GSS ENGINEERING CONSULTANTS LTD

PRELIMINARY SITE SERVICING REPORT
Five Rental Cottages on Georgian Bay
Georgian Escapes Inc.
Township of Georgian Bluffs

PROJECT 19-041

SUBMITTED TO:
Georgian Escapes Inc.
057898 12th Line
Meaford, ON N4L 1W5
April 30, 2025

TABLE OF CONTENTS

APPENDICES

FIGURES

1.0 INTRODUCTION AND BACKGROUND

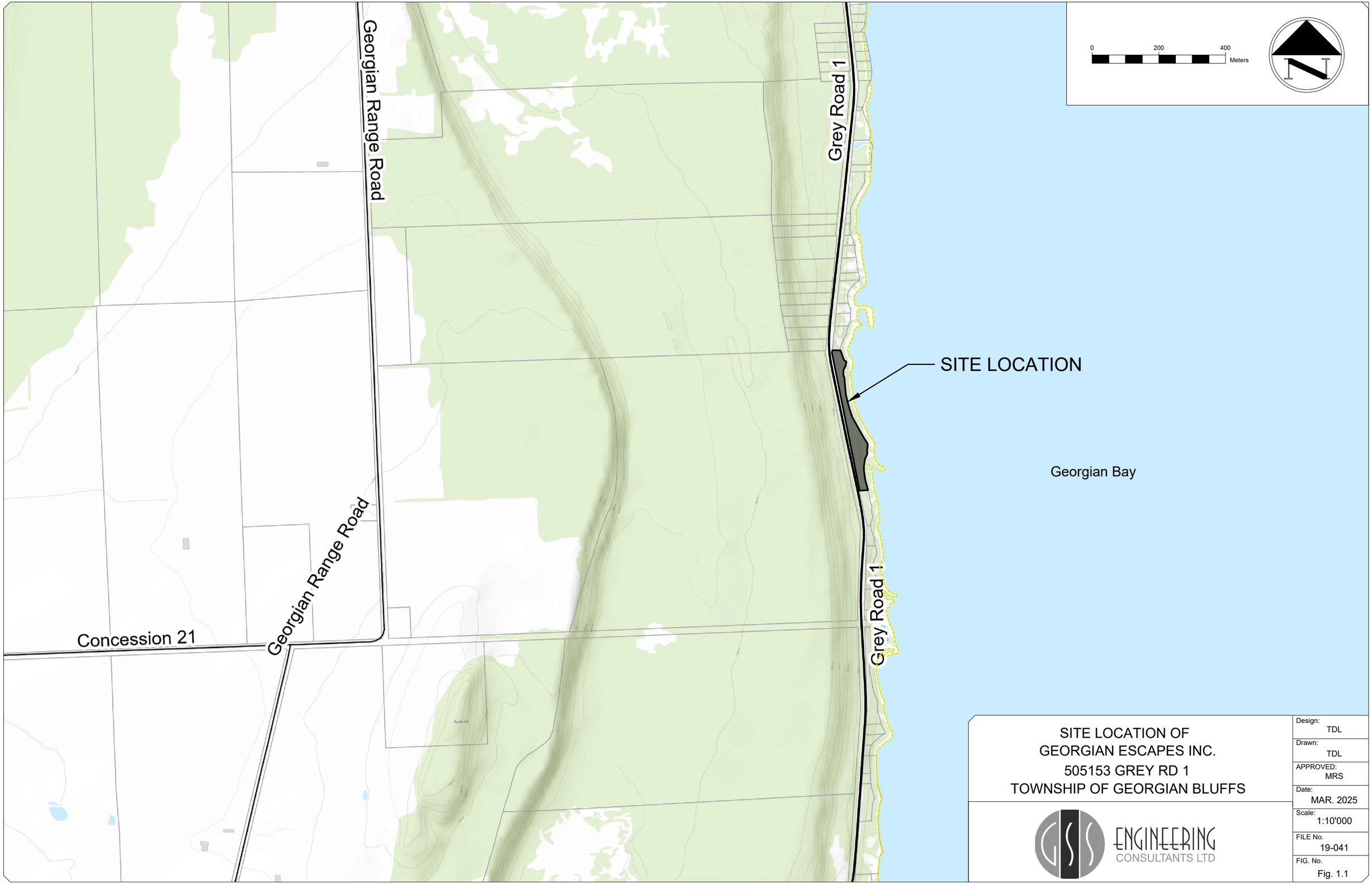
Georgian Escapes Inc. is proposing to develop five (5) rental cottages on the north part of the Lot at 505153 Grey Road 1 in the Township of Georgian Bluffs as shown on **Figure 1.1**. The lot is approximately 1.35 ha and has an old original log cottage on the south part of the lot.

The water supply for the rental cottages will be pumped from a new shore well and treated for domestic water supply. The sewage from the five (5) rental cottages will be collected by low pressure sewer to discharge into a concrete septic tank, then into a Class IV system for treatment.

The cottages will be accessed from Grey County Road 1 through one entrance and an on-site service road.

The existing conditions and proposed severance are shown on **Figure 1.2.**

A typical drawing of a proposed rental cottage is shown on **Figure 1.3 and 1.4.**



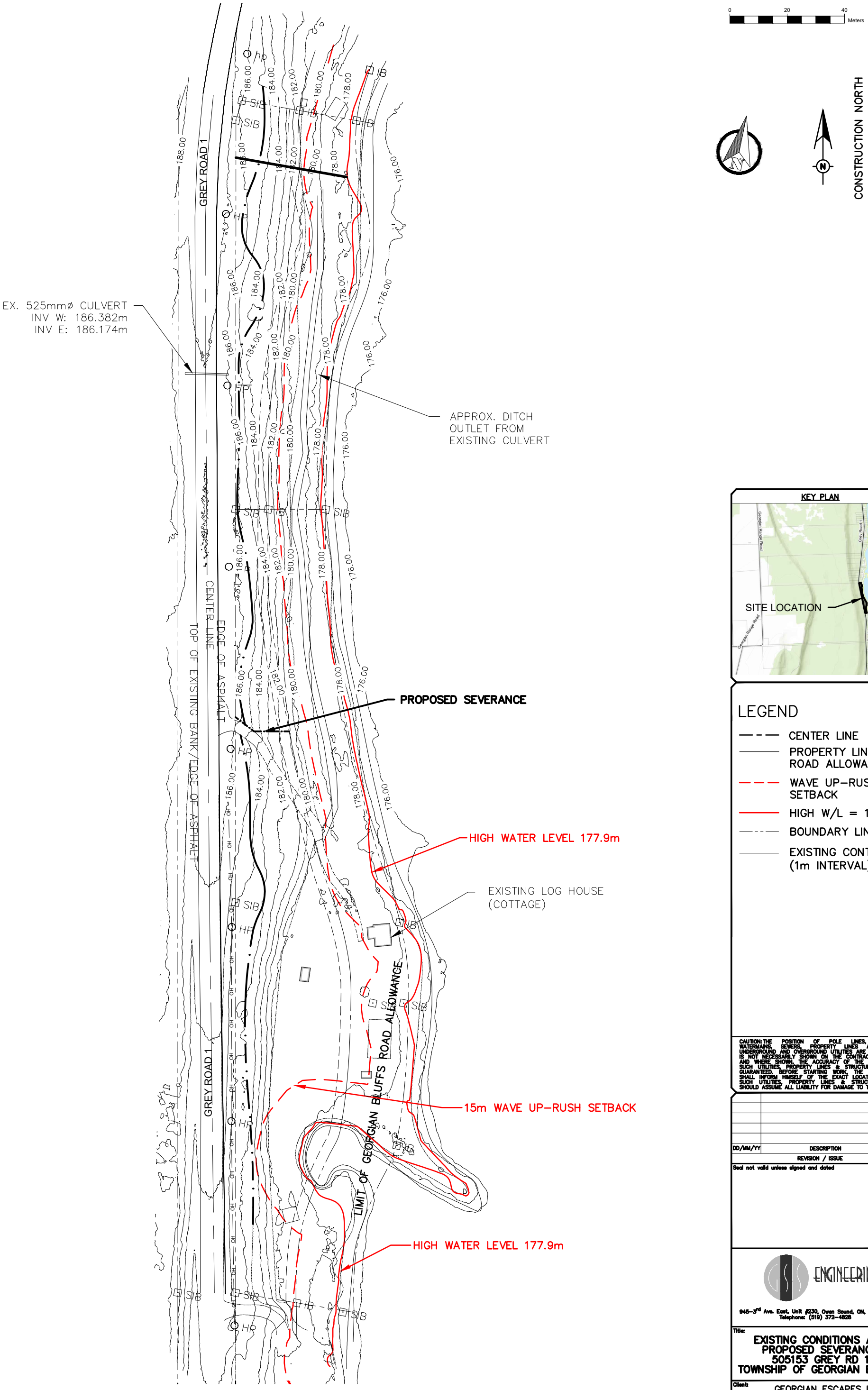
SITE LOCATION OF
GEORGIAN ESCAPES INC.
505153 GREY RD 1
TOWNSHIP OF GEORGIAN BLUFFS

GSS ENGINEERING CONSULTANTS LTD

Design:	TDL
Drawn:	TDL
APPROVED:	MRS
Date:	MAR. 2025
Scale:	1:10'000
FILE No.	19-041
FIG. No.	Fig. 1.1

Wednesday, April 22, 2026 3:10:56 PM

G:\GSS Common\2019\19-041 Engineering Services for 10-12 Cottage Rentals, Grey Rd. 1\Drawings\19-041.dwg Apr 22, 2026 - 3:10pm



CAUTION: THE POSITION OF POLE LINES, CONDUITS, WATERMAINS, SEWERS, PROPERTY LINES AND OTHER UNDERGROUND AND OVERGROUND UTILITIES ARE STRUCTURES IS NOT NECESSARILY SHOWN ON THE CONTRACT DRAWINGS AND WHERE SHOWN, THE ACCURACY OF THE POSITION OF SUCH UTILITIES, PROPERTY LINES & STRUCTURES IS NOT GUARANTEED. BEFORE STARTING WORK, THE CONTRACTOR SHALL INFORM HIMSELF OF THE EXACT LOCATION OF ALL SUCH UTILITIES, PROPERTY LINES & STRUCTURES, AND SHOULD ASSUME ALL LIABILITY FOR DAMAGE TO THEM.

DD/MM/YY	DESCRIPTION
	REVISION / ISSUE

Seal not valid unless signed and dated

GSS ENGINEERING
945-3rd Ave. East, Unit #230, Owen Sound, ON, N4K 2K8
Telephone: (519) 372-4828

Title:

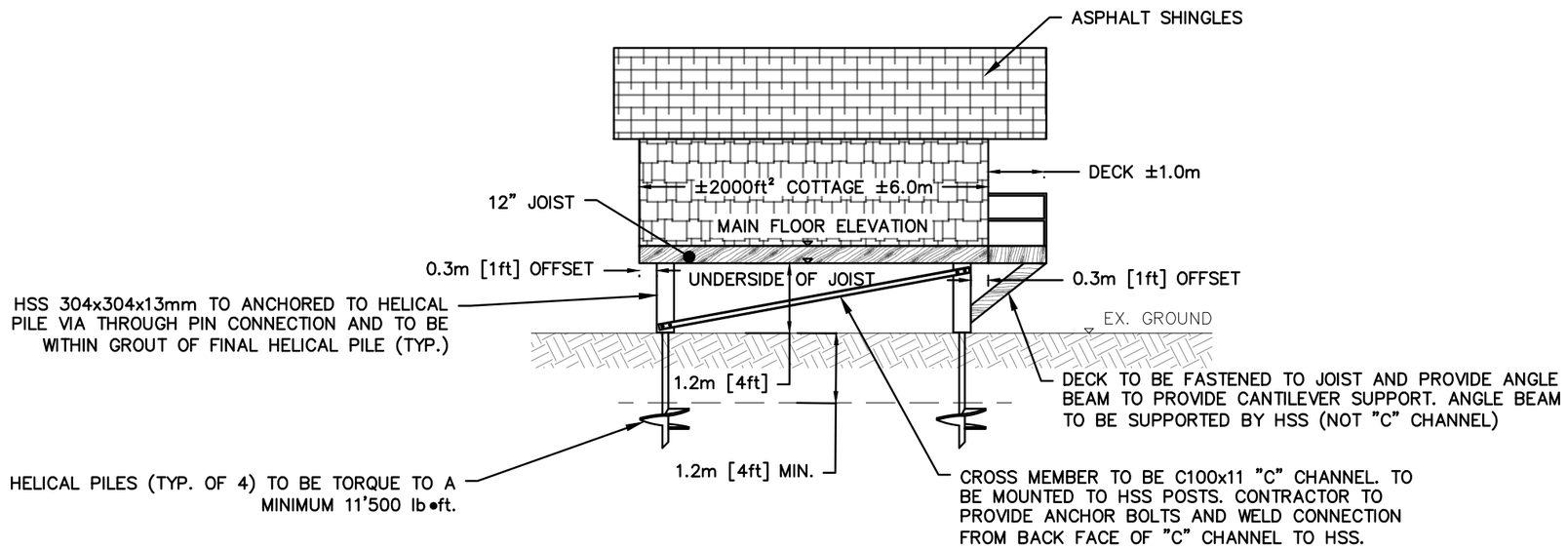
EXISTING CONDITIONS AND PROPOSED SEVERANCE 505153 GREY RD 1 TOWNSHIP OF GEORGIAN BLUFFS

Client: GEORGIAN ESCAPES INC.

Design:	MRS	Scale:	1:1250
Drawn:	TDL	Approved:	Design Engineer
Checked:	MRS		
Date:	MAR. 2025		

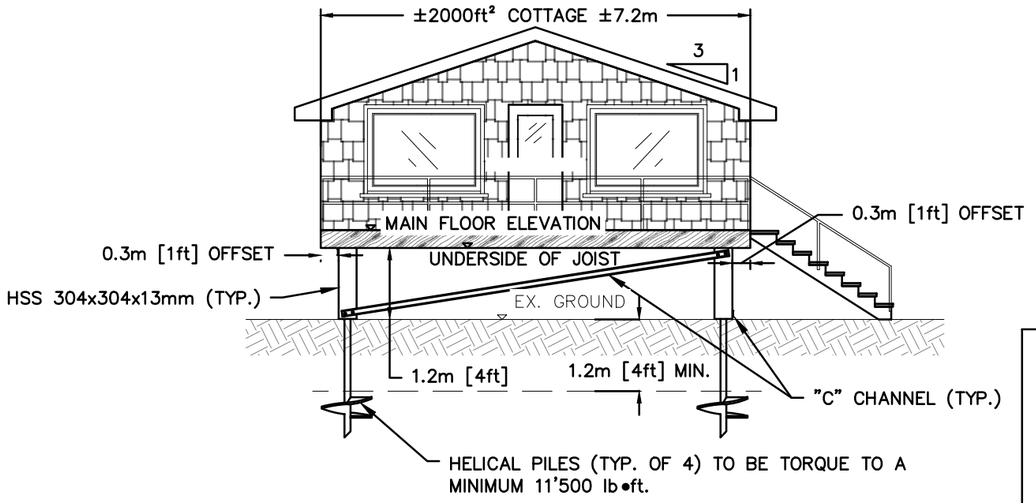
Drawing No. 19-041 Fig. 1.2

PLOTTED: Wednesday, April 22, 2026 2:53:45 PM
G:\GSS Common\2019\19-041 Engineering Services for 10-12 Cottage Rentals, Grey Rd. 1\Drawings\19-041.dwg Apr 22, 2026 - 2:53pm



NORTH & SOUTH ELEVATION

SCALE: 1 : 100



EAST ELEVATION

SCALE: 1 : 100

NOTES:

1. ALL STEEL COMPONENTS TO BE SPRAYED WITH EPOXY COATING TO PREVENT CORROSION AND RUSTING, AFTER ALL CONNECTING MEMBERS ARE ANCHORED & WELDED.
2. BUILDER/CONTRACTOR TO OBTAIN SIGN OFF FROM A GEOTECHINCAL ENGINEER AND A STRUCTURAL ENGINEER, PRIOR TO PERMIT. DRAWINGS ARE FOR ARCHITECTURAL PURPOSE ONLY, NOT TO BE USED FOR CONSTRUCTION. GSS ENGINEERING CAN NOT BE HELD LIABLE IF THE OWNER/CONTRACTOR USES THESE PLANS FOR CONSTRUCTION PURPOSES.

KEY PLAN

THIS DRAWING IS INTENDED FOR ARCHITECTURAL REFERENCE ONLY AND IS NOT SUITABLE FOR FULL CONSTRUCTION.

CAUTION: THE POSITION OF POLE LINES, CONDUITS, WATERMAINS, SEWERS, PROPERTY LINES AND OTHER UNDERGROUND AND OVERGROUND UTILITIES ARE STRUCTURES IS NOT NECESSARILY SHOWN ON THE CONTRACT DRAWINGS AND WHERE SHOWN, THE ACCURACY OF THE POSITION OF SUCH UTILITIES, PROPERTY LINES & STRUCTURES IS NOT GUARANTEED. BEFORE STARTING WORK, THE CONTRACTOR SHALL INFORM HIMSELF OF THE EXACT LOCATION OF ALL SUCH UTILITIES, PROPERTY LINES & STRUCTURES, AND SHOULD ASSUME ALL LIABILITY FOR DAMAGE TO THEM.

DD/MM/YY	DESCRIPTION
	REVISION / ISSUE

Seal not valid unless signed and dated

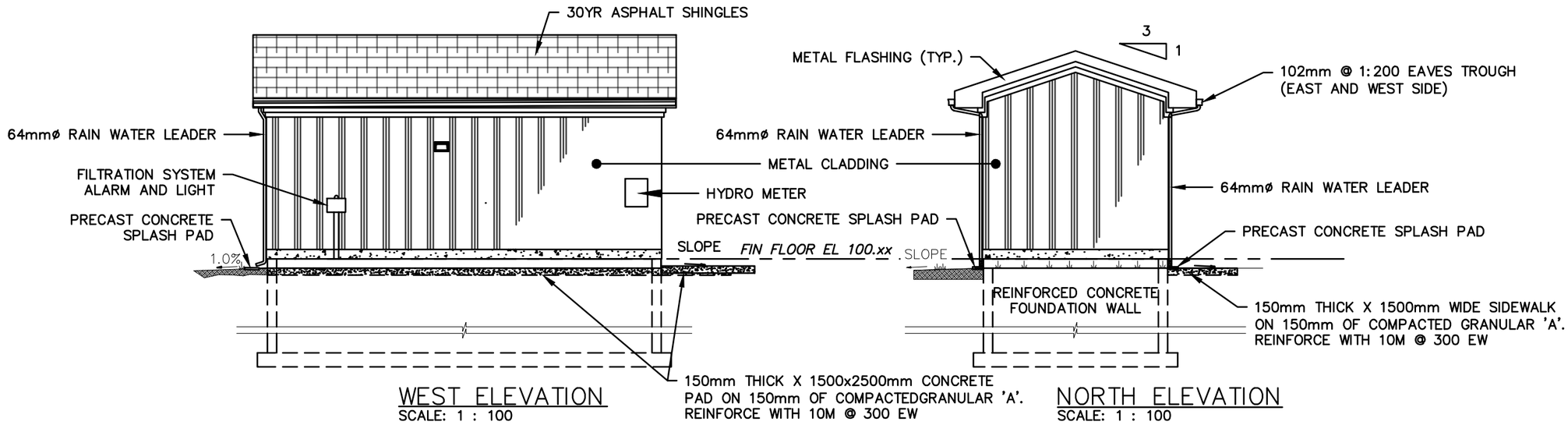
ENGINEERING CONSULTANTS LTD
945–3rd Ave. East, Unit #230, Owen Sound, ON, N4K 2K8
Telephone: (519) 372–4828

Title:
RENTAL COTTAGE DEVELOPMENT
COTTAGE FOUNDATION EXTERIOR
505153 GREY RD 1
TOWNSHIP OF GEORGIAN BLUFFS

Client: GEORGIAN ESCAPES INC.

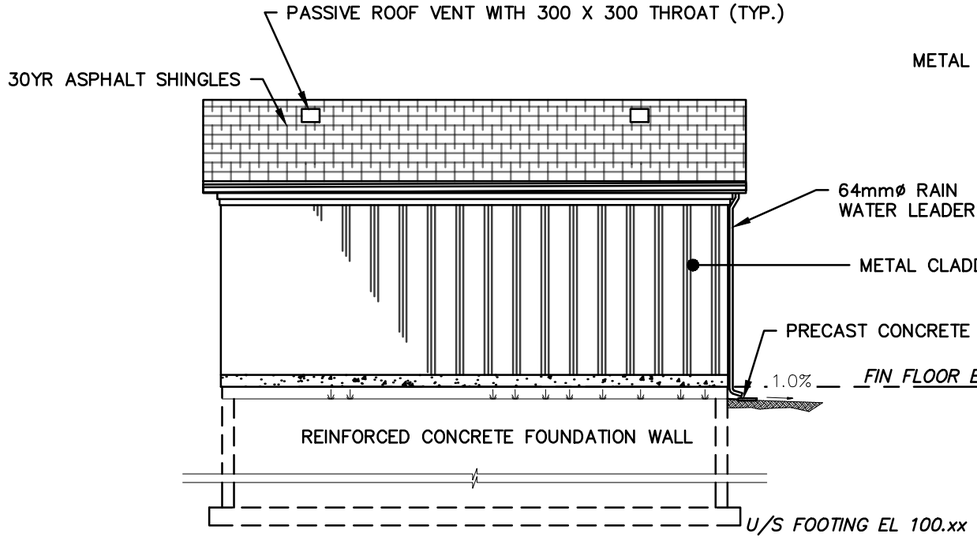
Design:	TDL	Scale:	1:100
Drawn:	TDL	Approved:	Design Engineer
Checked:	MRS		
Date:	MAR. 2025		

Drawing No. 19–041–Fig. 1.3

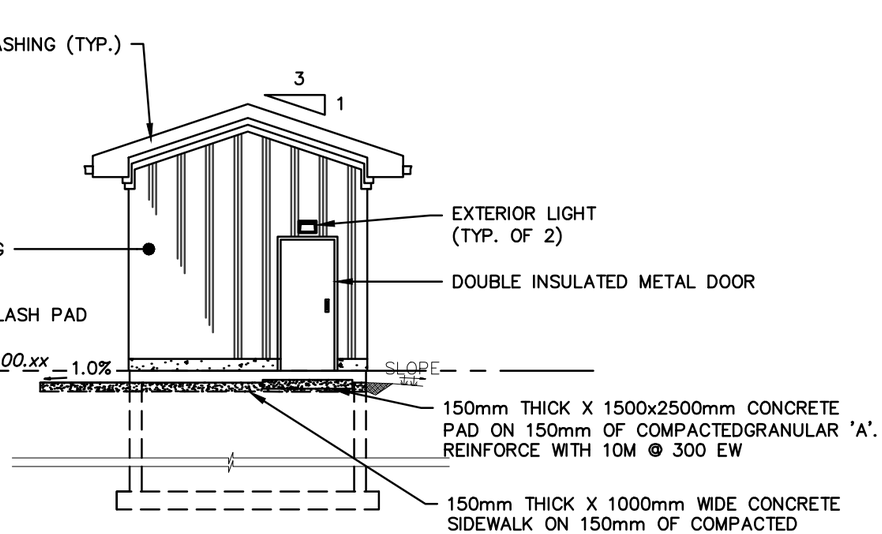


WEST ELEVATION
SCALE: 1 : 100

NORTH ELEVATION
SCALE: 1 : 100



EAST ELEVATION
SCALE: 1 : 100



SOUTH ELEVATION
SCALE: 1 : 100

KEY PLAN

THIS DRAWING IS INTENDED FOR ARCHITECTURAL REFERENCE ONLY AND IS NOT SUITABLE FOR FULL CONSTRUCTION.

CAUTION: THE POSITION OF POLE LINES, CONDUITS, WATERMAINS, SEWERS, PROPERTY LINES AND OTHER UNDERGROUND AND OVERGROUND UTILITIES ARE STRUCTURES IS NOT NECESSARILY SHOWN ON THE CONTRACT DRAWINGS AND WHERE SHOWN, THE ACCURACY OF THE POSITION OF SUCH UTILITIES, PROPERTY LINES & STRUCTURES IS NOT GUARANTEED. BEFORE STARTING WORK, THE CONTRACTOR SHALL INFORM HIMSELF OF THE EXACT LOCATION OF ALL SUCH UTILITIES, PROPERTY LINES & STRUCTURES, AND SHOULD ASSUME ALL LIABILITY FOR DAMAGE TO THEM.

DD/MM/YY	DESCRIPTION
	REVISION / ISSUE

Seal not valid unless signed and dated

GSS ENGINEERING CONSULTANTS LTD
945-3rd Ave. East, Unit #230, Owen Sound, ON, N4K 2K8
Telephone: (519) 372-4828

Title:
RENTAL COTTAGE DEVELOPMENT
WATER TREATMENT PLANT EXTERIOR
505153 GREY RD 1
TOWNSHIP OF GEORGIAN BLUFFS

Client: GEORGIAN ESCAPES INC.

Design:	TDL	Scale:	1:100
Drawn:	TDL	Approved:	Design Engineer
Checked:	MRS		
Date:	MAR. 2025		

Drawing No. 19-041 Fig. 1.4

2.0 WATER SUPPLY FROM GEORGIAN BAY (SHORE WELL)

2.1 Design Water Supply for Five (5) Rental Cottages

Average Domestic Water Demands

5 Two Bedroom Cottages @ 1,375 L/day

(assuming sewage flow generation is 80% of water supply).

5 × 1,375 L/day = **6,875 L/day**

Total Average Domestic Water Demands = 6,875 L/day

The maximum day factor for small systems is taken as **9.5** based on the MOE Design Guidelines for Drinking Water Systems.

Therefore, the maximum day water demand =

(9.5)(6,875) = **65,313 L/day**

= 45.4 L/min (9.9 Igpm)

The estimated peak hour factor is 14.3 times the average domestic water demand.

Therefore, the peak hour water demand =

(14.3 × 6,875) / 24 = **4,096 L/hour**

= 68.3 L/min

= 15.0 Igpm

Outdoor Water Use

Five (5) Rental Cottages

25% using an outdoor tap at any one time @ 20 L/min for an hour per day.

Outdoor water use =

(0.25)(5)(20)(60) = **1,500 L/hour**

= 25 L/min

= 5.5 Igpm

Summary of Water Demands

Condition	Flow
Average Day	6,875 L/day (4.8 L/min)
Maximum Day	65,313 L/day (45.4 L/min)
Peak Hour	4,096 L/hour (68.3 L/min)
Outdoor Use	1,500 L/hour (25 L/min)

Therefore, the water supply system needs to provide a raw water flow of:

68.3 L/min + 25 L/min = 93.3 L/min
Say **95 L/min (21 Igpm)**

2.2 Shore Well

It is proposed to install a shore well near Georgian Bay located as shown on **Figure 2.1**. The construction of the shore well is to be carried out as shown on **Figure 2.2**. The shore well is to use 2 submersible pumps (one standby) each with a rated capacity of 95 L/min (21 Igpm).

When the shore well is installed as per **Figure 2.2**, the capacity of the shore well to produce raw water is to be pump tested at 130 L/min for 2 hours to check the capacity of the shore well. The water quality in the bedrock at the Georgian Bay shore can be different than the water quality of Georgian Bay, therefore a chemical and bacterial analysis is to be carried out on the water supply. A picture of the existing area to install the shore well is shown on **Figure 2.3.**

2.3 Raw Water Pipeline

A raw water pipeline is to be constructed from the shore well to each household as shown on **Figure 2.1.** The raw water pipeline is to be PVC 62.5 mm inside diameter (2.5 inches). The electrical controls for the operation of the raw water submersible pumps are to be located at shore well location. The operational pressure range is to be 310 kPa (45 psi) to 448 kPa (65 psi) at the cottages.

2.4 Water Treatment Plant At Each Household

The water treatment system at each cottage shall be comprised of the following:

1) 5 micron cartridge filter to remove particles in the raw water

2) 1 micron cartridge filter to further remove particles in the raw water

3) Carbon cartridge filter to reduce any taste or odour problems in the water

4) NSF rated UV disinfection to kill bacteria, giardia cysts and cryptosporidium.

0 20 40 Meters

CONSTRUCTION NORTH

KEY PLAN

RAW WATER SHORE WELL

APPROX. DITCH OUTLET FROM EXISTING CULVERT

PRO. DRAINAGE DITCH

3.5m SETBACK

EXISTING TRAIL

TEST PIT #1

TEST PIT #2

TEST PIT #3

TEST PIT #4

3.5m SETBACK

5m ROAD ACCESS

PRO. DITCH

PRO. DITCH

PRO. DITCH

EDGE OF ASPHALT

EDGE OF ASPHALT

CENTER LINE

GREY ROAD 1

CENTER LINE

GREY ROAD 1

TOP OF EXISTING BANK/EDGE OF ASPHALT

TOP OF EXISTING BANK/EDGE OF ASPHALT

WATER FLOW DIRECTION

50mmø HYDRA-GUARD MUELLER FLUSHING VALVE

EX. MAIN ENTRANCE/EXIT

LEGEND

- CENTRE LINE
- PROPERTY LINE & ROAD ALLOWANCE
- EX. TEST PITS
- SAN — PROPOSED SANITARY SEWER
- WM — PROPOSED WATER LINE
- WAVE UP-RUSH SETBACK
- HIGH WATER LEVEL = 177.90m
- DIRECTIONAL FLOW DITCH
- PROPOSED BOLLARDS
- PROPOSED RENTAL COTTAGES
- PROPOSED ROAD ACCESS FOR COTTAGES
- PROPOSED SEWAGE HOLDING TANKS

CAUTION: THE POSITION OF POLE LINES, CONDUITS, WATERMAINS, SEWERS, PROPERTY LINES AND OTHER UNDERGROUND AND OVERGROUND UTILITIES ARE STRUCTURES IS NOT NECESSARILY SHOWN ON THE CONTRACT DRAWINGS AND WHERE SHOWN, THE ACCURACY OF THE POSITION OF SUCH UTILITIES, PROPERTY LINES & STRUCTURES IS NOT GUARANTEED. BEFORE STARTING WORK, THE CONTRACTOR SHALL INFORM HIMSELF OF THE EXACT LOCATION OF ALL SUCH UTILITIES, PROPERTY LINES & STRUCTURES, AND SHOULD ASSUME ALL LIABILITY FOR DAMAGE TO THEM.

DD/MM/YY	DESCRIPTION
	REVISION / ISSUE

Seal not valid unless signed and dated

GSS ENGINEERING CONSULTANTS LTD

945–3rd Ave. East, Unit #230, Owen Sound, ON, N4K 2K8
Telephone: (519) 372–4828

Title:
LOCATION OF RENTAL COTTAGES SHORE WELL, WATER TREATMENT PLANT AND SEWAGE STORAGE TANKS 505153 GREY RD 1 TOWNSHIP OF GEORGIAN BLUFFS

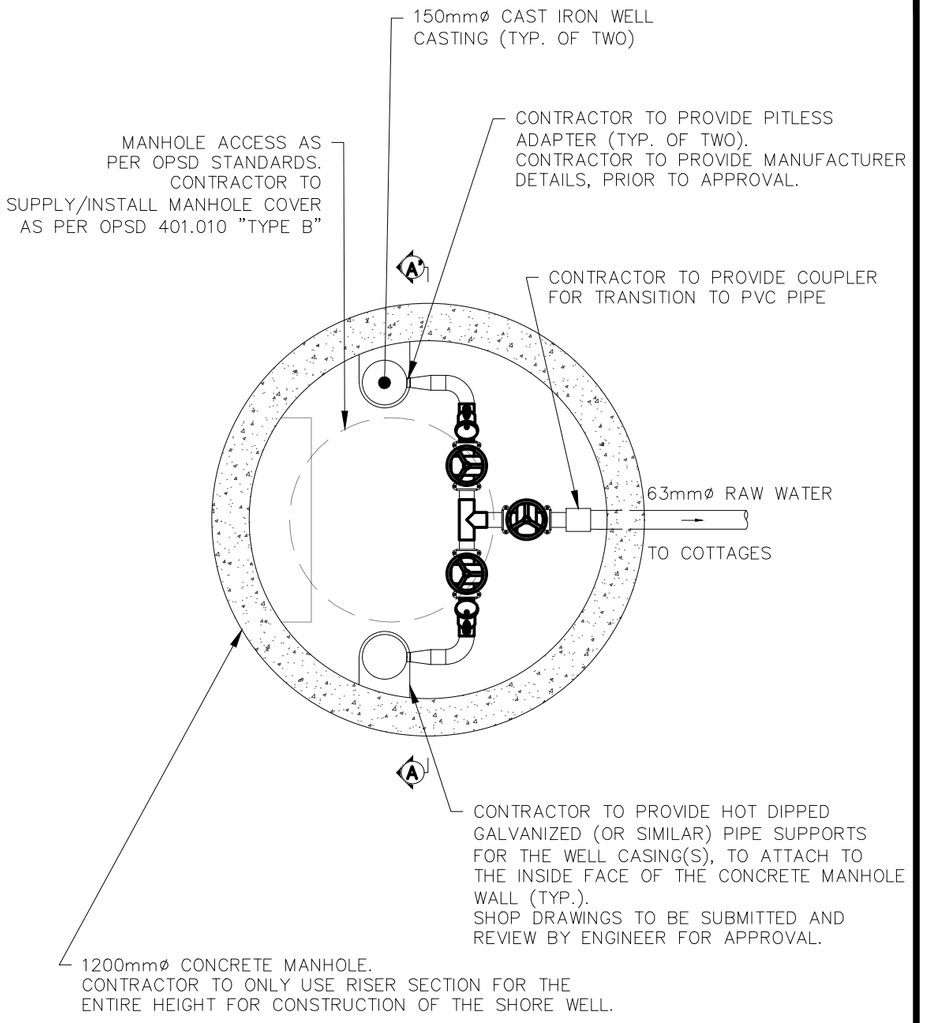
Client: GEORGIAN ESCAPES INC.

Design:	MRS	Scale:	1:750
Drawn:	TDL	Approved:	Design Engineer
Checked:	MRS		
Date:	MAR. 2025		

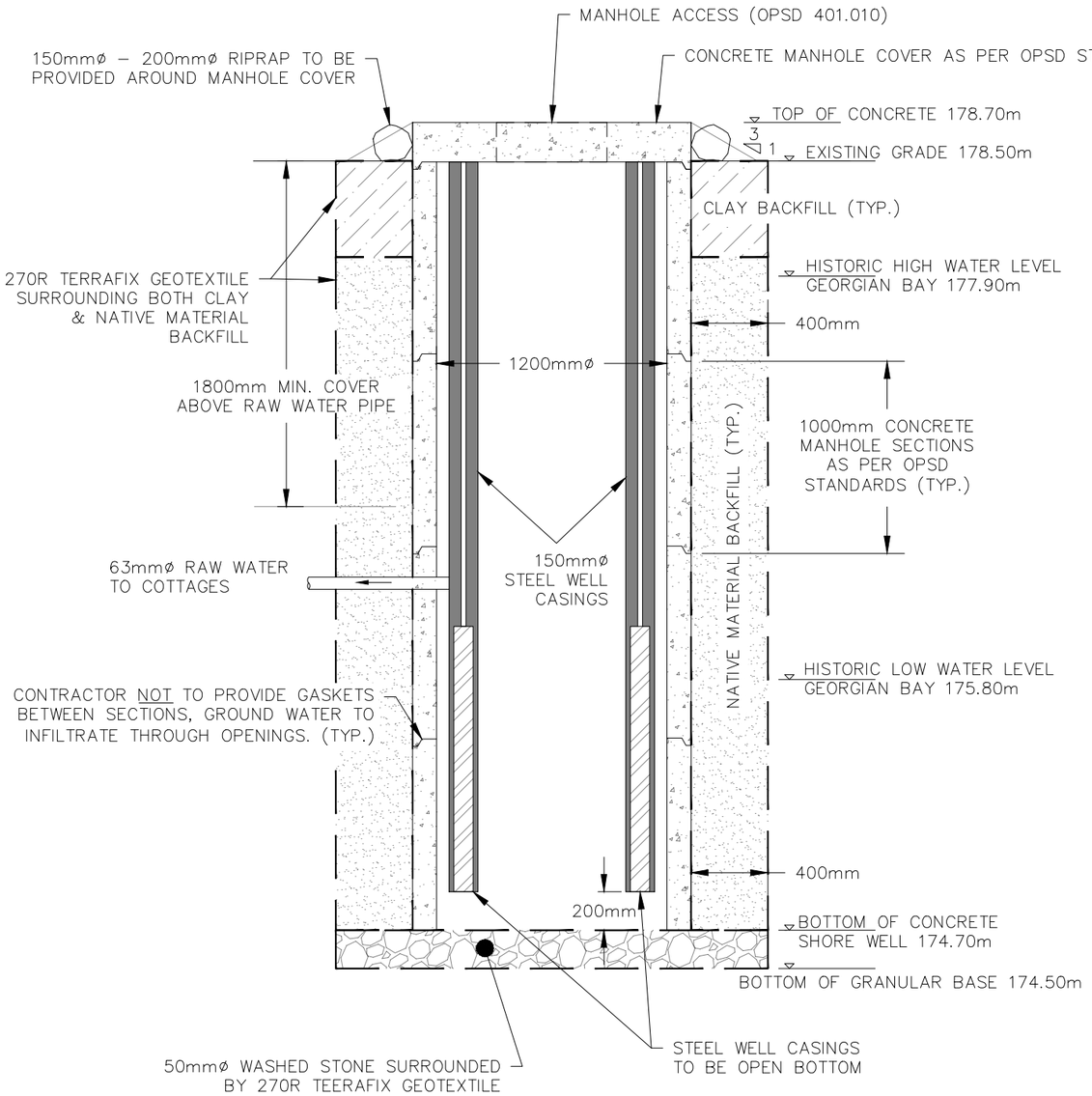
Drawing No. 19–041 Fig. 2.1

PLOTTED: Wednesday, April 22, 2026 3:12:53 PM

G:\GSS Common\2019\19-041 Engineering Services for 10-12 Cottage Rentals, Grey Rd. 1\Drawings\19-041.dwg Apr 22, 2026 – 3:12pm



SHOREWELL PLAN VIEW
SCALE 1:20



SHOREWELL SECTION VIEW
SCALE 1:30

CAUTION: THE POSITION OF POLE LINES, CONDUITS, WATERMAINS, SEWERS, PROPERTY LINES AND OTHER UNDERGROUND AND OVERGROUND UTILITIES ARE STRUCTURES IS NOT NECESSARILY SHOWN ON THE CONTRACT DRAWINGS AND WHERE SHOWN, THE ACCURACY OF THE POSITION OF SUCH UTILITIES, PROPERTY LINES & STRUCTURES IS NOT GUARANTEED. BEFORE STARTING WORK THE CONTRACTOR SHALL INFORM HIMSELF OF THE EXACT LOCATION OF ALL SUCH UTILITIES, PROPERTY LINES & STRUCTURES, AND SHOULD ASSUME ALL LIABILITY FOR DAMAGE TO THEM.

DD/MM/YY	DESCRIPTION
	REVISION / ISSUE

Seal not valid unless signed and dated

GSS ENGINEERING CONSULTANTS LTD
945–3rd Ave. East, Unit #230, Owen Sound, ON, N4K 2K8
Telephone: (519) 372–4828

Title:
SHOREWELL CONSTRUCTION AND RAW WATER SUBMERSIBLE PUMPS
505153 GREY RD 1
TOWNSHIP OF GEORGIAN BLUFFS

Client: GEORGIAN ESCAPES INC.

Design:	MRS	Scale:	AS SHOWN
Drawn:	TDL	Approved:	Design Engineer
Checked:	MRS		
Date:	MAR. 2024		

Drawing No. 19–041 Fig. 2.2

Figure 2.3

Picture of Existing Area for Installation of Shore Well

3.0 WASTEWATER TREATMENT & COLLECTION OF SEWAGE

3.1 Design Sewage Flow

It is proposed to develop five (5) individual rental cottages on the north half of the property at 505153 Grey Road 1 in the Township of Georgian Bluffs. There are to be 5 two-bedroom cottages. The calculation for daily sewage flows from each individual cottage is shown in Appendix A. The daily sewage flow for a 2 bedroom cottage is 1,100 L/day. The total daily sewage flow is:

5 (2 bedroom cottages) = 5 x 1,100 = 5,500 L/day
Total= 5,500 L/day.

3.2 Sewage Treatment

Sewage Treatment is proposed to be provided by employing a Wastewater Level 4 Treatment System and Disposal of Effluent in Shallow Buried Trenches (SBT).

It is proposed to have a Level 4 treatment system (Waterloo Biofilter or Peat Moss Biofilter) to treat the sewage before it is discharged to a shallow buried trench system. There will be a pumping system after the Level 4 treatment system to pump treated sewage to the pressurized distribution pipes in the shallow buried trench system, as shown on **Figures 19-041-A1 and 19-041-A2** in **Appendix A**.

The percolation time of the imported sand for the shallow buried trench will be $1 < T \leq 20$ minutes/cm. Therefore the length of pressurized distribution pipe in the shallow buried trench is calculated as follows:

Q/75 = 9,500 ÷ 75 = 126.7 metres

Shallow buried trench leaching beds will be required as shown schematically on **Figures 3.1 and 3.2**

The shallow buried trench system would include a Level 4 treatment system such as a Waterloo Biofilter or Peat Moss Biofilter. The design conceptual is shown on drawings which includes a plan view and cross-section view. The proposed shallow buried trenches will require installation of a retaining wall to provide a flat area where SBT pipes will be installed. **Figures 3.1 and 3.2** show the location of sewage infrastructure and cross-sections through the septic tanks and SBT pipes.

3.3 Wastewater Collection System

The wastewater (sewage) will be collected by way of a gravity sewer discharging into a single 18,200 L (4,000 gal.) septic tank.

The proposed septic tank size has been determined by calculating the 5,500 L/day of sewage flows multiplied by 2.5 as a safety factor (O.B.C. only requires a multiplication of 2).

Meters
10 0 10 20
1:300

CONSTRUCTION NORTH

GREY ROAD 1

TOP OF EXISTING BANK/EDGE OF ASPHALT

CENTER LINE

EDGE OF ASPHALT

WATER FLOW DIRECTION

PROPOSED PRIMARY ENTRANCE

PROPOSED ALTERNATIVE ENTRANCE

EX. MAIN ENTRANCE/EXIT

EX. 525mmø CULVERT
INV W: 186.382m
INV E: 186.174m

75mmø LOW PRESSURE SEWAGE COLLECTION SYSTEM

PRO. DITCH

PRO. DRAINAGE DITCH

APPROX. DITCH OUTLET FROM EXISTING CULVERT

EXISTING TRAIL

TOE OF SLOPE (APPROX.)

TOP OF SLOPE (APPROX.)

TEST PIT #1

TEST PIT #2

TEST PIT #3

20m SETBACK

3.5m SETBACK

5.45m SETBACK

5m ROAD ACCESS

3.0m (min.)

50mmø HYDRA-GUARD MUELLER FLUSHING VALVE

PROPOSED SHORE WELL AND SUBMERSIBLE PUMPS

RAW WATER SHORE WELL

75mmø RAW WATERMAIN TO COTTAGES

75mmø RAW WATERMAIN

PROPOSED 18,200L SEPTIC TANK

PROPOSED SEPTIC LEVEL 4 TREATMENT SYSTEM (42m LONG x 4.0m WIDE. PIPE LENGTHS TO BE 130m MINIMUM)

22.12% 35.11% 22.28% 21.42% 22.24% 26.81% 30.00% 29.54% 26.81% 27.11% 23.40% 20.64% 18.97%

GEORGIAN BAY
LOWEST WATER LEVEL: 175.80m
W/L = 176.75m (OCT. 06/2012)
W/L = 176.90m (SEPT. 02/2021)

KEY PLAN

LEGEND

- CENTER LINE
- WAVE UP-BRUSH SETBACK
- TOP OF EXISTING BANK
- PROPOSED AREA FOR RENTAL COTTAGES
- PROPOSED SEPTIC AREA
- PROPOSED ACCESS ROAD
- PROPERTY LINE & ROAD ALLOWANCE
- FUTURE COTTAGE AREA
- SAN — PROPOSED SANITARY SEWER
- WM — PROPOSED WATERMAIN
- HIGH WATER LEVEL 177.90m
- BOUNDARY LINE
- GRAVEL BOUNDARY
- DITCH/DIRECTION OF FLOW
- CONCRETE BOLLARDS
- 100.00 / 100.00 — PROPOSED ELEVATION / EXISTING ELEVATION / EXISTING SPOT ELEVATION (LIDAR DERIVED)

CAUTION: THE POSITION OF POLE LINES, CONDUITS, WATERMAINS, SEWERS, PROPERTY LINES AND OTHER UNDERGROUND AND OVERGROUND UTILITIES ARE STRUCTURES IS NOT NECESSARILY SHOWN ON THE CONTRACT DRAWINGS AND WHERE SHOWN, THE ACCURACY OF THE POSITION OF SUCH UTILITIES, PROPERTY LINES & STRUCTURES IS NOT GUARANTEED. BEFORE STARTING WORK, THE CONTRACTOR SHALL INFORM HIMSELF OF THE EXACT LOCATION OF ALL SUCH UTILITIES, PROPERTY LINES & STRUCTURES, AND SHOULD ASSUME ALL LIABILITY FOR DAMAGE TO THEM.

DD/MM/YY	REVISION / ISSUE
28/04/22	REVISED BUILDING LAYOUT & SERVICING PLAN
22/09/21	TEST PIT LOCATIONS
06/05/21	SUBMISSION TO TOWNSHIP
12/01/21	REVISED FOR 16m SETBACK FROM COUNTY ROAD
07/01/21	SUBMISSION TO GREY COUNTY

Seal not valid unless signed and dated

DRAFT FOR REVIEW
31/10/2025

GSS ENGINEERING
945-3rd Ave. East, Unit #230, Owen Sound, ON, N4K 2K8
Telephone: (519) 372-4828

Title:
505153 GREY RD 1
EXISTING FEATURES
TOWNSHIP OF GEORGIAN BLUFFS

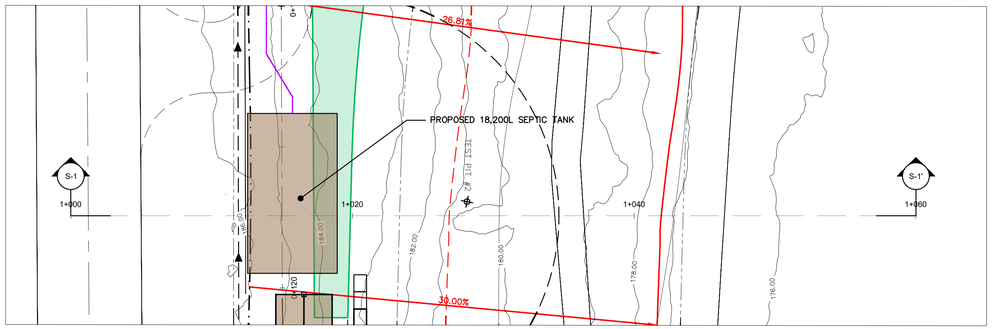
Client: OLIVIER CONSTRUCTION

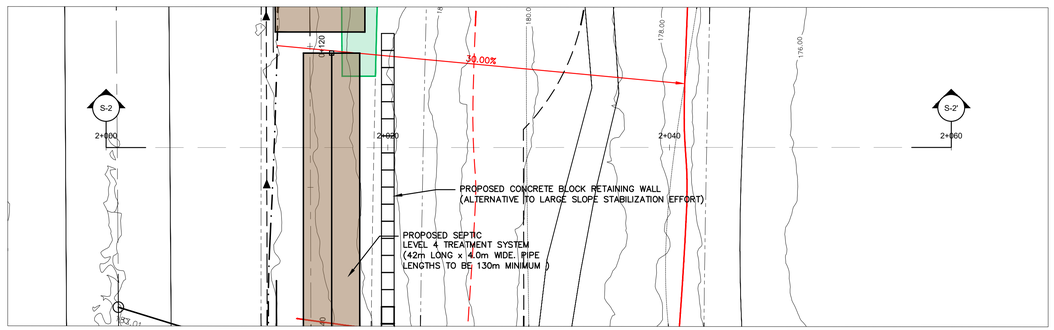
Design:	RS	Scale:	1: 300
Drawn:	TDL	Approved:	Design Engineer
Checked:	RS		
Date:	NOV. 2025		

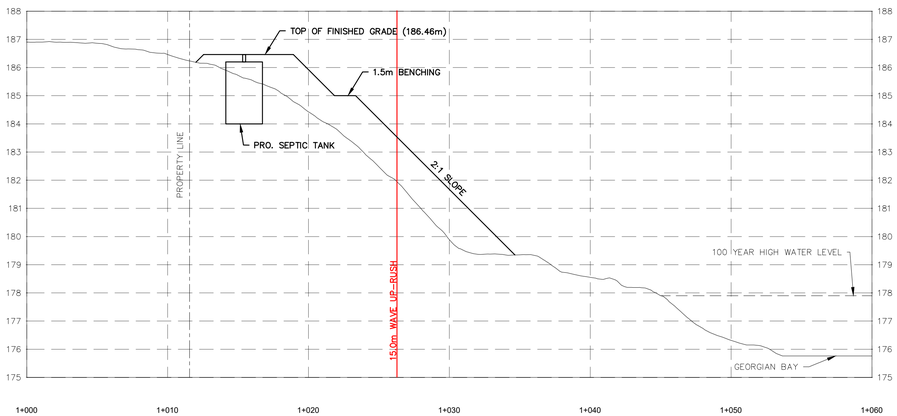
Drawing No. 19-041-Fig. 3.1

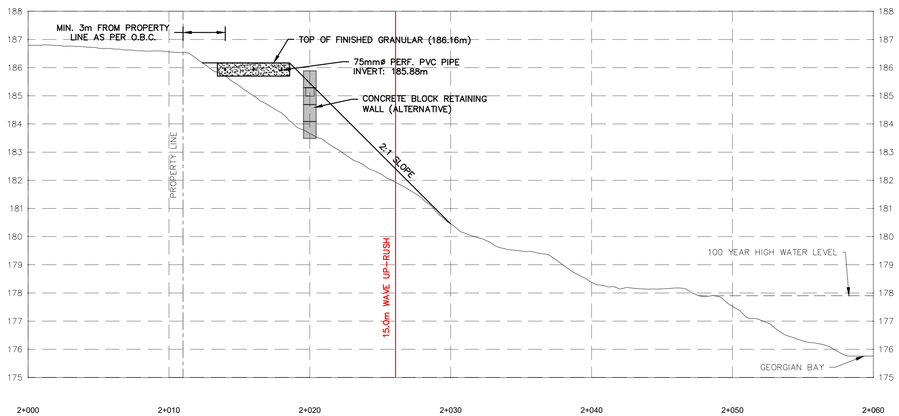
PLOTTED: April 28, 2026 11:13:36 AM

G:\GSS Common\2019\19-041 Engineering Services for 10-12 Cottage Rentals, Grey Rd. 1\Drawings\19-041.dwg Apr 28, 2026 - 11:13am









0 10 20 Meters

N

CONSTRUCTION NORTH

KEY PLAN

LEGEND

- CENTER LINE
- WAVE UP-BRUSH SETBACK
- TOP OF EXISTING BANK
- PROPOSED AREA FOR RENTAL COTTAGES
- PROPOSED SEPTIC AREA
- PROPOSED ACCESS ROAD
- PROPERTY LINE & ROAD ALLOWANCE
- FUTURE COTTAGE AREA
- SAN — PROPOSED SANITARY SEWER
- WM — PROPOSED WATERMAIN
- HIGH WATER LEVEL 177.90m
- BOUNDARY LINE
- GRAVEL BOUNDARY
- DITCH/DIRECTION OF FLOW
- CONCRETE BOLLARDS
- 100.00 / 100.00 — PROPOSED ELEVATION / EXISTING ELEVATION
- EXISTING SPOT ELEVATION (LIDAR DERIVED)

CAUTION: THE POSITION OF POLE LINES, CONDUITS, WATERMAINS, SEWERS, PROPERTY LINES AND OTHER UNDERGROUND AND OVERGROUND UTILITIES ARE STRUCTURES IS NOT NECESSARILY SHOWN ON THE CONTRACT DRAWINGS AND WHERE SHOWN, THE ACCURACY OF THE POSITION OF SUCH UTILITIES, PROPERTY LINES & STRUCTURES IS NOT GUARANTEED. BEFORE STARTING WORK, THE CONTRACTOR SHALL INFORM HIMSELF OF THE EXACT LOCATION OF ALL SUCH UTILITIES, PROPERTY LINES & STRUCTURES, AND SHOULD ASSUME ALL LIABILITY FOR DAMAGE TO THEM.

DD/MM/YY	DESCRIPTION
	REVISION / ISSUE

Seal not valid unless signed and dated

GSS ENGINEERING CONSULTANTS LTD

945–3rd Ave. East, Unit #230, Owen Sound, ON, N4K 2K8
Telephone: (519) 372–4828

Title:

505153 GREY RD 1
SEPTIC CROSS SECTIONS
TOWNSHIP OF GEORGIAN BLUFFS

Client: OLIVIER CONSTRUCTION

Design:	RS	Scale:	1:200 HORZ. / 1:100 VERT.
Drawn:	TDL	Approved:	Design Engineer
Checked:	RS		
Date:	NOV. 2025		

Drawing No. 19–041–Fig. 3.2

4.0 ACCESS ROAD TO RENTAL COTTAGES

It is understood from the Grey County roads department that only one entrance is allowed from Grey County Road 1. At present there is an existing entrance road to the existing property. Only one entrance would be allowed to service the proposed rental property and the proposed severed lot to the south. Since only one entrance is allowed, the access road to the rental cottages will need a turn-around or hammerhead at end of the service road to the cottages. The access road is to be 5 m in width and constructed with 300 mm of granular B and 150 mm of granular A, as shown on **Figure 3.1**. A reduced setback from the centerline of County Road 1 of 16 m is proposed with no structures in this 16 m setback, as shown on **Figure 3.1.**

5.0 SLOPE STABILITY

The Grey Sauble Conservation Authority requested a letter of opinion regarding the slope stability at the site. Four (4) test holes were dug on the slope and a summary of the test hole logs is provided in **Appendix B.** The locations of the test holes are shown on **Figure 2.1.** Bedrock was found (shale and dolostone) in two of the four test holes.

A review of the slope stability on the site was carried out by GEI Consultants Canada Inc. (GEI Consultants) and the results were provided in a March 3, 2025 letter to Georgian Escapes Ltd. A copy of that letter is provided in **Appendix D.** The letter indicated that there was a low potential for slope instability, and concluded that based on the existing slope conditions, and provided that the proposed excavation for the access roadway and site development is directed within the proposed limits, the proposed development is not expected to negatively impact the slope stability within the subject area.

6.0 STORMWATER ASSESSMENT FOR COTTAGE DEVELOPMENT

6.1 Extension of Grey Road 1 Culvert Under Proposed Access Road

Currently there is a 525 mm diameter culvert under Grey Road 1 that conveys runoff from west of the road to the subject property on the east side of the road. The runoff traverses the subject property and outlets to Georgian Bay. The culvert is located approximately 15 m south of the most southerly proposed cottage.

The existing culvert collects runoff from the roadside ditches on the west side of Grey Road 1 extending to the north and south. The ditch extending to the north is approximately 84 m long with a slope of 1.5% and a drainage area of 2.66 ha. The ditch extending to the south is approximately 53 m long with a slope of 0.3% and a drainage area of 1.36 ha. Therefore, the total drainage area to the existing culvert is 4.02 ha with a percent impervious area of 1.2% and an overall CN of 70.3.

As per Section 5.0, an access road to the subject property is proposed in accordance with **Figure 3.1**. A culvert will need to be installed under the proposed access road to convey the runoff from the existing culvert to Georgian Bay. The new culvert will also collect runoff from the roadside ditch on the west side of the proposed access road. The additional catchment area to the new culvert will be 0.28 ha with a percent impervious area of 71% and an overall CN of 87.

The existing and proposed culverts as well as their accompanying ditches and drainage areas are shown on **Figure 6.1**.

The existing and proposed culverts (and their drainage areas) were modelled using MIDUSS version 2.25 software. Modelling indicates that the regional Timmins storm results in the highest peak flows at the culverts (when compared to the 1:100-year storm), therefore, the Timmins storm was used as the regulatory storm for this property.

The model indicates that the peak runoff flow through the existing culvert is 0.25 m^3/s and the existing culvert has a capacity of 0.28 m^3/s. Therefore, the existing culvert can pass the peak runoff flow. Further, the peak flow through the new culvert would be 0.26 m^3/s. If the new culvert was 600 mm diameter with a length of 12 m and a slope of 2.5% it would have a capacity of 0.53 m^3/s and easily convey the peak runoff flow.

At the outlet of the proposed culvert the runoff would be conveyed to Georgian Bay via a ditch. Due to the severe slope in this area the ditch would have a slope of approximately 30% over 24 m. Modelling indicates that if this ditch had a base width of 0.5 m and 3:1 side slopes the water depth would be 0.11 m when conveying the peak flow of 0.26 m^3/s. Due to the severe slope of this ditch the model indicates the flow velocity could reach 2.83 m/s. It is recommended that this ditch be lined with a minimum of 250 mm diameter stone to avoid erosion.

The complete model output file for analysis of the existing and proposed culverts is provided in **Appendix E**.

6.2 Pre-Development vs. Post-Development Runoff

For evaluation of stormwater runoff, the development area was considered to be the land from the proposed access road to the bay as shown on **Figure 6.1** as DA-5. This area is approximately 0.59 ha with a slope of 30%. Currently this area is forest and has a percent impervious of 0% with an estimated CN of 70. The proposed development will increase the percent impervious to 25% and the CN to 77. The development would have no impact on the remaining drainage area parameters.

The stormwater runoff was modelled for the pre and post development scenarios using MIDUSS 2.25 software. The model indicates that the pre-development peak runoff flow is 0.041 m^3/s and the post-development is 0.046 m^3/s. This is a 12% increase.

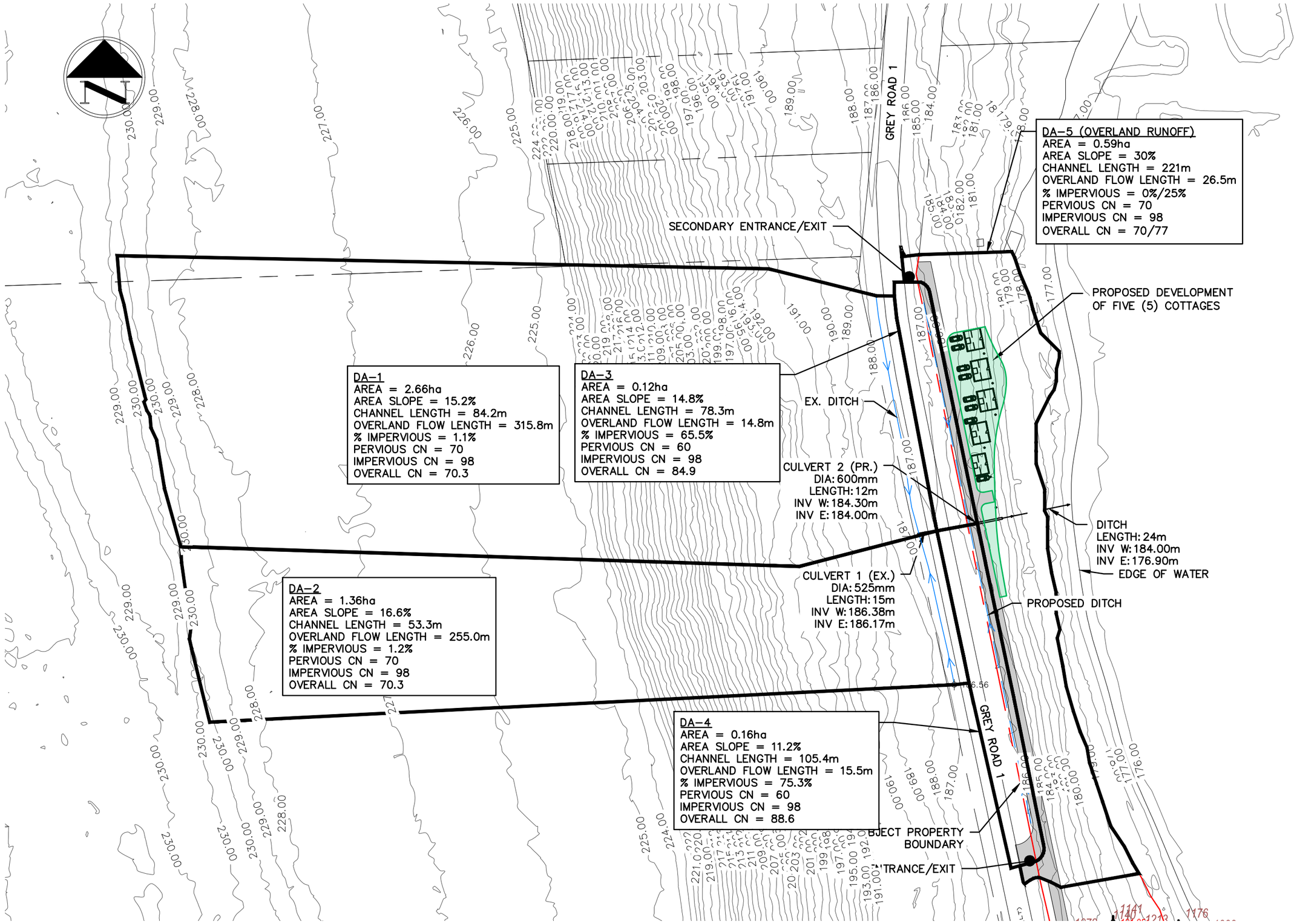
The complete model output file for pre-development versus post development runoff is provided in **Appendix E**.

It is proposed to allow the runoff from the development to flow overland to Georgian Bay similar to the runoff from the existing land. The minor increase in peak runoff is not expected to have an appreciable impact on erosion or flooding.

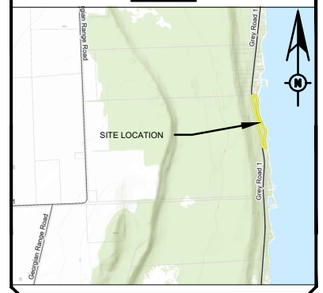
6.3 Post-Development Runoff Quality

The runoff from each cottage property would be routed to flow overland across the grass backyard of said property (approximately 8 m). The runoff would then flow overland across approximately 20 m of forested area before reaching Georgian Bay.

The overland flow across grass and forested area is expected to provide TSS (total suspended solids) removal for the minor increase in runoff from impervious lands.



KEY PLAN



LEGEND

- CENTRELINE
- WAVE UP-RUSH SETBACK
- TOP OF EXISTING BANK
- PROPERTY LINE AND ROAD ALLOWANCE
- PROPOSED SANITARY SEWER
- PROPOSED WATERMAIN
- HIGH WATER LEVEL (177.90m)
- BOUNDARY LINE
- EDGE OF GRAVEL
- PROPOSED COTTAGE RENTALS
- PROPOSED SEPTIC AREA
- PROPOSED ACCESS
- PROPOSED FUTURE COTTAGES

CAUTION: THE POSITION OF POLE LINES, CONDUITS, WATERMAINS, SEWERS, PROPERTY LINES AND OTHER UNDERGROUND AND OVERGROUND UTILITIES ARE STRUCTURES IS NOT NECESSARILY SHOWN ON THE CONTRACT DRAWINGS AND WHERE SHOWN, THE ACCURACY OF THE POSITION OF SUCH UTILITIES, PROPERTY LINES & STRUCTURES IS NOT GUARANTEED. BEFORE STARTING WORK, THE CONTRACTOR SHALL INFORM HIMSELF OF THE EXACT LOCATION OF ALL SUCH UTILITIES, PROPERTY LINES & STRUCTURES, AND SHOULD ASSUME ALL LIABILITY FOR DAMAGE TO THEM.

DD/MM/YY	DESCRIPTION
	REVISION / ISSUE

Seal not valid unless signed and dated

ENGINEERING CONSULTANTS LTD
945-3rd Ave. East, Unit #230, Owen Sound, ON, N4K 2K8
Telephone: (519) 372-4828

Title:

505153 GREY RD 1
STORM RUNOFF DRAINAGE AREAS
TOWNSHIP OF GEORGIAN BLUFFS

Client: GEORGIAN ESCAPES INC.

Design:	JTB	Scale:	1:1250
Drawn:	JTB	Approved:	Design Engineer
Checked:	MRS		
Date:	MAR. 2025		

Drawing No. FIGURE 6.1

7.0 CONCLUSIONS

The following is concluded from the assessment of water supply, sewage treatment, stormwater and access road for the five (5) rental cottages.

1) The five (5) rental cottages can be serviced by raw water supply from a shore well and water treatment of raw water by cartridge filters, UV disinfection and chlorination at each cottage.

2) Sewage from the rental cottages can be serviced by way of gravity sewer discharging to one (1) 18,200 Litre concrete holding tanks. Septic tank effluent can be further treated and discharged by employing Class IV treatment system and shallow buried trench.

3) The stormwater assessment determined that the existing culvert on Grey Road 1 and the proposed 600 mm ø culvert on the access road will adequately convey the peak regional storm runoff. The proposed backyard grass and the natural existing forest cover will provide treatment of the quality of stormwater runoff. The outlet ditch from the on-site culvert is proposed to be rip-rapped to the shore stones at the Georgian Bay shore to reduce erosion.

Respectfully Submitted,

GSS ENGINEERING CONSULTANTS LTD.

_____
Rakesh Sharma, P. Eng., Secretary Treasurer
Designated Consulting Engineer

RS/TDL/mg

APPENDIX A

Class 4 System Design Calculations for 2-Bedroom Rental Cottages

Figure 19-041-A1 Rental Cottage Development
Sewage Dispersal Bed – Plan View

Figure 19-041-A2 Cross-Sections for Level 4 Treatment System & Shallow Buried Trenches

TABLE 1
CLASS 4 SYSTEM DESIGN CALCULATIONS
"Classic" Absorption Trench or Filter Bed

July 2, 2024
19-041

To be submitted with application package

DAILY SEWAGE FLOW CALCULATION

2 Bedroom Rental Cottage

Based on Hydraulic Loads for Number of Bedrooms **and** the greater of Fixtures **or** Floor Area.

FIXTURES			
Plumbing Fixture Description	**Total # of Fixtures in Final Project Design**	**Unit**	**Total # of Fixture Units**
Bathroom Group (includes toilet, sink and bathtub and/or shower)	1	x 6 =	6
Toilet (alone)		x 4 =	
Washbasin		x 1.5 =	
Bathtub or Shower		x 1.5 =	
Kitchen Sink	1	x 1.5 =	1.5
Bar Sink		x 1.5 =	
Dishwasher	Add 1	x 1.5 =	1.5
Washing Machine	Add 1	x 1.5 =	1.5
Bidet		x 1 =	
Laundry Tub	Add 1	x 1.5 =	1.5
Other			
		Add units in last column	⬇
		Total Fixture Units =	12.0

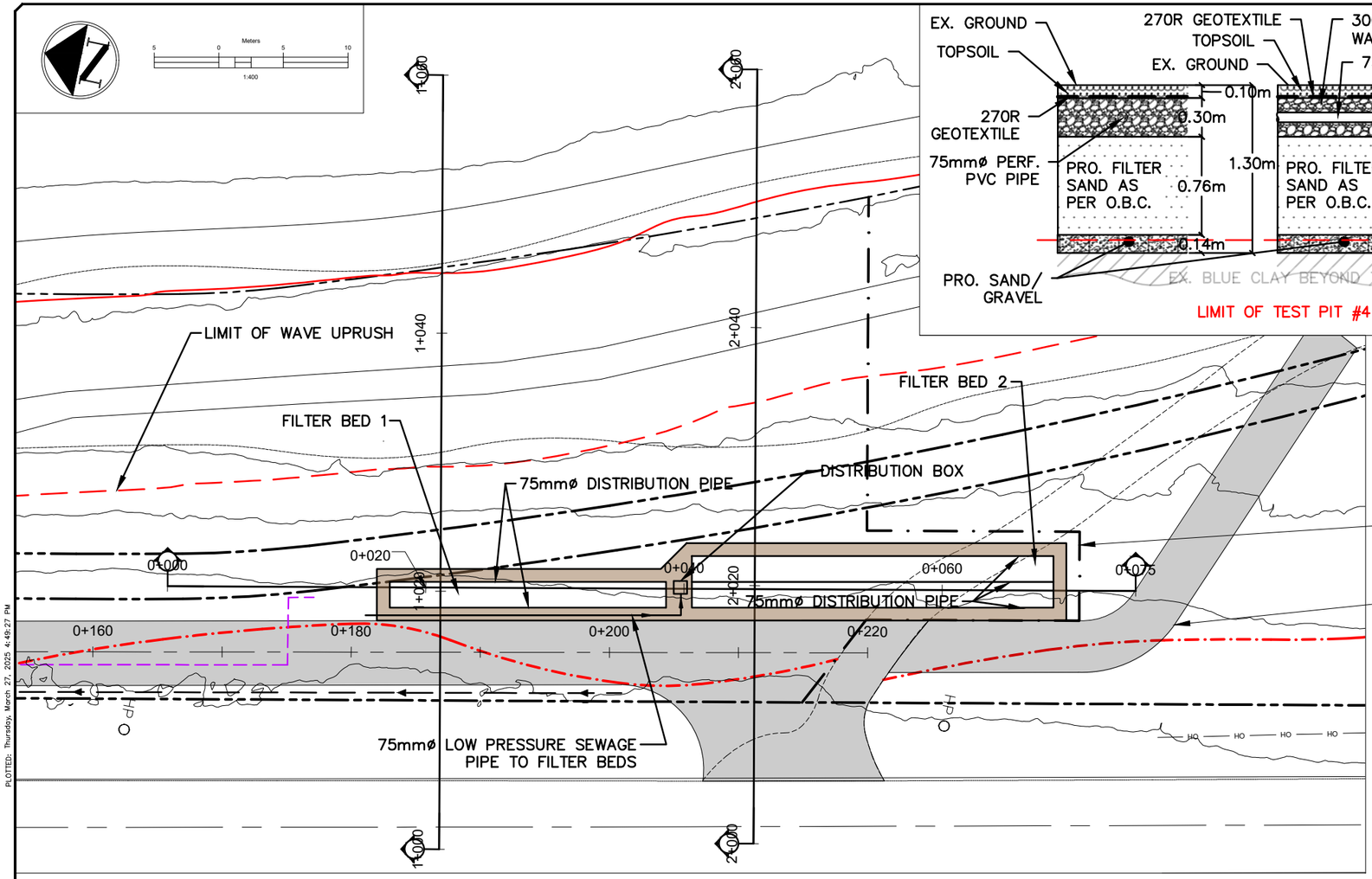
FLOOR AREA	
Proposed	m^2
Existing	m^2
Total Finished Footprint:	m^2

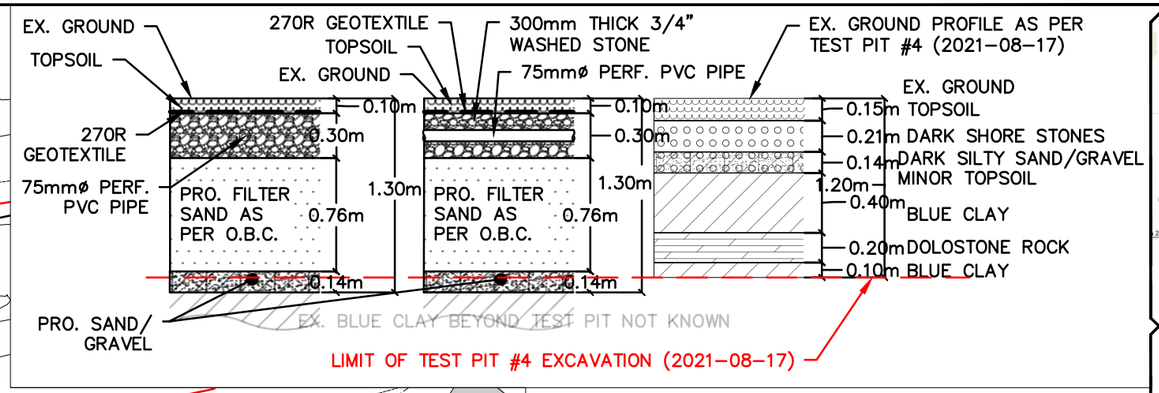
To convert ft^2 to m^2 multiply ft^2 by 0.093

Residential Occupancy	Final Project Design	(Q) in L	Total
1 Bedroom		750	
2 Bedrooms		1100	1,100
3 Bedrooms		1600	
4 Bedrooms		2000	
5 Bedrooms		2500	
PLUS Additional Flow For:			
Each Bedroom over 5		500	
OR *			
Floor Space for each $10m^2$ over 200 m^2 up to 400 m^2		100	
Floor Space for each $10m^2$ over 400 m^2 up to 600 m^2		75	
Floor Space for each $10m^2$ over 600 m^2		50	
OR *			
Each fixture unit over 20 fixture units		50	
		Add units in last column *	⬇
		Total Daily Design Flow (Q) =	1,100

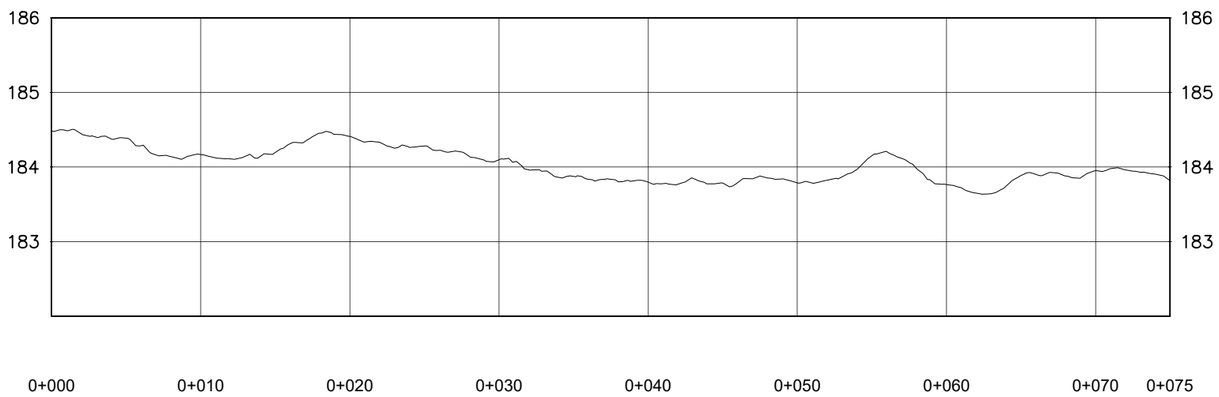
***NOTE**: Where you need to do multiple calculations, signified by the "OR" in the table, do the calculation for daily sewage flow based on bedrooms first, then use the largest additional flow calculation added to the bedroom calculation to determine the Total Daily Sewage Flow (Q)*

TOTAL DAILY DESIGN SEWAGE FLOW (Q) = 1,100 Litres





PROPOSED SEPTIC DISTRIBUTION
PIPE DETAIL & TEST PIT AT LOCATION
SCALE 1:40



CROSS SECTION S-A
HORIZONTAL 1:400
VERTICAL 1:80

LEGEND

- CENTRELINE
- WAVE UP-RUSH SETBACK
- TOP OF EXISTING BANK
- PROPERTY LINE AND ROAD ALLOWANCE
- HIGH WATER LEVEL (177.90m)
- BOUNDARY LINE
- EDGE OF GRAVEL
- PROPOSED SEPTIC SYSTEM FILTER BEDS
- PROPOSED ACCESS ROAD

CAUTION: THE POSITION OF POLE LINES, CONDUITS, WATERMAINS, SEWERS, PROPERTY LINES AND OTHER UNDERGROUND AND OVERGROUND UTILITIES ARE STRUCTURES IS NOT NECESSARILY SHOWN ON THE CONTRACT DRAWINGS AND WHERE SHOWN, THE ACCURACY OF THE POSITION OF SUCH UTILITIES, PROPERTY LINES & STRUCTURES IS NOT GUARANTEED. BEFORE STARTING WORK THE CONTRACTOR SHALL INFORM HIMSELF OF THE EXACT LOCATION OF ALL SUCH UTILITIES, PROPERTY LINES & STRUCTURES, AND SHOULD ASSUME ALL LIABILITY FOR DAMAGE TO THEM.

DD/MM/YY	DESCRIPTION
	REVISION / ISSUE

Seal not valid unless signed and dated

GSS ENGINEERING
945-3rd Ave. East, Unit #230, Owen Sound, ON, N4K 2K8
Telephone: (519) 372-4828

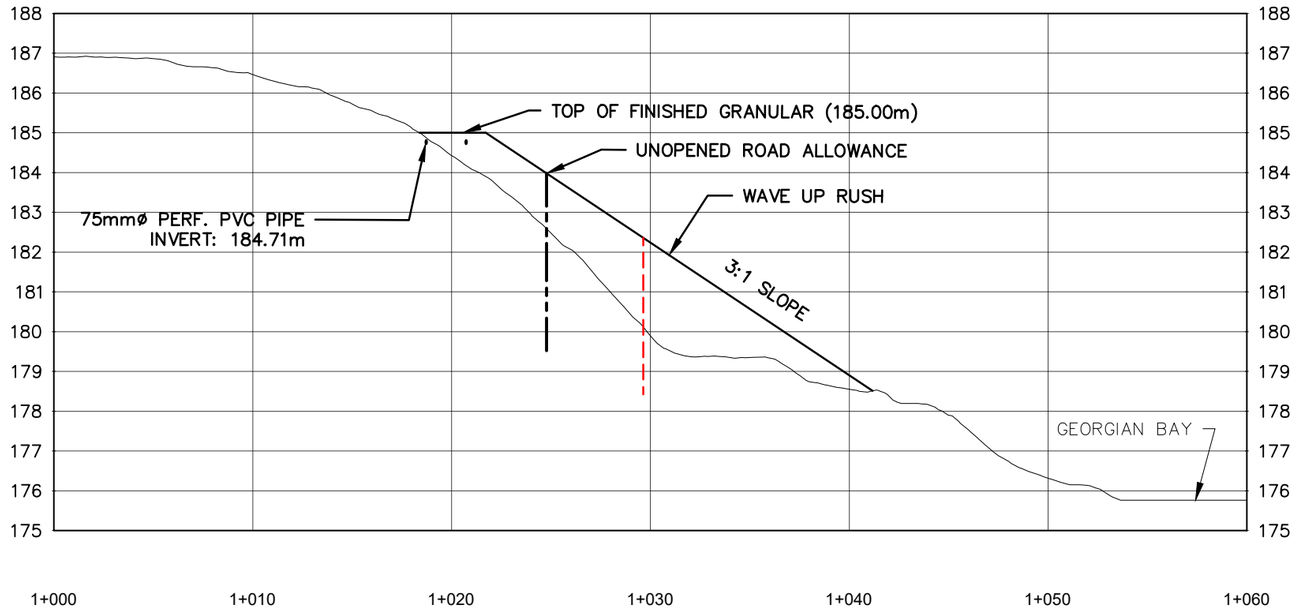
Title:
RENTAL COTTAGE DEVELOPMENT
SEWAGE FILTER BED LEVEL 4 TREATMENT
505153 GREY RD 1
TOWNSHIP OF GEORGIAN BLUFFS

Client: GEORGIAN ESCAPES INC.

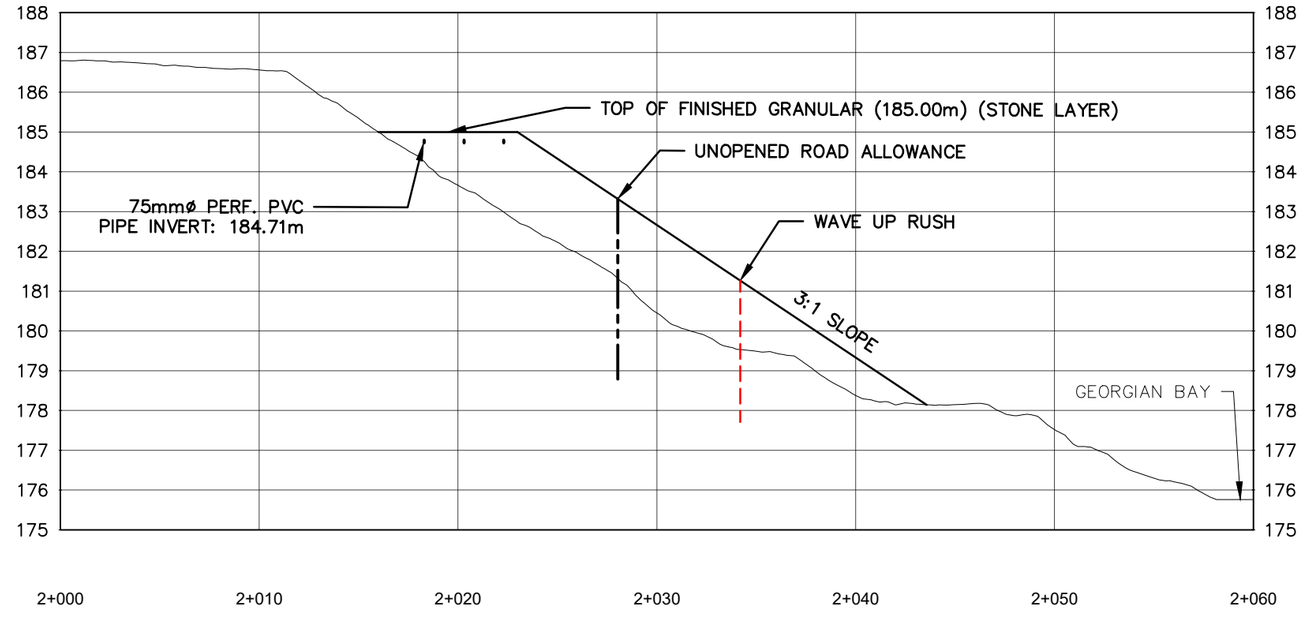
Design:	MRS	Scale:	AS SHOWN
Drawn:	TDL	Approved:	Design Engineer
Checked:	MRS		
Date:	MAR. 2025		

Drawing No. 19-041-FIG. A-1

PLOTTED: Thursday, March 27, 2025 4:49:27 PM
G:\GSS Common\2019\19-041 Engineering Services for 10-12 Cottage Rentals, Grey Rd. 1\Drawings\APPENDIX D DRAWING\19-041.dwg Mar 27, 2025 - 4:49pm



CROSS SECTION S–B
HORIZONTAL 1:300
VERTICAL 1:150



CROSS SECTION S–C
HORIZONTAL 1:300
VERTICAL 1:150

CAUTION: THE POSITION OF POLE LINES, CONDUITS, WATERMAINS, SEWERS, PROPERTY LINES AND OTHER UNDERGROUND AND OVERGROUND UTILITIES ARE STRUCTURES IS NOT NECESSARILY SHOWN ON THE CONTRACT DRAWINGS AND WHERE SHOWN, THE ACCURACY OF THE POSITION OF SUCH UTILITIES, PROPERTY LINES & STRUCTURES IS NOT GUARANTEED. BEFORE STARTING WORK, THE CONTRACTOR SHALL INFORM HIMSELF OF THE EXACT LOCATION OF ALL SUCH UTILITIES, PROPERTY LINES & STRUCTURES, AND SHOULD ASSUME ALL LIABILITY FOR DAMAGE TO THEM.

DD/MM/YY	DESCRIPTION
	REVISION / ISSUE

Seal not valid unless signed and dated

GSS ENGINEERING
945–3rd Ave. East, Unit #230, Owen Sound, ON, N4K 2K8
Telephone: (519) 372–4828

Title:
RENTAL COTTAGE DEVELOPMENT
SEWAGE FILTER BED
505153 GREY RD 1
TOWNSHIP OF GEORGIAN BLUFFS

Client: GEORGIAN ESCAPES INC.

Design:	MRS	Scale:	AS SHOWN
Drawn:	TDL	Approved:	Design Engineer
Checked:	MRS		
Date:	MAR. 2025		

Drawing No. 19–041–Fig. A–2

APPENDIX B

Summary of Test Hole Logs

PEOPLE | ENGINEERING | ENVIRONMENTS

August 25, 2021
Our File: 218194

Via Email: rossslaughter@gssengineering.ca

GSS Engineering Consultants Ltd.
1010 9th Avenue West, Unit 104D
Owen Sound, ON N4K 5R7

Attention Ross Slaughter, P. Eng

Re: Soil Testing for Sewage System (19-041)
505153 Grey Road 1 - Kemble
Township of Georgian Bluffs

Dear Ross,

As requested, we have performed a grading analysis on the soil sample delivered to us on August 18, 2021. It is understood that the sample was collected from a testpit depth of 0.75m to 1.15m and excavated in the area where a leaching or filter bed is to be constructed.

The soil sample is a well graded sand with traces of silt and gravel. From the attached Grain-Size Distribution Curve and based on the 5.7% silt content and The Hazen Formula, the co-efficient of permeability was calculated to be 4.1×10^{-1} cm/second. Based on these results and the relationship of soil types to percolation times as per the Ontario Building Code (OBC), we have assessed a percolation time, "T" of 2 to 4 minutes/cm.

Increased amounts of silt and clay will negatively affect the percolation time and the performance of the leaching or filter bed. The percolation time is also dependent upon the density, structure, and moisture content of the soil and the installation methods utilized. Therefore, it is the responsibility of the owner, system designer, and contractor to monitor the quality of the soils across the site and any imported material to assure themselves that the design criteria are met and if necessary, adjust the design of the system.

Should you have any questions, please do not hesitate to contact me.

Yours truly,

GM BLUEPLAN ENGINEERING LIMITED
Per:

Wm. E. Dubeau, P.Eng
WED/md

Encl.

cc: File No: 218194

TABLE 1

SUMMARY OF TEST HOLE LOGS

505153 Grey Road 1
Township of Georgian Bluffs

August 17, 2021 19-041

TEST HOLE 1

0 – 0.5m	Topsoil and Shore Stones	
0.5m - 0.9m	Brown Silty Sand/Gravel, Minor Topsoil	Sample 2 at 0.5 to 0.9 m
0.9m – 1.5m	Blue Shale/Clay	Sample 1 at 1.2 m - Dry

TEST HOLE 2

0 – 0.3m	Black Topsoil	
0.3m - 0.76m	Shore Stone, Minor Topsoil	
0.76m - 1.2m	Dark Brown Silty Sand/Gravel with Few Stones, Minor Topsoil	Sample 2 at 0.76m to 1.2m "T" = 2 to 4 min/cm
1.2m	Blue Clay	No Water Table

TEST HOLE 3

0 – 0.2m	Dark Topsoil	
0.2m - 0.6m	Dark Shore Stones with Minor Topsoil	
0.6m - 0.9m	Dark Silty Sand/Gravel	Sample 1
0.9m - 1.2m	Blue Clay, Dense	
1.2m	Bedrock	No Water Table

TEST HOLE 4

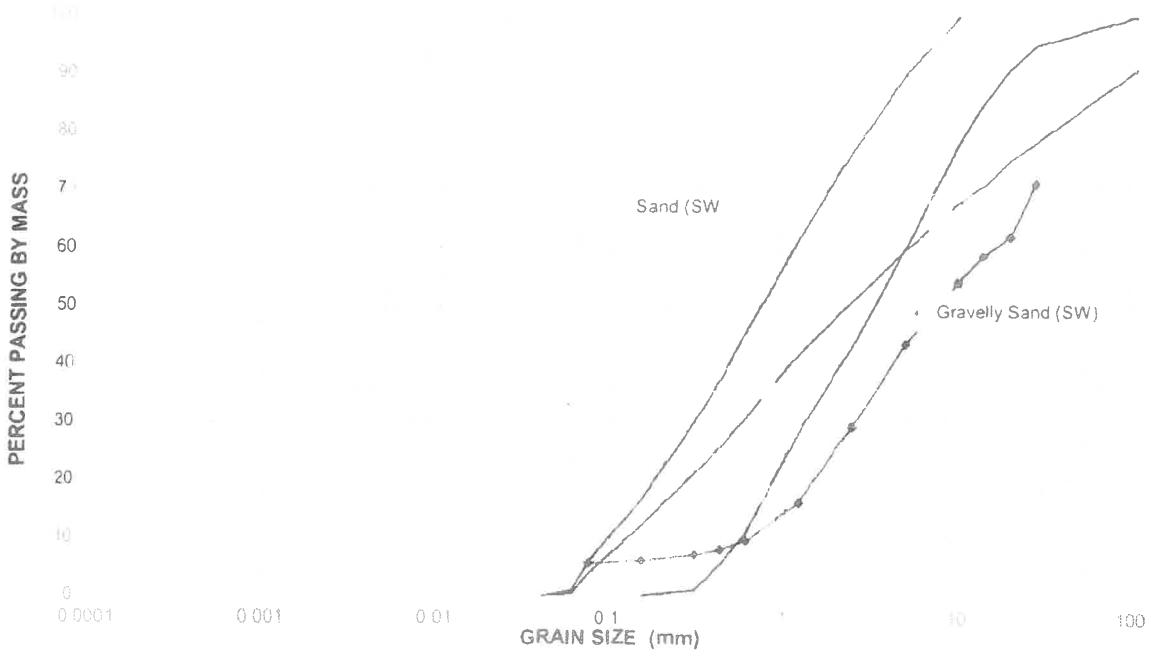
0 - 0.15m	Dark Topsoil	
0.15m - 0.36m	Dark Shore Stones	
0.36m - 0.5m	Dark Silty Sand/Gravel Minor Topsoil	
0.5m - 0.9m	Blue Clay	
0.9m - 1.1m	Dolostone Rock	
1.1m - 1.2m	Blue Clay	No Water Table

GM BluePlan Engineering Limited
Guelph, Owen Sound, Listowel, Kitchener, London, Hamilton, GTA
1260 - 2nd Avenue E , Unit 1 Owen Sound ON N4K 2J3
Phone 519-376 1805 Fax 519 376-8977 www GMBluePlan ca

PARTICLE SIZE ANALYSIS

PROJECT	M.T - GSS Engineering (19-041)	FILE NO.:	218194
LOCATION.	505153 Grey Road 1, Kemble	LAB SAMPLE NO	S-4294 (RCVD Aug 18)
CLIENT :	GSS Engineering	SAMPLE DATE	August 17, 2021
SOIL TYPE:	Sandy Gravel with a trace of Fines	SAMPLED BY.	Client
GRAPH #	5 - Well Graded Sands, Gravelly Sands Cu > 4	SOURCE:	TH#2 @ 30-46"

PARTICLE SIZE DISTRIBUTION



←		FINE	MEDIUM	COARSE	FINE	COARSE
CLAY	SILT	SAND			GRAVEL	

SIEVE SIZE PARTICLE DIA. (mm)	PERCENT PASSING SAMPLE	HYDROMETER PARTICLE DIA. (mm)	PERCENT PASSING SAMPLE
26.5	71.4	0.0600	
19	62.2	0.0400	
13.2	58.7	0.0300	
9.5	54.3	0.0250	
4.75	43.7	0.0200	
2.36	29.4	0.0120	
1.180	16.3	0.0090	
0.600	9.6	0.0060	
0.425	8.0	0.0045	
0.300	7.3	0.0032	
0.150	6.2	0 0023	
0.075	5.7	0.0013	

D_{10} : 0.64 mm D_{60} : 15.3 mm Cu : 23.9

Coefficient of Permeability: 4.1×10^{-1} cm/sec "T" Time : 2-4 mins/cm

Comments:

APPENDIX C

CT Values for Inactivation of Viruses by Free Chlorine

TABLE 7 – CT VALUES FOR INACTIVATION OF VIRUSES BY FREE CHLORINE

Temperature (°C)	Log Inactivation					
	2		3		4	
	pH		pH		pH	
	6 to 9	10	6 to 9	10	6 to 9	10
0.5	6	45	9	66	12	90
5	4	30	6	44	8	60
10	3	22	4	33	6	45
15	2	15	3	22	4	30
20	1	11	2	16	3	22
25	1	7	1	11	2	15

APPENDIX D

Letter of Opinion on Slope Stability

From GEI Consultants Canada Ltd. (March 3, 2025)

March 3, 2025
Project No. 2409083

VIA EMAIL: olivierconstructionltd@gmail.com

Georgian Escapes Ltd.
057898 12th Line
Meaford, ON N4L 1W5

Re: Slope Review
505153 Grey Road 1
Township of Georgian Bluffs

Dear Laurence:

It is understood that you are proposing to develop portions of the above noted property. The development includes the construction of seven (7) rental cottages and associated servicing. The site plan for the development is being undertaken by GSS Engineering Ltd,

As part of the draft plan submission for the proposed development, Grey Sauble Conservation Authority (GSCA) identified potential slope hazards on the site that require the review by a geotechnical engineer. This includes providing comments on the condition of the slopes and confirmation that the proposed development will not negatively impact the stability of the slopes on-site.

Site Setting and Background

The site is located within the Township of Georgian Bluffs, along Grey Road 1. There is an existing entrance located centrally on the property, which leads to the existing cottage on the south end of the property. There is a walking trail along the toe of the slope, that runs parallel to Grey Road 1. A 525mm dia. culvert crosses Grey Road 1, outlets through a ditch on the subject property.

The "Physiography of Southern Ontario", Chapman and Putnam, 1985, identifies the subject area as part of the Bruce Peninsula physiographic region. The region is characterized by the shallow overburden soils, over bedrock. Some shallow testholes were dug across the development area on August 17, 2021 by others. The encountered subsurface was generally surficial topsoil and shores stones over brown silty sand. The testholes were terminated within 1.2 mbgs on blue clay and shale. Groundwater was not reported to be encountered within the testholes.

Slope Review

The undersigned visited the site on December 16, 2024, to review the existing slope conditions. Based on the desktop review of the site from the available GSS Engineering Site Plans, the top of slope is generally considered to be at elevation 186.00m on the north end of the site and 184.00m towards the south. The bottom of slope varies in elevation, and along the north end of the site is 180.00m, and 179.00m at the south end. The steepest sections of the slope are towards the south end of the site, at an inclination of approximately 3H: 1V. At the north end of the site, the existing slope is at an inclination varying from 3.6H:1V to 4.6H:1V. For typical local soil conditions, a slope is generally considered stable at 3 horizontal units to 1 vertical unit.

During the site visit, general measurements of the slope inclinations were taken and were generally consistent with the desktop review. The slope was well treed, with a mix of coniferous and deciduous tree growth. There was no evidence of active erosion or over steepened sections of the slope. Additionally, no seepage of groundwater was observed along the sections of the slope reviewed.

Slope Stability Rating

Based on the above noted observations and slope measurements, the Slope Stability Rating Chart (Table 8.1) from the Ministry of Natural Resources (MNR) Geotechnical Principles for Stable Slopes Guidelines was used to evaluate the slope and determine the potential investigation requirements. The scoring of slope based on the parameters of the Chart is attached to this letter report. The total rating value was determined to be 18, which corresponds to a Low Potential for Slope Instability based on the existing conditions of the slope.

Proposed Development

As presented on the GSS Engineering The proposed development includes seven (7) rental cottage units, located on the north end of the subject property. The cottages will be accessed from a private laneway, located along the west side of the property, with two entrances from Grey Road 1. A shoreline well is proposed, and on-site water treatment plant and pumping station to service the cottage units. Sanitary services direct flows through proposed pump chamber to the in-ground wastewater treatment plant and dispersal bed located near the south end entrance.

The existing crossing culvert will receive additional erosion protection measures on the downstream end. Gabion stone will be placed at the end of the culvert, and along the drainage path towards Georgian Bay.

Initial grading concepts suggest the finished floor elevations of the cottage rental units are 186.30 to 186.00. Grading suggests the units are to feature walkout basements, with the foundations stepped down to achieve proper frost protection. The development will require filling portions of the top of slope to build the access road for the cottages and for the driveways and frontage. With the proposed walkout basements there is minimal grading required at the rear of the lots to tie in the existing grades along the slope.

An area near the south entrance is considered for future cottage units. A larger septic system is identified to be constructed on the southern portion of the lot, west of the existing cottage located on the site.

Closing

Based on the existing slope conditions, and provided that the proposed excavation for the roadway and site development is directed within the limits proposed, the proposed development is not expected to negatively impact the slope stability within the subject area. The existing slopes are at a maximum 3H:1V across the subject property. There was no evidence of active erosion or over steepened sections of the slope. The proposed development is setback from the 15 m wave up-rush limit by approximately 3.5m, and therefore outside of the shoreline hazard.

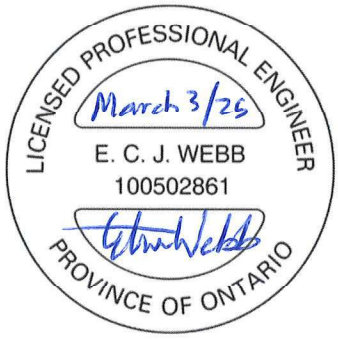
It must be noted that ground movement along the edges any slopes due to surficial erosion, long term soil creep or shallow surficial slippage is likely to occur over the long-term as part of the naturally evolving slope. The removal of existing trees and vegetation along the slopes should be minimized during construction.

Furthermore, should soil and site conditions be found to very significantly different than those discussed here in and observed during the excavation of the identified testholes, the owner or contractor is requested to contact the undersigned to review the site conditions and to review the site conditions and to confirm that the opinion provided herein remains appropriate.

The comments provided only relate to the slope review and therefore any site reviews related to the building and roadway construction are to be completed by other qualified persons or by GEI Consultants as part of an additional scope of work.

We trust that this report is satisfactory for your use, if you have any questions, please feel free to contact me.

GEI CONSULTANTS CANADA LTD.



Ethan C.J. Webb, P.Eng.
Project Designer

EW/WD:sg
\\geiconsultants.com\Data\Data_Storage\Working\GEORGIAN ESCAPES\2409083 505153 Grey Rd 1_Georgian Bluffs\2409083 Slope Review Letter Report.docx

Appendices

Appendix A Slope Stability Rating Chart

cc: GSS Engineering Consultants Ltd. – Ross Slaughter - rossslaughter@gssengineering.ca
GEI: Bill Dubeau – bdubeau@geiconsultants.com
File No. 2409083

Appendix A Slope Stability Rating Chart

Site Location: 505153 Grey Road 1		File No: 2409083	
Property Owner: Georgian Excapes Ltd.		Inspection Date: December 16, 2024	
Inspected By: E. Webb		Weather: Overcast	

				Rating Value
1.	**SLOPE INSPECTION**			
		Degrees	***Horiz. : Vert.***	
	a)	18 or less	3 : 1 or flatter	0
	b)	18 to 26	2 : 1 to 3 : 1	[6]
	c)	more than 26	steeper than 2 : 1	16
2.	**SOIL STRATIGRAPHY**			
	a)	Shale, Limestone, Granite (Bedrock)		[0]
	b)	Sand, Gravel		6
	c)	Glacial Till		9
	d)	Clay, Silt		12
	e)	Fill		16
	f)	Leda Clay		24
3.	**SEEPAGE FROM SLOPE FACE**			
	a)	None or Near bottom only		[0]
	b)	Near mid-slope only		6
	c)	Near crest only or from several levels		12
4.	**SLOPE HEIGHT**			
	a)	2 metres or less		0
	b)	2.1 to 5 metres		2
	c)	5.1 to 10 metres		[4]
	d)	Greater than 10 metres		8
5.	**VEGETATION COVER ON SLOPE FACE**			
	a)	Well vegetated; heavy shrubs or forested with mature trees		[0]
	b)	Light vegetation; Mostly grass, weeds, occasional trees, shrubs		4
	c)	No vegetation; bare		8
6.	**TABLELAND DRAINAGE**			
	a)	Tableland flat, no apparent drainage over slope		0
	b)	Minor drainage over slope, no active erosion		[2]
	c)	Drainage over slope, active erosion, gullies		4
7.	**PROXIMITY OF WATERCOURSE TO SLOPE TOE**			
	a)	15 metres or more from slope toe		0
	b)	Less than 15 metres from slope toe		[6]
8.	**PREVIOUS LANDSLIDE ACTIVITY**			
	a)	No		[0]
	b)	Yes		6
	SLOPE INSTABILITY RATING	**RATING VALUE TOTAL**	**INVESTIGATION REQUIREMENTS**	**TOTAL** 18

1.	Low potential	<24	Site inspection only, confirmation, report letter.
2.	Slight potential	25-35	Site inspection and surveying, preliminary study, detailed report.
3.	Moderate potential	>35	Boreholes, piezometers, lab tests, surveying, detailed report.

NOTES: a) Choose only one from each category; compare total rating value with above requirements.
b) If there is a water body (stream, creek, river, pond, bay, lake) at the slope toe; the potential for toe erosion and undercutting should be evaluated in detail and, protection provided if required.

APPENDIX E

Stormwater Modelling Results

Evaluation of Existing and Proposed Culverts

```
"                MIDUSS Output ----------------------------------------------->"
"                MIDUSS version                              Version 2.25  rev. 473"
"                MIDUSS created                                    February 7, 2010"
"           10   Units used:                                                ie METRIC"
"                Job folder:                C:\Users\GSS-CAD-LAPTOP-2\Documents"
"                Output filename:                                 19-041 Timmins.out"
"                Licensee name:                                                GSS"
"                Company                                             GSS Engineering"
"                Date & Time last used:                  2024-08-23 at 9:22:33 AM"
" 31          TIME PARAMETERS"
"       60.000   Time Step"
"      720.000   Max. Storm length"
"     1500.000   Max. Hydrograph"
" 32          STORM Mass Curve"
"            3   Mass Curve"
"      193.000   Rainfall depth"
"      720.000   Duration"
"           41   C:\Program Files (x86)\MIDUSS\Timmins.mrd   TIMMINS (Ontario)
Regional storm"
"             Maximum intensity            43.000    mm/hr"
"             Total depth                 193.000    mm"
"            6   500hyd   Hydrograph extension used in this file"
" 33          CATCHMENT 1"
"            1   Triangular SCS"
"            1   Equal length"
"            1   SCS method"
"            1   No description"
"        1.100   % Impervious"
"        2.660   Total Area"
"      315.800   Flow length"
"       15.200   Overland Slope"
"        2.631   Pervious Area"
"      315.800   Pervious length"
"       15.200   Pervious slope"
"        0.029   Impervious Area"
"      315.800   Impervious length"
"       15.200   Impervious slope"
"        0.250   Pervious Manning 'n'"
"       70.000   Pervious SCS Curve No."
"        0.578   Pervious Runoff coefficient"
"        0.100   Pervious Ia/S coefficient"
"       10.886   Pervious Initial abstraction"
"        0.015   Impervious Manning 'n'"
"       98.000   Impervious SCS Curve No."
"        0.867   Impervious Runoff coefficient"
"        0.100   Impervious Ia/S coefficient"
"        0.518   Impervious Initial abstraction"
"                    0.166     0.000     0.000     0.000 c.m/sec"
"             Catchment 1           Pervious   Impervious Total Area "
"             Surface Area          2.631      0.029      2.660      hectare"
```

```
"            Time of concentration  43.943     6.955      43.336     minutes"
"            Time to Centroid       527.783    413.777    525.913    minutes"
"            Rainfall depth         193.000    193.000    193.000    mm"
"            Rainfall volume        5077.33    56.47      5133.80    c.m"
"            Rainfall losses        81.419     25.656     80.806     mm"
"            Runoff depth           111.581    167.344    112.194    mm"
"            Runoff volume          2935.40    48.96      2984.37    c.m"
"            Runoff coefficient     0.578      0.867      0.581      "
"            Maximum flow           0.164      0.003      0.166      c.m/sec"
" 40         HYDROGRAPH Add Runoff "
"           4   Add Runoff "
"                    0.166     0.166     0.000     0.000"
" 33         CATCHMENT 2"
"           1   Triangular SCS"
"           1   Equal length"
"           1   SCS method"
"           2   No description"
"       1.200   % Impervious"
"       1.360   Total Area"
"     255.000   Flow length"
"      16.600   Overland Slope"
"       1.344   Pervious Area"
"     255.000   Pervious length"
"      16.600   Pervious slope"
"       0.016   Impervious Area"
"     255.000   Impervious length"
"      16.600   Impervious slope"
"       0.250   Pervious Manning 'n'"
"      70.000   Pervious SCS Curve No."
"       0.576   Pervious Runoff coefficient"
"       0.100   Pervious Ia/S coefficient"
"      10.886   Pervious Initial abstraction"
"       0.015   Impervious Manning 'n'"
"      98.000   Impervious SCS Curve No."
"       0.845   Impervious Runoff coefficient"
"       0.100   Impervious Ia/S coefficient"
"       0.518   Impervious Initial abstraction"
"                    0.082     0.166     0.000     0.000 c.m/sec"
"            Catchment 2            Pervious   Impervious Total Area "
"            Surface Area           1.344      0.016      1.360      hectare"
"            Time of concentration  37.643     5.958      37.088     minutes"
"            Time to Centroid       520.152    411.190    518.243    minutes"
"            Rainfall depth         193.000    193.000    193.000    mm"
"            Rainfall volume        2593.30    31.50      2624.80    c.m"
"            Rainfall losses        81.885     29.868     81.261     mm"
"            Runoff depth           111.115    163.132    111.739    mm"
"            Runoff volume          1493.03    26.62      1519.65    c.m"
"            Runoff coefficient     0.576      0.845      0.579      "
"            Maximum flow           0.082      0.002      0.082      c.m/sec"
" 40         HYDROGRAPH Add Runoff "
```

```
"            4   Add Runoff "
"                    0.082     0.248     0.000     0.000"
" 51          PIPE DESIGN"
"        0.248   Current peak flow    c.m/sec"
"        0.024   Manning 'n'"
"        0.525   Diameter    metre"
"        1.400   Gradient   %"
"             Depth of flow                0.390    metre"
"             Velocity                     1.441    m/sec"
"             Pipe capacity                0.276    c.m/sec"
"             Critical depth               0.337    metre"
" 53          ROUTE    Pipe Route 15"
"       15.00      Pipe Route 15 Reach length   ( metre)"
"        0.000   X-factor <= 0.5"
"        7.807   K-lag   ( seconds)"
"        0.000   Default(0) or user spec.(1) values used"
"        0.500   X-factor <= 0.5"
"       30.000   K-lag   ( seconds)"
"        0.608   Beta weighting factor"
"       19.780   Routing time step   ( seconds)"
"            1   No. of sub-reaches"
"             Peak outflow                 0.248    c.m/sec"
"                    0.082     0.248     0.248     0.000 c.m/sec"
" 40          HYDROGRAPH Next link "
"            5   Next link "
"                    0.082     0.248     0.248     0.000"
" 33          CATCHMENT 3"
"            1   Triangular SCS"
"            1   Equal length"
"            1   SCS method"
"            3   No description"
"       65.500   % Impervious"
"        0.120   Total Area"
"       14.800   Flow length"
"       14.800   Overland Slope"
"        0.041   Pervious Area"
"       14.800   Pervious length"
"       14.800   Pervious slope"
"        0.079   Impervious Area"
"       14.800   Impervious length"
"       14.800   Impervious slope"
"        0.250   Pervious Manning 'n'"
"       60.000   Pervious SCS Curve No."
"        0.419   Pervious Runoff coefficient"
"        0.100   Pervious Ia/S coefficient"
"       16.933   Pervious Initial abstraction"
"        0.015   Impervious Manning 'n'"
"       98.000   Impervious SCS Curve No."
"        0.855   Impervious Runoff coefficient"
"        0.100   Impervious Ia/S coefficient"
```

Capacity of Existing Culvert

Peak Runoff Flow Through Existing Culvert Under Grey Road 1

```
"        0.518   Impervious Initial abstraction"
"                     0.011     0.248     0.248     0.000 c.m/sec"
"             Catchment 3            Pervious   Impervious Total Area "
"             Surface Area           0.041      0.079      0.120      hectare"
"             Time of concentration  7.807      1.118      2.491      minutes"
"             Time to Centroid       501.692    406.696    426.200    minutes"
"             Rainfall depth         193.000    193.000    193.000    mm"
"             Rainfall volume        79.90      151.70     231.60     c.m"
"             Rainfall losses        112.038    27.947     56.959     mm"
"             Runoff depth           80.962     165.053    136.041    mm"
"             Runoff volume          33.52      129.73     163.25     c.m"
"             Runoff coefficient     0.419      0.855      0.705      "
"             Maximum flow           0.002      0.008      0.011      c.m/sec"
" 40          HYDROGRAPH Add Runoff "
"            4   Add Runoff "
"                     0.011     0.253     0.248     0.000"
" 33          CATCHMENT 4"
"            1   Triangular SCS"
"            1   Equal length"
"            1   SCS method"
"            4   No description"
"       75.300   % Impervious"
"        0.160   Total Area"
"       15.500   Flow length"
"       11.200   Overland Slope"
"        0.040   Pervious Area"
"       15.500   Pervious length"
"       11.200   Pervious slope"
"        0.120   Impervious Area"
"       15.500   Impervious length"
"       11.200   Impervious slope"
"        0.250   Pervious Manning 'n'"
"       60.000   Pervious SCS Curve No."
"        0.427   Pervious Runoff coefficient"
"        0.100   Pervious Ia/S coefficient"
"       16.933   Pervious Initial abstraction"
"        0.015   Impervious Manning 'n'"
"       98.000   Impervious SCS Curve No."
"        0.853   Impervious Runoff coefficient"
"        0.100   Impervious Ia/S coefficient"
"        0.518   Impervious Initial abstraction"
"                     0.015     0.253     0.248     0.000 c.m/sec"
"             Catchment 4            Pervious   Impervious Total Area "
"             Surface Area           0.040      0.120      0.160      hectare"
"             Time of concentration  8.726      1.249      2.305      minutes"
"             Time to Centroid       503.949    406.709    420.434    minutes"
"             Rainfall depth         193.000    193.000    193.000    mm"
"             Rainfall volume        76.27      232.53     308.80     c.m"
"             Rainfall losses        110.521    28.382     48.670     mm"
"             Runoff depth           82.479     164.618    144.330    mm"
```

```
"            Runoff volume          32.60      198.33     230.93     c.m"
"            Runoff coefficient     0.427      0.853      0.748      "
"            Maximum flow           0.002      0.013      0.015      c.m/sec"
" 40         HYDROGRAPH Add Runoff "
"           4   Add Runoff "
"                    0.015     0.260     0.248     0.000"
" 51         PIPE DESIGN"
"       0.260   Current peak flow    c.m/sec"
"       0.024   Manning 'n'"
"       0.600   Diameter    metre"
"       2.500   Gradient   %"
"            Depth of flow                0.298    metre"
"            Velocity                     1.855    m/sec"
"            Pipe capacity                0.526    c.m/sec"
"            Critical depth               0.332    metre"
" 53         ROUTE    Pipe Route 12"
"      12.00      Pipe Route 12 Reach length   ( metre)"
"       0.208   X-factor <= 0.5"
"       4.851   K-lag   ( seconds)"
"       0.000   Default(0) or user spec.(1) values used"
"       0.500   X-factor <= 0.5"
"      30.000   K-lag   ( seconds)"
"       0.500   Beta weighting factor"
"       7.676   Routing time step   ( seconds)"
"           1   No. of sub-reaches"
"            Peak outflow                 0.260    c.m/sec"
"                    0.015     0.260     0.260     0.000 c.m/sec"
" 40         HYDROGRAPH Next link "
"           5   Next link "
"                    0.015     0.260     0.260     0.000"
" 52         CHANNEL DESIGN"
"       0.260   Current peak flow    c.m/sec"
"       0.035   Manning 'n'"
"          0.   Cross-section type: 0=trapezoidal; 1=general"
"       0.500   Basewidth    metre"
"       3.000   Left bank slope"
"       3.000   Right bank slope"
"       0.150   Channel depth    metre"
"      30.000   Gradient   %"
"            Depth of flow                0.111    metre"
"            Velocity                     2.826    m/sec"
"            Channel capacity             0.475    c.m/sec"
"            Critical depth               0.205    metre"
" 53         ROUTE    Channel Route 24"
"      24.00      Channel Route 24 Reach length   ( metre)"
"       0.496   X-factor <= 0.5"
"       6.369   K-lag   ( seconds)"
"       0.000   Default(0) or user spec.(1) values used"
"       0.500   X-factor <= 0.5"
"      30.000   K-lag   ( seconds)"
```

Capacity of Proposed Culvert

Peak Runoff Flow Through Proposed Culvert Under Access Road

Depth of Flow in Outlet Ditch

Velocity of Flow in Outlet Ditch

```
"        0.500   Beta weighting factor"
"        6.417   Routing time step   ( seconds)"
"            1   No. of sub-reaches"
"             Peak outflow                  0.260    c.m/sec"
"                     0.015     0.260     0.260     0.000 c.m/sec"
```

Pre-Development vs. Post Development Runoff

```
"                MIDUSS Output ------------------------------------------->"
"                MIDUSS version                          Version 2.25  rev. 473"
"                MIDUSS created                               February 7, 2010"
"           10   Units used:                                          ie METRIC"
"                Job folder:              C:\Users\GSS-CAD-LAPTOP-2\Documents"
"                Output filename:                              19-041 DA5.out"
"                Licensee name:                                           GSS"
"                Company                                       GSS Engineering"
"                Date & Time last used:              2024-08-19 at 4:38:04 PM"
" 31          TIME PARAMETERS"
"       60.000   Time Step"
"      720.000   Max. Storm length"
"     1500.000   Max. Hydrograph"
" 32          STORM Mass Curve"
"            3   Mass Curve"
"      193.000   Rainfall depth"
"      720.000   Duration"
"           41   C:\Program Files (x86)\MIDUSS\Timmins.mrd   TIMMINS (Ontario)
Regional storm"
"             Maximum intensity           43.000    mm/hr"
"             Total depth                193.000    mm"
"            6   500hyd   Hydrograph extension used in this file"
" 33          CATCHMENT 101"
"            1   Triangular SCS"
"            1   Equal length"
"            1   SCS method"
"          101   PRE"
"        0.000   % Impervious"
"        0.590   Total Area"
"       26.500   Flow length"
"       30.000   Overland Slope"
"        0.590   Pervious Area"
"       26.500   Pervious length"
"       30.000   Pervious slope"
"        0.000   Impervious Area"
"       26.500   Impervious length"
"       30.000   Impervious slope"
"        0.250   Pervious Manning 'n'"
"       70.000   Pervious SCS Curve No."
"        0.539   Pervious Runoff coefficient"
"        0.100   Pervious Ia/S coefficient"
"       10.886   Pervious Initial abstraction"
"        0.015   Impervious Manning 'n'"
"       98.000   Impervious SCS Curve No."
"        0.000   Impervious Runoff coefficient"
"        0.100   Impervious Ia/S coefficient"
"        0.518   Impervious Initial abstraction"
"                    0.041     0.000     0.000     0.000 c.m/sec"
"             Catchment 101          Pervious   Impervious Total Area "
"             Surface Area           0.590      0.000      0.590      hectare"
```

Pre-Development Drainage Area

```
"              Time of concentration  8.102      1.282      8.102      minutes"
"              Time to Centroid       485.347    0.000      485.347    minutes"
"              Rainfall depth         193.000    193.000    193.000    mm"
"              Rainfall volume        1138.70    0.00       1138.70    c.m"
"              Rainfall losses        89.024     193.000    89.024     mm"
"              Runoff depth           103.976    0.000      103.976    mm"
"              Runoff volume          613.46     0.00       613.46     c.m"
"              Runoff coefficient     0.539      0.000      0.539      "
"              Maximum flow           0.041      0.000      0.041      c.m/sec"
" 40           HYDROGRAPH Add Runoff "
"             4   Add Runoff "
"                    0.041     0.041     0.000     0.000"
" 33           CATCHMENT 102"
"             1   Triangular SCS"
"             1   Equal length"
"             1   SCS method"
"           102   POST"
"        25.000   % Impervious"
"         0.590   Total Area"
"        26.500   Flow length"
"        30.000   Overland Slope"
"         0.442   Pervious Area"
"        26.500   Pervious length"
"        30.000   Pervious slope"
"         0.147   Impervious Area"
"        26.500   Impervious length"
"        30.000   Impervious slope"
"         0.250   Pervious Manning 'n'"
"        70.000   Pervious SCS Curve No."
"         0.539   Pervious Runoff coefficient"
"         0.100   Pervious Ia/S coefficient"
"        10.886   Pervious Initial abstraction"
"         0.015   Impervious Manning 'n'"
"        98.000   Impervious SCS Curve No."
"         0.852   Impervious Runoff coefficient"
"         0.100   Impervious Ia/S coefficient"
"         0.518   Impervious Initial abstraction"
"                    0.046     0.041     0.000     0.000 c.m/sec"
"              Catchment 102          Pervious   Impervious Total Area "
"              Surface Area           0.442      0.147      0.590      hectare"
"              Time of concentration  8.102      1.282      5.747      minutes"
"              Time to Centroid       485.347    406.712    458.195    minutes"
"              Rainfall depth         193.000    193.000    193.000    mm"
"              Rainfall volume        854.02     284.67     1138.70    c.m"
"              Rainfall losses        89.024     28.491     73.891     mm"
"              Runoff depth           103.976    164.509    119.109    mm"
"              Runoff volume          460.09     242.65     702.74     c.m"
"              Runoff coefficient     0.539      0.852      0.617      "
"              Maximum flow           0.031      0.016      0.046      c.m/sec"
```

Post Development Drainage Area

Pre-Development Peak Runoff

Post Development Peak Runoff