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Prepared for:

12714001 CANADA INC.
100-768 Boulevard St-Joseph
Gatineau, QC
J8Y 4B8

Prepared by:

J.L. RICHARDS & ASSOCIATES LIMITED
1565 Carling Avenue
Ottawa, ON
K1Z 8R1
Tel: 613-728-3571
Fax: 613-728-6012

Functional Servicing Report

2983, 3053 and 3079 Navan Road & 2690 Pagé Road, Ottawa, Ontario

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 Functional Servicing Report 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 Functional Servicing 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:

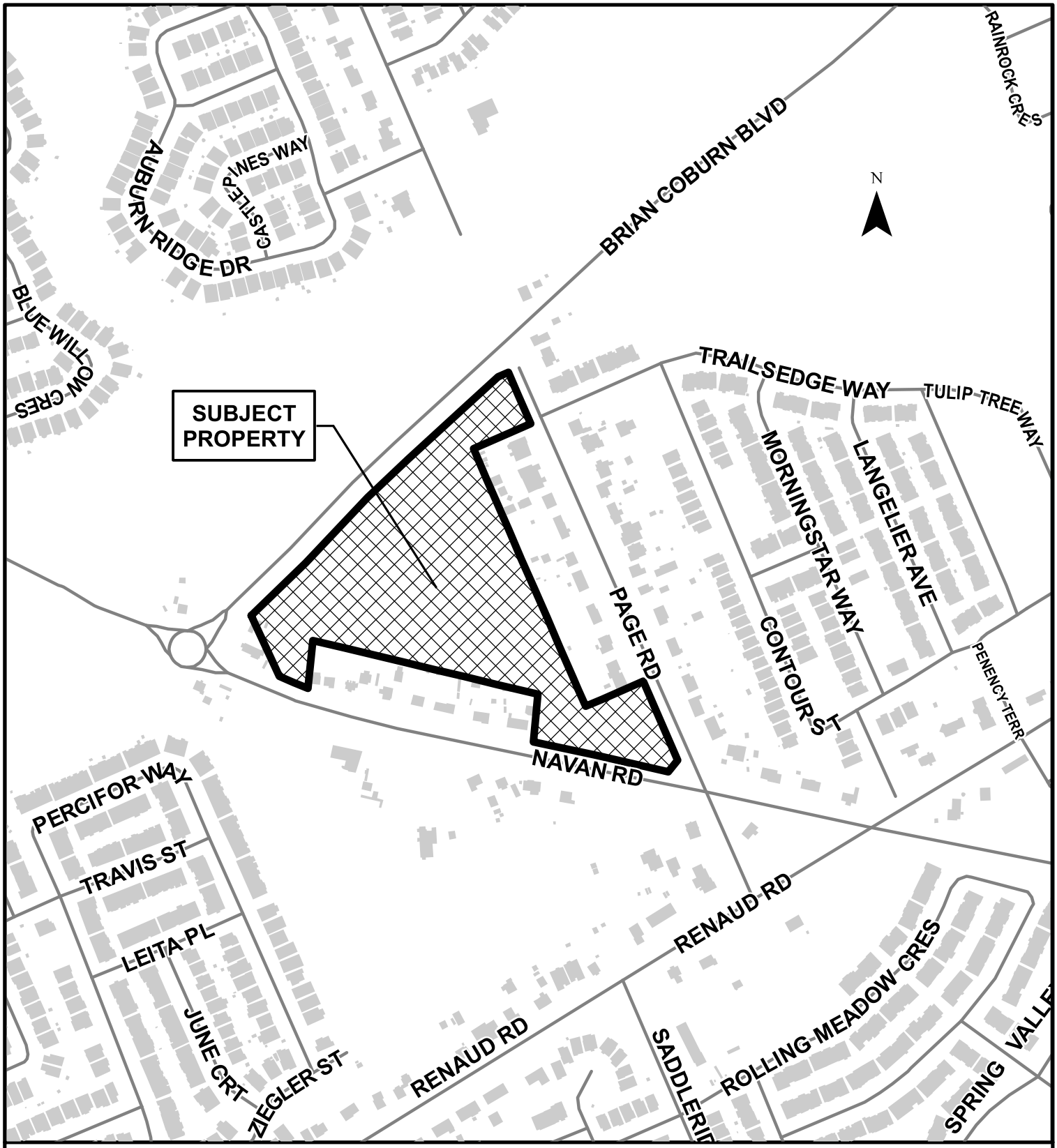
- the November 2009 Servicing Study Guidelines for Development Applications in the City of Ottawa (City);
- the Ottawa Sewer Design Guidelines (2012) and associated Technical Bulletins;
- the 2005 Gloucester East Urban Community (EUC) Infrastructure Servicing Study Update (ISSU) prepared by Stantec Consulting 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 Proposed Development

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 1 below, the property is entirely vegetated. Current zoning for this ±5.36 ha parcel is GM[2546] H(14.5). The Location Plan for the site is provided in Figure 2.

Figure 1: Site Aerial



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 2

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

Plot Date: Tuesday, July 6, 2021 1:28:10 PM

The Owner proposes to develop the subject properties under the following:

- One (1) Draft Plan of Subdivision;
- Three (3) Residential Site Plan Applications; and
- One (1) Industrial Site Plan Application.

The subdivision covers ±2.95 ha and contains three (3) streets and 69 townhouse units within 11 blocks. The residential site plans have a total area of ±1.67 ha and are located within Blocks 14, 15 and 18. The industrial site plan will feature a gas bar on a ±0.74 ha parcel located within Block 16. In total the subject site is ±5.36 ha and the development breakdown of the subject properties is presented in Figure 3. At this time no phasing is proposed. The approval of the subdivision will proceed first, and once the approval of the site plans is obtained; they will be developed accordingly.

The Draft Plan of Subdivision and the proposed Concept Plan for the proposed development (prepared by PMA Architects) 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 Infrastructure and Future Navan Road Widening

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)

Future Navan Road Widening

The City's Transportation Master Plan (2013) anticipates a future road widening of Navan Road, from Brian Coburn Boulevard to Mer Bleue Road, to four (4) lanes, therefore increasing the Right-of-Way to 37.5 meters. At the direction of the City, the servicing design and drawings have been revised to reflect this ultimate condition.

SUBDIVISION
AREA = 0.32ha
(BLOCK 1)
(STREET 3)

RESIDENTIAL
SITE PLAN
AREA = 0.56ha
(BLOCK 18)

RESIDENTIAL
SITE PLAN
AREA = 0.57ha
(BLOCK 14)

SUBDIVISION
AREA = 2.63ha
(BLOCKS 2-13 and BLOCK 17)
(STREET 1 AND STREET 2)

RESIDENTIAL
SITE PLAN
AREA = 0.54ha
(BLOCK 15)

INDUSTRIAL
SITE PLAN
AREA = 0.74ha
(BLOCK 16)

PROPOSED PARK BLOCK

PROPOSED SWM BLOCK

EX. 250mmØ SAN

PROJECT:
2983, 3053 AND 3079 NAVAN RD & 2690 PAGE RD

DRAWING:
DEVELOPMENTAL BREAKDOWN OF SUBJECT PROPERTIES

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DESIGN: MM
DRAWN: KT
CHECKED: MM
JLR #: 29899-000

SCALE: 1:2000
DRAWING #:
FIGURE 3

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

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1.4 Existing Topography and Functional Grading Plan

Based on the topography of the subject properties (refer to Appendix B), there is a southeasterly slope from Brian Coburn Boulevard to the intersection of Navan Road and Pagé Road. In particular, there is 4 to 5 meter elevation drop from the center of the development to the entrance on Navan Road. A more detailed survey of the site will be completed in the spring of 2022 which will provide additional information about the site and adjacent properties on Navan and Pagé. This survey will be used in the detailed design phase of this project.

A Functional Grading Plan (refer to Drawing FG) has been developed for the proposed site. Centre line of road grades (high points only) from the local streets were conceptually designed to tie into existing roads from the adjacent streets (Navan Road and Pagé Road). The conceptual road grades were developed to convey and safely evacuate the minor system's runoff excess to strategic low points and the 1:100-year runoff is to be contained on-site.

1.5 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 Functional Servicing 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 the private residential properties on Blocks 14, 15 and 18 and the gas station on Block 16. Following the approval of the Subdivision, the private residential properties 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.

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 ppu
Density Average Apt (used for Condo Units)	1.8 ppu
Commercial	
Average demand	28,000 L/gross ha/day
Fire Flow Requirements	
Municipal ROW / Private Site with Hydrants	FUS
Service Lateral Only	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 Concept Plan (Appendix D1). The proposed development consists of 69 row townhouse units, six (6) condominium buildings, and 0.93 hectares of commercial space. Refer to Appendix D1 for the detailed water demands calculation sheet.

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. 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	0.30	2.44
Maximum Day	5.34	0.45	5.79
Peak Hour	11.76	0.81	12.57

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 Drawing FWM (Functional Watermain Servicing). 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 are 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), the Fire Underwriters Survey (FUS) method shall be used for any public or private site where watermains and fire hydrants are being designed. Hence, the required fire flow (RFF) for the site was calculated using the FUS method.

Specifically, the protocol for the application of the FUS method as outlined in Appendix H: Protocol to Clarify the Application of the Fire Flow Calculation Method Published by Fire Underwriters Survey (FUS) of TB-2018-02 was used.

2.4.2 Required Fire Flow

The required fire flow (RFF) per the FUS was 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.

Based on the proposed layout for the development, the critical RFF was calculated at five (5) 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.
- Critical Fire Area 3: The gas retail and drive-thru located east of the Navan Road and Brian Coburn Intersection.
- Critical Fire Area 4: A four (4) storey condominium building (Building A) located southwest of the Pagé Road cul-de-sac.
- Critical Fire Area 5: A four (4) storey condominium building (Building C) located west of the Navan Road and Pagé Road intersection.

The RFF for each critical fire area was calculated in accordance with the Design Guidelines, and associated Technical Bulletins. According to ISDTB-2014-02, the required fire flows (based on FUS calculations) for the townhouse units can be capped at 10,000 L/min (167 L/s) since they satisfy 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.

Table 2-5 summarizes the calculated RFFs for the five (5) critical fire areas and the detailed RFF calculations are presented in Appendix D1.

Table 2-5: Fire Flow Requirements for Critical Fire Areas

Location	Block Number	Calculated RFF in L/min (L/s)
Critical Fire Area 1	Block 6	10,000 (167)
Critical Fire Area 2	Block 3	10,000 (167)

Location	Block Number	Calculated RFF in L/min (L/s)
Critical Fire Area 3	Block 16	6,000 (100)
Critical Fire Area 4	Block 14	14,000 (233)
Critical Fire Area 5	Block 18	15,000 (250)

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 within the subdivision and a 203 mm water service for the gas station within Block 16 as illustrated in Drawing FWM (Functional Watermain Servicing). The 203 mm diameter loop for the subdivision will connect to the existing 305 mm diameter watermains at the two (2) proposed connection 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.

Similarly, the water service for the gas station within Block 16 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. It should be noted that the water service to the gas station will not connect internally to the residential watermain loop. In the detailed design phase, upsizing of the watermain from a 203 mm diameter system to a 305 mm diameter system within the municipal right of way will be investigated. The use of larger sized mains will be considered as required to ensure there are sufficient flows within the system for fire protection.

Currently, the functional watermain supply is shown extending southwesterly from the Pagé Road connection and then running southeasterly between Block 14 and the existing lots on Pagé Road. During the detailed design phase, an alternative configuration will be considered. This alternative will involve the watermain travelling southwesterly from the Pagé Road connection to the intersection of Street 1 and Brian Coburn Boulevard. This modification may enhance the network's overall hydraulic capacity and will be reviewed at the detailed design stage.

2.5.2 Fire Protection

Fire protection to the site is anticipated to be achieved by five (5) on-site hydrants and the existing hydrants on Pagé Road and Navan Road. As shown in Drawing FWM, the on-site hydrants will be located along the 203 mm diameter watermain loop. It should be noted that these hydrant locations are preliminary and will be refined during the detailed design phase.

Hydrant spacing is in accordance with ISTB-2018-02, which states that the aggregated fire flow capacity of all fire hydrants within 150 m of a building shall not be less than the required fire flow of the building. Furthermore, ISTB-2018-02 highlights that the maximum capacity of fire flow for a hydrant is 95 L/s if the hydrant is within 75 m of a building. For hydrants located between 75 to 150 m from a structure, the hydrant flow capacity shall be taken as 63 L/s.

Fire protection for the private site plans (Blocks 14, 15, 16 and 18) will be detailed as part of their respective Site Plan Applications. For the purposes of this report, it will be demonstrated that the mains are anticipated to have sufficient flow for fire protection of the four (4) blocks.

2.5.3 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 2-6 and 2-7 summarize the hydraulic boundary conditions received from the City that were used in the HNA.

Table 2-6: 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 2-7: 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

Demand Scenarios	Head (m)
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 2-6 and Table 2-7, the simulation results found the minimum pressure on site to be 402 kPa (58.3 psi) as shown in Appendix D4. Based on the simulation results, the minimum pressure criterion of 276 kPa (40 psi) is anticipated to be met 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 2-6 and Table 2-7. As described in Section 2.2, the Concept Plan has been revised since receiving boundary conditions from the City. However, considering that the most critical required fire flow (RFF) of 250 L/s has not changed, the boundary conditions are expected to remain applicable for the purposes of reviewing the functional serviceability of this site.

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 15,000 L/min (250 L/s) boundary condition provided by the City (refer to Table 2-6 and 2-7), the system is expected to deliver a minimum of 10,000 L/min (167 L/s) within the site. This demonstrates that the fire flow requirement of 10,000 L/min (167 L/s) for the townhouse units within the subdivision can be met. It is noted that the boundary conditions used in this scenario are conservative for most of the site, including for all of the townhouse units.

The critical RFF for the residential site plans on Blocks 14 and 15 is 13,980 L/min (233 L/s) as described in Section 2.4.2. Using the 15,000 L/min (250 L/s) boundary condition provided by the City (refer to Table 2-6 and 2-7), it is anticipated that a minimum flow of 14,520 L/min (242 L/s) is available within the mains fronting these two blocks as shown in Appendix D5.

For the other residential site plan on Block 18, the RFF was calculated as 15,000 L/min (250 L/s). The simulation results (Appendix D5) found that the hydraulic capacity in this area is capable of supplying 15,000 L/min (250 L/s). Thus, it is expected that fire protection will be met for all three (3) residential site plans.

The simulation results (Appendix D5) show that the industrial site plan (Block 16) will deliver fire flows in excess of 169 L/s, which is above the calculated RFF in Section 2.4.2. Hence, the RFF can be fulfilled everywhere within the site. As noted in Section 2.5.2, the RFF will be provided by a combination of fire hydrants that each have a maximum flow capacity of 95 L/s (as per ISTB-2018-02).

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) is expected (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 anticipated 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 illustrated in Drawing FWM. Simulation results under peak hour demand and maximum hydraulic grade line (HGL) show that the pressure requirements listed in the Design Guidelines were achieved. Furthermore, fire flow requirements can be met for the site, noting that fire protection for the Site Plans (Blocks 14, 15, 16 and 18) will be detailed as part of their respective Site Plan Applications.

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, bypassing Pagé Road, and ultimately discharging into 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 tributary areas denoted in the EUC ISSU as Area 13A and 13B. Appendix E1 contains a copy of the overall sanitary drainage plan from the EUC ISSU highlighting Area 13A and 13B.

Area 13A:
Based on the design sheet included in the EUC ISSU (Appendix E1), the subject properties are 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. A copy of this design sheet is attached to Appendix E1.

Area 13B:
Based on the design sheet included in the EUC ISSU (Appendix E1), the subject properties are also 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.

From a 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 as shown in Drawing FSAN (Functional Sanitary Servicing).

- The recommended strategy of a sanitary sewer connection to the Renaud Road trunk sanitary sewer at Navan Road along Navan Road (at a minimum 0.35% slope) from the Pagé Road intersection (i.e., ±158.0 m distance) cannot be proposed due to pipe conflicts. The pipe locations and 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. An alternative sanitary servicing solution is provided in Section 3.2.

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, that would extend from the site entrance to Pagé Road, and then to the sanitary sewer at the intersection of Renaud Road and Navan Road, for an overall length of ±300 m.

As shown in the Functional Sanitary Servicing (Drawing FSAN), the Renaud Road 600 mm diameter trunk sewer runs southwesterly from Navan Road towards Pagé Road. Hence, there is an opportunity to connect the proposed Navan Road 200 mm diameter sanitary sewer, from the site entrance to the existing MH 10 at the intersection of Pagé Road and Navan Road (refer to Drawing FSAN). Wastewater would then flow in a southeasterly direction along Pagé Road and discharge into the Renaud Road 600 mm diameter trunk sanitary sewer. Given that this revised

sanitary sewer routing along Pagé Road is further downstream than the original servicing solution found in the EUC ISSU, there would not be any capacity issues and this strategy would limit the works crossing the existing forcemains on Pagé Road.

Refer to Drawing FSAN for the revised functional sanitary servicing which involves the above stated connection to existing MH 10 at the intersection of Pagé Road 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.

The proposed sanitary sewers have also been designed to accommodate any catchment areas identified within the EUC ISSU Report (Stantec, 2005) as well as the future Navan Road widening. Refer to Drawing FDSAN for the Functional Sanitary Drainage Plan and Drawing FSAN for the Functional Sanitary Servicing.

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 9.01 L/s (Navan) + 0.37 L/s (Pagé) = 9.38 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 6.60 ha in the EUC ISSU sanitary design sheet (Appendix E1). When the other areas of Area 13B is considered, the peak flow at Pagé Road was estimated at 12.71 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 (12.71 L/s) wastewater flows of 15.76 L/s were estimated to discharge southeasterly from existing MH 10 towards the Renaud Road 600 mm diameter trunk sanitary sewer. Although, the calculated peak flow of 15.76 L/s is above the allocated peak flow of 11.33 L/s as shown in the EUC ISSU design sheet (refer to Appendix E1 for the ISSU design sheet and Appendix E2 for the JLR Design Sheet). The design from the EUC ISSU 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 0.74%), 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 15.76 L/s will only account for 55% of the existing sanitary pipe capacity (from Navan to Renaud) or flow 55% 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 9.01 L/s (for Navan Road connection) and 0.37 L/s (for Pagé road connection), ii) the peak flow of 12.71 L/s at Pagé Road, and iii) the design flow of 15.76 L/s at Renaud Road. To accommodate these design flow targets, proposed 200 mm diameter sanitary sewers are proposed. Refer to Appendix E2 for the Design Sheets for the subject properties and Drawing FSAN for the functional sanitary servicing plan.

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 (refer to Drawing FSAN).

The Navan Road system will discharge into an off-site 200 mm diameter sewer that will be tributary to the existing 250 mm diameter sanitary sewer located along Pagé Road east 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 9.01 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). Based on the storm sewer design sheet included in the EUC ISSU and included in Appendix F1, the sub-areas to the connection point of the existing sewer network on Renaud Road have a contributing peak flow rate of 1906.25 L/s. The peak flow rate consists of runoff from Navan Road ROW corridor at the 1:10 year rate and runoff from the surrounding lands at a controlled release rate of 85 L/s/ha. The peak flow rate to the Renaud Road connection point should be maintained post development

4.3 Storm Criteria

This Functional Servicing 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 in Table 4-1.

4.4 Runoff Coefficient

Functional runoff coefficients (C-Factors) were calculated based on the weighted product between the percentage of the pervious area and the percentage of the impervious area. At the direction of the City, sample runoff coefficient were calculated based on zoning setbacks and maximum driveway widths. To better reflect the differences in impervious surfaces within the subdivision, the overall C-Factor was broken down by assigning a higher C-Factor to the front areas that includes the roadways and driveways and a lesser C-Factor to the rear yard areas. On this basis, functional C-Factors used in the Rational Method calculations have been summarized in Table 4-2 below (refer to Appendix F2 for the Functional Runoff Coefficient calculations). Runoff

coefficients for the remaining drainage areas were obtained from the EUC ISSU (Stantec, 2005). Refer to Appendix F1 for the EUC ISSU Storm Drainage Area Plan and Design Sheet.

Table 4-1: 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.
Peak flow rate from the site to be controlled to 85 L/s/ha and peak flow rate from Navan Road to be controlled to the 1:10 year rate.
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 at a peak flow rate equivalent to 85 L/s/ha.
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.

Table 4-2: Functional Design Runoff Coefficients

Scenario	Functional Runoff Coefficient
Rear Yards – Townhouse Units Only	0.61
Front Yards and ROW	0.66
Residential Site Plan	0.77
Industrial Site Plan (Gas Bar)	0.90
Park, Dry Pond and Abutting Properties on Navan and Pagé	0.30

4.5 Storm Servicing Strategy

As discussed in Section 4.2, the proposed sewers have been designed to accommodate any catchment areas identified within the EUC ISSU Report (Stantec, 2005) as well as the future Navan Road widening. Refer to Drawing FDST for the Functional Storm Drainage Plan and Appendix F3 for the Functional Storm Design Sheets.

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 Drawing FSTM for Functional Stormwater Servicing). 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. 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 underground storage cell.

Blocks 14 and 15 and the gas station block will detain on site the 1:100 year event and will discharge at a flow rate equivalent to 85 L/s/ha 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 a flow rate equivalent to 85 L/s/ha into the conventional storm sewers immediately upstream of the control structure.

The 2690 Pagé Road parcel which is directly on Pagé Road will discharge in to the site's conventional storm sewer network with capture of the 1:2 year event. Major overland flow will be detained in the street sag in up to the 1:100 year event.

4.6 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 by incorporating preliminary road grading with low points and a typical road cross section.

Storage requirements for the site were identified as shown in Table 4-3.

Table 4-3: Main Site Storage Volume Requirements and Release Rates (Navan Road)

Block	Release Rate	Storage Required (m^3)	Storage Required (m^3/ha)
Block 14	49 L/s (85 L/s/ha)	196	341
Block 15	46 L/s (85 L/s/ha)	186	344
Block 16	64 L/s (85 L/s/ha)	271	366
Block 18	52 L/s (85 L/s/ha)	185	332
Subdivision Minor	252 L/s draining to system	332	46
Subdivision Major	14 L/s to minor storage	304	203

The minor system storage will be provided by using the EcoBloc product. This is a crate type system which will provide maximum storage in a small footprint. The storage will be located in the SWM block under the dry pond. It has been represented in the model as a stage storage relationship with a constant storage area for the blocks reducing to a manhole dimension at 1 metre depth. When the downstream control orifice creates a backwater in the system the connection sewer to the storage will allow the system to back flow into the storage and utilise the storage. When the storm ends and headwater at the control orifice drops the connection sewer will allow the stored runoff to discharge.

On site plan blocks storage will be provided in the future with the opportunity to utilise underground storage similar to the proposed crate storage system as well as parking lot sag storage, alternative underground storage, potentially roof top storage, and/or a combination of these. This will be optimized at the detailed design stage with the design storage requirements as identified for each of the site plan blocks above.

4.7 Outlet Structure

The outlet structure for the subdivision will consist of a large manhole with an internal divider (refer to Figure 4). A control orifice, 410 mm diameter, at the invert of the sewer network will allow the controlled release through the system at the 85 L/s/ha release rate, 612 l/s. The divider wall will extend to the maximum HGL in the system at which point it would act as a weir to provide safe overflow of the minor system should the main orifice outlet block. Operation of the outlet structure is shown in Table 4-4 for the various storm events and distributions.

PROPOSED STORM WATER STORAGE CRATE
VOLUME: 330m³

DRY POND MAXIMUM
WATER LEVEL: 82.18 m

GROUNDWATER
DEPTH: 80.5 m

1m BERM ELEV 82.62
3:1 MAX SIDE SLOPES

CB CONNECTS
DIRECTLY TO
CRATE

BLOCK 13
PUBLIC PARK

BLOCK 17
PROPOSED SWM
732m²
POND BOTTOM = 81.55

BLOCK 4

STREET 1

3041

505 508 509 507 504 503

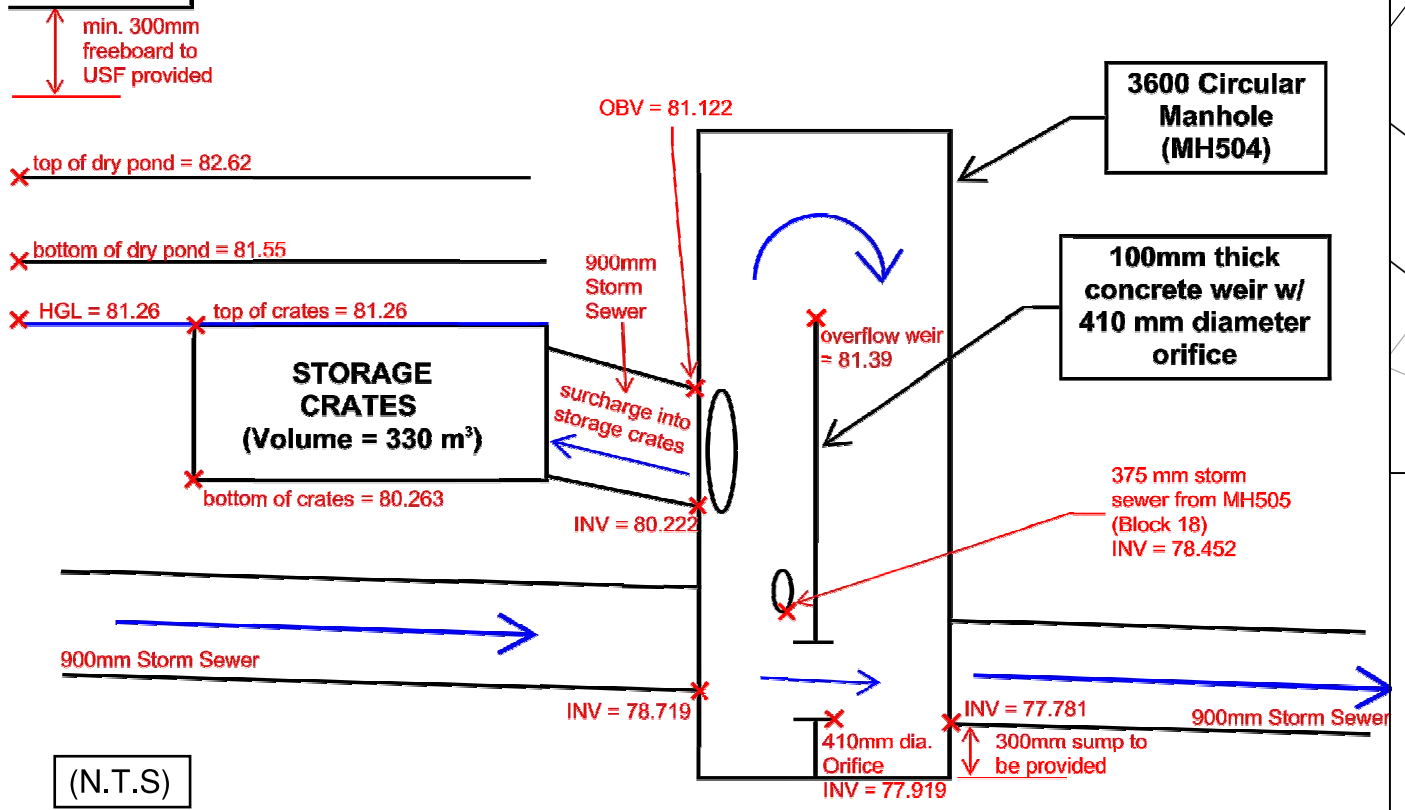
900mmØ ST

375mmØ ST

82.60 82.62 82.41 81.55 82.14 82.44 82.71 82.35 82.32 82.45 82.47 82.68 82.52 82.29

1+340 1+360 1+380 1+400 1+420 1+440 1+460 1+080 2+200 3+060 3+050 3+100 0+320 0+310 0+300 0+290 0+280 81.75

SKETCH OF OVERFLOW WEIR IN MANHOLE 504



(N.T.S)

PROJECT:
2983, 3053 and 3079 NAVAN ROAD & 2690 PAGE ROAD

DRAWING:
BLOCK 17 FUNCTIONAL DETENTION POND SKETCH

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DESIGN:	SP
DRAWN:	SP
CHECKED:	KF
JLR #:	29899-000

DRAWING #:
FIGURE 4

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

CITY FILE NO. D07-12-21-0081

PLOT DATE: Wednesday, April 13, 2022 11:59:08 AM

Table 4-4: Operation of the Outlet Structure in various storm events

Event	Max HGL (m)	Max Depth (m)	Total Inflow (m^3/s)	Total Orifice Discharge (m^3/s)
1:2 year 3-Hour Chicago	79.46	1.84	0.4	0.391
1:5 year 3-Hour Chicago	80.48	2.86	0.633	0.532
1:10 year 3-Hour Chicago	80.65	3.03	0.763	0.555
1:25 year 3-Hour Chicago	80.92	3.31	0.834	0.586
1:50 year 3-Hour Chicago	81.11	3.5	0.855	0.605
1:100 year 3-Hour Chicago	81.26	3.64	0.87	0.614
1:100 year 6-Hour Chicago	81.37	3.75	0.871	0.616
1:100 year 12-Hour SCS	81.2	3.58	0.811	0.61
1:100 year 24-Hour SCS	81.11	3.49	0.814	0.599

If the orifice becomes blocked the weir structure will operate to protect the basements from any flooding. The weir structure has been sized to minimize increases in flow depth. Operation of the outlet structure in the case of no orifice flow is shown in Table 4-5.

Table 4-5: Outlet Operation when orifice is blocked

1:100 year Storm Distributions	Max HGL (m)	Max Depth (m)	Total Inflow (m^3/s)	Total Weir Discharge (m^3/s)	Weir Flow Depth (m)
3-Hour Chicago	81.65	4.03	0.848	0.848	0.26
6-Hour Chicago	81.65	4.03	0.856	0.856	0.26
12-Hour SCS	81.65	4.03	0.844	0.843	0.26
24-Hour SCS	81.65	4.03	0.842	0.842	0.26

4.8 Minor System Freeboard

The maximum HGL in the system will occur in circumstances where the orifice is blocked however this not normal day to day operation. As such the USF's have been checked against the highest of the following criteria:

- 300 mm freeboard under the 1:100 year 6-hour Chicago critical storm event with the orifice operating
- Zero freeboard in the Climate Change event
- Zero freeboard with the orifice blocked and the weir operating in the 1:100 year event.

Table 4-6 shows the USF elevations against the criteria listed above for the critical 6-hour Chicago distribution in the 1:100 year return period.

Table 4-6: Maximum HGL and USF Comparison

Manhole	USF (m)	Normal Operation HGL (m)	Freeboard (m)	Climate Change HGL (m)	Freeboard (m)	Blocked Orifice Operation (m)	Freeboard (m)
509_(P-Stm)	81.88	81.45	0.43	81.61	0.27	81.83	0.05
510_(P-Stm)	81.88	81.47	0.41	81.64	0.24	81.88	0
511_(P-Stm)	82.15	81.49	0.66	81.68	0.47	81.98	0.17
512_(P-Stm)	82.6	81.49	1.11	81.68	0.92	82.01	0.59
513_(P-Stm)	82.6	82.21	0.39	82.23	0.37	82.21	0.39
514_(P-Stm)	82.6	82.27	0.33	82.29	0.31	82.27	0.33
522_(P-Stm)	82	81.52	0.48	81.71	0.29	81.95	0.05
523_(P-Stm)	82.3	81.57	0.73	81.79	0.51	82.05	0.25
527_(P-Stm)	82.8	82.46	0.34	82.46	0.34	82.46	0.34
CBMH3_(P-Stm)	83.25	82.79	0.46	82.85	0.4	82.84	0.41

The results show that a minimum of 330mm freeboard is achieved in normal operation of the system under both 1:100 year and climate change events, and maximum HGLs do not go above the USF in situations where the orifice is blocked.

4.9 Dry Pond Operation

The dry pond will receive major overland flow on site and detain it to release it at a controlled rate to the minor system storage. Pond side slopes will be less than 3:1 and have been simulated using a stage-storage curve developed from the proposed grading surface. The pond has been preliminarily sized to meet the OSDG requirements.

A draft geotechnical report entitled "Geotechnical Investigation of the Proposed Residential Development 2983, 3053, and 3079 Navan Road Ottawa, Ontario" was prepared by EXP. The borehole data provided in this report specifies that the groundwater table at the proposed dry pond block (Block 17) is at an elevation of 80.5 meters. As shown in Figure 4, the bottom of the pond is 1.05 meters above the groundwater table at an elevation of 81.55 meters.

Table 4-7: Dry Pond Operation in various storm events

Event	Max HGL (m)	Max Depth (m)	Overland System Inflow (m^3/s)	Total Inflow (m^3/s)	Max Storage Volume (m^3)
1:2 year 3-Hour Chicago	81.56	0.01	0	0.005	4
1:5 year 3-Hour Chicago	81.58	0.03	0.008	0.026	13
1:10 year 3-Hour Chicago	81.64	0.09	0.024	0.051	39
1:25 year 3-Hour Chicago	81.79	0.24	0.117	0.155	106

Event	Max HGL (m)	Max Depth (m)	Overland System Inflow (m^3/s)	Total Inflow (m^3/s)	Max Storage Volume (m^3)
1:50 year 3-Hour Chicago	81.91	0.36	0.193	0.239	165
1:100 year 3-Hour Chicago	82.12	0.57	0.266	0.321	271
1:100 year 6-Hour Chicago	82.18	0.63	0.261	0.316	304
1:100 year 12-Hour SCS	81.99	0.44	0.226	0.265	207
1:100 year 24-Hour SCS	81.94	0.39	0.223	0.262	183

The modelling results show that the pond remains dry in the 1:2 year event, other than runoff from the pond catchment, and has a maximum water level of 82.18 m, which provides 270 mm freeboard to the spill point in the road and more than 300mm freeboard to the surrounding area. Maximum pond depth is 630mm which is less than 1.5m.

4.10 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 siltsack or sentinel CB inserts 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.
- 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.
- Temporary ICDs 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 ICDs 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

CONNECT TO EXISTING 250mmØ SANITARY

CONNECT TO EXISTING 305mmØ WATERMAIN

EXISTING MH101 INV = 75.43

CONNECT TO EXISTING STORM AT MH101

CONNECT TO EXISTING SANITARY AT MH EX10

DOUBLE 600mmØ STORM TO CROSS BETWEEN EX 250mmØ SAN PIPE AND FORCEMAINS (300mmØ AND 400mmØ)

PROPOSED STORM WATER STORAGE CRATE VOLUME: 330m³

PROPOSED SWM

PROPOSED PARK

CONNECT TO EXISTING 305mmØ WATERMAIN

CONNECT TO EXISTING 305mmØ WATERMAIN

PAGE ROAD

RENAUD ROAD

BRIAN COBURN BLVD.

NAVAN ROAD

STREET 1

STREET 2

BLOCK 1 | BLOCK 2 | BLOCK 3 | BLOCK 4 | BLOCK 5 | BLOCK 6 | BLOCK 7 | BLOCK 8 | BLOCK 9 | BLOCK 10 | BLOCK 11 | BLOCK 12 | BLOCK 13 | BLOCK 14 | BLOCK 15 | BLOCK 16 | BLOCK 17 | BLOCK 18

BUILDING - A 4 STORY CONDOMINIUM BUILDING (48 UNITS)

BUILDING - B 4 STORY CONDOMINIUM BUILDING (36 UNITS) COMMERCIAL AND OFFICE SPACE AT-GRADE 10,000 SQFT

BUILDING - C 4 STORY CONDOMINIUM BUILDING (36 UNITS) COMMERCIAL AND OFFICE SPACE AT-GRADE 10,000 SQFT

BUILDING - D 4 STORY CONDOMINIUM BUILDING (47 UNITS)

CAR WASH

GAS BAR

CONVENIENCE

EX. 250mmØ SAN

300mmØ FORCEMAIN

400mmØ FORCEMAIN

300mmØ WM

250MMØ SAN

200mmØ SAN

LEGEND:

- PROPOSED 200mmØ WATERMAIN
- EXISTING WATERMAIN
- EXISTING SANITARY SEWER & MANHOLE
- EXISTING STORM SEWER & MANHOLE
- PROPOSED 200mm SANITARY SEWER & MANHOLE
- PROPOSED STORM SEWER & MANHOLE

PRELIMINARY DESIGN

THESE DOCUMENTS ARE NOT COMPLETE IN ALL DETAILS AND MAY BE SUBJECT TO CHANGE AS DESIGN DEVELOPMENT AND CODE REVIEW IS ADVANCED.

No.	ISSUE / REVISION	DD/MM/YY
2	FUNCTIONAL SERVICING REPORT RESUBMISSION	14/04/22
1	ADEQUACY OF PUBLIC SERVICES REPORT	07/09/21

SCALE: 1:1000

0 10 20 40 60 80m

CLIENT: Groupe Heafey Group

CONSULTANT: www.jlrichards.ca

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CONSULTANT:

PROFESSIONAL STAMP

PROFESSIONAL STAMP

PROJECT:

2983, 3053 and 3079 NAVAN ROAD & 2690 PAGE ROAD

DRAWING:

FUNCTIONAL OVERALL SERVICING

DESIGN: MM	
DRAWN: KT	DRAWING #: FOS
CHECKED: KF	
JLR #: 29899-000	

PLOT DATE: April 14, 2022 2:04:09 PM; CITY FILE NO. D07-12-21-0081

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

PAGE ROAD

BRIAN COBURN BLVD.

NAVAN ROAD

potential retaining wall

BLOCK 13
PROPOSED PARK BLOCK

PROPOSED SYM BLOCK

BLOCK 18

BLOCK 14

BLOCK 15

BLOCK 16

BLOCK 12

STREET 1

STREET 2

BUILDING - A
4 STORY CONDOMINIUM BUILDING
(48 UNITS)

BUILDING - B
4 STORY CONDOMINIUM BUILDING
(36 UNITS)
COMMERCIAL AND OFFICE SPACE
AT-GRADE 10,000 SQFT

BUILDING - C
4 STORY CONDOMINIUM BUILDING
(36 UNITS)
COMMERCIAL AND OFFICE SPACE
AT-GRADE 10,000 SQFT

BUILDING - C
4 STORY CONDOMINIUM BUILDING
(48UNITS)

BUILDING - D
4 STORY CONDOMINIUM BUILDING
(47 UNITS)

BUILDING - E
4 STORY CONDOMINIUM BUILDING
(48 UNITS)

CAR WASH

STACKING LINE

FF 86.05
USF 83.25

FF 85.80
USF 82.80

FF 85.30
USF 82.30

FF 84.95
USF 81.95

FF 84.85
USF 82.05

FF 85.10
USF 82.10

FF 84.80
USF 82.00

FF 85.60
USF 82.60

FF 84.65
USF 81.88

FF 85.15
USF 82.15

FF 85.70
USF 82.70

LEGEND

- X81.12 — ORIGINAL SURVEY
- ×81.55 — PROPOSED ELEVATION
- 84.40 x — Existing Elevation
- Overland Flow Arrows

No.	ISSUE / REVISION	DD/MM/YY
2	FUNCTIONAL SERVICING REPORT RESUBMISSION	14/04/22
1	ADEQUACY OF PUBLIC SERVICES REPORT	07/09/21

SCALE: 1:750
0 15 30 45 60m

CLIENT: Groupe Heafey Group

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

CONSULTANT:

PROFESSIONAL STAMP

PROFESSIONAL STAMP

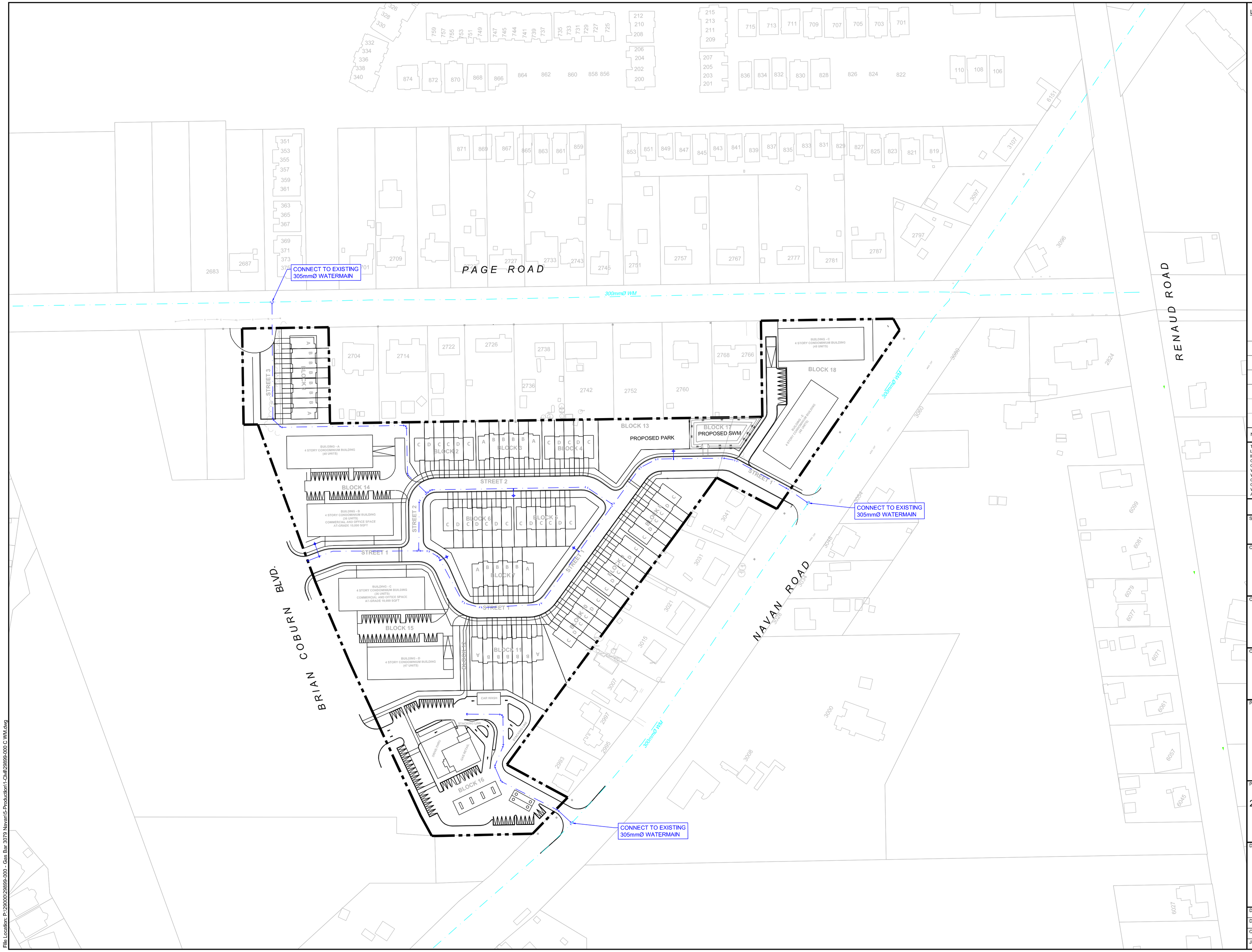
PROJECT:
2983, 3053 and 3079 NAVAN ROAD & 2690 PAGE ROAD

DRAWING:
FUNCTIONAL GRADING PLAN

DESIGN: KF	DRAWING #: FG
DRAWN: KT	
CHECKED: MM	
JLR #: 29899-000	

PLOT DATE: April 14, 2022 2:48:15 PM | CITY FILE NO. D07-12-21-0081

File Location: P:\29000\29899-000 - Gas Bar 3079 Navan\05-Production\1-Civil\29899-000 C Grading.dwg



LEGEND:

PROPOSED 200mmØ WATERMAIN

EXISTING WATERMAIN

PRELIMINARY DESIGN

THESE DOCUMENTS ARE NOT COMPLETE IN ALL DETAILS AND MAY BE SUBJECT TO CHANGE AS DESIGN DEVELOPMENT AND CODE REVIEW IS ADVANCED.

No.	ISSUE / REVISION	DD/MM/YY
2	FUNCTIONAL SERVICING REPORT RESUBMISSION	14/04/22
1	ADEQUACY OF PUBLIC SERVICES REPORT	07/09/21

SCALE: 1:1000

0 10 20 40 60 80m

CLIENT: GROUPE Heafey GROUP

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

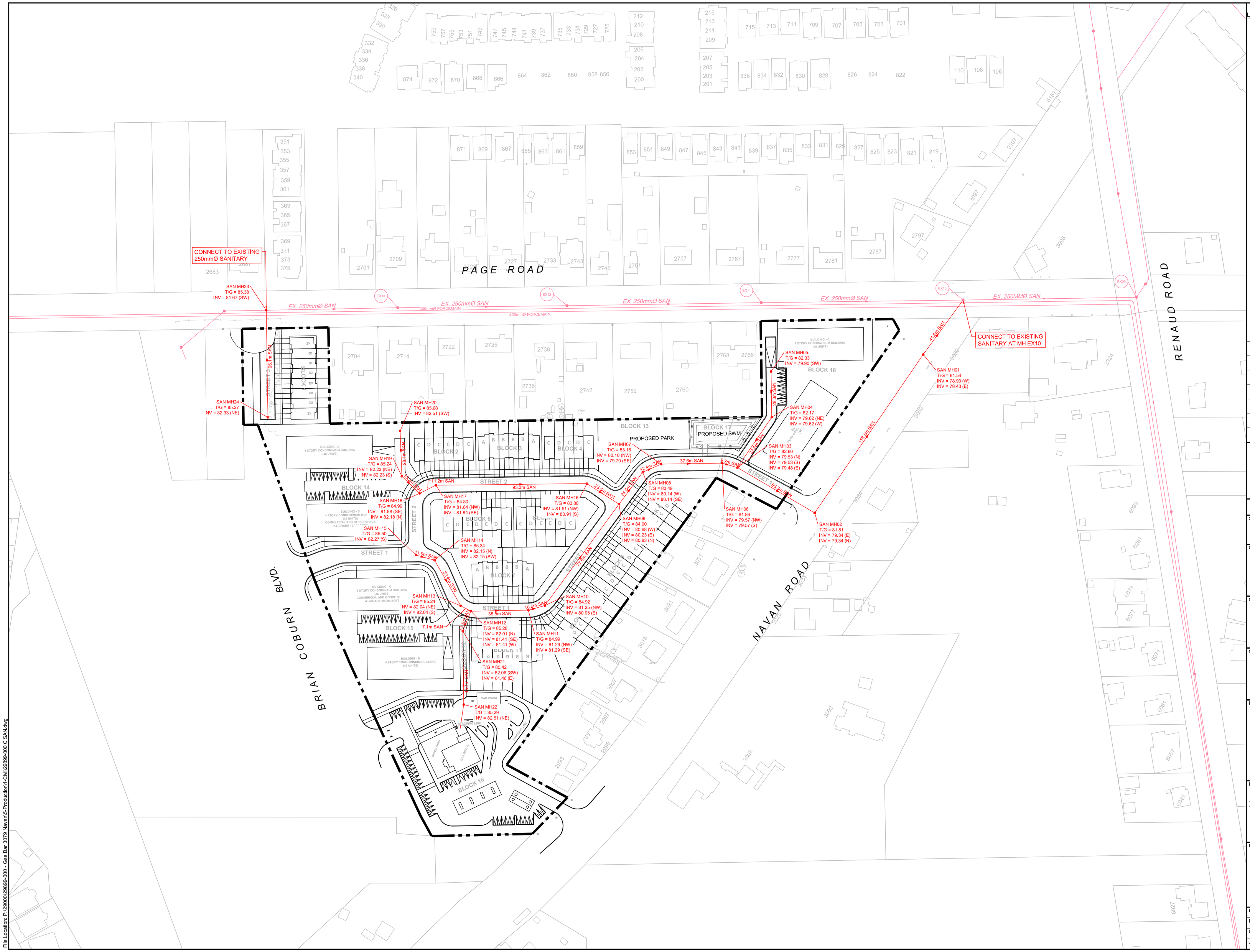
DRAWING:

FUNCTIONAL WATERMAIN SERVICING

DESIGN: MM	
DRAWN: KT	DRAWING #: FWM
CHECKED: KF	
JLR #: 29899-000	

PLOT DATE: April 14, 2022 2:56:00 PM; CITY FILE NO. D07-12-21-0081

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



LEGEND:

- EXISTING SANITARY SEWER & MANHOLE
- PROPOSED 200mm SANITARY SEWER & MANHOLE

PRELIMINARY DESIGN

THESE DOCUMENTS ARE NOT COMPLETE IN ALL DETAILS AND MAY BE SUBJECT TO CHANGE AS DESIGN DEVELOPMENT AND CODE REVIEW IS ADVANCED.

No.	ISSUE / REVISION	DD/MM/YY
2	FUNCTIONAL SERVICING REPORT RESUBMISSION	14/04/22
1	ADEQUACY OF PUBLIC SERVICES REPORT	07/09/21

SCALE: 1:1000

0 10 20 40 60 80m

CLIENT: Groupe Heafey

CONSULTANT: www.jlrichards.ca

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CONSULTANT:

PROFESSIONAL STAMP

PROFESSIONAL STAMP

PROJECT:

2983, 3053 and 3079 NAVAN ROAD & 2690 PAGE ROAD

DRAWING:

FUNCTIONAL SANITARY SERVICING

DESIGN:	MM
DRAWN:	KT
CHECKED:	KF
JLR #:	29899-000

DRAWING #: FSAN

PLOT DATE: April 14, 2022 2:57:06 PM CITY FILE NO. D07-12-21-0081

File Location: P:\29800\29899-000 - Gas Bar 3079 Navan\5-Production\1-Civil\29899-000 C SAN.dwg

LEGEND:

121 EXISTING STORM SEWER & MANHOLE

121 PROPOSED STORM SEWER & MANHOLE

PRELIMINARY DESIGN

THESE DOCUMENTS ARE NOT COMPLETE IN ALL DETAILS AND MAY BE SUBJECT TO CHANGE AS DESIGN DEVELOPMENT AND CODE REVIEW IS ADVANCED.

No.	ISSUE / REVISION	DD/MM/YY
2	FUNCTIONAL SERVICING REPORT RESUBMISSION	14/04/22
1	ADEQUACY OF PUBLIC SERVICES REPORT	07/09/21

SCALE: 1:1000

0 10 20 40 60 80m

CLIENT: GROUPE Heafey GROUP

CONSULTANT: www.jlrichards.ca

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CONSULTANT:

PROFESSIONAL STAMP

PROFESSIONAL STAMP

PROJECT:

2983, 3053 and 3079 NAVAN ROAD & 2690 PAGE ROAD

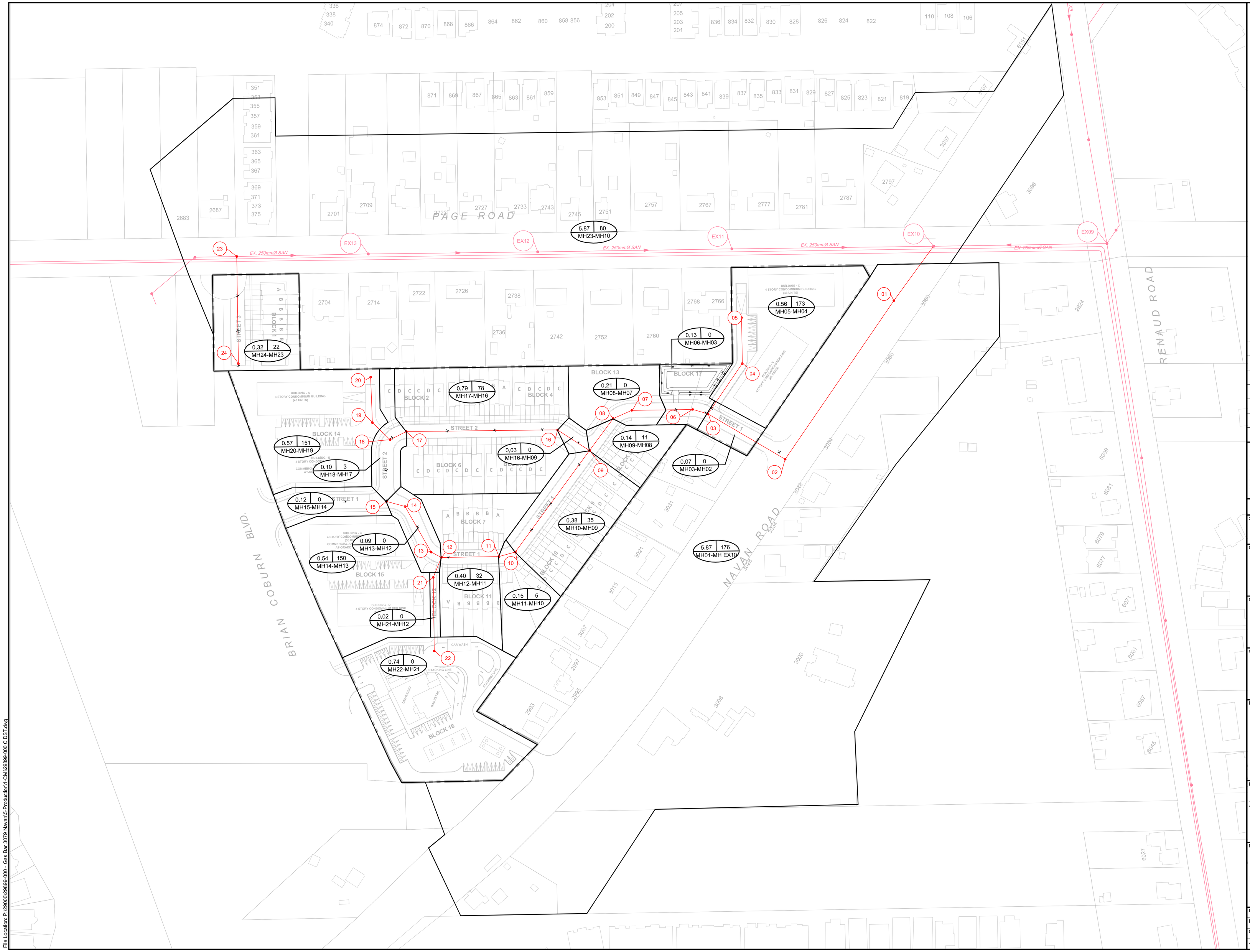
DRAWING:

FUNCTIONAL STORMWATER SERVICING

DESIGN: MM	
DRAWN: KT	DRAWING #:
CHECKED: KF	FSTM
JLR #: 29899-000	

PLOT DATE: April 14, 2022 2:57:29 PM CITY FILE NO. D07-12-21-0081

File Location: P:\29900\29899-000 - Gas Bar 3079 Navan\5-Products\civil-CIVIL\29899-000 C STM.dwg



LEGEND:

- EXISTING SANITARY SEWER & MANHOLE
- PROPOSED 200mm SANITARY SEWER & MANHOLE
- AREA IN HECTARES
- AREA POPULATION
- PIPE REACH UPSTREAM MAINTENANCE HOLE TO DOWNSTREAM MAINTENANCE HOLE

No.	ISSUE / REVISION	DD/MM/YY
2	FUNCTIONAL SERVICING REPORT RESUBMISSION	14/04/22
1	ADEQUACY OF PUBLIC SERVICES REPORT	07/09/21

SCALE: 1:1000

0 15 30 45 60m

CLIENT: Groupe Heafey

CONSULTANT: www.jlrichards.ca

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CONSULTANT:

PROFESSIONAL STAMP

PROFESSIONAL STAMP

PROJECT:

2983, 3053 and 3079 NAVAN ROAD & 2690 PAGE ROAD

DRAWING:

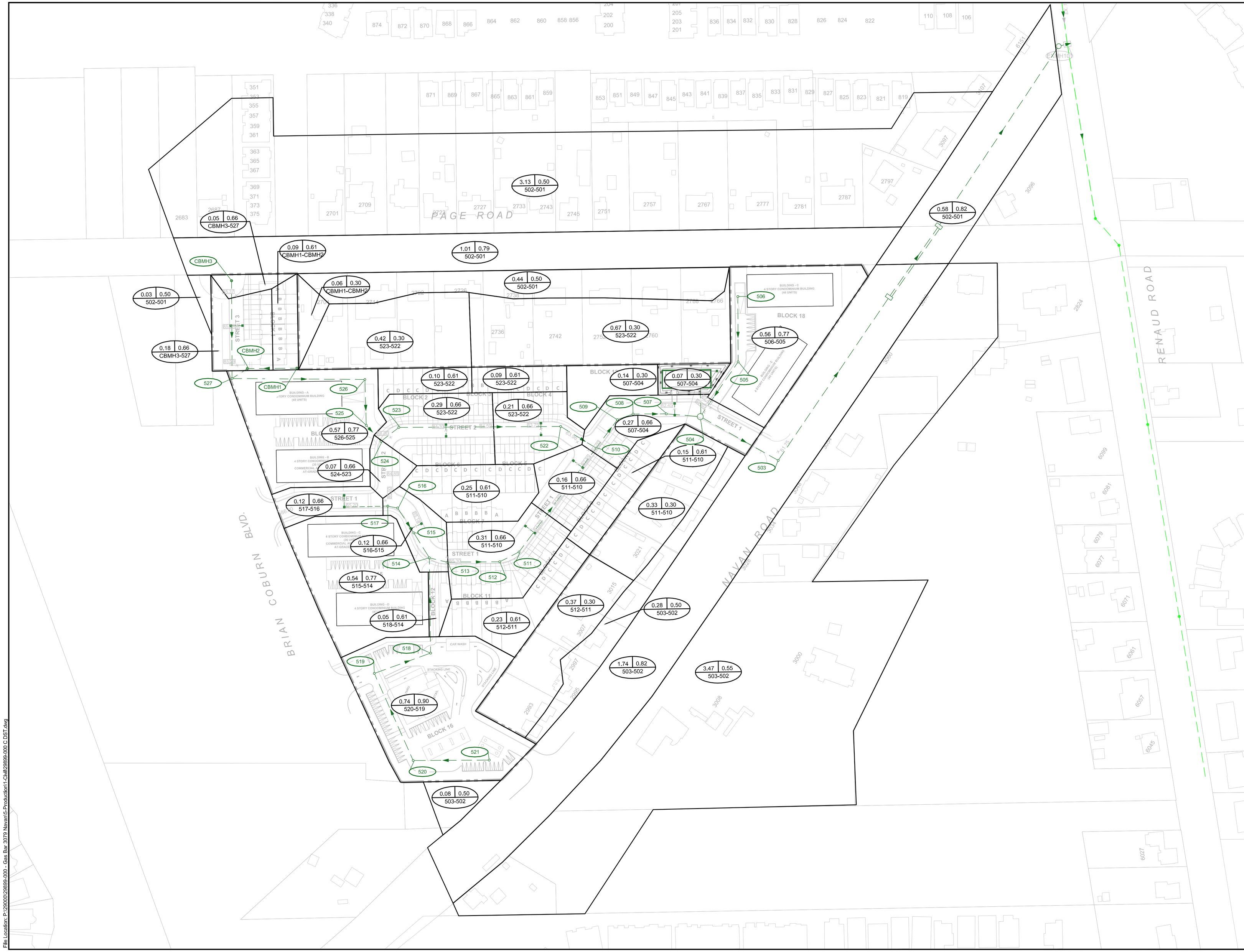
FUNCTIONAL SANITARY DRAINAGE PLAN

DESIGN:	MM
DRAWN:	KT
CHECKED:	KF
JLR #:	29899-000

DRAWING #: FDSAN

File Location: P:\29900\29899-000 - Gas Bar 3079 Navan\5-Production\1-Civil\29899-000 C DST.dwg

PLOT DATE: April 14, 2022 2:58:35 PM, CITY FILE NO. D07-12-21-0081



LEGEND:

- EXISTING STORM SEWER & MANHOLE
- PROPOSED STORM SEWER & MANHOLE
- AREA IN HECTARES
- RUNOFF COEFFICIENT
- PIPE REACH UPSTREAM MAINTENANCE HOLE TO DOWNSTREAM MAINTENANCE HOLE

No.	ISSUE / REVISION	DD/MM/YY
2	FUNCTIONAL SERVICING REPORT RESUBMISSION	12/04/22
1	ADEQUACY OF PUBLIC SERVICES REPORT	07/09/21

SCALE: 1:1000

0 15 30 45 60m

CLIENT: Groupe Heafey Group

CONSULTANT: www.jlrichards.ca

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CONSULTANT:

PROFESSIONAL STAMP

PROFESSIONAL STAMP

PROJECT:

2983, 3053 and 3079 NAVAN ROAD & 2690 PAGE ROAD

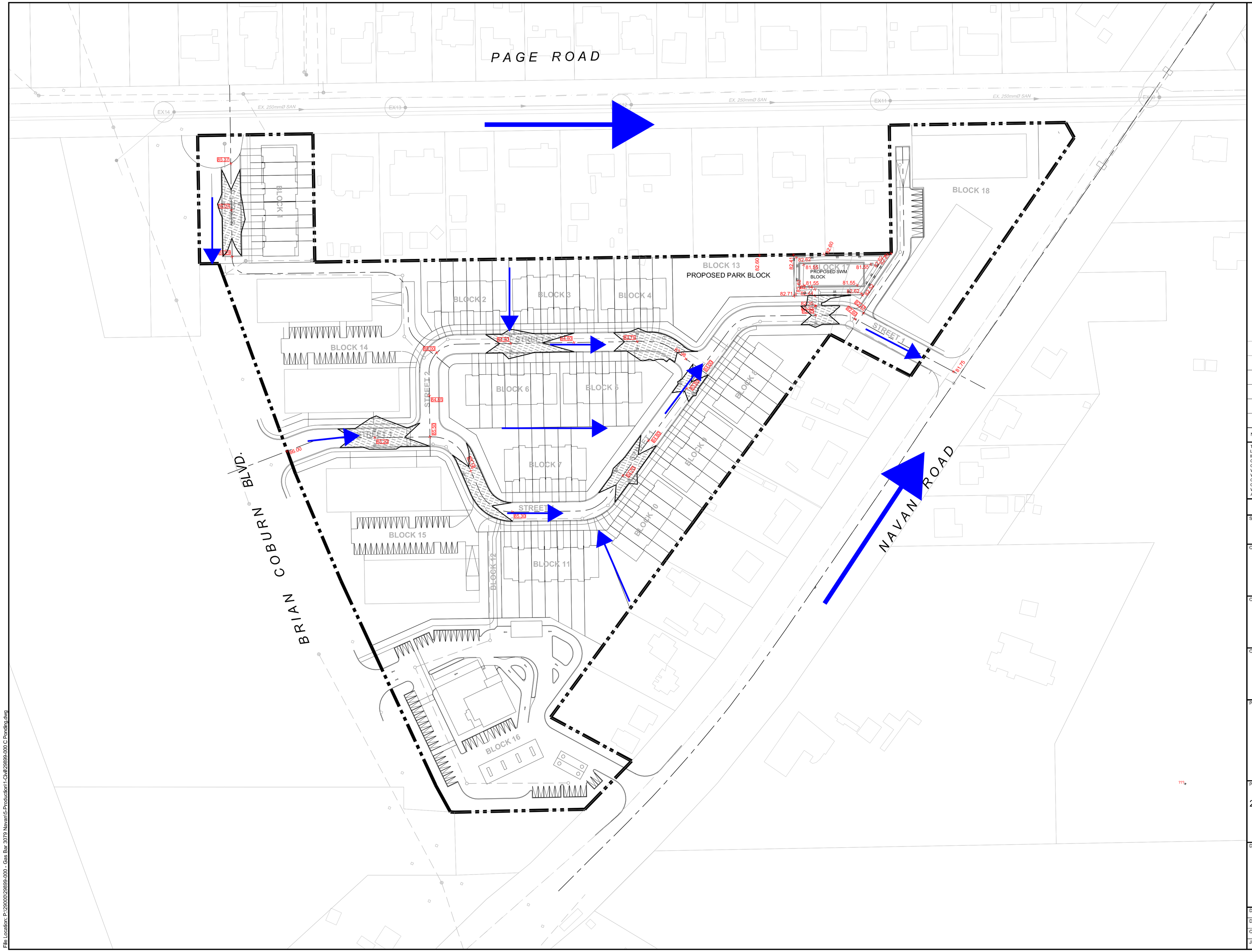
DRAWING:

FUNCTIONAL STORM DRAINAGE PLAN

DESIGN: MM	
DRAWN: KT	DRAWING #:
CHECKED: KF	FDST
JLR #: 29899-000	

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

PLOT DATE: April 14, 2022 2:58:16 PM CITY FILE NO. D07-12-21-0081



LEGEND

- ORIGINAL SURVEY
- PROPOSED ELEVATION
- PONDING EXTENT
- Overland Flow Arrows

No.	ISSUE / REVISION	DD/MM/YY
2	FUNCTIONAL SERVICING REPORT RESUBMISSION	14/04/22
1	ADEQUACY OF PUBLIC SERVICES REPORT	07/09/21

SCALE: 1:750

0 15 30 45 60m

CLIENT: Groupe Heafey Group

CONSULTANT: www.jlrichards.ca

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CONSULTANT:

PROFESSIONAL STAMP

PROFESSIONAL STAMP

PROJECT:

2983, 3053 and 3079 NAVAN ROAD & 2690 PAGE ROAD

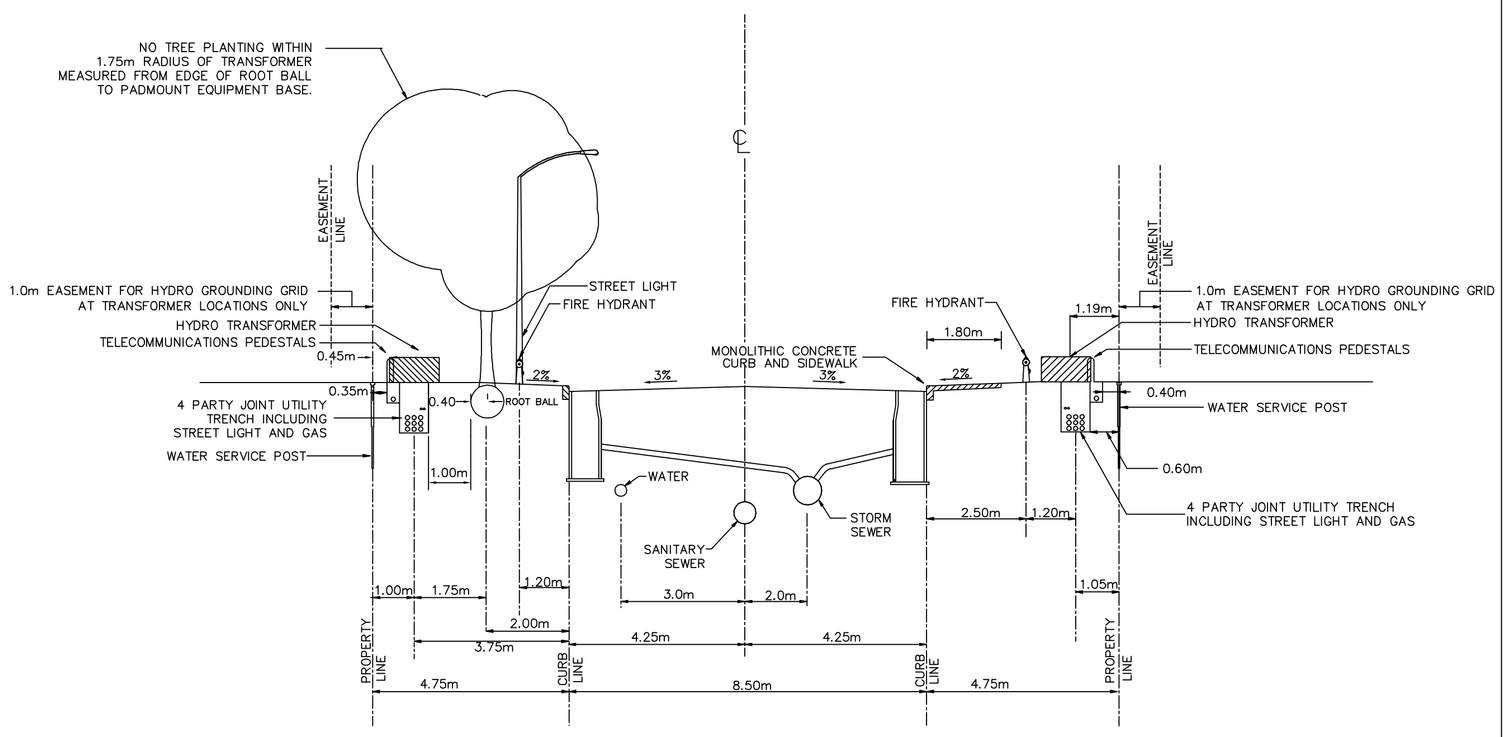
DRAWING:

FUNCTIONAL PONDING PLAN

DESIGN: KF	DRAWING #: FSWM
DRAWN: KT	
CHECKED: MM	
JLR #: 29899-000	

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

PLOT DATE: April 14, 2022 3:30:07 PM CITY FILE NO. D07-12-21-0081

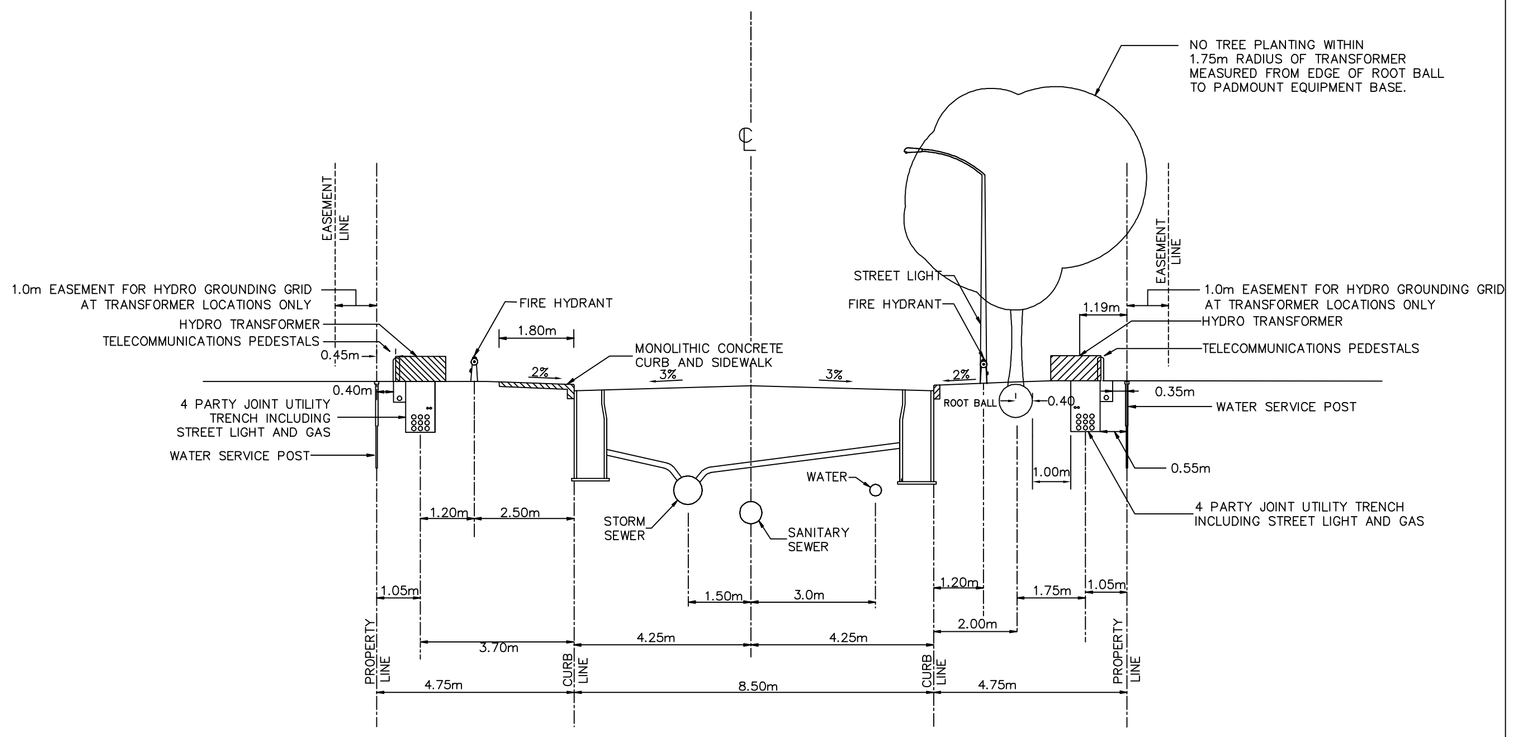


NOTES:

1. AT CATCH BASIN AND HYDRANT LOCATIONS THE GAS MAIN SHALL HAVE A MINIMUM 0.6 m CLEARANCE FROM STRUCTURES.

STREET 2 18 m ROW (w/ 1 Sidewalk)

- HYDRANTS AND SIDEWALKS LOCATED IN BOULEVARDS

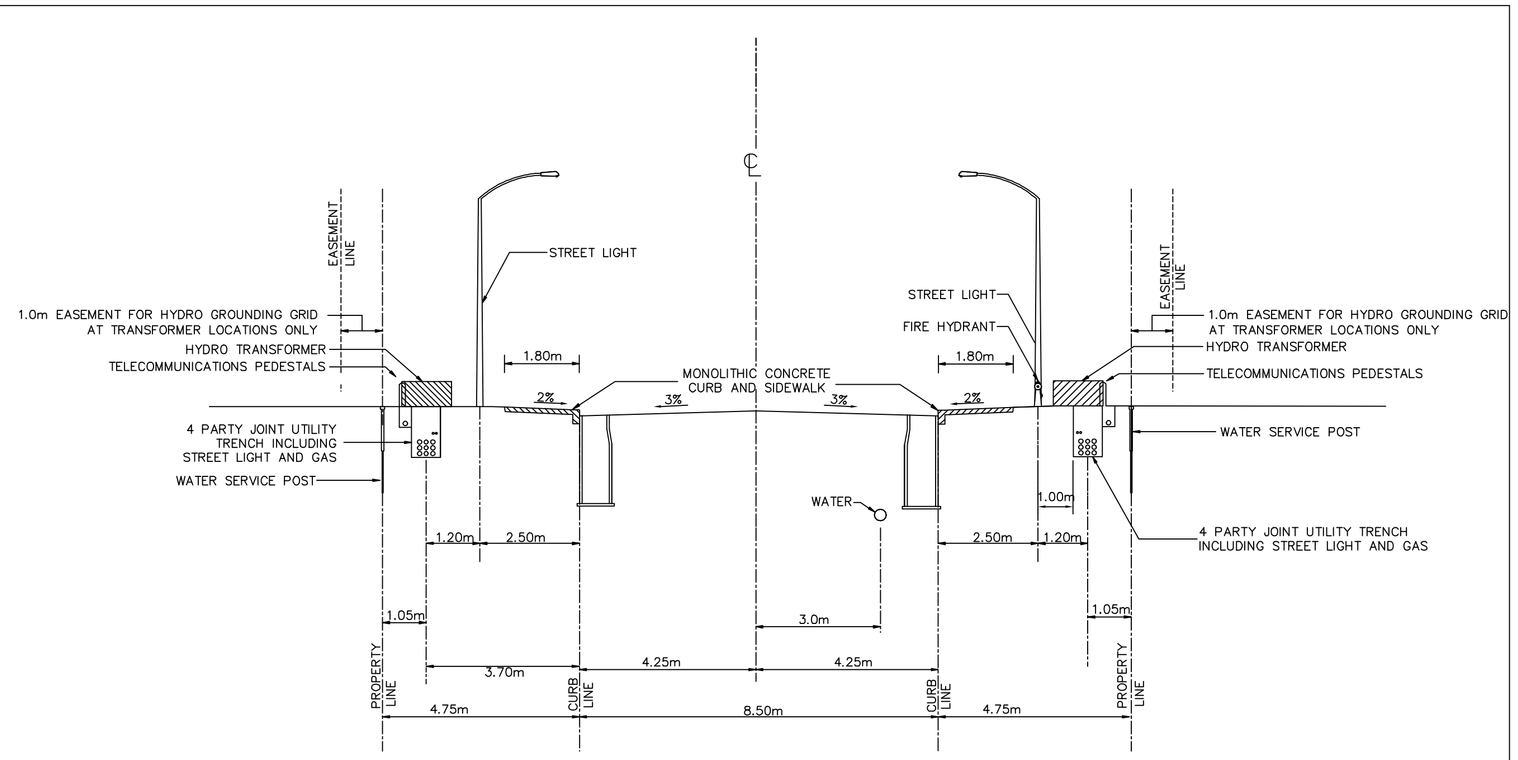


NOTES:

1. AT CATCH BASIN AND HYDRANT LOCATIONS THE GAS MAIN SHALL HAVE A MINIMUM 0.6 m CLEARANCE FROM STRUCTURES.

STREET 1 18 m ROW (w/ 1 Sidewalk)

- HYDRANTS AND SIDEWALKS LOCATED IN BOULEVARDS



NOTES:

1. AT CATCH BASIN AND HYDRANT LOCATIONS THE GAS MAIN SHALL HAVE A MINIMUM 0.6 m CLEARANCE FROM STRUCTURES.

STREET 1@ BRAIN COBURN 18 m ROW (w/ 2 Sidewalk)

- HYDRANTS AND SIDEWALKS LOCATED IN BOULEVARDS
- NO TREES

No.	ISSUE / REVISION	DD/MM/YY
2	FUNCTIONAL SERVICING REPORT RESUBMISSION	14/04/22
1	ADEQUACY OF PUBLIC SERVICES REPORT	07/09/21

SCALE: NTS

CLIENT: Groupe Heafey Group

CONSULTANT: www.jlrichards.ca

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CONSULTANT:

PROFESSIONAL STAMP

PROFESSIONAL STAMP

PROJECT:

2983, 3053 and 3079 NAVAN ROAD & 2690 PAGE ROAD

DRAWING:

FUNCTIONAL CROSS SECTIONS

DESIGN: TB	
DRAWN: TB/KT	DRAWING #:
CHECKED: SP	FXS
JLR #: 29899-000	

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

PLOT DATE: April 14, 2022 2:12:09 PM CITY FILE NO. D07-12-21-0081

Appendix A

Pre-consultation meeting notes
and Servicing Study Checklist

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.
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.

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./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

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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

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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

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

Hi 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

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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

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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12714001 Canada Inc – 2983, 3053 and 3079 Navan Road & 2690 Pagé Road

DEVELOPMENT SERVICING STUDY CHECKLIST

REFERENCED STUDIES AND REPORTS	REFERENCE
Functional Servicing Report for 12714001 Canada Inc, 2983, 3053 and 3079 Navan Road & 2690 Pagé Road (J.L. Richards & Associates Limited, April 12, 2022)	FSR

4.1	GENERAL CONTENT	REFERENCE
☐	Executive Summary (for larger reports only).	N/A
☒	Date and revision number of the report.	FSR (Title Page)
☒	Location map and plan showing municipal address, boundary, and layout of proposed development.	FSR (Figure 1 & 2) All Drawings
☒	Plan showing the site and location of all existing services.	Functional Overall Servicing (FOS)
☒	Development statistics, land use, density, adherence to zoning and official plan, and reference to applicable subwatershed and watershed plans that provide context to which individual developments must adhere.	FSR (Section 1)
☒	Summary of Pre-consultation Meetings with City and other approval agencies.	FSR (Appendix 'A')
☒	Reference and confirm conformance to higher level studies and reports (Master Servicing Studies, Environmental Assessments, Community Design Plans), or in the case where it is not in conformance, the proponent must provide justification and develop a defendable design criteria.	Reference made to Stantec 2005 EUC ISSU
☒	Statement of objectives and servicing criteria.	FSR (Section 1.0, 2.0, 3.0, 4.0, 5.0)
☒	Identification of existing and proposed infrastructure available in the immediate area.	FSR (Section 1.0, 2.0, 3.0, 4.0) Functional Overall Servicing (FOS)
☐	Identification of Environmentally Significant Areas, watercourses and Municipal Drains potentially impacted by the proposed development (Reference can be made to the Natural Heritage Studies, if available).	N/A
☒	Concept level master grading plan to confirm existing and proposed grades in the development. This is required to confirm the feasibility of proposed stormwater management and drainage, soil removal and fill constraints, and potential impacts to neighbouring properties. This is also required to confirm that the proposed grading will not impede existing major system flow paths.	Functional Grading Plan (FG)

☐	Identification of potential impacts of proposed piped services on private services (such as wells and septic fields on adjacent lands) and mitigation required to address potential impacts.	N/A
☐	Proposed phasing of the development, if applicable.	N/A
☐	Reference to geotechnical studies and recommendations concerning servicing.	To be confirmed
☒	All preliminary and formal site plan submissions should have the following information: ▪ Metric scale ▪ North arrow (including construction North) ▪ Key plan ▪ Name and contact information of applicant and property owner ▪ Property limits, including bearings and dimensions ▪ Existing and proposed structures and parking areas ▪ Easements, road widening and rights-of-way ▪ Adjacent street names	All Drawings

4.2	DEVELOPMENT SERVICING REPORT: WATER	REFERENCE
☐	Confirm consistency with Master Servicing Study, if available.	N/A
☒	Availability of public infrastructure to service proposed development.	SSR (Section 1.0, 2.0) Functional Overall Servicing (FOG)
☒	Identification of system constraints.	FSR (Section 2.0)
☒	Identify boundary conditions.	FSR (Section 2.0, Appendix 'D3')
☒	Confirmation of adequate domestic supply and pressure.	FSR (Section 2.0)
☒	Confirmation of adequate fire flow protection and confirmation that fire flow is calculated as per the Fire Underwriter's Survey. Output should show available fire flow at locations throughout the development.	FSR (Section 2.0, Appendix 'D1' & 'D5')
☒	Provide a check of high pressures. If pressure is found to be high, an assessment is required to confirm the application of pressure reducing valves.	FSR (Section 2.0)
☐	Definition of phasing constraints. Hydraulic modelling is required to confirm servicing for all defined phases of the project, including the ultimate design.	N/A
☒	Address reliability requirements, such as appropriate location of shutoff valves.	FSR (Section 2.0)
☐	Check on the necessity of a pressure zone boundary modification.	N/A

☒	Reference to water supply analysis to show that major infrastructure is capable of delivering sufficient water for the proposed land use. This includes data that shows that the expected demands under average day, peak hour and fire flow conditions provide water within the required pressure range.	FSR (Section 2.0, Appendix D1 to D6)
☒	Description of the proposed water distribution network, including locations of proposed connections to the existing system, provisions for necessary looping, and appurtenances (valves, pressure reducing valves, valve chambers, and fire hydrants), including special metering provisions.	FSR (Section 2.0) Functional Watermain Servicing (FWM)
☐	Description of off-site required feedermains, booster pumping stations, and other water infrastructure that will be ultimately required to service proposed development, including financing, interim facilities, and timing of implementation.	N/A
☒	Confirmation that water demands are calculated based on the City of Ottawa Design Guidelines.	FSR (Section 2.0)
☒	Provision of a model schematic showing the boundary conditions locations, streets, parcels, and building locations for reference.	FSR (Appendix 'D2')

4.3	DEVELOPMENT SERVICING REPORT: WASTEWATER	REFERENCE
☒	Summary of proposed design criteria (Note: Wet weather flow criteria should not deviate from the City of Ottawa Sewer Design Guidelines. Monitored flow data from relatively new infrastructure cannot be used to justify capacity requirements for proposed infrastructure).	FSR (Section 3.0, Appendix 'E1' & 'E2')
☐	Confirm consistency with Master Servicing Study and/or justifications for deviations.	Stantec 2005 EUC ISSU
☐	Consideration of local conditions that may contribute to extraneous flows that are higher than the recommended flows in the Guidelines. This includes groundwater and soil conditions, and age and condition of sewers.	N/A
☒	Description of existing sanitary sewer available for discharge of wastewater from proposed development.	FSR (Section 1.0, 3.0) Functional Sanitary Servicing (FSAN)
☒	Verify available capacity in downstream sanitary sewer and/or identification of upgrades necessary to service the proposed development. (Reference can be made to previously completed Master Servicing Study if applicable.)	FSR (Section 3.0, Appendix 'E1' & 'E2')
☒	Calculations related to dry weather and wet weather flow rates from the development in standard MOE sanitary sewer design table (Appendix 'C') format.	FSR (Appendix 'E1', 'E2')
☒	Description of proposed sewer network, including sewers, pumping stations and forcemains.	FSR (Section 3.0) Functional Sanitary Servicing (FSAN)

☐	Discussion of previously identified environmental constraints and impact on servicing (environmental constraints are related to limitations imposed on the development in order to preserve the physical condition of watercourses, vegetation, soil cover, as well as protecting against water quantity and quality).	N/A
☐	Pumping stations: impacts of proposed development on existing pumping stations or requirements for new pumping station to service development.	N/A
☐	Forcemain capacity in terms of operational redundancy, surge pressure and maximum flow velocity.	N/A
☐	Identification and implementation of the emergency overflow from sanitary pumping stations in relation to the hydraulic grade line to protect against basement flooding.	N/A
☐	Special considerations, such as contamination, corrosive environment, etc.	N/A

4.4	DEVELOPMENT SERVICING REPORT: STORMWATER	REFERENCE
☒	Description of drainage outlets and downstream constraints, including legality of outlets (i.e., municipal drain, right-of-way, watercourse, or private property).	FSR (Section 1.0, 4.0)
☒	Analysis of available capacity in existing public infrastructure.	FSR (Section 4.0)
☒	A drawing showing the subject lands, its surroundings, the receiving watercourse, existing drainage patterns, and proposed drainage pattern.	Drawings FSTM, FDST, FSMW
☒	Water quantity control objective (e.g. controlling post-development peak flows to pre-development level for storm events ranging from the 2 or 5 year event (dependent on the receiving sewer design) to 100 year return period); if other objectives are being applied, a rationale must be included with reference to hydrologic analyses of the potentially affected subwatersheds, taking into account long-term cumulative effects.	FSR (Section 4.0)
☒	Water Quality control objective (basic, normal or enhanced level of protection based on the sensitivities of the receiving watercourse) and storage requirements.	FSR (Section 4.0)
☒	Description of the stormwater management concept with facility locations and descriptions with references and supporting information.	FSR (Section 4.0) Drawings FDST, FSMW
☐	Setback from private sewage disposal systems.	N/A
☐	Watercourse and hazard lands setbacks.	N/A
☒	Record of pre-consultation with the Ontario Ministry of Environment and the Conservation Authority that has jurisdiction on the affected watershed.	FSR (Appendix 'A')

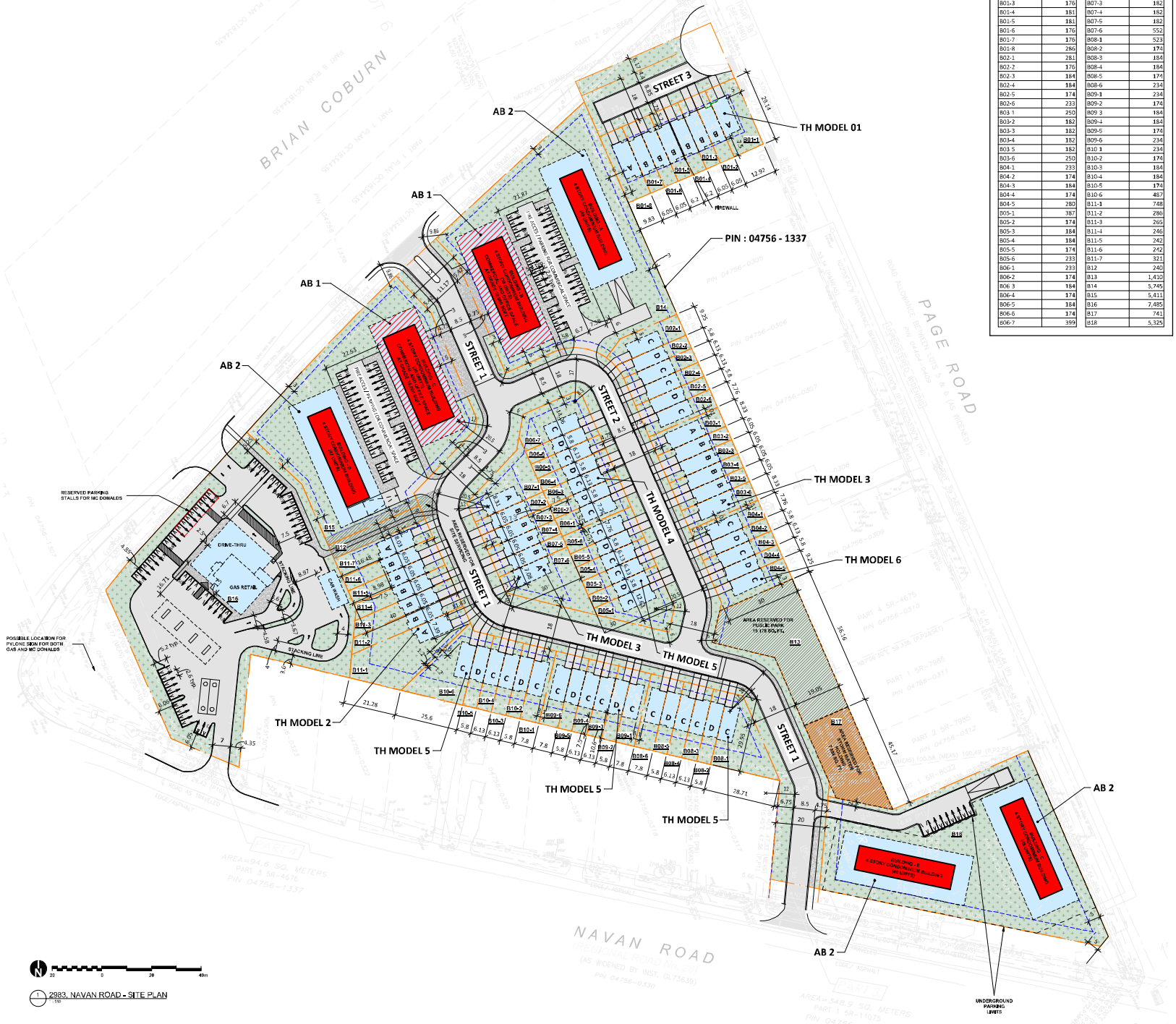
☐	Confirm consistency with subwatershed and Master Servicing Study, if applicable study exists.	Stantec 2005 EUC ISSU
☒	Storage requirements (complete with calculations) and conveyance capacity for minor events (1:2 year return period) and major events (1:100 year return period).	FSR (Section 4.0)
☐	Identification of watercourses within the proposed development and how watercourses will be protected, or, if necessary, altered by the proposed development with applicable approvals.	N/A
☒	Calculate pre- and post-development peak flow rates, including a description of existing site conditions and proposed impervious areas and drainage catchments in comparison to existing conditions.	FSR (Section 4.0)
☒	Any proposed diversion of drainage catchment areas from one outlet to another.	FSR (Section 4.0)
☒	Proposed minor and major systems, including locations and sizes of stormwater trunk sewers, and stormwater management facilities.	Drawings FOS, FSTM, FDST, FSMW
☐	If quantity control is not proposed, demonstration that downstream system has adequate capacity for the post-development flows up to and including the 100-year return period storm event.	Quantity control proposed per FSR (Section 4.0)
☐	Identification of potential impacts to receiving watercourses.	N/A
☐	Identification of municipal drains and related approval requirements.	N/A
☒	Description of how the conveyance and storage capacity will be achieved for the development.	FSR (Section 4.0)
☒	100 year flood levels and major flow routing to protect proposed development from flooding for establishing minimum building elevations (MBE) and overall grading.	SSR (Section 4.0) Drawings FOS, FSTM, FDST, FSMW
☒	Inclusion of hydraulic analysis, including hydraulic grade line elevations.	FSR (Section 4.0)
☒	Description of approach to erosion and sediment control during construction for the protection of receiving watercourse or drainage corridors.	SSR (Section 5.0)
☐	Identification of floodplains – proponent to obtain relevant floodplain information from the appropriate Conservation Authority. The proponent may be required to delineate floodplain elevations to the satisfaction of the Conservation Authority if such information is not available or if information does not match current conditions.	N/A
☐	Identification of fill constraints related to floodplain and geotechnical investigation.	N/A

4.5	APPROVAL AND PERMIT REQUIREMENTS	REFERENCE
The Servicing Study shall provide a list of applicable permits and regulatory approvals necessary for the proposed development, as well as the relevant issues affecting such approval. The approval and permitting shall include but not be limited to the following:		
☒	Conservation Authority as the designated approval agency for modification of floodplain, potential impact on fish habitat, proposed works in or adjacent to a watercourse, cut/fill permits and Approval under Lakes and Rivers Improvement Act. The Conservation Authority is not the approval authority for the Lakes and Rivers Improvement Act. Where there are Conservation Authority regulations in place, approval under the Lakes and Rivers Improvement Act is not required, except in cases of dams, as defined in the Act.	N/A
☐	Application for Environmental Compliance Approval (ECA) under the Ontario Water Resources Act.	As part of future submission
☐	Changes to Municipal Drains.	N/A
☐	Other permits (National Capital Commission, Parks Canada, Public Works and Government Services Canada, Ministry of Transportation, etc.).	N/A

4.6	CONCLUSION CHECKLIST	REFERENCE
☒	Clearly stated conclusions and recommendations.	FSR (Section 2.7, 3.6, 4.7)
☒	Comments received from review agencies, including the City of Ottawa and information on how the comments were addressed. Final sign-off from the responsible reviewing agency.	Comment Response Letter to City of Ottawa
☒	All draft and final reports shall be signed and stamped by a Professional Engineer registered in Ontario.	FSR All Drawings

Appendix B

Concept Plan, Draft Plan of Subdivision and Topographical Survey



1 2983, NAVAN ROAD - SITE PLAN
1:250

LOTS AREAS

LOT NUMBER	AREAS (M2)	LOT NUMBER	AREAS (M2)
B01-1	376	B07-1	444
B01-2	176	B07-2	182
B01-3	176	B07-3	182
B01-4	181	B07-4	182
B01-5	181	B07-5	182
B01-6	176	B07-6	552
B01-7	176	B08-1	523
B01-8	286	B08-2	174
B02-1	281	B08-3	184
B02-2	176	B08-4	184
B02-3	184	B08-5	174
B02-4	184	B08-6	234
B02-5	174	B09-1	234
B02-6	233	B09-2	174
B03-1	250	B09-3	184
B03-2	182	B09-4	184
B03-3	182	B09-5	174
B03-4	182	B09-6	234
B03-5	182	B10-1	234
B03-6	250	B10-2	174
B04-1	233	B10-3	184
B04-2	174	B10-4	184
B04-3	184	B10-5	174
B04-4	174	B10-6	487
B04-5	280	B11-1	748
B05-1	387	B11-2	286
B05-2	174	B11-3	265
B05-3	184	B11-4	246
B05-4	184	B11-5	242
B05-5	174	B11-6	242
B05-6	233	B11-7	321
B06-1	233	B12	240
B06-2	174	B13	1,410
B06-3	184	B14	5,745
B06-4	174	B15	5,411
B06-5	184	B16	7,485
B06-6	174	B17	741
B06-7	399	B18	5,325

SITE PLAN LEGEND

- EXISTING BUILDING
- NEW BUILDING
- NEW BUILDING WITH COMMERCIAL SPACE AT-GRADE
- GRASS
- ASPHALT
- LOT LINE
- SETBACKS
- NEW TREE
- FIREWALL
- 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 m² (5.34ha)
TOTAL DEVELOPABLE AREA: ~45,956.28 m² (4.59ha)
NET SITE AREA: ~38,956.28 m² (3.89ha)

UNITS

TOWNHOUSES: 69 UNITS
BLOCK 01:
- 1 X RESIDENTIAL APARTMENT BUILDING: 48 UNITS
- 1 X MIXED USE BUILDING
  - RESIDENTIAL: 36 UNITS
  - COMMERCIAL SPACES: ~929 m²

BLOCK 02:
- 1 X RESIDENTIAL APARTMENT BUILDING: 47 UNITS
- 1 X MIXED USE BUILDING
  - RESIDENTIAL: 36 UNITS
  - COMMERCIAL SPACES: ~929 m²

BLOCK 03:
- 2 X RESIDENTIAL APARTMENT BUILDING: 96 UNITS

TOTAL NUMBER OF UNITS: 332 UNITS
TOTAL COMMERCIAL SPACES: ~1,858 m²

	REQUIRED	PROVIDED
MAXIMUM DENSITY	NO MAX.	85.3 units/net ha
MINIMUM LOT WIDTH	NO MIN.	5.8 m
MINIMUM LOT AREA	NO MIN.	174 m²
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
MINIMUM 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
BLOCK 14:		
R12 - APARTEMENTS	1.2 p/unit = 101	101 (UNDERGROUND)
VISITOR:	0.2 p/unit = 17	17 (UNDERGROUND)
N79 - RETAIL STORE:	3.4 p/100 m² GFA = 32	32 (EXTERIOR)
		TOTAL: 150
BLOCK 15:		
R12 - APARTEMENTS	1.2 p/unit = 100	100 (UNDERGROUND)
VISITOR:	0.2 p/unit = 17	17 (UNDERGROUND)
N79 - RETAIL STORE:	3.4 p/100 m² GFA = 32	32 (EXTERIOR)
		TOTAL: 150
BLOCK 18:		
R12 - APARTEMENTS	1.2 p/unit = 116	145 (UNDERGROUND)
VISITOR:	0.2 p/unit = 17	17 (8 EXT. + 12 UND.)
		TOTAL: 162

GROSS FLOOR AREA

TOWNHOUSE A:	267 m²
TOWNHOUSE B:	239 m²
TOWNHOUSE C:	232 m²
TOWNHOUSE C (CORNER UNIT):	236 m²
TOWNHOUSE D:	225 m²
TOTAL MODEL 01 (ABBBBBBA)	1,968 m²
TOTAL MODEL 02 (ABBBBBA)	1,729 m²
TOTAL MODEL 03 (ABBBBA)	1,490 m²
TOTAL MODEL 04 (CDCDCDC)	1,611 m²
TOTAL MODEL 05 (CDCCDC)	1,386 m²
TOTAL MODEL 06 (CDCDC)	1,154 m²
MIXED USE BUILDING (TOTAL OF 2 BUILDINGS):	TOTAL: 4,130 m²
RESIDENTIAL:	3,201 m²
COMMERCIAL:	929 m²
RESIDENTIAL APARTMENT BUILDING (TOTAL OF 4 BUILDINGS) :	TOTAL: 4,130 m²
RESIDENTIAL:	4,130 m²

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
700, boul. Saint-Joseph, suite 100
Gatineau, QC J8Y 4B6

ARCHITECTURAL
PMA ARCHITECTES
(418) 861-9764
INFO@PMAARCHITECTES.COM
3070, chemin des Quatre-Bourgeois
Québec (QC) G1W 3K4
PMAARCHITECTES.COM

LAPALME RHEAULT ARCHITECTES ASSOCIÉS
62, boul. Saint-Raymond,
Gatineau, QC J8Y 1R3

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 — Peter Morton — Licence 8957 — 2022-04-14

REVISIONS

NO	DESCRIPTION	DATE
5	FOR COORDINATION	2022-04-14
4	FOR COORDINATION	2021-12-22
3	FOR COORDINATION	2021-12-20
2	FOR COORDINATION	2021-12-20
1	FOR COORDINATION	2021-12-16

NOTE

IT IS THE RESPONSIBILITY OF THE APPROPRIATE CONSTRUCTION AGENCY AND/OR ALL WORKING ON THE SITE AND TO IMPLEMENT ALL PRECAUTIONARY MEASURES TO THE ARCHITECT. ALL CONTRACTORS MUST CHECK ANY AND ALL PROJECT COSTS AND SITE DIMS. DO NOT SCALE DRAWINGS.

FOR COORDINATION
DO NOT USE FOR CONSTRUCTION
2022-04-14

DATE	DESIGNED
2022-04-14	PP
	DRAWN
	PP
PROJECT No	CHECKED
30054	PM

SHEET TITLE
SITE PLAN

SHEET No
A100

C:\Users\ppermelee\Documents\30054_DEV-NAVAN_CENTRAL_R21_ppermelee\WA53.rvt

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

THIS _____ DAY OF _____ 2022.

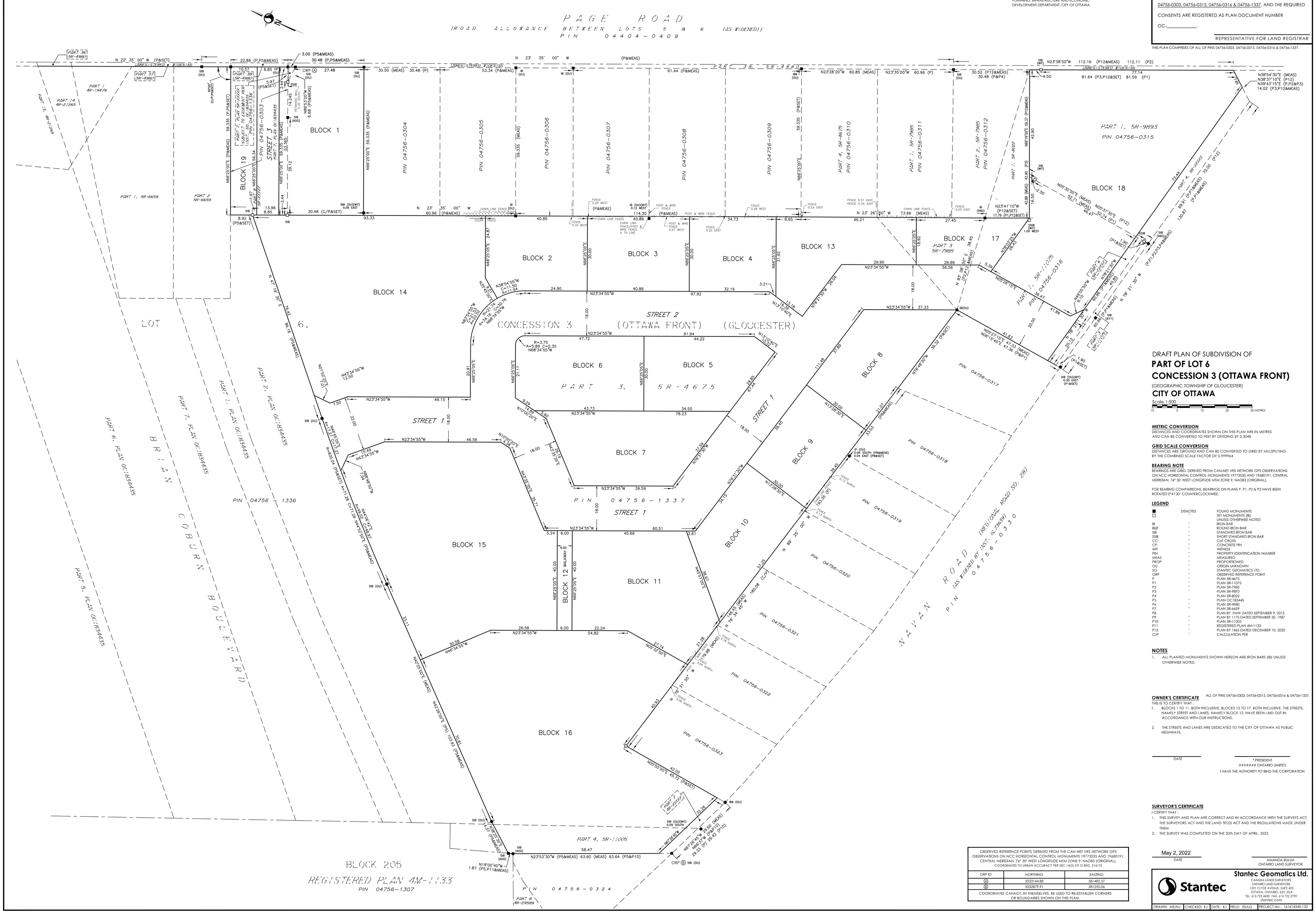
_____
STEPHEN WILLIS, MCIP, RPP, GENERAL MANAGER
PLANNING, INFRASTRUCTURE AND ECONOMIC
DEVELOPMENT DEPARTMENT, CITY OF OTTAWA

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 _____, 2022 AND ENTERED IN THE REGISTER FOR P.I.N.'s 04756-0303, 04756-0315, 04756-0316 & 04756-1337, AND THE REQUIRED CONSENTS ARE REGISTERED AS PLAN DOCUMENT NUMBER OC-_____.

_____
REPRESENTATIVE FOR LAND REGISTRAR

THIS PLAN COMPRISES OF ALL OF PINS 04756-0303, 04756-0315, 04756-0316 & 04756-1337.



DRAFT 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 SR-4675
P1	"	PLAN SR-11075
P2	"	PLAN SR-7985
P3	"	PLAN SR-9893
P4	"	PLAN SR-8022
P5	"	PLAN OC1834435
P6	"	PLAN SR-4990
P7	"	PLAN SR-6659
P8	"	PLAN BY PAW DATED SEPTEMBER 9, 2015
P9	"	PLAN BY 1175 DATED SEPTEMBER 30, 1987
P10	"	PLAN SB-1005
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.

OWNER'S CERTIFICATE

ALL OF PINS 04756-0303, 04756-0315, 04756-0316 & 04756-1337.

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 20th DAY OF APRIL, 2022.

May 2, 2022
DATE

AMANDA BULUA
ONTARIO LAND SURVEYOR

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.

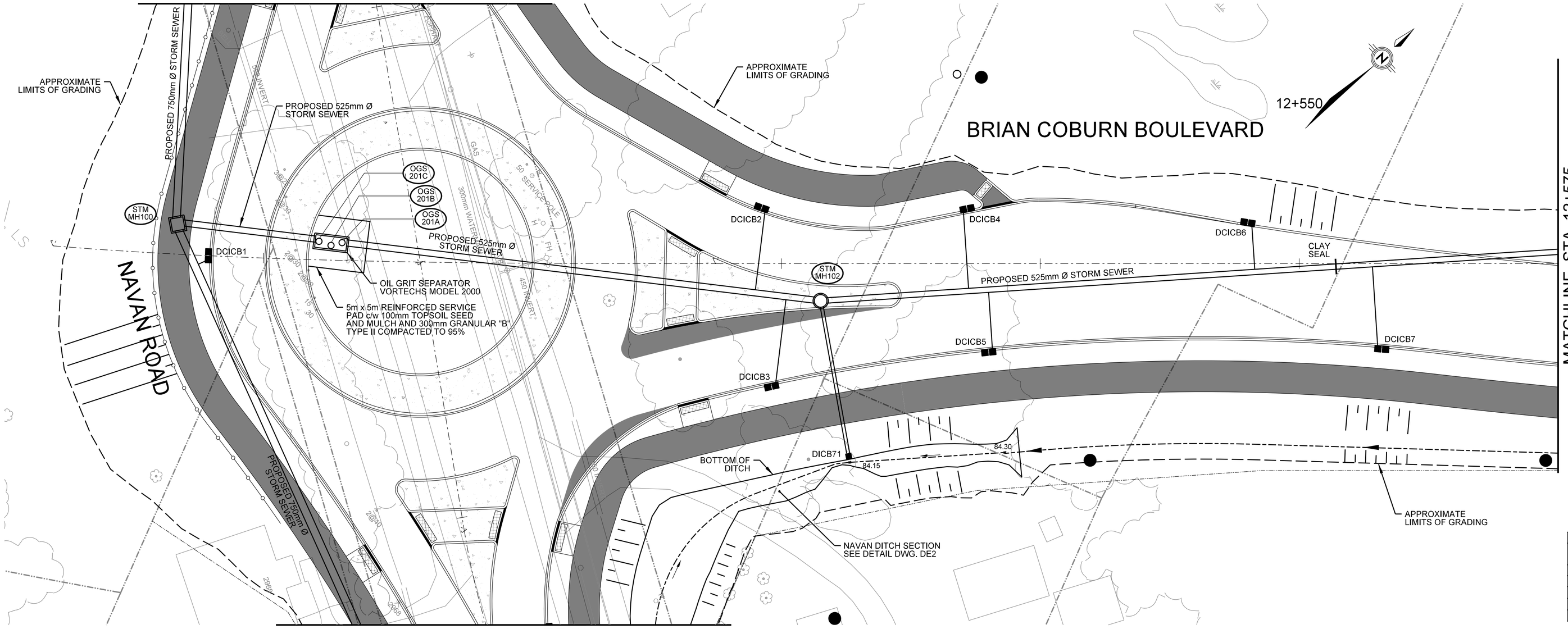
Stantec Geomatics Ltd.
CANADA LANDS SURVEYORS
ONTARIO LAND SURVEYORS
1331 CLYDE AVENUE, SUITE 400
OTTAWA, ONTARIO, K2C 3G4
TEL. 613.722.4420 FAX. 613.722.2799
stantec.com

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

Appendix C

Background Drawings –
Existing Infrastructure

FOR CONTINUATION SEE DWG. P18



FOR CONTINUATION SEE DWG. P19

BRIAN COBURN BOULEVARD
NEW ROAD CONSTRUCTION

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

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	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

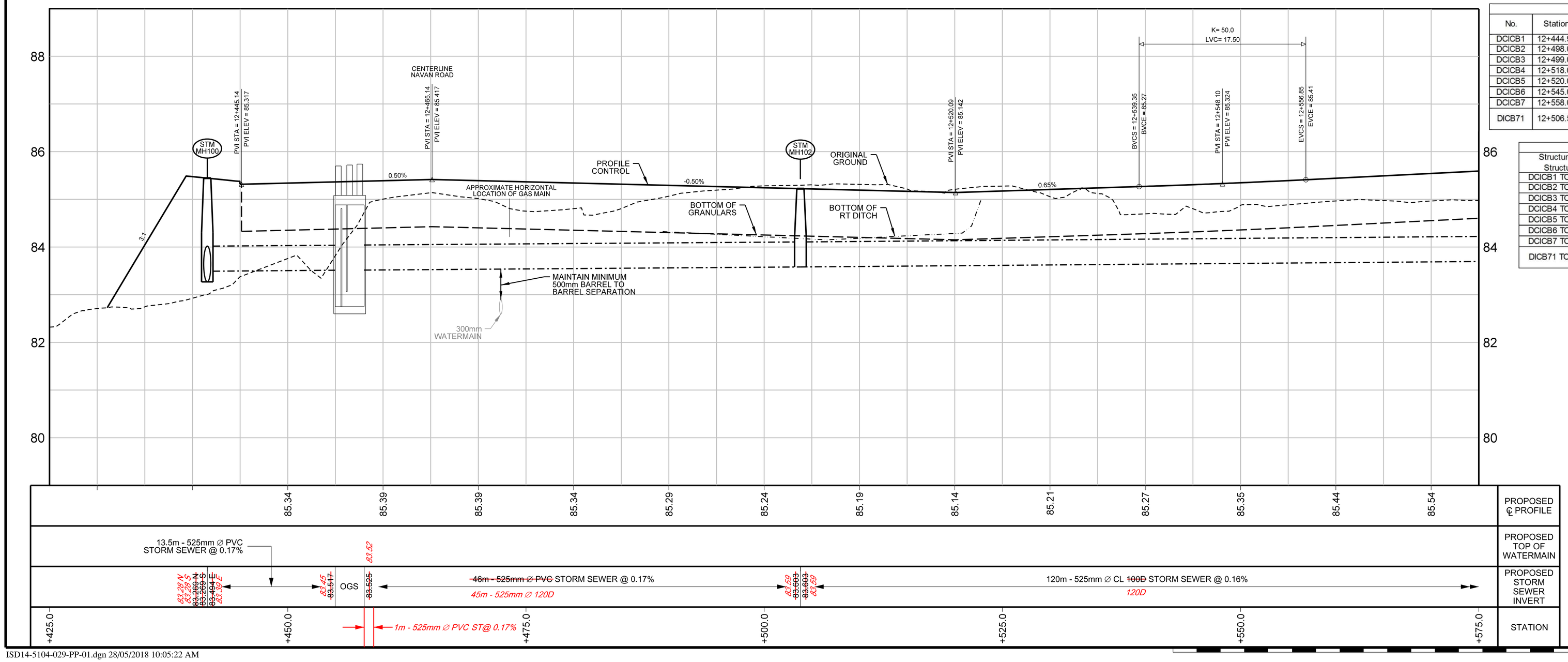
OGS - OIL GRIT SEPERATOR UNIT

CATCH BASIN DATA

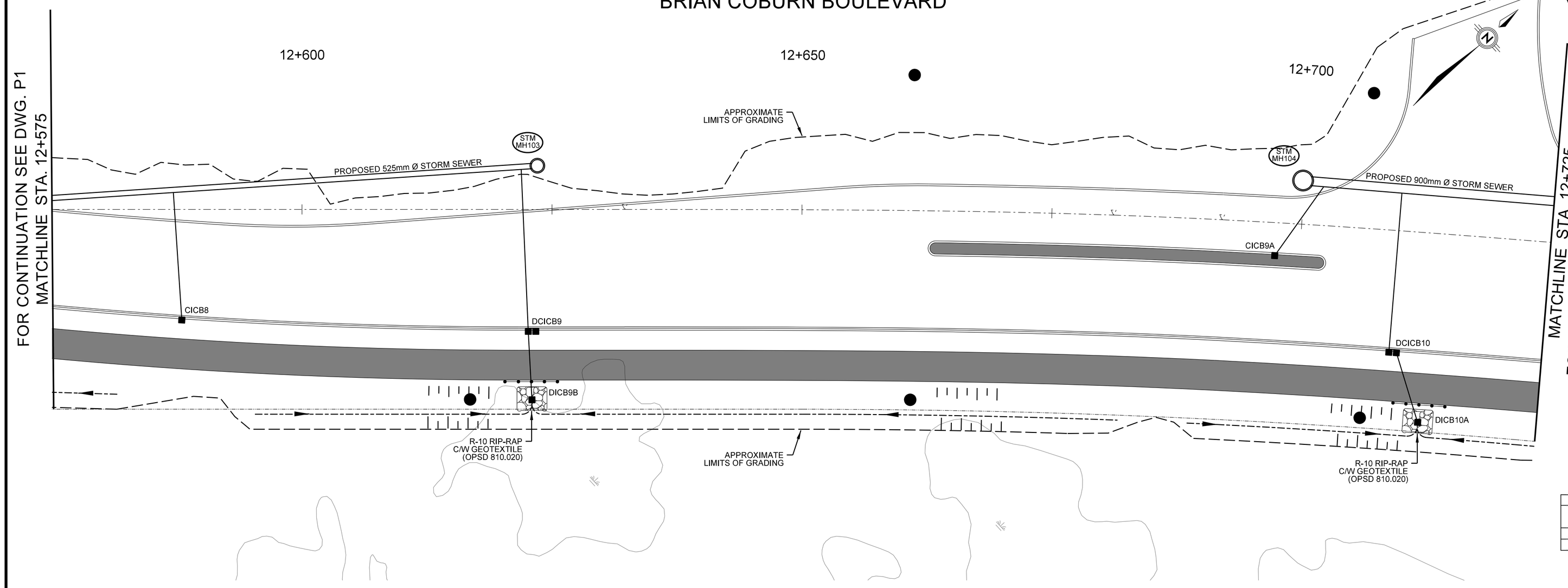
No.	Station	Offset (m)	Type		Elevations		Grate to Invert	ICD (L/s)
			Structure	Grate	Grate	Low Inv.		
DCICB1	12+444.99	0.00 L	705.020	S22 / S23 (2)	85.38	83.67	1.71	25
DCICB2	12+498.00	5.10 L	705.020	S22 / S23 (2)	85.33	83.90	1.43	20
DCICB3	12+499.00	11.56 R	705.020	S22 / S23 (2)	85.32	83.91	1.41	20
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	

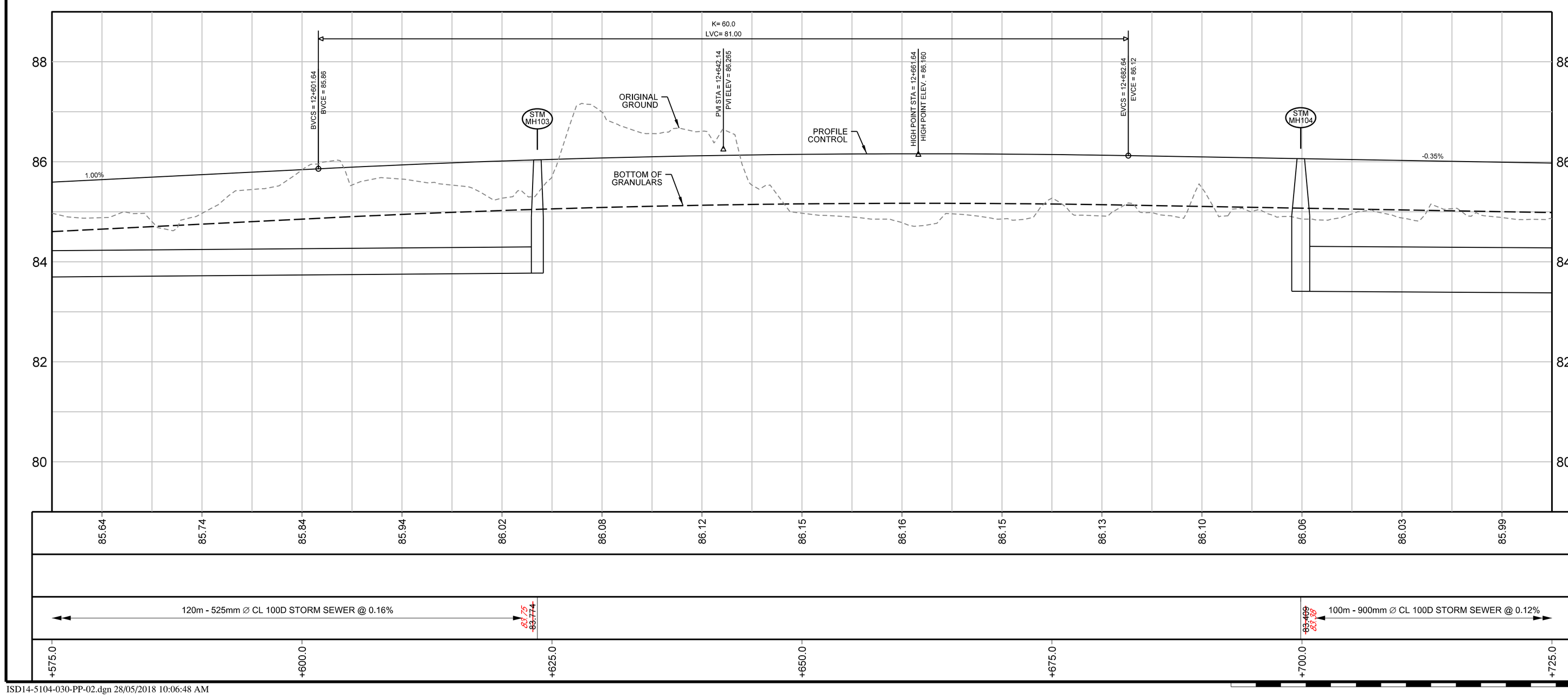
CATCH BASIN LEAD DATA

Structure to Structure	Dia.	Type	Length	Invert Elevations	
				Upstream	Downstream
DCICB1 TO MAIN	250mm	PVC	1.5	83.67	83.66
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

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	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

RECORD INFORMATION PROVIDED BY CITY OF OTTAWA

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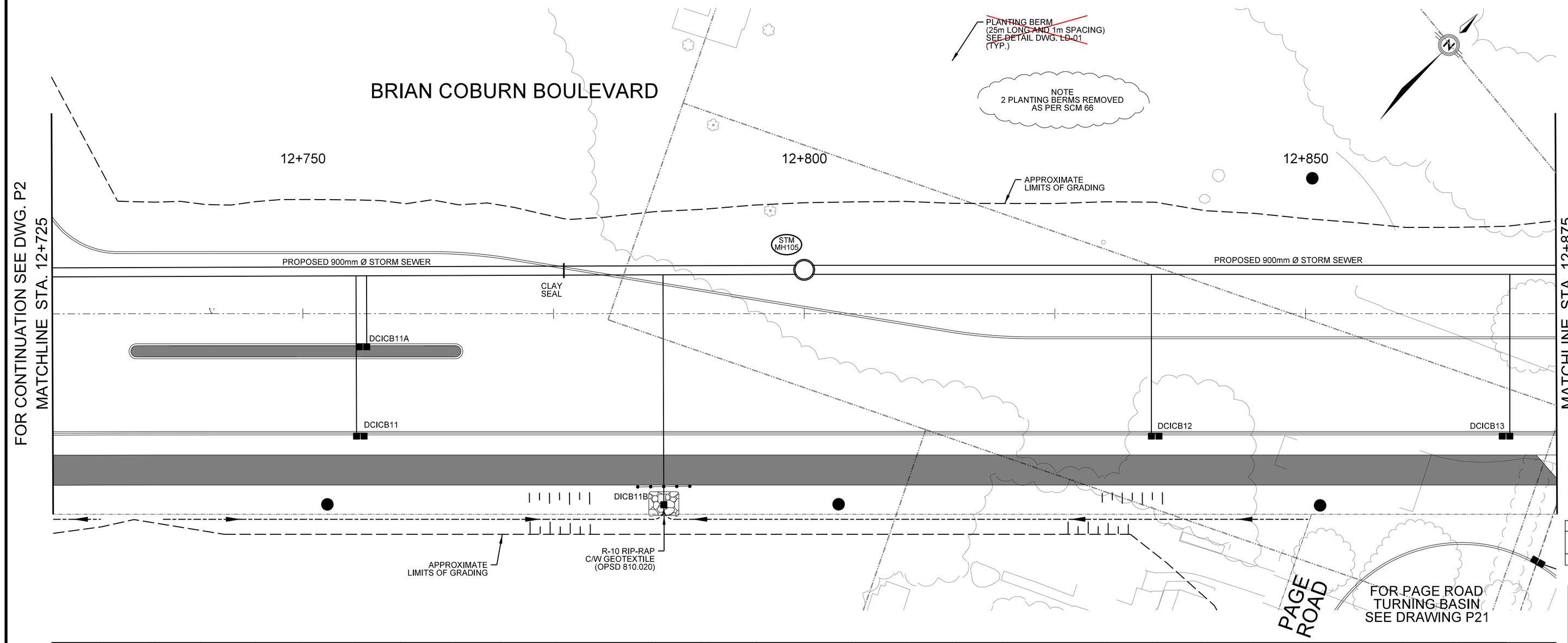
4	ISSUED FOR SCM NO. 67	R.C.	03.05.17
5	*AS BUILT*	*R.C.*	*30.03.18*



STORM MANHOLE DATA

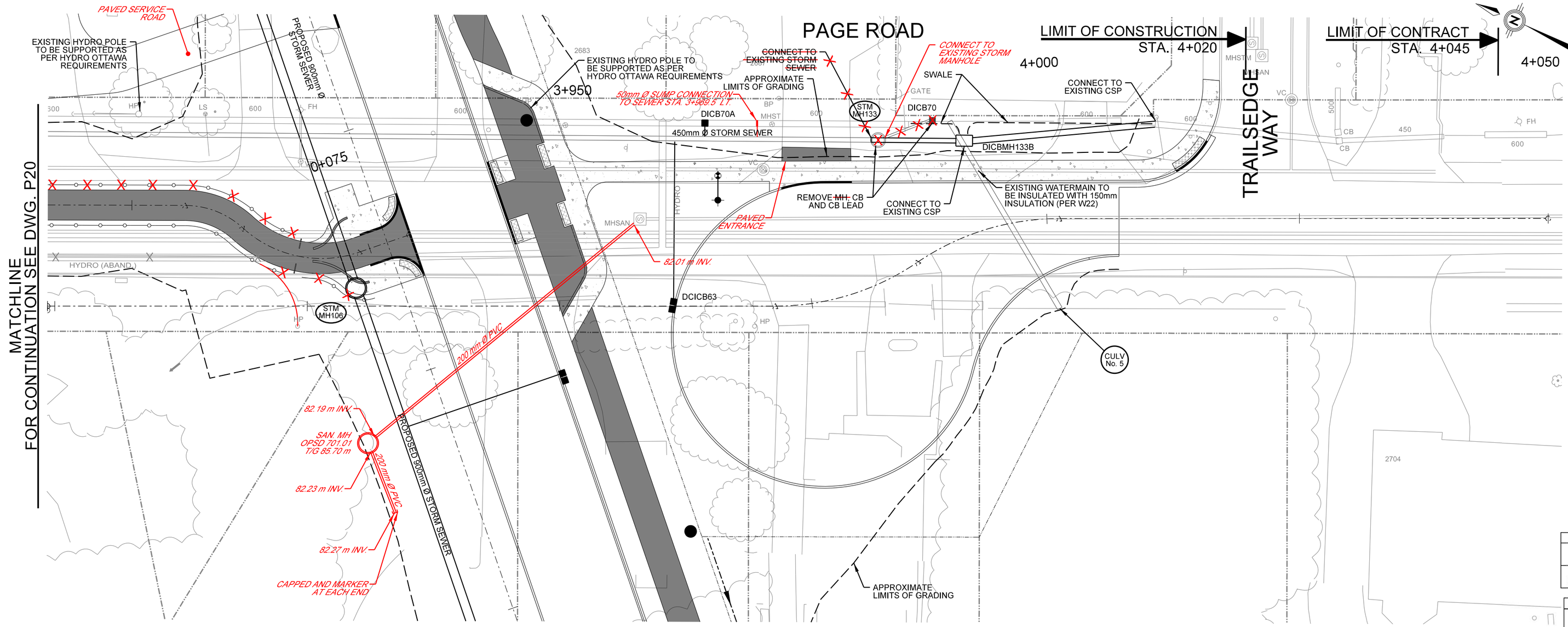
No.	Station	Offset (m)	Type		Elevations		Grate to Invert
			Structure	Cover	Grate	Low Inv.	
STM MH105	12+800.00	4.38 L	701.012	S24.1 / S25	85.95	83.29	2.66

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

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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

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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	~~84.69~~ *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.

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

Vinley CONSULTING ENGINEERS PLANNERS

FOREST VALLEY SANITARY SERVICING

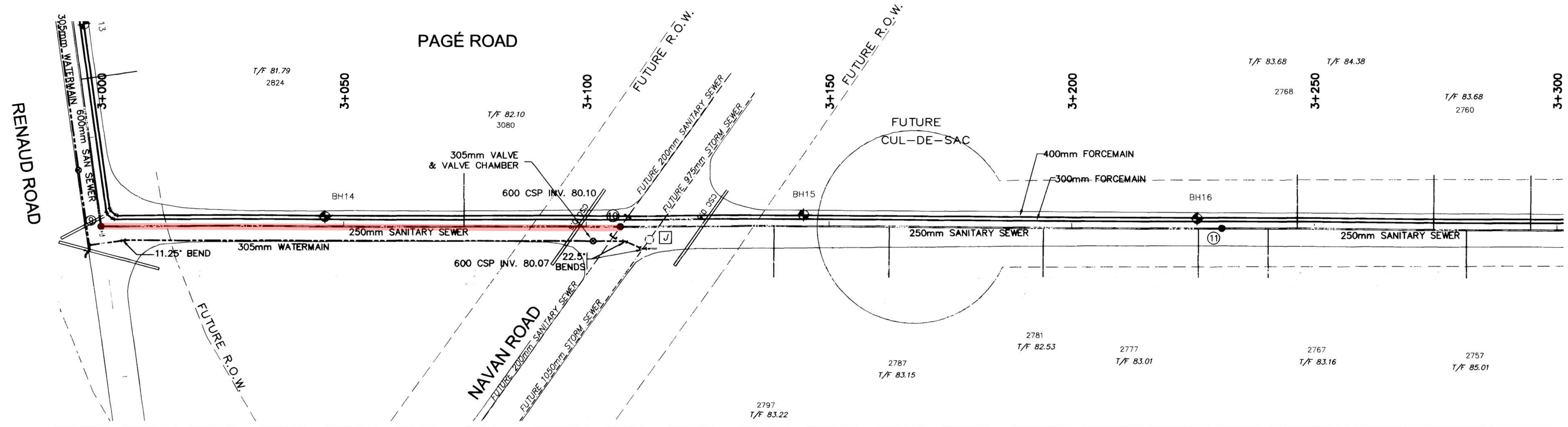
DUAL FORCEMAIN & SANITARY SEWER STA 3+000 – STA 3+300 PAGÉ ROAD

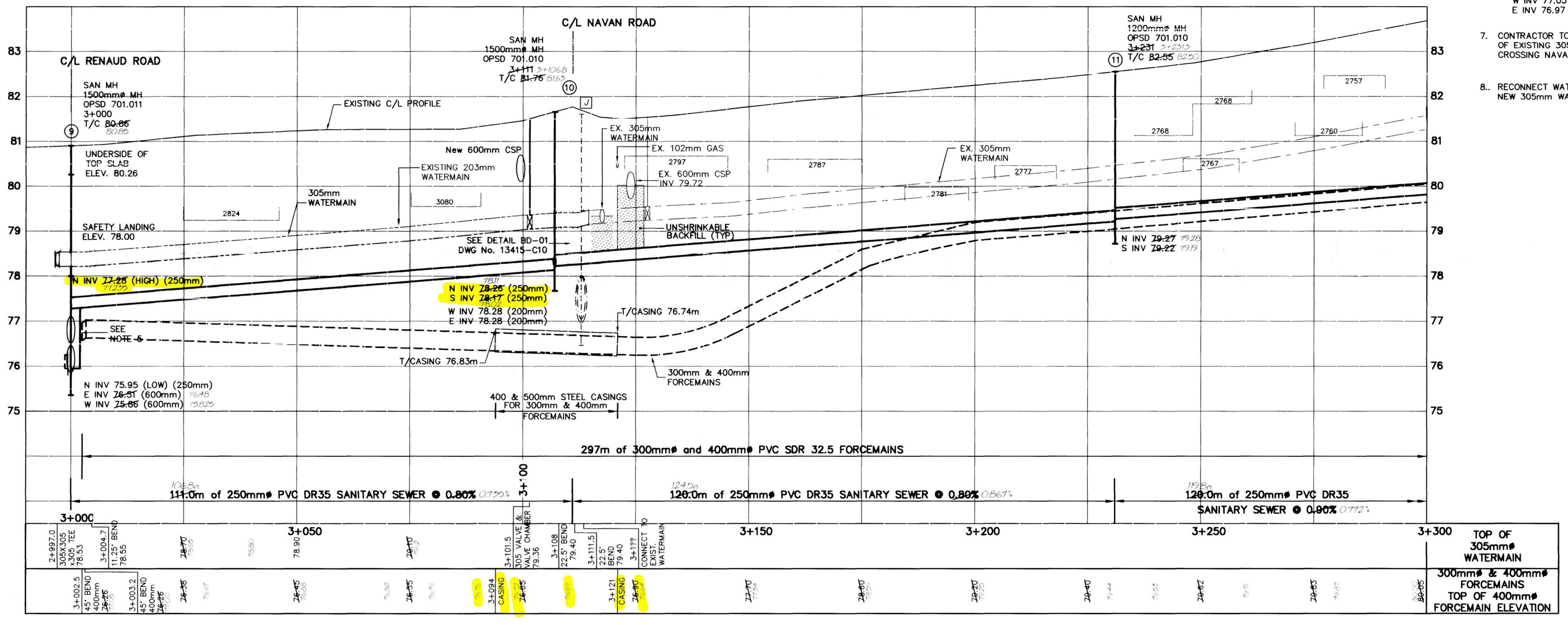
W. NEWELL, P.ENG. Director Infrastructure Services | *W. CLOUTHIER, P.ENG.* Manager Construction Services-Development

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:
   ☑ 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:
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+300 – STA 3+600 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-C7
SHEET 9 OF –
DATE MARCH 2005
SCALE Hor 0m 5 10m; Vert 0m 1m

PAGÉ ROAD

3+300 3+350 3+400 3+450 3+500 3+550 3+600

T/F 84.02 2752 | T/F 86.14 2742 | T/F 86.24 2738 | T/F 85.35 2726 | T/F 87.24 2722 | T/F 87.09 2714 | T/F 86.91 2704 | T/F 86.27 2690 | T/F 85.40 2684 | T/F 85.91 2680

FUTURE TRANSITWAY AND BY-PASS R.O.W. LIMIT (60m WIDE)

FUTURE STREET 7

400mm FORCEMAIN
300mm FORCEMAIN

BH17 | BH18 | BH19 | BH20

FUTURE CUL-DE-SAC

250mm SANITARY SEWER ⑫ 250mm SANITARY SEWER ⑬ 250mm SANITARY SEWER ⑭

2751 T/F 84.84 | 2745 T/F 85.80 | 2741 T/F 85.67 | 2727 T/F 85.65 | 2723 T/F 87.24 | 2709 T/F 86.22 | 2705 T/F 87.02 | 2701 T/F 86.71 | 2695 T/F 86.51 | 2687 T/F 85.79 | 2683 T/F 86.22 | 2679 T/F 86.26

FUTURE STREET 8

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.

87 86 85 84 83 82 81 80 79

SAN MH 1200mm⌀ MH OPSD 701.010 ⑫ 3+~~351~~ *3+350.11* T/C ~~84.95~~ *84.92*

SAN MH 1200mm⌀ MH OPSD 701.010 ⑬ 3+~~455.5~~ *3+456.5* T/C ~~86.05~~ *86.03*

SAN MH 1200mm⌀ MH OPSD 701.010 ⑭ 3+~~559.9~~ *3+560.18* T/C ~~85.05~~ *85.03*

EXISTING C/L PROFILE

EX. 305 WATERMAIN

2752 2751 2745 2742 2741 2738 2727 2726 2723 2722 2714 2709 2705 2704 2701 2695 2690 2687

N INV ~~81.12~~ *81.13*
S INV ~~81.07~~ *81.09*

S INV ~~81.80~~ *81.83*

N INV ~~80.28~~ *80.29*
S INV ~~80.23~~ *80.20*

400mm FORCEMAIN

300m of 300mm⌀ and 400mm⌀ PVC SDR 32.5 FORCEMAINS

119.8m 120.0m of 250mm⌀ PVC DR35 SANITARY SEWER @ ~~0.80%~~ *0.772%*

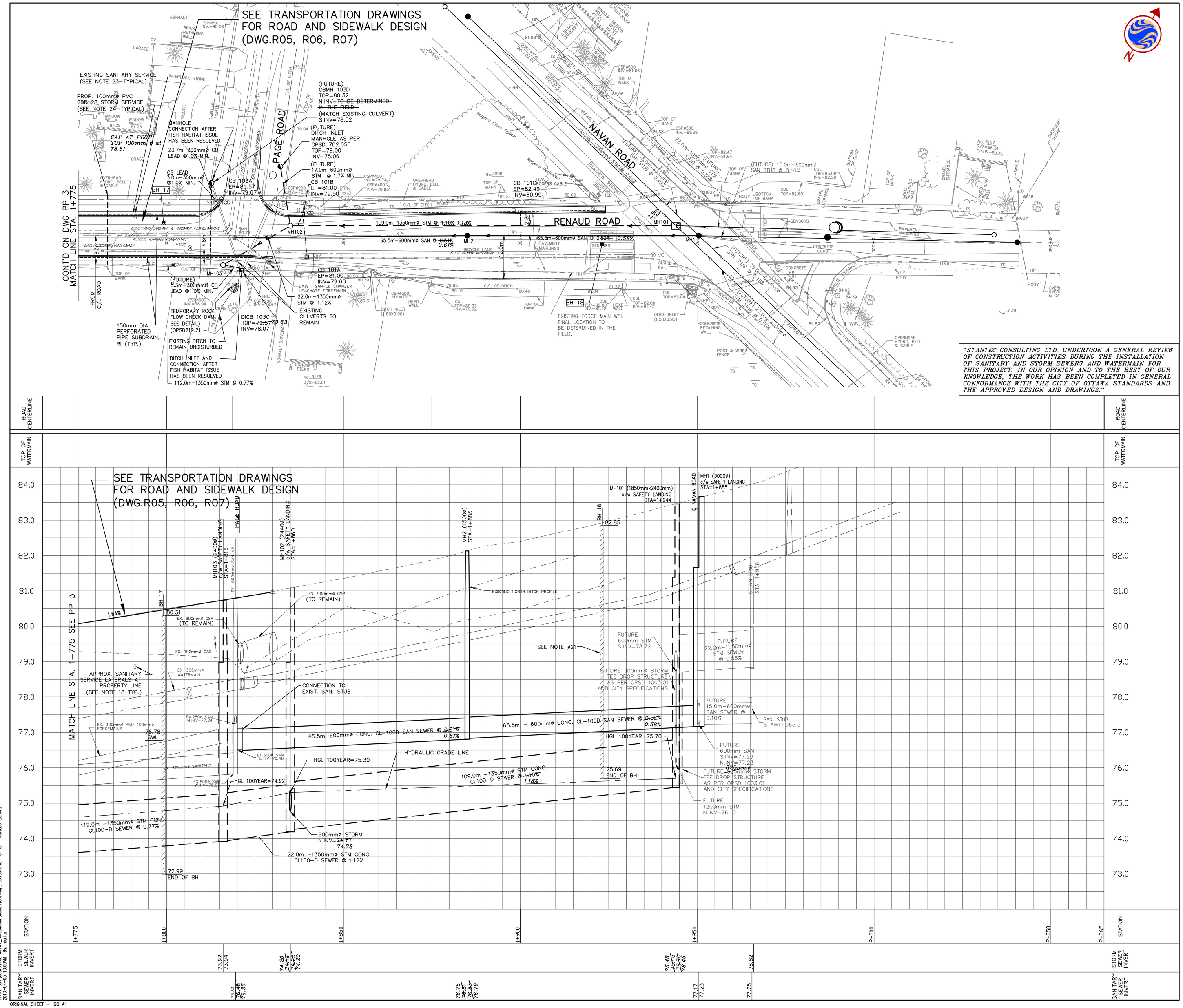
104.4m 104.5m of 250mm⌀ PVC DR35 SANITARY SEWER @ ~~0.80%~~ *0.776%*

107.3m 104.4m of 250mm⌀ PVC DR35 SANITARY SEWER @ ~~0.65%~~ *0.652%*

3+300 3+350 3+400 3+450 3+500 3+550 3+600

~~80.05~~ *80.06* | 80.15 | ~~80.28~~ | 80.42 | 80.50 | 80.56 | 80.66 | 80.70 | 80.82 | 80.89 | ~~80.91~~ | 80.95 | 81.02 | 81.10 | 81.19 | 81.26 | 81.34 | ~~81.42~~ | 81.44 | 81.50

300mm⌀ & 400mm⌀ FORCEMAINS TOP OF 400mm⌀ FORCEMAIN ELEVATION



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 1:50V

Drawing No. PP-4

Sheet 6 of 12

Revision 7

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 Townhouses (TH)	RESIDENTIAL UNITS Condo Units (CU)	POP'N	NON-RESIDENTIAL COMM (ha.)	AVERAGE DAILY DEMAND (l/s) Res.	Non-res.	Total	MAXIMUM DAILY DEMAND (l/s) Res.	Non-res.	Total	PEAK HOUR DEMAND (l/s) Res.	Non-res.	Total
NAVAN ROAD													
J-1	0	0	0	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
J-2	8	0	22	0.00	0.07	0.00	0.07	0.18	0.00	0.18	0.39	0.00	0.39
J-3	0	48	86	0.00	0.28	0.00	0.28	0.70	0.00	0.70	1.54	0.00	1.54
J-4	0	36	65	0.09	0.21	0.03	0.24	0.53	0.05	0.57	1.16	0.08	1.24
J-5	0	36	65	0.09	0.21	0.03	0.24	0.53	0.05	0.57	1.16	0.08	1.24
J-6	0	47	85	0.00	0.27	0.00	0.27	0.69	0.00	0.69	1.51	0.00	1.51
J-7	19	0	51	0.00	0.17	0.00	0.17	0.42	0.00	0.42	0.91	0.00	0.91
J-8	30	0	81	0.00	0.26	0.00	0.26	0.66	0.00	0.66	1.44	0.00	1.44
J-9	12	0	32	0.00	0.11	0.00	0.11	0.26	0.00	0.26	0.58	0.00	0.58
J-10	0	96	173	0.00	0.56	0.00	0.56	1.40	0.00	1.40	3.08	0.00	3.08
J-11	0	0	0	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
J-12	0	0	0	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
J-13	0	0	0	0.37	0.00	0.12	0.12	0.00	0.18	0.18	0.00	0.32	0.32
J-14	0	0	0	0.37	0.00	0.12	0.12	0.00	0.18	0.18	0.00	0.32	0.32
TOTALS	69	263	660	0.93	**2.14**	**0.30**	**2.44**	**5.34**	**0.45**	**5.79**	**11.76**	**0.81**	**12.57**

ASSUMPTIONS

RESIDENTIAL DENSITIES

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

p / p / u

p / p / u

AVG. DAILY DEMAND

- Residential 280 l / cap / day
- Institutional 28,000 l / ha / day
- Commercial 28,000 l / ha / day

MAX. DAILY DEMAND

- Residential 700 l / cap / day
- Institutional 42,000 l / ha / day
- Commercial 42,000 l / ha / day

MAX. HOURLY DEMAND

- Residential 1,540 l / cap / day
- Institutional 75,600 l / ha / day
- Commercial 75,600 l / ha / day

LOTS AREAS

LOT NUMBER	AREAS (M2)	LOT NUMBER	AREAS (M2)
B01-1	376	B07-1	444
B01-2	176	B07-2	182
B01-3	176	B07-3	182
B01-4	181	B07-4	182
B01-5	181	B07-5	182
B01-6	176	B07-6	552
B01-7	176	B08-1	523
B01-8	286	B08-2	174
B02-1	281	B08-3	184
B02-2	176	B08-4	184
B02-3	184	B08-5	174
B02-4	184	B08-6	234
B02-5	174	B09-1	234
B02-6	233	B09-2	174
B03-1	250	B09-3	184
B03-2	182	B09-4	184
B03-3	182	B09-5	174
B03-4	182	B09-6	234
B03-5	182	B10-1	234
B03-6	250	B10-2	174
B04-1	233	B10-3	184
B04-2	174	B10-4	184
B04-3	184	B10-5	174
B04-4	174	B10-6	487
B04-5	280	B11-1	748
B05-1	387	B11-2	286
B05-2	174	B11-3	265
B05-3	184	B11-4	246
B05-4	184	B11-5	242
B05-5	174	B11-6	242
B05-6	233	B11-7	321
B06-1	233	B12	240
B06-2	174	B13	1,410
B06-3	184	B14	5,745
B06-4	174	B15	5,411
B06-5	184	B16	7,485
B06-6	174	B17	741
B06-7	399	B18	5,325

SITE PLAN LEGEND

- EXISTING BUILDING
- NEW BUILDING
- NEW BUILDING WITH COMMERCIAL SPACE AT-GRADE
- GRASS
- ASPHALT
- LOT LINE
- SETBACKS
- NEW TREE
- FIREWALL
- 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 m² (5.34ha)
TOTAL DEVELOPABLE AREA:		~45,956.28 m² (4.59ha)
NET SITE AREA:		~38,956.28 m² (3.89ha)
UNITS		
TOWNHOUSES:		69 UNITS
BLOCK 01:		
1 X RESIDENTIAL APARTMENT BUILDING		48 UNITS
1 X MIXED USE BUILDING		
RESIDENTIAL:		36 UNITS
COMMERCIAL SPACES:		~929 m²
BLOCK 02:		
1 X RESIDENTIAL APARTMENT BUILDING		47 UNITS
1 X MIXED USE BUILDING		
RESIDENTIAL:		36 UNITS
COMMERCIAL SPACES:		~929 m²
BLOCK 03:		
2 X RESIDENTIAL APARTMENT BUILDING		96 UNITS
TOTAL NUMBER OF UNITS:		332 UNITS
TOTAL COMMERCIAL SPACES:		~1,858 m²
	REQUIRED	PROVIDED
MAXIMUM DENSITY	NO MAX.	85.3 units/net ha
MINIMUM LOT WIDTH	NO MIN.	5.8 m
MINIMUM LOT AREA	NO MIN.	174 m²
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
BLOCK 14:		
R12 - APARTEMENTS	1.2 p/unit = 101	101 (UNDERGROUND)
VISITOR:	0.2 p/unit = 17	17 (UNDERGROUND)
N79 - RETAIL STORE:	3.4 p/100 m² GFA = 32	32 (EXTERIOR)
		TOTAL: 150
BLOCK 15:		
R12 - APARTEMENTS	1.2 p/unit = 100	100 (UNDERGROUND)
VISITOR:	0.2 p/unit = 17	17 (UNDERGROUND)
N79 - RETAIL STORE:	3.4 p/100 m² GFA = 32	32 (EXTERIOR)
		TOTAL: 150
BLOCK 18:		
R12 - APARTEMENTS	1.2 p/unit = 116	145 (UNDERGROUND)
VISITOR:	0.2 p/unit = 17	17 (8 EXT. + 12 UND.)
		TOTAL: 162
GROSS FLOOR AREA		
TOWNHOUSE A:		267 m²
TOWNHOUSE B:		239 m²
TOWNHOUSE C:		232 m²
TOWNHOUSE C (CORNER UNIT):		236 m²
TOWNHOUSE D:		225 m²
TOTAL MODEL 01 (ABBBBBBA)		1,968 m²
TOTAL MODEL 02 (ABBBBBA)		1,729 m²
TOTAL MODEL 03 (ABBBBA)		1,490 m²
TOTAL MODEL 04 (CDCDCDC)		1,611 m²
TOTAL MODEL 05 (CDCCDC)		1,386 m²
TOTAL MODEL 06 (CDCDC)		1,154 m²
MIXED USE BUILDING (TOTAL OF 2 BUILDINGS):		TOTAL: 4,130 m²
RESIDENTIAL:		3,201 m²
COMMERCIAL:		929 m²
RESIDENTIAL APARTMENT BUILDING (TOTAL OF 4 BUILDINGS) :		TOTAL: 4,130 m²
RESIDENTIAL:		4,130 m²

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.

20 0 20 40m

1 2983, NAVAN ROAD - SITE PLAN
1 : 550

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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

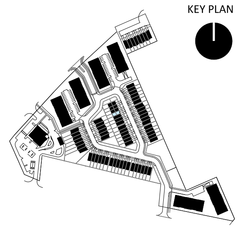
1565 CARLING AVENUE, SUITE 700,
OTTAWA, ON K1Z 8R1

SURVEYOR

Stantec

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

KEY PLAN



ARCHITECT SEAL

REVISIONS

NO	DESCRIPTION	DATE
4	FOR COORDINATION	2021-11-03
3	FOR COORDINATION	2021-09-30
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
2022-04-04

DATE 2022-04-04
DESIGNED PP
DRAWN PP
PROJECT No 20054
CHECKED PM

SHEET TITLE

SITE PLAN

SHEET No

A100

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

FUS Fire Flow Calculations

NAVAN ROAD DEVELOPMENT PROJECT - Commercial Building
(JLR 29899-000)

Step	Parameter	Value		Note
A	Type of Construction	Non-combustible		
	Coefficient (C)	0.8		
B	Ground Floor Area	686.22	m^2	Commercial area consisting of a Gas Retail and Drive Thru
C	Height in storeys	1	storeys	Basements are excluded.
	Total Floor Area	686.22	m^2	
D	Fire Flow Formula	$F=220C\sqrt{A}$		
	Fire Flow	4610	L/min	
	Rounded Fire Flow	5000	L/min	Flow rounded to nearest 1000 L/min.
E	Occupancy Class	Combustible		
	Occupancy Charge	0%		
	Occupancy Increase or Decrease	0		
	Fire Flow	5000	L/min	No rounding applied.
F	Sprinkler Protection	None		
	Sprinkler Credit	0%		
	Decrease for Sprinkler	0	L/min	
G	*North Side Exposure*			
	Exposing Wall:	Non-combustible		Gas Retail/Drive Thru
	Exposed Wall:	Wood Frame		4 Storey Condo Unit
	Length of Exposed Wall:	29.3	m	
	Height of Exposed Wall:	4	storeys	
	Length-Height Factor	117.2	m-storeys	
	Separation Distance	29.5	m	
	North Side Exposure Charge	10%		
	East Side Exposure			
	Exposing Wall:	Non-combustible		Gas Retail/Drive Thru
	Exposed Wall:	Non-combustible		Car Wash (East and South Face of Car Wash)
	Length of Exposed Wall:	21.8	m	
	Height of Exposed Wall:	1	storeys	
	Length-Height Factor	21.8	m-storeys	
	Separation Distance	16	m	
	East Side Exposure Charge	12%		
	South Side Exposure			
	Exposing Wall:	Non-combustible		
	Exposed Wall:	Wood Frame		
	Length of Exposed Wall:	7.5	m	
	Height of Exposed Wall:	2	storeys	
	Length-Height Factor	15.1	m-storeys	
	Separation Distance	46	m	Over 45 m to next structure
	South Side Exposure Charge	0%		
	West Side Exposure			
	Exposing Wall:	Non-combustible		Gas Retail/Drive Thru
	Exposed Wall:	Wood Frame		
	Length of Exposed Wall:		m	
	Height of Exposed Wall:		storeys	
	Length-Height Factor	0.0	m-storeys	
	Separation Distance		m	Over 200 m to next structure
	West Side Exposure Charge	0%		
	Total Exposure Charge	22%		The total exposure charge is below the maximum value of 75%.
	Increase for Exposures	1100	L/min	
H	Fire Flow	6100	L/min	
	Rounded Fire Flow	6000	L/min	Flow rounded to nearest 1000 L/min.
City Cap	**Required Fire Flow (RFF)**	**6000**	**L/min**	
		100	**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 - Commercial Building
(JLR 29899-000)

Step	Parameter	Value		Note
A	Type of Construction	Wood Frame		Building A
	Coefficient (C)	1.5		
B	Ground Floor Area	1033	m^2	4 Story Condominium Building
C	Height in storeys	4	storeys	Basements are excluded.
	Total Floor Area	4132	m^2	
D	Fire Flow Formula	$F=220C\sqrt{A}$		
	Fire Flow	21213	L/min	
	Rounded Fire Flow	21000	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	-3150		
	Fire Flow	17850	L/min	No rounding applied.
F	Sprinkler Protection	Automatic Fully Supervised		
	Sprinkler Credit	-50%		
	Decrease for Sprinkler	-8925	L/min	
G	*North Side Exposure*			
	Exposing Wall:	Wood Frame		Building A (4 Story Condo Unit)
	Exposed Wall:	Wood Frame		Proposed 8 Unit ROW townhouse & existing single house
	Length of Exposed Wall:	35.0	m	
	Height of Exposed Wall:	1	storeys	
	Length-Height Factor	35.0	m-storeys	
	Separation Distance	10.4	m	
	North Side Exposure Charge	13%		
	East Side Exposure			
	Exposing Wall:	Wood Frame		Building A (4 Story Condo Unit)
	Exposed Wall:	Wood Frame		Proposed 6 Unit ROW townhouse
	Length of Exposed Wall:	15.0	m	
	Height of Exposed Wall:	2	storeys	
	Length-Height Factor	30.0	m-storeys	
	Separation Distance	25.7	m	
	East Side Exposure Charge	8%		
	South Side Exposure			
	Exposing Wall:	Wood Frame		Building A (4 Story Condo Unit)
	Exposed Wall:	Wood Frame		Building B (4 Story Condo Unit)
	Length of Exposed Wall:	40.0	m	
	Height of Exposed Wall:	4	storeys	
	Length-Height Factor	160.0	m-storeys	
	Separation Distance	21	m	
	South Side Exposure Charge	10%		
	West Side Exposure			
	Exposing Wall:	Wood Frame		Building A (4 Story Condo Unit)
	Exposed Wall:	Wood Frame		No structure within 50 m
	Length of Exposed Wall:	0.0	m	
	Height of Exposed Wall:	0	storeys	
	Length-Height Factor	0.0	m-storeys	
	Separation Distance	50	m	Over 50m away from any structure
	West Side Exposure Charge	0%		
	Total Exposure Charge	31%		The total exposure charge is below the maximum value of 75%.
	Increase for Exposures	5534	L/min	
H	Fire Flow	14459	L/min	
	Rounded Fire Flow	14000	L/min	Flow rounded to nearest 1000 L/min.
City Cap	**Required Fire Flow (RFF)**	**14000**	**L/min**	
		233	**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 - Commercial Building
(JLR 29899-000)

Step	Parameter	Value		Note
A	Type of Construction	Wood Frame		Building C (4 Story Condominium Building)
	Coefficient (C)	1.5		
B	Ground Floor Area	1033	m^2	
C	Height in storeys	4	storeys	Basements are excluded.
	Total Floor Area	4132	m^2	
D	Fire Flow Formula	$F=220C\sqrt{A}$		
	Fire Flow	21213	L/min	
	Rounded Fire Flow	21000	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	-3150		
	Fire Flow	17850	L/min	No rounding applied.
F	Sprinkler Protection	Automatic Fully Supervised		
	Sprinkler Credit	-50%		
	Decrease for Sprinkler	-8925	L/min	
G	*North Side Exposure*			
	Exposing Wall:	Wood Frame		Building C (4 Story Condominium Building)
	Exposed Wall:	Wood Frame		Existing 1 story house
	Length of Exposed Wall:	42.0	m	
	Height of Exposed Wall:	2	storeys	
	Length-Height Factor	84.0	m-storeys	
	Separation Distance	26	m	
	North Side Exposure Charge	9%		
	East Side Exposure			
	Exposing Wall:	Wood Frame		Building C (4 Story Condominium Building)
	Exposed Wall:	Wood Frame		No structure within 50 meters
	Length of Exposed Wall:	0.0	m	
	Height of Exposed Wall:	0	storeys	
	Length-Height Factor	0.0	m-storeys	
	Separation Distance	50	m	
	East Side Exposure Charge	0%		
	South Side Exposure			
	Exposing Wall:	Wood Frame		Building C (4 Story Condominium Building)
	Exposed Wall:	Wood Frame		Building E (4 Story Condominium Building)
	Length of Exposed Wall:	36.0	m	
	Height of Exposed Wall:	4	storeys	
	Length-Height Factor	144.0	m-storeys	
	Separation Distance	14.6	m	
	South Side Exposure Charge	15%		
	West Side Exposure			
	Exposing Wall:	Wood Frame		Building C (4 Story Condominium Building)
	Exposed Wall:	Wood Frame		Existing 1 story house
	Length of Exposed Wall:	11.1	m	
	Height of Exposed Wall:	1	storeys	
	Length-Height Factor	11.1	m-storeys	
	Separation Distance	13.6	m	
	West Side Exposure Charge	12%		
	Total Exposure Charge	36%		The total exposure charge is below the maximum value of 75%.
	Increase for Exposures	6426	L/min	
H	Fire Flow	15351	L/min	
	Rounded Fire Flow	15000	L/min	Flow rounded to nearest 1000 L/min.
City Cap	**Required Fire Flow (RFF)**	**15000**	**L/min**	
		250	**L/s**	

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

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.

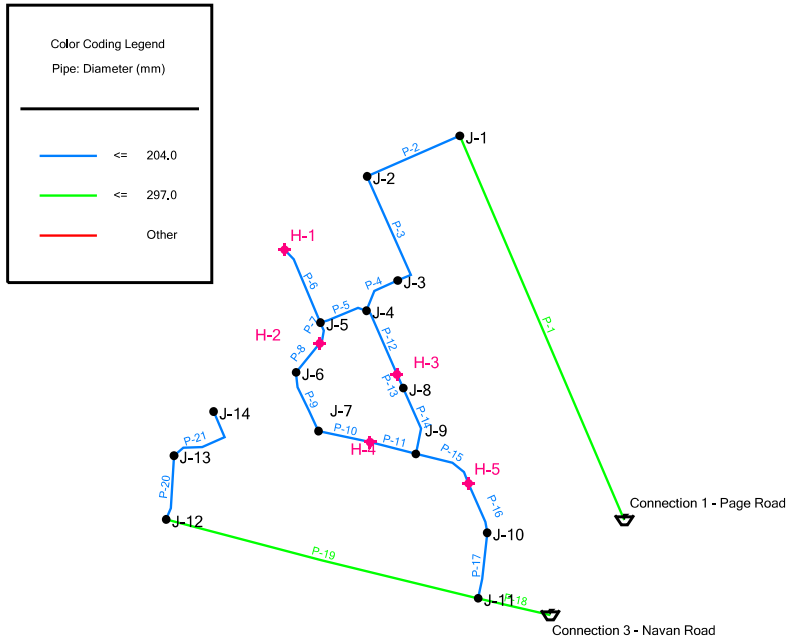
- Commercial Portion – Will the drive-thru/gas retail and car wash be of wood frame construction? Any fire protection?

Thank you,
Annie

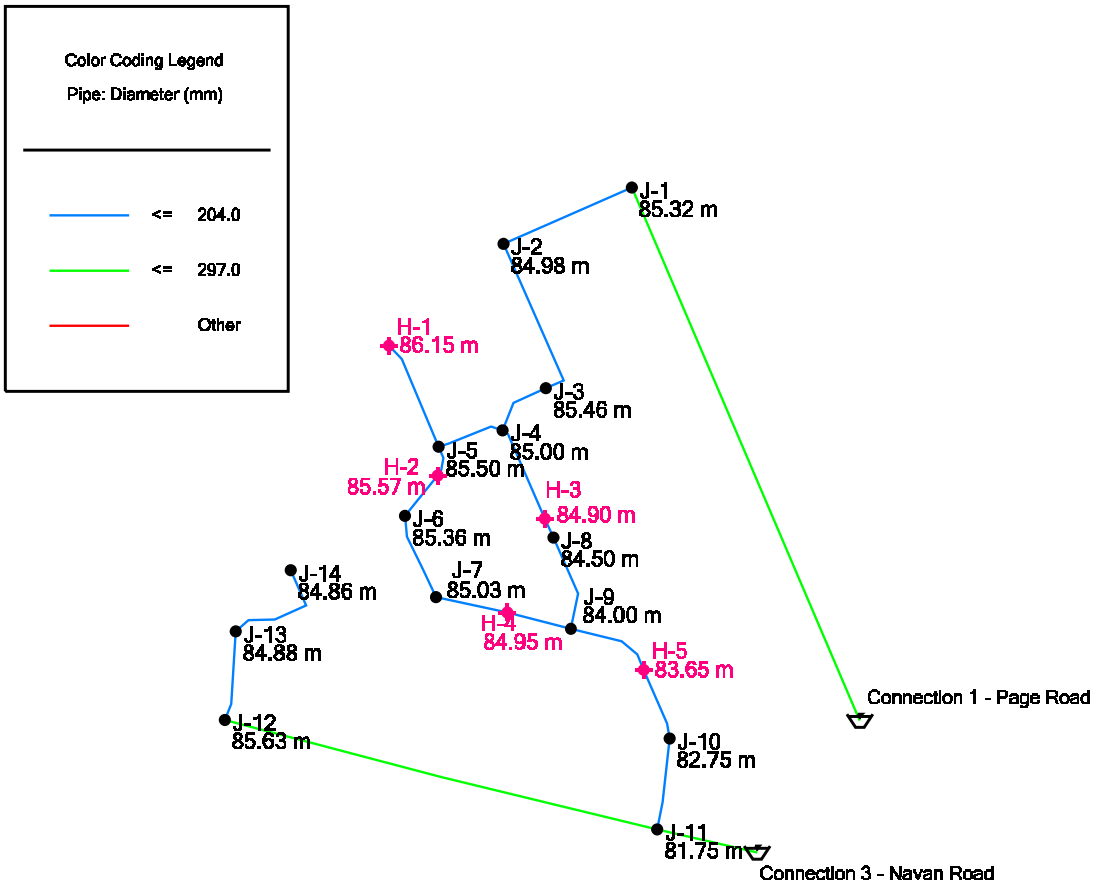
Appendix D2

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

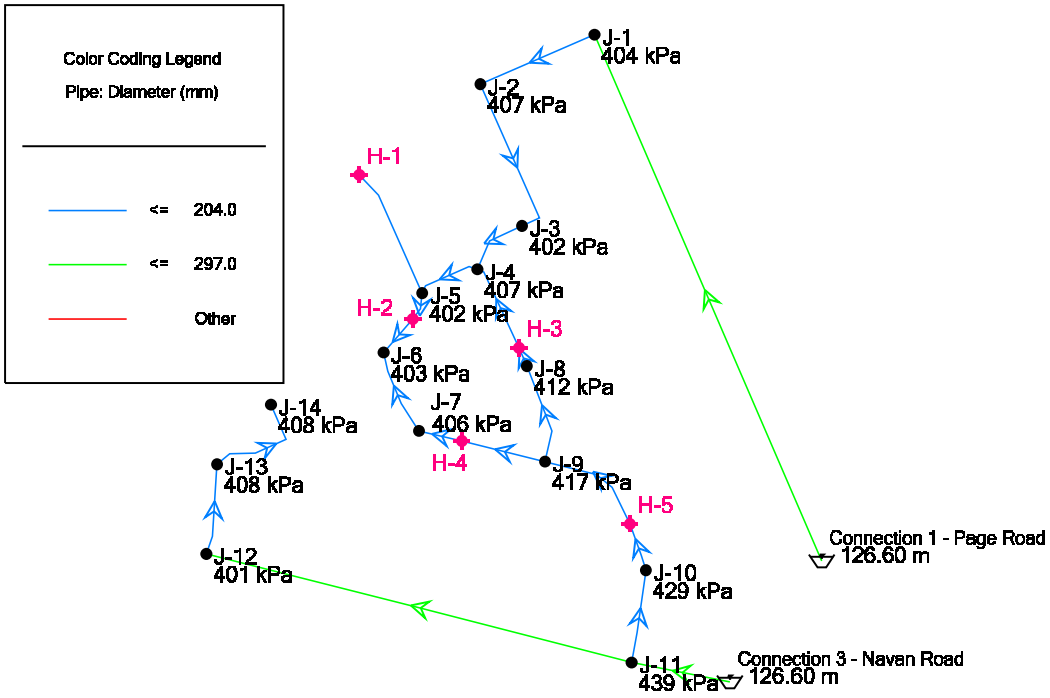
Disclaimer

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



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

Label	Elevation (m)	Demand (L/s)	Hydraulic Grade (m)	Pressure (kPa)
J-12	85.63	0.00	126.60	401
J-5	85.50	1.24	126.56	402
J-3	85.46	1.54	126.56	402
J-6	85.36	1.51	126.56	403
J-1	85.32	0.00	126.59	404
J-7	85.03	0.91	126.56	406
J-4	85.00	1.24	126.56	407
J-2	84.98	0.38	126.58	407
J-13	84.88	0.33	126.60	408
J-14	84.86	0.33	126.60	408
J-8	84.50	1.44	126.56	412
J-9	84.00	0.58	126.56	417
J-10	82.75	3.08	126.57	429
J-11	81.75	0.00	126.60	439

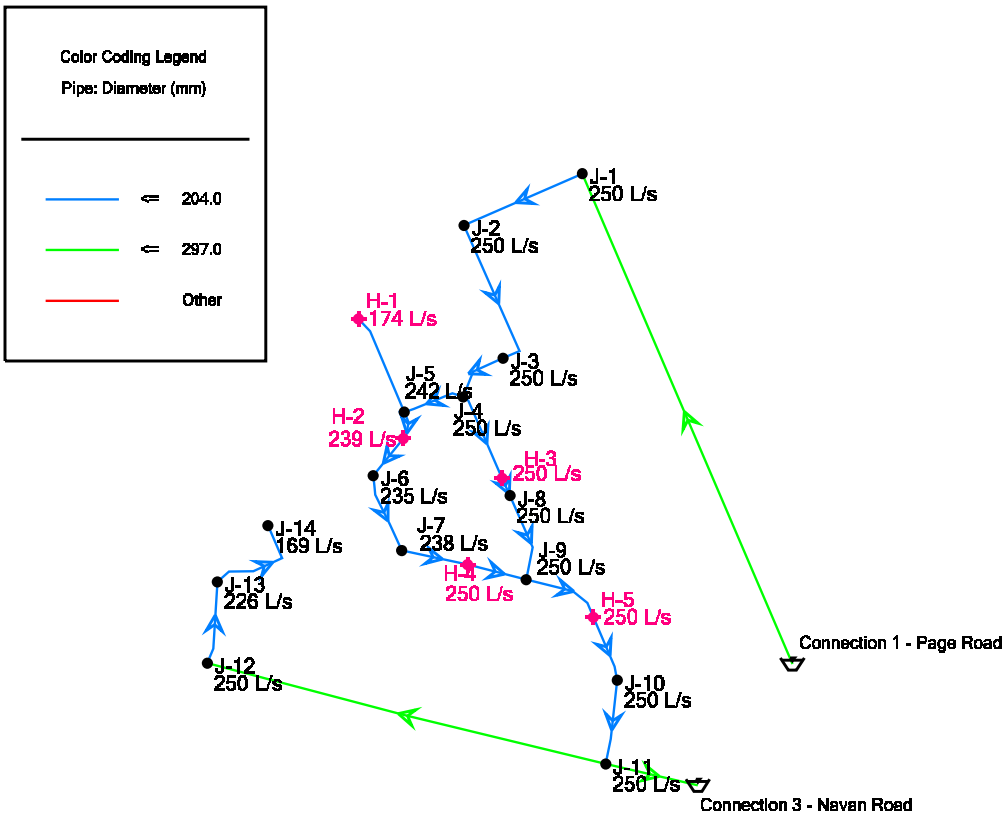
2983, 3053, and 3079 Navan Road and 2690 Page Road
Peak Hour Demand
Pipe Table

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)
86	P-8	25	204.0	PVC	110.0	126.56	126.56	0.57	0.02
85	P-7	16	204.0	PVC	110.0	126.56	126.56	0.57	0.02
52	P-5	36	204.0	PVC	110.0	126.56	126.56	1.81	0.06
82	P-6	75	204.0	PVC	110.0	126.56	126.56	0.00	0.00
54	P-9	48	204.0	PVC	110.0	126.56	126.56	-0.94	0.03
91	P-10	25	204.0	PVC	110.0	126.56	126.56	-1.85	0.06
51	P-4	37	204.0	PVC	110.0	126.56	126.56	2.84	0.09
104	P-12	51	204.0	PVC	110.0	126.56	126.56	-0.21	0.01
105	P-13	11	204.0	PVC	110.0	126.56	126.56	-0.21	0.01
57	P-14	56	204.0	PVC	110.0	126.56	126.56	-1.65	0.05
92	P-11	48	204.0	PVC	110.0	126.56	126.56	-1.85	0.06
50	P-3	93	204.0	PVC	110.0	126.58	126.56	4.38	0.13
108	P-15	64	204.0	PVC	110.0	126.56	126.57	-4.08	0.12
109	P-16	27	204.0	PVC	110.0	126.57	126.57	-4.08	0.12
49	P-2	70	204.0	PVC	110.0	126.59	126.58	4.77	0.15
48	P-1	320	297.0	PVC	120.0	126.60	126.59	4.77	0.07
62	P-21	64	204.0	PVC	110.0	126.60	126.60	0.33	0.01
61	P-20	51	204.0	PVC	110.0	126.60	126.60	0.66	0.02
65	P-19	245	297.0	PVC	120.0	126.60	126.60	0.66	0.01
97	P-17	52	204.0	PVC	110.0	126.57	126.60	-7.16	0.22
60	P-18	56	297.0	PVC	120.0	126.60	126.60	-7.82	0.11

Appendix D5

Simulation Results – Maximum Day + Fire Flow

2983, 3053, and 3079 Navan Road and 2690 Page Road
Max Day + Fire Flow Requirement



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

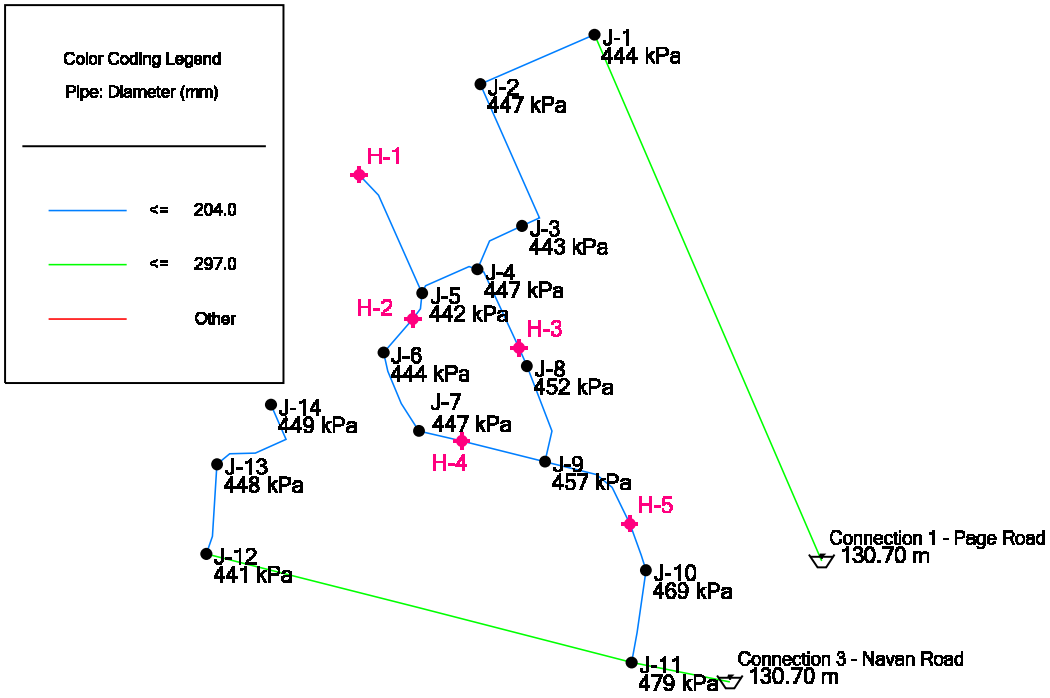
Max Day + Fire Flow Requirement

Label	ID	Fire Flow (Available) (L/s)	Flow (Total Available) (L/s)	Satisfies Fire Flow Constraints ?	Pressure (Residual Lower Limit) (kPa)	Pressure (Calculated System Lower Limit) (kPa)	Pressure (Calculated Residual) (kPa)	Junction w/ Minimum Pressure (System)
J-1	30	250	250	True	140	302	284	J-2
J-2	31	250	250	True	140	249	210	J-3
J-3	32	250	251	True	140	201	173	H-1
J-4	33	250	251	True	140	175	179	H-1
J-5	34	242	243	True	140	140	146	H-1
J-6	35	235	235	True	140	163	140	H-2
J-7	36	238	239	True	140	165	140	J-6
J-8	37	250	251	True	140	162	158	H-3
J-9	38	250	250	True	140	197	202	H-4
J-10	39	250	251	True	140	285	285	H-1
J-13	40	226	226	True	140	140	140	J-14
J-14	41	169	169	True	140	234	140	J-13
J-12	42	250	250	True	140	244	237	J-13
J-11	43	250	250	True	140	340	378	J-12
H-1	83	174	174	True	140	244	140	J-5
H-2	84	239	239	True	140	154	140	H-1
H-4	90	250	250	True	140	159	146	J-7
H-3	103	250	250	True	140	166	153	J-8
H-5	107	250	250	True	140	246	236	H-1

Appendix D6

Simulation Results – Maximum HGL

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



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

Label	Elevation (m)	Demand (L/s)	Hydraulic Grade (m)	Pressure (kPa)
J-12	85.63	0	130.70	441
J-5	85.50	0	130.70	442
J-3	85.46	0	130.70	443
J-6	85.36	0	130.70	444
J-1	85.32	0	130.70	444
J-7	85.03	0	130.70	447
J-4	85.00	0	130.70	447
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-8	84.50	0	130.70	452
J-9	84.00	0	130.70	457
J-10	82.75	0	130.70	469
J-11	81.75	0	130.70	479

2983, 3053, and 3079 Navan Road and 2690 Page Road
Maximum Pressure Analysis
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	320	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	93	204.0	PVC	110.0	130.70	130.70	0	0.00
51	P-4	37	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
82	P-6	75	204.0	PVC	110.0	130.70	130.70	0	0.00
85	P-7	16	204.0	PVC	110.0	130.70	130.70	0	0.00
86	P-8	25	204.0	PVC	110.0	130.70	130.70	0	0.00
54	P-9	48	204.0	PVC	110.0	130.70	130.70	0	0.00
91	P-10	25	204.0	PVC	110.0	130.70	130.70	0	0.00
92	P-11	48	204.0	PVC	110.0	130.70	130.70	0	0.00
104	P-12	51	204.0	PVC	110.0	130.70	130.70	0	0.00
105	P-13	11	204.0	PVC	110.0	130.70	130.70	0	0.00
57	P-14	56	204.0	PVC	110.0	130.70	130.70	0	0.00
108	P-15	64	204.0	PVC	110.0	130.70	130.70	0	0.00
109	P-16	27	204.0	PVC	110.0	130.70	130.70	0	0.00
97	P-17	52	204.0	PVC	110.0	130.70	130.70	0	0.00
60	P-18	56	297.0	PVC	120.0	130.70	130.70	0	0.00
65	P-19	245	297.0	PVC	120.0	130.70	130.70	0	0.00
61	P-20	51	204.0	PVC	110.0	130.70	130.70	0	0.00
62	P-21	64	204.0	PVC	110.0	130.70	130.70	0	0.00

Appendix E1

Wasterwater – EUC ISSU
Design Excerpts

SANITARY SEWER CALCULATION SHEET

LOCATION FROM M.H.	TO M.H.	RESIDENTIAL AREA (ha)	RESIDENTIAL POP.	CUMULATIVE AREA (ha)	CUMULATIVE POP.	PEAK FACT.	PEAK FLOW (L/s)	COMM AREA (ha)	COMM ACCU. AREA (ha)	INDUST AREA (ha)	INDUST ACCU. AREA (ha)	INDUST PEAK FACTOR (per MOE)	INST AREA (ha)	INST ACCU. AREA (ha)	C+I+I PEAK FLOW (L/s)	PEAK FLOW TOTAL AREA (ha)	PEAK FLOW ACCU. AREA (ha)	INFILT. FLOW (L/s)	TOTAL FLOW (L/s)	PIPE 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	1.82	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	237	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	18.98		0.00		0.00			0.00	0.00	19.75	28.20	7.90	26.88	320	250	254.0	0.24	30.39	87.4%	0.60	87.80	87.50	82.95	83.21	82.18	82.44		4.39	5.06
									0.00		0.00																								
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	56.10	2396	3.52	34.19		0.00		0.00		3.10	3.10	2.69	10.30	58.20	16.30	53.18	310	375	381.0	0.14	68.43	77.7%	0.60	87.80	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	27.58	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			3.10	2.69	2.40	68.50	19.18	62.81	295	375	381.0	0.14	68.43	91.8%	0.60	87.80	87.90	81.62	82.00	81.21	81.59		5.60	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	87.80	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	83.06	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	6.69
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	16.21	150	200	203.2	0.50	24.19	67.0%	0.76	86.80	86.90	81.45	81.65	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	4.86		0.00		0.00			0.00	0.00	6.45	6.45	1.83	6.38	85	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	106.50	275	525	533.4	0.10	141.87	75.1%	0.63	87.00	87.00	80.20	80.73	79.92	80.46		6.27	6.55
10A	10	14.80	731	14.80	731	3.48	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	5.45
11A	11	8.00	393	8.00	393	4.00	6.36		0.00		0.00			0.00	0.00	8.00	8.00	2.24	8.60	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	5.70		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	16	145.60	6931	3.11	87.34		0.00		0.00			8.30	7.20	1.90	153.90	43.09	137.63	230	600	609.6	0.100	202.56	68.0%	0.69	85.50	83.90	79.44	80.06	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	4.65	22	4.65	22	4.00	0.36		0.00		0.00			0.00	0.00	4.65	4.65	1.27	1.64	300		0.0		0.00	#DIV/0!	#DIV/0!	82.00	86.00		79.80		83.30		2.50	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		2.50	2.74
25F	25E	4.80	272	4.80	272	4.00	4.41		0.00		0.00			0.00	0.00	4.80	4.80	1.29	8.70	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	61	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	81.67	81.88	80.70	81.00		4.12	5.50
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	68.43	44.7%	0.60	86.50	86.50	80.62	81.00	80.21	80.59		5.50	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	68.43	68.3%	0.60	86.50	86.50	80.21	80.59	79.64	80.02		5.91	6.48
20	21	8.75	606	8.75	606	3.97	8.13		0.00		0.00		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
21	22	7.00	160	15.75	666	3.91	10.53		0.00	1.00	1.00	6.50	8.30	10.85	12.05	16.30	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
22	23	7.30	440	23.05	1106	3.77	16.89		0.00		1.00	6.50		10.85	12.05	7.30	34.90	9.77	36.71	275	300	304.8	0.19	43.97	86.0%	0.60	87.00	86.50	82.14	82.45	81.62	81.93		4.55	4.57
23B	23A	15.70	565	15.70	565	3.95	9.03		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
23A	23	9.40	584	25.10	1149	3.76	17.50		0.00		0.00			0.00	0.00	9.40	25.10	7.03	24.53	310	300	304.8	0.19	43.97	55.8%	0.60	86.00	86.50	81.02	81.32	80.43	80.73		4.68	5.77
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	85.79	78.4%	0.75	86.50	86.50	80.35	80.73	79.66	80.04		5.77	6.46
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	15.74	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	3.46	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	86.80	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	77.60	77.80		84.00		2.50	2.50
25	26	8.30	99	144.70	6099	3.24	66.75		0.00		11.40	4.15		14.15	31.45	8.30	170.25	47.67	146.87	380	600	609.6	0.10	202.55	72.0%	0.69	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	6.83		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	47.8%	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	6455	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%	0.69	86.50	83.90	78.79	79.40	78.07	78.68		7.10	6.22
12	13	0.60	32	300.60	12418	2.86	143.91	0.90	0.90		11.40	4.15		23.75	40.56	1.80	336.65	94.26	276.74	60	600	609.6	0.30	350.83	78.6%	1.20	83.90	82.50	78.07	78.68	77.89	78.50		6.22	4.00
13C	13	5.60	353	5.60	353	4.00	5.71		0.00		0.00			0.00	0.00	5.60	5.60	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	6.09		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	81.60	78.80	79.09	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	81.80	82.50	78.28	78.49	77.96	78.17		3.01	4.33
13	14	0.28	0	323.58	13175	2.83	151.30	0.54	1.44		11.40	4.15		23.75	41.03	0.80	360.15	100.84	293.17	100	600	609.6	0.40	405.10	72.4%	1.39	82.50	80.80	76.91	77.52	76.51	77.12	0.65	4.98	3.68
14	15	1.40	16	324.98	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	78.40	75.86	76.47	75.26	75.87	0.65	4.33	2.53
15	16	1.70	53	326.68	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	78.40	77.00	74.76	75.37	73.86	74.47	0.50	3.03	2.53
16	17	2.30	32	328.98	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	72.36	72.97		2.53	3.03
17	18	0.30	0	329.28	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	70.86	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	5.43	150	200	203.2	2.50	54.10	10.0%	1.67	83.50	79.00	80.26	80.46	76.51	76.71		3.04	2.29
31	32	1.40	34	6.20	286	4.00	4.63	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	68.30	68.51	0.21	2.50	2.50
32A	32	5.50	338	5.50	338	4.00	5.44		0.00		0.00			0.00	0.00	5.50	5.50	1.54	6.98	80	300	304.8	0.19	43.97	15.9%	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		4.61	4.72
33A	33	4.00	252	4.00	252	4.00	4.08		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	70.80	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	70.80	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	68.80	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	9.26	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	85	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	4.65
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	68.43	66.2%	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	2566	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	68.43	80.3%	0.60	72.00	76.00	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	68.43	85.3%	0.60	76.00	76.00	64.59	64.96	64.44	64.82		11.04	11.18

LOCATION FROM M.H.	TO M.H.	RESIDENTIAL AREA AND POPULATION AREA (ha)	POP.	CUMULATIVE AREA (ha)	CUMULATIVE POP.	PEAK FACT.	PEAK FLOW (L/s)	COMM AREA (ha)	COMM ACCU. AREA (ha)	INDUST AREA (ha)	INDUST ACCU. AREA (ha)	INDUST PEAK FACTOR (per MOE)	INST AREA (ha)	INST ACCU. AREA (ha)	C+I+I PEAK FLOW (L/s)
38A	38	3.00	174	3.00	174	4.00	2.82		0.00		0.00			0.00	0.00
38	39	3.40	182	58.44	3116	3.43	43.27		1.30		0.00			2.80	3.56
39	18	6.20	341	65.64	3457	3.39	47.46		1.30		0.00			2.80	3.56
50	51	8.20	656	8.20	656	3.95	8.88		0.00		0.00			0.00	0.00
51	52	4.10	236	12.30	790	3.86	12.36		0.00		0.00			0.00	0.00
52	18	4.70	174	17.00	964	3.81	14.88		0.00		0.00			0.00	0.00
18	19	0.00	0	411.90	17696	2.71	193.96		2.74		11.40			26.55	26.43
19	19A	0.00	0	411.90	17696	2.71	193.98		2.74		11.40	4.15		26.55	44.59
19A	19B	0.40	0	412.30	17696	2.71	193.98		2.74		11.40	4.15		26.55	44.59
60	19B	5.90	326	5.90	326	4.00	5.29		0.00		0.00			0.00	0.00
19B	FVPS	0.00	0	418.20	18022	2.70	196.97		2.74		11.40	4.15		26.55	44.59

FROM M.H.	TO M.H.	PEAK FLOW TOTAL AREA (ha)	ACCU. AREA (ha)	INFILT. FLOW (L/s)	TOTAL FLOW (L/s)	PIPE 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	3.00	0.84	3.66	160	200	203.2	0.32	19.35	18.9%	0.60	72.00	76.00	68.50	68.70	67.98	68.19		3.30	7.81
38	39	3.40	63.54	17.79	64.62	170	375	381.0	0.22	85.79	76.3%	0.75	76.00	72.00	64.44	64.82	64.07	64.45		11.18	7.56
39	18	6.20	69.74	19.53	70.55	106	375	381.0	0.22	85.79	82.2%	0.75	72.00	73.00	64.07	64.45	63.84	64.22		7.55	8.78
50	51	8.20	8.20	2.30	11.17	60	200	203.2	0.60	24.19	46.2%	0.78	74.00	74.00	69.00	69.20	68.70	68.90		4.80	5.10
51	52	4.10	12.30	3.44	15.81	140	200	203.2	0.67	26.00	66.4%	0.86	74.00	72.80	68.65	68.75	67.61	67.81	0.15	5.26	4.99
52	18	4.70	17.00	4.76	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	452.60	126.73	346.13	110	600	609.6	0.50	452.92	76.4%	1.55	73.00	71.80	63.61	64.22	63.06	63.67		8.78	7.83
19	19A	0.00	452.60	126.73	365.30	25	600	609.6	0.50	452.92	80.7%	1.56	71.80	71.80	63.06	63.67	62.93	63.54		7.83	7.46
19A	19B	0.40	452.99	126.84	365.41	51	600	609.6	0.50	452.92	80.7%	1.56	71.00	71.00	62.87	63.48	62.62	63.23	0.06	7.52	7.77
60	19B	5.90	5.90	1.65	6.93	120	200	203.2	0.32	19.36	35.8%	0.60	71.00	71.00	68.30	68.50	67.91	68.12		2.50	2.88
19B	FVPS	0.00	458.89	128.49	370.05	24	600	609.6	0.50	452.92	81.7%	1.55	71.00	71.80	62.56	63.17	62.44	63.05	0.06	7.83	8.45

DESIGN PARAMETERS

Residential Flow = 350 Lpcd
Commerical/Institutional Flow = 50000 L/ha/d
Industrial Flow = 35000 L/ha/d
Maximum Residential Peak Factor = 4.00
Minimum Residential Peak Factor = 2.00
Commerical/Institutional Peak Factor = 1.50

Industrial Peak Factor = as per MOE Graph
Extraneous Flow = 0.28 L/s/ha
Minimum Velocity = 0.76 m/s
Mannings n = 0.013
Harmon Peak Factor = 1+14/(4+(P/1000)1/2)*K, where K= 1

Low Density (LD)/Existing = 3.2 ppu
Low/Medium Density (LMD) = 3.2 ppu
Medium Density (MD) = 2.4 ppu
High Density (HD) = 1.9 ppu
MUC = 1.8 ppu
GUA = 3.1 ppu
(Telephone Conversation with Selma Hassan Sept. 10/2004 - Based on development applications - 361 Singles @ 3.2pers/unit and 164 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.

N

- SANITARY SEWER AND MANHOLE
- SANITARY TRUNK SEWER AND MANHOLE
- SANITARY FORCEMAIN
- SANITARY CATCHMENT AREA
- ORIGINAL GROUND / OBVERT
- AREA (ha) / POPULATION / MANHOLE No.
- 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
SANITARY TRUNK No.1
SANITARY TRUNK No.2
SANITARY TRUNK No.3
SANITARY TRUNK No.4
NAVAN ROAD
WALL ROAD
SAPHIR AVE.
GRAND PRE
ABANDONED C.P.R. RIGHT OF WAY
WSI LANDFILL
LOCAL PUMP STA. No.1
LOCAL PUMP STA. No.2
FOREST VALLEY PUMPING STATION
SCHOOL
PARK
INSTIT.
INSTITUTIONAL
COMMERCIAL
ESCARPMENT
FIRE HALL

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

Appendix E2

JLR Functional Sanitary Design Sheet

J.L.Richards
ENGINEERS · ARCHITECTS · PLANNERS

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

Street Name	MH No.		Residential							Commercial/Institutional				Infiltration			Peak Design Flow L/s	Pipe Data									Upstream Geometry				Downstream Geometry				
	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		Dia	Type	Actual Diameter	Slope	Q Full (L/s)	V Full	Length	Residual Capacity	% Full	TG From	Obvert	Invert	Cover	TG TO	Drop	Obvert	Invert	Cover
OUTLET TO PAGE (CUL-DU-SAC @ Brian Coburn)																																			
STREET 3	24	23	8		0.32	22	22	0.32	3.70	0.26		0.00	1.50	0.00	0.32	0.32	0.11	**0.37**	200	Circular	203.20	1.00%	34.22	1.06	66.13	33.85	1%	85.272	82.532	82.329	2.740	85.676		81.870	81.667	3.805
Page Road (2690 to Navan Road)	23	10			5.87	80	102	6.19	3.59	1.19		0.00	1.50	0.00	5.87	6.19	2.04	3.23																	
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	200	Circular	203.20	1.00%	34.22	1.06	11.91	34.18	0%	85.502	82.473	82.269	3.029	85.344		82.354	82.150	2.990
Site Plan - BLOCK 15 / STREET 1	14	13		83	0.45	150	150	0.57	3.55	1.73	0.09	0.09	1.50	0.05	0.54	0.66	0.22	1.99	200	Circular	203.20	0.35%	20.24	0.62	32.42	18.25	10%	85.344	82.354	82.150	2.990	85.243		82.240	82.037	3.002
STREET 1	13	12			0.09	0	150	0.66	3.55	1.73		0.09	1.50	0.05	0.09	0.75	0.25	2.02	200	Circular	203.20	0.35%	20.24	0.62	7.14	18.22	10%	85.243	82.240	82.037	3.002	85.284	0.600	82.215	82.012	3.069
Site Plan - BLOCK 16	22	21				0	0	0.00	3.80	0.00	0.74	0.74	1.50	0.36	0.74	0.74	0.24	0.60	200	Circular	203.20	1.00%	34.22	1.06	45.36	33.61	2%	85.292	82.715	82.512	2.577	85.421	0.600	82.262	82.059	3.159
Site Plan - BLOCK 16	21	12			0.02	0	0	0.02	3.80	0.00		0.74	1.50	0.36	0.02	0.76	0.25	0.61	200	Circular	203.20	0.35%	20.24	0.62	13.29	19.63	3%	85.421	81.662	81.459	3.759	85.284		81.615	81.412	3.669
STREET 1	12	11	12		0.40	32	182	1.08	3.53	2.08		0.83	1.50	0.40	0.40	1.91	0.63	3.12	200	Circular	203.20	0.35%	20.24	0.62	35.50	17.13	15%	85.284	81.615	81.412	3.669	84.988		81.491	81.288	3.497
STREET 1	11	10	2		0.15	5	187	1.23	3.53	2.14		0.83	1.50	0.40	0.15	2.06	0.68	3.22	200	Circular	203.20	0.35%	20.24	0.62	10.54	17.02	16%	84.988	81.491	81.288	3.497	84.922	0.300	81.454	81.251	3.468
STREET 1	10	09	13		0.38	35	222	1.61	3.50	2.52		0.83	1.50	0.40	0.38	2.44	0.81	3.73	200	Circular	203.20	0.35%	20.24	0.62	77.56	16.51	18%	84.922	81.154	80.951	3.768	84.000	0.450	80.883	80.679	3.117
Site Plan - BLOCK 14	20	19		84	0.48	151	151	0.48	3.55	1.74	0.09	0.09	1.50	0.04	0.57	0.57	0.19	1.97	200	Circular	203.20	1.00%	34.22	1.06	28.06	32.25	6%	85.685	82.714	82.511	2.970	85.238		82.434	82.230	2.805
Site Plan - BLOCK 14	19	18				0	151	0.48	3.55	1.74		0.09	1.50	0.04	0.00	0.57	0.19	1.97	200	Circular	203.20	0.35%	20.24	0.62	15.21	18.27	10%	85.238	82.434	82.230	2.805	84.988	0.300	82.380	82.177	2.608
STREET 2	18	17	1		0.10	3	154	0.58	3.55	1.77		0.09	1.50	0.04	0.10	0.67	0.22	2.04	200	Circular	203.20	0.35%	20.24	0.62	11.17	18.21	10%	84.988	82.080	81.877	2.908	84.800		82.041	81.838	2.759
STREET 2	17	16	29		0.79	78	232	1.37	3.50	2.63		0.09	1.50	0.04	0.79	1.46	0.48	3.16	200	Circular	203.20	0.35%	20.24	0.62	93.27	17.09	16%	84.800	82.041	81.838	2.759	83.797	0.600	81.715	81.512	2.082
STREET 2	16	09			0.03	0	232	1.40	3.50	2.63		0.09	1.50	0.04	0.03	1.49	0.49	3.17	200	Circular	203.20	0.35%	20.24	0.62	23.47	17.08	16%	83.797	81.115	80.912	2.682	84.000	0.600	81.033	80.829	2.967
STREET 1	09	08	4		0.14	11	465	3.15	3.39	5.11		0.92	1.50	0.45	0.14	4.07	1.34	6.90	200	Circular	203.20	0.35%	20.24	0.62	24.54	13.34	34%	84.000	80.433	80.229	3.567	83.491		80.347	80.144	3.144
STREET 1	08	07			0.21	0	465	3.36	3.39	5.11		0.92	1.50	0.45	0.21	4.28	1.41	6.97	200	Circular	203.20	0.35%	20.24	0.62	12.44	13.27	34%	83.491	80.347	80.144	3.144	83.164	0.400	80.303	80.100	2.861
STREET 1	07	06				0	465	3.36	3.39	5.11		0.92	1.50	0.45	0.00	4.28	1.41	6.97	200	Circular	203.20	0.35%	20.24	0.62	37.61	13.27	34%	83.164	79.903	79.700	3.261	81.862		79.772	79.568	2.090
STREET 1	06	03			0.13	0	465	3.49	3.39	5.11		0.92	1.50	0.45	0.13	4.41	1.46	7.02	200	Circular	203.20	0.35%	20.24	0.62	9.75	13.23	35%	81.862	79.772	79.568	2.090	82.600		79.737	79.534	2.863
Site Plan - BLOCK 18	05	04		96	0.58	173	173	0.58	3.54	1.98		0.00	1.50	0.00	0.58	0.58	0.19	2.17	250	Circular	254.00	1.00%	62.04	1.22	28.28	59.86	4%	82.327	80.152	79.898	2.175	82.165		79.869	79.615	2.296
Site Plan - BLOCK 18	04	03				0	173	0.58	3.54	1.98		0.00	1.50	0.00	0.00	0.58	0.19	2.17	250	Circular	254.00	0.35%	36.70	0.72	37.60	34.53	6%	82.165	79.869	79.615	2.296	82.600		79.737	79.483	2.863
STREET 1	03	02			0.05	0	638	4.12	3.33	6.89		0.92	1.50	0.45	0.05	5.04	1.66	**9.01**	200	Circular	203.20	0.35%	20.24	0.62	55.32	11.24	44%	82.600	79.737	79.534	2.863	81.809		79.544	79.341	2.265
NAVAN	02	01				0	638	4.12	3.33	6.89		0.92	1.50	0.45	0.00	5.04	1.66	9.01	200	Circular	203.20	0.35%	20.24	0.62	118.54	11.24	44%	81.809	79.544	79.341	2.265	81.544	0.500	79.129	78.926	2.415
NAVAN	01	EX10			5.87	176	814	9.99	3.28	8.66		0.92	1.50	0.45	5.87	10.91	3.60	12.71	200	Circular	203.20	0.35%	20.24	0.62	41.62	7.53	63%	81.544	78.629	78.426	2.915	81.586		78.483	78.280	3.103
																10.91																			
Page Road (Navan to Renaud)	EX10	Renaud					916	16.18	3.26	9.67		0.92	1.50	0.45	0.00	17.10	5.64	15.76	250	Circular	254.00	0.74%	53.19	1.05	106.80	37.42	30%									
			69	263	4.44	660					0.92					17.10																			
			Subject Properties Drainage Area:		5.36																															

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	

PER EUC Area 13A: 6.6
Area 13B: 10.5
Total: 17.1

Sanitary Inv Ex MH 13 Page Rd	81.13
Sanitary Inv Ex MH 14 Page Rd	81.83
Sanitary Inv at Ex MH 10 Page @ Navan	78.280

Appendix F1

Storm – EUC ISSU Design Excerpts

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= 0.65	R= 0.8	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	66.13	645.86	0.76	750	CONC	0.0035	90	667.1	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	4.81	0.00	0.00	0.00	1.60	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	78.61	79.80	2.26	3.40	2.70
603B	603A	0.00	4.42	3.47	0.00	0.00	1.24	1.90	16.26	16.26	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	1811.0	2.1	0.86	0.97	81.50	82.50	76.87	78.04	76.48	77.54		3.46	4.96
603	604	0.00	0.66	0.00	0.00	0.00	0.26	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	58.58	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	74.18	75.52	0.40	4.35	2.88
605	606	0.00	0.88	0.41	0.00	0.00	0.39	0.00	2.72	71.78	27.39	57.33	4115.22	1.37	1350	CONC	0.005	150	4313.1	2.9	0.86	0.95	78.40	77.00	73.75	75.12	72.85	74.22	0.40	3.25	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	70.96	72.32	1.50	3.18	3.68
607	608	0.00	0.00	0.00	0.00	0.00	0.26	0.00	0.55	76.26	29.67	54.33	4143.26	1.37	1350	CONC	0.005	90	4313.1	2.9	0.51	0.96	76.00	73.00	69.35	70.72	68.61	70.15	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	68.58	69.58	68.36	69.26		1.50	1.72
608D	608	0.00	0.00	0.00	0.00	0.00	0.38	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	69.26	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	0.006	60	1058.9	1.9	0.52	0.92	74.00	74.00	69.50	70.33	69.20	70.03		3.97	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	1855.62	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	2.80	0.00	0.00	0.00	1.11	0.00	8.05	119.04	30.16	53.70	6392.78	1.98	1950	CONC	0.002	290	6838.9	2.2	2.24	0.98	73.00	76.00	67.10	69.09	66.52	68.50	0.46	3.82	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	79.82	80.83	1.33	3.56	5.67
701A	701	0.00	6.89	0.00	0.00	0.00	0.00	1.28	12.52	12.52	15.00	83.58	1045.95	0.84	825	CONC	0.005	330	1058.9	1.9	2.87	0.99	86.50	86.50	82.96	83.89	81.31	82.15	2.65	2.70	4.35
701	702	0.00	1.66	0.00	0.00	0.00	0.48	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	79.59	75.89	76.50	1.83	4.00	2.50
702	703	0.00	0.00	0.38	0.00	0.00	0.54	0.00	1.74	59.65	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	68.63	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	54.98	4115.35	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	0.68	675	CONC	0.003	80	480.3	1.3	1.03	0.93	71.50	70.50	68.78	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	30.89	52.75	4442.71	1.98	1950	CONC	0.001	180	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	2.8	0.99	0.88	75.00	72.00	71.13	71.91	69.27	69.95		3.19	2.05
706B	706A	0.00	0.00	0.84	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	68.19	69.95	68.53	69.39		2.05	2.61
706A	706	0.00	0.00	1.74	0.00	0.00	1.18	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	36.96	47.62	11456.50	1.52	1500 x 4200	CONC	0.002	160	14595.0	2.3	1.16	0.78	76.00	72.00	66.52	68.04	66.20	67.72		7.98	4.28
610	Outlet	0.00	3.88	0.00	0.00	0.00	0.96	0.00	7.64	248.25	37.11	46.58	11563.08	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	66.09	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	67.16	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	1329.36	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	0.66	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	2.05	32.16	32.36	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

REVISION No.2 MARCH, 2005

CITY OF OTTAWA
GLOUCESTER EUC INFRASTRUCTURE SERVICING STUDY UPDATE

STORM SEWER SYSTEM

STM

Scale: 0 40 120 200m | Dwg. No. | Dwn by: E.C. | Date: 04.10.29 | Revision: 2

ABANDONED C.P.R. RIGHT OF WAY

GRAND PRE

WSI LANDFILL

100 YR. WL=80.00m (2)

POND 2

100 YR. WL=68.50m (3)

POND 3

100 YR. WL=87.00m

POND 1

SAPHIR AVE.

WALL ROAD

NAVAN ROAD

FOURTH LINE ROAD

PAGE ROAD

MER BLEUE ROAD

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

PROPOSED BLACKBURN BY-PASS EXTENSION

HYDRO CORRIDOR

PROPOSED TRANSITWAY

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

PARK

SCHOOL

INSTITUTIONAL

COMMERCIAL

CEMETERY

FIRE HALL

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.

- 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)

N

Appendix F2

Sample Functional Runoff Coefficients

2022-04-13
Our File: 29899-000

Runoff Coefficient
2983, 3053, and 3079 Navan Road & 2690 Page Road

The proposed development is comprised of four (4) subject properties under (1) Draft Plan of Subdivision and four (4) Site Plan Applications. In total there are 69 row townhouse units, six (6) condominium units and a gas station and retail establishment.

1. ROW TOWNHOUSE BLOCK:

An average run-off coefficient was calculated for front yard and rear yard of the smallest block (Block 4) which contains five (5) townhouse units. The runoff coefficients are based on zoning setbacks and a maximum driveway width of 50% of the area of the front yard as stated in Section 107 (2) in the City of Ottawa Zoning By-Laws. Since this scenario has the highest ratio of house area to greenspace, the resulting run-off coefficient would be the highest of any scenario for a townhouse block.

Unit Information

Unit Width	5.80	m
Block Depth	29.9	m
Unit Area	97	m^2
Total Number of Units	5	units
Number of Interior Units	4	units
Number of End Units	1	units
Corner Unit Width	6.25	m
Min. Corner Yard Setback	3	m
Min. Rear Yard Setback	7.5	m
Min. Front Yard Setback	3	m

Block Area

Total Block Area = (5.80 x 4 + 9.25 x 1) x 29.9 = 970.26 m^2 **(A_T)**
Zoning Footprint (Internal Unit) = (29.9 - 7.5 – 3) m x 5.80m = 112.52 m^2 **(B_T)**
Zoning Footprint (End Unit) = (29.9 - 7.5 - 3) x 6.25 = 121.25 m^2 **(C_T)**
Unit Driveway Area (50% of Front Yard Area) = 8.7 m^2 **(D_T)**

Assuming each lot has a highpoint at the centre, the unit and lot areas could be divided equally between the front and rear yards.

Rear Area:

Block Rear Area = $\frac{AT}{2} = \frac{970.26}{2}$ = 485.13 m^2 **(E_T)**

By: MM

Number of Internal Units: 4
Number of End Units: 1
Rear Impervious (House) Footprint: $\frac{4(BT)+1(CT)}{2} = \frac{4(112.52)+1(121.25)}{2}$ = 285.67 m^2 **(F_T)**

Front Area:
Block Front Area = Block Rear Area = 485.13 m^2 **(G_T)**
Number of Internal Units: 4
Number of End Units: 1
Front Impervious (House/Driveway) Footprint: $F_T + 6D_T = 285.67 + 5(8.7)$ = 329.17 m^2 **(I_T)**

Using a run-off coefficient of 0.2 for grassed areas and 0.9 for impervious areas (houses and driveways) the following weighted averages are calculated:

Run-off Coefficient:
Rear Coefficient = $\frac{0.2(E_T-F_T)+0.9F_T}{E_T} = \frac{0.2(485.13-285.67)+0.9(285.67)}{485.13}$ = **0.61** **(C_{RT})**
Front Coefficient = $\frac{0.2(G_T-I_T)+0.9(I_T)}{G_T} = \frac{0.2(485.13-329.17)+0.9(329.17)}{485.13}$ = **0.67** **(C_{FT})**

Summary: The rear yard runoff coefficient used for design is **0.61**

2. 18m ROW Road

A similar approach was used for the ROWs, a weighted average was calculated using the total 18m ROW Road.

Asphalt Road and Sidewalk (C=0.9)
There is approximately 585 m of 8.5 m asphalt road and 630 m of 1.8 m sidewalk. These lengths were measured directly from the Concept Plan in Appendix B1 of the Functional Servicing Report.
The total area of asphalt road is 585 x 8.5 = 4972.50 m^2 **(J_T)**
The total area of sidewalk is 630 x 1.8 = 1134.00 m^2 **(K_T)**

Driveways (C=0.9)
Within the boulevard there are 27 units which have driveways that do not overlap with sidewalks. For these cases the driveways have a width of 4.75 m within the boulevard span a distance of 2.9 m (50% of unit width).

The total area of driveways not fronting sidewalks can be taken as 27 x 4.75 x 2.9 = 371.93 m^2 **(L_T)**

Within the boulevard there are 42 units which have driveways that do overlap sidewalks. For these cases the sidewalk width must be subtracted from the driveway boulevard width since it was already considered in **(K_T).** Hence, these driveways span 4.75m - 1.8m = 2.95m within the boulevard and span a distance of 2.9m (50% of unit width).

The total area of driveways fronting sidewalks can be taken as 42 x 2.95 x 2.9 = 359.31 m^2 **(M_T)**

Grassed Area (C=0.2)

The total area of grass is equal to the total ROW Area subtracted by area of asphalt road, sidewalks, and driveways. I.e., Grassed Area = (18 x 585m – (4972.50 + 1134.00 + 371.93 + 359.31 = 3692.26 m^2 **(N_T)**

Table 1 summarizes the total areas within the 18m ROW and their respective c-factors.

Table 1: ROW C-factor breakdown

Description	**Area (m^2)**	**C-Factor**
Asphalt Road	4972.50	0.9
Sidewalk	1134.00	0.9
Driveways not fronting sidewalk (27 units)	371.93	0.9
Driveways fronting sidewalk (42 units)	359.31	0.9
Grass boulevard not fronting sidewalk	3692.26	0.2

3. FRONT YARD AND ROW C-FACTOR

The front yard and ROWs of the subdivision were grouped into one weighted front yard runoff coefficient. The weighted average is derived from the results front yard co-efficient calculated for the ROW townhouse block and from the results in Table 1 for the 18 m ROW.

$$= \frac{(J_T\ x\ 0.9)+(K_T\ x\ 0.9)+(L_T\ x\ 0.9)+(M_T\ x\ 0.9)+(N_T\ x\ 0.2)+\ (69\ x\ 97)\ x\ C_{FT}\ )}{(J_T)+(K_T)+(L_T)+(M_T)+(N_T)+(69\ x(97))}$$

$$= \frac{(4972.50\ x\ 0.9)+(1134x0.9)+(371.93x0.9)+(359.31x0.9)+(3692.26x0.2)+((69\ x(97)\ x\ \mathbf{0.67})}{(\ 4972.50)+(1134)+(371.93)+(359.3)+(3692.26)+(69\ x(97)\ )}$$

= 0.66

By: MM

4. Residential Site Plans (Block 14, 15 and 18)

A runoff coefficient was calculated for the residential site plans on Blocks 14, 15 and 16. Block 14 was used for the sample calculations since this block generates the highest ratio of impervious surfaces to grass.

A minimum zoned amenity space of 10% was assumed for the residential site plans. This is more conservative than the City of Ottawa By-Law requirement of 6m^2 per dwelling unit for low-rise apartment dwellings.

Block 14 Information

Total Block Area	0.575	ha
Zoning Limit Area	0.494	ha
Zoning Amenity Area (10% Zoning Limit Area)	0.049	ha **(O_T)**
Zoning Impervious Area (90% Zoning Limit Area)	0.445	ha **(P_T)**

The remaining area of the site plan (outside of the zoning area) is 0.069 ha of grass **(Q_T)** and 0.012 ha of impervious surfaces **(R_T)**.

Given that these are private site plans, a run-off coefficient of 0.25 was used for grassed areas and 0.9 for impervious areas. The following weighted averages are calculated:

$$= \frac{(\mathbf{0.25}\ (O_T+Q_T))+\mathbf{0.9}(P_T+R_T)}{(O_T+Q_T)+(P_T+R_T\ )}$$

$$= \frac{(\mathbf{0.25}\ (0.049+0.0688))+\mathbf{0.9}(0.445+0.0123)}{(0.049\quad .0688\ )+(0.455+0.012\ )}$$

= 0.77

5. Industrial Site Plan (Block 16)

Since there is minimal grass and amenity space within the industrial site plan a C-factor of **0.9** was assumed for all of Block 16.

6. Dry Pond and Park (Block 13 and Block 17)

A C-factor of 0.3 was assumed for both the Dry Pond and Park given that these areas are mainly grassed with minimal infrastructure.

7. Abutting Existing Units on Navan and Page that drain into 3079 Navan Road

The C-factor breakdowns based on actual impervious cover within the existing catchment areas are summarized in Table 2 and Table 3. A weighted average was calculated for impervious (C=0.9) and grassed (C=0.2).

Table 2: Existing Units on Navan Road C-factor breakdown

Description	**Area (m^2)**	**C-Factor**
Impervious	0.169	0.9
Grassed	0.971	0.2
Total	1.14	0.3

Table 3: Existing Units on Page Road C-factor breakdown

Description	**Area (m^2)**	**C-Factor**
Impervious	0.096	0.9
Grassed	0.598	0.2
Total	0.694	0.3

Table 4 below presents a summary of run-off coefficients to be used for functional design.

Table 4: Functional Design Run-off Coefficients

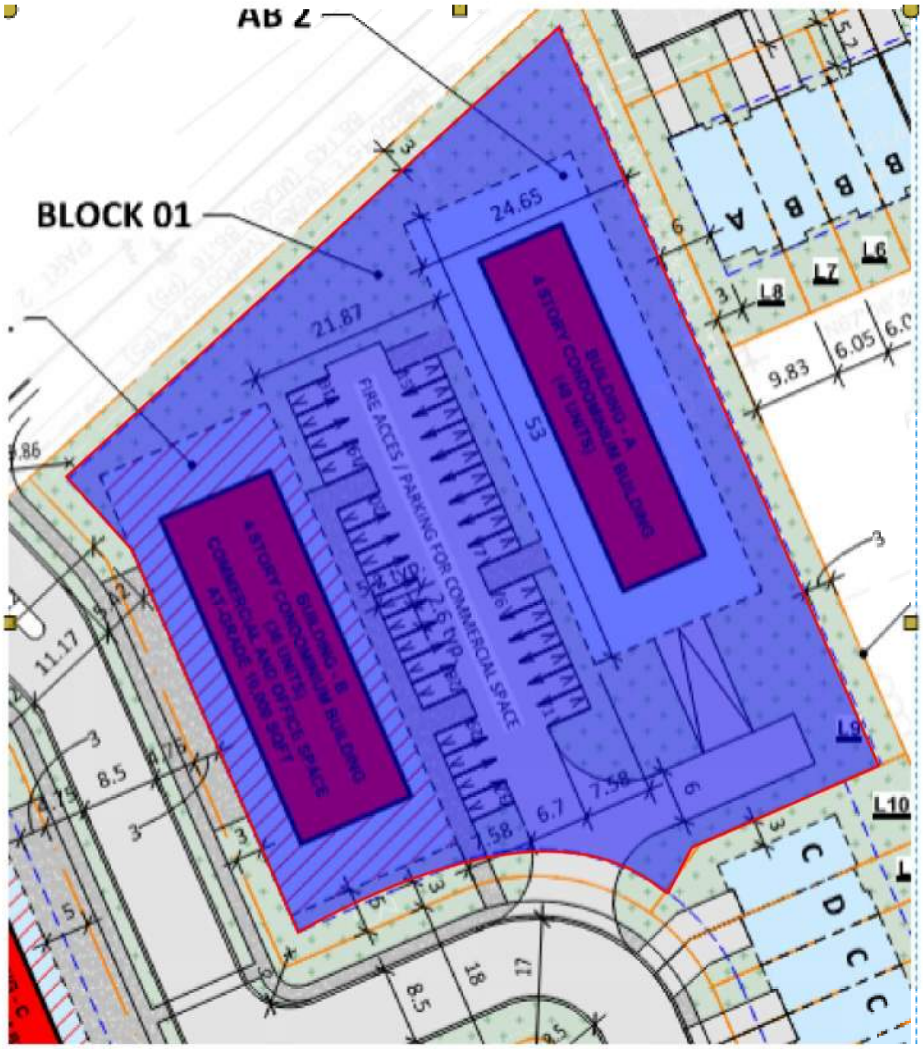
Scenario	**Runoff Coefficient (C)**
Rear Yards – Townhouse Units Only	**0.61**
Front Yards and ROW	**0.66**
Residential Site Plan	**0.77**
Industrial Site Plan (Gas Bar)	**0.90**
Park, Dry Pond and Abutting Properties on Navan and Page	**0.30**

By: MM

SAMPLE C-FACTOR CALCULATION FIGURES

BLOCK 4

BLOCK 14



C-FACTOR CALCULATED BASED ON ZONING SET BACKS AND MAXIMUM DRIVEWAY WIDTH OF 50% AREA OF FRONT YARD

ALL AREAS MEASURED DIRECTLY FROM CONCEPT PLAN IN APPENDIX B1 OF THE FUNCTIONAL SERVICING REPORT

LEGEND

ZONING AREA FOR INTERIOR RESIDENTIAL UNIT

ZONING AREA FOR CORNER RESIDENTIAL UNIT

ZONING AREA FOR SITE PLAN (10% AREA FOR AMENITY SPACE ASSUMED)

PROPERTY LINE (ORANGE LINE IN CONCEPT PLAN)

Appendix F3

JLR Functional Storm Design Sheet

J.L.Richards
ENGINEERS · ARCHITECTS · PLANNERS

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

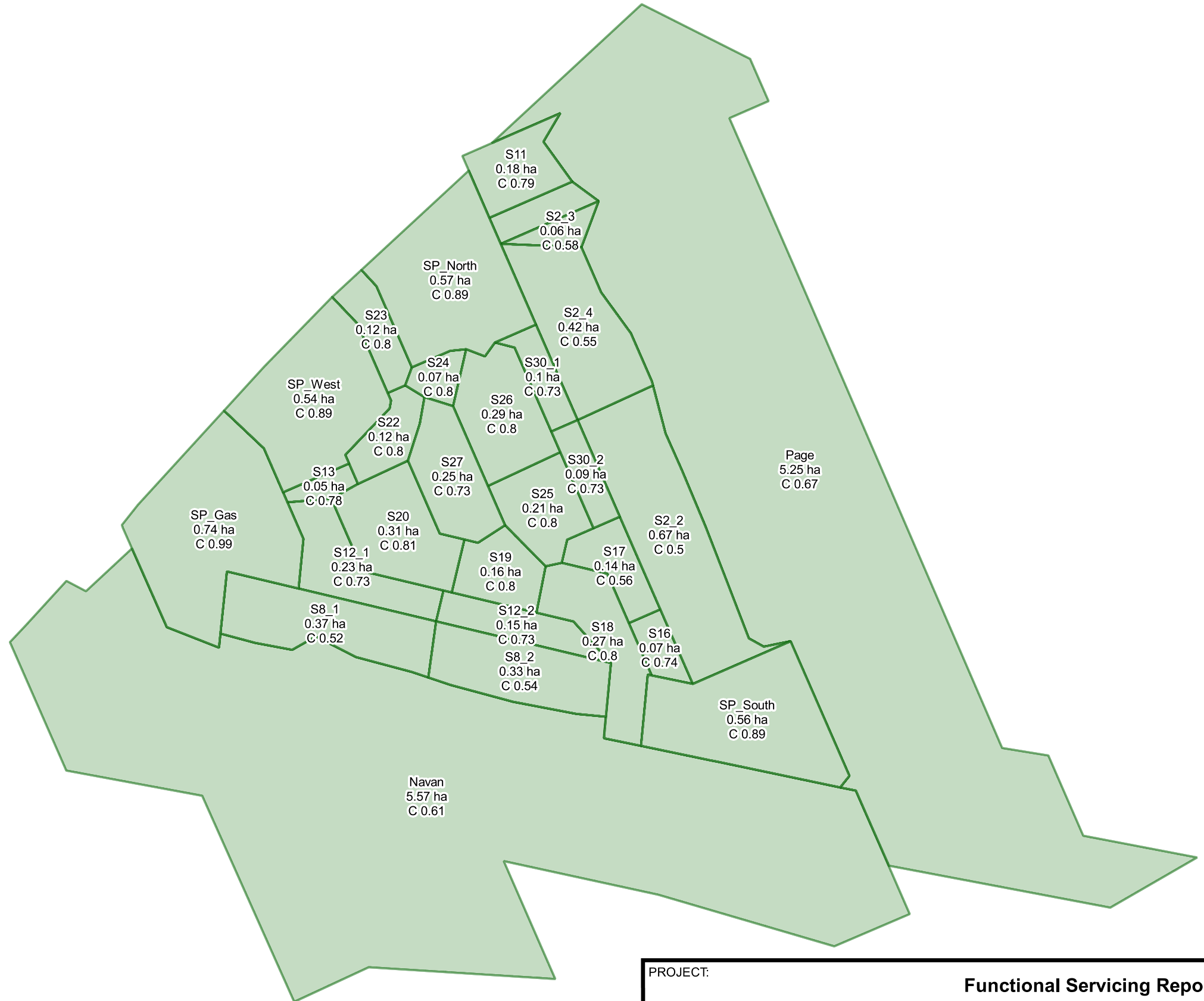
DESIGNED BY: CJ/KS
CHECKED BY: KF
2022-04-14

Street Name	Maintenace Hole No.		1:2 Year Storm								1:10 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					Controlled Flow (85 L/s/ha)	1:10 Year Peak Flow					Total Peak Flow	Pipe Data										Upstream Geometry					Downstream Geometry					
	From	To	0.3	0.50	0.55	0.61	0.66	0.77	0.79	0.9	0.82	1:2 Yr	1:10 Yr						2.78AR	Additional 2.78AR	Cum. 2.78AR	1:2 Yr Intensity	Peak Flow		2.78AR	Additional 2.78AR	Cum. 2.78AR	1:10 Yr Intensity	Peak Flow		REQ'D DIA.	REQ'D ACTUAL DIA.	Type	Actual Diameter	Slope	Q Full (L/s)	V Full	Length	Residual Capacity	% Full	TG From	Obvert	Invert	Springline Elev	Cover	TG To	Drop	Obvert	Invert	Springline Elev	Cover
OUTLET TO NAVAN @ RENAUD																																															
STREET 1	517	516					0.12					0.12	0.00	0.12	0.12	10.00	0.11	10.11	0.22		0.22	76.81	16.91	10.20	0.00		0.00	122.14	0.00	10.20	250	254	Circular	254.00	0.55%	46.01	0.91	6.2	35.81	22%	85.541	82.595	82.341	82.468	2.946	85.442		82.561	82.307	82.434	2.882
STREET 1	516	515					0.12					0.12	0.00	0.12	0.24	10.11	0.34	10.45	0.22		0.44	76.37	33.63	20.40	0.00		0.00	121.44	0.00	20.40	250	254	Circular	254.00	0.55%	46.01	0.91	18.3	25.61	44%	85.442	82.561	82.307	82.434	2.882	85.261		82.460	82.206	82.333	2.801
STREET 1 - Block 15	515	514						0.54				0.54	0.00	0.54	0.78	10.45	0.32	10.77	1.16		1.60	75.12	119.91	66.30	0.00		0.00	119.41	0.00	66.30	375	381	Circular	381.00	0.35%	108.21	0.95	18.1	41.91	61%	85.261	82.460	82.079	82.269	2.801	85.287		82.396	82.015	82.206	2.890
Site Plan - Block 16	521	520										0.00	0.00	0.00	0.00	10.00	0.86	10.86	0.00		0.00	76.81	0.00	0.00	0.00		0.00	122.14	0.00	0.00	250	254	Circular	254.00	0.55%	46.01	0.91	46.9	46.01	0%	85.096	83.089	82.835	82.962	2.007	85.292		82.831	82.577	82.704	2.461
Site Plan - Block 16	520	519								0.74		0.74	0.00	0.74	0.74	10.86	1.12	11.98	1.85		1.85	73.65	136.36	62.90	0.00		0.00	117.03	0.00	62.90	375	381	Circular	381.00	0.30%	100.18	0.88	58.9	37.28	63%	85.292	82.831	82.450	82.640	2.461	85.484		82.654	82.273	82.464	2.829
Site Plan - Block 16	519	518										0.00	0.00	0.00	0.74	11.98	0.70	12.68	0.00		1.85	69.96	129.54	62.90	0.00		0.00	111.07	0.00	62.90	375	381	Circular	381.00	0.30%	100.18	0.88	36.9	37.28	63%	85.484	82.654	82.273	82.464	2.829	85.358		82.544	82.163	82.353	2.814
Site Plan - Block 16	518	514				0.05						0.05	0.00	0.05	0.79	12.68	1.08	13.76	0.08		1.94	67.85	131.38	67.15	0.00		0.00	107.66	0.00	67.15	450	457.2	Circular	457.20	0.25%	148.72	0.91	58.8	81.57	45%	85.358	82.544	82.086	82.315	2.814	85.287		82.396	81.939	82.168	2.890
STREET 1	514	513										0.00	0.00	0.00	1.57	13.76	0.16	13.92	0.00		3.53	64.86	229.11	133.45	0.00		0.00	102.83	0.00	133.45	525	533.4	Circular	533.40	0.35%	265.43	1.19	11.3	131.98	50%	85.287	82.396	81.863	82.130	2.890	85.375		82.357	81.824	82.090	3.018
STREET 1	513	512										0.00	0.00	0.00	1.57	13.92	0.46	14.37	0.00		3.53	64.44	227.85	133.45	0.00		0.00	102.16	0.00	133.45	525	533.4	Circular	533.40	0.35%	265.43	1.19	32.5	131.98	50%	85.375	82.357	81.824	82.090	3.018	85.160	0.600	82.243	81.710	81.977	2.917
STREET 1	512	511	0.37			0.23						0.60	0.00	0.60	2.17	14.37	0.17	14.55	0.70		4.23	63.28	267.77	184.45	0.00		0.00	100.30	0.00	184.45	600	609.6	Circular	609.60	0.35%	378.96	1.30	13.3	194.51	49%	85.160	81.643	81.034	81.338	3.517	84.986		81.597	80.987	81.292	3.390
STREET 1	511	510	0.33			0.40	0.47					1.20	0.00	1.20	3.37	14.55	0.95	15.49	1.82		6.05	62.86	380.13	286.45	0.00		0.00	99.61	0.00	286.45	675	685.8	Circular	685.80	0.35%	518.80	1.40	79.8	232.35	55%	84.986	81.597	80.911	81.254	3.390	83.831	0.500	81.317	80.632	80.974	2.514
Block 1	CBMH3	527					0.23					0.23	0.00	0.23	0.23	10.00	0.98	10.98	0.42		0.42	76.81	32.41	19.55	0.00 0.00 0.00		0.00	122.14	0.00	19.55	300	304.8	Circular	304.80	0.55%	74.82	1.03	60.3	55.27	26%	85.376	82.903	82.598	82.751	2.473	85.533		82.571	82.266	82.419	2.961
Block 1	CBMH1	CBMH2	0.06			0.09						0.15	0.00	0.15	0.15	10.00	0.56	10.56	0.20		0.20	76.81	15.57	12.75	0.00		0.00	122.14	0.00	12.75	250	254	Circular	254.00	0.55%	46.01	0.91	30.6	33.26	28%	85.579	82.801	82.547	82.674	2.778	85.319		82.633	82.379	82.506	2.686
Block 1	CBMH2	527										0.00	0.00	0.00	0.15	10.56	0.21	10.77	0.00		0.20	74.71	15.14	12.75	0.00		0.00	118.75	0.00	12.75	250	254	Circular	254.00	0.55%	46.01	0.91	11.3	33.26	28%	85.319	82.633	82.379	82.506	2.686	85.533		82.571	82.317	82.444	2.961
Block 1	527	526										0.00	0.00	0.00	0.38	10.98	1.44	12.42	0.00		0.62	73.23	45.75	32.30	0.00		0.00	116.36	0.00	32.30	375	381	Circular	381.00	0.35%	108.21	0.95	82.0	75.91	30%	85.533	82.571	82.190	82.381	2.961	85.621		82.284	81.903	82.094	3.336
Site Plan - Block 14	526	525							0.57			0.57	0.00	0.57	0.95	12.42	0.48	12.90	1.22		1.84	68.61	126.58	80.75	0.00		0.00	108.89	0.00	80.75	450	457.2	Circular	457.20	0.30%	162.91	0.99	28.3	82.16	50%	85.621	82.284	81.827	82.056	3.336	85.278	0.400	82.199	81.742	81.971	3.079
Site Plan - Block 14	525	524										0.00	0.00	0.00	0.95	12.90	0.25	13.14	0.00		1.84	67.23	124.02	80.75	0.00		0.00	106.65	0.00	80.75	450	457.2	Circular	457.20	0.25%	148.72	0.91	13.4	67.97	54%	85.278	81.799	81.342	81.571	3.479	84.849		81.766	81.309	81.537	3.083
STREET 2	524	523					0.07					0.07	0.00	0.07	1.02	13.14	0.26	13.40	0.13		1.97	66.53	131.28	86.70	0.00		0.00	105.53	0.00	86.70	450	457.2	Circular	457.20	0.25%	148.72	0.91	14.0	62.02	58%	84.849	81.766	81.309	81.537	3.083	84.769		81.731	81.274	81.502	3.038
STREET 2	523	522	1.09			0.19	0.50					1.78	0.00	1.78	2.80	13.40	1.40	14.80	2.15		4.12	65.82	271.32	238.00	0.00		0.00	104.39	0.00	238.00	675	685.8	Circular	685.80	0.25%	438.47	1.19	99.9	200.47	54%	84.769	81.731	81.045	81.388	3.038	83.726		81.481	80.795	81.138	2.244
STREET 2	522	510										0.00	0.00	0.00	2.80	14.80	0.36	15.16	0.00		4.12	62.24	256.55	238.00	0.00		0.00	98.61	0.00	238.00	675	685.8	Circular	685.80	0.25%	438.47	1.19	25.6	200.47	54%	83.726	81.481	80.795	81.138	2.244	83.831	0.600	81.417	80.732	81.074	2.414
STREET 1	510	509										0.00	0.00	0.00	6.17	15.49	0.25	15.75	0.00		10.17	60.63	616.54	524.45	0.00		0.00	96.02	0.00	524.45	900	914.4	Circular	914.40	0.25%	944.29	1.44	21.8	419.84	56%	83.831	80.817	79.903	80.360	3.014	83.404	0.500	80.763	79.848	80.306	2.641
STREET 1	509	508										0.00	0.00	0.00	6.17	15.75	0.12	15.86	0.00		10.17	60.06	610.77	524.45	0.00		0.00	95.11	0.00	524.45	900	914.4	Circular	914.40	0.25%	944.29	1.44	10.3	419.84	56%	83.404	80.263	79.348	79.806	3.141	83.104	0.500	80.237	79.323	79.780	2.867
STREET 1	508	507										0.00	0.00	0.00	6.17	15.86	0.24	16.10	0.00		10.17	59.80	606.09	524.45	0.00		0.00	94.68	0.00	524.45	900	914.4	Circular	914.40	0.25%	944.29	1.44	20.5	419.84	56%	83.104	79.737	78.823	79.280	3.367	82.546		79.686	78.771	79.229	2.860
STREET 1	507	504	0.21				0.27					0.48	0.00	0.48	6.65	16.10	0.24	16.35	0.67		10.84	59.28	642.80	565.25	0.00		0.00	93.85	0.00	565.25	900	914.4	Circular	914.40	0.25%	944.29	1.44	21.1	379.04	60%	82.546	79.686	78.771	79.229	2.860	82.417	0.800	79.633	78.719	79.176	2.784
Site Plan - Block 18	506	505						0.56				0.56	0.00	0.56	0.56	10.00	0.71	10.71	1.20		1.20	76.81	92.07	47.60	0.00		0.00	122.14	0.00	47.60	375	381	Circular	381.00	0.35%	108.21	0.95	40.3	60.61	44%	82.351	79.118	78.737	78.927	3.233	82.146		78.977	78.596	78.786	3.169
Site Plan - Block 18	505	504										0.00	0.00	0.00	0.56	10.71	0.72	11.43	0.00		1.20	74.19	88.93	47.60	0.00		0.00	117.90	0.00	47.60	375	381	Circular	381.00	0.35%	108.21	0.95	41.0	60.61	44%	82.146	78.977	78.596	78.786	3.169	82.417		78.833	78.452	78.643	3.564
STREET 1	504	503										0.00	0.00	0.00	7.21	16.35	0.64	16.99	0.00		12.04	58.76	707.40	612.85	0.00		0.00	93.02	0.00	612.85	900	914.4	Circular	914.40	0.25%	944.29	1.44	55.1	331.44	65%	82.417	78.833	77.919	78.376	3.584	81.884		78.695	77.781	78.238	3.188
NAVAN	503	502		0.36	3.47						1.74	3.83	1.74	5.57	12.78	16.99	1.16	18.15	5.81		17.84	57.45	1025.10	938.40	3.97		3.97	90.90	360.57	1298.97	1050	1066.8	Circular	1066.80	0.30%	1560.35	1.75	121.8	261.38	83%	81.884	78.695	77.628	78.162	3.188	81.582		78.330	77.263	77.797	3.252
NAVAN	502	501		3.60					1.01		0.58	4.61	0.58	5.19	17.97	18.15	0.51	18.66	7.22		25.07	55.21	1384.04	1330.25	1.32		5.29	87.32	461.79	1792.04	600	1219.2	Circular	1219.20	0.25%	2033.65	1.74	53.4	241.61	88%	81.582	77.873	77.263	77.568	3.709	81.823		77.739	77.130	77.434	4.084
NAVAN	501	500										0.00	0.00	0.00	17.97	18.66	1.28	19.94	0.00		25.07	54.29	1360.95	1330.25	0.00		5.29	85.84	453.98	1784.23	1200	1219.2	Circular	1219.20	0.25%	2033.65	1.74	133.4	249.43	88%	81.823	78.349	77.130	77.739	3.474	83.132	0.600	78.015	76.796	77.406	5.117
NAVAN	500	EXMH101										0.00	0.00	0.00	17.97	19.94	0.05	19.99	0.00		25.07	52.14	1306.85	1330.25	0.00		5.29	82.38	435.67	1765.92	1200	1219.2	Circular	1219.20	0.25%	2033.65	1.74	5.5	267.73	87%	83.132	77.415	76.196	76.806	5.717	83.500	0.600	77.402	76.182	76.792	6.098
Site Area (Subdivision + Site Plans)							5.36					**15.65**	**2.32**	**17.97**																																		
Navan ROW											2.32																																				
From CAD																																														
At Ex MH 101 - Renaud @ Navan - (1350mm dia outlet)																																														

V:\29000\29899-000 - Gas Bar 3079 Navan\2-Design\1-Civil\Reports\2. FSR Rev 1 April 2022\Appendices\Appendix F - SWM\Appendix F3 - JLR ST DS\29899-000 Storm DS - April 2022 - with Road Widening.xlsm

Appendix F4

PCSWMM Schematic



Legend

Subcatchments

50 0 50 100 150 200 m

PROJECT:

Functional Servicing Report

2983, 3053 and 3079 Navan Road & 2690 Pagé Road, Ottawa, Ontario

DRAWING:

Stormwater Model Subcatchments

J.L.Richards ENGINEERS · ARCHITECTS · PLANNERS

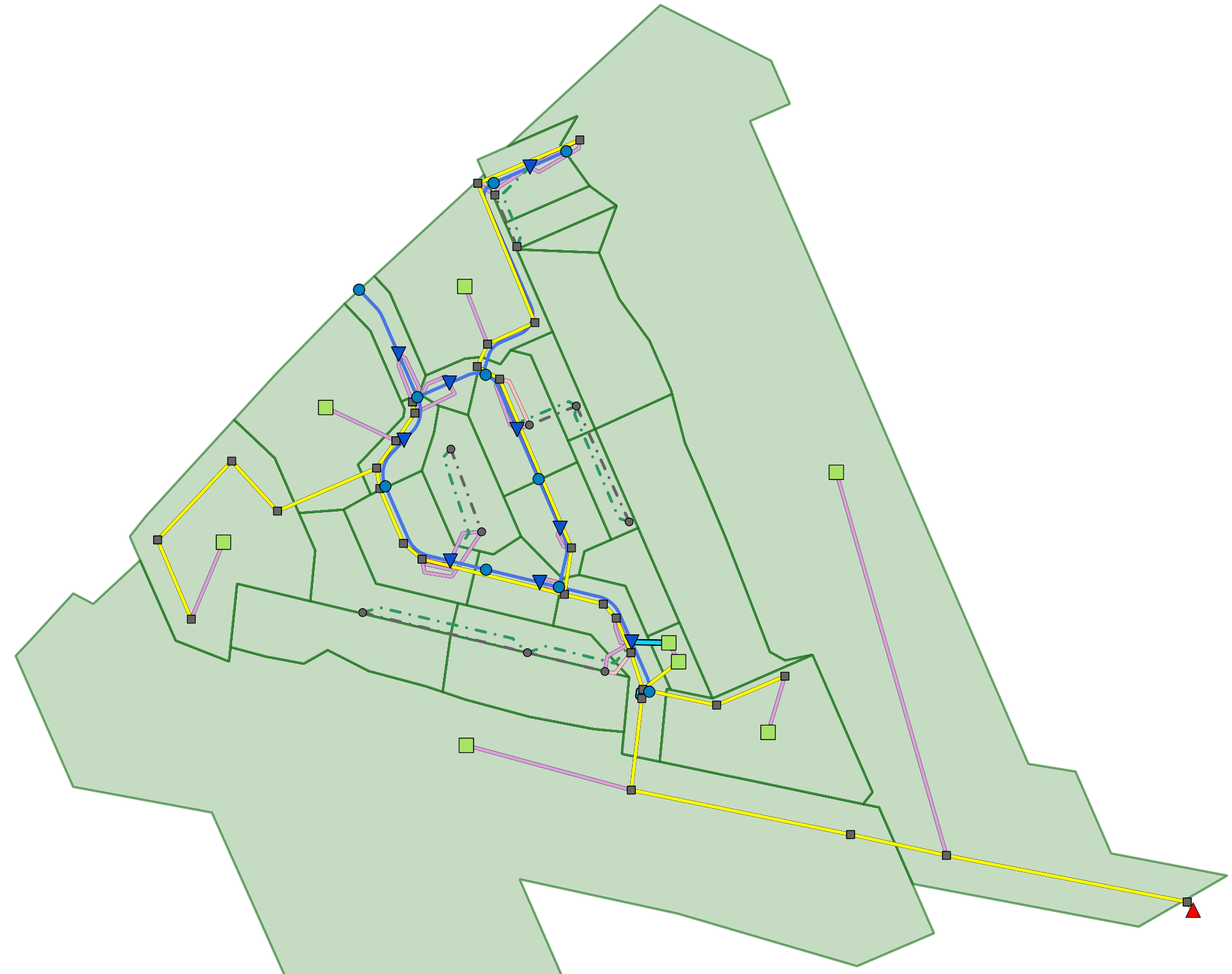
DESIGN: BP

DRAWN: BP

CHECKED: BP

JLR NO: 29899-000

DRAWING NO: **Figure App1**



Legend

- Outfalls
- Junctions

Storages
- Low Point
- Rear Yard Pot
- Manhole
- SWM Facility / On-Site Control

Conduits
- Rear Yard Sewer
- Rear Yard Swale
- Street
- Sewer
- Weirs
- Outlets
- Orifices
- Subcatchments

50 0 50 100 150 200 m

PROJECT:

Functional Servicing Report

2983, 3053 and 3079 Navan Road & 2690 Pagé Road, Ottawa, Ontario

DRAWING:

Stormwater Model Schematic

J.L.Richards ENGINEERS · ARCHITECTS · PLANNERS

DESIGN: BP
DRAWN: BP
CHECKED: BP

JLR NO: 29899-000

DRAWING NO: **Figure App2**

Legend

- Outfalls

Conduits

- Rear Yard Sewer
- Sewer
- Outlets
- Orifices
- Subcatchments

50 0 50 100 150 200 m

PROJECT:

Functional Servicing Report

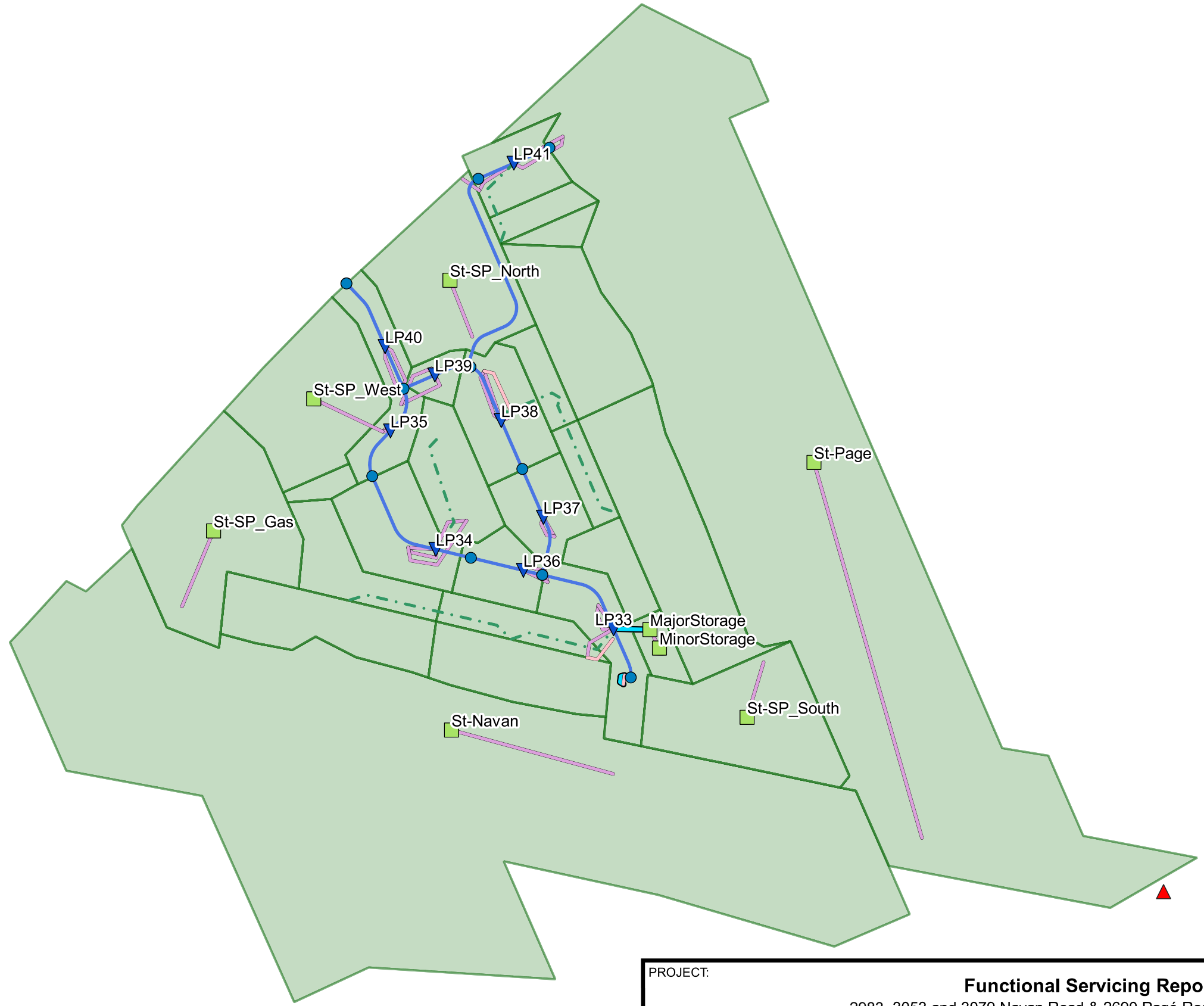
2983, 3053 and 3079 Navan Road & 2690 Pagé Road, Ottawa, Ontario

DRAWING:

Stormwater Minor Model Schematic

J.L.Richards ENGINEERS · ARCHITECTS · PLANNERS

DESIGN: BP	JLR NO: 29899-000
DRAWN: BP	DRAWING NO: **Figure App3**
CHECKED: BP	



Legend

- Outfalls
- Junctions

Conduits

- Rear Yard Swale
- Street
- Weirs
- Outlets
- Orifices
- Subcatchments

50 0 50 100 150 200 m

PROJECT:

Functional Servicing Report

2983, 3053 and 3079 Navan Road & 2690 Pagé Road, Ottawa, Ontario

DRAWING:

Stormwater Major Model Schematic

J.L.Richards ENGINEERS · ARCHITECTS · PLANNERS

DESIGN: BP	JLR NO: 29899-000
DRAWN: BP	DRAWING NO: **Figure App4**
CHECKED: BP	

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www.jlrichards.ca

Ottawa

864 Lady Ellen Place
Ottawa ON Canada
K1Z 5M2
Tel: 613 728-3571

ottawa@jlrichards.ca

Kingston

203-863 Princess Street
Kingston ON Canada
K7L 5N4
Tel: 613 544-1424

kingston@jlrichards.ca

Sudbury

314 Countryside Drive
Sudbury ON Canada
P3E 6G2
Tel: 705 522-8174

sudbury@jlrichards.ca

Timmins

834 Mountjoy Street S
Timmins ON Canada
P4N 7C5
Tel: 705 360-1899

timmins@jlrichards.ca

North Bay

501-555 Oak Street E
North Bay ON Canada
P1B 8L3
Tel: 705 495-7597

northbay@jlrichards.ca

Hawkesbury

326 Bertha Street
Hawkesbury ON Canada
K6A 2A8
Tel: 613 632-0287

hawkesbury@jlrichards.ca

Guelph

107-450 Speedvale Ave. West
Guelph ON Canada
N1H 7Y6
Tel: 519 763-0713

guelph@jlrichards.ca

J.L.Richards
ENGINEERS · ARCHITECTS · PLANNERS