

THIS AGREEMENT made in triplicate on the 7<sup>th</sup> day of May, 2018.

B E T W E E N:

THE CORPORATION OF THE MUNICIPALITY OF SOUTH HURON

(Hereinafter referred to as the "Municipality")

OF THE FIRST PART

– And –

GNUTTI CARLO CANADA

(Hereinafter referred to as the "Owner")

OF THE SECOND PART

WHEREAS the Owner is entering into this agreement with the Municipality dealing with the facilities, works and matters hereinafter mentioned and the provision and maintenance thereof by the Owner and any and all subsequent owners to the satisfaction of and at no expense to the Municipality, as a condition to the approval pursuant to Section 41 of the Planning Act, as amended, of site plans and drawings for a development (hereinafter called the "development") on the lands and premises of the Owner more particularly described in the Schedule "A" attached hereto in the Municipality of South Huron, in the County of Huron (the "property").

NOW THEREFORE WITNESSETH THAT in consideration of the covenants and provisions herein and for other good and valuable consideration now paid by the Municipality to the Owner (the receipt and sufficiency of which the Owner hereby acknowledges), the Municipality and the Owner covenant, agree and provide with each other that the Owner shall do and perform, at no expense to the Municipality (unless otherwise expressly provided herein), the following matters and things:

1. DRAWINGS AND CONSTRUCTION OF EXTERNAL WORKS:

The Owner shall submit to and have approved by the Municipality detailed design drawings of external road, sewer and other improvements, together with associated internal works. The Owner shall construct, prior to occupancy of any building (unless otherwise approved by the Municipality), at the Owner's expense and to the satisfaction of the Municipality, the following works:

- (a) water service;
- (b) fire protection;
- (c) sanitary sewer service;
- (d) roadways;
- (e) signage;
- (f) stormwater management;
- (g) lighting.

2. STORMWATER MANAGEMENT:

The Owner shall undertake all work required to implement the Stormwater Management Plan, prepared by MTE on April 17, 2018 and approved by the Municipal Engineer. The approved stormwater management plan (last revision date: April 17, 2018) is incorporated into the attached Schedule "C".

All stormwater management works for this property must be constructed to the satisfaction of the Municipality, prior to the Chief Building Official issuing an occupancy permit for the building shown on the attached Schedule "D". The Owner agrees to maintain the property in such a manner that ensures compliance with the approved Stormwater Management Plan. The owner shall implement all erosion and sediment control measures as shown in Schedule "C.1", but not limited to sediment fencing.

3. PARKING:

- (a) A minimum of four (4) of the parking spaces established on the property will be designated as an accessible parking spaces. Such accessible spaces shall be clearly marked with pavement markings and vertical signage containing the international symbol of access. An accessible route shall be provided from the designated parking spaces to the barrier free entrance of the building. All facilities designed to have regard for accessibility shall incorporate the County of Huron's Universal Design and Accessibility Guidelines for Site Plan Control.
- (b) The Owner shall provide, at its own expense, and at all times maintain on the lands, parking areas capable of accommodating a minimum of One Hundred and Twenty-Nine (129) parking spaces for motor vehicles as required under the applicable Zoning By-law.

4. LIGHTING FACILITIES:

All lighting of the site shall be oriented and its intensity controlled so as to prevent glare on adjacent roadways and adjacent properties to the satisfaction of the Municipality. Provide confirmation that lighting has been completed in accordance with the approved Site Plan, which forms Schedule "B" herein.

5. LANDSCAPING

The Owner shall landscape the site and thereafter maintain the same in general conformity with the approved plan attached hereto as Schedule "B", to the satisfaction of the Municipality of South Huron.

The Owner shall provide a landscape plan to the satisfaction of the Municipality of South Huron prior to implementation.

6. SCREENING

The refuse and recycling storage shown on Schedule "B" shall be visually screened within (1) year from the date of registration of this agreement.

7. FIRE ROUTE DESIGNATION:

The Owner shall identify the fire route. Such fire route shall be clearly marked showing street allowances and vehicular accesses for the approval of the Fire Chief. Signs specifying that parking is prohibited in the designated fire route shall be displayed.

8. FIRE PROTECTION

The Owner shall install the fire hydrant as shown in Schedule "B" herein.

9. 'AS CONSTRUCTED' PREMISES:

The Owner shall provide for the Municipality's records 'as constructed' drawings to the satisfaction of the Municipality for municipal services installed by the Owner which may, in the future, be assumed by the Municipality. These drawings shall be submitted in a satisfactory form prior to the release of any performance bond or security required by this agreement. The development shall be completed in accordance with Schedule "D" herein.

10. INSPECTION AND COMPLETION OF WORKS:

Where the Owner is required to construct certain works to be assumed by the Municipality or carry out work within a public highway, walkway or easement, the Owner shall have his Professional Engineer provide a qualified inspector acceptable to the Municipality to carry out on-site inspection of the works. Upon completion of the work and prior to requesting the Municipality to assume the works, the Owner shall supply to the Municipality, in a form acceptable, a certificate of the Owner's Professional Engineer substantially in the following form:

CERTIFICATE OF COMPLETION OF WORKS

TO: The Corporation of the Municipality of South Huron

For good and valuable consideration now paid by the Corporation of the Municipality of South Huron (hereinafter called the "MUNICIPALITY"), the receipt and sufficiency of which I/we hereby acknowledge, I/we hereby certify that the municipal services constructed pursuant to the Development Agreement between the Municipality and (Owner's Name) registered as No. \_\_\_\_\_ relating to municipal number Lot/Block No. \_\_\_\_\_ Plan No. \_\_\_\_\_ have been

- (a) inspected during construction in accordance with standard engineering practice; and
- (b) constructed in accordance with the plans and specifications approved by the Municipality.

Delivered under my/our hand and professional seal at South Huron, Ontario this \_\_\_\_\_ day of \_\_\_\_\_, 20\_\_\_\_.

Registered Professional Engineer

The Owner acknowledges and agrees that the form of the Certificate of Completion of Works required under this paragraph may vary depending on the development's requirements.

11. JOINT USE OF COMMON INTERNAL DRIVEWAYS:

At the time of the establishment of a joint use of common internal parking link, the Owner shall enter into an agreement with the Owner(s) of land(s) adjacent to the development as applicable. The Owner is to provide the Municipality with a copy of this agreement.

12. SIGNAGE

Provide confirmation that sign and pavement markings has been installed in accordance with the approved Signs and Pavement Markings Plan, which forms Schedule "E" herein.

13. SUBSURFACE DRAINAGE:

The Owner shall notify the Municipality, in writing, in the event that any existing sewer or drain is encountered during the progress of construction. The Owner shall have its Engineer investigate the matter and shall comply with the recommendations of the Owner's Engineer, as approved by the Municipality, with respect to the sewer or drain encountered. Such recommendations may include connecting the existing sewer to a new sewer being constructed or into another existing sewer, at no expense to the Municipality. The Owner shall also ensure that there is no interruption of any subsurface drainage flow because of construction on the site which would have an adverse effect on neighbouring properties. Should such an interruption occur, the Owner shall carry out any necessary remedial work to correct the problem as requested by the Municipality and to the satisfaction of the Municipality at no expense to the Municipality.

14. ABANDONED PRIVATE DRAIN CONNECTIONS:

The Owner acknowledges that any abandoned existing private drain connections shown on the site plans or encountered during construction are to be excavated at the street line and sealed to the satisfaction of the Municipality.

15. EXISTING PRIVATE DRAIN CONNECTIONS:

The Owner acknowledges that any existing private drain connections which are proposed for re-use are to be excavated at the street line and inspected and approved by the Municipality for such re-use.

16. UNDERTAKING OF CONSTRUCTION:

If no building permit is issued for the development within two (2) years of the date of the approval of the site plans and drawings pursuant to Section 41 of the Planning Act, (Ontario), as amended, or if a building permit is issued but, in the opinion of the Chief Building Official, the Owner does not seriously commence construction of the development within two (2) years from the date of the approval of the site plans and drawings pursuant to Section 41 of the Planning Act (Ontario), as amended, or if any building permit issued for this development is revoked at any time, the Municipality in its sole discretion may revoke its approval of the plans and drawings and may terminate the agreement by giving notice in writing and by registering a notice that the approval is revoked and the agreement is terminated.

17. WORK ACCORDING TO PLANS:

As the Owner has entered into this agreement as a condition precedent to the approval by the Municipality of site plans and drawings dealing with the facilities, works and matters mentioned herein, the Owner shall submit from time to time one or more plans and drawings as may be required pertaining to any of these facilities, works and matters including but not restricted to any plans or drawings specifically mentioned herein. Such plans and drawings as and when approved by the Municipality, whether before or after the date upon which this agreement is entered into, shall be treated as forming part of this agreement in the same manner and to the same extent as if such plans and drawings had been approved and actually attached to this agreement at the time that it is entered into. In all matters not herein provided for, the Owner shall develop his land and shall use the same in accordance with the applicable Zoning By-Law of the Municipality, as amended. The provisions of this agreement and any approved site plan or drawing pertaining to a facility, work or matter shall be construed and applied as complementary to each other but in the event of any conflict, the plan or drawing receiving the last approval shall govern. Without restricting the generality of this clause, the Owner shall develop his lands and shall construct works and maintain them in perpetuity in accordance with the approved Site Servicing Plan which is attached as Schedule "B".

18. WORK AT OWNER'S RISK:

All incidental matters including but not restricted to the removal and planting of trees; cutting, replacing and installing approaches; relocating utilities, pipes, poles, valves and equipment; resetting drains and manholes; and all other things required by this agreement or by the Municipality shall be carried out by the Owner at his own risk and expense. All work must be completed to the satisfaction of the Municipality and to the satisfaction of the owner of such utilities.

19. COMPLETION OF WORK:

All work required under this agreement, including but not restricted to asphalt surfacing, fencing, establishment of landscaping and as constructed drawings, completion of services and any other work set out herein, shall be completed or delivered, as the case may be, within a period of nine (9) months from the date of substantial completion of construction of the development as determined by the Chief Building Official. All such work shall be performed to the satisfaction of the Chief Building Official of the Municipality.

20. SECURITIES:

In order to ensure due performance of all work required under this agreement and to protect the Municipality in respect of its liability for holdback of costs under Section 17 of the Construction Lien Act (Ontario), as amended, for any work on municipal property, the Owner shall deposit with the Municipality prior to the issuance of a building permit, an irrevocable Letter of Credit from a chartered bank, issued in form and content satisfactory to the Municipality's Solicitor, in the amount of One Hundred Percent (100%) of the total securities as set out in Schedule "E".

All Letters of Credit shall be for a minimum guaranteed period of one (1) year or such longer time as the Municipality may decide. All Letters of Credit shall contain the following clause: "It is a condition of the Letter of Credit that it shall be deemed to be automatically extended without amendment from year to year from the present or any future expiration date thereof, unless at least thirty (30) days prior to the present or any

future expiration date, we notify you in writing by registered mail that we elect not to consider this Letter of Credit to be renewable for any additional period.” Unless each and every Letter of Credit is renewed as noted above, the Municipality shall have the absolute right to refuse to issue building permits and to prohibit occupancy, whether partially or fully completed, from the said date thirty (30) days prior to the expiration of that Letter of Credit.

20.1. SECURITY RELEASE

General securities outlined in Schedule “E” will be released upon the completion of all works, to the satisfaction of the Municipality of South Huron.

21. DEVELOPMENT CHARGES:

The Owner shall pay all development charges applicable to the development in accordance with the By-laws of the Municipality of South Huron.

22. MUNICIPALITY’S RIGHT TO ENTER:

The Municipality or any of its officers, servants or agents may, from time to time, at all reasonable times and upon producing proper identification, enter upon the Owner’s lands and premises for the purposes of inspecting the facilities, works and matters to be provided and maintained under this agreement and for the purpose of providing or maintaining at the Owner’s expense any facility, work or matter in default of the Owner providing or maintaining the same where such default has continued for fifteen (15) days or more. The Municipality, its officers, servants and agents shall not be liable to the Owner or any occupant of the lands and premises for any losses or damages of any kind whatsoever arising in any way from entry for such purposes. In the event of an emergency, the Municipality’s right to enter under this provision shall not be limited to situations in which the default of the Owner has continued for more than fifteen (15) days.

23. ROAD ALLOWANCE INDEMNITY:

Except as otherwise expressly provided in this agreement, the right of the Owner to use and occupy any untravelled portions of road allowances shall, at all times, be at the will of the Municipality and the construction and maintenance of any and all curbs, pavements, plantings and other improvements or works thereon shall at all times be at the risk and expense of the Owner. The Owner shall indemnify and save harmless the Municipality and any of its officers, employees or servants from and against all actions, suits, claims, damages, demands, costs, including reasonable legal fees and disbursements, liabilities and any other claims which may be brought against or made upon the Municipality or any of its officers, employees or servants in consequence of the use and occupation of untraveled portions of road allowances by the Owner or the construction, maintenance or existence of curbs, pavements, plantings or other improvements of the Owner thereon. Any amounts owed by the Owner to the Municipality under this indemnity shall constitute a lien and charge upon the lands of the Owner and shall be collectible in like manner as municipal taxes. Without limiting the foregoing agreement to indemnify, the Municipality may, in case any such action, suit, claim or demand is brought or made against the Municipality or any of its officers, employees or servants, settle any such action, suit, claim or demand on such terms as the Municipality shall see fit, and the Owner shall thereupon forthwith pay to the Municipality the sum or sums so paid, together with such sum as shall represent the reasonable costs of the Municipality and its solicitor in defending or settling any such action, suit, claim or demand.

24. INSURANCE:

Prior to the issuance of any building permit and any commencement of work for the development, the Owner shall supply the Municipality with a certified copy of a comprehensive general liability insurance policy with limits in an amount and in a form acceptable to the Municipality. The minimum limits of such policies shall be \$5,000,000 all inclusive, but the Municipality shall have the right to set higher amounts. Such policy or policies shall be issued in the joint names of the Owner and the Municipality. The said insurance policy shall indemnify the Municipality from any loss arising from any claims

for damages, injury or otherwise in connection with the work done by or on behalf of the Owner. Such insurance policy shall provide coverage for a period of at least one (1) year and shall continue until all the work required by the Owner under this Agreement is completed and, where applicable, assumed by the Municipality. The said insurance policy must also include a provision confirming that the insurance policy shall not be cancelled or materially amended without providing the Municipality with thirty (30) days' written notice of the insurer's intention to do so. The issuance of such a policy of insurance shall not be construed as relieving the Owner from responsibility for other or larger claims, if any, for which he may be held responsible.

25. GENERAL INDEMNITY:

The Owner shall indemnify and save harmless the Municipality and any of its officers, employees or servants from and against all actions, suits, claims, damages, demands, costs, including reasonable legal fees and disbursements, liabilities and any other claims which may be brought against or made upon the Municipality or any of its officers, employees or servants sustained or incurred by the Municipality or any of its officers, employees or servants as a result of the Municipality entering into this agreement with the Owner. Any amounts owed by the Owner to the Municipality under this indemnity shall constitute a lien and charge upon the lands of the Owner and shall be collectible in like manner as municipal taxes. Without limiting the foregoing agreement to indemnify, the Municipality may, in case any such action, suit, claim or demand is brought or made against the Municipality or any of its officers, employees or servants, settle any such action, suit, claim or demand on such terms as the Municipality shall see fit, and the Owner shall thereupon forthwith pay to the Municipality the sum or sums so paid, together with such sum as shall represent the reasonable costs of the Municipality and its solicitor in defending or settling any such action, suit, claim or demand.

26. BY-LAWS:

Notwithstanding any of the provisions of this agreement, the Owner shall be subject to all By-Laws of the Municipality. In the event of conflict between the provisions of this agreement and the provisions of any By-Law of the Municipality, the provisions of the By-Law prevail.

27. SUBSEQUENT OWNERS BOUND:

Subject to the provisions of the Registry Act and the Land Titles Act, the covenants, agreements, conditions and understandings therein contained on the part of the Owner shall be conditions running with the land described in Schedule "A" hereto and shall be binding upon the Owner and their heirs, estate trustees, administrators, successors and assigns, as the case may be, and subsequent owners and occupiers of the said lands from time to time (and "Owner", wherever used in this agreement, is intended and shall be construed to include such subsequent owners and occupiers).

28. SEPARATE COVENANTS:

All of the provisions of this agreement are and shall be construed and interpreted as covenants and agreements as though the words importing such covenants and agreements were used in each separate clause hereof. Should any covenant or provision of this agreement be adjudged unlawful or unenforceable, such covenant or provision shall be considered separate, distinct and severable from this agreement and the covenants and provisions of this agreement shall not be affected and shall remain fully enforceable.

29. ENFORCING PERFORMANCE OF REQUIREMENTS:

In addition to any remedy authorized or permitted by this agreement or by law, the Municipality, upon giving fifteen (15) days notice or forthwith in cases of emergency, may, in default of any matter or thing required to be done by the Owner under this agreement, do such matter or thing at the expense of the Owner and if the Municipality has incurred any expense, it may recover the expense by action, by performance bond or other security or by adding the said expenses to the tax roll and recovering same in like manner as municipal taxes. No proceeding by the Municipality under this clause and no waiver under any provision of this agreement shall prejudice the rights of the Municipality in respect of any subsequent default or any matter or thing required to be done by the Owner under this agreement. The rights of the Municipality may be

enforced by any remedy authorized or permitted by the Agreement or By-Law and no such remedy shall be exclusive or dependent on any other remedy.

30. NUMBER AND GENDER:

Words importing the singular only shall include the plural; words importing the masculine only shall include the female and words importing a person shall include corporations.

31. NOTICES:

Any notice required or permitted to be given hereunder shall be in writing and shall be effectively given if delivered personally or sent by registered mail in the case of notice to the Municipality as follows:

Municipality of South Huron  
P.O. Box 759  
322 Main Street South  
Exeter ON, N0M 1S6

And in the case of notice to the Owners, as follows:

Mr. Paul Buchanan  
404 Canada Avenue  
Huron Park, ON N0M 1Y0

Any notice so given shall be deemed conclusively to have been given and received when so personally delivered or on the third (3<sup>rd</sup>) business day following the sending thereof by registered mail.

32. REGISTRATION:

The Owner agrees that this document shall be registered against the title to the lands affected by it and that such registration shall be done by the Municipality. The cost of such registration and associated legal fees shall be the responsibility of the Owner.

The Owner further agrees that this agreement shall have priority over all mortgages that are registered against the property and the Owner hereby undertakes to deliver an agreement postponing those mortgages to this agreement and to register the same on title.

33. COSTS:

Any costs incurred by the Municipality for the review, implementation and administration of this agreement (including engineering, administrative costs and legal fees) shall be borne by the Owner.

IN WITNESS WHEREOF the Municipality and the Owner hereto have hereunto affixed their Corporate Seals duly attested by the hands of their proper officers in that behalf, the day and year first written above.

THE CORPORATION OF THE MUNICIPALITY OF  
SOUTH HURON

\_\_\_\_\_  
Per: Maureen Cole, Mayor

\_\_\_\_\_  
Per: Rebekah Msuya-Collison, Clerk

We have authority to bind the Corporation.

**SIGNED, SEALED AND DELIVERED**  
In the presence of

Gnutti Carlo Canada Limited

\_\_\_\_\_  
Per: Paul Buchanan, Duly Authorized Officer

I have the authority to bind the Corporation.



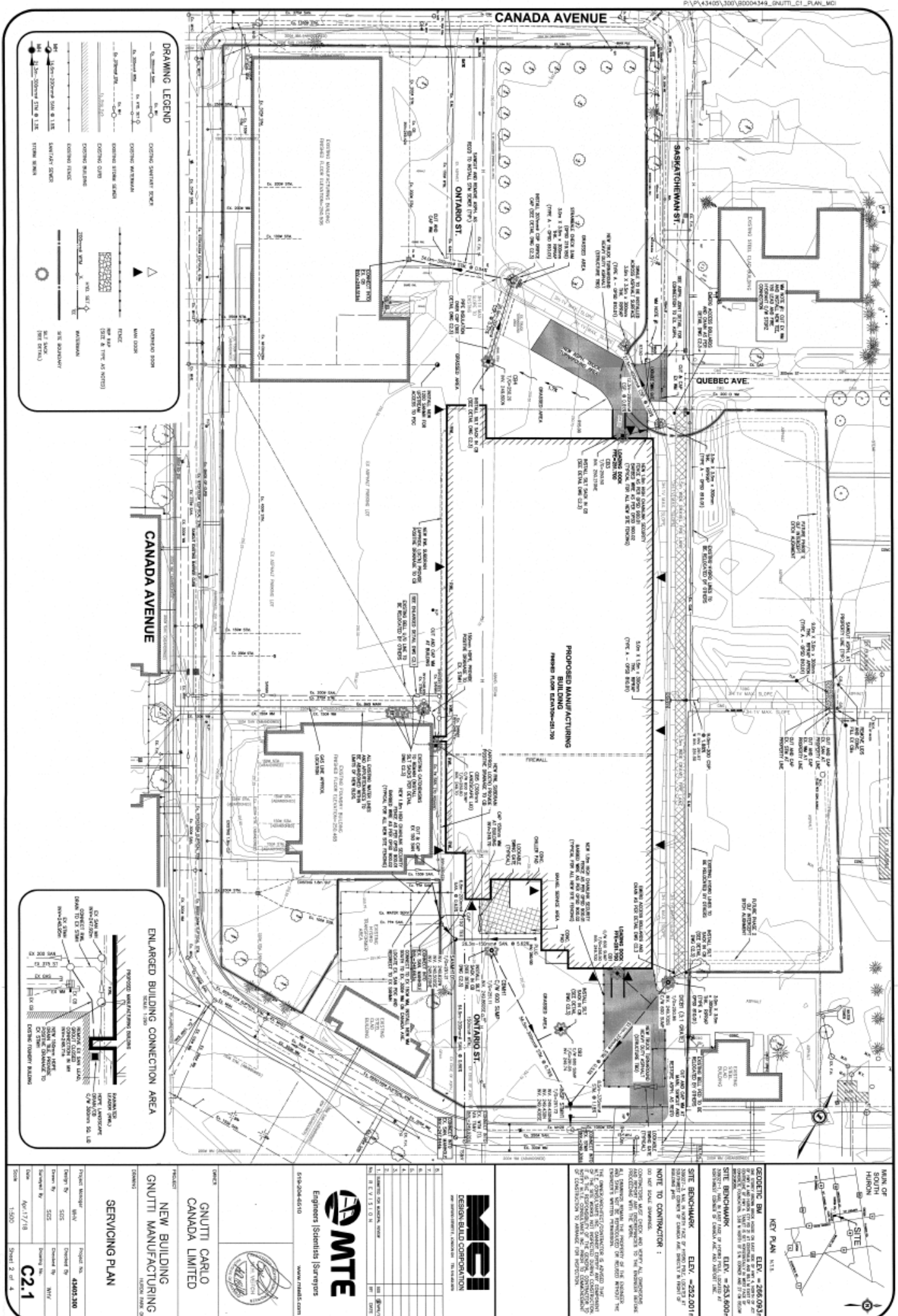
**SCHEDULE "A"**  
LEGAL DESCRIPTION

Note: It is understood and agreed that this Schedule forms part of the Municipality's Agreement.

Stephen CON 3 PT LOTS 6 AND; 7 RP 22R5240 PARTS 20 TO 33; 79 TO 82,  
and Stephen CON 3 PT LOTS 6 AND; RP 22R5240 PARTS 37 TO 49; AND 91,  
Stephen Ward, Municipality of South Huron.

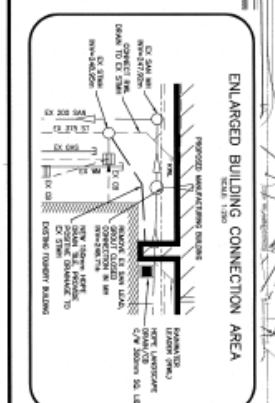
# SCHEDULE "B" SITE SERVICING PLAN

Note: It is understood and agreed that this Schedule forms part of the Municipality's Agreement.



**DRAWING LEGEND**

EXISTING SANITARY SEWER	PROPOSED SEWER
EXISTING WATER MAIN	PROPOSED WATER MAIN
EXISTING STORM SEWER	PROPOSED STORM SEWER
EXISTING DRIVE	PROPOSED DRIVE
EXISTING SIDEWALK	PROPOSED SIDEWALK
EXISTING FENCE	PROPOSED FENCE
EXISTING SIGN	PROPOSED SIGN
EXISTING LIGHT FIXTURE	PROPOSED LIGHT FIXTURE
EXISTING TREE	PROPOSED TREE
EXISTING CURB	PROPOSED CURB
EXISTING PAVEMENT	PROPOSED PAVEMENT
EXISTING GRADE	PROPOSED GRADE
EXISTING ELEVATION	PROPOSED ELEVATION
EXISTING DIMENSION	PROPOSED DIMENSION
EXISTING AREA	PROPOSED AREA
EXISTING VOLUME	PROPOSED VOLUME
EXISTING WEIGHT	PROPOSED WEIGHT
EXISTING LENGTH	PROPOSED LENGTH
EXISTING WIDTH	PROPOSED WIDTH
EXISTING HEIGHT	PROPOSED HEIGHT
EXISTING DEPTH	PROPOSED DEPTH
EXISTING DIAMETER	PROPOSED DIAMETER
EXISTING RADIUS	PROPOSED RADIUS
EXISTING ANGLE	PROPOSED ANGLE
EXISTING BEARING	PROPOSED BEARING
EXISTING DISTANCE	PROPOSED DISTANCE
EXISTING AREA	PROPOSED AREA
EXISTING VOLUME	PROPOSED VOLUME
EXISTING WEIGHT	PROPOSED WEIGHT
EXISTING LENGTH	PROPOSED LENGTH
EXISTING WIDTH	PROPOSED WIDTH
EXISTING HEIGHT	PROPOSED HEIGHT
EXISTING DEPTH	PROPOSED DEPTH
EXISTING DIAMETER	PROPOSED DIAMETER
EXISTING RADIUS	PROPOSED RADIUS
EXISTING ANGLE	PROPOSED ANGLE
EXISTING BEARING	PROPOSED BEARING
EXISTING DISTANCE	PROPOSED DISTANCE



**CLIENT**  
GNUTTI CARLO  
CANADA LIMITED

**PROJECT**  
NEW BUILDING  
GNUTTI MANUFACTURING

**SERVICING PLAN**

Project No. 43402-310

Drawn by: SCS  
Checked by: HW  
Date: Apr 17/18

Scale: 1:500  
Sheet 2 of 4

**MTE**  
Engineers | Scientists | Surveyors

519-904-4510  
www.mte.ca

**REVISIONS**

NO.	DESCRIPTION	DATE
1	ISSUED FOR PERMIT	APR 17/18
2	ISSUED FOR CONSTRUCTION	APR 17/18
3	ISSUED FOR AS-BUILT	APR 17/18

**KEY PLAN**

**GENETIC B.M.** ELEV. = 286.093m

**SITE BENCHMARK** ELEV. = 253.500m

**SITE BENCHMARK** ELEV. = 252.001m

**NOTE TO CONTRACTOR:**

CONTRACTOR MUST CHECK AND VERIFY ALL DIMENSIONS AND LOCATIONS OF ALL UTILITIES AND SERVICES TO BE INSTALLED. THE CONTRACTOR SHALL BE RESPONSIBLE FOR OBTAINING ALL NECESSARY PERMITS AND APPROVALS FROM THE APPROPRIATE AGENCIES. THE CONTRACTOR SHALL BE RESPONSIBLE FOR OBTAINING ALL NECESSARY PERMITS AND APPROVALS FROM THE APPROPRIATE AGENCIES.







**SCHEDULE "E"**  
**SECURITY TO BE PROVIDED**

Note: It is understood and agreed that this Schedule forms part of the Municipality's Agreement.

<b>ITEM</b>	<b>COST</b>
Stormwater Management Plan/Storm Sewer Service	\$78,200
Sanitary Sewer Service	\$15,000
Water Service/Fire Protection	\$11,000
Roadways (Paving, Curbs, Gutter)	\$87,000
Landscaping	\$5,000
<b>TOTAL</b>	<b>\$196,200</b>

## **SCHEDULE "F"**

### **STORM WATER MANAGEMENT DESIGN**

Note: It is understood and agreed that this Schedule forms part of the Municipality's Agreement.



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## **Stormwater Management Report**

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**Project Location:**  
404 Canada Avenue  
Huron Park, Ontario

**Prepared for:**  
Gnutti-Carlo Canada  
London, ON

**Prepared by:**  
MTE Consultants Inc.  
560 Wellington Street  
London, ON N6A 3R4

April 05, 2018

**File: 43405-300**









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## Stormwater Management Report

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**Project Location:**  
404 Canada Avenue  
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**Prepared for:**  
Gnutti-Carlo Canada  
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**Prepared by:**  
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**Technical Appendices**

Appendix A: SWM Storage Calculations

## **1.0 INTRODUCTION**

MTE Consultants Inc. was retained by Gnutti-Carlo Canada Ltd to complete the stormwater management design for the proposed site development located at 404 Canada Avenue, Huron Park, Ontario as part of an overall Site Plan submission to the Municipality of South Huron.

The proposed development for the site is the construction of a new manufacturing building with associated parking and driveways.

This report addresses the stormwater management requirements for the site. The site grading, servicing and stormwater management details are illustrated on the enclosed MTE drawing, Engineering Plans C1.1., C2.1, C2.2, C2.3

## **2.0 CRITERIA**

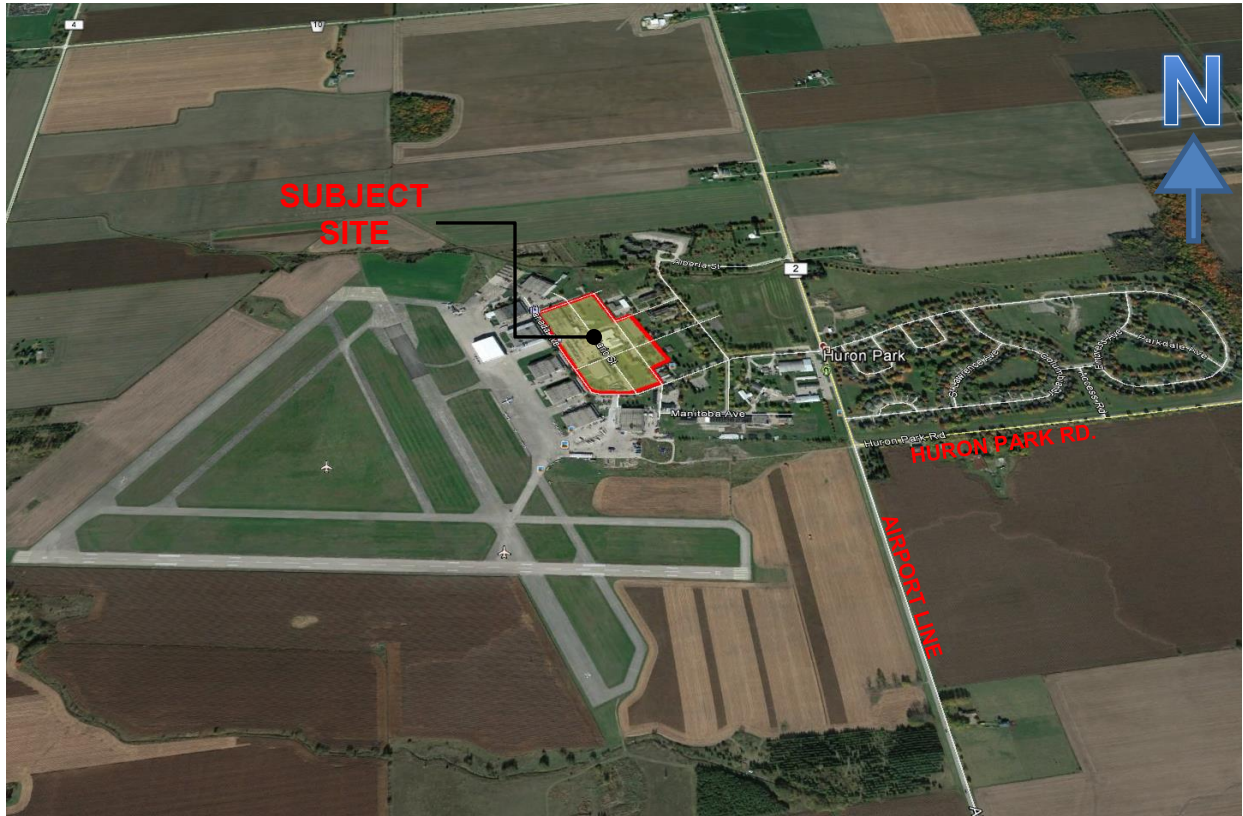
In order to successfully complete the stormwater management design for this site, the following specific tasks were undertaken:

- i) Calculated the allowable runoff rates using RATIONAL METHOD;
- ii) Determined the percent impervious of the site and catchment parameters for inclusion in modeling;
- iii) Calculated post-development runoff; and,
- iv) Adjust the site grades to attain the required storage for runoff control and to provide safe conveyance for both minor and major flows.

## **3.0 HYDROLOGY**

### **3.1 Predevelopment Drainage**

The site is approximately 5.57 hectares and has several industrial buildings, a parking lot, roadways and landscaped areas. The site has undergone several modifications over the past decades. The existing storm sewer system for this site was installed in the 1950's. Accordingly, an aerial image of 1952 was referenced to determine pre-development site characteristics. See Figure No. 1 for the Location Map and Figure No. 2 for the 1952 Aerial Image.



**Figure 1: Location Map**



**Figure 2: Aerial Image Ca 1952**

### 3.2 Pre Development Drainage

The pre development site statistics are as follows (See Figure No. 3):

#### General Post Development Site Statistics

Roof Area	7300 m <sup>2</sup>	c=0.9	ac=	6570.0
Paved Areas	22800 m <sup>2</sup>	c=0.9	ac=	20520.0
Landscaped Areas	25600 m <sup>2</sup>	c=0.2	ac=	5120.0
<b>Total</b>	<b>55700 m<sup>2</sup></b>		<b>ac=</b>	<b>32210.0</b>

Composite runoff coefficient = 32210 / 55700 = 0.58

### 3.3 Allowable Release Rate

Allowable release rate is considered to be the pre-development runoff and is calculated based on the Stratford 5 year storm and a 15 minute time of concentration.

$$I = \frac{A}{(t+B)^c} = \frac{875.105}{(15+7.641)^{0.762}} = 81.21 \text{ mm/hr}$$

Allowable release rate for this site based on pre-development site characteristics is as follows:

$$Q = 2.78 CiA$$

$$= 2.78 \times 0.58 \times 81.21 \times 5.57 = 729.35 \text{ l/s}$$

### 3.4 Post Development Drainage

The post development site statistics are as follows (See Figure No.4):

#### General Post Development Site Statistics

Roof Area	21100 m <sup>2</sup>	c=0.90	ac=	18990
Asphalt Areas	11400 m <sup>2</sup>	c=0.90	ac=	10260
Landscaped Areas	23200m <sup>2</sup>	c=0.20	ac=	4640
<b>Total</b>	<b>55700 m<sup>2</sup></b>		<b>ac=</b>	<b>33890</b>

$$\text{Composite runoff coefficient} = 33890 / 55700 = 0.61$$

Due to the small increase in impervious area compared to the pre-development state, runoff from the site will be more than the pre-development runoff. Post-development runoff is calculated as follows:

Post-development runoff is calculated based on the Stratford 5 year storm and a 15 minute time of concentration.

$$I = \frac{A}{(t+B)^c} = \frac{875.105}{(15+7.641)^{0.762}} = 81.21 \text{ mm/hr}$$

$$Q = 2.78 CiA \\ = 2.78 \times 0.61 \times 81.21 \times 5.57 = 767.08 \text{ l/s}$$

To match pre-development runoff rates, it is proposed to utilize above ground storage in a proposed channel/swale located west of the new building. **See Figure No. 3.**

The proposed development labeled as Area 101 in Figure No. 3 is 1.86 Ha. The east half of the development (0.93 Ha) shall drain to the east to the storm sewer system on Canada Avenue which connects to the storm sewer on New Brunswick Avenue.

The other half is proposed to drain via the proposed swale/storage to the west of the proposed development. This swale shall drain to the existing storm sewer along Ontario Street to New Brunswick Avenue. The storm sewer on New Brunswick outlets to a watercourse located North West of the site.

Quantity control shall be provided on the flow from the western half of the development such that the total runoff from the site shall not exceed the pre-development flow.

Total runoff from the uncontrolled site (excluding western half of proposed development) is calculated as follows;

$$Q = 2.78 CiA \\ = 2.78 \times 0.61 \times 81.21 \times (5.57-0.93) = 639.00 \text{ l/s}$$

Allowable release rate from the western half of the development is 90.35 l/s (729.35-639.00).

### 3.5 Roof Drainage

No roof storage is proposed on the proposed building.

### 3.6 Orifice Calculation

Flow from the proposed storage should be controlled to 90.35 and the orifice is sized as follows:

$$\begin{aligned} \text{Ponding Elevation (m)} &= 250.70\text{m} \\ \text{Orifice Springline (m)} &= \underline{249.75\text{m}} \\ \Delta H \text{ (head)} &= 0.95\text{m} \end{aligned}$$

$$\begin{aligned} Q &= 90.35 \text{ l/s} \\ \text{Area Orifice} &= \frac{Q}{c\sqrt{2g(\Delta h)}} = \frac{90.35 / 1000}{0.63 \sqrt{(2 \times 9.81 \times 0.95)}} = 0.0336 \text{ sq. m.} \end{aligned}$$

$$\text{Diameter Orifice Pipe} = (4 \times 0.0336 / \pi)^{0.5} = 0.207\text{m} = 207 \text{ mm}$$

A 207 mm diameter orifice is required. A 207mm diameter orifice plate will be installed on the downstream side of swale/storage.

### 3.7 Stormwater Detention Volumes

Table 1 provides a summary of stormwater quantity control storage requirements and demonstrates that adequate storage is available to control post development runoff to acceptable allowable release rates.

Refer to Appendix A for the calculations on ponding values.

**Table 1: Stormwater Storage Summary**

STORM EVENT	SRORAGE (m <sup>3</sup> )	
	REQUIRED	AVAILABLE
5YR	88.7	208.5
50 YR	208.0	

Surface storage will be provided within the storage swale as shown on enclosed Engineering Plan C2.2 for a maximum ponding elevation of 250.36 m corresponding to a maximum ponding depth of 0.66m for the 5 year storm event.

#### **4.0 TEMPORARY WATER QUALITY CONTROL**

In order to minimize the effects of erosion during the grading of the site, sediment control fencing will be installed as shown on the enclosed engineering drawing, around any stockpiles and around the catchbasins during construction. Any sediment that is tracked onto the road way during the course of construction will be cleaned by the contractor.

#### **5.0 CONCLUSION**

Based on the foregoing analysis, it is concluded that:

- i) the proposed stormwater management design provides adequate attenuation of post development flows;

It is recommended that:

- i) the site grading be undertaken according to the proposed elevations, details and erosion control measures shown on the enclosed engineering drawings;
- ii) the stormwater management facilities be installed as detailed on the enclosed engineering drawings; and,



- iii) the stormwater management facilities be inspected by MTE Consultants Inc. during construction and certified to the Municipality of South Huron upon completion.

All of which is respectfully submitted,

**MTE CONSULTANTS INC.**

George Karugu, P.Eng.



## **APPENDIX A**

### **SWM STORAGE CALCULATIONS**

**SWM STORAGE VOLUME CALCULATION - 2YR STORM EVENT**

JOB NUMBER: 43405  
 CLIENT: Gnutti-Carlo Canada  
 LOCATION: Canada Avenue  
 IDF STATION: Huron Park

**SITE INFORMATION**

**Subcatchment Area No. 1**

	AREA (m2)	RUNOFF COEFFICIENT
Roof Area (Controlled)	0	0.9
Paved Area (Hard Surface)	9300	0.9
Landscaped Area	0	0.25
Overall Area	9300	0.90
Paved + Landscaped	9300	0.90

Allowable Release Rate from Site (L/s):

Total Allowable Release Rate= 90.35  
 Release Rate from Roof= 0.00  
 Allowable Release from Other Areas= 90.35

**STORAGE VOLUME CALCULATION**

Modified Rational Method used to determine storage volume:

$Q=CiA/360$

5
A 875.105
B 7.641
C 0.762

$i=A/(t+B)^C$

TIME (MIN.)	i 100YR (mm/hr)	INFLOW (m3/sec)		ACCUMULATED RUNOFF VOLUME (m3)		2YEAR ALLOWABLE RELEASE VOL. (m3)		REQ'D STORAGE (m3)		
		ROOF	SURFACE	ROOF	SURFACE	ROOF	SURFACE	ROOF	SURFACE	TOTAL
10	98.2	0.000	0.228	0.0	137.0	0.0	54.2	0.0	82.8	
12	90.5	0.000	0.210	0.0	151.5	0.0	65.1	0.0	86.5	
14	84.1	0.000	0.195	0.0	164.2	0.0	75.9	0.0	88.3	
16	78.6	0.000	0.183	0.0	175.4	0.0	86.7	0.0	88.7	
18	73.9	0.000	0.172	0.0	185.5	0.0	97.6	0.0	87.9	
20	69.8	0.000	0.162	0.0	194.6	0.0	108.4	0.0	86.2	
22	66.1	0.000	0.154	0.0	203.0	0.0	119.3	0.0	83.7	
24	62.9	0.000	0.146	0.0	210.7	0.0	130.1	0.0	80.6	
26	60.1	0.000	0.140	0.0	217.8	0.0	140.9	0.0	76.9	
28	57.5	0.000	0.134	0.0	224.5	0.0	151.8	0.0	72.7	
30	55.1	0.000	0.128	0.0	230.7	0.0	162.6	0.0	68.1	88.7
32	53.0	0.000	0.123	0.0	236.6	0.0	173.5	0.0	63.1	
34	51.0	0.000	0.119	0.0	242.1	0.0	184.3	0.0	57.8	
36	49.3	0.000	0.115	0.0	247.4	0.0	195.2	0.0	52.2	
38	47.6	0.000	0.111	0.0	252.3	0.0	206.0	0.0	46.3	
40	46.1	0.000	0.107	0.0	257.1	0.0	216.8	0.0	40.2	
42	44.7	0.000	0.104	0.0	261.6	0.0	227.7	0.0	33.9	
44	43.3	0.000	0.101	0.0	265.9	0.0	238.5	0.0	27.4	
46	42.1	0.000	0.098	0.0	270.1	0.0	249.4	0.0	20.7	
48	40.9	0.000	0.095	0.0	274.1	0.0	260.2	0.0	13.9	

**SWM STORAGE VOLUME CALCULATION - 100YR STORM EVENT**

JOB NUMBER: 43405  
 CLIENT: Gnutti-Carlo Canada  
 LOCATION: Canada Avenue  
 IDF STATION: Huron Park

**SITE INFORMATION**

**Subcatchment Area No. 1**

	AREA (m2)	RUNOFF COEFFICIENT
Roof Area (Controlled)	0	0.9
Paved Area (Hard Surface)	9300	0.9
Landscaped Area	0	0.20
Overall Area	9300	0.90
Paved + Landscaped	9300	0.90

Allowable Release Rate from Site (L/s):

Total Allowable Release Rate= 90.35  
 Release Rate from Roof= 0.00  
 Allowable Release from Other Areas= 90.35

**STORAGE VOLUME CALCULATION**

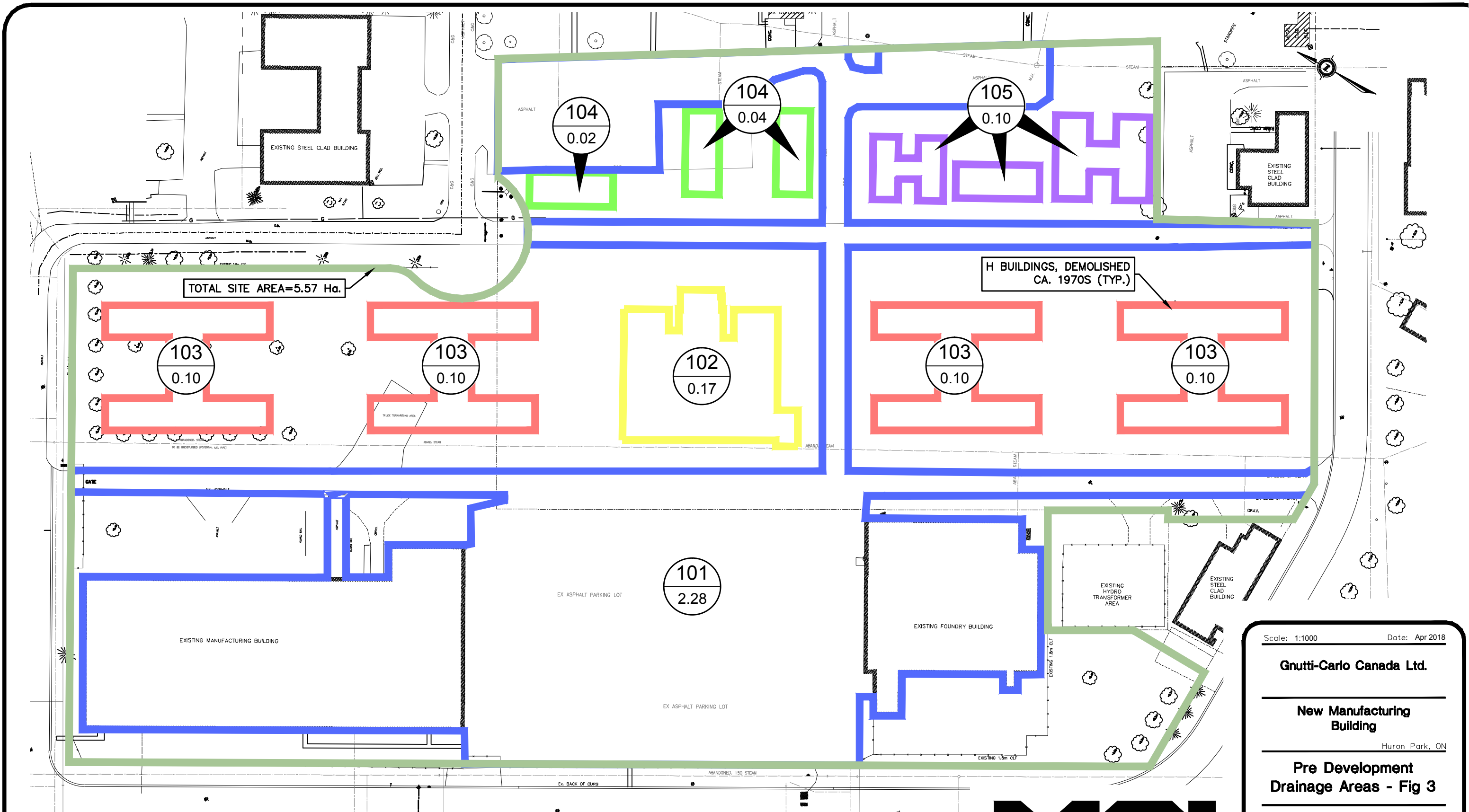
Modified Rational Method used to determine storage volume:

$Q=CiA/360$

100 YEAR EVENT	
A	1560.739
B	12.129
C	0.767

$i=A/(t+B)^C$

TIME (MIN.)	i 100YR (mm/hr)	INFLOW (m3/sec)		ACCUMULATED RUNOFF VOLUME (m3)		2YEAR ALLOWABLE RELEASE VOL. (m3)		REQ'D STORAGE (m3)		
		ROOF	SURFACE	ROOF	SURFACE	ROOF	SURFACE	ROOF	SURFACE	TOTAL
10	145.1	0.000	0.337	0.0	202.5	0.0	54.2	0.0	148.2	208.0
15	124.1	0.000	0.289	0.0	259.7	0.0	81.3	0.0	178.4	
20	109.0	0.000	0.253	0.0	304.2	0.0	108.4	0.0	195.8	
25	97.6	0.000	0.227	0.0	340.3	0.0	135.5	0.0	204.8	
30	88.6	0.000	0.206	0.0	370.7	0.0	162.6	0.0	208.0	
35	81.3	0.000	0.189	0.0	396.8	0.0	189.7	0.0	207.1	
40	75.2	0.000	0.175	0.0	419.7	0.0	216.8	0.0	202.9	
45	70.1	0.000	0.163	0.0	440.2	0.0	243.9	0.0	196.2	
50	65.7	0.000	0.153	0.0	458.6	0.0	271.1	0.0	187.5	
55	62.0	0.000	0.144	0.0	475.4	0.0	298.2	0.0	177.2	
60	58.6	0.000	0.136	0.0	490.8	0.0	325.3	0.0	165.5	
65	55.7	0.000	0.129	0.0	505.0	0.0	352.4	0.0	152.7	
70	53.1	0.000	0.123	0.0	518.3	0.0	379.5	0.0	138.8	
75	50.7	0.000	0.118	0.0	530.7	0.0	406.6	0.0	124.1	
80	48.6	0.000	0.113	0.0	542.4	0.0	433.7	0.0	108.7	
85	46.7	0.000	0.109	0.0	553.4	0.0	460.8	0.0	92.6	
90	44.9	0.000	0.104	0.0	563.8	0.0	487.9	0.0	75.9	
95	43.3	0.000	0.101	0.0	573.7	0.0	515.0	0.0	58.7	
100	41.8	0.000	0.097	0.0	583.1	0.0	542.1	0.0	41.0	
105	40.4	0.000	0.094	0.0	592.1	0.0	569.2	0.0	22.9	



101  
0.131

SUB-CATCHMENT NUMBER  
AREA (ha.)

**MCI**  
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Scale: 1:1000 Date: Apr 2018

**Gnutti-Carlo Canada Ltd.**

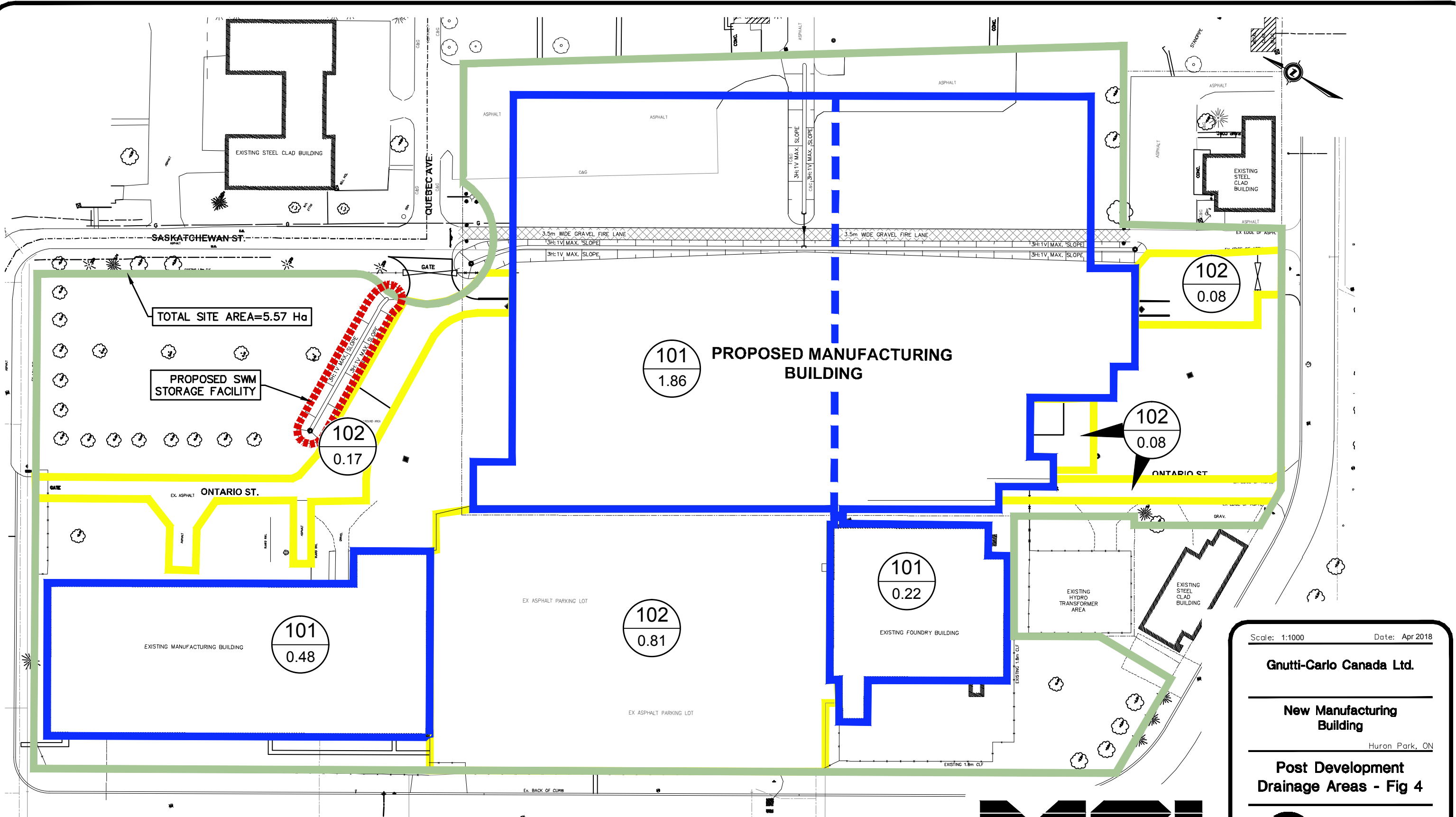
**New Manufacturing Building**

Huron Park, ON

**Pre Development Drainage Areas - Fig 3**

**MTE**  
Engineers | Scientists | Surveyors

Project No.: 43405-300



TOTAL SITE AREA=5.57 Ha

PROPOSED SWM STORAGE FACILITY

PROPOSED MANUFACTURING BUILDING

EXISTING MANUFACTURING BUILDING

EXISTING FOUNDRY BUILDING

EXISTING HYDRO TRANSFORMER AREA

EXISTING STEEL CLAD BUILDING

ONTARIO ST.

ONTARIO ST.

SASKATCHEWAN ST.

QUEBEC AVE.

Scale: 1:1000 Date: Apr 2018

Gnutti-Carlo Canada Ltd.

New Manufacturing Building

Huron Park, ON

Post Development Drainage Areas - Fig 4



Engineers | Scientists | Surveyors

Project No.: 43405-300

101	SUB-CATCHMENT NUMBER
0.131	AREA (ha.)

**MCI**  
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