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 25, 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 civic address for the parcel is 6150 Thunder Road.

Figure 1: Arial View of Subject Lands

The proposed development will consist of five (5) separate industrial buildings varying in size, totaling a building footprint area of 41 065 m^2. Surrounding the buildings will be asphalt parking lots and travel ways to enhance vehicular maneuverability, as well as landscaped area. To optimize functionality of the industrial site, included in the asphalt areas are loading docks as well as additional trailer parking in the central portion of the site. The site will have three (3) main entrances; one access off of boundary road, and two separate entrances off of 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	Industrial Building D	Industrial Building E	Total
Building Size	8 920 m^2	8 920 m^2	8 920 m^2	10 405 m^2	3 900 m^2	41 065 m^2
Approximate Allocated Office Space	225 m^2	225 m^2	225 m^2	260 m^2	125 m^2	1 060m^2
Number of Auto Parking Spaces	85	64	61	79	36	325
Number of Loading Docks	12	12	12	14	4	54
Number of Trailer Parking Spaces	15	15	15	15	0	60

This report has been prepared in consideration of the terms and conditions noted above and with the civil drawings prepared for the new development relating to 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, noes 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.

3 ADDITIONAL SITE PLAN CONTROL ENGINEERING REPORT

To support the civil design aspects of the subject site, additional investigations and reports were completed.

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 November 2021.

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 he 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. 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 assigned three (3) equivalent units for the subject property does not necessarily 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 18 750 L/day further explained in section 5.2 below.

Prior to this submission for site plan application, Avenue 31 had mandated Stantec to further review the system and comment on the availability of domestic water to service the parcel and the availability of the required additional equivalent units.

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 water tanks or cisterns to meet peak instantaneous demands. The sizing of such cisterns would be determined during the detailed building design phase for building permit.

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/9.2m^2 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	1 645 m^2 of Office Space	*Building A=1 834*
			Building B=1 834
			Building C=1 834
			Building D=2 120
			Building E=1 020
			8 641
Loading Bay	150L/Loading Bay	55 Loading Bays	*Building A=1 800*
			Building B=1 800
			Building C=1 800
			Building D=2 100
			Building E=600
			8 100
Misc. Additional Use (Dependant on Tennant)	-	-	**1 800**
		Total Consumption	*Building A=4 034*
			Building B= 4 034
			Building C= 4034
			Building D=4 620
			Building E=2 020
			18 741
		Number of Equivalent Residential Units (2 700 L/day ea.)	**7**

For the proposed development with five (5) separate industrial buildings, approximately 7 equivalent residential units are required. Shall the interior layout of the building change, or specifics of number of loading docks

To ensure that the demand for the development on the system is limited to the number of equivalent units requested above, a water meter chamber is required at the property boundary to accommodate (while ensuring it is not exceeded). The water meter will be in a concrete underground chamber located at the entrance off of Thunder Road, located with in the City's right

of way, ultimately owned and operated by the City of Ottawa. Details of this chamber are located on the civil servicing drawing C901 located in Appendix E.

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) storage tanks is required. Detailed design and selection of the most appropriate tanks will be completed and required during the building permit stage of future development on this site.

Based on available information at the time of this application, preliminary storage volumes of approximately 1 590 m^3 of water will be required to supply fire protection. The required fire flows for the development were calculated to be 9000 L/min based on table two in Appendix A-3.2.5.7 of the Ontario Building Code. Appendix D contains the fire flow calculations for the development. During the design, based on separation distances of the buildings, calculations are based on assuming that protection for one building (requiring the highest fire protection demand) will be required. Further verification and sizing is required by the fire consultant and mechanical engineering consultant during the building permit detailed design.

The location of the fire tanks and pumps are central to the site as can be seen on the site plan and engineering drawings. This system will be owned and operated privately.

On site fire hydrants have been supplied to ensure coverage for the entire footprint of each building. Hydrant locations can be viewed in the C401 DWG included in Appendix E.

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. Municipal potable water is available – in limited quantity – adjacent to the site.

An on-site wastewater collection and treatment system is required to service the staff and users of site facilities. 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. Detailed engineering and MECP consultation shall occur during site plan approval and prior to building permit applications.

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.

Discharge to the seasonal drainage ditch which intersects the north edge of the development is expected to require a high level of treatment prior to discharge. Consideration for storm water

discharge – which is proposed to outlet to the same receiver – along with sanitary flows will be required to ensure the overall discharge from the property meets Provincial objectives for post-development impacts. The downstream water quality cannot be negatively impacted as a result of the site development.

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.

Expected influent characteristics include,

- Flow – an average day flow (ADF) of between twenty (20) and fifty (50) cubic metres per day (m3/d) is typical of the proposed site use;
- Organic carbon (cBOD5) – typical domestic-commercial wastewater composition suggests a figure between 200 and 275 milligrams per litre (mg/l);
- Kjedahl nitrogen (TKN) - typical domestic-commercial wastewater composition suggests a figure between 60 and 80 milligrams per litre (mg/l);
- Solids (TSS) - typical domestic-commercial wastewater composition suggests a figure between 275 and 350 milligrams per litre (mg/l);
- Phosphorus (TP) - typical domestic-commercial wastewater composition suggests a figure between 10 and 15 milligrams per litre (mg/l);
- Temperature - typical domestic-commercial wastewater composition suggests a figure between 12 and °C; and,
- pH - typical domestic-commercial wastewater composition suggests a figure between 6.5 and 8.5.

Expected effluent quality, comparable to similar operating sites,

- cBOD5 – 10 mg/l;
- TSS – 10 mg/l;
- Ammonia (TAN) – 2 to 5 mg/l (seasonal);
- TP – 0.1 mg/l;
- pH – 6.5 to 9.0; and,
- e. coli. – 200 CFU/100ml.

These effluent limits are achievable through each of the shortlisted technologies listed earlier. The concentration in the discharge will be lowered when blended with discharge from the stormwater pond.

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.

J.F. Sabourin and Associates was retained to complete the modeling and summarize further details of the stormwater management approach for the proposed development. Refer to the separate report for all further details.

Conclusions of the stormwater management report have been integrated into the servicing drawings included in Appendix E. Site grading has been detailed to ensure surface storage is provided.

8 CONCLUSIONS

This report has been prepared to support the site plan application for the proposed industrial development located at 6150 Thunder Road.

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. Approximately 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.
- Sanitary Sewage
    - Onsite sewage treatment and collection facility will be designed in detail to release treated effluent to the unnamed drain running through the property. This final effluent rate will be considered during the stormwater management design as well to ensure post development flow rates do not exceed predevelopment conditions. Current Stormwater design outlets at a lesser rate the predevelopment with this taken into consideration.
- Stormwater
    - Currently stormwater runoff flows uncontrolled to the South & West borders of the property.
    - 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 greatly.
    - Stormwater release rate will be controlled through a number of on-site orifices and three (3) dry retention areas. The storm sewer network will require insulation due to

low cover, and a pump to elevate the conveyed water to the retention area at the downstream section of the network.

- An outlet control device/structure at the two main outlets (towards Boundary Roadside ditch, and the unnamed ditch) will ensure flows do not exceed predevelopment values.
- Storm quality treatment units are proposed. Final sizing to be confirmed upon further detailed design.
- 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

This document was prepared by LRL Associates Ltd. For exclusive use by Avenue 31. It may only be distributed in accordance and agreement with Avenue 31.

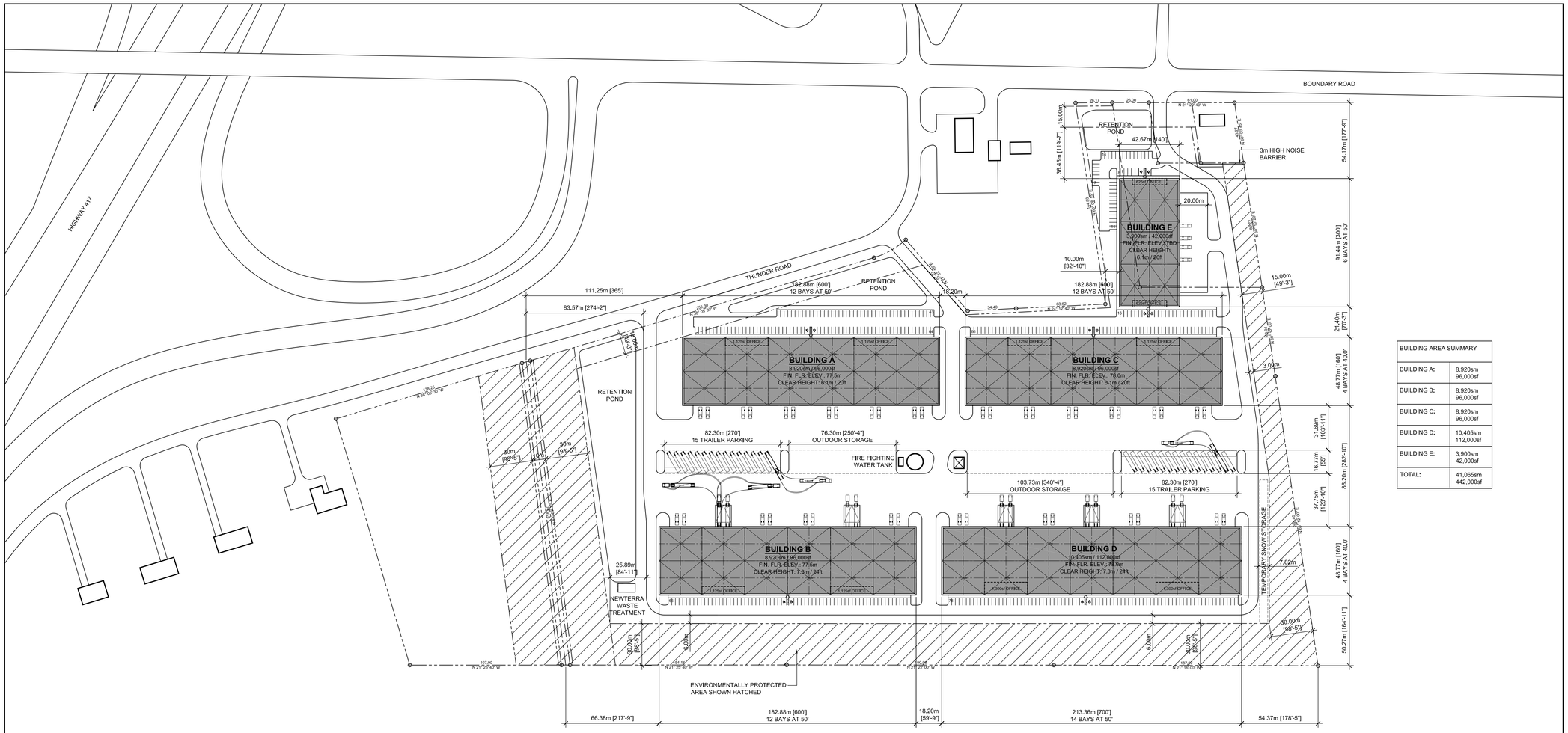
Prepared by:

LRL Associates Ltd.

Virginia Johnson, P. Eng.
Civil Engineer

APPENDIX A

Site Plan



03 SITE PLAN - OPTION B2r8

SPA-01 SCALE: 1:1500

BUILDING AREA SUMMARY	
BUILDING A:	8,920sm 96,000sf
BUILDING B:	8,920sm 96,000sf
BUILDING C:	8,920sm 96,000sf
BUILDING D:	10,405sm 112,000sf
BUILDING E:	3,900sm 42,000sf
TOTAL:	41,065sm 442,000sf

ZONING MECHANISM: ZONING BY-LAW 2008-250 CONSOLIDATION		REQUIRED	PROVIDED
ZONING: RG RURAL GENERAL INDUSTRIAL ZONE		LIGHT INDUSTRIAL LIMITED COMMERCIAL	LIGHT INDUSTRIAL USE WAREHOUSE (N95)
MINIMUM LOT AREA		0.4HA	15.35HA / 37.93 ACRES AREAS 1 & 3 ONLY
MINIMUM LOT WIDTH		30m	425m THUNDER ROAD 82m BOUNDARY ROAD
MAXIMUM LOT COVERAGE		50.0%	26.8% (4.11HA)
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	COMPLIANT WITH ZONING
	ALL OTHER CASES	8m	COMPLIANT WITH ZONING
MINIMUM REAR YARD		15m	COMPLIANT WITH ZONING
MAXIMUM FLOOR SPACE INDEX		2	COMPLIANT WITH ZONING
MAXIMUM BUILDING HEIGHT		15m	7m TO 9m
OUTDOOR STORAGE	NOT PERMITTED WITHIN ANY REQUIRED FRONT OR CORNER YARD		COMPLIANT WITH ZONING
	STORAGE MUST BE SCREEN WHEN ABUTTING RESIDENTIAL ZONES AND PUBLIC STREETS		COMPLIANT WITH ZONING

ZONING MECHANISM: ZONING BY-LAW 2008-250 CONSOLIDATION		REQUIRED	PROVIDED
MINIMUM WIDTH OF LANDSCAPING		3m	COMPLIANT WITH ZONING
PARKING - TYPICAL SECTION 101 0.8 SPACES PER 100m2 FOR FIRST 5,000m2 0.4 SPACES PER 100m2 AFTER FIRST 5,000m2 LIGHT INDUSTRIAL USE WAREHOUSE (N95)	BUILDING A: 8920sm	55 TYPICAL 1 BARRIER-FREE	105 TYPICAL 2 BARRIER-FREE
	BUILDING B: 9820sm	55 TYPICAL 1 BARRIER-FREE	63 TYPICAL 2 BARRIER-FREE
	BUILDING C: 8920sm	55 TYPICAL 1 BARRIER-FREE	64 TYPICAL 2 BARRIER-FREE
	BUILDING D: 10405sm	61 TYPICAL 1 BARRIER-FREE	76 TYPICAL 2 BARRIER-FREE
PARKING - BARRIER FREE SECTION 111 BYLAW 2017-301 1 PER 99 SPACES	BUILDING E: 3900sm	31 TYPICAL 1 BARRIER-FREE	55 TYPICAL 4 BARRIER-FREE
	TOTAL	262 TYPICAL 5 BARRIER-FREE	363 TYPICAL 12 BARRIER-FREE
BICYCLE PARKING SECTION 111 WAREHOUSE 1 SPACE PER 2000m2 BY-LAW 2015-190	BUILDING A: 8920sm	4 SPACES	4 - LOCATION TO BE DETERMINED
	BUILDING B: 9820sm	4 SPACES	4 - LOCATION TO BE DETERMINED
	BUILDING C: 8920sm	4 SPACES	4 - LOCATION TO BE DETERMINED
	BUILDING D: 10405sm	5 SPACES	6 - LOCATION TO BE DETERMINED
	BUILDING E: 3900sm	2 SPACES	4 - LOCATION TO BE DETERMINED

ZONING MECHANISM: ZONING BY-LAW 2008-250 CONSOLIDATION		REQUIRED	PROVIDED
LOADING SPACE SECTION 113 LIGHT INDUSTRIAL USE	BUILDING A	2 OVERSIZED (4,3m X 13m)	12 OVERSIZED (1 PER 8000sf)
	BUILDING B	2 OVERSIZED (4,3m X 13m)	12 OVERSIZED (1 PER 8000sf)
	BUILDING C	2 OVERSIZED (4,3m X 13m)	12 OVERSIZED (1 PER 8000sf)
	BUILDING D	2 OVERSIZED (4,3m X 13m)	14 OVERSIZED (1 PER 8000sf)
	BUILDING E	2 OVERSIZED (4,3m X 13m)	4 OVERSIZED (1 PER 10,000sf)

BUILDING CLASSIFICATION:

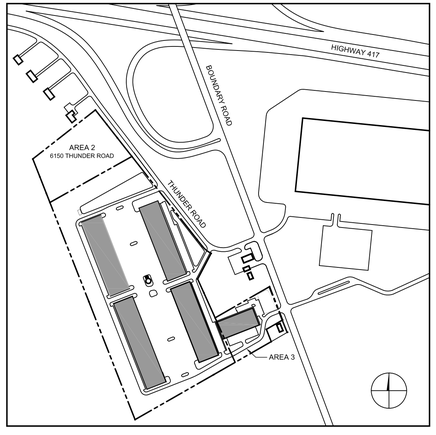
3.2.2.67: GROUP F, DIVISION 2, ANY HEIGHT, ANY AREA SPRINKLERED
- NON-COMBUSTIBLE CONSTRUCTION
- FLOOR ASSEMBLIES SHALL HAVE A MIN 2HR FIRE RESISTANCE RATING
- MEZZANINES SHALL HAVE A MIN 1HR FIRE RESISTANCE RATING
- LOAD BEARING WALLS AND COLUMNS SHALL HAVE A FIRE RESISTANCE RATING NOT LESS THAN SUPPORTED 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)
- 9m SPATIAL SEPARATION FOR 100% AREA OF UNPROTECTED OPENINGS WHEN FACING A STREET

3.4.2.5: LOCATION OF EXITS
- 45m MAXIMUM TRAVEL DISTANCE

02 SITE DATA AND ZONING INFORMATION

SP-A01 SCALE:



01 LOCATION PLAN

SP-A01 SCALE: NTS

24 X 36 – PLOT ARCH D

MCROBIE
ARCHITECTS + INTERIOR DESIGNERS

Avenue31

North

Revisions

No.	By	Description	Date
01	ERM	ISSUED FOR SITE PLAN APPLICATION	2021-11-25
02	ERM	REVISED FOR SITE PLAN APPLICATION	2021-11-26

Project

6160 THUNDER ROAD INDUSTRIAL PARK

6160 THUNDER ROAD, OTTAWA

Drawing

LOCATION PLAN, ZONING REVIEW AND SITE PLAN B2 r8

Scale: AS NOTED

Drawn: ERM

Checked: JAS

Stamp: ONTARIO ASSOCIATION OF ARCHITECTS — DAVID S. McROBIE LICENCE 2890

Project No.: 21-135

Drawing No.: SPA-01

Date: APRIL 2021

APPENDIX B

Pre Consultation Notes

Pre-Application Consultation Meeting Notes

Property Address: 6150 Thunder Road- "southern parcel"
File #PC2021-0254
August 9th, 2021

Attendees:
Anissa McAlpine City of Ottawa, Planner anissa.mcalpine@ottawa.ca
Kevin Hall, City of Ottawa, Project Manager Kevin.hall@ottawa.ca
Sami Rehman, City of Ottawa, Environmental Planner sami.rehman@ottawa.ca
Brent Harbers, SNCA bharbers@nation.on.ca
Stephen Kapusta, MTO, Stephen.kapusta@otario.ca

Regrets:
James Holland, SNCA jholland@nation.on.ca
Neeti Paudel, City of Ottawa, infrastructure approvals, Neeti.paudel@ottawa.ca

proponents:
Jennifer Murray, applicant <jmurray@ave31.com>;
Paul Hicks <hicks@republicurbanism.com>;
Gavin MacDonald <gmacdonald@ave31.com>;
Eric Malboeuf <Malboeuf@mcrobie.com>;

Subect:

- 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.

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

LRL
ENGINEERING | INGÉNIERIE

EXISTING TOPOGRAPHY

5368 Boundary Road and 6150 Thunder Road, Ottawa ON

APPENDIX B

DATE:
DECEMBER 2020

SK02

APPENDIX D

Fire Protection Calculations

Fire Flow Calculations as per Ontario Building Code (OBC)

LRL File No. : 200578
Project : Proposed Industrual Development
Location : 6160 Thunder Road, Ottawa
Date : November 25, 2021
Prepared by : V. Johnson

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 (m^3)
S_{Tot} = total of spatial coefficient values from property line exposures on all sides

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

		Exposure Distance (m)	(For All Buildings)
S_{Side1} =	0.00	>10	(North)
S_{Side2} =	0.00	>10	(East)
S_{Side3} =	0.00	>10	(South)
S_{Side4} =	0.00	>10	(West)
S_{Tot} =	**1.00**		

1.0 + (Sside 1 + Sside 2 + Sside 3 + Sside 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 Seperation)

Building Information based on Architectural Drawing

	Building A	Building B	Building C	Building D	Building E	
Floor Area (m)	8,920	8,920	8,920	10,405	3,900	
Building Height (m)	7	9	7	9	7	
Total Building Volume (m3)	62,440	80,280	62,440	93,645	27,300	
Min Wat Supply Volume -Q (L)	1,061,480	1,364,760	1,061,480	1,591,965	464,100	*

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. **=** 270 000L **

Required Fire Protection water Supply Volume **(Highest Between * and **) =** **1,591,965** L

APPENDIX E

Civil Engineering Drawings

INDUSTRIAL PARK
6160 THUNDER RD
OTTAWA, ON

REVISION 01

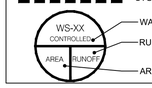
KEY PLAN (N.T.S.)

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

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

PROPOSED DEVELOPMENT
6160 THUNDER ROAD
REV.01 - ISSUED FOR APPROVAL - NOVEMBER 2021
LRL PROJECT no: 200578

LICENSED PROFESSIONAL ENGINEER
V. JOHNSON
100510576
NOV 25, 2021
PROVINCE OF ONTARIO
NOT AUTHENTIC UNLESS SIGNED AND DATED



GENERAL NOTES

1. ALL WORKS MATERIALS SHALL CONFIRM TO THE LAST REVISION OF THE STANDARDS AND SPECIFICATIONS FOR THE CITY OF OTTAWA, ONTARIO PROVINCIAL STANDARD DRAWINGS (OPSD) AND SPECIFICATIONS (OPSS), WHERE APPLICABLE. LOCAL UTILITY STANDARDS AND MINISTRY OF TRANSPORTATION STANDARDS WILL APPLY WHERE REQUIRED.
2. THE CONTRACTORS SHALL CONFIRM THE LOCATION OF ALL EXISTING UTILITIES WITHIN THE SITE AND ADJACENT WORK AREAS. THE CONTRACTORS SHALL BE RESPONSIBLE FOR PROTECTING ALL EXISTING UTILITIES TO THE SATISFACTION OF THE AUTHORITY HAVING JURISDICTION. THE CONTRACTOR SHALL BE RESPONSIBLE FOR THE REPAIR OR REPLACEMENT OF ANY SERVICES OR UTILITIES DISTURBED DURING CONSTRUCTION , TO THE SATISFACTION OF THE AUTHORITY HAVING JURISDICTION.
3. ALL DIMENSIONS SHALL BE CHECKED AND VERIFIED IN THE FIELD BY THE CONTRACTOR PRIOR TO THE START OF CONSTRUCTION, ANY DISCREPANCIES SHALL BE REPORTED IMMEDIATELY TO THE ENGINEER. LOST TIME DUE TO FAILURE OF THE CONTRACTORS TO CONFIRM UTILITY LOCATIONS AND NOTIFY ENGINEER OF POSSIBLE CONFLICTS PRIOR TO CONSTRUCTION WILL BE AT CONTRACTORS EXPENSE.
4. ANY AREA BEYOND THE LIMIT OF THE SITE DISTURBED DURING CONSTRUCTION SHALL BE RESTORED TO ORIGINAL CONDITION OR BETTER TO THE SATISFACTION OF THE AUTHORITY HAVING JURISDICTION AT THE CONTRACTOR'S EXPENSE.
   RELOCATING OF EXISTING SERVICES AND/OR UTILITIES SHALL BE AS SHOWN ON THE DRAWINGS OR DETECTED BY THE ENGINEER AT THE EXPENSE OF DEVELOPERS.
5. ALL WORK SHALL BE COMPLETED IN ACCORDANCE WITH THE 'OCCUPATIONAL HEALTH AND SAFETY ACT AND REGULATIONS FOR CONSTRUCTION PROJECTS'. THE GENERAL CONTRACTORS SHALL BE DEEMED TO BE THE 'CONTRACTOR' AS DEFINED IN THE ACT.
6. ALL THE CONSTRUCTION SIGNAGE MUST CONFIRM TO THE MINISTRY OF TRANSPORTATION OF ONTARIO MANUAL OF UNIFORM TRAFFIC CONTROL DEVICES PER LATEST AMENDMENT.
7. THE CONTRACTOR IS ADVISED THAT WORKS BY OTHERS MAY BE ONGOING DURING THE PERIOD OF THE CONTRACT. THE CONTRACTOR SHALL COORDINATE CONSTRUCTION ACTIVITIES TO PREVENT CONFLICTS.
8. ALL DIMENSIONS ARE IN METRES UNLESS SPECIFIED OTHERWISE.
9. THERE WILL BE NO SUBSTITUTION OF MATERIALS UNLESS PRIOR WRITTEN APPROVAL IS RECEIVED FROM THE ENGINEER.
10. ALL CONSTRUCTION SHALL BE CARRIED OUT IN ACCORDANCE WITH THE RECOMMENDATIONS MADE IN THE GEOTECHNICAL REPORT.
11. FOR DETAILS RELATING TO STORMWATER MANAGEMENT AND ROOF DRAINAGE REFER TO THE SITE SERVICING AND STORMWATER MANAGEMENT REPORT.
12. ALL SEWERS CONSTRUCTED WITH GRADES LESS THAN 1.0% SHALL BE INSTALLED USING LASER ALIGNMENT AND CHECKED WITH LEVEL INSTRUMENT PRIOR TO BACKFILLING.
13. THE CONTRACTOR IS RESPONSIBLE FOR OBTAINING ALL PERMITS REQUIRED AND TO BEAR THE COST OF THE SAME.
14. THE CONTRACTOR SHALL BE RESPONSIBLE FOR ADDITIONAL BEDDING, OR ADDITIONAL STRENGTH PIPE IF THE MAXIMUM TRENCH WIDTH AS SPECIFIED BY OPSD IS EXCEEDED.
15. ALL PIPE/CULVERT SECTION SIZES REFER TO INSIDE DIMENSIONS.
16. SHOULD DEEPLY BURIED ARCHAEOLOGICAL REMAINS BE FOUND ON THE PROPERTY DURING CONSTRUCTION ACTIVITIES, THE HERITAGE OPERATIONS UNIT OF THE ONTARIO MINISTRY OF CULTURE MUST BE NOTIFIED IMMEDIATELY.
17. ALL NECESSARY CLEARING AND GRUBBING SHALL BE COMPLETED BY THE CONTRACTOR. REVIEW WITH CONTRACT ADMINISTRATOR AND THE CITY OF OTTAWA PRIOR TO ANY TREE CUTTING/REMOVAL.
18. DRAWINGS SHALL BE READ ON CONJUNCTION WITH ARCHITECTURAL SITE PLAN.
19. THE CONTRACTOR SHALL PROVIDE THE PROJECT ENGINEER ON SET OF AS CONSTRUCTED SITE SERVICING AND GRADING DRAWINGS.
20. BENCHMARKS: IT IS THE RESPONSIBILITY OF THE CONTRACTOR TO VERIFY THAT THE SITE BENCHMARK(S) HAS NOT BEEN ALTERED OR DISTURBED AND THAT ITS RELATIVE ELEVATION AND DESCRIPTION AGREES WITH THE INFORMATION DEPICTED ON THIS PLAN.

EROSION AND SEDIMENT CONTROL NOTES

GENERAL

THE CONTRACTOR SHALL IMPLEMENT BEST MANAGEMENT PRACTICES, TO PROVIDE FOR PROTECTION OF THE AREA DRAINAGE SYSTEM AND THE RECEIVING WATERCOURSE, DURING CONSTRUCTION ACTIVITIES. THE CONTRACTOR ACKNOWLEDGES THAT FAILURE TO IMPLEMENT APPROPRIATE EROSION AND SEDIMENT CONTROL MEASURES MAY BE SUBJECT TO PENALTIES IMPOSED BY ANY APPLICABLE REGULATORY AGENCY.

THE CONTRACTOR ACKNOWLEDGES THAT SURFACE EROSION AND SEDIMENT RUNOFF RESULTING FROM THEIR CONSTRUCTION OPERATIONS HAS POTENTIAL TO CAUSE A DETRIMENTAL IMPACT TO ANY DOWNSTREAM WATERCOURSE OR SEWER, AND THAT ALL CONSTRUCTION OPERATIONS THAT MAY IMPACT UPON WATER QUALITY SHALL BE CARRIED OUT IN MANNER THAT STRICTLY MEETS THE REQUIREMENT OF ALL APPLICABLE LEGISLATION AND REGULATIONS.

AS SUCH, THE CONTRACTOR SHALL BE RESPONSIBLE FOR CARRYING OUT THEIR OPERATIONS, AND SUPPLYING AND INSTALLING ANY APPROPRIATE CONTROL MEASURES, SO AS TO PREVENT SEDIMENT LADEN RUNOFF ENTERING ANY SEWER OR WATERCOURSE WITHIN OR DOWNSTREAM OF THE WORKING AREA.

THE CONTRACTOR ACKNOWLEDGES THAT NO ONE MEASURE IS LIKELY TO BE 100% EFFECTIVELY FOR EROSION PROTECTION AND CONTROLLING SEDIMENT RUNOFF AND DISCHARGES FROM THE SITE. THEREFORE, WHERE NECESSARY THE CONTRACTOR SHALL IMPLEMENT ADDITIONAL MEASURES ARRANGED IN SUCH MANNER AS TO MITIGATE SEDIMENT RELEASE FROM THE CONSTRUCTION OPERATIONS AND ACHIEVE SPECIFIC MAXIMUM PERMITTED CRITERIA WHERE APPLICABLE. SUGGESTED ON-SITE MEASURES MAY INCLUDE, BUT SHALL NOT BE LIMITED TO, THE FOLLOWING METHODS: SEDIMENT PONDS, FILTER BAGS, PUMP FILTERS, SETTLING TANKS, SILT FENCE, STRAW BALES, FILTER CLOTHS, CATCH BASIN FILTERS, CHECK DAMS AND/OR OTHER RECOGNIZED TECHNOLOGIES AND METHOD AVAILABLE AT THE TIME OF CONSTRUCTION. SPECIFIC MEASURES SHALL BE INSTALLED IN ACCORDANCE WITH REQUIREMENTS OF OPSS 577 WHERE APPROPRIATE, OR IN ACCORDANCE WITH MANUFACTURER'S RECOMMENDATIONS.

WHERE, IN THE OPINION OF THE CONTRACT ADMINISTRATOR OR REGULATORY AGENCY, THE INSTALLED CONTROL MEASURES FAIL TO PERFORM ADEQUATELY, THE CONTRACTOR SHALL SUPPLY AND INSTALL ADDITIONAL OR ALTERNATIVE MEASURES AS DIRECTED BY THE CONTRACT ADMINISTRATOR OR REGULATORY AGENCY, AS SUCH, THE CONTRACTOR SHALL HAVE ADDITIONAL CONTROL MATERIALS ON SITE AT ALL TIME WHICH ARE EASILY ACCESSIBLE AND MAY BE IMPLEMENTED BY HIM AT THE MOMENT'S NOTICE.

PRIOR TO COMMENCING WORK, THE CONTRACTOR SHALL SUBMIT TO THE CONTRACT ADMINISTRATOR SIX COPIES OF A DETAILED EROSION AND SEDIMENT CONTROL PLAN (ESCP). THE ESCP WILL CONSIST OF WRITTEN DESCRIPTION AND DETAILED DRAWINGS INDICATING THE ON-SITE ACTIVITIES AND MEASURES TO BE USED TO CONTROL EROSION AND SEDIMENT MOVEMENT FOR EACH STEP OF THE WORK.

CONTRACTOR'S RESPONSIBILITIES

THE CONTRACTOR SHALL ENSURE THAT ALL WORKERS, INCLUDING SUB-CONTRACTOR, IN THE WORKING ARE ARE AWARE OF THE IMPORTANCE OF THE EROSION AND SEDIMENT CONTROL MEASURES AND INFORMED OF THE CONSEQUENCES OF THE FAILURE TO COMPLY WITH THE REQUIREMENTS OF ALL REGULATORY AGENCIES.

THE CONTRACTOR SHALL PERIODICALLY, AND WHEN REQUESTED BY THE CONTRACT ADMINISTRATOR, CLEAN OUT ACCUMULATED SEDIMENT DEPOSITS AS REQUIRED AT THE SEDIMENT CONTROL DEVICES, INCLUDING THOSE DEPOSITS THAT MAY ORIGINATE FROM OUTSIDE THE CONSTRUCTION AREA. ACCUMULATED SEDIMENT SHALL BE REMOVED IN SUCH A MANNER THAT PREVENTS THE DEPOSITION OF THIS MATERIAL INTO THE SEWER WATERCOURSE AND AVOIDS DAMAGE TO CONTROL MEASURES. THE SEDIMENT SHALL BE REMOVED FROM THE SITE AT THE CONTRACTOR'S EXPENSE AND MANAGED IN COMPLIANCE WITH REQUIREMENTS FRO EXCESS EARTH MATERIAL, AS SPECIFIED ELSEWHERE IN THE CONTRACT.

THE CONTRACTOR SHALL IMMEDIATELY REPORT TO THE CONTRACT ADMINISTRATOR ANY ACCIDENTAL DISCHARGES OF SEDIMENT MATERIAL INTO EITHER THE WATERCOURSE OR THE STORM SEWER SYSTEM. FAILURE TO REPORT WILL BE CONSTITUTE A BRACH OF THIS SPECIFICATION AND THE CONTRACTOR MAY ALSO BE SUBJECT TO THE PENALTIES IMPOSED BY THE APPLICABLE REGULATORY AGENCY. APPROPRIATE RESPONSE MEASURES, INCLUDING ANY REPAIRS TO EXISTING CONTROL MEASURES OR THE IMPLEMENTATION OF ADDITIONAL CONTROL MEASURES, SHALL BE CARRIED OUT BY THE CONTRACTOR WITHOUT DELAY.

THE SEDIMENT CONTROL MEASURES SHALL ONLY BE REMOVED WHEN, IN THE OPINION OF THE CONTRACT ADMINISTRATOR, THE MEASURE OR MEASURES, IS NO LONGER REQUIRED. NO CONTROL MEASURE MAY BE PERMANENTLY REMOVED WITHOUT PRIOR AUTHORIZATION FROM THE CONTRACT ADMINISTRATOR. ALL SEDIMENT AND EROSION CONTROL MEASURES SHALL BE REMOVED IN A MANNER THAT AVOIDS THE ENTRY OF ANY EQUIPMENT, OTHER THAN HAND-HELD EQUIPMENT, INTO ANY WATERCOURSE, AND PREVENTS THE RELEASE OF ANY SEDIMENT OR DEBRIS INTO ANY SEWER OR WATERCOURSE WITHIN OR DOWNSTREAM OF THE WORKING AREA. ALL ACCUMULATED SEDIMENT SHALL BE REMOVED FROM THE WORKING AREA AT THE CONTRACTOR'S EXPENSE AND MANAGED IN COMPLIANCE WITH THE REQUIREMENTS FOR EXCESS EARTH MATERIAL

WHERE, IN THE OPINION OF EITHER THE CONTRACT ADMINISTRATOR OR A REGULATORY AGENCY, ANY OF THE TERMS SPECIFIED HEREIN HAVE NOT BEEN COMPLIED WITH OR PERFORMED IN A SUITABLE MANNER, OR TAT ALL, THE CONTRACTOR ADMINISTRATOR OR A REGULATORY AGENCY HAS THE RIGHT TO IMMEDIATELY WITHDRAW ITS PERMISSION TO CONTINUE THE WORK BUT MAY RENEW ITS PERMISSION UPON BEING SATISFIED THAT THE DEFAULTS OR DEFICIENCIES IN THE PERFORMANCE OF THIS SPECIFICATION BY THE CONTRACTOR HAVE BEEN REMEDIED.

SPILL CONTROL NOTES

1. ALL CONSTRUCTION EQUIPMENT SHALL BE RE-FUELED, MAINTAINED, AND STORED NO LESS THAN 30 METRES FROM WATERCOURSE, STEAMS, CREEKS, WOODLOTS, AND ANY ENVIRONMENTALLY SENSITIVE AREAS, OR AS OTHERWISE SPECIFIED.
2. THE CONTRACTOR MUST IMPLEMENT ALL NECESSARY MEASURES IN ORDER TO PREVENT LEAKS, DISCHARGES OR SPILLS OF POLLUTANTS, DELETERIOUS MATERIALS, OR OTHER SUCH MATERIALS OR SUBSTANCES WHICH WOULD OR COULD CAUSE AN ADVERSE IMPACT TO THE NATURAL ENVIRONMENT.
3. IN THE EVENT OF A LEAK, DISCHARGE OR SPILL OF POLLUTANT, DELETERIOUS MATERIAL OR OTHER SUCH MATERIAL OR SUBSTANCE WHICH WOULD OR COULD CAUSE AN ADVERSE IMPACT TO THE NATURAL ENVIRONMENT, THE CONTRACTOR SHALL:
   - 3.1. IMMEDIATELY NOTIFY APPROPRIATE FEDERAL, PROVINCIAL, AND LOCAL GOVERNMENT MINISTRIES, DEPARTMENTS, AGENCIES, AND AUTHORITIES OF THE INCIDENT IN ACCORDANCE WITH ALL CURRENT LAWS, LEGISLATION, ACTS, BY-LAWS, PERMITS, APPROVALS, ETC.
   - 3.2. TAKE IMMEDIATE MEASURES TO CONTAIN THE MATERIAL OR SUBSTANCE, AND TO TAKE SUCH MEASURES TO MITIGATE AGAINST ADVERSE IMPACTS TO THE NATURAL ENVIRONMENT.
   - 3.3. RESTORE THE AFFECTED AREA TO THE ORIGINAL CONDITION OR BETTER TO THE SATISFACTION OF THE AUTHORITIES HAVING JURISDICTION.

MUD MAT NOTES

1. THE GRANULAR MATERIAL WILL REQUIRE PERIODIC REPLACEMENT AS IT BECOMES CONTAMINATED BY VEHICLE TRAFFIC.
2. SEDIMENT SHALL BE CLEANED FROM PUBLIC ROADS AT THE END OF EACH DAY.
3. SEDIMENT SHALL BE REMOVED FROM PUBLIC ROADS BY SHOVELING OR SWEEPING AND DISPOSED OR PROPERLY IN A CONTROLLED SEDIMENT DISPOSAL AREA.

SITE GRADING NOTES

1. PRIOR TO THE COMMENCEMENT OF THE SITE GRADING WORKS, ALL SILTATION CONTROL DEVICES SHALL BE INSTALLED AND OPERATIONAL PER EROSION CONTROL PLAN.
2. ALL GRANULAR AND PAVEMENT FOR ROADS/PARKING AREAS SHALL BE CONSTRUCTED IN ACCORDANCE WITH GEOTECHNICAL ENGINEER'S RECOMMENDATIONS.
3. ALL TOPSOIL AND ORGANIC MATERIAL SHALL BE STRIPPED WITHIN THE ROAD AND PARKING AREAS ALLOWANCE PRIOR TO THE COMMENCEMENT OF CONSTRUCTION.
4. PAVEMENT REINSTATEMENT FOR SERVICE AND UTILITY CUTS SHALL BE IN ACCORDANCE WITH THE CITY OF OTTAWA STD. R10 AND OPSD 509.010 AND OPSS 310.
5. GRANULAR 'A' SHALL BE PLACED TO A MINIMUM THICKNESS OF 30MM AROUND ALL STRUCTURES WITHIN THE PAVEMENT AREA.
6. SUB-EXCAVATE SOFT AREAS AND FILL WITH GRANULAR 'B' COMPACTED IN MAXIMUM 30MM LIFTS.
7. ALL WORK ON THE MUNICIPAL RIGHT OF WAY AND EASEMENTS TO BE INSPECTED BY THE MUNICIPALITY PRIOR BACKFILLING.
8. CONTRACTOR TO OBTAIN A ROAD OCCUPANCY PERMIT 48 HOURS PRIOR TO COMMENCING ANY WORK WITHIN THE MUNICIPAL ROAD ALLOWANCE, IF REQUIRED BY THE MUNICIPALITY.
9. ALL PAVEMENT MARKING FEATURES AND SITE SIGNAGE SHALL BE PLACED PER ARCHITECTURAL SITE PLAN. LINE PAINTING AND DIRECTIONAL SYMBOLS SHALL BE APPLIED WITH A MINIMUM OF TWO COATS OF ORGANIC SOLVENT PAINT.
10. REFER TO ARCHITECTURAL SITE PLAN FOR DIMENSIONS AND SITE DETAILS.
11. STEP JOINTS ARE TO BE USED WHERE PROPOSED ASPHALT MEETS EXISTING ASPHALT. ALL JOINTS MUST BE SEALED.
12. WHERE APPLICABLE THE CONTRACTOR IS TO SUBMIT SHOP DRAWINGS TO THE ENGINEER FOR APPROVAL PRIOR TO CONSTRUCTION. SHOP DRAWINGS MUST BE SITE SPECIFIC, SIGNED AND SEALED BY A LICENSED STRUCTURAL ENGINEER. ANY MODIFICATIONS IN ELEVATION BETWEEN THE SURVEY AND CONSTRUCTION THAT WILL AFFECT THE PROJECT ARE TO BE COMMUNICATED WITH THE ENGINEER PRIOR TO START OF CONSTRUCTION
13. PRIOR TO START OF ANY WORK ON SITE, THE CONTRACTOR IS RESPONSIBLE TO FIELD VERIFY EXISTING GRADES AND ENSURE OVERLAND DRAINAGE IS FEASIBLE WITH ACTUAL SITE CONDITIONS
14. ANY DISCREPANCIES ARE TO BE COMMUNICATED WITH THE ENGINEER PRIOR TO CONSTRUCTION.

ROADWORK SPECIFICATIONS

15. ROADWORK TO BE COMPLETED IN ACCORDANCE WITH GEOTECHNICAL REPORT, PREPARED BY PATERSON GROUP, DATED JULY 22ND 2021.
16. AL TOPSOIL AND ORGANIC MATERIAL SHALL BE STRIPPED WITHIN THE ROAD ALLOWANCE PRIOR TO THE COMMENCEMENT OF CONSTRUCTION AND STOCK PILLED ON SITE AS DIRECTED BY NATIONAL MUNICIPALITY.
17. THE SUBGRADE SHALL BE CROWNED AND SLOPED AT LEAST 2% AND PROOF ROLLED WITH HEAVY ROLLERS.
18. SUB-EXCAVATE SOFT AREAS AND FILL WITH GRANULAR 'A', TYPE II COMPACTED IN MAXIMUM 300MM LIFTS.
19. ALL GRANULAR FOR ROADS SHALL BE COMPACTED TO MINIMUM OF 100% STANDARD PROCTOR DENSITY MAXIMUM DRY DENSITY (SPMDD).

SANITARY, FOUNDATION DRAIN, STORM SEWER AND WATERMAIN NOTES

GENERAL

1. LASER ALIGNMENT CONTROL TO BE UTILIZED ON ALL SEWER INSTALLATIONS.
2. CLAY SEALS TO BE INSTALLED AS PER CITY STANDARD DRAWING S8. THE SEALS SHOULD BE AT LEAST 1.5M LONG (IN THE TRENCH DIRECTION) AND SHOULD EXTEND FROM TRENCH WALL TO TRENCH WALL. THE SEALS SHOULD EXTEND FROM THE FROST LINE AND FULLY PENETRATE THE BEDDING, SUB-BEDDING, AND COVER MATERIAL. THE BARRIERS SHOULD CONSIST OF RELATIVELY DRY AND COMPATIBLE BROWN SILTY CLAY PLACED IN MAXIMUM 225MM LIFTS AND COMPACTED TO A MINIMUM OF 95% SPMDD. THE CLAY SEALS SHOULD BE PLACED AT THE SITE BOUNDARIES AND AT 60M INTERVALS IN THE SERVICE TRENCHES.
3. SERVICES TO BUILDING TO BE TERMINATED 1.0M FROM THE OUTSIDE FACE OF BUILDING UNLESS OTHERWISE NOTED.
4. ALL MAINTENANCE STRUCTURE AND CATCH BASIN EXCAVATIONS TO BE BACKFILLED WITH GRANULAR MATERIAL COMPACTED TO 98% STANDARD PROCTOR DENSITY. A MINIMUM OF 300MM AROUND STRUCTURES.
5. "MODULOC" OR APPROVED PRE-CAST MAINTENANCE STRUCTURE AND CATCH BASIN ADJUSTERS TO BE USED IN LIEU OF BRICKING. PARGE ADJUSTING UNITS ON THE OUTSIDE ONLY.
6. SAFETY PLATFORMS SHALL BE PER OPSD 404.02.
7. DROP STRUCTURES SHALL BE IN ACCORDANCE WITH OPSD 1003.01, IF APPLICABLE.
8. THE CONTRACTOR IS TO PROVIDE CCTV CAMERA INSPECTIONS OF ALL SEWERS, INCLUDING PICTORIAL REPORT, ONE (1) CD COPY AND TWO (2) VIDEO RECORDING IN A FORMAT ACCEPTABLE TO ENGINEER. ALL SEWER ARE TO BE FLUSHED PRIOR TO CAMERA INSPECTION. ASPHALT WEAR COURSE SHALL NOT BE PLACED UNTIL THE VIDEO INSPECTION OF SEWERS AND NECESSARY REPAIRS HAVE BEEN COMPLETED TO THE SATISFACTION OF THE ENGINEER.
9. CONTRACTOR SHALL PERFORM LEAKAGE TESTING, IN THE PRESENCE OF THE CONSULTANT, FOR SANITARY SEWERS IN ACCORDANCE WITH OPSS 407. CONTRACTOR SHALL PERFORM VIDEO INSPECTION OF ALL SEWERS. A COPY OF THE VIDEO AND INSPECTION REPORT SHALL BE SUBMITTED TO THE CONSULTANT FOR REVIEW AND APPROVAL PRIOR TO PLACEMENT OF WEAR COURSE ASPHALT.

SANITARY

10. ALL SANITARY SEWER INSTALLATION SHALL CONFORM TO THE LATEST REVISIONS OF THE CITY OF OTTAWA AND THE ONTARIO PROVINCIAL STANDARD DRAWINGS (OPSD). AND SPECIFICATIONS (OPSS).
11. ALL SANITARY GRAVITY SEWER SHALL BE PVC SDR 35, IPEX 'RING-TITE' (OR APPROVED EQUIVALENT) PER CSA STANDARD B182.2 OR LATEST AMENDMENT, UNLESS SPECIFIED OTHERWISE.
12. SANITARY GRAVITY SEWER TRENCH AND BEDDING SHALL BE PER CITY OF OTTAWA STD. S6 AND S7 CLASS 'B' BEDDING, UNLESS SPECIFIED OTHERWISE.
13. SANITARY MAINTENANCE STRUCTURE FRAME AND COVERS SHALL BE PER CITY OF OTTAWA STD. S24 AND S25.
14. SANITARY MAINTENANCE STRUCTURES SHALL BE BENCHED PER OPSD 701.021.
15. 100MM THICK HIGH-DENSITY GRADE 'A' POLYSTYRENE INSULATION TO BE INSTALLED IN ACCORDANCE WITH CITY STD W22 WHERE INDICATED ON DRAWING SSP-1.

STORM

16. ALL REINFORCED CONCRETE STORM SEWER PIPE SHALL BE IN ACCORDANCE WITH CSA A257.2, OR LATEST AMENDMENT. ALL NON-REINFORCED CONCRETE STORM SEWER PIPE SHALL BE IN ACCORDANCE WITH CSA A257.1, OR LATEST AMENDMENT. PIPE SHALL BE JOINED WITH STD. RUBBER GASKETS AS PER CSA A257.3, OR LATEST AMENDMENT.
17. ALL STORM SEWER TRENCH AND BEDDING SHALL BE IN ACCORDANCE WITH THE CITY OF OTTAWA STD. S6 AND S7 CLASS 'B' UNLESS OTHERWISE SPECIFIED. BEDDING AND COVER MATERIAL SHALL BE SPECIFIED BY PROJECT GEOTECHNICAL ENGINEER.
18. ALL PVC STORM SEWERS ARE TO BE SDR 35 APPROVED PER C.S.A. B182.2 OR LATEST AMENDMENT, UNLESS OTHERWISE SPECIFIED.
19. CATCH BASIN SHALL BE IN ACCORDANCE WITH OPSD 705.010.
20. ALL CATCH BASINS SHALL HAVE 600MM SUMPS, UNLESS SPECIFIED OTHERWISE.
21. THE STORM SEWER CLASSES HAVE BEEN DESIGNED BASED ON BEDDING CONDITIONS SPECIFIED ABOVE. WHERE THE SPECIFIED TRENCH WIDTH IS EXCEEDED , THE CONTRACTOR IS REQUIRED TO PROVIDE AND SHALL BE RESPONSIBLE FOR EXTRA TEMPORARY AND/OR PERMANENT REPAIRS MADE NECESSARY BY THE WIDENED TRENCH.
22. ALL ROAD AND PARKING LOT CATCH BASINS TO BE INSTALLED WITH ORTHOGONALLY PLACED SUBDRAINS IN ACCORDANCE WITH DETAIL. PERFORATED SUBDRAIN FOR ROAD AND PARKING LOT CATCH BASIN SHALL BE INSTALLED PER CITY STD R1 UNLESS OTHERWISE NOTED.
23. PERFORATED SUBDRAIN FOR REAR YARD AND LANDSCAPING APPLICATIONS SHALL BE INSTALLED PER CITY STD S29, S30 AND S31, WHERE APPLICABLE.
24. RIP-RAP TREATMENT SEWER AND CULVERT OUTLETS PER OPSD 810.010.
25. ALL STORM SEWER/ CULVERTS TO BE INSTALLED WITH FROST TREATMENT PER OPSD 803.031 WHERE APPLICABLE.
26. ALL STORM MANHOLES WITH PIPE LESS THAN 900MM IN DIAMETER SHALL BE CONSTRUCTED WITH A 300MM SUMP AS PER SDG, CLAUSE 6.2.6.

WATERMAIN (DOMESTIC)

27. ALL WATERMAIN INSTALLATION SHALL CONFORM TO THE LATEST REVISIONS OF THE CITY OF OTTAWA AND THE ONTARIO PROVINCIAL STANDARD DRAWINGS (OPSD) AND SPECIFICATIONS (OPSS).
28. ALL PVC WATERMAINS SHALL BE AWWA C-900 CLASS 150, SDR 18 OR APPROVED EQUIVALENT.
29. WATERMAIN TRENCH AND BEDDING SHALL BE IN ACCORDANCE WITH CITY OF OTTAWA STANDARD W17. UNLESS SPECIFIED OTHERWISE. BEDDING AND COVER MATERIAL SHALL BE SPECIFIED BY THE PROJECT GEOTECHNICAL ENGINEER.
30. ALL PVC WATERMAINS, SHALL BE INSTALLED WITH A 10 GAUGE STRANDED COPPER TWU OR RWU TRACER WIRE IN ACCORDANCE WITH CITY OF OTTAWA STD. W.36.
31. CATHODIC PROTECTION IS REQUIRED ON ALL METALLIC FITTINGS PER CITY OF OTTAWA STD.25.5 AND W25.6.
32. VALVE BOXES SHALL BE INSTALLED PER CITY OF OTTAWA STD W24.
33. WATERMAIN IN FILL AREAS TO BE INSTALLED WITH RESTRAINED JOINTS PER CITY OF OTTAWA STD.25.5 AND W25.6.
34. THRUST BLOCKING OF WATERMAINS TO BE INSTALLED PER CITY OF OTTAWA STD. W25.3 AND W25.4.
35. THE CONTRACTOR SHALL PROVIDE ALL TEMPORARY CAPS, PLUGS, BLOW-OFFS, AND NOZZLES REQUIRED FOR TESTING AND DISINFECTION OF THE WATERMAIN.
36. WATERMAIN CROSSING OVER AND BELOW SEWERS SHALL BE IN ACCORDANCE WITH THE CITY OF OTTAWA STD. W25,2 AND W25, RESPECTIVELY.
37. WATER SERVICES ARE TO BE INSULATED PER CITY STD. W23 WHERE SEPARATION BETWEEN SERVICES AND MAINTENANCE HOLES ARE LESS THAN 2.4M.
38. THE MINIMUM VERTICAL CLEARANCE BETWEEN WATERMAIN AND SEWER/UTILITY IS 0.5M PER MOE GUIDELINES. FOR CROSSING UNDER SEWERS, ADEQUATE STRUCTURAL SUPPORT FOR THE SEWER IS REQUIRED TO PREVENT EXCESSIVE DEFLECTION OF JOINTS AND SETTLING. THE LENGTH OF WATER PIPE SHALL BE CENTERED AT THE POINT OF CROSSING TO ENSURE THAT THE JOINTS WILL BE EQUIDISTANT AND AS FAR AS POSSIBLE FROM THE SEWER.
39. ALL WATERMAINS SHALL HAVE A MINIMUM COVER OR 2.4M, OTHERWISE THERMAL INSULATION IS REQUIRED AS PER STD DWG W22.
40. GENERAL WATER PLANT TO UTILITY CLEARANCE AS PER STD DWG R20.
41. FIRE HYDRANT INSTALLATION AS PER STD DWG W19, ALL BOTTOM OF HYDRANT FLANGE ELEVATIONS TO BE INSTALLED 0.10M ABOVE PROPOSED FINISHED GRADE AT HYDRANT; FIRE HYDRANT LOCATION AS PER STD DWG W18.
42. BUILDING SERVICE TO BE CAPPED 1.0M OFF THE FACE OF THE BUILDING UNLESS OTHERWISE NOTED AND MUST BE RESTRAINED A MINIMUM OF 12M BACK FROM STUB.
43. ALL WATERMAINS SHALL BE HYDROSTATICALLY TESTED IN ACCORDANCE WITH THE CITY OF OTTAWA AND ONTARIO GUIDELINES UNLESS OTHERWISE DIRECTED. PROVISIONS FOR FLUSHING WATER LINE PRIOR TO TESTING, ETC. MUST BE PROVIDED.
44. ALL WATERMAINS SHALL BE BACTERIOLOGICALLY TESTED IN ACCORDANCE WITH THE CITY OF OTTAWA AND ONTARIO GUIDELINES. ALL CHLORINATED WATER TO BE DISCHARGED AND PRETREATED TO ACCEPTABLE LEVELS PRIOR TO DISCHARGE. ALL DISCHARGED WATER MUST BE CONTROLLED AND TREATED SO AS NOT TO ADVERSELY EFFECT ENVIRONMENT. IT IS RESPONSIBILITY OF THE CONTRACTOR TO ENSURE THAT ALL MUNICIPAL AND/OR PROVINCIAL REQUIREMENTS ARE FOLLOWED.
45. ALL WATERMAIN STUBS SHALL BE TERMINATED WITH A PLUG AND 50MM BLOW OFF UNLESS OTHERWISE NOTED.
46. FOR FIRE PROTECTION WATERMAIN INSTALLATION REQUIREMENTS, DETAILS TO BE CONFIRMED BY FIRE CONSULTANTS.

LEGEND:

━━━	EXISTING PROPERTY LINE TO REMAIN
═══	PROPOSED CURB
═══ DC	PROPOSED DEPRESSED CURB
┬┬┬┬	PROPOSED TERRACING (3:1 MIN.)
—□—□—	PROPOSED SILT FENCE AS PER OPSD 219.110
—○—○—	PROPOSED FENCE
▼	PROPOSED DOOR ENTRANCE/EXIT
▨	PROPOSED GRASS AREA (100mm TOP SOIL & SOD)
▨	PROPOSED CONCRETE FEATURES/SLAB
□	PROPOSED HEAVY DUTY ASPHALT
▨	PROPOSED LIGHT DUTY ASPHALT
▨	PROPOSED RIP RAP
×50.00	PROPOSED ELEVATION
×50.00HP	PROPOSED HIGH POINT ELEVATION
×50.00BC	PROPOSED BOTTOM OF CURB / ASPHALT ELEVATION
×50.00TC	PROPOSED TOP OF CURB ELEVATION
×50.00EX	MATCH INTO EXISTING ELEVATION
×70.19	EXISTING ELEVATION
➡	PROPOSED OVERLAND MAJOR FLOW ROUTE
— SUB — SUB —	PROPOSED 100mmØ PERFORATED SUBDRAIN
— STM — STM —	PROPOSED STORM SEWER
— SAN — SAN —	PROPOSED SANITARY SEWER
— WTR — WTR —	PROPOSED 75mmØ WATER SERVICE
— WM-FP — WM-FP —	PROPOSED 250mmØ WATERMAIN (FIRE PROTECT)
— STM — STM —	EXISTING STORM SEWER
— SAN — SAN —	EXISTING SANITARY SEWER
— WTR — WTR —	EXISTING WATERMAIN
— GAS — GAS —	EXISTING GAS LINE
●	EXISTING MANHOLE
■	EXISTING CATCHBASIN
■	PROPOSED CATCHBASIN-MANHOLE/CATCHBASIN
●	PROPOSED MANHOLE
⊗	PROPOSED CURB STOP
▬▬▬	PROPOSED PIPE INSULATION
— — —	PROPOSED 100 YEAR HIGH WATER LEVEL
■ ■ ■ ■	STORM WATERSHED EXTENT
WS-XX	WATERSHED NAME
CONTROLLED / RUNOFF	RUNOFF COEFFICIENT
AREA	AREA IN HECTARES

PAVEMENT STRUCTURE

		THICKNESS (mm)	
COURSE	MATERIAL	AUTOMOBILE PARKING	TRUCK ROUTE (HEAVY TRAFFIC)
SURFACE	HL.3 OR SUPERPAVE 12.5 ASPHALTIC CONCRETE	50	40
BINDER	HL.8 A/C (PG 58-28)	--	50
BASECOURSE	OPSS GRANULAR "A"	150	150
SUBBASE	OPSS GRANULAR "B" TYPE II	300	450

NOTE:
IN PREPARATION FOR PAVEMENT CONSTRUCTION AT THIS SITE, ANY SURFICIAL OR NEAR SURFACE/SUBGRADE LEVEL TOPSOIL AND ANY SOFT, WET OR DELETERIOUS MATERIALS SHOULD BE REMOVED FROM THE PROPOSED PAVED AREAS. THE EXPOSED SUBGRADE SHOULD BE INSPECTED AND APPROVED BY GEOTECHNICAL PERSONNEL AND ANY SOFT AREAS EVIDENT SHOULD BE SUBEXCAVATED AND REPLACED WITH SUITABLE EARTH BORROW APPROVED BY THE GEOTECHNICAL ENGINEER. THE SUBGRADE SHOULD BE SHAPED AND CROWNED TO PROMOTE DRAINAGE OF THE SITE DRAINAGE STRUCTURES. FOLLOWING APPROVAL OF THE PREPARATION OF THE SUBGRADE, THE PAVEMENT GRANULARS MAY BE PLACED.

PAVEMENT STRUCTURE AS PER GEOTECHNICAL REPORT PREPARED BY PATERSON GROUP, DATED JULY 22ND, 2021.

USE AND INTERPRETATION OF DRAWINGS

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

V. JOHNSON
100510576
Nov 25, 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.

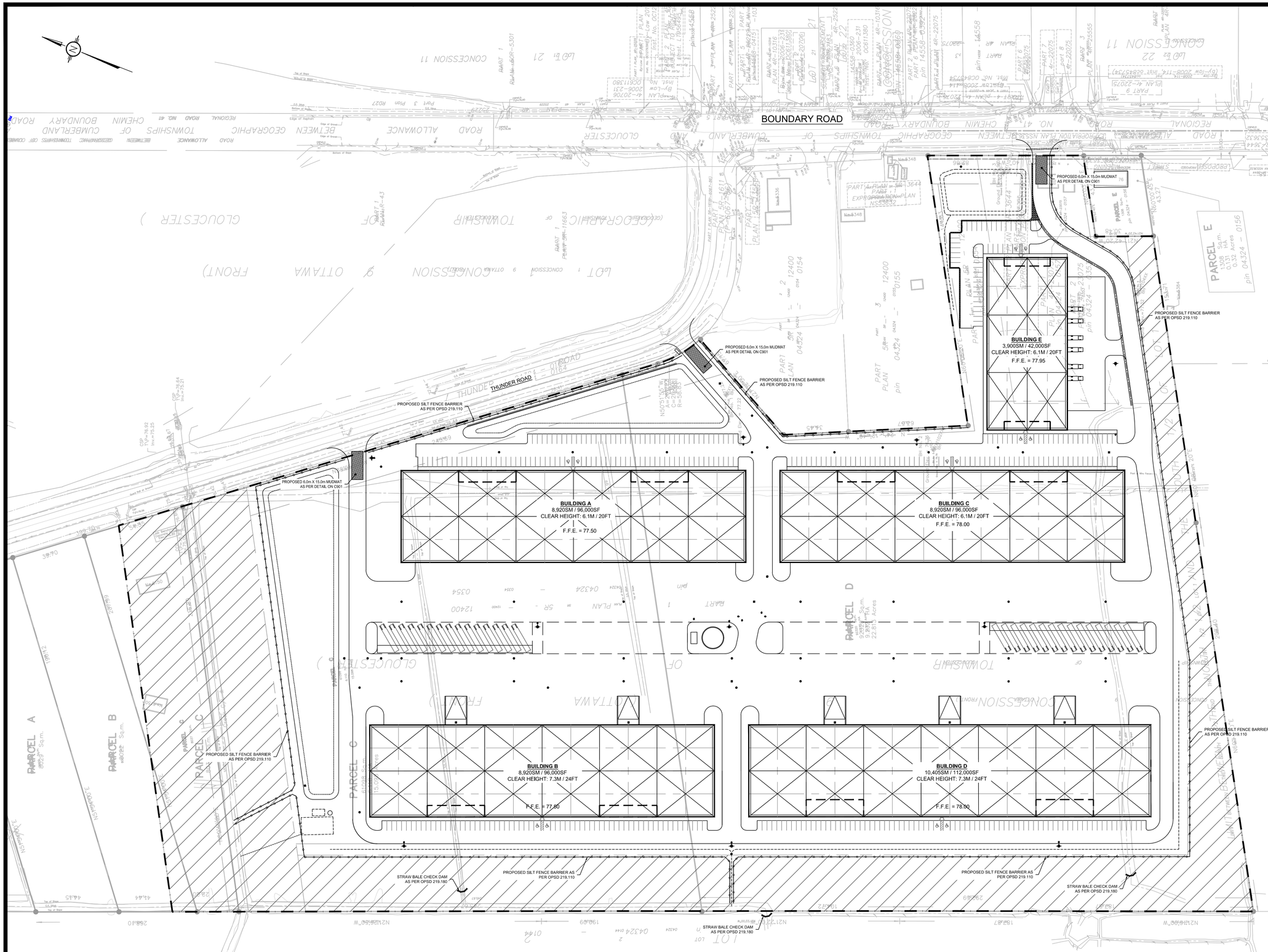
PROJECT
INDUSTRIAL PARK
6160 THUNDER RD
OTTAWA, OM

DRAWING TITLE
GENERAL NOTES

PROJECT NO.
200578

DATE
NOVEMBER 2020

C001



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SCALE: 1:1000

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

LICENSED PROFESSIONAL ENGINEER
V. JOHNSON
100510576
NOV 25 2021
PROVINCE OF ONTARIO

NOT AUTHENTIC UNLESS SIGNED AND DATED

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CLIENT

AVENUE 31

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

PROJECT

INDUSTRIAL PARK
6160 THUNDER RD
OTTAWA, OM

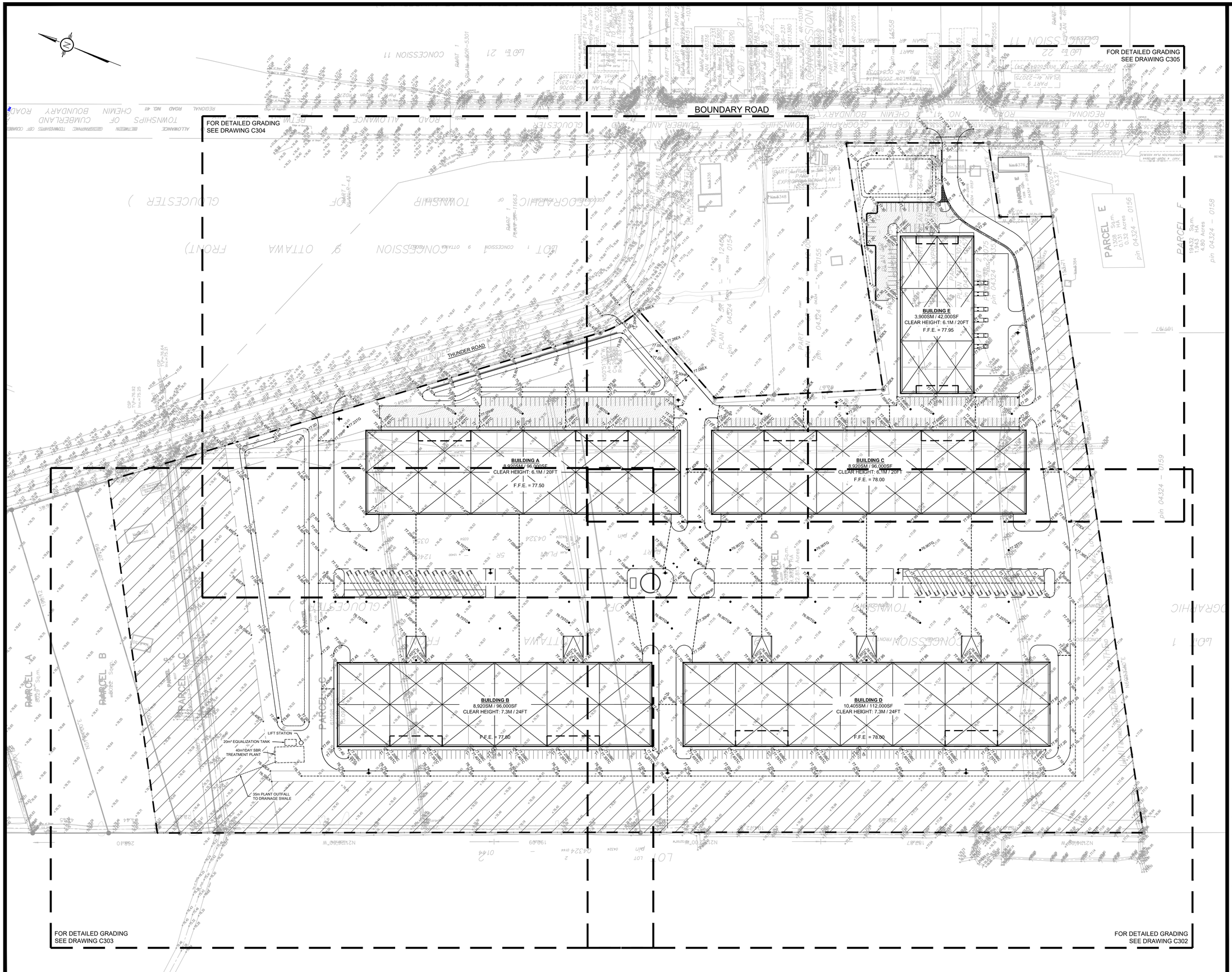
DRAWING TITLE

EROSION AND SEDIMENT CONTROL PLAN

PROJECT NO.
200578

DATE
NOVEMBER 2020

C101



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20m 10 0 20 40m

SCALE: 1:1000

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

LICENSED PROFESSIONAL ENGINEER
V. JOHNSON
100510576
NOV 25 2021
PROVINCE OF ONTARIO

NOT AUTHENTIC UNLESS SIGNED AND DATED

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

CLIENT

AVENUE 31

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

PROJECT

INDUSTRIAL PARK
6160 THUNDER RD
OTTAWA, OM

DRAWING TITLE

GRADING AND DRAINAGE - OVERALL PLAN

PROJECT NO.
200578

DATE
NOVEMBER 2020

C301

8,920SM / 96,000SF
CLEAR HEIGHT: 6.1M / 20FT
F.F.E. = 78.00

PROP SAN MH104
T/G = 77.08

PROP STM CB10
T/G = 76.90

PROP STM CBMH08
T/G = 76.90

PROP STM CBMH06
T/G = 76.91

PROP STM CBMH04
T/G = 76.91

PROP STM CBMH02
T/G = 77.25

PROP. ABOVE GROUND
FIRE PROTECTION TANK

PROP. FIRE PUMP

PROP STM MH05
T/G = 77.18

PROP STM MH04
T/G = 77.16

PROP STM MH03
T/G = 77.17

PROP STM MH02
T/G = 77.25

PROP STM MH01
T/G = 77.49

PROP STM CB09
T/G = 76.90

PROP SAN MH103
T/G = 76.97

PROP STM CBMH07
T/G = 76.90

PROP STM CBMH05
T/G = 76.90

PROP STM CBMH03
T/G = 76.92

PROP STM CBMH01
T/G = 77.25

PROP STM CB19
T/G = 76.80

PROP STM CB20
T/G = 76.80

PROP STM CB21
T/G = 76.84

BUILDING D
10,405SM / 112,000SF
CLEAR HEIGHT: 7.3M / 24FT

F.F.E. = 78.00

CONTROL AND TREATMENT UNIT
(CW PUMP TO HYDRATE AREA)

USE AND INTERPRETATION OF DRAWINGS

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01	ISSUED FOR APPROVAL	V.J.	25 NOV 2021

LICENSED PROFESSIONAL ENGINEER
V. JOHNSON
100510576
Nov 25, 2021
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CLIENT
AVENUE 31

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

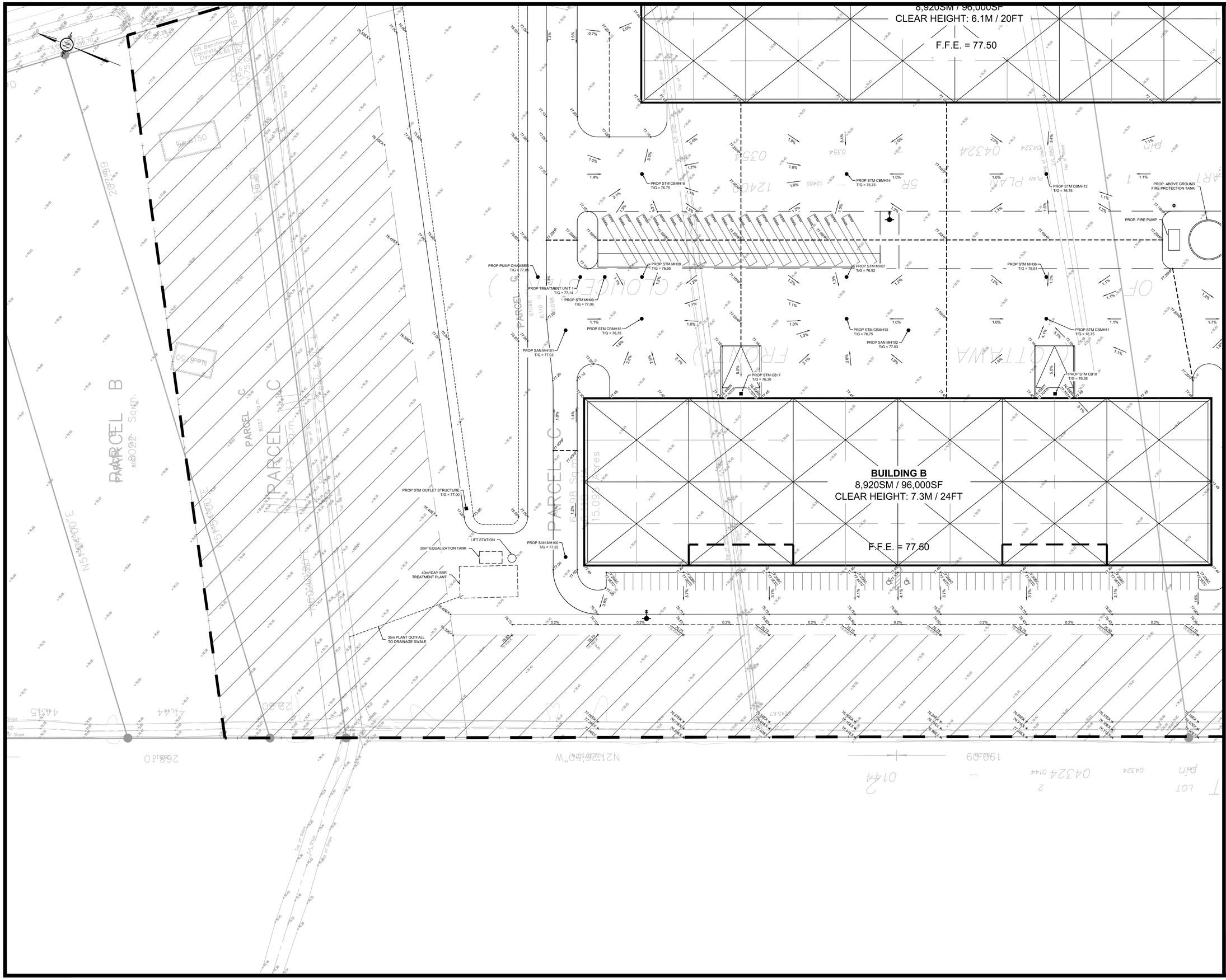
PROJECT
INDUSTRIAL PARK
6160 THUNDER RD
OTTAWA, OM

DRAWING TITLE
GRADING AND DRAINAGE PLAN

PROJECT NO.
200578

DATE
NOVEMBER 2020

C302



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10m 5 0 10 20m

SCALE: 1:500

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

LICENSED PROFESSIONAL ENGINEER
V. JOHNSON
100510576
NOV 25, 2021
PROVINCE OF ONTARIO

NOT AUTHENTIC UNLESS SIGNED AND DATED

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

CLIENT
AVENUE 31

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

PROJECT
INDUSTRIAL PARK
6160 THUNDER RD
OTTAWA, OM

DRAWING TITLE
GRADING AND DRAINAGE PLAN

PROJECT NO.
200578

DATE
NOVEMBER 2020

C303

THUNDER ROAD

BUILDING A
8,920SM / 96,000SF
CLEAR HEIGHT: 6.1M / 20FT

F.F.E. = 77.50

PROP STM MH101 T/G = 77.23
PROP STM CBMH102 T/G = 76.90
PROP STM CBMH103 T/G = 76.80
PROP STM CBMH104 T/G = 76.80
PROP STM CBMH105 T/G = 76.90
PROP STM CBMH106 T/G = 77.20
PROP STM MH110 T/G = 77.27
PROP STM CB111 T/G = 77.00
PROP SAN MH105 T/G = 77.02
PROP SAN MH104 T/G = 77.08
PROP STM CBMH16 T/G = 76.75
PROP STM CBMH14 T/G = 76.75
PROP STM CBMH12 T/G = 76.75
PROP STM CB10 T/G = 76.90
PROP STM CBMH08 T/G = 76.90
PROP. ABOVE GROUND FIRE PROTECTION TANK
PROP. FIRE PUMP
PROP PUMP CHAMBER T/G = 77.00
PROP STM MH08 T/G = 76.95
PROP STM MH07 T/G = 76.90
PROP STM MH06 T/G = 76.91
PROP STM MH05 T/G = 77.18
PROP STM MH04

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CLIENT
AVENUE 31

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

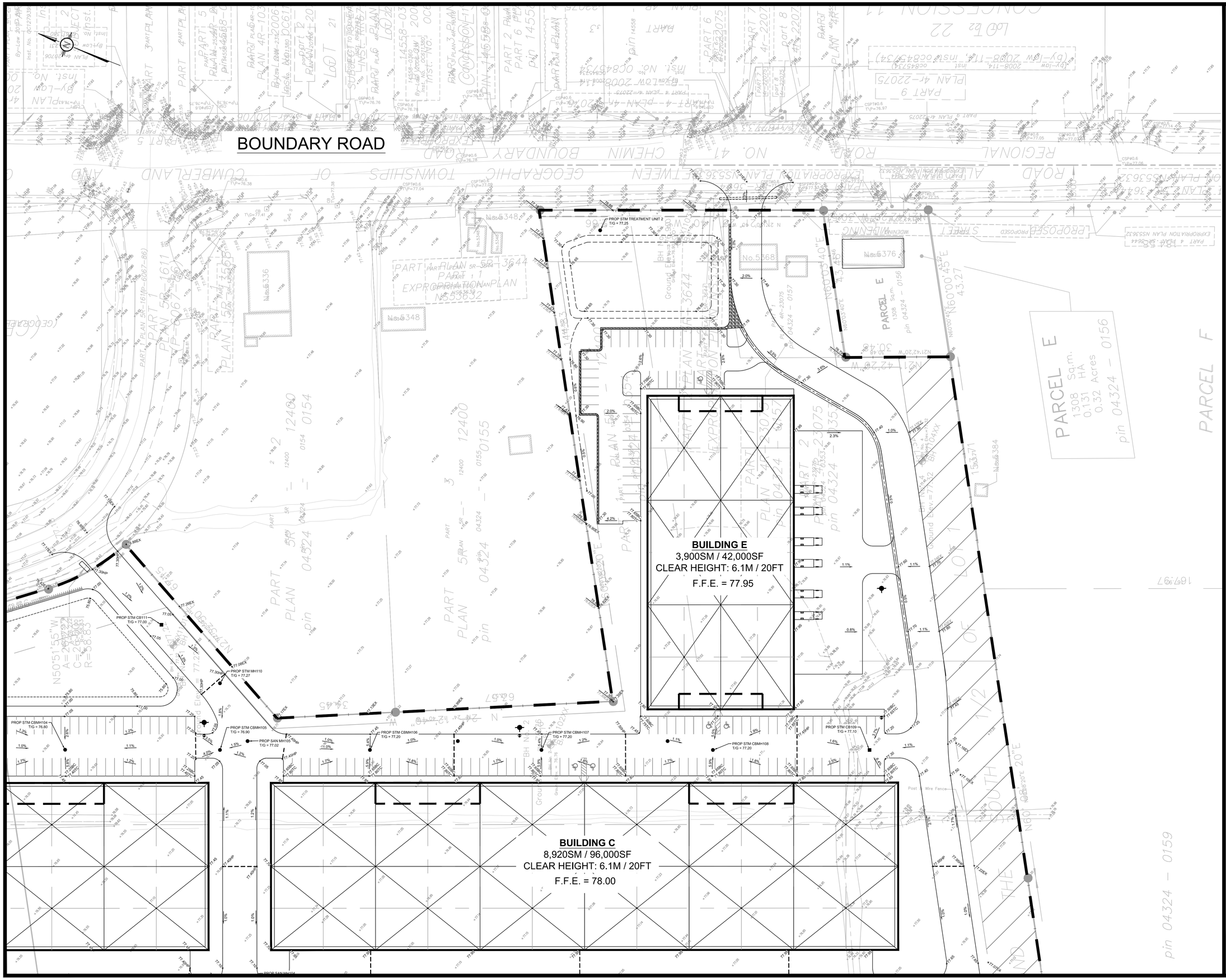
PROJECT
INDUSTRIAL PARK
6160 THUNDER RD
OTTAWA, OM

DRAWING TITLE
GRADING AND DRAINAGE PLAN

PROJECT NO.
200578

DATE
NOVEMBER 2020

C304



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OTTAWA, OM

DRAWING TITLE

GRADING AND DRAINAGE PLAN

PROJECT NO.
200578

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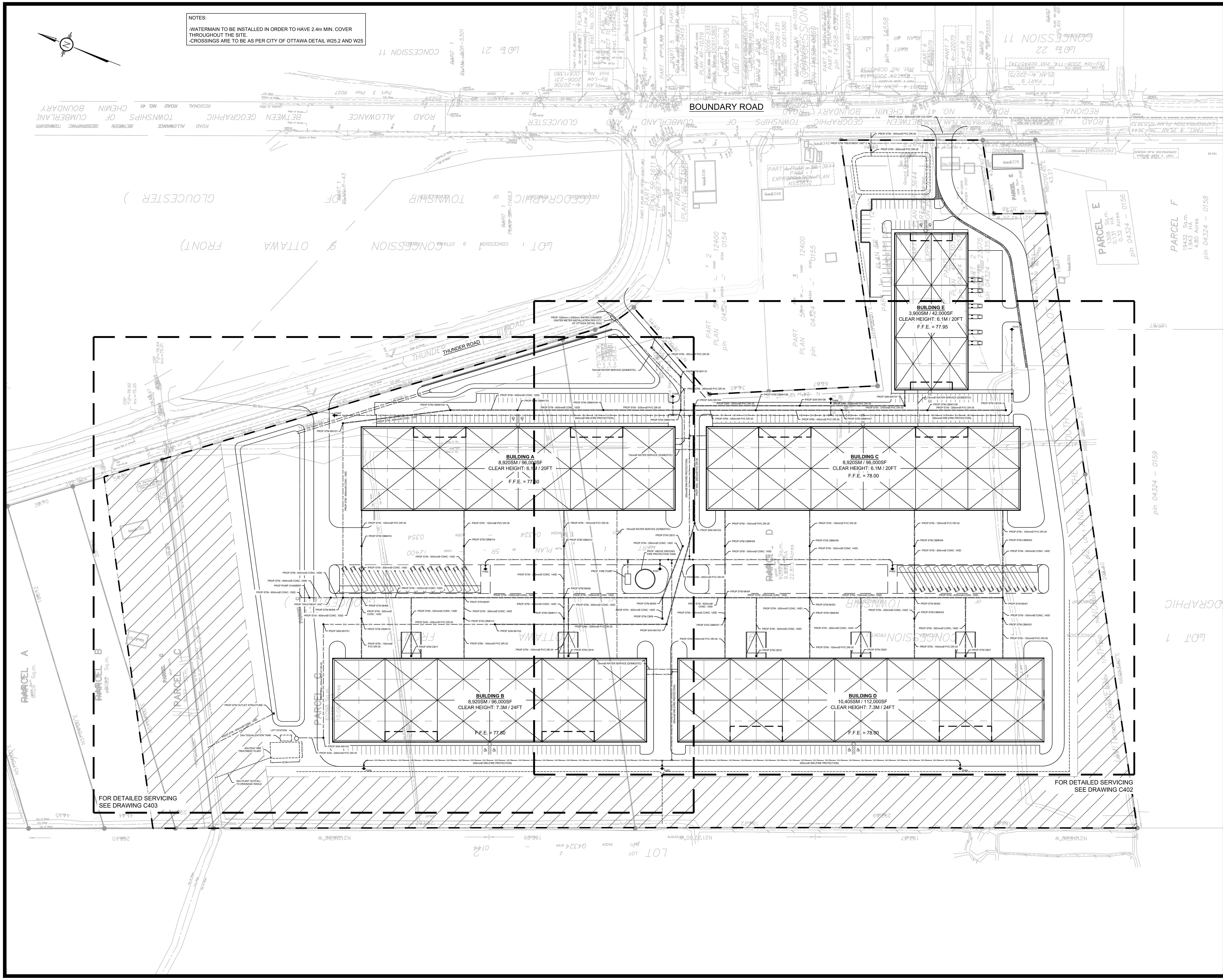
NOVEMBER 2020

C305



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SCALE: 1:1000

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

LICENSED PROFESSIONAL ENGINEER
V. JOHNSON
100510576
Nov 25, 2021
PROVINCE OF ONTARIO

NOT AUTHENTIC UNLESS SIGNED AND DATED

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

CLIENT
AVENUE 31

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

PROJECT
INDUSTRIAL PARK
6160 THUNDER RD
OTTAWA, OM

DRAWING TITLE
SERVICING - OVERALL PLAN

PROJECT NO.
200578

DATE
NOVEMBER 2020

C401

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

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10m 5 0 10 20m

SCALE: 1:500

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

V. JOHNSON
100510576
Nov 25, 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, OM

DRAWING TITLE
SERVICING PLAN

PROJECT NO.
200578

DATE
NOVEMBER 2020

C402

NOTES:

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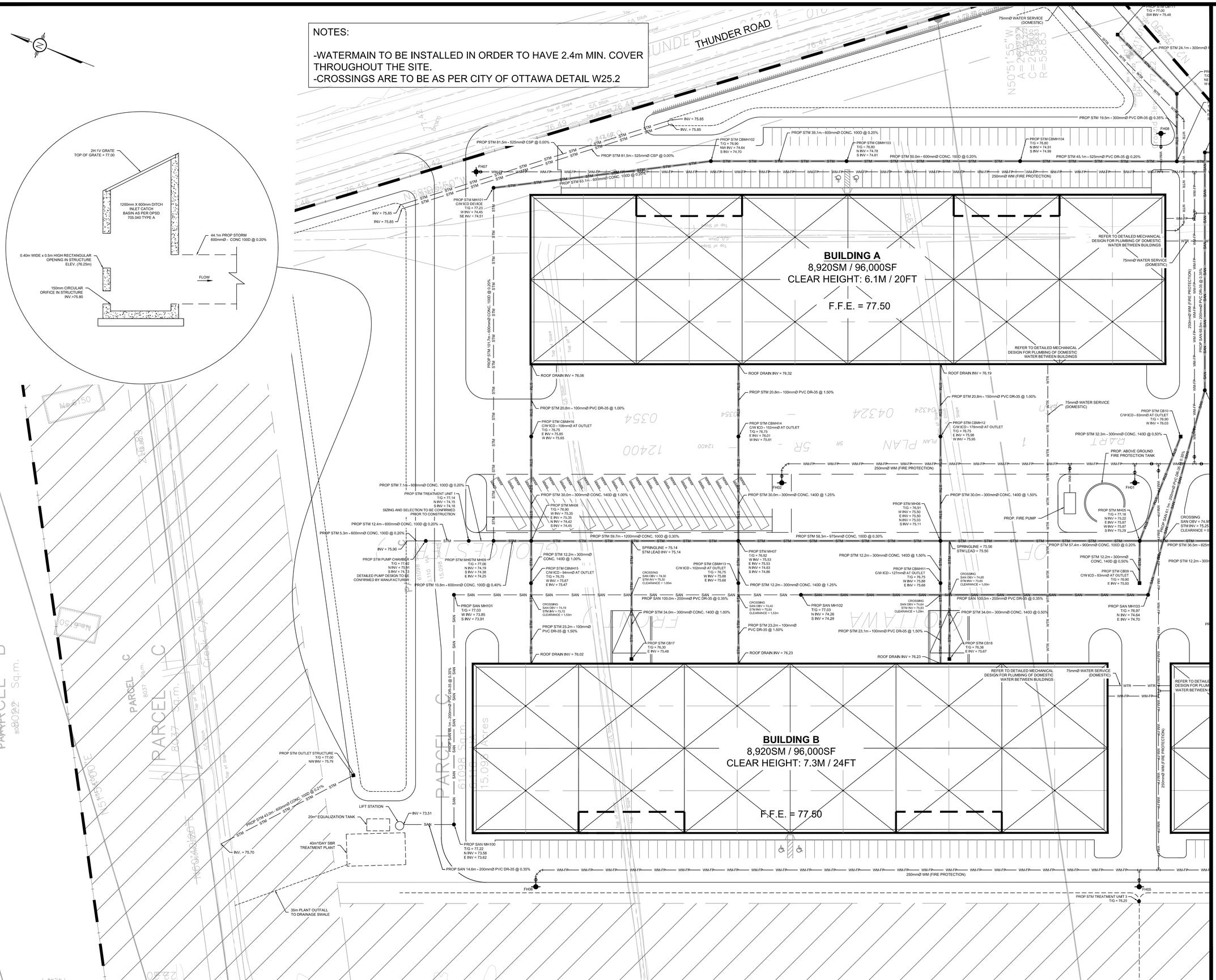

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SCALE: 1:500

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

LICENSED PROFESSIONAL ENGINEER
V. JOHNSON
100510576
NOV 25, 2021
PROVINCE OF ONTARIO

NOT AUTHENTIC UNLESS SIGNED AND DATED

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

CLIENT
AVENUE 31

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

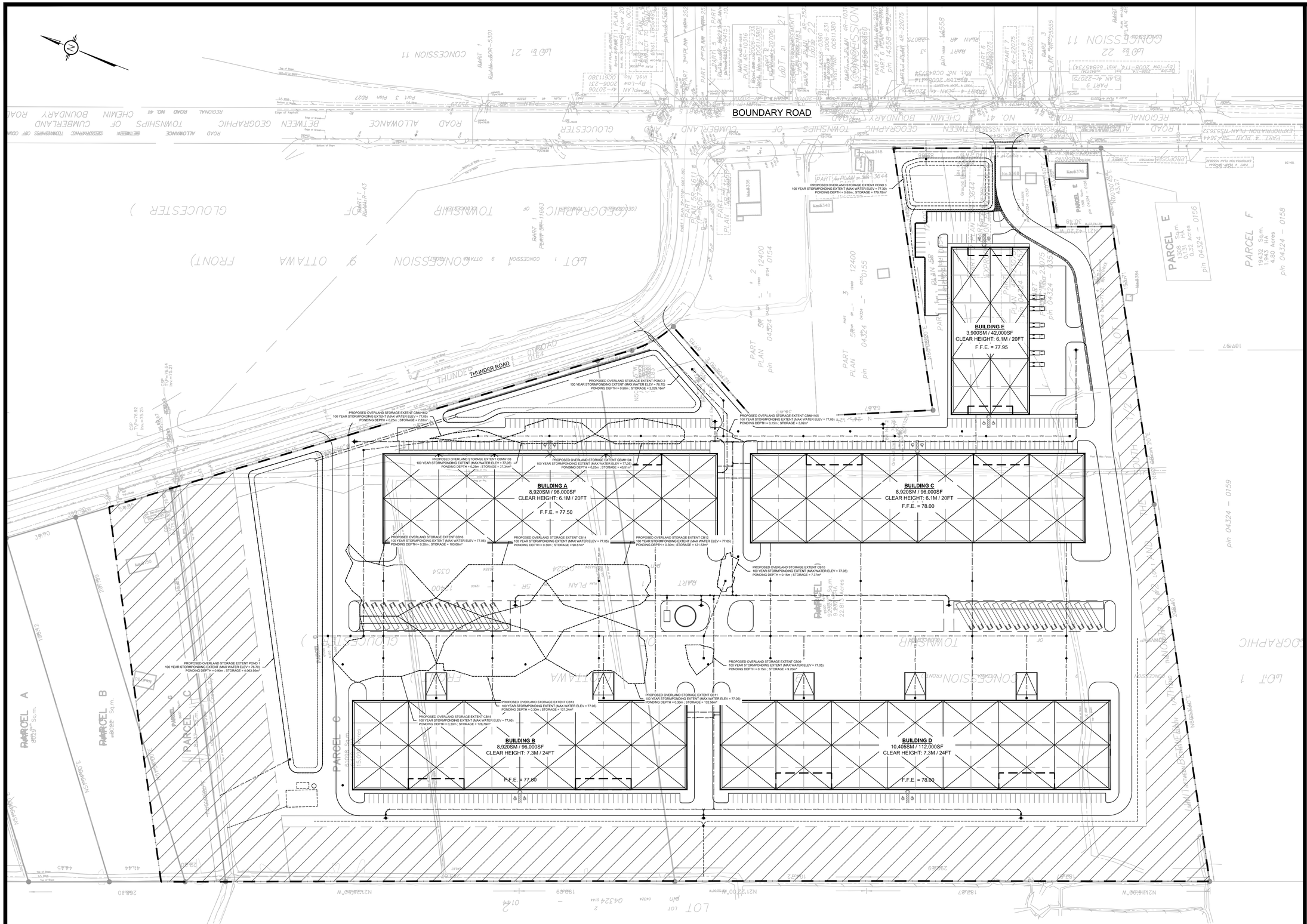
PROJECT
INDUSTRIAL PARK
6160 THUNDER RD
OTTAWA, OM

DRAWING TITLE
SERVICING PLAN

PROJECT NO.
200578

DATE
NOVEMBER 2020

C403



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CLIENT

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

PROJECT

INDUSTRIAL PARK
6160 THUNDER RD
OTTAWA, OM

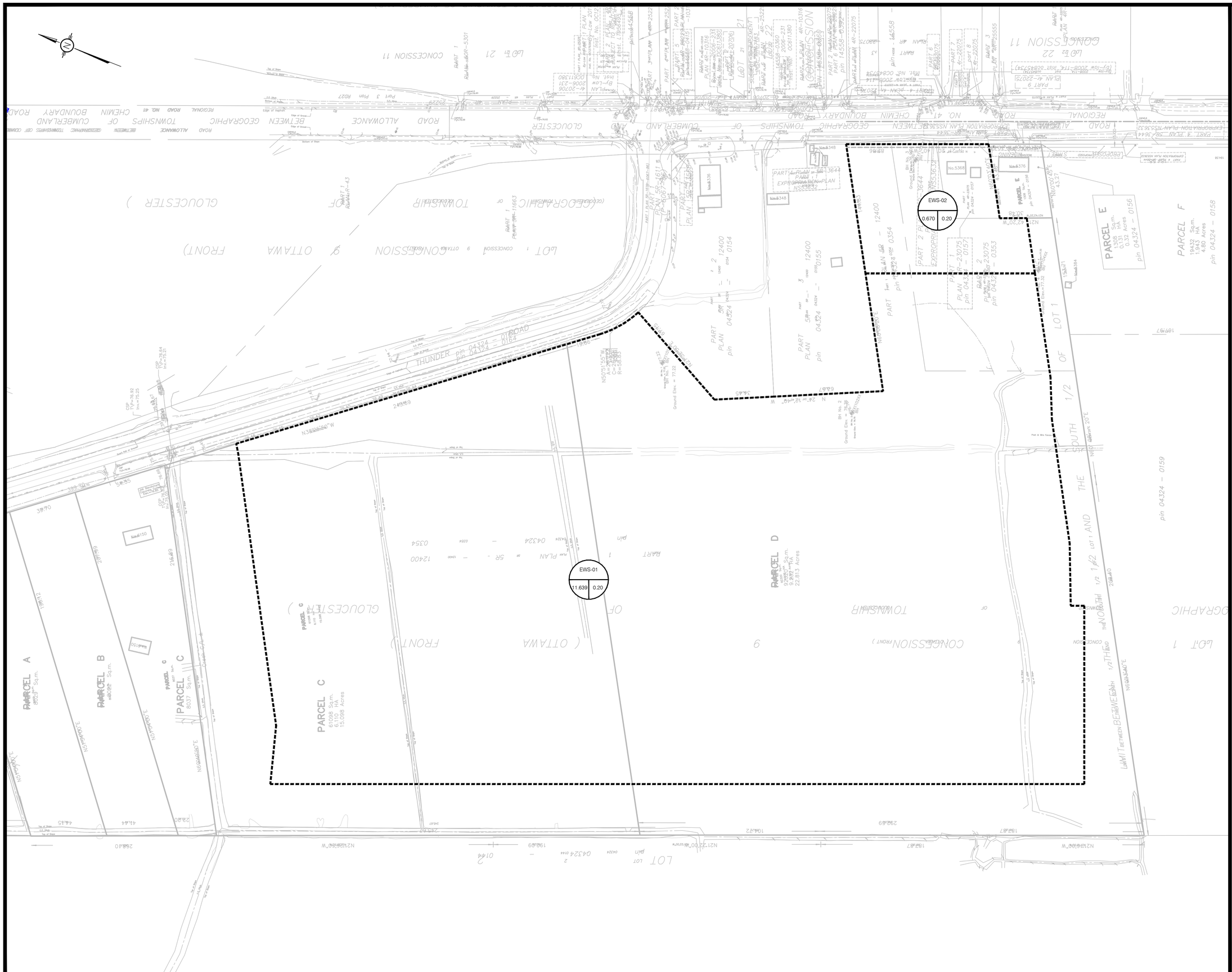
DRAWING TITLE

STORMWATER MANAGEMENT PLAN

PROJECT NO.
200578

DATE
NOVEMBER 2020

C601



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SCALE: 1:1000

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

LICENSED PROFESSIONAL ENGINEER
V. JOHNSON
100510576
NOV 25, 2021
PROVINCE OF ONTARIO

NOT AUTHENTIC UNLESS SIGNED AND DATED

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

CLIENT

AVENUE 31

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

PROJECT

INDUSTRIAL PARK
6160 THUNDER RD
OTTAWA, OM

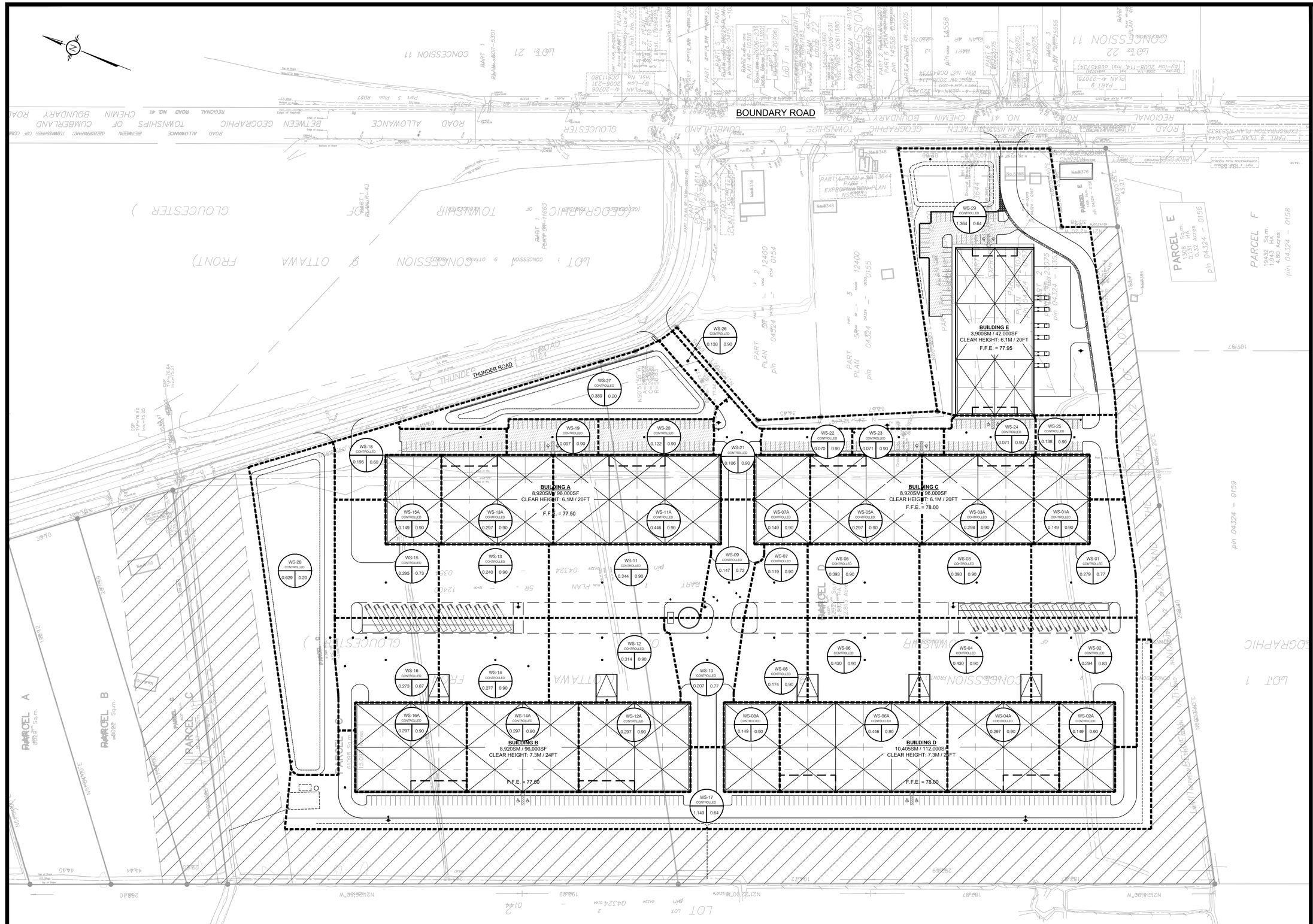
DRAWING TITLE

PRE-DEVELOPMENT
WATERSHED PLAN

PROJECT NO.
200578

DATE
NOVEMBER 2020

C701



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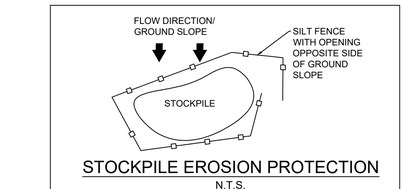
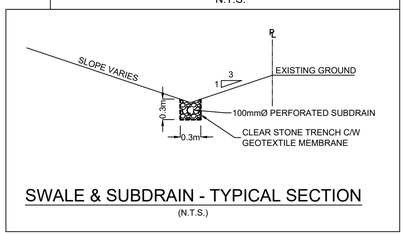


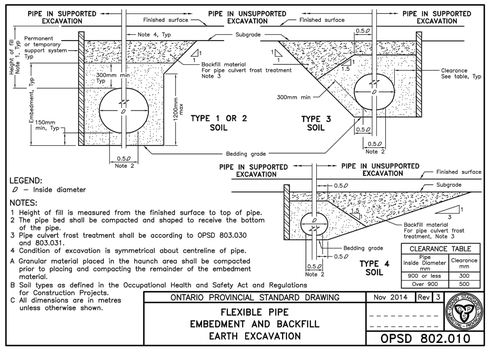
STOCKPILE EROSION PROTECTION

N.T.S.



SWALE & SUBDRAIN - TYPICAL SECTION

(N.T.S.)



LEGEND:

Ø – Inside diameter

NOTES:

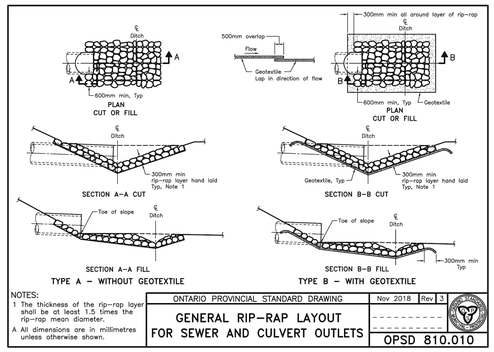
1. Height of fill is measured from the finished surface to top of pipe.
2. The pipe bed shall be compacted and shaped to receive the bottom of the pipe.
3. Pipe culvert frost treatment shall be according to OPSD 803.030 and 803.031.
4. Condition of excavation is symmetrical about centreline of pipe.

A Granular material placed in the haunch area shall be compacted prior to placing and compacting the remainder of the embedment material.

B Soil types as defined in the Occupational Health and Safety Act and Regulations for Construction Projects.

C All dimensions are in metres unless otherwise shown.

ONTARIO PROVINCIAL STANDARD DRAWING	Nov 2014	Rev 3
FLEXIBLE PIPE EMBEDMENT AND BACKFILL EARTH EXCAVATION		OPSD 802.010

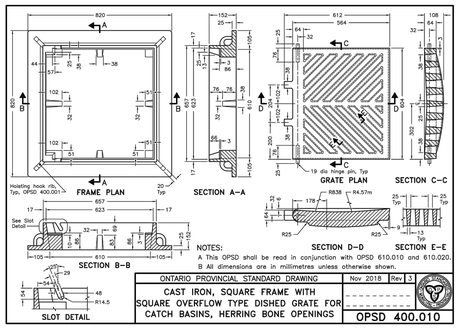


NOTES:

1 The thickness of the rip–rap layer shall be at least 1.5 times the rip–rap mean diameter.

A All dimensions are in millimetres unless otherwise shown.

ONTARIO PROVINCIAL STANDARD DRAWING	Nov 2018	Rev 3
GENERAL RIP–RAP LAYOUT FOR SEWER AND CULVERT OUTLETS		OPSD 810.010

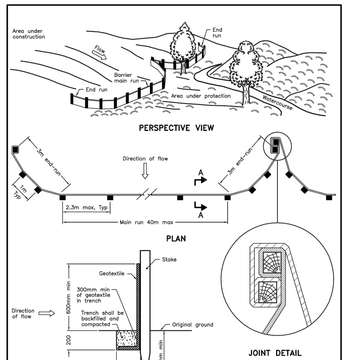


NOTES:

A This OPSD shall be read in conjunction with OPSD 610.010 and 610.020.

B All dimensions are in millimetres unless otherwise shown.

ONTARIO PROVINCIAL STANDARD DRAWING	Nov 2018	Rev 3
CAST IRON, SQUARE FRAME WITH SQUARE OVERFLOW TYPE DISHED GRATE FOR CATCH BASINS, HERRING BONE OPENINGS		OPSD 400.010



NOTE:

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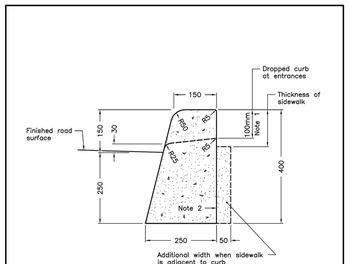
ONTARIO PROVINCIAL STANDARD DRAWING	Nov 2015	Rev 2
LIGHT–DUTY SILT FENCE BARRIER		OPSD 219.110



NOTES:

1 When sidewalk is continuously adjacent, the dropped curb at entrances shall be reduced to 75mm.

2 For slipforming procedure a 5% batter is acceptable.

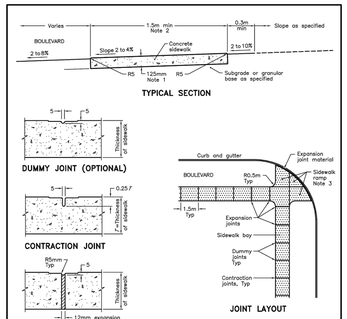
A Treatment at entrances shall be according to OPSD 351.010.

B Outlet treatment shall be according to the OPSD 610 Series.

C The transition from one curb type to another shall be a minimum length of 3.0m, except in conjunction with guide rail where it shall be according to the OPSD 900 Series.

D All dimensions are in millimetres unless otherwise shown.

ONTARIO PROVINCIAL STANDARD DRAWING	Nov 2012	Rev 2
CONCRETE BARRIER CURB		OPSD 600.110



NOTES:

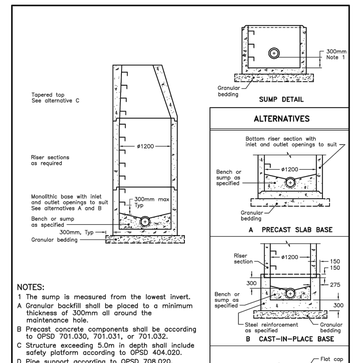
1 Sidewalk thickness at residential driveways and adjacent to curb shall be 150mm. At commercial and industrial driveways, the thickness shall be 200mm.

2 Sidewalk width shall be wider when specified.

3 This OPSD shall be read in conjunction with OPSD 310.030, 310.031, 310.032, 310.033 and 310.039.

A All dimensions are in millimetres unless otherwise shown.

ONTARIO PROVINCIAL STANDARD DRAWING	Nov 2015	Rev 2
CONCRETE SIDEWALK		OPSD 310.010



NOTES:

1 The sump is measured from the lowest invert.

A Granular backfill shall be placed to a minimum thickness of 300mm all around the maintenance hole.

B Precast concrete components shall be according to OPSD 701.030, 701.031, or 701.032.

C Structure exceeding 5.0m in depth shall include safety platform according to OPSD 404.020.

D Pipe support according to OPSD 708.020.

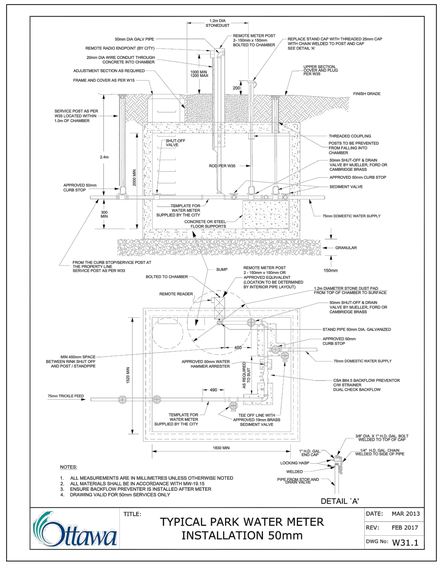
E For benching and pipe opening details, see OPSD 701.021.

F For adjustment unit and frame installation, see OPSD 704.010.

G All dimensions are nominal.

H All dimensions are in millimetres unless otherwise shown.

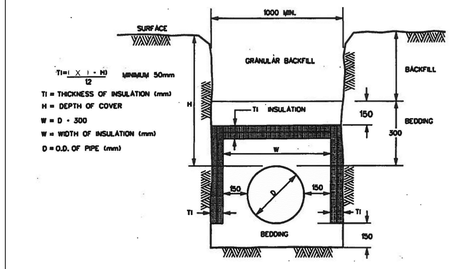
ONTARIO PROVINCIAL STANDARD DRAWING	Nov 2014	Rev 5
PRECAST CONCRETE MAINTENANCE HOLE 1200mm DIAMETER		OPSD 701.010



NOTES:

1. ALL MEASUREMENTS ARE IN MILLIMETRES UNLESS OTHERWISE NOTED
2. ALL MATERIALS SHALL BE IN ACCORDANCE WITH MW–19.10
3. ENSURE BACKFLOW PREVENTER IS INSTALLED AFTER METER
4. DRAWING VALID FOR 50mm SERVICES ONLY

TITLE:	DATE: MAR 2013
TYPICAL PARK WATER METER INSTALLATION 50mm	REV: FEB 2017
Ottawa	DWG No: W31.1



NOTES:

-FOR STORM INSULATION USE AN X VALUE OF 2000 IN THE ABOVE "TI" EQUATION.
-FOR SANITARY INSULATION USE AN X VALUE OF 2500 IN THE ABOVE "TI" EQUATION.
-FOR WATERMAIN INSULATION USE AN X VALUE OF 2400 IN THE ABOVE "TI" EQUATION.
-INCREMENTS OF INSULATION THICKNESS SHALL BE ADJUSTABLE TO 25mm.
-STAGGER JOINTS OF MULTIPLE SHEETS.
-ALL DIMENSIONS ARE IN MILLIMETERS UNLESS SHOWN OTHERWISE.

TYPICAL STORM AND SANITARYSEWER AND WATERMAIN INSULATION DETAIL

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