

MAY 22, 2026
Project No. 2025-054

12 STEWART RD., COLLINGWOOD
FUNCTIONAL SERVICING AND
STORMWATER MANAGEMENT REPORT

TOWN OF COLLINGWOOD



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1.0 Introduction

CAPES Engineering Ltd. has been retained by Alex Carter to prepare a functional servicing and stormwater management report in support of a Site Plan application for 12 Stewart Rd. in the Town of Collingwood. The existing lot is 0.154 ha in size and currently contains a commercial building. The site is located on the south side of Stewart Rd. west of High Street in the Town of Collingwood. It is proposed to demolish the existing commercial building to allow for the proposed re-development of the existing lot.

The proposed re-development is for a new commercial building that is intended to be used for racquet sports. The proposed redevelopment will improve the existing entrance, driveway, parking areas, and internal walkways.

The proposed servicing and stormwater management for the site are designed to meet the standards and guidelines of the Town of Collingwood (Town) and we do not believe any other approvals are required for the site.

The purpose of this report is to provide support for Site Plan Approval for the proposed re-development.

2.0 Existing Site Conditions

The lot is legally described as Part of Lot 43, Concession X (10) (formerly Township of Nottawasaga) in the Town of Collingwood, County of Simcoe. The legal plan prepared by Ron Emo in 1979 is included in **Appendix A** for reference.

The Site has a frontage of 25.14 m along Stewart Rd. The lot is rectangular in size with a depth of approximately 61 m. Under the current Official Plan the site is within an Industrial Park and is zoned M5 (Industrial Park).

The site is not located within an area regulated by the NVCA and as such it is not anticipated that the NVCA will review or provide comments on the proposed redevelopment.

The existing lot is currently developed with a one-storey commercial building which is being used as a gym/fitness center complete with a gravel driveway, parking area and limited landscaping. The landscaped areas are generally maintained lawn along the edges of the site and a small area along the frontage. There is a chain link fence along the east side of the site within an existing shared swale and there are three existing trees located on the west side of the site on an adjacent lot. The site is very flat but generally slopes from the south property boundary north towards the Stewart Rd. ROW at a grade of approximately 1.3%.

Stewart Rd. is located in a 20.12 m ROW and is a paved semi-urban road with 3.75 m lanes, open ditches on both sides of the road, and utility poles and overhead utilities on the northern side. The road contains water and sanitary sewer infrastructure. Record drawings for Stewart Rd. received from the Town are included in **Appendix C** for reference, however the design drawings do not seem to match the constructed details of the street. The detail drawings from 1973 show the fire hydrants on the north side of the road, while the hydrants are actually on the south side. The historic drawings of the site are, in our opinion, not an accurate representation of the site conditions.

2.1 Geotechnical Information

A Geotechnical Investigation (See **Appendix B**) was completed for the site by Peto MacCallum (dated April 2026). The study included 6 boreholes on the property to a maximum depth of 6.7 m. There is a surface layer up to 2.1 m deep of granular fill and sand with some clay and gravel. Below the surface layer there is a sandy silty/silty sand. Possible bedrock was encountered in three of the boreholes; BH 1 and 4 were terminated at 5.7 m while BH 2 was terminated at 3.7 m.

Groundwater was encountered at between 1.4 m and 2.2 m deep (elevations 184.5-185.10).

The available Ontario Geological Survey (OGS) mapping identifies the area as till with stone-poor, sandy silt to silty sand-textured till which agrees with the PML geotechnical findings.



Generally, a sandy silt to silty sand will have relatively poor infiltration capabilities for stormwater management.

We also reviewed the available MECP Well Records for the area (See **Appendix C**) for 104 High Street directly south of the site which seem to agree with the OGS mapping with silty sand and sandy silt till. Shallow groundwater was discovered at 1.5 m depth, however we should note that this may not represent a seasonal high groundwater for the site.

2.2 Existing Stormwater Infrastructure

The lot is very flat but overland flow generally occurs towards Stewart Rd. The existing lot has a low berm in the back yard parallel to the rear property line that we believe is intended to prevent runoff from the property to the south from entering the site.

It appears that none of the neighbouring properties have any on-site stormwater management controls and all discharge via sheet flow to the Stewart Rd. ditch system. The ditch in front of 12 Stewart Rd. flows east towards High Street. A ditch inlet at the SW corner of the intersection accepts ditch runoff and connects to the High Street storm sewer. It appears that there no formal stormwater controls for the overall subdivision.

2.2.1 Stormwater Management Approval Criteria

The Town has indicated that both quantity and quality control measures shall be addressed for the Site.

Post re-development peak runoff rates should not exceed the existing condition runoff rates and quality controls should adhere to the recommendations of the 2003 MECP guidelines.

The MECP list three levels of quality control protection for discharge to a natural aquatic habitat; enhanced, normal and basic. In this case the site is within an industrial development and has been developed for at least 40 years with no quality controls. The discharge from the site is to an industrial ditch connecting to a storm sewer and does not directly discharge to a watercourse. We believe the quality control requirement for the site should be set at basic or normal and best efforts to improve on the exiting condition as options are limited.

2.2.2 Existing Condition Stormwater Modelling

We have utilized PCSWMM 2024 modelling software to undertake the analysis of the existing site.

The contributing drainage area for the Site was determined by using a combination of aerial imagery from Simcoe County GIS Mapping, a topographic survey of the site completed in 2025 and a site visit completed in 2025.

The total drainage area for the site is 0.154 ha. The existing topography is mostly flat with an average slope from south to north of approximately 1.3%. There is a low berm located along the southern property line (within the site) that prevents runoff from the property to the south from entering the site. Runoff flows east along the grassed southern property line to the SE corner of the site.

There is a grassed common property line swale on the east side of the site which drains north towards Stewart Rd. Approximately half the site runoff is directed towards the eastern swale with the remainder draining north directly to the Stewart Rd. ROW.

There is no shared common swale on the west side of the site, rather there is a relatively flat grassed area with trees on the neighbouring property.

The site is already developed with a building and gravel parking and driving lane, and has been in this condition since at least 1978. The existing condition is approximately 90% impervious as almost the entire site was covered in gravel in the late 1980's. The majority of the pervious area on the site is

limited to a thin strip along the southern property line, along the eastern property line in the swale and in a small area in the NE corner.

Based on the geotechnical mapping listing the site as a silty sand/sandy silt we have assigned a soil type of a “silt loam” with the following Green Ampt infiltration parameters as per Rawls (1983).

$$K_{fs} = 6.5 \text{ mm/hr}$$

$$\text{Suction Head} = 169.926 \text{ mm}$$

$$\text{Initial Deficit (fraction)} = 0.217$$

Additional PCSWMM model input parameters for the Manning’s roughness coefficient (n) and depression storage were determined from the USDA TR55 and UNESCO SWM Manual as follows:

Table 5.9: Manning Roughness Coefficients - Overland Flow

Cover	n
Impervious areas	0.013
Woods	
with light underbrush	0.4
with dense underbrush	0.8
Lawns	
Short grass	0.15
Dense grass	0.24
Agriculture Land	0.050-0.170

Ref: Adapted from Soil Conservation Service, Urban Hydrology for Small Watersheds, U.S. Dept. of Agriculture, Soil Conservation Service, Engineering Division, Technical Release 55, June 1986

10.2 Initial Abstraction/Depression Storage

Table 10.2: Initial abstraction/depression storage

Cover	Depth (mm)
Woods	10
Pasture/Meadow	8
Cultivated	7
Lawns	5
Wetland	12/16
Impervious areas	2

Ref: UNESCO, Manual on Drainage in Urbanized Areas, 1987.

The pervious portion of the existing drainage area are grassed areas that appear to be mostly maintained and as such we have used an overall Manning’s value of 0.15 and depression storage value of 5 mm.

The IDF curves and equations as per the Town Standard 110 were utilized to model the 2-100 year 4-Hour Chicago storms. Additional rainfall data was obtained from the Ministry of Transportation – IDF Curve Look-up website for the Collingwood station to model the 2-100 year 24 hour SCS Type II, Regional Timmins storm and the 4 hour 25 mm Chicago (quality control) storm events.

We modelled a single catchment at 90% impervious discharging to the Steward Rd. ditch via sheet flow.

Please refer to **Table 1** on the following page for a summary of the results from the model.

Table 1 – Existing Condition Modelling Results

Storm Event	Peak Flow Offsite Total (m ³ /s)
4 Hr Chicago	
2-year	0.04
5-year	0.05
10-year	0.06
25-year	0.07
50-year	0.07
100-year	0.08
24 Hr SCS	
2-year	0.03
5-year	0.04
10-year	0.04
25-year	0.05
50-year	0.06
100-year	0.06
25 mm	0.01
Timmins	0.02

The PCSWMM summary output file for the 100-year 4 Hour Chicago storm has been included in **Appendix D** for reference. The remaining output files can be provided upon request in either digital or hardcopy format.

The peak runoff of 0.08 m³/s for the existing condition occurs from the 100-year 4 Hour Chicago storm event.

2.3 Existing Sanitary Infrastructure

There is an existing sanitary sewer main on Steward Rd. The existing sanitary main (according to the Town information) is a 250mm dia. Pipe and was installed in approximately 1973, and is listed as ACP (asbestos cement). The sanitary sewer main is shown as flowing east towards High Street at between 2% and 0.3%. We believe the connection for 12 Stewart Rd. occurs within the section of pipe at 2% slope between MH 2 and MH3.

There is no record of the actual size or location of the existing sanitary service to the property however we have assumed the size is 125 mm based on the 1973 drawings provided by the Town. The service is listed as being a minimum 2% slope and a minimum of 1.83 m at the property line.

2.4 Existing Water Supply Infrastructure

The Town records indicate there is an existing water service to the site providing water from a 300 mm dia. ductile iron water main located roughly in the middle of Stewart Rd. The Town has indicated this service may be split to 14 Stewart Rd.; however, they do not have any reliable records to confirm this.

The service is anticipated to be 25mm dia. Type K copper as this was the typical water service size noted on records for the extension of Stewart Rd. in 1989.

This site is subject to the Town water allocation policy and must demonstrate a high enough score to be eligible for any increase in water usage.

3.0 Proposed Site Plan

The proposed re-development includes the demolition of the existing commercial building, and removal of the gravel driveway and parking area. The proposed site plan consists of a new two storey (with full basement) 325.47 sq. m (footprint) commercial building to be used for racquet sports. The proposed building will have a full basement and two storeys with racquet courts and change rooms and will have a padel court on the rooftop.

Included in the proposed site plan is 1 barrier-free parking space and 14 regular parking spaces. Additionally, there are 4 bike parking spaces, concrete walkways and 15% landscaped areas. There is a proposed soft-scaped area on the west side of the building which is included in the 15% landscaped area. The site will be accessed via a 7.5 m wide driving entrance which aligns with the current entrance location.

The internal parking area south of the building will be accessed via 4.0 m wide one-way driving lanes on the east and west side of the building. Parking drive aisles will be a minimum of 6.0 m wide as per Town standards.

Pedestrian access from the main (front) entrance to the building will be via a 1.5 m wide sidewalk on the south, west (partial) and north sides of the building. A secondary doorway will be provided on the south side of the building for the main floor and a 2nd storey stairway will extend to the west side walkway at grade.

It is proposed to reuse the existing water and sanitary sewer servicing, however the contractor will need to locate and confirm the size, location and condition of the services. Whether the existing water service splits at the property line will also need to be confirmed and if needed separated.

It is proposed that since the site pervious area is increasing from 10% to 15% that no additional stormwater controls will be required but additional efforts will be made to increase the quality control of the site.

Garbage on the site will be handled internally, and no outdoor garbage facility will be required.

Snow storage areas are proposed in the open space in the front area and can be accommodated in the excess parking spaces provided on the site. As only 10 parking spaces are required, when needed, 4 additional parking spaces in the rear of the building can be used for excess snow storage.

3.1 Proposed Stormwater Management Plan

The Town has requested a review of the stormwater management to support the Site Plan application being completed for the re-development of the Site. We have utilized the same software for modelling of the re-development conditions as was used for the existing conditions.

We have utilized the same Green Ampt infiltration and pervious Mannings n parameters as the existing condition as the pervious areas will remain the same, although the area will be expanded. All of the proposed pervious area will be maintained lawn and consequently the Mannings n value and depression storage will match existing condition values of 0.15 and 5 mm respectively.

The overall imperviousness of the site will decrease from 90% to 85% and as such the peak runoff will be decreased and the quality of the site runoff will be improved from existing.

The runoff from the site enters a shallow ditch system and flows 170 m east to a ditch inlet. The flow then enters the Town storm sewer system and is transmitted (we believe north), however we do not know the specific discharge point of the storm sewer on High Street.

The apparent poor soils, relatively high groundwater and industrial subdivision setting do not lend themselves to an infiltration based stormwater system. In addition, the shallow ditch and the relative elevation difference between the ditch and site do not allow for a hydrodynamic stormwater sediment device such as an OGS or water filtration device such as a Jellyfish filter.

There is limited room on-site for a surface filtration feature due to the parking requirements and zoning setbacks. Approximately half of the site will be routed to the existing grassed areas and swale on the south side of the site, east side of the site and NE corner of the property which will aid in the improvement of water quality.

The proposed condition model is divided into 2 subcatchments as follows:

Subcatchment A1 – 0.088 ha – This is the south half of the property including the building, parking area and swale along the eastern side of the site and is 75% impervious. The proposed grading is to the south and east towards the existing grassed swale which is sheared on the property line with the site to the east.

Subcatchment A2 – 0.067 ha – This is the northern half of the site including the remainder of the parking area. The grading is intended to direct runoff of this area overland through the pervious areas in the NE and NW corners of the site. This subcatchment is approximately 90% impervious.

Pervious areas are primarily grassed and have been assigned a mannings n of 0.15 and a depression storage of 5 mm.

Please refer to the grading and stormwater details on the proposed Grading and Servicing Plan **Drawing C2**.

Please refer to **Table 2** for a summary of the existing and post re-development Peak Flows and to **Appendix E** for the 100yr storm PCSWMM output results.

Table 2 – Pre and Post Modelling Results

Storm Event	Existing Peak Flow Offsite Total (m ³ /s)	Proposed Peak Flow Offsite Total (m ³ /s)
4 Hr Chicago		
2-year	0.04	0.03
5-year	0.05	0.04
10-year	0.06	0.05
25-year	0.07	0.06
50-year	0.07	0.07
100-year	0.08	0.07
24 Hr SCS Type II		
2-year	0.03	0.03
5-year	0.04	0.03
10-year	0.04	0.04
25-year	0.05	0.05
50-year	0.06	0.05
100-year	0.06	0.06
25 mm	0.01	0.01
Timmins	0.02	0.02

The proposed post re-development peak flows are reduced below or are equal to the existing condition flows as per the Town standards.

3.1.1 Stormwater Quality Control

Stormwater quality has been analyzed using a 25 mm 4-hour Chicago design storm. The 25 mm design storm represents 95% of all rainfall activities in an average year. By basing quality controls off of the 25 mm design storm, quality measures will be effective for most rain events in a given year.

The peak runoff in the 25 mm storm is 0.009 cms (rounded to 0.01 cms in Table 2 above) or 9 L/s. 57% of the site is routed through the existing grassed swale which provides some measure of quality control.

The existing swale can not be considered an “enhanced feature” as per the STEP LID Manual ([https://wiki.sustainabletechnologies.ca/wiki/Enhanced swales](https://wiki.sustainabletechnologies.ca/wiki/Enhanced_swales)) but it will still provide some measure of quality improvement. We have assumed a 65% TSS reduction for the swale as the underlying soils have an infiltration rate higher than 15 mm/hr, the swale is fully vegetated and the velocity in the 25 mm storm between 0.5 m/s and 1.0 m/s.

An additional 41% of the site is directed to run through the landscaped areas in the NW and NE corner of the site. Again, although these areas are not formally vegetated filter strips as defined by the STEP LID manual, but there will be some improvement to the runoff from the asphalt as it flows over this vegetated area. We have assigned a 60% TSS removal for these areas.

The remaining 2% of the site, being the asphalt entrance area drains overland directly to the ditch on Stewart with no formal treatment.

The MECP recommended treatment level for this kind of site is between 60-70% TSS removal. On an overall average for the site, it only achieves approximately 60% TSS removal, and is an improvement on the current situation which only achieves an approximate 35% TSS removal.

3.2 Proposed Water Servicing

The existing commercial building on the site is currently used as a fitness center and the proposed use of the new building will be similar as it is proposed to be a racquet sport facility. The internal configuration will have no proposed water using fixtures in the basement, one universal washroom on the main floor (one flush toilet, sink and a shower), and washroom facilities on the 2nd floor (four flush toilets, four sinks and four showers). The building will have a full sprinkler system for fire protection.

Using the OBC Table 7.4.10.5 the equivalent average day demand hydraulic load for a total fixture unit below 260 is the minimum load of 2,360 L/day, or 0.027 L/s. The MECP recommends a maximum daily peak factor of 2.0 and an hourly peak factor of 4.0. Considering the MECP maximum peak factors, the hydraulic load for the peak day condition is 0.05 L/s and the peak hourly hydraulic load is 0.26 L/s.

It is not anticipated that the proposed building will require any additional water than the existing fitness center and the existing (assumed) 25 mm dia. domestic water service will be sufficient for the use.

The assumed 25 mm dia. service must be verified (location, condition and size) and whether there is a split in the service for the neighbouring property. It is proposed that at this time the water service would remain as is, and if it is found that the service is in fact split with the neighbour that discussions be initiated with the neighbour regarding options to separate the service lines.

The required peak fire flow required for the site is calculated using the Office of the Fire Marshal, OFM Guideline, Fire Protection Water Supply Guideline for Part 3 in the OBC (2020). Calculated fire flows are 56.67 L/s resulting in a combined fire and domestic flow of 56.93 L/s.

The closest fire hydrant is located on the south side of Stewart Rd. immediately in front of the site. The unobstructed distance from the fire hydrant to the main entrance to the building is less than 90 m (23 m from the hydrant to the entrance). Due to the proximity to the hydrant, the building being less than 3 stories and less than 600 sq. m no fire route is required, and no additional fire hydrants are required.

Please refer to **Appendix F** for detailed calculations for the domestic and fire flows required to service the site. It is understood that the Town will model the required flows in their system to determine if sufficient flow and pressure is available to service the re-development for the required domestic and fire flows.

3.3 Proposed Sanitary Servicing

As per the Town Engineering Standards, the following design parameter was used for the calculation of the sanitary sewage discharge.

The sanitary flows for the commercial portion of the building are calculated using OBC Table 8.2.1.3.B for the closest equivalent non residential use, which would be Country Club (excluding food service).

The flow is calculated using the number of patrons and the number of employees. The proposed maximum occupancy for the building is 60 people. We have assumed that there will be 4 employees, 10 hrs of operation with 3 courts. The total number of players is therefore 10 people per game x 45 minutes per game x 10 hrs of operation = 133 players

Employees = 4 employees x 50 l/employee/shift = 200 L/day

Patrons = 133 patrons x 40 L/patron = 5,320 L/day

The total flow calculated for the commercial portion is equal to 5,520 L/10 hr day or 0.15 L/s.

Using Manning's Formula to check the capacity of the existing (assumed) 125 mm dia. sanitary service at a slope of 2% is 10 L/s.

Alternatively, the calculated domestic water demand (0.26 L/s) could be used to approximate the sewage flows, in which case there would still be significant capacity in the existing sanitary line.

The Town Engineering Standards specify commercial lots shall have a sanitary service with a minimum size of 200 mm dia. per section 4.3.3.4. If the service is 125 mm dia. installed at a minimum slope of 2% there is sufficient capacity in the service lateral to service, the proposed building.

It is proposed to use the existing sanitary lateral to service the proposed building. The size, slope and condition of existing lateral are to be confirmed before construction occurs as any of these factors may result in the requirement for a new service to be installed. If a new service is required, it shall be the Town specified size of 200 mm dia.

3.4 Erosion and Sediment Control

We recommend that silt fence per OPSD 219.130 be installed along the exterior of the limit of re-development of the Site as shown in **Drawing C3**. These controls should remain in place and be maintained until the vegetation is re-established on the lots.

3.5 Utilities

Coordination with utilities is being completed by others. It is anticipated that the building will require a standard hydro connection from Stewart Rd. Telecommunications and Hydro connections will be coordinated directly by the Owner with the utilities at Building Permit stage.

4.0 Conclusions

The proposed re-development of 12 Stewart Rd., Collingwood will include a new two-story 325.47 sq. m commercial building. The building is proposed to be a racquet sport facility. The reconstructed site will include parking north and south of the building connected by one-way driving lanes on the east and west sides of the building.

It is proposed to re-use the existing sanitary and water service lines if condition/sizing allow. The service size, location and condition need to be confirmed prior to construction.

There is currently no stormwater management controls on the site, but it is proposed to reduce the impervious area which will reduce the peak flows offsite, and quality control will be improved from the existing condition.

We believe the redevelopment of the site can be constructed to meet the Town of Collingwood requirements.

Report Prepared By:



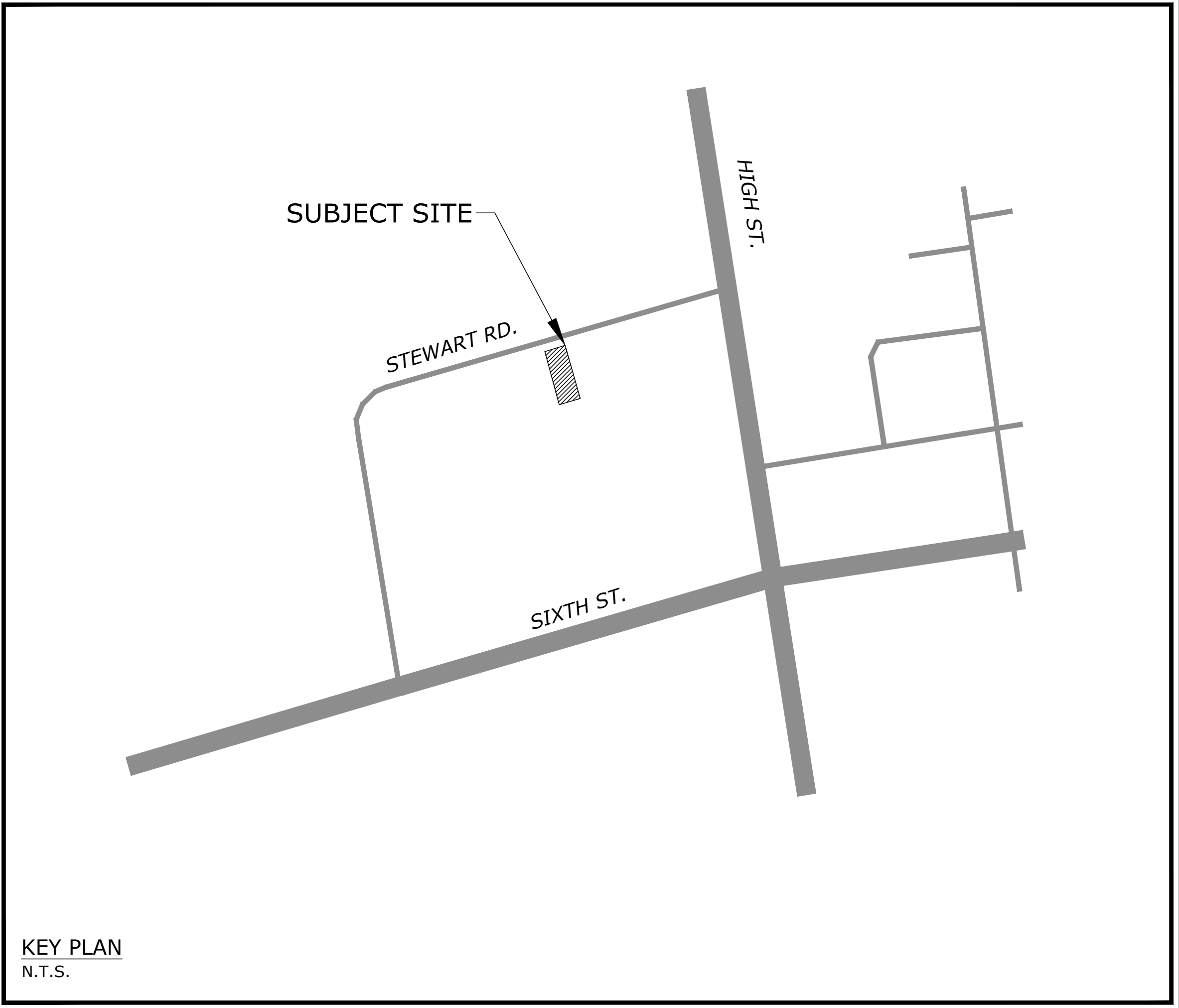
Clayton Capes, MSc. P.Eng.
CAPES Engineering



12 STEWART ROAD SITE PLAN TOWN OF COLLINGWOOD

DRAWING INDEX

C1	SITE PLAN
C2	GRADING AND SERVICING PLAN
C3	EROSION & SEDIMENT CONTROL PLAN
C4	STANDARD DETAILS
C5	GEOTECHNICAL SPECIFICATIONS

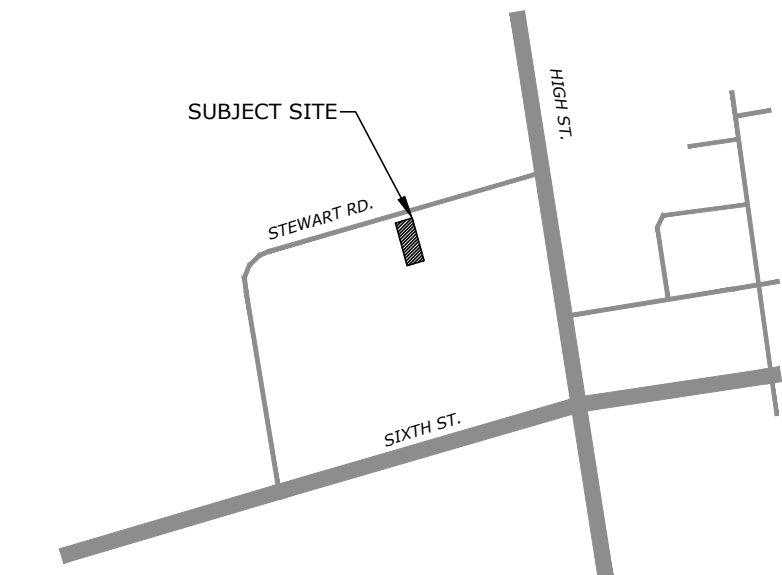
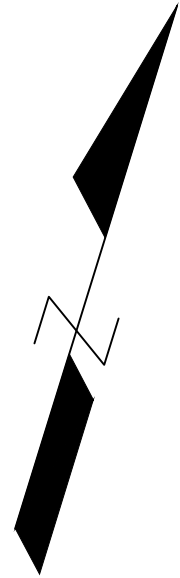


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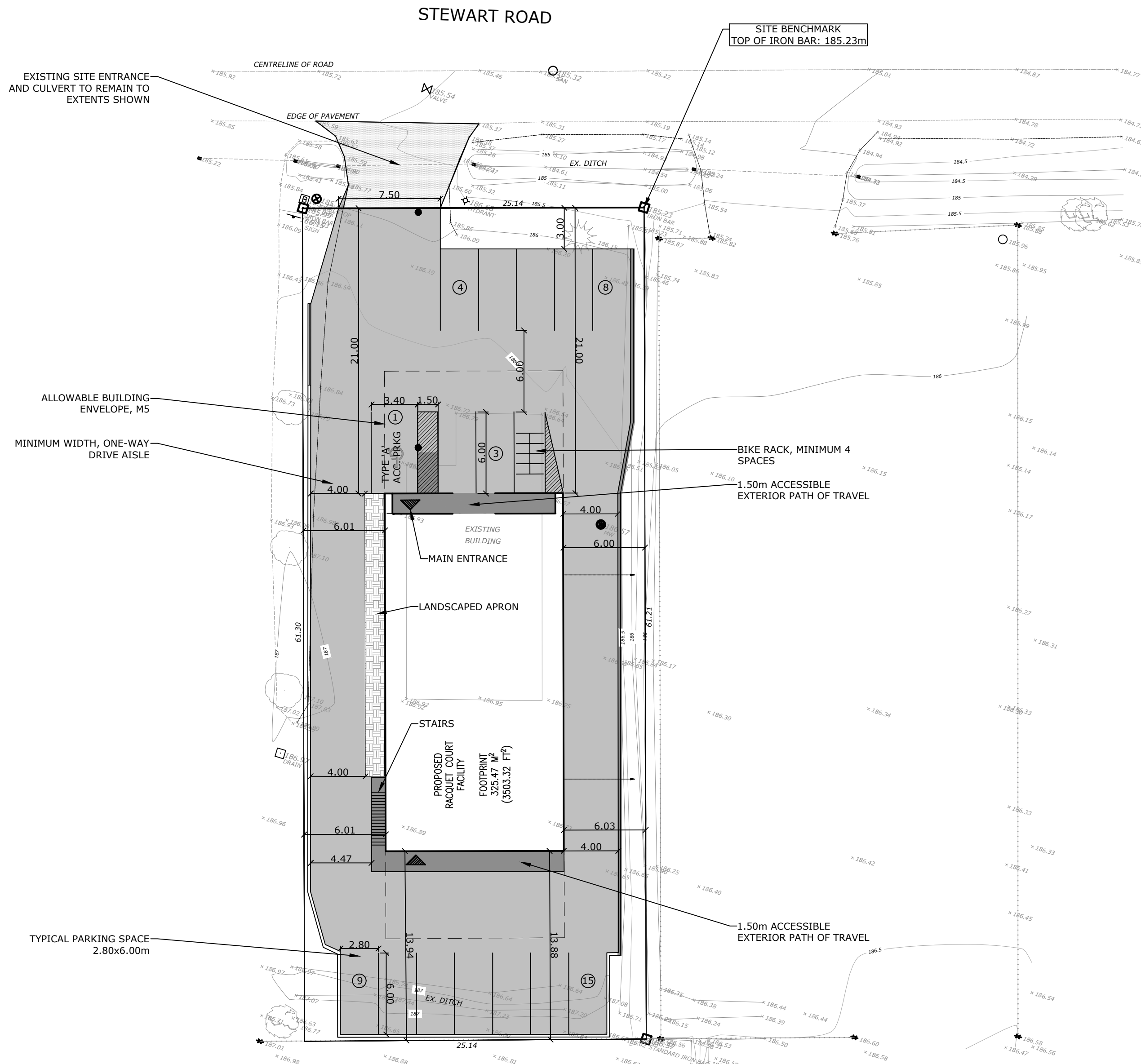
Project No. 2025-054

REVISED FOR APPROVALS - 26/04/29





KEY PLAN



ACCEPTED FOR
CONSTRUCTION
TOWN OF COLLINGWOOD

PER
DATE:

- Notes
- This drawing is the exclusive property of CAPES Engineering Ltd. The reproduction of any part without express written consent of this Corporation is strictly prohibited.
 - The contractor shall verify all dimensions, levels, and datums on site and report any discrepancies or omissions to CAPES Engineering Ltd. prior to construction.
 - This drawing is to be read and understood in conjunction with all other plans and documents applicable to this project.
 - CAPES Engineering Ltd. accepts no responsibility for interpretation of third party information, contractor to verify all third party information prior to construction.
 - This is not a plan of survey. Any and all representation of property boundaries are approximate only.

No	Revision	Date
1	FOR CLIENT REVIEW	2025-07-14
2	REVISED FOR APPROVALS	2026-04-29

THIS IS NOT A PLAN OF SURVEY. ALL BOUNDARIES SHOWN ARE APPROXIMATE ONLY, AND SHALL BE CONFIRMED BY LICENSED ONTARIO LAND SURVEYOR (OLS). ELEVATIONS SHOWN HEREON ARE GEODETIC DERIVED FROM GPS REAL TIME NETWORK OBSERVATIONS USING THE 'CAN-NET' VRS NETWORK. DATUM: CGVD 2028:78. ALL COORDINATES AND ARE IN "GRID" DISTANCES, NAD83 - UTM 17N (CANADA)

SITE BENCHMARK:
TOP OF IRON BAR, NORTHEAST LOT CORNER
ELEV. 185.23m

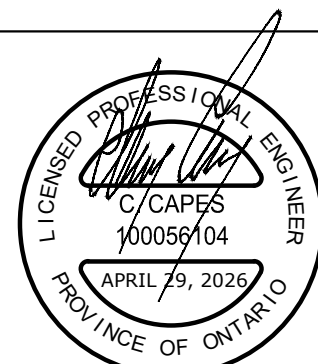
FIELD WORK COMPLETED: 08-MAY-2025 JoeTOPO SURVEYS AND CADD INC.

TOWN OF COLLINGWOOD ZONING BY-LAW, M5 ZONING			TOTAL BUILDING AREA = 316sq.m GROSS FLOOR AREA, 2 STOREY = 316sq.m APPROX.	
PROVISIONS	REQUIRED (M5)	PROVIDED		
MINIMUM LOT AREA (sq.m)	2,000	1540		
MINIMUM LOT FRONTAGE (m)	30.0	25.14		
MINIMUM FRONT YARD (m)	12.0	21.00		
MINIMUM INTERIOR SIDE YARD (m)	6.0	6.00		
MINIMUM REAR YARD (m)	7.5	13.88		
MAXIMUM HEIGHT (m)	15.0	15.0		
MAXIMUM LOT COVERAGE (%)	50	20.5		
MINIMUM LANDSCAPED OPEN SPACE (%)	15	15		
PARKING SETBACK FROM STREET (m)	3.0	3.0		
ENTRANCE WIDTH (m)	7.5 - 15.0	EX. 7.50		
PARKING REQUIREMENTS				
PARKING SPACES	3/100sq.m GFA	14		
DELIVERY SPACES	SEE BELOW	0		
LOADING SPACES	SEE BELOW	0		
ACCESSIBLE PARKING SPACES	SEE BELOW	1, TYPE 'A'		
BICYCLE SPACES	10% OF REQ'D PARKING (NO LESS THAN 4)	4		

Table 5.9.1.1 Required Number of Delivery Spaces	
Uses	Number of Delivery Spaces Required
Hotel or Motel	1 space per 150 suites
Hospital or School	1 space
Any other main building in a Commercial, Industrial or Community Services Zone	1 space for any building between 460 m² of GFA and 2500 m² of GFA. Any building larger than 2500 m² of GFA is automatically subject to Section 5.10 entitled Loading Space Regulations

Table 5.10.1.1 Required Number of Loading Spaces	
Gross Floor Area	Number of Loading Spaces Required
From 2,501 m² GFA to 7,000 m² GFA	1 space
From 7,001 m² GFA to 10,000 m² GFA	2 spaces
For every additional 2,500 m² GFA beyond 10,000 m² GFA	1 additional space

5.11 Accessible Parking	
5.11.1	The minimum number of required accessible parking spaces shall be in accordance with Table 5.11.1.1 entitled Required Number of Accessible Spaces.
Table 5.11.1.1 Required Number of Accessible Parking Spaces	
Total Number of Parking Spaces Required	Number of Accessible Parking Spaces Required
1 to 25 spaces	Minimum of 1 space
26 to 50 spaces	Minimum of 2 spaces
51 to 100 spaces	Minimum of 3 spaces
Over 100 spaces	2% of the total required parking spaces
5.11.2	Parking spaces for the disabled shall be included as part of the total calculation of required parking spaces for any lot, building or use.



Client
ALEX CARTER

CAPES
ENGINEERING

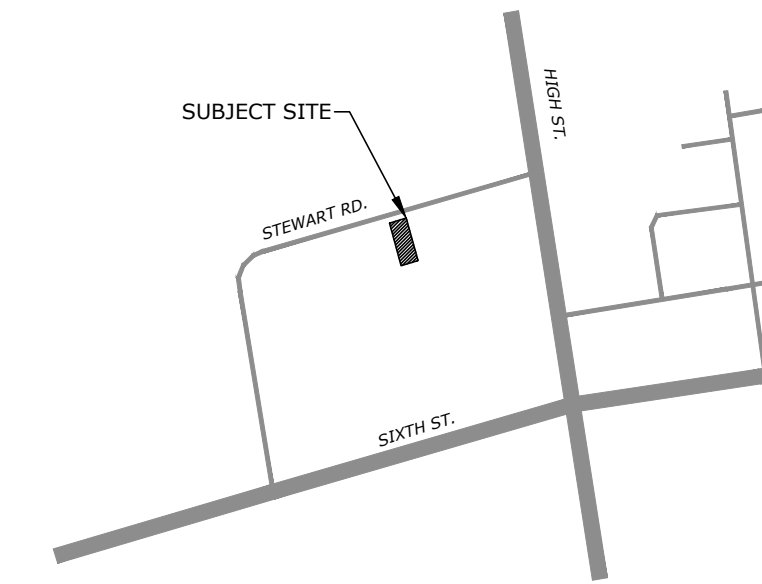
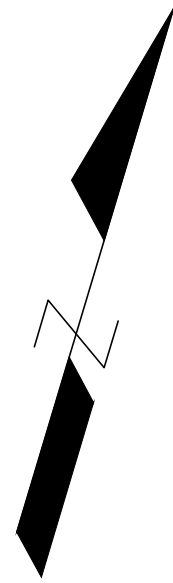
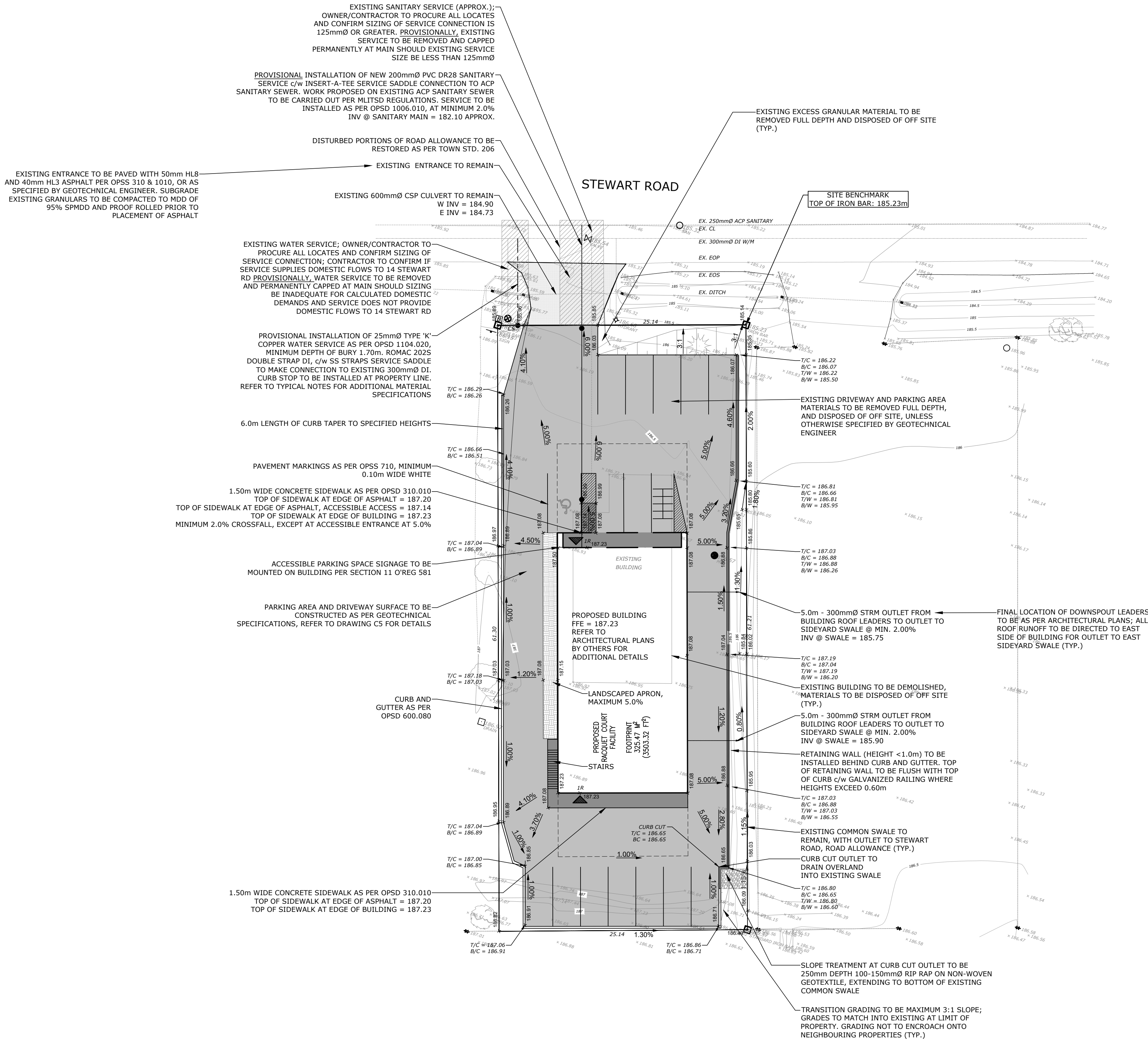
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12 STEWART ROAD SITE PLAN

SITE PLAN

Designed K. GRIFFIN	Checked C. CAPES	Date 25/10/31	Drawing No.
Project No. 2025-054	Rev No. 1		
Scale 1:250	0 5.0 10.0 15.0m		

C1



KEY PLAN

LEGEND

- 221.21 PROPOSED ELEVATION
- 221.21 EXISTING ELEVATION
- MAXIMUM 3:1 SLOPE UNLESS OTHERWISE NOTED
- CURB DEPRESSION
- HYDRANT & VALVE
- SANITARY MANHOLE/SEWER
- WATERMAIN
- SANITARY SINGLE HOUSE CONNECTION AND CLEANOUT
- WATER SERVICE CONNECTION AND CURB STOP

ACCEPTED FOR
CONSTRUCTION
TOWN OF COLLINGWOOD

PER
DATE:

Notes
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DATUM: CGVD 2028.78.
ALL COORDINATES AND ARE IN "GRID" DISTANCES, NAD83 - UTM 17N (CANADA)
SITE BENCHMARK:
TOP OF IRON BAR, NORTHEAST LOT CORNER
ELEV. 185.23m
FIELD WORK COMPLETED: 08-MAY-2025 JoeTOPO SURVEYS AND CADD INC.

No	Revision	Date
1	ISSUED FOR APPROVALS	25/11/12
2	REVISED FOR APPROVALS	26/04/29



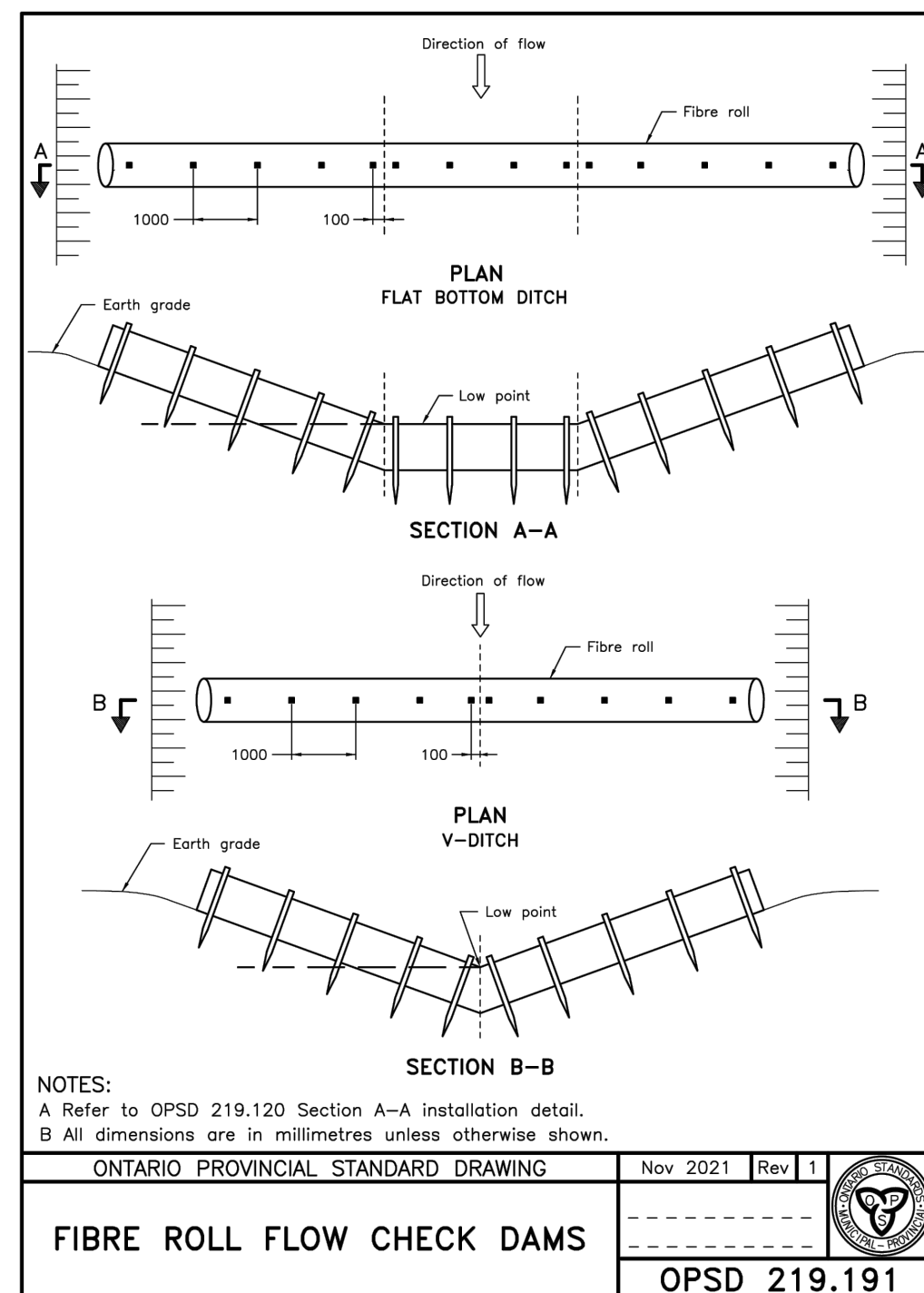
Client
ALEX CARTER



12 STEWART ROAD SITE PLAN
GRADING AND SERVICING PLAN

Designed K. GRIFFIN	Checked C. CAPES	Date 25/10/31	Drawing No.
Project No. 2025-054	Rev No. 2		C2
Scale 1:250	0 5.0 10.0 15.0m		

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- ## SEEDING

1. AREAS OF SITE LEFT UNSTABLE FOR MORE THAN 30 DAYS TO BE STABILIZED WITH ACCEPTABLE GROUND COVER
 OPTIONS: BLOWER TRUCK APPLICATION OF MEDIA/SEED/MULCH MIX, HYDROSEEDING, MECHANICAL OR BROADCAST; SPECIES TO BE APPROVED BY TOWN OF SANGER THINGS, IN ACCORDANCE WITH LANDSCAPING PLANS
3. SEEDING IDEALLY APPLIED BETWEEN APRIL 15 & MAY 30 OR AUGUST 15 & SEPTEMBER 15
4. BARE SOIL TO BE PROPERLY SCARIFIED TO PREPARE FOR PLANTING IF SOIL HAS BEEN CRUSTED OVER OR COMPACTED.
5. MINIMUM 75mm OF TOPSOIL APPLIED TO ALL AREAS SUBJECT TO PERMANENT LANDSCAPING.
6. TREED TRACKING/CAT TRACKING METHOD TO BE USED FOR SEEDING ON SLOPES > 3:1.
7. SEED COVERED WITH EROSION CONTROL MATS/BLANKETS/MATTING AS NEEDED FOR SLOPES > 2:1.
8. AREAS THAT DO NOT SHOW GROWTH WITHIN 14 DAYS TO BE RE-SEED, RE-MULCH APPLIED AFTER OR WITH SEED.

SODDING

10. SOD TO BE LAID IN STRAIGHT LINES, PERPENDICULAR TO SLOPING.
11. PIECES OF SOD TIGHTLY BUTTED TOGETHER BUT WITHOUT OVERLAPPING OR STRETCHING.
12. INSTALLED IN A BRICK-WORK TYPE PATTERN WITH STAGGERING OF JOINTS IN ADJACENT ROWS.
13. SOD TO BE NOTCHED INTO EXISTING GRASS.
14. SOD TO BE ANCHORED IN PLACE IF INSTALLED ON SLOPES $>3:1$.
15. SOD TO BE ADEQUATELY IRRIGATED POST INSTALLATION.
16. SOD TO BE INSTALLED DURING PROPER WEATHER CONDITIONS.

RIP-RAP

17. GEOTEXTILE FABRIC LINER TO BE INSTALLED UNDER RIP RAP

ROLLED EROSION CONTROL PRODUCTS

18. STRIPS INSTALLED PARALLEL TO FLOW IN SWALES OR CONVEYANCE CHANNELS.
19. STRIPS INSTALLED UP AND DOWN A HILL (VERTICALLY) FOR LONG SLOPES (DOES NOT INCLUDE WATERCOURSE BANKS).
20. BLANKETS OVERLAPPING 20cm ON SIDES, TOPS AND BOTTOMS.
21. BLANKETS NOT TO BE STRETCHED.
22. MAXIMUM SLOPE ON WHICH PRODUCT IS USED BASED ON MANUFACTURER'S SPECIFICATIONS.
23. CONTINUOUS CONTACT WITH SOIL SURFACE AND NO TENTING.
24. ANCHORED WITH SUFFICIENT QUANTITY OF WOODEN OR BIODEGRADABLE STAKES OR METAL STAPLES, SPACED AS SPECIFIED IN MANUFACTURER RECOMMENDATIONS.
25. FIRMLY ANCHORED AT TOP AND BOTTOM, WITH ANCHOR TRENCHE AT THE BOTTOM.

GROWTH MEDIA EROSION CONTROL BLANKETS

26. APPLIED AT A DEPTH OF 25-100mm.
27. >50mm THICKNESS APPLIED FOR SLOPES >2:1.
28. 75-100mm APPLIED FOR SLOPES 1:1 OR GREATER.
29. OVERLAPPED 1-3m AT THE TOP OF THE SLOPE TO WHICH THE BLANKET IS APPLIED.

VEGETATIVE BUFFER STRIPS

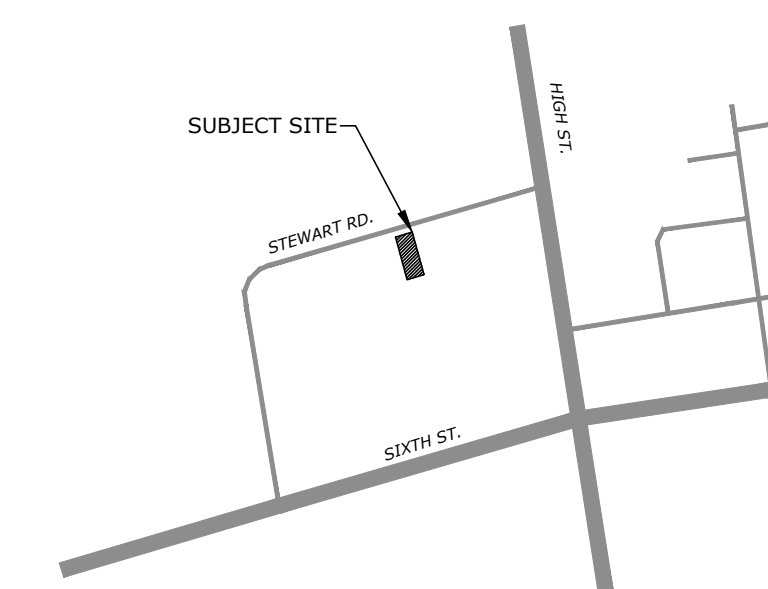
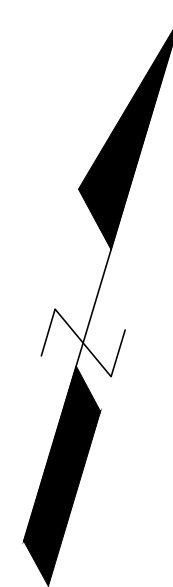
30. >30m WIDE AND ADJACENT TO WATERCOURSES.

INTERCEPTOR SWALE AND DIVERSION DIKE

31. SWALE MINIMUM 300mm DEEP AND 600mm WIDE.
32. BOTH SWALES AND DIKE SIDE SLOPES CONSTRUCTED TO BE 3:1 OR LESS.
33. STABILIZED BY SEEDING OR RIP RAP, ESPECIALLY AT INLET AND OUTLET.
34. IMMEDIATE STABILIZATION MANDATORY FOR SWALES/DIKES AND IMMEDIATELY FOLLOWING A STORM EVENT. SWALES TO BE STABILIZED WITH SEEDING OPERATIONS AND RIP-RAP TREATMENT AS REQUIRED.
35. FLOW VELOCITIES IN THE SWALE REDUCED WITH FLOW INTERRUPTION DEVICES.

CHECK DAMS

36. CENTRE HEIGHT < 1.0m; CENTRE NOTCHED APPROXIMATELY 150mm, INCLUDING SPILLWAY.
37. ROCK PILED WITH A MAXIMUM UPSTREAM SLOPE OF 2:1 AND MAXIMUM DOWNSTREAM SLOPE OF 4:1.
38. SIDES OF DAM PILED UP THE DITCH SLOPE AT LEAST 0.5m HIGHER THAN THE CENTRE OF THE DAM.
39. FOR DAMS USED IN SERIES IN A SWALE OR CHANNEL, HEIGHT OF SUCCESSIVE CHECK DAMS MUST BE EQUAL TO THE ELEVATION OF THE BASE OF THE PREVIOUS DAM.
40. CONSTRUCTED WITH 3 LAYERS; BOTTOM LAYER CONSISTING OF 450mm OF



KEY PLAN

LEGEND

- | | |
|---|---|
|  | PROPOSED ELEVATION |
|  | EXISTING ELEVATION |
|  | MAXIMUM 3:1 SLOPE
UNLESS OTHERWISE NOTED |
|  | CURB DEPRESSION |
|  | HYDRANT & VALVE |
|  | SEDIMENT FENCING |

- 5cm DIA. STONE, MIDDLE LAYER NON-WOVEN GEOTEXTILE FABRIC, AND TOP LAYER CONSISTING OF 10cm OF 15cm DIA. STONE.
41. CHECK DAM SPILLWAY WIDTH APPROXIMATELY THE SAME WIDTH AS THE DITCH BOTTOM.
 42. STONES PLACED UP THE SIDES OF THE DITCH ABOVE THE ELEVATION ON THE SPILLWAY TO PREVENT WASHOUTS.
 43. STONE SIZE OF 5-10cm FOR DITCH GRADES LESS THAN 2% AND 7-30cm FOR DITCH GRADES 2% AND GREATER.
 44. INSTALLED DOWNSTREAM OF SEDIMENT TRAPS.

SILT FENCING

45. TRENCHED IN AT LEAST 150mm.
46. STAKES INSTALLED ON DOWNSLOPE SIDE.
47. MAXIMUM 2.0m BETWEEN POSTS FOR HEAVY-DUTY FENCES AND 2.3m For LIGHT-DUTY.
48. ENDS TURNED UP SLOPE WHERE POSSIBLE.
49. FABRIC IS NON-WOVEN SYNTHETIC FABRIC MATERIAL (WITH A WEAVE DENSITY OF 270R OR EQUIVALENT) STRETCHED ACROSS AND ATTACHED TO SUPPORTING POST AND WIRE FENCE.
50. FABRIC TAUGHT BETWEEN POSTS.
51. STRUCTURAL FENCING USED TO BACK THE SILT FENCE.
52. POSITIONED ON A LEVEL CONTOUR RATHER THAN UP AND DOWN SLOPES.
53. GAPS, 2.0m MAXIMUM OVERLAP OF NEW CLOTH SECTIONS.
54. POSITIONED TO RECEIVE ONLY SURFACE SHEET FLOWS, NOT CONCENTRATED FLOWS.

55. TOE COMPACT
PLACEMENT.

- SEDIMENT TRAPS
56. 125m³ STORAGE PER HECTARE OF DRAINAGE AREA MINIMUM.
57. SEDIMENT TRAPS CAN BE USED TO TREAT UP TO 2 HECTARES OF DISTURBED AREA.
58. STABILIZED EMBANKMENTS.
59. LOCATED IN A FLAT LAND AREA, AWAY FROM WATERCOURSES AND WETLANDS.

MUD MAT/CONSTRUCTION ENTRANCE

60. STONE PAD TO BE MINIMUM 450mm THICK, 30m LONG AND 6.0m WIDE.
61. THE FIRST 15m FROM THE ENTRANCE SHALL BE CONSTRUCTED OF 50mm CLEAR STONE.
62. THE REMAINING 15m SHALL BE CONSTRUCTED WITH 150mm RIP RAP.
63. PAD UNDERLAIN WITH A GEOTEXTILE (OR GRADED AGGREGATE FILTER).
64. CLEAR/REPLACE/MAINTAIN AS REQUIRED DURING CONSTRUCTION.

ACCEPTED FOR
CONSTRUCTION
TOWN OF COLLINGWOOD

PER

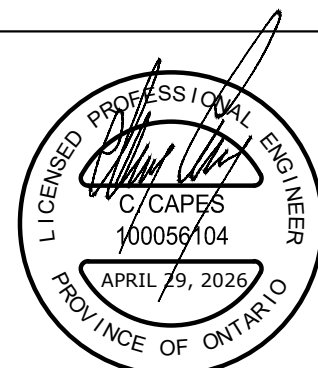
DATE:

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DATUM: CGVD 2028:78.
ALL COORDINATES AND ARE IN "GRID" DISTANCES, NAD83 - UTM 17N (CANADA)

SITE BENCHMARK:
TOP OF IRON BAR, NORTHEAST LOT CORNER
ELEV: 185.23m

FIELD WORK COMPLETED: 08-MAY-2025 JoeTOPO SURVEYS AND CADD INC.

[illegible]

Client
ALEX CARTER



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12 STEWART ROAD SITE PLAN

EROSION & SEDIMENT CONTROL PLAN

Designed K. GRIFFIN	Checked C. CAPES	Date 25/11/07
Project No. 2025-054		Rev No. 2
Scale 1:250 		

[illegible]

Appendices

Appendix A – Legal & Site Plan

PLAN MATERIALS	
ITEM	DESCRIPTION
MYLAR	TRANSLAR N° 3
GAUGE	0.08 mm
INK	HIGGINS N° 4465

**PLAN OF SURVEY OF
PART OF LOT 43, CONCESSION X
(FORMERLY TOWNSHIP OF NOTTAWASAGA)
TOWN OF COLLINGWOOD, COUNTY OF SIMCOE**

SCALE 1:750
0 5 10 15 30 M
ZUBEK, EMO AND PATTEN LTD.
1979

METRIC
THE MEASUREMENTS SHOWN ON THIS PLAN ARE IN
METRES AND MAY BE CONVERTED TO FEET BY
DIVIDING BY 0.3048.

CAUTION THIS PLAN IS NOT A PLAN OF SUBDIVISION
WITHIN THE MEANING OF THE PLANNING ACT.

NOTES

BEARINGS HEREON ARE ASTRONOMIC AND ARE REFERRED
TO THE BEARING OF STEWART ROAD ASSUMED TO BE
N73°44'40"E, IN ACCORDANCE WITH PLAN 51R-6303.

⊕ DENOTES 0.025x0.025x1.219 IRON SURVEY BAR
⊙ DENOTES 0.016x0.016x0.610 IRON SURVEY BAR

SURVEYOR'S CERTIFICATE

I HEREBY CERTIFY THAT:
1. THIS SURVEY AND PLAN ARE CORRECT AND IN ACCORDANCE
WITH THE SURVEYS ACT AND THE REGISTRY ACT AND THE
REGULATIONS MADE THEREUNDER.
2. THE SURVEY WAS COMPLETED JUNE 9, 1979.

JUNE 12, 1979 *Ronald J. EMO* O.L.S.

RONALD J. EMO
ONTARIO LAND SURVEYOR
COLLINGWOOD

PLAN 51R-8882

RECEIVED AND DEPOSITED

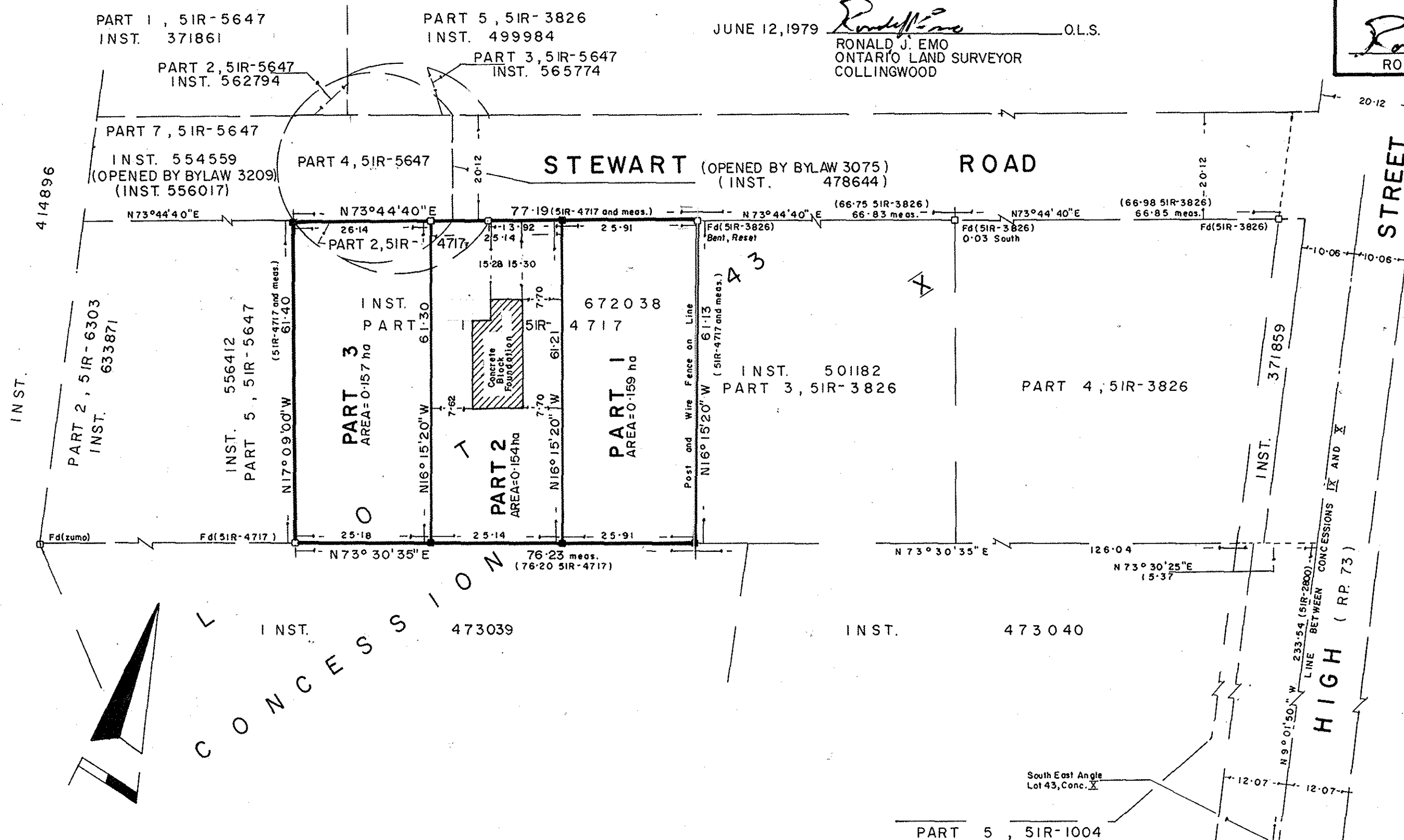
AUG 16, 1979
DATE

J. G. Baker
DEPUTY LAND REGISTRAR
FOR THE REGISTRY DIVISION OF
SIMCOE (51).

I REQUIRE THIS PLAN TO BE
DEPOSITED UNDER THE
REGISTRY ACT.

JUNE 19, 1979
DATE

Ronald J. EMO
RONALD J. EMO



ABBREVIATIONS:

A/C	AIR CONDITIONER / CONDITIONING	FOS	FACE OF STUDS	QT	QUARRY TILE
AB	ANCHOR BOLT	FRFP	FIREPROOF	QTY	QUANTITY
ABV	ABOVE	FR	FIRE RATED		
ACT	ACOUSTIC CEILING TILE	FT	FOOT, FEET	R	RISER
ADJ	ADJACENT	FTG	FOOTING	RAD	RADIUS
AFT	ABOVE FINISHED FLOOR	FUR	FURRING	RCP	REFLECTED
ALT	ALTERNATE	FUT	FUTURE		CEILING PLAN
ALUM	ALUMINUM			RD	ROOF DRAIN
ANOD	ANODIZED	GA	GAUGE	RE / REF	REFER, REFERENCE
AP	ACCESS PANEL	GALV	GALVANIZED	REFR	REFRIGERATOR
APL	ASSUMED PROPERTY LINE	GB	GRAB BAR	REG	REGISTER
APPROX	APPROXIMATELY	GC	GENERAL CONTRACTOR	REIN	REINFORCE
ARCH	ARCHITECTURAL	GL	GLASS	REQ	REQUIRE(D)
ASPH	ASPHALT	GR	GRADE	RESIL	RESILIENT
AUTO	AUTOMATIC	GYP	GYPSPUM	REV	REVERSE(D), REVISION
AVG	AVERAGE	GYP BD	GYPSPUM BOARD	RFC	ROOFING
				RFL	REFLECTED
BD	BOARD	HB	HOSE BIB	RH	RIGHT HAND
BITUM	BITUMINOUS	HC	HOLLOW CORE	RM	ROOM
BLDG	BUILDING	HDR	HEADER	RO	ROUGH OPENING
BLK	BLOCK	HDWD	HARDWOOD		
BLKG	BLOCKING	HDWR	HARDWARE	S	SOUTH
BM	BEAM	HM	HOLLOW METAL	SC	SCHEDULE
BO	BOTTOM OF	HOR/HORIZ	HORIZONTAL	SECT	SECTION
		HR	HANDRAIL, HOUR	SF	SQUARE FEET
CAB	CABINET	HT	HEIGHT	SH	SHELF
CARP	CARPET	HTR	HEATER	SHT	SHEET
CB	CATCH BASIN	HVAC	HEATING, VENTILATION,	SHG	SHEATHING
CEM	CEMENT		AIR CONDITIONING	SHWR	SHOWER
CER	CERAMIC	HW	HOT WATER	SHW	SIMILAR
CI	CAST IRON	ID	INSIDE DIAMETER	SLDG	SLIDING
CL	CLOSET	IN	INCH(ES)	SOG	SQUARE METERS
CLG	CEILING	INCL	INCLUDE(D), INCLUDING	SPEC	SPECIFY, SPECIFICATION
CLR	CLEAR	INSUL	INSULATE, INSULATION	SPKL	SPRINKLER
CMU	CONCRETE MASONRY UNIT	INT	INTERIOR	SPKR	SPEAKER
CNTR	COUNTER	JST	JOIST	SS	SQUARE
COL	COLUMN	JT	JOINT	SS	STAINLESS STEEL
CONC	CONCRETE	LAM	LAMINATE(D)	STD	STONE
COND	CONDITION	LAV	LAVATORY	STL	STEEL
CONN	CONNECTION	LF	LEAR FOOT / FEET	STOR	STORAGE
CONST	CONSTRUCTION	LH	LEFT HAND	STRUCT	STRUCTURAL
CONT	CONTINUOUS	LKR	LOCKER	SUSP	SUSPENDED
CORR	CORRIDOR	LR	LIVING ROOM	SW	SWITCH
CPT	CARPET TILE	LRG	LARGE	SYM	SYMMETRICAL
CSK	COUNTERSUNK	LT	LIGHT	SYN	SYNTHETIC
CT	CERAMIC TILE	LVR	LOUVER	STS	SYSTEM
CTR	CENTRE				
CW	COLD WATER				
DBL	DOUBLE	M	METERS	T	TREAD
DEMO	DEMOLISH / DEMOLITION	MAINT	MAINTENANCE	T&B	TOP AND BOTTOM
DF	DIAMETER	MATL	MATERIAL	T&G	TONGUE AND GROVE
DIA	DIAMETER	MAX	MAXIMUM	TB	TOWEL BAR
DM	DIMENSION	MECH	MECHANICAL	TBD	TO BE DETERMINED
DSP	DISPENSER	MEMB	MEMBRANE	TC	TOP OF CURB
DV	DIVISION	MEZZ	MEZZANINE	TEL	TELEPHONE
DN	DOWN	MFR	MANUFACTURER	TEMP	TEMPORARY/TEMPERATURE
DO	DOOR	MIN	MINIMUM	TER	TERRAZZO
DS	DOWN SPOUT	MIR	MIRROR	TF	TOP OF FOOTING
DTL	DETAIL	MISC	MISCELLANEOUS	THK	THICK, THICKNESS
DWG	DRAWING	MO	MOUNTED	THR	THRESHOLD
DWR	DRAWER	MTD	MOUNTED	THRU	THROUGH
		MTL	METAL	TO	TOP OF
E	EAST	MUL	MULLION	TOC	TOP OF CONCRETE
EA	EACH			TOL	TILE
EL	ELEVATION	N	NORTH	TOP	TOP OF PARAPET
ELEC	ELECTRICAL	N/A	NOT APPLICABLE	TOS	TOP OF SLAB
ELEV	ELEVATOR	NIC	NOT IN CONTRACT	TP	TOP OF PAVEMENT
EMER	EMERGENCY	NO	NUMBER	TPD	TOILET PAPER DISPENSER
ENG	ENGINEER	NOM	NOMINAL	TS	TOP OF STEEL
EOS	EDGE OF SLAB	NTS	NOT TO SCALE	TV	TELEVISION
EQ	EQUAL(LY)			TYP	TYPICAL
EQUIP	EQUIPMENT	O/	OVER	UNFIN	UNFINISHED
EST	ESTIMATE	OA	OVER ALL	UNO	UNLESS NOTED OTHERWISE
EW	EACH WAY	OC	ON CENTRE	UR	URINAL
EX/EXIST	EXISTING	OD	OUTSIDE DIAMETER		
EXP	EXPANSION	OFF	OFFICE	V	VOLT(S)
EXT	EXTERIOR	OH	OVERHANG	VCT	VINYL COMPOSITE TILE
FA	FIRE ALARM	OPNG	OPENING	VERT	VERTICAL
FAST	FASTEN(ER)	OPP	OPPOSITE	VEST	VESTIBULE
FD	FLOOR DRAIN	OVHD	OVERHEAD	VER	VERIFY
FDN	FOUNDATION			VOL	VOLUME
FE	FIRE EXTINGUISHER	PD	PEDESTAL		
FEC	FIRE EXTINGUISHER CABINET	PER	PERIMETER	W	WEST
FF	FINISHED FLOOR	PERF	PERFORATED	W/	WITH
FFE	FIXTURE, FURNITURE, EQUIPMENT	PERP	PERPENDICULAR	W/O	WITHOUT
FC	FINISHED GRADE	PL	PROPERTY LINE	W/C	WATER CLOSET
FHC	FIRE HOSE CABINET	PL	PLATE	WD	WOOD
FIN	FINISH(ED)	PLAM	PLASTIC LAMINATE	WF	WIDE FLANGE
FIN	FINISH(ED)	PLAS	PLASTER	WH	WATER HEATER
FIXT	FIXTURE	PLBS	PLUMBING	WI	WROUGHT IRON
FLASH	FLASHING	PLYWD	PLYWOOD	WP	WATERPROOF(ING)
FLR	FLOOR	PR	PAIR	WSC	WAINSCOT
FLUOR	FLUORESCENT	PRCST	PRECAST		
FOC	FACE OF CONCRETE	PRFAB	PREFABRICATED		
FOF	FACE OF FINISH	PROP	PROPERTY		
FOM	FACE OF MASONRY	PT	PAINT	YD	YARD

ABBREVIATIONS

	BARRIER FREE		FINISHES TAG		REFLECTED CEILING FINISHES AND HT.
	DOOR TAG		FLOOR DRAIN		REVISION NUMBER
	DETAIL BUBBLE		GRADE ELEVATION - NEW		ROOM NUMBER
	ELEVATION FINISHES		GRADE ELEVATION - EXIST.		SECTION TAG
	ELEVATION TAG		INTERIOR ELEVATION		WALL TYPE TAG
					WINDOW TAG

LEGEND

- ALL WORK SHALL BE CONDUCTED IN ACCORDANCE TO ALL STATUTES, BY LAWS, CODES AND REGULATIONS OF THE AUTHORITIES HAVING JURISDICTION OVER THIS PROJECT.
- ALL NOTES CONTAINED IN THESE DRAWINGS AND ANY WRITTEN SPECIFICATIONS SHALL BE PART OF THE CONSTRUCTION CONTRACT DOCUMENTS AND THE REQUIREMENTS OF SUCH NOTES WILL BE THE RESPONSIBILITY OF THE GC. CONSTRUCTION CONTRACT DOCUMENTS SHALL REPRESENT THE ENTIRE AGREEMENT BETWEEN THE CLIENT AND THE GC FOR THE COMPLETION OF THIS CONSTRUCTION PROJECT.
- FOR ALL STRUCTURAL, MECHANICAL AND ELECTRICAL DETAILS REFER TO ENGINEER'S DRAWINGS.
- GC SHALL FIELD VERIFY ALL SITE CONDITIONS AND REQUIREMENTS. GC WILL REPORT TO THE ARCHITECT UPON FINDING ANY DISCREPANCIES.
- NO CHANGES OR MODIFICATIONS TO THE WORK SHALL BE MADE WITHOUT THE APPROVAL OF THE CLIENT OR THE ARCHITECT REGARDING THESE DISCREPANCIES.
- COMMUNICATION WITH CLIENT, THE ARCHITECT, CONSULTANTS OR REGULATORY AGENCIES SHALL NOT BE CONSIDERED VALID AND ANY CHANGES IN WORK, ADDITIONAL COSTS, APPROVAL OR NON APPROVALS RESULTING DUE TO SUCH COMMUNICATION SHALL BE THE CONTRACTORS RESPONSIBILITY.
- ANY DAMAGES BY GC TO EXISTING BASE BUILDING WITHIN THIS CONTRACT WILL BE THE RESPONSIBILITY OF THE GC AND WILL BE RECTIFIED AT GC'S OWN EXPENSE.
- GC IS RESPONSIBLE FOR ALL DEMOLITION AND DISPOSAL OF ALL ITEMS SLATED FOR DEMOLITION / REMOVAL UNLESS OTHERWISE DIRECTED BY THE CLIENT.
- GC IS RESPONSIBLE FOR FLOOR PATCHING, LEVELING AND PREPARATION FOR AND OF FLOOR FINISHES.
- GC IS REQUIRED TO REVIEW, VERIFY, AND FULLY UNDERSTAND ALL SCOPE OF WORK RELATING TO THE CONTRACT DOCUMENTS AND THE SCOPE OF WORK WITHIN THIS PROJECT.
- THESE DRAWINGS ARE THE PROPERTY OF REFLECT ARCHITECTURE INC. AND THEY ARE NOT TO BE REPRODUCED IN WHOLE OR IN PART WITHOUT THE PRIOR WRITTEN CONSENT OF REFLECT ARCHITECTURE INC.
- DO NOT SCALE OFF DRAWINGS.
- GC IS RESPONSIBLE FOR LEAVING THE PREMISES CLEAN, READY FOR OCCUPANCY.
- GC TO SUPPLY AND INSTALL EVERYTHING UNLESS OTHERWISE NOTED OR AGREED UPON WITH THE CLIENT.

GENERAL NOTES

Ontario Building Code Data Matrix Parts 3 & 9									OBC Reference		
1	☒ New ☐ Addition ☐ Alteration				☐ Part 11 11.1 to 11.4		☒ Part 3 2.1.1		☐ Part 9 2.1.1 9.10.1,3		
	☐ Change of Use										
2	Major Occupancy(s): GROUP D						3.1.2.1.(1)		9.10.2		
3	Building Area : GF: 3502.5 SF (325.4 SM) 2F: 1740.5 SF (161.7 SM)						1.1.3.2		1.1.3.2		
4	Area of Work: 3502.5 SF (325.4 SM)						1.1.3.2		1.1.3.2		
5	Number of Storeys: Above Grade: 2 Below Grade: 1						3.2.1.1 & 1.1.3.2		2.1.1.3		
6	Number of Streets / Access Routes 1 STREET						3.2.2.10 & 3.2.5.5		9.10.19		
7	Building Classification: GROUP D						3.2.2.47 3.2.2.53 3.2.2.59		9.10.4		
8	Sprinkler System Proposed:				☒ Entire Building ☐ Basement Only ☐ In Lieu of Roof Rating ☐ Not Required		3.2.2.20 3.2.1.15 3.2.2.17		9.10.8		
9	Standpipe Required:				☐ Yes ☒ No		3.2.9				
10	Fire Alarm Required:				☒ Yes ☐ No		3.2.4		9.10.17.2		
11	Water Service/Supply is Adequate:				☒ Yes ☐ No		3.2.5.7				
12	High Building:				☐ Yes ☒ No		3.2.6				
13	Permitted Construction:		☐ Combustible		☐ Non Combustible		☒ Both		3.2.2.20-83		
	Actual Construction:		☐ Combustible		☐ Non Combustible		☒ Both		9.10.6		
14	Mezzanine(s) Area (m2): N/A						3.2.1.1.(3)-(8)		9.10.4.1		
15	Occupant Load for the Area of Work Based on: ☐ m2 /person				☒ Design of Building 60 PPL (WITH POSTED SIGNAGE)		3.1.17.1		9.9.1.3		
16	Barrier-free Design:				☒ Yes ☐ No		3.8		9.5.2		
17	Hazardous Substances:				☐ Yes ☒ No		3.3.1.2. & 3.3.1.19		9.10.1,3(4)		
18	Required Fire Resistance Rating (FRR)	Horizontal Assemblies			Listed Design No.			3.2.2.20-83 & 3.2.1.4		9.10.8 9.10.9	
		FRR (Hours)			Or Description (SG-2)						
		Floors:	N/A	Min	----						
		Roof:	N/A	Min	----						
		Mezzanine:	N/A	Min	----						
	3.2.2.27	FRR of Supporting Members (Hours)			Listed Design No.						
		Floors:	N/A	Min	-----(MIN.)						
		Roof:	N/A	Min	-----(MIN.)						
		Mezzanine:	N/A	Min	-----(MIN.)						
19	Special Separation: 3.2.3.1-D						3.2.3		9.10.14		
	Wall	Area of EBF (m2)	L.D. (m)	L/H or H/L	Permitted Max. % of Openings	Proposed % of Openings	FRR (Hours)	Listed Design or Description	Comb. Const.	Comb. Const., Nonc. Cladding	Non-Comb. Const.
	NORTH A	94.4	21.0	<3:1	100	67.4	0.75			☒	
	NORTH B	22.7	24.3	<3:1	100	0	0.75			☒	
	EAST A	224.9	6.0	3:1 to 10:1	52	0	0.75			☒	
	EAST B	2.0	13.0	3:1 to 10:1	100	15.0	0.75			☒	
	SOUTH A	111.9	13.9	<3:1	100	0.8	0.75			☒	
	SOUTH B	6.7	34.9	3:1 to 10:1	100	0	0.75			☒	
	WEST A	224.9	6.0	3:1 to 10:1	52	8.2	0.75			☒	
	WEST B	2.0	13.0	3:1 to 10:1	100	0	0.75			☒	

CLIENT:

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12 STEWART ROAD
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CONTACT: ALEX CARTER

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132 ROSEDALE VALLEY RD.
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TEL: 416 927 1658
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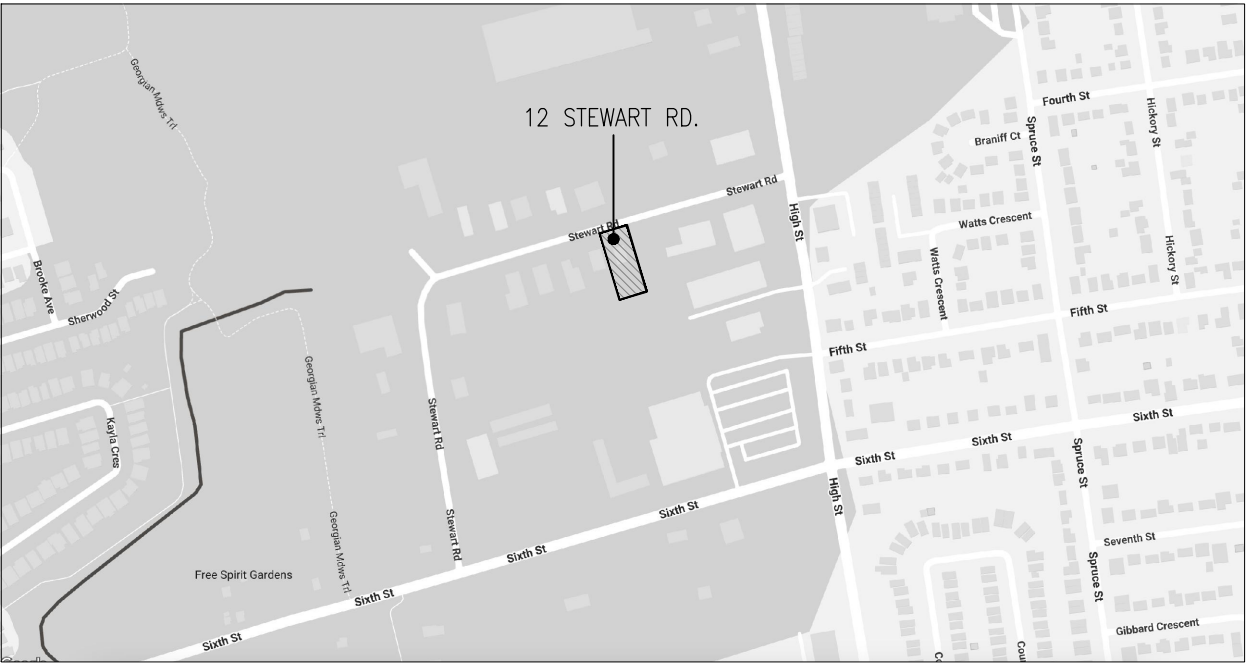
STRUCTURAL ENGINEERS:

CONTACT STRUCTURAL ENGINEERING INC.
209-675 KING ST. W
TORONTO, ON M5V 1M9
TEL: 647 366 9776
CONTACT: TIM JOYCE
EMAIL: TIM@CONTACTENGINEERING.CA

GENERAL CONTRACTOR:

TBC

PROJECT DIRECTORY



LOCATION MAP

ARCHITECTURAL:

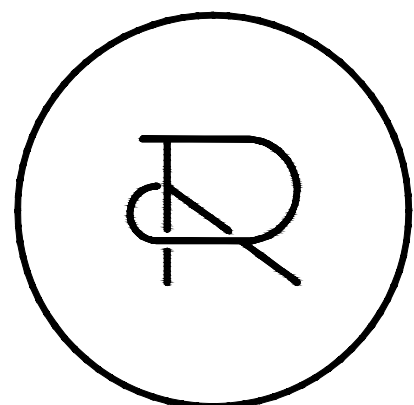
- A000 COVER SHEET, GENERAL INFORMATION
- A301 SITE PLAN
- A302 AREA PLANS
- A330 BASEMENT PLAN
- A331 GROUND FLOOR PLAN
- A332 SECOND FLOOR PLAN
- A333 ROOF PLAN
- A400 EXTERIOR ELEVATIONS
- A401 EXTERIOR ELEVATIONS
- A402 EXTERIOR ELEVATIONS

LIST OF DRAWINGS

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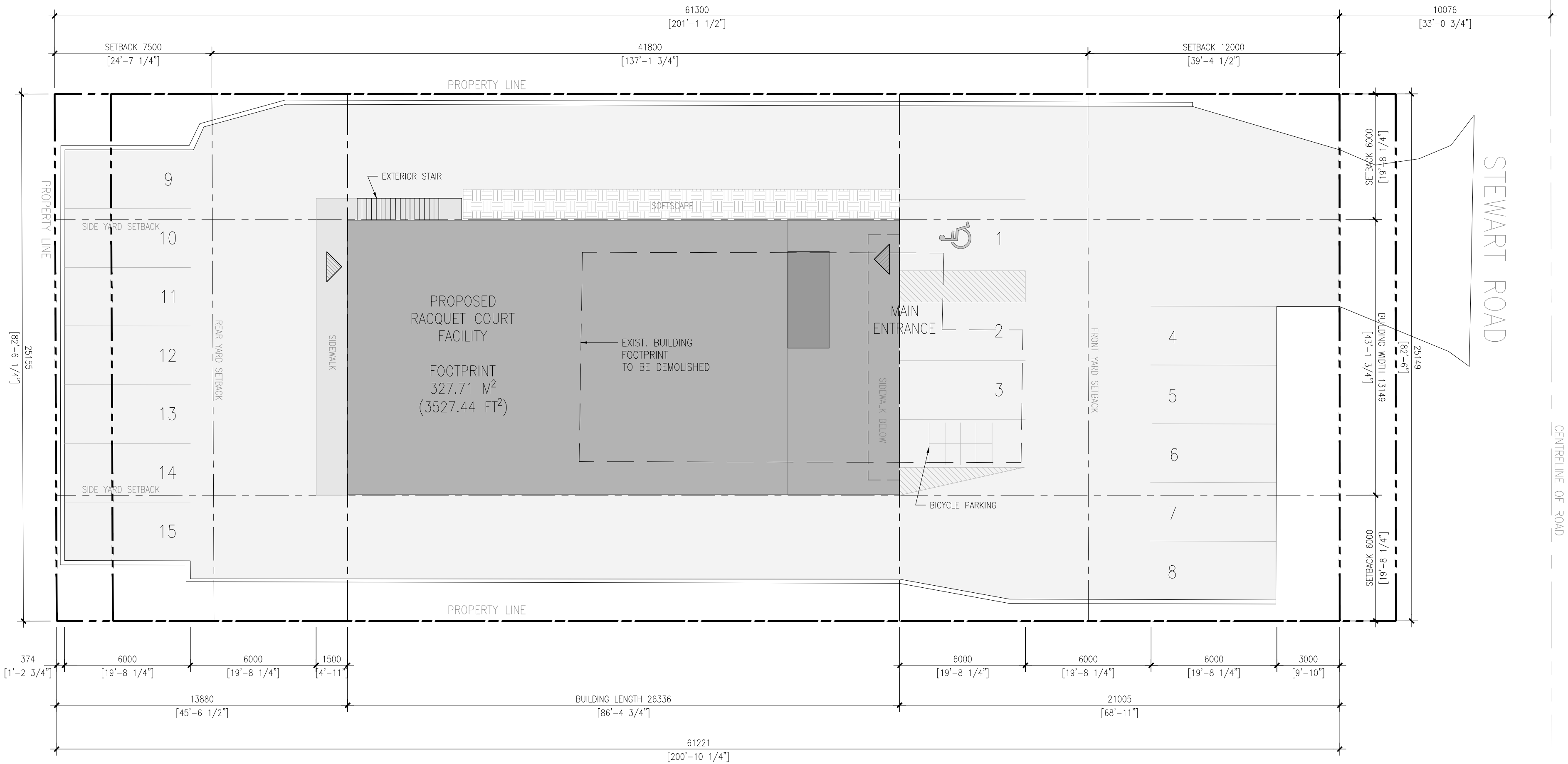
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1 Site Plan
A301 SCALE: 1:150

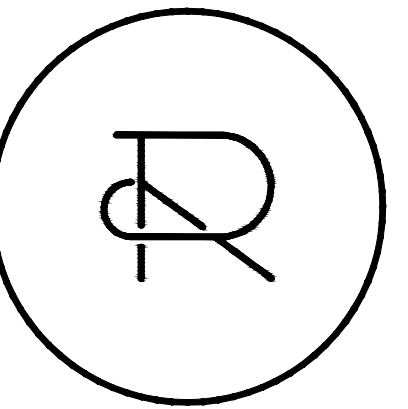
ZONING MATRIX – M5 ZONE

LOT PROVISIONS	REQUIRED	PROVIDED
MINIMUM LOT AREA (m ²)	2000	1540
MINIMUM LOT FRONTAGE (m)	30.0	25.14
MINIMUM FRONT YARD (m)	12.0	21.0
MINIMUM INTERIOR SIDE YARD (m)	6.0	6.0
MINIMUM REAR YARD (m)	7.5	13.8
MAXIMUM HEIGHT (m)	15.0	10.0
MAXIMUM LOT COVERAGE	50%	22%
MINIMUM LANDSCAPED OPEN SPACE	15%	15%
PARKING REQUIREMENTS (3 PER 100m ² GFA)	13	15
BICYCLE PARKING (10% OF PARKING)	4	8

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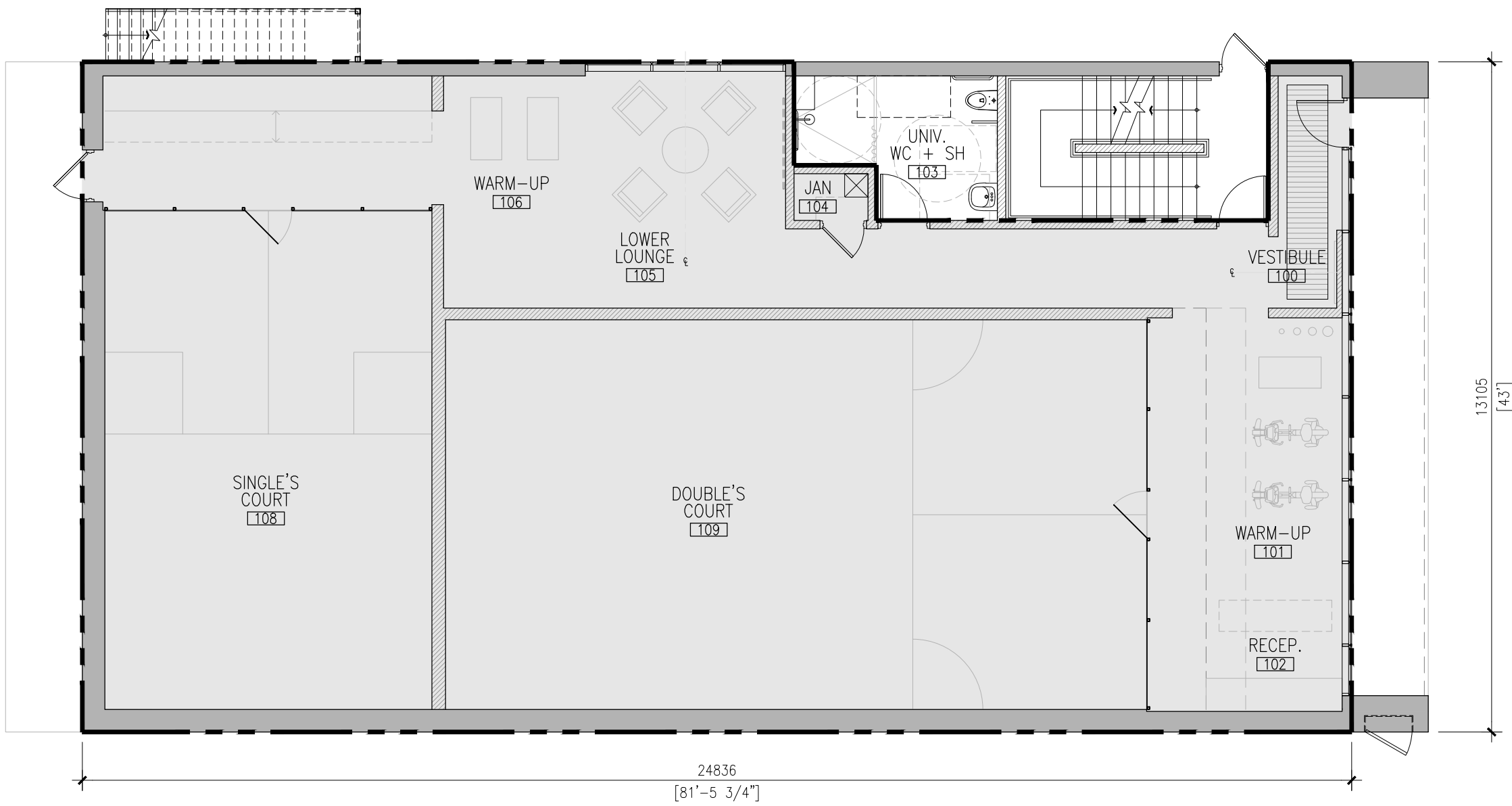
GENERAL NOTES

CRC SQUASH CLUB
12 STEWART RD
Collingwood, On

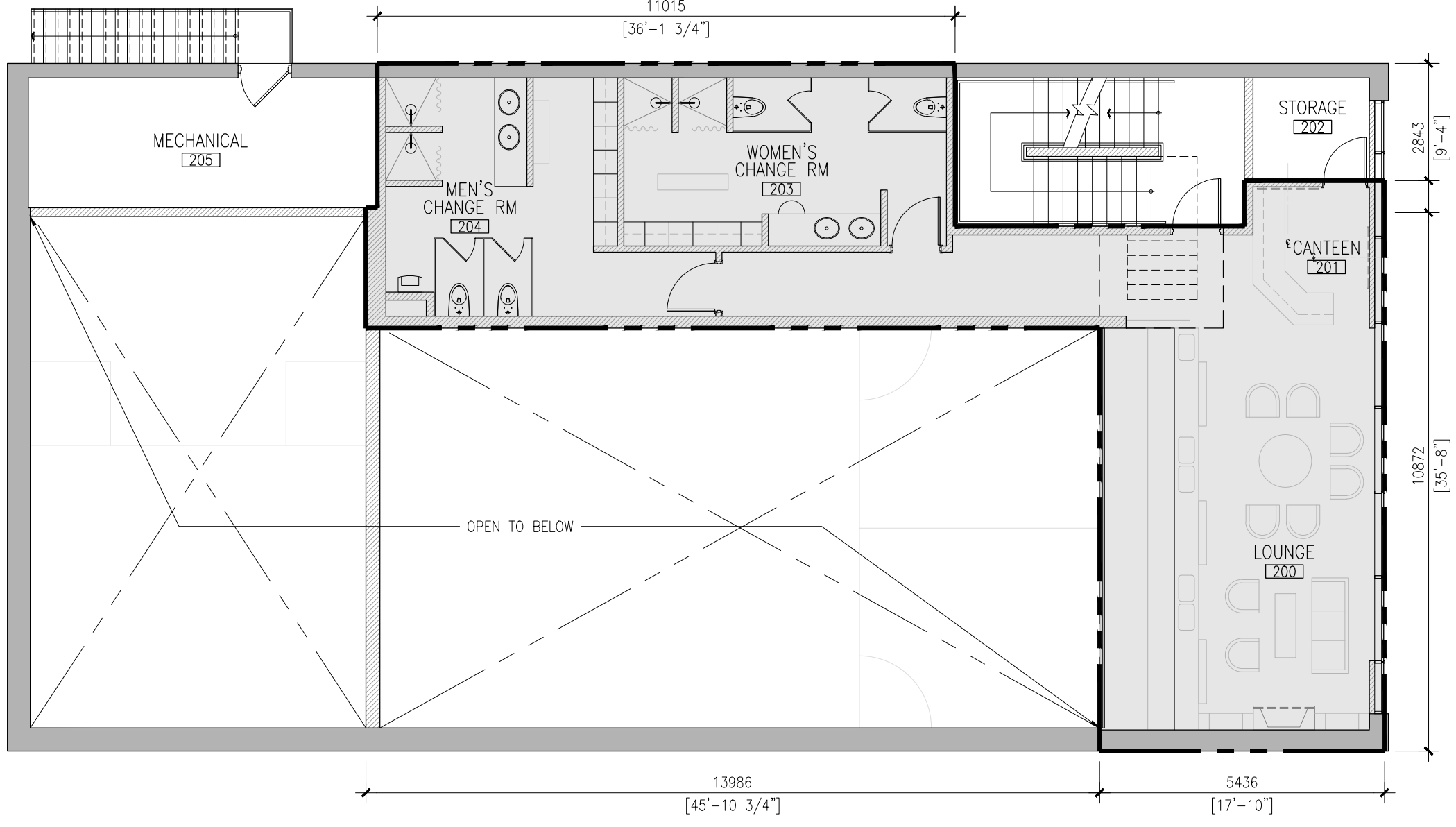
2601 PROJECT	1:150 SCALE	SD DRAWN	TW REVIEWED
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SITE PLAN

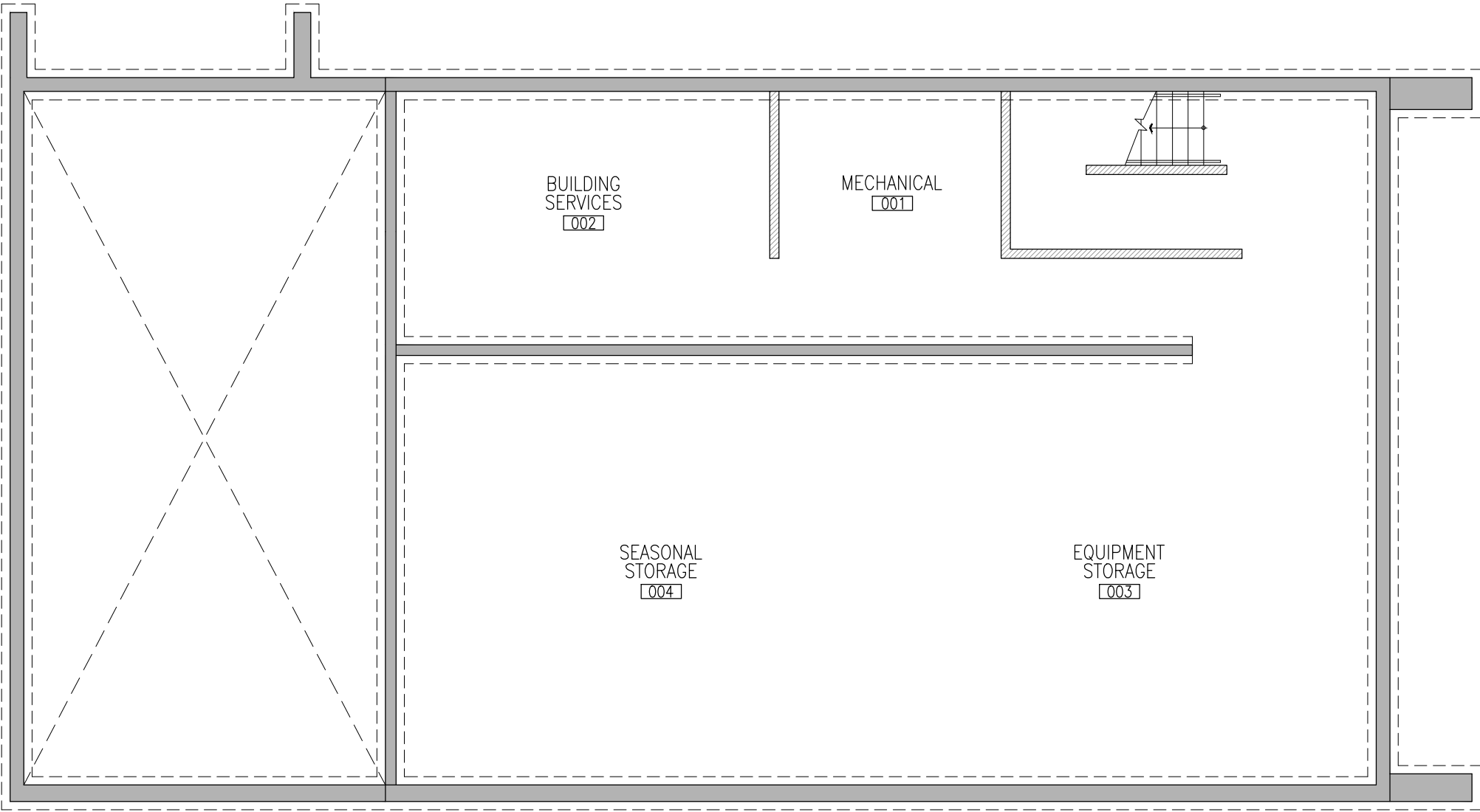
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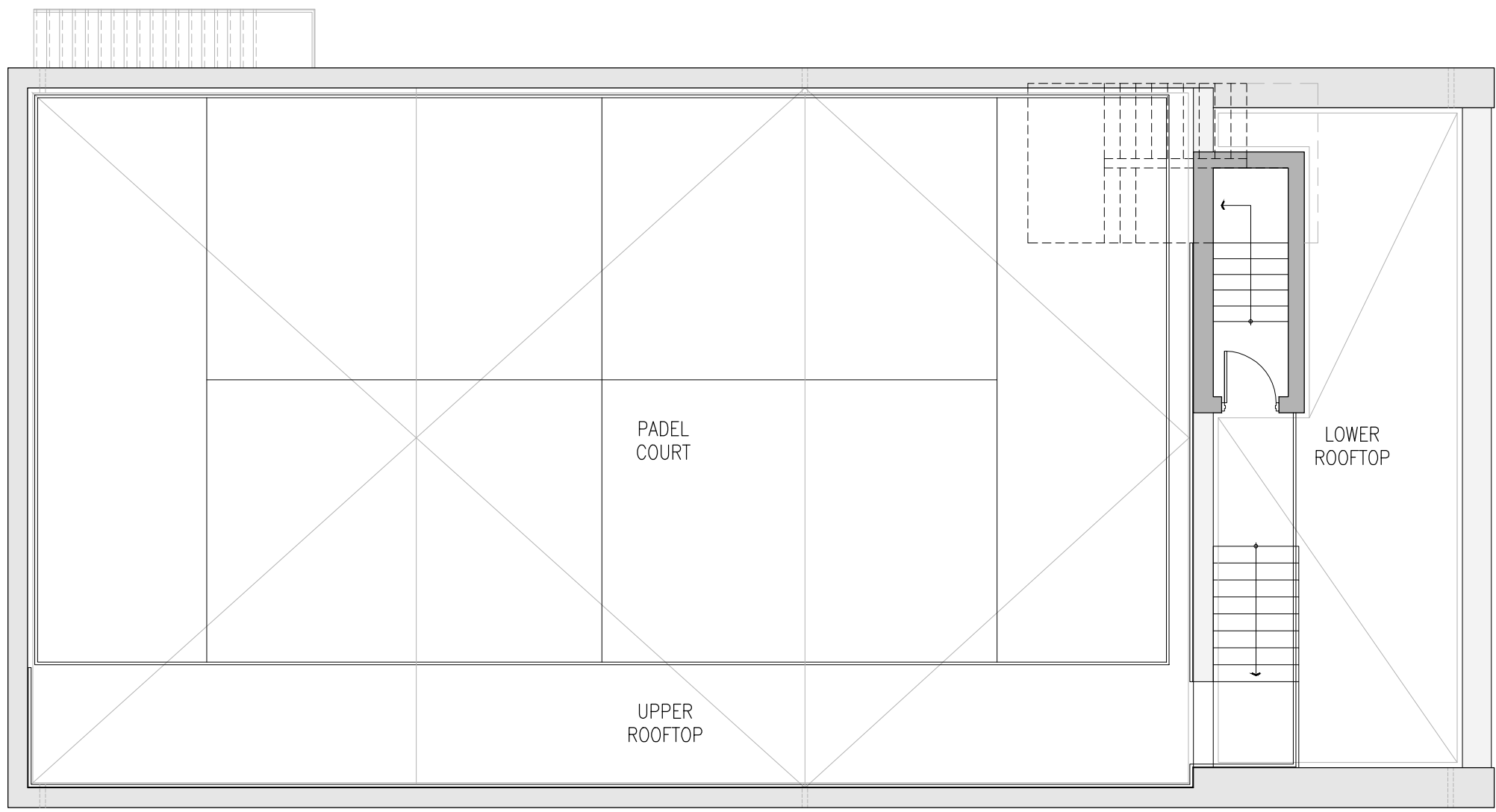
GROUND FLOOR



SECOND FLOOR



BASEMENT



ROOFTOP

1 Area Plans
A302 SCALE: 1:100

GFA SCHEDULE

BUILDING LEVEL	APPLICABLE GFA
BASEMENT	0 m ²
GROUND FLOOR	298.42 m ² (3212.16 FT ²)
SECOND FLOOR	118.11 m ² (1271.32 FT ²)
ROOFTOP	0 m ²
TOTAL	414.90 m ² (4465.94 ft ²)

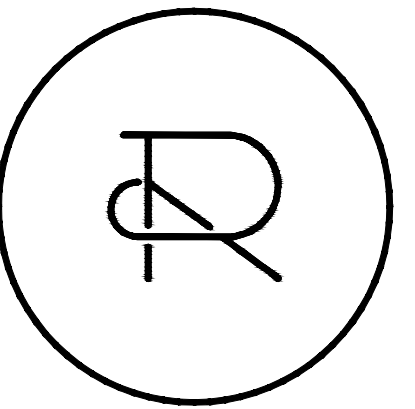
COLLINGWOOD ZONING BY-LAW 3-14

TERM	DEFINITION
	In the case of a dwelling unit, the aggregate sum of the areas of all habitable space measured from the exterior faces of the exterior walls, or from the centre of common walls, but shall not include any space used for storage, heating, laundry, attached garage or carports, porch or unfinished attic.
Gross Floor Area	In the case of all other buildings, the aggregate sum of all floor areas and mezzanines, measured from the exterior faces of the exterior walls, or from the centre of common walls, but shall not include any space used for storage, mechanical rooms, common halls, stairwells, private kitchens, washrooms and garages.

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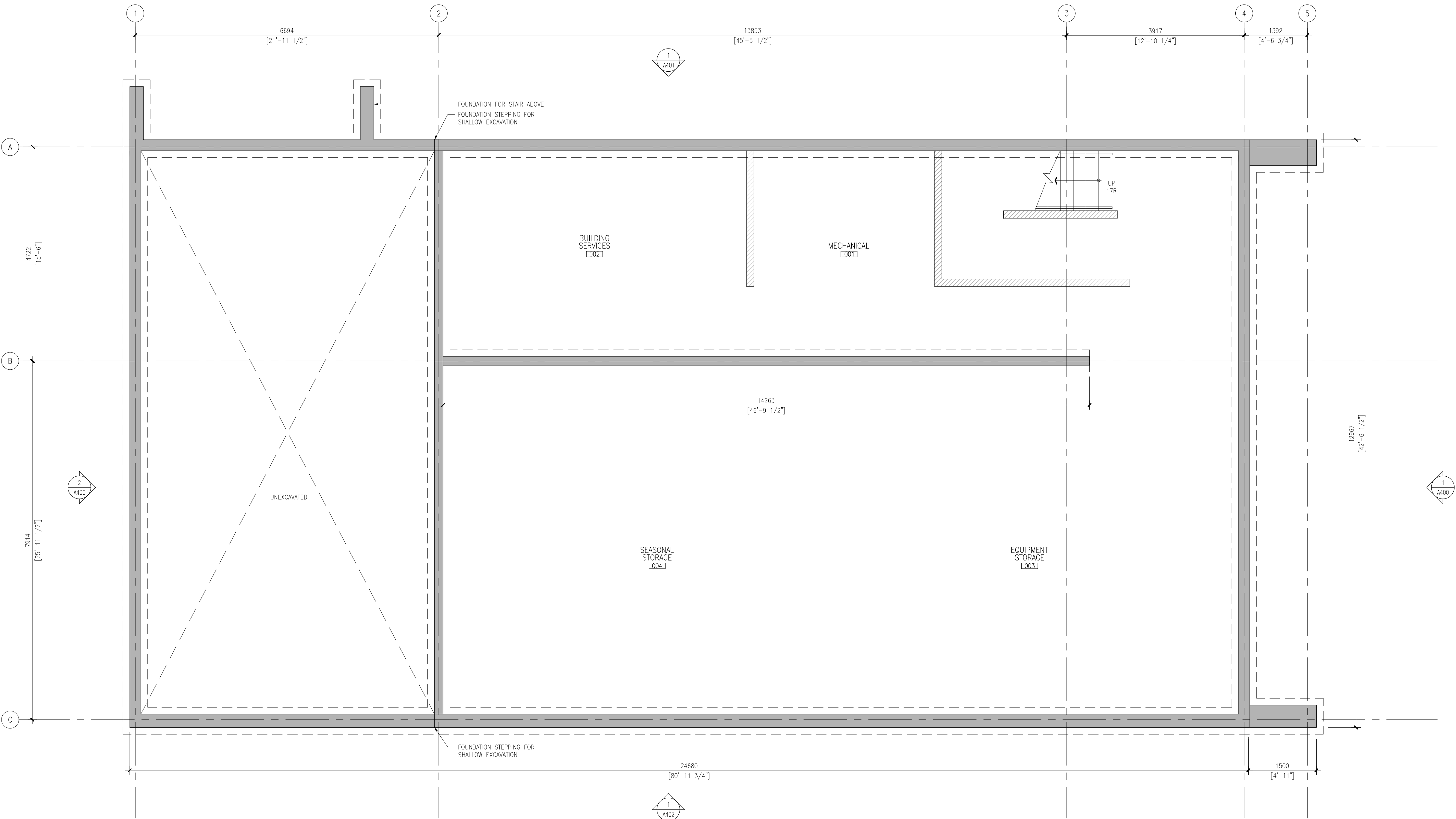
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2601 PROJECT	1:100 SCALE	SD DRAWN	TW REVIEWED
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AREA PLANS

A302



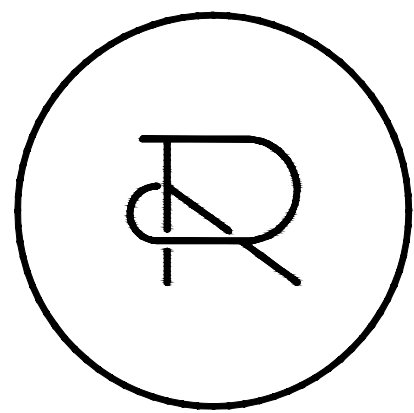
1
A330

Basement Floor Plan
SCALE: 1:50

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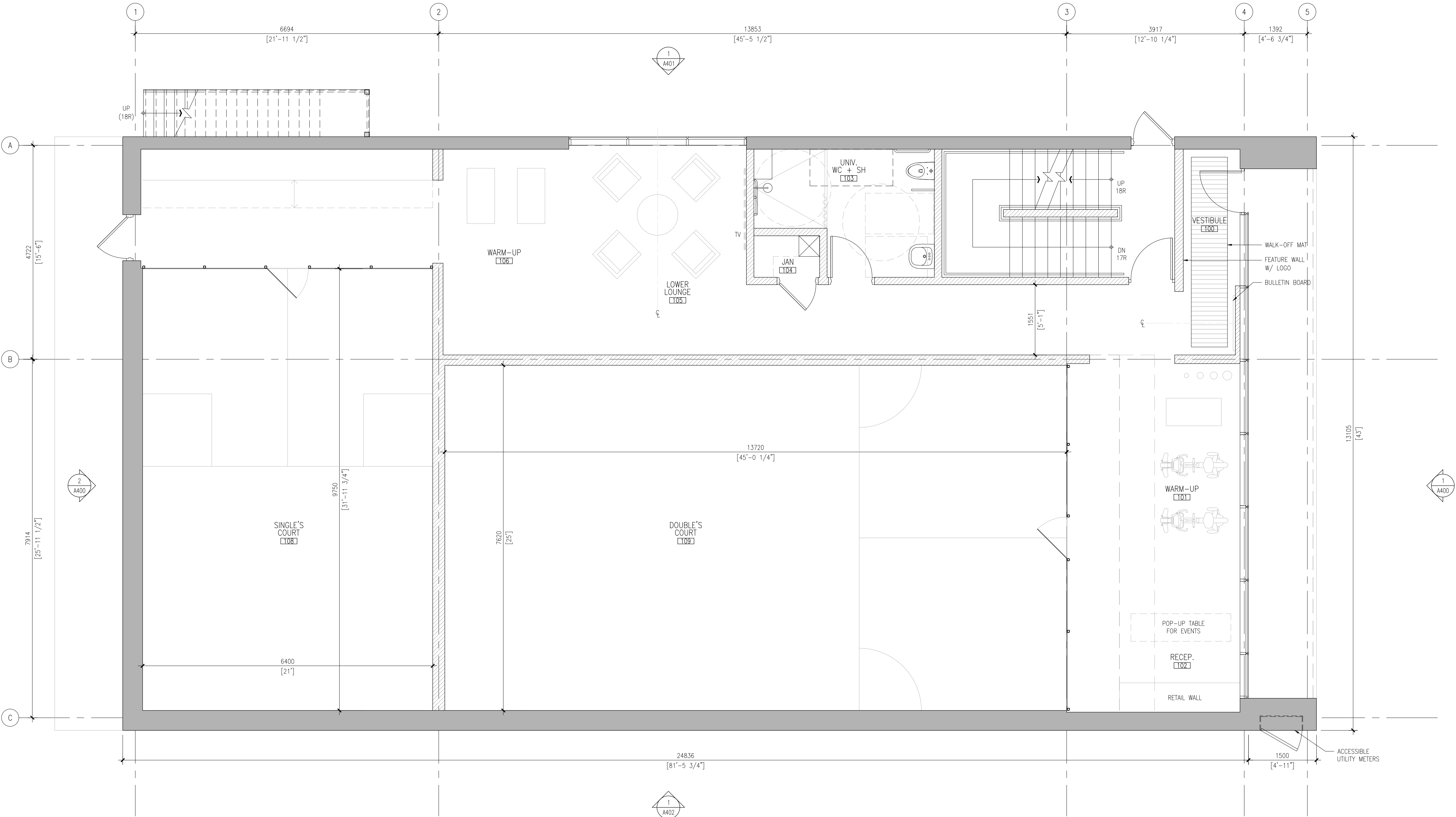
GENERAL NOTES

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2601	1:50	TD	TW
PROJECT	SCALE	DRAWN	REVIEWED

LOWER LEVEL /
BASEMENT FLOOR PLAN

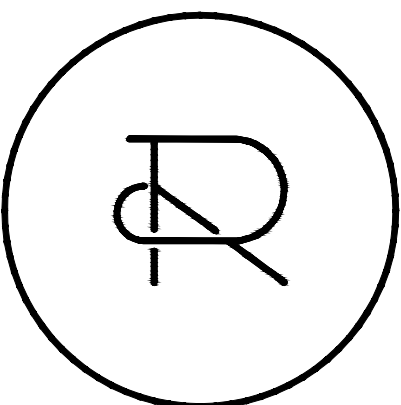
A330



1 Ground Floor Plan
A331 SCALE: 1:50

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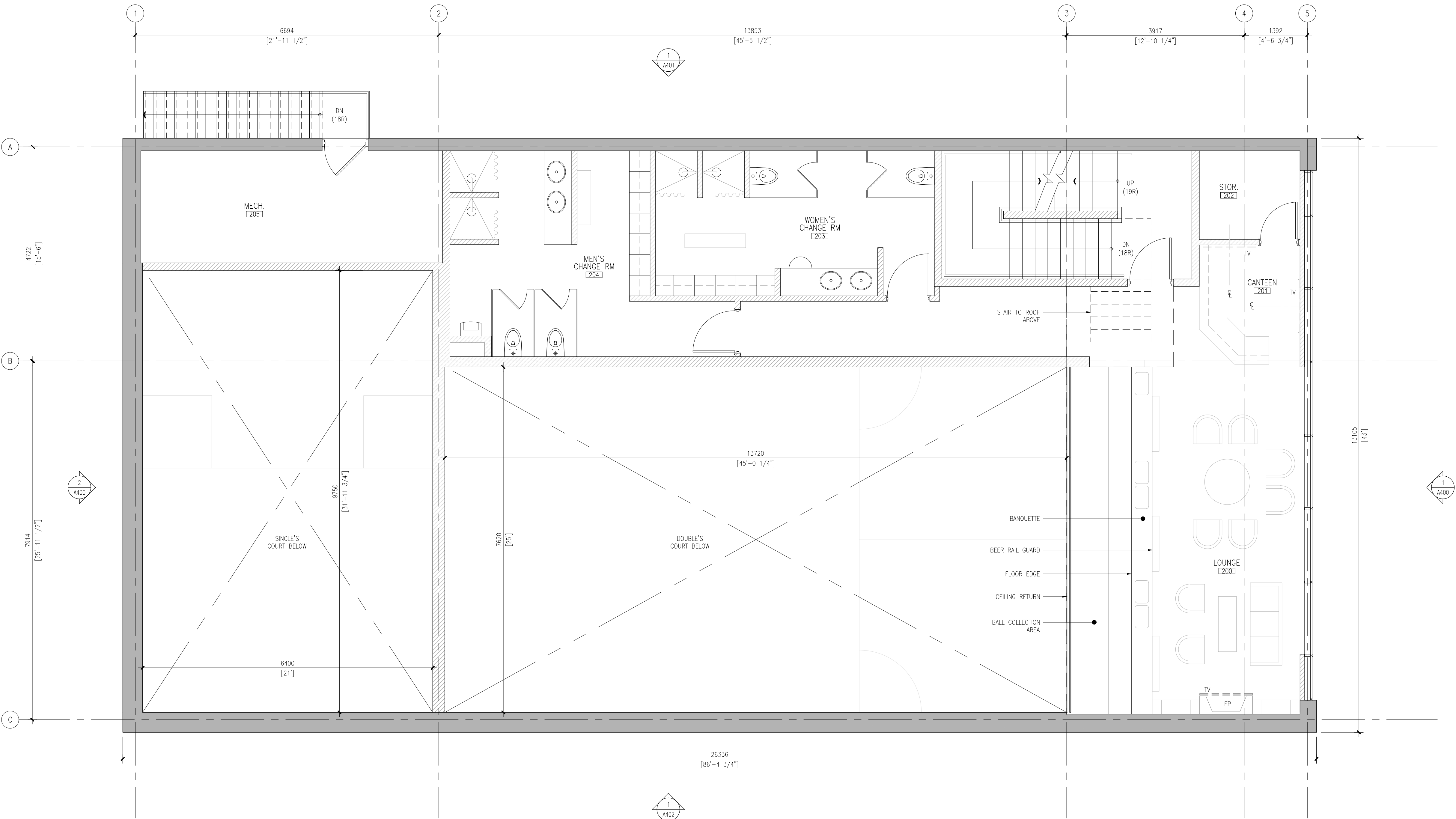
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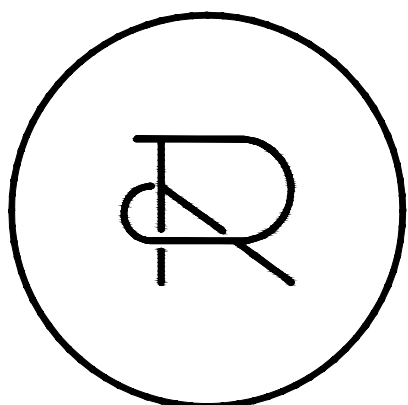
GROUND FLOOR PLAN

A331



1 Second Floor Plan
A332 SCALE: 1:50

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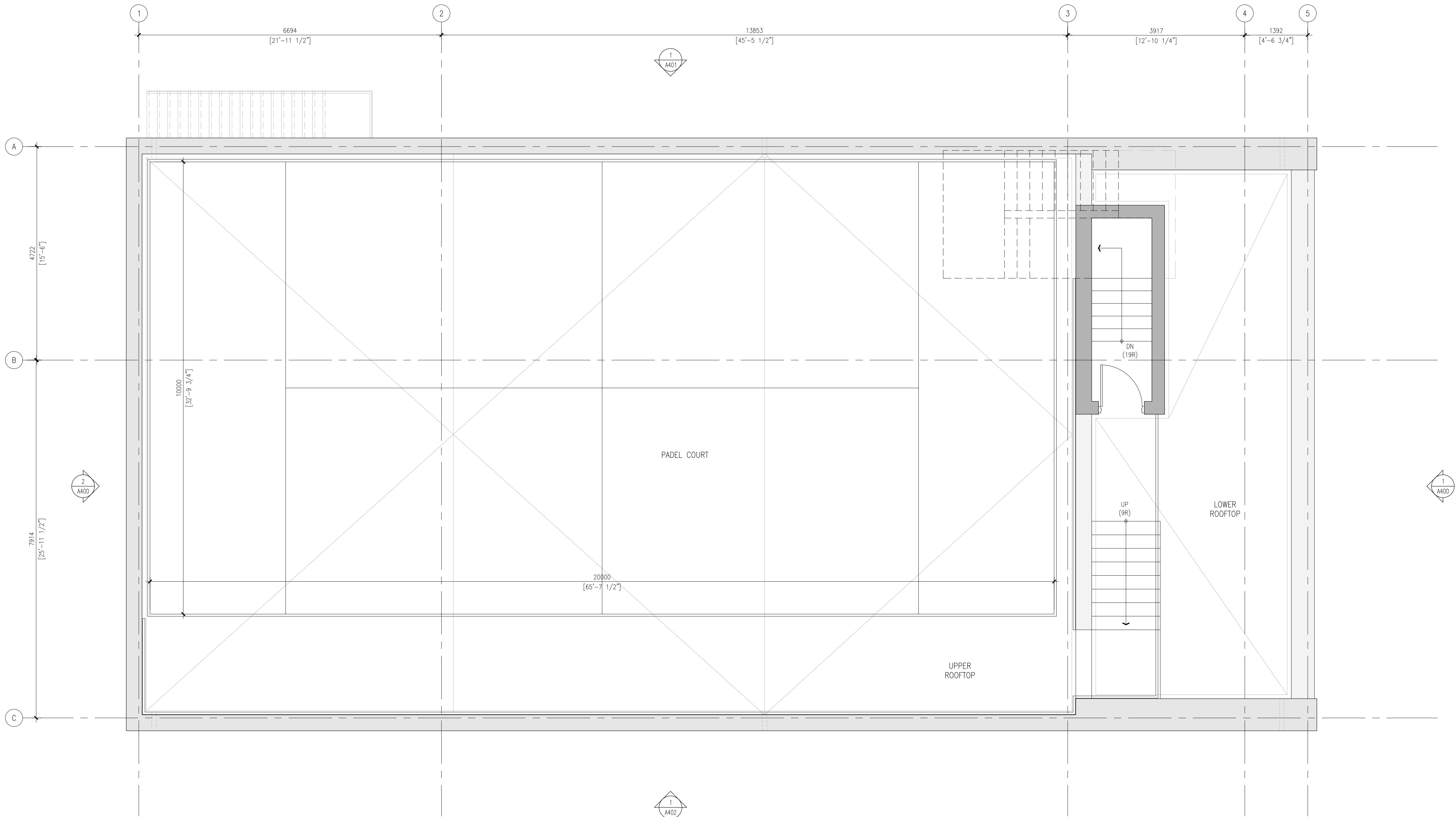
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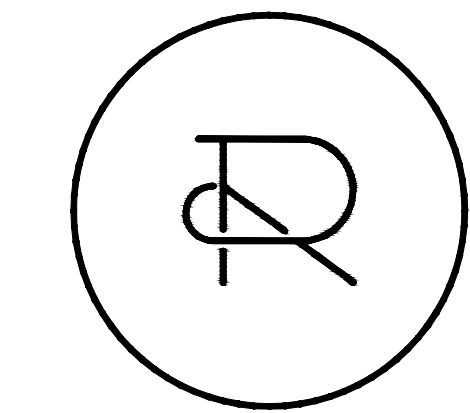
SECOND FLOOR PLAN

A332



1 Roof Plan
A333 SCALE: 1:50

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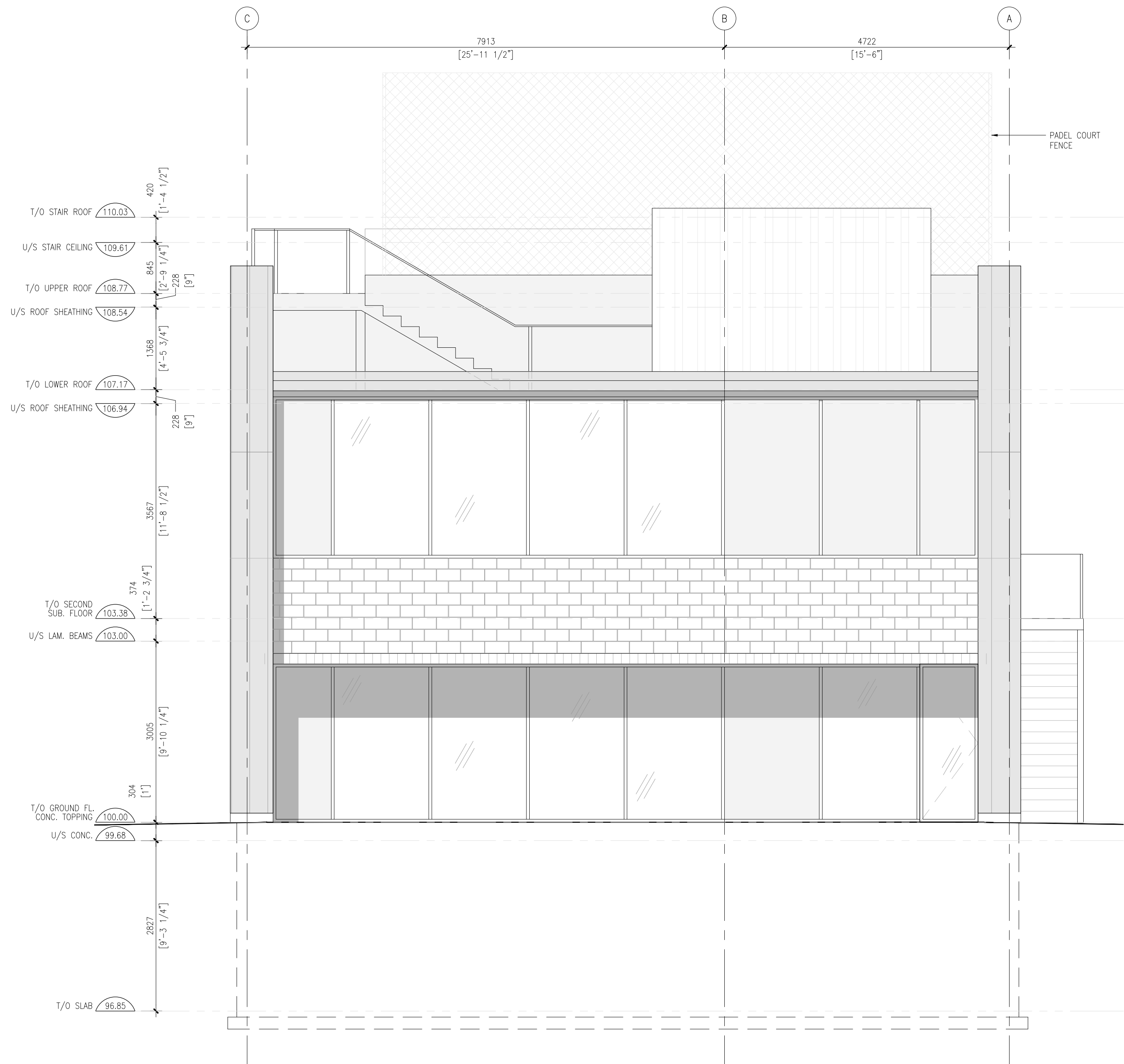
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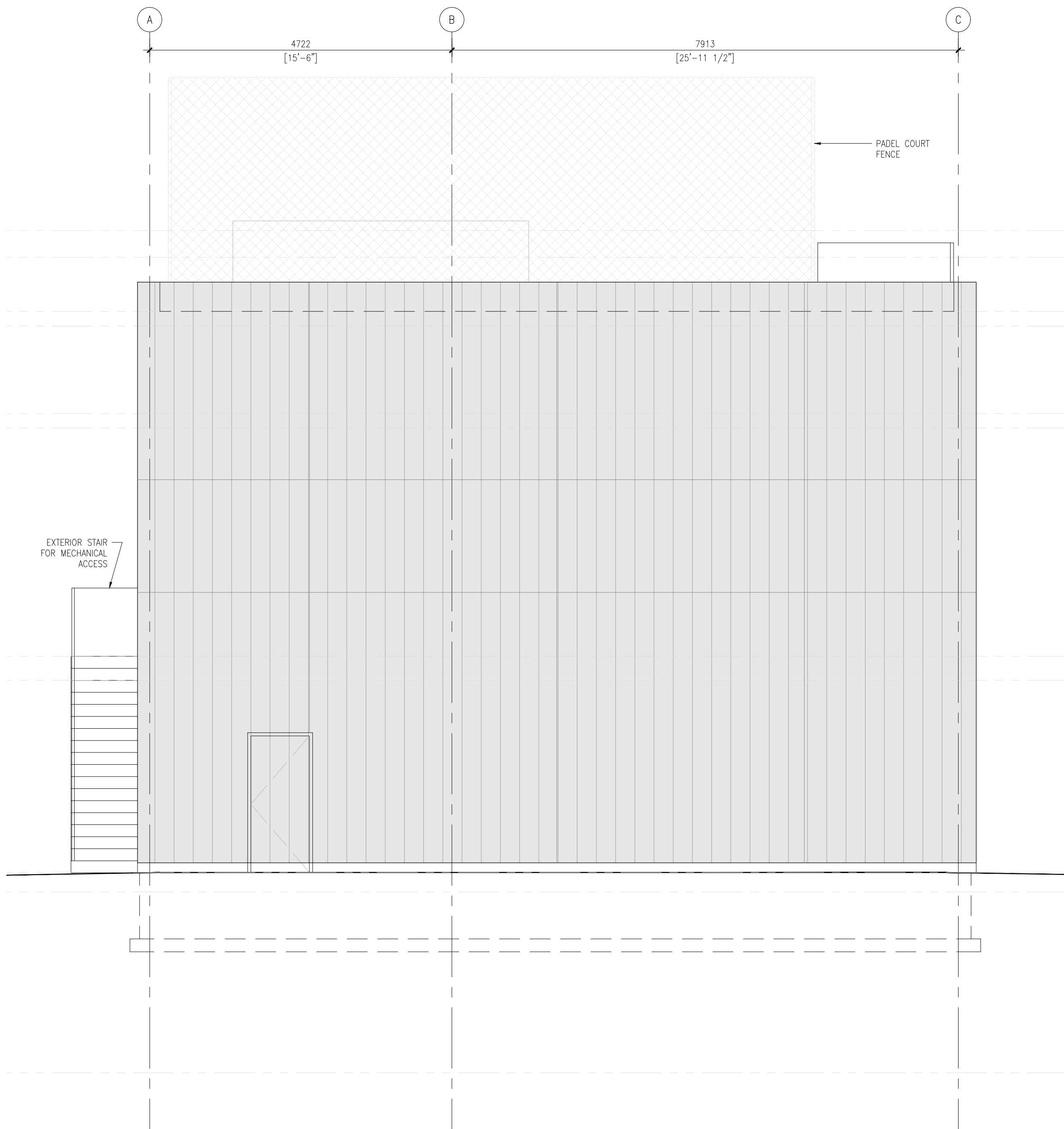
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1 Front (North) Elevation
A400 SCALE: 1:50

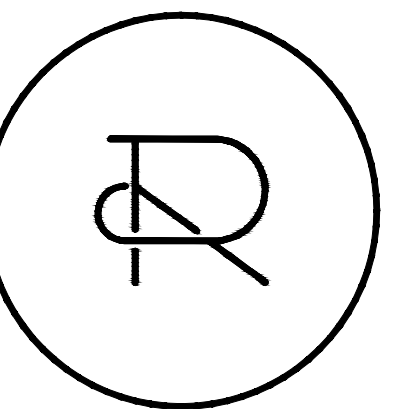


2 Rear (South) Elevation
A400 SCALE: 1:50

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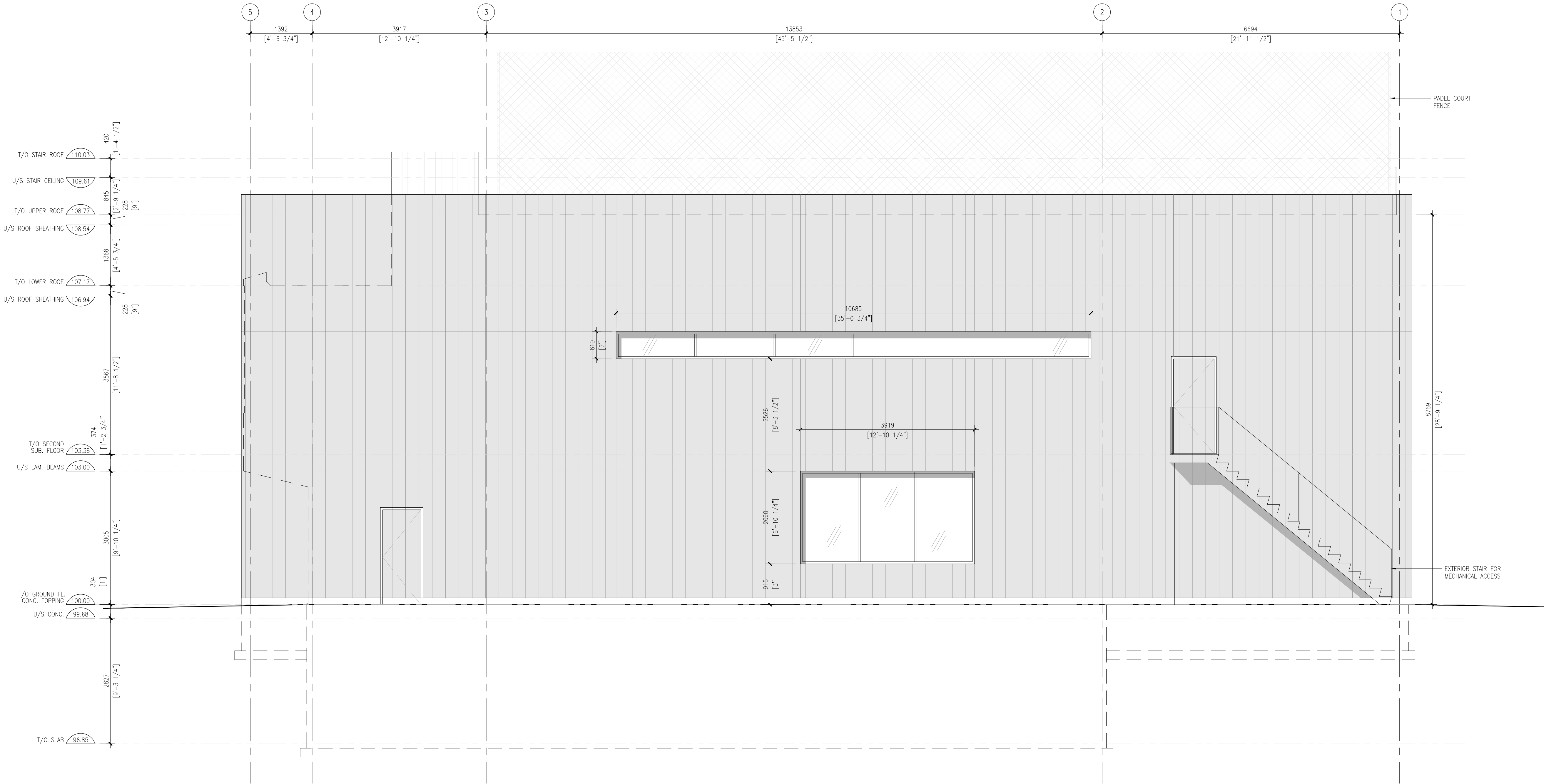
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2601	1:50	TD	TW
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NORTH AND SOUTH
ELEVATIONS

A400

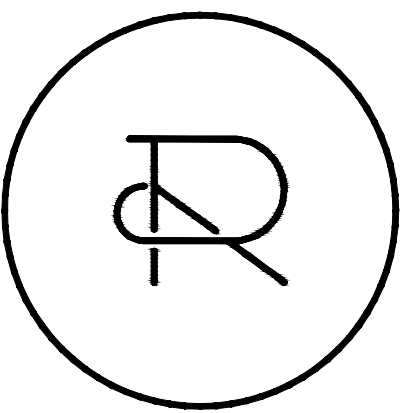


1 Side (West) Elevation
A401 SCALE: 1:50

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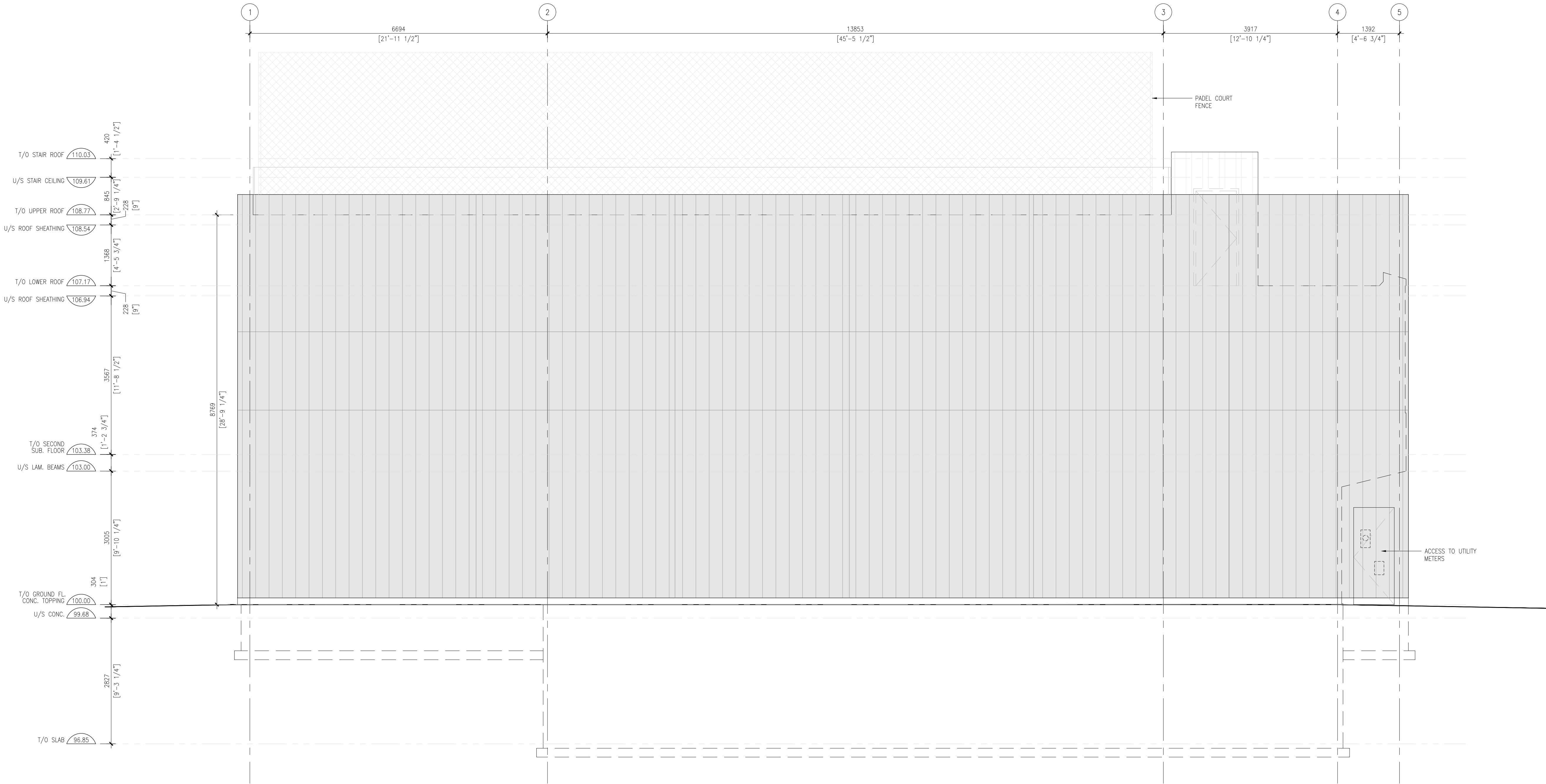
CRC SQUASH CLUB

12 STEWART RD
Collingwood, On

2601	1:50	TD	TW
PROJECT	SCALE	DRAWN	REVIEWED

WEST ELEVATION

A401

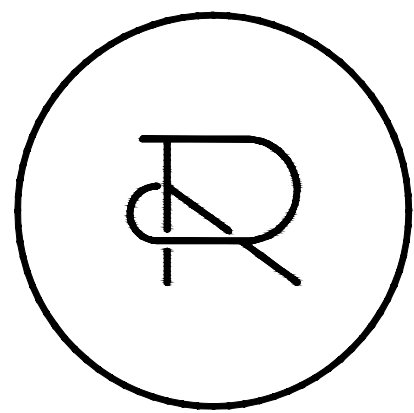


1 Side (East) Elevation
A402 SCALE: 1:50

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2601 PROJECT	1:50 SCALE	TD DRAWN	TW REVIEWED
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EAST ELEVATION

A402

Appendix B – Geotechnical Information



**GEOTECHNICAL INVESTIGATION
PROPOSED TWO-STOREY COMMERCIAL BUILDING
12 STEWART ROAD
COLLINGWOOD, ONTARIO**

**for
BAIRD HOLDING LTD.**

PETO MacCALLUM LTD.
19 CHURCHILL DRIVE
BARRIE, ONTARIO
L4N 8Z5
PHONE: (705) 734-3900
FAX: (705) 734-9911
EMAIL: barrie@petomaccallum.com

Distribution:

1 cc: Baird Holding Ltd. (acarter@assante.com)
1 cc: PML Hamilton
1 cc: PML Barrie

PML Ref.: 26BF002
Report 1
April 27, 2026

April 27, 2026

PML Ref.: 26BF002

Alex Carter
Baird Holding Ltd.
142 Hume Street
Collingwood, ON
L9Y 1V5

Dear Mr. Carter

**Geotechnical Report
Proposed Two-Storey Commercial Building
12 Stewart Road, Collingwood, Ontario**

We are pleased to present the results of the geotechnical desktop review recently completed for the above referenced project. Authorization to proceed with this assignment was provided by Mr. Alex Carter, in an email dated March 4, 2026.

We thank you for the opportunity to have been of service on this assignment and trust that this report is complete within the term of reference. Please contact this office should you have any questions and comments on this report.

Sincerely

Peto MacCallum Ltd.



Scott Jeffrey, P.Eng., QP_{ESA}, LEED_{GA}
Director
Regional Manager – Geotechnical and Geoenvironmental Services

SJ:NG:gs



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ATTACHMENTS

Drawing 1 – Borehole Location Plan
List of Abbreviations Sheet
Log of Borehole Sheets 1 to 6
Figure GS-1 – Grain Size Distribution Chart
Figure 1 – General Guidelines For Underpinning
Figure 2 – Backfill Requirements for Basement Walls
Appendix A – Statement of Limitations
Appendix B – Engineered Fill Guidelines



1. INTRODUCTION

It is understood that Baird Holding Ltd. Is planning to build a two-storey commercial building with one basement level and a building footprint of 316 m² at 12 Stewart Road in Collingwood. The project works will also include new servicing for the building as well as a paved parking area and driveway.

Currently, the site consists of an existing commercial building with a gravel driveway and parking lot. The project site is surrounded by other existing commercially used properties and buildings. The existing ground surface is relatively flat with a topographic relief across the site being around 0.45 m.

It is understood that plans call for the existing building to be demolished to make way for a new commercial/recreational development comprising a 362.9 m² two-storey building with one full basement level.

Peto MacCallum Ltd. (PML) previously completed a Phase One and Phase Two Environmental Site Assessments (PML Reference 25TX002) for the property including a borehole and monitoring well program comprising six boreholes ranging from 3.1 to 6.7 m depths.

The purpose of this geotechnical desktop review was to utilize the borehole information from PML's previous site investigation to assess the subsurface soil and ground water conditions at the site, and based on the information obtained, to provide geotechnical recommendations pertaining to the design and construction of the proposed commercial building.

The recommendations provided in this report are based on information available at the time of this report. Peto MacCallum Ltd. (PML) should review the final drawings when they are available. The review may result in a modification of our recommendations or require additional field or laboratory work to examine whether the design changes are acceptable from a geotechnical engineering viewpoint.

This report is subject to the Statement of Limitations included in Appendix A which must be read in conjunction with this report.



2. INVESTIGATION PROCEDURES

The field work for 2025 investigation was carried out on April 3, 2025 as part of the Phase Two Environmental Site Assessment completed by PML. The investigation comprised six boreholes drilled to depths of 3.1 to 6.7 m. All borehole locations are indicated on Drawing 1, appended

The ground surface elevations at the test hole locations were determined by PML with a Sokkia GCX3 Real Time Kinetic receiver connected to the Global Navigation Satellite System. It should be noted that the ground surface elevations at the test holes are approximate and are referenced for describing the soil stratigraphy. The provided elevations should not be used or relied upon for any other purpose.

The boreholes were advanced using either continuous flight hollow or solid stem augers, powered by a Geoprobe drill rig, supplied and operated by a specialist drilling contractor. The drilling operations were supervised by PML personnel.

Representative samples of the overburden were recovered from the boreholes at frequent depth intervals using a conventional split spoon sampler. Standard penetration tests were conducted simultaneously with the sampling operation to assess the strength characteristics of the substrata in the boreholes.

The ground water conditions in the open boreholes were closely monitored during the course of the borehole drilling. The boreholes without monitoring wells were backfilled in accordance with MTO Regulation 903 upon completion of drilling.

Upon completion of drilling, one ground water monitoring well was installed in Borehole 4 to facilitate water level readings. The monitoring well comprised 50 mm diameter PVC pipe and slotted screen with sand pack and was fitted with a protective flush-mount casings.



3. LABORATORY TESTING

All the recovered samples were delivered to PML's geotechnical laboratory, for detailed visual examination and moisture content determinations. One sample of a major subgrade soil type encountered were submitted for grain size analyses with the results presented in Figure GS-1, appended.

4. SUMMARIZED SUBSURFACE CONDITIONS

Reference is made to the appended Log of Borehole sheets 1 to 6 for details of the subsurface conditions, including soil classifications, inferred soil stratigraphy, standard penetration test data, ground water observations as well as the results of laboratory moisture content determinations.

Due to the soil sampling procedures and limited sample size, the depth/elevation demarcations on the borehole logs must be viewed as "transitional" zones between layers, and shall not be construed as exact geologic boundaries between layers.

In general, the subsurface conditions encountered during the recent investigation comprised a surficial granular/fill layer, over native silty sand to sandy silt.

4.1 Surface Granular/Fill

A surficial granular/fill was encountered at all boreholes extending to 1.4 to 2.1 m depth (elevations 184.5 to 185.6 m). The fill comprised of sand and gravel with some silt and clay. The fill had SPT N values ranging from 3 to 38 blows per 0.3 m penetration of the split spoon sampler. Moisture contents within the fill ranged from 6 to 12%.



4.2 Silty Sand/Sandy Silt

A sandy silt/silty sand deposit was encountered underlying the fill in all boreholes extending to the 3.1 to 6.7 m depth of exploration (elevations 180.3 to 183.9 m). One sample of the sandy silt/silty sand was submitted to the laboratory for a grain size analysis with results presented in Figure GS-1, appended. The sandy silt/silty sand was compact to very dense, with SPT N values ranging from 13 to greater than 50 blows per 0.3 m penetration of the split spoon sampler. The sandy silt/silty sand was moist to wet with moisture contents ranging from 3 to 17%.

4.3 Auger Refusal

Auger refusal was encountered within Boreholes 1, 2 and 4 leading to early termination of the boreholes. Based on subsurface information within the vicinity of the site from Ontario Well Records, it is suspected that the refusal encountered during drilling was due to bedrock.

4.4 Ground Water Conditions

Upon completion of drilling, free water was observed at 2.4 to 4.7 m depth within the boreholes. Monitoring wells were installed within Boreholes 1, 2, 4 and 6. Stabilized ground water levels were measured within the wells on April 16th and 22nd, 2025, and ranged from 1.4 to 2.2 m depth (elevations 184.5 to 185.1 m).

Ground water levels are subject to seasonal fluctuation and should be expected to be somewhat higher during the spring months and in response to major weather events.

5. ENGINEERING DISCUSSION AND RECOMMENDATIONS

As noted previously, Baird Holding Ltd. is planning to build a two-storey commercial building with one basement level and a building footprint of 316 m² at 12 Stewart Road in Collingwood. The project works will include new servicing for the building as well as a paved parking area and driveway.



5.1 Site Grading

The proposed building will have a finished floor at elevation 187.23 m with one full basement level. Based on current site grades, some upfilling will likely be required to achieve the finished exterior grades. The following general procedures are recommended for preparation of the site for fill placement. Reference is made to Appendix B for Engineered Fill Placement Guidelines.

- Pre-existing loose fill and loose native soil should be removed . Based on the borehole information, it is envisaged that subexcavation to a depth of approximately 0.6 m will be required to reach competent subgrade. Pre-existing fill below about 0.6 m depth can likely remain in place below exterior pavements subject to adequate proof rolling.
- The subgrade should be inspected and any deleterious materials found during subgrade inspection, should be removed/excavated.
- The exposed subgrade surface should be proof rolled with a tandem truck or equivalent and inspected by geotechnical personnel from PML. Any soft/loose spots encountered during the process should be sub-excavated and replaced with approved on-site or imported material, compacted to at least 98% of the Standard Proctor Maximum Dry Density (SPMDD).
- Fill placement should be conducted with approved on site or imported material placed in lifts not exceeding 200 mm and compacted to at least 98% of the SPMDD.
- All backfilling and compaction operations should be supervised on a full-time basis by geotechnical personnel from PML to examine and approve backfill materials, evaluate placement operations and verify that the specified degree of compaction is achieved uniformly throughout the fill.



5.2 Building Foundations

Given the planned finished floor elevation of 187.23 m and a full basement level, it is anticipated that footings will be founded on the compact to dense native silty sand/sandy silt.

Boreholes 2, 3, 5 and 6 were drilled just outside of the proposed building footprint. In general, the building can be supported on spread footings bearing below the existing fill deposits at about 1.5 to 2.0 m below existing ground level on native undisturbed silty sand/sandy silt. Footings founded at these depths may be designed for a Serviceability Limit State (SLS) bearing resistance of 150 kPa with a corresponding factored bearing resistance at Ultimate Limit State (ULS) of 225 kPa.

Alternatively, footings may be supported on adequately placed and well compacted engineered fill, provided the upper loose fill, native soils or deleterious material is removed prior to engineered fill placement. Footings founded on engineered fill may be designed for an SLS bearing resistance of 100 kPa with a corresponding factored bearing resistance at ULS of 150 kPa.

The Geotechnical bearing resistance at SLS is based on 25 mm of settlement in the bearing stratum with differential settlement not exceeding 75% of the value.

Footings subject to frost action must be provided with a minimum of 1.5 m of earth cover or equivalent insulation.

Geotechnical foundation design and construction recommendations should be reviewed by PML once building locations and elevations are finalized, and a provision should be made for supplementary investigations, recommendations and reporting, as needed.

5.3 Seismic Site Classification

Design provisions for earthquake loading should also be applied. Based on characteristics of the subsoils encountered in the boreholes at the site and considering deeper subsurface information in the vicinity of the site from other available sources, the subject property should be classified as Site Class C or Site Designation X_c for footings bearing on native undisturbed compact to dense



silty sand/sandy silt or engineered fill as per the 2025 National Building Code of Canada (NBCC 2025) Section 4.1.8.4. It is possible that the site designation could be improved by carrying out a site-specific geophysical survey such as by a Multi-Channel Analysis of Shear Wave velocity (MASW) testing.

5.4 Excavations and Ground Water Control

Basement and servicing depths were not provided at the time of this report, however it is expected that excavations will extend as deep as 2 to 3 m below the existing ground surface.

Provided that adequate ground water control is achieved, the soils encountered in the investigated boreholes at the site should be considered as Type 3 soil requiring excavation sidewalls to be constructed at no steeper than one horizontal to one vertical (1H:1V) from the base of the excavation in accordance with the Occupational Health and Safety Act. If an excavation contains more than one soil type, the excavation slope geometry shall be governed by the highest soil type.

Foundations of heavily loaded / settlement sensitive structures and/or utilities located within close proximity to the excavation may require underpinning to preserve the integrity of these structures. Further comments and general recommendations in this regard are presented on Figure 1.

All work should be carried out in accordance with the Occupational Health and Safety Act, 1990 and Ontario Regulation 213/91 for construction projects and with local regulations.

It is recommended that trench excavations be supervised on a full-time basis by experienced geotechnical personnel from Peto MacCallum Ltd. to examine actual in-situ soil conditions and verify that proper trenching procedures are implemented.

No surcharge loads should be placed in close proximity of excavation and trenches.

Based on borehole data, the ground water table was encountered between elevations 184.5 to 185.1 m. The ground water table is expected to be encountered during excavation of the utility installation, building footings and basement. Excavations above or slightly below the ground water table can be managed with conventional sump pumping. However, deeper excavations below the ground water table will require more aggressive dewatering methods.



The actual dewatering methods should be established at the contractor's discretion within the context of a performance specification for the project. Regardless of the dewatering method chosen, the hydraulic head and ground water inflow must be properly controlled to ensure a stable and safe excavation and to facilitate construction. The design of the dewatering system should be specified to maintain and control ground water at least 0.3 m below the excavation base level, in order to provide a stable excavation base throughout construction.

It is recommended that construction work be scheduled following periods of prolonged dry weather, and when the ground water table is usually at its lowest, in order to minimize the quantity of water to be handled.

Construction dewatering, like other water takings in Ontario, is governed by the Ontario Water Resources Act (OWRA) and the Water Taking and Transfer Regulation 387/04, a regulation under the OWRA. In accordance with these regulatory requirements, if the dewatering discharge during construction is expected to be greater than 50,000 L/d and meets the requirements of Ontario Regulation 63/16, the water taking can be registered with the Ministry of Environment, Conservation and Parks (MECP's) Environmental Activity and Sector Registry (EASR). If the conditions of EASR registration are not met and the dewatering discharge is expected to be greater than 50,000 L/d an application for a Permit-To-Take-Water (PTTW) must be filed with the MECP. Note that the 50,000 L/d threshold is during normal operations (i.e., extreme weather events are not included). A PTTW or registry on the EASR system may be required for the excavations that extend more than 0.3 m below the ground water level. When design and construction details are finalized, the project should be reviewed and a Hydrogeological Site Assessment may be required to assess the MECP requirements, and in support of registry on the EASR system or possibly a PTTW.

Once final foundation excavation levels are known, it is recommended that ground water level monitoring and trial excavations be conducted in advance of construction to assess the dewatering requirements. Where practical, it is recommended that excavations be carried out in the drier time of year.

5.5 Below Grade Walls

A basement has been proposed for the building. Perimeter walls must be designed to resist the unbalanced horizontal earth pressure imposed by the backfill adjacent to the walls. The lateral earth pressure, P , may be computed using the following equation and assuming a triangular pressure distribution:

$$P = K(\gamma h + q) + C_p$$

Where

- P = lateral pressure at depth h (m) below ground surface (kPa)
- K = lateral earth pressure coefficient of granular backfill = 0.5
- h = depth below grade (m) at which lateral pressure is calculated
- γ = unit weight of compacted granular backfill = 21.0 kN/m³
- q = surcharge loads (kPa)
- C_p = compaction pressure

The above equation assumes that drainage measures will be incorporated to prevent the buildup of hydrostatic pressure. In this regard, foundation wall backfill should comprise free draining granular material conforming to OPSS Granular B in conjunction with a weeping tile system. The weeping tiles should be protected by a properly designed granular filter or geotextile to prevent migration of fines into the system. The drainage pipe should be placed on a positive grade and lead to a frost-free outlet. The basement walls should be damp proofed. Alternatively, the native soil can be utilized with a proprietary drainage board product.

As per the building code the weeping tile should comprise a perforated pipe bedded in clear stone. Given the predominantly sand soil found at the site we recommend that the clear stone be wrapped in a geotextile filter fabric to avoid siltation of the drainage system and possible erosion of the backfill with time. An equivalent alternative weeping tile design would comprise a perforated pipe, fitted with geotextile sleeve, and bedded in concrete sand.

The footing walls should be backfilled in lifts and compacted to at least 95% SPMDD. The use of heavy compaction equipment should be prohibited near the wall to avoid potential damage. This area should be compacted using smaller compaction equipment such as a diesel plate packer or jumping jack.



Basement wall backfill should be placed in thin lifts compacted to a minimum 95% SPMDD. Over compaction close to the walls should be avoided as this could generate excessive pressure on the walls.

Reference is made to appended Figure 2, for general recommendations regarding drainage and backfill requirements for basement walls and floor slabs.

5.6 Slab-on-Grade Floors

Construction of the floor slab as a conventional slab-on-grade on the native undisturbed silty sand/sandy silt or adequately prepared fill is considered feasible.

Preparation of the floor slab subgrade should include stripping of all unsuitable loose or otherwise deleterious material followed by proofrolling of the exposed subgrade with a heavy roller to ensure uniform adequate support. Excessively loose, soft or compressible materials revealed during the proofrolling operations should be subexcavated and replaced with well compacted approved material.

Fill placed under the floor slab to achieve finished subgrade levels or as foundation excavation backfill should comprise approved inorganic material having a moisture content within 3% of the optimum value, placed in maximum 200 mm thick lifts and compacted to at least 95% SPMDD. A minimum of 150 mm thick layer of well compacted clear stone or 20 mm crusher run limestone is recommended directly beneath the slab-on-grade. Where clear stone is used, a geotextile filter is recommended between the subgrade soil and the clear stone to prevent soil migration into the open void space of the clear stone. A polyethylene vapour barrier should be placed at the surface of the stone if a moisture sensitive finish is to be placed on the floor.

Cognizant of the measured ground water levels, it is recommended that an underfloor drainage system be installed at this site. Underfloor drains consisting of 100 mm diameter perforated pipe surrounded by 150 mm of clear stone wrapped in approved geotextile should be installed at a spacing of 6 m on centre. The invert of the drainage pipe should be at least 200 mm below the underside of the floor slab. The underfloor drains should be installed separately from the perimeter drainage system and connected by positive drainage to a frost-free sump or outlet. Refer to Figure 2 for further details. Sump pits and pumps should be provided with back up pumps and an alternate emergency power source.

5.7 Pipe Installation

5.7.1 Pipe Bedding and Cover

Utility installation information has not been provided at the time of this report. However, the inverts are assumed to be at 2 to 3 m depth. At this depth, surficial fill and native silty sand/sandy silt was encountered in the boreholes.

Based on the estimated invert levels, bearing capacity issues are not anticipated for the underground utility installations founded in native materials provided adequate ground water control measures are implemented.

Pipe bedding thickness, composition and compaction should conform to OPSD 802.010 for flexible pipes and OPSD 802.03 for rigid pipes and should meet municipal standards. As a general guideline, a minimum 150 mm thick layer of OPSS Granular A bedding material is recommended for pipes 450 mm diameter or less; for larger diameter pipes, the thickness of the bedding should be increased to 200 mm. The selection of bedding material for large pipes may also be determined by the Design Engineer based on the types of pipe, bedding factors, and installation methods. If the subgrade becomes unduly wet during construction, additional bedding material should be provided. The granular bedding material should be placed in thin lifts not more than 150 mm thick per lift and each lift shall be compacted to at least 98% SPMDD, at water content levels within 2 % of Optimum Moisture Content (OMC) obtained from standard Proctor test. The bedding requirement should also satisfy local standards and regulations.



The bedding material should be carried up as backfill for at least 300 mm above the pipe obvert, and should be placed in 150 mm lifts compacted to 95% SPMDD.

5.7.2 Utility Trench Backfill

The trenches should be backfilled with approved material comprising inorganic, debris free material that is within 3% of its optimum moisture. The backfill should be compacted to 95% SPMDD. The upper 600 mm zone of the trench backfill under pavement areas should be compacted to at least 100% of the SPMDD. Trench backfilling should be carried out as soon as possible following trench excavation and pipe installation to avoid excessive wetting of the subgrade.

The inorganic in-situ native silty sand/sandy silt will generally be suitable for reuse as trench backfill on a selective basis.

5.8 Pavement Design and Reconstruction

Minor grade changes are anticipated for the site. Based on the strength and low frost susceptibility of the anticipated subgrade materials, the minimum parking lot pavement structure thickness is provided in below table.

RECOMMENDED PARKING LOT PAVEMENT STRUCTURE THICKNESS

MATERIAL	THICKNESS (mm)
Asphaltic Concrete HL-3	40
Asphaltic Concrete HL-8	50
Granular A Base Course	150
Granular B Subbase Course (Type I)	300
TOTAL THICKNESS	540



The granular base and subbase material shall conform to OPSS.MUNI 1010 requirements. Base and subbase material shall be compacted to a degree of 100% SPMDD, at moisture content levels within 2 % of OMC.

Preparation of the subgrade for pavement construction should involve removing obvious deleterious materials followed by proofrolling of the subgrade with a heavy roller. Excessively wet or deleterious material revealed by the proofrolling operations should be sub-excavated and replaced. The subgrade surface should be compacted to at least 95% SPMDD.

It is recommended that the parking lot be constructed during the drier time of the year. The pavement design assumes that a stable subgrade under construction equipment/traffic. If the subgrade is wet and unstable, additional thicknesses of the subbase course material may be required.

For the pavement to function properly, provision must be made for water to drain out of, and not collect in, the granular courses. In this regard, the pavement subgrade should be sloped to promote drainage towards catch basins or manholes.

The excavation around catch-basins and manholes should be backfilled with free-draining granular material to minimize differential movements between the pavement and structures due to frost action. The structures should be perforated and screened just above the drain level to permit drainage.

6. GEOTECHNICAL DESIGN AND CONSTRUCTION REVIEWS

Earthworks operations should be carried out under the supervision of PML to approve subgrade preparation, backfill materials, placement and compaction procedures, and verify that the specified compaction standards are achieved throughout fill materials.

Prior to placement of structural concrete, all founding surfaces must be inspected by PML to verify the design bearing capacity is available, or to reassess the design parameters based on the actual conditions.



The comments and recommendations provided in the report are based on the information revealed in the boreholes. Conditions away from and between boreholes may vary, considering

Geotechnical Investigation previous activity at the site. Geotechnical review during construction should be on going to confirm that the subsurface conditions are substantially similar to those encountered in the boreholes. Significant changes in the ground conditions revealed during construction may require modification to the geotechnical engineering recommendations provided in this report.



7. CLOSURE

The discussions and recommendations in this report have been made based on the findings in the boreholes. Soil and ground water conditions may vary between and beyond the boreholes. These variations may necessitate modifications to our recommendations and design considerations.

We trust that the information presented in this report is sufficient for your present purposes. Please do not hesitate to contact our office should you have any questions.

Sincerely

Peto MacCallum Ltd.

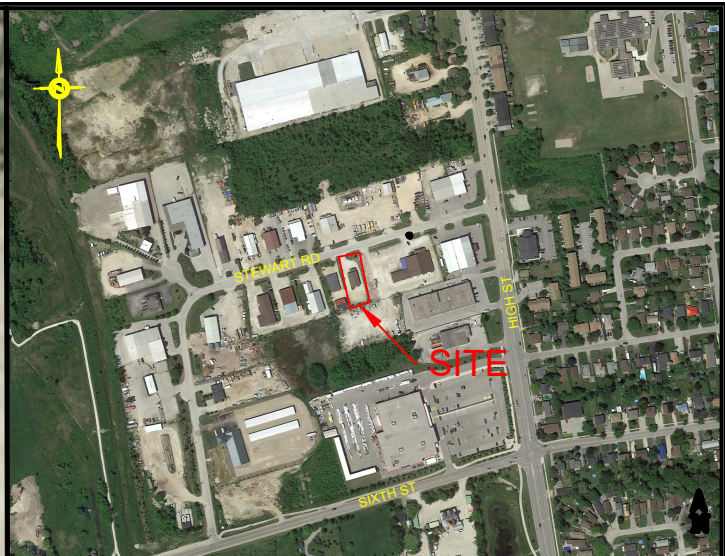
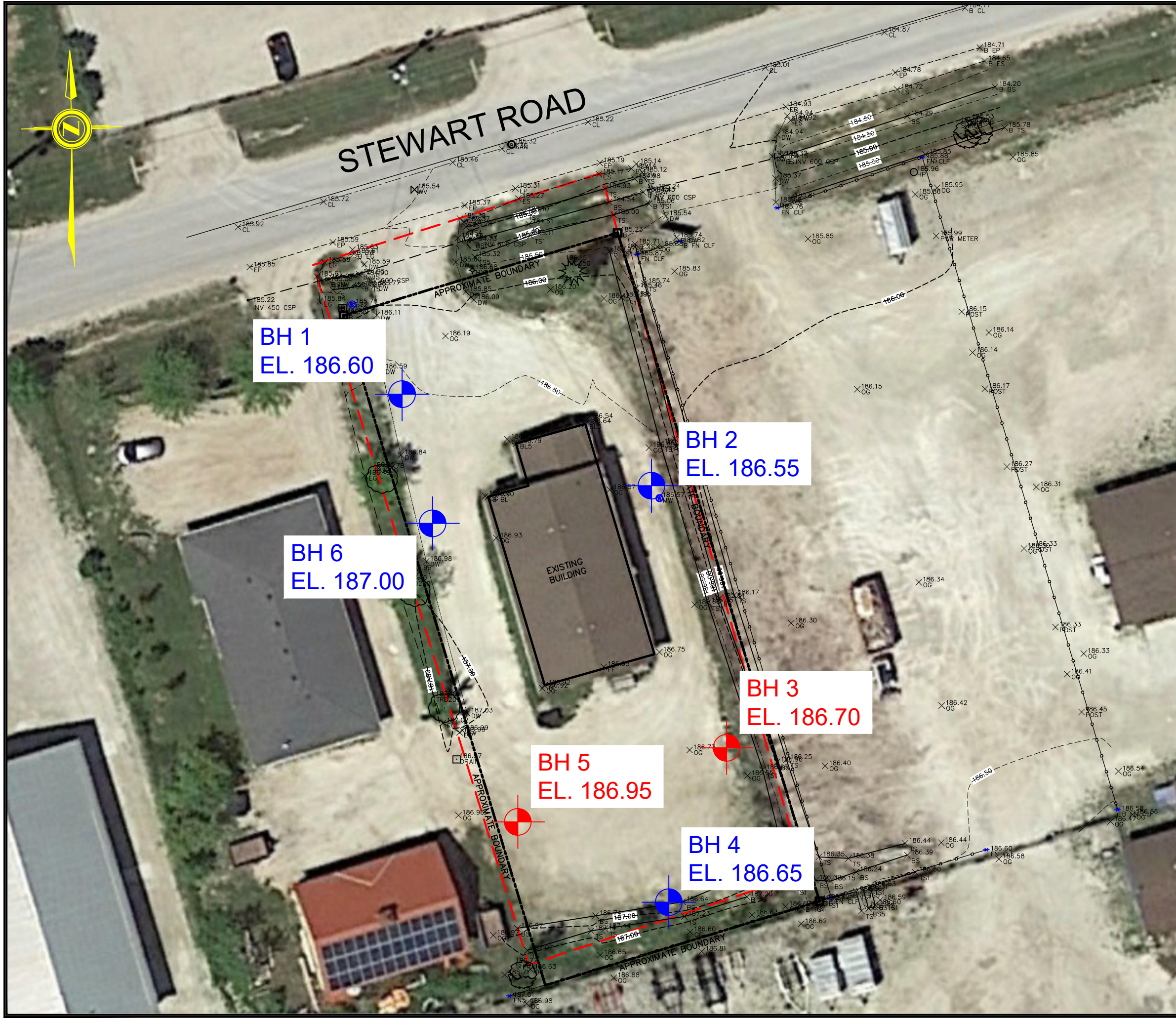
A handwritten signature in cursive script that reads 'N Gardlund'.

Niklas Gardlund, EIT
Project Supervisor, Geotechnical Services



Scott Jeffrey, P.Eng., QP_{ESA}, LEED_{GA}
Director
Regional Manager, Geotechnical and Geoenvironmental Services

SJ:NG:gs

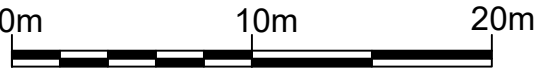


KEY PLAN
COLLINGWOOD, ONTARIO

LEGEND:

- BH 1
EL. 186.60 **BOREHOLE 1 LOCATION (MONITORING WELL)
SURFACE ELEVATION**
- BH 3
EL. 186.70 **BOREHOLE 3 LOCATION
SURFACE ELEVATION**
- PROJECT SITE**

- NOTES:
- THIS DRAWING WAS REPRODUCED FROM GOOGLE MAPS AND USING A TOPOGRAPHIC PLAN PROVIDED BY THE CLIENT.
 - DIMENSIONS ARE IN METRES AND/OR MILLIMETRES UNLESS OTHERWISE SHOWN. STATIONS ARE IN KILOMETRES AND METRES.



PLAN SCALE

BAIRD HOLDING LTD
BOREHOLE AND MONITORING WELL LOCATION PLAN
GEOTECHNICAL DESKTOP STUDY
12 STEWART ROAD, COLLINGWOOD, ONTARIO



DRAWN	NG	DATE	SCALE	PML REF.	DRAWING NO.
CHECKED	SJ	MARCH 2026	AS SHOWN	26BF002	1
APPROVED	SJ				

LIST OF ABBREVIATIONS



PENETRATION RESISTANCE

Standard Penetration Resistance N: - The number of blows required to advance a standard split spoon sampler 0.3 m into the subsoil. - Driven by means of a 63.5 kg hammer falling freely a distance of 0.76 m.

Dynamic Penetration Resistance: The number of blows required to advance a 51 mm, 60 degree cone, fitted to the end of drill rods, 0.3 m into the subsoil. The driving energy being 475 J per blow.

DESCRIPTION OF SOIL

The consistency of cohesive soils and the relative density or denseness of cohesionless soils are described in the following terms:

<u>CONSISTENCY</u>	<u>N (blows/0.3 m)</u>	<u>c (kPa)</u>	<u>DENSENESS</u>	<u>N (blows/0.3 m)</u>
Very Soft	0 - 2	0 - 12	Very Loose	0 - 4
Soft	2 - 4	12 - 25	Loose	4 - 10
Firm	4 - 8	25 - 50	Compact	10 - 30
Stiff	8 - 15	50 - 100	Dense	30 - 50
Very Stiff	15 - 30	100 - 200	Very Dense	> 50
Hard	> 30	> 200		
WTPL	Wetter Than Plastic Limit			
APL	About Plastic Limit			
DTPL	Drier Than Plastic Limit			

TYPE OF SAMPLE

SS	Split Spoon	TW	Thinwall Open
WS	Washed Sample	TP	Thinwall Piston
SB	Scraper Bucket Sample	OS	Oesterberg Sample
AS	Auger Sample	FS	Foil Sample
CS	Chunk Sample	RC	Rock Core
ST	Slotted Tube Sample	USS	Undisturbed Shear Strength
PH	Sample Advanced Hydraulically	RSS	Remoulded Shear Strength
PM	Sample Advanced Manually		

SOIL TESTS

Qu	Unconfined Compression	LV	Laboratory Vane
Q	Undrained Triaxial	FV	Field Vane
Qcu	Consolidated Undrained Triaxial	C	Consolidation
Qd	Drained Triaxial		

LOG OF BOREHOLE/MONITORING WELL NO. 1

1 of 1

17T 560795.1E 4927047N

PROJECT Proposed Commercial Building

LOCATION 12 Stewart Road, Collingwood, Ontario

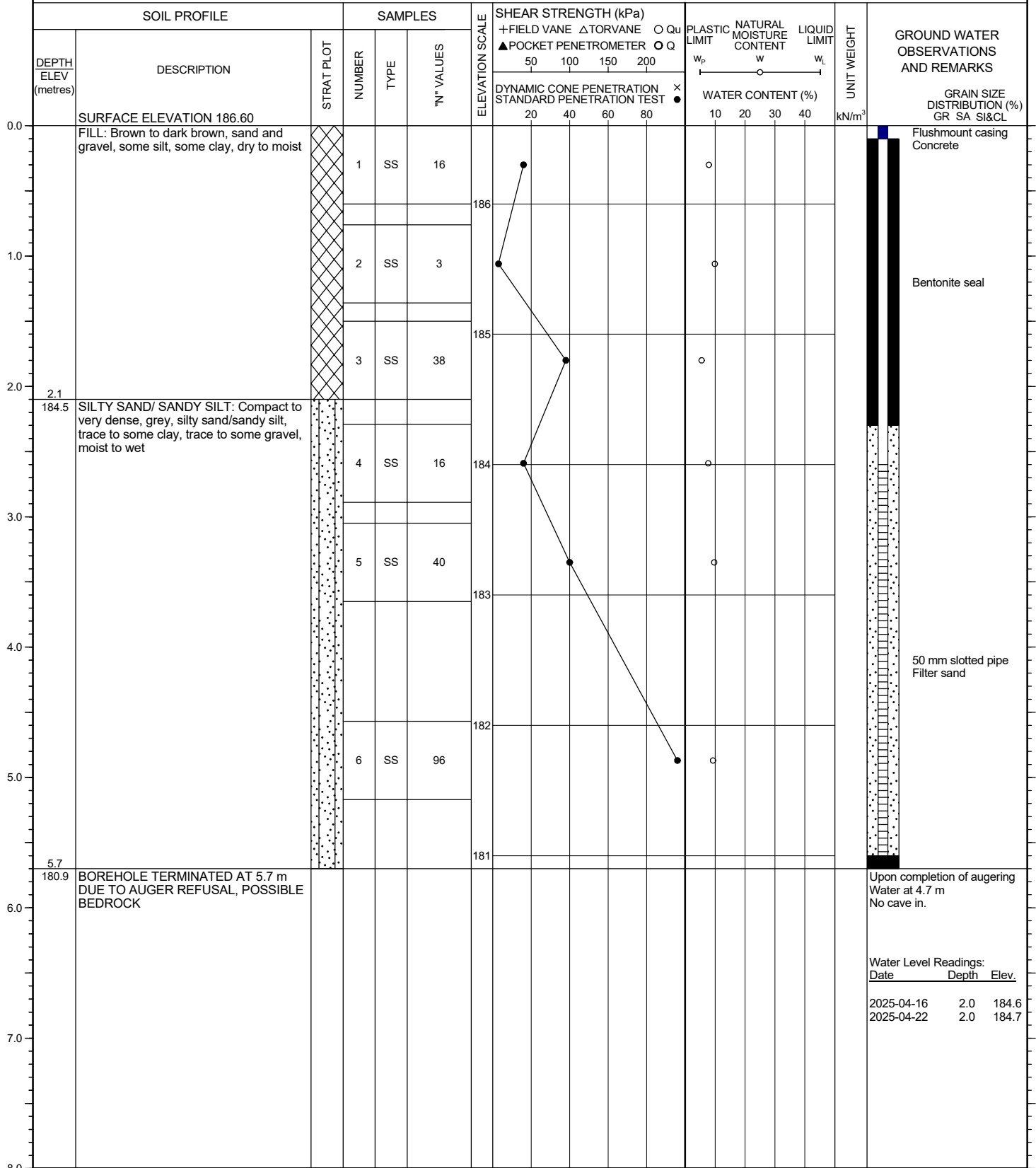
BORING METHOD Continuous Flight Solid Stem Augers

BORING DATE April 3, 2025

PML REF. 26BF002

ENGINEER ST

TECHNICIAN JK



NOTES

LOG OF BOREHOLE/MONITORING WELL NO. 2

1 of 1

17T 560814.7E 4927041N

PROJECT Proposed Commercial Building

LOCATION 12 Stewart Road, Collingwood, Ontario

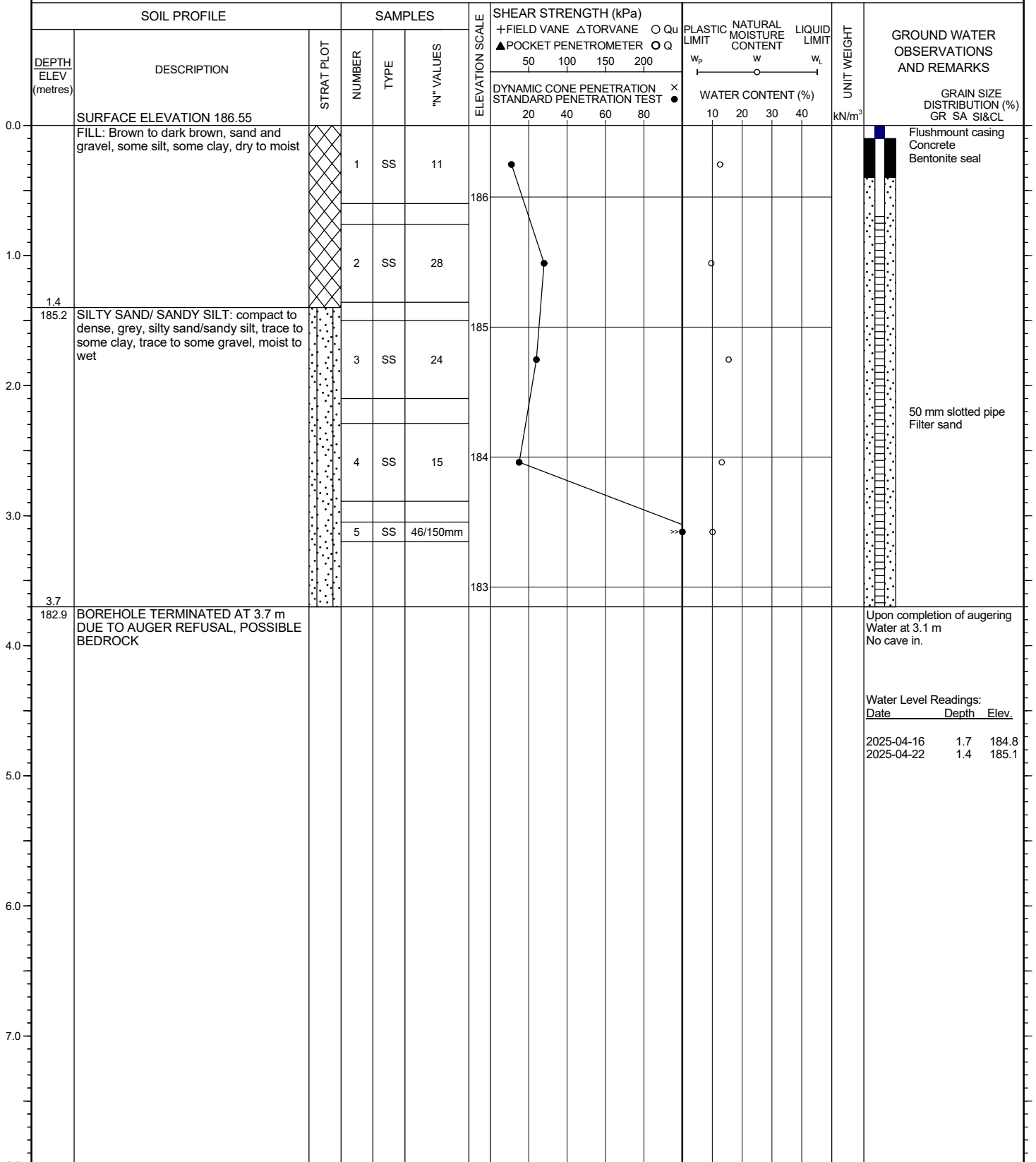
BORING METHOD Continuous Flight Solid Stem Augers

BORING DATE April 3, 2025

PML REF. 26BF002

ENGINEER ST

TECHNICIAN JK



LOG OF BOREHOLE NO. 3

17T 560819.3E 4927019N

1 of 1

PROJECT Proposed Commercial Building

LOCATION 12 Stewart Road, Collingwood, Ontario

BORING METHOD Continuous Flight Solid Stem Augers

BORING DATE April 3, 2025

PML REF. 26BF002

ENGINEER ST

TECHNICIAN JK

SOIL PROFILE			SAMPLES			SHEAR STRENGTH (kPa)		PLASTIC LIMIT		NATURAL MOISTURE CONTENT		LIQUID LIMIT		UNIT WEIGHT	GROUND WATER OBSERVATIONS AND REMARKS
DEPTH ELEV (metres)	DESCRIPTION	STRAT PLOT	NUMBER	TYPE	"N" VALUES	+ FIELD VANE Δ TORVANE ○ Qu		w _p	w	w _L	WATER CONTENT (%)				
						▲ POCKET PENETROMETER ○ Q					DYNAMIC CONE PENETRATION STANDARD PENETRATION TEST ×				
						50 100 150 200									
						20 40 60 80									
						ELEVATION SCALE									
						186									
						185									
						184									

NOTES

LOG OF BOREHOLE/MONITORING WELL NO. 4

1 of 1

17T 560815.3E 4927007N

PROJECT Proposed Commercial Building

LOCATION 12 Stewart Road, Collingwood, Ontario

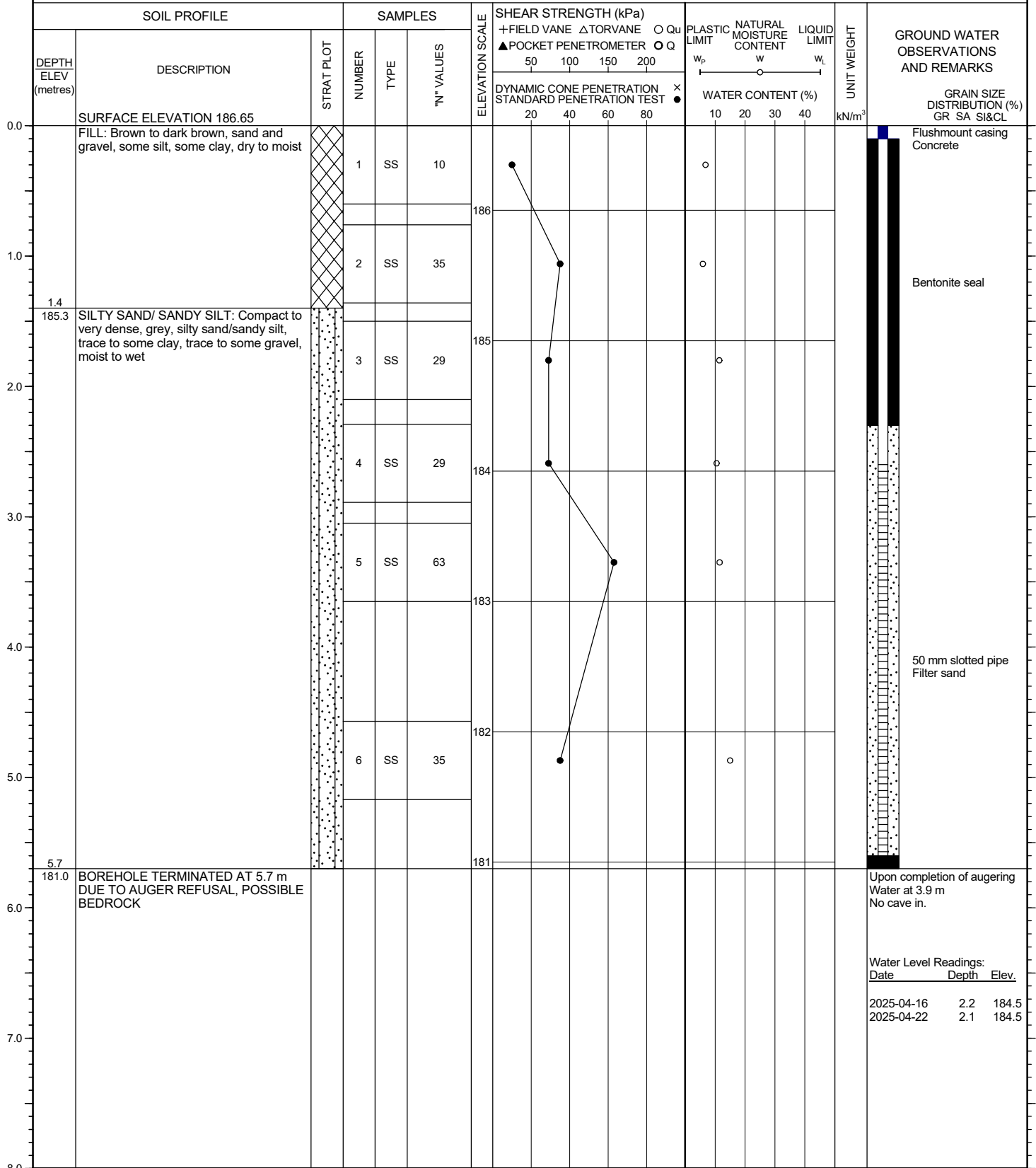
BORING METHOD Continuous Flight Solid Stem Augers

BORING DATE April 3, 2025

PML REF. 26BF002

ENGINEER ST

TECHNICIAN JK



NOTES

LOG OF BOREHOLE NO. 5

17T 560803.3E 4927011N

1 of 1

PROJECT Proposed Commercial Building
LOCATION 12 Stewart Road, Collingwood, Ontario
BORING METHOD Continuous Flight Solid Stem Augers

BORING DATE April 3, 2025

PML REF. 26BF002

ENGINEER ST

TECHNICIAN JK

SOIL PROFILE			SAMPLES			SHEAR STRENGTH (kPa)		PLASTIC LIMIT		NATURAL MOISTURE CONTENT		LIQUID LIMIT		UNIT WEIGHT kN/m ³	GROUND WATER OBSERVATIONS AND REMARKS
DEPTH ELEV (metres)	DESCRIPTION	STRAT PLOT	NUMBER	TYPE	"N" VALUES	+ FIELD VANE Δ TORVANE ○ Qu		w _p	w	w _L	WATER CONTENT (%)				
						▲ POCKET PENETROMETER ○ Q									
						DYNAMIC CONE PENETRATION STANDARD PENETRATION TEST ×									
						50	100	150	200						
						20	40	60	80						
0.0	SURFACE ELEVATION 186.95														
	FILL: Brown to dark brown, sand and gravel, some silt, some clay, dry to moist		1	SS	9										
1.0			2	SS	19										
1.4															
185.6	SILTY SAND/ SANDY SILT: Compact, grey, silty sand/sandy silt, trace to some clay, trace to some gravel, moist to wet		3	SS	13										
2.0															
			4	SS	23										
3.0															
3.1	BOREHOLE TERMINATED AT 3.1 m														
183.9															
4.0															
5.0															
6.0															
7.0															
						</									

NOTES

LOG OF BOREHOLE/MONITORING WELL NO. 6

1 of 1

17T 560797.1E 4927032N

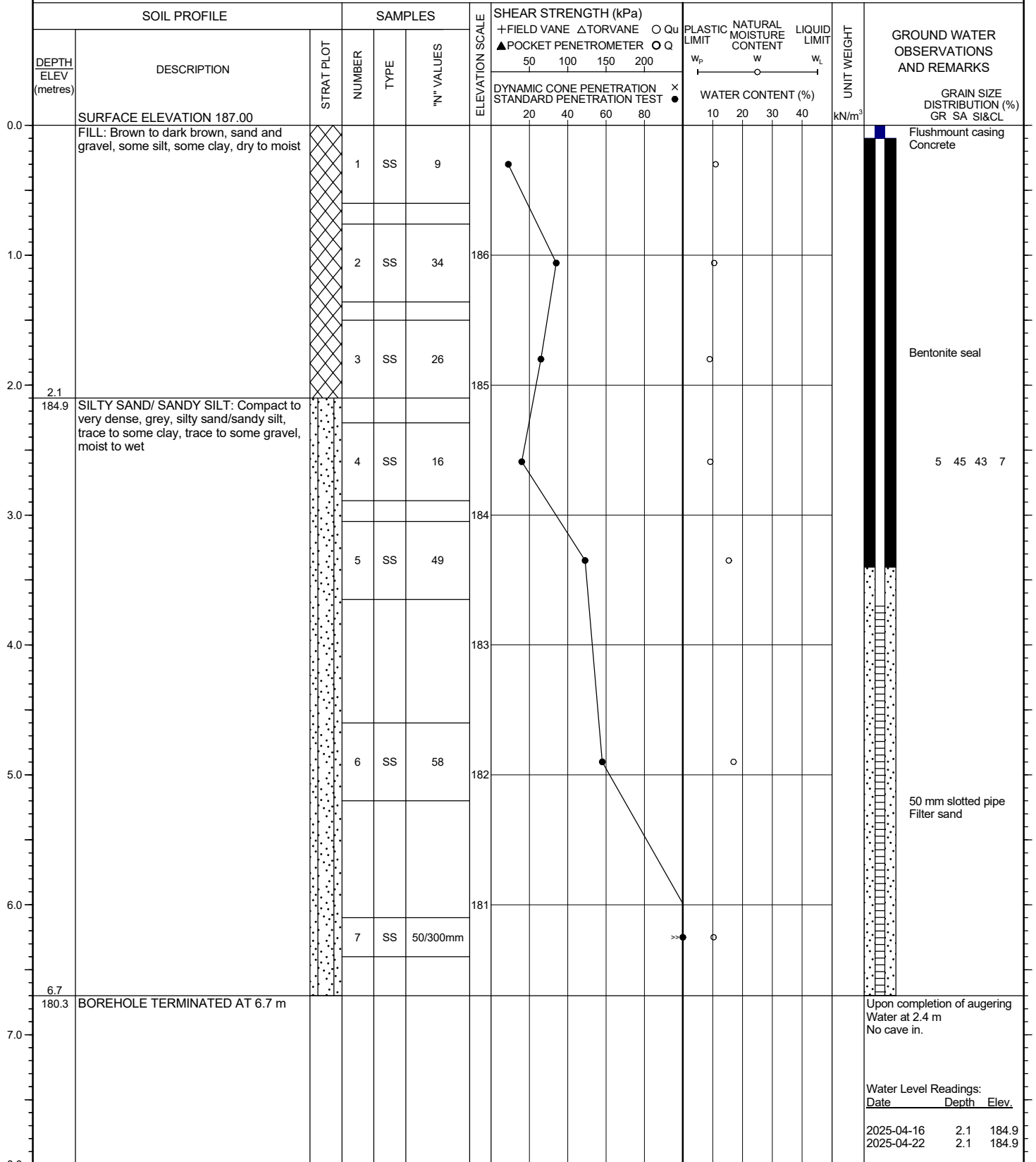
PROJECT Proposed Commercial Building
LOCATION 12 Stewart Road, Collingwood, Ontario
BORING METHOD Continuous Flight Solid Stem Augers

BORING DATE April 3, 2025

PML REF. 26BF002

ENGINEER ST

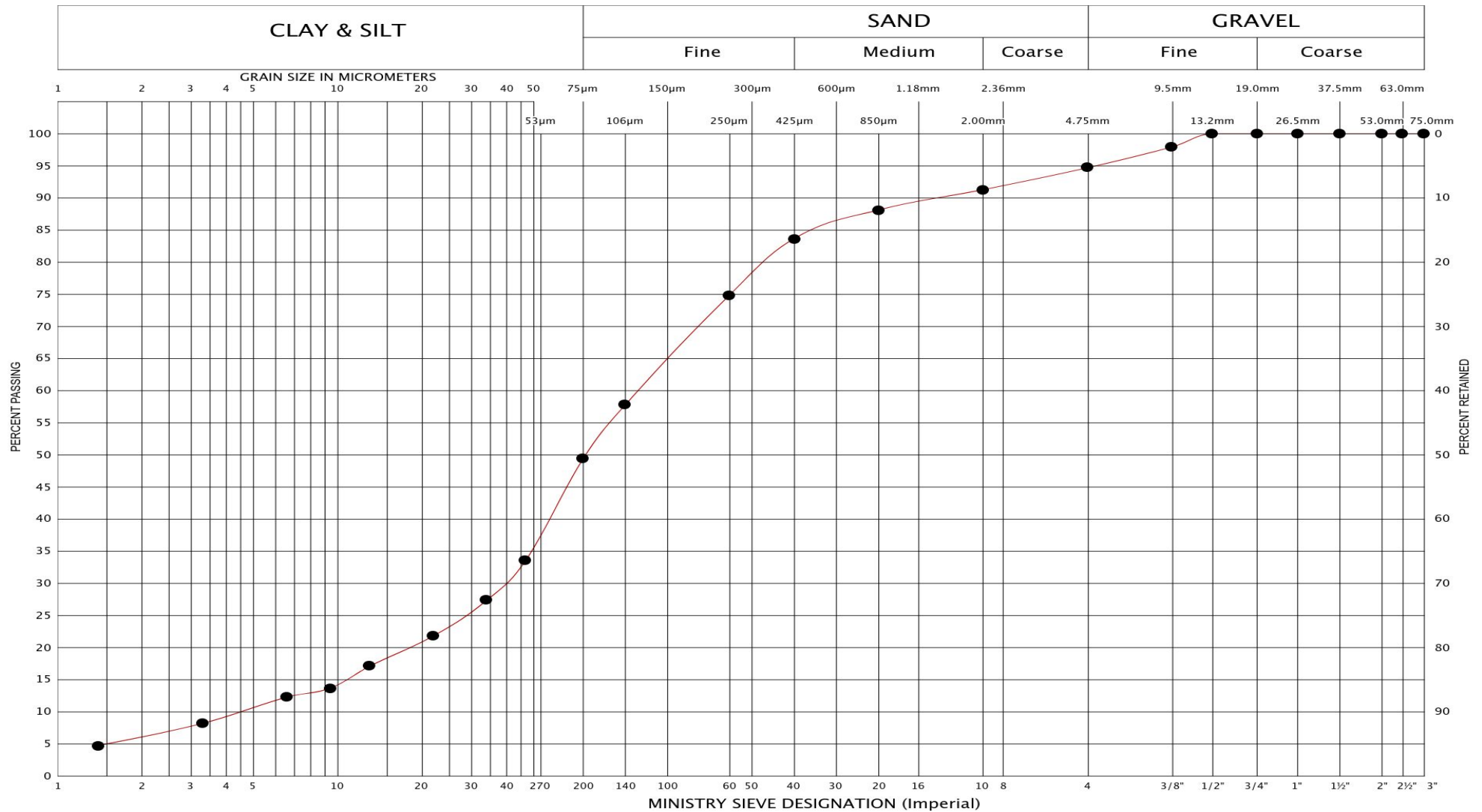
TECHNICIAN JK



NOTES

Water Level Readings:
Date Depth Elev.
2025-04-16 2.1 184.9
2025-04-22 2.1 184.9

UNIFIED SOIL CLASSIFICATION SYSTEM



LEGEND	BH	6
	SAMPLE	4
	SYMBOL	•

NOTES

1. The need to underpin existing footings/utilities is dependent upon soil type, proximity of the existing facility to the face of the excavation, loads imposed on the foundation and permissible movements.

ZONE A:

Foundations of relatively heavy and/or settlement sensitive structures/utilities located in Zone A generally require underpinning.

ZONE B:

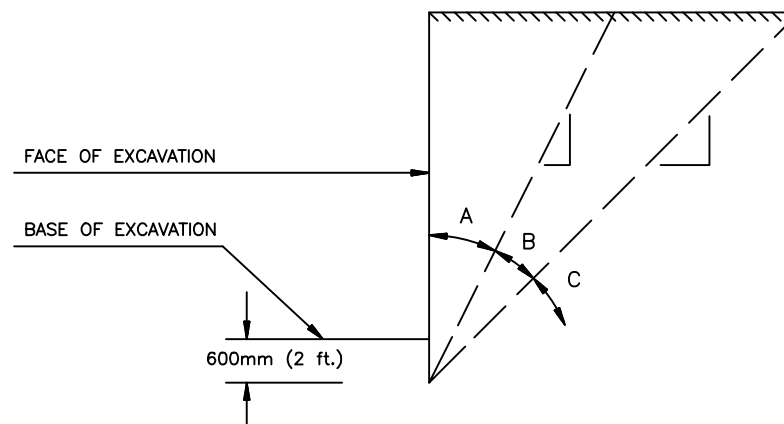
Foundations of structures located within Zone B generally do not require underpinning. Consideration should be given to underpinning of settlement sensitive utilities or heavy foundation units located in this zone.

ZONE C:

Utilities and foundations located within Zone C do not normally require underpinning.

Underpinning of foundations located in Zones A and B should extend at least into Zone C.

2. As an alternative to underpinning, it may be possible to control movement of existing utilities and foundations by supporting the face of the excavation with bracing/tiebacks or a rigid (caisson) wall. Horizontal and vertical earth pressures imposed on the excavation wall by non-underpinned foundations must be considered in the design of the support system.
3. A condition survey should be conducted prior to construction and appropriate monitoring (surface and insitu) carried out during construction to monitor any movement which may occur.
4. All work should be carried out in accordance with the Occupational Health and Safety Act and local regulations. Good quality workmanship and construction practices are to be employed.
5. This sheet is to be read in conjunction with text of report for this project. Additional comments and recommendations concerning these general guidelines will be provided if required.



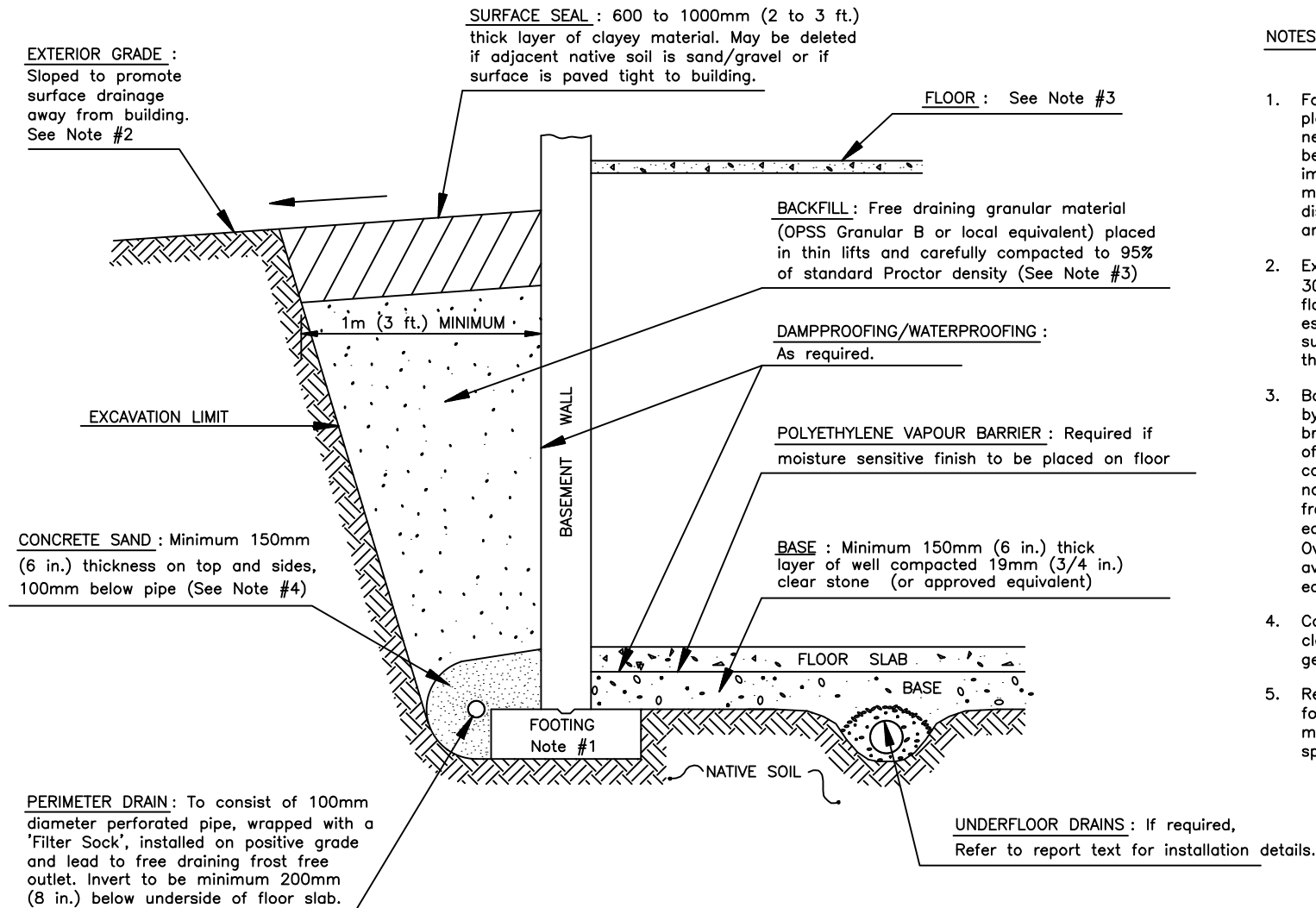
STANDARD DRAWING

GENERAL RECOMMENDATIONS REGARDING UNDERPINNING OF FOUNDATIONS/UTILITIES LOCATED CLOSE TO EXCAVATION



Peto MacCallum Ltd.
CONSULTING ENGINEERS

DRAWN:	DATE	SCALE	JOB NO.	FIGURE NO.
CHECKED: SJ	MARCH 2026	N.T.S.	26BF002	1
APPROVED: SJ				



NOTES

1. Footing may be constructed by placement of structural concrete neat against natural soil. Drain to be installed in a similar manner immediately above footing maintaining 200mm (8 in.) distance between top of drain and underside of floor slab.
2. Exterior grade to be minimum 300mm (12 in.) below interior floor slab, or other means established to prevent entry of surface water into building through building openings.
3. Basement wall to be supported by floor system or interior bracing prior to commencement of backfill placement. Heavy construction equipment should not be permitted within a distance from the foundation wall equivalent to half the wall height. Overcompaction of backfill to be avoided as excessive lateral earth pressure may result.
4. Concrete sand may be replaced with clear stone, if wrapped in approved geotextile.
5. Refer to text for details regarding founding levels, competent bearing material and construction details specific to particular site.

STANDARD DRAWING

GENERAL RECOMMENDATIONS REGARDING DRAINAGE AND BACKFILL REQUIREMENTS FOR BASEMENT WALL AND FLOOR SLAB CONSTRUCTION



Peto MacCallum Ltd.
CONSULTING ENGINEERS

DRAWN:	N.A.	DATE	SCALE	JOB NO.	FIGURE NO.
CHECKED:	SJ	MARCH 2026	N.T.S.	26BF002	2
APPROVED:	SJ				



APPENDIX A

Statement of Limitations

STATEMENT OF LIMITATIONS



STATEMENT OF LIMITATIONS

This report is prepared for and made available for the sole use of the client named. Peto MacCallum Ltd. (PML) hereby disclaims any liability or responsibility to any person or entity, other than those for whom this report is specifically issued, for any loss, damage, expenses, or penalties that may arise or result from the use of any information or recommendations contained in this report. The contents of this report may not be used or relied upon by any other person without the express written consent and authorization of PML.

This report shall not be relied upon for any purpose other than as agreed with the client named without the written consent of PML. It shall not be used to express or imply warranty as to the fitness of the property for a particular purpose. A portion of this report may not be used as a separate entity: that is to say the report is to be read in its entirety at all times.

The report is based solely on the scope of services which are specifically referred to in this report. No physical or intrusive testing has been performed, except as specifically referenced in this report. This report is not a certification of compliance with past or present regulations, codes, guidelines and policies.

The scope of services carried out by PML is based on details of the proposed development and land use to address certain issues, purposes and objectives with respect to the specific site as identified by the client. Services not expressly set forth in writing are expressly excluded from the services provided by PML. In other words, PML has not performed any observations, investigations, study analysis, engineering evaluation or testing that is not specifically listed in the scope of services in this report. PML assumes no responsibility or duty to the client for any such services and shall not be liable for failing to discover any condition, whose discovery would require the performance of services not specifically referred to in this report.

STATEMENT OF LIMITATIONS



STATEMENT OF LIMITATIONS (continued)

The findings and comments made by PML in this report are based on the conditions observed at the time of PML's site reconnaissance. No assurances can be made and no assurances are given with respect to any potential changes in site conditions following the time of completion of PML's field work. Furthermore, regulations, codes and guidelines may change at any time subsequent to the date of this report and these changes may affect the validity of the findings and recommendations given in this report.

The results and conclusions with respect to site conditions are therefore in no way intended to be taken as a guarantee or representation, expressed or implied, that the site is free from any contaminants from past or current land use activities or that the conditions in all areas of the site and beneath or within structures are the same as those areas specifically sampled.

Any investigation, examination, measurements or sampling explorations at a particular location may not be representative of conditions between sampled locations. Soil, ground water, surface water, or building material conditions between and beyond the sampled locations may differ from those encountered at the sampling locations and conditions may become apparent during construction which could not be detected or anticipated at the time of the intrusive sampling investigation.

Budget estimates contained in this report are to be viewed as an engineering estimate of probable costs and provided solely for the purposes of assisting the client in its budgeting process. It is understood and agreed that PML will not in any way be held liable as a result of any budget figures provided by it.

The Client expressly waives its right to withhold PML's fees, either in whole or in part, or to make any claim or commence an action or bring any other proceedings, whether in contract, tort, or otherwise against PML in anyway connected with advice or information given by PML relating to the cost estimate or Environmental Remediation/Cleanup and Restoration or Soil and Ground Water Management Plan Cost Estimate.



APPENDIX B

Engineered Fill Guidelines

The information presented in this appendix is intended for general guidance only. Site specific conditions and prevailing weather may require modification of compaction standards, backfill type or procedures. Each site must be discussed, and procedures agreed with Peto MacCallum Ltd. prior to the start of the earthworks and must be subject to ongoing review during construction. This appendix is not intended to apply to embankments. Steeply sloping ravine residential lots require special consideration.

For fill to be classified as engineered fill suitable for supporting structural loads, a number of conditions must be satisfied, including but not necessarily limited to the following:

1. Purpose

The site specific purpose of the engineered fill must be recognized. In advance of construction, all parties should discuss the project and its requirements and agree on an appropriate set of standards and procedures.

2. Minimum Extent

The engineered fill envelope must extend beyond the footprint of the structure to be supported. The minimum extent of the envelope should be defined from a geotechnical perspective by:

- at founding level, extend a minimum 1.0 m beyond the outer edge of the foundations, greater if adequate layout has not yet been completed as noted below; and
- extend downward and outward at a slope no greater than 45° to meet the subgrade

All fill within the envelope established above must meet the requirements of engineered fill in order to support the structure safely. Other considerations such as survey control, or construction methods may require an envelope that is larger, as noted in the following sections.

Once the minimum envelope has been established, structures must not be moved or extended without consultation with Peto MacCallum Ltd. Similarly, Peto MacCallum Ltd. should be consulted prior to any excavation within the minimum envelope.

3. Survey Control

Accurate survey control is essential to the success of an engineered fill project. The boundaries of the engineered fill must be laid out by a surveyor in consultation with engineering staff from Peto MacCallum Ltd. Careful consideration of the maximum building envelope is required.

During construction it is necessary to have a qualified surveyor provide total station control on the three dimensional extent of filling.

4. Subsurface Preparation

Prior to placement of fill, the subgrade must be prepared to the satisfaction of Peto MacCallum Ltd. All deleterious material must be removed and in some cases, excavation of native mineral soils may be required.

Particular attention must be paid to wet subgrades and possible additional measures required to achieve sufficient compaction. Where fill is placed against a slope, benching may be necessary and natural drainage paths must not be blocked.

5. Suitable Fill Materials

All material to be used as fill must be approved by Peto MacCallum Ltd. Such approval will be influenced by many factors and must be site and project specific. External fill sources must be sampled, tested and approved prior to material being hauled to site.

6. Test Section

In advance of the start of construction of the engineered fill pad, the Contractor should conduct a test section. The compaction criterion will be assessed in consultation with Peto MacCallum Ltd. for the various fill material types using different lift thicknesses and number of passes for the compaction equipment proposed by the Contractor.

Additional test sections may be required throughout the course of the project to reflect changes in fill sources, natural moisture content of the material and weather conditions.

The Contractor should be particularly aware of changes in the moisture content of fill material. Site review by Peto MacCallum Ltd. is required to ensure the desired lift thickness is maintained and that each lift is systematically compacted, tested and approved before a subsequent lift is commenced.

7. Inspection and Testing

Uniform, thorough compaction is crucial to the performance of the engineered fill and the supported structure. Hence, all subgrade preparation, filling and compacting must be carried out under the full time inspection by Peto MacCallum Ltd.

All founding surfaces for all buildings and residential dwellings or any part thereof (including but not limited to footings and floor slabs) on structural fill or native soils must be inspected and approved by PML engineering personnel prior to placement of the base/subbase granular material and/or concrete. The purpose of the inspection is to ensure the subgrade soils are capable of supporting the building/house foundation and floor slab loads and to confirm the building/house envelope does not extend beyond the limits of any structural fill pads.

8. Protection of Fill

Fill is generally more susceptible to the effects of weather than natural soil. Fill placed and approved to the level at which structural support is required must be protected from excessive wetting, drying, erosion or freezing. Where adequate protection has not been provided, it may be necessary to provide deeper footings or to strip and recompact some of the fill.

9. Construction Delay Time Considerations

The integrity of the fill pad can deteriorate due to the harsh effects of our Canadian weather. Hence, particular care must be taken if the fill pad is constructed over a long time period.

It is necessary therefore, that all fill sources are tested to ensure the material compactability prior to the soil arriving at site. When there has been a lengthy delay between construction periods of the fill pad, it is necessary to conduct subgrade proof rolling, test pits or boreholes to verify the adequacy of the exposed subgrade to accept new fill material.

When the fill pad will be constructed over a lengthy period of time, a field survey should be completed at the end of each construction season to verify the areal extent and the level at which the compacted fill has been brought up to, tested and approved.

In the following spring, subexcavation may be necessary if the fill pad has been softened attributable to ponded surface water or freeze/thaw cycles.

A new survey is required at the beginning of the next construction season to verify that random dumping and/or spreading of fill has not been carried out at the site.

10. Approved Fill Pad Surveillance

It should be appreciated that once the fill pad has been brought to final grade and documented by field survey, there must be ongoing surveillance to ensure that the integrity of the fill pad is not threatened.

Grading operations adjacent to fill pads can often take place several months or years after completion of the fill pad.

It is imperative that all site management and supervision staff, the staff of Contractors and earthwork operators be fully aware of the boundaries of all approved engineered fill pads.

Excavation into an approved engineered fill pad should never be contemplated without the full knowledge, approval and documentation by the geotechnical consultant.

If the fill pad is knowingly built several years in advance of ultimate construction, the areal limits of the fill pad should be substantially overbuilt laterally to allow for changes in possible structure location and elevation and other earthwork operations and competing interests on the site. The overbuilt distance required is project and/or site specified.

Iron bars should be placed at the corner/intermediate points of the fill pad as a permanent record of the approved limits of the work for record keeping purposes.

11. Unusual Working Conditions

Construction of fill pads may at times take place at night and/or during periods of freezing weather conditions because of the requirements of the project schedule. It should be appreciated therefore, that both situations present more difficult working conditions. The Owner, Contractor, Design Consultant and Geotechnical Engineer must be willing to work together to revise site construction procedures, enhance field testing and surveillance, and incorporate design modifications as necessary to suit site conditions.

When working at night there must be sufficient artificial light to properly illuminate the fill pad and borrow areas.

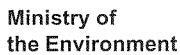
Placement of material to form an engineered fill pad during winter and freezing temperatures has its own special conditions that must be addressed. It is imperative that each day prior to placement of new fill, the exposed subgrade must be inspected and any overnight snow or frozen material removed. Particular attention should be given to the borrow source inspection to ensure only nonfrozen fill is brought to the site.

The Contractor must continually assess the work program and have the necessary spreading and compacting equipment to ensure that densification of the fill material takes place in a minimum amount of time. Changes may be required to the spreading methods, lift thickness, and compaction techniques to ensure the desired compaction is achieved uniformly throughout each fill lift.

The Contractor should adequately protect the subgrade at the end of each shift to minimize frost penetration overnight. Since water cannot be added to the fill material to facilitate compaction, it is imperative that densification of the fill be achieved by additional compaction effort and an appropriate reduced lift thickness. Once the fill pad has been completed, it must be properly protected from freezing temperatures and ponding of water during the spring thaw period.

If the pad is unusually thick or if the fill thickness varies dramatically across the width or length of the fill pad, Peto MacCallum Ltd. should be consulted for additional recommendations. In this case, alternative special provisions may be recommended, such as providing a surcharge preload for a limited time or increase the degree of compaction of the fill.

Appendix C – Background Information



or Print Below)

BH 2

Regulation 903 Ontario Water Resources Act

Page of

Measurements recorded in: ☐ Metric ☐ Imperial

First Name	Last Name / Organization	E-mail Address	☐ Well Constructed by Well Owner
220 Real Estate	limited Partnership do 4241551 Canada Inc.		

Mailing Address (Street Number/Name)	Municipality	Province	Postal Code	Telephone No. (inc. area code)
220 chemin du Tremblay	Boucherville	Quebec	J4B 4H7	514 599 5900

Address of Well Location (Street Number/Name)	Township	Lot	Concession
100-104 High St			

County/District/Municipality Simcoe	City/Town/Village Collingwood	Province Ontario	Postal Code L9Y4K2
---	---	----------------------------	------------------------------

UTM Coordinates	Zone	Easting	Northing	Municipal Plan and Sublot Number	Other
NAD 83	17	560724	4926928		

General Colour	Most Common Material	Other Materials	General Description	Depth (m/ft)	
				From	To
Brown	Silty sand		-	0	1.5
Brown	Sandy silt till		moist	1.5	3.0
Brown	Silty sand		wet	3.0	3.6
Brown	Sandy silt till		moist	3.6	4.5

Depth Set at (m/ft)		Type of Sealant Used (Material and Type)	Volume Placed (m³/ft³)
From	To		
0	.3	Concrete	
.3	4.2	Bentonite	

After test of well yield, water was:	Draw Down		Recovery	
☐ Clear and sand free	Time (min)	Water Level (m/ft)	Time (min)	Water Level (m/ft)
☐ Other, <i>specify</i> _____	Static Level			
If pumping discontinued, give reason:	1		1	
Pump intake set at (m/ft)	2		2	
Pumping rate (l/min / GPM)	3		3	
Duration of pumping	4		4	
_____ hrs + _____ min	5		5	
Final water level end of pumping (m/ft)	10		10	
If flowing give rate (l/min / GPM)	15		15	
Recommended pump depth (m/ft)	20		20	
	25		25	
Recommended pump rate	30		30	
(l/min / GPM)	40		40	
Well production (l/min / GPM)	50		50	
Disinfected?	60		60	
☐ Yes ☐ No				

Inside Diameter (cm/in)	Open Hole OR Material (Galvanized, Fibreglass, Concrete, Plastic, Steel)	Wall Thickness (cm/in)	Depth (m/ft)		☐ Water Supply ☐ Replacement Well ☐ Test Hole ☐ Recharge Well ☐ Dewatering Well ☒ Observation and/or Monitoring Hole ☐ Alteration (Construction) ☐ Abandoned,
			From	To	
5.1	P.V.C	6.5	0	1.5	

Outside Diameter (cm/in)	Material (Plastic, Galvanized, Steel)	Slot No.	Depth (m/ft)		☐ Abandoned, Poor Water Quality ☐ Abandoned, other, specify _____ ☐ Other, specify _____
			From	To	
6.4	P.V.C	510	1.5	4.5	

Water found at Depth 1.5 (m/ft) ☐ Gas	Kind of Water: ☐ Fresh ☐ Untested ☐ Other, specify _____	Depth (m/ft) From	To	Diameter (cm/in)
Water found at Depth (m/ft) ☐ Gas	Kind of Water: ☐ Fresh ☐ Untested ☐ Other, specify _____	0	9.5	21cm
Water found at Depth (m/ft) ☐ Gas	Kind of Water: ☐ Fresh ☐ Untested ☐ Other, specify _____			

Depth (m/ft)		Diameter (cm/in)
From	To	
0	4.5	21cm

Business Name of Well Contractor <i>Geo-Environmental</i>		Well Contractor's Licence No. <i>6607</i>	
Business Address (Street Number/Name) <i>Mansewood Ct.</i>		Municipality <i>Halter Hills</i>	
Province <i>Nt</i>	Postal Code <i>L7J0A1</i>	Business E-mail Address	
Bus. Telephone No. (inc. area code) <i>905 876 3388</i>		Name of Well Technician (Last Name, First Name) <i>Paquette Jeff</i>	
Well Technician's Licence No. <i>2386</i>		Signature of Technician and/or Contractor <i>Paquette</i>	Date Submitted <i>7/01/403/06</i>

Please provide a map below following instructions on the back.

Comments:

See map

Well owner's information package delivered	Date Package Delivered	Ministry Use Only
	YY YY MM DD Date Work Completed 2014 03 06	
☐ Yes ☐ No		



Ministry of
the Environment

Tag#: A157270

(or Print Below)

Well Record

Regulation 903 Ontario Water Resources Act

Page 1 of 1

Measurements recorded in: ☒ Metric ☐ Imperial

A157270

BH 3

Well Owner's Information

First Name	Last Name / Organization	E-mail Address	☐ Well Constructed by Well Owner	
220	Real Estate Limited Partnership c/o 4246551	Canada Inc.		
Mailing Address (Street Number/Name)	Municipality	Province	Postal Code	Telephone No. (inc. area code)
220 chemin du Tremblay	Boucherville	Quebec	J4B8H7	514 599 5900

Well Location

Address of Well Location (Street Number/Name)	Township	Lot	Concession		
100-104 High St.					
County/District/Municipality	City/Town/Village	Province	Postal Code		
Simcoe	Collingwood	Ontario	L9Y4R2		
UTM Coordinates	Zone	Easting	Northing	Municipal Plan and Sublot Number	Other
NAD	83	17	560746	4926968	

Overburden and Bedrock Materials/Abandonment Sealing Record (see instructions on the back of this form)

General Colour	Most Common Material	Other Materials	General Description	Depth (m/ft)
Brown	Silty Sand			0 - 2.5
Brown	Sandy Silt till			2.5 - 1.5
Brown	Sandy Silt till		moist	1.5 - 3.0
Brown	Sandy Silt till		moist - wet	3.0 - 4.5

Annular Space		
Depth Set at (m/ft)	Type of Sealant Used (Material and Type)	Volume Placed (m³/ft³)
0 - 0.3	concrete	
0.3 - 1.2	Bentonite	

Method of Construction	Well Use
☐ Cable Tool	☐ Diamond
☐ Rotary (Conventional)	☐ Jetting
☐ Rotary (Reverse)	☐ Driving
☒ Boring	☐ Digging
☐ Air percussion	☐ Public
☐ Other, specify	☐ Commercial
	☐ Domestic
	☐ Municipal
	☐ Livestock
	☐ Irrigation
	☐ Cooling & Air Conditioning
	☐ Industrial
	☐ Other, specify

Construction Record - Casing			Status of Well	
Inside Diameter (cm/in)	Open Hole OR Material (Galvanized, Fibreglass, Concrete, Plastic, Steel)	Wall Thickness (cm/in)	Depth (m/ft)	
5.1	P.V.C	0.65	0	1.5

Construction Record - Screen			Status of Well	
Outside Diameter (cm/in)	Material (Plastic, Galvanized, Steel)	Slot No.	Depth (m/ft)	
6.4	P.V.C	10	1.5	4.5

Water Details		Hole Diameter	
Water found at Depth	Kind of Water: ☐ Fresh ☐ Untested	Depth (m/ft)	Diameter (cm/in)
1.5 (m/ft)	☐ Gas ☐ Other, specify	From To	
Water found at Depth	Kind of Water: ☐ Fresh ☐ Untested	0 4.5	21cm
(m/ft)	☐ Gas ☐ Other, specify		
Water found at Depth	Kind of Water: ☐ Fresh ☐ Untested		
(m/ft)	☐ Gas ☐ Other, specify		

Well Contractor and Well Technician Information			
Business Name of Well Contractor	Well Contractor's Licence No.		
Geo-Environmental	6607		
Business Address (Street Number/Name)	Municipality		
1 Manswood Ct	Wotton Hill		
Province	Postal Code	Business E-mail Address	
Ont	L7R0A1		
Bus. Telephone No. (inc. area code)	Name of Well Technician (Last Name, First Name)		
905 876 3388	Paquette Jeff		
Well Technician's Licence No.	Signature of Technician and/or Contractor	Date Submitted	
23816	Paquette	20140306	

Results of Well Yield Testing

After test of well yield, water was:	Draw Down		Recovery	
	Time (min)	Water Level (m/ft)	Time (min)	Water Level (m/ft)
☐ Clear and sand free				
☐ Other, specify				
If pumping discontinued, give reason:	Static Level			
	1		1	
Pump intake set at (m/ft)	2		2	
Pumping rate (l/min / GPM)	3		3	
Duration of pumping	4		4	
hrs + min	5		5	
Final water level end of pumping (m/ft)	10		10	
If flowing give rate (l/min / GPM)	15		15	
Recommended pump depth (m/ft)	20		20	
Recommended pump rate (l/min / GPM)	25		25	
Well production (l/min / GPM)	30		30	
Disinfected?	40		40	
☐ Yes ☐ No	50		50	
	60		60	

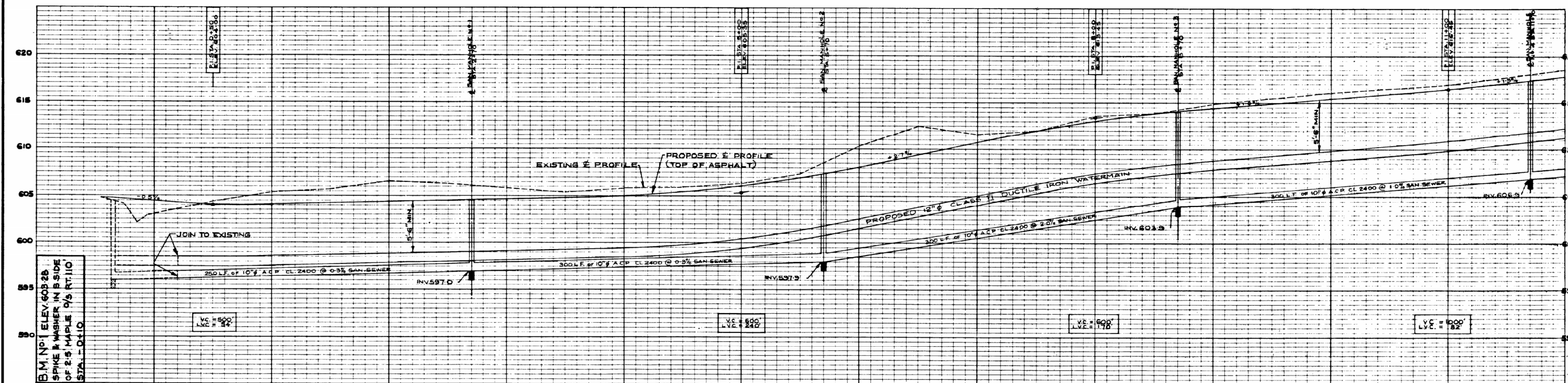
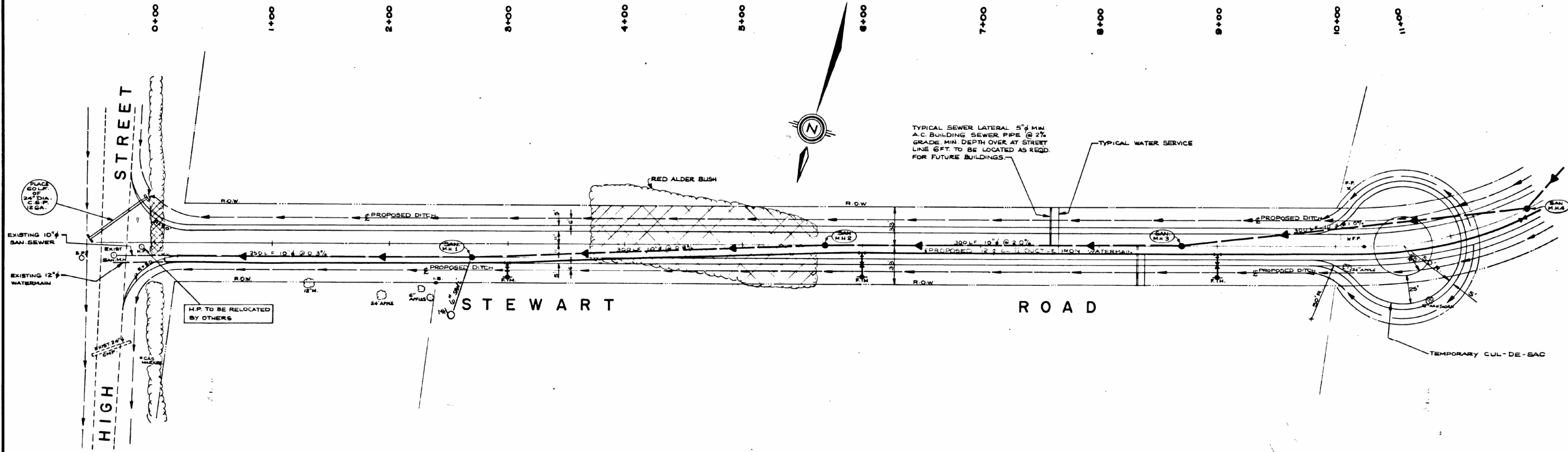
Map of Well Location

Please provide a map below following instructions on the back.

Comments:

See map

Well owner's information package delivered	Date Package Delivered	Ministry Use Only
☐ Yes ☐ No	Y Y Y Y M M D D	Audit No.
	Date Work Completed	2162540
	20140306	MAY 22 2014



CHINA	EXISTING	PROPOSED	ELEVATION
0+00	603.0	603.0	
+50	604.4	604.85	
+100	604.4	604.15	
+150	605.7	604.8	
+200	604.8	604.45	
+250	604.8	604.6	
+300	605.8	604.75	
+350	608.4	605.07	
+400	605.8	606.07	
+450	605.8	606.07	
+500	606.8	606.07	
+550	607.4	608.07	
+600	610.3	610.75	
+650	612.5	610.75	
+700	611.6	610.75	
+750	612.0	613.09	
+800	613.6	614.45	
+850	613.9	615.45	
+900	614.0	615.45	
+950	615.5	616.1	
+1000	616.5	616.5	
+1050	617.0	616.5	
+1100	617.0	616.5	

NOTES:

- CONTRACTOR TO CLEAR & GRUB ENTIRE WIDTH OF R.O.W. AND REMOVE ALL FENCES AND DEBRIS WITHIN THE R.O.W.
- ALL HYDRANTS TO BE 'CANADA VALVE' CENTURY HYDRANT 'B-50-B' WITH STEAMER NOZZLE
- ALL VALVES TO BE 'CANADA VALVE' MECHANICAL JOINT GATE VALVES '55' WITH CANADA VALVE 'SCREW TYPE VALVE BOXES TYPE 'D'.
- SEE DWG. NO. 7315-1 FOR DYKE DETAILS.

NO.	REVISIONS	DATE	INITIAL
1	Added MH at STA 2+66 - No. of 2	Aug/96	KA

APPROVED:

OAK-LEA HOLDINGS
OAK-LEA INDUSTRIAL PARK
TOWN OF COLLINGWOOD

PLAN & PROFILE

AINLEY and ASSOCIATES LTD.
Consulting Engineers
Barrie - Collingwood

SCALE: HORIZ. 1"=40'
VERT. 1"=5'

DESIGN: KCH
DRAWN: PHCC

CHECKED: WMT
DATE: MAY/73

DWG. NO. 7315-2



Appendix D – Existing Condition Stormwater

Active coordinate

44° 29' 45" N, 80° 14' 14" W (44.495833,-80.237500)

Retrieved: Mon, 10 Nov 2025 00:13:17 GMT



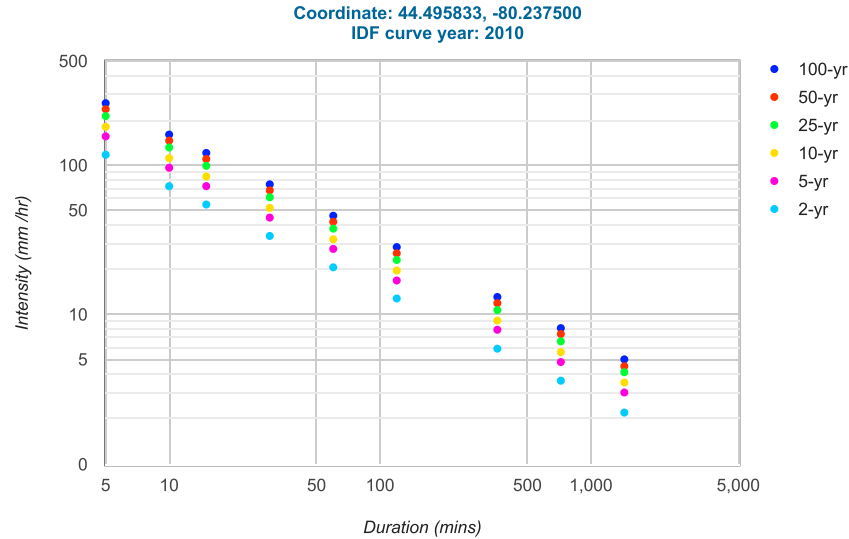
Location summary

These are the locations in the selection.

IDF Curve: 44° 29' 45" N, 80° 14' 14" W (44.495833,-80.237500)

Results

An IDF curve was found.



Coefficient summary

IDF Curve: 44° 29' 45" N, 80° 14' 14" W (44.495833,-80.237500)

Retrieved: Mon, 10 Nov 2025 00:13:17 GMT

Data year: 2010

IDF curve year: 2010

Return period	2-yr	5-yr	10-yr	25-yr	50-yr	100-yr
A	20.7	27.5	31.9	37.6	41.8	45.9
B	-0.699	-0.699	-0.699	-0.699	-0.699	-0.699

Statistics

Rainfall intensity (mm hr⁻¹)

Duration	5-min	10-min	15-min	30-min	1-hr	2-hr	6-hr	12-hr	24-hr
2-yr	117.6	72.4	54.6	33.6	20.7	12.8	5.9	3.6	2.2
5-yr	156.2	96.2	72.5	44.6	27.5	16.9	7.9	4.8	3.0
10-yr	181.2	111.6	84.1	51.8	31.9	19.7	9.1	5.6	3.5
25-yr	213.6	131.6	99.1	61.0	37.6	23.2	10.7	6.6	4.1
50-yr	237.4	146.3	110.2	67.9	41.8	25.7	11.9	7.4	4.5
100-yr	260.7	160.6	121.0	74.5	45.9	28.3	13.1	8.1	5.0

Rainfall depth (mm)

Duration	5-min	10-min	15-min	30-min	1-hr	2-hr	6-hr	12-hr	24-hr
2-yr	9.8	12.1	13.6	16.8	20.7	25.5	35.5	43.7	53.9
5-yr	13.0	16.0	18.1	22.3	27.5	33.9	47.2	58.1	71.6
10-yr	15.1	18.6	21.0	25.9	31.9	39.3	54.7	67.4	83.0
25-yr	17.8	21.9	24.8	30.5	37.6	46.3	64.5	79.4	97.9
50-yr	19.8	24.4	27.5	33.9	41.8	51.5	71.7	88.3	108.8
100-yr	21.7	26.8	30.2	37.3	45.9	56.5	78.7	97.0	119.5

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Existing Condition PCSWMM Model



Existing Condition PCSWMM Ourput - 100yr 4 hr Chicago Storm

EPA STORM WATER MANAGEMENT MODEL - VERSION 5.2 (Build 5.2.4)

Element Count

Number of rain gages 14
Number of subcatchments ... 1
Number of nodes 2
Number of links 1
Number of pollutants 0
Number of land uses 0

Raingage Summary

Name	Data Source	Data Type	Recording Interval
25mm	25mmQuality	INTENSITY	5 min.
Chicago_4h_100Yr	Chicago_4h_100Yr	INTENSITY	5 min.
Chicago_4h_10Yr	Chicago_4h_10Yr	INTENSITY	5 min.
Chicago_4h_25Yr	Chicago_4h_25Yr	INTENSITY	5 min.
Chicago_4h_2Yr	Chicago_4h_2Yr	INTENSITY	5 min.
Chicago_4h_50Yr	Chicago_4h_50Yr	INTENSITY	5 min.
Chicago_4h_5Yr	Chicago_4h_5Yr	INTENSITY	5 min.
SCS_Type_II_108.8mm_50Yr	SCS_Type_II_108.8mm_50Yr	INTENSITY	6 min.
SCS_Type_II_119.5mm_100Yr	SCS_Type_II_119.5mm_100Yr	INTENSITY	6 min.
SCS_Type_II_53.9mm_2Yr	SCS_Type_II_53.9mm_2Yr	INTENSITY	6 min.
SCS_Type_II_71.6mm_5Yr	SCS_Type_II_71.6mm	INTENSITY	6 min.
SCS_Type_II_83mm_10Yr	SCS_Type_II_83mm_10Yr	INTENSITY	6 min.
SCS_Type_II_97.9mm_25Yr	SCS_Type_II_97.9mm_25Yr	INTENSITY	6 min.
Timmins_Storm_(0-25)	Timmins_Storm_(0-25)	INTENSITY	60 min.

Subcatchment Summary

Name	Area	Width	%Imperv	%Slope	Rain Gage	Outlet
A1	0.15	25.00	90.00	1.3000	Chicago_4h_100Yr	J1

Node Summary

Name	Type	Invert Elev.	Max. Depth	Ponded Area	External Inflow
J1	JUNCTION	184.54	0.96	0.0	
Stewart	OUTFALL	184.45	0.00	0.0	

Link Summary

Name	From Node	To Node	Type	Length	%Slope	Roughness
C1	J1	Stewart	CONDUIT	2.0	4.4665	0.0100

Cross Section Summary

Conduit	Shape	Full Depth	Full Area	Hyd. Rad.	Max. Width	No. of Barrels	Full Flow
C1	DUMMY	0.00	0.00	0.00	0.00	1	0.00

Analysis Options

Flow Units CMS
Process Models:
 Rainfall/Runoff YES
 RDII NO
 Snowmelt NO
 Groundwater NO

Flow Routing YES
 Ponding Allowed YES
 Water Quality NO
 Infiltration Method GREEN_AMPT
 Flow Routing Method DYNWAVE
 Surcharge Method EXTRAN
 Starting Date 10/23/2020 00:00:00
 Ending Date 10/25/2020 00:00:00
 Antecedent Dry Days 0.0
 Report Time Step 00:01:00
 Wet Time Step 00:05:00
 Dry Time Step 00:05:00
 Routing Time Step 5.00 sec
 Variable Time Step YES
 Maximum Trials 8
 Number of Threads 1
 Head Tolerance 0.001500 m

	Volume	Depth
Runoff Quantity Continuity	hectare-m	mm
*****	-----	-----
Total Precipitation	0.011	71.774
Evaporation Loss	0.000	0.000
Infiltration Loss	0.001	7.177
Surface Runoff	0.010	63.288
Final Storage	0.000	1.800
Continuity Error (%)	-0.685	

	Volume	Volume
Flow Routing Continuity	hectare-m	10^6 ltr
*****	-----	-----
Dry Weather Inflow	0.000	0.000
Wet Weather Inflow	0.010	0.098
Groundwater Inflow	0.000	0.000
RDII Inflow	0.000	0.000
External Inflow	0.000	0.000
External Outflow	0.010	0.098
Flooding Loss	0.000	0.000
Evaporation Loss	0.000	0.000

Exfiltration Loss	0.000	0.000
Initial Stored Volume	0.000	0.000
Final Stored Volume	0.000	0.000
Continuity Error (%)	0.000	

Time-Step Critical Elements

None

Highest Flow Instability Indexes

All links are stable.

Most Frequent Nonconverging Nodes

Convergence obtained at all time steps.

Routing Time Step Summary

Minimum Time Step	:	4.50 sec
Average Time Step	:	5.00 sec
Maximum Time Step	:	5.00 sec
% of Time in Steady State	:	0.00
Average Iterations per Step	:	2.00
% of Steps Not Converging	:	0.00
Time Step Frequencies	:	
5.000 - 3.155 sec	:	100.00 %
3.155 - 1.991 sec	:	0.00 %
1.991 - 1.256 sec	:	0.00 %
1.256 - 0.792 sec	:	0.00 %
0.792 - 0.500 sec	:	0.00 %

Subcatchment Runoff Summary

Subcatchment	Total Precip mm	Total Runon mm	Total Evap mm	Total Infil mm	Imperv Runoff mm	Perv Runoff mm	Total Runoff mm	Total Runoff 10^6 ltr	Peak Runoff CMS	Runoff Coeff
A1	71.77	0.00	0.00	7.18	63.29	0.00	63.29	0.10	0.08	0.882

Node Depth Summary

Node	Type	Average Depth Meters	Maximum Depth Meters	Maximum HGL Meters	Time of Max Occurrence days hr:min	Reported Max Depth Meters
J1	JUNCTION	0.00	0.00	184.54	0 00:00	0.00
Stewart	OUTFALL	0.00	0.00	184.45	0 00:00	0.00

Node Inflow Summary

Node	Type	Maximum Lateral Inflow CMS	Maximum Total Inflow CMS	Time of Max Occurrence days hr:min	Lateral Inflow Volume 10^6 ltr	Total Inflow Volume 10^6 ltr	Flow Balance Error Percent
J1	JUNCTION	0.081	0.081	0 01:25	0.098	0.098	0.000
Stewart	OUTFALL	0.000	0.081	0 01:25	0	0.098	0.000

Node Surcharge Summary

Surcharging occurs when water rises above the top of the highest conduit.

Node	Type	Hours Surcharged	Max. Height Above Crown Meters	Min. Depth Below Rim Meters
J1	JUNCTION	48.00	0.000	0.960

Node Flooding Summary

No nodes were flooded.

Outfall Loading Summary

Outfall Node	Flow Freq Pcnt	Avg Flow CMS	Max Flow CMS	Total Volume 10^6 ltr
Stewart	9.69	0.006	0.081	0.098
System	9.69	0.006	0.081	0.098

Link Flow Summary

Link	Type	Maximum Flow CMS	Time of Max Occurrence days hr:min	Maximum Veloc m/sec	Max/ Full Flow	Max/ Full Depth
------	------	--------------------------	--	-----------------------------	----------------------	-----------------------

C1 DUMMY 0.081 0 01:25

Flow Classification Summary

```
-----
                Adjusted   ----- Fraction of Time in Flow Class -----
                /Actual      Up   Down Sub   Sup   Up   Down Norm Inlet
Conduit         Length      Dry Dry  Dry  Crit Crit Crit Crit Ltd  Ctrl
-----
```

Conduit Surcharge Summary

No conduits were surcharged.

Analysis begun on: Fri Nov 14 09:37:01 2025
Analysis ended on: Fri Nov 14 09:37:01 2025
Total elapsed time: < 1 sec

Appendix E – Proposed Condition Stormwater

Post Development PCSWMM Model View



Post Development PCSWMM Output - 100 yr 4 hr Chicago Storm

EPA STORM WATER MANAGEMENT MODEL - VERSION 5.2 (Build 5.2.4)

Element Count

Number of rain gages 14

Number of subcatchments ... 2

Number of nodes 3

Number of links 2

Number of pollutants 0

Number of land uses 0

Raingage Summary

Name	Data Source	Data Type	Recording Interval
-----	-----	-----	-----
25mm	25mmQuality	INTENSITY	5 min.
Chicago_4h_100Yr	Chicago_4h_100Yr	INTENSITY	5 min.
Chicago_4h_10Yr	Chicago_4h_10Yr	INTENSITY	5 min.
Chicago_4h_25Yr	Chicago_4h_25Yr	INTENSITY	5 min.
Chicago_4h_2Yr	Chicago_4h_2Yr	INTENSITY	5 min.
Chicago_4h_50Yr	Chicago_4h_50Yr	INTENSITY	5 min.
Chicago_4h_5Yr	Chicago_4h_5Yr	INTENSITY	5 min.
SCS_Type_II_108.8mm_50Yr	SCS_Type_II_108.8mm_50Yr	INTENSITY	6 min.
SCS_Type_II_119.5mm_100Yr	SCS_Type_II_119.5mm_100Yr	INTENSITY	6 min.
SCS_Type_II_53.9mm_2Yr	SCS_Type_II_53.9mm_2Yr	INTENSITY	6 min.
SCS_Type_II_71.6mm_5Yr	SCS_Type_II_71.6mm	INTENSITY	6 min.
SCS_Type_II_83mm_10Yr	SCS_Type_II_83mm_10Yr	INTENSITY	6 min.
SCS_Type_II_97.9mm_25Yr	SCS_Type_II_97.9mm_25Yr	INTENSITY	6 min.
Timmins_Storm_(0-25)	Timmins_Storm_(0-25)	INTENSITY	60 min.

Subcatchment Summary

Name	Area	Width	%Imperv	%Slope	Rain Gage	Outlet
A1	0.09	25.00	75.00	1.3000	Timmins_Storm_(0-25)	J2
A2	0.07	25.00	90.00	1.3000	Timmins_Storm_(0-25)	J1

Node Summary

Name	Type	Invert Elev.	Max. Depth	Ponded Area	External Inflow
J1	JUNCTION	184.54	0.96	0.0	
J2	JUNCTION	186.09	0.40	0.0	
Stewart	OUTFALL	184.45	0.00	0.0	

Link Summary

Name	From Node	To Node	Type	Length	%Slope	Roughness
C1	J1	Stewart	CONDUIT	8.1	1.1121	0.0100
C2	J2	J1	CONDUIT	61.4	2.5235	0.0300

Cross Section Summary

Conduit	Shape	Full Depth	Full Area	Hyd. Rad.	Max. Width	No. of Barrels	Full Flow
C1	DUMMY	0.00	0.00	0.00	0.00	1	0.00
C2	TRIANGULAR	0.30	0.30	0.14	2.00	1	0.44

Analysis Options

Flow Units CMS
Process Models:

Rainfall/Runoff YES
 RDII NO
 Snowmelt NO
 Groundwater NO
 Flow Routing YES
 Ponding Allowed YES
 Water Quality NO
 Infiltration Method GREEN_AMPT
 Flow Routing Method DYNWAVE
 Surcharge Method EXTRAN
 Starting Date 10/23/2020 00:00:00
 Ending Date 10/25/2020 00:00:00
 Antecedent Dry Days 0.0
 Report Time Step 00:01:00
 Wet Time Step 00:05:00
 Dry Time Step 00:05:00
 Routing Time Step 5.00 sec
 Variable Time Step YES
 Maximum Trials 8
 Number of Threads 1
 Head Tolerance 0.001500 m

*****	Volume	Depth
Runoff Quantity Continuity	hectare-m	mm
*****	-----	-----
Total Precipitation	0.030	193.000
Evaporation Loss	0.000	0.000
Infiltration Loss	0.006	35.754
Surface Runoff	0.024	155.858
Final Storage	0.000	1.630
Continuity Error (%)	-0.125	

*****	Volume	Volume
Flow Routing Continuity	hectare-m	10^6 ltr
*****	-----	-----
Dry Weather Inflow	0.000	0.000
Wet Weather Inflow	0.024	0.240
Groundwater Inflow	0.000	0.000
RDII Inflow	0.000	0.000

External Inflow	0.000	0.000
External Outflow	0.024	0.240
Flooding Loss	0.000	0.000
Evaporation Loss	0.000	0.000
Exfiltration Loss	0.000	0.000
Initial Stored Volume	0.000	0.000
Final Stored Volume	0.000	0.000
Continuity Error (%)	0.000	

Time-Step Critical Elements

None

Highest Flow Instability Indexes

All links are stable.

Most Frequent Nonconverging Nodes

Convergence obtained at all time steps.

Routing Time Step Summary

Minimum Time Step	:	4.50 sec
Average Time Step	:	5.00 sec
Maximum Time Step	:	5.00 sec
% of Time in Steady State	:	0.00
Average Iterations per Step	:	2.00
% of Steps Not Converging	:	0.00
Time Step Frequencies	:	
5.000 - 3.155 sec	:	100.00 %
3.155 - 1.991 sec	:	0.00 %
1.991 - 1.256 sec	:	0.00 %

1.256 - 0.792 sec : 0.00 %
 0.792 - 0.500 sec : 0.00 %

 Subcatchment Runoff Summary

Subcatchment	Total Precip mm	Total Runon mm	Total Evap mm	Total Infil mm	Imperv Runoff mm	Perv Runoff mm	Total Runoff mm	Total Runoff 10^6 ltr	Peak Runoff CMS	Runoff Coeff
A1	193.00	0.00	0.00	48.25	143.47	0.00	143.47	0.13	0.01	0.743
A2	193.00	0.00	0.00	19.30	172.17	0.00	172.17	0.11	0.01	0.892

 Node Depth Summary

Node	Type	Average Depth Meters	Maximum Depth Meters	Maximum HGL Meters	Time of Max Occurrence days hr:min	Reported Max Depth Meters
J1	JUNCTION	0.00	0.00	184.54	0 07:00	0.00
J2	JUNCTION	0.02	0.09	186.18	0 07:00	0.09
Stewart	OUTFALL	0.00	0.00	184.45	0 00:00	0.00

 Node Inflow Summary

Node	Type	Maximum Lateral Inflow CMS	Maximum Total Inflow CMS	Time of Max Occurrence days hr:min	Lateral Inflow Volume 10^6 ltr	Total Inflow Volume 10^6 ltr	Flow Balance Error Percent
------	------	-------------------------------------	-----------------------------------	--	---	---------------------------------------	-------------------------------------

J1	JUNCTION	0.007	0.016	0	07:00	0.115	0.24	0.001
J2	JUNCTION	0.008	0.008	0	07:00	0.126	0.126	-0.000
Stewart	OUTFALL	0.000	0.016	0	07:00	0	0.24	0.000

Node Surcharge Summary

No nodes were surcharged.

Node Flooding Summary

No nodes were flooded.

Outfall Loading Summary

Outfall Node	Flow Freq Pcnt	Avg Flow CMS	Max Flow CMS	Total Volume 10^6 ltr
Stewart	26.49	0.005	0.016	0.240
System	26.49	0.005	0.016	0.240

Link Flow Summary

Link	Type	Maximum Flow CMS	Time of Max Occurrence days hr:min	Maximum Veloc m/sec	Max/ Full Flow	Max/ Full Depth
------	------	--------------------------	--	-----------------------------	----------------------	-----------------------

```

-----
C1          DUMMY      0.016      0 07:00
C2          CONDUIT    0.008      0 07:00      1.23      0.02      0.15

```

```

*****
Flow Classification Summary
*****

```

```

-----
Conduit      Adjusted  ----- Fraction of Time in Flow Class -----
              /Actual      Up   Down  Sub   Sup   Up   Down  Norm  Inlet
              Length    Dry  Dry   Dry   Crit  Crit  Crit  Crit  Ltd  Ctrl
-----
C2            1.00     0.00  0.00  0.00  0.69  0.30  0.00  0.00  0.65  0.00

```

```

*****
Conduit Surcharge Summary
*****

```

No conduits were surcharged.

```

Analysis begun on:  Tue Nov 11 16:47:43 2025
Analysis ended on:  Tue Nov 11 16:47:43 2025
Total elapsed time: < 1 sec

```

Peak values

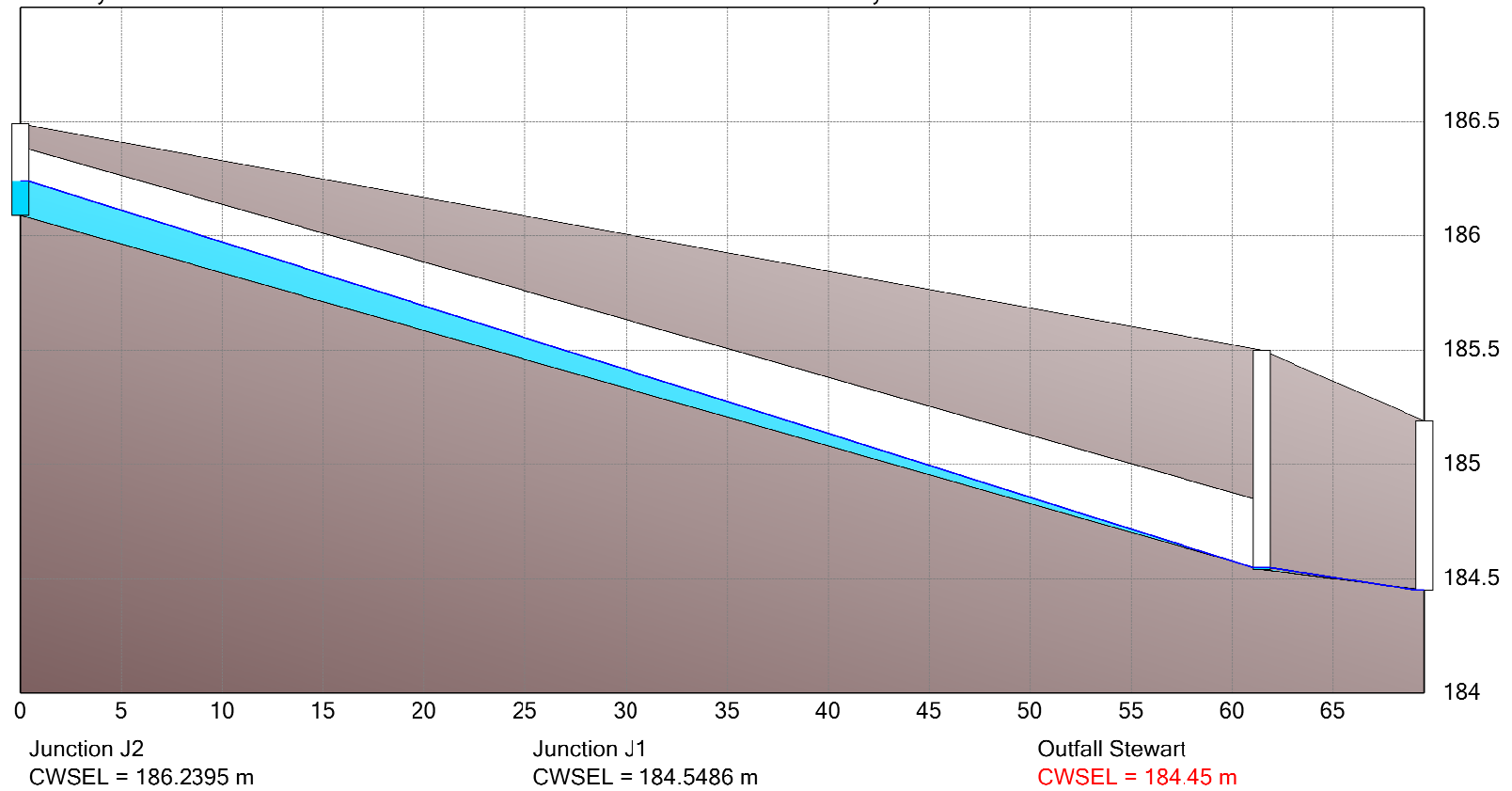
Swale Hydraulic Gradeline

100 Year Storm

— HGL

Conduit C2
Flow = 0.038 m³/s
Depth = 0.3 m
Velocity = 1.805 m/s

Conduit C1
Flow = 0.072 m³/s
Depth = 0 m
Velocity = 0 m/s



Appendix F – Water Demand

Project: 12 Stewart Rd.

Prepared by: C. Capes
 Checked by: C. Capes
 Project No: 2025-054
 Date: May 22, 2026

Fire Flow Demand Calculations

Commercial & Industrial Building

Number of Water Fixture Units = <260
 Water Demand = 2360 L/day OBC Table 7.4.10.5 Conversion of WFSU to L/day (minimum value 2360 L when WFU <260)
 Operating Hours = 8 hrs
 Average Day Demand = 2,360 L/day
 Max Day Demand = 4,720 L/day MECP Recommended Max Day Demand Factor = 2.0
 Peak Hourly Demand = 944 L/hr MECP Recommended Max Hour Demand Factor = 4.0
Domestic Peak Daily Demand = 0.05 L/s
Domestic Peak Hourly Demand = 0.26 L/s

Fire Flow Calculations

Based on Fire Underwriters Survey

1 $F = 220C\sqrt{A}$

Where F = Required fire flow in Lpm
 C = Construction type coefficient
 = 1.5 Type V wood frame (essentially all combustible)
 = 0.8 Type IV-A Mass Timber Construction
 = 0.9 Type IV-B Mass Timber Construction
 = 1.0 Type IV-C Mass Timber Construction
 = 1.5 Type IV-D Mass Timber Construction
 1.0 ordinary construction (brick or other masonry walls, combustible floor and interior)
 0.8 non-combustible (unprotected metal structure components, masonry or metal walls)
 0.6 fire-resistive construction (fully protected frame, floors, roof)

A = Total floor area in sq.m. excluding basements, includes garage per building

Floor	Area (sq.m)	%
1	325	100%
2	162	100%
Total	487	

A = for fire resistive bldgs., consider the 2 largest adjoining floors + 50% of each of any floors immediately above them **when the vertical openings are not adequately protected.**
 or
 A = for fire resistive bldgs., consider the area of largest adjoining floor + 25% of each of the 2 floors immediately adjoining floors **when the vertical openings and exterior vertical communications are protected for 1 hr rating.**

Total Applicable Area = 487

F1 = 3,884.66 L/min (adjust formula accordingly) **4000** L/min (Round to nearest 1000 L/min)

2 **Occupancy Reduction**

-25% reduction for non-combustible
 -15% reduction for limited combustible
0% reduction for combustible
 15% increase for free burning
 25% increase for rapid burning

Reduction = 0 L/min (0% of F1)
 F2 = 4000 L/min

3 **Sprinkler Reduction**

-30% Reduction for NFPA Sprinkler System (refer to FUS manual, 2020)

Reduction = 1200 L/min (30% of F2)
 F3 = 2800 L/min

4 **Separation Charge Building 1**

			0 to 3m	25%
North Side	>30 m	0%	3.1 to 10m	20%
East Side	>30 m	0%	10.1 to 20m	15%
South Side	>30 m	0%	20.1 to 30m	10%
West Side	10.1 to 20m	15%	>30 m	0%

Total Separation Charge Bldg. 1= 15% 600 L/min (40% of F3)
 F4= 3400 L/min

Fire Flow = F4
 = 3400 L/min
 = 56.67 L/s

