UNITED PROPERT RESOURCE CORPORATION

360 KENNEDY LANE EAST, RESIDENTIAL DEVELOPMENT, OTTAWA, ON

SERVICING REPORT

NOVEMBER 30, 2021
1ST SUBMISSION

360 KENNEDY LANE EAST, RESIDENTIAL DEVELOPMENT, OTTAWA, ON

SERVICING REPORT

UNITED PROPERTY RESOURCE CORPORATION

SITE PLAN AND ZONING BY-LAW AMENDMENT APPLICATION
1ST SUBMISSION

PROJECT NO.: 211-12127-00
DATE: NOVEMBER 2021

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November 30, 2021

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Click or tap here to enter text.
Click or tap here to enter text.

Attention: Zachariah Glennon

Click here to enter salutation

Subject: 360 Kennedy Lane East – Residential Development - Servicing Report

Please find attached our servicing and stormwater management reports, and accompanying civil engineering design drawings, prepared for your review and for site plan and zoning by-law amendment application.

Yours sincerely,

Erin Blanchette, EIT
Municipal Engineering

WSP ref.: 211-12127-00

QUALITY MANAGEMENT

ISSUE/REVISION	FIRST ISSUE	REVISION 1	REVISION 2	REVISION 3
Remarks	Issued for Site Plan and ZBLA Application			
Date	November 30, 2021			
Prepared by	Erin Blanchette			
Signature				
Checked by	Ding Bang (Winston) Yang			
Signature				
Project number	211-12127-00			

SIGNATURES

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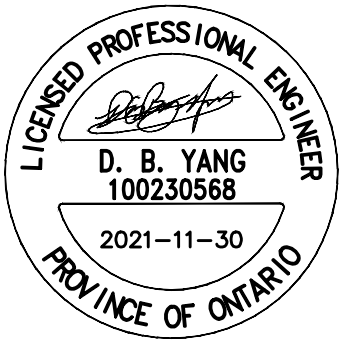

Ding Bang (Winston) Yang, P.Eng.
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1 GENERAL

1.1 EXECUTIVE SUMMARY

WSP was retained by United Property Resource Corporation to provide servicing and grading design services for the proposed new residential development located at 360 Kennedy Lane East, approximately 400m south of St Joseph Boulevard and 400m west of Tenth Line Road. This report outlines findings and calculations pertaining to the servicing of the proposed development with a gross lot area of 12,410m².

Currently the land proposed for the residential development is natural landscaping covered mainly by grass and trees, as well as a single storey church building and a single storey storage building with an asphalt surfaced parking area and laneway. The total study area for the site is considered to be 1.241ha in size. The site is bounded by residential development to the north, east and west, and park land to the south. Based on the topographic survey, the site is being divided into two drainage portions, the developed areas to the west and the landscape areas to the east. The flow from the eastern portion of the site will drain toward Kennedy Lane East via parking lot and grass area; the flow from the western portion of the site will be collected by the existing on-site ditches and discharge to the park land to the south.

The City of Ottawa required that the design of a drainage and stormwater management system in this development must be prepared in accordance with the following documents:

- Sewer Design Guidelines, City of Ottawa, October 2012;
- Stormwater Management Planning and Design Manual, Ministry of the Environment, March 2003; and
- Stormwater Management Facility Design Guidelines, City of Ottawa, April 2012

This report was prepared utilizing servicing design criteria obtained from available sources, and outlines the design for water, sanitary wastewater, and stormwater facilities.

The format of this report matches that of the servicing study checklist found in Section 4 of the City of Ottawa's Servicing Study Guidelines for Development Applications, November 2009.

The following municipal services are available within Kennedy Lane East to the development as recorded from as-built drawings from City of Ottawa:

Kennedy Lane East:

- 900mm storm sewer, 250mm sanitary sewer and 203mm watermain.

It is proposed that:

- On-site stormwater management systems, employing surface storage and underground storm chambers will be provided to attenuate flow rates. Existing drainage patterns, previously established controlled flow rates and storm sewers will be maintained. Refer to the stormwater management report for details.

1.2 DATE AND REVISION NUMBER

This version of the report is the first revision, dated November 30, 2021.

1.3 LOCATION MAP AND PLAN

The proposed residential development is located at 360 Kennedy Lane East, in the City of Ottawa at the location shown in Figure 1-1 below.

Figure 1-1 Site Location

1.4 ADHERENCE TO ZONING AND RELATED REQUIREMENTS

The proposed property use will be submitted for ZBLA in conformance with zoning and related requirements prior to approval and construction and is understood to be in conformance with any zoning requirements.

1.5 PRE-CONSULTATION MEETINGS

A pre-consultation meeting was held with the City of Ottawa on May 19, 2021. Notes from this meeting are provided in Appendix A.

1.6 HIGHER LEVEL STUDIES

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

- Ottawa Sewer Design Guidelines, Second Edition, Document SDG002, October 2012, City of Ottawa including:
    - Technical Bulletin ISDTB-2012-4 (20 June 2012)
    - Technical Bulletin ISDTB-2014-01 (05 February 2014)
    - Technical Bulletin PIEDTB-2016-01 (September 6, 2018)
    - Technical Bulletin ISDTB-2018-01 (21 March 2018)
    - Technical Bulletin ISDTB-2018-04 (27 June 2018)
- Ottawa Design Guidelines – Water Distribution, July 2010 (WDG001), including:
    - Technical Bulletin ISDTB-2014-02 (May 27, 2014)
    - Technical Bulletin ISTB-2018-02 (21 March 2018)
- Stormwater Management Planning and Design Manual, Ontario Ministry of the Environment and Climate Change, March 2003 (SMPDM).
- Design Guidelines for Drinking-Water Systems, Ontario Ministry of the Environment and Climate Change, 2008 (GDWS).
- Fire Underwriters Survey, Water Supply for Public Fire Protection (FUS), 1999.

1.7 STATEMENT OF OBJECTIVES AND SERVICING CRITERIA

The objective of the site servicing is to meet the requirements for the proposed modification of the site while adhering to the stipulations of the applicable higher-level studies and City of Ottawa servicing design guidelines.

1.8 AVAILABLE EXISTING AND PROPOSED INFRASTRUCTURE

A municipal sanitary sewer, a municipal storm sewer and a watermain are located within the Kennedy Lane East right of way. A new sanitary sewer, a new storm sewer and a new water service will be connected to the existing sewers along Kennedy Lane East from the proposed development. Quantity control is required to restrict the discharge leaving both the development areas, as noted in the Stormwater Management Report. The existing boundary roads at the site will remain open.

1.9 ENVIRONMENTALLY SIGNIFICANT AREAS, WATERCOURSES AND MUNICIPAL DRAINS

The eastern portion of the site drains to various ditches which discharge into a catchbasin where flow is directed to an existing 450mm storm sewer on Mountainside Crescent. Flow is ultimately directed to the Ottawa River.

The western portion of the site is drained predominantly through existing catchbasins which discharge to the sewer on Kennedy Lane East through a 300mm storm sewer. Flow is ultimately directed to the Ottawa River.

1.10 CONCEPT LEVEL MASTER GRADING PLAN

A detailed grading plan has been developed, matching the existing overland flow pattern in the west of directing overflow drainage to Kennedy Lane East. In the eastern portion of the site the grading has been adjusted to direct flow towards Kennedy Lane East as opposed to allowing flow to drain south into the parkland and the residential development to the east as in existing conditions. The site topographic survey, included in Appendix A, provides evidence of direction of overland flow.

Approximately 0.056 ha of the east of the site and 0.006 ha of the south of the site will remain uncontrolled in terms of drainage and will maintain the existing grading.

Grading will employ smooth transitions from the new work areas to existing grades. In some grassed areas 3:1 terracing are proposed between proposed and existing grades. No changes will be made to grades at the development perimeter.

1.11 IMPACTS ON PRIVATE SERVICES

There are no existing domestic private services (septic system and well) located on the site. There are no neighbouring properties using private services.

1.12 DEVELOPMENT PHASING

No phasing is expected for this development.

1.13 GEOTECHNICAL SUTDY

A geotechnical investigation report has been prepared by Pinchin Ltd. (Geotechnical Investigation – Proposed Residential Development, November 30, 2021), and its recommendations have been taken into account in developing the engineering specifications.

1.14 DRAWING REQUIREMENT

The engineering plans submitted for site plan approval are in compliance with City requirements.

2 WATER DISTRIBUTION

2.1 CONSISTENCY WITH MASTER SERVICING STUDY AND AVAILABILITY OF PUBLIC INFRASTRUCTURE

There is an existing 203mm diameter public watermain along Kennedy Lane East which will provide water to the development. A 203mm diameter private watermain will loop around the site to provide water to the development and will tie into the existing 203mm watermain on Kennedy Lane East.

Five new private fire hydrants will be required to service and provide adequate coverage to the proposed units. No changes are required to the existing City water distribution system to allow servicing for this property.

2.2 SYSTEM CONSTRAINTS AND BOUNDARY CONDITIONS

Boundary conditions have not yet been obtained from the City of Ottawa at the 203 mm diameter watermain on Kennedy Lane East for the development, and if obtained, will be added to Appendix B. A maximum fire flow demand of 250 l/s (15,000 l/min) has been calculated for the proposed development as indicated in Section 2.4.

Table 2-1: Boundary Conditions for Parcel 1

BOUNDARY CONDITIONS (to be completed)	
SCENARIO	Head (m)
Maximum HGL	
Minimum HGL (Peak Hour)	
Max Day + Fire Flow	

2.3 CONFIRMATION OF ADEQUATE DOMESTIC SUPPLY AND PRESSURE

Water demands are based on Table 4.2 of the Ottawa Design Guidelines – Water Distribution. As previously noted, the development is considered as a residential development, consisting of 71 stacked town units and 21 average towns. A water demand calculation sheet is included in Appendix B, and the total water demands are summarized as follows:

WATER DEMANDS (to be completed)	
SCENARIO	DEMAND
Average Day	0.60 l/s
Maximum Day	1.49 l/s
Peak Hour	3.29 l/s

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

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

Once boundary conditions are obtained from the City of Ottawa, further confirmation can be attained using a water model software.

Table 2-2: Summary of the minimum water pressure for the development under peak hour scenario

Peak Hour @ XXXm (TO BE COMPLETED LATER)	
ID	Pressure (kPa)

2.4 CONFIRMATION OF ADEQUATE FIRE FLOW PROTECTION

The fire flow rate has been calculated using the Fire Underwriters Survey (FUS) method. The method takes into account the type of building construction, the building occupancy, the use of sprinklers and the exposures to adjacent structures. A fire flow demand of 250 l/s for the development has been calculated. Calculations are included in Appendix B.

The proposed development can be serviced through the combination of existing and proposed hydrants. There is one existing fire hydrant on Kennedy Lane East just north of the site, and five new private hydrants are proposed throughout the site. All residential units are within 35m of a private hydrant. All of the proposed and existing hydrants are rated at 5700 l/min.

The proposed residential units on site will be serviced by a single 19 mm service off the 203 mm private watermain.

The minimum residual pressure will be evaluated once the boundary conditions are obtained from the City of Ottawa.

Table 2-3: Summary of the Residual Pressure for Parcel 1 under Max Day + Fire scenario

Max Day + Fire @ XXX l/s (TO BE COMPLETED LATER)	
ID	Residual Pressure (kPa)

2.5 CHECK OF HIGH PRESSURE

High pressure check will be evaluated once the boundary conditions are obtained from the City of Ottawa.

2.6 PHASING CONSTRAINTS

No phasing constraints exist.

2.7 RELIABILITY REQUIREMENTS

DMA chamber as per city of Ottawa standard W3 and shot off valve will be provided at the study boundary from Kennedy Lane East. Water can be supplied to the private watermain from Kennedy Lane East and can be isolated. A redundancy looping is provided for the subjected site, water can be supplied from either side Kennedy Lane East. Refer to servicing plan C05 for details.

2.8 NEED FOR PRESSURE ZONE BOUNDAY MODIFICATION

There is no need for a pressure zone boundary modification.

2.9 CAPABILITY OF MAJOR INFRASTRUCTURE TO SUPPLY SUFFICIENT WATER

The current infrastructure is capable of meeting the domestic demand based on City requirements and fire demand as determined by FUS requirements for the proposed residential units.

2.10 DESCRIPTION OF PROPOSED WATER DISTRIBUTION NETWORK

A 203mm private watermain is proposed to loop around the site and will distribute water to all residential units. Five private hydrants are proposed throughout the site.

2.11 OFF-SITE REQUIREMENTS

No off-site improvements to watermains, feedermains, pumping stations, or other water infrastructure are required to maintain existing conditions and service the adjacent buildings, other than the connection of the new private watermain to the City watermain in the south frontage of the site.

2.12 CALCULATION OF WATER DEMANDS

Water demands were calculated by as described in Sections 2.3 and 2.4 above.

2.13 MODEL SCHEMATIC

The water works consist a looping of 203mm watermain, five proposed private fire hydrants, and service connections to each residential unit. Additionally, the existing water service which leads to the existing one storey church building will be capped and integrated into the proposed network. A model schematic will be provided with WaterGEM for this development once the boundary conditions are obtained from the City of Ottawa.

3 WASTEWATER DISPOSAL

3.1 DESIGN CRITERIA

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

- Minimum Velocity 0.6 m/s
- Maximum Velocity 3.0 m/s
- Manning Roughness Coefficient 0.013
- Average sanitary flow for residential use 280 L/cap/day
- Average sanitary flow for commercial use 28,000 L/Ha/day
- Commercial/Institutional Peaking Factor 1.5
- Infiltration Allowance (Total) 0.33 L/s/Ha
- Minimum Sewer Slopes – 200 mm diameter 0.32%

3.2 CONSISTENCY WITH MASTER SERVICING STUDY

The outlet for the private sanitary sewer network is the 250 mm diameter municipal sewer on Kennedy Lane East.
The Ottawa Sewer Design Guidelines provide estimates of sewage flows based on residential development. The anticipated total flow based on a development area of 1.24ha is 2.51 L/s.
A sanitary drainage area plan and the sanitary design sheet have been attached to Appendix C for reference.

3.3 REVIEW OF SOIL CONDITIONS

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

3.4 DESCRIPTION OF EXISTING SANITARY SEWER

The outlet sanitary sewer is the existing 250 mm diameter sewer on Kennedy Lane East. This local sewer outlets to a sanitary trunk sewer, then discharges to a municipal wastewater treatment facility.

3.5 VERIFICATION OF AVAILABLE CAPACITY IN DOWNSTREAM SEWER

The capacity of the downstream 250 mm diameter sanitary sewer on Kennedy Lane East at 0.60% slope is 25.41 L/s, which is adequate for the flow assumptions from the proposed development. And the flow from the existing sanitary sewer upstream of 360 Kennedy Lane East has a total flow of 8.5 L/s. The downstream sanitary sewer will carry over the discharge from the subjected site and the upstream areas, a total flow of 11.24 L/s is anticipated.

A sanitary sewer design sheet is provided for both the subjected site and the upstream areas. See Appendix C for details.

3.6 DESCRIPTION OF PROPOSED SEWER NETWORK

The proposed sanitary sewer network on site will consist of 200 mm diameter private sanitary sewers with typical sanitary services for the residential units.

3.7 ENVIRONMENTAL CONSTRAINTS

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

3.8 PUMPING REQUIREMENTS

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

3.9 FORCE-MAINS

No force-mains are required specifically for this development.

3.10 EMERGENCY OVERFLOWS FROM SANITARY PUMPING STATIONS

No pumping stations are required for this site.

3.11 SPECIAL CONSIDERATIONS

There is no known need for special considerations for sanitary sewer design related to existing site conditions.

4 SITE STORM SERVICING

4.1 EXISTING CONDITION

The runoff from the west portion of the existing site is directed to a 900 mm diameter sewer on Kennedy Lane East. And the runoff from the east portion of the existing site is directed to the adjacent ditches next to the residential lots and park land. The overall flow from the site ultimately outlets to the Ottawa River. Drainage in excess of the minor system capacity currently flows overland to a the low section within the eastern and western part of the site and overflow to the adjacent property.

4.2 ANALYSIS OF AVAILABLE CAPACITY IN PUBLIC INFRASTRUCTURE

The total controlled area of the site draining toward Kennedy Lane East is 1.188 ha. There is 0.052 ha of uncontrolled area draining toward the existing ditches along the south and east property line. The runoff from the controlled areas will discharge to a 900mm storm pipe at Kennedy Lane East which ultimately drains to the Ottawa River via the 1800mm trunk sewer.

Of the 1.24ha draining to the boundary of the site, the uncontrolled area of 0.052 ha will be routed to the existing ditches at the property line and remaining unchanged from existing condition.

On-site attenuation to predevelopment flow is required for the purpose of advancing use of this storm outlet. Using the Rational Method, with coefficient of 0.20 for pervious areas and 0.9 for impervious areas, and a 10 minute time of concentration, results in an estimated 2 year flow of 110.46 L/s from this area. Using utility records from the City, the slope of the existing storm sewer 900 mm diameter running north to south on Kennedy Lane East is 0.60%, which equates to a capacity in excess of 1403.68 L/s. As the proposed stormwater management works for the site will reduced the runoff rate to a peak discharge at outlet equal to 125.7 L/s, capacity in the minor system is not a concern.

As the proposed stormwater management works for the site will restricted the 100 year flow to the pre-development 5 year runoff rate, capacity in the minor system is not a concern.

The allowable release rate for the site is 125.7 L/s as calculated in the Stormwater Management Report.

4.3 DRAINAGE DRAWING

Drawing C05 shows the receiving storm sewer and site storm sewer network for the site. Drawing C04 provides proposed grading and drainage and includes existing grading information. Drawing C06 provides a post-construction drainage sub-area plan. F02 provides a pre-development drainage sub-area. Post site sub-area information is also provided on the storm sewer design sheet attached in Appendix D.

4.4 WATER QUANTITY CONTROL OBJECTIVE

Refer to the Stormwater Management Report for the water quantity objective for the site.

4.5 WATER QUALITY CONTROL OBJECTIVE

The designated water quality control objective is 80% TSS removal. This objective will be achieved through the use of an oil/grit separator for the runoff generated from the developed site. Refer to the Stormwater Management Report for further details.

4.6 DESIGN CRITERIA

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

- Design Storm (minor system) — 1:2 year return (Ottawa)
- Rational Method Sewer Sizing
- Initial Time of Concentration — 10 minutes
- Runoff Coefficients
  - Landscaped Areas — C = 0.25
  - Asphalt/Concrete — C = 0.90
  - Traditional Roof — C = 0.90
- Pipe Velocities — 0.80 m/s to 6.0 m/s
- Minimum Pipe Size — 250 mm diameter (200 mm CB Leads and service pipes)

4.7 PROPOSED MINOR SYSTEM

The detail design for this site provides a storm sewer outlet to Kennedy Lane East, and small areas of uncontrolled surface drainage entering the adjacent park towards the south east side of the site (consistent with existing conditions).
Storage in underground tanks will be included on site to reduce surface ponding and will include flow control. Refer to the Storm Management Report for details.
The existing catchbasins and their leads, as well as the sewer connection to Kennedy Lane East will be removed. Please refer to the removals drawing C03 for details.
Weeping tile is proposed and will be connected to the main sewer without restrictions.

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

4.8 STORMWATER MANAGEMENT

Refer to Stormwater Management report for details.

4.9 INLET CONTROLS

Refer to Stormwater Management report for details.

4.10 ON-SITE DETENTION

Refer to Stormwater Management report for details.

4.11 WATERCOURSES

The minor flow will be ultimately directed to the Ottawa River.

4.12 PRE AND POST DEVELOPMENT PEAK FLOW RATES

Pre and post development peak flow rates for the site have been noted in storm sewer design sheet as well as the Stormwater Management report.

4.13 DIVERSION OF DRAINAGE CATCHMENT AREAS

With the exception of a small uncontrolled area to the south east of the site, the development will be regraded such that all overland flow is directed west towards Kennedy Lane East.

4.14 DOWNSTREAM CAPACITY WHERE QUANTITY CONTROL IS NOT PROPOSED

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

4.15 IMPACTS TO RECEIVING WATERCOURSES

No significant negative impact is anticipated to downstream receiving watercourses due to proposed quantity and quality control measures.

4.16 MUNICIPAL DRAINS AND RELATED APPROVALS

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

4.17 MEANS OF CONVEYANCE AND STORAGE CAPACITY

The means of flow conveyance and storage capacity are described in the Stormwater Management Report.

4.18 HYDRAULIC ANALYSIS

Hydraulic calculations for the site storm sewers are provided in the storm sewer design sheet and the Stormwater Management Report.

4.19 IDENTIFICATION OF FLOODPLAINS

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

4.20 FILL CONSTRAINTS

There are no known fill constraints applicable to this site related to any floodplain. The site is generally being raised higher relative to existing conditions. No fill constraints related to soil conditions are anticipated, as confirmed in the geotechnical report.

5 SEDIMENT AND EROSION CONTROL

5.1 GENERAL

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

- The installation of straw bales within existing drainage features surrounding the site.
- Filter cloths will remain on open surface structures such as manholes and catchbasins until these structures are commissioned and put into use.
- Installation of silt fence, where applicable, around the perimeter of the proposed work area.

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

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

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

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

Refer to the Erosion and Sedimentation Control Plan C08 provided in Appendix E.

6 APPROVAL AND PERMIT REQUIREMENTS

6.1 GENERAL

The proposed development is subject to site plan approval, zoning by-law amendment and building permit approval.

No approvals related to municipal drains are required.

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

7 CONCLUSION CHECKLIST

7.1 CONCLUSIONS AND RECOMMENDATIONS

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

7.2 COMMENTS RECEIVED FROM REVIEW AGENCIES

This is the first submission, there is no comment at this point.

APPENDIX

A

- PRE-CONSULTATION MEETING NOTES
- TOPOGRAPHIC SURVEY PLAN
- EMAILS FROM RVCA

Site Plan Pre- Application Consultation Notes

Date: Wednesday, May 19, 2021
Site Location: 360 Kennedy Lane E
Type of Development: ☒ **Residential (**☒ **townhomes,** ☒ **stacked,** ☐ **singles,** ☐ **apartments),** ☐ **Office Space,** ☐ **Commercial,** ☐ **Retail,** ☐ **Institutional,** ☐ **Industrial, Other:** N/A

Infrastructure

Water

Existing public services:

- Kennedy Lane E – 203mm DI

Watermain Frontage Fees to be paid ($190.00 per metre) on Woodroffe Avenue ☐ **Yes** ☒ **No**

Boundary conditions:
Civil consultant must request boundary conditions from the City's assigned Project Manager prior to first submission.

- Water boundary condition requests must include the location of the service(s) and the expected loads required by the proposed developments. Please provide all the following information:
  - Location of service(s)
  - Type of development and the amount of fire flow required (as per FUS, 1999)
  - Average daily demand: ___ L/s
  - Maximum daily demand: ___ L/s
  - Maximum hourly daily demand: ___ L/s
- Fire protection (Fire demand, Hydrant Locations)
- Please submit sanitary demands with the water boundary conditions

General comments

- Service areas with a basic demand greater than 50 m^3/day shall be connected with a minimum of two water services, separated by an isolation valve, to avoid creation of vulnerable service area.
- A District Metering Area Chamber (DMA) is required for new services 150mm or greater in diameter.

Sanitary Sewer

Existing public services:

- Kennedy Lane E – 250mm PVC

Is a monitoring manhole required on private property? ☒ **Yes** ☐ **No**

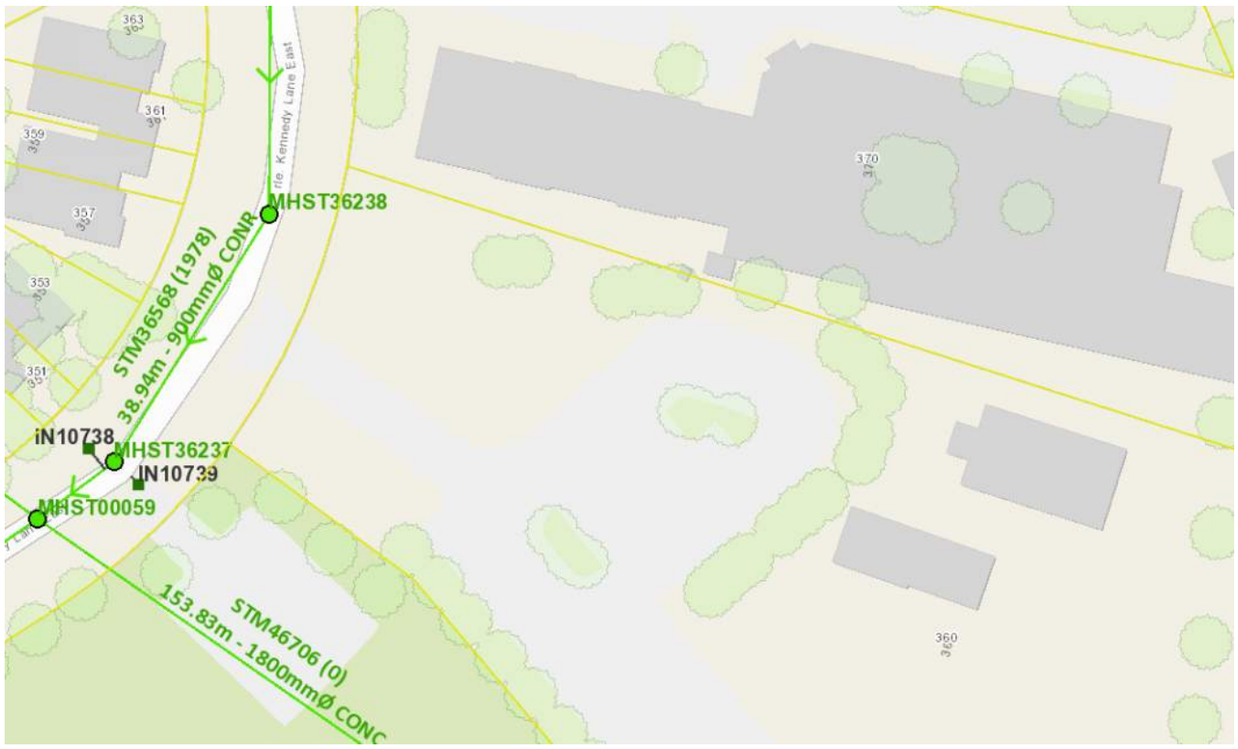
General comments

- Please submit sanitary demands with the water boundary conditions
- For infill developments within older neighbourhoods there is not an allotment for the sanitary capacity. As part of the rezoning application the consultant is required to demonstrate that there is sufficient capacity in the pipe network and system for the proposed sanitary demands.

Storm Sewer

Existing public services:

- Kennedy Lane E – 900mm Conc R



Stormwater Management

Quality Control:

- Rideau Valley Conservation Authority to confirm quality control requirements.

Quantity Control:

- LID features are strongly encouraged as the development is going from mostly pervious to impervious.
- Time of concentration (Tc): Tc = pre-development; maximum Tc = 10 min
- Allowable run-off coefficient: 0.5
- Allowable flowrate: Allowable flowrate: Control the 100-year storm events to the 5-year storm event.

Ministry of Environment, Conservation and Parks (MECEP)

All development applications should be considered for an Environmental Compliance Approval, under MECP regulations.

a. Consultants are required to determines if an approval for sewage works under Section 53 of OWRA is required.
b. ECA applications are required to be submitted online through the MECP portal. A business account required to submit ECA application. For more information visit https://www.ontario.ca/page/environmental-compliance-approval
c. If the consultants determines the site does not meet the definition of industrial site the consultant may request the MECP to exempt the works. The following information must be provided to the City Project Manager:
   (i) is designed to service one lot or parcel of land;
   (ii) discharges into a storm sewer that is not a combined sewer;
   (iii) does not service industrial land or a structure located on industrial land; and
   (iv) is not located on industrial land.

NOTE: Site Plan Approval, or Draft Approval, is required before any Ministry of the Environment and Climate Change (MOECC) application is sent

General Service Design Comments

- Existing sewers or watermains that are not reused must be decommissioned as per City Standards.
- The City of Ottawa Standard Detail Drawings should be referenced where possible for all work within the Public Right-of-Way.

Other

Capital Works Projects within proximity to application? ☐ **Yes** ☒ **No**

References and Resources

- As per section 53 of the Professional Engineers Act, O. Reg 941/40, R.S.O. 1990, all documents prepared by engineers must be signed and dated on the seal.
- All required plans & reports are to be provided in *.pdf format (at application submission and for any, and all, re-submissions)
- Please find relevant City of Ottawa Links to Preparing Studies and Plans below: https://ottawa.ca/en/city-hall/planning-and-development/information-developers/development-application-review-process/development-application-submission/guide-preparing-studies-and-plans#standards-policies-and-guidelines
- To request City of Ottawa plan(s) or report information please contact the City of Ottawa Information Centre:
  InformationCentre@ottawa.ca<mailto:InformationCentre@ottawa.ca>
  (613) 580-2424 ext. 44455
- geoOttawa
  http://maps.ottawa.ca/geoOttawa/

SITE PLAN APPLICATION – Municipal servicing

For information on preparing required studies and plans refer to:
http://ottawa.ca/en/development-application-review-process-0/guide-preparing-studies-and-plans

S/A	Number of copies	ENGINEERING		S/A	Number of copies
S		1. Site Servicing Plan	2. Site Servicing Report	S	
S		3. Grade Control and Drainage Plan	4. Geotechnical Study Alternatively, existing report with memo providing recommendations for works based on current geotechnical guidelines.	S	
		5. Composite Utility Plan	6. Groundwater Impact Study		
		7. Servicing Options Report	8. Wellhead Protection Study		
		9. Community Transportation Study and/or Transportation Impact Study / Brief	10. Erosion and Sediment Control Plan / Brief	S	
S		11. Storm water Management Report	12. Hydro-geological and Terrain Analysis		
		13. Water main Analysis	14. Noise / Vibration Study	S	
		15. Roadway Modification Design Plan	16. Confederation Line Proximity Study		

It is important to note that the need for additional studies and plans may result during application review. If following the submission of your application, it is determined that material that is not identified in this checklist is required to achieve complete application status, in accordance with the Planning Act and Official Plan requirements, City Planning will notify you of outstanding material required within the required 30 day period. Mandatory pre-application consultation will not shorten the City's standard processing timelines, or guarantee that an application will be approved. It is intended to help educate and inform the applicant about submission requirements as well as municipal processes, policies, and key issues in advance of submitting a formal development application. This list is valid for one year following the meeting date. If the application is not submitted within this timeframe the applicant must again pre-consult with the City.

Notes:

4. Geotechnical Study / Slope Stability Study – required as per Official Plan section 4.8.3. All site plan applications need to demonstrate the soils are suitable for development. A Slope Stability Study may be required with unique circumstances (Schedule K or topography may define slope stability concerns).

10. Erosion and Sediment Control Plan – required with all site plan applications as per Official Plan section 4.7.3.

11. Stormwater Management Report/Brief - required with all site plan applications as per Official Plan section 4.7.6.

REZONING APPLICATION – Municipal servicing

For information on preparing required studies and plans refer to:
http://ottawa.ca/en/development-application-review-process-0/guide-preparing-studies-and-plans

S/A	Number of copies	ENGINEERING		S/A	Number of copies
S		1. Site Servicing Plan	2. Site Servicing Report	**S**	
S		3. Grade Control and Drainage Plan	4. Geotechnical Study Alternatively, existing report with memo providing recommendations for works based on current geotechnical guidelines.	**S**	
		5. Composite Utility Plan	6. Groundwater Impact Study		
		7. Servicing Options Report	8. Wellhead Protection Study		
		9. Community Transportation Study and/or Transportation Impact Study / Brief	10. Erosion and Sediment Control Plan / Brief	**S**	
S		11. Storm water Management Report	12. Hydro-geological and Terrain Analysis		
		13. Water main Analysis	14. Noise / Vibration Study	**S**	
		15. Roadway Modification Design Plan	16. Confederation Line Proximity Study		

It is important to note that the need for additional studies and plans may result during application review. If following the submission of your application, it is determined that material that is not identified in this checklist is required to achieve complete application status, in accordance with the Planning Act and Official Plan requirements, City Planning will notify you of outstanding material required within the required 30 day period. Mandatory pre-application consultation will not shorten the City's standard processing timelines, or guarantee that an application will be approved. It is intended to help educate and inform the applicant about submission requirements as well as municipal processes, policies, and key issues in advance of submitting a formal development application. This list is valid for one year following the meeting date. If the application is not submitted within this timeframe the applicant must again pre-consult with the City.

Notes:

4. Geotechnical Study / Slope Stability Study – required as per Official Plan section 4.8.3. All site plan applications need to demonstrate the soils are suitable for development. A Slope Stability Study may be required with unique circumstances (Schedule K or topography may define slope stability concerns).

10. Erosion and Sediment Control Plan – required with all site plan applications as per Official Plan section 4.7.3.

11. Stormwater Management Report/Brief - required with all site plan applications as per Official Plan section 4.7.6.

382749, 5038085

TOPOGRAPHIC PLAN OF SURVEY OF

PART OF BLOCK 8
REGISTERED PLAN 50M-77
CITY OF OTTAWA

FARLEY, SMITH & DENIS SURVEYING LTD. 2021

Scale 1: 300

0 5 10 15 20 25 30 metres

Metric Note
Distances and coordinates on this plan are in metres and can be converted to feet by dividing by 0.3048.

Distance Note
Distances shown on this plan are ground distances and can be converted to grid distances by multiplying by the combined scale factor of 0.99997.

Bearing Note
Bearings hereon are grid bearings derived from the Can-Net Real Time Network and are referred to the Central Meridian of MTM Zone 9 (76°-30' West Longitude) Nad-83 (Original).

For bearing comparisons, a rotation of 0°02'00" clockwise was applied to bearings on P1, P2.

Elevation Notes
1. Elevations shown are geodetic and are referred to Geodetic Datum CGVD-1928 :1978.
2. It is the responsibility of the user of this information to verify that the job benchmark has not been altered or disturbed and that it's relative elevation and description agrees with the information shown on this drawing.

Utility Notes
1. This drawing cannot be accepted as acknowledging all of the utilities and it will be the responsibility of the user to contact the respective utility authorities for confirmation.
2. Only visible surface utilities were located.
3. Underground utility data derived from City of Ottawa utility sheet reference:
4. C-33-20, C-33-26, 13441.
5. Sanitary and storm sewer grades and inverts were compiled from: Field measurement and City of Ottawa Utility Sheets.
6. A field location of underground plant by the pertinent utility authority is mandatory before any work involving breaking ground, probing, excavating etc.

Notes & Legend

Denotes

- □—□ = Survey Monument Planted
- ■—■ = Survey Monument Found
- SIB = Standard Iron Bar
- IB = Iron Bar
- (Wit) = Witness
- Meas = Measured
- (P1) = Plan 50R-5659
- (P2) = Plan by (AOG) dated July 22, 1998 (Job No. C-063-98)
- Acc. = Accepted
- ○ MH–ST = Maintenance Hole (Storm)
- ○ MH–S = Maintenance Hole (Sanitary)
- ○ MH = Maintenance Hole (Unidentified)
- ST —— = Underground Storm Sewer
- S —— = Underground Sanitary Sewer
- W —— = Underground Water
- P —— = Underground Hydro
- G —— = Underground Gas
- B —— = Underground Bell
- TV —— = Underground Rogers
- ○ LS = Light Standard
- □ CB = Catch Basin
- ○ FH = Fire Hydrant
- □ TB–B = Bell Terminal Box
- □ TB–C = Cable Terminal Box
- □ TB–B = Bell Terminal Box
- □ TB–C = Cable Terminal Box
- □ TB–H = Hydro Terminal Box
- □ TB = Unidentified Terminal Box
- △ S = Sign
- ○ PO–M = Metal Pole
- □ AC = Air Conditioner
- Ø = Diameter
- CLF = Chain Link Fence
- BF = Board Fence
- Inv. = Invert
- T/G = Top of Grate
- El = Elevation
- U/Eave = Underside of Eave
- TpFdn = Top of Foundation
- C/L = Centreline
- +65.00 = Location of Elevations
- +65.00 = Top of Concrete Curb Elevation
- Deciduous Tree - The Symbol shown denotes location and trunk diameter only. Size of its' root system/overhead canopy may be smaller/larger than the symbol size depicted on this plan.
- Coniferous Tree - The Symbol shown denotes location and trunk diameter only. Size of its' root system/overhead canopy may be smaller/larger than the symbol size depicted on this plan.

ASSOCIATION OF ONTARIO LAND SURVEYORS
PLAN SUBMISSION FORM
V-15561

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

Surveyor's Certificate

I certify that :
1. This survey and plan are correct and in accordance with the Surveys Act, the Surveyors Act and the Regulations made under them.
2. The survey was completed on the 19th day of August, 2021.

Aug 25/21
Date

Daniel Robinson
Ontario Land Surveyor

FARLEY, SMITH & DENIS SURVEYING LTD.

ONTARIO LAND SURVEYORS
CANADA LAND SURVEYORS

Unit 275, 30 COLONNADE ROAD, OTTAWA, ONTARIO K2E 7J6
TEL. (613) 727-8226 E-mail: fsdsurveys@bellnet.ca

FILE No. : 446-21

J:\2021\446-21_360 Kennedy Ln East_church_topo\Final\446-21 360 Kennedy Lane_BB RP50m-77_F.dwg

TOPO 2X36

Yang, Winston

From: Jadallah, Ayham
Sent: November 17, 2021 8:02 AM
To: O'Neill, Meaghan; Yang, Winston
Cc: Hughes, Michelle
Subject: FW: Water Quality Requirements - Site Development- 360 Kennedy Lane E

Hi,

Please find below the response from CA and note that CLI approach might be applicable.

Thanks,
Ayham

From: Jamie Batchelor <jamie.batchelor@rvca.ca>
Sent: Tuesday, November 16, 2021 9:07 PM
To: Jadallah, Ayham <Ayham.Jadallah@wsp.com>
Cc: Emma Bennett <emma.bennett@rvca.ca>
Subject: Water Quality Requirements - Site Development- 360 Kennedy Lane E

Good Evening Ayham,

Based on the distance to the downstream outlet to the Ottawa River, the water quality target would be 80% TSS removal. Any stormwater management plan must conform to the 2003 MOE Stormwater Management Planning and Design Manual and any other relevant guiding documents that may be in place at the time of the official submission. The opportunity for LID measures should be explored for any proposed stormwater management plan. Specific attention will need to be placed on water budget/balance and the items mentioned above. It should be noted that these requirements are already within the existing 2003 MOE Design Manual.

The new consolidated linear infrastructure ECA approach from the Ministry of Environment, Conservation and Parks has an implementation scheduled for summer 2021. Therefore, based on the projected timeframe for this project, it may form part of the City's ECA for which the following criteria is noted:

- Water balance or runoff volume control to the 90th percentile
- OGS units will only address 50% treatment
- Other items identified in the new consolidated linear infrastructure ECA

Therefore, the applicant is strongly encouraged to design accordingly within their stormwater management approach.

Jamie Batchelor, MCIP, RPP
Planner, ext. 1191
Jamie.batchelor@rvca.ca

Rideau Valley Conservation Authority

3889 Rideau Valley Drive
PO Box 599, Manotick ON K4M 1A5
T 613-692-3571 | 1-800-267-3504 **F** 613-692-0831 | www.rvca.ca

APPENDIX

APPENDIX

B

- WATERMAIN BOUNDARY CONDITIONS FROM CITY OF OTTAWA (TO BE UPDATED)
- EMAILS FROM CITY OF OTTAWA
- FIRE UNDERWRITERS SURVEY – FIRE FLOW CALCULATION
- WATER DEMAND CALCULATION
- WATER MODEL OUTPUT – WATERGEM (TO BE UPDATED)

Fire Flow Design Sheet (FUS)
Queenswood United Church
360 Kennedy Lane East, City of Ottawa
WSP Project No. 211-12127-00
Date: 03-Nov-21

Group 1 (4 Walk Up Units)
Fire Flow Requirements Based on Fire Underwriters Survey (FUS) 1999

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

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

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

A = 994 m^2
C = 1.5
F = 10402.4 L/min

rounded off to 10,000 L/min (min value of 2000 L/min)

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

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

Reduction due to low occupancy hazard -15% x 10,000 = 8,500 L/min

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

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

Reduction due to Sprinkler System 0% x 8,500 = 0 L/min

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

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

Side 1	23	10%	north side
Side 2	1.6	25%	east side
Side 3	100	0%	south side
Side 4	40	5%	west side
		40%	(Total shall not exceed 75%)

Increase due to separation 40% x 8,500 = 3,400 L/min

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

The fire flow requirement is 12,000 L/min (Rounded to nearest 1000 L/min)
or **200 L/sec**
or 3,170 gpm (us)
or 2,640 gpm (uk)

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

Fire Flow Design Sheet (FUS)
Queenswood United Church
360 Kennedy Lane East, City of Ottawa
WSP Project No. 211-12127-00
Date: 03-Nov-21

Group 2 (3 Walk Up Units, 4 Townhouses)
Fire Flow Requirements Based on Fire Underwriters Survey (FUS) 1999

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

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

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

A = 1350 m^2
C = 1.5
F = 12127.0 L/min

rounded off to 12,000 L/min (min value of 2000 L/min)

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

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

Reduction due to low occupancy hazard -15% x 12,000 = 10,200 L/min

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

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

Reduction due to Sprinkler System -10% x 10,200 = -1,020 L/min

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

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

Side 1	14	15%	north side
Side 2	3.2	20%	east side
Side 3	100	0%	south side
Side 4	1.5	25%	west side
		60%	(Total shall not exceed 75%)

Increase due to separation 60% x 10,200 = 6,120 L/min

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

The fire flow requirement is 15,000 L/min (Rounded to nearest 1000 L/min)
or **250 L/sec**
or 3,963 gpm (us)
or 3,300 gpm (uk)

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

Fire Flow Design Sheet (FUS)
Queenswood United Church
360 Kennedy Lane East, City of Ottawa
WSP Project No. 211-12127-00
Date: 03-Nov-21

Group 3 (2 Walk Up Units, 5 Townhouses)
Fire Flow Requirements Based on Fire Underwriters Survey (FUS) 1999

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

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

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

A = 1307 m^2
C = 1.5
F = 11931.5 L/min

rounded off to 12,000 L/min (min value of 2000 L/min)

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

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

Reduction due to low occupancy hazard -15% x 12,000 = 10,200 L/min

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

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

Reduction due to Sprinkler System -10% x 10,200 = -1,020 L/min

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

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

Side 1	18	15%	north side
Side 2	1.3	25%	east side
Side 3	100	0%	south side
Side 4	3.2	20%	west side
		60%	(Total shall not exceed 75%)

Increase due to separation 60% x 10,200 = 6,120 L/min

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

The fire flow requirement is 15,000 L/min (Rounded to nearest 1000 L/min)
or **250 L/sec**
or 3,963 gpm (us)
or 3,300 gpm (uk)

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

Fire Flow Design Sheet (FUS)
Queenswood United Church
360 Kennedy Lane East, City of Ottawa
WSP Project No. 211-12127-00
Date: 03-Nov-21

Group 4 (4 Walk Up Units)
Fire Flow Requirements Based on Fire Underwriters Survey (FUS) 1999

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

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

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

A = 1073 m^2
C = 1.5
F = 10812.0 L/min

rounded off to 11,000 L/min (min value of 2000 L/min)

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

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

Reduction due to low occupancy hazard -15% x 11,000 = 9,350 L/min

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

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

Reduction due to Sprinkler System 0% x 9,350 = 0 L/min

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

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

Side 1	9.6	20%	north side
Side 2	31.9	5%	east side
Side 3	100	0%	south side
Side 4	1.3	25%	west side
		50%	(Total shall not exceed 75%)

Increase due to separation 50% x 9,350 = 4,675 L/min

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

The fire flow requirement is 14,000 L/min (Rounded to nearest 1000 L/min)
or **233 L/sec**
or 3,698 gpm (us)
or 3,080 gpm (uk)

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

Fire Flow Design Sheet (FUS)
Queenswood United Church
360 Kennedy Lane East, City of Ottawa
WSP Project No. 211-12127-00
Date: 03-Nov-21

Group 5 (5 Townhouses)
Fire Flow Requirements Based on Fire Underwriters Survey (FUS) 1999

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

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

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

A = 735 m^2
C = 1.5
F = 8945.7 L/min

rounded off to 9,000 L/min (min value of 2000 L/min)

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

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

Reduction due to low occupancy hazard -15% x 9,000 = 7,650 L/min

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

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

Reduction due to Sprinkler System 0% x 7,650 = 0 L/min

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

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

Side 1	15.4	15%	north side
Side 2	15.1	15%	east side
Side 3	9.8	20%	south side
Side 4	16.1	15%	west side
		65%	(Total shall not exceed 75%)

Increase due to separation 65% x 7,650 = 4,973 L/min

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

The fire flow requirement is 13,000 L/min (Rounded to nearest 1000 L/min)
or **217 L/sec**
or 3,434 gpm (us)
or 2,860 gpm (uk)

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

Fire Flow Design Sheet (FUS)
Queenswood United Church
360 Kennedy Lane East, City of Ottawa
WSP Project No. 211-12127-00
Date: 03-Nov-21

Group 6 (3 Walk Up Units, 2 Townhouses)
Fire Flow Requirements Based on Fire Underwriters Survey (FUS) 1999

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

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

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

A = 1082 m^2
C = 1.5
F = 10853.6 L/min

rounded off to 11,000 L/min (min value of 2000 L/min)

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

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

Reduction due to low occupancy hazard -15% x 11,000 = 9,350 L/min

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

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

Reduction due to Sprinkler System 0% x 9,350 = 0 L/min

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

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

Side 1	13.6	15%	north side
Side 2	15.3	15%	east side
Side 3	13.8	15%	south side
Side 4	9.4	20%	west side
		65%	(Total shall not exceed 75%)

Increase due to separation 65% x 9,350 = 6,078 L/min

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

The fire flow requirement is 15,000 L/min (Rounded to nearest 1000 L/min)
or **250 L/sec**
or 3,963 gpm (us)
or 3,300 gpm (uk)

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

Fire Flow Design Sheet (FUS)
Queenswood United Church
360 Kennedy Lane East, City of Ottawa
WSP Project No. 211-12127-00
Date: 03-Nov-21

Group 7 (4 Walk Up Units)
Fire Flow Requirements Based on Fire Underwriters Survey (FUS) 1999

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

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

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

A = 1029 m^2
C = 1.5
F = 10584.3 L/min

rounded off to 11,000 L/min (min value of 2000 L/min)

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

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

Reduction due to low occupancy hazard -15% x 11,000 = 9,350 L/min

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

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

Reduction due to Sprinkler System 0% x 9,350 = 0 L/min

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

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

Side 1	13.3	15%	north side
Side 2	9.4	20%	east side
Side 3	15.7	15%	south side
Side 4	17.8	15%	west side
		65%	(Total shall not exceed 75%)

Increase due to separation 65% x 9,350 = 6,078 L/min

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

The fire flow requirement is 15,000 L/min (Rounded to nearest 1000 L/min)
or **250 L/sec**
or 3,963 gpm (us)
or 3,300 gpm (uk)

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

Fire Flow Design Sheet (FUS)
Queenswood United Church
360 Kennedy Lane East, City of Ottawa
WSP Project No. 211-12127-00
Date: 03-Nov-21

Group 8 (5 Townhouses)
Fire Flow Requirements Based on Fire Underwriters Survey (FUS) 1999

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

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

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

A = 735 m^2
C = 1.5
F = 8945.7 L/min

rounded off to 9,000 L/min (min value of 2000 L/min)

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

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

Reduction due to low occupancy hazard -15% x 9,000 = 7,650 L/min

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

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

Reduction due to Sprinkler System 0% x 7,650 = 0 L/min

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

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

Side 1	11.7	15%	north side
Side 2	20.4	10%	east side
Side 3	12.2	15%	south side
Side 4	84.4	0%	west side
		40%	(Total shall not exceed 75%)

Increase due to separation 40% x 7,650 = 3,060 L/min

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

The fire flow requirement is 11,000 L/min (Rounded to nearest 1000 L/min)
or **183 L/sec**
or 2,906 gpm (us)
or 2,420 gpm (uk)

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

Water Demand Calculation Sheet

Project:	**Queenswood United Church**	**Date:**	**2021-11-30**
Location:	**City of Ottawa**	**Design:**	**WY**
WSP Project No.	**211-12127-00**	**Page:**	**1 of 1**

Proposed Buildings	Residential				Non-Residentail			Average Daily			Maximum Daily			Maximum Hourly			Fire
	Units			Pop.	Industrial	Institutional	Commercial	Demand (l/s)			Demand (l/s)			Demand (l/s)			Demand
	SF	APT	TH		(ha)	(ha)	(ha)	Res.	Non-Res.	Total	Res.	Non-Res.	Total	Res.	Non-Res.	Total	(l/s)
Proposed Residential																	
Walk Up Towns			71	128				0.41		0.41	1.04		1.04	2.28		2.28	250
Avg Towns			21	57				0.18		0.18	0.46		0.46	1.01		1.01	250
Total										0.60			1.49			3.29	

Population Densities

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

Average Daily Demand

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

Maximum Daily Demand

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

Maximum Hourly Demand

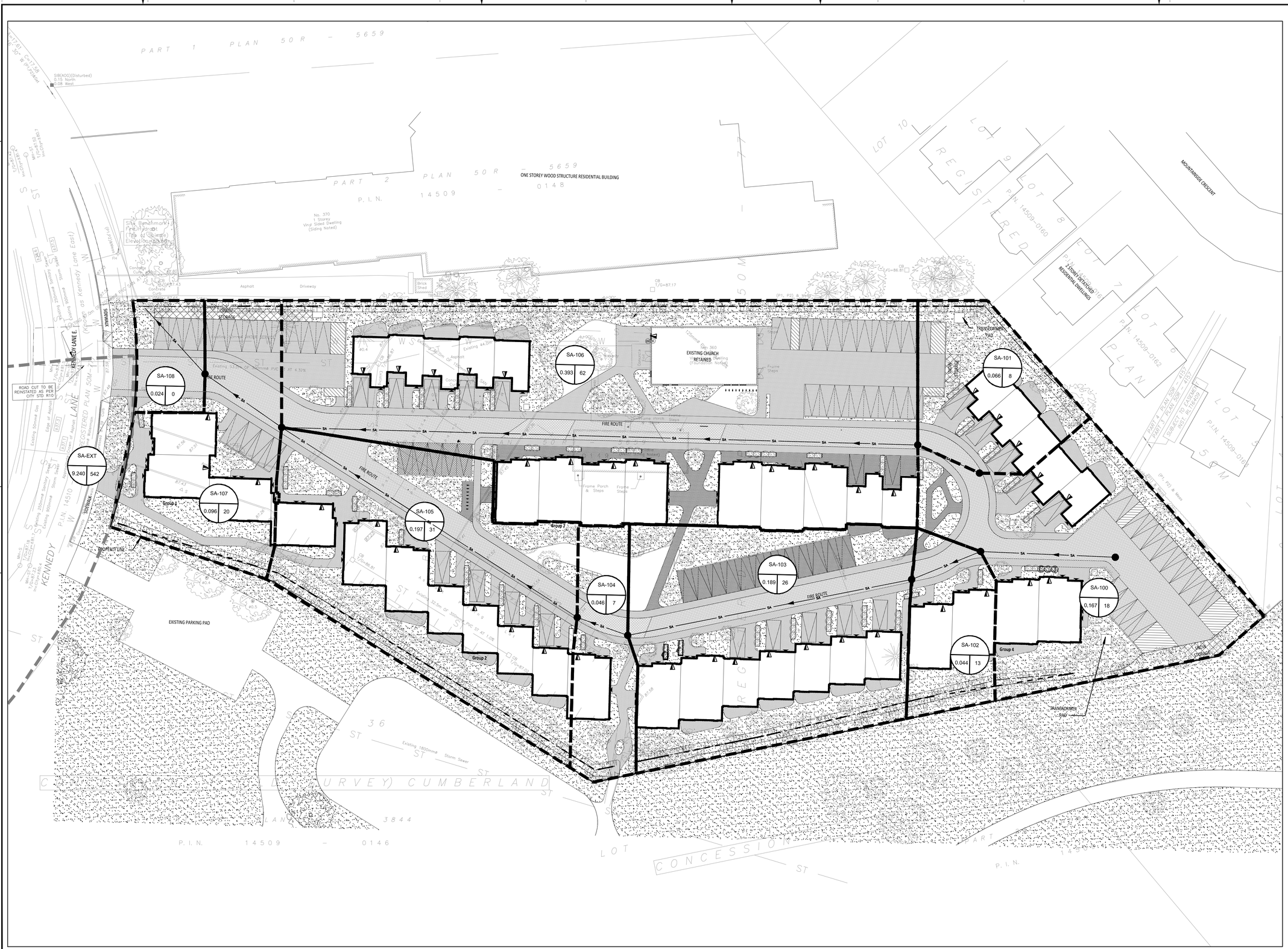
Residential	2.2	x max. day
Industrial	1.8	x max. day
Institutional	1.8	x max. day
Commercial	1.8	x max. day

APPENDIX

APPENDIX

C

- C07 –SANITARY DRAIANGE AREA PLAN
- F01 – OVERALL SANITARY DRAINAGE AREA PLAN
- SANITARY SEWER DESIGN SHEET



wsp

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F: 613-829-8299
WWW.WSP.COM

ARCHITECT:

KPMB ARCHITECTS
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CANADA M5A 0L6
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SEAL:

LICENSED PROFESSIONAL ENGINEER
D. B. YANG
100230568
2021-11-30
PROVINCE OF ONTARIO

NORTH

CLIENT:

UNITED PROPERTY RESOURCE CORPORATION
QUEENSWOOD UNITED CHURCH

CLIENT REF. #:

PROJECT:

QUEENSWOOD UNITED CHURCH

KEY PLAN:

ISSUED FOR - REVISION:

IS	RE	DATE	DESCRIPTION
1		2021-11-30	ISSUED FOR SPA AND ZBLA

PROJECT NO: 211-12127-00
DATE: NOVEMBER 2021
ORIGINAL SCALE: 1:300
IF THIS BAR IS NOT 25mm LONG, ADJUST YOUR PLOTTING SCALE.
25mm
DESIGNED BY: EB/DY
DRAWN BY: JT/EB
CHECKED BY: DY

DISCIPLINE: CIVIL

TITLE:

SANITARY DRAINAGE AREA PLAN

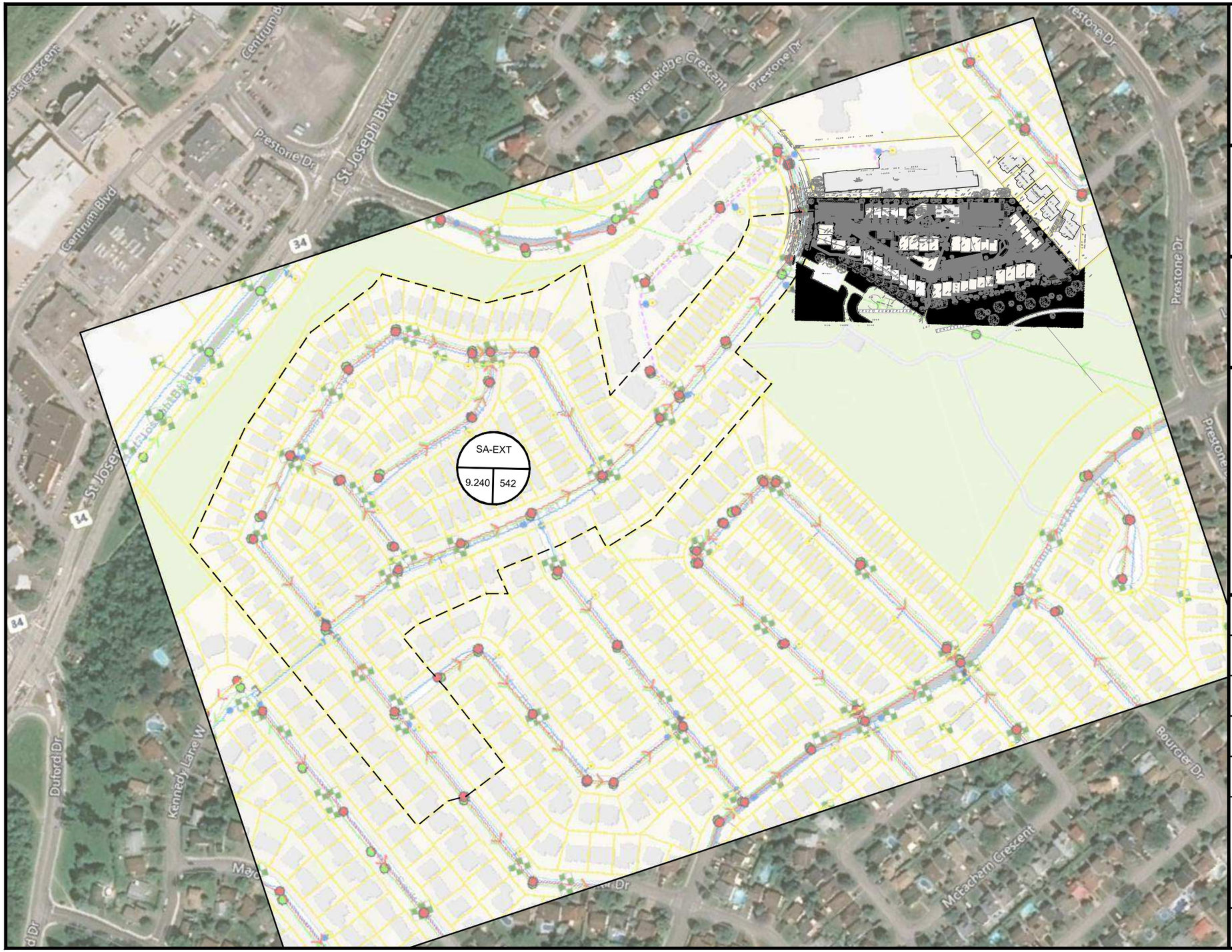
SHEET NUMBER: C07
SHEET #: 7 OF 8

ISSUE: ISSUED FOR REVIEW
REV #: 0
DATE OF: 2021-11-30

V:\10-13 ME 2021 Projects\211-12127-00 Queenswood United Church\3. Drawings\Working drawings\211-12127-00_C.dwg, Nov 30, 2021-10:55am BY:(cawy)(69741)

D07-XX-XX-XXXX

#XXXXX



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CLIENT:

UNITED PROPERTY RESOURCE CORPORATION
QUEENSWOOD UNITED CHURCH

CLIENT REF. #:

PROJECT:

QUEENSWOOD UNITED CHURCH

LEGEND

I.D.
AREA | POP

I.D. DENOTES SANITARY DRAINAGE AREA ID
AREA DENOTES SANITARY DRAINAGE AREA
POP DENOTES POPULATION

SANITARY DRAINAGE BOUNDARY

PROJECT NO: 211-12127-00	DATE: NOVEMBER 2021
ORIGINAL SCALE: 1:3000	IF THIS BAR IS NOT 25mm LONG, ADJUST YOUR PLOTTING SCALE.
DESIGNED BY: E.B.	
DRAWN BY: J.T.	
CHECKED BY: D.Y.	25mm

TITLE:

EXTERNAL SANITARY DRAINAGE AREA

SHEET NUMBER:

F1

SANITARY SEWER DESIGN SHEET

Queenswood United Church
Residential Development
Project: 211-12127-00
Date: November, 2021

LOCATION				RESIDENTIAL AREA AND POPULATION												INDUSTRIAL				COMMERCIAL		INSTITUTIONAL		I+C+I	INFILTRATION			TOTAL	PIPE					
LOCATION	FROM M.H.	TO M.H.	SANITARY DRAINAGE AREA ID	INDV AREA (ha)	ACCU AREA (ha)	NUMBER OF UNITS						POPULATION		PEAK FACT.	PEAK FLOW (l/s)	GROSS AREA (ha)	DEVEL. AREA (ha)	ACCU. AREA (ha)	PEAK FACTOR	INDIV AREA (ha)	ACCU. AREA (ha)	INDIV AREA (ha)	ACCU. AREA (ha)	PEAK FLOW (l/s)	INDIV AREA (ha)	ACCU. AREA (ha)	INFILT. FLOW (l/s)	TOTAL FLOW (l/s)	LENGTH (m)	DIA. (mm)	SLOPE (%)	CAP. (FULL) (l/s)	VEL. (FULL) (m/s)	AVAIL. CAP. (%)
						SINGLES	SEMIS	AVG TOWNS	WALK UP TOWNS	2-BED APT.	3-BED APT.	INDIV POP.	ACCU POP.																					
TO KEENEDY LANE EAST																																	
SA-100	SANMH08	SANMH07		0.167	0.167			2.00	7.00			18	18	3.71	0.22										0.167	0.17	0.06	**0.27**	23.81	200	0.65	26.44	0.84	**98.97%**
SA-102	SANMH07	SANMH06		0.044	0.211			0.00	7.00			13	31	3.68	0.37										0.044	0.21	0.07	**0.43**	13.14	200	0.33	18.84	0.60	**97.69%**
SA-103	SANMH06	SANMH05		0.189	0.400			5.00	7.00			26	57	3.64	0.67										0.189	0.40	0.13	**0.80**	51.09	200	0.33	18.84	0.60	**95.75%**
SA-104	SANMH05	SANMH04		0.046	0.446			0.00	4.00			7	64	3.63	0.75										0.046	0.45	0.15	**0.90**	9.46	200	0.33	18.84	0.60	**95.23%**
SA-105	SANMH04	SANMH03		0.197	0.643			4.00	11.00			31	95	3.60	1.10										0.197	0.64	0.21	**1.31**	62.05	200	0.33	18.84	0.60	**93.02%**
SA-101	SANMH10	SANMH09		0.066	0.066			3.00	0.00			8	8	3.74	0.10										0.066	0.07	0.02	**0.12**	11.97	200	0.65	26.44	0.84	**99.55%**
SA-106	SANMH09	SANMH03		0.393	0.459			7.00	24.00			62	70	3.63	0.82										0.393	0.46	0.15	**0.98**	112.37	200	0.33	18.84	0.60	**94.82%**
SA-107	SANMH03	SANMH02		0.096	1.198			0.00	11.00			20	185	3.53	2.11										0.096	1.20	0.40	**2.51**	16.50	200	0.33	18.84	0.60	**86.70%**
SA-108	SANMH02	*EX SANMH01*		0.024	1.222			0.00	0.00			0	185	3.53	2.11										0.024	1.22	0.40	**2.51**	15.74	200	0.33	18.84	0.60	**86.66%**
	EX SANMH01	*EX SANMH*		0.000	1.222			0.00	0.00			0	185	3.53	2.11										0.000	1.22	0.40	**2.51**	*16.40*	*200*	*1.00*	25.41	0.81	**90.11%**
UPSTREAM OF 330 KEENEDY LANE EAST																																	
SA-EXT	*EX SANMH*	*EX SANMH*		9.240	9.240	141	2	21.00				542	542	3.36	5.90										9.240	9.24	3.05	**8.95**	*38.00*	*250*	*0.60*	25.41	0.81	**64.76%**
DOWNSTREAM OF 330 KEENEDY LANE EAST																																	
	EX SANMH	*EX SANMH*			10.462							0	726	3.31	7.78										0.000	10.46	3.45	**11.24**	*36.90*	*250*	*0.60*	25.41	0.81	**55.78%**

DESIGN PARAMETERS

RESIDENTIAL AVG. DAILY FLOW =	280	l/cap/day	COMMERCIAL PEAK FACTOR =	1.5	(WHEN AREA > 20%)	PEAK POPULATION FLOW, (l/s) =	P*q*M/86400	UNIT TYPE	PERSONS/UNIT		
COMMERCIAL AVG. DAILY FLOW =	28,000	l/ha/day		1.0	(WHEN AREA < 20%)	PEAK EXTRANEOUS FLOW, (l/s) =	I*Ac	SINGLES	3.4		
	0.324	l/ha/s				RESIDENTIAL PEAKING FACTOR, M =	1+(14/(4+P^0.5))*K	SEMI-DETACHED	2.7		
INSTITUTIONAL AVG. DAILY FLOW =	28,000	l/ha/day	INSTITUTIONAL PEAK FACTOR =	1.5	(WHEN AREA > 20%)	Ac = CUMULATIVE AREA (ha)		TOWNHOMES	2.7		
	0.324	l/ha/s		1.0	(WHEN AREA < 20%)	P = POPULATION (THOUSANDS)		WALK UP TOWNS	1.8		
LIGHT INDUSTRIAL FLOW =	35,000	l/ha/day						2-BED APT. UNIT	2.1		
	0.405	l/ha/s	RESIDENTIAL CORRECTION FACTOR, K =	0.80		SEWER CAPACITY, Qcap (l/s) =	1/N S^(1/2) R^(2/3) Ac	3-BED APT. UNIT	3.1		
HEAVY INDUSTRIAL FLOW =	55,000	l/ha/day	MANNING N =	0.013		(MANNING'S EQUATION)					
	0.637	l/ha/s	PEAK EXTRANEOUS FLOW, I (l/s/ha) =	0.33							

DESIGNED:	NO.	REVISION	DATE
E.B	1.	City Submission No.1	2021-11-30
CHECKED:			
D.B.Y.			
PROJECT:			
Queenswood United Church			
Residential Development			
LOCATION:			
Ottawa, Ontario			
PAGE NO:	**FILE & DWG. REFERENCE:**		
1 of 1	C07		

APPENDIX

APPENDIX

D

- STORM SEWER DESIGN SHEET
- POST-DEVELOPMENT STORM DRAINAGE AREA PLAN C06
- GRADING PLAN C04
- SERVICING PLAN C05
- STORMTECH CHAMBERS DESIGN (TO BE UPDATED)
- STORMCEPTOR (TO BE UPDATED)

STORM SEWER DESIGN SHEET

Queenswood United Church
Residential Development
Project: 211-12127-00
Date: November, 2021

LOCATION				AREA (Ha)						RATIONAL DESIGN FLOW												PROPSOED SEWER DATA								
STREET	AREA ID	FROM	TO	C= 0.20	C= 0.35	C= 0.50	C= 0.60	C= 0.75	C= 0.90	IND 2.78AC	CUM 2.78 AC	INLET (min)	TOTAL (min)	i (2) (mm/hr)	i (5) (mm/hr)	i (100) (mm/hr)	BLDG FLOW (L/s)	2yr PEAK FLOW (L/s)	5yr PEAK FLOW (L/s)	100yr PEAK FLOW (L/s)	CONTROLLED FLOW (L/s)	DESIGN FLOW (L/s)	MODIFIED DESIGN FLOW (L/s)	MATERIAL PIPE	SIZE (mm)	SLOPE (%)	LENGTH (m)	CAPACITY (l/s)	VELOCITY (m/s)	TIME IN PIPE	AVAIL CAP (2yr) (L/s)	AVAIL CAP (2yr) (%)
POST-DEVELOPMENT																															
To Kennedy Lane																															
Private Street	S-012	CB06	STMH107	0.005					0.046	0.118	0.118	10.00	10.07	76.81	104.19	178.56		9.05				9.05		PVC DR-35	200	1.00	4.58	32.83	1.04	0.07	23.78	72.43%
		STMH107	STMH106							0.000	0.118	10.07	10.60	76.53	103.81	177.89		9.02				9.02		PVC DR-35	250	0.45	25.84	39.93	0.81	0.53	30.91	77.41%
		STMH106	STMH105							0.000	0.118	10.60	10.87	74.56	101.11	173.23		8.79				8.79		PVC DR-35	250	0.45	12.96	39.93	0.81	0.27	31.14	77.99%
		STMH105	STMH104							0.000	0.118	10.87	11.93	73.62	99.82	170.99		8.68				8.68		PVC DR-35	250	0.45	51.65	39.93	0.81	1.06	31.25	78.27%
Swale													20.00																		
Private Street	S-010	RYCB01	RYCB04	0.067					0.047	0.155	0.155	20.00	20.05	52.03	70.25	119.95		8.06				8.06		PVC DR-35	250	1.00	3.51	59.53	1.21	0.05	51.47	86.47%
Private Street	S-011	RYCB04	STMH104	0.052					0.046	0.144	0.299	20.05	20.34	51.95	70.15	119.77		15.53				15.53		PVC DR-35	250	1.00	20.94	59.53	1.21	0.29	44.00	73.92%
		STMH104	STMH103							0.000	0.417	20.34	20.56	51.50	69.52	118.69		21.46				21.46		PVC DR-35	300	0.30	10.05	53.02	0.75	0.22	31.56	59.52%
Private Street	S-008	CB05	CBMH39	0.029					0.097	0.259	0.259	10.00	10.15	76.81	104.19	178.56		19.88				19.88		PVC DR-35	200	1.00	9.25	32.83	1.04	0.15	12.95	39.45%
		CBMG39	TANK F							0.000	0.259	10.15	10.17	76.24	103.42	177.22		19.73				19.73		PVC DR-35	200	1.00	1.47	32.83	1.04	0.02	13.10	39.90%
	S-007	CB03	CBMH40	0.042					0.081	0.226	0.226	10.00	10.15	76.81	104.19	178.56		17.36				17.36		PVC DR-35	200	1.00	9.34	32.83	1.04	0.15	15.47	47.13%
		CBMH40	TANK F							0.000	0.226	10.15	10.17	76.24	103.41	177.21		17.23				17.23		PVC DR-35	200	1.00	1.34	32.83	1.04	0.02	15.60	47.52%
		TANK F	CBMH41							0.000	0.485	10.17	10.20	76.15	103.30	177.01		36.92				36.92		PVC DR-35	250	1.00	1.95	59.53	1.21	0.03	22.61	37.98%
		CBMH41	STMH103-STMH102							0.000	0.485	10.20	10.32	76.05	103.16	176.77		36.87				36.87		PVC DR-35	250	1.00	9.02	59.53	1.21	0.12	22.65	38.06%
		CB011	CBMH42	0.005					0.043	0.110	0.110	10.00	10.11	76.81	104.19	178.56		8.48				8.48		PVC DR-35	200	1.00	6.69	32.83	1.04	0.11	24.35	74.18%
	S-006,S-002	CB02	CBMH42	0.021					0.088	0.232	0.232	10.00	10.14	76.81	104.19	178.56		17.81				17.81		PVC DR-35	200	1.00	8.91	32.83	1.04	0.14	15.02	45.76%
		CBMH42	TANK G							0.000	0.342	10.14	10.16	76.26	103.45	177.27		26.10				26.10		PVC DR-35	200	1.00	1.15	32.83	1.04	0.02	6.73	20.51%
		TANK G	CBMH43							0.000	0.342	10.16	10.18	76.19	103.35	177.10		26.07				26.07		PVC DR-35	200	1.00	1.14	32.83	1.04	0.02	6.76	20.58%
		CBMH43	STMH103-STMH102							0.000	0.342	10.18	10.32	76.13	103.26	176.94		26.05				26.05		PVC DR-35	200	1.00	8.99	32.83	1.04	0.14	6.78	20.65%
		STMH103	STMH102							0.000	1.244	20.56	21.75	51.15	69.05	117.87		63.62				63.62		PVC DR-35	375	0.30	61.83	96.13	0.87	1.19	32.51	33.82%
		CB07	TANK D	0.021					0.084	0.222	0.222	10.00	10.05	76.81	104.19	178.56		17.04				17.04		PVC DR-35	200	1.00	3.08	32.83	1.04	0.05	15.79	48.10%
		TANK D	CBMH38							0.000	0.222	10.05	10.07	76.62	103.93	178.11		17.00				17.00		PVC DR-35	200	1.00	1.34	32.83	1.04	0.02	15.83	48.23%
Private Street	S-009	CBMH38	STMH109-STMH108							0.000	0.222	10.07	10.11	76.54	103.82	177.92		16.98				16.98		PVC DR-35	200	1.00	2.34	32.83	1.04	0.04	15.85	48.28%
		STMH109	STMH108							0.000	0.222	10.11	10.27	76.39	103.63	177.58		16.95				16.95		PVC DR-35	250	1.00	11.64	59.53	1.21	0.16	42.58	71.53%
Private Street	S-014	RYCB013	CBMH37	0.079					0.033	0.126	0.126	10.00	10.04	76.81	104.19	178.56		9.72				9.72		PVC DR-35	200	1.00	2.40	32.83	1.04	0.04	23.12	70.41%
	S-004	CBMH37	CBMH35	0.005					0.030	0.078	0.204	10.04	10.19	76.66	103.99	178.21		15.66				15.66		PVC DR-35	200	1.00	9.67	32.83	1.04	0.15	17.17	52.29%
		CBMH35	TANK C							0.000	0.204	10.19	10.22	76.07	103.19	176.82		15.54				15.54		PVC DR-35	200	1.00	1.42	32.83	1.04	0.02	17.29	52.66%
Private Street	S-005	CB014	CBMH34	0.008					0.020	0.054	0.054	10.00	10.12	76.81	104.19	178.56		4.18				4.18		PVC DR-35	200	1.00	7.25	32.83	1.04	0.12	28.65	87.25%
		CBMH34	TANK C							0.000	0.054	10.12	10.14	76.36	103.59	177.51		4.16				4.16		PVC DR-35	200	1.00	1.39	32.83	1.04	0.02	28.67	87.33%
																		0.00													
Private Street	S-013	CB09	TANK C	0.008					0.072	0.185	0.185	10.00	10.12	76.81	104.19	178.56		14.18				14.18		PVC DR-35	200	1.00	7.58	32.83	1.04	0.12	18.65	56.82%
		TANK C	CBMH36							0.000	0.443	10.22	10.23	75.99	103.07	176.61		33.69				33.69		PVC DR-35	250	1.00	1.42	59.53	1.21	0.02	25.83	43.40%
		CBMH36	STMH108-STMH102							0.000	0.443	10.23	10.38	75.91	102.97	176.44		33.66				33.66		PVC DR-35	250	1.00	10.79	59.53	1.21	0.15	25.87	43.45%
Private Street	S-003	CB010	CBMH32	0.019					0.057	0.153	0.153	10.00	10.10	76.81	104.19	178.56		11.76				11.76		PVC DR-35	200	1.00	5.97	32.83	1.04	0.10	21.07	64.17%
		CBMH32	TANK B							0.000	0.153	10.10	10.13	76.44	103.69	177.69		11.71				11.71		PVC DR-35	200	1.00	2.00	32.83	1.04	0.03	21.12	64.34%
		TANK B	CBMH33							0.000	0.153	10.13	10.16	76.32	103.53	177.40		11.69				11.69		PVC DR-35	200	1.00	2.03	32.83	1.04	0.03	21.14	64.39%
		CBMH33	STMH108-STMH102							0.000	0.153	10.16	10.29	76.20	103.36	177.11		11.67				11.67		PVC DR-35	200	1.00	8.40	32.83	1.04	0.13	21.16	64.45%
		STMH108	STMH102							0.000	0.818	10.38	12.54	75.36	102.21	175.13		61.68				61.68		PVC DR-35	375	0.30	112.54	96.13	0.87	2.16	34.45	35.84%
Private Street	S-001	CB012	CBMH30	0.009					0.074	0.190	0.190	10.00	10.13	76.81	104.19	178.56		14.60				14.60		PVC DR-35	200	1.00	8.32	32.83	1.04	0.13	18.23	55.52%
		CBMH30	TANK A							0.000	0.190	10.13	10.15	76.30	103.50	177.35		14.51				14.51		PVC DR-35	200	1.00	1.12	32.83	1.04	0.02	18.32	55.81%
		TANK A	CBMH31							0.000	0.190	10.15	10.17	76.23	103.40	177.19		14.50				14.50		PVC DR-35	200	1.00	1.29	32.83	1.04	0.02	18.34	55.85%
		CBMH31	STMH102-STMH101							0.000	0.190	10.17	10.32	76.15	103.30	177.01		14.48				14.48		PVC DR-35	200	1.00	9.26	32.83	1.04	0.15	18.35	55.89%
		STMH102	STMH101							0.000	2.252	21.75	21.99	49.38	66.64	113.73		111.23				111.23		PVC DR-35	375	1.00	23.01	175.51	1.59	0.24	64.28	36.62%
		STMH101	*Ex. MH-ST*							0.000	2.252	21.99	22.07	49.04	66.17	112.93		110.46				110.46		PVC DR-35	375	4.00	16.68	351.01	3.17	0.09	240.56	68.53%

Definition:
Q=2.78CiA, where:
Q = Peak Flow in Litres per Second (L/s)
A = Area in Hectares (Ha)
i = Rainfall Intensity in millimeters per hour (mm/hr)
i = 732.951/(TC+6.199)^0.810 — 2 Year
i = 1174.184/(TC+6.014)^0.816 — 5 Year
i = 1735.688/(TC+6.014)^0.820 — 100 Year

Notes:
1. Mannings coefficient (n) = 0.013

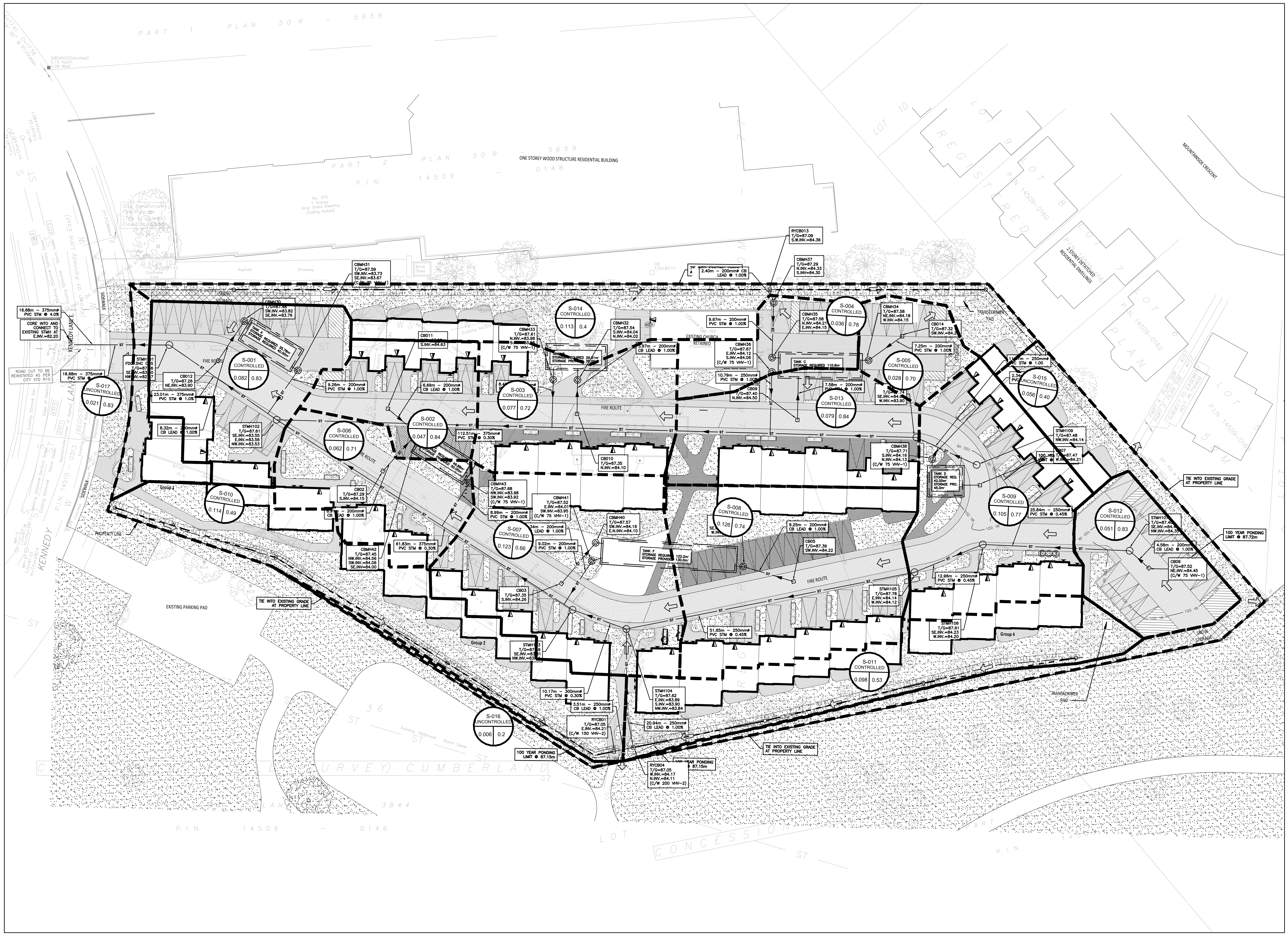
Time-of-Concentration in the Swale
FAA Equation: t (min) = 3.258 [(1.1 - C) L^0.5 / S^.33]
Where: Longest Watercourse Length, L (m). S (%)
Runoff Coef.C = 0.49 Impervious

No.	L (m)	S %	Tc (min)
3	98	1.00	20.00

Designed: D.B.Y./E.B
Checked: D.B.Y.
Dwg. Reference: C06

No.	Revision	Date
1.	City Submission No. 1	2021-11-30

File Reference: 211-12127-00
Date: 2021-11-30
Sheet No: 1 of 1



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2021-11-30
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QUEENSWOOD UNITED CHURCH

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DRAWN BY: JT/EB
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TITLE:
DRAINAGE AREA PLAN

SHEET NUMBER:
C06
SHEET # 6 OF 8

ISSUE:
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DATE OF: 2021-11-30
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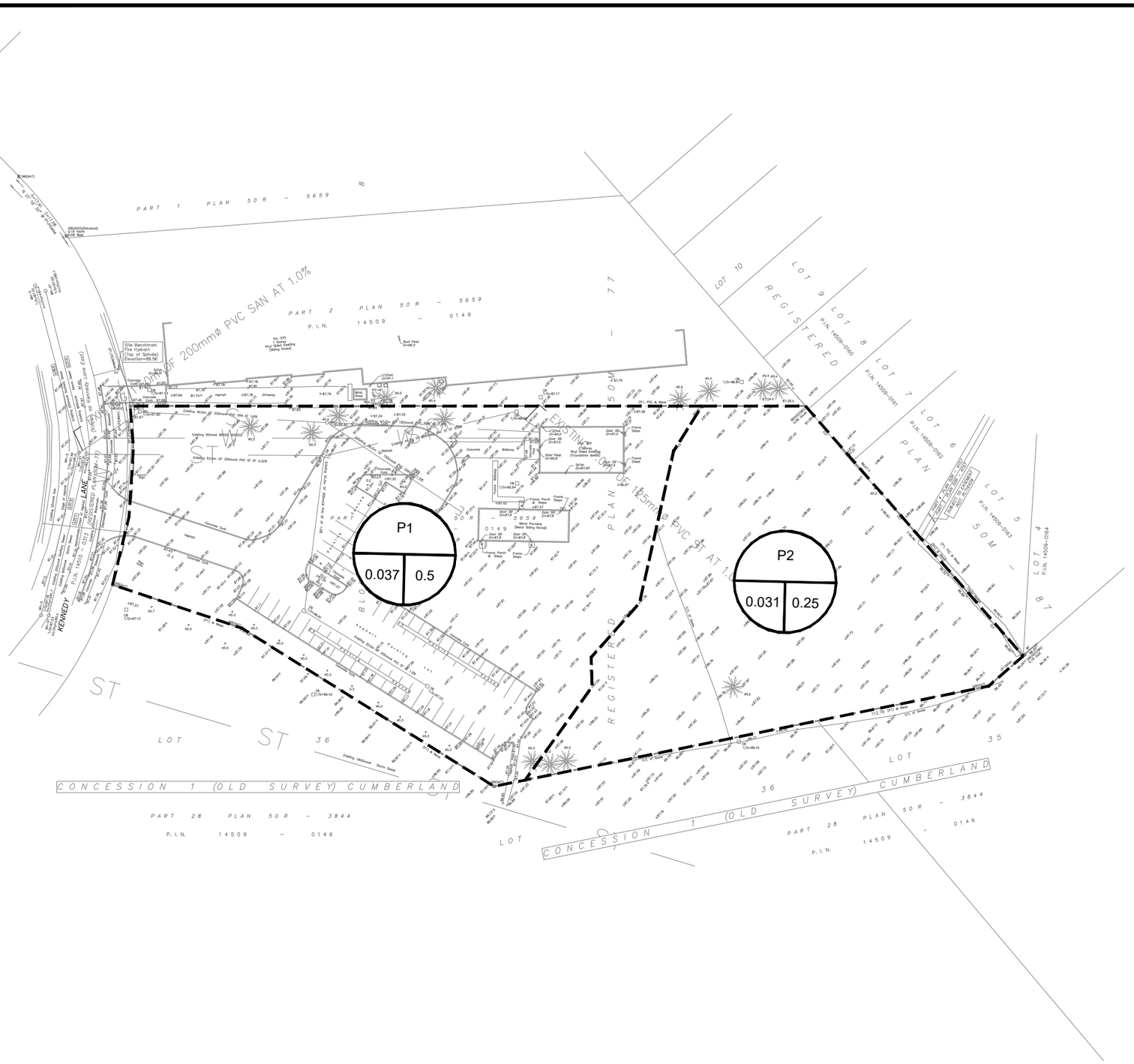

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LEGEND

I.D. / AREA C — I.D. DENOTES SANITARY DRAINAGE AREA ID; AREA DENOTES SANITARY DRAINAGE AREA; C DENOTES RUN OF COEFFICIENT

SANITARY DRAINAGE BOUNDARY

PROJECT NO: 211-12127-00	DATE: NOVEMBER 2021
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DRAWN BY: J.T.	
CHECKED BY: D.Y.	25mm

TITLE:

PRE-DEVELOPMENT DRAINAGE AREA PLAN

SHEET NUMBER:

F2

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TITLE: GRADING PLAN

SHEET NUMBER: C04
SHEET #: 4 OF 8

ISSUE: ISSUED FOR REVIEW
DATE OF: 2021-11-30
REV #: 0

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SHEET NUMBER: C05
SHEET #: 5 OF 8

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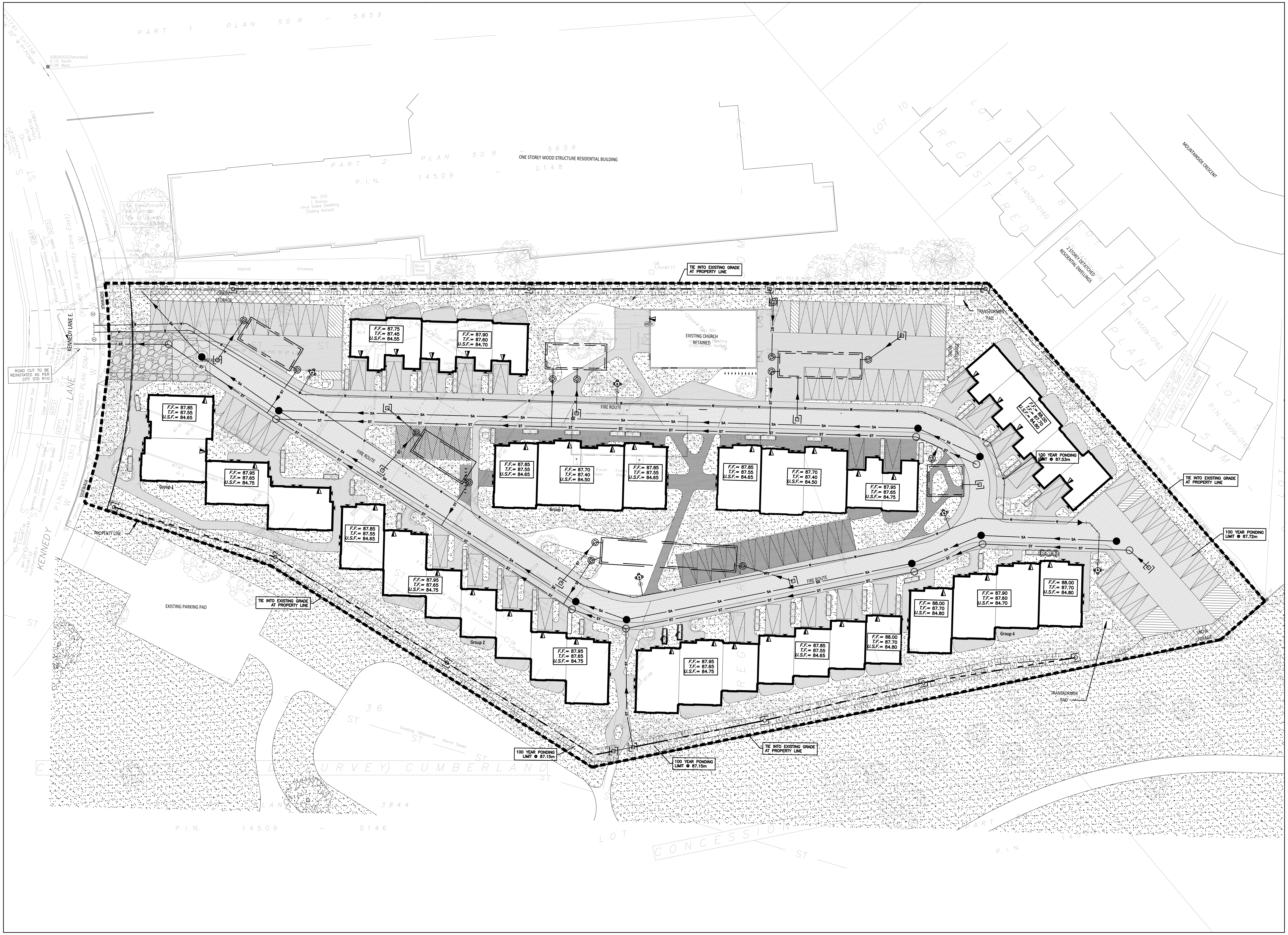
APPENDIX

APPENDIX

E

- EROSION AND SEDIMENTATION CONTROL PLAN C08



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2021-11-30
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DISCIPLINE: CIVIL

TITLE:

EROSION AND SEDIMENT CONTROL PLAN

SHEET NUMBER: C08
SHEET # 8 OF 8

ISSUE: ISSUED FOR REVIEW
REV #: 0
DATE OF: 2021-11-30

D07-XX-XX-XXXX

#XXXXX

APPENDIX

APPENDIX

F

- SUBMISSION CHECK LIST

4.1 General Content

☒ Executive Summary (for larger reports only).

Comments: Refer to Servicing Report Section 1.1

☒ Date and revision number of the report.

Comments: *Refer to front page of the Report*

☒ Location map and plan showing municipal address, boundary, and layout of proposed development.

Comments: *Refer to Figure 1.1 Site Location for Location Map and Plan*

☒ Plan showing the site and location of all existing services.

Comments: *Refer to drawing C05*

☒ Development statistics, land use, density, adherence to zoning and official plan, and reference to applicable subwatershed and watershed plans that provide context to which individual developments must adhere.

Comments: *Refer to Architectural Site Plan*

☒ Summary of Pre-consultation Meetings with City and other approval agencies.

Comments: Refer to Appendix A for Pre-Consultation Meeting Notes

☒ Reference and confirm conformance to higher level studies and reports (Master Servicing Studies, Environmental Assessments, Community Design Plans), or in the case where it is not in conformance, the proponent must provide justification and develop a defendable design criteria.

Comments: *N/A*

☒ Statement of objectives and servicing criteria.

Comments: Refer to Servicing Report Section 1.7

☒ Identification of existing and proposed infrastructure available in the immediate area.

Comments: *Refer to drawing C05*

☒ Identification of Environmentally Significant Areas, watercourses and Municipal Drains potentially impacted by the proposed development (Reference can be made to the Natural Heritage Studies, if available).

Comments: *N/A*

☒ Concept level master grading plan to confirm existing and proposed grades in the development. This is required to confirm the feasibility of proposed stormwater management and drainage, soil removal and fill constraints, and potential impacts to neighbouring properties. This is also required to confirm that the proposed grading will not impede existing major system flow paths.

Comments: *Refer to drawing C04*

☒ Identification of potential impacts of proposed piped services on private services (such as wells and septic fields on adjacent lands) and mitigation required to address potential impacts.

Comments: *N/A*

☒ Proposed phasing of the development, if applicable.

Comments: *N/A*

☒ Reference to geotechnical studies and recommendations concerning servicing.

Comments: *N/A*

☒ All preliminary and formal site plan submissions should have the following information:

- ☒ Metric scale
- ☒ North arrow (including construction North)
- ☒ Key plan
- ☒ Name and contact information of applicant and property owner
- ☒ Property limits including bearings and dimensions
- ☒ Existing and proposed structures and parking areas
- ☒ Easements, road widening and rights-of-way
- ☒ Adjacent street names

Comments: *Refer to drawing C03 to C08*

4.2 Development Servicing Report: Water

☒ Confirm consistency with Master Servicing Study, if available

Comments: *Refer to Servicing Report Section 2.1*

☒ Availability of public infrastructure to service proposed development

Comments: Refer to Servicing Report Section 2.1

☒ Identification of system constraints

Comments: N/A

☒ Identify boundary conditions

Comments: *Refer to Servicing Report Section 2.2*

☒ Confirmation of adequate domestic supply and pressure

Comments: *Refer to Servicing Report Section 2.3*

☒ Confirmation of adequate fire flow protection and confirmation that fire flow is calculated as per the Fire Underwriter's Survey. Output should show available fire flow at locations throughout the development.

Comments: *Refer to Servicing Report Section 2.4*

☒ Provide a check of high pressures. If pressure is found to be high, an assessment is required to confirm the application of pressure reducing valves.

Comments: *Refer to Servicing Report Section 2.5*

☒ Definition of phasing constraints. Hydraulic modeling is required to confirm servicing for all defined phases of the project including the ultimate design

Comments: *Refer to Servicing Report Section 2.6*

☒ Address reliability requirements such as appropriate location of shut-off valves

Comments: *Refer to Servicing Report Section 2.7*

☒ Check on the necessity of a pressure zone boundary modification.

Comments: *Refer to Servicing Report Section 2.8*

☒ Reference to water supply analysis to show that major infrastructure is capable of delivering sufficient water for the proposed land use. This includes data that shows that the expected demands under average day, peak hour and fire flow conditions provide water within the required pressure range

Comments: *Refer to Servicing Report Section 2.9*

☒ Description of the proposed water distribution network, including locations of proposed connections to the existing system, provisions for necessary looping, and appurtenances (valves, pressure reducing valves, valve chambers, and fire hydrants) including special metering provisions.

Comments: *Refer to Servicing Report Section 2.10*

☒ Description of off-site required feedermains, booster pumping stations, and other water infrastructure that will be ultimately required to service proposed development, including financing, interim facilities, and timing of implementation.

Comments: *Refer to Servicing Report Section 2.11*

☒ Confirmation that water demands are calculated based on the City of Ottawa Design Guidelines.

Comments: *Refer to Servicing Report Section 2.12*

☒ Provision of a model schematic showing the boundary conditions locations, streets, parcels, and building locations for reference.

Comments: *Refer to Servicing Report Section 2.13*

4.3 Development Servicing Report: Wastewater

☒ Summary of proposed design criteria (Note: Wet-weather flow criteria should not deviate from the City of Ottawa Sewer Design Guidelines. Monitored flow data from relatively new infrastructure cannot be used to justify capacity requirements for proposed infrastructure).

Comments: *Refer to Servicing Report Section 3.1*

☒ Confirm consistency with Master Servicing Study and/ or justifications for deviations.

Comments: *Refer to Servicing Report Section 3.2*

☒ Consideration of local conditions that may contribute to extraneous flows that are higher than the recommended flows in the guidelines. This includes groundwater and soil conditions, and age and condition of sewers.

Comments: *Refer to Servicing Report Section 3.3*

☒ Description of existing sanitary sewer available for discharge of wastewater from proposed development.

Comments: *Refer to Servicing Report Section 3.4*

☒ Verify available capacity in downstream sanitary sewer and/ or identification of upgrades necessary to service the proposed development. (Reference can be made to previously completed Master Servicing Study if applicable)

Comments: *Refer to Servicing Report Section 3.5*

☒ Identification and implementation of the emergency overflow from sanitary pumping stations in relation to the hydraulic grade line to protect against basement flooding.

Comments: Refer to Servicing Report Section 3.9 and 3.11

☒ Special considerations such as contamination, corrosive environment etc.

Comments: *Refer to Servicing Report Section 3.8*

4.4 Development Servicing Report: Stormwater

☒ Description of drainage outlets and downstream constraints including legality of outlets (i.e. municipal drain, right-of-way, watercourse, or private property)

Comments: *Refer to Servicing Report Section 4.1*

☒ Analysis of available capacity in existing public infrastructure.

Comments: *Refer to Servicing Report Section 4.2*

☒ A drawing showing the subject lands, its surroundings, the receiving watercourse, existing drainage patterns, and proposed drainage pattern.

Comments: *Refer to drawing C04 and C05*

☒ Water quantity control objective (e.g. controlling post-development peak flows to pre-development level for storm events ranging from the 2 or 5 year event (dependent on the receiving sewer design) to 100 year return period); if other objectives are being applied, a rationale must be included with reference to hydrologic analyses of the potentially affected subwatersheds, taking into account long-term cumulative effects.

Comments: *Refer to Stormwater Management Report*

☒ Water Quality control objective (basic, normal or enhanced level of protection based on the sensitivities of the receiving watercourse) and storage requirements.

Comments: Refer to Stormwater Management Report

☒ Description of the stormwater management concept with facility locations and descriptions with references and supporting information.

Comments: *Refer to Stormwater Management Report*

☒ Set-back from private sewage disposal systems.

Comments: *N/A*

☒ Watercourse and hazard lands setbacks.

Comments: N/A

☒ Record of pre-consultation with the Ontario Ministry of Environment and the Conservation Authority that has jurisdiction on the affected watershed.

Comments: N/A

☒ Confirm consistency with sub-watershed and Master Servicing Study, if applicable study exists.

Comments: N/A

☒ Storage requirements (complete with calculations) and conveyance capacity for minor events (1:5 year return period) and major events (1:100 year return period).

Comments: Refer to Stormwater Management Report

☒ Identification of watercourses within the proposed development and how watercourses will be protected, or, if necessary, altered by the proposed development with applicable approvals.

Comments: Refer to Stormwater Management Report

☒ Calculate pre and post development peak flow rates including a description of existing site conditions and proposed impervious areas and drainage catchments in comparison to existing conditions.

Comments: Refer to Stormwater Management Report

☒ Any proposed diversion of drainage catchment areas from one outlet to another.

Comments: Refer to Stormwater Management Report

☒ Proposed minor and major systems including locations and sizes of stormwater trunk sewers, and stormwater management facilities.

Comments: Refer to Stormwater Management Report and drawing C04 and C05

☒ If quantity control is not proposed, demonstration that downstream system has adequate capacity for the post-development flows up to and including the 100-year return period storm event.

Comments: Refer to Stormwater Management Report

☒ Identification of potential impacts to receiving watercourses

Comments: Refer to Stormwater Management Report

☒ Identification of municipal drains and related approval requirements.

Comments: Refer to Stormwater Management Report

☒ Descriptions of how the conveyance and storage capacity will be achieved for the development.

Comments: *Refer to Stormwater Management Report*

☒ 100 year flood levels and major flow routing to protect proposed development from flooding for establishing minimum building elevations (MBE) and overall grading.

Comments: N/A

☒ Inclusion of hydraulic analysis including hydraulic grade line elevations.

Comments: Refer to Stormwater Management Report

☒ Description of approach to erosion and sediment control during construction for the protection of receiving watercourse or drainage corridors.

Comments: *Refer to Servicing Report Section 5.0 and drawings C08*

☒ Identification of floodplains - proponent to obtain relevant floodplain information from the appropriate Conservation Authority. The proponent may be required to delineate floodplain elevations to the satisfaction of the Conservation Authority if such information is not available or if information does not match current conditions.

Comments: *N/A*

☒ Identification of fill constraints related to floodplain and geotechnical investigation.

Comments: *N/A*

4.5 Approval and Permit Requirements: Checklist

The Servicing Study shall provide a list of applicable permits and regulatory approvals necessary for the proposed development as well as the relevant issues affecting each approval. The approval and permitting shall include but not be limited to the following:

☐ Conservation Authority as the designated approval agency for modification of floodplain, potential impact on fish habitat, proposed works in or adjacent to a watercourse, cut/ fill permits and Approval under Lakes and Rivers Improvement Act. The Conservation Authority is not the approval authority for the Lakes and Rivers Improvement Act. Where there are Conservation Authority regulations in place, approval under the Lakes and Rivers Improvement Act is not required, except in cases of dams as defined in the Act.

Comments: Not applicable.

☐ Application for Certificate of Approval (CofA) under the Ontario Water Resources Act.

Comments: Not applicable.

☐ Changes to Municipal Drains.

Comments: *Not applicable.*

☐ Other permits (National Capital Commission, Parks Canada, Public Works and Government Services Canada, Ministry of Transportation etc.)

Comments: *Not applicable.*

4.6 Conclusion Checklist

☒ Clearly stated conclusions and recommendations

Comments:

☐ Comments received from review agencies including the City of Ottawa and information on how the comments were addressed. Final sign-off from the responsible reviewing agency.

Comments: *Further comments to be added following site plan application review.*

☒ All draft and final reports shall be signed and stamped by a professional Engineer registered in Ontario

Comments: