TATHAM ENGINEERING

Enhancing our communities

Cranberry Marsh Estates

FUNCTIONAL SERVICING REPORT

Hill Ridge Homes

File 120181 | March 4, 2022

Document Control

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March 4, 2022

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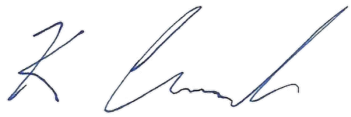	
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Issue	Date	Description
1	March 4, 2022	Draft Plan Submission

Document Contents

Tables

Appendices

Drawings

1 Introduction

Tatham Engineering Limited has been retained by Hill Ridge Homes to prepare a Functional Service Report in support of Draft Plan Approval for the proposed Cranberry Marsh Estates Residential Development in the Town of Collingwood, County of Simcoe. The primary objective of this report is to address the servicing requirements of the Town of Collingwood and Simcoe County with respect to the existing and proposed sanitary servicing, water supply and distribution, drainage and stormwater management (SWM), safe vehicular access to the site and utilities common to support a residential development (phone, hydro, cable, TV, gas, etc.)

Additional reports have been prepared in conjunction with this report in support of the proposed residential development and are summarized below.

- *Cranberry Marsh Estates Preliminary Stormwater Management Report* prepared by C.C. Tatham & Associates Ltd. (October 2011).
- *Cranberry Marsh Estates Development Traffic Review* prepared by C.C. Tatham & Associates Ltd. (August 2011).
- *Cranberry Marsh Estates Stormwater Management Report* prepared by Tatham Engineering (March 2022).
- *Cranberry Marsh Estates Traffic Impact Brief* prepared by Tatham Engineering (January 2022).

2 Development Site

2.1 SITE LOCATION & ZONING

The subject property consists of approximately 1.29 ha of undeveloped land located south of Highway 26 in the Town of Collingwood. The municipal address of the subject property is 11589 Highway 26. The subject property is bounded by Highway 26 to the north, Trafalgar Road and private residences to the west, Greentree Gardens and Emporium to the east and Cranberry Marsh to the south.

The subject property is zoned as R3-34 (H10) – *Residential Third Density Exception 34*, excluding the southern portion of the site, which is zoned as EP-11 – *Environmental Protection Exception 11*.

2.2 EXISTING CONDITIONS

A topographic survey of the subject property was completed by C.C. Tatham & Associates Ltd. in 2012. The existing grading of the 170 m deep segment of land fronting Highway 26 generally slopes from the south to the north at an average gradient of 0.6%, feeding an existing interceptor ditch, ultimately discharging onto the roadside ditch adjacent to Highway 26. The remainder of the subject property generally slopes from the north to south at an average slope of 0.3%, discharging into the Cranberry Marsh. Refer to the Pre-Development Drainage Plan (DP01) for details on existing drainage areas.

The site is currently vacant, and primarily tree covered with an environmentally protected marsh area at the south end of the property.

2.3 SUBSURFACE CONDITIONS

A geotechnical investigation, submitted under separate cover, completed by Peto MacCallum Ltd. dated January 2022. Fieldwork was conducted on November 22, 2021, consisting of four boreholes. The boreholes advanced to auger refusal, 3.4 m to 3.7 m below existing ground surface. Subsurface conditions are as follows:

- 50 mm to 200 mm of surficial topsoil;
- Borehole 1 showed a 650 mm layer of silt that was found to be very moist;
- Boreholes 2 - 4 showed a 0.5 m to 1.3 m layer of loose sand with trace amounts of silt and organics. The sand was found to be wet;
- A major till deposit extends below the silt or sand layers to the termination of the boreholes at 3.4 m for Borehole 3, and 3.7 m for Boreholes 1, 2 and 4. The till matrix varied from a silt

and sand with trace gravel and trace clay to a sandy silt with some gravel and trace clay. The till density was loose to very compact; and

- Auger refusal could have been due to boulders in the till or a shallow bedrock common in the area.

Groundwater was measured in the monitoring wells (Boreholes 1, 3 and 4) one month after installation (December 17, 2021). The geotechnical investigation established that the stabilized groundwater table is within 0.5 m of the ground surface.

The soil has been classified as Parkhill loam or silt loam (Type BC), as per the *Soil Survey of Simcoe County - Report No. 29 of the Ontario Soil Survey*, completed by the Ontario Department of Agriculture. This soil group has low to moderate infiltration rates when thoroughly wetted.

2.4 PROPOSED DEVELOPMENT

The proposed development features a 7.2 m private road and cul-de-sac, beginning at Highway 26 and extending 220 m towards Cranberry Marsh, followed by a turning circle and 7 parking spots. The development will feature 5 buildings fronting the private road and cul-de-sac, which will comprise of 26 freehold townhomes. The majority of lots will have 6 m frontages and are 28 m deep. The proposed development is shown on the Site Grading Plan (SG-1).

3 Water Supply & Distribution

3.1 EXISTING INFRASTRUCTURE

There is an existing 300 mm watermain running east-west on the north side of Highway 26, across from the proposed Cranberry Marsh Estates development.

The Collingwood water treatment plant has a rated capacity of 31,140 m^3/day per the Town of Collingwood 2020 Water Compliance Report. The 2019 and 2020 Water Compliance Reports showed maximum day flows of 25,576 m^3/day (82% of rated capacity) and 24,576 m^3/day (79% of rated capacity), respectively. Due to the lack of water supply that could sustain current growth, the Town has recently passed an Interim Control Bylaw (ICBL) that effectively limits the number of new connections for up to one year, while solutions are considered.

The Town is in the process of initiating an environmental assessment for expanding the treatment plant's rated capacity which they estimate will be online in 5 years.

3.2 PROPOSED INFRASTRUCTURE

The proposed water strategy for the Cranberry Marsh Estates development includes tapping into the existing 300 mm diameter watermain on the north side of Highway 26 and extending a 150 mm diameter PVC watermain south into the proposed development. Water service connections will extend into each townhouse unit and will be metered separately. In total, 261 m of the proposed 150 mm diameter watermain will run underneath the internal road along the west side. At the cul-de-sac, the watermain will terminate at a fire hydrant 16.8 m south of the south-west corner of Block 5. Additional fire hydrants have been proposed between Blocks 1 and 2 and Blocks 3 and 4. The proposed units fronting the internal road will have new service connections extended from the 150 mm diameter watermain. The proposed water system can be seen in the Site Servicing Plan and Profile (PP-1).

3.3 WATER DEMANDS ASSESSMENT

3.3.1 Water Supply Demands

Water supply demands for the proposed development have been calculated based on the Ministry of the Environment Conservation and Parks (MECP) guidelines and the Town of Collingwood design standards as noted below:

Table 1: Water Supply Design Criteria

DESIGN CRITERIA		SOURCE
Residential Population	2.40 persons/unit	See calculation below
Average Daily Demand Per Person	450 L/person/day	Town of Collingwood
Maximum Daily Demand Factor	7.7	MECP
Peak Hourly Demand Factor	11.5	MECP
Minimum Fire Flow	38 L/s	Town of Collingwood
Allowable Pressure Ranges		
Maximum Pressure	550 kPa (80 psi)	Town of Collingwood
Peak Hour Minimum Pressure	275 kPa (40 psi)	Town of Collingwood
Maximum Day Plus Fire Suppression Minimum Pressure	**140 kPa (20 psi)**	**Town of Collingwood**

A population density of 2.40 persons/unit was calculated from the Town of Collingwood Official Plan Section 2.5.7.2 which notes "A minimum density target of 50 residents and/or jobs per hectare within designated Greenfield areas" (50 residents/ha x 1.29 ha/26 units = 2.5 residents/unit).

Note that peaking factors were interpolated from Table 3-3 of the *Design Guidelines for Drinking-Water Systems* (MOE 2008) based on the design population.

Water demands have been based on 26 units and are calculated as follows:

Design Population (P) = 50 persons/ha x 1.29 ha

= 64.5 persons

Average day demand (ADD) = P x Average daily demand per person

= 62.5 persons x 450 L/day

= 29,025 L/day

= 29.0 m^3/day (0.34 L/s)

Peak Hour = ADD x Peak hourly factor

= 29.0 m^3/day x 11.5

= 333.8 m^3/day (3.86 L/s)

Maximum day demand (MDD) = ADD x Maximum daily factor

= 29.0 m^3/day x 7.7

= 223.5 m^3/day (2.59 L/s)

Maximum day plus fire flow = MDD + Minimum fire flow

= 2.6 L/s + 38 L/s

= 40.6 L/s

3.3.2 Water Supply Demands

The proposed 150 mm diameter watermain has sufficient capacity for the required peak hour demand. Refer to Appendix B for Watermain Capacity Calculations.

As outlined above, the Town of Collingwood drinking water treatment plant has a rated capacity of 31,140 m^3/day and the maximum day flow in 2020 was 24,576 m^3/day. The proposed maximum day flow of 223.5 m^3/day for the proposed Cranberry Marsh Estates Development could be accommodated by the treatment plant (excess capacity is 6,564 m^3/day).

The Town of Collingwood operates a hydraulic model of their water distribution system. We request that the Town add the proposed development to their model and confirm that the above demand flows can be achieved within the applicable pressure ranges as outlined above.

4 Sanitary Sewage Collection & Conveyance System

4.1 EXISTING INFRASTRUCTURE

An existing 750 mm diameter sanitary sewer is located north of the proposed property, flowing west to east under the north side of Highway 26. Drawings have indicated that there is a 200 mm diameter sanitary sewer stub that services the subject property, however it's existence will require confirmation. The ultimate discharge location is the Collingwood Wastewater Treatment Plant (WWTP).

In reviewing the Collingwood Wastewater Treatment Plant Annual Compliance Reports for 2019 and 2020, the plant has an average day flow rated capacity of 24,548 m^3/day and a maximum day flow rate capacity of 60,900 m^3/day. The 2019 reports show an average day flow and maximum day flow of 16,202 m^3/day and 33,460 m^3/day respectively, whereas the 2020 reports show an average day flow and maximum day flow of 18,854 m^3/day and 48,370 m^3/day respectively. Taking the more conservative 2020 numbers, the plant is operating at 74% of its average day flow rated capacity and 79% of its maximum day flow rated capacity. The available average day and maximum day surplus capacities are 5,694 m^3 and 12,530 m^3 respectively.

4.2 PROPOSED INFRASTRUCTURE

Sanitary discharge from the proposed units fronting the internal road will drain to the existing sanitary sewer via 226 m of 200 mm diameter PVC sanitary sewer that originates north of the cul-de-sac, and flows north, where it will connect to the existing 750 mm diameter sanitary sewer on Highway 26. A maintenance structure will be provided at the property line. The connection point to the trunk sewer was investigated and it was confirmed that the existing sanitary sewer is at sufficient depth for a sanitary service connection to the proposed buildings.

The proposed sanitary sewer system can be seen of the Site Servicing Plan and Profile (PP-1).

4.3 SANITARY DEMANDS ASSESSMENT

4.3.1 Sewage Demands

Design Population (P)	= 50 persons/ha x 1.29 ha
	= 64.5 persons
Infiltration (I)	= Infiltration Flow x Site Area
	= 0.23 L/ha/s x 1.29 ha

= 0.30 L/s = 25,635 L/day = 25.6 m^3/day

Average day flow (ADF) = P x Average daily demand per person + I

= 64.5 persons x 450 L/day + 25,635 L/day

= 29,025 L/day + 25,635 L/day

= 54,660 L/day

= 54.7 m^3/day = 0.63 L/s

Maximum Day Flow = (ADF-I) * PF + I

= (54.7 m^3/day – 25.6 m^3/day) x 7.7 + 25.6 m^3/day

= 249.7 m^3/day = 249,700 L/day= 2.9 L/s

Note that the maximum day peaking factor (PF) of 7.7 was derived as outlined in Section 3.3.1 of this report.

4.3.2 Sewage Capacity

As noted above, the Collingwood WWTP has average day and maximum day available capacities of 24,548 m^3/day and 60,900 m^3/day respectively whereas the proposed average day and maximum day flows for the proposed development are 54.7 m^3/day and 249.7 m^3/day respectively (average day and maximum day surplus capacities are 5,694 m^3 and 12,530 m^3 respectively). Therefore, the Collingwood WWTP can accommodate the increased sanitary flows from the Cranberry Marsh Estates Development.

The Town of Collingwood operates a hydraulic model of their sanitary sewer system. We request that the Town add the proposed development to their model and confirm that the downstream sewer system can accommodate the proposed development.

5 Stormwater Management

A separate Stormwater Management (SWM) Report has been prepared by Tatham Engineering to address drainage and stormwater management requirements for the development. A summary of the SWM servicing strategy is as follows:

- Enhanced water quality protection will be provided by treatment swale that will retain first flush runoff up to the 25 mm storm event to remove suspended solids before draining into the Cranberry Marsh. Runoff from events greater than the 25 mm storm will bypass the treatment swale and be conveyed directly to the Cranberry Marsh. Runoff directed towards the Highway 26 roadside ditch is considered clean and does not require quality treatment.
- Proposed condition peak flow rates discharging into the Highway 26 roadside ditch north of the site will be controlled to existing condition rates for all storms up to and including the 100-year event to ensure no adverse impacts for downstream landowners. As the Cranberry Marsh is the ultimate receiving waterbody for site drainage to the south, quantity control is not required.
- Emergency overland flow routes will be conveyed towards the cul-de-sac, which will convey peak flows to various low points between designated crosswalks. The maximum ponding depth will not exceed 150 mm before spilling over the east road curb, and flowing overland towards the treatment swale, and ultimately into the Cranberry Marsh.
- Siltation and erosion controls will be implemented for all construction activities, including topsoil stripping, material stockpiling, road construction and grading operations as per ESC01 and ESC02.

6 Transportation

A Traffic Impact Brief has been completed by Tatham Engineering under separate cover. A summary of the conclusions and recommendations are as follows:

- There is adequate spacing between the site access and to the immediate east the neighbouring Greentree Gardens and Emporium access.
- A left turn lane currently exists on Highway 26 to serve the site and thus there are no further requirements in this regard.
- The available sight lines on Highway 26 to the east and west of the site access exceed the minimum stopping sight distance requirement for a design speed of 70 km/h.
- Given the limited traffic volume to be generated by the development there will not be any significant operational impacts on the operations of Highway 26 and the surrounding lands. The operational assessment of the site access indicates that the intersection will experience adequate levels of service and average traffic delays for the northbound movements exiting the site through the 2031 horizon year. Therefore, no operational improvements are required.

7 Utilities

7.1 ELECTRICAL SERVICES

Tatham Engineering will be reviewing the proposed development from an electrical servicing standpoint and will confirm if external plant upgrades are required to service the site following submission of an electrical distribution plan.

7.2 GAS SERVICES

Enbridge Gas was contacted about their existing gas mains in the area and their ability to service the proposed development. Enbridge has previously noted that there is an ongoing pressure increase project along the Barrie to Collingwood line is complete. This project is expected to be completed in the fall of 2022.

Tatham Engineering will be reviewing the proposed development and providing gas load estimations under a separate cover.

7.3 TELEPHONE AND INTERNET SERVICES

Bell has been contacted regarding available services in the area.

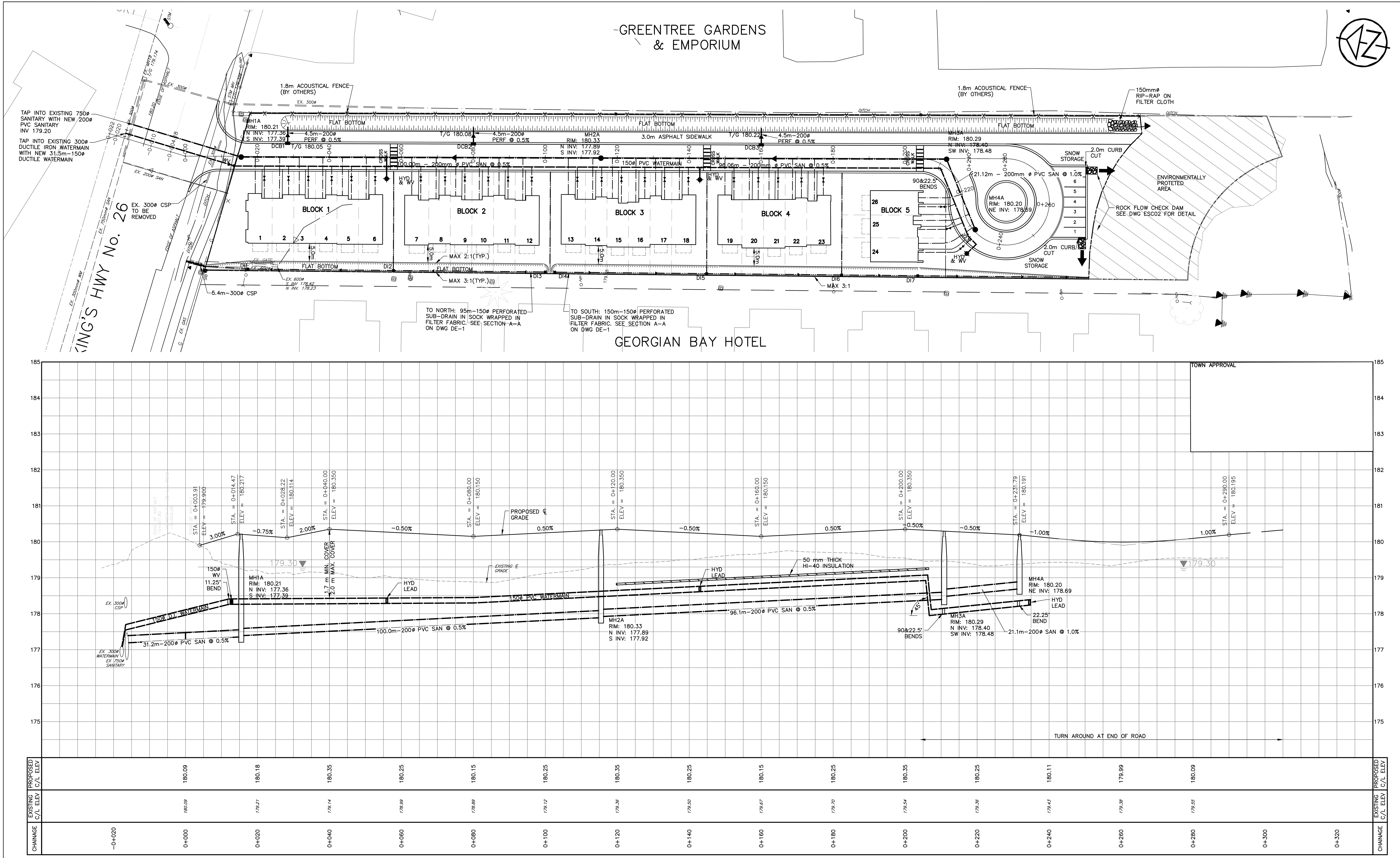
Rogers has been contacted regarding available services in the area. They have indicated that Roger's has infrastructure along the section of Highway 26 adjacent to the proposed site and would be able to service the site.

8 Summary

As outlined above, existing infrastructure surrounding the subject property can adequately service the development for sanitary sewage, potable water, hydro, natural gas, and telecommunications. A Stormwater Management Brief submitted under separate cover confirms that applicable runoff, quantity, quality, and erosion targets will be met. Additionally, a Traffic Impact Brief submitted under separate cover confirms that the proposed development will not adversely affect the existing surrounding road network. A summary of the servicing strategy is as follows:

- Potable water will be provided by connecting into the existing 300 mm diameter watermain on the north side of Highway 26 with a proposed 150 mm PVC watermain that extends into the subject site. The proposed watermain has sufficient capacity for the required peak hour demand.
- Fire hydrants will be required between Blocks 1 and 2, and between Blocks 3 and 4. The proposed watermain will terminate 16.8m south of the south-west corner of Block 5 with an additional fire hydrant.
- Sanitary flows from the proposed development will drain to the existing municipal 750 mm diameter sanitary sewer along Highway 26. A 200mm sanitary sewer and maintenance structure at the property line is proposed to service the development.
- Tatham Engineering will review electrical servicing and confirm if external plant upgrades are required to service the site.
- Tatham Engineering will be reviewing the proposed development and providing gas load estimations under a separate cover.
- Rogers has confirmed telephone and internet infrastructure along the section of Highway 26 adjacent to the proposed site and will be able to service the site.

Additional details related to the various servicing components will be provided at the detailed design stage. Detailed drawings will be completed for approval by the Town and relevant regulatory agencies to clear the conditions of Draft Plan Approval and associated Site Plan Agreement.



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LICENSED PROFESSIONAL ENGINEER 2022.03.04 D. M. CASULLO PROVINCE OF ONTARIO

CRANBERRY MARSH ESTATES
TOWN OF COLLINGWOOD

TATHAM ENGINEERING

SITE SERVICING PLAN AND PROFILE

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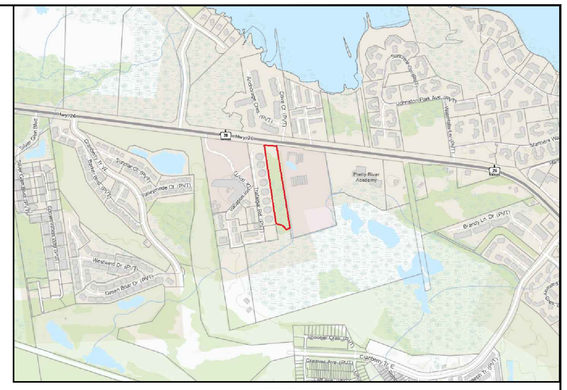

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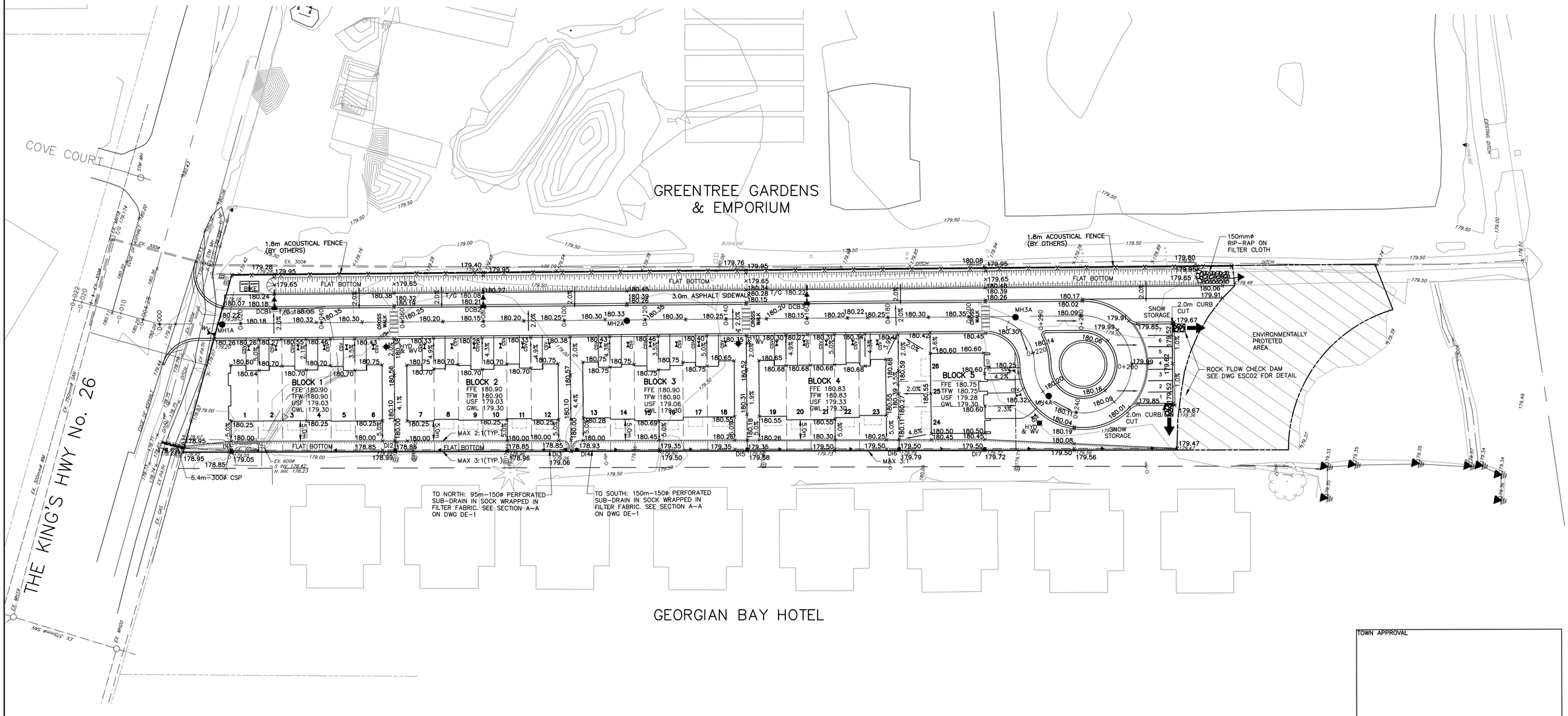

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2022.03.04
D. M. CASULO
PROVINCE OF ONTARIO

CRANBERRY MARSH ESTATES

TOWN OF COLLINGWOOD

TATHAM ENGINEERING

SITE GRADING PLAN

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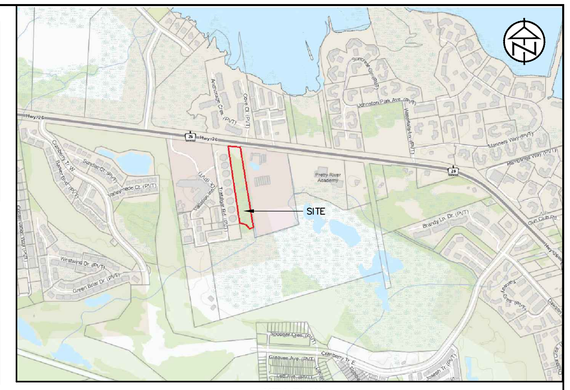
- EXISTING DITCH FLOW DIRECTION

TOWN APPROVAL



KEY PLAN

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2022.03.04
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PROVINCE OF ONTARIO

CRANBERRY MARSH ESTATES
TOWN OF COLLINGWOOD

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PRE-DEVELOPMENT DRAINAGE PLAN

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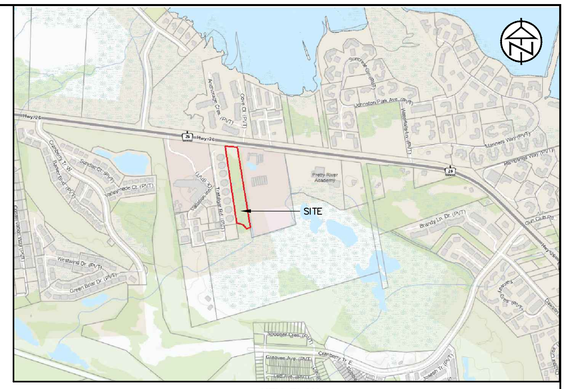
- PROPOSED SWALE FLOW DIRECTION



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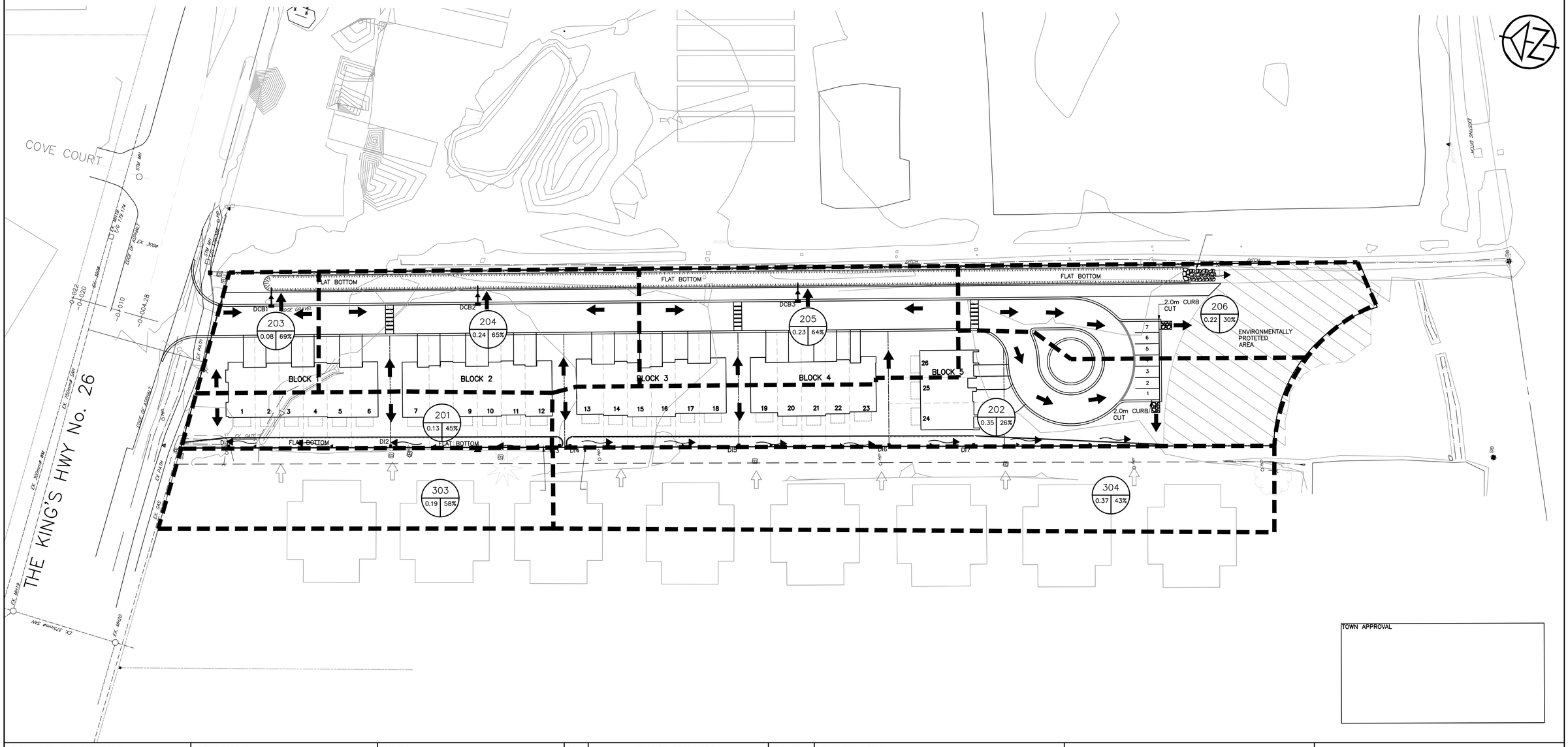

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CRANBERRY MARSH ESTATES
TOWN OF COLLINGWOOD

POST-DEVELOPMENT DRAINAGE PLAN

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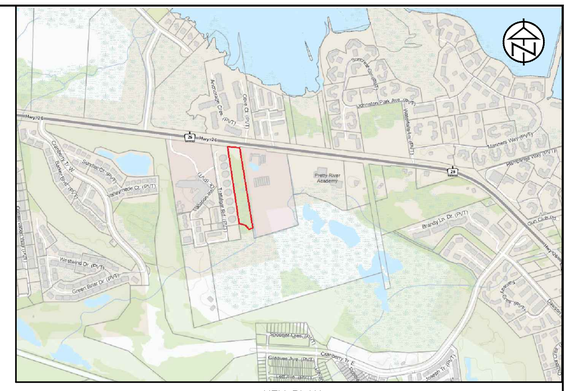
GREENTREE GARDENS & EMPORIUM



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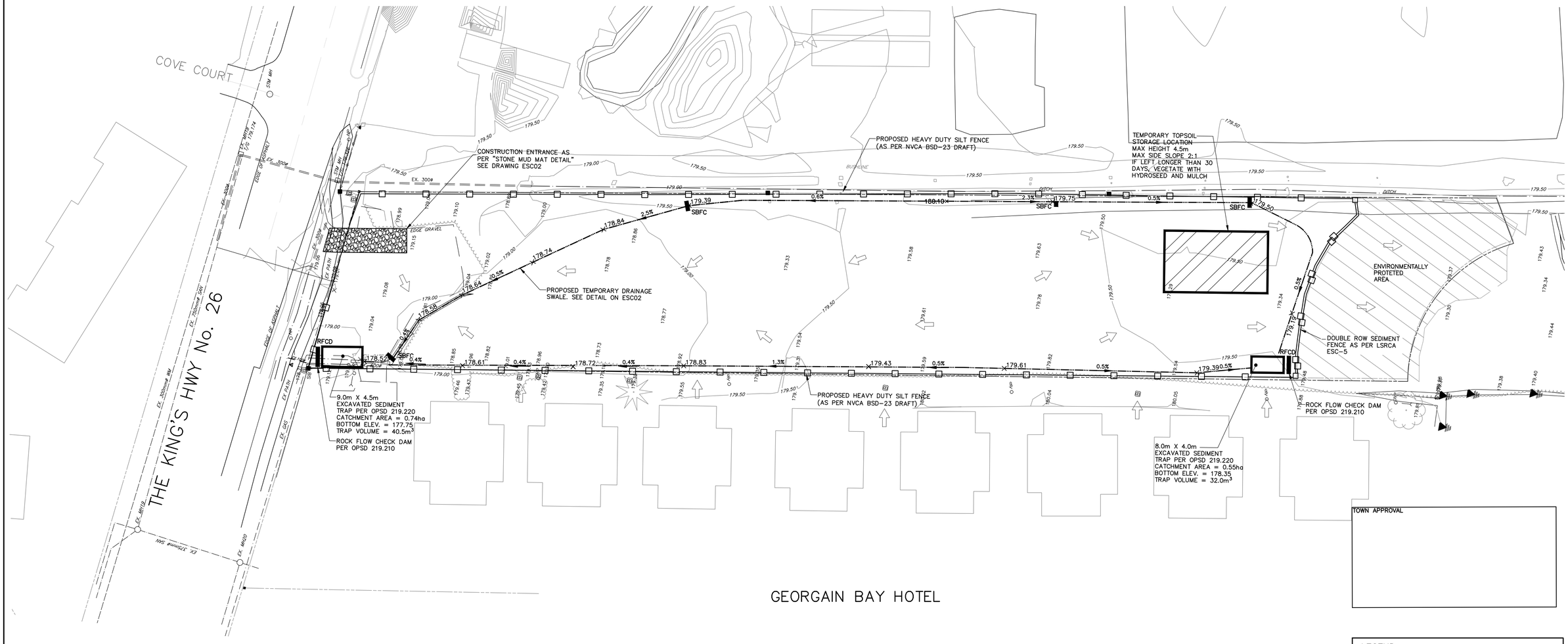

TOWN APPROVAL

LEGEND

- PROPOSED STRAW BALE FLOW CHECK (AS PER OPSD 219.210) — RFCD
- PROPOSED ROCK FLOW CHECK (AS PER OPSD 219.180) — SBFC
- PROPOSED HEAVY DUTY SILT FENCE (AS PER NVCA BSD-23 DRAFT)
- PROPOSED SWALE / DITCH — 0.5%
- EXISTING OVERLAND FLOW

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CRANBERRY MARSH ESTATES
TOWN OF COLLINGWOOD

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EROSION AND SEDIMENT CONTROL PLAN

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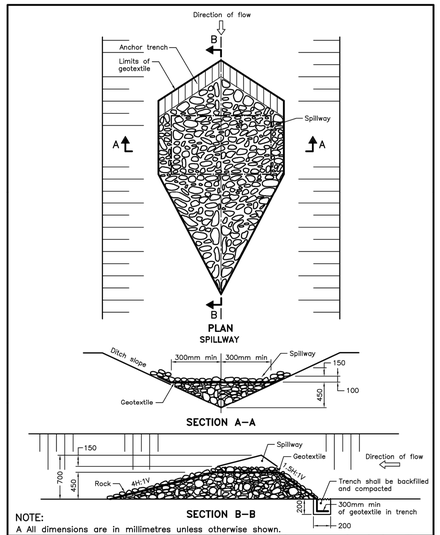
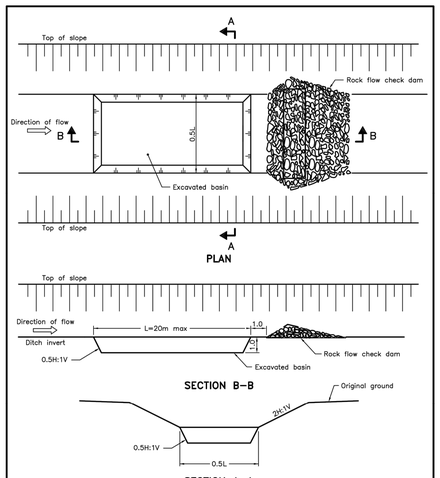
Drawing Name: 120181 – ESC01.dwg, Plotted: Mar 04, 2022



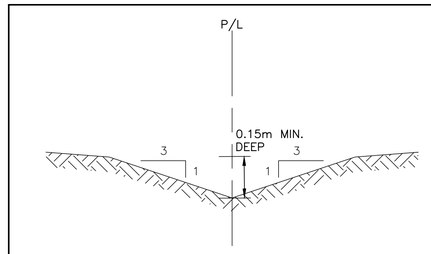
NOTE:
A All dimensions are in millimetres unless otherwise shown.

ONTARIO PROVINCIAL STANDARD DRAWING	Nov 2015	Rev 2
TEMPORARY ROCK FLOW CHECK DAM V–DITCH		OPSD 219.210



NOTES:
A Ditch cross–section upstream or downstream of sediment trap may be flat bottom or V–shaped. Flat bottom shown.
B This OPSD shall be read in conjuction with OPSD 219.210 or 219.211.
C All dimensions are in metres unless otherwise shown.

ONTARIO PROVINCIAL STANDARD DRAWING	Nov 2015	Rev 2
SEDIMENT TRAP IN DITCH		OPSD 219.220



TEMPORARY SWALE DETAIL
NTS

STONE SIZE
THE STONE PAD SHALL BE A MIN. 450mm THICK. USE 50mmø STONE OR RECLAIMED CONCRETE EQUIVALENT FOR FIRST 10m FROM ADJACENT ROAD & 150mmø STONE FOR REMAINDER OF STONE PAD.

LENGTH
AS REQUIRED BUT NOT LESS THAN 20m.

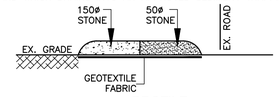
WIDTH
10m MIN. BUT NOT LESS THAN THE WIDTH AT POINTS WHERE INGRESS AND EGRESS OCCURS.

GEOTEXTILE FABRIC
TERRAFIX 270R OR APPROVED EQUIVALENT TO BE PLACED OVER THE ENTIRE AREA PRIOR TO PLACING STONE.

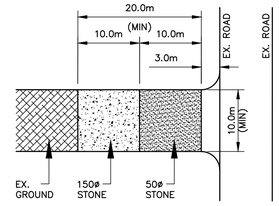
SURFACE WATER
ALL SURFACE WATER FLOWING OR DIRECTED TOWARD CONSTRUCTION ENTRANCES SHALL BE PIPED ACROSS THE ENTRANCE.

MAINTENANCE
THE CONTRACTOR SHALL MAINTAIN THE ENTRANCE IN A CONDITION WHICH WILL PREVENT TRACKING OR FLOWING OF SEDIMENT ONTO PUBLIC RIGHT–OF–WAY. THIS MAY REQUIRE PERIODIC DRESSING WITH ADDITIONAL STONE AS CONDITIONS DEMAND AND REPAIR AND/OR CLEANOUT OF ANY MEASURES USED TO TRAP SEDIMENT. ALL SEDIMENT SPILLED, DROPPED, WASHED OR TRACKED ONTO PUBLIC RIGHT–OF–WAY MUST BE REMOVED IMMEDIATELY BY THE CONTRACTOR. UPON OBSERVATION OF CONTINUOUS MUD TRACKING ONTO ADJACENT STREETS, THE STONE MAT IS TO BE FULLY REPLACED. INSPECTION AND REQUIRED MAINTENANCE AFTER EACH RAIN EVENT SHALL BE PROVIDED BY THE CONTRACTOR.

WASHING
WHEELS SHALL BE CLEANED TO REMOVE SEDIMENT PRIOR TO ENTRANCE ONTO PUBLIC RIGHT–OF–WAY. WHEN WASHING IS REQUIRED, IT SHALL BE DONE ON AN AREA STABILIZED WITH STONE AND WHICH DRAINS INTO AN APPROVED SEDIMENT TRAPPING DEVICE.



PROFILE



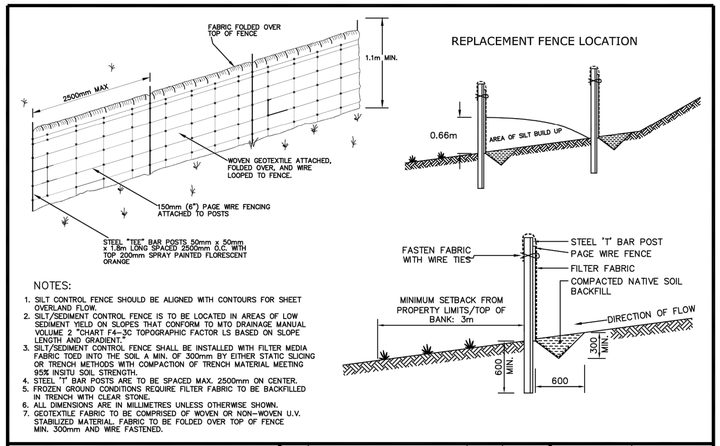
PLAN

STONE MUD MAT DETAIL
NTS

NOTES

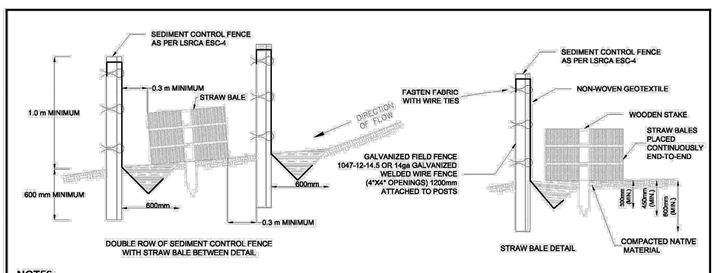
1. ALL SEDIMENT AND EROSION CONTROL MEASURES SHALL BE INSTALLED PRIOR TO THE COMMENCEMENT OF CONSTRUCTION. SEDIMENT AND EROSION CONTROL MEASURES THAT ARE DESIGNED TO CONTROL RUNOFF FROM SPECIFIC AREAS MUST BE INSTALLED PRIOR TO ANY DISTURBANCE OF THAT PART OF THE SITE. THE LOCATION OF ALL SILTATION AND EROSION CONTROL WORKS TO BE REVIEWED ON SITE AND MAY BE REVISED AS DIRECTED BY THE ENGINEER.
2. THE CONTRACTOR MAY CONSIDER ALTERNATIVE SEDIMENT AND EROSION CONTROL MEASURES. SUCH MEASURES MUST BE PRESENTED IN WRITING TO THE ENGINEER FOR APPROVAL OF THE TOWN AND NOTTAWASAGA VALLEY CONSERVATION AUTHORITY.
3. THE CONTRACTOR SHALL HAVE MATERIALS AVAILABLE ON SITE TO REPAIR SEDIMENT AND EROSION CONTROL MEASURES IN THE EVENT OF UNFORESEEN CONDITIONS SUCH AS HIGH WATER, EXTREME RAINFALL EVENTS, ETC.
4. ALL EROSION AND SEDIMENT CONTROL MEASURES MUST BE INSPECTED, CLEANED AND MAINTAINED BY THE CONTRACTOR AFTER EACH STORM EVENT. ALL WORKS WILL BE INSPECTED BY THE ENGINEER BI–WEEKLY AND AFTER EACH MAJOR STORM EVENT.
5. CONSTRUCTION OF ALL SILTATION AND EROSION CONTROL WORK IS TO BE IN ACCORDANCE WITH THE FOLLOWING STEPS:
   - 5.1. INSTALL NEW OR MAINTAIN EXISTING STONE MUD MAT AS PER DETAIL.
   - 5.2. INSTALL SILT FENCE AS PER NVCA STANDARDS (BSD–23).
   - 5.3. INSTALL TEMPORARY CATCH BASIN SEDIMENT TRAPS ON ALL NEW AND EXISTING CATCH BASINS. SEDIMENT TRAPS TO BE RECTANGULAR BY LAYFIELD OR APPROVED EQUAL. ALL CATCH BASINS TO REMAIN SCREENED UNTIL BASE COURSE ASPHALT IS PLACED AND LOT GRADING IS COMPLETE.
6. ALL CONSTRUCTION VEHICLES TO ACCESS SITE USING THE DESIGNATED CONSTRUCTION ACCESS POINTS.
7. EROSION AND SEDIMENT CONTROL MEASURES TO BE REMOVED BY THE CONTRACTOR ONCE GROUND COVER IS ESTABLISHED AND LANDSCAPING IS COMPLETE AND APPROVED BY THE ENGINEER.
8. STOCKPILE LOCATIONS ARE TO BE APPROVED BY THE ENGINEER.
9. PROVIDE FENCE OR APPROVED EQUAL ACROSS ALL CONSTRUCTION ACCESSES DURING PERIODS OF INACTIVITY.
10. CONSTRUCTION AREAS THAT EXCEED 30 DAYS OF INACTIVITY SHALL BE STABILIZED BY SEEDING IN ACCORDANCE WITH THE NOTTAWASAGA VALLEY CONSERVATION AUTHORITY'S TECHNICAL DESIGN GUIDELINES, STANDARDS AND POLICIES FOR SILTATION AND EROSION CONTROL. CONSTRUCTION CONTROL REQUIREMENTS, NOTES 1, 2 AND 3 AND/OR AS DIRECTED BY THE TOWN. THIS IS TO INCLUDE STOCKPILES OF FILL AND TOPSOIL.

TOWN APPROVAL



NOTES:
1. SILT CONTROL FENCE SHOULD BE ALIGNED WITH CONTOURS FOR SHEET OVERLAND FLOW.
2. SILT/SEDIMENT CONTROL FENCE IS TO BE LOCATED IN AREAS OF LOW SEDIMENT YIELD ON SLOPES THAT CONFORM TO MTO DRAINAGE MANUAL VOLUME 2 "CHART F4–3C TOPOGRAPHIC FACTOR LS BASED ON SLOPE LENGTH AND GRADIENT."
3. SILT/SEDIMENT CONTROL FENCE SHALL BE INSTALLED WITH FILTER MEDIA FABRIC TOED INTO THE SOIL A MIN. OF 300mm BY EITHER STATIC SLICING OR TRENCH METHODS WITH COMPACTION OF TRENCH MATERIAL MEETING 95% INSITU SOIL STRENGTH.
4. STEEL "I" BAR POSTS ARE TO BE SPACED MAX. 2500mm ON CENTER.
5. FROZEN GROUND CONDITIONS REQUIRE FILTER FABRIC TO BE BACKFILLED IN TRENCH WITH CLEAR STONE.
6. ALL DIMENSIONS ARE IN MILLIMETRES UNLESS OTHERWISE SHOWN.
7. GEOTEXTILE FABRIC TO BE COMPRISED OF WOVEN OR NON–WOVEN U.V. STABILIZED MATERIAL. FABRIC TO BE FOLDED OVER TOP OF FENCE MIN. 300mm AND WIRE FASTENED.

Nottawasaga Valley Conservation Authority					APR'D:	DATE: 03.03.06
TYPICAL DETAIL OF SILT/SEDIMENT FENCE					DRAWN: A.S.C	SCALE: NTS
	NO.	REVISION	APR'D	DATE	BSD-23 DRAFT	



NOTES:
1. SEDIMENT CONTROL FENCE SHOULD BE ALIGNED WITH CONTOURS FOR SHEET OVERLAND FLOW.
2. SEDIMENT CONTROL FENCE IS TO BE LOCATED IN AREAS OF LOW SEDIMENT YIELD ON SLOPES THAT CONFORM TO MTO DRAINAGE MANUAL VOLUME 2 CHART F4-3C TOPOGRAPHIC FACTOR LS BASED ON SLOPE LENGTH AND GRADIENT.
3. SEDIMENT CONTROL FENCE SHALL BE INSTALLED WITH FILTER MEDIA FABRIC TIED INTO THE SOIL A MINIMUM OF 300 mm BY EITHER STATIC SLICING OR TRENCH METHODS WITH COMPACTION OF TRENCH MATERIAL MEETING 95% STANDARD PROCTOR MAXIMUM DRY DENSITY.
4. STEEL "I" BAR POSTS ARE TO BE SPACED A MAXIMUM DISTANCE OF 2000 mm ON CENTER.
5. STRAW BALES TO BE PLACED END-TO-END CONTINUOUSLY BETWEEN SEDIMENT CONTROL FENCES.
6. FROZEN GROUND CONDITIONS REQUIRE FILTER FABRIC TO BE BACKFILLED IN TRENCH WITH CLEAR STONE.
7. GEOTEXTILE FABRIC TO BE COMPRISED OF NON-WOVEN U.V. STABILIZED MATERIAL FABRIC TO BE FOLDED OVER TOP OF FENCE A MINIMUM OF 300 mm AND WIRE FASTENED.
8. CONSTRUCTION OPERATIONS SHALL BE CARRIED OUT IN SUCH A MANNER THAT EROSION AND WATER POLLUTION IS MINIMIZED.
9. ALL DIMENSIONS IN MILLIMETRES UNLESS OTHERWISE SHOWN.

NO.	REVISION	DATE
1	SWM GUIDELINES UPDATE	06.2016

DOUBLE ROW SEDIMENT CONTROL FENCE

DATE: 06.2016
SCALE: NTS
LSRCA ESC-5

DISCLAIMER AND COPYRIGHT

CONTRACTOR MUST VERIFY ALL DIMENSIONS AND BE RESPONSIBLE FOR SAME. ANY DISCREPANCIES MUST BE REPORTED TO THE ENGINEER BEFORE COMMENCING WORK. DRAWINGS ARE NOT TO BE SCALED.

BENCHMARKS

ELEVATIONS SHOWN ON THIS PLAN ARE RELATED TO GEODETIC DATUM AND ARE DERIVED FROM BENCH MARK No. 0011972U311 HAVING A PUBLISHED ELEVATION OF 181.032 METRES.

NOTES

LEGAL SURVEY INFORMATION AND LOT DIMENSIONS SHOWN ON THIS PLAN ARE TAKEN FROM A SURVEY PLAN PREPARED BY C.C. TATHAM & ASSOCIATES LTD, DATED, 2012 WHICH MAY NOT BE FINAL AND ARE NOT GUARANTEED.

No.	REVISION DESCRIPTION	DATE
1.	1ST SUBMISSION	03/22

ENGINEER STAMP

LICENSED PROFESSIONAL ENGINEER
2022.03.04
D. M. CASULLO
PROVINCE OF ONTARIO

CRANBERRY MARSH ESTATES
TOWN OF COLLINGWOOD

EROSION AND SEDIMENT CONTROL DETAILS

TATHAM ENGINEERING

DESIGN: KG	FILE: 120181	DWG: ESC02
DRAWN: KH/SBU	DATE: MAR 2022	
CHECK: DC	SCALE: 1:500	

Drawing Name: 120181 – ESC01.dwg, Plotted: Mar 04, 2022

Appendix A:
Sanitary Design Sheet

TATHAM ENGINEERING

Sanitary Sewer Design Sheet

Version Number: 1 **Version Date:** March 4, 2022

Project Information

Cranberry Marsh Estates	120181

Drawing Reference

SAN01	March 04-22

Prepared By

Kyle Gowanlock	March 04-22

Reviewed By

Doris Casullo	March 04-22

Municipality

Town of Collingwood

Population Density

Capita per Unit	Low	Medium	High
	-	2.50	-

Infiltration

Infiltration (L/s/ha)	0.23

Flow

Development Type	Average (L/cap/day)	Peaking Factor
Residential	450	Harmon
Development Type	**Average (L/ha/day)**	**Peaking Factor**
Institution	-	-
Commercial	-	-
Industrial High Intensity	-	-
Industrial Low Intensity	-	-

Manning's Coefficient

Pipe Material	Value
Concrete	0.013
PVC	0.013
Applied	0.013

Engineer Stamp

Street Name	Area Label/ID	Upstream Maintenance Hole	Downstream Maintenance Hole	Development Type	Population Density	Number of Units	Population (cap)	Accumulated Population (cap)	Peaking Factor	Area (ha)	Cumulative Area (ha)	Average Flow (L/s)			Peak Flow (L/s)			Proposed Sanitary Sewer							
												Development	Infiltration	Total	Development	Infiltration	Total	Sewer Length (m)	Sewer Slope (%)	Actual Sewer Diameter (mm)	Full Flow Velocity (m/s)	Full Flow Capacity (L/s)	Actual Velocity (m/s)	Calculated Sewer Diameter (mm)	Percentage of Full Flow Capacity (%)
Street A	101	MH4A	MH3A	Residential	Med.	3	7.5	7.5	4.43	0.25	0.25	0.04	0.06	0.10	0.17	0.06	0.23	21.1	1.0%	200	1.04	32.80	0.31	31	0.7%
Street A	102	MH3A	MH2A	Residential	Med.	9	22.5	30.0	4.35	0.37	0.62	0.16	0.14	0.30	0.68	0.14	0.83	96.1	0.5%	200	0.74	23.19	0.34	57	3.6%
Street A	103	MH2A	MH1A	Residential	Med.	14	35.0	65.0	4.29	0.44	1.06	0.34	0.24	0.58	1.47	0.24	1.71	100.0	0.5%	200	0.74	23.19	0.42	75	7.4%
Street A	104	MH1A	EX SAN	Residential	Med.	0	0.0	65.0	4.29	0.03	1.09	0.34	0.25	0.59	1.47	0.25	1.72	31.2	0.5%	200	0.74	23.19	0.42	75	7.4%

I:\2020 Projects\120181 - Hill Ridge Homes\Design\Design Sheets\Sewer Design Sheet - Sanitary1.xlsx

Appendix B:
Watermain Capacity Calculations

TATHAM ENGINEERING	**Project:**	Cranberry Marsh Estates
	File No.:	121108
	Date:	March 2022
	Design:	KG
	Checked:	DC
	Revision:	

Cranberry Marsh Estates

Calculation of Water Flow Rates for Different Pipe Sizes
(Hazen Williams Formula - S.I. units)

Pipe Material: PVC Hazen Williams Coefficient, **C** = 150

Pressure drop over the pipe length, DP = 275 kN/m^2

Pipe Length (m)	**Water Flow Rate (m^3/hr) Pipe Diameter (mm)**									
	12	20	25	40	50	65	75	100	130	**150**
261	0.4	1.5	2.8	9.5	17.1	34.0	49.6	105.7	210.6	**306.9**

Flow rate provided by 150 mm dia. water service = 306.9 m^3/hr
= 85.25 L/s

Flow rate required (from peak flow water supply calculations)

Maximum Daily Demand	=	29025	L/d
Peak Hour Factor	=	11.5	
Peak Hour Demand	**=**	**3.86**	**L/s**

Hazen Williams Equation as used in this spreadsheet:

$$Q = (3.763 \times 10^{-6})\, C\, D^{2.63} (DP/L)^{0.54}$$

where Q is the water flow rate in m^3/hr
D is the pipe diameter in mm
L is the pipe length in m
DP is the pressure difference across pipe length L in kN/m^2