestic and fire pumps will be sized at detailed design by the Owner's mechanical engineer.

3.0 Wastewater Servicing

3.1 Background

East Urban Community Infrastructure Servicing Study Update (EUC ISSU, Stantec 2005)

The subject properties are tributary to a proposed sanitary sewer that will be part of the Navan Road right-of-way (ROW). The proposed system is intended to flow in a southeasterly direction, pass Pagé Road and ultimately outlet to the existing Renaud Road 600 mm diameter trunk sanitary sewer. From that point, wastewater flows will be conveyed in a southwesterly direction by the Renaud Road 600 mm diameter trunk sanitary sewer until discharging to the Forrest Valley Pump Station and pumped to the Forest Valley Trunk sewer.

The subject properties are part of two areas denoted in the EUC ISSU as Area 13A and 13B.

Area 13B:
Based on the design sheet included in the EUC ISSU, the subject properties are part of the 10.50 ha that forms Area 13B and tributary to the sewer reach identified as MH13B to MH13A, spanning from the subject properties' entrance to Pagé Road.

Area 13A:
Based on the design sheet included in the EUC ISSU, the subject properties are also part of the 6.60 ha that forms Area 13A and tributary to the sewer reach identified as MH13A to MH13, spanning from Pagé Road to Renaud Road as per the EUC ISSU Design Sheet.

Based on the review of the planned sanitary servicing on Navan Road as well as the background documents presented in Appendix C, the following were key highlights:

- The existing Renaud Road trunk sanitary sewer at Navan Road has an invert of 77.17 m and obvert of 77.77 m.
- There are two (2) existing forcemains along Pagé Road (±157.6 m) with top of casing elevations of ±76.69 m that would need to be crossed to extend sanitary servicing along Navan Road.
- There is an existing 250 mm diameter sanitary sewer along Pagé Road that flows in a southerly direction from Navan Road to Renaud Road which was not part of the EUC ISSU Design. From the background documents provided the existing sanitary sewer has a south invert of 78.02 at existing MH 10 at the Pagé and Navan Road intersection.
- In reviewing adding an extension from the Renaud Road trunk sanitary sewer at Navan Road along Navan Road (at a minimum 0.35% slope) to the Pagé Road intersection (i.e., ±158.0 m distance), the existing inverts would not allow for flows to be conveyed in a southeasterly direction as intended in the EUC ISSU Design but rather flows would flow south via the 250mm sanitary sewer along Pagé Road

3.2 Revised Sanitary Servicing

Given the linear infrastructure constraints at the Pagé Road intersection, an alternate sanitary servicing solution was reviewed to replace the recommended strategy developed as part of the EUC ISSU. The original strategy was to construct a 200 mm diameter sanitary sewer along Navan Road, from the entrance to Pagé Road, and then to Renaud Road for an overall length of ±300 m long. The Renaud Road 600 mm diameter trunk sewer runs southwesterly to Pagé Road. Hence, there is an opportunity to connect the Navan Road 200 mm diameter sanitary sewer, from the site entrance to Pagé Road, and connect to the existing MH 10 at the intersection of Pagé and Navan Road which would take flows in a southerly direction along Pagé Road and connect to the Renaud Road 600 mm diameter trunk sanitary sewer. Given that the revised sanitary sewer routing along Pagé Road is further downstream then the original servicing solution (i.e., EUC ISSU), there would not be any capacity issues and would limit the works crossing the existing forcemains.

Refer to Figure 2 for the Conceptual Sanitary Sewer Servicing showing the above stated connection at existing MH 10 at the intersection of Pagé and Navan Road. In addition, the 2690 Pagé Road parcel is to be serviced via the existing 250 mm diameter sanitary sewer on Pagé Road in accordance with the EUC ISSU tributary to Area 13A.

3.3 Proposed Sanitary Sewer System

The proposed sanitary sewers within the subject properties and along Navan Road were conceptually sized in accordance with the Ottawa Sewer Design Guidelines ((OSDG) - (October 2012)) and associated Technical Bulletins. As described in Section 3.2, the sanitary servicing has slightly been modified from what was shown in the EUC ISSU to prevent a sub-standard connection.

Key design parameters reflecting the revised sanitary parameters have been summarized in Table 3-1 below.

Table 3-1: Wastewater Servicing Design Criteria

Design Criteria	Design Value	Reference
Residential average flow	280 L per capita/day	ISTB-2018-01
Residential peaking factor	Harmon Formula x 0.8	City Section 4.4.1
Commercial average flow	28,000 L/gross ha/day	ISTB-2018-01
ICI peaking factor (1)	1.0/1.5	ISTB-2018-01
Infiltration Allowance 0.05 L/s/ha (dry I/I) 0.28 L/s/ha (wet I/I)	0.33 L/s/ha	ISTB-2018-01
Minimum velocity	0.6 m/s	OSDG Section 6.1.2.2
Maximum velocity	3.0 m/s	OSDG Section 6.1.2.2
Manning Roughness Coefficient	0.013	OSDG Section 6.1.8.2
Minimum allowable slopes	Varies	OSDG Table 6.2, Section 6.1.2.2

3.4 Theoretical Sanitary Peak Flow

Wastewater flows from the subject properties were estimated based on the population associated with the Concept Plan, Draft Plan of Subdivision, the theoretical unit flow of 280 L/capita/day and the adjusted Harmon peaking factor. Based on this design criteria, a total combined peak wastewater flow of 9.00 L/s (Navan) + 0.37 L/s (Pagé) = 9.37 L/s was estimated. This peak wastewater flow represents part of the overall flows allocated for Areas 13B and 13A, which are shown as 10.50 ha and 6.06 ha in the EUC ISSU sanitary design sheet (Appendix E). When the other areas of Area 13B is considered, the peak flow at Pagé Road was estimated at 12.43 L/s. As presented in Section 3.2, it is proposed to connect the Navan Road 200 mm diameter sanitary sewer, from the site entrance to Pagé Road, and connect to the existing MH 10 at the intersection of Pagé and Navan Road.

Therefore, when the areas included in Area 13A (6.60 ha) as shown in the EUC ISSU, are combined with the flows from Area 13B (12.43 L/s) wastewater flow of 15.68 L/s was estimated to discharge southerly from existing MH 10 towards the Renaud Road 600 mm diameter trunk sanitary sewer. Although, the calculated peak flow of 15.68 L/s is above the allocated peak flow of 11.33 L/s as shown in the EUC ISSU design sheet (refer to Appendix E for the ISSU design sheet and the JLR Design Sheet). The design basis was based on the previous OSDG of 350 L/p/day. Given the updated design parameters of 280 L/p/day prescribed in ISTB 2018-03 from the previous 350 L/cap/day, and the existing 250 mm sanitary sewer system on Pagé Road currently has a free-flowing capacity of 29.0 L/s (250mm diameter sewer with an As-Constructed slope of 0.73%) it is expected that this sewer will have adequate capacity to accommodate the flows generated from the subject site. The total amalgamated flows stated above of 15.68 L/s will only account for 54% of the existing sanitary pipe capacity (from Navan to Renaud) or flow 54% full.

3.5 Proposed Sanitary Sewer Sizing

The wastewater analysis described in Section 3.2 shows that the proposed sanitary sewers must be sized to accommodate: i) the peak wastewater flow in the subdivision of 9.00 L/s (for Navan

Road connection) and 0.37 L/s (for Pagé road connection), ii) the peak flow of 12.43 L/s at Pagé Road, and iii) the design flow of 15.68 L/s at Renaud Road. To accommodate these design flow targets, proposed 200 mm diameter sanitary sewers are proposed. The Design Sheet included (Appendix E) as well as the high-level servicing Figure 2.

3.6 Wastewater Servicing Conclusions

The subject properties will be serviced by a local sanitary system consisting of 200 mm diameter sewers discharging to two locations i) Navan Road and ii) Pagé Road.

The Navan Road system will be discharged into an off-site 200 mm diameter sewer system will be tributary to the existing 250 mm diameter sanitary sewer located along Pagé Road south of Navan Road. The Pagé Road system will be discharged into an existing 250 mm diameter sanitary sewer located along Pagé Road. Both systems merging at the Pagé and Navan intersection and ultimately tributary to the Renaud Road trunk sewer. The theoretical peak wastewater flows of 9.0 L/s and 0.37 L/s were calculated based on the design criteria described in the Ottawa Sewer Design Guidelines and associated Technical Bulletins as shown in the Design Sheet included in Appendix E.

4.0 Storm Servicing and Stormwater Management

4.1 Existing Conditions

The subject properties are bounded on three (3) frontages; Navan Road, Pagé Road and Brian Coburn Boulevard. As noted in Section 1.3, short sections of storm sewers are existing on Navan Road and Brian Coburn Boulevard. These storm sewers have limited capacities and were not sized for the subject properties.

4.2 Background

There are no existing storm sewers that have capacity for the subject properties. However, storm servicing and stormwater management for the subject properties have been reviewed as part of the East Urban Community Infrastructure Servicing Study Update (EUC ISSU, Stantec 2005). A summary of the EUC ISSU that pertains with the properties follows:

East Urban Community Infrastructure Servicing Study Update (Stantec, 2005)

The subject properties are tributary to a proposed storm sewer system that will be part of the Navan Road right-of-way (ROW). The proposed storm sewer system is intended to flow in a southeasterly direction, pass the Pagé Road intersection, and to ultimately connect to the existing Renaud Road 1350 mm diameter trunk storm sewer. From that point, the captured storm sewer flows will be conveyed in a southwesterly direction by the Renaud Road 1350 mm diameter trunk storm sewer, pass the Pagé Road intersection until discharging to an existing end-of-pipe facility referred to as Pond #3, which in turn outlets to Mud Creek. This facility was designed to provide an enhanced protection level (80% total suspended solids removal), erosion control as well as providing quantity storage for its serviced area.

The minor system flow allowance for the subject properties should be set based on the design criteria developed as part of the EUC ISSU. The subject properties are part of two (2) separate areas denoted in the EUC ISSU (refer to Appendix F1 for the EUC ISSU Storm Drainage Area Plan). As illustrated in Appendix F2, part of Area 603b shown as 10.93 ha includes the 2983 Navan Road and 3053 Navan Road properties while part of Area 603a shown as 7.04 ha includes the 3079 Navan Road property as well as 2690 Pagé Road. Based on the storm sewer design sheet included in the EUC ISSU, the sub-areas listed Table 4-1 were accounted in the preliminary sizing of the Navan Road trunk storm sewers denoted as MH603B-MH603A and MH603A-MH603 (refer to EUC ISSU Design Sheet in Appendix F1 & F2).

Table 4-1: Extract of EUS ISSU Storm Sewer Design Sheet

Sewer Reach	R = 0.5	R = 0.55	R = 0.76	R = 0.82
MH603B-MH603A	4.42	3.47	1.24	1.80
MH603A-MH603	5.58	0.00	1.08	0.38

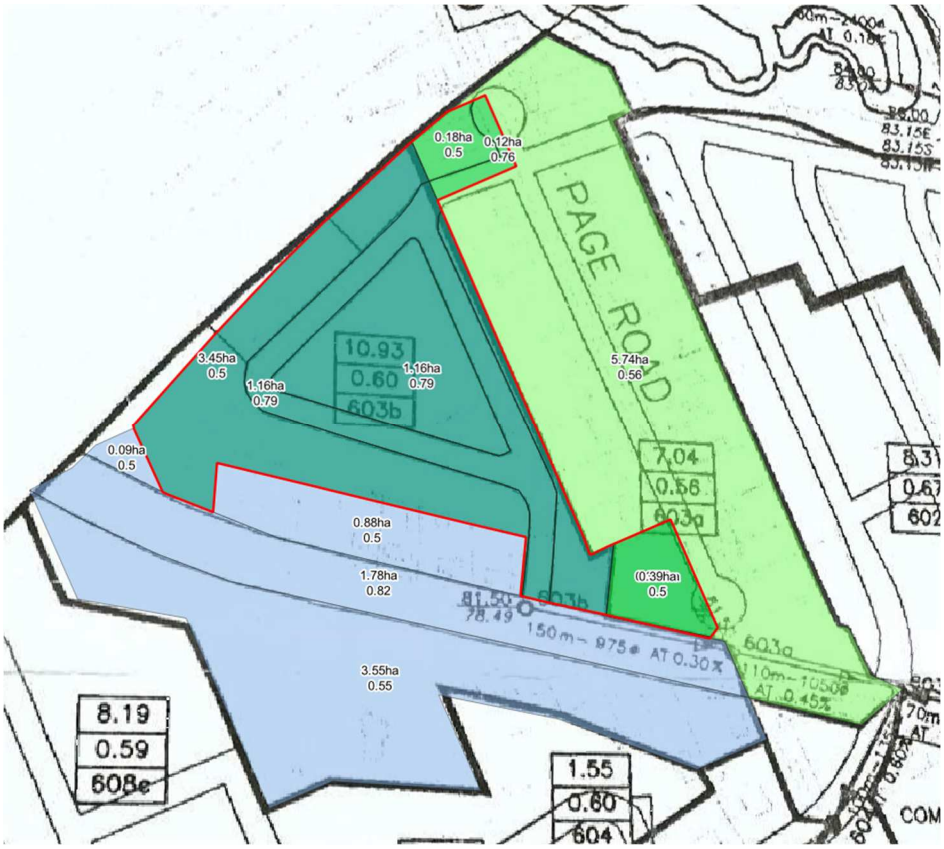
4.3 Minor System Peak Flow Allowance Calculation

The allowable minor system flow for the four (4) subject properties was calculated based on the information summarized in Table 4-1. To facilitate this exercise, the areas corresponding to the subject properties that are tributary to either of the storm sewer reaches along with their runoff coefficients have been summarized in Table 4-2 below. It should be noted that the rows shaded in grey represent the subject properties while those in light blue the adjacent areas part of these trunk sewer reaches. To illustrate the area breakdown, Figure 2 depicts the areas tributary to sewer reaches MH603B-MH603A and MH603A-MH603.

Table 4-2: EUS ISSU Storm Sewer Design Sheet with Specific Areas

Sewer Reach	R = 0.5	R = 0.55	R = 0.76	R = 0.82
MH603B-MH603A	3.45	0.00	1.16	0.00
MH603B-MH603A	0.97	3.47	0.08	1.80
Total	4.42	3.47	1.24	1.80
MH603A-MH603 (North End Pagé Road)	0.18	0.00	0.12	0.00
MH603A-MH603 (South End Pagé Road)	0.39	0.00	0.00	0.00
MH603A-MH603	5.01	0.00	0.96	0.38
Total	5.58	0.00	1.08	0.38

Figure 2: Breakdown of Areas



Based on the areas denoted in Table 4-2 and illustrated in Figure 2, a functional level storm sewer design sheet was prepared to assess the minor system peak flow allowance of the subject properties (refer to Appendix F3). The original sizing basis of the EUC ISSU was carried out assuming a 1:5-year design capture calculated based on a time of concentration of 22 minutes; an inlet time of 20 minute was used based on the Design Guideline current at the time, and an assumed pipe travelling time of 2 minutes. Based on the design calculations using the 1:5-year rainfall intensity, a Tc of 22 min, and the areas and corresponding runoff coefficient shown in Table 4-2, a minor system peak flow allowance of 520 L/s was calculated, consisting of 486 L/s for 2983 Navan Road and 3053 Navan Road properties and 34 L/s for the 3079 Navan Road property. Hence, the overall minor system peak flow allowance to proposed Navan Road trunk sewer system is to be limited to 520 L/s (Appendix F2).

A similar analysis undertaken on 2690 Navan discharging to Pagé Road was calculated to have a release rate of 34 L/s.

4.4 Comparison of Minor System Flow

The minor system peak flow of 520 L/s represents the level of service corresponding to the Design Guidelines in effect in 2005. The minor system peak flow was re-evaluated based on today's Design Guidelines, reflecting the proposed Runoff-Coefficient, time of concentration (Tc) and design capture. The peak flow calculation for the subject properties is shown in Appendix F3.

As shown in this Design Sheet, the minor system flow reflecting the three (3) subject properties was found to be 560 L/s, exceeding the peak flow allowance of 520 L/s. Given that the 2005 minor system flow allowance (520 L/s) is sub-standard to current Design Guidelines, sub-surface storage will be required to detain the minor system flow while not creating any ponding at the surface during the 1:2-year storm in accordance with today's Design Guidelines.

Discussions were held during a pre-consultation meeting (virtual) with the City of Ottawa on January 18, 2021. At the meeting, servicing requirements were discussed including connections to the water distribution system as well as storm servicing in general. It was confirmed during the meeting that the 1:100-year flows were to be detained on-site while releasing the captured flows at the minor system flow allowance.

Based on the design constraint and the allowable peak flow of 520 L/s, on-site storage will be required; minor system storage (sub-surface at the elevation of the storm sewer) which will be supplemented via surface storage to capture major overland flow. As such, due to the minor system design constraint, underground storage will be provided on the properties that will be treated as future Site Plans and a dry pond will be incorporated into the servicing within the Plan of Subdivision. Surface storage will also supplement the above-noted storage solutions.

For 2690 Pagé Road the peak release from the site was re-evaluated using current design guideline requirements. Based on this design sheet the peak flow from the site was found to be 35 L/s, a negligible increase on the allowable release from the site based on the EUS ISSU Storm Sewer Design Sheet, therefore it is considered that no control is required for the 1:2 year return period event but storage will be required to detain the 1:100 year event on site.

4.5 Storm Criteria

This AASR Report and associated high-level drawings have been prepared based on the discussions held during the pre-consultation meeting (Appendix A) and subsequent E-Mail correspondences. The storm design criteria used in this high-level functional level servicing is based on the items described below:

Table 4-3: Storm Servicing Design Criteria

General Design Criteria
Proposed storm sewers to be sized to capture the 1:2-year peak flows to be estimated with the Rational Method based on the City of Ottawa Intensity-Duration-Frequency (IDF) curves.
Peak flows estimated based on an inlet time of ten (10) minutes, as per the Technical Bulletin ISDTB-2012-4.
Calculated peak flows to be estimated based on calculated Runoff-Coefficients. The weighted C-Factors have been calculated based on 0.90 for all hard surfaces and 0.60 for all landscaped areas.
The sum of all storm flows to be controlled to the allowable peak flow described in Section 4.2.
Proposed storm sewer systems on each of the individual Site Plans are to capture the 1:2-year design flow and have no surface ponding. Due to the allowable peak flow that is less than 1:2-year, minor system storage is required.
The stormwater management system on each of the individual Site Plans is to detain the 1:100-year flows while releasing the 1:2-year peak flows.
The storm sewer system along the ROW to be sized to capture the 1:2-year design flow without surface ponding. Due to the allowable peak flow that is less than 1:2-year, minor system storage will be required.
The 1:100-year peak flows to be detained by means of on-site retention measures; i) at grade surface ponding, ii) underground storage, and iii) dry pond.
Quality control will be accommodated by Pond #3 to meet an MECP Enhanced Level of Protection (80% TSS removal).
Inlet control devices (ICDs) will be sized at detailed design to capture the 1:2-year event and ensure a freeboard in the sewer network to the underside of footing (USF) of 300 mm during the 1:100-year storm
Maximum street ponding depth of 350 mm (static and dynamic) as per the Design Guidelines and maximum depth of rear yard flow to be 300 mm. During the Climate Change event, the street ponding is not to reach the lowest building opening while the storm HGL must remain at or below the USF. The product of the velocity and depth of major system flows on streets during the 1:100-year design storm event is not to exceed 0.60 m²/s.
• Minimum roadway profile grades at 0.5%. • Roadway cross-fall of 3% was used for all streets. • Minimum roadway slope of 0.1% from crest-to-crest for overland flow route. • Minimum vertical clearance of 0.15 m between the spill elevation on the street and the finished grade (garage elevation). • Minimum vertical clearance of 0.30 m between the rear yard spill elevation and the ground elevation at the building in the rear yards.
Provide measures to ensure that site preparation and construction is in accordance with the current Best Management Practices for Erosion and Sediment Control.

4.6 Storm Servicing Strategy

The proposed storm servicing strategy for the site consists of a conventional storm sewer system on the municipal right-of-way (ROW) with capture of the 1:2-year event. The storm sewer system will connect to new public sewers on Navan Road (refer to Figure 4 in Appendix F3). Prior to the connection point there will be a control orifice in a manhole structure that will control flows to the required allowable release rate. This has been an approved approach to control flows in other projects within the City of Ottawa, one example is Quinn's Pointe, see Appendix F4 for plan and profile of that project showing the outlet control orifice in the manhole structure. Head in the storm sewer system will build up and be held in an underground storage cell. The underground storage will release into the Navan Road storm sewer via the control structure at the end of the storm.

Major overland flow on the ROW will be directed via a series of sags to a dry pond facility. The dry pond facility will detain runoff from up to the 1:100 year event. The dry pond will have a controlled release into the downstream control structure prior to the Navan Road storm sewer.

Blocks 14 and 15 and the gas station block will detain on site the 1:100 year event and will discharge at the 1:2 year rate into the storm sewers in the ROW upstream of the control structure. Block 18 will detain the 1:100 year even on site and will discharge at the 1:2 year rate into the conventional storm sewers downstream of the control structure. The release rate of the control structure will be reduced to account for the uncontrolled 1:2 year release from Block 18 and the uncontrolled release from any grading along the boundary of the site to achieve the required overall release rate.

The 2690 Page Road parcel which is directly on Pagé Road has a 1:2 year release rate less than the allowable and therefore no minor system controls are required to discharge to Pagé Road.

4.7 On-Site Storage Volume Requirements

Storage volume requirements were evaluated using the PCSWMM software platform (Refer to Appendix F5 for PCSWMM Schematic). A functional level dual drainage model was developed; the minor system spanned from the upstream end of the system within the future Site Plans, through the municipal right-of-way (ROW) included Draft Plan of Subdivision, along Navan Road until the connection point with the Renaud Road 1350 mm diameter trunk storm sewer. The minor system also included underground storage (storage node) on the future Site Plans, as well as a dry pond near the entrance of the site, equipped with a restrictor at the downstream of the system to limit the release of minor system flows to the proposed Navan Road trunk storm sewer system. The major system included surface storage within the future Site Plans as well as roadway sag storage throughout the ROW of the subdivision. Given that a functional level dual drainage model was developed, allowances were made for each of the future Site Plans (minor and major) and roadway sag storage.

The storage required for the Block off Pagé Road was also evaluated in PCSWMM to detain the 1:100 year event on site. Surface storage of 45 m^3 is required to detain the 1:100 year event on site. This will include sag storage estimated at 15 m^3 (or 50m^3 per ha) as well as an approximately 10m square dry pond to accommodate the additional required storage.

Storage requirements for the site were identified as shown in Table 4-4 for the main site off Navan Road and in Table 4-5 for the site off Pagé Road.

Table 4-4: Main Site Storage Volume Requirements and Release Rates (Navan Road)

Block	Release Rate	Storage Required (m^3)	Storage Required (m^3/ha)
North	80 L/s (1:2 year)	144	270
North West	70 L/s (1:2 year)	144	275
Gas Station	150 L/s (1:2 year)	204	300
East	120 L/s (1:2 year)	180	300
Subdivision Minor	400 L/s (1:2 year)	300	120
Subdivision Major	755 L/s (1:100 year uncontrolled to major system pond) / 10 L/s controlled to minor system	340[1]	140
Uncontrolled	100 L/s (1:100 year)	-	-
Total Site	**500 L/s (1:100 year)**	**1312**	**260**

[1] The value for the major system storage only represents dry pond storage and does not include the estimated 50 m^3/ha of street sag storage within the subdivision.

Table 4-5: Main Site Storage Volume Requirements and Release Rates (Pagé Road)

Block	Release Rate	Storage Required (m^3)	Storage Required (m^3/ha)
North East off Pagé	35 L/s (1:2 year)	45	150
Total Site	**35 L/s (1:100 year)**	**45**	**150**

4.8 Storm and Stormwater Management Conclusions

The release rate from the site is set by the East Urban Community Infrastructure Servicing Study Update (EUC ISSU, Stantec 2005) of which the site is part. The site contributes to the Navan Road storm system, which under the 2005 EUC ISSU has quality control provided by a downstream stormwater management pond, Pond #3. The 2005 EUC ISSU sized the downstream pond and storm sewer system to accept a flow of 520 L/s from the site based on area weighting of the two catchments in the EUC ISSU covering the extents of the site.

The stormwater management control measures proposed for the site utilise a mixture of on-site control for the blocks and underground and dry pond storage for the runoff from the subdivision. Underground storage is required due to the allowable release rate from the site being less than the 1:2 year runoff captured by the minor system. The conceptual release rate from the site is 500 L/s, less than the allowable calculated.

5.0 Erosion and Sedimentation Control

Erosion and sediment control measures, as outlined in the Ontario Ministry of Natural Resources (MNR) Guidelines on Erosion and Sediment Control for Urban Construction Sites, will be implemented to trap sediment on site. The following erosion and sediment control measures could be implemented during construction:

- Supply and installation of a silt fence barrier, as per OPSD 219.110.
- Supply and installation of filter fabric between the frame and cover of catch basins and maintenance holes adjacent to the project area during construction, to prevent sediment from entering the sewer system. The filter fabric is to be inspected regularly and corrected as required.
- Stockpiling of material during construction is to be located along flat areas away from drainage paths. For material placed on sloped areas, stockpiles are to be enclosed with a silt fence to protect watercourses.
- All catch basins are to be equipped with sumps, inspected frequently, and cleaned as required.
- Sandbags are to be placed blocking part of the sewer pipe in the connecting storm maintenance holes to eliminate construction debris from entering the existing storm sewer system. The sandbags are to be removed after the proposed storm sewers have been fully cleaned.
- A mud mat is to be built at each of the site entranceways to prevent the transport of sediment onto paved surfaces. The mud mat shall be:
    - Minimum of 20 m in length for the full width of the entrance way (10 m wide minimum).
    - Minimum of 400 mm thick underlain with a geotextile (or graded aggregate filter); and
    - Constructed with 50 mm diameter clear stone for the first 10 m (extending from the paved street) and the remainder of the length with 150 mm diameter clear stone.

The proposed removal and reinstatement measures as well as the erosion control measures shall conform to the following documents:

- "Guidelines on Erosion and Sediment Control for Urban Construction Sites" published by Ontario Ministries of Natural Resources, Environment, Municipal Affairs, and Transportation & Communication, Association of Construction Authorities of Ontario and Urban Development Institute, Ontario, May 1987.
- "MTO Drainage Manual", Chapter F: "Erosion of Materials and Sediment Control", Ministry of Transportation & Communications, 1985.
- "Erosion and Sediment Control" Training Manual by Ministry of Environment, Spring 1998.
- Applicable Regulations and Guidelines of the Ministry of Natural Resources.

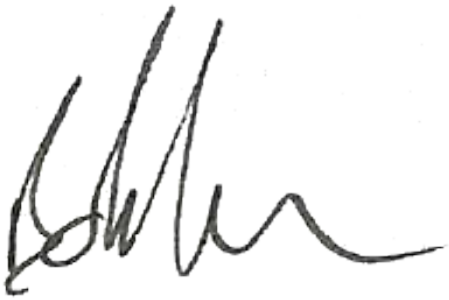
This report has been prepared for the exclusive use of 12714001 Canada Inc., for the stated purpose, for the named facility. Its discussions and conclusions are summary in nature and cannot be properly used, interpreted, or extended to other purposes without a detailed understanding and discussions with the client as to its mandated purpose, scope, and limitations. This report was prepared for the sole benefit and use of 12714001 Canada Inc. and may not be used or relied on by any other party without the express written consent of J.L. Richards & Associates Limited.

J.L. RICHARDS & ASSOCIATES LIMITED

Prepared by:

Karla Ferrey, P.Eng.
Senior Civil Engineer

Reviewed by:



Bobby Pettigrew, M. Eng., P.Eng.
Senior Water Resources Engineer

Appendix A

Pre-consultation meeting notes

From: Belan, Steve <Steve.Belan@ottawa.ca>
Sent: Friday, April 23, 2021 2:15 PM
To: Tim F. Chadder <tchadder@jlrichards.ca>; Gabrielle Snow <gsnow@jlrichards.ca>
Cc: Curry, William <William.Curry@ottawa.ca>; Young, Mark <Mark.Young@ottawa.ca>; Castro, Phil <phil.castro@ottawa.ca>; Giampa, Mike <Mike.Giampa@ottawa.ca>
Subject: Pre-con Follow-up - 3079 Navan Road

CC: Will Curry, Mark Young, Phil Castro, Mike Giampa

Hello Gabrielle,

I apologize for the delay on getting these out. Please refer to the below and/or attached notes, regarding the Pre-Application Consultation (pre-con) Meeting held on January 18, and March 25, for the property at 3079 Navan Road for ZBLA and subdivision in order to allow the development of in fill subdivision with low-rise apartments, town house unit and a commercial block at the corner of Brian Coburn and Navan. I have also attached the required Plans & Study List for application submission. During the Covid-19 pandemic the City will not be requiring any paper copies as listed in the attached list.

Below or attached, are staff's preliminary comments based on the information available at the time of pre-con meeting:

Planning

- A severance application may be required depending on how the owner wishes to proceed with the creating the commercial block at the intersection
- We need to discuss the order of applications. There are pros and cons to moving forward with a severance of the commercial blocks to address ownership issues.
- We support the move to low-rise buildings along Brain Coburn Blvd.
- Lynda Mongeon would be able to facilitate the transfer of surplus City lands as needed
- Contributions to the Mud Creek restoration will need to be determine.
- The Applicant must now provide a proposed strategy for public consultation as directed by Bill 73

Urban Design

1. PRUD appreciates and supports the desire to retain trees on-site. The arrangement and viability of this should be reviewed in depth by our Planning Forester.
2. The size and locations of the commercial block is supported. It would be worth exploring the possibility of obtaining additional city lands at the intersection of Brian Coburn and Navan Road to complete the block and allow for possible built form at this gateway location.

3. The current drive through configuration/location adjacent to this community entrance is a significant concern. Please re-consider the layout of the commercial site.
4. Please review the proposal in conjunction with the EUC Phase 1 CDP.
5. PRUD would support the inclusion of a park block to serve the new residents. Consider a location that allows for tree retention, and connectivity to the community to the east.
6. Access to Page Road should be discouraged. If this is planned to become a cul-de sac at Navan Road this should also be considered.
7. 18.0 m public r.o.w as proposed is supported.
8. Please ensure that rear yards with a minimum depth of 7.5 m for townhomes are provided abutting existing residential uses.
9. The 3 townhomes on Page Road should be re-considered. This typology is not common on Page Road.
10. A design brief will be required in support of your applications. Please see attached terms of reference.

Engineering

The attached “Pre-application consultation servicing memo” summarizes engineering design considerations as per our discussion. [Ensure the memo addresses all relevant engineering issues.]

Required for both Site Plan and Subdivision:

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:

Location of service connections (MAP)

Type of development and the amount of fire flow required (as per FUS).

Average daily demand: ___ l/s.

Maximum daily demand: ___l/s.

Maximum hourly daily demand: ___ l/s.

Subdivision Draft Plan requirements

Functional Servicing Report

4 M plan

4 R Plan

Detailed Subdivision Design

Cover Page

Road Cross Sections

Site Plan

Topographical Plan of Survey Plan with a published Bench Mark

Grading & Drainage Plan

General Plan of Services

Plan and profile Plans

CUP

SWM Plan

Erosion & Sediment Control Plan

Landscape Plans and TCR

Design Brief and Stormwater Management Report

Geotechnical Report

Transportation Noise Study

TIA

Site Plan Requirements

Site Plan

Topographical Plan of Survey Plan with a published Bench Mark

Grading & Drainage Plan

General Plan of Services

Erosion & Sediment Control Plan

Design Brief and Stormwater Management Report

Geotechnical Report

Lighting Plan and or and Memo

Stationary Noise Study

TIA

Design Criteria

Storm Pre to post, C of .5, Pre tc 20; post tc 10

5-year pipe minimum and store up to 100-year on site. No 2-year ponding on site.

Permissible ponding of 350mm for 100-year

At 100-year ponding elevation you must spill to City ROW

100-year Spill elevation must be 300mm lower than any building opening

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.**

1. Site Plans for this file are to be a C of .5. Subdivision is to be calculated as per the SDG. Your permitted with a 5-year pipe design and store up to the 100-year for both subdivision and Site Plan.
2. If you discharge to a pipe that discharges to a City SWM facility, then no additional quality controls are required. However, you are required to confirm with the Conservation Authority.
3. No, but the City does confirm it is the responsibility of the proponent to demonstrate the site is serviceable for water, storm and sanitary and that the receiving sewers have capacity. The Functional Servicing Report provides the ultimate servicing solution for watermain storm and sanitary.
4. Unknown currently. Who owns 2973...apparently the City. Depends if they sell it or what? More ideal if it was within a City Block or City ROW but not an easement.
5. No. No occupancy unless it is serviced properly.
6. You may discharge to the **ditch and not the 750mm Ø storm** along Navan Road if that is to be your determined outlet. Quality Controls are provided by the Conservation Authority. 5-year Pre to post with a tc of 20 minutes Pre and a tc of 10 minutes with a 0.5 C, store up to the 100-year.
7. You are permitted to use infiltration designs anywhere within the city but they must demonstrate functionality and have supporting documentation.
8. You must demonstrate, not assume the 750 mm Ø storm pipe was designed to include your entire site. The road-side ditch primarily runs towards Page Road. This will require further investigation. The City will not support any municipal owned infrastructure within the proposed Gas Station parcel. 2973 is City Owned.

Any info you may require is available from the Info Centre "ISD Information Centre / Centre Information" informationcentre@ottawa.ca

The City reserves the right to change any decisions provided herein should new information warrant it.

Feel free to contact the Infrastructure Project Manager, Will Curry, at Will.Curry@ottawa.ca for follow-up questions.

Transportation

A TIA is warranted, please proceed to scoping.

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

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

Synchro files are required at Step 4.

ROW protection on Navan is 44.5m.

Corner sight triangle: 5m x 5m

A stationary Noise Impact Study is required if there is noise sensitive use within 100m.

Clear throat requirements on Navan as per TAC guidelines

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 and/or sidewalks.

Turning templates will be required for all accesses showing the largest vehicle to access the site; required for internal movements and at all access (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.

As built plans for Brian Coburn should be available through our Drawing Center; the applicant should contact: ISD Information Centre / Centre Information informationcentre@ottawa.ca.

There may be a fee.

A Noise Study will be required for traffic noise impacts and any newly created stationary noise sources.

Feel free to contact the Transportation Project Manager, Mike Giampa, at Mike.Giampa@ottawa.ca, for follow-up questions.

Environmental

- Environmental impact statements shall be submitted to identify any Species at risk
- A TCR will be required for these applications.
- A permit is required prior to any tree removal on site which can be made available at site plan approval. Please contact the planner associated with the file or Mark Richardson (mark.richardson@ottawa.ca) when the permit is required or for additional information.
- There may be adjacent or co-owned trees on or near the property line. Please ensure that all trees with a Critical Root Zone extending from adjoining sites onto the development site are addressed in the TCR.
- Please identify any City-owned trees – Forestry Services will need to provide permission for their removal.
- Please be aware of the City's Bird-Safe Design Guidelines

Parkland

- These lands have not been consider for any previous Parkland dedication /Cash-in-lieu of parkland
- Parkland requirements would be based on proposed unit counts.
- It would be preferred that the park is located in the interior of the site. However, we will consider a location with frontage on Brian Coburn and Page next to, but not including the pedestrian/service access to Page Road.

Conservation Authority

- The Conservation Authority will make comments concerning:
  - Stormwater runoff quality criteria
  - Area specific stormwater runoff criteria

Other

- [Insert other concerns or notes]
- You are encouraged to contact the Ward Councillor, Councillor Dudas, at Laura.Dudas@ottawa.ca about the proposal.

Please refer to the links to Guide to preparing studies and plans and fees for further 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.

Please do not hesitate to contact me if you have any questions.

Regards,
Steve Belan

Steve Belan, MCIP, RPP
Planner Planning Services, Development Review Services
Planning, Infrastructure and Economic Development
City of Ottawa / Ville d'Ottawa
110 Laurier Avenue West, 4th Floor / 110, avenue Laurier Ouest, 4e étage
Ottawa, ON K1P 1J1
Telephone / tél.: 613-580-2424 ext./poste 27591
E-mail / courriel: Steve.Belan@ottawa.ca

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From:	Curry, William
To:	Gabrielle Snow
Cc:	Belan, Steve; Tim F. Chadder; Lucie Dalrymple; Guy Forget
Subject:	Navan Road Site
Date:	Tuesday, January 19, 2021 11:10:35 AM

Gabrielle,

I have already provided my Submission list to Steve for distribution.

I can offer these other items at this time.

I reviewed the report prepared by IBI and they followed the parameters of the Stantec EUC to demonstrate the site was serviceable for zoning purposes only. Historically I can tell you IBI tends to take their own liberties in what they deem we the City should accept.

There were several documents submitted for zoning and I don't know if Taggart is making those available to the applicant.

I will require a FSR for this file for Draft Plan of Subdivision, regardless of what was submitted.

Info only
I looked at the existing topographical plan of survey and it will require more existing elevations to be considered acceptable.
The Storm and Sanitary **pipe(s)** Outlets are as per the EUC and are to be on Navan Road and connected to Renaud Road. Design to City Standards may be another issue if you read IBI's report.
This site is lower than all the surrounding roads. Preloading would be ideal for this site. Note that the attempts to sometimes retain trees and preload areas is a conflict and some trees can't be saved.

The watermain option out to Page; you should consider or attempt to go through the City owned parcel between the proposed Townhouses and Brian Coburn. Also the easement location within that private parcel is critical as we accept nothing else within the easement other than asphalt and curbs. Maybe it is best to go in a straight line and loose some trees.
It is hard to believe you need a Dry Pond for this site with all the green spaces. I know this is just concept currently. Private Bio-swales could be considered

elsewhere...etc. Water table here is a concern.

Let me know if I can assist further.

Thanks

Will Curry, C.E.T.

Planning, Infrastructure and Economic Development /
Planification, d'infrastructure et de développement économique
City of Ottawa | Ville d'Ottawa
613.580.2424 ext./poste 16214
110 Laurier Ave., 4th Fl East;
Ottawa ON K1P 1J1

William.Curry@Ottawa.ca

Guy Forget

From: Curry, William <William.Curry@ottawa.ca>
Sent: Monday, January 18, 2021 10:53 AM
To: Gabrielle Snow
Cc: Belan, Steve; Tim F. Chadder; Baird, Natasha; Lucie Dalrymple; Guy Forget
Subject: Re: Navan Road - Second Pre-Application

Gabrielle,

1. Site Plans for this file are to be a C of .5. Subdivision is to be calculated as per the SDG. Your permitted with a 5-year pipe design and store up to the 100-year for both subdivision and Site Plan.
2. If you discharge to a pipe that discharges to a City SWM facility, then no additional quality controls are required. However, you are required to confirm with the Conservation Authority.
3. No, but the City does confirm it is the responsibility of the proponent to demonstrate the site is serviceable for water, storm and sanitary and that the receiving sewers have capacity. The Functional Servicing Report provides the ultimate servicing solution for watermain storm and sanitary.
4. Unknown currently. Who owns 2973...apparently the City. Depends if they sell it or what? More ideal if it was within a City Block or City ROW but not an easement.
5. No. No occupancy unless it is serviced properly.
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7. You are permitted to use infiltration designs anywhere within the city but they must demonstrate functionality and have supporting documentation.
8. You must demonstrate, not assume the 750 mm Ø storm pipe was designed to include your entire site. The road-side ditch primarily runs towards Page Road. This will require further investigation. The City will not support any municipal owned infrastructure within the proposed Gas Station parcel. 2973 is City Owned.

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thanks

Will Curry, C.E.T.

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City of Ottawa | Ville d'Ottawa
613.580.2424 ext./poste16214

110 Laurier Ave., 4th Fl East;
Ottawa ON K1P 1J1

William.Curry@Ottawa.ca

From: Gabrielle Snow <gsnow@jlrichards.ca>
Sent: Friday, January 15, 2021 3:51 PM
To: Belan, Steve <Steve.Belan@ottawa.ca>; Curry, William <William.Curry@ottawa.ca>
Cc: Tim F. Chadder <tchadder@jlrichards.ca>; Lucie Dalrymple <ldalrymple@jlrichards.ca>; Guy Forget <gforget@jlrichards.ca>
Subject: RE: Navan Road - Second Pre-Application

Hi Steve and Will,

Leading up to the second pre-application meeting for 2983, 3053 and 3079 Navan Road, I wanted to forward you some questions regarding servicing:

Question 1: The City to confirm that the quantity control criterion from the EUC ISU prevails; The 1:100 year post-development peak flows for the overall subdivision be limited to the 1:5 year peak flows calculated based on a C-Factor of 0.60.
Question 2: The City to confirm that the quality control criterion from the EUC ISU prevails; Given that 2983 Navan Road is tributary to Pond #3 which was sized to meet the enhanced protection level, there is no be any additional water quality control requirements for the subdivision.
Question 3: The City to confirm that the ultimate servicing solution for storm & sanitary hinges on proposed storm and sanitary sewers along Navan Road, from 3053 Navan Road to Renaud Road.

Question 4: Given that water servicing to support the subdivision requires looping, can an easement be granted within 2973 Navan Road to facilitate water servicing as this future watermain connection would be the supply for both the subdivision and future gas station? The second watermain connection would be within 3053 Navan Road.
Question 5: To support the gas station under interim condition, would the City entertain that wastewater flows be captured by a holding tank assuming that the car wash would not be commissioned.
Question 6: Given that the lands for the future gas station currently sheet flows to the open ditch system & CB/DICB and 750 mm diameter storm sewer along Navan Road, its is assumed that storm servicing for the gas station can be developed to maintain the same drainage pattern. As such, the City to confirm the quantity control criterion for the gas station. The 1:100 year post-development peak flows from the gas station be limited to pre-development levels (C-Factor of 0.20). Prior to outlet into the 750 mm diameter storm sewer, a proposed OGS would be sized to achieve the enhanced protection level (TSS 80%).
Question 7: To minimize runoff volume discharged to the 750 mm diameter storm sewer, rooftop flows from the building and car wash could be captured and infiltrated. Although infiltration for this type of usage is generally not recommended, the City to confirm whether infiltration of the rooftop flows would be permitted.
Question 8: In support of servicing for the overall subdivision and gas station, would the City be favorable of an easement within the 2973 Navan Road to facilitate water and storm servicing (connection to the existing 750 mm diameter storm sewer)? As alternate, would the City entertain selling the eastern part of 2973 Navan Road?

Also, would it be possible to get information on the following for Brian Coburn Blvd:

- Built infrastructure for lanes (i.e. turning lanes, bike lanes etc.);
- Traffic signals;

- Infrastructure underground.

Thanks in advance and have a great weekend,

Gabrielle Snow
Intern Planner

J.L. Richards & Associates Limited
700 - 1565 Carling Avenue, Ottawa, ON K1Z 8R1
Direct: 343-803-3913

J.L. Richards & Associates Limited is proactively doing our part to protect the wellbeing of our staff and communities while improving our communication technology. ***We are pleased to announce that we have implemented direct phone lines for all of our staff, allowing you to connect with us regardless of whether we are working remotely or in the office.*** *We are dedicated to delivering quality services to you through value and commitment, as always. Please reach out to us if you have any questions about your project.*

From: Gabrielle Snow
Sent: Friday, January 15, 2021 10:53 AM
To: 'Belan, Steve' <Steve.Belan@ottawa.ca>
Cc: 'Sauve, Diane' <Diane.Sauve@ottawa.ca>; Tim F. Chadder (tchadder@jlrichards.ca) <tchadder@jlrichards.ca>
Subject: RE: Navan Road - Second Pre-Application

Hi Steve,

Please find the revised concept plan attached. Note that the only changes made were removing a row of townhouses and replacing them with another 3-storey condo building along the southeast corner.

Can you please confirm that the meeting on the 18th is still on? If it is, can Raad and Carmine be sent invites? Their emails are:
rakrawi@groupeheafey.com
carmine@zayoungroup.com

Should you have any questions, please feel free to reach out.

Thanks again,

From: Belan, Steve <Steve.Belan@ottawa.ca>
Sent: Thursday, January 14, 2021 4:38 PM
To: Gabrielle Snow <gsnow@jlrichards.ca>
Subject: RE: Navan Road - Second Pre-Application

Thank you

From: Gabrielle Snow <gsnow@jlrichards.ca>
Sent: January 14, 2021 4:02 PM
To: Belan, Steve <Steve.Belan@ottawa.ca>

Cc: Tim F. Chadder <tchadder@jlrichards.ca>
Subject: RE: Navan Road - Second Pre-Application

Hi Steve,

Quick update, the client might provide us with an updated concept plan tomorrow that would include minor changes only however there is a chance that the concept plan I provided earlier will be the final draft to be discussed at the pre-consult meeting. If we receive an updated concept plan from them, I will be sure to promptly send it your way.

Thanks,

Gabrielle

Gabrielle Snow
Intern Planner

J.L. Richards & Associates Limited
700 - 1565 Carling Avenue, Ottawa, ON K1Z 8R1
Direct: 343-803-3913

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From: Gabrielle Snow
Sent: Thursday, January 14, 2021 3:30 PM
To: Belan, Steve <Steve.Belan@ottawa.ca>
Cc: Tim F. Chadder (tchadder@jlrichards.ca) <tchadder@jlrichards.ca>
Subject: RE: Navan Road - Second Pre-Application

Hi Steve,

My apologies for the wait on receiving the concept plan—we only just received it from the client. Please find the concept plan attached to this email.

Should you have any questions, please feel free to reach out.

Additionally, would it be possible to get Raad and Carmine added to the zoom meeting? They have not received invites. Their emails are:
rakrawi@groupeheafey.com
carmine@zayoungroup.com

Thanks,

From: Belan, Steve <Steve.Belan@ottawa.ca>
Sent: Thursday, January 7, 2021 12:49 PM
To: Gabrielle Snow <gsnow@jlrichards.ca>
Subject: RE: Navan Road - Second Pre-Application

Gabrielle,

I have asked the Admin Assistant to set up a Zoom Call for the 18th some time between 11 and 3. You should receive an email some time. If you haven't by Monday, remind me again please.

Steve

From: Gabrielle Snow <gsnow@jlrichards.ca>
Sent: January 07, 2021 11:46 AM
To: Belan, Steve <Steve.Belan@ottawa.ca>
Cc: Tim F. Chadder <tchadder@jlrichards.ca>
Subject: RE: Navan Road - Second Pre-Application

Hi Steve,

I have gotten word from our client that we should be getting the concept plan by next Friday, Jan 15th. Once we receive it, I will share it with you.

Would it be possible to set up a meeting for the week of Jan 18th? Tim and I have the most availability on the 19th and 20th.

Thanks in advance,

Gabrielle

Gabrielle Snow
Intern Planner

J.L. Richards & Associates Limited
700 - 1565 Carling Avenue, Ottawa, ON K1Z 8R1
Direct: 343-803-3913

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From: Belan, Steve <Steve.Belan@ottawa.ca>
Sent: Monday, December 14, 2020 2:39 PM

To: Gabrielle Snow <gsnow@jlrichards.ca>
Subject: RE: Navan Road - Second Pre-Application

Gabrielle,

I am reluctant to set up a meeting until I know that your group has prepared some kind of concept plan. This will is my last week before the Christmas Holidays and therefore very busy. If you have some material to share I will make a meeting for Thursday afternoon.

Regarding the parkland dedication, There is no plan for a park in the secondary plan. However, it will be up to the parks planner to make this call. I would imagine it will also depend on the number of units that you are proposing. I have spoken with them any they have indicated that they will get back to me.

Steve Belan

From: Gabrielle Snow <gsnow@jlrichards.ca>
Sent: December 07, 2020 3:30 PM
To: Belan, Steve <Steve.Belan@ottawa.ca>
Cc: Tim F. Chadder <tchadder@jlrichards.ca>; Lucie Dalrymple <ldalrymple@jlrichards.ca>
Subject: Navan Road - Second Pre-Application

Hi Steve,

I hope this email finds you well.

I am reaching out to request a second pre-application meeting as it relates to the proposed Navan Road development. As mentioned during the last meeting, the client was able to acquire abutting properties (2983 Navan Road, 3053 Navan Road) in addition to 3079 Navan road. Since a number of additional development plans and considerations have changed as a result, we are looking to have a second meeting.

We are aiming to get you the site plan, pre-application meeting form and additional materials by early next week. With this in mind, do you think it would be possible to schedule the pre-application meeting end of week next week or sometime early the week after?

Also, would you be able to confirm that cash in lieu of parkland would be accepted for this development?

Thanks in advance,

Gabrielle

Gabrielle Snow
Intern Planner

J.L. Richards & Associates Limited
700 - 1565 Carling Avenue, Ottawa, ON K1Z 8R1
Direct: 343-803-3913

J.L. Richards
& Associates Limited
ENGINEERS • ARCHITECTS • PLANNERS

CANADA'S BEST MANAGED COMPANIES

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Appendix B1

Concept Plan, Draft Plan of Subdivision and Topographical Survey

1 2983, NAVAN ROAD - SITE PLAN
1 : 550

LOTS AREAS

LOT NUMBER	AREAS (M2)	LOT NUMBER	AREAS (M2)
L1	376	L39	184
L2	176	L40	174
L3	176	L41	234
L4	181	L42	234
L5	181	L43	174
L6	176	L44	184
L7	176	L45	184
L8	286	L46	174
L9	5,745	L47	487
L10	281	L48	748
L11	176	L49	286
L12	184	L50	265
L13	184	L51	246
L14	174	L52	242
L15	233	L53	242
L16	250	L54	321
L17	182	L55	240
L18	182	L56	7,485
L19	182	L57	5,411
L20	182	L58	444
L21	250	L59	182
L22	233	L60	182
L23	174	L61	182
L24	184	L62	182
L25	174	L63	552
L26	280	L64	387
L27	1,410	L65	174
L28	736	L66	184
L29	5,288	L67	184
L30	523	L68	174
L31	174	L69	233
L32	184	L70	233
L33	184	L71	174
L34	174	L72	184
L35	234	L73	174
L36	234	L74	184
L37	174	L75	174
L38	184	L76	399

SITE PLAN LEGEND

EXISTING BUILDING	LOT LINE
NEW BUILDING	SETBACKS
NEW BUILDING WITH COMMERCIAL SPACE AT-GRADE	NEW TREE
GRASS	FIREWALL
ASPHALT	SIDEWALK

SITE INFORMATION & DEVELOPMENT STATISTICS

LOTS		PIN
		04756 - 0303
		04756 - 0315
		04756 - 0316
		04756 - 1337
ZONING		GM[2546] H(14.5)
SITE AREA		
TOTAL SITE AREA:		~53,441.14 m^2 (53.4ha)
TOTAL DEVELOPABLE AREA:		~45,956.28 m^2 (45.9ha)
NET SITE AREA:		~38,956.28 m^2 (38.9ha)
UNITS		
TOWNHOUSES: 69 UNITS		
APARTMENTS: 6 BUILDINGS / TOTAL OF 263 UNITS		
COMMERCIAL SPACES: ~20,000 m^2		
	REQUIRED	PROVIDED
MAXIMUM DENSITY	NO MAX.	8.53 units/net ha
MINIMUM LOT WIDTH	NO MIN.	5.8 m
MINIMUM LOT AREA	NO MIN.	174 m^2
MAXIMUM BUILDING HEIGHT	14.5 m	14.5 m
SETBACKS		
MINIMUM FRONT YARD:	3 m	3 m
MINIMUM CORNER SIDE YARD:	3 m	3 m
MINIMUM INTERIOR SIDE YARD:		
NON-RESIDENTIAL OR MIXED-USE:	5 m	5 m
LOW-RISE RESIDENTIAL :	1.2 m	1.2 m
MID-RISE RESIDENTIAL :	3 m	3 m
MINIMIM REAR YARD:		
ABUTTING A STREET:	3 m	3 m
FROM A RESIDENTIAL ZONE:	7.5 m	7.5 m
FOR A RESIDENTIAL BUILDING:	7.5 m	7.5 m
PARKING RATES		
R9 - TOWNHOUSES:	1 p/unit = 69	69 (GARAGES)
VISITOR:	0	69 DRIVE AISLES
R12 - APARTMENTS - BLOCK 01:	1.2 p/unit = 101	101
VISITOR:	0.2 p/unit = 17	17
R12 - APARTMENTS - BLOCK 02:	1.2 p/unit = 101	101
VISITOR:	0.2 p/unit = 17	17
R12 - APARTMENTS - BLOCK 03:	1.2 p/unit = 116	~145
VISITOR:	0.2 p/unit = 20	8 ext. + 12 int.
N79 - RETAIL STORE - BLOCK 01:	3.4 p/100 m^2 GFA = 32	32
N79 - RETAIL STORE - BLOCK 02:	3.4 p/100 m^2 GFA = 32	32
GROSS FLOOR AREA		
TOWNHOUSE A:		267 m^2
TOWNHOUSE B:		239 m^2
TOWNHOUSE C:		232 m^2
TOWNHOUSE C (CORNER UNIT):		236 m^2
TOWNHOUSE D:		225 m^2
TOTAL MODEL 01 (ABBBBBBA)		1,968 m^2
TOTAL MODEL 02 (ABBBBBA)		1,729 m^2
TOTAL MODEL 03 (ABBBBA)		1,490 m^2
TOTAL MODEL 04 (CDCDCDC)		1,611 m^2
TOTAL MODEL 05 (CDCCDC)		1,386 m^2
TOTAL MODEL 06 (CDCDC)		1,154 m^2
APARTMENT BUILDING 1:		TOTAL: 4,130 m^2
RESIDENTIAL:		3,201 m^2
COMMERCIAL:		929 m^2
APARTMENT BUILDING 2:		TOTAL: 4,130 m^2
RESIDENTIAL:		4,130 m^2

NOTE

1. ASSUMES TYPICAL RESIDENTIAL FLOOR HEIGHT OF 3m.

2. THE BASE PLAN (LOT LINES, EXISTING ROADS AND SURROUNDING AREAS) IS BASED ON THE TOPOGRAPHICAL PLAN OF SURVEY, SURVEYED STANTEC GEOMATICS LTD.

3. DISTANCES SHOWN ON THIS PLAN ARE IN METRES AND CAN BE CONVERTED TO FEET BY DIVIDING BY 0,3048.

PROJECT

NAVAN ROAD DEVELOPMENT

2983, Navan Road, Orleans,
ON K1C 7G4

OWNER

GROUPE Heafey GROUP
768, BOUL. SAINT-JOSEPH, SUITE 100
GATINEAU, QC J8Y 4B8

ARCHITECTURAL

PMA ARCHITECTES
(418) 651-8954
INFO@PMAARCHITECTES.COM
3070, CHEMIN DES QUATRE-BOURGEOIS
QUÉBEC (QC) G1W 2K4
PMAARCHITECTES.COM

LAPALME RHEAULT ARCHITECTES + ASSOCIÉS
53, BOUL. SAINT-RAYMOND,
GATINEAU, QC J8Y 1R8

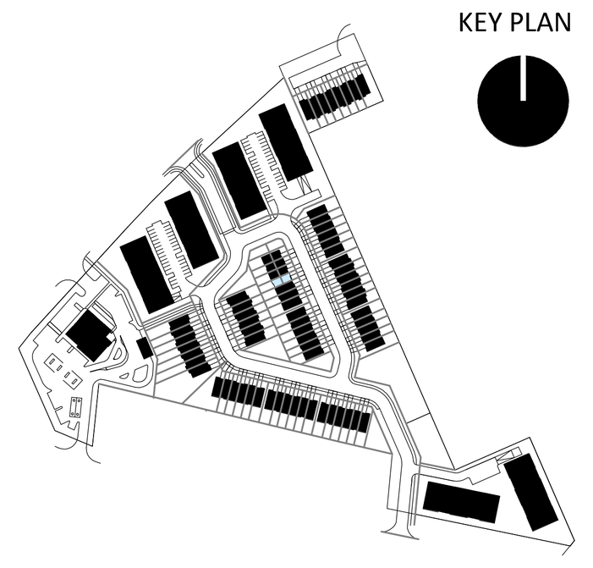
ENGINEERS / PLANNER

J.L.Richards
ENGINEERS · ARCHITECTS · PLANNERS
1565 CARLING AVENUE, SUITE 700,
OTTAWA, ON K1Z 8R1

SURVEYOR

Stantec
1331 CLYDE AVENUE, SUITE 400,
OTTAWA, ON K2C 3G4

KEY PLAN



ARCHITECT SEAL

ONTARIO ASSOCIATION OF ARCHITECTS
PIERRE MARTIN
LICENCE 6757

REVISIONS

NO	DESCRIPTION	DATE
2	FOR COORDINATION	2021-08-26
1	FOR COORDINATION	2021-08-18

NOTE

IT IS THE RESPONSIBILITY OF THE APPROPRIATE CONTRACTOR TO CHECK AND VERIFY ALL DIMENSIONS ON THE SITE AND TO REPORT ALL ERRORS AND/OR OMISSIONS TO THE ARCHITECT. ALL CONTRACTORS MUST COMPLY WITH ALL PERTINENT CODES AND BY-LAWS. DO NOT SCALE DRAWINGS.

FOR COORDINATION
DO NOT USE FOR CONSTRUCTION
2021-08-26

DATE	DESIGNED
2021-08-26	PP
	DRAWN: PP
PROJECT No: 20054	CHECKED: PM

SHEET TITLE: SITE PLAN

SHEET No: A100

APPROVED UNDER SECTION 51 OF THE PLANNING ACT BY THE CITY OF OTTAWA,

THIS ______ DAY OF ________________ 2021.

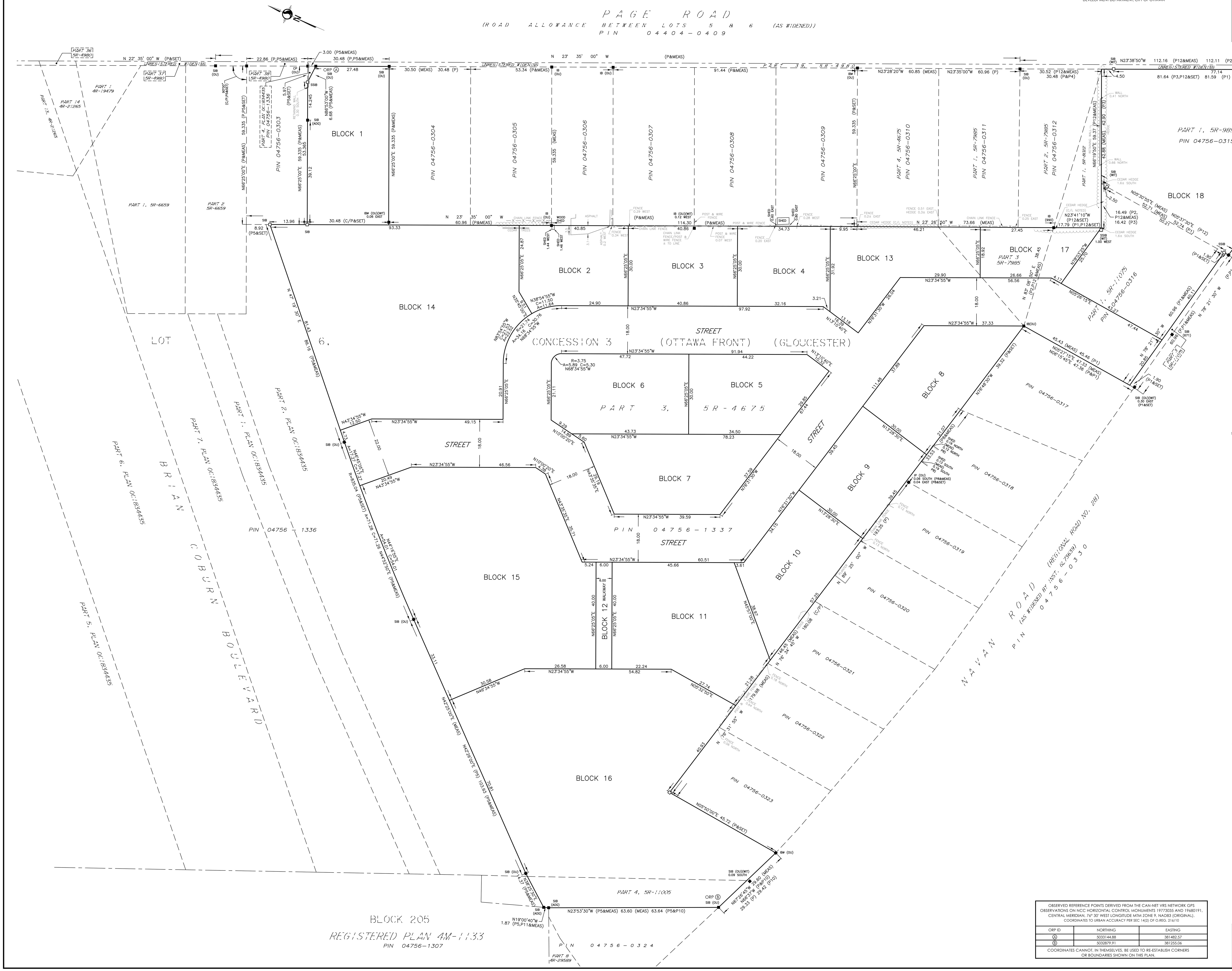
STEPHEN WILLIS, MCIP, RPP. GENERAL MANAGER
PLANNING, INFRASTRUCTURE AND ECONOMIC
DEVELOPMENT DEPARTMENT, CITY OF OTTAWA

PLAN 4M-

I HEREBY CERTIFY THAT THIS PLAN 4M-______ IS REGISTERED IN THE LAND REGISTRY OFFICE FOR THE LAND TITLES DIVISION OF OTTAWA-CARLETON (No.4) AT_____ O'CLOCK ON THE______ DAY OF _____________, 2021 AND ENTERED IN THE REGISTER FOR P.I.N.____________________, AND THE REQUIRED CONSENTS ARE REGISTERED AS PLAN DOCUMENT NUMBER OC-____________.

REPRESENTATIVE FOR LAND REGISTRAR

THIS PLAN COMPRISES OF ALL OF PINS 04756-0315 & 04756-1337 AND PART OF PIN 04756-0316.



OBSERVED REFERENCE POINTS DERIVED FROM THE CAN-NET VRS NETWORK GPS OBSERVATIONS ON NCC HORIZONTAL CONTROL MONUMENTS 19773035 AND 19680191, CENTRAL MERIDIAN, 76° 30' WEST LONGITUDE MTM ZONE 9, NAD83 (ORIGINAL). COORDINATES TO URBAN ACCURACY PER SEC 14(2) OF O.REG. 216/10		
ORP ID	NORTHING	EASTING
(A)	5033144.88	381482.57
(B)	5032879.91	381255.06
COORDINATES CANNOT, IN THEMSELVES, BE USED TO RE-ESTABLISH CORNERS OR BOUNDARIES SHOWN ON THIS PLAN.		

PLAN OF SUBDIVISION OF

PART OF LOT 6
CONCESSION 3 (OTTAWA FRONT)

(GEOGRAPHIC TOWNSHIP OF GLOUCESTER)

CITY OF OTTAWA

Scale 1:500

10 0 10 20 30 METRES

METRIC CONVERSION

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

GRID SCALE CONVERSION

DISTANCES ARE GROUND AND CAN BE CONVERTED TO GRID BY MULTIPLYING BY THE COMBINED SCALE FACTOR OF 0.999964

BEARING NOTE

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

FOR BEARING COMPARISONS, BEARINGS ON PLANS P, P1, P2 & P3 HAVE BEEN ROTATED 0°41'30" COUNTERCLOCKWISE.

LEGEND

■	DENOTES	FOUND MONUMENTS
□	"	SET MONUMENTS (IB) UNLESS OTHERWISE NOTED
IB	"	IRON BAR
IBØ	"	ROUND IRON BAR
SIB	"	STANDARD IRON BAR
SSIB	"	SHORT STANDARD IRON BAR
CC	"	CUT CROSS
CP	"	CONCRETE PIN
WIT	"	WITNESS
PIN	"	PROPERTY IDENTIFICATION NUMBER
MEAS	"	MEASURED
PROP	"	PROPORTIONED
OU	"	ORIGIN UNKNOWN
SG	"	STANTEC GEOMATICS LTD.
ORP	"	OBSERVED REFERENCE POINT
P	"	PLAN 5R-4675
P1	"	PLAN 5R-11075
P2	"	PLAN 5R-7985
P3	"	PLAN 5R-9893
P4		PLAN 5R-8022
P5	"	PLAN OC183445
P6	"	PLAN 5R-4980
P7	"	PLAN 5R-6659
P8		PLAN BY FMW DATED SEPTEMBER 9, 2015
P9	"	PLAN BY 1175 DATED SEPTEMBER 30, 1987
P10	"	PLAN 5R-11005
P11	"	REGISTERED PLAN 4M-1133
P12	"	PLAN BY 1465 DATED DECEMBER 10, 2020
C/P	"	CALCULATION PER

NOTES

1. ALL PLANTED MONUMENTS SHOWN HEREON ARE IRON BARS (IB) UNLESS OTHERWISE NOTED.
2. TOTAL AREA OF LANDS BEING SUBDIVIDED HEREON BY * IS * Ha.

OWNER'S CERTIFICATE

ALL OF PINS 04756-0315 & 04756-1337 & PART OF 04756-0316.

THIS IS TO CERTIFY THAT :

1. BLOCKS 1 TO 11, BOTH INCLUSIVE, BLOCKS 13 TO 17, BOTH INCLUSIVE, THE STREETS, NAMELY STREET AND LANES, NAMELY BLOCK 12, HAVE BEEN LAID OUT IN ACCORDANCE WITH OUR INSTRUCTIONS.
2. THE STREETS AND LANES ARE DEDICATED TO THE CITY OF OTTAWA AS PUBLIC HIGHWAYS.

DATE

*,PRESIDENT
####### ONTARIO LIMITED
I HAVE THE AUTHORITY TO BIND THE CORPORATION

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 1st DAY OF MAY, 2021.

DATE

FRANCIS LAU
ONTARIO LAND SURVEYOR

Stantec Geomatics Ltd.
CANADA LANDS SURVEYORS
ONTARIO LAND SURVEYORS
1331 CLYDE AVENUE, SUITE 400
OTTAWA, ONTARIO, K2C 3G4
TEL. 613.722.4420 FAX. 613.722.2799
stantec.com

DRAWN: ME/NJ	CHECKED: KJ	DATE: KJ	FIELD: ES/LG	PROJECT No.: 161614345-132

ASSOCIATION OF ONTARIO LAND SURVEYORS
PLAN SUBMISSION FORM
2048683

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

January 29, 2021

PAGE ROAD

ROAD ALLOWANCE BETWEEN LOTS 5 & 6 (AS WIDENED)
PIN 04404–0409

UNREGISTERED WIDENING

PART 36 5R–4980 | PART 37 5R–4980 | PART 38 5R–4980 | (PART 39 5R–4980)

77.22 (P,P6&SET)

13.55 (P,P6&SET)

PART 14 48–21265 | PART 1 48–19479

PART 1 5R–4659 | PART 2 5R–4659

N67°06'30"E 59.335 (P,P5&SET) 59.34 (MEAS)

N67°06'30"E 59.335 (P,P&MEAS)

N22°53'30"W (REFERENCE BEARING) N22°54'00"W (P1,P7) N22°53'00"W (P6)

N22°53'30"W (MEAS) N22°53'10"W (P5) 44.50 (P,P5&SET)

22.86 (P,P5&SET) | 3.00 (P5&MEAS) | 5R–48 (P,P5&MEAS) | 47.48 (P,P5&SET)

30.50 (MEAS) | 30.48 (P) | 53.34 (P&MEAS) | 91.44 (P&MEAS) | 91.40 (MEAS) 91.44 (P) | 30.48 (P,P1,P2&SET)

30.48 (P,P1,P2&SET) | 81.59 (P1&SET) 81.63 (P,P2) 81.64 (P1) | 100.58 (MEAS) 100.48 (P,P2,P4)

PART 1 5R–9893 | PIN 04756–0315

PART 2 5R–7985 | PIN 04756–0312 | PART 1 5R–8022 | PART 1 5R–7985 | PIN 04756–0311 | PART 4 5R–4675 | PIN 04756–0310

PIN 04756–0302 | PIN 04756–0303 | PIN 04756–0304 | PIN 04756–0305 | PIN 04756–0306 | PIN 04756–0307 | PIN 04756–0308 | PIN 04756–0309

No. 2738 | No. 2742

N67°17'30"W 6.88 (P5&MEAS) | PART 4 5R–7985 PIN 04756–0311

5.97 (P5&SET) | 5.90 (P5&SET) | 97.35 (P,P5&SET) | 97.36 (P,P5&SET) | 92.86 (P,P5&SET)

13.96 | 30.48 (C/P&SET) | 53.34 (C/P&MEAS)

HEDGE 0.46 EAST | CEDAR HEDGE (C/L NOTED) | HEDGE 1.16 EAST | 114.38 (MEAS) | FENCE 0.27 WEST | 205.71 (MEAS) 205.74 (P) | FENCE 0.11 WEST | FENCE 0.09 EAST | FENCE 0.28 EAST | FENCE 0.51 EAST | HEDGE 0.36 EAST | FENCE 0.25 EAST | FENCE & HEDGE 0.25 EAST | 43.24 (P2&SET)

N22°53'30"W (P&MEAS)

CHAIN LINK FENCE | SHED | DRIVEWAY | 0.04 CULVERT | SIB(OU) WIT 0.10 NORTH 0.13 WEST | SIB(OU) WIT 0.06 WEST | SIB(OU) WIT 0.12 WEST

CEDAR HEDGE 1.6± SOUTH | CEDAR HEDGE (C/L NOTED) | CEDAR HEDGE 1.6± SOUTH | 54.65 (MEAS) 54.64 (P1) | 52.765 (MEAS) 52.74 (P1) | 16.49 (MEAS) 16.48 (P1) | 17.72 (MEAS) 17.79 (P1)

N52°44'20"E 38.45 (MEAS) 38.37 (P2,P4) | N38°20'30"E 45.05 (MEAS) | 1.90 (P1&MEAS)

PART 3 5R–7985

PART 2 | AREA=3,070.7 SQ. METERS | PART 1 5R–11075 | PIN 04756–0316

PART 2 5R–11075

N37°40'00"W 67.86 (P1&MEAS) | N37°40'00"W 67.93 (MEAS) | N37°40'00"W 67.93 (P1)

N52°19'40"W 49.39 (P,P8) N52°25'10"W 49.34 (MEAS) | N19°19'40"W 39.32 (P&MEAS)

PART 1 | AREA = 45,617 SQ. METERS | PART 3 5R–4675 | PIN 04756 – 1337

PART 1 PLAN OC1834435 | PART 2 PLAN OC1834435 | PART 6 PLAN OC1834435 | PART 7 PLAN OC1834435 | PART 5 PLAN OC1834435

PIN 04756 – 1336

PIN 04756–0317 | PIN 04756–0318 | PIN 04756–0319 | PIN 04756–0320 | PIN 04756–0321 | PIN 04756–0322 | PIN 04756–0323 | PIN 04756–0324 | PIN 04756–1307

No. 3015 | No. 3007

N19°19'20"W 178.98 (MEAS) 179.01 (P,P11) | N19°19'20"W 1.87 (P5,P11&SET) | N19°19'20"W 63.64 (P5,P10)

N22°12'00"W (P5,P10&MEAS) 63.60 (MEAS) 63.64 (P5,P10)

N68°01'30"E 45.71 (P&SET)

PART 4 5R–11005

FENCE 0.12 NORTH | FENCE 0.13 NORTH | FENCE 0.18 NORTH | FENCE 0.64 NORTH | FENCE 0.06 NORTH | POST & WIRE FENCE | OPEN WIRE FENCE | GARAGE | SHED 0.16 NORTH (MEAS) 0.12 NORTH (P,B) | SHED 0.13 SOUTH (MEAS) 0.19 SOUTH (P,B) | IP (SQ) (WIT) 0.08 SOUTH (P&MEAS) 0.04 EAST (P,B&SET)

LOT 6 | CONCESSION 3 | (OTTAWA FRONT) | (GLOUCESTER)

BLOCK 250
REGISTERED PLAN 4M–1133

NAVAN ROAD
(REGIONAL ROAD No. 28)
(AS WIDENED BY INST. GL73639)
PIN 04756–0320

RENAUD ROAD

MATCH LINE "A" | MATCH LINE "B"

MATCH DETAIL
SCALE 1:500

TOPOGRAPHIC PLAN OF SURVEY
PART OF LOT 6
CONCESSION 3 (OTTAWA FRONT)
(GEOGRAPHIC TOWNSHIP OF GLOUCESTER)
CITY OF OTTAWA

Scale 1:500
0 5 10 15 20 30 METRES

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

GRID SCALE CONVERSION
DISTANCES ARE GROUND AND CAN BE CONVERTED TO GRID BY MULTIPLYING BY THE COMBINED SCALE FACTOR OF 0.999964

BEARING NOTE
BEARINGS ARE ASTRONOMIC AND ARE REFERRED TO THE WESTERLY LIMIT OF PAGE ROAD, AS SHOWN ON PLAN 5R-4980, HAVING A BEARING OF N22°53'30"W.

A BEARING ROTATION CLOCKWISE OF 0°41'20" HAVE BEEN APPLIED TO BEARINGS SHOWN ON P5, P6, AND P7.

ELEVATION NOTE
ELEVATIONS SHOWN HEREON ARE GEODETIC (CGVD-1928:1978) AND ARE DERIVED FROM THE CAN-NET VRS NETWORK.

LEGEND

■	DENOTES	FOUND MONUMENTS
□	-	SET MONUMENTS
IB	-	IRON BAR
IRB	-	ROUND IRON BAR
SIB	-	STANDARD IRON BAR
SSIB	-	SHORT STANDARD IRON BAR
CC	-	CUT CROSS
CP	-	CONCRETE PIN
WIT	-	WITNESS
PIN	-	PROPERTY IDENTIFICATION NUMBER
MEAS	-	MEASURED
PROP	-	PROPORTIONED
OU	-	ORIGIN UNKNOWN
SG	-	STANTEC GEOMATICS LTD.
ORP	-	OBSERVED REFERENCE POINT
P	-	PLAN SR-4675
P1	-	PLAN SR-11075
P2	-	PLAN SR-7985
P3	-	PLAN SR-9893
P4	-	PLAN SR-8022
P5	-	PLAN OC1834345
P6	-	PLAN SR-4980
P7	-	PLAN SR-6659
P8	-	PLAN BY FMW DATED SEPTEMBER 9, 2015
P9	-	PLAN BY 1173 DATED SEPTEMBER 30, 1987
P10	-	PLAN SR-11005
P11	-	REGISTERED PLAN 4M-1133
C/P	-	CALCULATION PER
ACU		AIR CONDITIONING UNIT
AN		ANCHOR
AP		AIR PUMP
ANT		ANTENNA
BH		BOREHOLE
BIB		HOSE BIB
BKR		BIKE RACK
BENCH		BENCH
BOL		BOLLARD
BOUL		BOULDER
CB		CATCH BASIN
DCB		DOUBLE CB
DICB		DITCH CB
CBMH		CB MANHOLE
DCBMH		DOUBLE CB MANHOLE
CBSI		SIDE INLET CB
CHM		CHIMNEY
CSV		VALVE CURB STOP
DRN		DRAIN
EPOST		ELECTRICAL OUTLET
FP		FLAG POLE
FL		FLOOD LIGHT
FTF		FUEL TANK FILLER CAP
GC		GARBAGE CAN
GFL		PIPE FLANGE (GAS)
GFP		GAS FUEL PUMP
GP		POLE GUYWIRE
GSR		GAS SERVICE REGULATOR
GV		GAS VALVE
HIC		HICKENBOTTOM
HDS		HEADSTONE
HLS		LIGHT STANDARD HYDRO
HM		HYDRO METER
HTN		HYDRO TRANSFORMER
HW		HAND WELL
HYD		FIRE HYDRANT
JBX		JUNCTION BOX
MB		MAILBOX
MP		MONITORING PIN
MH		MAINTENANCE HOLE UNIDENTIFIED
MHBELL		MAINTENANCE HOLE BELL
MHF		MAINTENANCE HOLE FIBRE OPTIC
MHH		MAINTENANCE HOLE HYDRO
MHI		MAINTENANCE HOLE INVERT
MHSAN		MAINTENANCE HOLE SANITARY
MHSTM		MAINTENANCE HOLE STORM
MHT		MAINTENANCE HOLE TRAFFIC
MW		MONITORING WELL
NPB		NEWS PAPER BOX
OLP		LIGHT STANDARD ORNAMENTAL
OW		OBSERVATION WELL
PKM		PARKING METER
PLBX		PULL BOX
PLQ		PLAQUE
PLR		PILLAR
PZ		PIEZOMETER
RLC		RED LIGHT CAMERA
RWSL		RAILWAY SIGNAL LIGHT
RWSS		RAILWAY SWITCH STAND
SAT		SATELLITE DISH
SCLP		SCULPTURE
SCP		SUMP/CATCH PIT
SCV		SPRINKLER CONTROL VALVE
SH		SPRINKLER HEAD
SM		SIAMESE CONNECTION
SN		SIGN
SPAN		SOLAR PANEL
SPT		SEPTIC TANK LID
TBL		TABLE
TB BELL		TERMINAL BOX - BELL
TB CATV		TERMINAL BOX - CABLE
TCB		TRAFFIC CONTROL BOX
TPIT		TEST PIT
TSL		TRAFFIC SIGNAL LIGHT
UMB		MARKER BELL UNDERGROUND
UMC		MARKER CABLE UNDERGROUND
G		NATURAL GAS LOCATE
UMO		MARKER OIL UNDERGROUND
UP		UTILITY POLE
VB		VALVE BOX
VC		VALVE CHAMBER
WV		WATER VALVE
_cm		TREE CONIFEROUS Ø _centimetres
_cm		TREE DECIDUOUS Ø _centimetres

UPDATE NOTE:
1. TOPOGRAPHIC INFORMATION SHOWN HEREON UPDATED PER FIELD SURVEY DATED THE 14TH. DAY OF DECEMBER, 2020.

January 25, 2021
DATE

FRANCIS LAU
ONTARIO LAND SURVEYOR

SURVEYOR'S CERTIFICATE
I CERTIFY THAT :
1. THIS SURVEY AND PLAN ARE CORRECT AND IN ACCORDANCE WITH THE SURVEYS ACT, THE SURVEYORS ACT AND THE REGULATIONS MADE UNDER THEM.
2. THE SURVEY WAS COMPLETED ON THE 14th DAY OF DECEMBER, 2020.

DATE

BRIAN J. WEBSTER
ONTARIO LAND SURVEYOR

SRO COORDS: X= 3813188 Y= 5032979

Stantec Geomatics Ltd.
CANADA LANDS SURVEYORS
ONTARIO LAND SURVEYORS
1331 CLYDE AVENUE, SUITE 400
OTTAWA, ONTARIO, K2C 3G4
TEL 613.722.4420 FAX 613.722.2799
stantec.com

DRAWN: ME	CHECKED: KJ	PM: BW	FIELD: CA\SJ	PROJECT No.: 161613834-114

K:\Ottawa\161613834\Topographical\Drawing\161613834-111_topo_r02_r26.dwg

Appendix B2

Conceptual Design Drawings – JLR Conceptual Servicing & Grading

PROJECT NORTH

LEGEND:

- CONCEPTUAL WATERMAIN
- EXISTING WATERMAIN
- EXISTING SANITARY SEWER & MANHOLE
- EXISTING STORM SEWER & MANHOLE
- CONCEPTUAL SANITARY SEWER & MANHOLE
- CONCEPTUAL STORM SEWER & MANHOLE

PAGE ROAD

NAVAN ROAD

BRIAN COBURN BLVD.

CONNECT TO EXISTING 250mmØ SANITARY

CONNECT TO EXISTING 305mmØ WATERMAIN

CONNECT TO EXISTING DICB63, PROPOSED TO CHANGE TO A CBMH

EXISTING MH101 INV = 75.43

CONNECT TO EXISTING STORM AT MH101

CONNECT TO EXISTING SANITARY AT MH EX10

DOUBLE 750mmØ STORM TO CROSS BETWEEN EX 250mmØ SAN PIPE AND FORCEMAINS (300mmØ AND 400mmØ)

CONNECT TO EXISTING 305mmØ WATERMAIN

CONNECT TO EXISTING 305mmØ WATERMAIN

PROPOSED PARK

PROPOSED SWM

300mmØ WM

400mmØ FORCEMAIN

EX. 250mmØ SAN

EX. 1350mmØ ST

1200mmØ ST

No.	ISSUE / REVISION	DD/MM/YY
1	ADEQUACY OF PUBLIC SERVICES REPORT	07/09/21

VERIFY SHEET SIZE AND SCALES. THE BAR TO THE RIGHT IS 25mm IF THIS IS A FULL SIZE DRAWING. 0 25mm

SCALE: 1:1000

0 10 20 40 60 80m

CLIENT: Groupe Heafey

CONSULTANT: www.jlrichards.ca

J.L.Richards ENGINEERS · ARCHITECTS · PLANNERS

CONSULTANT:

PROFESSIONAL STAMP

PROFESSIONAL STAMP

PROJECT:

2983, 3053 and 3079 NAVAN ROAD & 2690 PAGE ROAD

DRAWING:

CONCEPTUAL SITE SERVICING

DESIGN:

DRAWN:

CHECKED:

JLR #: 29899-000

DRAWING #: CS1

File Location: P:\29000\29899-000 - Gas Bar 3079 Navan\5-Production\1-Civil\29899-000 C OS.dwg

PLOT DATE: Wednesday, September 8, 2021 3:22:03 PM

PAGE ROAD

BRIAN COBURN BLVD.

NAVAN ROAD

PROJECT NORTH

anticipated RETAINING WALL location, limits to be confirmed at detailed design

PROPOSED PARK BLOCK

PROPOSED SWM BLOCK

FF 86.20
USF 82.60

FF 85.80
USF 82.20

x Conceptual Design Proposed Grades

x Existing Grades - Topo Survey

Conceptual Design CB Locations

No.	ISSUE / REVISION	DD/MM/YY
1	ADEQUACY OF PUBLIC SERVICES REPORT	07/09/21

VERIFY SHEET SIZE AND SCALES. THE BAR TO THE RIGHT IS 25mm IF THIS IS A FULL SIZE DRAWING. 0 25mm

SCALE: 1:750

0 15 30 45 60m

CLIENT:

CONSULTANT: www.jlrichards.ca

J.L.Richards
ENGINEERS · ARCHITECTS · PLANNERS

CONSULTANT:

PROFESSIONAL STAMP

PROFESSIONAL STAMP

PROJECT:

2983, 3053 and 3079 NAVAN ROAD &
2690 PAGE ROAD

DRAWING:

CONCEPTUAL GRADING

DESIGN:

DRAWN:

CHECKED:

JLR #: 29899-000

DRAWING #:

CG1

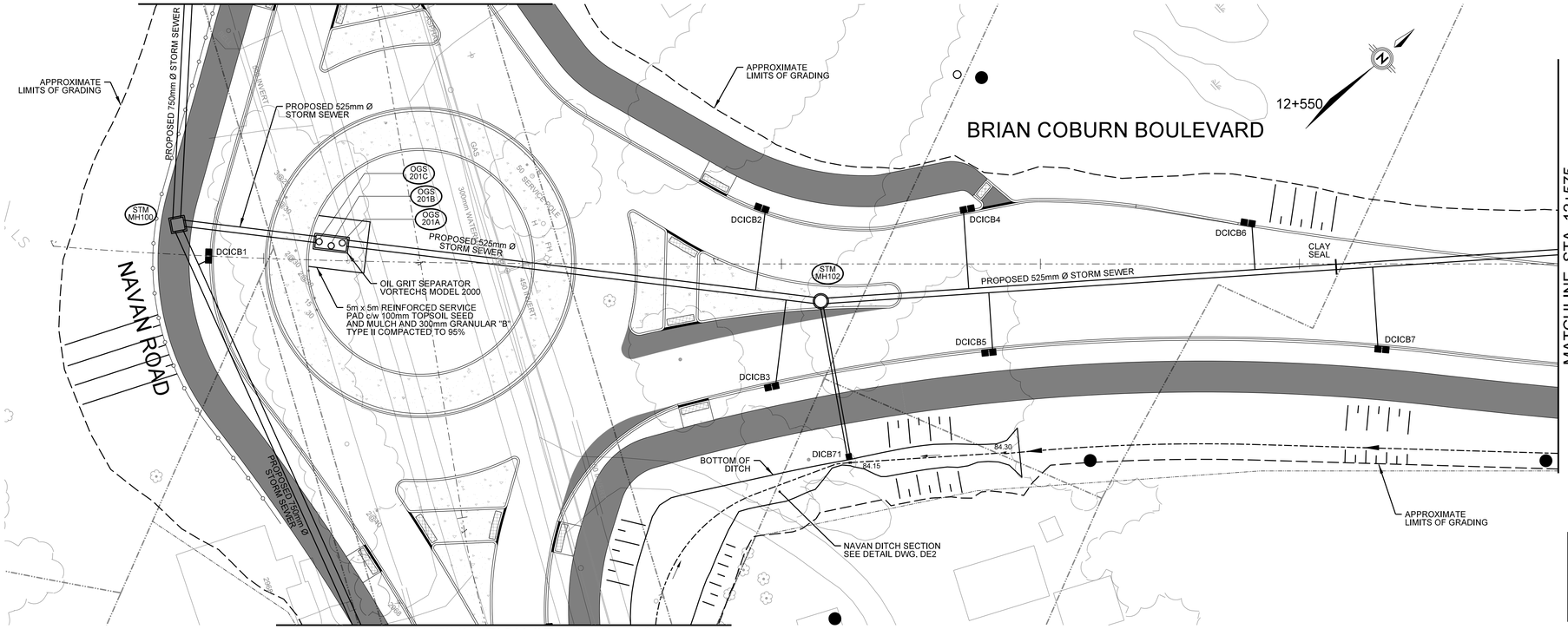
File Location: P:\29000\29899-000 - Gas Bar 3079 Navan\5-Production\1-Civil\29899-000 C Grading.dwg

PLOT DATE: Friday, September 3, 2021 9:38:33 AM

Appendix C

Background Drawings –
Existing Infrastructure

FOR CONTINUATION SEE DWG. P18



FOR CONTINUATION SEE DWG. P19

MATCHLINE STA. 12+575
FOR CONTINUATION SEE DWG. P2

BRIAN COBURN BOULEVARD
NEW ROAD CONSTRUCTION

GRADING & DRAINAGE
STA. 12+425 TO STA. 12+575

W. R. Newell, P.Eng.
General Manager
Infrastructure Services Department

J. Mojsej, P.Eng.
Project Manager
Design & Construction - Municipal East

Robinson Consultants

AS-BUILT

RECORD INFORMATION PROVIDED BY CITY OF OTTAWA

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Ottawa

Contract No.	Dwg. No.
ISD14-5104	P1

Sheet _ of _

Asset No. _____

Asset Group ___

Des.	Chk'd.
C.T.	R.C.
Dwn.	Chk'd.
C.T.	D.R.
Utility Circ. No. _____	Index No. ____
Const. Inspector _____	

Scale: HORIZONTAL 0m 5 10

NOTE: The location of utilities is approximate only, the exact location should be determined by consulting the municipal authorities and utility companies concerned. The contractor shall prove the location of utilities and shall be responsible for adequate protection from damage.

REVISIONS

No.	Description	By	Date (dd/mm/yy)
1	ISSUED FOR PRELIMINARY DESIGN CIRCULATION	R.C.	31,10,14
2	ISSUED FOR TENDER	R.C.	05,06,15
3	ISSUED FOR CONSTRUCTION	R.C.	01,03,16
4	REVISED OGS INVERTS AS PER SCM 12	R.C.	28,03,16
5	ISSUED FOR SCM No. 67	R.C.	03,05,17
6	*AS BUILT*	*R.C.*	*30.03.18*

STORM MANHOLE DATA

No.	Station	Offset (m)	Type		Elevations		Grate to Invert
			Structure	Cover	Grate	Low Inv.	
STM MH100	12+441.55	2.89 L	M4	S24.1 / S25	85.46	83.27	2.19
STM MH102	12+503.80	3.60 R	701.010	S24.1 / S25	85.40	83.60	1.80
OGS 201A	12+457.55	1.72 L	OGS	OGS	85.74	N/A	N/A
OGS 201B	12+456.49	1.42 L	OGS	OGS	85.72	N/A	N/A
OGS 201C	12+455.31	1.79 L	OGS	OGS	85.70	N/A	N/A

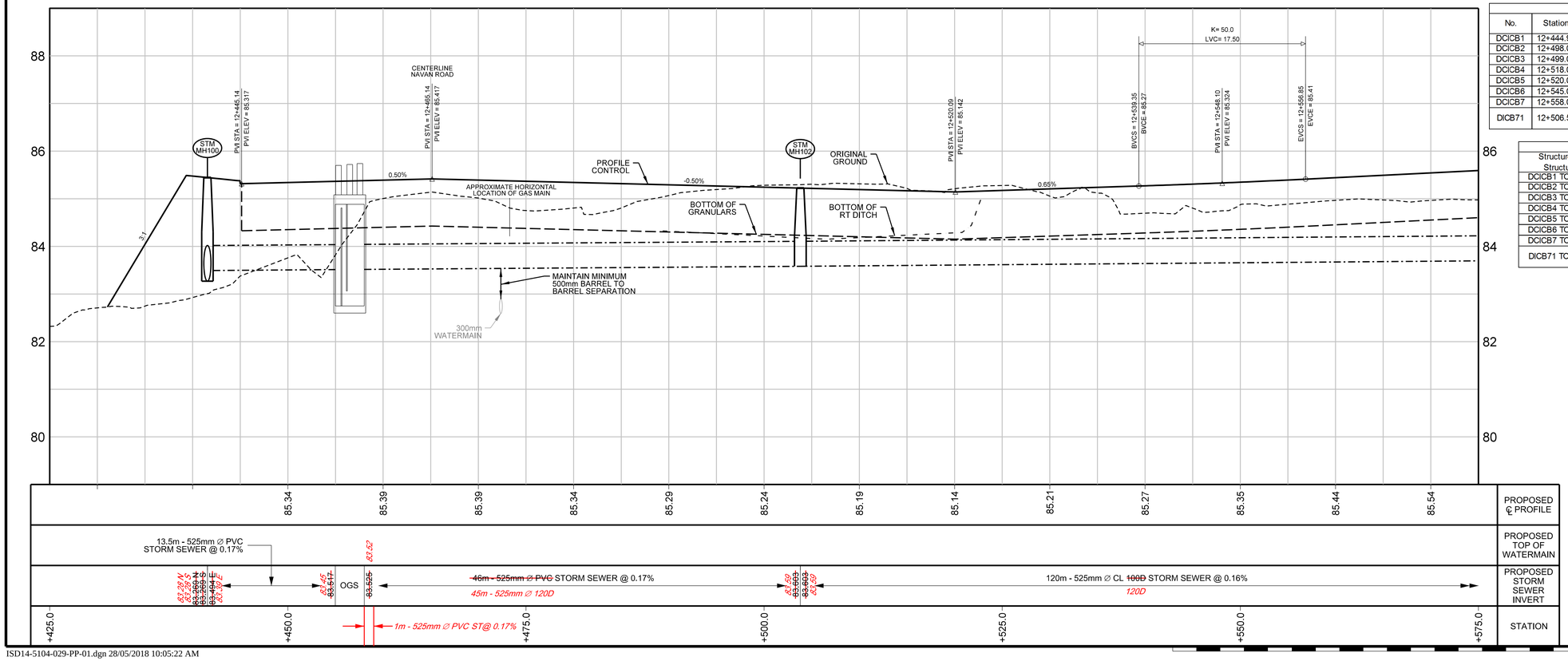
OGS - OIL GRIT SEPERATOR UNIT

CATCH BASIN DATA

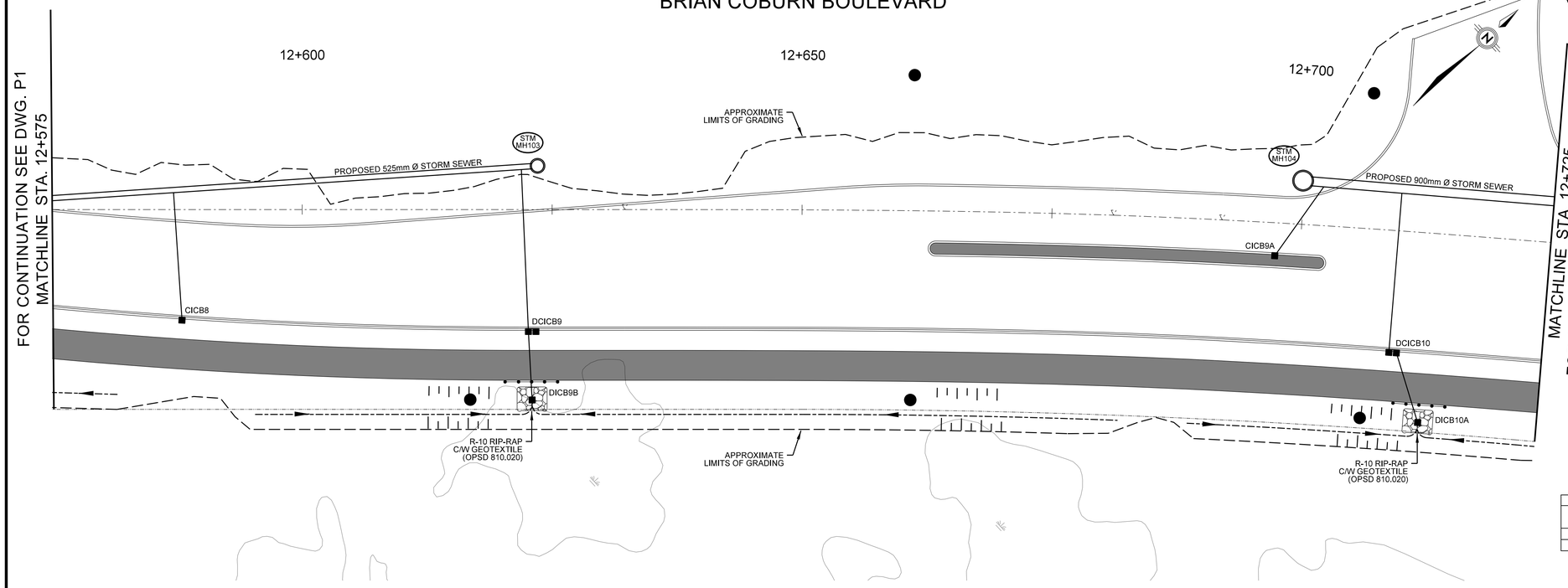
No.	Station	Offset (m)	Type		Elevations		Grate to Invert	ICD (L/s)
			Structure	Grate	Grate	Low Inv.		
DCICB1	12+444.99	0.00 L	705.020	S22 / S23 (2)	85.38	83.67	1.71	25
DCICB2	12+498.00	5.10 L	705.020	S22 / S23 (2)	85.33	83.90	1.43	20
DCICB3	12+499.00	11.56 R	705.020	S22 / S23 (2)	85.32	83.91	1.41	20
DCICB4	12+518.00	5.00 L	705.020	S22 / S23 (2)	85.18	83.97	1.21	20
DCICB5	12+520.00	8.25 R	705.020	S22 / S23 (2)	85.17	83.95	1.22	30
DCICB6	12+545.00	3.65 L	705.020	S22 / S23 (2)	85.43	83.98	1.45	15
DCICB7	12+558.00	7.94 R	705.020	S22 / S23 (2)	85.50	84.03	1.47	20
DICB71	12+506.51	18.60 R	705.030 (2:1)	403.010 (A)	84.15	83.70	0.45	

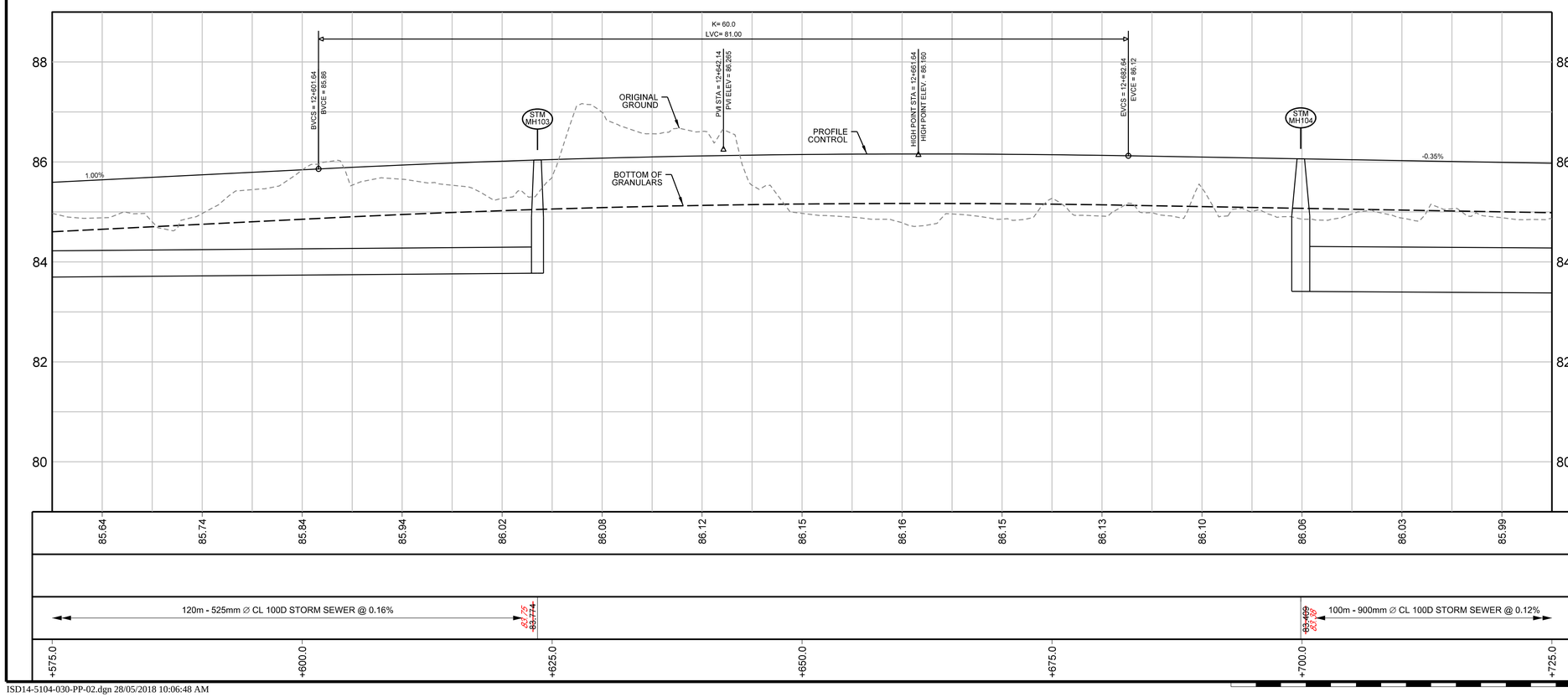
CATCH BASIN LEAD DATA

Structure to Structure	Dia.	Type	Length	Invert Elevations	
				Upstream	Downstream
DCICB1 TO MAIN	250mm	PVC	1.5	83.67	83.86
DCICB2 TO MAIN	250mm	PVC	8.1	83.90	83.82
DCICB3 TO MAIN	250mm	PVC	8.6	83.91	83.82
DCICB4 TO MAIN	250mm	PVC	7.9	83.97	83.89
DCICB5 TO MAIN	250mm	PVC	6.0	83.95	83.89
DCICB6 TO MAIN	250mm	PVC	4.7	83.98	83.93
DCICB7 TO MAIN	250mm	PVC	8.2	84.03	83.95
DICB71 TO MAIN	300mm	PVC	15.2	83.70	83.60



BRIAN COBURN BOULEVARD





BRIAN COBURN BOULEVARD
NEW ROAD CONSTRUCTION

GRADING & DRAINAGE
STA. 12+575 TO STA. 12+725

W. R. Newell, P.Eng.	J. Mojsej, P.Eng.
General Manager	Project Manager
Infrastructure Services Department	Design & Construction - Municipal East

Robinson Consultants

AS-BUILT

RECORD INFORMATION PROVIDED BY CITY OF OTTAWA

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Ottawa

Contract No.	Dwg. No.
ISD14-5104	P2

Sheet _ of _

Asset No. _____

Asset Group ___

Des.	Chk'd.
C.T.	R.C.
Dwn.	Chk'd.
C.T.	D.R.
Utility Circ. No.	Index No.
_____	___

Const. Inspector _____

Scale: HORIZONTAL
0m 5 10

NOTE: The location of utilities is approximate only, the exact location should be determined by consulting the municipal authorities and utility companies concerned. The contractor shall prove the location of utilities and shall be responsible for adequate protection from damage.

REVISIONS

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2	ISSUED FOR TENDER	R.C.	05,06,15
3	ISSUED FOR CONSTRUCTION	R.C.	01,03,16
4	ISSUED FOR SCM NO. 62	R.C.	29,03,17
5	ISSUED FOR SCM No. 67	R.C.	03,05,17
4	*AS BUILT*	*R.C.*	*30.03.18*

STORM MANHOLE DATA

No.	Station	Offset (m)	Type		Elevations		Grate to Invert
			Structure	Cover	Grate	Low Inv.	
STM MH103	12+623.54	4.38 L	701.010	S24.1 / S25	86.00	83.77	2.23
STM MH104	12+699.88	4.37 L	701.012	S24.1 / S25	86.03	83.41	2.62

CATCH BASIN DATA

No.	Station	Offset (m)	Type		Elevations		Grate to Invert	ICD (L/s)
			Structure	Grate	Grate	Low Inv.		
CICB8	12+588.00	10.76 R	705.010	S22 / S23	85.73	84.13	1.60	25
DCICB9	12+623.00	11.90 R	705.020	S22 / S23 (2)	86.00	84.22	1.78	30
DCICB10	12+709.99	11.90 R	705.020	S22 / S23 (2)	85.99	84.09	1.90	30
CICB9A	12+697.5	3.00 R	705.010	S22 / S23	86.21	84.31	1.90	10
DICB9B	12+623	19.05 R	705.030 2:1	403.010 (A)	85.00	84.30	0.70	N/A
DICB10A	12+713	19.00 R	705.030 2:1	403.010 (A)	85.00	84.18	0.82	N/A

CATCH BASIN LEAD DATA

Structure to Structure	Dia.	Type	Length	Invert Elevations	
				Upstream	Downstream
CICB8 TO MAIN	200mm	PVC	13.0	84.13	84.00
DCICB9 TO MAIN	250mm	PVC	16.5	84.22	84.06
DCICB10 TO MAIN	250mm	PVC	16.2	84.09	83.93
CICB9A TO MAIN	200mm	PVC	8.2	84.31	84.23
DICB9B TO DCICB9	200mm	PVC	6.6	84.30	84.22
DICB10A TO DCICB10	200mm	PVC	7.0	84.18	84.09

BRIAN COBURN BOULEVARD NEW ROAD CONSTRUCTION

GRADING & DRAINAGE STA. 12+725 TO STA. 12+875

W. R. Newell, P.Eng. *General Manager Infrastructure Services Department*	J. Mojsej, P.Eng. *Project Manager Design & Construction - Municipal East*

Robinson Consultants

AS-BUILT

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Ottawa

Contract No.	Dwg. No.
ISD14-5104	P3

Sheet _ of _

Asset No. _____

Asset Group ___

Des.	Chk'd.
C.T.	R.C.
Dwn.	Chk'd.
C.T.	D.R.
Utility Circ. No. ____	Index No. ___
Const. Inspector _____	

Scale: HORIZONTAL 0m 5 10

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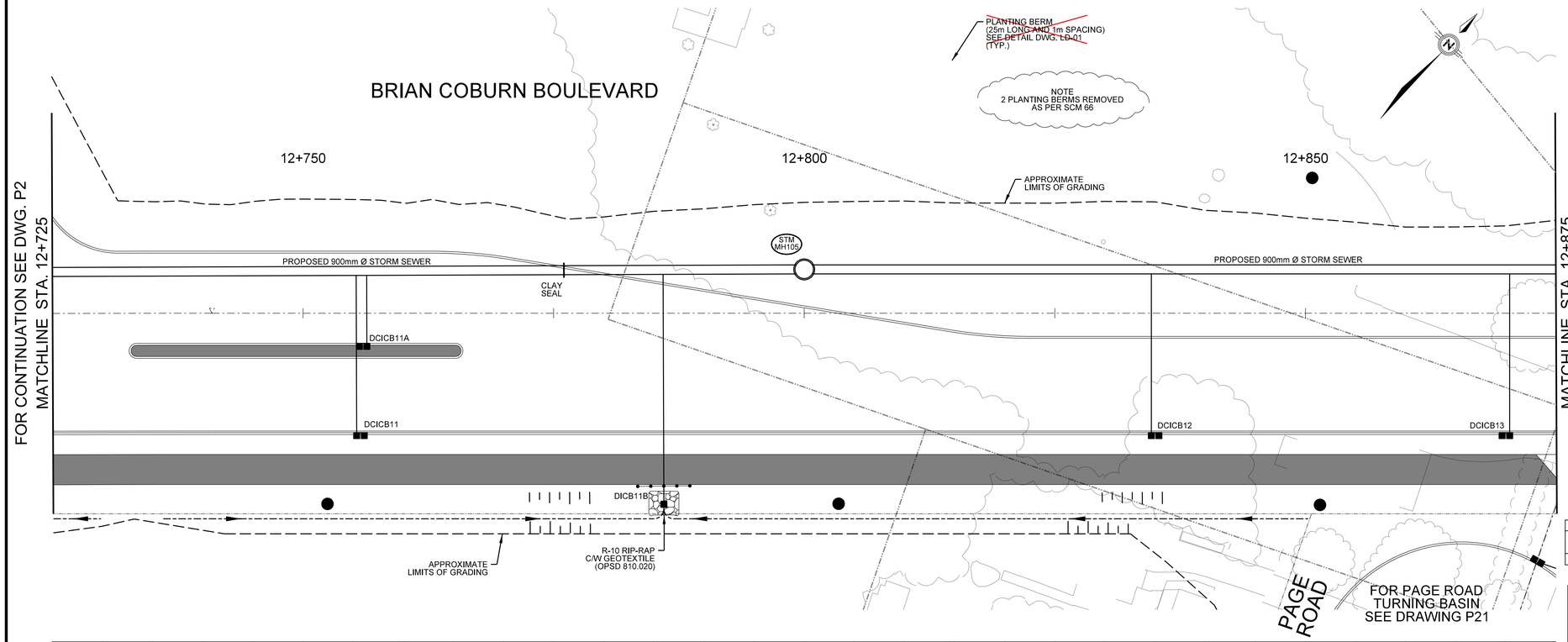
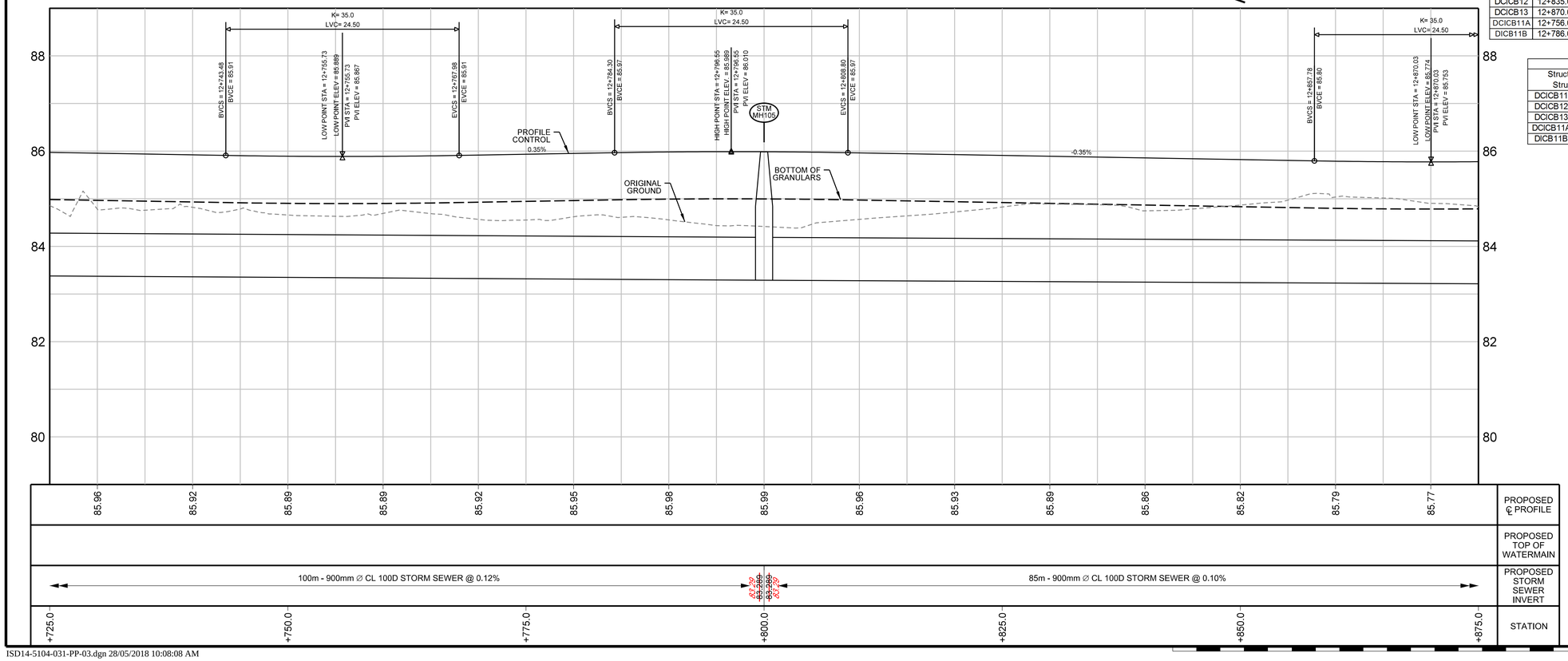
3	ISSUED FOR SCM NO. 62	R.C.	29.03.17
4	ISSUED FOR SCM NO. 67	R.C.	03.05.17
5	*AS BUILT*	*R.C.*	*30.03.18*

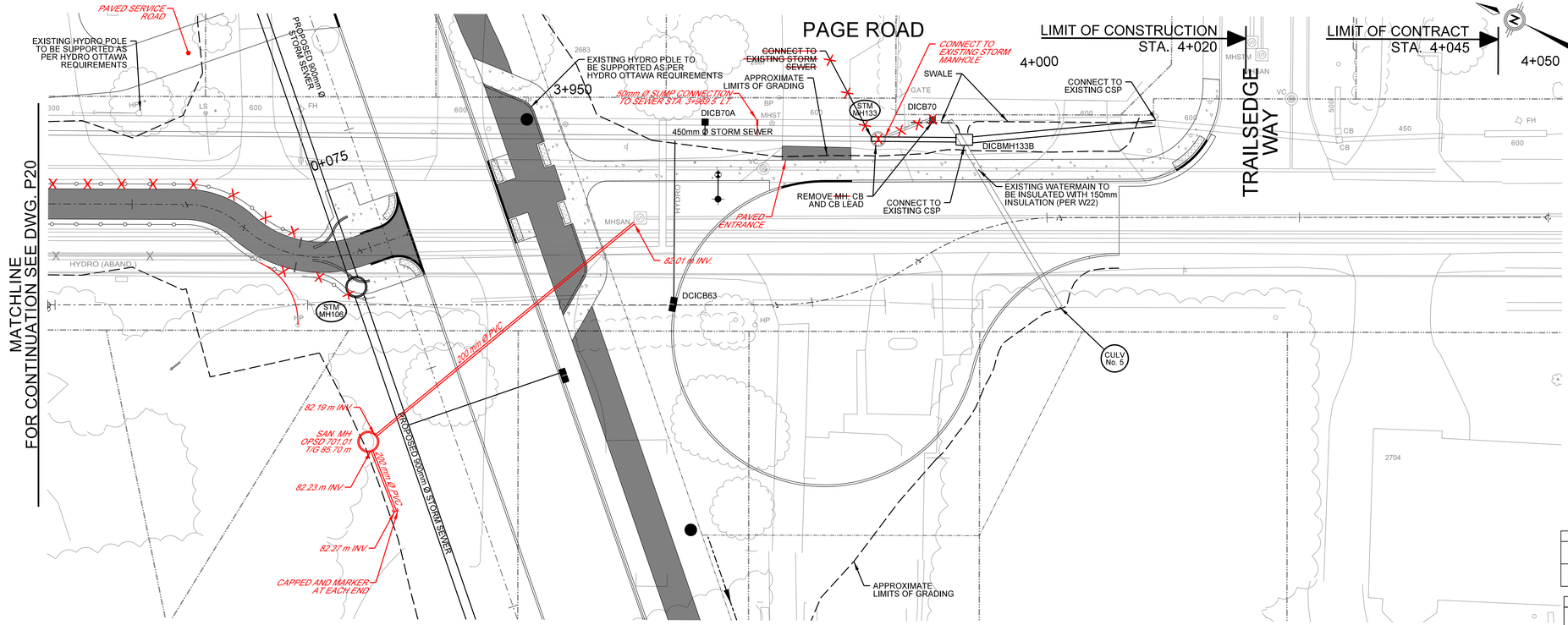


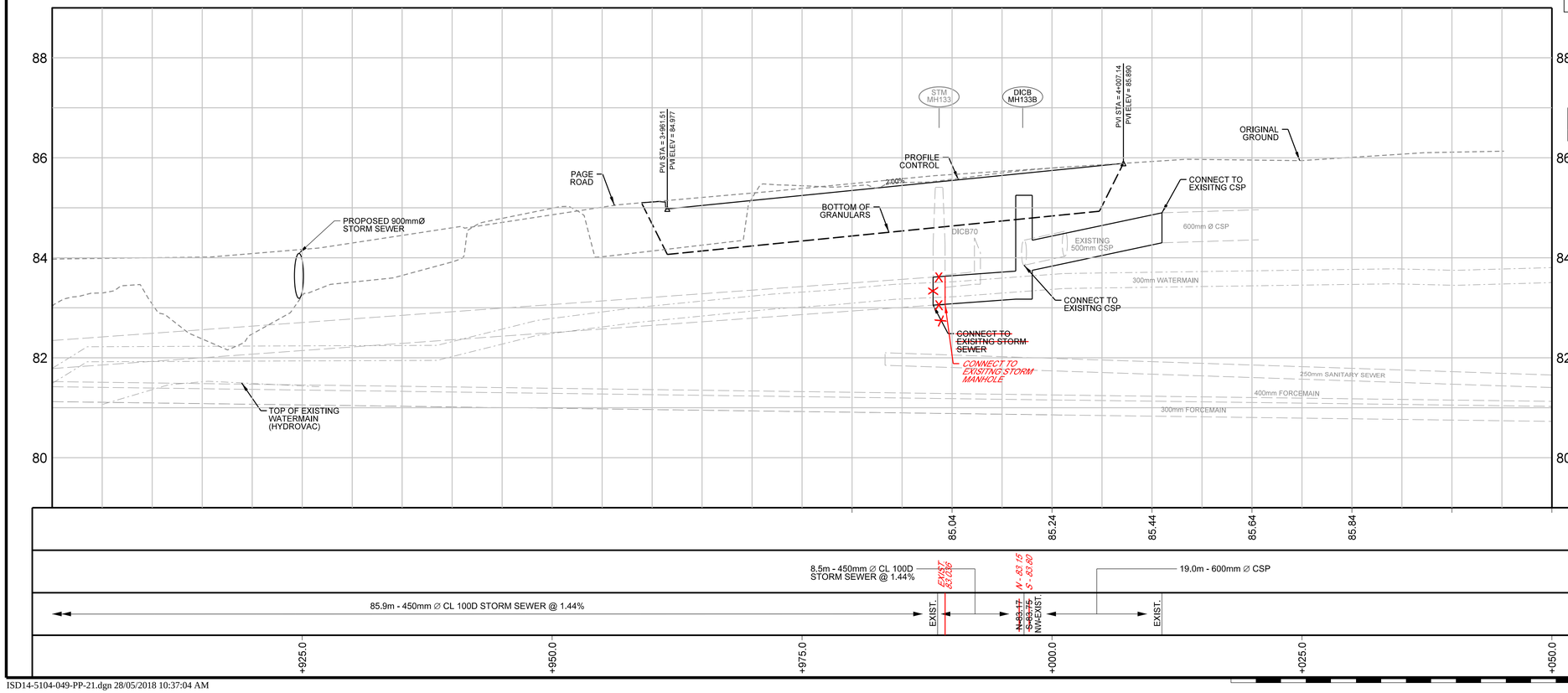
STORM MANHOLE DATA							
No.	Station	Offset (m)	Type		Elevations		Grate to Invert
			Structure	Cover	Grate	Low Inv.	
STM MH105	12+800.00	4.38 L	701.012	S24.1 / S25	85.95	83.29	2.66

CATCH BASIN DATA								
No.	Station	Offset (m)	Type		Elevations		Grate to Invert	ICD (L/s)
			Structure	Grate	Grate	Low Inv.		
DCICB11	12+755.73	11.90 R	705.020	S22 / S23 (2)	85.83	83.93	1.90	40
DCICB12	12+835.00	11.90 R	705.020	S22 / S23 (2)	85.84	83.94	1.90	25
DCICB13	12+870.03	11.90 R	705.020	S22 / S23 (2)	85.72	83.82	1.90	35
DCICB11A	12+756.00	3.00 R	705.020	S22 / S23 (2)	86.03	84.13	1.90	15
DICB11B	12+786.00	19.05 R	705.030 2:1	403.010 (A)	84.70	84.01	0.69	10

CATCH BASIN LEAD DATA					
Structure to Structure	Dia.	Type	Length	Invert Elevations	
				Upstream	Downstream
DCICB11 TO MAIN	250mm	PVC	16.2	83.93	83.77
DCICB12 TO MAIN	250mm	PVC	16.4	83.94	83.78
DCICB13 TO MAIN	250mm	PVC	16.4	83.82	83.65
DCICB11A TO MAIN	250mm	PVC	7.7	84.13	84.05
DICB11B TO MAIN	200mm	PVC	22.9	84.01	83.76







BRIAN COBURN BOULEVARD NEW ROAD CONSTRUCTION

GRADING & DRAINAGE PAGE ROAD - SOUTH TURNING BASIN

W. R. Newell, P.Eng.	J. Mojsej, P.Eng.
General Manager	*Project Manager*
Infrastructure Services Department	*Design & Construction - Municipal East*

Robinson Consultants

AS-BUILT

RECORD INFORMATION PROVIDED BY CITY OF OTTAWA

ALL NUMERICAL VALUES THAT ARE NOT STROKED OUT AND REPLACED IN ITALICS ON AS-BUILT DRAWINGS ARE CONSIDERED TO BE DESIGN VALUES ONLY AND NOT MEASURED IN THE FIELD.

Ottawa

Contract No.	Dwg. No.
ISD14-5104	P21

Sheet _ of _

Asset No. _____

Asset Group ___

Des.	Chk'd.
C.T.	R.C.
Dwn.	Chk'd.
C.T.	D.R.
Utility Circ. No. ____	Index No. ____

Const. Inspector _____

Scale: HORIZONTAL 0m 5 10

NOTE: The location of utilities is approximate only, the exact location should be determined by consulting the municipal authorities and utility companies concerned. The contractor shall prove the location of utilities and shall be responsible for adequate protection from damage.

REVISIONS

No.	Description	By	Date (dd/mm/yy)
1	ISSUED FOR PRELIMINARY DESIGN CIRCULATION	R.C.	31.10.14
2	ISSUED FOR TENDER	R.C.	05.06.15
3	ISSUED FOR CONSTRUCTION	R.C.	01.03.16
4	REVISED STORM SEWER, PROFILE & CULVERT STATIONS SCM NO. 33	R.C.	14.07.16
5	REVISED STORM SEWER CONFIGURATION SCM NO. 49	R.C.	13.10.16
6	*AS BUILT*	*R.C.*	*30.03.18*

STORM MANHOLE DATA

No.	Station	Offset (m)	Type		Elevations		Grate to Invert
			Structure	Cover	Grate	Low Inv.	
DICBMH133B	3+994.3	9.56 L	702.040	403.010 (B-4:1)	~~85.25~~ *85.23*	~~83.17~~ *83.15*	2.08

CATCH BASIN DATA

No.	Station	Offset (m)	Type		Elevations		Grate to Invert	ICD (L/s)
			Structure	Grate	Grate	Low Inv.		
DCICB63	3+961.51	0	705.020	S22 / S23 (2)	85.12	83.58	1.54	N/A
DICB70A	3+964.00	18.50 L	705.030	403.010 (A-HOR)	85.25	83.55	1.70	N/A

CATCH BASIN LEAD DATA

Structure to Structure	Dia.	Type	Length	Invert Elevations	
				Upstream	Downstream
DCICB63 TO MAIN	250mm	PVC	17.7	83.58	83.42
DICB70A TO MAIN	200mm	PVC	1.5	83.55	82.90
DICBMH 133B TO STMH 133				*83.15*	*83.036*

Culvert	Size (mm)	Length (m)	Downstream			Upstream		
			Station	Offset (m)	Invert	Station	Offset (m)	Invert
5	500	21.5	3+993.62	11.29 L	~~84.08~~ *83.85*	4+0001.28	8.90 R	~~84.09~~ *84.03*

AS-BUILT DRAWING
THIS DRAWING HAS BEEN REVISED TO INCORPORATE CHANGES INDICATED ON THE CONTRACTOR'S MARKED UP DRAWINGS. CONTRACTOR'S DRAWINGS WERE NOT VERIFIED ON SITE BY THE ENGINEER. THE ENGINEER DOES NOT TAKE RESPONSIBILITY FOR INFORMATION ON THIS DRAWING THAT IS IN CONFLICT WITH EXISTING CONDITION DUE TO INACCURATE OR MISSING INFORMATION ON THE MARKED UP DRAWINGS PROVIDED.

Vinley CONSULTING ENGINEERS PLANNERS

NO.	REVISIONS	BY	DATE
6	AS – CONSTRUCTED	GTP	FEB/2007
5	REVISED WATERMAIN	GTP	DEC 7/05
4	ISSUED FOR TENDER	GTP	JUN 9/05

NOTE:
The location of the utilities is approximate only, the exact location should be determined by consulting the municipal authorities and utility companies concerned.
The contractor shall prove the location of utilities and shall be responsible for adequate protection from damage

FOREST VALLEY SANITARY SERVICING

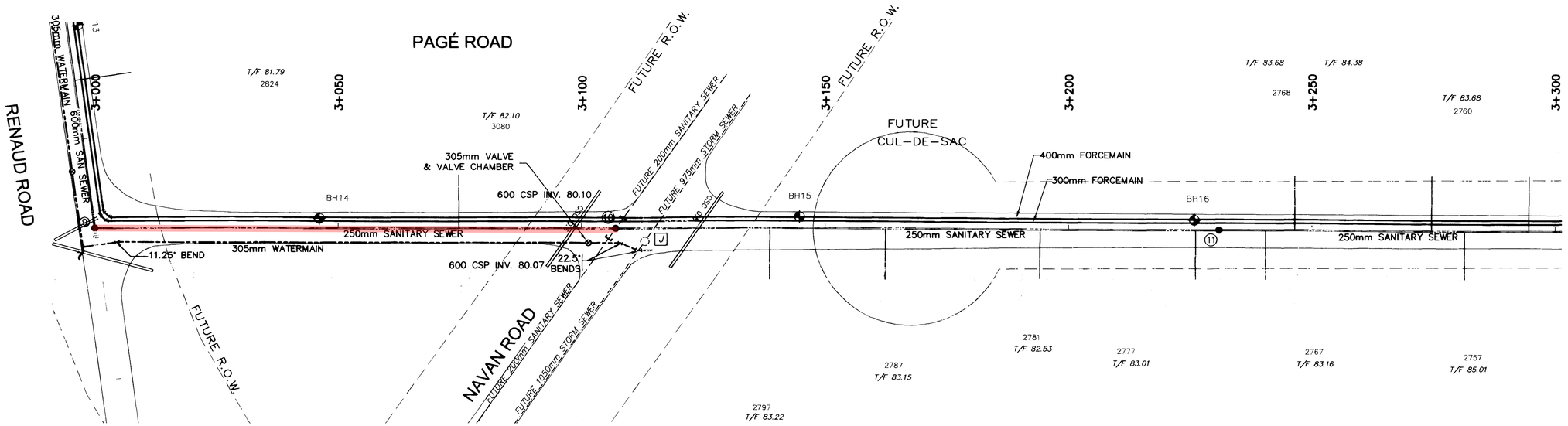
DUAL FORCEMAIN & SANITARY SEWER STA 3+000 – STA 3+300 PAGÉ ROAD

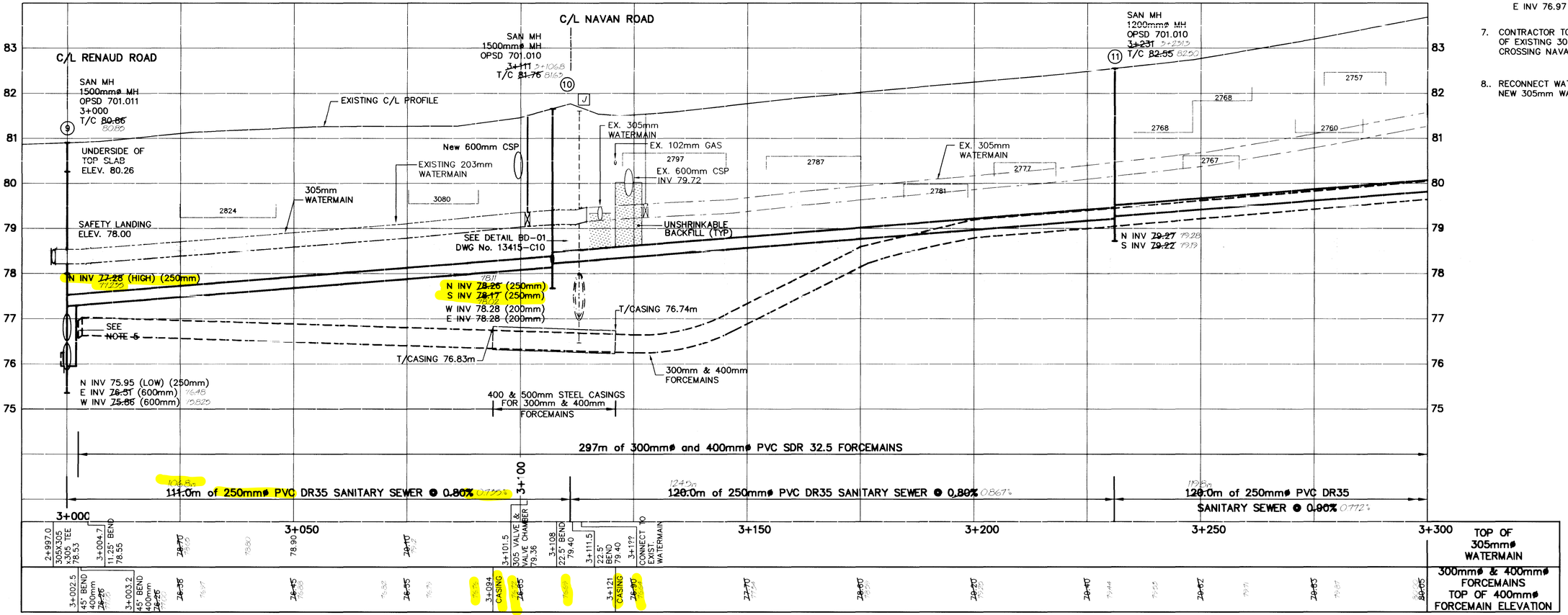
W. NEWELL, P.ENG. — Director Infrastructure Services
W. CLOUTHIER, P.ENG. — Manager Construction Services-Development

Dwn: AVH | Chkd: GTP | Des: GTP | Chkd: JM

Ottawa

CONTRACT NO. ISB05-2011
DWG. NO. 13415-C6
SHEET 8 OF –
DATE MARCH 2005
SCALE Hor 0m 5 10m; Vert 0m 1m





NOTES:

1. *T/F 85.79* – TOP OF FOUNDATION ELEVATION
2. ALL SANITARY SERVICE LATERALS SHALL CROSS BELOW THE EXISTING WATERMAIN, EXISTING STORM SEWER PIPE AND EXISTING DITCH ELEVATION.
3. ALL SANITARY SERVICE LATERAL INVERTS SHALL BE A 3.0m MINIMUM BELOW THE TOP OF FOUNDATION ELEVATION AT THE PROPERTY LINE.
4. ALL SANITARY SERVICE LATERALS SHALL BE INSTALLED AS PER OPSD 1006.020.
5. 250mm DROP STRUCTURE AS PER OPSD 1003.020
6. FUTURE STORM MANHOLE:
   J STA 3+112.9
   W INV 77.05 (975mm)
   E INV 76.97 (1050mm)
7. CONTRACTOR TO CONFIRM ELEVATION AND LOCATION OF EXISTING 305mm WATERMAIN PRIOR TO CROSSING NAVAN ROAD.
8. RECONNECT WATER SERVICES TO NEW 305mm WATERMAIN

AS-BUILT DRAWING
THIS DRAWING HAS BEEN REVISED TO INCORPORATE CHANGES INDICATED ON THE CONTRACTOR'S MARKED UP DRAWINGS. CONTRACTOR'S DRAWINGS WERE NOT VERIFIED ON SITE BY THE ENGINEER. THE ENGINEER DOES NOT TAKE RESPONSIBILITY FOR INFORMATION ON THIS DRAWING THAT IS IN CONFLICT WITH EXISTING CONDITION DUE TO INACCURATE OR MISSING INFORMATION ON THE MARKED UP DRAWINGS PROVIDED.

Vinley CONSULTING ENGINEERS PLANNERS

NO.	REVISIONS	BY	DATE
5	AS - CONSTRUCTED	GTP	FEB/2007
4	ISSUED FOR TENDER	GTP	JUN 9/05
3	ISSUED TO CITY FOR REVIEW	GTP	05/03/23
2	ISSUED TO CITY FOR REVIEW	GTP	05/03/18
1	ISSUED FOR UTILITY CIRCULATION	GTP	05/03/15

NOTE:
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FOREST VALLEY SANITARY SERVICING

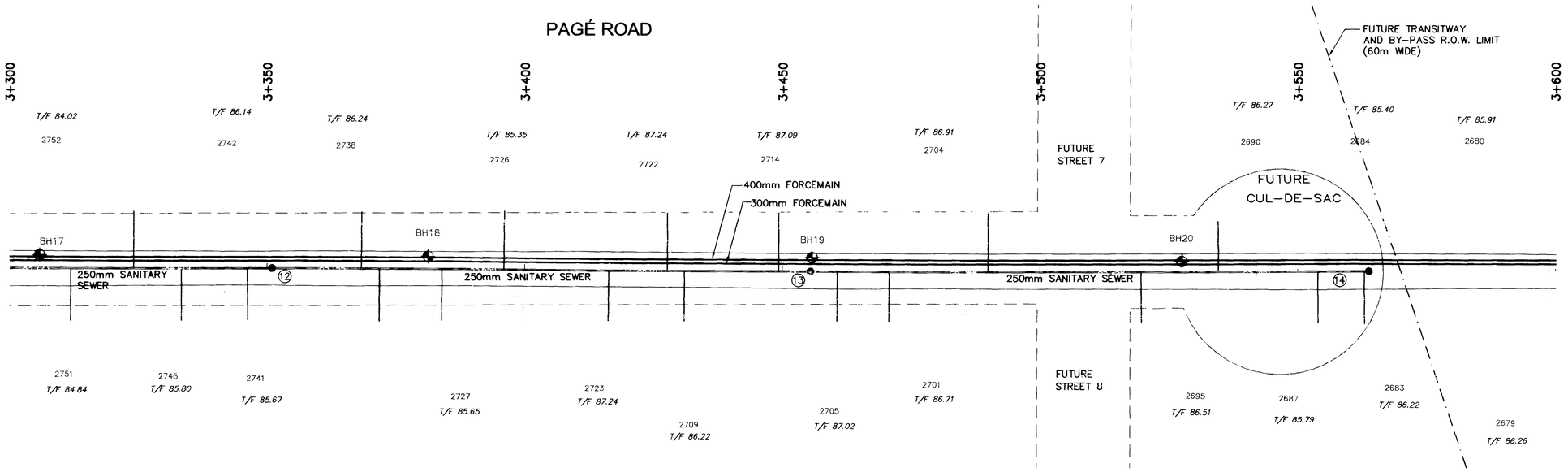
DUAL FORCEMAIN & SANITARY SEWER STA 3+300 – STA 3+600 PAGÉ ROAD

W. NEWELL, P.ENG.	W. CLOUTHIER, P.ENG.
Director Infrastructure Services	Manager Construction Services-Development

Dwn: AVH | Chkd: GTP | Des: GTP | Chkd: JM

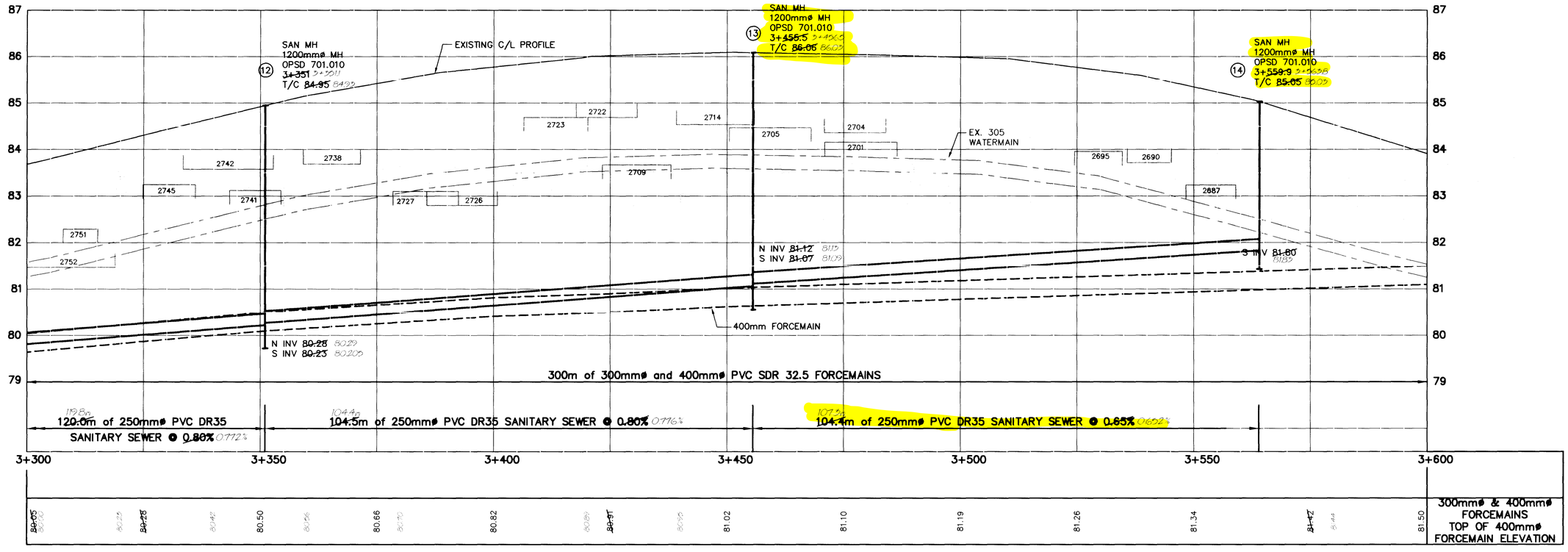
Ottawa
CONTRACT NO. ISB05-2011
DWG. NO. 13415-C7
SHEET 9 OF –
DATE MARCH 2005
SCALE Hor 0m 5 10m, Vert 0m 1m

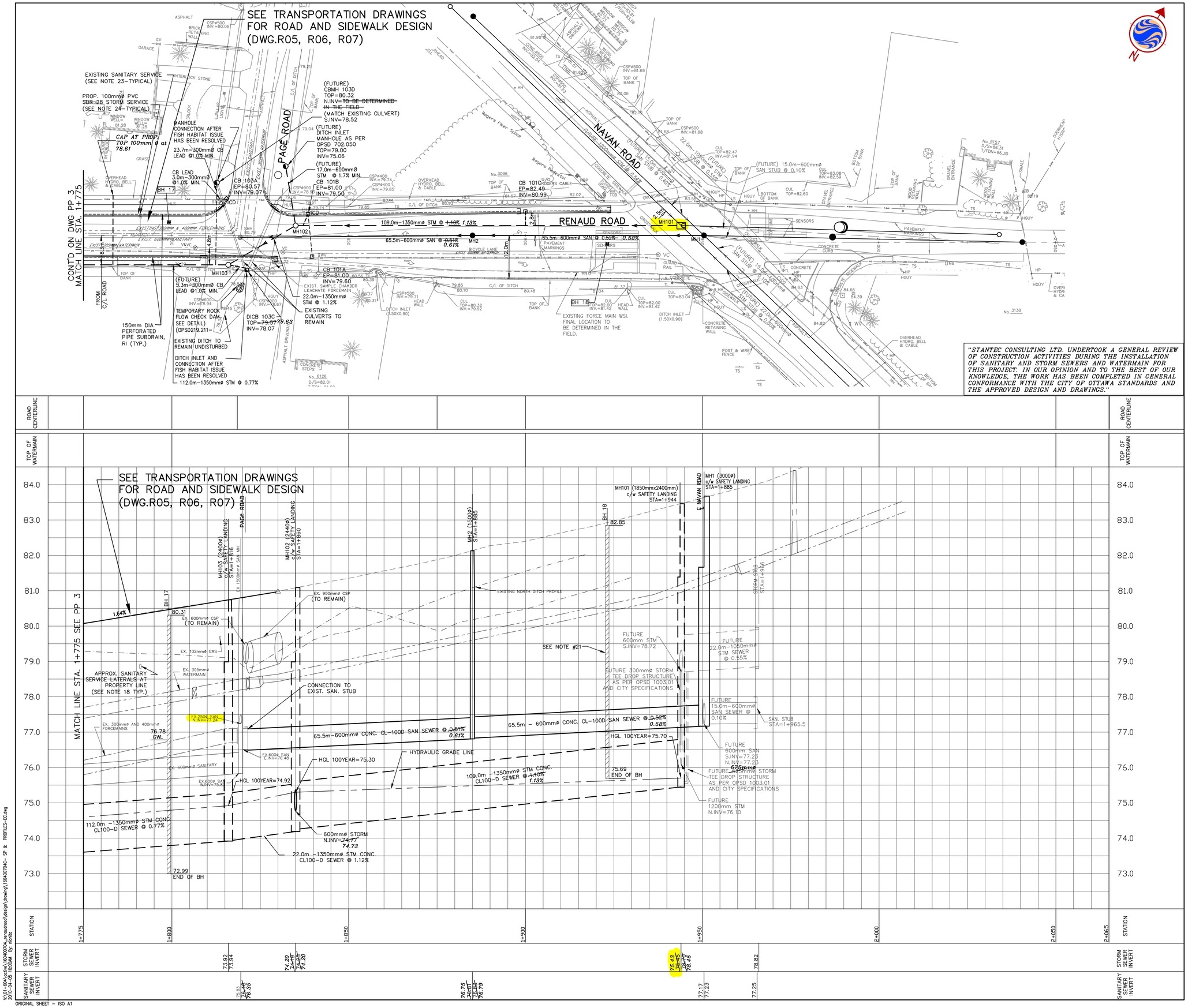
PAGÉ ROAD



NOTES:

1. *T/F 85.79* – TOP OF FOUNDATION ELEVATION
2. ALL SANITARY SERVICE LATERALS SHALL CROSS BELOW THE EXISTING WATERMAIN, EXISTING STORM SEWER PIPE AND EXISTING DITCH ELEVATION.
3. ALL SANITARY SERVICE LATERAL INVERTS SHALL BE A 3.0m MINIMUM BELOW THE TOP OF FOUNDATION ELEVATION AT THE PROPERTY LINE.
4. ALL SANITARY SERVICE LATERALS SHALL BE INSTALLED AS PER OPSD 1006.020.





ROAD CENTERLINE | TOP OF WATERMAIN

Stantec Consulting Ltd.
1505 Laperriere Avenue
Ottawa ON Canada
K1Z 7T1
Tel. 613.722.4420
Fax. 613.722.2799
www.stantec.com

Stantec

Notes

1. ALL MATERIALS AND CONSTRUCTION METHODS TO BE IN ACCORDANCE WITH OPS AND CITY OF OTTAWA STANDARD SPECIFICATIONS AND DRAWINGS AND OPSD SUPPLEMENT. ONTARIO PROVINCIAL STANDARDS WILL APPLY WHERE NO CITY STANDARDS ARE AVAILABLE.
2. THE CONTRACTOR IS RESPONSIBLE FOR OBTAINING ALL PERMITS REQUIRED AND BEAR COST OF SAME INCLUDING WATER PERMIT AND ASSOCIATED COSTS.
3. SERVICE AND UTILITY LOCATIONS ARE APPROXIMATE. CONTRACTOR TO VERIFY LOCATION AND ELEVATION OF EXISTING SERVICES AND UTILITIES PRIOR TO ANY CONSTRUCTION. CONTRACTOR SHALL BE RESPONSIBLE FOR OBTAINING LOCATES FROM ALL UTILITY COMPANIES TO LOCATE EXISTING UTILITIES PRIOR TO EXCAVATION. THE CONTRACTOR IS RESPONSIBLE FOR PROTECTION AND REINSTATEMENT.
4. ALL DISTURBED AREAS SHALL BE REINSTATED TO EQUAL OR BETTER CONDITION TO THE SATISFACTION OF THE ENGINEER & THE CITY. PAVEMENT REINSTATEMENT FOR SERVICE AND UTILITY CUTS SHALL BE IN ACCORDANCE WITH OPSD 509.010 AND OPSS 310.
5. STORM SEWERS 375mm DIA. OR SMALLER SHALL BE PVC SDR 35. STORM SEWERS LARGER THAN 375mm DIA. SHALL BE CONCRETE CSA A 257 CLASS 100 D.
6. STORM MANHOLES SIZE SHALL BE AS INDICATED ON THE PROFILES IN ACCORDANCE WITH OPSD c/w FRAME AND COVER AS PER CITY OF OTTAWA S24.1 AND S25.
7. STREET CBs SHALL BE CURB INLET TYPE AS PER CITY STANDARD S3. FRAME AND COVER AS PER CITY STANDARD S22 AND S23, AND PROVIDED WITH 150mmø SPACERS. ALL CBs SHALL HAVE 600mmø SUMPS. CB LEADS SHALL BE 200mmø (MIN.) PVC SDR35 AT 1.0% MIN. ALL STREET CBs WILL BE INTERCONNECTED WITH ICDs. SEE SCHEDULE ON DWG. OSD-1.
8. THE CONTRACTOR SHALL IMPLEMENT BEST MANAGEMENT PRACTICES TO PROVIDE PROTECTION FOR RECEIVING STORM SEWERS OR DRAINAGE DURING CONSTRUCTION ACTIVITIES. (ie: FILTER CLOTH ON CATCH BASINS, STRAW BALE CHECK DAMS AND SEDIMENT CONTROLS AROUND ALL DISTURBED AREAS). DEWATERING SHALL BE PUMPED INTO SEDIMENT TRAPS. (SEE EROSION CONTROL PLAN).
9. GRANULAR "A" SHALL BE PLACED TO A MINIMUM THICKNESS OF 300 mm AROUND ALL STRUCTURES WITHIN PAVEMENT AREA
10. SEWER TRENCH SHALL CONSIST OF A CLASS "B" BEDDING AS PER CITY OF OTTAWA STANDARDS S6 AND S7. COMPACTION SHALL BE A MINIMUM OF 98% STANDARD PROCTOR DENSITY.
11. ALL GRANULAR FOR ROADS SHALL BE COMPACTED TO A MINIMUM OF 98% STANDARD PROCTOR DENSITY.
12. ALL NECESSARY CLEARING AND GRUBBING SHALL BE COMPLETED BY THE CONTRACTOR. REVIEWED BY THE CITY OF OTTAWA PRIOR TO TREE CUTTING.
13. CONTRACTOR SHALL PERFORM VIDEO INSPECTION OF ALL STORM SEWERS. A COPY OF THE VIDEO AND INSPECTION REPORT SHALL BE SUBMITTED TO THE CONSULTANT FOR REVIEW.
14. ASPHALT WEAR COURSE SHALL NOT BE PLACED UNTIL THE VIDEO INSPECTION OF SEWERS & NECESSARY REPAIRS HAVE BEEN CARRIED OUT TO THE SATISFACTION OF THE CONSULTANT.
15. SUB-EXCAVATE SOFT AREAS & FILL WITH GRANULAR 'B' COMPACTED IN 0.15m LAYERS.
16. CONCRETE CURBS SHALL BE CONSTRUCTED AS PER CITY STANDARD SC1.1
17. ALL DIMENSIONS ARE IN METRES UNLESS OTHERWISE STATED.
18. RECONNECT EXISTING SANITARY SERVICE LATERALS FROM EXISTING RESIDENTAL UNITS AS REQUIRED AS PER CITY STANDARD S11.
19. STORM SERVICE LATERALS TO BE INSTALL FOR THE EXISTING RESIDENTS ALONG RENAUD ROAD TO PROPERTY LINE AS REQUIRED AS PER CITY STANDARD S11. CONNECTION LOCATION AND INV. TO BE DETERMINED IN FIELD. (INVERT AT PROPERTY LINE SHALL BE A MINIMUM OF 3.0m BELOW TOP OF FOUNDATION WALL.)
20. 150mmø SUBDRAIN TO BE INSTALLED 300mm BELOW SUBGRADE LEVEL CONTINUOUS ALONG BOTH SIDES OF PAVEMENT, CONNECTED TO CATCHBASINS.
21. REFER TO GEOTECHNICAL REPORT BY PATERSONGROUP DATED NOVEMBER 17, 2008 FOR TEST PIT INFORMATION AND GEOTECHNICAL RECOMMENDATIONS.

7	*AS RECORDED*	*GBU*	*GT*	*11.12.12*
6	*AS RECORDED*	*CTL*	*PM*	*11.03.25*
5	ISSUED FOR CONSTRUCTION	NI	TJW	10.04.01
4	ISSUED FOR TENDER	NI	TJW	09.04.17
3	ADD FRONT YARD GRADING	NI	TJW	09.02.25
2	REVISED AS PER CITY COMMENTS/ ADD BOREHOLES INFORMATION	NI	TJW	08.12.01
1	REVISED STORM SEWER ALIGNMENT AS PER CITY COMMENTS	NI	TJW	08.10.17
0	1ST SUBMISSION	NI	TJW	08.08.12
Revision		By	Appd.	YY.MM.DD
File Name: 160400704C-SP&PP		NI	PM	TJW	08.07.10
		Dwn.	Chkd.	Dsgn.	YY.MM.DD

Seal

RECORD DRAWING
DATE DEC. 12/11

Client/Project

CLARIDGE HOMES (CARSON) INC.

RENAUD ROAD IMPROVEMENTS

Ottawa ON Canada

Title

RENAUD ROAD
STA. 1+775 TO STA. 1+966

Project No. 160400704

Scale 1:500H 0 5 15 25m
1:50V 0 0.5 1.5 2.5m

Drawing No. PP-4

Sheet 6 of 12

Revision 7

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2010-04-05 10:00AM by: nicolls

ORIGINAL SHEET – ISO A1

Appendix D1

Water Demands and FUS Calculations

WATERMAIN DEMAND CALCULATION SHEET

PROJECT : NAVAN ROAD DEVELOPMENT PROJECT
LOCATION : CITY OF OTTAWA
DEVELOPER : 12714001 Canada Inc.

NODE	RESIDENTIAL UNITS			POP'N	NON-RESIDENTIAL COMM. (ha.)	AVERAGE DAILY DEMAND (l/s)			MAXIMUM DAILY DEMAND (l/s)			PEAK HOUR DEMAND (l/s)		
	Townhouses (TH)	Condo Units (CU)	TOTAL UNITS			Res.	Non-res.	Total	Res.	Non-res.	Total	Res.	Non-res.	Total
NAVAN ROAD														
	69	263	332	660	0.27	2.14	0.09	2.23	5.34	0.13	5.47	11.76	0.23	11.99
TOTALS	**69**	**263**	**332**	**660**	**0.27**	**2.14**	**0.09**	**2.23**	**5.34**	**0.13**	**5.47**	**11.76**	**0.23**	**11.99**

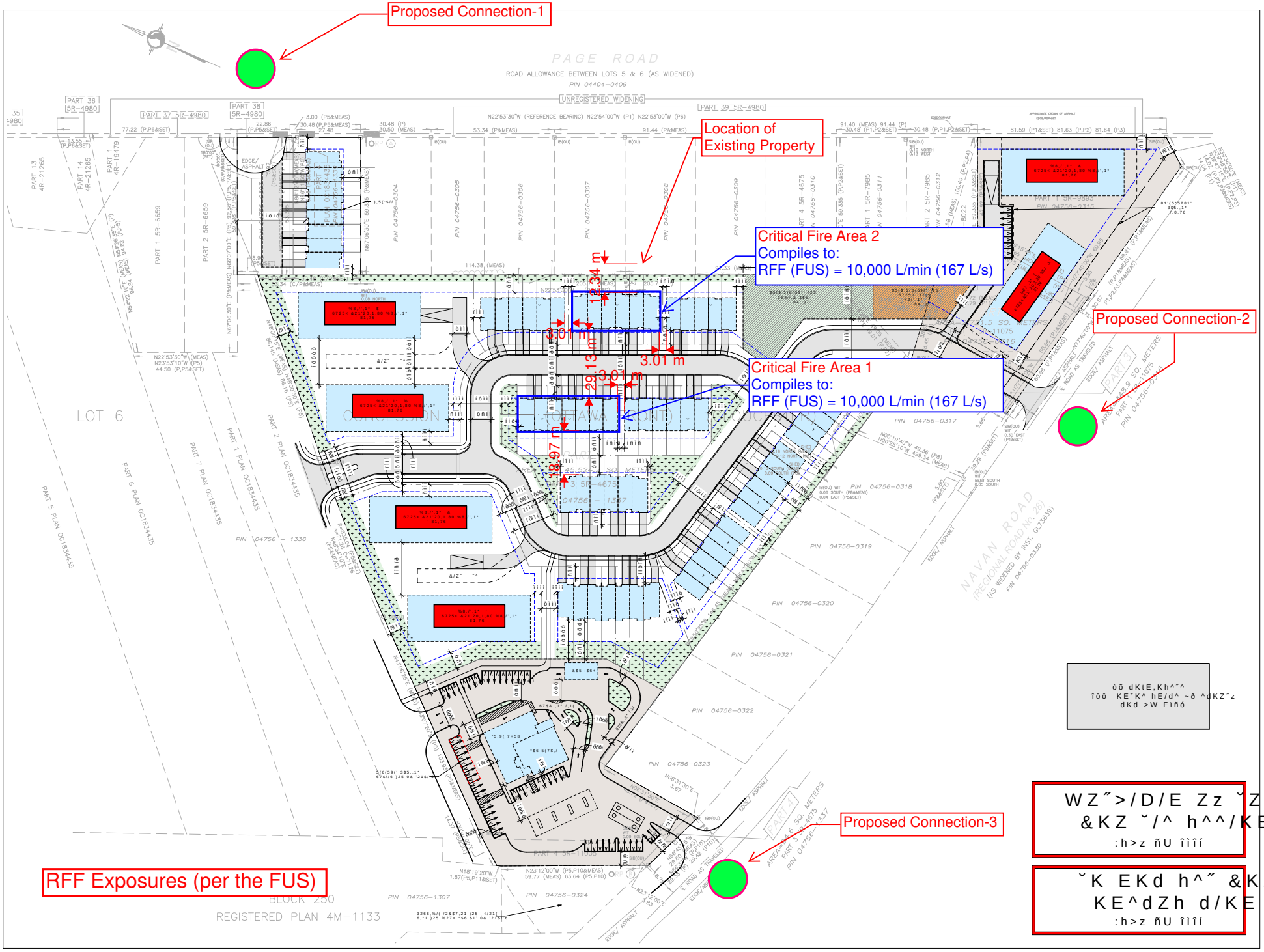
ASSUMPTIONS

RESIDENTIAL DENSITIES
- Townhouse (TH) 2.7 p / p / u
- Condo Units (CU) 1.8 p / p / u

AVG. DAILY DEMAND
- Residential 280 l / cap / day
- Institutional 28,000 l / ha / day
- Commercial (Employment Area) 28,000 l / ha / day

MAX. DAILY DEMAND
- Residential 700 l / cap / day
- Industrial (Business Park) 42,000 l / ha / day
- Commercial (Employment Area) 42,000 l / ha / day

MAX. HOURLY DEMAND
- Residential 1,540 l / cap / day
- Industrial (Business Park) 75,600 l / ha / day
- Commercial (Employment Area) 75,600 l / ha / day



PMA ARCHITECTES

LAPALME RHEAULT

3

FUS Fire Flow Calculations

NAVAN ROAD DEVELOPMENT PROJECT - Row Townhouse

(JLR 29899-000)

Step	Parameter	Value		Note
A	Type of Construction	Wood Frame		
	Coefficient (C)	1.5		
B	Ground Floor Area	586.7	m^2	Includes 7 units of Row TH
C	Height in storeys	2	storeys	Basements are excluded.
	Total Floor Area	1173.4	m^2	
D	Fire Flow Formula	F=220C√A		
	Fire Flow	11304	L/min	
	Rounded Fire Flow	11000	L/min	Flow rounded to nearest 1000 L/min.
E	Occupancy Class	Limited Combustible		Residential buildings have a limited combustible occupancy.
	Occupancy Charge	-15%		
	Occupancy Increase or Decrease	-1650		
	Fire Flow	9350	L/min	No rounding applied.
F	Sprinkler Protection	None		
	Sprinkler Credit	0%		
	Decrease for Sprinkler	0	L/min	
G	*North Side Exposure*			
	Exposing Wall:	Wood Frame		7 Unit Row TH
	Exposed Wall:	Wood Frame		Two (2) 6 Unit Row TH separated by 3.01 m
	Length of Exposed Wall:	39.1	m	
	Height of Exposed Wall:	2	storeys	
	Length-Height Factor	78.3	m-storeys	
	Separation Distance	29.13	m	
	North Side Exposure Charge	9%		
	East Side Exposure			
	Exposing Wall:	Wood Frame		7 Unit Row TH
	Exposed Wall:	Wood Frame		6 Unit Row TH
	Length of Exposed Wall:	14.2	m	
	Height of Exposed Wall:	2	storeys	
	Length-Height Factor	28.4	m-storeys	
	Separation Distance	3.01	m	
	East Side Exposure Charge	22%		
	South Side Exposure			
	Exposing Wall:	Wood Frame		7 Unit Row TH
	Exposed Wall:	Wood Frame		6 Unit Row TH
	Length of Exposed Wall:	25.0	m	
	Height of Exposed Wall:	2	storeys	
	Length-Height Factor	50.0	m-storeys	
	Separation Distance	18.97	m	
	South Side Exposure Charge	13%		
	West Side Exposure			
	Exposing Wall:	Wood Frame		7 Unit Row TH
	Exposed Wall:	Wood Frame		4 Storey Condo Unit
	Length of Exposed Wall:	14.2	m	
	Height of Exposed Wall:	4	storeys	
	Length-Height Factor	56.8	m-storeys	
	Separation Distance	30.81	m	
	West Side Exposure Charge	5%		
	Total Exposure Charge	49%		The total exposure charge is below the maximum value of 75%.
	Increase for Exposures	4582	L/min	
H	Fire Flow	13932	L/min	
	Rounded Fire Flow	14000	L/min	Flow rounded to nearest 1000 L/min.
City Cap	**Required Fire Flow (RFF)**	**10000**	**L/min**	The City of Ottawa's cap does apply since north and south separations are greater than 10 m AND total exposing area is less than 600 sq-m
		167	**L/s**	

Fire Underwriters Survey (FUS) Fire Flow Calculations
In accordance with City of Ottawa Technical Bulletin ISTB-2018-02 dated March 21, 2018

FUS Fire Flow Calculations

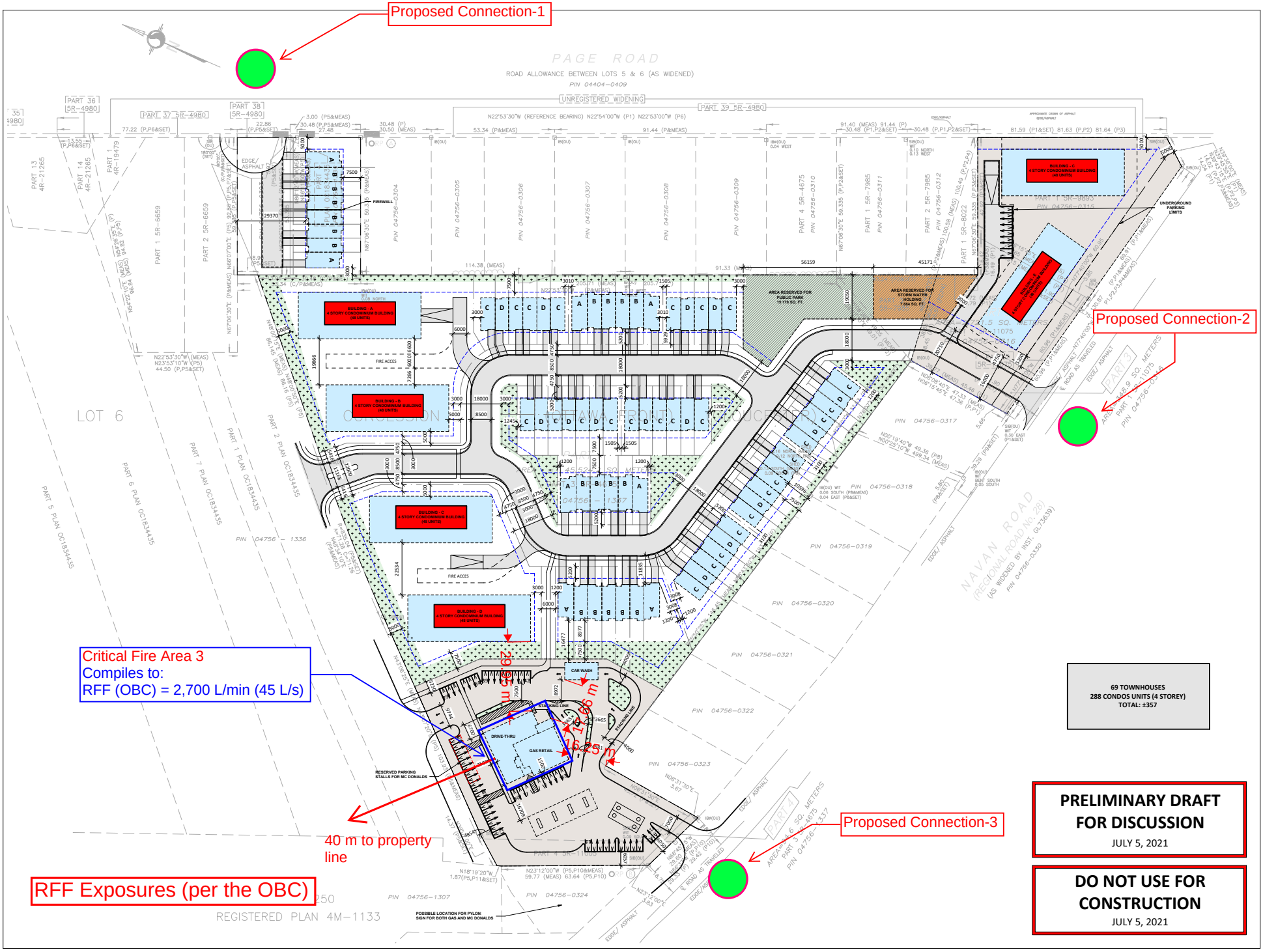
NAVAN ROAD DEVELOPMENT PROJECT - Row Townhouse

(JLR 29899-000)

Step	Parameter	Value		Note
A	Type of Construction	Wood Frame		
	Coefficient (C)	1.5		
B	Ground Floor Area	565.38	m^2	Includes 6 units of Row TH
C	Height in storeys	2	storeys	Basements are excluded.
	Total Floor Area	1130.76	m^2	
D	Fire Flow Formula	F=220C√A		
	Fire Flow	11097	L/min	
	Rounded Fire Flow	11000	L/min	Flow rounded to nearest 1000 L/min.
E	Occupancy Class	Limited Combustible		Residential buildings have a limited combustible occupancy.
	Occupancy Charge	-15%		
	Occupancy Increase or Decrease	-1650		
	Fire Flow	9350	L/min	No rounding applied.
F	Sprinkler Protection	None		
	Sprinkler Credit	0%		
	Decrease for Sprinkler	0	L/min	
G	*North Side Exposure*			
	Exposing Wall:	Wood Frame		6 Unit Row TH
	Exposed Wall:	Wood Frame		Shed/Garage on existing property fronting Page Rd.
	Length of Exposed Wall:	4.0	m	
	Height of Exposed Wall:	1	storeys	
	Length-Height Factor	4.0	m-storeys	
	Separation Distance	12.34	m	
	North Side Exposure Charge	12%		
	East Side Exposure			
	Exposing Wall:	Wood Frame		6 Unit Row TH
	Exposed Wall:	Wood Frame		5 Unit Row TH
	Length of Exposed Wall:	14.2	m	
	Height of Exposed Wall:	2	storeys	
	Length-Height Factor	28.4	m-storeys	
	Separation Distance	3.01	m	
	East Side Exposure Charge	22%		
	South Side Exposure			
	Exposing Wall:	Wood Frame		6 Unit Row TH
	Exposed Wall:	Wood Frame		7 Unit Row TH and 6 Unit Row TH separated by 3.01 m
	Length of Exposed Wall:	34.9	m	
	Height of Exposed Wall:	2	storeys	
	Length-Height Factor	69.7	m-storeys	
	Separation Distance	29.13	m	
	South Side Exposure Charge	9%		
	West Side Exposure			
	Exposing Wall:	Wood Frame		6 Unit Row TH
	Exposed Wall:	Wood Frame		6 Unit Row TH
	Length of Exposed Wall:	14.2	m	
	Height of Exposed Wall:	2	storeys	
	Length-Height Factor	28.4	m-storeys	
	Separation Distance	3.01	m	
	West Side Exposure Charge	22%		
	Total Exposure Charge	65%		The total exposure charge is below the maximum value of 75%.
	Increase for Exposures	6078	L/min	
H	Fire Flow	15428	L/min	
	Rounded Fire Flow	15000	L/min	Flow rounded to nearest 1000 L/min.
City Cap	**Required Fire Flow (RFF)**	**10000**	**L/min**	The City of Ottawa's cap does apply since north and south separations are greater than 10 m AND total exposing area is less than 600 sq-m
		167	**L/s**	

Fire Underwriters Survey (FUS) Fire Flow Calculations

In accordance with City of Ottawa Technical Bulletin ISTB-2018-02 dated March 21, 2018



Project
NAVAN ROAD DEVELOPMENT PROJECT
Navan Road, Ottawa, Ontario
Owner
Architect
PMA ARCHITECTES
(418) 681-8954
INFO@PMAARCHITECTES.COM
3070, CHEMIN DES QUATRE-BOURGEOIS QUÉBEC (QC) G1W 2K4
PMAARCHITECTES.COM
LAPALME RHEAULT ARCHITECTES ASSOCIÉS
Mechanic-electricity
Landscape architect
Structural engineer
Designer
Seal
Seal
Revision
Reference
A: Detail number
B: Number of the sheet where it is detailed
Note
Before starting work the contractor will have to check all dimensions and site conditions and notify the architect in writing if there is a discrepancy. This document and its content are protected by copyright laws and any copying is prohibited unless granted permission by the architect.
Date 2021-07-05
Scale 1 : 500
Folder 20054
Draw by P.POMERLEAU
Title
SITE PLAN DRAFT
Sheet
P101

C:\Users\ppomerleau\Documents\20054_DEV-NAVAN_CENTRAL_R21_ppomerleau.rvt

3079 Navan Road Gas Retail Fire Flow Calculation
(per OFM/OBC Guidelines)

Type of Structure: Gas Station of non-combustible steel construction
A= Proposed building has an area of 700 m2
Proposed building is 1 storey
Steel Construction (non-combustible), no sprinkler system
Exposure: 29.95 m northside, 17.66 m eastside, 16.25 m southside, 40.00 m westside

Q= = Required fire flow (litres) **75600 L**
= K V S_{tot}

"K" - Water Supply Coefficient from Table 1 **K =** **27**

"V" - Total building volume in cubic meters **V =** **2800 m^3**
700 m^2 x 4.00 m x 1-storey for proposed gas retail =2800 m3

"S_{tot}" - total of spatial coefficient values from Figure 1 **S_{tot} =** **1.0**

1 + 0 (since exposure distances for all four directions is greater than 10 m)

Fire Flow Requirement from Table 2 = **2700 L/min**
Since Q < 180,000 L, required fire flow = 2,700 L/min **713 USGPM**
45 L/s

Mahad Musse

From: Pascal Pomerleau <PPomerleau@pmaarchitectes.com>
Sent: June 11, 2021 8:55 AM
To: Annie Williams
Cc: Karla Ferrey; Mahad Musse; Raad Akrawi; azayoun@groupeheafey.com
Subject: RE: Navan Road Project - Building Aspects

Hi Annie,

No, they are not. I was reading your last e-mail and I think I have mis explained myself. The 4-story building will be built of **COMBUSTIBLE** construction. Same as the towns. Regular wood construction.

Thanks,

PMA ARCHITECTES

PASCAL POMERLEAU
M. ARCH. | CHARGÉ DE PROJETS

T. (418) 651-8954 | 220
C. (819) 593-1035
PPOMERLEAU@PMAARCHITECTES.COM

3070, CHEMIN DES QUATRE-BOURGEOIS
QUÉBEC (QC) G1W 2K4

PMAARCHITECTES.COM

De : Annie Williams <awilliams@jlrichards.ca>
Envoyé : 11 juin 2021 08:44
À : Pascal Pomerleau <PPomerleau@pmaarchitectes.com>
Cc : Karla Ferrey <kferrey@jlrichards.ca>; Mahad Musse <mmusse@jlrichards.ca>; Raad Akrawi <rakrawi@groupeheafey.com>; azayoun@groupeheafey.com
Objet : RE: Navan Road Project - Building Aspects

Hi Pascal,

Are the 4-storey condominium buildings considered to be fire-resistive construction? If so, will the vertical openings be protected or unprotected?

Thank you,
Annie

Annie Williams, P.Eng.
Civil Engineer

J.L. Richards & Associates Limited
700 - 1565 Carling Avenue, Ottawa, ON K1Z 8R1
Direct: 343-803-4523

J.L. Richards & Associates Limited is proactively doing our part to protect the wellbeing of our staff and communities while improving our communication technology. ***We are pleased to announce that we have implemented direct phone lines for all of our staff, allowing you to connect with us regardless of whether we are working remotely or in the office.*** *We are dedicated to delivering quality services to you through value and commitment, as always. Please reach out to us if you have any questions about your project.*

From: Annie Williams
Sent: Thursday, June 10, 2021 2:50 PM
To: PPomerleau@pmaarchitectes.com
Cc: Karla Ferrey <kferrey@jlrichards.ca>; Mahad Musse <mmusse@jlrichards.ca>; Raad Akrawri <rakrawi@groupeheafey.com>; azayoun@groupeheafey.com
Subject: RE: Navan Road Project - Building Aspects

Hi Pascal,

Thank you very much for the call today. I made the following notes from our discussion, please notify me of any errors.

- 48-unit 4-storey condominium buildings – Can we assume these to be similar to apartment units? Will the buildings be of non-combustible construction with windows on all 4 sides? Will they include a sprinkler system and if so, will it be automatic fully supervised?
  Similar to apartment units, non-combustible windows all 4 sides, yes sprinkler system (can assume automatic fully supervised – 'best case'). Noted that mech. engineer will have to submit a certified letter to City stating that sprinkler system is automatic fully supervised.

- Row Townhouses – Will any of the blocks have a 2-hr firewall (per OBC Div. B 3.1.10)? If so, where are they located? We note there are 9 units in the middle which are separated by less than 3m so there is likely a firewall required here. We are assuming wood frame construction for the row townhouses.
  OBC does not require any firewalls, gypsum composition wall. Considering making 3m separation between the 2 blocks. 7 units should be ok without firewall. 8 units would need firewall. 7 units together footprint is <600 m2 (it is 554 m2). Wood frame construction. Firewalls can be added as needed to meet fire flow requirements.

- Commercial Portion – Will the drive-thru/gas retail and car wash be of wood frame construction? Any fire protection?
  Steel construction (non-combustible), no sprinkler unless required.

As we discussed, you are shifting the center townhouses to provide a 3m separation between the 7-unit block and the 6-unit block and you will send us the updated Site Plan once ready. I will send email confirmation once we have determined whether a firewall is required within the 6-unit block backing towards Page Road.

Also just copying the note from Karla below about the updated grading relationships in case this item is still outstanding.

Thank you,
Annie

From: Karla Ferrey <kferrey@jlrichards.ca>
Sent: Thursday, June 10, 2021 1:11 PM
To: PPomerleau@pmaarchitectes.com
Cc: Mahad Musse <mmusse@jlrichards.ca>; Annie Williams <awilliams@jlrichards.ca>; Raad Akrawri <rakrawi@groupeheafey.com>; azayoun@groupeheafey.com
Subject: RE: Navan Road Project - Building Aspects

Pascal,

Any chance you can coordinate with Annie right away to get the information she needs so that we can submit the Watermain Boundary Condition request to the City. The City usually takes a couple weeks to respond and this will delay the water modelling if we can't get this information into the City in a timely manner.

Also, could you give us an update on when we can expect the updated grading relationships discussed at our meeting earlier this week.

Thanks

Karla

From: Annie Williams <awilliams@jlrichards.ca>
Sent: Wednesday, June 9, 2021 11:59 AM
To: PPomerleau@pmaarchitectes.com
Cc: Mahad Musse <mmusse@jlrichards.ca>; Karla Ferrey <kferrey@jlrichards.ca>
Subject: RE: Navan Road Project - Building Aspects

Hi Pascal,

Following my voicemail, I've attached the updated site plan. Please let me know your answers to the questions below as we require this information to submit our request for boundary coniditions to the City, which we need for our design.

Feel free to give me a call to discuss.

Thank you,
Annie

From: Annie Williams
Sent: Thursday, June 3, 2021 9:25 AM
To: PPomerleau@pmaarchitectes.com
Cc: Mahad Musse <mmusse@jlrichards.ca>; Karla Ferrey <kferrey@jlrichards.ca>
Subject: Navan Road Project - Building Aspects

Good morning Pascal,

We are working on the Navan Road Development Project and wanted to clarify a few items about the buildings in support of our hydraulic water analysis:

- 48-unit 4-storey condominium buildings – Can we assume these to be similar to apartment units? Will the buildings be of non-combustible construction with windows on all 4 sides? Will they include a sprinkler system and if so, will it be automatic fully supervised?

- Row Townhouses – Will any of the blocks have a 2-hr firewall (per OBC Div. B 3.1.10)? If so, where are they located? We note there are 9 units in the middle which are separated by less than 3m so there is likely a firewall required here. We are assuming wood frame construction for the row townhouses.

- Commercial Portion – Will the drive-thru/gas retail and car wash be of wood frame construction? Any fire protection?

Thank you,
Annie

11.2.2 Water Demand Requirements — Pipe Schedule Method.

11.2.2.1 Table 11.2.2.1 shall be used in determining the minimum water supply requirements for light and ordinary hazard occupancies protected by systems with pipe sized according to the pipe schedules of Section 23.7.

Table 11.2.2.1 Water Supply Requirements for Pipe Schedule Sprinkler Systems

Occupancy Classification	Minimum Residual Pressure Required		Acceptable Flow at Base of Riser (Including Hose Stream Allowance)		Duration (minutes)
	psi	bar	gpm	L/min	
Light hazard	15	1	500–750	1900-2850	30–60
Ordinary hazard	20	1.4	850–1500	3200-5700	60–90

11.2.2.2 Pressure and flow requirements for extra hazard occupancies shall be based on the hydraulic calculation methods of 11.2.3.

11.2.2.3 The pipe schedule method shall be permitted as follows:

(1) Additions or modifications to existing pipe schedule systems sized according to the pipe schedules of Section 23.7
(2) Additions or modifications to existing extra hazard pipe schedule systems
(3) New systems of 5000 ft^2 (465 m^2) or less
(4) New systems exceeding 5000 ft^2 (465 m^2) where the flows required in Table 11.2.2.1 are available at a minimum residual pressure of 50 psi (3.4 bar) at the highest elevation of sprinkler

11.2.2.4 Table 11.2.2.1 shall be used in determining the minimum water supply requirements.

11.2.2.5 The lower duration value of Table 11.2.2.1 shall be acceptable only where the sprinkler system waterflow alarm device(s) and supervisory device(s) are electrically supervised and such supervision is monitored at an approved, constantly attended location.

11.2.2.6* Residual Pressure.

11.2.2.6.1 The residual pressure requirement of Table 11.2.2.1 shall be met at the elevation of the highest sprinkler.

11.2.2.6.2 Friction Loss Due to Backflow Prevention Valves.

11.2.2.6.2.1 When backflow prevention valves are installed on pipe schedule systems, the friction losses of the device shall be accounted for when determining acceptable residual pressure at the top level of sprinklers.

11.2.2.6.2.2 The friction loss of this device [in psi (bar)] shall be added to the elevation loss and the residual pressure at the top row of sprinklers to determine the total pressure needed at the water supply.

11.2.2.7 The lower flow figure of Table 11.2.2.1 shall be permitted only where the building is of noncombustible construction or the potential areas of fire are limited by building size or compartmentation such that no open areas exceed 3000 ft^2 (280 m^2) for light hazard or 4000 ft^2 (370 m^2) for ordinary hazard.

11.2.3 Water Demand Requirements — Hydraulic Calculation Methods.

11.2.3.1 General.

11.2.3.1.1 The water demand for sprinklers shall be determined only from one of the following, at the discretion of the designer:

(1) Density/area curves of Figure 11.2.3.1.1 in accordance with the density/area method of 11.2.3.2
(2) The room that creates the greatest demand in accordance with the room design method of 11.2.3.3
(3) Special design areas in accordance with 11.2.3.4

11.2.3.1.2 The minimum water supply shall be available for the minimum duration specified in Table 11.2.3.1.2.

11.2.3.1.3 The lower duration values in Table 11.2.3.1.2 shall be permitted where the sprinkler system waterflow alarm device(s) and supervisory device(s) are electrically supervised and such supervision is monitored at an approved, constantly attended location.

11.2.3.1.4 Restrictions. When either the density/area method or room design method is used, the following shall apply:

(1)*For areas of sprinkler operation less than 1500 ft^2 (139 m^2) used for light and ordinary hazard occupancies, the density for 1500 ft^2 (139 m^2) shall be used.
(2) For areas of sprinkler operation less than 2500 ft^2 (232 m^2) for extra hazard occupancies, the density for 2500 ft^2 (232 m^2) shall be used.

11.2.3.1.5 Unsprinklered Combustible Concealed Spaces.

11.2.3.1.5.1* When using the density/area or room design method, unless the requirements of 11.2.3.1.5.2 are met for buildings having unsprinklered combustible concealed spaces, as described in 8.15.1.2 and 8.15.6, the minimum area of sprinkler operation for that portion of the building shall be 3000 ft^2 (280 m^2).

(A) The design area of 3000 ft^2 (280 m^2) shall be applied only to the sprinkler system or portions of the sprinkler system that are adjacent to the qualifying combustible concealed space.

(B) The term *adjacent* shall apply to any sprinkler system protecting a space above, below, or next to the qualifying concealed space except where a barrier with a fire resistance rating at least equivalent to the water supply duration completely separates the concealed space from the sprinklered area.

11.2.3.1.5.2 The following unsprinklered concealed spaces shall not require a minimum area of sprinkler operation of 3000 ft^2 (280 m^2):

(1) Noncombustible and limited-combustible concealed spaces with minimal combustible loading having no access. The space shall be considered a concealed space even with small openings such as those used as return air for a plenum.
(2) Noncombustible and limited-combustible concealed spaces with limited access and not permitting occupancy or storage of combustibles. The space shall be considered a concealed space even with small openings such as those used as return air for a plenum.
(3) Combustible concealed spaces filled entirely with noncombustible insulation.
(4)*Light or ordinary hazard occupancies where noncombustible or limited-combustible ceilings are directly attached

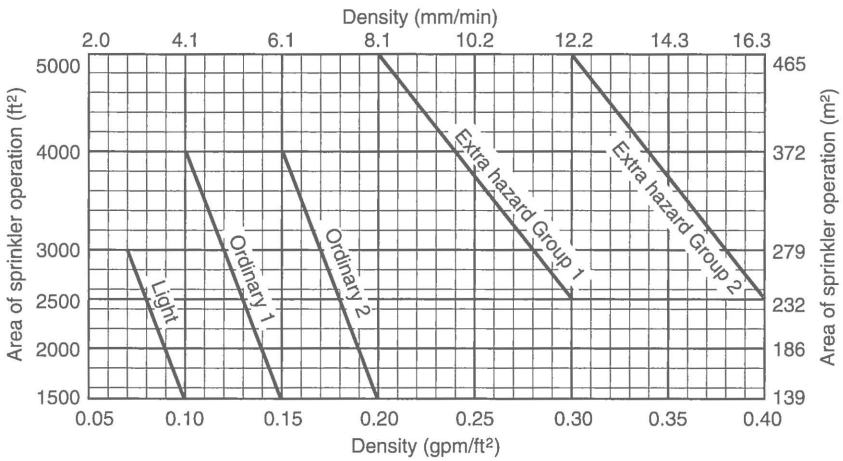


FIGURE 11.2.3.1.1 Density/Area Curves.

Table 11.2.3.1.2 Hose Stream Allowance and Water Supply Duration Requirements for Hydraulically Calculated Systems

Occupancy	Inside Hose		Total Combined Inside and Outside Hose		Duration (minutes)
	gpm	L/min	gpm	L/min	
Light hazard	0, 50, or 100	0, 190, or 380	100	380	30
Ordinary hazard	0, 50, or 100	0, 190, or 380	250	950	60–90
Extra hazard	0, 50, or 100	0, 190, or 380	500	1900	90–120

to the bottom of solid wood joists or solid limited-combustible construction or noncombustible construction so as to create enclosed joist spaces 160 ft^3 (4.5 m^3) or less in volume, including space below insulation that is laid directly on top or within the ceiling joists in an otherwise sprinklered concealed space.

(5) Concealed spaces where rigid materials are used and the exposed surfaces have a flame spread index of 25 or less and the materials have been demonstrated to not propagate fire more than 10.5 ft (3.2 m) when tested in accordance with ASTM E84, *Standard Test Method for Surface Burning Characteristics of Building Materials*, or ANSI/UL 723, *Standard for Test for Surface Burning Characteristics of Building Materials*, extended for an additional 20 minutes in the form in which they are installed in the space.

(6) Concealed spaces in which the exposed materials are constructed entirely of fire-retardant-treated wood as defined by NFPA 703.

(7) Concealed spaces over isolated small rooms not exceeding 55 ft^2 (5.1 m^2) in area.

(8) Vertical pipe chases under 10 ft^2 (0.9 m^2), provided that in multifloor buildings the chases are firestopped at each floor using materials equivalent to the floor construction, and where such pipe chases contain no sources of ignition, piping shall be noncombustible, and pipe penetrations at each floor shall be properly sealed.

(9) Exterior columns under 10 ft^2 (0.9 m^2) in area formed by studs or wood joists, supporting exterior canopies that are fully protected with a sprinkler system.

(10)*Light or ordinary hazard occupancies where noncombustible or limited-combustible ceilings are attached to the bottom of composite wood joists either directly or on to metal channels not exceeding 1 in. (25 mm) in depth, provided the adjacent joist channels are firestopped into volumes not exceeding 160 ft^3 (4.5 m^3) using materials equivalent to ½ in. (13 mm) gypsum board, and at least 3½ in. (90 mm) of batt insulation is installed at the bottom of the joist channels when the ceiling is attached utilizing metal channels.

11.2.3.2 Density/Area Method.

11.2.3.2.1 Water Supply.

11.2.3.2.1.1 The water supply requirement for sprinklers only shall be calculated from the density/area curves of Figure 11.2.3.1.1 or from Chapter 22 where density/area criteria are specified for special occupancy hazards.

11.2.3.2.1.2 When using Figure 11.2.3.1.1, the calculations shall satisfy any single point on the appropriate density/area curve.

11.2.3.2.1.3 When using Figure 11.2.3.1.1, it shall not be necessary to meet all points on the selected curves.

11.2.3.2.2 Sprinklers.

11.2.3.2.2.1 The densities and areas provided in Figure 11.2.3.1.1 shall be for use only with spray sprinklers.

11.2.3.2.2.2 Quick-response sprinklers shall not be permitted for use in extra hazard occupancies or other occupancies where there are substantial amounts of flammable liquids or combustible dusts.

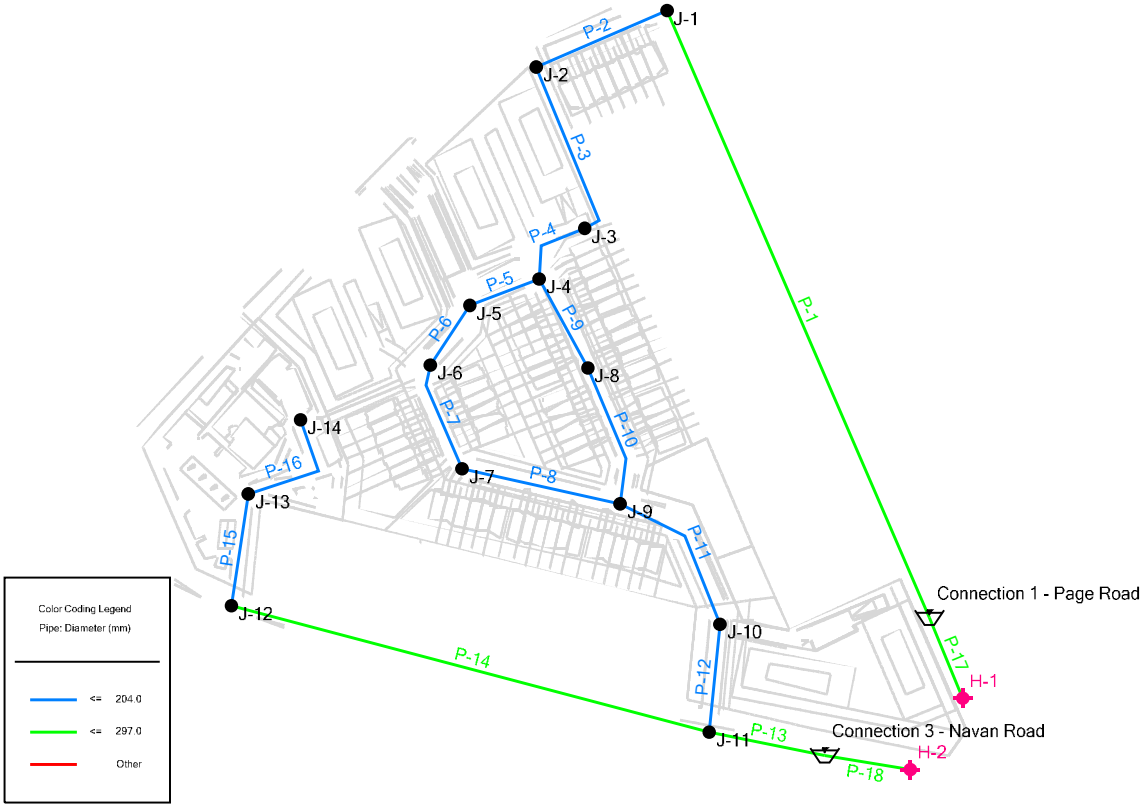
11.2.3.2.2.3 For extended coverage sprinklers, the minimum design area shall be that corresponding to the hazard in Figure 11.2.3.1.1 or the area protected by five sprinklers, whichever is greater.

11.2.3.2.2.4 Extended coverage sprinklers shall be listed with and designed for the minimum flow corresponding to the density for the hazard as specified in Figure 11.2.3.1.1.

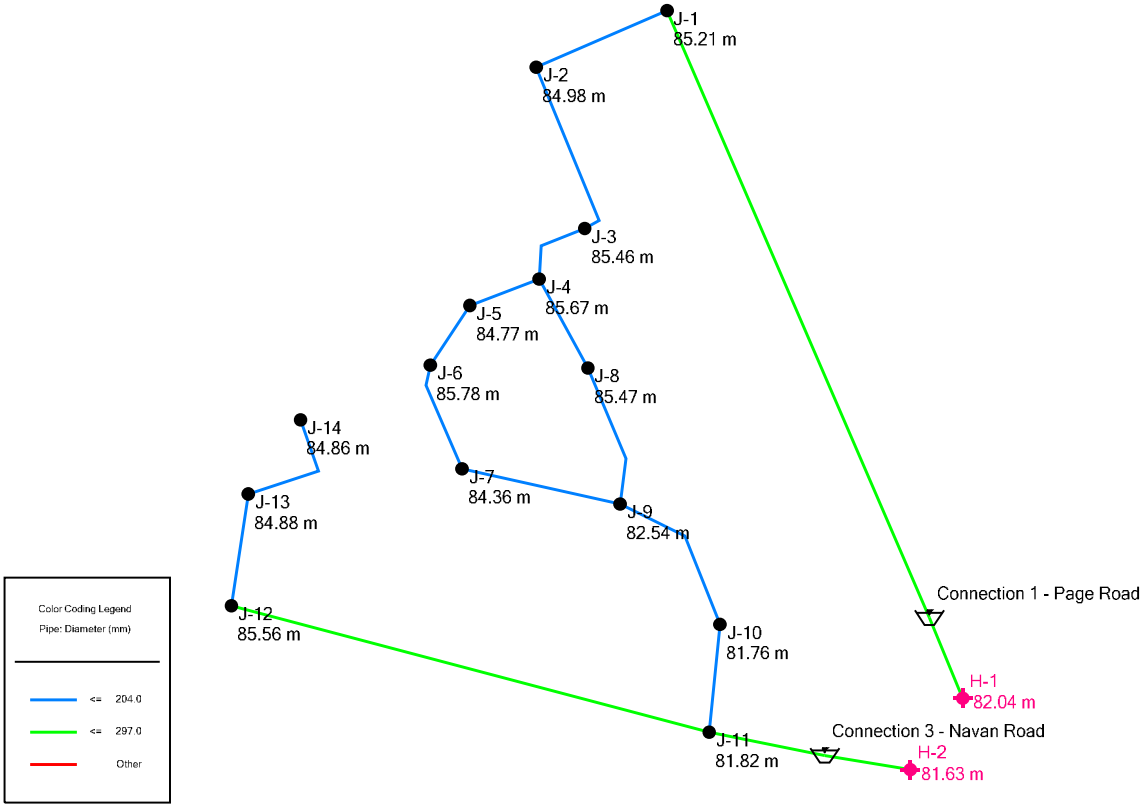
Appendix D2

WaterCAD Schematics

2983, 3053, and 3079 Navan Road and 2690 Page Road
Model Schematic



2983, 3053, and 3079 Navan Road and 2690 Page Road
Model Schematic
Elevation Model



Appendix D3

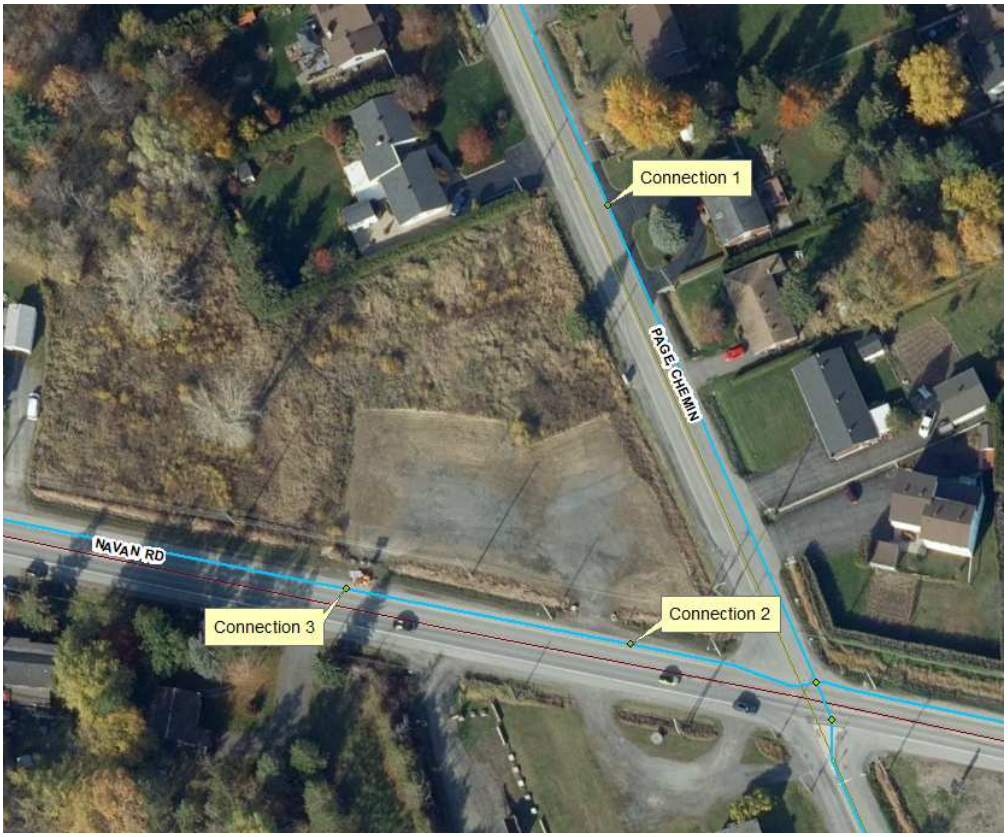
City Correspondence –
Boundary Conditions

Boundary Conditions
3079 Navan Road

Provided Information

Scenario	Demand	
	L/min	L/s
Average Daily Demand	137	2.28
Maximum Daily Demand	340	5.66
Peak Hour	746	12.44
Fire Flow Demand #1	10,020	167.00
Fire Flow Demand #2	15,000	250.00

Location



Results

Connection 1 – Page Rd.

Demand Scenario	Head (m)	Pressure[1] (psi)
Maximum HGL	130.7	68.2
Peak Hour	126.6	62.4
Max Day plus Fire 1	126.2	61.7
Max Day plus Fire 2	123.0	57.3

Ground Elevation = 82.8 m

Connection 2 – Navan Rd.

Demand Scenario	Head (m)	Pressure[1] (psi)
Maximum HGL	130.7	69.7
Peak Hour	126.6	63.9
Max Day plus Fire 1	126.2	63.3
Max Day plus Fire 2	123.2	59.0

Ground Elevation = 81.7 m

Connection 3 – Navan Rd.

Demand Scenario	Head (m)	Pressure[1] (psi)
Maximum HGL	130.7	69.4
Peak Hour	126.6	63.5
Max Day plus Fire 1	125.8	62.4
Max Day plus Fire 2	122.3	57.4

Ground Elevation = 81.9 m

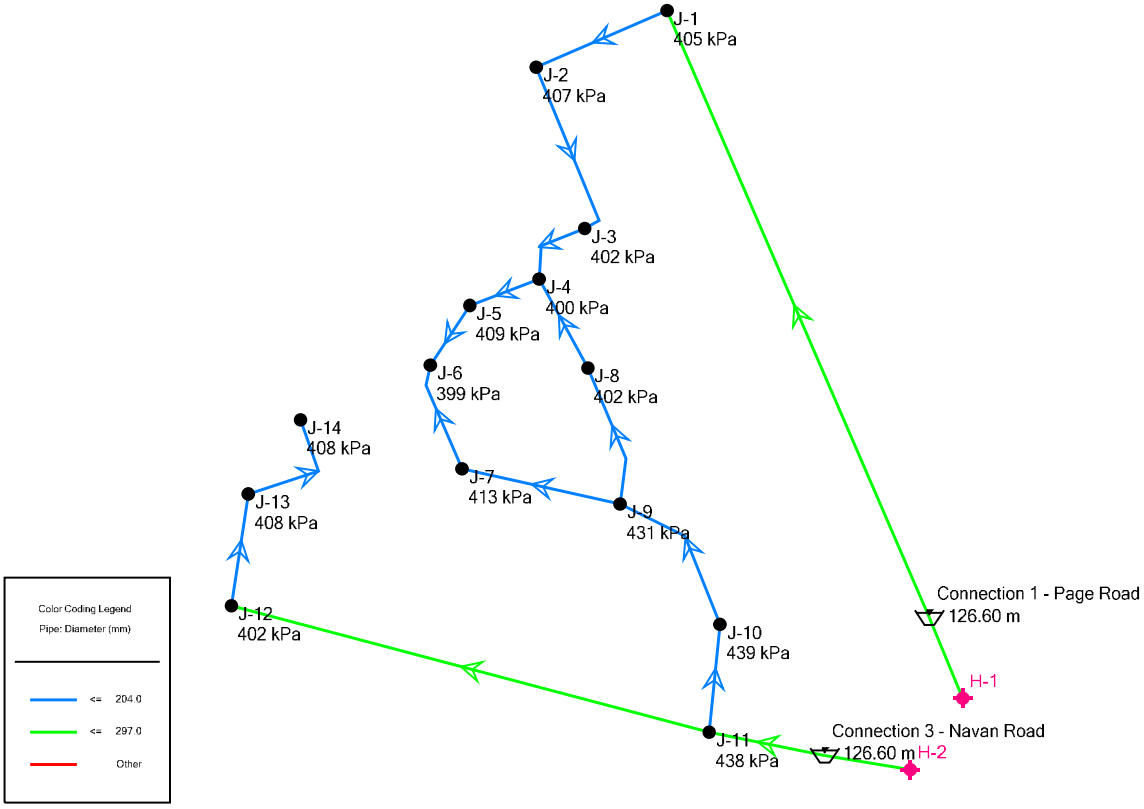
Disclaimer

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

Appendix D4

Simulation Results – Peak Hour

2983, 3053, and 3079 Navan Road and 2690 Page Road
Peak Hour Demand
Existing Condition



2983, 3053, and 3079 Navan Road and 2690 Page Road
Peak Hour Demand
Existing Condition
Junction Table

Label	Elevation (m)	Demand (L/s)	Hydraulic Grade (m)	Pressure (kPa)
J-6	85.78	1.51	126.56	399
J-4	85.67	1.24	126.56	400
J-12	85.56	0.00	126.60	402
J-8	85.47	1.44	126.56	402
J-3	85.46	1.54	126.56	402
J-1	85.21	0.00	126.59	405
J-2	84.98	0.38	126.58	407
J-13	84.88	0.03	126.60	408
J-14	84.86	0.03	126.60	408
J-5	84.77	1.24	126.56	409
J-7	84.36	0.91	126.56	413
J-9	82.54	0.58	126.56	431
J-11	81.82	0.00	126.60	438
J-10	81.76	3.08	126.57	439

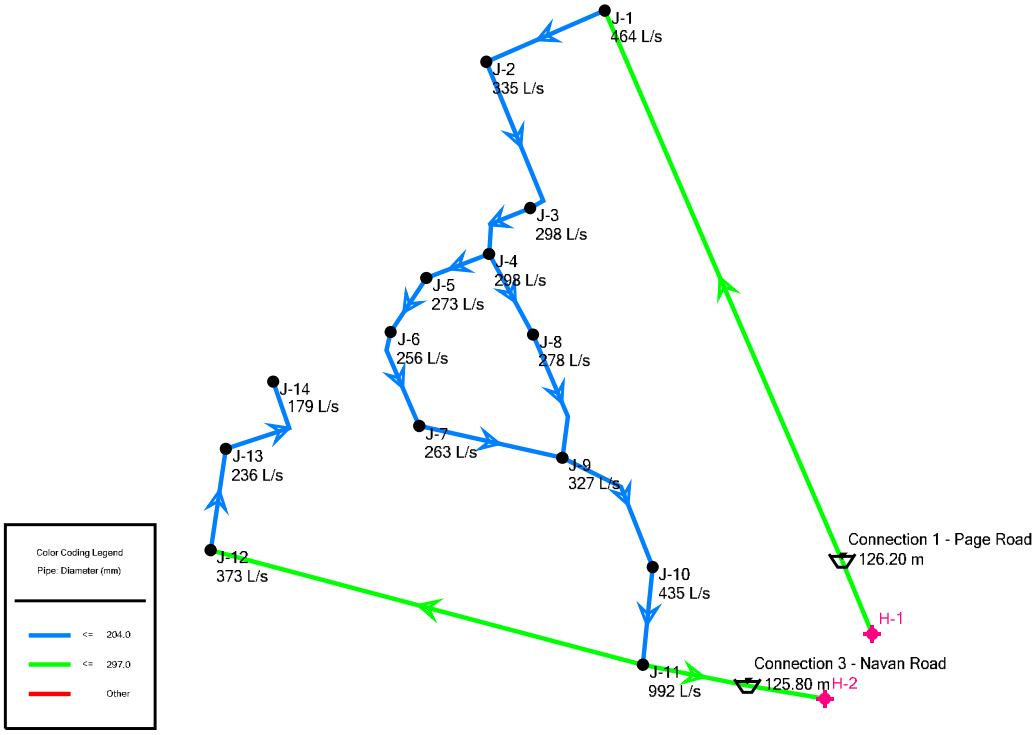
2983, 3053, and 3079 Navan Road and 2690 Page Road
Peak Hour Demand
Existing Condition
Pipe Table

ID	Label	Length (Scaled) (m)	Diameter (mm)	Material	Hazen-Williams C	Hydraulic Grade (Start) (m)	Hydraulic Grade (Stop) (m)	Flow (L/s)	Velocity (m/s)
53	P-6	35	204.0	PVC	110.0	126.56	126.56	0.55	0.02
52	P-5	36	204.0	PVC	110.0	126.56	126.56	1.79	0.05
54	P-7	55	204.0	PVC	110.0	126.56	126.56	-0.96	0.03
51	P-4	39	204.0	PVC	110.0	126.56	126.56	2.82	0.09
56	P-9	50	204.0	PVC	110.0	126.56	126.56	-0.22	0.01
55	P-8	79	204.0	PVC	110.0	126.56	126.56	-1.87	0.06
57	P-10	71	204.0	PVC	110.0	126.56	126.56	-1.66	0.05
50	P-3	89	204.0	PVC	110.0	126.58	126.56	4.36	0.13
58	P-11	82	204.0	PVC	110.0	126.56	126.57	-4.11	0.13
49	P-2	70	204.0	PVC	110.0	126.59	126.58	4.74	0.15
48	P-1	324	297.0	PVC	120.0	126.60	126.59	4.74	0.07
61	P-15	55	204.0	PVC	110.0	126.60	126.60	0.07	0.00
62	P-16	63	204.0	PVC	110.0	126.60	126.60	0.03	0.00
65	P-14	242	297.0	PVC	120.0	126.60	126.60	0.07	0.00
59	P-12	53	204.0	PVC	110.0	126.57	126.60	-7.19	0.22
60	P-13	58	297.0	PVC	120.0	126.60	126.60	-7.26	0.10
63	P-17	43	297.0	PVC	120.0	126.60	126.60	0.00	0.00
64	P-18	43	297.0	PVC	120.0	126.60	126.60	0.00	0.00

Appendix D5

Simulation Results – Maximum Day + Fire Flow

2983, 3053, and 3079 Navan Road and 2690 Page Road
Maximum Day + Fire Flow Requirement (10,000 L/min)
Existing Condition



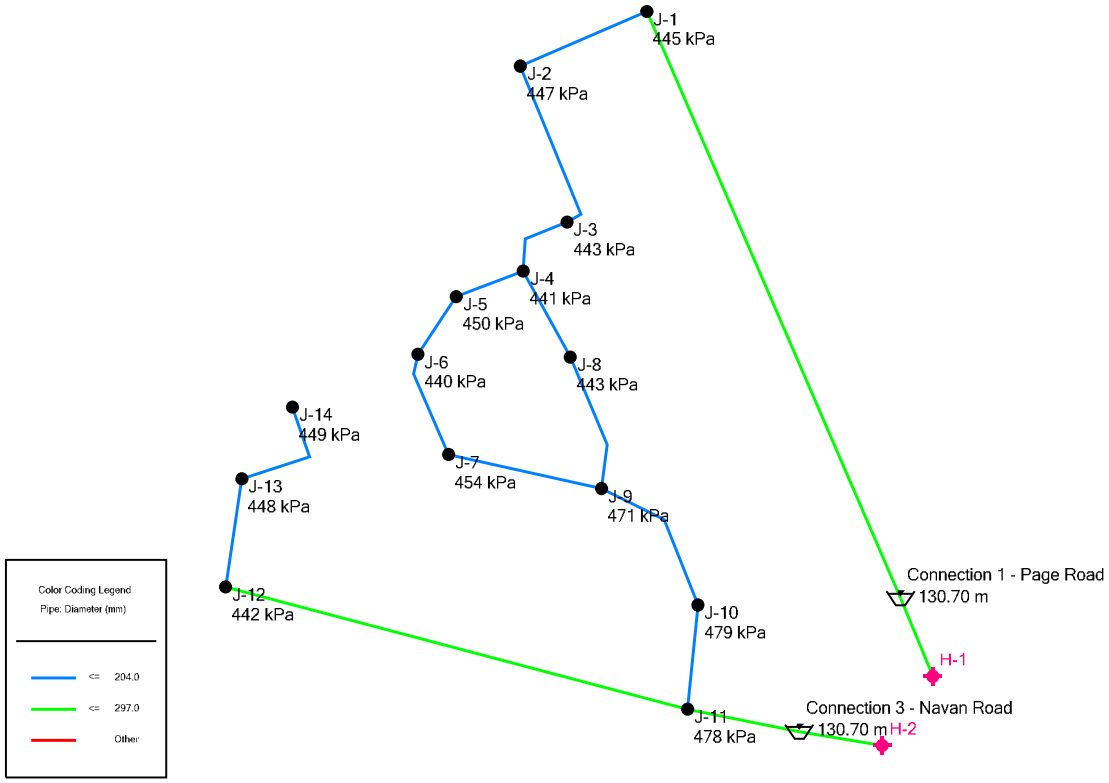
2983, 3053, and 3079 Navan Road and 2690 Page Road
Maximum Day + Fire Flow Requirement (10,000 L/min)
Existing Condition
Junction Table

Label	Fire Flow (Needed) (L/s)	Fire Flow (Available) (L/s)	Flow (Total Available) (L/s)	Satisfies Fire Flow Constraints?	Pressure (Residual Lower Limit) (kPa)	Pressure (Calculated Residual) (kPa)	Junction w/ Minimum Pressure (System)
J-14	167	179	179	True	140	140	J-13
J-13	167	236	236	True	140	140	J-14
J-6	167	256	256	True	140	140	J-5
J-7	167	263	263	True	140	140	J-6
J-5	167	273	274	True	140	140	J-6
J-8	167	278	279	True	140	140	J-4
J-3	167	298	299	True	140	140	J-4
J-4	167	298	299	True	140	140	J-6
J-9	167	327	328	True	140	145	J-6
J-2	167	335	335	True	140	140	J-3
J-12	167	373	373	True	140	140	J-13
J-10	167	435	436	True	140	140	J-6
J-1	167	464	464	True	140	140	J-2
J-11	167	992	992	True	140	177	J-12
H-2	167	1,000	1,000	True	140	201	J-6
H-1	167	1,000	1,000	True	140	199	J-6

Appendix D6

Simulation Results – Maximum HGL

2983, 3053, and 3079 Navan Road and 2690 Page Road
Maximum Pressure Analysis
Existing Condition



2983, 3053, and 3079 Navan Road and 2690 Page Road
Maximum Pressure Analysis
Existing Condition
Junction Table

Label	Elevation (m)	Demand (L/s)	Hydraulic Grade (m)	Pressure (kPa)
J-6	85.78	0	130.70	440
J-4	85.67	0	130.70	441
J-12	85.56	0	130.70	442
J-8	85.47	0	130.70	443
J-3	85.46	0	130.70	443
J-1	85.21	0	130.70	445
J-2	84.98	0	130.70	447
J-13	84.88	0	130.70	448
J-14	84.86	0	130.70	449
J-5	84.77	0	130.70	450
J-7	84.36	0	130.70	454
J-9	82.54	0	130.70	471
J-11	81.82	0	130.70	478
J-10	81.76	0	130.70	479

2983, 3053, and 3079 Navan Road and 2690 Page Road
Maximum Pressure Analysis
Existing Condition
Pipe Table

ID	Label	Length (Scaled) (m)	Diameter (mm)	Material	Hazen-Williams C	Hydraulic Grade (Start) (m)	Hydraulic Grade (Stop) (m)	Flow (L/s)	Velocity (m/s)
48	P-1	324	297.0	PVC	120.0	130.70	130.70	0	0.00
49	P-2	70	204.0	PVC	110.0	130.70	130.70	0	0.00
50	P-3	89	204.0	PVC	110.0	130.70	130.70	0	0.00
51	P-4	39	204.0	PVC	110.0	130.70	130.70	0	0.00
52	P-5	36	204.0	PVC	110.0	130.70	130.70	0	0.00
53	P-6	35	204.0	PVC	110.0	130.70	130.70	0	0.00
54	P-7	55	204.0	PVC	110.0	130.70	130.70	0	0.00
55	P-8	79	204.0	PVC	110.0	130.70	130.70	0	0.00
56	P-9	50	204.0	PVC	110.0	130.70	130.70	0	0.00
57	P-10	71	204.0	PVC	110.0	130.70	130.70	0	0.00
58	P-11	82	204.0	PVC	110.0	130.70	130.70	0	0.00
59	P-12	53	204.0	PVC	110.0	130.70	130.70	0	0.00
60	P-13	58	297.0	PVC	120.0	130.70	130.70	0	0.00
65	P-14	242	297.0	PVC	120.0	130.70	130.70	0	0.00
61	P-15	55	204.0	PVC	110.0	130.70	130.70	0	0.00
62	P-16	63	204.0	PVC	110.0	130.70	130.70	0	0.00
63	P-17	43	297.0	PVC	120.0	130.70	130.70	0	0.00
64	P-18	43	297.0	PVC	120.0	130.70	130.70	0	0.00

Appendix E1

Wasterwater – EUC ISSU Design

N

12a — SANITARY SEWER AND MANHOLE

12 — SANITARY TRUNK SEWER AND MANHOLE

SANITARY FORCEMAIN

SANITARY CATCHMENT AREA

71.50 / 67.33 — ORIGINAL GROUND / OBVERT

3.25 / 56 / 2 — AREA (ha) / POPULATION / MANHOLE No.

3.25 / 56 / 2 / 3.2 INST — AREA (ha) / POPULATION / MANHOLE No. / INST (INSTUTIONAL) ha / IND (INDUSTRIAL) ha / COM (COMMERCIAL) ha

* EQUIVALENT AREA (17.7 l/s ALLOWABLE PEAK FLOW UNDER C of O SEWER USE AGREEMENT)

PROPOSED SITE, 2983-3053-3079 Navan Road and 2690 Pagé Road

HYDRO CORRIDOR

PROPOSED TRANSITWAY

PROPOSED BLACKBURN BY-PASS EXTENSION

MER BLEUE ROAD

FOURTH LINE ROAD

PAGE ROAD

NAVAN ROAD

WALL ROAD

SAPHIR AVE.

GRAND PRE

ABANDONED C.P.R. RIGHT OF WAY

SANITARY TRUNK No.1

SANITARY TRUNK No.2

SANITARY TRUNK No.3

SANITARY TRUNK No.4

SCHOOL

PARK

INSTIT.

INSTITUTIONAL

COMMERCIAL

ESCARPMENT

FIRE HALL

WSI LANDFILL

FOREST VALLEY PUMPING STATION

LOCAL PUMP STA. No.1

LOCAL PUMP STA. No.2

REVISION No.2 MARCH, 2005

CITY OF OTTAWA
GLOUCESTER EUC INFRASTRUCTURE SERVICING STUDY UPDATE

SANITARY SEWER SYSTEM

Scale 0 40 120 200m

Dwg. No. SAN

Dwn By E.C. Date 04.10.29 Revision 2

SANITARY SEWER CALCULATION SHEET

LOCATION		RESIDENTIAL AREA AND POPULATION						COMM		INDUST			INST		C+I+I	PEAK FLOW				PIPE														
FROM M.H.	TO M.H.	AREA (ha)	POP.	CUMULATIVE AREA (ha)	CUMULATIVE POP.	PEAK FACT.	PEAK FLOW (L/s)	AREA (ha)	ACCU. AREA (ha)	AREA (ha)	ACCU. AREA (ha)	PEAK FACTOR (per MOE)	AREA (ha)	ACCU. AREA (ha)	PEAK FLOW (L/s)	TOTAL AREA (ha)	ACCU. AREA (ha)	INFILT. FLOW (L/s)	TOTAL FLOW (L/s)	LENGTH (m)	DIAMETER NOM (mm)	DIAMETER ACT (mm)	SLOPE (%)	CAP. (FULL) (L/s)	Q/Qcap (%)	VEL. (FULL) (m/s)	Upstream OG (m)	Downstream OG (m)	Upstream Invert (m)	Upstream Obvert (m)	Downstream Invert (m)	Downstream Obvert (m)	Drop Structure (m)	US Frost Depth (m)	DS Frost Depth (m)
1	2	3.25	66	3.25	66	4.00	0.91		0.00		0.00			0.00	0.00	3.25	3.25	0.91	1.81	250	200	203.2	0.32	19.35	9.4%	0.60	88.25	88.00	84.83	85.03	84.03	84.23			3.22	3.77
2	3	5.20	181	8.45	247	4.00	3.84		0.00		0.00			0.00	0.00	5.20	8.45	2.37	6.21	320	200	203.2	0.32	19.35	32.1%	0.60	88.00	87.80	84.03	84.23	83.00	83.21			3.77	4.39
3	4	19.75	995	28.20	1232	3.74	18.66		0.00		0.00			0.00	0.00	19.75	28.20	7.90	26.56	320	250	254.0	0.24	30.39	87.4%	0.60	87.60	87.50	82.95	83.21	82.18	82.44			4.39	5.06
4A	4	19.80	979	19.80	979	3.81	15.10		0.00		0.00			0.00	0.00	19.80	19.80	5.54	20.64	365	250	254.0	0.24	30.39	67.9%	0.60	88.00	87.50	83.83	84.08	82.95	83.20			3.92	4.30
4	5	7.10	185	55.10	2396	3.62	34.19		0.00		0.00		3.10	3.10	2.69	10.20	58.20	16.30	53.18	310	375	381.0	0.14	58.43	77.7%	0.60	87.50	87.80	82.06	82.44	81.62	82.00			5.06	5.60
5A	5	7.90	362	7.90	362	4.00	5.87		0.00		0.00			0.00	0.00	7.90	7.90	2.21	8.08	320	200	203.2	0.65	27.56	29.3%	0.85	87.40	87.80	84.05	84.25	81.97	82.17			3.15	5.43
5	6	2.40	170	65.40	2928	3.45	40.94		0.00		0.00			0.00	0.00	2.40	68.50	19.18	62.81	295	375	381.0	0.14	58.43	91.8%	0.60	87.50	87.50	81.62	82.00	81.21	81.59			5.80	5.91
6	7	15.90	787	81.30	3715	3.36	50.60		0.00		0.00			3.10	2.69	15.90	84.40	23.63	76.92	115	450	457.2	0.11	98.64	78.0%	0.60	87.50	87.50	81.13	81.59	81.01	81.46			5.91	6.04
7	8	6.80	353	88.10	4068	3.33	54.83		0.00		0.00			3.10	2.69	6.80	91.20	25.54	83.09	235	450	457.2	0.11	98.64	84.2%	0.60	87.50	86.90	81.01	81.46	80.75	81.21			6.04	5.69
8A	8	11.85	826	11.85	826	3.85	12.89		0.00		0.00			0.00	0.00	11.85	11.85	3.32	18.21	150	200	203.2	0.50	24.19	67.0%	0.75	86.50	86.90	81.45	81.85	80.70	80.90			4.85	6.00
8	9	2.60	128	102.55	5022	3.24	65.98		0.00		0.00		2.20	5.30	4.60	4.80	107.85	30.20	100.78	170	525	533.4	0.10	141.87	71.0%	0.63	86.90	87.00	80.37	80.90	80.20	80.73			6.00	6.27
9A	9	6.45	300	6.45	300	4.00	6.86		0.00		0.00			0.00	0.00	6.45	6.45	1.53	8.38	65	200	203.2	0.32	19.35	33.0%	0.60	87.00	87.00	81.42	81.62	81.14	81.35			5.38	5.65
9	10	2.70	0	110.70	5322	3.22	69.42		0.00		0.00			5.30	4.60	2.70	116.00	32.48	104.59	275	525	533.4	0.10	141.87	73.1%	0.63	87.00	87.00	80.20	80.73	79.92	80.46			6.27	6.56
10A	10	14.80	731	14.80	731	3.68	11.50		0.00		0.00		0.60	0.60	0.52	15.40	15.40	4.31	16.34	270	200	203.2	0.32	19.35	84.4%	0.60	87.50	87.00	83.56	83.76	82.69	82.90			3.74	4.10
10	11	4.30	117	129.80	6170	3.16	78.96		0.00		0.00		2.40	8.30	7.20	6.70	138.10	38.67	124.84	405	525	533.4	0.10	141.87	88.0%	0.63	87.00	85.50	79.92	80.46	79.52	80.05			6.55	6.45
11A	11	8.00	393	8.00	393	4.00	8.36		0.00		0.00			0.00	0.00	8.00	8.00	2.24	8.69	95	200	203.2	0.32	19.35	44.4%	0.60	86.00	85.50	80.42	80.62	80.11	80.32			5.38	5.18
11B	11	5.90	352	5.90	352	4.00	6.70		0.00		0.00			0.00	0.00	5.90	5.90	1.65	7.36	90	200	203.2	0.32	19.35	38.0%	0.60	86.00	85.50	81.69	81.89	81.40	81.60			4.11	3.90
11	12	1.90	18	145.60	6931	3.11	87.34		0.00		0.00			8.30	7.20	1.90	153.90	43.09	137.83	230	600	609.6	0.100	202.65	68.0%	0.69	85.50	83.90	79.44	80.05	79.21	79.82			6.45	4.08
25D	25C	7.40	48	7.40	48	4.00	0.78		0.00		0.00			0.00	0.00	7.40	7.40	2.07	2.85	420	200	203.2	0.32	19.35	14.7%	0.60	86.30	86.00	83.02	83.22	81.67	81.88			3.08	4.12
LOCAL PS 2	25C	4.55	22	4.55	22	4.00	0.36		0.00		0.00			0.00	0.00	4.55	4.55	1.27	1.64	300		0.0		0.00	#DIV/0!	#DIV/0!	82.00	86.00		79.50		83.30			2.80	2.70
25G	25E	7.40	496	7.40	496	3.98	7.99		0.00		0.00			0.00	0.00	7.40	7.40	2.07	10.06	230	200	203.2	0.32	19.35	52.0%	0.60	81.50	81.00	78.80	79.00	78.06	78.26			2.90	2.74
25F	25E	4.60	272	4.60	272	4.00	4.41		0.00		0.00			0.00	0.00	4.60	4.60	1.29	5.70	120	200	203.2	2.50	54.10	10.5%	1.67	84.00	81.00	81.30	81.50	78.30	78.50			2.50	2.50
25E	LOCAL PS 1	0.00	0	12.00	768	3.87	12.04		0.00		0.00			0.00	0.00	0.00	12.00	3.36	15.40	70	200	203.2	0.32	19.35	79.6%	0.60	81.00	81.00	78.06	78.26	77.84	78.04			2.74	2.96
LOCAL PS 1	25C	0.00	0	12.00	768	3.87	12.04		0.00		0.00			0.00	0.00	0.00	12.00	3.36	15.40	340		0.0		0.00	#DIV/0!	#DIV/0!	81.00	86.00		78.50		83.50			2.50	2.50
25C	25B	7.00	51	30.95	890	3.83	13.81		0.00		0.00			0.00	0.00	7.00	30.95	8.67	22.48	460	300	304.8	0.19	43.97	51.1%	0.60	86.00	86.50	81.57	81.88	80.70	81.00			4.12	5.60
25B	25A	11.80	337	42.75	1226	3.74	18.59		0.00		0.00			0.00	0.00	11.80	42.75	11.97	30.56	295	375	381.0	0.14	58.43	44.7%	0.60	86.50	86.50	80.62	81.00	80.21	80.59			5.60	5.91
25A	25	17.00	845	59.75	2071	3.57	29.99		0.00		0.00			0.00	0.00	17.00	59.75	16.73	46.72	405	375	381.0	0.14	58.43	68.3%	0.60	86.50	86.50	80.21	80.59	79.84	80.02			5.91	6.48
20	21	8.75	505	8.75	505	3.97	8.13		0.00		0.00			0.00	0.00																			
21	22	7.00	160	15.75	665	3.91	10.53		0.00	1.00	1.00	6.50	2.55	2.55	2.21	11.30	11.30	3.16	13.51	320	200	203.2	0.32	19.35	69.8%	0.60	87.00	86.80	83.91	84.11	82.88	83.09			2.89	3.71
22	23	7.30	440	23.05	1106	3.77	16.69		0.00		1.00	6.50	8.30	10.85	12.05	18.30	27.60	7.73	30.31	335	300	304.8	0.19	43.97	68.9%	0.60	86.80	87.00	82.78	83.09	82.14	82.45			3.71	4.55
23B	23A	15.70	565	15.70	565	3.95	9.03		0.00		0.00			10.85	12.05	7.30	34.90	9.77	36.71	275	300	304.8	0.19	43.97	88.0%	0.60	87.00	86.50	82.14	82.45	81.62	81.93			4.55	4.57
23A	23	9.40	584	25.10	1149	3.76	17.50		0.00		0.00			0.00	0.00	15.70	15.70	4.40	13.43	325	250	254.0	0.45	41.38	32.4%	0.82	86.80	86.00	82.52	82.77	81.07	81.32			4.03	4.68
23	24	2.60	120	50.75	2374	3.53	33.92		0.00		1.00	6.50	3.30	14.15	14.92	5.90	65.90	18.45	67.29	315	375	381.0	0.22	65.79	78.4%	0.75	86.50	86.50	80.35	80.73	79.66	80.04			4.66	5.77
24A	24	25.10	544	25.10	544	3.96	8.72		0.00		0.00			0.00	0.00	25.10	25.10	7.03	18.74	235	200	203.2	0.32	19.35	81.3%	0.60	86.00	86.50	83.00	83.20	82.24	82.45			2.80	4.05
24	25	0.80	0	76.65	2918	3.45	40.82		0.00		1.00	6.50		14.15	14.92	0.80	91.80	25.70	81.44	235	450	457.2	0.11	98.64	82.6%	0.60	86.50	86.50	79.58	80.04	79.33	79.78			6.46	6.72
LANDFILL PS	25	0.00	0	0.00	0	4.00	0.00		0.00	10.40	10.40	4.20		0.00	17.69	10.40	10.40	2.91		120		0.0		0.00	#VALUE!	#DIV/0!	80.00	86.50	77.50	77.80		84.00			2.50	2.50
25	26	8.30	99	144.70	5089	3.24	66.75		0.00		11.40	4.15		14.15	31.45	8.30	170.25	47.87	148.87	380	600	609.6	0.10	202.55	72.0%	0.89	86.50	86.50	79.17	79.78	78.79	79.40			6.72	7.10
26A	26	6.90	360	6.90	360	4.00	5.83		0.00		0.00		1.30	1.30	1.13	8.20	8.20	2.30	9.26	175	200	203.2	0.32	19.35	47.6%	0.60	86.00	86.50	81.00	81.20	80.44	80.64			4.80	5.86
26	12	2.80	6	154.40	5455	3.21	70.93		0.00		11.40	4.15		15.45	32.58	2.80	181.25	50.75	154.26	720	600	609.6	0.10	202.55	76.2%	0.89	86.50	83.90	78.79	79.40	78.07	78.68			7.10	5.22
12	13	0.60	32	300.60	12418	2.86	143.91	0.90	0.90		11.40	4.15		23.75	40.58	1.50	336.85	94.26	276.74	60	600	609.6	0.30	350.83	78.5%	1.20	83.90	82.50	78.07	78.68	77.89	78.50			5.22	4.00
13C	13	5.60	353	5.60	353	4.00	5.71		0.00		0.00			0.00	0.00	5.60	5.90	1.57	7.28	150	200	203.2	0.66	27.79	26.2%	0.86	83.50	82.50	80.80	81.00	79.81	80.01			2.50	2.49
13B	13A	10.50	314	10.50	314	4.00	5.09		0.00		0.00			0.00	0.00	10.50	10.50	2.94	8.03	160	200	203.2	0.32	19.35	41.5%	0.60	81.50	81.50	78.80	79.00	78.28	78.49			2.50	3.01
13A	13	6.60	90	17.10	404	4.00	6.54		0.00		0.00			0.00	0.00	6.60	17.10	4.79	11.33	100	200	203.2	0.32	19.35	58.6%	0.60	81.50	82.50	78.28	78.49	77.96	78.17			3.01	4.33
13	14	0.26	0	323.56	13175	2.83	151.30	0.54	1.44		11.40	4.15		23.75	41.03	0.60	360.15	100.84	293.17	100	600	609.6	0.40	405.10	72.4%	1.39	82.50	80.80	78.91	77.52	76.51	77.12	0.65	4.99	3.68
14	15	1.40	18	324.96	13191	2.83	151.46		1.44		11.40	4.15		23.75	41.03	1.40	361.55	101.23	293.72	150	600	609.6	0.40	405.10	72.5%	1.39	80.80	79.40	78.88	76.47	75.26	76.07	0.65	4.33	2.53
15	16	1.70	53	326.66	13244	2.83	151.97		1.44		11.40	4.15		23.75	41.03	1.70	363.25	101.71	294.71	150	600	609.6	0.60	496.14	59.4%	1.70	79.40	77.00	74.78	75.37	73.86	74.47	0.50	3.03	2.53
16	17	2.30	32	328.96	13276	2.83	152.28		1.44		11.40	4.15		23.75	41.03	2.30	365.55	102.35	295.67	250	600	609.6	0.60	496.14	59.6%	1.70	77.00	76.00	73.86	74.47	72.96	73.57			2.53	3.03
17	18	0.30	0	329.26	13276	2.83	152.28		1.44		11.40	4.15		23.75	41.03	0.30	365.85	102.44	295.75	100	600	609.6	0.80	572.90	51.6%	1.96	76.00	73.00	70.66	71.27	69.86	70.47	1.70	4.73	2.53
30	31	4.80	252	4.80	252	4.00	4.08		0.00		0.00			0.00	0.00	4.80	4.80	1.34	8.43	150	200	203.2	2.50	54.10	10.0%	1.67	83.50	79.00	80.26	80.46	78.51	78.71			3.04	2.29
31	32	1.40	34	6.20	286	4.00	4.83	1.30	1.30		0.00			0.00	1.13	2.70	7.50	2.10	7.86	205	200	203.2	3.90	67.57	11.6%	2.08	79.00	71.00	76.30	76.50	69.30	69.51	0.21	2.50	2.50
32A	32	5.50	336	5.50	336	4.00	5.44		0.00		0.00			0.00	0.00	5.50	5.50	1.54	6.88	80	300	304.8	0.19	43.97	15.6%	0.60	70.50	71.00	66.24	66.54	66.08	66.39			3.96	4.61
32	33	4.05	38	15.75	659	3.91	10.44		1.30		0.00			0.00	1.13	4.05	17.05	4.77	16.35	160	300	304.8	0.19	43.97	37.2%	0.60	71.00	70.80	66.08	66.39	65.78	66.08			4.81	4.72
33A	33	4.00	252	4.00	252	4.00	4.06		0.00		0.00			0.00	0.00	4.00	4.00	1.12	5.20	85	200	203.2	0.32	19.35	26.9%	0.60	70.50	70.60	66.07	66.27	65.79	66.00			4.23	4.80
33	34	0.90	42	20.65	953	3.81	14.73		1.30		0.00		2.80	2.80	3.56	3.70	24.75	6.93	25.22	185	300	304.8	0.19	43.97	57.3%	0.60	70.60	70.50	65.69	66.00	65.34	65.65			4.80	4.85
34A	34	3.70	176	3.70	176	4.00	2.86		0.00		0.00			0.00	0.00	3.70	3.70	1.04	3.89	80	200	203.2	2.00	48.38	8.0%	1.49	71.50	70.50	66.80	69.00	67.20	67.40			2.50	3.10
34	35	3.80	227	28.15	1357	3.71	20.39		1.30		0.00			2.80	3.56	3.80	32.25	9.03	32.98	160	300	304.8	0.19	43.97	75.0%	0.60	70.50	71.00	65.34	65.65	65.04	65.34			4.85	5.66
35C	35B	7.30	445	7.30	445	4.00	7.21		0.00		0.00			0.00	0.00	7.30	7.30	2.04	9.29	160	200	203.2	1.90	47.16	19.6%	1.45	75.00	72.00	72.30	72.50	69.26	69.46			2.50	2.54
35B	35A	0.96	50	8.26	495	3.98	7.98		0.00		0.00			0.00	0.00	0.96	8.26	2.31	10.30	65	200	203.2	0.32	19.35	53.2%	0.60	72.00	72.00	69.26	69.46	68.98	69.19			2.54	2.81
35A	35	2.70	134	10.96	630	3.92	10.01		0.00		0.00			0.00	0.00	2.70	10.96	3.07	13.07	70	200	203.2	2.50	54.10	24.2%	1.67	72.00	71.00	67.99	68.20	66.24	66.45	0.99	3.80	4.55
35	36	0.73	42	39.84	2029	3.58	29.43		1.30		0.00			2.80	3.56	0.73	43.94	12.30	45.29	110	375	381.0	0.14	58.43	68.2%	0.60	71.00	72.00	64.96	65.34	64.81	65.19			5.66	6.81
36	37	9.80	538	49.64	2568	3.50	36.38		1.30		0.00			2.80	3.56	9.80	53.74	15.05	54.98	165	375	381.0	0.14	58.43	80.3%	0.60	72.00	78.00	64.81	65.19	64.58	64.96			6.81	11.04
37	38	3.40	193	53.04	2759	3.47	38.82		1.30		0.00			2.80	3.56	3.40	57.14	16.00	58.38	95	375	381.0	0.14	58.43	85.3%	0.60	76.00	78.00	64.58	64.96	64.44	64.82			11.04	11.18

LOCATION		RESIDENTIAL AREA AND POPULATION						COMM		INDUST			INST		C+I+I	PEAK FLOW				PIPE														
FROM M.H.	TO M.H.	AREA (ha)	POP.	CUMULATIVE AREA (ha)	CUMULATIVE POP.	PEAK FACT.	PEAK FLOW (L/s)	AREA (ha)	ACCU. AREA (ha)	AREA (ha)	ACCU. AREA (ha)	PEAK FACTOR (per MOE)	AREA (ha)	ACCU. AREA (ha)	PEAK FLOW (L/s)	TOTAL AREA (ha)	ACCU. AREA (ha)	INFILT. FLOW (L/s)	TOTAL FLOW (L/s)	LENGTH (m)	DIAMETER NOM (mm)	DIAMETER ACT (mm)	SLOPE (%)	CAP. (FULL) (L/s)	Q/Qcap (%)	VEL. (FULL) (m/s)	Upstream OG (m)	Downstream OG (m)	Upstream Invert (m)	Upstream Obvert (m)	Downstream Invert (m)	Downstream Obvert (m)	Drop Structure (m)	US Frost Depth (m)	DS Frost Depth (m)
38A	38	3.00	174	3.00	174	4.00	2.92		0.00		0.00			0.00	0.00	3.00	3.00	0.84	3.86	160	200	203.2	0.32	19.35	19.9%	0.60	72.00	76.00	68.60	68.79	67.99	68.19		3.30	7.61
38	39	3.40	182	59.44	3116	3.43	43.27		1.30		0.00			2.80	3.56	3.40	63.54	17.79	64.92	170	375	381.0	0.22	85.79	75.3%	0.75	76.00	72.00	64.44	64.82	64.07	64.45		11.16	7.55
39	18	6.20	341	65.64	3457	3.39	47.46		1.30		0.00			2.80	3.56	6.20	69.74	19.53	70.55	105	375	381.0	0.22	85.79	82.2%	0.75	72.00	73.00	64.07	64.45	63.84	64.22		7.56	8.78
50	51	8.20	555	8.20	555	3.95	8.88		0.00		0.00			0.00	0.00	8.20	8.20	2.30	11.17	60	200	203.2	0.50	24.19	46.2%	0.76	74.00	74.00	69.00	69.29	68.70	68.90		4.80	5.10
51	52	4.10	235	12.30	790	3.86	12.36		0.00		0.00			0.00	0.00	4.10	12.30	3.44	15.81	140	200	203.2	0.67	28.00	56.4%	0.86	74.00	72.80	68.65	68.75	67.81	67.81	0.15	5.25	4.99
52	18	4.70	174	17.00	964	3.81	14.68		0.00		0.00			0.00	0.00	4.70	17.00	4.78	19.64	70	250	254.0	0.32	35.09	56.0%	0.69	72.80	73.00	67.56	67.81	67.33	67.59		4.99	5.41
18	19	0.00	0	411.90	17696	2.71	193.96		2.74		11.40			26.55	25.43	0.00	432.69	126.73	346.13	110	600	609.6	0.50	452.92	76.4%	1.55	73.00	71.50	63.61	64.22	63.06	63.67		8.78	7.83
19	19A	0.00	0	411.90	17696	2.71	193.96		2.74		11.40	4.15		26.55	44.59	0.00	432.69	126.73	368.30	25	600	609.6	0.50	452.92	80.7%	1.55	71.50	71.00	63.06	63.67	62.93	63.54		7.83	7.46
19A	19B	0.40	0	412.30	17696	2.71	193.96		2.74		11.40	4.15		26.55	44.59	0.40	432.09	126.84	368.41	51	600	609.6	0.50	452.92	80.7%	1.55	71.00	71.00	62.87	63.48	62.62	63.23	0.06	7.62	7.77
50	19B	5.90	326	5.90	326	4.00	5.26		0.00		0.00			0.00	0.00	5.90	5.90	1.65	8.83	120	200	203.2	0.32	19.35	35.8%	0.60	71.00	71.00	68.30	68.50	67.91	68.12		2.50	2.88
19B	FVPS	0.00	0	418.20	18022	2.70	196.97		2.74		11.40	4.15		26.55	44.59	0.00	438.89	128.49	370.65	24	600	609.6	0.50	452.92	81.7%	1.55	71.00	71.50	62.66	63.17	62.44	63.05	0.06	7.83	8.45

DESIGN PARAMETERS

Residential Flow =	350 Lpcd	Industrial Peak Factor =	as per MOE Graph	Low Density (LD)/Existing =	3.2 ppu
Commerical/Institutional Flow =	50000 L/ha/d	Extraneous Flow =	0.28 L/s/ha	Low/Medium Density (LMD) =	3.2 ppu
Industrial Flow =	35000 L/ha/d	Minimum Velocity =	0.76 m/s	Medium Density (MD) =	2.4 ppu
Maximum Residential Peak Factor =	4.00	Mannings n =	0.013	High Density (HD) =	1.9 ppu
Minimum Residential Peak Factor =	2.00	Harmon Peak Factor =	1+14/(4+(P/1000)^1/2)*K, where K= 1	MUC =	1.9 ppu
Commerical/Institutional Peak Factor =	1.50			GUA =	3.1 ppu

(Telephone Conversation with Selma Hassan Sept. 10/2004 - Based on development applications - 361 Singles @ 3.2pers/unit and 184 Singles @ 3 pers/unit)

Designed: B.D	PROJECT:	Gloucester EUC Infrastructure Servicing Study Update	
Checked: F.W	LOCATION:	City of Ottawa	
Dwg. Reference: SAN	File Ref.: 1634-00493	Date: Mar-05	Sheet No.

Appendix E2

JLR Conceptual Sanitary
Design Sheet + Figure 3

J.L.Richards
ENGINEERS · ARCHITECTS · PLANNERS

2983, 3053 and 3079 Navan Road and 2690 Page Road
CONCEPTUAL SANITARY SEWER DESIGN SHEET
JLR NO. 29899

DESIGNED BY: CJM
CHECKED BY: KF
Date: August 2021

Street Name	MH No.		Residential								Commercial/Institutional				Infiltration			Peak Design Flow L/s
	From	To	Multiples	Apartments	Area (ha)	Pop.	Cum. Pop.	Cum. Area (ha)	Peaking Factor	Residential Flow (L/s)	Area (ha)	Cum. Area (ha)	Peaking Factor	Inst. Flow (L/s)	Area (ha)	Cum. Area (ha)	Peak Extr. Flow L/s	
OUTLET TO PAGE (CUL-DU-SAC @ Brian Coburn)																		
STREET 3	24	23	8		0.31	22	22	0.31	3.70	0.26		0.00	1.50	0.00	0.31	0.31	0.10	**0.37**
Page Road (2690 to Navan Road)	23	10			6.29	86	108	6.60	3.59	1.25		0.00	1.50	0.00	6.29	6.60	2.18	3.43
OUTLET TO PAGE @ NAVAN																		
STREET 1	15	14			0.12	0	0	0.12	3.80	0.00		0.00	1.50	0.00	0.12	0.12	0.04	0.04
Site Plan - Buildings C & D / STREET 1	14	13		83	0.45	149	149	0.57	3.55	1.72	0.09	0.09	1.50	0.05	0.54	0.66	0.22	1.98
STREET 1	13	12			0.09	0	149	0.66	3.55	1.72		0.09	1.50	0.05	0.09	0.75	0.25	2.01
Site Plan - Gas Retail Drive-Thru	22	21				0	0	0.00	3.80	0.00	0.75	0.75	1.50	0.36	0.75	0.75	0.25	0.61
Site Plan - Gas Retail Drive-Thru	21	12			0.02	0	0	0.02	3.80	0.00		0.75	1.50	0.36	0.02	0.77	0.25	0.62
STREET 1	12	11	12		0.40	32	181	1.08	3.53	2.07		0.84	1.50	0.41	0.40	1.92	0.63	3.11
STREET 1	11	10	2		0.14	5	186	1.22	3.53	2.13		0.84	1.50	0.41	0.14	2.06	0.68	3.22
STREET 1	10	09	13		0.39	35	221	1.61	3.51	2.51		0.84	1.50	0.41	0.39	2.45	0.81	3.73
Site Plan - Buildings A & B	20	19		48	0.29	86	86	0.29	3.61	1.01		0.00	1.50	0.00	0.29	0.29	0.09	1.10
Site Plan - Buildings A & B	19	18		36	0.19	65	151	0.48	3.55	1.74	0.09	0.09	1.50	0.05	0.29	0.57	0.19	1.97
STREET 2	18	17	1		0.10	3	154	0.58	3.55	1.77		0.09	1.50	0.05	0.10	0.67	0.22	2.04
STREET 2	17	16	29		0.79	78	232	1.36	3.50	2.63		0.09	1.50	0.05	0.79	1.46	0.48	3.16
STREET 2	16	09			0.03	0	232	1.39	3.50	2.63		0.09	1.50	0.05	0.03	1.49	0.49	3.17
STREET 1	09	08	4		0.14	11	464	3.14	3.39	5.10		0.94	1.50	0.46	0.14	4.08	1.34	6.90
STREET 1	08	07			0.21	0	464	3.35	3.39	5.10		0.94	1.50	0.46	0.21	4.29	1.41	6.97
STREET 1	07	06				0	464	3.35	3.39	5.10		0.94	1.50	0.46	0.00	4.29	1.41	6.97
STREET 1	06	03			0.12	0	464	3.47	3.39	5.10		0.94	1.50	0.46	0.12	4.41	1.45	7.01
Site Plan - Buildings C & E	05	04		48	0.20	86	86	0.20	3.61	1.01		0.00	1.50	0.00	0.20	0.20	0.07	1.07
Site Plan - Buildings C & E	04	03		48	0.40	86	172	0.60	3.54	1.97		0.00	1.50	0.00	0.40	0.60	0.20	2.17
STREET 1	03	02			0.07	0	636	4.14	3.33	6.87		0.94	1.50	0.46	0.07	5.08	1.67	**9.00**
NAVAN	02	01				0	636	4.14	3.33	6.87		0.94	1.50	0.46	0.00	5.08	1.67	9.00
NAVAN	01	EX10			5.43	162	798	9.56	3.29	8.51		0.94	1.50	0.46	5.43	10.50	3.47	12.43
																10.50		
Page Road (Navan to Renaud)	EX10	Renaud					906	16.16	3.26	9.58		0.94	1.50	0.46	0.00	17.10	5.64	15.68
																17.10		

Design Parameters		
Single Family Population	3.4	Cap/Unit
Semi-Detached/Townhouse Population	2.7	Cap/Unit
Apartments Population	1.8	Cap/Unit
Residential Flows	280	L/Cap/Day
Infiltration Flows	0.33	L/s/ha
Manning Coefficient	0.013	

Appendix F1

Storm – EUC ISSU Design

STORM SEWER CALCULATION SHEET (RATIONAL METHOD) - POND 3

Manning's 0.013 **Return Frequency** = 5 years

		AREA (Ha)							FLOW					SEWER DATA																	
From Node	To Node	R= 0.3	R= 0.5	R= 0.55	R= 0.6	R= 0.75	R= 0.79	R= 0.82	Indiv. 2.78 AC	Accum. 2.78 AC	Time of Conc.	Rainfall Intensity	Peak Flow Q (l/s)	DIA. (m) (actual)	DIA. (mm) (nominal)	TYPE	SLOPE (m/m)	LENGTH (m)	CAPACITY (l/s)	VELOCITY (m/s)	TIME OF FLOW (min.)	RATIO Q/Q full	Upstream OG	Downstream OG	Upstream Invert	Upstream Obvert	Downstream Invert	Downstream Obvert	Drop Structure	US Frost Depth	DS Frost Depth
601A	601	0.00	4.45	0.00	0.00	0.00	1.50	0.00	9.48	9.48	21.00	68.13	645.86	0.76	750	CONC	0.0035	90	687.1	1.5	1.00	0.94	86.00	85.50	81.27	82.03	80.95	81.71		3.97	3.79
601	602	0.00	4.91	0.00	0.00	0.00	1.80	0.00	10.78	20.26	22.00	66.15	1340.16	0.91	900	CONC	0.0055	220	1400.6	2.1	1.72	0.96	85.50	83.90	80.80	81.71	79.59	80.50		3.79	3.40
602	603	0.00	0.66	3.50	0.00	0.97	1.43	1.75	15.42	35.68	23.71	63.03	2248.78	0.99	975	CONC	0.01	70	2338.0	3.0	0.38	0.96	83.90	82.50	79.51	80.50	78.81	79.80	2.26	3.40	2.70
603B	603A	0.00	4.42	3.47	0.00	0.00	1.24	1.80	18.28	18.28	22.00	66.15	1208.89	0.99	975	CONC	0.003	150	1280.5	1.7	1.50	0.94	81.50	81.50	77.50	78.49	77.05	78.04		3.01	3.46
603A	603	0.00	5.58	0.00	0.00	0.00	1.08	0.38	10.99	29.27	23.50	63.39	1855.51	1.07	1050	CONC	0.0045	110	1911.0	2.1	0.86	0.97	81.50	82.50	76.97	78.04	76.48	77.54		3.46	4.96
603	604	0.00	0.66	0.00	0.00	0.00	0.28	0.00	1.53	66.48	25.96	59.41	3949.46	1.37	1350	CONC	0.006	100	4313.1	2.9	0.57	0.92	82.50	80.80	76.17	77.54	75.57	76.94	0.52	4.96	3.86
604	605	0.00	1.03	0.00	0.00	0.00	0.52	0.00	2.57	69.06	26.53	58.56	4043.75	1.37	1350	CONC	0.006	150	4313.1	2.9	0.86	0.94	80.80	78.40	75.05	76.42	74.15	75.52	0.40	4.38	2.88
605	606	0.00	0.89	0.41	0.00	0.00	0.39	0.00	2.72	71.78	27.39	57.33	4115.22	1.37	1350	CONC	0.006	150	4313.1	2.9	0.86	0.95	78.40	77.00	73.75	75.12	72.85	74.22	0.40	3.28	2.78
606	607	0.00	1.66	0.00	0.00	0.00	0.74	0.00	3.93	75.71	28.24	56.17	4252.25	1.37	1350	CONC	0.006	250	4313.1	2.9	1.43	0.99	77.00	76.00	72.45	73.82	70.95	72.32	1.60	3.18	3.68
607	608	0.00	0.00	0.00	0.00	0.00	0.25	0.00	0.55	76.26	29.67	54.33	4143.26	1.37	1350	CONC	0.006	90	4313.1	2.9	0.51	0.96	76.00	73.00	69.35	70.72	68.81	70.18	1.10	5.28	2.82
608E	608D	0.41	3.79	0.00	0.00	0.00	1.58	0.00	9.08	9.08	20.00	70.25	637.88	0.91	900	CONC	0.0013	170	680.9	1.0	2.73	0.94	71.00	71.00	68.59	69.50	68.36	69.28		1.50	1.72
608D	608	0.00	0.00	0.00	0.00	0.00	0.39	0.00	0.86	9.94	22.73	64.77	643.62	0.91	900	CONC	0.0013	150	680.9	1.0	2.41	0.95	71.00	73.00	68.36	69.28	68.17	69.08		1.72	3.92
608C	608B	0.00	2.57	3.82	0.00	0.00	1.80	0.00	13.37	13.37	19.00	72.53	969.39	0.84	825	CONC	0.005	60	1058.9	1.9	0.52	0.92	74.00	74.00	69.50	70.33	69.20	70.03		3.67	3.97
608B	608A	0.00	3.12	0.00	0.00	0.00	0.96	0.00	6.45	19.81	19.52	71.32	1412.95	0.99	975	CONC	0.005	120	1653.2	2.1	0.93	0.85	74.00	72.80	69.04	70.03	68.44	69.43		3.97	3.37
608A	608	1.26	2.29	0.00	0.00	0.00	1.25	0.00	6.98	26.79	20.45	69.27	1855.82	1.07	1050	CONC	0.005	70	2014.4	2.3	0.52	0.92	72.80	73.00	68.37	69.43	68.02	69.08		3.37	3.92
608	609	0.00	2.60	0.00	0.00	0.00	1.11	0.00	6.05	119.04	30.18	53.70	6392.78	1.98	1950	CONC	0.002	290	6638.9	2.2	2.24	0.96	73.00	76.00	67.10	69.08	66.52	68.50	0.46	3.92	7.50
700	701	16.26	2.78	0.00	0.00	1.39	4.09	0.00	29.31	29.31	25.00	60.90	1784.60	0.91	900	CONC	0.0095	170	1840.8	2.8	1.01	0.97	86.00	86.50	81.53	82.45	79.92	80.83	1.33	3.56	5.67
701A	701	0.00	6.89	0.00	0.00	0.00	0.00	1.29	12.52	12.52	15.00	83.56	1045.95	0.84	825	CONC	0.005	330	1058.9	1.9	2.87	0.99	86.50	86.50	82.96	83.80	81.31	82.15	2.65	2.70	4.35
701	702	0.00	1.56	0.00	0.00	0.00	0.46	1.30	6.14	47.97	26.01	59.33	2845.74	0.99	975	CONC	0.023	210	3545.7	4.6	0.76	0.80	86.50	79.00	78.51	79.50	73.68	74.67		7.00	4.33
702A	702	0.00	0.00	0.00	0.00	3.11	1.67	0.00	10.15	10.15	20.00	70.25	713.19	0.61	600	CONC	0.02	150	905.9	3.1	0.81	0.79	83.50	79.00	78.89	79.50	75.89	76.50	1.83	4.00	2.50
702	703	0.00	0.00	0.36	0.00	0.00	0.54	0.00	1.74	59.85	26.77	58.21	3483.92	1.07	1050	CONC	0.024	210	4413.3	4.9	0.71	0.79	79.00	71.00	73.60	74.67	68.56	69.63		4.33	1.37
703	704	5.02	0.00	0.41	0.00	0.00	0.41	0.00	5.71	65.57	27.48	57.20	3750.72	1.83	1800	CONC	0.0012	160	4154.1	1.6	1.69	0.90	71.00	70.80	67.80	69.63	67.61	69.44		1.37	1.36
704	705	0.99	0.00	0.55	0.00	3.19	0.45	0.00	9.31	74.87	29.17	54.96	4115.38	1.83	1800	CONC	0.0013	180	4323.7	1.6	1.82	0.95	70.80	70.50	67.61	69.44	67.38	69.20		1.36	1.30
705A	705	0.00	0.00	2.06	0.00	0.00	1.74	0.00	6.97	6.97	23.00	64.29	448.15	0.69	675	CONC	0.003	80	480.3	1.3	1.03	0.93	71.50	70.50	68.76	69.44	68.52	69.20		2.06	1.30
705	706	0.00	0.00	0.92	0.00	0.00	0.44	0.00	2.37	84.22	30.99	52.75	4442.71	1.98	1950	CONC	0.001	160	4694.4	1.5	1.75	0.95	70.50	71.00	67.22	69.20	67.06	69.04		1.30	1.96
706C	706B	0.00	0.00	5.20	0.00	0.00	2.00	0.00	12.34	12.34	21.00	68.13	840.94	0.69	675	CONC	0.012	155	960.6	2.6	0.99	0.88	75.00	72.00	71.13	71.81	69.27	69.95		3.19	2.05
706B	706A	0.00	0.00	0.64	0.00	0.00	0.22	0.00	1.46	13.80	21.99	66.16	913.32	0.76	750	CONC	0.007	80	971.7	2.1	0.63	0.94	72.00	72.00	69.19	69.95	68.63	69.39		2.05	2.61
706A	706	0.00	0.00	1.74	0.00	0.00	1.16	0.00	5.21	19.01	22.62	64.98	1235.49	0.91	900	CONC	0.005	70	1335.4	2.0	0.57	0.93	72.00	71.00	68.48	69.39	68.13	69.04		2.61	1.96
706	707	0.00	0.00	0.50	0.00	0.00	0.21	0.00	1.23	104.46	32.74	50.81	5307.00	1.98	1950	CONC	0.0015	100	5749.5	1.9	0.89	0.92	71.00	72.00	67.06	69.04	66.91	68.89		1.96	3.11
707	708	0.00	0.00	2.66	0.00	0.00	1.20	0.00	6.70	111.16	33.63	49.87	5543.80	1.98	1950	CONC	0.0015	175	5749.5	1.9	1.56	0.96	72.00	76.00	66.91	68.89	66.65	68.63		3.11	7.37
708	609	0.00	0.00	1.38	0.00	0.00	0.67	0.00	3.58	114.74	35.20	48.33	5545.19	1.98	1950	CONC	0.0015	85	5749.5	1.9	0.76	0.96	76.00	76.00	66.65	68.63	66.52	68.50	0.46	7.37	7.50
609	610	0.00	3.00	0.00	0.00	0.00	1.21	0.00	6.83	240.60	35.96	47.62	11456.50	1.52	1500 x 4200	CONC	0.002	160	14595.0	2.3	1.15	0.78	76.00	72.00	66.52	68.04	66.20	67.72		7.96	4.28
610	Outlet	0.00	3.98	0.00	0.00	0.00	0.96	0.00	7.64	248.25	37.11	46.58	11563.06	1.52	1500 x 4200	CONC	0.002	100	14595.0	2.3	0.72	0.79	72.00	70.00	66.20	67.72	66.00	67.52		4.28	2.48
800	801	0.00	0.00	2.51	0.00	0.00	0.73	0.00	5.44	5.44	18.00	74.97	407.91	0.84	825	CONC	0.001	140	473.6	0.9	2.72	0.86	70.00	70.00	67.60	68.44	67.46	68.30		1.56	1.70
801	802	0.00	0.00	1.02	0.00	0.00	0.34	0.00	2.31	7.75	20.72	68.71	532.33	0.91	900	CONC	0.001	80	597.2	0.9	1.47	0.89	70.00	70.00	67.38	68.30	67.30	68.22		1.70	1.78
802	803	0.00	0.00	2.06	0.00	0.00	0.77	0.00	4.84	12.59	22.19	65.79	828.22	1.07	1050	CONC	0.001	195	900.9	1.0	3.22	0.92	70.00	70.00	67.15	68.22	66.96	68.02		1.78	1.98
803	804	0.00	0.00	1.60	0.00	0.00	0.75	0.00	4.09	16.68	25.41	60.25	1005.07	1.07	1050	CONC	0.0013	80	1027.1	1.1	1.16	0.98	70.00	70.00	66.96	68.02	66.85	67.92		1.98	2.08
804	805	0.00	0.00	2.76	0.00	0.00	0.83	0.00	6.04	22.72	26.57	58.50	1329.38	1.22	1200	CONC	0.0012	285	1409.0	1.2	3.94	0.94	70.00	70.00	66.70	67.92	66.36	67.58		2.08	2.42
805	806	0.00	0.00	1.51	0.00	0.00	0.70	0.00	3.85	26.57	30.51	53.32	1416.74	1.22	1200	CONC	0.0013	80	1466.5	1.3	1.06	0.97	70.00	70.00	66.36	67.58	66.26	67.47		2.42	2.53
806	807	0.86	0.00	1.24	0.00	0.00	0.41	0.00	3.51	30.08	31.57	52.09	1567.14	1.22	1200	CONC	0.0017	70	1677.0	1.4	0.81	0.93	70.00	70.00	66.26	67.47	66.14	67.36		2.53	2.64
807	Outlet	0.00	0.00	0.86	0.00	0.00	0.34	0.00	2.06	32.15	32.38	51.19	1645.68	1.22	1200	CONC	0.0017	80	1677.0	1.4	0.93	0.98	70.00	70.00	66.14	67.36	66.00	67.22		2.64	2.78

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

Notes:
1) Ottawa IDF Curve
2) Min Velocity = 0.80 m/sec

Designed: B.D

Checked: F.W

Dwg. : STM / STM P1

PROJECT: Gloucester EUC Infrastructure Servicing Study Update

LOCATION: Stormwater Management Pond 3

File Ref. 1634-00493

Date: March-05

Sheet No. 1 of 1

N

- STORM SEWER AND MANHOLE
- STORM TRUNK SEWER AND MANHOLE
- STORM CATCHMENT AREA (POND #1)
- STORM CATCHMENT AREA (POND #2)
- STORM CATCHMENT AREA (POND #3)
- 30m CREEK BUFFER
- ORIGINAL GROUND / OBVERT
- AREA (ha) / RUNOFF COEFFICIENT / MANHOLE No.
- AREAS OF INSUFFICIENT COVER (LESS THAN 2.0m)

1. "PONDS 1 AND 3 EAST URBAN COMMUNITY DESIGN BRIEF" (STANTEC CONSULTING, APRIL 2001)
2. "CITY OF GLOUCESTER EAST URBAN COMMUNITY MASTER DRAINAGE PLAN" (GORE & STORRIE, 1992)
3. WATER LEVEL TO BE CONFIRMED AS PART OF THE REDESIGN OF POND 3.

PROPOSED SITE,
2983-3053-3079 Navan Road and
2690 Pagé Road

HYDRO CORRIDOR
PROPOSED TRANSITWAY
PROPOSED BLACKBURN BY-PASS EXTENSION
MER BLEUE ROAD
FOURTH LINE ROAD
PAGE ROAD
NAVAN ROAD
WALL ROAD
SAPHIR AVE.
GRAND PRE
ABANDONED C.P.R. RIGHT OF WAY
STORM TRUNK SEWER No.1
STORM TRUNK SEWER No.2
STORM TRUNK SEWER No.3
STORM TRUNK SEWER No.4
STORM TRUNK SEWER No.5
STORM TRUNK SEWER No.6

POND 1
100 YR. WL=87.00m
NWL=80.10m

POND 2
100 YR. WL=80.00m
(2)

POND 3
100 YR. WL=68.50m
NWL=67.00m
(3)

WSI LANDFILL

SCHOOL
PARK
INSTIT.
INSTITUTIONAL
COMMERCIAL
ESCARPMENT
FIRE HALL

REVISION No.2 MARCH, 2005

CITY OF OTTAWA
GLOUCESTER EUC INFRASTRUCTURE
SERVICING STUDY UPDATE

STORM SEWER SYSTEM

Scale: 0 40 120 200m
Dwg. No.: STM
Own By: E.C.
Date: 04.10.29
Revision: 2

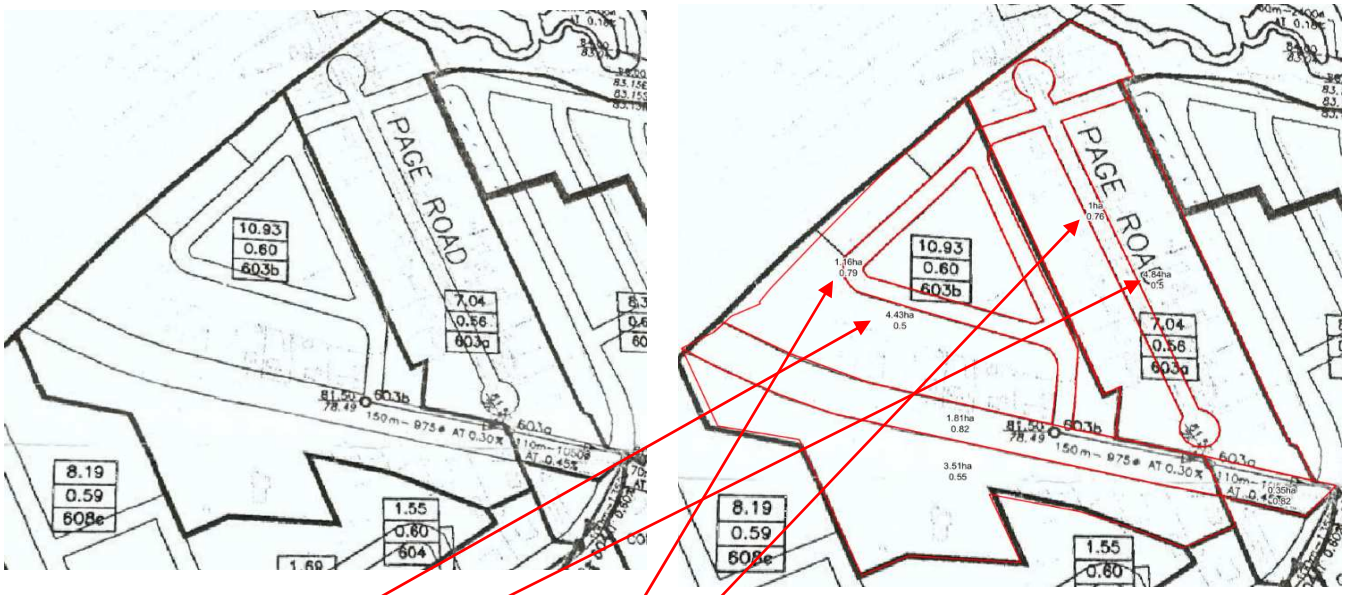
Appendix F2

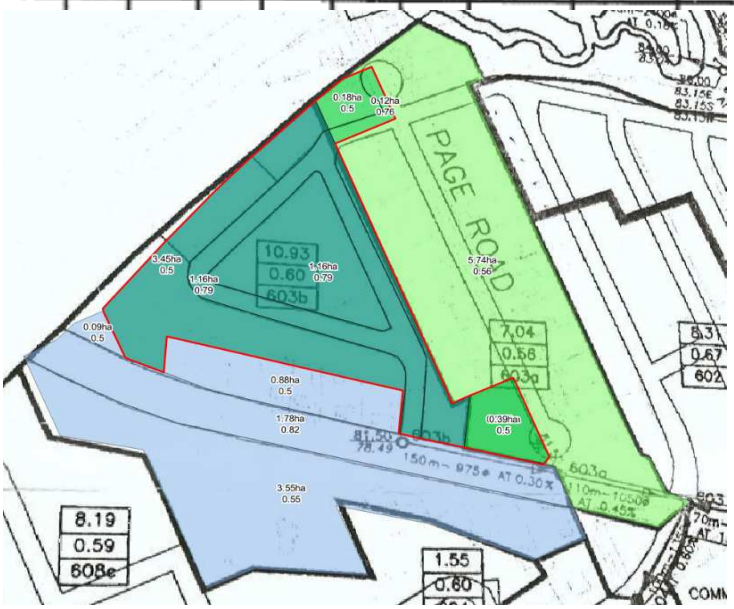
Calculation of Pre-Development Release Rate

Calculation of Pre Development Release Rate from site

Manning's 0.013 Return Frequency = 5 years

From Node	To Node	AREA (Ha) R= 0.3	R= 0.5	R= 0.55	R= 0.6	R= 0.75	R= 0.79	R= 0.82	FLOW Indiv. 2.78 AC	Accum. 2.78 AC	Time of Conc.	Rainfall Intensity	Peak Flow Q (l/s)	L/s/ha
603B	603A	0.00	4.42	3.47	0.00	0.00	1.24	1.80	18.28	18.28	22.00	66.15	1208.89	184
603A	603	0.00	5.58	0.00	0.00	0.00	1.06	0.38	10.99	29.27	23.50	63.39	1855.51	164





Flow from proponent development area only

603B	603A	0	3.45	0	0	0	1.16	0	7.34	7.34	22	66.15	**486**	184
603B	603A	0	0.97	3.47	0	0	0.08	1.8	10.93	10.93	22	66.15	723	184
													1209	
603B	603A	0	4.42	3.47	0	0	1.24	1.8	18.276	18.276	23.5	63.39	1159	176
603A	603	0	0.18	0	0	0	0.125	0	0.53	0.53	23.5	63.39	**34**	176
603A	603	0	0.39	0	0	0	0	0	0.54	0.54	23.5	63.39	**34**	176
603A	603	0	5.01	0	0	0	0.946	0.38	9.91	9.91	23.5	63.39	628	176
													1855	

Total Allowable Release to Navan Road is 486 + 34 = 520 L/s

Total Allowable Release to Page Road is 34 L/s

Appendix F3

JLR Conceptual Storm Design Sheet + Figure 4

J.L.Richards
ENGINEERS · ARCHITECTS · PLANNERS

2983, 3053 and 3079 Navan Road and 2690 Page Road
CONCEPTUAL STORM SEWER DESIGN SHEET
JLR NO. 29899

DESIGNED BY: CJ/KS
CHECKED BY: KF
9/8/2021

Street Name	Maintenace Hole No.		1:2 Year Storm			Total Areas	Total Area (ha)	Cum. Total Area (ha)	Inlet Time (min.)	In Pipe Flow Time (min)	Total Time	1:2 Year Peak Flow				Pipe Data						
	From	To	0.2	0.65	0.9	1:2 Yr						2.78AR	Cum. 2.78AR	1:2 Yr Intensity	Peak Flow	CAD.Dia	Slope	Q Full (L/s)	V Full	Length	Residual Capacity	% Full
OUTLET TO PAGE (CUL-DU-SAC @ Brian Coburn)																						
STREET 3	528	527		0.31		0.31	0.31	0.31	10.00	0.97	10.97	0.56	0.56	76.81	43.02	250	0.55%	46.01	0.94	54.3	2.99	94%
STREET 3	527	CBMH1				0.00	0.00	0.31	10.97	0.37	11.34	0.00	0.56	73.29	41.05	250	0.55%	46.01	0.94	20.9	4.96	89%
OUTLET TO NAVAN @ RENAUD																						
STREET 1	517	516		0.12		0.12	0.12	0.12	10.00	0.11	10.11	0.22	0.22	76.81	16.65	250	0.55%	46.01	0.94	6.2	29.35	36%
STREET 1	516	515		0.15		0.15	0.15	0.27	10.11	0.33	10.44	0.27	0.49	76.38	37.27	250	0.55%	46.01	0.94	18.3	8.74	81%
STREET 1	515	514		0.54		0.54	0.54	0.81	10.44	0.25	10.68	0.98	1.46	75.17	110.03	375	0.55%	135.65	1.23	18.1	25.62	81%
Site Plan - Gas Retail Drive-Thru	521	520				0.00	0.00	0.00	10.00	0.77	10.77	0.00	0.00	76.81	0.00	250	0.65%	50.02	1.02	46.9	50.02	0%
Site Plan - Gas Retail Drive-Thru	520	519			0.38	0.38	0.38	0.38	10.77	0.85	11.62	0.94	0.94	73.98	69.41	300	0.65%	81.33	1.15	58.9	11.92	85%
Site Plan - Gas Retail Drive-Thru	519	518				0.00	0.00	0.38	11.62	0.50	12.12	0.00	0.94	71.10	66.71	375	0.55%	135.65	1.23	36.9	68.94	49%
Site Plan - Gas Retail Drive-Thru	518	514			0.38	0.38	0.38	0.75	12.12	0.96	13.08	0.94	1.88	69.52	130.45	450	0.30%	162.91	1.02	58.8	32.46	80%
STREET 1	514	513				0.00	0.00	1.56	13.08	0.17	13.24	0.00	3.34	66.71	222.82	600	0.25%	320.28	1.13	11.3	97.46	70%
STREET 1	513	512				0.00	0.00	1.56	13.24	0.48	13.72	0.00	3.34	66.25	221.28	600	0.25%	320.28	1.13	32.5	99.00	69%
STREET 1	512	511		0.18		0.18	0.18	1.74	13.72	0.20	13.92	0.33	3.67	64.96	238.10	600	0.25%	320.28	1.13	13.3	82.18	74%
STREET 1	511	510		0.75		0.75	0.75	2.49	13.92	1.01	14.93	1.36	5.02	64.44	323.56	750	0.25%	580.71	1.31	79.8	257.15	56%
Site Plan - Buildings A & B	526	525		0.29		0.29	0.29	0.29	10.00	0.41	10.41	0.51	0.51	76.81	39.55	300	0.65%	81.33	1.15	28.3	41.78	49%
Site Plan - Buildings A & B	525	524		0.29		0.29	0.29	0.57	10.41	0.24	10.65	0.51	1.03	75.27	77.52	450	0.25%	148.72	0.94	13.4	71.19	52%
STREET 2	524	523				0.00	0.00	0.57	10.65	0.25	10.90	0.00	1.03	74.40	76.63	450	0.25%	148.72	0.94	14.0	72.09	52%
STREET 2	523	522		0.72		0.72	0.72	1.29	10.90	1.61	12.50	1.30	2.33	73.52	171.38	525	0.25%	224.33	1.04	99.9	52.95	76%
STREET 2	522	510				0.00	0.00	1.29	12.50	0.41	12.92	0.00	2.33	68.36	159.36	525	0.25%	224.33	1.04	25.6	64.97	71%
STREET 1	510	509				0.00	0.00	3.78	14.93	0.28	15.21	0.00	7.35	61.93	455.31	750	0.25%	580.71	1.31	21.8	125.39	78%
STREET 1	509	508				0.00	0.00	3.78	15.21	0.13	15.34	0.00	7.35	61.28	450.54	750	0.25%	580.71	1.31	10.3	130.17	78%
STREET 1	508	507				0.00	0.00	3.78	15.34	0.24	15.57	0.00	7.35	60.98	448.32	750	0.30%	636.13	1.44	20.5	187.81	70%
STREET 1	507	504	0.14	0.41	0.07	0.62	0.62	4.40	15.57	0.24	15.82	0.99	8.35	60.44	504.44	750	0.30%	636.13	1.44	21.1	131.70	79%
Site Plan - Buildings C & E	506	505				0.00	0.00	0.00	10.00	0.72	10.72	0.00	0.00	76.81	0.00	450	0.25%	148.72	0.94	40.3	148.72	0%
Site Plan - Buildings C & E	505	504			0.61	0.61	0.61	0.61	10.72	0.73	11.45	1.53	1.53	74.15	113.17	450	0.25%	148.72	0.94	41.0	35.55	76%
STREET 1	504	503		0.08		0.08	0.08	5.09	15.82	0.39	16.21	0.14	10.02	59.90	599.99	825	0.71%	1261.82	2.36	55.2	661.83	48%
NAVAN	503	502				0.00	0.00	5.09	16.21	0.77	16.97	0.00	10.02	59.06	591.52	975	0.71%	1969.99	2.64	121.3	1378.47	30%
NAVAN	502	501				0.00	0.00	5.09	16.97	0.06	17.04	0.00	10.02	57.47	575.64	750	0.71%	6213.87	14.07	53.4	5638.24	9%
NAVAN	501	500				0.00	0.00	5.09	17.04	0.76	17.79	0.00	10.02	57.34	574.37	1200	0.67%	3329.23	2.94	133.4	2754.86	17%
NAVAN	500	EXMH101				0.00	0.00	5.09	17.79	0.03	17.82	0.00	10.02	55.88	559.67	1200	0.67%	3329.23	2.94	5.5	2769.56	17%

EX DICB63

CONNECT TO EXISTING DICB63

450mmØ

EX DICBMH133B

Ex. 250mmØ SAN

527

528

CBMH1

526

525

524

523

517

516

515

514

519

513

522

512

510

509

508

518

511

520

507

504

506

521

505

825mmØ ST

503

975mmØ ST

2x 750mmØ ST

502

501

1200mmØ ST

500

1200mmØ ST

EX. 1050mmØ ST

EX. 1350mmØ ST

MH101

EXISTING MH101 INV = 75.43

CONNECT TO EXISTING STORM AT MH101

DOUBLE 750mmØ STORM TO CROSS EX 250mmØ SAN PIPE AND 300mmØ AND 400mmØ FORCEMAINS

BRIAN COBURN BLVD.

PAGE ROAD

RENAUD ROAD

NAVAN ROAD

Ex. 250mmØ SAN

Ex. 250mmØ SAN

Ex. 250mmØ SAN

LEGEND:

PROPOSED STORM 500

EXISTING STORM EX500

EXISTING SANITARY EX12

PROJECT:

2983, 3053 AND 3079 NAVAN ROAD & 2690 PAGE ROAD

DRAWING:

CONCEPTUAL STORMWATER MANAGEMENT PLAN

www.jlrichards.ca

J.L.Richards ENGINEERS · ARCHITECTS · PLANNERS

DESIGN:	CM
DRAWN:	KS
CHECKED:	KF
JLR #:	29899-000

SCALE 1:2000

DRAWING #: FIGURE 4

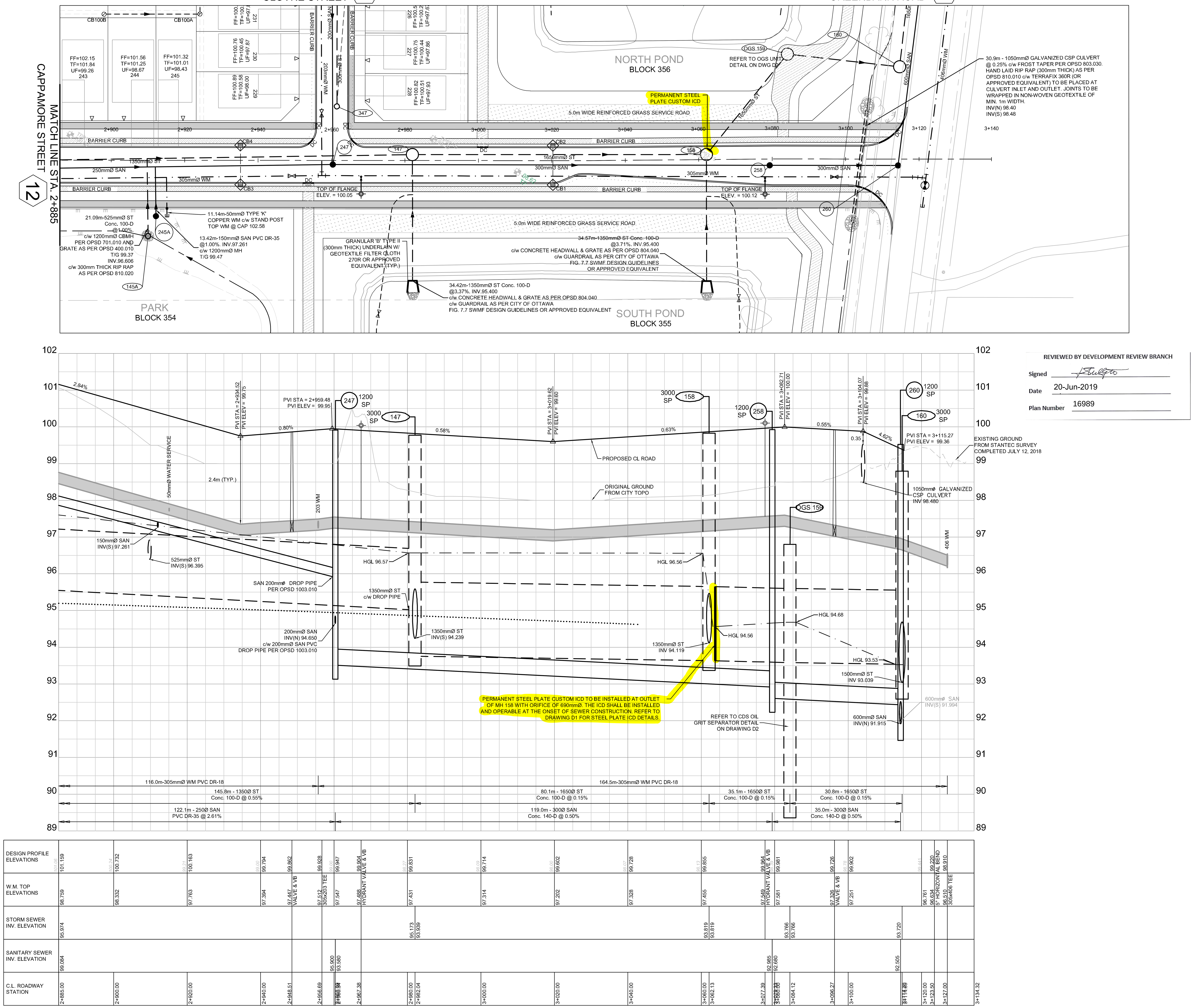
File Location: P:\2900\29899-000 - Gas Bar 3079 Navan\5-Production\1-Civil\FIGURE\29899-000 C ST-FIGURE.dwg

PLOT DATE: Wednesday, September 8, 2021 3:03:33 PM

Appendix F4

Sample Outlet Orifice

CAPPAMORE STREET



REVIEWED BY DEVELOPMENT REVIEW BRANCH

Signed

Date 20-Jun-2019

Plan Number 16989

KEYPLAN

LEGEND:

No.	ISSUE / REVISION	DD/MM/YY
06	ISSUED FOR EARLY COMMENCE WORK NOTIFICATION	19/JUN/19
05	ISSUED FOR CONSTRUCTION	13/MAY/19
04	ISSUED TO CITY FOR REVIEW - 3rd SUBMISSION ISSUED FOR TENDER ADDENDA	05/APR/19
03	ISSUED FOR TENDER	19/MAR/19
02	ISSUED TO CITY FOR REVIEW - 2nd SUBMISSION	14/FEB/19
01	ISSUED TO CITY FOR REVIEW - 1st SUBMISSION	07/NOV/18

VERIFY SHEET SIZE AND SCALES. BAR TO THE RIGHT IS 25mm IF THIS IS A FULL SIZE DRAWING.

SCALE: 1:500H, 1:50V

CLIENT: minto Communities

CONSULTANT: J.L.Richards ENGINEERS · ARCHITECTS · PLANNERS www.jlrichards.ca

CONSULTANT:

PROFESSIONAL STAMP: M. N. L. DALRYMPLE

PROJECT NORTH

PROJECT:
MINTO COMMUNITIES INC.
QUINN'S POINTE STAGE 2
3960 GREENBANK ROAD

DRAWING:
PLAN & PROFILE
CAPPAMORE STREET
STA. 2+885 TO 3+134

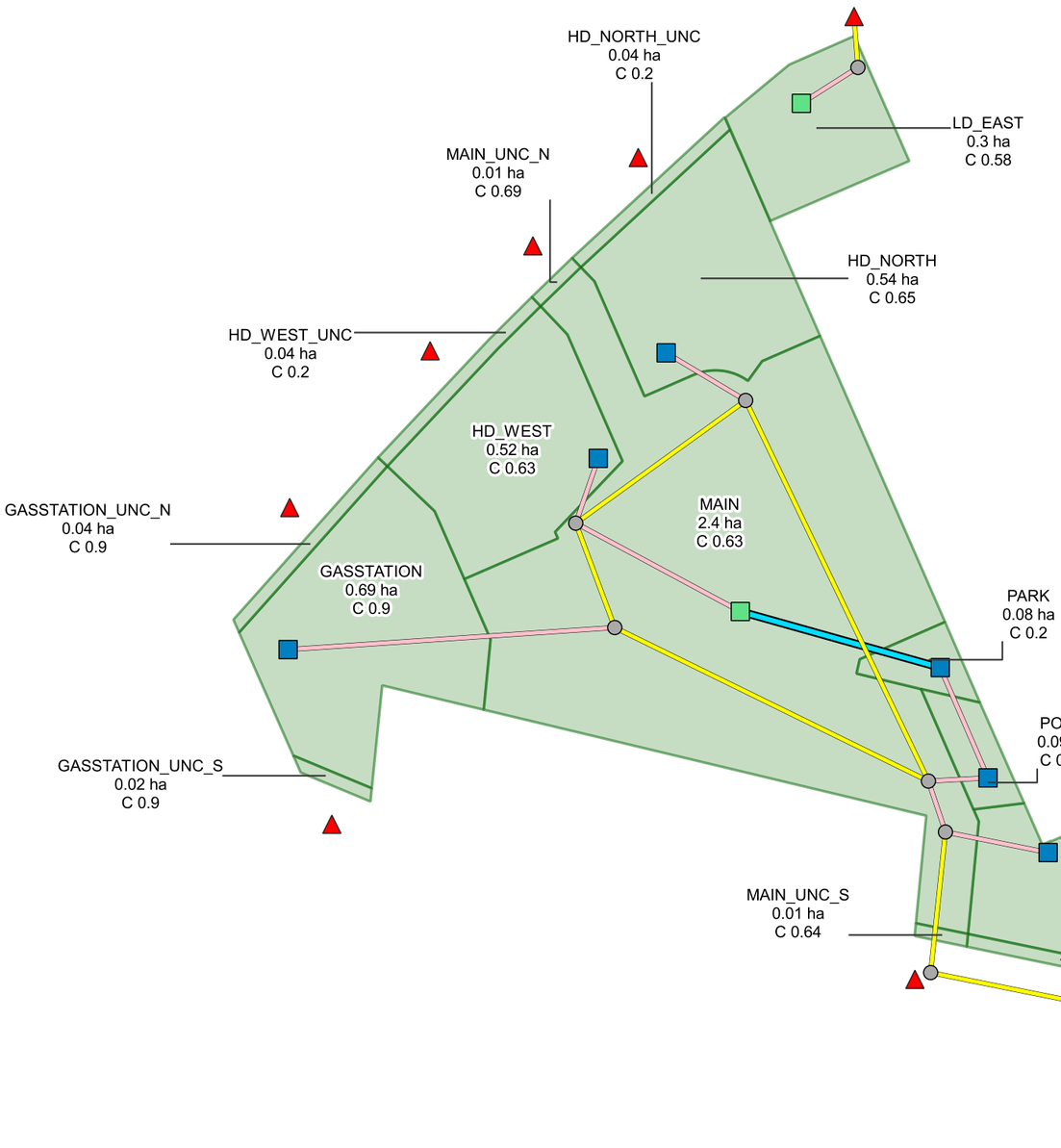
DESIGN: AT
DRAWN: CJM
CHECKED: LD
JLR #: 26610-001.1
DRAWING #: 13

PLOT DATE: Wednesday, June 19, 2019 3:35:05 PM

File Location: v:\26000\26610 - barrhaven expansion - minto brazeau mattamy\26610-001.1 quinn's pointe phase 2\3-dwg\01-Civil\26610-001 C P&P 11-13 CAPPAMORE (STREET 2).dwg

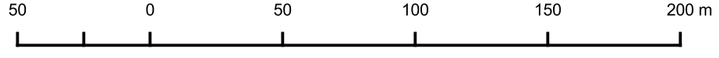
Appendix F5

PCSWMM Schematic



Legend

- Outfalls
- Manhole Structure
- Surface Storage
- SWM Storage
- Storm Sewer Network
- Overland Flow
- Control Structures (ICDs/Orifices)
- Outlets
- Subcatchments



PROJECT:

2983, 3053 and 3079 Navan Road & 2690 Page Road

OTTAWA, ONTARIO

DRAWING:

Stormwater Management Model Schematic

J.L.Richards
ENGINEERS · ARCHITECTS · PLANNERS

DESIGN:	BP	JLR NO:	29899-000
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