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Assessment of Adequacy of Public Services

Wildpine Trails

J.L.Richards
ENGINEERS · ARCHITECTS · PLANNERS

Value through **service** and **commitment**

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1.0 Introduction

1.1 Background

In 2020, J.L. Richards & Associates Limited (JLR) was retained by Wildpine Trails Inc. (LHI) to prepare a Report that would assess the adequacy of public services in support of a Draft Plan of Subdivision Application for their property sited at 37 Wildpine Court, referred as Wildpine Trails.

In May of 2023, LHI decided to redevelop the subject property with a 4 storey apartment building with 94 units (Lot 1), two semi-detached units (Lot 2) and a public 18m right-of-way connecting two existing cul-du-sacs. A secondary pre-consultation meeting was held with the City of Ottawa on May 16, 2023, to review the proposed new site plan and outline the requirement for revisions to the current applications.

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

- Municipal Design Guidelines (see Section 1.4);
- The Upper Poole Creek Subwatershed Study (MMM 2000)
- Notes prepared to summarize the February 27, 2020 pre-consultation meeting; and
- Follow-up pre-consultations with the Mississippi Valley Conservation Authority (MVCA) to discuss the requirements of the Hydrological Impact Study (HIS).

The associated background studies prepared for the site should be read in conjunction with Adequacy of Public Services report and are referenced in the report:
- Hydrological Impact Study (HIS) (J.L. Richards & Associates Limited, April 2024),
- Geotechnical Investigation and Slope Stability Analysis, Proposed Residential Development, 37 Wildpine Court, Ottawa, Ontario (Geotechnical Report) (EXP Services Ltd, December 2023),
- Environmental Impact Statement, 37 Wildpine Court, Stittsville, Ottawa (EIS) (Kilgour & Associates Ltd, April 2024)

A copy of the pre-consultation meeting notes (February 27, 2020) is included in Appendix A. The reference documents stated above can be found in Appendix H.

1.2 Site Description and Condition

The subject property is located within the urban limits of the City of Ottawa, specifically in the Stittsville area. The subject property, 37 Wildpine Court, is located at the extremity of two (2) existing cul-de-sacs, namely Ravencroft Court and Wildpine Court. As illustrated on Figure 1 (below), the property is mostly vegetated and includes a single-family house and a garage, and an asphalted turning circle.

Figure 1: Site Location

LHI proposes to redevelop the subject property with a 4 storey apartment building with 94 units, two semi-detached units and a public 18m right-of-way connecting two existing cul-du-sacs.

The Conceptual Plan for the proposed development is included in Appendix B. The proposed servicing for the development is shown in Figure F-SGE in Appendix E.

1.3 Existing Conditions and Infrastructure

As previously noted, the subject property abuts two existing ROWs. Based on the existing topographical survey and imagery, the existing impervious surfaces within 37 Wildpine Court consists of a single-family dwelling, wooden garage, metal shed as well as brick interlock, gravel driveway and asphalted cul-de-sac. The topographical survey shows that runoff from all the impervious surfaces is sheet flowing towards either Poole Creek or a wetland.

A review of existing services was carried out along the frontage of the subject property to identify existing sewers and watermains. Based on the review of the Drawings obtained from the City of Ottawa (Appendix C), the following infrastructure has been identified to exist within both municipal ROW abutting 37 Wildpine Court:

Watermains:

- 203 mm diameter PVC watermain is located at the property limit at Ravenscroft Court
- 203 mm diameter ductile iron watermain is located at the property limit at Wildpine Court

Sanitary Sewers:

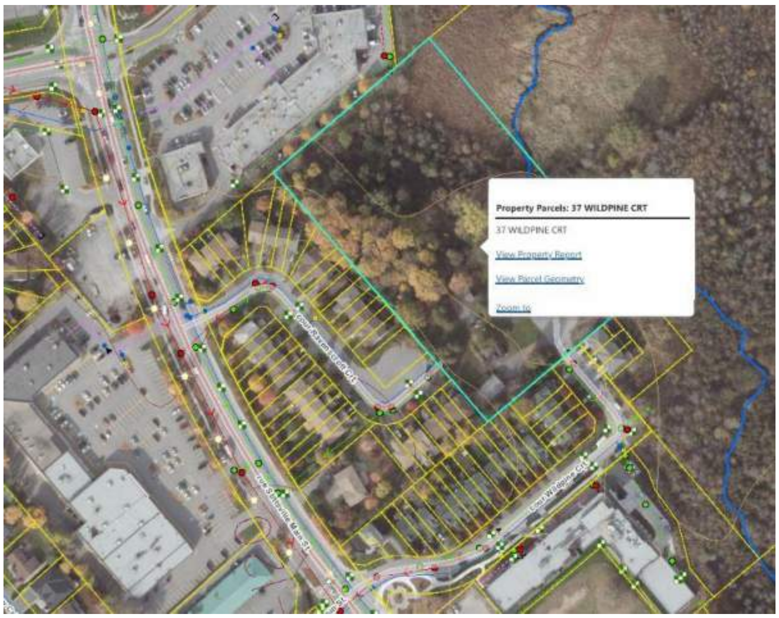
- 250 mm diameter PVC sanitary sewer is located at the property limit at Ravenscroft Court
- 250 mm diameter PVC sanitary sewer is located at the property limit at Wildpine Court

Storm Sewers:

- 300 mm diameter PVC storm sewer is located at the property limit at Ravenscroft Court
- 300 mm diameter PVC storm sewer is located at the property limit at Wildpine Court

Figure 2 below shows the existing infrastructure bounding the subject property.

Figure 2: Existing Infrastructure



1.4 Municipal Design Guidelines

This AAPS Report and associated functional site servicing drawing was prepared in accordance with the following:

Ottawa Sewer Design Guidelines (October 2012) complete with the following Technical Bulletins;

- ISTB-2012-01;
- ISTDB-2014-01;
- PIEDTB-2016-01;
- ISTB-2018-01, ISTB-2018-04;
- ISTB-2019-01, ISTB-2019-02;
- ISTB-2020-02, ISTB-2020-03; and,
- ISTB-2021-02.

City of Ottawa Water Distribution Guidelines complete with the following Technical Bulletins:

- ISTDB-2010-02;
- ISTDB-2014-02; and
- ISTDB-2018-02.

Detail Drawings as well as well as Sewer Material Specifications including:

- Sewer Connection (2003-513) and Sewer Use (2003-514) By-Laws;
- Watermains/Services Material Specifications as well as Water and Road Standard Detail Drawings;
- Water By-Law (2018-167).

1.5 Pre-Consultation, Permits and Approvals

A pre-consultation meeting was originally held between the LHI, Fotenn, the MVCA and the City of Ottawa on February 27, 2020 (Appendix A). A follow-up pre-consultation meeting was held between the MVCA and JLR to discuss the requirements of the HIS. The storm discharge criteria used for the preparation of this Report is presented in Section 4.1 (below). An additional pre-consultation meeting was held with the City of Ottawa on May 16, 2023, to review the proposed new site plan and outline the requirement for revisions to the current applications.

Once the AAPS Report is approved under the joint OPA/ZBLA, the development of the above-referenced property will be subject to the Draft Plan of Subdivision and municipal Site Plan control approval process with the City of Ottawa. At such time, the City of Ottawa Development Servicing Study Checklist will be prepared. It is expected that the Application for Environmental Compliance Approval (ECA) will be dealt under Transfer of Review.

2.0 Water Servicing

2.1 Water Supply and Design Criteria

A Hydraulic Network Analysis (HNA) was carried out for the proposed site to confirm that the existing watermain and proposed water service can provide adequate supply while complying with both the Ottawa Design Guidelines for Water Distribution (July 2010) (herein referred to as the Design Guidelines) and Technical Bulletins ISDTB-2014-02 and ISTB-2018-02.

Section 4.2.2 of the Design Guidelines requires 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 1 summarizes the design criteria for water servicing, which will also serve as the basis of the detailed design for the site.

Table 1: Water Design Criteria

Design Criteria	Design Value
Population > 500	
Residential average demand	280 L/cap/day
Residential maximum demand	2.5 x Avg
Residential peak hour	2.2 x Max Day
Density Single Family	3.4
Density Semi & townhouse	2.7
Density (apt) 1-bedroom (plus Den)	1.4
Density (apt) 2-bedroom	2.1
Density (apt) 3-bedroom	3.1
Population < 500	
Residential average demand	280 L/cap/day
Peaking Factors	MECP Table 3-3
Fire Flow Requirements	
Municipal ROW	FUS
Pressure/Flow	
Peak hour	>275 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 water demands presented in this section reflect the unit count proposed on the Site Plan. Domestic water demands were calculated for 94 apartment units, including 31 1-bedroom units, 29 1-bedroom plus den units, and 34 2-bedroom units. Domestic water demands were also calculated for the two semi-detached units.

The residential consumption rate for average day demand was set in accordance with Table 4-2 of the Design Guidelines. Since the proposed population for Wildpine Trails is less than 500 people, peaking factors interpolated from Table 3-3 of the MECP Design Guidelines were used to generate the maximum day, peak hour, and minimum hour demands. Table 2 summarizes the water consumption rates and peaking factors used in the HNA.

Table 2: Water Consumption Rates and Peaking Factors

Demand Scenario	Residential
Average Day Demand	280 L/c/d
Maximum Day Demand (Interpolated from Table 3-3, MECP 2008)	4.84 x Avg Day
Peak Hour Demand (Interpolated from Table 3-3, MECP 2008)	7.31 x Avg Day

Table 3 summarizes the water demand results based on the proposed site details and the peaking factors identified in Table 2 (refer to Appendix D for detailed calculations).

Table 3: Theoretical Water Demands

Demand Scenario	Water Demand (L/s)	
	Apartment Building	Semi-Detached Units
Average Day	0.51	0.02
Maximum Day	2.45	0.09
Peak Hour	3.69	0.14

2.3 Proposed Watermain Sizing and Roughness

Water supply will be provided by a proposed 200 mm diameter watermain loop between Ravenscroft Court and Wildpine Court, with a 200 mm diameter water service extending from the loop to the apartment building. Two 19 mm diameter water services will be extended from the loop to the semi-detached units.

Watermain roughness coefficients were determined using friction factors presented in Section 4.2.12 of the Design Guidelines and the internal pipe diameters were modelled based on Section 4.3.5 of the Design Guidelines.

2.4 Fire Flow Requirements

Within the City of Ottawa, the required fire flow (RFF) within a municipal right-of-way (ROW) must be estimated per the guidance of the Fire Underwriters Survey (FUS, 2020) for the given type of development. Three (3) fire flow scenarios were requested as boundary conditions from the City:

- Fire flow #1 (RFF = 69.2 L/s) which corresponds to the maximum sprinkler and hose allowance per the Ontario Building Code.
- Fire flow #2 (RFF = 217 L/s) which corresponds to the most critical FUS requirement for the site assuming a vertical fire wall for the apartment building.
- Fire flow #3 (RFF = 283 L/s) which corresponds to the most critical FUS fire flow scenario for the site assuming no vertical firewall.

Hydraulic boundary conditions were provided by the City via email dated May 29, 2023 (included in Appendix D) and are summarized below.

Table 4: Hydraulic Boundary Conditions

Demand Scenario	Head (m)	Pressure[1] (psi)
Maximum HGL	160.3	59.2
Peak Hour	156.4	53.6
Max Day plus Fire Flow #1 (Assumed Sprinkler 69.2 L/s)	154.7	51.3

Demand Scenario	Head (m)	Pressure[1] (psi)
Max Day plus Fire Flow #2 (With Firewall 217 L/s)	136.3	25.2
Max Day plus Fire Flow #3 (Without Firewall 283 L/s)	123.4	6.8

The sprinkler flow was assumed conservatively, and the Owner's mechanical engineer shall confirm the sprinkler system requirements at the detailed design stage. The boundary conditions received from the City also confirmed that a fire flow of 283 L/s is unavailable from the existing water distribution system once the watermain loop has been constructed. Therefore, the apartment building will require one (1) 2-hour vertical firewall to subdivide the building into two (2) fire areas. The assumed firewall location is shown in Appendix D and in the Drawings.

2.5 Headloss Calculations

Headloss calculations were carried out using the Hazen-Williams equation to confirm sizing of service laterals. The proposed functional servicing was evaluated under the demand scenarios listed in Section 2.2. The operating pressures at the apartment building's ground finished floor elevation were calculated using the water demand scenarios listed in Table 2-2. The Headloss Calculation Spreadsheet included in Appendix D summarizes the operating pressures estimated at the building under peak hour, maximum pressure, and maximum day plus fire flow scenarios.

2.5.1 Peak Hour

The peak hour demand shown in Table 2-2 was applied along the proposed 200 mm diameter water service lateral. Using the boundary conditions shown in Table 4, the anticipated pressure at the building was found to be 356 kPa (51.6 psi), exceeding the minimum pressure criterion of 276 kPa (40 psi).

As per the boundary conditions received from the City, the anticipated pressure at the connection point servicing the two semi-detached units under the peak hour condition was found to be 369 kPa (53.6 psi), exceeding the minimum pressure criterion of 276 kPa (40 psi).

2.5.2 Maximum Day Plus Fire Flow

The boundary conditions provided by the City for the maximum day plus fire flow conditions were used to confirm that the required fire flow per the FUS can be provided for the building. The headloss calculations were carried out for the maximum day plus sprinkler flow for the proposed service lateral. The anticipated pressure at the building was found to be 156 kPa (22.6 psi), exceeding the minimum pressure requirement of 140 kPa (20 psi).

The existing hydrants are capable of supplementing the FUS fire flow for both the apartment building and the semi-detached units based on the boundary conditions, in accordance with Technical Bulletin ISTB-2018-02. A new hydrant is proposed off the 200 mm diameter watermain loop, within 45 m of the building's Siamese connection in accordance with the Ontario Building Code (OBC). This will provide three (3) hydrants within 150 m of the apartment building and the semi-detached units, therefore the total required fire flow of 217 L/s and 167 L/s per the FUS, respectively, is met with the proposed servicing.

2.5.3 Maximum HGL

The Water Design Guidelines require that a high pressure check (maximum hydraulic grade elevation) be performed to ensure that the maximum pressure constraint of 552 kPa (80 psi) is not exceeded. Based on a zero demand (0 L/s) condition and the maximum HGL boundary condition at the building (refer to Table 2-3), a maximum pressure of 394 kPa (57.2 psi) is expected at the building. This pressure is below the maximum pressure constraint of 552 kPa (80 psi) therefore a pressure reducing valve (PRV) is not required for the building.

Given the height of the apartment building, domestic and fire pumps as well as the sprinkler system will be designed by the Owner’s mechanical engineer at the detailed design stage.

As per the boundary conditions received from the City, the anticipated pressure at the connection point servicing the two semi-detached units for the maximum HGL condition was found to be 408 kPa (59.2 psi), which is below the maximum pressure constraint of 552 kPa (80 psi).

2.6 Summary and Conclusions

Based on the HNA presented above, it is expected that the proposed 200 mm diameter watermain loop can provide adequate water supply to the apartment building (via the proposed 200 mm diameter water service) and the two semi-detached units. The peak hour, maximum day plus fire flow, and maximum HGL pressures achieve the required design criteria. The peak hour pressure for the building and the two semi-detached units exceeds the minimum criteria of 276 kPa (40 psi). The maximum day plus sprinkler flow pressure for the building and the two semi-detached units exceeds the minimum requirement of 140 kPa (20 psi), and the maximum HGL pressure for the building and the two semi-detached units is below the maximum pressure constraint of 552 kPa (80 psi). The required fire flow calculated in accordance with FUS can be supplied by the sprinkler system and the existing/proposed municipal hydrants.

3.0 Wastewater Servicing

3.1 Background

The subject property is within the serviced area of the Stittsville Trunk Collector Sewer, which ultimately conveys the wastewater flows to the Robert O. Pickard Environmental Centre (ROPEC) for treatment. Wastewater flows from Wildpine Trails (both from the apartment building and the two proposed semis) will be collected and conveyed via service laterals that will outlet to the proposed sanitary sewer extension along Wildpine Court.

The sanitary sewers will outlet to the 250 mm diameter sanitary sewer along Wildpine Court. Both sanitary sewers then outlet to the trunk 300 mm diameter sanitary sewer on Stitsville Main Street.

The proposed sanitary sewers for Wildpine Trails were conceptually sized based on the City of Ottawa Sewer Design Guidelines ((OSDG) - (October 2012)) and associated Technical Bulletins. Key design parameters have been summarized in Table 5.

Table 5: 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
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
Density Semi & townhouse Density (apt) 1-bedroom (plus Den) Density (apt) 2-bedroom Density (apt) 3-bedroom	2.7 person/unit 1.4 person/unit 2.1 person/unit 3.1 person/unit	OSDG Section 4.3
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

3.2 Theoretical Sanitary Peak Flow

Peak wastewater flows were estimated based on the proposed density for 94 apartment units, including 31 1-bedroom units, 29 1-bedroom plus den units, and 34 2-bedroom units as well for the two semi-detached units using the above criteria. Based on the design criteria, and site constraints a total combined peak wastewater flow of 2.10 L/s was calculated. Table 6 summarizes the theoretical peak flows for the project site (refer to Appendix E for calculations).

Table 6: Theoretical Peak Wastewater Flow

Design Criteria	Flow (L/s)
Theoretical Population: 162 (95 apt units + 2 semis)	
Peak Wastewater Flow (Dry Weather) based on Harmon	1.85
Dry & Wet I/I (0.33 L/s/ha – 0.77 ha)	0.25
Total Theoretical Peak Flow	**2.10**

3.3 Proposed Sanitary Sewer Sizing

The proposed sanitary sewers within the project site will collect wastewater flows before discharging into the existing Wildpine Court 250 mm diameter sanitary sewer system. Given the overall peak wastewater flows of 2.10 L/s, the proposed sanitary sewer extension on Wildpine Court will consist of 200 mm diameter sewers with overall slopes of 0.32% (refer to Drawing F-SE), the minimum sewer slope as per Section 6.1.2.2 of the Guidelines. This configuration can, therefore, accommodate peak flows up to 19.4 L/s, exceeding the target flow of 2.10 L/s. The downstream sewers were designed based on the pervious ODSG requirement of 350 L/c/d, given the updated design parameters of 280 L/c/d per the ISTB-2018, the downstream sewers are expected to accommodate the additional 2.10 L/s.

The upstream section of the sewer along the public ROW will be set to 0.65%; however, the sewer reaches closer to the existing Wildpine Court will be set to a flatter slope (minimum of 0.32%) to maximize the cover over this sanitary sewer reaches. Final grades will be set at detailed design while considering cover, crossing, etc.

3.4 Wastewater Servicing Conclusions

Wastewater from this development is tributary to the existing Wildpine Court 250 mm diameter sanitary sewer which is available at the Site boundary limit. The theoretical peak wastewater flow of 2.10 L/s will be accommodated by proposed Wildpine 200 mm diameter sewer extension which will be at the minimum slope of 0.32%.

4.0 Storm Servicing and Stormwater Management

4.1 Background

The subject property is adjacent to the Poole Creek channel and there is an unevaluated wetland within the northern portion of the property. Runoff from the site currently flows overland into either Poole Creek or the wetland which is connected to Poole Creek. There is currently no minor system storm sewer servicing the site however developments to the south and west have minor system storm servicing in an urbanized cross section. Part of the rear yards of the development to the west contributes flow to the wetland.

The proposed development site is split between a block for a four-storey apartment complex and a portion of the site with a connector right-of-way between Ravenscroft Court and Wildpine Court and subdivision.

Poole Creek and the unevaluated wetland are within the Hazard Regulation Limits of the Mississippi Valley Conservation Authority (MVCA).

4.2 Design Criteria and Constraints

The design of stormwater management servicing for the site will be as per the municipal design requirement documents set out in Section 1.4. The site is immediately south of the Upper Poole Creek Subwatershed Study, which states that there is no water quantity control for developments but there is a requirement for 80% TSS removal of stormwater runoff to Poole Creek. Since the site is downstream of the Upper Poole Creek Subwatershed Study the City has directed that the quantity control criteria in the subwatershed study is not applicable and the post development runoff to Poole Creek must meet pre-development conditions. The site is within the Carp River PCSWMM Model managed by the City.

An Environmental Impact Statement has been prepared on the unevaluated wetland area to the north and it has identified that pre-development water balance conditions must be maintained for the health of the wetland function. Due to the proposed development being within 30 metres of the wetland the MVCA requires a Hydrological Impact Study to be completed.

4.3 Hydrological Impact Study Findings

The Hydrological Impact Study (HIS) detailed the long term continuous water balance simulations that had been undertaken in PCSWMM models of the pre, post and mitigated development scenarios.

Inputs to the long term continuous simulation modelling included soil parameters based on the results of the geotechnical investigations. The geotechnical investigations of the site included testholes, groundwater elevation recordings and infiltration testing. The infiltration testing results were used in the ground infiltration parameters with the soils data used in the groundwater component of the modelling.

The modelling found that infiltration would reduce as a result of the development however by integrating infiltration mitigation measures into the development the infiltration of the site would be increased to beyond that currently achieved at the site and runoff would reduce but still required control to meet predevelopment levels. The outcomes of the HIS can be summarized in Table 7. Note that the values in Table 7 sum to 100 plus or minus the modelling error in the groundwater component.

Table 7: Summary of Hydrological Impact Study Results[1]

Water Budget Component	Pre Development Percent of Water Budget (%)	Post Development Percent of Water Budget (%)	Mitigation Option Percent of Water Budget (%)
Rainfall	100	100	100
Evapotranspiration	51	29	29
Runoff	27	68	53
Infiltration	21	4	19

4.4 Allowable Peak Flow

The runoff from the proposed four-storey apartment complex site currently drains towards both the wetland and Poole Creek. Analysis of the existing topography has identified the overland flow path split between the two drainage areas. The predevelopment flow rates to both the Wetland and Poole Creek have been identified as being the allowable release rates. The pre-development / allowable release rates for the site under various storm return period events are shown in Table 8 and Table 9.

[1] It should be noted that percentages sum to 100 ± model groundwater errors.

In addition, there is currently flow from the existing dual drainage system servicing Wildpine Court which drains to Poole Creek. The service area for this system includes the residential properties on Wildpine Court, the municipal right-of-way and the controlled runoff from the Wildpine Residence development. As-built data from the Wildpine Residence development has been used to simulate the existing major and minor system on Wildpine Court discharging to Poole Creek as shown in Table 8 and Table 9. The discharge from the minor system is at the outlet of the sewer system on Wildpine Court which discharges to Poole Creek and the Major System discharge is the result of overland flow from Wildpine Court.

Table 8: Peak Pre-Development Flow Rates (3-hour Chicago Storm)

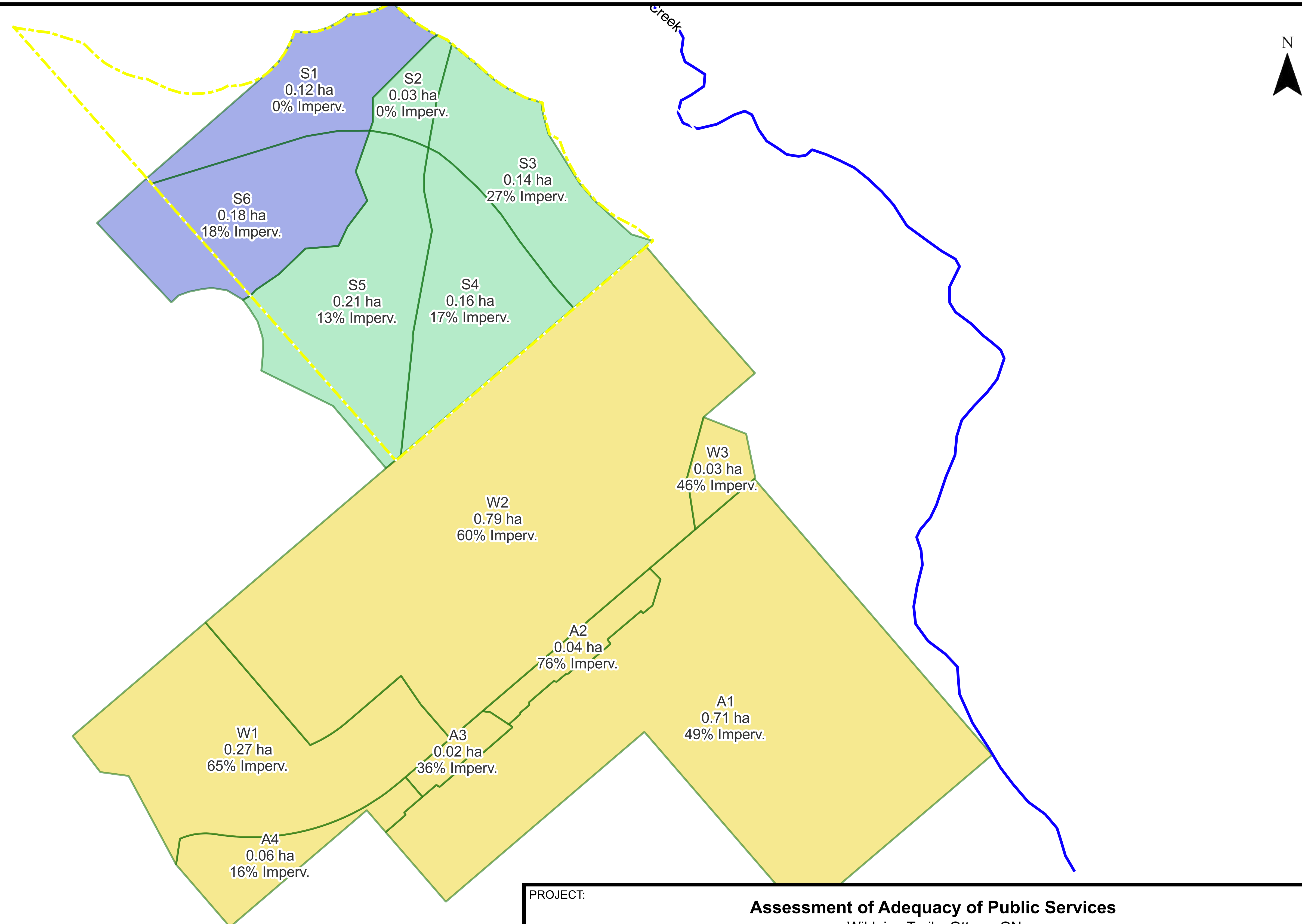
Return Period Event	Peak Flow to Wetland (l/s)	Peak Flow to Poole Creek from Site (l/s)	Peak Flow to Poole Creek from Minor System (l/s)	Peak Flow to Poole Creek from Major System (l/s)	Total Peak Flow to Poole Creek (l/s)
1:2 year	0.0	0.1	161.0	3.0	164.2
1:5 year	0.3	14.4	211.4	5.2	231.3
1:10 year	8.0	26.3	236.3	38.0	308.5
1:25 year	19.8	41.1	254.3	98.0	413.2
1:50 year	28.2	52.0	268.1	134.5	482.7
1:100 year	41.6	65.6	279.2	181.8	568.1

Table 9: Peak Pre-Development Flow Rates (24-hour SCS Storm)

Return Period Event	Peak Flow to Wetland (l/s)	Peak Flow to Poole Creek from Site (l/s)	Peak Flow to Poole Creek from Minor System (l/s)	Peak Flow to Poole Creek from Major System (l/s)	Total Peak Flow to Poole Creek (l/s)
1:2 year	0.0	6.4	124.8	2.5	133.8
1:5 year	7.4	20.7	178.7	4.3	211.1
1:10 year	15.3	29.0	210.8	5.5	260.5
1:25 year	23.2	37.7	236.0	26.1	322.9
1:50 year	36.2	49.2	248.2	49.2	382.9
1:100 year	54.1	69.8	258.7	81.3	463.9

For the pre-development condition, site impervious accounted for the current gravel turning area and buildings on the site. The pre-development catchment details such as imperviousness and area for each catchment are displayed in Figure 3, which is colour coded to indicate the outlet groups in the tables. Soil infiltration parameters were based on the infiltration testing results from the geotechnical investigations carried out on the site and detailed in the HIS report. For the Wildpine Court area the hydrologic parameters and model set up was based on the as-built drawings for the Wildpine Residential development.

The pre-development model schematic is provided in Appendix G.



Legend

- Development Limits
- Existing Major/Minor System on Wildpine Court to Poole Creek
- Site Overland flow to Poole Creek
- Site Overland Flow to Wetland

10 0 10 20 30 40 m

PROJECT:

Assessment of Adequacy of Public Services
Wildpine Trails, Ottawa ON

DRAWING:

Pre Development Event Simulation Model Schematic

J.L.Richards
ENGINEERS · ARCHITECTS · PLANNERS

DESIGN: BP
DRAWN: BP
CHECKED:

JLR NO: 29803-000
DRAWING NO: **Figure 3**

4.5 Conceptual Storm Servicing Solution

The conceptual stormwater management servicing for the site includes the following components:

- Rooftop control for the 4-storey apartment building to control flows to 10 L/s from the roof and discharged to surface runoff to the bioretention cell to the north-east of the building;
- Conveyance of stormwater runoff from the apartment building lot via the building drainage system and ditch systems to two bioretention cells to capture flow and control prior to release to the downstream receivers;
- Conventional storm sewer system with catchbasin ICDs on the public right-of-way corridor connecting to the existing 300mm diameter sewer on Wildpine Court;
- Control of flows from the residential properties on Block 3 via a rear yard superpipe and controlled release to the conventional storm sewer system on the public right-of-way; and,
- Upsizing of the downstream section of the existing storm sewer on Wildpine Court at the outlet from a PVC 375mm diameter to a PVC 400mm diameter sewer.

The stormwater management solution for the apartment block consists of rooftop control and two bioretention cells, one with filtration and one with infiltration. The two bioretention cells, together with the storage on the roof of the building, as an overall system will contribute to achieving the required water budget. The West cell will provide sufficient storage and infiltration to control flows to pre-development release rates from the site and the East cell will provide filtration to achieve the water quality criteria. The bioretention cells include a 450mm deep surface storage basin with a level spreader overflow berm to the downstream receiver, a 300mm deep soil layer consisting of filter media to facilitate water quality treatment and a 400mm deep storage layer of clearstone to hold runoff prior to infiltration. The west bioretention cell which is along the wetland side of the site is 35m long by 3m wide and the east bioretention cell, fronting Poole Creek, is 30m long by 3m wide. The bioretention cells are located within the setback limits of the site.

Bioretention cells will be designed in accordance with industry best practices and standards and will include a level spreader design consistent with the flows it will experience which could include concrete, wood or metal finishing.

The base of the bioretention cell on the west fronting the wetland is at 115.05 m and the highest recorded groundwater elevation at the closest borehole, BH2, is 113.68 m. The east bioretention cell, fronting Poole Creek, will have a base elevation of 115.00 m and the highest recorded groundwater elevation in the vicinity is at TP-6, 113.16 m. The bioretention cells have 1m clearance to the maximum recorded groundwater elevations. A summary of the groundwater and LID levels is shown in Table 10

Table 10: Groundwater level comparisons

Bioretention Cell	Highest Groundwater Recorded (m)	Bottom Elevation of LID (m)	Difference (m)
West Cell	113.68	115.05	+1.37
East Cell	113.16	115.00	+1.84

The drainage system for the apartment block includes a system to drain the lands above the extended portion of the underground garage structure. Roof drains for the underground garage structure extend up to the surface and capture flow at low points in the grassed areas surrounding the sealed driveway section. A trench drain located at the bottom of the ramp to the garage structure will be collected as part of the building drainage system as well.

The stormwater management for the public right-of-way and residential semi-detached units fronting the right-of-way utilizes the existing storm sewer on Wildpine Court. ICDs at the catchbasins on the public right-of-way will control flow to the 1:2-year rational method flow rate with a controlled release rate of 6 L/s.

The combined maximum capture rate of the street ICDs exceeds the 2-year peak flow rate. Each ICD is sized to capture 6.0 L/s of flow while the 2-year rational flow rate is 10.9 L/s. Therefore, there will be no ponding in the 1:2 year event and this will be confirmed in detailed design with detailed grading.

Rear yard runoff from the residential semi-detached units will be controlled via a superpipe in the rear yard of the residential sites. A single superpipe will be placed on one of the properties with a joint agreement between the two lots. The 35m long, 600mm diameter pipe will control flows with a Vortex Type 70 ICD prior to discharge to the public storm sewer. Only private runoff from the rear yards will be conveyed to the superpipe.

Despite the upstream controls on the residential site and the ICD controls on the public right-of-way there is an increase in flows to the downstream storm sewer system such that the HGL in the system is affected in the 1:100-year event. To mitigate the impact of the increased flows on the HLG the downstream 375mm diameter PVC sewer is recommended for upsizing to a 400mm diameter PVC sewer which will provide additional capacity for the increased flows.

4.6 Modelling of the Stormwater Management Solution

The PCSWMM model has been set up to simulate the various elements of the system to an extent that is representative of the site as per the level of detail currently developed.

Different simulations were run to represent the different storm events. The following storm events for the pre- and post-development conditions were tested:

- 3-hour Chicago storm, 2, 5, 10, 25, 50, 100-yr return periods
- 24-hour SCS storm, 2, 5, 10, 25, 50, 100-yr return periods
- Pre-, Post-, LID Continuous simulations for the water balance

4.6.1 Drainage Areas

Models for the assessment of the stormwater management solution are consistent with the DST drawing, however, the continuous simulation models for the water budget assessment do not need to account for hydraulics and the delineation of the catchments is dictated by surface runoff direction as well as groundwater flow direction. Discussion on the water balance modelling is provided in the HIS report.

4.6.2 Building Conveyance System

The ground above the garage roof structure has been simulated in the PCSWMM model as completely impervious catchments draining to storage nodes representing the sag storage contained within each grassed area. Where the catchment represents grassed area this has included an LID element in the model which allows the infiltrated runoff to be captured by the model and directed to the building conveyance system as it would be by the drainage system on top of the garage roof structure. The modelled approach ensures that the volume of flow reaches the downstream bioretention cells at a flow rate that approximates the building conveyance system. The grassed area LID components only include surface storage at 4.67mm depth to represent typical depression storage on a catchment. The LID component is used instead of a typical pervious grassed area catchment to ensure that infiltrated flows are able to be captured in the building plumbing system and conveyed to the bioretention cells.

4.6.3 Bioretention Cells

The two bioretention cells have been simulated in the PCSWMM model with LID elements in the catchment. The schematic shows the approximate extent of the LIDs, but the actual areas are entered into the model parameters. Runoff from the bioretention cells is directed to a storage node which represents the depth of storage used when there is overflow from the bioretention cell, overflow is conveyed in the model via a conduit representing a channel to simulate the sheet flow down the hillside to the downstream receiver. The storage node does not double count the storage within the bioretention cell as it only represents storage of flow above the spill from the bioretention cell as it spills over.

4.6.4 Street and Residential Lot Dual Drainage

A dual drainage system has been developed for the Wildpine Connector right-of-way based on the preliminary conceptual grading plan for the developed area. To assess impact on the downstream system the minor system was developed from the available as-built information and the City of Ottawa GeoOttawa data while major system flow was represented based on street sag storage connected by spill locations.

4.6.5 Runoff from adjacent areas

Based on the available information from the Storm Drainage Plan for the Rowley Townhouse Project (Drawing 8633-STMI, Novatech Consultants, 1992) (a copy is included in Appendix G) runoff from the rear of properties at 27 to 33 Ravenscroft Court and the side yard of 38 Ravenscroft Court will overland sheet flow onto the new development. This area has been included in the pre and post development scenarios. Drainage delineation is based on the drawing from Novatech and parameters have been assessed based on the extent of impervious surface on aerial photography.

4.7 Evaluation of Conceptual Stormwater Management Solution

A schematic of the post development modelling scenario is provided in Appendix G. Additionally, Figure 4 below displays the catchments specifications such as area and imperviousness, colour coded by outlet group identified in the results tables.

4.7.1 Quantity Control

Quantity control is provided on the site via the rooftop control and bioretention cells for the apartment block and superpipe on the rear of the residential lot. The pre and post development peak flow rates to each of the downstream receivers is compared in Table 11 and Table 13 below.

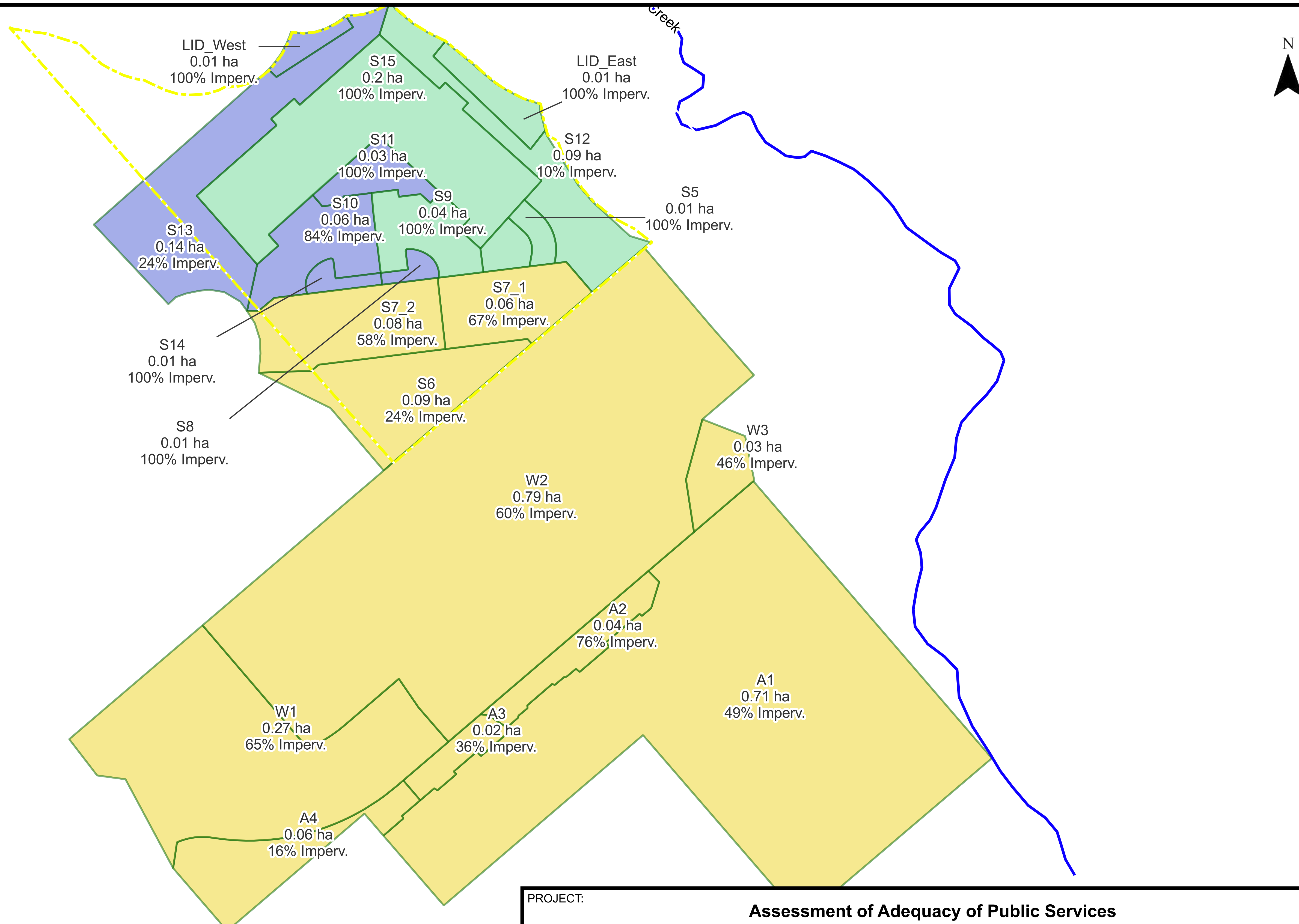
Table 11: Peak Flow Comparison to Wetland (3-hour Chicago Storm)

Return Period Event	Pre-Development (l/s)	Post Development (l/s)	Difference in flow (l/s)
1:2 year	0.0	0	0.0
1:5 year	0.3	0	-0.3
1:10 year	8.0	0	-8.0
1:25 year	19.8	3.81	-16.0
1:50 year	28.2	15.26	-12.9
1:100 year	41.6	25.8	-15.8

Table 12: Peak Flow Comparison to Wetland (24-hour SCS Storm)

Return Period Event	Pre-Development (l/s)	Post Development (l/s)	Difference in flow (l/s)
1:2 year	0.0	0	0.0
1:5 year	7.4	0	-7.4
1:10 year	15.3	0	-15.3
1:25 year	23.2	10.64	-12.5
1:50 year	36.2	27.9	-8.3
1:100 year	54.1	35.6	-18.5

The flows to the wetland shown in Table 11 and Table 12 indicate that the post development flows are lower than the pre-development flows in all events. The west bioretention cell, which features exfiltration, will increase groundwater flow to the wetland through infiltration.



Legend

- Development Limits
- Apartment Site Flow to Poole Creek via Eastern Bioretention Cell
- Apartment Site Flows to Wetland via Western Bioretention Cell
- Flows via Existing Major/Minor System on Wildpine Court to Poole Creek

10 0 10 20 30 40 m

PROJECT:

Assessment of Adequacy of Public Services
Wildpine Trails, Ottawa ON

DRAWING:

Post Development Event Simulation Model Schematic

J.L.Richards
ENGINEERS · ARCHITECTS · PLANNERS

DESIGN:	BP
DRAWN:	BP
CHECKED:	
JLR NO:	29803-000
DRAWING NO:	**Figure 4**

Table 13: Peak Flow Comparison to Poole Creek (3-hour Chicago Storm)

Return Period Event	Total Pre-Development (l/s)	Post from Apartment Site (l/s)	Post from Minor System (l/s)	Post from Wildpine Major System (l/s)	Total Post Development Flow (l/s)	Difference in flow (l/s)
1:2	164.2	11.13	176.3	3.0	190.4	+26
1:5	231.3	12.76	235.9	5.2	253.9	+23
1:10	308.5	20.71	262.6	38.1	321.3	+13
1:25	413.2	24.39	283.5	83.5	391.4	-22
1:50	482.7	27.48	298.4	130.7	456.7	-26
1:100	568.1	32.24	310.0	172.5	514.7	-53

Table 14: Peak Flow Comparison to Poole Creek (24-hour SCS Storm)

Return Period Event	Total Pre-Development (l/s)	Post from Apartment Site (l/s)	Post from Minor System (l/s)	Post from Wildpine Major System (l/s)	Total Post Development Flow (l/s)	Difference in flow (l/s)
1:2	133.8	11.2	139.7	2.5	153.4	+20
1:5	211.1	19.4	201.9	4.3	225.6	+14
1:10	260.5	25.4	236.0	5.5	266.9	+6
1:25	322.9	34.2	263.6	26.0	323.8	+1
1:50	382.9	39.6	276.6	49.2	365.5	-17
1:100	463.9	43.4	288.5	78.6	410.4	-53

Flows to Poole Creek shown in Table 13 and Table 14 indicate that flows to Poole Creek are overall reduced in large storm events where the increase in flow from the connector street is able to be mitigated by the reduction in flow from the apartment site and the bioretention cell control. In frequent events there is a minor increase in flows to Poole Creek. Opportunity for further overcontrol to mitigate impacts to Poole Creek is limited as the overflow component from the east bioretention cell to Poole Creek, which is the only component that could be subject to further control in the frequent events, is only half of the total difference in flow to Poole Creek post to pre. Further expansion of the cell will be considered with detailed grading as currently it appears that further expansion is limited by topography in the area. Flows on the Wildpine Court minor system are already controlled to prevent ponding in the 1:2-year event and cannot be reduced further, and major system flows in the frequent events are small.

Poole Creek was included in the City's model of the Carp River developed in 2017. At the location in Poole Creek in the Carp River model the upstream drainage area is 1263 ha while the drainage area to Poole Creek for this study is 2.5 ha. Peak flow in Poole Creek in the Carp River model at this location during the 1:2-year event is 4,112 L/s compared to the post development flow of 190.5 L/s from the site. The increase in flow is negligible compared to the peak flows in Poole Creek, less than 0.8% of the flow, and due to the location in the watershed and the relatively small catchment contributing from the site the increase in flow from the site will not occur at the same time as the peak in Poole Creek, thus mitigating impacts further. Peak flows in Poole Creek occur at around 1.5 hours following the peak of the rainfall event, while runoff from the site enters Poole Creek during the peak of the rainfall event. The differences are summarized in Table 15. There will therefore be no discernible impact on peak flows in the Carp River as a result of the proposed stormwater management measures.

Similarly, in infrequent events the flow in Poole Creek 10,059 L/s and the flow from the site is around 5% of this flow, the reduction in the peak flow of 53 L/s is equivalent to 0.5% of the flow in the Carp River and therefore there will be no discernible impact on peak flows in the Carp River in infrequent events. It should be noted that further controls on the negligible impact in the frequent events will have further impact on reduction of flows in the infrequent events.

Table 15: Differences to Poole Creek (Carp River Model)

Parameter	From Site	Poole Creek (Carp River Model)	Difference
Peak Flow 1:2 year event (L/s)	190	4112	4.6 %
Increase in peak flow (L/s)	26	-	0.64%
Time of Peak Flow (hours following rainfall peak)	0.25	1.5	1.25 hours

4.7.2 Operation of the Bioretention Cells

The results in Table 11 to Table 14 show that the bioretention West cell retains all flows in frequent events and overtopping will only occur in larger events while some overflow occurs in the smaller events in the East cell. The model has included an element to assess the velocity of the overland sheet flow occurring from the bioretention cell in the storm events. The flows and velocities are shown in Table 16 and Table 17.

Table 16: Bioretention Cells Overflow Analysis (3-hour Chicago Event)

Return Period Event	West Cell Overflow Rate (l/s)	West Cell Overflow Velocity (m/s)	East Cell Overflow Rate (l/s)	East Cell Overflow Velocity (m/s)
1:2	0.0	0	9.3	0
1:5	0.0	0	10.9	0.12
1:10	0.0	0	18.8	0.14
1:25	3.8	0	22.5	0.16
1:50	15.3	0.18	25.6	0.16
1:100	25.8	0.22	30.4	0.17

Table 17: Bioretention Cells Overflow Analysis (24-hour SCS Event)

Return Period Event	West Cell Overflow Rate (l/s)	West Cell Overflow Velocity (m/s)	East Cell Overflow Rate (l/s)	East Cell Overflow Velocity (l/s)
1:2	0.0	0	9.3	0

Return Period Event	West Cell Overflow Rate (l/s)	West Cell Overflow Velocity (m/s)	East Cell Overflow Rate (l/s)	East Cell Overflow Velocity (l/s)
1:5	0.0	0	17.5	0.14
1:10	0.0	0	23.6	0.16
1:25	10.6	0.16	32.3	0.18
1:50	27.9	0.23	37.8	0.19
1:100	35.6	0.26	41.5	0.2

The results show that velocities of flow overtopping the bioretention cells will be low and below velocities which are likely to induce erosion of the slope. The MTO Drainage Management Manual advises in Design Chart 2.17 that the maximum permissible velocity for a grassed slope before erosion would occur is 0.8 m/s.

4.7.3 Operation of Street and Residential System

The street system has a low point sag with catchbasins controlled to the 1:2-year capture rate by ICDs. The modelling results show that there is 140mm of ponding in the 1:100-year Chicago storm event with the preliminary sizing and grading. The design sheet for the system, including the downstream system is included in Appendix F and shows that with the increase in the downstream pipe size there is sufficient capacity in the system for the 1:2-year event.

At the upstream end of the existing system on Wildpine Court the HGL has been assessed under the 1:100-year event under both pre- and post development conditions with the results provided in Table 18: System HGLs (1:100 year 3-hour Chicago Storm).

Table 18: System HGLs (1:100 year 3-hour Chicago Storm)

Scenario	MHST09442 Existing on Wildpine Court (m)	MHST09441 Existing on Wildpine Court (m)	SU8 Proposed on Connector ROW (m)	Semi-Detached USF (m)
Pre-development	117.51	115.12	-	
Post Development (Existing Storm Sewer)	117.52	115.22	115.55	117.00
Post Development (Upsized Storm Sewer Section)	117.49	115.08	115.55	117.00

The table shows that with the increased pipe size the impact on the HGL from the increased flows is mitigated. HGLs in the Wildpine Connector right-of-way provide greater than 300mm freeboard to the proposed semi-detached residential properties. In addition, flows to Poole Creek overall from the development are maintained to pre-development levels.

4.7.4 Quality Control

The bioretention cells are designed in accordance with the Sustainable Technologies Evaluation Program Low Impact Development Stormwater Management Planning and Design Guide, located as a wiki online, and the west cell infiltrates all flow from the apartment site in beyond the water quality event and in up to the 1:2 year return period events while the east cell controls the release of flows via an underdrain.

Analysis of water quality requirements under Table 3.2 of the Ministry of the Environment Stormwater Management Planning and Design Guide is set out in Table 19.

Table 19: Water Quality Analysis under Table 3.2 of MEOE SWMPDG

	West Bioretention Cell to Wetland	East Bioretention Cell to Poole Creek
Drainage Area (ha)	0.247	0.360
Upstream Imperviousness (%)	53%	78%
Storage Volume Required for 80% TSS removal by infiltration (m^3/ha)	20	28
Volume Required (m^3)	5	10
Quality Volume Provided (m^3)	5	10
Quantity Volume Provided (m^3)	42.25	30.5
Total Volume Provided (m^3)	47.25	40.5

Table 19 shows that sufficient water quality volume is provided to for 80% TSS removal. Therefore, water quality control for up to 80% TSS removal is achieved for the apartment site runoff to the biorentention cells.

Runoff from Block 3 and the Wildpine Connector right of way corridor will be by means of an OGS unit to be sized in detailed design.

4.8 Evaluation of Conceptual Stormwater Management Solution under Stress Test

An evaluation of the conceptual stormwater management solution was conducted under a stress test scenario that assumed that both bioretention cells are saturated at the beginning of the simulation as a conservative evaluation and that no infiltration occurs in the west cell and the underdrain is blocked in the east cell.

4.8.1 Quantity Control

The pre and post development peak flow rates to each of the downstream receivers under the stress test scenario is compared in Table 20 and Table 22 below.

Table 20: Peak Flow Comparison to Wetland (3-hour Chicago Storm)

Return Period Event	Pre-Development (l/s)	Post Development (l/s)	Difference in flow (l/s)
1:2 year	0.0	0	0.0
1:5 year	0.3	0	-0.3
1:10 year	8.0	1.72	-6.3
1:25 year	19.8	15.11	-4.7
1:50 year	28.2	26.92	-1.2
1:100 year	41.6	41	-0.6

Table 21: Peak Flow Comparison to Wetland (24-hour SCS Storm)

Return Period Event	Pre-Development (l/s)	Post Development (l/s)	Difference in flow (l/s)
1:2 year	0.0	0	0.0
1:5 year	7.4	1.03	-6.4
1:10 year	15.3	13.2	-2.1
1:25 year	23.2	30.62	+7.5
1:50 year	36.2	47.57	+11.4
1:100 year	54.1	56.14	+2.0

The flows to the wetland shown in Table 20 and Table 21 indicate that should the bioretention cell cease to function as designed, there may be some increase in flows to the wetland in infrequent longer duration events. The potential increase will be partially offset by a corresponding loss of infiltration capacity. Observation of the bioretention cell to ensure that it is operating as expected following rainfall events will be included in the Operation and Maintenance Manual.

Table 22: Peak Flow Comparison to Poole Creek (3-hour Chicago Storm)

Return Period Event	Total Pre-Development (l/s)	Post from Apartment Site (l/s)	Post from Minor System (l/s)	Post from Wildpine Major System (l/s)	Total Post Development Flow (l/s)	Difference in flow (l/s)
1:2	164.2	12.25	176.3	3.0	191.5	+27
1:5	231.3	19.3	235.9	5.2	260.4	+29
1:10	308.5	22.42	262.6	38.1	323.0	+15
1:25	413.2	26.99	283.5	83.5	394.0	-19
1:50	482.7	30.7	298.4	130.7	459.9	-23
1:100	568.1	39.05	310.0	172.5	521.5	-47

Table 23: Peak Flow Comparison to Poole Creek (24-hour SCS Storm)

Return Period Event	Total Pre-Development (l/s)	Post from Apartment Site (l/s)	Post from Minor System (l/s)	Post from Wildpine Major System (l/s)	Total Post Development Flow (l/s)	Difference in flow (l/s)
1:2	133.8	17.8	139.7	2.5	160.0	+26
1:5	211.1	24.4	201.9	4.3	230.7	+20
1:10	260.5	29.7	236.0	5.5	271.1	+11
1:25	322.9	35.5	263.6	26.0	325.1	+2

Return Period Event	Total Pre-Development (l/s)	Post from Apartment Site (l/s)	Post from Minor System (l/s)	Post from Wildpine Major System (l/s)	Total Post Development Flow (l/s)	Difference in flow (l/s)
1:50	382.9	39.7	276.6	49.2	365.6	-17
1:100	463.9	43.4	288.5	78.6	410.4	-53

Flows to Poole Creek under the stress test scenario, shown in Table 22 and Table 23 indicate that if the underdrain were to cease functioning and the bioretention cell become saturated then there would be negligible impact on Poole Creek compared to the results in Table 13 and Table 14.

4.8.2 Operation of the Bioretention Cells

The flows and velocities from the bioretention cells under the stress test scenario, where there is no infiltration or underdrain operating and the cells are saturated at the start of the event, are shown in Table 24 and Table 25.

Table 24: Bioretention Cells Overflow Analysis (3-hour Chicago Event)

Return Period Event	West Cell Overflow Rate (l/s)	West Cell Overflow Velocity (m/s)	East Cell Overflow Rate (l/s)	East Cell Overflow Velocity (m/s)
1:2	0.0	0	12.3	0.12
1:5	0.0	0	19.3	0.15
1:10	1.7	0	22.4	0.15
1:25	15.1	0.18	27.0	0.17
1:50	26.9	0.23	30.7	0.18
1:100	41.0	0.27	39.1	0.19

Table 25: Bioretention Cells Overflow Analysis (24-hour SCS Event)

Return Period Event	West Cell Overflow Rate (l/s)	West Cell Overflow Velocity (m/s)	East Cell Overflow Rate (l/s)	East Cell Overflow Velocity (l/s)
1:2	0.0	0	17.8	0.14
1:5	1.0	0	24.4	0.16
1:10	13.2	0.17	29.7	0.17
1:25	30.6	0.24	35.5	0.19
1:50	47.6	0.29	39.7	0.19
1:100	56.1	0.31	43.4	0.2

The results show that velocities of flow overtopping the bioretention cells will remain below values indicated in the MTO Design Chart 2.17 for permissible maximum velocities and will not result in erosion of the slopes despite infiltration or underdrain filtration flow not occurring.

4.9 Storm and Stormwater Management Conclusions

The proposed development for the site has a stormwater management solution which achieves the required water quantity and quality criteria for the site. Flows from the site are controlled to the pre-development release rate from the site in all events in up to the 1:100-year event, pre-development water balance is achieved with the proposed bioretention cells and water quality is also provided.

This report has been prepared for the exclusive use of Wildpine Trails 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 Wildpine Trails 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 Associate;
Manager, Ottawa, Civil Development

Prepared by:

Bobby Pettigrew, P.Eng.
Senior Water Resources Engineer

Appendix A

Summary of pre-consultation meetings (2)

Karla Ferrey

From: Raad Akrawi <rakrawi@groupeheafey.com>
Sent: Friday, May 26, 2023 5:35 PM
To: Tamara Nahal; Pascal Pomerleau; Bobby Pettigrew; Karla Ferrey; Delwar Ahmed; Guy Forget; Ismail Taki; Anthony Francis Ph.D.; Chris.Kimmerly@exp.com; posen@fotenn.com
Cc: Carmine Zayoun
Subject: RE: 37 Wildpine - Required Plans & Studies

Hi Chris & Ismail: The City planner just confirmed that the Phase I & II ESA does not need to be updated. The intended use is still residential.

All other studies it does need to be updated.

Regards,
Raad

From: Raad Akrawi
Sent: Friday, May 26, 2023 12:45 PM
To: Tamara Nahal <nahal@fotenn.com>; Pascal Pomerleau <ppomerleau@pmaarchitectes.com>; Bobby Pettigrew <bpettigrew@jlrichards.ca>; Karla Ferrey <kferrey@jlrichards.ca>; Delwar Ahmed <Delwar.Ahmed@exp.com>; Guy Forget <gforget@jlrichards.ca>; Ismail Taki <ismail.taki@exp.com>; Anthony Francis Ph.D. <afrancis@kilgourassociates.com>; Chris.Kimmerly@exp.com; posen <posen@fotenn.com>
Cc: Carmine Zayoun <carmine@zayoungroup.com>
Subject: FW: 37 Wildpine - Required Plans & Studies
Importance: High

Team,

Due to a number of challenges related to the stormwater design with the previous design, Carmine has decided to change the concept plan from townhouses to a 4-storey apartment building and a semi (see attached). The EXP/Fotenn/JLR/PMA team was aware of this change and they attended the meeting with the City staff last week to discuss this, except for the EXP and KAL team.

That said, below is a list of studies and plans submitted by the City planner "Lisa Stern" that need to be updated with an addendum to ensure that the conclusions/recommendations of the report have not changed with the revised proposal, including Phase I & II ESA. The deadline to update and submit the updated reports and plans is **June 15th.** The revised application will need to be submitted before July. Therefore, all plans and studies must be submitted **before or on June 15th.**

Regards,

Raad

From: Stern, Lisa <lisa.stern@ottawa.ca>
Sent: Friday, May 26, 2023 11:25 AM
To: Tamara Nahal <nahal@fotenn.com>
Cc: Raad Akrawi <rakrawi@groupeheafey.com>; Carmine Zayoun <carmine@zayoungroup.com>; Jaime Posen <posen@fotenn.com>; Rathnasooriya, Shika <Thakshika.Rathnasooriya@ottawa.ca>; Mercedes Liedtke <mliedtke@mvc.on.ca>; Surprenant, Eric <Eric.Surprenant@ottawa.ca>; Giampa, Mike <Mike.Giampa@ottawa.ca>; Hayley, Matthew <Matthew.Hayley@ottawa.ca>
Subject: RE: 37 Wildpine - Required Plans & Studies

Tamara,

Please find comments on the revised proposal below.

Planning:

- A low rise apartment is generally supported by the Neighbourhood Designation policies of the Suburban Transect in the Official Plan.
- A rezoning, subdivision and site plan control application are required to facilitate the proposed development. Site plan cannot be completed until the subdivision is REGISTERED. The following are requirements for the rezoning and subdivision only. The existing subdivision and rezoning applications can be used however, a new sign and new circulation will be required (revision/recirculation fee applies).
- A new planning rationale is required to address the new proposal and compatibility with surrounding land uses.
- Lot 2 will be its own lot by virtue of the public road. Please ensure that the configuration and zoning is appropriate for the intended use. The Wildpine alignment may have to shift slightly north to ensure that a dwelling with a driveway can be developed.
- **All plans and studies should be updated with an addendum to ensure that the conclusions/recommendations of the report have not changed with the revised proposal**.

Engineering:
From an engineering perspective, all criteria and standards provided in the original pre-consultation notes apply. We would like to see quantity control measures for each storm event and infiltration targets achieved for the revised application.

Transportation:
No TIA required.

MVCA:
We have discussed internally regarding the question about a revised water balance analysis for 37 Wildpine. The purpose of the water balance is to satisfy the SWM requirements and ensure existing runoff is maintained. Given that most of the development is located outside of the MVCA regulation limit, and with the Bill 23 changes, the water balance will likely not need to be revised from MVCA's perspective.

For the revised applications, we would like to see the HIS and SWM updated as part of the revised plan of subdivision and zoning by-law amendment. Additionally, we would like the **Geotechnical Report to address the underground parking, with respect to flooding when the Site Plan application is submitted**.

From: Tamara Nahal <nahal@fotenn.com>
Sent: May 24, 2023 11:26 AM
To: Stern, Lisa <lisa.stern@ottawa.ca>
Cc: Raad Akrawi <rakrawi@groupeheafey.com>; Carmine Zayoun <carmine@zayoungroup.com>; Jaime Posen <posen@fotenn.com>
Subject: 37 Wildpine - Required Plans & Studies

Hi Lisa,

I hope you had a lovely long weekend and didn’t get caught in that flash rainstorm on Sunday!

Thank you again for meeting with the project team for 37 Wildpine last week. I was wondering if you could please circulate the required plans & studies list for the new low-rise apartment building concept for 37 Wildpine Crt.

Thanks very much for your time and attention.

Best,

Tamara

Tamara Nahal
Planner

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fotenn.com

Please use code *5709 to access Fotenn’s head office building at 396 Cooper Street, Suite 300 in Ottawa.

Follow Us

'

Guy Forget

From: Raad Akrawi <rakrawi@groupeheafey.com>
Sent: Thursday, October 15, 2020 3:33 PM
To: Guy Forget
Cc: 'Carmine Zayoun'
Subject: RE: Wildpine Trails Inc.
Attachments: 37 Wildpine_Zayoun_2020-09-29 L1-2.pdf; SWM_Upper Poole Creek Subwatershed Study _2000.pdf

Hi Guy,

Apology for the late reply – in regards to the concept plan, please use the one attached.

Also, I have received additional information from the City through the planner, which would affect stormwater management for the above-noted project. Please see below.

"

Hi Jaime,

Our engineer found some new information for the site and updated the pre-consult notes. Could you help pass this along to your team. There are 2 attachments, one as pdf in the email and one in the link below.

https://ottawacity.sharepoint.com/:b:/s/External-PSDevelopmentReview/EVCdQZ9TpfNLrHctsxIXgU0ByuL4WU4bv0FA9NcEYU3H3w?email=posen%40fotenn.com&e=wfRnlx

Engineering

- The Servicing Study Guidelines for Development Applications are available at the following link: https://ottawa.ca/en/city-hall/planning-and-development/information-developers/development-application-review-process/development-application-submission/guide-preparing-studies-and-plans
- Record drawings and utility plans are available for purchase from the City's Information Centre. Contact the City's Information Centre by email at informationcentre@ottawa.ca or by phone at (613) 580-2424 x44455
- ~~Stormwater quantity control criteria – post development peak flows from the site are to be controlled to pre-development levels for all storms up to and including the 100-year storm~~.
- Storm water quantity control criteria- follow the criteria provided in the Upper Poole Creek subwatershed study.
- The Upper Pool Creek subwatershed study includes criteria on infiltration, baseflow temperatures as well as water quality. The applicant may discuss the criteria shown in the attached pdf with the MVCA.
- It appears that based on the lay of the land, runoff from the existing land is directly discharged to Poole Creek.

- Existing sanitary sewers are available on Wildpine Court and Ravenscroft Crt. to make service connection. Please make appropriate service connection based on the existing available capacity of the sewer.
- Existing watermain stubs are available on Wildpine Court and Ravenscroft Court for service connections.
- Stormwater quality control – Consult with the Conservation Authority (MVCA) for their requirements. Include the correspondence with MVCA in the stormater/site servicing report.
- MECP ECA (Environmental Compliance Approval) is required due to direct discharge to Poole Creek. ECA application will be direct submission to MECP (MOE).
- Clearly show and label the property lines on all sides of the property.
- Clearly show and label all the easements (if any) on the property, on all plans.
- When calculating the post development composite runoff coefficient (C), please provide a drawing showing the individual drainage area and its runoff coefficient.
- When using the modified rational method to calculate the storage requirements for the site, the underground storage should not be included in the overall available storage. The modified rational method assumes that the restricted flow rate is constant throughout the storm which, in this case, underestimates the storage requirement prior to the 1:100 year head elevation being reached. Alternately, if you wish to include the underground storage, you may use an assumed average release rate equal to 50% of the peak allowable rate. Otherwise, disregard the underground storage as available storage or provide modeling to support the design.
- Engineering plans are to be submitted on standard A1 size (594mm x 841mm) sheets.
- Phase 1 ESA and Phase 2 ESA must conform to clause 4.8.4 of the Official Plan that requires that development applications conform to Ontario Regulation 153/04.
- Provide the following information for water main boundary conditions:
    1. Location map with water service connection location
    2. Average daily demand (l/s)
    3. Maximum daily demand (l/s)
    4. Maximum hourly demand (l/s)
    5. Fire flow demand (provide detailed fire flow calculations based on the fire underwriters survey method)
- If you are proposing any exterior light fixtures, all must be included and approved as part of the site plan approval. Therefore, the lights must be clearly identified by make, model and part number. All external light fixtures must meet the criteria for full cut-off classification as recognized by the Illuminating Engineering Society of North America (IESNA or IES), and must result in minimal light spillage onto adjacent properties (as a guideline, 0.5 fc is normally the maximum allowable spillage). In order to satisfy these criteria, the applicant must provide certification from an acceptable professional engineer. The location of all exterior fixtures, a table showing the fixture types (including make, model, part number), and the mounting heights must be included on a plan.

Feel free to contact Infrastructure Project Manager, Santhosh Kuruvilla, at santhosh.kuruvilla@ottawa.ca, for follow-up questions.

"

Regards,
Raad Akrawi

From: Guy Forget <gforget@jlrichards.ca>
Sent: October 15, 2020 9:36 AM
To: Raad Akrawi <rakrawi@groupeheafey.com>
Subject: Wildpine Trails Inc.

Hi Raad,

We have just noted that you have forwarded to us two different concepts; Option 1 and Option 2.

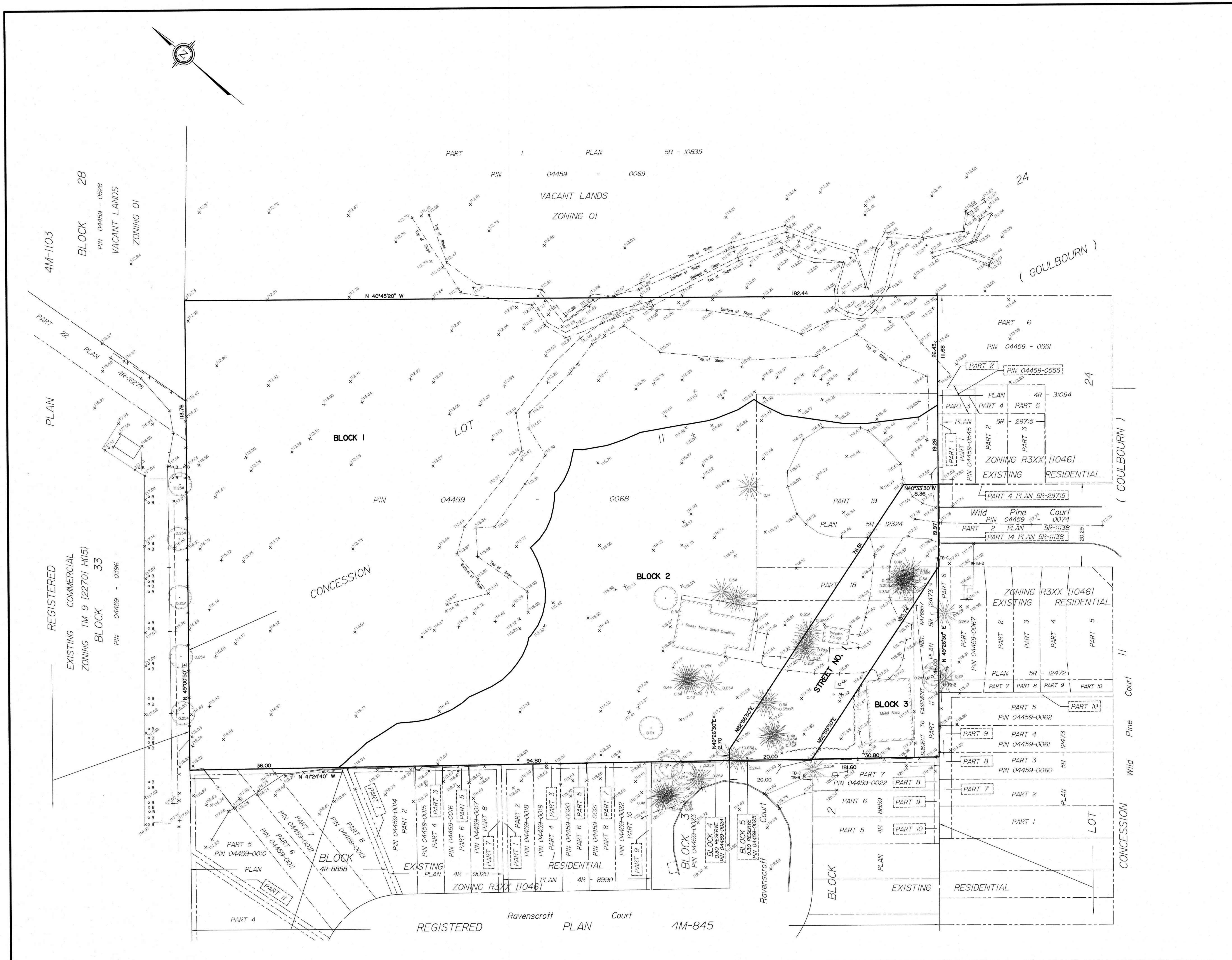
Can you tell me which of the two will be used?

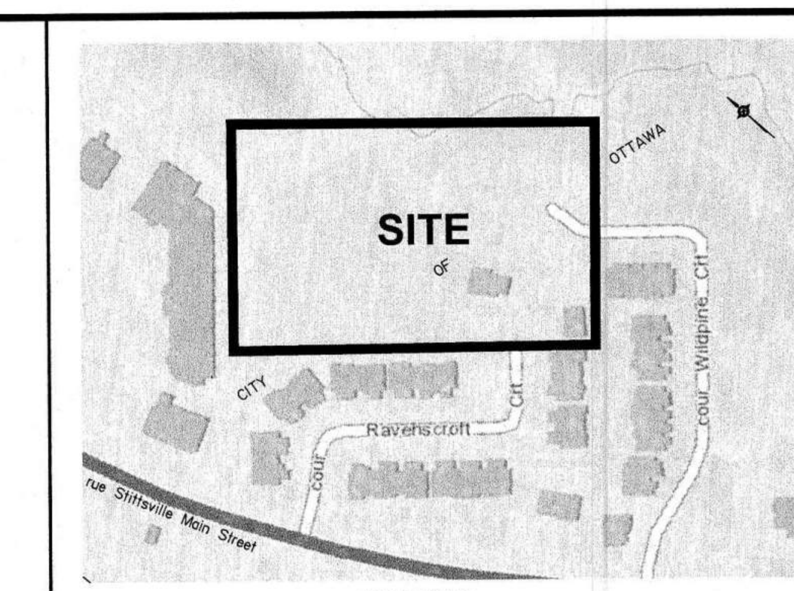
Guy Forget, P.Eng., LEED AP
Senior Water Resources Engineer

J.L. Richards & Associates Limited
700 - 1565 Carling Avenue, Ottawa, ON K1Z 8R1
Direct: 343-804-5363

Appendix B

Concept Plan and Topographical Survey





KEY MAP
NOT TO SCALE

DRAFT PLAN OF SUBDIVISION OF

PART OF LOT 24

CONCESSION 11

Geographic Township of Goulbourn

CITY OF OTTAWA

Prepared by Annis, O'Sullivan, Vollebekk Ltd.

Scale 1 : 400

16 12 8 4 0 8 16 Metres

Metric

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

SURVEYOR'S CERTIFICATE

I CERTIFY THAT :
The boundaries of the lands to be subdivided and their relationship to adjoining lands have been accurately and correctly shown.

June 8, 2023
Date

T. Hartwick
ONTARIO LAND SURVEYOR

OWNER'S CERTIFICATE

This is to certify that I am the owner of the lands to be subdivided and that this plan was prepared in accordance with my instructions.

Date

Carmine Zayoun
Wild Pine Trails Inc.
I have authority to bind the corporation.

ADDITIONAL INFORMATION REQUIRED UNDER SECTION 51-17 OF THE PLANNING ACT

(a) see plan
(b) see plan
(c) see plan
(d) multi-family residential housing, open space
(e) see plan
(f) see plan
(g) see plan
(h) City of Ottawa
(i) see soils report
(j) see plan
(k) sanitary, storm sewers, municipal water, bell, hydro, cable and gas to be available
(l) subject to instrument N476857, see plan for location

AREA SCHEDULE

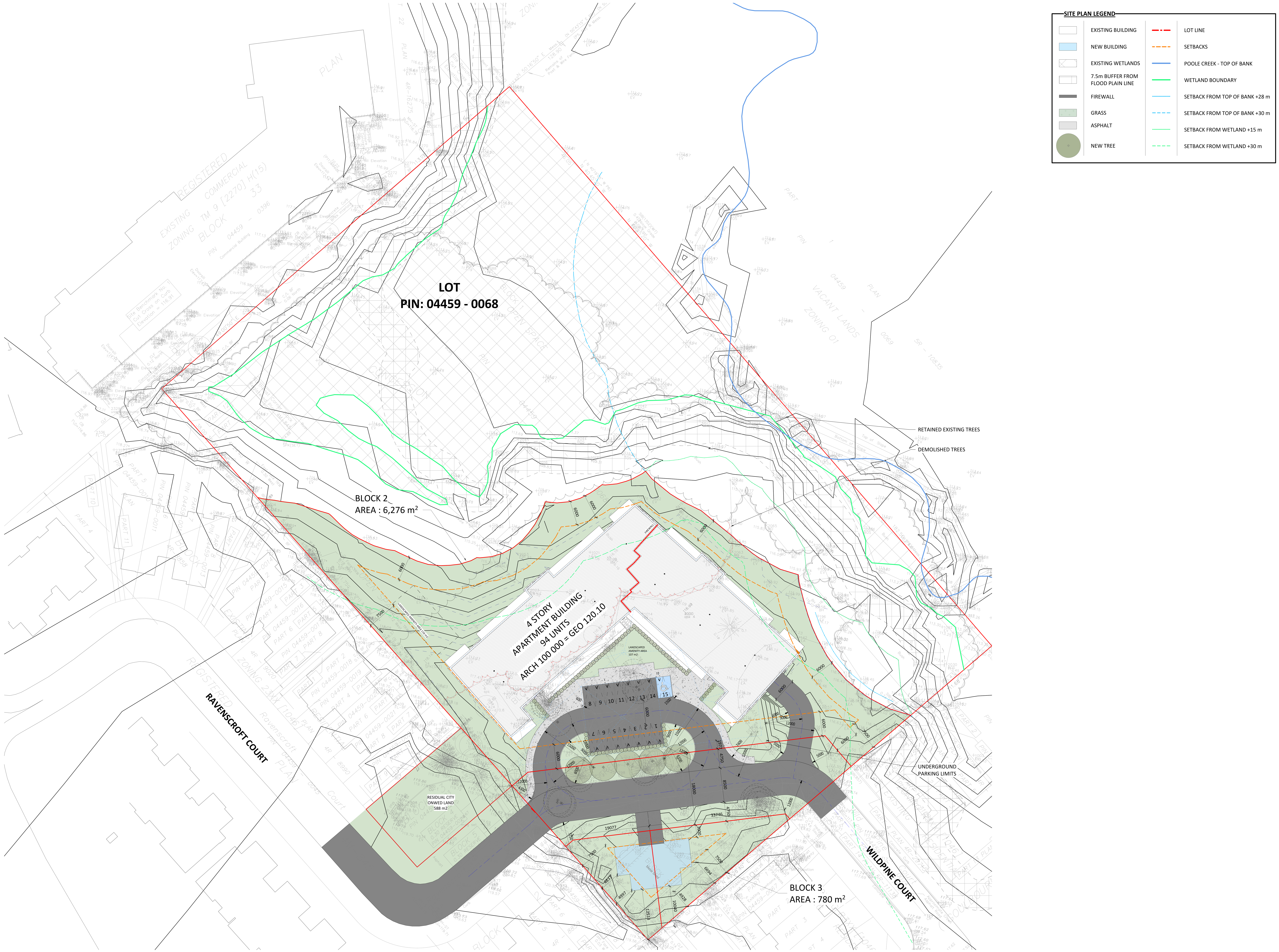
LOT\BLOCK	AREA (sqm)
1	12 092
2	6 410
3	708
STREET	1 303
TOTAL	20 513

NOTES AND LEGEND

+ 65.00	denotes	Location of Elevations
TB-B	"	Bell Terminal Box
TB-C	"	Cable Terminal Box
B	"	Bollard
(symbol)	"	Deciduous Tree
(symbol)	"	Coniferous Tree

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

Job No. 21203-20 Zayoun Pt Lt 24 CII GO DPS D4 | FL/M



C:\Users\ppomerleau\Documents\21010_A_GEN_R21_ppomerleauUW453.rvt

PROJECT

WILDPINE DEVELOPMENT

OWNER

LATITUDE Homes

1202, CARP ROAD,
STITTSVILLE, ON K2S 1B9

ARCHITECTURAL

PMA ARCHITECTES

(418) 651-8954
INFO@PMAARCHITECTES.COM

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

CIVIL

J.L.Richards
ENGINEERS · ARCHITECTS · PLANNERS

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

PLANNER

FOTENN
Planning + Design
396 Cooper Street, Suite 300, Ottawa ON K2P 2H7
613.730.5709 www.fotenn.com

SURVEYOR

ANNIS, O'SULLIVAN, VOLLEBEKK LTD.
SURVEYING

14 CONCOURSE GATE, SUITE 500,
NEPEAN, ON K2E 7S6

ENVIROMENTAL CONSULTANT

Kilgour & Associates Ltd.
Environmental Consultants

2285, ST-LAURENT BLVD, SUITE 16C,
OTTAWA, ON K1G 4Z6

KEY PLAN

ARCHITECT SEAL

REVISIONS

NO	DESCRIPTION	DATE

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.

DO NOT USE FOR CONSTRUCTION

DATE	DESIGNED
2023-11-23	P.P.
	DRAWN
	P.P.
PROJECT No	CHECKED
21010	P.M.

SHEET TITLE

SITE PLAN

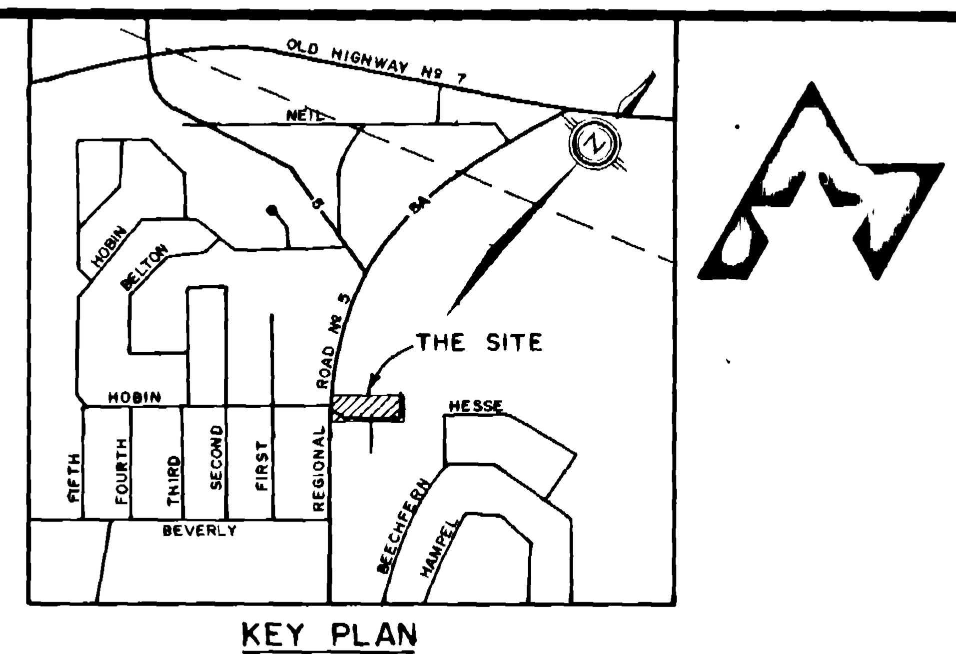
SHEET No

A101

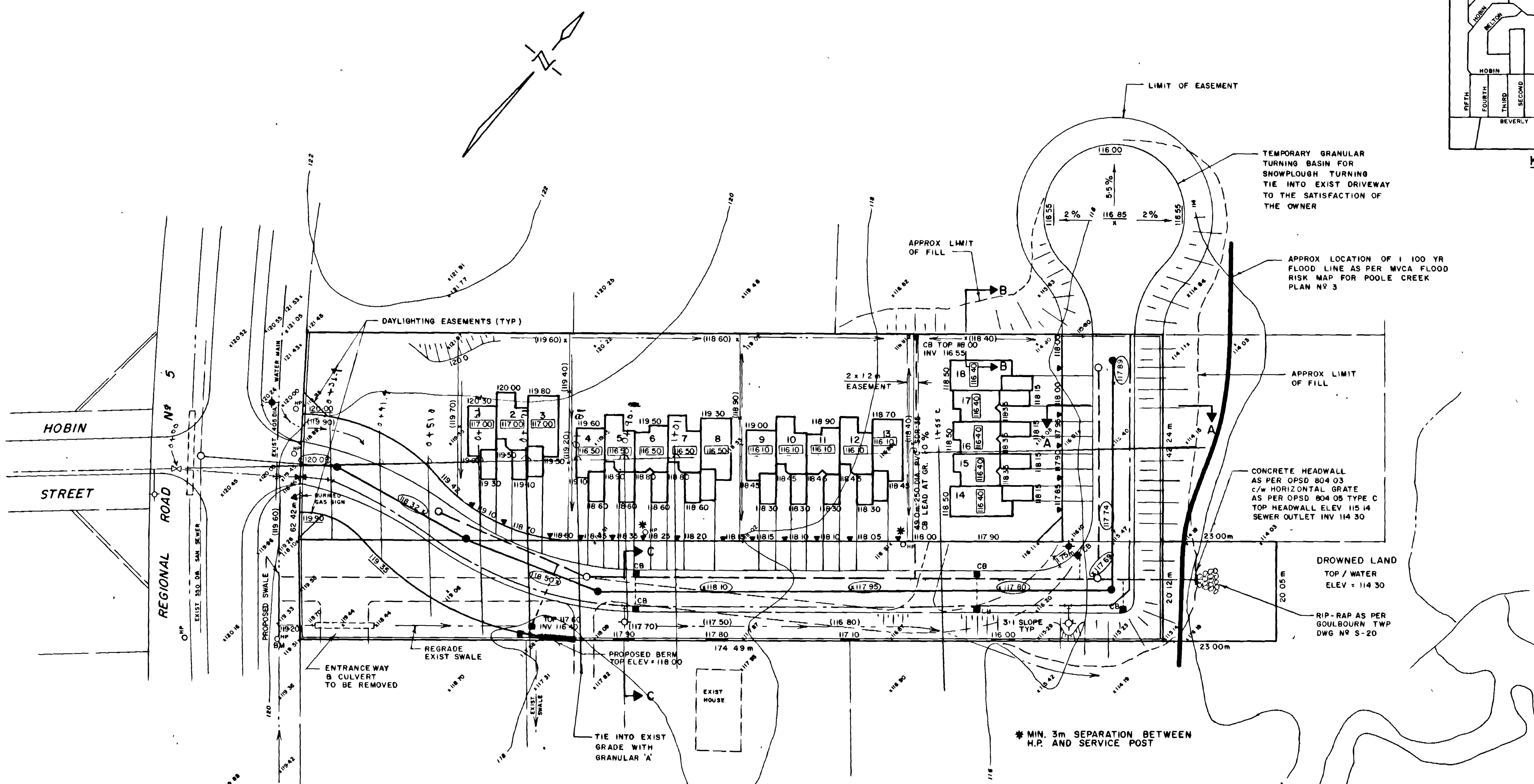
Appendix C

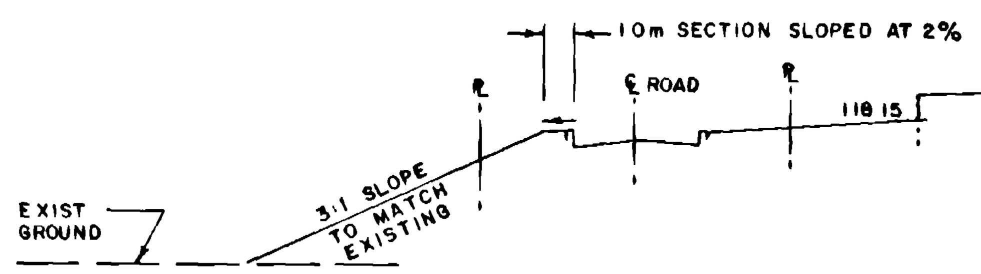
Drawings of Existing Infrastructure


ROAD WIDENING DETAIL
SEE NOTES 4&5 ON DWG Nº 88-6288-GPI CENTRELINE OF THE PROPOSED ACCESS SHOULD BE SHIFTED APPROXIMATELY 10m TO THE NORTH SO AS TO IMPROVE THE ALIGNMENT OF THE INTERSECTION
DAYLIGHTING EASEMENT
EXIST TEE SHALL BE REMOVED & SALVAGED & REPLACE WITH CROSS. CONNECTION BY R.M.O.C.
REGIONAL ROAD Nº 5
APPROX LOCATION OF 1:100 YR FLOOD LINE AS PER MVCA FLOOD RISK MAP FOR POOLE CREEK PLAN Nº 3.
CONCRETE HEADWALL AS PER OPSD 804.03 c/w HORIZONTAL GRATE AS PER OPSD 804.05 TYPE C TOP HEADWALL ELEV 115.14 INV. SEWER 114.30
RIP-RAP AS PER GOULBOURN TWP DWG Nº S-20
BEAVER DAM
POOLE CREEK IN ACCORDANCE WITH NCC TOPOGRAPICAL MAPPING 348-013
NOTE
REFER TO DWG Nº 88-6288-GPI FOR GRADING & DRAINAGE DETAILS
Regional Municipality of Ottawa-Carleton Works Department
Municipalité Régionale d'Ottawa-Carleton Département des Travaux
Approved
FOR DIRECTOR
Date 7 Dec 87
WATER WORKS
REG. MUN. OF OTTAWA-CARLETON
ENGINEERING DIVISION REVISED
REG. MUN. OF OTTAWA-CARLETON
ENGINEERING DIVISION REVISED
104.0m-375 DIA STORM SEWER
105.0m-250 DIA SANITARY SEWER
200 DIA WATER MAIN
WILDPINE COURT
15.0m AT GR 2.0%
60.5 m AT GR 3.0%
103.0m AT GR 0.5%
50.0m AT GR 0.5%
EXISTING GROUND
PROPOSED ℄ ROAD GRADE
TIE INTO EXISTING GRADE WITH GRANULAR MATERIAL AT 5.5% SLOPE
PROPOSED GRADE
EXISTING GROUND
CONNECTION BY RMOC WORKS DEPT LOCATION OF EXIST. 400 DIA WATER MAIN IS APPROX.
33.0m-300DIA PVC SDR 35 STORM SEWER AT GR 2.5%
104.0m-375DIA PVC SDR 35 STORM SEWER AT GR 1.0%
43.0m-300DIA PVC SDR 35 STORM SEWER AT GR 1.0%
EXIST 350 DIA SAN. SEWER INV 114.51
27.5m-250 DIA PVC SDR 35 SANITARY SEWER AT GR 0.40%
30.0m-250DIA PVC SDR 35 SANITARY SEWER AT GR 0.40%
29.0m-250DIA PVC SDR 35 SANITARY SEWER AT GR 0.40%
105.0m-250 DIA PVC SDR 35 SANITARY SEWER AT GR 0.40%
47.0m-250DIA PVC SDR 35 SANITARY SEWER AT GR 0.4%
233.0m-200DIA D.I. CL 50 WATER MAIN
REFER TO NOTES ABOVE FOR SEWER OUTLET
20.0m-375DIA PVC SDR 35 ST SEWER AT GR 1.0%
TOP OF WATER MAIN
STORM SEWER INVERT
SANITARY SEWER INVERT
CHAINAGE
TYPICAL ROAD CROSS SECTION
NTS
SIDEWALK
SUBDRAIN
WATERMAIN
PROPERTY LINE
1 REV PER R.M.O.C. WORKS DEPT. 060688 D.M.
REVISIONS
CLIENT LANTANA DEVELOPMENTS INC.
PROJECT WILD PINE COURT
TITLE PLAN & PROFILE 3704
OLIVER MANGIONE McCALLA & ASSOCIATES LIMITED
Consulting Engineers
Nepean, Ontario
DESIGN K.P.E.
DRAWN G.P.L.
CHECKED K.P.E.
DATE SEPTEMBER, 1987
SCALE 1:500 HORIZ 1:50 VERT
DRAWING No 88-6288-1
7853

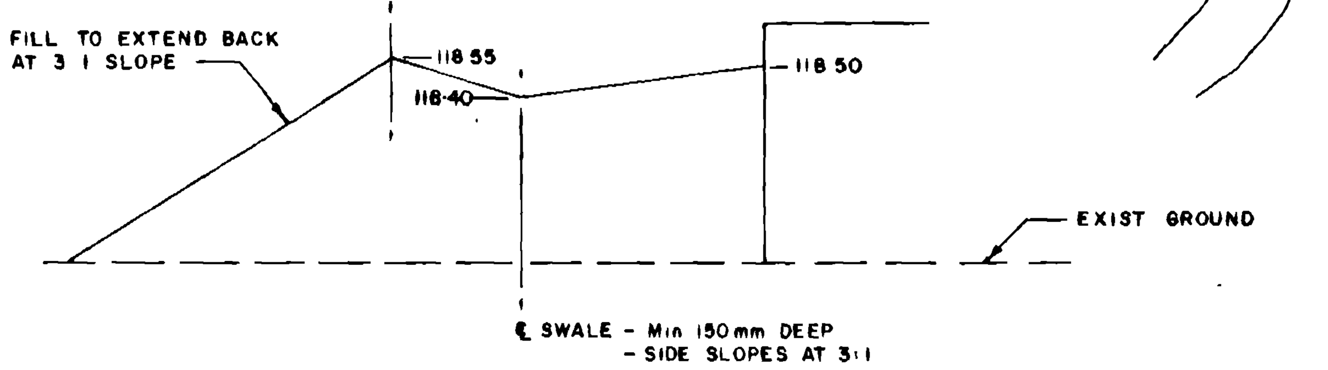


KEY PLAN
NTS

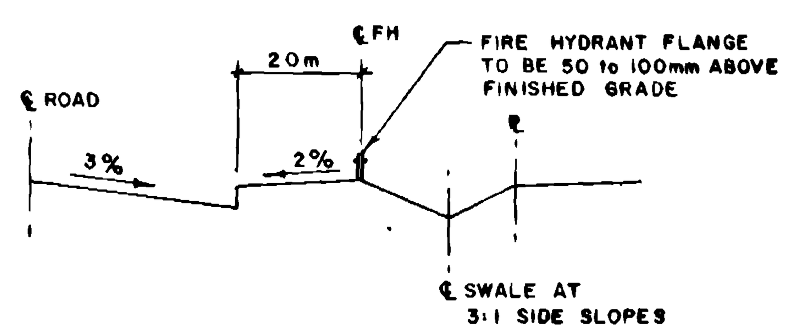




CROSS SECTION A-A
NTS



CROSS SECTION B-B
NTS



CROSS SECTION C-C
NTS

NOTES

1. Services to each unit:

   Sanitary - 150 mm dia. PVC SDR-28
   Storm - 100 mm dia. PVC SDR-28
   Water - 19 mm dia. copper with curb stop

2. Concrete mountable curb and gutter to be in accordance with Township of Goulbourn's Drawing No. R-20.

3. Rear yard catch basin to be placed in one lot only - 300 mm minimum from property line.

4. From edge of Regional Road to limit of right-of-way, road to be constructed to Regional Standards as follows:

   450 mm Granular 'B'
   150 mm Granular 'A'
   2-50 mm Base Course Asphalt - HL-8
   40 mm Wear Course Asphalt - HL-3

5. Road curb to be constructed to 5 metres within Regional Road right-of-way and then tapered to nothing. They should not encroach within the shoulder of Regional Road.

6. The joint along the existing edge of the Regional Road pavement should be staggered 300 mm with the sawcut depth equal to the top course of asphalt only.

7. Street light within Regional Road right-of-way shall consist of a concrete spun pole with a minimum 3.7 metre (12 foot) davit running parallel to the Regional Road. Lamp shall be a 200 Watt High Pressure Sodium mounted 10.7 metres above the asphalt. The exact location shall be determined in the field, however, the pole shall be a minimum of 3.7 metres (12 feet) from the edge of road.

8. Internal street light at Station 2 + 00 to be in accordance with Township of Goulbourn Drawing Number R-26.

BENCH MARK
NAIL IN HYDRO POLE 6" ABOVE GROUND S.W. CORNER OF SITE AT ENTRANCE TO ROW EAST SIDE OF R.R. Nº 5
ELEV = 119.567

Regional Municipality of Ottawa-Carleton Works Department
Municipalité Régionale d'Ottawa-Carleton Département des Travaux
Approved
For DIRECTOR
R.O. Pickard WORKS COMMISSIONER
Date 7 June 88
WATER WORKS

LEGEND

- EXISTING ELEVATION
- 120.00 PROPOSED ELEVATION
- (x 116.37) PROPOSED ℄ ROAD ELEVATION
- (116.80) PROPOSED ℄ SWALE ELEVATION
- PROPOSED SWALE
- PROPOSED SURFACE DRAINAGE
- CB PROPOSED CATCH BASIN
- SERVICE LOCATION
- PROPOSED SANITARY SEWER
- PROPOSED STORM SEWER
- PROPOSED WATER MAIN
- PROPOSED TERRACING
- PROPOSED STREET LIGHT (Also refer to notes 7 & 8)
- 116.40 MINIMUM BOTTOM OF FOOTING ELEVATION (RAISE IF REQUIRED TO ACCOMODATE THE PROPOSED LOT GRADING)

CLIENT	LANTANA DEVELOPMENTS INC.	
PROJECT	WILD PINE COURT	3704-1
TITLE	GRADING & DRAINAGE PLAN	
	OLIVER MANGIONE McCALLA & ASSOCIATES LIMITED Consulting Engineers	Nepean Ontario

LICENSED PROFESSIONAL ENGINEER K P EMPEY PROVINCE OF ONTARIO

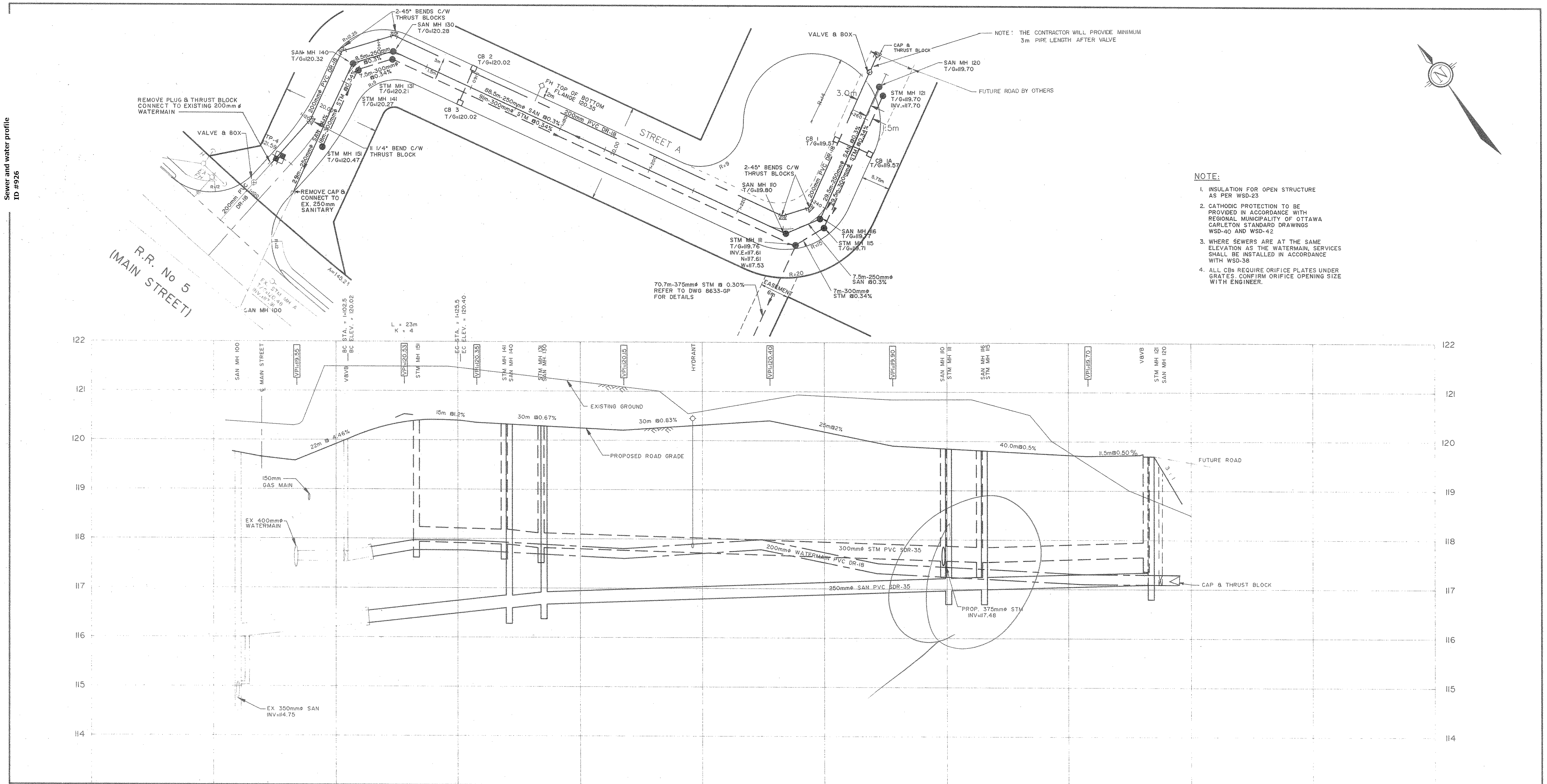
No	REVISIONS	DATE	BY

APP'D

DESIGN	DRAWN	CHECKED	DATE	SCALE	DRAWING No	REV
K P E	G P L	K P E	SEPTEMBER, 1987	1:500	88-6288-GP1	

7853

Plan & Profile
NCC #348-013
File #92
RAVENSCROFT COURT
Sewer and water profile
ID #926



℄ ROAD ELEVATION	119.55, 120.00, 120.37, 120.42, 120.40, 120.35, 120.34, 120.36, 120.21, 120.15, 120.27, 120.28, 120.40, 120.18, 119.90, 119.85, 119.83, 119.79, 119.72, 119.70, 119.75, 119.65
TOP OF WATERMAIN ELEVATION	117.15 400x200 T.V.S., 117.60 VBVB, 117.78 CAP & BLOCK, 118.08, 11 1/4°BEND 118.02, 118.00, 117.95, 45°BEND 117.94, 45°BEND 117.96, 117.81, 117.75, 117.88, 118.00, 117.78, 117.50, 45° BEND 117.43, 45°BEND 117.39, 117.32, 117.35, 117.25
STORM SEWER ELEVATION	118.07, 18m-300mmø STM @ 0.34%, 118.01 117.98, 7.5m-300ø STM@0.34%, 117.95 117.92, 91m-300mmø STM @ 0.34%, N= 117.61 W=117.53 E=117.61, 117.63 117.65, 7m-300mmø STM @ 0.34%, 29.5m-300mmø STM @ 0.34%, 117.75
SANITARY SEWER ELEVATION	116.00, 55.5m-250mmø SAN @ 1.1%, 116.60 116.63, 8.5m-250ø SAN @0.3%, 116.66 116.68, 88.5m-250mmø SAN @ 0.3%, 116.95 116.98, 117.00 117.03, 7.5m-250mmø SAN @ 0.3%, 29.5m-250mmø SAN @ 0.3%, 117.13
EXISTING ℄ R.O.W. ELEVATION	120.40, 120.30, 121.50, 121.50, 120.50, 120.92, 120.85, 120.88, 120.50, 119.00
CHAINAGE	1+080 SAN, 1+092 VPI, 1+100, 1+102, 1+108, 1+114 VPI, 1+116.4 STM, 1+120, 1+125, 1+129 VPI, 1+134.4 STM, 1+135.5 SAN, 1+141.9 STM, 1+142.5 SAN, 1+142.8, 1+150, 1+159 VPI, 1+173 HYD, 1+175, 1+189 VPI, 1+200, 1+214 VPI, 1+215, 1+224 SAN, 1+225, 1+225.4 STM, 1+230, 1+231.5 SAN, 1+232.4STM, 1+238, 1+242, 1+250, 1+254 VPI, 1+266 STM, 1+267 SAN, 1+269 V&VB, 1+275, 1+300

REVIEWED & APPROVED FOR ENGINEERING RELATED DETAILS ONLY.
Per: [signature] Date Nov. 26/92
A. J. ROBINSON & ASSOCIATES INC.

NOTE:
THE POSITION OF ALL POLE LINES, CONDUITS, WATERMAINS, SEWERS AND OTHER UNDERGROUND AND OVERGROUND UTILITIES AND STRUCTURES IS NOT NECESSARILY SHOWN ON THE CONTRACT DRAWINGS, AND WHERE SHOWN, THE ACCURACY OF THE POSITION OF SUCH UTILITIES AND STRUCTURES IS NOT GUARANTEED. BEFORE STARTING WORK, DETERMINE THE EXACT LOCATION OF ALL SUCH UTILITIES AND STRUCTURES AND ASSUME ALL LIABILITY FOR DAMAGE TO THEM.

No.	REVISION	DATE	BY
2	REVISED AS PER TOWNSHIP COMMENTS	SEP. 17/92	SC
1	ISSUED FOR APPROVAL	JULY 23/92	SC

REGISTERED PROFESSIONAL ENGINEER — D. BOEHME — PROVINCE OF ONTARIO

REGISTERED PROFESSIONAL ENGINEER — S.C. COURTLAND — PROVINCE OF ONTARIO

NOVATECH
ENGINEERING CONSULTANTS LTD
OTTAWA, ONTARIO

DESIGN	SCC
CHECKED	SCC
DRAWN	HEE
CHECKED	SCC
APPROVED	JR

SCALE
1:400 HORIZONTAL
1:40 VERTICAL

TOWNSHIP OF GOULBOURN

ROWLEY TOWN HOUSE PROJECT

PLAN AND PROFILE
STREET No. 1

PROJECT No. 8633
DATE JULY 1992
DRAWING No. 8633-PP1

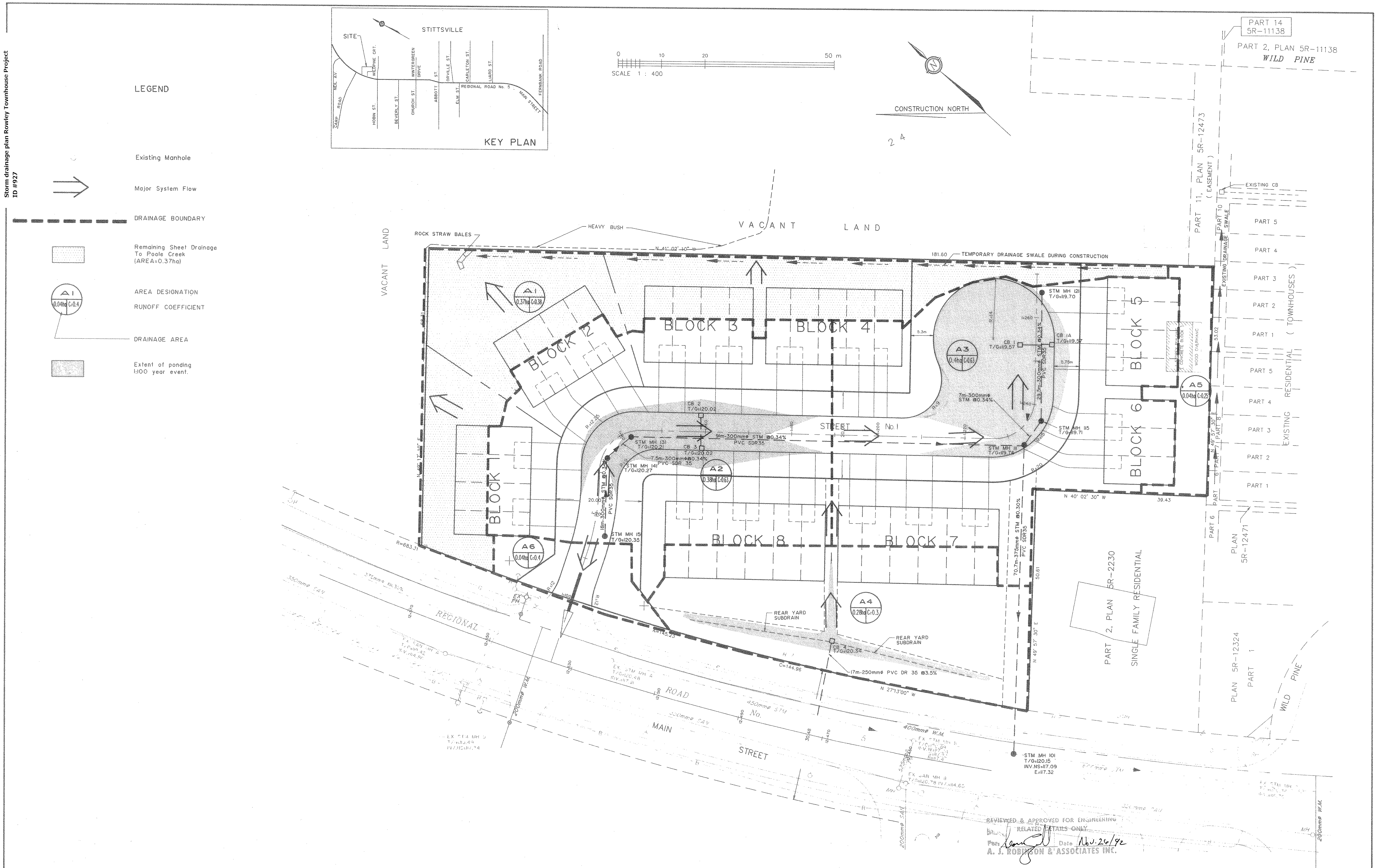
Storm Drainage Plan

NCC #348-013 File #93

RAVENSCROFT COURT

Storm drainage plan Rowley Townhouse Project

ID #927



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No.	REVISION	DATE	BY
2	REVISED AS PER TOWNSHIP COMMENTS	SEP. 17/92	SC
1	ISSUED FOR APPROVAL	AUGUST/92	UB

REGISTERED PROFESSIONAL ENGINEER S.C. COURTLAND PROVINCE OF ONTARIO

REGISTERED PROFESSIONAL ENGINEER U.O. BOEHME PROVINCE OF ONTARIO

NOVATECH ENGINEERING CONSULTANTS LTD OTTAWA, ONTARIO

DESIGN	S.C.C	SCALE 1:400
CHECKED	U.B.	
DRAWN	H.E.E	
CHECKED	S.C.C	
APPROVED	J.R.	

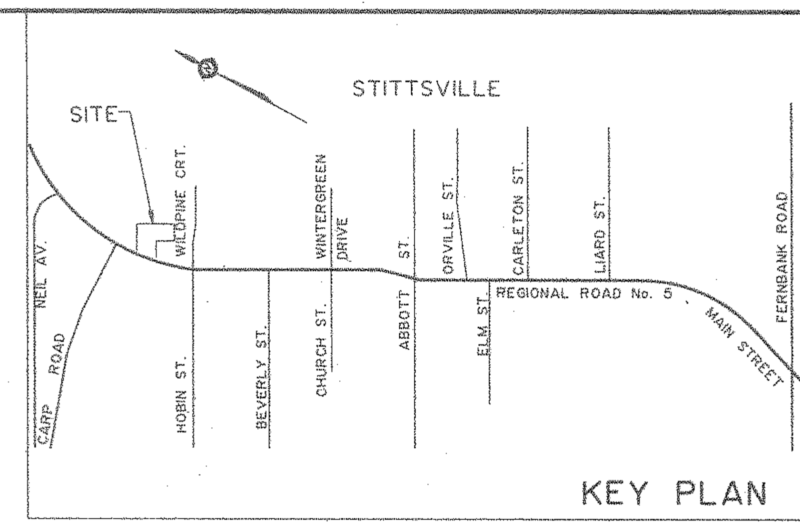
TOWNSHIP OF GOULBOURN

ROWLEY TOWNHOUSE PROJECT

STORM DRAINAGE PLAN

PROJECT No.	8633
FIELD BOOK	
DATE	JANUARY 1992
DRAWING No.	8633-STMI

General Plan of Services
NCC #348-013
File #94
RAVENSCROFT COURT
General plan of services for Rowley Townhouse Project
ID #928



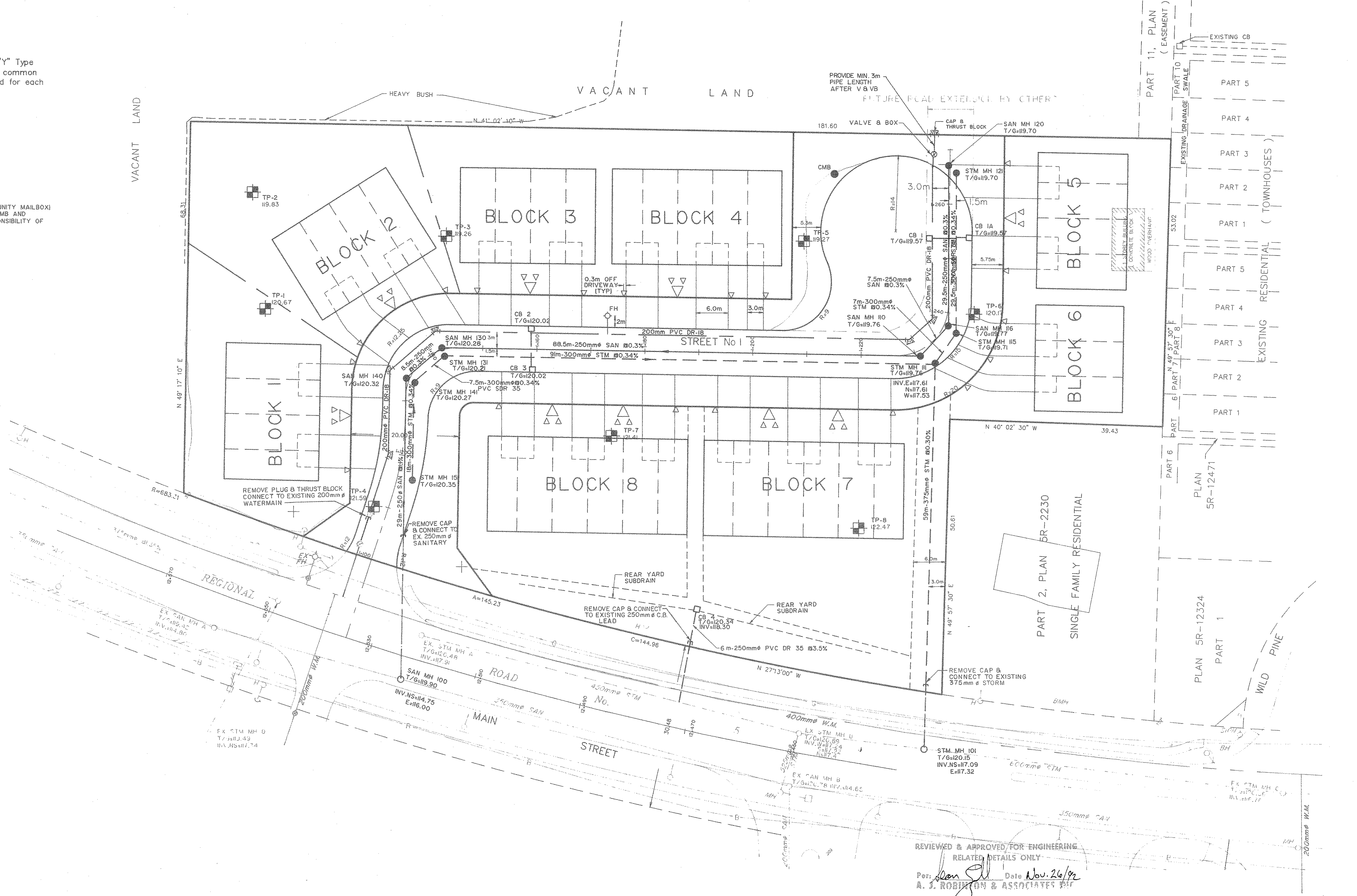
LEGEND

- TP-1 120.67 — Test Pit Location And Elevation
- Proposed Manhole
- Existing Manhole
- Sanitary, Storm, & Water Service
- Denotes Sanitary, & Storm Service With "Y" Type Water Connection (See WSD 26 & 27) In common Individual Storm/Sanitary services required for each unit.
- Proposed Fire Hydrant
- CMB — Community Mail Box

NOTE:
ALL COSTS RELATED TO EQUIPMENT (COMMUNITY MAILBOX) INSTALLATION, PRECAST PAD, ACCESS TO CMB AND MAINTENANCE OF THE ABOVE IS THE RESPONSIBILITY OF CANADA POST CORPORATION.

NOTE:

1. INSULATION FOR OPEN STRUCTURE AS PER WSD-23
2. CATHODIC PROTECTION TO BE PROVIDED IN ACCORDANCE WITH REGIONAL MUNICIPALITY OF OTTAWA CARLETON STANDARD DRAWINGS WSD-40 AND WSD-42
3. WHERE SEWERS ARE AT THE SAME ELEVATION AS THE WATERMAIN, SERVICES SHALL BE INSTALLED IN ACCORDANCE WITH WSD-38
4. ALL C.B.s REQUIRE ORIFICE PLATES UNDER GRATES CONFIRM ORIFICE OPENING SIZE WITH ENGINEER.



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No.	REVISION	DATE	BY
2	REVISED AS PER TOWNSHIP COMMENTS	SEP. 17/92	SC
1	ISSUED FOR APPROVAL	AUGUST/92	UB

REGISTERED PROFESSIONAL ENGINEER — S.C. COURTLAND — PROVINCE OF ONTARIO

REGISTERED PROFESSIONAL ENGINEER — UDO BOEHME — PROVINCE OF ONTARIO

NOVATECH
ENGINEERING CONSULTANTS LTD
OTTAWA, ONTARIO

DESIGN	S.C.C
CHECKED	U.B.
DRAWN	H.E.E
CHECKED	S.C.C
APPROVED	J.R.
SCALE	1:400

TOWNSHIP OF GOULBOURN
ROWLEY TOWNHOUSE PROJECT
GENERAL PLAN OF SERVICES
STREET A

PROJECT No.	8633
FIELD BOOK	
DATE	JANUARY 1992
DRAWING No.	8633-GP

Grading Plan

NCC #348-013 File #95

RAVENSCROFT COURT

Grading plan for Rowley Townhouse Project

ID #929

NOTE:
THE POSITION OF ALL POLE LINES, CONDUITS, WATERMAINS, SEWERS AND OTHER UNDERGROUND AND OVERGROUND UTILITIES AND STRUCTURES IS NOT NECESSARILY SHOWN ON THE CONTRACT DRAWINGS, AND WHERE SHOWN, THE ACCURACY OF THE POSITION OF SUCH UTILITIES AND STRUCTURES IS NOT GUARANTEED. BEFORE STARTING WORK, DETERMINE THE EXACT LOCATION OF ALL SUCH UTILITIES AND STRUCTURES

3	AS PER TOWNSHIP COMMENTS	SEP. 17/92	SC
2	REVISED AS PER SWM REPORT	AUGUST/92	UB

S.C. COURTLAND — REGISTERED PROFESSIONAL ENGINEER

UDO BOEHME — REGISTERED PROFESSIONAL ENGINEER

NOVATECH ENGINEERING CONSULTANTS LTD

DESIGN	S.C.C	SCALE	1:400
CHECKED	U.B.		
DRAWN	H.E.E		
CHECKED			

TOWNSHIP OF GOULBOURN

ROWLEY TOWNHOUSE PROJECT

PROJECT No. 8633

FIELD BOOK

DATE JANUARY 1992

DRAWING No.

Appendix D

Water Distribution System –
Hydraulic Network Analysis

Water Demand Calculations
37 Wildpine (JLR 29803-000)

Apartment Building

Unit Breakdown	No.	Person Per Unit (Table 4.1)
1 Bed	60	1.4
2 Bed	34	2.1
Total Unit Count =	94	
Total Population	156	ppl
Average Day Consumption Rate	280	L/c/d
Average Day Demand	**0.51**	**L/s**
Maximum Day Peaking Factor	4.84	MOE Table 3-3
Maximum Day Demand	**2.45**	**L/s**
Peak Hour Peaking Factor	7.31	MOE Table 3-3
Peak Hour Demand	**3.69**	**L/s**

Semi-Detached Units

Unit Breakdown	No.	Person Per Unit (Table 4.1)
Semi-detached	2	2.7
Total Unit Count =	2	
Total Population	6	ppl
Average Day Consumption Rate	280	L/c/d
Average Day Demand	**0.02**	**L/s**
Maximum Day Peaking Factor	4.84	MOE Table 3-3
Maximum Day Demand	**0.09**	**L/s**
Peak Hour Peaking Factor	7.31	MOE Table 3-3
Peak Hour Demand	**0.14**	**L/s**

C:\Users\ppomerleau\Documents\21010_A_GEN_R21_ppomerleauUW453.rvt

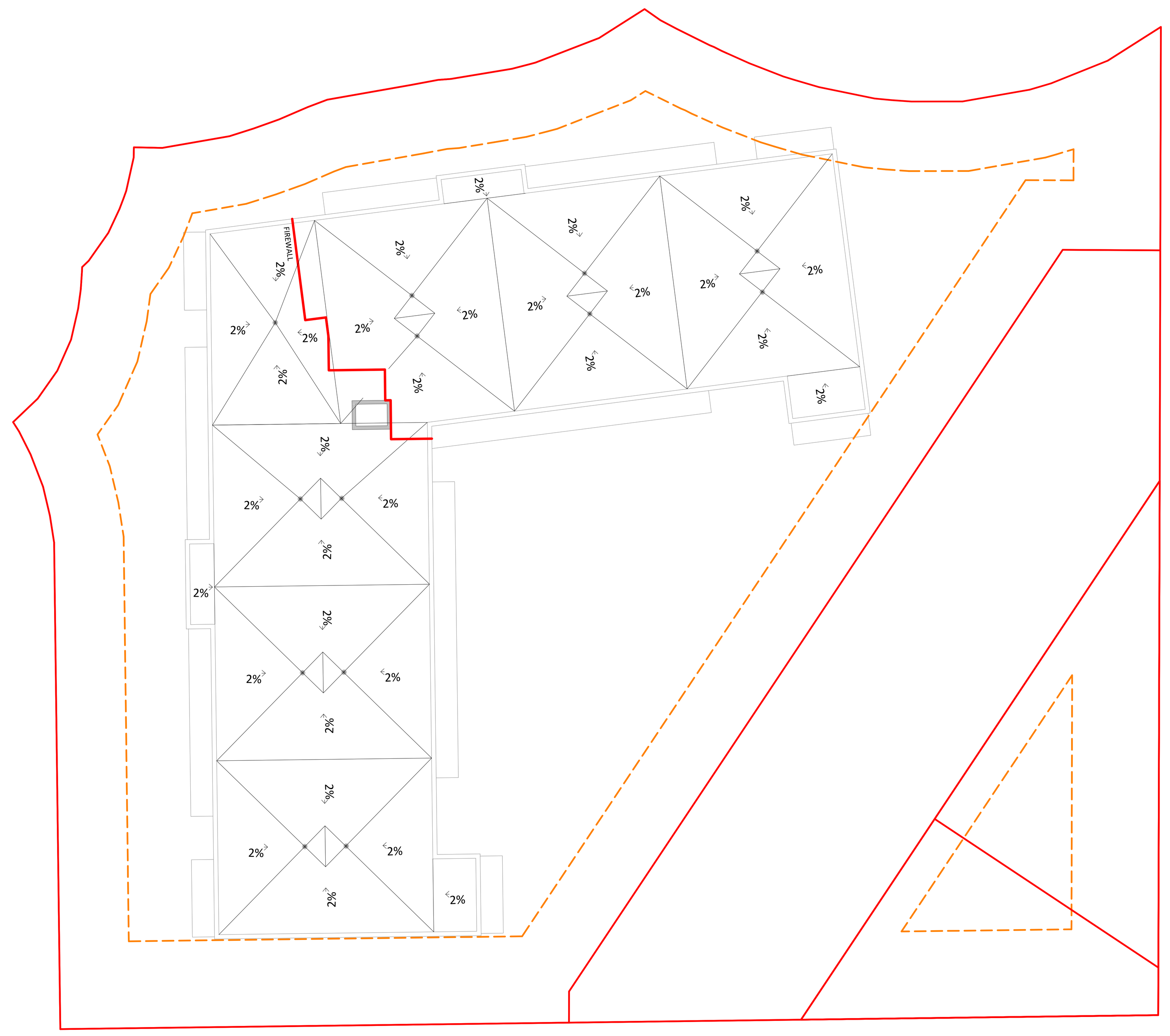
NUMBER OF PARKING		
LEVEL	NUMBER	TYPE
LEVEL P1	93	RESIDENTIAL
LEVEL P1	1	RESIDENTIAL - ADAPTED
LEVEL P1	4	VISITOR
	98	
LEVEL 1	14	VISITOR
LEVEL 1	1	VISITOR - ADAPTED
	15	
TOTAL	113	

1 LEVEL P1
1 : 300

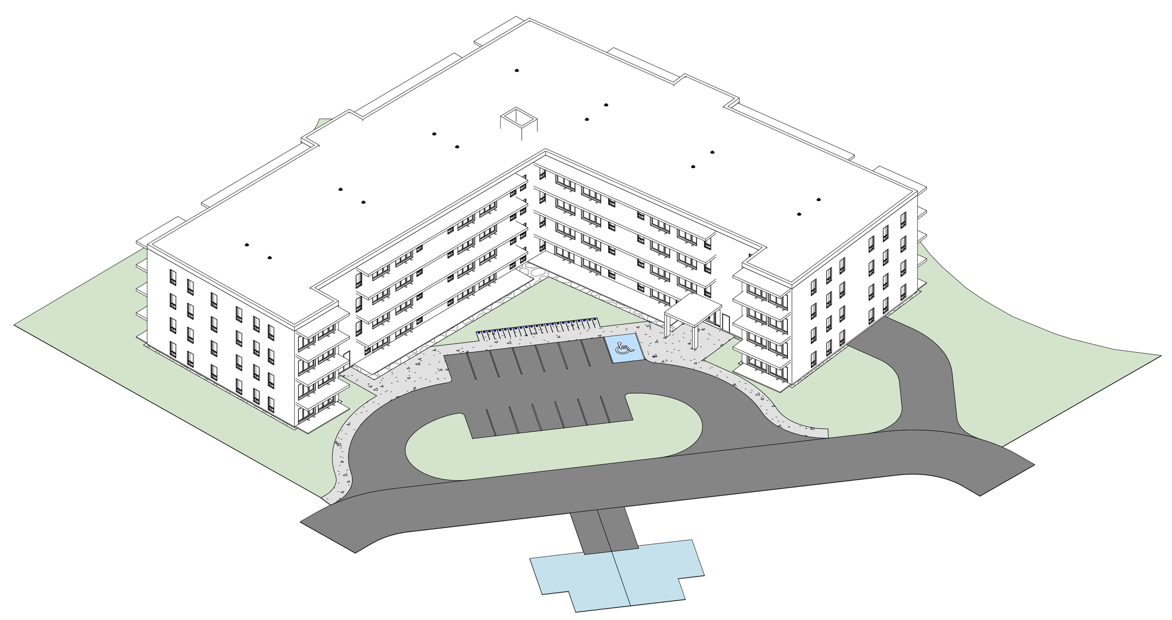
3 LEVEL 2-4
1 : 300

STATISTICS - TOTAL NUMBER OF UNITS					
TYPE	NUMBER	TOTAL GROSS AREA PER TYPE	AVE. AREA	DISTRIBUTION	REQ. %
1 BED	31	19,736 ft²	637 ft²	33%	0%
1 BED + DEN	29	22,119 ft²	763 ft²	31%	0%
2 BED	34	33,526 ft²	986 ft²	36%	0%
	94	75,381 ft²	2,385 ft²		

2 LEVEL 1
1 : 300



4 ROOF
1 : 300



5 VUE STAT

PROJECT

WILDPINE DEVELOPMENT

OWNER

LATITUDE Homes

1202, CARP ROAD,
STITTSVILLE, ON K2S 1B9

ARCHITECTURAL

PMA ARCHITECTES

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QUÉBEC (QC) G1W 2K4

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CIVIL

J.L.Richards
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OTTAWA, ON K1Z 8R1

PLANNER

FOTENN
Planning + Design

396 Cooper Street, Suite 300, Ottawa ON K2P 2H7
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SURVEYOR

ANNIS, O'SULLIVAN, VOLLEBEKK LTD.

14 CONCOURSE GATE, SUITE 500,
NEPEAN, ON K2E 7S6

ENVIROMENTAL CONSULTANT

Kilgour & Associates Ltd.
Environmental Consultants

2285, ST-LAURENT BLVD, SUITE 16C,
OTTAWA, ON K1G 4Z6

KEY PLAN

ARCHITECT SEAL

REVISIONS

NO	DESCRIPTION	DATE

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.

DO NOT USE FOR CONSTRUCTION

DATE
2023-06-13

DESIGNED
P.P.

DRAWN
P.P.

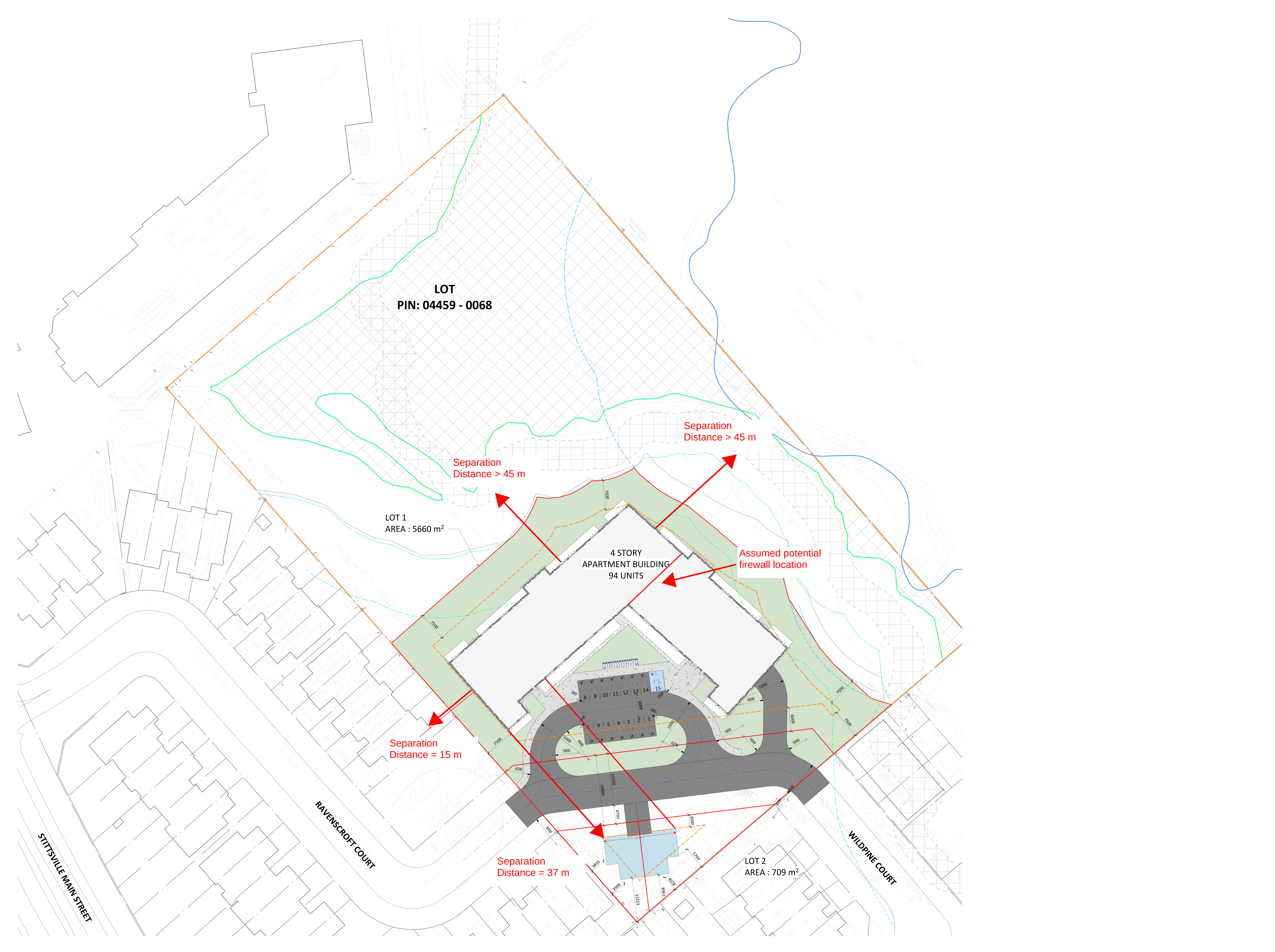
PROJECT No
21010

CHECKED
P.M.

SHEET TITLE

STATISTICS

SHEET No
A003



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PROJECT

WILDPINE DEVELOPMENT

OWNER

LATITUDE Homes

1202, CARP ROAD,
STITTSVILLE, ON K2S 1B9

ARCHITECTURAL

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REVISIONS

NO	DESCRIPTION	DATE

NOTE

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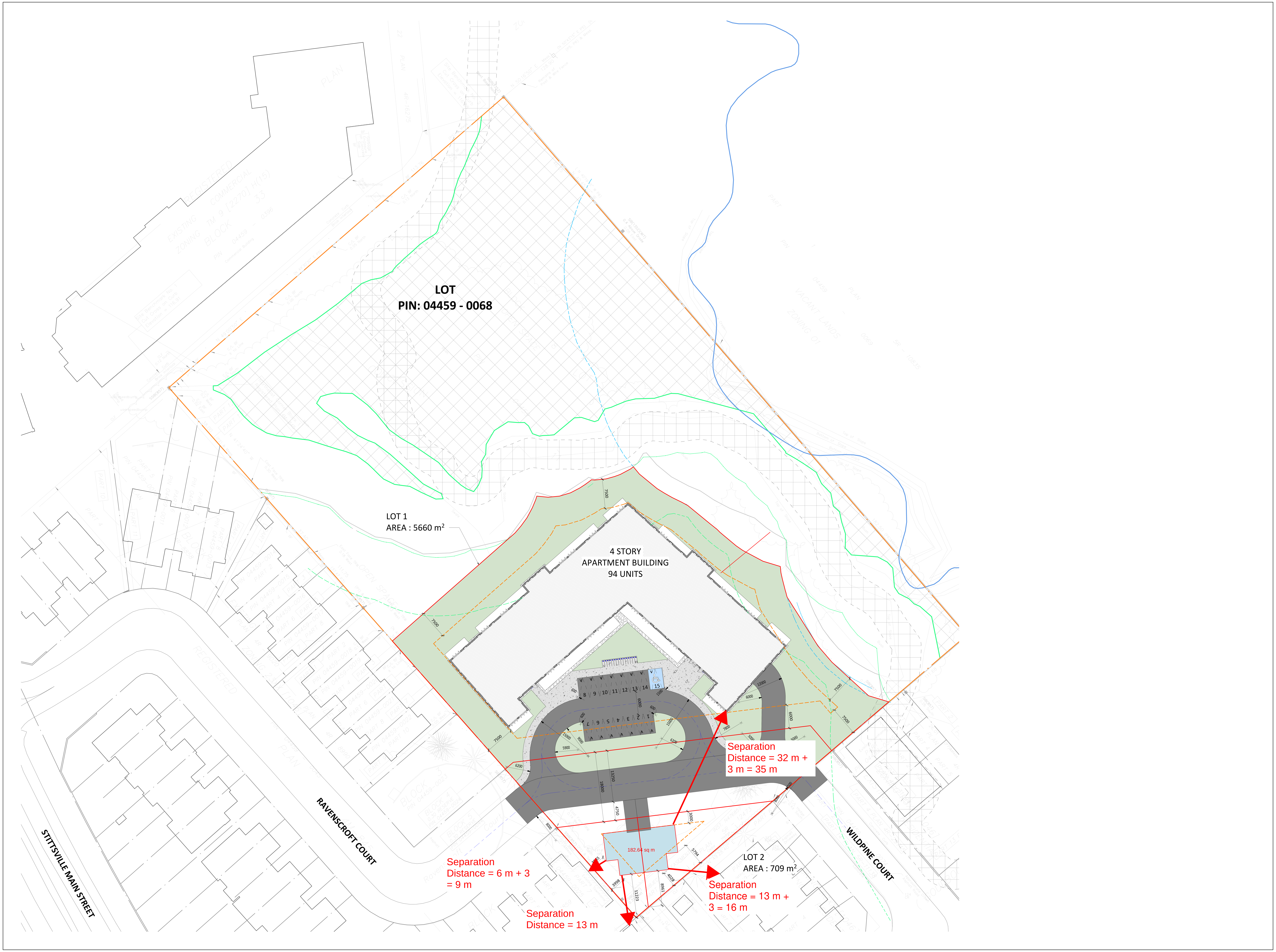
DATE	DESIGNED
2023-05-26	P.P.
	DRAWN
	P.P.
PROJECT No	CHECKED
21010	P.M.

SHEET TITLE

SITE PLAN

SHEET No

A101



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PROJECT

WILDPINE DEVELOPMENT

OWNER

LATITUDE Homes

1202, CARP ROAD,
STITTSVILLE, ON K2S 1B9

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Kilgour & Associates Ltd.
Environmental Consultants

2285, ST-LAURENT BLVD, SUITE 16C,
OTTAWA, ON K1G 4Z6

KEY PLAN

ARCHITECT SEAL

REVISIONS

NO	DESCRIPTION	DATE

NOTE

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DO NOT USE FOR CONSTRUCTION

DATE: 2023-05-26

DESIGNED: P.P.

DRAWN: P.P.

PROJECT No: 21010

CHECKED: P.M.

SHEET TITLE

SITE PLAN

SHEET No

A101

FUS Fire Flow Calculations

37 Wildpine - 4-Storey Apartment Building

(JLR 29803-000)

Building With Firewall				
Step	**Parameter**	**Value**		**Note**
A	Type of Construction	Wood Frame		
	Coefficient (C)	1.5		
B	Sum of All Floors	1200	m^2	Gross area for 1 storey.
C	Height in storeys	4	storeys	Parking garage is excluded.
	Total Floor Area	4800	m^2	
D	Fire Flow Formula	F=220C√A		
	Fire Flow	22863	L/min	
	Rounded Fire Flow	23000	L/min	Flow rounded to nearest 1000 L/min.
E	Occupancy Class	Limited Combustible		Residential.
	Occupancy Charge	-15%		
	Occupancy Increase or Decrease	-3450		
	Fire Flow	19550	L/min	No rounding applied.
F	Sprinkler Protection	Automatic Fully Supervised		
	Sprinkler Credit	-50%		
	Decrease for Sprinkler	-9775	L/min	
G	*South Side Exposure*			
	Exposing Wall:	Wood Frame		
	Exposed Wall:	Wood Frame		
	Length of Exposed Wall:	19.0	m	
	Height of Exposed Wall:	2	storeys	
	Length-Height Factor	38.0	m-storeys	
	Separation Distance	37	m	Shortest distance from bldg to bldg + 3 m.
	South Side Exposure Charge	5%		
	West Side Exposure			
	Exposing Wall:	Wood Frame		
	Exposed Wall:	Wood Frame		
	Length of Exposed Wall:	9.7	m	
	Height of Exposed Wall:	2	storeys	
	Length-Height Factor	19.4	m-storeys	
	Separation Distance	15	m	
	West Side Exposure Charge	12%		
	North Side Exposure			
	Exposing Wall:	Wood Frame		
	Exposed Wall:	Wood Frame		
	Length of Exposed Wall:	0.0	m	
	Height of Exposed Wall:	0	storeys	
	Length-Height Factor	0.0	m-storeys	
	Separation Distance	50	m	
	North Side Exposure Charge	0%		
	East Side Exposure			
	Exposing Wall:	Wood Frame		
	Exposed Wall:	Wood Frame		
	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%		
	Total Exposure Charge	17%		The total exposure charge is below the maximum value of 75%.
	Increase for Exposures	3324	L/min	
H	Fire Flow	13099	L/min	
	Rounded Fire Flow	13000	L/min	Flow rounded to nearest 1000 L/min.
City Cap	**Required Fire Flow (RFF)**	**13000**	**L/min**	The City of Ottawa's cap does not apply since the building is a high rise building.
		217	**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

37 Wildpine - Semi-detached units

(JLR 29803-000)

Semi-detached units				
Step	**Parameter**	**Value**		**Note**
A	Type of Construction	Wood Frame		
	Coefficient (C)	1.5		
B	Sum of All Floors	183	m^2	Gross area for 1 storey.
C	Height in storeys	3	storeys	Parking garage is excluded.
	Total Floor Area	549	m^2	
D	Fire Flow Formula	F=220C√A		
	Fire Flow	7732	L/min	
	Rounded Fire Flow	8000	L/min	Flow rounded to nearest 1000 L/min.
E	Occupancy Class	Limited Combustible		Residential.
	Occupancy Charge	-15%		
	Occupancy Increase or Decrease	-1200		
	Fire Flow	6800	L/min	No rounding applied.
F	Sprinkler Protection	None		
	Sprinkler Credit	0%		
	Decrease for Sprinkler	0	L/min	
G	*South Side Exposure*			
	Exposing Wall:	Wood Frame		
	Exposed Wall:	Wood Frame		
	Length of Exposed Wall:	13.0	m	
	Height of Exposed Wall:	2	storeys	
	Length-Height Factor	26.0	m-storeys	
	Separation Distance	13	m	Shortest distance from bldg to bldg + 3 m.
	South Side Exposure Charge	12%		
	West Side Exposure			
	Exposing Wall:	Wood Frame		
	Exposed Wall:	Wood Frame		
	Length of Exposed Wall:	11.0	m	
	Height of Exposed Wall:	2	storeys	
	Length-Height Factor	9.0	m-storeys	
	Separation Distance	8	m	
	West Side Exposure Charge	17%		
	North Side Exposure			
	Exposing Wall:	Wood Frame		
	Exposed Wall:	Wood Frame		
	Length of Exposed Wall:	19.0	m	
	Height of Exposed Wall:	4	storeys	
	Length-Height Factor	76.0	m-storeys	
	Separation Distance	35	m	
	North Side Exposure Charge	5%		
	East Side Exposure			
	Exposing Wall:	Wood Frame		
	Exposed Wall:	Wood Frame		
	Length of Exposed Wall:	11.0	m	
	Height of Exposed Wall:	2	storeys	
	Length-Height Factor	22.0	m-storeys	
	Separation Distance	16	m	
	East Side Exposure Charge	12%		
	Total Exposure Charge	46%		The total exposure charge is below the maximum value of 75%.
	Increase for Exposures	3128	L/min	
H	Fire Flow	9928	L/min	
	Rounded Fire Flow	10000	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 not apply since the building is a high rise building.
		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

William Rugamba

From:	Rathnasooriya, Shika <Thakshika.Rathnasooriya@ottawa.ca>
Sent:	May 29, 2023 9:20 AM
To:	Tatyana Roumie
Cc:	Annie Williams; Karla Ferrey
Subject:	RE: Request for Hydraulic Boundary Conditions - 37 Wildpine Court
Attachments:	37 Wildpine Court_Boundary Condition(19May2023).docx
Follow Up Flag:	Follow up
Flag Status:	Completed

Good morning Tatyana,

Please find the boundary conditions attached. The local water distribution system servicing this development cannot accommodate fire flows in excess of 13,000 l/min.

Thanks,

Shika Rathnasooriya, P.Eng
Project Manager
Planning, Real Estate and Economic Development Department - West Branch
City of Ottawa
110 Laurier Avenue West Ottawa, ON
613.580.2424 ext. 23433

From: Tatyana Roumie <troumie@jlrichards.ca>
Sent: May 18, 2023 3:44 PM
To: Rathnasooriya, Shika <Thakshika.Rathnasooriya@ottawa.ca>
Cc: Surprenant, Eric <Eric.Surprenant@ottawa.ca>; Annie Williams <awilliams@jlrichards.ca>; Karla Ferrey <kferrey@jlrichards.ca>
Subject: Request for Hydraulic Boundary Conditions - 37 Wildpine Court

Hello Shika,

Further to our meeting on Tuesday, here's our revised request that we are requesting again as per your request for revisions to the applications that are currently ongoing, one for re-zoning and one for the plan of subdivision.

We are requesting water and wastewater boundary conditions for Latitude Homes' proposed development at 37 Wildpine Court. The subject property consists of one 4-storey apartment building located north of Ravenscroft Court and Wildpine Court.

Based on the Ottawa Design Guidelines for Water Distribution, the 2020 FUS Guidelines and the Site Plan the estimated water demands are as follows:

- Average Day Demand = 0.51 L/s
- Maximum Day Demand = 2.45 L/s
- Peak Hour Demand = 3.70 L/s
- Assumed Sprinkler Flow = 69.2 L/s
- FUS Fire Flow (No Firewall) = 283 L/s
- FUS Fire Flow (With Firewall) = 217 L/s

It is proposed to create a 200 mm diameter watermain loop between Ravenscroft and Wildpine with a water service extending from the loop to the building. It is requested that the water boundary conditions be provided on Ravenscroft Court and Wildpine Court as shown in the attached. Please provide the boundary conditions for all three fire flows listed above. If the requested fire flow is not available on the 200 mm diameter watermain, we ask that the maximum available fire flow be provided.

We kindly ask that the City provide boundary conditions for the demand scenarios listed above, at your earliest convenience.

We also attached the estimated peak flows for wastewater and the existing services as per GeoOttawa. Please confirm if there is capacity at either Ravenscroft Court or Wildpine Court to accommodate our peak wastewater flow of 2.05 L/s.

Should you have any questions or require anything further, please do not hesitate to contact us.

Thank you,
Tatyana

Tatyana Roumie, EIT, M.Eng.
Civil Engineering Intern

J.L. Richards & Associates Limited
1000-343 Preston Street, Ottawa, ON K1S 1N4
Direct: 343-804-9370

J.L. Richards & Associates Limited
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CANADA BEST MANAGED COMPANIES Platinum member

'

'

Boundary Conditions
37 Wildpine

Provided Information

Scenario	Demand	
	L/min	L/s
Average Daily Demand	31	0.51
Maximum Daily Demand	147	2.45
Peak Hour	222	3.70
Fire Flow Demand #1 - Assumed Sprinkler Flow	4,152	69.20
Fire Flow Demand #2 - With Firewall	13,020	217.00
Fire Flow Demand #3 - Without Firewall	16,980	283.00

Location

Results

Connection 1 – Stittsville Main St.

Demand Scenario	Head (m)	Pressure[1] (psi)
Maximum HGL	160.3	59.2
Peak Hour	156.4	53.6
Max Day plus Fire Flow #1	154.7	51.3
Max Day plus Fire Flow #2	136.3	25.2

Max Day plus Fire Flow #3	123.4	6.8
[1] Ground Elevation =	118.6	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.

J.L. Richards & Associates Limited

HEAD LOSS - HAZEN-WILLIAMS
37 Wildpine - 4-Storey Apartment Building
(JLR 29803-000)

Demand Scenario (Calculated in June 2023)	Flow (L/s)
Average Day	0.51
Maximum Day	2.45
Fire Flow Demand	217.00
Peak Hour	3.69

Boundary Conditions (Email from City, May 29, 2023):

Water Demand Scenario	Demand (L/s)	Head (m) on Stittsville Main St. Connection
Peak Hour	3.70	156.4
Maximum HGL	0.00	160.3
Max Day plus Fire Flow #1	69.20	154.7
Max Day plus Fire Flow #2	217.00	136.3
Max Day plus Fire Flow #3	283.00	123.4

Headloss Calculations (Hazen Williams Equation)

Hazen Williams equation (Mays, 1999; Streeter et al., 1998; Viessman and Hammer, 1993) where k=0.85 for meter and seconds units or 1.318 for feet and seconds units:

$$H = L\left[\frac{V}{kC}\left(\frac{4}{D}\right)^{0.63}\right]^{1/0.54} \qquad V = \frac{Q}{A} \qquad A = \frac{\pi}{4}D^2$$

Where,
HL = Headloss (m)
Q - Flow (m^3/s)
L - Length (m)
C - Hazen Williams "C"
D - Watermain Diameter (m)
V - Velocity (m/s)
A - Watermain Cross-Sectional Area (m^2)

37 Wildpine Court Headloss Calculations

Water Demand Condition	Flow (Q) (L/s)	Flow (Q) (m^3/s)	Length (m)	C	D (m)	V (m/s)	A (m2)	Head Loss (m)	HGL (m)	Calculated HGL (m)	Elevation (m) of Tower	Pressure @ Node (m)	Pressure @ Node (kPa)	Pressure @ Node (psi)	ODG 4.2.2 Requirement	Criteria Achieved?
Peak Hour	3.69	0.004	9.0	100	0.204	0.113	0.033	0.001	156.400	156.399	120.10	36.299	356	51.6	276 kPa	Yes
Maximum HGL (Building)	0.00	0.000	9.0	100	0.204	0.000	0.033	0.000	160.300	160.300	120.10	40.200	394	57.2	552 kPa	Yes
Max Day + Sprinkler Flow (200 mm Service lateral)	71.65	0.072	9.0	100	0.204	2.192	0.033	0.331	136.300	135.969	120.10	15.869	156	22.6	140 kPa	Yes

Appendix E

Functional Wastewater Flows

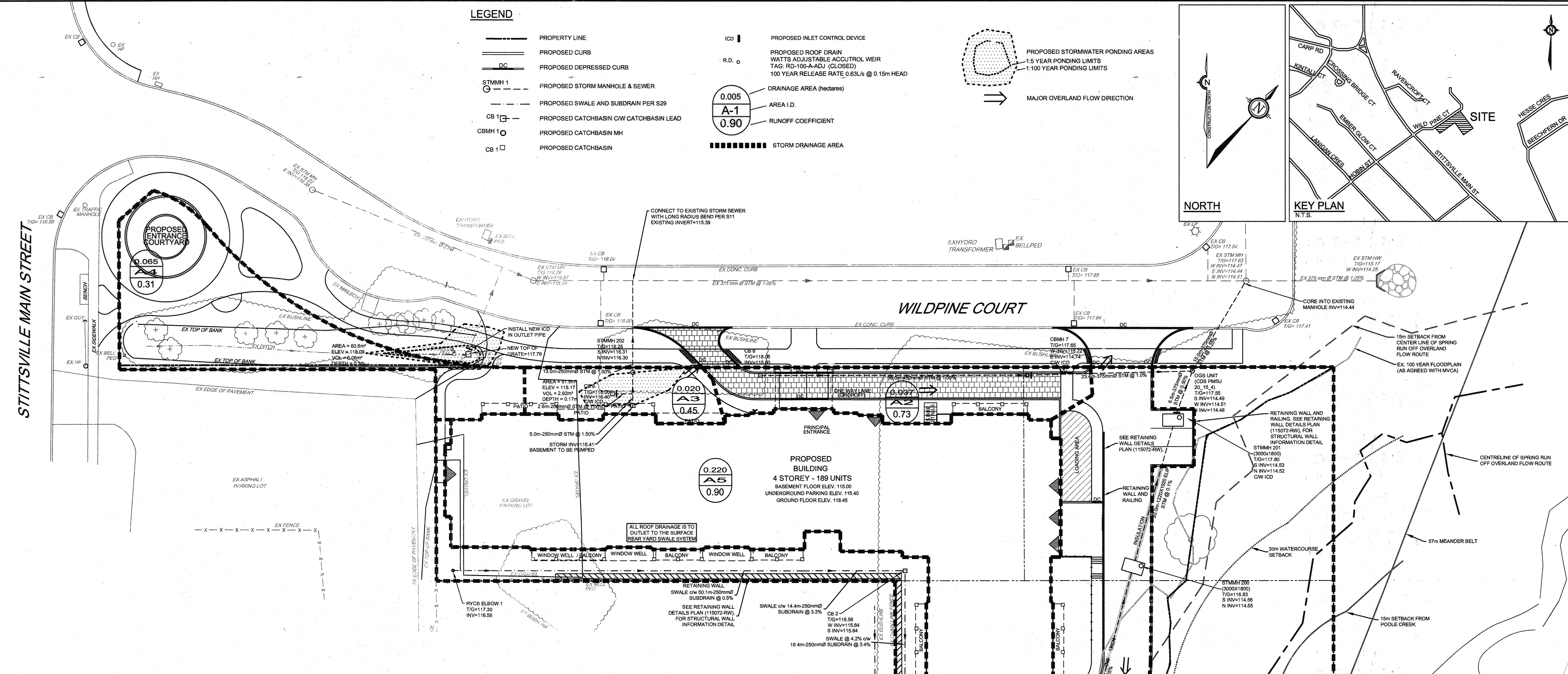
Wastewater Calculations
37 Wildpine Trails (JLR 29803-003)

Area	0.7696	Ha.
Unit Breakdown	**No.**	**Person Per Unit (Table 4.1)**
No. Townhouse	2	2.7
1 Bedroom units	60	1.4
2 Bedroom units	34	2.1
Total Population	160.8	ppl
Theoretical Wastewater Flow	280	L/c/d
Average Wastewater Flow	**0.52**	**L/s**
Harmon Peaking Factor	3.545	
Peak Wastewater Flow	**1.85**	**L/s**
Dry & Wet I/I (0.33 L/s/ha)	0.25	L/s

Total Peak WW Flow (L/s)	**2.10**	**L/s**

Appendix F

Stormwater Design Sheets



INLET CONTROL DEVICE FOR AREA A-1 @ STMMH 201						
DESIGN EVENT	ICD TYPE AND SIZE	DIAMETER OF OUTLET PIPE (mm)	DESIGN FLOW (L/s)	DESIGN HEAD (m)	STORAGE REQUIRED (m³)	MAX STORAGE PROVIDED (m³)
1:5 YEAR	PLATE 100mm	375	11.8	0.30	12.7	45.6
1:100 YEAR	PLATE 100mm	375	16.7	0.60	29.7	45.6

INLET CONTROL DEVICE FOR AREA A-2 @ CBMH 7						
DESIGN EVENT	ICD TYPE AND SIZE	DIAMETER OF OUTLET PIPE (mm)	DESIGN FLOW (L/s)	DESIGN HEAD (m)	STORAGE REQUIRED (m³)	MAX STORAGE PROVIDED (m³)
1:5 YEAR	TEMPEST LMF 60	375	2.9	0.86	3.0	10.3
1:100 YEAR	TEMPEST LMF 60	375	3.4	1.15	8.0	10.3

INLET CONTROL DEVICE FOR AREA A-3@ CB 9						
DESIGN EVENT	ICD TYPE AND SIZE	DIAMETER OF OUTLET PIPE (mm)	DESIGN FLOW (L/s)	DESIGN HEAD (m)	STORAGE REQUIRED (m³)	MAX STORAGE PROVIDED (m³)
1:5 YEAR	TEMPEST LMF 40	200	1.6	1.5	0.6	0.6
1:100 YEAR	TEMPEST LMF 40	200	1.7	1.65	2.1	3.5

INLET CONTROL DEVICE FOR AREA A-4 @ EX CB						
DESIGN EVENT	ICD TYPE AND SIZE	DIAMETER OF OUTLET PIPE (mm)	DESIGN FLOW (L/s)	DESIGN HEAD (m)	STORAGE REQUIRED (m³)	MAX STORAGE PROVIDED (m³)
1:5 YEAR	TEMPEST LMF 60	200	3.5	1.22	1.4	1.4
1:100 YEAR	TEMPEST LMF 60	200	3.8	1.32	5.1	6.5

R-1 to R-10 ROOF DRAIN TABLE - PROPOSED BUILDING ROOF						
ROOF DRAIN MODEL No.	ROOF DRAIN OPENING SETTING	1:5 YEAR RELEASE RATE	APPROX. 100 YR PONDING DEPTH	1:100 YEAR RELEASE RATE	STORAGE REQUIRED (m³)	STORAGE PROVIDED (m³)
RD - 100 - A - ADJ	CLOSED	6.3 L/S	0.15	6.3 L/S	101.9	110

* REFER TO THE 'SERVICING AND STORMWATER MANAGEMENT REPORT' R-2015-177 PREPARED BY NOVATECH FOR DRAINAGE AREA IDs AND SWM DETAILS.

**ALL 10 CONTROLLED FLOW ROOF DRAINS FOR THE PROPOSED BUILDING TO BE WATTS ADJUSTABLE ACCUTROL ROOF DRAINS

NOTE:
THE POSITION OF ALL POLE LINES, CONDUITS, WATERMAINS, SEWERS AND OTHER UNDERGROUND AND OVERGROUND UTILITIES AND STRUCTURES IS NOT NECESSARILY SHOWN ON THE CONTRACT DRAWINGS, AND WHERE SHOWN, THE ACCURACY OF THE POSITION OF SUCH UTILITIES AND STRUCTURES IS NOT GUARANTEED. BEFORE STARTING WORK, DETERMINE THE EXACT LOCATION OF ALL SUCH UTILITIES AND STRUCTURES AND ASSUME ALL LIABILITY FOR DAMAGE TO THEM.

APPROVED ☒ REFUSED ☐
THIS 1 DAY OF May, 20 17
DERRICK MOODIE, MANAGER
DEVELOPMENT REVIEW WEST
PLANNING, INFRASTRUCTURE AND ECONOMIC DEVELOPMENT DEPARTMENT, CITY OF OTTAWA

No.	REVISION	DATE	BY
6	ISSUED FOR FINAL APPROVAL	MAR 1/17	CJR
5	RE-ISSUED FOR SPA - FINAL REVIEW	NOV 17/16	CJR
4	REVISED PER CITY COMMENTS	JULY 19/16	CJR
3	REVISED PER CITY COMMENTS	JUNE 24/16	CJR
2	REVISED PER CITY COMMENTS	APRIL 6/16	CJR
1	ISSUED FOR SITE PLAN APPLICATION	NOV 13/15	CJR

SCALE 1:300

DESIGN LSC
CHECKED CJR
DRAWN LSC
CHECKED CJR
APPROVED CJR

LICENSED PROFESSIONAL ENGINEER C.J. RUDDLE PROVINCE OF ONTARIO

NOVATECH
Engineers, Planners & Landscape Architects
Suite 200, 240 Michael Cowpland Drive
Ottawa, Ontario, Canada K2M 1P6
Telephone (613) 254-9643
Facsimile (613) 254-5867
Website www.novatech-eng.com

LOCATION
10 WILDPINE COURT
WILDPINE RESIDENCE

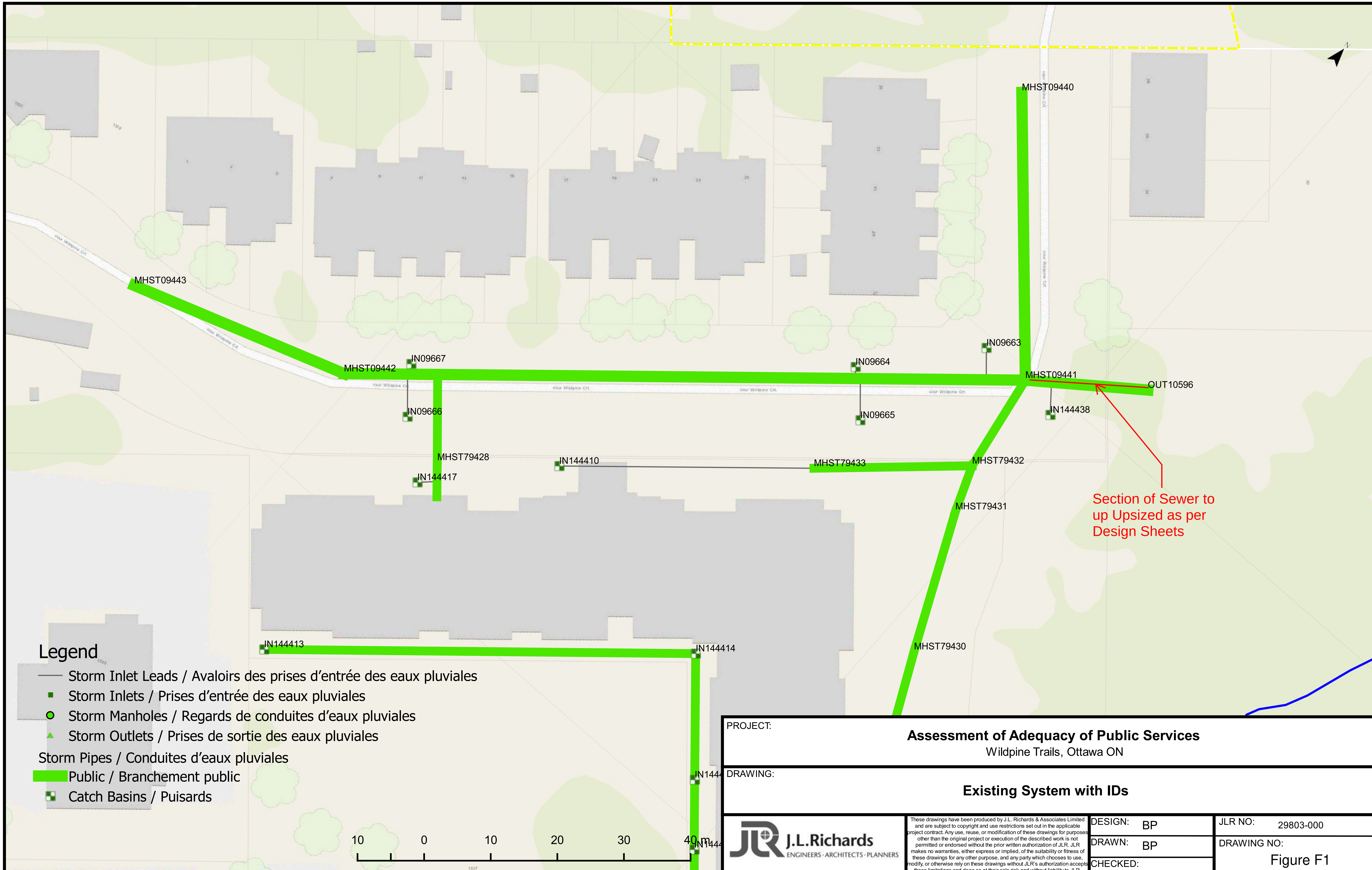
DRAWING NAME
STORMWATER MANAGEMENT PLAN

PROJECT No. 115072
REV REV # 6
DRAWING No. 115072-SWM

PLAN NO. 17194

D07-12-15-0178

M:\2015\115072\CAD\Design\115072-SWM.dwg, SWM, Mar 01, 2017 - 12:22pm, mhoriak



PROJECT:	**Assessment of Adequacy of Public Services** Wildpine Trails, Ottawa ON
DRAWING:	**Existing System with IDs**

J.L.Richards ENGINEERS · ARCHITECTS · PLANNERS

DESIGN:	BP
DRAWN:	BP
CHECKED:	
JLR NO:	29803-000
DRAWING NO:	Figure F1

J.L.Richards
ENGINEERS · ARCHITECTS · PLANNERS

STORM SEWER DESIGN SHEET EXISTING

PROJECT: Wildpine Redevelopment

JLR NO.: 29803-003

Prepared By: ML
Checked By: BP

Date: 2023-06-14

Location			Drainage Areas				Peak Flow Estimation (Rational Method)										
			C-Factor (1:2 Yr)							1:2 Year Storm							
Street Name	From MH	To MH	0.20	0.90	Total Area (ha)	Cum. Total Area (ha)	Inlet Time (min.)	In Pipe Flow Time (min)	Total Time	2.78AR	Add. 2.78AR	Cum. 2.78AR	1:2 Yr Intensity (mm/hr)	Peak Flow (L/s)	Plug Flow (L/s)	Cum. Plug Flow (L/s)	Total Peak Flow (L/s)
OUTLET TO: POND (SWM FACILITY)																	
Wildpine Court	MHST09443	MHST09442			0.00	0.00	10.00	0.45	10.45	0.00		0.00	76.81	0.00	3.50	3.50	**3.50**
Wildpine Court	MHST09442	MHST09441	0.434	0.635	1.07	1.07	**10.45**	1.78	12.23	1.83		1.83	75.13	137.50	1.60	5.10	**142.60**
New Wildpine Extension	SU8	SU9	0.035	0.049	0.08	0.08	10.00	0.79	10.79	0.14		0.14	76.81	10.94		0.00	**10.94**
New Wildpine Extension	SU9	MHST09440	0.089	0.062	0.15	0.24	**10.79**	0.16	10.95	0.20		0.35	73.92	25.64		0.00	**25.64**
Wildpine Court	MHST09440	MHST09441			0.00	0.24	10.95	0.88	11.83	0.00		0.35	73.34	25.44		0.00	**25.44**
Wildpine Court	MHST09441	OUT10596	0.0188	0.0109	0.03	1.33	12.23	0.31	12.54	0.04		2.21	69.18	153.22	14.70	19.80	**173.02**
TOTALS:			0.577	0.757	1.33												

Location			Sewer Data									Upstream Geometry			Downstream Geometry		
Street Name	From MH	To MH	Type	Nominal Dia. (mm)	Actual Dia. (mm)	Slope	Length (m)	Q Full (L/s)	V Full (m/s)	Residual Capacity (L/s)	% Full	Obvert	Invert	Springline Elev	Obvert	Invert	Springline Elev
OUTLET TO: POND (SWM FACILITY)																	
Wildpine Court	MHST09443	MHST09442	**PVC**	**300**	304.80	1.71%	48.42	132.08	1.81	**128.58**	**3%**	116.775	116.470	116.622	**115.945**	115.640	115.792
Wildpine Court	MHST09442	MHST09441	**PVC**	**375**	381.00	0.72%	145.32	154.74	1.36	**12.14**	**92%**	115.941	115.560	115.750	**114.901**	114.520	114.710
New Wildpine Extension	SU8	SU9	**PVC**	**300**	304.80	0.70%	54.43	84.29	1.16	**73.35**	**13%**	115.775	115.470	115.622	**115.395**	115.090	115.242
New Wildpine Extension	SU9	MHST09440	**PVC**	**300**	304.80	0.70%	11.40	84.50	1.16	**58.87**	**30%**	115.395	115.090	115.242	**115.315**	115.010	115.162
Wildpine Court	MHST09440	MHST09441	**PVC**	**300**	304.80	0.70%	61.36	84.45	1.16	**59.02**	**30%**	115.190	115.010	115.162	114.885	114.580	114.732
Wildpine Court	MHST09441	OUT10596	**PVC**	**375**	381.00	0.76%	26.19	159.84	1.40	**-13.18**	**108%**	114.881	114.500	114.691	114.681	114.300	114.491
TOTALS:																	

Design Parameters (Per OSDG)	
Manning's Coefficient =	0.013
1:2 Year Intensity =	732.951 / (Tc + 6.199)^0.810

Note: Tc is the time of concentration in minutes

Legend	
89.232	Proposed Mainline Sewers
89.232	Existing (As-Built Information)

J.L.Richards
ENGINEERS · ARCHITECTS · PLANNERS

STORM SEWER DESIGN SHEET UPSIZED

PROJECT: Wildpine Redevelopment

JLR NO.: 29803-003

Prepared By: ML
Checked By: BP

Date: 2023-06-14

Location			Drainage Areas				Peak Flow Estimation (Rational Method)										
			C-Factor (1:2 Yr)							1:2 Year Storm							
Street Name	From MH	To MH	0.20	0.90	Total Area (ha)	Cum. Total Area (ha)	Inlet Time (min.)	In Pipe Flow Time (min)	Total Time	2.78AR	Add. 2.78AR	Cum. 2.78AR	1:2 Yr Intensity (mm/hr)	Peak Flow (L/s)	Plug Flow (L/s)	Cum. Plug Flow (L/s)	Total Peak Flow (L/s)
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Wildpine Court	MHST09443	MHST09442			0.00	0.00	10.00	0.45	10.45	0.00		0.00	76.81	0.00	3.50	3.50	**3.50**
Wildpine Court	MHST09442	MHST09441	0.434	0.635	1.07	1.07	**10.45**	1.78	12.23	1.83		1.83	75.13	137.50	1.60	5.10	**142.60**
New Wildpine Extension	SU8	SU9	0.035	0.049	0.08	0.08	10.00	0.79	10.79	0.14		0.14	76.81	10.94		0.00	**10.94**
New Wildpine Extension	SU9	MHST09440	0.089	0.062	0.15	0.24	**10.79**	0.16	10.95	0.20		0.35	73.92	25.64		0.00	**25.64**
Wildpine Court	MHST09440	MHST09441			0.00	0.24	10.95	0.88	11.83	0.00		0.35	73.34	25.44		0.00	**25.44**
Wildpine Court	MHST09441	OUT10596	0.0188	0.0109	0.03	1.33	12.23	0.30	12.53	0.04		2.21	69.18	153.22	14.70	19.80	**173.02**
TOTALS:			0.577	0.757	1.33												

Location			Sewer Data									Upstream Geometry			Downstream Geometry		
Street Name	From MH	To MH	Type	Nominal Dia. (mm)	Actual Dia. (mm)	Slope	Length (m)	Q Full (L/s)	V Full (m/s)	Residual Capacity (L/s)	% Full	Obvert	Invert	Springline Elev	Obvert	Invert	Springline Elev
OUTLET TO: POND (SWM FACILITY)																	
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Wildpine Court	MHST09442	MHST09441	PVC	375	381.00	0.72%	145.32	154.74	1.36	**12.14**	**92%**	115.941	115.560	115.750	**114.901**	114.520	114.710
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New Wildpine Extension	SU9	MHST09440	PVC	300	304.80	0.70%	11.40	84.50	1.16	**58.87**	**30%**	115.395	115.090	115.242	**115.315**	115.010	115.162
Wildpine Court	MHST09440	MHST09441	PVC	300	304.80	0.70%	61.36	84.45	1.16	**59.02**	**30%**	115.190	115.010	115.162	114.885	114.580	114.732
Wildpine Court	MHST09441	OUT10596	PVC	400	406.40	0.76%	26.19	189.85	1.46	**16.83**	**91%**	114.906	114.500	114.703	114.706	114.300	114.503
TOTALS:																	

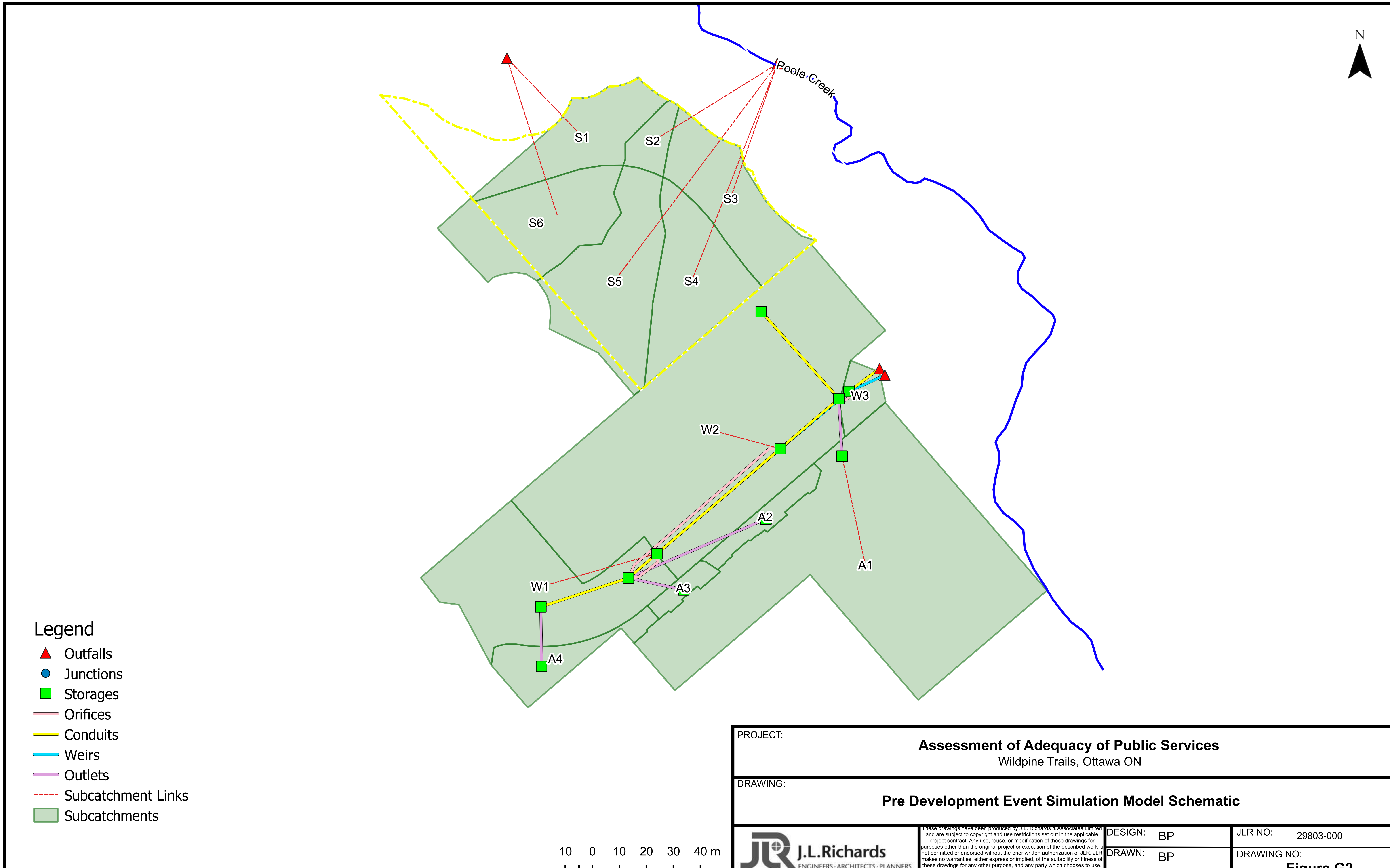
Design Parameters (Per OSDG)	
Manning's Coefficient =	0.013
1:2 Year Intensity =	732.951 / (Tc + 6.199)^0.810

Note: Tc is the time of concentration in minutes

Legend	
89.232	Proposed Mainline Sewers
89.232	Existing (As-Built Information)

Appendix G

Stormwater Model Schematics



PROJECT:

Assessment of Adequacy of Public Services

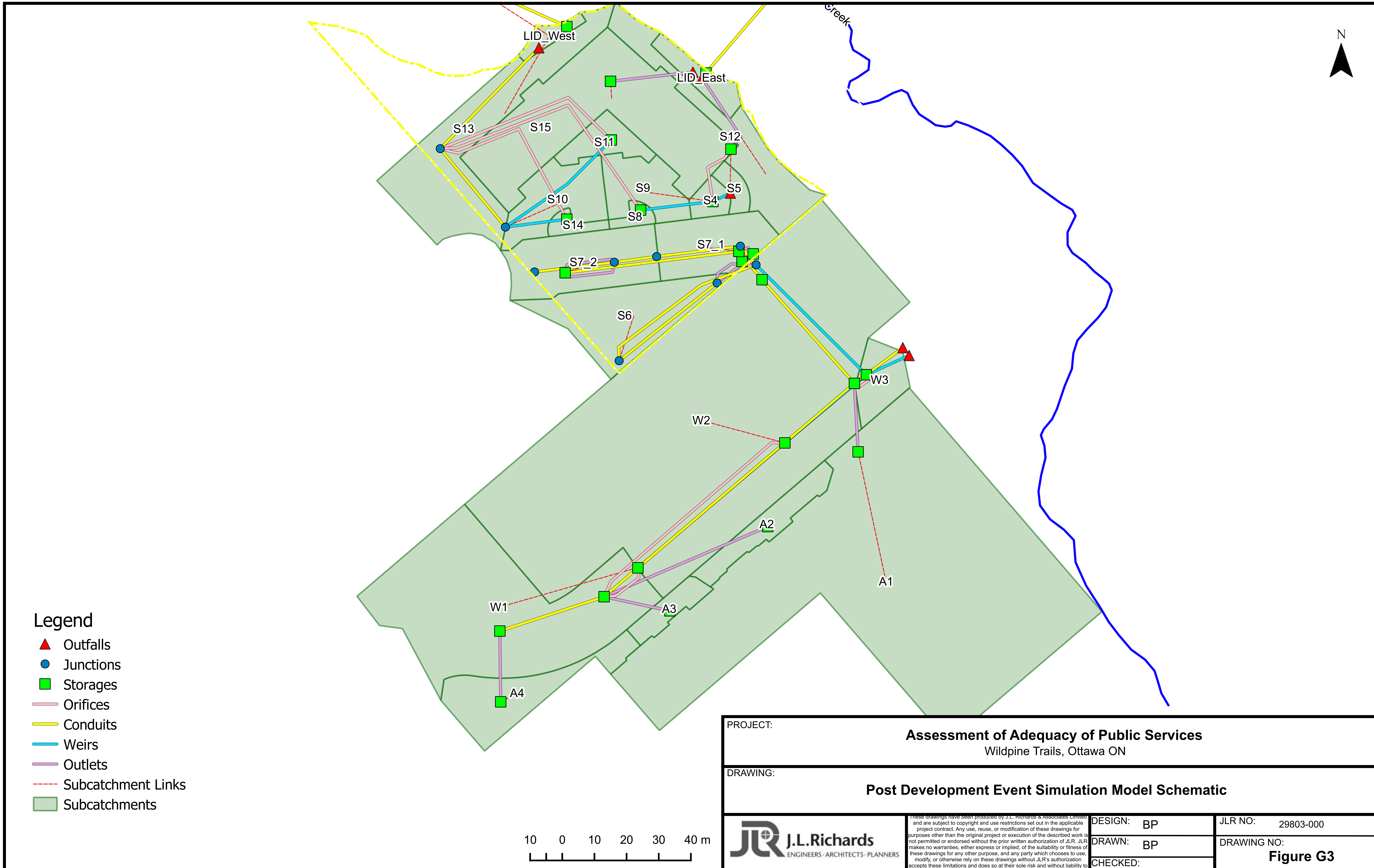
Wildpine Trails, Ottawa ON

DRAWING:

Pre Development Event Simulation Model Schematic

J.L.Richards
ENGINEERS · ARCHITECTS · PLANNERS

DESIGN:	BP	JLR NO:	29803-000
DRAWN:	BP	DRAWING NO:	**Figure G2**
CHECKED:			



PROJECT:

Assessment of Adequacy of Public Services

Wildpine Trails, Ottawa ON

DRAWING:

Post Development Event Simulation Model Schematic

J.L.Richards
ENGINEERS · ARCHITECTS · PLANNERS

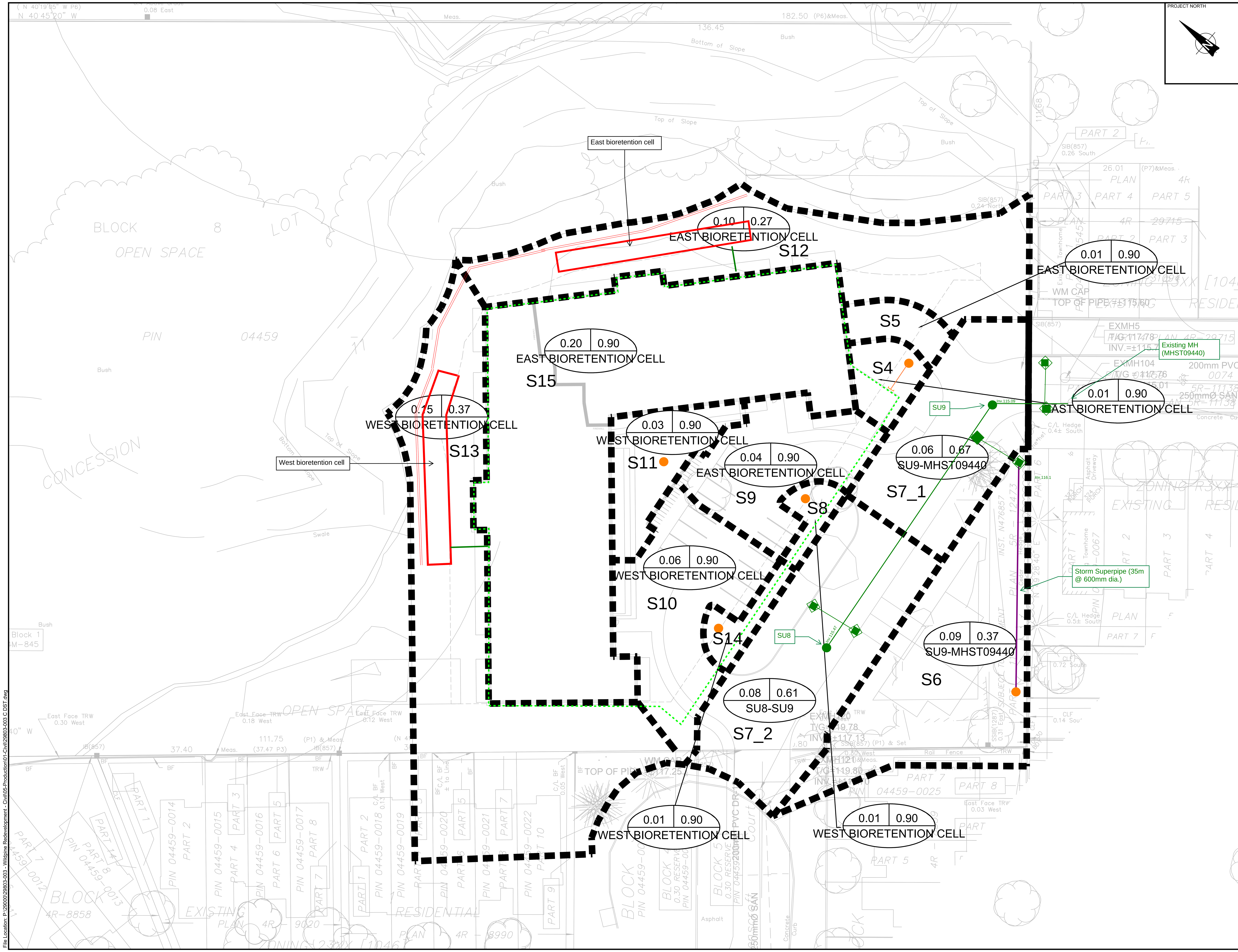
DESIGN: BP

DRAWN: BP

CHECKED:

JLR NO: 29803-000

DRAWING NO: **Figure G3**



LEGEND:

- STM DA BOUNDARY
- 0.10 | 0.61 / 523-522: AREA IN HECTARES; RUNOFF COEFFICIENT; PIPE REACH UPSTREAM MAINTENANCE HOLE TO DOWNSTREAM MAINTENANCE HOLE
- Limits of Underground Parking Garage
- Proposed Storm sewer and MH
- Proposed Bioretention Cell
- Proposed Berm (0.45m height acting as level spreader)
- Proposed Landscaped CB/Pot

No.	ISSUE / REVISION	DD/MM/YY
2	RE-ISSUED TO CITY FOR REVIEW	20/12/23
1	ISSUED TO CITY FOR REVIEW	14/06/23

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

SCALE: 1:250

CLIENT:

CONSULTANT: www.jlrichards.ca

J.L.Richards ENGINEERS · ARCHITECTS · PLANNERS

CONSULTANT:

PROFESSIONAL STAMP | PROFESSIONAL STAMP

PROJECT:

WILDPINE TRAILS

37 WILDPINE COURT

DRAWING:

STORM DRAINAGE PLAN

DESIGN: KF
DRAWN: NQ
CHECKED: KF
JLR #: 29803-001

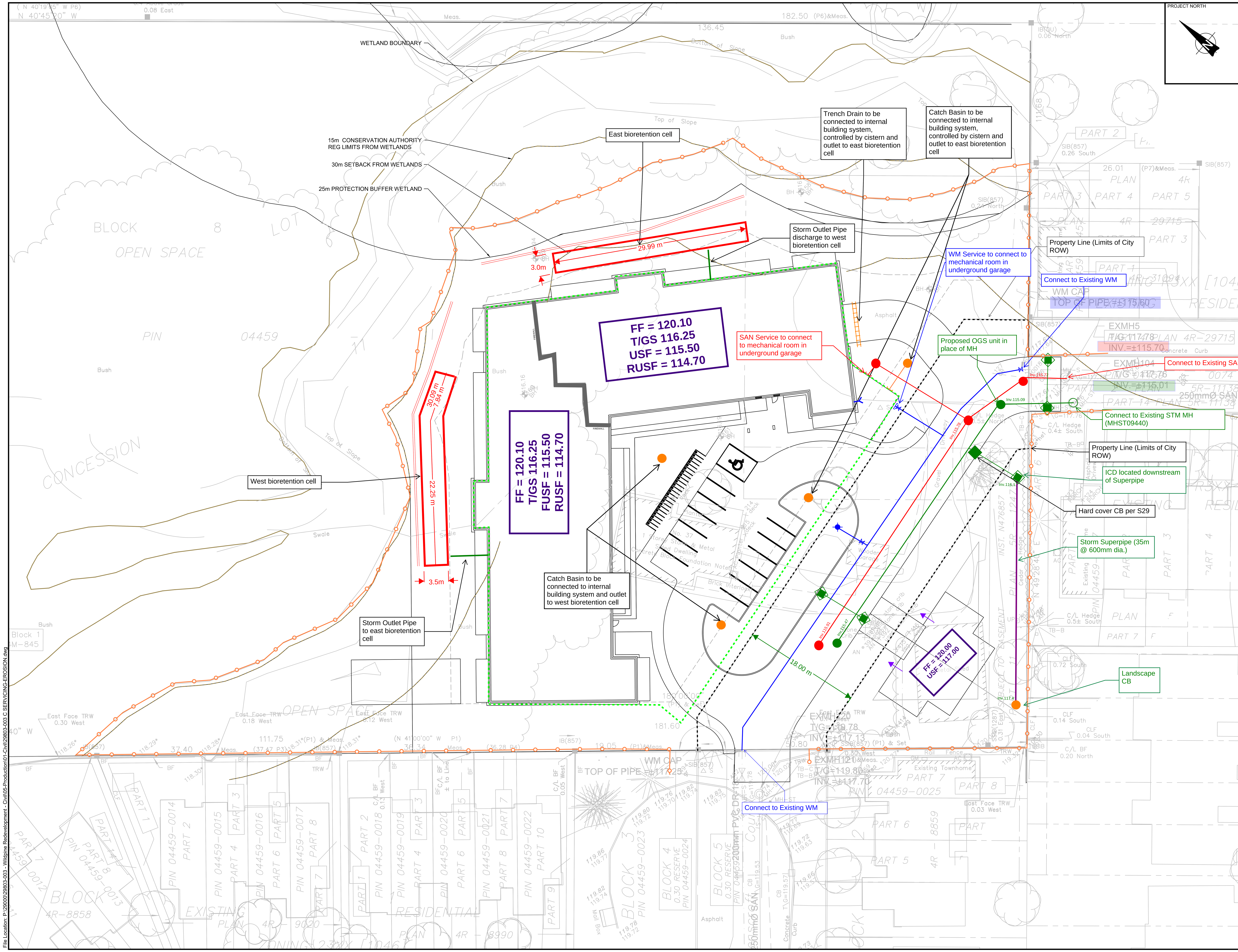
DRAWING #: DST

PLOT DATE: December 20, 2023 1:11:24 PM

File Location: P:\29000\29803-003 - Wildpine Redevelopment - Civil\05-Production\01-Civil\29803-003 C DST.dwg

FUNCTIONAL DESIGN DRAWINGS

F-SE Functional Servicing and Erosion Sediment Control
F-G Functional Grading



Proposed Bioretention Cell	
Proposed Berm (0.45m height acting as level spreader)	
Proposed Trench Drain	
Proposed Siamese Connection	
Proposed Hydrant	
Proposed Watermain and Valve	
Proposed 200 mm dia. Sanitary sewer and MH	
Proposed Storm sewer and MH	
Erosion and Sedimentation Silt Fence	
Property Line (Limits of City ROW)	
Limits of Underground Parking Garage	
Three service connection for Townhouse (STM, WM, SAN)	
Proposed Catch Basin c/w ICD	
Proposed Catch Basin with Hard Cover per S29	
Proposed Landscaped CB/Pot	

No.	ISSUE / REVISION	DD/MM/YY
1	ISSUES TO CITY FOR REVIEW	14/06/23

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

SCALE: 1:250

CLIENT:

CONSULTANT: www.jlrichards.ca

J.L.Richards ENGINEERS · ARCHITECTS · PLANNERS

CONSULTANT:

PROFESSIONAL STAMP | PROFESSIONAL STAMP

PROJECT:

WILDPINE TRAILS

37 WILDPINE COURT

DRAWING:

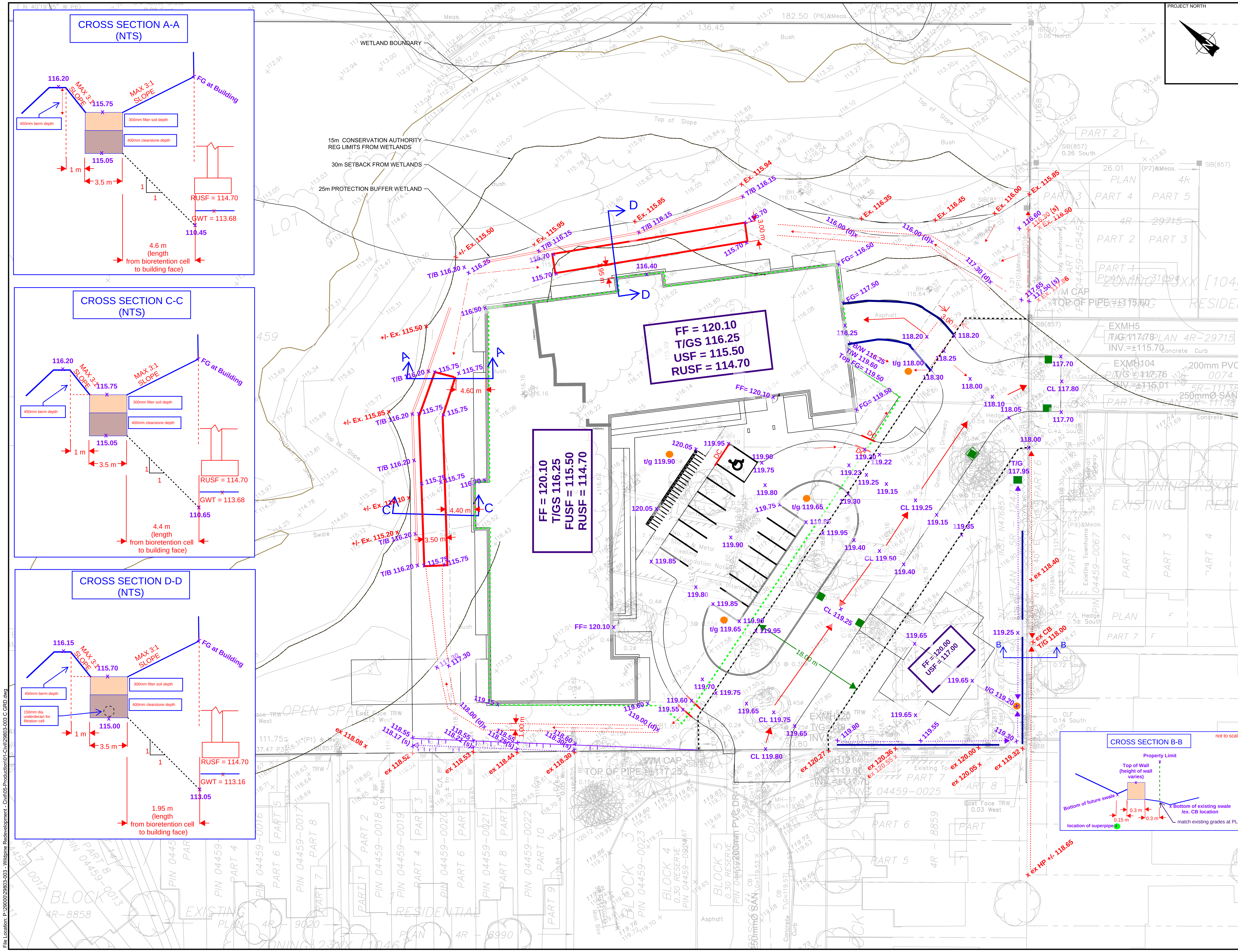
FUNCTIONAL SERVICING, EROSION AND SEDEMENT CONTROL PLAN

DESIGN: KF
DRAWN: NQ
CHECKED: KF
JLR #: 29803-001

DRAWING #: F-SE

PLOT DATE: December 20, 2023 8:41:24 AM

File Location: P:\29000\29803-003 - Wildpine Redevelopment - Civil\05-Production\01-Civil\29803-003 C SERVICING-EROSION.dwg



117.00	Proposed Grades
FF 120.10	Proposed Finish Floor
USF 115.50	Proposed Underside of Footing
	Proposed Catch Basin c/w ICD
	Proposed Catch Basin with Hard Cover per S29
	Proposed Landscaped CB/Pot
	Proposed Swale
	Existing Swale
	Retaining Wall, approx. location

No.	ISSUE / REVISION	DD/MM/YY
1	ISSUES TO CITY FOR REVIEW	14/06/23

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

SCALE: 1:250

CLIENT:

CONSULTANT: www.jlrichards.ca

J.L.Richards
ENGINEERS · ARCHITECTS · PLANNERS

CONSULTANT:

PROFESSIONAL STAMP

PROFESSIONAL STAMP

PROJECT:

WILDPINE TRAILS

37 WILDPINE COURT

DRAWING:

FUNCTIONAL GRADING

DESIGN: KF
DRAWN: NQ
CHECKED: KF
JLR #: 29803-001

DRAWING #: F-G

PLOT DATE: December 12, 2023 3:03:34 PM

File Location: P:\29000\29803-003 - Wildpine Redevelopment - Civil\05-Production\01-Civil\29803-003 C GRD.dwg www.jlrichards.ca

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