

ZIBI BLOCK 204

Site Servicing Report

City of Ottawa, Ontario



CIMA+ file number: A000931
April 19, 2022
Revision No. 0

ZIBI BLOCK 204

Site Servicing Report

City of Ottawa, Ontario



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1. Introduction

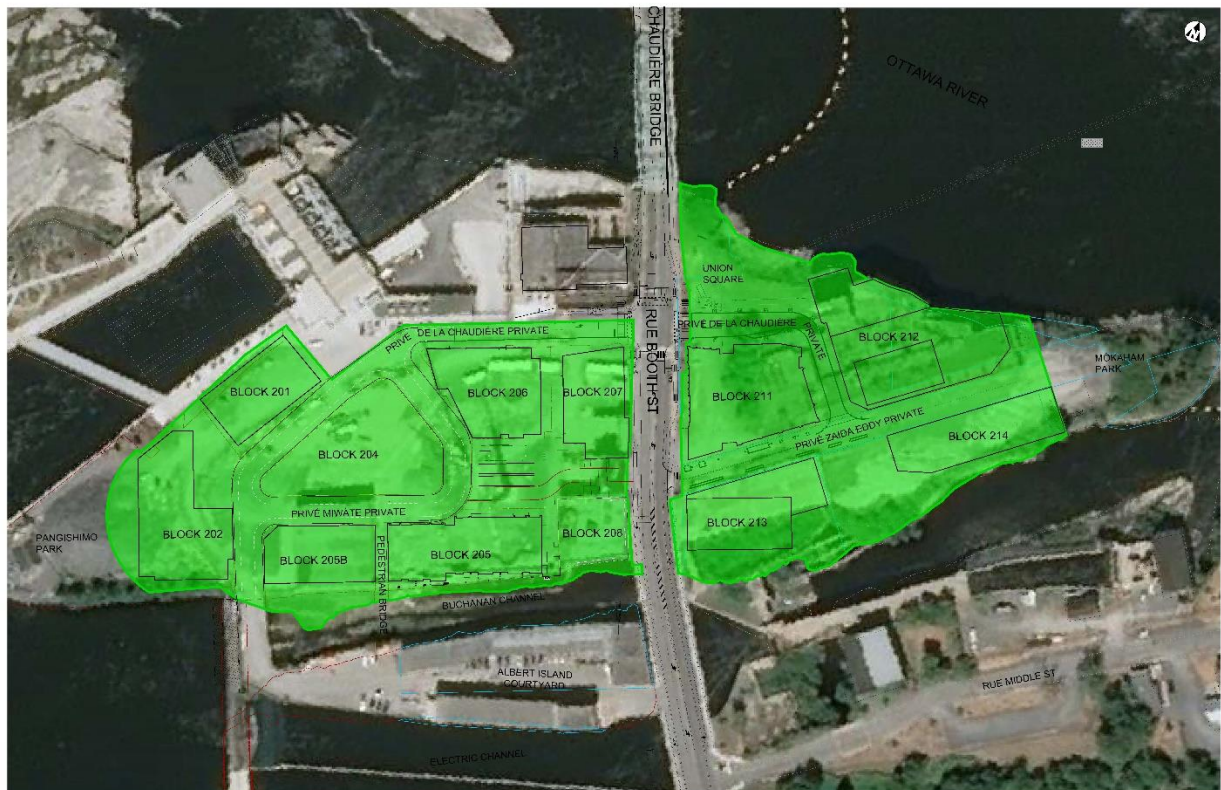
CIMA+ was retained by Windmill Dream on holdings LP to prepare a Site Servicing and Stormwater Management Report for the proposed construction of mixed uses (retail and residential) high-rise building on Chaudière Island, Ottawa, Ontario henceforth referred to as ZIBI – Block 204.

The purpose of this assessment is to confirm that the proposed development can be adequately serviced by the existing municipal and private infrastructure (water, sanitary, and storm) surrounding the site. This assessment shall be used in support of the application for Site Plan Control.

1.1 Site Description and Proposed Development

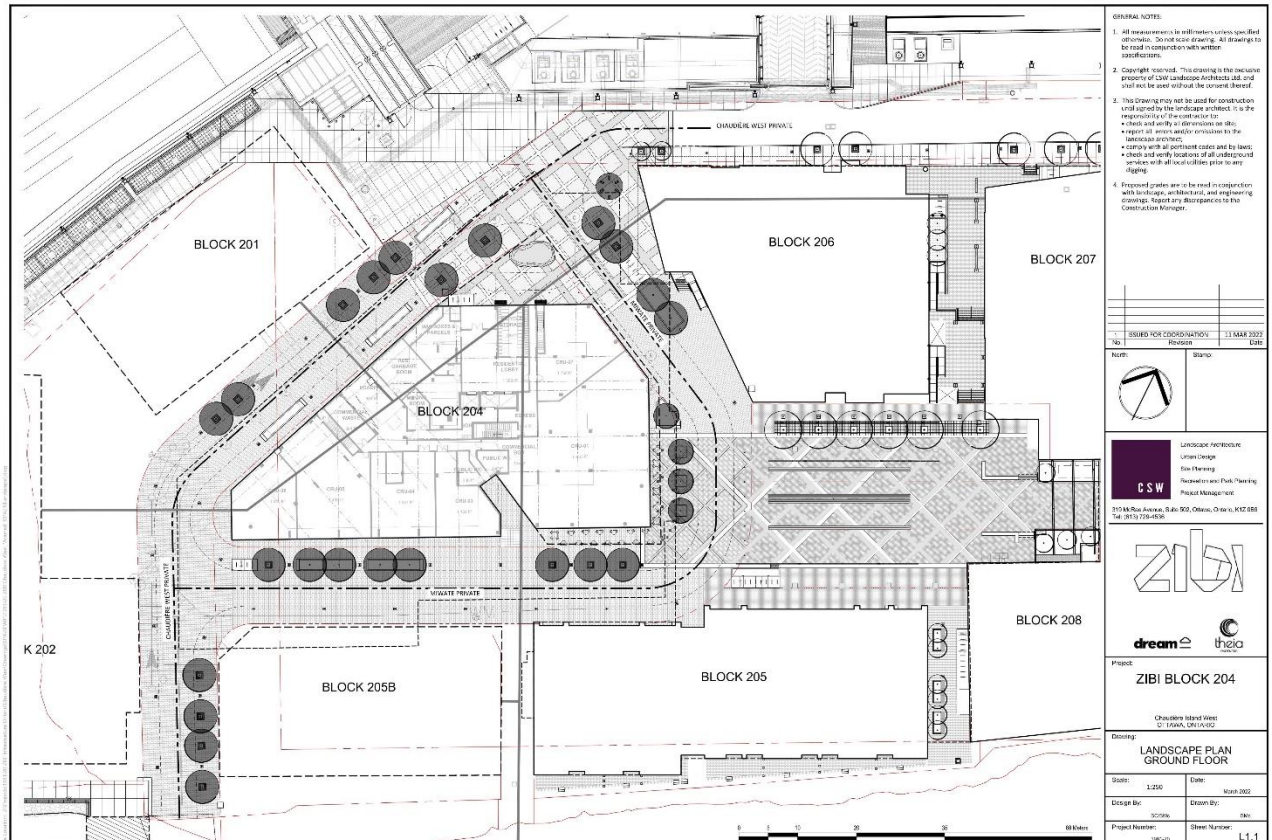
The site is located on Chaudière Island, Ottawa on the west side of Booth Street and Chaudière Bridge. (Refer to **Figure 1** below). As an update to the current status, the overall ZIBI site received site plan approval on May 2018 following the submission of a Master Servicing report from the engineering consulting firm David Schaeffer Engineering Ltd (DSEL). In August 2018, DSEL submitted a Functional Servicing and Storm Water Management Report – Phase 1 which includes Block 204. This site servicing report was prepared respecting the approval already confirmed for the aforementioned Phase 1.

Figure 1-1: Site Location - Plan View.



ZIBI – Block 204 is comprised of twenty-two (22) storey building including one level of underground parking surrounded with woonerf landscaping street type design. The building footprint is about +/- 2700 m² for the first level, over an underground parking of 4200 m². The underground parking has significant larger surface than the building footprint since it is connected with other underground parking infrastructure (205A and 206) to the east and design to include further underground parking connections. Each additional building floor varies between 775 m² and 1225 m². Refer to **Figure 2** for a conceptual site plan of the proposed development (prepared by Neuf Architects Inc/CSW Landscape Architecture).

Figure 1-2: Conceptual Site Plan.



1.2 Review of Available Background Documentation

The following design guidelines have been used to estimate the theoretical servicing requirements for the proposed development; while geoOttawa, a detailed topographic survey prepared by Stantec, and the available as-built drawings provided by the client and City of Ottawa Information Centre have been used to determine the existing municipal services location, size, material, and inverts fronting the site.

- + Ottawa Sewer Design Guidelines (October 2012), as amended by all applicable Technical Bulletins;
- + Ottawa Design Guidelines – Water Distribution (2010), as amended by all applicable Technical Bulletins;
- + Ministry of the Environment Design Guidelines for Sewage Works (2008).

- + Ministry of the Environment Stormwater Management Planning and Design Manual (2003).
- + Ministry of the Environment Design Guidelines for Drinking-Water Systems (2008); and
- + Fire Underwriters Survey (FUS) Water Supply for Public Fire Protection (1999).

1.3 Existing Infrastructure

Chaudière Island is presently in the course of re-development. On the west side of the island, the construction of Buildings 205A and 208 (see Figure 1) were undertaken, now completed, and occupied. Buildings 206 and 207 (see Figure 1) are presently through construction. They are presently completing the underground parking and should be ready for occupancy 2024.

As identified using the detailed topographic survey completed by Stantec Geomatics Ltd, geoOttawa and the available Utility Record Drawings provided by the City of Ottawa Information Centre, the following municipal infrastructure are available within the right-of-way fronting the proposed development site (refer to **Appendix E** for Existing Conditions Plan). The municipal services collectors on Booth and Chaudière Streets are all constructed and connected with the City of Ottawa networks. A new pumping station, to be located on the east side of Booth Street on Chaudière Island, is presently through approvals.

Booth Street

- 203mm diameter ductile iron watermain (North of Middle Street);
- 305mm diameter PVC watermain (South of Middle Street);
- 250mm diameter sanitary sewer.
- 525mm diameter storm sewer.

Chaudière Private Street

- 203mm diameter ductile iron watermain;
- 250mm diameter sanitary sewer;
- 450mm diameter storm sewer.

1.4 Consultation and Permits

In response to the pre-consultation requirements defined in the City's Development Servicing Study Checklist, the following agencies were consulted in support of the preparation of this report. The Development Servicing Study Checklist as well as all relevant correspondence with the consulted agencies can be found in **Appendix A**.

City of Ottawa

The City of Ottawa Information Centre was contacted to obtain any Reports, Studies, Engineering, and/or Utility Plans including sanitary sewer, storm sewer, watermain, gas, etc. within or adjacent to the site location. The available as-built plans were obtained, while no existing reports or studies were available. Given a detailed utility survey was previously completed by Stantec Geomatics Ltd for the project the UCC drawings were not obtained.

CIMA+ also contacted Allison Hamlin from the City of Ottawa and Abdul Mottalib, City of Ottawa to obtain any site-specific servicing and stormwater management design criteria for the proposed development. The provided comments and criteria relevant to the Site Servicing and Stormwater Management Report are referenced within the appropriate sections of this report.

Rideau Valley Conservation Authority (RVCA)

The subject site falls under the jurisdiction of the Rideau Valley Conservation Authority (RVCA). As previously mentioned, a functional Servicing and Storm Water Management Report – Phase 1 for ZIBI development was submitted in August 2018 which included the RVCA reviewed and approval. These approved criteria were acknowledged and respected as part of this site plan approval report.

Ministry of the Environment, Conservation and Parks (MECP)

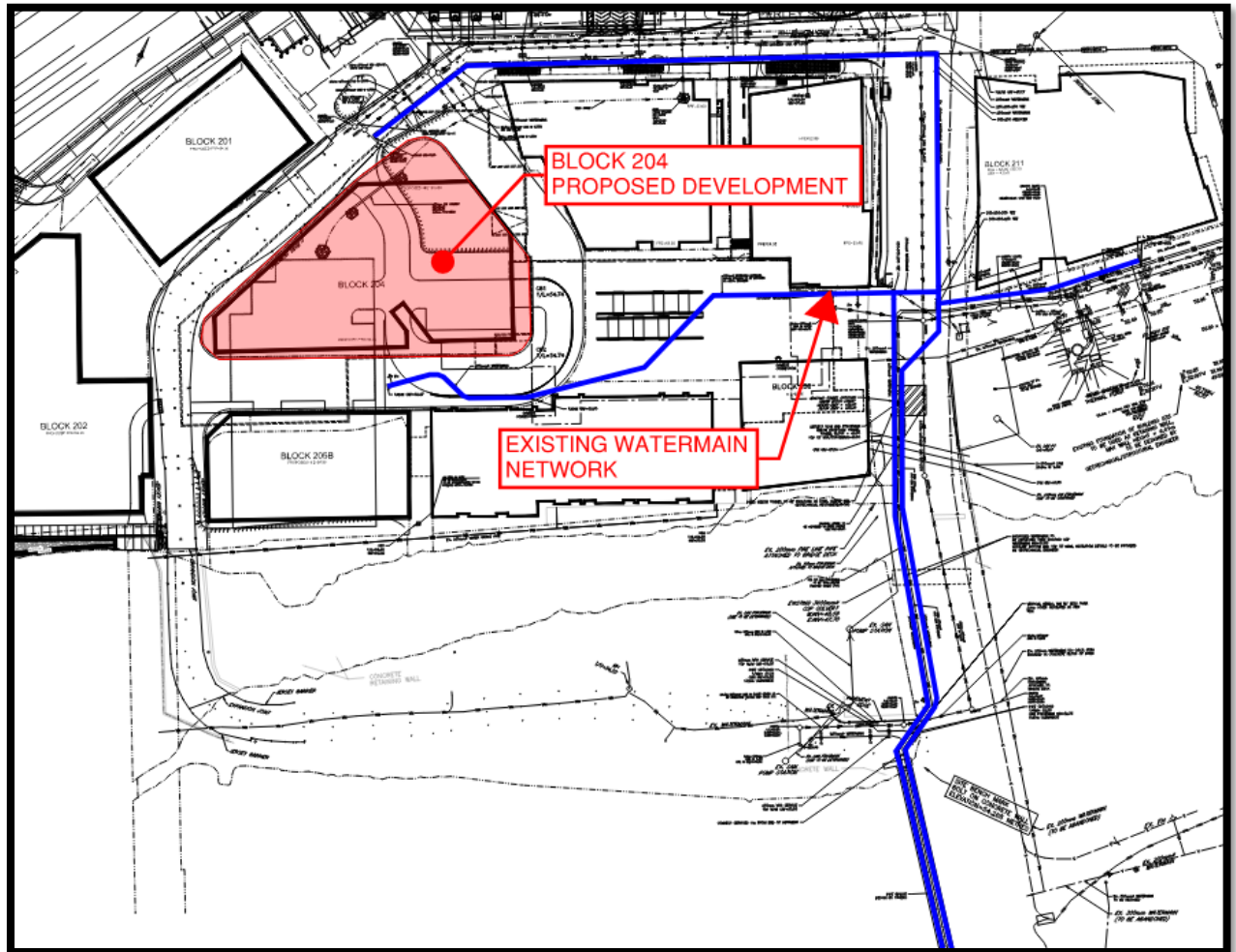
It is expected that the application can be submitted to the MECP, if required, as direct submission from Dream following City's Ottawa review.

2. Water Servicing

2.1 Existing Condition

The current ZIBI development is comprised of watermain networks along Booth Street, Chaudière Private and through the underground parking lot below the Head Street Square Courtyard. These the watermain networks vary between 200mm and 300mm in diameter. Refer to Functional Servicing and Stormwater Management Report by DSEL dated August 2018 for technical information about existing watermain network. Refer also to **Figure 2-1** below for visual representation of existing watermain network.

Figure 2-1 Existing Watermain Network



2.2 Water Supply Design Criteria

The design criteria for determining the water demand requirements for the proposed development follow the parameters outlined in the Ottawa Design Guidelines – Water Distribution (2010) and associated technical bulletins, as well as the MOE Design Guidelines for Drinking-Water Systems (2008). Namely, the following parameters have been used in determining the water demands:

Table 2-1: Water Supply Design Criteria

Design Criteria	Residential / Commercial Areas
Average Day Demand for Residential	350 L/capita/day
Maximum Daily Demand for Residential	3.2 × average daily demand
Maximum (Peak) Hour Demand for Residential	4.9 × average daily demand
Average Day Demand Retail	2.5 L/m ² /day
Average Day Demand Amenity	2.5 L/m ² /day
Maximum Daily Demand for Retail and Amenity	1.5 x average daily demand
Maximum (Peak) Hour Demand	1.8 x Maximum Daily Demand
Desired Operating Pressure under Normal Operating Conditions	50 to 70 psi
Minimum Operating Pressure under Normal Operating Conditions	40 psi
Maximum Operating Pressure under Normal Operating Conditions	80 psi
Minimum Operating Pressure under Maximum Daily Demand + Fire Flow	20 psi

In addition to those design criteria identified in **Table 2-1**, the following comments and criteria must be considered in the water supply servicing strategy in accordance with City Guidelines:

- + The subject site is located within the 1W pressure zone;
- + Residential buildings with a basic day demand greater than 50 m³/day (0.57 L/s) are required to be connected to a minimum of two (2) water services separated by an isolation valve to avoid a vulnerable service area;
- + Fire flow demand requirements shall be based on the Fire Underwriters Survey (FUS) Water Supply for Public Fire Protection 1999 and Technical Bulletin ISTB-2018-02;
- + Exposure separation distances shall be defined on a figure to support the FUS calculation and required fire flow (RFF);
- + Hydrant capacity shall be assessed if relying on any public hydrants to provide fire protection, particularly if high design fire flows are being proposed, to demonstrate the Required Fire Flow (RFF) can be achieved. Identification of which hydrants are being considered to meet the RFF on a fire hydrant coverage figure is required as part of the boundary conditions request.

2.3 Proposed Water Supply Servicing and Calculations

Water Demands

The water supply demands for the proposed development are presented in **Table 2-2** below. The demands were developed utilizing the development statistics provided by Neuf Architects Inc. and those design criteria identified in *Section 2.1*. Refer to **Appendix B** for detailed calculations.

Table 2-2: Water Demands Block 204

Demand Type	Average Daily Demand (L/s)	Maximum Daily Demand (L/s)	Maximum (Peak) Hour Demand (L/s)
Residential	1.58	5.06	7.74
Retail & Amenity	0.09	0.14	0.25
Total	1.67	5.19	7.99

Given the basic day demand is more than 50 m³/day (0.57 L/s), two connection is required.

The Water demands for the entire ZIBI site have been updated and are presented in **Table 2-3** below. Flows from existing building came from previous servicing reports. Refer to **Appendix B** for detailed calculations.

Table 2-3: Water Demands Block 204, 211, 206, 207, 205A, 208, EO

Demand Type	Average Daily Demand (L/s)	Maximum Daily Demand (L/s)	Maximum (Peak) Hour Demand (L/s)
Total	5.77	14.12	24.96

Proposed Watermain Network Extension

The existing 300mm watermain along Chaudière Island will be extended around Block 204 and connect to the existing watermain stub south of the site. This will create a loop and increase service level and redundancy within the ZIBI watermain network. The proposed design is as per the approved Master Servicing Study (MSS). The proposed watermain extension will have an additional two fire hydrants and will have service connection stubs for the future development of Block 201, 202 and 205B. Each building will require two separate water connection separated by a valve. A portion of the watermain network will be located inside the underground parking garage. Detailed design by the mechanical consultant will be provided upon completion.

Proposed Service Connection

The proposed connection point for Block 204 will connect to the 300mm Watermain along Chaudière Private. The building will have two 150mm service connection separated by a valve for redundancy purposes.

Required Fire Flow (RFF)

The required fire flow for the site was developed using the Fire Underwriters Survey (FUS) Water Supply for Public Fire Protection 1999 and Technical Bulletin ISTB-2018-02. It was determined that an RFF of **21,000 L/min (350 L/s)** would be required to provide adequate protection.

It was assumed that multiple municipal hydrants would be required to meet the fire flow requirements and a fire hydrant coverage figure was prepared in support of the boundary conditions request from the City.

Refer to **Appendix B** for detailed calculations, including supporting figures for exposure distances and hydrant coverage.

Municipal Boundary Conditions

Using the proposed demands, required fire flow, and supporting figures the City provided boundary conditions for hydraulic analysis for current conditions, based on computer model simulation. The boundary conditions are as follows:

Table 2-4: Watermain Boundary Conditions

Hydraulic Condition (HGL = Hydraulic Grade Line)	Boundary Condition (Connection 1) (Head) (m)	Boundary Condition (Connection 2) (Head) (m)
	Booth Street 305 mm diameter	Booth Street 203 mm diameter
Minimum HGL	107.7	107.7
Maximum HGL	115.7	115.7
Maximum Day + Fire Flow	102.2	98.1

Hydraulic Analysis – Water Supply Adequacy

Since the water and fire flow demands were inferior to the approved master servicing study, no further hydraulic analysis was performed. Refer to table 2-5 and 2-6 for comparison.

Table 2-5 WATER DEMANDS FROM MASTER SERVICING STUDY

Water Demand – Proposed Site Conditions

Design Parameter	Anticipated Demand (L/min)	Boundary Condition ¹ (m H ₂ O / kPa) Connection @ Booth Street		Boundary Condition ¹ (m H ₂ O / kPa) Connection @ Wellington Street	
Average Daily Demand	858.9	61.7	605.3	58.6	574.9
Max Day + Fire Flow	1754.6 + 22,000 = 23,754.6	47.0	461.1	51.5	505.2
Peak Hour	3624.5	54.8	536.6	51.6	506.2

1) Boundary conditions supplied by the City of Ottawa for demands as indicated in correspondence. Assumed ground elevation @ Booth Street **53.4m**, @ Wellington Street **56.5m**, See **Appendix B**.

Table 2-6: PROPOSED WATER DEMANDS

Demand Type	Average Daily Demand (L/min)	Maximum Daily Demand + Fire Flow (L/min)	Maximum (Peak) Hour Demand (L/min)
Total	346.2	21,847.34	1497.40

The approved master servicing study had identified that the recommended pressures exceeded the 80psi for the average daily demand and therefore pressure reducing valves will be required for the proposed development.

Hydrant Analysis

The proposed Block 204 development is surrounded by two new fire hydrant and 3 existing hydrants. Hydrants #5, #8 and #9 will have a max fire flow of 5700L/min. Hydrants #6 and #7 will have the rest of the fire flow with a capacity of 1950L/min. Refer to Appendix B for proposed and existing hydrants.

2.4 Water Supply Summary and Conclusions

The water supply design for the proposed development follows the parameters outlined in the Ottawa Design Guidelines – Water Distribution (2010) as amended by all applicable technical bulletins, as well as the MOE Design Guidelines for Drinking-Water Systems (2008).

There is adequate flow and pressure in the water distribution system to meet the required water demands for the proposed development. Pressure reducing valves will be required for the proposed development.

Water Data Card for service connection is to be completed and submitted once design has been finalized and in preparation to Commence Work Notification and Water Permit Application.

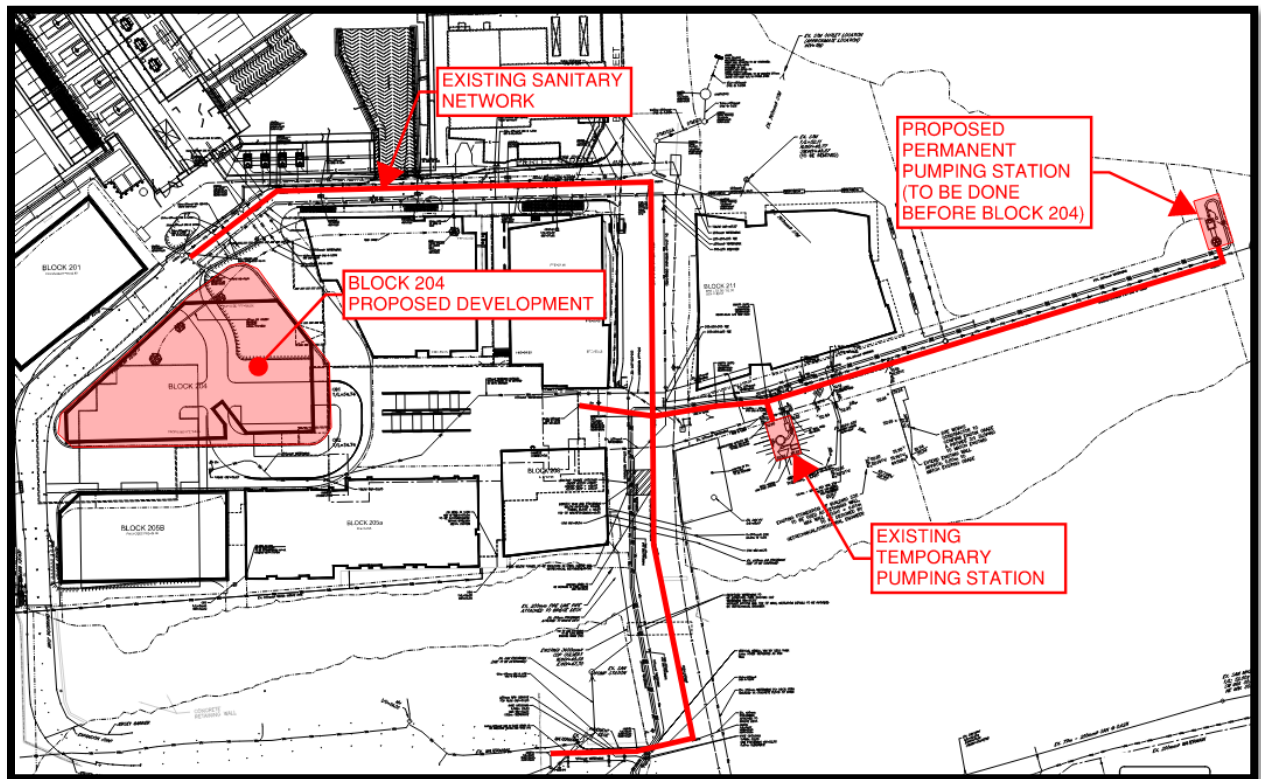
3. Sanitary Servicing

3.1 Existing Conditions

The current site is comprised of a sanitary network that extends from Chaudière Private, Booth Street and Zaida Eddy Street. The sanitary network is comprised of 250-300mm diameter sewer. See **Figure 3-1** for extent of existing network. The sanitary network currently is discharging into a temporary pumping station within the footprint of the existing building 535 to service the first phase of the ZIBI development. As per the report prepared by Hatch dated November 2018, the current station has a max wet weather peak flow capacity of 13 L/s.

The Technical Memorandum for Block 206 prepared by DSEL dated March 2021, stated that the new development of Block 206 exceeded 80% of the temporary pump capacity and that the new permanent pumping station needed to be built before the next block development. The design of the permanent pumping station is currently going through Site Plan application. Refer to ZIBI Pumping Station Preliminary Design Report by Hatch in **Appendix C**.

Figure 3-1 Existing Sanitary Network



3.2 Sanitary Servicing Design Criteria

The design criteria for determining the sanitary peak flow rates for the proposed development follow the parameters outlined in the City of Ottawa Sewer Design Guidelines, 2012 as amended by all applicable Technical Bulletins. Namely, the following parameters have been used in determining the peak sanitary flow rates:

Table 3-1: Sanitary Peak Flow Determination Design Criteria

Design Criterion	Residential and Commercial Areas
Residential Base Flow	280 L/capita/day
Commercial Base Flow	2.8 L/m ² /day
Populations – Studio	1.4 Persons Per Unit
Population – 1 Bedroom	1.4 Persons Per Unit
Population – 2 Bedroom	2.1 Persons Per Unit
Population – 3 Bedroom	2.7 Persons Per Unit
Peaking Factor for Residential	Determined by Harmon Equation

	$P.F. = 1 + \left[\frac{1}{4 + \left(\frac{P}{1,000}\right)^{\frac{1}{2}}} \right] \times 0.8$ <p>(P = population; P.F. = peaking factor) Maximum P.F. = 4.0 Minimum P.F. = 2.0</p>
Peaking Factor for Commercial	1.5
Dry Weather Infiltration Rate	0.05 L/s/effective gross hectare (for all areas)
Wet Weather Infiltration	0.28 L/s/effective gross hectare (for all areas)
Total Infiltration Allowance	0.33 L/s/effective gross hectare (for all areas)

3.3 Proposed Sanitary Servicing and Calculations

Proposed Sanitary Network Extension

The proposed Sanitary network extension will be as per the approved Master Servicing Study. A detailed Sanitary Calculation sheet has been developed with all the existing and future flows. Refer to **Appendix C** for detail calculations.

Proposed Sanitary Peak Flows

The estimated peak flows from the proposed development and existing development based on the design criteria listed in **Table 3-1** are outlined in the following Table.

Table 3-2: Block 204 Peak Sanitary Flows

Flow Type	Total Flow Rate (L/s)
Total Estimated Average Flow Rate	1.56
Total Estimate Peak Flow Rate (Exclude extraneous flow)	4.74

Refer to **Appendix C** for detailed calculations.

Table 3-3: Total Peak Sanitary Flows (Block 204, 211, 206, 207, 205A, 208, EO)

Flow Type	Total Flow Rate (L/s)
Total Estimated Average Dry Weather Flow Rate	5.96
Total Estimate Peak Dry Weather Flow Rate	15.02
Total Estimate Peak Wet Weather Flow Rate	15.86

Refer to **Appendix C** for detailed calculations.

Block 204 Sanitary Service Connections

Block 204 sanitary servicing will be connected to the new extended 250mm sanitary network by gravity. Connections shall be 200 mm PVC DR26 at a gradient of 2%.

3.4 Sanitary Servicing Summary and Conclusions

The sanitary servicing design for the proposed development conforms to the requirements of the City of Ottawa Sewer Design Guidelines, 2012, as amended by all applicable Technical Bulletins.

New pumping Station will need to be built and operational before the occupancy of Block 204.

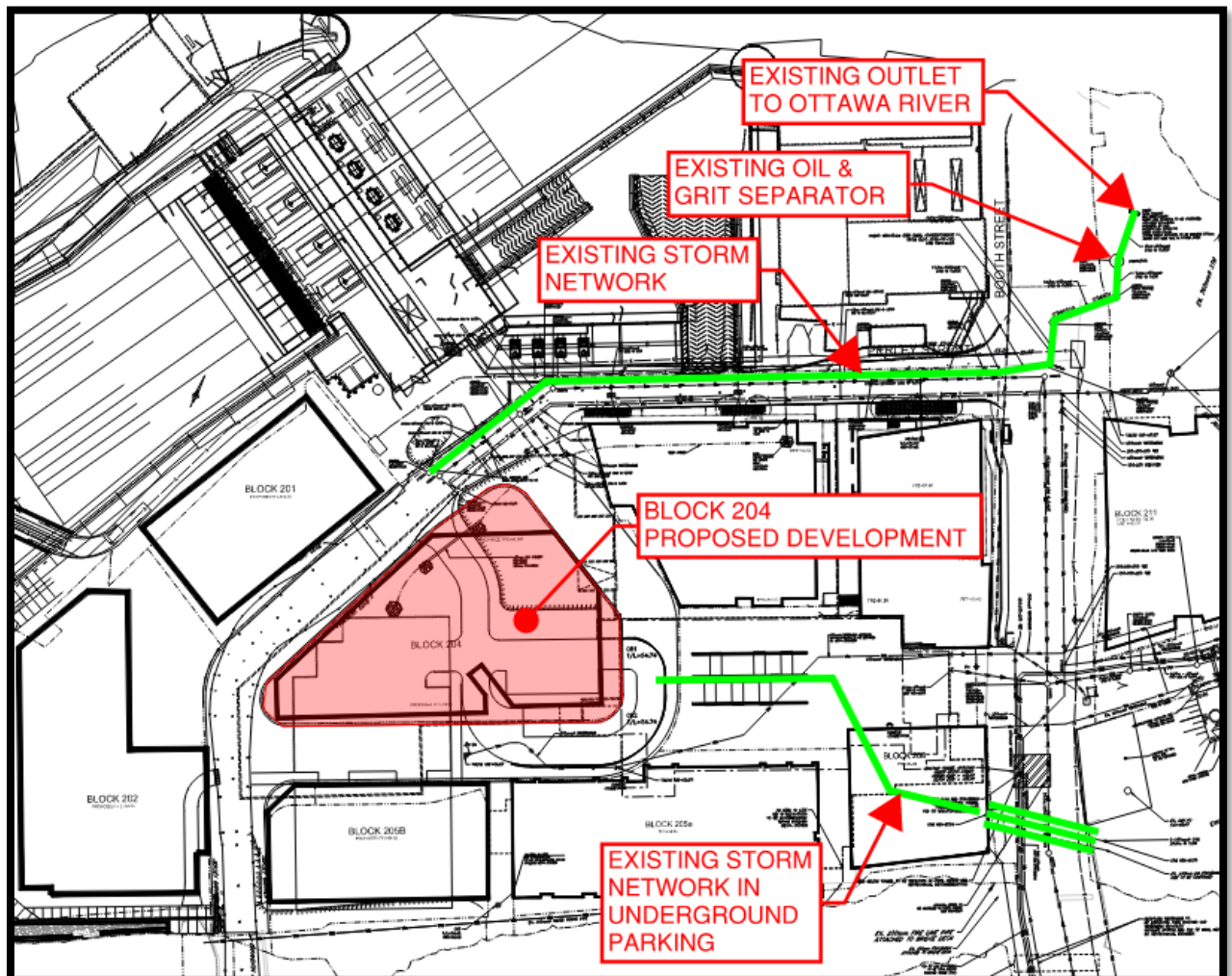
Peak wastewater demands are below the ultimate sanitary flow in the approved Master Servicing Study who confirmed that there is adequate residual capacity in the city of Ottawa system to accommodate the proposed wastewater flow.

4. Storm Servicing and Stormwater Management

4.1 Existing Conditions

The western part of ZIBI development is comprised of two existing storm networks. The storm network located in the upper of the development drains most of the north and west parts of the island and discharges to an outlet on the East side of Booth and onto the Ottawa River. The second storm network drains the courtyard between Block 205A, 206 and 204 and is discharge into the underground parking lot where it eventually crosses Booth Street and onto the Ottawa River. See **Figure 4-1** below for existing storm configuration.

Figure 4-1 Existing Storm Network



As per the Functional Servicing and Stormwater Management Report by DSEL dated August 2018, the Storm Water Management approach was to design the Storm Network to capture the 2-year storm event and that larger storm events are to use major system flow route. Refer to **Table 4-1** for flows that was calculated in the Phase I servicing report.

Table 4-1: Peak Release Flows – Existing Site

Storm Event	Minor / Major System Flow from Area Fut & 104B (1.059 Ha)			Minor / Major System Flow from Area 104A (0.234 Ha)		
	Minor Flow to HW100 (L/s)	Major Flow to Booth (L/s)	On-Site Max Flow Depth (m)	Minor Flow to Outlet South of 535 (L/s)	Major Flow to Booth (L/s)	On-Site Max Flow Depth (m)
2-Year	183.5	0.28	0.0	15.8	0	0
5-Year	246.6	18.2	0.02	22.3	0	0
100-Year	344.5	121.3	0.10	60.0	0	0

The existing storm network is also comprised of a Stormceptor STC4000 capable of treating 80% TSS removal before discharge to the Ottawa River. The storm network that drains the Courtyard into the underground parking garage is also equipped with an internal mechanical system to treat 80% TSS removal. Refer to Functional Servicing and Stormwater Management Report by DSEL dated August 2018 for technical details of the existing Storm Network.

4.2 Storm Servicing Strategy and Design Criteria

As stated in the Servicing Report by DSEL, quantity control is not required for the site as it will not increase flood risk to the Ottawa River. However, the site plan configuration has been modified since the last stormwater report and a larger area than what was anticipated will be draining to the storm network. Roof retention of Block 204 will be implemented in order to not exceed the anticipated peak flow that was identified in the Phase I report.

As stated in the Servicing Report by DSEL, the site currently has a Stormceptor to ensure 80% TSS removal is achieved as per the set requirement by the Rideau Valley Conservation Authority. Therefore, no additional quality treatment will be required for the proposed development.

4.3 Proposed Storm Servicing and Stormwater Management Design and Calculations

Proposed Storm Network Extension

The proposed storm sewer extension has been sized to capture the 5-year storm event. A Storm Sewer Hydraulic Design sheet using the rational method has been developed to analyze the existing and proposed storm network for the 2,5 and 100-year storm event. Refer to **Appendix D** for detail calculations.

Proposed Flow Rates and Stormwater Quantity Control

To calculate the peak flow rate, an evaluation of the runoff coefficient was done. The site is comprised of landscape surface, interlock pavers and hard surfaces such as roof and pavement. Refer to **Table 4-2** for the values that were used. The City of Ottawa Sewer Design Guideline does not have an attributed value for interlock pavers and therefore the value of 0.75 was used for from the MTO Drainage Management Manual (1997). Refer to **Appendix D** for table. For the 100-year Storm, the runoff coefficient has been increased by 25% as per City of Ottawa Guideline.

Table 4-2: Runoff Coefficient

Type of surface	Runoff Coefficient
Landscape	0.2
Interlock Pavers	0.75
Hard surface	0.9

For the hydraulic analysis of the storm network, a time of concentration of 10 minutes was used for the beginning of the network. The Block 204 will be doing water retention and will have a release rate of 21.13L/s. The flow restriction on the roof will result in 47m³ of water retention. Around 30% of the roof surface will be developed as green surface and has been considered in the calculations. Below is a table that summarized the peak flow for different storm event and compares the anticipated flow from the Phase I servicing report.

Table 4-2: Post-development Flow Rate

Rain event	Phase I anticipated Flow to HW 100 (1.059ha) (L/s)	From STM-111 to HW 100 (1.27ha) (L/s)	Phase I anticipated Flow Courtyard (0.234ha) (L/s)	Area "A10" Courtyard (0.134ha) (L/s)
2-year	183.78	176.56	15.8	21.46
5-year	264.8	234.09	22.3	29.11
100-year	465.8	457.48	60.0	62.53

For the Area of the Courtyard, the flow calculated appears to be higher than what was calculated during the Phase I, however, in the Phase I servicing report, it was calculated that the plumbing system in the underground garage had a capacity of 535L/s. Therefore, the existing network will be able to convey the 100-year storm event.

The main network draining to HW 100 has a greater area than what was anticipated during the design of Phase I. However, due to the retention done by Block 204 and using a runoff coefficient of 0.75 for interlock pavers, we obtain a peak flow that is lower than what was anticipated.

Stormwater Service Connections

The Block 204 and future Blocks will have a storm service of 250mm diameter with a minimum slope of 1%. The service line will be used to convey the roof flow and foundation drain.

Stormwater Quality Control

As mentioned in section 4.1, the site is currently equipped with a Stormceptor to treat 80% TSS removal as required by the Rideau Valley Conservation Authority.

4.4 Storm Servicing and Stormwater Management Summary and Conclusions

The storm servicing design for the proposed development conforms to the requirements of the City of Ottawa Sewer Design Guidelines, 2012, as amended by all applicable Technical Bulletins.

The peak flow rate for the 100-year storm is below the anticipated flow that was calculated during the Phase I report. Therefore, no additional storm analysis was done.

Roof Flow Control Declaration will be provided upon completion of the Mechanical and Structural design.

5. Conclusion

The purpose of this assessment is to confirm that the proposed development can be adequately serviced using the existing municipal infrastructure (water, sanitary, and storm) surrounding the site. This assessment shall be used in support of a Site Plan Control Application to allow for the construction of Block 204.

The important information and findings as a result of this assessment are as follows:

- + The anticipated water demands for the ZIBI site are **346.49 L/min** (average day), **21,847.34 L/min** (max day + fire flow), and **1497.4 L/min** (peak hour). Based on the boundary conditions provided by the City an additional private hydrant will be required on site to provide adequate fire flow. There is adequate flow and pressure in the water distribution system to meet the required potable water demands for the proposed development.
- + The estimated sanitary flow for the proposed Block 204 development is **1.56 L/s** (average flow rate) and **4.74 L/s** (peak flow rate);
- + The estimated sanitary flow for the ZIBI site is **5.96 L/s** (average flow rate), **15.02 L/s** (peak dry weather), and **15.86 L/s** (peak wet weather). The new permanent pumping station designed by Hatch will need to be in operation before the Block 204 occupancy. The City of Ottawa has indicated that they can accept the anticipated sanitary flow for full built-up of the ZIBI development in the Master Servicing Study (MSS);
- + Storm Peak Flow to HW-100 outlet for the 100-year event is lower than what was anticipated in the Phase I servicing report. Runoff of the Courtyard has been increased but internal plumbing has the capacity to convey the 100-year storm event;
- + The site is currently equipped with an Oil Grit Separator and therefore no additional quality treatment was proposed for the development;

- + Roof Flow Control Declaration will be provided upon completion of the Mechanical and Structural design.

We trust this Site Servicing and Stormwater Management Report is to your satisfaction. If you have any questions regarding this report, please do not hesitate to contact any of the signatories.

A

Appendix A Pre-consultation Correspondence

Julien Sauvé

From: Hamlin, Allison <Allison.Hamlin@ottawa.ca>
Sent: Wednesday, January 19, 2022 9:32 AM
To: Paul Cope; Darrin Rankine; Justin Robitaille
Cc: Mottalib, Abdul; Paudel, Neeti; Wang, Randolph; Patel, Parthvi
Subject: Pre-application Consultation Follow-up Email - ZIBI Block 204, 317 Miwate Private

--EXTERNAL--

Hello,

Thank you for meeting with us to discuss the fourth phase of development at Zibi. Your presentation was very helpful.

Please refer to the below and attached notes regarding the Pre-Application Consultation Meeting held on January 6, 2022, for the 22-storey, mixed-use, high-rise development at Zibi (Block 204, 315 private, Miwate Private, Chaudière Island).

Below are staff's preliminary comments based on the information presented at the time of the pre-consultation meeting:

Planning

- A site plan application (Complex) will be required.
- Zoning: MD5[2172] S332; OP(2003): Central Area and Central Area Secondary Plan, Mixed Use on Schedule Q; New OP: Ottawa River Islands Special District within the Downtown Core Transect.
- Please provide details of if/how lands will be severed and how the woonerf will be added to the plan of condo in your cover letter.
- Please provide a legal description and a legal survey of the subject lands with your application. A topographical sketch will not be sufficient.

Transportation

- TIA requirements - An addendum with trips, MMLoS and TDM for this site is accepted. It is recommended that the development provide as many TDM measures to enable and encourage travel by active modes.
- Ensure continuous, safe, and accessible pedestrian connections is provided from the site to the transit service on Booth Street. Recommend providing a close/ direct active mode connection through Block 204, 206 and 207 to Booth Street.
- Site triangles at the following locations on the final plan will be required:
 - Local Road to Local Road: 3 metre x 3 metres
- On site plan:

- Show all details of the roads abutting the site up to and including the opposite curb; include such items as pavement markings, accesses and/or sidewalks.
- Turning templates will be required for all accesses showing the largest vehicle to access the site; required for internal movements and at all access (entering and exiting and going in both directions).
- Show all curb radii measurements; ensure that all curb radii are reduced as much as possible
- Show lane/aisle widths.
- Sidewalk is to be continuous across access as per City Specification 7.1.
- AODA legislation applies for all areas accessible to the public. Consider using Accessibility Design Standards

Urban Design

- A Design Brief is required as part of the submission. The Terms of Reference is attached for convenience.
- Please consider both the Design Framework and Development Principles and the Heritage Interpretive Plan within the analysis.
- The site is within a Design Priority Area and formal review by the City's Urban Design Review Panel is required. The applicant can also benefit from informal review by the UDRP prior to submitting the application. Please reach out to the City's UDRP coordinator at udrp@ottawa.ca for scheduling details. Please note the UDRP is currently under high pressure with respect to project scheduling. Priority is given to projects at the stage of formal review.
- With respect to the design presented at the pre-consultation meeting, the programming and general site organization appears to have followed the approved master plan for the island. The detailed analysis and architectural aspirations presented by the architect are also appreciated. However, certain aspects of the design, particularly the positioning, shape, and the massing articulation of the tower are not most convincing.
 - Locating the tower to the northmost part of the site, while creating opportunities for a south-facing roof top amenity space, crowds the north shore of the island with a wall of towers. Do the benefits of this design strategy outweigh the shortcomings? Have the overall microclimate conditions of the site and the surrounding area been fully examined?
 - The generally rectangular shape of the tower appears to be quite arbitrary for the site and its location and does not respond to geometry of the site and the surrounding contextual elements effectively.
- Moving forward, it is important to continue to explore site plan and massing options taking into consideration the views of the island from the various vantage points as well as the overall optimal microclimate conditions of the site and the island. It is recommended as a best practice that a shadow study and a desk top wind study be prepared for each massing options explored to facilitate decision making.

Infrastructure

Capacity issues for sewers

- Please find the Servicing Report Template & Study Guidelines” in the attachment and prepare the servicing study accordingly. For capacity issue, please see section 3.2.1 page 3-3 and follow this section. A completed checklist with corresponding references from the servicing study is mandatory for the completeness of the study. Please add a completed checklist in the report.
 - Sanitary: as per approved master plan
 - Storm: as per approved master plan
 - Water: as per approved master plan
 - Sewage Pumping Station: Block 204 triggers Sewage Pumping Station. Sewage pumping station approval is required for this site as per the master plan agreement.

Required information for Water boundary conditions (not required if you're using existing service)

- Boundary conditions are required to confirm that the require fire flows can be achieved as well as availability of the domestic water pressure on the city street in front of the development. Please use Table 3-3 of the MOE Design Guidelines for Drinking-Water System to determine Maximum Day and Maximum Hour peaking factors for 0 to 500 persons and use Table 4.2 of the Ottawa Design Guidelines, Water Distribution for 501 to 3,000 persons.
 1. Location of Service
 2. A sketch of the proposed water service to the city watermain
 3. Street Number & Name
 4. Type of development and units
 5. Amount of fire flow required ___ l/s (Calculation as per the FUS Method).
 6. Average daily demand: -l/s
 7. Maximum daily demand: -l/s
 8. Maximum hourly daily demand: -l/s
- Please note proposed development will require 2 separate service connections from the city watermains if the basic day demand is greater than 50m³/day to avoid the creation of a vulnerable service area. Two water meters will be required for two service connections and the service connections will have to be looped.

Underground and above ground building footprints

- All underground and above ground building footprints and permanent walls need to be shown on the plan to confirm that any permanent structure does not extend either above or below into the existing property lines, sight triangles and/or future road widening protection limits.

Grade limitations for underground ramps

- Underground ramps should be limited to a 12% grade and must contain a subsurface melting device when exceeding 6%. If the ramp's break over slope exceeds 8%, a vertical-curve transition or a transition slope of half the ramp slope should be used.

Stormwater management criteria

- Quantity and quality control of the storm flow will be implemented as per master plan.

Monitoring MHs

- Onsite Monitoring MHs are required for sewers (sanitary and storm) if there will be commercial component with the residential development.

Studies required for Site Plan application

- Serviceability Study
- Erosion and sediment Control Plan, it can be combined with grading plan
- Stormwater Management Report
- Geotechnical Study
- Phase 2 Noise Control Detailed Study
- ESA-Phase 1 Study and Phase 2: Updated Phase II is required to ensure further contamination has not occurred and a description of the remediation process with available test results for our review.
- Filling of RSC.
- Wind Analysis
- Sewage Pumping Station

MOECC SWM Requirement:

- It will be indicated in the first review comments whether an ECA is required for that submission.

Relevant information

- Servicing & site works shall be in accordance with the following documents:
 - Ottawa Sewer Design Guidelines (2012)
 - Ottawa Design Guidelines – Water Distribution (2010)
 - Geotechnical Investigation and Reporting Guidelines for Development Applications in the City of Ottawa (2007)
 - City of Ottawa Slope Stability Guidelines for Development Applications (2004)
 - City of Ottawa Environmental Noise Control Guidelines (2006)
 - City of Ottawa Park and Pathway Development Manual (2012)
 - City of Ottawa Accessibility Design Standards (2012)
 - Ottawa Standard Tender Documents (2015)
 - Ontario Provincial Standards for Roads & Public Works (2015)
- Record drawings and utility plans can be purchased from the City (Contact the City's Information Centre by email at InformationCentre@ottawa.ca or by phone at (613) 580-2424 x.44455).

City Surveyor

- The determination of property boundaries, minimum setbacks and other regulatory constraints are a critical component of development. An Ontario Land Surveyor (O.L.S.) needs to be consulted at the outset of a project to ensure properties are properly defined and can be used as the geospatial framework for the development.

- o Topographic details may also be required for a project and should be either carried out by the O.L.S. that has provided the Legal Survey or done in consultation with the O.L.S. to ensure that the project is integrated to the appropriate control network.

Questions regarding the above requirements can be directed to the City's Surveyor, Bill Harper, at Bill.Harper@ottawa.ca

Community Representative Comments

- Please see attached minutes

Other

- o Plans are to be standard A1 size (594 mm x 841 mm) sheets, utilizing an appropriate Metric scale (1:200, 1:250, 1:300, 1:400 or 1:500).
- o All PDF submitted documents are to be unlocked and flattened.
- o You are encouraged to contact the Ward Councillor, Councillor Catherine McKenney, about the proposal.

Please refer to the links to [Guide to preparing studies and plans](#) and [fees](#) for further information. Additional information is available related to [building permits, development charges, and the Accessibility Design Standards](#). Be aware that other fees and permits may be required, outside of the development review process. You may obtain background drawings by contacting informationcentre@ottawa.ca.

These pre-application consultation comments are valid for one year. If you submit a development application(s) after this time, you may be required to meet for another pre-consultation meeting and/or the submission requirements may change. You are as well encouraged to contact us for a follow-up meeting if the plan/concept will be further refined. Please do not hesitate to contact me if you have any questions.

Regards,

Allison Hamlin, MCIP, RPP

Planner III (A) | *Urbaniste III (A)*

Development Review Central | *Examen des demandes d'aménagement secteur centre*

Planning, Real Estate and Economic Development Department | *Services de la planification, des biens immobiliers et du développement économique*

City of Ottawa | *Ville d'Ottawa*

110 Laurier Avenue West. Ottawa, ON | 110, avenue. Laurier Ouest. Ottawa (Ontario) K1P 1J1

613.580.2424 ext./ poste 25477

ottawa.ca/planning / ottawa.ca/urbanisme

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B

Appendix B Water Supply Calculations





PROJECT NAME: ZIBI Block 204
CIMA+ PROJECT NUMBER: A000931
CLIENT: DREAM
PROJECT STATUS: Site Plan Application

WATER CONSUMPTION CALCULATIONS

APPLICABLE DESIGN GUIDELINES:

1. Ottawa Design Guidelines - Water Distribution (2010)
2. City of Ottawa Technical Bulletin ISTB-2018-02, ISDTB-2014-02 and ISD-2010-02
3. MOE Design Guidelines for Drinking-Water Systems

RESIDENTIAL AND COMMERCIAL WATER DEMANDS:

RESIDENTIAL DESIGN CRITERIA:

Residential Average Day Demand: 350 L/c/day
 Maximum Day Peaking Factor: 3.2 x Average Daily Demand
 Maximum (Peak Hour) Peaking Factor: 4.9 x Average Daily Demand

Per Unit Populations:

Unit Type	Persons Per Unit
Single Family	3.4
Semi-detached	2.7
Duplex	2.3
Townhouse (row)	2.7
Apartments:	
Bachelor	1.4
1 Bedroom	1.4
2 Bedroom	2.1
3 Bedroom	3.1
Average Apt.	1.8

EQUIVALENT POPULATION :

Unit Type	Number of Units	Persons Per Unit	Population
1 Bedroom Apartments	141	1.4	197
2 Bedroom Apartments	79	2.1	166
Studio	19	1.4	27
Total	239		390

RETAIL & AMENITY DESIGN CRITERIA:

Contributing Retail & Amenity Area: 3,153.000 m²
 Retail & Amenity Average Day Demand: 2.5 L/m²/d
 Maximum Day Peaking Factor: 1.5 x Average Daily Demand
 Maximum (Peak Hour) Peaking Factor: 1.8 x Maximum Daily Demand

WATER DEMANDS:

Demand Type	Average Daily Demand (L/s)	Maximum Daily Demand (L/s)	Maximum (Peak) Hour Demand (L/s)
Residential	1.58	5.06	7.74
Retail & Amenity	0.09	0.14	0.25
Total	1.67	5.19	7.99

NOTES:

1. Maximum Day and Maximum Hour residential peaking factors determined using Table 3-3 of the MOE Design Guidelines for Drinking-Water System for 0 to 500 persons.
2. Given basic day demand less than 50 m³/day (0.57 L/s), only one connection is required.

Prepared by: Julien Sauvé, P.Eng. Date: 2022/04/05
 PEO #100200100

Verified by: André Chaumont, P.Eng. Date: 2022/04/05
 PEO #90409194



PROJECT NAME: ZIBI Block 204
CIMA+ PROJECT NUMBER: A000931
CLIENT: DREAM
PROJECT STATUS: Site Plan Application

WATER CONSUMPTION CALCULATIONS

APPLICABLE DESIGN GUIDELINES:

1. Ottawa Design Guidelines - Water Distribution (2010)
2. City of Ottawa Technical Bulletin ISTB-2018-02, ISDTB-2014-02 and ISD-2010-02
3. MOE Design Guidelines for Drinking-Water Systems

WATER DEMANDS:

Phase	Block	Type	Unit Rate		No Units	Avg Day L/min	Max Day L/min	Peak Hour L/min
1	208	Office	75	L/9.3m ² /d	975	5.46	8.19	14.75
1	208	Retail	2.5	L/m ² /d	736	1.28	1.92	3.45
1	208	Restaurant	125	L/seat/d	8	0.69	1.04	1.88
1	205A	Res	474.6	L/unit/d	71	23.4	114.66	173.16
1	205A	Retail	2.5	L/m ² /d	754	1.31	1.96	3.53
3	207	Office	75	L/9.3m ² /d	4544	25.45	38.17	68.71
3	207	Retail	2.5	L/m ² /d	567	0.98	1.48	2.66
3	207	Restaurant	125	L/seat/d	150	13.02	19.53	35.16
4	206	Res	280	L/unit/d	447	86.92	217.29	478.04
4	206	Retail	2.5	L/m ² /d	857	1.49	2.23	4.02
4	206	Amenity	2.5	L/m ² /d	1509	2.62	3.93	7.07
2	211	Office	75	L/9.3m ² /d	14480	81.09	121.64	218.95
2	211	Retail	2.5	L/m ² /d	1082	1.88	2.82	5.07
5	204	Res	350	L/p/d	390.00	94.79	303.33	464.48
5	204	Retail	2.5	L/m ² /d	1595.60	2.77	4.16	7.48
5	204	Amenity	2.5	L/m ² /d	1557.60	2.70	4.06	7.30
1	EO	Office	75	L/p/d	12	0.63	0.94	1.69
					Total	346.49	847.34	1497.40

NOTES:

1. Maximum Day and Maximum Hour residential peaking factors determined using Table 3-3 of the MOE Design Guidelines for Drinking-Water System for 0 to 500 persons.

Prepared by: Julien Sauvé, P.Eng.
PEO #100200100

Date: 2022/04/05

Verified by: André Chaumont, P.Eng.
PEO #90409194

Date: 2022/04/05



PROJECT NAME: ZIBI Block 204
CIMA+ PROJECT NUMBER: A000931
CLIENT: DREAN
PROJECT STATUS: Site Plan Control

FIRE FLOW ASSESSMENT

APPLICABLE DESIGN GUIDELINES:

1. Fire Underwriters Survey (FUS) Water Supply for Public Fire Protection, 1999
2. Ottawa Design Guidelines - Water Distribution (2010) including Appendix H per ISTB-2018-02
3. City of Ottawa Technical Bulletin ISTB-2018-02
4. MOE Design Guidelines for Drinking-Water Systems

STEP A - DETERMINE THE TYPE OF CONSTRUCTION

Type of Construction	Coefficient (C)	Value Selected (C)
Fire-resistive Construction (> 3 hours)	0.6	0.7
Fire-resistive Construction (> 2 hours)	0.7	
Non-combustible Construction	0.8	
Ordinary Construction	1.0	
Wood Frame Construction	1.5	

STEP B - DETERMINE THE FLOOR AREA

Floor/Level	Floor Area Per Level (sq. ft.)	Floor Area Per Level (m2)	Fire Resistive Building	Protected Openings (one hour rating)	Area of Structure Considered (m2)
GFA Level 1:	22,779	2,116	YES	YES	22,779
Mezzanine	9,416	875			219
GFA Level 2:	12,239	1,137			284
GFA Level 3:	8,783	816			-
GFA Level 4:	11,741	1,091			-
GFA Level 5:	11,741	1,091			-
GFA Level 6:	11,741	1,091			-
GFA Level 7:	11,741	1,091			-
GFA Level 8:	11,741	1,091			-
GFA Level 9:	11,741	1,091			-
GFA Level 10:	7,660	712			-
GFA Level 11:	7,543	701			-
GFA Level 12:	7,543	701			-
GFA Level 13:	7,543	701			-
GFA Level 14:	7,543	701			-
GFA Level 15:	7,543	701			-
GFA Level 16:	7,543	701			-
GFA Level 17:	7,543	701			-
GFA Level 18:	7,543	701			-
GFA Level 19:	7,543	701			-
GFA Level 20:	7,543	701			-
GFA Level 21:	7,543	701			-
GFA Level 22:	7,543	701			-
GFA Level Mechanical Penthouse	2,165	201	-		
TOTAL FLOOR AREA (A):	224,004	20,811			23,282



PROJECT NAME: ZIBI Block 204
 CIMA+ PROJECT NUMBER: A000931
 CLIENT: DREAN
 PROJECT STATUS: Site Plan Control

FIRE FLOW ASSESSMENT

STEP C - DETERMINE THE HEIGHT IN STOREYS

Floor/Level	Number of Storeys	Percent of Floor Area Considered
Ground Level:	1	100%
Mezzanine	1	25%
Level 2:	1	25%
Level 3:	1	-
Level 4:	1	-
Level 5:	1	-
Level 6:	1	-
Level 7:	1	-
Level 8:	1	-
Level 9:	1	-
Level 10:	1	-
Level 11:	1	-
Level 12:	1	-
Level 13:	1	-
Level 14:	1	-
Level 15:	1	-
Level 16:	1	-
Level 17:	1	-
Level 18:	1	-
Level 19:	1	-
Level 20:	1	-
Level 21:	1	-
Level 22:	1	-
Mechanical Penthouse	1	-
HEIGHT IN STOREYS:	24	

STEP D - DETERMINE BASE FIRE FLOW (ROUND TO NEAREST 1,000 L/min)

$$F = 220C\sqrt{A}$$

Where:

- F is the required fire flow in L/min
- C is the coefficient related to the type of construction, and;
- A is the total floor area of the building in m²

Coefficient Related to Type of Construction (C) = 0.7
 Floor Area Considered (A) = 23,282 m²

REQUIRED (BASE) FIRE FLOW (F) = 23000 L/min (Rounded to Nearest 1,000 L/min)

STEP E - DETERMINE THE INCREASE OR DECREASE FOR OCCUPANCY AND APPLY TO STEP D (STEP D x STEP E, DO NOT ROUND)

Occupancy Class	Occupancy Factor	Value Selected (C)
Non-combustible	0.75	0.85
Limited combustible	0.85	
Combustible	1.00	
Free burning	1.15	
Rapid burning	1.25	

REQUIRED (BASE) FIRE FLOW (F) = 19550 L/min (Not rounded)



PROJECT NAME: ZIBI Block 204
 CIMA+ PROJECT NUMBER: A000931
 CLIENT: DREAN
 PROJECT STATUS: Site Plan Control

FIRE FLOW ASSESSMENT

STEP F - DETERMINE THE DECREASE, IF ANY, FOR AUTOMATIC SPRINKLER PROTECTION AND APPLY TO VALUE IN STEP D ABOVE (DO NOT ROUND)

Sprinkler System Design	Sprinkler Design Charge	Value Selected (C)	Total Charge
Automatic sprinkler system conforming to NFPA standards	-30%	Yes	-30%
Standard water supply	-10%	Yes	-10%
Fully supervised system	-10%	Yes	-10%
TOTAL CHARGE FOR SPRINKLER SYSTEM			-50%

DECREASE FOR SPRINKLER PROTECTION = -11500 L/min (Not rounded)

STEP G - DETERMINE THE TOTAL INCREASE FOR EXPOSURES AND APPLY TO VALUE IN STEP D ABOVE (DO NOT ROUND)

Façade	Separation Distance (m)	Length-height Factor of Exposed Wall (m-storeys)	Assumed Construction of Exposed Wall of Adjacent	Total Charge
North Façade	16.0	1222	Fire Resistive or Ordinary with Unprotected Openings	15%
East Façade	16.0	256	Fire Resistive or Ordinary with Unprotected Openings	15%
South Façade	17.0	1420	Fire Resistive or Ordinary with Unprotected Openings	15%
West Façade	17.0	56	Fire Resistive or Ordinary with Unprotected Openings	11%
TOTAL CHARGE FOR EXPOSURES				56%

INCREASE FOR EXPOSURES = 12880 L/min (Not rounded)

STEP H - DETERMINE FIRE FLOW INCLUDING ALL INCREASES AND REDUCTIONS ((STEP E + STEP F + STEP G, ROUND TO NEAREST 1,000 L/min)

TOTAL REQUIRED FIRE FLOW (RFF) = 21000 L/min (Rounded to Nearest 1,000 L/min)
 350.00 L/s
 5548 USGPM



PROJECT NAME: ZIBI Block 204
CIMA+ PROJECT NUMBER: A000931
CLIENT: DREAN
PROJECT STATUS: Site Plan Control

FIRE FLOW ASSESSMENT

NOTES/COMMENTS:

STEP A - DETERMINE THE TYPE OF CONSTRUCTION

1. Building is made of typical Reinforced Concrete and has a fire rating of two hours. Extrapolation was used to determine the coefficient

STEP B - DETERMINE THE FLOOR AREA

1. Assumed vertical openings and exterior vertical communications are properly protected (one hour rating), thus only the area of the largest floor plus 25% of each of the two immediately adjoining floors accounted for per Fire Underwriters Survey (FUS) Water Supply for Public Fire Protection, 1999

STEP C - DETERMINE THE HEIGHT IN STOREYS

1. One levels of underground parking not considered as they are at least 50% below grade (note F of Fire Underwriters Survey (FUS) Water Supply for Public Fire Protection, 1999)

STEP D - DETERMINE BASE FIRE FLOW (ROUND TO NEAREST 1,000 L/min)

1. No notes or comments.

STEP E - DETERMINE THE INCREASE OR DECREASE FOR OCCUPANCY AND APPLY TO STEP D (STEP D x STEP E, DO NOT ROUND)

1. Occupancy selected will fall under C-2 occupancy type as per Neuf Architect.

STEP F - DETERMINE THE DECREASE, IF ANY, FOR AUTOMATIC SPRINKLER PROTECTION AND APPLY TO VALUE IN STEP D ABOVE (DO NOT ROUND)

1. Sprinkler system will be fully supervised.

STEP G - DETERMINE THE TOTAL INCREASE FOR EXPOSURES AND APPLY TO VALUE IN STEP D ABOVE (DO NOT ROUND)

1. Refer to sketch in Appendix for distance used in calculation.

STEP H - DETERMINE FIRE FLOW INCLUDING ALL INCREASES AND REDUCTIONS ((STEP E + STEP F + STEP G, ROUND TO NEAREST 1,000 L/min)

1. No notes or comments.

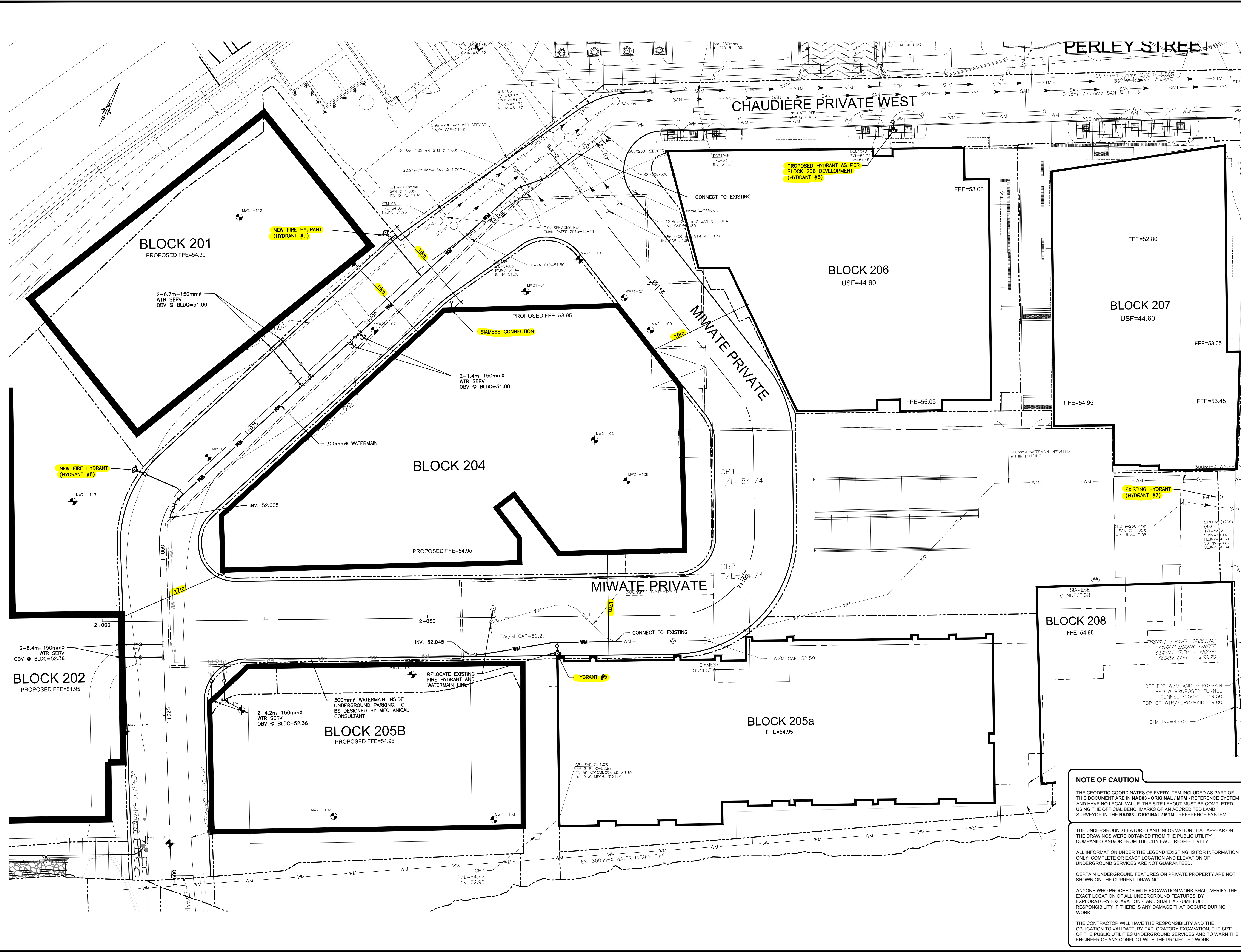
Prepared by: Julien Sauvé, P.Eng.
PEO# 100173201

Date: 2022/04/05

Verified by: André Chaumont, P.Eng.
PEO #90409194

Date: 2022/04/05

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EXISTING		PROPOSED	
WM	WATERMAIN	WM	WATERMAIN
SAN	SANITARY SEWER	SAN	SANITARY SEWER
STM	STORM SEWER	STM	STORM SEWER
D	DRAIN	D	DRAIN
G	GAS LINE (APPROX. LOC.)	G	GAS LINE (APPROX. LOC.)
T	UNDERGROUND TELEPHONE (APPROX. LOC.)	T	UNDERGROUND TELEPHONE (APPROX. LOC.)
CA	UNDERGROUND TRAFFIC CABLE (APPROX. LOC.)	CA	UNDERGROUND TRAFFIC CABLE (APPROX. LOC.)
E	UNDERGROUND ELECTRICITY (APPROX. LOC.)	E	UNDERGROUND ELECTRICITY (APPROX. LOC.)
OT	OVERHEAD WIRES	OT	OVERHEAD WIRES
OT	OVERHEAD TRAFFIC CABLE (APPROX. LOC.)	OT	OVERHEAD TRAFFIC CABLE (APPROX. LOC.)
---	RIGHT-OF-WAY LIMITS	---	RIGHT-OF-WAY LIMITS
---	EASEMENT	---	EASEMENT
---	TOP OF SLOPE	---	TOP OF SLOPE
---	BOTTOM OF SLOPE	---	BOTTOM OF SLOPE
---	CATCHBASIN	---	CATCHBASIN
---	MANHOLE/CATCHBASIN	---	MANHOLE/CATCHBASIN
---	MANHOLE	---	MANHOLE
---	FIRE HYDRANT	---	FIRE HYDRANT
---	VALVE	---	VALVE
---	REDUCER	---	REDUCER
---	TEE	---	TEE
---	VALVE CHAMBER	---	VALVE CHAMBER
---	PRIVATE UTILITIES (WATERMAIN)	---	PRIVATE UTILITIES (WATERMAIN)
---	NATURAL GAS VALVE	---	NATURAL GAS VALVE
---	TRENCH DRAIN	---	TRENCH DRAIN
---	SIGN	---	SIGN
---	STOP SIGN	---	STOP SIGN
---	TRAFFIC LIGHT	---	TRAFFIC LIGHT
---	ELECTRICITY POLE	---	ELECTRICITY POLE
---	TELEPHONE POLE	---	TELEPHONE POLE
---	ELECT.-TEL.-STREET LIGHT POLE	---	ELECT.-TEL.-STREET LIGHT POLE
---	ELECT.-TEL.-TRANSFORMER POLE	---	ELECT.-TEL.-TRANSFORMER POLE
---	PRIVATE STREET LIGHT	---	PRIVATE STREET LIGHT
---	ELECTRICITY MANHOLE	---	ELECTRICITY MANHOLE
---	TELEPHONE MANHOLE	---	TELEPHONE MANHOLE
---	SURVEY STATION	---	SURVEY STATION
---	WATERMAIN INSULATION	---	WATERMAIN INSULATION
---	UNDERGROUND PARKING	---	UNDERGROUND PARKING
---	GARAGE OUTLINE	---	GARAGE OUTLINE
---	BOREHOLE (LOC. APPROX.)	---	BOREHOLE (LOC. APPROX.)
---	WORK LIMIT	---	WORK LIMIT

ABBREVIATIONS	
STM	STORM
SAN	SANITARY
WM	WATERMAIN
WTR	WATER
INV	INVERT
MH	MANHOLE
CB	CATCHBASIN
TL	TOP OF LID
OBV	OBVERT
FFE	FINISHED FLOOR ELEVATION
BLDG	BUILDING
SERV	SERVICE

No.	Date	Description	By
1	APR 11, 2022	ISSUED FOR SITE PLAN APPLICATION	A.C.

DESIGNED BY: **CIMA+**

APPROVED BY:

ENGINEER:

CLIENT:

PROJECT NAME: **ZIBI ONTARIO BLOCK 204 OTTAWA, ONTARIO**

SHEET TITLE: **EXPOSURE SEPARATION DISTANCES AND FIRE HYDRANT COVERAGE**

DISCIPLINE: CIVIL	
DRAWER: S.C. POGGIOLI	SCALE: 1:250
DESIGNER: J. SALUVE	DATE: 2022/03/14
APPROVER: A. CHALMONT	APPROVER: A. CHALMONT
PROJECT No.: A000931	DRAWING No.:
SHEET No.:	of 11

NOTE OF CAUTION

THE GEODETIC COORDINATES OF EVERY ITEM INCLUDED AS PART OF THIS DOCUMENT ARE IN NAD83 - ORIGINAL / MTM - REFERENCE SYSTEM AND HAVE NO LEGAL VALUE. THE SITE LAYOUT MUST BE COMPLETED USING THE OFFICIAL BENCHMARKS OF AN ACCREDITED LAND SURVEYOR IN THE NAD83 - ORIGINAL / MTM - REFERENCE SYSTEM.

THE UNDERGROUND FEATURES AND INFORMATION THAT APPEAR ON THE DRAWINGS WERE OBTAINED FROM THE PUBLIC UTILITY COMPANIES AND/OR FROM THE CITY EACH RESPECTIVELY.

ALL INFORMATION UNDER THE LEGEND 'EXISTING' IS FOR INFORMATION ONLY. COMPLETE OR EXACT LOCATION AND ELEVATION OF UNDERGROUND SERVICES ARE NOT GUARANTEED.

CERTAIN UNDERGROUND FEATURES ON PRIVATE PROPERTY ARE NOT SHOWN ON THE CURRENT DRAWING.

ANYONE WHO PROCEEDS WITH EXCAVATION WORK SHALL VERIFY THE EXACT LOCATION OF ALL UNDERGROUND FEATURES, BY EXPLORATORY EXCAVATIONS, AND SHALL ASSUME FULL RESPONSIBILITY IF THERE IS ANY DAMAGE THAT OCCURS DURING WORK.

THE CONTRACTOR WILL HAVE THE RESPONSIBILITY AND THE OBLIGATION TO VALIDATE, BY EXPLORATORY EXCAVATION, THE SIZE OF THE PUBLIC UTILITIES UNDERGROUND SERVICES AND TO WARN THE ENGINEER OF ANY CONFLICT WITH THE PROJECTED WORK.

C

Appendix C Wastewater Collection Calculations





PROJECT NAME: ZIBI - Ontario - Urban_Development
 CIMA+ PROJECT: A000931
 CLIENT: Windmill DREAM Ontario 207 LP
 PROJECT STATUS: Preliminary Design (Assessment of Adequacy of Public Services)

WASTEWATER PEAK FLOW DETERMINATION

APPLICABLE DESIGN GUIDELINES:

1. City of Ottawa Sewer Design Guidelines, 2012
2. City of Ottawa Technical Bulletin ISTB-2018-01
3. Ontario Building Code 8.2.1.3.B.

DOMESTIC CONTRIBUTIONS:

RESIDENTIAL DESIGN CRITERIA:

Residential Average Flow: 280 L/c/day
 Residential Peak Factor: Harmon Equation (Min 2.0 and Max 4.0)

$$P.F. = 1 + \left(\frac{14}{4 + \left(\frac{P}{1000} \right)^{\frac{1}{2}}} \right) * K$$

where:
 P=Population
 K=Correction Factor =0.8

Per Unit Populations:

Unit Type	Persons Per Unit
Single Family	3.4
Semi-detached	2.7
Duplex	2.3
Townhouse (row)	2.7
Apartments:	
Bachelor	1.4
1 Bedroom	1.4
2 Bedroom	2.1
3 Bedroom	3.1
Average Apt.	1.8

For the design of new systems, the average residential flow of 280 L/capita per day (as noted in Figure 4.3) shall be used. The peaking factor shall be derived from the Harmon Formula with the minimum permissible peaking factor being 2.0 and the maximum being 4.0. A correction factor of 0.8 shall then be applied to the Harmon Peaking factor.

- Infiltration Allowance (Dry weather): 0.05 L/s/effective gross ha (for all areas)
- Infiltration Allowance (Wet weather): 0.28 L/s/effective gross ha (for all areas)
- Infiltration Allowance (Total I/I): 0.33 L/s/effective gross ha (for all areas)

COMMERCIAL & INSTITUTIONAL CONTRIBUTIONS:

COMMERCIAL AND INSTITUTIONAL DESIGN CRITERIA:

Retail Average Flow:	28000 L/ha/day	2.8 L/m ² /day	Effective Gross Area:	3 ha
Restaurant Average Flow:	125 L/seat/day		DryWeather Infiltration rate	0.05 L/s/effective gross ha
Office Average Flow:	75 L/9.3m ² /day	8.1 L/m ² /day	WetWeather Infiltration rate	0.28 L/s/effective gross ha
Office Average Flow:	75 L/c/day		Total Infiltration Allowance:	0.33 L/s/effective gross ha
Commercial Peak Factor:	1.5		Peak Extraneous Flow:	0.99 L/s

AVERAGE FLOW:

Phase	Block	Type	Unit Rate	Floor Area	Population	Number of Seats	Average Flow (L/s)	Peak Factor	Peak Flow (L/s)
1	208	Office	8.1 L/m ² /day	2527	-	-	0.24	1.5	0.35
1	205A	Residential	280 L/c/day	-	127	-	0.41	3.4	1.40
1	205A	Retail	2.8 L/m ² /day	750	-	-	0.02	1.5	0.04
2	211	Office	8.1 L/m ² /day	14480	-	-	1.35	1.5	2.03
2	211	Retail	2.8 L/m ² /day	1082	-	-	0.04	1.5	0.05
3	207	Office	8.1 L/m ² /day	6451	-	-	0.60	1.5	0.90
3	207	Retail	2.8 L/m ² /day	575	-	-	0.02	1.5	0.03
3	207	Restaurant	125 L/seat/day	-	-	150	0.22	1.5	0.33
4	206	Residential	280 L/c/day	-	447	-	1.45	3.4	4.93
4	206	Retail	2.8 L/m ² /day	799	-	-	0.03	1.5	0.04
4	204	Residential	280 L/c/day	-	390	-	1.26	3.4	4.30
4	204	Retail	8.1 L/m ² /day	1596	-	-	0.15	1.5	0.22
4	204	Amenity	8.1 L/m ² /day	1558	-	-	0.15	1.5	0.22
1	EO	Office	75 L/c/day	-	10	-	0.01	1.5	0.01
1	ZIBI	Office	75 L/c/day	-	20	-	0.02	1.5	0.03

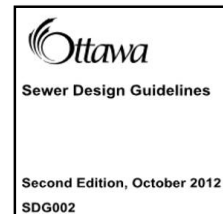
Total	5.96	14.87
Total Dryweather Flow		15.02
Total Wetweather Flow		15.86

NOTES:

1. Base sanitary flow, population densities, and infiltration rate are based on City of Ottawa design guidelines.
2. Harmon Equation has been used to calculate the residential peak factor for sanitary flows (see above) - maximum value of 4.0.
3. Population densities per City of Ottawa Sewer Design Guidelines, 2012, Section 4.3, Table 4.2 Per Unit Populations.

Prepared by: Zakaria Moumine, EIT Date: 2022/03/24
 PEO# 100564657

Verified by: Julien Sauvé, P.Eng. Date: 2022/03/24
 PEO# 100200100





ZIBI - Ontario - Urban_Development
A000931 (360)
HYDRAULIC CALCULATIONS FOR SANITARY SEWERS

Manning Coefficient:	0.013
Maximum permitted velocity :	3.00
Minimum permitted velocity :	0.60

Hydraulic Calculations for Sanitary Sewers

Building Flow	Section	Dia.	Length	Slope	Capacity (full)	Velocity (full)	Flow	Cumulative Flow	Velocity (actual)	% Full
		mm	m	%	m ³ /s	m/s	m ³ /s	m ³ /s	m/s	
Building 202 / 205B	SAN-109 to SAN-108	250	30.6	0.35%	0.035	0.72	0.00665	0.00665	0.55	19%
	SAN-108 to SAN-107	250	9.9	0.35%	0.035	0.72	0.00000	0.00665	0.55	19%
Building 204 / 201	SAN-107 to SAN-106	250	57.2	0.35%	0.035	0.72	0.00919	0.01584	0.70	45%
	SAN-106 to SAN-105	250	22.2	1.00%	0.059	1.21	0.00000	0.01584	1.02	27%
	SAN-105 to SAN-104	250	9.2	1.10%	0.062	1.27	0.00000	0.01584	1.05	26%
Building 206 / 207 / EO	SAN-104 to SAN-103	250	107.8	1.50%	0.073	1.48	0.00624	0.02208	1.28	30%
	SAN-103 to SAN-102	250	67.3	0.42%	0.039	0.79	0.00000	0.02208	0.81	57%
ZIBI / 205a / 208/ 209	SAN-102 to SAN-101	250	18.3	0.45%	0.040	0.81	0.00462	0.02670	0.86	67%
Building 211 / 213	SAN-101 to SAN-100A	250	14.8	0.50%	0.042	0.86	0.00798	0.03468	0.96	83%
Building 212	SAN-100A to SAN-401A	300	75.9	0.23%	0.047	0.66	0.00520	0.03988	0.74	85%
Building 214 / 215	SAN-401A to SAN-402A	1,500	61.5	0.23%	3.393	1.92	0.00340	0.04328	0.66	1%
	SAN-402A to SAN PS	525	4.2	3.90%	0.849	3.92	0.00000	0.04328	2.05	5%

Remarks :

1. Slope of 2.00% has been assumed for all building connections.
2. Sewer runs generally do not achieve minimum flushing velocities (0.6m/s) under actual peak flow conditions, where the height of flow is less than 30% of the sewer diameter in accordance with City of Ottawa and MOE guidelines. A flushing program is to be implemented.
3. Sanitary Flows used for Future development are from the Master Servicing Study

Prepared by: Julien Sauvé, P.Eng
PEO# 100200100

Date: #####

Verified by: André Chaumont, P.Eng
PEO# 90409194

Date: #####

March 14, 2022

Ms. Taryn Glancy, P.Eng.
Project Manager
Zibi
6 Booth Street, Albert Island
Ottawa, ON K1R 6K8

Dear Taryn:

Subject: Preliminary Design for the Pumping Station to Service the Zibi Development on Chaudière Island - City of Ottawa

Hatch is pleased to present the Preliminary Design Report for the Zibi Permanent Pumping Station in the City of Ottawa.

We trust that this report is sufficient for your review and approval. Should you have any further questions, please do not hesitate to contact us.

Very truly yours,



Peter Rüsç, M.Eng., P.Eng., PMP
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Zibi Pumping Station, Chaudière Island, City of Ottawa

Preliminary Design Report



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Revision and Version Tracking

Report Title: Zibi Pumping Station, Chaudière Island, City of Ottawa – Preliminary Design Report

Submission Date: March 14, 2022

Version #	Filename:	Author	Checker	Approver	Date:
V0.50	Draft 1: Zibi Pumping Station Chaudière Island, Ottawa - Preliminary Design Report	P. Rüsç / A Gibbs	P. Rüsç	P. Rüsç	July 30, 2021
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V0.95	Zibi Pumping Station Chaudière Island, Ottawa - Preliminary Design Report	P. Rüsç / A Gibbs	P. Rüsç	P. Rüsç	December 2, 2021
V1.00	Zibi Pumping Station Chaudière Island, Ottawa - Preliminary Design Report	P. Rüsç / A Gibbs	P. Rüsç	P. Rüsç	March 14, 2022



Peter Rüsç: Project Engineer

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1 Introduction

This report has been prepared for Zibi for the preliminary design of a new sewage pumping station to be located on Chaudière Island in the City of Ottawa. A site plan is attached in Appendix 1: Figure 1. The pumping station will service the planned Zibi development on Chaudière Island.

The internal collection system will collect sewage by gravity to a low point near the proposed pumping station; refer to the site plan for details. The proposed pumping station is designed to lift the collected sewage through two existing forcemains to a manhole located on Brickhill Street (near Pimisi Station) in Ottawa, to be treated elsewhere.

The purpose of this report is to:

- Provide the design criteria and rationale used to provide a preliminary design for the sewage pumping station;
- List specific requirements incorporated in the design;
- Outline the preliminary arrangement of the pumping station and site requirements;

This report is to be reviewed, and submitted to the City of Ottawa for review and comments for inclusion into the final design. This report is also to be submitted as part of the Environmental Compliance Approval (ECA) application.

2 Methodology

2.1 Capacity of the Pumping Station

Zibi, after review of the phasing of the development, requested a final capacity of the pumping station at 45 L/s, with a likely sewage flow of 30 to 35 L/s. Refer to an e-mail from Zibi in Appendix 4.

In line with the City of Ottawa requirements, a wet well with submersible pumps with an underground control valve chamber will form the core pumping station. The pumping station will be equipped with 2 duty and 1 standby pumps.

The invert of the incoming sewer and the forcemain is dictated by the existing ground levels / sewer designs and the requirements for storage in the wet well / approach pipe of the pumping station. The final inverts were set by Hatch, taking the incoming sewer, storage requirements, and operational levels / volumes into account.

For approval purposes, the firm capacity of this pumping station will be 45 L/s, with an expected peak flow of 30-35 L/s. Refer to Section 3.3 for a detailed description of pump/forcemain combinations and resulting capacities.

3 Design of the Pumping Station

3.1 Existing System Components / Elevations / Other Requirements

The MECP Design Guidelines (online version) call for a flow velocity of at least 0.6 m/s in forcemains, however Hatch's preference is for a velocity of above 1.0 m/s (ideally 1.25 m/s to 1.5 m/s) to maintain adequate self-cleaning velocities in the forcemain. The forcemains are pre-existing for this project, with an ID of 201 mm. This will result in a velocity of 0.95 m/s (at 30 L/s) and 1.42 m/s at 45 L/s. Therefore, the flow velocity requirements of the City and the MECP will be fully met.

Since there is inadequate storage in existing sewers and manholes to allow for emergency storage exceeding 30 minutes, a storage pipe will provide additional storage for the pumping station. In conjunction with a dedicated diesel drive standby generator, the storage will primarily serve to provide additional time to troubleshoot the station, should there be a failure / outage. An emergency overflow has been indicated upstream of the pumping station, connecting to an existing storm sewer. An overflow elevation of 47.109 m has been provided in as-built drawings for the sewers on site. We understand that this level was set to ensure that no basements will be flooded. The station will be designed for a minimum

time-to-overflow of 30 minutes at 45 L/s, which will result in a minimum time-to-overflow of 45 minutes at 30 L/s. Since the expected flows are at the lower end of the design range, the actual storage time will be at the higher end of the design range.

3.2 Approach Pipe

The pumping station uses an approach pipe to bridge the elevation difference to the pumping station wet well from the end of the storage pipe, thus creating good suction conditions for the pumps. The key purpose is to create smooth flow conditions that will not entrain air, to avoid issues associated with air in the forcemain. The approach pipe is designed to have a hydraulic jump at the junction of the incoming supercritical flow and the subcritical flows into the wet well. This will allow for self-cleaning of the approach pipe as sewage cycles between the operating levels.

3.3 Station Configuration

After a detailed analysis, it was determined that three pumps (2 duty, 1 standby) appears to be a more desirable station configuration. With this arrangement, two pumps are required to meet duty of 45 L/s using a single forcemain. Each pump can pump 30 -35 L/s using a dedicated forcemain. Therefore, with two pumps and two forcemains in operation a maximum capacity of approximately 60-70 L/s can be achieved. This results in a more energy efficient design, while accommodating flow variations between 30 and up to 50 L/s with two pumps and two forcemains in service and still meeting the desired 45 L/s with a single forcemain in service. The third pump operates as a standby pump in all cases.

3.4 Sizing of the Wet Well

Sizing of the wet well was performed for a single pump pumping through a dedicated forcemain achieving a flow of up to 35 L/s. Other operational scenarios are less severe and will be accommodated by this arrangement. The wet well capacity required to achieve a given pump cycle time, with one pump in service, can be calculated as follows:

$$V = \frac{T_c \cdot Q}{4}$$

Where:

V = wet well volume in L;

T_c = Pump Cycle Time in seconds;

Q = Pump discharge rate, in L/s

Since normally three pumps are available, 8 starts and stops per hour equally spread over 3 pumps were used to calculate the wet well volume (for pumps of this size, generally between 15 and 30 starts per hour are allowed). The active wet well volume required can be calculated as:

$$V = \frac{T_c \cdot Q}{4} = \frac{450s \cdot 35 L/s}{4} = 3940L$$

Given the physical size of the pumps, and operational volume requirements, Hatch recommends a wet well within a precast chamber 2400mm x 3000mm to fit the pumps and piping. Allowing for 90% of the area being usable (to allow for some benching, equipment), this provides an area of:

$$A = 0.9 * l * w = 0.9 * 2.438 * 3.048 = 6.69m^2$$

A live wet well depth may be calculated as:

$$H = \frac{V}{A} = \frac{3.94m^3}{6.69m^2} = \sim 0.59m$$

3.5 Storage Requirements

In the event of an equipment failure the station will have the storage capacity to prevent incoming sewage flow from spilling into the storm system for at least 30 minutes. Significant storage within the wet well is not practical due to site considerations, hence a storage pipe was designed. The storage pipe is a 51.7m

1500 mm sewer between SANMH 401A and SANMH 402A. Low flow benching has been added to the storage pipe to accommodate all sewage flows under normal operating conditions (up to 45 L/s). The storage pipe elevations have been set to provide full storage at 100 mm below the overflow to the storm sewer. The maintenance hole SANMH 401A will be increased in diameter to 2400mm and the maintenance hole SANMH 402A will be increased in diameter to 3000mm. Hatch has confirmed both of these maintenance holes can accommodate joining to a 1500 mm sewer. The storage pipe will, net of the low flow channel and the benching, have a storage volume of 1.55 m³/m.

3.6 Station Levels

The system operating levels are controlled with a combination of an ultrasonic level sensor and backup floats. The low water level (LWL) is set at the sequent depth for 45 L/s of the approach pipe, this level is set at 44.35m. LWL1, at which Pump 1 starts, is set at 44.95m, 0.60m higher than LWL. Pump 1 will be set to run at 25 L/s to reduce energy consumption while ensuring suitable conveyance velocities in the forcemain. LWL2, is set at 45.15m, at which point Pump 2 starts at 25 L/s and the first pump continues to run at 25 L/s for a combined duty of up to 50 L/s. Should the sewage level further increase, to high water level (HWL), set 0.20m above the LWL2 at 45.35m, both pumps to run at full speed, 30-35 L/s each for a total pumpage of 60-70 L/s. Should sewage levels continue to rise, the alarm high water level (HHWL) will be reached. This arrangement allows for additional emergency capacity to prevent overflows, and should be utilized unless the discharge cannot be accepted by the downstream sewer. The HHWL has been set to coincide with the top of the low flow channel in the storage pipe. The low-low water level is set 0.20m below the LWL to raise an alarm and also turn of the pump. A float is set 0.10m below the LLWL as a backup to turn off the pumps in the event of a transducer failure. The wet well invert (station floor) is 0.55m below the LLWL to allow for variety of pumps to be installed and allow for construction tolerances.

Table 1 - Level Elevation Summary

Level	Elevation	Notes
Station Floor	43.60m	
Low-Low Water Level	44.15m	Alarm level (float at 44.05m).
Low Water Level	44.35m	First pumps stops.
Low Water Level 1	44.95m	First pump starts (~25 L/s). Second pump stops.
Low Water Level 2	45.15m	Second pump starts (~2 x 25 L/s, from 1 x 35 L/s).
High Water Level	45.35m	Two pumps running each at 30 to 35 L/s.
High-High Water Level	45.55m	Alarm level (float at 45.65m).

Should only a single forcemain be operational, 45 L/s capacity will be met with 2 pumps running at full speed. Under peak flow conditions this may utilize some storage, however it would be expected that under circumstances where only a single forcemain is available, the station will be manned and that vac-trucks will be kept on standby.

3.7 Sizing and Pressure Class of the Forcemain, and System Curve

The forcemains are existing, and the sizing was indicated above, as were the expected velocities. A review of the forcemain profile confirmed that the forcemains are not continuously rising to the high point; this usually indicates a potential for transients. Variable frequency drives (VFDs) will be used in the station, primarily to improve energy consumption and to allow for longer runtimes. In addition, they will aid in limiting transients during normal operation by ramping up and ramping down the pump speed to control sewage flow rates. VFDs can also be used increase operational speed to perform controlled and periodic flushing of the forcemains if full speed pumping operation does not regularly occur.

The static head of this pumping station will range between 15.1m (for High-High Water Level) and 16.3 m during normal operation (Based on Low Water Level) based on the operating levels as defined in section 3.6 above, and the forcemain discharge elevation of 60.69 m. Forcemain distances and losses are calculated based on as-built drawings sent to Hatch.

A system curve has been calculated from 0-80 L/s using the HW-C factors of 120, 130 and 140 for the 200 mm SDR-26 PVC forcemain for single and dual forcemain operation. Minor losses were estimated by allowing for a 'k' value of 2 for fittings inside the pumping station and 16.1 for the forcemains. This 'k' value results in an additional dynamic head of 1.8 m at a flow rate of 45.0 L/s.

Friction losses are noted as follows, at 45 L/s and 30 L/s respectively:

- Hazen Williams C (HW-C) = 120: 14.1 m and 6.7 m
- HW-C = 130: 12.2 m and 5.7 m
- HW-C = 140: 10.6 m and 5.0 m

From the friction loss difference, and the general transient understanding, it is advisable to limit pumping capacity to 30 L/s, unless higher capacities are required.

A graph of the system curve is attached as Appendix 1: Figure 3. The following lines have been plotted:

- Maximum static head, and friction losses based on a HW-C of 120, along with minor losses;
- Intermediate static head (LWL1), and friction losses based on a HW-C of 130, along with minor losses;
- Minimum static head (OWL), and friction losses based on a HW-C of 140, along with minor losses.

Since the forcemain is < 300 mm diameter, the pump selection was based on the maximum curve. The full calculations are shown in Appendix 2.

3.8 Pump Selection

From the hydraulic system curve, three identical pumps have been pre-selected for the proposed pumping station – these are KSB 80-253/224XFG-K. Hatch has reached out to other manufacturers and the option presented is currently deemed the most suitable selection for this application.

Each pump is a submersible wastewater pump with a 255 mm diameter impeller. It operates with 600 V, 60 Hz, 3 phase motor with an output rating of 18.64 kW at 1777 rpm. These pumps require a minimum water level of 0.45 m, therefore the floor level proposed in section 3.6 of 0.75 m below the LWL is suitable.

With submersible pumps the NPSH requirements are met by designing the station to operate above the minimum water level. Hatch has calculated the NPSH available at the station and has confirmed that it will exceed the NPSH required by the pump manufacturer by a suitable margin for flows up to ~ 50 L/s per pump. The additional submergence below the LLWL alarm level contributes to having increased NPSH margin available.

The data sheet for the proposed pump is attached in Appendix 3. The pump curve for single and two pump operation has been plotted on the system curve derived in Section 3.7 above.

3.9 Variable Frequency Drives

As noted above, VFD drives will reduce energy costs, and transient issues during normal operation. In addition, the VFDs will lessen the inrush current to the pumps, and will allow for a higher number of starts per hour.

3.10 Emergency Backup Times and Emergency Overflow

Storage is available above the HHWL in the wet well, storage pipes and maintenance holes SANMH 401A and SANMH 402A. Any storage upstream of SANMH 401A was considered negligible.

The overflow elevation of the system was presented to Hatch as 47.109m on drawing, "PLAN AND PROFILE OF ZAIDA EDDY PRIVATE, SHEET No. 6" provided by Zibi. It is expected that the City/MECP will require a minimum emergency storage of 30 minutes of sewage flows, this would require a total storage of 81,000 L of storage. The storage time prior to overflow is 41 minutes at the full incoming flow condition, and is 53 minutes when the incoming flow rate is 35 L/s.

In the event of the surrounding water exceeding the 100 year flood level (46.81m), the system overflow may be compromised. A duckbill check valve should be installed on the overflow connection in SANMH 402A to eliminate water flowing into the station through the overflow connection during flood conditions.

3.11 Regular and Emergency Maintenance

With a three pump / two forcemain configuration, the pumps can either pump through both forcemains concurrently, or one at a time. With a flow rate of 25 L/s for single pump operation, operation of a single pump / two forcemain will result in low flow velocities. It is therefore proposed that the valves in the control valve chamber be adjusted to suit operation of a pump / forcemain combination, with 1 pump assigned to one forcemain and the other 2 pumps to the other forcemain. It is recommended that the assignment is changed every 6 month as part of regular maintenance. A selector switch will be incorporated into the pump controls to ensure that the pumps will function correctly.

3.12 Operation, Maintenance and Service Manuals

Access for maintenance personnel to the wet well will be provided through a hinged access cover with a locking device. Standard manhole ladders, set in the pre-cast concrete chamber, as well as safety platforms will be in accordance with applicable design standards for the given depth of the wet well. Three additional access openings, with locks and hinged covers, will facilitate maintenance of the pumps.

The wet well and the control valve chamber will both be located underground with locked access hatches. Therefore, additional security measures such as fencing should be unnecessary.

Operation, Maintenance and Service Manuals will be provided in accordance with the requirements of Section 7.1.5.3 of the City of Ottawa Pumping Station Design Guidelines. These manuals should be kept at a convenient location near the pumping station.

4 Electrical Works

4.1 Power Supply

A dedicated 3-phase supply will be made available for the pumping station. Details of the power supply requirement are provided in Appendix 1. There is an existing generator for the station, that was purchased by Zibi for the temporary pumping station. This generator was sized with the permanent station in mind and Hatch has confirmed it can be used at the permanent station. More information on the backup generator is available in Appendix 5.

4.2 Control Panel

The control panel will contain the control schematic (3-position mode selector switch, push-buttons and any other ancillary equipment required to provide a safe pump control). These components will be supplied as loose equipment, in the same package as the submersible pumps. The general contractor will install, commission and start-up the control system as per the pump control supplier documentation.

4.2.1 Operation

The pump control shall be based on the “Lead-Lag” principle. The operator can select three modes of operation from 2 selector switches:

- MANUAL mode: Each pump can be started and stopped individually, from push-buttons;
- AUTO mode: Pumps start and stop as per the “Lead-Lag” principle.
At the first start Pump P-1 will be the lead pump and will start at the LWL1 level. Should the level reach LWL2, then the lag pump P-2 starts. The lag pump will stop once the LWL1 is reached. The lead pump stop once the LWL level is reached. Once both pumps are stopped, pump P-2 becomes the “lead” pump and P-3 the “lag” pump and P-1 becomes the standby pump. After each operation, the “lead” position alternates.
- OFF position: All pumps are stopped.

The control panel will include the LIT-1 ultrasonic level transducer. This transducer will provide the level inputs, (LWL, LWL1, LWL2, HWL) to be used to control the pumps.

Floats will be used to control the alarm levels (LLWL, HHWL) in addition to the ultrasonic transducer, and as backup to the transducer. An alarm will activate when the floats are used to control the pumps indicating the ultrasonic transducer is in a state of failure.

The controls for the submersible pumps will be provided by the pump manufacturer.

Each pump circuit is fitted with a thermomagnetic circuit breaker with instantaneous magnetic trip and adjustable overload relay.

Control power for pump schematic is to be provided from a Un-interruptible Power Supply (UPS). The UPS will power the level transmitter and auto-dialer.

A heating element with a thermostat will control the temperature of the control panel.

The following items shall also be included in the motor control panel:

- Duplex receptacle with ground fault protection;
- Lightning arrester;
- Motor temperature surveillance;
- Intrinsically safe relays for level switches installed in classified area;
- Pump Protection Relays for submersible motor protection;
- Smoke detector for smoke alarm;
- Manual transfer switch for generator operation of the station;
- Dry contacts for the alarm function of high-high water level, pump faults, power failure, smoke alarm, diesel generator fault, illegal entry is to be wired to the alarm control panel.

The time totalizer and event counter will enable staff to monitor the performance of pumps. A flow meter can be provided if required, however due to the limited space on site, and no receiving SCADA endpoint is not recommended. It is recommended that volume calculations are based on runtimes.

Each pump will be monitored for failing to respond to a "start" command. The pump failing to respond will be locked out and the lag pump will assume the lead duty position.

A separate "Alarm Control Panel" (ACP) will be provided on the outside of the pumping station main control panel. The ACP will house the alarming control logic required and a programmable auto-dialer to relay alarms. The dialler will store at least 4 pre-set emergency numbers, and will dial in case of an alarm until the dialed call is acknowledged. As a backup, an industrial outdoor strobe/audible alarm unit will also be mounted on the outside of the ACP that will be activated only in case of an auto-dialer failure, or if the auto-dialer alarm is not acknowledged within an adjustable short period of time. Alarm notifications instructions will also be added near the strobe light/audible alarm for manual alarming. The ACP can also be replaced (in future) with a SCADA system, should this become a requirement.

5 Confined Space Entry Requirements

The proposed wet well pumping station is classified as "confined space" similar to any underground maintenance hole or chamber.

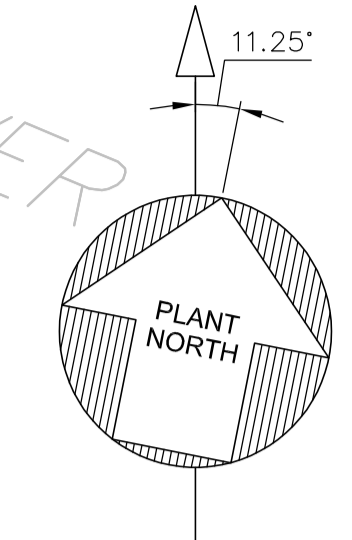
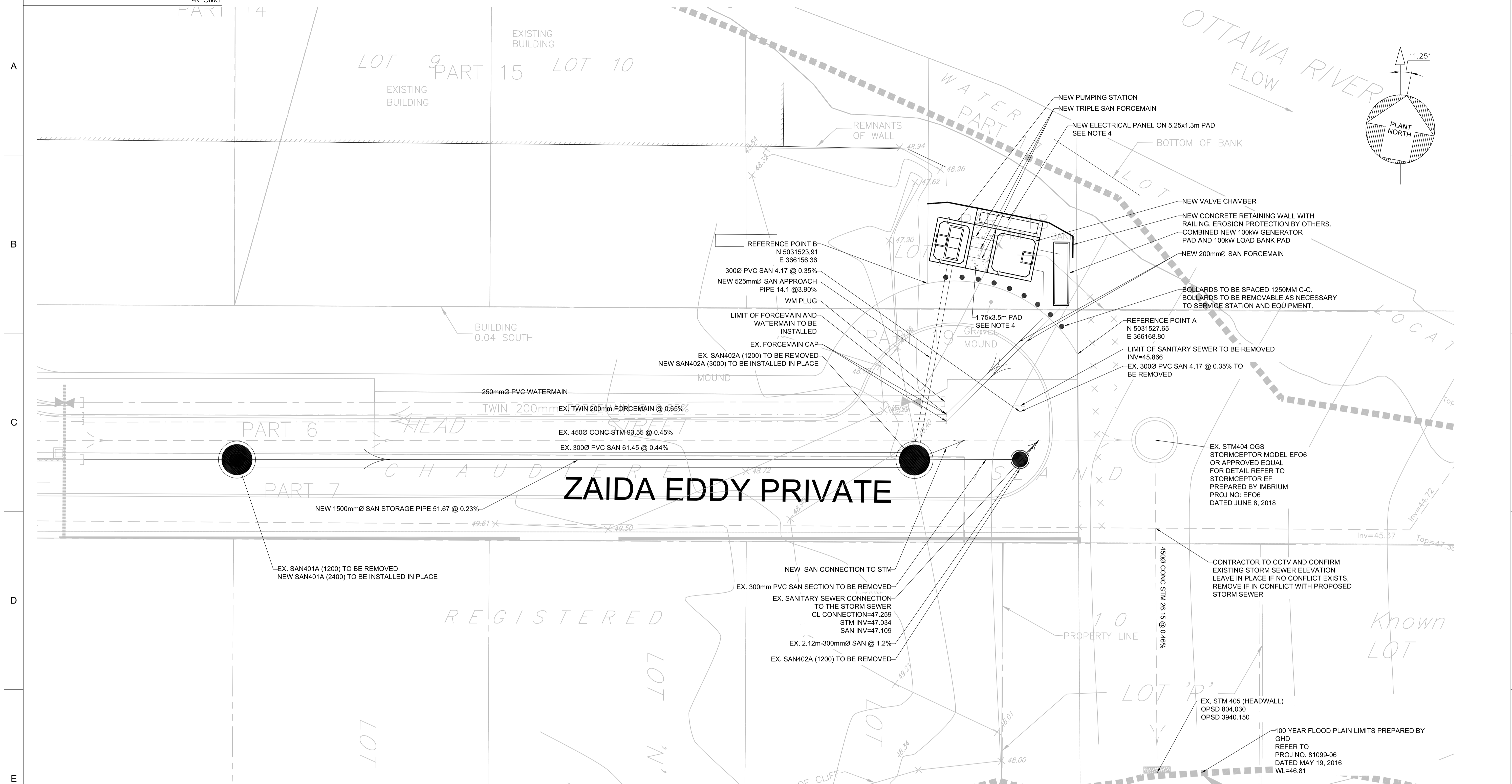
Entry to the wet well is subject to the following requirements:

- Ontario Regulation 632/05 (Confined Spaces)
http://www.elaws.gov.on.ca/html/regs/english/elaws_regs_050632_e.htm
- Confined Spaces Guidelines prepared by the Ontario Ministry of Labour
http://www.labour.gov.on.ca/english/hs/pdf/gl_confined.pdf

Entry procedures shall be developed by the owner of the Pumping Station in accordance with the above noted regulations and laws, and safety equipment shall meet legal requirements and be maintained in strict accordance with manufacturer's requirements.

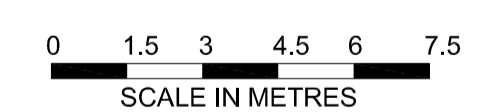
Appendix 1

- Figures
- Site Plan
 - System Schematic
 - Process Mechanical Layout and Details
 - Electrical Single Line Diagram
 - Electrical Layout
 - Structural Details



ZAIDA EDDY PRIVATE

SITE PLAN 1



- NOTE:**
- DRAWING BASE PLAN USED PROVIDED BY DSEL JANUARY 8, 2021. HATCH HAS NOT VERIFIED THE CORRECTNESS OF THESE DRAWINGS AND SHALL NOT BE RESPONSIBLE FOR ANY INACCURACIES AS A RESULT OF ERRORS IN THE BASE DRAWINGS.
 - CONTRACTOR TO CONFIRM ALL INVERTS OF EXISTING SEWERS PRIOR TO CONSTRUCTION COMMENCING.
 - REFERENCE POINTS TO BE FIELD VERIFIED PRIOR TO CONSTRUCTION COMMENCING.
 - PADS TO BE FLUSH WITH TOP OF STATION AND VALVE CHAMBER.

FOR CLIENT REVIEW

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ZIBI WINDMILL DREAM ONTARIO PUMPING STATION

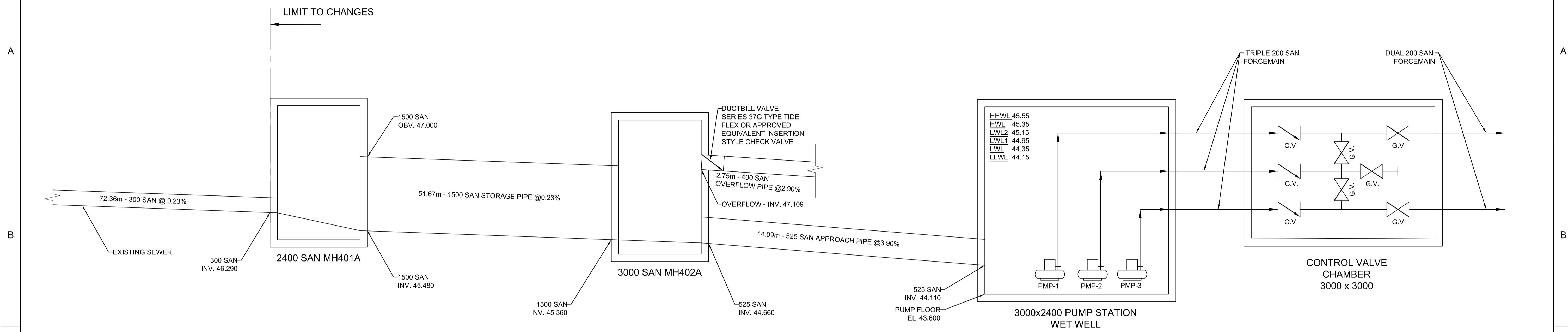
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DRAFTSPERSON	J.BAJAGIC	NR	11-19-2021
DESIGNER	A.GIBBS	NR	11-19-2021
CHECKER	A.GIBBS/P.RUSCH		11-19-2021
DESIGN COORD.			-
RESP. ENG.	P.RUSCH		11-19-2021
LEAD DISC. ENG.			-
ENG. MANAGER			-
PROJ. MANAGER	P.RUSCH		11-19-2021

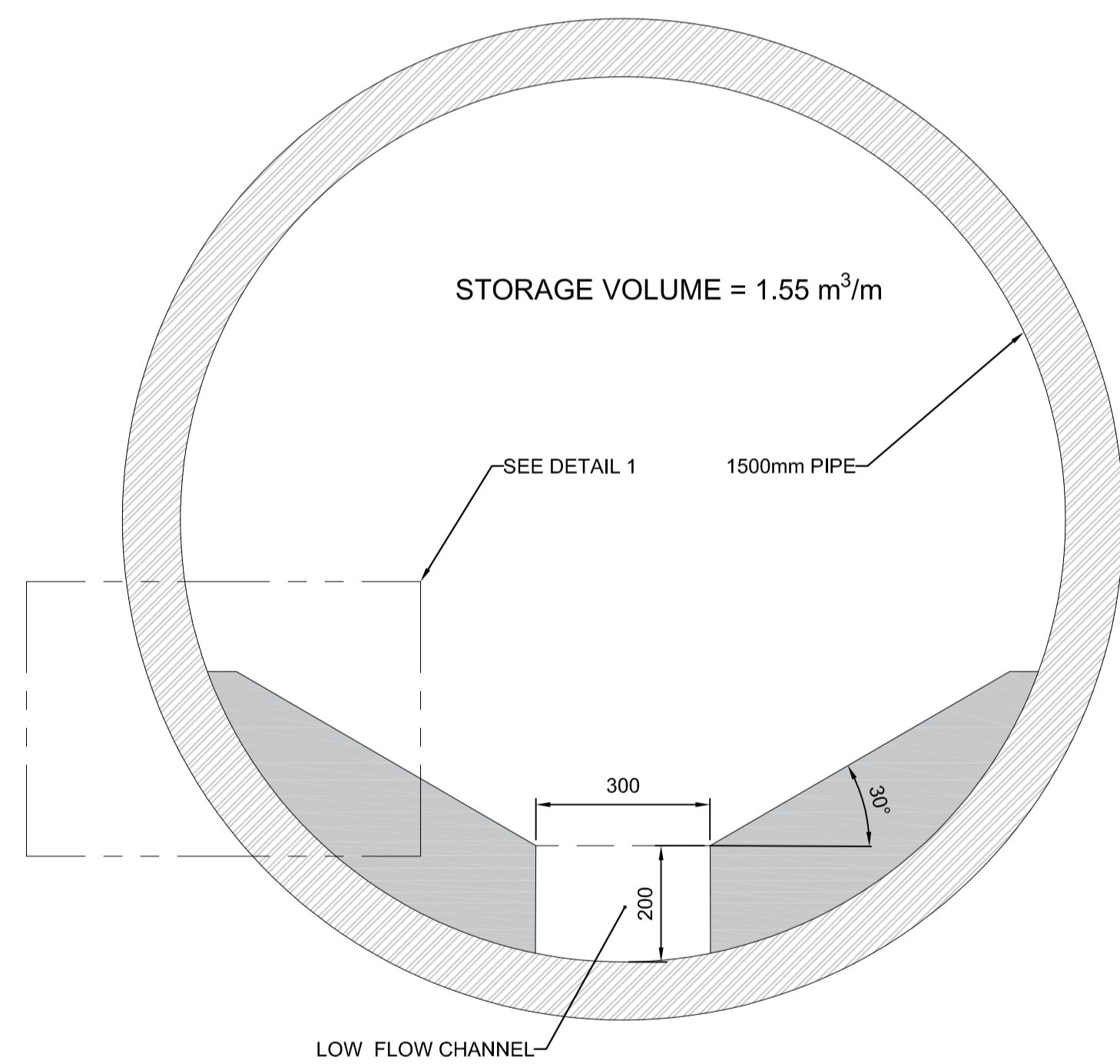
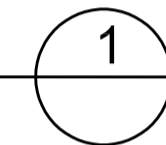
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B	FOR CLIENT REVIEW	J.B.	P.R.	11-24-2021
A	FOR CLIENT REVIEW	J.B.	P.R.	11-19-2021

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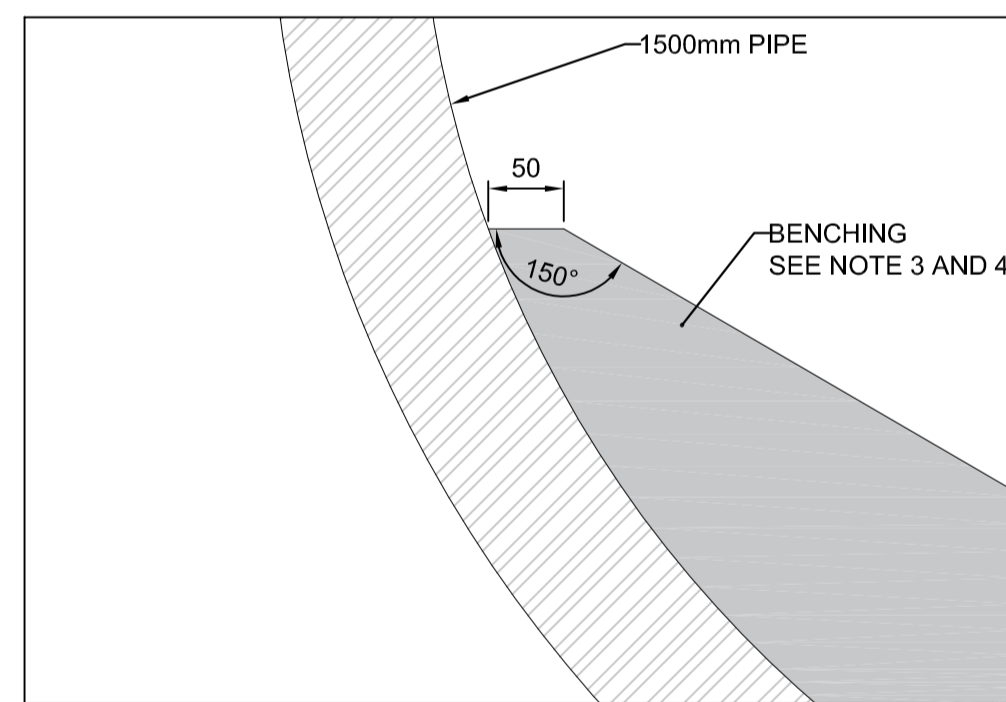
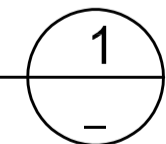
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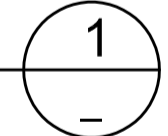
SCHEMATIC DIAGRAM
N.T.S.



BENCHING DETAILS - STORAGE PIPE
1:10



DETAIL 1
1:5



- GENERAL NOTES:
- ALL ELEVATIONS SHOWN ARE IN METERS.
 - ALL PIPE SIZES AND DIMENSIONS ARE SHOWN MILLIMETERS.
 - ALL CONCRETE BENCHING SHOULD CONFORM TO CAN 3-A23.3-M77 (LATEST REVISION):
- 28 DAY STRENGTH: 30MPa
- SLUMP: 50mm
- ENTRAINED AIR: 6%
 - BENCHING TO BE 30MPa CONCRETE AS PER NOTE 3. ALL BENCHING SHALL BE RE-ENFORCED AS PER CSA A23.3 FOR SLABS

FOR CLIENT REVIEW

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HATCH

zibi

ZIBI WINDMILL DREAM ONTARIO
PUMPING STATION

PROCESS MECHANICAL
SCHEMATIC PLAN AND DETAIL

D	FOR CLIENT REVIEW	J.B.	P.R.	03-14-2022
C	FOR CLIENT REVIEW	J.B.	P.R.	12-03-2021
B	FOR CLIENT REVIEW	J.B.	P.R.	11-26-2021
A	FOR CLIENT REVIEW	J.B.	P.R.	11-19-2021

No.	DESCRIPTION	BY	CHK'D	DATE
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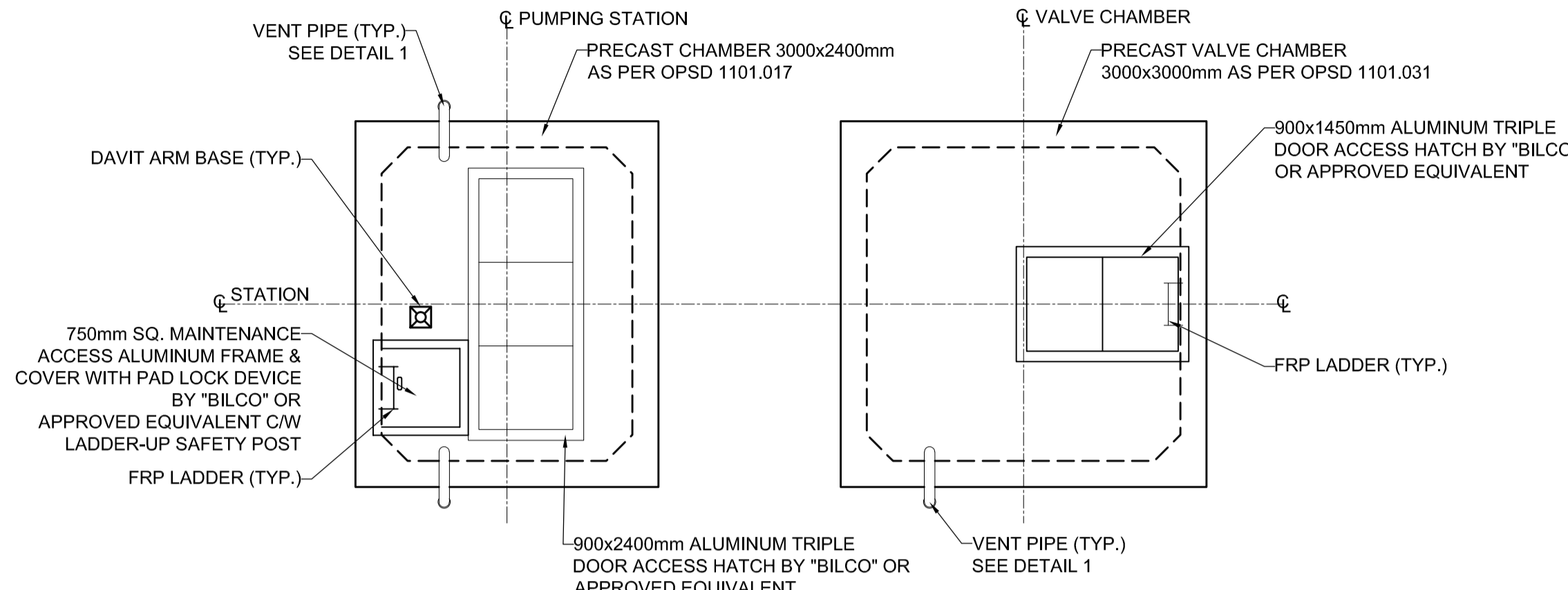
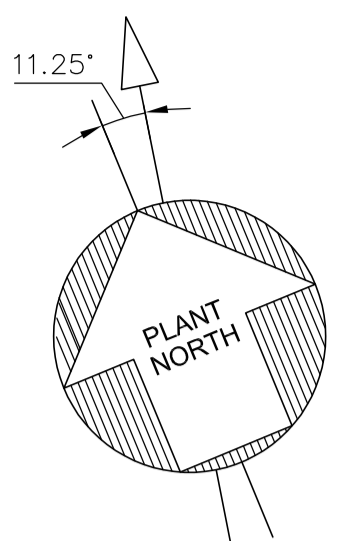
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DRAFTSPERSON	J.BAJAGIC	NR	11-19-2021
DESIGNER	A.GIBBS	NR	11-19-2021
CHECKER	A.GIBBS/P.RUSCH		11-19-2021
DESIGN COORD.			-
RESP. ENG.	P.RUSCH		11-19-2021
LEAD DISC. ENG.			-
ENG. MANAGER			-
PROJ. MANAGER	P.RUSCH		11-19-2021

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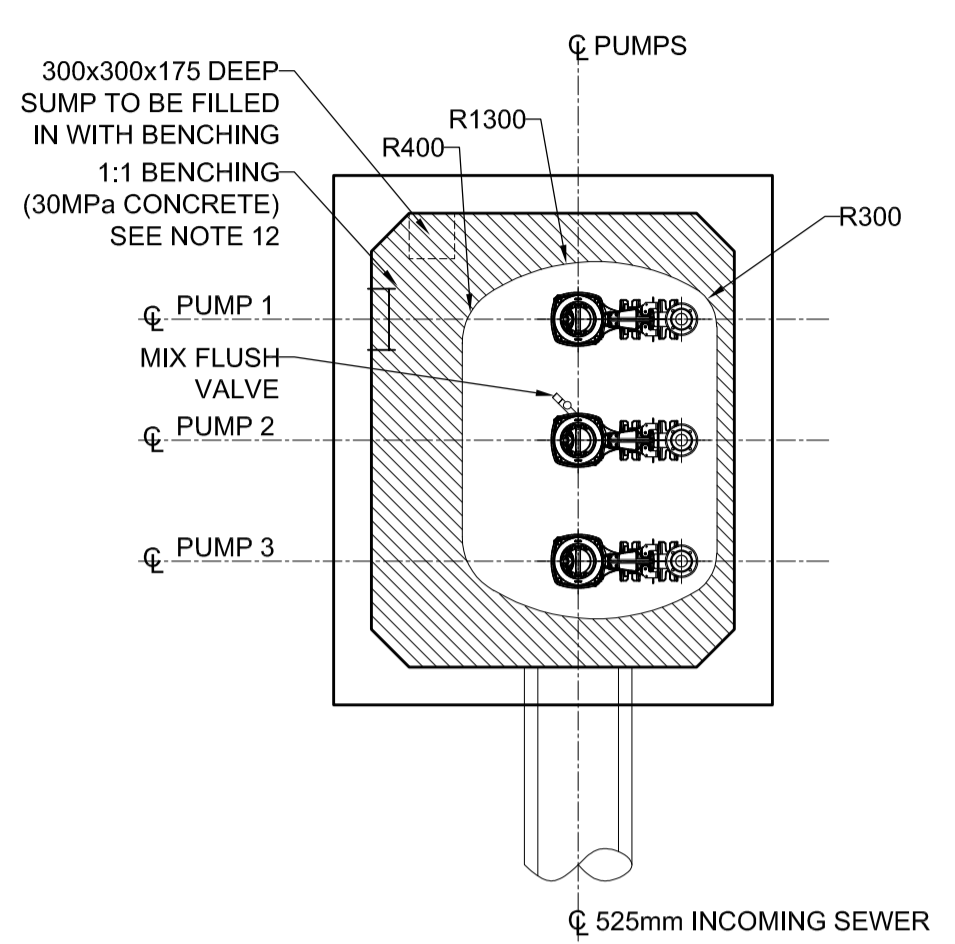
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DWG. No. H364639-0000-240-262-0001
REV D

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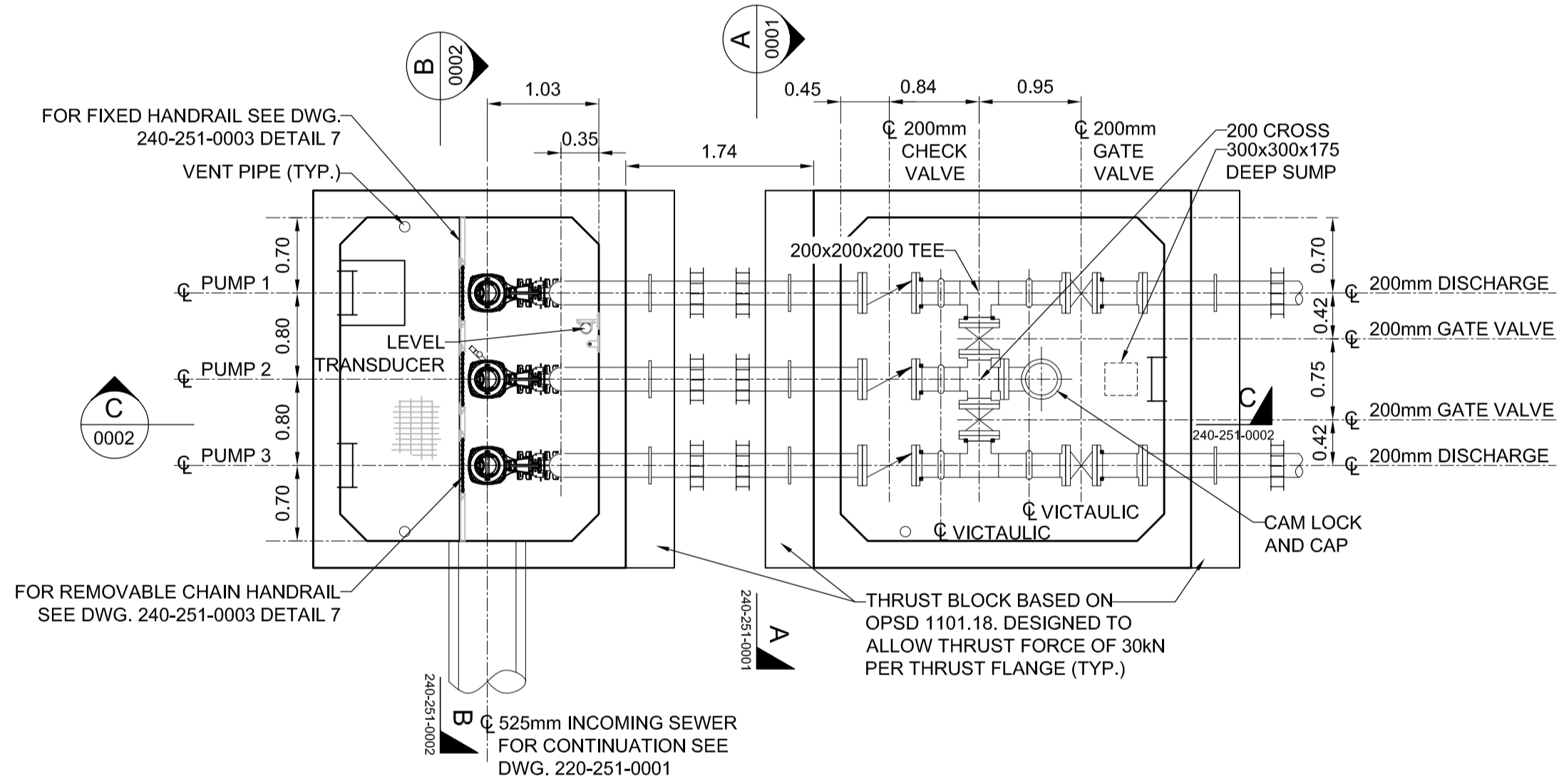
- ALL ELEVATIONS SHOWN ARE IN METERS.
- ALL PIPE SIZES AND DIMENSIONS ARE SHOWN MILLIMETERS.
- REFER TO SITE PLAN DRAWING H364639-0000-220-251-0001 FOR POSITION AND ORIENTATION OF PUMPING STATION.
- ALL PIPES TO HAVE FLEXIBLE JOINTS OUTSIDE OF THE PUMPING STATION. FORCEMAIN JOINT IS TO BE CONSTRUCTED WITH TIE RODS.
- ALL VICTAULIC COUPLINGS FOR STAINLESS STEEL SHALL BE STYLE 77. ALL VICTAULIC COUPLINGS SHALL BE EPOXY COATED OR HOT DIP GALVANIZED.
- ALL CONCRETE BENCHING SHOULD CONFORM TO CAN 3-A23.3-M77 (LATEST REVISION):
 - 28 DAY STRENGTH: 30MPa
 - SLUMP: 50mm
 - ENTRAINED AIR: 6%
- CHAMFER ALL EXPOSED CONCRETE CONES/EDGES 20mm.
- BACKFILL SHALL BE FREE-DRAINING MATERIAL (MTO GRANULAR "B" OR APPROVED EQUAL), MINIMUM 300mm, THICKNESS, AND BE COMPACTED TO 100% STANDARD PROCTOR DENSITY.
- BACKFILLING SHALL PROCEED UNIFORMLY ON ALL SIDES OF THE STRUCTURE (AS APPLICABLE), IN MAX. 0.2 METER LAYERS AND WITH MAX. 0.5 METER DIFFERENCE IN ELEVATION BETWEEN LEVELS BEHIND ANY SIDE TO BE BACKFILLED.
- REFER TO SPECIFICATIONS FOR PUMP MODEL
- ELECTRICAL PANEL TO BE HOUSED IN SEPARATE ENCLOSURE.
- BENCHING TO BE 30MPa CONCRETE AS PER NOTE 6. ALL BENCHING SHALL BE RE-REINFORCED AS PER CSA A23.3 FOR SLABS



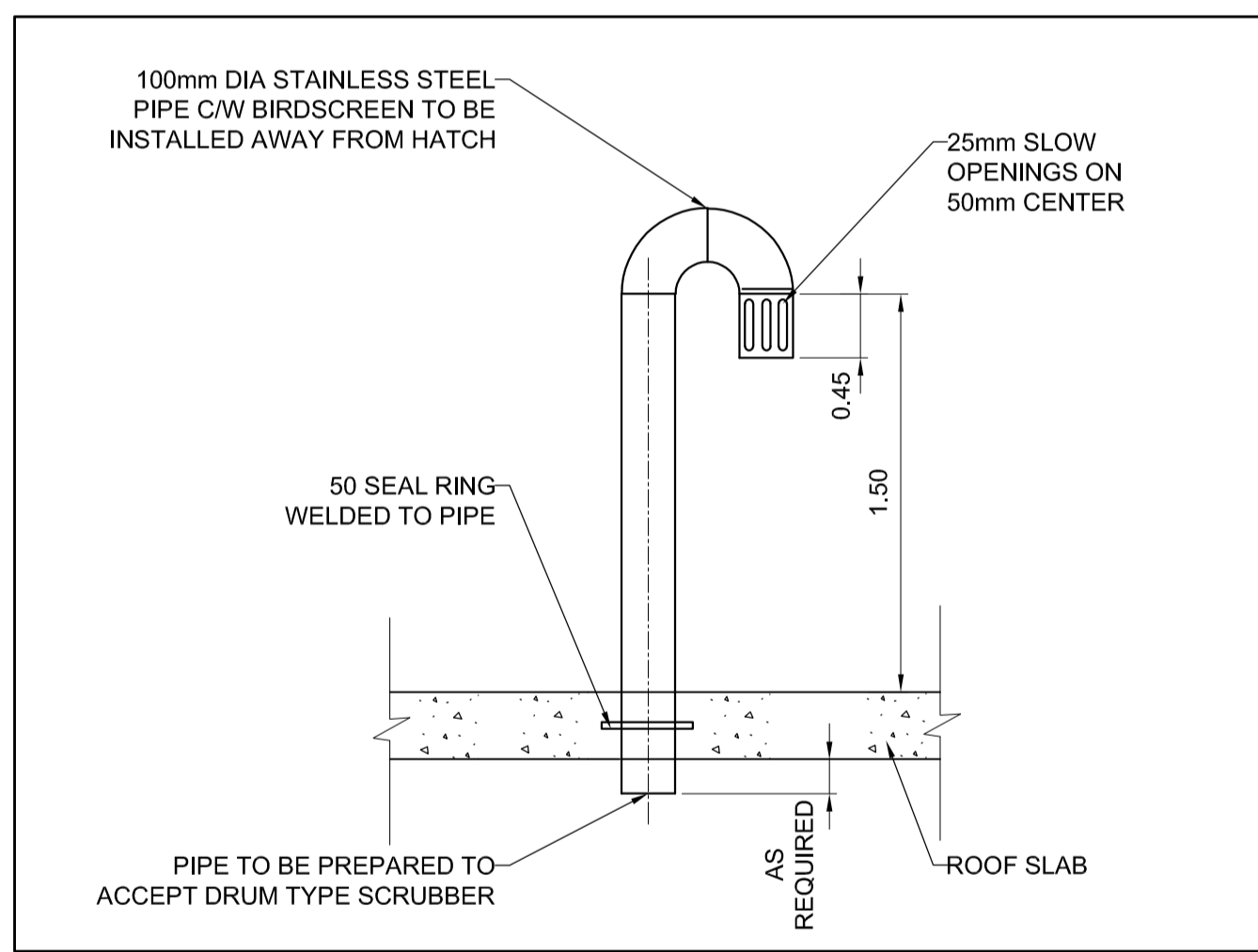
ROOF PLAN 1



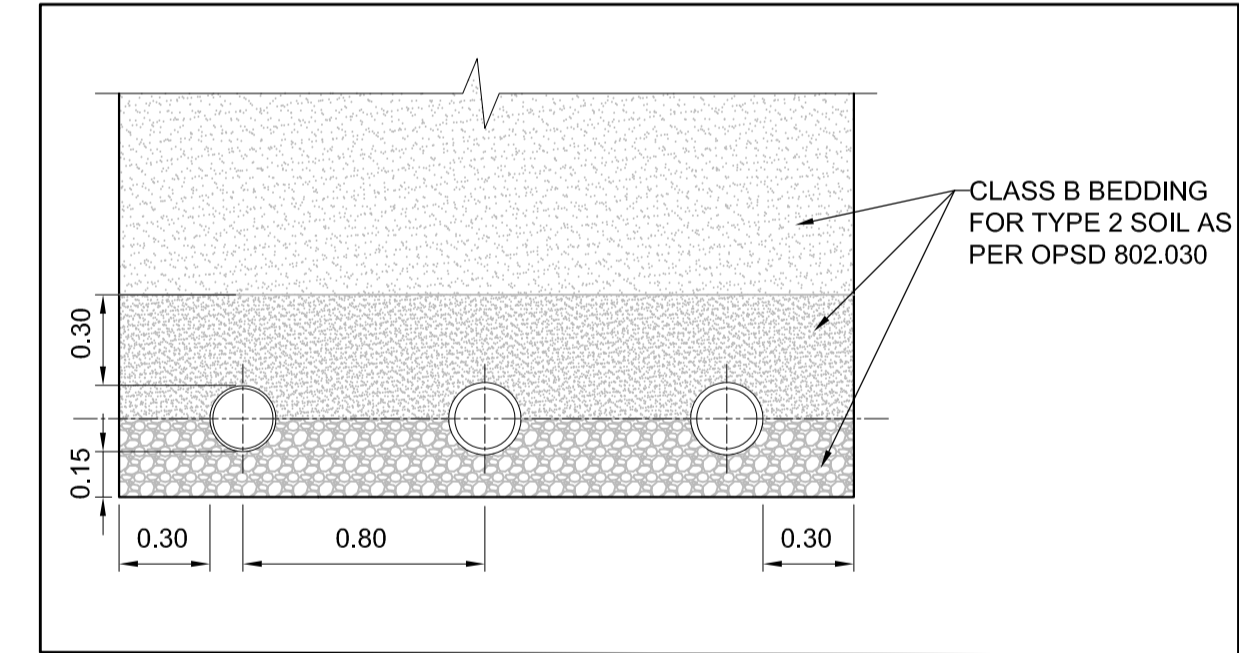
BENCHING PLAN 3



FLOOR PLAN 2



ROOF VENT DETAIL 1
 N.T.S.



SECTION A
 1:25
 0001

FOR CLIENT REVIEW

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ZIBI WINDMILL DREAM ONTARIO PUMP STATION
PROCESS MECHANICAL PLAN AND DETAILS

DRAFTSPERSON	J.BAJAGIC	NR	11-26-2021
DESIGNER	A.GIBBS	NR	11-26-2021
CHECKER	A.GIBBS/P.RUSCH		11-26-2021
DESIGN COORD.			
RESP. ENG.	P.RUSCH		11-26-2021
LEAD DISC. ENG.			
ENG. MANAGER			
PROJ. MANAGER	P.RUSCH		11-26-2021

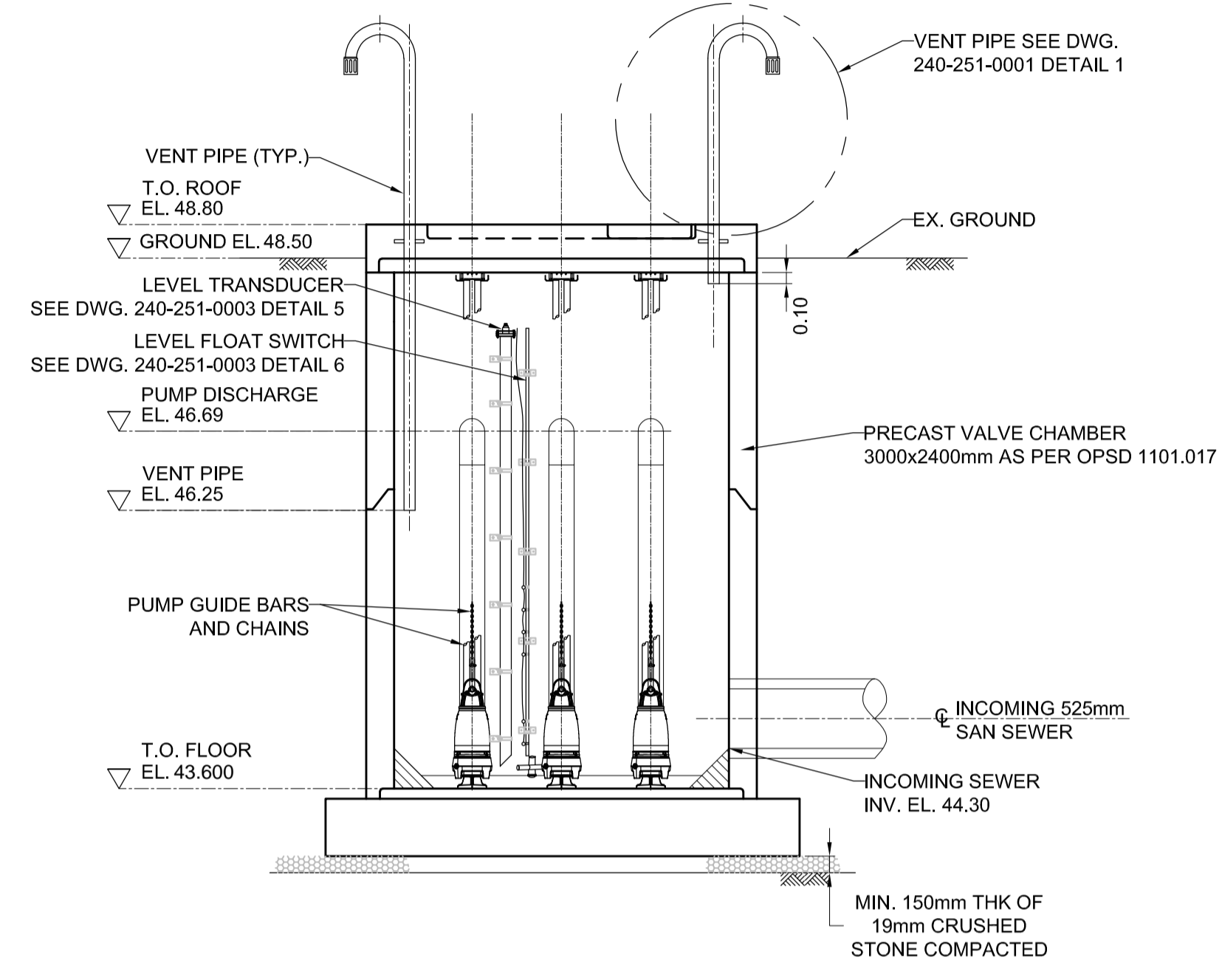
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A	FOR CLIENT REVIEW	J.B.	P.R.	11-26-2021
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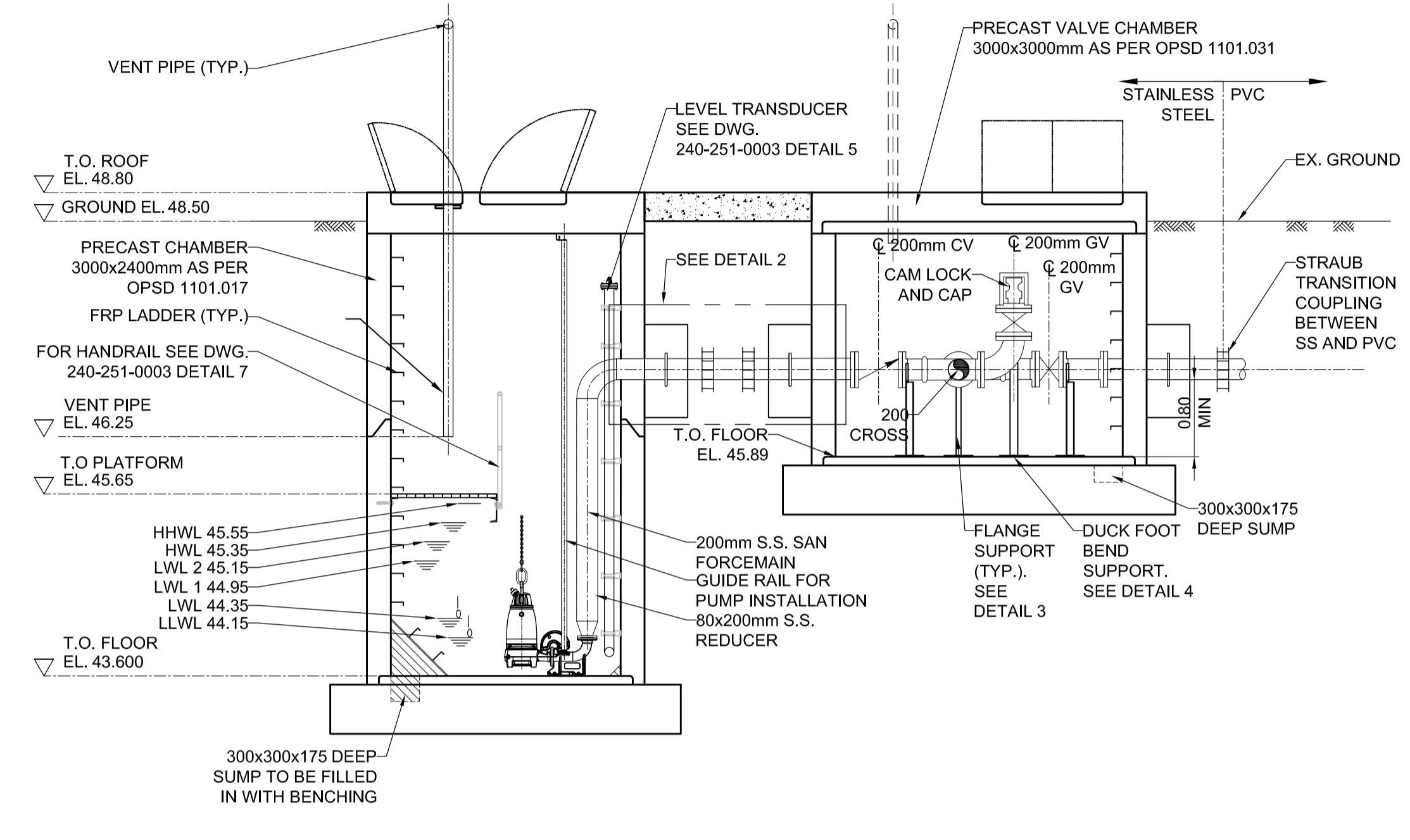
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 REV B

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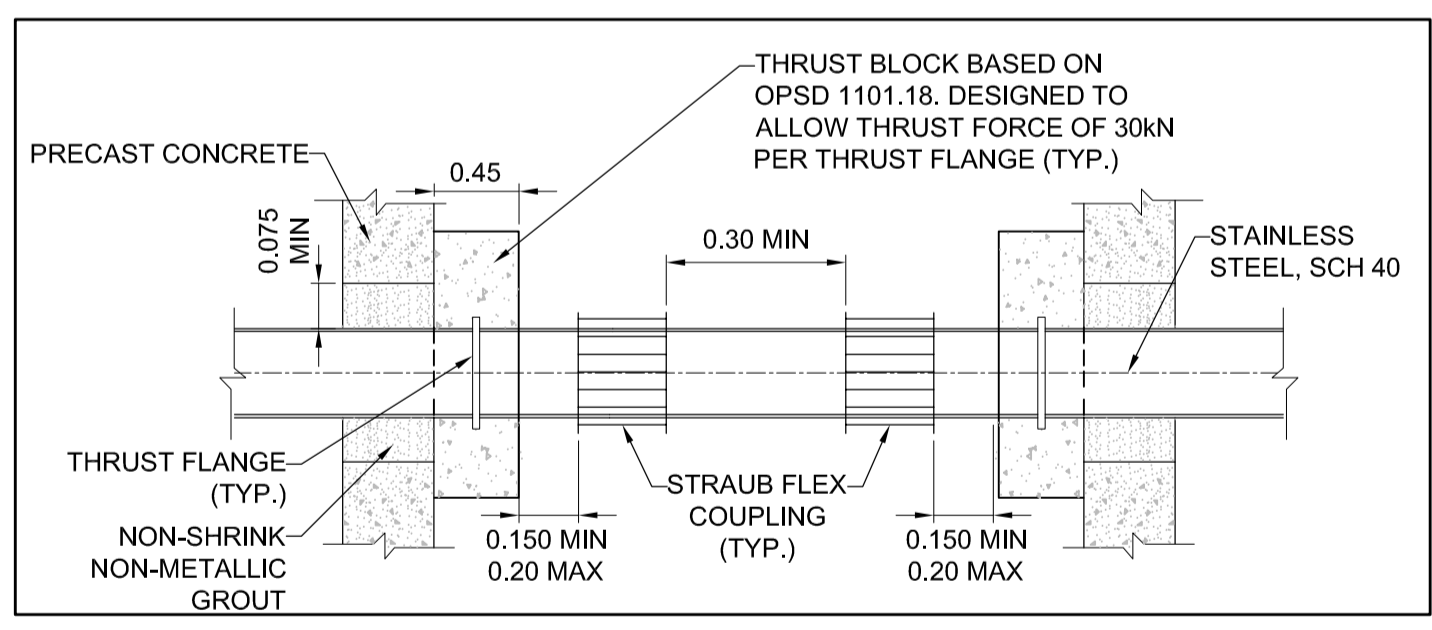
- ALL ELEVATIONS SHOWN ARE IN METERS.
- ALL PIPE SIZES AND DIMENSIONS ARE SHOWN MILLIMETERS.
- REFER TO SITE PLAN DRAWING H364639-0000-220-251-0001 FOR POSITION AND ORIENTATION OF PUMPING STATION.
- ALL PIPES TO HAVE FLEXIBLE JOINTS OUTSIDE OF THE PUMPING STATION. FORCEMAIN JOINT IS TO BE CONSTRUCTED WITH TIE RODS.
- ALL CONCRETE SHOULD CONFORM TO CAN 3-A23.3-M77 (LATEST REVISION):
 - 28 DAY STRENGTH: 30MPa
 - SLUMP: 50mm
 - ENTRAINED AIR: 6%
- CHAMFER ALL EXPOSED CONCRETE CONES/EDGES 20mm.
- BACKFILL SHALL BE FREE-DRAINING MATERIAL (MTO GRANULAR "B" OR APPROVED EQUAL), MINIMUM 300mm THICKNESS, AND BE COMPACTED TO 100% STANDARD PROCTOR DENSITY.
- BACKFILLING SHALL PROCEED UNIFORMLY ON ALL SIDES OF THE STRUCTURE (AS APPLICABLE), IN MAX. 0.2 METER LAYERS AND WITH MAX. 0.5 METER DIFFERENCE IN ELEVATION BETWEEN LEVELS BEHIND ANY SIDE TO BE BACKFILLED.
- PROVIDE POLYETHYLENE SLIP MEMBRANE ALL AROUND STRUCTURE (TO PREVENT SOIL ADFREEZING) TO A MIN. DEPTH OF 2.0m BELOW FINISHED GRADE.
- REFER TO SPECIFICATIONS FOR PUMP MODEL
- ELECTRICAL PANEL TO BE HOUSED IN SEPARATE ENCLOSURE.
- CONTRACTOR TO PROVIDE AND INSTALL SIX FROST STRAPS EQUALLY SPACED AROUND THE PERIMETER OF EACH CHAMBER, EXTENDING FROM BASE SLAB TO CAP. REFER TO OPSD 701.100 FOR FROST STRAP DIMENSION, MATERIALS AND INSTALLATION REQUIREMENTS.
- BENCHING TO BE 30MPa CONCRETE AS PER NOTE 6. ALL BENCHING SHALL BE RE-ENFORCED AS PER CSA A23.3 FOR SLABS



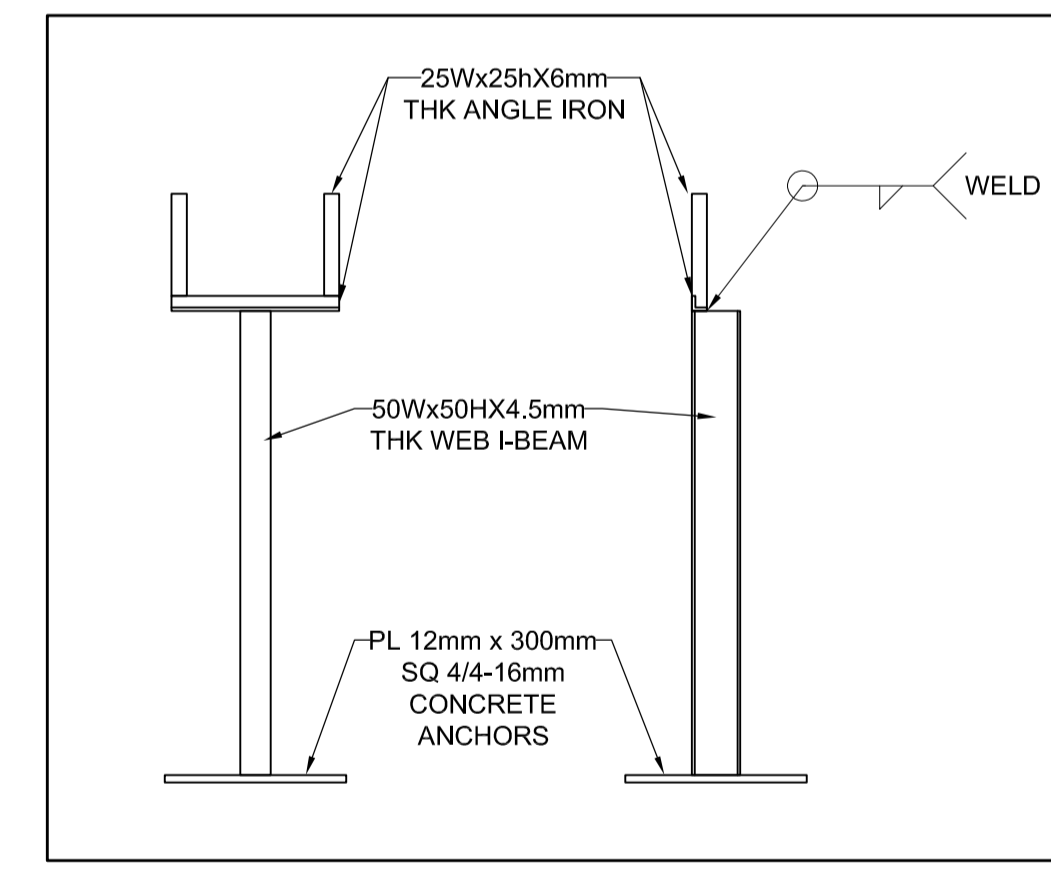
SECTION B
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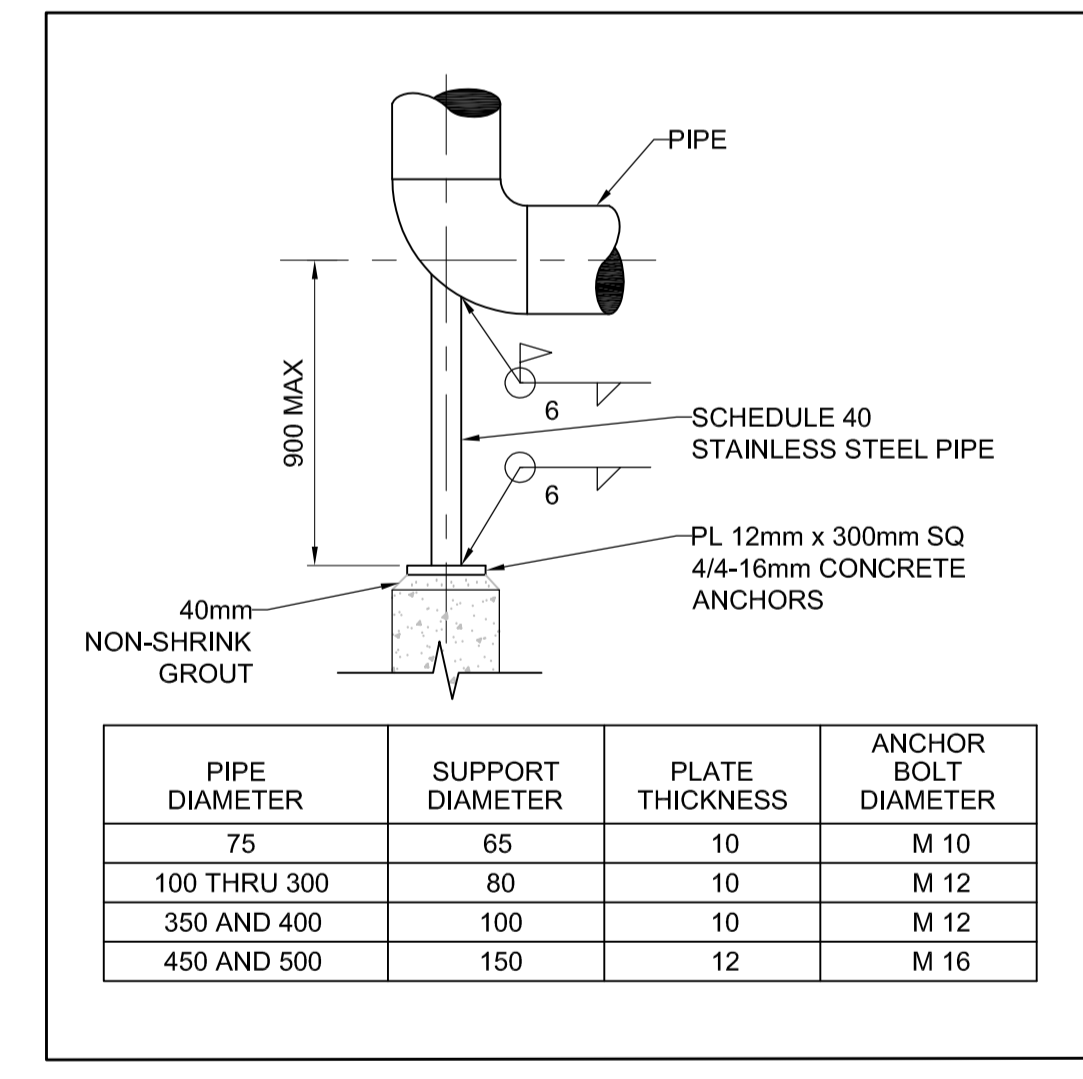
SECTION C
 SCALE 0001



TYP. DETAIL OF PIPE ENTRY AND EXIT THROUGH PRECAST MH
 N.T.S.



SUPPORT DETAIL 3
 N.T.S.



SUPPORT DETAIL 4
 N.T.S.

PIPE DIAMETER	SUPPORT DIAMETER	PLATE THICKNESS	ANCHOR BOLT DIAMETER
75	65	10	M 10
100 THRU 300	80	10	M 12
350 AND 400	100	10	M 12
450 AND 500	150	12	M 16

FOR CLIENT REVIEW

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ZIBI WINDMILL DREAM ONTARIO PUMP STATION

PROCESS MECHANICAL SECTION B, C AND DETAILS

DRAWING No.	DRAWING TITLE	REG. PROFESSIONAL	REVISIONS	BY	CHK'D	DATE	ROLE	NAME	SIGNATURE	DATE
C	FOR CLIENT REVIEW			J.B.	P.R.	03-14-2022	ENG. MANAGER			
B	FOR CLIENT REVIEW			J.B.	P.R.	12-03-2021	PROJ. MANAGER			
A	FOR CLIENT REVIEW			J.B.	P.R.	11-26-2021				

SCALE 1:50 OR AS NOTED
 DWG. No. H364639-0000-240-251-0002
 REV C

USERNAME: BAJAGIC, JANKO
 DATE: 12/3/2021
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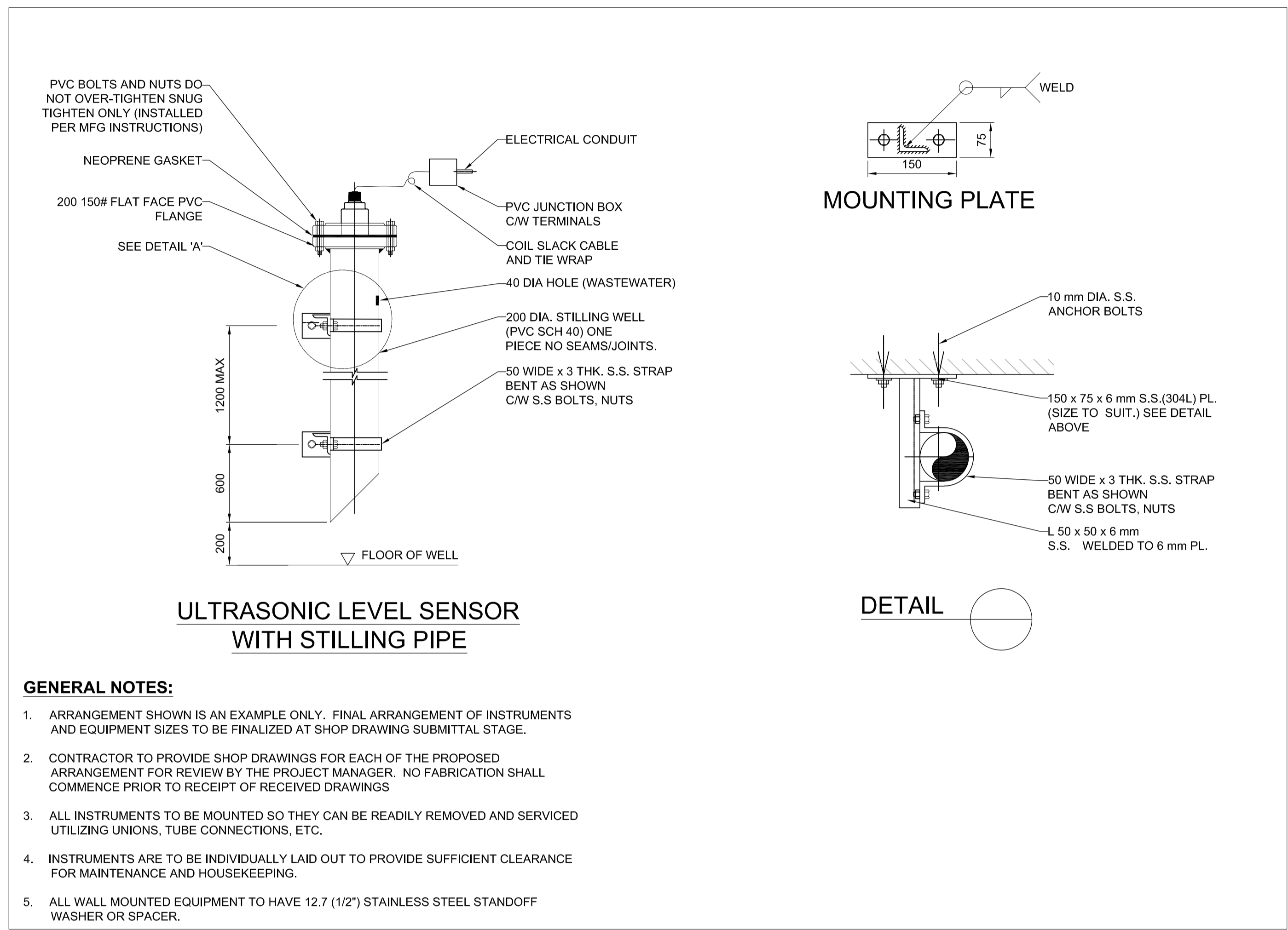
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C

D

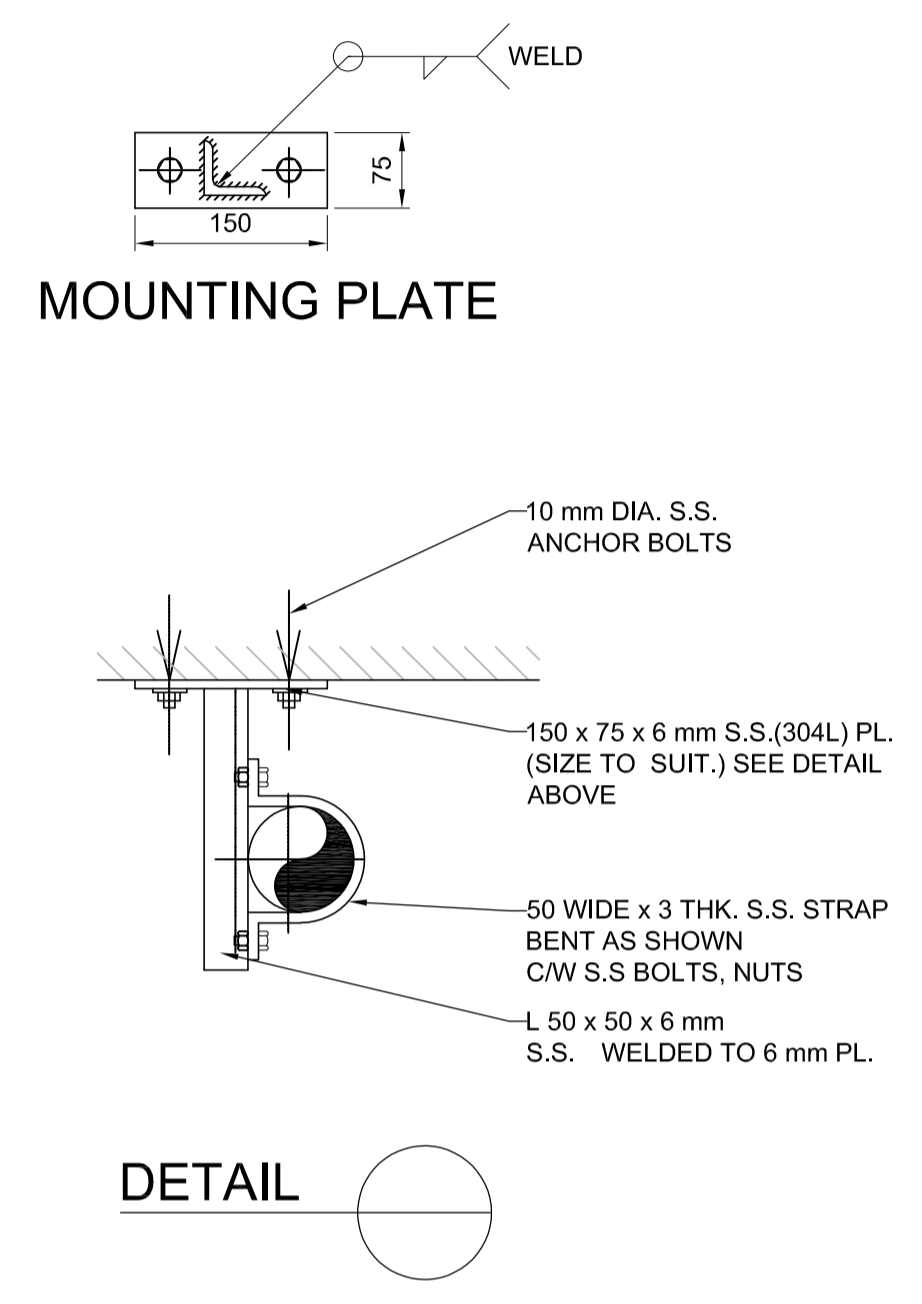
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F



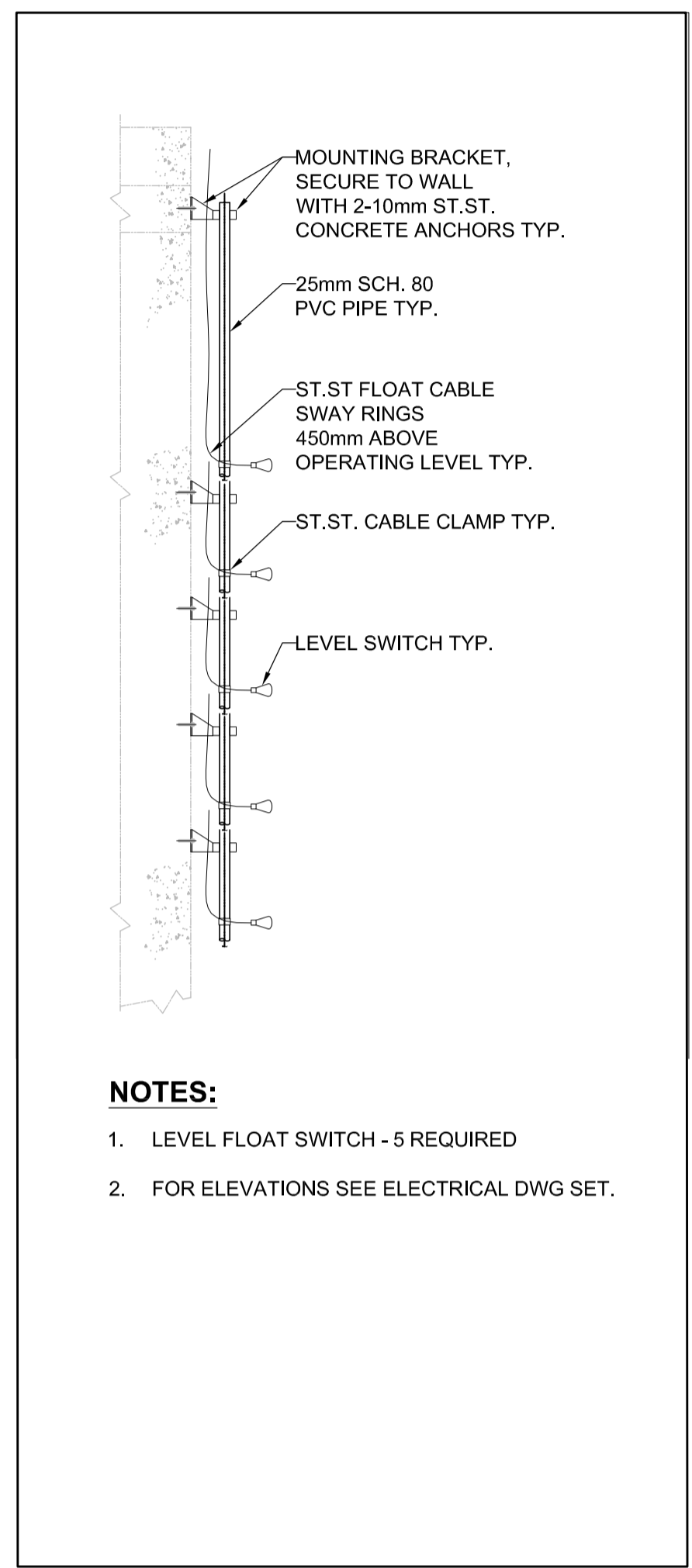
ULTRASONIC LEVEL SENSOR WITH STILLING PIPE

- GENERAL NOTES:**
- ARRANGEMENT SHOWN IS AN EXAMPLE ONLY. FINAL ARRANGEMENT OF INSTRUMENTS AND EQUIPMENT SIZES TO BE FINALIZED AT SHOP DRAWING SUBMITTAL STAGE.
 - CONTRACTOR TO PROVIDE SHOP DRAWINGS FOR EACH OF THE PROPOSED ARRANGEMENT FOR REVIEW BY THE PROJECT MANAGER. NO FABRICATION SHALL COMMENCE PRIOR TO RECEIPT OF RECEIVED DRAWINGS
 - ALL INSTRUMENTS TO BE MOUNTED SO THEY CAN BE READILY REMOVED AND SERVICED UTILIZING UNIONS, TUBE CONNECTIONS, ETC.
 - INSTRUMENTS ARE TO BE INDIVIDUALLY LAID OUT TO PROVIDE SUFFICIENT CLEARANCE FOR MAINTENANCE AND HOUSEKEEPING.
 - ALL WALL MOUNTED EQUIPMENT TO HAVE 12.7 (1/2") STAINLESS STEEL STANDOFF WASHER OR SPACER.



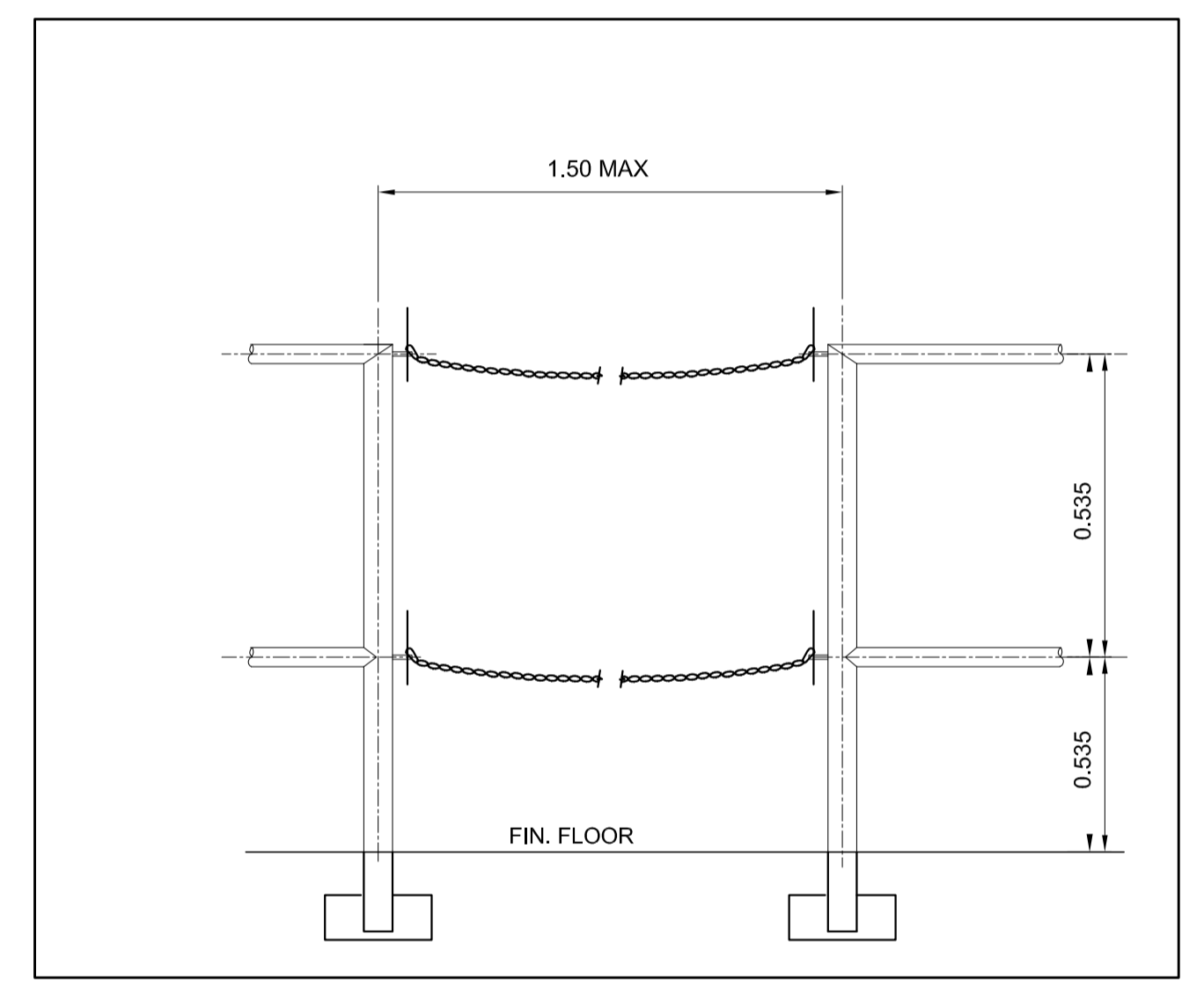
ULTRASONIC LEVEL SENSOR AND STILLING PIPE DETAIL

5



LEVEL FLOAT SWITCH DETAIL

6



HANDRAIL DETAIL

7

FOR CLIENT REVIEW

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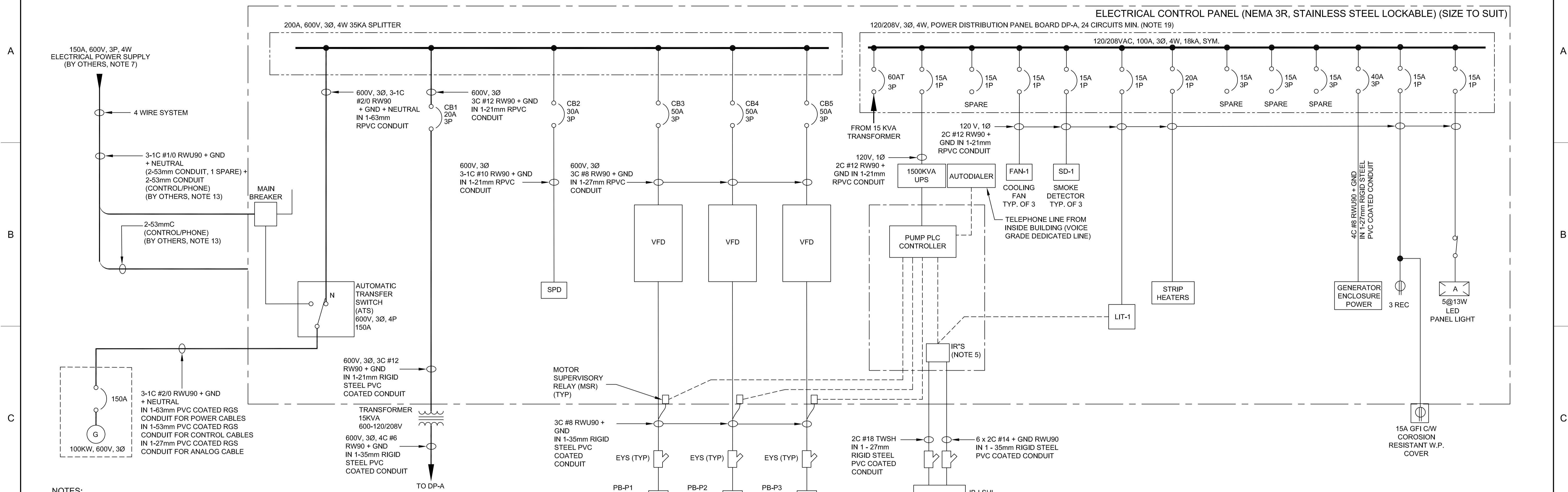
ZIBI WINDMILL DREAM ONTARIO PUMP STATION
PROCESS MECHANICAL DETAILS

DRAFTSPERSON	J.BAJAGIC	NR	11-26-2021
DESIGNER	A.GIBBS	NR	11-26-2021
CHECKER	A.GIBBS/P.RUSCH		11-22-2021
DESIGN COORD.			-
RESP. ENG.	P.RUSCH		11-26-2021
LEAD DISC. ENG.			-
ENG. MANAGER			-
PROJ. MANAGER	P.RUSCH		11-26-2021

B	FOR CLIENT REVIEW	J.B.	P.R.	12-03-2021
A	FOR CLIENT REVIEW	J.B.	P.R.	11-26-2021

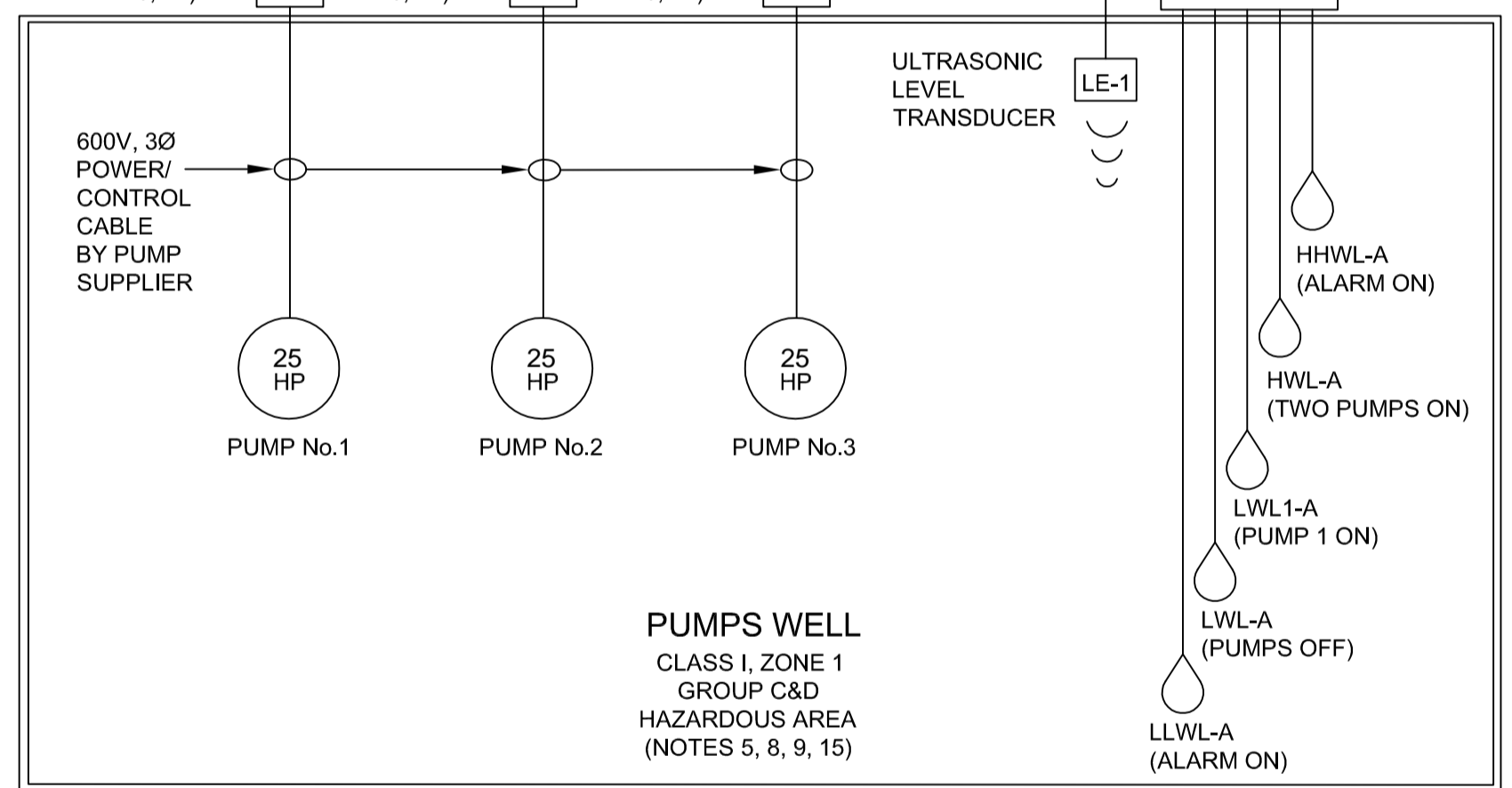
No.	DESCRIPTION	BY	CHK'D	DATE

USERNAME: BAJAGIC, JANKO
 DATE: 12/3/2021 TIME: 9:57:33 AM
 FILE: C:\PWORKING\HATCH\DPD-CANADA_CENTRAL\DM5442\H364639-000-240-251-0003



NOTES:

1. PROVIDE COMPLETE GROUNDING SYSTEM AS PER THE OESC LATEST EDITION AND TO THE SATISFACTION OF THE ELECTRICAL AUTHORITY HAVING JURISDICTION.
2. ALL CONDUCTORS TO BE COPPER RW90 (RWU90) UNLESS OTHERWISE INDICATED.
3. PROVIDE POWER BOXES WITH TERMINAL BLOCKS SUITABLE FOR CLASSIFIED AREA.
4. PROVIDE NEMA 4X WITH TERMINAL BLOCKS FOR INTRINSICALLY SAFE CIRCUITS.
5. PROVIDE INTRINSICALLY SAFE RELAYS (IR'S) AS REQUIRED TO MEET CLASS I, ZONE 1 GROUP C & D CLASSIFICATION.
6. INSTALL POWER BOXES AND JB-LSHL AT PUMPS WELL LOCATION.
7. ELECTRICAL POWER SUPPLY AND OVERCURRENT PROTECTION DEVICE BY OTHERS. POWER SUPPLY UNDERGROUND CABLES AND DUCT BANK TO NEW OUTDOOR ELECTRICAL PANEL BY OTHERS COMPLETE WITH CABLE TERMINATIONS.
8. ALL WIRING METHODS IN CLASSIFIED AREAS ARE TO BE IN ACCORDANCE WITH APPLICABLE REQUIREMENTS OF SECTIONS 18 AND 22 OF THE LATEST EDITION OF THE ONTARIO ELECTRICAL SAFETY CODE.
9. ALL ELECTRICAL EQUIPMENT, PUMPS, AND MOTORS FOR USE IN CLASSIFIED AREAS MUST BE APPROVED FOR INSTALLATION IN SUCH CLASSIFIED AREA DIVISION INDICATED.
10. ALL SIDE MOUNTED EQUIPMENT TO BE RATED EEMAC 4X. LOCKABLE ENCLOSURE.
11. POWER BOXES AND JB-LSHL ON OUTSIDE OF PUMP WELL. ALL POWER AND JUNCTION BOXES TO BE EXPLOSION PROOF RATED.
12. OUTDOOR CONTROL PANEL NEMA 3R, COMPLETE WITH LOCKABLE DOOR HANDLE, DOOR SWITCH TO DETECT ILLEGAL ENTRY, AND SMOKE DETECTOR.
13. ELECTRICAL POWER SUPPLY UNDERGROUND DUCT BANK TO BE PROVIDED BY OTHERS. UTILITY POWER CABLES, COMMUNICATION AND TELEPHONE WIRING REQUIRED FROM THE SERVICE TO THE PUMP STATION CONTROL PANEL SHALL BE PROVIDED BY OTHERS.
14. THE PANEL LAYOUT SHOWN IS INTENDED TO RELAY THE MINIMUM SCOPE OF WORK AND HARDWARE REQUIRED. ACTUAL LAYOUT MAY VARY TO SUIT FIELD CONDITIONS. THE CONTRACTOR TO SUBMIT COMPLETE AND DETAILED PANEL LAYOUT SHOP DRAWING FOR REVIEW. PANEL DOOR TO BE LOCKABLE.
15. ALL EQUIPMENT WITHIN THE HAZARDOUS LOCATION SHALL BE APPROVED FOR THAT LOCATION.
16. THE CONTRACTOR IS RESPONSIBLE FOR MOUNTING OF ALL NEW POWER AND CONTROL PANELS, TRANSFORMER, JUNCTION AND POWER BOXES COMPLETE WITH REQUIRED CONCRETE PADS AND HARDWARE.
17. WIRE GAUGE MAY CHANGE PENDING RECOMMENDED BREAKER SETTING BY PUMP MANUFACTURER. MINIMUM ACCEPTED SIZE IS #8 AWG FOR POWER CABLES, #14 FOR CONTROL CABLES.
18. AUTOMATIC TRANSFER SWITCH TO BE INSTALLED INSIDE ELECTRICAL ENCLOSURE.
19. POWER DISTRIBUTION PANELBOARD BY EATON POW-R-LINE C SERIES OR APPROVED EQUAL.



SINGLE LINE DIAGRAM

Ultrasonic			Float		
NOTES	Name	Level (m)	Level (m)	Name	NOTES
	HHWL	45.55	45.65	HHWL-A	ALARM
ALARM LEVEL	HHWL	45.55	45.45	HWL-A	PUMP 2 ON
BOTH PUMPS FULL SPEED	HWL	45.35			
PUMP 2 ON	LWL2	45.15			
PUMP 1 ON PUMP 2 OFF	LWL1	44.95	45.05	LWL1-A	PUMP 1 ON PUMP 2 OFF
PUMP 1 OFF	LWL	44.35			
ALARM	LLWL	44.15	44.25	LWL-A	PUMP 1 OFF
			44.05	LLWL-A	ALARM

FOR CLIENT REVIEW

THIS DRAWING WAS PREPARED FOR THE EXCLUSIVE USE OF WINDMILL DREAM ONTARIO LP ("ZIBI") AND IS ISSUED PURSUANT TO THE ZIBI WINDMILL DREAM PUMPING STATION AGREEMENT BETWEEN ZIBI AND HATCH LTD. ("HATCH"). UNLESS OTHERWISE AGREED IN WRITING WITH ZIBI OR SPECIFIED ON THIS DRAWING, HATCH DOES NOT ACCEPT AND DISCLAIMS ANY AND ALL LIABILITY OR RESPONSIBILITY ARISING FROM ANY USE OF OR RELIANCE ON THIS DRAWING BY ANY THIRD PARTY OR ANY MODIFICATION OR MISUSE OF THIS DRAWING BY ZIBI. AND (B) THIS DRAWING IS CONFIDENTIAL AND ALL INTELLECTUAL PROPERTY RIGHTS EMBODIED OR REFERENCED IN THIS DRAWING REMAIN THE PROPERTY OF HATCH.



ZIBI WINDMILL DREAM ONTARIO PUMPING STATION

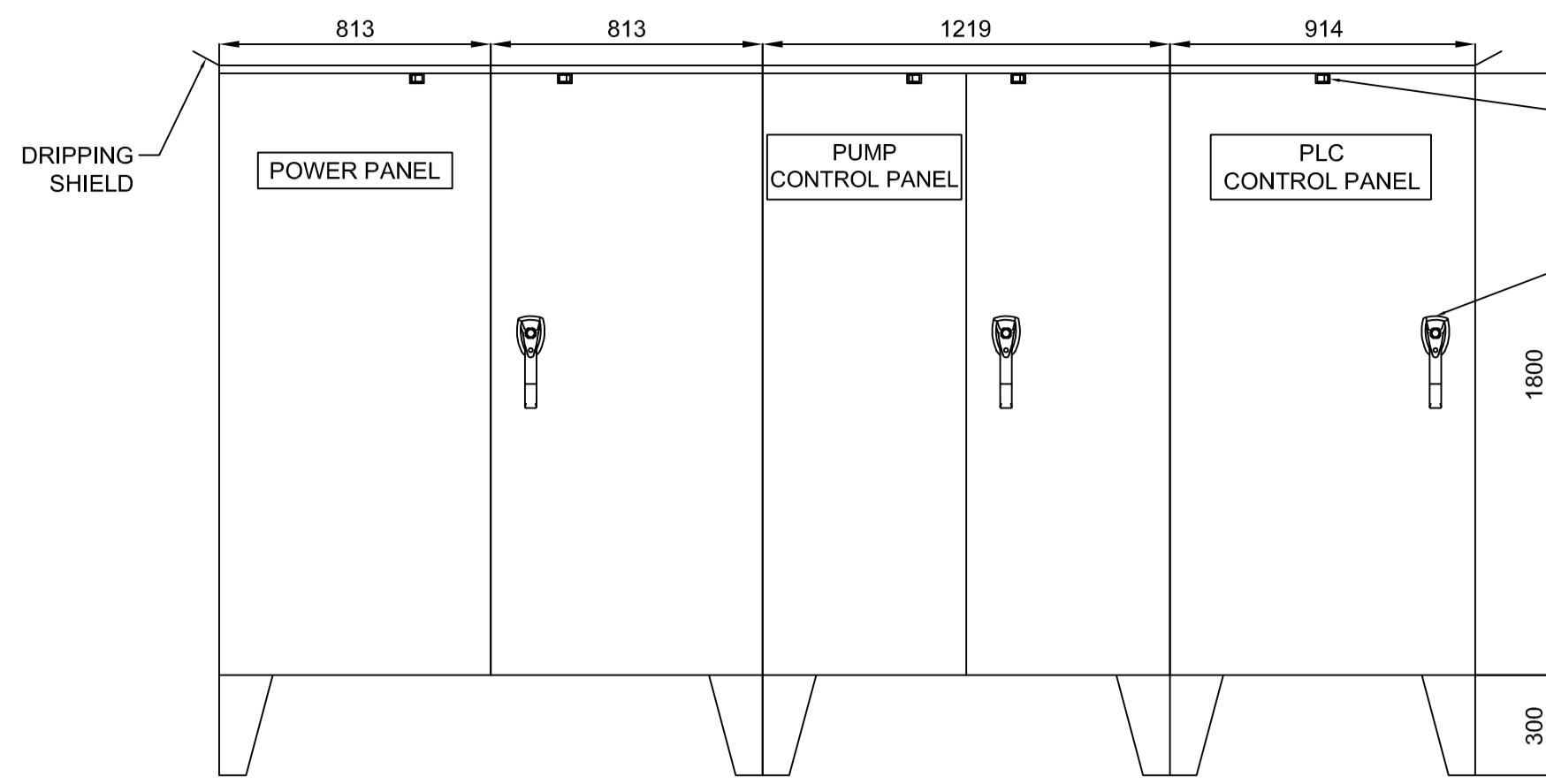
ELECTRICAL SINGLE LINE DIAGRAM

DRAFTSPERSON	L.BO	NR	12-03-2021
DESIGNER	G.NING	NR	12-03-2021
CHECKER	G.NING		12-03-2021
DESIGN COORD.			-
RESP. ENG.	G.NING		12-03-2021
LEAD DISC. ENG.			-
ENG. MANAGER			-
PROJ. MANAGER	P.RUSCH		12-03-2021

DRAWING No.		DRAWING TITLE	
REFERENCE DRAWINGS		REG. PROFESSIONAL	
B FOR CLIENT REVIEW		L.B. G.N. 03-14-2022	
A FOR CLIENT REVIEW		L.B. G.N. 12-03-2021	
No.	DESCRIPTION	BY	CHK'D DATE
REVISIONS		DRAWING APPROVAL STATUS: Client Review	

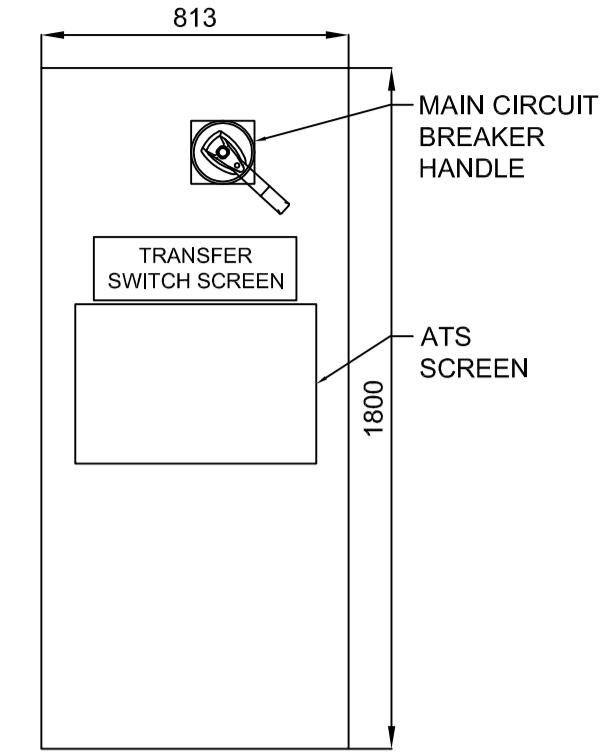
SCALE NTS OR AS NOTED	DWG. No.	REV
	H364639-0000-260-262-0001	B

- NOTES:**
1. PROVIDE COMPLETE GROUNDING SYSTEM AS PER THE OESC LATEST EDITION AND TO THE SATISFACTION OF THE ELECTRICAL AUTHORITY HAVING JURISDICTION.
 2. ALL SIDE MOUNTED EQUIPMENT TO BE RATED EEMAC 4X. LOCKABLE ENCLOSURE.
 3. OUTDOOR CONTROL PANEL NEMA 3R, COMPLETE WITH LOCKABLE DOOR HANDLE, DOOR SWITCH TO DETECT ILLEGAL ENTRY, AND SMOKE DETECTOR.
 4. PROVIDE NEMA 4X WITH TERMINAL BLOCKS FOR INTRINSICALLY SAFE CIRCUITS.
 5. THE CONTRACTOR IS RESPONSIBLE FOR MOUNTING OF ALL NEW POWER AND CONTROL PANELS, TRANSFORMER, JUNCTION AND POWER BOXES COMPLETE WITH REQUIRED CONCRETE PADS AND HARDWARE.
 6. AUTOMATIC TRANSFER SWITCH TO BE INSTALLED INSIDE ELECTRICAL ENCLOSURE.
 7. PUMP PACKAGE TO INCLUDE VFDS AND PUMP PLC CONTROLLER(S) AS REQUIRED. ONE SUPPLIER SHALL BE RESPONSIBLE FOR THE PROVISION OF THE PUMP PACKAGE.
 8. POWER DISTRIBUTION PANELBOARD BY EATON POW-R-LINE C SERIES OR APPROVED EQUAL.
 9. MAIN BREAKER TO BE MECHANICALLY INTERLOCKED WITH ENCLOSURE TO PREVENT OPENING OF ENCLOSURE WHEN MAIN BREAKER IS IN THE CLOSED POSITION.
 10. THE PANEL LAYOUT SHOWN IS INTENDED TO RELAY THE MINIMUM SCOPE OF WORK AND HARDWARE REQUIRED. ACTUAL LAYOUT MAY VARY TO SUIT FIELD CONDITIONS. THE CONTRACTOR TO SUBMIT COMPLETE AND DETAILED PANEL LAYOUT SHOP DRAWING FOR REVIEW. PANEL DOOR TO BE LOCKABLE.



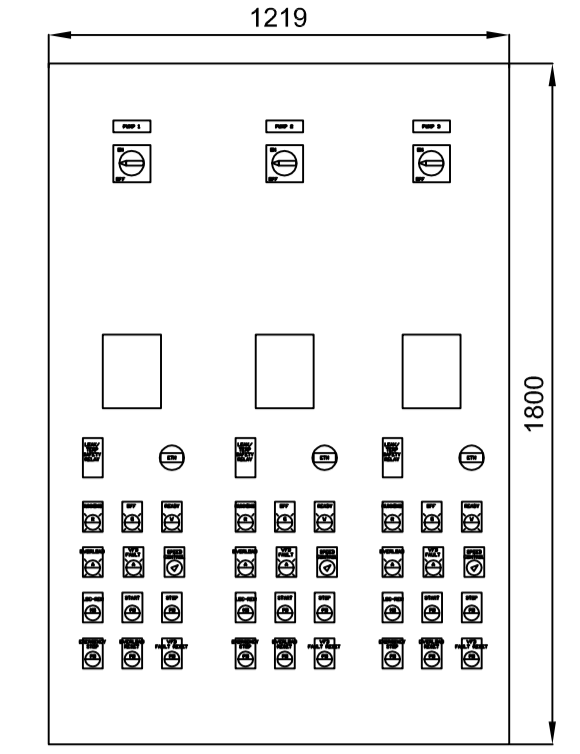
POWER AND CONTROL PANEL OUTER DOOR LAYOUT

SCALE: 1:20



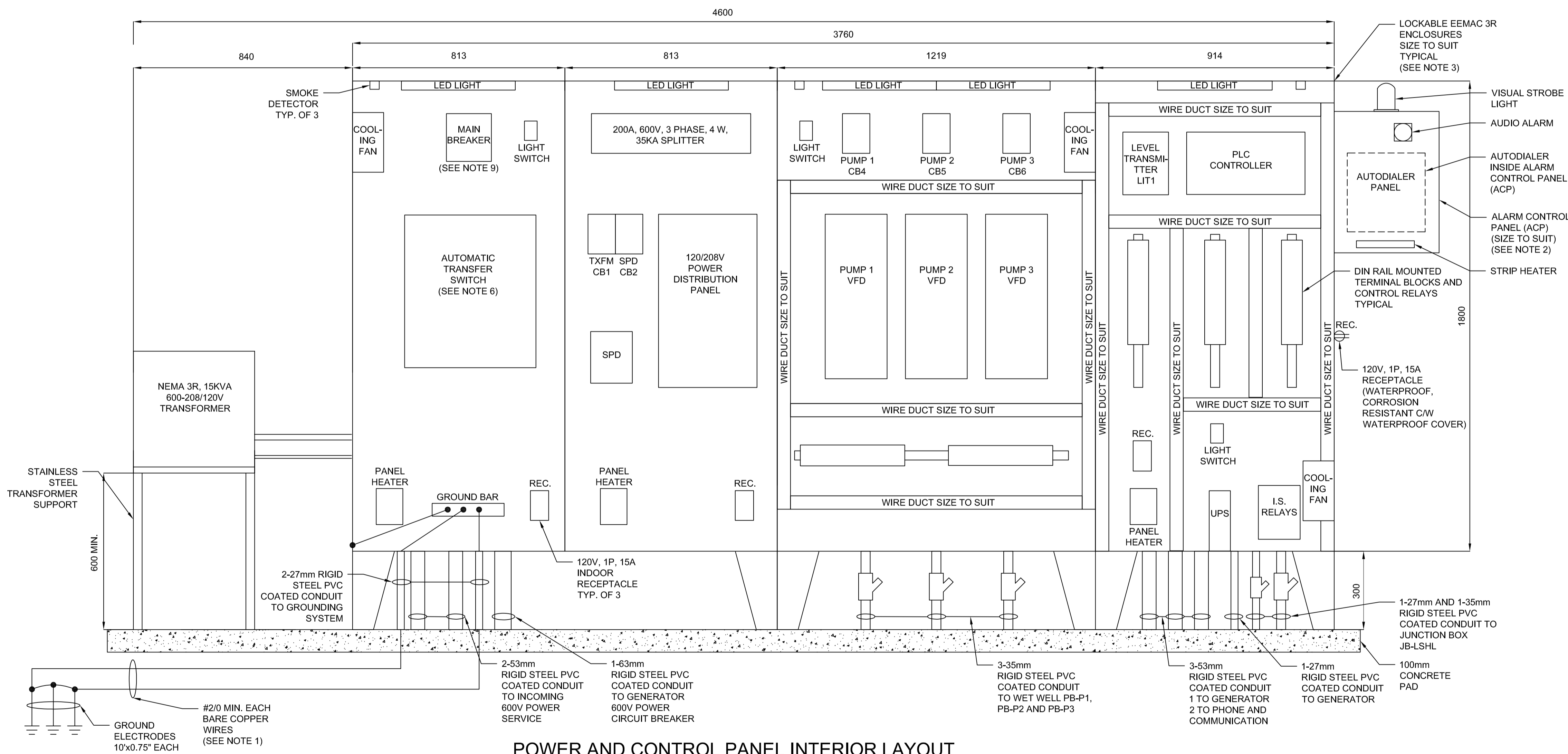
POWER PANEL INNER DOOR LAYOUT

SCALE: 1:20



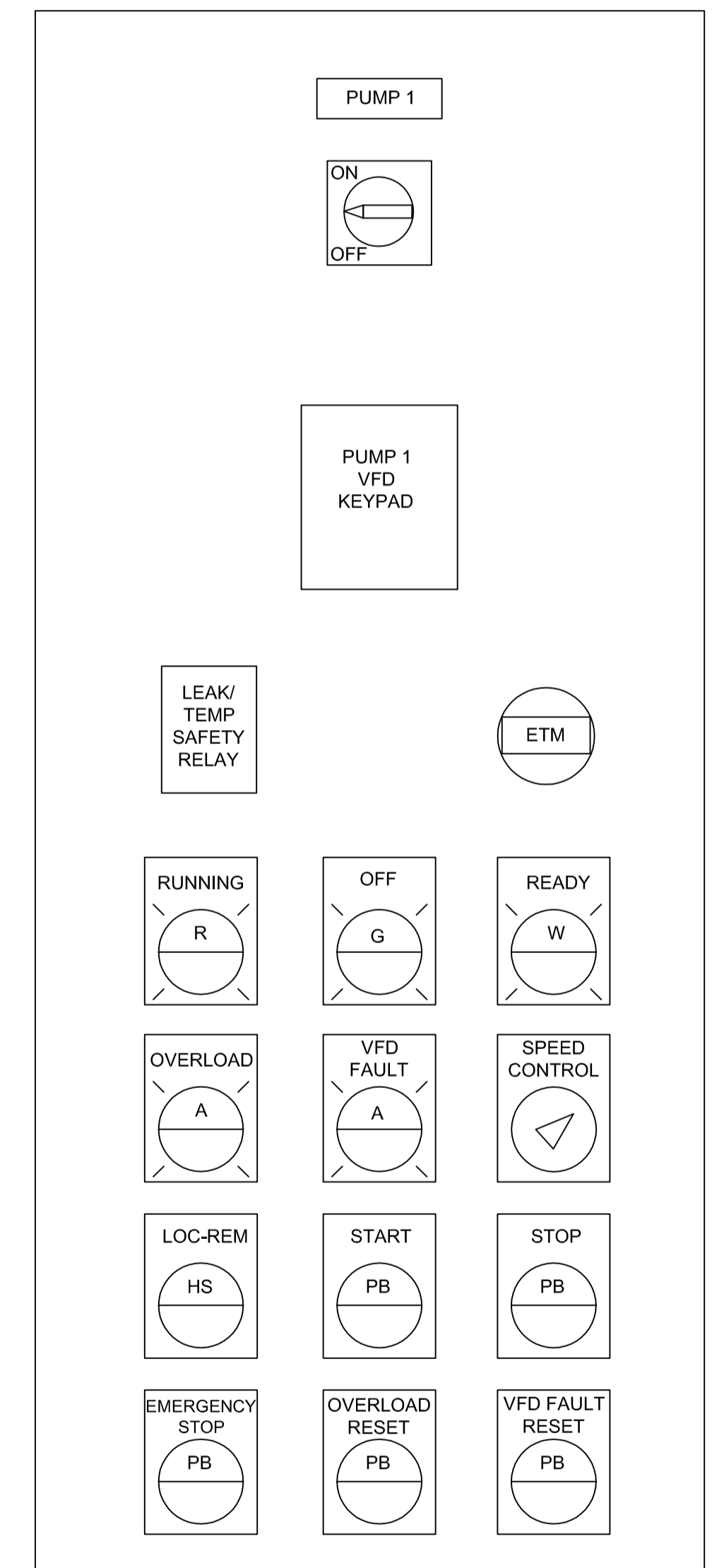
PUMP CONTROL PANEL INNER DOOR LAYOUT

SCALE: 1:20



POWER AND CONTROL PANEL INTERIOR LAYOUT

SCALE: 1:10



**PUMP 1 INNER DOOR LAYOUT
(TYP. FOR PUMP 2 AND PUMP 3)**

SCALE: 1:10

FOR CLIENT REVIEW

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HATCH

zibi

ZIBI WINDMILL DREAM ONTARIO PUMPING STATION

ELECTRICAL POWER AND CONTROL PANEL LAYOUT

DRAFTSPERSON	L.BO	NR	12-03-2021
DESIGNER	G.NING	NR	12-03-2021
CHECKER	G.NING		12-03-2021
DESIGN COORD.			-
RESP. ENG.	G.NING		12-03-2021
LEAD DISC. ENG.			-
ENG. MANAGER			-
PROJ. MANAGER	P.RUSCH		12-03-2021

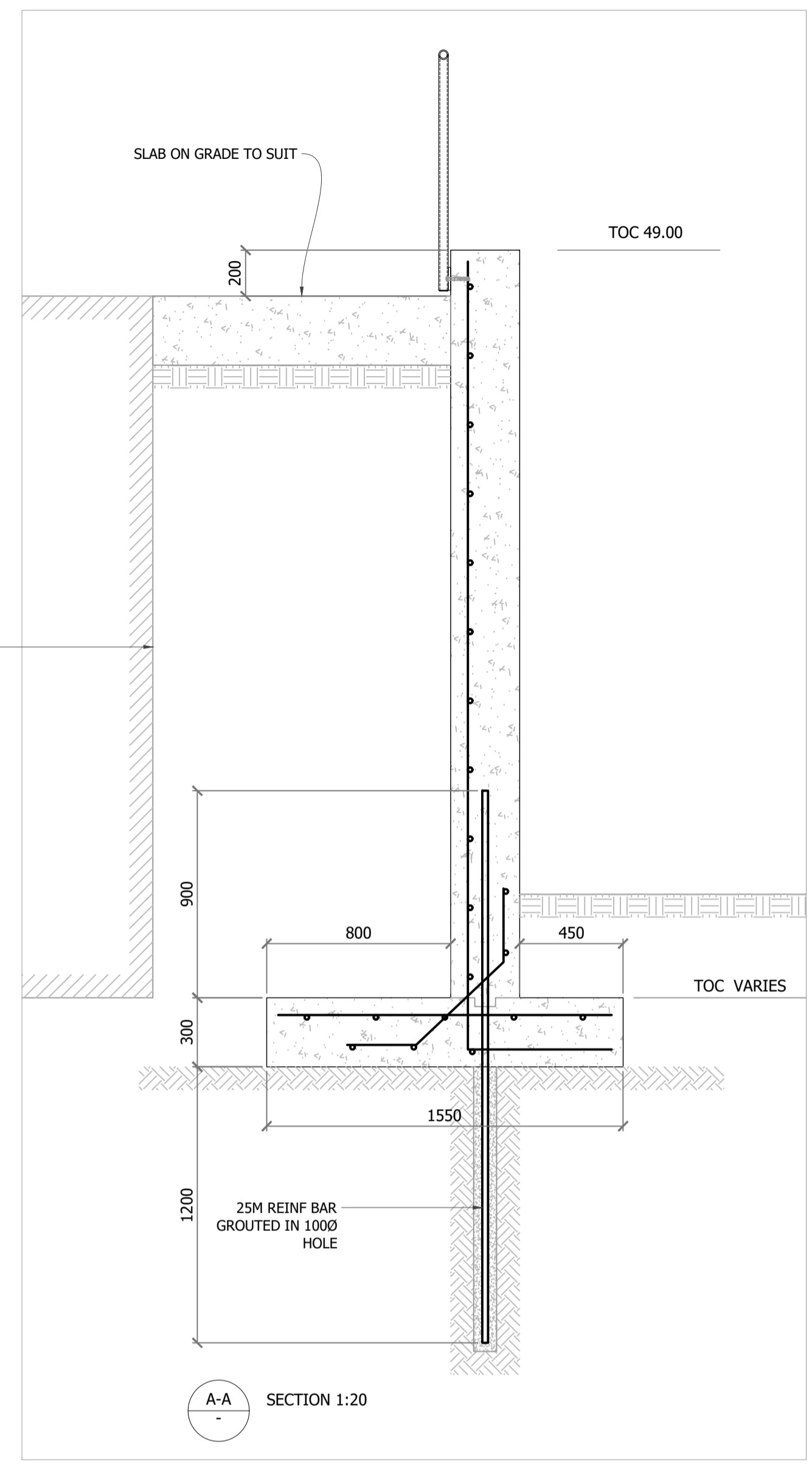
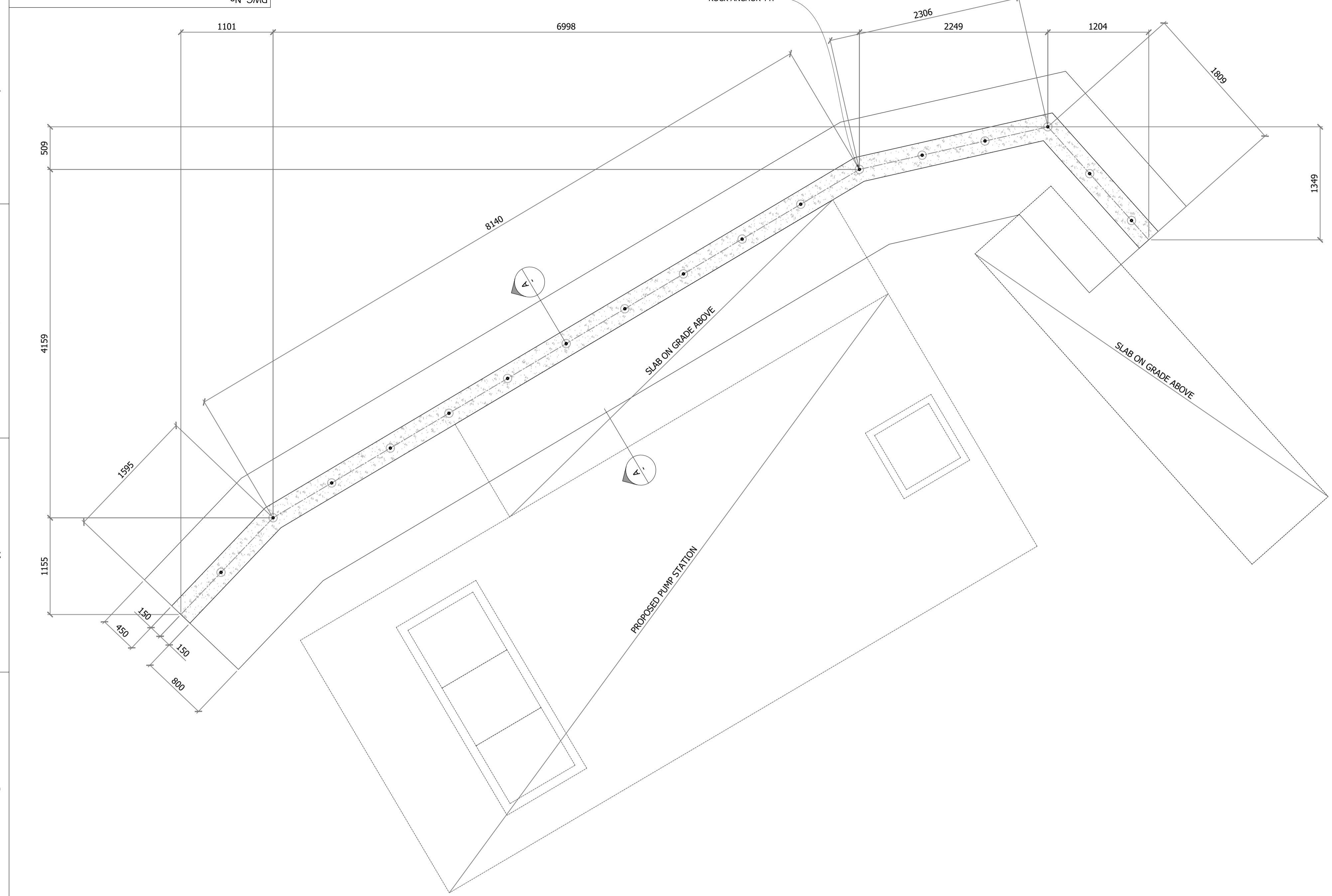
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1:10 / 1:20 OR AS NOTED	H364639-0000-260-262-0002	A

DRAWING No.	DRAWING TITLE	REG. PROFESSIONAL
	REFERENCE DRAWINGS	
	REVISIONS	
A	FOR CLIENT REVIEW	
No.	DESCRIPTION	L.B. G.N. 12-03-2021

DRAWING APPROVAL STATUS: Client Review			
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A
B
C
D
E
F

A
B
C
D
E
F



PLAN AT TOP OF RETAINING WALL FOOTING

FOR CLIENT REVIEW

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ZIBI WINDMILL DREAM ONTARIO PUMPING STATION
STRUCTURAL RETAINING WALL DETAILS

DRAFTSPERSON	ARP	NR	MAR 2022
DESIGNER	JPM	NR	MAR 2022
CHECKER	JPM	NR	MAR 2022
DESIGN COORD.	-	PR	-
RESP. ENG.	-	-	-
LEAD DISC. ENG.	-	-	-
ENG. MANAGER	-	-	-
PROJ. MANAGER	-	-	-

DRAWING No.	DRAWING TITLE	REG. PROFESSIONAL
1	REFERENCE DRAWINGS	

No.	DESCRIPTION	A.P.	J.M.	03-14-2022		
BY	CHK'D	DATE	ROLE	NAME	SIGNATURE	DATE
A	FOR CLIENT REVIEW					

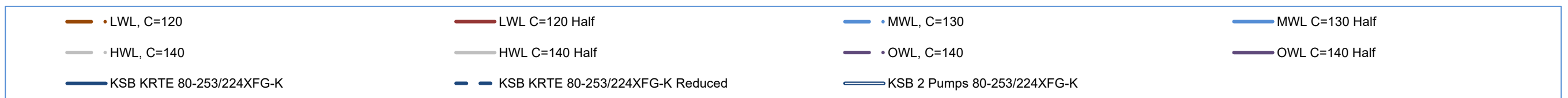
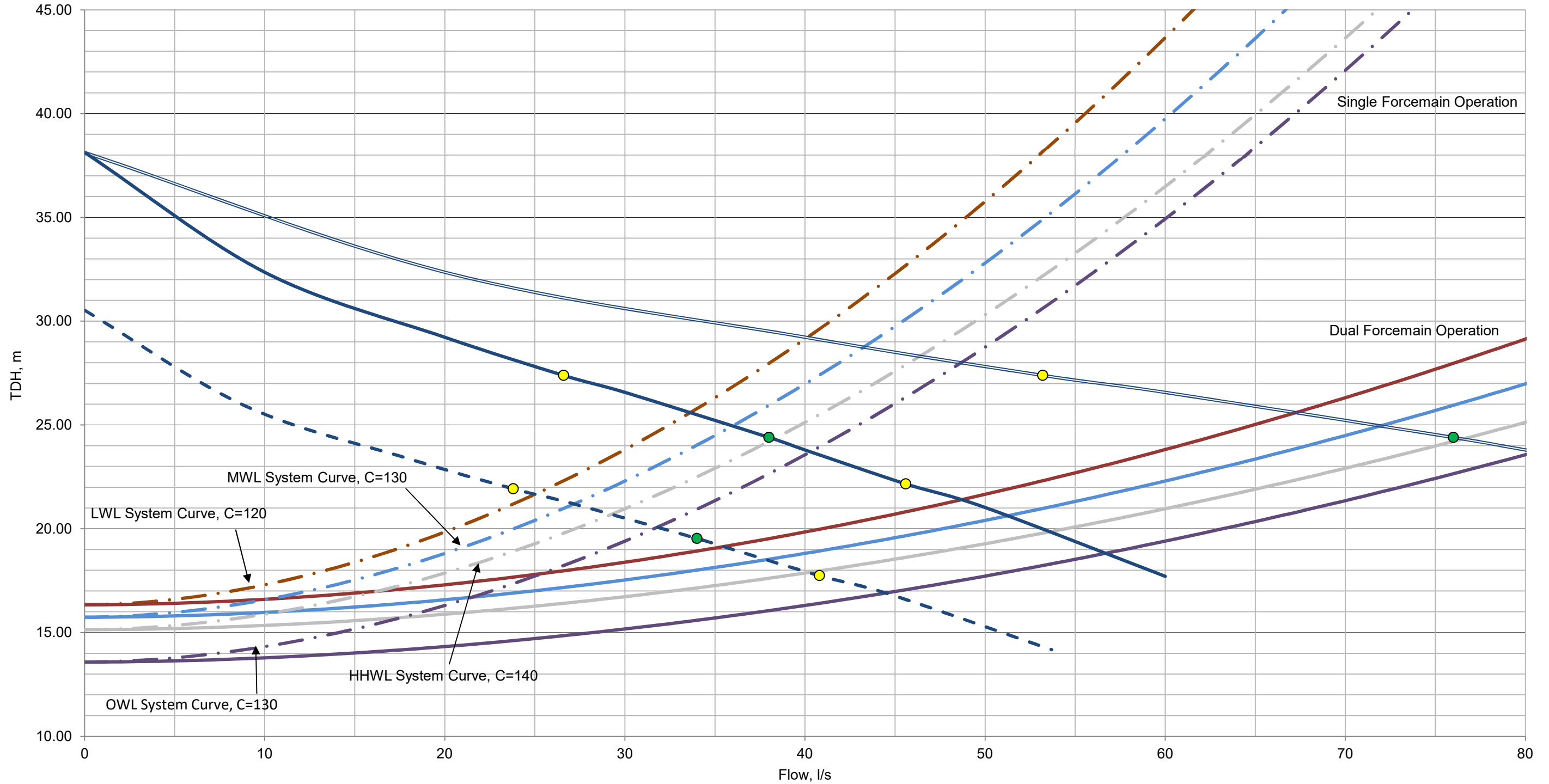
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SCALE VARIES OR AS NOTED
 DWG. No. H364639-0000-230-272-0001
 REV A

USER: JEFFREY.P. MARSH
 DATE: 2022-03-11 TIME: 4:59:24 PM
 FILE: C:\SECANT\PROJECTS\C1 - HATCH\YEAR 2021\A - ZIBI\RETAINING WALL

Appendix 2 System Curve and Calculations

Pump/System Performance Curves for Proposed Pumps



Windmill Dream Hydraulic Calculations

Incoming Sewer Hydraulics

Upstream Invert at Maintenance Hole SAN401A	46.290	m
Extra Drop within Maintenance Hole SAN401A	0.81	m
Exit Invert at Maintenance Hole SAN401A	45.480	m
Storage Pipe Length	51.67	m
Storage Pipe Slope	0.23%	
Entrance Invert at Maintenance Hole SAN402A	45.360	m

Design Notes

Invert on drawing "Zaida Eddy Private" (717_Block 211_PP1_Asbuilt.pdf)

Dimensioned off of "Zaida Eddy Private" (717_Block 211_PP1_Asbuilt.pdf)
Continuing slope from MH SAN100A to MH SAN401A

Approach Pipe

Drop within Maintenance Hole SAN402A	0.700	m
Exit Invert at Maintenance Hole SAN402A	44.660	m
Approach Pipe Length	14.1	m
Approach Pipe Slope	3.90%	
Approach Pipe Diameter	0.533	m
Invert at Pumping Station	44.110	m

Calculated to ensure suitable hydraulic jump in approach pipe.
Assuming a 525 nominal diameter pipe.

Minimum Active Volume of Wet Well

Flow to PS (half station capacity = max starts)	0.045	m ³ /s
Maximum Flow Rate Per Pump	0.035	m ³ /s
Number of Pump Starts per Hour (combined for all pumps)	8	
Number of Pumps in Operation	1	
Min. Volume of Wetwell+Approach Pipe (between LWL and LWL1)	3.94	m ³

Minimum specified by all manufacturers
Designing for station to run with one pump for extended periods

Wet Well Dimensions

Width of Wet Well	2.44	m
Length of Wet Well	3.05	m
Wet Well Area	7.43	m ²
Effective Surface Area	6.69	m ²
Minimum Operational Depth (LWL to LWL1)	0.59	m
Minimum Operational Depth (LWL to LWL1)	0.60	m

Excluding benching and pumps. Assuming 90% surface area in wet well remaining.
Calculated Value
Set Value

Water Levels

HHWL (Alarm)	45.55	m	Top of Benching	45.56	m
HWL (Pumps full speed)	45.35	m			
LWL2 (Pump 2 on)	45.15	m			
LWL1 (Pump 1 on)	44.95	m			
LWL (Pumps off)	44.35	m			
LLWL (Alarm)	44.15	m			
Approach Pipe Fill Ratio at LWL	0.45				
Total Active Wet Well Volume (excluding pump motor)	4.01	m ³			

Aligning to just below top of the low flow channel in storage pipe. Float Level.
Set as 200mm below alarm. Pump speeds increase to full speed.
Pump 2 Start
Pump 1 Start

Per Approach pipe calculator, capacity at 0.45 d/D = 56.6l/s. Adequate.
Since active volume is greater than minimum volume pumps will not cycle too frequently.

Wet Well Floor

Low-Low Water Level	44.15	m
Minimum Water Level above Wet Well Floor	0.445	m
Additional Safety Factor	0.11	m
Wet Well Floor	43.60	m
Top of volute	44.04	m

Based on pump manufacturers

As per drawing "KSB 80-253/224XFG-K", assuming minimum water level is at the top of the volute.

Storage

Minimum Overflow Time	30	minutes
Maximum Flow to Pumping Station	0.045	m ³ /s
Storage Volume Required between HWL and Overflow	81.0	m ³
Overflow Invert	47.109	m

Invert on drawing "Zaida Eddy Private" (717_Block 211_PP1_Asbuilt.pdf)

Wet Well Dimensions

Width of Wet Well	2.44	m
Length of Wet Well	3.05	m
Wet Well Area	7.43	m ²
Storage Volume in Wet Well above HWL	11.6	m ³

Assuming a pre-fabricated maintenance hole

Using full storage capacity since motors to not extend significantly into volume between HWL and OWL

SAN402A Maintenance Hole

SAN402A Maintenance Hole Diameter	3.05	m
SAN402A Maintenance Hole Storage above High Water Alarm Level	11.4	m ³

SAN401A Maintenance Hole

SAN401A Maintenance Hole Diameter	2.44	m
SAN401A Maintenance Hole Storage above HWL	7.3	m ³

Confirmed 1500mm RCP can be joined to 2400mm MH as per Decast literature.
Assuming storage upstream of SAN401A is insignificant.

Storage Pipe (SAN401A - SAN402A)

Diameter	1.52	m
Effective Storage (full area less benching and low flow channel)	1.55	m ³ /m
Available Storage Volume	80.1	m ³
Storage in Storage Pipe	80.1	m ³
Storage in Maintenance Holes (Including Wet Well)	30.2	m ³
Total Volume below OWL	110.3	m ³
Storage Time (incoming flow of 45 L/s)	40.9	minutes
Storage Time (incoming flow of 35 L/s)	52.5	minutes

Refer to Schematic Drawing.

Available volume prior to overflow

Including Approach Pipe volume unoccupied during operation
Including volume in Wet Well above HWL

NPSH Requirements

NPSH _r	KSB - Pump		
	LWL	LWL 1	Overflow
Flow Rate (L/s)	22.5	30	34
NPSH _r Required (Maximum), (m)	3.3	4.1	4.6
Target/Initial Safety Factor	1.7	1.7	1.7
NPSH Required @ Flow incl. FS (m)	5.61	6.97	7.82

KSB 80-253/224XFG-K

NPSH_a Determination

Pump Station Elevation	44.15	m	101.3	kPa
Atmospheric Pressure	10.33	m		
h _{vap} Vapour Pressure at 30°C	0.43	m		
h _{vol} partial pressure due to organics	0.6	m		
NPSH _a (site specific subtotal)	9.30	m		

Height above sea level at low water level
Standard atmospheric pressure at site elevation.
From water property table. A-8 in Sanks.
From Sanks
Using Equation 10-25 in Pumping Station Design (Jones): NPSHA = H_{bar} + h_s - h_{vap} - h_{f_s} - Σh_m - h_{vol} - FS

NPSH Comparison

	LWL	LWL 1	OWL
Pump Flow Rate, Q	22.5	30	34
Total Suction Losses	0.00	0.00	0.00
NPSH _a at liquid Surface	9.30	9.30	9.30
Correction above minimum liquid level of pump	0.31	0.91	3.07
Adjusted NPSH _a (relative to minimum liquid level of pump)	9.61	10.21	12.37
NPSH Required @ Flow including a factor of safety	5.61	6.97	7.82
Final NPSH Safety Factor	2.91	2.49	2.69

Values selected to represent the potential range of flows.
Losses are already factored into suction since hardware is integrated.

Appendix 3
KSB Pump Curve

Data sheet



Customer item no.:35L/s @ 25m
Communication dated: 11/03/2022
Doc. no.: Zibi Pump
Quantity: 1

Number: ES 8001749776
Item no.: 200
Date: 11/03/2022
Page: 1 / 7

KRTE 80-253/224XFG-K

Version no.: 1

Operating data

Requested flow rate	35.000 l/s	Actual flow rate	35.253 l/s
Requested developed head	25.00 m	Actual developed head	25.15 m
Pumped medium	Wastewater, municipal untreated	Efficiency	75.4 %
Pumped medium details	Not containing chemical and mechanical substances which affect the materials	Power absorbed	11.88 kW
Ambient air temperature	20.0 °C	Pump speed of rotation	1777 rpm
Fluid temperature	20.0 °C	Shutoff head	38.14 m
Fluid density	1030 kg/m ³	Max. power on curve	16.61 kW
Fluid viscosity	1.00 mm ² /s	Design	Single system 1 x 100 %
Static head	15.00 m	Performance test	Yes
Ex-Request acc.to Atex	II T3		

Design

Design	Close-coupled submersible	Calculated temperature increase at shaft seal	K
Orientation	Vertical	Impeller type	Single vane, radial flow (E)
Suction flange pump drilled according to(DN1)	unmachined	Wear ring	Casing wear ring
Discharge flange pump drilled according to(DN2)	EN 1092-2 / DN 80 / PN 10	Impeller diameter	255.0 mm
Shaft seal	2 mech. seals in tandem arrangement with oil reservoir	Free passage size	76 mm
Shaft seal manufacturer	KSB	Direction of rotation from drive	Clockwise
Type	4STK	Ex protection	Explosion protection to CSA Class1, Div1, Gr.C, D T3
Material code	SIC/SIC/NBR	Color	Ultramarine blue (RAL 5002) KSB-blue

Driver, accessories

Driver type	Electric motor	Motor service factor	1.15
Model (make)	KSB	Temperature sensor	PTC resistor
Motor const. type	KSB Sub. motor	Motor winding	575 V
Operating mode	S1, non submerged operation	Number of poles	4
NEMA code letter	H	Starting mode	Direct-on-line starting
Frequency	60 Hz	Connection mode	Delta
Rated voltage	575 V	Motor cooling method	closed-circuit jacket cooling
Rated power P2	18.64 kW	Motor cooling jacket	With
Available reserve	56.87 %	Motor version	X
Rated current	24.5 A	Cable design	Rubber hose
Starting current ratio	6.7	Cable entry	Sealed along entire length
Insulation class	H according IEC 34-1	Power cable	AWG 11-7+15-5
Type of protection	XP/II/1/CD	Number of power cables	1
Motor enclosure	IP68	Moisture sensor	With
Cos phi at 4/4 load	0.85	Cable length	10.00 m
Motor efficiency at 4/4 load	89.9 %		

Data sheet



Customer item no.: 35L/s @ 25m
Communication dated: 11/03/2022
Doc. no.: Zibi Pump
Quantity: 1

Number: ES 8001749776
Item no.: 200
Date: 11/03/2022
Page: 2 / 7

KRTE 80-253/224XFG-K

Version no.: 1

Materials G

Pump casing (101)	Cast iron A 48 Class 35 B	Casing wear ring (502.1)	Cast iron A 48 Class 35 B
Discharge cover (163)	Cast iron A 48 Class 35 B	Cooling jacket (66-2)	Stainless steel A 276 Type 316 Ti
Shaft (210)	Chrome steel ASTM A276 Type 420 T	Motor housing (811)	Cast iron A 48 Class 35 B
Impeller (230)	Cast iron A 48 Class 35 B	Motor cable (824)	Chloroprene rubber
Bearing bracket (330)	Cast iron A 48 Class 35 B	Screw (900)	Stainless steel A 193 B8M
O-Ring (412)	Nitrile rubber NBR		

Packaging

IPPC Standard ISPM 15	Yes	Packaging for transport	Ship
Packaging category	B1 Wooden or plywood case, cover provided with polypropylene cellular sheet, outdoor storage up to 3 months	Outdoor storage at -40°C to +50°C for up to 3 months. Packet must be covered. No corrosion protection, only transport protection.	
Packaging for storage	Indoor		

Nameplates

Nameplates language	International	Duplicate nameplate	With
---------------------	---------------	---------------------	------

Certifications

Hydraulic performance test		Test participation	Non-witnessed
Acceptance standard	ISO 9906 2B	Quantity, non-witnessed	1
Quantity meas. points Q-H	5	Quantity, witnessed	0
Certificate	Inspection cert. 3.1 to EN 10204		

Data sheet



Customer item no.:35L/s @ 25m
Communication dated: 11/03/2022
Doc. no.: Zibi Pump
Quantity: 1

Number: ES 8001749776
Item no.: 200
Date: 11/03/2022
Page: 3 / 7

KRTE 80-253/224XFG-K

Version no.: 1

Installation parts

Installation type	stationary 2 guide rail	Type	Chain
Scope of supply	Pump with installation parts For guide rail arrangements, the guide rails are not included in KSB's scope of supply.	Material	CrNiMo steel 1.4404
		Length	5.00 m
		Max. load	400 kg
Installation depth	4.50 m	Lifting Bail	With
Material concept	G		

Duckfoot bend

Size	DN 80
Flange design	ASME
Duckfoot bend size (DN2 / DN3)	DN 80 Drilled according to ASME
Material	Cast iron A 48 Class 35 B
Mounting type	Composite anchor bolts
Foundation rail	Without

Claw

Design	Straight
Size	DN 80

Lifting chain / -rope

Performance curve

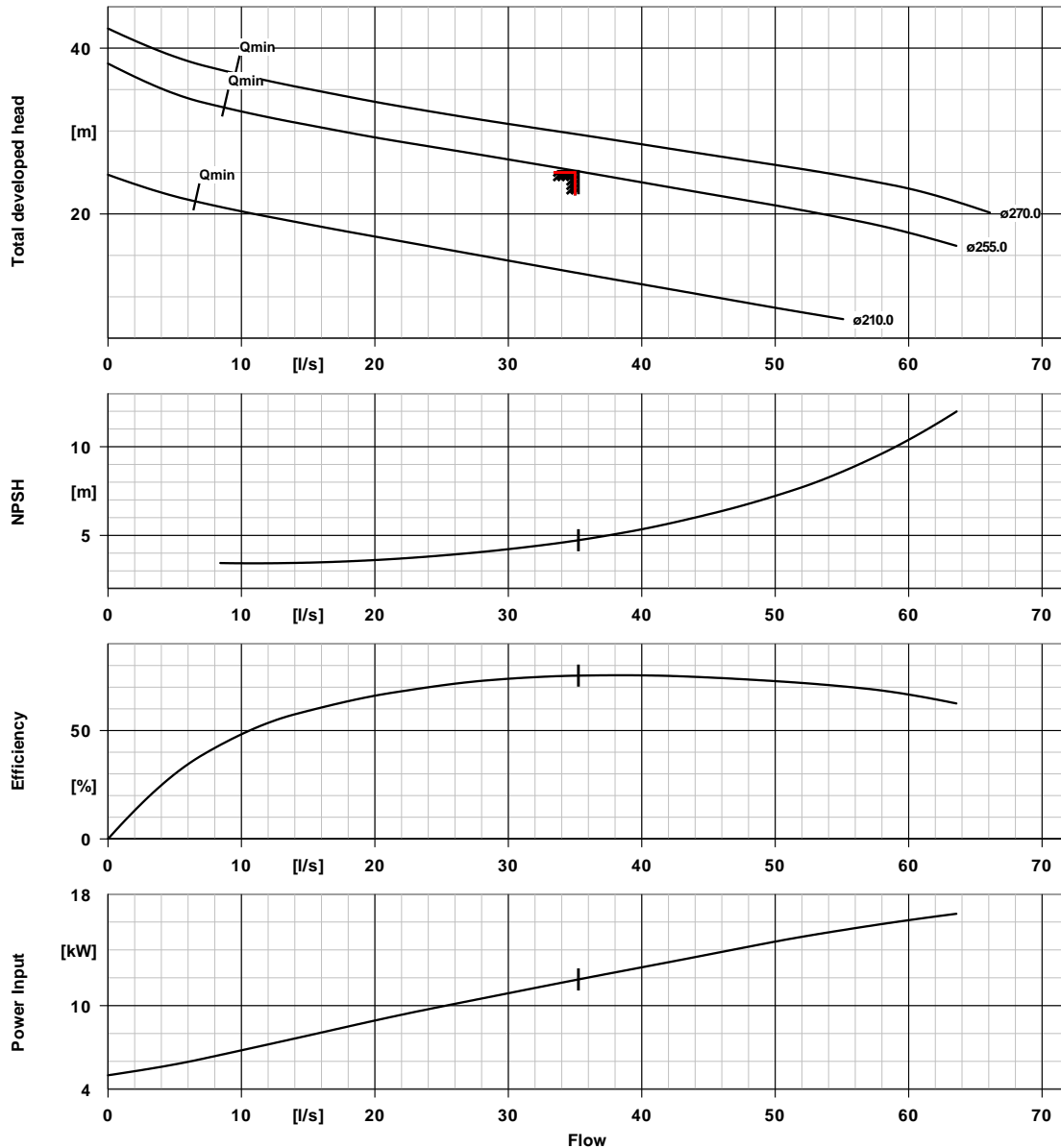


Customer item no.:35L/s @ 25m
 Communication dated: 11/03/2022
 Doc. no.: Zibi Pump
 Quantity: 1

Number: ES 8001749776
 Item no.:200
 Date: 11/03/2022
 Page: 4 / 7

KRTE 80-253/224XFG-K

Version no.: 1



Curve data

Speed of rotation	1777 rpm	Efficiency	75.4 %
Fluid density	1030 kg/m ³	Power absorbed	11.88 kW
Viscosity	1.00 mm ² /s	NPSH 3%	4.73 m
Flow rate	35.253 l/s	Curve number	K43404/2
Requested flow rate	35.000 l/s	Effective impeller diameter	255.0 mm
Total developed head	25.15 m	Acceptance standard	ISO 9906 2B
Requested developed head	25.00 m		

Motor data sheet



Customer item no.:35L/s @ 25m
 Communication dated: 11/03/2022
 Doc. no.: Zibi Pump
 Quantity: 1

Number: ES 8001749776
 Item no.:200
 Date: 11/03/2022
 Page: 5 / 7

KRTE 80-253/224XFG-K

Version no.: 1

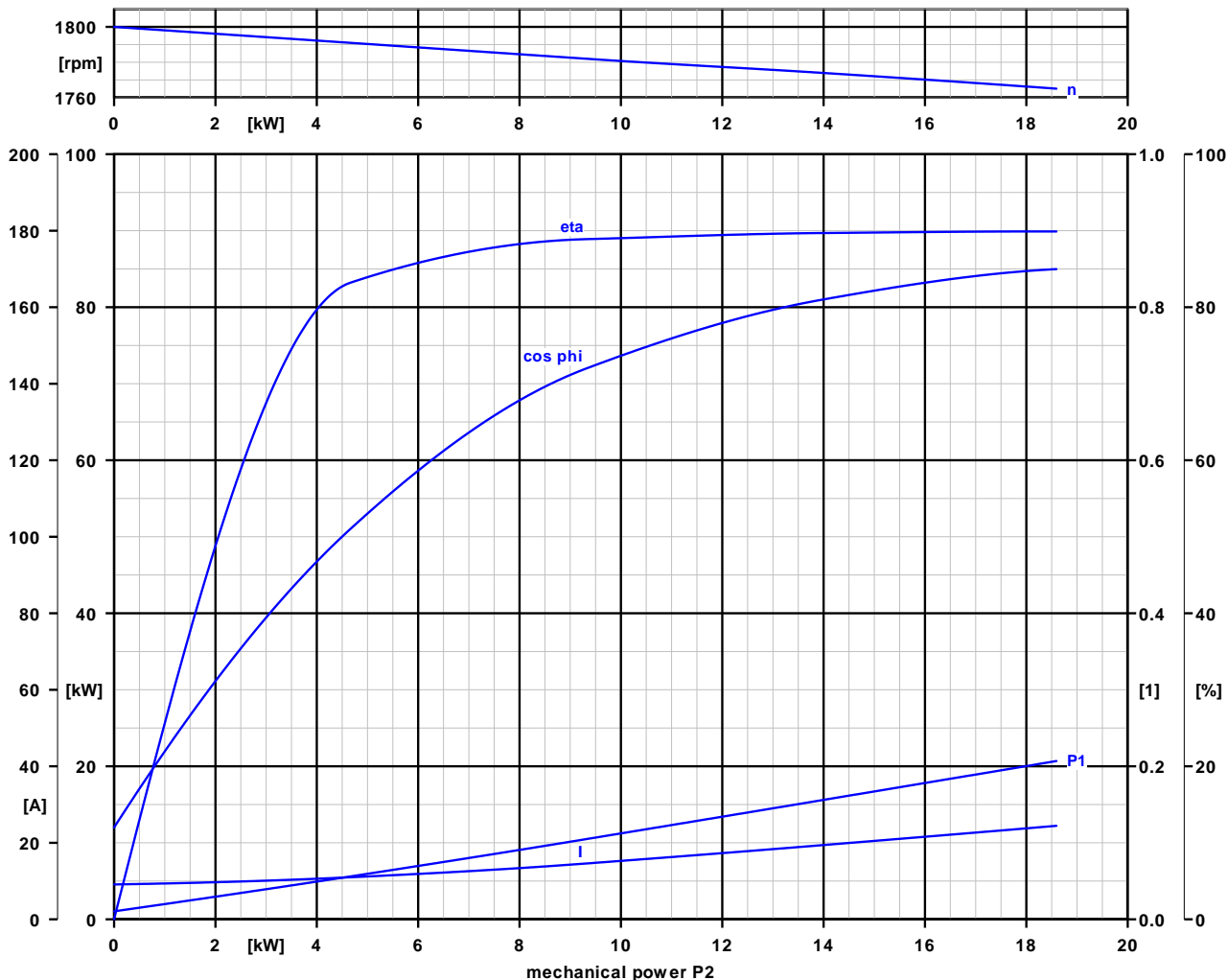
Motor data

Motor manufacturer	KSB	Rated speed	1765 rpm
Motor size	22F	Starting current ratio	6.7
Motor construction type	KSB Sub. motor	Starting mode	Direct-on-line starting
Motor material	Grey cast iron EN-GJL-250	Power cable	AWG 11-7+15-5
Efficiency class	not classified	Number of power cables	1
Rated voltage	575 V	Power cable Ø min.	21.0 mm
Frequency	60 Hz	Power cable Ø max.	23.0 mm
Motor power	18.64 kW	Cable standard	CSA
Rated current	24.5 A	Switching frequency	10.00 1/h

Curve data

The no-load point is not a guarantee point within the meaning of IEC 60034

Load	0.0 %	25.0 %	50.0 %	75.0 %	100.0 %
P2	0.00 kW	4.66 kW	9.32 kW	13.98 kW	18.64 kW
n	1800 rpm	1791 rpm	1782 rpm	1774 rpm	1765 rpm
P1	1.05 kW	5.60 kW	10.49 kW	15.59 kW	20.74 kW
I	9.1 A	11.0 A	14.6 A	19.4 A	24.5 A
Eta	0.0 %	83.2 %	88.9 %	89.7 %	89.9 %
cos phi	0.12	0.51	0.72	0.81	0.85



Installation plan

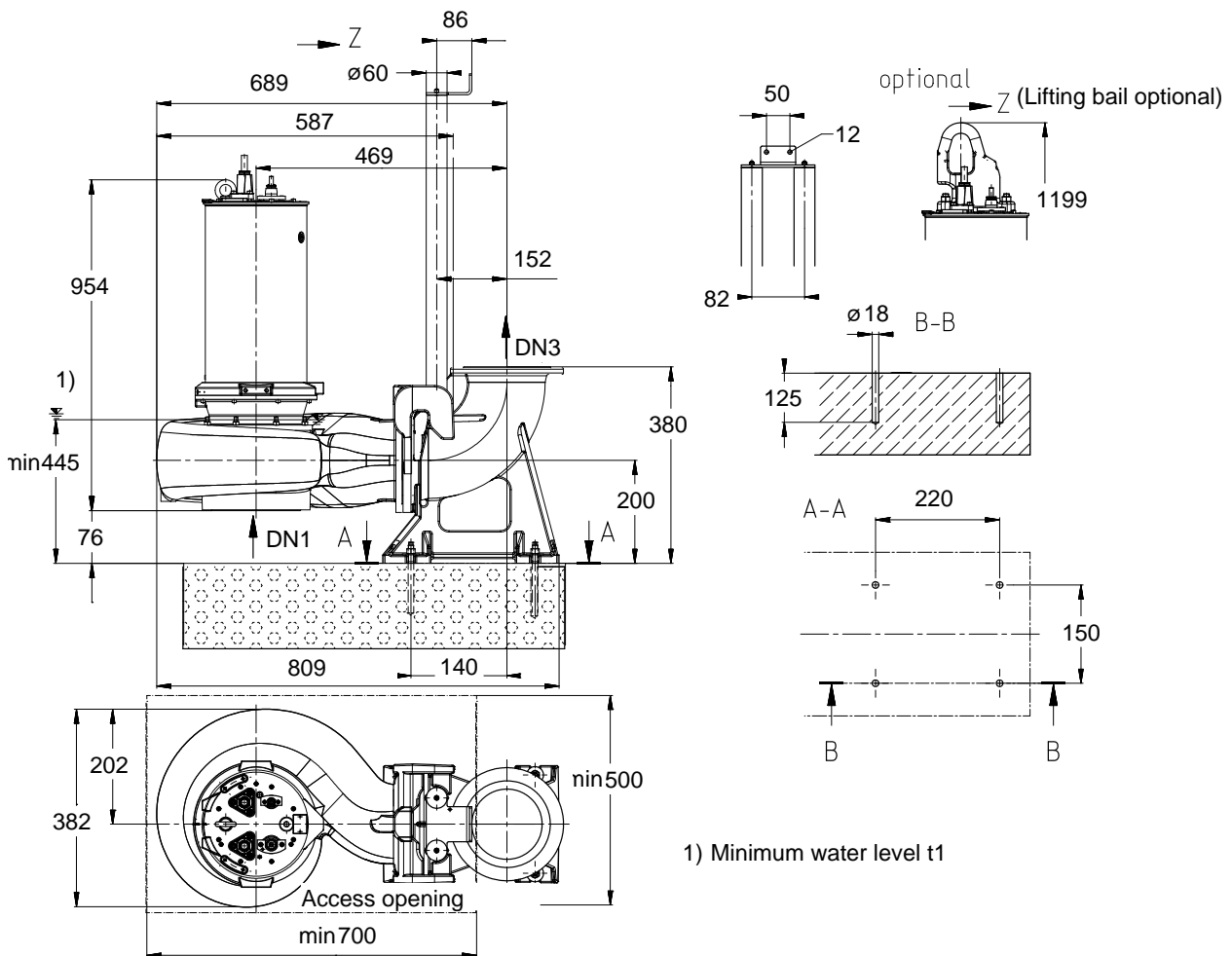


Customer item no.:35L/s @ 25m
 Communication dated: 11/03/2022
 Doc. no.: Zibi Pump
 Quantity: 1

Number: ES 8001749776
 Item no.:200
 Date: 11/03/2022
 Page: 6 / 7

KRTE 80-253/224XFG-K

Version no.: 1



Drawing is not to scale

Dimensions in mm

Motor

Motor manufacturer	KSB
Motor size	22F
Motor power	18.64 kW
Number of poles	4
Speed of rotation	1765 rpm
Motor enclosure	IP68

Connections

Suction flange pump drilled according to(DN1)	unmachined
Duckfoot bend size (DN2 / DN3)	DN 80 Drilled according to ASME

Weight net

Pump, Motor, Cable	291 kg
Claw / Foot	35 kg
Total	326 kg

Installation plan



Customer item no.:35L/s @ 25m
Communication dated: 11/03/2022
Doc. no.: Zibi Pump
Quantity: 1

Number: ES 8001749776
Item no.:200
Date: 11/03/2022
Page: 7 / 7

KRTE 80-253/224XFG-K

Version no.: 1

Connect pipes without stress or strain!

Dimensional tolerances for shaft axis height: DIN 747
Dimensions without tolerances, middle tolerances to:
Connection dimensions for pumps:
Dimensions without tolerances - welded parts:
Dimensions without tolerances - gray cast iron parts:
Dimensions without tolerances - stainless steel parts:

ISO 2768-m
EN735
ISO 13920-B
ISO 8062-CT11
ISO 8062-CT12

**For auxiliary connections see
separate drawing.**

Appendix 4

Email RE: System Flow

Gibbs, Andrew

From: Taryn Glancy <TGlancy@zibi.ca>
Sent: Friday, June 4, 2021 12:59 PM
To: Rusch, Peter; afobert; Gibbs, Andrew
Subject: Pump Station Design Flows
Attachments: Copy of san-2021-05-10_windmill_worksheet.xlsx

Follow Up Flag: Follow up
Flag Status: Completed

Hi Peter,

We have finalized the design flows for the pump station. Please proceed with design and schedule. Max capacity of the station would be 45 L/s, however likely operating at 30-35 L/s based on our discussions.

I have contacted Gemtec to review the slope stability, and will set up a meeting soon.

Thanks,



TARYN GLANCY, P. ENG.
PROJECT MANAGER

6 Booth St (Albert Island), Ottawa, ON K1R 6K8
C 613-219-2722 E TGlancy@zibi.ca

Appendix 5 Generator Sizing TM-1

Project Memo

H 282834

November 7, 2018

To: David Schaeffer Engineering Limited
Attention: Adam Fobert, P.Eng

From: Peter Rüsç / Grace Ning

cc:

**Re: Zibi Development / Chaudiere Island, City of Ottawa
Generator Sizing for Dual Use**

1. Introduction

Hatch has been retained by David Schaeffer Engineering Limited (DSEL) to design the pumping facilities for the Zibi Development on Chaudiere Island in the City of Ottawa. The pumping facilities will consist of a permanent pumping station, and there may be a temporary pumping station to allow for a longer planning timeframe for the overall site. DSEL has advised that the permanent station will have a peak sanitary flow of 32.7 L/s. Furthermore, Zibi has advised that Zibi requires a standby generator for other purposes on site. Hatch in conjunction with the DSEL suggested that it may be prudent to re-use the generator for the permanent pumping station, if feasible.

The flows from the permanent pumping station will be conveyed through twin forcemains, for discharge at Brickhill Street near Albert Street in the City of Ottawa. Hatch has previously completed a technical memorandum (Forcemain TM) to provide suggested forcemain diameters to DSEL. The forcemain TM is attached to this TM, and it is our understanding that the Forcemain TM may not be approved by the City of Ottawa at the time of writing.

The purpose of this TM is to set out probable pump sizes and derive a load list for the permanent pumping station that will require to be supplied by the generator. It has to be understood that the sizing is based on the background information presented in this memo and, depending on the final layout of the pumping station may result in an inadequate generator.

2. Pump Sizing

Hatch has, in the Forcemain TM derived a likely duty point for the pumping station, and as such has pre-selected 2 pumps for the following duty points:

- 33 L/s, with a total dynamic head of 25 m. This selection mimics the flow of the duty point referenced in the forcemain TM, with an additional allowance of 2.0m for additional depth / friction losses etc. This pump (from Flygt) would have a 15 kW motor.

If you disagree with any information contained herein, please advise immediately.

- 40 L/s, with a total dynamic head of 27 m. This selection provides for a [somewhat] random scenario where the PS needs to either provide for more flows, or for more total dynamic head. This pump from Flygt would have a 22 kW motor.

Hatch has also requested a pump selection from KSB, however these show a larger motor for the smaller pump and a similar sized motor for the larger pump. As such we believe that a pump with a 15 kW motor should adequately cover the duty scenario set out in the forcemain TM.

3. Generator Load Cases (for Pumping Station Use)

In the design of the conceptual layout of the permanent station, Hatch as assumed that, under certain extreme conditions, the second pump could be started, therefore the generator should be compliant with the following load cases:

- Load case 1:
 - Start Pump # 1, 15 kW, Soft Starter (peak current inrush = 3 x nominal)
 - Start Pump # 2, 15 kW, Soft Starter (peak current inrush = 3 x nominal)
 - Add miscellaneous electrical loads, 5 kW total, in 2 steps.
 - Voltage drop to be less than 25%
- Load case 2:
 - Start Pump # 1, 22 kW, VFD (peak current inrush = 2 x nominal)
 - Start Pump # 2, 22 kW, VFD (peak current inrush = 2 x nominal)
 - Add miscellaneous electrical loads, 5 kW total, in 2 steps.
 - Voltage drop to be less than 30%

Pumps of these sizes generally require 600 V power supply, and as such the genset should be a 3 Phase 600 V unit.

Zibi needs to determine the final generator size from the interim demands for other interim uses and the above noted proposed permanent pumping station demands.

Should there be any questions or concerns, please do not hesitate to contact us.

D

Appendix D Stormwater Management Calculations



EVALUATION OF RUNOFF COEFFICIENTS

Client: DREAM Windmill
Project: ZIBI
Location: Ottawa, Ontario
Project #: A000931



Area	Grassed Area (m ²)	Runoff Coefficient	Interlock Pavers Area (m ²)	Runoff Coefficient	Hard Surface Area (m ²)	Runoff Coefficient	Total Area (m ²)	Runoff Coefficient (10-year event)	Runoff Coefficient (100-year)
A1	322	0.20	98	0.75	1946	0.90	2366	0.80	0.95
A2	0	0.20	0	0.75	1228	0.90	1228	0.90	0.95
A3	0	0.20	0	0.75	1572	0.90	1572	0.90	0.95
A4	23	0.20	1358	0.75	728	0.90	2109	0.80	0.95
A5	28	0.20	736	0.75	0	0.90	764	0.73	0.91
A6	634	0.20	0	0.75	1479	0.90	2113	0.69	0.86
A7	0	0.20	959	0.75	0	0.90	959	0.75	0.94
A8	0	0.20	271	0.75	0	0.90	271	0.75	0.94
A9	38	0.20	1299	0.75	0	0.90	1337	0.73	0.92
TOTAL	1045	0.20	4721	0.75	6953	0.90	12719	0.79	0.95
A10	0	0.20	1963	0.75	0	0.90	1963	0.75	0.94
TOTAL	1045	0.20	6684	0.75	6953	0.90	14682	0.78	0.95

Prepared by: Julien Sauvé, P.Eng.
 PEO No.: 100200100

Date: 2022-03-17

Verified by: André Chaumont, P.Eng.
 PEO No.: 90409194

Date: 2022-03-17

Design Chart 1.07: Runoff Coefficients**- Urban for 5 to 10-Year Storms**

Land Use	Runoff Coefficient	
	Min.	Max.
Pavement - asphalt or concrete	0.80	0.95
- brick	0.70	0.85
Gravel roads and shoulders	0.40	0.60
Roofs	0.70	0.95
Business - downtown	0.70	0.95
- neighbourhood	0.50	0.70
- light	0.50	0.80
- heavy	0.60	0.90
Residential - single family urban	0.30	0.50
- multiple, detached	0.40	0.60
- multiple, attached	0.60	0.75
- suburban	0.25	0.40
Industrial - light	0.50	0.80
- heavy	0.60	0.90
Apartments	0.50	0.70
Parks, cemeteries	0.10	0.25
Playgrounds (unpaved)	0.20	0.35
Railroad yards	0.20	0.35
Unimproved areas	0.10	0.30
Lawns - Sandy soil		
- flat, to 2%	0.05	0.10
- average, 2 to 7%	0.10	0.15
- steep, over 7%	0.15	0.20
- Clayey soil		
- flat, to 2%	0.13	0.17
- average, 2 to 7%	0.18	0.22
- steep, over 7%	0.25	0.35

For flat or permeable surfaces, use the lower values. For steeper or more impervious surfaces, use the higher values. For return period of more than 10 years, increase above values as 25-year - add 10%, 50-year - add 20%, 100-year - add 25%.

The coefficients listed above are for unfrozen ground.



STORAGE VOLUME CALCULATIONS

Project: ZIBI
 Block 204
Project #: A000931
Station OTTAWA SEWER DESIGN GUIDELINES
Date: 4/5/2022 14:02

File #VALUE!
Location:

Description: Storage volume calculations with the rational method

Specified Release Rate: 100 L/s/ha

Area : A6 0.2113 ha
Runoff Coefficient C : 0.86
Rainfall Event : 100 ans
Discharge Flow Q : 0.02113 m³/s
Discharge Factor K : 1

Design Volume: 47.30 m³

Rainfall Pluviometry Coefficients	2 year		5 year		10 year	
	30 min. or less	Over 30 min.	30 min. or less	Over 30 min.	30 min. or less	Over 30 min.
A	732.951	732.951	998.071	998.071	1174.184	1174.184
B	6.199	6.199	6.053	6.053	6.014	6.014
C	0.810	0.810	0.814	0.814	0.816	0.816
Rainfall Pluviometry Coefficients	25 year		50 year		100 year	
	30 min. or less	Over 30 min.	30 min. or less	Over 30 min.	30 min. or less	Over 30 min.
A	1402.884	1402.884	1569.58	1569.58	1735.688	1735.688
B	6.018	6.018	6.014	6.014	6.014	6.014
C	0.819	0.819	0.820	0.820	0.820	0.820

Prepared by: Julien Sauvé
 PEO No.: 100200100

Date: 3/28/2022

Verified by: André Chaumont
 PEO No.: 90409194

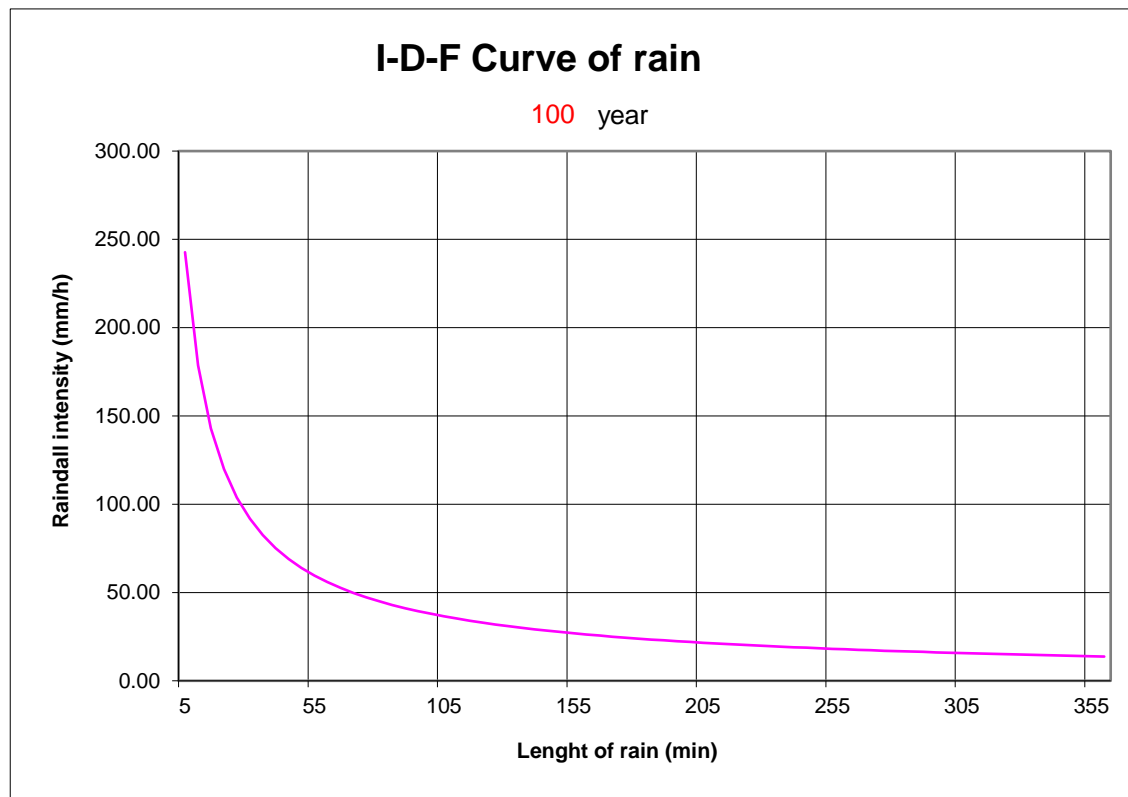
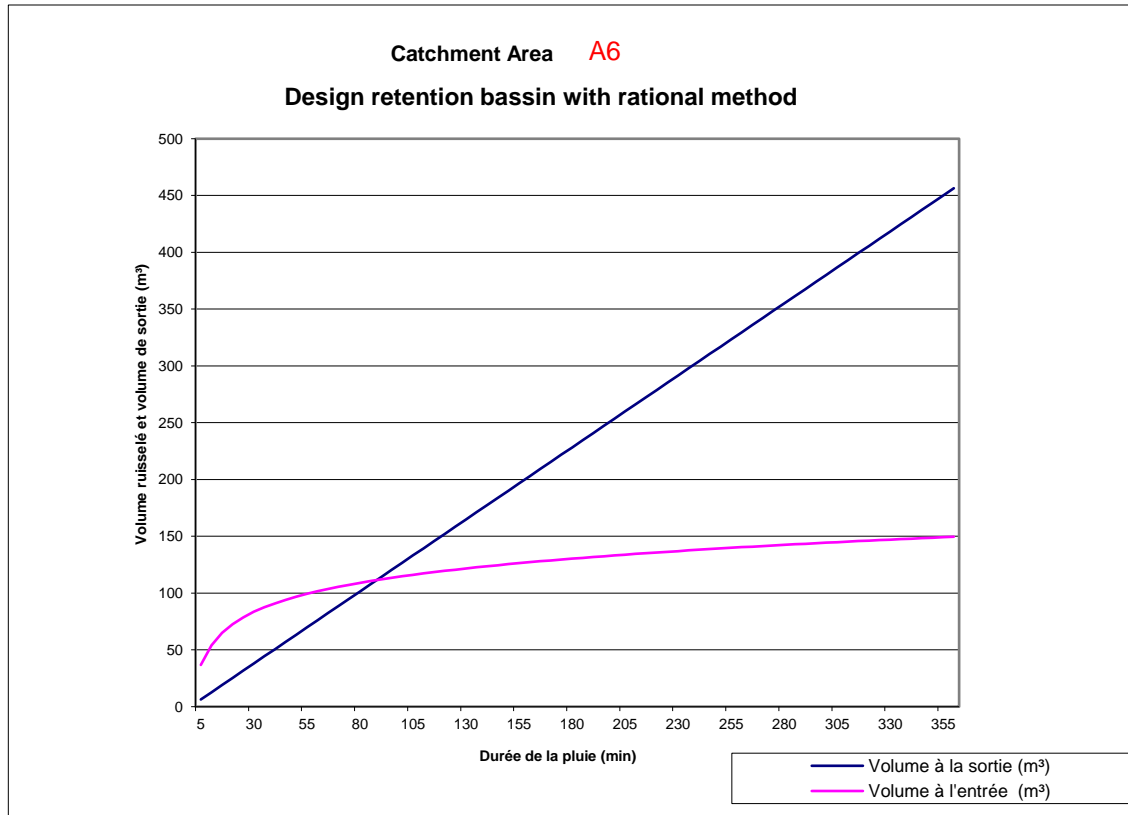
Date: 3/28/2022

Init. _____

Rainfall Duration (min) <i>T</i> (1)	Rainfall Intensity (mm/h) <i>I</i> (2)	Rainfall intensity for Climate Ch. (mm/h) <i>I(2)*(factor)</i> (3)	Runoff Volume (m ³) <i>CIAT</i> (4)	Output Volume (m ³) <i>kQT</i> (5)	Retention Volume (m ³) <i>(4)-(5)</i> (6)
5.0	242.70	266.97	36.75	6.339	30.41
10.0	178.56	196.41	54.08	12.678	41.40
15.0	142.89	157.18	64.92	19.017	45.90
20.0	119.95	131.95	72.66	25.356	47.30
25.0	103.85	114.23	78.63	31.695	46.93
30.0	91.87	101.06	83.47	38.034	45.44
35.0	82.58	90.84	87.54	44.373	43.16
40.0	75.15	82.66	91.04	50.712	40.32
45.0	69.05	75.96	94.11	57.051	37.06
50.0	63.95	70.35	96.85	63.39	33.46
55.0	59.62	65.59	99.32	69.729	29.59
60.0	55.89	61.48	101.57	76.068	25.50
65.0	52.65	57.91	103.64	82.407	21.23
70.0	49.79	54.77	105.56	88.746	16.81
75.0	47.26	51.98	107.34	95.085	12.25
80.0	44.99	49.49	109.01	101.424	7.58
85.0	42.95	47.25	110.58	107.763	2.81
90.0	41.11	45.22	112.06	114.102	-2.04
95.0	39.43	43.38	113.46	120.441	-6.98
100.0	37.90	41.69	114.79	126.78	-11.99
105.0	36.50	40.15	116.06	133.119	-17.05
110.0	35.20	38.72	117.28	139.458	-22.18
115.0	34.01	37.41	118.44	145.797	-27.36
120.0	32.89	36.18	119.55	152.136	-32.58
125.0	31.86	35.05	120.62	158.475	-37.85
130.0	30.90	33.99	121.65	164.814	-43.16
135.0	30.00	33.00	122.65	171.153	-48.51
140.0	29.15	32.07	123.61	177.492	-53.89
145.0	28.36	31.19	124.54	183.831	-59.30
150.0	27.61	30.37	125.43	190.17	-64.74
155.0	26.91	29.60	126.31	196.509	-70.20
160.0	26.24	28.86	127.15	202.848	-75.70
165.0	25.61	28.17	127.97	209.187	-81.21
170.0	25.01	27.54	128.77	215.526	-86.75
175.0	24.44	26.89	129.55	221.865	-92.32
180.0	23.90	26.29	130.31	228.204	-97.90
185.0	23.39	25.73	131.04	234.543	-103.50
190.0	22.90	25.19	131.76	240.882	-109.12
195.0	22.43	24.67	132.47	247.221	-114.75
200.0	21.98	24.18	133.15	253.56	-120.41
205.0	21.55	23.71	133.82	259.899	-126.07
210.0	21.14	23.26	134.48	266.238	-131.76
215.0	20.75	22.83	135.12	272.577	-137.45
220.0	20.37	22.41	135.75	278.916	-143.16

225.0	20.01	22.04	136.37	285.255	-148.89
230.0	19.66	21.63	136.97	291.594	-154.62
235.0	19.33	21.26	137.57	297.933	-160.37
240.0	19.01	20.94	138.15	304.272	-166.12
245.0	18.69	20.56	138.72	310.611	-171.89
250.0	18.39	20.23	139.28	316.95	-177.67
255.0	18.11	19.92	139.83	323.289	-183.46
260.0	17.83	19.64	140.37	329.628	-189.26
265.0	17.56	19.34	140.90	335.967	-195.07
270.0	17.29	19.02	141.42	342.306	-200.88
275.0	17.04	18.75	141.94	348.645	-206.71
280.0	16.80	18.48	142.44	354.984	-212.54
285.0	16.56	18.22	142.94	361.323	-218.38
290.0	16.33	17.96	143.43	367.662	-224.23
295.0	16.11	17.72	143.91	374.001	-230.09
300.0	15.89	17.48	144.39	380.34	-235.95
305.0	15.68	17.25	144.86	386.679	-241.82
310.0	15.48	17.03	145.32	393.018	-247.70
315.0	15.28	16.84	145.77	399.357	-253.58
320.0	15.09	16.60	146.22	405.696	-259.47
325.0	14.90	16.39	146.67	412.035	-265.37
330.0	14.72	16.19	147.10	418.374	-271.27
335.0	14.54	16.00	147.53	424.713	-277.18
340.0	14.37	15.84	147.96	431.052	-283.09
345.0	14.20	15.62	148.38	437.391	-289.01
350.0	14.04	15.44	148.79	443.73	-294.94
355.0	13.88	15.26	149.20	450.069	-300.87
360.0	13.72	15.09	149.61	456.408	-306.80
Max Volume (V max):					47.30
Design Volume (V design) :					47.30

ZIBI
Block 204





PROJECT NAME: ZIBI
 CIMA+ PROJECT NUMBER: A000931
 CLIENT: DREAM
 PROJECT STATUS: Site Plan Application Block 204

STORM SEWER HYDRAULIC DESIGN SHEET (SSDS) – RATIONAL METHOD

APPLICABLE DESIGN GUIDELINES:

1. City of Ottawa Sewer Design Guidelines, 2012

STORM SEWER DESIGN CALCULATIONS:

DESIGN CRITERIA:

Rainfall Station: City of Ottawa Sewer Design Guidelines, 2012 (Macdonald-Cartier Airport)
 Manning's Coefficient (n): 0.013
 Maximum Permitted Velocity: 3.00 m/s
 Minimum Permitted Velocity: 0.80 m/s

IDF PARAMETERS AND RATIONAL FORMULA:

Design Storm (year):	2	
IDF Regression Constants: (a)	732.951	
(b)	6.199	
(c)	0.810	
IDF Curve Equation (mm/hr):	$I = a / (\text{Time in min} + b)^c$	
Rational Formula (L/s):	$Q = 2.78 \cdot C \cdot I \cdot A$	where: Q = Flow (L/s) C = Runoff Coefficient I = Rainfall Intensity (mm/hr) A = Area (hectares)

OTHER FORMULAS USED IN CALCULATION TABLE:

Time of Concentration (minutes):	$T_c = T_i + T_f$	where: T _c = time of concentration (min) T _i = inlet time before pipe (min) T _f = time of flow in pipe (min) = L/(60*V) L = pipe length (m) V = actual velocity (m/s)
Manning's Equation (L/s):	$Q_{cap} = (1/n) \cdot A \cdot R^{2/3} \cdot S^{1/2}$	where: Q _{cap} = flow rate at capacity (L/s) n = Manning's roughness coefficient A = area of flow (m ²) R = hydraulic radius (m)* S = slope of pipe (%) <small>* Hydraulic radius is defined as the area of flow (m²) divided by wetted perimeter (m)</small>

LOCATION			RUNOFF	AREA	FLOW					SEWER DATA									
Street/Catchment Name	From MH/CB	To MH/CB	C =	(ha)	Section 2.78*AC (ha)	Accum 2.78*AC (ha)	Time of Conc (min)	Rainfall Intensity (mm/hr)	Peak Flow (L/s)	Diameter (mm)	Material Type	Slope (%)	Length (m)	Capacity (full) (L/s)	Velocity (full) (m/s)	Velocity (actual) (m/s)	Time of Flow (min)	Ratio (%)	
A10	Trench drain	Underground parking	0.75	0.134	0.279	0.279	10.00	76.805	21.46	375	CONC	0.20%	2.00	78.41	0.71	0.60	0.06	27%	
A8	STM-110	STM-109	0.75	0.027	0.056	0.056	10.00	76.805	4.32	375	PVC	0.30%	32.40	96.03	0.87	0.44	1.24	5%	
A9	STM-111	STM-109	0.73	0.134	0.272	0.272	10.00	76.805	20.89	375	CONC	0.20%	59.40	78.41	0.71	0.60	1.66	27%	
-	STM-109	STM-108	-	-	-	0.328	11.66	70.976	23.30	375	PVC	0.30%	11.90	96.03	0.87	0.71	0.28	24%	
A7	STM-108	STM-107	0.75	0.096	0.200	0.528	11.94	70.088	37.03	375	PVC	0.30%	9.30	96.03	0.87	0.81	0.19	39%	
A5	STM-107	STM-106	0.73	0.076	0.154	0.683	12.13	69.497	47.44	450	PVC	0.40%	57.70	180.32	1.14	0.94	1.02	26%	
A6 (Block 204)			0.69	0.211	Controlled Flow by roof drain (100L/s/ha)				21.13										
-	STM-106	STM-105	-	-	-	0.683	13.15	66.518	66.54	450	CONC	1.02%	21.60	287.94	1.82	1.46	0.25	23%	
A4	STM-105	STM-104	0.80	0.211	0.469	1.152	13.39	65.839	96.97	450	CONC	1.12%	10.70	301.73	1.90	1.67	0.11	32%	
A1 & A2 & A3	STM-104	STM-103	0.85	0.516	1.219	2.371	13.50	65.550	176.56	450	CONC	1.47%	99.60	345.67	2.18	2.18	0.76	51%	
-	STM-103	STM-102B	-	-	-	2.371	14.26	63.567	171.86	525	CONC	0.64%	11.00	344.05	1.59	1.58	0.12	50%	
-	STM-102B	STM-102A	-	-	-	2.371	14.38	63.276	171.17	525	CONC	0.88%	9.10	403.43	1.87	1.79	0.08	42%	
-	STM-102A	STM-101	-	-	-	2.371	14.46	63.066	170.67	600	CONC	0.75%	14.80	531.75	1.89	1.66	0.15	32%	
-	STM-101	STM-102 (OGS)	-	-	-	2.371	14.61	62.701	169.81	600	CONC	0.38%	7.90	378.50	1.34	1.29	0.10	45%	
-	STM-102 (OGS)	HW100	-	-	-	2.371	14.71	62.453	169.22	600	CONC	0.43%	10.90	402.63	1.43	1.37	0.13	42%	
				1.271															

Existing Network

Prepared by: Julien Sauvé, P.Eng.
PEO #100200100

Date: 4/5/2022

Verified by: André Chaumont, P.Eng.
PEO #90409194

Date: 4/5/2022



PROJECT NAME: ZIBI
 CIMA+ PROJECT NUMBER: A000931
 CLIENT: DREAM
 PROJECT STATUS: Site Plan Application Block 204

STORM SEWER HYDRAULIC DESIGN SHEET (SSDS) – RATIONAL METHOD

APPLICABLE DESIGN GUIDELINES:
 1. City of Ottawa Sewer Design Guidelines, 2012

STORM SEWER DESIGN CALCULATIONS:

DESIGN CRITERIA:

Rainfall Station: City of Ottawa Sewer Design Guidelines, 2012 (Macdonald-Cartier Airport)
 Manning's Coefficient (n): 0.013
 Maximum Permitted Velocity: 3.00 m/s
 Minimum Permitted Velocity: 0.80 m/s

IDF PARAMETERS AND RATIONAL FORMULA:

Design Storm (year):	5	
IDF Regression Constants: (a)	998.071	
(b)	6.053	
(c)	0.814	
IDF Curve Equation (mm/hr):	$I = a / (\text{Time in min} + b)^c$	
Rational Formula (L/s):	$Q = 2.78 \cdot C \cdot I \cdot A$	where: Q = Flow (L/s) C = Runoff Coefficient I = Rainfall Intensity (mm/hr) A = Area (hectares)

OTHER FORMULAS USED IN CALCULATION TABLE:

Time of Concentration (minutes):	$T_c = T_i + T_f$	where: T _c = time of concentration (min) T _i = inlet time before pipe (min) T _f = time of flow in pipe (min) = L/(60*V) L = pipe length (m) V = actual velocity (m/s)
Manning's Equation (L/s):	$Q_{cap} = (1/n) \cdot A \cdot R^{2/3} \cdot S^{1/2}$	where: Q _{cap} = flow rate at capacity (L/s) n = Manning's roughness coefficient A = area of flow (m ²) R = hydraulic radius (m)* S = slope of pipe (%) <small>* Hydraulic radius is defined as the area of flow (m²) divided by wetted perimeter (m)</small>

LOCATION			RUNOFF	AREA	FLOW					SEWER DATA									
Street/Catchment Name	From MH/CB	To MH/CB	C =	(ha)	Section 2.78*AC (ha)	Accum 2.78*AC (ha)	Time of Conc (min)	Rainfall Intensity (mm/hr)	Peak Flow (L/s)	Diameter (mm)	Material Type	Slope (%)	Length (m)	Capacity (full) (L/s)	Velocity (full) (m/s)	Velocity (actual) (m/s)	Time of Flow (min)	Ratio (%)	
A10	Trench drain	Underground parking	0.75	0.134	0.279	0.279	10.00	104.193	29.11	375	CONC	0.20%	2.00	78.41	0.71	0.66	0.05	37%	
A8	STM-110	STM-109	0.75	0.027	0.056	0.056	10.00	104.193	5.87	375	PVC	0.30%	32.40	96.03	0.87	0.47	1.14	6%	
A9	STM-111	STM-109	0.73	0.134	0.272	0.272	10.00	104.193	28.33	375	CONC	0.20%	59.40	78.41	0.71	0.65	1.53	36%	
-	STM-109	STM-108	-	-	-	0.328	11.53	96.765	31.76	375	PVC	0.30%	11.90	96.03	0.87	0.77	0.26	33%	
A7	STM-108	STM-107	0.75	0.096	0.200	0.528	11.78	95.632	50.53	375	PVC	0.30%	9.30	96.03	0.87	0.88	0.18	53%	
A5	STM-107	STM-106	0.73	0.076	0.154	0.683	11.96	94.870	64.76	450	PVC	0.40%	57.70	180.32	1.14	1.04	0.92	36%	
A6 (Block 204)			0.69	0.211	Controlled Flow by roof drain (100L/s/ha)				21.13										
-	STM-106	STM-105	-	-	-	0.683	12.88	91.086	83.31	450	CONC	1.02%	21.60	287.94	1.82	1.55	0.23	29%	
A4	STM-105	STM-104	0.80	0.211	0.469	1.152	13.11	90.188	125.02	450	CONC	1.12%	10.70	301.73	1.90	1.80	0.10	41%	
A1 & A2 & A3	STM-104	STM-103	0.85	0.516	1.219	2.371	13.21	89.810	234.09	450	CONC	1.47%	99.60	345.67	2.18	2.34	0.71	68%	
-	STM-103	STM-102B	-	-	-	2.371	13.92	87.204	227.91	525	CONC	0.64%	11.00	344.05	1.59	1.70	0.11	66%	
-	STM-102B	STM-102A	-	-	-	2.371	14.03	86.822	227.00	525	CONC	0.88%	9.10	403.43	1.87	1.92	0.08	56%	
-	STM-102A	STM-101	-	-	-	2.371	14.11	86.546	226.35	600	CONC	0.75%	14.80	531.75	1.89	1.81	0.14	43%	
-	STM-101	STM-102 (OGS)	-	-	-	2.371	14.25	86.072	225.22	600	CONC	0.38%	7.90	378.50	1.34	1.40	0.09	60%	
-	STM-102 (OGS)	HW100	-	-	-	2.371	14.34	85.748	224.45	600	CONC	0.43%	10.90	402.63	1.43	1.47	0.12	56%	
				1.271															

Existing Network

Prepared by: Julien Sauvé, P.Eng.
 PEO #100200100

Date: 4/5/2022

Verified by: André Chaumont, P.Eng.
 PEO #90409194

Date: 4/5/2022



PROJECT NAME: ZIBI
 CIMA+ PROJECT NUM: A000931
 CLIENT: DREAM
 PROJECT STATUS: Site Plan Application Block 204

STORM SEWER HYDRAULIC DESIGN SHEET (SSDS) – RATIONAL METHOD

APPLICABLE DESIGN GUIDELINES:

1. City of Ottawa Sewer Design Guidelines, 2012

STORM SEWER DESIGN CALCULATIONS:

DESIGN CRITERIA:

Rainfall Station: City of Ottawa Sewer Design Guidelines, 2012 (Macdonald-Cartier Airport)
 Manning's Coefficient (n): 0.013
 Maximum Permitted Velocity: 3.00 m/s
 Minimum Permitted Velocity: 0.80 m/s

IDF PARAMETERS AND RATIONAL FORMULA:

Design Storm (year):	100	
IDF Regression Constants: (a)	1735.688	
(b)	6.014	
(c)	0.820	
IDF Curve Equation (mm/hr):	$I = a / (\text{Time in min} + b)^c$	
Rational Formula (L/s):	$Q = 2.78 \cdot C \cdot I \cdot A$	where: Q = Flow (L/s) C = Runoff Coefficient I = Rainfall Intensity (mm/hr) A = Area (hectares)

OTHER FORMULAS USED IN CALCULATION TABLE:

Time of Concentration (minutes):	$T_c = T_i + T_f$	where: T _c = time of concentration (min) T _i = inlet time before pipe (min) T _f = time of flow in pipe (min) = L/(60*V) L = pipe length (m) V = actual velocity (m/s)
Manning's Equation (L/s):	$Q_{cap} = (1/n) \cdot A \cdot R^{2/3} \cdot S^{1/2}$	where: Q _{cap} = flow rate at capacity (L/s) n = Manning's roughness coefficient A = area of flow (m ²) R = hydraulic radius (m)* S = slope of pipe (%) <small>* Hydraulic radius is defined as the area of flow (m²) divided by wetted perimeter (m)</small>

LOCATION			RUNOFF	AREA	FLOW					SEWER DATA									
Street/Catchment Name	From MH/CB	To MH/CB	C =	(ha)	Section 2.78*AC (ha)	Accum 2.78*AC (ha)	Time of Conc (min)	Rainfall Intensity (mm/hr)	Peak Flow (L/s)	Diameter (mm)	Material Type	Slope (%)	Length (m)	Capacity (full) (L/s)	Velocity (full) (m/s)	Velocity (actual) (m/s)	Time of Flow (min)	Ratio (%)	
A10	Trench drain	Underground parking	0.94	0.134	0.350	0.350	10.00	178.559	62.53	375	CONC	0.20%	2.00	78.41	0.71	0.79	0.04	80%	
A8	STM-110	STM-109	0.94	0.027	0.071	0.071	10.00	178.559	12.60	375	PVC	0.30%	32.40	96.03	0.87	0.60	0.91	13%	
A9	STM-111	STM-109	0.92	0.134	0.343	0.343	10.00	178.559	61.20	375	CONC	0.20%	59.40	78.41	0.71	0.78	1.26	78%	
-	STM-109	STM-108	-	-	-	0.413	11.26	167.768	69.33	375	PVC	0.30%	11.90	96.03	0.87	0.94	0.21	72%	
A7	STM-108	STM-107	0.94	0.096	0.251	0.664	11.48	166.112	110.32	375	PVC	0.30%	9.30	96.03	0.87	0.87	0.18	115%	
A5	STM-107	STM-106	0.91	0.076	0.192	0.856	11.65	164.738	141.08	450	PVC	0.40%	57.70	180.32	1.14	1.26	0.77	78%	
A6 (Block 204)			0.86	0.211	Controlled Flow by roof drain (100L/s/ha)				21.13										
-	STM-106	STM-105	-	-	-	0.856	12.42	159.109	157.39	450	CONC	1.02%	21.60	287.94	1.82	1.86	0.19	55%	
A4	STM-105	STM-104	0.95	0.211	0.557	1.414	12.61	157.748	244.13	450	CONC	1.12%	10.70	301.73	1.90	2.11	0.08	81%	
A1 & A2 & A3	STM-104	STM-103	0.95	0.516	1.363	2.776	12.70	157.164	457.48	450	CONC	1.47%	99.60	345.67	2.18	2.18	0.76	132%	
-	STM-103	STM-102B	-	-	-	2.776	13.46	152.106	443.44	525	CONC	0.64%	11.00	344.05	1.59	1.59	0.12	129%	
-	STM-102B	STM-102A	-	-	-	2.776	13.57	151.372	441.40	525	CONC	0.88%	9.10	403.43	1.87	1.87	0.08	109%	
-	STM-102A	STM-101	-	-	-	2.776	13.65	150.860	439.98	600	CONC	0.75%	14.80	531.75	1.89	2.11	0.12	83%	
-	STM-101	STM-102 (OGS)	-	-	-	2.776	13.77	150.127	437.94	600	CONC	0.38%	7.90	378.50	1.34	1.34	0.10	116%	
-	STM-102 (OGS)	HW100	-	-	-	2.776	13.87	149.518	436.25	600	CONC	0.43%	10.90	402.63	1.43	1.43	0.13	108%	
				1.271															

Existing Network

Prepared by: Julien Sauvé, P.Eng.
PEO #100200100

Date: 4/5/2022

Verified by: André Chaumont, P.Eng.
PEO #90409194

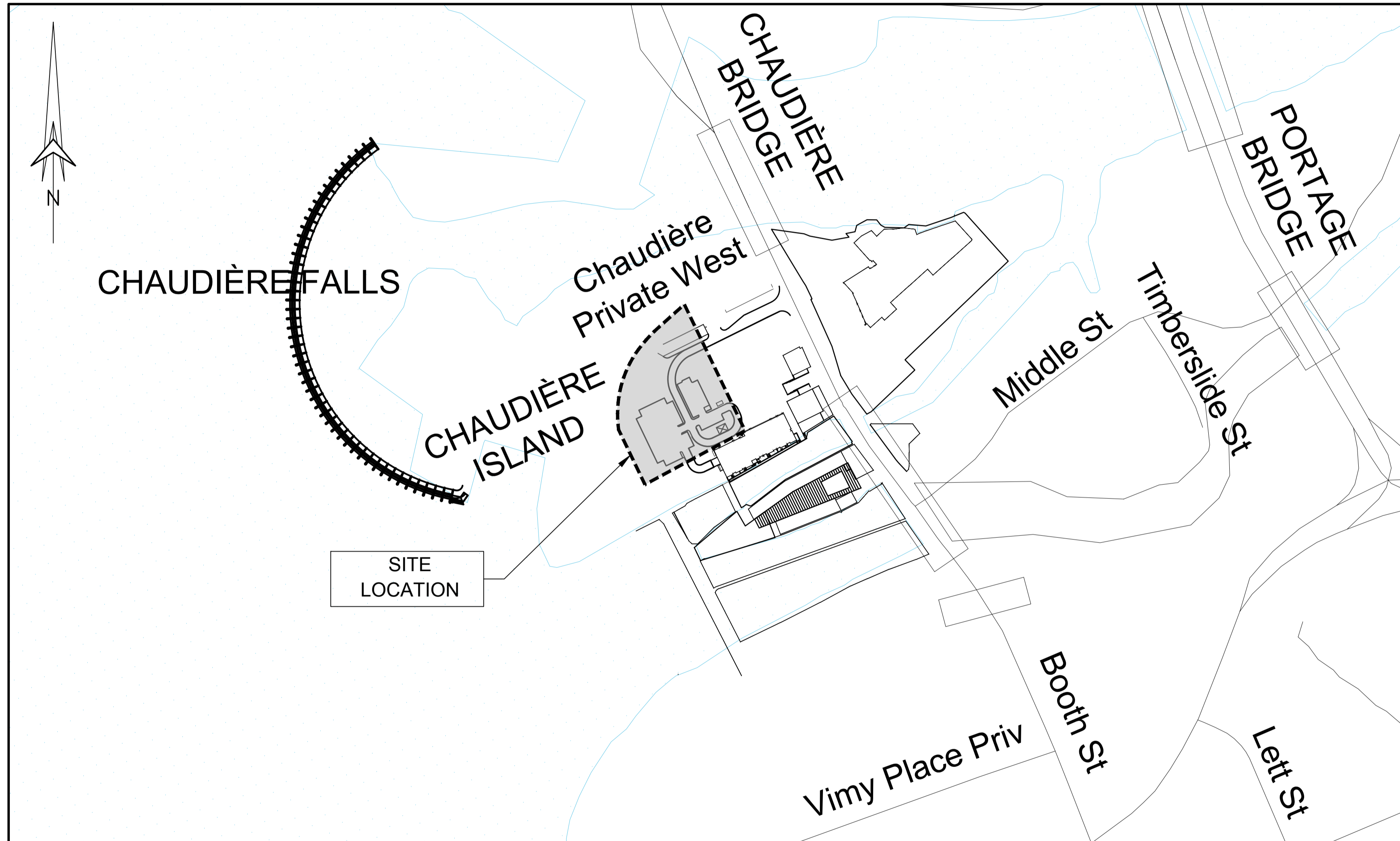
Date: 4/5/2022

E

Appendix E Drawings



DREAM THEIA BLOCK 204A L



LIST OF DRAWINGS

PLAN No:	DESCRIPTION
C000	COVER PAGE
C001	TOPOGRAPHICAL SURVEY PLAN
C002	NOTES PLAN
C003	SEDIMENT AND EROSION CONTROL PLAN
C004A	GRADE CONTROL AND DRAINAGE PLAN (INTERIM)
C004B	GRADE CONTROL AND DRAINAGE PLAN (ULTIMATE)
C005A	SITE SERVICING PLAN (INTERIM)
C005B	SITE SERVICING PLAN (ULTIMATE)
C006A	PLANS AND PROFILE (CHAUDIÈRE PRIVATE)
C006B	PLANS AND PROFILE (MIWATE PRIVATE)
C007	CROSS-SECTIONS
C008	STORM WATER MANAGEMENT PLAN

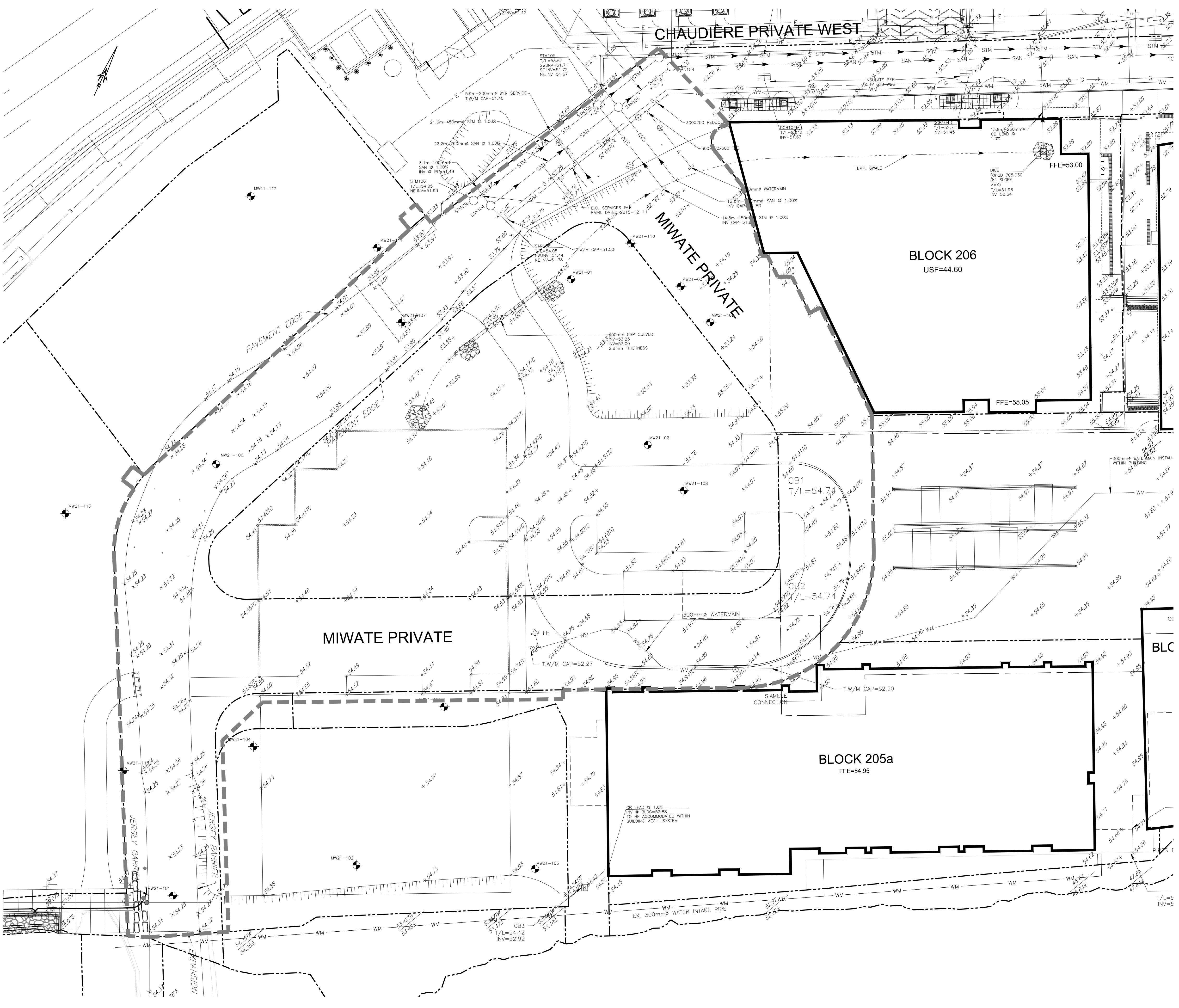
ZIBI ONTARIO 315 PRIVE MIWATE, CHAUDIÈRE ISLAND OTTAWA, ONTARIO



7, 815 838-2828
118-380 Chaudière Island, Ottawa, ON K1P 3G8 CANADA

DREAM THEIA BLOCK 204A L
ZIBI ONTARIO, 315 PRIVE MIWATE,
CHAUDIÈRE ISLAND, OTTAWA, ONTARIO
ISSUED FOR SITE PLAN APPLICATION, APRIL 18, 2022

TITLEBLOCK 24x36 VERT ENG 3.0
 PRINT DATE: 2022/03/14 - PAPER SIZE: ISO A1 (594.00 x 841.00 MM)
 PATH: Z:\Cima-C100L\Projects\24x36\24x36_VERT\24x36_VERT.dwg / LAYOUT: C001_Topo



EXISTING

- WM WATERMAIN
- SAN SANITARY SEWER
- STM STORM SEWER
- D DRAIN
- G GAS LINE (APPROX. LOC.)
- T UNDERGROUND TELEPHONE (APPROX. LOC.)
- CA UNDERGROUND TRAFFIC CABLE (APPROX. LOC.)
- FENCE
- E UNDERGROUND ELECTRICITY (APPROX. LOC.)
- OVERHEAD WIRES
- LOT LINE
- RIGHT-OF-WAY LIMITS
- EASEMENT
- TOP OF SLOPE
- DITCH CENTER
- BOTTOM OF SLOPE
- CATCHBASIN
- MANHOLE/CATCHBASIN
- MANHOLE
- FIRE HYDRANT
- VALVE
- REDUCER
- TEE
- VALVE CHAMBER
- PRIVATE UTILITIES (WATERMAIN)
- NATURAL GAS VALVE
- SIGN
- STOP SIGN
- TRAFFIC LIGHT
- ELECTRICITY POLE
- TELEPHONE POLE
- ELECT.-TEL-STREET LIGHT POLE
- ELECT.-TEL-TRANSFORMER POLE
- PRIVATE STREET LIGHT
- ELECTRICITY MANHOLE
- TELEPHONE MANHOLE
- SURVEY STATION
- ELEVATION
- INV
- BOREHOLE (LOC. APPROX.)
- WORK LIMIT

PROPOSED

ABBREVIATIONS

- STM → STORM
- SAN → SANITARY
- WM → WATERMAIN
- WTR → WATER
- INV → INVERT
- MH → MANHOLE
- CB → CATCHBASIN
- TL → TOP OF LID
- OBV → OVERT
- FFE → FINISHED FLOOR ELEVATION
- BLDG → BUILDING
- SERV → SERVICE

1:250
 0 2.5 5 10 15m

No.	Date	Description	By
1	APR. 18, 2022	ISSUED FOR SITE PLAN APPLICATION	A.C.

DESIGNED BY: _____ APPROVED BY: _____

ENGINEER: **CIMA+**

CLIENT: **DREAM THEIA ONTARIO
BLOCK 204A LP**

PROJECT NAME: **ZIBI ONTARIO
BLOCK 204
315 PRIVE MIWATE PRIVATE,
CHAUDIÈRE ISLAND
OTTAWA, ONTARIO**

SHEET TITLE: **TOPOGRAPHICAL
SURVEY PLAN**

DISCIPLINE: **CIVIL**

DRAWN BY: S.C. POGGIOLI SCALE: 1:250

DESIGNED BY: J. SAUVE DATE: 2022/03/14

APPROVED BY: A. CHAUMONT APPROVER: A. CHAUMONT

PROJECT No: A000931 DRAWING No: _____

SHEET No: **C001**

1 of 11

TOPOGRAPHIC INFORMATION

- CHAUDIÈRE AND ALBERT ISLAND TOPOGRAPHIC INFORMATION PROVIDED BY FAIRHALL, MOFFATT & WOODLAND LIMITED, DATED JANUARY 15, 2015.
- BOOTH STREET/FLEET STREET/ALLOYD STREET/ALBERT STREET TOPOGRAPHIC INFORMATION PROVIDED BY STANTEC GEOMATICS LIMITED, DATED APRIL 20, 2018.
- TEMPORARY ROAD CHAUDIÈRE & ALBERT STREET TOPOGRAPHIC INFORMATION PROVIDED BY STANTEC GEOMATICS LIMITED, DATED AUGUST 06, 2018.

LEGAL INFORMATION

- LEGAL SURVEY PROVIDED BY STANTEC GEOMATICS LIMITED, DATED 2022

BENCH MARK

- MULTIPLE ON-SITE AS PER SURVEY
- JOB BENCH MARK #3 CP SET IN TOP OF CONCRETE WALL.
- ELEVATION = 50.204
- FOR BENCH MARK LOCATIONS REFER TO MASTER PLAN ZIBI ONTARIO DRAWING EX-1, PREPARED BY DSEL, DATED JUNE 27 2018

NOTE OF CAUTION

THE GEODETIC COORDINATES OF EVERY ITEM INCLUDED AS PART OF THIS DOCUMENT ARE IN NAD83 - ORIGINAL / MTM - REFERENCE SYSTEM AND HAVE NO LEGAL VALUE. THE SITE LAYOUT MUST BE COMPLETED USING THE OFFICIAL BENCHMARKS OF AN ACCREDITED LAND SURVEYOR IN THE NAD83 - ORIGINAL / MTM - REFERENCE SYSTEM.

THE UNDERGROUND FEATURES AND INFORMATION THAT APPEAR ON THE DRAWINGS WERE OBTAINED FROM THE PUBLIC UTILITY COMPANIES AND/OR FROM THE CITY EACH RESPECTIVELY.

ALL INFORMATION UNDER THE LEGEND 'EXISTING' IS FOR INFORMATION ONLY. COMPLETE OR EXACT LOCATION AND ELEVATION OF UNDERGROUND SERVICES ARE NOT GUARANTEED.

CERTAIN UNDERGROUND FEATURES ON PRIVATE PROPERTY ARE NOT SHOWN ON THE CURRENT DRAWING.

ANYONE WHO PROCEEDS WITH EXCAVATION WORK SHALL VERIFY THE EXACT LOCATION OF ALL UNDERGROUND FEATURES, BY EXPLORATORY EXCAVATIONS, AND SHALL ASSUME FULL RESPONSIBILITY IF THERE IS ANY DAMAGE THAT OCCURS DURING WORK.

THE CONTRACTOR WILL HAVE THE RESPONSIBILITY AND THE OBLIGATION TO VALIDATE, BY EXPLORATORY EXCAVATION, THE SIZE OF THE PUBLIC UTILITIES UNDERGROUND SERVICES AND TO WARN THE ENGINEER OF ANY CONFLICT WITH THE PROJECTED WORK.

GENERAL NOTES

1. GRADE CONTROL AND DRAINAGE - GENERAL

- 1.1. The Contractor must conform to all laws, codes, ordinances, and regulations adopted by federal, provincial or municipal government councils and government agencies, applying to work to be carried out.
- 1.2. Unless otherwise indicated, all materials and construction methods to be in accordance with the requirements of the latest edition of the City of Ottawa Design Guidelines, Ontario Provincial Standard Specifications and Drawings (OPSS and OPSD), the Ontario Ministry of Environment, Conservation and Parks (MECP), applicable Conservation Authorities, the municipal standard specifications and drawings, and all other governing authorities as they apply.
- 1.3. Wherever standards, laws and/or regulations are mentioned they refer to their current versions, modifications included.
- 1.4. The boreholes and test pits shown on the plan are for information purposes only. Their location on the plan is approximate. The Contractor must refer to the boreholes and test pit records to obtain information about observed stratigraphy on site.
- 1.5. The Contractor is responsible for obtaining all permits required to complete all works and bear cost of same, including road cut permit and water permit and their associated costs.
- 1.6. The Contractor is responsible for the coordination of his activities with others on site.
- 1.7. Submit copies of inspection and test reports to Owner's representative.
- 1.8. The location of existing underground municipal services and public utilities as shown on the plans are approximate. The Contractor must determine the exact location, size, material and elevation of all existing utilities (on-site and off-site) prior to any excavation work. Damage to any existing services and/or existing utilities during construction, whether or not shown on the drawings must be repaired by the Contractor at his own expense.
- 1.9. Site preparation includes clearing, grubbing, stripping of topsoil, demolition, removal of unsuitable materials, cut, fill and rough grading of all areas to receive finished surfaces.
- 1.10. N/A
- 1.11. Compaction must conform to the following requirements:
 - Exposed subgrade
 - 95% Standard Proctor maximum dry density (SPMDD)
 - Granular Subbase foundations
 - 99% Standard Proctor maximum dry density (SPMDD)
 - Granular Base foundations
 - 99% Standard Proctor maximum dry density (SPMDD)
 - Asphalt pavement
 - As per OPSS MUNI 310 / City of Ottawa Special Provisions
 - Subgrade fill (pavement areas - OPSS Select Subgrade Material):
 - 95% Standard Proctor Maximum Dry Density (SPMDD)
 - Structural fill (building footprints OPSS Granular 'A' or Granular 'B' Type II Material):
 - 98% Standard Proctor Maximum Dry Density (SPMDD)

2. DEMOLITION AND REMOVALS

- 1.20. During the construction period the Contractor is responsible for installing and maintaining temporary traffic signage, including traffic signs, traffic markings and temporary traffic lights, and flagmen, as required by the Owner, the Consultant, the Municipality, and other governing authorities.
- 1.21. The Contractor must control surface runoff from precipitation during construction.
- 1.22. The Contractor must ensure the following mitigation measures are implemented in order to reduce the risk of ground contamination from petroleum products:
 - The list of persons and agencies to contact in the event of an emergency must be posted in plain sight on the work site for the duration of the construction period;
 - Machinery must be clean and kept clean to limit any grease or oil deposits inside the work area;
 - Frequent inspections must be performed to detect any oil, fuel, grease or other leaks. If a leak is detected, the necessary corrective action must be taken immediately;
 - An emergency kit for the recovery of petroleum products must be kept on site at all times. The kit must include at least 30 m of absorbent booms, a box of absorbent pads and solid absorbent material (powder or granules). The kit must be stored near the location of work and machinery, and kept within easy reach at all times to ensure a rapid response;
 - In the event of a spill the Contractor must immediately report to the Spills Action Centre of the MECP at 1-800-268-6060. Hydrocarbons and contaminated soils will be recovered by a specialized firm.
- 1.23. The Contractor must ensure the following measures are implemented regarding the handling of concrete:
 - Concrete should either be mixed away from the site or should be prepared on paved surfaces if only small quantities are required (i.e. minor repairs);
 - Excess concrete must be disposed off-site at a location that meets all regulatory requirements;
 - The washing of concrete trucks and other equipment used for mixing concrete should not be carried out within 30 m of a watercourse or wetland and should take place outside of the work site;
 - All concrete trucks should collect their wash water and recycle it back into their trucks for disposal off-site at a location meeting all regulatory requirements.
- 1.24. The Contractor must protect and maintain in service the existing works which must remain in place. If they are damaged, the Contractor must immediately make the replacements and necessary repairs to the satisfaction of the Owner's representative and without additional expense to the Owner.
- 1.25. The Contractor must perform the necessary clearing and grubbing in accordance with OPSS MUNI 201.
- 1.26. The Contractor must carry out necessary saw cuts even if they are not shown on the drawings.
- 1.27. The Contractor must entirely remove the demolition wreckage from the construction site in accordance with the requirements of the MECP and in accordance with OPSS MUNI 190 and OPSS MUNI 510.
 - The Contractor must discard recyclable demolition materials in collaboration with a regional recycling company. The Contractor must be able to provide proof, upon request, that the materials were properly recycled and that the chosen recycling company is recognized in the recycling field;
 - All other demolition materials must be disposed off-site at authorized licensed landfills and in conformity with the applicable laws and regulations. The Contractor must be able to provide, upon request, copies of the disposal tickets.
- 1.28. The Contractor is responsible for locating existing public utilities and (if required) submit a request for the interruption of public utility services, such as gas, telephone, power, cable, sewers, watermain, etc.
- 1.29. The Contractor must conduct all removals required to make the work complete.
- 1.30. Unless otherwise specified, all materials, products and others coming from the demolition belong to the Contractor.
- 1.31. Surfaces and works located outside of the construction work limit must be reinstated as they were before beginning of work.
- 1.32. Earth removal must be inspected by an experienced Geotechnical Engineer to ensure that all unsuitable materials are removed prior to the placement of fill, including concrete and/or others, and to confirm the compaction degree and condition of the founding soils. All unsuitable materials must be hauled off site and disposed as per provincial and municipal regulations.
- 1.33. Subgrade must be approved by experienced geotechnical personnel before proceeding with placement of fill.
- 1.34. All granular fill must be placed in maximum 300 mm thick loose lifts and compacted using suitable methods as per the requirements.
- 1.35. If soft spots develop in the subgrade during compaction or due to construction traffic, the affected areas should be excavated and replaced with OPSS Granular B Type II material.
- 1.36. If contaminated material is encountered during the work, the Contractor must dispose off-site all materials from the contaminated area in accordance with the requirements of the MECP and OPSS MUNI 180. Prior to the start of work the Contractor must provide the name and location of landfill(s) where the contaminated materials will be disposed to the Consultant. The Contractor must obtain from the landfill Owner documents confirming that he has the right to accept the contaminated material. During the work, the contractor must provide the Consultant copies of all check-in receipts issued by the landfill Owner.
- 1.37. The Contractor is responsible for providing a confirmation that the imported material used as subgrade fill is free of any contaminants such as Petroleum Hydrocarbons (C₆-C₁₀), PAH (Polycyclic Aromatic Hydrocarbons), MAH (Monocyclic Aromatic Hydrocarbons) and metals like mercury, silver, arsenic, cadmium, cobalt, chromium, copper, tin, manganese, molybdenum, nickel, lead and zinc.

3. GENERAL SUBGRADE PREPARATION

- 2.01. The Contractor must visit the premises in order to be fully aware of existing conditions on site, including all elements to be removed and demolished. No claim will be accepted due to a poor evaluation of the work to be completed.
- 2.02. The Contractor must protect and maintain in service the existing works which must remain in place. If they are damaged, the Contractor must immediately make the replacements and necessary repairs to the satisfaction of the Owner's representative and without additional expense to the Owner.
- 2.03. The Contractor must perform the necessary clearing and grubbing in accordance with OPSS MUNI 201.
- 2.04. The Contractor must carry out necessary saw cuts even if they are not shown on the drawings.
- 2.05. The Contractor must entirely remove the demolition wreckage from the construction site in accordance with the requirements of the MECP and in accordance with OPSS MUNI 190 and OPSS MUNI 510.
 - The Contractor must discard recyclable demolition materials in collaboration with a regional recycling company. The Contractor must be able to provide proof, upon request, that the materials were properly recycled and that the chosen recycling company is recognized in the recycling field;
 - All other demolition materials must be disposed off-site at authorized licensed landfills and in conformity with the applicable laws and regulations. The Contractor must be able to provide, upon request, copies of the disposal tickets.
- 2.06. The Contractor is responsible for locating existing public utilities and (if required) submit a request for the interruption of public utility services, such as gas, telephone, power, cable, sewers, watermain, etc.
- 2.07. The Contractor must conduct all removals required to make the work complete.
- 2.08. Unless otherwise specified, all materials, products and others coming from the demolition belong to the Contractor.
- 2.09. Surfaces and works located outside of the construction work limit must be reinstated as they were before beginning of work.
- 2.10. Earth removal must be inspected by an experienced Geotechnical Engineer to ensure that all unsuitable materials are removed prior to the placement of fill, including concrete and/or others, and to confirm the compaction degree and condition of the founding soils. All unsuitable materials must be hauled off site and disposed as per provincial and municipal regulations.
- 2.11. Subgrade must be approved by experienced geotechnical personnel before proceeding with placement of fill.
- 2.12. All granular fill must be placed in maximum 300 mm thick loose lifts and compacted using suitable methods as per the requirements.
- 2.13. If soft spots develop in the subgrade during compaction or due to construction traffic, the affected areas should be excavated and replaced with OPSS Granular B Type II material.
- 2.14. If contaminated material is encountered during the work, the Contractor must dispose off-site all materials from the contaminated area in accordance with the requirements of the MECP and OPSS MUNI 180. Prior to the start of work the Contractor must provide the name and location of landfill(s) where the contaminated materials will be disposed to the Consultant. The Contractor must obtain from the landfill Owner documents confirming that he has the right to accept the contaminated material. During the work, the contractor must provide the Consultant copies of all check-in receipts issued by the landfill Owner.
- 2.15. The Contractor is responsible for providing a confirmation that the imported material used as subgrade fill is free of any contaminants such as Petroleum Hydrocarbons (C₆-C₁₀), PAH (Polycyclic Aromatic Hydrocarbons), MAH (Monocyclic Aromatic Hydrocarbons) and metals like mercury, silver, arsenic, cadmium, cobalt, chromium, copper, tin, manganese, molybdenum, nickel, lead and zinc.

4. EXCAVATION AND BACKFILL

- 4.01. Subgrade preparation must be completed as per Section '3.0 General Subgrade Preparation'.
- 4.02. The management of excess materials to comply with OPSS MUNI 180.
- 4.03. Topsoil and detritus fill, such as those containing organic materials, must be stripped from under any buildings, paved areas, pipe bedding, and other settlement sensitive structures.
- 4.04. Due to the relatively shallow depth of the bedrock surface and the anticipated founding level for the proposed building, all existing overburden material must be excavated from within the proposed building footprint.
- 4.05. Existing foundation walls and other construction debris must be entirely removed from within the building perimeter. Under paved areas, existing construction remnants, such as foundation walls, must be excavated to a minimum of 1 m below final grade.
- 4.06. Fill used for grading beneath the building areas must consist, unless otherwise specified, of clean imported granular fill, such as Ontario Provincial Standard Specifications (OPSS) Granular A or Granular B Type II. This material must be tested and approved prior to delivery to the site. The fill must be placed in lifts no greater than 300 mm thick and compacted using suitable compaction equipment for the lift thickness. Fill placed beneath the building must be compacted to at least 98% of its standard Proctor maximum dry density (SPMDD).
- 4.07. Non-specified existing fill along with site-excavated soil can be used as general landscaping fill where settlement of the ground surface is of minor concern. These materials should be spread in thin lifts and at least compacted by the ends of the spreading equipment to minimize voids. If these materials are to be used to bulk up the subgrade level for areas to be paved, they should be compacted in thin lifts to a minimum density of 95% of their respective SPMDD.
- 4.08. Non-specified existing fill and site-excavated soils are not suitable for use as backfill against foundation walls unless a composite drainage blanket connected to a perimeter drainage system is provided.
- 4.09. Based on the bedrock encountered in the area, it is expected that line-drilling in conjunction with hoe-rimming or controlled blasting may be required to remove the bedrock. In areas of weathered bedrock and where only a small quantity of bedrock is to be removed, bedrock removal may be possible by hoe-rimming.
- 4.10. Rock excavation must conform to OPSS 403 MUNI / City of Ottawa Special Provision F-4031 and to all laws, codes, ordinances and regulations adopted by federal, provincial and municipal government councils and government agencies, applying to the work to be carried out.
- 4.11. Prior to considering blasting operations, the effects on the existing services, buildings and other structures must be addressed. A pre-blast or construction survey located in proximity of the blasting operations must be conducted prior to commencing construction. The extent of the survey must be determined by the blasting consultant and sufficient to respond to any inquiries related to the blasting operations. As a general guideline, peak particle velocity (measured at the structures) must not exceed 25 mm/s during the blasting program to reduce the risks of damage to the existing structures. The blasting operations should be planned and conducted under the supervision of a licensed professional engineer who is an experienced blasting consultant.

SERVICING NOTES

1. MUNICIPAL SERVICES - GENERAL

- 1.1. Unless otherwise indicated, all materials and construction methods to be in accordance with the requirements of the latest edition of the Ontario Provincial Standard Specifications and Drawings (OPSS and OPSD), the Ontario Ministry of Environment, Conservation and Parks (MECP), applicable Conservation Authorities, the municipal standard specifications and drawings, and all other governing authorities as they apply.
- 1.2. Wherever standards, laws and/or regulations are mentioned they refer to their current versions, modifications included.
- 1.3. The boreholes and test pits shown on the plan are for information purposes only. Their location on the plan is approximate. The Contractor must refer to the boreholes and test pit records to obtain information about observed stratigraphy on site.
- 1.4. The location of existing underground municipal services and public utilities as shown on the plans are approximate. The Contractor must determine the exact location, size, material and elevation of all existing utilities (on-site and off-site) prior to any excavation work. Damage to any existing services and/or existing utilities during construction, whether or not shown on the drawings must be repaired by the Contractor at his own expense.
- 1.5. The Contractor is responsible for obtaining all permits required to complete all works and bear cost of same, including water permit and associated costs.
- 1.6. The Contractor is responsible for the coordination of his activities with others on-site.
- 1.7. Terminate and plug all service connections at 1.0 meter from edge of the building.
- 1.8. The Contractor must complete compaction as per OPSS MUNI 501 and note the following requirements for service trenching:

MATERIALS	COMPACTION
Pipe bedding	95% Standard Proctor Maximum Dry Density
Trench backfill and pipe cover	95% Standard Proctor Maximum Dry Density
- 1.9. The Contractor is responsible for making or arranging all connections to the existing sewers as per municipal requirements. Prior to connection, the Contractor must provide, to the Engineer and the City for approval, all test results performed on the internal services. Test results must include C.C.T.V. inspection of sewers, infiltration/infiltration tests for sewers and manholes, deformation tests of sewers, watermain hydrostatic leakage test, flushing and disinfecting operations, and bacteriological water analysis.
- 1.10. Advise the City Public Works at least 72 hours in advance before any connection to the City services. Coordinate with City as required.
- 1.11. The Contractor must determine the exact invert (geodetic elevation), diameter and construction material of the existing conduits at the proposed connections. He must also carry out, if necessary, exploratory excavations in order to determine the exact location and inverts of existing duct banks. This information must be provided to the Engineer prior to start undertaking any municipal services work and a 48 hour period must be allocated to the Engineer for design review.
- 1.12. The Contractor is responsible for all excavation, backfill and reinstatement of all areas disturbed during construction to existing conditions or better and all associated works to the satisfaction of the Engineer and municipal authorities.
 - Asphalt reinstatement must be in accordance with OPSS MUNI 310.
 - Landscapes areas to be reinstated with 150 mm of topsoil and sod in accordance with OPSS MUNI 802 and OPSS MUNI 803.
- 1.13. It is recommended that a trench box be used at all times to protect personnel working in trenches with steep or vertical sides. Services are expected to be installed by 'cut and cover' methods and excavations should not remain open for extended periods of time.
- 1.14. The pipe bedding for sewer and water pipes must consist of at least 150 mm of OPSS Granular A material. The material must be placed in maximum 300 mm thick lifts and compacted to a minimum of 95% of its SPMDD. The bedding material should extend at least to the spring line of the pipe.
- 1.15. The cover material, which must consist of OPSS Granular A, will extend from the spring line of the pipe to at least 300 mm above the top of the pipe. The inverts must be placed in maximum 300 mm thick loose lifts and compacted to a minimum of 95% of its SPMDD.
- 1.16. Where hard surface areas are considered above the trench backfill, the trench backfill material within the frost zone (about 1.8 m below finished grade) must match the soils exposed at the trench walls to minimize differential frost heaving. The trench backfill must be placed in maximum 300 mm thick loose lifts and compacted to a minimum of 95% of the material's SPMDD.
- 1.17. Dewatering of pipeline, utility and associated structure in rock excavations to be completed as per OPSS MUNI 403.
- 1.18. Trenching, backfilling and compacting must conform to OPSS MUNI 401.

2. WATERMAIN

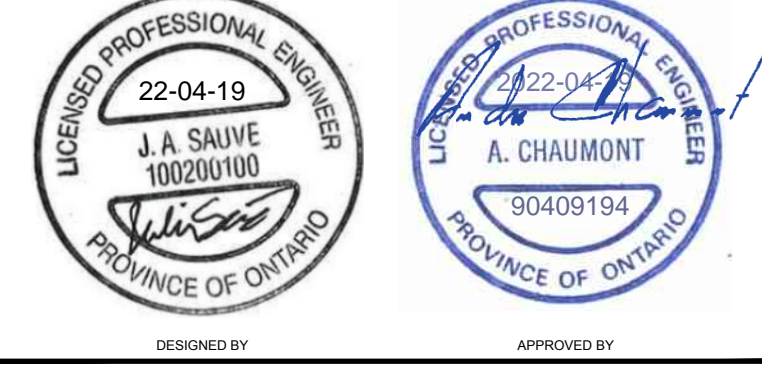
- 2.1. Watermain, water service connections and associated appurtenances must be constructed in accordance with the Ontario Provincial Standard Specifications / City of Ottawa Standards Specifications / Ministry of Environment and Climate Change Requirements. Specifically watermain must conform to OPSS MUNI 441.
- 2.2. Watermain must be constructed as per OPSS MUNI 441 and specifically OPSS 802.010 for earth excavations and 802.013 for rock excavation. Bedding and cover material to be OPSS Granular 'A' compacted to 95% Standard Proctor Maximum Dry Density.
- 2.3. Watermain pipe materials must be class 150 PVC DR 18 or approved equivalent, unless otherwise shown on the Drawings. Materials must conform to OPSS 441.
- 2.4. All watermain must be installed with a minimum of 2.40 meters cover from finished grade. Where a minimum of 2.40 meters cover is not reached, thermal insulation is required as per City of Ottawa Details W22 and W23.
- 2.5. Watermain service connections must be installed a minimum of 2.40 meters from any catchbasin, manhole or object that may contribute to freezing. Thermal insulation must be installed as per City of Ottawa Details W22 and W23 where 2.40 meters of separation cannot be achieved.
- 2.6. Cathodic protection (if required) must be installed as per City of Ottawa Details W40 and W42.
- 2.7. Thrust block and restraints must be as per City of Ottawa Details W25.3, W25.4, W25.5 and W25.6.
- 2.8. Valves to be installed as per OPSS 441 and conform to the following:
 - All valves must open in a counter clockwise direction;
 - Designed for cold water working pressure of 1035 kPa;
 - Types must be one of the following:
 - Valves less than 75 mm to be brass or bronze gate valves;
 - Valves greater than or equal to 75 mm, and less than or equal to 300 mm, to be cast or ductile iron gate valves;
 - Valves greater than 300 mm up to and including 500 mm to be gate or butterfly valves;
 - Valves greater than 500 mm to be butterfly valves.
- 2.9. A continuous 12 gauge copper tracer wire must be installed over all watermains. Tracer wire must be tied to all fire hydrants.
- 2.10. Valve box assembly to be as per City of Ottawa Detail W24.
- 2.11. When a watermain pipe crosses a sewer pipe, installation must be as per City of Ottawa Detail W25.2.
- 2.12. Watermains must be thoroughly flushed and cleaned to remove all dirt and debris prior to the disinfection process.
- 2.13. All watermains must be hydrostatically and bacteriologically tested as per provincial and municipal regulations. It is the Contractor's responsibility to ensure that all requirements are followed.
- 2.14. The Contractor must make arrangements with and give a minimum of 24 hours' notice to the City for the closing off of necessary valves in the water distribution system. The City will operate valves at the time of tie-ins, etc. at no expense to the Contractor under normal conditions; however the Contractor will be responsible for all costs associated with emergency shutdowns if they occur outside of the normal working hours of the City forces (Monday to Friday, 7:00 a.m. to 5:00 p.m.)

3. STORM SEWER

- 2.15. Hydrostatic testing to be completed as per OPSS 441.07.24. Testing must be completed under the supervision of the Contract Administrator. The test section will be either a section between valves or the completed watermain. Test pressure to be 1035 kPa.
- 2.16. Flushing and Disinfecting to be completed as per OPSS 441.07.25 under the supervision of the Contract Administrator.
- 2.17. The Contractor must obtain a permit from the City before using an existing fire hydrant located within the City's territory.
- 2.18. The Contractor must coordinate and pay the cost of connection, inspection and disinfection by municipal personnel.
- 2.19. Contractor must coordinate the supply and installation of water meter and remote water meter for the building with the mechanical engineer.
- 3.01. Storm sewers, laterals and storm service connections must be constructed in accordance with the Ontario Provincial Standard Specifications / City of Ottawa Standards Specifications / Ministry of Environment and Climate Change Requirements. Specifically storm sewers must conform to OPSS MUNI 410.
- 3.02. PVC storm sewer material to conform to OPSS MUNI 1841. PVC storm sewers to be installed as per OPSS 802.010 for earth excavation and 802.013 for rock excavation. Bedding and cover material to be OPSS Granular 'A'.
- 3.03. The allowable deflected pipe diameter when using flexible pipe is as follows:
 - Pipes 100 to 750 mm: 7.5% of the base inside diameter of the pipe
 - Greater than 750 mm: 5.0% of the base inside diameter of the pipe
- 3.04. Final backfill material for storm sewers must be approved native material or select subgrade material in conformance with OPSS MUNI 212.
- 3.05. Storm sewer pipes must be type PVC SDR-35, unless noted otherwise on the drawings.
- 3.06. All storm sewers to be C.C.T.V. inspected by the Contractor as per OPSS MUNI 409. Report must be provided to the Engineer in two (2) copies and the C.C.T.V. inspection in DVD format only.
- 3.07. Storm manholes, manhole/catchbasins, catchbasins, ditch inlets and valve chambers to be installed as per OPSS 407.
- 3.08. Adjustment or rebuilding of manholes, manhole/catchbasins, catchbasins, ditch inlets and valve chambers to be completed as per OPSS 409 / City of Ottawa Special Provisions F-4080 and F-4081.
- 3.09. Excavating, backfilling, and compacting for manholes, manhole/catchbasins, catchbasins, ditch inlets and valve chambers to be completed as per OPSS 402.
- 3.10. Storm manhole, manhole/catchbasin and catchbasin excavations to be backfilled with OPSS Granular 'B' compacted to 99% Standard Proctor Maximum Dry Density (SPMDD). Joints between sections must be wrapped in a non-woven geotextile.
- 3.11. Storm manholes and manhole/catchbasins to be as per OPSS 701.010 and must be equipped with safety platform as per OPSS 404.020 when exceeding 5.0 m to the lowest invert.
- 3.12. Storm manhole frame and cover to be as per OPSS 401.010 Type 'A' closed cover.
- 3.13. A maintenance hole drop structure tee is to be used as per OPSS 1003.010 when the drop from the inlet invert to the outlet invert is greater than 600 mm and less than 1200 mm. A drop structure wye is to be used as per OPSS 1003.020 when the drop exceeds 1200 mm.
- 3.14. Storm service connections to rigid main sewer pipe to be as per City of Ottawa Detail S11. Connections to flexible main sewer pipe to be as per City of Ottawa Detail S11.1.
- 3.15. When a minimum cover of 1.5 meters is not reached, frost protection is required.
- 3.16. For building roof drain sizes and location refer to architectural and mechanical drawings.
- 3.17. For insulation of storm sewer, refer to city of Ottawa detail W22 and use a value of 1.5m instead of 2.4m to figure out thickness of board insulation

4. SANITARY SEWER

- 4.01. Sanitary sewers, laterals and service connections must be constructed in accordance with the Ontario Provincial Standard Specifications / City of Ottawa Standards Specifications / Ministry of Environment and Climate Change Requirements. Specifically sanitary sewers must conform to OPSS MUNI 410.
- 4.02. PVC sanitary sewer pipe material to type PVC SDR-35, conforming to OPSS MUNI 1841. PVC sanitary sewers to be installed as per OPSS 802.010 for earth excavation and 802.013 for rock excavation. Bedding and cover material to be OPSS Granular 'A'.
- 4.03. The allowable deflected pipe diameter when using flexible pipe is as follows:
 - Pipes 100 to 750 mm: 7.5% of the base inside diameter of the pipe
 - Greater than 750 mm: 5.0% of the base inside diameter of the pipe
- 4.04. Final backfill material for sanitary sewers must be approved native material or select subgrade material in conformance with OPSS MUNI 212.
- 4.05. All sanitary sewers to be C.C.T.V. inspected by the Contractor as per OPSS MUNI 409. Report must be provided to the Engineer in two (2) copies and the C.C.T.V. inspection in DVD format only.
- 4.06. Sanitary manholes to be installed as per OPSS 407.
- 4.07. Adjustment or rebuilding of sanitary manholes to be completed as per OPSS 408.
- 4.08. Excavating, backfilling, and compacting for sanitary manholes to be completed as per OPSS MUNI 402.
- 4.09. Sanitary manholes to be backfilled with OPSS Granular 'B' compacted to 99% Standard Proctor Maximum Dry Density (SPMDD). Joints between sections must be wrapped in a non-woven geotextile.
- 4.10. Sanitary manholes to be as per OPSS 701.010 and must be equipped with safety platform as per OPSS 404.020 when exceeding 5.0 m to the lowest invert.
- 4.11. Sanitary manhole frame and cover to be as per OPSS 401.010 Type 'A' closed cover.
- 4.12. A maintenance hole drop structure tee is to be used as per OPSS 1003.010 when the drop from the inlet invert to the outlet invert is greater than 600 mm and less than 1200 mm. A drop structure wye is to be used as per OPSS 1003.020 when the drop exceeds 1200 mm.
- 4.13. Sanitary service connections to rigid main sewer pipe to be as per City of Ottawa Detail S11. Connections to flexible main sewer pipe to be as per City of Ottawa Detail S11.1.
- 4.14. When a minimum cover of 1.8 meters is not reached, frost protection is required.
- 4.15. Benching is required inside the concrete bottom of sanitary manholes as per OPSS 701.021.



DREAM THEA ONTARIO
BLOCK 204A LP

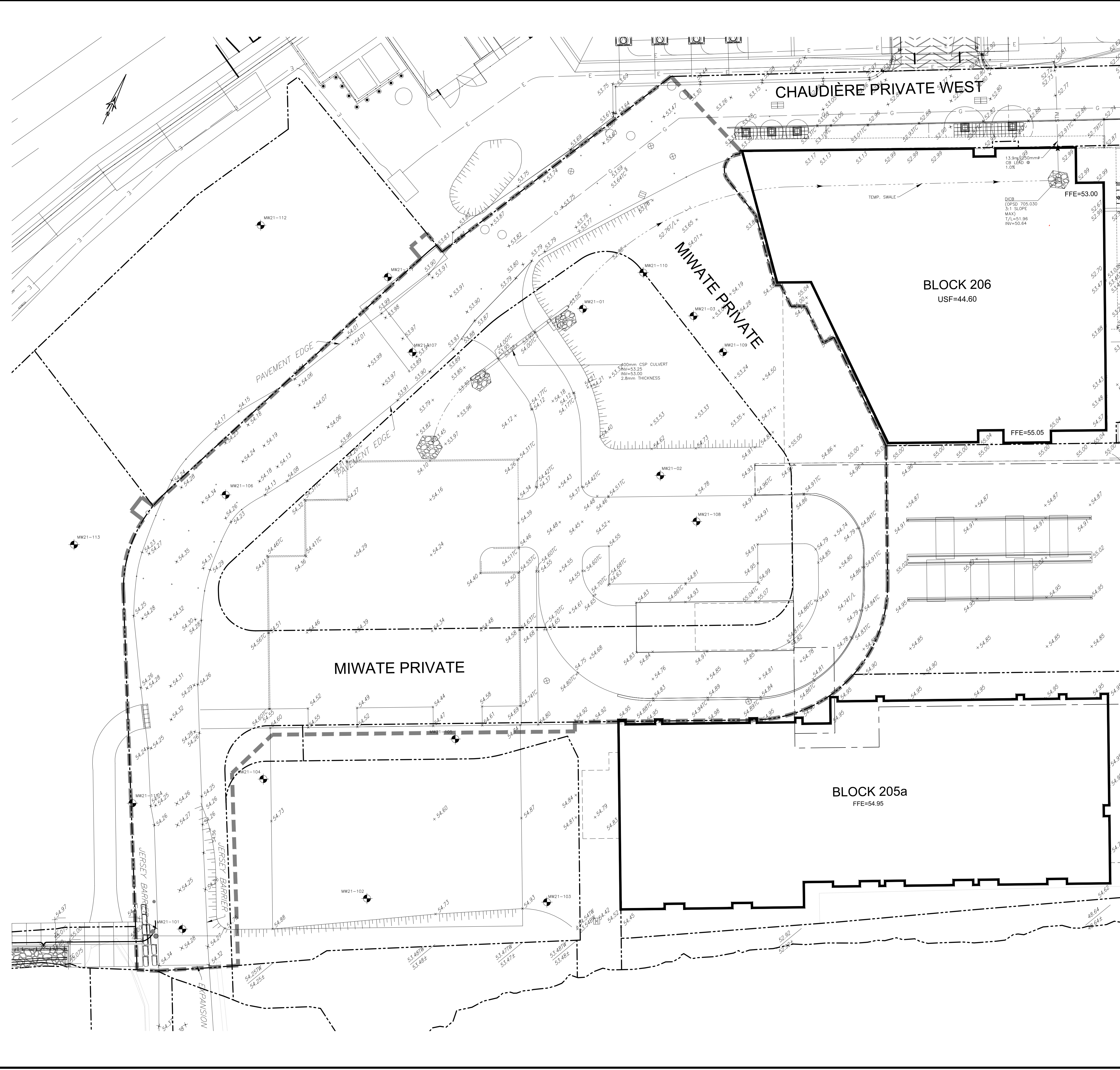
ZIBI ONTARIO
BLOCK 204
315 PRIVE MIWATE PRIVATE,
CHAUDIERE ISLAND
OTTAWA, ONTARIO

NOTES PLAN

CIVIL

OWNER:	S.C.POGGIOLI	SCALE:	
DESIGNER:	J. SAUVÉ	DATE:	2022/03/14
APPROVER:	A. CHAUMONT	APPROVER:	A. CHAUMONT
PROJECT NO.:	A000931	DRAWING NO.:	C002
SHEET:		2 of 11	

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 PRINT DATE: 2022/03/14 PAPER SIZE: ISO A1 (594.00 x 841.00 MM)
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- 1. SEDIMENT AND EROSION CONTROL**
- Unless otherwise indicated, all materials and construction methods to be in accordance with the requirements of the latest edition of the Ontario Provincial Standard Specifications and Drawings (OPSS and OPSD), the Ontario Ministry of Environment, Conservation and Parks (MECP), applicable Conservation authorities, the municipal standard specifications and drawings, and all other governing authorities as they apply.
 - Wherever standards, laws and/or regulations are mentioned they refer to their current versions, modifications included.
 - Specifically, sediment and erosion control measures to be constructed as per OPSS/MUNI 805.
 - The Contractor must implement best management practices and provide adequate sediment and erosion control measures during construction:
 - Prevent soil erosion which can result from stormwater runoff or wind erosion during construction;
 - Prevent sediment deposits in the storm sewer and/or collecting streams and;
 - Prevent air pollution from dust and particulate matter.
 - Provisions must be made for sediment and erosion control measures prior to stripping the site of vegetation and other deleterious materials. Measures such as phase stripping, vegetation buffer zones, silt fences, straw bales, sediment traps/basins, rock checks, etc. must be constructed and maintained in order to control sediment, as required by the provincial and municipal governing authorities.
 - The Contractor must set up the measures shown on the plan, inspect them frequently and clean and repair or replace the deteriorated structures.
 - When the sediment and erosion control measures have to be removed in order to complete a portion of the work, these same measures must be reinstated.
 - When storing soil on site in piles the Contractor must cover each pile with tarps, straw or a geotextile fabric to avoid fine particle transport by wind and/or streaming rain water.
 - During the construction period, sediment capture silt sacks or filter cloths must be installed and maintained between the frame and cover of all catchbasins and catchbasin/manholes to minimize sediments entering the storm sewer system. All landscaping areas must be completed prior to the removal of the silt sacks or filter cloths.
 - The light duty silt fence barrier must be installed as per OPSD 219.110.
 - At all times the Contractor must maintain the municipal access roads clean and free of sediments. When cleaning the access roads, the Contractor must take the necessary precautions to clear the surfaces covered with sediment prior to cleaning with water.
 - For dust control, Contractor to apply calcium chloride (Type I - OPSS 2501 and CAN/CSSB-15-1) and water with equipment approved by the Owner's representative at rate in accordance to OPSS/MUNI 506 when directed by Owner's representative.
 - At the end of the construction period, the Contractor is responsible for removal of the temporary sediment and erosion control measures and reconditioning the affected areas.
 - This plan is a "Living Document" which may be revised in the event that the control measures are not sufficient.

EXISTING

- WM - WATERMAIN
- SAN - SANITARY SEWER
- STM - STORM SEWER
- D - DRAIN
- G - GAS LINE (APPROX. LOC.)
- T - UNDERGROUND TELEPHONE (APPROX. LOC.)
- CA - UNDERGROUND TRAFFIC CABLE (APPROX. LOC.)
- E - UNDERGROUND ELECTRICITY (APPROX. LOC.)
- OVERHEAD WIRES
- LOT LINE
- RIGHT-OF-WAY LIMITS
- EASEMENT
- TOP OF SLOPE
- DITCH CENTER
- BOTTOM OF SLOPE
- CATCHBASIN
- MANHOLE/CATCHBASIN
- MANHOLE
- FIRE HYDRANT
- VALVE
- REDUCER
- TEE
- VALVE CHAMBER
- PRIVATE UTILITIES (WATERMAIN)
- NATURAL GAS VALVE
- SIGN
- STOP SIGN
- TRAFFIC LIGHT
- ELECTRICITY POLE
- TELEPHONE POLE
- ELECT.-TEL-STREET LIGHT POLE
- ELECT.-TEL-STRETFORMER POLE
- PRIVATE STREET LIGHT
- ELECTRICITY MANHOLE
- TELEPHONE MANHOLE
- SURVEY STATION
- ELEVATION
- MW21-01 BOREHOLE (LOC. APPROX.)
- WORK LIMIT

ABBREVIATIONS

- STM - STORM
- SAN - SANITARY
- WM - WATERMAIN
- WTR - WATER
- INV - INVERT
- MH - MANHOLE
- CB - CATCHBASIN
- TL - TOP OF LID
- OBV - OVERT
- FFE - FINISHED FLOOR ELEVATION
- BLDG - BUILDING
- SERV - SERVICE

1:250 0 2.5 5 10 15m

No.	Date	Description	By
1	APR. 18, 2022	ISSUED FOR SITE PLAN APPLICATION	A.C.

DESIGNED BY:

APPROVED BY:

CIMA+

CLIENT: **DREAM THEIA ONTARIO
BLOCK 204A LP**

PROJECT NAME: **ZIBI ONTARIO
BLOCK 204
315 PRIVE MIWATE PRIVATE,
CHAUDIERE ISLAND
OTTAWA, ONTARIO**

**SEDIMENT & EROSION
CONTROL PLAN**

DISCIPLINE: **CIVIL**

DRAWN BY: S.C. POGGIOLI | SCALE: 1:250

DESIGNED BY: J.A. SAUVE | DATE: 2022/03/14

APPROVED BY: A. CHAUMONT | APPROVER: A. CHAUMONT

PROJECT No: A000931 | DRAWING No: **C003**

SHEET No: 3 of 11

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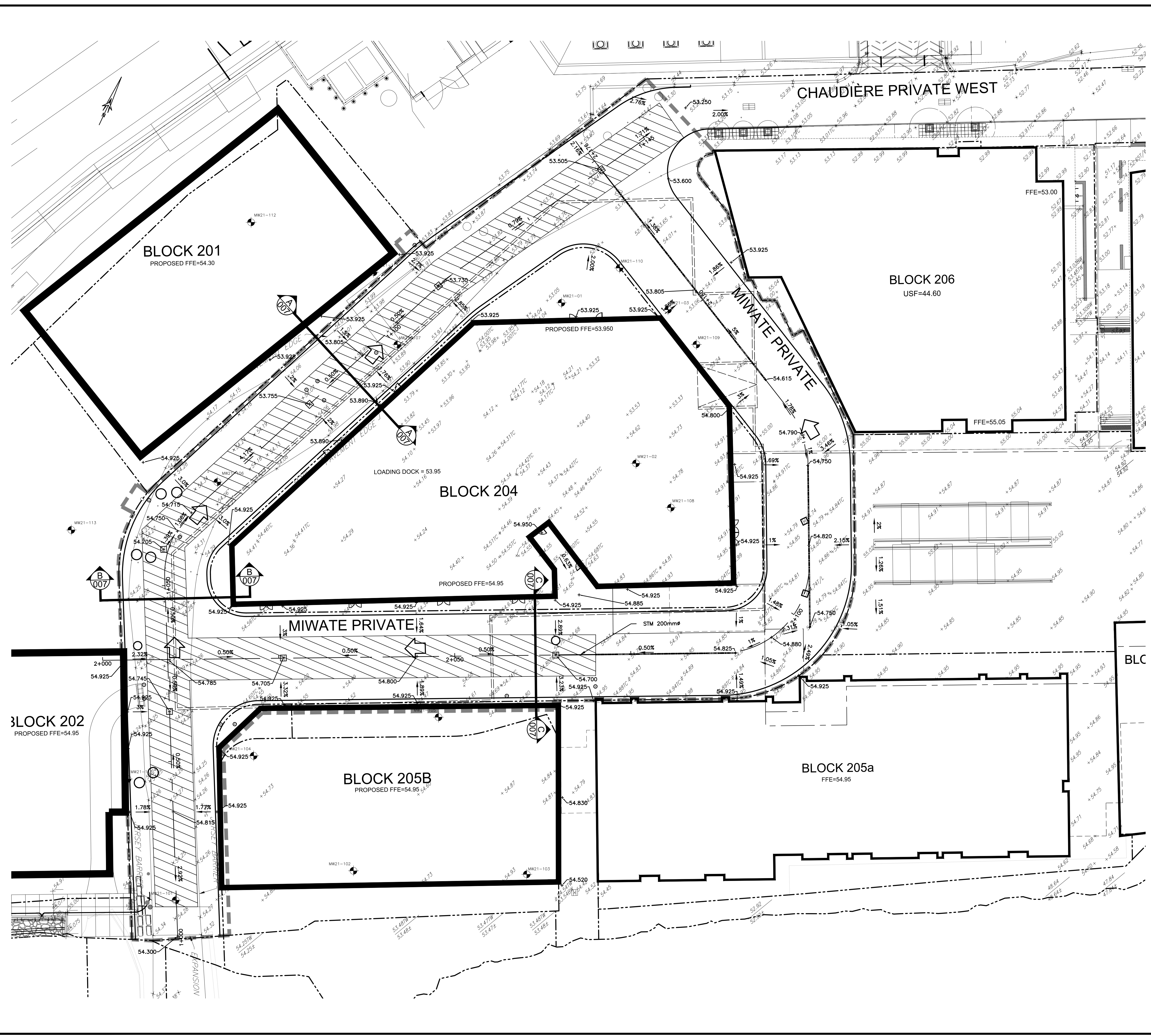
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THE CONTRACTOR WILL HAVE THE RESPONSIBILITY AND THE OBLIGATION TO VALIDATE, BY EXPLORATORY EXCAVATION, THE SIZE OF THE PUBLIC UTILITIES UNDERGROUND SERVICES AND TO WARN THE ENGINEER OF ANY CONFLICT WITH THE PROJECTED WORK.

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EXISTING	PROPOSED
WM	WATERMAIN
SAN	SANITARY SEWER
STM	STORM SEWER
D	DRAIN
G	GAS LINE (APPROX. LOC.)
T	UNDERGROUND TELEPHONE (APPROX. LOC.)
CA	UNDERGROUND TRAFFIC CABLE (APPROX. LOC.)
E	UNDERGROUND ELECTRICITY (APPROX. LOC.)
	OVERHEAD WIRES
	LOT LINE
	RIGHT-OF-WAY LIMITS
	EASEMENT
	TOP OF SLOPE
	DITCH CENTER
	BOTTOM OF SLOPE
	CATCHBASIN
	MANHOLE/CATCHBASIN
	MANHOLE
	FIRE HYDRANT
	VALVE
	REDUCER
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	VALVE CHAMBER
	PRIVATE UTILITIES (WATERMAIN)
	NATURAL GAS VALVE
	SIGN
	STOP SIGN
	TRAFFIC LIGHT
	ELECTRICITY POLE
	TELEPHONE POLE
	ELECT.-TEL-STREET LIGHT POLE
	ELECT.-TEL-TRANSFORMER POLE
	PRIVATE STREET LIGHT
	ELECTRICITY MANHOLE
	TELEPHONE MANHOLE
	SURVEY STATION
	ELEVATION
	+ 99,000
	BOREHOLE (LOC. APPROX.)
	TEMPORARY ASPHALT
	REFER TO DETAIL 201
	OVERLAND FLOW
	TRENCH DRAIN
	WORK LIMIT
	UNDERGROUND PARKING
	GARAGE LIMIT
	ABBREVIATIONS
	STM
	STM
	SAN
	WM
	WTR
	INV
	MH
	CB
	TIL
	OBV
	FFE
	BLDG
	SERV

No.	Date	Description	By
1	APR. 18, 2022	ISSUED FOR SITE PLAN APPLICATION	A.C.

LICENSED PROFESSIONAL ENGINEER
 22-04-19
 J. A. SAUVE
 100200100
 PROVINCE OF ONTARIO

LICENSED PROFESSIONAL ENGINEER
 22-04-19
 A. CHAUMONT
 90409194
 PROVINCE OF ONTARIO

DESIGNED BY: APPROVED BY:



CLIENT:
 DREAM THEIA ONTARIO
 BLOCK 204A LP

PROJECT NAME:
 ZIBI ONTARIO
 BLOCK 204
 315 PRIVE MIWATE PRIVATE,
 CHAUDIERE ISLAND
 OTTAWA, ONTARIO

DISCIPLINE:	CIVIL
DRAWN BY:	S.C. POGGIOLI
SCALE:	1:250
DESIGNED BY:	J. SAUVE
DATE:	2022/03/14
APPROVED BY:	A. CHAUMONT
PROJECT NO.:	A000931
DRAWING NO.:	C004A
SHEET NO.:	4 of 11

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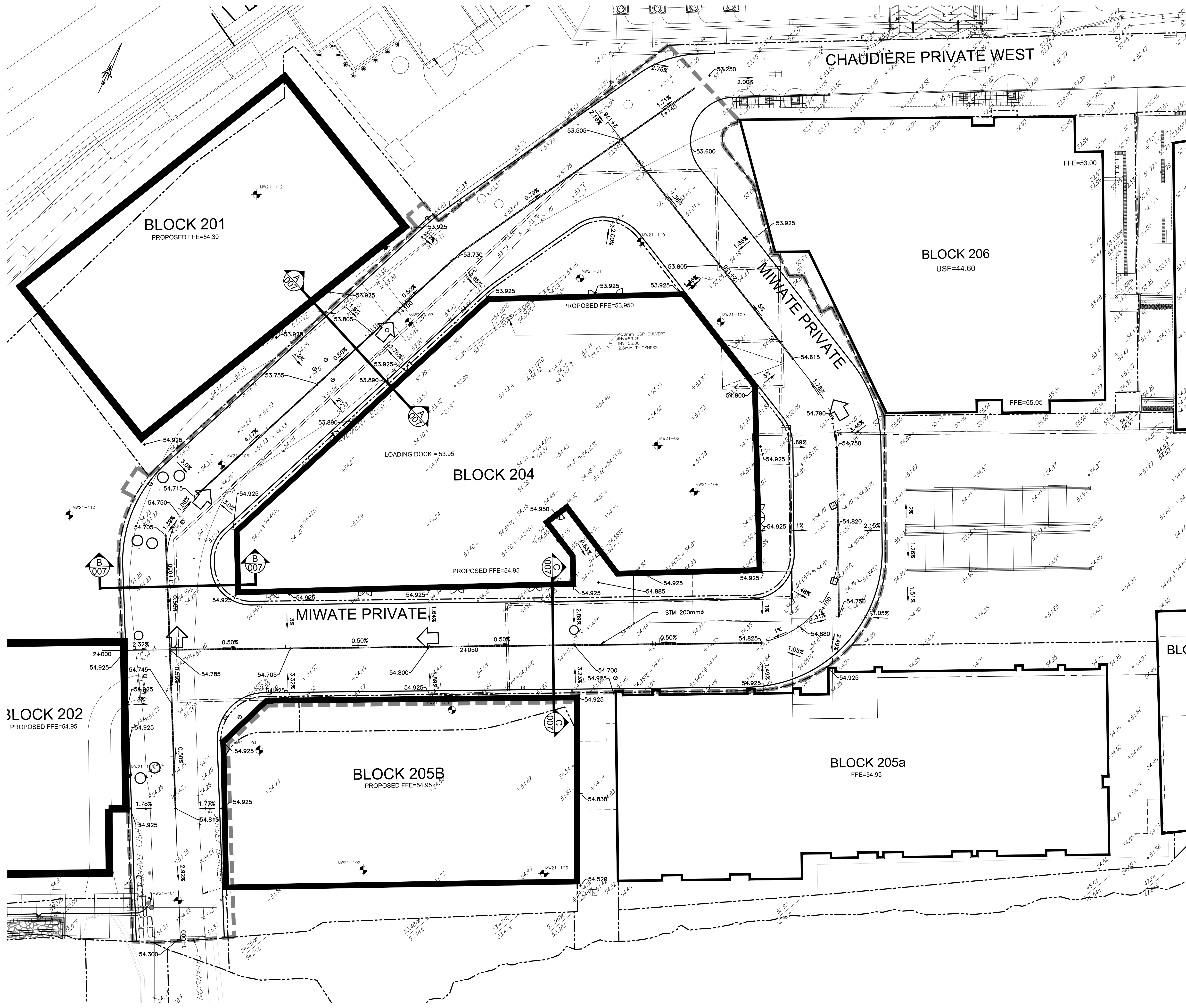
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THE CONTRACTOR WILL HAVE THE RESPONSIBILITY AND THE OBLIGATION TO VALIDATE, BY EXPLORATORY EXCAVATION, THE SIZE OF THE PUBLIC UTILITIES UNDERGROUND SERVICES AND TO WARN THE ENGINEER OF ANY CONFLICT WITH THE PROJECTED WORK.

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EXISTING

- WM WATERMAIN
- SAN SANITARY SEWER
- STM STORM SEWER
- D DRAIN
- G GAS LINE (APPROX. LOC.)
- T UNDERGROUND TELEPHONE (APPROX. LOC.)
- CA UNDERGROUND TRAFFIC CABLE (APPROX. LOC.)
- E UNDERGROUND ELECTRICITY (APPROX. LOC.)
- OVERHEAD WIRES
- LOT LINE
- RIGHT-OF-WAY LIMITS
- EASEMENT
- TOP OF SLOPE
- DITCH CENTER
- BOTTOM OF SLOPE

PROPOSED

- CATCHBASIN
- MANHOLE/CATCHBASIN
- MANHOLE
- FIRE HYDRANT
- VALVE
- REDUCER
- TEE
- VALVE CHAMBER
- PRIVATE UTILITIES (WATERMAIN)
- NATURAL GAS VALVE
- SIGN
- STOP SIGN
- TRAFFIC LIGHT
- ELECTRICITY POLE
- TELEPHONE POLE
- ELECT.-TEL-STREET LIGHT POLE
- ELECT.-TEL-TRANSFORMER POLE
- PRIVATE STREET LIGHT
- ELECTRICITY MANHOLE
- TELEPHONE MANHOLE
- SURVEY STATION
- ELEVATION
- + 99,000
- WM21-01 BOREHOLE (LOC. APPROX.)
- OVERLAND FLOW
- TRENCH DRAIN
- WORK LIMIT
- UNDERGROUND PARKING
- GARAGE LIMIT

ABBREVIATIONS

- STM STORM
- SAN SANITARY
- WM WATERMAIN
- WTR WATER
- INV INVERT
- MH MANHOLE
- CB CATCHBASIN
- TL TOP OF LID
- OBV OVERT
- FFE FINISHED FLOOR ELEVATION
- BLDG BUILDING
- SERV SERVICE

1:200 0 2.5 5 10 15m

1	APR. 18, 2022	ISSUED FOR SITE PLAN APPLICATION	A.C.
No.	Date	Description	By

DESIGNED BY:

APPROVED BY:



CLIENT: DREAM THEIA ONTARIO
 BLOCK 204A LP

PROJECT NAME: ZIBI ONTARIO
 BLOCK 204
 315 PRIVE MIWATE PRIVATE,
 CHAUDIERE ISLAND
 OTTAWA, ONTARIO

SHEET TITLE: GRADE CONTROL AND
 DRAINAGE PLAN
 (ULTIMATE)

DISCIPLINE: CIVIL	SCALE: 1:250
DRAWN BY: S.C. POGGIOLI	DATE: 2022/03/14
DESIGNED BY: J.A. SAUVE	APPROVED BY: A. CHAUMONT
PROJECT NO: A000931	DRAWING NO: C004B
SHEET NO: 5 of 11	

NOTE OF CAUTION

THE GEODETIC COORDINATES OF EVERY ITEM INCLUDED AS PART OF THIS DOCUMENT ARE IN NAD83 - ORIGINAL / MTM - REFERENCE SYSTEM AND HAVE NO LEGAL VALUE. THE SITE LAYOUT MUST BE COMPLETED USING THE OFFICIAL BENCHMARKS OF AN ACCREDITED LAND SURVEYOR IN THE NAD83 - ORIGINAL / MTM - REFERENCE SYSTEM.

THE UNDERGROUND FEATURES AND INFORMATION THAT APPEAR ON THE DRAWINGS WERE OBTAINED FROM THE PUBLIC UTILITY COMPANIES AND/OR FROM THE CITY EACH RESPECTIVELY.

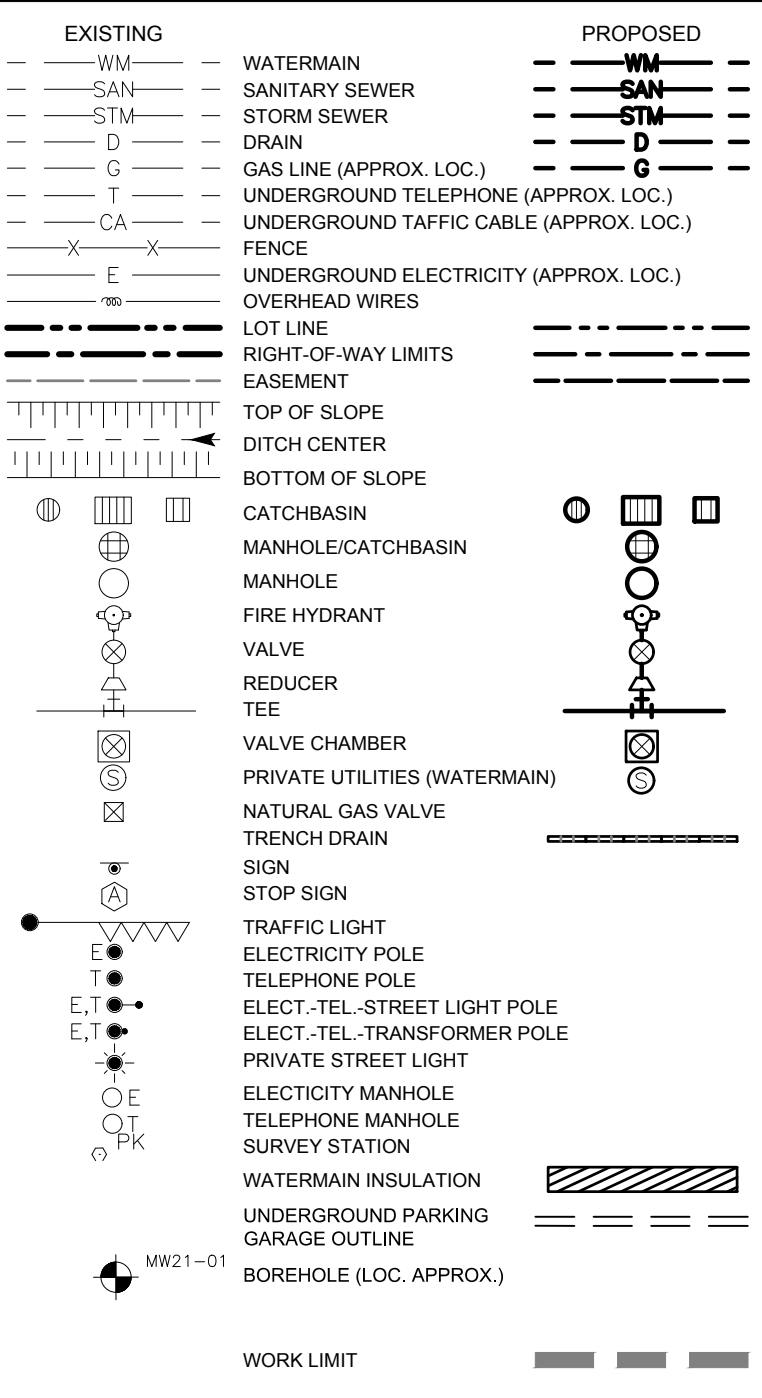
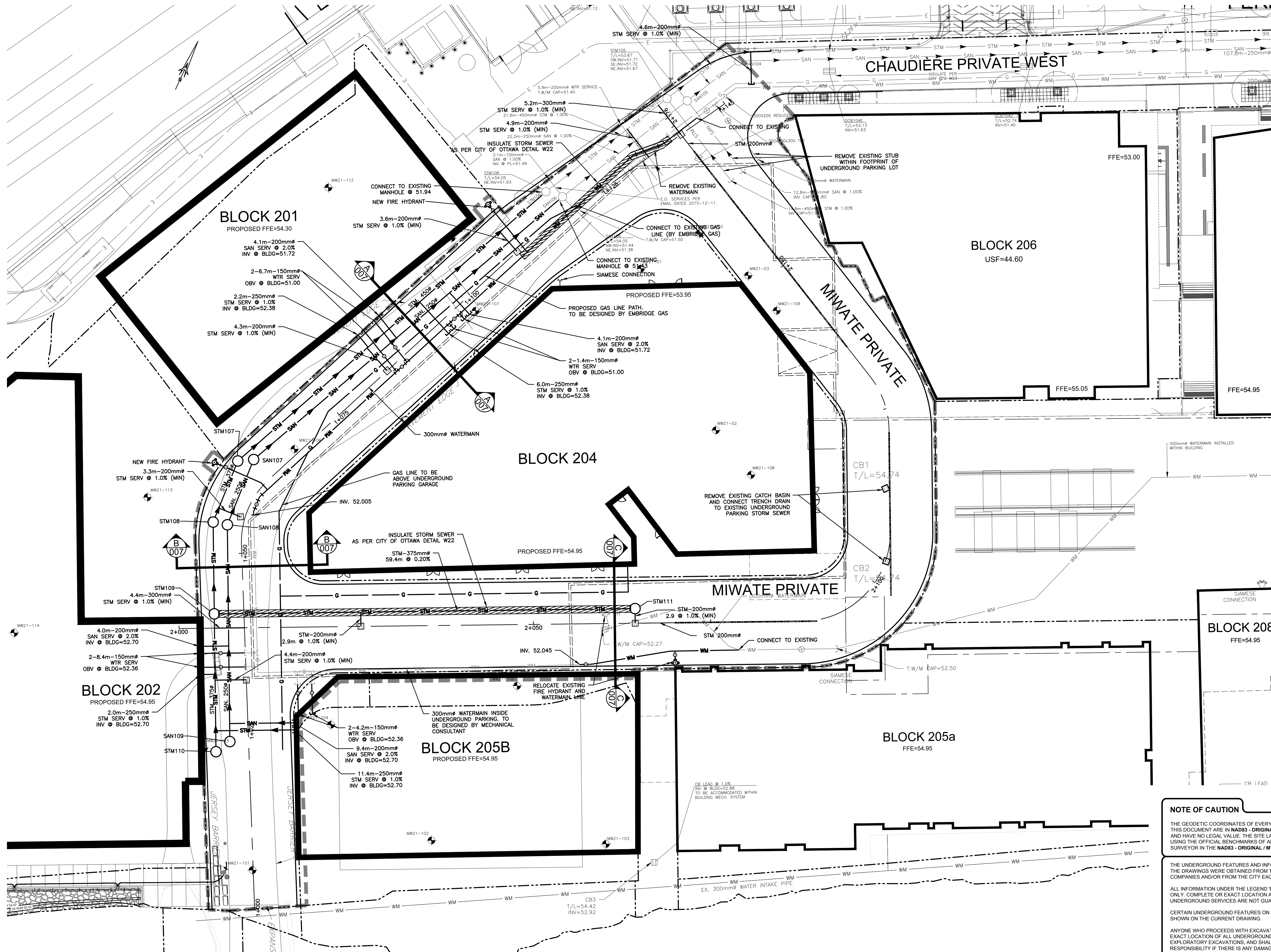
ALL INFORMATION UNDER THE LEGEND 'EXISTING' IS FOR INFORMATION ONLY. COMPLETE OR EXACT LOCATION AND ELEVATION OF UNDERGROUND SERVICES ARE NOT GUARANTEED.

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THE CONTRACTOR WILL HAVE THE RESPONSIBILITY AND THE OBLIGATION TO VALIDATE, BY EXPLORATORY EXCAVATION, THE SIZE OF THE PUBLIC UTILITIES UNDERGROUND SERVICES AND TO WARN THE ENGINEER OF ANY CONFLICT WITH THE PROJECTED WORK.

TITLE: LOCK 24/38 VERT ENG 3.0
 PRINT DATE: 2022/03/14 / PAPER SIZE: A3
 PATH: Z:\Cma-C\10\01_P\Projects\A000931_Zib\Block 7_Ottawa\400_Drafting\400_Civ\C-6_Servicing.dwg / LAYOUT: C05A Interim



ABBREVIATIONS

STM	STORM
SAN	SANITARY
WM	WATERMAIN
WTR	WATER
INV	INVERT
MH	MANHOLE
CB	CATCHBASIN
TL	TOP OF LID
OBV	OBVERT
FFE	FINISHED FLOOR ELEVATION
BLDG	BUILDING
SERV	SERVICE

No.	Date	Description	By
1	APR. 18, 2022	ISSUED FOR SITE PLAN APPLICATION	A.C.

DESIGNED BY:

APPROVED BY:

CIMA+

ENGINEER: J.A. SAUVÉ

PROJECT NAME: DREAM THEIA ONTARIO BLOCK 204A LP

PROJECT NAME: ZIBI ONTARIO BLOCK 204
315 PRIVE MIWATE PRIVATE, CHAUDIERE ISLAND OTTAWA, ONTARIO

DISCIPLINE: CIVIL

DRAWER: S.C. POGGIOLI

DESIGNER: J. SAUVÉ

APPROVER: A. CHAUMONT

SCALE: 1:250

DATE: 2022/03/14

DRAWING NO.: C005A

SHEET TITLE: SITE SERVICING LAYOUT (INTERIM)

SHEET NO.: 6 of 11

NOTE OF CAUTION

THE GEODETIC COORDINATES OF EVERY ITEM INCLUDED AS PART OF THIS DOCUMENT ARE IN NAD83 - ORIGINAL / MTM - REFERENCE SYSTEM AND HAVE NO LEGAL VALUE. THE SITE LAYOUT MUST BE COMPLETED USING THE OFFICIAL BENCHMARKS OF AN ACCREDITED LAND SURVEYOR IN THE NAD83 - ORIGINAL / MTM - REFERENCE SYSTEM.

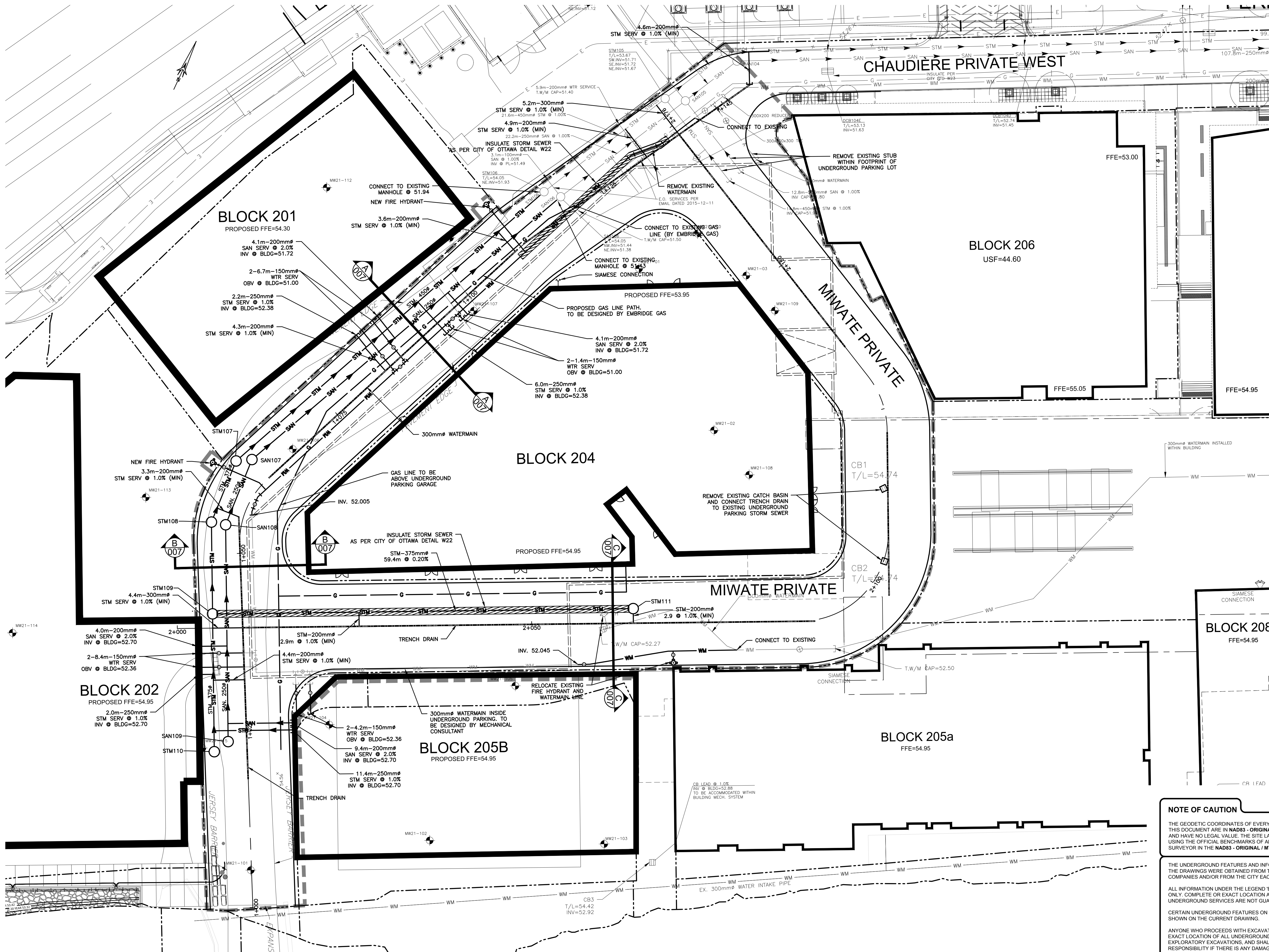
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THE CONTRACTOR WILL HAVE THE RESPONSIBILITY AND THE OBLIGATION TO VALIDATE, BY EXPLORATORY EXCAVATION, THE SIZE OF THE PUBLIC UTILITIES UNDERGROUND SERVICES AND TO WARN THE ENGINEER OF ANY CONFLICT WITH THE PROJECTED WORK.



EXISTING		PROPOSED	
WM	WATERMAIN	WM	WATERMAIN
SAN	SANITARY SEWER	SAN	SANITARY SEWER
STM	STORM SEWER	STM	STORM SEWER
D	DRAIN	D	DRAIN
G	GAS LINE (APPROX. LOC.)	G	GAS LINE (APPROX. LOC.)
T	UNDERGROUND TELEPHONE (APPROX. LOC.)	T	UNDERGROUND TELEPHONE (APPROX. LOC.)
CA	UNDERGROUND TRAFFIC CABLE (APPROX. LOC.)	CA	UNDERGROUND TRAFFIC CABLE (APPROX. LOC.)
E	UNDERGROUND ELECTRICITY (APPROX. LOC.)	E	UNDERGROUND ELECTRICITY (APPROX. LOC.)
OT	OVERHEAD WIRES	OT	OVERHEAD WIRES
CA	LOT LINE	CA	LOT LINE
E	RIGHT-OF-WAY LIMITS	E	RIGHT-OF-WAY LIMITS
ES	EASEMENT	ES	EASEMENT
TS	TOP OF SLOPE	TS	TOP OF SLOPE
BS	BOTTOM OF SLOPE	BS	BOTTOM OF SLOPE
CB	CATCHBASIN	CB	CATCHBASIN
MH	MANHOLE/CATCHBASIN	MH	MANHOLE/CATCHBASIN
FH	FIRE HYDRANT	FH	FIRE HYDRANT
V	VALVE	V	VALVE
R	REDUCER	R	REDUCER
T	TEE	T	TEE
VC	VALVE CHAMBER	VC	VALVE CHAMBER
NU	NATURAL GAS VALVE	NU	NATURAL GAS VALVE
TD	TRENCH DRAIN	TD	TRENCH DRAIN
SS	STOP SIGN	SS	STOP SIGN
TL	TRAFFIC LIGHT	TL	TRAFFIC LIGHT
EP	ELECTRICITY POLE	EP	ELECTRICITY POLE
TP	TELEPHONE POLE	TP	TELEPHONE POLE
ESL	ELECT-STREET LIGHT POLE	ESL	ELECT-STREET LIGHT POLE
EST	ELECT-TEL-TRANSFORMER POLE	EST	ELECT-TEL-TRANSFORMER POLE
PSL	PRIVATE STREET LIGHT	PSL	PRIVATE STREET LIGHT
EMH	ELECTRICITY MANHOLE	EMH	ELECTRICITY MANHOLE
TMH	TELEPHONE MANHOLE	TMH	TELEPHONE MANHOLE
ST	SURVEY STATION	ST	SURVEY STATION
WI	WATERMAIN INSULATION	WI	WATERMAIN INSULATION
UP	UNDERGROUND PARKING	UP	UNDERGROUND PARKING
GO	GARAGE OUTLINE	GO	GARAGE OUTLINE
BO	BOREHOLE (LOC. APPROX.)	BO	BOREHOLE (LOC. APPROX.)
WL	WORK LIMIT	WL	WORK LIMIT

1:250

No.	Date	Description	By
1	APR. 18, 2022	ISSUED FOR SITE PLAN APPLICATION	A.C.

DESIGNED BY: J.A. SAUVÉ
 APPROVED BY: A. CHAUMONT

22-04-19
 J.A. SAUVÉ
 100200100
 PROVINCE OF ONTARIO

22-04-19
 A. CHAUMONT
 90409194
 PROVINCE OF ONTARIO

CIMA+

ENGINEER: DREAM THEIA ONTARIO
 BLOCK 204A LP

PROJECT NAME: ZIBI ONTARIO
 BLOCK 204
 315 PRIVE MIWATE PRIVATE,
 CHAUDIERE ISLAND
 OTTAWA, ONTARIO

SHEET TITLE: SITE SERVICING LAYOUT
 (ULTIMATE)

DISCIPLINE: CIVIL

DRAWER: S.C. POGGIOLI
 DESIGNER: J. SAUVÉ
 APPROVER: A. CHAUMONT

SCALE: 1:250
 DATE: 2022/03/14

PROJECT NO: A000931
 SHEET NO: 7 of 11

C005B

NOTE OF CAUTION

THE GEODETIC COORDINATES OF EVERY ITEM INCLUDED AS PART OF THIS DOCUMENT ARE IN NAD83 - ORIGINAL / MTM - REFERENCE SYSTEM AND HAVE NO LEGAL VALUE. THE SITE LAYOUT MUST BE COMPLETED USING THE OFFICIAL BENCHMARKS OF AN ACCREDITED LAND SURVEYOR IN THE NAD83 - ORIGINAL / MTM - REFERENCE SYSTEM.

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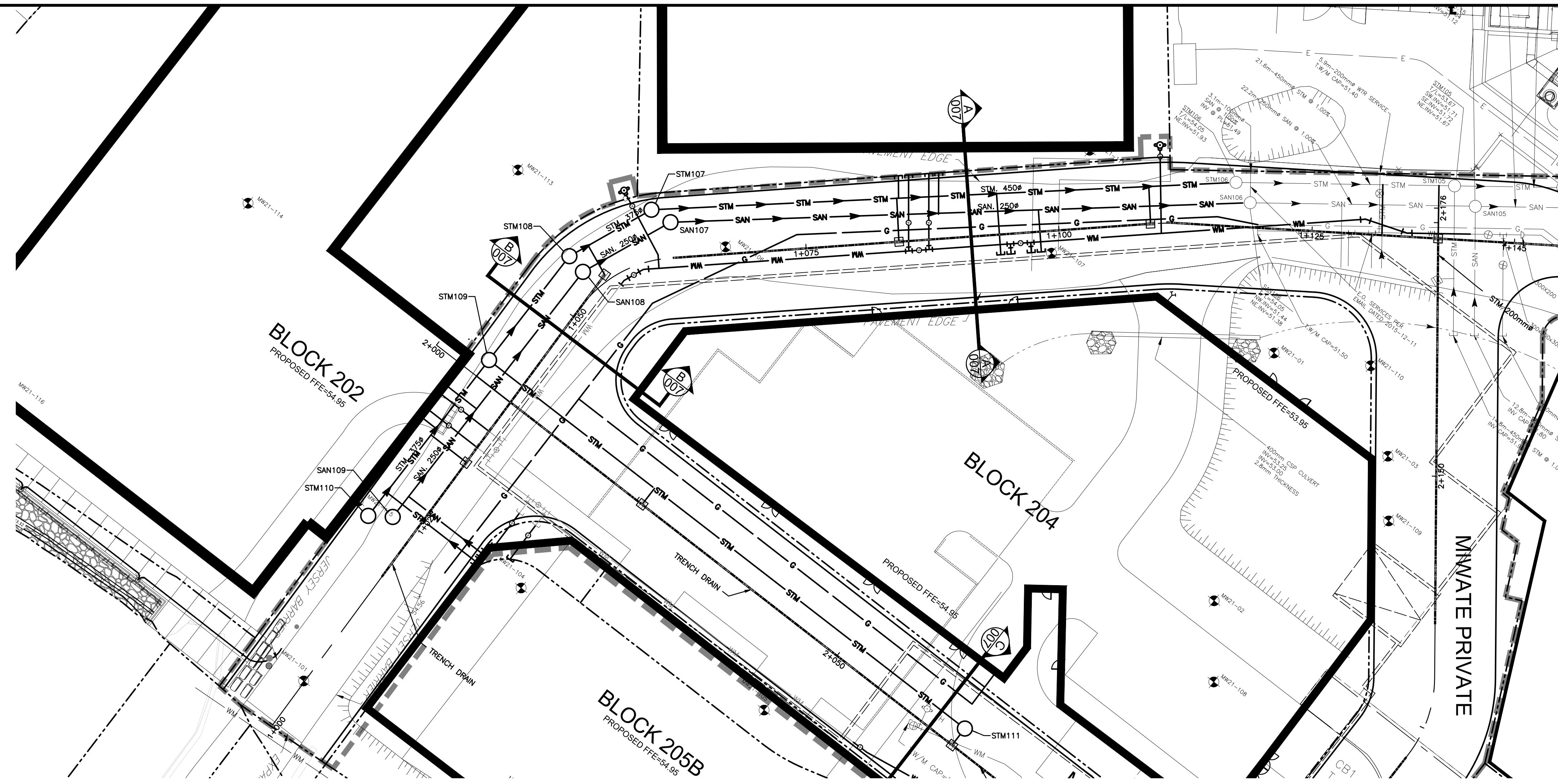
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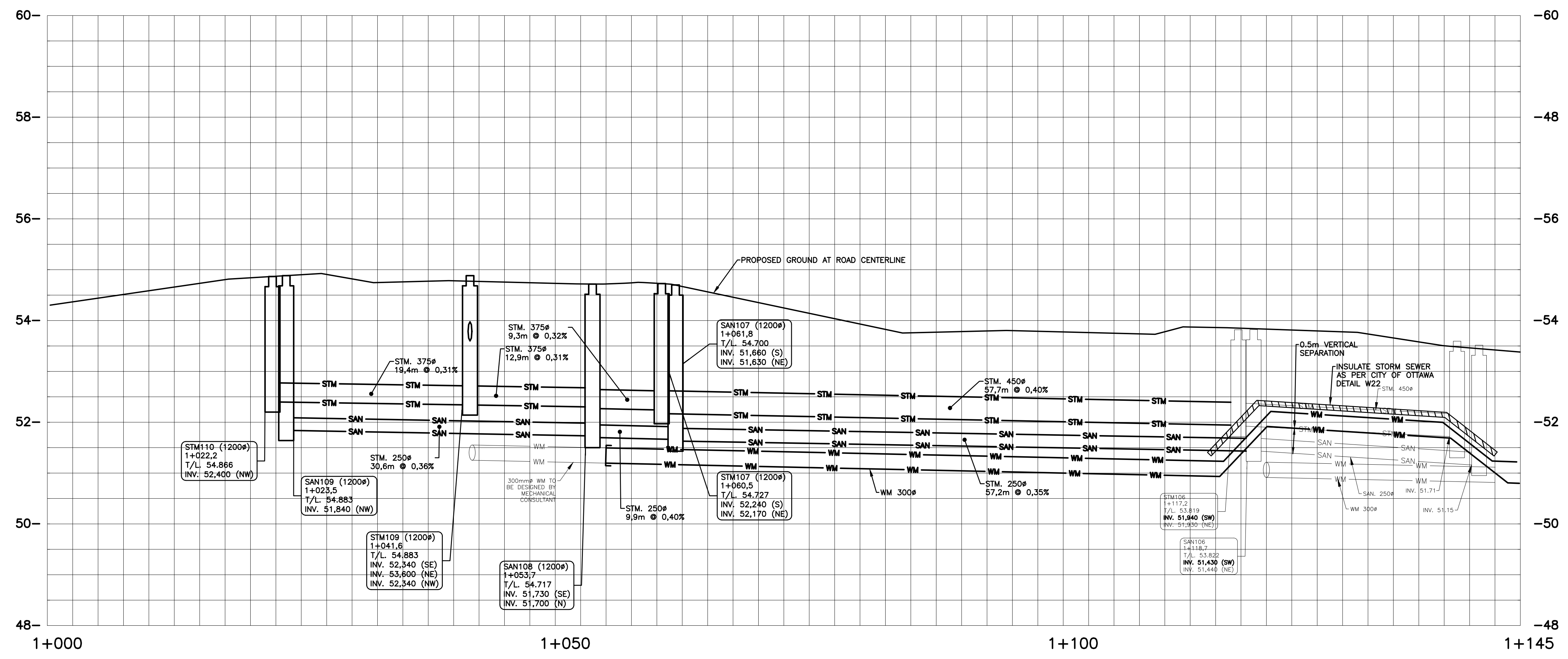
PRINT DATE: 2022/03/14 / PAPER SIZE: A0
 PATH: Z:\Cma-C\10\01_P\Projects\A000931_Zib\07_Ottawa\400_Drafting\400_Civic-6_Servicing.dwg / LAYOUT: C006A
 TITLE: LOCK 24/38 VERT ENG 3.0



EXISTING		PROPOSED	
WM	WATERMAIN	WM	WATERMAIN
SAN	SANITARY SEWER	SAN	SANITARY SEWER
STM	STORM SEWER	STM	STORM SEWER
D	DRAIN	D	DRAIN
G	GAS LINE (APPROX. LOC.)	G	GAS LINE (APPROX. LOC.)
T	UNDERGROUND TELEPHONE (APPROX. LOC.)	T	UNDERGROUND TELEPHONE (APPROX. LOC.)
CA	UNDERGROUND TRAFFIC CABLE (APPROX. LOC.)	CA	UNDERGROUND TRAFFIC CABLE (APPROX. LOC.)
E	UNDERGROUND ELECTRICITY (APPROX. LOC.)	E	UNDERGROUND ELECTRICITY (APPROX. LOC.)
OT	OVERHEAD WIRES	OT	OVERHEAD WIRES
---	LOT LINE	---	LOT LINE
---	RIGHT-OF-WAY LIMITS	---	RIGHT-OF-WAY LIMITS
---	EASEMENT	---	EASEMENT
---	TOP OF SLOPE	---	TOP OF SLOPE
---	BOTTOM OF SLOPE	---	BOTTOM OF SLOPE
⊙	CATCHBASIN	⊙	CATCHBASIN
⊙	MANHOLE/CATCHBASIN	⊙	MANHOLE/CATCHBASIN
⊙	MANHOLE	⊙	MANHOLE
⊙	FIRE HYDRANT	⊙	FIRE HYDRANT
⊙	VALVE	⊙	VALVE
⊙	REDUCER	⊙	REDUCER
⊙	TEE	⊙	TEE
⊙	VALVE CHAMBER	⊙	VALVE CHAMBER
⊙	PRIVATE UTILITIES (WATERMAIN)	⊙	PRIVATE UTILITIES (WATERMAIN)
⊙	NATURAL GAS VALVE	⊙	NATURAL GAS VALVE
⊙	TRENCH DRAIN	⊙	TRENCH DRAIN
⊙	SIGN	⊙	SIGN
⊙	STOP SIGN	⊙	STOP SIGN
⊙	TRAFFIC LIGHT	⊙	TRAFFIC LIGHT
⊙	ELECTRICITY POLE	⊙	ELECTRICITY POLE
⊙	TELEPHONE POLE	⊙	TELEPHONE POLE
⊙	ELECT.-TEL.-STREET LIGHT POLE	⊙	ELECT.-TEL.-STREET LIGHT POLE
⊙	ELECT.-TEL.-TRANSFORMER POLE	⊙	ELECT.-TEL.-TRANSFORMER POLE
⊙	PRIVATE STREET LIGHT	⊙	PRIVATE STREET LIGHT
⊙	ELECTRICITY MANHOLE	⊙	ELECTRICITY MANHOLE
⊙	TELEPHONE MANHOLE	⊙	TELEPHONE MANHOLE
⊙	SURVEY STATION	⊙	SURVEY STATION
⊙	WATERMAIN INSULATION	⊙	WATERMAIN INSULATION
⊙	UNDERGROUND PARKING	⊙	UNDERGROUND PARKING
⊙	GARAGE OUTLINE	⊙	GARAGE OUTLINE
⊙	BOREHOLE (LOC. APPROX.)	⊙	BOREHOLE (LOC. APPROX.)
---	WORK LIMIT	---	WORK LIMIT

1:250

No.	Date	Description	By
1	APR. 18, 2022	ISSUED FOR SITE PLAN APPLICATION	A.C.



STAMPS:

DESIGNED BY

APPROVED BY

ENGINEER: **CIMA+**

CLIENT: DREAM THEIA ONTARIO BLOCK 204A LP

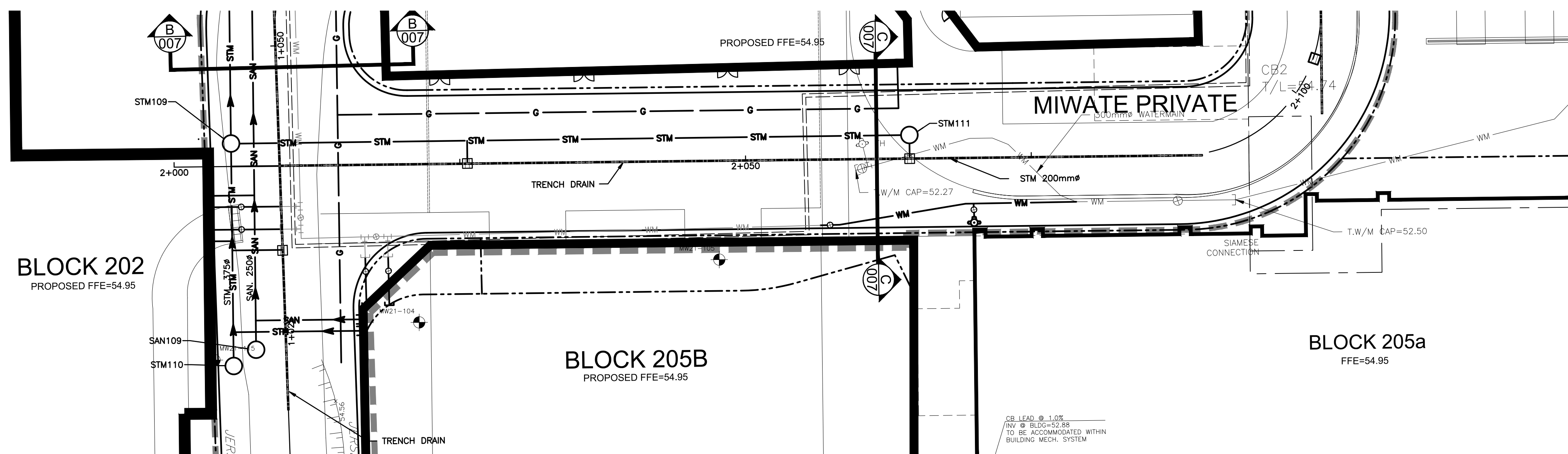
PROJECT NAME: ZIBI ONTARIO BLOCK 204
315 PRIVE MIWATE PRIVATE, CHAUDIERE ISLAND OTTAWA, ONTARIO

SHEET TITLE: PLAN AND PROFILE STA. 1+000 TO 1+145

DISCIPLINE: CIVIL

DRAWN BY: S.C. POGGIOLI	SCALE: H=1:250 V=1:50
DESIGNER: J. SAUVE	DATE: 2022/03/14
APPROVER: A. CHAUMONT	APPROVER: A. CHAUMONT
PROJECT NO: A000931	DRAWING NO: C006A

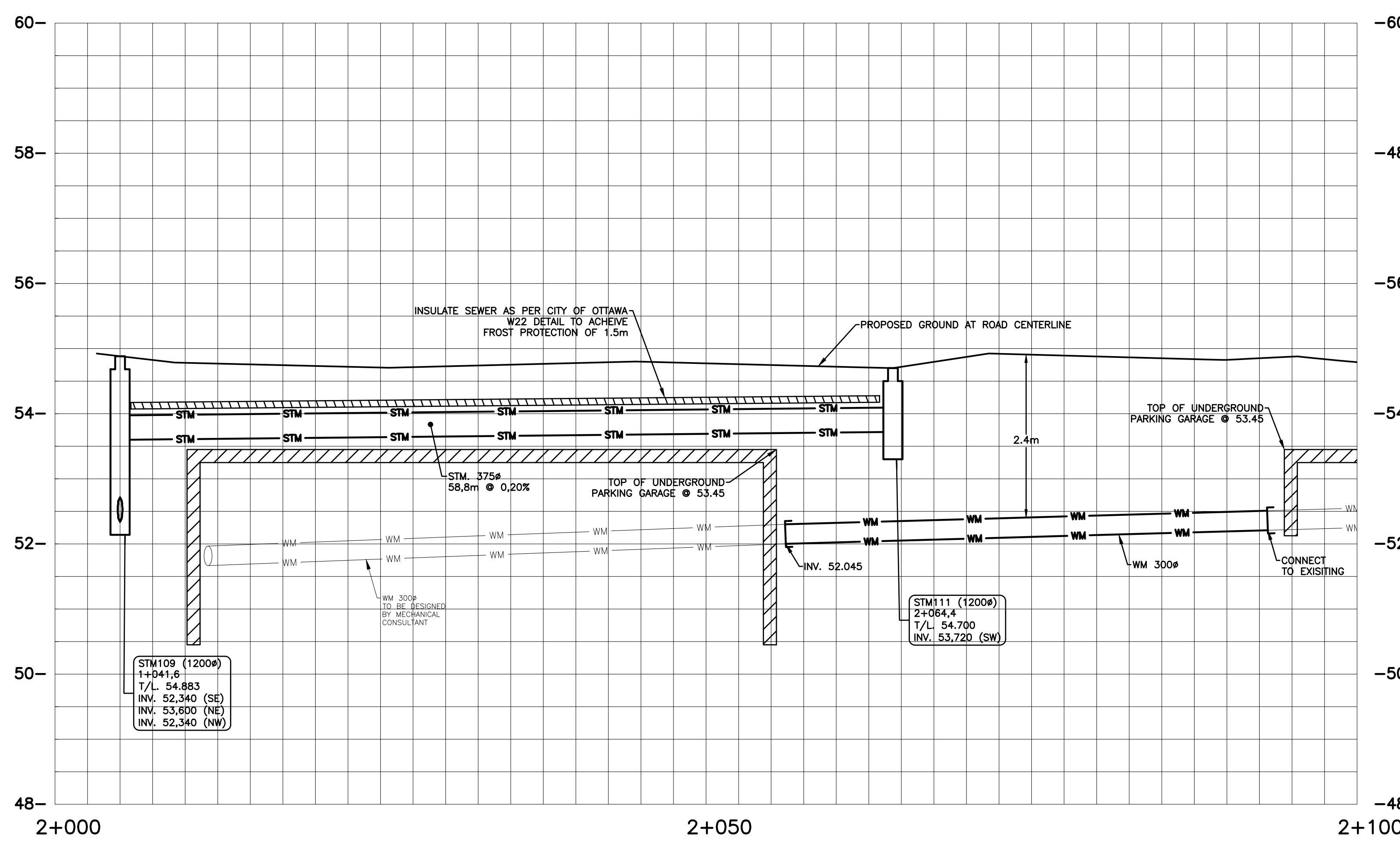
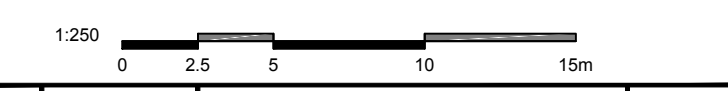
SHEET: 8 of 11



EXISTING		PROPOSED	
WM	WATERMAIN	WM	WATERMAIN
SAN	SANITARY SEWER	SAN	SANITARY SEWER
STM	STORM SEWER	STM	STORM SEWER
D	DRAIN	D	DRAIN
G	GAS LINE (APPROX. LOC.)	G	GAS LINE (APPROX. LOC.)
T	UNDERGROUND TELEPHONE (APPROX. LOC.)	T	UNDERGROUND TELEPHONE (APPROX. LOC.)
CA	UNDERGROUND TRAFFIC CABLE (APPROX. LOC.)	CA	UNDERGROUND TRAFFIC CABLE (APPROX. LOC.)
E	UNDERGROUND ELECTRICITY (APPROX. LOC.)	E	UNDERGROUND ELECTRICITY (APPROX. LOC.)
OW	OVERHEAD WIRES	OW	OVERHEAD WIRES
Lot Line	LOT LINE	Lot Line	LOT LINE
Right-of-Way Limits	RIGHT-OF-WAY LIMITS	Right-of-Way Limits	RIGHT-OF-WAY LIMITS
EASEMENT	EASEMENT	EASEMENT	EASEMENT
Top of Slope	TOP OF SLOPE	Top of Slope	TOP OF SLOPE
Ditch Center	DITCH CENTER	Ditch Center	DITCH CENTER
Bottom of Slope	BOTTOM OF SLOPE	Bottom of Slope	BOTTOM OF SLOPE
Catchbasin	CATCHBASIN	Catchbasin	CATCHBASIN
Manhole/Catchbasin	MANHOLE/CATCHBASIN	Manhole/Catchbasin	MANHOLE/CATCHBASIN
Manhole	MANHOLE	Manhole	MANHOLE
Fire Hydrant	FIRE HYDRANT	Fire Hydrant	FIRE HYDRANT
Valve	VALVE	Valve	VALVE
Reducer	REDUCER	Reducer	REDUCER
Tee	TEE	Tee	TEE
Valve Chamber	VALVE CHAMBER	Valve Chamber	VALVE CHAMBER
Private Utilities (Watermain)	PRIVATE UTILITIES (WATERMAIN)	Private Utilities (Watermain)	PRIVATE UTILITIES (WATERMAIN)
Natural Gas Valve	NATURAL GAS VALVE	Natural Gas Valve	NATURAL GAS VALVE
Trench Drain	TRENCH DRAIN	Trench Drain	TRENCH DRAIN
Sign	STOP SIGN	Sign	STOP SIGN
Stop Sign	STOP SIGN	Stop Sign	STOP SIGN
Traffic Light	TRAFFIC LIGHT	Traffic Light	TRAFFIC LIGHT
Electricity Pole	ELECTRICITY POLE	Electricity Pole	ELECTRICITY POLE
Telephone Pole	TELEPHONE POLE	Telephone Pole	TELEPHONE POLE
E.T.	ELECT-TEL-STREET LIGHT POLE	E.T.	ELECT-TEL-STREET LIGHT POLE
E.T.	ELECT-TEL-TURNER POLE	E.T.	ELECT-TEL-TURNER POLE
Private Street Light	PRIVATE STREET LIGHT	Private Street Light	PRIVATE STREET LIGHT
Electricity Manhole	ELECTRICITY MANHOLE	Electricity Manhole	ELECTRICITY MANHOLE
Telephone Manhole	TELEPHONE MANHOLE	Telephone Manhole	TELEPHONE MANHOLE
Survey Station	SURVEY STATION	Survey Station	SURVEY STATION
Watermain Insulation	WATERMAIN INSULATION	Watermain Insulation	WATERMAIN INSULATION
Underground Parking	UNDERGROUND PARKING	Underground Parking	UNDERGROUND PARKING
Garage Outline	GARAGE OUTLINE	Garage Outline	GARAGE OUTLINE
Workhole (Loc. Approx.)	WORKHOLE (LOC. APPROX.)	Workhole (Loc. Approx.)	WORKHOLE (LOC. APPROX.)
Work Limit	WORK LIMIT	Work Limit	WORK LIMIT

ABBREVIATIONS

STM	→	STORM
SAN	→	SANITARY
WM	→	WATERMAIN
WTR	→	WATER
INV	→	INVERT
MH	→	MANHOLE
CB	→	CATCHBASIN
TL	→	TOP OF LID
OBV	→	OBIERT
FFE	→	FINISHED FLOOR ELEVATION
BLDG	→	BUILDING
SERV	→	SERVICE



No.	Date	Description	By
1	APR. 18, 2022	ISSUED FOR SITE PLAN APPLICATION	A.C.

STAMPS:

22-04-19
LICENSED PROFESSIONAL ENGINEER
J. A. SAUVE
100200100
PROVINCE OF ONTARIO

22-03-14
LICENSED PROFESSIONAL ENGINEER
A. CHAUMONT
90409194
PROVINCE OF ONTARIO

DESIGNED BY: [Signature] APPROVED BY: [Signature]

ENGINEER:

CLIENT:

**DREAM THEIA ONTARIO
BLOCK 204 LP**

PROJECT NAME:

**ZIBI ONTARIO
BLOCK 204
315 PRIVE MIWATE PRIVATE,
CHAUDIERE ISLAND
OTTAWA, ONTARIO**

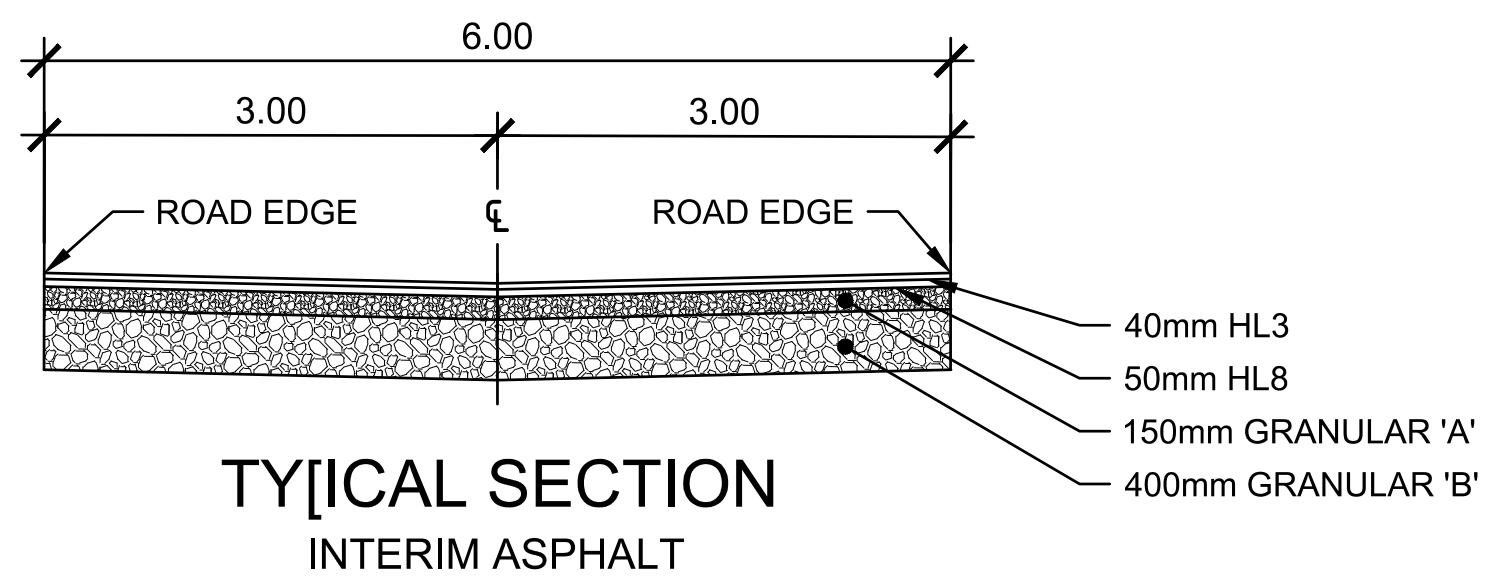
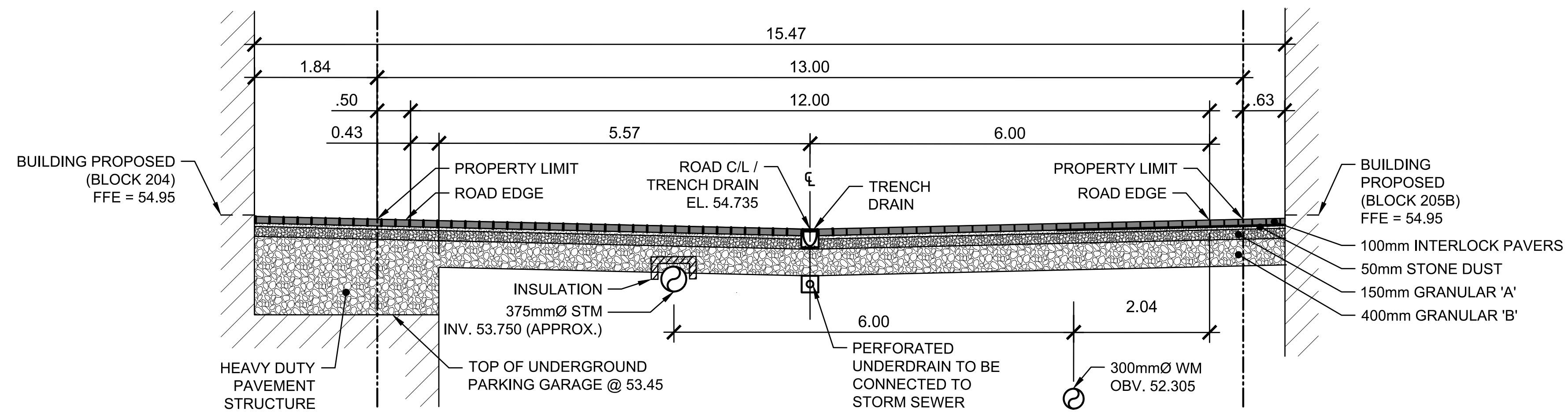
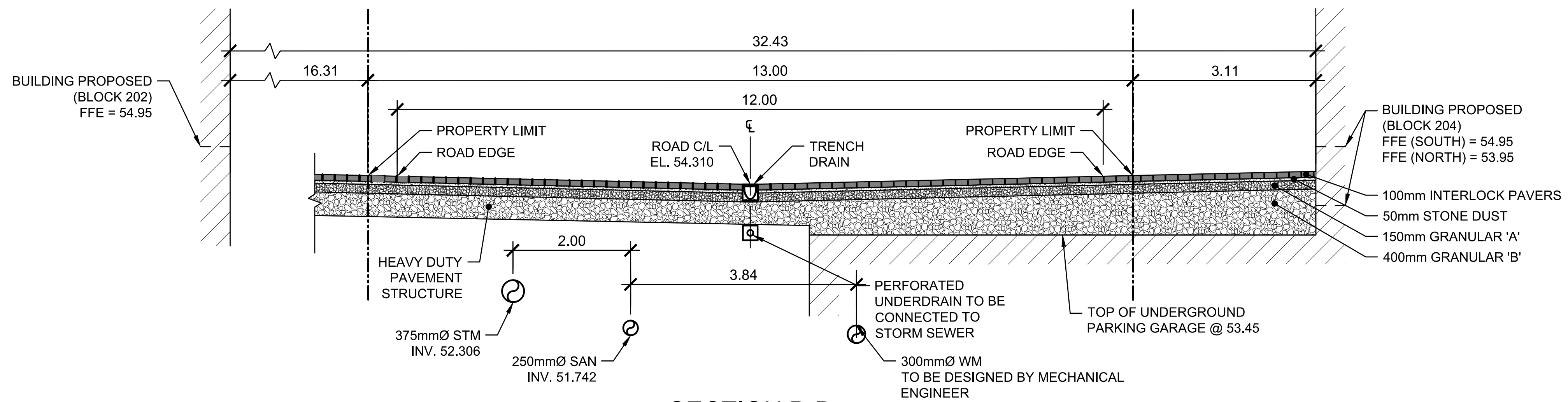
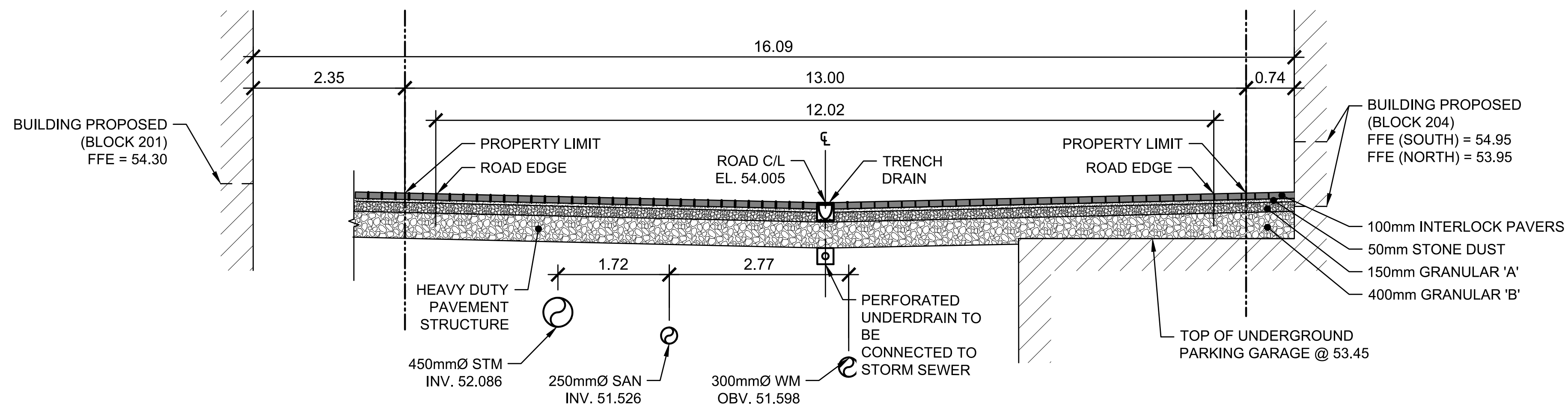
SHEET TITLE:

**PLAN AND PROFILE
STA. 2+000 TO 2+100**

DISCIPLINE:

CIVIL

DRAWER: S.C. POGGIOLI		SCALE: H=1:250 V=1:50	
DESIGNER: J. SAUVE		DATE: 2022/03/14	
APPROVER: A. CHAUMONT		APPROVER: A. CHAUMONT	
PROJECT NO: A000931		DRAWING NO: C006B	
SHEET NO: 9 of 11			



No.	Date	Description	By
1	APR. 18, 2022	ISSUED FOR SITE PLAN APPLICATION	A.C.

STAMPS:

DESIGNED BY: J.A. SAUVE
APPROVED BY: A. CHAUMONT

ENGINEER:

CLIENT:

DREAM THEIA ONTARIO
BLOCK 204A LP

PROJECT NAME:

ZIBI ONTARIO
BLOCK 204
315 PRIVE MIWATE PRIVATE,
CHAUDIERE ISLAND
OTTAWA, ONTARIO

SHEET TITLE:

TYPICAL CROSS SECTIONS

DISCIPLINE:

CIVIL

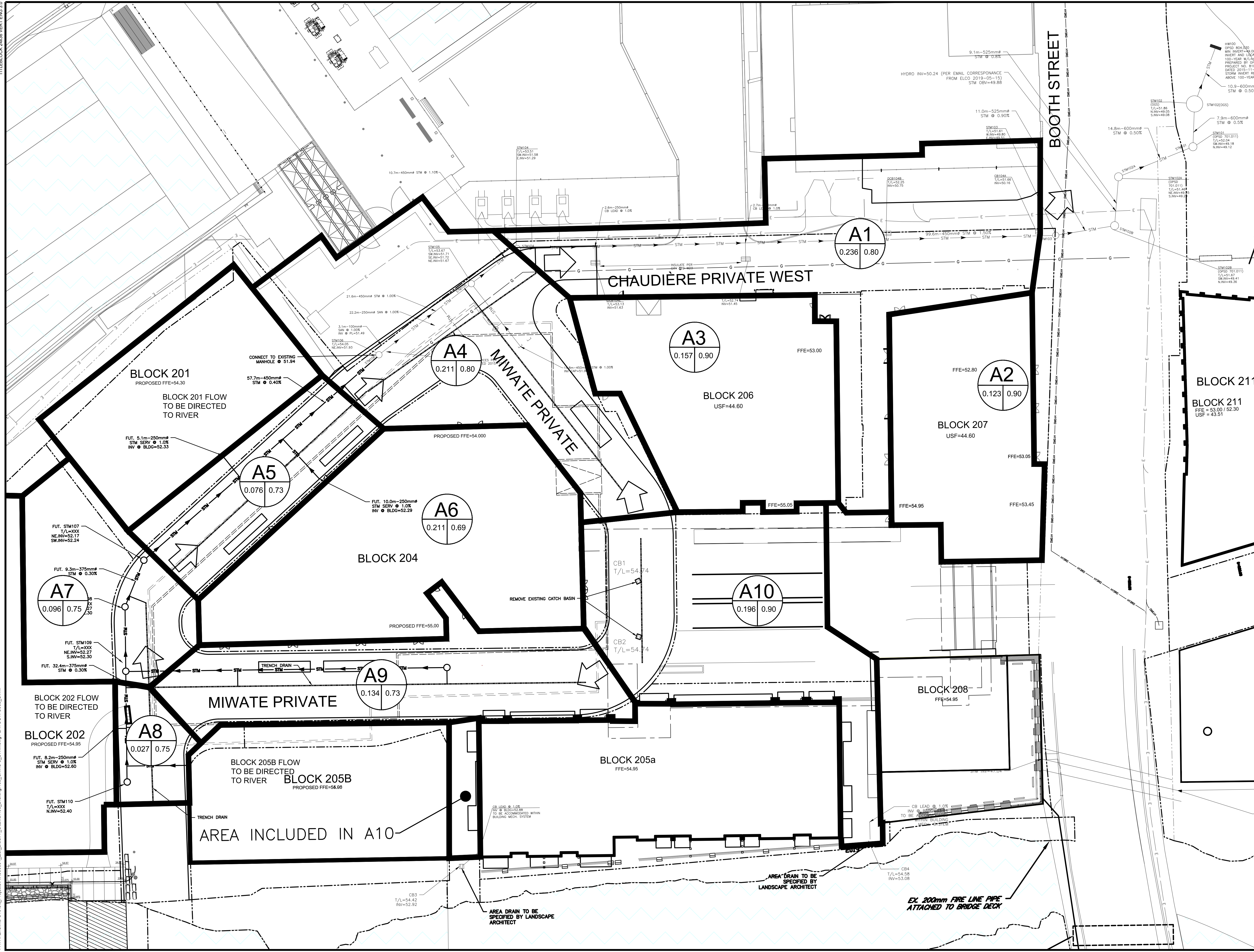
DRAWER: S.C. POGGIOLI
DESIGNER: J. SAUVE
APPROVER: A. CHAUMONT

SCALE: 1:50
DATE: 2022/03/14
APPROVER: A. CHAUMONT

PROJECT NO: A000931
SHEET NO: 10 of 11

DRAWING NO: C007

PRINT DATE: 2022/03/14 | PAPER SIZE: ISO (A1) 594.00 x 841.00 (MM) | PATH: Z:\C:\m\c\1001\Projects\A00000931_200\Block 7_Ontario\A00_Drafting\A00_Civil\A00_SWM.dwg | LAYOUT: C008_SWM



EXISTING		PROPOSED	
WM	WATERMAIN	WM	WATERMAIN
SSM	SANITARY SEWER	SSM	SANITARY SEWER
STM	STORM SEWER	STM	STORM SEWER
D	DRAIN	D	DRAIN
G	GAS LINE (APPROX. LOC.)	G	GAS LINE (APPROX. LOC.)
T	UNDERGROUND TELEPHONE (APPROX. LOC.)	T	UNDERGROUND TELEPHONE (APPROX. LOC.)
CA	UNDERGROUND TRAFFIC CABLE (APPROX. LOC.)	CA	UNDERGROUND TRAFFIC CABLE (APPROX. LOC.)
E	FENCE	E	FENCE
EL	UNDERGROUND ELECTRICITY (APPROX. LOC.)	EL	UNDERGROUND ELECTRICITY (APPROX. LOC.)
OW	OVERHEAD WIRES	OW	OVERHEAD WIRES
LOT	LOT LINE	LOT	LOT LINE
ROW	RIGHT-OF-WAY LIMITS	ROW	RIGHT-OF-WAY LIMITS
EAS	EASEMENT	EAS	EASEMENT
TOP	TOP OF SLOPE	TOP	TOP OF SLOPE
BOT	BOTTOM OF SLOPE	BOT	BOTTOM OF SLOPE
DITCH	DITCH CENTER	DITCH	DITCH CENTER
CB	CATCHBASIN	CB	CATCHBASIN
MHC	MANHOLE/CATCHBASIN	MHC	MANHOLE/CATCHBASIN
MH	MANHOLE	MH	MANHOLE
FH	FIRE HYDRANT	FH	FIRE HYDRANT
V	VALVE	V	VALVE
R	REDUCER	R	REDUCER
T	TEE	T	TEE
VC	VALVE CHAMBER	VC	VALVE CHAMBER
PU	PRIVATE UTILITIES (WATERMAIN)	PU	PRIVATE UTILITIES (WATERMAIN)
ELEV	ELEVATION	ELEV	ELEVATION
BH	BOREHOLE (LOC. APPROX.)	BH	BOREHOLE (LOC. APPROX.)
OF	OVERLAND FLOW	OF	OVERLAND FLOW
TD	TRENCH DRAIN	TD	TRENCH DRAIN
WL	WORK LIMIT	WL	WORK LIMIT
UGP	UNDERGROUND PARKING	UGP	UNDERGROUND PARKING
GL	GARAGE LIMIT	GL	GARAGE LIMIT

Sub-catchment	A4	0.305	0.69
Area in Hectares			
Coefficient de Ruissellement			
Overland Flow			
Catchment Area Limit			

No.	Date	Description	By
1	APR. 18, 2022	ISSUED FOR SITE PLAN APPLICATION	A.C.

DESIGNED BY	J. A. SAUVE 100200100 PROVINCE OF ONTARIO
APPROVED BY	A. CHAUMONT 90409194 PROVINCE OF ONTARIO

CIMA+

CLIENT: DREAM THEIA ONTARIO
BLOCK 204A LP

PROJECT NAME: ZIBI ONTARIO
BLOCK 204
315 PRIVE MIWATE PRIVATE,
CHAUDIERE ISLAND
OTTAWA, ONTARIO

SHEET TITLE: STORMWATER
MANAGEMENT PLAN

DISCIPLINE: CIVIL

DRAWN BY: S.C. POGGIOLI	SCALE: 1:300
DESIGNER: J. SAUVE	DATE: 2022/03/14
APPROVER: A. CHAUMONT	APPROVER: A. CHAUMONT
PROJECT No: A000931	DRAWING No: C008

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