Functional Servicing Report

Chick-fil-A

Type of Document:
Functional Servicing Report

Project Name:
Chick-fil-A Orleans

Project Number:
BRM-23002042-H0

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1 Legal Notification

This Report was prepared by EXP Services Inc. for the account of Chick-fil-A.

Any use which a third party makes of the Report, or any reliance on or decisions to be made based on it, are the responsibility of such third parties. EXP Services Inc. accepts no responsibility for damages, if any, suffered by any third party as a result of decisions made or actions based on this project.

2 Introduction

EXP Inc. has been retained by Chick-fil-A to prepare a Functional Servicing Report (FSR) to assess the servicing requirements relating to the proposed development located at 4280 Innes Road in Orleans which is located in Ottawa, Ontario. For additional background information, please refer to **Appendix A**, **EXP Drawing A100**.

This Functional Servicing Report (FSR) identifies and presents the servicing requirements for the proposed project. This FSR includes municipal water, sanitary drainage, and stormwater management (SWM) services, prior to the detailed design being undertaken. The Report will outline the requirements for site servicing for the proposed development and determine the available existing and proposed municipal servicing for discharge of storm and sanitary flows and water servicing.

2.1 Site Description

2.1.1 Existing Site

The property under study is a 0.474 ha site located on the northeast corner of Innes Road and Tenth Line Road in Orleans, Ontario. The parking lot is bound by Innes Road to the north, Swiss Chalet to the east, an existing commercial development to the south, and another commercial area to the west. The existing commercial site located at 4280 Innes Rd, Orleans, directly immediately adjacent to the site is not part of this development.

The current site is a parking lot. See **Figure 1** for an aerial view of the existing site.

Figure 1: Existing Site

2.1.2 Proposed Site

The project entails the construction of a proposed Chick-fil-A accompanied by the necessary sidewalks, landscape areas, parking lot and drive aisles.

The proposed development involves the construction of a proposed Chick-fil-A at the east corner of the site and will consist of a parking lot, a 461.94 m^2 building, sidewalk, landscape areas, and drive thru. The existing infrastructure on the existing commercial development will be modified to meet the requirements of the new development. The existing services will be utilized in accordance with city comments, which include demonstrating the use of services and capacity within the internal system.

For more detailed information regarding the building and site location, please refer to the **EXP Drawing A100 - Site Plan** provided in **Appendix A**.

2.2 References

The following documents were referred to in the preparation of this report:

- City of Ottawa Sewer Design Guidelines, Second Edition, October 2012
- Comments on 4280 Innes Road, Orleans (Chick-Fil-A) Phase 1/2 Pre-Consultation Submission
- Technical Bulletin PIEDTB-2018-01
- City of Ottawa Water Design Guidelines, Section 4.2.2 of the Water Distribution Guidelines.
- Ontario Building Code or Fire Underwriter Surveys
- Technical Bulletin ISTB-2021-03
- Technical Bulletin ISTB-2018-02, Appendix I Table 1

3 Sanitary Sewer Servicing

3.1 Sanitary Sewer System

The proposed Chick-fil-A site at 4280 Innes Road, Orleans, Ontario will connect to the existing sanitary infrastructure within the existing commercial development. The sanitary sewage flow from the site will be directed to the existing SAN MH09 situated east, of the subject site. The inverts, size and slope of the existing sanitary service is to be confirmed on field by the contractor. The existing sanitary sewers, maintenance holes, as well as the proposed sanitary sewer arrangement for the Chick-fil-A Development are shown on **EXP Drawing PS100 – Site Servicing, EXP Drawing PS101 – Site Servicing and Drawing SS-01 – Servicing Plan by Stantec** within **Appendix B.**

Sanitary sewage outflow from the site is calculated using the current City of Ottawa Sewer Design Guidelines and Technical Bulletin PIEDTB-2018-01 as depicted in **Table 1** below. Sewage flows will be calculated based on use as a commercial site with an average design flow of **0.324 L/sec/ha** (28,000 L/gross ha/day) plus allowances for infiltration. Based on the site area of **0.474** hectares, the sanitary flow equates to **0.39 L/s**.

Table 1: Proposed Sanitary Design Criteria (City of Ottawa Standards)

Avg. Flow Rate	0.324	L/sec/ha
Peak Hourly Factor	1.5	Per Harmon Formula
Total Area	0.474	ha
Infiltration	0.33	L/s/ha

The Dry Weather proposed sanitary flow is depicted in **Table 2** below.

Table 2: Dry Weather Sanitary Flow

Type of Flow	Proposed Flow (L/s)
Average Domestic Flow (L/s)	0.324 L/sec/ha * 0.474 ha = **0.154 L/s**
Peak Domestic Flow (L/s)	0.154 L/s * 1.5 = **0.23 L/s**

The Wet Weather proposed sanitary flow is depicted in **Table 3** below.

Table 3: Wet Weather Sanitary Flow

Type of Flow	Proposed Flow (L/s)
Peak Domestic Flow (L/s)	0.23 L/s
Infiltration Flow (L/s)	0.33 L/sec/ha * 0.474 ha = **0.16 L/s**
TOTAL FLOW (L/s)	**0.39 L/s**

The sanitary sewage flow from the proposed Chick-fil-A site will discharge to the existing Sanitary Maintenance Hole 09 located east of the proposed Chick-fil-A.

3.2 Downstream Considerations

The Asset Management team at the City of Ottawa will analyze the system to ensure there is adequate residual capacity in the receiving and downstream wastewater system to support the proposed flow of **0.39 L/s** for the development. However, it is expected that the **0.39 L/s** is acceptable.

3.3 Proposed Sanitary Service

EXP proposes to service the new development with a new 200mm sanitary connection at 1.0% with a control maintenance hole within the site. This setup will include a grease interceptor and venting. The proposed connections to the building will be 150mm at a 2.0% slope. The sanitary service connection to the proposed building, will be designed to the Orleans Standards, as shown on **EXP Drawing PS100 – Site Servicing Plan**.

4 Water Supply and Appurtenances

4.1 Existing Water Supply

According to the survey conducted by JD BARNES on June 12, 2023, there is an existing 200mm watermain located east of the proposed restaurant. The existing watermain is shown on **EXP Drawing PS101 – Site Servicing and Drawing SS-01 – Servicing Plan by Stantec in Appendix B.**

4.2 Proposed Water Demand

The unit rate and peaking factors of water consumption, minimum pipe size and allowable pressure in line were established from the City of Ottawa Water Design Guidelines.

The pressures and volumes must be sufficient for peak hour conditions and under fire conditions as established by the City of Ottawa Standards. New water supply and distribution systems should maintain normal operating pressures between 345 kPa (50 psi) and 552 kPa (80 psi) during maximum daily flow. The maximum sustained operating pressure shall not exceed 552 kPa (81 psi). Minimum residual pressure at any hydrant shall not be less than 140 KPa (20 PSI).

4.2.1.1 Fire Flow

A detailed Fire Flow calculation has been prepared using the recommendation for the Fire Underwriters Survey as per City of Ottawa Technical Bulletin ISTB-2021-03. The fire flow calculation indicates that the recommended fire flow for this proposed development will be **6,000 l/min (100 litres/sec)**.

Calculations for the required domestic and fire flow demand are provided in **Appendix C**.

Currently, there is an existing class AA fire hydrant north of the proposed building for fire fighting purposes. The proposed building is 30 m unobstructed distance to the proposed fire department connection. Fire protection of the proposed building will be via the existing fire hydrant since the building is located within the 45 m range permitted by the Ontario Building Code; therefore, a private fire hydrant is not required. Refer to the **EXP Drawing PS100 – Site Servicing** within **Appendix B** showing the extent of proposed water servicing to be installed. Under proposed conditions, the existing fire hydrant is utilized.

As per City of Ottawa Technical Bulletin ISTB-2018-02, the combined flow of all contributing fire hydrants within 150 meters of the building must meet or exceed the required fire flow. Appendix I of the same bulletin is summarized in **Table 4.**

Table 4: Maximum Flow to be considered from a given hydrant (City of Ottawa, Technical Bulletin ISTB-2018-02)

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

The nearest existing Class AA fire hydrant is within 75 meters of the proposed building and can provide a flow of **5,700 L/min (95 L/s)**. There are three additional municipal Class AA fire hydrants within 150 meters of the proposed building, located within the existing commercial development owned by the applicant. Each of these hydrants can individually contribute 3,800 L/min (63.3 L/s), summing up to a total of 11,400 L/min (190 L/s). The combined flow of all four contributing fire hydrants is **17,100 L/min (285 L/s)**, which exceeds the required fire flow of **6,000 L/min (100 L/s)**.

4.2.2 Demand Requirements

It is proposed that the site will be serviced via a new 50mm diameter water service for domestic flow, connected into the existing 200mm watermain located to the east of the existing Swiss Chalet. The proposed water service contains a water valve located at the property line.

Water demands for the proposed development were determined from the City of Ottawa Water Design Guidelines; the design criteria is summarized in **Table 6**.

Table 5: Proposed Water Distribution Design Criteria (City of Ottawa Water Design Guidelines)

Total Area	0.474	ha
Commercial Average Daily Demand	28,000	L/ha/day
Commercial Maximum Daily Demand	1.5 * Average Day	L/gross ha/day
Commercial Maximum Hour Demand	1.8 * Average Day	L/gross ha/day
Chick-fil-A Hours Open Hours	11	Hours

The total water demand for the site is estimated as the maximum daily water demand plus fire, resulting in a total demand of approximately (0.50 l/s + 100 l/s) = **100.50 L/s**. The total water demand was calculated in **Table 6**.

Table 6: Water Demand Calculations

Demand Type	Total Demand (L/s)
Commercial Average Daily Demand	((28,000 L/ha/day * 0.474 ha)/ 11 Hours) = **0.335 L/s**
Commercial Maximum Daily Demand	**0.50 L/s**
Commercial Maximum Hourly Demand	0.60 L/s
Fire Flow (FUS method)	**100 L/s**
Maximum Daily Demand + Fire Flow	**100.50 L/s**

Fire protection of the proposed building will be via the existing fire hydrant at the north of the site since the building is located within the 90 m range of the existing fire hydrant.

Refer to the **EXP Drawing PS100 – Site Servicing Plan** within **Appendix B**. showing the extent of proposed water servicing, to be installed.

4.3 Proposed Connection

As part of the proposed project, we plan to connect the new Chick-fil-A building to the existing water infrastructure. This connection will ensure that the building has access to the necessary water supply for its operations and can utilize the existing infrastructure efficiently.

The City of Ottawa's asset management team has supplied the boundary conditions for the downstream municipal watermain at the subject property based on the following information: the type of development is a commercial development, with an average daily demand of 0.335 L/s, a maximum daily demand of 0.50 L/s, and a maximum hourly daily demand of 0.60 L/s. The required fire flow, according to the FUS Method, is 100 L/s, and according to the OBC Method, it is 30 L/s. For detailed correspondence with the City regarding these boundary conditions, please refer to **Appendix D**. The boundary conditions in the 305 mm, **Lanther Drive** municipal watermain provided by the City of Ottawa at the subject property indicate a minimum HGL of 130.3 m and a maximum HGL of 128.2 m. The peak hourly pressure demands for the proposed Connection 1 at the existing private watermain were assigned to the upstream junction at Lanther Drive & Vantage Drive, off the public looped watermains, with a peak hour

pressure of 54.5 psi and max day + Fire Flow#1 of 57.2 psi. Refer to **Boundary Conditions 4280 Innes Road** within **Appendix D**.

Based on these boundary conditions and the calculated headloss off the private watermain, the headloss calculation indicates a peak hour pressure of 53.04 psi at the building and a max day + Fire Flow #1 of 55.74 psi. The minimum requirement for maximum hourly demand is 40 psi, and the maximum requirement for maximum hourly demand is 80 psi. Therefore, there is sufficient pressure to service the proposed development. The calculated head loss calculations for the private watermain can be found in **Appendix D**.

5 Stormwater Management

5.1 Pre-Development Hydrology

5.1.1 Existing Drainage

The subject site is currently an existing parking lot. It drains into an on-site catch basin, where the proposed restaurant will be built, and towards the parking lot driveways, leading to existing catch basins located south of the site within the existing commercial development. Refer to **EXP Drawing SWM100 - Pre-Development Drainage Plan within Appendix B**, as well as **Drawing SS-1 – Servicing Plan by Stantec.**

The existing storm sewer that drains this site is a private on site 450mm diameter STM, located south of the proposed site within the existing commercial development. The subject site is part of the Loblaws Properties Limited Innes Road development. According to **Drawing SS-1 – Servicing Plan by Stantec**, the site is designated to drain to the existing 1800mm diameter storm sewer located within the Innes Road Right of Way (RoW).

There is an Inlet Control Device (ICD) downstream at Existing STM MH108, which regulates the flow into the storm sewer system. Additionally, a Stormceptor is installed downstream of Existing STM MH108 to provide quality control for the site. Prior to the existing storm sewer that drains the subject site, there is an 825mm diameter concrete sewer.

The subject site falls within the **Ottawa River Watershed**.

5.1.2 External Drainage

Based on the existing topography, there are no external drainage areas draining to the subject property. Refer to **EXP Drawing SWM100 - Pre-Development Drainage Plan** within **Appendix B**.

5.2 Stormwater Management Analysis

The storm drainage system for the Chick-fil-A site collects water through a series of catch basins, roof drains, and catch basin manholes surrounding the existing building. According to the City of Ottawa requirements, the site must have an accessible storm sewer with a private storm main network internal to the site. As per these requirements, we are utilizing the existing storm infrastructure, and the storm flows from our site are then conveyed via the existing private on-site storm sewer system.

The proposed Chick-fil-A development is situated on what is currently an existing parking lot. Since the area is mostly hard surface in its current state and the proposed development will also be primarily hard surface, there will be no net increase in storm runoff generated by the site. There will be no negative impacts on the overall stormwater management systems. The existing drainage patterns at 4280 Innes Road will be improved to self-

contain the site. Additionally, no additional flows will be directed to the existing municipal storm sewer systems beyond what they currently receive from the subject area. Control is provided downstream within the existing development, through an inlet control device at existing STM MH108 ensuring effective stormwater management. The proposed restaurant development will reduce the total amount of stormwater runoff generated due to newly constructed landscaped areas. Please refer to the Post-Development Drainage plan, **EXP Drawing SWM200**, available in **Appendix B**.

5.3 Allowable Release Rate

The existing private on site 450mm diameter STM located south of our proposed restaurant has been designed to accommodate the stormwater flow from the subject site at a run-off co-efficient of 0.84.

Existing Contributing Drainage Area = 0.41 ha
Runoff Coefficient C = 0.84

Proposed Contributing Drainage Area = 0.43 ha
Runoff Coefficient C = 0.77

Due to grading modifications, a portion of the site that was previously landscaped and drained uncontrolled to the street will now be captured on-site. However, as shown in the storm calculations included in **Appendix E**, the overall flow from the subject site has decreased due to the increased landscape area.

The comparison between the pre-development release rate and post development release rates can be found in **Table 6**.

Table 7: Pre & Post Development Peak Flow

Storm Event (yr)	Pre-Dev. Peak Flow (L/s)	Post-Dev. Peak Flow (L/s)
2	73.17	70.87
5	99.26	96.14
10	116.36	112.71
25	137.84	133.51
50	153.83	149.00
100	170.11	164.76

The proposed development must meet the City of Ottawa's drainage standards. According to the City of Ottawa Pre-Con Comments, the minor and major system design requirements must control the 100-year post-development peak flow rate to match the 100-year pre-development peak flow rate, using a runoff coefficient of 0.5 or the existing coefficient, whichever is lower. All drainage must be contained on-site up to and including the stress test event (100-year + 20% event). Given our existing Inlet Control Device (ICD) downstream at Existing STM MH108, as shown in **Drawing SS-1 – Servicing Plan by Stantec**, and the improved site conditions, we expect meet the City of Ottawa requirements. The enhanced landscaping has reduced ponding by increasing the infiltration capacity and reducing surface runoff.

Since the area is mostly hard surface in its current state and the proposed development will also be primarily hard surface, there will be no net increase in storm runoff generated by the site. The addition of 348 square meters (m^2) of landscaped area ensures that the new development will generate less storm runoff than the existing site. The pervious area will increase from 346 m^2 to 694 m^2 with the proposed development. There will be no negative impacts on the overall stormwater management systems. The existing drainage patterns at 4280 Innes Road will be improved to self-contain the site. Furthermore, no additional flows will be directed to the existing municipal storm sewer systems beyond what they currently receive from the subject area.

The ICD was originally designed for a runoff coefficient of 0.84 for this portion of the overall site. However, we have improved the site conditions, resulting in a reduced runoff coefficient of 0.77. This improvement further ensures compliance with the City of Ottawa's drainage standards.

For a detailed breakdown of the pre- and post-development run-off coefficient, see **Calculation Sheet 1** and **Calculation Sheet 2** in **Appendix E,** as well as **Drawing SS-1 – Servicing Plan by Stantec** within **Appendix B** for the downstream ICD device.

As per the **Functional Servicing and Stormwater Management Report for Choice Properties Real Estate Investment Trust at 4270 Innes Road, City of Ottawa (Project No.: 17-961, September 2017 – Rev 1)**, located in **Appendix F**, there is currently no ponding on the site. Given that the elevations are similar to pre-development conditions, significant changes are not expected. In the unlikely event of ponding, it would be confined to the parking lot area, away from pedestrian paths.

5.4 Stormwater Quantity Management

Since the existing drainage pattern is being improved and post-development flows are controlled to be lower than pre-development flows, it is not anticipated that the proposed development will negatively impact the existing private downstream receiving system. We are utilizing the existing stormwater infrastructure on the site, including the current Inlet Control Device (ICD) and private sewer system, rather than proposing new infrastructure.

Stormwater quantity will be controlled through the existing ICD located at the downstream end of the private sewer system before it releases to the municipal sewers. This approach ensures that post-development flows from the site are managed effectively and controlled to the acceptable allowable release rate for this commercial development. By leveraging the existing infrastructure, we are maintaining continuity and ensuring compliance with the City of Ottawa's drainage standards. As the proposed site has a lower runoff coefficient than the allocated runoff coefficient, no additional quantity controls are proposed.

5.5 Stormwater Quality Management

The stormwater quality control for the development will adhere to the City of Ottawa's stormwater management criteria:

- *Quality Control – Suspended Solids:*
  a) Provide enhanced level of protection (80%) for suspended soils removal.
  b) Demonstrate ISO 14034 Environmental Technology Verification (ETV) protocol for sizing OGS units.

This target is achieved through the existing stormwater management system, which includes an STC 6000 unit providing quality control. The design of the onsite storm sewer drainage system incorporates this stormwater quality treatment unit to ensure compliance with the City of Ottawa's standards. The proposed development features an increase in roof and landscaped areas, which enhances the overall stormwater quality.

As the proposed site has a lower runoff coefficient than the allocated runoff coefficient, no additional quantity controls are necessary. The increase in pervious areas, from 346 m² to 694 m², further contributes to reducing stormwater runoff. The existing STC 6000 unit will continue to provide effective quality control, ensuring that the stormwater management system meets all required standards.

The Stormceptor sizing considers our drainage area of 0.41 hectares with an initial runoff coefficient of 0.84. However, we have improved the site conditions, reducing the runoff coefficient to 0.77. The Stormceptor is currently installed at the location shown on **Drawing SS-1 – Servicing Plan by Stantec**, downstream of EX. STM MH108.

5.6 Storm Conveyance

Storm drainage for the subject site will be collected by a series catchbasins, roof drains and catchbasin manholes. Storm flows are then conveyed via the proposed storm sewer system to the existing private onsite storm sewer system.

The existing sewer connection is located within the existing parking lot entrance. The proposed grading will improve the existing drainage patterns to self-contain the site. As shown in the site grading and site servicing drawings located in **Appendix B** this site has been designed to integrate both minor and major storm systems. The overall site grading ensures that the existing drainage pattern on adjacent properties has not been altered and stormwater runoff from the subject development has been self-contained.

5.6.1 Minor System: Storm Sewer

The site has been graded to contain the stormwater from the site, and to direct it through a series of catchbasins located throughout the site and roof water leaders on the building. These catchbasins and roof drains flow into an underground storm sewer system (minor system). The underground storm sewer has been designed to accommodate the 5-year peak storm event based on City of Ottawa's Intensity Duration Frequency (IDF) curve with Time of Concentration of (Tc) 10 minutes, using Rational Method. Storm sewer sizing and gradients will maintain a minimum velocity of 0.9 m/sec and maximum 3.0 m/sec. The detailed design of the minor system is provided in **Calculation Sheet 3** in **Appendix E**.

5.6.2 Major System: Overland Flow

In the event of a major storm, defined as storms 100-year post-development peak flow rate leaving the site area to the 100-year pre-development peak flow rate, the outlet control provided in the system in the form of an Inlet Control Device will utilize the available storm sewer infrastructure by allowing the system to back up, thus providing the required storage. Outlet controls in the sewer system are designed to restrict the post-development flows exiting from the system to the 100-year predevelopment allowable release rate. Thus, effectively restricting the flows by detaining the water in the system to release it at an allowable release rate. This will ensure that it will not have any impact on downstream overland flow capacity, and the municipal sewers. The controlled release rates of stormwater are directed to a Stormceptor to ensure that runoff from the site is treated to the City of Ottawa water quality requirements before it is released from the site.

In events larger than the 100-year return storm, the site has been graded to include an overland flow route. This route allows the stormwater to overtop the local highpoints and flow overland and off-site existing commercial

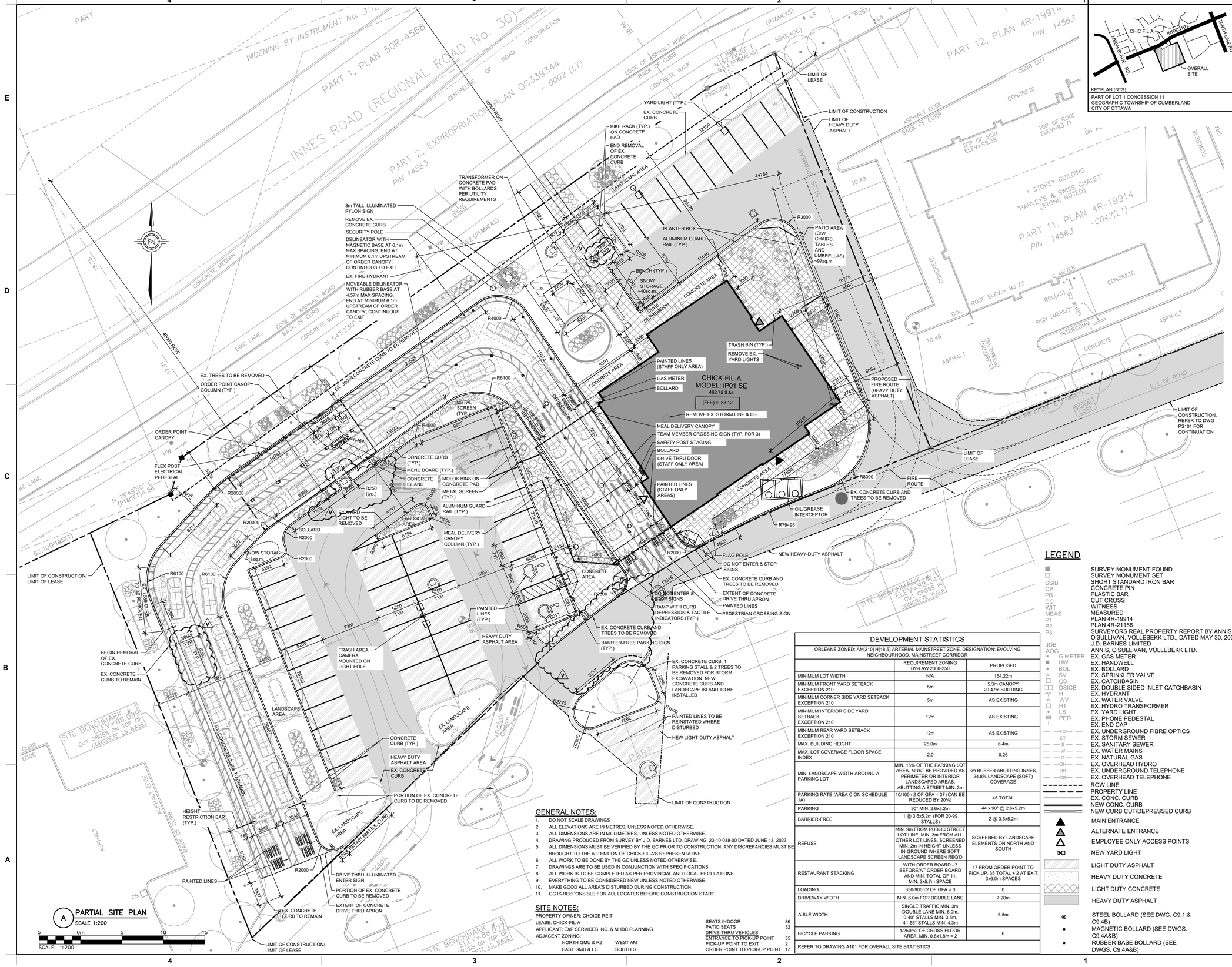
development, consistent with the existing overland flow route. The existing overland discharge point is towards Innes Road. The major overland flow routes are shown on **EXP Drawing SWM100**, and **SWM200** in **Appendix B**.

6 Conclusion

Implementation of the design outlined in this report will ensure that the site can be serviced and complies with the requirements of the reviewing authorities and is of acceptable quality both during and after construction. In summary:

- Type of development: Commercial Development
- The total development area is 0.474 ha.
- The site will discharge sanitary flows to the existing SAN MH09 situated east of the proposed restaurant. The proposed Wet Weather Sanitary Flow is 0.39 L/s.
- The proposed sanitary connection is 200mm diameter with slope of 1.0%.
- The average water daily demand is 0.335 L/s
- The maximum water daily demand: 0.50 L/s
- The maximum hourly daily demand: 0.60 L/s
- The required fire flow demand using the FUS Method is 100 L/s
- The combined flow of all four contributing fire hydrants is 285 L/s, which exceeds the required fire flow of 6,000 L/min (100 L/s).
- The total water demand for the site is estimated as the maximum day water demand plus fire, resulting in a total demand of approximately Maximum Daily Demand + Fire Flow= (0.50 l/s + 100 l/s) = 100.50 L/s.
- The maximum hourly daily demand: 0.60 L/s
- The headloss calculation indicates a peak hour pressure of 53.04 psi at the building, exceeding the minimum requirement of 40 psi for maximum hourly demands.
- Quantity Control is not required as we are using the existing Inlet Control Device, and we are discharging to the private on-site storm sewers, while improving existing conditions.
- Runoff quality treatment is considered, with the existing downstream STC 6000.

Appendix A
Site Plan



A PARTIAL SITE PLAN

SCALE 1:200

5 0m 5 10 15

SCALE: 1:200

DEVELOPMENT STATISTICS

ORLEANS ZONED: AM[210] H(18.5) ARTERIAL MAINSTREET ZONE. DESIGNATION: EVOLVING NEIGHBOURHOOD, MAINSTREET CORRIDOR

	REQUIREMENT ZONING BY-LAW 2008-250	PROPOSED
MINIMUM LOT WIDTH	N/A	154.22m
MINIMUM FRONT YARD SETBACK EXCEPTION 210	5m	5.3m CANOPY 20.47m BUILDING
MINIMUM CORNER SIDE YARD SETBACK EXCEPTION 210	5m	AS EXISTING
MINIMUM INTERIOR SIDE YARD SETBACK EXCEPTION 210	12m	AS EXISTING
MINIMUM REAR YARD SETBACK EXCEPTION 210	12m	AS EXISTING
MAX. BUILDING HEIGHT	25.0m	6.4m
MAX. LOT COVERAGE FLOOR SPACE INDEX	2.0	0.26
MIN. LANDSCAPE WIDTH AROUND A PARKING LOT	MIN. 15% OF THE PARKING LOT AREA, MUST BE PROVIDED AS PERIMETER OR INTERIOR LANDSCAPED AREAS. ABUTTING A STREET MIN. 3m	3m BUFFER ABUTTING INNES, 24.8% LANDSCAPE (SOFT) COVERAGE
PARKING RATE (AREA C ON SCHEDULE 1A)	10/100m2 OF GFA = 37 (CAN BE REDUCED BY 20%)	46 TOTAL
PARKING	90° MIN. 2.6x5.2m	44 x 90° @ 2.6x5.2m
BARRIER-FREE	1 @ 3.6x5.2m (FOR 20-99 STALLS)	2 @ 3.6x5.2m
REFUSE	MIN. 9m FROM PUBLIC STREET LOT LINE, MIN. 3m FROM ALL OTHER LOT LINES. SCREENED MIN. 2m IN HEIGHT UNLESS IN-GROUND WHERE SOFT LANDSCAPE SCREEN REQ'D	SCREENED BY LANDSCAPE ELEMENTS ON NORTH AND SOUTH
RESTAURANT STACKING	WITH ORDER BOARD - 7 BEFORE/AT ORDER BOARD AND MIN. TOTAL OF 11. MIN. 3x5.7m SPACE	17 FROM ORDER POINT TO PICK UP, 35 TOTAL + 2 AT EXIT 3x6.0m SPACES
LOADING	350-900m2 OF GFA = 0	0
DRIVEWAY WIDTH	MIN. 6.0m FOR DOUBLE LANE	7.20m
AISLE WIDTH	SINGLE TRAFFIC MIN. 3m, DOUBLE LANE MIN. 6.0m, 0-40° STALLS MIN. 3.5m, 41-55° STALLS MIN. 4.3m	6.8m
BICYCLE PARKING	1/250m2 OF GROSS FLOOR AREA, MIN. 0.6x1.8m = 2	6
REFER TO DRAWING A101 FOR OVERALL SITE STATISTICS		

GENERAL NOTES:

1. DO NOT SCALE DRAWINGS
2. ALL ELEVATIONS ARE IN METRES, UNLESS NOTED OTHERWISE.
3. ALL DIMENSIONS ARE IN MILLIMETRES, UNLESS NOTED OTHERWISE.
4. DRAWING PRODUCED FROM SURVEY BY J.D. BARNES LTD. DRAWING 23-10-038-00 DATED JUNE 13, 2023
5. ALL DIMENSIONS MUST BE VERIFIED BY THE GC PRIOR TO CONSTRUCTION. ANY DISCREPANCIES MUST BE BROUGHT TO THE ATTENTION OF CHICK-FIL-A'S REPRESENTATIVE.
6. ALL WORK TO BE DONE BY THE GC UNLESS NOTED OTHERWISE.
7. DRAWINGS ARE TO BE USED IN CONJUNCTION WITH SPECIFICATIONS.
8. ALL WORK IS TO BE COMPLETED AS PER PROVINCIAL AND LOCAL REGULATIONS.
9. EVERYTHING TO BE CONSIDERED NEW UNLESS NOTED OTHERWISE.
10. MAKE GOOD ALL AREA'S DISTURBED DURING CONSTRUCTION.
11. GC IS RESPONSIBLE FOR ALL LOCATES BEFORE CONSTRUCTION START.

SITE NOTES:

PROPERTY OWNER: CHOICE REIT
LEASE: CHICK-FIL-A
APPLICANT: EXP SERVICES INC. & MHBC PLANNING
ADJACENT ZONING:
NORTH GMU & R2 WEST AM
EAST GMU & LC SOUTH G

SEATS INDOOR	86
PATIO SEATS	32
DRIVE-THRU VEHICLES	
ENTRANCE TO PICK-UP POINT	35
PICK-UP POINT TO EXIT	2
ORDER POINT TO PICK-UP POINT	17

LEGEND

■	SURVEY MONUMENT FOUND
□	SURVEY MONUMENT SET
SSIB	SHORT STANDARD IRON BAR
CP	CONCRETE PIN
PB	PLASTIC BAR
CC	CUT CROSS
WIT	WITNESS
MEAS	MEASURED
P1	PLAN 4R-19914
P2	PLAN 4R-21156
P3	SURVEYORS REAL PROPERTY REPORT BY ANNIS, O'SULLIVAN, VOLLEBEKK LTD., DATED MAY 30, 2006
JDB	J.D. BARNES LIMITED
AOG	ANNIS, O'SULLIVAN, VOLLEBEKK LTD.
G METER	EX. GAS METER
HW	EX. HANDWELL
BOL	EX. BOLLARD
SV	EX. SPRINKLER VALVE
CB	EX. CATCHBASIN
DSICB	EX. DOUBLE SIDED INLET CATCHBASIN
H	EX. HYDRANT
WV	EX. WATER VALVE
HT	EX. HYDRO TRANSFORMER
LS	EX. YARD LIGHT
PED	EX. PHONE PEDESTAL
	EX. END CAP
FO	EX. UNDERGROUND FIBRE OPTICS
ST	EX. STORM SEWER
S	EX. SANITARY SEWER
W	EX. WATER MAINS
G	EX. NATURAL GAS
OH	EX. OVERHEAD HYDRO
UB	EX. UNDERGROUND TELEPHONE
OB	EX. OVERHEAD TELEPHONE
	ROW LINE
	PROPERTY LINE
	EX. CONC. CURB
	NEW CONC. CURB
	NEW CURB CUT/DEPRESSED CURB
	MAIN ENTRANCE
	ALTERNATE ENTRANCE
	EMPLOYEE ONLY ACCESS POINTS
	NEW YARD LIGHT
	LIGHT DUTY ASPHALT
	HEAVY DUTY CONCRETE
	LIGHT DUTY CONCRETE
	HEAVY DUTY ASPHALT
	STEEL BOLLARD (SEE DWG. C9.1 & C9.4B)
	MAGNETIC BOLLARD (SEE DWGS. C9.4A&B)
	RUBBER BASE BOLLARD (SEE DWGS. C9.4A&B)

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CHICK-FIL-A
ORLEANS
4280 Innes Road
Ottawa, ON

FSR#30042

BUILDING TYPE / SIZE: iP01 SE
RELEASE: XXXXXXXXX

REVISION SCHEDULE

NO.	DATE	DESCRIPTION
U	2025-04-21	FOR TENDER
V	2025-05-21	REISSUED FOR SPA

Issued for SPA

CONSULTANT PROJECT # BRM0023002042-H0
PROJECT STATUS SPA
DATE MAY 2023
DRAWN BY T.M.

SHEET
SITE PLAN

SHEET NUMBER
A100

City File: D07-12-24-0131 & Plan: 17597

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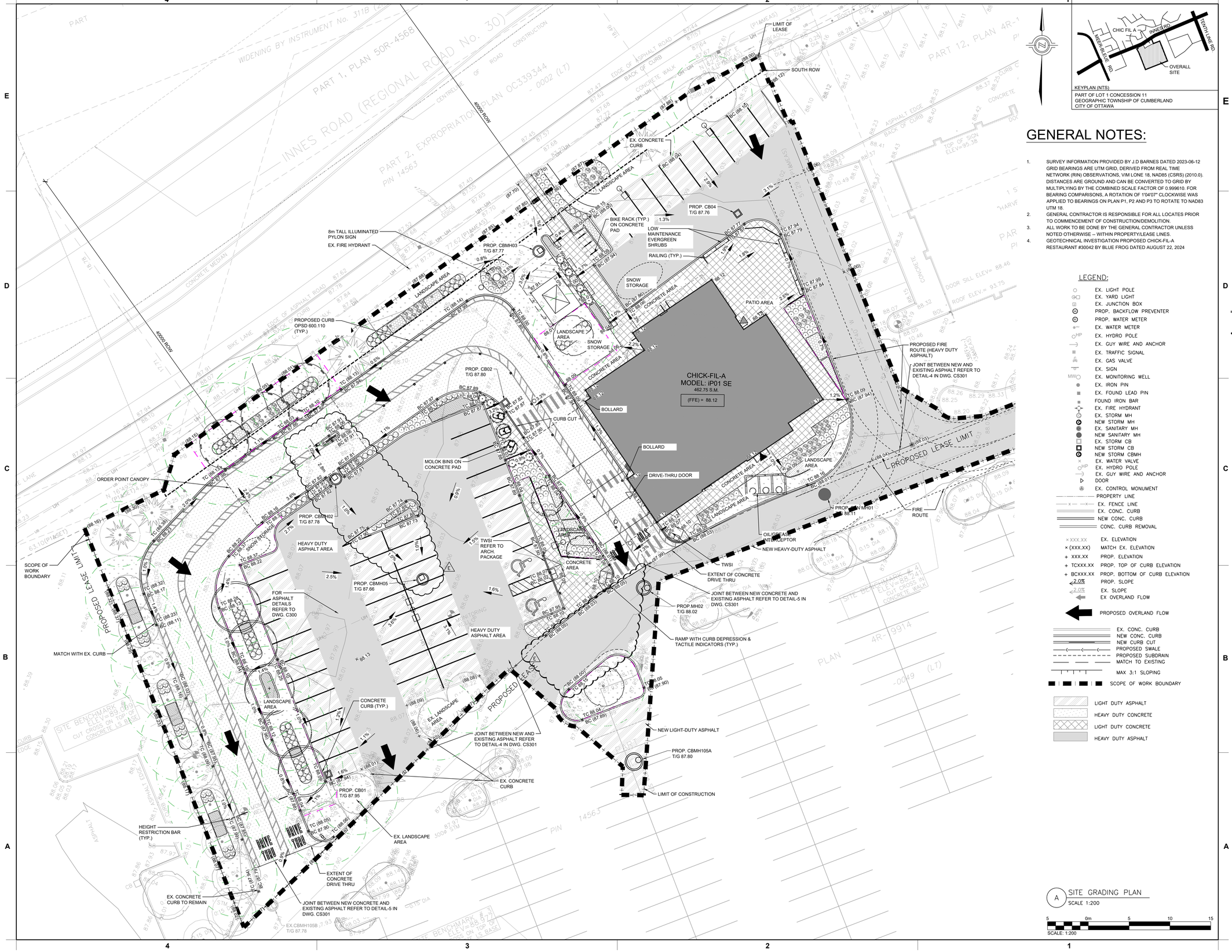
21 May 2025

Appendix B
Engineering Drawings



KEYPLAN (NTS)

PART OF LOT 1 CONCESSION 11
GEOGRAPHIC TOWNSHIP OF CUMBERLAND
CITY OF OTTAWA

GENERAL NOTES:

1. SURVEY INFORMATION PROVIDED BY J.D BARNES DATED 2023-06-12 GRID BEARINGS ARE UTM GRID, DERIVED FROM REAL TIME NETWORK (RIN) OBSERVATIONS, VIM LONE 18, NAD85 (CSRS) (2010.0). DISTANCES ARE GROUND AND CAN BE CONVERTED TO GRID BY MULTIPLYING BY THE COMBINED SCALE FACTOR OF 0.999610. FOR BEARING COMPARISONS, A ROTATION OF 1°04'07" CLOCKWISE WAS APPLIED TO BEARINGS ON PLAN P1, P2 AND P3 TO ROTATE TO NAD83 UTM 18.
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4. GEOTECHNICAL INVESTIGATION PROPOSED CHICK-FIL-A RESTAURANT #30042 BY BLUE FROG DATED AUGUST 22, 2024

LEGEND:

- EX. LIGHT POLE
- EX. YARD LIGHT
- EX. JUNCTION BOX
- PROP. BACKFLOW PREVENTER
- PROP. WATER METER
- EX. WATER METER
- EX. HYDRO POLE
- EX. GUY WIRE AND ANCHOR
- EX. TRAFFIC SIGNAL
- EX. GAS VALVE
- EX. SIGN
- EX. MONITORING WELL
- EX. IRON PIN
- EX. FOUND LEAD PIN
- FOUND IRON BAR
- EX. FIRE HYDRANT
- EX. STORM MH
- NEW STORM MH
- EX. SANITARY MH
- NEW SANITARY MH
- EX. STORM CB
- NEW STORM CB
- NEW STORM CBMH
- EX. WATER VALVE
- EX. HYDRO POLE
- EX. GUY WIRE AND ANCHOR
- DOOR
- EX. CONTROL MONUMENT
- PROPERTY LINE
- EX. FENCE LINE
- EX. CONC. CURB
- NEW CONC. CURB
- CONC. CURB REMOVAL

- ×XXX.XX EX. ELEVATION
- ×(XXX.XX) MATCH EX. ELEVATION
- +XXX.XX PROP. ELEVATION
- +TCXXX.XX PROP. TOP OF CURB ELEVATION
- +BCXXX.XX PROP. BOTTOM OF CURB ELEVATION
- 2.0% PROP. SLOPE
- 2.0% EX. SLOPE
- EX OVERLAND FLOW
- PROPOSED OVERLAND FLOW
- EX. CONC. CURB
- NEW CONC. CURB
- NEW CURB CUT
- PROPOSED SWALE
- PROPOSED SUBDRAIN
- MATCH TO EXISTING
- MAX 3:1 SLOPING
- SCOPE OF WORK BOUNDARY
- LIGHT DUTY ASPHALT
- HEAVY DUTY CONCRETE
- LIGHT DUTY CONCRETE
- HEAVY DUTY ASPHALT

A SITE GRADING PLAN
SCALE 1:200

5 0m 5 10 15
SCALE: 1:200

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5200 Buffington Road
Atlanta, Georgia 30349-2998

CHICK-FIL-A ORLEANS

4280 Innes Road
Ottawa, ON

FSR#30042

BUILDING TYPE / SIZE: iP01 SE
RELEASE: XXXXXXXXX

REVISION SCHEDULE

NO.	DATE	DESCRIPTION
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CONSULTANT PROJECT # BRM0023002042-H0
PROJECT STATUS SPA
DATE OCTOBER 2024
DRAWN BY K.J

SHEET
SITE GRADING PLAN

SHEET NUMBER
CS100

City File: D07-12-24-0131 & Plan: 17597

Issued for SPA

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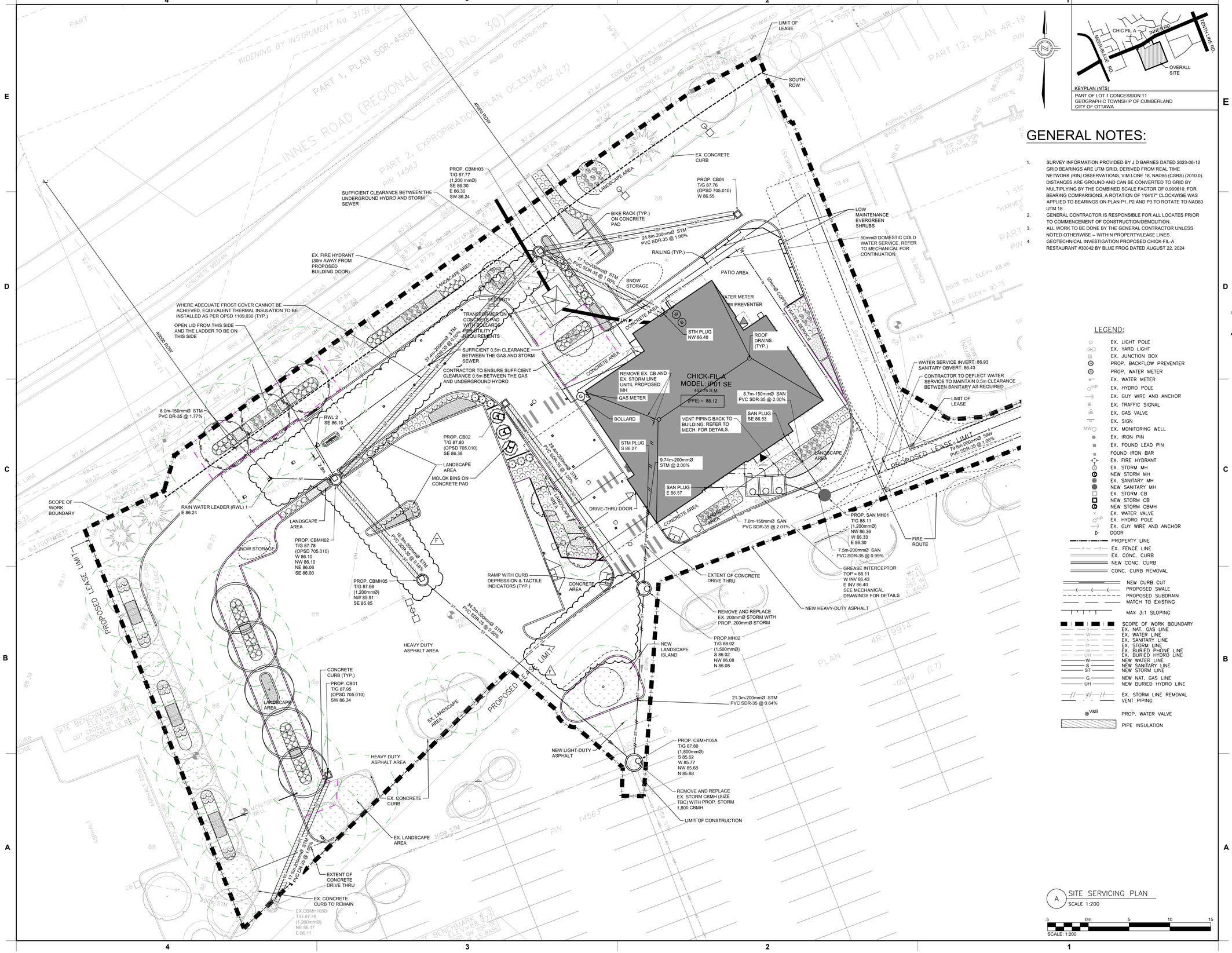
15 May 2025
XREF-CFA-TBLK.dwg - CS100



KEYPLAN (NTS)

PART OF LOT 1 CONCESSION 11
GEOGRAPHIC TOWNSHIP OF CUMBERLAND
CITY OF OTTAWA

GENERAL NOTES:

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- EX. LIGHT POLE
- EX. YARD LIGHT
- EX. JUNCTION BOX
- PROP. BACKFLOW PREVENTER
- PROP. WATER METER
- EX. WATER METER
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- EX. GUY WIRE AND ANCHOR
- EX. TRAFFIC SIGNAL
- EX. GAS VALVE
- EX. SIGN
- EX. MONITORING WELL
- EX. IRON PIN
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- FOUND IRON BAR
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- EX. BURIED HYDRO LINE
- NEW WATER LINE
- NEW SANITARY LINE
- NEW STORM LINE
- NEW NAT. GAS LINE
- NEW BURIED HYDRO LINE
- EX. STORM LINE REMOVAL
- VENT PIPING
- PROP. WATER VALVE
- PIPE INSULATION

A SITE SERVICING PLAN
SCALE 1:200

5 0m 5 10 15
SCALE: 1:200

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CHICK-FIL-A ORLEANS

4280 Innes Road
Ottawa, ON

FSR#30042

BUILDING TYPE / SIZE: iP01 SE
RELEASE: XXXXXXXXX

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CONSULTANT PROJECT # BRM0023002042-H0
PROJECT STATUS SPA
DATE OCTOBER 2024
DRAWN BY K.J

SHEET
SITE SERVICING PLAN

SHEET NUMBER
PS100

City File: D07-12-24-0131 & Plan: 17597

Issued for SPA

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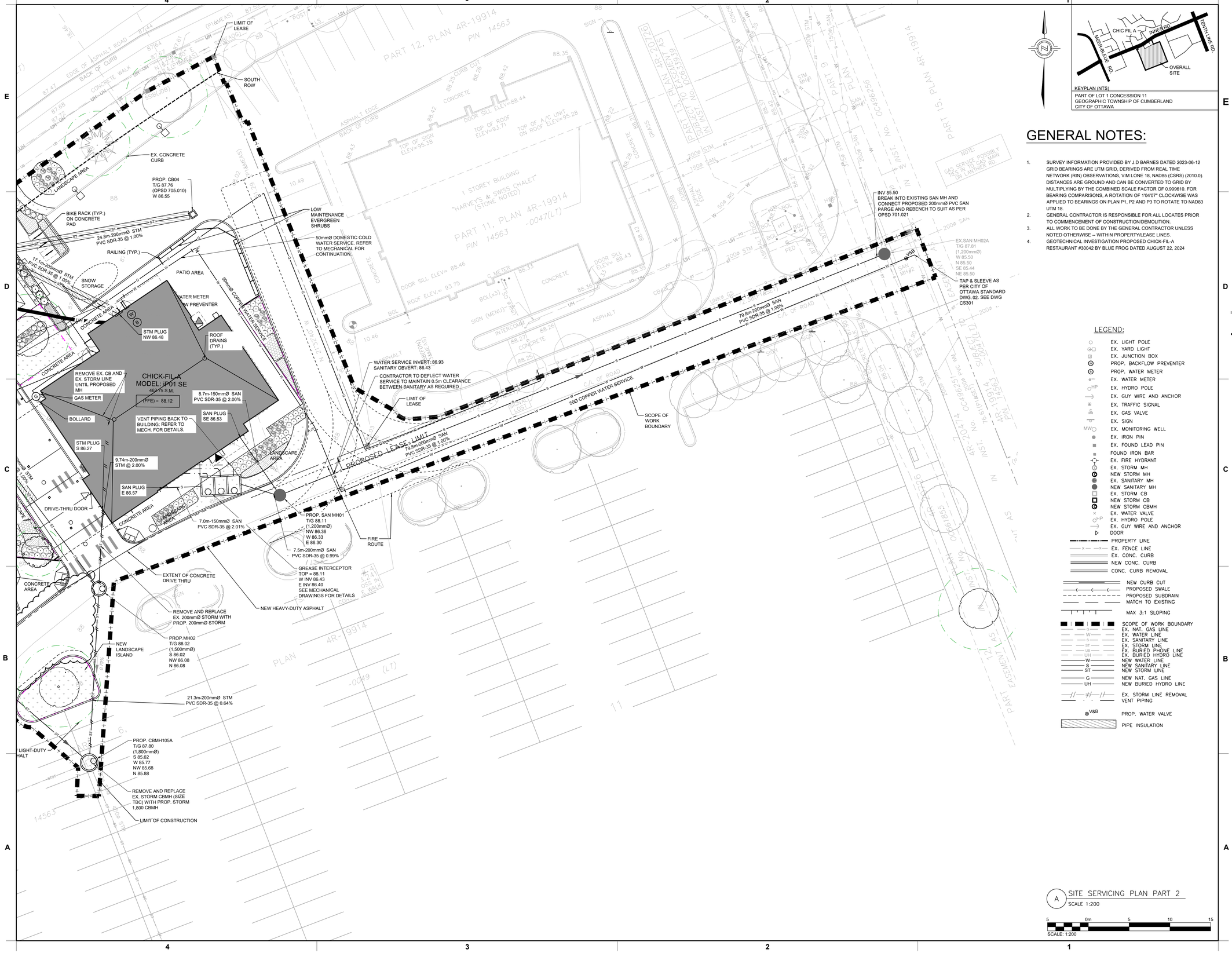
21 May 2025
XREF-CFA-TBLK.dwg - PS100



KEYPLAN (NTS)

PART OF LOT 1 CONCESSION 11
GEOGRAPHIC TOWNSHIP OF CUMBERLAND
CITY OF OTTAWA

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- EX. STORM LINE REMOVAL
- VENT PIPING
- PROP. WATER VALVE
- PIPE INSULATION

A SITE SERVICING PLAN PART 2
SCALE 1:200

5 0m 5 10 15
SCALE: 1:200

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CHICK-FIL-A ORLEANS

4280 Innes Road Ottawa, ON

Issued for SPA

FSR#30042

BUILDING TYPE / SIZE: iP01 SE
RELEASE: XXXXXXXXX

REVISION SCHEDULE

NO.	DATE	DESCRIPTION
A	2024-10-04	FOR SPA
B	2025-01-23	FOR SPA
C	2025-04-15	FOR SPA
D	2025-04-21	FOR TENDER
E	2025-04-23	ADDENDUM01
F	2025-05-21	FOR SPA

CONSULTANT PROJECT #: BRM0023002042-H0
PROJECT STATUS: SPA
DATE: OCTOBER 2024
DRAWN BY: K.J

SHEET: SITE SERVICING PLAN PART 2

SHEET NUMBER

PS101

City File: D07-12-24-0131 & Plan: 17597

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21 May 2025
XREF-CFA-TBLK.dwg - PS101

KEYPLAN (NTS)

PART OF LOT 1 CONCESSION 11
GEOGRAPHIC TOWNSHIP OF CUMBERLAND
CITY OF OTTAWA

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- XXX.XX PROP. ELEVATION
- TCXXX.XX PROP. TOP OF CURB ELEVATION
- BCXXX.XX PROP. BOTTOM OF CURB ELEVATION
- 2.0% PROP. SLOPE
- 2.0% EX. SLOPE

EXISTING OVERLAND FLOW

- EX. CONC. CURB
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- NEW CURB CUT
- PROPOSED SWALE
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- MATCH TO EXISTING
- MAX 3:1 SLOPING

CATCHMENT I.D.
AREA (ha) | RUN-OFF COEFFICIENT

DRAINAGE AREA BOUNDARY

A PRE DEVELOPMENT DRAINAGE PLAN
SCALE 1:200

5 0m 5 10 15
SCALE: 1:200

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CONSULTANT PROJECT # BRM0023002042-H0
PROJECT STATUS SPA
DATE OCTOBER 2024
DRAWN BY K.J

SHEET
PRE-DEVELOPMENT DRAINAGE PLAN

SHEET NUMBER
SWM100

City File: D07-12-24-0131 & Plan: 17597

Issued for SPA

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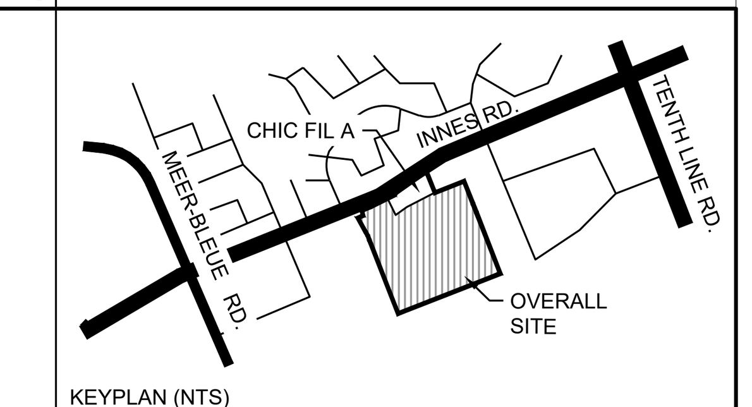
16 April 2025
XREF-CFA-TBLK.dwg - CS100



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GEOGRAPHIC TOWNSHIP OF CUMBERLAND
CITY OF OTTAWA

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A POST DEVELOPMENT DRAINAGE PLAN
SCALE 1:200

5 0m 5 10 15
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FSR#30042

BUILDING TYPE / SIZE: iP01 SE
RELEASE: XXXXXXXXX

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CONSULTANT PROJECT # BRM0023002042-H0
PROJECT STATUS SPA
DATE OCTOBER 2024
DRAWN BY K.J

SHEET
POST-DEVELOPMENT DRAINAGE PLAN

SHEET NUMBER
SWM200

City File: D07-12-24-0131 & Plan: 17597

E:\BRM\BRM-23002042-H0\60 Execution\65 Drawings\23002042-H0-SWM200-RA.dwg
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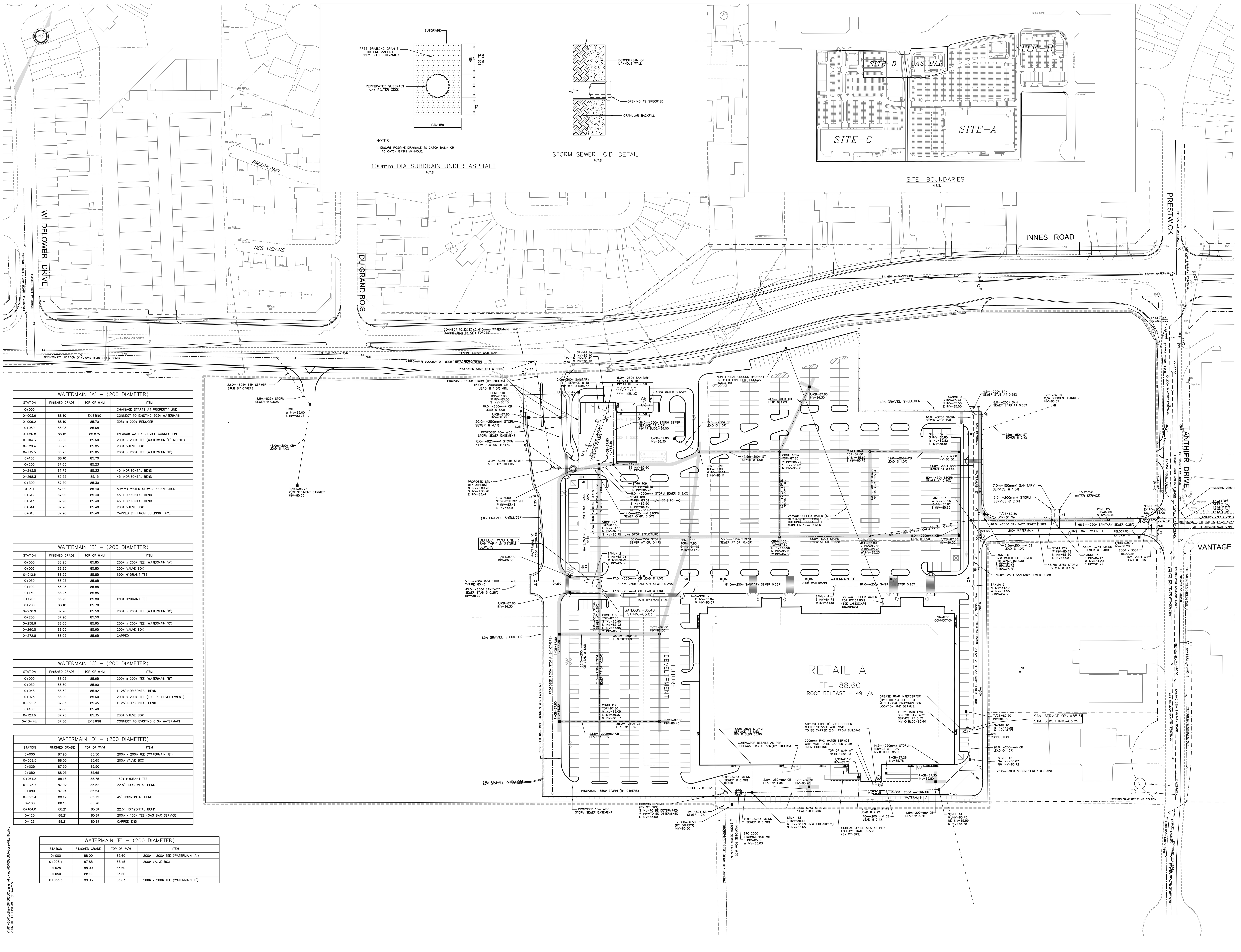
XREF-CFA-TBLK.dwg - SWM200



WATERMAIN 'A' – (200 DIAMETER)			
STATION	FINISHED GRADE	TOP OF W/M	ITEM
0+000			CHAINAGE STARTS AT PROPERTY LINE
0+003.9	88.10	EXISTING	CONNECT TO EXISTING 305ø WATERMAIN
0+006.2	88.10	85.70	305ø x 200ø REDUCER
0+050	88.08	85.68	
0+056.8	88.15	85.875	150mmø WATER SERVICE CONNECTION
0+104.3	88.00	85.60	200ø x 200ø TEE (WATERMAIN 'E'–NORTH)
0+128.4	88.25	85.85	200ø VALVE BOX
0+135.5	88.25	85.85	200ø x 200ø TEE (WATERMAIN 'B')
0+150	88.10	85.70	
0+200	87.63	85.23	
0+243.5	87.73	85.33	45' HORIZONTAL BEND
0+268.3	87.55	85.15	45' HORIZONTAL BEND
0+300	87.70	85.30	
0+311	87.90	85.40	50mmø WATER SERVICE CONNECTION
0+312	87.90	85.40	45' HORIZONTAL BEND
0+313	87.90	85.40	45' HORIZONTAL BEND
0+314	87.90	85.40	200ø VALVE BOX
0+315	87.90	85.40	CAPPED 2m FROM BUILDING FACE

WATERMAIN 'B' – (200 DIAMETER)			
STATION	FINISHED GRADE	TOP OF W/M	ITEM
0+000	88.25	85.85	200ø x 200ø TEE (WATERMAIN 'A')
0+006	88.25	85.85	200ø VALVE BOX
0+012.6	88.25	85.85	150ø HYDRANT TEE
0+050	88.25	85.85	
0+100	88.25	85.85	
0+150	88.25	85.85	
0+170.1	88.20	85.80	150ø HYDRANT TEE
0+200	88.10	85.70	
0+230.9	87.90	85.50	200ø x 200ø TEE (WATERMAIN 'D')
0+250	87.90	85.50	
0+258.9	88.05	85.65	200ø x 200ø TEE (WATERMAIN 'C')
0+260.5	88.05	85.65	200ø VALVE BOX
0+272.8	88.05	85.65	CAPPED

WATERMAIN 'C' – (200 DIAMETER)			
STATION	FINISHED GRADE	TOP OF W/M	ITEM
0+000	88.05	85.65	200ø x 200ø TEE (WATERMAIN 'B')
0+030	88.30	85.90	
0+048	88.32	85.92	11.25' HORIZONTAL BEND
0+075	88.00	85.60	200ø x 200ø TEE (FUTURE DEVELOPMENT)
0+091.7	87.85	85.45	11.25' HORIZONTAL BEND
0+100	87.80	85.40	
0+123.6	87.75	85.35	200ø VALVE BOX
0+134.4±	87.80	EXISTING	CONNECT TO EXISTING 610ø WATERMAIN

WATERMAIN 'D' – (200 DIAMETER)			
STATION	FINISHED GRADE	TOP OF W/M	ITEM
0+000	87.90	85.50	200ø x 200ø TEE (WATERMAIN 'B')
0+008.5	88.05	85.65	200ø VALVE BOX
0+025	87.90	85.50	
0+050	88.05	85.65	
0+061.2	88.15	85.75	150ø HYDRANT TEE
0+075.7	87.92	85.52	22.5' HORIZONTAL BEND
0+080	87.94	85.54	
0+095.4	88.12	85.72	45' HORIZONTAL BEND
0+100	88.16	85.76	
0+104.0	88.21	85.81	22.5' HORIZONTAL BEND
0+125	88.21	85.81	200ø x 100ø TEE (GAS BAR SERVICE)
0+126	88.21	85.81	CAPPED END

WATERMAIN 'E' – (200 DIAMETER)			
STATION	FINISHED GRADE	TOP OF W/M	ITEM
0+000	88.00	85.60	200ø x 200ø TEE (WATERMAIN 'A')
0+008.4	87.85	85.45	200ø VALVE BOX
0+025	88.00	85.60	
0+050	88.10	85.60	
0+053.5	88.03	85.63	200ø x 200ø TEE (WATERMAIN 'F')

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Stantec

Legend

- PROPOSED SANITARY SEWER
- PROPOSED STORM SEWER
- PROPOSED CATCH BASIN
- PROPOSED CATCHBASIN / MANHOLE
- PROPOSED STORM MANHOLE
- PROPOSED SANITARY MANHOLE
- PROPOSED WATERMAIN
- VB PROPOSED VALVE BOX
- PROPOSED FIRE HYDRANT AND VALVE
- M PROPOSED WATER METER
- RM PROPOSED REMOTE WATER METER
- PROPOSED 100ø SUB-DRAIN (SEE DETAIL)
- PHASE 1 – CONSTRUCTION LIMITS

GENERAL NOTES

1. ALL WORK SHALL BE CARRIED OUT IN COMPLIANCE WITH THE APPLICABLE HEALTH AND SAFETY ACT AND REGULATIONS FOR CONSTRUCTION PROJECTS.
2. ALL WORK AND MATERIALS TO CONFORM WITH CURRENT MINISTRY OF THE ENVIRONMENT & ENERGY OF ONTARIO, CITY OF OTTAWA, ONTARIO PROVINCIAL STANDARDS AND SPECIFICATIONS. LOCAL UTILITY STANDARDS AND MINISTRY OF TRANSPORTATION STANDARDS WILL APPLY WHERE REQUIRED.
3. THE CONTRACTOR IS ADVISED THAT WORKS BY OTHERS MAY BE ONGOING DURING THE PERIOD OF THIS CONTRACT. THE CONTRACTOR SHALL COORDINATE CONSTRUCTION ACTIVITIES WITH ALL OTHER CONTRACTORS AND PREVENT CONSTRUCTION CONFLICTS.
4. THE INFORMATION SHOWN FOR EXISTING UTILITIES WAS PROVIDED BY OTHERS. THE CONTRACTOR IS RESPONSIBLE FOR LOCATING AND PROTECTING ALL UTILITIES DURING CONSTRUCTION. ALL EXISTING UTILITIES MUST BE LOCATED AND VERIFIED BY EACH UTILITY PRIOR TO COMMENCEMENT OF WORK. ANY VARIANCE IS TO BE IMMEDIATELY REPORTED TO THE ENGINEER. LOST TIME DUE TO FAILURE OF THE CONTRACTOR TO CONFIRM UTILITY LOCATIONS AND NOTIFY THE ENGINEER OF POSSIBLE CONFLICTS PRIOR TO CONSTRUCTION WILL BE AT THE CONTRACTORS EXPENSE.
5. ALL CONSTRUCTION SHALL BE CARRIED OUT IN ACCORDANCE WITH THE RECOMMENDATIONS MADE IN THE GEOTECHNICAL REPORT.

WATERMAINS

1. WATERMAIN SHALL BE POLYVINYL CHLORIDE (PVC) CLASS 150 DR-18 PIPE MANUFACTURED TO AWWA C900-89 AND CSA CAN3 B137.3-M1986 WITH GASKETED BELL END C/W #14 AWG SOLID COPPER TRACER WIRE.
2. ALL WATERMAINS, WATER SERVICES, CONNECTIONS AND APPURTENANCES AS PER CITY OF OTTAWA STANDARDS. THE CONTRACTOR SHALL CO-ORDINATE AND PAY ALL RELATED COSTS INCLUDING THE COST OF CONNECTION, INSPECTION AND DISINFECTION BY CITY OF OTTAWA PERSONELL. WATERMAIN TRENCH TO BE IN ACCORDANCE WITH CITY OF OTTAWA W17.
3. ALL WATERMAINS SHALL HAVE MIN. COVER OF 2.4m. WATERMAINS ARE TO BE INSTALLED TO THE ELEVATIONS SHOWN ON THE APPROVED SITE SERVICING DRAWING. WHERE SPECIFIC WATERMAIN ELEVATIONS ARE NOT SHOWN ON SERVICING DRAWING, A MINIMUM COVER OF 2.4m FROM PROPOSED GRADES, AS SHOWN ON THE GRADING PLAN, MUST BE MAINTAINED AT ALL TIMES. IN PREGRADE AREAS COVER TO BE FROM PREGRADED ELEVATIONS.
4. ALL WATERMAIN BENDS, JOINTS, TEES AND PLUGS SHALL BE MECHANICALLY RETRAINED IN ACCORDANCE WITH CITY OF OTTAWA STANDARDS.

6. ALL FIRE HYDRANT INSTALLATIONS SHALL BE PER CITY OF OTTAWA W19. HYDRANTS SHALL BE PAINTED IN ACCORDANCE WITH OTTAWA STANDARDS.
6. ALL HYDRANT FLANGE ELEVATIONS TO BE INSTALLED 0.15m ABOVE PROPOSED FINISHED GRADE AT HYDRANT.
7. BUILDING SERVICE VALVES TO BE 3.0m OFF THE FACE OF THE BUILDING UNLESS OTHERWISE NOTED AND MUST BE RESTRAINED A MINIMUM OF 12m BACK FROM STUB.
8. WATERMAINS MUST COMPLY WITH MINIMUM HORIZONTAL AND VERTICAL CLEARANCES IN ACCORDANCE WITH LOCAL PROVINCIAL GUIDELINES AND THE APPLICABLE BUILDING AND PLUMBING CODE. WHERE HORIZONTAL SEPARATIONS CANNOT BE ACHIEVED, APPROVAL FROM THE ENGINEER MUST BE OBTAINED AND A MINIMUM 500mm VERTICAL SEPARATION MUST BE MAINTAINED.
9. ALL WATERMAINS SHALL BE HYDROSTATICALLY TESTED IN ACCORDANCE WITH LOCAL MUNICIPAL AND PROVINCIAL GUIDELINES UNLESS OTHERWISE DIRECTED. PROVISIONS FOR FLUSHING WATER LINE PRIOR TO TESTING, ETC. MUST BE PROVIDED.
10. ALL WATERMAINS SHALL BE BACTERIALOGICALLY TESTED IN ACCORDANCE WITH LOCAL MUNICIPAL AND PROVINCIAL GUIDELINES. ALL CHLORINATED WATER TO BE DISCHARGED AND PRETREATED TO ACCEPTABLE LEVELS PRIOR TO DISCHARGE. ALL DISCHARGED WATER MUST BE CONTROLLED AND TREATED SO AS NOT TO ADVERSELY EFFECT THE ENVIRONMENT. IT IS THE RESPONSIBILITY OF THE CONTRACTOR TO ENSURE THAT ALL MUNICIPAL AND/OR PROVINCIAL REQUIREMENTS ARE FOLLOWED.
11. ALL WATERMAIN STUBS SHALL BE TERMINATED WITH A PLUG AND 50mm BLOW OFF UNLESS OTHERWISE NOTED.
12. CATHODIC PROTECTION PER CITY OF OTTAWA W40 AND W42.

STORM AND SANITARY SEWERS

1. STORM AND SANITARY MANHOLES SHALL BE IN ACCORDANCE WITH OPSD 701.010 TO 701.014. FRAME AND COVER TO OPSD 401.020. SAFETY PLATFORM TO BE INSTALLED IN ALL MANHOLES WHERE DEPTH EXCEEDS 5.0m.
2. ALL CATCH BASINS TO BE PRECAST TO OPSD 705.010 c/w FRAME AND GRATE AS PER OPSD 400.020.
3. SEWER TRENCH SHALL CONSIST OF CLASS 'B' BEDDING PER CITY OF OTTAWA STANDARDS S6 AND S7. COMPACTION SHALL BE A MINIMUM OF 98% STANDARD PROCTOR DENSITY.
4. ALL STORM SEWER PIPES UP TO 450mm DIA. SHALL BE PVC SDR-35 OR APPROVED EQUIVALENT. ALL STORM SEWER PIPES 525mm DIA. AND LARGER SHALL BE CONCRETE AND EQUAL TO C.S.A. SPECIFICATIONS A257.2 REINFORCED CLASSES AS SPECIFIED (65-D, 100-D, 140-D,) OR LATEST AMENDMENT UNLESS OTHERWISE SPECIFIED.
5. ALL SANITARY PVC SEWER PIPES SHALL BE SDR-35 EQUAL TO CSA SPECIFICATIONS B182.2-M1990 OR LATEST AMENDMENT UNLESS OTHERWISE NOTED.
6. ALL MANHOLE AND CATCH BASIN EXCAVATIONS TO BE BACKFILLED WITH GRANULAR MATERIAL COMPACTED TO 98% STANDARD PROCTOR DENSITY.
7. STORM MANHOLES SHALL BE BENCHED TO SPRING LINE UNLESS OTHERWISE SPECIFIED. SANITARY MANHOLES SHALL BE BENCHED TO OBVERT. MINIMUM WIDTH OF BENCHING TO BE 230mm OR AS SPECIFIED ON DRAWINGS.
8. "MODULOC" OR APPROVED PRE-CAST MANHOLE AND CATCH BASIN ADJUSTERS TO BE USED IN LIEU OF BRICKING. PARGE ADJUSTING UNITS ON THE OUTSIDE ONLY.
9. FOR CONSTRUCTION DETAILS NOT SHOWN ON PLANS, REFERENCE SHALL BE MADE TO THE LOCAL PROVINCIAL STANDARDS DRAWINGS AND MUNICIPAL STANDARDS.
10. SERVICES TO BUILDINGS TO BE TERMINATED 1.5m FROM THE OUTSIDE FACE OF BUILDING UNLESS OTHERWISE NOTED.
11. ALL SINGLE CATCH BASIN LEADS TO BE 250mmø PVC. SDR-35 OR APPROVED EQUIVALENT UNLESS OTHERWISE SPECIFIED.
12. ALL CB LEAD INVERTS TO BE 1.5m BELOW FINISHED GRADE UNLESS OTHERWISE SPECIFIED.
13. ALL IRRIGATION SLEEVES ARE TO BE 100mmø PVC UNLESS OTHERWISE NOTED. SEE LANDSCAPE DRAWING FOR DETAILS.
14. THE CONTRACTOR IS TO PROVIDE CCTV CAMERA INSPECTIONS OF ALL SANITARY AND STORM SEWERS, INCLUDING PICTORIAL REPORT, ONE (1) CD COPY AND TWO (2) VIDEO TAPES IN A FORMAT SATISFACTORY TO THE ENGINEER. ALL SEWERS ARE TO BE FLUSHED PRIOR TO CAMERA INSPECTION.
15. LASER ALIGNMENT CONTROL TO BE UTILIZED ON ALL SEWER INSTALLATIONS.
16. EXISTING MANHOLES TO BE RE-BENCHED WHERE A NEW CONNECTION IS MADE.

Revision		By	Appd.	Date
14C	INNES ROAD ENTRANCE ALIGNMENT	CV	RMW	JUL.18/05
13C	SERVICING & GRADING REVISIONS	CV	RMW	APR 19/05
12C	ISSUED FOR CONSTRUCTION	DMV	RMW	NOV 11/04
11	SITE PLAN SERVICING AND GRADING REVISION	DMV	RMW	OCT.28/04
10	RE-ISSUED FOR TENDER	BCB	RMW	AUG.27/04
9	ISSUED FOR TENDER	BCB	RMW	JULY 19/04
8	ISSUED FOR APPROVAL	BCB	RMW	JULY 19/04
7	REVISED PER CITY COMMENTS	SK	RMW	JUN.21/04
6	REVISED PROPERTY LINES AS PER AOVL	BCB	RJB	JUN.8/04
5	REVISED AS PER CITY COMMENTS	RMW	RJB	MAY 6/04
4	REVISED SITE PLAN AND SERVICING	RMW	RJB	APR.2/04
3	ADDED STORM SEWER EASEMENT	BCB	RBJ	FEB.23/04
2	SUBMITTED FOR SITE PLAN APPROVAL	BCB	RBJ	NOV.3/03
1	REVISED SITE PLAN	BCB	RJB	OCT.8/03

File Name: 60400250U-BASE	Dwn.	Chkd.	Dsgn.	Date
	BCB	RMW	RJB	JUNE 2003

Seals

Client/Project

LOBLAWS PROPERTIES LIMITED

INNES ROAD

Ottawa, Ontario

Title

SERVICING PLAN

Project No. 60400250

Scale 1:750 (0, 7.5, 22.5, 37.5m)

Drawing No. SS-1

Sheet 1 of 6

Revision 14C

Appendix C
Fire Flow Calculations

PROJECT NO. : BRM-23002042-H0
PROJECT NAME. : Chick-fil-A Orleans
Date: April, 2025

Calculation Sheet : 1

Fire Underwriters Survey (FUS) Calculations

Required Fire Flow Calculation

F = 220 x C x √A **L/min** *FUS Water Supply for Public Fire Protection, 2020*

F = Required Fire Flow
C = Construction Type Coefficient
A = Total Above-Ground Floor Area (m^2)

1 Estimate of Fire Flow (Baseline)

OBC Occupancy	Commercial
Foot Print	462 m^2
Number of Storeys	1

Level	Area (m^2)
1	461.94

Construction Class

Construction Class	Non Combustible
Coefficient	1.0

Total Area of Building

A=	462 m^2

Fire Flow

F= 220 * 1* √462
F= 4729
F= 5000 **L/min** *rounded to nearest 1000L/min, must be >2000 L/min*

2 Occupancy Charge

Contents	Free Burning
Charge	0.15

O= F * Occupancy Charge
O= 5000*-0.15
O= 750 **L/min** *no rounding*

3 Automatic Sprinkler Reduction

NFPA Sprinkler Standard	No	0%	0%
Standard Water Supply	No	0%	
Fully Supervised System	No	0%	

S= F * Sprinkler Reduction
S= 5000*0%
S= 0 **L/min** *no rounding*

4 Exposure Increase

Direction	Distance (m)	Charge	TOTAL
North	>45	0%	10%
East	29	10%	
South	>45	0%	
West	>45	0%	

max 75%

E= F * Exposure Charge
E= 5000*10%
E= 500 **L/min** *no rounding*

H Adjusted Fire Flow

Fa= F+O+E+S
Fa= 5000+750-0-500
Fa= 6250 L/min
Fa= 6000 **L/min** *rounded to nearest 1000L/min*

REQUIRED FIRE FLOW	**6000**	**L/min**
	100	**L/s**
	1585	**usgm**

Appendix D
Water Boundary Conditions Calculation

Khadija Jawwad

From: Elsby, Cam <Cam.Elsby@ottawa.ca>
Sent: Tuesday, September 24, 2024 11:00 AM
To: Khadija Jawwad
Cc: Kate Logan; Saifullah Khan
Subject: Re: 4270 Innes Road, Orleans (Chick-Fil-A) Phase 1/2 Pre-Consultation Submission
Attachments: 4270 Innes Boundary Condition.docx

Hi Khadija,

Please find attached boundary condition result as requested.

Please don't hesitate to reach out should you have any questions or concerns.

Kind regards,

Cam Elsby, P.Eng.
Project Manager, Infrastructure Approvals
Planning, Development and Building Services Department (PDBS) | Direction générale des services de la planification, de l'aménagement et du bâtiment (DGSPAB)
Development Review – East Branch
City of Ottawa | Ville d'Ottawa
110 Laurier Avenue West Ottawa, ON | 110, avenue Laurier Ouest. Ottawa (Ontario) K1P 1J1
613.580.2424 ext./poste 21443
cam.elsby@ottawa.ca

From: Elsby, Cam <Cam.Elsby@ottawa.ca>
Sent: Tuesday, September 17, 2024 1:03 PM
To: Khadija Jawwad <Khadija.Jawwad@exp.com>
Cc: Kate Logan <Kate.Logan@exp.com>; Saifullah Khan <saifullah.khan@exp.com>
Subject: Re: 4270 Innes Road, Orleans (Chick-Fil-A) Phase 1/2 Pre-Consultation Submission

Thanks Khadija, I've now passed your requests onto our Asset Management team for processing. Please note that their turnaround time is approximately 2 weeks at this time due to a large influx of requests.

Please don't hesitate to reach out should you have any questions or concerns.

Kind regards,

Cam Elsby, P.Eng.
Project Manager, Infrastructure Approvals
Planning, Development and Building Services Department (PDBS) | Direction générale des services de la planification, de l'aménagement et du bâtiment (DGSPAB)
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cam.elsby@ottawa.ca

From: Khadija Jawwad <Khadija.Jawwad@exp.com>
Sent: Tuesday, September 17, 2024 12:13 PM
To: Elsby, Cam <Cam.Elsby@ottawa.ca>
Cc: Kate Logan <Kate.Logan@exp.com>; Saifullah Khan <saifullah.khan@exp.com>
Subject: RE: 4270 Innes Road, Orleans (Chick-Fil-A) Phase 1/2 Pre-Consultation Submission

Hello Cam,
To summarize the information:
- **Location of service:** Provided in the attached drawing. (Marked up in blue file named: *Water Connection.pdf*)
- **Type of development:** Commercial Development
- **Average daily demand:** 0.335 L/s
- **Maximum daily demand:** 0.50 L/s
- **Maximum hourly daily demand:** 0.60 L/s
- **Required fire flow and completed FUS Design Declaration if applicable.** FUS Method: 100 L/s, OBC Method: 30 L/s

Best,

Khadija Jawwad, EIT
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From: Khadija Jawwad
Sent: Tuesday, September 17, 2024 12:10 PM
To: Elsby, Cam <Cam.Elsby@ottawa.ca>
Cc: Kate Logan <Kate.Logan@exp.com>; Saifullah Khan <saifullah.khan@exp.com>
Subject: RE: 4270 Innes Road, Orleans (Chick-Fil-A) Phase 1/2 Pre-Consultation Submission

Hello Cam,

Please find attached.

If you need any further information or details please let me know. 😊

Best,

Khadija Jawwad, EIT
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From: Elsby, Cam <Cam.Elsby@ottawa.ca>
Sent: Tuesday, September 17, 2024 10:43 AM
To: Khadija Jawwad <Khadija.Jawwad@exp.com>
Cc: Kate Logan <Kate.Logan@exp.com>; Saifullah Khan <saifullah.khan@exp.com>; Rashid, Zoha <zoha.rashid@ottawa.ca>; Andrew Hannaford <ahannaford@mhbcplan.com>; Gilbert, Jerrica <jerrica.gilbert@ottawa.ca>
Subject: Re: 4270 Innes Road, Orleans (Chick-Fil-A) Phase 1/2 Pre-Consultation Submission

Hi Khadija,

I've reviewed the submitted calculations for the boundary condition request and peak sanitary flow and have the following comments:

1. The water demands should be calculated using the gross commercial area rather than just the building area; please revise the demands accordingly.
2. Please provide a revised connection figure to clearly distinguish the connection point into the municipal water system, including the watermain size.

Once these changes are made, I'll be sure to pass the requests over to our Asset Management team for processing.

With regards to your question about runoff coefficient, typically a runoff coefficient of 0.2 is used for grassed or purely landscaped areas.

Please don't hesitate to reach out should you have any further questions or concerns.

Kind regards,

Cam Elsby, P.Eng.
Project Manager, Infrastructure Approvals
Planning, Development and Building Services Department (PDBS) | Direction générale des services de la planification, de l'aménagement et du bâtiment (DGSPAB)
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cam.elsby@ottawa.ca

From: Gilbert, Jerrica <jerrica.gilbert@ottawa.ca>
Sent: Monday, September 16, 2024 3:10 PM
To: Khadija Jawwad <Khadija.Jawwad@exp.com>; Elsby, Cam <Cam.Elsby@ottawa.ca>
Cc: Kate Logan <Kate.Logan@exp.com>; Saifullah Khan <saifullah.khan@exp.com>; Rashid, Zoha <zoha.rashid@ottawa.ca>; Andrew Hannaford <ahannaford@mhbcplan.com>
Subject: FW: 4270 Innes Road, Orleans (Chick-Fil-A) Phase 1/2 Pre-Consultation Submission

Hi Khadija and Cam,

I am forwarding Khadija's questions highlighted below to Cam since he is the Engineer on this file. I'm not entirely sure if Asset Management will review at this stage given that this isn't a formal application yet, but Cam would have more insight on that process than I would.

Thank you,

Jerrica Gilbert (they/them), RPP MCIP
Planner II | Urbaniste II
Development Review - East | Examen des demandes d'aménagement - est
Planning, Development and Building Services Department (PDBS) | Direction générale des services de la planification, de l'aménagement et du bâtiment (DGSPAB)
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From: Khadija Jawwad <Khadija.Jawwad@exp.com>
Sent: September 16, 2024 2:58 PM
To: Gilbert, Jerrica <jerrica.gilbert@ottawa.ca>
Cc: Kate Logan <Kate.Logan@exp.com>; Saifullah Khan <saifullah.khan@exp.com>
Subject: 4270 Innes Road, Orleans (Chick-Fil-A) Phase 1/2 Pre-Consultation Submission

Hello Jerrica,

As per the City of Ottawa Comments:

Please provide the boundary conditions for the 200 mm watermain at 4210 Innes Road. Location of connection will be 72 m east of the limit of lease.

We have calculated the following expected demands:
• **Location of service:** Provided in the attached drawing. (Marked up in blue and yellow in file named: *Sanitary and WM Connection.pdf*)
• **Type of development:** Commercial Development
• **Average daily demand:** 0.033 l/s
• **Maximum daily demand:** 0.05 l/s
• **Maximum hourly daily demand:** 0.06 l/s
• **Required fire flow and completed FUS Design Declaration if applicable.** OBC Method: 30 L/s, FUS Method: 100 L/s
• **Supporting Calculations for all demands listed above and required fire flow as per Ontario Building Code or Fire Underwriter Surveys (See technical Bulletin ISTB-2021-03).**

Am I to be using FUS or OBC for calculating fire flow?

Attached are the proposed peak wet weather sanitary flow rate and supporting calculations. Could you please forward this to the City of Ottawa Asset Management team for analysis to demonstrate that there is adequate residual capacity in the receiving and downstream wastewater system to accommodate the proposed development?
Peak wet weather sanitary flow rate of 0.39 L/s for the development. Calculations attached in *Sanitary and watermain calcs*.

Please let me know if you need any clarifications.

Best,

Khadija Jawwad, EIT
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'

Boundary Conditions
4270 Innes Road

Provided Information

Scenario	Demand	
	L/min	L/s
Average Daily Demand	20	0.34
Maximum Daily Demand	30	0.50
Peak Hour	36	0.60
Fire Flow Demand #1	6,000	100.00

Location

Results

Connection 1 – Lanther Drive

Demand Scenario	Head (m)	Pressure[1] (psi)
Maximum HGL	130.3	60.2
Peak Hour	126.3	54.5
Max Day plus Fire Flow #1	128.2	57.2

[1] Ground Elevation = 87.9 m

Notes

1. *Demands for proposed Connection 1 at existing private water main were assigned to upstream junction at Lanther Drive & Vantage Drive off the public looped watermains. The engineer must calculate headloss off the private watermain.*

Disclaimer

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

CFA Orleans - Peak Hour Pressure Private Watermain - PRESSURE LOSS CALCULATION

	Q = REQUIRED FLOW for FIRE PROTECTION (L/S)	Q = REQUIRED FLOW for DOMESTIC DEMAND (L/S)	D = NOMINAL PIPE DIAMETER (m)	L = LENGTH OF WATERMAIN (m)	TYPE	C VALUE	INSIDE DIAMETER (m)	WALL THICKNESS (m)	CROSS SECTIONAL AREA (m2)	V =FLOW VELOCITY (m/s)
Existing Private Watermain	n/a	0.6	0.200	192.0	PVC	110	0.200	0.006	0.031	0.02
Proposed Private Watermain	n/a	0.6	0.050	123.4	PVC	100	0.046	0.003	0.002	0.36

	START TOP OF PIPE ELEV (m)	END TOP OF PIPE ELEV (m)	STATIC HEAD (m)
Existing Private Watermain	85.70	85.63	0.07
Proposed Private Watermain	85.63	85.60	0.03

	MINOR HEAD LOSSES					
	200 mm PVC			50mm PVC		
	Existing Private Watermain			Proposed Private Watermain		
	Number	K	Sub Total K	Number	K	Sub Total K
Inlet Anti Vortex Plate		1.00	0.00		1.00	0.00
Pipe Contraction		0.25	0.00		0.25	0.00
Pipe Expansion		0.25	0.00		0.25	0.00
Strainer/Reducer		0.50	0.00		0.50	0.00
Standard 90d Bend	1	0.90	0.90	3	0.90	2.70
Standard 45d Bend		0.45	0.00		0.45	0.00
Standard 22.5d Bend		0.23	0.00		0.23	0.00
Standard 11.25d Bend		0.10	0.00	1	0.10	0.10
Long Radius Bend, 45d / 90d		0.50	0.00		0.50	0.00
Tee - flow through run		0.60	0.00		0.60	0.00
Tee - flow through branch	1	1.80	1.80		1.80	0.00
Gate Valve	1	0.40	0.40		0.40	0.00
300mm to 400mm Pipe Expansion		0.20	0.00		0.20	0.00
Backflow Preventor		1.20	0.00	1	1.20	1.20
Meter		5.00	0.00	1	5.00	5.00
Drain Valve	1	0.40	0.40		0.40	0.00
Check Valve		4.00	0.00		4.00	0.00
Pipe Exit		1.00	0.00		1.00	0.00
K TOTALS			3.50			9.00

	H = STATIC HEAD = HIGHEST SYSTEM ELEV - PIPE CONNECTION ELEV (m)	HL1 = FITTINGS FRICTION HEAD LOSS = (K TOTAL) (V)**2/2G (m)		HL2 = PIPE WALL FRICTION HEAD LOSS = 6.78 (L)/(D)**1.1655 *(V/C)**1.85 (m)		HL3 = VELOCITY HEAD = (V)**2 / 2G (m)		H TOTAL = TOTAL DYNAMIC HEAD = H + HL1 + HL2 + HL3 (m)		SYSTEM PRESSURE LOSS (Kpa)	SYSTEM PRESSURE LOSS (psi)
Existing Private Watermain	0.07	0.000	n/a	0.00	n/a	0.00	n/a	0.07	n/a	0.70	0.10
Proposed Private Watermain	0.03	0.000	n/a	0.92	n/a	0.01	n/a	0.95	n/a	9.36	1.36

Provided Peak Hour Pressure at Connection 1: 54.50 psi

Proposed Pressure at the Building: 53.04 psi

CFA Orleans - Max Day + Fire Flow - Private Watermain - PRESSURE LOSS CALCULATION

	Q = REQUIRED FLOW for FIRE PROTECTION (L/S)	Q = REQUIRED FLOW for DOMESTIC DEMAND (L/S)	D = NOMINAL PIPE DIAMETER (m)	L = LENGTH OF WATERMAIN (m)	TYPE	C VALUE	INSIDE DIAMETER (m)	WALL THICKNESS (m)	CROSS SECTIONAL AREA (m2)	V =FLOW VELOCITY (m/s)
Existing Private Watermain	n/a	0.6	0.200	192.0	PVC	110	0.200	0.006	0.031	0.02
Proposed Private Watermain	n/a	0.6	0.050	123.4	PVC	100	0.046	0.003	0.002	0.36

	START TOP OF PIPE ELEV (m)	END TOP OF PIPE ELEV (m)	STATIC HEAD (m)
Existing Private Watermain	85.70	85.63	0.07
Proposed Private Watermain	85.63	85.60	0.03

	MINOR HEAD LOSSES					
	200 mm PVC			50mm PVC		
	Existing Private Watermain			Proposed Private Watermain		
	Number	K	Sub Total K	Number	K	Sub Total K
Inlet Anti Vortex Plate		1.00	0.00		1.00	0.00
Pipe Contraction		0.25	0.00		0.25	0.00
Pipe Expansion		0.25	0.00		0.25	0.00
Strainer/Reducer		0.50	0.00		0.50	0.00
Standard 90d Bend	1	0.90	0.90	3	0.90	2.70
Standard 45d Bend		0.45	0.00		0.45	0.00
Standard 22.5d Bend		0.23	0.00		0.23	0.00
Standard 11.25d Bend		0.10	0.00	1	0.10	0.10
Long Radius Bend, 45d / 90d		0.50	0.00		0.50	0.00
Tee - flow through run		0.60	0.00		0.60	0.00
Tee - flow through branch	1	1.80	1.80		1.80	0.00
Gate Valve	1	0.40	0.40		0.40	0.00
300mm to 400mm Pipe Expansion		0.20	0.00		0.20	0.00
Backflow Preventor		1.20	0.00	1	1.20	1.20
Meter		5.00	0.00	1	5.00	5.00
Drain Valve	1	0.40	0.40		0.40	0.00
Check Valve		4.00	0.00		4.00	0.00
Pipe Exit		1.00	0.00		1.00	0.00
K TOTALS			3.50			9.00

	H = STATIC HEAD = HIGHEST SYSTEM ELEV - PIPE CONNECTION ELEV (m)	HL1 = FITTINGS FRICTION HEAD LOSS = (K TOTAL) (V)**2/2G (m)		HL2 = PIPE WALL FRICTION HEAD LOSS = 6.78 (L)/(D)**1.1655 *(V/C)**1.85 (m)		HL3 = VELOCITY HEAD = (V)**2 / 2G (m)		H TOTAL = TOTAL DYNAMIC HEAD = H + HL1 + HL2 + HL3 (m)		SYSTEM PRESSURE LOSS (Kpa)	SYSTEM PRESSURE LOSS (psi)
Existing Private Watermain	0.07	0.000	n/a	0.00	n/a	0.00	n/a	0.07	n/a	0.70	0.10
Proposed Private Watermain	0.03	0.000	n/a	0.92	n/a	0.01	n/a	0.95	n/a	9.36	1.36

Provided Max Day + Fire Flow Pressure at Connection 1: 57.20 psi

Proposed Pressure at the Building: 55.74 psi

Appendix E
Storm Water Management Calculation

PROJECT NO. :BRM-23002042-H0
PROJECT NAME. : Proposed Chick fil A, 4280 Innes Road in Orleans, Ottawa, Ontario
Date: January 2025

CALCULATION Sheet :1

Pre Development Site Hydrology

Drawing No. DP1

Land Type	Area, A		C	Total Area	A x C	Weighted C
	(m2)	(ha)		(ha)		
Hardsurface	3733.8	0.373	0.90	0.408	0.3	0.84
Landscape	345.84	0.035	0.20		0.007	

Total Area	0.41	ha
Weighted Runoff Coefficient, C	0.84	

Run off Calculation (using Modified Rational Method):

Q = C_i * C * i * A / 360 cms

C = Runoff Coefficient
i = Rainfall intensity (mm/hr) [City of Ottawa IDF]
A = Watershed area (ha)

Time of Concentration, T_c	10.00	min

IDF Eqn : $i = A / (B + T)^{C}$

A, B & C Parameter for IDF Curve

Year	A =	B =	C =
2	732.951	6.20	0.81
5	998.071	6.05	0.814
10	1174.184	6.01	0.816
25	1402.884	6.02	0.819
50	1569.58	6.01	0.82
100	1735.688	6.01	0.82

Pre Development Peak Flows:

YEAR	Rainfall	Intensity Peaking	Flows	
	mm/hr	Factor, C_i	m3/sec	L/Sec
2	76.81	1.00	0.073	73.17
5	104.19	1.00	0.099	99.26
10	122.14	1.00	0.116	116.36
25	144.69	1.00	0.138	137.84
50	161.47	1.00	0.154	153.83
100	178.56	1.00	0.170	170.11

PROJECT NO. :BRM-23002042-H0
PROJECT NAME. : Proposed Chick fil A, 4280 Innes Road in Orleans, Ottawa, Ontario
Date: January 2025

CALCULATION Sheet : 2

Peak Flow Calculations

Refer to SWM200 for Catchment ID

Catchment ID	Land Use	Area, A (ha)	Runoff Coeff C	Total Area (ha)	A x C	Weighted C	Notes
201	Impervious	0.046	0.90	0.046	0.042	0.90	Proposed Development Area-Considered in analysis
	Pervious	0.000	0.20		0.000		
202	Impervious	0.084	0.90	0.094	0.075	0.82	Proposed Development Area-Considered in analysis
	Pervious	0.010	0.20		0.002		
203	Impervious	0.002	0.90	0.021	0.002	0.27	Proposed Development Area-Considered in analysis
	Pervious	0.019	0.20		0.004		
204	Impervious	0.031	0.90	0.031	0.028	0.90	Proposed Development Area-Considered in analysis
	Pervious	0.000	0.20		0.000		
205	Impervious	0.056	0.90	0.088	0.050	0.64	Proposed Development Area-Considered in analysis
	Pervious	0.032	0.20		0.006		
206	Impervious	0.098	0.90	0.114	0.088	0.80	Proposed Development Area-Considered in analysis
	Pervious	0.016	0.20		0.003		
207	Impervious	0.034	0.90	0.034	0.031	0.90	Proposed Development Area-Considered in analysis
	Pervious	0.000	0.20		0.000		

Storm Peak Flow Controlled Area:

Total Area (Catchment 201-206)	0.43	ha
Weighted Runoff Coefficient, C	0.77	

Run off Calculation (using Modified Rational Method):

$Q = C_t * C * i * A / 360$ cms

C = Runoff Coefficient
i = Rainfall intensity (mm/hr.) [City of Ottawa IDF]
A = Watershed area (ha)

Time of concentration, T_c	10.00	min

IDF Eqn : $i = A / (B + T)^C$

A, B & C parameter for IDF Curve

Year	A =	B =	C =
2	732.95	6.20	0.81
5	998.071	6.05	0.814
10	1174.184	6.01	0.816
25	1402.884	6.02	0.819
50	1569.58	6.01	0.82
100	1735.688	6.01	0.82

Storm Peak Flow Controlled Site Areas:

YEAR	Rainfall	Intensity Peaking	Flows	
	mm/hr.	Factor, C_t	m3/sec	L/sec
2	76.81	1.00	0.071	70.87
5	104.19	1.00	0.096	96.14
10	122.14	1.00	0.113	112.71
25	144.69	1.00	0.134	133.51
50	161.47	1.00	0.149	149.00
100	178.56	1.00	0.165	164.76

PROJECT NO. :BRM-23002042-H0

PROJECT NAME. : Proposed Chick fil A, 4280 Innes Road in Orleans, Ottawa, Ontario

Date: January 2025

Q=0.0028*C*I*A (cms)
C : RUNOFF COEFFICIENT
I : RAINFALL INTENSITY
I=A / (t + B) ^ C
A : AREA (ha)

Minimum Velocity 0.90 m/sec
Max Velocity 3.00 m/sec
Mannings Coefficient 0.013

[City of Ottawa IDF]
For Yr: A = 998.071
B = 1174.184
C = 0.814

CALCULATION Sheet :3

Prepared by: Khadija Jawwad
Checked by: Kate Logan, P.Eng.
Last Revised: 4/14/2025

Sub Catchment ID	MAINTENANCE HOLE FROM	MAINTENANCE HOLE TO	LENGTH (m)	INCREMENT C	INCREMENT A	INCREMENT CA	TOTAL CA	FLOW TIME (min) TO	FLOW TIME (min) IN	I -year (mm/h)	TOTAL Q (cms)	S (%)	D (mm)	Q FULL (cms)	V FULL (m/s)	Sec. Time (min)	Accum. Time (min)	Perc. Capacity (%)	**Storage (m3)**
Area - 205	PROP CB01	EX. CBMH105B	9.70	0.64	0.088	0.06	0.06	10.00	0.15	3.14	0.001	1.00	**200**	0.0328	1.04	0.15	10.15	2%	0.30
Area - 207	PROP. CB02	PROP. MH02	28.44	0.90	0.034	0.03	0.03	10.00	0.45	3.14	0.000	1.00	**200**	0.03	1.04	0.45	10.45	1%	0.89
Area - 201	Building	PROP. MH02	9.74	0.90	0.046	0.04	0.07	10.00	0.11	3.14	0.001	2.00	**200**	0.05	1.48	0.11	10.11	1%	0.31
	PROP. MH02	EX. CBMH105A	21.30	0.00	0.000	0.00	0.07	10.45	0.43	3.14	0.001	0.64	**200**	0.03	0.84	0.43	10.88	2%	0.67
Area - 202	PROP. CB04	PROP. CBMH03	24.80	0.82	0.094	0.08	0.08	10.00	0.40	3.14	0.001	1.00	**200**	0.03	1.04	0.40	10.40	2%	0.78
Area - 203	PROP. CBMH03	PROP. CBMH02	37.00	0.27	0.021	0.01	0.08	10.40	0.84	3.14	0.001	0.50	**200**	0.02	0.74	0.84	11.23	3%	1.16
Area - 204	PROP. CBMH02	PROP. CBMH05	18.10	0.90	0.031	0.03	0.11	11.23	0.41	3.14	0.001	0.50	**200**	0.02	0.74	0.41	11.64	4%	0.57
Area - 206	PROP. CBMH05	EX. CBMH105A	34.20	0.80	0.114	0.09	0.20	11.64	0.59	3.14	0.002	0.50	**300**	0.07	0.97	0.59	12.23	3%	2.42

7.10

Appendix F
Functional Servicing and Stormwater Management Report for Choice Properties Real Estate Investment Trust at 4270 Innes Road, City of Ottawa (Project No.: 17-961, September 2017 – Rev 1)

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FUNCTIONAL SERVICING AND STORMWATER MANAGEMENT REPORT

FOR

CHOICE PROPERTIES REAL ESTATE INVESTMENT TRUST
4270 INNES ROAD

CITY OF OTTAWA

PROJECT NO.: 17-961

SEPTEMBER 2017 – REV 1

FUNCTIONAL SERVICING AND STORMWATER MANAGEMENT REPORT
FOR
4270 INNES ROAD

CHOICE PROPERTIES REAL ESTATE INVESTMENT TRUST

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FOR
4270 INNES ROAD
CHOICE PROPERTIES REAL ESTATE INVESTMENT TRUST
SEPTEMBER 2017 – REV 1

CITY OF OTTAWA
PROJECT NO.: 17-961

1.0 INTRODUCTION

David Schaeffer Engineering Limited (DSEL) has been retained by Choice Properties to prepare a Functional Servicing and Stormwater Management report in support of their application for a Site Plan Amendment (SPA) at 4270 Innes Road.

The subject property is located within the City of Ottawa urban boundary, in the Cumberland ward. As illustrated in ***Figure 1***, the subject property is located south west of the intersection of Innes Road and Lanthier Drive. Comprised of a single parcel, the subject property measures approximately ***6.43 ha*** and is zoned Arterial Mainstreet (AM).

Figure 1: Site Location

The proposed SPA would allow for the addition of three single-storey commercial buildings located within the existing parking lot. The proposed development would include approximately ***2,734 m²*** of ground level retail, with additional parking and associated drive aisles within ***1.6 ha*** of the existing site. A copy of the proposed site plan is included in ***Drawings/Figures***.

No change in floor area is proposed to the existing buildings. The site plan proposes to revise existing drive aisles and curbed islands to allow for fire routes and pedestrian access.

The objective of this report is to provide sufficient detail to demonstrate that the proposed development is supported by existing municipal services.

1.1 Existing Conditions

The existing site consists of two commercial buildings with associated asphalt parking lots and drive aisles. The elevations range between 87.91m and 88.19m from the Northeast to the Southwest corner of the property.

Sewer and watermain mapping collected from the City of Ottawa indicate that the following services exist across the property frontages within the adjacent municipal right-of-ways:

Water

- 200mm diameter private internal PVC watermain network located within the subject site

Wastewater

- 200-250mm diameter private internal sanitary sewer network located within the subject site tributary to the Cumberland Collector Sewer

Stormwater

- 450 mm diameter private internal storm sewer network located within the subject site tributary to Billberry Creek

1.2 Required Permits / Approvals

The proposed development is subject to the site plan control approval process. The City of Ottawa must approve the engineering design drawings and reports prior to the issuance of site plan control.

The proposed development is a single parcel; as a result, the stormwater management system qualifies for an exemption under the OWRA.

1.3 Pre-consultation

Pre-consultation correspondence, along with the servicing guidelines checklist, is located in ***Appendix A***.

2.0 GUIDELINES, PREVIOUS STUDIES, AND REPORTS

2.1 Existing Studies, Guidelines, and Reports

The following studies were utilized in the preparation of this report.

- **Ottawa Sewer Design Guidelines**,
  City of Ottawa, *SDG002,* October 2012.
  (City Standards)

- **Ottawa Design Guidelines – Water Distribution**
  City of Ottawa, July 2010.
  (Water Supply Guidelines)

  - **Technical Bulletin ISD-2010-2**
    City of Ottawa, December 15, 2010.
    (*ISD-2010-2*)

  - **Technical Bulletin ISDTB-2014-02**
    City of Ottawa, May 27, 2014.
    (*ISDTB-2014-02*)

- **Design Guidelines for Sewage Works,**
  Ministry of the Environment, 2008.
  (MOE* Design Guidelines*)

- **Stormwater Planning and Design Manual,**
  Ministry of the Environment, March 2003.
  (SWMP Design Manual)

- **Ontario Building Code Compendium**
  Ministry of Municipal Affairs and Housing Building Development Branch, January 1, 2010 Update.
  (OBC)

- **Water Supply for Public Fire Protection**
  Fire Underwriters Survey, 1999.
  (FUS)

- **Final Stormwater Management Report**
  Loblaws – Innes Road and Lanthier Drive
  Stantec Consulting Ltd., November 25, 2004 Update.
  (Loblaws SWM Report)

- **Trinity Development Group – Innes Road**
  Stormwater Management Report
  Stantec Consulting Ltd., March 28, 2005.
  (Trinity SWM Report)

3.0 WATER SUPPLY SERVICING

3.1 Existing Water Supply Services

The subject property lies within the City of Ottawa 2E pressure zone, as shown by the Water Distribution System figure located in ***Appendix B***. A 200mm diameter private internal watermain exists within the subject site and is available to service the development, as shown by drawing ***EX-1***.

Table 1 summarizes the ***Water Supply Guidelines*** employed in the preparation of the preliminary water demand estimate.

Table 1
Water Supply Design Criteria

Design Parameter	Value
Commercial Retail	2.5 L/m^2/d
Commercial Office	75 L/9.3m^2/d
Commercial Maximum Daily Demand	1.5 x avg. day
Commercial Maximum Hour Demand	1.8 x max. day
Minimum Watermain Size	150mm diameter
Minimum Depth of Cover	2.4m from top of watermain to finished grade
During normal operating conditions desired operating pressure is within	350kPa and 480kPa
During normal operating conditions pressure must not drop below	275kPa
During normal operating conditions pressure must not exceed	552kPa
During fire flow operating pressure must not drop below	140kPa

Daily average based on Appendix 4-A from **Water Supply Guidelines*
*** Residential Max. Daily and Max. Hourly peaking factors per MOE Guidelines for Drinking-Water Systems Table 3-3 for 0 to 500 persons.*
-Table updated to reflect ISD-2010-2

Table 2 summarizes the water supply demand for the existing development based on the ***Water Supply Guidelines***.

Table 2
Water Demand
Existing Site Conditions

Design Parameter	Anticipated Demand[1] (L/min)
Average Daily Demand	27.5
Max Day	41.3
Peak Hour	74.3

1) Water demand calculation per ***Water Supply Guidelines***. See ***Appendix B*** for detailed calculations.

3.2 Water Supply Servicing Design

It is proposed that the development will connect to the existing 200mm diameter watermain network within the subject site. Servicing details for the proposed connection are shown by drawing ***SSP-1***.

Table 3 summarizes the anticipated water supply demand the proposed and the existing development based on the ***Water Supply Guidelines***.

Table 3
Water Demand
Proposed Site Conditions

Design Parameter	Anticipated Demand[1] (L/min)
Average Daily Demand	32.3
Max Day + Fire Flow	48.4 + 13,000 = 13,048.4
Peak Hour	87.1
1) Water demand calculation per ***Water Supply Guidelines***. See ***Appendix B*** for detailed calculations.	

Fire flow requirements are to be determined in accordance with Local Guidelines (***FUS***), City of Ottawa ***Water Supply Guidelines***, and the Ontario Building Code.

Using the ***FUS*** method a conservative estimation of fire flow had been established. The following assumptions were assumed:

- Type of construction - Ordinary Construction
- Occupancy type – Free Burning Combustibility
- Sprinkler Protection – Non-Sprinkler System

The above assumptions result in an estimated maximum fire flow of approximately ***13,000 L/min***, actual building materials selected will affect the estimated flow.

The City of Ottawa was contacted to obtain boundary conditions associated with the estimated water demand as indicated in ***Table 3***. No response was received at the time of publication. Correspondence with the City has been included in ***Appendix A***.

3.3 Water Supply Conclusion

Anticipated water demand under proposed conditions was submitted to the City of Ottawa for establishing boundary conditions. No response was received at the time of publication.

The proposed water supply design conforms to all relevant City Guidelines and Policies.

4.0 WASTEWATER SERVICING

4.1 Existing Wastewater Services

The subject site lies within the Cumberland Collector Sewer catchment area, as shown by the City sewer mapping included in ***Appendix C***. An existing 200-250 mm diameter sanitary sewer located within the subject site is available to service the proposed development, as shown by drawing ***EX-1***.

Table 4 summarizes the ***City Standards*** employed in the design of the wastewater sewer system.

Table 4
Wastewater Design Criteria

Design Parameter	Value
Commercial Floor Space	5 L/m^2/d
Infiltration and Inflow Allowance	0.28L/s/ha
Sanitary sewers are to be sized employing the Manning's Equation	$Q = \frac{1}{n} A R^{2/3} S^{1/2}$
Minimum Sewer Size	200mm diameter
Minimum Manning's 'n'	0.013
Minimum Depth of Cover	2.5m from crown of sewer to grade
Minimum Full Flowing Velocity	0.6m/s
Maximum Full Flowing Velocity	3.0m/s
Extracted from Sections 4 and 6 of the City of Ottawa Sewer Design Guidelines, October 2012.	

Table 5 demonstrates the existing peak flow from the existing commercial building. See ***Appendix C*** for associated calculations.

Table 5
Summary of Existing Peak Wastewater Flow

Design Parameter	Total Flow (L/s)
Estimated Average Dry Weather Flow	1.83
Estimated Peak Dry Weather Flow	2.75
Estimated Peak Wet Weather Flow	4.55

4.2 Wastewater Design

It is proposed that Building C & D will connect to the proposed 200 mm diameter sanitary sewer located within the drive aisle south of the development via 150 mm diameter service laterals, as shown by drawing ***SSP-1***.

It is proposed that Building E will connect to the 200 mm diameter sanitary sewer located within the drive aisle west of the development via a 150 mm diameter service lateral, as shown by drawing ***SSP-2***.

Based on the *Section 4.4.1* of the ***City Standards***, the subject site was anticipated to have a sanitary flow rate of 50,000 L/ha/day. ***Table 6*** demonstrates the anticipated peak flow for the subject site. See ***Appendix C*** for associated calculations.

Table 6
Summary of Anticipated Peak Wastewater Flow

Design Parameter	Total Flow (L/s)
Estimated Average Dry Weather Flow	7.44
Estimated Peak Dry Weather Flow	11.16
Estimated Peak Wet Weather Flow	12.96

Table 7 demonstrates the estimated peak flow from the proposed and the existing development. See ***Appendix C*** for associated calculations.

Table 7
Summary of Estimated Peak Wastewater Flow

Design Parameter	Total Flow (L/s)
Estimated Average Dry Weather Flow	2.15
Estimated Peak Dry Weather Flow	3.23
Estimated Peak Wet Weather Flow	5.03

The estimated sanitary flow based on the proposed site plan provide in ***Drawings/Figures*** anticipates a peak wet weather flow of ***5.03 L/s***; therefore there is sufficient capacity available in the local sewers to accommodate the proposed development.

A sanitary analysis was conducted for the existing internal sanitary sewers located within the subject property in order to assess the available capacity. Based on the analysis, there is an available residual capacity of approximately 15.0 L/s; detailed calculations are included in ***Appendix C***.

The analysis above indicates that sufficient capacity is available in the existing internal sanitary sewers to accommodate the proposed development.

4.3 Wastewater Servicing Conclusions

The site is tributary to the Cumberland Collector sewer; based on the sanitary analysis sufficient capacity is available to accommodate the anticipated ***5.03 L/s*** peak wet weather flow from the proposed development.

Based on the sanitary analysis, sufficient capacity is available in the existing internal sanitary sewers to accommodate the proposed development.

The proposed wastewater design conforms to all relevant ***City Standards***.

5.0 STORMWATER MANAGEMENT

5.1 Existing Stormwater Services

Stormwater runoff from the subject property is tributary to the City of Ottawa sewer system located within the Ottawa Central sub-watershed. As such, approvals for proposed development within this area are under the approval authority of the City of Ottawa.

Flows that influence the watershed in which the subject property is located are further reviewed by the principal authority. The subject property is located within the Bilberry Creek sub-watershed, and is therefore subject to review by the Rideau Valley Conservation Authority (RVCA). Consultation with the RVCA is located in ***Appendix A***.

The existing area to be modified by the proposed development is approximately ***1.6 ha*** and is separated into two areas ***Retail C*** and ***Retail D*** and ***Retail E*** with existing rational method coefficients of ***0.72*** and ***0.82***, respectively, as shown by ***FIG-1*** and ***FIG-2*** included in ***Appendix D***. Based on the previously approved Servicing Plan, two Stormceptor oil and grit separators were installed as part of the private storm sewer system.

Based on the ***Loblaws SWM Report***, the subject site discharges stormwater towards Innes Road at an elevation of 89.90.

5.2 Post-development Stormwater Management Target

Retail C and ***Retail D***, and ***Retail E*** with be result in modified rational method coefficients of ***0.70*** and ***0.86***, respectively, as shown by ***FIG-3*** and ***FIG-4*** included in ***Appendix D***.

The area within ***Retail C*** and ***Retail D*** will control post-development release rates to an equivalent pre-development release rate.

The Retail E development proposes to convert parking lot area to rooftop area, as such a decrease of the ponding volume is anticipated. Stormwater management within the south west corner of the subject site will be analyzed to demonstrate an overall increase in ponding volume.

The established pre-development peak flows for the 5-year and 100-year storm events are summarized in ***Table 8***. See ***Appendix D*** for associated calculations.

Table 8
Pre-Development Stormwater Flow Rate Summary

Control Area	5-Year Release Rate	100-Year Release Rate
	(L/s)	(L/s)
Retail C & D	95.9	205.3
Retail E	146.1	304.6

Based on ***Table 8***, the ***Retail C & D*** will be required to control to 5-year and 100-year release rate of ***95.9 L/s*** and ***205.3 L/s***, respectively.

Stormwater runoff is treated by the existing oil and grit separators on-site, therefore, additional stormwater quality controls are not required. Correspondence with the RVCA has been included in ***Appendix A***.

5.3 Proposed Stormwater Management System – Retail C & D

It is proposed that the stormwater outlet from the Retail C development will be to the 300 mm diameter storm sewer south of the development. It is proposed that the stormwater outlet from the Retail D development will be to the 450 mm diameter storm sewer south west of the development. Servicing is shown by ***SSP-1***.

Flow from rooftops will be controlled before discharging to the existing storm sewer system. The release rate and storage calculations for roof top attenuation were estimated based on Zurn Industries Ltd. design guidelines for Model Z-105-5 Control-Flo Single Notch drains. According to the Control-Flo Roof Drainage System Specification Drainage sheets notch ratings, each notch releases 5 G.P.M. per inch of head relevant literature is provide in ***Appendix D***. Other products may be specified provided that the restricted release rate and sufficient storage is provided to meet or exceed the values in ***Appendix D***.

Surface runoff from the sidewalks, access lanes and parking areas will be directed to a catchbasin system, outletting to the existing 450 mm diameter storm sewer south of the proposed development, as shown by ***SSP-1***. As specified by Section 5.2, the development area will control post-development 5-year and 100-year release rates to ***95.9 L/s*** and ***205.3 L/s***, respectively. Refer to ***SWM-1*** for sub-catchment control areas.

Table 9 summarizes post-development release rates outlined in *Section 5.2*. Detailed calculations are included in ***Appendix D***.

Table 9
Stormwater Flow Rate Summary – Retail C & D

Control Area	5-Year Release Rate	5-Year Storage	100-Year Release Rate	100-Year Required Storage	100-Year Available Storage
	(L/s)	(m^3)	(L/s)	(m^3)	(m^3)
A1	72.7	0.0	155.7	0.0	0.0
Retail C	2.3	4.9	3.0	11.3	11.5
Retail D	3.5	10.4	4.7	23.3	38.1
Total	**78.5**	**15.3**	**163.4**	**34.6**	**49.7**

It is anticipated that approximately ***34.6 m^3*** of rooftop storage will be required on site to attenuate flow to the pre-development 5-year and 100-year release rates of ***95.9 L/s*** and ***205.3 L/s;*** storage calculations are contained within ***Appendix D***.

5.4 Proposed Stormwater Management System – Retail E

It is proposed that the stormwater outlet from the proposed development will be to the existing 450 mm diameter storm sewer within the subject site via a 200 mm diameter service lateral, as shown by ***SSP-2***.

Flow from rooftops will be controlled before discharging to the existing storm sewer system. The release rate and storage calculations for roof top attenuation were estimated based on Zurn Industries Ltd. design guidelines for Model Z-105-5 Control-Flo Single Notch drains. According to the Control-Flo Roof Drainage System Specification Drainage sheets notch ratings, each notch releases 5 G.P.M. per inch of head relevant literature is provide in ***Appendix D***. Other products may be specified provided that the restricted release rate and sufficient storage is proved to meet or exceed the values in ***Appendix D***.

Surface runoff from the sidewalks, access lanes and parking areas will be directed to the existing catchbasin system west of the proposed development outletting to the existing 450 mm diameter storm sewer west development, as shown by ***SSP-2***.

As shown by ***FIG-2*** included in ***Appendix D***, the pre-development ponding volume of ***18.2 m^3*** was been estimated. Based on ***SWM-2***, the post-development ponding volume in the modified parking area of ***9.9 m^3*** was estimated.

Table 10 summarizes post-development building release rates. Detailed calculations are included in ***Appendix D***.

Table 10
Stormwater Flow Rate Summary – Retail E

Control Area	5-Year Release Rate	5-Year Storage	100-Year Release Rate	100-Year Required Storage	100-Year Available Storage
	(L/s)	(m^3)	(L/s)	(m^3)	(m^3)
Roof Controls	8.3	25.1	10.9	56.1	90.9

As indicated in ***Table 10***, it is proposed that ***90.9 m^3*** of rooftop storage will be provided post-development, therefore, a stormwater storage increase of ***72.7 m^3*** is proposed; storage calculations are contained in ***Appendix D***.

5.5 Stormwater Servicing Conclusions

Post development stormwater runoff will be controlled to the pre-development allowable target release rate for the 5-year and 100-year storm events. The post-development 5-year and 100-year allowable release rate for Retail C & D was calculated as ***95.9 L/s*** and ***205.3 L/s***.

Stormwater runoff is treated by the existing oil and grit separators on-site, therefore, additional stormwater quality controls are not required. Correspondence with the RVCA has been included in ***Appendix A***.

The proposed stormwater design conforms to all relevant ***City Standards*** and Policies for approval.

6.0 UTILITIES

Gas and Hydro services currently exist within the subject site right-of-way. Utility servicing will be coordinated with the individual utility companies prior to site development.

7.0 EROSION AND SEDIMENT CONTROL

Soil erosion occurs naturally and is a function of soil type, climate and topography. During construction the extent of erosion losses is exaggerated due to the removal of vegetation and the top layer of soil becoming agitated.

Prior to topsoil stripping, earthworks or underground construction, erosion and sediment controls will be implemented and will be maintained throughout construction.

Silt fence will be installed around the perimeter of the site and will be cleaned and maintained throughout construction. Silt fence will remain in place until the working areas have been stabilized and re-vegetated.

Catch basins will have SILTSACKs or an approved equivalent installed under the grate during construction to protect from silt entering the storm sewer system.

A mud mat will be installed at the construction access in order to prevent mud tracking onto adjacent roads.

Erosion and sediment controls must be in place during construction. The following recommendations to the contractor will be included in contract documents.

- Limit extent of exposed soils at any given time.
- Re-vegetate exposed areas as soon as possible.
- Minimize the area to be cleared and grubbed.
- Protect exposed slopes with plastic or synthetic mulches.
- Install silt fence to prevent sediment from entering existing ditches.
- No refueling or cleaning of equipment near existing watercourses.
- Provide sediment traps and basins during dewatering.
- Install filter cloth between catch basins and frames.
- Plan construction at proper time to avoid flooding.

Establish material stockpiles away from watercourses, so that barriers and filters may be installed.

The contractor will, at every rainfall, complete inspections and guarantee proper performance. The inspection is to include:

- Verification that water is not flowing under silt barriers.
- Clean and change filter cloth at catch basins.

8.0 CONCLUSION AND RECOMMENDATIONS

David Schaeffer Engineering Ltd. (DSEL) has been retained by Choice Properties to prepare a Functional Servicing and Stormwater Management report in support of their application for a Site Plan Amendment (SPA) at 4207 Innes Road. The preceding report outlines the following:

- The watermain boundary conditions have been requested from the City of Ottawa, however they were unavailable at the time of this publication;
- The FUS method for estimating fire flow indicated ***13,000 L/min*** is required for the proposed development;
- The proposed development is anticipated to have a peak wet weather flow of ***5.03 L/s***; Based on the anticipated sanitary flow rates specified by ***City Standards***, sufficient capacity is available to support the development;
- The development will be control post-development 5-year and 100-year release rates to equivalent pre-development release rates as specified in Section 5.2;
- It is proposed that stormwater objectives will be met through storm water retention via roof top storage; it is anticipated that ***90.7 m^3*** of rooftop storage will be required to attenuate flow to the established release rates;
- Stormwater runoff is treated by the existing oil and grit separators on-site, therefore, additional stormwater quality controls are not required. Correspondence with the RVCA has been included in ***Appendix A***.

Prepared by,
David Schaeffer Engineering Ltd.

Per: Robert D. Freel, P. Eng.

Prepared by,
David Schaeffer Engineering Ltd.

Per: Alison J Gosling, EIT.

Reviewed by,
David Schaeffer Engineering Ltd.

2017-09-29 #17-961

Per: Adam D. Fobert, P.Eng.

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APPENDIX A

Pre-Consultation

DEVELOPMENT SERVICING STUDY CHECKLIST

17-961 05/09/2017

4.1 General Content		
☐	Executive Summary (for larger reports only).	N/A
☒	Date and revision number of the report.	Report Cover Sheet
☒	Location map and plan showing municipal address, boundary, and layout of proposed development.	Drawings/Figures
☒	Plan showing the site and location of all existing services.	Figure 1
☒	Development statistics, land use, density, adherence to zoning and official plan, and reference to applicable subwatershed and watershed plans that provide context to applicable subwatershed and watershed plans that provide context to which individual developments must adhere.	Section 1.0
☒	Summary of Pre-consultation Meetings with City and other approval agencies.	Section 1.3
☒	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.	Section 2.1
☒	Statement of objectives and servicing criteria.	Section 1.0
☒	Identification of existing and proposed infrastructure available in the immediate area.	Sections 3.1, 4.1, 5.1
☐	Identification of Environmentally Significant Areas, watercourses and Municipal Drains potentially impacted by the proposed development (Reference can be made to the Natural Heritage Studies, if available).	N/A
☒	Concept level master grading plan to confirm existing and proposed grades in the development. This is required to confirm the feasibility of proposed stormwater management and drainage, soil removal and fill constraints, and potential impacts to neighbouring properties. This is also required to confirm that the proposed grading will not impede existing major system flow paths.	GP-1/GP-2
☐	Identification of potential impacts of proposed piped services on private services (such as wells and septic fields on adjacent lands) and mitigation required to address potential impacts.	N/A
☐	Proposed phasing of the development, if applicable.	N/A
☒	Reference to geotechnical studies and recommendations concerning servicing.	Section 1.4
☒	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	SSP-1/SSP-2

4.2 Development Servicing Report: Water		
☐	Confirm consistency with Master Servicing Study, if available	N/A
☒	Availability of public infrastructure to service proposed development	Section 3.1
☒	Identification of system constraints	Section 3.1
☒	Identify boundary conditions	Section 3.1, 3.2
☒	Confirmation of adequate domestic supply and pressure	Section 3.3

*Extracted from the City of Ottawa-Servicing Study Guidelines for Development Applications

☒	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.	Section 3.2
☐	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.	N/A
☐	Definition of phasing constraints. Hydraulic modeling is required to confirm servicing for all defined phases of the project including the ultimate design	N/A
☐	Address reliability requirements such as appropriate location of shut-off valves	N/A
☐	Check on the necessity of a pressure zone boundary modification	N/A
☒	Reference to water supply analysis to show that major infrastructure is capable of delivering sufficient water for the proposed land use. This includes data that shows that the expected demands under average day, peak hour and fire flow conditions provide water within the required pressure range	Section 3.2, 3.3
☐	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.	N/A
☐	Description of off-site required feedermains, booster pumping stations, and other water infrastructure that will be ultimately required to service proposed development, including financing, interim facilities, and timing of implementation.	N/A
☒	Confirmation that water demands are calculated based on the City of Ottawa Design Guidelines.	Section 3.2
☐	Provision of a model schematic showing the boundary conditions locations, streets, parcels, and building locations for reference.	N/A

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).	Section 4.2
☐	Confirm consistency with Master Servicing Study and/or justifications for deviations.	N/A
☐	Consideration of local conditions that may contribute to extraneous flows that are higher than the recommended flows in the guidelines. This includes groundwater and soil conditions, and age and condition of sewers.	N/A
☒	Description of existing sanitary sewer available for discharge of wastewater from proposed development.	Section 4.1
☒	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)	Section 4.2
☒	Calculations related to dry-weather and wet-weather flow rates from the development in standard MOE sanitary sewer design table (Appendix 'C') format.	Section 4.2, Appendix C
☒	Description of proposed sewer network including sewers, pumping stations, and forcemains.	Section 4.2
☐	Discussion of previously identified environmental constraints and impact on servicing (environmental constraints are related to limitations imposed on the development in order to preserve the physical condition of watercourses, vegetation, soil cover, as well as protecting against water quantity and quality).	N/A

*Extracted from the City of Ottawa-Servicing Study Guidelines for Development Applications

☐	Pumping stations: impacts of proposed development on existing pumping stations or requirements for new pumping station to service development.	N/A
☐	Forcemain capacity in terms of operational redundancy, surge pressure and maximum flow velocity.	N/A
☐	Identification and implementation of the emergency overflow from sanitary pumping stations in relation to the hydraulic grade line to protect against basement flooding.	N/A
☐	Special considerations such as contamination, corrosive environment etc.	N/A

4.4 Development Servicing Report: Stormwater Checklist

☒	Description of drainage outlets and downstream constraints including legality of outlets (i.e. municipal drain, right-of-way, watercourse, or private property)	Section 5.1
☒	Analysis of available capacity in existing public infrastructure.	Section 5.1, Appendix D
☒	A drawing showing the subject lands, its surroundings, the receiving watercourse, existing drainage patterns, and proposed drainage pattern.	Drawings/Figures
☒	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.	Section 5.2
☒	Water Quality control objective (basic, normal or enhanced level of protection based on the sensitivities of the receiving watercourse) and storage requirements.	Section 5.2
☒	Description of the stormwater management concept with facility locations and descriptions with references and supporting information	Section 5.3, 5.4
☐	Set-back from private sewage disposal systems.	N/A
☐	Watercourse and hazard lands setbacks.	N/A
☒	Record of pre-consultation with the Ontario Ministry of Environment and the Conservation Authority that has jurisdiction on the affected watershed.	Appendix A
☐	Confirm consistency with sub-watershed and Master Servicing Study, if applicable study exists.	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).	Section 5.3, 5.4
☐	Identification of watercourses within the proposed development and how watercourses will be protected, or, if necessary, altered by the proposed development with applicable approvals.	N/A
☒	Calculate pre and post development peak flow rates including a description of existing site conditions and proposed impervious areas and drainage catchments in comparison to existing conditions.	Section 5.1, 5.3, 5.4
☐	Any proposed diversion of drainage catchment areas from one outlet to another.	N/A
☐	Proposed minor and major systems including locations and sizes of stormwater trunk sewers, and stormwater management facilities.	N/A
☐	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.	N/A
☐	Identification of potential impacts to receiving watercourses	N/A
☐	Identification of municipal drains and related approval requirements.	N/A

*Extracted from the City of Ottawa-Servicing Study Guidelines for Development Applications

☒	Descriptions of how the conveyance and storage capacity will be achieved for the development.	Section 5.3, 5.4
☐	100 year flood levels and major flow routing to protect proposed development from flooding for establishing minimum building elevations (MBE) and overall grading.	N/A
☐	Inclusion of hydraulic analysis including hydraulic grade line elevations.	N/A
☒	Description of approach to erosion and sediment control during construction for the protection of receiving watercourse or drainage corridors.	Section 6.0
☐	Identification of floodplains – proponent to obtain relevant floodplain information from the appropriate Conservation Authority. The proponent may be required to delineate floodplain elevations to the satisfaction of the Conservation Authority if such information is not available or if information does not match current conditions.	N/A
☐	Identification of fill constraints related to floodplain and geotechnical investigation.	N/A

4.5 Approval and Permit Requirements: Checklist

☒	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 ct. 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.	Section 1.2
☐	Application for Certificate of Approval (CofA) under the Ontario Water Resources Act.	N/A
☐	Changes to Municipal Drains.	N/A
☐	Other permits (National Capital Commission, Parks Canada, Public Works and Government Services Canada, Ministry of Transportation etc.)	N/A

4.6 Conclusion Checklist

☒	Clearly stated conclusions and recommendations	Section 8.0
☐	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.	
☐	All draft and final reports shall be signed and stamped by a professional Engineer registered in Ontario	

*Extracted from the City of Ottawa-Servicing Study Guidelines for Development Applications

Alison Gosling

From: Jamie Batchelor <jamie.batchelor@rvca.ca>
Sent: Friday, September 15, 2017 8:56 AM
To: Alison Gosling
Subject: RE: 4207 Innes Road - RVCA Requirement

Okay thanks. I thought that might be the case. In that event, no further water quality control measures would be required for the proposed redevelopment as it would be treated by the existing oil grit separators downstream onsite.

From: Alison Gosling [mailto:AGosling@dsel.ca]
Sent: Friday, September 15, 2017 8:50 AM
To: Jamie Batchelor <jamie.batchelor@rvca.ca>
Subject: RE: 4207 Innes Road - RVCA Requirement

Good morning Jamie,

Based on the previously approved servicing plan, it appears that two Stormceptor oil/grit separators have been installed downstream of the proposed connections.

Thank you,

Alison Gosling, E.I.T.
Project Coordinator / Junior Designer

DSEL
david schaeffer engineering ltd.

120 Iber Road, Unit 103
Stittsville, ON K2S 1E9

phone: (613) 836-0856 ext.542
fax: (613) 836-7183
email: agosling@dsel.ca

From: Jamie Batchelor [mailto:jamie.batchelor@rvca.ca]
Sent: Friday, September 15, 2017 8:44 AM
To: Alison Gosling <AGosling@dsel.ca>
Subject: RE: 4207 Innes Road - RVCA Requirement

Hi Alison,

I apologize for not getting to you sooner on this one. Given the distance to the creek and that the proposed development involves redeveloping a portion of the site including re-orientation of the parking we would be looking for the opportunity to achieve 80% TSS for the redeveloped portion only. That being said, I understand the development on

that site is not very old, if it can be demonstrated that it already is being treated as part of the overall development, then no additional water quality control measures would be required.

From: Alison Gosling [mailto:AGosling@dsel.ca]
Sent: Tuesday, August 29, 2017 2:49 PM
To: Jamie Batchelor <jamie.batchelor@rvca.ca>
Subject: 4207 Innes Road - RVCA Requirement

Good afternoon Jamie,

We wanted to touch base with you regarding a development at 4207 Innes Road. The development involves the construction of two 1-storey commercial buildings within the existing parking lot, as shown by the attached site plan. The existing commercial building is to be retained.

Based on the information available, the existing storm sewers servicing the site travels 1.2 km to an outlet into Billberry Creek, as shown by the figure below. Since there are no proposed changes to the existing stormwater management system and the runoff from the site will be from a roof top source which was previously parking area, can you confirm if any quality controls will be required?

Please feel free to contact me to discuss.

Thank you,

Alison Gosling, E.I.T.
Project Coordinator / Junior Designer

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120 Iber Road, Unit 103
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phone: (613) 836-0856 ext.542
fax: (613) 836-7183
email: agosling@DSEL.ca

Alison Gosling

From: Alison Gosling
Sent: Tuesday, August 29, 2017 1:10 PM
To: 'Diamond, Emily (MOECC)'
Subject: 4270 Innes Road - ECA Requirement

Good afternoon Emily,

We just wanted to touch base with you regarding a proposed development we are working on located at 4270 Innes Road. The existing 6.43ha site currently consists of two commercial building and is zoned Arterial Mainstreet.

The development consists of the addition of three commercial buildings located within the existing parking lot and will be serviced by the existing services on-site. The subject site will remain one parcel of land.

Our understanding is this project would be exempt from requiring an Environmental Compliance Approval through the Ministry of the Environment and Climate Change, as it falls under the approval exemption set out in Ontario Regulation 525/98 as part of the Ontario Water Resources Act.

Subsection 53(1) and (3) of the Act do not apply to the use, operation, establishment, alteration, extension or replacement of or a change in a storm water management facility that,
(a) is designed to service one lot or parcel of land;
(b) discharges into a storm sewer that is not a combined sewer;
(c) does not service industrial land or a structure located on industrial land; and
(d) is not located on industrial land.

I hope you could comment on my assumption that this property would require an ECA. Please feel free to call to discuss this further.

Thank you,

Alison Gosling, E.I.T.
Project Coordinator / Junior Designer

DSEL
david schaeffer engineering ltd.

120 Iber Road, Unit 103
Stittsville, ON K2S 1E9

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fax: (613) 836-7183
email: agosling@DSEL.ca

APPENDIX B

Water Supply

Choice Properties
4270 Innes Road
Existing Site Conditions

Water Demand Design Flows per Unit Count
City of Ottawa - Water Distribution Guidelines, July 2010

Domestic Demand

Type of Housing	Per / Unit	Units	Pop
Single Family	3.4		0
Semi-detached	2.7		0
Townhouse	2.7		0
Apartment			0
Bachelor	1.4		0
1 Bedroom	1.4		0
2 Bedroom	2.1		0
3 Bedroom	3.1		0
Average	1.8		0

	Pop	Avg. Daily		Max Day		Peak Hour	
		m^3/d	L/min	m^3/d	L/min	m^3/d	L/min
Total Domestic Demand	0	0.0	0.0	0.0	0.0	0.0	0.0

Institutional / Commercial / Industrial Demand

Property Type	Unit Rate	Units	Avg. Daily m^3/d	Avg. Daily L/min	Max Day m^3/d	Max Day L/min	Peak Hour m^3/d	Peak Hour L/min
Commercial floor space	2.5 $L/m^2/d$	15,854	39.6	27.5	59.5	41.3	107.0	74.3
Office	75 $L/9.3m^2/d$		0.00	0.0	0.0	0.0	0.0	0.0
Industrial - Light	35,000 L/gross ha/d		0.00	0.0	0.0	0.0	0.0	0.0
Industrial - Heavy	55,000 L/gross ha/d		0.00	0.0	0.0	0.0	0.0	0.0
		Total I/CI Demand	39.6	27.5	59.5	41.3	107.0	74.3
		Total Demand	**39.6**	**27.5**	**59.5**	**41.3**	**107.0**	**74.3**

Choice Properties
4270 Innes Road
Proposed Site Conditions

Water Demand Design Flows per Unit Count
City of Ottawa - Water Distribution Guidelines, July 2010

Domestic Demand

Type of Housing	Per / Unit	Units	Pop
Single Family	3.4		0
Semi-detached	2.7		0
Townhouse	2.7		0
Apartment			0
Bachelor	1.4		0
1 Bedroom	1.4		0
2 Bedroom	2.1		0
3 Bedroom	3.1		0
Average	1.8		0

	Pop	Avg. Daily		Max Day		Peak Hour	
		m^3/d	L/min	m^3/d	L/min	m^3/d	L/min
Total Domestic Demand	0	0.0	0.0	0.0	0.0	0.0	0.0

Institutional / Commercial / Industrial Demand

			Avg. Daily		Max Day		Peak Hour	
Property Type	**Unit Rate**	**Units**	m^3/d	L/min	m^3/d	L/min	m^3/d	L/min
Commercial floor space	2.5 $L/m^2/d$	2,734	6.84	4.7	10.3	7.1	18.5	12.8
Ex. Commercial floor space	2.5 $L/m^2/d$	15,854	39.6	27.5	59.5	41.3	107.0	74.3
Industrial - Light	35,000 L/gross ha/d		0.00	0.0	0.0	0.0	0.0	0.0
Industrial - Heavy	55,000 L/gross ha/d		0.00	0.0	0.0	0.0	0.0	0.0
		Total I/CI Demand	46.5	32.3	69.7	48.4	125.5	87.1
		Total Demand	**46.5**	**32.3**	**69.7**	**48.4**	**125.5**	**87.1**

Fire Flow Estimation per Fire Underwriters Survey

Water Supply For Public Fire Protection - 1999

Fire Flow Required

1. Base Requirement

$F = 220C\sqrt{A}$ L/min *Where **F** is the fire flow, **C** is the Type of construction and **A** is the Total floor area*

Type of Construction: Ordinary Construction

C	1		*Type of Construction Coefficient per FUS Part II, Section 1*
A	364.0	m^2	*Total floor area based on FUS Part II section 1*

Fire Flow	4197.3	L/min	
	4000.0	**L/min**	*rounded to the nearest 1,000 L/min*

Adjustments

2. Reduction for Occupancy Type

Free Burning	15%	
Fire Flow	**4600.0**	**L/min**

3. Reduction for Sprinkler Protection

Non-Sprinklered	0%	
Reduction	**0**	**L/min**

4. Increase for Separation Distance

N	30.1m-45m	5%	
S	>45m	0%	
E	20.1m-30m	10%	
W	>45m	0%	
	% Increase	**15%**	*value not to exceed 75% per FUS Part II, Section 4*
	Increase	**690.0**	**L/min**

Total Fire Flow

Fire Flow	5290.0	L/min	*fire flow not to exceed 45,000 L/min nor be less than 2,000 L/min per FUS Section 4*
	5000.0	**L/min**	*rounded to the nearest 1,000 L/min*

Notes:
-Type of construction, Occupancy Type and Sprinkler Protection information provided by _____.
-Calculations based on Fire Underwriters Survey - Part II

Fire Flow Estimation per Fire Underwriters Survey

Water Supply For Public Fire Protection - 1999

Fire Flow Required

1. Base Requirement

$F = 220C\sqrt{A}$ L/min *Where **F** is the fire flow, **C** is the Type of construction and **A** is the Total floor area*

Type of Construction: Ordinary Construction

C	1		*Type of Construction Coefficient per FUS Part II, Section 1*
A	688.0	m^2	*Total floor area based on FUS Part II section 1*

Fire Flow	5770.5	L/min	
	6000.0	**L/min**	*rounded to the nearest 1,000 L/min*

Adjustments

2. Reduction for Occupancy Type

Free Burning	15%
Fire Flow	**6900.0 L/min**

3. Reduction for Sprinkler Protection

Non-Sprinklered	0%
Reduction	**0 L/min**

4. Increase for Separation Distance

N	30.1m-45m	5%	
S	>45m	0%	
E	>45m	0%	
W	30.1m-45m	5%	
	% Increase	**10%**	*value not to exceed 75% per FUS Part II, Section 4*
	Increase	**690.0 L/min**	

Total Fire Flow

Fire Flow	7590.0	L/min	*fire flow not to exceed 45,000 L/min nor be less than 2,000 L/min per FUS Section 4*
	8000.0	**L/min**	*rounded to the nearest 1,000 L/min*

Notes:
-Type of construction, Occupancy Type and Sprinkler Protection information provided by _____.
-Calculations based on Fire Underwriters Survey - Part II

Fire Flow Estimation per Fire Underwriters Survey

Water Supply For Public Fire Protection - 1999

Fire Flow Required

1. Base Requirement

$F = 220C\sqrt{A}$ L/min *Where **F** is the fire flow, **C** is the Type of construction and **A** is the Total floor area*

Type of Construction: Ordinary Construction

C	1		*Type of Construction Coefficient per FUS Part II, Section 1*
A	1640.0	m^2	*Total floor area based on FUS Part II section 1*

Fire Flow	8909.3	L/min	
	9000.0	**L/min**	*rounded to the nearest 1,000 L/min*

Adjustments

2. Reduction for Occupancy Type

Free Burning	15%	
Fire Flow	**10350.0**	**L/min**

3. Reduction for Sprinkler Protection

Non-Sprinklered	0%	
Reduction	**0**	**L/min**

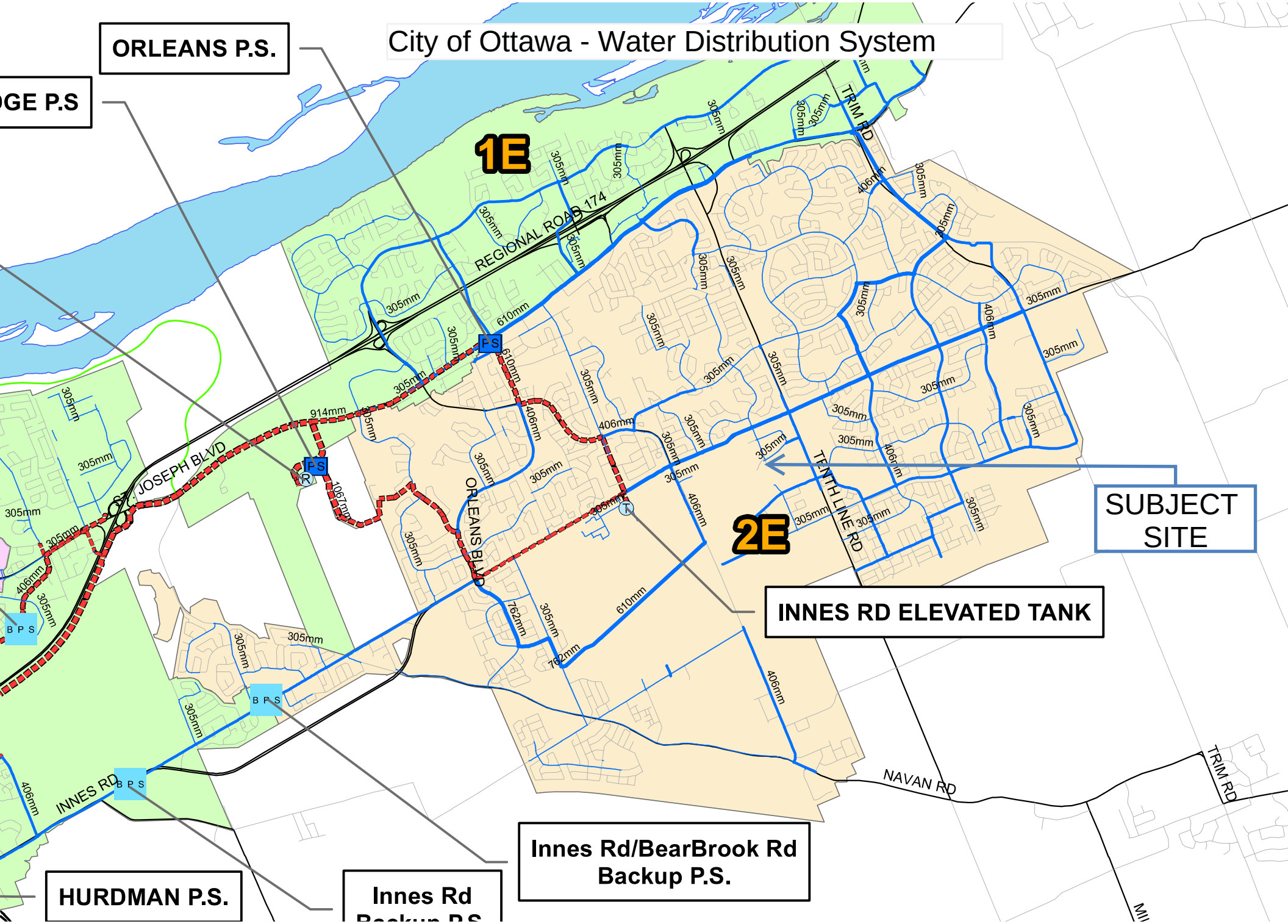
4. Increase for Separation Distance

N	>45m	0%	
S	>45m	0%	
E	0m-3m	25%	
W	>45m	0%	
	% Increase	**25%**	*value not to exceed 75% per FUS Part II, Section 4*
	Increase	**2587.5**	**L/min**

Total Fire Flow

Fire Flow	12937.5	L/min	*fire flow not to exceed 45,000 L/min nor be less than 2,000 L/min per FUS Section 4*
	13000.0	**L/min**	*rounded to the nearest 1,000 L/min*

Notes:
-Type of construction, Occupancy Type and Sprinkler Protection information provided by _____.
-Calculations based on Fire Underwriters Survey - Part II


City of Ottawa - Water Distribution System
ORLEANS P.S.
GE P.S
1E
2E
REGIONAL ROAD 174
TRIM RD
ST. JOSEPH BLVD
ORLEANS BLVD
TENTH LINE RD
NAVAN RD
INNES RD
SUBJECT SITE
INNES RD ELEVATED TANK
Innes Rd/BearBrook Rd Backup P.S.
HURDMAN P.S.
Innes Rd
305mm
406mm
610mm
762mm
914mm
1067mm
P S
B P S

APPENDIX C

Wastewater Collection

Choice Properties
4207 Innes Road
Existing Site Conditions

Wastewater Design Flows per Unit Count
City of Ottawa Sewer Design Guidelines, 2004

Site Area 6.43 **ha**

Extraneous Flow Allowances

Infiltration / Inflow **1.80 L/s**

Institutional / Commercial / Industrial Contributions

Property Type	**Unit Rate**		**No. of Units**	**Avg Wastewater (L/s)**
Commercial floor space*	5	$L/m^2/d$	15,854	1.83
Hospitals	900	L/bed/d		0.00
School	70	L/student/d		0.00
Ex. Industrial - Light**	35,000	L/gross ha/d		0.00
Industrial - Light**	35,000	L/gross ha/d		0.00
Industrial - Heavy**	55,000	L/gross ha/d		0.00

Average I/C/I Flow	**1.83**
Peak Institutional / Commercial Flow	2.75
Peak Industrial Flow**	0.00
Peak I/C/I Flow	**2.75**

** assuming a 12 hour commercial operation*
*** peak industrial flow per City of Ottawa Sewer Design Guidelines Appendix 4B*

Total Estimated Average Dry Weather Flow Rate	**1.83 L/s**
Total Estimated Peak Dry Weather Flow Rate	**2.75 L/s**
Total Estimated Peak Wet Weather Flow Rate	**4.55 L/s**

Choice Properties
4207 Innes Road
Anticipated Site Conditions

Wastewater Design Flows per Unit Count
City of Ottawa Sewer Design Guidelines, 2004

Site Area 6.43 **ha**

Extraneous Flow Allowances

Infiltration / Inflow **1.80 L/s**

Institutional / Commercial / Industrial Contributions

Property Type	**Unit Rate**	**No. of Units**	**Avg Wastewater (L/s)**
Commercial floor space*	50,000 L/gross ha/d	6.43	7.44
Ex. Industrial - Light**	35,000 L/gross ha/d		0.00
Industrial - Light**	35,000 L/gross ha/d		0.00
Industrial - Heavy**	55,000 L/gross ha/d		0.00

Average I/C/I Flow	**7.44**
Peak Institutional / Commercial Flow	11.16
Peak Industrial Flow**	0.00
Peak I/C/I Flow	**11.16**

** assuming a 12 hour commercial operation*

*** peak industrial flow per City of Ottawa Sewer Design Guidelines Appendix 4B*

Total Estimated Average Dry Weather Flow Rate	**7.44 L/s**
Total Estimated Peak Dry Weather Flow Rate	**11.16 L/s**
Total Estimated Peak Wet Weather Flow Rate	**12.96 L/s**

Choice Properties
4207 Innes Road
Proposed Site Conditions

Wastewater Design Flows per Unit Count
City of Ottawa Sewer Design Guidelines, 2004

Site Area 6.43 **ha**

Extraneous Flow Allowances

Infiltration / Inflow **1.80 L/s**

Institutional / Commercial / Industrial Contributions

Property Type	**Unit Rate**	**No. of Units**	**Avg Wastewater (L/s)**
Commercial floor space*	5 $L/m^2/d$	2,734	0.32
Ex. Commercial floor space*	5 $L/m^2/d$	15,854	1.83
Industrial - Light**	35,000 L/gross ha/d		0.00
Industrial - Heavy**	55,000 L/gross ha/d		0.00

Average I/C/I Flow	**2.15**
Peak Institutional / Commercial Flow	3.23
Peak Industrial Flow**	0.00
Peak I/C/I Flow	**3.23**

** assuming a 12 hour commercial operation*

*** peak industrial flow per City of Ottawa Sewer Design Guidelines Appendix 4B*

Total Estimated Average Dry Weather Flow Rate	**2.15 L/s**
Total Estimated Peak Dry Weather Flow Rate	**3.23 L/s**
Total Estimated Peak Wet Weather Flow Rate	**5.03 L/s**

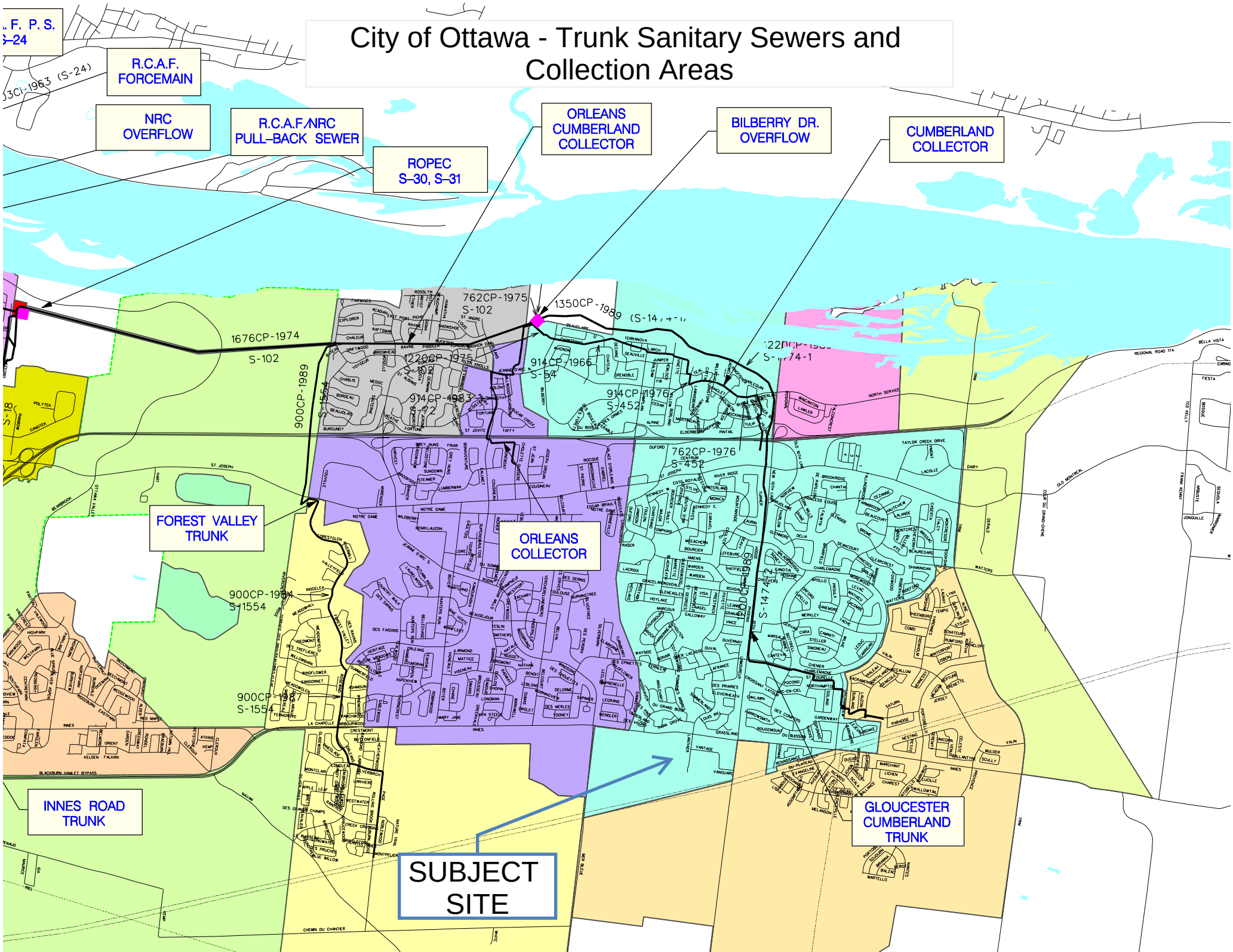
SANITARY SEWER CALCULATION SHEET

CLIENT: **CHOICE PROPERTIES**
LOCATION: **4207 INNES ROAD**
FILE REF: **17-961**
DATE: **29-Sep-17**

DESIGN PARAMETERS

Avg. Daily Flow Res.	350	L/p/d	Peak Fact Res. Per Harmons: Min = 2.0, Max =4.0		Infiltration / Inflow	0.28	L/s/ha
Avg. Daily Flow Comm	50,000	L/ha/d	Peak Fact. Comm.	1.5	Min. Pipe Velocity	0.60	m/s full flowing
Avg. Daily Flow Instit.	50,000	L/ha/d	Peak Fact. Instit.	1.5	Max. Pipe Velocity	3.00	m/s full flowing
Avg. Daily Flow Indust.	35,000	L/ha/d	Peak Fact. Indust. per MOE graph		Mannings N	0.013	

Location			Residential Area and Population									Commercial		Institutional		Industrial			Infiltration				Pipe Data							
Area ID	Up	Down	Area	Number of Units by type				Pop.	Cumulative Area	Cumulative Pop.	Peak. Fact.	Q_{res}	Area	Accu. Area	Area	Accu. Area	Area	Accu. Area	Q_{C+I+I}	Total Area	Accu. Area	Infiltration Flow	Total Flow	DIA	Slope	Length	$A_{hydraulic}$	R	Velocity	Q_{cap}	Q / Q full
			(ha)	Singles	Semi's	Town's	Apt's		(ha)		(-)	(L/s)	(ha)	(ha)	(ha)	(ha)	(ha)	(ha)	(L/s)	(ha)	(ha)	(L/s)	(L/s)	(mm)	(%)	(m)	(m^2)	(m)	(m/s)	(L/s)	(-)
EX. RETAIL A	BLDG A	EX. SANMH5	6.430					0.0	6.430	0.0	4.00	0.00	1.585	1.59		0.00		0.00	1.4	8.015	8.015	2.244	3.62	150	5.50	11.0	0.018	0.038	2.02	35.7	0.10
	EX. SANMH5	EX. SANMH4	0.000					0.0	6.430	0.0	4.00	0.00		1.59		0.00		0.00	1.4	0.000	8.015	2.244	3.62	200	0.40	94.5	0.031	0.050	0.66	20.7	0.17
RETAIL E	BLDG E	SAN4	0.000					0.0	0.000	0.0	4.00	0.00	0.164	0.16		0.00		0.00	0.1	0.164	0.164	0.046	0.19	200	1.00	5.3	0.031	0.050	1.04	32.8	0.01
	SAN4	SAN3	0.000					0.0	0.000	0.0	4.00	0.00		0.16		0.00		0.00	0.1	0.000	0.164	0.046	0.19	200	0.32	69.8	0.031	0.050	0.59	18.6	0.01
EX. RETAIL B	EX. SANMH8	SAN3	0.000					0.0	0.000	0.0	4.00	0.00	0.003	0.00		0.00		0.00	0.0	0.003	0.003	0.001	0.00	250	0.28	26.1	0.049	0.063	0.64	31.5	0.00
	SAN3	EX. SANMH7	0.000					0.0	0.000	0.0	4.00	0.00		0.17		0.00		0.00	0.1	0.000	0.167	0.047	0.19	250	0.28	34.1	0.049	0.063	0.64	31.5	0.01
	EX. SANMH7	EX. SANMH6	0.000					0.0	0.000	0.0	4.00	0.00		0.17		0.00		0.00	0.1	0.000	0.167	0.047	0.19	250	0.28	79.5	0.049	0.063	0.64	31.5	0.01
	EX. SANMH6	EX. SANMH4	0.000					0.0	0.000	0.0	4.00	0.00		0.17		0.00		0.00	0.1	0.000	0.167	0.047	0.19	250	0.28	81.0	0.049	0.063	0.64	31.5	0.01
RETAIL D	BLDG D	SAN2						0.0	0.000	0.0	4.00	0.00	0.069	0.24		0.00		0.00	0.2	0.069	0.069	0.019	0.22	150	1.00	1.6	0.018	0.038	0.86	15.2	0.01
	SAN2	SAN1	0.000					0.0	0.000	0.0	4.00	0.00		0.24		0.00		0.00	0.2	0.000	0.069	0.019	0.22	200	0.32	46.8	0.031	0.050	0.59	18.6	0.01
RETAIL C	SAN1	EX.SANMH2	0.000					0.0	0.000	0.0	4.00	0.00	0.04	0.27		0.00		0.00	0.2	0.036	0.105	0.029	0.27	200	0.32	99.3	0.031	0.050	0.59	18.6	0.01
	EX.SANMH2	EX. SANMH3	0.000					0.0	0.000	0.0	4.00	0.00		0.27		0.00		0.00	0.2	0.000	0.105	0.029	0.27	200	0.68	64.0	0.031	0.050	0.86	27.0	0.01
	EX. SANMH4	EX. SANMH3	0.000					0.0	6.430	0.0	4.00	0.00		1.75		0.00		0.00	1.5	0.000	8.182	2.291	3.81	250	0.28	36.0	0.049	0.063	0.64	31.5	0.12
	EX. SANMH3	OUTLET	0.000					0.0	6.430	0.0	4.00	0.00		2.02		0.00		0.00	1.8	0.000	8.182	2.291	4.05	250	0.28		0.049	0.063	0.64	31.5	0.13


City of Ottawa - Trunk Sanitary Sewers and Collection Areas
R.C.A.F. FORCEMAIN
NRC OVERFLOW
R.C.A.F./NRC PULL-BACK SEWER
ROPEC S-30, S-31
ORLEANS CUMBERLAND COLLECTOR
BILBERRY DR. OVERFLOW
CUMBERLAND COLLECTOR
762CP-1975 S-102
1350CP-1989
1676CP-1974 S-102
1220CP-1975 S-102
914CP-1966 S-54
914CP-1976 S-452
762CP-1976 CENTRUM S-452
900CP-1989 S-1554
FOREST VALLEY TRUNK
ORLEANS COLLECTOR
INNES ROAD TRUNK
GLOUCESTER CUMBERLAND TRUNK
SUBJECT SITE

APPENDIX D

Stormwater Management

Estimated Peak Stormwater Flow Rate
City of Ottawa Sewer Design Guidelines, 2012

Retail C & D

Existing Drainage Charateristics From Internal Site

Area	0.493	ha
C	0.72	Rational Method runoff coefficient
L	60	m
Up Elev	88.08	m
Dn Elev	87.75	m
Slope	0.5	%
Tc	11.6	min

5-Year	Imp.	Perv.	Total
Area	0.370	0.123	0.493
C	0.9	0.2	0.72

100-Year	Imp.	Perv.	Total
Area	0.370	0.123	0.493
C	1.13	0.25	0.91

1) Time of Concentration per Federal Aviation Administration

$$t_c = \frac{1.8(1.1-C)L^{0.5}}{S^{0.333}}$$

tc, in minutes
C, rational method coefficient, (-)
L, length in ft
S, average watershed slope in %

Estimated Peak Flow

Estimated Existing Condition Peak Flow

Total Area 0.493 ha
C 0.72 Rational Method runoff coefficient

	5-year					**100-year**				
t_c (min)	**i (mm/hr)**	**Q_{actual} (L/s)**	**$Q_{release}$ (L/s)**	**Q_{stored} (L/s)**	**V_{stored} (m^3)**	**i (mm/hr)**	**Q_{actual} (L/s)**	**$Q_{release}$ (L/s)**	**Q_{stored} (L/s)**	**V_{stored} (m^3)**
11.6	96.6	95.9	95.9	0.0	0.0	165.5	205.3	205.3	0.0	0.0

Note:
C value for the 100-year storm is increased by 25%, to a maximum of 1.0 per Ottawa Sewer Design Guidelines (5.4.5.2.1)

Retail E

Existing Drainage Charateristics From Internal Site

Area	0.996	ha
C	0.82	Rational Method runoff coefficient
L	38	m
Up Elev	88.08	m
Dn Elev	87.68	m
Slope	1.1	%
Tc	5.4	min

5-Year	Imp.	Perv.	Total
Area	0.889	0.108	0.996
C	0.9	0.2	0.82

100-Year	Imp.	Perv.	Total
Area	0.889	0.108	0.996
C	1.13	0.25	1.00

1) Time of Concentration per Federal Aviation Administration

$$t_c = \frac{1.8(1.1-C)L^{0.5}}{S^{0.333}}$$

tc, in minutes
C, rational method coefficient, (-)
L, length in ft
S, average watershed slope in %

Estimated Peak Flow

Estimated Existing Condition Peak Flow

Total Area 0.467 ha
C 0.82 Rational Method runoff coefficient

	5-year					**100-year**				
t_c (min)	**i (mm/hr)**	**Q_{actual} (L/s)**	**$Q_{release}$ (L/s)**	**Q_{stored} (L/s)**	**(m^3)**	**i (mm/hr)**	**Q_{actual} (L/s)**	**$Q_{release}$ (L/s)**	**Q_{stored} (L/s)**	**V_{stored} (m^3)**
5.4	136.7	146.1	146.1	0.0	0.0	234.9	304.6	304.6	0.0	0.0

Note:
C value for the 100-year storm is increased by 25%, to a maximum of 1.0 per Ottawa Sewer Design Guidelines (5.4.5.2.1)

Summary of Release Rates and Storage Volumes

Control Area	**5-Year Release Rate (L/s)**	**5-Year Storage Storage (m^3)**	**100-Year Release Rate Release Rate (L/s)**	**100-Year Storage Storage (m^3)**
Retail C & D	95.9	0.0	205.3	0.0
Retail E	146.1	0.0	304.6	0.0
Total	**242.0**	**0.0**	**509.9**	**0.0**

Stormwater - Proposed Development
City of Ottawa Sewer Design Guidelines, 2012

Target Flow Rate

Area 0.493 ha

5-year		**100-year**	
Q	95.9 L/s	**Q**	205.3 L/s

Estimated Post Development Peak Flow from Unattenuated Areas

Area ID A1
Total Area 0.388 ha
C 0.65 Rational Method runoff coefficient

	5-year					100-year				
t_c (min)	i (mm/hr)	Q_{actual} (L/s)	$Q_{release}$ (L/s)	Q_{stored} (L/s)	V_{stored} (m^3)	i (mm/hr)	Q_{actual}* (L/s)	$Q_{release}$ (L/s)	Q_{stored} (L/s)	V_{stored} (m^3)
10.0	104.2	72.7	72.7	0.0	0.0	178.6	155.7	155.7	0.0	0.0

Note:
C value for the 100-year storm is increased by 25%, to a maximum of 1.0 per Ottawa Sewer Design Guidelines (5.4.5.2.1)

Estimated Post Development Peak Flow from Attenuated Areas

Building ID BLDG C
Roof Area 0.036 ha
Avail Storage Area 0.035
C 0.90 Rational Method runoff coefficient *Note: Rational Method Coefficient "C" increased by 25% for 100-year calculations*
t_c 10 min, tc at outlet without restriction

Estimated Number of Roof Drains
Building Length 22.86
Building Width 16.76
Number of Drains 2
m^2 / Drain 172.9 max 232.25m^2/notch as recommended by Zurn for Ottawa

Roof Top Rating Curve per Zurn Model Z-105-5

d (m)	A (m^2)	V_{acc} (m^3)	V_{avail} (m^3)	Q_{notch} (L/s)	Q_{roof} (L/s)	$V_{drawdown}$ (hr)
0.000	0	0.0	0.0	0.00	0.00	0.00
0.025	21.6	0.2	0.2	0.38	0.76	0.07
0.050	86.5	1.3	1.4	0.77	1.54	0.29
0.075	194.5	3.4	4.9	1.14	2.28	0.71
0.100	345.8	6.7	11.5	1.52	3.04	1.32
0.125	345.8	8.6	20.2	1.90	3.80	1.95
0.150	345.8	8.6	28.8	2.28	4.56	2.48

* Assumes one notch opening per drain, assumes maximum slope of 10cm

	5-year					100-year				
t_c (min)	i (mm/hr)	Q_{actual} (L/s)	$Q_{release}$ (L/s)	Q_{stored} (L/s)	V_{stored} (m^3)	i (mm/hr)	Q_{actual} (L/s)	$Q_{release}$ (L/s)	Q_{stored} (L/s)	V_{stored} (m^3)
10	104.2	9.5	2.3	7.2	4.3	178.6	18.1	3.0	15.0	9.0
15	83.6	7.6	2.3	5.3	4.8	142.9	14.4	3.0	11.4	10.3
20	70.3	6.4	2.3	4.1	4.9	120.0	12.1	3.0	9.1	10.9
25	60.9	5.5	2.3	3.3	4.9	103.8	10.5	3.0	7.5	11.2
30	53.9	4.9	2.3	2.6	4.7	91.9	9.3	3.0	6.3	11.3
35	48.5	4.4	2.3	2.1	4.5	82.6	8.3	3.0	5.3	11.2
40	44.2	4.0	2.3	1.7	4.2	75.1	7.6	3.0	4.6	11.0
45	40.6	3.7	2.3	1.4	3.8	69.1	7.0	3.0	4.0	10.7
50	37.7	3.4	2.3	1.1	3.4	64.0	6.5	3.0	3.5	10.4
55	35.1	3.2	2.3	0.9	3.0	59.6	6.0	3.0	3.0	9.9
60	32.9	3.0	2.3	0.7	2.6	55.9	5.7	3.0	2.6	9.5
65	31.0	2.8	2.3	0.5	2.1	52.6	5.3	3.0	2.3	9.0
70	29.4	2.7	2.3	0.4	1.6	49.8	5.0	3.0	2.0	8.5
75	27.9	2.5	2.3	0.3	1.1	47.3	4.8	3.0	1.8	7.9
80	26.6	2.4	2.3	0.1	0.6	45.0	4.5	3.0	1.5	7.4
85	25.4	2.3	2.3	0.0	0.1	43.0	4.3	3.0	1.3	6.8
90	24.3	2.2	2.2	0.0	0.0	41.1	4.2	3.0	1.1	6.2
95	23.3	2.1	2.1	0.0	0.0	39.4	4.0	3.0	1.0	5.5
100	22.4	2.0	2.0	0.0	0.0	37.9	3.8	3.0	0.8	4.9
105	21.6	2.0	2.0	0.0	0.0	36.5	3.7	3.0	0.7	4.3
110	20.8	1.9	1.9	0.0	0.0	35.2	3.6	3.0	0.5	3.6

5-year Q_{roof}	**2.29 L/s**	**100-year Q_{roof}**	**3.01 L/s**
5-year Max. Storage Required	**4.9 m^3**	**100-year Max. Storage Required**	**11.3 m^3**
5-year Storage Depth	**0.075 m**	**100-year Storage Depth**	**0.099 m**
5-year Estimated Drawdown Time	**0.72 hr**	**100-year Estimated Drawdown Time**	**1.30 hr**

Building ID BLDG D
Roof Area 0.069 ha
Avail Storage Area 0.065
C 0.90 Rational Method runoff coefficient *Note: Rational Method Coefficient "C" increased by 25% for 100-year calculations*
t_c 10 min, tc at outlet without restriction

Estimated Number of Roof Drains

Building Length	38.10
Building Width	18.29
Number of Drains	3
m^2 / Drain	217.9 max 232.25m^2/notch as recommended by Zurn for Ottawa

Roof Top Rating Curve per Zurn Model Z-105-5

d	A	V_{acc}	V_{avail}	Q_{notch}	Q_{roof}	$V_{drawdown}$
(m)	(m^2)	(m^3)	(m^3)	(L/s)	(L/s)	(hr)
0.000	0	0.0	0.0	0.00	0.00	0.00
0.025	40.9	0.3	0.3	0.38	1.14	0.08
0.050	163.4	2.4	2.7	0.77	2.31	0.37
0.075	367.7	6.5	9.2	1.14	3.42	0.89
0.100	653.6	12.6	21.8	1.52	4.56	1.66
0.125	653.6	16.3	38.1	1.90	5.70	2.46
0.150	653.6	16.3	54.5	2.28	6.84	3.12

* Assumes one notch opening per drain, assumes maximum slope of 10cm

	5-year					100-year				
t_c	i	Q_{actual}	$Q_{release}$	Q_{stored}	V_{stored}	i	Q_{actual}	$Q_{release}$	Q_{stored}	V_{stored}
(min)	(mm/hr)	(L/s)	(L/s)	(L/s)	(m^3)	(mm/hr)	(L/s)	(L/s)	(L/s)	(m^3)
10	104.2	17.9	3.5	14.4	8.6	178.6	34.1	4.7	29.5	17.7
15	83.6	14.4	3.5	10.8	9.8	142.9	27.3	4.7	22.6	20.4
20	70.3	12.1	3.5	8.6	10.3	120.0	22.9	4.7	18.3	21.9
25	60.9	10.5	3.5	6.9	10.4	103.8	19.8	4.7	15.2	22.8
30	53.9	9.3	3.5	5.7	10.3	91.9	17.6	4.7	12.9	23.2
35	48.5	8.3	3.5	4.8	10.1	82.6	15.8	4.7	11.1	23.3
40	44.2	7.6	3.5	4.1	9.8	75.1	14.4	4.7	9.7	23.3
45	40.6	7.0	3.5	3.5	9.3	69.1	13.2	4.7	8.5	23.0
50	37.7	6.5	3.5	2.9	8.8	64.0	12.2	4.7	7.6	22.7
55	35.1	6.0	3.5	2.5	8.3	59.6	11.4	4.7	6.7	22.2
60	32.9	5.7	3.5	2.1	7.7	55.9	10.7	4.7	6.0	21.6
65	31.0	5.3	3.5	1.8	7.1	52.6	10.1	4.7	5.4	21.0
70	29.4	5.1	3.5	1.5	6.4	49.8	9.5	4.7	4.8	20.4
75	27.9	4.8	3.5	1.3	5.7	47.3	9.0	4.7	4.4	19.6
80	26.6	4.6	3.5	1.0	5.0	45.0	8.6	4.7	3.9	18.9
85	25.4	4.4	3.5	0.8	4.2	43.0	8.2	4.7	3.5	18.1
90	24.3	4.2	3.5	0.6	3.5	41.1	7.9	4.7	3.2	17.2
95	23.3	4.0	3.5	0.5	2.7	39.4	7.5	4.7	2.9	16.3
100	22.4	3.9	3.5	0.3	1.9	37.9	7.2	4.7	2.6	15.5
105	21.6	3.7	3.5	0.2	1.1	36.5	7.0	4.7	2.3	14.5
110	20.8	3.6	3.5	0.1	0.3	35.2	6.7	4.7	2.1	13.6

5-year Q_{roof}	**3.53 L/s**	**100-year Q_{roof}**	**4.67 L/s**
5-year Max. Storage Required	**10.4 m^3**	**100-year Max. Storage Required**	**23.3 m^3**
5-year Storage Depth	**0.077 m**	**100-year Storage Depth**	**0.102 m**
5-year Estimated Drawdown Time	**0.97 hr**	**)0-year Estimated Drawdown Time**	**1.74 hr**

Summary of Release Rates and Storage Volumes

Control Area	5-Year Release Rate (L/s)	5-Year Required Storage (m^3)	100-Year Release Rate (L/s)	100-Year Required Storage (m^3)	100-Year Available Storage (m^3)
A1	72.7	0.0	155.7	0.0	0.0
Retail C	2.3	4.9	3.0	11.3	11.5
Retail D	3.5	10.4	4.7	23.3	38.1
Total	**78.5**	**15.3**	**163.4**	**34.6**	**49.7**

Stormwater - Proposed Development
City of Ottawa Sewer Design Guidelines, 2012

Target Flow Rate

Area 0.996 ha

Estimated Post Development Peak Flow from Attenuated Areas

Building ID BLDG E
Roof Area 0.164 ha
Avail Storage Area 0.156
C 0.90 Rational Method runoff coefficient *Note: Rational Method Coefficient "C" increased by 25% for 100-year calculations*
t_c 10 min, tc at outlet without restriction

Estimated Number of Roof Drains
Building Length 54.2
Building Width 29.5
Number of Drains 7
m^2 / Drain 222.6 max 232.25m^2/notch as recommended by Zurn for Ottawa

Roof Top Rating Curve per Zurn Model Z-105-5						
d	A	V_{acc}	V_{avail}	Q_{notch}	Q_{roof}	$V_{drawdown}$
(m)	(m^2)	(m^3)	(m^3)	(L/s)	(L/s)	(hr)
0.000	0	0.0	0.0	0.00	0.00	0.00
0.025	97.4	0.8	0.8	0.38	2.66	0.08
0.050	389.5	5.7	6.5	0.77	5.39	0.38
0.075	876.4	15.4	21.9	1.14	7.98	0.91
0.100	1558.0	30.0	51.9	1.52	10.64	1.70
0.125	1558.0	39.0	90.9	1.90	13.30	2.51
0.150	1558.0	39.0	129.8	2.28	15.96	3.19

* Assumes one notch opening per drain, assumes maximum slope of 10cm

	5-year					100-year				
t_c	i	Q_{actual}	$Q_{release}$	Q_{stored}	V_{stored}	i	Q_{actual}	$Q_{release}$	Q_{stored}	V_{stored}
(min)	(mm/hr)	(L/s)	(L/s)	(L/s)	(m^3)	(mm/hr)	(L/s)	(L/s)	(L/s)	(m^3)
10	104.2	42.7	8.3	34.5	20.7	178.6	81.3	10.9	70.4	42.3
15	83.6	34.3	8.3	26.0	23.4	142.9	65.1	10.9	54.2	48.8
20	70.3	28.8	8.3	20.5	24.7	120.0	54.6	10.9	43.7	52.5
25	60.9	25.0	8.3	16.7	25.1	103.8	47.3	10.9	36.4	54.6
30	53.9	22.1	8.3	13.9	24.9	91.9	41.9	10.9	30.9	55.7
35	48.5	19.9	8.3	11.6	24.4	82.6	37.6	10.9	26.7	56.1
40	44.2	18.1	8.3	9.9	23.7	75.1	34.2	10.9	23.3	55.9
45	40.6	16.7	8.3	8.4	22.7	69.1	31.5	10.9	20.5	55.4
50	37.7	15.4	8.3	7.2	21.5	64.0	29.1	10.9	18.2	54.6
55	35.1	14.4	8.3	6.1	20.3	59.6	27.2	10.9	16.2	53.6
60	32.9	13.5	8.3	5.2	18.9	55.9	25.5	10.9	14.5	52.3
65	31.0	12.7	8.3	4.5	17.4	52.6	24.0	10.9	13.1	50.9
70	29.4	12.0	8.3	3.8	15.9	49.8	22.7	10.9	11.8	49.4
75	27.9	11.4	8.3	3.2	14.3	47.3	21.5	10.9	10.6	47.7
80	26.6	10.9	8.3	2.6	12.6	45.0	20.5	10.9	9.6	46.0
85	25.4	10.4	8.3	2.1	10.9	43.0	19.6	10.9	8.6	44.1
90	24.3	10.0	8.3	1.7	9.2	41.1	18.7	10.9	7.8	42.2
95	23.3	9.6	8.3	1.3	7.4	39.4	18.0	10.9	7.0	40.1
100	22.4	9.2	8.3	0.9	5.6	37.9	17.3	10.9	6.3	38.1
105	21.6	8.8	8.3	0.6	3.7	36.5	16.6	10.9	5.7	35.9
110	20.8	8.5	8.3	0.3	1.8	35.2	16.0	10.9	5.1	33.8

5-year Q_{roof}	**8.26 L/s**	**100-year Q_{roof}**	**10.92 L/s**
5-year Max. Storage Required	**25.1 m^3**	**100-year Max. Storage Required**	**56.1 m^3**
5-year Storage Depth	**0.078 m**	**100-year Storage Depth**	**0.103 m**
5-year Estimated Drawdown Time	**1.00 hr**	**00-year Estimated Drawdown Time**	**1.78 hr**

Summary of Release Rates and Storage Volumes

Control Area	5-Year Release Rate (L/s)	5-Year Required Storage (m^3)	100-Year Release Rate (L/s)	100-Year Required Storage (m^3)	100-Year Available Storage (m^3)
Retail E	8.3	25.1	10.9	56.1	90.9

LEGEND

PERVIOUS AREA

IMPERVIOUS AREA

LIMIT OF WORK

CON. 11

INNES RD

PART 2, EXPROPRIATION PLAN 0C339344 PIN 14563-0002 (LT)

PART 6, PLAN 4R-19914

PART 12

PLAN 4R-1991

PART 11

PIN 14563-0047 (LT)

N15°45'40"E (P1&Set) 4.56

(P1&Set) 63.10

N53°48'20"E

77.62 (P1&Meas)

(P1&Set) 51.29

N22°36'50"W

N67°23'10"E

Lawn

Shrubs

SSIB (UDE)

Wrought Iron Fence

Columns

Parking Spaces

Asphalt

Canopy

Base

Sign

Rail Fence

TOTAL AREA=0.493ha

C-VALUE=$\frac{(0.370\times0.9)+(0.123\times0.2)}{0.493ha} = 0.72$

DSEL david schaeffer engineering ltd SMART SUBDIVISIONS™

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Fax. (613) 836-7183
www.DSEL.ca

RATIONAL METHOD COEFFICIENT - EXISTING CONDITIONS
RETAIL C & D

PROJ NO.:	17-961
DRAWN BY:	AJG
DATE:	2017-09-21
SCALE:	1:400
FIGURE NO.:	FIG-1

z:\projects\17-961_choice-properties-reit_4270-innes-rd\b_design\b2_drawings\b2-2_main (dsel)\spa_sub1\cad\2017-09-20_961_ajg.dwg

LEGEND

- PERVIOUS AREA
- IMPERVIOUS AREA
- LIMIT OF WORK

PLAN 4R–20726 Asphalt PART 1

PART 2, PLAN 4R–20726

PART 3, PLAN 4R–20726

Lawn

Sign

Shrubs

Parking Spaces

195.68 (P3&Meas)

22.66

SUBJECT TO EASEMENT AS IN INST. No. OC496256

SUBJECT TO EASEMENT AS IN INST. No. OC496250

N22°41'30"W

Spike (AOG)

SUBJECT TO EASEMENT AS IN INST. No. OC427624

PART 2, PLAN 4R–20474

PART 7, PLAN 4R–20726

SUBJECT TO EASEMENT IN GROSS AS IN INST. No. OC561855

PART 1, PLAN 4R–20474 (P1&Meas) 95.38

Parking Spaces

Asphalt Ramp

Canopy

Above

Asphalt

Rail Fence

Lawn

RETAIL E:
V AVAILABLE=18.2m³
100–YEAR MAX PONDING ELEV=87.90m

CONCESSION

PIN 14563–0049 (LT)

PART 6, PLAN 4R–19914

2 STOREY METAL CLAD BUILDING

Garbage Enclosure Board Fence

Garbage Compactor

Guard Rail

Garbage Compactor

10.00 (P1, P3&Meas)

PART 9, PLAN 4R–20726

PART 4, PLAN 4R–20726

PART 5, PLAN 4R–20726

(P1&Set) 5.00

PART 10, PLAN 4R–20726

PART 7, PLAN 4R–19914

SUBJECT TO EASEMENT AS IN INST. No. OC427624

114.54 (P1&Set)

SIB(AOG)

106.05 (P1&Set)

Bottom of Slope

Grass

N67°23'30"E (Reference Bearing)

PART OF PART 1, PLAN 50R–5795

TOTAL AREA=0.996ha

$$C\text{–VALUE}=\frac{(0.889\times0.9)+(0.108\times0.2)}{0.996\text{ha}}=0.82$$

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RATIONAL METHOD COEFFICIENT - EXISTING CONDITIONS
RETAIL E

PROJ NO.:	17–961
DRAWN BY:	AJG
DATE:	2017–09–21
SCALE:	1:600
FIGURE NO.:	FIG-2

z:\projects\17–961_choice–properties–reit_4270–innes–rd\b_design\b2_drawings\b2–2_main (dsel)\spa_sub1\cad\2017–09–20_961_ajg.dwg

LEGEND

PERVIOUS AREA

IMPERVIOUS AREA

LIMIT OF WORK

TOTAL AREA=0.493ha

C-VALUE=$\frac{(0.353 \times 0.9)+(0.140 \times 0.2)}{0.493ha} = 0.70$

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RATIONAL METHOD COEFFICIENT - PROPOSED CONDITIONS
RETAIL C & D

PROJ NO.:	17-961
DRAWN BY:	AJG
DATE:	2017-09-21
SCALE:	1:400
FIGURE NO.:	FIG-3

z:\projects\17-961_choice-properties-reit_4270-innes-rd\b_design\b2_drawings\b2-2_main (dsel)\spa_sub1\cad\2017-09-20_961_ajg.dwg

LEGEND

PERVIOUS AREA

IMPERVIOUS AREA

LIMIT OF WORK

TOTAL AREA=0.996ha

$$\text{C-VALUE}=\frac{(0.943\times0.9)+(0.053\times0.2)}{0.996\text{ha}} = 0.86$$

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www.DSEL.ca

RATIONAL METHOD COEFFICIENT - PROPOSED CONDITIONS
RETAIL E

PROJ NO.:	17-961
DRAWN BY:	AJG
DATE:	2017-09-21
SCALE:	1:600
FIGURE NO.:	FIG-4

z:\projects\17-961_choice-properties-reit_4270-innes-rd\b_design\b2_drawings\b2-2_main (dsel)\spa_sub1\cad\2017-09-20_961_ajg.dwg

Zurn Roof Drains

Control-Flo...Today's Successful Answer to More

THE ZURN "CONTROL-FLO CONCEPT"

Originally, Zurn introduced the scientifically-advanced "Control-Flo" drainage principle for dead-level roofs. Today, after thousands of successful applications in modern, large dead-level roof areas, Zurn engineers have adapted the comprehensive "Control-Flo" data to **sloped roof** areas.

WHAT IS "CONTROL-FLO"?

It is an advanced method of removing rain water off dead-level or sloped roofs. As contrasted with conventional drainage practices, which attempt to drain off storm water as quickly as it falls on the roof's surface, "Control-Flo" drains the roof at a controlled rate. Excess water accumulates on the roof under controlled conditions...then drains off at a lower rate after a storm abates.

CUTS DRAINAGE COSTS

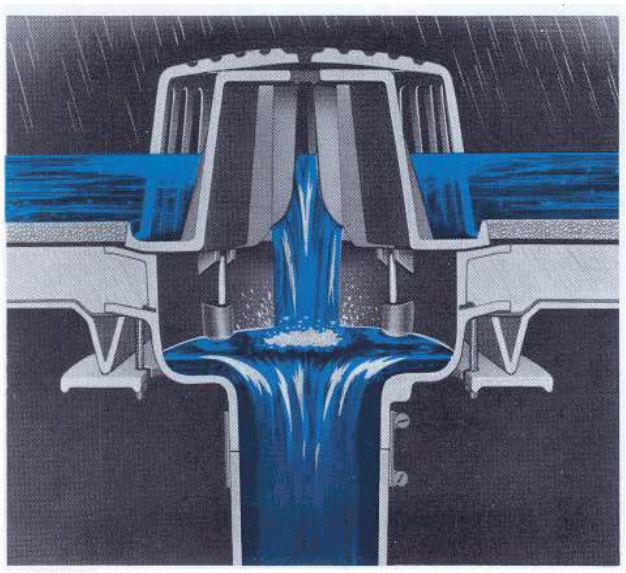
Fewer roof drains, smaller diameter piping, smaller sewer sizes, and lower installation costs are possible with a "Control-Flo" drainage system because roof areas are utilized as temporary storage reservoirs.

REDUCES PROBABILITY OF STORM DAMAGE

Lightens load on combination sewers by reducing rate of water drained from roof tops during severe storms thereby reducing probability of flooded sewers, and consequent backflow into basements and other low areas.

THANKS TO EXCLUSIVE ZURN "AQUA-WEIR" ACTION

Key to successful "Control-Flo" drainage is a unique scientifically-designed weir containing accurately calibrated notches with sides formed by parabolic curves which provide flow rates directly proportional to the head. Shape and size of notches are based on predetermined flow rates, and all factors involved in roof drainage to assure permanent regulation of drainage flow rates for specific geographic locations and rainfall intensities.

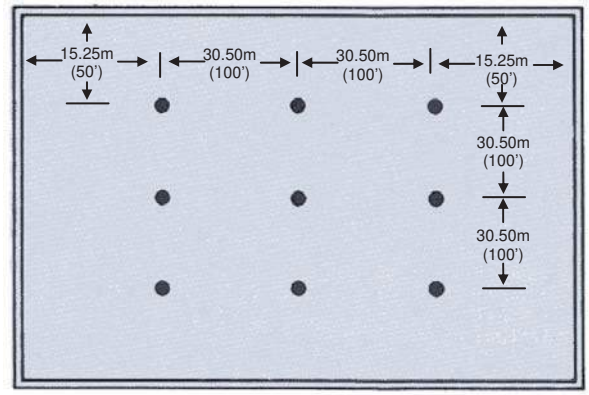


DEFINITION

DEAD LEVEL ROOFS

DIAGRAM "A"

A dead-level roof for purposes of applying the Zurn "Control-Flo" drainage principle is one which has been designed for zero slope across its entire surface. Measurements shown are for maximum distances.



(Plan View)

(Section View)

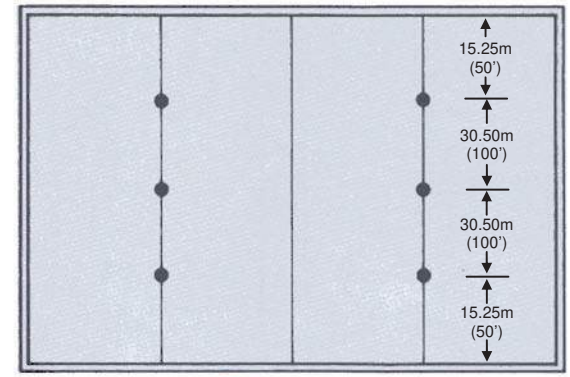
SLOPED ROOFS

DIAGRAM "B"

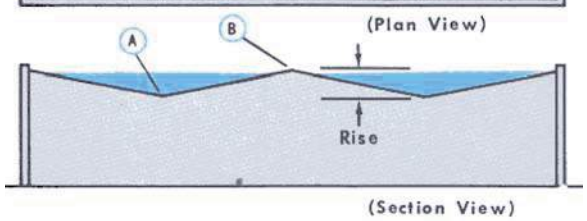
A sloped roof is one designed commonly with a shallow slope. The Zurn "Control-Flo" drainage system can be applied to any slope which results in a total rise up to 152mm (6").

The total rise of a roof as calculated for "Control-Flo" application is defined as the vertical increase in height in inches, from the low point or valley of a sloping roof (A) to the top of the sloping section (B). (Example: a roof that slopes 3mm (1/8") per foot having a 7.25m (24') span would have a rise of 7.25m x 3mm or 76mm (24' x 1/8" or 3")).

Measurements shown are for maximum distances.



(Plan View)

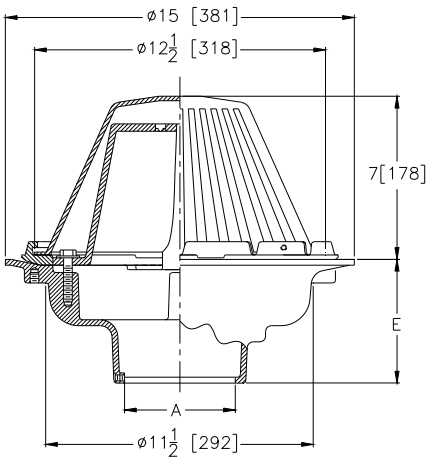


(Section View)

Dimensions and other measurements given in metric and imperial forms.

Economical Roof Drainage Installations

SPECIFICATION DATA



ENGINEERING SPECIFICATION: ZURN Z-105 "Control-Flo" roof drain for dead -level or sloped roof construction, Dura-Coated cast iron body. "Control-Flo" weir shall be linear functioning with integral membrane flashing clamp/ gravel guard and Poly-Dome. All data shall be verified proportional to flow rates.

ROOF DESIGN RECOMMENDATIONS

Basic roofing design should incorporate protection that will prevent roof overloading by installing adequate overflow scuppers in parapet walls.

GENERAL INFORMATION

The "Control-Flo" roof drainage data is tabulated for four areas (232.25m^2 (2500 sq. ft.), 464.502m^2 (5000 sq. ft.), 696.75m^2 (7500 sq. ft.), 929m^2 (10,000 sq. ft.) notch areas ratings) for each locality. For each notch area rating the maximum discharge in L.P.M. (G.P.M.) - draindown in hours, and maximum water depth at the drain in inches for a dead level roof — 51mm (2 inch) rise — 102mm (4 inch) rise and 152mm (6 inch) rise—are tabulated. The rise is the total change in elevation from the valley to the peak. Values for areas, rise or combination thereof other than those listed, can be arrived at by extrapolation. All data listed is based on the fifty-year return frequency storm. In other words the maximum conditions as listed will occur on the average of once every fifty years.

NOTE: The tabulated "Control-Flo" data enables the individual engineer to select his own design limiting condition. The limiting condition can be draindown time, roof load factor, or maximum water depth at the drain. If draindown time is the limiting factor because of possible freezing conditions, it must be recognized that the maximum time listed will occur on the average of once every 50 years and would most likely be during a heavy summer thunder storm. Average winter draindown times would be much shorter in duration than those listed.

GENERAL RECOMMENDATIONS

On sloping roofs, we recommend a design depth referred to as an equivalent depth. An equivalent depth is the depth of water attained at the drains that results in the same roof stresses as those realized on a dead-level roof. In all cases this equivalent depth is almost equal to that attained by using the same notch area rating for the different rises to 152mm (6"). With the same depth of water at the drain the roof stresses will decrease with increasing total rise. Therefore, it would be possible to have a depth in excess of 152mm (6") at the drain on a sloping roof without exceeding stresses normally encountered in a 152mm (6") depth on a dead-level roof. However, it is recommended that scuppers be placed to limit the maximum water depth on any roof to 152mm (6") to prevent the overflow of the weirs on the drains and consequent overloading of drain piping. In the few cases where the data shows a flow rate in excess of 136 L.P.M. (30 G.P.M.) if all drains and drain lines are sized according to recommendations, and the one storm in fifty years occurs, the only consequence will be a brief flow through the scuppers or over-flow drains.

NOTE: An equivalent depth is that depth of water attained at the drains at the lowest line or valley of the roof with all other conditions such as notch area and rainfall intensity being equal. For Toronto, Ontario a notch area rating of 464.50m^2 (5,000 sq. ft.) results in a 74mm (2.9 inch) depth on a dead level roof for a 50-year storm. For the same notch area and conditions, equivalent depths for a 51mm (2"), 102mm (4") and 152mm (6") rise respectively on a sloped roof would be 86mm (3.4"), 104mm (4.1") and 124mm (4.9"). Roof stresses will be approximately equal in all cases.

Control-Flo Drain Selection Is Quick and Easy...

The exclusive Zurn "Selecta-Drain" Chart (pages 8—11) tabulates selection data for 34 localities in Canada. Proper use of this chart constitutes your best assurance of sure, safe, economical application of Zurn "Control-Flo" systems for your specific geographical area. If the "Selecta-Drain Chart does not cover your specific design criteria, contact Zurn Industries Limited, Mississauga, Ontario, for additional data for your locality. Listed below is additional information pertinent to proper engineering of the "Control-Flo" system.

ROOF USED AS TEMPORARY RETENTION

The key to economical "Control-Flo" is the utilization of large roof areas to temporarily store the maximum amount of water without overloading average roofs or creating excessive draindown time during periods of heavy rainfall. The data shown in the "Selecta-Drain" Chart enables the engineer to select notch area ratings from 232.25 m^2 (2,500 $ft.^2$) to 929m^2 (10,000 $ft.^2$) and to accurately predict all other design factors such as maximum roof load, L.P.M. (G.P.M.) discharge, draindown time and water depth at the drain. Obviously, as design factors permit the notch area rating to increase the resulting money saved in being able to use small leaders and drain lines will also increase.

ROOF LOADING AND RUN-OFF RATES

The four values listed in the "Selecta-Drain" Chart for notch area ratings for different localities will normally span the range of good design. If areas per notch below 232.25m^2 (2,500 $ft.^2$) are used considerable economy of the "Control-Flo" concept is being lost. The area per notch is limited to 929m^2 (10,000 $ft.^2$) to keep the draindown time within reasonable limits. Extensive studies show that stresses due to water load on a sloping roof for any fixed set of conditions are very nearly the same as those on a dead-level roof. A sloping roof tends to concentrate more water in the valleys and increase the water depth at this point. The greater depth around the drain leads to a faster run-off rate, particularly a faster early run -off rate. As a result, the total volume of water stored on the roof is less, and the total load on the sloping roof is less. By using the same area on the sloping roof as on the dead-level roof the increase in roof stresses due to increased water depth in the valleys is offset by the decrease in the total load due to less water stored. The net result of the maximum roof stress is approximately the same for any single span rise and fixed set of conditions. A fixed set of conditions, would be the same notch area, the same frequency store, and the same locality.

SPECIAL CONSIDERATIONS FOR STRUCTURAL SAFETY: Normal practice of roof design is based on 18kg (40 lbs.) per 929 cm^2 (sq ft.). (Subject to local codes and by-laws.) Thus it is extremely important that design is in accordance with normal load factors so deflection will be slight enough in any bay to prevent progressive deflection which could cause water depths to load the roof beyond its design limits.

ADDITIONAL NOTCH RATINGS

The 'Selecta-Drain" Chart along with Tables I and II enables the engineer to select "Control-Flo" Drains and drain pipe sizes for most Canadian applications. These calculations are computed for a proportional flow weir that is sized to give a flow of 23 L.P.M. (5 G.P.M.) per inch of head. The 23 L.P.M. (5 G.P.M.) per inch of head notch opening is selected as the bases of design as it offers the most economical installation as applied to actual rainfall experienced in Canada.

Should you require design criteria for locations outside of Canada or for special project applications please contact Zurn Industries Limited, Mississauga, Ontario.

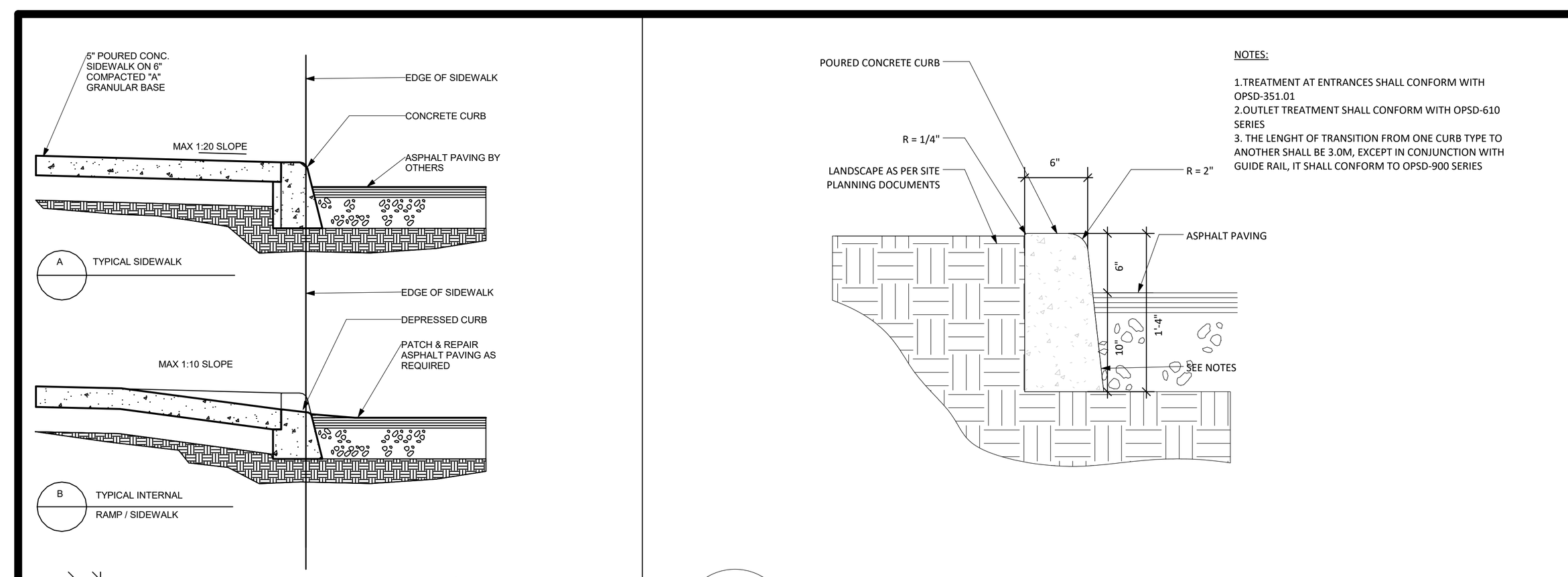
LEADER AND DRAIN PIPE SIZING

Since all data in the "Selecta-Drain" Chart is based on the 50-year-storm it is possible to exceed the water depth listed in these charts if a 100-year or 1000-year storm would occur. Therefore, for good design it is recommended that scuppers or other methods be used to limit water depth to the design depth and tables I and II be used to size the leaders and drain pipes. If the roof is capable of supporting more water than the design depth it is permissible to locate the scuppers or other overflow means at a height that will allow a greater water depth on the roof. However, in this case the leader and drain pipes should be sized to handle the higher flow rates possible based on a flow rate of 23 L.P.M. (5 G.P.M.) per inch of depth at the drain.

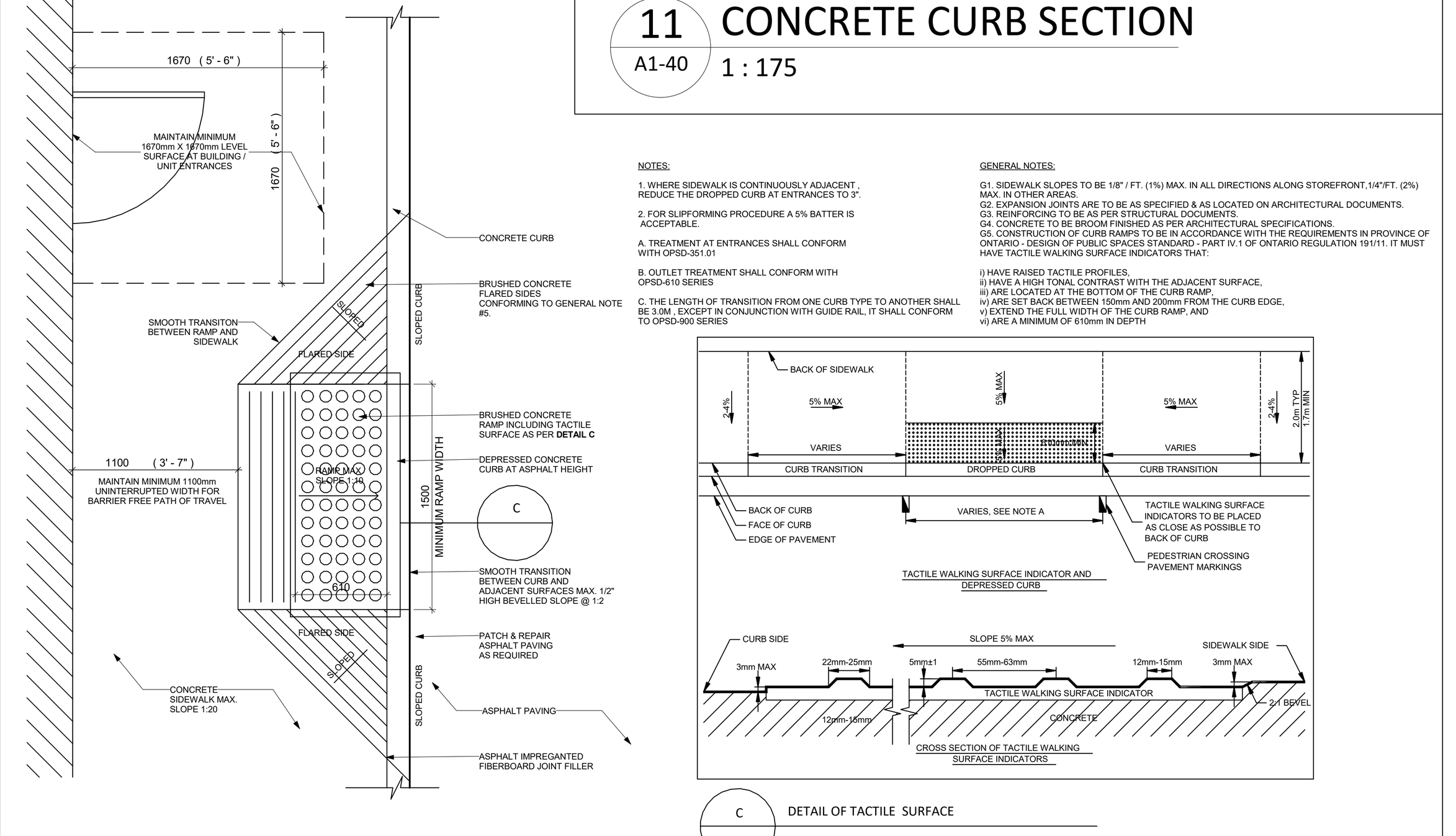
PROPER DRAIN LOCATION

The following good design practice is recommended for selecting the proper number of "Control-Flo" drains for a given area. **On dead-level roofs**, drains should be located no further than 15.25m (50 feet) from edge of roof and no further than 30.50m (100 feet) between drains. See diagram "A" page 2. **On sloping roofs**, drains should be located in the valleys at a distance no greater than 15.25m (50 feet) from each end of the valleys and no further than 30.50m (100 feet) between drains. See diagram "B" page 2. Compliance with these recommendations will assure good run off regardless of wind direction.

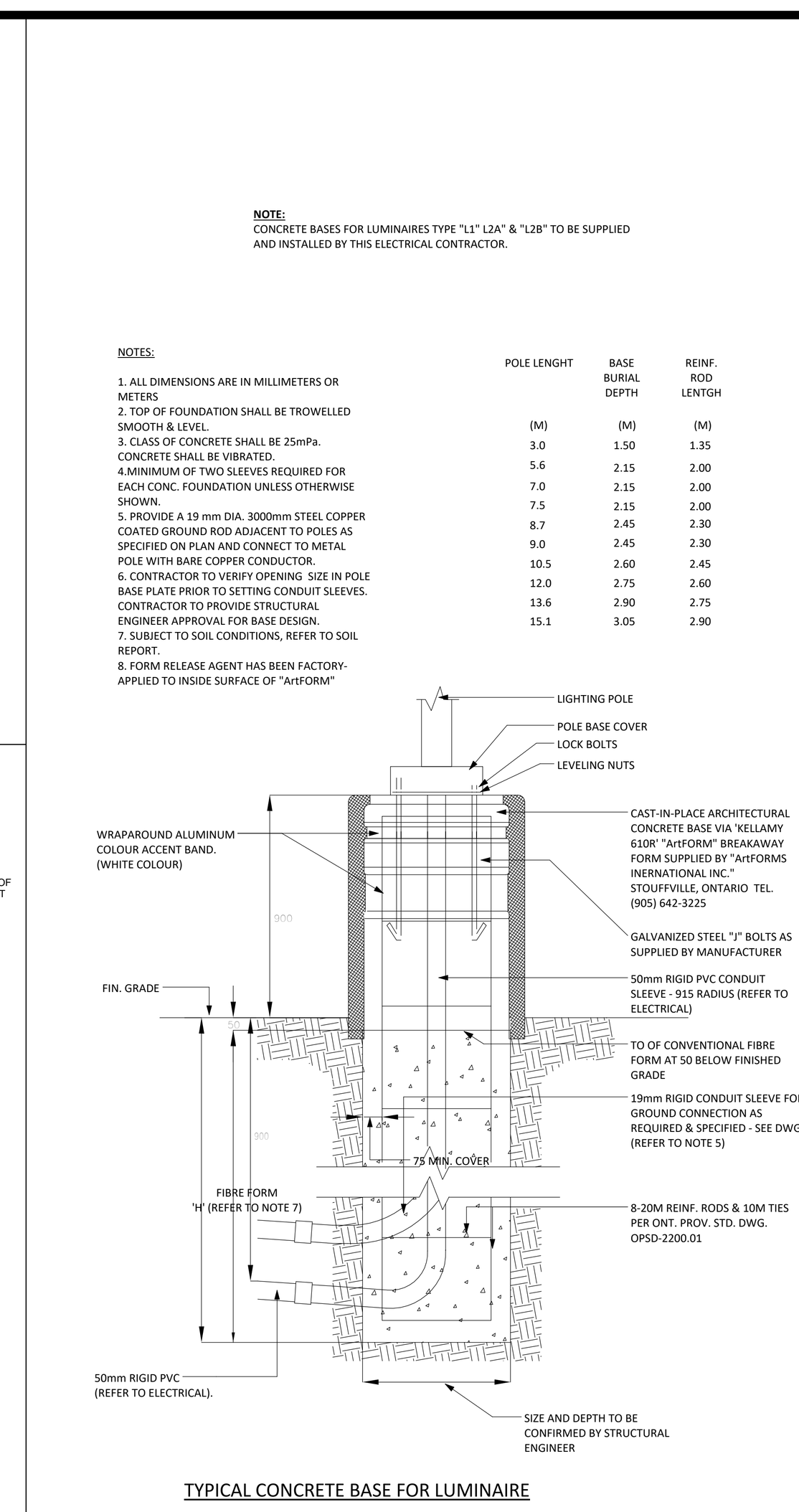
DRAWINGS / FIGURES



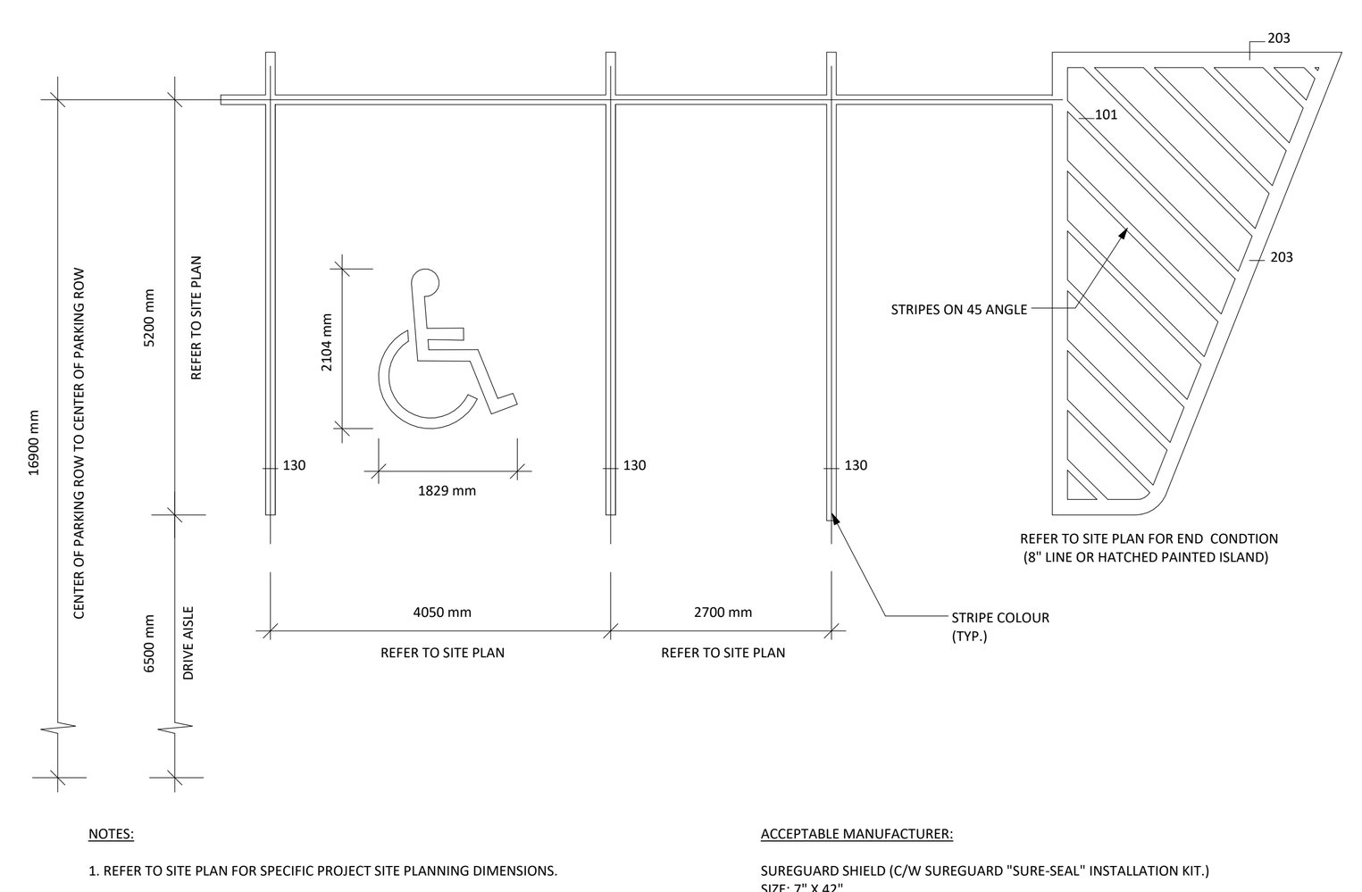
11 CONCRETE CURB SECTION
A1-40 1 : 175



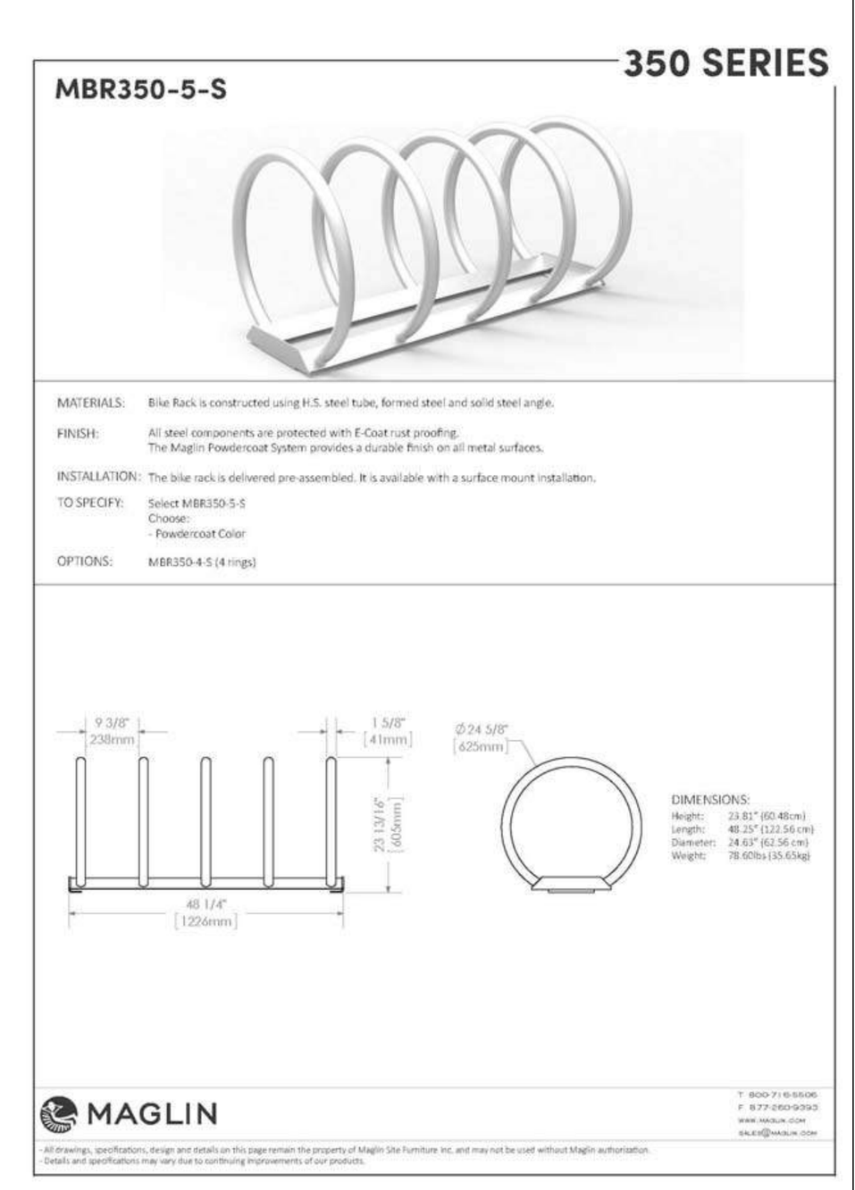
10 CURB DEPRESSION
A1-40 1 : 35



9 LIGHT STANDARD
A1-40 1 : 500

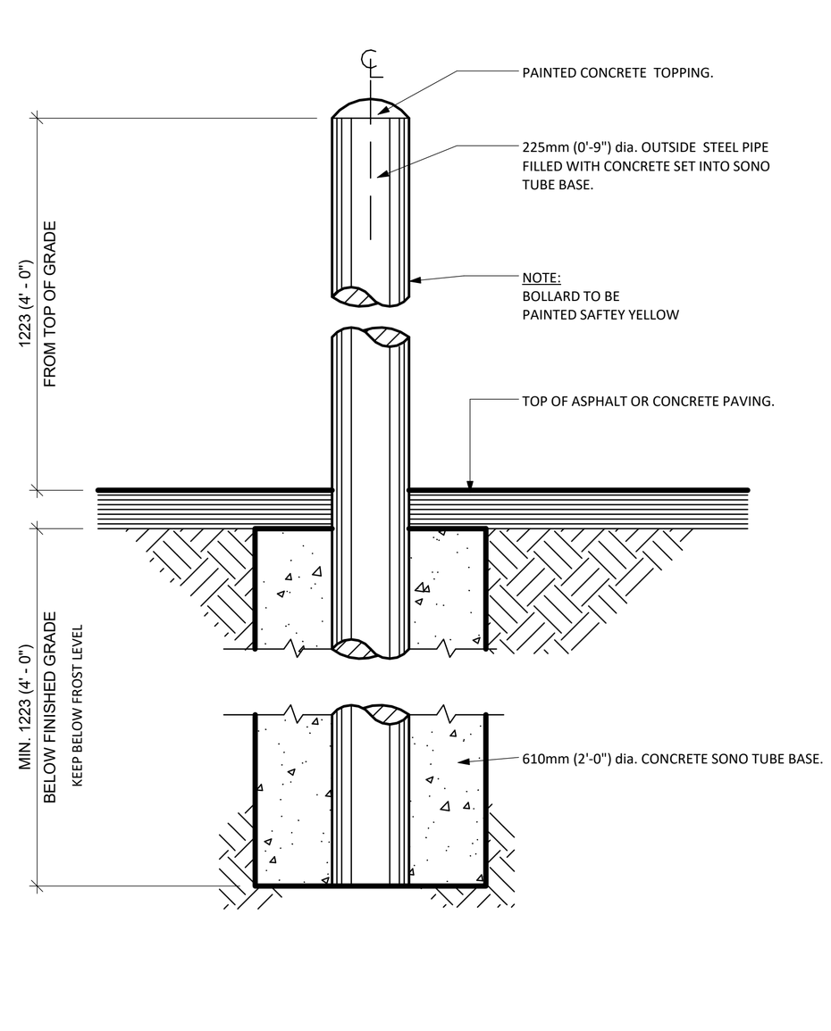


8 STANDARD PARKING DETAIL
A1-40 1 : 100

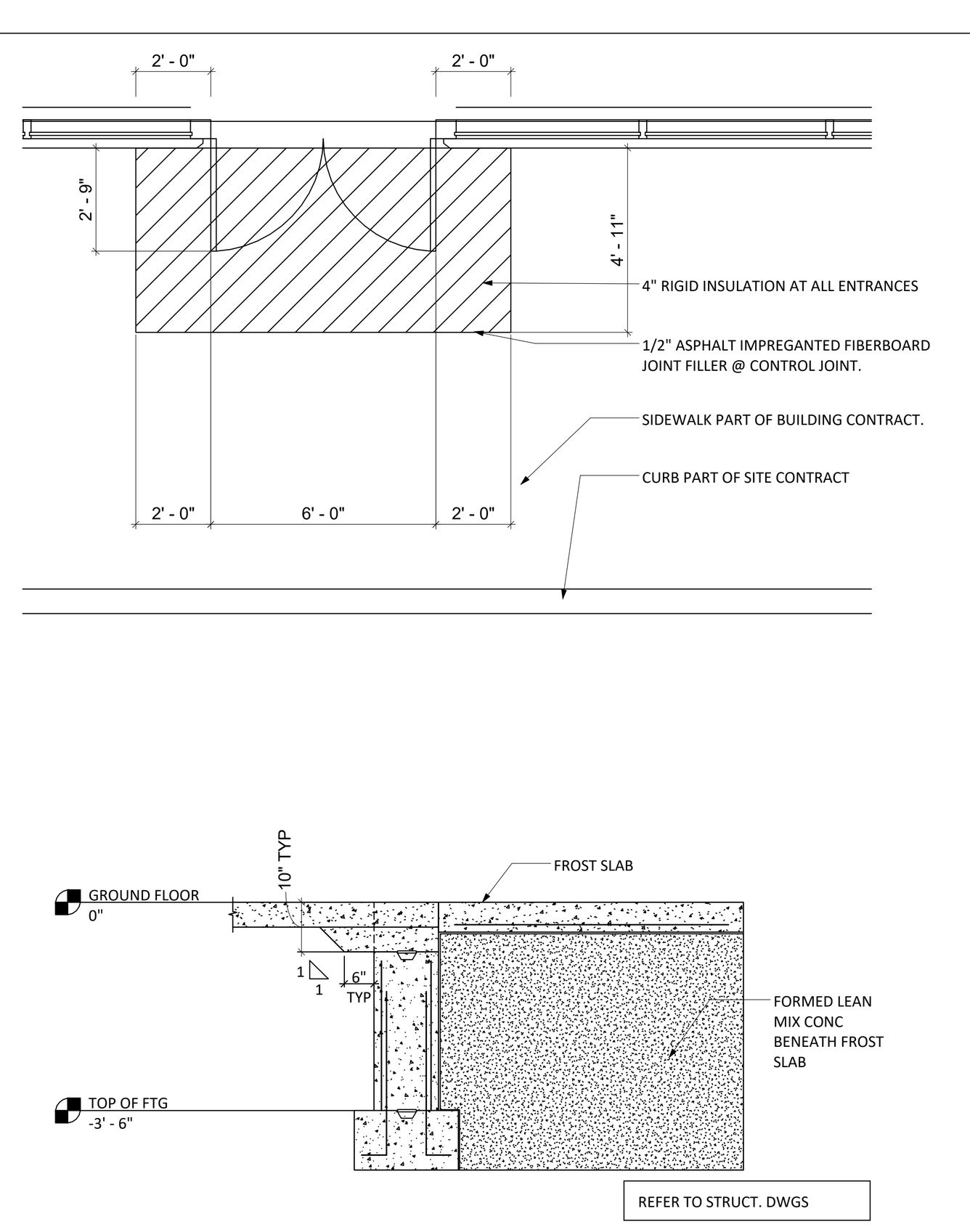


7 BIKE RACK DETAIL
A1-40 N.T.S.

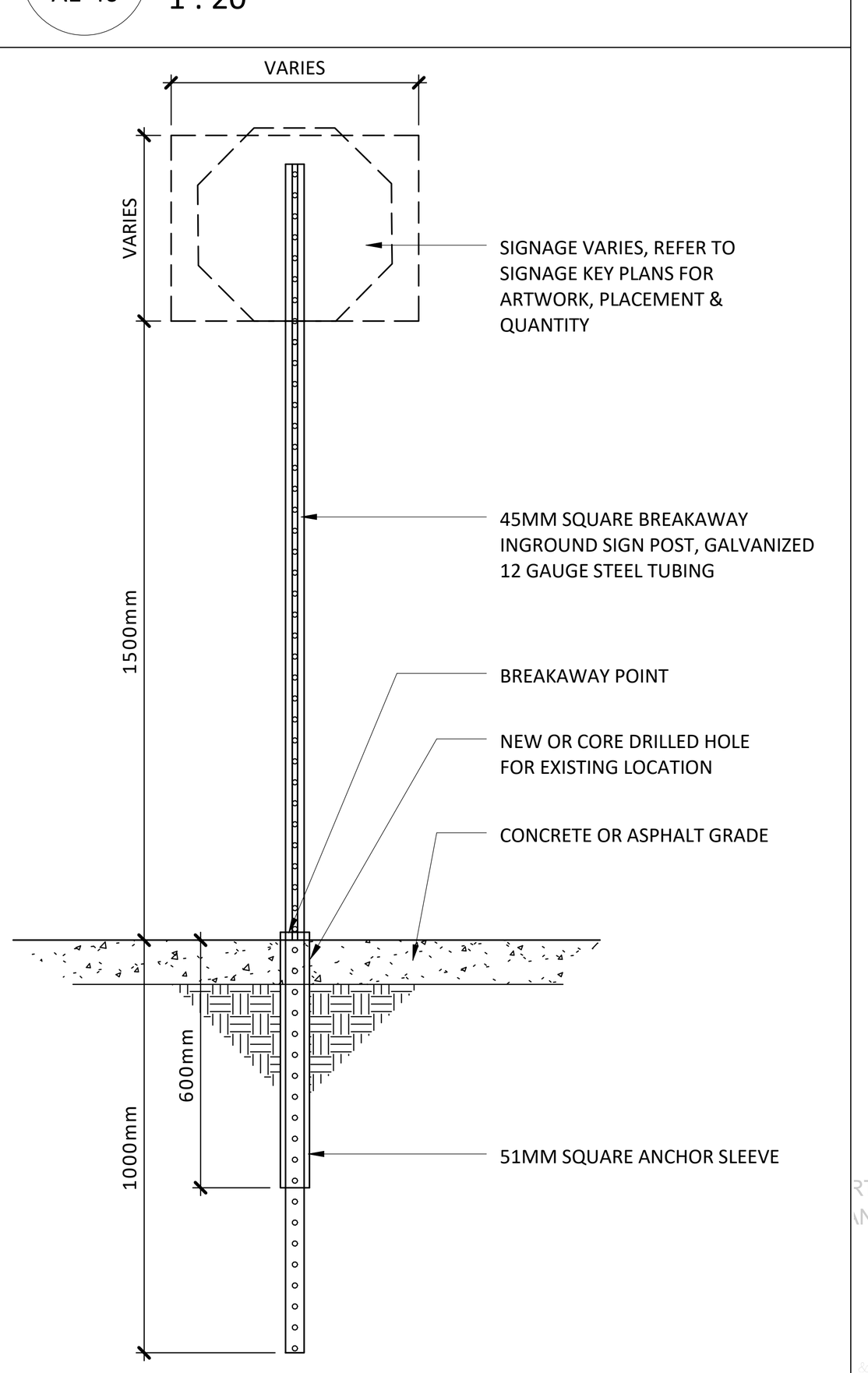
6 MOLOKS
A1-40 N.T.S.



5 TYPICAL BOLLARD DETAIL
A1-40 1 : 20



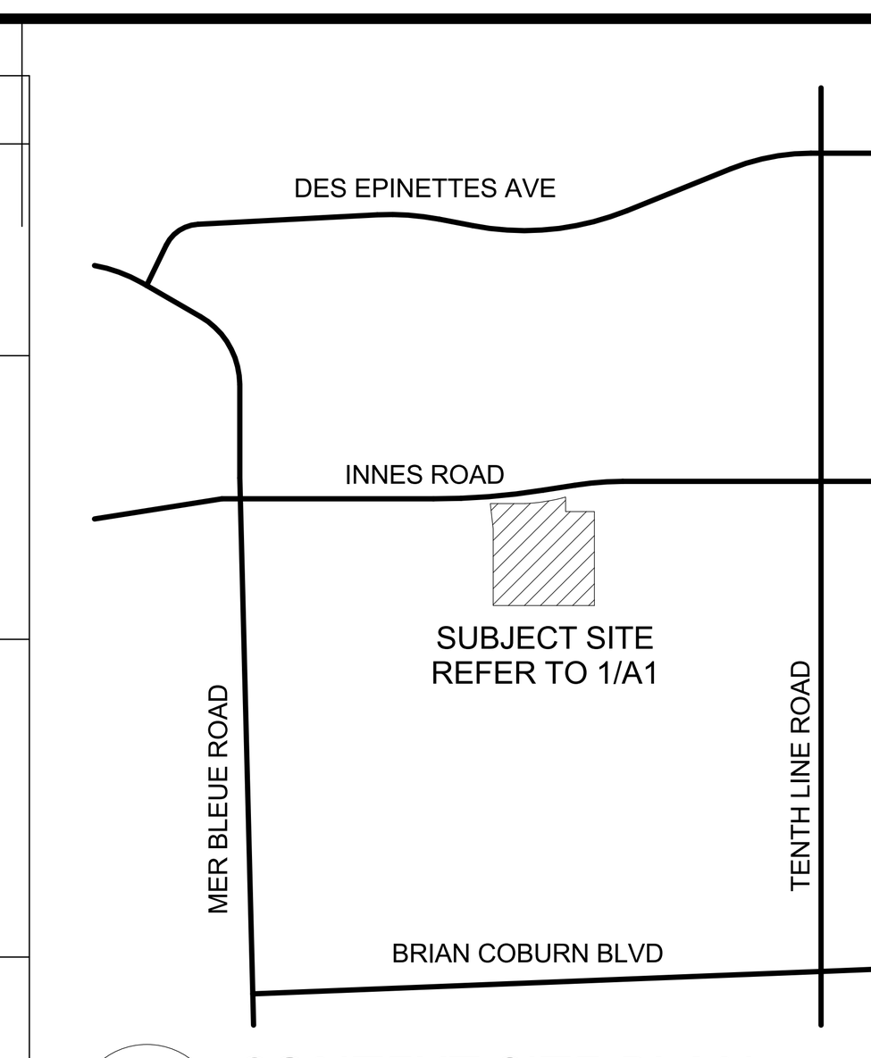
4 FROST SLAB DETAIL
A1-40 1 : 50



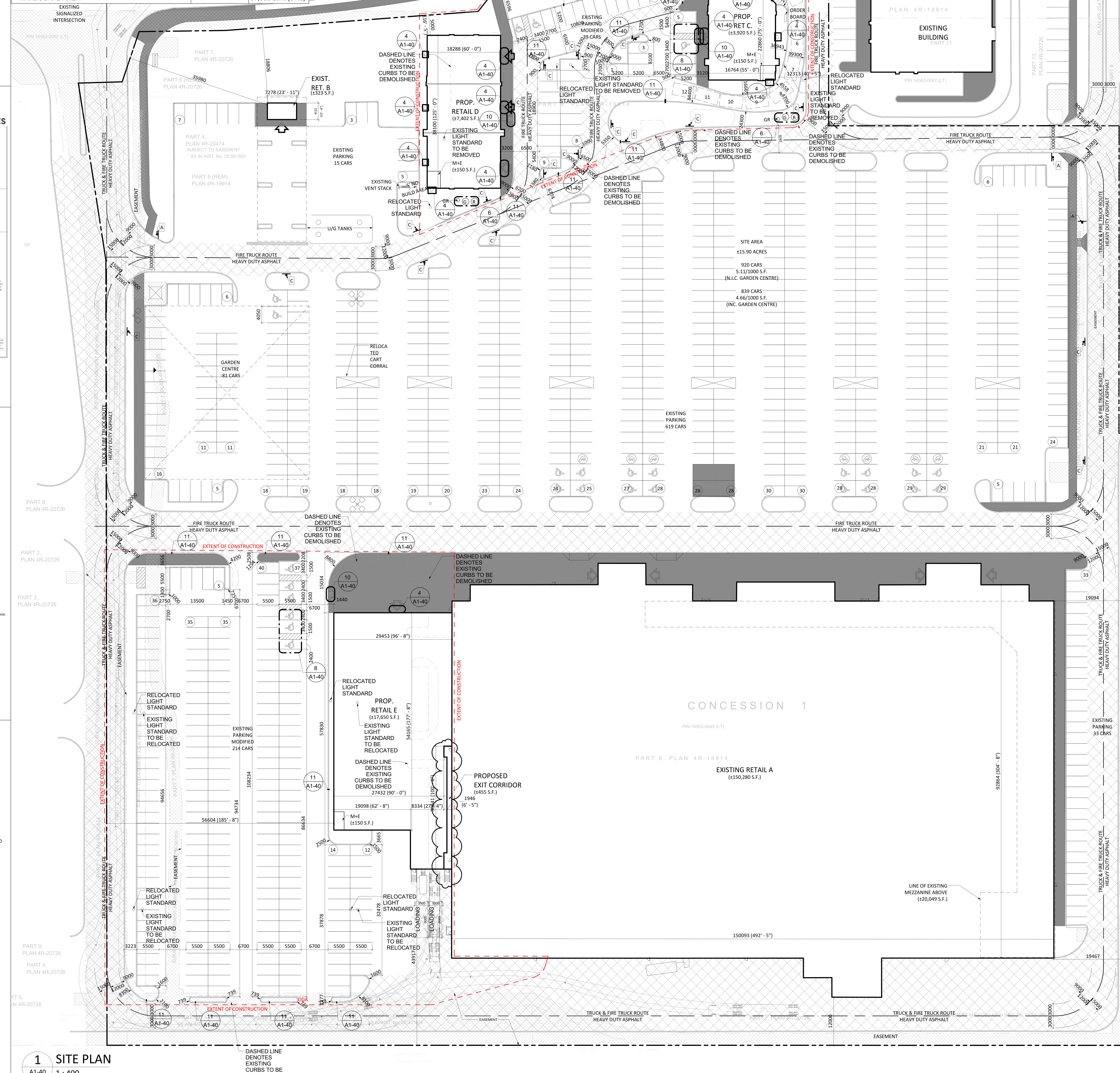
3 TRAFFIC SIGN
A1-40 N.T.S.

ZONING COMPLIANCE CHART ARTERIAL MAINSTREET ZONE

	REQUIRED	PROPOSED
MINIMUM SETBACK		
FRONT LOT LINE	5 METERS	5 METERS
CORNER SIDE LOT LINE	5 METERS	35.9 METERS
INTERIOR SIDE LOT LINE	12 METERS	12.3 METERS
REAR LOT LINE	12 METERS	12 METERS
PARKING SPACE REQUIREMENT (AREA C)	3.4 / 100 S.M.	
RETAIL C	13 CARS	15 CARS
RETAIL D	23 CARS	25 CARS
RETAIL E	60 CARS	214 CARS
MINIMUM PARKING SPACE LENGTH	5.2 METERS	5.2 METERS
MINIMUM PARKING SPACE WIDTH	2.6 METERS	2.7 METERS
MINIMUM AISLE WIDTH	6.7 METERS	6.8 METERS
BARRIER-FREE PARKING REQUIREMENT		
RETAIL C	2 CARS	2 CARS
RETAIL D	2 CARS	2 CARS
RETAIL E	6 CARS	6 CARS
MINIMUM BARRIER-FREE PARKING SPACE LENGTH	5.2 METERS	5.2 METERS
MINIMUM BARRIER-FREE PARKING SPACE WIDTH		
TYPE A	3.4 METERS	3.4 METERS
TYPE B	2.4 METERS	2.4 METERS
LOADING SPACES	0 SPACES	0 SPACES
RETAIL C	0SPACE	0 SPACE
RETAIL D	0 SPACE	0 SPACE
RETAIL E	1 SPACES	2 SPACES
LOADING SPACE LENGTH	9.0 METERS	9.0 METERS
LOADING SPACE WIDTH	3.5 METERS	3.5 METERS
LOADING SPACE HEIGHT	4.2 METERS	N/A
LOADING SPACE AISLE WIDTH	9.0 METERS	18.1 METERS
QUEUING MIN. WIDTH	3.0 METERS	3.0 METERS
QUEUING MIN. LENGTH	5.7 METERS	5.7 METERS
BUILDING HEIGHT	25 METERS	7.09 METERS
MINIMUM LANDSCAPE BUFFER		
ABUTTING STREET	3 METERS	3 METERS
ABUTTING OPEN SPACE OR RESIDENTIAL	3 METERS	3 METERS
MINIMUM LOT AREA	N/A	N/A
LANDSCAPE AREA	15%	7,033 S.M. (16%)
HARDSCAPE AREA		37,033 S.M. (84%)



2 CONTEXT SITE PLAN
A1-40 1 : 1500



1 SITE PLAN
A1-40 1 : 400

TURNER FLEISCHER

TURNER FLEISCHER ARCHITECTS INC.
67 Lesmill Road Toronto ON Canada M3B 2T8
Telephone (416) 425-2222
turnerfleischer.com

The issuance of this record drawing is a representation by Turner Fleischer Architects Inc. that the construction, enlargement or alteration of the building is in general, as opposed to precise, conformity with the design prepared and provided by Turner Fleischer Architects Inc., but is not a representation that the construction, enlargement or alteration of the building is in conformity with a design that has been prepared or provided by others.The revisions to these contract documents, reflecting the significant changes in the work made during construction, are based on data furnished by the contractor to Turner Fleischer Architects Inc. Turner Fleischer Architects Inc. shall not be held responsible for the accuracy or completeness of the information provided by the contractor.

Ottawa

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120 IBER ROAD, SUITE 103
OTTAWA, ONTARIO K2S 1E9
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FOTENN
111 QUEEN ST. EAST
SOUTH BUILDING, SUITE 450
TORONTO, ONTARIO
M5C 1S2
T416.789.4530

LEGAL INFO:

PART OF LOT 1
CONCESSION 11
(GEOGRAPHIC TOWNSHIP OF CUMBERLAND)
MUNICIPALITY OF OTTAWA

SITE AREA	±15.90 ACRES	±6.43 HA.
EXISTING RETAIL A AREA	±150,280 S.F.	±13,961 S.M.
RETAIL A MEZZANINE	±20,049 S.F.	±1,863 S.M.
EXISTING RETAIL B	±323 S.F.	±30 S.M.
PROPOSED RETAIL C	±3,920 S.F.	±364 S.M.
PROPOSED RETAIL D	±7,402 S.F.	±688 S.M.
PROPOSED RETAIL E	±17,650 S.F.	±1,640 S.M.
CORRIDOR (N.I.C)	±455 S.F.	±42 S.M.
M+E ROOM	±450 S.F.	±42 S.M.
TOTAL BUILDING AREA	±200,074 S.F.	±18,588 S.M.
TOTAL GROUND FLOOR AREA	±180,025 S.F.	±16,725 S.M.
PARKING PROVIDED	920 CARS	
(N.I.C. GARDEN CENTRE)	5.11/1000 S.F.	5.50/100 S.M.
PARKING PROVIDED	839 CARS	
(INC. GARDEN CENTRE)	4.66/1000 S.F.	5.02/100 S.M.
COVERAGE (±180,025 S.F.)	25.99 %	
EXISTING RETAIL AREA	±170,652 S.F.	±15,854 S.M.
PROPOSED RETAIL AREA	±29,422 S.F.	±2,734 S.M.
TOTAL RETAIL AREA	±200,074 S.F.	±18,588 S.M.
DIFFERENCE	±29,422 S.F.	±2,534 S.M.

DENOTES DDA AREA

LEGEND

- PROPOSED ENTRANCE ARROW
- PROPOSED EXIT ARROW
- PROPOSED FIRE HYDRANT
- PROPOSED SIAMESE CONNECTION
- PROPOSED SIGN
- PROPOSED FIRE & TRUCK ROUTE (HEAVY DUTY ASPHALT)

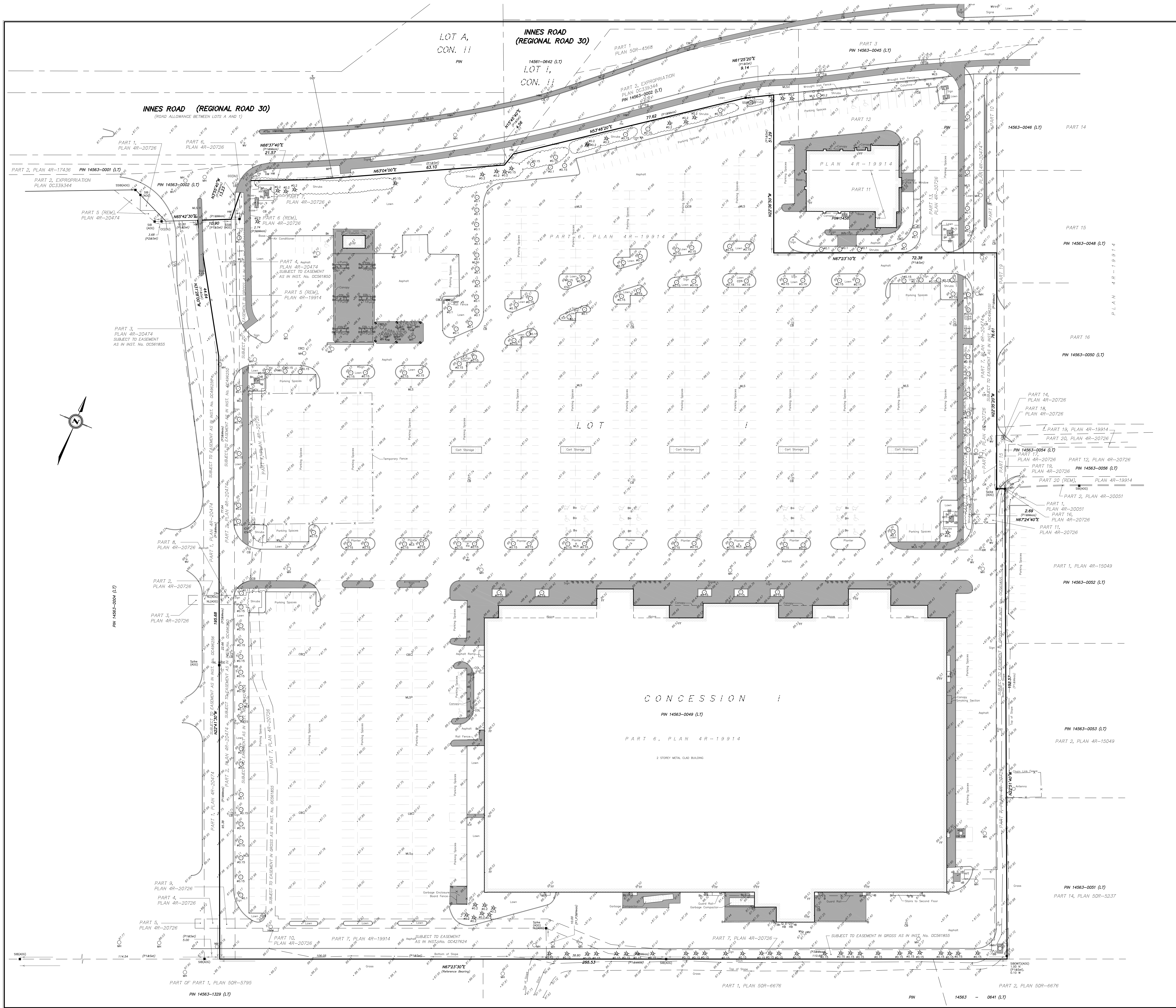
#	DATE	DESCRIPTION	BY
7	2017-08-04	ISSUED FOR COORDINATION	AR
6	2017-08-03	ISSUED FOR COORDINATION	AR
5	2017-07-27	ISSUED FOR COORDINATION	AR
4	2017-06-23	ISSUED FOR COORDINATION	AR
3	2017-06-21	ISSUED FOR COORDINATION	AR
2	2017-06-16	ISSUED FOR COORDINATION	AR
1	2017-06-09	ISSUED FOR REVIEW	AR

Choice Properties REIT

PROJECT
4270 INNES ROAD
OTTAWA, ONTARIO

DRAWING
SITE PLAN

PROJECT NO. 02.102R - 2326
PROJECT DATE 2017-05-11
DRAWN BY AR
CHECKED BY JMK
SCALE As indicated
DRAWING NO. A1-40



TOPOGRAPHIC SURVEY OF
PART OF LOT 1
CONCESSION 11
(GEOGRAPHIC TOWNSHIP OF CUMBERLAND)

CITY OF OTTAWA

SCALE 1 : 400

10 0 10 20 30 40 metres

SPEIGHT, VAN NOSTRAND & GIBSON LIMITED
ONTARIO LAND SURVEYORS
2016

ELEVATION NOTE

ELEVATIONS ARE BASED ON THE CANADIAN GEODETIC DATUM AND WERE DERIVED FROM CITY OF OTTAWA BENCH MARK NCC 228, HAVING A PUBLISHED ELEVATION OF 86.486 metres.

BEARING NOTE

BEARINGS HEREON ARE GRID BEARINGS AND ARE REFERRED TO THE SOUTHERLY LIMIT OF PART 6 AS SHOWN ON PLAN 4R-19914, HAVING A BEARING OF N67°23'30"E.

METRIC

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

LEGEND

■	DENOTES	SURVEY MONUMENT FOUND
□	"	SURVEY MONUMENT PLANTED
WIT	"	WITNESS MONUMENT
SIB	"	STANDARD IRON BAR
SSIB	"	SHORT STANDARD IRON BAR
IB	"	IRON BAR
CC	"	CUT CROSS
N,S,E,W	"	NORTH, SOUTH, EAST, WEST
OU	"	ORIGIN UNKNOWN
AOG	"	ANNIS, O'SULLIVAN, VOLLEBEKK LIMITED, O.L.S.
JDB	"	J. D. BARNES LIMITED
P1	"	PLAN 4R-19914
P2	"	PLAN 4R-20474
P3	"	PLAN 4R-20726
MH	"	MANHOLE
MET	"	METER (GAS)
BB	"	BELL BOX
HMH	"	HYDRO MANHOLE
COL	"	COLUMN
CB	"	CATCH BASIN
FH	"	FIRE HYDRANT
WV	"	WATER VALVE
FF	"	FINISHED FLOOR
HW	"	HAND WELL
ICV	"	IRRIGATION CONTROL VALVE
WP	"	WOODEN POLE
ATS	"	AUTOMATIC TRAFFIC SIGNAL
MLS	"	METAL LIGHT STANDARD
HB	"	HYDRO BOX
B	"	BOLLARD
HYT	"	HYDRO TRANSFORMER
PIN	"	IRON PIN
CDT	"	CONDUIT
WA	"	WATER
BRP	"	BREATHER PIPE
INT	"	INTERCOM
BU	"	BUSH
OH	"	OVERHEAD WIRE
	"	WELL
	"	DECIDUOUS TREE
	"	CONIFEROUS TREE
	"	CONCRETE

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 MAY 15, 2016.

DATE : ______

D.A. WILTON
ONTARIO LAND SURVEYOR

SPEIGHT, VAN NOSTRAND & GIBSON LIMITED
ONTARIO LAND SURVEYORS
750 OAKDALE ROAD, Units 65 & 66
TORONTO, ONTARIO M3N 2Z4
TEL. 416 749-SVNG(7864) FAX 416 749-7866
E-MAIL: toronto@svng.on.ca

DRAWN :	F. H./F. P. B.	FILE NAME :	A0110387
CHECKED :	D. A. W.	PLOT SCALE :	MET. 1=0.4
JOB No. :	011-0387	PLOTTED :	MAY 19, 2016
REF. No. :		UPDATED :	

TOPOGRAPHIC SURVEY OF
PART OF LOT 1
CONCESSION 11
(GEOGRAPHIC TOWNSHIP OF CUMBERLAND)

CITY OF OTTAWA

SCALE 1 : 400

10 0 10 20 30 40 metres

SPEIGHT, VAN NOSTRAND & GIBSON LIMITED
ONTARIO LAND SURVEYORS
2016

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METRIC

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

LEGEND

■	DENOTES	SURVEY MONUMENT FOUND
□	–	SURVEY MONUMENT PLANTED
WIT	–	WITNESS MONUMENT
SIB	–	STANDARD IRON BAR
SSIB	–	SHORT STANDARD IRON BAR
IB	–	IRON BAR
CC	–	CUT CROSS
N,S,E,W	–	NORTH, SOUTH, EAST, WEST
OU	–	ORIGIN UNKNOWN
ADG	–	ANNIS, O'SULLIVAN, VOLLEBEKK LIMITED, O.L.S.
JDB	–	J. D. BARNES LIMITED
P1	–	PLAN 4R–19914
P2	–	PLAN 4R–20474
P3	–	PLAN 4R–20726
MH	–	MANHOLE
MCT	–	METER (GAS)
BB	–	BELL BOX
HMH	–	HYDRO MANHOLE
COL	–	COLUMN
CB	–	CATCH BASIN
FH	–	FIRE HYDRANT
WV	–	WATER VALVE
FF	–	FINISHED FLOOR
HW	–	HAND WELL
ICV	–	IRRIGATION CONTROL VALVE
WP	–	WOODEN POLE
ATS	–	AUTOMATIC TRAFFIC SIGNAL
MLS	–	METAL LIGHT STANDARD
HB	–	HYDRO BOX
B	–	BOLLARD
HYT	–	HYDRO TRANSFORMER
PIN	–	IRON PIN
CDT	–	CONDUIT
WA	–	WATER
BRP	–	BREATHER PIPE
INT	–	INTERCOM
BU	–	BUSH
OH	–	OVERHEAD WIRE
	–	WELL
	–	DECIDUOUS TREE
	–	CONIFEROUS TREE
	–	CONCRETE

SYMBOLS LEGEND

MANHOLE, CATCH BASIN, POLE, CLEAN OUT, STREET LIGHT, HYDRANT, VALVE, TRANSFORMER, HAND WELL, PEDESTAL, CONTROL BOX / PLUG, VALVE CHAMBER, TRAFFIC BOX, AIR PUMP, SIGN, BUS SHELTER, TRAFFIC CONTROL BOX, FLUSH TO GRADE VAULT

LEGEND UTILITY CODES

W – LOCATED WATER PIPE
E – ELECTRIC
T – TELEPHONE
C – COMMUNICATION CABLES/DUCT
GS – GAS SERVICE
GM – GAS MAIN
SAN – SANITARY SEWER
STM – STORM SEWER
IR – IRRIGATION
FL – FUEL
U – UNKNOWN SERVICE
TNPL – TRANS NORTHERN PIPELINE
ALL – ALL STREAM
F/O – FIBER OPTIC

MARK IT Locates Inc.

Utility Mapping Quality Levels as per ASCE 38–02

A – Locating exact vertical and horizontal position of underground utilities using appropriate safe excavation techniques and recording these data.

B – Designating the horizontal position of underground utilities by the application of appropriate surface geophysical methods.
– Limited in scope to verification of provided level D information.
– Utilities may escape detection. (See Notes)

C – Survey of surface features.

D – Records and plans research including record collection and review.

Notes:

1. This information is provided for design purposes only.
2. This information is not a substitute for sanctioned locates as provided by the utility owner.
3. Prior to any excavation, all utility owners must be contacted to obtain sanctioned locates, as stipulated by the Occupational Health and Safety Act.
4. Inferred utility depths indicated on this drawing are only estimates and should be verified by direct physical exposure.
5. Underground infrastructure shown on this drawing was obtained on a best–effort, best–practices basis, within the limitations of the technology employed.
6. The spatial accuracy of the plotted information is dependent on the accuracy of the base map information as provided by others.
7. This information is provided on a best effort basis within the limitations of the technology. Consequently some utilities may escape detection (i.e. non–conductive, inaccessible, incomplete Level D information provided by the Client and/or physical constraints encountered during the course of the survey, etc.)
8. The information herein documents the position of suspected or known utilities existing at this site as of the drawing date.
9. Quality Level "D" information was obtained by Mark IT Locates Inc. during the course of this investigation.

Buried Utility Map

For: Choice Properties	Site: 4270 Innes Rd, Ottawa, ON K4A 5E6, Canada	
Project# 2016–0563	Date: Jun 13th, 2016	Checked: C.W.T.J.

AO (841 x 1189)