

#2052 County Road 18
Stormwater Brief
March 06th, 2024

Prepared by:

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Project Number: 2136509

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1 INTRODUCTION

The Greer Galloway Group has been retained to complete a stormwater brief for the proposed development. The subject property is located at #2052 County Road 18, Bloomfield in Prince Edward County. The proposed development concept includes the construction of a 14 unit motel building, a 2-storey residence, a concrete walkway to provide access to the motel units and building, regrading and paving of the asphalt driveway and asphalt parking lot. This brief has been prepared in consideration of stormwater management to support planning and site plan design documents.

2 GEOTECHNICAL BACKGROUND

A desktop review of the site soils was assessed using the Ministry of Agriculture online database and GIS viewer 'AgMaps'. It was found that the existing soil condition is described as 'Brighton Sandy Loam'. The soil is classified as Hydrologic Soils Group 'B' and is considered to have good drainage.

3 EXISTING CONDITIONS

The property has an area of approximately 0.32 ha. The existing site consists of a commercial building that has had a number of uses over time, a residential building, and a parking lot with driveway access on County Road 18. It is to be noted that the existing commercial building will be removed as a part of the construction.

A topographic survey was completed to assess the existing grading of the subject site. Based upon the surveyed conditions, the site is generally flat, the highpoint of the property is located at the entrance of the commercial building and it appears to sheet flow to the sides of the property and ultimately to the field adjacent to the site on north, east and west side of the property. It is to be noted that there is no municipal ditch in the vicinity of the property.

A pre-development stormwater model was created for the existing site and has been identified as Parcel 100 in the attached figure. The drainage of the existing site has been assessed and summarized accordingly. Enclosed in Appendix 'A' the design sheet titled 'Storm Flow Calculations – Predevelopment' can be referred to for calculations of the 1 in 5-year and 1 in 100-year existing site flows. Based on the existing land use and soils, a composite runoff coefficient of 0.61 was selected. Time of concentration of 15 minutes was selected as the site is located in a rural area and adjacent lands do not appear to warrant a reduction of this typical minimum. The watershed area is less than 1 ha. Top elevation is 78.93 m, bottom elevation is 78.12m and watershed length is 34 m. Runoff sheet flows from the site at 2.4% and flow into the adjacent field.

The Airport Method was used to calculate the time of concentration (T_c) as follows:

$$T_c = \frac{3.26 \times (1.1 - C) \times \sqrt{L}}{\sqrt[3]{S}}$$

Equation 2.1.1.1

Where: T_c = Time of Concentration (15 minutes)
 C = Runoff Coefficient (0.61)
 L = Watershed Length (34 metres)
 S = Watershed Slope (2.4%)

Intensity-Duration-Frequency curves were used to determine the 1 in 5 year and 1 in 100-year rainfall intensities for the watershed. Based on a time of concentration of 15 minutes, the 5-year peak intensity is 73 mm/hr and the 100-year peak intensity is 121 mm/hr. This results in predevelopment peak flow rates of 40 litres/second and 66 litres/second for the 5-year and 100-year storms, respectively.

4 POST DEVELOPMENT AND STORMWATER

The post development drainage pattern will closely resemble the predevelopment drainage pattern. A net decrease in flows will occur at the outlet because of a decrease in impervious surfaces as a part of the development concept. Development of the land can be referred to on the site plan drawings, located in Appendix 'B'.

As described above, the proposed development will result in a decrease to percent imperviousness of the site from 75% to 50%. The composite runoff coefficient will decrease from 0.55 to 0.54. Top elevation is 79.05 m, bottom elevation is 78.00 m and watershed length is 46.6 m. Watershed elevation has changed resulting in a decrease of watershed slope by 0.1%.

Using the Modified Rational Method (refer to calculations in Appendix 'A'), uncontrolled inflows of 36 litres/second would occur at a time of concentration of 15 minutes under the 1 in 100-year event, resulting in a peak storage requirement of -6.2 m³. Uncontrolled inflows of 60 litres/second would occur at a time of concentration of 15 minutes under the 1 in 5-year event, resulting in a peak storage requirement of -3.7 m³. Therefore no stormwater quantity control will be required.

As the site is less than 1.0 hectare, stormwater quality, are not typically required if adequate conveyance is provided. There are no known existing stormwater restrictions or issues that warrant the provision of site-specific quality control measures. Due to an increase in pervious areas and reduction in imperviousness areas, water quality is expected to be improved by the site development. Additionally, roof drains will be outleted on grassed areas should contribute to an overall enhancement of water quality. Therefore, no stormwater control measures are required.

5 CONCLUSION

Based on the above, we provide the following as it relates to the planned conversion of 2052 County Road 18 to a motel property:

1. The property is under a hectare in size and therefore no quality or quantity measures are typically required.
2. The existing site's high point is located at the entrance of the commercial building and runoff appears to sheet flow on all four sides of the property and ultimately to the field adjacent to the site. The site has no existing roadside ditches. This drainage pattern will be maintained under post development conditions.
3. The existing site historically discharged flows of approximately 37 litres/second and 67 litres/second during the 1 in 5-year event and 1 in 100-year event respectively.
4. The proposed changes will result in an overall reduction of composite runoff coefficient and percent imperviousness.
5. Due to the proposed changes, there is a reduction in flow from 61 litres/second to 57 litres/second under the 1 in 100 year storm and from 37 litres/second to 34 litres/second under the 1 in 5 year storm. Therefore, there would be an overall reduction in outflows.
6. Roof drains will be outleted on grassed areas will contribute in improving water quality treatment for the site.
7. The proposed changes will aid in improving the stormwater conditions and are not expected to negatively affect adjacent properties in any significant way.

If there are any questions or comments, please direct them to the undersigned.

Respectfully submitted,

Written by,

Reviewed by,

Yash Chokshi, EIT

Adele Voldock, P.Eng

THE GREER GALLOWAY GROUP INC.
CONSULTING ENGINEERS

APPENDIX A STORM WATER CALCULATION

APPENDIX B DETAIL DRAWINGS

- NOTES:
1. ALL WORK SHALL BE IN ACCORDANCE WITH RELEVANT CODES AND GUIDELINES.
 2. ALL DRAWINGS AND ADDENDA ARE TO BE READ AS, AND IN CONJUNCTION WITH THE SPECIFICATIONS.
 3. ALL EQUIPMENT SHALL BE INSTALLED AS SPECIFIED OR APPROVED EQUIVALENT.
 4. CONTRACTOR MUST CHECK AND VERIFY ALL DIMENSIONS BEFORE PROCEEDING WITH WORK AND BE RESPONSIBLE FOR SAME.
 5. CONTRACTOR MUST REPORT ANY DISCREPANCIES TO ENGINEER FOR RESOLUTION BEFORE COMMENCING THE WORK.
 6. ANY CHANGES MUST BE APPROVED BY THE ENGINEER.

A A DETAIL NO.
 B B DRAWING NO. - WHERE DETAILED

EXISTING	LEGEND	PROPOSED
	GRAVEL	N/A
	BUILDINGS	N/A
	DECKING	N/A
	GRASS	N/A
	ROAD	N/A
	SHOULDER OF ROAD	N/A
	CONCRETE SIDEWALK	N/A
	ASPHALT	N/A
	CENTRELINE	N/A
	EMERGENCY VEHICLE ROUTE/RADI	N/A
	GRAVEL OUTLINE	N/A
	FENCE LINE	N/A
	DRAINAGE PATH	N/A
	PROPERTY LINE	N/A
	SLOPE IDENTIFIER	N/A
	SEPTIC	N/A
	TREE	N/A
	TREE CANOPY	N/A
	SHRUB	N/A
	SIGNAGE	N/A
	LIGHT STANDARD	N/A
	STORM CATCHBASIN	N/A
	HYDRO POLE	N/A
	HYDRO LINE	N/A
	BELL POLE	N/A
	BELL LINE	N/A
	ANCHOR	N/A
	PARKING SPACES	N/A
	PRECAST CURBS	N/A
	BUILDING ENTRANCE	N/A
	T/G ELEVATIONS	N/A
	SWAILE ELVATIONS	N/A
	SLOPE LABELS	N/A

REVISION	DESCRIPTION	DATE
03	RE-ISSUED FOR SITE PLAN SUBMISSION	23/08/01
02	RE-ISSUED FOR SITE PLAN SUBMISSION	23/01/10
01	ISSUED FOR SITE PLAN SUBMISSION	21/12/08

REVISION DESCRIPTION DATE

NORTH

PROJECT

OUTERBANKS MOTEL

2052 COUNTY ROAD 18
 PRINCE EDWARD COUNTY, ON

FRASER YOUNG

DRAWING TITLE

PROPOSED SITE SERVICING PLAN

DESIGNED BY

Y. CHOKSHI

DRAWN BY

E. L / BCF

REVIEWED BY

A. VOLDOCK

APPROVED BY

A. VOLDOCK

PROJECT DATE

2021/12/06 (YY/ MM/ DD)

PROJECT #

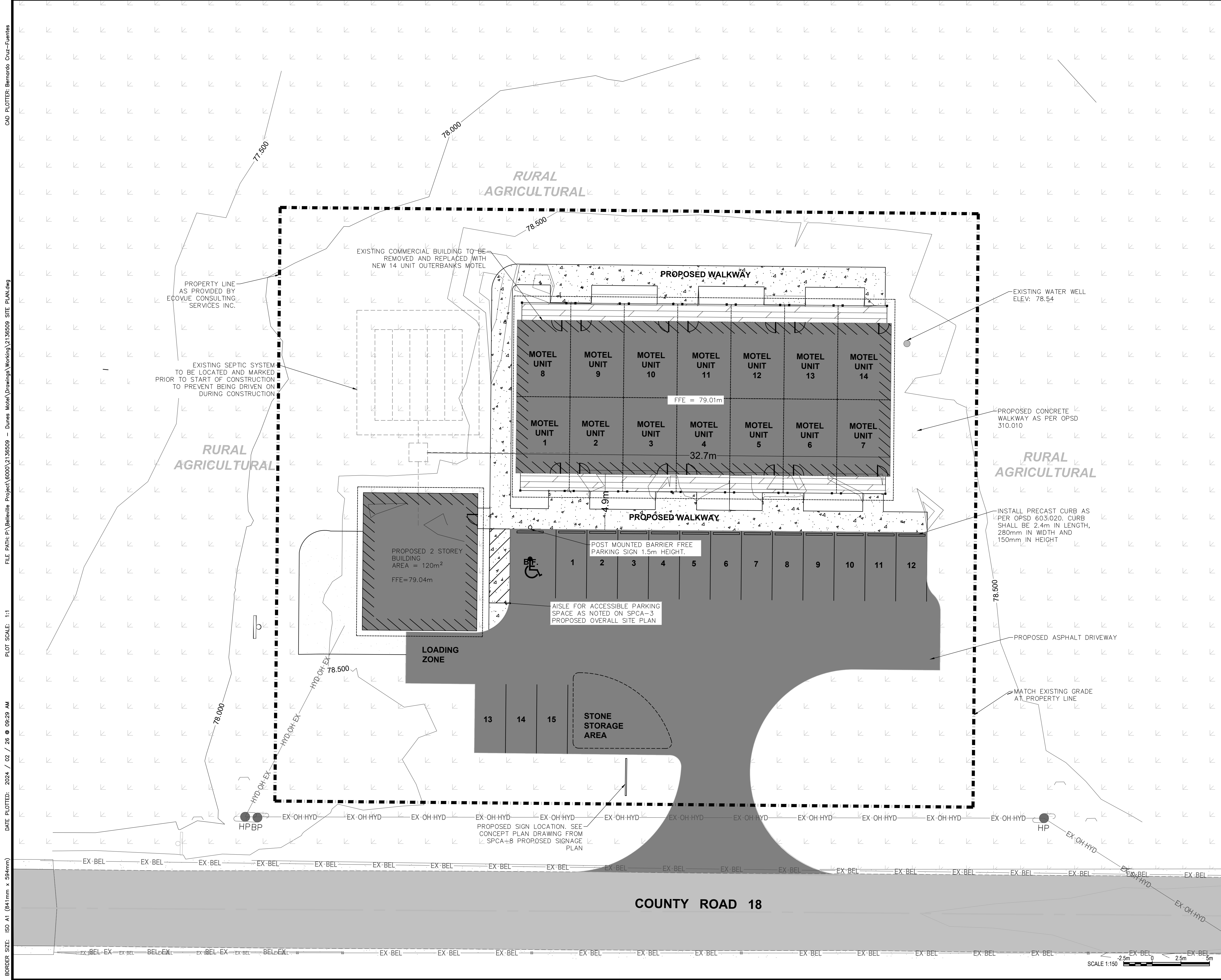
21-3-6509

DRAWING #

SPCA-5

DRAWING SCALE (ISO A1)

HOR: 1:150
 VER: X : XXX



CAD PLOTTER: Bernardo Cruz-Fuentes
 FILE PATH: P:\Belleville Project\6000\2136509 - Dunes Motel\Drawings\Working\2136509 SITE PLAN.dwg
 DATE PLOTTED: 2024 / 02 / 26 @ 09:29 AM
 PLOT SCALE: 1:1
 BORDER SIZE: ISO A1 (841mm x 594mm)