CORPORATION OF THE TOWNSHIP OF EDWARDSBURGH CARDINAL

BY-LAW NO. 2022-64

"BEING A BY-LAW TO AUTHORIZE THE EXECUTION OF A SITE PLAN CONTROL AGREEMENT WITH SHORELINE RAIL GROUP INC. AND 2866246 ONTARIO INC."

WHEREAS the Council of the Corporation of the Township of Edwardsburgh Cardinal deems it advisable to enter into a Site Plan Control Agreement with ShoreLine Rail Group Inc. and 2866246 Ontario Inc. respecting development of a property described as:

> PT LT 35 CON 1 EDWARDSBURGH PTS 1, 7 & 8, 15R9747; EDWARDSBURGH/CARDINAL Property Roll #0701 701 050 11501 Identified as Part of PIN 68155-0792 - AND -

PT LT 36 CON 1 EDWARDSBURGH AS IN PR63012; S/T PR28288, PR66760; EDWARDSBURGH/CARDINAL Property Roll #0701 701 020 12500 Identified as PIN 68155-0610 - AND -

> PT LT 36 CON 1 EDWARDSBURGH PT 1, 15R9899; EDWARDSBURGH/CARDINAL Property Roll #0701 701 020 12704 Identified as PIN 68155-0621

WHEREAS Authority is granted under Section 41 of the Planning Act, RSO 1990, c.P. 13, as amended to the Council of the Corporation of the Township of Edwardsburgh/Cardinal to enter into and amend such agreements; and

NOW THEREFORE BE IT RESOLVED THAT the Council of the Corporation of the Township of Edwardsburgh Cardinal enacts as follows:

- 1. That the Mayor and Clerk are hereby authorized to execute an agreement with ShoreLine Rail Group Inc. and 2866246 Ontario Inc. and that a signed copy of said agreement is attached hereto as Schedule "A".
- 2. That the following by-law to authorize execution of a site plan control previously passed is hereby repealed: By-law 2020-76, GC68282 registered on March 2, 2021.
- 3. That this by-law shall come into force and effect upon passing.

Read a first and second time in open Council this 2 day of November, 2022.

Read a third and final time, passed, signed and sealed in open Council this 2 day of November, 2022.

Mayor Clerk

SITE PLAN AGREEMENT

BETWEEN

SHORE LINE RAIL GROUP INC.

AND

THE CORPORATION OF THE TOWNSHIP OF EDWARDSBURGH/CARDINAL

November <u>17</u>2022

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THIS AGREEMENT MADE BETWEEN:

SHORE LINE RAIL GROUP INC. and 2866246 ONTARIO INC (The "Owner)

AND:

THE CORPORATION OF THE TOWNSHIP OF EDWARDSBURGH/CARDINAL (The "Township")

WHEREAS the Township of Edwardsburgh/Cardinal has enacted Site Plan Control Bylaw 2002-31 pursuant to the provisions of Section 41 of the Planning Act R.S.O. 1990, Chapter P.13, as amended;

AND WHEREAS the Owner is the Owner of the lands, more particularly described in Schedule "A" attached, and which are hereinafter referred to as the "Site";

NOW THEREFORE THIS AGREEMENT WITNESSETH that in consideration of the approval of the plans for the development on the subject parcel of land by the Township and the sum of One Dollar (\$1.00) of lawful money of Canada paid by the Township to the Owner the receipt whereof is hereby acknowledged by the Owner, the Owner and the Township agree as follows:

1. DEFINITIONS

In this Agreement:

"ACCEPTANCE" - means the date on which the Township accepts that all works and obligations which are constructed, installed, supplied or performed by the Owner pursuant to this Agreement and further referred to in this Agreement;

"AGREEMENT" - shall mean this Agreement and the Schedules which Schedules shall also be deemed to be covenants as though specifically set out therein;

"APPROVAL" - means the Township is satisfied that certain works have been constructed, installed or performed to the satisfaction of the Township, and as required in this Agreement;

"TOWNSHIP" - shall mean the Corporation of the Township of Edwardsburgh/Cardinal and shall include its successor and assigns and its officers, employees, agents, and contractors;

"TOWNSHIP ENGINEER" - Means the Director of Operations of the Corporation of the Township of Edwardsburgh/Cardinal or such other person or persons designated;

"CHIEF BUILDING OFFICIAL" - shall mean the person appointed by the Township as the Chief Building Official, or his/her designate;

"TOWNSHIP TREASURER" - shall mean the Treasurer of the Corporation of the Township of Edwardsburgh/Cardinal or such other person or persons so designated;

"MAINTAIN" - includes repair, replace, and/or keep operational;

"PLAN(S)" OR "SITE PLAN" - means the Site Plan and all associated plans approved by Council and includes the land described in Schedule "A";

"ROAD" - shall mean those public roads or any part thereof, any daylighting triangles, and areas of road widening shown or laid out on the Site Plan. The use of "Street" or "Public Highway" shall be synonymous with "Road";

"WORKS" - shall mean the whole works, materials, matters and things required by this Agreement to be supplied, performed, or constructed.

2. LANDS

The Owner agrees that the lands affected by this Agreement shall be those described in Schedule "A". The Owner warrants that it is the Owner in fee simple of the lands described in Schedule "A".

3. SCOPE OF WORKS AND CONFORMITY

The Owner agrees to construct and maintain the proposed development in conformity with this Agreement and Schedules attached hereto. No works shall be erected on the lands other than those erected in conformity with the said Schedules. It is understood and agreed that written approval of the Township, in a form determined solely by the Township, is required prior to any departure from the specifications of the Schedules being undertaken.

4. GENERAL

a) The Owner shall not call into question, directly or indirectly, in any proceeding whatsoever, in law or in equity, or before any administrative tribunal, the right of the

Township to enter into this Agreement and to enforce each and every term, covenant and condition herein contained.

b) The Owner covenants and agrees with the Township that if the Owner sells or conveys the lands herein described as the "Site" or any part thereof; that each transfer of an interest in land shall contain a covenant on the part of the Grantee in such Deed binding itself, its heirs, executors administrators, successors and assigns to the terms of this Agreement. Furthermore, the carrying out of the Works and obligations of the Owner under this Agreement shall include a similar covenant in all subsequent Deeds of Grant of the said lands until the Works and obligations of the Owner under this Agreement have been fully performed. All covenants and Agreements herein contained, assumed by, or imposed upon the Owner are deemed to be covenants which run with and bind the lands herein described and every part thereof.

c) The Owner agrees that there will be no subdivision of the lands herein described on Schedule "A" except by application pursuant to the provisions of the Planning Act, R.S.O. 1990, Chapter P13, as amended.

d) The Owner shall provide, in addition, digital copies of plans included in the Schedules of this Agreement in a pdf format.

e) The Owner shall supply to the Township, one set of "as-constructed" road, grading and service drawings including the location of all works, certified under seal by a Professional Engineer, for Township records, upon completion of the Works. Furthermore, the Owner may be required to provide the "as-constructed" information and attribute data for the works in an electronic form that is compatible with the Township's computer systems.

f) The Owner covenants and agrees to satisfy all conditions of approval and abide by all municipal by-laws, statutes and regulations, including those of the United Counties of Leeds & Grenville.

g) The Owner further covenants and agrees to satisfy all conditions of approval and abide by all Federal and Provincial statutes and regulations.

5. BUILDING AND PLANNING REQUIREMENTS

a) The Owner shall not commence or permit the commencement of any building or structure before the issuance to the Owner by the Township of a building permit, as required.

b) The Owner further agrees that the proposed Works specified in the Schedules attached hereto shall be erected in conformity with the said Schedules to the

satisfaction of the Township. No buildings or other Works shall be erected on the said lands other than those in conformity with Schedules. It is understood and agreed that written authority of the Township shall be obtained prior to any alterations being made which would in any way represent a departure from the specifications detailed in the said Schedules.

c) Nothing in this Agreement shall restrict the Owner from applying at any time in the future for building permits to construct extensions and/or additional buildings as may be permitted from time to time by the By-Laws of the Township, subject to the requirement by the Township of a new Site Plan Approval.

d) The property and buildings subject to this Agreement shall be maintained per the provisions of this Agreement as well as being in compliance with any Property Standards By-law adopted by the Township of Edwardsburgh/Cardinal Council. The Owner shall repair and maintain at all times and to the satisfaction of the Township, all buildings located on the subject property together with all other on-site works.

e) The Owner covenants and agrees to pay to the Township any applicable fees which are established by By-Law of the Council of the Township and said charges shall be those in effect on the date of issue of a building permit for which an application has been made.

I) The Owner shall comply with those additional planning and engineering requirements set out in Schedule "C" hereto attached.

6. **REGISTRATION**

The Township shall require this Agreement to be registered against the lands to which it applies immediately following the execution by the parties hereto and the Owner agrees not to register any other instrument against the subject lands until this has been accomplished.

7. FAILURE TO COMPLY

The Owner acknowledges and agrees that failure to comply with any term or condition herein may result in the Township taking such action to enforce compliance, as deemed appropriate by the Township.

8. SERVICING AND EASEMENT REQUIREMENTS

a) The Owner shall provide, dedicate, and register such easements to the Township which may be required for water, sewer, drainage or other purposes related to the development of the Owner's lands. Copies of any and all plans and registration documents shall be provided to the Township by the Owner

b) The Owner agrees to clean out and remove solids accumulated in the sumps of catch basins. Township shall be permitted lawful entry onto the Site in order to examine and adjust, at the Owner's expense, all storm water management devices that do not then conform to the requirements of this Agreement. If the Township determines that the devices are not in conformance with this Agreement, the Township shall not enter to complete the adjustments aforesaid unless it has given prior written notice to the Owner and an opportunity to rectify the defect, all in accordance with the default provisions for this agreement. If, in the opinion of the Township, the non-conformance presents an emergency, the Township may, without notice to the Owner enter upon the Site to complete the required adjustments at the Owner's expense.

c) The Owner shall arrange at its own expense with Hydro One, Bell Canada, Union Gas, the local cable company or any other similar utility company for the installation of such services to the Site and for the provision of any easements with respect to such installations and in accordance with the terms, conditions and specifications laid down by said company. If in relation to the development of the Site the Owner is required, it shall also arrange for the relocation of any existing installation at no cost to the Township. Notwithstanding the aforementioned, the location of all boxes, lines or other works proposed to be installed in connection with the provisions of any service shall be submitted for approval to the Township before installation.

d) Water and sanitary services are to be provided on site by the owner and are subject to the approval of the South Nation Conservation Authority or Ministry of Environment Conservation and Parks, as appropriate.

9. IMPLEMENTATION OF REPORTS AND STUDIES

a) All reports and/or studies required as a result of the Works in this Agreement shall be implemented to the Township's satisfaction at the sole expense of the Owner.

b) The Owner covenants and agrees to abide by the recommendations as shown in Schedule "B8" to this agreement, which are provided by "Stage 3 Archaeological Assessment of the Gainford Sisters Site", prepared by Past Recovery Archaeological Services on January 6, 2017, as reviewed by the Ministry of Heritage, Sport, Tourism and Culture Industries and entered into register on March 1, 2018.

10. COMPLETION TIME LIMIT

Failure by the Owner to complete all Works required by this Agreement within the time limit specified by the Township or as extended, in writing at its sole discretion, shall constitute a default, in which case the Township may avail itself of the remedies hereinafter prescribed or available to it in law.

11. FINANCIAL REQUIREMENTS

a) Payment

The Owner shall pay to the Township, by cash or certified cheque, the charges and fees, as set out in this Agreement and other financial requirements including but not limited to reasonable administrative, legal, planning and engineering fees, development charges and building permit fees that may be required of the Township as established by by-law or resolution of the Council of the Township in effect at the time of application for a building permit.

b) Default

In the event of a default by the Owner or its assigns in the provision and maintenance of all matters and things required to be done by the Owner pursuant to this Agreement, the Township may at the expense of the Owner, enter upon the lands and do all such matters and things as are in default. Any costs incurred by the Township pursuant to this clause shall be paid by the Owner to the Township within thirty (30) days of the mailing of an invoice by the Township addressed to the Owner at its last known address. "Cost" and "expense of the Owner" in this Clause shall be actual cost incurred by the Township plus twenty-five percent (25 %) of such cost as a charge for overhead and administration fees. Any costs referred to in this clause may be recovered by the Township in like manner as municipal taxes pursuant to the provisions of Section 427 of the Municipal Act, 2001, S.O. 2001, c.25 as amended.

c) Taxes

The Owner shall pay all arrears of taxes outstanding against the lands prior to the execution of this Agreement. The Owner shall pay all taxes levied or to be levied on the lands on the basis of and in accordance with assessment and the collector's roll entries until such time as the lands have been reassessed and re-entered on the tax roll.

12. INSURANCE

a) The Owner shall provide before the execution of this Agreement, and continue in force until such time as all obligations under this Agreement are satisfied, a comprehensive policy of public liability and property damage insurance acceptable to the Township, providing insurance coverage in respect of any one occurrence to the limit of at least Five Million Dollars (\$5,000,000.00) per occurrence, exclusive of interest and costs against loss or damage resulting from bodily injury to, or death of one or more persons and loss of or damage to property. Such policy shall designate the Township as a named additional insured thereunder.

b) The policy shall provide coverage against all claims for all damage or injury including death to any person or persons, for damage to any property of the Township or any other public or private property resulting from or arising out of any act or omission on the part of the Owner or any of its servants or agents or contractors during the construction or installation or maintenance of any Works to be performed pursuant to this Agreement. The policy shall include completed operations coverage and shall be maintained in effect until all obligations under this Agreement are satisfied.

c) The policy shall include blanket written contractual liability, cross liability, contingent employer's liability, personal injury endorsement, liability with respect to nonowned licensed vehicles. In the event that the Owner intends to carry out any shoring, blasting, excavating, underpinning, demolition, pile driving, caisson works and works below ground surface including tunnelling and grading on the lands, it shall first provide the Township with the Certificate of Public Liability Insurance covering such operations in a format satisfactory to the Township, in which the Township is named as additional insured prior to undertaking any such operations.

d) The Owner shall forward to the Township, prior to the signing of this Agreement by the Township, a Certificate of Liability Insurance. This Certificate of Insurance shall be signed by an authorized employee of the Insurance Company providing the insurance. Such insurance policy shall contain an endorsement to provide the Township and the Owner with not less than thirty (30) days written notice of cancellation.

e) The Owner shall furnish, prior to commencement of any construction, and at such other times as the Township may require, a certified copy of the policy together with proof of payment of the premiums for same.

13. RELEASE OF PLANS

The Owner hereby releases to the Township its rights to any approved drawings that form part of this Agreement, for the purposes of tendering the construction upon any default of this Agreement. The Owner shall also ensure that appropriate releases to the Township are obtained from the Owner's consultants, if required.

14. INDEMNITY

The Owner, on behalf of himself, his heirs, executors, administrators and assigns, including his successors in title; covenants and agrees to indemnify and save harmless the Township from all actions, causes of actions, suits, claims or demands whatsoever which arise directly or by reason of the development of the Site Plan and the construction and maintenance or the improper or inadequate construction and/or maintenance of Works.

15. GENERAL CONDITIONS

a) If required, the Owner shall at its own cost submit to the Ministry of the Environment Conservation and Parks for approval all plans required by the said Ministry and shall be responsible for obtaining any subsequent approvals from the Ministry of the Environment Conservation and Parks for the proposed site works, facility or any addition thereto and shall supply the Township with copies of all approvals or conditions enforced or set by the Ministry.

b) If required, the Owner shall at its own cost submit to the Technical Standards and Safety Authority (T.S.S.A.) for approval all plans required by said Authority and shall be responsible for obtaining any subsequent approvals from the T.S.S.A. for proposed site works, facility or any addition thereto and shall supply the Township with copies of all approvals or conditions enforced or set by the Authority.

c) Any notice required or permitted by this Agreement to be given by the parties hereto shall be in writing and shall be conclusively deemed to have been delivered on the date of mailing of such notice.

d) Any such notice required to be given herein shall be in writing and shall be delivered in person or by prepaid registered mail, to the attention of the Owner and/or the Township as follows:

TO THE OWNER:

Shore Line Rail Group

1044 Hunters Lane Oxford Station, ON K0G 1T0 Attention: Clayton Jones

or such other address as the Owner has notified the Chief Administrative Officer of the Township in writing.

TO THE TOWNSHIP:

THE CORPORATION OF THE TOWNSHIP OF EDWARDSBURGH/CARDINAL 18 Centre Street P.O. Box 129 Spencerville, ON K0E 1X0

e) All clause headings are for ease of reference only and shall not affect the construction or interpretation of this Agreement.

16. BINDING EFFECT; ASSIGNMENT

This Agreement shall ensure to the benefit of and be binding upon the parties hereto and their respective successors and assigns, and all covenant and agreements herein contained, assumed by, or imposed upon the Owner are deemed to be covenants which run with and bind the lands and every part thereof. This agreement may not be assigned without the prior written consent of each party.

17. SEVERABILITY

The invalidity or unenforceability of any particular provision of this agreement will not affect or limit the validity or enforceability of the remaining provisions.

18. EFFECTIVE DATE

This agreement is effective as of the date shown at the bottom of the first page, even if any signatures are made after that date.

19. COUNTERPARTS

This agreement may be signed in any number of counterparts, each of which is an original, and all of which taken together, constitute one single document. Counterparts may be transmitted by fax or in electronically scanned form. Parties transmitting by fax or electronically will also deliver the original counterpart to the other parties, but failure to do so does not invalidate this agreement.

20. INTERPRETATION

In construing this agreement, words in the singular shall include the plural and vice versa and words importing the masculine shall include the feminine, and the neuter and vice versa, and words importing persons shall include corporations and vice versa.

21. DISPUTE RESOLUTION

All matters in dispute between the parties, unless otherwise herein provided shall be determined by arbitration conducted by a single arbitrator in accordance with a submission made by either party under the Arbitration Act, 1991 S.O. 1991, CHAPTER 17. The decision of any such arbitrator shall be final and binding upon the parties, and any such arbitrator shall have the power to award costs in his or her discretion.

IN WITNESS WHEREOF the parties hereto have executed this agreement.

THE CORPORATION OF THE TOWNSHIP O	OF EDWARDSB	JRGH/CARDINAL

Mayor

Clerk

I/We have authority to bind the Corporation.

OWNER, 2866246 ONTARIO INC.

Owner.

I/We have authority to bind the Corporation.

OWNER, SHORELINE RAIL GROUP INC.

Owner-

I/We have authority to bind the Corporation.

DATED AT Spencerville, ON this 17 day of Novenber, 2022

SCHEDULE "A"

Description of the lands to which this agreement applies

PT LT 35 CON 1 EDWARDSBURGH PTS 1, 7 & 8, 15R9747; EDWARDSBURGH/CARDINAL Property Roll #0701 701 050 11501

Identified as Part of PIN 68155-0792

- AND -

PT LT 36 CON 1 EDWARDSBURGH AS IN PR63012; S/T PR28288, PR66760; EDWARDSBURGH/CARDINAL

Property Roll #0701 701 020 12500

Identified as PIN 68155-0610

- AND -

PT LT 36 CON 1 EDWARDSBURGH PT 1, 15R9899; EDWARDSBURGH/CARDINAL

Property Roll #0701 701 020 12704

Identified as PIN 68155-0621

SCHEDULE "B1" to "B7" INCLUSIVE

Being the approved drawings, reports and plans:

- Schedule "B1" Site Plan, Overall (dated October 27, 2022)
- Schedule "B2" Site Plan, Greenergy Site and Elevations
- Schedule "B3" Site Plan, Propane Loading Facility
- Schedule "B4" Site Plan, Land Use Separation Setbacks
- Schedule "B5" Site Plan, County Road 2 Main Entrance Taper
- Schedule "B6" Stormwater Management Report, prepared by Pinchin
- Schedule "B7" Fire Suppression Infrastructure
- Schedule "B8" Review and Recommendations of Archaeological Assessment



SCHEDULE B1

- All dimensions in meters unless otherwise
- All elevations are in meters unless otherwise
- All elevations are preliminary and to be
- Do not derive measurements from scaled
- Location of all existing infrastructure and details are approximate and shall be checked and verified prior to proceeding with work. Property line and extents of berm are approximate.

- PINCHIN 2360 Meadowpine Blvd. Mississauga, Ontario L5N 6S2 CANADIAN RAIL EQUIPMENT WORKS & SERVICES INC. 3518 COUNTY RD 2, PRESCOTT, ONTARIO
- SITE PLAN APPROVAL SITE PLAN

scale: As Shown	PROJECT NO: 294639
DATE: 10/03/2022	REVISION NO: 0.0
drawn by: EN	DRAWING NO:
checked by: IZH	SP100





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SCHEDULE B2 2 OF 3



M:\12 KPREY CONSTRUCTION/DOB JOHNSTOWN/JTWN-A (STTE MODEL)/JTWN-A-

SCHEDULE B2 3 OF 3



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SCHEDULE B3



SCHEDULE B4





DRAFT Stormwater Management Report

3518 County Rd. 2, Johnstown, ON

Prepared for:

Canadian Rail Equipment Works & Services Inc. c/o Shoreline Rail Group Inc.

3518 County Road 2, Johnstown, ON, K0E 1T1

July 19, 2022

Pinchin File: 294639



Stormwater Management Report 3518 County Rd. 2, Johnstown, ON Canadian Rail Equipment Works & Services Inc. c/o Shoreline Rail Group Inc.

July 19, 2022 Pinchin File: 294639 DRAFT

Issued to:Canadian Rail IIssued on:Group Inc.Pinchin File:July 19, 2022Issuing Office:294639

Canadian Rail Equipment Works & Services Inc. c/o Shoreline Rail Group Inc. July 19, 2022 294639 Mississauga, ON

Author:

Ian Hutcheson, P.Eng. Senior Project Manager 289.971.0814 ihutcheson@pinchin.com

Reviewer:

Linda Drisdelle, P.Eng., M.Eng., MBA, FEC General Manager 905.699.0015 Idrisdelle@pinchin.com



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1.0 INTRODUCTION AND FACILITY DESCRIPTION

1.1 Introduction

Pinchin Ltd. was retained by Canadian Rail Equipment Works & Services Inc. c/o Shoreline Rail Group Inc. (Client) to prepare a Stormwater Management Report for the rail and intermodal yard located at 3518 County Rd. 2, Johnstown, ON (Site).

The Site is owned by Shoreline Rail Group Inc. (Shoreline) and 2866246 Ontario Inc. is operated by CREWS as a rail and intermodal yard.

1.2 Existing Conditions

The Site has been developed in several phases. Phases I and II are operated as a rail storage yard, and a transloading area for liquids and gases, respectively. Phase III is developed as Greenergy, who uses the site as a fuel terminal.

1.3 Proposed Development

An additional three (3) phases of development are proposed at the Site. Phase IV will be operated as a transloading area for solid items (ex. Lumber), and Phases V and VI will consist of additional rail car parking area.

The stormwater management report will be used in support of an application to amend Ministry of the Environment, Conservation and Parks' (MECP) Environmental Compliance Approval (ECA) No. 2309-BCSHXU issued to Shoreline Rail Group Inc. on September 17, 2019.

Pinchin is requesting that the amended ECA be issued to CREWS.

1.4 Zoning and NAICS Code

The Site is situated on Business Park Industrial (MBP) Zoned Lands and is surrounded by Business Park Industrial Zoned Lands. The zoning supports the operations at the Site.

See Appendix I for a copy of the Zoning.

Operations at the Site are covered by NAICS code 4821 - Rail Transportation.



1.6 Ontario Water Resource Act

The Ontario Water Resource Act (OWRA) provides the following definition:

- "Sewage Works" means any works for the collection, transmission, treatment and disposal of sewage or any part of such works, but does not include plumbing to which the Building Code Act, 1992 applies;
- "Sewage" includes drainage, storm water, commercial wastes and industrial wastes and such other matter or substance as is specified by the regulations.

According to Section 53. (1) of the OWRA "...no person shall use, operate, establish, alter, extend or replace new or existing sewage works except under and in accordance with an environmental compliance approval."

2.0 PRECONSULTATION

2.1 MECP

On October 27, 2021, an initial pre-consultation meeting with held with the MECP's local district officer, Surface Water Branch and local Hydrogeologist. Based on the initial pre-consultation meeting the following criteria will be required for the Site:

- 1. Provide enhanced level protection for the Site;
- 2. Quantity control is not required due to the proximity of the Site to the St. Lawrence River;
- For liquid Transloading Areas, all runoff must be captured and tested, prior to release. For the Transloading Area, effluent must have an Oil and Grease, and Total Suspended Concentration not exceeding 15 mg/L and 25 mg/L respectively; and
- 4. Confirm with the South Nation Conservation Authority and the Town of Prescott, their requirements for the Site.

See Appendix II for a copy of the pre-consultation summary with the MECP.

2.2 Town of Prescott

The Town of Prescott (Town) was contacted to confirm their stormwater requirements for the Site. The Town has indicated that:

- 1. They have no issue with runoff to the St. Lawrence River, assuming it does not affect neighbouring properties or is contaminated; and
- 2. There is no requirement to infiltrate a portion of the stormwater into the ground on-Site.



See Appendix II for a copy of the pre-consultation with the Town.

2.3 South Nation Conservation Authority

The South Nation Conservation Authority (SNCA) was contacted to confirm their stormwater requirements for the Site. The SNCA has indicated that:

- 1. They required the design to meet the MECP's Stormwater Management Planning and Design Manual; and
- 2. There is no requirement to infiltrate a portion of the stormwater into the ground on-Site.

See Appendix II for a copy of the pre-consultation with the SNCA.

3.0 PROPOSED SITE DRAINAGE

The Site is approximately 37.20 ha and at developed conditions is divided into 13 sub-catchments based on expected drainage patterns.

3.1 Phase I

All stormwater runoff (Sub-catchments 10, 11 and 12) from Phase I will flow to the south towards the St. Lawrence River following the existing drainage patterns. All storms up to the Quality Storm will be captured and conveyed in a proposed 250 mm diameter culvert and directed towards Stormwater Management Pond (SWM Pond No.2). All storms in excess of the Quality Storm, up to the 100-yr storm will overwhelm the 250 mm diameter culvert and be captured and directed to the ditch along the west side of the entrance way via an existing 600 mm diameter culvert to the south.

The ditch flows along the southern property boundary of the Site, ultimately discharging to a municipal culvert crossing under County Road 2.

Stormwater runoff from Sub-catchment 13 does not come in contact with the rail lines in Phase I and is considered clean water. Stormwater runoff from Sub-catchment 13 will follow its natural drainage patterns and flow off property to the south and east.

3.2 Phase II

All stormwater runoff (Sub-catchments 5 and 6) from Phase II will flow to the south towards the St. Lawrence River following the existing drainage patterns. All storms up to the 50-yr design storm with a duration of 24 hours will be captured and conveyed to the proposed Lined Pond. Pinchin notes that this is consistent with ECA No. 2309-BCSHXU, issued to Shoreline Rail Group Inc. for ongoing operations at the Phase III development.



The ditch flows along the southern property boundary of the Site, ultimately discharging to a municipal culvert crossing under County Road 2.

3.3 Phase III

All stormwater runoff from Phase III is managed via the Lined Pond (Greenergy Pond) contained within the Phase III boundary and detailed in ECA No. 2309-BCSHXU. Stormwater collected in the Greenergy Pond is pumped to the Greenergy ditch and will flow through Phase IV, V and VI.

3.4 Phase IV, V and VI

All stormwater runoff (Sub-catchment 3) from Phases IV, V and VI will flow to the mid point of the Phase V and VI railway tracks and be collected in the existing Greenergy Ditch. All runoff will be conveyed under the Phase V and VI railway tracks via a 525mm pipe and discharge to the West Drainage Ditch.

The West Drainage Ditch will convey all storms up to the 100-yr design storm south towards the St. Lawrence River. A 450mm high rock check dam will divert the Quality storm through a 450mm diameter pipe to SWM Pond No.1. All storms in excess of the Quality Storm, up to the 100-yr storm will overflow the 450mm high rock check dam and continue down the West Drainage Ditch.

The West Drainage Ditch flows past the proposed Office Building and Parking Lot where it will collect runoff from Sub-catchments 2 and 8 and continue into the enhanced swale along the southern property boundary of the Site, ultimately discharging to the municipal culvert crossing under County Road 2. Sub-catchment 7

Stormwater runoff from Sub-catchment 7 will follow its natural drainage patterns and flow to the enhanced swale.

Stormwater runoff from Sub-catchment 13 does not come in contact with the rail lines in Phase IV, V or VI and is considered clean water. Stormwater runoff from Sub-catchment 1 will follow its natural drainage patterns and flow off property to the south and west.

Stormwater runoff from Sub-catchment 4 will follow its natural drainage patterns and flow off property to the North. While runoff from Sub-catchment 4 will come into contact with a portion of the rail spur, no rail cars are stored here so any runoff contact will be minimal.

Stormwater runoff from Sub-catchment 13 does not come in contact with the rail lines in Phase I and is considered clean water. Stormwater runoff from Sub-catchment 13 will follow its natural drainage patterns and flow off property to the south and east.

The post development drainage patterns are indicated in drawing SWM100, Appendix III.



4.0 STORMWATER MODELLING

4.1 Post Development Runoff

The rainfall intensity is calculated using the Intensity-Duration-Frequency (IDF) curve parameters from the Ministry of Transportation's IDF Curve Lookup Tool for Coordinates Coordinate: 44.720833, -75.495833.

The Site at post-development conditions is considered a combination of Gravel and Paved Roads/Parking Lots, Roofs, Wooded Area, Bare Rock, Landscaped Area, Water and Railyard Area.

Post development flow rates are calculated using the rational method, the weighted runoff co-efficient and rain fall intensity for each sub-catchment.

See Appendix IV for calculation data sheets detailing runoff calculations.

4.2 Quality Control

4.2.1 Phase I

Enhanced level quality control for Phase I is provided using a Wet Pond (SWM Pond. No.2) type stormwater management system with a permanent pool, extended detention, and total volume of 1,249 m³, 231 m³ and 1,862 m³ respectively. SWM Pond No.2 is equipped with a 100 mm overflow/orifice plate at an elevation of 81.26 m to drain runoff stored in the extended detention portion of the pond. As part of the outfall structure, SWM Pond No.2 contains a 600 mm overflow pipe located at 81.27 m to prevent the pond from overfilling.

4.2.2 Phases II

Quality control for Phase II is provided using the Lined Pond and testing the effluent prior to its discharge.

4.2.3 Phases IV, V, VI

Enhanced level quality control for Phases IV, V and VI is provided using a Wet Pond (SWM Pond. No 1.) for sub-catchment 3 and an enhanced swale for sub-catchments 2 and 8.

SWM Pond. No.1 has a permanent pool, extended detention, and total volume of 2,685 m³, 463 m³ and 3,979 m³ respectively. SWM Pond No.1 is equipped with a 100 mm orifice plate at an elevation of 86.67 m to drain runoff stored in the extended detention portion of the pond. As part of the outfall structure, SWM Pond No.1 contains a 600 mm overflow pipe located at 81.78 m to prevent the pond from overfilling.



An enhanced swale will be used to provide water quality control for sub-catchments 2 and 8. The swale has been over sized to handle the 100-yr storm from sub-catchments 2, 3, 7 and 8. To provide quality control the swale has been sized to in accordance with the MECP's SWM Planning & Design Manual and has a bottom width of 0.75m, side slopes of 2.5:1, has a flow rate of less than 0.15 m³/s and a maximum velocity of less than 0.5 m/s. Grass will be promoted to grow higher than 75 mm to enhance filtration of suspended solids.

A copy of the design drawings is included in Appendix V.

5.0 MONITORING AND REPORTING

5.1 Monitoring

The Transloading/Lined Pond will be sampled prior to any discharge. Prior to a release the concentration of Oil and Grease, and Total Suspended shall not exceed 15 mg/L and 25 mg/L respectively. Prior to a release the pH of the effluent will be between 6.5 and 8.5.

- 1. Non-compliance with respect to a Concentration Limit is deemed to have occurred when any single grab sample for O&G or TSS is greater than 15 mg/L and 25 mg/L respectively
- 2. Non-compliance with respect to pH is deemed to have occurred when any single measurement is outside of the indicated range.

5.2 Reporting

Annually a performance report with be submitted to the MECP's the District Manager, a performance Report will contain, but shall not be limited to, the following information:

- All monitoring data in hard copy and electronic spreadsheet that can be manipulated by the reviewer and include, but not be limited to, a summary and interpretation of all monitoring data collected, a comparison to the effluent limits, and the Provincial Water Quality Objectives (PWQOs) and the Ontario Drinking Water Quality Standards (Ontario Regulation 169/03) for the monitored parameters, including an overview of the success and adequacy of the sewage works and presentation of photographic;
- b. A description of any operating problems encountered and corrective actions taken;
- c. A summary of any effluent quality assurance or control measures undertaken in the reporting period;
- d. A summary of the calibration and maintenance carried out on all effluent monitoring equipment;



- e. An interpretation of monitoring data that considers the potential for adverse impact to groundwater resources in particular at / near the location of the outfall ditch; and
- f. any other information the District Manager requires from time to time

6.0 STATEMENT OF LIMITATIONS

The purpose of the Stormwater Management Report is to design a stormwater management system to satisfy the requirements of the MECP, Town and Conservation Authority, while working within the constraints of maintaining and expanding operations at the Site.

This assessment was performed in general compliance with currently acceptable practices for environmental investigations, specific Client requests, and the project budget, as applicable to this Site.

Pinchin accepts no responsibility for any deficiency, misstatement or inaccuracy contained in this report as a result of omissions, misinterpretations or fraudulent acts of persons interviewed or contacted.

The analytical results are representative of the sampling location at the time of sampling only. Conclusions derived are specific to the area of study during the investigation period. In addition, Pinchin cannot guarantee the completeness or accuracy of information supplied by a third party.

No assessment can wholly eliminate uncertainty regarding the potential for recognized environmental conditions on the property. Performance of this assessment to the standards established by Pinchin is intended to reduce, but not eliminate, uncertainty regarding the potential for recognized environmental conditions on the property.

This report is intended for Client use only. Any use of this report by a party other than the Client, or any reliance on (or decisions made based on) the findings described in this report, are the sole responsibility of such third parties, and Pinchin accepts no responsibility for damages, suffered by any third party as a result of decisions made or actions conducted based on this report. No other warranties are implied or expressed.

Template: Water Sampling and Analysis Report, ERC, February 18, 2021

APPENDIX I Zoning

(1 Page)



APPENDIX II Pre-Consultation Summaries

(5 Pages)
Sandy Luong

From:	lan Hutcheson
Sent:	Wednesday, December 22, 2021 11:26 AM
То:	Raffael, Chris (MECP); Gilbert, Beth (MECP); Guo, Thomas (MECP);
	robert.ulfig@ontario.ca
Cc:	Michelle Peatling
Subject:	CREWS/MECP Meeting Minutes
Attachments:	Shoreline_PIN 0610_Phase II ESA_20210316.pdf; Shoreline_PIN 0621_Phase I ESA_
	20210219.pdf; 230580 Phase I ESA Report 3518 Hwy 2 Johnstown CREWS Oct 15
	2018.pdf; Crews Development Areas.jpg

Good Morning

Please find attached

- 1. The site drawing detailing the different phases (existing and proposed for CREWS).
- 2. Phase 1 and 2 for the Site;
- 3. In addition below is the meeting minutes for yesterday's meeting.

MINUTES

Attendees:

Ian Hutcheson, Pinchin Chris Raffael, MECP Beth Gilbert, MECP Thomas Guo, MECP Robert Ulfig, MECP

Ian gave an overview of the different phases, what operations occur at each phase (ie. Transloading or storage), and what had been previously discussed during consulation including:

- 1. Capture and test stormwater runoff from Transloading areas
- 2. Enhanced Level protection Site Wide;
- 3. TSS and O/G discharge limit for transload areas of 25mg/L and 15 mg/L respectively.

Quantity Control was discussed and Robert indicated that due to the proximity of the Site to the River, Quantity Control is not required. However, Beth and Robert asked that the Town and the Conservation Authority be asked if there are any infiltration targets they require for the Site. Ian to reach out to the town and CA to determine this.

Treatment train approach was discussed and will be used to achieve 80% TSS removal as and OGI on its own will not provide this.

Thomas has requested if a Phase II was completed for the former gas station on-Site. Ian to find out.

Any questions please let me know

lan

Sandy Luong

From: Sent: To: Subject: Dion Willcott <dwillcott@prescott.ca> Wednesday, January 12, 2022 3:03 PM Ian Hutcheson RE: Stormwater runoff

This Email is from an **EXTERNAL** source. Ensure you trust this sender before clicking on any links or attachments.

Good Afternoon lan,

The Town has no requirement for storm water to be infiltrated back into the soil.

Thanks, Dion

From: Ian Hutcheson [mailto:ihutcheson@Pinchin.com]
Sent: Wednesday, January 12, 2022 1:27 PM
To: Dion Willcott <dwillcott@prescott.ca>; Michelle Peatling <mpeatling@Pinchin.com>
Subject: RE: Stormwater runoff

Good Afternoon Dion,

I am working with Michelle on this file, can you confirm if the town has any requirement to infiltrate a certain amount of stormwater back into the ground on a developed site?

Thanks

Ian Hutcheson, P.Eng. Senior Project Manager, Emissions Reduction & Compliance Pinchin Ltd. | C:289.971.0814

From: Dion Willcott sent: Thursday, September 9, 2021 9:00 AM
To: Michelle Peatling mpeatling@Pinchin.com
Subject: Stormwater runoff

This Email is from an **EXTERNAL** source. Ensure you trust this sender before clicking on any links or attachments.

Good Morning Michelle, Here is to follow up with your inquiry. Normally there is no concern for the Town of Prescott for the natural runoff into the river unless the runoff affects other neighbor's and or it is contaminated in anyway and as long as it doesn't exceed M.E.C.P. limits of discharge.

Town of Prescott Water Dept. Thanks, Dion

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Sandy Luong

From: Sent: To: Cc: Subject: Laura Crites <lcrites@nation.on.ca> Thursday, January 13, 2022 9:42 AM Ian Hutcheson Michelle Peatling RE: SWM Resources for ECA

This Email is from an **EXTERNAL** source. Ensure you trust this sender before clicking on any links or attachments.

Good morning lan,

At this time SNC does not have a requirement, but encourage infiltration when possible.

Thank you, Laura

From: Ian Hutcheson ihitcheson@Pinchin.com>
Sent: January 12, 2022 1:26 PM
To: Laura Crites closes @litto:sinultrange
To: Laura Crites closes @litto:sinultrange
Subject: RE: SWM Resources for ECA

Good Afternoon Laura,

Does SNC have any requirement to infiltrate a certain amount of stormwater back into the ground on a developed site?

Thanks

Ian Hutcheson, P.Eng. Senior Project Manager, Emissions Reduction & Compliance Pinchin Ltd. | C:289.971.0814

From: Laura Crites
Sent: Tuesday, August 31, 2021 1:10 PM
To: Michelle Peatling
Subject: SWM Resources for ECA

This Email is from an **EXTERNAL** source. Ensure you trust this sender before clicking on any links or attachments.

Hello Michelle,

Thanks for speaking with me last week regarding the stormwater management requirements for the train yard in Prescott. Thank you for your patience and my apologies for the delayed response.

Here are some resources you may find helpful:

South Nation Conservation reviews stormwater management facilities in accordance with the Ontario Ministry of the Environment, Conservation, and Parks' "Stormwater Management Planning and Design Manual": <u>https://www.ontario.ca/document/stormwater-management-planning-and-design-manual-0</u>. The design should have no issues if it can meet these guidelines.

Credit Valley Conservation also has information on Low Impact Development as a means of managing stormwater: <u>https://cvc.ca/low-impact-development/.</u>

Have a nice day, Laura



Laura Crites | Planning Technician 38 Victoria Street, Box 29, Finch, ON KOC 1K0 Tel: 613-984-2948 or 1-877-984-2948 | Fax: 613-984-2872 nation.on.ca | make a donation

Our local environment, we're in it together. Notre environnement local, protégeons-le ensemble.

COVID-19 UPDATE: Our offices and facilities are closed to visitors and guests; some Conservation Areas remain open for passive recreation. More info at: <u>www.nation.on.ca/coronavirus.</u> Our staff are working during this time and we do not anticipate any service disruptions.

MISE À JOUR COVID-19: Nos bureaux et installations sont fermés aux visiteurs et invités; certaines aires de conservation restent ouvertes aux loisirs passifs. Plus d'informations sur: www.nation.on.ca/fr/coronavirus. Notre personnel travaille pendant cette période et nous ne prévoyons aucune interruption de service.

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APPENDIX III Drainage Patterns

(1 Page)



APPENDIX IV Design Calculations

(15 Page)

Post-Development Flow Rates CREWS

The Site is divided into thirteen (13) sub-catchments based on proposed topography. The Greenergy Site is self contained and has not been included. The flow rate from each sub-catchment is calculated for the Site in post-development conditions.

Methodology

-The rainfall intensity is calculated using the Intensity-Duration-Frequency (IDF) curve parameters from the Ministry of Transportation's IDF Curve Lookup Tool for Coordinates Coordinates 44.720833, -75.495833 and.

-The post-development time of concentration is calculated using the Airport Formula for the individual sub-catchments where the Runoff Coefficient is less than 0.4.

-The post-development time of concentration is calculated using the Airport Formula, since the average Runoff Coefficient is less than 0.4. -The flow rate is calculated using the Rational Method.

-Runoff coefficients used are taken from from Design Chart 1.07, Ontario Ministry of Transportation, "MTO Drainage Management Manual, 1997.

-Runoff coefficients are adjusted for the 25-yr to 100-yr storms per the Ontario Ministry of Transportation, "MTO Drainage Management Manual, 1997,

Table 1 - IDF Curve Parameters

Parameter	2-Yr	5-Yr	10-Yr	25-Yr	50-Yr	100-Yr
A	858	1214	1487	1898	2110	2518
С	0.822	0.847	0.858	0.871	0.870	0.882

Sample Calculations

Airport Formula

T_c = Time of Concentration (min)

- C = Runoff Coefficient
- S_w = watershed slope (m/m)

L = Watershed Length (m)

- = (3.26 x (1.1 0.3) x 815.7 ° ⁵) ÷ 0.1 ° ³³
- = 159.25 minutes

Rainfall Intensity

-From Table 1 IDF Curve Parameters

- Intensity (I)= A : (t_c)^c
 - = 858 ÷ (159.25 minutes)^{0 822}
 - = 16.56 mm/hr

Rational Method

- Q = Design Flow (m3/s)
- C = Weighted Runoff Coefficient

A = Drainage Area (ha)

- Q = 0.0028 x C x | x A
- = 0.0028 x 0.3 x 16 56 mm/hr x 7 614 ha
- = 0.11 m3/s

Table 2 - Post-Development Runoff Coefficients

Land Use	Runoff C	oefficient
	Min.	Max.
Pavement - Asphalt or Concrete	0.80	0.95
Gravel Roads and Shoulders	0.4	0.6
Roofs	0.7	0.95
Industrial - Heavy	0.6	0.9
Railroad Yards	0.2	0.35
Woodland or Cutover - Flat 0-5 % Slopes ⁽¹⁾	0.	30
Landscaped Area ⁽²⁾	0.13	0.17
Unimproved Areas	0.1	0.30
Lakes and Wetlands	0.	05
Bare Rock		0.90

⁽¹⁾Site has silty clay, Runoff Coefficent used is an average between Silt Loam and Clay Loam

Table 3 - Post-Development, Sub-Catchment Run-off Coefficients

Sub-Catchement	Area	Length	Slope	Gravel	Paved	Roof Area	Railyard	Wooded	Bare Rock	Landscape	Water
				Road Area	Area	(ha)	Area	Area	Area	d Area	Body
	(ha)	(m)	(%)	(ha)	(ha)		(ha)	(ha)	(ha)	(ha)	(ha)
1	7.61	815.70	0.10	0.00	0.00	0.00	0.00	7.61	0.00	0.00	0.00
2	0.73	120.89	0.28	0.21	0.00	0.07	0.43	0.00	0.00	0.02	0.00
3	11.57	590.77	0.10	0.21	0.00	0.07	11.09	0.00	0.00	0.20	0.00
4	1.17	429.25	0.10	0.00	0.00	0.00	0.12	1.05	0.00	0.00	0.00
5	3.38	456.00	0.10	0.21	0.00	0.00	3.17	0.00	0.00	0.00	0.00
6	2.39	394.00	0.10	1.44	0.00	0.00	0.76	0.00	0.00	0.19	0.00
7	2.46	186.63	0.05	0.00	0.00	0.00	0.00	1.98	0.00	0.00	0.49
8	1.02	163.07	0.15	0.05	0.13	0.01	0.05	0.00	0.00	0.78	0.00
9	0.23	39.93	0.15	0.02	0.00	0.00	0.00	0.21	0.00	0.00	0.00
10	3.95	670.72	0.10	0.56	0.00	0.09	3.30	0.00	0.00	0.00	0.00
11	0.81	234.22	0.03	0.43	0.00	0.00	0.25	0.00	0.00	0.13	0.00
12	1.02	209.35	0.10	0.04	0.00	0.00	0.45	0.00	0.00	0.53	0.00
13	0.85	216.95	0.10	0.00	0.00	0.00	0.00	0.00	0.04	0.81	0.00

Table 4 - Post-Development, Weighted Run-off Coefficients & Time of Concentrations

Sub-Catchement	Area	5 Year	10 Year	25 Year	50 Year	100 Year	Tc	Tc	T _c	T _c	T _c
		Runoff	Runoff	Runoff	Runoff	Runoff	5 Year	10 Year	25 Year	50 Year	100 Year
	(ha)	Coefficient	Coefficient	Coefficient	Coefficient	Coefficient	(min)	(min)	(min)	(min)	(min)
1	7.61	0.30	0.30	0.33	0.36	0.38	159.25	159.25	153.28	147.30	144.32
2	0.73	0.49	0.49	0.54	0.59	0.61	33.18	33.18	30.52	27.87	26.54
3	11.57	0.22	0.22	0.24	0.26	0.27	151.08	151.08	147.37	143.67	141.82
4	1.17	0.29	0.29	0.32	0.35	0.36	117.06	117.06	112.88	108.70	106.61
5	3.38	0.25	0.25	0.27	0.30	0.31	126.99	126.99	123.32	119.65	117.81
6	2.39	0.65	0.65	0.71	0.78	0.81	62.72	62.72	53.78	44.83	40.36
7	2.46	0.25	0.25	0.28	0.30	0.31	102.65	102.65	99.61	96.58	95.06
8	1.02	0.23	0.23	0.26	0.28	0.29	67.38	67.38	65.56	63.73	62.82
9	0.23	0.35	0.35	0.38	0.42	0.44	28.91	28.91	27.57	26.23	25.55
10	3.95	0.30	0.30	0.33	0.36	0.38	145.45	145.45	139.95	134.45	131.70
11	0.81	0.51	0.51	0.56	0.61	0.64	91.47	91.47	83.59	75.72	71.78
12	1.02	0.18	0.18	0.20	0.22	0.23	93.16	93.16	91.28	89.40	88.46
13	0.85	0.16	0.16	0.18	0.19	0.20	97.22	97.22	95.54	93.86	93.02

-Per the Ontario Ministry of Transportation, "MTO Drainage Management Manual, 1997, the runoff co-efficient for the 25, 50 and 100 yr storms has been increased by 1.1, 1.2 and 1.25 respectively.

Table 5 - Post-Development, Intensities and Peak Flow Rates

Sub-Catchement	5-yr	10-yr	25-yr	50-yr	100-Yr	5 Year	10 Year	25 Year	50 Year	100 Year
	Intensity	Intensity	Intensity	Intensity	Intensity	Peak Flow				
	(mm/hr)	(mm/hr)	(mm/hr)	(mm/hr)	(mm/hr)	(m ³ /s)				
1	16.56	19.18	23.70	27.41	31.37	0.106	0.123	0.167	0.210	0.251
2	62.53	73.70	96.65	116.69	139.69	0.062	0.074	0.106	0.140	0.174
3	17.32	20.07	24.52	28.01	31.86	0.121	0.141	0.189	0.236	0.279
4	21.49	24.98	30.94	35.71	40.98	0.020	0.024	0.032	0.041	0.049
5	20.06	23.30	28.64	32.85	37.52	0.047	0.054	0.074	0.092	0.110
6	36.46	42.67	59.01	77.17	96.53	0.158	0.185	0.281	0.401	0.523
7	24.02	27.96	34.50	39.58	45.34	0.042	0.048	0.066	0.082	0.098
8	34.31	40.13	49.66	56 82	65.33	0.023	0.027	0.037	0.046	0.055
9	70.25	82.92	105.60	123.02	144.44	0.016	0.019	0.026	0.034	0 041
10	17.88	20.74	25.65	29.68	34.01	0.060	0.069	0.094	0.119	0.142
11	26.49	30.87	40.19	48.91	58 09	0.031	0.036	0.051	0.068	0.084
12	26 08	30.39	37.22	42.33	48 31	0.014	0.016	0.022	0.027	0.032
13	25 15	29.30	35.77	40.57	46.21	0.010	0.011	0.015	0.019	0.022
				ar - 6 - 01492	Total	0.71	0.83	1.16	1.51	1.86

References

IDF Curve Look-Up, Ministry of Transportation
 Ministry of Transportation, MTO Drainage Management Manual. 1995-1997

Stormwater Conveyance for Phase 4, 5, 6

Pipe Under Phase 5 & 6 Tracks

- The ditch under the Phase 5 & 6 Tracks will convey all water from Phase 5 & 6 and all water from Phase 4

- The required flow rate is the 100-yr storm flow rate from Phases 4, 5 & 6

Required Flow	Rate:	0.279 9.865	m ³ /s ft ³ /s
Pipe Sizing (100-yr Storm)			
Invert Elev	ation:	87.160	m
Long. S	Slope:	0.0037	m/m
Le	ength:	84.561	m
Type of	Pipe:	СР	
Mannings Coeff	icient:	0.012	
Velocity of Full	Flow:	1.31	m/s
Capacity of Pipe Flowing	g Full:	0.283	m³/s
Diar	neter:	525	mm
Outlet Elev	ation:	86.85	
Ditch Sizing (100-yr Storm)			
Invert Elev	ation:	86.85	m
Long. S	Slope:	0.04%	
Ĺe	ength:	187.45	m
Top of	Ditch:	88.71	m
Bottom V	Vidth:	0.5	m
Side S	Slope:	2.5;1	
C	epth:	1.86	m
Top V	Vidth:	9.81	m
Free B	oard:	0.5	m
Water D	epth:	1.36	m
Cross Sectional Area		5.33	m²
	y=	1.36	m
	B=	7.31	m
	b=	0.5	m
Wetted Perimeter		7.839	m
	b=	0.5	m
	y ≃	1.36	m
Liverandia Dediver (D)	Z=	2.5:1	m/m
Hydraulic Radius (R)	~ -	0.67	9 m
	n =	0.01	ა

Actual Velocity = 1.189 m/sActual Flow = $6.330 \text{ m}^3/\text{s}$

Pond Inflow

- The Quality Storm must be captured and conveyed to the Stormwater Pond. The intensity of the Quality Storm is estimated using equation 4.9 of the SWM Planning and Design Manual

- The weighted runoff coefficient for subcatchments 3 is used to calculate intensity.

- Flow rate is calculated in accordance with equation 4.8 of the SWM Planning and Design Manual

I = Intensity

C = Runoff Coefficient

| = 43 C+ 5.9 = 43 x 0.26 + 5.9 = 15.21 mm/hr

Rational Method

Q = Design Flow (m3/s) C = Weighted Runoff Coefficient

A = Drainage Area (ha)

Q = 0.0028 x C x I x A = 0.0028 x 0.26 x 53.25 mm/hr x 11.57 ha = 0.128 m3/s = 4.52 ft3/s

Pipe Sizing (Quality Storm)

- The size of pipe required to convey the quality storm from the ditch to the pond is calculated using Mannings equation

Pipe Inlet (Ditch) Inv.: 86.77 m Pipe Outlet (Pond) Inv.): 86.67 m Length: 55.74 m Slope: 0.0018 m/m Dia. 450.00 mm Mannings Coefficient 0.012 Velocity of Full Flow 0.824 m/s Capacity of Pipe Flowing Full 0.131 m³/s

Quality Control - Phases 4, 5 & 6 CREWS

The MECP has stated that an Enhanced Level of Protection is to be provided for the Site in its developed state.

Storage Volume Required

- Wet Pond Type Stormwater Management features will be used to provide an Enhanced Level of Protection.

- The Storage Volume for Impervious Level (m³/ha) is interpolated for each sub-catchment based on the percentage of impervious area.

Using Table 3.2 of the Stormwater Management Planning & Design Manual, March 2003, the Storage Volume Required for each Sub-Catchment to provide Enhanced Level Protection is calculated using the Impervious Area and the Percent Impervious Area for each sub-catchment. The Storage Volume for Impervious Level for the different stormwater types is shown in Table 1. The Storage Volume Required for each Sub-Catchment is shown in Table 2.

-Quality control storage is comprised of permanent pool storage and extended detention storage. The extended detention storage volume is based on 40 m3 /ha of contributing area. The remaining amount represents the permanent pool volume:

Table 1 - Storage Volume for different SWM Types

Protection Lovel	SM/M Tupp	Storage Volume (m ³ /ha) for Imp. Level					
FIDIECTION Level	Saalai Làbe	35%	Storage Volume (m'/ha) 35% 55% 25 30 80 105 110 150 140 190	70%	85%		
Enhanced	Infiltration	25	30	35	40		
Enhanced	Wetlands	80	105	120	140		
100% Long-term 55	Hybrid Wet Pond/Wetland	110	150	175	195		
Removal)	Wet Pond	140	190	225	250		

Table 2 - Storage Volume required for each Sub-Catchment - Wet Pond No. 1

			in an	
Sub-Catchment	Area (ha)	Percent Impervious (%)	Storage Volume for Imp. Level (m ³ /ha)	Storage Volume Required (m ³)
3	11.57	98.27%	272.12	. 3147.30
TOTAL	11.57			3147.30

Total Water Quality Volume: Extended Detention Volume: Permanent Pool Volume:	272 12 <u>-40</u> 232.12 2684.66	m ³ /ha m ³ /ha m ³ /ha m ³
Extended Detention Volume:	40	m³/ha
Extended Detention Volume:	462.64	m³

- Per the the Stormwater Management Planning & Design Manual, March 2003, the mean permanent pool depth shall be 1 - 2 m. To accommodate the required depth, the volume of the permanent pool is increased.

Table 3 - Stage-Storage-Discharge - Wet Pond No. 1

Stage	Elevation	Depth	Volume
	(m)	(m)	(m ³)
Bollom of Pond	84.97	0.00	0.00
	85.07	0.10	84 57
	85.17	0.20	177 73
	85.27	0.30	279.90
	85 37	0.40	391.47
1	85.47	0.50	512.83
	85.57	0.60	644.40
	85.67	0.00	786.57
	85.77	0.80	939.73
	95.97	0.00	1104 30
	85.97	1.00	1280.67
	86.07	1.00	1469.23
	96.17	1.10	1670.40
	86.19	1.20	1712 18
	96.21	1.22	1754.48
	86.23	1.24	1707.31
	96.25	1.20	1940.67
	00 23	1.20	1004 57
	86.20	1.30	1004.07
	96.31	1.34	1929.00
	06.31	1.34	2010.47
	80.33	1.30	2019.47
	00.35	1.36	2003.33
	06.30	1.39	2000.70
	80.37	1.40	2112.13
	86.30	1.410	2133.04
	86.39	1.415	2147.43
h	86.40	1.420	21/1.17
	86.42	1.44	2195.02
	80.42	1.45	2219.02
	80.43	1.40	2243.13
	80.44	1.47	2207.43
	00.45	1.40	2291.64
	60.40	1.49	2310.40
	80.47	1.50	2341.10
Tap of Darm Daol	10.00	1.00	2009.07
I OD OF FEITH. POOL	80.07	1.70	2879.23
Tes of Estanded Detection	80.//	1.80	3104.40
TOD OF EXtended Detention	86.78	1.81	3193.76
T	86.79	1.82	3223.27
IOD OF POND	87.03	2.06	3978.90

Pond Outfall		0.000	- 1
	Max Flow	0 279	m°/s
	T/G: Elevation	86.6	m
Release Rate for	Max Flow		
	Max. Outflow:	0.279	m ³ /s
		279.37	L/s
		9.87	ft ³ /s

Pipe Sizing - The size of pipe required to convey the max storm from the pond to the ditch is calculated using Mannings equation - The size of pipe required to convey the max storm from the pond to the ditch is calculated using Mannings equation

Pipe Inlet (Pond) Invi	ert: 84.97	m	
Pipe Outlet (Ditch) Inv	ert. 84.84	m	
Leng	th: 68.17	m	
Slo	pe. 0.0020	m/m	
Pipe [Dia. 600.00	mm	
Mannings Coeffici	ent 0.012		
Velocity of Full FI	ow 1.052	m/s	
Capacity of Pipe Flowing F	ull 0.297	m³/s	

For Quality control the extended detention volume is to release over a period of 24 hours Release Rate f

Volume to Release:	462.64	m ³
Duration:	24.00	hrs
Release Rate:	19.28	m ³ /hr
	5.35	L/s

- The draw down time is calculated using Equation 4.11 of the SWM Design Guidelines

Where:

- $t = drawdown time in seconds A_p = surface area of the pond (m²)$
- $\label{eq:C} \begin{array}{l} C = \mbox{discharge coefficient (typically 0.63)} \\ A_o = \mbox{cross-sectional area of the orifice (m^2)} \end{array}$
- h₂ = ending water elevation above the orifice (m)
- h = maximum water elevation above the orifice (m
- $C_2 =$ slope coefficient from the area-depth linear regression
- C3 = intercept from the area-depth linear regression

- C2 and C3 are determined by plotting the pond depth against its area to get a linear equation



Stormwater Conveyance for Phase 1

Pipe Under Entrance Driveway will Convey Stormwater from Phase 1

- The northernly pipe under the driveway entrance will convey the quality storm to Pond No. 2
- The existing culvert will convey all storms in excess of the quality storm to the existing ditch from Phase 1

Required Flow Rate (100-yr):	0.258	m³/s
	9.095	ft ³ /s
Pipe Sizing (100-yr Storm)		
Invert Elevation	81.53	m
Long. Slope	0.0133	m/m
Length	20.715	m
Type of Pipe	CP	
Mannings Coefficient	0.012	
Velocity of Full Flow	1.51	m/s
Capacity of Pipe Flowing Full	0.074	m³/s
Diameter	250	mm
Outlet Elevation	81.26	m

Pipe Sizing (Quality Storm)

Pond Inflow

- The Quality Storm must be captured and conveyed to the Stormwater Pond. The intensity of the Quality Storm is estimated using equation 4.9 of the SWM Planning and Design Manual

- The weighted runoff coefficient for subcatchments 10, 11 & 12 is used to calculate intensity.

- Flow rate is calculated in accordance with equation 4.8 of the SWM Planning and Design Manual

I = Intensity

C = Runoff Coefficient

Rational Method

Q = Design Flow (m3/s)

C = Weighted Runoff Coefficient

A = Drainage Area (ha)

Q = 0.0028 x C x I x A

= 0.0028 x 0.31 x 19.24 mm/hr x 5.78 ha

- = 0.097 m3/s
- = 3.4 ft3/s

- The size of pipe required to convey the quality storm from the ditch to the pond is calculated using Mannings equation

Pipe Inlet (ditch) Inv.:	82.61	m
Pipe Outlet (Pond) Inv.):	81.26	m
Length:	33.67	m
Slope:	0.04	m/m
Dia.:	250	mm
Mannings Coefficient:	0.012	
Velocity of Full Flow:	2.634	m/s
Capacity of Pipe Flowing Full:	0.129	m³/s

Ditch Sizing (100-yr storm)

- The size of the ditch required to convey the 100-yr storm is calculated using Mannings equation

Invert Ele	evation:	81.26	m
Long	. Slope:	3.91%	
	Length:	40.00	m
Тор с	of Ditch:	82.26	m
		0.05	
Bottom	Width:	0.25	m
Side	e Slope:	2.5:1	
	Depth:	1.00	m
Тор	Width:	4.25	m
Free	Board:	0.5	m
\M/ator	Depth	0.50	m
VValei	Depui.	0.00	111
Cross Sectional Area	рерит.	0.63	m²
Cross Sectional Area	y=	0.63 0.50	m² m
Cross Sectional Area	y= B=	0.63 0.50 2.25	m² m m
Cross Sectional Area	у= В= b=	0.63 0.50 2.25 0.25	m² m m m
Cross Sectional Area	у= В= b=	0.63 0.50 2.25 0.25 2.486	m ² m m m m
Cross Sectional Area	y= B= b= b=	0.63 0.50 2.25 0.25 2.486 0.25	m ² m m m m m
Cross Sectional Area	y= B= b= b= y=	0.63 0.50 2.25 0.25 2.486 0.25 0.25 0.50	m ² m m m m m m
Cross Sectional Area	y= B= b= y= z=	0.63 0.50 2.25 0.25 2.486 0.25 0.50 2.5:1	m ² m m m m m m/m
Cross Sectional Area Wetted Perimeter Hydraulic Radius (R)	y= B= b= y= z=	0.63 0.50 2.25 0.25 2.486 0.25 0.50 2.5:1 0.251	m ² m m m m m m/m
Cross Sectional Area	y= B= b= y= z=	0.63 0.63 0.50 2.25 0.25 2.486 0.25 0.50 2.5:1 0.251 0.013	m ² m m m m m m/m

Actual Velocity =	6.057	m/s
Actual Flow =	3.786	m³/s

Quality Control - Phase 1 CREWS

The MECP has stated that an Enhanced Level of Protection is to be provided for the Site in its developed state

Storage Volume Required

Wet Pond Type Stormwater Management features will be used to provide an Enhanced Level of Protection

- The storage Volume for Impervious Level (m³/ha) is interpolated to province an Enhanced Level of Protection
- The Storage Volume for Impervious Level (m³/ha) is interpolated for each sub-catchement based on the percentage of impervious area
- Using table 3.2 of the Storagement Planning & Design Hanual, Merch 2002, The Storage Volume Required for each Sub-Catchment to provide Enhanced Level Protection is
caticulated using the Impervious Area and the Percent Impervious Area for each sub-catchement. The Storage Volume for Impervious Level for the different stormwater types is shown in Table 1
The Storage Volume Required for each Sub-Catchment is shown in Table 2
- Quality control storage is comprised of permanent pool storage and extended detention storage. The extended detention storage volume is based on 40 m3 /ha of controluting area. The
remaining amount represents the permanent pool volume:

Table 1 - Storage Volume for different SWM Types

Destanting Land Child Taxa	Storage Volume (m ³ /ha) for Imp. Level				
Protection Level	Svvvv Type	35%	55%	70%	85%
	Infiitration	25	30	36	40
Enhanced	Wetlands	80	105	120	140
(50% Long-larm	Hybrid Wet Pond/Wetland	110	150	175	195
SS (tenioral)	Wet Pond	140	190	225	250

Taken from Table 3.2 of the Stormwater Management Planning & Design Manual, March 2003

Table 2 - Storage Volume required for each Sub-Catchment - Wet Pond No- 2

Sub Catchement	Area	Percent	Storage Volume	Storage Volume	Permanent Pool	Permanent Pool	Extended	Extended
	(ha)	Impervious	for Imp Level	Required	Volume	Volume	Detention Volume:	Detention Volume
		(%)	(m³/ຄອ)	(m ³)	(m³ <i>i</i> na)	(m ³)	(m³/ha)	(m ³)
10	3.25	100.00%	275 00	1067 05	235 00	928 93	40.00	156 12
11	0.81	84 44%	243 66	201.42	209 06	169 07	40.00	32 35
12	1 02	48.10%	188.50	192.10	148 50	151.33	40.00	40 76
TOTAL	5.78		0	1480 56	- 5	1249 34	<u> </u>	231 23

Samole Calculation

Total Water Quality Volume	275 00	m³/ha
Extended Detention Volume	-40	m³/ha
Permanent Pool Volume	235 00	m³/ha
	928.93	m ³
Extended Detention Volume	40	m³ina
Extended Detention Volume	158.12	m ³

For Quality control the extended dotention volume is to release over a period of 24 hours

Release Rate

Volume to Relea	se: 231 23	m ³
Durat	ch: 24.00	nrs
Release Ra	e 9 63	m3/n
	2 68	L/s

Per the the Stormwater Management Planning & Design Manual, March 2003, the mean permanent peol depth shall be 1 - 2 m. To accommodate the required destin, the volume of the permanent pool is increased

Table 3 - Stage-Storage-Discharge - Wet Pond No. 2

Stage	Elevation	Depth	Volume
	(1.)	(m)	(m ³)
Boltom of Pond	79 71	0.00	000
the second s	79.81	0.10	42.14
	79.91	0 20	88.57
	80.01	0.30	139 58
	80 11	0 40	135.43
	60 21	0 50	256 40
	80,31	0 60	322.75
	60.41	0 70	324 77
	80.51	0.80	472 71
	80.61	0.90	556 87
	80.71	1.00	647.49
	80.81	1.10	744.87
	£0.91	1 20	849 26
	80.33	1 22	671.01
	80.95	1.24	893.05
	80.97	1 26	915.38
	60 99	1 28	238 02
	81 01	1.30	960 95
	61 03	1 32	984.19
	81.05	1.34	1007.73
	81 07	1,56	1031.58
	81 (09	1.38	1055 73
	81.10	1 39	1067 93
	81,11	1.40	1080 20
	81.12	1.41	1092 55
	61.13	1 42	1098 76
	81.14	1.43	1111.23
	61 15	1 4 4	1123 78
	81.1ô	1.45	1136.41
	81.17	146	1149 11
	81.19	1.47	1161.90
	81 19	1 4 5	1174 77
	81 20	1 49	1187 72
	81 21	1 50	1200 75
Top of Perm Pool	81 26	1 55	1267.11
Top of Extended Detention	61 27	1 56	1498 25
Icp of Pond	81.47	1.76	1861 62

Pond Outfall			
	T/G Elevation	81 5	m
Release Rate fo	r Max Flow		
	Max Out ow	0 129	m ³ /s
		129.32	L/s
		4 57 f13/s	ft ³ /s
 The size of pipe 	e required to convey the	max storm from	n the pond to the dtch is calculated using Mannings equation
	Pond Outer river	30.39	
	Length:	9.02 m	m
	Slope!	0 20%	
	Pipe Dis	500 00	mm
	Mannings Coefficient	0 012	
	Velocity of Full Flow	0 932	mis
Capacit	ty of Pipe Flowing Full	0 183	m ³ /s

Release Rate for Quality Control

For Quality control the extended detention volume is to release over a period of 24 hours

Volume to Release	158.12	m³	
Duration:	24.00	hrs	
Release Rate:	6 59	m³/hr	
	1 83	L/s	

The draw down time is calculated using Equation 4.11 of the SWM Design Guidelines

Where

- I = drawdown time in seconds

- $\begin{array}{l} \Lambda_p = \mbox{ surface area of the point (m^2)} \\ C = \mbox{ discharge coefficient (typ cally 0.63)} \\ \Lambda_o = \mbox{ cross-sectional area of the onfice (m^2)} \end{array}$

- C2 and C3 are determined by piotting the portid depth against its area to get a linear equation



Stormwater Conveyance for Phase 2

Conveyance Route

- Stormwater will pass through an existing culvert under the road at the bottom of Phase 2, into the new lined stormwater pond

- A second culvert is proposed to meet the required flow rate

Required Flow Rate (100-yr):	0.633 22.335	m³/s cfs	
Pipe Sizing (100-yr Storm)			
	Ex. 600m	m Pipe	Prop. 250mm Pipe
Inlet Invert Elevation	87.30	m	87.30 m
Outlet Invert Elevation	87.16	m	87.16 m
Long. Slope	0.0079	m/m	0.0079 m/m
Length	18.303	m	18.30 m
Type of Pipe	CP		CP
Mannings Coefficient	0.012		0.012
Velocity of Full Flow	2.09	m/s	1.16 m/s
Capacity of Pipe Flowing Full	0.590	m³/s	0.057 m ³ /s
Diameter	600	mm	250 mm
Outlet Elevation	87.16	m	87.159 m
Total Flow:	0.65	m³/s	

Lined Pond - The lined pond serving phase 2 will be equipped with an overflow

Overflow Pipe Sizing (100-yr Storm	<u>1)</u>	
Bottom Invert Elevation Outlet (Ditch) Invert Elevation Invert (Overflow) Elevation Long. Slope Length	84.32 83.00 87.17 0.04 33.75	m m m m/m m
Type of Pipe Mannings Coefficient Velocity of Full Flow Capacity of Pipe Flowing Full Diameter	CP 0.012 4.12 0.809 500	m/s m³/s mm
Pipe Sizing (Drain)		
Bottom Invert Elevation Outlet (Ditch) Invert Elevation Long. Slope Length	84.32 83.00 0.04 33.75	m m m/m m
Type of Pipe Mannings Coefficient Velocity of Full Flow Capacity of Pipe Flowing Full Diameter	CP 0.012 2.60 0.127 250	m/s m³/s mm
Volume to Drain Time to Drain	3222.64 7.027	m ³ hours

Quality Control - Transloading Area CREWS

The MECP has stated that for Phase II, the Transloading Area, all stormwater runoff must be captured and tested prior to release.

Storage Volume Required

- All runoff from the transloading area must be captured and tested prior to release. As such, all post development runoff from Subcatchments 5 must be captured. Based on current drainage patterns all runoff from Subcatchment 6, drains to Subcatchment 5, therefore the capture device must be sized to handle both Subcatchments

Table 1 - Storage Volume

Sub-Catchement	Return Period (yr)	Area (ha)	Duration (min)	Rainfall Intensity (mm/hr)	Runoff Coefficient	Peak Flow Rate (m ³ /s)	Volume (m ³)
Sub-Catchement Return Period (yr) 5 2 5 10 25 50 100 25 50 100 6 2 5 10 100 100 6 2 5 10	3.38	5	115.30	0.25	0.27	80.84	
			1440	2.20	0.31	0.01	555 26
	5		5	153.40	0.25	0.36	107.55
	-		1440	2.90	0.31	0.01	731.94
	10		5	177.80	0.25	0.42	124.65
			1440	3.40	0.31	0.01	858 13
	25		5	209.60	0.25	0.49	146.95
			1440	4.00	0.31	0.01	1009.57
	50		5	232.90	0.25	0.54	163.28
			1440	4.40	0.31	0.01	1110.53
	100		5	255.60	0.25	0.60 17	179.20
			1440	4.90	0.31	0.01	1236.72
6	2	2.39	5	115.30	0.65	0.50	149.91
			1440	2.20	0.81	0.01	1029.72
	5		5	153.40	0.65	0.66	199.44
			1440	2.90	0.81	0.02	1357.36
	10		5	177.80	0.65	0.77	231.17
			1440	3.40	0.81	0.02	1591.39
	25		5	209.60	0.65	0.91	272.51
			1440	4.00	0.81	0.02	1872.22
	50		5	232,90	0.65	1.01	302.81
			1440	4.40	0.81	0.02	2059.45
	100		5	255.60	0.65	1.11	332.32
			1440	4.90	0.81	0.03	2293.47
	Total Sto	orage Required (50-yr Design Storm)		(Contraction of the second	3169.97

Table 2 - Stage-Storage -	Transloading Pond
Table 2 - Olage-Olorage -	fransioading rond

Elevation	Depth	Volume
(m)	(m)	(m³)
84.32	0.00	0.00
84.42	0.10	20.03
84.52	0.20	45.07
84.62	0.30	75.30
84.72	0.40	110.93
84.82	0.50	152.17
84.92	0.60	199.20
85 02	0.70	252.23
85.12	0.80	311.47
85.22	0.90	377.10
85.32	1.00	449.33
85.42	1.10	528.37
85.52	1,20	614.40
85.62	1.30	707.63
85 72	1.40	808.27
85.82	1.50	916.50
85.92	1.60	1032.53
86 02	1.70	1156.57
86.12	1.80	1288.80
86.22	1.90	1429.43
86.32	2.00	1578.67
86.42	2.10	1736.70
86.52	2.20	1903.73
86.62	2.30	2079.97
86.72	2.40	2265.60
86.82	2.50	2460.83
86.92	2.60	2665.87
87.02	2.70	2880.90
87.12	2.80	3106.13
87.17	2.85	3222.64
87.22	2.90	3341.77
87.32	3.00	3588.00

Stormwater Conveyance and Treatment for Proposed Office Area

Methodology - Enhanced swales are proposed to treat runoff from Subcatchment 2 and 8

- The existing culvert will convey all storms in excess of the quality storm to the existing ditch from Phase 1

Quantity Control/Conveyance Required Flow Rate (100-yr)

kate (100-yr)		
Subcatchment 2	0.174	m³/s
Subcatchment 3	0.279	m³/s
Subcatchment 7	0.098	m³/s
Subcatchment 8	0.055	m ³ /s
Total:	0.606	m ³ /s
	21.409	cfs

<u>Subcatchment 2, 3, 8</u> - The proposed ditch must be able to handle all flow from the 100 year storm from the Subcatchments 2, 3 and 8

Quantity Control Ditch Sizing - The size of the ditch required to convey the 100-yr storm is calculated using Mannings equation

Required Flow Rate (100-yr)	0.508	m³/s
Inlet Elevation:	80.19	m
Outlet Elevation:	77.12	m
Long, Slope:	6,98%	m/m
Length:	44.01	m
Top of Ditch:	80.694	m
Bottom Width:	0.75	m
Side Stope:	2.5:1	
Depth:	0.50	m
Top Width:	2.75	m
Free Board:	0.3	m
Water Depth:	0.20	m
Cross Sectional Area	0.23	m ²
y=	0.20	m
B=	1.55	m
b=	0.75	m
Wetted Perimeter	1.644	m
b=	0.75	m
у=	0.20	m
Z=	2.5:1	m/m
Hydraulic Radius (R)	0.140	m
n=	0.013	
Actual Velocity =	5 4 7 5	m/s
Actual Flow =	1.259	m ³ /e
		111/5

Subcatchment 2, 3, 7 & 8 - The proposed ditch must be able to handle all flow from the 100 year storm from the Subcatchments 2, 3, 7 and 8

<u>Quantity Control Ditch Sizing</u> - The size of the ditch required to convey the 100-yr storm is calculated using Mannings equation

Required Flow Rate (100-yr):	0.606	m³/s	
Inlet Elevation:	77.12	m	
Outlet Elevation (box culvert):	77.04	m	
Long. Slope:	0.08%	m/m	
Length	104.22	m	
Top of Ditch:	78.00	m	
Bottom Width:	0.75	m	
Side Slope:	2.5:1		
Depth	0.88	m	
Top Width:	5.13	m	
Free Board:	0.3	m	
Water Depth:	0.58	m	
Cross Sectional Area	1.26	m²	
y=	0.58	m	
B=	3.633	m	
b=	0.75	m	
Wetted Perimeter	3.855	m	Ĩ
b≃	0.75	m	
y=	0.58	m	
Z=	2.5:1	m/m	
Hydraulic Radius (R)	0.328	m	
n =	0.013		
Actual Velocity =	1.034	m/s	

stual volocity -	1.004	114.02
Actual Flow =	1.307	m³/s

Quality Control

- The Quality Storm must be captured and conveyed to the Enhanced Swale. The intensity of the Quality Storm is estimated using equation 4.9 of the SWM Planning and Design Manual

- The weighted runoff coefficient for subcatchment 2, 7, 8 is used to calculate intensity.

- Flow rate is calculated in accordance with equation 4.8 of the SWM Planning and Design Manual

I = Intensity

C = Runoff Coefficient

|= 43 C+ 5.9 = 43 x 0.29 + 5.9 = 18.29 mm/hr

Pinchin File: 294639

Rational Method

Q = Design Flow (m³/s) C = Weighted Runoff Coefficient

A = Drainage Area (ha)

 $Q \approx 0.0028 \times C \times I \times A$

- = 0.0028 x 0.29 x 18.29 mm/hr x 4.2 ha
- = 0.062 m3/s
- = 2.2 ft3/s

Max Velocity:	0.50	m/s
Max Flow;	0.062	m³/s
Min. Cross Sectional Area;	0.124	m²
<u>Area of Trapezoidal Ditch</u> Bottom Width: Side Slope	0.75 2.5 [.] 1	m

 $\label{eq:Water Depth} Water Depth: 0.119 \mbox{ m} \\ \mbox{- The depth of flow to provide quality control will be 12 cm.}$

	0.124	m²
y≃	0.12	m
B=	1.34	m
b=	0.75	m
	1.389	m
b≖	0.75	m
y≓	0.12	m
z=	2.5:1	m/m
	0.089	m
n =	0.013	
	y≃ B= b≃ y≃ z=	0.124 y= 0.12 B= 1.34 b= 0.75 1.389 b= 0.75 y= 0.75 y= 0.12 z= 2.51 0.089 n = 0.013

Actual Velocity =	0.435	m/s
Actual Flow ≂	0.054	m ³ /s

APPENDIX V Design Drawin**y**s (4 Pages)









SCHEDULE B7 1 OF 3



August 8 2019

Dear Ms. McKinstry,

As part of our ongoing discussions with Edwardsburgh/Cardinal regarding the development and construction of the Greenergy Johnstown Terminal, Greenergy Fuels Canada Inc had committed to provide an overview of the fire suppression infrastructure that will be included as part of the terminal design.

After many discussions with local stakeholders, it was decided that the best option for fire suppression infrastructure would include the addition of two fire hydrants on the property. Appended to this letter is a design of the property which illustrates the location of the two hydrants. The two hydrants are indicated with 'FH' on the drawing:

- First hydrant located at property entrance on County Road 2
- Second hydrant located 1,500 ft inside the property

The addition of these two hydrants will provide local responders the necessary water access in the unlikely event of a fire. The technical specifications of the hydrants have also been appended to this letter.

Sincerely,

Zac Scott

Senior VP Operations

SCHEDULE B7 2 OF 3





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SCHEDULE B7 3 OF 3

CLOW CANADA - M-67 HERITAGE BRIGADIER FIRE HYDRANT SPECIFICATION

TESTING AND DESIGN SPECIFICATIONS (PER AWWA C502 / NSF /ULC & FM)

- 1. Hydrant shall be manufactured in accordance with AWWA C502 latest revision
- 2. Hydrant Has been certified by UL in accordance with the ANSI/NSF 61 and ANSI/NSF 372 (LEAD CONTENT VERIFICATION OF PRODUCTS INCONTACT WITH POTABLE WATER)
- 3. Hydrant shall be designed for 250 PSI working pressure and tested to 500 PSI hydrostatic pressure.
- 4. Hydrant shall be rated for 250 PSI. FM working pressure and 200 PSI. ULC working pressure.
- 5. Hydrant shall be a compression type, dry barrel design with centre operating stem construction.
- 6. The O-ring seating surface on the upper stem shall be constructed of stainless steel.
- 7. Epoxy coating to be applied to interior and exterior of hydrant shoe for corrosion protection.
- 8. Hydrant shall be manufactured with operating nut and integral thrust collar made of bronze. A Delrin washer bearing shall be located above thrust collar for ease of hydrant operation.
- 9. Hydrant shall have a lower valve assembly that fully encapsulates the lower operating rod threads. This allows for increased corrosion resistance and ease of disassembly.
- 10. Intermediate section shall be ductile iron. (AWWA C110-08)

STANDARD HYDRANT FEATURES

- 1. Body style: Octagon with Octagon nozzle caps
- 2. Hydrant shall have an internally lubricated bronze operating nut with O-ring seals. Operating nut shall be of the Hydra-lubeTM design to ensure self lubrication during operation.
- 3. Hydrant hose nozzles shall be mechanically locked into place by an external allen screw, and have O-ring seals.
- 4. Hydrant Lower rod shall be 1-1/4" in sq.
- 5. Hydrant shall have a main valve opening of 5-1/4".
- 6. Hydrant shall be a traffic model, complete with safety flanges and stem coupling. Upper body can be rotated 360 degrees to adjust pumper direction.
- 7. Hydrant shall be manufactured with a lower valve plate that bottoms out in the shoe for maximum opening.
- 8. Hydrant shall be backed by manufacturer's 12 year limited warranty
- 9. Hydrant shall be the Clow Canada Brigadier as manufactured by Clow Canada.





CONCORD

Ministry of Tourism, Culture and Sport

Archaeology Programs Unit Programs and Services Branch Culture Division 401 Bay Street, Suite 1700 Toronto ON M7A 0A7 Tel.: (416) 314-2120 Email: Andrea.Williams@ontario.ca

Ministère du Tourisme, de la Culture et du Sport

Unité des programmes d'archéologie Direction des programmes et des services Division de culture 401, rue Bay, bureau 1700 Toronto ON M7A 0A7 Tél. : (416) 314-2120 Email: Andrea.Williams@ontario.ca



Mar 13, 2018

Peter Sattelberger (P111) Past Recovery Archaeological Services 2 - 99c Dufferin Perth ON K7H3A5

RE: Review and Entry into the Ontario Public Register of Archaeological Reports: Archaeological Assessment Report Entitled, "STAGE 3 ARCHAEOLOGICAL ASSESSMENT OF THE GAINFORD SISTERS SITE, BeFu-16, PART LOT 35, CONCESSION 1, GEOGRAPHIC TOWNSHIP OF EDWARDSBURGH, TOWNSHIP OF EDWARDSBURGH-CARDINAL, COUNTY OF LEEDS AND GRENVILLE, ONTARIO ", Dated Feb 14, 2018, Filed with MTCS Toronto Office on Mar 1, 2018, MTCS Project Information Form Number P111-0038-2016, MTCS File Number 0004600

Dear Mr. Sattelberger:

This office has reviewed the above-mentioned report, which has been submitted to this ministry as a condition of licensing in accordance with Part VI of the Ontario Heritage Act, R.S.O. 1990, c 0.18.¹ This review has been carried out in order to determine whether the licensed professional consultant archaeologist has met the terms and conditions of their licence, that the licensee assessed the property and documented archaeological resources using a process that accords with the 2011 Standards and Guidelines for Consultant Archaeologists set by the ministry, and that the archaeological fieldwork and report recommendations are consistent with the conservation, protection and preservation of the cultural heritage of Ontario.

The report documents the assessment of the study area as depicted in Supplementary Documentation Maps 2, 3 and 21 of the above titled report and recommends the following:

This study provides the basis for the following recommendations:

1) The pre-Contact component of the Gainford Sisters Site (BeFu-16) is of a high level of cultural heritage value or interest, warranting Stage 4 mitigation of development impacts. No land use development applications involving or allowing soil disturbance within the area of the pre-Contact component of the Gainford Sisters Site (BeFu-16) and a 10 metre protective buffer should be approved until outstanding concerns for the site have been addressed.

2) As the Stage 3 assessment has confirmed that the cultural heritage value or interest of the post-Contact component of the Gainford Sisters Site (BeFu-16) has been sufficiently documented, no further concerns remain for this component of the site.

3) As the project proponent has yet to finalize development plans for the portion of the subject property

containing the pre-Contact component of the Gainford Sisters Site (BeFu-16), recommendations related to the available options are provided below:

Option A (preferred approach) – Avoidance and Protection

Address outstanding concerns for the site through the implementation of an avoidance and protection strategy, a strategy incorporating both short and long term measures to ensure the protection of the site. Steps should be taken to engage with the Mohawk Council of Akwesasne while formulating an appropriate Stage 4 mitigation strategy. The approach must include the following short term avoidance measures in the event that grading or other soil disturbing activities associated with any future development would extend to the edge of the site Gainford Sisters Site (BeFu-16) and a 10 metre protective buffer (hereafter referred to as the 'protected area'; see Map 21):

•A temporary barrier (snow fencing) should be erected around the protected area through the completion of the development-related activities.

•'No go' instructions should be issued to all on-site construction crews, engineers, architects, or others involved in day-to-day decisions during construction.

•The location of the protected area should be added to all contract drawings, when applicable, including explicit instructions or labelling to avoid that area.

•Any grading or soil disturbing activities should be monitored by a licensed consultant archaeologist to verify the effectiveness of the avoidance strategy. If impacts to the site are observed at any time, MTCS is to be notified immediately.

•After the completion of any grading or soil disturbing activities, the area should be inspected by a licensed consultant archaeologist and a report (Stage 4 monitoring report) must be submitted to MTCS, documenting the effectiveness of the avoidance strategy in ensuring that the area to be avoided remains intact.

This approach must also include appropriate mechanisms to ensure the long term protection of the protected area. The most commonly used mechanisms are restrictive covenants on titles, zoning by-law amendments, and transfer of ownership to a municipality or other public land-holding body. Allowable uses for the protected area must not include any activities that might alter the archaeological site in any way, either temporarily or permanently. This includes even minor forms of soil disturbance such as tree removal, minor landscaping, utilities installation, etc. If transfer of ownership is part of the avoidance and protection strategy, the proposed new owner must provide documentation confirming their awareness of their obligations for the archaeological site and their willingness and capacity to fulfill those obligations.

Option B – Mitigative Excavations

If avoidance and protection of all or part of the protected area is not compatible with the proposed development project, steps should be taken to engage with the Mohawk Council of Akwesasne while formulating an appropriate Stage 4 mitigation strategy. As the pre-Contact component of the Gainford Sisters Site (BeFu-16) has been determined to be undisturbed (i.e. not ploughed), any future Stage 4 mitigative excavations must minimally include:

•The controlled and systematic hand excavation of one metre square units over the area of the pre-Contact component of the site using the existing site grid (see Map 13).

•Excavated soils should be screened through six millimetre hardware mesh and all artifacts should be collected by provenience.

•All exposed subsoil surfaces should be carefully cleaned by shovel or trowel to aid in identifying any subsurface cultural features present.

•Following this cleaning and inspection, continue excavations at least 10 cm below the subsoil interface.

•Unit excavations should be continued outwards from the known limits of the pre-Contact component of the site until artifact yields of 10 artifacts or less are reached along the edges of the block excavation. Block excavations should, however, be continued in the event that at least two formal tools or diagnostic artifacts and/or fire-cracked rock, bone, or burnt artifacts are recovered.

•Unit excavations must extend a minimum of two metres beyond any uncovered cultural features.

•Soil samples should be collected from all cultural features and/or strata rich in organic remains or containing diagnostic artifacts, as well as from a minimum of five percent of all other cultural features identified.

4) Any future Stage 4 mitigation of development impacts to the pre-Contact component of the Gainford Sisters Site (BeFu-16) should be undertaken by a licensed consultant archaeologist, in compliance with Standards and Guidelines for Consultant Archaeologists (MTCS 2011).

Based on the information contained in the report, the ministry is satisfied that the fieldwork and reporting for the archaeological assessment are consistent with the ministry's 2011 Standards and Guidelines for Consultant Archaeologists and the terms and conditions for archaeological licences. This report has been entered into the Ontario Public Register of Archaeological Reports. Please note that the ministry makes no representation or warranty as to the completeness, accuracy or quality of reports in the register.

Should you require any further information regarding this matter, please feel free to contact me.

Sincerely,

Andrea Williams Archaeology Review Officer

cc. Archaeology Licensing Officer Clayton Jones, Jones Rail Industries Ltd./ CREWS Debra McKinstry, Township of Edwardsburgh/Cardinal

¹In no way will the ministry be liable for any harm, damages, costs, expenses, losses, claims or actions that may result: (a) if the Report(s) or its recommendations are discovered to be inaccurate, incomplete, misleading or fraudulent; or (b) from the issuance of this letter. Further measures may need to be taken in the event that additional artifacts or archaeological sites are identified or the Report(s) is otherwise found to be inaccurate, incomplete, misleading or fraudulent; misleading or fraudulent.

SCHEDULE "C"

Additional Township Conditions

- 1. This agreement and its schedules do not relieve the Owner or any other person from any obligation to comply with any other applicable legal requirements, including the provisions of the EPA, TSSA, Transport Canada, provincial and federal legislation, any regulations made thereunder, and municipal by-laws and regulations.
- 2. The Owner shall obtain such permits as may be required from Municipal or Provincial authorities including the Ministry of Transportation, Ministry of Environment, Conservation and Parks, the South Nation Conservation, and the United Counties of Leeds & Grenville and all other Federal, Provincial, or regulatory agencies. The Owner shall file copies thereof with the Township.

Roads

- 3. The Owner shall be responsible for all approvals from the United Counties of Leeds and Grenville, and subsequent improvements to their satisfaction, regarding improvements that may be required within the County Road 2 right-of-way to service this development.
- 4. Provision of lands for potential future road purposes shall be provided to the United Counties of Leeds and Grenville within one year of the execution of the agreement. The road allowance for County Road 2 shall be 30.5 m. Should sufficient allowance exist, a letter from a surveyor would meet the Counties' needs. Should the allowance not meet minimum desired right-of-way, an appropriate dedication of 1/2 the desired allowance width, measured from the centerline of the current road shall be made. The lands to be transferred for road widening purposes shall be free and clear of all and any encumbrances and at no cost to the United Counties of Leeds and Grenville.
- 5. The Owner shall provide adequate parking facilities on-site or other approved locations where workers employed on the Site shall be required to park their vehicles, except for those times when reasonable access to the Site is not available due to services or street construction in the public street or except as may be authorized in writing by the Township.
- 6. Where any road has been used for the provision of access to a construction site and has been damaged by the Owner, or any employees or authorized agents of the Owner
as a result of such use, the Owner shall restore or reconstruct it to its former state to the satisfaction of the Township or appropriate road authority.

Fire Suppression

- 7. The Owner shall also obtain all necessary approvals from the Township regarding the provision and installation of required fire hydrants.
- 8. The Owner shall provide adequate water supply for firefighting. A report from their consultant shall confirm that the municipal system will have proper capacity to serve this site, and that the design for the site will meet the requirements of the Technical Standards and Safety Authority (TSSA), Ontario Building Code and any other applicable Codes or Regulations and shall be in accordance with the Township's Agreement with the Town of Prescott, barring which the owner shall be responsible for any required amendments to this agreement.
- 9. Access routes for firefighting shall be designed and constructed in accordance with the TSSA and/or Ontario Building Code Act and Regulations. The approved access routes shall be maintained in accordance with the Fire Protection and Prevention Act, 1997. The Owner agrees to provide, maintain, and post signs designating fire lanes. The Owner further agrees to abide by any Township By-law relating to the maintenance and signage of such access routes. The location of any fire hydrants and shall be in accordance with the TSSA and/or Ontario Building Code. The required fire hydrants shall be installed and in service prior to the commencement of any storage or transloading of flammable material on the site.
- 10. The Owner shall be responsible to maintain all infrastructure relating to the fire suppression system. Hydrants shall be maintained in operating condition, free of snow and ice accumulations and readily available and unobstructed for use at all times in accordance with the Ontario Fire Code and the requirements of the Township. No person shall obstruct the free access to any fire hydrant. Vegetation or other objects shall neither be planted nor placed within a 1.5 metre radius beside or behind a hydrant without the express written consent of the Township.

Certificate of Insurance

11. The Owner shall submit a certificate of insurance in a form satisfactory to the Township. The certificate of insurance must be issued in favor of the Township in an amount not less than five million dollars per occurrence, must contain an endorsement naming the Township as an additional insured and an unconditional thirty days' notice of any material change or cancellation of the policy.

Servicing

- 12. The Owner shall be responsible for any temporary services required for this development, including electrical services.
- 13. The Owner shall contact all utilities, including but not limited to Hydro One, Bell Canada and Union Gas Distribution for service and meter installation details.
- 14. The Owner acknowledges and agrees that if easement(s) are required to service this development, the Owner shall provide the easement(s).
- 15. The Township will have no responsibility to install any extension to municipal services which may be required in order for the Owner to comply with this Agreement or with any Provincial or Municipal laws or by-laws. In cases where such an extension of municipal services is required, the Work shall be undertaken by and at the expense of the Owner and construction shall be to the standards established by the Township for the installation of such municipal services. The owner shall provide public liability insurance in a form acceptable to the Township for any Works involving the extension of municipal services and obtain any required approvals and permits from the Township.
- 16. The Owner shall be responsible to maintain all infrastructure relating to the storm sewer networks on the property. The Owner shall be required to maintain, clean, and/or repair all infrastructure within the Site.
- 17. Where the owner is proposing manholes, the maintenance of such manholes is required and it shall be the responsibility of the Owner to perform a regular removal of any trapped material (minimum once per 6 months). All materials arising from any spill shall be remediated immediately in accordance with Provincial or Federal Laws and Regulations at the sole expense and responsibility of the owner. These facilities are not to be dismantled or removed unless approval has been granted by the Township.
- 18. CCTV Inspection The Owner shall be responsible, at his expense, to provide all necessary CCTV inspection for storm sewer works on the Site. If the inspection is not satisfactory to the Township, the Owner shall rectify the works at his sole expense.
- 19. Video Examination Video examination of storm sewers, 200 mm or larger in diameter shall be required by the Township, at the Owner's expense, before final release of the Works.

Sediment and Erosion Control

20. The Owner shall maintain all streets within the area on a continuous basis during construction, in order that they are clear of mud, dust, and other material, resulting from vehicles involved in construction, to the satisfaction of the Township. The Owner shall prevent the "flushing" of dirt and debris associated with construction work into any municipal ditch. Upon any default by the Owner to maintain the streets, the Township may, at his/her discretion, arrange for the required cleaning to be performed and the cost incurred by the Township in doing so shall be recovered from the Owner.

Land Use Compatibility

- 21. The Owner shall ensure that the performance of Works required as a result of the Agreement, whether by the Owner or its employees, servants or agents or its contractors or subcontractors, shall be performed so as to not constitute a nuisance or disturbance to abutting or nearby properties or to the owners thereof. The Owner shall comply with and shall ensure that all of its contractors and subcontractors shall comply with any written instructions issued by the Township concerning any such nuisance or disturbance regardless of whether such instructions require positive action or discontinuance of action.
- 22. No site operations shall be conducted within 70m of a residential use and no transloading shall occur within 300m of a residential land use, as shown on Schedule B4 to this agreement.

Snow Storage

23. Snow removal and storage is the responsibility of the property owner. Snow storage areas shall be setback from property lines, foundations, fencing and/or landscaping requirements a minimum of 1.5 metres. Snow storage areas shall not occupy driveways, aisles, required parking spaces or any portion of a road allowance.

Lighting

- 24. All exterior lighting shall be directed to shine away and down from abutting residential zones and public highways. Any illuminated/lighted signage and lighting shall be designed, installed and maintained to:
 - Prevent light spill over or glare onto the County road allowance; and
 - Prevent light from falling within the vision of motorists in such a manner as to create a traffic hazard; and

• Not diminish or detract from the effectiveness of any traffic signal or similar safety or warning device, as determined by the Director of Public Works of the United Counties of Leeds and Grenville or his/her designate. Digital/LED signs will only be considered via amendment to this agreement.

Waste Disposal

25. The Owner is responsible for the disposal of waste from this site and shall arrange for the removal of all construction waste and recycling material from the site at their own expense in accordance with Township By-Laws.

LRO # 15 Notice

The applicant(s) hereby applies to the Land Registrar.

Properties						
68155 - 0792 LT						
PT LT 35 CON 1 EDWARDSBURGH PTS 1, 7 & 8, 15R9747; EDWARDSBURGH/CARDINAL						
PRESCOTT						
68155 - 0610 LT						
PT LT 36 CON 1 EDWARDSBURGH AS IN PR63012; S/T PR28288, PR66760; EDWARDSBURGH/CARDINAL						
COUNTY RD 2 PRESCOTT						
68155 - 0621 LT						
PT LT 36 CON 1 EDWARDSBURGH PT 1, 15R9899; EDWARDSBURGH/CARDINAL						
CARDINAL						

Consideration

Consideration \$0.00

Applicant(s)

The notice is based on or affects a valid and existing estate, right, interest or equity in land

Name	THE CORPORATION OF THE TOWNSHIP OF EDWARDSBURGH/CARDINAL					
Address for Service	18 Centre Street, P.O. Box 129,					
	Spencerville, Ontario, K0E 1X0					
This document is not authorized under Power of Attorney by this party.						

This document is being authorized by a municipal corporation Tory Deschamps, Mayor and Rebecca Crich, Clerk.

Statements

This notice is pursuant to Section 71 of the Land Titles Act. This notice is for an indeterminate period

Schedule: See Schedules

Signed By								
Amanda Jayne Spink		Box 428, 522 St. Lawrence St. Winchester K0C 2K0	acting for Applicant(s)	Signed	2023 11 20			
Tel	613-774-2670							
Fax	613-774-2266							
l have t	he authority to sign and register th	e document on behalf of the Applicant(s).						
Subr	nitted By							
AULT 8	AULT	Box 428, 522 St. Lawrence St. Winchester K0C 2K0			2023 11 20			

Tel613-774-2670Fax613-774-2266

Fees/Taxes/Payment						
Statutory Registration Fee	\$69.95					
Total Paid	\$69.95					

File Number

Applicant Client File Number :

11145