

LRL

ENGINEERING | INGÉNIERIE

Servicing Report

Site Plan Control Application
Proposed Industrial Development
5368 Boundary Road and 6150 Thunder Road, Ottawa ON

Prepared for:

Avenue 31
222 Somerset Street West
Unit 401, Ottawa ON
K2P 2G3

Attention: Ms. Jennifer Murray

LRL File No.: 200578

November 25th, 2021
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1 INTRODUCTION AND SITE DESCRIPTION

LRL Associates Ltd. was retained by Avenue 31 to prepare a servicing report to support site plan application for the property located at the southwest corner of the intersection of Boundary Road and Thunder Road in Ottawa ON. The development encompasses two separate parcels with civic addresses of 6150 Thunder Road and 5368 Boundary Road.



Figure 1: Aerial View of Subject Lands

The proposed development will consist of three (3) separate industrial buildings varying in size, totaling a combined building footprint area of 32 496 m². Surrounding the buildings will be asphalt parking lot and travel ways for vehicular maneuverability, outdoor storage area and landscaping. To optimize functionality of the industrial site, included in the area surrounding the building footprints are depressed loading docks (1.2m below finished floor of the buildings) and gravel storage areas. The site will have three (3) main entrances; one access off boundary road, and two separate entrances from Thunder Road. A detailed site plan has been included in Appendix A for reference.

The specifics of the proposed buildings outlined in the site plan are summarized in table 1 below.



Table 1: Site Development, Proposed Building Details

	Industrial Building A	Industrial Building B	Industrial Building C	Total
Building Size	14 493 m ²	14 493 m ²	3 510 m ²	32 496 m ²
Approximate Allocated Office Space	600 m ²	600 m ²	200 m ²	1400 m ²
Number of Auto Parking Spaces	123	127	42	292
Number of Loading Docks	16	16	6	38

This report has been prepared with considerations given to the conditions noted above. The civil drawings and design specifics are based off of the site plan in Appendix A. Should there be any changes in the design features, which may relate to the servicing and stormwater considerations, LRL Associates Ltd. should be advised to review the report recommendations and design conclusions.

2 PRE-CONSULTATION

A pre consultation with the City of Ottawa Staff took place on August 9th, 2021. Following the meeting, notes were circulated outlining general submission requirements and engineering considerations relating to the domestic water supply and stormwater management criteria. Refer to Appendix B for the circulated pre consultation notes.

Additional consultation has taken place over the duration of advancements of this development concept, throughout the Official Plan Amendment (OPA) and Zoning By-law Amendment (ZBLA) process to further discuss water servicing capacities to support the development.

3 ADDITIONAL SITE PLAN CONTROL ENGINEERING REPORT

To support the civil design aspects of the subject site, additional investigations and reports were completed. Where appropriate, the conclusions of the reports listed below were incorporated into the detailed civil design.

The following documents were prepared for the development and have been referenced:

- Environmental Impact Statement, prepared by Kilgour and Associates Ltd, dated July 15, 2021.
- Geotechnical Investigation, prepared by Patterson Group Inc., dated July 22, 2021
- SWM Report, prepared by J.F. Sabourin and Associates Inc., dated May 2023.

4 EXISTING SITE AND AVAILABLE SERVICES

The subject site measures approximately 12.3 ha with most of the land vacant with ground cover consisting primarily of long grasses, shallow vegetation and trees surrounding the boundary of the property.



The property is bordered to the east by Boundary Road, North by Thunder Road, and is bounded on the northwest corner by an unnamed drain.

Existing topography of the land is relatively flat, with elevations ranging from approximately 76.0 m to 77.5 m. The general elevation interior to the site boundary is slightly lower than those of the surrounding roads. Appendix C includes an overall site boundary with contours demonstrating the existing topography.

The site does not have access to municipal storm, sanitary or traditional water service as the infrastructure does not exist on Boundary Road or Thunder Road; however, the site is within the service boundary of the Carlsbad Springs trickle-feed water system. This system is supplied by the City of Ottawa's central distribution system and distributed via a network of small diameter pipes in the area of the subject lands.

The following infrastructure is in place along the frontage of the property:

- 100mm HDPE Trickle Feed Watermain (Boundary Road)
- 75mm HDPE Trickle Feed Watermain (Thunder Road)

Further discussion relating to the servicing requirements for the industrial development are summarized in the following sections.

5 WATER SERVICE

5.1 Carlsbad Springs Trickle-Feed Water Supply System

The proposed development site boundary falls within the Carlsbad Springs trickle-feed Water System. The Carlsbad Springs trickle-feed Water System is intended to provide sufficient water for indoor (domestic) use only through a network of small diameter mainline piping. During the design and planning stages of this system, no allowances were made for outdoor water use fire protection, therefore fire suppression requirements will have to be addressed with a designed site-specific fire reservoir.

A 102mm diameter pipe exists along Boundary Road and a 75mm pipe exists along Thunder Road which would be utilized for domestic supply.

The subject site has been allocated a pre-set constant flow rate, referred to as equivalent units (2,700L/d per unit) – however; the original assigned three (3) equivalent units for the subject property does not represent the amount of water expected to be consumed within the development. In fact, given the magnitude of the site, and proposed development layout, to ensure that the domestic demands of the development could be fulfilled by the trickle-feed system, calculations have been done based on allocated building uses and seven (7) equivalent units are required to meet domestic demands of approximately 18 810 L/day further explained in section 5.2 below.

5.2 Domestic Demands

The domestic demands of the site are intended to be met using the flow provided by the trickle-feed water system in conjunction with buildings specific cisterns to meet peak instantaneous demands. The cisterns have been designed for each building on site based on their average daily demands as a result of building use and size. Each cistern has been sized for a working capacity 1.5 times larger than the average day flows.



The demands summarized in table 3 on the following page provide a magnitude of the average water demands which are required to meet the domestic flow requirements of a fully built out site with specifics as outlined in the site development plan included in Appendix A.

To calculate the average day water demands for the development, the following design parameters have been used based on available City of Ottawa Design Guidelines.

- Office Space – 75 L/9.2m² of office space per day
- Loading Bay – 150 L/day per loading bay

Table 2: Domestic Demands based on Building Use

Use	Average Day Demands	Value	Total (L/day)
Office Space	75 L/9.2m ²	1 400 m ² of Office Space	Building A=4 891
			Building B=4 891
			Building C=1 630
			11 413
Loading Bay	150L/Loading Bay	38 Loading Bays	Building A=2 400
			Building B=2 400
			Building C=900
			5 700
Misc. Additional Use (Dependant on Tennant)	-	-	1 700
Total Consumption			Building A=8141
			Building B=8141
			Building C=2 530
			18 810
Number of Equivalent Residential Units (2 700 L/day ea.)			7

For the proposed development with three (3) separate industrial buildings, approximately 7 equivalent residential units are required.

As previously mentioned, the site is provided with municipal water via the Carlsbad Trickle-Feed Drinking Water System, requiring a total of seven (7) equivalent units, providing a water supply of 7 x 2 700 L/day = 18 900 L/day. Given the layout of the site, with one building having primary frontage and entrance off Boundary Road, one (1) allocated service has been considered to this isolated area, and the remaining six (6) have been associated to the two (2) larger buildings having primary entrance off Thunder Road.

A water meter chamber is proposed at the property line for each incoming service. Within the metering chambers proposed, an automatic flow control will be installed to limit the instantaneous



flow to the allowable rates summarized below. Details of the water meter chamber are located on the civil detail drawing C901 located in Appendix E.

The flow controls are summarized below.

<u>Thunder Road (Building A and B)</u>	<u>Boundary Road (Building C)</u>
$= 16\,200 \text{ L/day} \div 24 \text{ hours} \div 3600 \text{ second}$	$= 16\,200 \text{ L/day} \div 24 \text{ hours} \div 3600 \text{ second}$
$= 0.19 \text{ L/s}$	$= 0.03 \text{ L/s}$

Each building will be equipped with water storage reservoirs sized to accommodate peak flows with an additional volume to account for equipment, access and monitoring which is summarized below in table 3.

Table 3: Domestic Water Reservoir Sizing

	Average Flow	Peak Flow (1.5 Factor)	Proposed Storage Cistern Size
Building A	8 141 L/day	12 210	15 000
Building B	8 141 L/day	12 210	15 000
Building C	2 530 L/day	3 795	5 000

5.3 Fire Protection

In order to provide adequate fire protection and fulfill the fire suppression demands for the subject site, an above grade (or equivalent seized underground precast concrete tank) storage tank is required.

The required fire flow was calculated based on table two (2) in Appendix A of the OBC 2012 Section 3.2.5. This is applicable given that the development is not supplied by municipal water. Each building was assessed independently due to the sprawling nature of the site plan.

The following considerations were utilized when calculating the fire flow and volume required for the storage tanks (based on NFPA 22) :

- Building A and B Volumes= 121 000 m³
- Building C Volume=29 000
- Exposure distance between buildings= Larger than 10m in all directions
- Building Classification= F-2
- Water Supply Coefficient= 17

Minimum Storage volumes of approximately 2057 m³ of water will be required to supply fire protection for building A and building B. Approximately 495 m³ is the minimum volume required for Building C. Tanks of 2500m³ and 600m³ have been proposed for the buildings and are shown on the servicing drawings for the development. Fire flow calculations are included in appendix D for reference.



Further review and is required by the fire consultant and mechanical engineering consultant during the building permit detailed design. Items such as low level pressure switches and building automation for water level sensor alarms are required.

On site fire hydrants have been supplied to ensure coverage for the site. Hydrant locations can be viewed in the C401 DWG included in **Appendix E**. Buildings are to be sprinklered which will be further designed by the fire consultant. Siamese connects have been proposed, with a hydrant located within a 45 meter radius of the connection.

6 SANITARY SERVICE

There is no municipal sanitary sewer proximal to the proposed development, and the development property is outside of the serviced urban boundary of the City of Ottawa.

An on-site wastewater collection and treatment system is required to service the staff and users of the 3 proposed buildings located on this development parcel. The treatment system shall be scaled to meet the required flows under the Ontario Building Code table 8.2.1.3 for the subject development. The wastewater treatment and discharge will require approval by the Ministry of the Environment, Conservation and Parks (MECP) in the form of an Environmental Compliance Approval (ECA) for the works.

6.1 Sanitary Demands

As per section 5 of this report, the domestic demands are restricted to the available servicing through the Carlsbad Trickle Feed System.

Based on the intended building use, the resultant peak flows to be collected are as follows:

$$\begin{aligned} &= (\text{Average Flows} \times \text{Peak Factor (1.5)}) + \text{Extraneous Flows} \\ &= 28\,215 \text{ Litres/day} + (12.31 \text{ Ha} \times 0.28 \text{ L/sec/Ha}) \\ &= 3.77 \text{ L/s} \end{aligned}$$

A sanitary sewer system to collect and convey effluents from the buildings to the proposed sanitary treatment unit has been proposed and further detailed on drawing C401 in **Appendix E**.

6.2 Sanitary Sewage Treatment

Detailed engineering and MECP consultation is ongoing and is intended to be finalized and during site plan application process with approval to be granted prior to final review and the issuance of permits for construction.

The geotechnical and hydrogeological characteristics of the site, as well as the proximity to a suitable surface water receiver, suggest discharge to a water course is the preferred outlet option subject to confirmation through consultation with the MECP. A similar approach is presently employed for a neighbouring development of similar scale.

The proposed servicing will provide wastewater collection and treatment for all of the build out of the site. Pre-fabricated, manufactured treatment systems suitable for the proposed influent include sequencing batch reactor (SBR) technology, moving bed biological reactor (MBBR) technology, and membrane biological reactor (MBR) technology. The flexibility, adaptability and



adjustability of the SBR process offer distinct advantages over other technologies; however, it is expected that tertiary filtration will be required post treatment to ensure effluent solids and phosphorus limits are consistently met. The final determination of process technology and configuration will be confirmed during further detailed engineering working alongside the manufacturer.

7 STORMWATER MANAGEMENT

Currently there is no municipal storm sewer adjacent to the subject lot. In pre-development conditions, the stormwater accumulated on the property would be retained from various depressions in the topography, sheet drain in the north direction to the unnamed drain or towards the undeveloped lands bordering the parcel to the south and west, ultimately reaching the surrounding pervious area.

A combination of an on-site sewer network, detention areas, quality treatment units, best management practices and low impact development principles are designed to be implemented to ensure the proposed development will meet the City's stormwater quantity and quality requirements. This section will discuss the stormwater approach and on site collection and conveyance of the runoff expected. However, J.F. Sabourin and Associates (JFSA) was retained to complete the modeling and summarize further details of the stormwater management approach for the proposed development with considerations given to the existing water levels in the outlet waterway which will further detail the design. For further details relating to the Stormwater management and modeling of the network and quantity control measured proposed, refer to the stormwater report dated May 2023 completed by JFSA .

7.1 Existing Site and Drainage Description

The existing 12.3 ha site is relatively flat, with a slight topography change in direction dividing the site into two (2) pre development watersheds:

- EWS 01- undeveloped, vegetated land draining with low slopes from east to west towards the site boundary ultimately entering the unnamed watercourse to the west of the site, the Bearbrook tributary.
- EWS02- undeveloped with the exception of one residential home, reaching the roadside ditch along Boundary Road.

7.2 Design Criteria

The stormwater management criteria for this development is based on the pre-consultation with City of Ottawa officials, South Nation Conservation Authority, the City of Ottawa Sewer Design Guidelines including City of Ottawa Stormwater Management Design Guidelines, 2012 (City Standards), as well as the Ministry of the Environment's Stormwater Management Planning and Design Manual, 2003 (SWMP Manual).

7.2.1 Water Quality

To provide the controlled runoff water quality control for this site, oil-grit (sediment) separators are proposed which will provide an 80% (minimum) Total Suspended Solids (TSS) removal while treating >90% of the annual runoff. Stormceptor Oil and Grit separators are proposed and will be installed at the downstream ends of both proposed outlets. See **Appendix F** for the site specific design, type, and more information on the treatment units proposed.



7.2.2 Water Quantity

In pre-development conditions, the extent of this site is vacant with the majority of the land coverage being treed. The post-development conditions will result in an increase in the impervious surfaces; therefore, quantity control measures will be implemented.

The allowable release rate, to mimic pre-development conditions, was determined by JFSA using SWMHYMO modeling. The 100-year and 5-year post-development flows will be controlled to the respective 100-year and 5-year pre-development levels. To do so, an inlet control device will be installed at the outlets with retention being provided on site in allocated stormwater retention basins, as well as small ponding depths above catch basins in the paved surface.

7.3 Proposed Stormwater Management Design Overview

The site has been designed to mimic pre development conditions with 2 separate outlets; a North Outlet encompassing building A and B, and an east outlet capturing the entirety of the site surrounding building C. This is detailed in the pre and post development watershed plans (C701 and C702) included in **Appendix E**.

Surface grading has been completed to ensure water is directed away from all building envelopes, collected in a series of catch basin manholes or directed overland to and conveyed to stormwater retention areas prior to being attenuated and directed offsite. All storm sewers have been sized using the rational method, further confirmed through the detailed PCSWMM model completed by JFSA for the subject development. Refer to **Appendix F** for storm sewer design details.

8 CONCLUSIONS

This report has been prepared to support the site plan application for the proposed industrial development located at 6150 Thunder Road consisting of three (3) separate stand alone buildings with accompanying parking, loading docks and outdoor storage.

Based on the forgoing the conclusions in relation to the serviceability of the site are as follows:

- Water:
 - Domestic demands will be required to be supplied by the Carlsbad Springs trickle-feed supply system. Seven (7) equivalent connections are required to meet the domestic demands of the proposed buildings.
 - A storage tank and pressure system as well as on site fire hydrants are required to provide the water required for fire suppression is required to meet the fire demands of development on the subject property.
 - One connection servicing building C off of Boundary road will be controlled to a flow of 0.03 L/s at the metering chamber.
 - Building A and B will be connected to the trickle feed system off of Thunder Road controlled to a constant rate of 0.19 L/s at the metering chamber .
 - Each building will be equipped with outdoor water storage reservoirs sized to accommodate peak flows.
- Sanitary Sewage:



- Building uses have been assessed to provide an expected sanitary effluent of 3.77 L/s.
- A 250mm diameter PVC sanitary sewer has been proposed to be installed from the proposed buildings conveying eluent to the NW corner of the property where it will enter the onsite sewage treatment unit.
- Onsite sewage treatment and collection facility will be designed in detail during the next submission to release treated effluent to the unnamed drain running through the property.
- Stormwater Management:
 - The property is mostly pervious area in existing conditions. In developing the lot into a “light industrial” lot, the development has increased the impervious area triggering a large quantity of runoff to be stored on site to meet the quantity targets outlined by JFSA in the detailed stormwater management design. The predevelopment peak flows for the site under the 100 year SCS 24 Hr storm event are 0.289 m³/s.
 - Stormwater release rate will be controlled through two separate outlet control devises: one controlling runoff before entering the ditch along Boundary Road, and one offering flow control before leaving the subject property into the Bearbrook Tributary waterway. The site has been designed to ensure post development flows do not exceed predevelopment values.
 - Loading docks will be collected via trench drains and require storm pumps to elevate the water to the retention area at the downstream section of the network.
 - Storm quality treatment units (Stormceptor EFO6 (North) and Stormceptor EFO4 (East) or approved equivalent) are proposed at each outlet as specified on the Civil engineering Drawings which ensure quality control objectives are met.
 - Reference to separate Stormwater Management Report Prepared by J.F. Sabourin and Associates Inc. is required for full SWM design description and modeling details.

9 CLOSURE

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Prepared by:

LRL Associates Ltd.



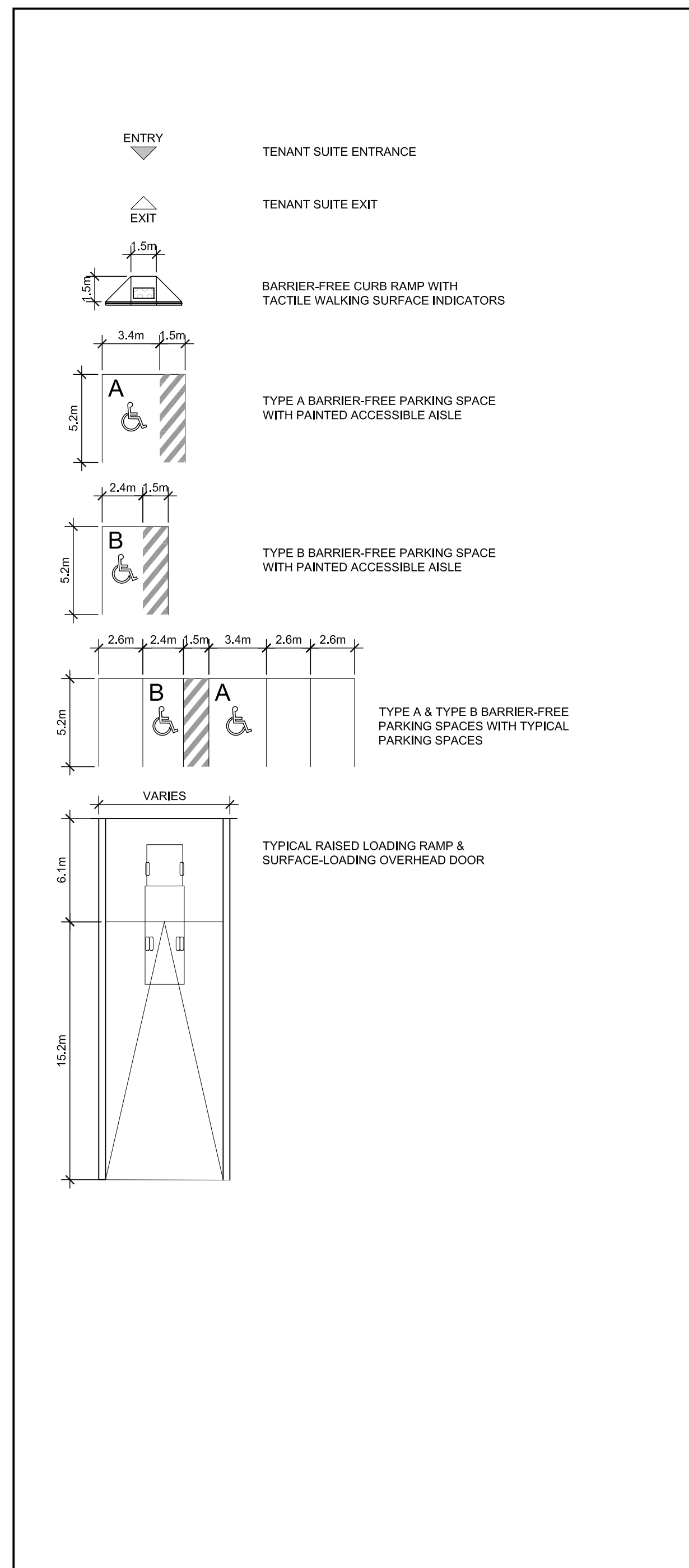
Virginia Johnson, P. Eng.
Civil Engineer



APPENDIX A

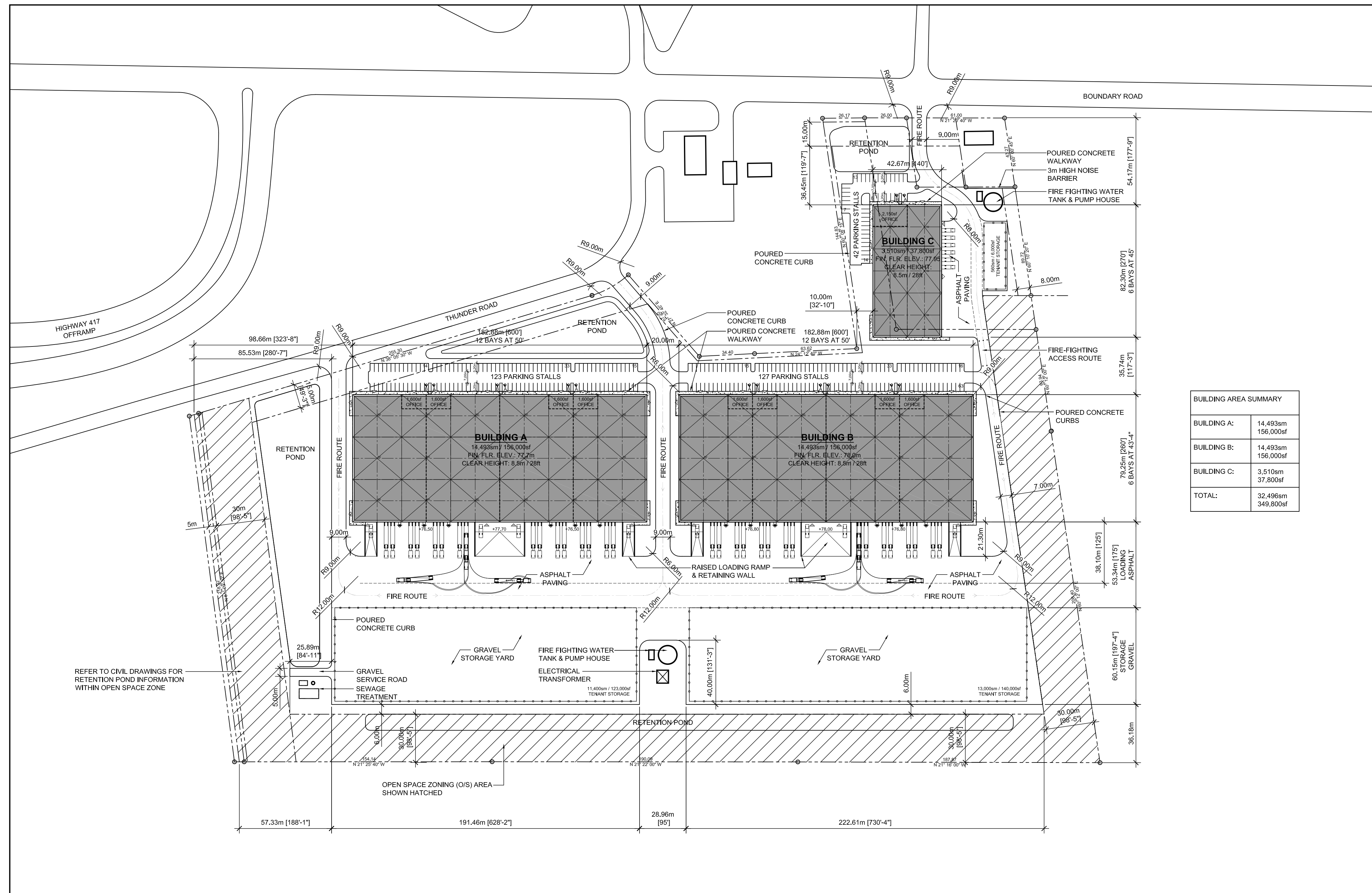
Site Plan





04 DRAWING LEGEND

SPA-01 SCALE:



03 SITE PLAN

SPA-01 SCALE: 1:1500

ZONING MECHANISM: ZONING BY-LAW 2008-250 CONSOLIDATION	REQUIRED	PROVIDED
ZONING: RG908R-h RURAL GENERAL INDUSTRIAL ZONE	LIGHT INDUSTRIAL LIMITED COMMERCIAL	LIGHT INDUSTRIAL USE WAREHOUSE (N95)
MINIMUM LOT AREA	0.4HA	AREA 1: 13.89HA AREA 2: 1.46HA TOTAL: 15.35HA 37.93 ACRES
MINIMUM LOT WIDTH	30m	425m THUNDER ROAD 82m BOUNDARY ROAD
MAXIMUM LOT COVERAGE	50.0%	AREA 1: 20.8% (2.90HA) AREA 2: 24.0% (0.35HA) TOTAL: 21.17% (3.25HA)
MINIMUM FRONT YARD	15m	COMPLIANT WITH ZONING
MINIMUM CORNER SIDE YARD	12m	COMPLIANT WITH ZONING
MINIMUM INTERIOR YARD SETBACK	ABUTTING A RG, RH OR RC ZONE 3m ALL OTHER CASES 8m	COMPLIANT WITH ZONING
MINIMUM REAR YARD	15m	COMPLIANT WITH ZONING
MAXIMUM FLOOR SPACE INDEX	2	0.21 FSI
MAXIMUM BUILDING HEIGHT	15m	10.5m
OUTDOOR STORAGE	NOT PERMITTED WITHIN ANY REQUIRED FRONT OR CORNER YARD STORAGE MUST BE SCREEN WHEN ABUTTING RESIDENTIAL ZONES AND PUBLIC STREETS	COMPLIANT WITH ZONING

02 SITE DATA AND ZONING INFORMATION

SPA-01 SCALE:

ZONING MECHANISM: ZONING BY-LAW 2008-250 CONSOLIDATION	REQUIRED	PROVIDED
MINIMUM WIDTH OF LANDSCAPING	3m	COMPLIANT WITH ZONING
PARKING - TYPICAL SECTION 101	BUILDING A: 14,493sm 78 TYPICAL 1 BARRIER-FREE	117 TYPICAL 3 BARRIER-FREE TYPE A 3 BARRIER-FREE TYPE B
0.8 SPACES PER 100m ² FOR FIRST 5,000m ² 0.4 SPACES PER 100m ² AFTER FIRST 5,000m ² LIGHT INDUSTRIAL USE WAREHOUSE (N95)	BUILDING B: 14,493sm 78 TYPICAL 1 BARRIER-FREE	121 TYPICAL 3 BARRIER-FREE TYPE A 3 BARRIER-FREE TYPE B
PARKING - BARRIER-FREE SECTION 111 PART C BY-LAW 2017-301 AND SECTION 3.1 - CITY OF OTTAWA ACCESSIBILITY DESIGN STANDARDS	BUILDING C: 3,510sm 27 TYPICAL 1 BARRIER-FREE	40 TYPICAL 1 BARRIER-FREE TYPE A 1 BARRIER-FREE TYPE B
TOTAL	183 TYPICAL 3 BARRIER-FREE	278 TYPICAL 7 BARRIER-FREE TYPE A 7 BARRIER-FREE TYPE B
BICYCLE PARKING SECTION 111	BUILDING A: 14,493sm 8 SPACES	8 - LOCATION TO BE DETERMINED
WAREHOUSE 1 SPACE PER 2000m ² BY-LAW 2015-190	BUILDING B: 14,493sm 8 SPACES	8 - LOCATION TO BE DETERMINED
	BUILDING C: 3,510sm 2 SPACES	4 - LOCATION TO BE DETERMINED

ZONING MECHANISM: ZONING BY-LAW 2008-250 CONSOLIDATION	REQUIRED	PROVIDED
LOADING SPACE SECTION 113	BUILDING A 2 OVERSIZED (4.3m X 13m)	20 OVERSIZED (1 PER 8,000sf)
LIGHT INDUSTRIAL USE	BUILDING B 2 OVERSIZED (4.3m X 13m)	20 OVERSIZED (1 PER 8,000sf)
	BUILDING C 2 OVERSIZED (4.3m X 13m)	8 OVERSIZED (1 PER 6,000sf)

BUILDING CLASSIFICATION:
ONTARIO BUILDING CODE 332/2012

3.2.2.67: GROUP F, DIVISION 2, ANY HEIGHT, ANY AREA SPRINKLERED

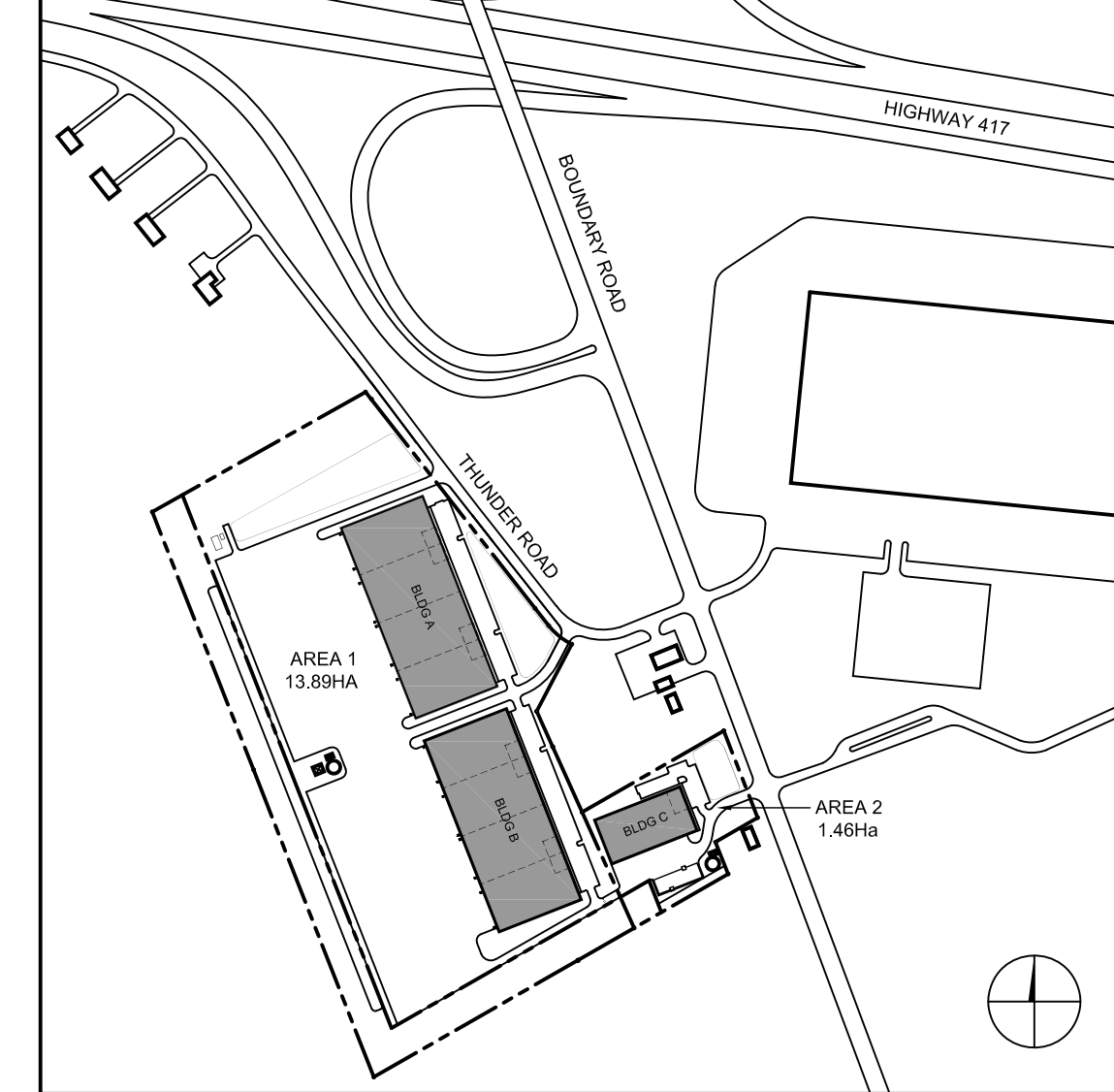
- NON-COMBUSTIBLE CONSTRUCTION
- FLOOR ASSEMBLIES SHALL HAVE A MIN 2HR FIRE RESISTANCE RATING
- MEZZANINES SHALL HAVE A MIN 1HR FIRE RESISTANCE RATING
- LOAD BEARING WALLS AND COLUMNS SHALL HAVE A FIRE RESISTANCE RATING NOT LESS THAN SUPPORTED ASSEMBLIES

3.2.3.1: SPATIAL SEPARATION - TABLE 3.2.3.1.E

- 15m MINIMUM SPATIAL SEPARATION FOR 100% AREA OF UNPROTECTED OPENINGS (EBF > 200m²)
- 10m MINIMUM SPATIAL SEPARATION FOR 50% AREA OF UNPROTECTED OPENINGS (EBF > 200M²)
- 9m SPATIAL SEPARATION FOR 100% AREA OF UNPROTECTED OPENINGS WHEN FACING A STREET

3.4.2.5: LOCATION OF EXITS

- 45m MAXIMUM TRAVEL DISTANCE

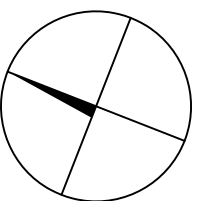


01 LOCATION PLAN

SPA-01 SCALE: NTS

BUILDING AREA SUMMARY	
BUILDING A:	14,493sm 156,000sf
BUILDING B:	14,493sm 156,000sf
BUILDING C:	3,510sm 37,800sf
TOTAL:	32,496sm 349,800sf

North



Revisions

No.	By	Description	Date
01	ERM	ISSUED FOR SITE PLAN APPLICATION	2023-05-19

Project

**THUNDER ROAD
INDUSTRIAL PARK**

6160 THUNDER ROAD, OTTAWA

Drawing
**LOCATION PLAN,
ZONING REVIEW
AND SITE PLAN C3**

Scale AS NOTED

Stamp

Drawn ERM

Checked JAS



Project No. 21-135

Drawing No.

Date APRIL 2021

SPA-01

APPENDIX B
Pre Consultation Notes



Pre-Application Consultation Meeting Notes

Property Address: 6150 Thunder Road- “southern parcel”

File #PC2021-0254

August 9th, 2021

Attendees:

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Paul Hicks <hicks@republicurbanism.com>;

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Subject:

- This pre-consultation meeting is to discuss the site plan control application needed for an industrial development at 5368 Boundary Road and a portion of 6150 Thunder Road.
- 6150 Thunder Road and 5368 Boundary Road are subject to a current Zoning By-law Amendment and Official Plan Amendment [applications](#). Please note the site is not currently zoned nor designated for industrial development.
- The following notes are provided based on the assumption that the site will be zoned RG for Rural General industrial. Please note that a decision has not been rendered by the City Council on this matter yet. There is no current date expected for these applications to go before the Agriculture and Rural Affairs Committee nor council for a decision.
- Matters of holding symbols, split zoning, or setbacks greater than those typical of the RG zone may be recommended by staff to the ARAC on the above noted OPA and ZBLA applications.
- The following notes are provided based on a typical industrial site plan application. Staff would be pleased to update these pre-consultation notes, and the list of required plans and studies should an Official Plan Amendment and Zoning By-law Amendment be approved on the site.
- Please note that a City of Ottawa New Official Plan is scheduled to go to Council for a decision in Fall of 2021. The required submissions should speak to the proposed policies of the New Official Plan and how the proposal intends to comply with proposed policies. Depending on timing of application submission, the policy regime and requirements may change.

Proposed:

- Proposed is a one storey warehouse with retail and office component. Illustrated in the site plan provided is a 585 m² office, a 585 m² retail and a 4,960 m² warehouse space and 74 parking spaces.
- 6150 Thunder Road is 16.71 ha in size, with frontage on both Thunder Road and Boundary Road. The property is bisected by an unnamed watercourse. The lands subject to the site plan pre-consultation are those located north of the watercourse and understood to be about 2.5 ha in size.
- The subject site is located directly south of a series of existing residences that front onto Thunder Road. Opposite the subject lands are on/off ramps of the 417 Highway. To the west of the property, lands are forested and contain the headwaters of Bearbrook Creek.
- The subject lands are designated General Rural in the Official Plan.
- There site is part of the Natural Heritage System identified on Schedule L1
- The proposed use is not appropriate in the General Rural Area. An OPA is required to bring the lands into the Rural Employment lands to support the use.
- The property is currently zoned RU (Rural Countryside) which does not permit warehouse/office, or retail use. A zoning amendment will be required to permit a warehouse, or retail use.
- The subject lands are serviced with water by the Carlsbad Trickle Feed (Pubic service area). Water availability to the site is limited. Please see Engineering notes below.
- Until such a time as a zoning amendment is approved for the site, it is challenging discuss the permitted uses or zoning provisions. Should a zoning amendment for a rural industrial use be approved by City Council for the site, matters of water servicing, compatibility with adjacent users, natural heritage or hazard lands may result in the use of zoning hold symbols, or setbacks different than those typical in the proposed RG zone being utilized.

Design Considerations

- A planning rationale would be required to support the site plan application: It must assess the types and levels of contaminant discharges expected by the specific industry, including those associated with transportation facilities which serve the industries. **Necessary mitigative measures should be identified based upon technical assessments.** Rationalization of site design should be provided. Discussion of existing and proposed D-6 Guidelines needs to be provided. Greater setbacks than the minimums provided in the zoning by-law may be required.
- The city will be looking for recommendations to reduce energy and water consumption through landscaping and lot layout, as per OP section 4.9
- The public frontage of the site should be designed to include high quality landscaping.
- Elevation drawings are required for the proposed buildings.
- A landscape plan is required as part of the submission package.

Engineering Considerations

- Connection will be to the Carlsbad Trickle Feed Water System. A servicing report or brief will be required to confirm that there is capacity in the system to supply the site. There are 3 residential equivalent connections to the Trickle Feed System available to site (combined with 6150 Thunder road lands to the north of the unnamed water course). Staff advise there

are 6 additional connections available on first come first serve basis for site plans at the time of registration.

- Stormwater will need to be controlled post development to the pre-development rates. Quality controls will come from the CA.
- The site will require a septic system. As the flows are expected to exceed 10,000l/d, then the approval will be the MECP and not the Ottawa Septic Office.
- MECP approval for stormwater will most likely be required. You will need to confirm with the MECP.
- You will need to confirm whether this property is in the capture area of the Municipal Drains in the area. There is some Drainage Act Approvals proceeding in this area.
- All approvals from other authorities, including ECA approvals from the MECP should be identified.

Transportation and Noise Considerations

- Please provide a figure to confirm the sight lines for the access close to Boundary on Thunder.
- Any comments related to the site plan that were not addressed previously at ZBLA and OPA applications should be addressed.
- Ensure the throat length at the access is met per TAC standards for a collector road.
- Stationary noise study will be required (site is in close proximity to noise sensitive use).

Environmental Considerations

- Any development will require an EIS as the site is identified as part of the City's Natural Heritage System (Official Plan Schedule L1). The EIS will need to address,
 - Significant woodlands and compensation for any removal
 - Headwater Drainage Feature assessment and watercourse relocation. Consideration of thermal regimes.
 - Potential SAR habitat, OP Section 4.7.4
 - Watercourse Setbacks, OP section 4.7.3. Low impact development cannot be located in these setbacks.
 - Significant wildlife habitat
 - Setbacks from wetlands on adjacent properties.
- Tree Conservation Report (TCR) will be required. TCR can be combined with the EIS to reduce duplications. Guidance for this report can be found on the city's website through the link provided below.
- We encourage the applicant to review and draw design elements from the City's Bird-Safe Design Guidelines to incorporate into their design, especially for the office section

of their proposal where large glass windows are anticipated. <https://ottawa.ca/en/city-hall/public-engagement/projects/bird-friendly-design-guidelines>

- The city will be looking for recommendations to reduce energy and water consumption through landscaping and lot layout, as per OP section 4.9
- Please draw best practices from the City's protocol to protection wildlife during construction into the EIS recommendations
- Here are some relevant links:
https://documents.ottawa.ca/sites/documents/files/documents/eis_guidelines2015_en.pdf
https://documents.ottawa.ca/sites/documents/files/birdsafedesign_guidelines_en.pdf
https://documents.ottawa.ca/sites/documents/files/documents/construction_en.pdf
- The applicant should consult with the with Conservation Authority regarding potential floodplain and if any permits will be required.

Conservation Authority Comments

Environmental

- An EIS with mitigation recommendations for the protection of the adjacent natural features, thermal impacts of the stormwater infrastructure, and offsetting requirements for the loss of headwater drainage features.
- headwater drainage features assessment following standard protocols
- A landscaping plan implementing the requirements of the EIS
- A detail design of the any realigned drainage features

Stormwater Management

- Treatment to achieve 80% TSS removal. The stormwater package should include, at a minimum, a report demonstrating how the standards are achieved, a grading and drainage plan and a sediment and erosion control plan.
- The design must implement the recommendations of the floodplain analysis, environmental studies and plans

Hazards

- Completion of a flood analysis demonstrating that development of the property will have no negative impacts on flooding or erosion upstream or downstream of the property.

Conservation Authority Regulations

- Any interference with a watercourse may require a permit under O. Reg. 170/06 and restrictions may apply

MTO comments

- A building and land use permit is required from the MTO. MTO staff will be looking to review a Transportation Impact Assessment, a Stormwater Management Plan, and a Site Illumination Plan.

Development Applications Required

To move forward with this proposal, an [Site Plan Control, \(standard\)](#) will be required. Please review the fees associated with this [here](#).

Enclosed is a *Study and Plan Identification List*, which identifies the required studies and plans to support your application would be provided with these notes. Staff would be pleased to update this list, upon request should the site zoning be approved. For additional information on preparing studies and plans, please click on the following hyperlink: [Guide to Preparing Studies and Plans](#).

The property is in Ward 19-Cumberland, with Councillor Catherine Kitts It is in your best interest to initiate contact with close neighbours as well as the Councillor and Registered Community Groups. In addition, it may be beneficial to contact key technical agencies that may be involved in this file to discuss the proposal before submitting an application.

You may also want to reference information available on the City's website for building permits/demolition permits and development charges as well. For additional information on these items, please follow the following associated links: [Building Permits](#) or [Development Charges](#). Please contact Building Code Services if you have any questions regarding permits or charges; they can be reached by phoning 311.

The above pre-consultation comments are valid for one year. If you submit a development application after this time, you may be required to meet for another pre-consultation meeting and/or the submission requirements may change.

Please do not hesitate to contact me if you have questions or require clarification.

APPLICANT'S STUDY AND PLAN IDENTIFICATION LIST



– SITE PLAN APPLICATION – private/municipal servicing

For information on preparing required studies and plans refer to:

<http://ottawa.ca/en/development-application-review-process-0/guide-preparing-studies-and-plans>

required	ENGINEERING		required
x	1. Site Servicing Plan	2. Assessment of Adequacy of Servicing / Site Servicing Study / Brief	x
x	3. Grade Control and Drainage Plan	4. Geotechnical Study / Slope Stability Study	X
	5. Composite Utility Plan	6.	
	7. Servicing Options Report	8. Wellhead Protection Study	
x	9. Transportation impact assessment	10. Erosion and Sediment Control Plan / Brief	x
x	11. Storm water Management Report	12. Hydro-geological and terrain analysis	x
	13. Hydraulic Water main Analysis	14. Stationary noise	x
	15. Roadway Modification Design Plan	16. Confederation Line Proximity Study	

required	PLANNING / DESIGN / SURVEY		Required
	17. Draft Plan of Subdivision	18. Plan Showing Layout of Parking Garage	
	19. Draft Plan of Condominium	20. Planning Rationale	x
x	21. Site Plan	22. Minimum Distance Separation (MDS)	
	23. Concept Plan Showing Proposed Land Uses and Landscaping	24. Agrology and Soil Capability Study	
	25. Concept Plan Showing Ultimate Use of Land	26. Cultural Heritage Impact Statement	
x	27. Landscape Plan – on site plan will likely be sufficient	28. Archaeological Resource Assessment Requirements: S (site plan) A (subdivision, condo)	
x	29. Survey Plan	30. Shadow Analysis	
x	31. Architectural Building Elevation Drawings (dimensioned)	32. Design Brief (includes the Design Review Panel Submission Requirements)	
	33. Wind Analysis		

required	ENVIRONMENTAL		required
	34. Phase 1 Environmental Site Assessment	35. Impact Assessment of adjacent Waste Disposal/Former Landfill Site	
	36. Phase 2 Environmental Site Assessment (depends on the outcome of Phase 1)	37. Assessment of Landform Features	
	38. Record of Site Condition	39. Mineral Resource Impact Assessment	
x	40. Tree Conservation Report	41. Environmental Impact Statement / Impact Assessment of Endangered Species	x
	42. Mine Hazard Study / Abandoned Pit or Quarry Study	43. Site illumination plan	x

Meeting Date: August 9, 2021

Application Type: **Site Plan Control**

File Lead: Anissa McAlpine

Engineer/Project Manager:
Kevin Hall

Site Address: 1650 Thunder Road (Southern parcel)

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

**SITE PLAN APPLICATION – PRIVATE/COMMUNAL SERVICING
REQUIRED ENGINEERING STUDIES AND ASSESSMENTS**



Notes:

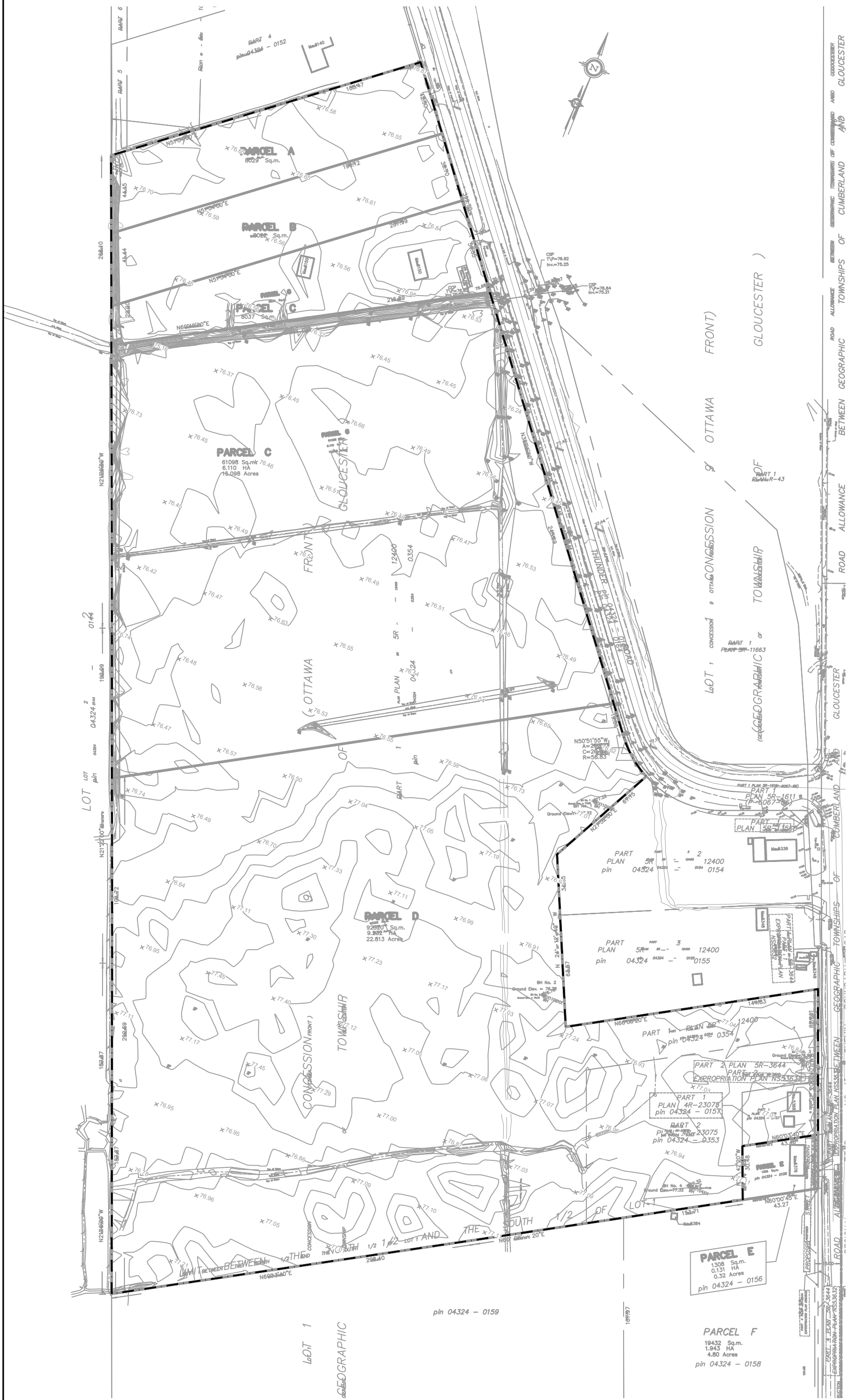
2. The City requires sufficient information (water, stormwater, sanitary) - required as per Official Plan section 4.4.2. for proposals. May be a brief at submission stage.
4. Geotechnical Study / Slope Stability Study – required as per Official Plan section 4.8.3. All site plan applications need to demonstrate the soils are suitable for development. A Slope Stability Study may be required with unique circumstances (Schedule K or topography may define slope stability concerns).
6. Groundwater Impact Assessment required as per Official Plan sections 4.4.2, 4.7.5 & 4.8.2. When reviewing development applications the City will consider the potential impact on groundwater.
8. Wellhead Protection Plan required as per Official Plan sections 4.4.2, 4.4.2.4, 4.7.5 & 4.8.2. When reviewing development applications, the City will consider the potential impact on wellhead protection areas (municipal wells and wells with an MRA).
10. Erosion and Sediment Control Plan – required with all site plan applications as per Official Plan section 4.7.3.
11. Stormwater Management Report/Brief - required with all site plan applications as per Official Plan section 4.7.6.
12. Hydrogeological and Terrain Analysis Study – required as per Official Plan 4.4.2.1, 4.4.2.4 & 4.7.5. Will be required for a proposed change in land use that would allow residential development or institutional uses (such as schools or seniors homes) on private water and wastewater servicing.
14. Noise and Vibration Study – a Noise Study will be required if noise sensitive development is proposed within 250 metres of an existing or proposed highway or a railway right-of-way, or 100 metres of an arterial or collector roadway or rapid-transit corridor. A Vibration Study will be required if the proposed development is within 75 metres of either an existing or proposed railway ROW. A Noise Study may also be required if the proposed development is adjacent to an existing or proposed stationary noise source..
35. An Impact Assessment of an Adjacent Waste Disposal/Former Landfill Site study is required for development proposals within 500 metres of a solid waste disposal site or other appropriate influence area or former landfill site. For contaminated sites a Record of Site Condition or letter of continued use is required.
39. A Mineral Resource Impact Assessment study is required, as per Official Plan section 3.7.4 adjacent to an unlicensed Limestone Resource or Sand and Gravel Resource Area (very limited uses considered within 500 metres of Limestone Resource Area or 300 metres of Sand and Gravel Resource Area). A study is required
 - adjacent to, or within 300 metres of, a licensed pit
 - adjacent to, or within 500 metres of, a licensed quarry

APPENDIX C

Site Topography



EXISTING TOPOGRAPHY
5368 Boundary Road and 6150 Thunder Road, Ottawa ON



APPENDIX B

DATE:
DECEMBER 2020

SK02

PARCEL E
1308 Sq.m.
0.131 HA
0.32 Acres
pin 04324 - 0156

PARCEL F
19432 Sq.m.
1.943 HA
4.80 Acres
pin 04324 - 0158

pin 04324 - 0159

LOT 1
GEOGRAPHIC

ROAD ALLOWANCE BETWEEN GEOGRAPHIC TOWNSHIPS OF OTTAWA & GLOUCESTER (FRONT)
ROAD ALLOWANCE BETWEEN GEOGRAPHIC TOWNSHIPS OF CUMBERLAND AND GLOUCESTER
GLOUCESTER

APPENDIX D

Fire Protection Calculations





Fire Flow Calculations as per Ontario Building Code (OBC)

LRL File No. : 200578

Project : Proposed Industrial Development

Location : 6160 Thunder Road, Ottawa

Date : February 23, 2023

Prepared by : V. Johnson

Modified By: K.Bhekharee

Fire Protection Water Supply Calculations

Q = KVS_{Tot}

where

Q = minimum supply of water (L)

K = water supply coefficient from Table 1 of the OFM guidelines

V = total building volume (m³)

S_{Tot} = total of spatial coefficient values from property line exposures on all sides

S_{Tot} = 1.0 + (S_{side1} + S_{side2} + S_{side3} + S_{side4})

S _{Side1} =	0.00
S _{Side2} =	0.00
S _{Side3} =	0.00
S _{Side4} =	0.00
S_{Tot} =	1.00

Exposure Distance (m) (For All Buildings)

>10 (North)

>10 (East)

>10 (South)

>10 (West)

1.0 + (S_{side 1} + S_{side 2} + S_{side 3} + S_{side 4}) (Max. value = 2.0)

Building Classification= F-2

(From Table 3.1.2.1)

Water Supply Coefficient (K)= 17

(From Table A3.2.5.7)(Non Combustible w Fire Separatic

Building Information based on Architectural Drawing

	Building A	Building B	Building C
Total Building Volume (m3)	121,000	121,000	29,000
Min Wat Supply Volume -Q (L)	2,057,000	2,057,000	493,000

*As Confirmed by Architect

**

Building A & B

Required Minimum Water Supply Flow Rate (From Table 2) = 9000 L/min

*Assume fire protection for largest demand of 1 building

Minimum Fire Protection Water Supply Volume for 30 min. = 27000 **

Required Fire Protection water Supply Volume (Highest Between * and **) = **2,057,000** L
Minimum

Building C

Required Minimum Water Supply Flow Rate (From Table 2) = 9000 L/min

*Assume fire protection for largest demand of 1 building

Minimum Fire Protection Water Supply Volume for 30 min. = 27000 **

Required Fire Protection water Supply Volume (Highest Between * and **) = **493,000** L
Minimum

APPENDIX E
Civil Engineering Drawings



INDUSTRIAL PARK 6160 THUNDER RD OTTAWA, ON

REVISION 02



KEY PLAN (N.T.S.)

DRAWING INDEX	
TITLE PAGE	
GENERAL NOTES PLAN	C000
EROSION AND SEDIMENT CONTROL PLAN	C101
GRADING AND DRAINAGE - OVERALL PLAN	C301
GRADING AND DRAINAGE PLAN	C302
GRADING AND DRAINAGE PLAN	C303
GRADING AND DRAINAGE PLAN	C304
GRADING AND DRAINAGE PLAN	C305
SERVICING - OVERALL PLAN	C401
SERVICING PLAN	C402
SERVICING PLAN	C403
STORMWATER MANAGEMENT PLAN	C601
PRE-DEVELOPMENT WATERSHED PLAN	C701
POST-DEVELOPMENT WATERSHED PLAN	C702
CONSTRUCTION DETAIL PLAN	C901



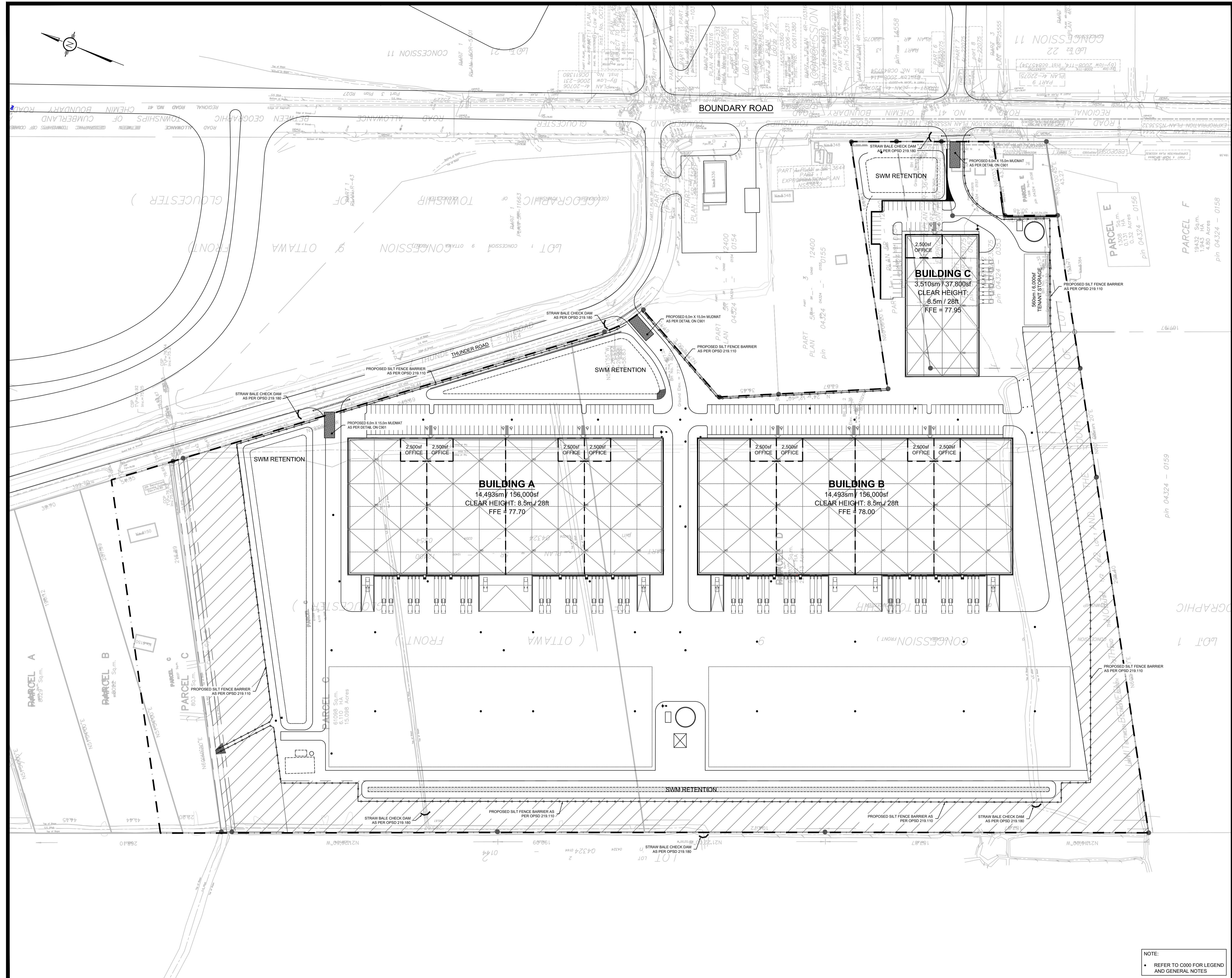
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5430 Canotek Road | Ottawa, ON, K1J 9G2
www.lrl.ca | (613) 842-3434

PROPOSED DEVELOPMENT
6160 THUNDER ROAD
REV.02 - ISSUED FOR APPROVAL - MAY 2023
LRL PROJECT no: 200578





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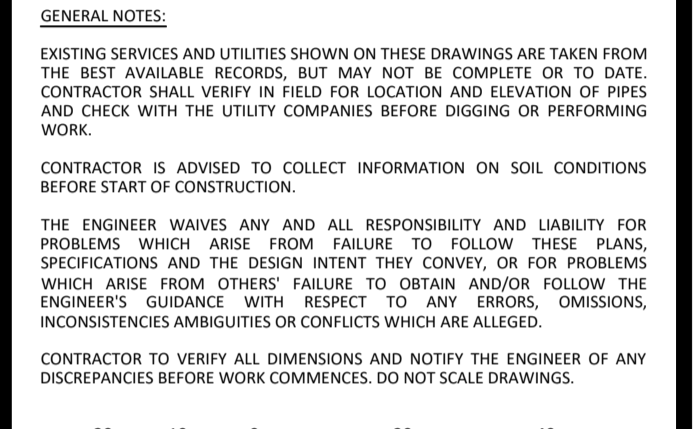
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No.	REVISIONS	BY	DATE
02	ISSUED FOR APPROVAL	V.J.	24 MAY 2023
01	ISSUED FOR APPROVAL	V.J.	25 NOV 2021

NOT AUTHENTIC UNLESS SIGNED AND DATED

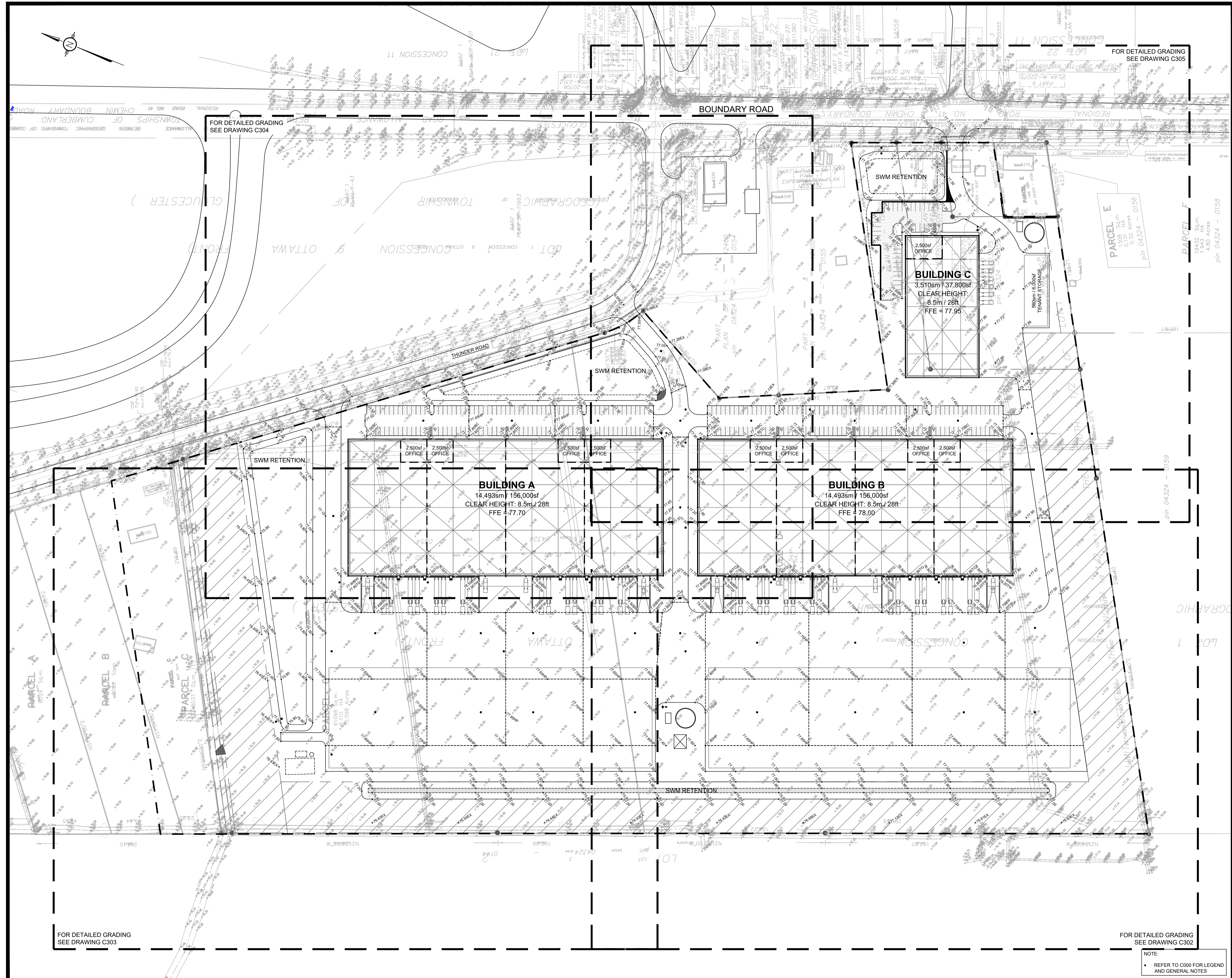
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www.lrl.ca | (613) 842-3434

CLIENT	AVENUE 31
DESIGNED BY:	V.J.
DRAWN BY:	M.L.
APPROVED BY:	V.J.

PROJECT	INDUSTRIAL PARK 6160 THUNDER RD OTTAWA, ON
DRAWING TITLE	EROSION AND SEDIMENT CONTROL PLAN
PROJECT NO.	200578
DATE	NOVEMBER 2020

NOTE:
REFER TO C000 FOR LEGEND AND GENERAL NOTES

C101



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02	ISSUED FOR APPROVAL	V.J.	24 MAY 2023
01	ISSUED FOR APPROVAL	V.J.	25 NOV 2021
No.	REVISIONS	BY	DATE

PROFESSIONAL ENGINEER
LRL ASSOCIATES LTD.
V. JOHNSON
100510576
05-24-2023
PROVINCE OF ONTARIO

NOT AUTHENTIC UNLESS SIGNED AND DATED

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CLIENT: AVENUE 31

DESIGNED BY: V.J. DRAWN BY: M.L. APPROVED BY: V.J.

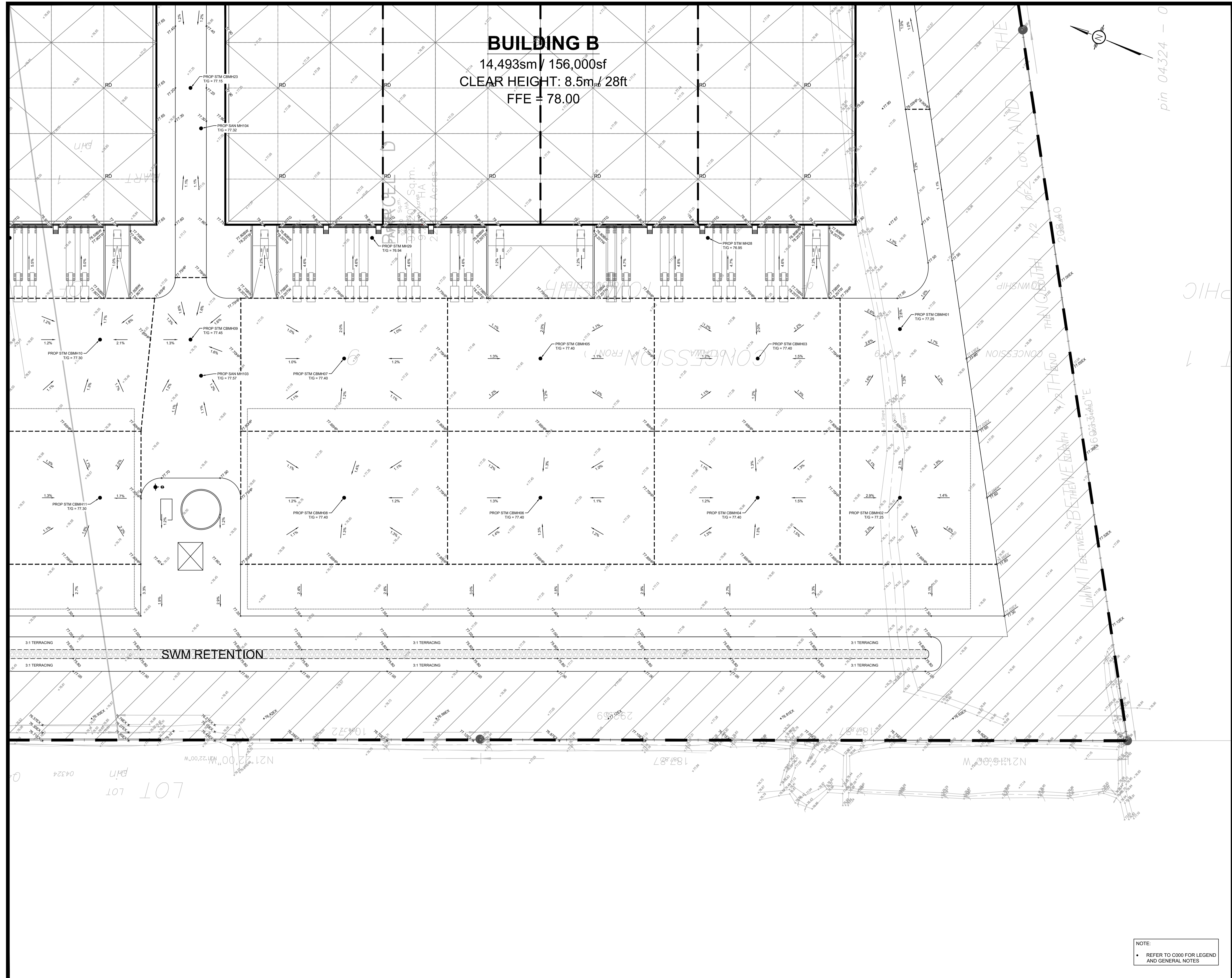
PROJECT: INDUSTRIAL PARK
 6160 THUNDER RD
 OTTAWA, ON

DRAWING TITLE: GRADING AND DRAINAGE - OVERALL PLAN

PROJECT NO.: 200578
 DATE: NOVEMBER 2020

NOTE:
 REFER TO C000 FOR LEGEND AND GENERAL NOTES

C301



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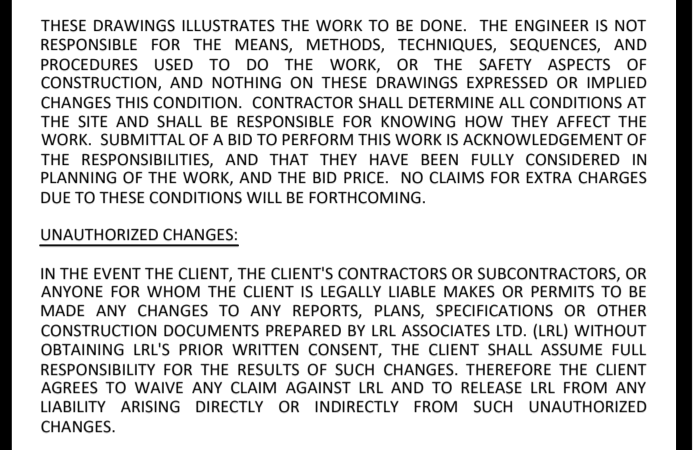
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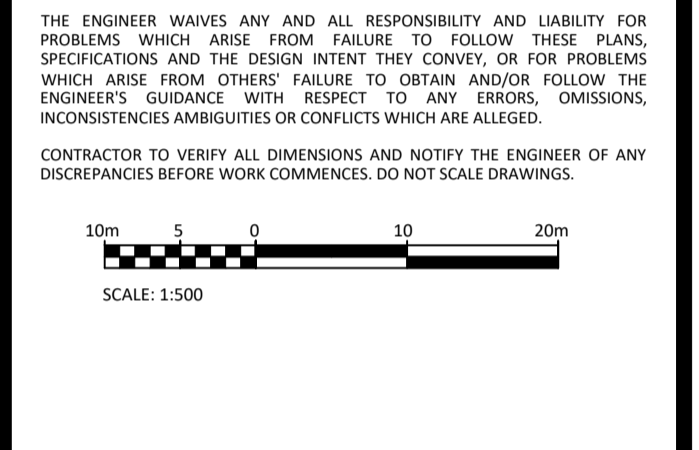
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No.	REVISIONS	BY	DATE
02	ISSUED FOR APPROVAL	V.J.	24 MAY 2023
01	ISSUED FOR APPROVAL	V.J.	25 NOV 2021



CLIENT

AVENUE 31

DESIGNED BY: V.J. DRAWN BY: M.L. APPROVED BY: V.J.

PROJECT

INDUSTRIAL PARK
 6160 THUNDER RD
 OTTAWA, OM

DRAWING TITLE

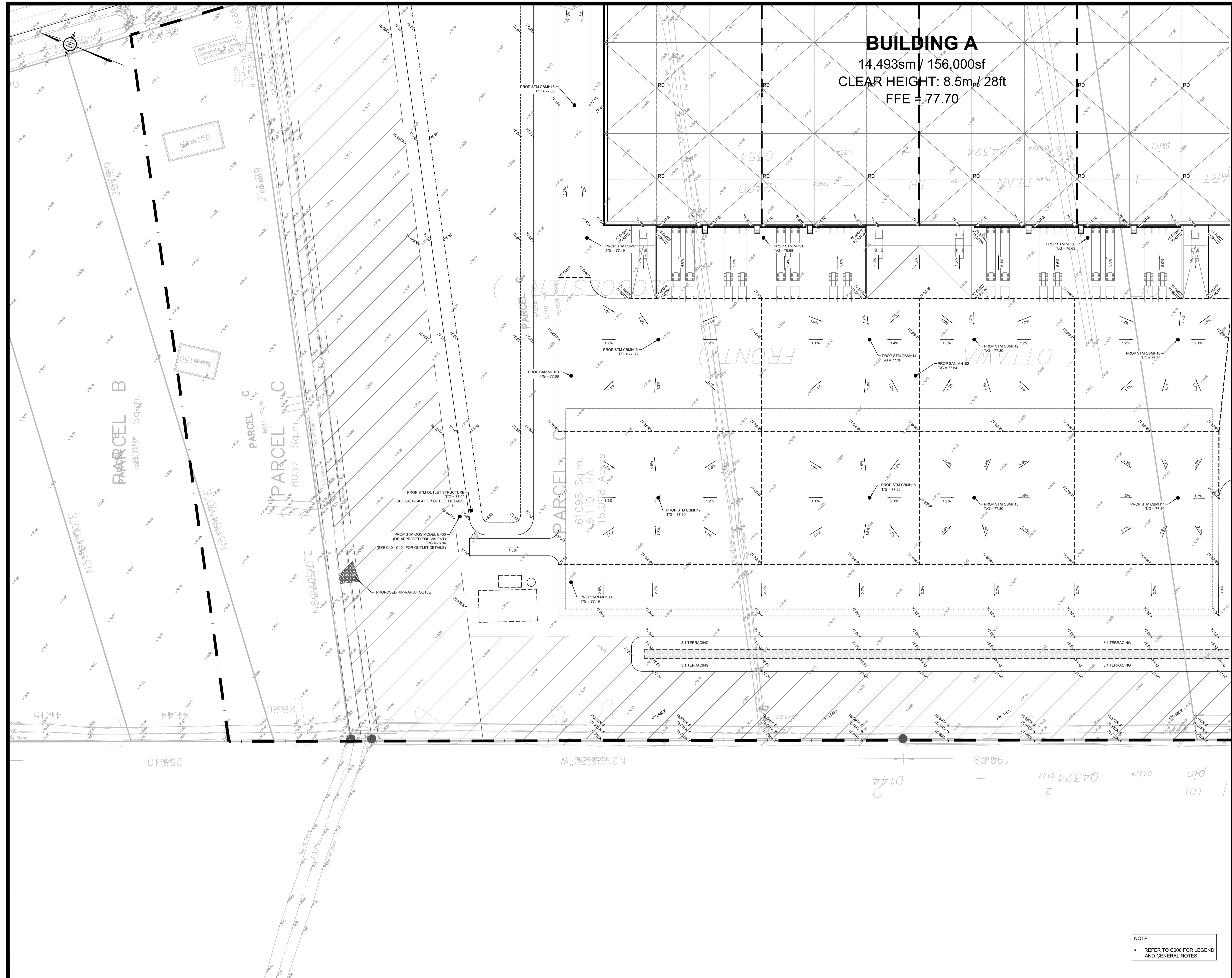
GRADING AND DRAINAGE PLAN

PROJECT NO. 200578

DATE NOVEMBER 2020

C302

NOTE:
 • REFER TO C000 FOR LEGEND AND GENERAL NOTES



BUILDING A
 14,493sm / 156,000sf
 CLEAR HEIGHT: 8.5m / 28ft
 FFE = 77.70

USE AND INTERPRETATION OF DRAWINGS

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01	ISSUED FOR APPROVAL	V.J.	25 NOV 2021
No.	REVISIONS	BY	DATE



NOT AUTHENTIC UNLESS SIGNED AND DATED

LRL
 ENGINEERING | ENGINEIRIE
 5430 Canotek Road | Ottawa, ON, K1J 9G2
 www.lrl.ca | (613) 842-3434

CLIENT
AVENUE 31

DESIGNED BY: V.J. DRAWN BY: M.L. APPROVED BY: V.J.

PROJECT
**INDUSTRIAL PARK
 6160 THUNDER RD
 OTTAWA, ON**

DRAWING TITLE
GRADING AND DRAINAGE PLAN

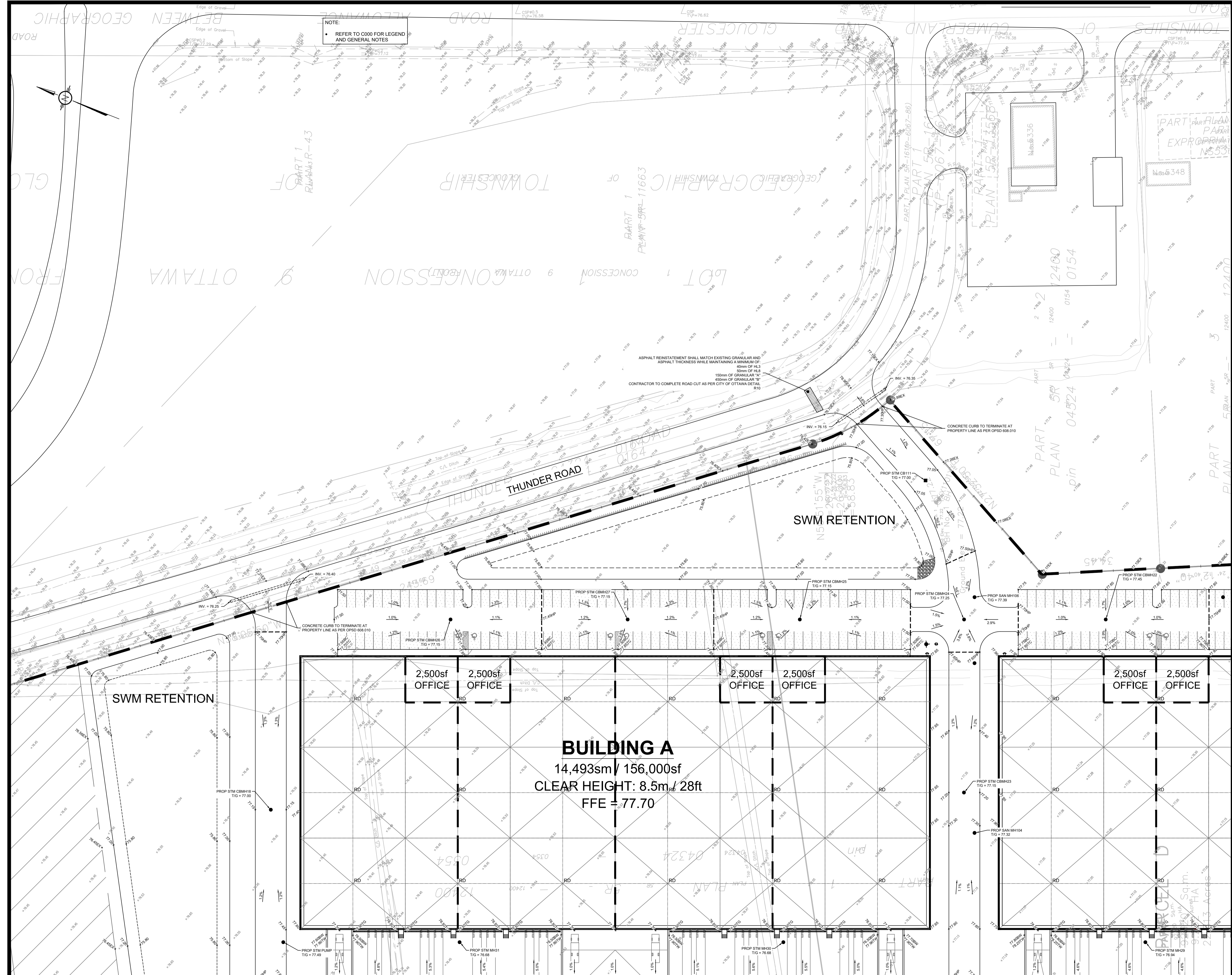
PROJECT NO.
200578

DATE
NOVEMBER 2020

C303

NOTE:
 • REFER TO C000 FOR LEGEND AND GENERAL NOTES

Handwritten notes: 0172, 04324 0144, 04324, PIN, LOT 2



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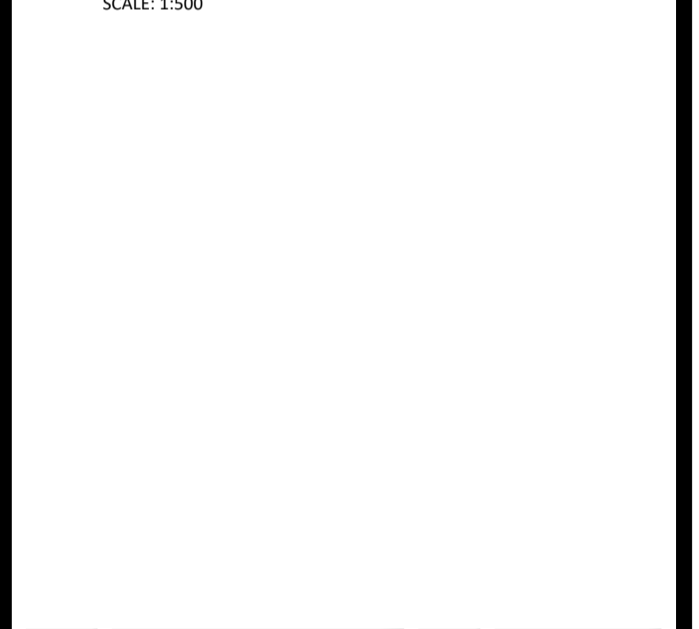
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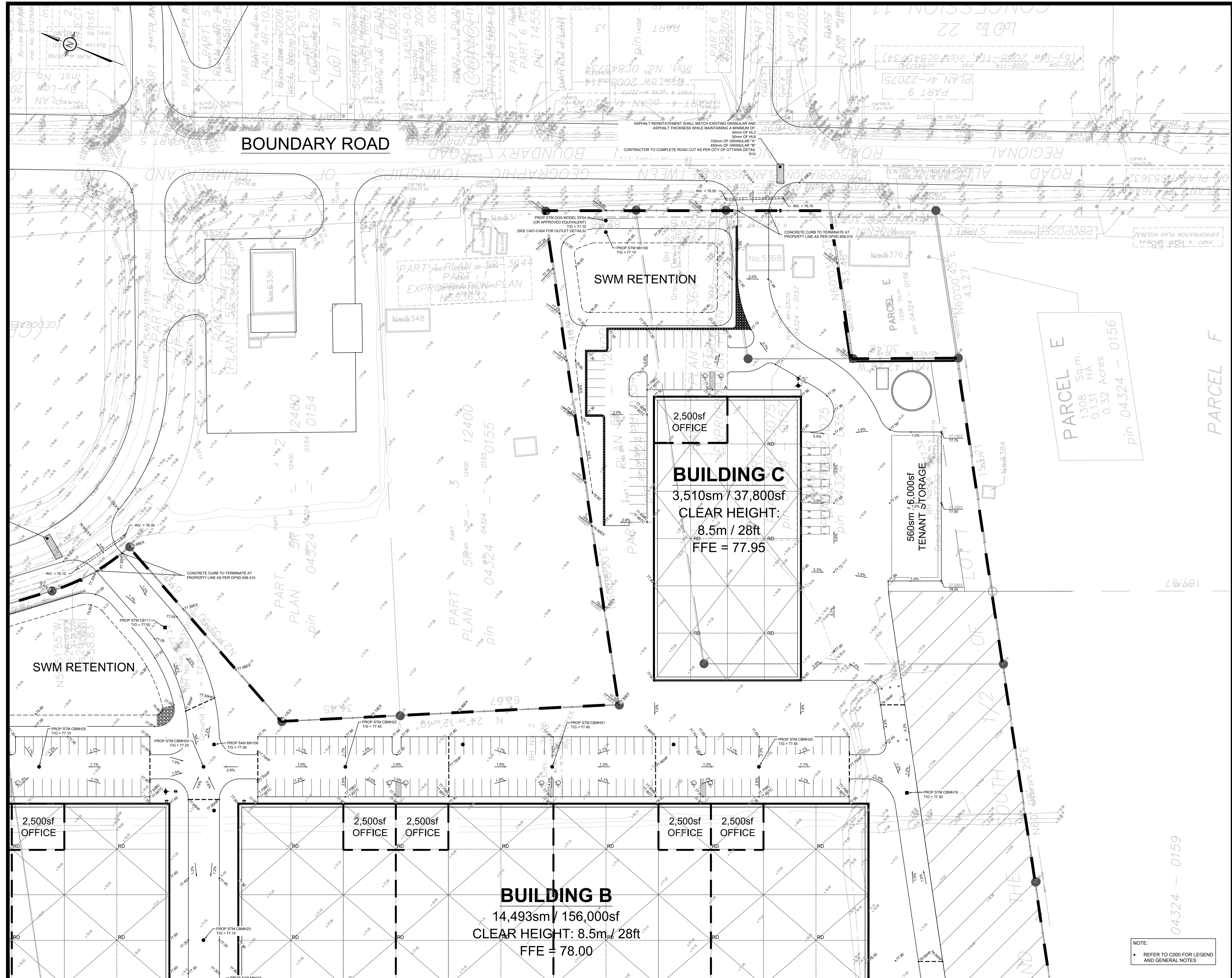
CLIENT: AVENUE 31

DESIGNED BY: V.J. DRAWN BY: M.L. APPROVED BY: V.J.

PROJECT: INDUSTRIAL PARK
 6160 THUNDER RD
 OTTAWA, OM

DRAWING TITLE: GRADING AND DRAINAGE PLAN

PROJECT NO: 200578
 DATE: NOVEMBER 2020
C304



BOUNDARY ROAD

SWM RETENTION

BUILDING C
 2,500sf OFFICE
 3,510sm / 37,800sf
 CLEAR HEIGHT:
 8.5m / 28ft
 FFE = 77.95

560sm / 6,000sf
 TENANT STORAGE

PARCEL E
 1308 Sq.m.
 0.131 HA
 0.32 Acres
 pin 04324 - 0156

PARCEL F

BUILDING B
 14,493sm / 156,000sf
 CLEAR HEIGHT: 8.5m / 28ft
 FFE = 78.00

2,500sf OFFICE

2,500sf OFFICE

2,500sf OFFICE

2,500sf OFFICE

SWM RETENTION

NOTE:
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SCALE: 1:500
 0m 5 10 20m

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01	ISSUED FOR APPROVAL	V.J.	25 NOV 2021

V. J. JUREK
 100510576
 05-24-2023
 PROVINCE OF ONTARIO

NOT AUTHENTIC UNLESS SIGNED AND DATED

LRL
 ENGINEERING | INGENIERIE
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 www.lrl.ca | (613) 842-3434

CLIENT: AVENUE 31

DESIGNED BY: V.J. DRAWN BY: M.L. APPROVED BY: V.J.

PROJECT: INDUSTRIAL PARK
 6160 THUNDER RD
 OTTAWA, OM

DRAWING TITLE: GRADING AND DRAINAGE PLAN

PROJECT NO: 200578 DATE: NOVEMBER 2020

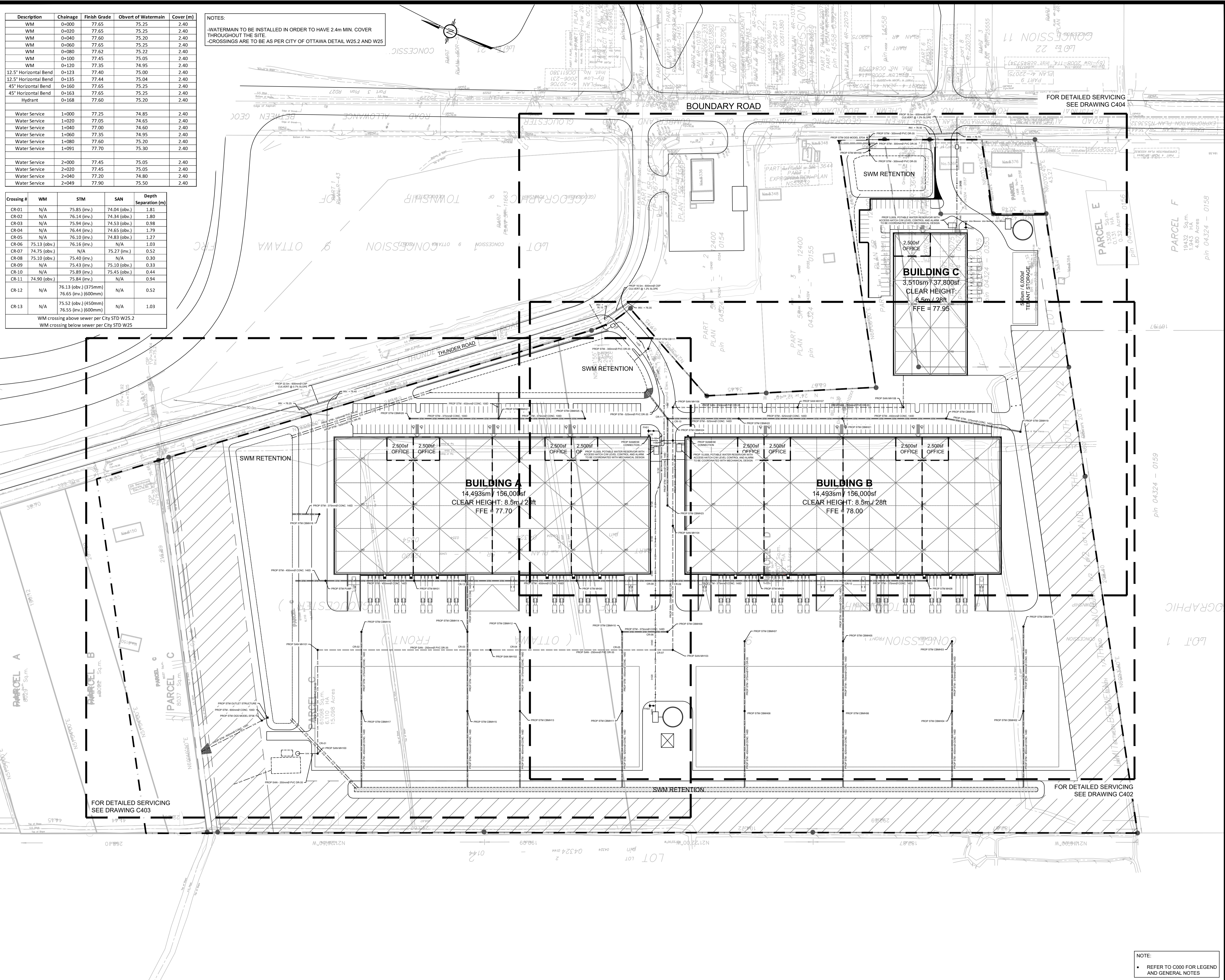
C305

Description	Chainage	Finish Grade	Obvert of Watermain	Cover (m)
WM	0+00	77.65	75.25	2.40
WM	0+020	77.65	75.25	2.40
WM	0+040	77.60	75.20	2.40
WM	0+060	77.65	75.25	2.40
WM	0+080	77.62	75.22	2.40
WM	0+100	77.45	75.05	2.40
WM	0+120	77.35	74.95	2.40
12.5° Horizontal Bend	0+135	77.40	75.00	2.40
45° Horizontal Bend	0+160	77.65	75.25	2.40
45° Horizontal Bend	0+163	77.65	75.25	2.40
Hydrant	0+168	77.60	75.20	2.40
Water Service	1+000	77.25	74.85	2.40
Water Service	1+020	77.05	74.65	2.40
Water Service	1+040	77.00	74.60	2.40
Water Service	1+060	77.35	74.95	2.40
Water Service	1+080	77.60	75.20	2.40
Water Service	1+091	77.70	75.30	2.40
Water Service	2+000	77.45	75.05	2.40
Water Service	2+020	77.45	75.05	2.40
Water Service	2+040	77.20	74.80	2.40
Water Service	2+049	77.90	75.50	2.40

Crossing #	WM	STM	SAN	Depth Separation (m)
CR-01	N/A	75.85 (inv.)	74.04 (obv.)	1.81
CR-02	N/A	76.34 (inv.)	74.34 (obv.)	1.80
CR-03	N/A	75.94 (inv.)	74.53 (obv.)	0.98
CR-04	N/A	76.44 (inv.)	74.65 (obv.)	1.79
CR-05	N/A	76.10 (inv.)	74.83 (obv.)	1.27
CR-06	75.33 (obv.)	76.36 (inv.)	N/A	1.03
CR-07	74.75 (obv.)	N/A	75.27 (inv.)	0.52
CR-08	75.10 (obv.)	N/A	N/A	0.30
CR-09	N/A	75.43 (inv.)	75.10 (obv.)	0.33
CR-10	N/A	75.89 (inv.)	75.45 (obv.)	0.44
CR-11	74.90 (obv.)	75.84 (inv.)	N/A	0.94
CR-12	N/A	76.13 (obv.) (375mm)	N/A	0.52
		76.65 (inv.) (600mm)		
CR-13	N/A	75.52 (obv.) (450mm)	N/A	1.03
		76.55 (inv.) (600mm)		

WM crossing above sewer per City STD W25.2
WM crossing below sewer per City STD W25

NOTES:
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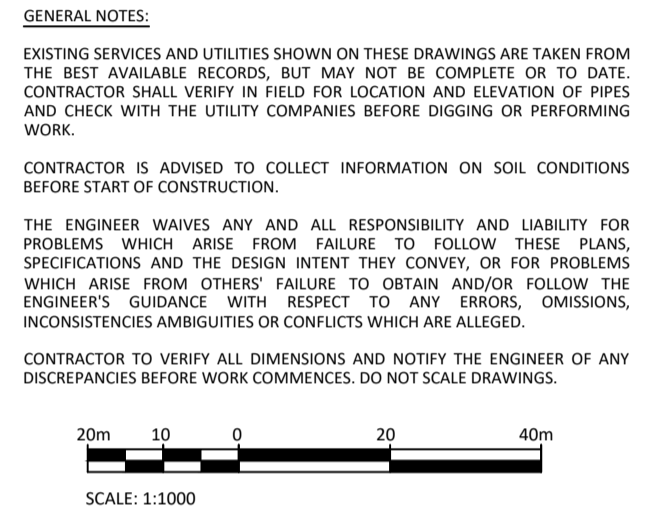
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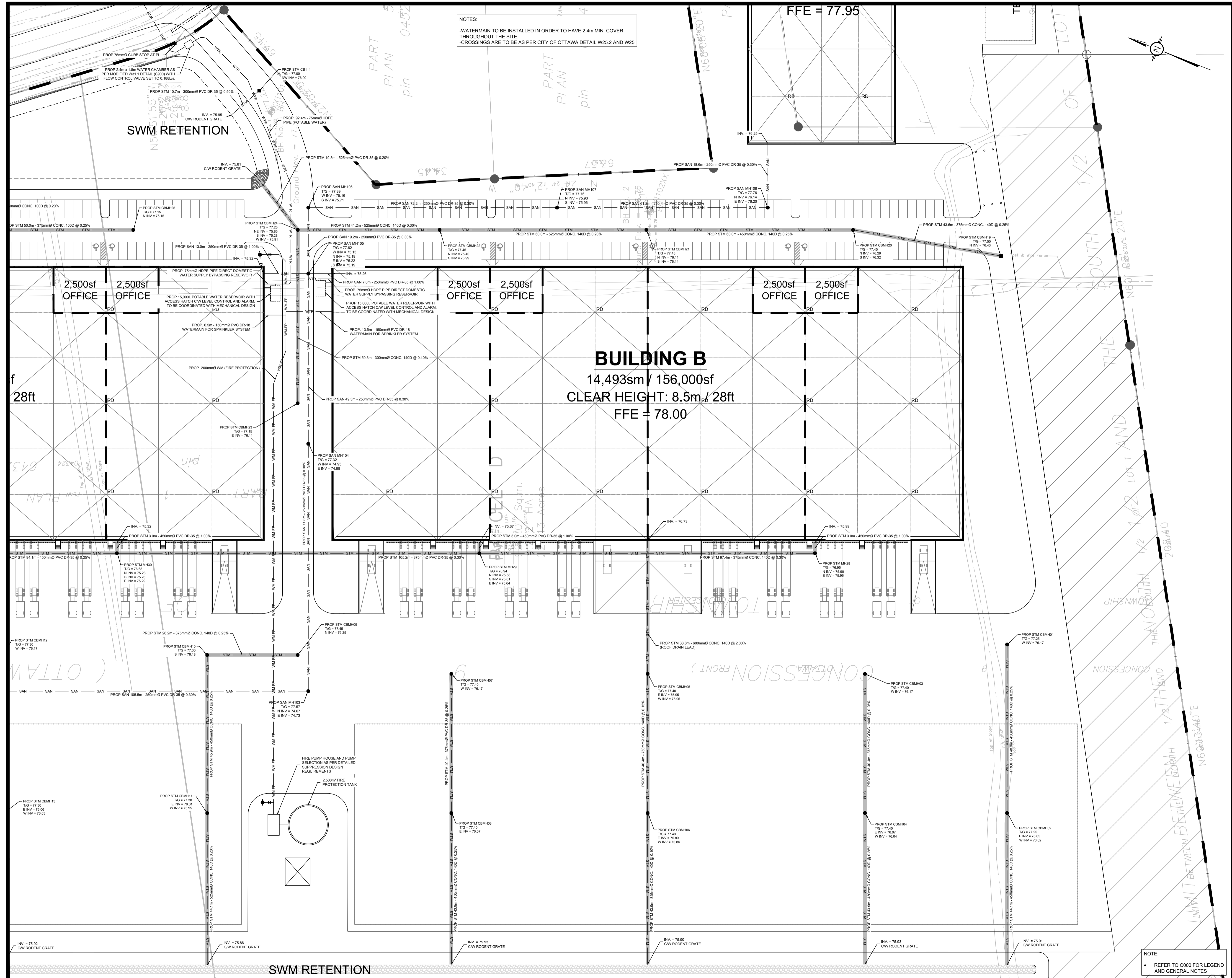
CLIENT: AVENUE 31
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PROJECT: INDUSTRIAL PARK
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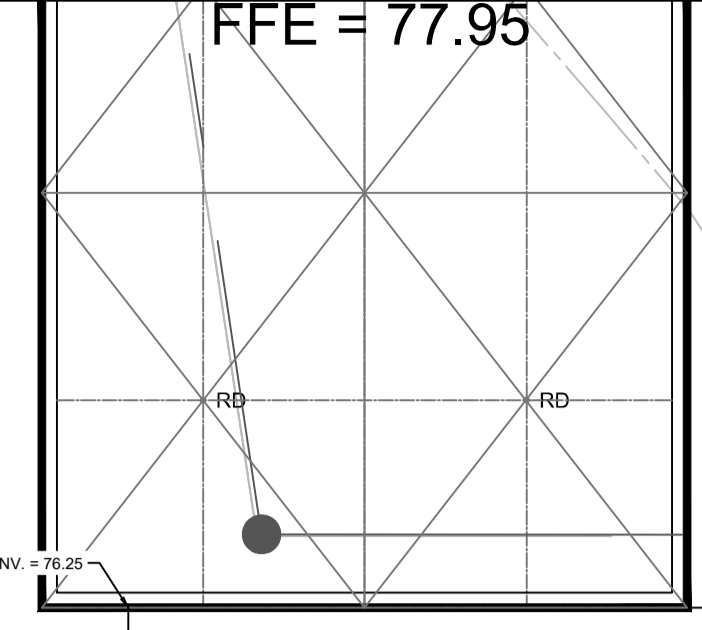
DRAWING TITLE: SERVICING - OVERALL PLAN

PROJECT NO: 200578
DATE: NOVEMBER 2020
C401

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IN THE EVENT THE CLIENT, THE CLIENT'S CONTRACTORS OR SUBCONTRACTORS, OR ANYONE FOR WHOM THE CLIENT IS LEGALLY LIABLE MAKES OR PERMITS TO BE MADE ANY CHANGES TO ANY REPORTS, PLANS, SPECIFICATIONS OR OTHER CONSTRUCTION DOCUMENTS PREPARED BY LRL ASSOCIATES LTD. (LRL) WITHOUT OBTAINING LRL'S PRIOR WRITTEN CONSENT, THE CLIENT SHALL ASSUME FULL RESPONSIBILITY FOR THE RESULTS OF SUCH CHANGES. THEREFORE THE CLIENT AGREES TO WAIVE ANY CLAIM AGAINST LRL AND TO RELEASE LRL FROM ANY LIABILITY ARISING DIRECTLY OR INDIRECTLY FROM SUCH UNAUTHORIZED CHANGES.

IN ADDITION, THE CLIENT AGREES, TO THE FULLEST EXTENT PERMITTED BY LAW, TO INDEMNIFY AND HOLD HARMLESS LRL FROM ANY DAMAGES, LIABILITIES OR COSTS, INCLUDING REASONABLE ATTORNEY'S FEES AND COST OF DEFENSE, ARISING FROM SUCH CHANGES.

IN ADDITION, THE CLIENT AGREES TO INCLUDE IN ANY CONTRACTS FOR CONSTRUCTION APPROPRIATE LANGUAGE THAT PROHIBITS THE CONTRACTOR OR ANY SUBCONTRACTORS OF ANY TIER FROM MAKING ANY CHANGES OR MODIFICATIONS TO LRL'S CONSTRUCTION DOCUMENTS WITHOUT THE PRIOR WRITTEN APPROVAL OF LRL AND THAT FURTHER REQUIRES THE CONTRACTOR TO INDEMNIFY BOTH LRL AND THE CLIENT FROM ANY LIABILITY OR COST ARISING FROM SUCH CHANGES MADE WITHOUT SUCH PROPER AUTHORIZATION.

GENERAL NOTES:

EXISTING SERVICES AND UTILITIES SHOWN ON THESE DRAWINGS ARE TAKEN FROM THE BEST AVAILABLE RECORDS, BUT MAY NOT BE COMPLETE OR TO DATE. CONTRACTOR SHALL VERIFY THE LOCATION AND DEPTH OF ALL EXISTING PIPES AND CHECK WITH THE UTILITY COMPANIES BEFORE DIGGING OR PERFORMING WORK.

CONTRACTOR IS ADVISED TO COLLECT INFORMATION ON SOIL CONDITIONS BEFORE START OF CONSTRUCTION.

THE ENGINEER WAIVES ANY AND ALL RESPONSIBILITY AND LIABILITY FOR PROBLEMS WHICH ARISE FROM FAILURE TO FOLLOW THESE PLANS, SPECIFICATIONS AND THE DRAWINGS, WHETHER THEY CONVEY OR FOR PROBLEMS WHICH ARISE FROM OTHERS' FAILURE TO OBTAIN AND/OR FOLLOW THE ENGINEER'S GUIDANCE WITH RESPECT TO ANY ERRORS, OMISSIONS, INCONSISTENCIES, AMBIGUITIES OR CONFLICTS WHICH ARE ALLEGED.

CONTRACTOR TO VERIFY ALL DIMENSIONS AND NOTIFY THE ENGINEER OF ANY DISCREPANCIES BEFORE WORK COMMENCES. DO NOT SCALE DRAWINGS.

10m 5 0 10 20m
 SCALE: 1:500

02	ISSUED FOR APPROVAL	V.J.	24 MAY 2023
01	ISSUED FOR APPROVAL	V.J.	25 NOV 2021
No.	REVISIONS	BY	DATE

LRL
 ENGINEERING | INGÉNIERIE
 5430 Canotek Road | Ottawa, ON, K1J 9G2
 www.lrl.ca | (613) 842-3434

CLIENT: AVENUE 31

DESIGNED BY: V.J. DRAWN BY: M.L. APPROVED BY: V.J.

PROJECT: INDUSTRIAL PARK 6160 THUNDER RD OTTAWA, ON

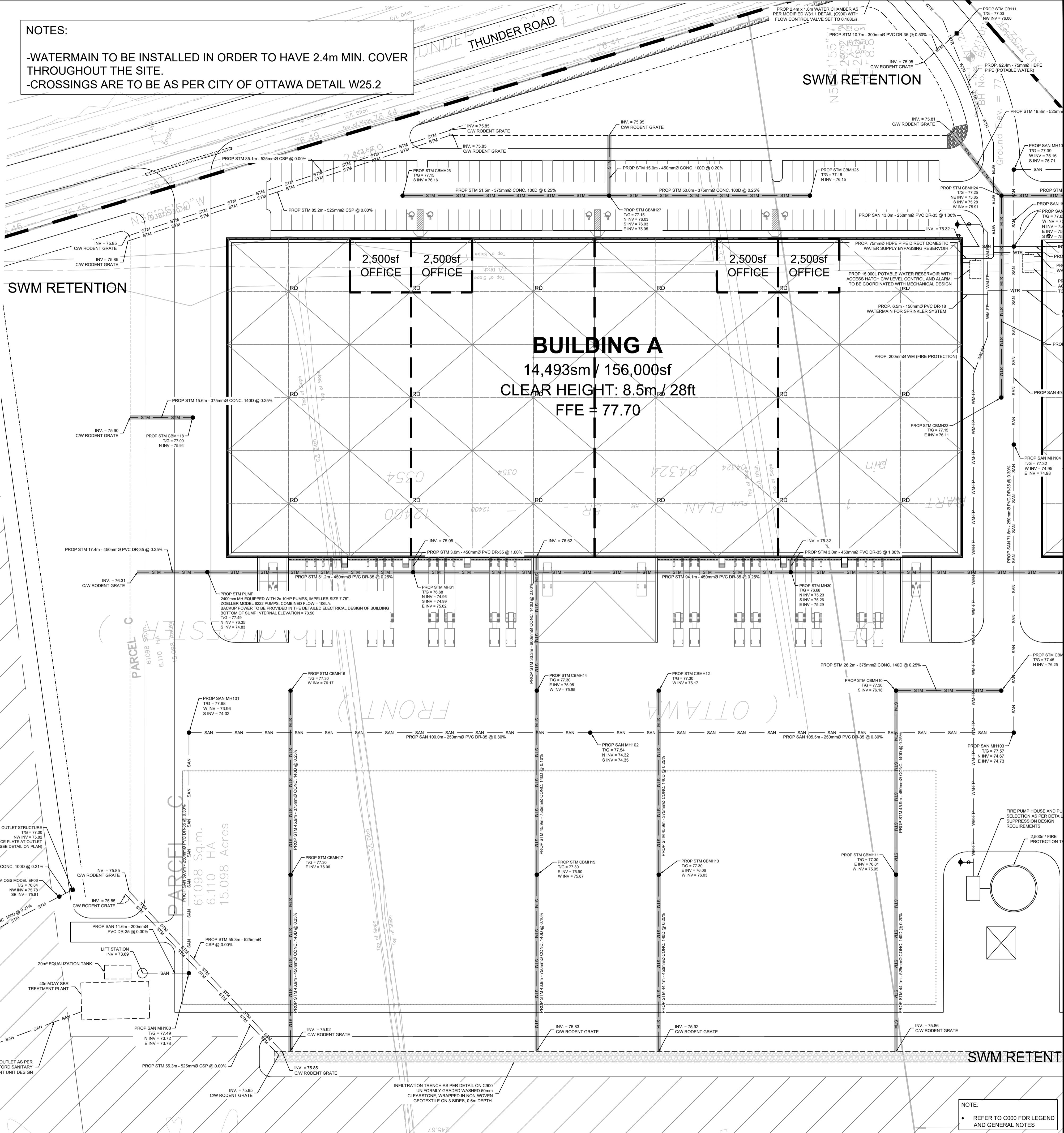
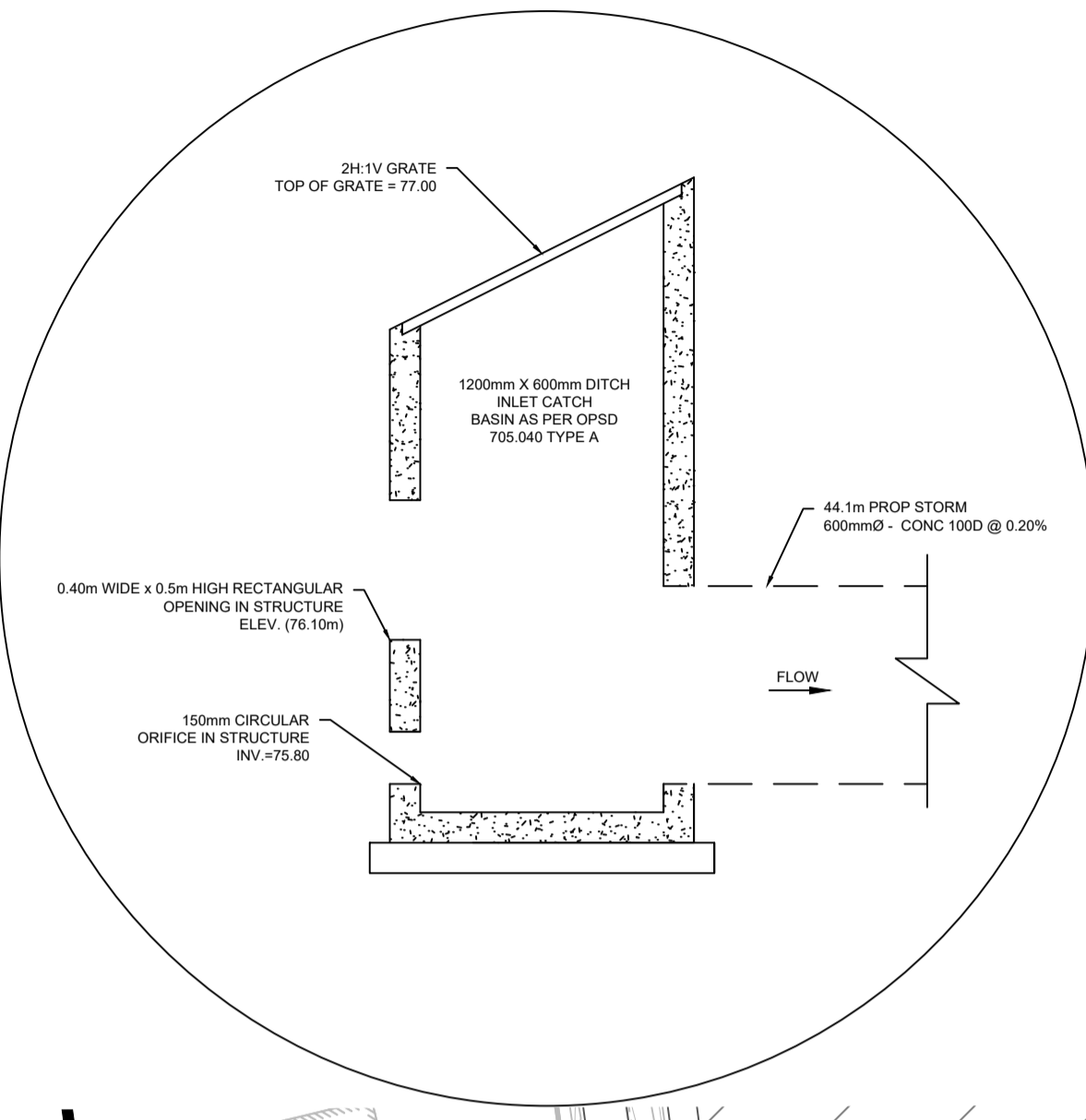
DRAWING TITLE: SERVICING PLAN

PROJECT NO: 200578 DATE: NOVEMBER 2020

NOTE:
 • REFER TO C000 FOR LEGEND AND GENERAL NOTES

C402

NOTES:
 -WATERMAIN TO BE INSTALLED IN ORDER TO HAVE 2.4m MIN. COVER THROUGHOUT THE SITE.
 -CROSSINGS ARE TO BE AS PER CITY OF OTTAWA DETAIL W25.2



USE AND INTERPRETATION OF DRAWINGS
 GENERAL CONDITIONS OF THE CONTRACT FOR CONSTRUCTION ARE PART OF THE CONTRACT DOCUMENTS AND DESCRIBE THE USE AND INTENT OF THE DRAWINGS. THE CONTRACT DOCUMENTS INCLUDE NOT ONLY THE DRAWINGS, BUT ALSO THE OWNER-CONTRACTOR AGREEMENTS, CONDITIONS OF THE CONTRACT, THE SPECIFICATIONS, ADDENDA, AND MODIFICATIONS ISSUED AFTER EXECUTION OF THE CONTRACT. THESE CONTRACT DOCUMENTS ARE COMPLEMENTARY, AND WHAT IS REQUIRED BY ANY ONE SHALL BE BINDING AS REQUIRED BY ALL. WORK NOT COMPLETELY DELINEATED HEREON SHALL BE CONSTRUCTED OF THE SAME MATERIALS AND DETAIL SHOWN IN THE WORK SHOWN MORE COMPLETELY ELSEWHERE IN THE CONTRACT DOCUMENTS.

BY USE OF THE DRAWINGS FOR CONSTRUCTION OF THE PROJECT, THE OWNER CONFIRMS THAT HE HAS REVIEWED AND APPROVED THE DRAWINGS. THE CONTRACTOR CONFIRMS THAT HE HAS VISITED THE SITE, FAMILIARIZED HIMSELF WITH THE LOCAL CONDITIONS, VERIFIED FIELD DIMENSIONS AND CORRELATED HIS OBSERVATIONS WITH THE REQUIREMENTS OF THE CONTRACT DOCUMENTS.

AS INSTRUMENTS OF SERVICE, ALL DRAWINGS, SPECIFICATIONS, CAD FILES OR OTHER ELECTRONIC MEDIA AND COPIES THEREOF FURNISHED BY THE ENGINEER ARE HIS PROPERTY. THEY ARE TO BE USED ONLY FOR THIS PROJECT AND ARE NOT TO BE USED ON ANY OTHER PROJECT, INCLUDING REPEATS OF THE PROJECT. CHANGES TO THE DRAWINGS MAY ONLY BE MADE BY THE ENGINEER.

UNLESS THE REVISION TITLE IS "ISSUED FOR CONSTRUCTION", THESE DRAWINGS SHALL BE CONSIDERED PRELIMINARY AND SHALL NOT BE USED AS A CONSTRUCTION DOCUMENT.

THESE DRAWINGS ILLUSTRATE THE WORK TO BE DONE. THE ENGINEER IS NOT RESPONSIBLE FOR THE MEANS, METHODS, TECHNIQUES, SEQUENCES, AND PROCEDURES USED TO DO THE WORK, OR THE SAFETY ASPECTS OF CONSTRUCTION, AND NOTHING ON THESE DRAWINGS EXPRESSED OR IMPLIED CHANGES THIS CONDITION. CONTRACTOR SHALL DETERMINE ALL CONDITIONS AT THE SITE AND SHALL BE RESPONSIBLE FOR KNOWING HOW THEY AFFECT THE WORK. SUBMITTAL OF A BID TO PERFORM THIS WORK IS ACKNOWLEDGEMENT OF THE RESPONSIBILITIES, AND THAT THEY HAVE BEEN FULLY CONSIDERED IN PLANNING OF THE WORK AND THE BID PRICE. NO CLAIMS FOR EXTRA CHARGES DUE TO THESE CONDITIONS WILL BE FORTHCOMING.

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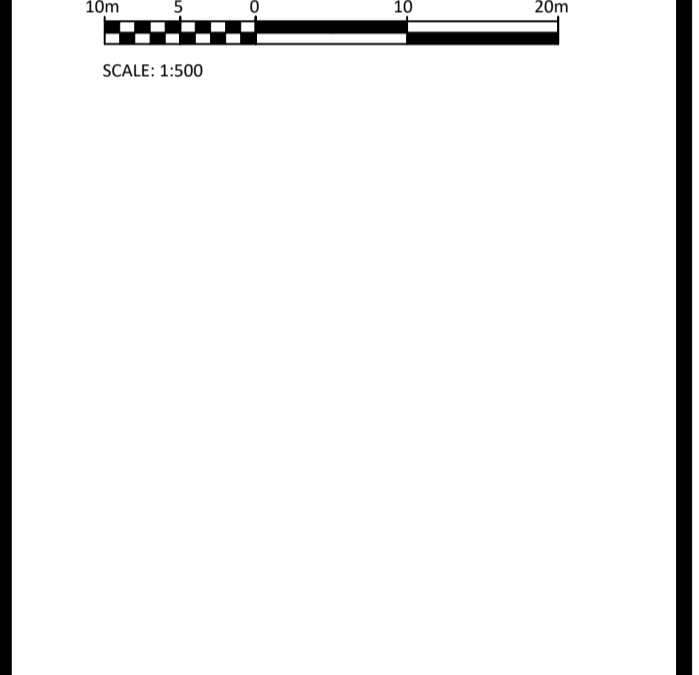
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No.	REVISIONS	BY	DATE
02	ISSUED FOR APPROVAL	V.J.	24 MAY 2023
01	ISSUED FOR APPROVAL	V.J.	25 NOV 2021



NOT AUTHENTIC UNLESS SIGNED AND DATED



CLIENT
AVENUE 31

DESIGNED BY: V.J. DRAWN BY: M.L. APPROVED BY: V.J.
 PROJECT
**INDUSTRIAL PARK
 6160 THUNDER RD
 OTTAWA, ON**

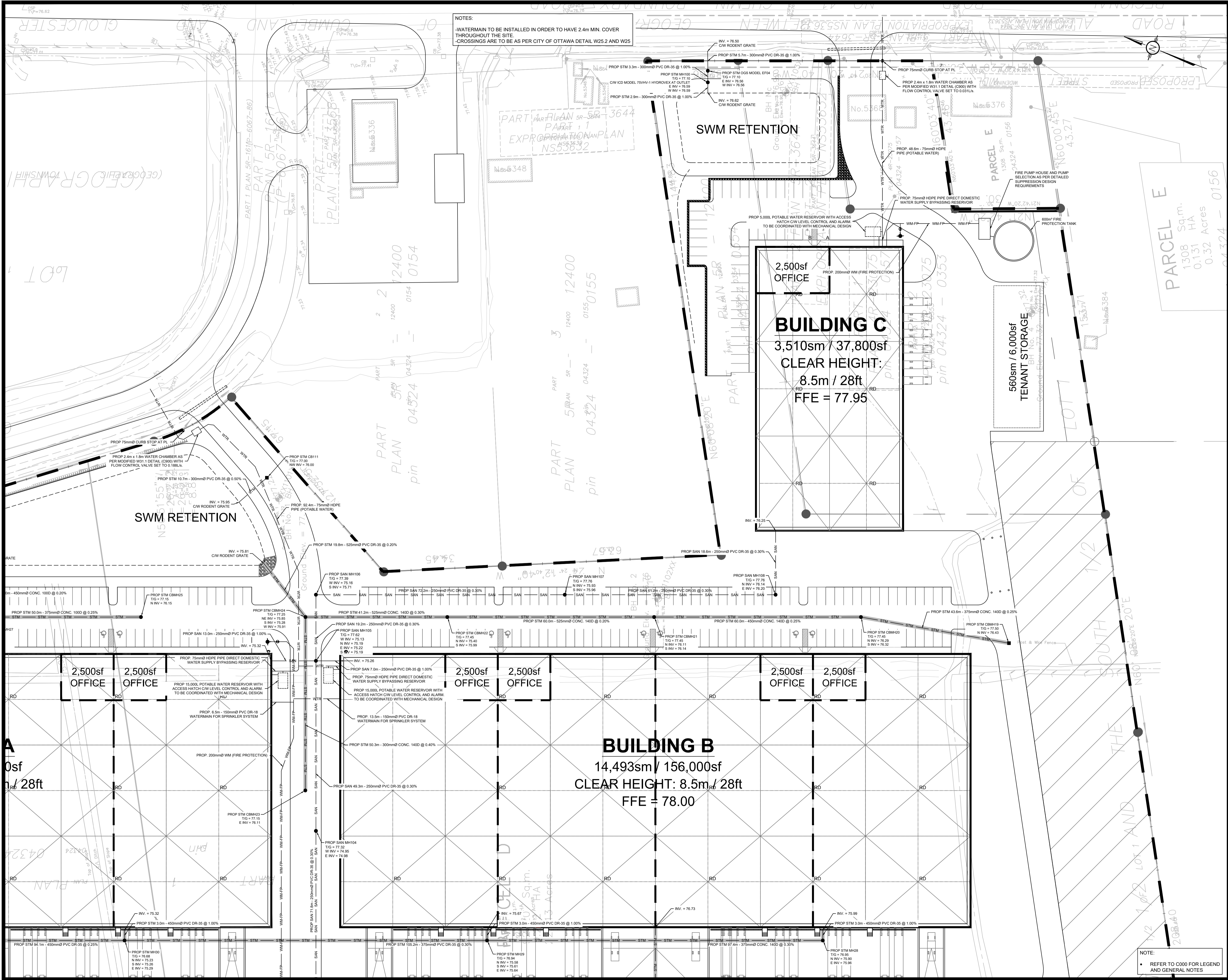
DRAWING TITLE
SERVICING PLAN

PROJECT NO.
 200578
 DATE
 NOVEMBER 2020

NOTE:
 • REFER TO C000 FOR LEGEND AND GENERAL NOTES

C403

NOTES:
 -WATERMAIN TO BE INSTALLED IN ORDER TO HAVE 2.4m MIN. COVER THROUGHOUT THE SITE.
 -CROSSINGS ARE TO BE AS PER CITY OF OTTAWA DETAIL W25.2 AND W25.3



GENERAL CONDITIONS OF THE CONTRACT FOR CONSTRUCTION ARE PART OF THE CONTRACT DOCUMENTS AND DESCRIBE THE SCOPE AND INTENT OF THE DRAWING. THE CONTRACTOR SHALL BE RESPONSIBLE FOR OBTAINING ALL NECESSARY PERMITS AND APPROVALS FROM THE LOCAL AUTHORITY. THE CONTRACTOR SHALL BE RESPONSIBLE FOR OBTAINING ALL NECESSARY PERMITS AND APPROVALS FROM THE LOCAL AUTHORITY. THE CONTRACTOR SHALL BE RESPONSIBLE FOR OBTAINING ALL NECESSARY PERMITS AND APPROVALS FROM THE LOCAL AUTHORITY.

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SCALE: 1:500

No.	REVISIONS	BY	DATE
02	ISSUED FOR APPROVAL	V.J.	24 MAY 2023
01	ISSUED FOR APPROVAL	V.J.	25 NOV 2021



NOT AUTHENTIC UNLESS SIGNED AND DATED

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 5430 Canotek Road | Ottawa, ON, K1J 9G2
 www.lrl.ca | (613) 842-3434

CLIENT
 AVENUE 31

DESIGNED BY: V.J. DRAWN BY: M.L. APPROVED BY: V.J.

PROJECT
 INDUSTRIAL PARK
 6160 THUNDER RD
 OTTAWA, ON

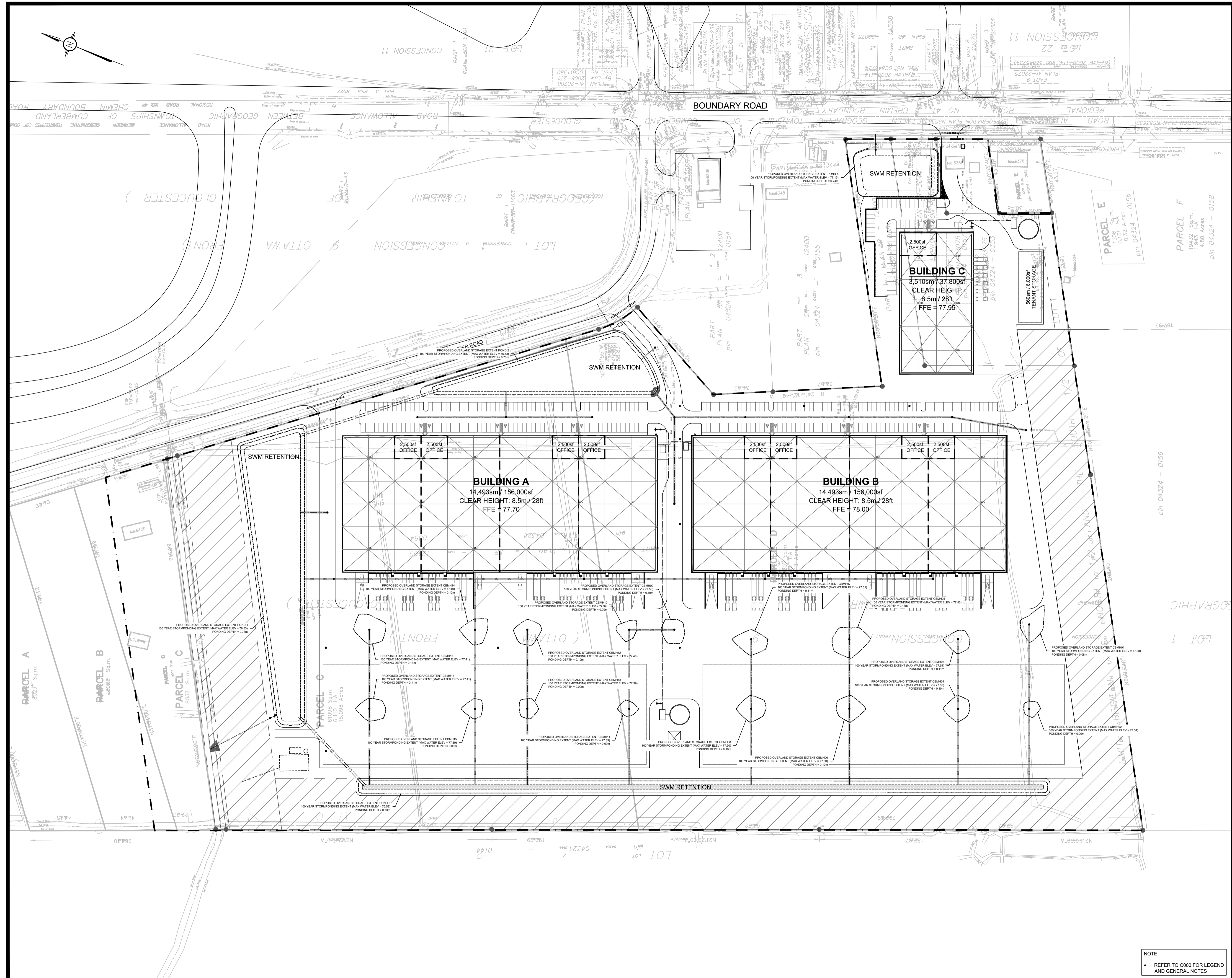
DRAWING TITLE
 SERVICING PLAN

PROJECT NO.
 200578

DATE
 NOVEMBER 2020

C404

NOTE:
 REFER TO C000 FOR LEGEND AND GENERAL NOTES



USE AND INTERPRETATION OF DRAWINGS

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02	ISSUED FOR APPROVAL	V.J.	24 MAY 2023
01	ISSUED FOR APPROVAL	V.J.	25 NOV 2021

No.	REVISIONS	BY	DATE
02	ISSUED FOR APPROVAL	V.J.	24 MAY 2023
01	ISSUED FOR APPROVAL	V.J.	25 NOV 2021

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www.lrl.ca | (613) 842-3434

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5430 Canotek Road | Ottawa, ON, K1J 9G2
www.lrl.ca | (613) 842-3434

CLIENT
AVENUE 31

DESIGNED BY: V.J. DRAWN BY: M.L. APPROVED BY: V.J.

PROJECT
**INDUSTRIAL PARK
6160 THUNDER RD
OTTAWA, ON**

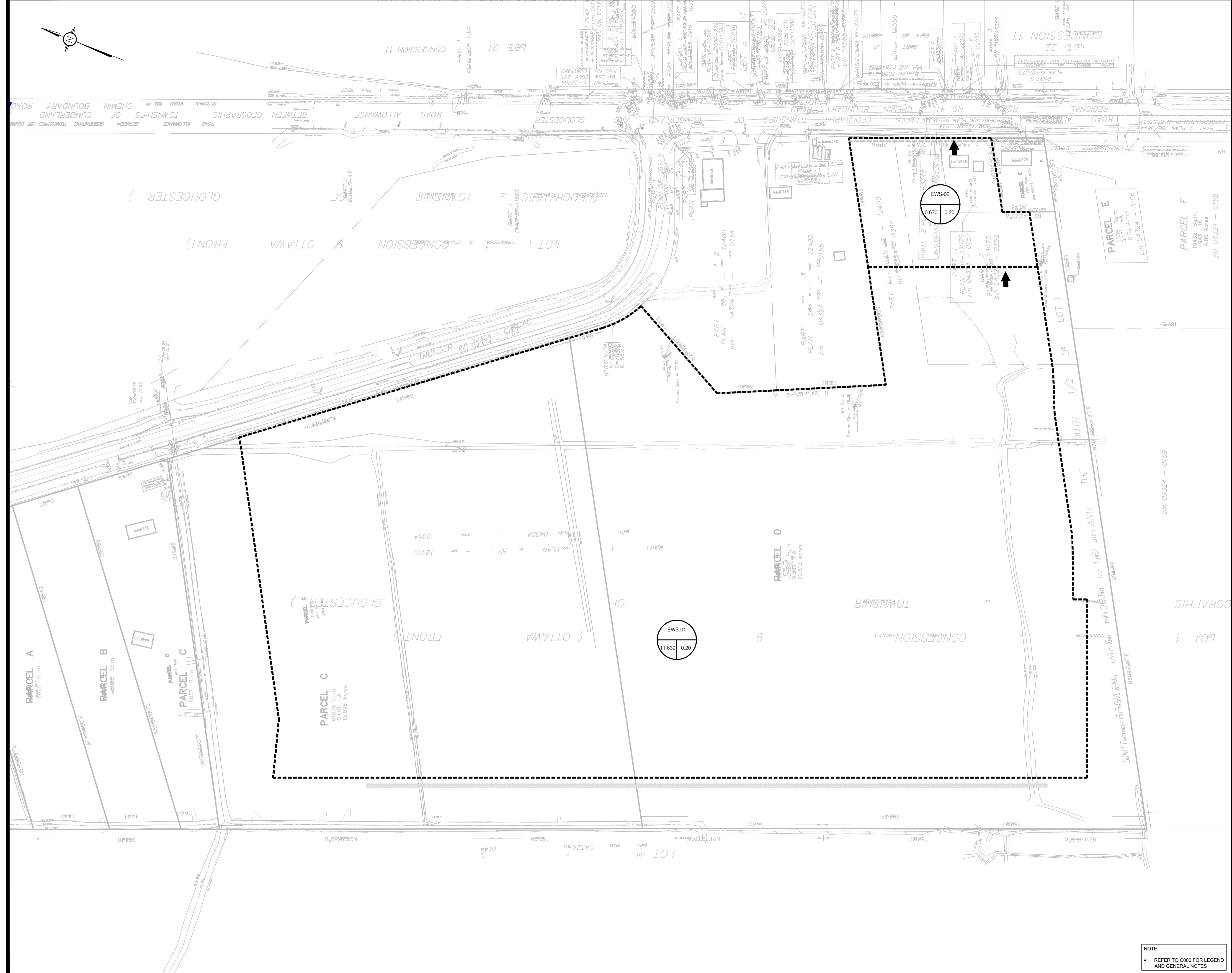
DRAWING TITLE
STORMWATER MANAGEMENT PLAN

PROJECT NO.
200578

DATE
NOVEMBER 2020

C601

NOTE:
REFER TO C000 FOR LEGEND AND GENERAL NOTES



USE AND INTERPRETATION OF DRAWINGS

GENERAL CONDITIONS OF THE CONTRACT FOR CONSTRUCTION ARE PART OF THE CONTRACT DOCUMENTS AND DESCRIBE USE AND INTENT OF THE DRAWING. THE CONTRACTOR CONFIRMS THAT HE HAS VISITED THE SITE, FAMILIARIZED HIMSELF WITH THE LOCAL CONDITIONS, VERIFIED FIELD DIMENSIONS AND CORRELATED HIS OBSERVATIONS WITH THE REQUIREMENTS OF THE CONTRACT DOCUMENTS.

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20m 10 0 20 40m
SCALE: 1:1000

No.	REVISIONS	BY	DATE
02	ISSUED FOR APPROVAL	V.J.	24 MAY 2023
01	ISSUED FOR APPROVAL	V.J.	25 NOV 2021

LRL
ENGINEERING | INGENIERIE
5430 Canotek Road | Ottawa, ON, K1J 9G2
www.lrl.ca | (613) 842-3434

CLIENT: AVENUE 31

DESIGNED BY: V.J. DRAWN BY: M.L. APPROVED BY: V.J.

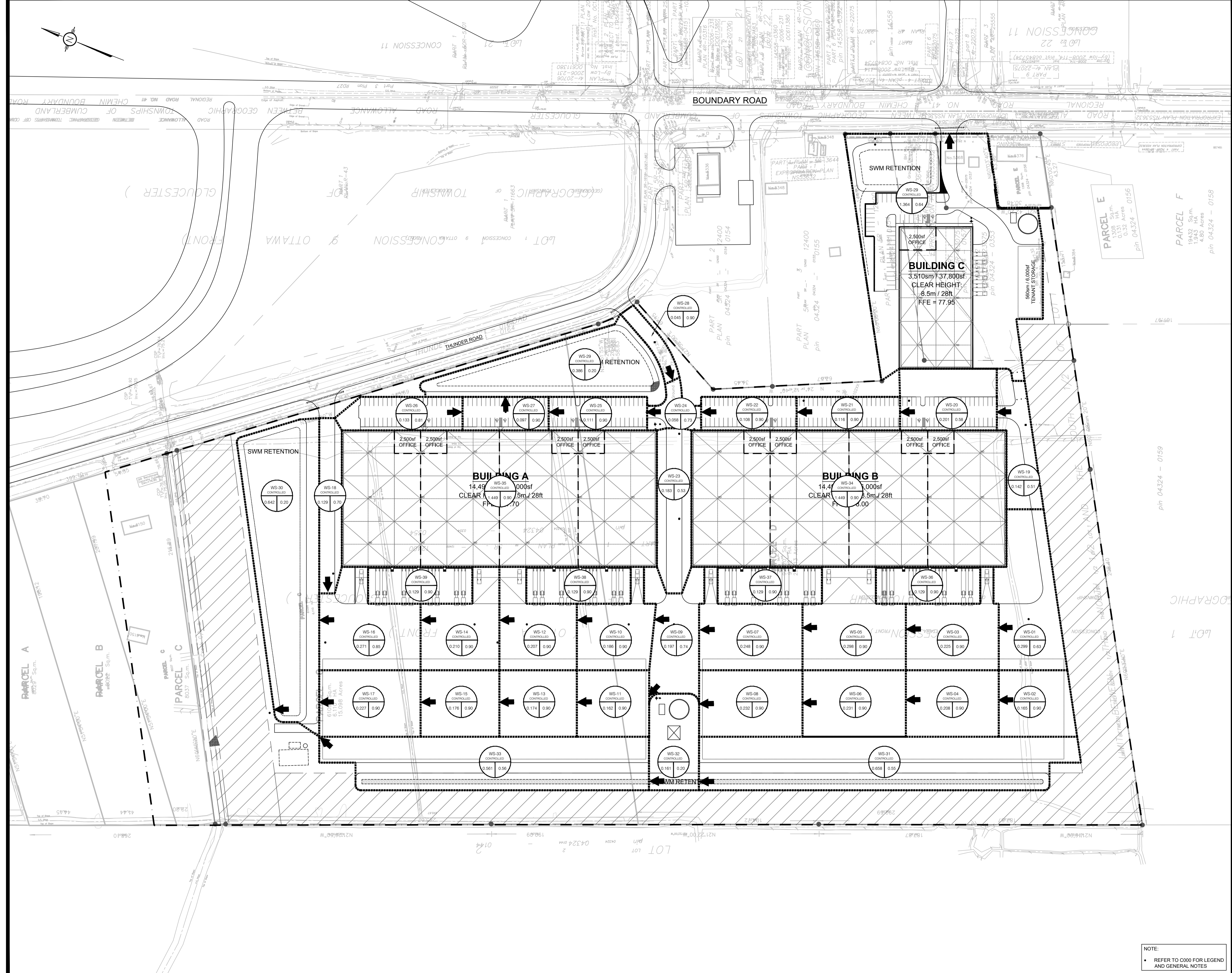
PROJECT: INDUSTRIAL PARK
6160 THUNDER RD
OTTAWA, ON

DRAWING TITLE: PRE-DEVELOPMENT
WATERSHED PLAN

PROJECT NO: 200578
DATE: NOVEMBER 2020

NOTE:
REFER TO C000 FOR LEGEND AND GENERAL NOTES

C701



USE AND INTERPRETATION OF DRAWINGS

GENERAL CONDITIONS OF THE CONTRACT FOR CONSTRUCTION ARE PART OF THE CONTRACT DOCUMENTS AND DESCRIBE USE AND INTENT OF THE DRAWING. THE CONTRACTOR CONFIRMS THAT HE HAS VISITED THE SITE, FAMILIARIZED HIMSELF WITH THE LOCAL CONDITIONS, VERIFIED FIELD DIMENSIONS AND CORRELATED HIS OBSERVATIONS WITH THE REQUIREMENTS OF THE CONTRACT DOCUMENTS.

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CONTRACTOR TO VERIFY ALL DIMENSIONS AND NOTIFY THE ENGINEER OF ANY DISCREPANCIES BEFORE WORK COMMENCES. DO NOT SCALE DRAWINGS.

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SCALE: 1:1000

No.	REVISIONS	BY	DATE
02	ISSUED FOR APPROVAL	V.J.	24 MAY 2023
01	ISSUED FOR APPROVAL	V.J.	25 NOV 2021

LRL
LICENSED PROFESSIONAL ENGINEER
V. JOHNSON
100510576
05-24-2023
PROVINCE OF ONTARIO

NOT AUTHENTIC UNLESS SIGNED AND DATED

LRL
ENGINEERING | INGENIERIE
5430 Canotek Road | Ottawa, ON, K1J 9G2
www.lrl.ca | (613) 842-3434

CLIENT: AVENUE 31

DESIGNED BY: V.J. DRAWN BY: M.L. APPROVED BY: V.J.

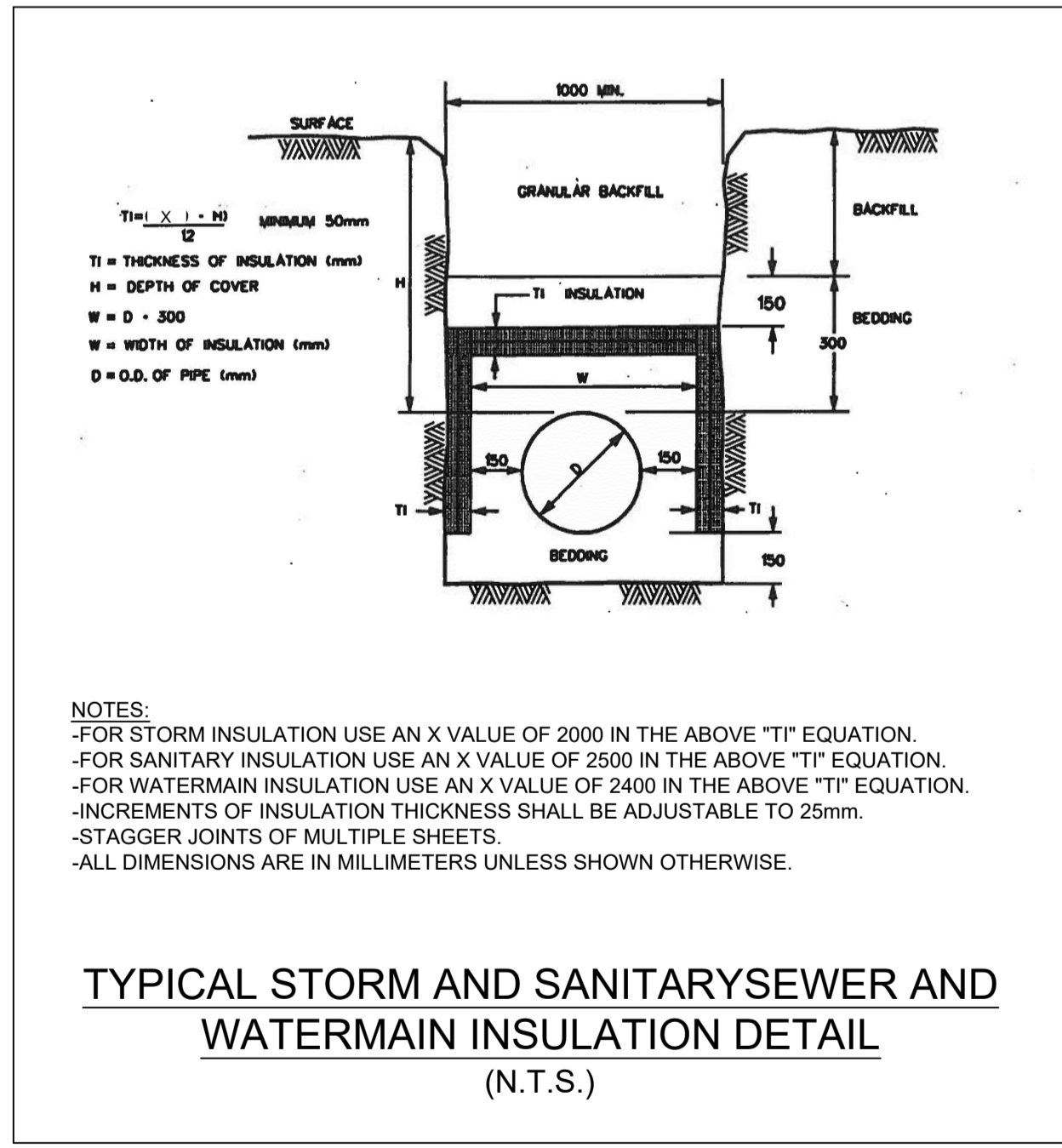
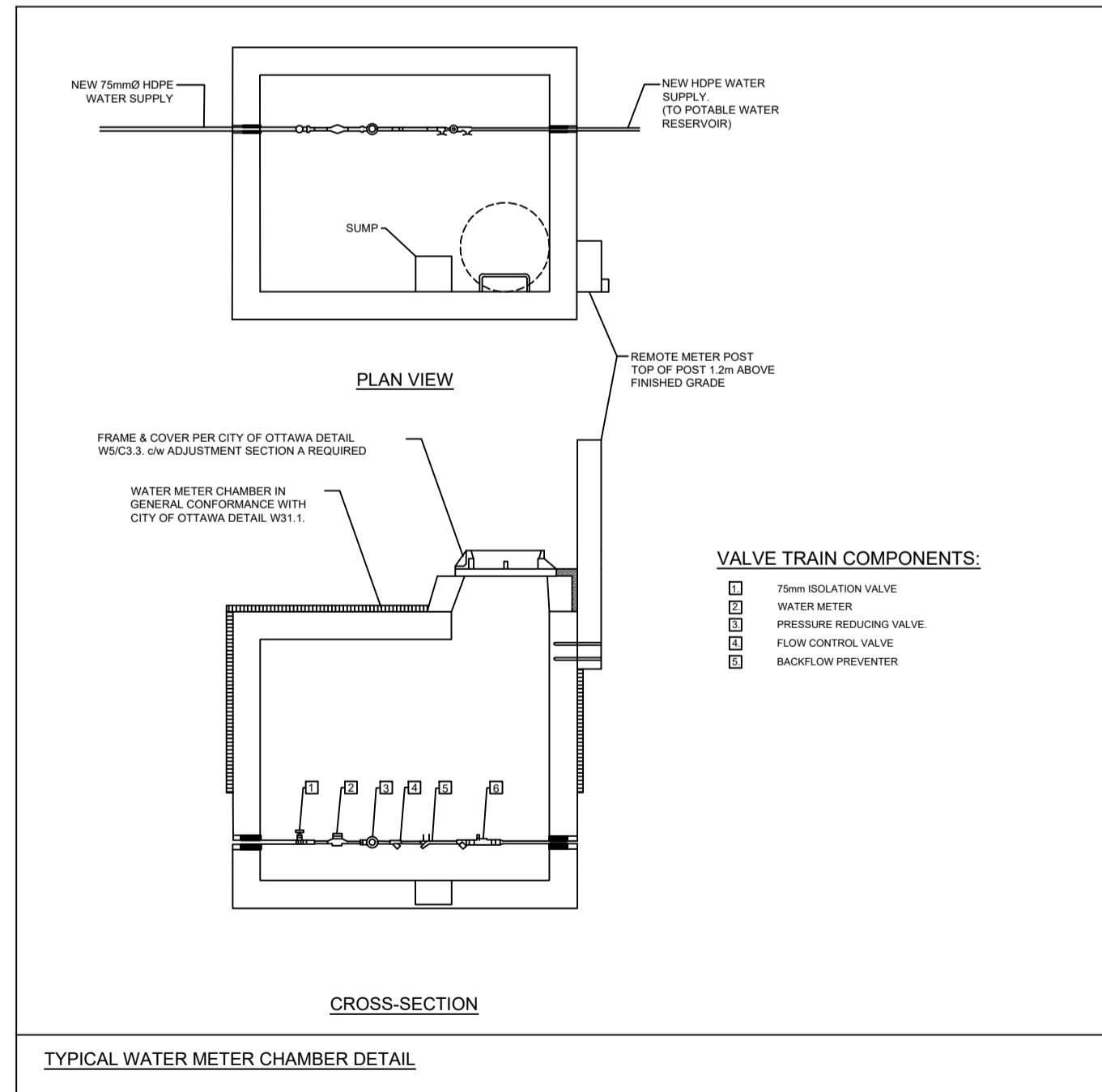
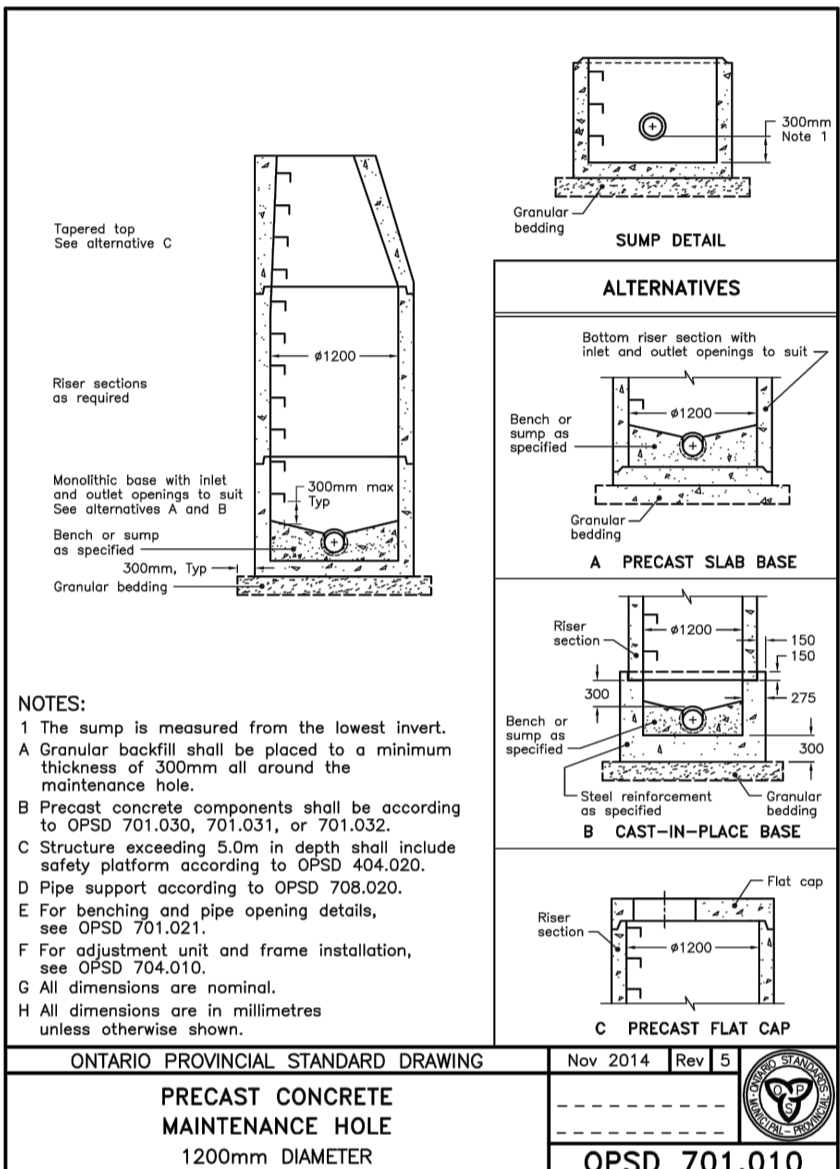
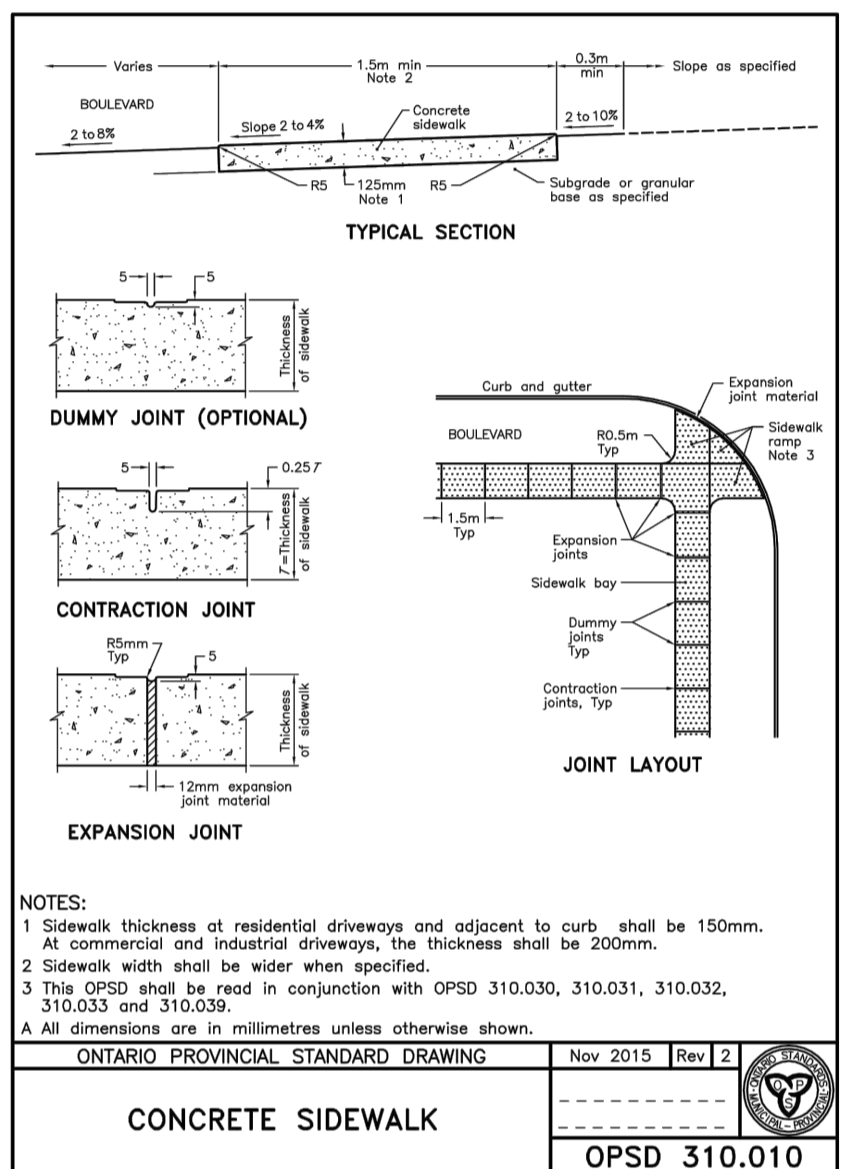
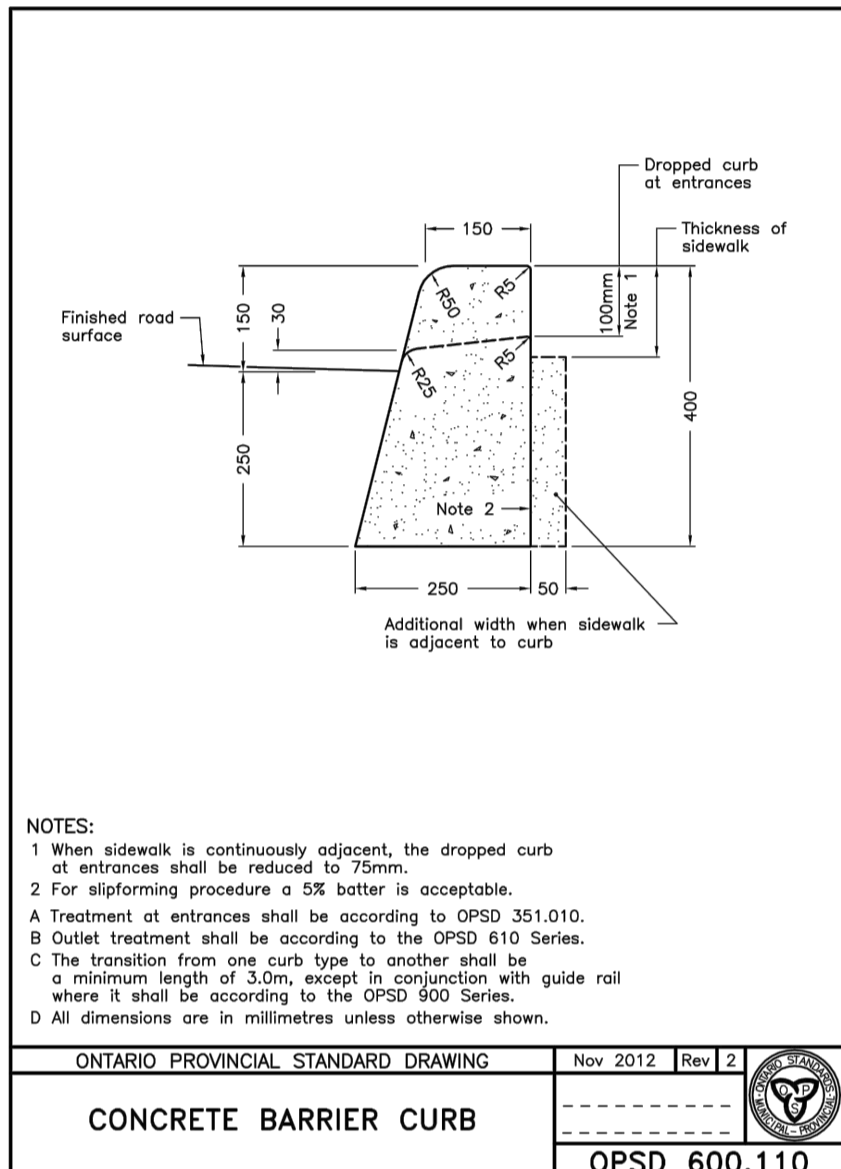
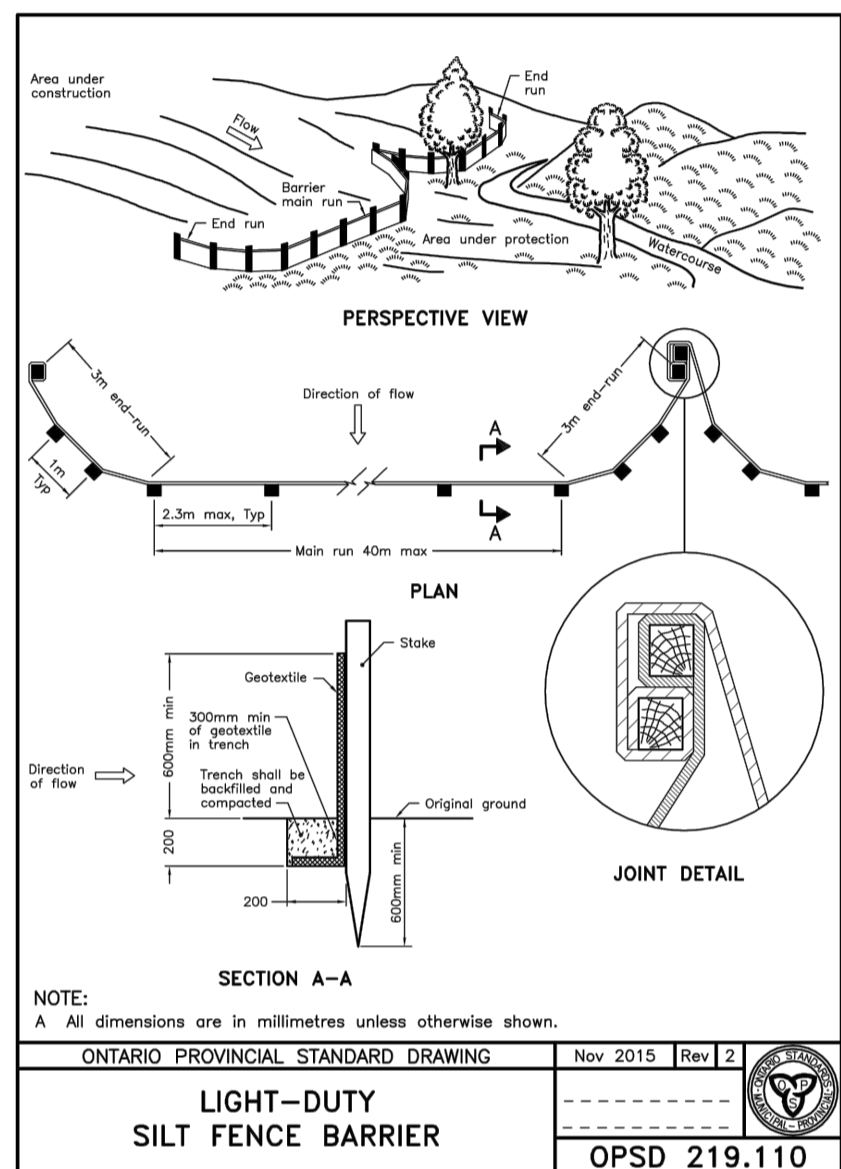
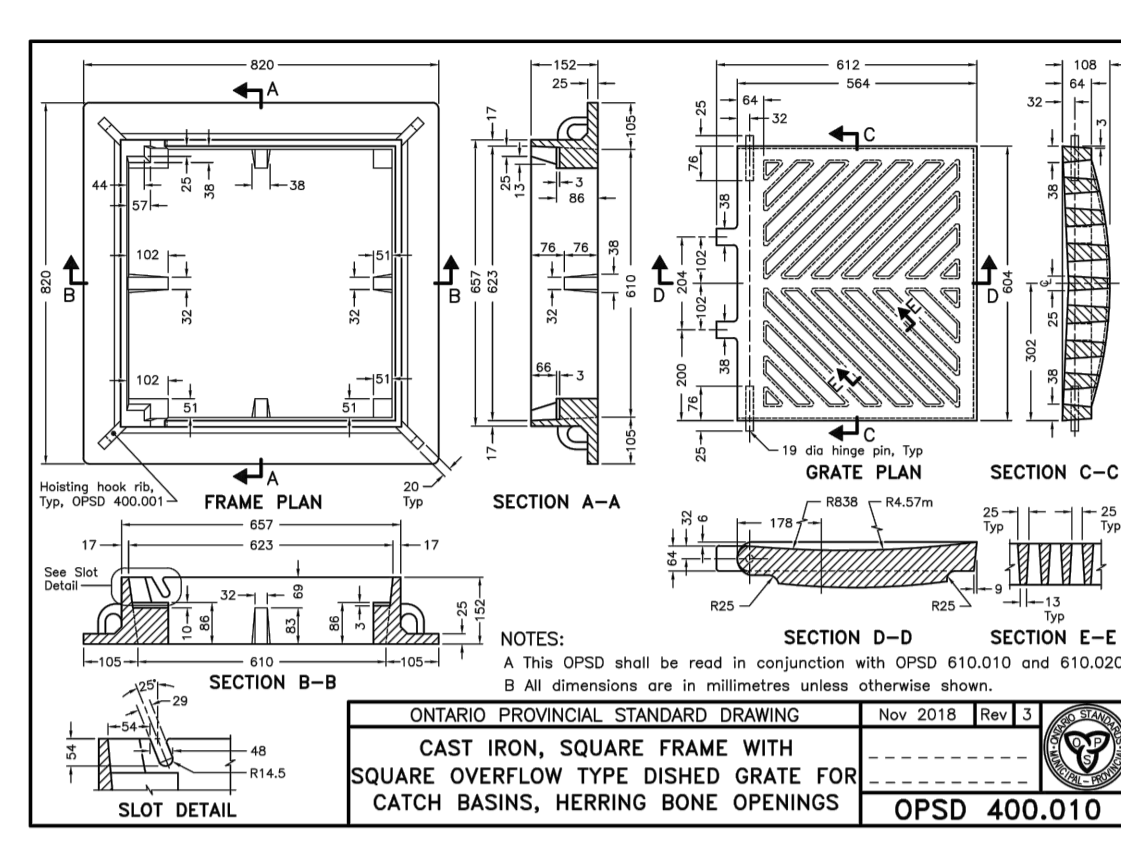
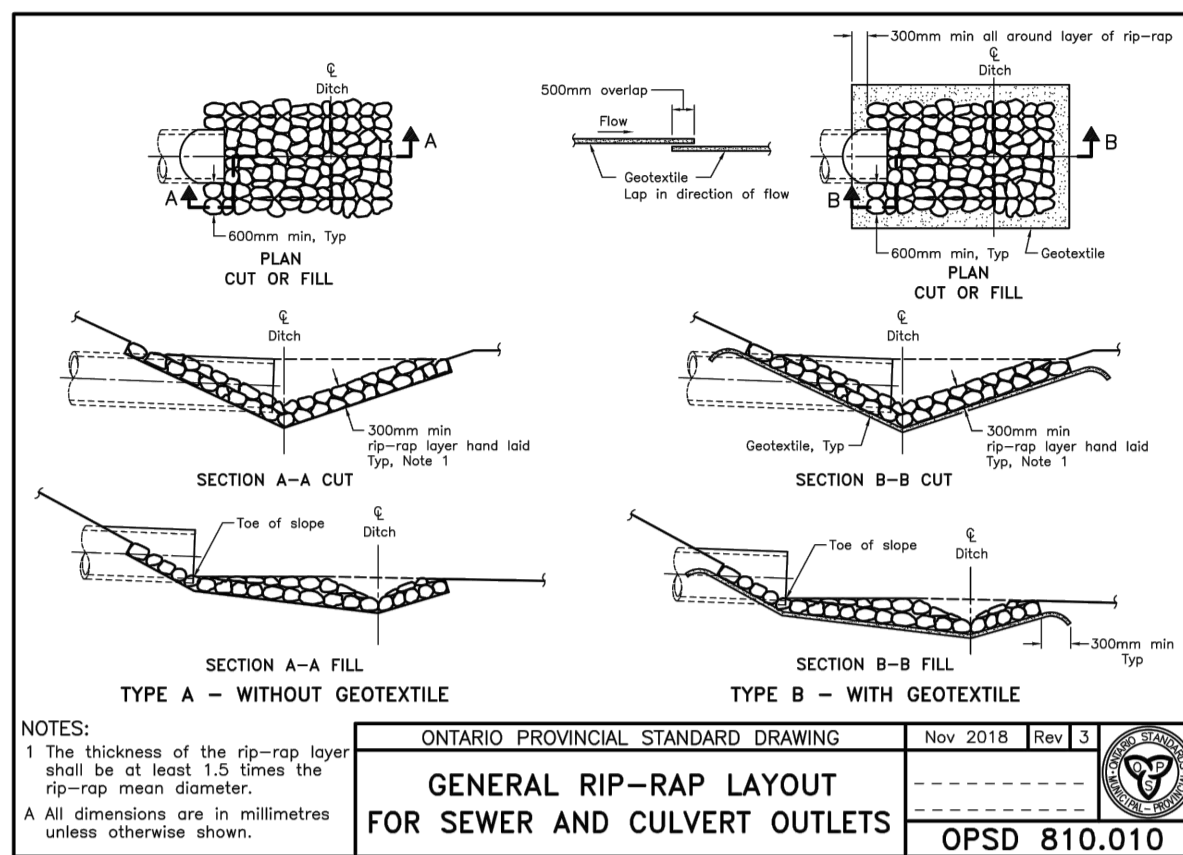
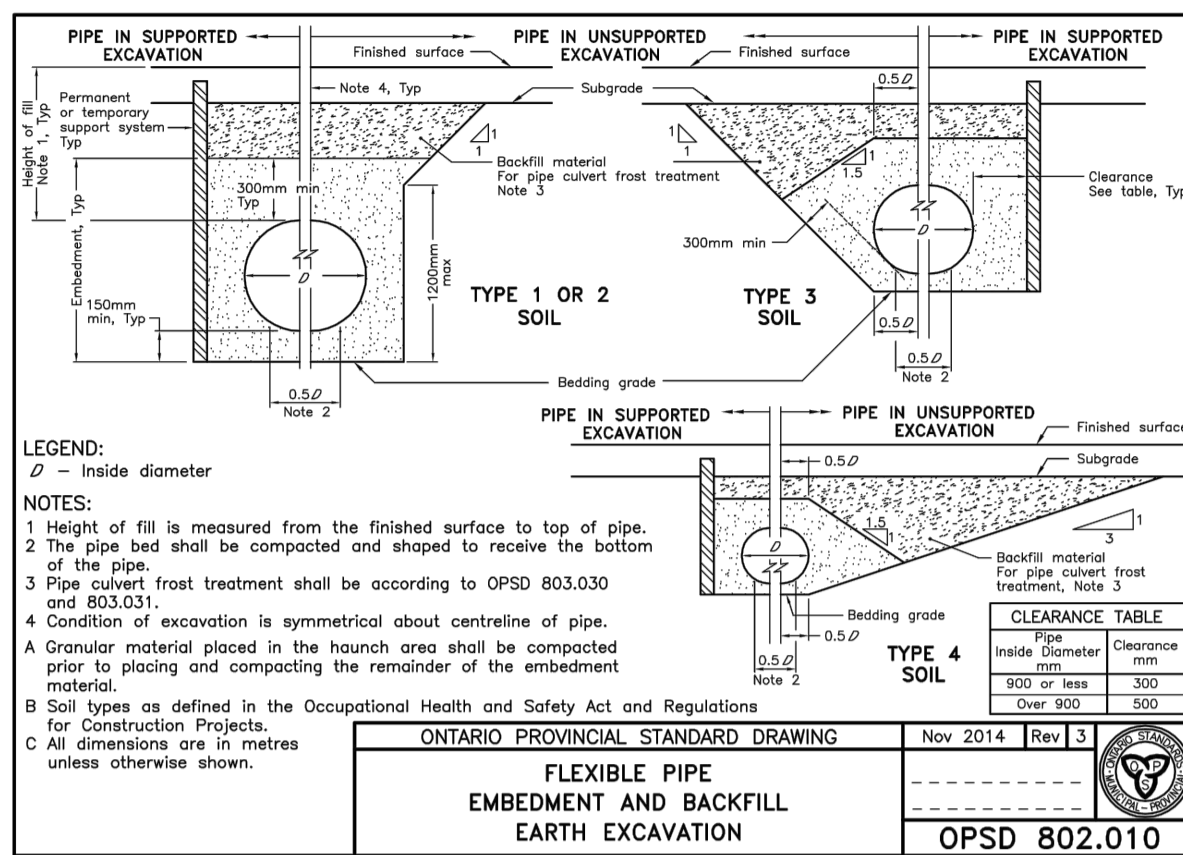
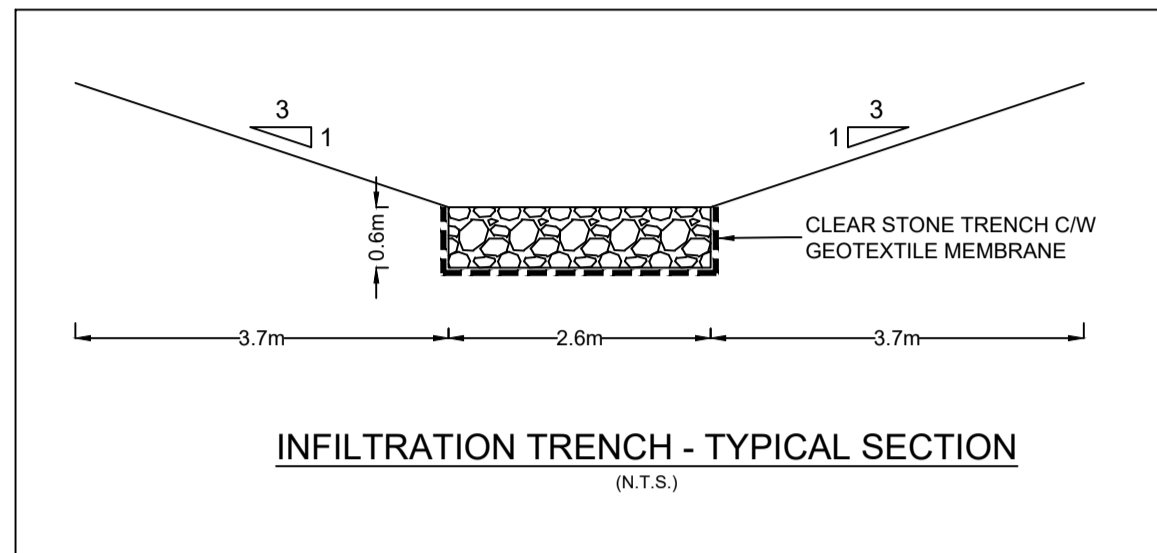
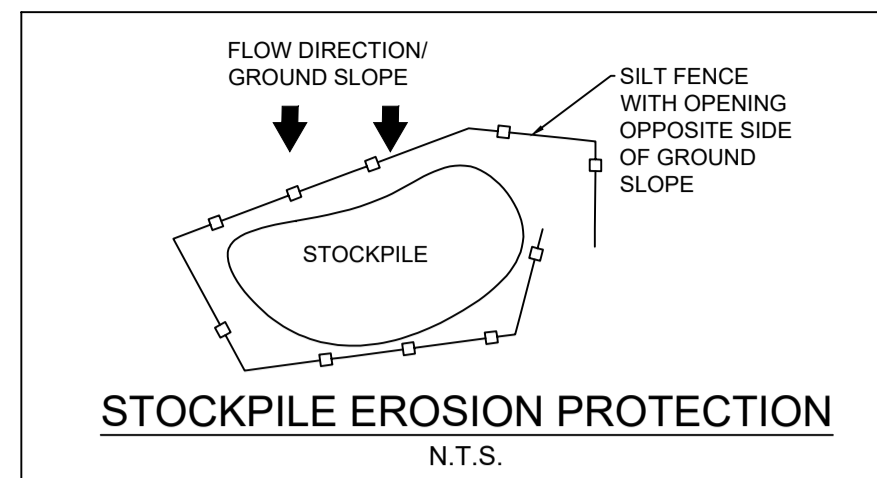
PROJECT: INDUSTRIAL PARK
6160 THUNDER RD
OTTAWA, ON

DRAWING TITLE: POST-DEVELOPMENT
WATERSHED PLAN

PROJECT NO: 200578
DATE: NOVEMBER 2020

NOTE:
REFER TO C000 FOR LEGEND AND GENERAL NOTES

C702



USE AND INTERPRETATION OF DRAWINGS

GENERAL CONDITIONS OF THE CONTRACT FOR CONSTRUCTION ARE PART OF THE CONTRACT DOCUMENTS AND DESCRIBE THE USE AND INTENT OF THE DRAWING. THE CONTRACT DOCUMENTS INCLUDE NOT ONLY THE DRAWINGS, BUT ALSO THE OWNER-CONTRACTOR AGREEMENTS, CONDITIONS OF THE CONTRACT, THE SPECIFICATIONS, ADDENDA, AND MODIFICATIONS ISSUED AFTER EXECUTION OF THE CONTRACT. THESE CONTRACT DOCUMENTS ARE COMPLEMENTARY, AND WHAT IS REQUIRED BY ANY ONE SHALL BE BINDING AS REQUIRED BY ALL. WORK NOT COMPLETELY DELINEATED HEREON SHALL BE CONSTRUCTED OF THE SAME MATERIALS AND DETAILED SIMILARLY AS WORK SHOWN MORE COMPLETELY ELSEWHERE IN THE CONTRACT DOCUMENTS.

BY USE OF THE DRAWINGS FOR CONSTRUCTION OF THE PROJECT, THE OWNER CONFIRMS THAT HE HAS REVIEWED AND APPROVED THE DRAWINGS. THE CONTRACTOR CONFIRMS THAT HE HAS VISITED THE SITE, FAMILIARIZED HIMSELF WITH THE LOCAL CONDITIONS, VERIFIED FIELD DIMENSIONS AND CORRELATED HIS OBSERVATIONS WITH THE REQUIREMENTS OF THE CONTRACT DOCUMENTS.

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CLIENT: AVENUE 31

DESIGNED BY: V.J. DRAWN BY: M.L. APPROVED BY: V.J.

PROJECT: INDUSTRIAL PARK
6160 THUNDER RD
OTTAWA, ON

DRAWING TITLE: CONSTRUCTION DETAIL PLAN

PROJECT NO: 200578
DATE: NOVEMBER 2020

C901

APPENDIX F

Stormwater Management Details

(Storm Sewer Design Sheet, OGS, Pump Selection)



LRL Associates Ltd.
Storm Design Sheet



LRL File No. 200578
Project: Thunder Development
Location: Boundary Rd, Ottawa (ON)
Date: May 23, 2023
Designed: M. Longtin
Checked: V. Johnson
Drawing Reference: C.401

Storm Design Parameters

Rational Method **Runoff Coefficient (C)** Ottawa Macdonald-Cartier International Airport IDF curve
 $Q = 2.78CIA$ Grass 0.2 Equation (5 year event, intensity in mm/hr)
 $Q = \text{Peak flow (L/s)}$ Gravel 0.80 $I = 998.071 / (Td + 6.053)^{0.814}$
 $A = \text{Drainage area (ha)}$ Asphalt / rooftop 0.90
 $C = \text{Runoff coefficient}$ Manning's "n" = 0.013
 $I = \text{Rainfall intensity (mm/hr)}$

LOCATION			AREA (ha)			FLOW					STORM SEWER							
WATERSHED / STREET	From MH	To MH	C = 0.20	C = 0.80	C = 0.90	Indiv. 2.78AC	Accum. 2.78AC	Time of Conc. (min.)	Rainfall Intensity (mm/hr)	Peak Flow Q (L/s)	Pipe Diameter (mm)	Type	Slope (%)	Length (m)	Capacity Full (L/s)	Velocity Full (m/s)	Time of Flow (min.)	Ratio (Q/Q _{FULL})
WS-01	CBMH01	CBMH02	0.115	0.000	0.184	0.52	0.52	10.00	104.19	54.67	450	Concrete	0.25%	48.9	142.6	0.90	0.91	0.38
WS-02	CBMH02	OUTLET	0.000	0.000	0.165	0.41	0.41	10.91	99.62	95.70	450	Concrete	0.25%	44.1	142.6	0.90	0.82	0.67
WS-03	CBMH03	CBMH04	0.000	0.000	0.225	0.56	0.56	10.00	104.19	58.53	375	Concrete	0.25%	40.4	87.7	0.79	0.85	0.67
WS-04	CBMH04	OUTLET	0.000	0.000	0.208	0.52	0.52	10.85	99.92	110.52	450	Concrete	0.25%	43.9	142.6	0.90	0.82	0.78
WS-34	ROOF	CBMH05	0.000	0.000	1.449	3.63	3.63	10.00	104.19	377.82	600	Concrete	2.00%	40.4	868.3	3.07	0.22	0.44
WS-05	CBMH05	CBMH06	0.000	0.000	0.298	0.75	0.75	10.00	104.19	455.56	750	Concrete	0.25%	40.4	556.6	1.26	0.53	0.82
WS-06	CBMH06	OUTLET	0.000	0.000	0.231	0.58	0.58	10.53	101.45	514.29	825	Concrete	0.20%	43.9	641.9	1.20	0.61	0.80
WS-07	CBMH07	CBMH08	0.000	0.000	0.248	0.62	0.62	10.00	104.19	64.65	375	Concrete	0.25%	40.4	87.7	0.79	0.85	0.74
WS-08	CBMH08	OUTLET	0.000	0.000	0.232	0.58	0.58	10.85	99.92	122.52	450	Concrete	0.25%	43.9	142.6	0.90	0.82	0.86
WS-09	CBMH09	CBMH10	0.046	0.000	0.152	0.41	0.41	10.00	104.19	42.21	375	Concrete	0.25%	40.4	87.7	0.79	0.85	0.48
WS-10	CBMH10	CBMH11	0.000	0.000	0.186	0.47	0.47	10.85	99.92	88.76	450	Concrete	0.25%	43.9	142.6	0.90	0.82	0.62
WS-11	CBMH11	CBMH12	0.000	0.000	0.162	0.41	0.41	11.66	96.15	127.74	450	Concrete	0.25%	43.9	142.6	0.90	0.82	0.90
WS-12	CBMH12	CBMH13	0.000	0.000	0.207	0.52	0.52	10.00	104.19	53.94	375	Concrete	0.25%	45.9	87.7	0.79	0.96	0.62
WS-13	CBMH13	OUTLET	0.000	0.000	0.174	0.43	0.43	10.96	99.36	97.07	450	Concrete	0.25%	44.1	142.6	0.90	0.82	0.68
WS-35	ROOF	CBMH14	0.000	0.000	1.449	3.63	3.63	10.00	104.19	377.82	600	Concrete	2.00%	40.4	868.3	3.07	0.22	0.44
WS-14	CBMH14	CBMH15	0.000	0.000	0.210	0.52	0.52	10.00	104.19	432.49	750	Concrete	0.20%	45.9	497.9	1.13	0.68	0.87
WS-15	CBMH15	OUTLET	0.000	0.000	0.176	0.44	0.44	10.68	100.74	476.92	750	Concrete	0.20%	43.9	497.9	1.13	0.65	0.96
WS-16	CBMH16	CBMH17	0.021	0.000	0.249	0.64	0.64	10.00	104.19	66.22	375	Concrete	0.25%	45.9	87.7	0.79	0.96	0.76
WS-17	CBMH17	OUTLET	0.000	0.000	0.227	0.57	0.57	10.96	99.36	122.63	450	Concrete	0.25%	44.1	142.6	0.90	0.82	0.86

LRL Associates Ltd.
Storm Design Sheet



LRL File No. 200578
Project: Thunder Development
Location: Boundary Rd, Ottawa (ON)
Date: May 23, 2023
Designed: M. Longtin
Checked: V. Johnson
Drawing Reference: C.401

Storm Design Parameters

<u>Rational Method</u>	<u>Runoff Coefficient (C)</u>	Ottawa Macdonald-Cartier International Airport IDF curve
Q = 2.78CIA	Grass 0.2	Equation (5 year event, intensity in mm/hr)
Q = Peak flow (L/s)	Gravel 0.80	$I=998.071 / (Td + 6.053)^{0.814}$
A = Drainage area (ha)	Asphalt / rooftop 0.90	
C = Runoff coefficient		Manning's "n" = 0.013
I = Rainfall intensity (mm/hr)		

WS	From	To	C	S	L	Q	Q	Q	Q	Q	Q	Q	Q	Q	Q	Q	Q	Q
WS-18	CBMH18	OUTLET	0.037	0.000	0.092	0.25	0.25	10.00	104.19	26.00	375	Concrete	0.25%	15.6	87.7	0.79	0.33	0.30
WS-19	CBMH19	CBMH20	0.079	0.000	0.063	0.20	0.20	10.00	104.19	20.93	375	Concrete	0.25%	43.6	87.7	0.79	0.92	0.24
WS-20	CBMH20	CBMH21	0.093	0.000	0.108	0.32	0.32	10.92	99.59	52.96	450	Concrete	0.25%	60.0	142.6	0.90	1.12	0.37
WS-21	CBMH21	CBMH22	0.000	0.000	0.116	0.29	0.29	12.03	94.56	80.50	525	Concrete	0.20%	60.0	192.3	0.89	1.13	0.42
WS-22	CBMH22	CBMH24	0.000	0.000	0.108	0.27	0.27	13.16	90.03	104.72	525	Concrete	0.20%	41.2	192.3	0.89	0.77	0.54
WS-23	CBMH23	CBMH24	0.096	0.000	0.086	0.27	0.27	10.00	104.19	28.05	300	Concrete	0.40%	50.3	61.2	0.87	0.97	0.46
WS-24	CBMH24	OUTLET	0.014	0.000	0.044	0.12	0.12	14.90	83.89	142.62	525	Concrete	0.20%	19.8	192.3	0.89	0.37	0.74
WS-25	CBMH25	CBMH27	0.000	0.000	0.111	0.28	0.28	10.00	104.19	28.91	375	Concrete	0.25%	50.0	87.7	0.79	1.05	0.33
WS-26	CBMH26	CBMH27	0.018	0.000	0.116	0.30	0.30	11.05	98.96	29.57	375	Concrete	0.25%	51.5	87.7	0.79	1.08	0.34
WS-27	CBMH27	OUTLET	0.000	0.000	0.097	0.24	0.24	12.13	94.14	81.33	450	Concrete	0.20%	60.0	127.5	0.80	1.25	0.64
WS-36	MH28	MH29	0.000	0.000	0.129	0.32	0.32	10.00	104.19	33.68	375	Concrete	0.30%	93.5	96.0	0.87	1.79	0.35
WS-37	MH29	MH30	0.000	0.000	0.129	0.32	0.32	11.79	95.59	64.58	375	Concrete	0.30%	105.2	96.0	0.87	2.02	0.67
WS-38	MH30	MH31	0.000	0.000	0.129	0.32	0.32	13.81	87.61	92.90	450	Concrete	0.25%	94.1	142.6	0.90	1.75	0.65
WS-39	MH31	MH32	0.000	0.000	0.129	0.32	0.32	15.56	81.80	119.35	450	Concrete	0.25%	94.1	142.6	0.90	1.75	0.84

Detailed Stormceptor Sizing Report – WS-1-39

Project Information & Location			
Project Name	6160 Thunder Rd.	Project Number	200578
City	Ottawa	State/ Province	Ontario
Country	Canada	Date	5/17/2023
Designer Information		EOR Information (optional)	
Name	Brandon O'Leary	Name	Virginia Johnson
Company	Forterra	Company	LRL Associates Ltd.
Phone #	905-630-0359	Phone #	613-915-9503
Email	brandon.oleary@forterrabp.com	Email	vjohnson@lrl.ca

Stormwater Treatment Recommendation

The recommended Stormceptor Model(s) which achieve or exceed the user defined water quality objective for each site within the project are listed in the below Sizing Summary table.

Site Name	WS-1-39
Recommended Stormceptor Model	EFO6
TSS Removal (%) Provided	80
Particle Size Distribution (PSD)	Fine Distribution
Rainfall Station	OTTAWA MACDONALD-CARTIER INT'L A

The recommended Stormceptor model achieves the water quality objectives based on the selected inputs, historical rainfall records and selected particle size distribution.

EFO Sizing Summary			
EFO Model	% TSS Removal Provided	% Runoff Volume Captured Provided	Standard EFO Hydrocarbon Storage Capacity
EFO4	67	78	265 L (70 gal)
EFO6	80	94	610 L (160 gal)
EFO8	85	98	1070 L (280 gal)
EFO10	89	99	1670 L (440 gal)
EFO12	91	99	2475 L (655 gal)
Parallel Units / MAX	Custom	Custom	Custom

For Stormceptor Specifications and Drawings Please Visit:
<http://www.imbriumsystems.com/technical-specifications>

OVERVIEW

Stormceptor® EF is a continuation and evolution of the most globally recognized oil-grit separator (OGS) stormwater treatment technology - **Stormceptor®**. Also known as a hydrodynamic separator, the enhanced flow Stormceptor EF is a high performing oil-grit separator that effectively removes a wide variety of pollutants from stormwater and snowmelt runoff at higher flow rates as compared to the original Stormceptor. Stormceptor EF captures and retains sediment (TSS), free oils, gross pollutants and other pollutants that attach to particles, such as nutrients and metals. Stormceptor EF's patent-pending treatment and scour prevention technology and internal bypass ensures sediment is retained during all rainfall events.

Design Methodology

Stormceptor is sized using PCSWMM for Stormceptor, a continuous simulation model based on US EPA SWMM. The program calculates hydrology using local historical rainfall data and specified site parameters. With US EPA SWMM's precision, every Stormceptor unit is designed to achieve a defined water quality objective. The TSS removal data presented follows US EPA guidelines to reduce the average annual TSS load. The Stormceptor's unit process for TSS removal is settling. The settling model calculates TSS removal by analyzing:

- Site parameters
- Continuous historical rainfall data, including duration, distribution, peaks & inter-event dry periods
- Particle size distribution, and associated settling velocities (Stokes Law, corrected for drag)
- TSS load
- Detention time of the system

Hydrology Analysis

PCSWMM for Stormceptor calculates annual hydrology with the US EPA SWMM and local continuous historical rainfall data. Performance calculations of Stormceptor are based on the average annual removal of TSS for the selected site parameters. The Stormceptor is engineered to capture sediment particles by treating the required average annual runoff volume, ensuring positive removal efficiency is maintained during each rainfall event, and preventing negative removal efficiency (scour). Smaller recurring storms account for the majority of rainfall events and average annual runoff volume, as observed in the historical rainfall data analyses presented in this section.

Rainfall Station

State/Province	Ontario	Total Number of Rainfall Events	4093
Rainfall Station Name	OTTAWA MACDONALD-CARTIER INT'L A	Total Rainfall (mm)	20978.1
Station ID #	6000	Average Annual Rainfall (mm)	567.0
Coordinates	45°19'N, 75°40'W	Total Evaporation (mm)	1822.0
Elevation (ft)	370	Total Infiltration (mm)	4187.5
Years of Rainfall Data	37	Total Rainfall that is Runoff (mm)	14968.6

Notes

- Stormceptor performance estimates are based on simulations using PCSWMM for Stormceptor, which uses the EPA Rainfall and Runoff modules.
- Design estimates listed are only representative of specific project requirements based on total suspended solids (TSS) removal defined by the selected PSD, and based on stable site conditions only, after construction is completed.
- For submerged applications or sites specific to spill control, please contact your local Stormceptor representative for further design assistance.

ONLINE APPLICATION

Stormceptor EF's internal bypass and patent-pending scour prevention technology has demonstrated very effective retention of pollutants in third-party testing and verification following the Canadian ETV's **Procedure for Laboratory Testing of Oil-Grit Separators**. Sediment scour prevention demonstrated an effluent concentration of less than 10 mg/L for sediment particles ranging from 1 to 1,000 microns, even during peak influent flow rates associated with infrequent high intensity storm events. While Stormceptor EF will capture oil, only the Stormceptor EFO configuration has been third-party tested and verified to retain greater than 99% of captured oil. Based on these verified performance attributes, the most efficient and widely accepted application of Stormceptor EF is an online configuration, which allows all upstream conveyance flows to enter and exit the unit. The online application eliminates the need for costly additional bypass structures, piping and installation expense.

FLOW ENTRANCE OPTIONS

Single Inlet Pipe – A common design which includes one inlet pipe and one outlet pipe. A 90-degree (maximum) bend is also accepted with this configuration.

Inlet Grate – Allows surface runoff to enter the unit from grade. The inlet grate option can also be used in conjunction with one inlet pipe or multiple inlet pipes. A removable flow deflector is added in the Stormceptor EF4/EFO4.

Maximum Pipe Diameter		
Model	Inlet (in/mm)	Outlet (in/mm)
EF4 / EFO4	24 / 610	24 / 610
EF6 / EFO6	36 / 915	36 / 915
EF8 / EFO8	48 / 1220	48 / 1220
EF10 / EFO10	72 / 1828	72 / 1828
EF12 / EFO12	72 / 1828	72 / 1828

Multiple Inlet Pipe – Allows for multiple inlet pipes of various diameters to enter the unit.

Maximum Pipe Diameter		
Model	Inlet (in/mm)	Outlet (in/mm)
EF4 / EFO4	18 / 457	24 / 610
EF6 / EFO6	30 / 762	36 / 915
EF8 / EFO8	42 / 1067	48 / 1220
EF10 / EFO10	60 / 1524	72 / 1828
EF12 / EFO12	60 / 1524	72 / 1828

Drainage Area		Up Stream Storage	
Total Area (ha)	10.861	Storage (ha-m)	Discharge (cms)
Imperviousness %	80.00	0.0000	0.000
		0.2499	0.039
		0.3265	0.080
		0.5433	0.239

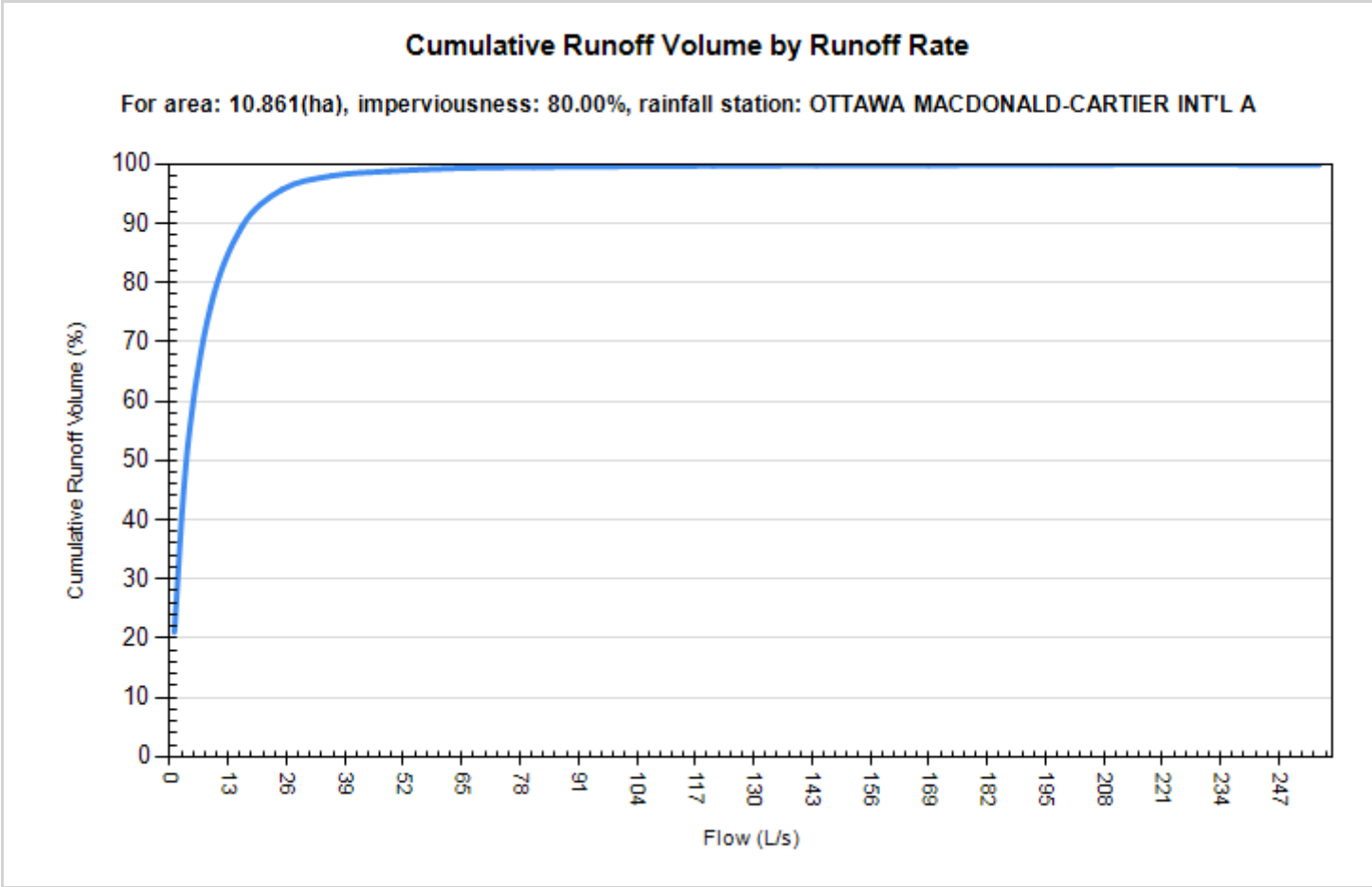
Up Stream Flow Diversion		Design Details	
Max. Flow to Stormceptor (cms)		Stormceptor Inlet Invert Elev (m)	
		Stormceptor Outlet Invert Elev (m)	
		Stormceptor Rim Elev (m)	
		Normal Water Level Elevation (m)	
		Pipe Diameter (mm)	
		Pipe Material	
		Multiple Inlets (Y/N)	No
		Grate Inlet (Y/N)	No

Water Quality Objective	
TSS Removal (%)	80.0
Runoff Volume Capture (%)	90.00
Oil Spill Capture Volume (L)	
Peak Conveyed Flow Rate (L/s)	239
Water Quality Flow Rate (L/s)	39

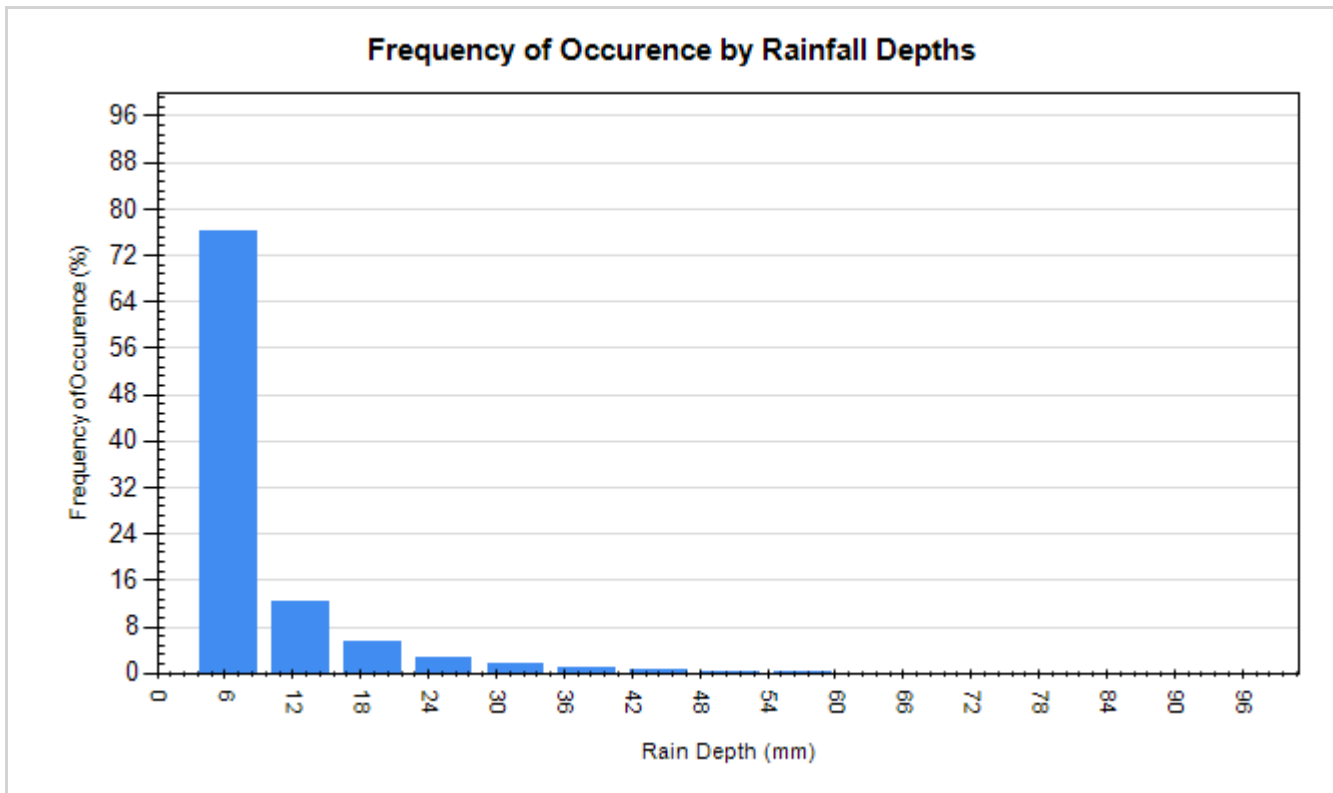
Particle Size Distribution (PSD)		
Removing the smallest fraction of particulates from runoff ensures the majority of pollutants, such as metals, hydrocarbons and nutrients are captured. The table below identifies the Particle Size Distribution (PSD) that was selected to define TSS removal for the Stormceptor design.		
Fine Distribution		
Particle Diameter (microns)	Distribution %	Specific Gravity
20.0	20.0	1.30
60.0	20.0	1.80
150.0	20.0	2.20
400.0	20.0	2.65
2000.0	20.0	2.65

Site Name		WS-1-39	
Site Details			
Drainage Area		Infiltration Parameters	
Total Area (ha)	10.861	Horton's equation is used to estimate infiltration	
Imperviousness %	80	Max. Infiltration Rate (mm/hr)	61.98
Oil Spill Capture Volume (L)		Min. Infiltration Rate (mm/hr)	10.16
		Decay Rate (1/sec)	0.00055
		Regeneration Rate (1/sec)	0.01
Surface Characteristics		Evaporation	
Width (m)	659.00	Daily Evaporation Rate (mm/day)	2.54
Slope %	2	Dry Weather Flow	
Impervious Depression Storage (mm)	0.508	Dry Weather Flow (L/s)	0
Pervious Depression Storage (mm)	5.08		
Impervious Manning's n	0.015		
Pervious Manning's n	0.25		
Maintenance Frequency		Winter Months	
Maintenance Frequency (months) >	12	Winter Infiltration	0
TSS Loading Parameters			
TSS Loading Function		Build Up/ Wash-off	
Buildup/Wash-off Parameters		TSS Availability Parameters	
Target Event Mean Conc. (EMC) mg/L	125	Availability Constant A	0.057
Exponential Buildup Power	0.40	Availability Factor B	0.04
Exponential Washoff Exponent	0.20	Availability Exponent C	1.10
		Min. Particle Size Affected by Availability (micron)	400

Cumulative Runoff Volume by Runoff Rate			
Runoff Rate (L/s)	Runoff Volume (m ³)	Volume Over (m ³)	Cumulative Runoff Volume (%)
1	341997	1289593	21.0
4	854220	780742	52.5
9	1232799	395339	75.7
16	1455688	174132	89.4
25	1558067	70528	95.7
36	1596060	32198	98.0
49	1608755	19552	98.8
64	1616150	12083	99.3
81	1620412	7814	99.5
100	1622457	5754	99.6
121	1623818	4403	99.7
144	1624818	3383	99.8
169	1625454	2740	99.8
196	1625962	2225	99.9
225	1626354	1833	99.9
256	1626664	1521	99.9



Rainfall Event Analysis				
Rainfall Depth (mm)	No. of Events	Percentage of Total Events (%)	Total Volume (mm)	Percentage of Annual Volume (%)
6.35	3113	76.1	5230	24.9
12.70	501	12.2	4497	21.4
19.05	225	5.5	3469	16.5
25.40	105	2.6	2317	11.0
31.75	62	1.5	1765	8.4
38.10	35	0.9	1206	5.8
44.45	28	0.7	1163	5.5
50.80	12	0.3	557	2.7
57.15	7	0.2	378	1.8
63.50	1	0.0	63	0.3
69.85	1	0.0	64	0.3
76.20	1	0.0	76	0.4
82.55	0	0.0	0	0.0
88.90	1	0.0	84	0.4
95.25	0	0.0	0	0.0
101.60	0	0.0	0	0.0



Stormceptor® EF Sizing Report

STORMCEPTOR®		ESTIMATED NET ANNUAL SEDIMENT (TSS) LOAD REDUCTION		05/23/2023														
Province:	Ontario	Project Name:	6160 Thunder Rd.															
City:	Ottawa	Project Number:	200578															
Nearest Rainfall Station:	OTTAWA CDA RCS	Designer Name:	Brandon O'Leary															
Climate Station Id:	6105978	Designer Company:	Forterra															
Years of Rainfall Data:	20	Designer Email:	brandon.oleary@forterrabp.com															
Site Name:	WS-40	Designer Phone:	905-630-0359															
Drainage Area (ha):	1.364	EOR Name:	Virginia Johnson															
Runoff Coefficient 'c':	0.64	EOR Company:	LRL Associates Ltd.															
Particle Size Distribution:	Fine	EOR Email:	vjohnson@lrl.ca															
Target TSS Removal (%):	80.0	EOR Phone:	613-915-9503															
Required Water Quality Runoff Volume Capture (%):	90.0	<table border="1" style="width: 100%; border-collapse: collapse;"> <thead> <tr> <th colspan="2" style="text-align: center;">Net Annual Sediment (TSS) Load Reduction Sizing Summary</th> </tr> <tr> <th style="width: 50%;">Stormceptor Model</th> <th style="width: 50%;">TSS Removal Provided (%)</th> </tr> </thead> <tbody> <tr> <td style="text-align: center;">EFO4</td> <td style="text-align: center;">94</td> </tr> <tr> <td style="text-align: center;">EFO6</td> <td style="text-align: center;">100</td> </tr> <tr> <td style="text-align: center;">EFO8</td> <td style="text-align: center;">100</td> </tr> <tr> <td style="text-align: center;">EFO10</td> <td style="text-align: center;">100</td> </tr> <tr> <td style="text-align: center;">EFO12</td> <td style="text-align: center;">100</td> </tr> </tbody> </table>			Net Annual Sediment (TSS) Load Reduction Sizing Summary		Stormceptor Model	TSS Removal Provided (%)	EFO4	94	EFO6	100	EFO8	100	EFO10	100	EFO12	100
Net Annual Sediment (TSS) Load Reduction Sizing Summary																		
Stormceptor Model	TSS Removal Provided (%)																	
EFO4	94																	
EFO6	100																	
EFO8	100																	
EFO10	100																	
EFO12	100																	
Oil / Fuel Spill Risk Site?	Yes																	
Upstream Flow Control?	Yes																	
Upstream Orifice Control Flow Rate to Stormceptor (L/s):	4																	
Peak Conveyance (maximum) Flow Rate (L/s):	4																	
<p>Recommended Stormceptor EFO Model: EFO4</p> <p>Estimated Net Annual Sediment (TSS) Load Reduction (%): 94</p> <p>Water Quality Runoff Volume Capture (%): > 90</p>																		



Stormceptor[®] EF Sizing Report

THIRD-PARTY TESTING AND VERIFICATION

► **Stormceptor[®] EF and Stormceptor[®] EFO** are the latest evolutions in the Stormceptor[®] oil-grit separator (OGS) technology series, and are designed to remove a wide variety of pollutants from stormwater and snowmelt runoff. These technologies have been third-party tested in accordance with the Canadian ETV **Procedure for Laboratory Testing of Oil-Grit Separators** and performance has been third-party verified in accordance with the **ISO 14034 Environmental Technology Verification (ETV)** protocol.

PERFORMANCE

► **Stormceptor[®] EF and EFO** remove stormwater pollutants through gravity separation and floatation, and feature a patent-pending design that generates positive removal of total suspended solids (TSS) throughout each storm event, including high-intensity storms. Captured pollutants include sediment, free oils, and sediment-bound pollutants such as nutrients, heavy metals, and petroleum hydrocarbons. Stormceptor is sized to remove a high level of TSS from the frequent rainfall events that contribute the vast majority of annual runoff volume and pollutant load. The technology incorporates an internal bypass to convey excessive stormwater flows from high-intensity storms through the device without resuspension and washout (scour) of previously captured pollutants. Proper routine maintenance ensures high pollutant removal performance and protection of downstream waterways.

PARTICLE SIZE DISTRIBUTION (PSD)

► The **Canadian ETV PSD** shown in the table below was used, or in part, for this sizing. This is the identical PSD that is referenced in the Canadian ETV **Procedure for Laboratory Testing of Oil-Grit Separators** for both sediment removal testing and scour testing. The Canadian ETV PSD contains a wide range of particle sizes in the sand and silt fractions, and is considered reasonably representative of the particle size fractions found in typical urban stormwater runoff.

Particle Size (µm)	Percent Less Than	Particle Size Fraction (µm)	Percent
1000	100	500-1000	5
500	95	250-500	5
250	90	150-250	15
150	75	100-150	15
100	60	75-100	10
75	50	50-75	5
50	45	20-50	10
20	35	8-20	15
8	20	5-8	10
5	10	2-5	5
2	5	<2	5

Stormceptor® EF Sizing Report

Upstream Flow Controlled Results

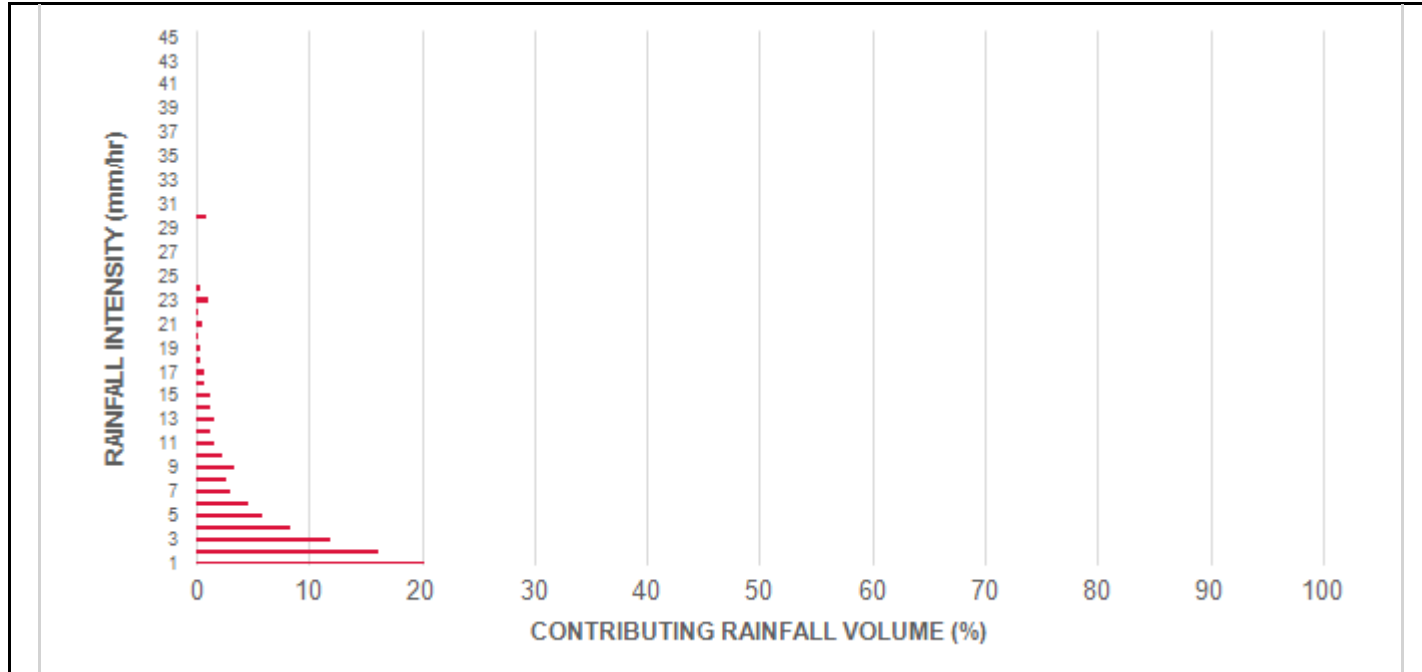
Rainfall Intensity (mm / hr)	Percent Rainfall Volume (%)	Cumulative Rainfall Volume (%)	Flow Rate (L/s)	Flow Rate (L/min)	Surface Loading Rate (L/min/m ²)	Removal Efficiency (%)	Incremental Removal (%)	Cumulative Removal (%)
0.5	8.6	8.6	1.21	73.0	61.0	100	8.6	8.6
1	91.4	100.0	2.43	146.0	121.0	93	85.3	93.9
2	0.0	100.0	4.00	240.0	200.0	83	0.0	93.9
3	0.0	100.0	4.00	240.0	200.0	83	0.0	93.9
4	0.0	100.0	4.00	240.0	200.0	83	0.0	93.9
5	0.0	100.0	4.00	240.0	200.0	83	0.0	93.9
6	0.0	100.0	4.00	240.0	200.0	83	0.0	93.9
7	0.0	100.0	4.00	240.0	200.0	83	0.0	93.9
8	0.0	100.0	4.00	240.0	200.0	83	0.0	93.9
9	0.0	100.0	4.00	240.0	200.0	83	0.0	93.9
10	0.0	100.0	4.00	240.0	200.0	83	0.0	93.9
11	0.0	100.0	4.00	240.0	200.0	83	0.0	93.9
12	0.0	100.0	4.00	240.0	200.0	83	0.0	93.9
13	0.0	100.0	4.00	240.0	200.0	83	0.0	93.9
14	0.0	100.0	4.00	240.0	200.0	83	0.0	93.9
15	0.0	100.0	4.00	240.0	200.0	83	0.0	93.9
16	0.0	100.0	4.00	240.0	200.0	83	0.0	93.9
17	0.0	100.0	4.00	240.0	200.0	83	0.0	93.9
18	0.0	100.0	4.00	240.0	200.0	83	0.0	93.9
19	0.0	100.0	4.00	240.0	200.0	83	0.0	93.9
20	0.0	100.0	4.00	240.0	200.0	83	0.0	93.9
21	0.0	100.0	4.00	240.0	200.0	83	0.0	93.9
22	0.0	100.0	4.00	240.0	200.0	83	0.0	93.9
23	0.0	100.0	4.00	240.0	200.0	83	0.0	93.9
24	0.0	100.0	4.00	240.0	200.0	83	0.0	93.9
25	0.0	100.0	4.00	240.0	200.0	83	0.0	93.9
30	0.0	100.0	4.00	240.0	200.0	83	0.0	93.9
35	0.0	100.0	4.00	240.0	200.0	83	0.0	93.9
40	0.0	100.0	4.00	240.0	200.0	83	0.0	93.9
45	0.0	100.0	4.00	240.0	200.0	83	0.0	93.9
Estimated Net Annual Sediment (TSS) Load Reduction =								94 %

Climate Station ID: 6105978 Years of Rainfall Data: 20

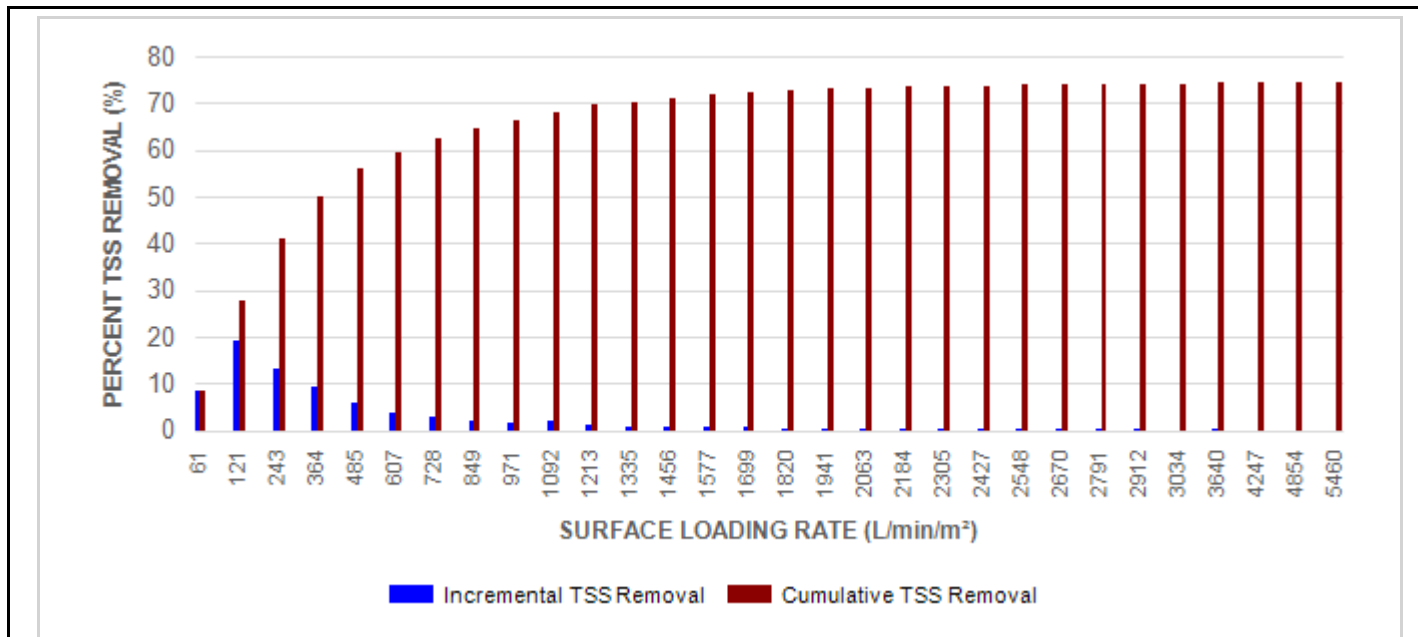


Stormceptor® EF Sizing Report

RAINFALL DATA FROM OTTAWA CDA RCS RAINFALL STATION



INCREMENTAL AND CUMULATIVE TSS REMOVAL FOR THE RECOMMENDED STORMCEPTOR® MODEL



Stormceptor® EF Sizing Report

Maximum Pipe Diameter / Peak Conveyance

Stormceptor EF / EFO	Model Diameter		Min Angle Inlet / Outlet Pipes	Max Inlet Pipe Diameter		Max Outlet Pipe Diameter		Peak Conveyance Flow Rate	
	(m)	(ft)		(mm)	(in)	(mm)	(in)	(L/s)	(cfs)
EF4 / EFO4	1.2	4	90	609	24	609	24	425	15
EF6 / EFO6	1.8	6	90	914	36	914	36	990	35
EF8 / EFO8	2.4	8	90	1219	48	1219	48	1700	60
EF10 / EFO10	3.0	10	90	1828	72	1828	72	2830	100
EF12 / EFO12	3.6	12	90	1828	72	1828	72	2830	100

SCOUR PREVENTION AND ONLINE CONFIGURATION

► Stormceptor® EF and EFO feature an internal bypass and superior scour prevention technology that have been demonstrated in third-party testing according to the scour testing provisions of the Canadian ETV **Procedure for Laboratory Testing of Oil-Grit Separators**, and the exceptional scour test performance has been third-party verified in accordance with the ISO 14034 ETV protocol. As a result, Stormceptor EF and EFO are approved for online installation, eliminating the need for costly additional bypass structures, piping, and installation expense.

DESIGN FLEXIBILITY

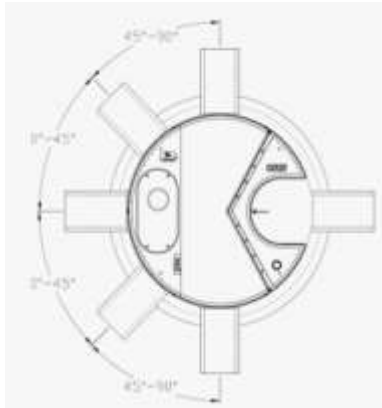
► Stormceptor® EF and EFO offers design flexibility in one simplified platform, accepting stormwater flow from a single inlet pipe or multiple inlet pipes, and/or surface runoff through an inlet grate. The device can also serve as a junction structure, accommodate a 90-degree inlet-to-outlet bend angle, and can be modified to ensure performance in submerged conditions.

OIL CAPTURE AND RETENTION

► While Stormceptor® EF will capture and retain oil from dry weather spills and low intensity runoff, Stormceptor® EFO has demonstrated superior oil capture and greater than 99% oil retention in third-party testing according to the light liquid re-entrainment testing provisions of the Canadian ETV **Procedure for Laboratory Testing of Oil-Grit Separators**. Stormceptor EFO is recommended for sites where oil capture and retention is a requirement.



Stormceptor® EF Sizing Report



INLET-TO-OUTLET DROP

Elevation differential between inlet and outlet pipe inverts is dictated by the angle at which the inlet pipe(s) enters the unit.

0° - 45° : The inlet pipe is 1-inch (25mm) higher than the outlet pipe.

45° - 90° : The inlet pipe is 2-inches (50mm) higher than the outlet pipe.

HEAD LOSS

The head loss through Stormceptor EF is similar to that of a 60-degree bend structure. The applicable K value for calculating minor losses through the unit is 1.1.

For submerged conditions the applicable K value is 3.0.

Pollutant Capacity

Stormceptor EF / EFO	Model Diameter		Depth (Outlet Pipe Invert to Sump Floor)		Oil Volume		Recommended Sediment Maintenance Depth *		Maximum Sediment Volume *		Maximum Sediment Mass **	
	(m)	(ft)	(m)	(ft)	(L)	(Gal)	(mm)	(in)	(L)	(ft³)	(kg)	(lb)
EF4 / EFO4	1.2	4	1.52	5.0	265	70	203	8	1190	42	1904	5250
EF6 / EFO6	1.8	6	1.93	6.3	610	160	305	12	3470	123	5552	15375
EF8 / EFO8	2.4	8	2.59	8.5	1070	280	610	24	8780	310	14048	38750
EF10 / EFO10	3.0	10	3.25	10.7	1670	440	610	24	17790	628	28464	78500
EF12 / EFO12	3.6	12	3.89	12.8	2475	655	610	24	31220	1103	49952	137875

*Increased sump depth may be added to increase sediment storage capacity

** Average density of wet packed sediment in sump = 1.6 kg/L (100 lb/ft³)

Feature	Benefit	Feature Appeals To
Patent-pending enhanced flow treatment and scour prevention technology	Superior, verified third-party performance	Regulator, Specifying & Design Engineer
Third-party verified light liquid capture and retention for EFO version	Proven performance for fuel/oil hotspot locations	Regulator, Specifying & Design Engineer, Site Owner
Functions as bend, junction or inlet structure	Design flexibility	Specifying & Design Engineer
Minimal drop between inlet and outlet	Site installation ease	Contractor
Large diameter outlet riser for inspection and maintenance	Easy maintenance access from grade	Maintenance Contractor & Site Owner

STANDARD STORMCEPTOR EF/EFO DRAWINGS

For standard details, please visit <http://www.imbriumsystems.com/stormwater-treatment-solutions/stormceptor-ef>

STANDARD STORMCEPTOR EF/EFO SPECIFICATION

For specifications, please visit <http://www.imbriumsystems.com/stormwater-treatment-solutions/stormceptor-ef>

Stormceptor[®] EF Sizing Report

STANDARD PERFORMANCE SPECIFICATION FOR “OIL GRIT SEPARATOR” (OGS) STORMWATER QUALITY TREATMENT DEVICE

PART 1 – GENERAL

1.1 WORK INCLUDED

This section specifies requirements for selecting, sizing, and designing an underground Oil Grit Separator (OGS) device for stormwater quality treatment, with third-party testing results and a Statement of Verification in accordance with ISO 14034 Environmental Management – Environmental Technology Verification (ETV).

1.2 REFERENCE STANDARDS & PROCEDURES

ISO 14034:2016 Environmental management – Environmental technology verification (ETV)

Canadian Environmental Technology Verification (ETV) Program’s **Procedure for Laboratory Testing of Oil-Grit Separators**

1.3 SUBMITTALS

1.3.1 All submittals, including sizing reports & shop drawings, shall be submitted upon request with each order to the contractor then forwarded to the Engineer of Record for review and acceptance. Shop drawings shall detail all OGS components, elevations, and sequence of construction.

1.3.2 Alternative devices shall have features identical to or greater than the specified device, including: treatment chamber diameter, treatment chamber wet volume, sediment storage volume, and oil storage volume.

1.3.3 Unless directed otherwise by the Engineer of Record, OGS stormwater quality treatment product substitutions or alternatives submitted within ten days prior to project bid shall not be accepted. All alternatives or substitutions submitted shall be signed and sealed by a local registered Professional Engineer, based on the exact same criteria detailed in Section 3, in entirety, subject to review and approval by the Engineer of Record.

PART 2 – PRODUCTS

2.1 OGS POLLUTANT STORAGE

The OGS device shall include a sump for sediment storage, and a protected volume for the capture and storage of petroleum hydrocarbons and buoyant gross pollutants. The minimum sediment & petroleum hydrocarbon storage capacity shall be as follows:

2.1.1	4 ft (1219 mm) Diameter OGS Units:	1.19 m ³ sediment / 265 L oil
	6 ft (1829 mm) Diameter OGS Units:	3.48 m ³ sediment / 609 L oil
	8 ft (2438 mm) Diameter OGS Units:	8.78 m ³ sediment / 1,071 L oil
	10 ft (3048 mm) Diameter OGS Units:	17.78 m ³ sediment / 1,673 L oil
	12 ft (3657 mm) Diameter OGS Units:	31.23 m ³ sediment / 2,476 L oil

Stormceptor® EF Sizing Report

PART 3 – PERFORMANCE & DESIGN

3.1 GENERAL

The OGS stormwater quality treatment device shall be verified in accordance with ISO 14034:2016 Environmental management – Environmental technology verification (ETV). The OGS stormwater quality treatment device shall remove oil, sediment and gross pollutants from stormwater runoff during frequent wet weather events, and retain these pollutants during less frequent high flow wet weather events below the insert within the OGS for later removal during maintenance. The Manufacturer shall have at least ten (10) years of local experience, history and success in engineering design, manufacturing and production and supply of OGS stormwater quality treatment device systems, acceptable to the Engineer of Record.

3.2 SIZING METHODOLOGY

The OGS device shall be engineered, designed and sized to provide stormwater quality treatment based on treating a minimum of 90 percent of the average annual runoff volume and a minimum removal of an annual average 60% of the sediment (TSS) load based on the Particle Size Distribution (PSD) specified in the sizing report for the specified device. Sizing of the OGS shall be determined by use of a minimum ten (10) years of local historical rainfall data provided by Environment Canada. Sizing shall also be determined by use of the sediment removal performance data derived from the ISO 14034 ETV third-party verified laboratory testing data from testing conducted in accordance with the Canadian ETV protocol Procedure for Laboratory Testing of Oil-Grit Separators, as follows:

3.2.1 Sediment removal efficiency for a given surface loading rate and its associated flow rate shall be based on sediment removal efficiency demonstrated at the seven (7) tested surface loading rates specified in the protocol, ranging 40 L/min/m² to 1400 L/min/m², and as stated in the ISO 14034 ETV Verification Statement for the OGS device.

3.2.2 Sediment removal efficiency for surface loading rates between 40 L/min/m² and 1400 L/min/m² shall be based on linear interpolation of data between consecutive tested surface loading rates.

3.2.3 Sediment removal efficiency for surface loading rates less than the lowest tested surface loading rate of 40 L/min/m² shall be assumed to be identical to the sediment removal efficiency at 40 L/min/m². No extrapolation shall be allowed that results in a sediment removal efficiency that is greater than that demonstrated at 40 L/min/m².

3.2.4 Sediment removal efficiency for surface loading rates greater than the highest tested surface loading rate of 1400 L/min/m² shall assume zero sediment removal for the portion of flow that exceeds 1400 L/min/m², and shall be calculated using a simple proportioning formula, with 1400 L/min/m² in the numerator and the higher surface loading rate in the denominator, and multiplying the resulting fraction times the sediment removal efficiency at 1400 L/min/m².

The OGS device shall also have sufficient annual sediment storage capacity as specified and calculated in Section 2.1.

3.3 CANADIAN ETV or ISO 14034 ETV VERIFICATION OF SCOUR TESTING

The OGS device shall have Canadian ETV or ISO 14034 ETV Verification of third-party scour testing conducted in

Stormceptor[®] EF Sizing Report

accordance with the Canadian ETV Program's **Procedure for Laboratory Testing of Oil-Grit Separators**.

3.3.1 To be acceptable for on-line installation, the OGS device must demonstrate an average scour test effluent concentration less than 10 mg/L at each surface loading rate tested, up to and including 2600 L/min/m².

3.4 LIGHT LIQUID RE-ENTRAINMENT SIMULATION TESTING

The OGS device shall have Canadian ETV or ISO 14034 ETV Verification of completed third-party Light Liquid Re-entrainment Simulation Testing in accordance with the Canadian ETV **Program's Procedure for Laboratory Testing of Oil-Grit Separators**, with results reported within the Canadian ETV or ISO 14034 ETV verification. This re-entrainment testing is conducted with the device pre-loaded with low density polyethylene (LDPE) plastic beads as a surrogate for light liquids such as oil and fuel. Testing is conducted on the same OGS unit tested for sediment removal to assess whether light liquids captured after a spill are effectively retained at high flow rates.

3.4.1 For an OGS device to be an acceptable stormwater treatment device on a site where vehicular traffic occurs and the potential for an oil or fuel spill exists, the OGS device must have reported verified performance results of greater than 99% cumulative retention of LDPE plastic beads for the five specified surface loading rates (ranging 200 L/min/m² to 2600 L/min/m²) in accordance with the Light Liquid Re-entrainment Simulation Testing within the Canadian ETV Program's **Procedure for Laboratory Testing of Oil-Grit Separators**. However, an OGS device shall not be allowed if the Light Liquid Re-entrainment Simulation Testing was performed with screening components within the OGS device that are effective at retaining the LDPE plastic beads, but would not be expected to retain light liquids such as oil and fuel.

STANDARD PERFORMANCE SPECIFICATION FOR “OIL GRIT SEPARATOR” (OGS) STORMWATER QUALITY TREATMENT DEVICE

PART 1 – GENERAL

1.1 WORK INCLUDED

This section specifies requirements for selecting, sizing, and designing an underground Oil Grit Separator (OGS) device for stormwater quality treatment, with third-party testing results and a Statement of Verification in accordance with ISO 14034 Environmental Management – Environmental Technology Verification (ETV).

1.2 REFERENCE STANDARDS & PROCEDURES

ISO 14034:2016 Environmental management – Environmental technology verification (ETV)

Canadian Environmental Technology Verification (ETV) Program’s **Procedure for Laboratory Testing of Oil-Grit Separators**

1.3 SUBMITTALS

1.3.1 All submittals, including sizing reports & shop drawings, shall be submitted upon request with each order to the contractor then forwarded to the Engineer of Record for review and acceptance. Shop drawings shall detail all OGS components, elevations, and sequence of construction.

1.3.2 Alternative devices shall have features identical to or greater than the specified device, including: treatment chamber diameter, treatment chamber wet volume, sediment storage volume, and oil storage volume.

1.3.3 Unless directed otherwise by the Engineer of Record, OGS stormwater quality treatment product substitutions or alternatives submitted within ten days prior to project bid shall not be accepted. All alternatives or substitutions submitted shall be signed and sealed by a local registered Professional Engineer, based on the exact same criteria detailed in Section 3, in entirety, subject to review and approval by the Engineer of Record.

PART 2 – PRODUCTS

2.1 OGS POLLUTANT STORAGE

The OGS device shall include a sump for sediment storage, and a protected volume for the capture and storage of petroleum hydrocarbons and buoyant gross pollutants. The **minimum** sediment & petroleum hydrocarbon storage capacity shall be as follows:

2.1.1	4ft (1219mm) Diameter OGS Units:	1.19m ³ sediment / 265L oil
	6ft (1829mm) Diameter OGS Units:	3.48m ³ sediment / 609L oil
	8ft (2438mm) Diameter OGS Units:	8.78m ³ sediment / 1,071L oil
	10ft (3048mm) Diameter OGS Units:	17.78m ³ sediment / 1,673L oil
	12ft (3657mm) Diameter OGS Units:	31.23m ³ sediment / 2,476L oil

PART 3 – PERFORMANCE & DESIGN

3.1 GENERAL

The OGS stormwater quality treatment device shall be verified in accordance with ISO 14034:2016 Environmental management – Environmental technology verification (ETV). The OGS stormwater quality

treatment device shall remove oil, sediment and gross pollutants from stormwater runoff during frequent wet weather events, and retain these pollutants during less frequent high flow wet weather events below the insert within the OGS for later removal during maintenance. The Manufacturer shall have at least ten (10) years of local experience, history and success in engineering design, manufacturing and production and supply of OGS stormwater quality treatment device systems, acceptable to the Engineer of Record.

3.2 SIZING METHODOLOGY

The OGS device shall be engineered, designed and sized to provide stormwater quality treatment based on treating a minimum of 90 percent of the average annual runoff volume and a minimum removal of an annual average 60% of the sediment (TSS) load based on the Particle Size Distribution (PSD) specified in the sizing report for the specified device. Sizing shall be determined using historical rainfall data and a sediment removal performance curve derived from the actual third-party verified laboratory testing data. The OGS device shall also have sufficient annual sediment storage capacity as specified and calculated in Section 2.1.

3.3 CANADIAN ETV or ISO 14034 ETV VERIFICATION OF SCOUR TESTING

The OGS device shall have Canadian ETV or ISO 14034 ETV Verification of third-party scour testing conducted in accordance with the Canadian ETV Program's **Procedure for Laboratory Testing of Oil-Grit Separators**.

3.3.1 To be acceptable for on-line installation, the OGS device must demonstrate an average scour test effluent concentration less than 10 mg/L at each surface loading rate tested, up to and including 2600 L/min/m².

3.4 LIGHT LIQUID RE-ENTRAINMENT SIMULATION TESTING

The OGS device shall have Canadian ETV or ISO 14034 ETV Verification of completed third-party Light Liquid Re-entrainment Simulation Testing in accordance with the Canadian ETV Program's **Procedure for Laboratory Testing of Oil-Grit Separators**, with results reported within the Canadian ETV or ISO 14034 ETV verification. This re-entrainment testing is conducted with the device pre-loaded with low density polyethylene (LDPE) plastic beads as a surrogate for light liquids such as oil and fuel. Testing is conducted on the same OGS unit tested for sediment removal to assess whether light liquids captured after a spill are effectively retained at high flow rates.

3.4.1 For an OGS device to be an acceptable stormwater treatment device on a site where vehicular traffic occurs and the potential for an oil or fuel spill exists, the OGS device must have reported verified performance results of greater than 99% cumulative retention of LDPE plastic beads for the five specified surface loading rates (ranging 200 L/min/m² to 2600 L/min/m²) in accordance with the Light Liquid Re-entrainment Simulation Testing within the Canadian ETV Program's **Procedure for Laboratory Testing of Oil-Grit Separators**. However, an OGS device shall not be allowed if the Light Liquid Re-entrainment Simulation Testing was performed with screening components within the OGS device that are effective at retaining the LDPE plastic beads, but would not be expected to retain light liquids such as oil and fuel.

Trusted. Tested. Tough.®

SECTION: Z2.20.100

ZM2349

0423

Supersedes

0521

Product information presented here reflects conditions at time of publication. Consult factory regarding discrepancies or inconsistencies.



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 SHIP TO: 3649 Cane Run Road • Louisville, KY 40211-1961
 Tel: (502) 778-2731 • 1 (800) 928-PUMP

Visit our website:
 zoellerengineered.com



62 HD SERIES TECHNICAL DATA 4" & 6" FLANGED DISCHARGE UNITS 5 - 20 BHP



MODEL NUMBER:	<input type="checkbox"/> 6220	<input type="checkbox"/> 6221	<input type="checkbox"/> 6222	<input type="checkbox"/> 6223	<input type="checkbox"/> 6224
PUMP NAME PLATE HORSEPOWER: BHP	5.0	7.5	10.0	15.0	20.0
NEC LOCKED ROTOR CODE:	D	F	C	E	B
MAXIMUM KW INPUT:	5.2	7.8	9.8	13.5	16.8
IMPELLER DIAMETERS: in (mm) STANDARD	6-7/8" (175mm)	7-3/8" (187mm)	7-3/4" (197mm)	8-5/8" (219mm)	9-1/2" (241mm)
DISCHARGE SIZE:	<input type="checkbox"/> 4" FLANGED HORIZONTAL or <input type="checkbox"/> 6" FLANGED HORIZONTAL				
	<input type="checkbox"/> Standard Hydraulic Design - page 2 <input type="checkbox"/> Vortex Hydraulic Design - page 4 <input type="checkbox"/> High Head Hydraulic Design (4" discharge only) - page 3				

SOLID SIZE: in (mm)	3" (75 mm)	TANDEM SEALS:	STANDARD		
IMPELLER TYPE:	SEMI-OPEN <input type="checkbox"/> OPTIONAL VORTEX	MOTOR DESIGN LETTER:	NEMA B		
IMPELLER MATERIAL:	DUCTILE IRON	CORD LENGTH: ft (m)	25' (7.6 m) <input type="checkbox"/> _____'		
FLANGE:	ANSI B16.1	SENSOR CORD SIZE:	#18 - 5 SOOW		
PUMP NET WEIGHT: lbs. (kg)	350 lbs. (159kg)	POWER CORD SIZE:	#12-4	#8-4	#4-4
MOTOR SHAFT:	416 SS	TYPE SOOW	AMPS:	<20	<36.7
RPM:	1750	STATOR & LEAD WIRES INSULATION:	CLASS F		
MOTOR TYPE:	STANDARD SUBMERSIBLE	MAXIMUM STATOR TEMPERATURE:	311 °F (155 °C)		
	<input type="checkbox"/> *** INVERTER DUTY SUBMERSIBLE	* DRY PIT (5 - 10 BHP)	<input type="checkbox"/>		
		* HIGH TEMPERATURE (5 - 10 BHP)	<input type="checkbox"/> (175°F MAX.)		

SHAFT SEAL CONSTRUCTION:	STANDARD	CARBON/CERAMIC
	OPTIONAL UPPER	<input type="checkbox"/> SILICON CARBIDE/SILICON CARBIDE
	OPTIONAL LOWER	<input type="checkbox"/> SILICON CARBIDE/SILICON CARBIDE
O-RING ELASTOMERS	STANDARD	BUNA-N
	OPTIONAL	<input type="checkbox"/> VITON
STANDARD SENSING DEVICES**	MOTOR THERMAL SHUTOFF	THERMAL SENSORS WITH AUTOMATIC RESET
	MOISTURE DETECTION	MOISTURE SENSING PROBES
IMPELLER TRIM:	<input type="checkbox"/> OPTIONAL	DESIGN POINT: _____ GPM @ _____' TDH, IMPELLER DIA. _____"
RECOMMENDED FLUID LEVEL FOR CONTINUOUS OPERATIONS: in (m)		24" (0.6m) (For Continuous Duty, Refer to Warranty)
MAXIMUM WATER TEMPERATURE:		104 °F (40 °C)

* Contact factory. These configurations are not CSA listed.

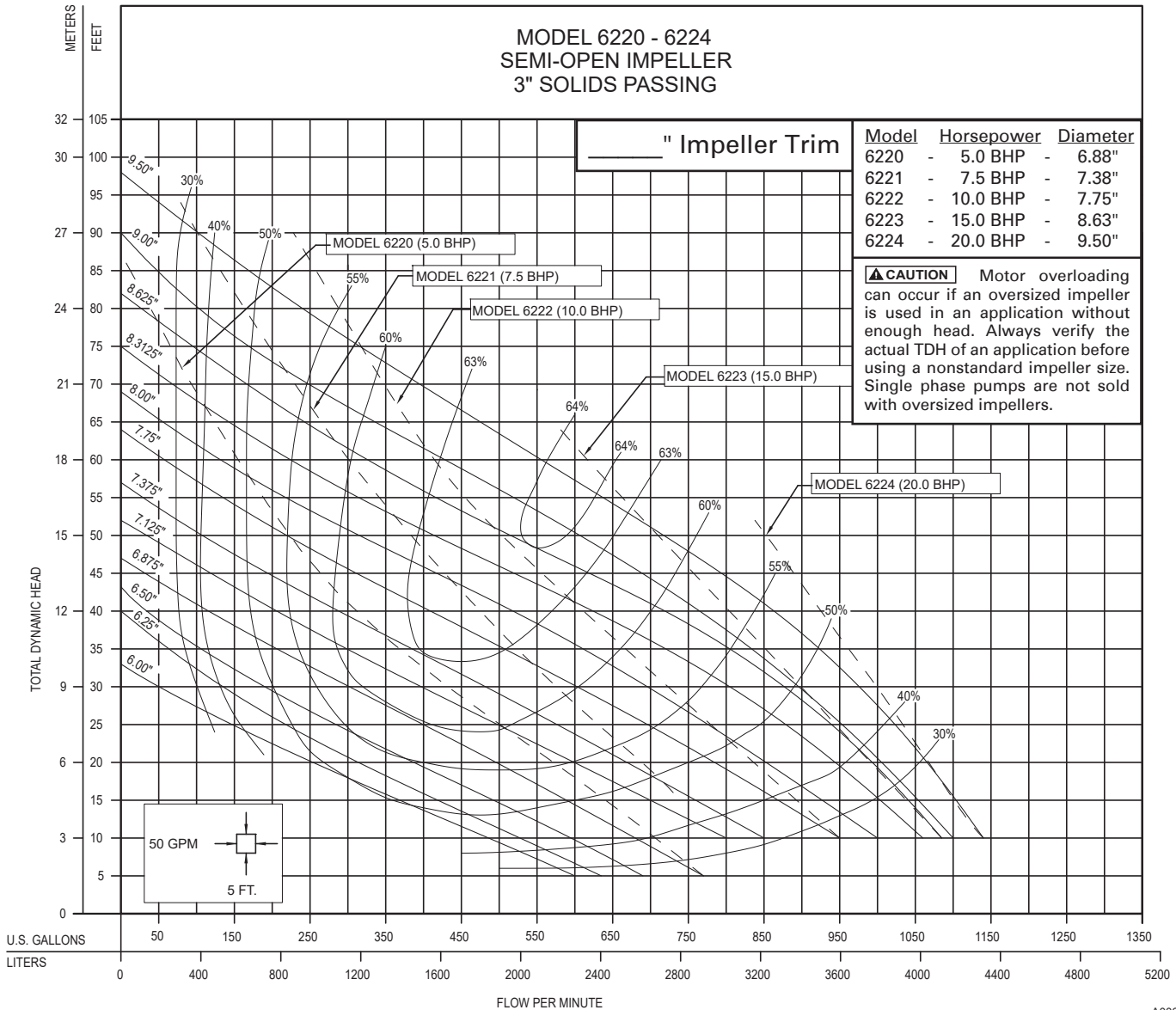
** Requires a circuit in control panel to function.

*** 30 Hz -60 Hz Max, NEMA MG-1 Part 30, cCSAus certified when used with type VPWM inverter.

MODEL	BHP	SERVICE FACTOR	<input type="checkbox"/> 230V/ 1 PHASE		<input type="checkbox"/> 200V/ 3 PHASE		<input type="checkbox"/> 230V/ 3 PHASE		<input type="checkbox"/> 460V/ 3 PHASE		<input type="checkbox"/> 575V/ 3 PHASE	
			FLA	LRA	FLA	LRA	FLA	LRA	FLA	LRA	FLA	LRA
6220	5.0	1.2	27.5	91.0	17.5	61.9	15.2	53.8	7.6	26.9	6.1	21.8
6221	7.5	1.2	36.7	137.0	25.0	109.0	22.0	95.0	11.0	47.5	9.0	37.8
6222	10.0	1.2	N/A	N/A	32.0	109.0	28.0	95.0	14.0	47.5	11.0	37.8
6223	15.0	1.2	N/A	N/A	48.3	197.0	41.7	172.0	20.9	86.0	16.4	70.0
6224	20.0	1.0	N/A	N/A	59.4	197.0	54.0	172.0	27.0	86.0	22.0	70.0



Semi-Open Impeller PERFORMANCE DATA 5 - 20 BHP 4" & 6" Flanged Discharge Units 3" Solids Passing Capacity



A00618

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"SWPA Data Categories Presented -- Data on this sheet supply design information as the minimum recommended by the Submersible Wastewater Pump Association (SWPA) and is defined in accordance with SWPA's Standardized Definitions for Pump and Motor Characteristics. The accuracy of the data is the responsibility of Zoeller Engineered Products."

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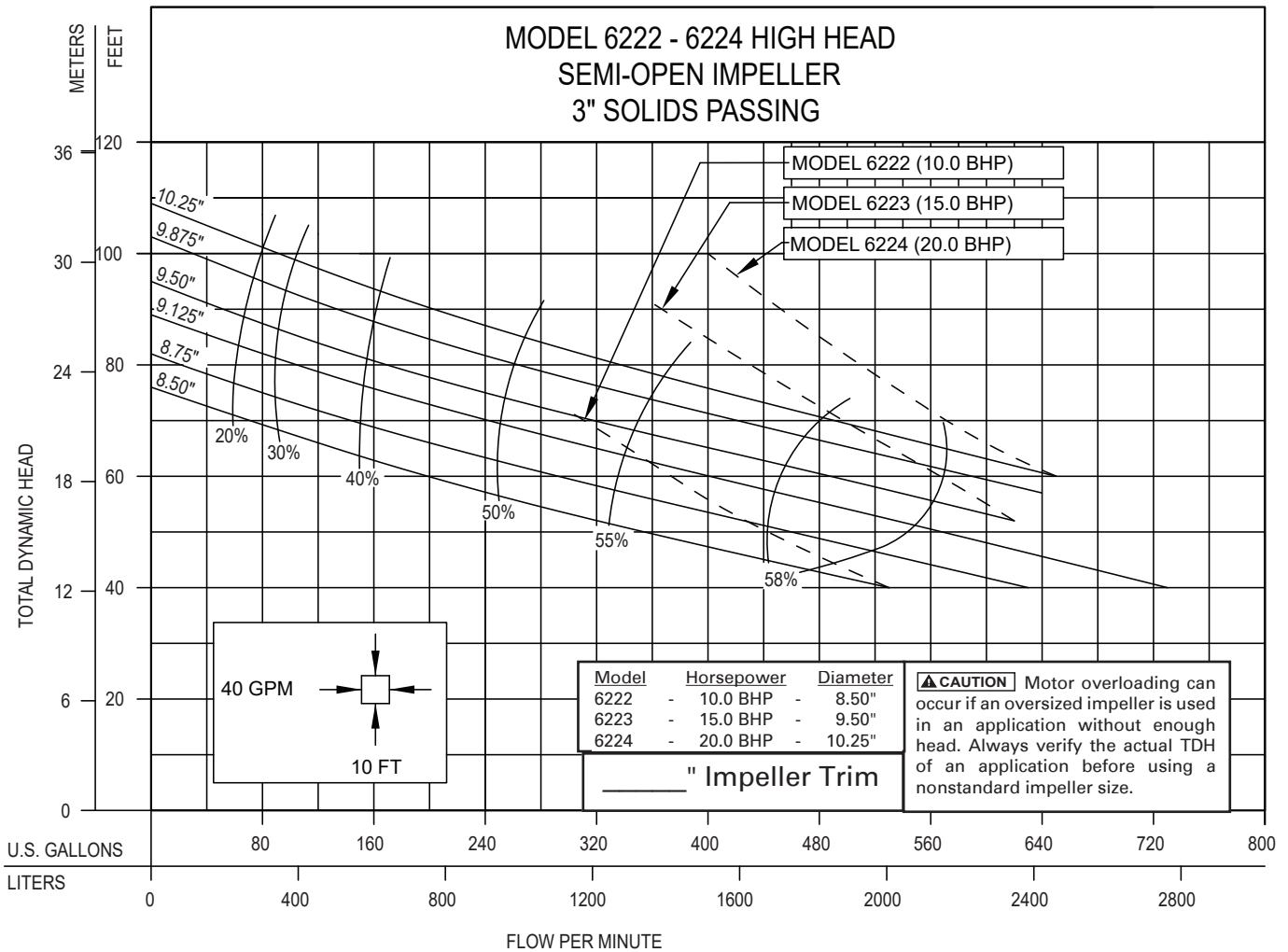
High Head Semi-Open Impeller

PERFORMANCE DATA

10 - 15 - 20 BHP

4" Flanged Discharge

3" Solids Passing Capacity



A00619

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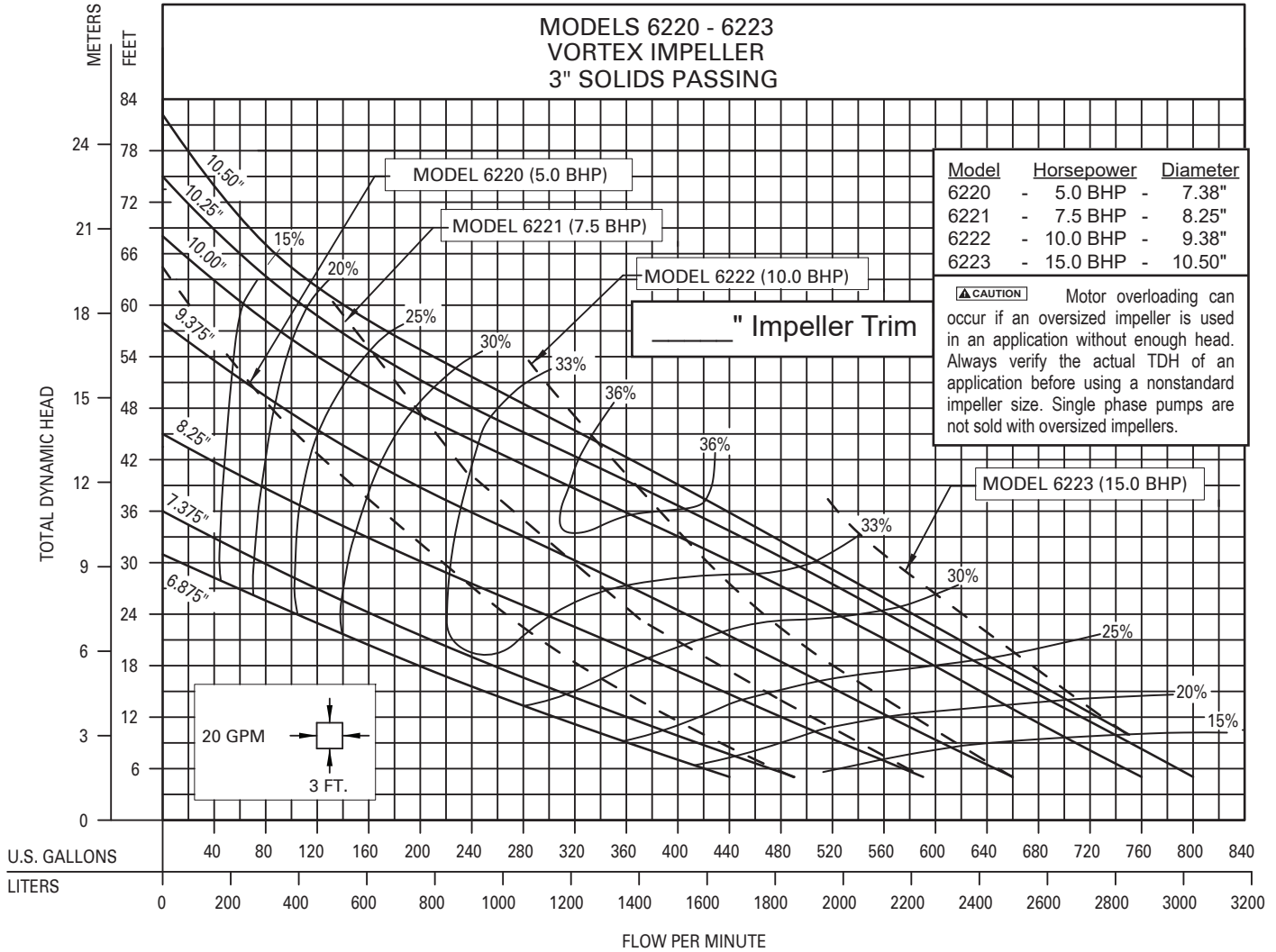
Vortex Impeller

PERFORMANCE DATA

5.0 - 15.0 BHP

4" & 6" Flanged Discharge Units

3" Solids Passing Capacity



B00617

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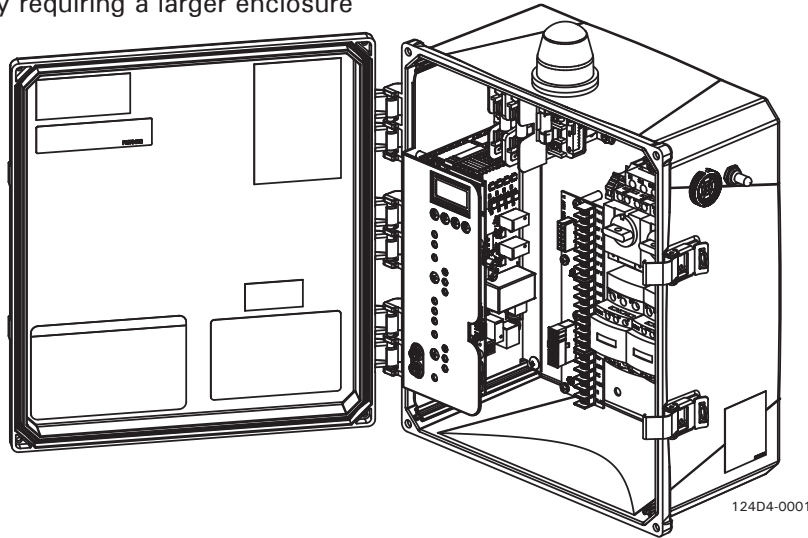
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Product information presented here reflects conditions at time of publication. Consult factory regarding discrepancies or inconsistencies.

TECHNICAL DATA SHEET

Pivot® Pro Series Control Panels

- Pivot 1Ph control panel, highly featured
- Pivot Pro 1Ph or 3Ph control panel with advanced features such as a user-friendly LCD interface and support for pump sensors and Z Control®
- Pivot Pro + The Pivot Pro + control panel is a Pivot Pro control panel built with one or more options and usually requiring a larger enclosure



SPECIFICATIONS

Certifications

- cCSAus certified to standard UL508
- FCC Class-B certification to ISED Canada ICES-003, Issue 6
- For outdoor or indoor use

Components

- Red alarm beacon with 360° visibility
- Audible alarm buzzer rated 95 db at 2' (0.6 m)
- SILENCE/RESET/TEST toggle switch with weatherproof rubber boot
- HAND/OFF/AUTO control are included for each pump
- RS-485 (12VDC, 2W) powered serial port for optional Z Control® Gateway connectivity
- Auxiliary output dry contacts (NO-COM-NC) terminals, Form C, 5A resistive load
- PUMP RUN dry contact, (NO-COM)
- NEMA 4X 14"x12"x6" enclosure with lockable latch

Power

- Control circuit powered by 120VAC, 60 Hz
- Alarm circuit can be powered by separate power feed, if needed
- Alarm and control circuits individually fused, 3A, fast-acting, 120VAC
- Circuit breaker protection on 1Ph models
- Multi-tap 200/230/460V transformer on 3Ph models
- Max alarm and control circuit power consumption:

Simplex models 32W, Duplex models 40W

- Max standby power consumption: 5W
- Terminals for 120VAC control power, 120VAC alarm power, up to 4 float switches (duplex), pump input power
- 1Ph IEC motor contactors, models 120/208/240 VAC, 50/60Hz, up to 50A maximum
- 3PH IEC motor contactors, models 208/230/380/460/575 VAC, 60Hz

Field Wiring & Maintenance

- 4 enclosure mounting brackets are included
- 2 sets of wiring schematics and installation instructions are included along with an inside door mounted QR code for easy access to additional support material online
- All wires and terminal locations thoroughly labeled for easy identification
- All components are serviceable (See FM3364 for available replacement parts)

STANDARD FEATURES (For a more thorough description of features, see ZM3376 Panel Selection Guide, or FM3295 Cross Reference and Features Comparison List, or FM3272 Installation Instructions, or FM3394 Quick Reference Guide.)

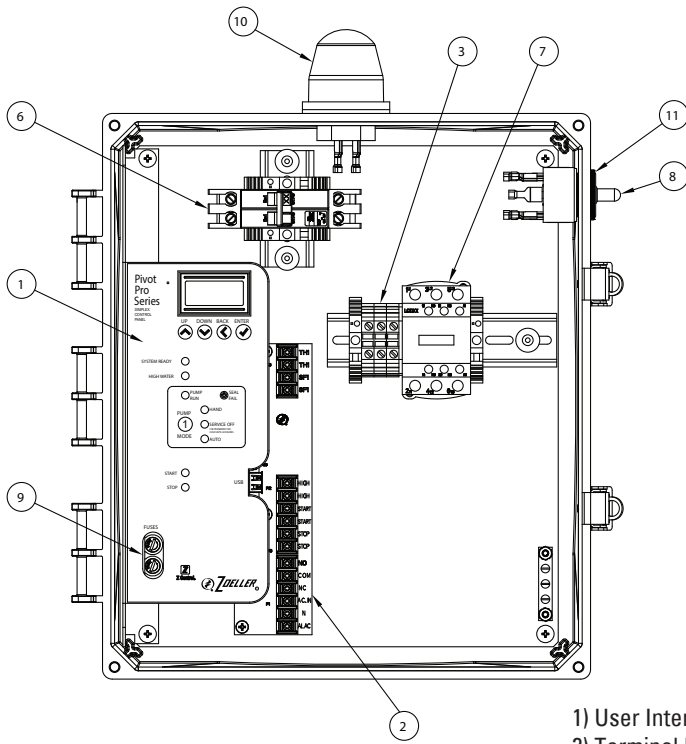
- 5 year limited warranty
- RED/AMBER/GREEN LEDs for float switch indicators, Pump Run, High Water, System Ready, and HOA functions
- Ample room for field wiring
- TEST toggle will check all LEDs, globe, and horn
- Elapsed time and cycle counts via USB port & LCD
- Z Control® enabled (requires Wi-Fi Gateway 90002-0001)
 - o Connecting to the Z Control® Cloud allows remote access to view equipment status and adjust settings
 - o Configure alert settings for nearly instant email, text, and push notifications of changing conditions
 - o Free access to the Z Control® Cloud
 - o Easy setup and use
 - o Leverage this technology to reduce/eliminate unnecessary site trips and provide real-time peace of mind
- Lockable LCD menu allows for easy access to status, counters, and settings
- Adjustable settings (see Installation Instructions)
 - o ‘Smart’ or ‘Standard’ float logic (Smart logic will compensate for bad floats. Standard logic will operate like traditional panels.)
 - o CONTINUOUS RUN alarm: 20 minute default (enable or disable via USB port)
 - o HOA Pump Run & Service Off Timeouts (enable or disable via USB port)
 - Service OFF and Permanent OFF pump modes
 - Smart HOA timer prevents pump damage caused by accidental “ON”
 - Smart HOA includes a Service OFF reminder alarm
 - o Globe mode (solid, blink, or alarm-specific blink pattern)
 - o Duplex float configuration (Stop/Lead/Lag/High or Stop/Lead/High/Lag)
- Seal fail indicator/alarm for each pump (feature requires moisture sensor in pump)
- Thermal trip indicator/alarm for each pump (feature requires thermal sensor in pump)
- Lead/lag selector with pump run ratio settings
- Float switch logic choices: Smart or Relay, 3 or 4 float, SLLH or SLHL
- Current overload alarms (as applicable)

Alarm Conditions

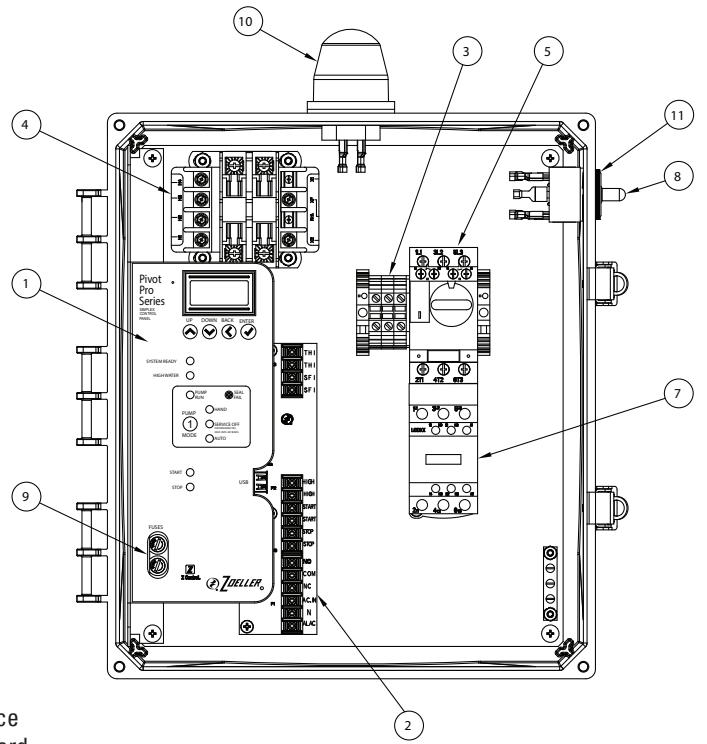
Alarm Condition	User Interface LEDs						
	Latching	Globe	System Ready	High Water	Pump Run (1 or 2)	Pump Off (1 or 2)	Stop, Start/Lead, or Lag
Overload (3PH only)	No	Fast Blink	Off	Off	Solid Red	Off	Off
Failed Contactor	Yes	Fast Blink	Off	Off	Solid Red	Off	Off
Service Off Timeout	No	Double Blink	Off	Off	Off	Blinking Red	Off
Disabled Alarm Circuit	No	Double Blink	Off	Solid Red	Off	Off	Solid Red
Continuous Run	Yes	Solid	Off	Off	Blinking Amber	Off	Off
High Water Float Logic Error	Yes	Slow Blink	Off	Blinking Red	Off	Off	Off
Float Logic Error	Yes	Slow Blink	Off	Off	Off	Off	Blinking Red
Float Questionable	Yes	Slow Blink	Off	Off	Off	Off	Blinking Amber
High Water	Yes	Solid	Off	Solid Red	Off	Off	Off
Seal Fail Alarm	Yes	Fast Blink	Off	Off	Blinking Red	Off	Off
Thermal Alarm	Yes	Fast Blink	Off	Off	Blinking Red	Off	Off
High Control Voltage	Yes	Off	Blinking Green	Blinking Red	Blinking Red	Blinking Red	Blinking Red

COMMON PIVOT PRO CONTROL PANEL DETAILS

PART NO.	REV	SIMPLEX OR DUPLEX	ENCLOSURE	VOLTAGE	PHASE	FULL LOAD AMP	BREAKER OR OVERLOAD RATING	DIMENSIONS "A" X "B" X "C"
11314-0001	A	SIMPLEX	NEMA-4X	120/208/240	1	0 TO 7	15	14" X 12" X 6"
11324-0001	A	SIMPLEX	NEMA-4X	120/208/240	1	7 TO 15	20	14" X 12" X 6"
11334-0001	A	SIMPLEX	NEMA-4X	120/208/240	1	15 TO 20	30	14" X 12" X 6"
11344-0001	A	SIMPLEX	NEMA-4X	120/208/240	1	20 TO 30	50	14" X 12" X 6"
11354-0001	A	SIMPLEX	NEMA-4X	120/208/240	1	0 TO 20	25	14" X 12" X 6"
12124-0001	A	DUPLEX	NEMA-4X	120	1	7 TO 15	20	14" X 12" X 6"
12134-0001	A	DUPLEX	NEMA-4X	120	1	15 TO 20	30	14" X 12" X 6"
12314-0001	A	DUPLEX	NEMA-4X	120/208/240	1	0 TO 7	15	14" X 12" X 6"
12324-0001	A	DUPLEX	NEMA-4X	120/208/240	1	7 TO 15	20	14" X 12" X 6"
12334-0001	A	DUPLEX	NEMA-4X	120/208/240	1	15 TO 20	30	14" X 12" X 6"
12344-0001	A	DUPLEX	NEMA-4X	120/208/240	1	20 TO 30	50	14" X 12" X 6"
12354-0001	A	DUPLEX	NEMA-4X	120/208/240	1	0 TO 20	25	14" X 12" X 6"
114A4-0001	B	SIMPLEX	NEMA-4X	208/240/480	3	1.0 TO 1.6	1.0 TO 1.6	14" X 12" X 6"
114B4-0001	B	SIMPLEX	NEMA-4X	208/240/480	3	1.6 TO 2.5	1.6 TO 2.5	14" X 12" X 6"
114C4-0001	B	SIMPLEX	NEMA-4X	208/240/480	3	2.5 TO 4	2.5 TO 4	14" X 12" X 6"
114D4-0001	B	SIMPLEX	NEMA-4X	208/240/480	3	4 TO 6.3	4 TO 6.3	14" X 12" X 6"
114E4-0001	B	SIMPLEX	NEMA-4X	208/240/480	3	6 TO 10	6 TO 10	14" X 12" X 6"
114F4-0001	B	SIMPLEX	NEMA-4X	208/240/480	3	9 TO 14	9 TO 14	14" X 12" X 6"
114G4-0001	B	SIMPLEX	NEMA-4X	208/240/480	3	13 TO 18	13 TO 18	14" X 12" X 6"
114H4-0001	B	SIMPLEX	NEMA-4X	208/240/480	3	17 TO 23	17 TO 23	14" X 12" X 6"
114Q4-0001	B	SIMPLEX	NEMA-4X	208/240/480	3	20 TO 25	20 TO 25	14" X 12" X 6"
11604-0001	B	SIMPLEX	NEMA-4X	575	3	30 TO 40	30 TO 40	14" X 12" X 6"
116A4-0001	B	SIMPLEX	NEMA-4X	575	3	1.0 TO 1.6	1.0 TO 1.6	14" X 12" X 6"
116B4-0001	B	SIMPLEX	NEMA-4X	575	3	1.6 TO 2.5	1.6 TO 2.5	14" X 12" X 6"
116C4-0001	B	SIMPLEX	NEMA-4X	575	3	2.5 TO 4	2.5 TO 4	14" X 12" X 6"
116D4-0001	B	SIMPLEX	NEMA-4X	575	3	4 TO 6.3	4 TO 6.3	14" X 12" X 6"
116E4-0001	B	SIMPLEX	NEMA-4X	575	3	6 TO 10	6 TO 10	14" X 12" X 6"
116F4-0001	B	SIMPLEX	NEMA-4X	575	3	9 TO 14	9 TO 14	14" X 12" X 6"
116R4-0001	B	SIMPLEX	NEMA-4X	575	3	23 TO 32	23 TO 32	14" X 12" X 6"
12404-0001	B	DUPLEX	NEMA-4X	208/240/480	3	30 TO 40	30 TO 40	16" X 14" X 7"
124A4-0001	B	DUPLEX	NEMA-4X	208/240/480	3	1.0 TO 1.6	1.0 TO 1.6	14" X 12" X 6"
124B4-0001	B	DUPLEX	NEMA-4X	208/240/480	3	1.6 TO 2.5	1.6 TO 2.5	14" X 12" X 6"
124C4-0001	B	DUPLEX	NEMA-4X	208/240/480	3	2.5 TO 4	2.5 TO 4	14" X 12" X 6"
124D4-0001	B	DUPLEX	NEMA-4X	208/240/480	3	4 TO 6.3	4 TO 6.3	14" X 12" X 6"
124E4-0001	B	DUPLEX	NEMA-4X	208/240/480	3	6 TO 10	6 TO 10	14" X 12" X 6"
124F4-0001	B	DUPLEX	NEMA-4X	208/240/480	3	9 TO 14	9 TO 14	14" X 12" X 6"
124G4-0001	B	DUPLEX	NEMA-4X	208/240/480	3	13 TO 18	13 TO 18	14" X 12" X 6"
124H4-0001	B	DUPLEX	NEMA-4X	208/240/480	3	17 TO 23	17 TO 23	14" X 12" X 6"
124Q4-0001	B	DUPLEX	NEMA-4X	208/240/480	3	20 TO 25	20 TO 25	14" X 12" X 6"
124R4-0001	B	DUPLEX	NEMA-4X	208/240/480	3	23 TO 32	23 TO 32	16" X 14" X 7"
126A4-0001	B	DUPLEX	NEMA-4X	575	3	1.0 TO 1.6	1.0 TO 1.6	14" X 12" X 6"
126B4-0001	B	DUPLEX	NEMA-4X	575	3	1.6 TO 2.5	1.6 TO 2.5	14" X 12" X 6"
126C4-0001	B	DUPLEX	NEMA-4X	575	3	2.5 TO 4	2.5 TO 4	14" X 12" X 6"
126D4-0001	B	DUPLEX	NEMA-4X	575	3	4 TO 6.3	4 TO 6.3	14" X 12" X 6"
126E4-0001	B	DUPLEX	NEMA-4X	575	3	6 TO 10	6 TO 10	14" X 12" X 6"
126F4-0001	B	DUPLEX	NEMA-4X	575	3	9 TO 14	9 TO 14	14" X 12" X 6"

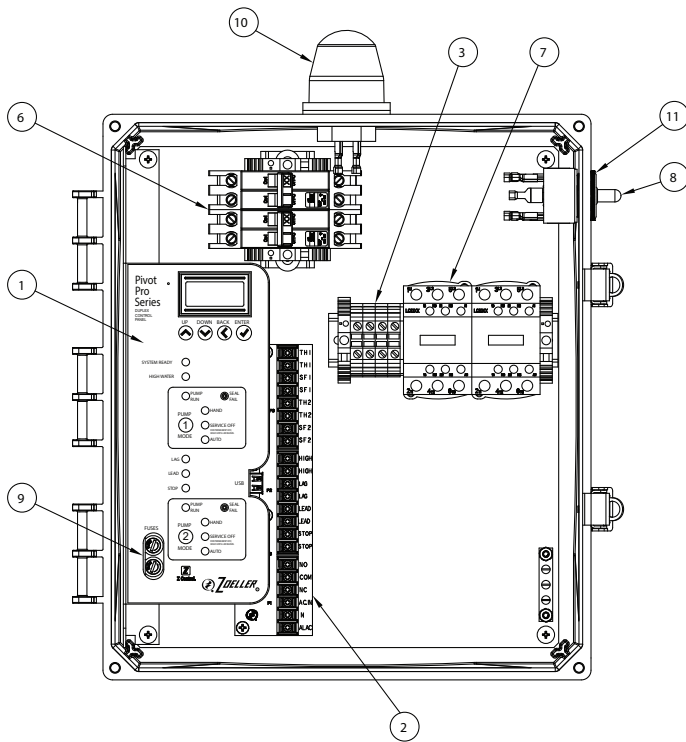


Simplex, 1PH Pivot Pro

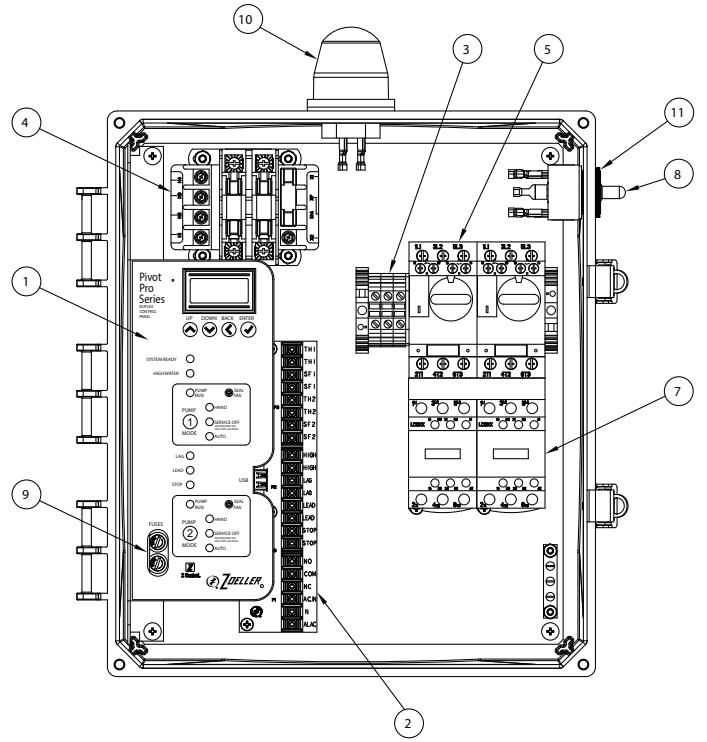


Simplex, 3PH Pivot Pro

- 1) User Interface
- 2) Terminal Board
- 3) Pump Power Terminals (TB1)
- 4) Transformer (3PH Only)
- 5) Overload(s) (3PH Only)
- 6) Circuit Breaker(s) (1PH Only)
- 7) Motor Contactor(s)
- 8) Test/Silence/Reset Switch
- 9) Fuses
- 10) Globe
- 11) Alarm Buzzer



Duplex, 1PH Pivot Pro



Duplex, 3PH Pivot Pro

SK3296



Address: 15 Worthington Drive
Brantford, Ontario N3T 5M1
Canada

Phone: (877) 710-7867

To: **Walmart Mechanical Sales** **Bid Date:** 2023-05-23
24 Gurdwara Rd. **Expiration Date:** 2023-06-22
Nepean, Ontario K2E 8B5 **Creator:** Porter Clements, porter@walmart.net
Canada **Outside Sales Rep.:**
Attn.: **Shipping Address:**
Phone: (613) 225-9774

Job Name: **Thunder Rd & Boundary Rd, Ottawa**

Comments:

Section Title: New section

Label / Item #	Product No.	Qty	Amount
	6222-0008 BA6222 575V/3Ph/1750/10.0Bhp/4"D/cCSAus	2	\$20,406.40
	126F4-0001 Control,Pivot Pro/Dup/3Ph/575V/9-14A	1	\$2,659.30
	10-1881 Switch, Mechanical Variable level float, Adjustable Weight 115/230V/5A, 25ft Cord	4	\$436.80
	10-0253 Float bracket holder stainless steel (4 Flt)	1	\$193.20
	6030-0203 Valve,Unicheck-4" C.I./Flanged	2	\$4,149.60
	6030-0086 Plug Valve, 4" Flanged with Hand Lever, Cast Iron, 175 PSI	2	\$4,243.40
	39-0031 Lifting Cable, Stainless Steel, 8ft Long, 1/8" [Commercial Duty Pumps & 2HP Grinders]	2	\$261.80
	39-0154 Disconnect, 4" Horizontal: powder coated, ductile iron with stainless steel Upper Guide Rail Bracket (2" SS or galvanized rail guides supplied by contractor to suit sump depth)	2	\$5,591.60

Product information presented here reflects conditions at time of publication. Consult factory regarding discrepancies or inconsistencies.

MAIL TO: P.O. BOX 16347 • Louisville, KY 40256-0347
SHIPTO: 3649 Cane Run Road • Louisville, KY 40211-1961
TEL: (502) 778-2731 • 1 (800) 928-PUMP • **FAX:** (502) 774-3624

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zoellerpumps.com

PVC PLASTIC TYPE UNICHECKS

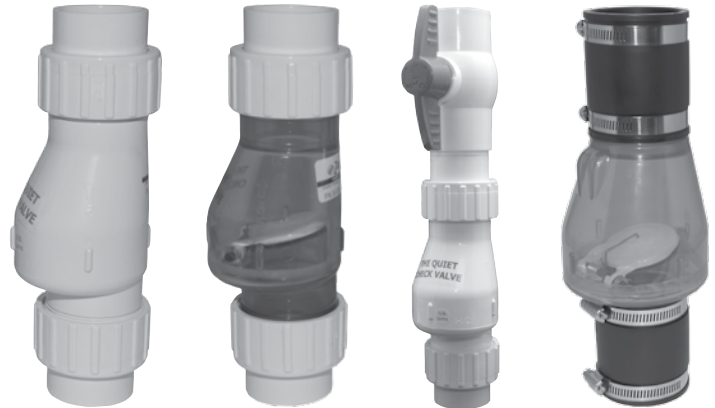
COMPARE THESE FEATURES

THE "QUIET CHECK"
 PVC SOLVENT WELD
 WITH UNION CHECK VALVE

ITEM NUMBER	PIPE SIZE	VALVE BODY	WEIGHT EACH	LENGTH	CARTON QUANTITY
30-0040	1½ inch	White	2 lbs.	9.50 inches	12
30-0041	1½ inch	Clear*	2 lbs.	9.50 inches	12
30-0042	2 inches	White	3 lbs.	10.50 inches	12
30-0043	2 inches	Clear*	3 lbs.	10.50 inches	12
30-0044	3 inches	White	3 lbs.	9.50 inches	8
30-0045	3 inches	Clear*	3 lbs.	9.50 inches	8
30-0241	1½ inches	White	1.2 lbs.	10.50 inches	12
30-0242	1½ inches	Clear*	1.2 lbs.	10.50 inches	12
30-0243	2 inches	White	1.8 lbs.	11.50 inches	12
30-0244	2 inches	Clear*	1.8 lbs.	11.50 inches	12
QUIET CHECKS WITH QUARTER TURN BALL VALVES					
30-0046	1½ inch	White	3 lbs.	14.75 inches	12
30-0047	1½ inch	Clear*	3 lbs.	14.75 inches	12
30-0048	2 inches	White	4 lbs.	16 inches	12
30-0049	2 inches	Clear*	4 lbs.	16 inches	12

* Clear check valve body allows easy viewing of conditions inside the valve.

P / N	Service Part
152294	1½" union assembly
152293	2.0" union assembly



P/N 30-0040
White PVC

P/N 30-0041
Clear PVC

P/N 30-0046
White PVC

P/N 30-0242
Clear PVC

- 1/2 lb. spring "magically" eliminates water hammer
- Reduces motor and pump noise from plumbing system
- Designed for both horizontal and vertical usage
- Full flow, non-clog design installation
- Durably constructed PVC check body and compression end fittings
- Solvent weld ends allow for easy installation
- 30-0044 and 30-0045, no unions, solvent weld only
- No threading of pipe required
- **Pressure rated at 50 PSI (115')**
40 PSI (92') for P/N 30-0241 & 30-0242
30 PSI (69') for P/N 30-0243 & 30-0244
- **Consult factory if use over 130° F required**
- **Suitable for installation below basin cover**

COMPRESSION TYPE UNICHECKS



P/N 30-0030

P/N 30-0020

P/N 30-0015

ITEM NUMBER	PIPE SIZE	WEIGHT	LENGTH	CARTON QUANTITY
30-0015	1½ inch	1.1 lbs.	7½ inches	12
30-0020	2 inches	1.7 lbs.	9¾ inches	12
30-0030	3 inches	5 lbs.	14 inches	2

*Pressure rated to 125 psi (285') at 75° F.

GENERAL CAUTION: Water hammer creates momentary high pressure surges. These surges can cause severe damage to check valves and the piping system. Consideration for water hammer must be included in the piping system design. Reference ASPE Data Book, Chapter 2.33. May require check valves with special non-slam features or other engineered solutions.

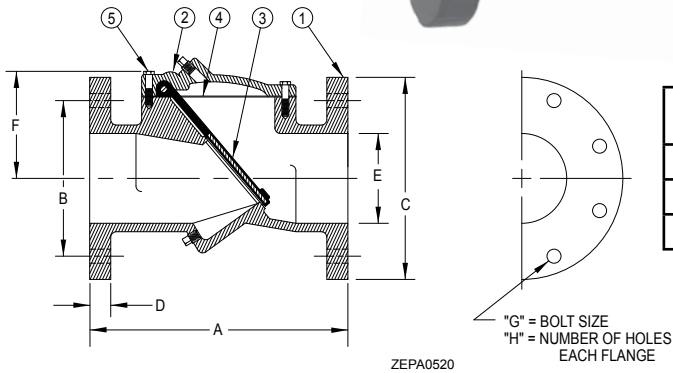
3" & 4" FLANGED CHECK VALVES

Features:

- Heavy-duty ductile iron construction
- Angled seal for non-slam closure
- Non-clog design
- Reinforced disc
- Drip tight seating
- Rated up to 250 PSIG
- Designed for both horizontal and vertical usage
- Optional backflow actuator and mechanical indicator



PART NUMBER	PART NAME	MATERIAL
1	Body	Ductile iron ASTM A536, Grade 65-45-12
2	Cover	Ductile iron ASTM A536, Grade 65-45-12
3	Disc	Buna-N w/ steel and nylon reinforcement
4	Gasket	Compressed nonasbestos fiber
5	Cover Bolt	Alloy steel SAE Grade 5



PART NUMBER	VALVE SIZE	"A"	"B"	"C"	"D"	"E"	"F"	"G"	"H"	WEIGHT
6030-0197	2-1/2"	8-1/2"	5-1/2"	7	11/16"	2-1/2"	3-3/8"	5/8"	4	32 lbs.
6030-0202	3"	9-1/2"	6"	7-1/2"	3/4"	3"	5-1/8"	5/8"	4	37 lbs.
6030-0203	4"	11-1/2"	7-1/2"	9	15/16"	4"	5-3/4"	5/8"	8	63 lbs.

2" - 3" - 4" CAST IRON PLUG VALVES

Threaded Connection - 2" & 3"
Flanged Connection - 3" & 4"



Features:

- Designed to handle solids bearing flows
- Cast iron housing - rated 175 psi
- 99% pure nickel welded seat
- 1/4 turn Buna plug
- Upper and lower ball bearings
- Provided with hand lever



* Hand lever not shown in pictures.

THREADED MODELS				
SIZE	PART NUMBER	WIDTH	HEIGHT	WEIGHT
2"	6030-0082	5-1/4"	7-1/8"	12 LBS.
3"	6030-0083	8-3/4"	14-1/8"	45 LBS.

FLANGED MODELS				
SIZE	PART NUMBER	WIDTH	HEIGHT	WEIGHT
3"	6030-0085	8"	14-1/8"	53 LBS.
4"	6030-0086	9"	16-3/4"	66 LBS.

GENERAL CAUTION: Water hammer creates momentary high pressure surges. These surges can cause severe damage to check valves and the piping system. Consideration for water hammer must be included in the piping system design. Reference ASPE Data Book, Chapter 2.33. May require check valves with special non-slam features or other engineered solutions.

Notice to installing contractor: Instructions must remain with installation.

SECTION: Z8.00.400

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ZM3027

1021

Supersedes

0418

Product information presented here reflects conditions at time of publication. Consult factory regarding discrepancies or inconsistencies.



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GUIDE RAIL SYSTEM INSTALLATION PROCEDURES 4" P/N 39-0154 and 39-0155



GENERAL INFORMATION

These models are complete systems used in sewage or dewatering installations with side outlet flanged pumps. They can be used in basins at any depth. The guide rail systems are particularly useful when the liquid level is above the discharge pump. The systems feature easy automatic engagement and disengagement for removing the pump for service or repair without draining the basin.

General Construction: A flanged discharge elbow is supplied with the rail system which also supports the lower rail guides. The discharge elbow, as well as the mounting plate are made of durable ductile iron that is epoxy coated. Upper guide rail brackets (supplied) and intermediate guide brackets (optional) are stainless steel. The mounting plate is available in non-sparking brass. All models require the use of 2" schedule 40 (galvanized steel or stainless steel) pipe for guide rails. Pipe is furnished by the user.

Lifting Cable: The pump is equipped with lifting lugs that are an integral part of the motor housing or cover for lifting. A permanently attached chain, cable or choker (purchased separately), should be used to aid in pump installation and removal. It is not necessary to use a separate pull chain on the mounting plate which is bolted to the pump discharge flange.

Rail Support Bracket: As mentioned above, all the rail systems utilize 2" standard pipe for the guide rails. The supplied top rail support is to be mounted to the hatch frame. Intermediate brackets are available for deep installations. It is recommended that an intermediate stabilizer support bracket be ordered separately and used for each 15 feet of basin depth.

INSTALLING RAIL SYSTEM PARTS

Discharge Base and Rails:

1. Lower the base elbow into the basin.
2. Position the base elbow by dropping a plumb line from the center of the pipe supports, located on top rail support, to center of rail pins protruding from the base elbow. Level the elbow flange in two directions 90° to each other. Mark the position of the base, hold down bolts through the holes/slots in the base.
3. Move the base aside to allow for installation of 3/4" mounting bolts (not included). Secure base with mounting bolts.
4. Cut the 2" pipe guide rails (supplied by others) to the proper length and install them between the upper guide rail bracket and the pins on the base elbow. It is recommended that the guide rails are to be schedule 40, galvanized or stainless steel.

▲ IMPORTANT : Discharge pipe and guide rails must be parallel if intermediate guide bracket is used.

INSTALLING INTERMEDIATE GUIDE BRACKET (Required for each 15 feet of basin depth)

1. Remove the guide rails and cut a piece from each one. The amount to cut from each one must be determined to permit installing the intermediate guide bracket in the desired location. After cutting, the pipes must be exactly the same length. The intermediate guide rail bracket attaches to the discharge piping.
2. Place the cut pieces of pipe over the guide rail pins located on the base elbow.
3. Set the intermediate guide bracket in position with the guides into the pipe. Put a U-bolt around the discharge pipe and tighten lightly.
4. Measure from pipe seat on intermediate guide bracket to pipe seat on top rail support and cut two (2) guide rails to length. Put rails in place and tighten screws in top support.
5. Recheck guide rails, they must be straight and plumb. Move intermediate guide bracket if necessary to perfectly align. After aligning rails, finish tightening the nuts on the U-bolt.
6. If a second intermediate guide bracket is used, the above procedure must be followed again.

ATTACHING MOUNTING PLATE TO PUMP

1. Install the Buna-N O-rings onto the mounting plate. Lightly grease O-rings with a general purpose grease to aid in assembly. Position mounting plate against pump discharge flange. Plate is oriented correctly when the angled machined surfaces face the pump and the guide portion of the bracket faces up.
2. Secure mounting plate to pump with screws and washers provided. Tighten securely.
3. The 64 HD and X64 HD Series solids-handling pumps have 3 pipe legs. Remove these legs from the pump.

INSTALLING PUMP AND DISCONNECT

Position pump so the guide rails are captured by the mounting plate. Slowly lower the pump down the guide rails. The angled surface of the mounting plate should come to seat in the inclined surface on the arms.

After lowering the pump down the guide rail, secure the upper end of the lifting cable to the top rail support to keep it from falling into the pit.

Order intermediate stabilizer for basin depths greater than 15 feet.

Zoeller Engineered Products 4" Guide Rail System

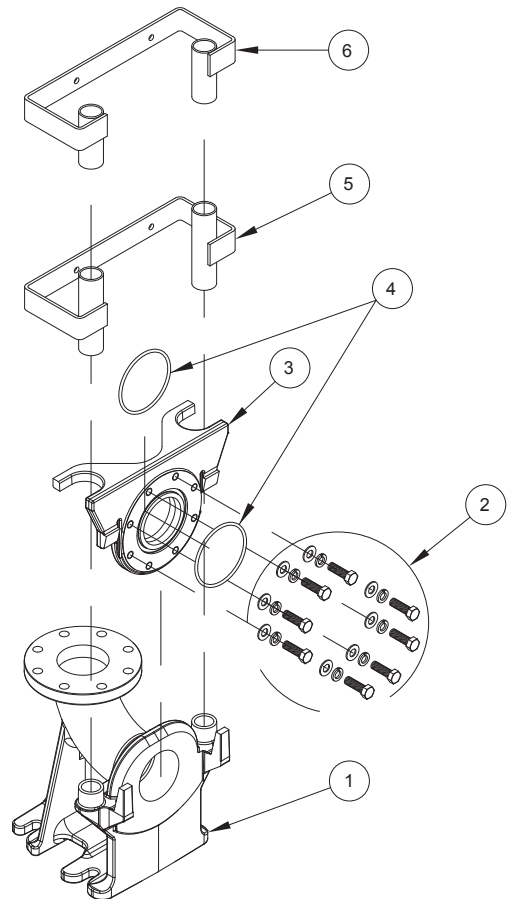
4" Systems - P/N 39-0154 and 39-0155

Parts List For 39-0154 - 4" Standard Z-Rail® Guide Rail System			
Item No.	Description	Qty.	5/17 to Current Revision A
1	Powder Coated Ductile Iron Discharge Elbow	1	154400
2	Stainless Steel Hardware	-	Consult Factory
3	Powder Coated Ductile Iron Mounting plate	1	154402
4	Buna-N O-ring	2	154795
**5	Stainless Steel Intermediate Stabilizer Bracket	1	006050
6	Stainless Steel Upper Guide Rail Bracket	1	006045

** Optional Order P/N for pit depths greater than 15 ft.

Parts List For 39-0155 - 4" Non-sparking Z-Rail® Guide Rail System			
Item No.	Description	Qty.	5/17 to Current Revision A
1	Powder Coated Ductile Iron Discharge Elbow	1	154400
2	Stainless Steel Hardware	-	Consult Factory
3	Bronze Mounting plate	1	154404
4	Buna-N O-ring	2	154795
**5	Stainless Steel Intermediate Stabilizer Bracket	1	006050
6	Stainless Steel Upper Guide Rail Bracket	1	006045

** Optional Order P/N for pit depths greater than 15 ft.



SK3145