SEPTEMBER 4, 2026

Project No. 2025-054

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

TOWN OF COLLINGWOOD

CAPES ENGINEERING

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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 327.71 sq. m (footprint) 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. There is also an existing swale along the eastern property line which is partially shared with 10 Stewart. The swale is vegetated and a chain link fence has been constructed on 10 Stewart approximately 1 m off, and parallel to, the property line. The swale wanders on and off the 12 Stewart property and partially onto the 10 Stewart lot.

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 Steward 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. Best efforts to improve on the exiting condition are limited, but the proposed reduction in impervious area on the site is already an improvement on the existing condition.

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 mm/hr

Suction Head = 169.926 mm

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 m^3/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.

The sanitary flows for the existing commercial building are calculated using OBC Table 8.2.1.3.B for the closest equivalent (current) non residential use, which, as a gym would be a Country Club (excluding

food service). The precise number of patrons for this facility is unknown, but the existing building is smaller than the proposed, and does not have staff on site on a full time basis. The gym website indicates a staff member is present 8 am -12 pm twice weekly.

The gym is open 24 hrs a day and, based on the floor area (215 sq. m) and the assumption of 1 patron per 5 sq. m of floor space we have calculated an approximate number of 43 patrons in the gym at one time. Assuming 2 hrs of peak usage in the morning and 3 hrs in the evening and a reduced number of people during the rest of the day (5 people/hour) gives the equivalent of (43 patrons x 5 hrs) + (5 patrons x 19 hrs) + (1 staff x 4 hrs) = 311 patrons in a 24 hr period.

Employees = 1 employee x 50 L/employee/shift = 50 L/day

Patrons = 310 patrons x 40 L/patron = 12,400 L/day

The total flow calculated is equal to 12,450 L/ day or 0.14 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.

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 is 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.

The specific number of water using fixture units in the existing building is unknown. Using the OBC Table 7.4.10.5 for the equivalent average day demand hydraulic load for a total fixture unit below 260 gives 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.

Another option is to use the calculated maximum sewage load of 0.14 L/s as equivalent to the maximum peak hourly water demand.

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) 327.71 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 13 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 area is limited on the site. Approximately 30 sq. m is provided in the SE corner of the site (designated on the Site Plan). Some additional snow could be stored on the east side of the site, however this should be limited to the area adjacent to the building where the existing swale is further from the curb line and no significant landscape plantings are proposed to ensure drainage can flow freely during thaw periods. Snow in excess of what can be stored (approximately 50 cu. m) will need to be removed offsite by private contractor.

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, amenity area in the SW and snow storage area in the SE and the swale along the eastern side of the site and is 80.7% impervious. The proposed grading is to the south and east towards the existing grassed swale which is shared 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 87% 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.

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	0.04
5-year	0.05	0.05
10-year	0.06	0.05
25-year	0.07	0.06
50-year	0.07	0.07
100-year	0.08	0.08
24 Hr SCS Type II		
2-year	0.03	0.03
5-year	0.04	0.04
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. Refer to **Appendix E** for the 100yr storm PCSWMM output results, the 100 year HGL for the existing swale to demonstrate capacity and for the 25 mm storm event for quality control.

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.

In the proposed condition 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. This is a very slight reduction compared to the existing condition where the runoff is 10 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) 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 is 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 these vegetated areas. 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. We believe there are few other options to improve the site runoff quality.

3.2 Proposed Water Servicing

The existing commercial building on the site is currently used as a fitness center (gym) 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 and as per Town requirements a separate fire supply line has been provided to the building.

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 (or calculated) 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 is equal to 5,520 L/10 hr day or 0.15 L/s.

We believe that the proposed sanitary sewage flows are effectively equal to the existing.

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.

The ESC fencing should also be placed around the existing tree in the front yard to act as tree preservation fencing for the duration of the construction. The placement of this fencing may require temporary removal when landscaping works are being completed.

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 327.71 sq. m (footprint) 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. A new dedicated fire line will be provided for the building sprinkler system.

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 and will meet a level adequate for an industrial subdivision discharging to a Municipal ditch.

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

Report Prepared By:



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CAPES Engineering



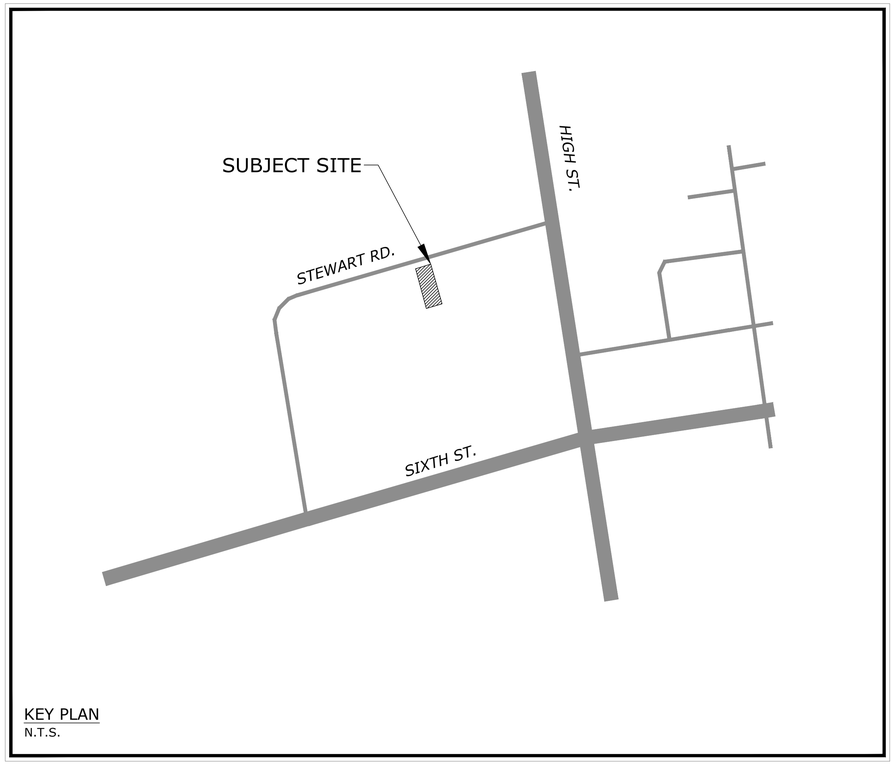
Appendices

Appendix A – Legal & Site Plan

12 STEWART ROAD SITE PLAN
TOWN OF COLLINGWOOD

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KEY PLAN
N.T.S.

Project No. 2025-054

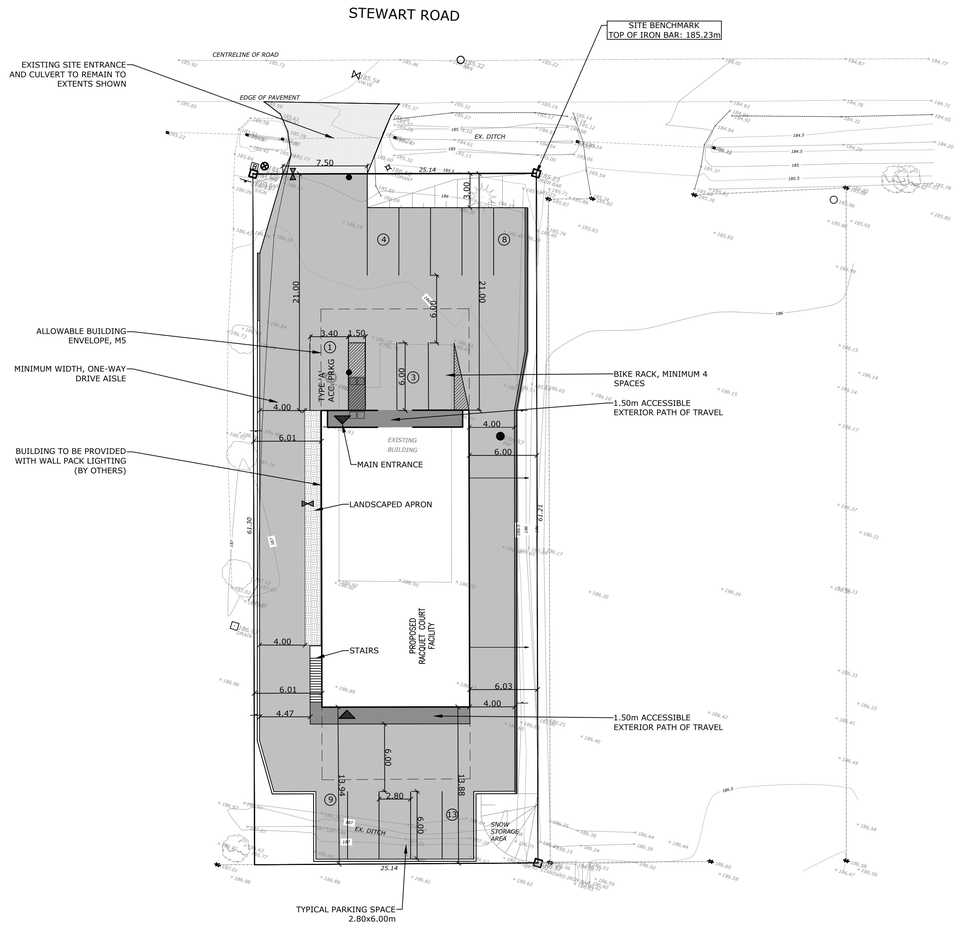
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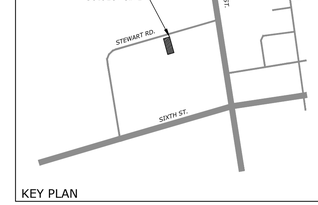
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ALEX CARTER - 12 STEWART ROAD SITE PLAN - PROJECT No. 2025-054
REVISED FOR APPROVALS - 26/09/04

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TOWN OF COLLINGWOOD ZONING BY-LAW, M5 ZONING	TOTAL BUILDING AREA (NO EXCLUSIONS) = 489.40sq.m GROUND FLOOR AREA (NO EXCLUSIONS) = 327.27sq.m GROSS FLOOR AREA, 2 STOREY = 416.54sq.m APPROX. BUILDING FOOTPRINT = 345.86sq.m	
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	22.4
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	13
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 m ² 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.

ACCEPTED FOR CONSTRUCTION
TOWN OF COLLINGWOOD

PER .....

DATE: .....

Notes
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No	Revision	Date
1	FOR CLIENT REVIEW	2025-07-14
2	REVISED FOR APPROVALS	2026-04-29
3	REVISED FOR APPROVALS	2026-06-22
4	REVISED FOR APPROVALS	2026-09-04

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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.

LICENSED PROFESSIONAL ENGINEER
C. CAPES
100506104
SEPT. 1, 2026
PROVINCE OF ONTARIO

Client
ALEX CARTER

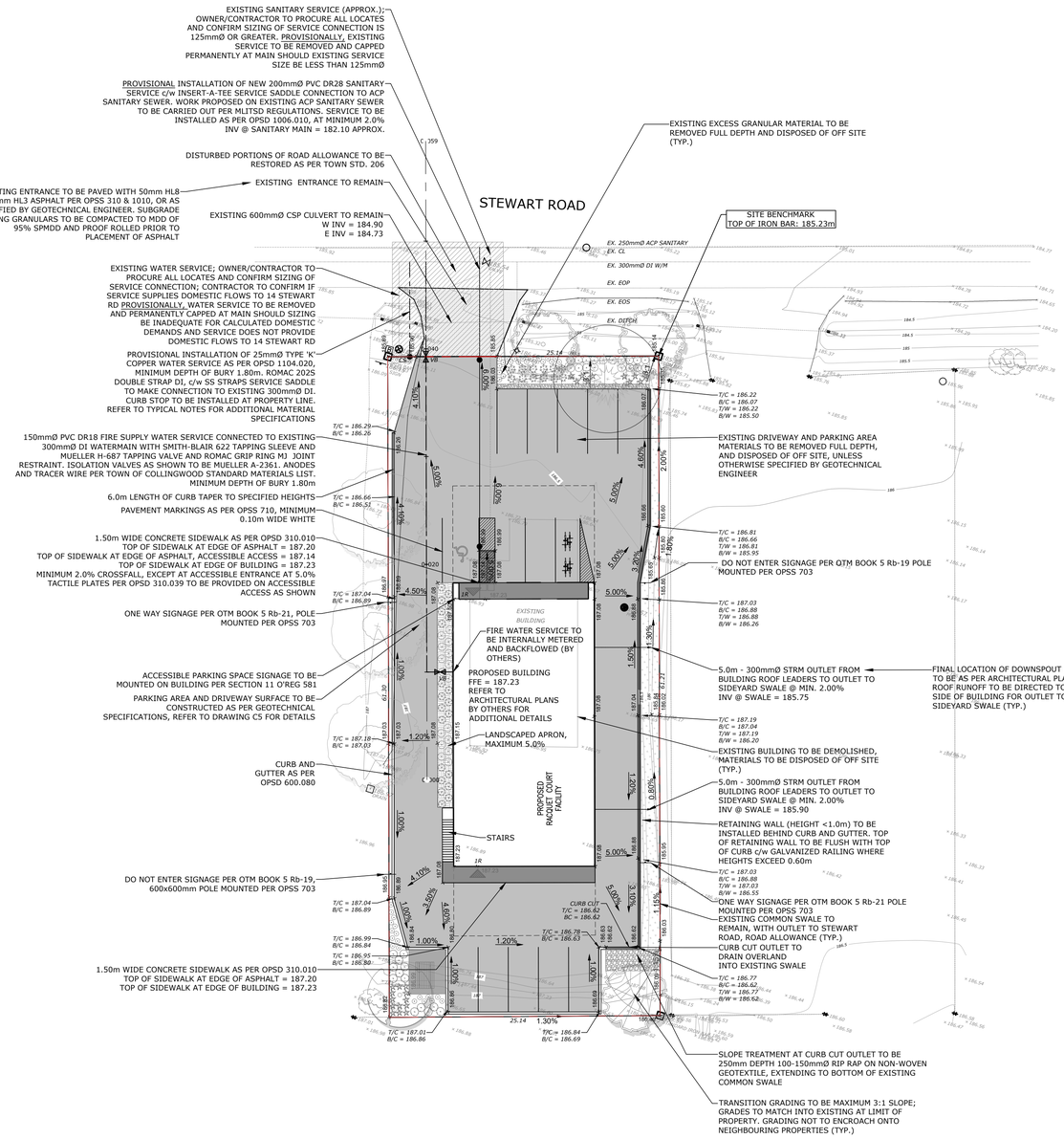
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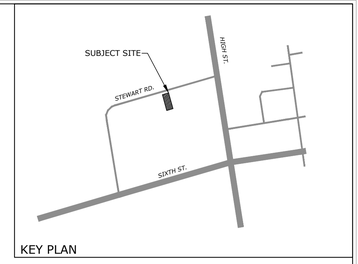
12 STEWART ROAD SITE PLAN

SITE PLAN

Designed	Checked	Date	Drawing No.
K. GRIFFIN	C. CAPES	25/10/31	C1
Project No. 2025-054		Rev No. 1	
Scale 1:250	0 5.0 10.0 15.0m		

Title: C:\CAD\Capes engineering dropbox\Projects\2025\2025-054 12 stewart rd\Drawings\10_Reference\Dwg\2025-054 EX25BASE GRF2.dwg Date Plotted: September 9, 2026 - 4:30 PM

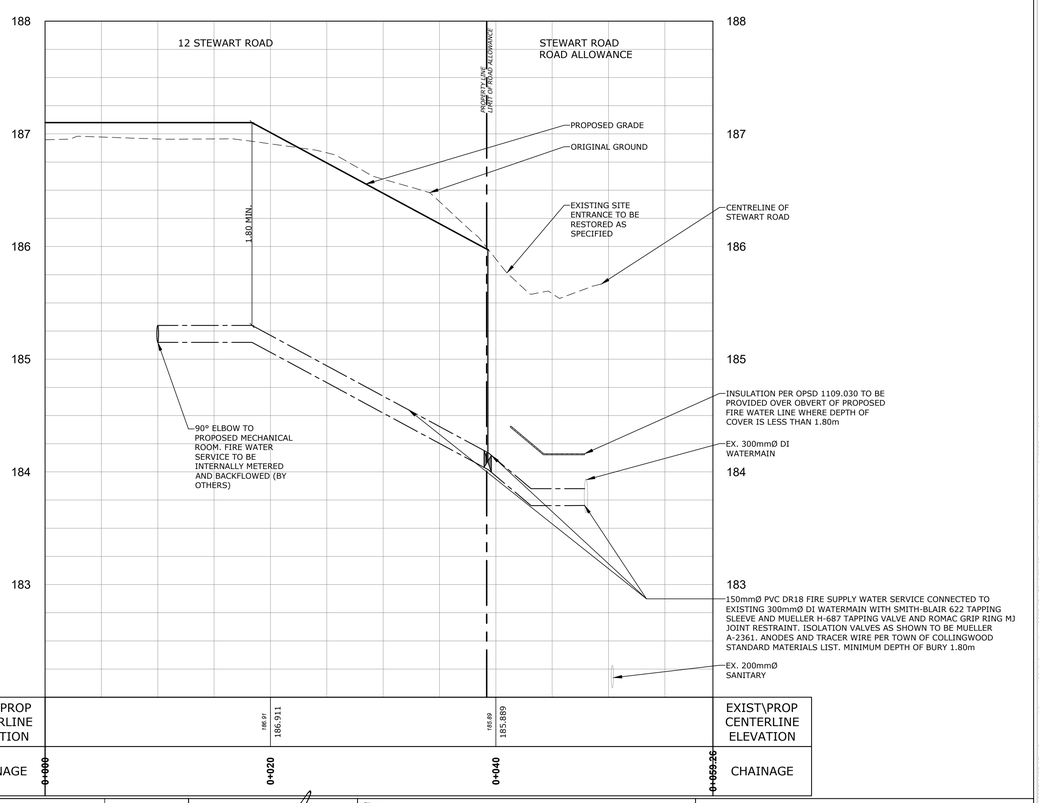




KEY PLAN

LEGEND

- * 221.21 — PROPOSED ELEVATION
- x 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: .....

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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
3	REVISED FOR APPROVALS	26/06/22
4	REVISED FOR APPROVALS	26/09/04

LICENSED PROFESSIONAL ENGINEER — C/CAPES 100056104 — SEPT. 4, 2026 — PROVINCE OF ONTARIO

Client: ALEX CARTER

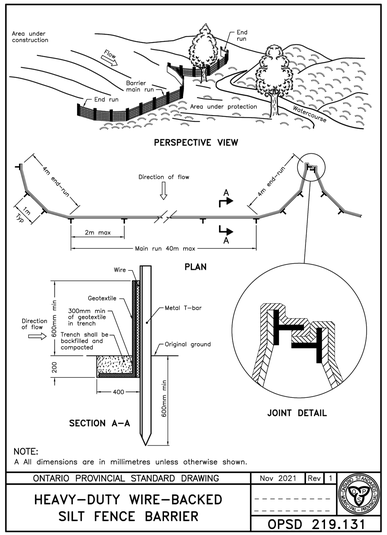
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12 STEWART ROAD SITE PLAN

GRADING AND SERVICING PLAN

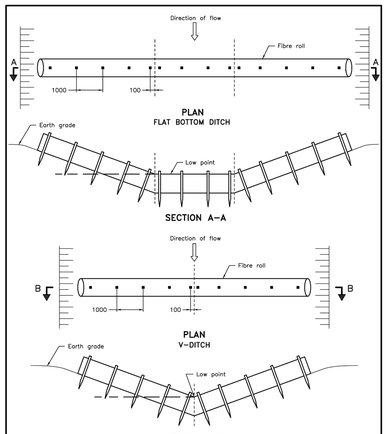
Designed	Checked	Date	Drawing No.
K. GRIFFIN	C. CAPES	25/10/31	C2
Project No.		Rev No.	
2025-054		4	
Scale			
H 1:250 V 1:25		0 5.0 10.0 15.0m	

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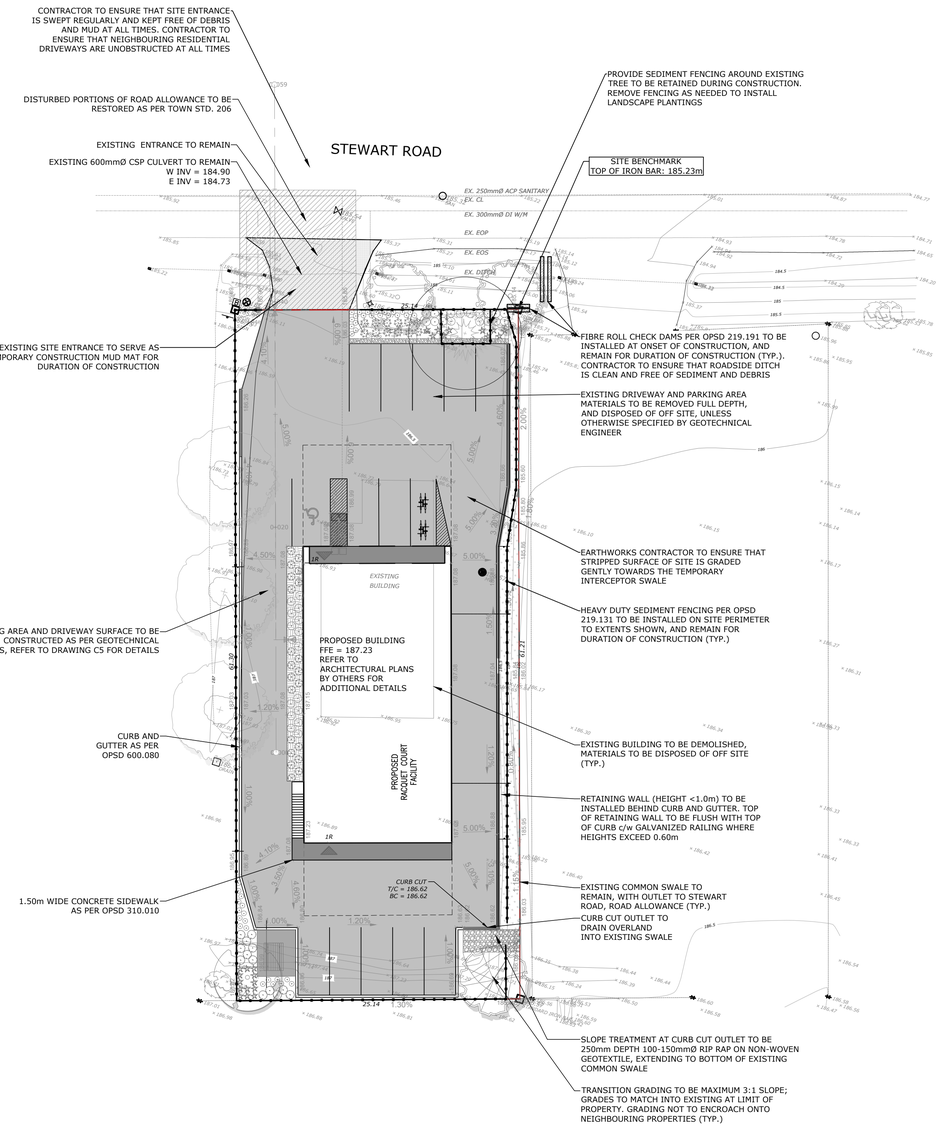
NOTE:
A All dimensions are in millimetres unless otherwise shown.

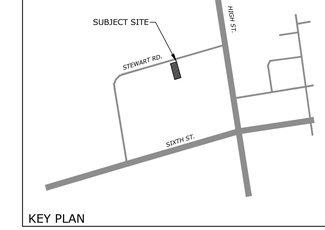
ONTARIO PROVINCIAL STANDARD DRAWING	Nov 2021	Rev	1
HEAVY–DUTY WIRE–BACKED SILT FENCE BARRIER			
	OPSD 219.131		



NOTES:
A Refer to OPSD 219.120 Section A–A installation detail.
B All dimensions are in millimetres unless otherwise shown.

ONTARIO PROVINCIAL STANDARD DRAWING	Nov 2021	Rev	1
FIBRE ROLL FLOW CHECK DAMS			
	OPSD 219.191		





LEGEND

* 221.21	PROPOSED ELEVATION
x 221.21	EXISTING ELEVATION
	MAXIMUM 3:1 SLOPE UNLESS OTHERWISE NOTED
	CURB DEPRESSION
	HYDRANT & VALVE
	SEDIMENT FENCING

ESC NOTES

SEEDING

1. AREAS OF SITE LEFT UNSTABLE FOR MORE THAN 30 DAYS TO BE STABILIZED WITH ACCEPTABLE GROUND COVER
2. OPTIONS: BLOWER TRUCK APPLICATION OF MEDIA/SEED/MULCH MIX, HYDROSEEDING, MECHANICAL OR BROADCAST; SPECIES TO BE APPROVED BY TOWN OF SAUGEEN SHORES, IN ACCORDANCE WITH LANDSCAPING PLANS
3. SEEDING IDEALLY APPLIED BETWEEN APRIL 15 & MAY 30 OR AUGUST 15 & SEPTEMBER 30.
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. TREAD 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-SEEDED.
9. 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 TRENCH 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 SUBSEQUENT 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 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. NO GAPS, 2.0m MINIMUM OVERLAP OF NEW CLOTH SECTIONS.
54. POSITIONED TO RECEIVE ONLY MODERATE SHEET FLOWS, NOT CONCENTRATED FLOWS.
55. TOE COMPACTED AS MUCH AS POSSIBLE TO AVOID USE OF STONE 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.

No	Revision	Date
1	ISSUED FOR APPROVALS	25/11/12
2	REVISED FOR APPROVALS	26/04/29
3	REVISED FOR APPROVALS	26/06/22
4	REVISED FOR APPROVALS	26/09/04

LICENSED PROFESSIONAL ENGINEER
C/CAPES
100056104
SEPT. 4, 2026
PROVINCE OF ONTARIO

Client
ALEX CARTER

CAPES ENGINEERING
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12 STEWART ROAD SITE PLAN

EROSION & SEDIMENT CONTROL PLAN

Designed	Checked	Date	Drawing No.
K. GRIFFIN	C. CAPES	25/11/07	C3
Project No.		Rev No.	
2025-054		4	
Scale	0 5.0 10.0 15.0m		
1:250			

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GENERAL – CONSTRUCTION

A) ALL WORK TO BE CARRIED OUT IN ACCORDANCE WITH TOWN OF COLLINGWOOD STANDARDS, O.P.S.D. AND O.P.S.S. WHERE CONFLICT OCCURS, TOWN OF COLLINGWOOD STANDARD TO GOVERN.

B) TRENCH BACKFILL (OPSD 802.XXX AS APPLICABLE) TO BE SELECT NATIVE MATERIAL OR IMPORTED SELECT SUBGRADE TO OPSS 1010. BACKFILL TO BE PLACED IN MAXIMUM 200 mm THICK LIFTS AND COMPACTED TO 95% OF THE MATERIAL'S STANDARD PROCTOR MAXIMUM DRY DENSITY (SPMDD).

C) PIPE BEDDING TO BE GRANULAR 'A' PIPE COVER TO BE GRANULAR 'B' MAX. AGGREGATE SIZE 25mm FOR RIGID PIPE AND GRANULAR 'A' FOR FLEXIBLE PIPE. (MINIMUM BEDDING DEPTH 150 mm, MINIMUM COVER 300mm, COMPACTED TO A MINIMUM 95% SPMDD).

D) CLEAR STONE WRAPPED IN FILTER FABRIC CAN BE SUBSTITUTED FOR BEDDING MATERIAL IF APPROVED BY THE ENGINEER.

E) ALL MAINTENANCE HOLES ARE 1200 mm DIAMETER UNLESS OTHERWISE SPECIFIED.

F) ALL TOPSOIL AND EARTH EXCAVATION TO BE STOCK PILED OR REMOVED TO AN APPROVED SITE AS DIRECTED BY ENGINEER.

G) THE OWNER'S ENGINEER SHALL PROVIDE BENCH MARK ELEVATIONS AND HORIZONTAL ALIGNMENT REFERENCE FOR THE CONTRACTOR. THE CONTRACTOR SHALL BE RESPONSIBLE FOR THE DETAILED LAYOUT OF THE WORK.

H) ALL PROPERTY BARS TO BE PRESERVED AND REPLACED BY O.L.S. AT CONTRACTOR'S EXPENSE IF REMOVED DURING CONSTRUCTION.

I) ALL MAINTENANCE HOLE AND CATCHBASIN FRAMES AND COVERS TO BE SET TO BASE COURSE HL8 ASPHALT ELEVATION AND RAISED PRIOR TO PLACEMENT OF FINAL COURSE HL3 ASPHALT TO THE SATISFACTION OF THE TOWN.

J) THE CONTRACTOR SHALL MAKE HIS OWN ARRANGEMENTS FOR THE SUPPLY OF TEMPORARY WATER AND POWER.

K) DEWATERING TO BE CARRIED OUT IN ACCORDANCE WITH OPSS-517 AND 518 TO MAINTAIN ALL TRENCHES IN A DRY CONDITION. CONTRACTOR RESPONSIBLE FOR OBTAINING M.O.E. PERMIT IF REQUIRED.

L) ALL ENGINE DRIVEN PUMPS TO BE ADEQUATELY SILENCED, SUITABLE FOR OPERATION IN A RESIDENTIAL DISTRICT.

M) DISTURBED AREAS TO BE REINSTATED TO PREVIOUS CONDITION OR BETTER.

N) THE CONTRACTOR IS RESPONSIBLE FOR PRESERVATION OF ALL EXISTING FACILITIES AS WELL AS ALL UTILITY COMPANIES PRIOR TO COMMENCING WORK AND CO-ORDINATE CONSTRUCTION ACCORDINGLY.

NO.	REVISION	APR'D	DATE		
1.	REVISED BASE ASPHALT TYPE	EDH	JUL/04	TOWN OF COLLINGWOOD	APR'D: EDH / DRAWN: / DATE: JAN/03 / SCALE: N/A
				GENERAL – CONSTRUCTION NOTES	STD. No. 122

STORM SEWERS

A) M.H., CBMH AND DICBMH TO OPSD – 701.XXX (AS APPROPRIATE) C/W SUMP UNLESS NOTED OTHERWISE.

B) STEPS TO OPSD 405.010.

C) M.H. FRAMES AND GRATES TO OPSD–401.01 OPEN COVER.

D) C.B.'S TO OPSD – 705.010, 705.020

E) DICB'S TO OPSD – 705.030, 705.040, 706.010, 706.020, 706.030, 706.040

F) C.B. AND CBMH FRAMES AND GRATES TO OPSD – 400.020 AND REAR LOT 400.120..

G) PIPE SUPPORT AT M.H.'S, CB'S AND CBMH'S TO OPSD – 708.020.

H) C.B. LEADS – 250mm DIA SINGLE AND 300mm DIA DOUBLE TO OPSD – 708.010, 708.030.

I) PROTECTION DURING CONSTRUCTION TO OPSD – 808.010.

J) BEDDING AND COVER TO OPSD – 802.010. (FLEXIBLE PIPE) GRANULAR 'A' EMBEDMENT MATERIAL OR OTHER APPROVED HOMOGENEOUS GRANULAR MATERIAL OR OPSD – 802.030, 802.031 AND 802.032 (RIGID PIPE) GRANULAR 'A' BEDDING AND GRANULAR 'B' (MAXIMUM AGGREGATE SIZE 25mm) COVER.

K) TRENCH BACKFILL TO BE SELECT NATIVE MATERIAL AS APPROVED BY ENGINEER OR IMPORTED GRANULAR MATERIAL.

L) BACKFILL AND EMBEDMENT MATERIAL TO BE COMPACTED TO A DRY DENSITY OF AT LEAST 95% OF THE MATERIAL'S SPMDD.

M) WHERE RESIDENTIAL STORM SEWER CONNECTIONS ARE REQUIRED, THE STORM SEWER SHALL BE OVERSIZED.

N) SERVICE CONNECTION TO TOWN STD. 530 100mm, GRANULAR 'A' EMBEDMENT, TERMINATE AT PROPERTY LINE 1.0m RIGHT OF SANITARY SERVICE (FACING LOT) c/w A CAP/PLUG AND A 38mm x 89mm MARKER STAKE PAINTED WHITE.

NO.	REVISION	APR'D	DATE		
1.	ADDED RESIDENTIAL STORM CONNECTION	EDH	JUL/04	TOWN OF COLLINGWOOD	APR'D: EDH / DRAWN: / DATE: JAN/03 / SCALE: N/A
				NOTES – STORM SEWERS	STD. No. 123

SANITARY SEWERS

A) M.H.'S TO OPSD–701.XXX AS APPROPRIATE.

B) BENCHING TO OPSD – 701.021. NOTE: MINIMUM HOLE SIZE 1 WALL IF PRE–CAST RISER SECTION SHALL CONFORM WITH MANUFACTURER'S SPECIFICATIONS.

C) STEPS TO OPSD – 405.010.

D) FROST STRAPS SHALL BE INSTALLED ON ALL MAINTENANCE HOLE AS PER OPSD – 701.100

E) BEDDING AND COVER TO OPSD – 802.010 (FLEXIBLE PIPE), GRANULAR 'A' EMBEDMENT MATERIAL OR OTHER APPROVED HOMOGENEOUS GRANULAR MATERIAL.

F) TRENCH BACKFILL TO BE SELECT NATIVE MATERIAL AS APPROVED BY ENGINEER OR IMPORTED GRANULAR MATERIAL.

G) FRAMES AND COVERS TO OPSD – 401.01 TYPE 'A' (CLOSED COVER).

H) SERVICE CONNECTIONS TO OPSD–1006.020 (125 mm), GRANULAR 'A' EMBEDMENT, TERMINATE AT THE PROPERTY LINE 2.5m RIGHT OF WATER SERVICE (FACING LOT) WITH A 125 X 100 REDUCER C/W PLUG AND 38mm x 89mm MARKER POST PAINTED GREEN. MINIMUM GRADE TO BE 2.0%

I) RADIUS BENDS TO BE USED ON SANITARY SEWER CONNECTIONS WHERE THE ANGLE OF CONNECTION BETWEEN THE SERVICE AND SEWER EXCEEDS 90°.

J) BACKFILL AND EMBEDMENT MATERIAL TO BE COMPACTED TO A DRY DENSITY OF AT LEAST 95% OF THE MATERIAL'S STANDARD PROCTOR MAXIMUM DRY DENSITY (SPMDD).

K) CLEAR STONE WRAPPED WITH FILTER FABRIC CAN BE SUBSTITUTED FOR EMBEDMENT MATERIAL IF APPROVED BY THE ENGINEER.

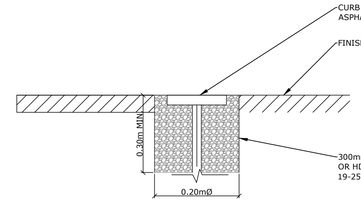
L) MAINTENANCE HOLE FRAMES TO BE SET TO BASE COURSE ASPHALT ELEVATION AND RAISED PRIOR TO PLACING SURFACE COURSE ASPHALT TO THE SATISFACTION OF THE TOWN.

M) PIPE SUPPORT AT MAINTENANCE HOLES AS PER OPSD 708.020.

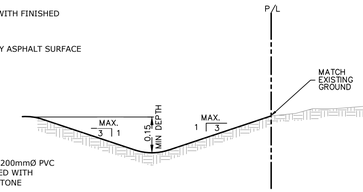
N) ALL MAINTENANCE HOLES, UNLESS EXPRESSLY IDENTIFIED ARE 1200 mm DIAMETER.

O) GENERAL INSTALLATION AND TESTING OF SEWERS AND APPURTENANCES TO BE IN ACCORDANCE WITH O.P.S.S. 407, 408, 409 (CCTV), 410, 421 AND ALL SPECIFICATIONS REFERENCED WITHIN THESE SECTIONS.

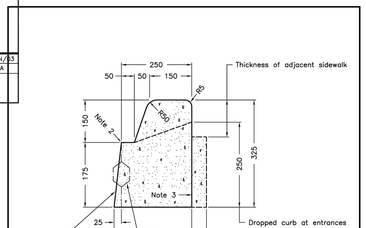
NO.	REVISION	APR'D	DATE		
1.	REVISED SERVICE LOCATION	EDH	JUL/04	TOWN OF COLLINGWOOD	APR'D: EDH / DRAWN: / DATE: JAN/03 / SCALE: N/A
2.	REMOVED TEST FITTING	EDH	APR/07	NOTES – SANITARY SEWERS	STD. No. 124



FROST COLLAR DETAIL
N.T.S.



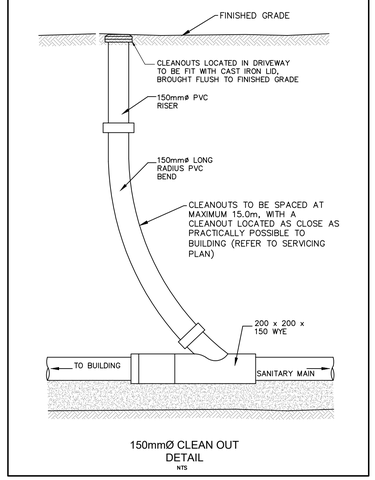
TYPICAL SIDE YARD SWALE
N.T.S.



NOTES:
1 When curb and gutter is adjacent to concrete pavement or base, this drawing shall be used in conjunction with OPSD 552.010 and 552.020.
2 Flexible and composite pavement shall be placed 5mm above the adjacent edge of gutter.
3 For slipforming procedure a 5% batter is acceptable.

A Treatment at entrances shall be according to OPSD 351.010.
B Outlet treatment shall be according to the OPSD 610 Series.
C The transition from one curb type to another shall be a minimum length of 3.0m, except in conjunction with guide rail where it shall be according to the OPSD 900 Series.
D All dimensions are in millimetres unless otherwise shown.

ONTARIO PROVINCIAL STANDARD DRAWING	Nov 2012	Rev 2
CONCRETE BARRIER CURB WITH NARROW GUTTER		OPSD 600.080



150mmØ CLEAN OUT DETAIL
NTS

WATER MAINS

A) BEDDING AND COVER TO OPSD–802.010, GRANULAR 'A' EMBEDMENT MATERIAL OR OTHER APPROVED HOMOGENEOUS GRANULAR MATERIAL.

B) TRENCH BACKFILL TO BE SELECT NATIVE MATERIAL AS APPROVED BY ENGINEER OR IMPORTED GRANULAR MATERIAL.

C) THRUST BLOCKS TO OPSD–1103.010 AND 1103.020 WHERE SUITABLE SOILS ARE ENCOUNTERED.

D) SERVICE CONNECTIONS TO OPSD–1104.010, 100 mm GRANULAR 'A' EMBEDMENT AND COVER OVER PIPE. TERMINATE AT PROPERTY LINE AT CENTER OF LOT C/W CURB STOP AND BOX, TESTING TAIL TO SURFACE ATTACHED TO A 38mm x 89mm MARKER POST PAINTED BLUE.

E) HYDRANTS TO OPSD–1105.010. DRAIN PLUGS SHALL BE INSTALLED WHERE HIGH WATER TABLE IS ENCOUNTERED.

F) BACKFILL AND EMBEDMENT MATERIAL TO BE COMPACTED TO A DRY DENSITY OF AT LEAST 95% OF THE MATERIAL'S STANDARD PROCTOR MAXIMUM DRY DENSITY (SPMDD).

G) MINIMUM COVER ON WATER MAIN AND SERVICES TO BE ~~1.8m~~ 1.8m

H) GATE VALVES, BENDS AND HYDRANT LEADS AND FITTINGS TO BE CONNECTED WITH ROMAX GRIP RING RESTRAINING CLAMP.

I) CLEARANCE BETWEEN WATER MAINS AND SEWERS TO BE A MINIMUM OF 0.5m VERTICAL WHERE WATER MAIN IS BELOW SEWER OR 2.5 m MINIMUM HORIZONTAL SEPARATION. WHERE WATER MAIN IS ABOVE SEWER, THE MINIMUM SEPARATION TO BE 150 mm (BEDDING MATERIAL).

J) SERVICE TO OPSD – 1104.010 AND SHALL BE DIRECT TAP.

K) FOLLOWING TESTING, CONTRACTOR SHALL OPERATE EACH WATER SERVICE TO VERIFY FULL FLOW AND PRESSURE AT THE CURB STOP TO THE SATISFACTION OF THE ENGINEER.

P) GENERAL INSTALLATION AND TESTING OF WATER MAIN AND APPURTENANCES TO BE IN ACCORDANCE WITH O.P.S.S. 701 AND ALL SPECIFICATIONS REFERENCED WITHIN THESE SECTIONS.

~~Q) ALL WATERMAIN TESTING AND DISINFECTION WILL BE CONDUCTED BY OPC AT THE DEVELOPERS COST. IT SHOULD BE NOTED THAT NEW WATERMAINS ARE NOT TO BE CONNECTED TO EXISTING WATERMAINS UNTIL BACTERIOLOGICAL TESTING HAS BEEN SUCCESSFULLY COMPLETED.~~

ALL HYDRANTS SHALL BE, CANADA VALVE, CENTURY No. 1 OPEN LEFT WITH 2 CSA HOSE PORTS, ONE STORZ 4" PUMPER PORT, AND A BREAK AWAY TYPE 6" MJ BASE

ALL WATERMAIN TESTING SHALL BE COMPLETED BY THE DEVELOPER'S QUALIFIED THIRD PARTY CONTRACTOR IN ACCORDANCE WITH THE MECP WATERMAIN DISINFECTION PROCEDURE AT THE DEVELOPER'S COST TO THE SATISFACTION OF THE TOWN, THE TOWN WILL COLLECT THE REQUIRED MICROBIOLOGICAL WATER QUALITY SAMPLES, AT THE DEVELOPER'S COST, PRIOR TO PLACING THE WATERMAIN INTO SERVICE

NO.	REVISION	APR'D	DATE		
1.	REVISED SERVICE LOCATION	EDH	JUL/04	TOWN OF COLLINGWOOD	APR'D: EDH / DRAWN: / DATE: JAN/03 / SCALE: N/A
2.	REVISED WATERMAIN TESTING	EDH	APR/07	NOTES – WATER MAINS	STD. No. 125

ROADS

A) SUBGRADE AND BOULEVARD MATERIAL TO BE COMPACTED TO A MINIMUM DRY DENSITY OF AT LEAST 95% SPMDD. SUBGRADE TO BE PROOF ROLLED AND CERTIFIED PRIOR TO PLACING GRANULAR 'B'.

B) GRANULAR 'A' AND 'B' BASE TO BE COMPACTED TO 100% OF THE MATERIAL'S RESPECTIVE SPMDD.

C) ROADWAYS TO BE CONSTRUCTED WITH MIN. 300MM GRANULAR 'B' TYPE 1, 150 MM GRANULAR 'A', AND 50 MM HL8 BASE 40 MM HL3 SURFACE COURSE ASPHALT. ALL SUBDRAINS TO BE CONSTRUCTED IN ACCORDANCE WITH OPSS 405.

D) SELECT SUBGRADE MATERIAL, OR IMPORTED GRANULAR MATERIAL APPROVED BY THE ENGINEER, COMPACTED TO 98% S.P.M.D.D. TO BE USED AS FILL IN ALL AREAS WHERE PROPOSED PIPE INVERTS ARE HIGHER THAN EXISTING GRADE OR AS INSTRUCTED BY THE ENGINEER.

E) ALL GRANULARS AND ASPHALT MATERIALS AND PLACEMENT TO BE IN ACCORDANCE WITH OPSS 314 AND OPSS 310

F) JOINTS WITH EXISTING ASPHALT TO BE SAW CUT STRAIGHT PRIOR TO PLACING NEW ASPHALT AND TACK COAT APPLIED TO EXISTING ASPHALT.

G) STOP SIGNS AND STREET SIGNS TO TOWN STANDARDS.

150mm TOPSOIL AND SOD TO OPSS.MUNI 802 AND 803

H) REINSTATEMENT OF ALL DISTURBED BOULEVARDS TO INCLUDE REGRADING, ~~100mm TOPSOIL AND SOD TO OPSS 570 AND 571.~~

I) CONCRETE CURB AND GUTTER TO OPSD 600.040 OR OPSD 600.070 AND OPSS 353

J) CONCRETE SIDEWALK TO OPSD 310.010, 310.030 AND OPSS 351. SUBBASE TO CONSIST OF MINIMUM 150 mm OF GRANULAR 'A'.

K) 100 mm DIAMETER PIPE SUBDRAINS SHALL BE PROVIDED AS PER STANDARD 210 ON BOTH SIDES OF THE ROAD.

L) SUBDRAIN TO BE INSTALLED 200 mm BELOW CURB IN GRANULAR 'A' TRENCH AND CONNECTED TO EACH CB OR CBMH.

M) SUBDRAINS TO BE PERFORATED OTHER THAN THE 2 m SECTION IMMEDIATELY UPSTREAM OF ALL STRUCTURES WHICH SHALL BE NON–PERFORATED.

NO.	REVISION	APR'D	DATE		
				TOWN OF COLLINGWOOD	APR'D: EDH / DRAWN: / DATE: JAN/03 / SCALE: N/A
				NOTES – ROADS	STD. No. 126

MATERIALS

A) SANITARY SEWER – SDR 35 PVC (INCREASE SPECIFICATION WHERE INSTALLATION DICTATES)

B) SANITARY SERVICES – SDR 28 PVC. – 125 mm COLOUR GREEN (USING TEE CONNECTIONS TO MAINS UNLESS SHOWN OTHERWISE).

C) WATER MAIN – DUCTILE IRON CLASS 52, OR PRESSURE CLASS 350 CEMENT LINED. CONDUCTIVITY CONNECTORS TO BE USED ON ALL JOINTS.

D) WATER MAIN SERVICES – 20mm DIAMETER TYPE "K" SOFT COPPER PIPE.

E) MAIN STOPS TO 201–A3H3, 3/4",BALL STYLE, AWWA THREAD BY COMPRESSION CAMBRIDGE BRASS.

F) CURB STOPS TO 203–H3H3, 3/4", BALL STYLE WITH DRAIN, COMPRESSION JOINT BY CAMBRIDGE BRASS.

G) SERVICE BOXES TO NUMBER 7, D–1 CLOW OR MUELLER, 24" BLACK RODS STRAIGHT.

~~H) HYDRANT ACCESSORIES – MARKER'S FLEX STAKE MODEL FHV 804, REFLECTIVE HYDRANT DECAL, YELLOW, 48" LENGTH; ANTI TAMPER DEVICE FOR CENTURY HYDRANTS, BLUE.~~

I) HYDRANT ACCESSORIES – MARKER'S FLEX STAKE MODEL FHV 804, REFLECTIVE HYDRANT DECAL, YELLOW, 48" LENGTH; ANTI TAMPER DEVICE FOR CENTURY HYDRANTS, BLUE.

J) VALVES – RESILIENT SEATED, RSGV, MECHANICAL JOINT, OPEN LEFT CLOW OR MUELLER WITH 5 SL–48 SLIDING VALVE BOX.

K) MECHANICAL JOINT DUCTILE FITTINGS – AWWA/ANSI C153/A21.53

L) RESTRAINER–ROLMAC GRIPPER RING UP TO 300mm, SIGMA ONE LOCK RESTRAINING GLANDS OVER 300mm.

M) LIVE TAP SADDLES – EPOXY CAOTED C/W STAINLESS STEEL BOLTS.

N) FILTER FABRIC – TERRAFIX 270R OR APPROVED EQUAL.

O) PERFORATED SUBDRAINS – 100mm BIG 'O' WITH GEOTEXTILE FILTER SOCK OR APPROVED EQUAL.

P) STORM SEWER – PVC SDR35, CONCRETE CLASS III OR HDPE OPEN PROFILE BELL & SPIGOT (BOSS 2000 AND MIN. PIPE STIFFNESS=320Kpa OR EQUAL).

Q) STORM SEWER CONNECTION PVC SDR28 – 100mm COLOUR WHITE

R) CULVERTS – SMOOTH WALL HDPE (MIN. PIPE STIFFNESS = 320Kpa) OR CORRUGATED METAL PIPE (MIN. THICKNESS = 2.0 mm)

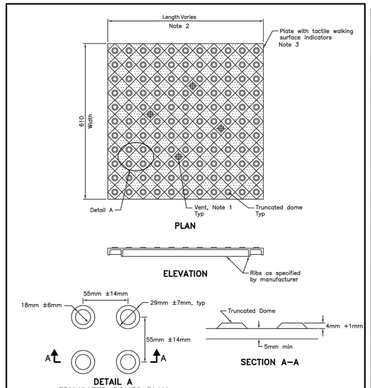
S) RIP–RAP TO OPSD 1004.05.06

T) ALL SPECIFIED AGGREGATES TO OPSD 1010.

U) HYDRANTS ARE TO BE 1.85m LONG. EXTENSIONS IF REQUIRED ARE TO BE INSTALLED BELOW THE 1.85m SECTION.

ALL HYDRANTS SHALL BE, CANADA VALVE, CENTURY No. 1 OPEN LEFT WITH 2 CSA HOSE PORTS, ONE STORZ 4" PUMPER PORT, AND A BREAK AWAY TYPE 6" MJ BASE

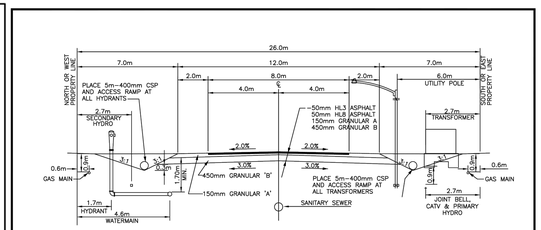
NO.	REVISION	APR'D	DATE		
1.	ADDED STORM SEWER CONNECTION	EDH	JUL/04	TOWN OF COLLINGWOOD	APR'D: EDH / DRAWN: / DATE: JAN/03 / SCALE: N/A
2.	ADDED HYDRANT LENGTH	EDH	APR/07	NOTES – MATERIALS	STD. No. 127



DETAIL A
TRUNCATED DOMES PLAN

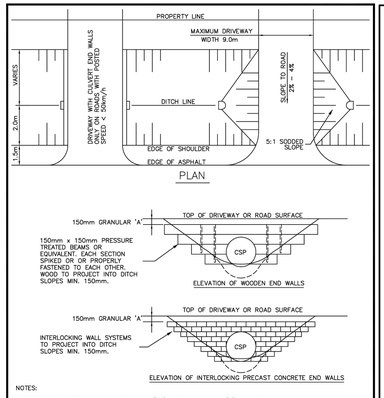
NOTES:
1 Vents shall be as specified by the manufacturer.
2 Length of plate may be increased to suit the curb depression width.
3 Material of plate shall be as specified in Contract Documents.
A Adjacent cast iron plates shall be permanently connected using a locking mechanism and any hardware shall be hot dipped galvanized.
B All dimensions are in millimetres unless otherwise shown.

ONTARIO PROVINCIAL STANDARD DRAWING	Nov 2019	Rev 1
CONCRETE SIDEWALK RAMPS TACTILE WALKING SURFACE INDICATORS COMPONENT		OPSD 310.039



NOTES:
1. WIDTH ON STORM, SANITARY AND WATERMAIN AS PER DESIGN CRITERIA.
2. UTILITY CORRIDOR SHALL HAVE A MINIMUM COVER OF 0.6m.
3. MINIMUM PAVEMENT AND ROAD STRUCTURE DESIGN AS PER TOWN DESIGN CRITERIA OR AS PER GEOTECHNICAL INVESTIGATION RECOMMENDATION.
3. TREES TO BE PLACED IN LOCATIONS AS PER APPROVED LANDSCAPE PLAN.
4. ACTIVELY GROWING NURSERY SOD TO BE LAID ON 100mm OF TOPSOIL PROPERLY GRADED AND ROLLED.
5. HYDRANTS AND WATERMAINS TO BE ON OPPOSITE SIDE OF ROAD FROM ELECTRICAL TRANSFORMER.
6. ALL SERVICE LOCATIONS SHOWN ARE FOR GUIDELINE PURPOSES ONLY AND MAY DEVIATE AS PER THE DIRECTION OF THE TOWN WHEN STANDARD LOCATION CANNOT BE ACHIEVED.
7. ALL DIMENSIONS ARE IN METRES UNLESS OTHERWISE SHOWN.

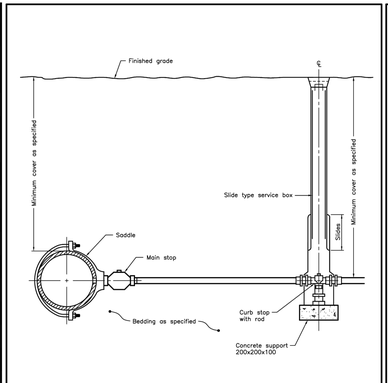
NO.	REVISION	APR'D	DATE		
1.	ASPHALT & GRANULAR THICKNESS	EDH	JUN/05	TOWN OF COLLINGWOOD	APR'D: EDH / DRAWN: / DATE: JAN/03 / SCALE: NTS
2.	UTILITY POLE DISTANCE FROM P/L	EDH	JAN/07	LOCAL INDUSTRIAL 26.0m ROAD ALLOWANCE 8.0m ASPHALT SURFACE	STD. No. 206



NOTES:
1. DRIVEWAY CONSTRUCTED OF GRANULAR 'B' CORE, GRANULAR 'A' CULVERT EMBEDMENT.
2. DRIVEWAY SURFACE SHALL BE 50mm HL3A OVER 150mm GRANULAR 'A' FROM STREET TO P/L.
3. CULVERT SHALL BE HDPE BOSS 2000 SMOOTH WALL 320kPa OR CSP 2.0mm THICKNESS.
4. CULVERT END WALL SHALL NOT PROJECT ABOVE EDGE OF SHOULDER.

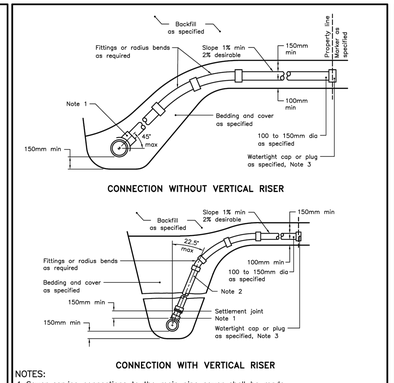
NO.	REVISION	APR'D	DATE

TOWN OF COLLINGWOOD	APR'D: EDH	DATE: JAN/03
RURAL DRIVEWAY ENTRANCE WITH CULVERT DETAIL	DRAWN: CCTA	SCALE: NTS
	STD. No.	406



NOTES:
A Couplings shall not be permitted unless the service length exceeds 20m between the main stop and curb stop.
B All water services shall be installed 90° to the longitudinal axis of the watermain.
C Backfill material within 500mm of service box shall be native or imported, as specified.
D All dimensions are in millimetres unless otherwise shown.

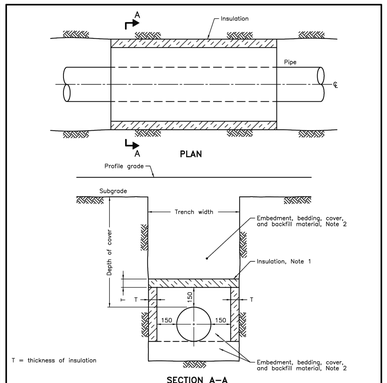
ONTARIO PROVINCIAL STANDARD DRAWING	Nov 2018	Rev 3
WATER SERVICE CONNECTION 32, 38, and 50mm DIAMETER SIZES		OPSD 1104.020



NOTES:
1 Sewer service connections to the main pipe sewer shall be made using factory made tees, strap–on–saddles, or other approved saddles.
2 Vertical risers shall be as specified.
3 Cap or plug at property line shall be adequately braced.

A Maintenance holes shall be used at the main sewer to connect service connections greater than 200mm.
B For new construction, saddles shall be installed on the main pipe before that pipe is laid.
C Approved cut–in tool shall be used for field made connections.
D All dimensions are in millimetres unless otherwise shown.

ONTARIO PROVINCIAL STANDARD DRAWING	Nov 2021	Rev 4
SEWER SERVICE CONNECTIONS FOR MAIN PIPE SEWER		OPSD 1006.010



SECTION A–A
TYPICAL PIPE INSULATION DETAIL

NOTES:
1 The insulation material shall be extruded polystyrene according to OPSS 1605 with a minimum compressive strength of 275 kPa.
2 Pipe embedment or bedding, cover, and backfill shall be according to:
a) Flexible OPSD 802.010, 802.013, 802.020, and 802.023.
b) Rigid – OPSD 802.030, 802.031, 802.032, 802.033, 802.050, 802.051, 802.052, and 802.053.

A Minimum insulation thickness shall be 50mm.
B Joints shall be staggered for multiple insulation sheets.
C This OPSD is to be read in conjunction with OPSD 3090.100 and 3090.101.
D All dimensions are in millimetres unless otherwise shown.

ONTARIO PROVINCIAL STANDARD DRAWING	Nov 2020	Rev 1
INSULATION FOR SEWERS AND WATERMAINS IN SHALLOW TRENCHES		OPSD 1109.030

ACCEPTED FOR CONSTRUCTION
TOWN OF COLLINGWOOD

PER .....

DATE: .....

Notes
1. 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.
2. The contractor shall verify all dimensions, levels, and datums on site and report any discrepancies or omissions to CAPES Engineering Ltd. prior to construction.
3. This drawing is to be read and understood in conjunction with all other plans and documents applicable to this project.
4. CAPES Engineering Ltd. accepts no responsibility for interpretation of third party information, contractor to verify all third party information prior to construction.
5. This is not a plan of survey. Any and all representation of property boundaries are approximate only.

No	Revision	Date
1	ISSUED FOR APPROVALS	25/11/12
2	REVISED FOR APPROVALS	26/04/29
3	REVISED FOR APPROVALS	26/06/22
4	REVISED FOR APPROVALS	26/09/04

LICENSED PROFESSIONAL ENGINEER
C. CAPES
100056104
SEPT. 9, 2026
PROVINCE OF ONTARIO

Client
ALEX CARTER

CAPES ENGINEERING
WWW.CAPESENGINEERING.COM

12 STEWART ROAD SITE PLAN

STANDARD DETAILS

Designed	Checked	Date	Drawing No.
K. GRIFFIN	C. CAPES	25/10/31	C4
Project No. 2025-054		Rev No. 4	
Scale AS NOTED			

File: C:\CAPES engineering projects\Projects\2025\2025-054 12 stewart rd\Drawings\02_Reference\Dwg\2025-054 ENGTEMPLATE (APP).dwg Date Plotted: September 9, 2026 - 9:31 PM

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 Park's (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:

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

N Gardlund

Niklas Gardlund, EIT
Project Supervisor, Geotechnical Services

S. A. JEFFREY — 100170855 — PROVINCE OF ONTARIO — 2026-04-27

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

SJ:NG:gk

ACCEPTED FOR
CONSTRUCTION
TOWN OF COLLINGWOOD

PER .....

DATE: .....

Notes
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2. The contractor shall verify all dimensions, levels, and datums on site and report any discrepancies or omissions to CAPES Engineering Ltd. prior to construction.
3. This drawing is to be read and understood in conjunction with all other plans and documents applicable to this project.
4. CAPES Engineering Ltd. accepts no responsibility for interpretation of third party information, contractor to verify all third party information prior to construction.
5. This is not a plan of survey. Any and all representation of property boundaries are approximate only.

No	Revision	Date
1	ISSUED FOR APPROVALS	25/11/12
2	REVISED FOR APPROVALS	26/04/29
3	REVISED FOR APPROVALS	26/06/22
4	REVISED FOR APPROVALS	26/09/04

LICENSED PROFESSIONAL ENGINEER — C. CAPES — 100056104 — SEPT. 7, 2026 — PROVINCE OF ONTARIO

Client
ALEX CARTER

CAPES ENGINEERING
WWW.CAPESENGINEERING.COM

12 STEWART ROAD SITE PLAN

GEOTECHNICAL SPECIFICATIONS

Designed	Checked	Date	Drawing No.
K. GRIFFIN	C. CAPES	26/04/29	C5
Project No. 2025-054		Rev No. 4	
Scale AS NOTED			

File: C:\CAD\Capes engineering dropbox\Projects\2025\2025-054 12 stewart rd\Drawings\02c_ReferenceDwg\2025-054 EXISTING SITE.dwg Date Plotted: September 9, 2026 - 4:31 PM

Materials Specifications

Water Distribution — **March 2026**

Product/Use	Type	Standards/Specifications	Approved Manufacturer	Description/Model	Requirements/Comments
Water Main	Polyvinyl Chloride (PVC) 100 mm to 300 mm	Minimum DR 18 (Class 235) AWWA C900 CSA B137.3 ASTM D3139 NSF/ANSI 61 Certification OPSS.MUNI.441	IPEX Westlake	Blue Brute® CIOD PVC Pressure Pipe	Must be blue in colour Supplied with gaskets CIOD
	Polyvinyl Chloride (PVC) 350 mm to 450 mm	Minimum DR 18 (Class 235) AWWA C900 CSA B137.3 ASTM D3139 NSF/ANSI 61 Certification OPSS.MUNI.441	IPEX Westlake	Centurion® CIOD PVC Pressure Pipe	Must be blue in colour Supplied with gaskets CIOD *Materials for pipes over 450 mm must be selected in consultation with the Town
	High Density Polyethylene (HDPE)	Minimum DR 11 CSA B137.1 AWWA C906 NSF/ANSI 61 Certification OPSS.MUNI.441	KWH Pipe Ltd		Thermal butt fusion joints *Only to be used in specialized installations with approval by Town
Fittings	Ductile Iron	AWWA C153/ANSI A21.53 AWWA C110/ANSI A21.10 AWWA C104/ANSI A21.4 Minimum Pressure Class 350 OPSS.MUNI.441 NSF/ANSI 61/372 Certification	Tyler Union/Bibby SIGMA Corporation STAR® Pipe Products		Epoxy coated Cement lined Mechanical joint restrainer ends

Product/Use	Type	Standards/Specifications	Approved Manufacturer	Description/Model	Requirements/Comments
Warning Tape	For Non-Potable Water Main		Supplied by Seton Canada or approved equal		3.5 mm polyethylene underground warning tape 75mm wide, blue in colour with 50mm black lettering "CAUTION: BURRIED NON-POTABLE WATER LINE BELOW".
Valve Box	For watermain <400 mm	ASTM A48	Bibby-Ste-Croix	VB 2200 Slide Type 1.65 to 2.15	Cast Iron 130 mm diameter slide type (Cover 185 mm diameter) Valve box cover must be stamped "WATER"
			STAR® Pipe Products	Cat VB-0003 Item V8666A	
			SIGMA Corporation		
Water Service Connections	Crosslinked Polyethylene 25mm to 50mm	SDR 9 AWWA C904 ASTM F876, F877 & F2023 CSA B137.5 NSF/ANSI 14 and 61 Certification	REHAU IPEX	MUNICIPEX® Blue 904®	
	Copper 25mm to 50mm	ASTM B88 AWWA C800 NSF/ANSI 61 & 372 Certification	Great Lakes Copper Ltd	Seamless copper water tube type "K"	
Service Saddle	For services 25-50mm on PVC and Ductile Iron pipe	NSF/ANSI 61 & 372 Certification	Robar Industries Ltd	Series 2606 product #2626	Stainless Steel Double Bolt
			Cambridge Brass	403 Teck Saddle Series 8403	

Product/Use	Type	Standards/Specifications	Approved Manufacturer	Description/Model	Requirements/Comments
Hydrants		AWWA C502 OPSS.MUNI.441 NSF/ANSI 61/372 Certification	Mueller Canada	Century	Hydrant painted chrome yellow 100mm ULC Stortz pumper connection (painted black) Two 63.5 mm side ports (CSA thread) 25 mm operating nut - open left Self-draining 1.8 m cover minimum Breakaway flange
Hydrant Leads		Minimum DR 18 (Class 235) AWWA C900-16 CSA B137.3 ASTM D3139 OPSS.MUNI.441 NSF/ANSI 61 Certification	IPEX Westlake	Blue Brute® CIOD PVC Pressure Pipe	150 mm diameter lead Fully restrained No bends permitted
Hydrant Flex Marker			Flexstake	C804	1.2 m yellow post with red hydrant graphic on white reflective background at top of post (both sides)
Hydrant Sign					Red hydrant graphic on white reflective background 250 mm x 350 mm Aluminum, engineer grade

Product/Use	Type	Standards/Specifications	Approved Manufacturer	Description/Model	Requirements/Comments
Valves	Resilient Wedge Gate Valves	AWWA C509 & C515 AWWA C550 ASTM A536 & A126 OPSS.MUNI.441 NSF/ANSI 61/372 Certification	Mueller Canada Clow Canada	A-2361 MJ by MJ A2639 or A2640	Open left (counterclockwise) Epoxy coated, Ductile Iron Mechanical joint ends Stainless steel hardware
Tapping Sleeve	Ductile Iron	ASTM D2000 & ASTM A3 AWWA C223 NSF/ANSI 61 & 372 Certification	Robar Industries Ltd Smith-Blair Mueller	6906 622 H-304 MJ or flange outlet	Epoxy Coated Stainless steel hardware Mechanical joint outlet
	Polyvinyl Chloride (PVC)	ASTM D2000 AWWA C223 & C213 & 207 NSF/ANSI 61 & 372 Certification	Robar Industries Ltd Smith-Blair	6606BB 663	Stainless steel Stainless steel hardware Mechanical Joint Outlet
Tapping Valve	Resilient Wedge Gate Valves	AWWA C509 & C515 ASTM A536 NSF/ANSI 61 & 372 Certification	Mueller Clow Canada	H-687 F-6114	Resilient seat tapping valve Open left (counterclockwise) Epoxy coated ductile iron Flange X mechanical joint end Stainless steel hardware
Air Release	Combination Air & Vacuum Release Valves	AWWA C512 ASTM A536 NSF/ANSI 61 & 372 Certification	Cla-Val Val-Matic	36 Series VM201C or VM202C	Epoxy coated Single Body Housing Sized to manufacturer's specification
Pressure Reducing	Pressure Reducing Valves	ASTM A536 NSF/ANSI 61 & 372 Certification	Mueller (Singer Valve) Cla-Val	Series 106/206 PR Model 90-01	Flanged ends To be installed in a chamber To be approved by Town

Product/Use	Type	Standards/Specifications	Approved Manufacturer	Description/Model	Requirements/Comments
Joint Restraints	For PVC pipe to Mechanical Joint Fitting 100 mm to 400 mm	ASTM F1674 AWWA C900 AWWA C111/A21.11 UNI-B-13-94	STAR® Pipe Products Romac Industries Inc	PVC Stargrip Series 4000 Grip Ring (100 to 300mm only)	
	For Ductile Iron Pipe to Mechanical Joint Fitting 100 mm to 400 mm	ASTM F1674 AWWA C151/A21.51 AWWA C111/A21.11	Romac Industries Inc SIGMA Corporation	Grip Ring (100 to 300mm only) ONE-LOK Series SLDE for DI	
	For PVC Pipe Bell and Spigot Joint	ASTM F1674 & AS36 AWWA C900 UNI-B-13-94	SIGMA Corporation STAR® Pipe Products	PV-Lok for C900 PVC Pipe Pipe restrainers series 1100	
	For Ductile Iron Pipe Bell and Spigot Joint	AWWA C151/A21.51	STAR® Pipe Products	Pipe restrainers series 1100C	For connections and repairs
Couplings	For PVC, Ductile Iron, Cast Iron Pipe	ASTM A536 NSF/ANSI 61 & 372 Certification	Romac Industries Inc Krausz	Macro HP (Two Bolt) 4-12" ALPHA (TWO BOLT) 4-12"	Dresser Style Epoxy coated Stainless steel hardware
	For HDPE Pipe	ASTM A536 NSF/ANSI 61 & 372 Certification	Krausz Romac Industries Inc	Hymax ALPHA	Dresser Style Epoxy coated Stainless steel hardware

Product/Use	Type	Standards/Specifications	Approved Manufacturer	Description/Model	Requirements/Comments
Corporation (Main) Stops	25mm to 50mm	AWWA C800 NSF/ANSI 61 & 372 Certification ASTM B62 & B584	Mueller	300 B-25008N	Ball valve AWWA CC Taper Thread Inlet x Compression outlet No Lead
			Cambridge Brass	301NL-A4H4 (25 mm) 301NL-A5H5 (31 mm) 301NL-A6H6 (38 mm) 301NL-A7H7 (50 mm)	
Curb Stops	25mm to 50mm	AWWA C800 NSF 61 & 372 Certification ASTM B62 & B584	Mueller Canada	300 B-25209N	Ball valve Compression joints Non draining No Lead
			Cambridge Brass	202NL-H4H4 (25 mm) 202NL-H5H5 (31 mm) 202NL-H6H6 (38 mm) 202NL-H7H7 (50 mm)	
Service Couplings	25mm to 50mm	AWWA C800 ASTM B62 & B584 NSF/ANSI 61 & 372 Certification	Mueller Canada	H-15403N	Compression joints Couplings not permitted in new construction between main stop and curb stop (property line) or services <20m in length
			Philmac	UTC -Universal Transition Coupling	
			Cambridge Brass	118NL-H4H4 (25 mm) 118NL-H5H5 (31 mm) 118NL-H6H6 (38 mm) 118NL-H7H7 (50 mm)	
Product/Use	Type	Standards/Specifications	Approved Manufacturer	Description/Model	Requirements/Comments

Product/Use	Type	Standards/Specifications	Approved Manufacturer	Description/Model	Requirements/Comments
Service Boxes			Mueller Canada	8D1(25mm) 8D2 (31-50mm)	Epoxy coated cast iron Box top must be stamped "WATER" Standard pentagon screw type brass plug 13mm Type 304 stainless steel rod (36")with SS cotter pin Minimum depth of burry 1.7 m Adjustable
			Clow Canada	D1 (25mm) or D2 (31-50 mm)	
Anodes	All metallic pipe, fittings, and appurtenances	ASTM B-418 Type II or ASTM B-843 Type M1 OPSS.MUNI.442			Magnesium or Zinc
Sacrificial Nuts	On all bolts	ASTM B-418 Type II	Brentech		
			Duratron	DSN0750	
Insulation	For direct buried water pipes with <1.7m cover		Dow Chemical Co.	Styrofoam Highload 100	Extruded polystyrene Minimum 50mm thick
			Owens Corning	Formular NGX 400	
Tracer Wire	For all non-metallic water main, hydrant laterals and service pipe (direct buried)				#10 Gauge TWU single stranded copper White plastic coating Splices made with DryConn waterproof connectors For Horizontal Direction Drilling applications additional requirements apply including a minimum of 3 wires
Product/Use	Type	Standards/Specifications	Approved Manufacturer	Description/Model	Requirements/Comments

Automatic Flushing Station Meter Pit		NSF/ANSI 61 & 372 Certification AWWA C800 NSF/ANSI 61 & 372 Certification AWWA C800	Kupferle Mueller Canada	Eclipse 9800A (25 mm) THERMAL-COIL®	203-CS-18-72-F-B-B-S nonfreezing
Meter					Meter to be specified in consultation with the Town

IMPORTANT:

"All chemicals and materials used in the alteration or operation of the drinking water system that come into contact with water within the system shall meet all applicable standards set by both the American Water Works Association ("AWWA") and the American National Standards Institute ("ANSI") safety criteria standards NSF/60, NSF/61 and NSF/372."

ACCEPTED FOR CONSTRUCTION
TOWN OF COLLINGWOOD

PER .....

DATE: .....

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No	Revision	Date
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2	REVISED FOR APPROVALS	26/04/29
3	REVISED FOR APPROVALS	26/06/22
4	REVISED FOR APPROVALS	26/09/04

LICENSED PROFESSIONAL ENGINEER — PROVINCE OF ONTARIO — C/CAPES 100056104 — SEPT. 4, 2026

Client: ALEX CARTER

CAPES ENGINEERING — WWW.CAPESENGINEERING.COM

12 STEWART ROAD SITE PLAN

TOWN APPROVED WATERMAIN MATERIALS

Designed	Checked	Date	Drawing No.
K. GRIFFIN	C. CAPES	26/06/22	C6
Project No. 2025-054		Rev No. 4	
Scale AS NOTED			

File: C:\CAPES Engineering Dropbox\Projects\2025\2025-054 12 Stewart Rd\Drawings\02. Ref\remotes\dwg\2025-054 EXISTSHOE OPT2.dwg Date Plotted: September 9, 2025 - 4:31 PM

PLAN MATERIALS	
ITEM	DESCRIPTION
MYLAR	TRANSLAR Nº 3
GAUGE	0·08mm
INK	HIGGINS Nº 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

PART	LOT.	CONC.	INST.	AREA
1	43	X	672038	0·159 ha
2				0·154 ha
3				0·157 ha

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. C. 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

8882

PART 1, 51R-5647 INST. 371861

PART 5, 51R-3826 INST. 499984

PART 2, 51R-5647 INST. 562794

PART 3, 51R-5647 INST. 565774

PART 7, 51R-5647 INST. 554559 (OPENED BY BYLAW 3209) (INST. 556017)

PART 4, 51R-5647

STEWART (OPENED BY BYLAW 3075) (INST. 478644) ROAD

20·12

N73°44'40"E

77·19 (51R-4717 and meas.)

(66·75 51R-3826) 66·83 meas.

(66·98 51R-3826) 66·85 meas.

Fd (51R-3826) Bent, Reset

Fd (51R-3826) 0·03 South

Fd (51R-3826)

26·14

25·14

13·92

25·91

15·28 15·30

PART 2, 51R-4717

INST. 414896

INST. 633871 PART 2, 51R-6303

INST. 556412 PART 5, 51R-5647

(51R-4717 and meas.) 61·40

N17°09'00"W

INST. PART 3 672038 51R-4717

PART 3 AREA=0·157 ha

61·30

N16°15'20"W

Concrete Block Foundation

7·70

7·62

PART 2 AREA=0·154 ha

61·21

PART 1 AREA=0·159 ha

Post and Wire Fence on Line

61·13 (51R-4717 and meas.)

N16°15'20"W

43

X

INST. 501182 PART 3, 51R-3826

PART 4, 51R-3826

INST. 371859

10·06

10·06

STREET

Fd (zumo)

Fd (51R-4717)

25·18

25·14

25·91

N73°30'35"E

76·23 meas. (76·20 51R-4717)

126·04

N73°30'25"E 15·37

CONCESSION X AND IX

233·54 (51R-2800) LINE BETWEEN

N9°01'50"W

HIGH (R.P. 73)

INST. 473039

INST. 473040

South East Angle Lot 43, Conc. X

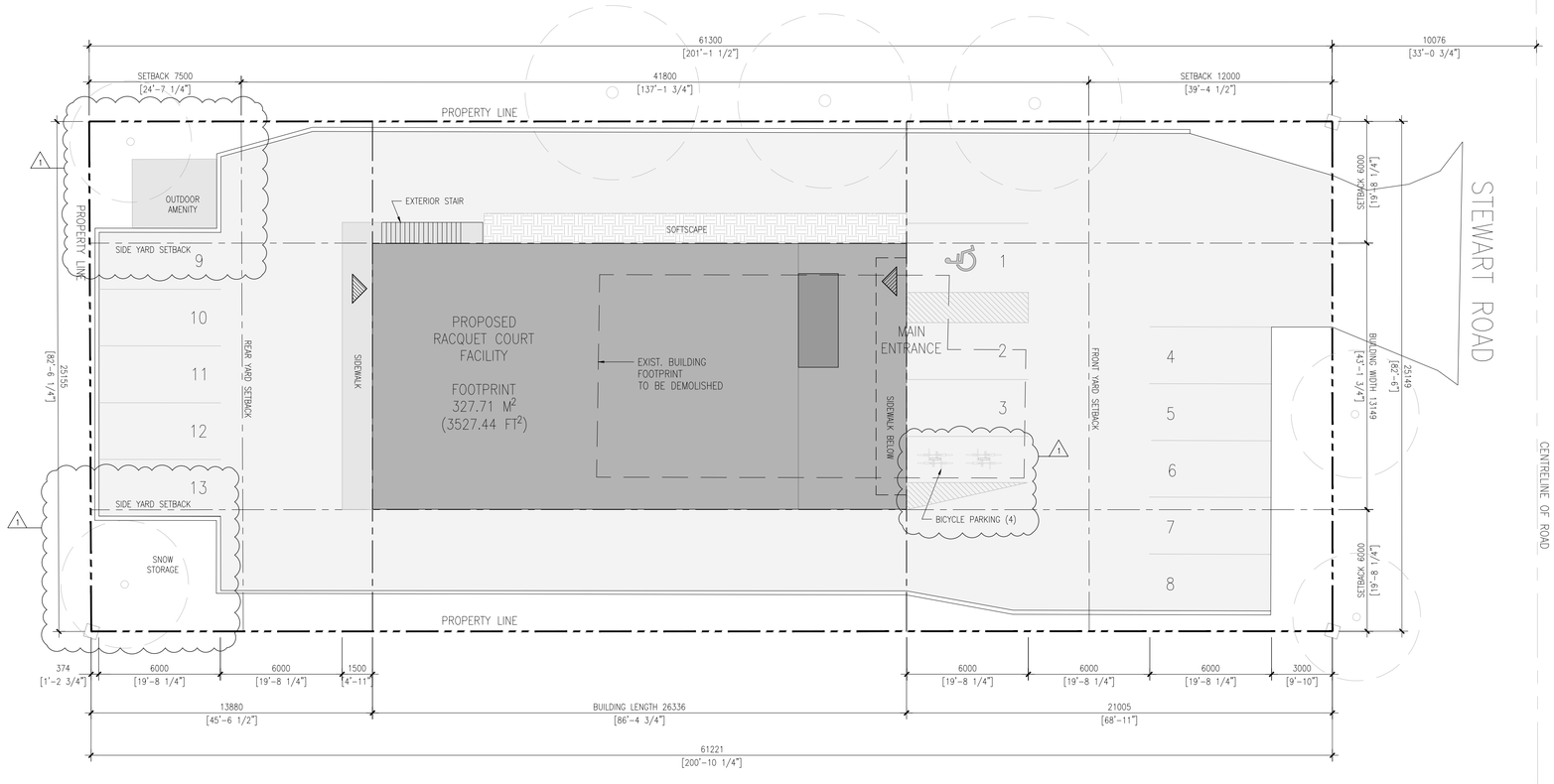
12·07

12·07

PART 5, 51R-1004

SURVEY FOR 1476 WALLACE ROAD LTD. JOB Nº 72-47-8

ROAD ALLOWANCE BETWEEN LOTS 42 AND 43



1 / A301 Site Plan
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	13
BICYCLE PARKING (10% OF PARKING)	4	4

1	2026-09-04	Revised Per SPA Comments

REVISION RECORDS

2026-06-30	Issued For Pricing
2026-05-27	Issued For Site Plan Approval
2026-04-23	Issued For Coordination
2026-04-17	Issued For Coordination
2026-03-31	Issued For Coordination
2026-03-31	Issued For Review

ISSUE RECORDS

ONTARIO ASSOCIATION OF ARCHITECTS
TREVOR WALLACE
LICENCE
7293

REFLECT
ARCHITECTURE
info@reflectarchitecture.com
416.453.3639

DO NOT SCALE DRAWINGS.

ALL WORK SHALL BE CONDUCTED IN ACCORDANCE WITH ALL STATUTES, BY LAWS, CODES AND REGULATIONS OF THE AUTHORITIES HAVING JURISDICTION OVER THIS PROJECT.

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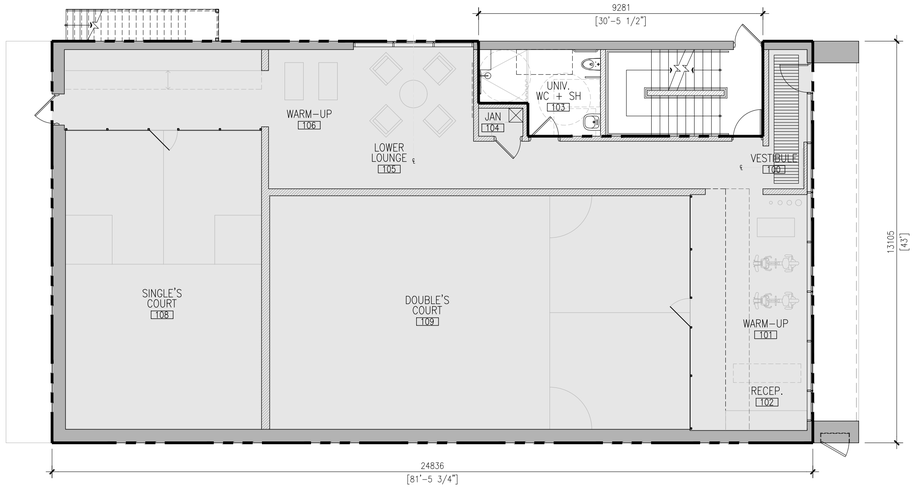
GENERAL NOTES

CRC SQUASH CLUB
12 STEWART RD
Collingwood, On

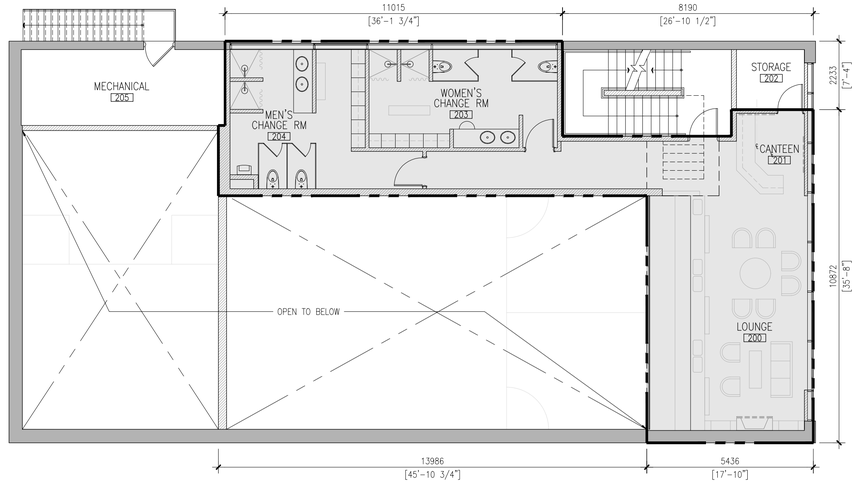
2601	1:150	SD	TW
PROJECT	SCALE	DRAWN	REVIEWED

SITE PLAN

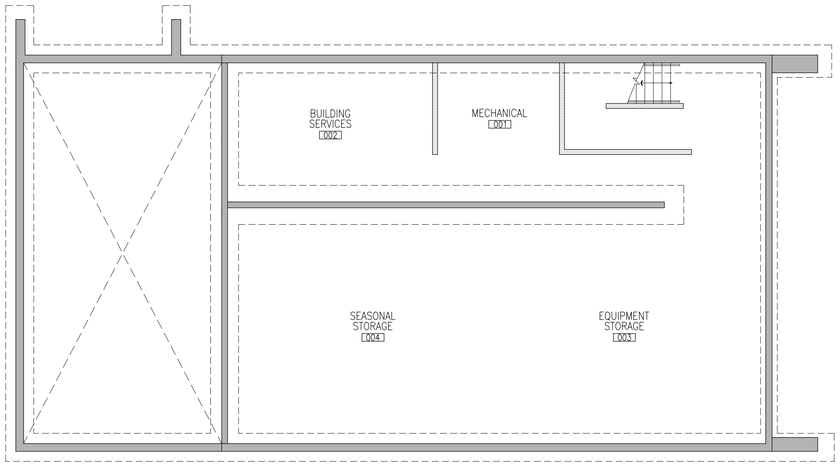
A301



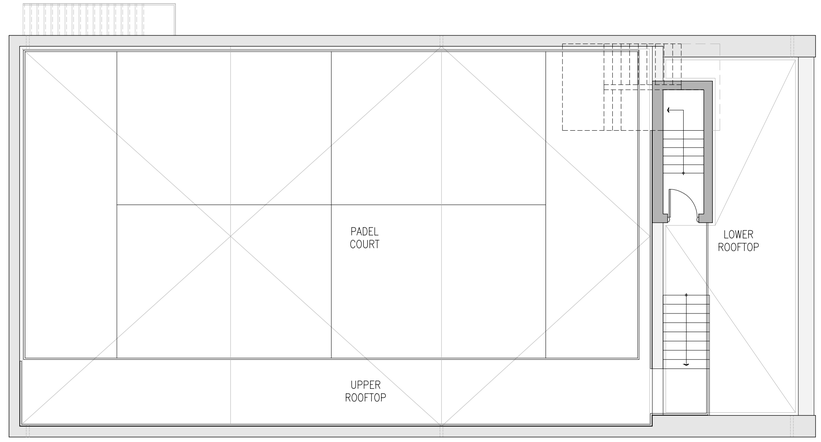
GROUND FLOOR



SECOND FLOOR



BASEMENT



ROOFTOP

1 / A302 Area Plans
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	416.54 m^2 (4483.59 ft^2)

1

COLLINGWOOD ZONING BY-LAW 3-14

TERM	DEFINITION
Gross Floor Area	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. 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.

1 2026-09-04 Revised Per SPA Comments

REVISION RECORDS

2026-06-30 Issued For Pricing
2026-05-27 Issued For Site Plan Approval
2026-04-23 Issued For Coordination
2026-04-17 Issued For Coordination

ISSUE RECORDS

ONTARIO ASSOCIATION of ARCHITECTS
TREVOR WALLACE
LICENCE
7293

REFLECT
ARCHITECTURE
info@reflectarchitecture.com
416.453.3639

DO NOT SCALE DRAWINGS.

ALL WORK SHALL BE CONDUCTED IN ACCORDANCE WITH ALL STATUTES, BY LAWS, CODES AND REGULATIONS OF THE AUTHORITIES HAVING JURISDICTION OVER THIS PROJECT.

THIS DRAWING IS THE PROPERTY OF REFLECT ARCHITECTURE AND MAY NOT BE REPRODUCED OR USED WITHOUT THE EXPRESSED CONSENT OF THE ARCHITECT. THE CONTRACTOR IS RESPONSIBLE FOR CHECKING AND VERIFYING ALL LEVELS AND DIMENSIONS AND SHALL REPORT ALL DISCREPANCIES TO THE ARCHITECT AND OBTAIN CLARIFICATION PRIOR TO COMMENCING WORK.

GENERAL NOTES

CRC SQUASH CLUB
12 STEWART RD
Collingwood, On

2601	1:100	SD	TW
PROJECT	SCALE	DRAWN	REVIEWED

AREA PLANS

A302

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
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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

Peto MacCallum Ltd.
CONSULTING ENGINEERS

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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BARRIE, COLLINGWOOD, HAMILTON, KITCHENER, LONDON, TORONTO

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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 m^2 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 m^2 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 m^2 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 Park's (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/m^3
- 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.

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

STEWART ROAD

APPROXIMATE BOUNDARY

APPROXIMATE BOUNDARY

APPROXIMATE BOUNDARY

EXISTING BUILDING

BH 1
EL. 186.60

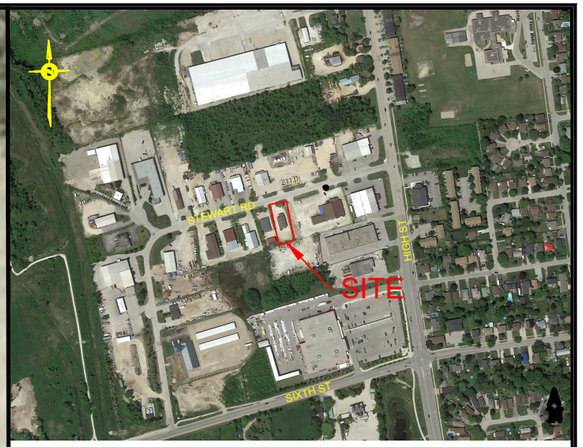
BH 2
EL. 186.55

BH 3
EL. 186.70

BH 4
EL. 186.65

BH 5
EL. 186.95

BH 6
EL. 187.00



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:

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

0m 10m 20m

PLAN SCALE

BAIRD HOLDING LTD

BOREHOLE AND MONITORING WELL LOCATION PLAN

GEOTECHNICAL DESKTOP STUDY
12 STEWART ROAD, COLLINGWOOD, ONTARIO

Peto MacCallum Ltd.
CONSULTING ENGINEERS

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:

CONSISTENCY	N (blows/0.3 m)	c (kPa)	DENSENESS	N (blows/0.3 m)
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		

Peto MacCallum Ltd.
CONSULTING ENGINEERS

LOG OF BOREHOLE/MONITORING WELL NO. 1

17T 560795.1E 4927047N

PROJECT Proposed Commercial Building — ***PML REF.*** 26BF002

LOCATION 12 Stewart Road, Collingwood, Ontario — ***BORING DATE*** April 3, 2025 — ***ENGINEER*** ST

BORING METHOD Continuous Flight Solid Stem Augers — ***TECHNICIAN*** JK

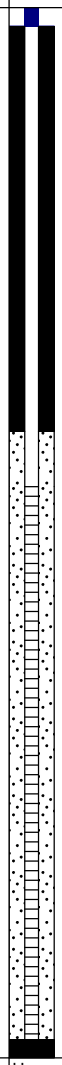
DEPTH (metres)	ELEV	DESCRIPTION	STRAT PLOT	SAMPLES NUMBER	SAMPLES TYPE	SAMPLES "N" VALUES	ELEVATION SCALE
		SURFACE ELEVATION 186.60					
0.0		FILL: Brown to dark brown, sand and gravel, some silt, some clay, dry to moist		1	SS	16	186
1.0				2	SS	3	
2.0	2.1 184.5			3	SS	38	185
		SILTY SAND/ SANDY SILT: Compact to very dense, grey, silty sand/sandy silt, trace to some clay, trace to some gravel, moist to wet		4	SS	16	184
3.0				5	SS	40	183
4.0							
5.0	5.7 180.9			6	SS	96	182
		BOREHOLE TERMINATED AT 5.7 m DUE TO AUGER REFUSAL, POSSIBLE BEDROCK					181
6.0							
7.0							
8.0							

SHEAR STRENGTH (kPa)
+FIELD VANE △TORVANE ○ Qu
▲POCKET PENETROMETER ○ Q
50 100 150 200
DYNAMIC CONE PENETRATION ×
STANDARD PENETRATION TEST ●
20 40 60 80

PLASTIC LIMIT w_P — NATURAL MOISTURE CONTENT w — LIQUID LIMIT w_L
WATER CONTENT (%)
10 20 30 40

UNIT WEIGHT kN/m³

GROUND WATER OBSERVATIONS AND REMARKS
GRAIN SIZE DISTRIBUTION (%) GR SA SI&CL



Upon completion of augering
Water at 4.7 m
No cave in.

Water Level Readings:

Date	Depth	Elev.
2025-04-16	2.0	184.6
2025-04-22	2.0	184.7

NOTES

Peto MacCallum Ltd.
CONSULTING ENGINEERS

LOG OF BOREHOLE/MONITORING WELL NO. 2

17T 560814.7E 4927041N

PROJECT Proposed Commercial Building — **PML REF.** 26BF002

LOCATION 12 Stewart Road, Collingwood, Ontario — **BORING DATE** April 3, 2025 — **ENGINEER** ST

BORING METHOD Continuous Flight Solid Stem Augers — **TECHNICIAN** JK

DEPTH / ELEV (metres)	DESCRIPTION	STRAT PLOT	SAMPLES: NUMBER	SAMPLES: TYPE	SAMPLES: "N" VALUES
	SURFACE ELEVATION 186.55				
0.0	FILL: Brown to dark brown, sand and gravel, some silt, some clay, dry to moist		1	SS	11
			2	SS	28
1.4 / 185.2	SILTY SAND/ SANDY SILT: compact to dense, grey, silty sand/sandy silt, trace to some clay, trace to some gravel, moist to wet		3	SS	24
			4	SS	15
			5	SS	46/150mm
3.7 / 182.9	BOREHOLE TERMINATED AT 3.7 m DUE TO AUGER REFUSAL, POSSIBLE BEDROCK				

ELEVATION SCALE: 186, 185, 184, 183

SHEAR STRENGTH (kPa)
+FIELD VANE △TORVANE ○ Qu
▲POCKET PENETROMETER ○ Q
50 100 150 200
DYNAMIC CONE PENETRATION ×
STANDARD PENETRATION TEST ●
20 40 60 80

PLASTIC LIMIT w_P — NATURAL MOISTURE CONTENT w — LIQUID LIMIT w_L
WATER CONTENT (%)
10 20 30 40

UNIT WEIGHT kN/m³

GROUND WATER OBSERVATIONS AND REMARKS
GRAIN SIZE DISTRIBUTION (%) GR SA SI&CL

Flushmount casing
Concrete
Bentonite seal
50 mm slotted pipe
Filter sand

Upon completion of augering
Water at 3.1 m
No cave in.

Water Level Readings:

Date	Depth	Elev.
2025-04-16	1.7	184.8
2025-04-22	1.4	185.1

NOTES

Peto MacCallum Ltd.
CONSULTING ENGINEERS

LOG OF BOREHOLE NO. 3

17T 560819.3E 4927019N

PROJECT Proposed Commercial Building — ***PML REF.*** 26BF002

LOCATION 12 Stewart Road, Collingwood, Ontario — ***BORING DATE*** April 3, 2025 — ***ENGINEER*** ST

BORING METHOD Continuous Flight Solid Stem Augers — ***TECHNICIAN*** JK

DEPTH (metres) / ELEV	DESCRIPTION	STRAT PLOT	SAMPLES: NUMBER	SAMPLES: TYPE	SAMPLES: "N" VALUES	ELEVATION SCALE
	SURFACE ELEVATION 186.70					
0.0	FILL: Brown to dark brown, sand and gravel, some silt, some clay, dry to moist		1	SS	8	
						186
1.0			2	SS	22	
1.4 / 185.3	SILTY SAND/ SANDY SILT: Compact to dense, grey, silty sand/sandy silt, trace to some clay, trace to some gravel, moist to wet		3	SS	24	185
2.0						
			4	SS	36	184
3.0 / 3.1 / 183.6	BOREHOLE TERMINATED AT 3.1 m					
4.0						
5.0						
6.0						
7.0						
8.0						

SHEAR STRENGTH (kPa)
+FIELD VANE △TORVANE ○ Qu
▲POCKET PENETROMETER ○ Q
50 100 150 200
DYNAMIC CONE PENETRATION ×
STANDARD PENETRATION TEST ●
20 40 60 80

PLASTIC LIMIT w_P — NATURAL MOISTURE CONTENT w — LIQUID LIMIT w_L
WATER CONTENT (%)
10 20 30 40

UNIT WEIGHT kN/m³

GROUND WATER OBSERVATIONS AND REMARKS

GRAIN SIZE DISTRIBUTION (%) GR SA SI&CL

Upon completion of augering
Water at 2.4 m
No cave in.

NOTES

Peto MacCallum Ltd.
CONSULTING ENGINEERS

LOG OF BOREHOLE/MONITORING WELL NO. 4

17T 560815.3E 4927007N

PROJECT Proposed Commercial Building — **PML REF.** 26BF002

LOCATION 12 Stewart Road, Collingwood, Ontario — **BORING DATE** April 3, 2025 — **ENGINEER** ST

BORING METHOD Continuous Flight Solid Stem Augers — **TECHNICIAN** JK

DEPTH (metres)	ELEV	DESCRIPTION	STRAT PLOT	SAMPLES NUMBER	SAMPLES TYPE	SAMPLES "N" VALUES	ELEVATION SCALE
		SURFACE ELEVATION 186.65					
0.0		FILL: Brown to dark brown, sand and gravel, some silt, some clay, dry to moist		1	SS	10	
				2	SS	35	
1.4	185.3	SILTY SAND/ SANDY SILT: Compact to very dense, grey, silty sand/sandy silt, trace to some clay, trace to some gravel, moist to wet		3	SS	29	
				4	SS	29	
				5	SS	63	
				6	SS	35	
5.7	181.0	BOREHOLE TERMINATED AT 5.7 m DUE TO AUGER REFUSAL, POSSIBLE BEDROCK					

SHEAR STRENGTH (kPa)
+FIELD VANE △TORVANE ○ Qu
▲POCKET PENETROMETER ○ Q
50 100 150 200
DYNAMIC CONE PENETRATION ×
STANDARD PENETRATION TEST ●
20 40 60 80

PLASTIC LIMIT w_P — NATURAL MOISTURE CONTENT w — LIQUID LIMIT w_L
WATER CONTENT (%)
10 20 30 40

UNIT WEIGHT kN/m³

GROUND WATER OBSERVATIONS AND REMARKS
GRAIN SIZE DISTRIBUTION (%) GR SA SI&CL

Flushmount casing
Concrete
Bentonite seal
50 mm slotted pipe
Filter sand

Upon completion of augering
Water at 3.9 m
No cave in.

Water Level Readings:

Date	Depth	Elev.
2025-04-16	2.2	184.5
2025-04-22	2.1	184.5

NOTES

Peto MacCallum Ltd.
CONSULTING ENGINEERS

LOG OF BOREHOLE NO. 5

17T 560803.3E 4927011N

PROJECT Proposed Commercial Building — ***PML REF.*** 26BF002

LOCATION 12 Stewart Road, Collingwood, Ontario — ***BORING DATE*** April 3, 2025 — ***ENGINEER*** ST

BORING METHOD Continuous Flight Solid Stem Augers — ***TECHNICIAN*** JK

DEPTH (metres) / ELEV	DESCRIPTION	STRAT PLOT	SAMPLES: NUMBER	SAMPLES: TYPE	SAMPLES: "N" VALUES	ELEVATION SCALE	SHEAR STRENGTH (kPa) + FIELD VANE △ TORVANE ○ Qu ▲ POCKET PENETROMETER ○ Q; DYNAMIC CONE PENETRATION × STANDARD PENETRATION TEST ●	PLASTIC LIMIT w_P / NATURAL MOISTURE CONTENT w / LIQUID LIMIT w_L; WATER CONTENT (%)	UNIT WEIGHT kN/m³	GROUND WATER OBSERVATIONS AND REMARKS; GRAIN SIZE DISTRIBUTION (%) GR SA SI&CL
	SURFACE ELEVATION 186.95						50 100 150 200	10 20 30 40		
0.0	FILL: Brown to dark brown, sand and gravel, some silt, some clay, dry to moist		1	SS	9					
1.0			2	SS	19	186				
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	185				
2.0			4	SS	23					
3.0						184	20 40 60 80			
3.1 / 183.9	BOREHOLE TERMINATED AT 3.1 m									Upon completion of augering Water at 2.7 m No cave in.
4.0										
5.0										
6.0										
7.0										
8.0										

NOTES

Peto MacCallum Ltd.
CONSULTING ENGINEERS

LOG OF BOREHOLE/MONITORING WELL NO. 6

17T 560797.1E 4927032N

PROJECT Proposed Commercial Building — **PML REF.** 26BF002

LOCATION 12 Stewart Road, Collingwood, Ontario — **BORING DATE** April 3, 2025 — **ENGINEER** ST

BORING METHOD Continuous Flight Solid Stem Augers — **TECHNICIAN** JK

DEPTH (metres)	ELEV	DESCRIPTION	STRAT PLOT	SAMPLES NUMBER	SAMPLES TYPE	SAMPLES "N" VALUES	ELEVATION SCALE
		SURFACE ELEVATION 187.00					
0.0		FILL: Brown to dark brown, sand and gravel, some silt, some clay, dry to moist		1	SS	9	
				2	SS	34	186
1.0							
				3	SS	26	
2.0	2.1						185
	184.9	SILTY SAND/ SANDY SILT: Compact to very dense, grey, silty sand/sandy silt, trace to some clay, trace to some gravel, moist to wet		4	SS	16	
3.0							184
				5	SS	49	
4.0							183
				6	SS	58	
5.0							182
6.0				7	SS	50/300mm	181
	6.7						
	180.3	BOREHOLE TERMINATED AT 6.7 m					
7.0							
8.0							

SHEAR STRENGTH (kPa)
+FIELD VANE △TORVANE ○ Qu
▲POCKET PENETROMETER ● Q
50 100 150 200
DYNAMIC CONE PENETRATION ×
STANDARD PENETRATION TEST ●
20 40 60 80

PLASTIC LIMIT w_P — NATURAL MOISTURE CONTENT w — LIQUID LIMIT w_L
WATER CONTENT (%)
10 20 30 40

UNIT WEIGHT kN/m³

GROUND WATER OBSERVATIONS AND REMARKS

GRAIN SIZE DISTRIBUTION (%)
GR SA SI&CL

Flushmount casing
Concrete
Bentonite seal
5 45 43 7
50 mm slotted pipe
Filter sand

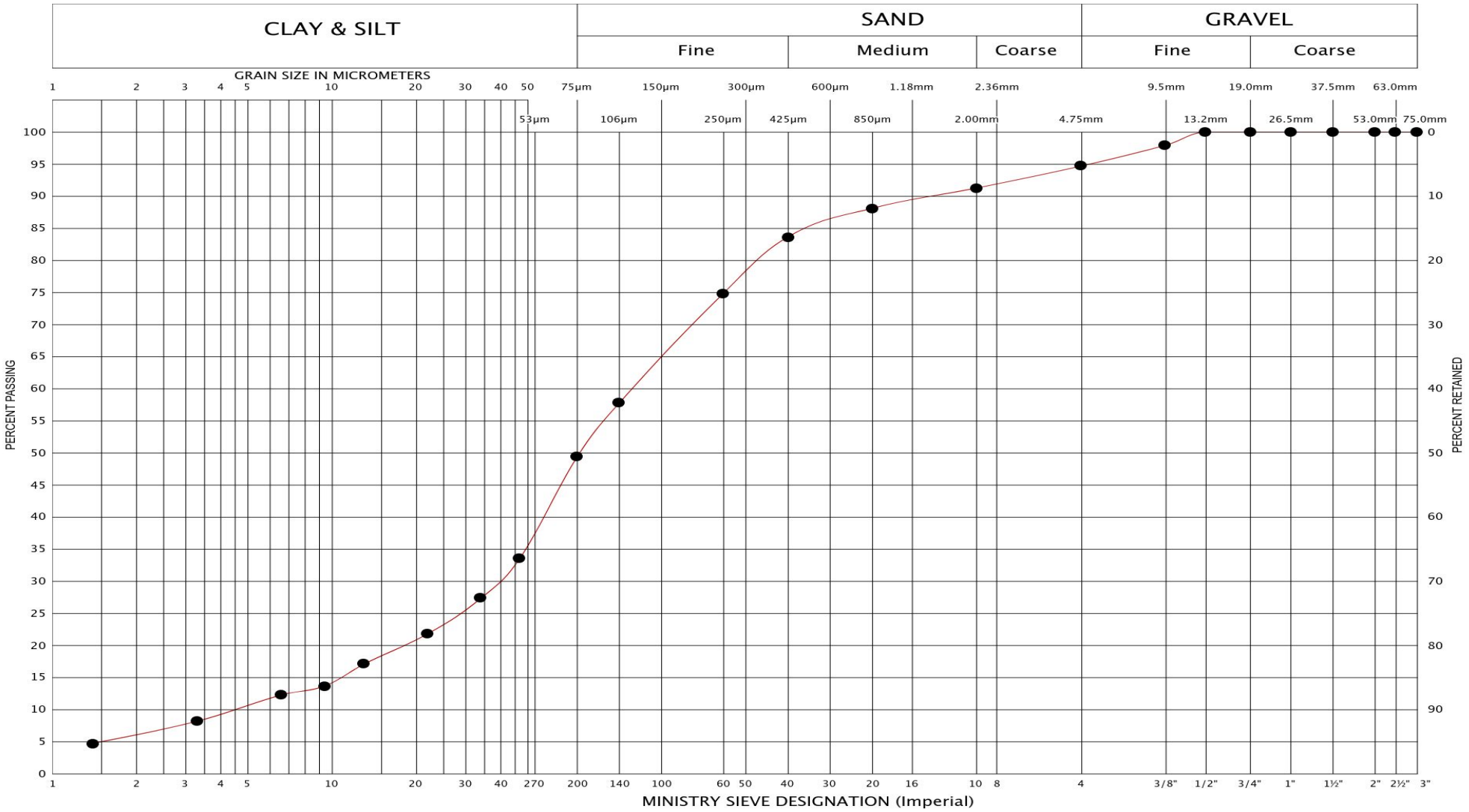
Upon completion of augering
Water at 2.4 m
No cave in.

Water Level Readings:

Date	Depth	Elev.
2025-04-16	2.1	184.9
2025-04-22	2.1	184.9

NOTES

UNIFIED SOIL CLASSIFICATION SYSTEM



LEGEND	BH	6
	SAMPLE	4
	SYMBOL	●

PML Peto MacCallum Ltd.
CONSULTING ENGINEERS

GRAIN SIZE DISTRIBUTION

Silty Sand, Trace Clay, Trace Gravel

FIG No.: GS-1

Project No.: 26BF002

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.

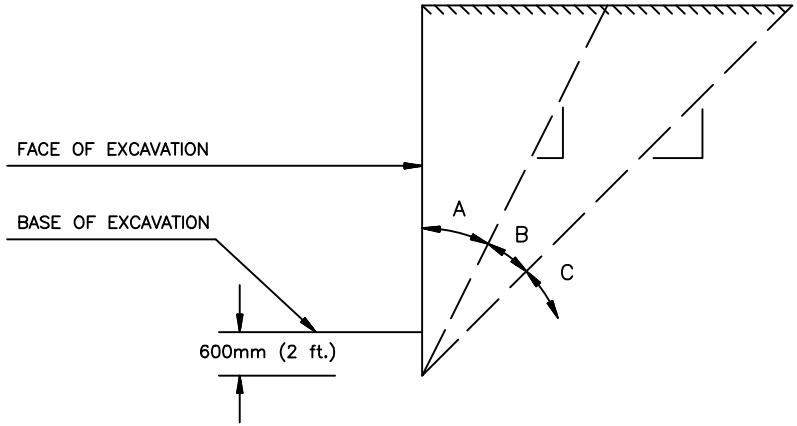
   Underpinning of foundations located in Zones A and B should extend at least into Zone C.

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.

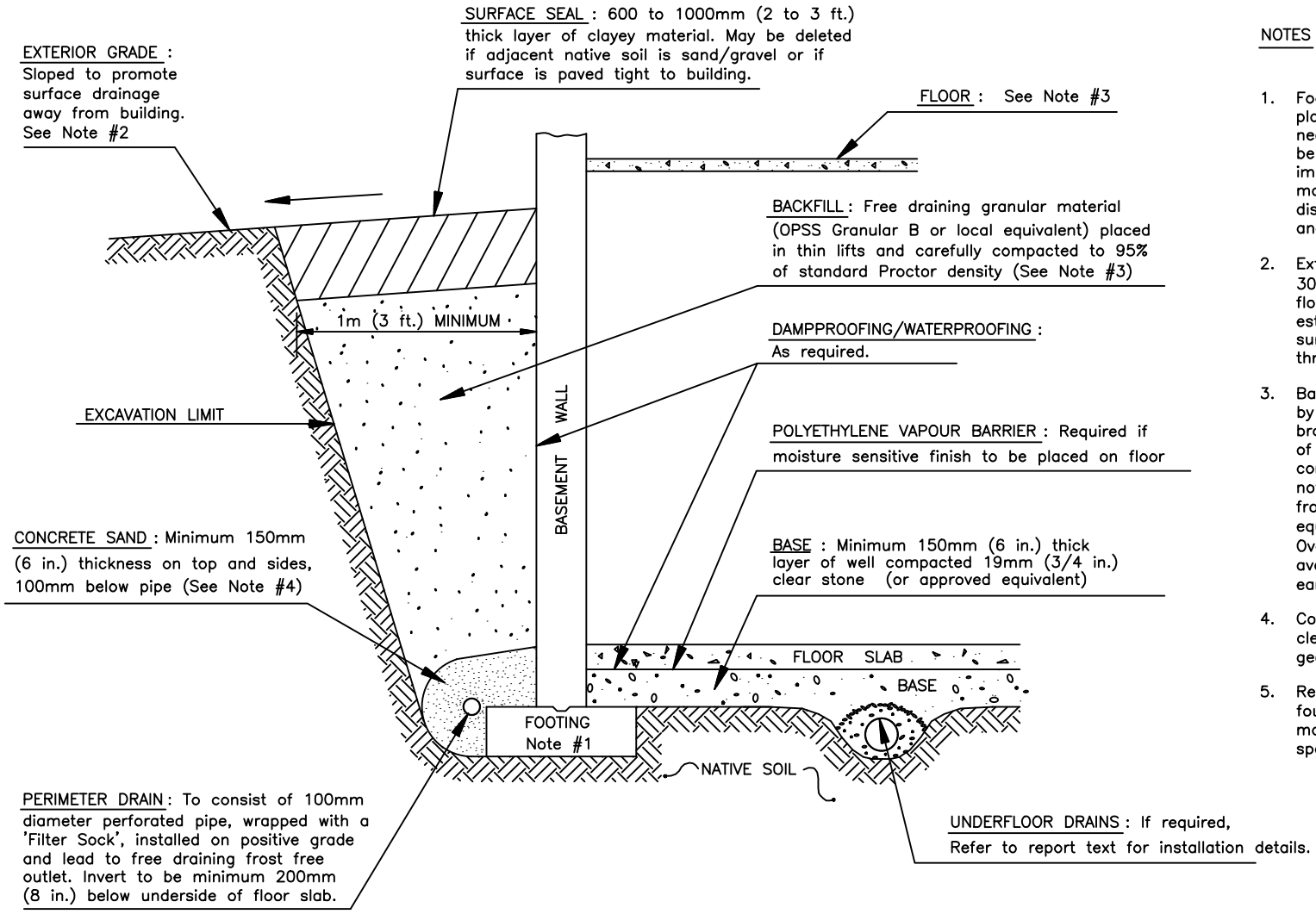


STANDARD DRAWING

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 permited 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

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
(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

ENGINEERED FILL

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

Ontario — Ministry of the Environment

Well Record

Regulation 903 Ontario Water Resources Act

Measurements recorded in: ☐ Metric ☐ Imperial

Tag#: A157269 (or Print Below) — A157269 — BH 2

Page ____ of ____

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	5145995900

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	L9Y4K2

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

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) From	Depth (m/ft) 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

Annular Space

Depth Set at (m/ft) From	To	Type of Sealant Used (Material and Type)	Volume Placed (m^3/ft^3)
0	.3	Concrete	
.3	1.2	Bentonite	

Method of Construction

☐ Cable Tool ☐ Diamond
☐ Rotary (Conventional) ☐ Jetting
☐ Rotary (Reverse) ☐ Driving
☑ Boring ☐ Digging
☐ Air percussion
☐ Other, specify ____

Well Use

☐ Public ☐ Commercial ☐ Not used
☐ Domestic ☐ Municipal ☐ Dewatering
☐ Livestock ☑ Test Hole ☑ Monitoring
☐ Irrigation ☐ Cooling & Air Conditioning
☐ Industrial
☐ Other, specify ____

Construction Record - Casing

Inside Diameter (cm/in)	Open Hole OR Material (Galvanized, Fibreglass, Concrete, Plastic, Steel)	Wall Thickness (cm/in)	Depth (m/ft) From	Depth (m/ft) To
5.1	P.V.C	.165	0	1.5

Construction Record - Screen

Outside Diameter (cm/in)	Material (Plastic, Galvanized, Steel)	Slot No.	Depth (m/ft) From	Depth (m/ft) To
6.4	P.V.C	.10	1.5	4.5

Status of Well

☐ Water Supply
☐ Replacement Well
☐ Test Hole
☐ Recharge Well
☐ Dewatering Well
☑ Observation and/or Monitoring Hole
☐ Alteration (Construction)
☐ Abandoned, Insufficient Supply
☐ Abandoned, Poor Water Quality
☐ Abandoned, other, specify
☐ Other, specify

Water Details

Water found at Depth (m/ft)	Kind of Water	
1.5 (m/ft)	☐ Fresh ☐ Untested ☐ Gas ☐ Other, specify	
(m/ft)	☐ Fresh ☐ Untested ☐ Gas ☐ Other, specify	
(m/ft)	☐ Fresh ☐ Untested ☐ Gas ☐ Other, specify	

Hole Diameter

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

Results of Well Yield Testing

After test of well yield, water was:
☐ Clear and sand free
☐ Other, specify ____

If pumping discontinued, give reason:

Pump intake set at (m/ft)

Pumping rate (l/min / GPM)

Duration of pumping ____ hrs + ____ min

Final water level end of pumping (m/ft)

If flowing give rate (l/min / GPM)

Recommended pump depth (m/ft)

Recommended pump rate (l/min / GPM)

Well production (l/min / GPM)

Disinfected? ☐ Yes ☐ No

	Draw Down Time (min)	Draw Down Water Level (m/ft)	Recovery Time (min)	Recovery Water Level (m/ft)
Static Level				
1			1	
2			2	
3			3	
4			4	
5			5	
10			10	
15			15	
20			20	
25			25	
30			30	
40			40	
50			50	
60			60	

Map of Well Location

Please provide a map below following instructions on the back.

Comments: See map

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	Province	Postal Code	Business E-mail Address
1 Maplewood Crt.	Maple Hills	ON	L7J0A1	

Bus. Telephone No. (inc. area code)	Name of Well Technician (Last Name, First Name)	Well Technician's Licence No.	Signature of Technician and/or Contractor	Date Submitted
9058763358	Paquette, Jeff	2386	Paquette	2014 03 06

Well owner's information package delivered	Date Package Delivered	Date Work Completed
☐ Yes ☐ No		2014 03 06

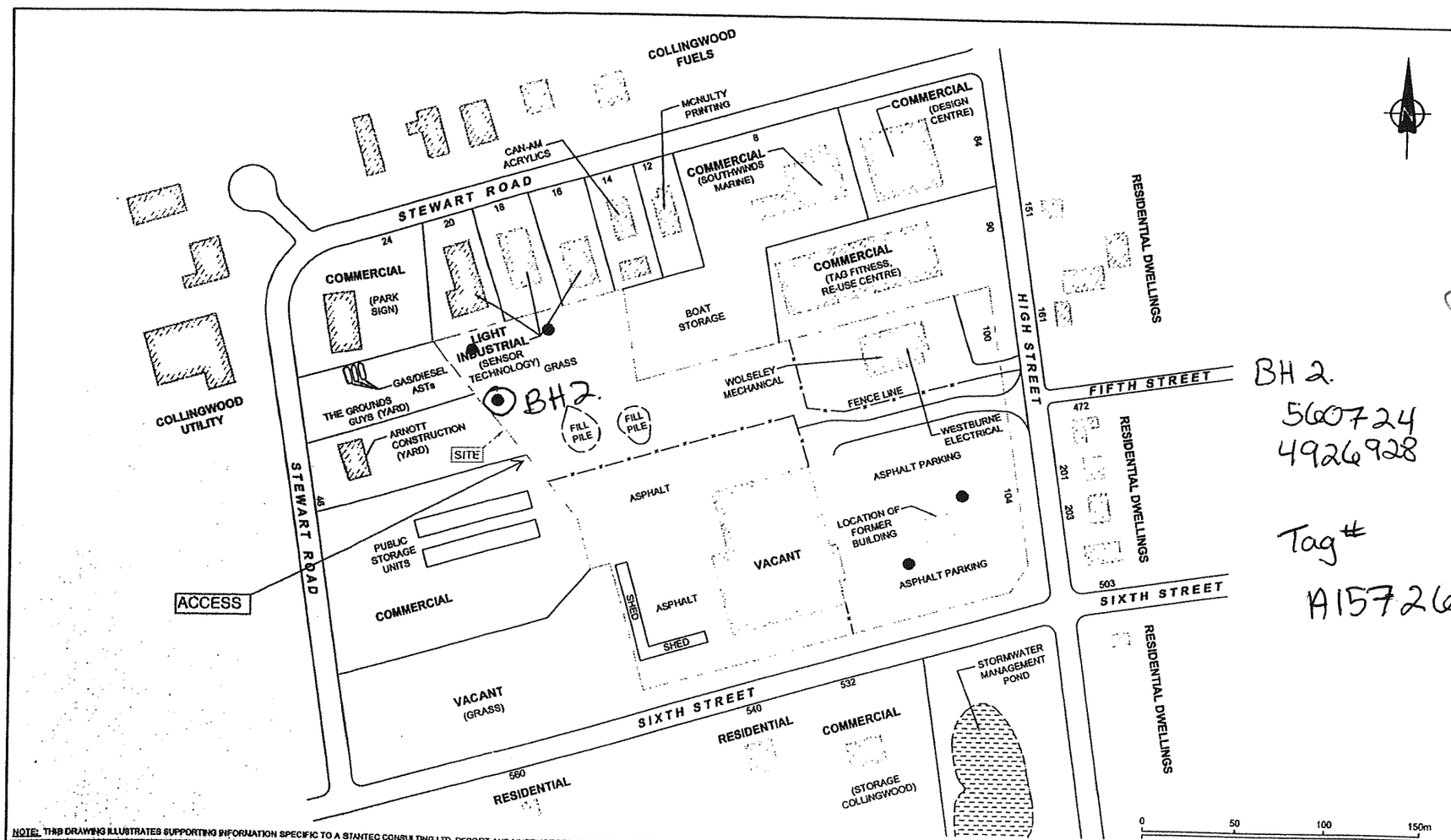
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MAY 22 2014

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BH 2.
560724
4926928

Tag #
A157269

C4UA 216512

MAY 22 2014

NOTE: THIS DRAWING ILLUSTRATES SUPPORTING INFORMATION SPECIFIC TO A STANTEC CONSULTING LTD. REPORT AND MUST NOT BE USED FOR OTHER PURPOSES.

Reference:	Project No.: 122120147	Client: GOWLING LAFLEUR HENDERSON	SITE PLAN	Dwg. No.: 1
	Scale: 1 : 2000			
	Date: 14/01/31	Site Address: 100 AND 104 HIGH STREET, COLLINGWOOD, ONTARIO		
	Dwn. By: CD VM/DM SL2014010284			
	App'd By: TG			

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Ontario — Ministry of the Environment

Well Record

Regulation 903 Ontario Water Resources Act

Page 1 of 1

Measurements recorded in: ☑ Metric ☐ Imperial

Tag#: A157270 (or Print Below)

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	5145995900

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	575071	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) From	Depth (m/ft) To
Brown	Silty Sand			0	.75
Brown	Sandy Silt till			.75	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) From	Depth Set at (m/ft) To	Type of Sealant Used (Material and Type)	Volume Placed (m^3/ft^3)
0	.3	concrete	
.3	1.2	Bentonite	

Method of Construction

☐ Cable Tool ☐ Diamond
☐ Rotary (Conventional) ☐ Jetting
☐ Rotary (Reverse) ☐ Driving
☑ Boring ☐ Digging
☐ Air percussion
☐ Other, specify

Well Use

☐ Public ☐ Commercial ☐ Not used
☐ Domestic ☐ Municipal ☐ Dewatering
☐ Livestock ☐ Test Hole ☑ Monitoring
☐ Irrigation ☐ Cooling & Air Conditioning
☐ Industrial
☐ Other, specify

Construction Record - Casing

Inside Diameter (cm/in)	Open Hole OR Material (Galvanized, Fibreglass, Concrete, Plastic, Steel)	Wall Thickness (cm/in)	Depth (m/ft) From	Depth (m/ft) To
5.1	P.V.C	.065	0	1.5

Construction Record - Screen

Outside Diameter (cm/in)	Material (Plastic, Galvanized, Steel)	Slot No.	Depth (m/ft) From	Depth (m/ft) To
6.4	P.V.C	.010	1.5	4.5

Status of Well

☐ Water Supply
☐ Replacement Well
☐ Test Hole
☐ Recharge Well
☐ Dewatering Well
☑ Observation and/or Monitoring Hole
☐ Alteration (Construction)
☐ Abandoned, Insufficient Supply
☐ Abandoned, Poor Water Quality
☐ Abandoned, other, specify
☐ Other, specify

Water Details

Water found at Depth	Kind of Water	
1.5 (m/ft) ☐ Gas	☐ Fresh ☐ Untested ☐ Other, specify	
(m/ft) ☐ Gas	☐ Fresh ☐ Untested ☐ Other, specify	
(m/ft) ☐ Gas	☐ Fresh ☐ Untested ☐ Other, specify	

Hole Diameter

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

Results of Well Yield Testing

After test of well yield, water was:
☐ Clear and sand free
☐ Other, specify

If pumping discontinued, give reason:

Pump intake set at (m/ft)

Pumping rate (l/min / GPM)

Duration of pumping ____ hrs + ____ min

Final water level end of pumping (m/ft)

If flowing give rate (l/min / GPM)

Recommended pump depth (m/ft)

Recommended pump rate (l/min / GPM)

Well production (l/min / GPM)

Disinfected? ☐ Yes ☐ No

	Draw Down Time (min)	Draw Down Water Level (m/ft)	Recovery Time (min)	Recovery Water Level (m/ft)
Static Level				
1			1	
2			2	
3			3	
4			4	
5			5	
10			10	
15			15	
20			20	
25			25	
30			30	
40			40	
50			50	
60			60	

Map of Well Location

Please provide a map below following instructions on the back.

Comments: See Map

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
17 Morsewood Crt	Halton Hills

Province	Postal Code	Business E-mail Address
Ont	L7J0A1	

Bus. Telephone No. (inc. area code)	Name of Well Technician (Last Name, First Name)
9057876338	Paquette Jeff

Well Technician's Licence No.	Signature of Technician and/or Contractor	Date Submitted
23816	Paquette	2014 03 06

Well owner's information package delivered ☐ Yes ☐ No

Date Package Delivered: Y Y Y Y M M D D

Date Work Completed: 2014 03 06

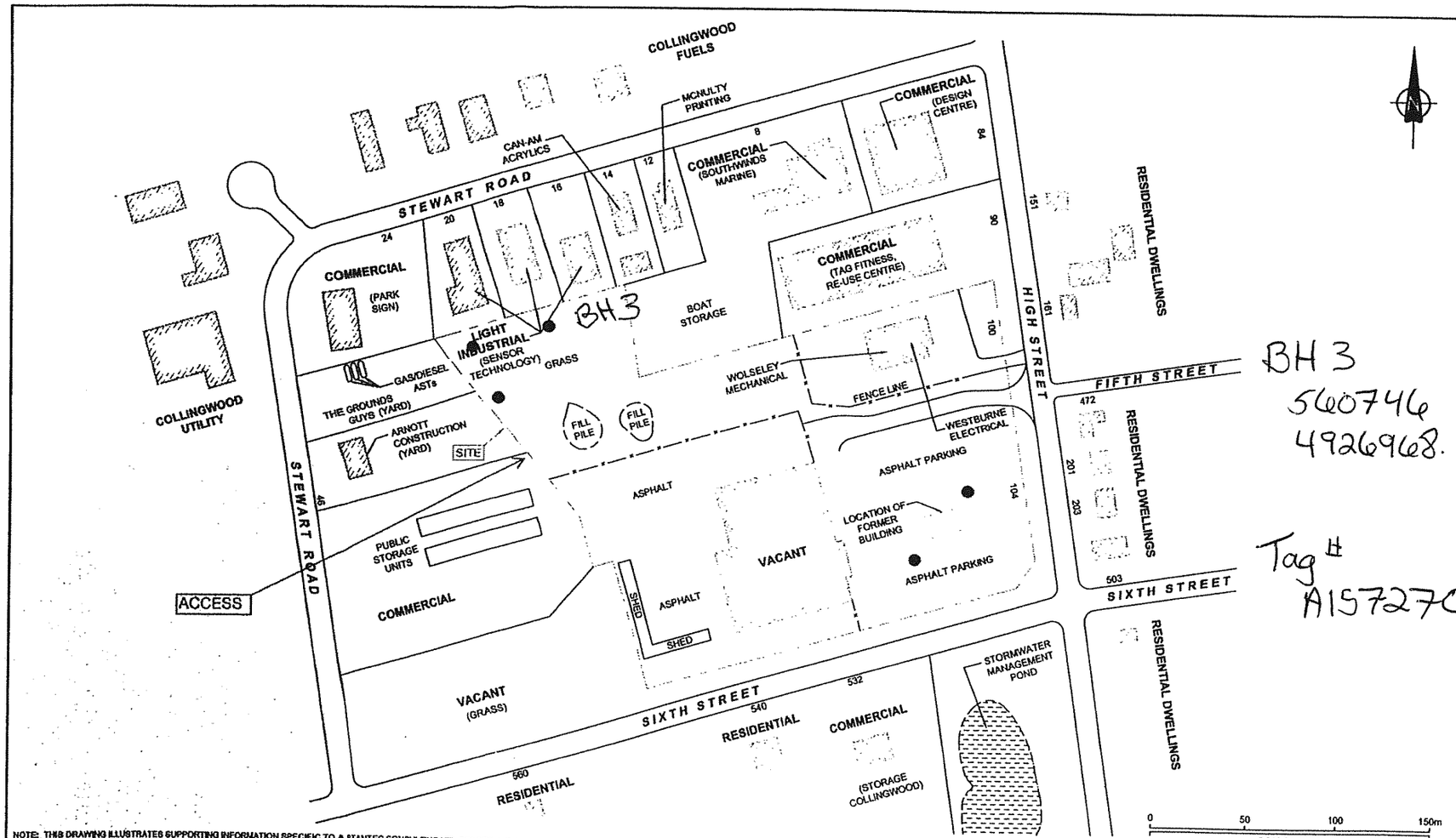
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BH 3
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Tag #
A157270

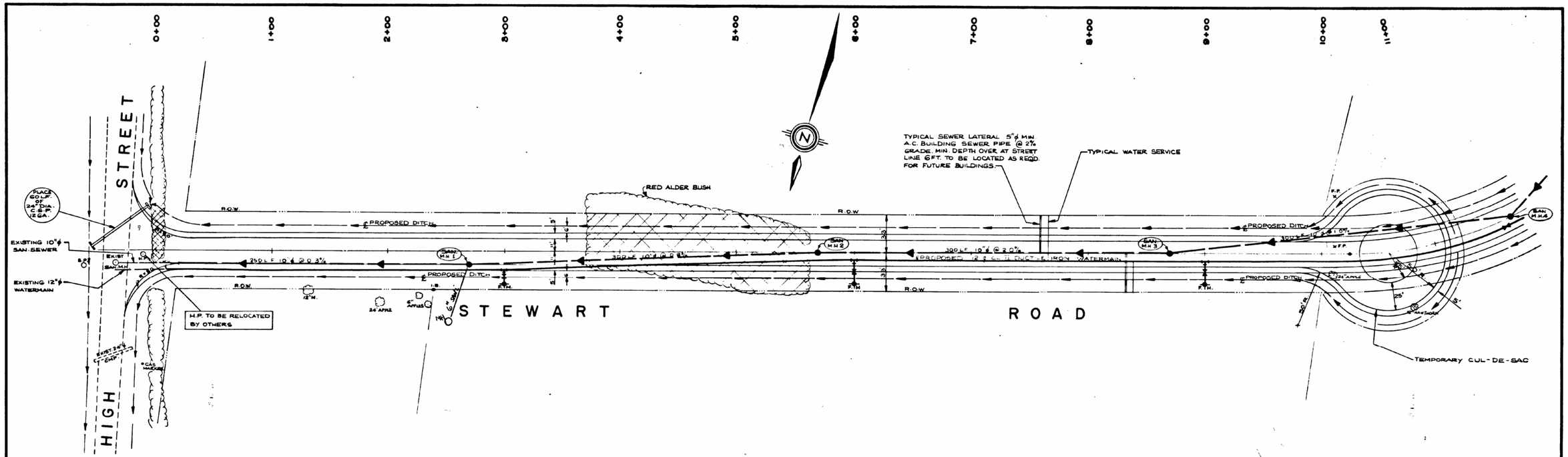
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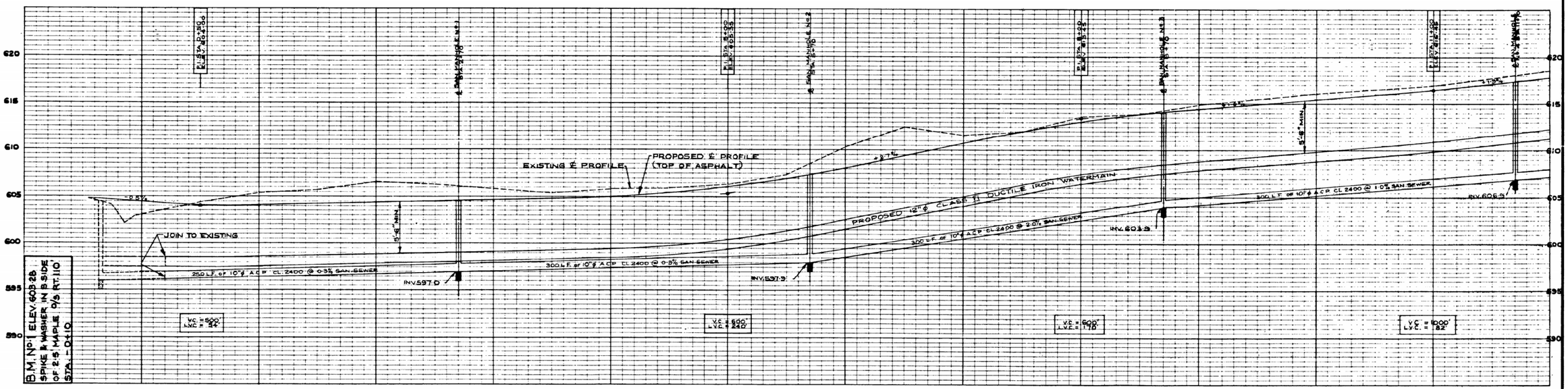
MAY 22 2014

NOTE: THIS DRAWING ILLUSTRATES SUPPORTING INFORMATION SPECIFIC TO A STANTEC CONSULTING LTD. REPORT AND MUST NOT BE USED FOR OTHER PURPOSES.

Reference:	Project No.: 122120147	Client: GOWLING LAFLEUR HENDERSON	SITE PLAN	Dwg. No.: 1	
	Scale: 1 : 2000				
	Date: 14/01/31				
	Dwn. By: CD SL2014010284 VM/DM	Site Address: 100 AND 104 HIGH STREET, COLLINGWOOD, ONTARIO			
	App'd By: TG				

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CHAINAGE	EXISTING ELEV.ns	PROPOSED ℄ ELEV.ns
0+00	603.0	603.0
+50	604.4	604.95
1+00	605.4	604.15
+50	605.7	604.8
2+00	606.8	604.45
+50	606.8	604.6
3+00	605.8	604.15
+50	606.4	
4+00	605.8	605.07
+50	605.8	
5+00	606.8	606.07
+50	607.4	
6+00	610.3	608.07
+50	612.5	610.75
7+00	611.6	
+50	612.0	613.09
8+00	613.6	
+50	613.8	614.45
9+00	614.6	
+50	615.5	615.45
10+00	616.1	
+50	616.5	616.48
11+00	617.0	

Notes:

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

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

Approved

ONTARIO ASSOCIATION OF PROFESSIONAL ENGINEERS — CIVIL — W. M. TROTTER

REGISTERED PROFESSIONAL ENGINEER — CIVIL — P. W. AINLEY

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

PLAN & PROFILE

AINLEY and ASSOCIATES LTD.
Consulting Engineers
Barrie — Collingwood

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

DESIGN	K.C.H.	CHECKED	W.M.T.	DWG. No. 7315-2
DRAWN	P.H.C.C.	DATE	MAY/73	

DSU-2402


FH-F9-3
FH-G9-19
FH-G9-18
STEWART ROAD
STEWART-ROAD
29-03A 29-003.1
250mm 1973
29-003 29-002.1
250mm 1973
29-002 29-001.1
250mm 1973
300--1973
29-001
15
17
19
21
23
14
16
18
20
8
10

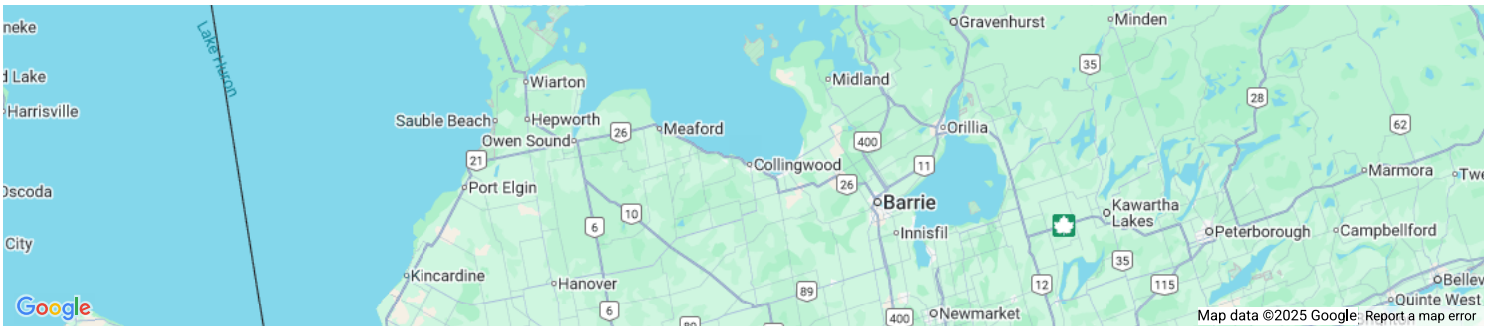
Appendix D – Existing Condition Stormwater

Ontario IDF CURVE LOOKUP

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

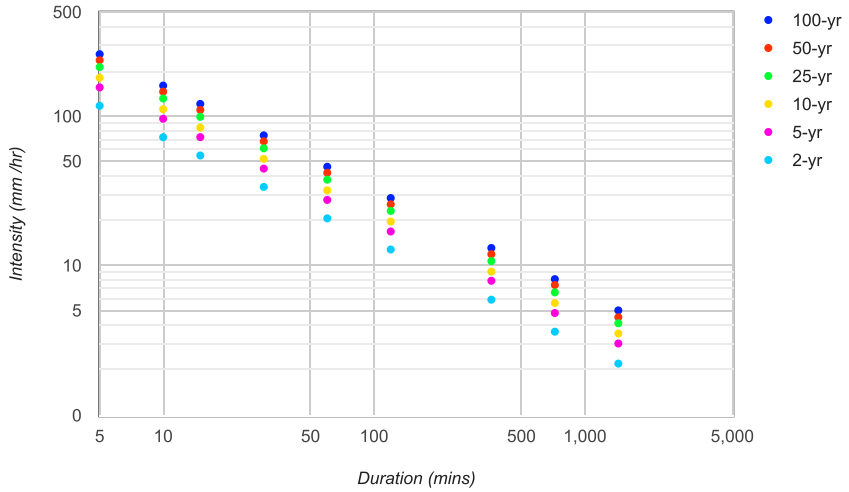
These are the locations in the selection.

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

Results

An IDF curve was found.

Coordinate: 44.495833, -80.237500
IDF curve year: 2010



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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Last Modified: September 2016

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
****************
                                                  Data       Recording
Name                 Data Source                  Type       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
```

Runoff Quantity Continuity	Volume hectare-m	Depth 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	

Flow Routing Continuity	Volume hectare-m	Volume 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
****

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

Proposed Condition PCSWMM Model



Proposed Condition 25 mm 4 Hr Chicago Storm - PCSWMM Output

```
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
****************
                                                  Data       Recording
Name                 Data Source                  Type       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	80.70	1.3000	25mm	J2
A2	0.07	25.00	87.00	1.3000	25mm	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
```

Runoff Quantity Continuity	Volume hectare-m	Depth mm
Total Precipitation	0.009	56.858
Evaporation Loss	0.000	0.000
Infiltration Loss	0.001	9.427
Surface Runoff	0.007	45.848
Final Storage	0.000	1.669
Continuity Error (%)	-0.152	

Flow Routing Continuity	Volume hectare-m	Volume 10^6 ltr
Dry Weather Inflow	0.000	0.000
Wet Weather Inflow	0.007	0.071
Groundwater Inflow	0.000	0.000
RDII Inflow	0.000	0.000

```
External Inflow .....          0.000         0.000
External Outflow .....         0.007         0.071
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	56.86	0.00	0.00	10.97	44.35	0.00	44.35	0.04	0.00	0.780
A2	56.86	0.00	0.00	7.39	47.82	0.00	47.82	0.03	0.00	0.841

****
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 04:05	0.00
J2	JUNCTION	0.01	0.07	186.16	0 04:05	0.07
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	0.004	0.009	0	04:05	0.0318	0.0707	0.005
J2	JUNCTION	0.005	0.005	0	04:05	0.0389	0.0389	-0.001
Stewart	OUTFALL	0.000	0.009	0	04:05	0	0.0707	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	7.38	0.006	0.009	0.071
System	7.38	0.006	0.009	0.071

****
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	0.009	0	04:05			
C2	CONDUIT	0.005	0	04:05	1.09	0.01	0.12

****
Flow Classification Summary
****

	Adjusted	Fraction of Time in Flow Class								
Conduit	/Actual Length	Dry	Up Dry	Down Dry	Sub Crit	Sup Crit	Up Crit	Down Crit	Norm Ltd	Inlet Ctrl
C2	1.00	0.03	0.00	0.00	0.85	0.12	0.00	0.00	0.81	0.00

****
Conduit Surcharge Summary
****

No conduits were surcharged.

Analysis begun on: Fri Sep 4 10:57:04 2026
Analysis ended on: Fri Sep 4 10:57:04 2026
Total elapsed time: < 1 sec

Post Development 100 yr 4 hr Chicago Storm - PCSWMM Output

```
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
****************
                                                  Data       Recording
Name                 Data Source                  Type       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	80.70	1.3000	Chicago_4h_100Yr	J2
A2	0.07	25.00	87.00	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	
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
```

Runoff Quantity Continuity	Volume hectare-m	Depth mm
Total Precipitation	0.011	71.774
Evaporation Loss	0.000	0.000
Infiltration Loss	0.002	11.901
Surface Runoff	0.009	58.436
Final Storage	0.000	1.669
Continuity Error (%)	-0.322	

Flow Routing Continuity	Volume hectare-m	Volume 10^6 ltr
Dry Weather Inflow	0.000	0.000
Wet Weather Inflow	0.009	0.090
Groundwater Inflow	0.000	0.000
RDII Inflow	0.000	0.000

```
External Inflow .....          0.000          0.000
External Outflow .....         0.009          0.090
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	13.85	56.55	0.00	56.55	0.05	0.04	0.788
A2	71.77	0.00	0.00	9.33	60.91	0.00	60.91	0.04	0.04	0.849

****
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	0.01	184.55	0 01:25	0.01
J2	JUNCTION	0.01	0.15	186.24	0 01:25	0.15
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	0.035	0.075	0	01:25	0.0406	0.0902	0.005
J2	JUNCTION	0.043	0.043	0	01:25	0.0496	0.0496	-0.003
Stewart	OUTFALL	0.000	0.075	0	01:25	0	0.0902	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	8.83	0.006	0.075	0.090
System	8.83	0.006	0.075	0.090

****
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       0.075     0  01:25
C2                    CONDUIT     0.041     0  01:25      1.84    0.09    0.27


**************************
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
-------------------------------------------------------------------------------------------
C2                      1.00   0.01  0.00  0.00  0.86  0.13  0.00  0.00  0.81  0.00


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

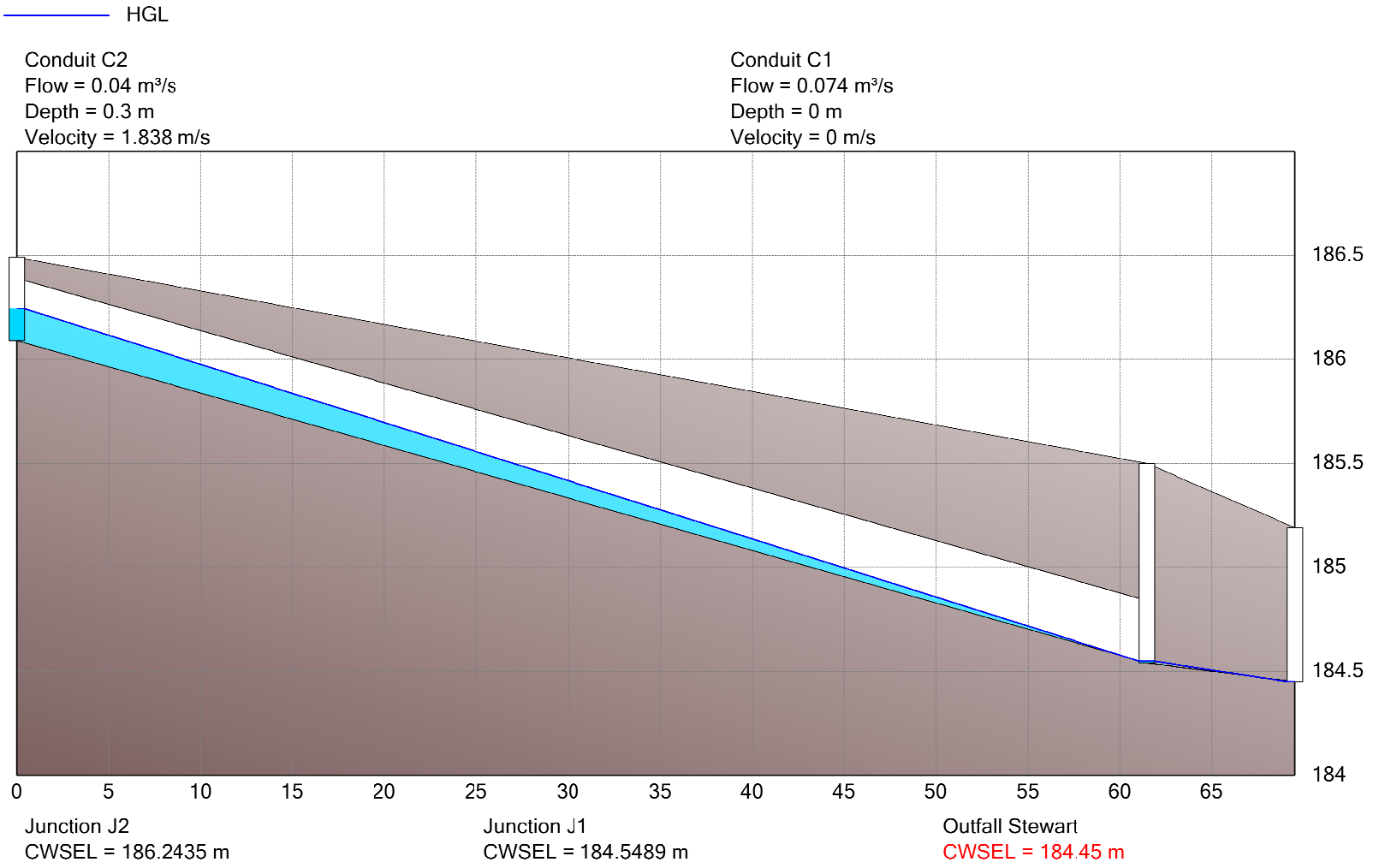
No conduits were surcharged.


Analysis begun on:  Fri Sep  4 10:27:54 2026
Analysis ended on:  Fri Sep  4 10:27:54 2026
Total elapsed time: < 1 sec
```

Peak values

Existing SWALE HGL

100 Year Storm Event - Proposed Condition



Appendix F – Water Demand

CAPES ENGINEERING

CALCULATION SHEET

Project: **12 Stewart Rd.**

Fire Flow Demand Calculations

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

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

North Side	**>30 m**	0%
East Side	**>30 m**	0%
South Side	**>30 m**	0%
West Side	**10.1 to 20m**	15%

0 to 3m	25%
3.1 to 10m	20%
10.1 to 20m	15%
20.1 to 30m	10%
>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