



Functional Servicing Report

Chick-fil-A

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Functional Servicing Report

Project Name:

Chick-fil-A Orleans

Project Number:

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Prepared and Reviewed By:

Khadija Jawwad, EIT

Kate Logan, P.Eng. Project Engineer

Approved By:

Saifullah Khan, P.Eng. Project Engineer, Central Ontario

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Table of Contents

1	Legal Notification	1
2	Introduction	2
2.1	Site Description	2
2.2	References	3
3	Sanitary Sewer Servicing	3
3.1	Sanitary Sewer System	3
3.2	Downstream Considerations.....	4
3.3	Proposed Sanitary Service.....	4
4	Water Supply and Appurtenances	4
4.1	Existing Water Supply	4
4.2	Proposed Water Demand	4
4.3	Proposed Connection.....	6
5	Stormwater Management	7
5.1	Pre-Development Hydrology.....	7
5.2	Stormwater Management Analysis.....	7
5.3	Allowable Release Rate	8
5.4	Stormwater Quantity Management.....	8
5.5	Stormwater Quality Management	9
5.6	Storm Conveyance	9
6	Conclusion.....	10

List of Tables

Table 1: Proposed Sanitary Design Criteria (City of Ottawa Standards).....	3
Table 2: Dry Weather Sanitary Flow	4
Table 3: Wet Weather Sanitary Flow	4
Table 4: Maximum Flow to be considered from a given hydrant (City of Ottawa, Technical Bulletin ISTB-2018-02)	5
Table 5: Proposed Water Distribution Design Criteria (City of Ottawa Water Design Guidelines)	6
Table 6: Water Demand Calculations	6

List of Figures

Figure 1: Existing Site.....	2
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List of Appendices

Appendix A Site Plan	
Appendix B Engineering Drawings	
Appendix C Fire Flow Calculations	
Appendix D Storm Water Management Calculation	

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 4270 Innes Road in Orleans which is located in Ottawa, Ontario. For additional background information, please refer to **Appendix A**, specifically **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 4270 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 m² 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 **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 4270 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 4270 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 **Drawing PS100 – Site Servicing, 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)	$0.324 \text{ L/sec/ha} * 0.474 \text{ ha} = \mathbf{0.154 \text{ L/s}}$
Peak Domestic Flow (L/s)	$0.154 \text{ L/s} * 1.5 = \mathbf{0.23 \text{ L/s}}$

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)	$0.33 \text{ L/sec/ha} * 0.474 \text{ ha} = \mathbf{0.16 \text{ L/s}}$
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 there will be no negative downstream effects.

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 1.0% slope. The sanitary service connection to the proposed building, will be designed to the Orleans Standards, as shown on **Drawing PS100 – Site Servicing Plan by Stantec**.

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 **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 **Drawing PS100 – Site Servicing Plan by Stantec** 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. 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 $(0.50 \text{ l/s} + 100 \text{ l/s}) = \mathbf{100.50 \text{ L/s}}$. The total water demand was calculated in **Table 6**.

Table 6: Water Demand Calculations

Demand Type	Total Demand (L/s)
Commercial Average Daily Demand	$((28,000 \text{ L/ha/day} * 0.474 \text{ ha}) / 11 \text{ Hours}) = \mathbf{0.335 \text{ L/s}}$
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 **Drawing PS100 – Site Servicing Plan by Stantec** 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 will provide the boundary conditions for the downstream municipal watermain at the subject property. These conditions will include the minimum and maximum Hydraulic Grade Line (HGL) values. Based on these boundary conditions, we will calculate the pressure at the water meter to determine if it falls within an acceptable range for the proposed development.

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 **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 **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 4270 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, **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 = 0.79

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 D**, the overall flow from the subject site has decreased due to the increased landscape area.

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.

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 (m²) of landscaped area ensures that the new development will generate less storm runoff than the existing site. The pervious area will increase from 346 m² to 694 m² with the proposed development. There will be no negative impacts on the overall stormwater management systems. The existing drainage patterns at 4270 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 0.79. 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 D**, as well as **Drawing SS-1 – Servicing Plan by Stantec** within **Appendix B** for the downstream ICD device.

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 0.79. 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 D**.

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 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.
- 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

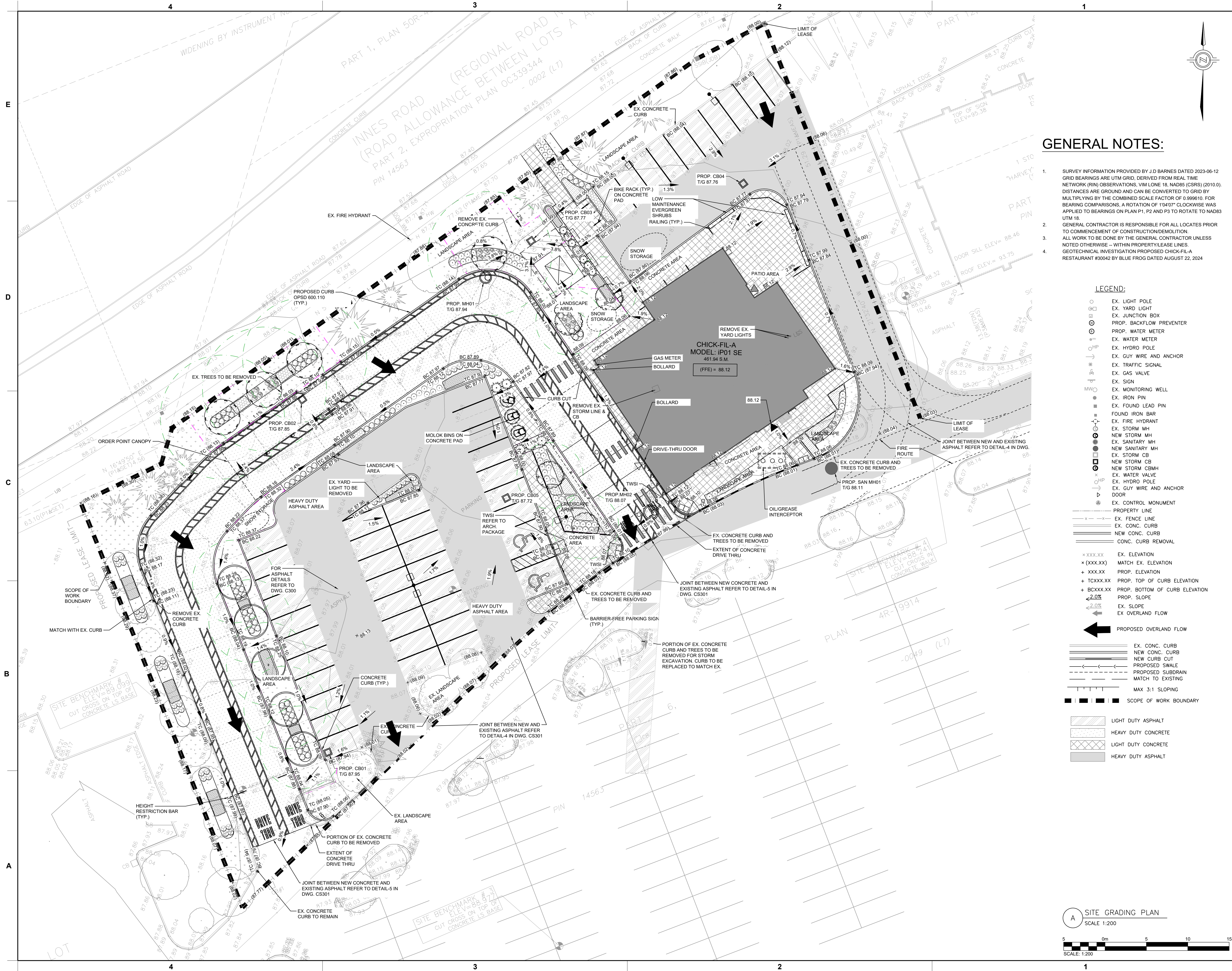
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2 October 2024

Appendix B

Engineering Drawings



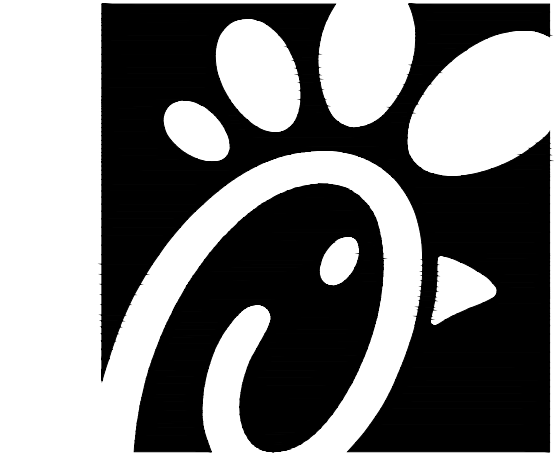
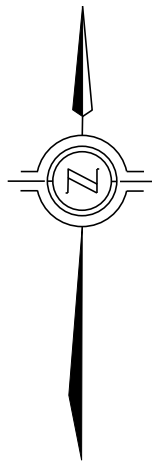
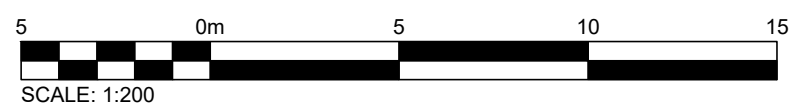
GENERAL NOTES:

- SURVEY INFORMATION PROVIDED BY J.D BARNES DATED 2023-06-12. GRID BEARINGS ARE UTM GRID, DERIVED FROM REAL TIME NETWORK (RTN) OBSERVATIONS, VIM LONE 18, NAD83 (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.
- GENERAL CONTRACTOR IS RESPONSIBLE FOR ALL LOCATES PRIOR TO COMMENCEMENT OF CONSTRUCTION/DEMOLITION.
- ALL WORK TO BE DONE BY THE GENERAL CONTRACTOR UNLESS NOTED OTHERWISE - WITHIN PROPERTY/LEASE LINES.
- 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
- EX. CONTROL MONUMENT
- PROPERTY LINE
- EX. FENCE LINE
- EX. CONC. CURB
- NEW CONC. CURB
- CONC. CURB REMOVAL
- EX. ELEVATION
- MATCH EX. ELEVATION
- PROP. ELEVATION
- TCXXX.XX
- BCXXX.XX
- PROP. TOP OF CURB ELEVATION
- PROP. BOTTOM OF CURB ELEVATION
- PROP. SLOPE
- EX. SLOPE
- EX. OVERLAND FLOW
- PROPOSED OVERLAND FLOW
- EX. CONC. CURB
- NEW CONC. CURB
- NEW CONC. 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



Chick-fil-A

Chick-fil-A
5200 Buffington Road
Atlanta, Georgia 30349-2998

exp Services Inc.
T: +1.905.793.8800 | F: +1.905.793.0641
1595 Clark Boulevard
Brampton, ON L6T 4V1
Canada
www.exp.com



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CHICK-FIL-A
ORLEANS

4270 Innes Road
Ottawa, ON

FSR#30038

BUILDING TYPE / SIZE: IP01 SE
RELEASE: XXXXXXXXX

REVISION SCHEDULE
NO. DATE DESCRIPTION
A 2024-10-04 FOR SPA

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

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SHEET
SITE GRADING PLAN

SHEET NUMBER

CS100

Issued for SPA

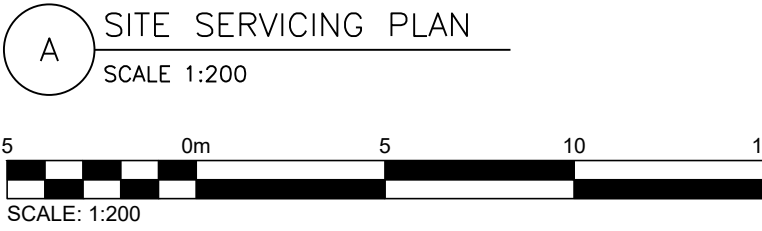


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- EX. FOUND LEAD PIN
- FOUND IRON BAR
- EX. FIRE HYDRANT
- EX. STORM MH
- NEW STORM MH
- EX. SANITARY MH
- NEW SANITARY MH
- EX. STORM CB
- NEW STORM CB
- NEW STORM CBMH
- EX. WATER VALVE
- EX. HYDRO POLE
- EX. GUY WIRE AND ANCHOR
- DOOR
- PROPERTY LINE
- EX. FENCE LINE
- EX. CONC. CURB
- NEW CONC. CURB
- CONC. CURB REMOVAL
- NEW CURB CUT
- PROPOSED SWALE
- PROPOSED SUBDRAIN
- MATCH TO EXISTING
- MAX 3:1 SLOPING
- SCOPE OF WORK BOUNDARY
- EX. NAT. GAS LINE
- EX. WATER LINE
- EX. SANITARY LINE
- EX. STORM LINE
- EX. BURIED PHONE LINE
- 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



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Ottawa, ON

FSR#30038

BUILDING TYPE / SIZE: IP01 SE
RELEASE: XXXXXXXXX

REVISION SCHEDULE		
NO.	DATE	DESCRIPTION
A	2024-10-04	FOR SPA

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

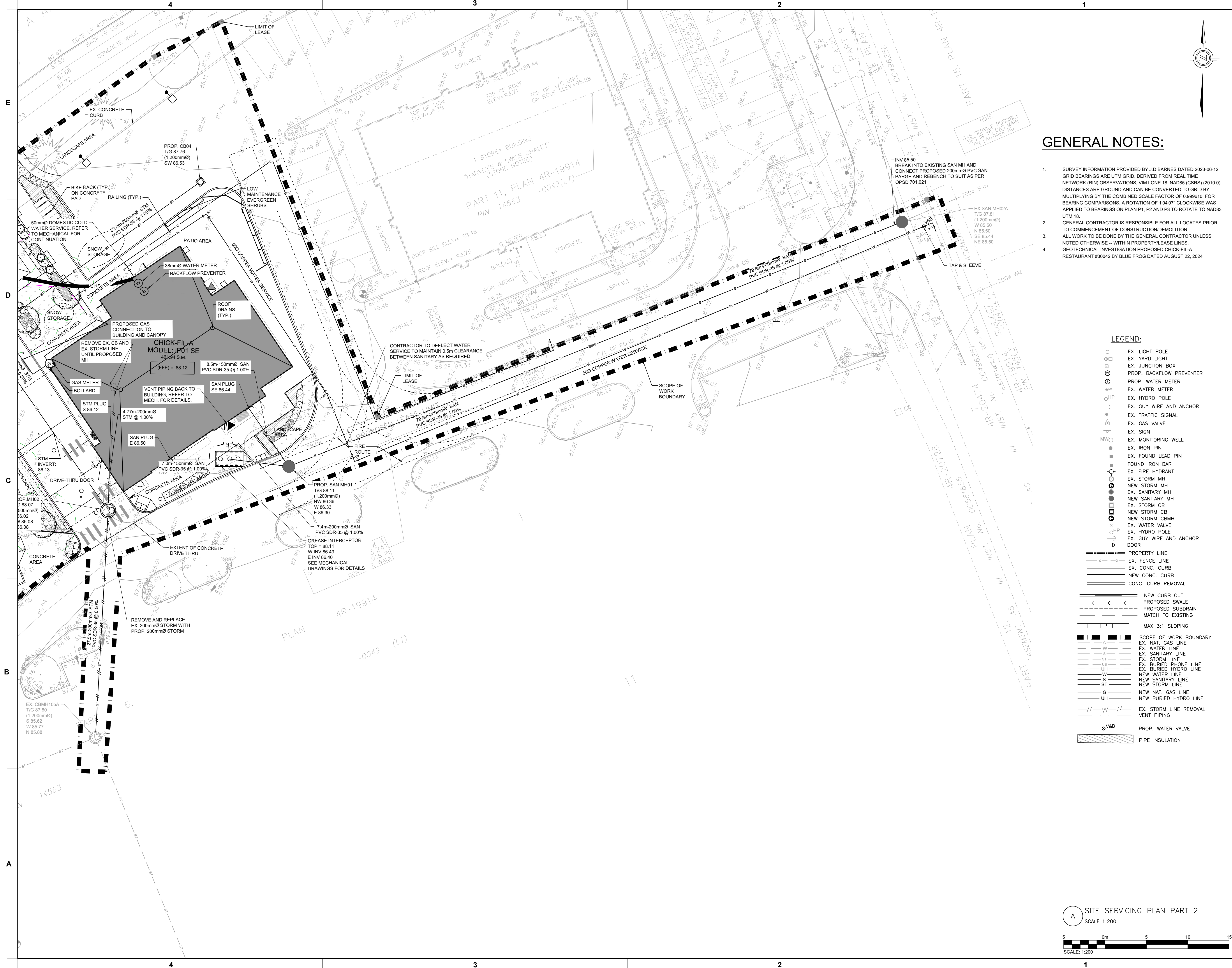
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SHEET
SITE SERVICING PLAN

SHEET NUMBER

PS100

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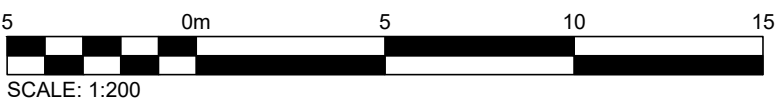
GENERAL NOTES:

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- GENERAL CONTRACTOR IS RESPONSIBLE FOR ALL LOCATES PRIOR TO COMMENCEMENT OF CONSTRUCTION/DEMOLITION. ALL WORK TO BE DONE BY THE GENERAL CONTRACTOR UNLESS NOTED OTHERWISE - WITHIN PROPERTY/LEASE LINES.
- 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
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- EX. FIRE HYDRANT
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- NEW STORM CB
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- EX. HYDRO POLE
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- 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 PART 2
SCALE 1:200



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Chick-fil-A
5200 Buffington Road
Atlanta, Georgia 30349-2998

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RELEASE: XXXXXXXXX

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PROJECT STATUS		SPA
DATE		OCTOBER 2024
DRAWN BY		K.J.

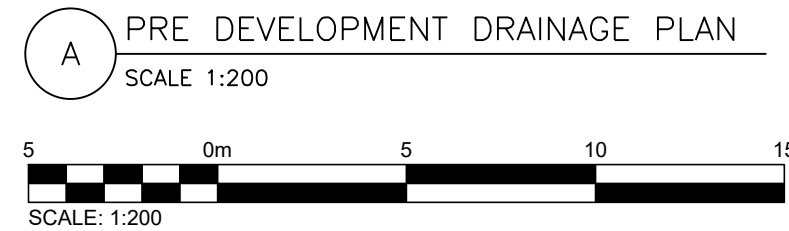
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SHEET
SITE SERVICING PLAN
PART 2





















































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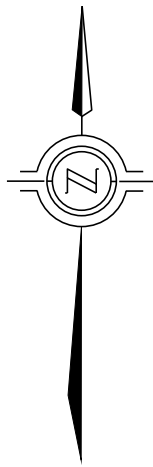
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1. SURVEY INFORMATION PROVIDED BY J.D BARNES DATED 2023-06-12 GRID BEARINGS ARE UTM GRID, DERIVED FROM REAL TIME NETWORK (RTN) OBSERVATIONS, VIM LONE 18, NAD85 (CSRS) (2010.0). DISTANCES ARE GROUND AND CAN BE CONVERTED TO GRID BY MULTIPLYING BY THE COMBINED SCALE FACTOR OF 0.999610. FOR BEARING COMPARISONS, A ROTATION OF 104.07° CLOCKWISE WAS APPLIED TO BEARINGS ON PLAN P1, P2 AND P3 TO ROTATE TO NAD83 UTM 18.
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	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
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	EX. FOUND LEAD PIN
	FOUND IRON BAR
	EX. FIRE HYDRANT
	EX. STORM MH
	NEW STORM MH
	EX. SANITARY MH
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	EX. HYDRO POLE
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	DOOR
	EX. CONTROL MONUMENT
	PROPERTY LINE
	EX. FENCE LINE
	EX. CONC. CURB
	NEW CONC. CURB
	CONC. CURB REMOVAL
	EX. ELEVATION
	MATCH EX. ELEVATION
	PROP. ELEVATION
	PROP. TOP OF CURB ELEVATION
	PROP. BOTTOM OF CURB ELEVATION
	PROP. SLOPE
	EX. SLOPE
	EXISTING OVERLAND FLOW
	EX. CONC. CURB
	NEW CONC. CURB
	NEW CURB CUT
	PROPOSED SWALE
	PROPOSED SUBDRAIN
	MATCH TO EXISTING
	MAX 3:1 SLOPING
	CATCHMENT I.D.
	AREA (ha)
	RUN-OFF COEFFICIENT
	DRAINAGE AREA BOUNDARY



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RELEASE: XXXXXXXXXX

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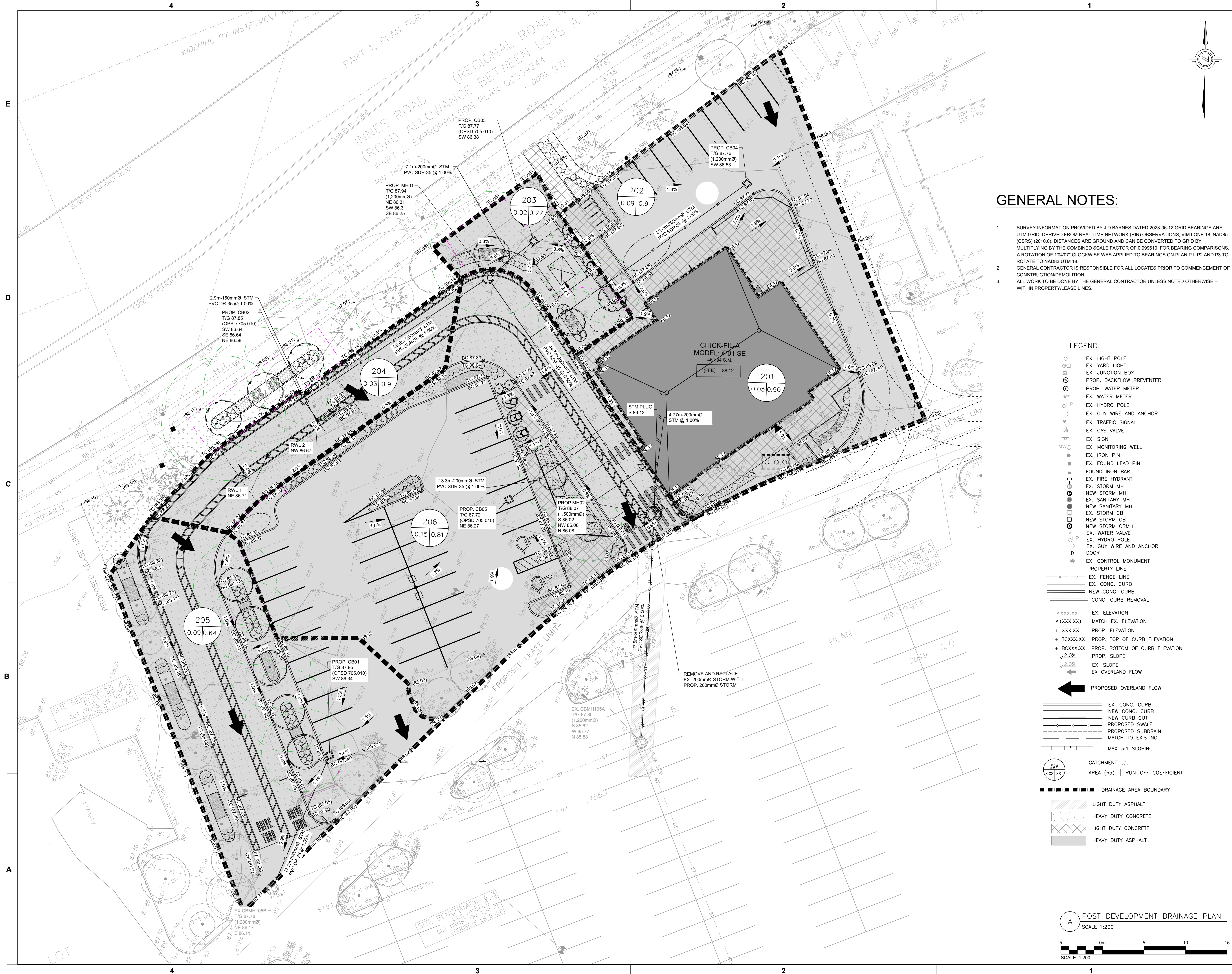
CONSULTANT PROJECT #	BRM0023002042-H0
PROJECT STATUS	SPA
DATE	OCTOBER 2024
DRAWN BY	K.J

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SHEET
PRE-DEVELOPMENT
DRAINAGE PLAN

SHEET NUMBER

SWM100

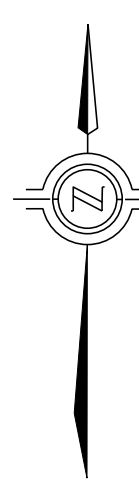
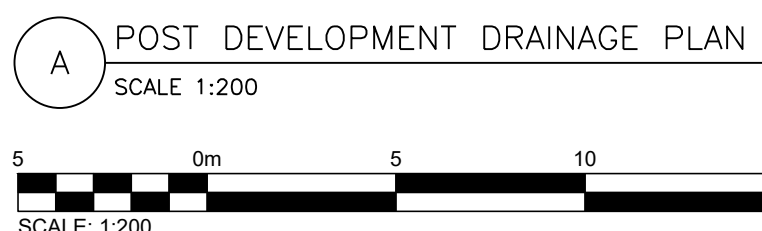


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- EX. SLOPE
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- CATCHMENT I.D.
- AREA (ha) RUN-OFF COEFFICIENT
- DRAINAGE AREA BOUNDARY
- LIGHT DUTY ASPHALT
- HEAVY DUTY CONCRETE
- LIGHT DUTY CONCRETE
- HEAVY DUTY ASPHALT



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BUILDING TYPE / SIZE: IP01 SE
RELEASE: XXXXXXXX

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SHEET
POST-DEVELOPMENT
DRAINAGE PLAN

SHEET NUMBER

SWM200













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	PROPOSED SANITARY SEWER
	PROPOSED STORM SEWER
	PROPOSED CATCH BASIN
	PROPOSED CATCH-BASIN / MANHOLE
	PROPOSED STORM MANHOLE
	PROPOSED SANITARY MANHOLE
	PROPOSED WATERMAIN
 VB 3'-6"	PROPOSED VALVE BOX
	PROPOSED FIRE HYDRANT AND VALVE
	PROPOSED WATER METER
	PROPOSED REMOTE WATER METER
	PROPOSED 100% SUB-DRAIN (SEE DETAIL)
PHASE 1 - CONSTRUCTION LIMITS	

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 AND CLIMATE CITY OF OTTAWA REGULATIONS, STANDARDS, ORDINANCES AND SPECIFICATIONS, LOCAL UTILITY STANDARDS AND MINISTRY OF TRANSPORTATION STANDARDS.
3. THE CONTRACTOR IS ADVISED THAT WORKS BY OTHERS MAY BE ONGOING DURING THE TERM OF THIS CONTRACT. THE CONTRACTOR SHALL COORDINATE CONSTRUCTION ACTIVITIES WITH OTHERS AND AVOID ANY INTERFERENCE WITH THEIR WORK.
4. THE INFORMATION SHOWN FOR EXISTING UTILITIES WAS PROVIDED BY OTHERS. THE CONTRACTOR IS RESPONSIBLE FOR LOCATING AND PROTECTING ALL UTILITIES DURING CONSTRUCTION. THE CONTRACTOR SHALL BE RESPONSIBLE FOR VERIFYING THE LOCATION, UTILITY PROFILE AND DEPTH OF ALL UTILITIES. ANY VARIANCE IS TO BE IMMEDIATELY REPORTED TO THE ENGINEER. LOCATIONS OF UTILITIES SHALL BE RE-VERIFIED PRIOR TO CONSTRUCTION. THE CONTRACTOR SHALL NOTIFY ALL AFFECTED UTILITIES PRIOR TO CONSTRUCTION. WORK SHALL BE IN ACCORDANCE WITH THE UTILITY STANDARDS. CONSTRUCTION SHALL BE AT THE CONTRACTORS RISK.
5. ALL CONSTRUCTION SHALL BE CARRIED OUT IN ACCORDANCE WITH THE RECOMMENDATIONS OF THE ENGINEER.

WATERMAIN SHALL BE POLYVNYL-CHLORIDE (PVC) CLASS 150 DR-18 PIPE MANUFACTURED ACCORDING TO AWWA C900-89 AND CSA CAN B137.3-W1986 WITH GASKETED BELL END C/W #14 ANCHOR BOLTS. CONTRACTOR SHALL BE RESPONSIBLE FOR OBTAINING ALL NECESSARY PERMITS.

ALL WATERMANS, WATER SERVICES, CONNECTIONS AND APPURTENANCES AS PER CITY OF OTTAWA STANDARDS. THE CONTRACTOR SHALL CO-ORDINATE AND PAY ALL RELATED COSTS FOR ALL MOST NEARBY EXISTING UTILITY LOCATIONS. THE CONTRACTOR SHALL PROVIDE PERSONNEL, WATERMAIN TRENCH TO BE IN ACCORDANCE WITH CITY OF OTTAWA W.T.

ALL WATERMANS SHALL HAVE MIN. COVER OF 2.4m. WATERMANS ARE TO BE INSTALLED AT THE ELEVATIONS SHOWN ON THE APPROVED SITE SERVISING DRAWING, WHERE SPECIFIC ELEVATIONS ARE NOT SHOWN, THE ELEVATIONS ARE TO BE THE SAME AS THE ELEVATIONS FROM PROPOSED GRADES AS SHOWN ON SEWERING DRAWING. WATERMANS MUST BE MAINTAINED AT TIMES, IN PREGRADE AREAS COVER TO BE FROM PREGRADE ELEVATIONS.

ALL WATERMAIN BENDS, JOINTS, TEES AND PLUGS SHALL BE MECHANICALLY RETRAINED ACCORDANCE WITH CITY OF OTTAWA STANDARDS.

ALL FIRE HYDRANT INSTALLATIONS SHALL BE PER CITY OF OTTAWA W.H. HYDRANTS SHALL BE INSTALLED IN ACCORDANCE WITH CITY OF 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 STAIR.

8. WATERMANS 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 FOR THE ENGINEER MUST BE OBTAINED AND A MINIMUM 500mm VERTICAL SEPARATION MUST 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.

12. ALL WATERSHEDS SHALL BE BACTERIOLOGICALLY 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 PROVING 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.

1. STORM AND SANITARY MANHOLES SHALL BE IN ACCORDANCE WITH OPSD 701.010 TO 701.014 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 403.020.

3. SEWER TRENCH SHALL CONSIST OF CLASS 'B' BEDDING PER CITY OF OTTAWA STANDARDS AND 5% COMPACTION SHALL BE A MINIMUM OF 90% 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 SHALL MEET OR EXCEED C.S.A. SPECIFICATIONS A257.2 REINFORCED CLASSES AS SPECIFIED (65-D, 101-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 BENCHMARKED TO SPRING LINE UNLESS OTHERWISE SPECIFIED. SANITARY MANHOLES SHALL BE BENCHMARKED TO GUYOT. MINIMUM WIDTH OF BENCHMARKING TO 230mm OR AS SPECIFIED ON DRAWINGS.

8. "MODULOG" 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 250mm 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 100mm PVC UNLESS OTHERWISE NOTED. SEE

14. THE CONTRACTOR IS TO PROVIDE CCTV CAMERA INSPECTIONS OF ALL SANITARY AND SEWERS, INCLUDING PICTORIAL REPORT, ONE (1) CD COPY AND TWO (2) VIDEO TAPES IN FORMAT SATISFACTORY TO THE ENGINEER. ALL SEWERS ARE TO BE FLUSHED PRIOR TO

16. EXISTING MANHOLES TO BE RE-BENCHED WHERE A NEW CONNECTION IS MADE.

14C INNES ROAD ENTRANCE ALIGNMENT	CV	RMW	JUL 18,
13C SERVING & GRADING REVISIONS	CV	RMW	APR 19

12C	ISSUED FOR CONSTRUCTION	DMV	RMW	NOV. 11,
11	SITE PLAN SERVICING AND GRADING REVISION	DMV	RMW	OCT. 28,
10	RE-ISSUED FOR TENDER	BCB	RMW	AUG. 27,

9	ISSUED FOR TENDER	BCB	RMW	JULY 19
8	ISSUED FOR APPROVAL	BCB	RMW	JULY 19
7	REVISED PER CITY COMMENTS	SK	RMW	JULY 23

	REVISIONS PER CITY COMMENTS	BY	DATE	SOURCE
6	REVISED PROPERTY LINES AS PER ADVL	BCB	RJB	JUN.8/
5	REVISED AS PER CITY COMMENTS	RMW	RJB	MAY 6/

4	REVISED SITE PLAN AND SERVICING	RMW	RJB	APR.2/
3	ADDED STORM SEWER EASEMENT	BCB	RBJ	FEB.23/
2	SUBMITTED FOR SITE PLAN APPROVAL	BCB	RBJ	NOV.3/

1	REVISED SITE PLAN	BCB	RJB	OCT.8/
Revision		By	Appd.	Date

File Name: 60400250U-BASE	BCB	RMW	RJB	JUNE 21
Scale	Dwn.	Chkd.	Dsgn.	Date

Client/Project

LOBLAWS PROPERTIES LIMITED

INNES ROAD

Ottawa, Ontario

Title

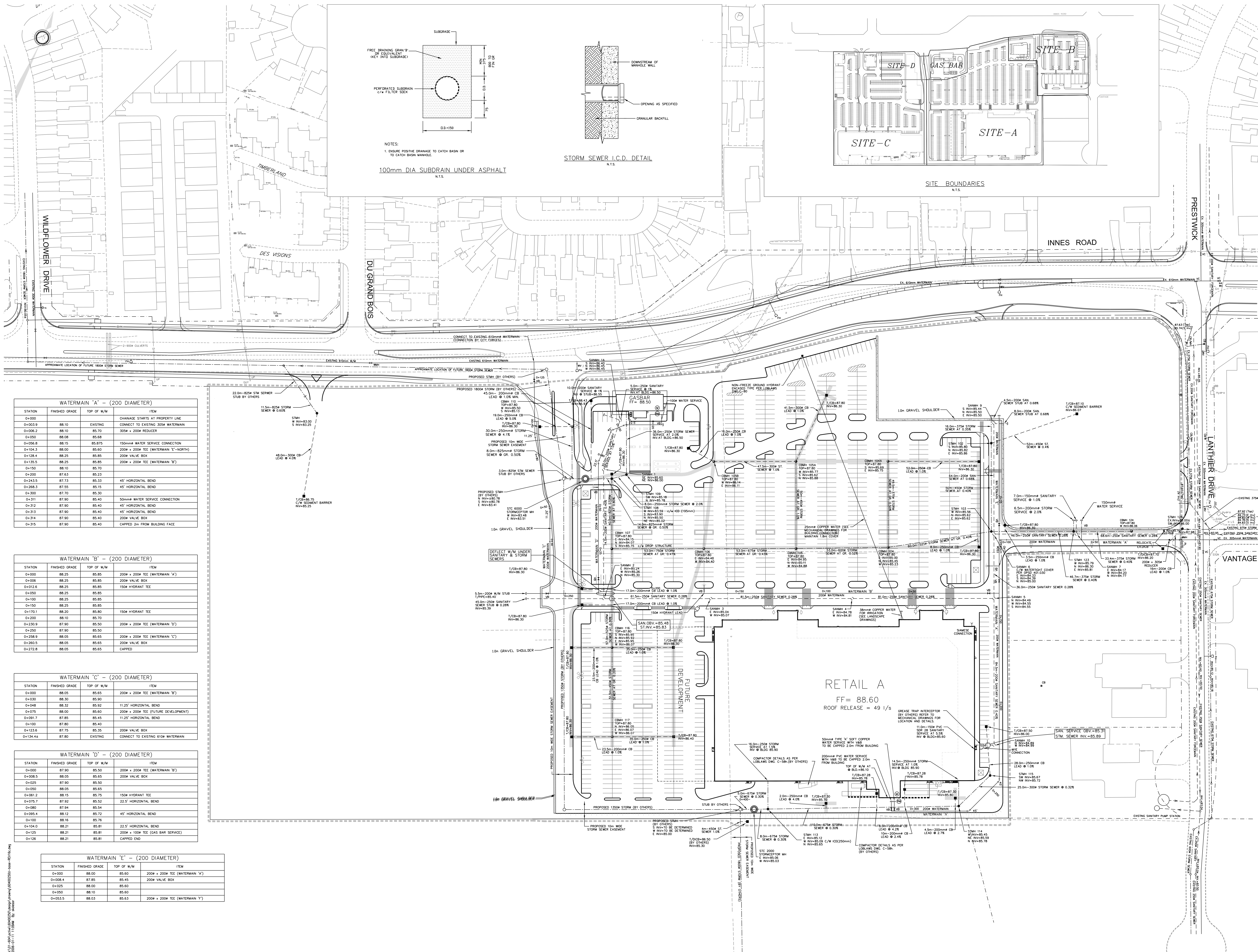
SERVICING PLAN

Project No. 60400250

Scale 0 7.5 22.5 37.5
1:750

Drawing No.	Sheet	Revision
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SS-1 1 of 6 14C



Appendix C

Fire Flow Calculations

Fire Underwriters Survey (FUS) Calculations

Required Fire Flow Calculation

$$F = 220 \times C \times \sqrt{A} \text{ L/min}$$

FUS Water Supply for Public Fire Protection, 1999

F = Required Fire Flow

C = Construction Type Coefficient

A = Total Above-Ground Floor Area (m²)

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

$$F = 220 \times 1 \times \sqrt{462}$$

$$F = 4729$$

$$F = 5000 \text{ L/min}$$

rounded to nearest 1000L/min, must be >2000 L/min

2 Occupancy Charge

Contents	Free Burning
Charge	0.15

$$O = F \times \text{Occupancy Charge}$$

$$O = 5000 \times 0.15$$

$$O = 750 \text{ L/min}$$

no rounding

3 Automatic Sprinkler Reduction

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

$$S = F \times \text{Sprinkler Reduction}$$

$$S = 5000 \times 0\%$$

$$S = 0 \text{ L/min}$$

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%

$$E = F \times \text{Exposure Charge}$$

$$E = 5000 \times 10\%$$

$$E = 500 \text{ L/min}$$

no rounding

H Adjusted Fire Flow

$$Fa = F + O + E + S$$

$$Fa = 5000 + 750 + 0 + 500$$

$$Fa = 6250 \text{ L/min}$$

$$Fa = 6000 \text{ L/min}$$

rounded to nearest 1000L/min

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

Appendix D

Storm Water Management Calculation

PROJECT NO. :BRM-23002042-H0
 PROJECT NAME. : Proposed Chick fil A, 4270 Innes Road in Orleans, Ottawa, Ontario
 Date: October 2024



CALCULATION Sheet :1

Pre Development Site Hydrology

Drawing No. DP1

Land Type	Area, A		C	Total Area (ha)	A x C	Weighted C
	(m2)	(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):

$$Q = C_i * C * i * A / 360 \text{ cms}$$

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, 4270 Innes Road in Orleans, Ottawa, Ontario
 Date: October 2024



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	0.094	0.90	0.094	0.085	0.90	Proposed Development Area-Considered in analysis
	Pervious	0.000	0.20		0.000		
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	0.130	0.90	0.149	0.117	0.81	Proposed Development Area-Considered in analysis
	Pervious	0.018	0.20		0.004		

Storm Peak Flow Controlled Area:

Total Area (Catchment 201-206)	0.43	ha
Weighted Runoff Coefficient, C	0.79	

Run off Calculation (using Modified Rational Method):

$$Q = C_p \cdot C \cdot i \cdot A / 360 \text{ cms}$$

C = Runoff Coefficient

i = Rainfall intensity (mm/hr.) [City of Ottawa IDF]

A = Watershed area (ha)

Time of concentration, T _c	10.00	min
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$$\text{IDF Eqn : } i = A / (B + T)^C$$

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 _p	m3/sec	L/sec
2	76.81	1.00	0.072	72.12
5	104.19	1.00	0.098	97.83
10	122.14	1.00	0.115	114.68
25	144.69	1.00	0.136	135.86
50	161.47	1.00	0.152	151.61
100	178.56	1.00	0.168	167.66

PROJECT NO. :BRM-23002042-H0

PROJECT NAME. : Proposed Chick fil A, 4270 Innes Road in Orleans, Ottawa, Ontario

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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: 10/3/2024

Sub Catchment ID	MAINTENANCE HOLE		LENGTH	INCREMENT			TOTAL	FLOW TIME		I -year	TOTAL Q	S	D	Q FULL	V FULL	Sec. Time	Accum. Time	Perc. Capacity	Storage (m3)
	FROM	TO		C	A	CA		TO	IN										
			(m)				CA			(mm/h)	(cms)	(%)	(mm)	(cms)	(m/s)	(min)	(min)	(%)	
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 - 204	PROP. CB02	PROP.MH01	26.60	0.90	0.031	0.03	0.03	10.00	0.42	3.14	0.000	1.00	200	0.0328	1.04	0.42	10.42	1%	0.84
Area - 203	PROP. CB03	PROP.MH01	7.05	0.27	0.021	0.01	0.01	10.00	0.11	3.14	0.000	1.00	200	0.0328	1.04	0.11	10.11	0%	0.22
Area - 202	PROP. CB04	PROP. MH02	31.99	0.90	0.094	0.08	0.08	10.00	0.51	3.14	0.001	1.00	200	0.03	1.04	0.51	10.51	2%	1.01
Area - 206	PROP. CB05	PROP. MH02	23.31	0.81	0.149	0.12	0.12	10.00	0.37	3.14	0.001	1.00	200	0.03	1.04	0.37	10.37	3%	0.73
Area - 201	PROP. BUILDING	PROP. MH02	4.77	0.90	0.046	0.04	0.04	10.00	0.08	3.14	0.000	1.00	200	0.03	1.04	0.08	10.08	1%	0.15
	PROP MH01	PROP MH02	34.73	0.00	0.000	0.00	0.03	10.42	0.78	3.14	0.000	0.50	200	0.02	0.74	0.78	11.21	1%	1.09
	PROP MH02	EX. CBMH105A	27.50	0.00	0.000	0.00	0.28	11.21	0.36	3.14	0.002	0.50	450	0.20	1.27	0.36	11.57	1%	4.38

8.72