12189 – 0 DIXIE ROAD, CALEDON, ON

STORMWATER MANAGEMENT BRIEF

MARCH 5, 2025

CLIENT: **2572934 ONTARIO INC.**

MUNICIPALITY: **TOWN OF CALEDON**

ENGINEERING
Where Community Design & Develop

ARIK ENGINEERING LTD.
Where Community Design & Develop

260 Nebo Road, Unit 205, Hamilton, Ontario, L8W 3K5
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PROJECT # 25109

ERK ENGINEERING
Where Community Design & Develop

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1.0 INTRODUCTION

1.1. STUDY OBJECTIVE

ARIK Engineering Ltd., has been retained by **2572934 Ontario Inc.** to prepare a stormwater management brief for the proposed development located at 12189 – 0 Dixie Road, Caledon, Ontario. The proposed development is located at the east side of Dixie Road and north of Spokanne Street. The development is bounded by Dixie Road to the west, Spokanne Street to the south and existing vacant lands to the north and east. An existing dwelling currently located on the property. The client would like to convert the existing dwelling to temporary office and provide gravel trailer parking area along north side of the existing building. The total area of the site is approximately 0.76ha.

The purpose of this report is to provide Stormwater Management Design Brief for the property 12189 – 0 Dixie Road legally know as Part of Lot 18, Concession 4, Town of Caledon. The site grading for the proposed trailer gravel parking extension area has been designed to follow the existing drainage pattern.

1.2. EXISTING TOPOGRAPHY AND DRAINAGE PATTERN

As per the natural topography of the subject site, most of the site drains from front to rear towards the existing culvert located along mid portion of the rear property line towards east. A small portion of the front of the existing building drains towards Dixie Road. Existing topographic survey is attached for reference.

2.0 STORMWATER MANAGEMENT ANALYSIS

2.1. PRE-DEVELOPMENT & POST-DEVELOPMENT RUNOFF VOLUME CALCULATIONS

Pre-development and post-development runoff volume have been calculated based on Town of Caledon IDF curves.

Design Storm –100-Year- 3 Hour Chicago Storm

100 -Year- IDF CURVE DATA (Town of Caledon)
$I = A/(t + B)^C$
I = Intensity (mm/hr)
A= 4688.00
B= 17.00
c= 0.9624

Refer to the attached SWMHYMO files for rainfall depth of 87.03mm for 100-Year storm event.

Following are the calculations for pre-development and post-development runoff volumes for the proposed parking extension based on 100-year storm event.

2.2. PRE-DEVELOPMENT RUNOFF VOLUME: (AS PER EXISTING CONDTIONS)

Weighted Average Runoff Coefficient (C) (Pre-Development Conditions)
AREA -1
Existing Building/Concrete/Asphalt Impervious Area= 462.57 m^2
Existing Grass Area= 642.48 m^2
Total Area= 1105.05 m^2
Weighted Ave. C=[(462.57 m^2 x 0.90)+ (642.48 m^2x 0.25)]/(1105.05m^2)
Weighted Ave. C= 0.52
D= 87.03mm (100-year storm rainfall depth)

PRE-DEVELOPMENT RUNOFF VOLUME ⇔ AxCxD= 1105.05m^2x0.52x87.03mm---------50.01m^3

Weighted Average Runoff Coefficient (C) (Pre-Development Conditions)
AREA -2
Existing Building/Concrete/Asphalt Impervious Area = 427.42 m^2
Existing Grass Area= 6023.93 m^2
Total Area= 6451.35 m^2
Weighted Ave. C=[(427.42 m^2 x0.90 + 6023.93 m^2x 0.25)]/(6451.35m^2)
Weighted Ave. C= 0.29
D= 87.03mm (100-year storm rainfall depth)

PRE-DEVELOPMENT RUNOFF VOLUME ⇔ AxCxD= 6451.35m^2x0.29x87.03mm---------162.82m^3

2.3. POST-DEVELOPMENT RUNOFF VOLUME:(AS PER PROPOSED GRADING)

Weighted Average Runoff Coefficient (C) (Post-Development Conditions)
AREA -1
Proposed/Existing Impervious Area= 573.38m^2
Proposed Grass Area: 328.74 m^2
Total Area= 902.12 m^2
Weighted Ave.
C=[(573.38 m^2x 0.90) + (328.74 m^2x 0.25)] /(902.12m^2)
Weighted Ave. C= 0.66
D= 87.03mm (100-year storm rainfall depth)

POST-DEVELOPMENT RUNOFF VOLUME ⇔ AxCxD= 902.12m^2x0.66x87.03mm---------51.82m^3

Weighted Average Runoff Coefficient (C) (Post-Development Conditions)
AREA -2
Proposed/Existing Impervious Area= 730.72m^2
Proposed Gravel Area= 3115.41m^2
Proposed Grass Area: 2808.15 m^2
Total Area= 6654.28 m^2
Weighted Ave.
C=[(730.72 m^2x 0.90) + (3115.41 m^2 x 0.70) + (2808.15 m^2x 0.25)] /(6654.28m^2)
Weighted Ave. C= 0.53
D= 87.03mm (100-year storm rainfall depth)

POST-DEVELOPMENT RUNOFF VOLUME ⇔ AxCxD= 6654.28m^2x0.53x87.03mm---------306.93m^3

2.4. REQUIRED RUNOFF VOLUME

REQUIRED VOLUME (AREA-1) = POST-DEV. RUNOFF VOLUME – PRE-DEVE. RUNOFF VOLUME
= 51.82 m^3 – 50.01 m^3
= 1.81 m^3

The required volume is insignificant or post-development conditions are almost equivalent to the pre-development conditions, it has been noted that the post-development conditions will not impact the runoff volume as compared to the pre-development conditions in Area 1. All imperviousness in Area1 ultimately drains to the grass area which will infiltrate into the ground; therefore, no storage system is required in Area 1.

REQUIRED VOLUME (AREA-2) = POST-DEV. RUNOFF VOLUME – PRE-DEVE. RUNOFF VOLUME
= 306.93 m^3 – 162.82 m^3
= 144.11 m^3

2.5. PROPOSED INFILTRATION SYSTEM DESIGN

Gravel parking area has been proposed in replacement of the grass area to promote runoff to infiltrate into the ground similar to the existing grass area. The proposed gravel area infiltration system has been designed based on the required volume. The depth of infiltration system has been calculated as per MECP Manual Equation 4.2 as mentioned below:

d= PT/1000

d= Maximum allowable depth of the infiltration system (m)
P = Percolation Rate (mm/hr)
T= Drawdown Time (24 – 48 hrs) (hr.)

According to the Ministry of Northern Development, Mines, Natural Resources and Forestry geotechnical boreholes records, till/silty clay was found around the development area.
It has been proposed to provide gravel parking area and provide 50mm clear stone layer under the gravel parking to promote slow infiltration in the ground for the additional runoff generated. The infiltration rate of 5mm/hr. has been assumed to design the infiltration system. Drawdown time of 48 hours has been used to calculate the depth of infiltration system as follows:

Depth of the proposed infiltration system (d) = PT /1000 = (5mm/hr x48 hrs)/1000 = 0.24m ~0.30m

Figure 1 represents pre-development drainage area plan. **Figure 2** represents post-development drainage area plan including the proposed details for the 50mm clear stone under the gravel parking area.

REQUIRED STORAGE VOLUME AREA-2:
144.11 m^3 (Gross post-development storm runoff 306.93 m^3)

PROVIDED STORAGE VOLUME:
= DEPTH (m) x AREA (m^2) x40% (50mm CLEAR STONE VOIDS VOLUME)
= 0.30m x 3115.41m^2 x 40%
= 373.85 m^3
PROVIDED STORAGE > REQUIRED STORAGE

Provided storage is 373.85m^3 which is greater than the effective storage of 144.11m^3 and also greater than the gross post-development storm storage of 306.93m^3.

It has been proposed to provide 300mm depth of 50mm clear stone under the entire proposed gravel parking extension. Refer to **Figure 1** for detail "A" of the 50mm clear stone under the gravel parking area.

The proposed grading has been designed to follow the existing drainage pattern. It has been proposed to provide gravel with 50mm clear stone to match post-development runoff coefficient to pre-development conditions, also the provided storage is well above the required storage, therefore, the proposed development will not impact the existing storm drainage pattern.

It should be noted that the existing drainage from the subject site will remain undisturbed, however, additional runoff will be captured into the proposed 50mm clear stone and ultimately slowly infiltrate into the ground.

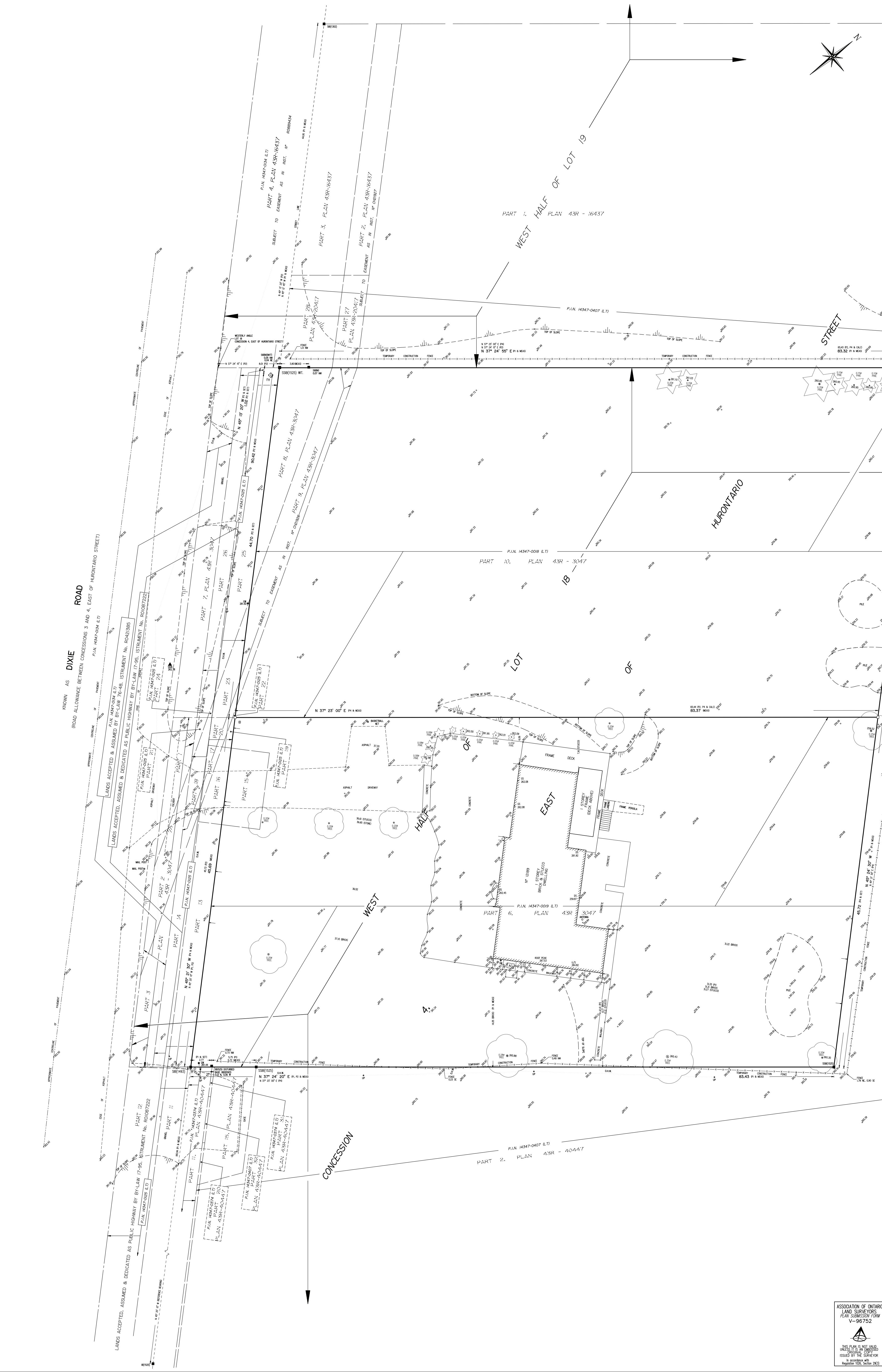
If you have any questions on this matter, please contact the undersigned.

Respectfully Submitted By:

ARIK ENGINEERING LTD.

_____

Abdul Razzak, MEng., P.Eng.



PLAN OF SURVEY AND TOPOGRAPHY OF
PART OF LOT 18
CONCESSION 4
EAST OF HURONTARIO STREET
GEOGRAPHIC TOWNSHIP OF CHINGUACOUSY
TOWN OF CALEDON
REGIONAL MUNICIPALITY OF PEEL

SCALE 1 : 150

0 1 2 3 4 5 10 15 metres

GENESIS LAND SURVEYING INC.

METRIC NOTE

DISTANCES SHOWN ON THIS PLAN ARE IN METRES AND CAN BE CONVERTED TO FEET BY DIVIDING BY 0.3048.

NOTE

1. THIS PLAN MUST BE READ IN CONJUNCTION WITH SURVEY REPORT DATED JANUARY 24TH, 2025.
2. THIS PLAN AND REPORT WERE PREPARED FOR KING CONSULTANTS INC. AND THE UNDERSIGNED ACCEPTS NO RESPONSIBILITY FOR USE BY OTHER PARTIES.

ELEVATION NOTE

ELEVATIONS ARE SHOWN HEREON ARE REFERRED TO CITY OF BRAMPTON BENCHMARK N° 042200367 AVING A PUBLISHED ELEVATION OF 257.317 METRES (ADJUSTMENT: ONT.78).

SNOW NOTE

THE FIELDWORK WAS COMPLETED DURING HEAVY SNOW CONDITIONS AND EVERY ATTEMPT HAS BEEN MADE TO ACCURATELY CAPTURE ALL RELEVANT TOPOGRAPHIC DETAILS, ANY OMISSIONS SHOULD BE REPORTED TO THE UNDERSIGNED.

BEARING NOTES

BEARINS SHOWN HEREON ARE REFERRED TO THE NORTHEASTERLY LIMIT OF DIXIE ROAD, PARTICULARLY THE SOUTHWESTERLY LIMIT OF PART 11 ON PLAN 43R-40447, HAVING A BEARING OF N 45° 20' 10" W, AS SHOWN ON PLAN 43R-40447

BEARING COMPARISON NOTE

A ROTATION OF 00° 21' 25" COUNTER-CLOCKWISE HAS BEEN APPLIED TO BEARINGS ON PLANS P2

A ROTATION OF 00° 50' 10" COUNTER-CLOCKWISE HAS BEEN APPLIED TO BEARINGS ON PLANS P4

NOTE

UNDERLYING PARTS SHOWN HEREON BELONG TO PLAN 43R-20417, UNLESS ARE OTHERWISE NOTED.

LEGEND

□	DENOTES	MONUMENT PLANTED
■	——	MONUMENT FOUND
WIT	——	WITNESS
IB	——	IRON BAR
SIB	——	STANDARD IRON BAR
SSIB	——	SHORT STANDARD IRON BAR
P1	——	PLAN 43R-40447
P2	——	PLAN 43R-20417
P3	——	PLAN 43R-16437
P4	——	PLAN 43R-3047
P5	——	PLAN 43R-1187
1493	——	YOUNG & YOUNG SURVEYING INC., O.L.S.
1113	——	ROBERT TERRENCE STEPHENSON O.L.S.
1525	——	R. AVIS SURVEYING INC., O.L.S.
NI	——	NOT IDENTIFIED
P.I.N.	——	PROPERTY IDENTIFICATION NUMBER
N,S,E,W	——	NORTH, SOUTH, EAST, WEST
MEAS	——	MEASURED
UP	——	UTILITY POLE
O.H.W.	——	OVERHEAD UTILITY WIRES
DS/GS	——	DOOR/GARAGE SILL ELEVATION
TC/BC	——	TOP/BOTTOM OF CURB
U/S	——	UNDERSIDE OF EAVES ELEVATION
GM	——	GAS METER
AC	——	AIR CONDITIONING UNIT
ø	——	DIAMETER

SURVEYOR'S CERTIFICATE

I CERTIFY THAT :

1. THIS SURVEY AND PLAN ARE CORRECT AND IN ACCORDANCE WITH THE SURVEYS ACT, THE SURVEYORS ACT AND THE REGULATIONS MADE UNDER THEM.
2. THE SURVEY WAS COMPLETED ON JANUARY 23, 2025.

JANUARY 24, 2025
DATE

SCOTT DALZIEL
ONTARIO LAND SURVEYOR

ASSOCIATION OF ONTARIO LAND SURVEYORS
PLAN SUBMISSION FORM
V-96752

THIS PLAN IS NOT VALID UNLESS IT IS AN EMBOSSED ORIGINAL COPY ISSUED BY THE SURVEYOR

In accordance with Regulation 1026, Section 29(3)

GENESIS Land Surveying Inc.
10 FOUR SEASONS PLACE, 10TH FLOOR
TORONTO, M9B 6H7
T 905-499-2956 T 1800-262-9784
WWW.GENESISLANDSURVEY.COM

DRAFTED BY: GSA	CHECKED BY: S.D.	PROJECT No. GLS-2322

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================================================================================

   SSSSS  W   W  M   M  H   H  Y   Y  M   M   OOO        999    999    =========
   S      W W W  MM MM  H   H   Y Y   MM MM  O   O      9   9  9   9
   SSSSS  W W W  M M M  HHHHH    Y    M M M  O   O  ##  9   9  9   9   Ver  4.05
       S   W W   M   M  H   H    Y    M   M  O   O       9999   9999   Sept 2011
   SSSSS   W W   M   M  H   H    Y    M   M   OOO           9      9   =========
                                                         9   9  9   9   # 3124689
        StormWater Management HYdrologic Model           999    999    =========

 ********************************************************************************
 ***************************** SWMHYMO Ver/4.05  ********************************
 *********  A single event and continuous hydrologic simulation model  *********
 *********     based on the principles of HYMO and its successors      *********
 *********                  OTTHYMO-83 and OTTHYMO-89.                  *********
 ********************************************************************************
 ********* Distributed by:  J.F. Sabourin and Associates Inc.          *********
 *********                  Ottawa,  Ontario: (613) 836-3884           *********
 *********                  Gatineau, Quebec: (819) 243-6858           *********
 *********                  E-Mail: swmhymo@jfsa.Com                   *********
 ********************************************************************************

 +++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++
 +++++++++ Licensed user: ARIK ENGINEERING LTD                          +++++++++
 +++++++++                Hannon                SERIAL#:3124689        +++++++++
 +++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++

 ********************************************************************************
 *********           ++++++ PROGRAM ARRAY DIMENSIONS ++++++            *********
 *********           Maximum value for ID numbers  :     10           *********
 *********           Max. number of rainfall points: 105408           *********
 *********           Max. number of flow points    : 105408           *********
 ********************************************************************************


 ***********************   D E T A I L E D   O U T P U T   ***********************
 ********************************************************************************
 *         DATE: 2025-02-17     TIME: 12:32:14     RUN COUNTER: 001264         *
 ********************************************************************************
 * Input   filename: C:\SWMHYMO\12189DIX\12189DIX.DAT                           *
 * Output  filename: C:\SWMHYMO\12189DIX\12189DIX.out                           *
 * Summary filename: C:\SWMHYMO\12189DIX\12189DIX.sum                           *
 * User comments:                                                               *
 * 1:_____________________________________________________________________________*
 * 2:_____________________________________________________________________________*
 * 3:_____________________________________________________________________________*
 ********************************************************************************

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*#  Project Name: 12189-0 DIXIE ROAD, TOWN OF CALEDON
*#  Project Number: 25109
*#  Date        : FEBRUARY 17, 2025
*#  Modeller    : ABDUL RAZZAK
*#  Company     : ARIK ENGINEERING LTD.
*#  License #   : 3124689
*#*************************************************************************
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| START            |  Project  dir.: C:\SWMHYMO\12189DIX\

--------------------  Rainfall dir.: C:\SWMHYMO\12189DIX\

    TZERO =   .00 hrs on        0
    METOUT=   2 (output = METRIC)
    NRUN  = 001
    NSTORM=   0
-------------------------------------------------------------------------------
--
001:0002--------------------------------------------------------------------------
--
*
*
*
*+++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++
*==================TOWN OF CALEDON IDF CURVES=======================
*====================100 YEAR 3HR CHICAGO STORM=====================
*+++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++
*
*
*
--------------------
| CHICAGO STORM    |    IDF curve parameters: A=4688.000
| Ptotal= 87.03 mm |                          B=  17.000
--------------------                          C=    .962
                       used in:   INTENSITY =  A / (t + B)^C

                       Duration of storm  =  3.00 hrs
                       Storm time step    = 10.00 min
                       Time to peak ratio =   .33

              TIME    RAIN |   TIME    RAIN |   TIME    RAIN |   TIME    RAIN
               hrs   mm/hr |    hrs   mm/hr |    hrs   mm/hr |    hrs   mm/hr
               .17   4.882 |   1.00 196.536 |   1.83  12.479 |   2.67   4.509
               .33   6.958 |   1.17  83.092 |   2.00   9.597 |   2.83   3.912
               .50  11.016 |   1.33  41.245 |   2.17   7.658 |   3.00   3.436
               .67  21.032 |   1.50  25.073 |   2.33   6.286 |
               .83  62.122 |   1.67  17.061 |   2.50   5.276 |
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001:0003--------------------------------------------------------------------------
--
      FINISH
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     -------------------------
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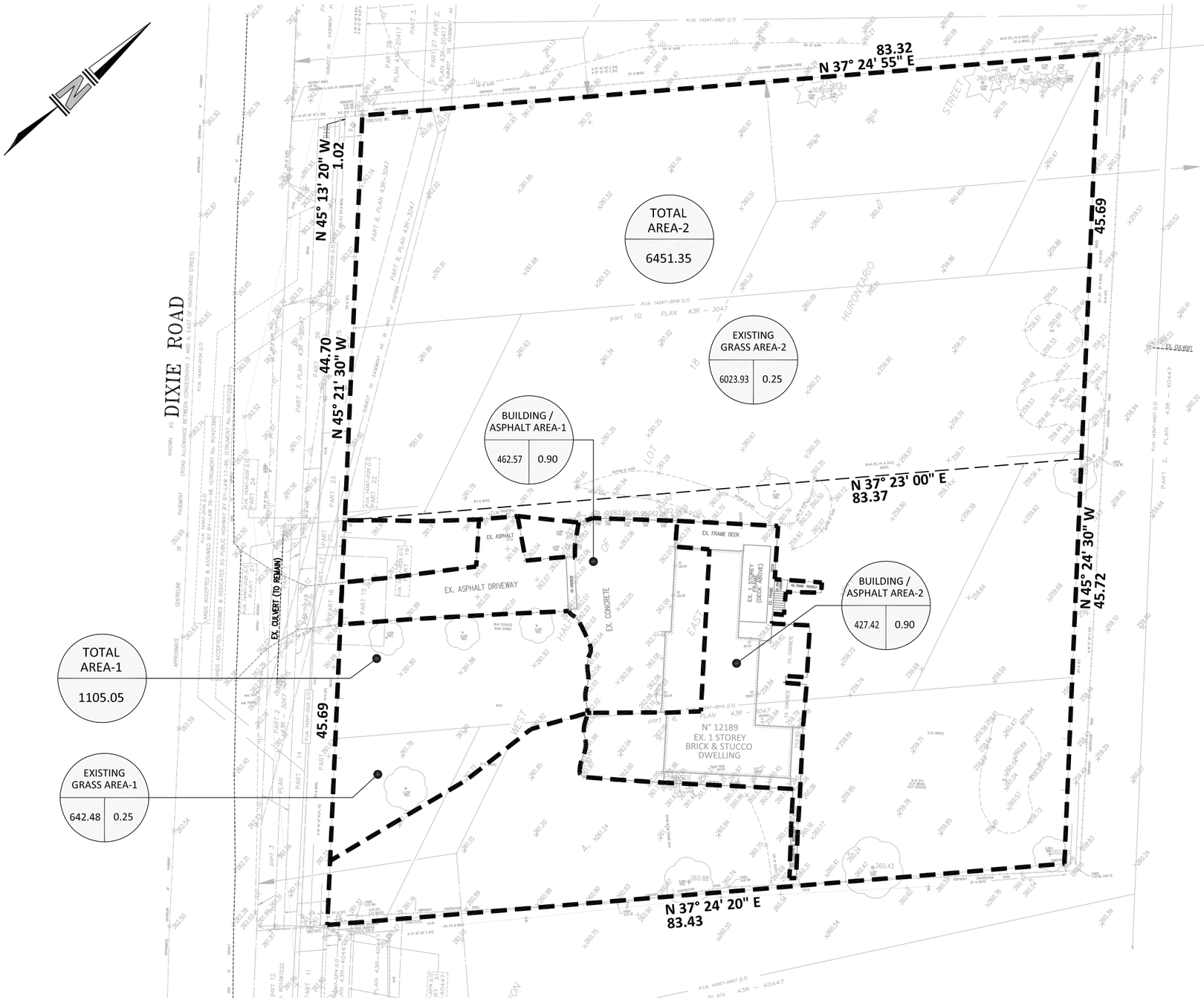

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email: info@arikengineering.com
web: www.arikengineering.com
phone: +1-289-965-9772

LEGEND

- PRE-DEVELOPMENT DRAINAGE AREA
- AREA / 503.84 / 0.25 — DRAINAGE AREA I.D; RUNOFF COEFFICIENT; AREA IN m²

PROJECT:

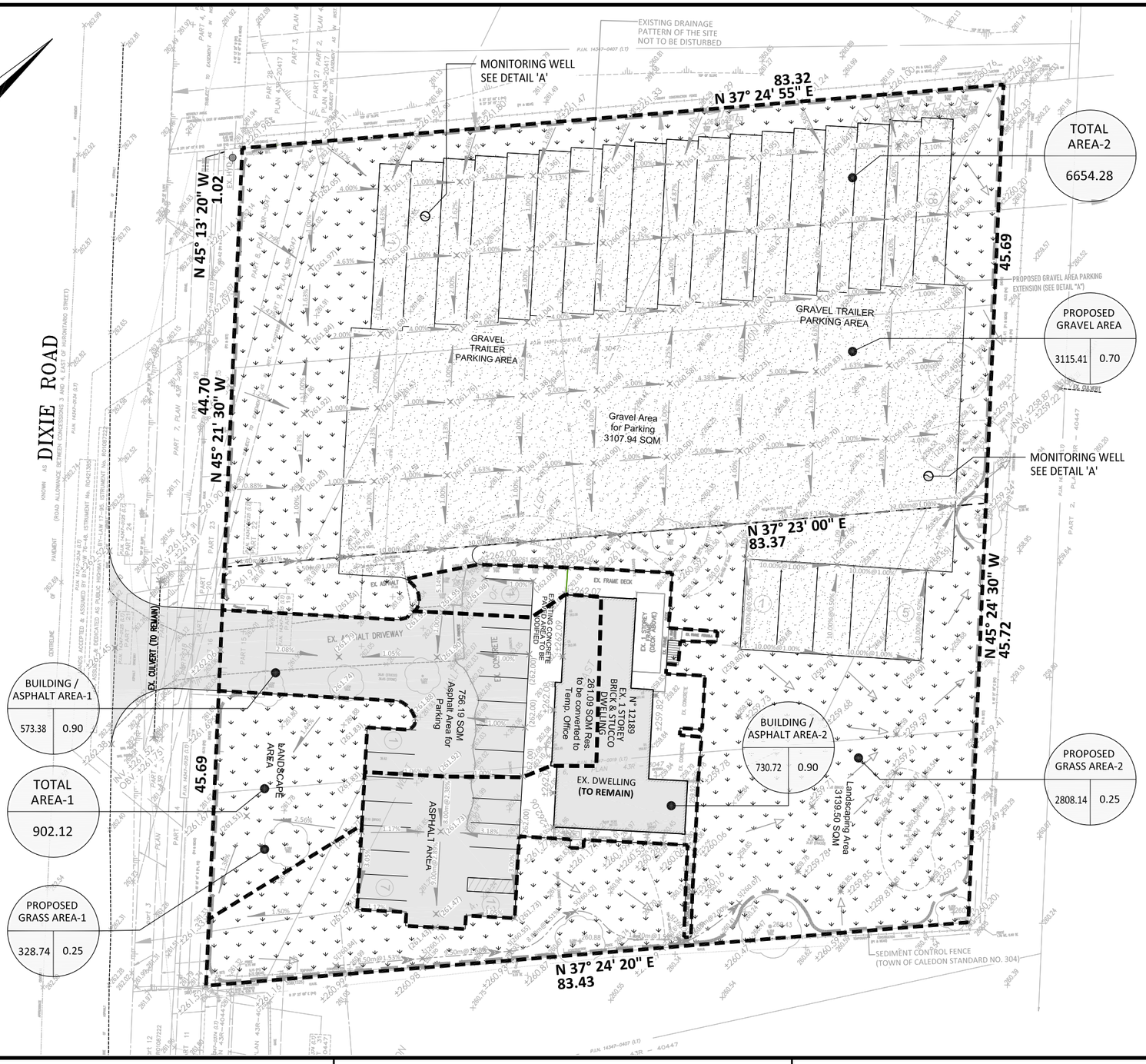
12189 - 0 DIXIE ROAD
TOWN OF CALEDON

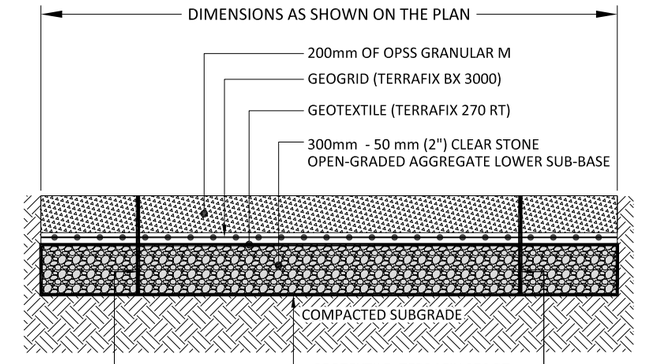
FIGURE -1

PRE-DEVELOPMENT DRAINAGE AREA PLAN

DATE: MARCH 05, 2025
SCALE: 1:500
PROJECT NO. 25109

12189 - 0 DIXIE ROAD





PROPOSED GRAVEL AREA INFILTRATION SYSTEM DETAIL "A"

N.T.S.

NOTES:

1. MONITORIING WELL TO BE INSTALLED WITH 150mm DIAMETER PERFORATED HDPE PIPE (WRAPPED WITH FILTER FABRIC) WITH LOCKABLE BASE CAP TO BE FLUSHED WITH FINAL GRADE.
2. GRAVEL DEPTH AND SPECIFICATIONS TO BE CONFIRMED BY THE GEOTECHNICAL ENGINEER.

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LEGEND

- STORM DRAINAGE AREA
- AREA / 328.74 / 0.25 — DRAINAGE AREA I.D, RUNOFF COEFFICIENT, AREA IN m²

PROJECT:

12189 - 0 DIXIE ROAD
TOWN OF CALEDON

FIGURE -2

POST-DEVELOPMENT DRAINAGE AREA PLAN

DATE: MARCH 05, 2025
SCALE: 1:500
PROJECT NO. 25109

12189 - 0 DIXIE ROAD

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