APPLICATIONS FOR CONSENT

Tom Davies Square
200 Brady Street
Sudbury, Ontario P3A 5P3

September 22, 2025

PL-CON-2025-00027 THE DAVIS CONSTRUCTION MANAGEMENT GROUP LTD.

Ward: 9

PIN(s) 73470-0562, 73470-0603, Firstly, North half of Lot 6, Concession 2, designated as Part 1, Plan 53R-20717; Secondly: North half of Lot 6, Concession 2, except Part 1, Plan SR-439, Parts 1-3, Plan SR-1134, Part 1, Plan SR-1413, Parts 1 & 3, Plan SR-1903, Parts 3, 4, 7 & 8, Plan 53R-12478, Parts 1 & 2, Plan 53R-18878, and Parts 1 & 2, Plan 53R-20717, Township of Dill, 147 Birch Drive, Sudbury, 271 Birch Drive, Sudbury, 271 Birch Drive, Sudbury, [By-law 2010-100Z, RU]

Transfer a west portion of the subject property, providing approximately 90.0m lot frontage and 4.04 ha lot area, and also, consolidate an approximate 7682.0 sq. m east portion with abutting PIN 73470-0061 (LT), Parcel 49443 SEC SES, Part Lot 6, Concession 2, Part 4, Plan 53R-12478, Township of Dill.

PREVIOUSLY SUBJECT TO CONSENT APPLICATIONS B0154/2008 (31 JUL 08), B0036/2016 (16 MAY 16) AND B0013/2022 (19 APR 22) AND MINOR VARIANCE APPLICATION PL-MV-2025-00037 (APR 30/25)

PL-CON-2025-00039 TRELEAVEN REAL ESTATE HOLDINGS INC.

Ward: 6

PIN(s) 73503-1715 and 73503-1717, Part Lot 1, Concession 3, Part 5, Plan 53R-21413, Township of Hanmer, 6022 Municipal Road 80, Hanmer [By-law 2010-100Z, R3]

Grant, firstly, an approximate 362.0 sq. m easement in the nature of a right-of-way for access in favour of PIN 73503-1716 (LT), municipally known as 6034 Municipal Road 80 and PIN 73503-1717 (LT), municipally known as 6040 Municipal Road 80, and secondly, an approximate 331.0 sq. m easement in the nature of a right-of-way for snow storage in favour of abutting PIN 73503-1716 (LT), municipally known as 6034 Municipal Road 80 and PIN 73503-1717 (LT), municipally known as 6040 Municipal Road 80.

PREVIOUSLY THE SUBJECT OF CONSENT APPLICATIONS B33/2024 TO B34/2024 (SEP 16/24), B71/2020 TO B73/2020 (NOV 30/20), B84/92 (APRIL 13/92), B256/91 (JULY 29/91), B36/87 (MAR. 9/87), B35/85 (APRIL 29/85) & B255/80 TO B257/80 (DEC. 15/80) B75/2015 (AUG 24, 2015), AND MINOR VARIANCE APPLICATION A186/91 (JULY 29/91).

Greater | Grand Sudbury

APPLICATIONS FOR CONSENT

PL-CON-2025-00040 **1916556 ONTARIO LIMITED**

Ward: 6

PIN(s) 73503-1716 and 73503-1717, Part Lot 1, Concession 3, Parts 7, 8, and 9, Plan 53R-21413, Township of Hanmer, 6034 Municipal Road 80, Hanmer, 6040 Municipal Road 80, Hanmer, [By-law 2010-100Z, R3]

Grant, firstly, an approximate 1,754.0 sq. m easement in the nature of a right-of-way for access in favour of abutting PIN 73503-1715 (LT), municipally known as 6022 Municipal Road 80, secondly, an approximate 277.0 sq. m easement in the nature of a right-of-way for drainage in favour of PIN 73503-1715 (LT), municipally known as 6022 Municipal Road 80, thirdly, an approximate 1384.0 sq. m easement in the nature of a right-of-way for use, access and maintenance of the storm water management pond in favour of abutting PIN 73503-1715 (LT), municipally known as 6022 Municipal Road 80, fourthly, an approximate 21.0 sq. m easement in the nature of a right-of-way for use and access to refuse storage containers in favour of PIN 73503-1715 (LT), municipally known as 6022 Municipal Road 80, fifthly, an approximate 587.0 sq. m easement in the nature of a right-of-way for snow storage in favour of abutting PIN 73503-1715 (LT), municipally known as 6022 Municipal Road 80, and sixthly, an approximate 139.0 sq. m easement in the nature of a right-of-way for emergency services in favour of abutting PIN 73503-1715 (LT), municipally known as 6022 Municipal Road 80.

PREVIOUSLY THE SUBJECT OF CONSENT APPLICATIONS B33/2024 TO B34/2024 (SEP 16/24), B71/2020 TO B73/2020 (NOV 30/20), B84/92 (APRIL 13/92), B256/91 (JULY 29/91), B36/87 (MAR. 9/87), B35/85 (APRIL 29/85) & B255/80 TO B257/80 (DEC. 15/80) B75/2015 (AUG 24, 2015), AND MINOR VARIANCE APPLICATION A186/91 (JULY 29/91).

PL-CON-2025-00043 **ERIC HANSEN**
SHERYL-ANN HANSEN

Ward: 2

PIN(s) 733960054, Parcel 8166 SEC SWS, Part Broken Lot 7, Concession 5 as in EP4430, except LT64259; Part Lot 7, Concession 4, being Location CL-3211, Part 1, Plan 53R-9778, Township of Louise, 700 Grassy Lake Road, Whitefish, [By-law 2010-100Z, RU]

To create a new lot on the east vacant portion of the subject property providing a lot frontage of approximately 290.0m and a lot area of approximately 69120.0 sq. m.

PREVIOUSLY SUBJECT TO CONSENT APPLICATIONS B0299/1974 (OCT 21/74) AND B0228/1981 TO B0230/1981 (NOV 30/81)

Written submissions regarding these applications must be received no later than Wednesday, September 17, 2025 for consideration.

Box 5000, Station A
200 Brady Street
Sudbury, Ontario P3A 5P3
(705) 671-2489 ext 4376 or 4346
(705) 673-2200 FAX

Record #: PL-CON-2025-00027

APPLICATION SUMMARY

File Date: May 7, 2025

Application Type: Consent (Land Severance)

Address(es): 147 Birch Drive, Sudbury P3E 4N1, 271 Birch Drive, Sudbury, ON, 271 Birch Drive, Sudbury P3E 4N1

Applicant(s): D.S. DORLAND LIMITED

Owner(s): THE DAVIS CONSTRUCTION MANAGEMENT GROUP LTD.

PLANNING APPLICATION
PURPOSE OF TRANSACTION

[X] **Addition to Lot**

Area
7682

Area (Second Additional Lot if Applicable)

Depth
93

Depth (Second Additional Lot if Applicable)

Frontage
0

Frontage (Second Additional Lot if Applicable)

[X] **Creation of New Lot**

Area
40400

Depth
375

Frontage
90

[ ] **Creation of Lot(s) for Semi-Detached or Row Housing**

Area

Depth

Frontage

☐ Cancellation of Prior Consent

File No. of Prior Consent

Type of Consent being cancelled

If you are cancelling a prior lot creation, is there a current driveway accessing the created lot?

☐ Easement/Right-of-Way

Area

Depth

Frontage

Area (Second Easement or Right-of-Way if Applicable)

Depth (Second Easement or Right-of-Way if Applicable)

Frontage (Second Easement or Right-of-Way if Applicable)

☐ Lease

Area

Depth

Frontage

☐ Other

Describe Other

Area

Depth

Frontage

GENERAL APPLICATION

Are there multiple properties associated with the application?
Yes

Please describe the additional properties associated with this application
73470-0603 (LT)

Are you the registered owner or an authorized agent?
Authorized Agent

What is the date of acquisition of subject land?
August 28, 2009

What is the number of dwelling units on the property?
1

What is the number of proposed new buildings/structures on the property?

What is the number of existing buildings/structures on the property?
1

If this application is approved, would any existing dwelling units be legalized?
No

How many dwelling units will be legalized?

Is this property located within an area subject to the Greater Sudbury Source Protection Plan?
No

Provide details on how the property is designated in the Source Protection Plan

CONSENT

Name of person(s) to whom land or interest in land is intended to be conveyed, leased or mortgaged
Rebecca Cawte
Timothy Peter Cawte

Are there any easements or restrictive covenants affecting the subject land?
No

Please indicate a description of each easement or covenant and its effect

Has the land ever had any previous severances?
Yes

Name of transferee
THE DAVIS CONSTRUCTION MANAGEMENT GROUP LTD.

Date of transfer
September 14, 2016

Use of severed land
Residential

Is property located with 1km (.6 miles) of a First Nation Reserve?
No

Has the parcel intended to be severed ever been, or is it now part of a Plan of Subdivision?
No

Please indicate the file number and status of the application

What is the current designation of the subject land in the applicable Official Plan?
Rural

Explain how the application conforms with the Official Plan
No change to the Official Plan

Explain how the application is consistent with the Provincial Policy Statements
Provincial Policy Statement - provide rural residential lot creation

Explain how the application conforms, or does not conflict with the Growth Plan for Northern Ontario
Provides for rural residential development

CONCURRENT APPLICATIONS

☒ **Minor Variance**

File Number(s) - Minor Variance	Status - Minor Variance
PL-MV-2025-00037	Certified

☐ **Rezoning**

File Number(s) - Rezoning	Status - Rezoning

☐ **Official Plan Amendment**

File Number(s) - Official Plan Amendment	Status - Official Plan Amendment

LAND RETAINED

Area	Depth	Frontage
67500	400	88.3

Existing use of land
Residential

Proposed use of land
No Change

Proposed use of land

Will a certificate be required for the retained land?
No

WATER/SEWAGE - RETAINED

Municipally owned and operated piped water system	☐
Municipally owned and operated sanitary sewage system	☐
Lake	☐
Pit Privy	☐
Individual Well	☒
Communal Well	☐
Individual Septic System	☒
Communal Septic System	☐
Other	☐

Explain Other

PROPERTY ACCESS - RETAINED

Provincial highway	☐
Road maintained by the municipality	☒
Municipal road that is maintained seasonally	☐
Municipal road that is maintained yearly	☐
Water	☐

Indicate the parking and docking facilities to be used if via water

Estimate the distance of these facilities from the retained land and nearest public road by water

LAND SEVERED

Existing use of land

Vacasnt

Proposed use of land

Residential

Parcel # and/or Lot and registered Plan of Subdivision # of property which will benefit

N/A

WATER/SEWAGE - SEVERED

Municipally owned and operated piped water system	☐
Municipally owned and operated sanitary sewage system	☐
Lake	☐
Pit Privy	☐
Individual Well	☒
Communal Well	☐
Individual Septic System	☒
Communal Septic System	☐
Other	☐

Explain Other

PROPERTY ACCESS - SEVERED

Provincial highway	☐
Road maintained by the municipality	☒
Municipal road that is maintained seasonally	☐
Municipal road that is maintained yearly	☐
Water	☐

Indicate the parking and docking facilities to be used via water

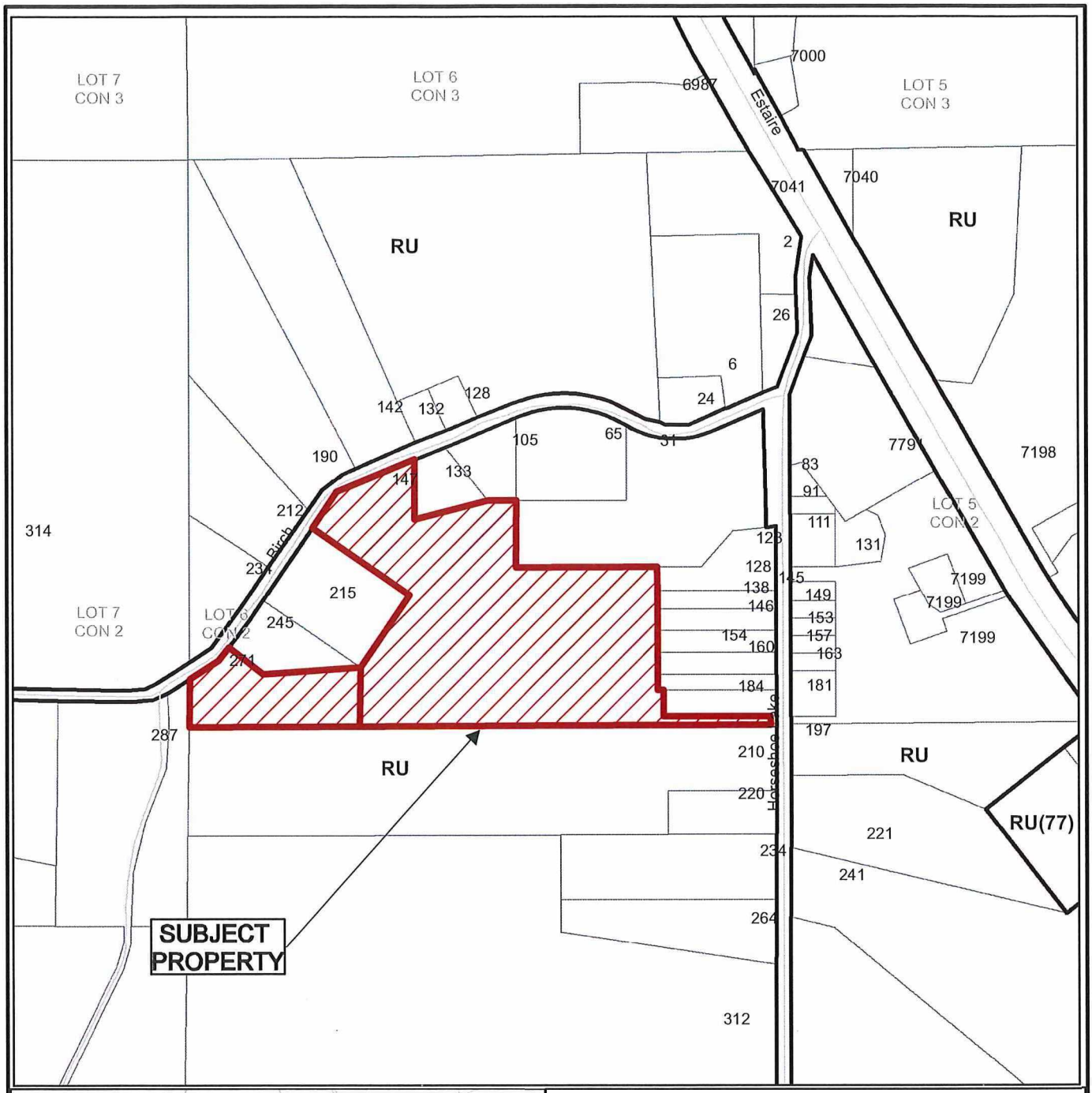
Estimate the distance of these facilities from the severed land and nearest public road by water

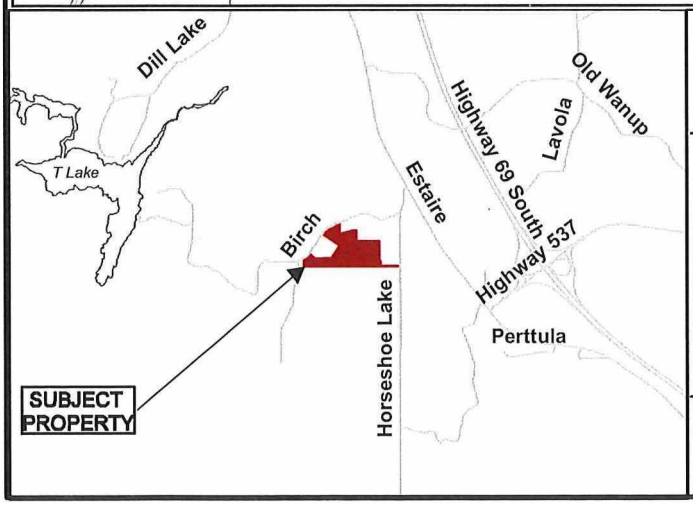
PROPOSED BUILDING/STRUCTURE

Building Description	Location	Same As Existing	Proposed Ground Floor Area (m2)	Proposed Gross Floor Area (m2)	Proposed Number of Storeys	Proposed Width (m)	Proposed Length (m)	Proposed Height (m)	Proposed Front Yard Setback (m)	Proposed Rear Yard Setback (m)	Proposed Side Yard Setback (m)	Proposed Side Yard Setback Other (m)

EXISTING BUILDING/STRUCTURE

Building Description	Location	To Be Demolished	Existing Ground Floor Area (m2)	Existing Gross Floor Area (m2)	Existing Number of Storeys	Existing Width (m)	Existing Length (m)	Existing Height (m)	Existing Front Yard Setback (m)	Existing Rear Yard Setback (m)	Existing Side Yard Setback (m)	Existing Side Yard Setback Other (m)
Residential Dwelling	Retained Land	No	244	437	1.5	16.7	19.0	6.0	21.8	364.0	18.4	21.6





Application for Consent

N

Subject Property being PIN 73470-0562 and 73470-0603,
Firstly, North half of Lot 6, Concession 2, designated as Part 1,
Plan 53R-20717; Secondly: North half of Lot 6, Concession 2,
except Part 1, Plan SR-439, Parts 1-3, Plan SR-1134,
Part 1, Plan SR-1413, Parts 1 & 3, Plan SR-1903,
Parts 3, 4, 7 & 8, Plan 53R-12478, Parts 1 & 2,
Plan 53R-18878, and Parts 1 & 2, Plan 53R-20717,
Township of Dill,
147 & 271 Birch Drive, Sudbury,
City of Greater Sudbury

NTS | PL-CON-2025-00027

Sketch 1 | Date: 2025 06 19

SKETCH FOR PLANNING ACT APPLICATIONS
GEOGRAPHIC TOWNSHIP OF DILL
CITY OF GREATER SUDBURY
DISTRICT OF SUDBURY

NOTE

THIS IS NOT A PLAN OF SURVEY AND SHOULD ONLY BE USED FOR THE PURPOSE STATED IN THE TITLE BLOCK.

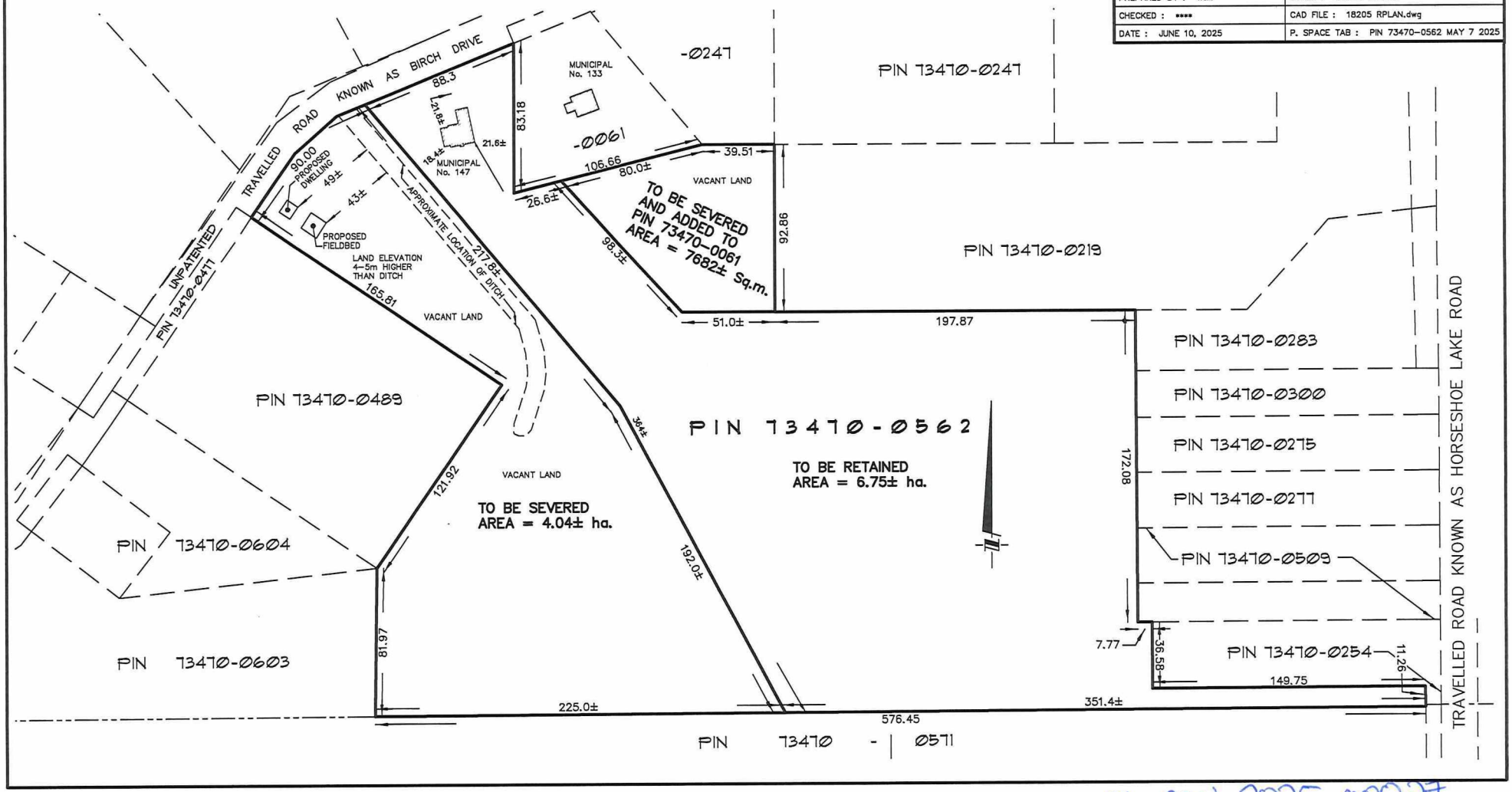
SCALE 1:2000

0 50 100 150 METRES

D.S. DORLAND LIMITED
ONTARIO LAND SURVEYORS
GEOMATICS PROFESSIONALS

298 LARCH STREET
SUDBURY, ONTARIO, P3B 1M1
PHONE (705) 673-2556 FAX (705) 673-1051
WWW.DSDORLANDLIMITED.CA

PREPARED BY : WJM	SCALE : 1:2000 METRIC
CHECKED : ****	CAD FILE : 18205 RPLAN.dwg
DATE : JUNE 10, 2025	P. SPACE TAB : PIN 73470-0562 MAY 7 2025



PL-CON-2025-00027
sketch 2

Box 5000, Station A
200 Brady Street
Sudbury, Ontario P3A 5P3
(705) 671-2489 ext 4376 or 4346
(705) 673-2200 FAX

Record #: PL-CON-2025-00039

APPLICATION SUMMARY

File Date: June 10, 2025

Application Type: Consent (Land Severance)

Address(es): 6022 Municipal Road 80, Hanmer P3P 1W7

Applicant(s): DORLAND GEOMATICS

Owner(s): TRELEAVEN REAL ESTATE HOLDINGS INC.

PLANNING APPLICATION
PURPOSE OF TRANSACTION

☐ **Addition to Lot**

Area	**Area (Second Additional Lot if Applicable)**
Depth	**Depth (Second Additional Lot if Applicable)**
Frontage	**Frontage (Second Additional Lot if Applicable)**

☐ **Creation of New Lot**

Area

Depth

Frontage

☐ **Creation of Lot(s) for Semi-Detached or Row Housing**

Area

Depth

Frontage

☐ Cancellation of Prior Consent

File No. of Prior Consent

Type of Consent being cancelled

If you are cancelling a prior lot creation, is there a current driveway accessing the created lot?

☒ Easement/Right-of-Way

Area
5145

Depth
159.58

Frontage
31.02

Area (Second Easement or Right-of-Way if Applicable)
5156

Depth (Second Easement or Right-of-Way if Applicable)
159.66

Frontage (Second Easement or Right-of-Way if Applicable)
31.04

☐ Lease

Area

Depth

Frontage

☐ Other

Describe Other

Area
5145

Depth
159.58

Frontage
31.02

GENERAL APPLICATION

Are there multiple properties associated with the application?
Yes

Please describe the additional properties associated with this application
Municipal 6034 (PIN 73503-1716) &
Municipal # 6040 (PIN 73503-1717)

Are you the registered owner or an authorized agent?
Authorized Agent

What is the date of acquisition of subject land?
2023/03/30

What is the number of dwelling units on the property?
4

What is the number of proposed new buildings/structures on the property?

What is the number of existing buildings/structures on the property?
1

If this application is approved, would any existing dwelling units be legalized?
No

How many dwelling units will be legalized?

Is this property located within an area subject to the Greater Sudbury Source Protection Plan?
No

Provide details on how the property is designated in the Source Protection Plan

CONSENT

Name of person(s) to whom land or interest in land is intended to be conveyed, leased or mortgaged
Treleaven Real Estate Holdings Inc.

Are there any easements or restrictive covenants affecting the subject land?
No

Please indicate a description of each easement or covenant and its effect

Has the land ever had any previous severances?
Yes

Name of transferee
Ronald Thibert

Date of transfer
2022/03/11

Use of severed land
existing 4 unit row housing (no severance is being applied for, just ROW for shared access between Mun. # 6022, 6034 & 6040)-see sketch page 3 of 6.

There will be an easement for sanitary & watermain service line that will be partly on Mun. # 6022 & partly on Mun.# 6034 property (see sketch page 4 of 6)

Is property located with 1km (.6 miles) of a First Nation Reserve?
No

Has the parcel intended to be severed ever been, or is it now part of a Plan of Subdivision?
No

Please indicate the file number and status of the application

What is the current designation of the subject land in the applicable Official Plan?
Living Area 1

Explain how the application conforms with the Official Plan
Residential units are permitted uses in Living Area 1

Explain how the application is consistent with the Provincial Policy Statements
N/A this is just an application for the following:

1) a shared 6.0m wide R.O.W. for access between Municipal # 6022 & 6034 MR 80 (note: this ROW will also cross over Mun. # 6040 so fire/garbage trucks can move in a forward direction)-See attached sketch-page 3 of 6.

2) an easement for sanitary & water services lines in benefit of Mun. # 6022 (see sketch 4 of 6 attached- note the proposed sanitary sewer is centered along the property line between Mun.# 6022 & 6034)

3) an easement for
for a refuse & a recycling container (2 moloks) will be described as a part on a future plan of survey) because these 3 adjoining properties will be using these moloks (Municipal # 6022, 6034 & 6040 MR 80) Moloks are proposed on Mun.# 6040 property -see sketch 4 of 6

4) a proposed drainage easement will be described in a future plan of survey (see sketch 5 of 6) This drainage easement will cross over into Mun. # 6034 & 6040.

5) Mun.# 6022 will benefit from a drainage easement for the proposed Storm Water Management Pond which is within Mun. # 6034 & 6040 (see sketch page 5 of 6)

Explain how the application conforms, or does not conflict with the Growth Plan for Northern Ontario
N/A this is just an application for the following:
1) a shared 6.0m wide R.O.W. for access between Municipal # 6022 & 6034 MR 80 (note: this ROW will also cross over Mun. # 6040 so fire/garbage trucks can move in a forward direction)-See attached sketch-page 3 of 6.

2) an easement for sanitary & water services lines in benefit of Mun. # 6022 (see sketch 4 of 6 attached- note the proposed sanitary sewer is centered along the property line between Mun.# 6022 & 6034)

3) an easement for
for a refuse & a recycling container (2 moloks) will be described as a part on a future plan of survey) because these 3 adjoining properties will be using these moloks (Municipal # 6022, 6034 & 6040 MR 80) Moloks are proposed on Mun.# 6040 property -see sketch 4 of 6

4) a proposed drainage easement will be described in a future plan of survey (see sketch 5 of 6) This drainage easement will cross over into Mun. # 6034 & 6040.

5) Mun.# 6022 will benefit from a drainage easement for the proposed Storm Water Management Pond which is within Mun. # 6034 & 6040 (see sketch page 5 of 6)

CONCURRENT APPLICATIONS

☐ **Minor Variance**

File Number(s) - Minor Variance **Status - Minor Variance**

☐ **Rezoning**

File Number(s) - Rezoning

Status - Rezoning

☐ **Official Plan Amendment**

File Number(s) - Official Plan Amendment

Status - Official Plan Amendment

LAND RETAINED

Area	Depth	Frontage
5145	159.58	31.02

Existing use of land

4 unit row dwelling

Proposed use of land

existing 4 unit row dwelling building & proposed 6 unit row dwelling building

Proposed use of land

Will a certificate be required for the retained land?

No

WATER/SEWAGE - RETAINED

Municipally owned and operated piped water system	[X]
Municipally owned and operated sanitary sewage system	[X]
Lake	[ ]
Pit Privy	[ ]
Individual Well	[ ]
Communal Well	[ ]
Individual Septic System	[ ]
Communal Septic System	[ ]
Other	[ ]

Explain Other

PROPERTY ACCESS - RETAINED

Provincial highway	[ ]
Road maintained by the municipality	[ ]
Municipal road that is maintained seasonally	[ ]
Municipal road that is maintained yearly	[X]
Water	[ ]

Indicate the parking and docking facilities to be used if via water

Estimate the distance of these facilities from the retained land and nearest public road by water

LAND SEVERED

Existing use of land

n/a this application is for ROW & easements (NO severance)

Proposed use of land

n/a this application is for ROW & easements (NO severance)

Parcel # and/or Lot and registered Plan of Subdivision # of property which will benefit

n/a

WATER/SEWAGE - SEVERED

Municipally owned and operated piped water system	[X]
Municipally owned and operated sanitary sewage system	[X]
Lake	[ ]
Pit Privy	[ ]
Individual Well	[ ]
Communal Well	[ ]
Individual Septic System	[ ]
Communal Septic System	[ ]
Other	[ ]

Explain Other

PROPERTY ACCESS - SEVERED

Provincial highway	[ ]
Road maintained by the municipality	[ ]
Municipal road that is maintained seasonally	[ ]
Municipal road that is maintained yearly	[X]
Water	[ ]

Indicate the parking and docking facilities to be used via water

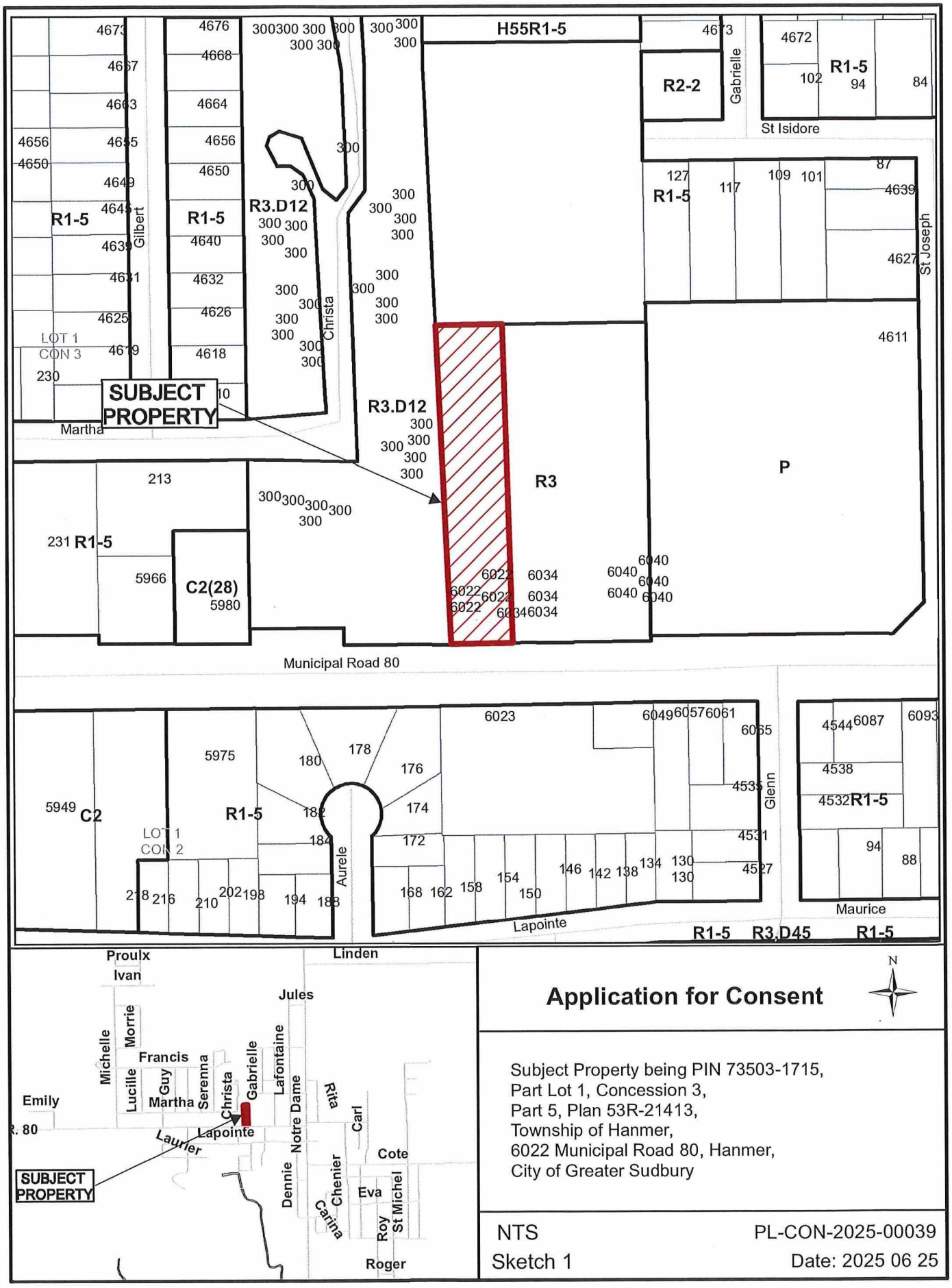
Estimate the distance of these facilities from the severed land and nearest public road by water

PROPOSED BUILDING/STRUCTURE

Building Description	Location	Same As Existing	Proposed Ground Floor Area (m2)	Proposed Gross Floor Area (m2)	Proposed Number of Storeys	Proposed Width (m)	Proposed Length (m)	Proposed Height (m)	Proposed Front Yard Setback (m)	Proposed Rear Yard Setback (m)	Proposed Side Yard Setback (m)	Proposed Side Yard Setback Other (m)

EXISTING BUILDING/STRUCTURE

Building Description	Location	To Be Demolished	Existing Ground Floor Area (m2)	Existing Gross Floor Area (m2)	Existing Number of Storeys	Existing Width (m)	Existing Length (m)	Existing Height (m)	Existing Front Yard Setback (m)	Existing Rear Yard Setback (m)	Existing Side Yard Setback (m)	Existing Side Yard Setback Other (m)
4 unit row housing building	Retained Land	No	516	516	1	14.4	38.6	6.1	24.9	95.9	7.6	8.7



Application for Consent

Subject Property being PIN 73503-1715,
Part Lot 1, Concession 3,
Part 5, Plan 53R-21413,
Township of Hanmer,
6022 Municipal Road 80, Hanmer,
City of Greater Sudbury

NTS
Sketch 1

PL-CON-2025-00039
Date: 2025 06 25

SKETCH FOR PLANNING ACT APPLICATIONS

PROPOSED DEVELOPMENT # 6022, 6034 & 6040 MR80

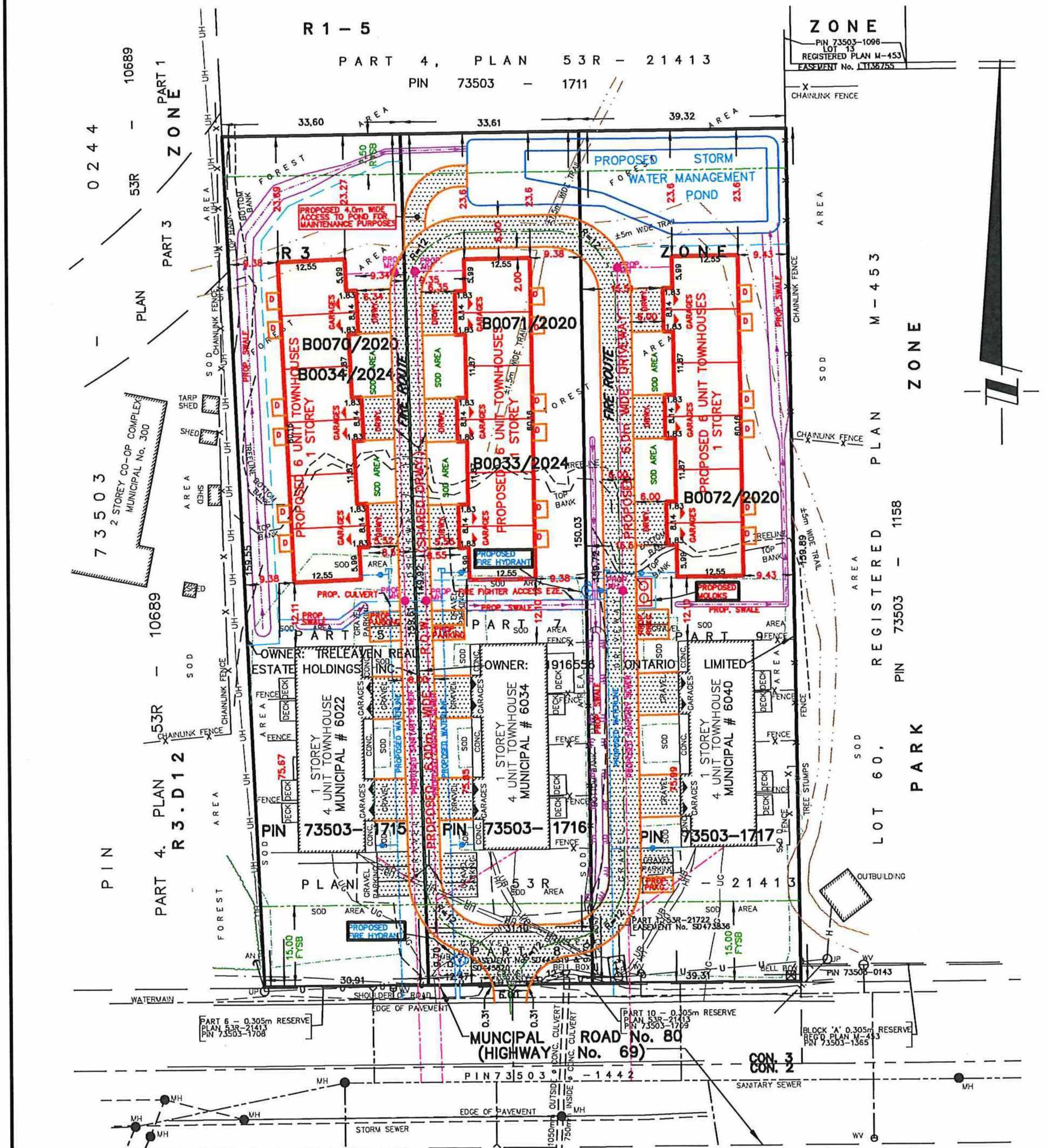
PART OF LOT 1, CONCESSION 3
GEOGRAPHIC
TOWNSHIP OF HANMER
CITY OF GREATER SUDBURY
DISTRICT OF SUDBURY

SCALE 1:750
METRES
0 5 10 20 30 40 50

CAUTION:
THIS IS NOT A PLAN OF SURVEY AND SHOULD ONLY BE USED FOR THE PURPOSE NOTED IN THE TITLE BLOCK

FIELD WORK WAS COMPLETED OCT. 14, 2024.

PROPERTY BOUNDARY DIMENSIONS SHOWN HEREON ARE DERIVED FROM PLAN 53R-21413.



LEGEND

PIN DENOTES PROPERTY IDENTIFIER NUMBER
LT DENOTES LAND TITLES
☒ DENOTES BELL BOX
○ UP DENOTES UTILITY POLE
AN DENOTES ANCHOR
WV DENOTES WATER VALVE
—UH—UH— DENOTES UNDERGROUND HYDRO LINE
—UG—UG— DENOTES UNDERGROUND GAS LINE
—U—U— DENOTES OVERHEAD UTILITY LINES
—X—X— DENOTES FENCE
DENOTES GARAGE
● MH DENOTES MANHOLE

DENOTES PROPOSED AREA OF GRAVEL DRIVEWAYS & PARKING AREAS

D DENOTES PROPOSED DECK
FYSB DENOTES FRONT YARD SETBACK (MIN.)
RYSB DENOTES REAR YARD SETBACK (MIN.)
R.O.W. DENOTES RIGHT-OF-WAY

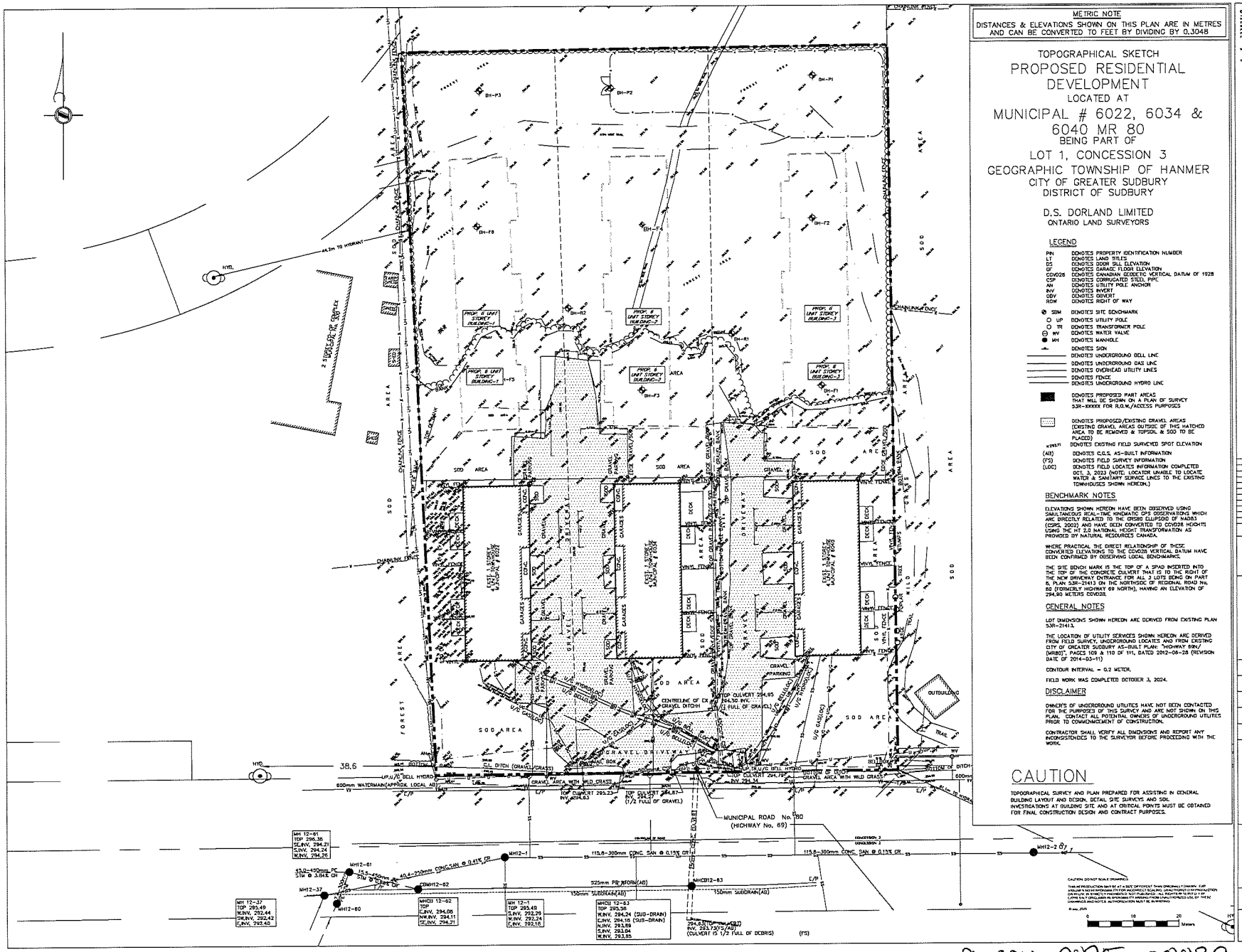
NOTE: 2 MOLOKS WILL BE SERVING ALL 3 LOTS.

** SEE EXP SERVICES SITE SERVICING DRAWING & LOT GRADING PLAN FOR THIS DEVELOPMENT.

D.S. DORLAND LIMITED
ONTARIO LAND SURVEYORS
GEOMATICS PROFESSIONALS
298 LARCH STREET
SUDBURY, ONTARIO, P3B 1M1
PHONE (705) 673-2556 FAX (705) 673-1051
WWW.DSDORLANDLIMITED.CA

PREPARED BY : A. ALATYPPO	SCALE : 1:750 METRIC
FIELD WORK DATE: MAY 3, 2024	CAD FILE : 18712-18718-SKETCH.dwg
DATE : AUGUST 4, 2025	P. SPACE TAB : SKETCH PROP.750s(PG2OF7)

PL-CON-2025-00039 sketch 2



METRIC NOTE

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

TOPOGRAPHICAL SKETCH

PROPOSED RESIDENTIAL DEVELOPMENT

LOCATED AT

MUNICIPAL # 6022, 6034 & 6040 MR 80

BEING PART OF

LOT 1, CONCESSION 3

GEOGRAPHIC TOWNSHIP OF HANMER

CITY OF GREATER SUDBURY

DISTRICT OF SUDBURY

D.S. DORLAND LIMITED

ONTARIO LAND SURVEYORS

LEGEND

PIN	DENOTES PROPERTY IDENTIFICATION NUMBER
LT	DENOTES LAND TITLES
DSI	DENOTES DOOR SILL ELEVATION
GF	DENOTES GARAGE FLOOR ELEVATION
CGVD28	DENOTES CANADIAN GEODETIC VERTICAL DATUM OF 1928
CSP	DENOTES CORRUGATED STEEL PIPE
AN	DENOTES UTILITY POLE ANCHOR
INV	DENOTES INVERT
CBV	DENOTES CULVERT
ROW	DENOTES RIGHT OF WAY
SBM	DENOTES SITE BENCHMARK
UP	DENOTES UTILITY POLE
TR	DENOTES TRANSFORMER POLE
WV	DENOTES WATER VALVE
MH	DENOTES MANHOLE
	DENOTES SIGN
	DENOTES UNDERGROUND BELL LINE
	DENOTES UNDERGROUND GAS LINE
	DENOTES OVERHEAD UTILITY LINES
	DENOTES FENCE
	DENOTES UNDERGROUND HYDRO LINE
	DENOTES PROPOSED PART AREAS THAT WILL BE SHOWN ON A PLAN OF SURVEY 53R-XXXXX FOR R.O.W./ACCESS PURPOSES
	DENOTES PROPOSED/EXISTING GRAVEL AREAS (EXISTING GRAVEL AREAS OUTSIDE OF THIS HATCHED AREA TO BE REMOVED & TOPSOIL & SOD TO BE PLACED)
W293.11	DENOTES EXISTING FIELD SURVEYED SPOT ELEVATION
(AS)	DENOTES C.G.S. AS-BUILT INFORMATION
(FS)	DENOTES FIELD SURVEY INFORMATION
(LOC)	DENOTES FIELD LOCATES INFORMATION COMPLETED OCT. 3, 2023 (NOTE: LOCATOR UNABLE TO LOCATE WATER & SANITARY SERVICE LINES TO THE EXISTING TOWNHOUSES SHOWN HEREON.)

BENCHMARK NOTES

ELEVATIONS SHOWN HEREON HAVE BEEN OBSERVED USING SIMULTANEOUS REAL-TIME KINEMATIC GPS OBSERVATIONS WHICH ARE DIRECTLY RELATED TO THE ORSIM CLUSTOOD OF NAD83 (CSRS, 2002) AND HAVE BEEN CONVERTED TO CGVD28 HEIGHTS USING THE HT 2.0 NATIONAL HEIGHT TRANSFORMATION AS PROVIDED BY NATURAL RESOURCES CANADA.

WHERE PRACTICAL THE DIRECT RELATIONSHIP OF THESE CONVERTED ELEVATIONS TO THE CGVD28 VERTICAL DATUM HAVE BEEN CONFIRMED BY OBSERVING LOCAL BENCHMARKS.

THE SITE BENCH MARK IS THE TOP OF A SPAD INSERTED INTO THE TOP OF THE CONCRETE CULVERT THAT IS TO THE RIGHT OF THE NEW DRIVEWAY ENTRANCE FOR ALL 3 LOTS BEING ON PART 8, PLAN 53R-21413 ON THE NORTHSIDE OF REGIONAL ROAD No. 80 (FORMERLY HIGHWAY 69 NORTH), HAVING AN ELEVATION OF 294.90 METERS CGVD28.

GENERAL NOTES

LOT DIMENSIONS SHOWN HEREON ARE DERIVED FROM EXISTING PLAN 53R-21413.

THE LOCATION OF UTILITY SERVICES SHOWN HEREON ARE DERIVED FROM FIELD SURVEY, UNDERGROUND LOCATES AND FROM EXISTING CITY OF GREATER SUDBURY AS-BUILT PLAN: "HIGHWAY R&V (MR80)", PAGES 109 & 110 OF 111, DATED 2012-06-28 (REVISION DATE OF 2014-03-11)

CONTOUR INTERVAL = 0.2 METER.

FIELD WORK WAS COMPLETED OCTOBER 3, 2024.

DISCLAIMER

OWNER'S OF UNDERGROUND UTILITIES HAVE NOT BEEN CONTACTED FOR THE PURPOSES OF THIS SURVEY AND ARE NOT SHOWN ON THIS PLAN. CONTACT ALL POTENTIAL OWNERS OF UNDERGROUND UTILITIES PRIOR TO COMMENCEMENT OF CONSTRUCTION.

CONTRACTOR SHALL VERIFY ALL DIMENSIONS AND REPORT ANY INCONSISTENCIES TO THE SURVEYOR BEFORE PROCEEDING WITH THE WORK.

CAUTION

TOPOGRAPHICAL SURVEY AND PLAN PREPARED FOR ASSISTING IN GENERAL BUILDING LAYOUT AND DESIGN. DETAIL SITE SURVEYS AND SOIL INVESTIGATIONS AT BUILDING SITE AND AT CRITICAL POINTS MUST BE OBTAINED FOR FINAL CONSTRUCTION DESIGN AND CONTRACT PURPOSES.

exp Services Inc.
Infrastructure Services - Sudbury
417 St. Antoine St., Unit 1 - 3rd
Sudbury, Ontario, Canada
P3C 3Y9
Ph: 705 674 9691
Fax: 705 674 9693
www.exp.com

LEGEND

	EXISTING PROPERTY BOUNDARY
273	EXISTING CONTOURS
W	EXISTING WATERMAIN
SS	EXISTING SANITARY SEWER
X	EXISTING CHAIN LINK FENCE
	EXISTING DITCH LINE
	EXISTING TREE LINE
	EXISTING SOD AREA
	EXISTING GRAVEL DRIVEWAY
UB	UNDERGROUND BELL SERVICES
UG	UNDERGROUND GAS SERVICES
UH	UNDERGROUND HYDRO SERVICES
U	UTILITY LINES OVERHEAD

No.	Revision	By:	Date
1	ISSUED FOR DRAFT REVIEW	PT	2024-10-03

ISSUED FOR REVIEW

Professional Seal(s)

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Checked By: AL	Date: 2025-05-05
Approved By:	Date:

Date Printed: 2025-05-15

File Name: 24006124-6022 HANMER-SITEPLAN-R1-07-23-2025.DWG

Project Title

1916555 ONTARIO DEVELOPMENT

MR80 HANMER TOWNHOUSE DEVELOPMENT

6034, 6040 MUNICIPAL ROAD 80, HANMER, ONTARIO

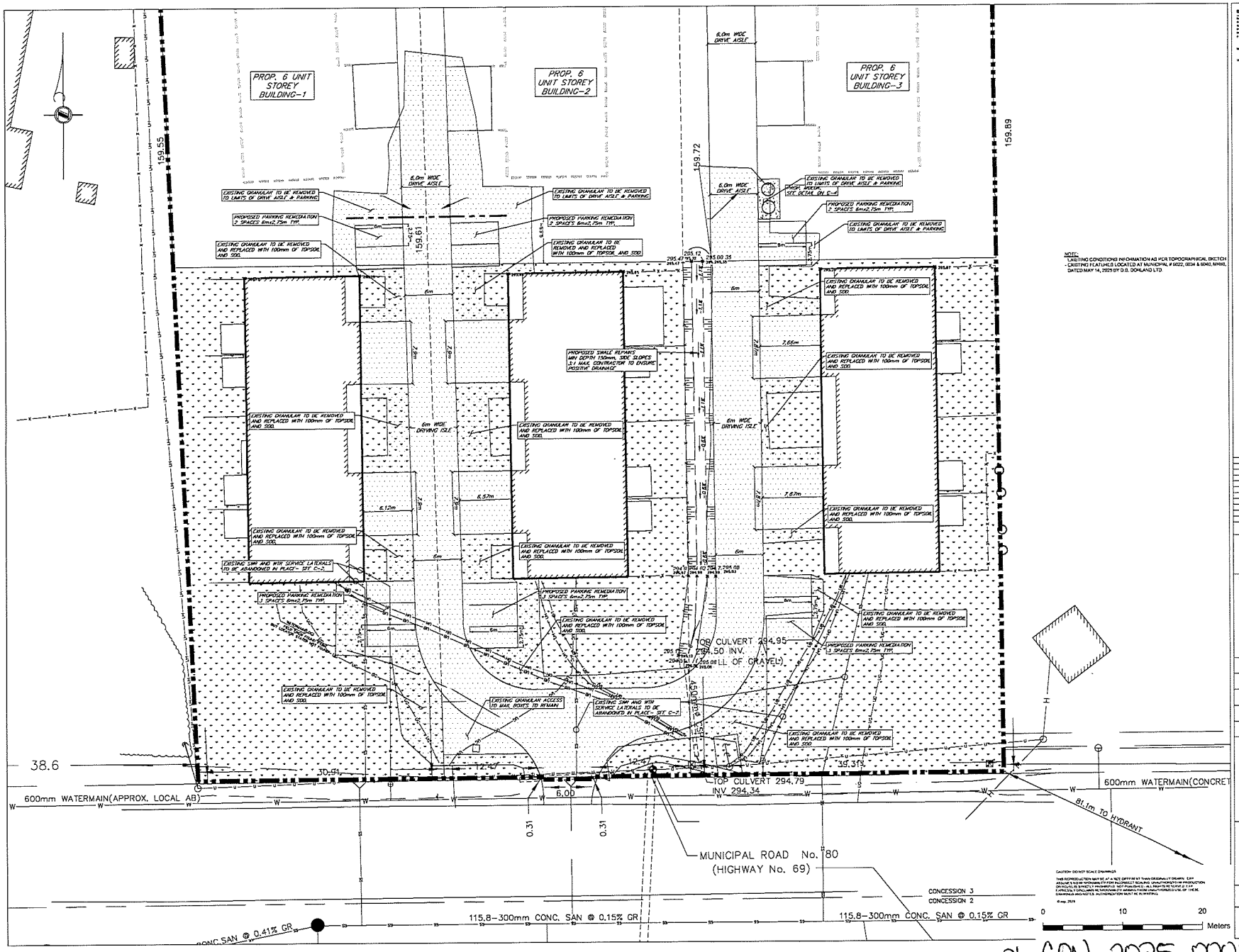
Dwg. Title

EXISTING CONDITIONS DRAWING

Project No. SUD-00024006124-A0

Dwg. No. EX-1 | Rev. No. 0

PL-CON-2025-00039 Sketch 3



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LEGEND

- EXISTING PROPERTY BOUNDARY
- 273 EXISTING CONTOURS
- W EXISTING WATERMAIN
- SS EXISTING SANITARY SEWER
- X EXISTING CHAIN LINK FENCE
- UB UNDERGROUND BELL SERVICES
- UG UNDERGROUND GAS SERVICES
- UH UNDERGROUND HYDRO SERVICES
- U UTILITY LINES OVERHEAD
- EXISTING SOD AREA
- PROPOSED SOD AREA
- PROPOSED GRAVEL DRIVEWAY
- PROPOSED DITCH
- ~0.5% PROPOSED GRADIENT
- 292.80 PROPOSED SPOT ELEVATION
- 292.10 EXISTING SPOT ELEVATION

No.	Revision	By:	Date
1	ISSUED FOR DRAFT REVIEW	HF	2026-04-04

ISSUED FOR REVIEW

Professional Seal(s)

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Date Printed: 2026-07-22	

File Name: 24006124-6022 HANMER-SITEPLAN-R1-07-23-2025.DWG

Project Title

1916555 ONTARIO DEVELOPMENT

MR80 HANMER TOWNHOUSE DEVELOPMENT

6034, 6040 MUNICIPAL ROAD 80, HANMER, ONTARIO

Dwg. Title

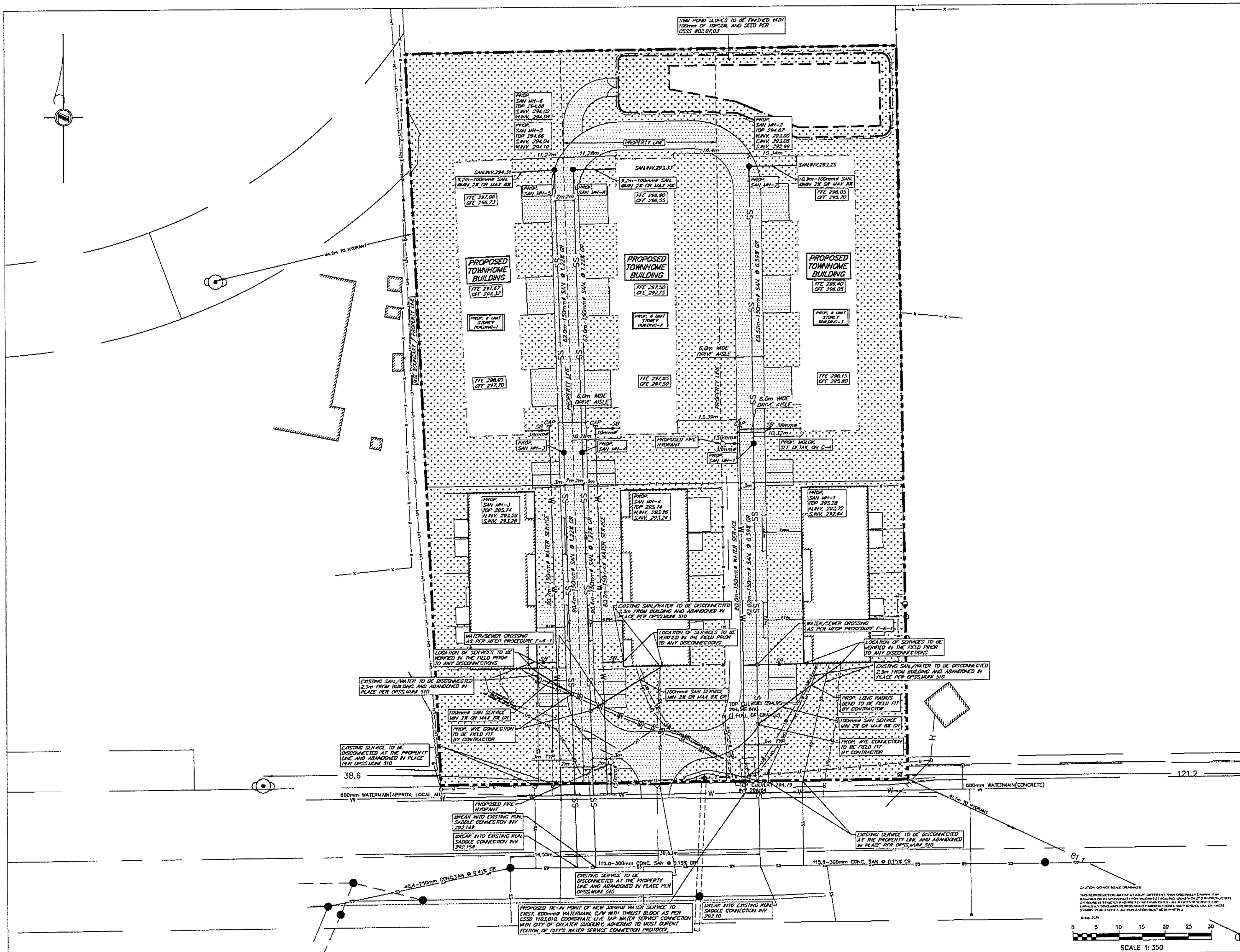
PROPOSED REMEDIAL WORKS

Project No. SUD-00024006124-A0

Dwg. No. C-1

Rev. No. 1

PL-CON-2025-00039 Sketch 4



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LEGEND

- EXISTING PROPERTY BOUNDARY
- EXISTING CONTOURS
- EXISTING WATERMAIN
- EXISTING SANITARY SEWER
- EXISTING STORM SEWER
- EXISTING CHAIN LINK FENCE
- EXISTING DITCH LINE
- EXISTING TREE LINE
- EXISTING SOD AREA
- EXISTING GRAVEL DRIVEWAY
- UNDERGROUND BELL SERVICES
- UNDERGROUND GAS SERVICES
- UNDERGROUND HYDRO SERVICES
- UTILITY LINES OVERHEAD
- PROPOSED BUILDING
- PROPOSED LANDSCAPED AREA TO BE REINFORCED WITH VMAX SC250 TRM w/ STAPLE PATTERN 'E'
- PROPOSED LANDSCAPED AREA
- PROPOSED GRAVEL DRIVEWAY
- PROPOSED FILTER MEDIA
- PROPOSED DITCH
- PROPOSED CULVERT
- PROPOSED WATERMAIN
- PROPOSED SERVICE BOX
- PROPOSED FIRE HYDRANT
- PROPOSED SANITARY SEWER
- PROP. SAN MH-1 — PROPOSED SANITARY MANHOLE
- FFE 296.40 — PROPOSED TOP OF FINISHED FLOOR ELEVATION
- GFF 296.05 — PROPOSED GARGE FINISHED FLOOR ELEVATION

No.	Revision	By:	Date
1	ISSUED FOR DRAFT REVIEW	PT	2025-06-04

ISSUED FOR REVIEW

Professional Seal(s)

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Approved By:	Date:

Date Printed: 2025-07-22

File Name: 24006124-6022 HANMER-SITEPLAN-R1-07-23-2025.DWG

Project Title

1916555 ONTARIO DEVELOPMENT

MR80 HANMER TOWNHOUSE DEVELOPMENT

6034, 6040 MUNICIPAL ROAD 80, HANMER, ONTARIO

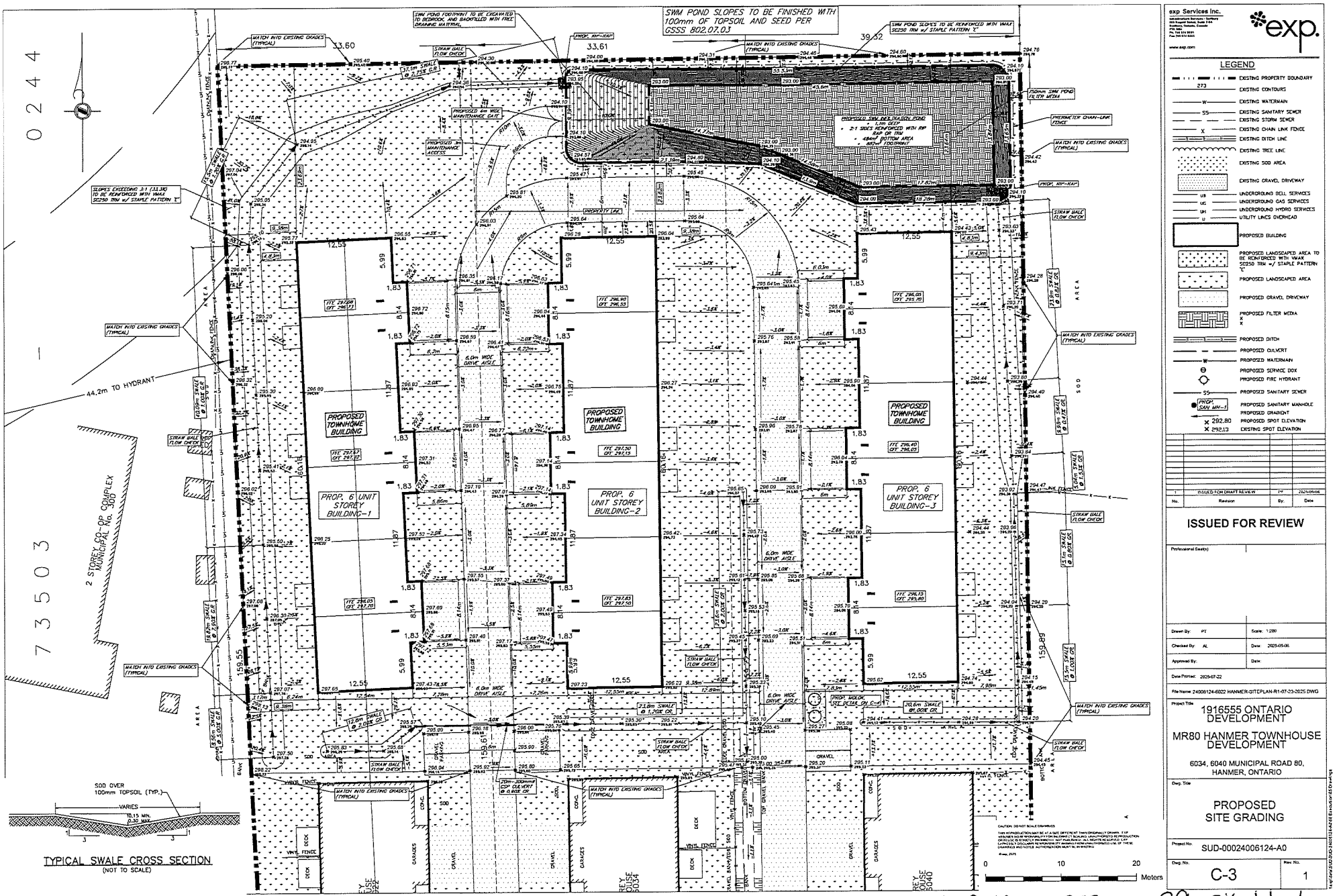
Dwg. Title

SITE SERVICING AND LAYOUT

Project No. SUD-00024006124-A0

Dwg. No. C-2 | Rev. No. 1

PL-CON-2025-00039 Sketch5



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LEGEND

- EXISTING PROPERTY BOUNDARY
- EXISTING CONTOURS
- EXISTING WATERMAIN
- EXISTING SANITARY SEWER
- EXISTING STORM SEWER
- EXISTING CHAIN LINK FENCE
- EXISTING DITCH LINE
- EXISTING TREE LINE
- EXISTING SOD AREA
- EXISTING GRAVEL DRIVEWAY
- EXISTING UNDERGROUND BELL SERVICES
- EXISTING UNDERGROUND GAS SERVICES
- EXISTING UNDERGROUND HYDRO SERVICES
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- PROPOSED BUILDING
- PROPOSED LANDSCAPED AREA TO BE REINFORCED WITH VMAT SC250 TRM w/ STAPLE PATTERN 'C'
- PROPOSED LANDSCAPED AREA
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- PROPOSED FILTER MEDIA
- PROPOSED DITCH
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- PROPOSED WATERMAIN
- PROPOSED SERVICE BOX
- PROPOSED FIRE HYDRANT
- PROPOSED SANITARY SEWER
- PROPOSED SANITARY MANHOLE
- PROPOSED GRADIENT
- 292.80 PROPOSED SPOT ELEVATION
- 292.13 EXISTING SPOT ELEVATION

No.	Revision	By:	Date
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ISSUED FOR REVIEW

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Date Printed: 2025-07-22	

File Name: 24008124-6822 HANMER-SITEPLAN-R1-07-23-2025.DWG

Project Title
1916555 ONTARIO DEVELOPMENT
MR80 HANMER TOWNHOUSE DEVELOPMENT
6034, 6040 MUNICIPAL ROAD 80, HANMER, ONTARIO

Dwg. Title
PROPOSED SITE GRADING

Project No. SUD-00024006124-A0

Dwg. No. C-3 | Rev. No. 1

PL-CON-2025-00039 Sketch 6

GENERAL NOTES:

1. SITE LOCATION: 6034, 6040 MR 80, HANMER, ONTARIO.
2. OVERALL SCOPE OF WORK: NEW BUILDING DEVELOPMENT, INCLUDING SITE GRADING AND DRAINAGE, WATER SERVICING, SANITARY SERVICING, NEW SITE FINISHES, TO REQUIRED STANDARDS, AS INDICATED, TO SATISFACTION OF THE ENGINEER, CONTRACT ADMINISTRATOR, OWNER, AND CITY OF GREATER SUDBURY.
3. EXISTING SITE TOPOGRAPHICAL/ELEVATION, DETAILS, SURFACE LEVEL INFRASTRUCTURE AND PROPERTY INFORMATION OBTAINED BY BORTOLUSSI SURVEYING LTD., FROM SITE SURVEY CARRIED OUT IN MAY 2024, WITH BENCHMARKS ESTABLISHED AS NOTED.
4. THE SUBSURFACE LOCATION OF UTILITIES WAS OBTAINED FROM CITY AS-BUILT DRAWINGS AND IS APPROXIMATE ONLY, AND ALL SERVICES ARE NOT NECESSARILY SHOWN. THE EXACT LOCATIONS SHALL BE DETERMINED BY CONSULTING WITH ONE-CALL AND THE UTILITY COMPANIES CONCERNED. THE CONTRACTOR SHALL BE RESPONSIBLE FOR LOCATING AND PROTECTION OF ALL UTILITIES AND SERVICES.
5. BEFORE COMMENCING WORK, VERIFY THE LOCATION OF BURIED SERVICES ON AND ADJACENT TO THE SUBJECT SITE. IF RELOCATION OF SERVICES IS REQUIRED DUE TO INTERFERENCE WITH EXECUTION OF WORK, ARRANGE WITH THE APPROPRIATE AUTHORITY. RECORD LOCATION OF MAINTAINED, REROUTED AND ABANDONED UNDERGROUND SERVICE LINES.
6. EXISTING UNDERGROUND UTILITIES NEAR THE SITE ARE ANTICIPATED TO INCLUDE: WATERMAIN, SANITARY, NATURAL GAS AND FIBER OPTIC CABLE.
7. EXISTING OVERHEAD UTILITIES NEAR THE SITE ARE ANTICIPATED TO INCLUDE: ELECTRICAL SERVICES, BELL AND EASTLINK COMMUNICATIONS.
8. ALL WORK SHALL BE CARRIED OUT IN ACCORDANCE WITH THE SUPPLIED DRAWINGS, RELEVANT ONTARIO PROVINCIAL STANDARD DRAWINGS AND SPECIFICATIONS, AND GREATER SUDBURY STANDARD DRAWINGS AND SPECIFICATIONS.
9. THE CONTRACTOR IS TO ABIDE BY ALL APPLICABLE HEALTH & SAFETY REQUIREMENTS.
10. ALL WORK SHALL BE IN COMPLIANCE WITH THE REQUIREMENTS OF THE LATEST EDITIONS OF THE APPLICABLE CSA STANDARDS AND THE ONTARIO BUILDING CODE.
11. THESE DRAWING SHOULD BE READ IN CONJUNCTION WITH OTHER ENGINEERS' PLANS. ANY DISCREPANCIES SHALL BE CLARIFIED PRIOR TO CONSTRUCTION.
12. ALL DIMENSIONS AND ELEVATIONS ARE IN METERS UNLESS NOTED OTHERWISE.
13. CONTRACTOR TO FIELD CHECK ALL DIMENSIONS, ELEVATIONS AND EXISTING CONDITIONS AND REPORT ANY DISCREPANCIES TO THE CONSULTANT PRIOR TO STARTING CONSTRUCTION.
14. ONLY DRAWING MARKED "FOR CONSTRUCTION" ARE TO BE USED FOR THIS PROJECT AND THE CONSTRUCTION OF THE WORKS.
15. THE CONTRACTOR, IF WORKING FROM DRAWINGS NOT SPECIFICALLY MARKED "FOR CONSTRUCTION" EXCEPT REFERENCED ONTARIO PROVINCIAL STANDARD DRAWINGS (OPSD), MUST ASSUME FULL RESPONSIBILITY AND BEAR THE COSTS FOR ANY CORRECTIONS OR DAMAGES RESULTING FROM THEIR WORK.
16. CONTRACTOR IS RESPONSIBLE TO REPLACE/REPAIR AT THEIR COST ANY DEFICIENT WORK AS NOTED BY THE CONTRACT ADMINISTRATOR.
17. CONTRACTOR IS RESPONSIBLE TO NOTIFY ALL UTILITIES PRIOR TO COMMENCEMENT OF WORK AND COORDINATE CONSTRUCTION ACCORDINGLY.
18. THE CONTRACTOR SHALL MAINTAIN CONSTRUCTION SITE IN AN ORGANIZED AND ORDERLY STATE AT ALL TIMES.
19. CLEAN UP GROUNDS AND ACCESS ROADS DAILY AND AS DIRECTED BY THE OWNER, CONSULTANT, OR THE CITY.
20. THE CONTRACTOR SHALL RESTORE ALL CONSTRUCTION DAMAGES TO THE SATISFACTION OF THE OWNER, CONSULTANT, AND THE CITY.
21. ALL AREAS OF THE EXISTING SITE DISTURBED BY CONSTRUCTION ARE TO BE REHABILITATED TO EXISTING CONDITIONS OR BETTER.
22. MAINTAIN EXISTING ELEVATIONS AT PROPERTY LINE AND ON EXISTING ASPHALT ROADS, UNLESS INDICATED OTHERWISE.
23. CONTRACTOR TO PROVIDE STREET CLEANING SERVICES ON A CONTINUOUS BASIS DURING CONSTRUCTION UNTIL SURFACE FINISHES HAVE BEEN CONSTRUCTED AND HAVE STABILIZED.
24. COMPLY WITH ALL WRITTEN RECOMMENDATIONS OF MANUFACTURERS AND SUPPLIERS, INCLUDING PRODUCT TECHNICAL BULLETINS REGARDING HANDLING, STORAGE, AND INSTALLATION PROCEDURES.
25. ALL CONSTRUCTION ACTIVITY WILL COMPLY WITH CITY OF GREATER SUDBURY NOISE BYLAW.
26. A GEOTECHNICAL TEST PIT INVESTIGATION REPORT WAS PREPARED FOR THE PROJECT BY EXP SERVICES INC. IT IS RECOMMENDED THAT THE REPORT BE REVIEWED, TO ENSURE FAMILIARITY WITH GEOTECHNICAL FINDINGS AND CONSTRUCTION RECOMMENDATIONS (GEOTECHNICAL REPORT DATED JUNE 18, 2024, PROJECT No. SUD-24007118-A0).
27. CARRY OUT DETAILED PRE-CONSTRUCTION PHOTOGRAPHIC PROPERTY SURVEY OF EXISTING BUSINESSES, DRIVEWAYS AND YARDS AT PERIMETER. WHERE GRADING INTO ADJOINING PROPERTIES, REHABILITATE PROPERTIES SURFACES, TOPSOIL AND GRASS FINISHES TO EXISTING OR BETTER CONDITIONS. ENSURE POSITIVE DRAINAGE TO SWALES.
28. PRIOR TO COMMENCING ANY WORK WITHIN THE MUNICIPAL RIGHT-OF-WAY, THE CONTRACTOR WILL OBTAIN ALL NECESSARY ROAD OCCUPANCY PERMITS, CONNECTION PERMITS, AND ANY OTHERS THAT ARE REQUIRED, FROM THE CITY'S ENGINEERING SERVICES.
29. THE CERTIFICATION TEST RESULTS FOR ALL WORK COMPLETED IN THE MUNICIPAL RIGHT-OF-WAY AND ALL PIPE WORK CONSTRUCTED ON PRIVATE PROPERTY SHALL BE IN CONFORMANCE WITH THE CITY'S CERTIFICATION REQUIREMENTS.
30. ALL WORK WITHIN CITY RIGHT-OF-WAY SHALL BE CONSTRUCTED IN ACCORDANCE WITH CITY OF GREATER SUDBURY DESIGN STANDARDS AND SPECIFICATIONS, OR THE ONTARIO PROVINCIAL STANDARDS MAY, SUBJECT TO THE APPROVAL OF THE CITY OF GREATER SUDBURY, BE USED WHERE NO STANDARD OR SPECIFICATION IS NOTED.
31. ALL DISTURBED AREAS WITHIN THE MUNICIPAL RIGHT-OF-WAY SHALL BE RECTIFIED TO THE ORIGINAL CONDITION OR BETTER AND TO THE SATISFACTION OF THE GENERAL MANAGER OF GROWTH AND INFRASTRUCTURE.
32. CONTRACTOR IS TO ENSURE THAT PROPERTY OWNER PERMISSION IS OBTAINED PRIOR TO CARRYING OUT ANY GRADING WORK ON ADJACENT PROPERTIES.

DRAINAGE:

1. CONNECTIONS INTO THE EXISTING CITY DRAINAGE INFRASTRUCTURE TO BE COMPLETED OR CONFIRMED PRIOR TO ANY WORKS WHICH MAY BE AFFECTED.
2. ALL SWALES SHALL BE CONSTRUCTED PER SPECIFIED DETAILS PROVIDED ON THIS DRAWING SET.
3. PERFORATED SUBDRAIN SHALL BE COMPLETE WITH A KNITTED SOCK GEOTEXTILE PER OPSS 405 AND SURROUNDED WITH CLEARSTONE WRAPPED WITH GEOTEXTILE TERRAFIX 270R, OR APPROVED EQUIVALENT.
4. ALL SUBDRAINS MUST DISCHARGE TO POSITIVE OUTLET OR TIE INTO STORM SEWER STRUCTURES.
5. ENSURE POSITIVE DRAINAGE THROUGHOUT PARKING LOT AND SURROUNDINGS, TOWARDS DRAINAGE RECEPTACLES.
6. THE EXTERIOR GRADE AROUND THE BUILDING IS TO BE SLOPED AWAY FROM THE WALLS TO PREVENT SURFACE RUNOFF FROM ENTERING THE BUILDING.
7. SEE SITE GRADING PLAN AND ASSOCIATED STORMWATER MANAGEMENT REPORT FOR DETAILS ON PROPOSED ELEVATIONS, RETENTION AND TREATMENT FACILITIES, AND OTHER DRAINAGE ELEMENTS.

WATER SERVICE:

1. THE SITE SERVICING SCOPE OF THIS PROJECT INVOLVES ABANDONMENT OF EXISTING WATER SERVICE LINES, AS WELL AS PREPARATION OF NEW WATER SERVICE CONNECTION.
2. ANY CHANGES TO BE REVIEWED WITH DESIGN ENGINEER
3. WATER SERVICES TO HAVE A MINIMUM OF 2.0m DEPTH OF COVER, IF NOT ATTAINABLE, INSULATE AS NEEDED PER INDICATED DETAIL ON THIS DRAWING.
4. INSTALL PER GSSS 442, GSSD 1104.010, 1104.011, 1104.020, CONNECTIONS TO EXISTING WATERMAIN PER GSSS 441.07.22.
5. TO BE PVC DR 18 (SEE GSSS 441) AND BEDDED AS PER GSSD 1227.010
6. PIPE TO INCLUDE CORROSION PROTECTION AS PER GSSS 442
7. SERVICE SHALL BE PRESSURE TESTED AND CHLORINATED AS PER GSSS 201. SATISFACTORY BACTERIOLOGICAL TEST RESULTS SHALL BE OBTAINED FROM THE HEALTH UNIT PRIOR TO CONNECTIONS TO THE EXISTING SYSTEM. NO CONNECTION TO THE EXISTING WATERMAIN SHALL TAKE PLACE UNTIL NEW SERVICE LINES HAVE BEEN TESTED AND APPROVED BY LOCAL AUTHORITIES.
8. ENSURE DETAILED FAMILIARITY WITH CITY OF GREATER SUDBURY'S "PROTOCOL FOR NEW WATERMAIN, WATER SERVICE AND WASTEWATER CONNECTIONS" GUIDE. MOST CURRENT EDITION OF THE PROTOCOL AT THE TIME OF THIS DRAWING PREPARATION IS V7.0 (MARCH 2021).
9. ALL WATERMAIN PIPE BEDDING, INSTALLATION AND BACKFILL MUST BE INSPECTED ON A FULL TIME BASIS BY A QUALIFIED SITE REVIEWER, DESIGNATED BY THE ENGINEER.
10. MAINTAIN MINIMUM 2.5m SEPARATION FROM OUTSIDE EDGE OF ANY NEARBY SEWER LINE, AND MAINTAIN A MINIMUM 0.5m VERTICAL SEPARATION BETWEEN INVERT AND CROWN AND MAXIMIZE DISTANCE OF SANITARY SEWER FROM JOINTS, AS PER MOE PROCEDURE F-6-1.
11. VALVE BOX PER GSSD 1101.020.
12. INSTALL WITH AN APPROPRIATE TRACER WIRE PER GSSED 1110.000
13. ONLY WATER/WASTEWATER STAFF FROM CITY OF GREATER SUDBURY MAY OPERATE VALVES.
14. WATER SERVICES SHALL BE CONSTRUCTED AS SHOWN ON THE PLAN. WATER SERVICE MAY REQUIRE INSTALLATION AT GREATER DEPTHS IN CERTAIN LOCATIONS TO AVOID CONFLICT WITH OTHER SERVICES, EXISTING OR PROPOSED; REVIEW WITH DESIGN ENGINEER PRIOR TO MAKING ANY CHANGES TO DEPTH OR ALIGNMENT OF WATER SERVICE.

SANITARY SERVICE:

1. DEPTH OF COVER TO PIPE OBVERT AT MINIMUM 2.0m; ANY REDUCTIONS TO BE ADDRESSED WITH PROVISION OF INSULATION PROTECTION PER INDICATED DETAIL.
2. SANITARY SERVICES SHALL BE CONSTRUCTED AS SHOWN ON THE PLAN. SANITARY SERVICE MAY REQUIRE INSTALLATION AT GREATER DEPTHS IN CERTAIN LOCATIONS TO AVOID CONFLICT WITH OTHER SERVICES, EXISTING OR PROPOSED; REVIEW WITH DESIGN ENGINEER PRIOR TO MAKING ANY CHANGES TO DEPTH OR ALIGNMENT OF SANITARY SERVICE.
3. ALL SANITARY PIPE BEDDING, INSTALLATION AND BACKFILL MUST BE INSPECTED ON A FULL TIME BASIS BY A QUALIFIED INSPECTOR, DESIGNATED BY THE ENGINEER.
4. GRAVITY SANITARY PIPE MATERIAL – PVC MINIMUM SDR 35.
5. ALL NEWLY INSTALLED AND BACKFILLED PIPE SHALL BE SUBJECTED TO A LEAKAGE TEST, CONDUCTED IN THE PRESENCE OF OWNER. TEST PRESSURE SHALL BE 150 PERCENT OF SYSTEM OPERATING PRESSURE BASED ON PRESSURE AS MEASURED AT LOWEST POINT IN PIPELINE, BEFORE APPLYING THE SPECIFIED TEST PRESSURE, ALL AIR SHALL BE EXPELLED FROM THE PIPE. PERFORM LEAKAGE TESTING OF SANITARY SEWERS IN ACCORDANCE WITH OPSS 410 AND OPSS 407; A COPY OF THE INSPECTION REPORT SHALL BE SUBMITTED TO THE DESIGN ENGINEER FOR REVIEW.
6. AFTER SANITARY PIPE INSTALLATIONS, CCTV CAMERA INSPECTION AND REPORT IS REQUIRED TO BE PROVIDED FOR REVIEW BY THE DESIGN ENGINEER. SEWER TO BE FLUSHED PRIOR TO CAMERA INSPECTION. DO NOT INSTALL ASPHALT ON SITE UNTIL SEWERS ARE CONFIRMED TO BE INSTALLED TO THE SATISFACTION OF THE ENGINEER.

MATERIALS AND SUBSURFACE CONDITIONS:

1. THE FIELDWORK FOR THIS GEOTECHNICAL INVESTIGATION WAS CARRIED OUT IN JANUARY 16 AND 17 2025, CONSISTING OF ELEVEN BOREHOLES, ADVANCED TO A DEPTH UP TO 2.1 AND 5.2m BELOW GROUND SURFACE, WITH BOREHOLE LOCATIONS AS SHOWN ON DRAWINGS. REPORT DATED 2/10/2025 SUD-24014195-A0
2. IN GENERAL, THE SOIL CONDITIONS AT THIS SITE CONSIST OF TOPSOIL OVERLYING SILT 0.7M-1.4M THICK AND SILTY SAND 1.7M TO 4.1M THICK. TO SUMMARIZE: THE SITE HAS UP TO 200 MM OF TOPSOIL UNDERLAIN BY A SILT STRATUM 0.7 M TO 1.4 M THICK, UNDERLAIN BY A LAYER OF SILTY SAND 1.7M TO 4.1 M THICK FOR THE REMAINING DEPTH OF THE BOREHOLE.
3. GROUNDWATER AT THE SITE IS ENCOUNTERED AT A DEPTH OF 2.0 TO 4.0 M BELOW GRADE AT THE TIME OF THE INVESTIGATION.
4. IN-SITU SOILS/FILL MAY BE CLASSIFIED AS TYPE 3 SOILS FOR EXCAVATIONS TERMINATING ABOVE THE GROUNDWATER LEVEL IN CONFORMANCE WITH THE ONTARIO OCCUPATIONAL HEALTH & SAFETY ACT.
5. ALL EXCAVATIONS MUST BE COMPLETED IN ACCORDANCE WITH THE MOST RECENT REGULATIONS IN THE ONTARIO OCCUPATIONAL HEALTH AND SAFETY ACT.
6. PRIOR TO THE PLACEMENT OF THE FOOTINGS, TOPSOIL, ORGANICS, FILL AND ANY OTHER DELETERIOUS MATERIAL MUST BE REMOVED DOWN TO THE UNDISTURBED NATIVE SOILS.
7. TO PROTECT THE FOOTING BASE FROM CONSTRUCTION ACTIVITY OR INCLEMENT WEATHER, A 150 MM THICK LAYER OF GRANULAR "A" MATERIAL (OPSS 1010) CAN BE PLACED DIRECTLY BELOW THE FOOTINGS AND EXTEND A MINIMUM OF 300 MM ON EITHER SIDE OF THE FOOTING EDGE AND THEN SLOPE DOWN AT 1H:1V. IN-LIEU OF THE GRANULAR "A", A LEAN MIX CONCRETE BASE CAN BE POURED. THE LEAN MIX CONCRETE SHOULD EXTEND A MINIMUM OF 300 MM ON EITHER SIDE OF THE FOOTINGS. NOTE THAT THE FOOTING BASE SHOULD NOT BE LEFT EXPOSED BEYOND THE DAY OF EXCAVATION. FOLLOWING THE BLENDING AND CHINKING OF THE MATERIAL THE SUBGRADE SHOULD BE COVERED WITH A FILTER CLOTH CONSISTING OF TERRAFIX 270R, OR APPROVED EQUIVALENT. ALL FILTER CLOTH OVERLAP JOINTS SHOULD BE A MINIMUM OF 0.6M IN LENGTH. ONCE SUBGRADE IS PREPARED, ALL REQUIRED UPFILL MATERIAL SHALL CONSIST OF GRANULAR 'B' TYPE I OR II, OR SELECT SUBGRADE MATERIAL TO THE SIDE THE PAVEMENT/GRANULAR STRUCTURE SUBBASE (OPSS 1010).
8. ENGINEERED FILL CAN BE PLACED BETWEEN THE NATIVE SOILS AND FOOTINGS TO RAISE THE BASE OF FOOTING ELEVATION IF NECESSARY. THE ENGINEERED FILL IS TO CONSIST OF GRANULAR "B" TYPE I OR II (OPSS 1010). A FINAL 150 MM THICK LAYER OF GRANULAR "A" (OPSS) SHOULD BE PLACED DIRECTLY BELOW THE FOOTING. THE ENGINEERED FILL BELOW ANY FOOTINGS IS TO EXTEND HORIZONTALLY A MINIMUM OF 300 MM FROM ANY FOOTING EDGE AND THEN SLOPE DOWN AT 1H:1V TO THE UNDERLYING NATIVE SOILS.
9. ALL ENGINEERED FILL IS TO BE PLACED IN MAXIMUM 150 MM THICK LIFTS AND IS TO BE COMPACTED TO 100% OF THE STANDARD PROCTOR MAXIMUM DRY DENSITY (SPMDD) WITHIN 1.5% OF OPTIMUM MOISTURE CONTENT UNDER FULL TIME SUPERVISION BY AN EXP REPRESENTATIVE.
10. FOOTINGS FOUNDED ON THE UNDISTURBED NATIVE SOILS, OR ON ENGINEERED FILL OVERLYING UNDISTURBED NATIVE SOILS, CAN BE DESIGNED WITH A FACTORED GEOTECHNICAL RESISTANCE AT ULTIMATE LIMIT STATES (ULS) OF 112 KPA. THIS VALUE WAS CALCULATED USING A GEOTECHNICAL RESISTANCE FACTOR OF 0.5. A BEARING PRESSURE AT SERVICEABILITY LIMIT STATES (SLS) OF 75 KPA MAY BE USED. FOOTINGS DESIGNED WITH THE RECOMMENDATIONS CONTAINED HEREIN ARE EXPECTED TO SETTLE LESS THAN 25 MM TOTAL AND 20 MM DIFFERENTIAL.
11. FOUNDATIONS WHICH ARE TO BE PLACED AT DIFFERENT ELEVATIONS IN SOILS OR NEAR SERVICE TRENCHES SHOULD BE LOCATED SUCH THAT THE FOOTINGS ARE SET BELOW A LINE DRAWN UP AT 10 HORIZONTALS TO 7 VERTICAL FROM THE NEAR EDGE OF A LOWER FOUNDATION OR BOTTOM OF A SERVICE TRENCH.
12. ALL IMPORTED BACKFILL MATERIAL USED TO BACKFILL THE FOUNDATION WALLS SHOULD CONSIST OF GRANULAR "B" TYPE I OR GRANULAR "B" TYPE II (OPSS 1010) MATERIAL, WITH A MAXIMUM AGGREGATE SIZE NOT EXCEEDING 120 MM. THE GRANULAR "B" MATERIAL USED AGAINST THE FOUNDATION WALLS SHOULD HAVE NO SIZES GREATER THAN 75 MM AND MUST BE PLACED IN LIFTS NO GREATER THAN 150 MM IN THICKNESS AND MUST BE COMPACTED TO 98% OF THE SPMDD. CARE MUST BE TAKEN TO ENSURE DAMAGE TO THE FOUNDATION WALLS DOES NOT OCCUR.
13. THE EXTERIOR GRADE AROUND THE BUILDINGS SHOULD BE SLOPED AWAY FROM THE WALLS TO PREVENT SURFACE RUNOFF FROM ENTERING THE BUILDING. PERMANENT PERIMETER WEEPING TILE SHOULD BE INSTALLED WHERE ANY FLOOR IS LESS THAN 150 MM ABOVE FINAL GRADE AND IS REQUIRED TO BE DRY. THE DRAINAGE TILE SHOULD HAVE A MINIMUM DIAMETER OF 100 MM, AND BE SURROUNDED BY WELL-DRAINING FILTER MATERIAL (I.E. 20 MM CLEAR STONE GRAVEL). THE FILTER MATERIAL SHOULD BE SURROUNDED WITH A NON-WOVEN GEOTEXTILE. THE PERFORATED
14. SUBGRADE SHALL BE PREPARED SUCH THAT THERE WILL BE NO PERCHED WATER ON BEDROCK.
15. ANY PERCHED WATER SHALL BE REMOVED USING CONVENTIONAL PUMPS AND DISCHARGED TO A POSITIVE OUTLET AWAY FROM THE WORK AREA AND BE PROVIDED WITH SEDIMENT CONTROL MEASURES.
16. THE CONTRACTOR SHALL BE RESPONSIBLE FOR OFF SITE DISPOSAL OF ALL UNWANTED MATERIALS. THE CONTRACT ADMINISTRATOR SHALL FIELD-DETERMINE MATERIAL FOR RE-USE WITHIN THE PROJECT.
17. MANAGEMENT OF EXCESS MATERIALS SHALL BE ACCORDING TO GSSS 180.
18. THE CONTRACTOR MUST ABIDE BY O. Reg. 406/19: "ON-SITE AND EXCESS SOIL MANAGEMENT" RELATED TO SITE SOIL MATERIALS.
19. THE GROUND WATER WAS ENCOUNTERED AT THE SITE APPROXIMATELY 2.0 M BELOW GRADE. EXCAVATIONS BELOW 2.0 M WILL BE DIFFICULT TO ACHIEVE AND WILL REQUIRE EXTENSIVE DEWATERING AND AS SUCH SHOULD BE AVOIDED.
20. DEWATERING REQUIREMENTS WILL BE GOVERNED BY THE TIME OF THE YEAR THE CONSTRUCTION IS PERFORMED. IT IS THE RESPONSIBILITY OF THE CONTRACTOR TO PROPOSE A SUITABLE DEWATERING SYSTEM BASED ON THE TIME OF CONSTRUCTION AND GROUNDWATER LEVELS.
21. THE METHOD USED SHOULD NOT UNDERMINE ANY ADJACENT STRUCTURES. THE DEWATERING METHOD IS THE RESPONSIBILITY OF THE CONTRACTOR, AND THE CONTRACTOR SHOULD SUBMIT HIS PROPOSAL TO THE PRIME CONSULTANT FOR REVIEW AND APPROVAL PRIOR TO CONSTRUCTION.

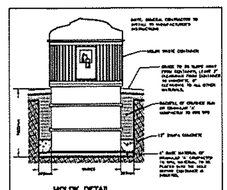
(CONTINUED)

CONTINUED...

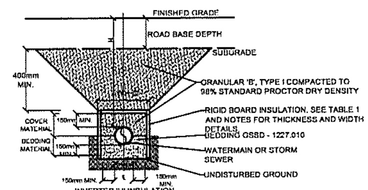
22. IT IS RECOMMENDED THAT THE CONTRACTOR CONDUCT A TEST DIG PRIOR TO CONSTRUCTION TO FAMILIARIZE THEMSELVES WITH THE GROUNDWATER CONDITIONS.
23. REASONABLE ASSUMPTIONS AND RECOMMENDATIONS HAVE BEEN PROVIDED BASED ON THE CURRENT UNDERSTANDING OF THE SUBSURFACE CONDITIONS PRESENT WITHIN THE GEOTECHNICAL INVESTIGATION BOREHOLES. GEOTECHNICAL RECOMMENDATIONS SHOULD BE REVIEWED AND UPDATED AS REQUIRED UPON SUBGRADE REVIEW BY GEOTECHNICAL ENGINEER OR THEIR DESIGNATED REPRESENTATIVE.
24. RECOMMENDED GRAVEL STRUCTURE FOR LIGHT TRAFFIC AND PARKING AREAS:
   - 250mm GRANULAR 'A' BASE
   - 300mm GRANULAR 'B' TYPE II OR 450mm GRANULAR 'B' TYPE I SUBBASE
25. RECOMMENDED GRAVEL STRUCTURE FOR HEAVY TRAFFIC AND LOADING AREAS:
   - 350mm GRANULAR 'A' BASE
   - 450mm GRANULAR 'B' TYPE II OR 600mm GRANULAR 'B' TYPE I SUBBASE
26. A MINIMUM SUBBASE MATERIAL OVERLYING SHALLOW BEDROCK IS TO BE NO LESS THAN 300mm.
18. ALL ORGANICS OR ANY OTHER DELETERIOUS MATERIALS OR BLAST ROCK FILL MUST BE REMOVED DOWN TO NATIVE SUBGRADE. AN UPFILL REQUIRED BELOW THE PAVEMENT AND GRANULAR STRUCTURE CAN CONSIST OF GRANULAR 'B' TYPE I OR TYPE II OR A SELECT SUBGRADE MATERIAL (SSM) IN ACCORDANCE WITH OPSS 1010.
19. THE ROADWAY AND PARKING LOT GRANULAR SURFACE, BASE AND SUB-BASE MATERIALS MUST BE IN ACCORDANCE WITH OPSS 1010 AND MUST BE PLACED IN MAXIMUM 150mm LIFTS AND COMPACTED TO 100% OF THE STANDARD PROCTOR MAXIMUM DRY DENSITY (SPMDD) AT A MOISTURE CONTENT WITHIN 2.0% OF THE OPTIMUM MOISTURE CONTENT.
20. THE LONG-TERM PERFORMANCE OF PAVEMENT STRUCTURES IS HIGHLY DEPENDENT UPON THE SUB-GRADE SUPPORT CONDITIONS. STRINGENT CONSTRUCTION CONTROL PROCEDURES SHOULD BE MAINTAINED TO ENSURE THAT UNIFORM SUB-GRADE MOISTURE AND DENSITY CONDITIONS ARE ACHIEVED.
21. THE FINISHED SURFACE AND UNDERLYING SUB-GRADE MUST BE SLOPED TO PROVIDE EFFECTIVE DRAINAGE TO THE SITE DITCHING AND OTHER DRAINAGE ELEMENTS.
22. SUBGRADE SOILS SHOULD BE PROOF-ROLL COMPACTED PRIOR TO PLACING ANY ENGINEERED FILL. ANY SOFT AREAS ENCOUNTERED DURING PROOF-ROLLING SHOULD BE EXCAVATED AND REPLACED WITH A GRANULAR 'A' OR GRANULAR 'B' TYPE II (OPSS 1010) MATERIAL.
23. THE MOST SEVERE LOADING CONDITIONS ON A SOIL PAVEMENT STRUCTURE SUB-GRADE USUALLY OCCUR DURING CONSTRUCTION. CONSEQUENTLY, SPECIAL PROVISIONS SUCH AS ADDITIONAL GRANULAR SUB-BASE, MAY BE REQUIRED, ESPECIALLY IF CONSTRUCTION IS COMPLETED DURING UNFAVORABLE WEATHER CONDITIONS OVER NATIVE SOILS. TYPICALLY, THE FIRST LIFT OF ENGINEERED FILL IS PLACED WITH A THICKNESS OF 300mm PRIOR TO VIBRATORY COMPACTION TO MITIGATE DISTURBANCE OF THE SUB-GRADE SOILS.
24. IF WET SOIL CONDITIONS ARE PRESENT DURING CONSTRUCTION, A NON-WOVEN GEOTEXTILE SEPARATOR (TERRAFIX 270R OR EQUIVALENT) SHOULD BE PLACED BETWEEN THE SUBGRADE SOILS AND ANY UP FILL/PAVEMENT STRUCTURE MATERIAL TO STABILIZE THE NATIVE SOILS.
25. MAINTAIN COMPATIBILITY WITH ADJACENT SUBGRADE CONDITIONS. CONSTRUCT FROST TAPERS IN CONFORNANCE WITH OPSD 803.030 AND/OR 803.031.
26. IF CONSTRUCTION PROCEEDS DURING THE WINTER MONTHS, THE BASE AND SIDES OF THE TRENCH, AS WELL AS ALL FILL MATERIALS, SHOULD NOT BE ALLOWED TO FREEZE.
27. IF CONSTRUCTION PROCEEDS DURING THE WINTER MONTHS, ALL SUBGRADE SOILS NEED TO BE MAINTAINED AT A MINIMUM TEMPERATURE OF 5°C. NO GRANULAR MATERIAL MAY BE PLACED UNDER FROZEN CONDITIONS, WITH ALL FILL MATERIAL MAINTAINED AT A MINIMUM TEMPERATURE OF 5°C PRIOR TO AND DURING INSTALLATION.
28. ANY EXCAVATED MATERIAL CONTAMINATED WITH ORGANICS, CONSTRUCTION DEBRIS, OR OTHER DELETERIOUS MATERIALS MUST NOT BE REUSED AS BACKFILL MATERIAL. THIS MATERIAL CAN BE REUSED FOR GENERAL LANDSCAPING PURPOSES, PROVIDED IT IS ENVIRONMENTALLY SAFE TO DO SO.
29. CONTRACTOR IS TO CARRY OUT THE FOLLOWING THIRD-PARTY TESTING OF SITE MATERIAL TO CONFIRM IT MEETS REQUIREMENTS – ALSO ENSURE THAT THESE TESTS ARE OBTAINED FOR WORK TAKING PLACE ON THE CITY ROW TO ENSURE CERTIFICATION OF SITE; CONTRACTOR IS RESPONSIBLE TO COORDINATE WITH MATERIAL TESTING LABORATORY TO ALLOW SUFFICIENT TIME TO OBTAIN THE REQUIRED TESTING RESULTS:
   - GRANULAR 'A' AND GRANULAR 'B' SIEVE GRADATION
   - GRANULAR 'A' AND GRANULAR 'B' COMPACTION (MULTIPLE LOCATIONS, PRIOR TO PLACING NEXT LIFT OR MATERIAL)
   - CONCRETE STRENGTH (MIN. 1 TEST PER POUR)
   - SUBGRADE REVIEW
33. NOTE THAT SOILS ENCOUNTERED IN THE CONSTRUCTION EXCAVATIONS MAY VARY SIGNIFICANTLY ACROSS THE SITE. GEOTECHNICAL CONCLUSIONS ARE BASED SOLELY ON THE MATERIALS ENCOUNTERED IN BOREHOLE EXPLORATIONS. IF DIFFERENT SUBSURFACE CONDITIONS ARE ENCOUNTERED AT THE TIME OF CONSTRUCTION, IT IS RECOMMENDED THAT EXP BE CONTACTED IMMEDIATELY TO EVALUATE THE CONDITIONS ENCOUNTERED.
34. WATER (I.E. SURFACE WATER RUNOFF) SHOULD NOT BE PERMITTED TO ENTER AND/OR POND WITHIN THE CONSTRUCTION AREA.
35. TOPSOIL AND PLACEMENT OF TOPSOIL SHALL ADHERE TO GSSS 802.
36. SOD AND PLACEMENT OF SOD SHALL ADHERE TO GSSS 803.
37. SEED AND COVER AND THE PLACEMENT OF SEED AND COVER SHALL ADHERE TO OPSS.MUNI 804.
38. CONTRACTOR SHALL BE RESPONSIBLE FOR WATERING AND MAINTENANCE UNTIL VEGETATION IS ESTABLISHED AND HEALTHY AT THE CONSULTANTS DISCRETION.
39. ENGINEERED FILL AGGREGATE MATERIALS SHALL ADHERE TO GSSS 1010.
40. GENERAL SURFACE GRADING OF GRANULAR MATERIALS SHALL BE COMPLETED IN ACCORDANCE WITH OPSS.MUNI 206.
41. EARTH AND ROCK EXCAVATION SHALL BE IN ACCORDANCE WITH OPSS.MUNI 206.
42. CONCRETE MATERIALS AND PRODUCTION SHALL ADHERE TO GSSS 1350.
43. RIP RAP SHALL BE INSTALLED PER GSSS 511.
44. JOINTS BETWEEN NEW AND PREVIOUSLY INSTALLED ASPHALT SHALL BE CONSTRUCTED IN ACCORDANCE WITH OPSS.MUNI 310.07.11.
45. TEMPORARY EROSION AND SEDIMENT CONTROL DEVICES SHALL BE IN CONFORMANCE WITH OPSS.MUNI 805.

SEDIMENTATION CONTROL:

1. ENSURE THAT EXCAVATED MATERIAL IS NOT ALLOWED TO WASH UNABATED INTO SURROUNDING DRAINAGE COURSES AND WATER BODIES. INSTALL SILT FENCE BARRIER AROUND SITE, AND STRAW BALE FLOW CHECKS ALONG DITCH LINES DOWNSTREAM OF SITE AND AT CULVERT ENTRANCES.
2. SILT FENCE BARRIERS AS PER OPSD 219.110. STRAW BALE FLOW CHECKS AS PER OPSD 219.180.
3. IF THE SEDIMENT AND EROSION CONTROL MEASURES ARE NOT FUNCTIONING PROPERLY, NO FURTHER WORK SHALL OCCUR UNTIL THE PROBLEM IS ADDRESSED.
4. INSTALL ADDITIONAL SILT FENCE BARRIERS IF IT IS NOTICED THAT CONSTRUCTION ACTIVITIES NEGATIVELY IMPACT SURROUNDING PROPERTIES NOT ALREADY PROTECTED.
5. SEDIMENT BARRIERS, CHECK DAMS, AND TEMPORARY CONSTRUCTION ACCESS TO BE INSTALLED PRIOR TO THE BEGINNING OF CONSTRUCTION.
6. ALL SEDIMENT CONTROL DEVICES TO BE ROUTINELY INSPECTED AND MAINTAINED IN PROPER WORKING ORDER UNTIL AREAS ARE STABILIZED.
7. MAXIMUM ALLOWED SEDIMENT ACCUMULATION AT THE SEDIMENT FENCING IS HALF THE FENCE FABRIC HEIGHT.
8. AFTER SIGNIFICANT RAIN EVENT, ALL SEDIMENT AND EROSION CONTROLS MUST BE INSPECTED AND RECTIFIED AS SOON AS POSSIBLE
9. IF NECESSARY, TRUCKS WILL BE WASHED DOWN BEFORE LEAVING THE SITE.
10. THE SITE WILL BE WET DOWN IF NECESSARY TO CONTROL DUST.
11. CALCIUM CHLORIDE DUST CONTROL MUST NOT BE USED IN GROUND WATER PROTECTION AREAS AND IMMEDIATELY UPSTREAM OF BODIES OF WATER.
12. ALL CONSTRUCTION ACTIVITY WILL COMPLY WITH CITY OF GREATER SUDBURY NOISE BYLAW.
13. ALL CONSTRUCTION VEHICLES TO ENTER AND EXIT SITE FROM TEMPORARY CONSTRUCTION ACCESS AS APPROVED BY THE CITY OF GREATER SUDBURY.
14. ALL TOPSOIL STOCKPILES TO BE SURROUNDED WITH SEDIMENT CONTROL FENCING.
15. FILTER FABRIC TO BE PLACED UNDER GRATES AND LIDS ON ALL ONSITE AND DOWNSTREAM CATCHBASINS TO TRAP SEDIMENT. SILT TRAPS ARE TO BE CLEANED REGULARLY AND ARE NOT TO BE REMOVED UNTIL ALL CONSTRUCTION ACTIVITY IS COMPLETE. FILTER FABRIC FOR SILT CONTROL TO BE TERRA FIX 270R OR APPROVED EQUIVALENT.
16. WHERE CONSTRUCTION ACTIVITY OCCURS WITHIN THE CITY RIGHT OF WAY, SEDIMENT CONTROLS WILL BE PLACED ON THE CATCHBASINS ON PUBLIC STREETS ACROSS THE PROPERTY'S FRONTAGE.
17. STREET SWEEPING, CATCHBASIN CLEANING AND DUST CONTROL ARE THE RESPONSIBILITY OF THE DEVELOPER AND MUST BE KEPT UNDER CONTROL ON ALL ROADWAYS TO THE SATISFACTION OF THE GENERAL MANAGER OF GROWTH AND INFRASTRUCTURE.
18. SURFACE EROSION PROTECTION MUST BE APPLIED FOR ALL DISTURBED AREAS, SUBJECT TO EROSION, UNTIL VEGETATION IS ESTABLISHED.
19. A LOG BOOK SHALL BE KEPT ONSITE INDICATING INSPECTION SCHEDULES, REPAIRS MADE, & ANY CONCERNS NOTED.
20. ADDITIONAL MATERIALS SUCH AS CLEAR STONE, FILTER FABRIC, PUMPS, HOSES AND SILTSOXX, OR APPROVED EQUIVALENT TO BE KEPT ONSITE AT ALL TIMES FOR CONDUCTING REPAIRS TO SEDIMENT CONTROL MEASURES.
21. ENGINEERED CHANGES TO THE ESC MEASURES MAY BE REQUIRED AS SITE CONDITIONS CHANGE.
22. ANY DEWATERING OCCURRING ONSITE MUST BE IN ACCORDANCE WITH AN APPROVED DEWATERING PLAN, WHICH MUST INCLUDE SILT TRAPS.
23. REFUELING, EQUIPMENT MAINTENANCE, AND HAZARDOUS MATERIAL STORAGE MUST TAKE PLACE A MINIMUM OF 30M FROM ANY WATERCOURSE OR ENVIRONMENTALLY SENSITIVE AREA.
24. AN APPROVED SPILL MANAGEMENT PLAN IS TO BE KEPT ONSITE AT ALL TIMES.
25. SPILLS ARE TO BE REPORTED IMMEDIATELY TO THE MECP SPILLS ACTION CENTER AT 1-800-268-6060
26. TEMPORARY FUEL AND OTHER HAZARDOUS MATERIAL STORAGE IS TO BE LOCATED MINIMUM 30M AWAY FROM ANY WATERCOURSE OR ENVIRONMENTALLY SENSITIVE AREA.

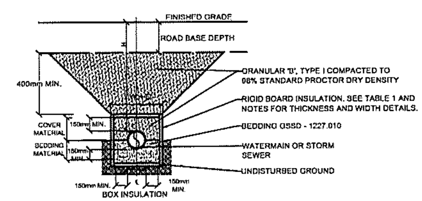


MOLOK DETAIL

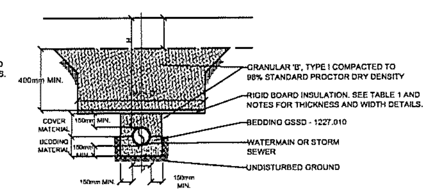


INVERTED 'U' INSULATION

MINIMUM WIDTH 'V' (mm)			
COVER REDUCTION	SLAB	INVERTED 'U'	BOX
300	800	-	-
600	1400	500	-
900	-	670	-
1200	-	800	650
1500	-	-	800
1800	-	-	1000



BOX INSULATION



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LEGEND

No.	Revision	By	Date
1	ISSUED FOR DRAFT REVIEW	PF	2025-06-04

ISSUED FOR REVIEW

Professional Seal(s)

Drawn By: DKR	Scale: AS SHOWN
Checked By: P.F.	Date: 2025-05-06
Approved By:	Date:
Date Printed: 2025-07-22	
File Name: 24006124-6022 HANMER-SITEPLAN-R1-07-23-2025.DWG	

Project Title: 1916555 ONTARIO DEVELOPMENT

MR80 HANMER TOWNHOUSE DEVELOPMENT

6034, 6040 MUNICIPAL ROAD 80, HANMER, ONTARIO

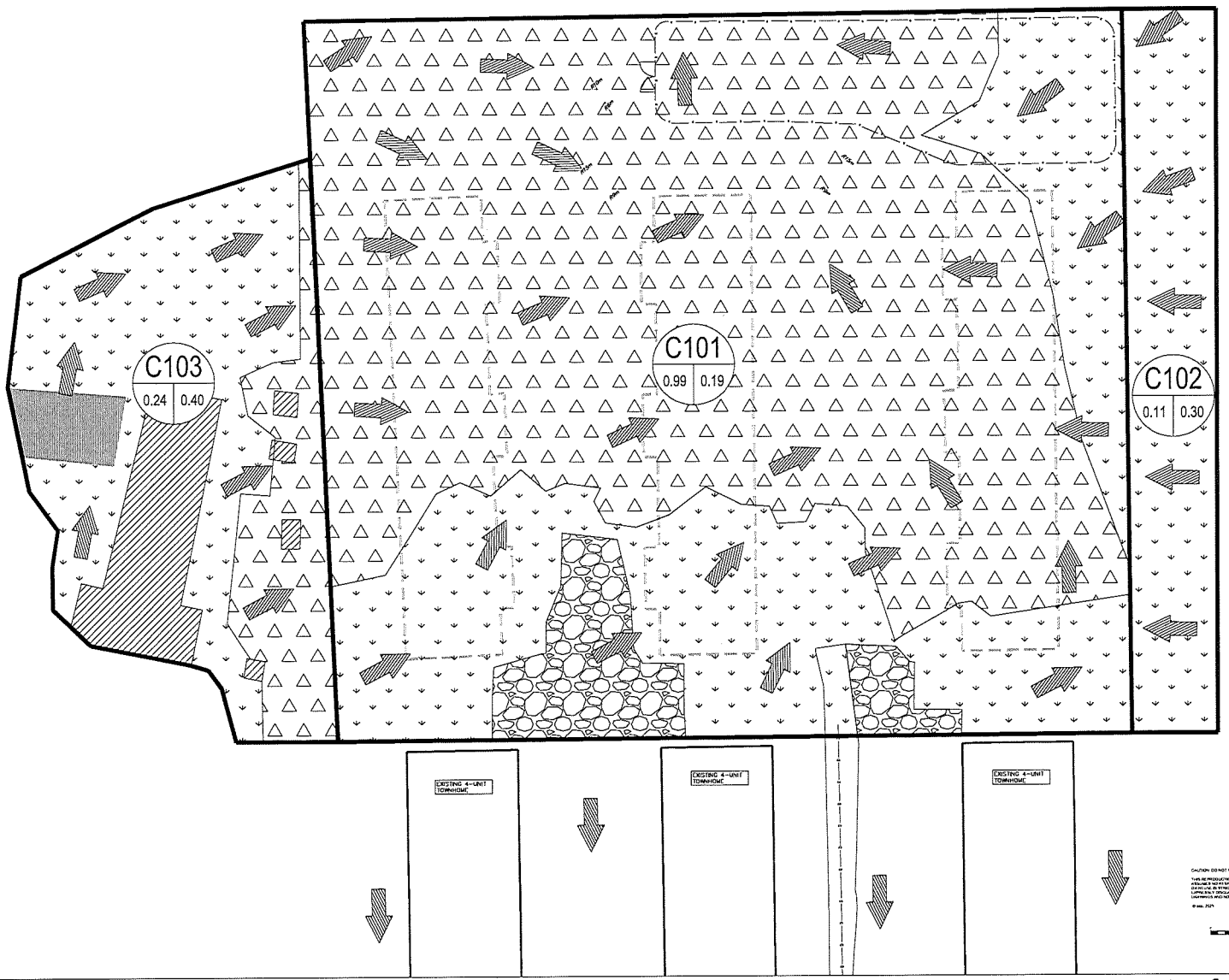
Dwg. Title: PROPOSED NOTES AND DETAILS

Project No. SUD-00024006124-A0

Dwg. No. C-4 | Rev. No. 1

PL-CON-2025-00039

Sketch 7



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LEGEND

- LAWNS
- WOODS
- GRANULAR
- BUILDINGS
- ASPHALT
- OVERLAND FLOW ROUTE
- X-1 (CATCHMENT AREA / AREA (ha) / RUNOFF COEFFICIENT: 0.50 / 0.32)

No.	Revision	By:	Date
1	ISSUED FOR SWM	PT	2025-05-06

ISSUED FOR SWM

Professional Seal(s)

Drawn By: PT	Scale: 1:250
Checked By: AL	Date: 2025-05-06
Approved By:	Date:

Date Plotted: 2025-05-10

File Name: 24006124-6022 HANMER-SITEPLAN-R1-01-23-2025.DWG

Project Title: 1916555 ONTARIO DEVELOPMENT

MR80 HANMER TOWNHOUSE DEVELOPMENT

6034, 6040 MUNICIPAL ROAD 80, HANMER, ONTARIO

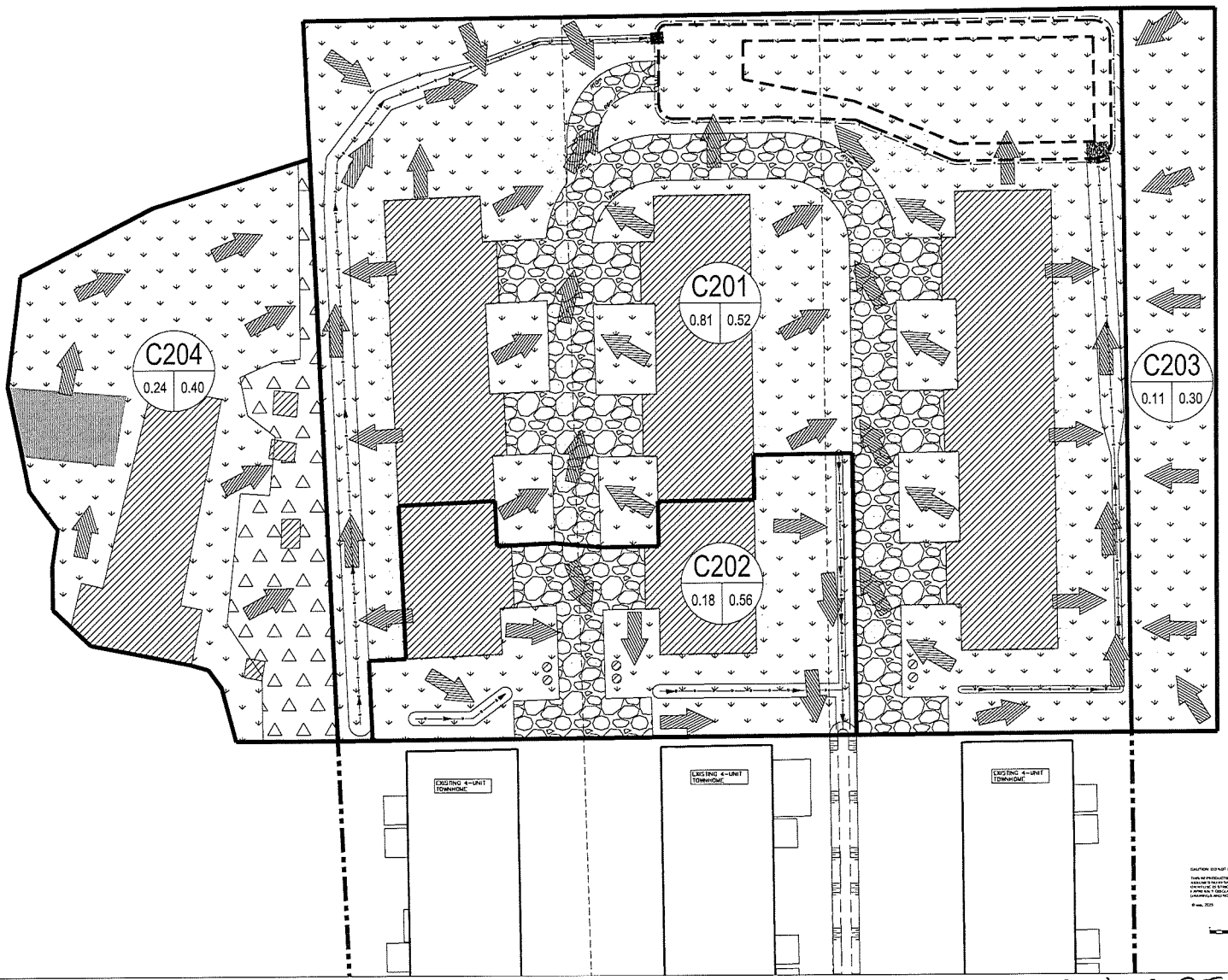
Dwg. Title: STORM WATER MANAGEMENT DRAWING

Project No. SUD-00024006124-A0

Dwg. No. SWM1

Rev. No. 0

PL-CON-2025-00039 Sketch 8



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Fax: 705 474 8095
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LEGEND

- LAWNS
- WOODS
- GRANULAR
- BUILDINGS
- ASPHALT
- OVERLAND FLOW ROUTE
- X-1 (CATCHMENT AREA AREA (ha)) / 0.50 (RUNOFF COEFFICIENT) 0.32

No.	Revision	By:	Date
1	ISSUED FOR SWM	HT	2025-05-06

ISSUED FOR SWM

Professional Seal(s)

Drawn By: HT	Scale: 1:250
Checked By: AL	Date: 2025-05-06
Approved By:	Date:

Date Plotted: 2025-06-10

File Name: 240006124-6022 HANMER-SITEPLAN-R1-07-23-2026.DWG

Project Title
1916555 ONTARIO DEVELOPMENT
MR80 HANMER TOWNHOUSE DEVELOPMENT
6034, 6040 MUNICIPAL ROAD 80, HANMER, ONTARIO

Dwg. Title
STORM WATER MANAGEMENT DRAWING

Project No. SUD-00024006124-A0

Dwg. No. SWM2 | Rev. No. 0

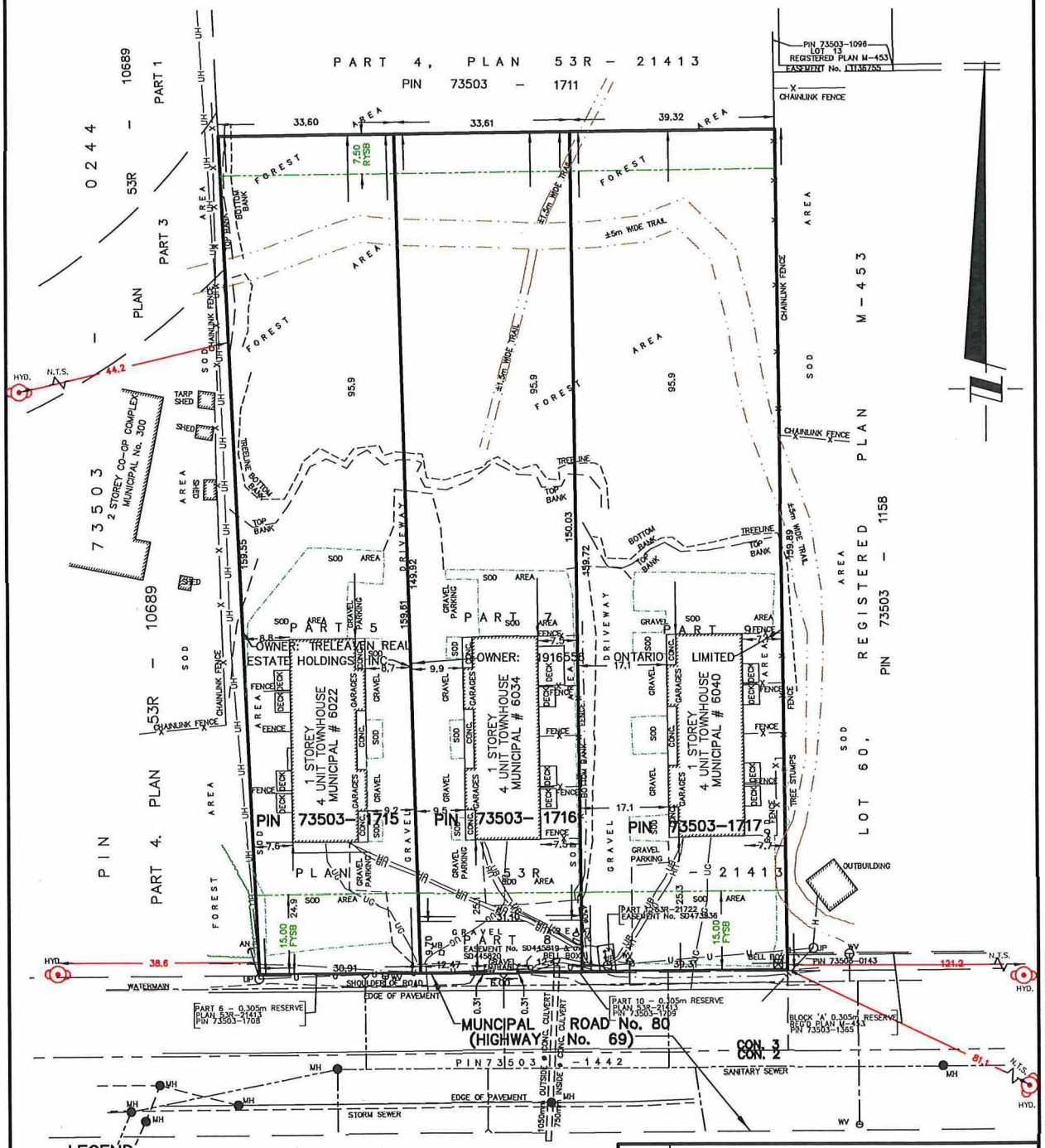
PL-CON-2025-00039 Sketch 9

SKETCH FOR PLANNING ACT APPLICATIONS

EXISTING CONDITIONS MUN.# 6022, 6034 & 6040 MR80

PART OF LOT 1, CONCESSION 3
GEOGRAPHIC
TOWNSHIP OF HANMER
CITY OF GREATER SUDBURY
DISTRICT OF SUDBURY

SCALE 1:750
0 5 10 20 30 40 50 METRES



LEGEND

PIN	DENOTES PROPERTY IDENTIFIER NUMBER
LT	DENOTES LAND TITLES
☒	DENOTES BELL BOX
○ UP	DENOTES UTILITY POLE
← AN	DENOTES ANCHOR
⊖ WV	DENOTES WATER VALVE
—UH—UH—	DENOTES UNDERGROUND HYDRO LINE
—UG—UG—	DENOTES UNDERGROUND GAS LINE
—u—u—	DENOTES OVERHEAD UTILITY LINES
—x—x—	DENOTES FENCE
▶	DENOTES GARAGE
● MH	DENOTES MANHOLE

CAUTION:
THIS IS NOT A PLAN OF SURVEY AND SHOULD ONLY BE USED FOR THE PURPOSE NOTED IN THE TITLE BLOCK

FIELD WORK WAS COMPLETED OCT. 14, 2024.

PROPERTY BOUNDARY DIMENSIONS SHOWN HEREON ARE DERIVED FROM PLAN 53R-21413.

MB	DENOTES MAIL BOX
FYSB	DENOTES FRONT YARD SETBACK (MIN.)
RYSB	DENOTES REAR YARD SETBACK (MIN.)

D.S. DORLAND LIMITED
ONTARIO LAND SURVEYORS
GEOMATICS PROFESSIONALS
298 LARCH STREET
SUDBURY, ONTARIO, P3B 1M1
PHONE (705) 673-2556 FAX (705) 673-1051
WWW.DSDORLANDLIMITED.CA

PREPARED BY : A. ALATYPPO	SCALE : 1:750 METRIC
FIELD WORK DATE: MAY 3, 2024	CAD FILE : 18712-18718-SKETCH.dwg
DATE : AUGUST 4, 2025	P. SPACE TAB : SKETCH EXIST.750s(PG1OF7)

PL-CON-2025-00039 Sketch 10

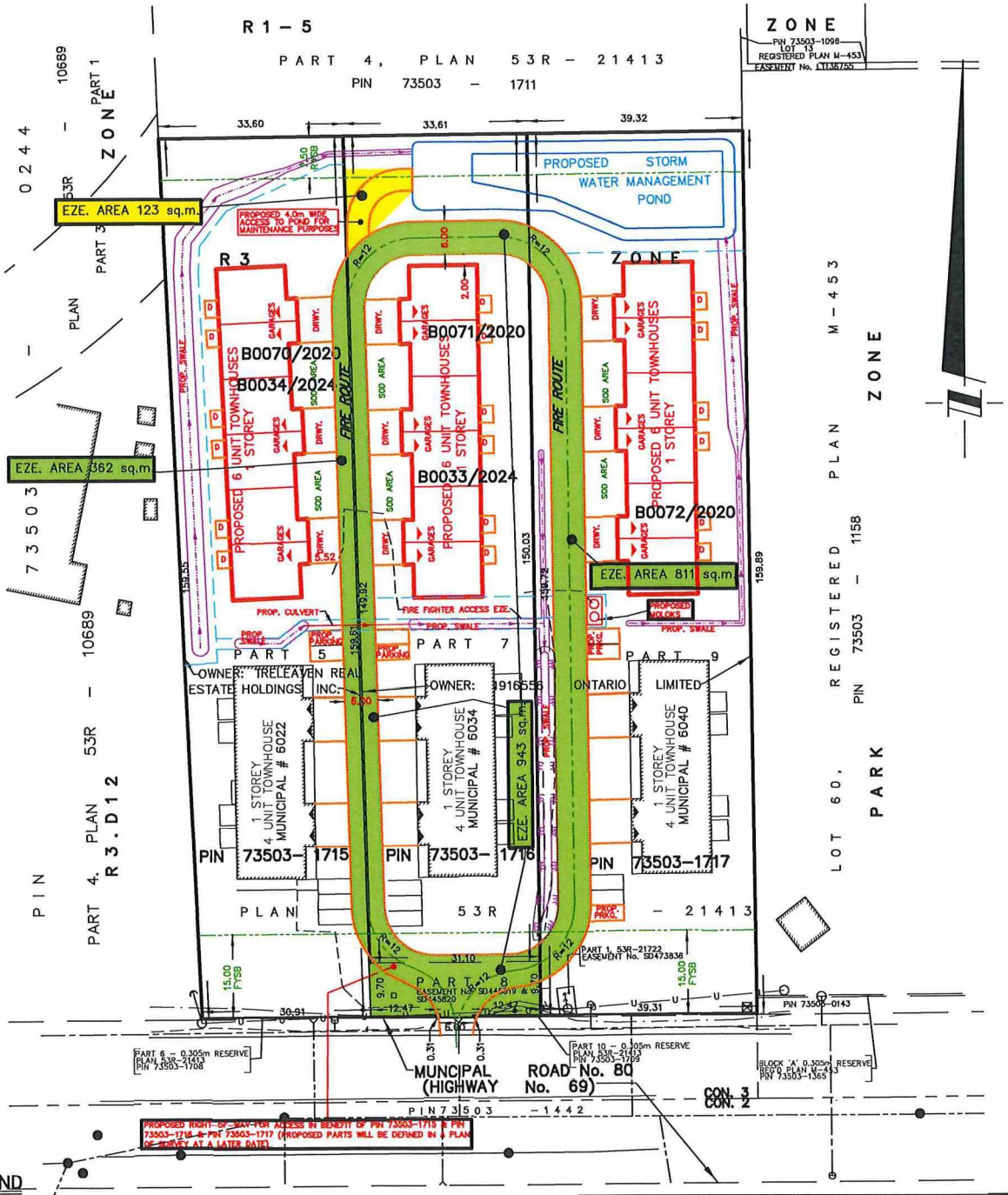
SKETCH FOR PLANNING ACT APPLICATIONS

PROPOSED R.O.W. FOR # 6022, 6034 & 6040 MR80 AND R.O.W. ACCESS TO S.W.M. POND

PART OF LOT 1, CONCESSION 3
GEOGRAPHIC
TOWNSHIP OF HANMER
CITY OF GREATER SUDBURY
DISTRICT OF SUDBURY

SCALE 1:750
0 5 10 20 30 40 50 METRES

CAUTION:
THIS IS NOT A PLAN OF SURVEY AND SHOULD ONLY BE USED FOR THE PURPOSE NOTED IN THE TITLE BLOCK
FOR CLARITY, NOT ALL EXISTING TOPOGRAPHICAL ARE SHOWN ON THIS SKETCH.
FIELD WORK WAS COMPLETED OCT. 14, 2024.
PROPERTY BOUNDARY DIMENSIONS SHOWN HEREON ARE DERIVED FROM PLAN 53R-21413.



LEGEND

EZE	DENOTES EASEMENT
PIN	DENOTES PROPERTY IDENTIFIER NUMBER
LT	DENOTES LAND TITLES
☒	DENOTES BELL BOX
O UP	DENOTES UTILITY POLE
⟵ AN	DENOTES ANCHOR
⊖ WV	DENOTES WATER VALVE
D	DENOTES PROPOSED DECK
S.W.M.	DENOTES STORM WATER MANAGEMENT
FYSB	DENOTES FRONT YARD SETBACK (MIN.)
RYSB	DENOTES REAR YARD SETBACK (MIN.)
R.O.W.	DENOTES RIGHT-OF-WAY
—U—	DENOTES OVERHEAD UTILITY LINES
	DENOTES GARAGE
MH	DENOTES MANHOLE

DENOTES PROPOSED R.O.W./ACCESS IN BENEFIT OF MUN.# 6022, 6034 & 6040 (FOR GARBAGE TRUCKS & EMERGENCY VEHICLES TO MOVE IN A FORWARD MOTION).

DENOTES PROPOSED R.O.W. ACCESS INTO S.W.M. POND AREA FOR MAINTENANCE PURPOSES

DENOTES PROPOSED AREA OF GRAVEL DRIVEWAYS & PARKING AREAS

NOTES:
EASEMENTS & R.O.W. WILL BE DEFINED AS PARTS ON FUTURE PLAN OF SURVEY.
** SEE EXP SERVICES SITE SERVICING DRAWING & LOT GRADING PLAN FOR THIS DEVELOPMENT.

D.S. DORLAND LIMITED
ONTARIO LAND SURVEYORS
GEOMATICS PROFESSIONALS
298 LARCH STREET
SUDBURY, ONTARIO, P3B 1M1
PHONE (705) 673-2556 FAX (705) 673-1051
WWW.DSDORLANDLIMITED.CA

PREPARED BY : A. ALATYPPO	SCALE : 1:750 METRIC
FIELD WORK DATE: MAY 3, 2024	CAD FILE : 18712-18718-SKETCH.dwg
DATE : AUGUST 4, 2025	P. SPACE TAB : SKETCH PROP.ROW750a(PG3OF7)

PL-CON-2025-00039 Sketch 11

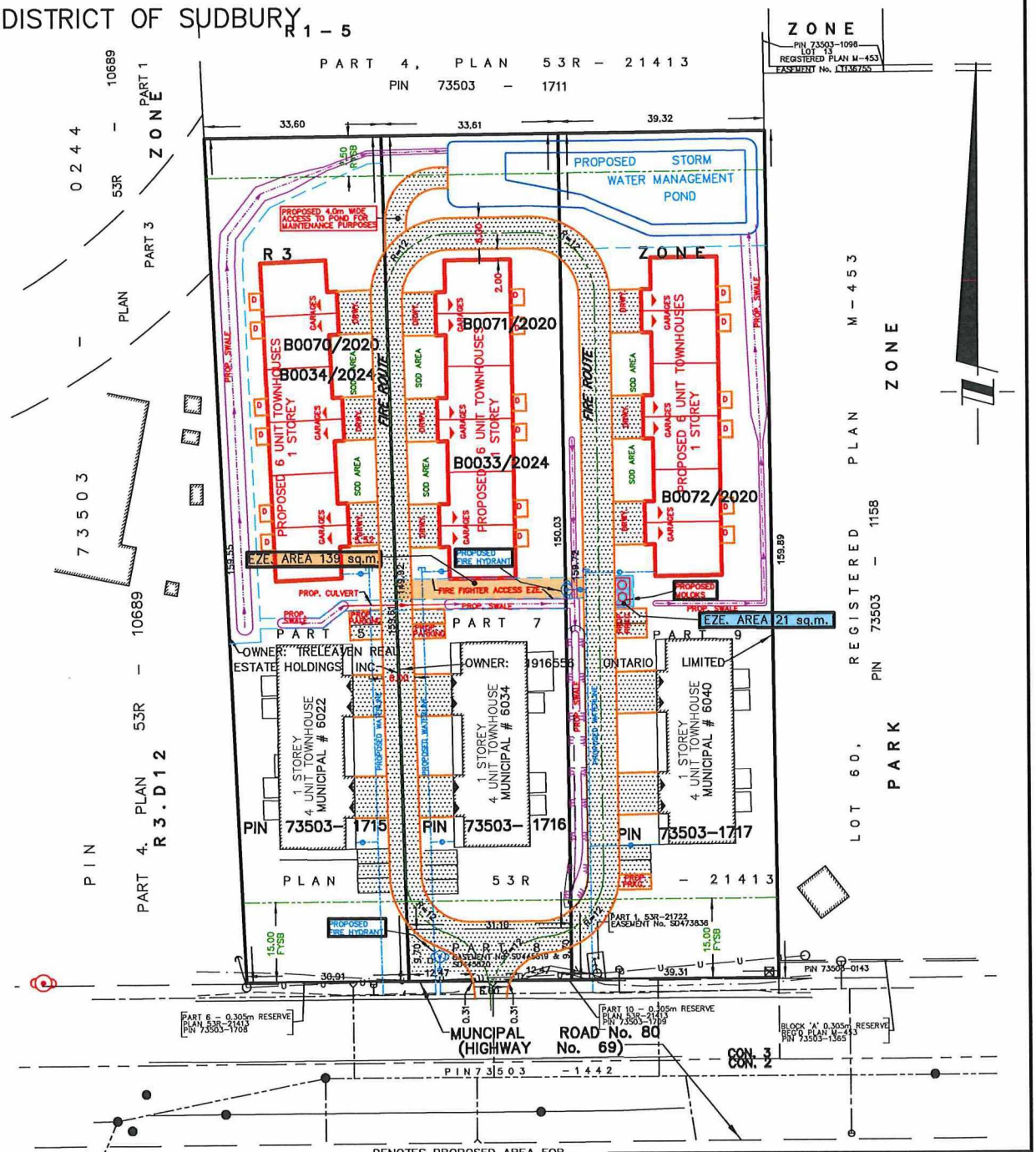
SKETCH FOR PLANNING ACT APPLICATIONS

PROPOSED EASEMENT FOR FIRE FIGHTER ACCESS & EASEMENT FOR REFUSE/RECYCLING CONTAINERS MUN.# 6022, 6034 & 6040 MR80

PART OF LOT 1, CONCESSION 3
GEOGRAPHIC
TOWNSHIP OF HANMER
CITY OF GREATER SUDBURY
DISTRICT OF SUDBURY

SCALE 1:750
0 5 10 20 30 40 50 METRES

CAUTION:
THIS IS NOT A PLAN OF SURVEY AND SHOULD ONLY BE USED FOR THE PURPOSE NOTED IN THE TITLE BLOCK
FOR CLARITY, NOT ALL EXISTING TOPOGRAPHICAL ARE SHOWN ON THIS SKETCH.
FIELD WORK WAS COMPLETED OCT. 14, 2024.
PROPERTY BOUNDARY DIMENSIONS SHOWN HEREON ARE DERIVED FROM PLAN 53R-21413.



LEGEND

PIN	DENOTES PROPERTY IDENTIFIER NUMBER
LT	DENOTES LAND TITLES
☒	DENOTES BELL BOX
UP	DENOTES UTILITY POLE
AN	DENOTES ANCHOR
WV	DENOTES WATER VALVE
D	DENOTES PROPOSED DECK
FYSB	DENOTES FRONT YARD SETBACK (MIN.)
RYSB	DENOTES REAR YARD SETBACK (MIN.)
R.O.W.	DENOTES RIGHT-OF-WAY
U	DENOTES OVERHEAD UTILITY LINES
	DENOTES GARAGE
MH	DENOTES MANHOLE

DENOTES PROPOSED AREA FOR REFUSE/RECYCLING CONTAINER EASEMENT IN BENEFIT FOR MUN. # 6022, 6034 & 6040

DENOTES PROPOSED FIRE FIGHTER ACCESS EASEMENT IN BENEFIT FOR MUN. # 6022, 6034 & 6040

DENOTES PROPOSED AREA OF GRAVEL DRIVEWAYS & PARKING AREAS

NOTES: 2 MOLOKS WILL BE SERVING ALL 3 LOTS
EASEMENTS WILL BE DEFINED AS PARTS ON FUTURE PLAN OF SURVEY.
** SEE EXP SERVICES SITE SERVICING DRAWING & LOT GRADING PLAN FOR THIS DEVELOPMENT.

D.S. DORLAND LIMITED
ONTARIO LAND SURVEYORS
GEOMATICS PROFESSIONALS
298 LARCH STREET
SUDBURY, ONTARIO, P3B 1M1
PHONE (705) 673-2556 FAX (705) 673-1051
WWW.DSDORLANDLIMITED.CA

PREPARED BY : A. ALATYPPO	SCALE : 1:750 METRIC
FIELD WORK DATE: MAY 3, 2024	CAD FILE : 18712-18718-SKETCH.dwg
DATE : AUGUST 4, 2025	P. SPACE TAB : SKETCH PROP.eze750s(PG4OF7)

PL-CON-2025-00039 sketch 12

SKETCH FOR PLANNING ACT APPLICATIONS

PROPOSED DRAINAGE EASEMENTS FOR MUN.# 6022 6034 & 6040 MR 80

PART OF LOT 1, CONCESSION 3
GEOGRAPHIC
TOWNSHIP OF HANMER
CITY OF GREATER SUDBURY
DISTRICT OF SUDBURY

SCALE 1:750
0 5 10 20 30 40 50 METRES

CAUTION:
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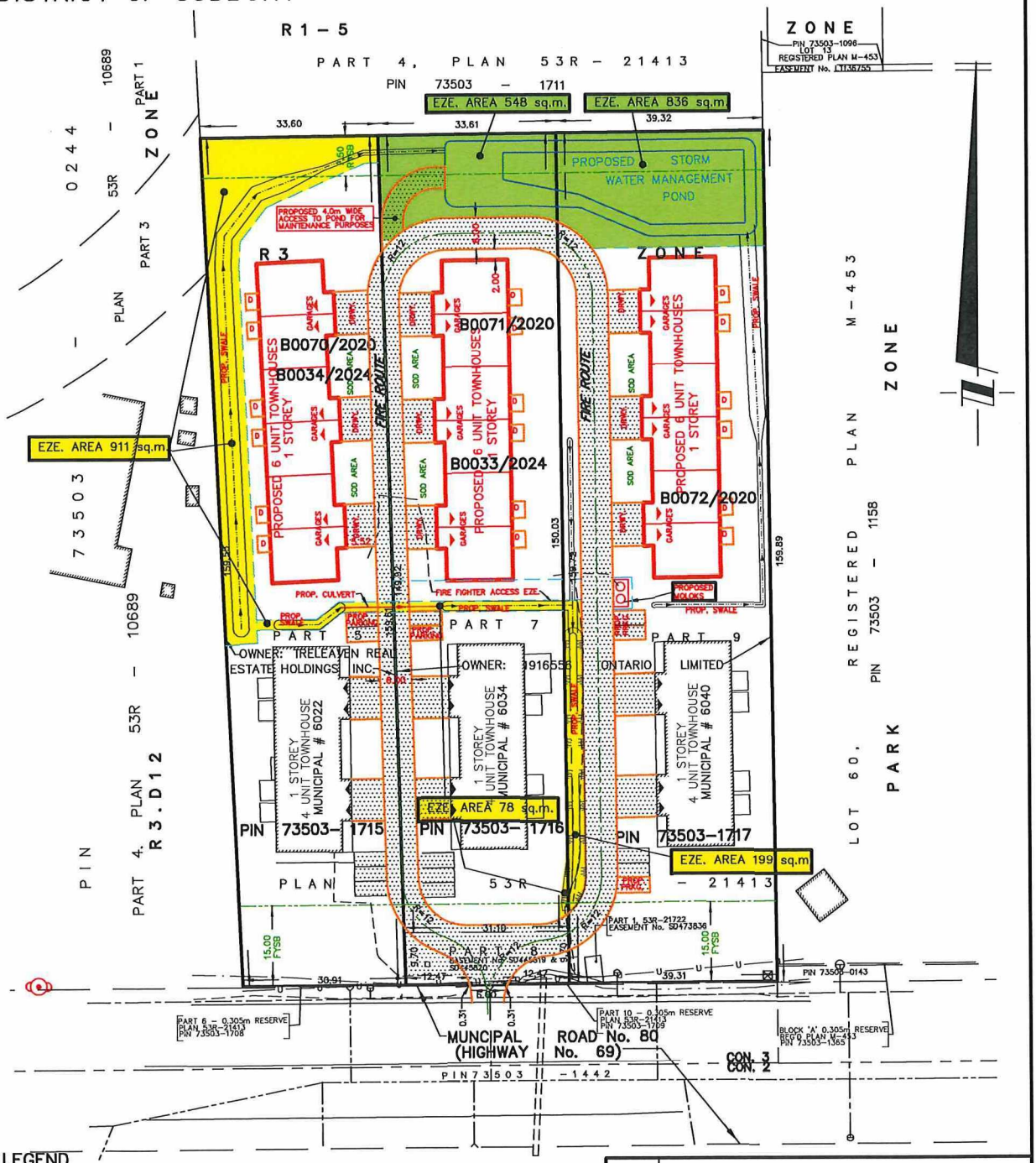
FIELD WORK WAS COMPLETED OCT. 14, 2024.
PROPERTY BOUNDARY DIMENSIONS SHOWN HEREON ARE DERIVED FROM PLAN 53R-21413.



LEGEND

EZE	DENOTES EASEMENT
PIN	DENOTES PROPERTY IDENTIFIER NUMBER
LT	DENOTES LAND TITLES
☒	DENOTES BELL BOX
UP	DENOTES UTILITY POLE
AN	DENOTES ANCHOR
WV	DENOTES WATER VALVE
D	DENOTES PROPOSED DECK
FYSB	DENOTES FRONT YARD SETBACK (MIN.)
RYSB	DENOTES REAR YARD SETBACK (MIN.)
R.O.W.	DENOTES RIGHT-OF-WAY
U	DENOTES OVERHEAD UTILITY LINES
	DENOTES GARAGE
MH	DENOTES MANHOLE

DENOTES PROPOSED DRAINAGE EASEMENT FOR STORM WATER MANAGEMENT POND IN BENEFIT OF MUN. # 6022, 6034 & 6040.

DENOTES FOR PROPOSED DRAINAGE EASEMENT FOR PROPOSED SWALES FOR MUN. # 6022, 6034 & 6040.

DENOTES PROPOSED AREA OF GRAVEL DRIVEWAYS & PARKING AREAS

NOTES:
EASEMENTS WILL BE DEFINED AS PARTS ON FUTURE PLAN OF SURVEY.
** SEE EXP SERVICES SITE SERVICING DRAWING & LOT GRADING PLAN FOR THIS DEVELOPMENT.

D.S. DORLAND LIMITED
ONTARIO LAND SURVEYORS
GEOMATICS PROFESSIONALS
298 LARCH STREET
SUDBURY, ONTARIO, P3B 1M1
PHONE (705) 673-2556 FAX (705) 673-1051
WWW.DSDORLANDLIMITED.CA

PREPARED BY : A. ALATYPPO	SCALE : 1:750 METRIC
FIELD WORK DATE: MAY 3, 2024	CAD FILE : 18712-18718-SKETCH.dwg
DATE : AUGUST 4, 2025	P. SPACE TAB : SKETCH PROP.pondDitch750a(PG50F7)

PL-CON-2025-00039 sketch 13

SKETCH FOR PLANNING ACT APPLICATIONS

PROPOSED EASEMENT FOR SNOW STORAGE FOR MUN.# 6022, 6034 & 6040 MR 80

PART OF LOT 1, CONCESSION 3
GEOGRAPHIC
TOWNSHIP OF HANMER
CITY OF GREATER SUDBURY
DISTRICT OF SUDBURY

SCALE 1:750
0 5 10 20 30 40 50 METRES

CAUTION:
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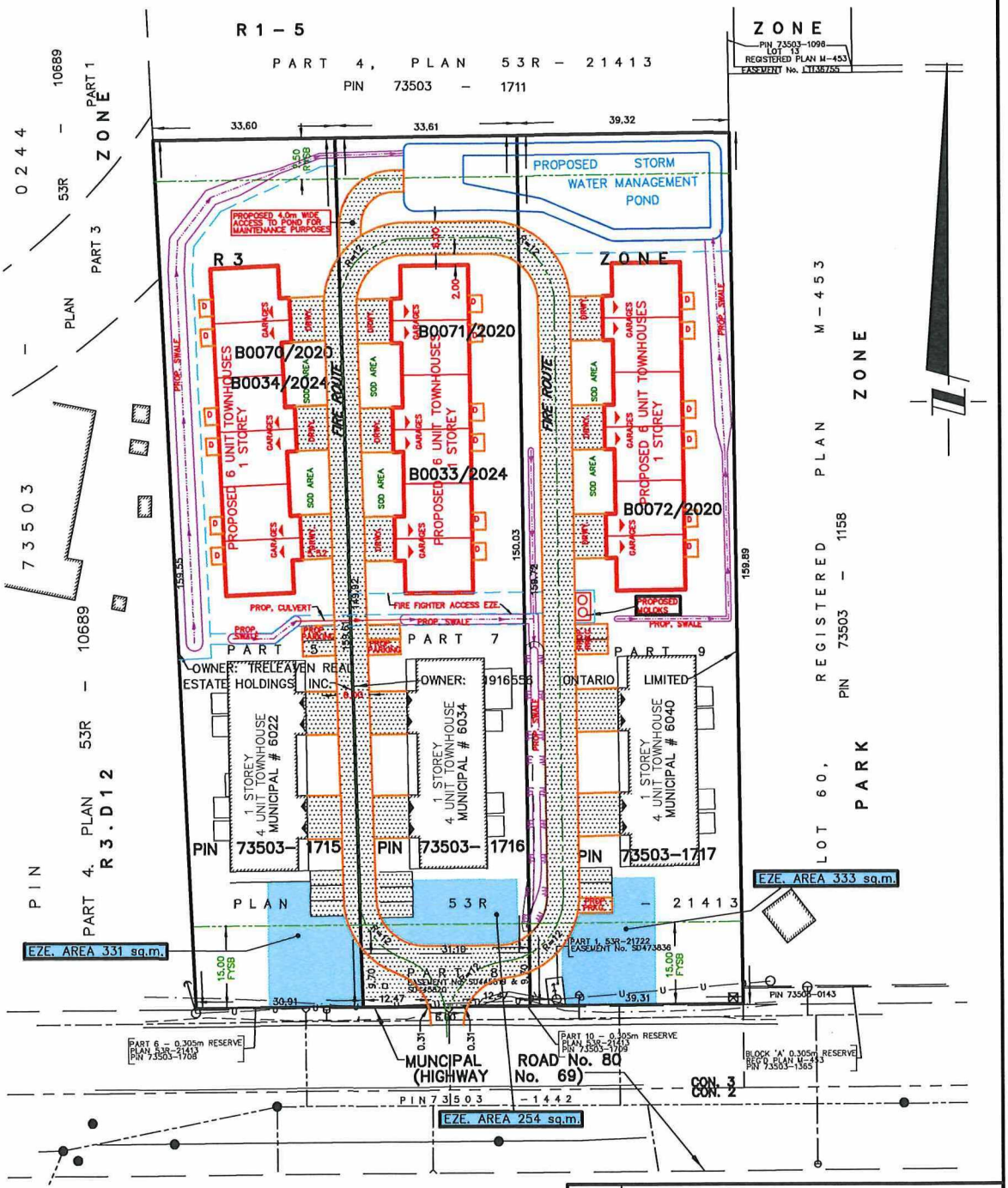
FOR CLARITY, NOT ALL EXISTING TOPOGRAPHICAL ARE SHOWN ON THIS SKETCH.
FIELD WORK WAS COMPLETED OCT. 14, 2024.
PROPERTY BOUNDARY DIMENSIONS SHOWN HEREON ARE DERIVED FROM PLAN 53R-21413.



LEGEND

PIN	DENOTES PROPERTY IDENTIFIER NUMBER
LT	DENOTES LAND TITLES
☒	DENOTES BELL BOX
O UP	DENOTES UTILITY POLE
← AN	DENOTES ANCHOR
⊖ WV	DENOTES WATER VALVE
D	DENOTES PROPOSED DECK
FYSB	DENOTES FRONT YARD SETBACK (MIN.)
RYSB	DENOTES REAR YARD SETBACK (MIN.)
R.O.W.	DENOTES RIGHT-OF-WAY
—U—	DENOTES OVERHEAD UTILITY LINES
	DENOTES GARAGE
● MH	DENOTES MANHOLE

DENOTES PROPOSED AREA FOR SNOW STORAGE EASEMENTS FOR MUN. # 6022, 6034 & 6040

DENOTES PROPOSED AREA OF GRAVEL DRIVEWAYS & PARKING AREAS

NOTES: THE EASEMENTS FOR THE SNOW STORAGE AREAS WILL BE DEFINED AS PARTS ON FUTURE PLAN OF SURVEY.
** SEE EXP SERVICES SITE SERVICING DRAWING & LOT GRADING PLAN FOR THIS DEVELOPMENT.

D.S. DORLAND LIMITED
ONTARIO LAND SURVEYORS
GEOMATICS PROFESSIONALS
298 LARCH STREET
SUDBURY, ONTARIO, P3B 1M1
PHONE (705) 673-2556 FAX (705) 673-1051
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PREPARED BY : A. ALATYPPO	SCALE : 1:750 METRIC
FIELD WORK DATE: MAY 3, 2024	CAD FILE : 18712-18718-SKETCH.dwg
DATE : AUGUST 4, 2025	P. SPACE TAB : SKETCH PROP.eze750s(PG6OF7)

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PROPOSED ROW HOUSING DEVELOPMENT MUNICIPAL # 6022, 6034 & 6040 MR 80

ITEM:	PROVIDED	CALCULATIONS
LOT AREA MUNICIPAL # 6022	5145 Sq.m.	
LOT AREA MUNICIPAL # 6034	5156 Sq.m.	
LOT AREA MUNICIPAL # 6040	6284 Sq.m.	
GROSS FLOOR AREA OF EXISTING 4 PLEX BUILDING + PROPOSED 6 PLEX BUILDING MUNICIPAL # 6022	1315 Sq.m.	
GROSS FLOOR AREA OF EXISTING 4 PLEX BUILDING + PROPOSED 6 PLEX BUILDING MUNICIPAL # 6034	1315 Sq.m.	516 (EXISTING TOWNHOUSES) + 799 (PROPOSED TOWNHOUSES) = 1315 sq.m. PER LOT
GROSS FLOOR AREA OF EXISTING 4 PLEX BUILDING + PROPOSED 6 PLEX BUILDING MUNICIPAL # 6040	1315 Sq.m.	
PROPOSED ROW DWELLING HEIGHTS (1 STOREY)	6m ±	MAXIMUM HEIGHT IN ROW DWELLING = 11.0m
BICYCLE PARKING REQUIREMENTS FOR ROW HOUSING (NOT REQUIRED):	BICYCLE PARKING CAN BE CONTAINED WITHIN GARAGE OF EACH UNIT	
PARKING SPACES REQUIRED FOR EACH OF THE MUNICIPAL # 6022, 6034 & 6040 LOTS	PROVIDED = 15 (10+5=15)	REQUIRED: ROW DWELLING REQUIRES 1.5/UNIT REQUIRED = 10x1.5 = 15 SPACES REQUIRED VISITOR SPACES = 15−10= 5 SPACES (THERE ARE 10 UNITS WITH GARAGES= 10 SPACES)
BARRIER FREE PARKING SPACES REQUIRED (FOR ROW HOUSING PER LOT)	PROVIDED = 0	TOTAL # VISITOR PARKING SPACES PROVIDED = 6 (SINCE < 10 SPACES 0 BARRIER FREE SPACES ARE REQUIRED)
MUN. # 6022 LOT COVERAGE (%) (MAXIMUM COVERAGE = 40%)	25.6%	(799+516)/ 5145 = 25.6%
MUN. # 6034 LOT COVERAGE (%) (MAXIMUM COVERAGE = 40%)	25.5%	(799+516)/ 5156 = 25.5%
MUN. # 6040 LOT COVERAGE (%) (MAXIMUM COVERAGE = 40%)	20.9%	(799+516)/ 6284 = 20.9%
ZONE: EXISTING: R3	PROPOSED R3 (NO CHANGE)	
GARBAGE/RECYCLING LOCATION PROPOSED 2 MOLOKS WILL BE SERVICING ALL 3 LOTS (MUN.# 6022, 6034 & 6040)	A PROPOSED PART ON A PLAN OF SURVEY WILL DESCRIBE THE AREA OF THE MOLOKS & A AGREEMENT ON TITLE WILL BE MADE REGARDING THE SHARED AGREEMENT OF THESE REFUSE/RECYCLING CONTAINERS BETWEEN THE 3 LOTS	
MINIMUM FRONT YARD = 15.0m	PROVIDED MORE THAN MINIMUM OF 15.0m	
MINIMUM REAR YARD = 7.5m	PROVIDED MORE THAN MINIMUM OF 7.5m	
MINIMUM INTERIOR SIDE YARD(ROW DWELLING) = 1.2m (FOR 1 STOREY) 1.8m (2 STOREY)	PROVIDED MORE THAN MINIMUM REQUIREMENTS	
7.5m PRIVACY YARD DEPTH IS REQUIRED ABUTTING THE FULL LENGTH OF AT LEAST ONE EXTERIOR WALL OF EACH ROW DWELLING UNIT	PROVIDED MINIMUMS	
ROW & MULTIPLE DWELLINGS: COURT YARD BUILDING SEPARATION FOR DWELLINGS, WHERE BOTH WALLS CONTAIN BALCONIES OR HABITABLE ROOM WINDOWS = 15.0m. 7.5m WHERE ONLY ONE WALL CONTAINS BALCONIES OR HABITABLE ROOM WINDOWS. 3.0m WHERE NEITHER WALLS CONTAINS BALCONIES OR HABITABLE ROOM WINDOWS	PROVIDED MINIMUMS (THERE IS ONE WINDOW ON NORTH SIDES OF ALL EXISTING 4 UNIT DWELLING BUILDINGS & THERE WILL BE NO PROPOSED WINDOWS ON THE S. WALL OF THE PROPOSED 6 UNIT DWELLING BUILDINGS)	
MINIMUM 3.0m PLANTING STRIP IS REQUIRED WHERE R3 ZONE ABUTS R1 ZONE. THIS WIDTH CAN BE REDUCED TO 1.8m IF PLANTING STRIP CONTAINS OPAQUE FENCE HAVING HEIGHT OF 1.5m OR MORE	PROVIDED MINIMUM OF PLANTING STRIP AS REQUIRED	
OUTDOOR PARKING AREAS SHALL BE PERMITTED IN ANY PART OF ANY YARD, EXCEPT THAT NO PART OF ANY PARKING AREA SHALL BE LOCATED IN THE REQUIRED FRONT YARD FOR ANY RESIDENTIAL ZONE	NO PARKING IS SHOWN IN THE REQUIRED FRONT YARD	
GRAVEL AREA (%) MUNICIPAL # 6022	13.7%	703/ 5145 = 13.7%
GRAVEL AREA (%) MUNICIPAL # 6034	24.6%	1270/ 5156 = 24.6%
GRAVEL AREA (%) MUNICIPAL # 6040	18.5%	1162/ 6284 = 18.5%
LANDSCAPED AREA (%) MUNICIPAL # 6022	60.7%	3123/ 5145 = 60.7% (MINIMUM 30%)
LANDSCAPED AREA (%) MUNICIPAL # 6034	49.9%	2573/ 5156 = 49.9% (MINIMUM 30%)
LANDSCAPED AREA (%) MUNICIPAL # 6040	60.6%	3808/ 6284 = 60.6% (MINIMUM 30%)

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298 LARCH STREET
SUDBURY, ONTARIO, P3B 1M1
PHONE (705) 673−2556 FAX (705) 673−1051
WWW.DSDORLANDLIMITED.CA

PREPARED BY : A. ALATYPPO	SCALE : 1:200 METRIC
FIELD WORK DATE: MAY 3, 2024	CAD FILE : 18712−18718−SKETCH.dwg
DATE : AUGUST 4, 2025	P. SPACE TAB : STATS TABLE 200s (PG. 7 OF 7)

PL-CON-2025-00039 Sketch 15

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PL-CON-2025-00039

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Lion's Playground
Municipal Rd 80

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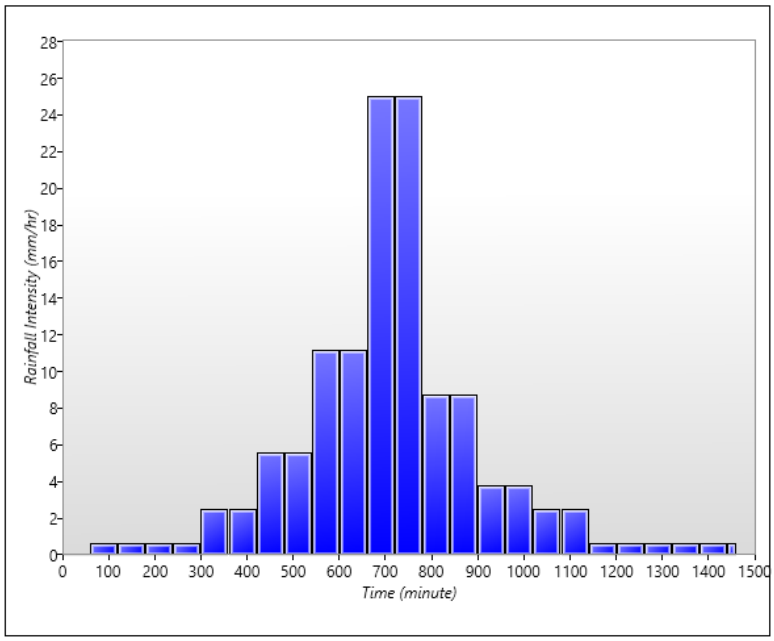
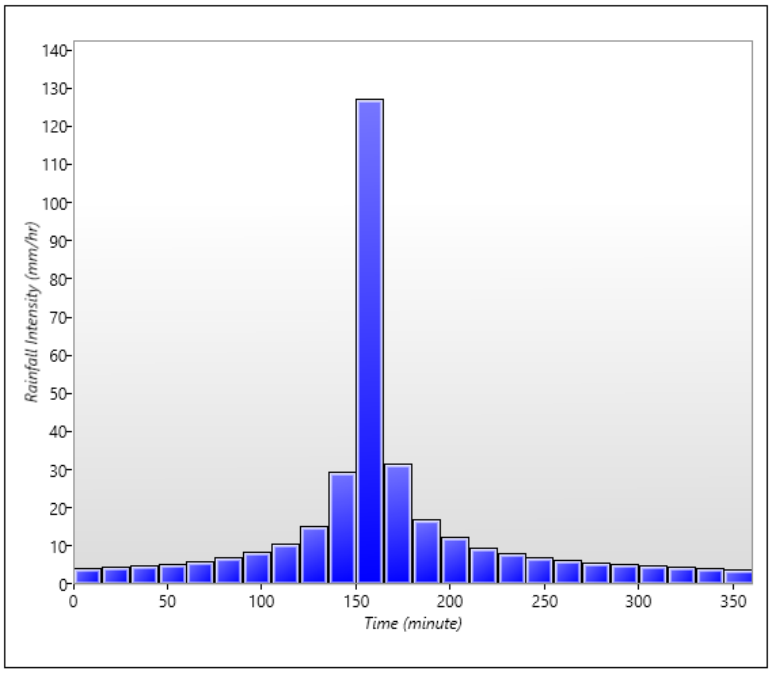

Rainfall Intensity (mm/hr)
28
26
24
22
20
18
16
14
12
10
8
6
4
2
0
0
100
200
300
400
500
600
700
800
900
1000
1100
1200
1300
1400
1500
Time (minute)


Rainfall Intensity (mm/hr)
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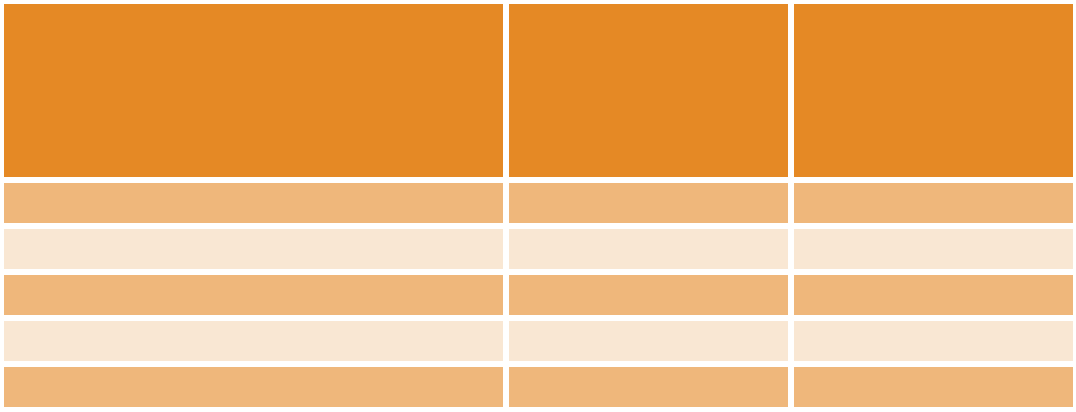
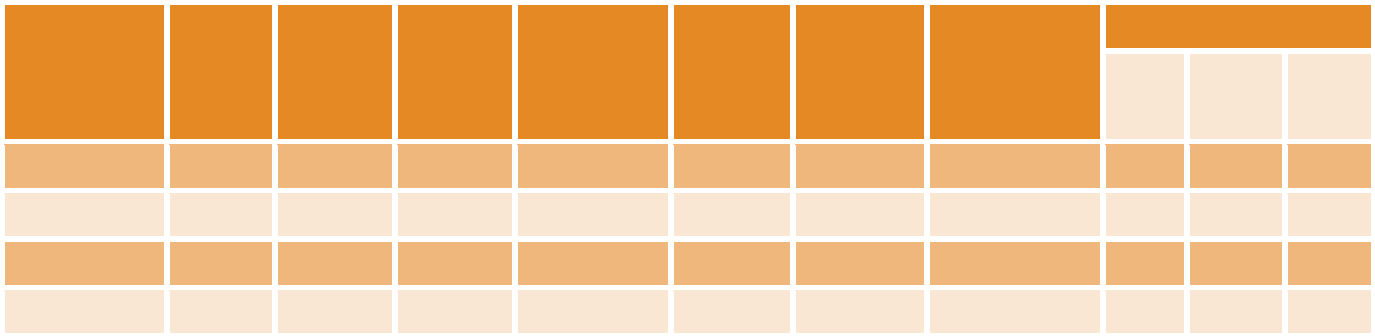
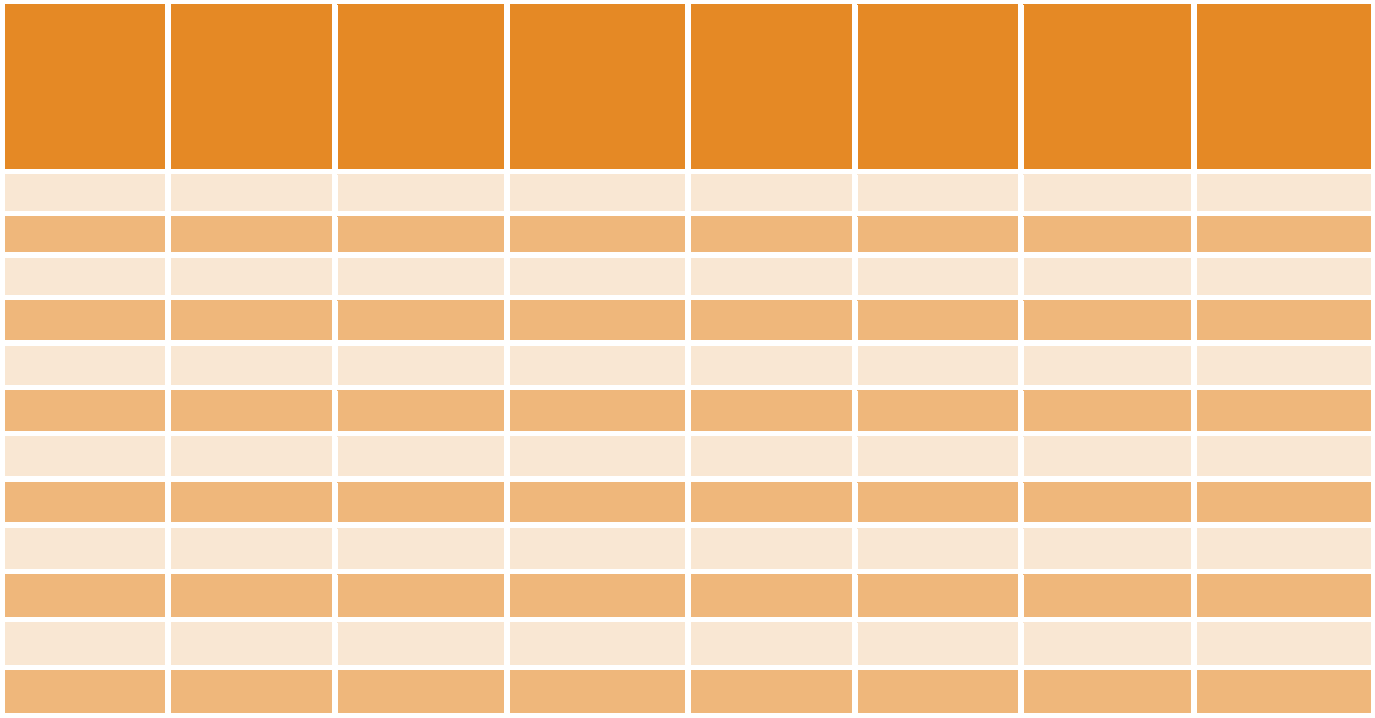
130
120
110
100
90
80
70
60
50
40
30
20
10
0
0
50
100
150
200
250
300
350
Time (minute)







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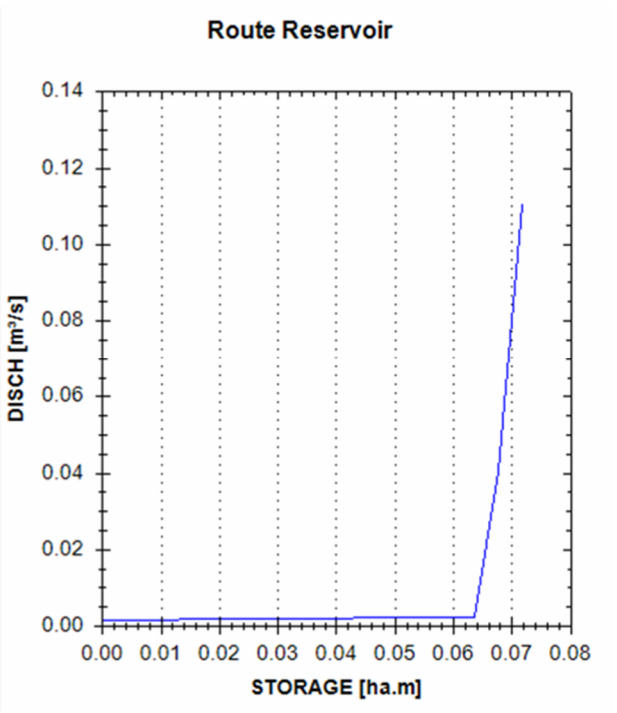
1	0.001	0.000
2	0.001	0.005
3	0.002	0.010
4	0.002	0.016
5	0.002	0.019
6	0.002	0.022
7	0.002	0.025
8	0.002	0.028
9	0.002	0.031
10	0.002	0.034
11	0.002	0.038
12	0.002	0.041
13	0.002	0.045
14	0.002	0.048
15	0.002	0.052
16	0.002	0.056
17	0.002	0.060
18	0.002	0.064
19	0.040	0.068
20	0.110	0.072



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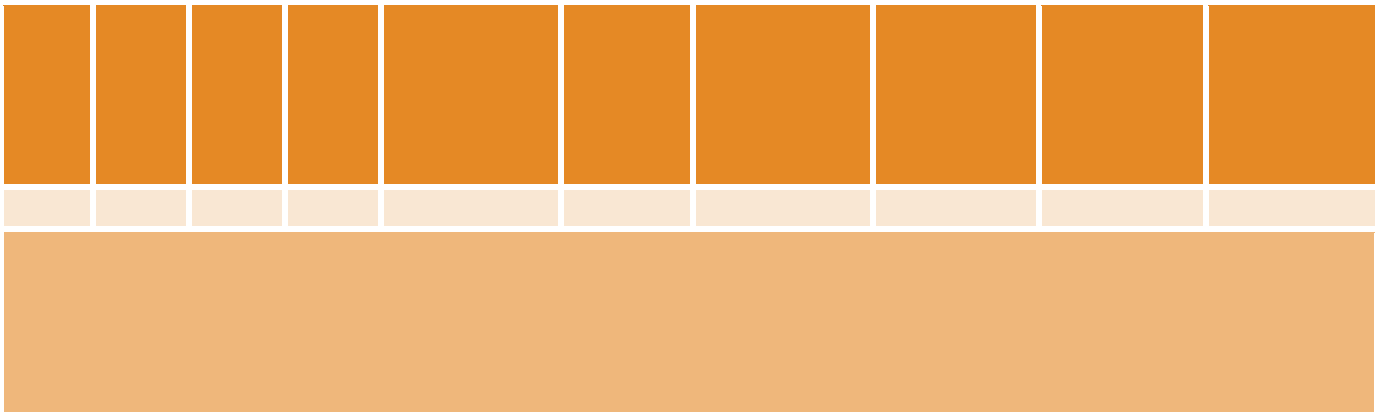
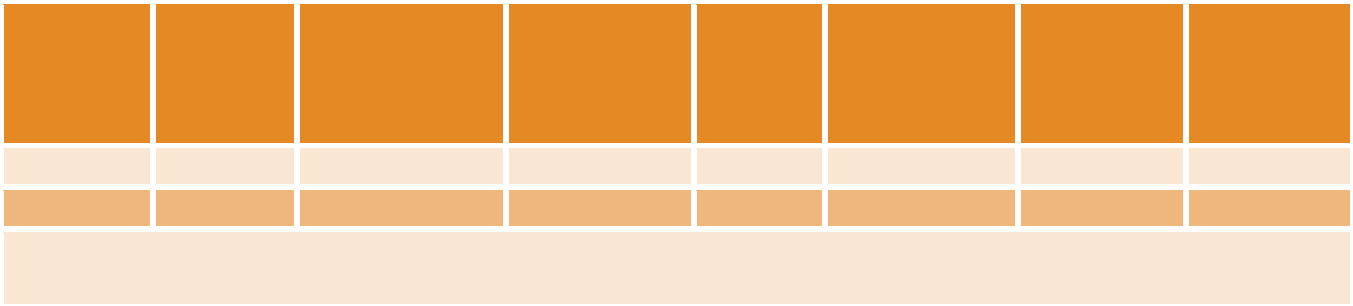
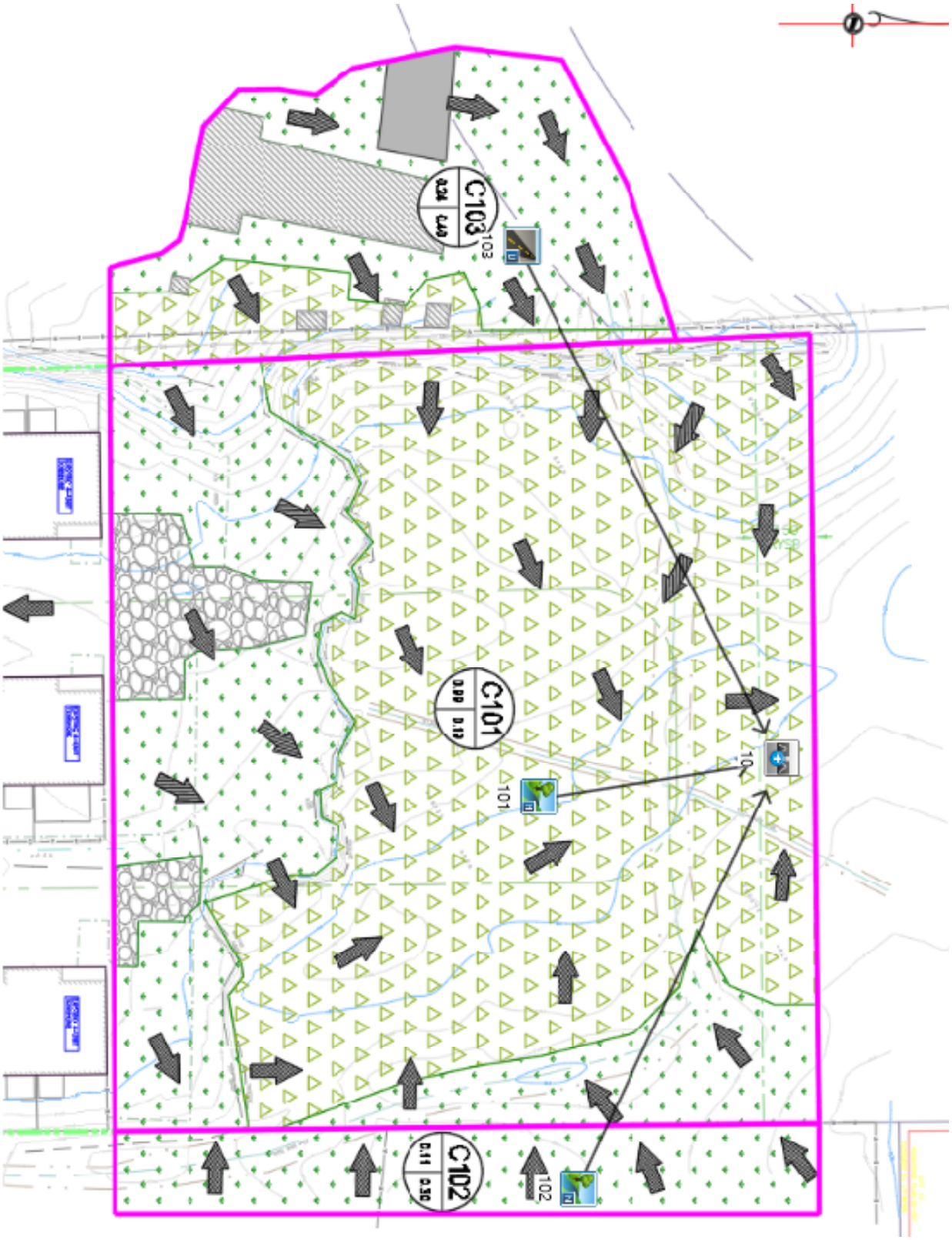
LICENSED PROFESSIONAL ENGINEER
J. S. STILLMAN
100550202
2025-07-08
PROVINCE OF ONTARIO

Peter Fiala



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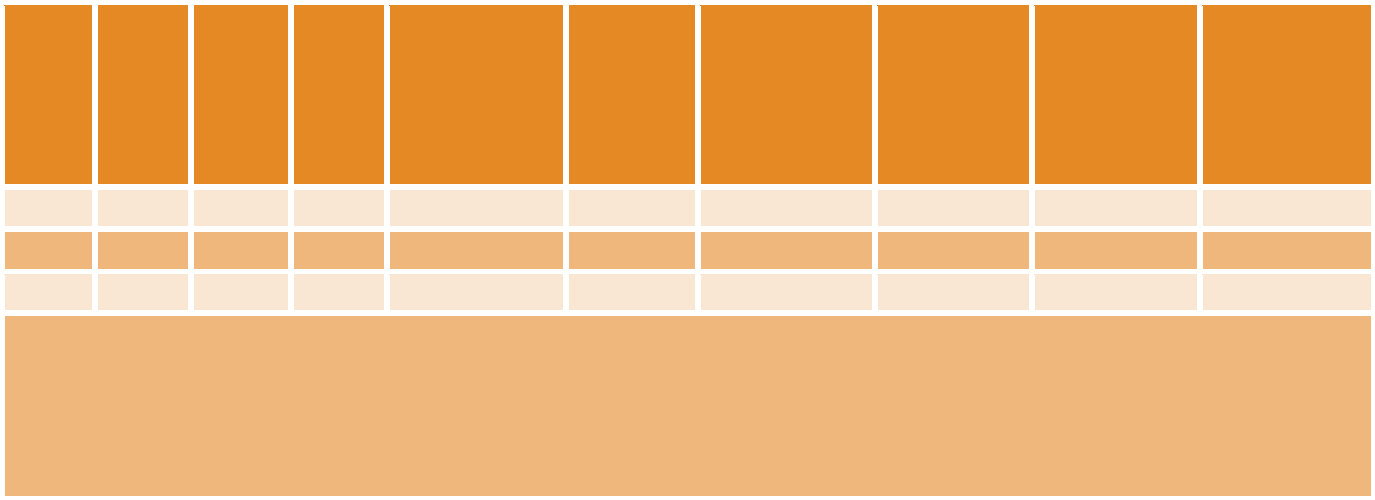

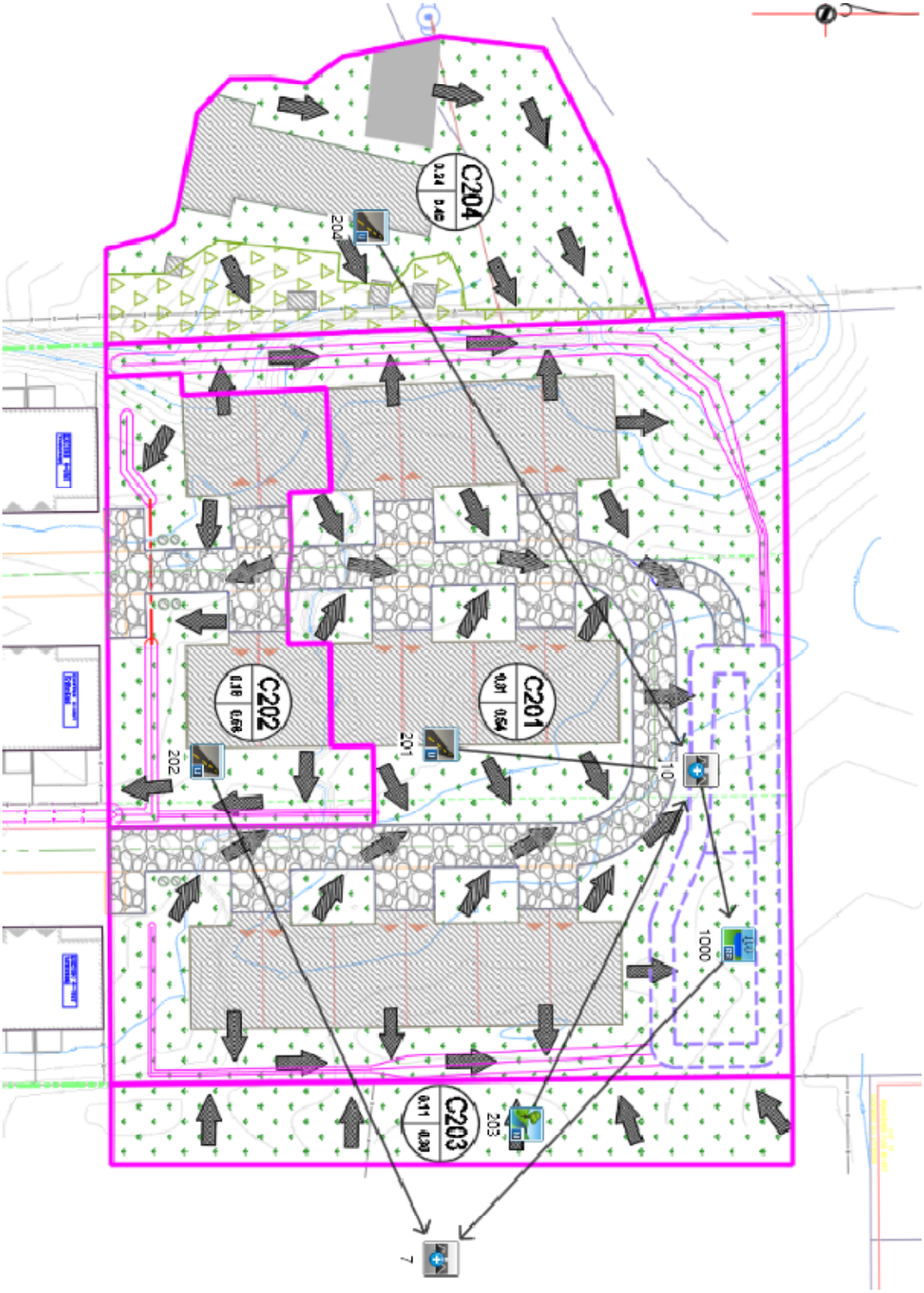
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C201
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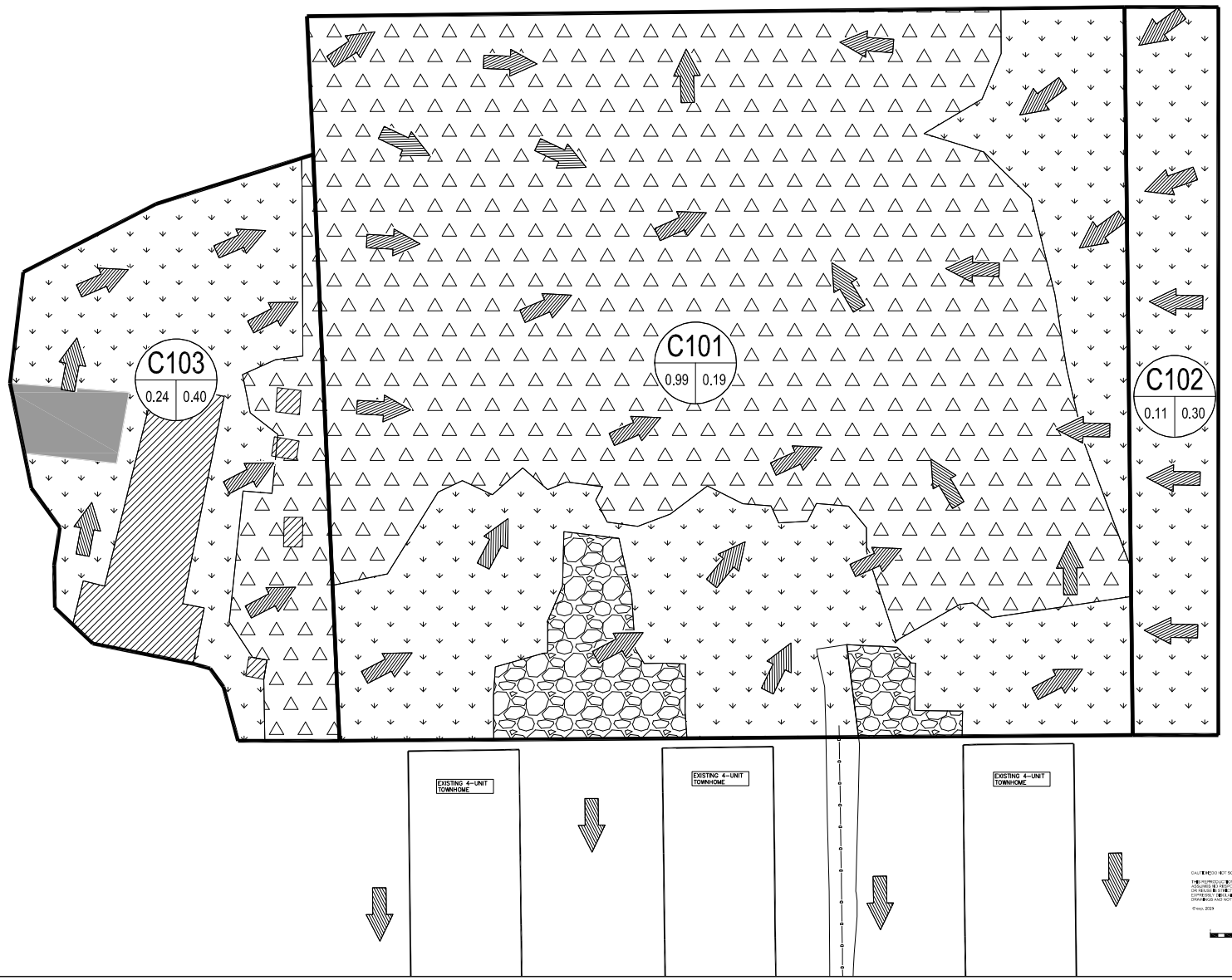
1000
7

Appendix B

Pre-Development Catchment Areas (SWM1)



exp Services Inc.
Environment One Future Sudbury
609 Regent Street, Suite 7A5A
Sudbury, Ontario, Canada
P3E 5S9
Tel: 705 674 9681
Fax: 705 674 3393
www.exp.com

LEGEND

- LAWNS
- WOODS
- GRANULAR
- BUILDINGS
- ASPHALT
- OVERLAND FLOW ROUTE
- X-1 (0.50 / 0.32): CATCHMENT AREA AREA (ha); RUNOFF COEFFICIENT

No.	Revision	By	Date
1	ISSUED FOR SWM	PT	2025-06-06

ISSUED FOR SWM

Professional Seal(s)

Drawn By: PT	Scale: 1:250
Checked By: AL	Dated: 2025-06-06
Approved By:	Dated:
Date Plotted: 2025-06-10	

File Name: I:\24006124-6022 HANMER-SITE\PLANS\1-20-06-2025.DWG

Project Title:
1916555 ONTARIO DEVELOPMENT
MR80 HANMER TOWNHOUSE DEVELOPMENT
6034, 6040 MUNICIPAL ROAD 80, HANMER, ONTARIO

Dwg. Title:
STORM WATER MANAGEMENT DRAWING

Project No.: SUD-00024006124-A0

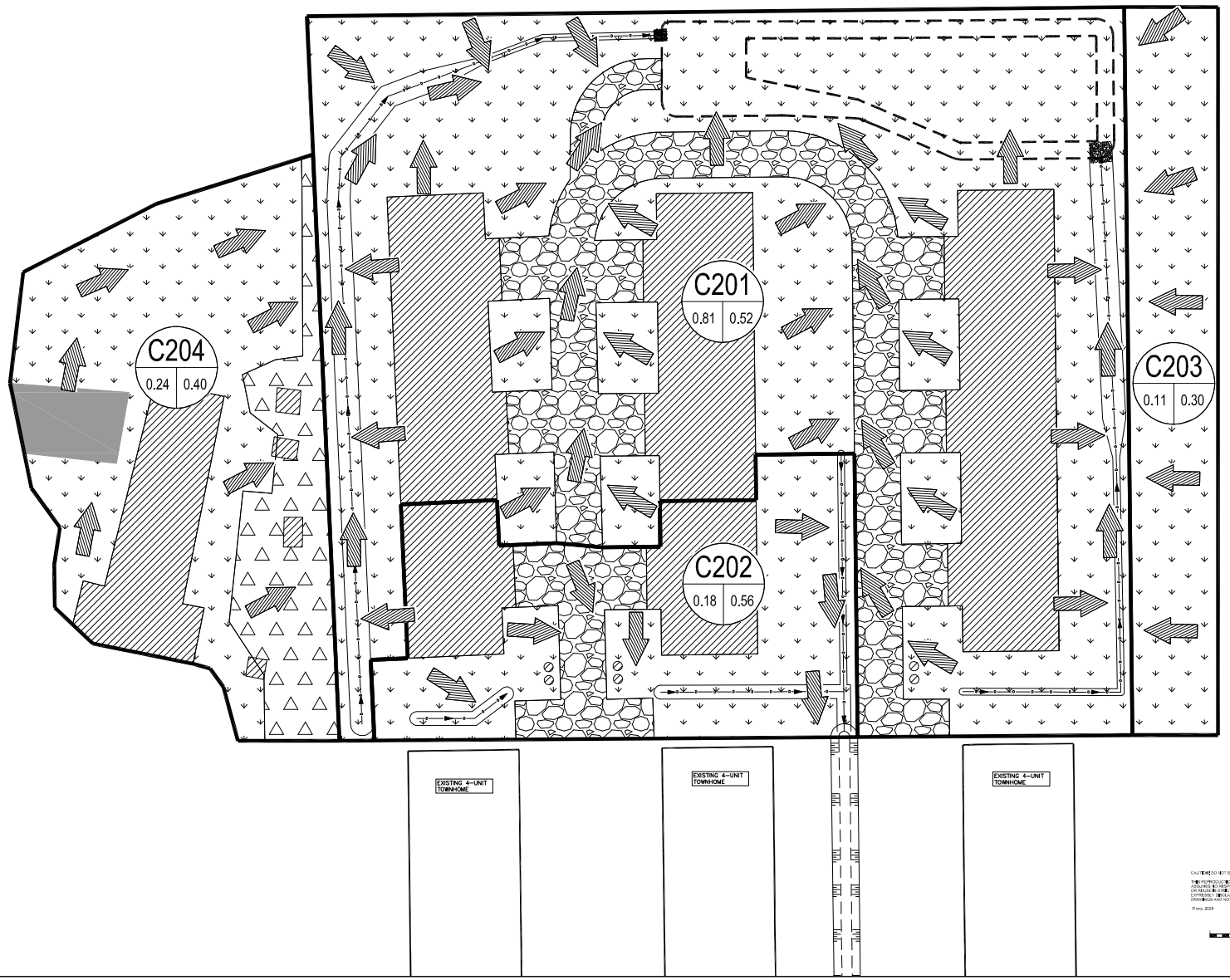
Dwg. No.: SWM1

Rev. No.: 0

PL-CON-2025-00039

Appendix C

Post-Development Catchment Areas (SWM2)



PL-CON-2025-00039

exp Services Inc.
Environment, Energy & Advisory
609 Regent Street, Suite 340
Sudbury, Ontario, Canada
P3E 5S9
Tel 705 674 9681
Fax 705 674 3301
www.exp.com

LEGEND

- LAWNS
- WOODS
- GRANULAR
- BUILDINGS
- ASPHALT
- OVERLAND FLOW ROUTE
- X-1 (0.50 / 0.32): CATCHMENT AREA (ha) / RUNOFF COEFFICIENT

No.	Revision	By	Date
1	ISSUED FOR SWM	PT	2025-06-06

ISSUED FOR SWM

Professional Seal(s)

Drawn By: PT	Scale: 1:250
Checked By: AL	Dated: 2025-06-06
Approved By:	Dated:
Date Printed: 2025-06-10	

File Name: 124006124-6022 HANMER-SITEPLAN-ENG-06-06-2025.DWG

Project Title:
1916555 ONTARIO DEVELOPMENT
MR80 HANMER TOWNHOUSE DEVELOPMENT
6034, 6040 MUNICIPAL ROAD 80, HANMER, ONTARIO

Dwg. Title:
STORM WATER MANAGEMENT DRAWING

Project No.: SUD-00024006124-A0

Dwg. No.: SWM2 | Rev. No.: 0

Appendix D

Pre-Development Visual OTTHYMO Model Output Sheets

```
*******************************************
** SIMULATION:01 - 2yr 6hr 15min Chicago **
*******************************************

--------------------
| ADD HYD  (  0010)|
|   1 +  2 =  3    |          AREA    QPEAK    TPEAK     R.V.
--------------------          (ha)    (cms)    (hrs)     (mm)
        ID1= 1 (  0101):     0.99   0.006     3.00     3.29
      + ID2= 2 (  0102):     0.11   0.002     2.75     4.40
        ================================================
        ID = 3 (  0010):     1.10   0.007     3.00     3.40

     NOTE:  PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.
--------------------------------------------------------------------------------

--------------------
| ADD HYD  (  0010)|
|   3 +  2 =  1    |          AREA    QPEAK    TPEAK     R.V.
--------------------          (ha)    (cms)    (hrs)     (mm)
        ID1= 3 (  0010):     1.10   0.007     3.00     3.40
      + ID2= 2 (  0103):     0.24   0.005     2.75     9.61
        ================================================
        ID = 1 (  0010):     1.34   0.011     3.00     4.50

     NOTE:  PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.
--------------------------------------------------------------------------------
*******************************************
** SIMULATION:02 - 5yr 6hr 15min Chicago **
*******************************************

--------------------
| ADD HYD  (  0010)|
|   1 +  2 =  3    |          AREA    QPEAK    TPEAK     R.V.
--------------------          (ha)    (cms)    (hrs)     (mm)
        ID1= 1 (  0101):     0.99   0.015     3.00     7.17
      + ID2= 2 (  0102):     0.11   0.004     2.75     8.87
        ================================================
        ID = 3 (  0010):     1.10   0.017     3.00     7.34

     NOTE:  PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.
--------------------------------------------------------------------------------

--------------------
| ADD HYD  (  0010)|
|   3 +  2 =  1    |          AREA    QPEAK    TPEAK     R.V.
--------------------          (ha)    (cms)    (hrs)     (mm)
        ID1= 3 (  0010):     1.10   0.017     3.00     7.34
      + ID2= 2 (  0103):     0.24   0.011     2.75    16.70
        ================================================
        ID = 1 (  0010):     1.34   0.026     2.92     9.00

     NOTE:  PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.
--------------------------------------------------------------------------------
*******************************************
** SIMULATION:03 - 10yr 6hr 15min Chicago **
*******************************************

--------------------
| ADD HYD  (  0010)|
|   1 +  2 =  3    |          AREA    QPEAK    TPEAK     R.V.
--------------------          (ha)    (cms)    (hrs)     (mm)
        ID1= 1 (  0101):     0.99   0.022     3.00     9.80
      + ID2= 2 (  0102):     0.11   0.005     2.75    11.81
        ================================================
        ID = 3 (  0010):     1.10   0.024     2.92    10.00

     NOTE:  PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.
--------------------------------------------------------------------------------

--------------------
| ADD HYD  (  0010)|
|   3 +  2 =  1    |          AREA    QPEAK    TPEAK     R.V.
--------------------          (ha)    (cms)    (hrs)     (mm)
        ID1= 3 (  0010):     1.10   0.024     2.92    10.00
      + ID2= 2 (  0103):     0.24   0.014     2.75    21.08
        ================================================
        ID = 1 (  0010):     1.34   0.036     2.92    11.97

     NOTE:  PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.
--------------------------------------------------------------------------------
*******************************************
** SIMULATION:04 - 25yr 6hr 15min Chicago **
*******************************************
```

```
--------------------
| ADD HYD  (  0010)|
|   1 +  2 =  3    |          AREA    QPEAK    TPEAK     R.V.
--------------------          (ha)    (cms)    (hrs)     (mm)
        ID1= 1 (  0101):     0.99   0.030     3.00    13.43
      + ID2= 2 (  0102):     0.11   0.007     2.75    15.83
        ================================================
        ID = 3 (  0010):     1.10   0.034     2.92    13.67

     NOTE:  PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.
--------------------------------------------------------------------------------


--------------------
| ADD HYD  (  0010)|
|   3 +  2 =  1    |          AREA    QPEAK    TPEAK     R.V.
--------------------          (ha)    (cms)    (hrs)     (mm)
        ID1= 3 (  0010):     1.10   0.034     2.92    13.67
      + ID2= 2 (  0103):     0.24   0.022     2.75    26.84
        ================================================
        ID = 1 (  0010):     1.34   0.049     2.83    16.01

     NOTE:  PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.
--------------------------------------------------------------------------------
****************************************
** SIMULATION:05 - 50yr 6hr 15min Chicago **
****************************************


--------------------
| ADD HYD  (  0010)|
|   1 +  2 =  3    |          AREA    QPEAK    TPEAK     R.V.
--------------------          (ha)    (cms)    (hrs)     (mm)
        ID1= 1 (  0101):     0.99   0.042     3.00    18.69
      + ID2= 2 (  0102):     0.11   0.009     2.75    21.55
        ================================================
        ID = 3 (  0010):     1.10   0.047     2.92    18.97

     NOTE:  PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.
--------------------------------------------------------------------------------


--------------------
| ADD HYD  (  0010)|
|   3 +  2 =  1    |          AREA    QPEAK    TPEAK     R.V.
--------------------          (ha)    (cms)    (hrs)     (mm)
        ID1= 3 (  0010):     1.10   0.047     2.92    18.97
      + ID2= 2 (  0103):     0.24   0.029     2.75    34.74
        ================================================
        ID = 1 (  0010):     1.34   0.069     2.83    21.77

     NOTE:  PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.
--------------------------------------------------------------------------------
****************************************
** SIMULATION:06 - 100yr 6hr 15min Chicago **
****************************************


--------------------
| ADD HYD  (  0010)|
|   1 +  2 =  3    |          AREA    QPEAK    TPEAK     R.V.
--------------------          (ha)    (cms)    (hrs)     (mm)
        ID1= 1 (  0101):     0.99   0.053     3.00    23.38
      + ID2= 2 (  0102):     0.11   0.011     2.75    26.61
        ================================================
        ID = 3 (  0010):     1.10   0.060     2.92    23.70

     NOTE:  PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.
--------------------------------------------------------------------------------


--------------------
| ADD HYD  (  0010)|
|   3 +  2 =  1    |          AREA    QPEAK    TPEAK     R.V.
--------------------          (ha)    (cms)    (hrs)     (mm)
        ID1= 3 (  0010):     1.10   0.060     2.92    23.70
      + ID2= 2 (  0103):     0.24   0.036     2.75    41.51
        ================================================
        ID = 1 (  0010):     1.34   0.086     2.83    26.86

     NOTE:  PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.
--------------------------------------------------------------------------------
************************************************
** SIMULATION:07 - 2Yr 24Hr 60Minute AES Type II **
************************************************


--------------------
| ADD HYD  (  0010)|
```

```
|   1 +  2 =  3    |          AREA    QPEAK    TPEAK     R.V.
------------------           (ha)    (cms)    (hrs)     (mm)
        ID1= 1 (  0101):     0.99   0.006    13.00     7.83
      + ID2= 2 (  0102):     0.11   0.001    13.00     9.61
        ================================================
        ID = 3 (  0010):     1.10   0.007    13.00     8.01

     NOTE:  PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.
--------------------------------------------------------------------------------

--------------------
| ADD HYD  (  0010)|
|   3 +  2 =  1    |          AREA    QPEAK    TPEAK     R.V.
------------------           (ha)    (cms)    (hrs)     (mm)
        ID1= 3 (  0010):     1.10   0.007    13.00     8.01
      + ID2= 2 (  0103):     0.24   0.003    13.00    17.15
        ================================================
        ID = 1 (  0010):     1.34   0.010    13.00     9.63

     NOTE:  PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.
--------------------------------------------------------------------------------
************************************************
** SIMULATION:08 - 5Yr 24Hr 60Minute AES Type II **
************************************************

--------------------
| ADD HYD  (  0010)|
|   1 +  2 =  3    |          AREA    QPEAK    TPEAK     R.V.
------------------           (ha)    (cms)    (hrs)     (mm)
        ID1= 1 (  0101):     0.99   0.012    13.00    15.70
      + ID2= 2 (  0102):     0.11   0.002    13.00    18.30
        ================================================
        ID = 3 (  0010):     1.10   0.014    13.00    15.96

     NOTE:  PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.
--------------------------------------------------------------------------------

--------------------
| ADD HYD  (  0010)|
|   3 +  2 =  1    |          AREA    QPEAK    TPEAK     R.V.
------------------           (ha)    (cms)    (hrs)     (mm)
        ID1= 3 (  0010):     1.10   0.014    13.00    15.96
      + ID2= 2 (  0103):     0.24   0.005    13.00    30.26
        ================================================
        ID = 1 (  0010):     1.34   0.019    13.00    18.49

     NOTE:  PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.
--------------------------------------------------------------------------------
************************************************
** SIMULATION:09 - 10Yr 24Hr 60Minute AES Type II **
************************************************

--------------------
| ADD HYD  (  0010)|
|   1 +  2 =  3    |          AREA    QPEAK    TPEAK     R.V.
------------------           (ha)    (cms)    (hrs)     (mm)
        ID1= 1 (  0101):     0.99   0.016    13.00    20.43
      + ID2= 2 (  0102):     0.11   0.002    13.00    23.44
        ================================================
        ID = 3 (  0010):     1.10   0.018    13.00    20.74

     NOTE:  PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.
--------------------------------------------------------------------------------

--------------------
| ADD HYD  (  0010)|
|   3 +  2 =  1    |          AREA    QPEAK    TPEAK     R.V.
------------------           (ha)    (cms)    (hrs)     (mm)
        ID1= 3 (  0010):     1.10   0.018    13.00    20.74
      + ID2= 2 (  0103):     0.24   0.006    13.00    37.27
        ================================================
        ID = 1 (  0010):     1.34   0.024    13.00    23.67

     NOTE:  PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.
--------------------------------------------------------------------------------
************************************************
** SIMULATION:10 - 25Yr 24Hr 60Minute AES Type II **
************************************************

--------------------
| ADD HYD  (  0010)|
|   1 +  2 =  3    |          AREA    QPEAK    TPEAK     R.V.
------------------           (ha)    (cms)    (hrs)     (mm)
        ID1= 1 (  0101):     0.99   0.021    13.00    27.21
```

```
      + ID2= 2 (  0102):     0.11   0.003    13.00    30.71
        ==================================================
        ID = 3 (  0010):     1.10   0.023    13.00    27.56

     NOTE:  PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.
--------------------------------------------------------------------------------

--------------------
| ADD HYD  (  0010)|
|   3 +  2 =  1    |          AREA    QPEAK    TPEAK     R.V.
--------------------          (ha)    (cms)    (hrs)     (mm)
        ID1= 3 (  0010):     1.10   0.023    13.00    27.56
      + ID2= 2 (  0103):     0.24   0.008    13.00    46.85
        ==================================================
        ID = 1 (  0010):     1.34   0.031    13.00    30.98

     NOTE:  PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.
--------------------------------------------------------------------------------
**************************************************
** SIMULATION:11 - 50Yr 24Hr 60Minute AES Type II **
**************************************************

--------------------
| ADD HYD  (  0010)|
|   1 +  2 =  3    |          AREA    QPEAK    TPEAK     R.V.
--------------------          (ha)    (cms)    (hrs)     (mm)
        ID1= 1 (  0101):     0.99   0.028    13.00    36.99
      + ID2= 2 (  0102):     0.11   0.004    13.00    41.09
        ==================================================
        ID = 3 (  0010):     1.10   0.031    13.00    37.40

     NOTE:  PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.
--------------------------------------------------------------------------------

--------------------
| ADD HYD  (  0010)|
|   3 +  2 =  1    |          AREA    QPEAK    TPEAK     R.V.
--------------------          (ha)    (cms)    (hrs)     (mm)
        ID1= 3 (  0010):     1.10   0.031    13.00    37.40
      + ID2= 2 (  0103):     0.24   0.010    13.00    60.12
        ==================================================
        ID = 1 (  0010):     1.34   0.041    13.00    41.43

     NOTE:  PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.
--------------------------------------------------------------------------------
**************************************************
** SIMULATION:12 - 100Yr 24Hr 60Minute AES Type II **
**************************************************

--------------------
| ADD HYD  (  0010)|
|   1 +  2 =  3    |          AREA    QPEAK    TPEAK     R.V.
--------------------          (ha)    (cms)    (hrs)     (mm)
        ID1= 1 (  0101):     0.99   0.034    13.00    45.49
      + ID2= 2 (  0102):     0.11   0.004    13.00    50.05
        ==================================================
        ID = 3 (  0010):     1.10   0.038    13.00    45.95

     NOTE:  PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.
--------------------------------------------------------------------------------

--------------------
| ADD HYD  (  0010)|
|   3 +  2 =  1    |          AREA    QPEAK    TPEAK     R.V.
--------------------          (ha)    (cms)    (hrs)     (mm)
        ID1= 3 (  0010):     1.10   0.038    13.00    45.95
      + ID2= 2 (  0103):     0.24   0.012    13.00    71.24
        ==================================================
        ID = 1 (  0010):     1.34   0.050    13.00    50.44

     NOTE:  PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.
--------------------------------------------------------------------------------
```

Appendix E

Post-Development Visual OTTHYMO Model Output Sheets - Uncontrolled

```
*****************************************
** SIMULATION:01 - 2yr 6hr 15min Chicago **
*****************************************

--------------------
| ADD HYD  (  0005)|
|   1 +  2 =  3    |          AREA    QPEAK    TPEAK     R.V.
--------------------          (ha)    (cms)    (hrs)     (mm)
        ID1= 1 (  0201):     0.81   0.030     2.75    15.56
      + ID2= 2 (  0202):     0.19   0.010     2.75    17.51
        ====================================================
        ID = 3 (  0005):     0.99   0.040     2.75    15.92

     NOTE:  PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.
-------------------------------------------------------------------------------

--------------------
| ADD HYD  (  0005)|
|   3 +  2 =  1    |          AREA    QPEAK    TPEAK     R.V.
--------------------          (ha)    (cms)    (hrs)     (mm)
        ID1= 3 (  0005):     0.99   0.040     2.75    15.92
      + ID2= 2 (  0203):     0.11   0.002     2.75     4.40
        ====================================================
        ID = 1 (  0005):     1.10   0.041     2.75    14.76

     NOTE:  PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.
-------------------------------------------------------------------------------

--------------------
| ADD HYD  (  0005)|
|   1 +  2 =  3    |          AREA    QPEAK    TPEAK     R.V.
--------------------          (ha)    (cms)    (hrs)     (mm)
        ID1= 1 (  0005):     1.10   0.041     2.75    14.76
      + ID2= 2 (  0204):     0.24   0.005     2.75     9.61
        ====================================================
        ID = 3 (  0005):     1.34   0.047     2.75    13.85

     NOTE:  PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.
-------------------------------------------------------------------------------
*****************************************
** SIMULATION:02 - 5yr 6hr 15min Chicago **
*****************************************

--------------------
| ADD HYD  (  0005)|
|   1 +  2 =  3    |          AREA    QPEAK    TPEAK     R.V.
--------------------          (ha)    (cms)    (hrs)     (mm)
        ID1= 1 (  0201):     0.81   0.051     2.75    25.17
      + ID2= 2 (  0202):     0.19   0.019     2.75    27.93
        ====================================================
        ID = 3 (  0005):     0.99   0.069     2.75    25.68

     NOTE:  PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.
-------------------------------------------------------------------------------

--------------------
| ADD HYD  (  0005)|
|   3 +  2 =  1    |          AREA    QPEAK    TPEAK     R.V.
--------------------          (ha)    (cms)    (hrs)     (mm)
        ID1= 3 (  0005):     0.99   0.069     2.75    25.68
      + ID2= 2 (  0203):     0.11   0.004     2.75     8.87
        ====================================================
        ID = 1 (  0005):     1.10   0.073     2.75    23.99

     NOTE:  PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.
-------------------------------------------------------------------------------

--------------------
| ADD HYD  (  0005)|
|   1 +  2 =  3    |          AREA    QPEAK    TPEAK     R.V.
--------------------          (ha)    (cms)    (hrs)     (mm)
        ID1= 1 (  0005):     1.10   0.073     2.75    23.99
      + ID2= 2 (  0204):     0.24   0.011     2.75    16.70
        ====================================================
        ID = 3 (  0005):     1.34   0.083     2.75    22.70

     NOTE:  PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.
-------------------------------------------------------------------------------
*****************************************
** SIMULATION:03 - 10yr 6hr 15min Chicago **
*****************************************

--------------------
| ADD HYD  (  0005)|
```

```
|   1 +  2 =  3    |          AREA    QPEAK    TPEAK     R.V.
------------------           (ha)    (cms)    (hrs)     (mm)
        ID1= 1 (  0201):     0.81   0.072     2.75    30.86
      + ID2= 2 (  0202):     0.19   0.024     2.75    34.01
        ================================================
        ID = 3 (  0005):     0.99   0.095     2.75    31.45

     NOTE:  PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.
--------------------------------------------------------------------------------


--------------------
| ADD HYD  (  0005)|
|   3 +  2 =  1    |          AREA    QPEAK    TPEAK     R.V.
--------------------          (ha)    (cms)    (hrs)     (mm)
        ID1= 3 (  0005):     0.99   0.095     2.75    31.45
      + ID2= 2 (  0203):     0.11   0.005     2.75    11.81
        ================================================
        ID = 1 (  0005):     1.10   0.100     2.75    29.48

     NOTE:  PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.
--------------------------------------------------------------------------------


--------------------
| ADD HYD  (  0005)|
|   1 +  2 =  3    |          AREA    QPEAK    TPEAK     R.V.
--------------------          (ha)    (cms)    (hrs)     (mm)
        ID1= 1 (  0005):     1.10   0.100     2.75    29.48
      + ID2= 2 (  0204):     0.24   0.014     2.75    21.08
        ================================================
        ID = 3 (  0005):     1.34   0.115     2.75    27.99

     NOTE:  PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.
--------------------------------------------------------------------------------
*******************************************
** SIMULATION:04 - 25yr 6hr 15min Chicago **
*******************************************


--------------------
| ADD HYD  (  0005)|
|   1 +  2 =  3    |          AREA    QPEAK    TPEAK     R.V.
--------------------          (ha)    (cms)    (hrs)     (mm)
        ID1= 1 (  0201):     0.81   0.090     2.75    38.12
      + ID2= 2 (  0202):     0.19   0.030     2.75    41.71
        ================================================
        ID = 3 (  0005):     0.99   0.120     2.75    38.79

     NOTE:  PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.
--------------------------------------------------------------------------------


--------------------
| ADD HYD  (  0005)|
|   3 +  2 =  1    |          AREA    QPEAK    TPEAK     R.V.
--------------------          (ha)    (cms)    (hrs)     (mm)
        ID1= 3 (  0005):     0.99   0.120     2.75    38.79
      + ID2= 2 (  0203):     0.11   0.007     2.75    15.83
        ================================================
        ID = 1 (  0005):     1.10   0.127     2.75    36.48

     NOTE:  PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.
--------------------------------------------------------------------------------


--------------------
| ADD HYD  (  0005)|
|   1 +  2 =  3    |          AREA    QPEAK    TPEAK     R.V.
--------------------          (ha)    (cms)    (hrs)     (mm)
        ID1= 1 (  0005):     1.10   0.127     2.75    36.48
      + ID2= 2 (  0204):     0.24   0.022     2.75    26.84
        ================================================
        ID = 3 (  0005):     1.34   0.148     2.75    34.77

     NOTE:  PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.
--------------------------------------------------------------------------------
*******************************************
** SIMULATION:05 - 50yr 6hr 15min Chicago **
*******************************************


--------------------
| ADD HYD  (  0005)|
|   1 +  2 =  3    |          AREA    QPEAK    TPEAK     R.V.
--------------------          (ha)    (cms)    (hrs)     (mm)
        ID1= 1 (  0201):     0.81   0.116     2.75    47.80
      + ID2= 2 (  0202):     0.19   0.038     2.75    51.89
        ================================================
        ID = 3 (  0005):     0.99   0.153     2.75    48.56
```

```
     NOTE:  PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.
--------------------------------------------------------------------------------

--------------------
| ADD HYD  (  0005)|
|   3 +  2 =  1    |          AREA    QPEAK    TPEAK     R.V.
--------------------          (ha)    (cms)    (hrs)     (mm)
        ID1= 3 (  0005):     0.99   0.153     2.75    48.56
      + ID2= 2 (  0203):     0.11   0.009     2.75    21.55
        ================================================
        ID = 1 (  0005):     1.10   0.163     2.75    45.85

     NOTE:  PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.
--------------------------------------------------------------------------------

--------------------
| ADD HYD  (  0005)|
|   1 +  2 =  3    |          AREA    QPEAK    TPEAK     R.V.
--------------------          (ha)    (cms)    (hrs)     (mm)
        ID1= 1 (  0005):     1.10   0.163     2.75    45.85
      + ID2= 2 (  0204):     0.24   0.029     2.75    34.74
        ================================================
        ID = 3 (  0005):     1.34   0.192     2.75    43.88

     NOTE:  PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.
--------------------------------------------------------------------------------
********************************************
** SIMULATION:06 - 100yr 6hr 15min Chicago **
********************************************

--------------------
| ADD HYD  (  0005)|
|   1 +  2 =  3    |          AREA    QPEAK    TPEAK     R.V.
--------------------          (ha)    (cms)    (hrs)     (mm)
        ID1= 1 (  0201):     0.81   0.138     2.75    55.90
      + ID2= 2 (  0202):     0.19   0.044     2.75    60.35
        ================================================
        ID = 3 (  0005):     0.99   0.183     2.75    56.73

     NOTE:  PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.
--------------------------------------------------------------------------------

--------------------
| ADD HYD  (  0005)|
|   3 +  2 =  1    |          AREA    QPEAK    TPEAK     R.V.
--------------------          (ha)    (cms)    (hrs)     (mm)
        ID1= 3 (  0005):     0.99   0.183     2.75    56.73
      + ID2= 2 (  0203):     0.11   0.011     2.75    26.61
        ================================================
        ID = 1 (  0005):     1.10   0.194     2.75    53.71

     NOTE:  PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.
--------------------------------------------------------------------------------

--------------------
| ADD HYD  (  0005)|
|   1 +  2 =  3    |          AREA    QPEAK    TPEAK     R.V.
--------------------          (ha)    (cms)    (hrs)     (mm)
        ID1= 1 (  0005):     1.10   0.194     2.75    53.71
      + ID2= 2 (  0204):     0.24   0.036     2.75    41.51
        ================================================
        ID = 3 (  0005):     1.34   0.229     2.75    51.54

     NOTE:  PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.
--------------------------------------------------------------------------------
************************************************
** SIMULATION:07 - 2Yr 24Hr 60Minute AES Type II **
************************************************

--------------------
| ADD HYD  (  0005)|
|   1 +  2 =  3    |          AREA    QPEAK    TPEAK     R.V.
--------------------          (ha)    (cms)    (hrs)     (mm)
        ID1= 1 (  0201):     0.81   0.013    13.00    26.63
      + ID2= 2 (  0202):     0.19   0.004    13.00    28.63
        ================================================
        ID = 3 (  0005):     0.99   0.017    13.00    27.00

     NOTE:  PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.
--------------------------------------------------------------------------------

--------------------
| ADD HYD  (  0005)|
```

```
|   3 +  2 =  1    |          AREA    QPEAK    TPEAK     R.V.
------------------           (ha)    (cms)    (hrs)     (mm)
        ID1= 3 (  0005):     0.99   0.017    13.00    27.00
      + ID2= 2 (  0203):     0.11   0.001    13.00     9.61
        ================================================
        ID = 1 (  0005):     1.10   0.018    13.00    25.25

     NOTE:  PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.
--------------------------------------------------------------------------------

--------------------
| ADD HYD  (  0005)|
|   1 +  2 =  3    |          AREA    QPEAK    TPEAK     R.V.
------------------           (ha)    (cms)    (hrs)     (mm)
        ID1= 1 (  0005):     1.10   0.018    13.00    25.25
      + ID2= 2 (  0204):     0.24   0.003    13.00    17.15
        ================================================
        ID = 3 (  0005):     1.34   0.021    13.00    23.82

     NOTE:  PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.
--------------------------------------------------------------------------------
************************************************
** SIMULATION:08 - 5Yr 24Hr 60Minute AES Type II **
************************************************

--------------------
| ADD HYD  (  0005)|
|   1 +  2 =  3    |          AREA    QPEAK    TPEAK     R.V.
------------------           (ha)    (cms)    (hrs)     (mm)
        ID1= 1 (  0201):     0.81   0.022    13.00    42.38
      + ID2= 2 (  0202):     0.19   0.006    13.00    46.16
        ================================================
        ID = 3 (  0005):     0.99   0.028    13.00    43.08

     NOTE:  PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.
--------------------------------------------------------------------------------

--------------------
| ADD HYD  (  0005)|
|   3 +  2 =  1    |          AREA    QPEAK    TPEAK     R.V.
------------------           (ha)    (cms)    (hrs)     (mm)
        ID1= 3 (  0005):     0.99   0.028    13.00    43.08
      + ID2= 2 (  0203):     0.11   0.002    13.00    18.30
        ================================================
        ID = 1 (  0005):     1.10   0.029    13.00    40.59

     NOTE:  PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.
--------------------------------------------------------------------------------

--------------------
| ADD HYD  (  0005)|
|   1 +  2 =  3    |          AREA    QPEAK    TPEAK     R.V.
------------------           (ha)    (cms)    (hrs)     (mm)
        ID1= 1 (  0005):     1.10   0.029    13.00    40.59
      + ID2= 2 (  0204):     0.24   0.005    13.00    30.26
        ================================================
        ID = 3 (  0005):     1.34   0.034    13.00    38.76

     NOTE:  PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.
--------------------------------------------------------------------------------
************************************************
** SIMULATION:08 - 5Yr 24Hr 60Minute AES Type II **
************************************************

--------------------
| ADD HYD  (  0005)|
|   1 +  2 =  3    |          AREA    QPEAK    TPEAK     R.V.
------------------           (ha)    (cms)    (hrs)     (mm)
        ID1= 1 (  0201):     0.81   0.022    13.00    42.38
      + ID2= 2 (  0202):     0.19   0.006    13.00    46.16
        ================================================
        ID = 3 (  0005):     0.99   0.028    13.00    43.08

     NOTE:  PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.
--------------------------------------------------------------------------------

--------------------
| ADD HYD  (  0005)|
|   3 +  2 =  1    |          AREA    QPEAK    TPEAK     R.V.
------------------           (ha)    (cms)    (hrs)     (mm)
        ID1= 3 (  0005):     0.99   0.028    13.00    43.08
      + ID2= 2 (  0203):     0.11   0.002    13.00    18.30
        ================================================
        ID = 1 (  0005):     1.10   0.029    13.00    40.59
```

NOTE: PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.

ADD HYD (0005)		AREA	QPEAK	TPEAK	R.V.
1 + 2 = 3		(ha)	(cms)	(hrs)	(mm)
ID1= 1 (0005):		1.10	0.029	13.00	40.59
+ ID2= 2 (0204):		0.24	0.005	13.00	30.26
ID = 3 (0005):		1.34	0.034	13.00	38.76

NOTE: PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.

****
** SIMULATION:09 - 10Yr 24Hr 60Minute AES Type II **
****

ADD HYD (0005)		AREA	QPEAK	TPEAK	R.V.
1 + 2 = 3		(ha)	(cms)	(hrs)	(mm)
ID1= 1 (0201):		0.81	0.027	13.00	50.86
+ ID2= 2 (0202):		0.19	0.007	13.00	55.06
ID = 3 (0005):		0.99	0.033	13.00	51.64

NOTE: PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.

ADD HYD (0005)		AREA	QPEAK	TPEAK	R.V.
3 + 2 = 1		(ha)	(cms)	(hrs)	(mm)
ID1= 3 (0005):		0.99	0.033	13.00	51.64
+ ID2= 2 (0203):		0.11	0.002	13.00	23.44
ID = 1 (0005):		1.10	0.035	13.00	48.81

NOTE: PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.

ADD HYD (0005)		AREA	QPEAK	TPEAK	R.V.
1 + 2 = 3		(ha)	(cms)	(hrs)	(mm)
ID1= 1 (0005):		1.10	0.035	13.00	48.81
+ ID2= 2 (0204):		0.24	0.006	13.00	37.27
ID = 3 (0005):		1.34	0.042	13.00	46.76

NOTE: PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.

****
** SIMULATION:11 - 50Yr 24Hr 60Minute AES Type II **
****

ADD HYD (0005)		AREA	QPEAK	TPEAK	R.V.
1 + 2 = 3		(ha)	(cms)	(hrs)	(mm)
ID1= 1 (0201):		0.81	0.041	13.00	77.54
+ ID2= 2 (0202):		0.19	0.010	13.00	82.74
ID = 3 (0005):		0.99	0.051	13.00	78.51

NOTE: PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.

ADD HYD (0005)		AREA	QPEAK	TPEAK	R.V.
3 + 2 = 1		(ha)	(cms)	(hrs)	(mm)
ID1= 3 (0005):		0.99	0.051	13.00	78.51
+ ID2= 2 (0203):		0.11	0.004	13.00	41.09
ID = 1 (0005):		1.10	0.054	13.00	74.75

NOTE: PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.

ADD HYD (0005)

```
|   1 +  2 =  3    |          AREA    QPEAK    TPEAK     R.V.
------------------           (ha)    (cms)    (hrs)     (mm)
        ID1= 1 (  0005):     1.10   0.054    13.00    74.75
      + ID2= 2 (  0204):     0.24   0.010    13.00    60.12
        ==========================================================
        ID = 3 (  0005):     1.34   0.064    13.00    72.16

     NOTE:  PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.
-------------------------------------------------------------------------------
*****************************************************
** SIMULATION:12 - 100Yr 24Hr 60Minute AES Type II **
*****************************************************


--------------------
| ADD HYD  (  0005)|
|   1 +  2 =  3    |          AREA    QPEAK    TPEAK     R.V.
------------------           (ha)    (cms)    (hrs)     (mm)
        ID1= 1 (  0201):     0.81   0.047    13.00    90.14
      + ID2= 2 (  0202):     0.19   0.011    13.00    95.73
        ==========================================================
        ID = 3 (  0005):     0.99   0.059    13.00    91.18

     NOTE:  PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.
-------------------------------------------------------------------------------


--------------------
| ADD HYD  (  0005)|
|   3 +  2 =  1    |          AREA    QPEAK    TPEAK     R.V.
------------------           (ha)    (cms)    (hrs)     (mm)
        ID1= 3 (  0005):     0.99   0.059    13.00    91.18
      + ID2= 2 (  0203):     0.11   0.004    13.00    50.05
        ==========================================================
        ID = 1 (  0005):     1.10   0.063    13.00    87.05

     NOTE:  PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.
-------------------------------------------------------------------------------


--------------------
| ADD HYD  (  0005)|
|   1 +  2 =  3    |          AREA    QPEAK    TPEAK     R.V.
------------------           (ha)    (cms)    (hrs)     (mm)
        ID1= 1 (  0005):     1.10   0.063    13.00    87.05
      + ID2= 2 (  0204):     0.24   0.012    13.00    71.24
        ==========================================================
        ID = 3 (  0005):     1.34   0.075    13.00    84.25

     NOTE:  PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.
-------------------------------------------------------------------------------
```

Appendix F

Storage Requirements Calculations

```
*****************************************
** SIMULATION:01 - 2yr 6hr 15min Chicago **
*****************************************

--------------------
| RESERVOIR(  1000)|     OVERFLOW IS OFF
| IN= 2---> OUT= 1 |
| DT=  5.0 min     |     OUTFLOW    STORAGE   |  OUTFLOW    STORAGE
--------------------      (cms)     (ha.m.)   |   (cms)     (ha.m.)
     **** WARNING : FIRST OUTFLOW IS NOT ZERO.
                       0.0013     0.0000   |   0.0019      0.0376
                       0.0014     0.0050   |   0.0019      0.0411
                       0.0015     0.0103   |   0.0020      0.0446
                       0.0016     0.0158   |   0.0020      0.0482
                       0.0016     0.0187   |   0.0021      0.0519
                       0.0017     0.0217   |   0.0021      0.0557
                       0.0017     0.0247   |   0.0022      0.0596
                       0.0018     0.0278   |   0.0022      0.0636
                       0.0018     0.0310   |   0.0404      0.0677
                       0.0018     0.0343   |   0.1102      0.0718

                                 AREA     QPEAK     TPEAK       R.V.
                                 (ha)     (cms)     (hrs)       (mm)
   INFLOW : ID= 2 (  0010)      1.160      0.034      2.75      12.57
   OUTFLOW: ID= 1 (  1000)      1.160      0.002      6.33      12.58

                  PEAK   FLOW   REDUCTION [Qout/Qin](%)=  4.44
                  TIME SHIFT OF PEAK FLOW         (min)=215.00
                  MAXIMUM  STORAGE   USED       (ha.m.)=  0.0115

--------------------------------------------------------------------------------
*****************************************
** SIMULATION:02 - 5yr 6hr 15min Chicago **
*****************************************

--------------------
| RESERVOIR(  1000)|     OVERFLOW IS OFF
| IN= 2---> OUT= 1 |
| DT=  5.0 min     |     OUTFLOW    STORAGE   |  OUTFLOW    STORAGE
--------------------      (cms)     (ha.m.)   |   (cms)     (ha.m.)
     **** WARNING : FIRST OUTFLOW IS NOT ZERO.
                       0.0013     0.0000   |   0.0019      0.0376
                       0.0014     0.0050   |   0.0019      0.0411
                       0.0015     0.0103   |   0.0020      0.0446
                       0.0016     0.0158   |   0.0020      0.0482
                       0.0016     0.0187   |   0.0021      0.0519
                       0.0017     0.0217   |   0.0021      0.0557
                       0.0017     0.0247   |   0.0022      0.0596
                       0.0018     0.0278   |   0.0022      0.0636
                       0.0018     0.0310   |   0.0404      0.0677
                       0.0018     0.0343   |   0.1102      0.0718

                                 AREA     QPEAK     TPEAK       R.V.
                                 (ha)     (cms)     (hrs)       (mm)
   INFLOW : ID= 2 (  0010)      1.160      0.061      2.75      20.88
   OUTFLOW: ID= 1 (  1000)      1.160      0.002      6.33      20.88

                  PEAK   FLOW   REDUCTION [Qout/Qin](%)=  2.76
                  TIME SHIFT OF PEAK FLOW         (min)=215.00
                  MAXIMUM  STORAGE   USED       (ha.m.)=  0.0209

--------------------------------------------------------------------------------
*****************************************
** SIMULATION:03 - 10yr 6hr 15min Chicago **
*****************************************

--------------------
| RESERVOIR(  1000)|     OVERFLOW IS OFF
| IN= 2---> OUT= 1 |
| DT=  5.0 min     |     OUTFLOW    STORAGE   |  OUTFLOW    STORAGE
--------------------      (cms)     (ha.m.)   |   (cms)     (ha.m.)
     **** WARNING : FIRST OUTFLOW IS NOT ZERO.
                       0.0013     0.0000   |   0.0019      0.0376
                       0.0014     0.0050   |   0.0019      0.0411
                       0.0015     0.0103   |   0.0020      0.0446
                       0.0016     0.0158   |   0.0020      0.0482
                       0.0016     0.0187   |   0.0021      0.0519
                       0.0017     0.0217   |   0.0021      0.0557
                       0.0017     0.0247   |   0.0022      0.0596
                       0.0018     0.0278   |   0.0022      0.0636
                       0.0018     0.0310   |   0.0404      0.0677
                       0.0018     0.0343   |   0.1102      0.0718

                                 AREA     QPEAK     TPEAK       R.V.
                                 (ha)     (cms)     (hrs)       (mm)
   INFLOW : ID= 2 (  0010)      1.160      0.078      2.75      25.89
   OUTFLOW: ID= 1 (  1000)      1.160      0.002      6.33      25.90
```

```
                    PEAK   FLOW   REDUCTION [Qout/Qin](%)=  2.25
                    TIME SHIFT OF PEAK FLOW         (min)=215.00
                    MAXIMUM  STORAGE   USED       (ha.m.)=  0.0266

--------------------------------------------------------------------------------
*****************************************
** SIMULATION:04 - 25yr 6hr 15min Chicago **
*****************************************
--------------------
| RESERVOIR(  1000)|     OVERFLOW IS OFF
| IN= 2---> OUT= 1 |
| DT=  5.0 min     |     OUTFLOW    STORAGE   |  OUTFLOW    STORAGE
--------------------      (cms)     (ha.m.)   |   (cms)     (ha.m.)
     **** WARNING : FIRST OUTFLOW IS NOT ZERO.
                          0.0013     0.0000   |   0.0019      0.0376
                          0.0014     0.0050   |   0.0019      0.0411
                          0.0015     0.0103   |   0.0020      0.0446
                          0.0016     0.0158   |   0.0020      0.0482
                          0.0016     0.0187   |   0.0021      0.0519
                          0.0017     0.0217   |   0.0021      0.0557
                          0.0017     0.0247   |   0.0022      0.0596
                          0.0018     0.0278   |   0.0022      0.0636
                          0.0018     0.0310   |   0.0404      0.0677
                          0.0018     0.0343   |   0.1102      0.0718

                                AREA     QPEAK     TPEAK       R.V.
                                (ha)     (cms)     (hrs)       (mm)
   INFLOW : ID= 2 (  0010)      1.160      0.113      2.75      32.37
   OUTFLOW: ID= 1 (  1000)      1.160      0.002      4.00      32.38

                    PEAK   FLOW   REDUCTION [Qout/Qin](%)=  1.60
                    TIME SHIFT OF PEAK FLOW         (min)= 75.00
                    MAXIMUM  STORAGE   USED       (ha.m.)=  0.0340

--------------------------------------------------------------------------------
*****************************************
** SIMULATION:05 - 50yr 6hr 15min Chicago **
*****************************************
--------------------
| RESERVOIR(  1000)|     OVERFLOW IS OFF
| IN= 2---> OUT= 1 |
| DT=  5.0 min     |     OUTFLOW    STORAGE   |  OUTFLOW    STORAGE
--------------------      (cms)     (ha.m.)   |   (cms)     (ha.m.)
     **** WARNING : FIRST OUTFLOW IS NOT ZERO.
                          0.0013     0.0000   |   0.0019      0.0376
                          0.0014     0.0050   |   0.0019      0.0411
                          0.0015     0.0103   |   0.0020      0.0446
                          0.0016     0.0158   |   0.0020      0.0482
                          0.0016     0.0187   |   0.0021      0.0519
                          0.0017     0.0217   |   0.0021      0.0557
                          0.0017     0.0247   |   0.0022      0.0596
                          0.0018     0.0278   |   0.0022      0.0636
                          0.0018     0.0310   |   0.0404      0.0677
                          0.0018     0.0343   |   0.1102      0.0718

                                AREA     QPEAK     TPEAK       R.V.
                                (ha)     (cms)     (hrs)       (mm)
   INFLOW : ID= 2 (  0010)      1.160      0.147      2.75      41.11
   OUTFLOW: ID= 1 (  1000)      1.160      0.002      6.33      41.12

                    PEAK   FLOW   REDUCTION [Qout/Qin](%)=  1.35
                    TIME SHIFT OF PEAK FLOW         (min)=215.00
                    MAXIMUM  STORAGE   USED       (ha.m.)=  0.0440

--------------------------------------------------------------------------------
*****************************************
** SIMULATION:06 - 100yr 6hr 15min Chicago **
*****************************************
--------------------
| RESERVOIR(  1000)|     OVERFLOW IS OFF
| IN= 2---> OUT= 1 |
| DT=  5.0 min     |     OUTFLOW    STORAGE   |  OUTFLOW    STORAGE
--------------------      (cms)     (ha.m.)   |   (cms)     (ha.m.)
     **** WARNING : FIRST OUTFLOW IS NOT ZERO.
                          0.0013     0.0000   |   0.0019      0.0376
                          0.0014     0.0050   |   0.0019      0.0411
                          0.0015     0.0103   |   0.0020      0.0446
                          0.0016     0.0158   |   0.0020      0.0482
                          0.0016     0.0187   |   0.0021      0.0519
                          0.0017     0.0217   |   0.0021      0.0557
                          0.0017     0.0247   |   0.0022      0.0596
                          0.0018     0.0278   |   0.0022      0.0636
                          0.0018     0.0310   |   0.0404      0.0677
```

```
                          0.0018     0.0343   |   0.1102      0.0718

                                AREA     QPEAK     TPEAK       R.V.
                                (ha)     (cms)     (hrs)       (mm)
   INFLOW : ID= 2 (  0010)      1.160     0.176      2.75      48.51
   OUTFLOW: ID= 1 (  1000)      1.160     0.002      6.00      48.52

                   PEAK   FLOW   REDUCTION [Qout/Qin](%)=  1.19
                   TIME SHIFT OF PEAK FLOW         (min)=195.00
                   MAXIMUM  STORAGE   USED       (ha.m.)=  0.0524

------------------------------------------------------------------------------
**************************************************
** SIMULATION:07 - 2Yr 24Hr 60Minute AES Type II **
**************************************************
--------------------
| RESERVOIR(  1000)|     OVERFLOW IS OFF
| IN= 2---> OUT= 1 |
| DT=  5.0 min     |     OUTFLOW    STORAGE   |  OUTFLOW    STORAGE
--------------------      (cms)     (ha.m.)   |   (cms)     (ha.m.)
     **** WARNING : FIRST OUTFLOW IS NOT ZERO.
                          0.0013     0.0000   |   0.0019      0.0376
                          0.0014     0.0050   |   0.0019      0.0411
                          0.0015     0.0103   |   0.0020      0.0446
                          0.0016     0.0158   |   0.0020      0.0482
                          0.0016     0.0187   |   0.0021      0.0519
                          0.0017     0.0217   |   0.0021      0.0557
                          0.0017     0.0247   |   0.0022      0.0596
                          0.0018     0.0278   |   0.0022      0.0636
                          0.0018     0.0310   |   0.0404      0.0677
                          0.0018     0.0343   |   0.1102      0.0718

                                AREA     QPEAK     TPEAK       R.V.
                                (ha)     (cms)     (hrs)       (mm)
   INFLOW : ID= 2 (  0010)      1.160     0.017     13.00      22.02
   OUTFLOW: ID= 1 (  1000)      1.160     0.002     15.50      22.04

                   PEAK   FLOW   REDUCTION [Qout/Qin](%)=  9.69
                   TIME SHIFT OF PEAK FLOW         (min)=150.00
                   MAXIMUM  STORAGE   USED       (ha.m.)=  0.0176

------------------------------------------------------------------------------
**************************************************
** SIMULATION:08 - 5Yr 24Hr 60Minute AES Type II **
**************************************************
--------------------
| RESERVOIR(  1000)|     OVERFLOW IS OFF
| IN= 2---> OUT= 1 |
| DT=  5.0 min     |     OUTFLOW    STORAGE   |  OUTFLOW    STORAGE
--------------------      (cms)     (ha.m.)   |   (cms)     (ha.m.)
     **** WARNING : FIRST OUTFLOW IS NOT ZERO.
                          0.0013     0.0000   |   0.0019      0.0376
                          0.0014     0.0050   |   0.0019      0.0411
                          0.0015     0.0103   |   0.0020      0.0446
                          0.0016     0.0158   |   0.0020      0.0482
                          0.0016     0.0187   |   0.0021      0.0519
                          0.0017     0.0217   |   0.0021      0.0557
                          0.0017     0.0247   |   0.0022      0.0596
                          0.0018     0.0278   |   0.0022      0.0636
                          0.0018     0.0310   |   0.0404      0.0677
                          0.0018     0.0343   |   0.1102      0.0718

                                AREA     QPEAK     TPEAK       R.V.
                                (ha)     (cms)     (hrs)       (mm)
   INFLOW : ID= 2 (  0010)      1.160     0.028     13.00      36.19
   OUTFLOW: ID= 1 (  1000)      1.160     0.002     15.08      36.20

                   PEAK   FLOW   REDUCTION [Qout/Qin](%)=  6.50
                   TIME SHIFT OF PEAK FLOW         (min)=125.00
                   MAXIMUM  STORAGE   USED       (ha.m.)=  0.0324

------------------------------------------------------------------------------
**************************************************
** SIMULATION:09 - 10Yr 24Hr 60Minute AES Type II **
**************************************************
--------------------
| RESERVOIR(  1000)|     OVERFLOW IS OFF
| IN= 2---> OUT= 1 |
| DT=  5.0 min     |     OUTFLOW    STORAGE   |  OUTFLOW    STORAGE
--------------------      (cms)     (ha.m.)   |   (cms)     (ha.m.)
     **** WARNING : FIRST OUTFLOW IS NOT ZERO.
                          0.0013     0.0000   |   0.0019      0.0376
                          0.0014     0.0050   |   0.0019      0.0411
                          0.0015     0.0103   |   0.0020      0.0446
```

0.0016	0.0158	|	0.0020	0.0482
0.0016	0.0187	|	0.0021	0.0519
0.0017	0.0217	|	0.0021	0.0557
0.0017	0.0247	|	0.0022	0.0596
0.0018	0.0278	|	0.0022	0.0636
0.0018	0.0310	|	0.0404	0.0677
0.0018	0.0343	|	0.1102	0.0718

	AREA (ha)	QPEAK (cms)	TPEAK (hrs)	R.V. (mm)
INFLOW : ID= 2 (0010)	1.160	0.034	13.00	43.89
OUTFLOW: ID= 1 (1000)	1.160	0.002	16.33	43.90

PEAK FLOW REDUCTION [Qout/Qin](%)= 5.64
TIME SHIFT OF PEAK FLOW (min)=200.00
MAXIMUM STORAGE USED (ha.m.)= 0.0406

****
** SIMULATION:10 - 25Yr 24Hr 60Minute AES Type II **
****

RESERVOIR(1000)|	OVERFLOW IS OFF			
IN= 2---> OUT= 1 |				
DT= 5.0 min |	OUTFLOW (cms)	STORAGE (ha.m.)	OUTFLOW (cms)	STORAGE (ha.m.)
**** WARNING : FIRST OUTFLOW IS NOT ZERO.				
	0.0013	0.0000	0.0019	0.0376
	0.0014	0.0050	0.0019	0.0411
	0.0015	0.0103	0.0020	0.0446
	0.0016	0.0158	0.0020	0.0482
	0.0016	0.0187	0.0021	0.0519
	0.0017	0.0217	0.0021	0.0557
	0.0017	0.0247	0.0022	0.0596
	0.0018	0.0278	0.0022	0.0636
	0.0018	0.0310	0.0404	0.0677
	0.0018	0.0343	0.1102	0.0718

	AREA (ha)	QPEAK (cms)	TPEAK (hrs)	R.V. (mm)
INFLOW : ID= 2 (0010)	1.160	0.042	13.00	54.31
OUTFLOW: ID= 1 (1000)	1.160	0.002	19.58	54.32

PEAK FLOW REDUCTION [Qout/Qin](%)= 4.99
TIME SHIFT OF PEAK FLOW (min)=395.00
MAXIMUM STORAGE USED (ha.m.)= 0.0518

****
** SIMULATION:11 - 50Yr 24Hr 60Minute AES Type II **
****

RESERVOIR(1000)|	OVERFLOW IS OFF			
IN= 2---> OUT= 1 |				
DT= 5.0 min |	OUTFLOW (cms)	STORAGE (ha.m.)	OUTFLOW (cms)	STORAGE (ha.m.)
**** WARNING : FIRST OUTFLOW IS NOT ZERO.				
	0.0013	0.0000	0.0019	0.0376
	0.0014	0.0050	0.0019	0.0411
	0.0015	0.0103	0.0020	0.0446
	0.0016	0.0158	0.0020	0.0482
	0.0016	0.0187	0.0021	0.0519
	0.0017	0.0217	0.0021	0.0557
	0.0017	0.0247	0.0022	0.0596
	0.0018	0.0278	0.0022	0.0636
	0.0018	0.0310	0.0404	0.0677
	0.0018	0.0343	0.1102	0.0718

	AREA (ha)	QPEAK (cms)	TPEAK (hrs)	R.V. (mm)
INFLOW : ID= 2 (0010)	1.160	0.053	13.00	68.52
OUTFLOW: ID= 1 (1000)	1.160	0.007	17.58	68.53

PEAK FLOW REDUCTION [Qout/Qin](%)= 12.35
TIME SHIFT OF PEAK FLOW (min)=275.00
MAXIMUM STORAGE USED (ha.m.)= 0.0641

****
** SIMULATION:12 - 100Yr 24Hr 60Minute AES Type II **
****

RESERVOIR(1000)|	OVERFLOW IS OFF
IN= 2---> OUT= 1 |	

DT= 5.0 min	OUTFLOW (cms)	STORAGE (ha.m.)	OUTFLOW (cms)	STORAGE (ha.m.)
**** WARNING : FIRST OUTFLOW IS NOT ZERO.				
	0.0013	0.0000	0.0019	0.0376
	0.0014	0.0050	0.0019	0.0411
	0.0015	0.0103	0.0020	0.0446
	0.0016	0.0158	0.0020	0.0482
	0.0016	0.0187	0.0021	0.0519
	0.0017	0.0217	0.0021	0.0557
	0.0017	0.0247	0.0022	0.0596
	0.0018	0.0278	0.0022	0.0636
	0.0018	0.0310	0.0404	0.0677
	0.0018	0.0343	0.1102	0.0718

	AREA (ha)	QPEAK (cms)	TPEAK (hrs)	R.V. (mm)
INFLOW : ID= 2 (0010)	1.160	0.062	13.00	80.32
OUTFLOW: ID= 1 (1000)	1.160	0.021	15.08	80.34

PEAK FLOW REDUCTION [Qout/Qin](%)= 33.89
TIME SHIFT OF PEAK FLOW (min)=125.00
MAXIMUM STORAGE USED (ha.m.)= 0.0656

Appendix G

Post-Development Visual OTTHYMO Model Output Sheets - Controlled

```
*******************************************
** SIMULATION:01 - 2yr 6hr 15min Chicago **
*******************************************

--------------------
| ADD HYD  (  0007)|
|   1 +  2 =  3    |          AREA    QPEAK    TPEAK     R.V.
--------------------          (ha)    (cms)    (hrs)     (mm)
        ID1= 1 (  1000):     1.16   0.002     6.33    12.58
      + ID2= 2 (  0202):     0.18   0.009     2.75    16.65
        ================================================
        ID = 3 (  0007):     1.34   0.011     2.75    13.13

     NOTE:  PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.
--------------------------------------------------------------------------------
*******************************************
** SIMULATION:02 - 5yr 6hr 15min Chicago **
*******************************************

--------------------
| ADD HYD  (  0007)|
|   1 +  2 =  3    |          AREA    QPEAK    TPEAK     R.V.
--------------------          (ha)    (cms)    (hrs)     (mm)
        ID1= 1 (  1000):     1.16   0.002     6.33    20.88
      + ID2= 2 (  0202):     0.18   0.017     2.75    26.65
        ================================================
        ID = 3 (  0007):     1.34   0.019     2.75    21.67

     NOTE:  PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.
--------------------------------------------------------------------------------
*******************************************
** SIMULATION:03 - 10yr 6hr 15min Chicago **
*******************************************

--------------------
| ADD HYD  (  0007)|
|   1 +  2 =  3    |          AREA    QPEAK    TPEAK     R.V.
--------------------          (ha)    (cms)    (hrs)     (mm)
        ID1= 1 (  1000):     1.16   0.002     6.33    25.90
      + ID2= 2 (  0202):     0.18   0.022     2.75    32.53
        ================================================
        ID = 3 (  0007):     1.34   0.023     2.75    26.80

     NOTE:  PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.
--------------------------------------------------------------------------------
*******************************************
** SIMULATION:04 - 25yr 6hr 15min Chicago **
*******************************************

--------------------
| ADD HYD  (  0007)|
|   1 +  2 =  3    |          AREA    QPEAK    TPEAK     R.V.
--------------------          (ha)    (cms)    (hrs)     (mm)
        ID1= 1 (  1000):     1.16   0.002     4.00    32.38
      + ID2= 2 (  0202):     0.18   0.028     2.75    39.99
        ================================================
        ID = 3 (  0007):     1.34   0.029     2.75    33.42

     NOTE:  PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.
--------------------------------------------------------------------------------
*******************************************
** SIMULATION:05 - 50yr 6hr 15min Chicago **
*******************************************

--------------------
| ADD HYD  (  0007)|
|   1 +  2 =  3    |          AREA    QPEAK    TPEAK     R.V.
--------------------          (ha)    (cms)    (hrs)     (mm)
        ID1= 1 (  1000):     1.16   0.002     6.33    41.12
      + ID2= 2 (  0202):     0.18   0.035     2.75    49.90
        ================================================
        ID = 3 (  0007):     1.34   0.037     2.75    42.31

     NOTE:  PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.
--------------------------------------------------------------------------------
*******************************************
** SIMULATION:06 - 100yr 6hr 15min Chicago **
*******************************************

--------------------
| ADD HYD  (  0007)|
|   1 +  2 =  3    |          AREA    QPEAK    TPEAK     R.V.
--------------------          (ha)    (cms)    (hrs)     (mm)
        ID1= 1 (  1000):     1.16   0.002     6.00    48.52
```

```
      + ID2= 2 (  0202):     0.18   0.042     2.75    58.17
        ==========================================================
        ID = 3 (  0007):     1.34   0.043     2.75    49.83

     NOTE:  PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.
--------------------------------------------------------------------------------
************************************************
** SIMULATION:07 - 2Yr 24Hr 60Minute AES Type II **
************************************************

--------------------
| ADD HYD  (  0007)|
|   1 +  2 =  3    |          AREA    QPEAK    TPEAK     R.V.
--------------------          (ha)    (cms)    (hrs)     (mm)
        ID1= 1 (  1000):     1.16   0.002    15.50    22.04
      + ID2= 2 (  0202):     0.18   0.003    13.00    27.26
        ==========================================================
        ID = 3 (  0007):     1.34   0.005    13.00    22.75

     NOTE:  PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.
--------------------------------------------------------------------------------
************************************************
** SIMULATION:08 - 5Yr 24Hr 60Minute AES Type II **
************************************************

--------------------
| ADD HYD  (  0007)|
|   1 +  2 =  3    |          AREA    QPEAK    TPEAK     R.V.
--------------------          (ha)    (cms)    (hrs)     (mm)
        ID1= 1 (  1000):     1.16   0.002    15.08    36.20
      + ID2= 2 (  0202):     0.18   0.005    13.00    44.32
        ==========================================================
        ID = 3 (  0007):     1.34   0.007    13.00    37.31

     NOTE:  PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.
--------------------------------------------------------------------------------
************************************************
** SIMULATION:09 - 10Yr 24Hr 60Minute AES Type II **
************************************************

--------------------
| ADD HYD  (  0007)|
|   1 +  2 =  3    |          AREA    QPEAK    TPEAK     R.V.
--------------------          (ha)    (cms)    (hrs)     (mm)
        ID1= 1 (  1000):     1.16   0.002    16.33    43.90
      + ID2= 2 (  0202):     0.18   0.006    13.00    53.01
        ==========================================================
        ID = 3 (  0007):     1.34   0.008    13.00    45.13

     NOTE:  PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.
--------------------------------------------------------------------------------
************************************************
** SIMULATION:10 - 25Yr 24Hr 60Minute AES Type II **
************************************************

--------------------
| ADD HYD  (  0007)|
|   1 +  2 =  3    |          AREA    QPEAK    TPEAK     R.V.
--------------------          (ha)    (cms)    (hrs)     (mm)
        ID1= 1 (  1000):     1.16   0.002    19.58    54.32
      + ID2= 2 (  0202):     0.18   0.008    13.00    64.59
        ==========================================================
        ID = 3 (  0007):     1.34   0.010    13.00    55.72

     NOTE:  PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.
--------------------------------------------------------------------------------
************************************************
** SIMULATION:11 - 50Yr 24Hr 60Minute AES Type II **
************************************************

--------------------
| ADD HYD  (  0007)|
|   1 +  2 =  3    |          AREA    QPEAK    TPEAK     R.V.
--------------------          (ha)    (cms)    (hrs)     (mm)
        ID1= 1 (  1000):     1.16   0.007    17.58    68.53
      + ID2= 2 (  0202):     0.18   0.010    13.00    80.14
        ==========================================================
        ID = 3 (  0007):     1.34   0.011    13.00    70.10

     NOTE:  PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.
--------------------------------------------------------------------------------
************************************************
** SIMULATION:12 - 100Yr 24Hr 60Minute AES Type II **
************************************************
```

ADD HYD (0007)					
1 + 2 = 3		AREA (ha)	QPEAK (cms)	TPEAK (hrs)	R.V. (mm)
ID1= 1 (1000):		1.16	0.021	15.08	80.34
+ ID2= 2 (0202):		0.18	0.011	13.00	92.92
ID = 3 (0007):		1.34	0.025	15.00	82.05

NOTE: PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.

Geotechnical Investigation and Design Report

1916555 Ontario Limited

Type of Document:
Final Report

Project Name:
Proposed Development
6022 MR80
Hanmer, Ontario

Project Number:
SUD-24014195-A0

Prepared By:
Steven Kacan, P.Eng
Civil/Geotechnical Engineer,
Earth and Environmental Northeastern Ontario

EXP
885 Regent Street
Sudbury, Ontario, P3E 5M4
t: [redacted]
f: +1.705.674.5583

Date Submitted:
2025-02-20

Table of Contents

1. Introduction

Further to our Proposal No. 24-121-GP_rev.1, dated June 21, 2024, and your subsequent authorization to proceed, EXP Services Inc. (EXP) has completed the field investigation and the geotechnical engineering evaluation for the above noted project. Our comments and recommendations, based on the results of the field investigation and our understanding of the project scope are provided in this report.

It is understood by EXP that a residential development is to be constructed north of 6022 MR80, in Hanmer, Ontario. Details of the development were provided to the geotechnical representative prior to site investigation, locations of the boreholes are shown on the attached drawing, Dwg. No. A-1, included in Appendix A.

2. Field Investigation

The field investigation for this project consisted of the advancement of eleven (11) sampled boreholes within the proposed development site. The boreholes were advanced from January 16 to 17, 2025, with the borehole logs found in Appendix B, Figs. B-2 to B-12. The advancement of the boreholes was supervised on a full-time basis by a geotechnical representative from EXP.

The sampled boreholes were advanced using a truck mounted, CME 55 drill rig, equipped with a hollow stem auger and split spoon sampling equipment, in locations free of buried or overhead services. Soils samples were then obtained directly from the augers within the first 0.75 m intervals thereafter in conjunction with the Standard Penetration Test (SPT), at depths noted on the attached borehole logs in Appendix B. The SPT “N” values have been recorded at each sample interval to provide an assessment of the in-situ compactness condition of the subgrade soils. Monitoring wells were installed in boreholes BH-1 and BH-3.

Groundwater levels were measured within the open boreholes prior to backfilling. Boreholes were backfilled with auger cuttings and sealed with bentonite chips.

The retained soil samples were logged in the field and then carefully packaged and transported to our laboratory for detailed examination and testing.

The borehole locations and elevations were obtained by handheld GPS during the field investigation. The borehole locations and elevations should be considered accurate only to the degree implied by the methods used and should not be used for design purposes.

3. Laboratory Testing

A laboratory testing program was performed on representative soil samples and consisted of moisture content determinations and grain size distributions. The laboratory test results are summarized on the attached borehole logs in Appendix B, with more detailed results available in Appendix C.

4. Subsurface Conditions

Details of the soils encountered during the field investigation are summarized on the attached borehole logs in Appendix B. The logs include textural descriptions of the subsoil and indicate the soil boundaries inferred from non-continuous sampling and observations during the field investigation. These boundaries reflect approximate transition zones for the purpose of geotechnical design and should not be interpreted as exact planes of geological change. When reading this report, the explanatory notes and definitions provided in Figures B-1A, and B-1B in Appendix B should be referenced.

All boreholes except for BH-F4 encountered organics or topsoil. The organics/topsoil extended to depths ranging from 50 mm to 0.6 m. Underlying the organics in boreholes BH-F1, BH-F2, BH-F5, BH-F6, BH-P1, BH-P2, BH-R1 and BH-R2 and from surface in BH-F4 was a silt. The silt was light to dark brown, with some sand and moist. Uncorrected SPT "N" values within the material varied between 10 to 15 blows per 300 mm, classifying the soil as compact in compactness condition. The silt extended to depths between 0.3 to 0.8 m. The moisture content of the silt varied between 13 and 34%.

Underlying the organics in boreholes BH-F3, BH-F6 and BH-P3 and under the silt in boreholes BH-F1, BH-F2, BH-F4, BH-F5, BH-R1 and BH-R2 is a sand and silt. The sand and silt extended to the termination of all boreholes except for boreholes BH-F3, BH-F5, BH-P3. The sand and silt was brown to grey in colour and wet. Uncorrected SPT "N" values with the material varied between 1 to 15 blows per 300 mm, classifying the soil as very loose to compact in compactness condition. The moisture content of the sand and silt was between 9 and 28%.

Under the silt layer in boreholes BH-P1 and BH-P2 was a sand. The sand contained trace silt, trace gravel, and was brown to grey. The sand was brown to grey in colour and wet. This sand extended to the termination of the boreholes. Uncorrected SPT "N" values with the material varied between 4 to 11 blows per 300 mm, classifying the soil as very loose to compact in compactness condition. The moisture content of the sand was between 12 and 27%.

Under the sand and silt was a shale layer in boreholes BH-F3, BH-F5 and BH-P3. This shale extended to the termination depth of the boreholes.

Refusal was encountered in boreholes BH-F1, BH-F4 and BH-P2 and under the shale in BH-F3, BH-F5 and BH-P3. Refusal on suspected boulder or bedrock was inferred. Refusal depths are summarized in the table bellow.

Table 4-1: Refusal Depths

Borehole	Refusal Depth
BH-F1	2.7 m
BH-F3	3.3 m
BH-F4	4.7 m
BH-F5	2.4 m
BH-P2	3.2 m
BH-P3	2.7 m

Groundwater was encountered at boreholes BH-F2, BH-F6, and BH-P2, and ranged in depth from 2.0 to 4.0 m from surface. Caved conditions were encountered in borehole BH-F3, BH-F4, and BH-P1 and BH-P3 at depths ranging from 2.0 to 4.4 m below grade. Seasonal variations in the water table should be anticipated, with higher levels occurring during wet weather conditions (spring thaw and late fall) and lower levels occurring during dry weather conditions.

5. Foundation Recommendations

Based on the soil conditions encountered within the boreholes, it is recommended that the proposed building be founded conventional strip or spread footings bearing on the encountered native soils or engineered fill over native soils.

Note that foundations should be kept as high as possible to avoid excavations below the groundwater levels on site.

Note that the proposed foundation details and loading conditions have not been provided to EXP at the time of this report. EXP should be retained to review the final designs and specifications to confirm that they are in general agreement with the assumptions on which our recommendations are based. If not accorded the privilege of making this review, EXP will assume no responsibility for interpretation of the recommendations in this report.

5.1 Conventional Strip or Spread Footings on Native Soils or on Engineered Fill Overlying Native Soils

Prior to the placement of the footings, topsoil, organics, fill and any other deleterious material must be removed down to the undisturbed native soils. The exposed subgrade should be proof rolled to identify any soft or unstable areas. The exposed subgrade and proof rolling is to be inspected by a representative from EXP prior to placing fill material or concrete. Any soft or loose areas encountered below the footing locations or any areas that are subject to softening/loosening when exposed to water and construction activities should be excavated down to a firm subgrade and replaced with Granular “A” or Granular “B” Type II in accordance with Ontario Provincial Standards and Specifications (OPSS) 1010. If wet soil conditions are present during construction, a non-woven geotextile separator (Terrafix 270R or equivalent) is to be used between the subgrade soils and the Granular “A” or Granular “B” Type II to stabilize the native soils.

To protect the footing base from construction activity or inclement weather, a 150 mm thick layer of Granular “A” material (OPSS 1010) can be placed directly below the footings and extend a minimum of 300 mm on either side of the footing edge and then slope down at 1H:1V. In-lieu of the Granular “A”, a lean mix concrete base can be poured. The lean mix concrete should extend a minimum of 300 mm on either side of the footings. Note that the footing base should not be left exposed beyond the day of excavation.

Engineered fill can be placed between the native soils and footings to raise the base of footing elevation if necessary. The engineered fill is to consist of Granular “B” Type I or II (OPSS 1010). A final 150 mm thick layer of Granular “A” (OPSS) should be placed directly below the footing. The engineered fill below any footings is to extend horizontally a minimum of 300 mm from any footing edge and then slope down at 1H:1V to the underlying native soils.

All engineered fill is to be placed in maximum 150 mm thick lifts and is to be compacted to 100% of the Standard Proctor Maximum Dry Density (SPMDD) within 1.5% of optimum moisture content under full time supervision by an EXP representative.

Footings founded on the undisturbed native soils, or on engineered fill overlying undisturbed native soils, can be designed with a factored geotechnical resistance at Ultimate Limit States (ULS) of 112 kPa. This value was calculated using a geotechnical resistance factor of 0.5. A bearing pressure at Serviceability Limit States (SLS) of 75 kPa may be used. Footings designed with the recommendations contained herein are expected to settle less than 25 mm total and 20 mm differential.

Foundations which are to be placed at different elevations in soils or near service trenches should be located such that the footings are set below a line drawn up at 10 horizontals to 7 vertical from the near edge of a lower foundation or bottom of a service trench, as indicated on Figure 5-1 below.

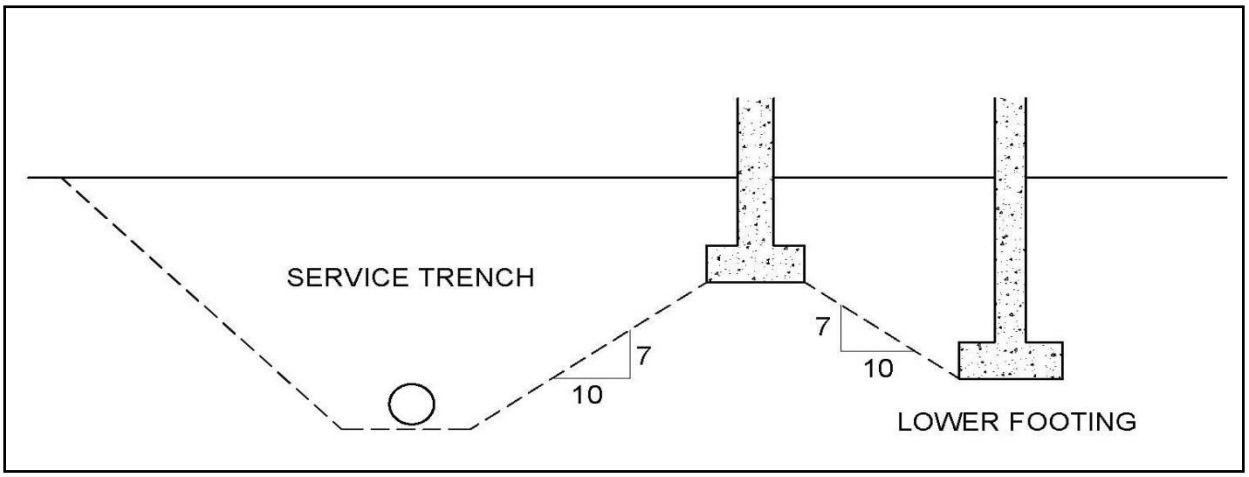


Figure 5-1: Footings near Service Trenches or at Different Elevations

These foundation recommendations assume the structures are lightly loaded. Strip and spread footing widths must comply with minimum Code requirements.

5.2 Frost Considerations

The freezing index in the Sudbury area is approximately 1330 C degree-days. There is potential for up to 2.1 m of frost penetration to occur over the winter months in unprotected, unheated areas and 1.7 m for heated structures.

As such, foundations for unheated structures should be provided with a minimum of 2.1 m of earth cover frost protection and heated structures should be provided with 1.7 m of earth cover frost protection. Note that to be considered a heated structure; the building must be maintained continuously at a minimum temperature of 18°C. If this will not occur, the building/structure shall be considered unheated.

Should sufficient earth cover not be provided, insulation will be required. Insulation should consist of rigid extruded polystyrene, have a minimum compressive strength of 275 kPa, and an R-Value of 5 for every 25.4 mm of thickness, (i.e., Styrofoam HI 40). Any exposed insulation is to be protected against sunlight and physical damage. A rough estimate for cost evaluation purposes can be made by assuming that 25.4 mm of rigid insulation designed for below grade installation is equivalent to 300 mm of soil cover. Note that insulation for heated structures should be placed both horizontally and vertically along the outside edge of the foundation. Insulation for unheated structures must extend below the entire foundation.

Detailed insulation recommendations can be provided by EXP, if necessary, once the final foundation designs have been determined.

5.3 Site Classification for Seismic Response

The Ontario Building Code (OBC) has adopted the National Building Code of Canada requirements for seismic design considerations. Based on the conditions encountered at the borehole locations, the Site Classification for Seismic Response has been estimated to be Site Class D as per the OBC clause 4.1.8.4, Site Properties and Table 4.1.8.4 A, Site Classification for Seismic Response.

These earthquake/seismic design parameters should be reviewed in detail by the structural engineer and incorporated into the design as required. If a Site Classification based on shear wave velocity testing is required, EXP can provide a quote to perform the necessary testing.

5.4 Backfill Recommendations

All imported backfill material used to backfill the foundation walls should consist of Granular "B" Type I or Granular "B" Type II (OPSS 1010) material, with a maximum aggregate size not exceeding 120 mm. The Granular "B" material used against the foundation walls should have no sizes greater than 75 mm and must be placed in lifts no greater than 150 mm in thickness and must be compacted to 98% of the SPMDD. Care must be taken to ensure damage to the foundation walls does not occur.

5.5 Lateral Earth Pressure

Any foundations and any retaining structures should be designed to resist lateral earth pressure. The expression for calculating lateral earth pressure "p" at any depth "h" is given by the following:

$$p = K(\gamma h + q) + \gamma_w h_w$$

where,
- p = Lateral earth pressure (kPa)
- K = Coefficient of earth pressure
- γ = Unit weight of backfill (kN/m^3)
- γ_w = Unit weight of water (kN/m^3)
- h = Depth to point of interest (m)
- h_w = Depth of water above point of interest (m)
- q = Surcharge load acting adjacent to the wall at the ground surface (kPa)

Table 5-1 lists various earth pressure properties for given materials.

Table 5-1: Material Types and Earth Pressure Parameters

Material	Friction Angle ø´ (unfactored)	Coefficient of Active Earth Pressure (k_a)	Coefficient of Passive Earth Pressure (k_p)	Coefficient of Earth Pressure at rest (k_o)	Unit Weight (kN/M^3)
Granular "A"	38°	0.24	4.2	0.38	22
Granular "B"	38°	0.24	4.2	0.38	21

Note: Values given for horizontal earth pressures are for horizontal backfill. For sloping backfill, the design requirements outlined in the Canadian Foundation Engineering Manual should be used.

The mobilization of full active or passive resistance requires a measurable and perhaps significant wall movement or rotation. Therefore, unless the structural element can tolerate these deflections, the at-rest earth pressure should be used in design.

The effects of compaction surcharge should be considered in the calculations of active and at rest earth pressures. The lateral pressure due to compaction should be taken as at least 12 kPa at the surface, and its magnitude should be assumed to diminish linearly with depth to zero at the depth where the active (or at rest) pressure is equal to 12 kPa. This pressure distribution should be added to the calculated active (or at rest) pressure. Notwithstanding, lighter compaction equipment and smaller lifts should be used adjacent to walls to prevent overstressing.

5.6 Surface Drainage

The exterior grade around the buildings should be sloped away from the walls to prevent surface runoff from entering the building. Permanent perimeter weeping tile should be installed where any floor is less than 150 mm above final grade and is required to be dry. The drainage tile should have a minimum diameter of 100 mm, and be surrounded by well-draining filter material (i.e. 20 mm Clear Stone gravel). The filter material should be surrounded with a non-woven geotextile. The perforated

drainage tile should drain to a suitable drainage area or interior sump. All subsurface walls should be adequately damp-proofed above the water table and waterproofed below the water table. The roof drains should discharge away from the building to appropriate drainage areas.

5.7 Dewatering

The ground water was encountered at the site approximately 2.0 m below grade. Excavations below 2.0 m will be difficult to achieve and will require extensive dewatering and as such should be avoided.

Dewatering requirements will be governed by the time of the year the construction is performed. It is the responsibility of the Contractor to propose a suitable dewatering system based on the time of construction and groundwater levels. The method used should not undermine any adjacent structures. The dewatering method is the responsibility of the Contractor, and the Contractor should submit his proposal to the Prime Consultant for review and approval prior to construction. It is recommended that the contractor conduct a test dig prior to construction to familiarize themselves with the groundwater conditions.

Should excavations extend below the groundwater levels, extensive dewatering will be required and it is recommended to have a hydrogeological study completed for the site to further understand dewatering volumes, environmental impacts on adjacent water bodies or structures, and if a permit to take water (PTTW) will be required to complete the dewatering program. Should a hydrogeological study be required, please contact EXP to further discuss additional field work and reporting.

5.8 Pavement Structure Design Recommandations

The recommended pavement structure designs for both light traffic and heavy traffic areas are provided below. The recommended pavement structures outlined below assume adequate provision for drainage. A conventional asphalt pavement structure as noted below will typically have a functional service life of 12 years. This represents the number of years to the first rehabilitation (via overlay or resurfacing), assuming that regular maintenance and crack sealing is completed. Subsequent resurfacing is typically expected to last at least 10 years.

Layer	Light Traffic or Parking Areas	Heavy Traffic or Loading Areas
Asphalt	50 mm SP 12.5 Surface Course	40 mm SP 12.5 Surface Course 50 mm SP 19.0 Binder Course 90 mm Total Thickness
Base	150 mm Granular “A”	150 mm Granular “A”
Subbase	300 mm Granular “B” Type II Or 450 mm Granular “B” Type I	450 mm Granular “B” Type II Or 600 mm Granular “B” Type I

Rigid pavement can be considered in areas of sharp truck turning or where heavy loads will be situated. The rigid pavement structure should include 200 mm of concrete over a 100 mm thick OGDL (Open Graded Drainage Layer) and a 200 mm thick base course, consisting of Granular “A” over the subbase material to improve the support and function as a drainage layer.

The roadway granular base and sub-base materials must be in accordance with OPSS 1010 and must be placed in maximum 150 mm lifts and compacted to 100% of the Standard Proctor Maximum Dry Density (SPMDD) at a moisture content within 2.0% of the optimum moisture content.

The long-term performance of pavement structures is highly dependent upon the sub-grade support conditions. Stringent construction control procedures should be maintained to ensure that uniform sub-grade moisture and density conditions are achieved. In addition, the need for adequate drainage cannot be overemphasized. The finished surface and underlying sub-grade must be sloped to provide effective drainage to catchbasins, ditching, and/or subdrains etc.

Surface water should not be allowed to pond along the outside edges of paved areas. Sub-drains should be installed to intercept excess subsurface moisture and prevent sub-grade softening.

Additional comments on the construction of the pavement structures are as follows:

- To ensure maximum service life of the pavement structures, all organics/peat and other deleterious materials should be removed to the native subgrade. An upfill required below the pavement structure can consist of Granular "B" Type I or II or a Select Subgrade Material (SSM) in accordance with OPSS 1010.
- Any subgrade soils should be proof-roll compacted prior to placing any engineered fill. Any soft areas encountered during proof-rolling should be excavated and replaced with a Granular "A" or Granular "B" Type II (OPSS 1010) material.
- If ditches are utilized, they should have inverts of at least 600 mm below the bottom of the sub-base.
- The most severe loading conditions on a soil pavement structure sub-grade usually occur during construction. Consequently, special provisions such as additional granular sub-base, may be required, especially if construction is completed during unfavorable weather conditions over native soils. Typically, the first lift of engineered fill is placed with a thickness of 300 mm prior to vibratory compaction to mitigate disturbance of the sub-grade soils.
- If wet soil conditions are present during construction, a non-woven geotextile separator (Terrafix 270R or equivalent) should be placed between the subgrade soils and any upfill/pavement structure material to stabilize the native soils.

6. Excavations

The in-situ native soils may be classified as Type 3 soils for excavations terminating above the groundwater level and Type 4 soils for excavations terminating below the groundwater level in conformance with the Ontario Occupational Health and Safety Act (OHSA). Excavation side slopes in Type 3 soils should remain stable at a slope of 1H:1V. Excavation side slopes in Type 4 soils should remain stable at a slope of 3H:1V.

Excavations below the groundwater level will require dewatering and will be difficult, and as such should be avoided.

The need to excavate flatter side slopes if excessively wet or soft/loose materials, or concentrated seepage zones are encountered, should not be overlooked

Water (i.e. surface water runoff) should not be permitted to enter and/or pond within the construction area. Stockpiles should be kept a sufficient distance from any soil excavation so as not to surcharge the excavation side slopes.

All excavations must be completed in accordance with the most recent regulations in the Ontario Occupational Health and Safety Act. The contractor should be aware that slope height, slope inclination, or excavation depths, should in no case, exceed those specified in local, provincial or federal safety regulations. Such regulations are strictly enforced and, if not followed, the owner, the contractor or earthwork or utility subcontractor could be liable for substantial penalties.

It is important to note that soils encountered in the construction excavations may vary significantly across the site. Our preliminary soil classifications are based solely on the materials encountered in widely spaced explorations. The contractor should verify that similar conditions exist throughout the proposed area of excavation. If different subsurface conditions are encountered at the time of construction, we recommend that EXP be contacted immediately to evaluate the conditions encountered.

6.1 Re-use of Excavated Material

The encountered soils are too poorly graded or fine grained to be re-used as free draining engineered fill. All in-situ materials may be used for general landscaping purposes away from structures/roads or in areas where non-free draining backfill may be required, provided it is environmentally safe to do so.

Any soils being removed from the site, must comply with the excess soil regulations (O.Reg. 406/19). While it is the responsibility of the source site to ensure soil exported off-site for reuse is suitable for the intended receiving site, it is highly recommended that the receiving site conduct an independent review of the analytical results to confirm the suitability of the soil to be reused at the specific receiving site.

7. Buried Service Recommendations

Recommendations for proposed buried services are included in the following sections.

7.1 Frost Protection

Protection against freezing is an integral part of a sewer and water system design. The standard solution calls for burying the top of the utility lines in the ground below the anticipated frost penetration depth (2.1 m in the Sudbury Area). Where this cannot be achieved, an alternate solution involves incorporating rigid polystyrene insulation (i.e. Styrofoam HIGHLOAD-40), which can be used to reduce the depth of trench required. The two design configurations frequently used are horizontal placement, and the inverted "U". Both of these methods require suitable design, as well as correct construction procedures. Installing insulation does not alter conventional utility line construction practice to an appreciable extent. However, in some cases, a wider trench may be required to accommodate the horizontal layer of insulation. Another option is to use pre-insulated pipe.

A rough estimate for cost evaluation can be made by assuming that 25 mm of rigid insulation designed for below grade installation is equivalent to 300 mm of soil cover. This and any other design values should, however, be confirmed with the insulation manufacturer.

Maintaining compatibility with adjacent subgrade conditions should minimize annual differential frost heaving. This is usually accomplished by backfilling the service trenches with materials matching the surrounding soils. Another approach to minimizing the annual differential heaving of subgrade soil is to construct frost tapers in conformance with OPSD 803.030 and/or 803.03. The same amount of heaving will occur whether a frost taper is installed, or the trench is backfilled with excavated material. However, the heaving of a frost taper is spread across the length of the taper causing the differential heaving to be less abrupt.

7.2 Pipe Embedment and Bedding

Any fill materials, organics, and other deleterious materials are to be removed down to competent native soils prior to placement of the bedding material. Pipe bedding requirements as outlined in the OPSD 802.010 for flexible pipes and OPSD 802.031 and 802.032 for rigid pipes will be sufficient for sanitary, storm and watermain pipes. The pipe bedding should consist of a Clear Stone gravel (OPSS 1004) or Granular "A" material (OPSS.MUNI 1010) with a minimum thickness of 150 mm beneath the pipe and raised to the pipe springline. The granular bedding should be placed in lifts not exceeding 150 mm and compacted to 98% of the material's SPMDD. Particular care should be taken when compacting beneath the pipe haunches. The cover material should consist of a compacted sand material with no sizes greater than 25 mm or a Granular "A" material.

Bedding thicknesses may be increased in areas where the native soil base supporting the bedding is wet, or subject to disturbance. Where soft or loose base conditions are encountered below the water table, base stabilization may be required.

This may include the placement of crushed stone sub-bedding, wrapped in a non-woven geotextile, to prevent base disturbance and to allow the removal of water through standard filtered sump and pump methods.

If construction proceeds during the winter months, the base and sides of the trench, as well as all fill materials, should not be allowed to freeze.

7.3 Excavated Soil and Trench Backfill

It is typical practice in Northern Ontario to re-use a portion of the in-situ excavated native material as fill within exterior (outside) trench utility services, especially where these trenches interrupt traveled sections of a roadway. This is to ensure compatibility with adjacent subgrade soils to minimize annual differential frost heaving.

Non-organic material from the service trench excavation may be re-used as random fill above the top of the pipe cover material to the underside of the pavement structure subbase materials. All re-used materials must be placed in lifts not exceeding 150 mm and be compacted to 98% of the SPMDD within 2% of the optimum moisture content. EXP cautions that any native material below the groundwater level may not meet the above compaction requirements without significant reworking and drying prior to placement. If stockpiling of trench excavated material for re-use is required, it is recommended that it be covered to prevent exposure to rain and it cannot be allowed to freeze. All unsuitable materials from the trench excavation not reused must be disposed of off-site.

Any excavated material contaminated with organics, construction debris, or other deleterious materials must not be re-used as backfill material. This material may be re-used for general landscaping purposes, provided it is environmentally safe to do so.

8. Soil Drainage Characteristics

It is understood that infiltration trenches are proposed to be constructed as part of this development. The size and depth of the trenches are unknown at this time, we have provided general soil properties for design considerations. Refer to appendix C for laboratory grain size analysis results.

Location	Soil Type	D_{10} (mm)	D_{60} (mm)	C_U	K (cm/s)	Percolation Rate T (min/cm)	Recommended T (min/cm)	Infiltration Rate I ($mm/hr/m^2$)
BH-P1 SS3	Sand, trace Silt, trace Gravel	0.048	0.52	10.8	0.0023	10-15	15	82.8
BH-P2 SS3	Sand, trace Silt	0.16	0.4	2.5	0.025	5-10	10	900
BH-P3 SS2	Sand and Silt	0.0082	0.067	8.2	0.000067	25-35	35	2.4

9. Construction Constraints Under Cold Weather Conditions

For all construction activities at this site, the following applies:

- During excavations, all subgrade soils must be maintained at a minimum temperature of 5° C.
- No granular material may be placed under frozen conditions, with all fill material maintained at a minimum temperature of 5° C prior to and during installation. If granular fill is to be placed in freezing conditions, the granular fill must be restricted to Granular "B" Type II material. Since Granular "B" Type II has a larger aggregate size, care should be taken to prevent point loading on the underside of the concrete.
- Soils and granular fill material that is in direct contact with fresh concrete must be at a minimum temperature of 5° C prior to pouring the concrete and must be free of snow and ice fragments.
- All granular fill, prior to placement of concrete, must be reviewed by this office to ensure it is free of frost, buried ice and snow.
- All reinforcing steel in the concrete forms must be free of ice and snow, and must be maintained at a minimum temperature of 5° C.
- During the placement of concrete in cold weather conditions, a field cured cylinder should be placed beside the heated form for a period of 6 days. The field cured cylinder should be returned to a designated laboratory on the sixth day for 7 day compressive strength testing.
- All heated and tarped areas should be monitored for temperature using a max/min thermometer.
- All concrete is to have a minimum of 6 to 8% air entrainment to prevent cracking and shall be maintained at a minimum temperature of 10° C for a period of 4 to 7 days.

The 6 to 8% air entrained concrete during cold weather placement is to prevent significant strength loss of concrete because of freezing and thawing. The air entrainment will provide the capacity to absorb stresses during freeze/thaw action.

10. Construction Quality Control

Construction quality control of the "earthworks" should be provided throughout the project by a representative of EXP to verify all design assumptions, recommendations, and confirmation of the subsurface soil conditions. This includes inspection of the excavation and subgrade prior to the placement of any structural fill and foundations, to ensure that all deleterious materials have been removed and to ensure that the actual conditions are not markedly different than those on which the recommendations made herein are based. Compaction control of structural fill is also recommended as standard practice, as is sampling and testing of aggregates and concrete.

11. Design Review

The recommendations made in this report are in accordance with our present understanding of the project and are provided solely for the design team responsible for the project. If there are any changes, such as relocation of any structures or other features which may affect our analysis, the information obtained during this investigation may be inadequate and additional field work and reporting may be required.

EXP Services Inc. should be retained to review the final design and specifications to confirm that it is in general agreement with the assumptions on which our recommendations are based. If not accorded the privilege of making this review, EXP Services Inc. will assume no responsibility for interpretation of the recommendations in this report.

12. Limitations

A subsurface investigation is a limited sampling of a site. Should any conditions at the site be encountered that differ from those reported at the test locations, we require that we be notified immediately to allow reassessment of our recommendations.

Whereas this investigation has estimated the groundwater level at the time of the fieldwork, and commented on general construction problems, the presence of conditions, which would be difficult to establish from our boreholes, may affect the type and nature of dewatering procedures which should be used in practice. These conditions include local and seasonal fluctuations in the groundwater table, erratic changes in the soil profile between the tests, and thin layers of soil with large or small permeabilities compared with the general soil mass, etc.

The comments given in this report are intended only for the guidance of the design team responsible for the project. The number of test holes required to determine the localized underground conditions between test holes affecting construction costs, techniques, sequencing, equipment, scheduling, etc. could be greater than has been carried out for design purposes. Contractors bidding on or undertaking the works should, in this light, decide on their own investigations, as well as their own interpretations of the factual test hole results, so that they may draw their own conclusions as to how the subsurface conditions may affect them.

The investigation and comments are necessarily ongoing as new information of underground conditions becomes available. For example, more specific information is available with respect to in-situ subsurface conditions between test locations once construction is underway. Subsurface soil interpretation between test holes, as well as the recommendations of this report, should be verified through field inspections provided by EXP to validate the current information for use during the construction stage.

Virtually no scope of work, no matter how exhaustive, can identify all contaminants or all conditions above or below ground. For example, conditions elsewhere on the property may differ from those encountered, and conditions may change with time. Therefore, no warranty is provided that the entire site condition is represented by those identified at specific locations.

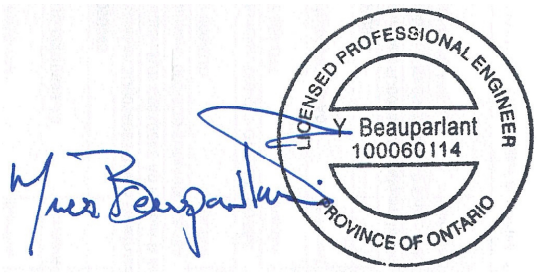
This report in no way reflects any on-site environmental considerations.

13. Closure

We trust that these comments provide you with sufficient information to proceed with design. Should you have any questions, please do not hesitate to contact this office.

Yours truly,

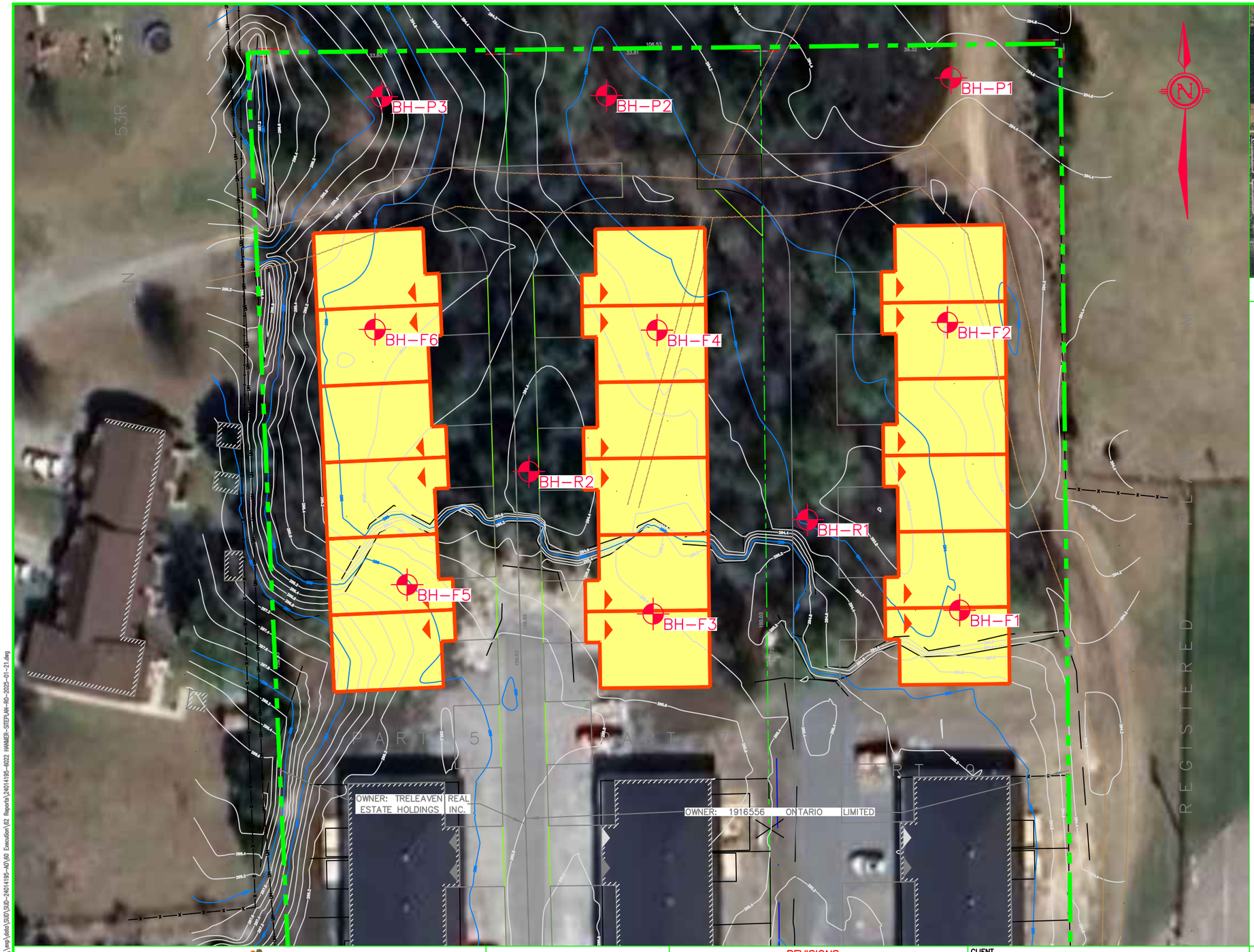
EXP Services Inc.



Steven Kacan, P.Eng
Civil/Geotechnical Engineer
Earth & Environmental Services
Northeastern Ontario

Yves Beauparlant, P.Eng.
Manager, Earth & Environmental Services
Northeastern Ontario

Appendix A – Drawings



KEYPLAN - N.T.S.

LEGEND

EXP BOREHOLE

– NOTES –

1) The boundaries and soil types have been established only at Test Hole locations. Between Test Holes, they are assumed and may be subject to considerable error.
2) Do not use Test Hole elevations for design purposes.
3) Soil samples will be retained in storage for 3 month and then destroyed unless client advises that an extended time period is required.
4) Quantities should not be established from the information provided at the Test Hole locations.
5) This drawing forms part of the report, project number as referenced, and should be used only in conjunction with this report.

EXP Services Inc.
Sudbury Branch
t: +1.705.674.4401 | f: +1.705.674.5583
885 Regent Street
Sudbury, ON P3E 5M4
Canada
www.exp.com

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REVISIONS		
No.	DESCRIPTION	DATE

CLIENT: 1916555 ONTARIO LIMITED

PROJECT: MR80 PROPOSED DEVELOPMENT HANMER, ON

PROJECT NO.: SUD-24014195-A0

TITLE: BOREHOLE LOCATION PLAN

DATE: JAN 2025 | SCALE: NTS | DWG NO.: A-1

Feb 19, 2025 – 10:30am \\exp\data\SUD\SUD-24014195-A01\60 Execution\62 Reports\24014195–6022 HANMER–SITEPLAN–R0–2025–01–21.dwg

PL-CON-2025-00039

Appendix B – Borehole Logs

Notes on Sample Descriptions

1. All sample descriptions included in this report follow the International Society for Soil Mechanics and Foundation Engineering (ISSMFE), as outlined in the Canadian Foundation Engineering Manual. Note, however, that behavioral properties (i.e. plasticity, permeability) take precedence over particle gradation when classifying soil. Please note that, with the exception of those samples where a grain size analysis has been made, all samples are classified visually. Visual classification is not sufficiently accurate to provide exact grain sizing or precise differentiation between size classification systems.

UNIFIED SOIL CLASSIFICATION

CLAY (PLASTIC) TO	FINE	MEDIUM	CRS.	FINE	COARSE
SILT (NONPLASTIC)	SAND			GRAVEL	

0.002	0.006	0.02	0.06	0.2	0.6	2.0	6.0	20	60	200

EQUIVALENT GRAIN DIAMETER IN MILLIMETRES

ISSMFE SOIL CLASSIFICATION

CLAY	SILT			SAND			GRAVEL			COBBLES	BOULDERS
	FINE	MEDIUM	COARSE	FINE	MEDIUM	COARSE	FINE	MEDIUM	COARSE		

2. Fill: Where fill is designated on the borehole log it is defined as indicated by the sample recovered during the boring process. The reader is cautioned that fills are heterogeneous in nature and variable in density or degree of compaction. The borehole description may therefore not be applicable as a general description of site fill materials. All fills should be expected to contain obstruction such as wood, large concrete pieces or subsurface basements, floors, tanks, etc., none of these may have been encountered in the boreholes. Since boreholes cannot accurately define the contents of the fill, test pits are recommended to provide supplementary information. Despite the use of test pits, the heterogeneous nature of fill will leave some ambiguity as to the exact composition of the fill. Most fills contain pockets, seams, or layers of organically contaminated soil. This organic material can result in the generation of methane gas and/or significant ongoing and future settlements. Fill at this site may have been monitored for the presence of methane gas and, if so, the results are given on the borehole logs. The monitoring process does not indicate the volume of gas that can be potentially generated nor does it pinpoint the source of the gas. These readings are to advise of the presence of gas only, and a detailed study is recommended for sites where any explosive gas/methane is detected. Some fill material may be contaminated by toxic/hazardous waste that renders it unacceptable for deposition in any but designated land fill sites; unless specifically stated the fill on this site has not been tested for contaminants that may be considered toxic or hazardous. This testing and a potential hazard study can be undertaken if requested. In most residential/commercial areas undergoing reconstruction, buried oil tanks are common and are generally not detected in a conventional geotechnical site investigation.

3. Till: The term till on the borehole logs indicates that the material originates from a geological process associated with glaciation. Because of this geological process the till must be considered heterogeneous in composition and as such may contain pockets and/or seams of material such as sand, gravel, silt or clay. Till often contains cobbles (75 to 200 mm) or boulders (over 200 mm). Contractors may therefore encounter cobbles and boulders during excavation, even if they are not indicated by the borings. It should be appreciated that normal sampling equipment cannot differentiate the size or type of any obstruction. Because of the horizontal and vertical variability of till, the sample description may be applicable to a very limited zone; caution is therefore essential when dealing with sensitive excavations or dewatering programs in till materials.

Notes On Soil Descriptions

4. The following table gives a description of the soil based on particle sizes. With the exception of those samples where grain size analyses have been performed, all samples are classified visually. The accuracy of visual examination is not sufficient to differentiate between this classification system or exact grain size.

Soil Classification		Terminology	Proportion
Clay and Silt	<0.060 mm	“trace” (e.g. Trace sand)	1% to 10%
Sand	0.060 to 2.0 mm	“some” (e.g. Some sand)	10% to 20%
Gravel	2.0 to 75 mm	adjective (e.g. sandy, silty)	20% to 35%
Cobbles	75 to 200 mm	“and” (e.g. and sand)	35% to 50%
Boulders	>200 mm		

The compactness of Cohesionless soils and the consistency of the cohesive soils are defined by the following:

Cohesionless Soil		Cohesive Soil		
Compactness	**Standard Penetration Resistance “N” Blows / 0.3 m**	**Consistency**	**Undrained Shear Strength (kPa)**	**Standard Penetration Resistance “N” Blows / 0.3 m**
Very Loose	0 to 4	Very soft	<12	<2
Loose	4 to 10	Soft	12 to 25	2 to 4
Compact	10 to 30	Firm	25 to 50	4 to 8
Dense	30 to 50	Stiff	50 to 100	8 to 15
Very Dense	Over 50	Very Stiff	100 to 200	15 to 30
		Hard	>200	>30

5. **ROCK CORING**

Where rock drilling was carried out, the term RQD (Rock Quality Designation) is used. The RQD is an indirect measure of the number of fractures and soundless of the rock mass. It is obtained from the rock cores by summing the length of the core covered, counting only those pieces of sound core that are 100 mm or more length. The RQD value is expressed as a percentage and is the ratio of the summed core lengths to the total length of core run. The classification based on the RQD value is given below.

RQD Classification	RQD (%)
Very Poor Quality	<25
Poor Quality	25 to 50
Fair Quality	50 to 75
Good Quality	75 to 90
Excellent Quality	90 to 100

$$\text{Recovery Designation \% Recovery} = \frac{\text{Length of Core Per Run}}{\text{Total Length of Run}} \times 100$$

Log of Borehole BH-F1

Project No. SUD-24014195-A0 | Figure No. B-2

Project: MR80 Development | Sheet No. 1 of 1

Location: Hanmer, Ontario

503803 E, 5166710 N

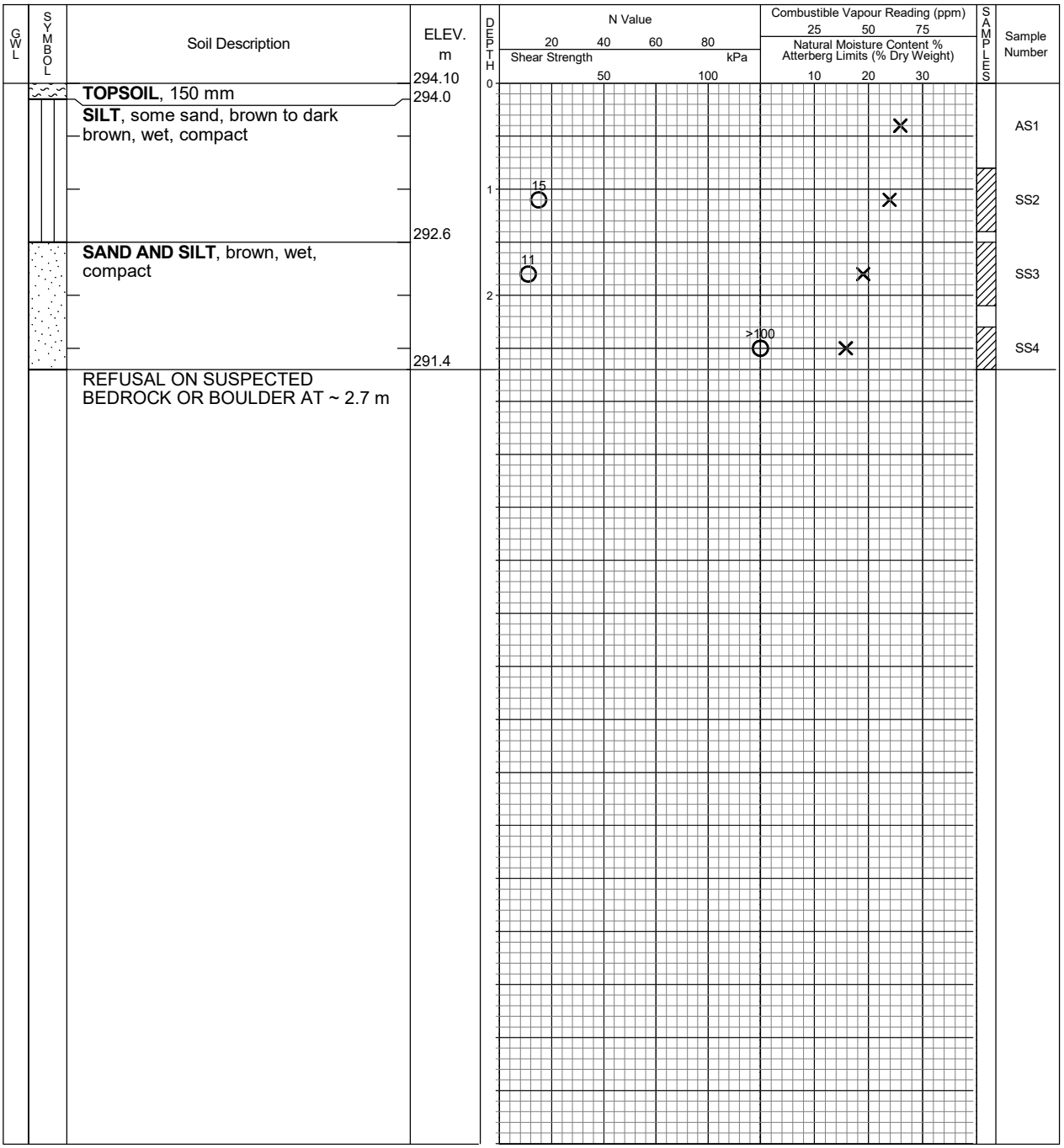
Date Drilled: Jan 16, 2025

Drill Type: CME 55 Track

Datum: Geodetic (hand-held GPS)

Auger Sample | SPT (N) Value | Dynamic Cone Test | Shelby Tube | Field Vane Test (S)

Combustible Vapour Reading | Natural Moisture | Plastic and Liquid Limit | Undrained Triaxial at % Strain at Failure | Penetrometer



SUDBURY GEO SUD-24014195-A0 - MR80 DEVEOLOPMENT.GPJ NEW.GDT 2/19/25

EXP Services Inc.
885 Regent Street
Sudbury, ON P3E 5M4
CANADA
t: +1.705.674.9681
f: +1.705.674.5583

Borehole data requires interpretation assistance from EXP before use by others.

See Figures B-1A and B-1B for Notes on Sample Description

Time	Water Level (m)	Depth to Cave (m)
upon completion	dry	no cave

Log of Borehole BH-F2

Project No. SUD-24014195-A0 | Figure No. B-3

Project: MR80 Development | Sheet No. 1 of 1

Location: Hanmer, Ontario

503797 E, 5166748 N

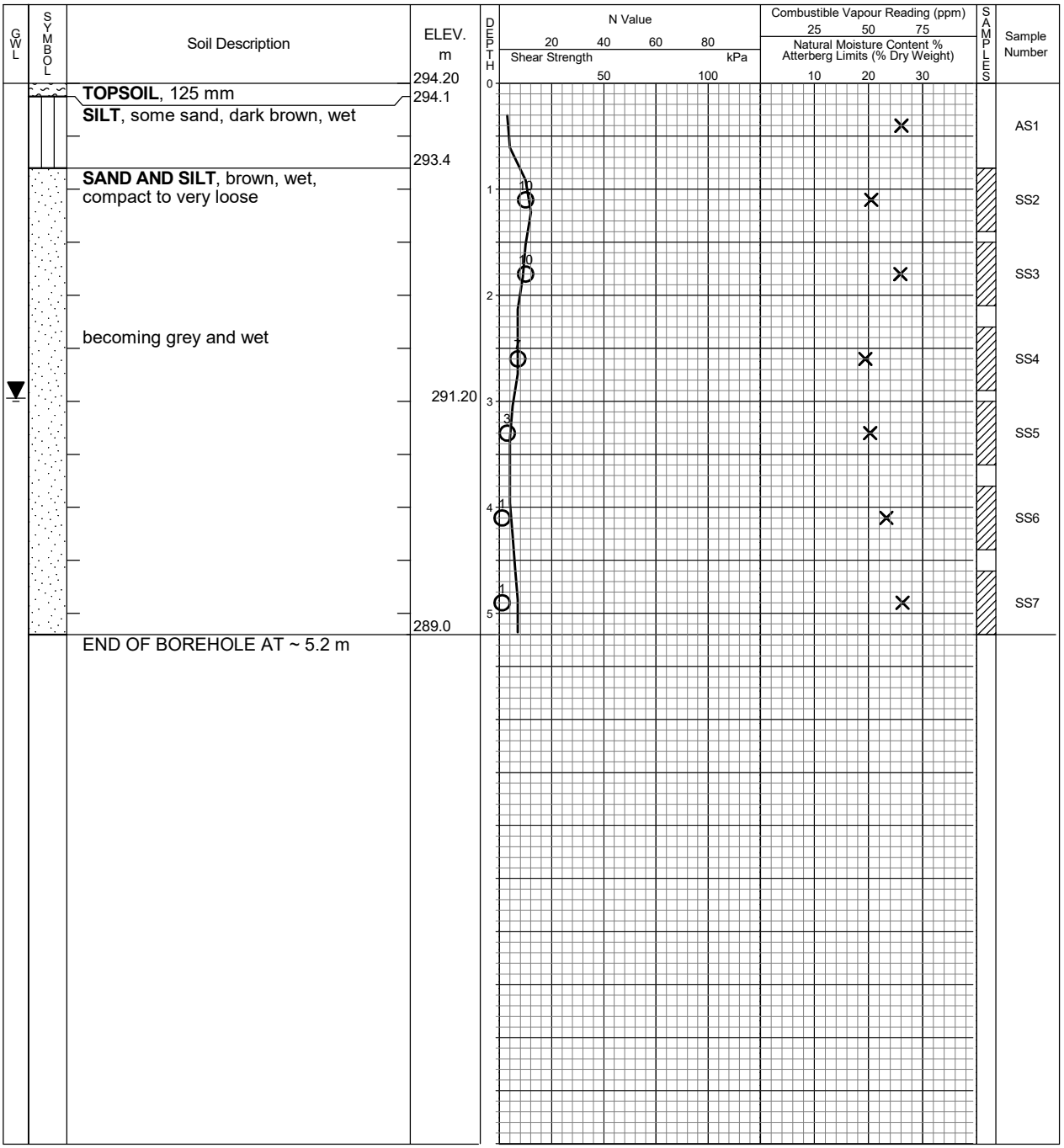
Date Drilled: Jan 16, 2025

Drill Type: CME 55 Track

Datum: Geodetic (hand-held GPS)

Auger Sample | SPT (N) Value | Dynamic Cone Test | Shelby Tube | Field Vane Test (S)

Combustible Vapour Reading | Natural Moisture | Plastic and Liquid Limit | Undrained Triaxial at % Strain at Failure | Penetrometer



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EXP Services Inc.
885 Regent Street
Sudbury, ON P3E 5M4
CANADA
t: +1.705.674.9681
f: +1.705.674.5583

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See Figures B-1A and B-1B for Notes on Sample Description

Time	Water Level (m)	Depth to Cave (m)
upon completion	3.0	3.1

Log of Borehole BH-F3

Project No. SUD-24014195-A0 | Figure No. B-4

Project: MR80 Development | Sheet No. 1 of 1

Location: Hanmer, Ontario

503762 E, 5166711 N

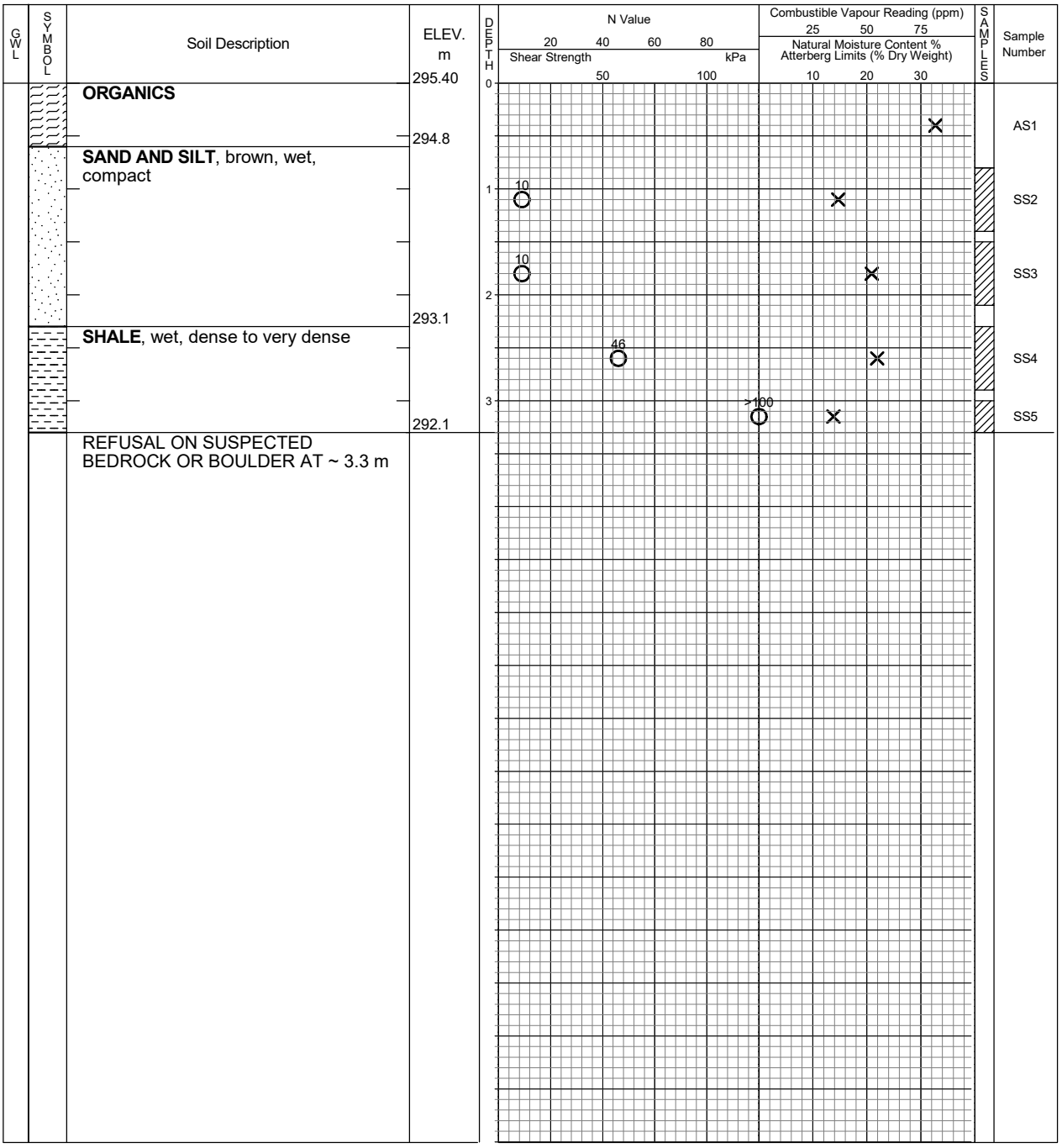
Date Drilled: Jan 17, 2025

Drill Type: CME 55 Track

Datum: Geodetic (hand-held GPS)

Auger Sample | SPT (N) Value | Dynamic Cone Test | Shelby Tube | Field Vane Test (S)

Combustible Vapour Reading | Natural Moisture | Plastic and Liquid Limit | Undrained Triaxial at % Strain at Failure | Penetrometer



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EXP Services Inc.
885 Regent Street
Sudbury, ON P3E 5M4
CANADA
t: +1.705.674.9681
f: +1.705.674.5583

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See Figures B-1A and B-1B for Notes on Sample Description

Time	Water Level (m)	Depth to Cave (m)
upon completion	dry	2.7

Log of Borehole BH-F4

Project No. SUD-24014195-A0 | Figure No. B-5

Project: MR80 Development | Sheet No. 1 of 1

Location: Hanmer, Ontario

503763 E, 5166741 N

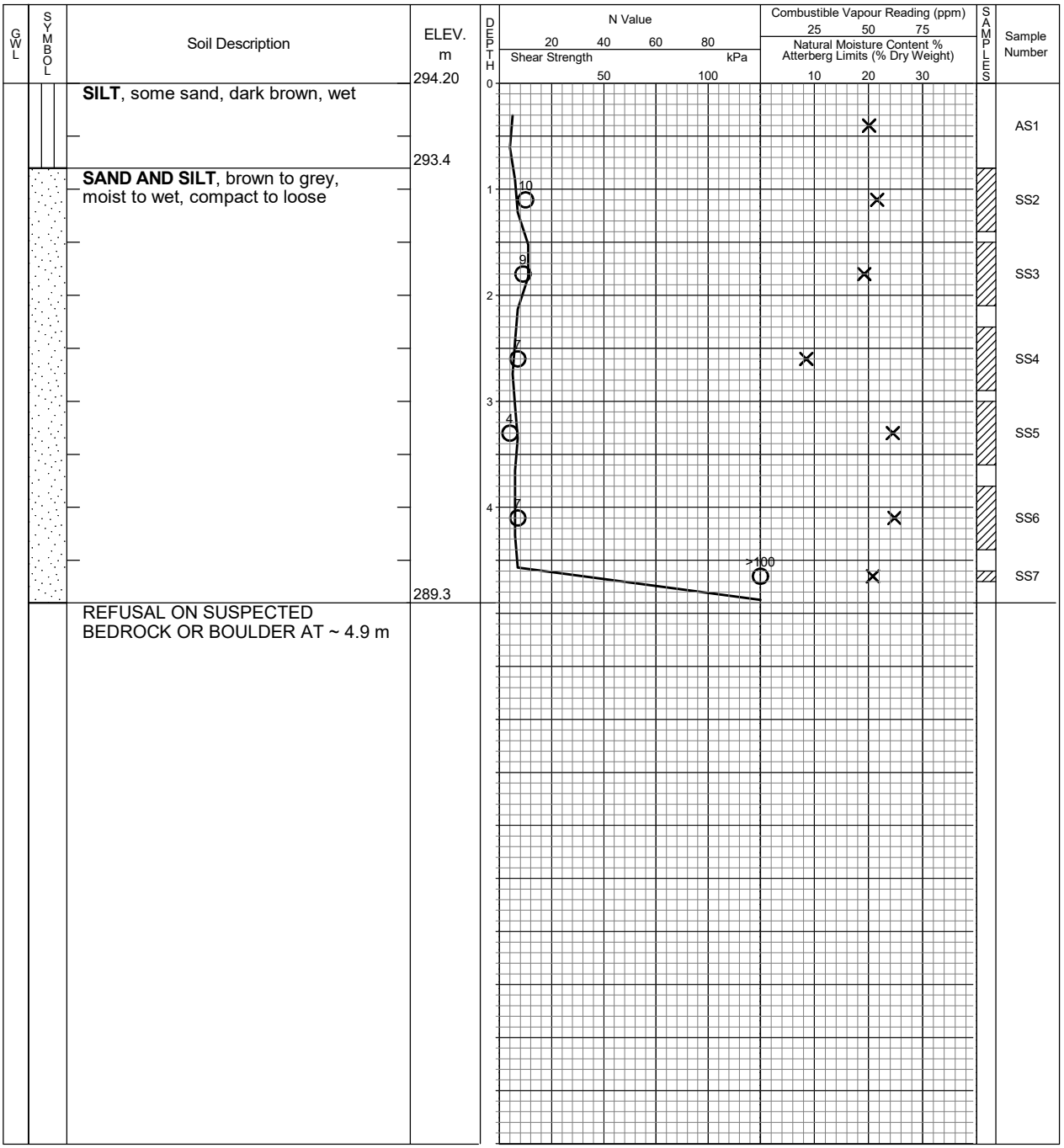
Date Drilled: Jan 17, 2025

Drill Type: CME 55 Track

Datum: Geodetic (hand-held GPS)

Auger Sample | SPT (N) Value | Dynamic Cone Test | Shelby Tube | Field Vane Test (S)

Combustible Vapour Reading | Natural Moisture | Plastic and Liquid Limit | Undrained Triaxial at % Strain at Failure | Penetrometer



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EXP Services Inc.
885 Regent Street
Sudbury, ON P3E 5M4
CANADA
t: +1.705.674.9681
f: +1.705.674.5583

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See Figures B-1A and B-1B for Notes on Sample Description

Time	Water Level (m)	Depth to Cave (m)
upon completion	dry	3.3

Log of Borehole BH-F5

Project No. SUD-24014195-A0 | Figure No. B-6

Project: MR80 Development | Sheet No. 1 of 1

Location: Hanmer, Ontario

503737 E, 5166711 N

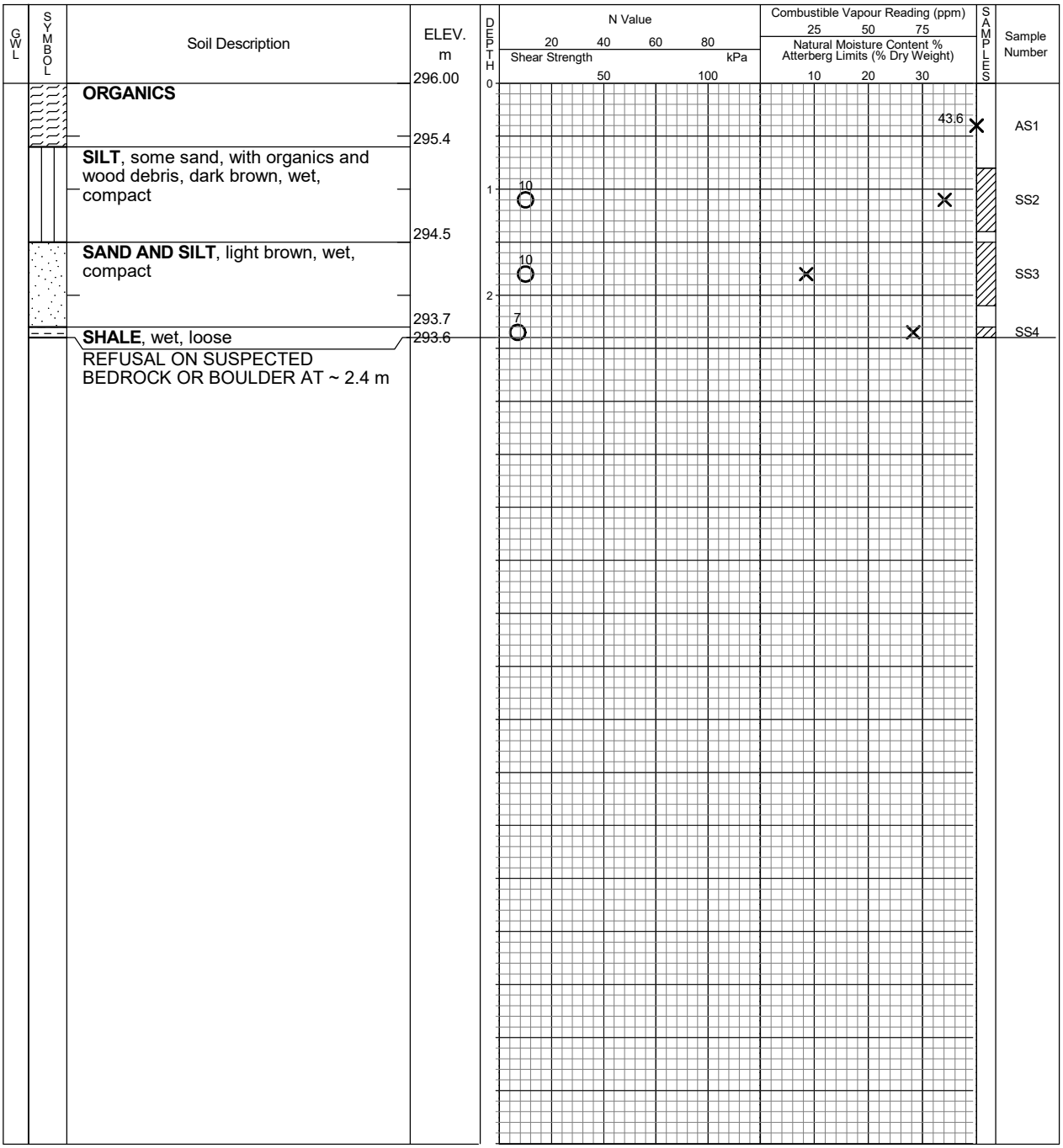
Date Drilled: Jan 17, 2025

Drill Type: CME 55 Track

Datum: Geodetic (hand-held GPS)

Auger Sample | SPT (N) Value | Dynamic Cone Test | Shelby Tube | Field Vane Test (S)

Combustible Vapour Reading | Natural Moisture | Plastic and Liquid Limit | Undrained Triaxial at % Strain at Failure | Penetrometer



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EXP Services Inc.
885 Regent Street
Sudbury, ON P3E 5M4
CANADA
t: +1.705.674.9681
f: +1.705.674.5583

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See Figures B-1A and B-1B for Notes on Sample Description

Time	Water Level (m)	Depth to Cave (m)
upon completion	dry	no cave

PL-CON-2025-00039

Log of Borehole BH-F6

Project No. SUD-24014195-A0 | Figure No. B-7

Project: MR80 Development | Sheet No. 1 of 1

Location: Hanmer, Ontario

503730 E, 5166738 N

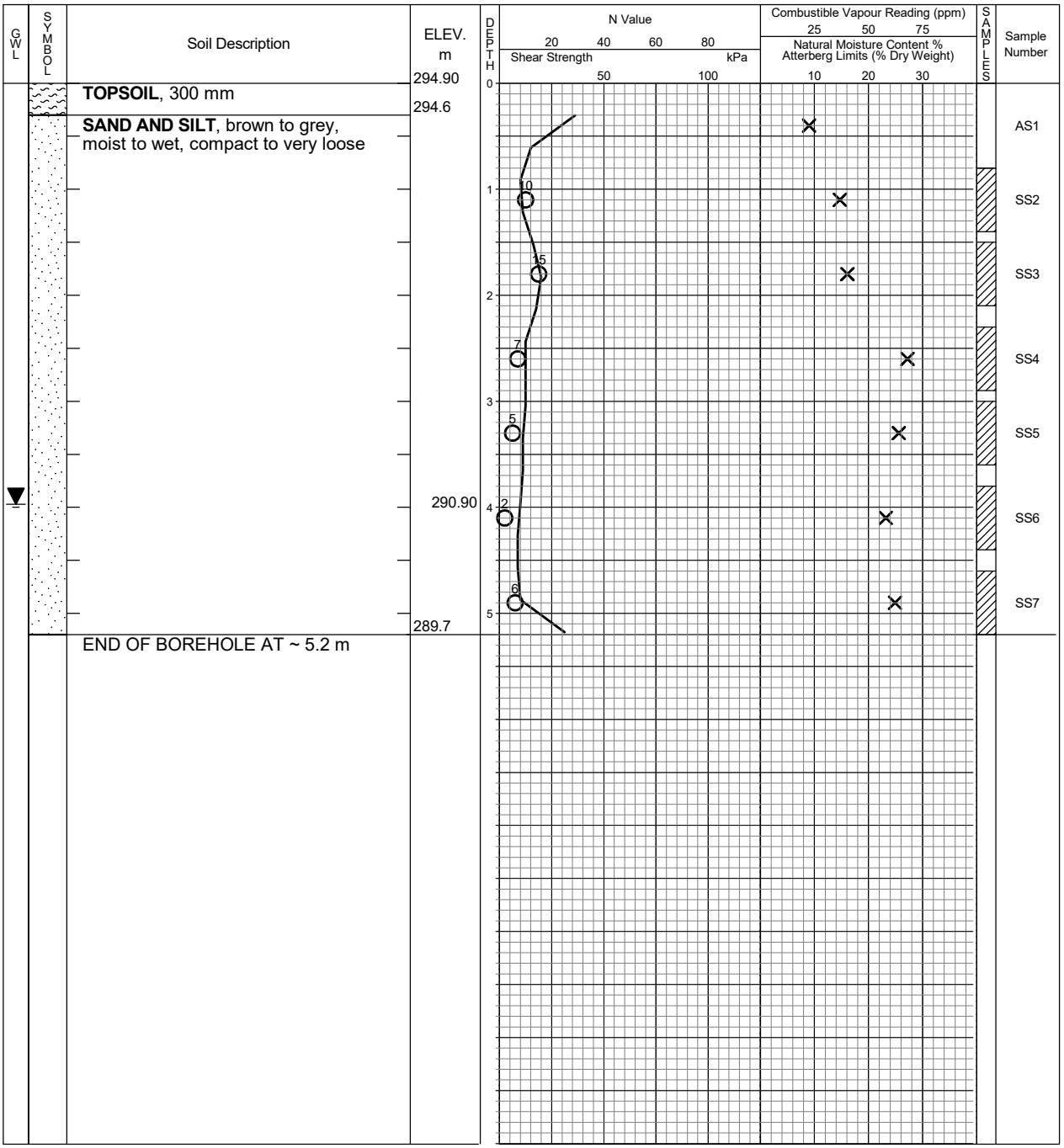
Date Drilled: Jan 16, 2025

Drill Type: CME 55 Track

Datum: Geodetic (hand-held GPS)

Auger Sample | SPT (N) Value | Dynamic Cone Test | Shelby Tube | Field Vane Test (S)

Combustible Vapour Reading | Natural Moisture | Plastic and Liquid Limit | Undrained Triaxial at % Strain at Failure | Penetrometer



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EXP Services Inc.
885 Regent Street
Sudbury, ON P3E 5M4
CANADA
t: +1.705.674.9681
f: +1.705.674.5583

Borehole data requires interpretation assistance from EXP before use by others.

See Figures B-1A and B-1B for Notes on Sample Description

Time	Water Level (m)	Depth to Cave (m)
upon completion	4.0	4.4

Log of Borehole BH-P1

Project No. SUD-24014195-A0 | Figure No. B-8

Project: MR80 Development | Sheet No. 1 of 1

Location: Hanmer, Ontario

503795 E, 5166783 N

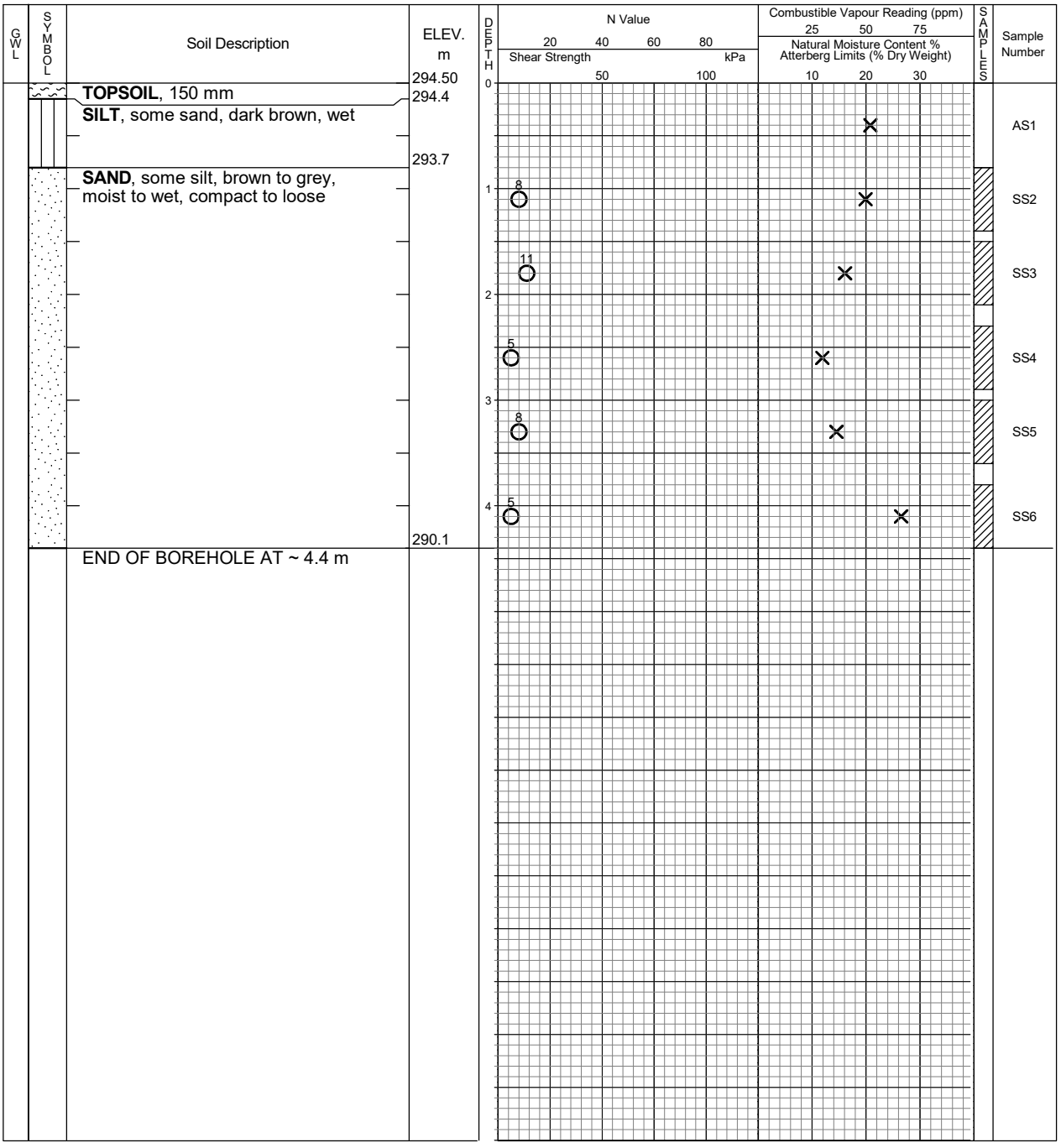
Date Drilled: Jan 16, 2025

Drill Type: CME 55 Track

Datum: Geodetic (hand-held GPS)

Auger Sample
SPT (N) Value
Dynamic Cone Test
Shelby Tube
Field Vane Test (S)

Combustible Vapour Reading
Natural Moisture
Plastic and Liquid Limit
Undrained Triaxial at % Strain at Failure
Penetrometer



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EXP Services Inc.
885 Regent Street
Sudbury, ON P3E 5M4
CANADA
t: +1.705.674.9681
f: +1.705.674.5583

Borehole data requires interpretation assistance from EXP before use by others.

See Figures B-1A and B-1B for Notes on Sample Description

Time	Water Level (m)	Depth to Cave (m)
upon completion	dry	3.5

Log of Borehole BH-P2

Project No. SUD-24014195-A0 | Figure No. B-9

Project: MR80 Development | Sheet No. 1 of 1

Location: Hanmer, Ontario

503761 E, 5166777 N

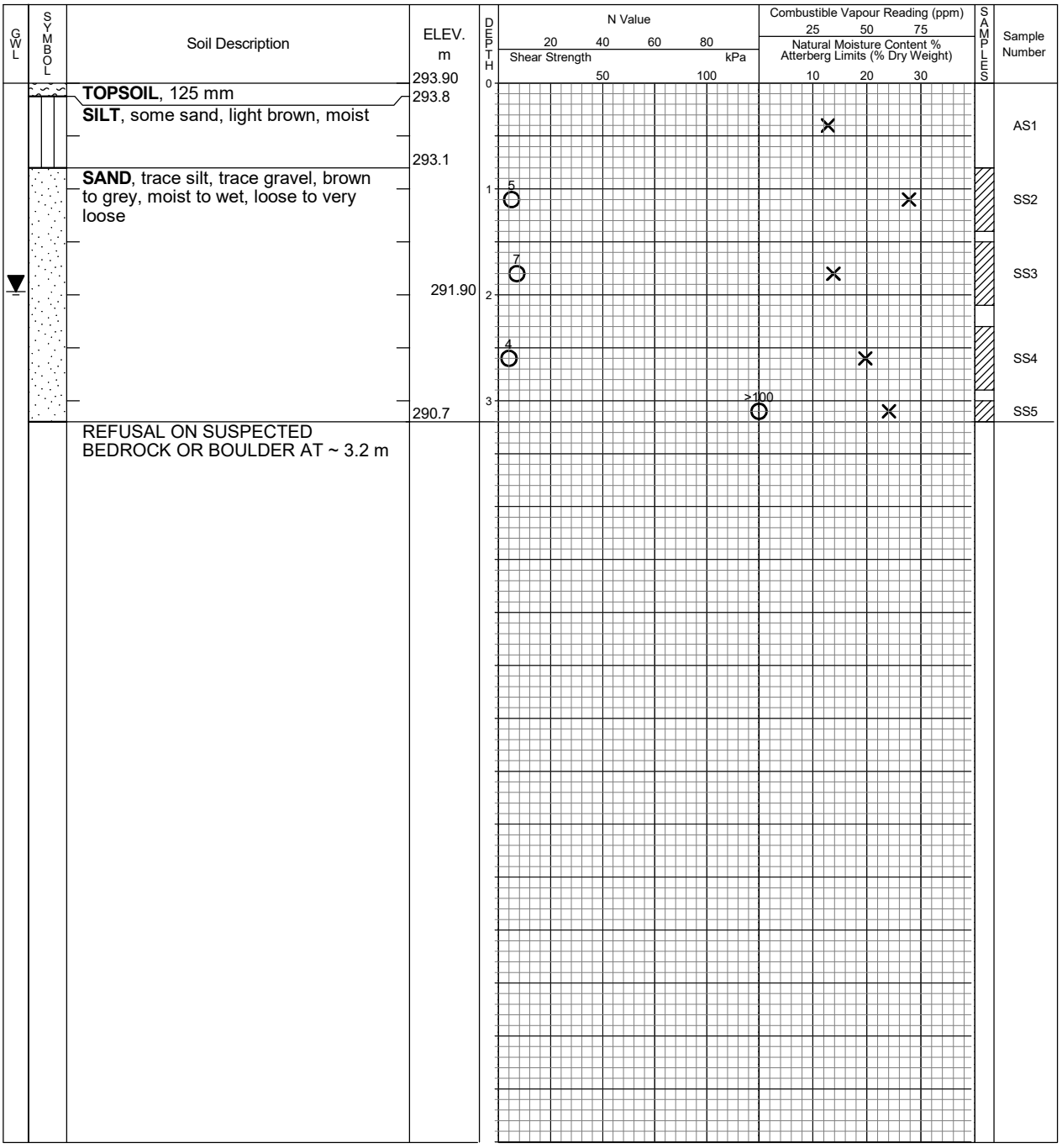
Date Drilled: Jan 16, 2025

Drill Type: CME 55 Track

Datum: Geodetic (hand-held GPS)

Auger Sample | SPT (N) Value | Dynamic Cone Test | Shelby Tube | Field Vane Test (S)

Combustible Vapour Reading | Natural Moisture | Plastic and Liquid Limit | Undrained Triaxial at % Strain at Failure | Penetrometer



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EXP Services Inc.
885 Regent Street
Sudbury, ON P3E 5M4
CANADA
t: +1.705.674.9681
f: +1.705.674.5583

Borehole data requires interpretation assistance from EXP before use by others.

See Figures B-1A and B-1B for Notes on Sample Description

Time	Water Level (m)	Depth to Cave (m)
upon completion	2.0	2.1

Log of Borehole BH-P3

Project No. SUD-24014195-A0 | Figure No. B-10

Project: MR80 Development | Sheet No. 1 of 1

Location: Hanmer, Ontario

503733 E, 5166771 N

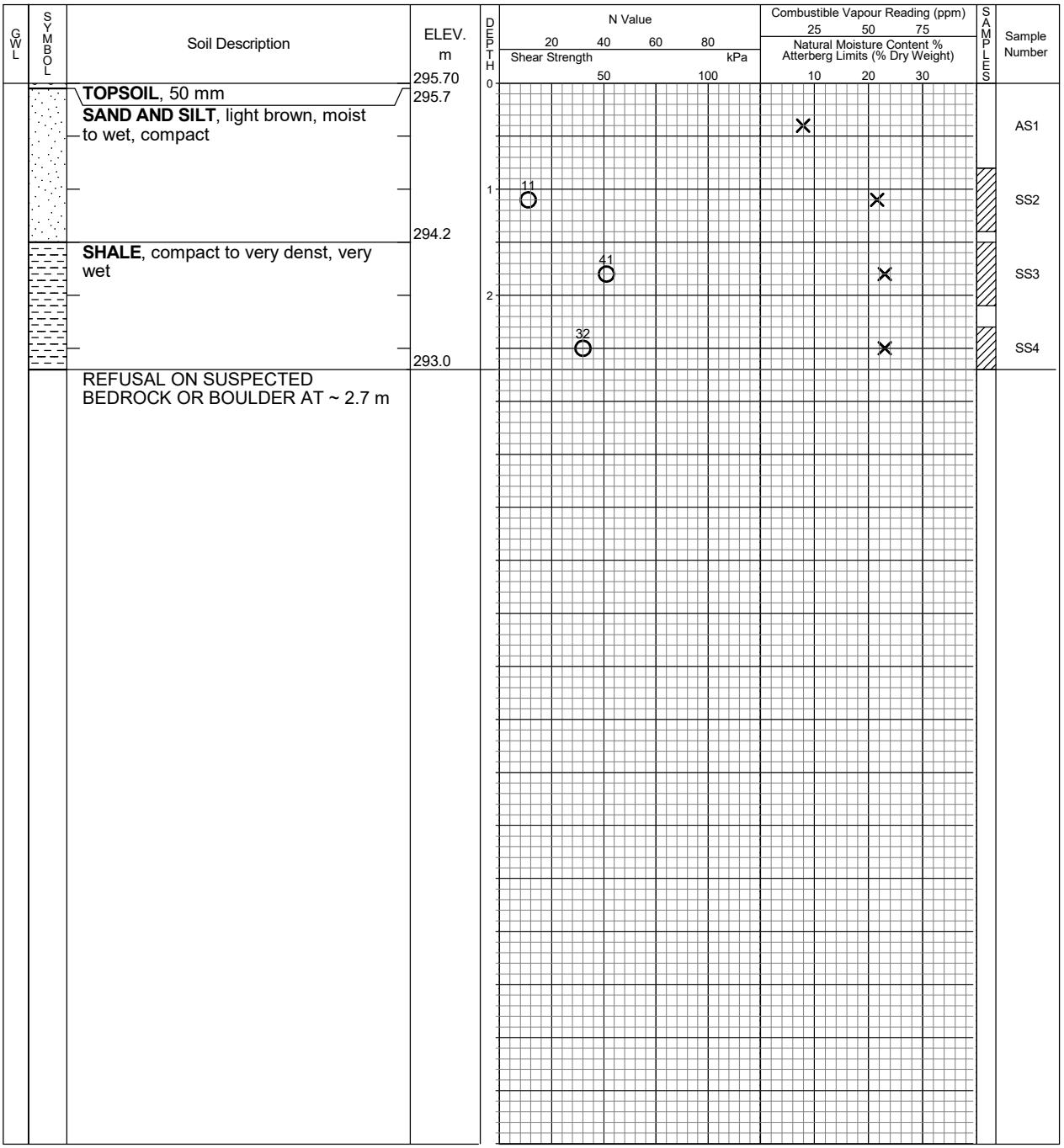
Date Drilled: Jan 16, 2025

Drill Type: CME 55 Track

Datum: Geodetic (hand-held GPS)

Auger Sample | SPT (N) Value | Dynamic Cone Test | Shelby Tube | Field Vane Test (S)

Combustible Vapour Reading | Natural Moisture | Plastic and Liquid Limit | Undrained Triaxial at % Strain at Failure | Penetrometer



SUDBURY GEO SUD-24014195-A0 - MR80 DEVEOLOPMENT.GPJ NEW.GDT 2/19/25

EXP Services Inc.
885 Regent Street
Sudbury, ON P3E 5M4
CANADA
t: +1.705.674.9681
f: +1.705.674.5583

Borehole data requires interpretation assistance from EXP before use by others.

See Figures B-1A and B-1B for Notes on Sample Description

Time	Water Level (m)	Depth to Cave (m)
upon completion	dry	2.0

Log of Borehole BH-R1

Project No. SUD-24014195-A0 | Figure No. B-11

Project: MR80 Development | Sheet No. 1 of 1

Location: Hanmer, Ontario

503784 E, 5166729 N

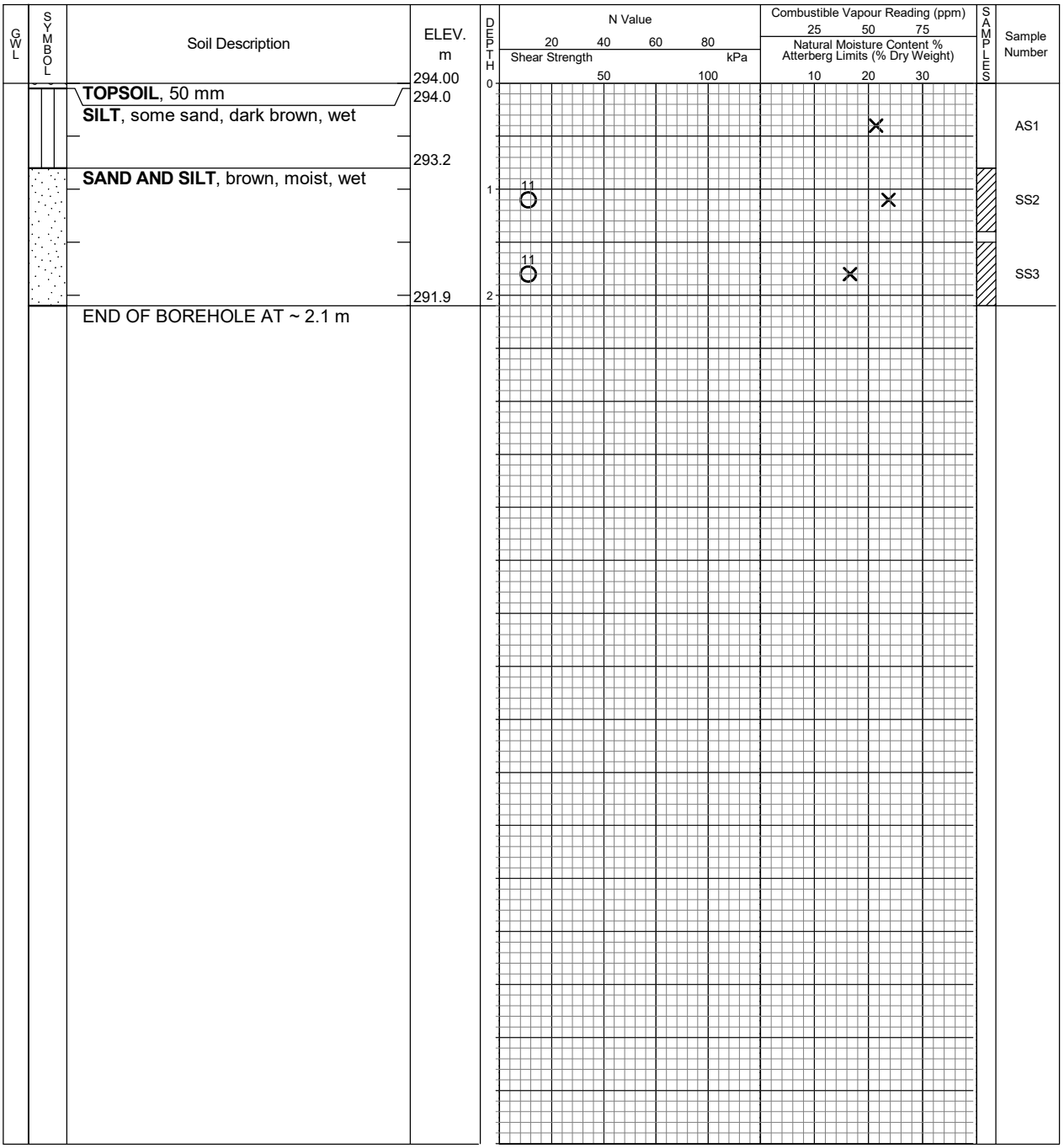
Date Drilled: Jan 17, 2025

Drill Type: CME 55 Track

Datum: Geodetic (hand-held GPS)

Auger Sample | SPT (N) Value | Dynamic Cone Test | Shelby Tube | Field Vane Test (S)

Combustible Vapour Reading | Natural Moisture | Plastic and Liquid Limit | Undrained Triaxial at % Strain at Failure | Penetrometer



SUDBURY GEO SUD-24014195-A0 - MR80 DEVEOLOPMENT.GPJ NEW.GDT 2/19/25

EXP Services Inc.
885 Regent Street
Sudbury, ON P3E 5M4
CANADA
t: +1.705.674.9681
f: +1.705.674.5583

Borehole data requires interpretation assistance from EXP before use by others.

See Figures B-1A and B-1B for Notes on Sample Description

Time	Water Level (m)	Depth to Cave (m)
upon completion	dry	no cave

Log of Borehole BH-R2

Project No. SUD-24014195-A0 | Figure No. B-12

Project: MR80 Development | Sheet No. 1 of 1

Location: Hanmer, Ontario

503744 E, 5166730 N

Date Drilled: Jan 16, 2025

Drill Type: CME 55 Track

Datum: Geodetic (hand-held GPS)

Auger Sample | SPT (N) Value | Dynamic Cone Test | Shelby Tube | Field Vane Test (S)

Combustible Vapour Reading | Natural Moisture | Plastic and Liquid Limit | Undrained Triaxial at % Strain at Failure | Penetrometer

GWL	SYMBOL	Soil Description	ELEV. m	DEPTH	N Value / Shear Strength kPa	Combustible Vapour Reading (ppm) / Natural Moisture Content % / Atterberg Limits (% Dry Weight)	SAMPLES	Sample Number
		TOPSOIL, 200 mm	294.30	0				
		SILT, some sand, dark brown, wet	294.1					AS1
		SAND AND SILT, brown, moist, compact, wet	293.5	1	11		SS2	SS2
					12		SS3	SS3
		END OF BOREHOLE AT ~ 2.1 m	292.2	2				

N Value: 20 40 60 80 | Shear Strength: 50 100 kPa

Combustible Vapour Reading (ppm): 25 50 75 | Natural Moisture Content % Atterberg Limits (% Dry Weight): 10 20 30

SUDBURY GEO SUD-24014195-A0 - MR80 DEVEOLOPMENT.GPJ NEW.GDT 2/19/25

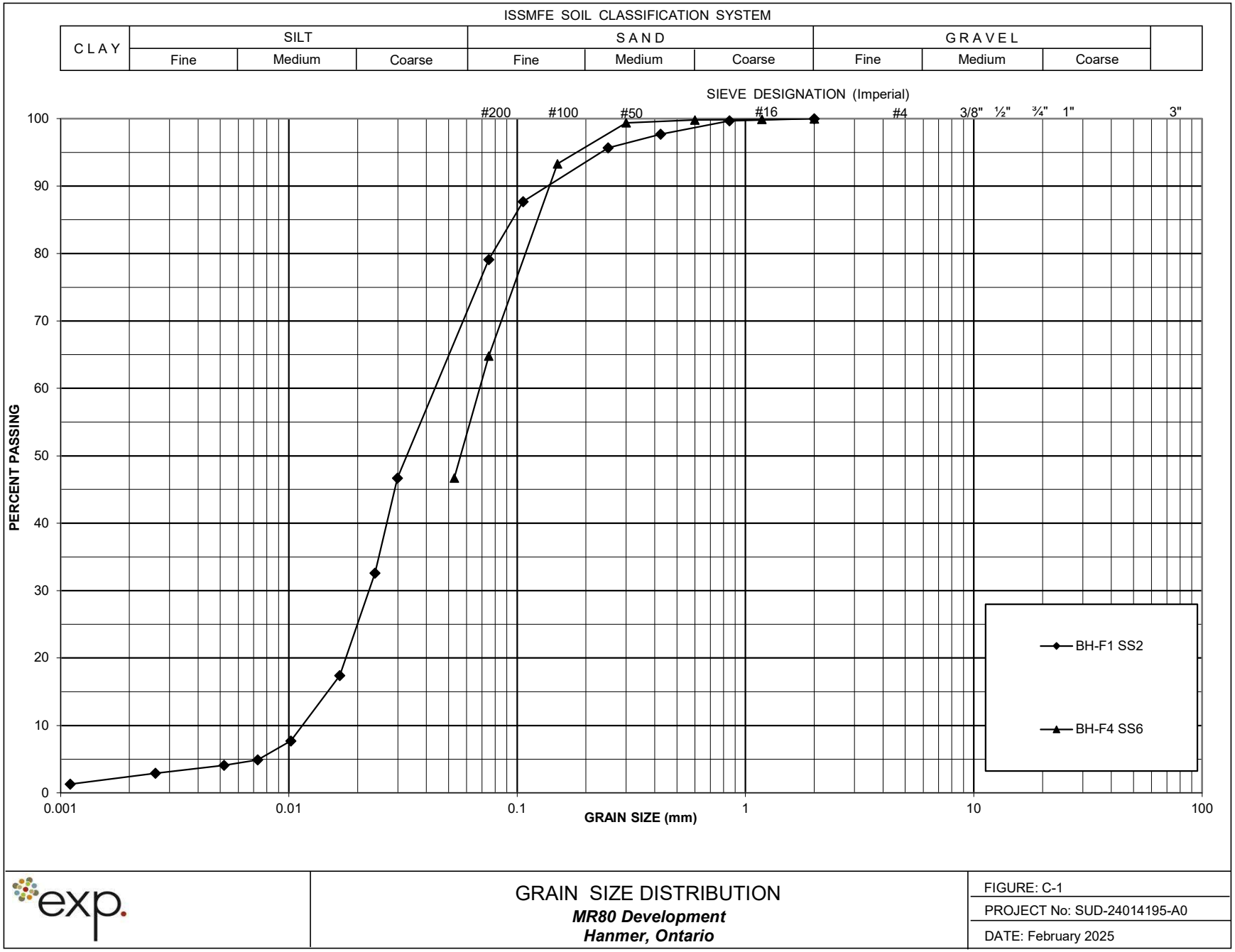
EXP Services Inc.
885 Regent Street
Sudbury, ON P3E 5M4
CANADA
t: +1.705.674.9681
f: +1.705.674.5583

Borehole data requires interpretation assistance from EXP before use by others.

See Figures B-1A and B-1B for Notes on Sample Description

Time	Water Level (m)	Depth to Cave (m)
upon completion	dry	no cave

Appendix C – Geotechnical Laboratory Testing



GRAIN SIZE DISTRIBUTION

MR80 Development

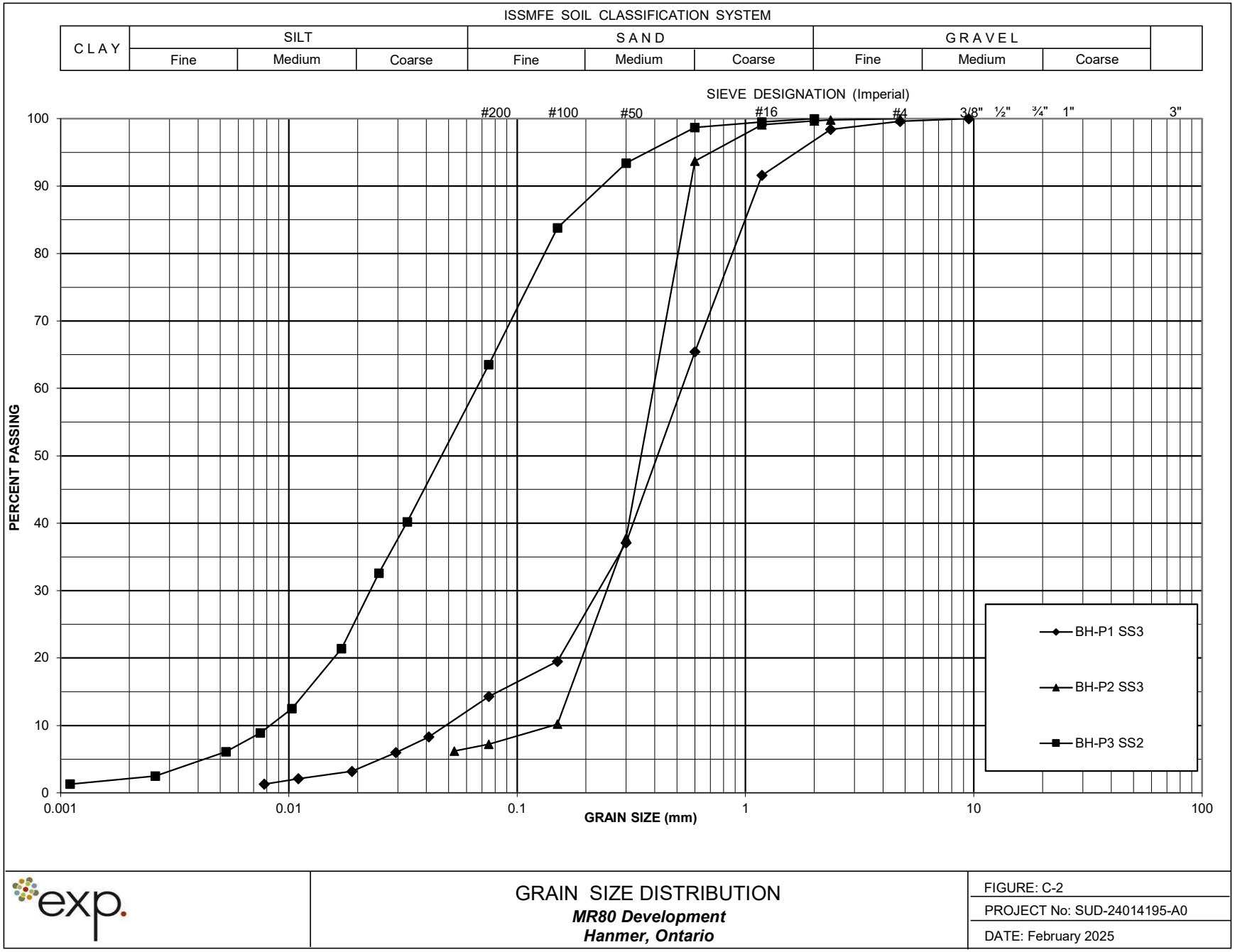
Hanmer, Ontario

FIGURE: C-1

PROJECT No: SUD-24014195-A0

DATE: February 2025

PL-CON-2025-00039



exp.

GRAIN SIZE DISTRIBUTION

MR80 Development

Hanmer, Ontario

FIGURE: C-2

PROJECT No: SUD-24014195-A0

DATE: February 2025

PL-CON-2025-00039

Box 5000, Station A
200 Brady Street
Sudbury, Ontario P3A 5P3
(705) 671-2489 ext 4376 or 4346
(705) 673-2200 FAX

Record #: PL-CON-2025-00040

APPLICATION SUMMARY

File Date: June 10, 2025

Application Type: Consent (Land Severance)

Address(es): 6034 Municipal Road 80, Hanmer P3P 1W7

Applicant(s): DORLAND GEOMATICS

Owner(s): 1916556 ONTARIO LIMITED

PLANNING APPLICATION
PURPOSE OF TRANSACTION

☐ **Addition to Lot**

Area	Area (Second Additional Lot if Applicable)
Depth	Depth (Second Additional Lot if Applicable)
Frontage	Frontage (Second Additional Lot if Applicable)

☐ **Creation of New Lot**

Area	
Depth	
Frontage	

☐ **Creation of Lot(s) for Semi-Detached or Row Housing**

Area

Depth

Frontage

☒ Cancellation of Prior Consent

File No. of Prior Consent

Type of Consent being cancelled

If you are cancelling a prior lot creation, is there a current driveway accessing the created lot?

☒ Easement/Right-of-Way

Area
5156

Depth
159.66

Frontage
31.04

Area (Second Easement or Right-of-Way if Applicable)
5145

Depth (Second Easement or Right-of-Way if Applicable)
159.58

Frontage (Second Easement or Right-of-Way if Applicable)
31.02

☐ Lease

Area

Depth

Frontage

☐ Other

Describe Other

Area
5156

Depth
159.66

Frontage
31.04

GENERAL APPLICATION

Are there multiple properties associated with the application?
Yes

Please describe the additional properties associated with this application
#6022 MR 80 (PIN 73503-1715) This property is owned by Treleaven Real Estate Holdings Inc. (c/o Jeff Treleaven)

and

#6040 MR 80 (PIN 73503-1717) This property is owned by 1916556 Ontario Limited (c/o Amit Parmar)

Are you the registered owner or an authorized agent?
Authorized Agent

What is the date of acquisition of subject land?
2023/05/08

What is the number of dwelling units on the property?
4

What is the number of proposed new buildings/structures on the property?

What is the number of existing buildings/structures on the property?
1

If this application is approved, would any existing dwelling units be legalized?
No

How many dwelling units will be legalized?

Is this property located within an area subject to the Greater Sudbury Source Protection Plan?
No

Provide details on how the property is designated in the Source Protection Plan

CONSENT

Name of person(s) to whom land or interest in land is intended to be conveyed, leased or mortgaged
1916556 Ontario Limited (c/o Amit Parmar)

Are there any easements or restrictive covenants affecting the subject land?
No

Please indicate a description of each easement or covenant and its effect

Has the land ever had any previous severances?
Yes

Name of transferee
Ronald Thibert

Date of transfer
2022/03/11

Use of severed land
4 unit row housing

Is property located with 1km (.6 miles) of a First Nation Reserve?
No

Has the parcel intended to be severed ever been, or is it now part of a Plan of Subdivision?
No

Please indicate the file number and status of the application

What is the current designation of the subject land in the applicable Official Plan?
Living Area 1

Explain how the application conforms with the Official Plan
Residential row housing units are permitted use in Living Area 1

Explain how the application is consistent with the Provincial Policy Statements
N/A this is just an application for the following:

1) a shared 6.0m wide R.O.W. for access between Municipal # 6022 & 6034 MR 80 (note: this ROW will also cross over Mun. # 6040 so fire/garbage trucks can move in a forward direction)-See attached sketch-page 3 of 7. This ROW will be described on a future plan of survey.

2) an easement for access into Storm Water Management Pond for maintenance purposes will be within Mun. # 6024 (see sketch 3 of 7 attached. This easement will be described on a future plan of survey.

3) an easement for a refuse & a recycling container (2 moloks) will be described as a part on a future plan of survey) because these 3 adjoining properties will be using these moloks (Municipal # 6022, 6034 & 6040 MR 80) Moloks are proposed on Mun.# 6040 property -see sketch 4 of 7. This easement will be described on a future plan of survey.

4) an easement for Fire Fighter Access will cross over Mun.# 6034 & 6040 & will provide access to Mun.#6022 too. (see sketch 4 of 7). This easement will be described on a future plan of survey.

5) a proposed drainage easement will be described in a future plan of survey (see sketch 5 of 7) This drainage easement will cross over into Mun. # 6040. This easement will be described on a future plan of survey.

6) Mun.# 6022, 6034 & 6040 will benefit from a drainage easement for the proposed Storm Water Management Pond which is within Mun. # 6034 & 6040 (see sketch page 5 of 7). This easement will be described on a future plan of survey.

7) Snow storage easements will be provided on all 3 lots & will be described in a future plan of survey (see page 6 of 7)

Explain how the application conforms, or does not conflict with the Growth Plan for Northern Ontario
N/A this is just an application for the following:

1) a shared 6.0m wide R.O.W. for access between Municipal # 6022 & 6034 MR 80 (note: this ROW will also cross over Mun. # 6040 so fire/garbage trucks can move in a forward direction)-See attached sketch-page 3 of 7. This ROW will be described on a future plan of survey.

2) an easement for access into Storm Water Management Pond for maintenance purposes will be within Mun. # 6024 (see sketch 3 of 7 attached. This easement will be described on a future plan of survey.

3) an easement for a refuse & a recycling container (2 moloks) will be described as a part on a future plan of survey) because these 3 adjoining properties will be using these moloks (Municipal # 6022, 6034 & 6040 MR 80) Moloks are proposed on Mun.# 6040 property -see sketch 4 of 7. This easement will be described on a future plan of survey.

4) an easement for Fire Fighter Access will cross over Mun.# 6034 & 6040 & will provide access to Mun.#6022 too. (see sketch 4 of 7). This easement will be described on a future plan of survey.

5) a proposed drainage easement will be described in a future plan of survey (see sketch 5 of 7) This drainage easement will cross over into Mun. # 6040. This easement will be described on a future plan of survey.

6) Mun.# 6022, 6034 & 6040 will benefit from a drainage easement for the proposed Storm Water Management Pond which is

within Mun. # 6034 & 6040 (see sketch page 5 of 7). This easement will be described on a future plan of survey.

7) Snow storage easements will be provided on all 3 lots & will be described in a future plan of survey (see page 6 of 7)

CONCURRENT APPLICATIONS

☐ **Minor Variance**

File Number(s) - Minor Variance

Status - Minor Variance

☐ **Rezoning**

File Number(s) - Rezoning

Status - Rezoning

☐ **Official Plan Amendment**

File Number(s) - Official Plan Amendment

Status - Official Plan Amendment

LAND RETAINED

Area	Depth	Frontage
5156	159.66	31.04

Existing use of land

4 unit row housing residential

Proposed use of land

existing 4 unit row housing residential building & a proposed 6 unit row housing building

Proposed use of land

Will a certificate be required for the retained land?

No

WATER/SEWAGE - RETAINED

Municipally owned and operated piped water system	[X]
Municipally owned and operated sanitary sewage system	[X]
Lake	[ ]
Pit Privy	[ ]
Individual Well	[ ]
Communal Well	[ ]
Individual Septic System	[ ]
Communal Septic System	[ ]
Other	[ ]

Explain Other

PROPERTY ACCESS - RETAINED

Provincial highway	[ ]
Road maintained by the municipality	[ ]
Municipal road that is maintained seasonally	[ ]
Municipal road that is maintained yearly	[X]
Water	[ ]

Indicate the parking and docking facilities to be used if via water

Estimate the distance of these facilities from the retained land and nearest public road by water

LAND SEVERED

Existing use of land

n/a this application is for a ROW & easements (NO severance).
Note: there is an existing 4 unit townhouse on Mun. # 6034 & 6040

Proposed use of land

n/a this application is for ROW & easements (No severance)
Note: there is a 6 unit townhouse proposed on Mun.# 6034 & on Mun.# 6040 lot.

Parcel # and/or Lot and registered Plan of Subdivision # of property which will benefit

n/a

WATER/SEWAGE - SEVERED

Municipally owned and operated piped water system	[X]
Municipally owned and operated sanitary sewage system	[X]
Lake	[ ]
Pit Privy	[ ]
Individual Well	[ ]
Communal Well	[ ]
Individual Septic System	[ ]
Communal Septic System	[ ]
Other	[ ]

Explain Other

PROPERTY ACCESS - SEVERED

Provincial highway	[ ]
Road maintained by the municipality	[ ]
Municipal road that is maintained seasonally	[ ]
Municipal road that is maintained yearly	[X]
Water	[ ]

Indicate the parking and docking facilities to be used via water

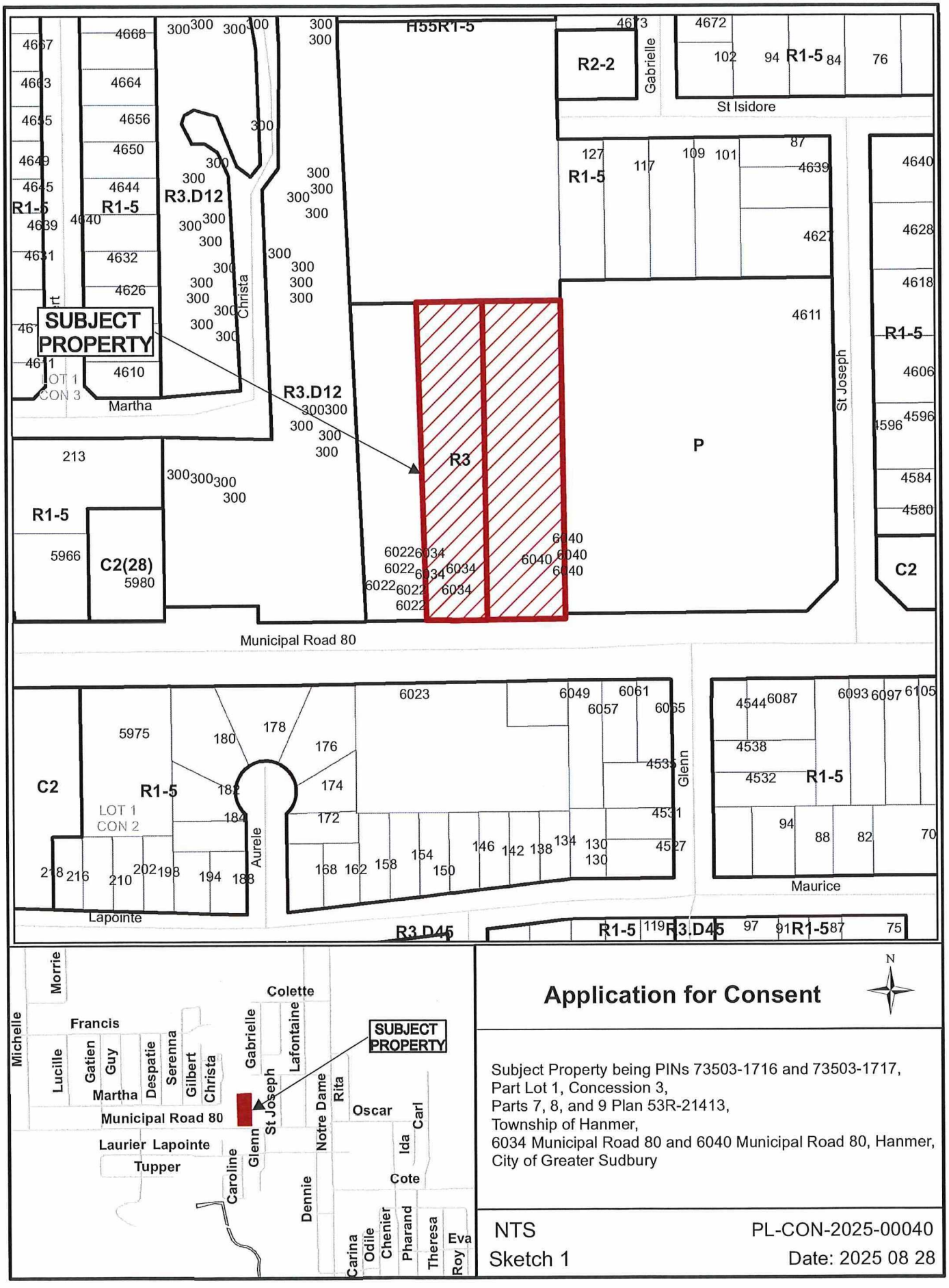
Estimate the distance of these facilities from the severed land and nearest public road by water

PROPOSED BUILDING/STRUCTURE

Building Description	Location	Same As Existing	Proposed Ground Floor Area (m2)	Proposed Gross Floor Area (m2)	Proposed Number of Storeys	Proposed Width (m)	Proposed Length (m)	Proposed Height (m)	Proposed Front Yard Setback (m)	Proposed Rear Yard Setback (m)	Proposed Side Yard Setback (m)	Proposed Side Yard Setback Other (m)

EXISTING BUILDING/STRUCTURE

Building Description	Location	To Be Demolished	Existing Ground Floor Area (m2)	Existing Gross Floor Area (m2)	Existing Number of Storeys	Existing Width (m)	Existing Length (m)	Existing Height (m)	Existing Front Yard Setback (m)	Existing Rear Yard Setback (m)	Existing Side Yard Setback (m)	Existing Side Yard Setback Other (m)
4 unit row housing	Retained Land	No	516	516	1	14.4	38.6	6.1	25.1	95.9	7.5	9.5



Application for Consent

Subject Property being PINs 73503-1716 and 73503-1717,
Part Lot 1, Concession 3,
Parts 7, 8, and 9 Plan 53R-21413,
Township of Hanmer,
6034 Municipal Road 80 and 6040 Municipal Road 80, Hanmer,
City of Greater Sudbury

NTS
Sketch 1

PL-CON-2025-00040
Date: 2025 08 28

SKETCH FOR PLANNING ACT APPLICATIONS

PROPOSED DEVELOPMENT # 6022, 6034 & 6040 MR80

PART OF LOT 1, CONCESSION 3
GEOGRAPHIC
TOWNSHIP OF HANMER
CITY OF GREATER SUDBURY
DISTRICT OF SUDBURY

SCALE 1:750
METRES
0 5 10 20 30 40 50

CAUTION:
THIS IS NOT A PLAN OF SURVEY AND SHOULD ONLY BE USED FOR THE PURPOSE NOTED IN THE TITLE BLOCK

FIELD WORK WAS COMPLETED OCT. 14, 2024.

PROPERTY BOUNDARY DIMENSIONS SHOWN HEREON ARE DERIVED FROM PLAN 53R-21413.

LEGEND

PIN	DENOTES PROPERTY IDENTIFIER NUMBER
LT	DENOTES LAND TITLES
☒	DENOTES BELL BOX
UP	DENOTES UTILITY POLE
AN	DENOTES ANCHOR
WV	DENOTES WATER VALVE
UH—UH	DENOTES UNDERGROUND HYDRO LINE
UG—UG	DENOTES UNDERGROUND GAS LINE
u—u	DENOTES OVERHEAD UTILITY LINES
x—x	DENOTES FENCE
	DENOTES GARAGE
MH	DENOTES MANHOLE
	DENOTES PROPOSED AREA OF GRAVEL DRIVEWAYS & PARKING AREAS
D	DENOTES PROPOSED DECK
FYSB	DENOTES FRONT YARD SETBACK (MIN.)
RYSB	DENOTES REAR YARD SETBACK (MIN.)
R.O.W.	DENOTES RIGHT-OF-WAY

NOTE: 2 MOLOKS WILL BE SERVING ALL 3 LOTS.

** SEE EXP SERVICES SITE SERVICING DRAWING & LOT GRADING PLAN FOR THIS DEVELOPMENT.

D.S. DORLAND LIMITED
ONTARIO LAND SURVEYORS
GEOMATICS PROFESSIONALS
298 LARCH STREET
SUDBURY, ONTARIO, P3B 1M1
PHONE (705) 673-2556 FAX (705) 673-1051
WWW.DSDORLANDLIMITED.CA

PREPARED BY : A. ALATYPPO	SCALE : 1:750 METRIC
FIELD WORK DATE: MAY 3, 2024	CAD FILE : 18712-18718-SKETCH.dwg
DATE : AUGUST 4, 2025	P. SPACE TAB : SKETCH PROP.750s(PG2OF7)

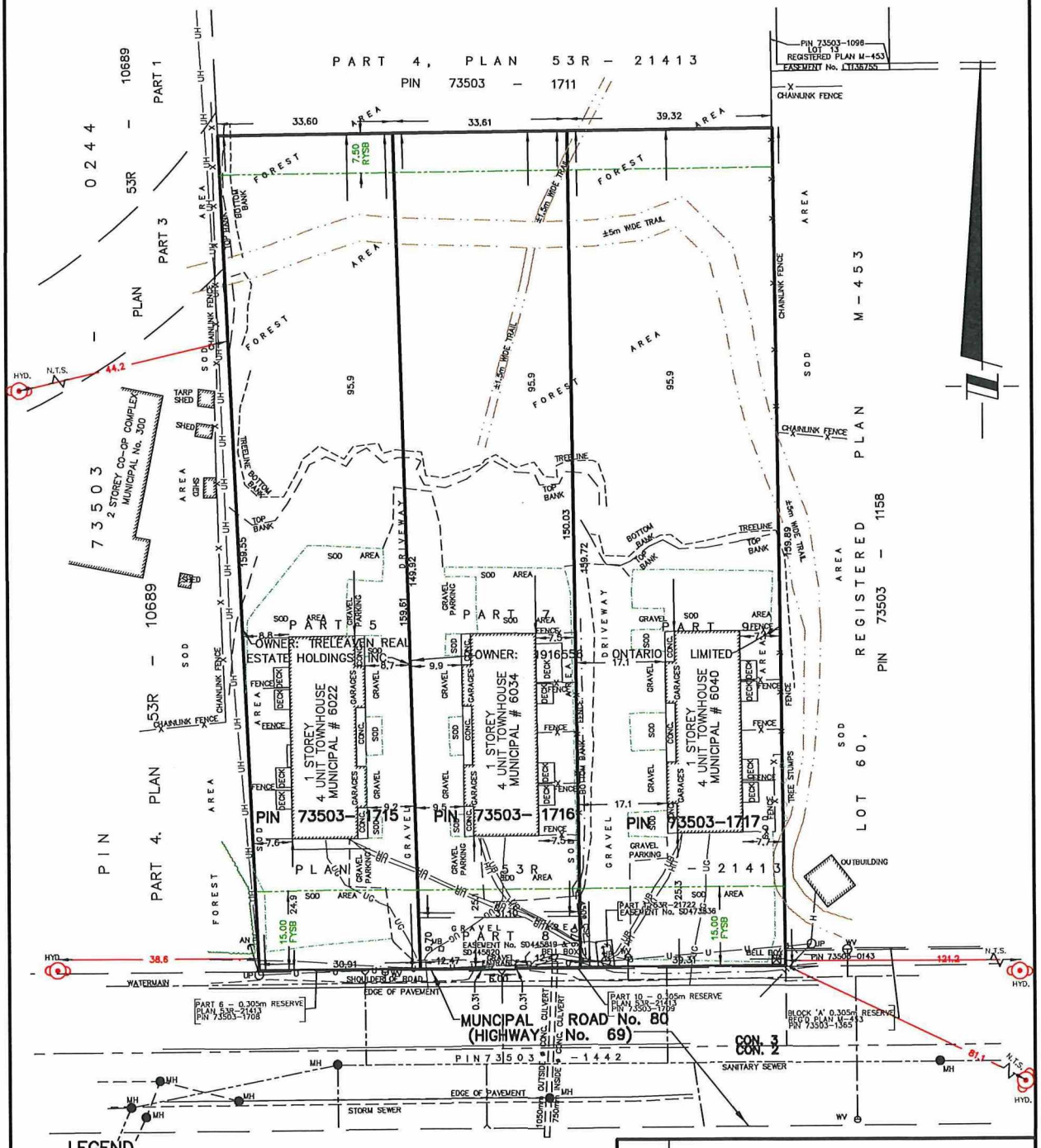
PL-CON-2025-00040 Sketch 2

SKETCH FOR PLANNING ACT APPLICATIONS

EXISTING CONDITIONS MUN.# 6022, 6034 & 6040 MR80

PART OF LOT 1, CONCESSION 3
GEOGRAPHIC
TOWNSHIP OF HANMER
CITY OF GREATER SUDBURY
DISTRICT OF SUDBURY

SCALE 1:750
0 5 10 20 30 40 50 METRES



LEGEND

PIN	DENOTES PROPERTY IDENTIFIER NUMBER
LT	DENOTES LAND TITLES
☒	DENOTES BELL BOX
UP	DENOTES UTILITY POLE
AN	DENOTES ANCHOR
WV	DENOTES WATER VALVE
UH—UH	DENOTES UNDERGROUND HYDRO LINE
UG—UG	DENOTES UNDERGROUND GAS LINE
u—u	DENOTES OVERHEAD UTILITY LINES
x—x	DENOTES FENCE
	DENOTES GARAGE
MH	DENOTES MANHOLE

CAUTION:
THIS IS NOT A PLAN OF SURVEY AND SHOULD ONLY BE USED FOR THE PURPOSE NOTED IN THE TITLE BLOCK

FIELD WORK WAS COMPLETED OCT. 14, 2024.

PROPERTY BOUNDARY DIMENSIONS SHOWN HEREON ARE DERIVED FROM PLAN 53R-21413.

MB	DENOTES MAIL BOX
FYSB	DENOTES FRONT YARD SETBACK (MIN.)
RYSB	DENOTES REAR YARD SETBACK (MIN.)

D.S. DORLAND LIMITED
ONTARIO LAND SURVEYORS
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298 LARCH STREET
SUDBURY, ONTARIO, P3B 1M1
PHONE (705) 673-2556 FAX (705) 673-1051
WWW.DSDORLANDLIMITED.CA

PREPARED BY : A. ALATYPPO	SCALE : 1:750 METRIC
FIELD WORK DATE: MAY 3, 2024	CAD FILE : 18712-18718-SKETCH.dwg
DATE : AUGUST 4, 2025	P. SPACE TAB : SKETCH EXIST.750s(PG1OF7)

PL-CON-2025-00040 Sketch 3

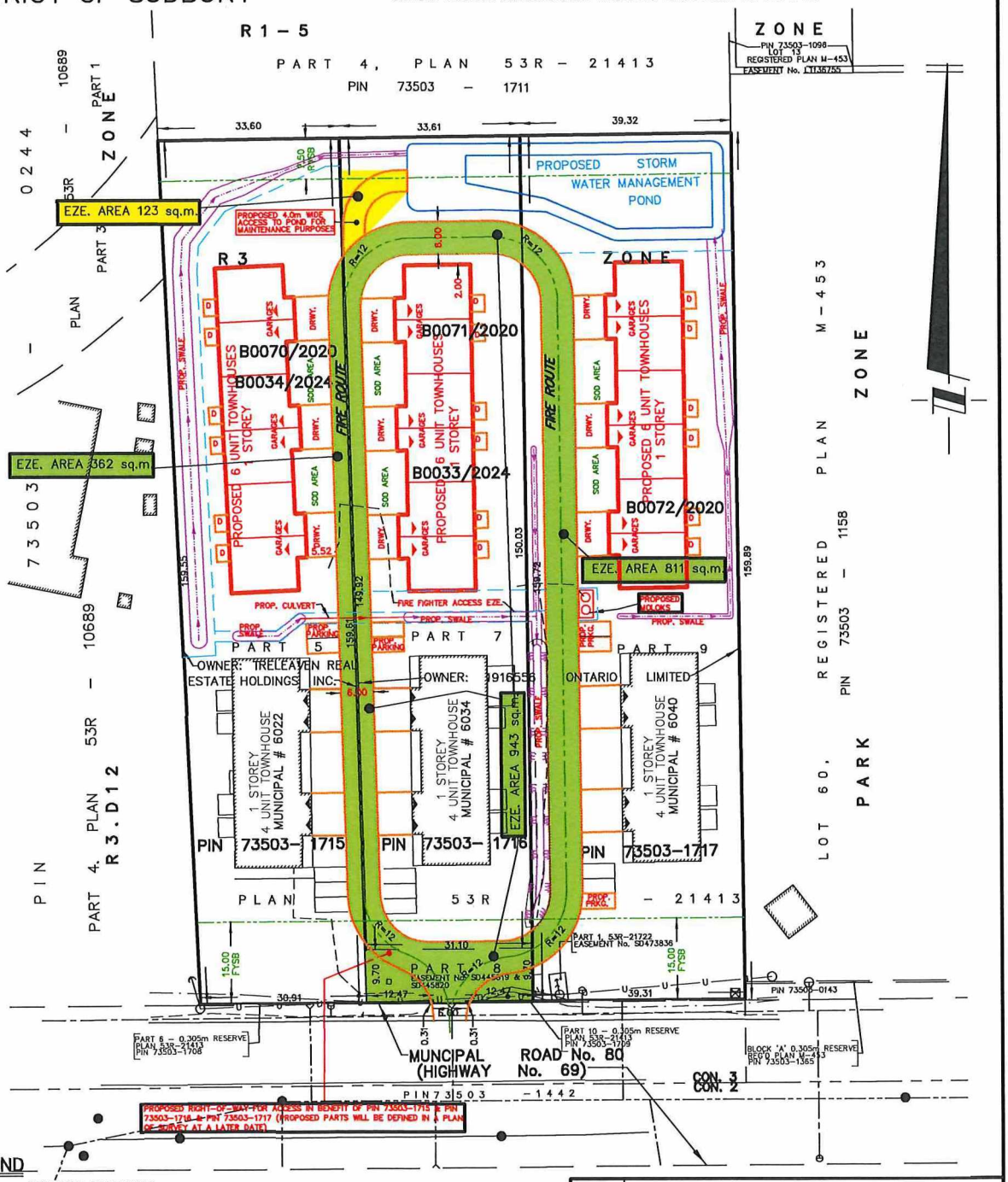
SKETCH FOR PLANNING ACT APPLICATIONS

PROPOSED R.O.W. FOR # 6022, 6034 & 6040 MR80 AND R.O.W. ACCESS TO S.W.M. POND

PART OF LOT 1, CONCESSION 3
GEOGRAPHIC
TOWNSHIP OF HANMER
CITY OF GREATER SUDBURY
DISTRICT OF SUDBURY

SCALE 1:750
0 5 10 20 30 40 50 METRES

CAUTION:
THIS IS NOT A PLAN OF SURVEY AND SHOULD ONLY BE USED FOR THE PURPOSE NOTED IN THE TITLE BLOCK
FOR CLARITY, NOT ALL EXISTING TOPOGRAPHICAL ARE SHOWN ON THIS SKETCH.
FIELD WORK WAS COMPLETED OCT. 14, 2024.
PROPERTY BOUNDARY DIMENSIONS SHOWN HEREON ARE DERIVED FROM PLAN 53R-21413.



LEGEND

EZE	DENOTES EASEMENT
PIN	DENOTES PROPERTY IDENTIFIER NUMBER
LT	DENOTES LAND TITLES
☒	DENOTES BELL BOX
UP	DENOTES UTILITY POLE
AN	DENOTES ANCHOR
WV	DENOTES WATER VALVE
D	DENOTES PROPOSED DECK
S.W.M.	DENOTES STORM WATER MANAGEMENT
FYSB	DENOTES FRONT YARD SETBACK (MIN.)
RYSB	DENOTES REAR YARD SETBACK (MIN.)
R.O.W.	DENOTES RIGHT-OF-WAY
U	DENOTES OVERHEAD UTILITY LINES
	DENOTES GARAGE
MH	DENOTES MANHOLE

DENOTES PROPOSED R.O.W./ACCESS IN BENEFIT OF MUN.# 6022, 6034 & 6040 (FOR GARBAGE TRUCKS & EMERGENCY VEHICLES TO MOVE IN A FORWARD MOTION).

DENOTES PROPOSED R.O.W. ACCESS INTO S.W.M. POND AREA FOR MAINTENANCE PURPOSES

DENOTES PROPOSED AREA OF GRAVEL DRIVEWAYS & PARKING AREAS

NOTES:
EASEMENTS & R.O.W. WILL BE DEFINED AS PARTS ON FUTURE PLAN OF SURVEY.
** SEE EXP SERVICES SITE SERVICING DRAWING & LOT GRADING PLAN FOR THIS DEVELOPMENT.

D.S. DORLAND LIMITED
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PHONE (705) 673-2556 FAX (705) 673-1051
WWW.DSDORLANDLIMITED.CA

PREPARED BY : A. ALATYPPO	SCALE : 1:750 METRIC
FIELD WORK DATE: MAY 3, 2024	CAD FILE : 18712-18718-SKETCH.dwg
DATE : AUGUST 4, 2025	P. SPACE TAB : SKETCH PROP.ROW750s(PG3OF7)

PL-CON-2025-00040 Sketch 4

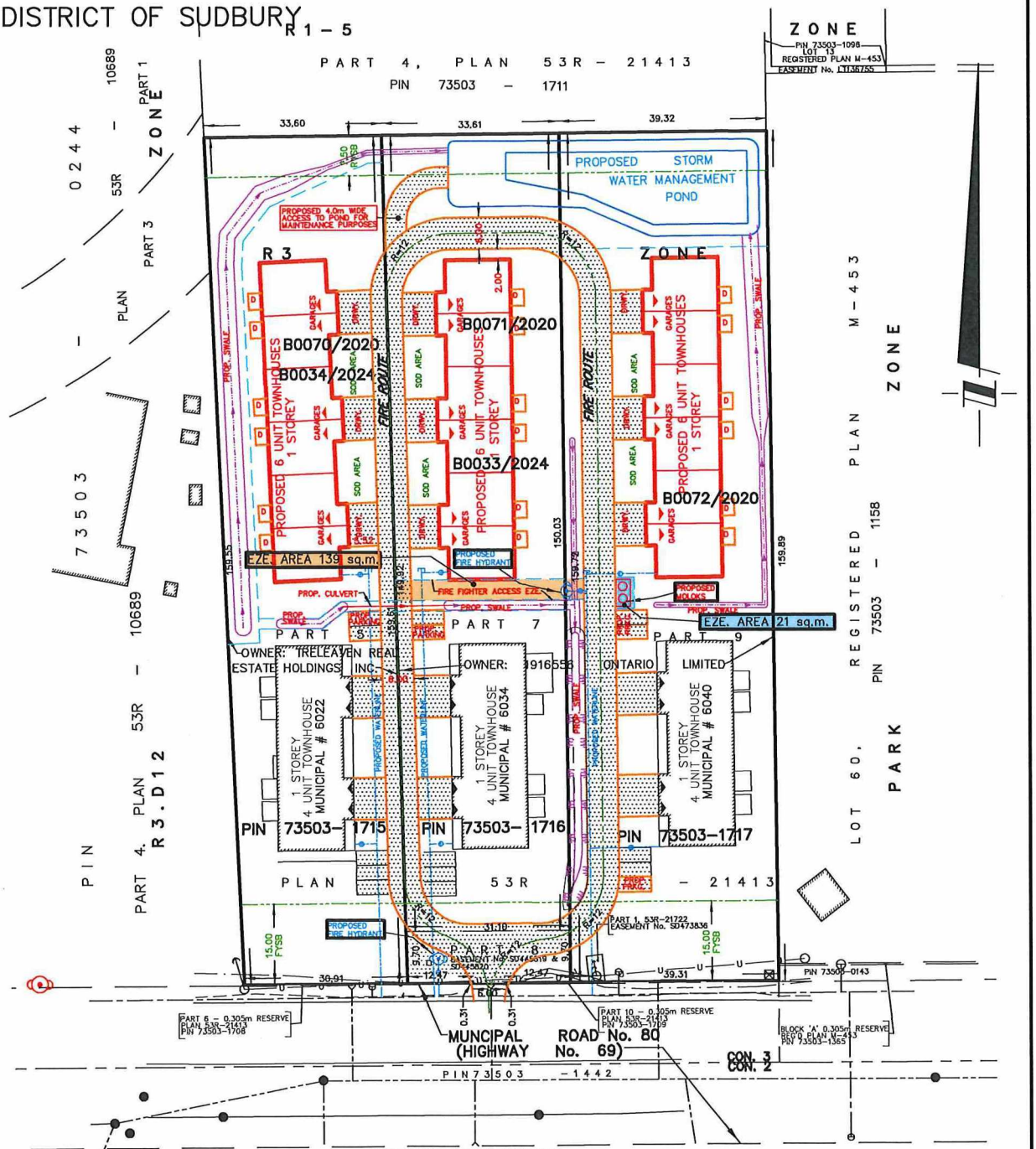
SKETCH FOR PLANNING ACT APPLICATIONS

PROPOSED EASEMENT FOR FIRE FIGHTER ACCESS & EASEMENT FOR REFUSE/RECYCLING CONTAINERS MUN.# 6022, 6034 & 6040 MR80

PART OF LOT 1, CONCESSION 3
GEOGRAPHIC
TOWNSHIP OF HANMER
CITY OF GREATER SUDBURY
DISTRICT OF SUDBURY

SCALE 1:750
0 5 10 20 30 40 50 METRES

CAUTION:
THIS IS NOT A PLAN OF SURVEY AND SHOULD ONLY BE USED FOR THE PURPOSE NOTED IN THE TITLE BLOCK
FOR CLARITY, NOT ALL EXISTING TOPOGRAPHICAL ARE SHOWN ON THIS SKETCH.
FIELD WORK WAS COMPLETED OCT. 14, 2024.
PROPERTY BOUNDARY DIMENSIONS SHOWN HEREON ARE DERIVED FROM PLAN 53R-21413.



LEGEND

PIN	DENOTES PROPERTY IDENTIFIER NUMBER
LT	DENOTES LAND TITLES
☒	DENOTES BELL BOX
O UP	DENOTES UTILITY POLE
⟵ AN	DENOTES ANCHOR
⊖ WV	DENOTES WATER VALVE
D	DENOTES PROPOSED DECK
FYSB	DENOTES FRONT YARD SETBACK (MIN.)
RYSB	DENOTES REAR YARD SETBACK (MIN.)
R.O.W.	DENOTES RIGHT-OF-WAY
—U—	DENOTES OVERHEAD UTILITY LINES
	DENOTES GARAGE
● MH	DENOTES MANHOLE

DENOTES PROPOSED AREA FOR REFUSE/RECYCLING CONTAINER EASEMENT IN BENEFIT FOR MUN. # 6022, 6034 & 6040

DENOTES PROPOSED FIRE FIGHTER ACCESS EASEMENT IN BENEFIT FOR MUN. # 6022, 6034 & 6040

DENOTES PROPOSED AREA OF GRAVEL DRIVEWAYS & PARKING AREAS

NOTES: 2 MOLOKS WILL BE SERVING ALL 3 LOTS EASEMENTS WILL BE DEFINED AS PARTS ON FUTURE PLAN OF SURVEY.
** SEE EXP SERVICES SITE SERVICING DRAWING & LOT GRADING PLAN FOR THIS DEVELOPMENT.

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PHONE (705) 673-2556 FAX (705) 673-1051
WWW.DSDORLANDLIMITED.CA

PREPARED BY : A. ALATYPPO	SCALE : 1:750 METRIC
FIELD WORK DATE: MAY 3, 2024	CAD FILE : 18712-18718-SKETCH.dwg
DATE : AUGUST 4, 2025	P. SPACE TAB : SKETCH PROP.eze750a(PG40F7)

PL-CON-2025-00040 Sketch5

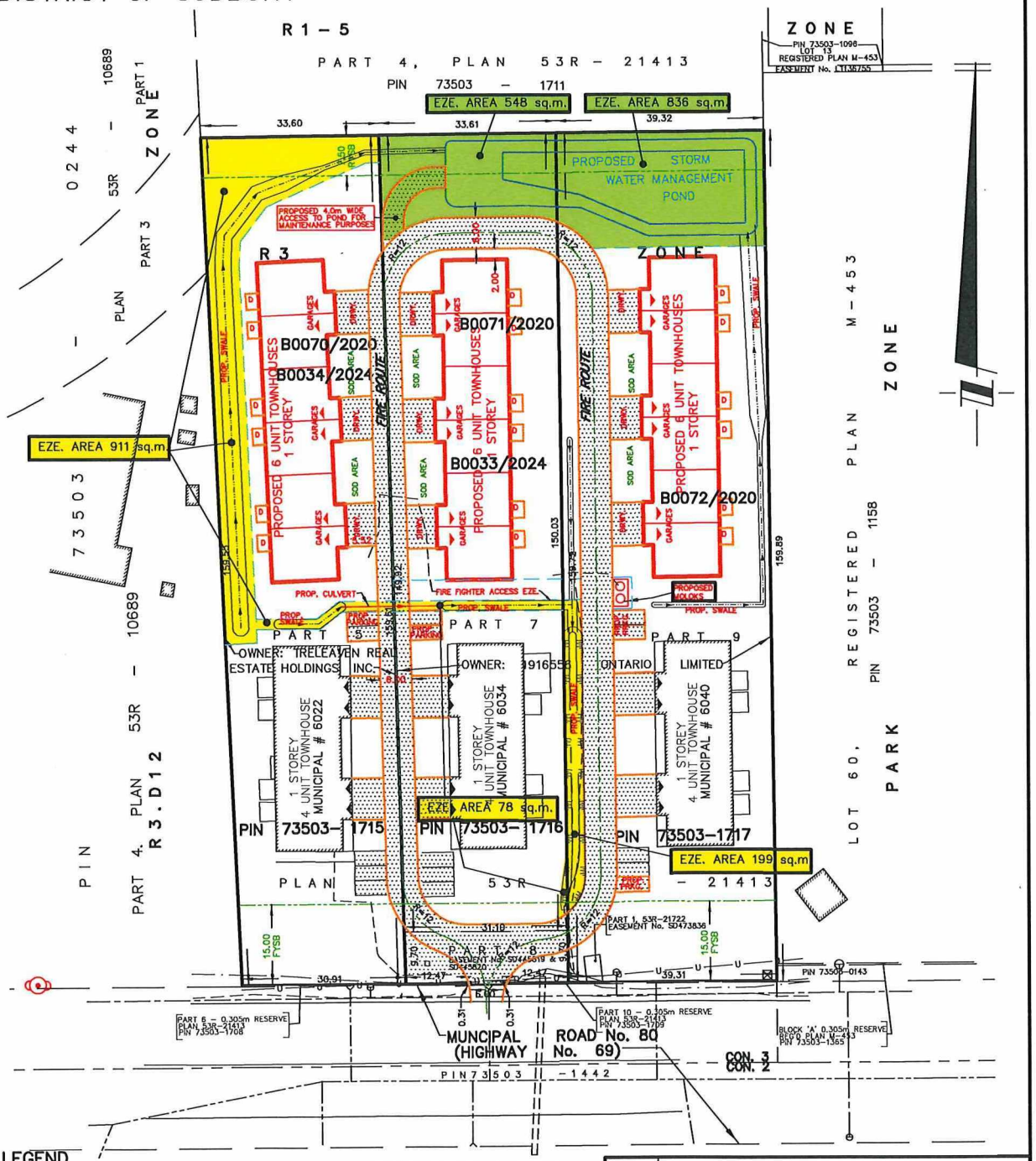
SKETCH FOR PLANNING ACT APPLICATIONS

PROPOSED DRAINAGE EASEMENTS FOR MUN.# 6022 6034 & 6040 MR 80

PART OF LOT 1, CONCESSION 3
GEOGRAPHIC
TOWNSHIP OF HANMER
CITY OF GREATER SUDBURY
DISTRICT OF SUDBURY

SCALE 1:750
METRES
0 5 10 20 30 40 50

CAUTION:
THIS IS NOT A PLAN OF SURVEY AND SHOULD ONLY BE USED FOR THE PURPOSE NOTED IN THE TITLE BLOCK
FOR CLARITY, NOT ALL EXISTING TOPOGRAPHICAL ARE SHOWN ON THIS SKETCH.
FIELD WORK WAS COMPLETED OCT. 14, 2024.
PROPERTY BOUNDARY DIMENSIONS SHOWN HEREON ARE DERIVED FROM PLAN 53R-21413.



LEGEND

EZE	DENOTES EASEMENT
PIN	DENOTES PROPERTY IDENTIFIER NUMBER
LT	DENOTES LAND TITLES
☒	DENOTES BELL BOX
O UP	DENOTES UTILITY POLE
← AN	DENOTES ANCHOR
⊖ WV	DENOTES WATER VALVE
D	DENOTES PROPOSED DECK
FYSB	DENOTES FRONT YARD SETBACK (MIN.)
RYSB	DENOTES REAR YARD SETBACK (MIN.)
R.O.W.	DENOTES RIGHT-OF-WAY
—U—	DENOTES OVERHEAD UTILITY LINES
	DENOTES GARAGE
MH	DENOTES MANHOLE

DENOTES PROPOSED DRAINAGE EASEMENT FOR STORM WATER MANAGEMENT POND IN BENEFIT OF MUN. # 6022, 6034 & 6040.

DENOTES FOR PROPOSED DRAINAGE EASEMENT FOR PROPOSED SWALES FOR MUN. # 6022, 6034 & 6040.

DENOTES PROPOSED AREA OF GRAVEL DRIVEWAYS & PARKING AREAS

NOTES:
EASEMENTS WILL BE DEFINED AS PARTS ON FUTURE PLAN OF SURVEY.
** SEE EXP SERVICES SITE SERVICING DRAWING & LOT GRADING PLAN FOR THIS DEVELOPMENT.

D.S. DORLAND LIMITED
ONTARIO LAND SURVEYORS
GEOMATICS PROFESSIONALS
298 LARCH STREET
SUDBURY, ONTARIO, P3B 1M1
PHONE (705) 673-2556 FAX (705) 673-1051
WWW.DSDORLANDLIMITED.CA

PREPARED BY : A. ALATYPPO	SCALE : 1:750 METRIC
FIELD WORK DATE: MAY 3, 2024	CAD FILE : 18712-18718-SKETCH.dwg
DATE : AUGUST 4, 2025	P. SPACE TAB : SKETCH PROP.pondDitch750s(PG50F7)

PL-COND-2025-00040 Sketch 6

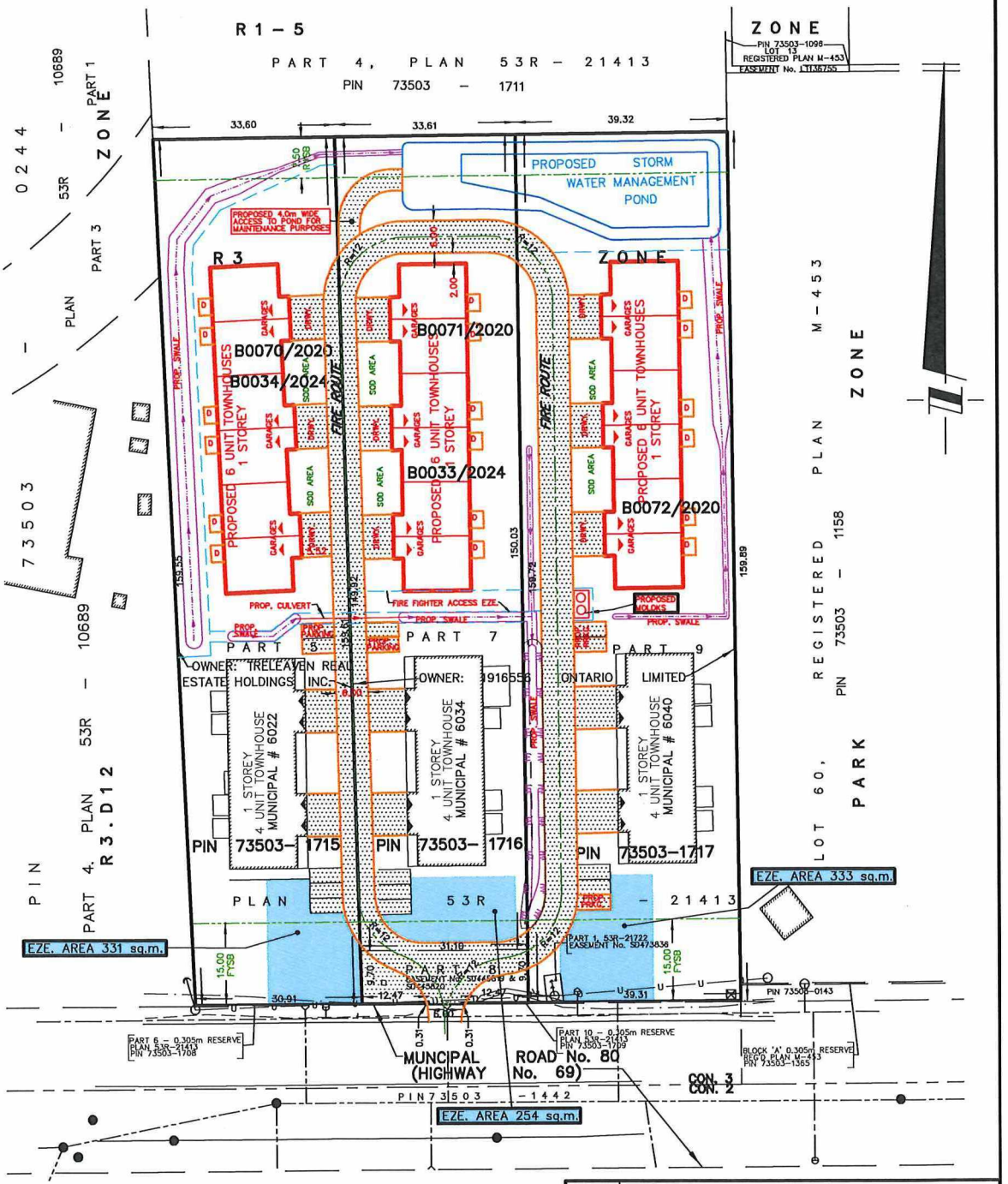
SKETCH FOR PLANNING ACT APPLICATIONS

PROPOSED EASEMENT FOR SNOW STORAGE FOR MUN.# 6022, 6034 & 6040 MR 80

PART OF LOT 1, CONCESSION 3
GEOGRAPHIC
TOWNSHIP OF HANMER
CITY OF GREATER SUDBURY
DISTRICT OF SUDBURY

SCALE 1:750
0 5 10 20 30 40 50 METRES

CAUTION:
THIS IS NOT A PLAN OF SURVEY AND SHOULD ONLY BE USED FOR THE PURPOSE NOTED IN THE TITLE BLOCK
FOR CLARITY, NOT ALL EXISTING TOPOGRAPHICAL ARE SHOWN ON THIS SKETCH.
FIELD WORK WAS COMPLETED OCT. 14, 2024.
PROPERTY BOUNDARY DIMENSIONS SHOWN HEREON ARE DERIVED FROM PLAN 53R-21413.



LEGEND

PIN	DENOTES PROPERTY IDENTIFIER NUMBER
LT	DENOTES LAND TITLES
☒	DENOTES BELL BOX
O UP	DENOTES UTILITY POLE
← AN	DENOTES ANCHOR
⊖ WV	DENOTES WATER VALVE
D	DENOTES PROPOSED DECK
FYSB	DENOTES FRONT YARD SETBACK (MIN.)
RYSB	DENOTES REAR YARD SETBACK (MIN.)
R.O.W.	DENOTES RIGHT-OF-WAY
—U—	DENOTES OVERHEAD UTILITY LINES
	DENOTES GARAGE
● MH	DENOTES MANHOLE

DENOTES PROPOSED AREA FOR SNOW STORAGE EASEMENTS FOR MUN. # 6022, 6034 & 6040

DENOTES PROPOSED AREA OF GRAVEL DRIVEWAYS & PARKING AREAS

NOTES: THE EASEMENTS FOR THE SNOW STORAGE AREAS WILL BE DEFINED AS PARTS ON FUTURE PLAN OF SURVEY.
** SEE EXP SERVICES SITE SERVICING DRAWING & LOT GRADING PLAN FOR THIS DEVELOPMENT.

D.S. DORLAND LIMITED
ONTARIO LAND SURVEYORS
GEOMATICS PROFESSIONALS
298 LARCH STREET
SUDBURY, ONTARIO, P3B 1M1
PHONE (705) 673-2556 FAX (705) 673-1051
WWW.DSDORLANDLIMITED.CA

PREPARED BY : A. ALATYPPO	SCALE : 1:750 METRIC
FIELD WORK DATE: MAY 3, 2024	CAD FILE : 18712-18718-SKETCH.dwg
DATE : AUGUST 4, 2025	P. SPACE TAB : SKETCH PROP.eze750s(PG60F7)

PL-CON-2025-00040 Sketch7

PROPOSED ROW HOUSING DEVELOPMENT MUNICIPAL # 6022, 6034 & 6040 MR 80

ITEM:	PROVIDED	CALCULATIONS
LOT AREA MUNICIPAL # 6022	5145 Sq.m.	
LOT AREA MUNICIPAL # 6034	5156 Sq.m.	
LOT AREA MUNICIPAL # 6040	6284 Sq.m.	
GROSS FLOOR AREA OF EXISTING 4 PLEX BUILDING + PROPOSED 6 PLEX BUILDING MUNICIPAL # 6022	1315 Sq.m.	
GROSS FLOOR AREA OF EXISTING 4 PLEX BUILDING + PROPOSED 6 PLEX BUILDING MUNICIPAL # 6034	1315 Sq.m.	516 (EXISTING TOWNHOUSES) + 799 (PROPOSED TOWNHOUSES) = 1315 sq.m. PER LOT
GROSS FLOOR AREA OF EXISTING 4 PLEX BUILDING + PROPOSED 6 PLEX BUILDING MUNICIPAL # 6040	1315 Sq.m.	
PROPOSED ROW DWELLING HEIGHTS (1 STOREY)	6m ±	MAXIMUM HEIGHT IN ROW DWELLING = 11.0m
BICYCLE PARKING REQUIREMENTS FOR ROW HOUSING (NOT REQUIRED):	BICYCLE PARKING CAN BE CONTAINED WITHIN GARAGE OF EACH UNIT	
PARKING SPACES REQUIRED FOR EACH OF THE MUNICIPAL # 6022, 6034 & 6040 LOTS	PROVIDED = 15 (10+5=15)	REQUIRED: ROW DWELLING REQUIRES 1.5/UNIT REQUIRED = 10x1.5 = 15 SPACES REQUIRED VISITOR SPACES = 15−10= 5 SPACES (THERE ARE 10 UNITS WITH GARAGES= 10 SPACES)
BARRIER FREE PARKING SPACES REQUIRED (FOR ROW HOUSING PER LOT)	PROVIDED = 0	TOTAL # VISITOR PARKING SPACES PROVIDED = 6 (SINCE < 10 SPACES 0 BARRIER FREE SPACES ARE REQUIRED)
MUN. # 6022 LOT COVERAGE (%) (MAXIMUM COVERAGE = 40%)	25.6%	(799+516)/ 5145 = 25.6%
MUN. # 6034 LOT COVERAGE (%) (MAXIMUM COVERAGE = 40%)	25.5%	(799+516)/ 5156 = 25.5%
MUN. # 6040 LOT COVERAGE (%) (MAXIMUM COVERAGE = 40%)	20.9%	(799+516)/ 6284 = 20.9%
ZONE: EXISTING: R3	PROPOSED R3 (NO CHANGE)	
GARBAGE/RECYCLING LOCATION PROPOSED 2 MOLOKS WILL BE SERVICING ALL 3 LOTS (MUN.# 6022, 6034 & 6040)	A PROPOSED PART ON A PLAN OF SURVEY WILL DESCRIBE THE AREA OF THE MOLOKS & A AGREEMENT ON TITLE WILL BE MADE REGARDING THE SHARED AGREEMENT OF THESE REFUSE/RECYCLING CONTAINERS BETWEEN THE 3 LOTS	
MINIMUM FRONT YARD = 15.0m	PROVIDED MORE THAN MINIMUM OF 15.0m	
MINIMUM REAR YARD = 7.5m	PROVIDED MORE THAN MINIMUM OF 7.5m	
MINIMUM INTERIOR SIDE YARD(ROW DWELLING) = 1.2m (FOR 1 STOREY) 1.8m (2 STOREY)	PROVIDED MORE THAN MINIMUM REQUIREMENTS	
7.5m PRIVACY YARD DEPTH IS REQUIRED ABUTTING THE FULL LENGTH OF AT LEAST ONE EXTERIOR WALL OF EACH ROW DWELLING UNIT	PROVIDED MINIMUMS	
ROW & MULTIPLE DWELLINGS: COURT YARD BUILDING SEPARATION FOR DWELLINGS, WHERE BOTH WALLS CONTAIN BALCONIES OR HABITABLE ROOM WINDOWS = 15.0m. 7.5m WHERE ONLY ONE WALL CONTAINS BALCONIES OR HABITABLE ROOM WINDOWS. 3.0m WHERE NEITHER WALLS CONTAINS BALCONIES OR HABITABLE ROOM WINDOWS	PROVIDED MINIMUMS (THERE IS ONE WINDOW ON NORTH SIDES OF ALL EXISTING 4 UNIT DWELLING BUILDINGS & THERE WILL BE NO PROPOSED WINDOWS ON THE S. WALL OF THE PROPOSED 6 UNIT DWELLING BUILDINGS)	
MINIMUM 3.0m PLANTING STRIP IS REQUIRED WHERE R3 ZONE ABUTS R1 ZONE. THIS WIDTH CAN BE REDUCED TO 1.8m IF PLANTING STRIP CONTAINS OPAQUE FENCE HAVING HEIGHT OF 1.5m OR MORE	PROVIDED MINIMUM OF PLANTING STRIP AS REQUIRED	
OUTDOOR PARKING AREAS SHALL BE PERMITTED IN ANY PART OF ANY YARD, EXCEPT THAT NO PART OF ANY PARKING AREA SHALL BE LOCATED IN THE REQUIRED FRONT YARD FOR ANY RESIDENTIAL ZONE	NO PARKING IS SHOWN IN THE REQUIRED FRONT YARD	
GRAVEL AREA (%) MUNICIPAL # 6022	13.7%	703/ 5145 = 13.7%
GRAVEL AREA (%) MUNICIPAL # 6034	24.6%	1270/ 5156 = 24.6%
GRAVEL AREA (%) MUNICIPAL # 6040	18.5%	1162/ 6284 = 18.5%
LANDSCAPED AREA (%) MUNICIPAL # 6022	60.7%	3123/ 5145 = 60.7% (MINIMUM 30%)
LANDSCAPED AREA (%) MUNICIPAL # 6034	49.9%	2573/ 5156 = 49.9% (MINIMUM 30%)
LANDSCAPED AREA (%) MUNICIPAL # 6040	60.6%	3808/ 6284 = 60.6% (MINIMUM 30%)

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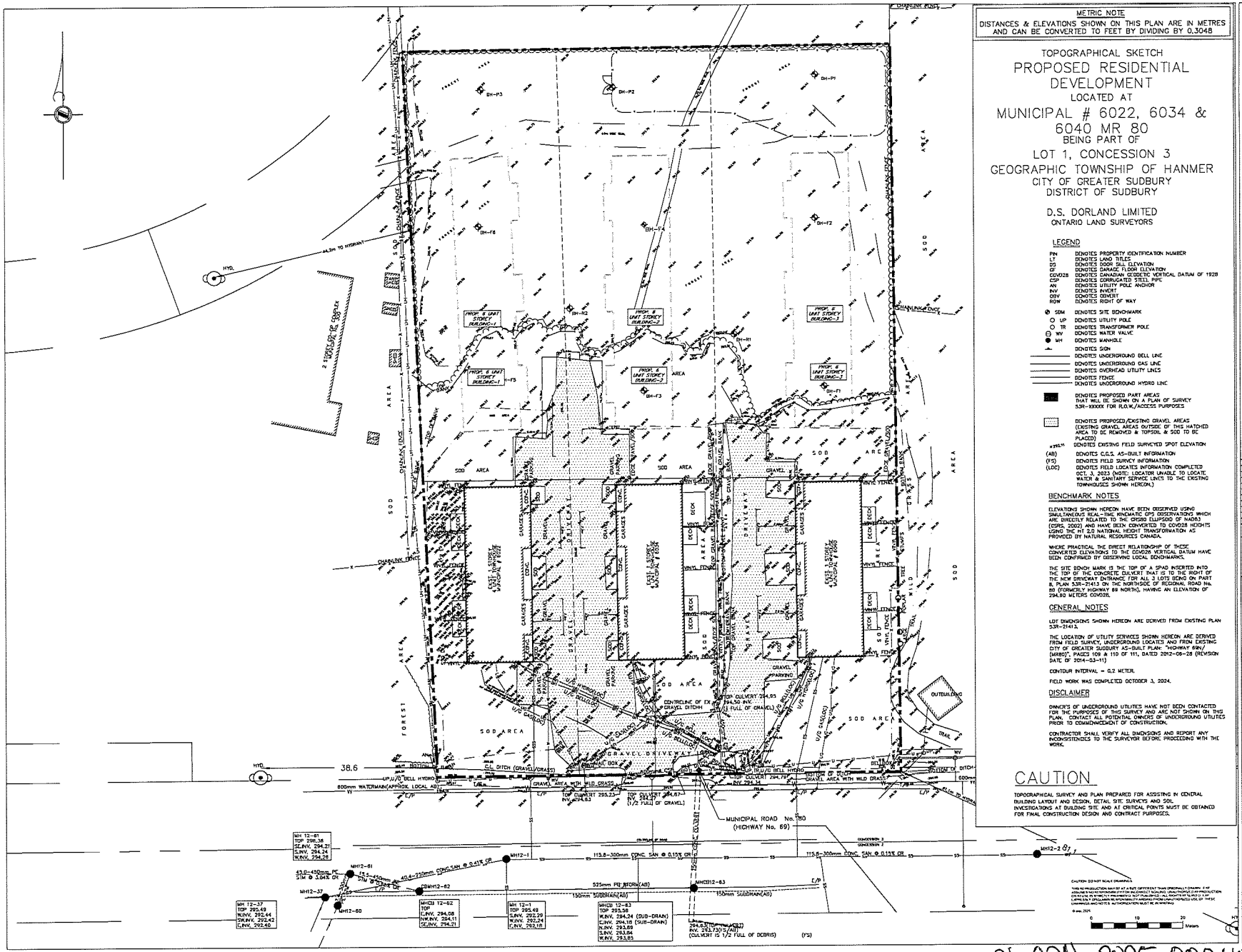
WWW.DSDORLANDLIMITED.CA

PREPARED BY : A. ALATYPPO	SCALE : 1:200 METRIC
FIELD WORK DATE: MAY 3, 2024	CAD FILE : 18712-18718-SKETCH.dwg
DATE : AUGUST 4, 2025	P. SPACE TAB : STATS TABLE 200s (PG. 7 OF 7)

PL-CON-2025-00040 Sketch 8



METRIC NOTE

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

TOPOGRAPHICAL SKETCH

PROPOSED RESIDENTIAL DEVELOPMENT

LOCATED AT

MUNICIPAL # 6022, 6034 & 6040 MR 80

BEING PART OF

LOT 1, CONCESSION 3

GEOGRAPHIC TOWNSHIP OF HANMER

CITY OF GREATER SUDBURY

DISTRICT OF SUDBURY

D.S. DORLAND LIMITED

ONTARIO LAND SURVEYORS

LEGEND

PIN	DENOTES PROPERTY IDENTIFICATION NUMBER
LT	DENOTES LAND TITLES
DS	DENOTES DOOR SILL ELEVATION
GF	DENOTES GARAGE FLOOR ELEVATION
CGVD28	DENOTES CANADIAN GEODETIC VERTICAL DATUM OF 1928
CSP	DENOTES CORRUGATED STEEL PIPE
AN	DENOTES UTILITY POLE ANCHOR
ENT	DENOTES ENCROACHMENT
DIV	DENOTES DIVERT
ROW	DENOTES RIGHT OF WAY
SBM	DENOTES SITE BENCHMARK
UP	DENOTES UTILITY POLE
TR	DENOTES TRANSFORMER POLE
WV	DENOTES WATER VALVE
MH	DENOTES MANHOLE
	DENOTES SIGN
	DENOTES UNDERGROUND BELL LINE
	DENOTES UNDERGROUND GAS LINE
	DENOTES OVERHEAD UTILITY LINES
	DENOTES FENCE
	DENOTES UNDERGROUND HYDRO LINE
	DENOTES PROPOSED PART AREAS THAT WILL BE SHOWN ON A PLAN OF SURVEY 53R-XXXXX FOR R.O.W./ACCESS PURPOSES
	DENOTES PROPOSED/EXISTING GRAVEL AREAS (EXISTING GRAVEL AREAS OUTSIDE OF THIS HATCHED AREA TO BE REMOVED & TOPSOIL & SOD TO BE PLACED)
x295.19	DENOTES EXISTING FIELD SURVEYED SPOT ELEVATION
(AB)	DENOTES C.G.S. AS-BUILT INFORMATION
(FS)	DENOTES FIELD SURVEY INFORMATION
(LOC)	DENOTES FIELD LOCATES INFORMATION COMPLETED OCT. 3, 2023 (NOTE: LOCATOR UNABLE TO LOCATE WATER & SANITARY SERVICE LINES TO THE EXISTING TOWNHOUSES SHOWN HEREON.)

BENCHMARK NOTES

ELEVATIONS SHOWN HEREON HAVE BEEN OBSERVED USING SIMULTANEOUS REAL-TIME KINEMATIC GPS OBSERVATIONS WHICH ARE DIRECTLY RELATED TO THE CSRS ELLIPSOID OF NAD83 (CSRS, 2002) AND HAVE BEEN CONVERTED TO CGVD28 HEIGHTS USING THE HT 2.0 NATIONAL HEIGHT TRANSFORMATION AS PROVIDED BY NATURAL RESOURCES CANADA.

WHERE PRACTICAL THE DIRECT RELATIONSHIP OF THESE CONVERTED ELEVATIONS TO THE CGVD28 VERTICAL DATUM HAVE BEEN CONFIRMED BY OBSERVING LOCAL BENCHMARKS.

THE SITE BENCH MARK IS THE TOP OF A SPAD INSERTED INTO THE TOP OF THE CONCRETE CULVERT THAT IS TO THE RIGHT OF THE NEW DRIVEWAY ENTRANCE FOR ALL 3 LOTS BEING ON PART 8, PLAN 53R-21413 ON THE NORTHSIDE OF REGIONAL ROAD No. 80 (FORMALTY HIGHWAY 69 NORTH), HAVING AN ELEVATION OF 294.90 METERS CGVD28.

GENERAL NOTES

LOT DIMENSIONS SHOWN HEREON ARE DERIVED FROM EXISTING PLAN 53R-21413.

THE LOCATION OF UTILITY SERVICES SHOWN HEREON ARE DERIVED FROM FIELD SURVEY, UNDERGROUND LOCATES AND FROM EXISTING CITY OF GREATER SUDBURY AS-BUILT PLAN: "HIGHWAY #69/ (MR80)", PAGES 109 & 110 OF 111, DATED 2012-08-28 (REVISION DATE OF 2014-03-11)

CONTOUR INTERVAL = 0.2 METER.

FIELD WORK WAS COMPLETED OCTOBER 3, 2024.

DISCLAIMER

OWNER'S OF UNDERGROUND UTILITIES HAVE NOT BEEN CONTACTED FOR THE PURPOSES OF THIS SURVEY AND ARE NOT SHOWN ON THIS PLAN. CONTACT ALL POTENTIAL OWNERS OF UNDERGROUND UTILITIES PRIOR TO COMMENCEMENT OF CONSTRUCTION.

CONTRACTOR SHALL VERIFY ALL DIMENSIONS AND REPORT ANY INCONSISTENCIES TO THE SURVEYOR BEFORE PROCEEDING WITH THE WORK.

CAUTION

TOPOGRAPHICAL SURVEY AND PLAN PREPARED FOR ASSISTING IN GENERAL BUILDING LAYOUT AND DESIGN, DETAIL SITE SURVEYS AND SOIL INVESTIGATIONS AT BUILDING SITE AND AT CRITICAL POINTS MUST BE OBTAINED FOR FINAL CONSTRUCTION DESIGN AND CONTRACT PURPOSES.

exp Services Inc.
exp.
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LEGEND

- EXISTING PROPERTY BOUNDARY
- 273 EXISTING CONTOURS
- W EXISTING WATERMAIN
- SS EXISTING SANITARY SEWER
- X EXISTING CHAIN LINK FENCE
- EXISTING DITCH LINE
- EXISTING TREE LINE
- EXISTING SOD AREA
- EXISTING GRAVEL DRIVEWAY
- UB UNDERGROUND BELL SERVICES
- UG UNDERGROUND GAS SERVICES
- UH UNDERGROUND HYDRO SERVICES
- U UTILITY LINES OVERHEAD

No.	Revision	By:	Date
1	ISSUED FOR DRAFT REVIEW	PT	2024-10-03

ISSUED FOR REVIEW

Professional Seal(s)

Drawn By: PT	Scale: 1:350
Checked By: AL	Date: 2025-03-06
Approved By:	Date:
Date Printed: 2025-06-10	

File Name: 24006124-6022 HANMER-SITEPLAN-R1-07-23-2025.DWG

Project Title

1916555 ONTARIO DEVELOPMENT

MR80 HANMER TOWNHOUSE DEVELOPMENT

6034, 6040 MUNICIPAL ROAD 80, HANMER, ONTARIO

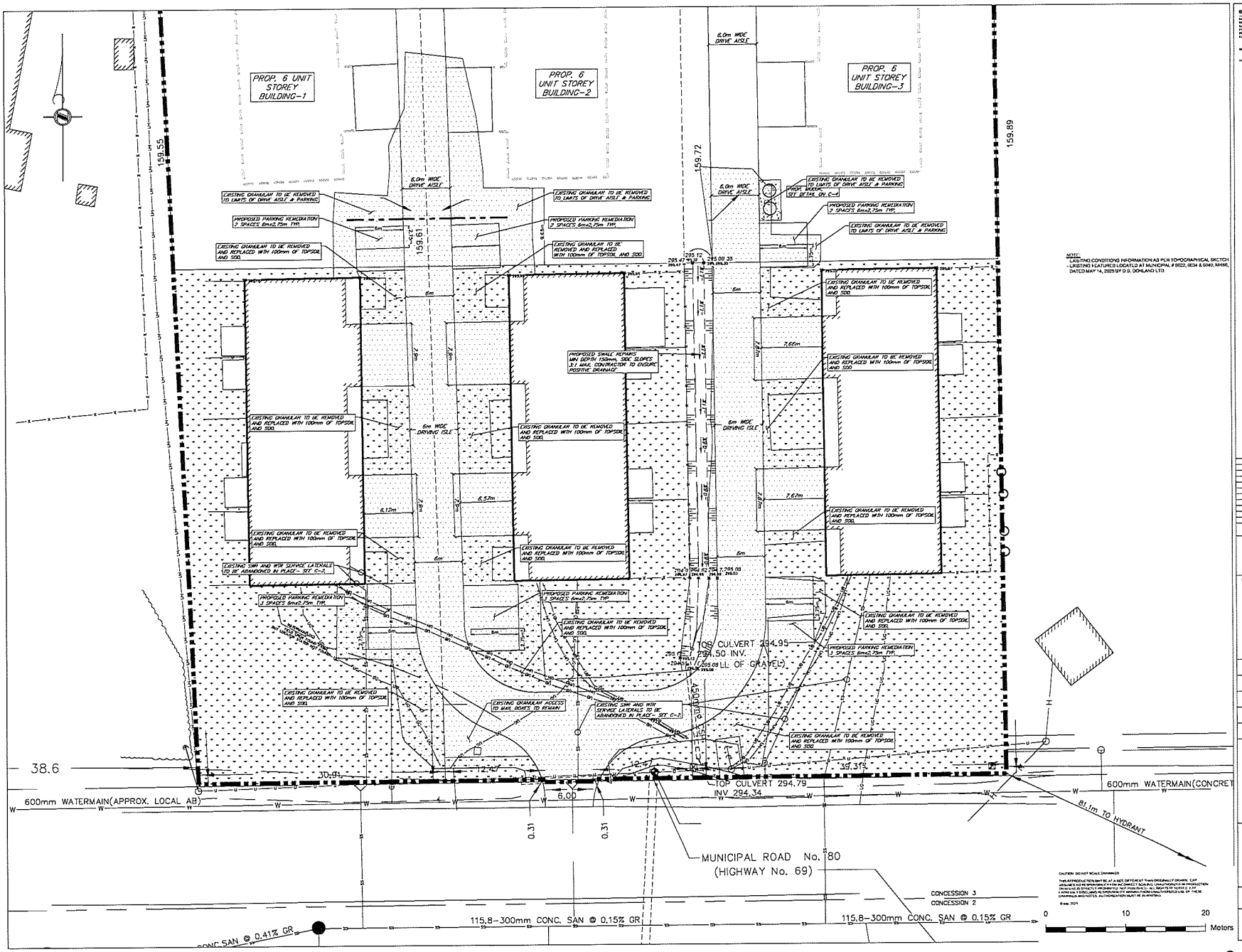
Dwg. Title

EXISTING CONDITIONS DRAWING

Project No. SUD-00024006124-A0

Dwg. No. EX-1 | Rev. No. 0

PL-CON-2025-00040
Sketch 9



NOTE:
- EXISTING CONDITIONS INFORMATION AS PER TOPOGRAPHICAL SKETCH - EXISTING FEATURES LOCATED AT MUNICIPAL # 6022, 6034 & 6040, MNR, DATED MAY 14, 2025 BY D.S. DONLAND LTD.

exp Services Inc.

LEGEND

- EXISTING PROPERTY BOUNDARY
- 273 EXISTING CONTOURS
- W EXISTING WATERMAIN
- SS EXISTING SANITARY SEWER
- X EXISTING CHAIN LINK FENCE
- UB UNDERGROUND BELL SERVICES
- UG UNDERGROUND GAS SERVICES
- UH UNDERGROUND HYDRO SERVICES
- U UTILITY LINES OVERHEAD
- EXISTING SOD AREA
- PROPOSED SOD AREA
- PROPOSED GRAVEL DRIVEWAY
- PROPOSED DITCH
- -0.5% PROPOSED GRADIENT
- 292.80 PROPOSED SPOT ELEVATION
- 292.13 EXISTING SPOT ELEVATION

No.	Revision	By:	Date
1	ISSUED FOR DRAFT REVIEW	JH	2025-09-04

ISSUED FOR REVIEW

Professional Seal(s)

Drawn By: HT	Scale: 1:200
Checked By: AL	Date: 2025-05-06
Approved By:	Date:
Date Printed: 2025-07-22	

File Name: 24006124-6022 HANMER-SITEPLAN-R1-07-23-2025.DWG

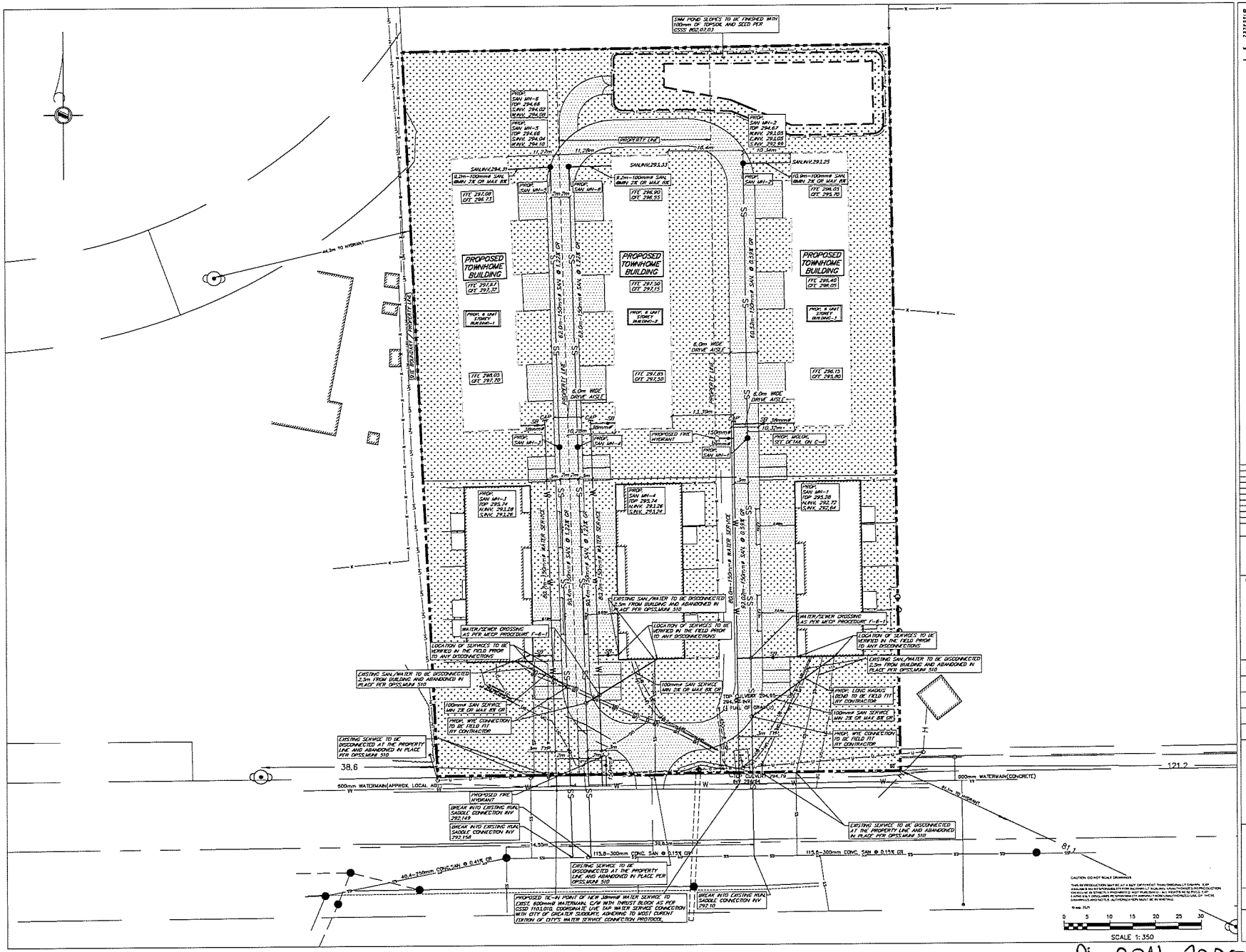
Project Title
1916555 ONTARIO DEVELOPMENT
MR80 HANMER TOWNHOUSE DEVELOPMENT
6034, 6040 MUNICIPAL ROAD 80, HANMER, ONTARIO

Dwg. Title
PROPOSED REMEDIAL WORKS

Project No. SUD-00024006124-A0

Dwg. No. C-1 | Rev. No. 1

PL-CON-2025-00040
Sketch 10



exp Services Inc.

exp.

LEGEND

- EXISTING PROPERTY BOUNDARY
- 273 EXISTING CONTOURS
- W EXISTING WATERMAIN
- SS EXISTING SANITARY SEWER
- EXISTING STORM SEWER
- X EXISTING CHAIN LINK FENCE
- EXISTING DITCH LINE
- EXISTING TREE LINE
- EXISTING SOD AREA
- EXISTING GRAVEL DRIVEWAY
- UB UNDERGROUND BELL SERVICES
- UG UNDERGROUND GAS SERVICES
- UH UNDERGROUND HYDRO SERVICES
- U UTILITY LINES OVERHEAD
- PROPOSED BUILDING
- PROPOSED LANDSCAPED AREA TO BE REINFORCED WITH NAUE SC250 TRM w/ STAPLE PATTERN 'C'
- PROPOSED LANDSCAPED AREA
- PROPOSED GRAVEL DRIVEWAY
- PROPOSED FILTER MEDIA
- PROPOSED DITCH
- PROPOSED CULVERT
- W PROPOSED WATERMAIN
- PROPOSED SERVICE BOX
- PROPOSED FIRE HYDRANT
- SS PROPOSED SANITARY SEWER
- PROP. SAN MH-1 PROPOSED SANITARY MANHOLE
- TTC 296.40 / OFT 296.05 PROPOSED TOP OF FINISHED FLOOR ELEVATION / PROPOSED GARGE FINISHED FLOOR ELEVATION

No.	Revision	By:	Date
1	ISSUED FOR DRAFT REVIEW	PT	2025-07-04

ISSUED FOR REVIEW

Professional Seal(s)

Drawn By: PT	Scale: 1:350
Checked By: AL	Date: 2025-05-06
Approved By:	Date:
Date Printed: 2025-07-22	

File Name: 24006124-6022 HANMER-SITEPLAN-R1-07-23-2025.DWG

Project Title

1916555 ONTARIO DEVELOPMENT

MR80 HANMER TOWNHOUSE DEVELOPMENT

6034, 6040 MUNICIPAL ROAD 80, HANMER, ONTARIO

Dwg. Title

SITE SERVICING AND LAYOUT

Project No. SUD-00024006124-A0

Dwg. No. C-2 | Rev. No. 1

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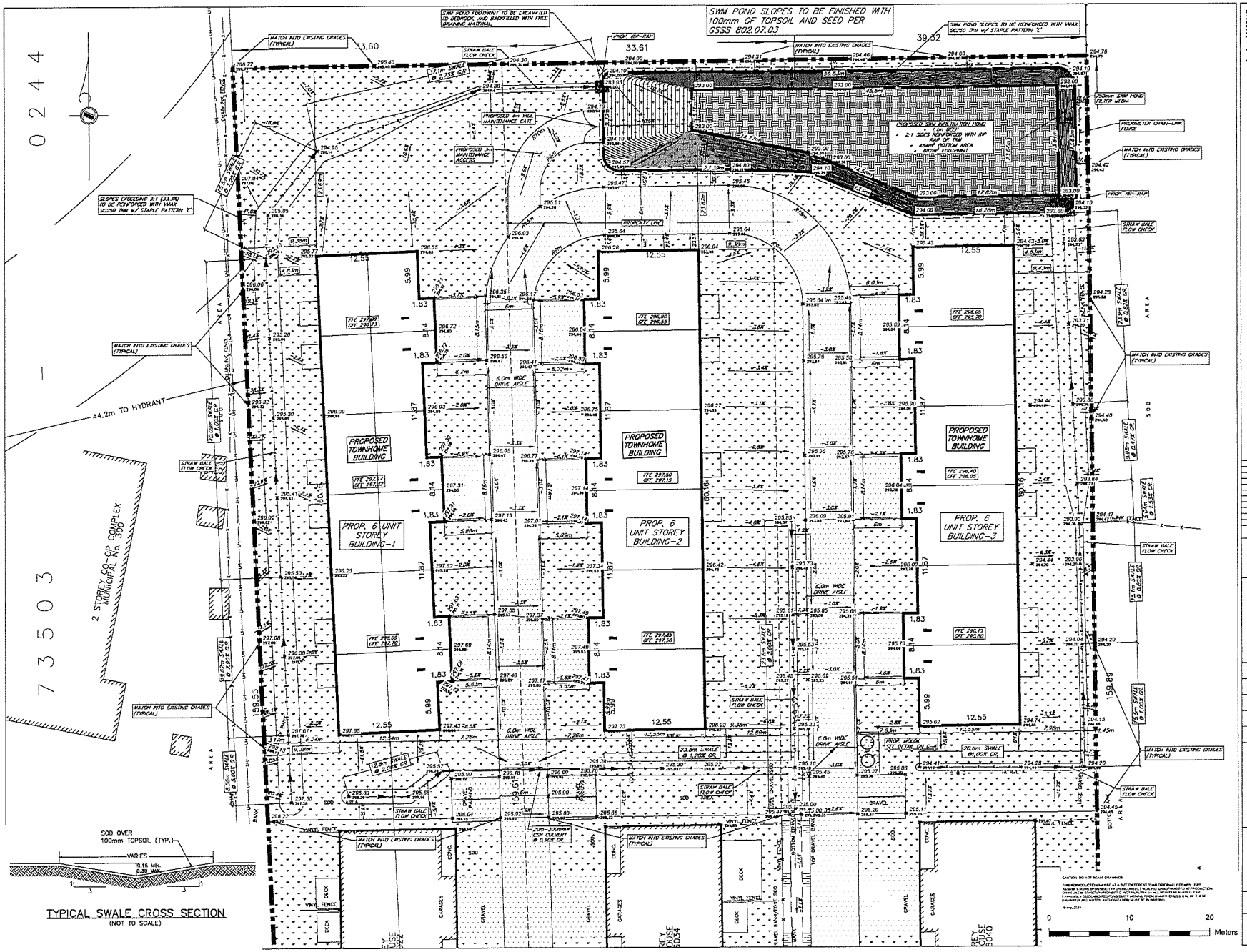
PL-CON-2025-00040
Sketch 11



SOD OVER 100mm TOPSOIL (TYP.)

VARIES

0.15 MIN. 0.30 MAX.

3 1 3 1

TYPICAL SWALE CROSS SECTION
(NOT TO SCALE)

0 10 20 Meters

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exp Services Inc.
Infrastructure Services - Sudbury
839 Progress Avenue, Suite 3-4A
Sudbury, Ontario, Canada
P3E 1K5
Ph: 705 674 8841
Fax: 705 674 8442
www.exp.com

exp.

LEGEND

- EXISTING PROPERTY BOUNDARY
- 273 EXISTING CONTOURS
- W EXISTING WATERMAIN
- SS EXISTING SANITARY SEWER
- EXISTING STORM SEWER
- X EXISTING CHAIN LINK FENCE
- EXISTING DITCH LINE
- EXISTING TREE LINE
- EXISTING SOD AREA
- EXISTING GRAVEL DRIVEWAY
- UB UNDERGROUND BELL SERVICES
- UG UNDERGROUND GAS SERVICES
- UH UNDERGROUND HYDRO SERVICES
- U UTILITY LINES OVERHEAD
- PROPOSED BUILDING
- PROPOSED LANDSCAPED AREA TO BE REINFORCED WITH VMAT SC250 TRM w/ STAPLE PATTERN 'E'
- PROPOSED LANDSCAPED AREA
- PROPOSED GRAVEL DRIVEWAY
- PROPOSED FILTER MEDIA
- PROPOSED DITCH
- PROPOSED CULVERT
- PROPOSED WATERMAIN
- PROPOSED SERVICE BOX
- PROPOSED FIRE HYDRANT
- SS PROPOSED SANITARY SEWER
- PROP. SAN MH-1 PROPOSED SANITARY MANHOLE
- PROPOSED GRADIENT
- 292.80 PROPOSED SPOT ELEVATION
- 292.13 EXISTING SPOT ELEVATION

No.	Revision	By:	Date
1	ISSUED FOR DRAFT REVIEW	HT	2025-04-04

ISSUED FOR REVIEW

Professional Seal(s)

Drawn By: HT	Scale: 1:200
Checked By: AL	Date: 2025-05-01
Approved By:	Date:
Date Printed: 2025-07-22	

File Name: 24006124-6022 HANMER-SITEPLAN-R1-07-23-2025.DWG

Project Title:
1916555 ONTARIO DEVELOPMENT
MR80 HANMER TOWNHOUSE DEVELOPMENT
6034, 6040 MUNICIPAL ROAD 80, HANMER, ONTARIO

Dwg. Title:
PROPOSED SITE GRADING

Project No: SUD-00024006124-A0

Dwg. No: C-3 Rev. No: 1

PL-CON-2025-00040
Sketch 12

GENERAL NOTES:

1. SITE LOCATION: 6034, 6040 MR 80, HANMER, ONTARIO.
2. OVERALL SCOPE OF WORK: NEW BUILDING DEVELOPMENT, INCLUDING SITE GRADING AND DRAINAGE, WATER SERVICING, SANITARY SERVICING, NEW SITE FINISHES, TO REQUIRED STANDARDS, AS INDICATED, TO SATISFACTION OF THE ENGINEER, CONTRACT ADMINISTRATOR, OWNER, AND CITY OF GREATER SUDBURY.
3. EXISTING SITE TOPOGRAPHICAL/ELEVATION, DETAILS, SURFACE LEVEL INFRASTRUCTURE AND PROPERTY INFORMATION OBTAINED BY BORTOLUSSI SURVEYING LTD., FROM SITE SURVEY CARRIED OUT IN MAY 2024, WITH BENCHMARKS ESTABLISHED AS NOTED.
4. THE SUBSURFACE LOCATION OF UTILITIES WAS OBTAINED FROM CITY AS-BUILT DRAWINGS AND IS APPROXIMATE ONLY, AND ALL SERVICES ARE NOT NECESSARILY SHOWN. THE EXACT LOCATIONS SHALL BE DETERMINED BY CONSULTING WITH ONE-CALL AND THE UTILITY COMPANIES CONCERNED. THE CONTRACTOR SHALL BE RESPONSIBLE FOR LOCATING AND PROTECTION OF ALL UTILITIES AND SERVICES.
5. BEFORE COMMENCING WORK, VERIFY THE LOCATION OF BURIED SERVICES ON AND ADJACENT TO THE SUBJECT SITE. IF RELOCATION OF SERVICES IS REQUIRED DUE TO INTERFERENCE WITH EXECUTION OF WORK, ARRANGE WITH THE APPROPRIATE AUTHORITY. RECORD LOCATION OF MAINTAINED, REROUTED AND ABANDONED UNDERGROUND SERVICE LINES.
6. EXISTING UNDERGROUND UTILITIES NEAR THE SITE ARE ANTICIPATED TO INCLUDE: WATERMAIN, SANITARY, NATURAL GAS AND FIBER OPTIC CABLE.
7. EXISTING OVERHEAD UTILITIES NEAR THE SITE ARE ANTICIPATED TO INCLUDE: ELECTRICAL SERVICES, BELL AND EASTLINK COMMUNICATIONS.
8. ALL WORK SHALL BE CARRIED OUT IN ACCORDANCE WITH THE SUPPLIED DRAWINGS, RELEVANT ONTARIO PROVINCIAL STANDARD DRAWINGS AND SPECIFICATIONS, AND GREATER SUDBURY STANDARD DRAWINGS AND SPECIFICATIONS.
9. THE CONTRACTOR IS TO ABIDE BY ALL APPLICABLE HEALTH & SAFETY REQUIREMENTS.
10. ALL WORK SHALL BE IN COMPLIANCE WITH THE REQUIREMENTS OF THE LATEST EDITIONS OF THE APPLICABLE CSA STANDARDS AND THE ONTARIO BUILDING CODE.
11. THESE DRAWING SHOULD BE READ IN CONJUNCTION WITH OTHER ENGINEERS' PLANS. ANY DISCREPANCIES SHALL BE CLARIFIED PRIOR TO CONSTRUCTION.
12. ALL DIMENSIONS AND ELEVATIONS ARE IN METERS UNLESS NOTED OTHERWISE.
13. CONTRACTOR TO FIELD CHECK ALL DIMENSIONS, ELEVATIONS AND EXISTING CONDITIONS AND REPORT ANY DISCREPANCIES TO THE CONSULTANT PRIOR TO STARTING CONSTRUCTION.
14. ONLY DRAWING MARKED "FOR CONSTRUCTION" ARE TO BE USED FOR THIS PROJECT AND THE CONSTRUCTION OF THE WORKS.
15. THE CONTRACTOR, IF WORKING FROM DRAWINGS NOT SPECIFICALLY MARKED "FOR CONSTRUCTION" EXCEPT REFERENCED ONTARIO PROVINCIAL STANDARD DRAWINGS (OPSD), MUST ASSUME FULL RESPONSIBILITY AND BEAR THE COSTS FOR ANY CORRECTIONS OR DAMAGES RESULTING FROM THEIR WORK.
16. CONTRACTOR IS RESPONSIBLE TO REPLACE/REPAIR AT THEIR COST ANY DEFICIENT WORK AS NOTED BY THE CONTRACT ADMINISTRATOR.
17. CONTRACTOR IS RESPONSIBLE TO NOTIFY ALL UTILITIES PRIOR TO COMMENCEMENT OF WORK AND COORDINATE CONSTRUCTION ACCORDINGLY.
18. THE CONTRACTOR SHALL MAINTAIN CONSTRUCTION SITE IN AN ORGANIZED AND ORDERLY STATE AT ALL TIMES.
19. CLEAN UP GROUNDS AND ACCESS ROADS DAILY AND AS DIRECTED BY THE OWNER, CONSULTANT, OR THE CITY.
20. THE CONTRACTOR SHALL RESTORE ALL CONSTRUCTION DAMAGES TO THE SATISFACTION OF THE OWNER, CONSULTANT, AND THE CITY.
21. ALL AREAS OF THE EXISTING SITE DISTURBED BY CONSTRUCTION ARE TO BE REHABILITATED TO EXISTING CONDITIONS OR BETTER.
22. MAINTAIN EXISTING ELEVATIONS AT PROPERTY LINE AND ON EXISTING ASPHALT ROADS, UNLESS INDICATED OTHERWISE.
23. CONTRACTOR TO PROVIDE STREET CLEANING SERVICES ON A CONTINUOUS BASIS DURING CONSTRUCTION UNTIL SURFACE FINISHES HAVE BEEN CONSTRUCTED AND HAVE STABILIZED.
24. COMPLY WITH ALL WRITTEN RECOMMENDATIONS OF MANUFACTURERS AND SUPPLIERS, INCLUDING PRODUCT TECHNICAL BULLETINS REGARDING HANDLING, STORAGE, AND INSTALLATION PROCEDURES.
25. ALL CONSTRUCTION ACTIVITY WILL COMPLY WITH CITY OF GREATER SUDBURY NOISE BYLAW.
26. A GEOTECHNICAL TEST PIT INVESTIGATION REPORT WAS PREPARED FOR THE PROJECT BY EXP SERVICES INC. IT IS RECOMMENDED THAT THE REPORT BE REVIEWED, TO ENSURE FAMILIARITY WITH GEOTECHNICAL FINDINGS AND CONSTRUCTION RECOMMENDATIONS (GEOTECHNICAL REPORT DATED JUNE 18, 2024, PROJECT No. SUD-24007118-A0).
27. CARRY OUT DETAILED PRE-CONSTRUCTION PHOTOGRAPHIC PROPERTY SURVEY OF EXISTING BUSINESSES, DRIVEWAYS AND YARDS AT PERIMETER. WHERE GRADING INTO ADJOINING PROPERTIES, REHABILITATE PROPERTIES SURFACES, TOPSOIL AND GRASS FINISHES TO EXISTING OR BETTER CONDITIONS. ENSURE POSITIVE DRAINAGE TO SWALES.
28. PRIOR TO COMMENCING ANY WORK WITHIN THE MUNICIPAL RIGHT-OF-WAY, THE CONTRACTOR WILL OBTAIN ALL NECESSARY ROAD OCCUPANCY PERMITS, CONNECTION PERMITS, AND ANY OTHERS THAT ARE REQUIRED, FROM THE CITY'S ENGINEERING SERVICES.
29. THE CERTIFICATION TEST RESULTS FOR ALL WORK COMPLETED IN THE MUNICIPAL RIGHT-OF-WAY AND ALL PIPE WORK CONSTRUCTED ON PRIVATE PROPERTY SHALL BE IN CONFORMANCE WITH THE CITY'S CERTIFICATION REQUIREMENTS.
30. ALL WORK WITHIN CITY RIGHT-OF-WAY SHALL BE CONSTRUCTED IN ACCORDANCE WITH CITY OF GREATER SUDBURY DESIGN STANDARDS AND SPECIFICATIONS, OR THE ONTARIO PROVINCIAL STANDARDS MAY, SUBJECT TO THE APPROVAL OF THE CITY OF GREATER SUDBURY, BE USED WHERE NO STANDARD OR SPECIFICATION IS NOTED.
31. ALL DISTURBED AREAS WITHIN THE MUNICIPAL RIGHT-OF-WAY SHALL BE RECTIFIED TO THE ORIGINAL CONDITION OR BETTER AND TO THE SATISFACTION OF THE GENERAL MANAGER OF GROWTH AND INFRASTRUCTURE.
32. CONTRACTOR IS TO ENSURE THAT PROPERTY OWNER PERMISSION IS OBTAINED PRIOR TO CARRYING OUT ANY GRADING WORK ON ADJACENT PROPERTIES.

DRAINAGE:

1. CONNECTIONS INTO THE EXISTING CITY DRAINAGE INFRASTRUCTURE TO BE COMPLETED OR CONFIRMED PRIOR TO ANY WORKS WHICH MAY BE AFFECTED.
2. ALL SWALES SHALL BE CONSTRUCTED PER SPECIFIED DETAILS PROVIDED ON THIS DRAWING SET.
3. PERFORATED SUBDRAIN SHALL BE COMPLETE WITH A KNITTED SOCK GEOTEXTILE PER OPSS 405 AND SURROUNDED WITH CLEARSTONE WRAPPED WITH GEOTEXTILE TERRAFIX 270R, OR APPROVED EQUIVALENT.
4. ALL SUBDRAINS MUST DISCHARGE TO POSITIVE OUTLET OR TIE INTO STORM SEWER STRUCTURES.
5. ENSURE POSITIVE DRAINAGE THROUGHOUT PARKING LOT AND SURROUNDINGS, TOWARDS DRAINAGE RECEPTACLES.
6. THE EXTERIOR GRADE AROUND THE BUILDING IS TO BE SLOPED AWAY FROM THE WALLS TO PREVENT SURFACE RUNOFF FROM ENTERING THE BUILDING.
7. SEE SITE GRADING PLAN AND ASSOCIATED STORMWATER MANAGEMENT REPORT FOR DETAILS ON PROPOSED ELEVATIONS, RETENTION AND TREATMENT FACILITIES, AND OTHER DRAINAGE ELEMENTS.

WATER SERVICE:

1. THE SITE SERVICING SCOPE OF THIS PROJECT INVOLVES ABANDONMENT OF EXISTING WATER SERVICE LINES, AS WELL AS PREPARATION OF NEW WATER SERVICE CONNECTION.
2. ANY CHANGES TO BE REVIEWED WITH DESIGN ENGINEER
3. WATER SERVICES TO HAVE A MINIMUM OF 2.0m DEPTH OF COVER, IF NOT ATTAINABLE, INSULATE AS NEEDED PER INDICATED DETAIL ON THIS DRAWING.
4. INSTALL PER GSSS 442, GSSD 1104.010, 1104.011, 1104.020, CONNECTIONS TO EXISTING WATERMAIN PER GSSS 441.07.22.
5. TO BE PVC DR 18 (SEE GSSS 441) AND BEDDED AS PER GSSD 1227.010
6. PIPE TO INCLUDE CORROSION PROTECTION AS PER GSSS 442
7. SERVICE SHALL BE PRESSURE TESTED AND CHLORINATED AS PER GSSS 201. SATISFACTORY BACTERIOLOGICAL TEST RESULTS SHALL BE OBTAINED FROM THE HEALTH UNIT PRIOR TO CONNECTIONS TO THE EXISTING SYSTEM. NO CONNECTION TO THE EXISTING WATERMAIN SHALL TAKE PLACE UNTIL NEW SERVICE LINES HAVE BEEN TESTED AND APPROVED BY LOCAL AUTHORITIES.
8. ENSURE DETAILED FAMILIARITY WITH CITY OF GREATER SUDBURY'S "PROTOCOL FOR NEW WATERMAIN, WATER SERVICE AND WASTEWATER CONNECTIONS" GUIDE. MOST CURRENT EDITION OF THE PROTOCOL AT THE TIME OF THIS DRAWING PREPARATION IS V7.0 (MARCH 2021).
9. ALL WATERMAIN PIPE BEDDING, INSTALLATION AND BACKFILL MUST BE INSPECTED ON A FULL TIME BASIS BY A QUALIFIED SITE REVIEWER, DESIGNATED BY THE ENGINEER.
10. MAINTAIN MINIMUM 2.5m SEPARATION FROM OUTSIDE EDGE OF ANY NEARBY SEWER LINE, AND MAINTAIN A MINIMUM 0.5m VERTICAL SEPARATION BETWEEN INVERT AND CROWN AND MAXIMIZE DISTANCE OF SANITARY SEWER FROM JOINTS, AS PER MOE PROCEDURE F-6-1.
11. VALVE BOX PER GSSD 1101.020.
12. INSTALL WITH AN APPROPRIATE TRACER WIRE PER GSSD 1110.000
13. ONLY WATER/WASTEWATER STAFF FROM CITY OF GREATER SUDBURY MAY OPERATE VALVES.
14. WATER SERVICES SHALL BE CONSTRUCTED AS SHOWN ON THE PLAN. WATER SERVICE MAY REQUIRE INSTALLATION AT GREATER DEPTHS IN CERTAIN LOCATIONS TO AVOID CONFLICT WITH OTHER SERVICES, EXISTING OR PROPOSED; REVIEW WITH DESIGN ENGINEER PRIOR TO MAKING ANY CHANGES TO DEPTH OR ALIGNMENT OF WATER SERVICE.

SANITARY SERVICE:

1. DEPTH OF COVER TO PIPE OBVERT AT MINIMUM 2.0m; ANY REDUCTIONS TO BE ADDRESSED WITH PROVISION OF INSULATION PROTECTION PER INDICATED DETAIL.
2. SANITARY SERVICES SHALL BE CONSTRUCTED AS SHOWN ON THE PLAN. SANITARY SERVICE MAY REQUIRE INSTALLATION AT GREATER DEPTHS IN CERTAIN LOCATIONS TO AVOID CONFLICT WITH OTHER SERVICES, EXISTING OR PROPOSED; REVIEW WITH DESIGN ENGINEER PRIOR TO MAKING ANY CHANGES TO DEPTH OR ALIGNMENT OF SANITARY SERVICE.
3. ALL SANITARY PIPE BEDDING, INSTALLATION AND BACKFILL MUST BE INSPECTED ON A FULL TIME BASIS BY A QUALIFIED INSPECTOR, DESIGNATED BY THE ENGINEER.
4. GRAVITY SANITARY PIPE MATERIAL – PVC MINIMUM SDR 35.
5. ALL NEWLY INSTALLED AND BACKFILLED PIPE SHALL BE SUBJECTED TO A LEAKAGE TEST, CONDUCTED IN THE PRESENCE OF OWNER. TEST PRESSURE SHALL BE 150 PERCENT OF SYSTEM OPERATING PRESSURE BASED ON PRESSURE AS MEASURED AT LOWEST POINT IN PIPELINE. BEFORE APPLYING THE SPECIFIED TEST PRESSURE, ALL AIR SHALL BE EXPELLED FROM THE PIPE. PERFORM LEAKAGE TESTING OF SANITARY SEWERS IN ACCORDANCE WITH OPSS 410 AND OPSS 407; A COPY OF THE INSPECTION REPORT SHALL BE SUBMITTED TO THE DESIGN ENGINEER FOR REVIEW.
6. AFTER SANITARY PIPE INSTALLATIONS, CCTV CAMERA INSPECTION AND REPORT IS REQUIRED TO BE PROVIDED FOR REVIEW BY THE DESIGN ENGINEER. SEWER TO BE FLUSHED PRIOR TO CAMERA INSPECTION. DO NOT INSTALL ASPHALT ON SITE UNTIL SEWERS ARE CONFIRMED TO BE INSTALLED TO THE SATISFACTION OF THE ENGINEER.

MATERIALS AND SUBSURFACE CONDITIONS:

1. THE FIELDWORK FOR THIS GEOTECHNICAL INVESTIGATION WAS CARRIED OUT IN JANUARY 16 AND 17 2025, CONSISTING OF ELEVEN BOREHOLES, ADVANCED TO A DEPTH UP TO 2.1 AND 5.2m BELOW GROUND SURFACE, WITH BOREHOLE LOCATIONS AS SHOWN ON DRAWINGS. REPORT DATED 2/10/2025 SUD-24014195-A0
2. IN GENERAL, THE SOIL CONDITIONS AT THIS SITE CONSIST OF TOPSOIL OVERLYING SILT 0.7M-1.4M THICK AND SILTY SAND 1.7M TO 4.1M THICK. TO SUMMARIZE: THE SITE HAS UP TO 200 MM OF TOPSOIL UNDERLAIN BY A SILT STRATUM 0.7 M TO 1.4 M THICK, UNDERLAIN BY A LAYER OF SILTY SAND 1.7M TO 4.1 M THICK FOR THE REMAINING DEPTH OF THE BOREHOLE.
3. GROUNDWATER AT THE SITE IS ENCOUNTERED AT A DEPTH OF 2.0 TO 4.0 M BELOW GRADE AT THE TIME OF THE INVESTIGATION.
4. IN-SITU SOILS/FILL MAY BE CLASSIFIED AS TYPE 3 SOILS FOR EXCAVATIONS TERMINATING ABOVE THE GROUNDWATER LEVEL IN CONFORMANCE WITH THE ONTARIO OCCUPATIONAL HEALTH & SAFETY ACT.
5. ALL EXCAVATIONS MUST BE COMPLETED IN ACCORDANCE WITH THE MOST RECENT REGULATIONS IN THE ONTARIO OCCUPATIONAL HEALTH AND SAFETY ACT.
6. PRIOR TO THE PLACEMENT OF THE FOOTINGS, TOPSOIL, ORGANICS, FILL AND ANY OTHER DELETERIOUS MATERIAL MUST BE REMOVED DOWN TO THE UNDISTURBED NATIVE SOILS.
7. TO PROTECT THE FOOTING BASE FROM CONSTRUCTION ACTIVITY OR INCLEMENT WEATHER, A 150 MM THICK LAYER OF GRANULAR "A" MATERIAL (OPSS 1010) CAN BE PLACED DIRECTLY BELOW THE FOOTINGS AND EXTEND A MINIMUM OF 300 MM ON EITHER SIDE OF THE FOOTING EDGE AND THEN SLOPE DOWN AT 1H:1V. IN-LIEU OF THE GRANULAR "A", A LEAN MIX CONCRETE BASE CAN BE POURED. THE LEAN MIX CONCRETE SHOULD EXTEND A MINIMUM OF 300 MM ON EITHER SIDE OF THE FOOTINGS. NOTE THAT THE FOOTING BASE SHOULD NOT BE LEFT EXPOSED BEYOND THE DAY OF EXCAVATION. FOLLOWING THE BLENDING AND CHINKING OF THE MATERIAL THE SUBGRADE SHOULD BE COVERED WITH A FILTER CLOTH CONSISTING OF TERRAFIX 270R, OR APPROVED EQUIVALENT. ALL FILTER CLOTH OVERLAP JOINTS SHOULD BE A MINIMUM OF 0.6M IN LENGTH. ONCE SUBGRADE IS PREPARED, ALL REQUIRED UPFILL MATERIAL SHALL CONSIST OF GRANULAR 'B' TYPE I OR II, OR SELECT SUBGRADE MATERIAL TO THE SIDE THE PAVEMENT/GRANULAR STRUCTURE SUBBASE (OPSS 1010).
8. ENGINEERED FILL CAN BE PLACED BETWEEN THE NATIVE SOILS AND FOOTINGS TO RAISE THE BASE OF FOOTING ELEVATION IF NECESSARY. THE ENGINEERED FILL IS TO CONSIST OF GRANULAR "B" TYPE I OR II (OPSS 1010). A FINAL 150 MM THICK LAYER OF GRANULAR "A" (OPSS) SHOULD BE PLACED DIRECTLY BELOW THE FOOTING. THE ENGINEERED FILL BELOW ANY FOOTINGS IS TO EXTEND HORIZONTALLY A MINIMUM OF 300 MM FROM ANY FOOTING EDGE AND THEN SLOPE DOWN AT 1H:1V TO THE UNDERLYING NATIVE SOILS.
9. ALL ENGINEERED FILL IS TO BE PLACED IN MAXIMUM 150 MM THICK LIFTS AND IS TO BE COMPACTED TO 100% OF THE STANDARD PROCTOR MAXIMUM DRY DENSITY (SPMDD) WITHIN 1.5% OF OPTIMUM MOISTURE CONTENT UNDER FULL TIME SUPERVISION BY AN EXP REPRESENTATIVE.
10. FOOTINGS FOUNDED ON THE UNDISTURBED NATIVE SOILS, OR ON ENGINEERED FILL OVERLYING UNDISTURBED NATIVE SOILS, CAN BE DESIGNED WITH A FACTORED GEOTECHNICAL RESISTANCE AT ULTIMATE LIMIT STATES (ULS) OF 112 KPA. THIS VALUE WAS CALCULATED USING A GEOTECHNICAL RESISTANCE FACTOR OF 0.5. A BEARING PRESSURE AT SERVICEABILITY LIMIT STATES (SLS) OF 75 KPA MAY BE USED. FOOTINGS DESIGNED WITH THE RECOMMENDATIONS CONTAINED HEREIN ARE EXPECTED TO SETTLE LESS THAN 25 MM TOTAL AND 20 MM DIFFERENTIAL.
11. FOUNDATIONS WHICH ARE TO BE PLACED AT DIFFERENT ELEVATIONS IN SOILS OR NEAR SERVICE TRENCHES SHOULD BE LOCATED SUCH THAT THE FOOTINGS ARE SET BELOW A LINE DRAWN UP AT 10 HORIZONTALS TO 7 VERTICAL FROM THE NEAR EDGE OF A LOWER FOUNDATION OR BOTTOM OF A SERVICE TRENCH.
12. ALL IMPORTED BACKFILL MATERIAL USED TO BACKFILL THE FOUNDATION WALLS SHOULD CONSIST OF GRANULAR "B" TYPE I OR GRANULAR "B" TYPE II (OPSS 1010) MATERIAL, WITH A MAXIMUM AGGREGATE SIZE NOT EXCEEDING 120 MM. THE GRANULAR "B" MATERIAL USED AGAINST THE FOUNDATION WALLS SHOULD HAVE NO SIZES GREATER THAN 75 MM AND MUST BE PLACED IN LIFTS NO GREATER THAN 150 MM IN THICKNESS AND MUST BE COMPACTED TO 98% OF THE SPMDD. CARE MUST BE TAKEN TO ENSURE DAMAGE TO THE FOUNDATION WALLS DOES NOT OCCUR.
13. THE EXTERIOR GRADE AROUND THE BUILDINGS SHOULD BE SLOPED AWAY FROM THE WALLS TO PREVENT SURFACE RUNOFF FROM ENTERING THE BUILDING. PERMANENT PERIMETER WEEPING TILE SHOULD BE INSTALLED WHERE ANY FLOOR IS LESS THAN 150 MM ABOVE FINAL GRADE AND IS REQUIRED TO BE DRY. THE DRAINAGE TILE SHOULD HAVE A MINIMUM DIAMETER OF 100 MM, AND BE SURROUNDED BY WELL-DRAINING FILTER MATERIAL (I.E. 20 MM CLEAR STONE GRAVEL). THE FILTER MATERIAL SHOULD BE SURROUNDED WITH A NON-WOVEN GEOTEXTILE. THE PERFORATED
14. SUBGRADE SHALL BE PREPARED SUCH THAT THERE WILL BE NO PERCHED WATER ON BEDROCK.
15. ANY PERCHED WATER SHALL BE REMOVED USING CONVENTIONAL PUMPS AND DISCHARGED TO A POSITIVE OUTLET AWAY FROM THE WORK AREA AND BE PROVIDED WITH SEDIMENT CONTROL MEASURES.
16. THE CONTRACTOR SHALL BE RESPONSIBLE FOR OFF SITE DISPOSAL OF ALL UNWANTED MATERIALS. THE CONTRACT ADMINISTRATOR SHALL FIELD-DETERMINE MATERIAL FOR RE-USE WITHIN THE PROJECT.
17. MANAGEMENT OF EXCESS MATERIALS SHALL BE ACCORDING TO GSSS 180.
18. THE CONTRACTOR MUST ABIDE BY O. Reg. 406/19: "ON-SITE AND EXCESS SOIL MANAGEMENT" RELATED TO SITE SOIL MATERIALS.
19. THE GROUND WATER WAS ENCOUNTERED AT THE SITE APPROXIMATELY 2.0 M BELOW GRADE. EXCAVATIONS BELOW 2.0 M WILL BE DIFFICULT TO ACHIEVE AND WILL REQUIRE EXTENSIVE DEWATERING AND AS SUCH SHOULD BE AVOIDED.
20. DEWATERING REQUIREMENTS WILL BE COVERNED BY THE TIME OF THE YEAR THE CONSTRUCTION IS PERFORMED. IT IS THE RESPONSIBILITY OF THE CONTRACTOR TO PROPOSE A SUITABLE DEWATERING SYSTEM BASED ON THE TIME OF CONSTRUCTION AND GROUNDWATER LEVELS.
21. THE METHOD USED SHOULD NOT UNDERMINE ANY ADJACENT STRUCTURES. THE DEWATERING METHOD IS THE RESPONSIBILITY OF THE CONTRACTOR, AND THE CONTRACTOR SHOULD SUBMIT HIS PROPOSAL TO THE PRIME CONSULTANT FOR REVIEW AND APPROVAL PRIOR TO CONSTRUCTION.

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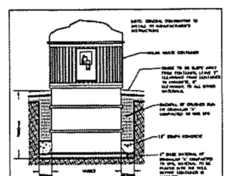
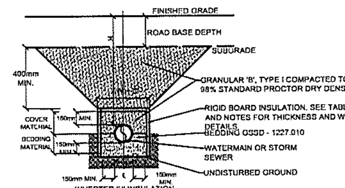
22. IT IS RECOMMENDED THAT THE CONTRACTOR CONDUCT A TEST DIG PRIOR TO CONSTRUCTION TO FAMILIARIZE THEMSELVES WITH THE GROUNDWATER CONDITIONS.
23. REASONABLE ASSUMPTIONS AND RECOMMENDATIONS HAVE BEEN PROVIDED BASED ON THE CURRENT UNDERSTANDING OF THE SUBSURFACE CONDITIONS PRESENT WITHIN THE GEOTECHNICAL INVESTIGATION BOREHOLES. GEOTECHNICAL RECOMMENDATIONS SHOULD BE REVIEWED AND UPDATED AS REQUIRED UPON SUBGRADE REVIEW BY GEOTECHNICAL ENGINEER OR THEIR DESIGNATED REPRESENTATIVE.
24. RECOMMENDED GRAVEL STRUCTURE FOR LIGHT TRAFFIC AND PARKING AREAS:
 - 250mm GRANULAR 'A' BASE
 - 300mm GRANULAR 'B' TYPE II OR 450mm GRANULAR 'B' TYPE I SUBBASE
25. RECOMMENDED GRAVEL STRUCTURE FOR HEAVY TRAFFIC AND LOADING AREAS:
 - 350mm GRANULAR 'A' BASE
 - 450mm GRANULAR 'B' TYPE II OR 600mm GRANULAR 'B' TYPE I SUBBASE
26. A MINIMUM SUBBASE MATERIAL OVERLYING SHALLOW BEDROCK IS TO BE NO LESS THAN 300mm.
18. ALL ORGANICS OR ANY OTHER DELETERIOUS MATERIALS OR BLAST ROCK FILL MUST BE REMOVED DOWN TO NATIVE SUBGRADE. AN UPFILL REQUIRED BELOW THE PAVEMENT AND GRANULAR STRUCTURE CAN CONSIST OF GRANULAR 'B' TYPE I OR TYPE II OR A SELECT SUBGRADE MATERIAL (SSM) IN ACCORDANCE WITH OPSS 1010.
19. THE ROADWAY AND PARKING LOT GRANULAR SURFACE, BASE AND SUB-BASE MATERIALS MUST BE IN ACCORDANCE WITH OPSS 1010 AND MUST BE PLACED IN MAXIMUM 150mm LIFTS AND COMPACTED TO 100% OF THE STANDARD PROCTOR MAXIMUM DRY DENSITY (SPMDD) AT A MOISTURE CONTENT WITHIN 2.0% OF THE OPTIMUM MOISTURE CONTENT.
20. THE LONG-TERM PERFORMANCE OF PAVEMENT STRUCTURES IS HIGHLY DEPENDENT UPON THE SUB-GRADE SUPPORT CONDITIONS. STRINGENT CONSTRUCTION CONTROL PROCEDURES SHOULD BE MAINTAINED TO ENSURE THAT UNIFORM SUB-GRADE MOISTURE AND DENSITY CONDITIONS ARE ACHIEVED.
21. THE FINISHED SURFACE AND UNDERLYING SUB-GRADE MUST BE SLOPED TO PROVIDE EFFECTIVE DRAINAGE TO THE SITE DITCHING AND OTHER DRAINAGE ELEMENTS.
22. SUBGRADE SOILS SHOULD BE PROOF-ROLL COMPACTED PRIOR TO PLACING ANY ENGINEERED FILL. ANY SOFT AREAS ENCOUNTERED DURING PROOF-ROLLING SHOULD BE EXCAVATED AND REPLACED WITH A GRANULAR 'A' OR GRANULAR 'B' TYPE II (OPSS 1010) MATERIAL.
23. THE MOST SEVERE LOADING CONDITIONS ON A SOIL PAVEMENT STRUCTURE SUB-GRADE USUALLY OCCUR DURING CONSTRUCTION. CONSEQUENTLY, SPECIAL PROVISIONS SUCH AS ADDITIONAL GRANULAR SUB-BASE, MAY BE REQUIRED, ESPECIALLY IF CONSTRUCTION IS COMPLETED DURING UNFAVORABLE WEATHER CONDITIONS OVER NATIVE SOILS. TYPICALLY, THE FIRST LIFT OF ENGINEERED FILL IS PLACED WITH A THICKNESS OF 300mm PRIOR TO VIBRATORY COMPACTION TO MITIGATE DISTURBANCE OF THE SUB-GRADE SOILS.
24. IF WET SOIL CONDITIONS ARE PRESENT DURING CONSTRUCTION, A NON-WOVEN GEOTEXTILE SEPARATOR (TERRAFIX 270R OR EQUIVALENT) SHOULD BE PLACED BETWEEN THE SUBGRADE SOILS AND ANY UP FILL/PAVEMENT STRUCTURE MATERIAL TO STABILIZE THE NATIVE SOILS.
25. MAINTAIN COMPATIBILITY WITH ADJACENT SUBGRADE CONDITIONS. CONSTRUCT FROST TAPERS IN CONFORMANCE WITH OPSD 803.030 AND/OR 803.031.
26. IF CONSTRUCTION PROCEEDS DURING THE WINTER MONTHS, THE BASE AND SIDES OF THE TRENCH, AS WELL AS ALL FILL MATERIALS, SHOULD NOT BE ALLOWED TO FREEZE.
27. IF CONSTRUCTION PROCEEDS DURING THE WINTER MONTHS, ALL SUBGRADE SOILS NEED TO BE MAINTAINED AT A MINIMUM TEMPERATURE OF 5°C. NO GRANULAR MATERIAL MAY BE PLACED UNDER FROZEN CONDITIONS, WITH ALL FILL MATERIAL MAINTAINED AT A MINIMUM TEMPERATURE OF 5°C PRIOR TO AND DURING INSTALLATION.
28. ANY EXCAVATED MATERIAL CONTAMINATED WITH ORGANICS, CONSTRUCTION DEBRIS, OR OTHER DELETERIOUS MATERIALS MUST NOT BE REUSED AS BACKFILL MATERIAL. THIS MATERIAL CAN BE REUSED FOR GENERAL LANDSCAPING PURPOSES, PROVIDED IT IS ENVIRONMENTALLY SAFE TO DO SO.
29. CONTRACTOR IS TO CARRY OUT THE FOLLOWING THIRD-PARTY TESTING OF SITE MATERIAL TO CONFIRM IT MEETS REQUIREMENTS – ALSO ENSURE THAT THESE TESTS ARE OBTAINED FOR WORK TAKING PLACE ON THE CITY ROW TO ENSURE CERTIFICATION OF SITE: CONTRACTOR IS RESPONSIBLE TO COORDINATE WITH MATERIAL TESTING LABORATORY TO ALLOW SUFFICIENT TIME TO OBTAIN THE REQUIRED TESTING RESULTS:
 - GRANULAR 'A' AND GRANULAR 'B' SIEVE GRADATION
 - GRANULAR 'A' AND GRANULAR 'B' COMPACTION (MULTIPLE LOCATIONS, PRIOR TO PLACING NEXT LIFT OR MATERIAL)
 - CONCRETE STRENGTH (MIN. 1 TEST PER POUR)
 - SUBGRADE REVIEW
33. NOTE THAT SOILS ENCOUNTERED IN THE CONSTRUCTION EXCAVATIONS MAY VARY SIGNIFICANTLY ACROSS THE SITE. GEOTECHNICAL CONCLUSIONS ARE BASED SOLELY ON THE MATERIALS ENCOUNTERED IN BOREHOLE EXPLORATIONS. IF DIFFERENT SUBSURFACE CONDITIONS ARE ENCOUNTERED AT THE TIME OF CONSTRUCTION, IT IS RECOMMENDED THAT EXP BE CONTACTED IMMEDIATELY TO EVALUATE THE CONDITIONS ENCOUNTERED.
34. WATER (I.E. SURFACE WATER RUNOFF) SHOULD NOT BE PERMITTED TO ENTER AND/OR POND WITHIN THE CONSTRUCTION AREA.
35. TOPSOIL AND PLACEMENT OF TOPSOIL SHALL ADHERE TO GSSS 802.
36. SOD AND PLACEMENT OF SOD SHALL ADHERE TO GSSS 803.
37. SEED AND COVER AND THE PLACEMENT OF SEED AND COVER SHALL ADHERE TO OPSS.MUNI 804.
38. CONTRACTOR SHALL BE RESPONSIBLE FOR WATERING AND MAINTENANCE UNTIL VEGETATION IS ESTABLISHED AND HEALTHY AT THE CONSULTANTS DISCRETION.
39. ENGINEERED FILL AGGREGATE MATERIALS SHALL ADHERE TO GSSS 1010.
40. GENERAL SURFACE GRADING OF GRANULAR MATERIALS SHALL BE COMPLETED IN ACCORDANCE WITH OPSS.MUNI 206.
41. EARTH AND ROCK EXCAVATION SHALL BE IN ACCORDANCE WITH OPSS.MUNI 206.
42. CONCRETE MATERIALS AND PRODUCTION SHALL ADHERE TO GSSS 1350.
43. RIP RAP SHALL BE INSTALLED PER GSSS 511.
44. JOINTS BETWEEN NEW AND PREVIOUSLY INSTALLED ASPHALT SHALL BE CONSTRUCTED IN ACCORDANCE WITH OPSS.MUNI 310.07.11.
45. TEMPORARY EROSION AND SEDIMENT CONTROL DEVICES SHALL BE IN CONFORMANCE WITH OPSS.MUNI 805.

SEDIMENTATION CONTROL:

1. ENSURE THAT EXCAVATED MATERIAL IS NOT ALLOWED TO WASH UNABATED INTO SURROUNDING DRAINAGE COURSES AND WATER BODIES. INSTALL SILT FENCE BARRIER AROUND SITE, AND STRAW BALE FLOW CHECKS ALONG DITCH LINES DOWNSTREAM OF SITE AND AT CULVERT ENTRANCES.
2. SILT FENCE BARRIERS AS PER OPSD 219.110. STRAW BALE FLOW CHECKS AS PER OPSD 219.180.
3. IF THE SEDIMENT AND EROSION CONTROL MEASURES ARE NOT FUNCTIONING PROPERLY, NO FURTHER WORK SHALL OCCUR UNTIL THE PROBLEM IS ADDRESSED.
4. INSTALL ADDITIONAL SILT FENCE BARRIERS IF IT IS NOTICED THAT CONSTRUCTION ACTIVITIES NEGATIVELY IMPACT SURROUNDING PROPERTIES NOT ALREADY PROTECTED.
5. SEDIMENT BARRIERS, CHECK DAMS, AND TEMPORARY CONSTRUCTION ACCESS TO BE INSTALLED PRIOR TO THE BEGINNING OF CONSTRUCTION.
6. ALL SEDIMENT CONTROL DEVICES TO BE ROUTINELY INSPECTED AND MAINTAINED IN PROPER WORKING ORDER UNTIL AREAS ARE STABILIZED.
7. MAXIMUM ALLOWED SEDIMENT ACCUMULATION AT THE SEDIMENT FENCING IS HALF THE FENCE FABRIC HEIGHT.
8. AFTER SIGNIFICANT RAIN EVENT, ALL SEDIMENT AND EROSION CONTROLS MUST BE INSPECTED AND RECTIFIED AS SOON AS POSSIBLE.
9. IF NECESSARY, TRUCKS WILL BE WASHED DOWN BEFORE LEAVING THE SITE.
10. THE SITE WILL BE WET DOWN IF NECESSARY TO CONTROL DUST.
11. CALCIUM CHLORIDE DUST CONTROL MUST NOT BE USED IN GROUND WATER PROTECTION AREAS AND IMMEDIATELY UPSTREAM OF BODIES OF WATER.
12. ALL CONSTRUCTION ACTIVITY WILL COMPLY WITH CITY OF GREATER SUDBURY NOISE BYLAW.
13. ALL CONSTRUCTION VEHICLES TO ENTER AND EXIT SITE FROM TEMPORARY CONSTRUCTION ACCESS AS APPROVED BY THE CITY OF GREATER SUDBURY.
14. ALL TOPSOIL STOCKPILES TO BE SURROUNDED WITH SEDIMENT CONTROL FENCING.
15. FILTER FABRIC TO BE PLACED UNDER GRATES AND LIDS ON ALL ONSITE AND DOWNSTREAM CATCHBASINS TO TRAP SEDIMENT. SILT TRAPS ARE TO BE CLEANED REGULARLY AND ARE NOT TO BE REMOVED UNTIL ALL CONSTRUCTION ACTIVITY IS COMPLETE. FILTER FABRIC FOR SILT CONTROL TO BE TERRA FIX 270R OR APPROVED EQUIVALENT.
16. WHERE CONSTRUCTION ACTIVITY OCCURS WITHIN THE CITY RIGHT OF WAY, SEDIMENT CONTROLS WILL BE PLACED ON THE CATCHBASINS ON PUBLIC STREETS ACROSS THE PROPERTY'S FRONTAGE.
17. STREET SWEEPING, CATCHBASIN CLEANING AND DUST CONTROL ARE THE RESPONSIBILITY OF THE DEVELOPER AND MUST BE KEPT UNDER CONTROL ON ALL ROADWAYS TO THE SATISFACTION OF THE GENERAL MANAGER OF GROWTH AND INFRASTRUCTURE.
18. SURFACE EROSION PROTECTION MUST BE APPLIED FOR ALL DISTURBED AREAS, SUBJECT TO EROSION, UNTIL VEGETATION IS ESTABLISHED.
19. A LOG BOOK SHALL BE KEPT ONSITE INDICATING INSPECTION SCHEDULES, REPAIRS MADE, & ANY CONCERNS NOTED.
20. ADDITIONAL MATERIALS SUCH AS CLEAR STONE, FILTER FABRIC, PUMPS, HOSES AND SILTSOXX, OR APPROVED EQUIVALENT TO BE KEPT ONSITE AT ALL TIMES FOR CONDUCTING REPAIRS TO SEDIMENT CONTROL MEASURES.
21. ENGINEERED CHANGES TO THE ESC MEASURES MAY BE REQUIRED AS SITE CONDITIONS CHANGE.
22. ANY DEWATERING OCCURRING ONSITE MUST BE IN ACCORDANCE WITH AN APPROVED DEWATERING PLAN, WHICH MUST INCLUDE SILT TRAPS.
23. REFUELING, EQUIPMENT MAINTENANCE, AND HAZARDOUS MATERIAL STORAGE MUST TAKE PLACE A MINIMUM OF 30M FROM ANY WATERCOURSE OR ENVIRONMENTALLY SENSITIVE AREA.
24. AN APPROVED SPILL MANAGEMENT PLAN IS TO BE KEPT ONSITE AT ALL TIMES.
25. SPILLS ARE TO BE REPORTED IMMEDIATELY TO THE MECP SPILLS ACTION CENTER AT 1-800-268-6060
26. TEMPORARY FUEL AND OTHER HAZARDOUS MATERIAL STORAGE IS TO BE LOCATED MINIMUM 30M AWAY FROM ANY WATERCOURSE OR ENVIRONMENTALLY SENSITIVE AREA.



MOLOK DETAIL
(N.T.S.)



INVERTED 'U' INSULATION

MINIMUM WIDTH 'W' (mm)			
COVER REDUCTION	SLAB	INVERTED 'U'	BOX
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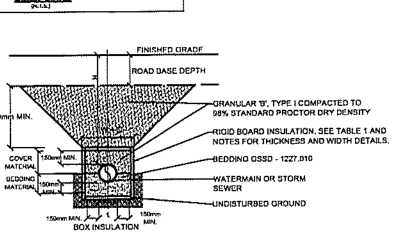
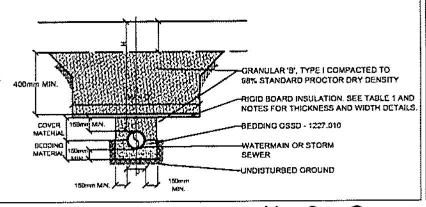
600	1400	500	-
900	-	670	-
1200	-	800	650
1500	-	-	800
1800	-	-	1000



BOX INSULATION



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LEGEND

No.	Revision	By:	Date
1	ISSUED FOR DRAFT REVIEW	PF	2025-05-04

ISSUED FOR REVIEW

Professional Seal(s)

Drawn By: DKR | Scale: AS SHOWN
Checked By: P.F. | Date: 2025-05-00
Approved By: | Date:
Date Printed: 2025-07-22
File Name: 24000124-6022 HANMER-SITEPLAN-R1-07-23-2025.DWG

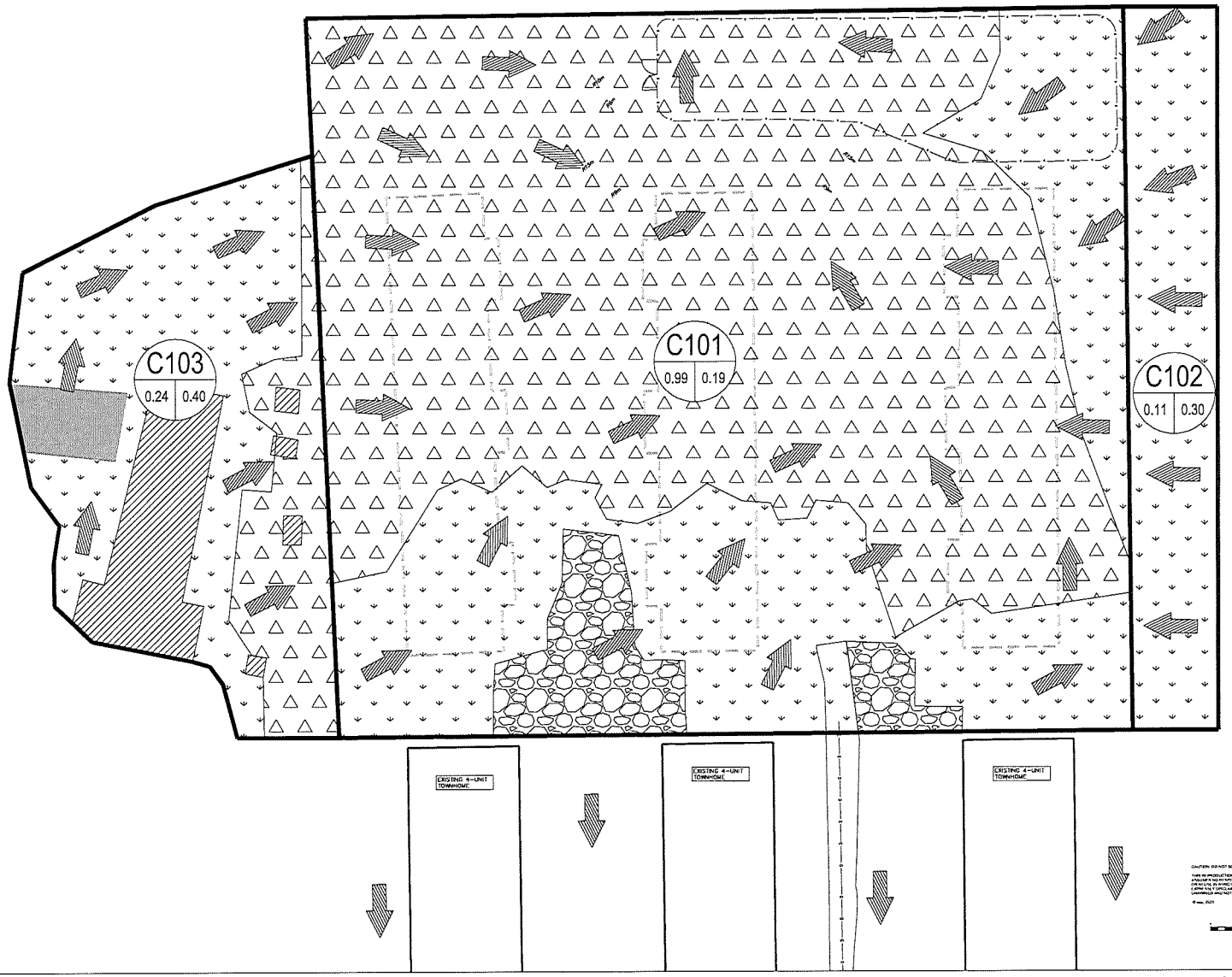
Project Title
1916555 ONTARIO DEVELOPMENT
MR80 HANMER TOWNHOUSE DEVELOPMENT
6034, 6040 MUNICIPAL ROAD 80, HANMER, ONTARIO

Dwg. Title
PROPOSED NOTES AND DETAILS

Project No. SUD-00024006124-A0

Dwg. No. C-4 | Rev. No. 1

PL-CON-2025-00040
Sketch 13



exp Services Inc.
Infrastructure Services - Sudbury
839 Paget Street, Suite 7-A3
Sudbury, Ontario, Canada
P3E 5S7
Tel: 705 674 9681
Fax: 705 674 6803
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LEGEND

- LAWNS
- WOODS
- GRANULAR
- BUILDINGS
- ASPHALT
- OVERLAND FLOW ROUTE
- CATCHMENT AREA AREA (ha)
- RUNOFF COEFFICIENT

X-1 | 0.50 | 0.32

No.	Revision	By:	Date
1	ISSUED FOR SWM	HT	2025-05-06

ISSUED FOR SWM

Professional Seal(s)

Drawn By: HT	Scale: 1:250
Checked By: AL	Date: 2025-05-06
Approved By:	Date:
Date Printed: 2025-06-10	

File Name: 24006124-6022 HANMER-SITEPLAN-R1-07-23-2020.DWG

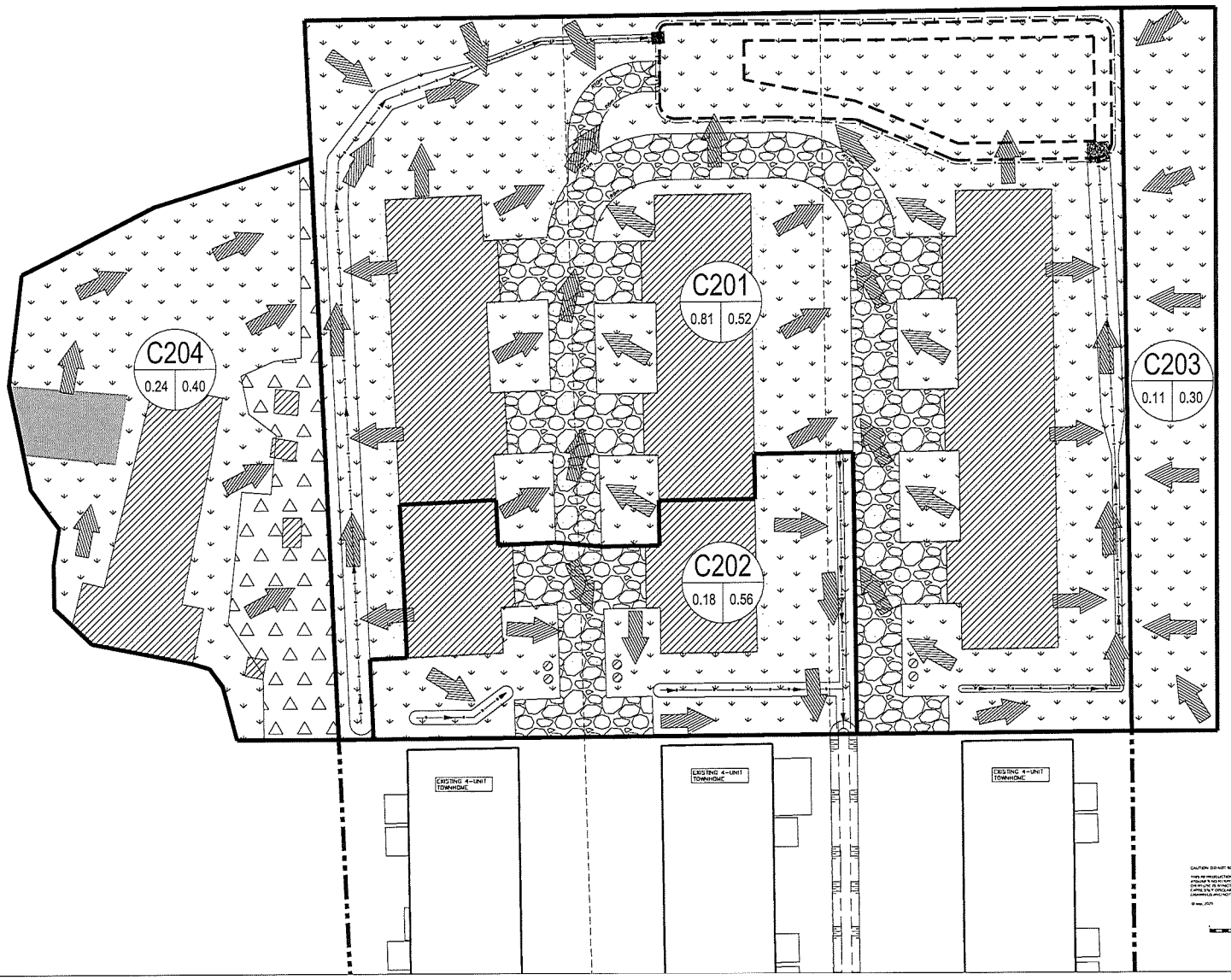
Project Title
1916555 ONTARIO DEVELOPMENT
MR80 HANMER TOWNHOUSE DEVELOPMENT
6034, 6040 MUNICIPAL ROAD 80, HANMER, ONTARIO

Dwg. Title
STORM WATER MANAGEMENT DRAWING

Project No. SUD-00024006124-A0

Dwg. No. SWM1 | Rev. No. 0

PL-CON-2025-00040
Sketch 14



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LEGEND

- LAWNS
- WOODS
- GRANULAR
- BUILDINGS
- ASPHALT
- OVERLAND FLOW ROUTE
- X-1 (0.50 | 0.32) — CATCHMENT AREA AREA (ha) / RUNOFF COEFFICIENT

No.	Revision	By:	Date
1	ISSUED FOR SWM	PT	2025/07/05

ISSUED FOR SWM

Professional Seal(s)

Drawn By: PT	Scale: 1:250
Checked By: AL	Date: 2025-05-06
Approved By:	Date:
Date Plotted: 2025-06-10	

File Name: 24006124-6022 HANMER-SITEPLAN-R1-07-23-2025.DWG

Project Title
1916555 ONTARIO DEVELOPMENT
MR80 HANMER TOWNHOUSE DEVELOPMENT
6034, 6040 MUNICIPAL ROAD 80, HANMER, ONTARIO

Dwg. Title
STORM WATER MANAGEMENT DRAWING

Project No. SUD-00024006124-A0

Dwg. No. SWM2 | Rev. No. 0

PL-CDN-2025-00040
Sketch 15

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    -


Lion's Playground
Municipal Rd 80

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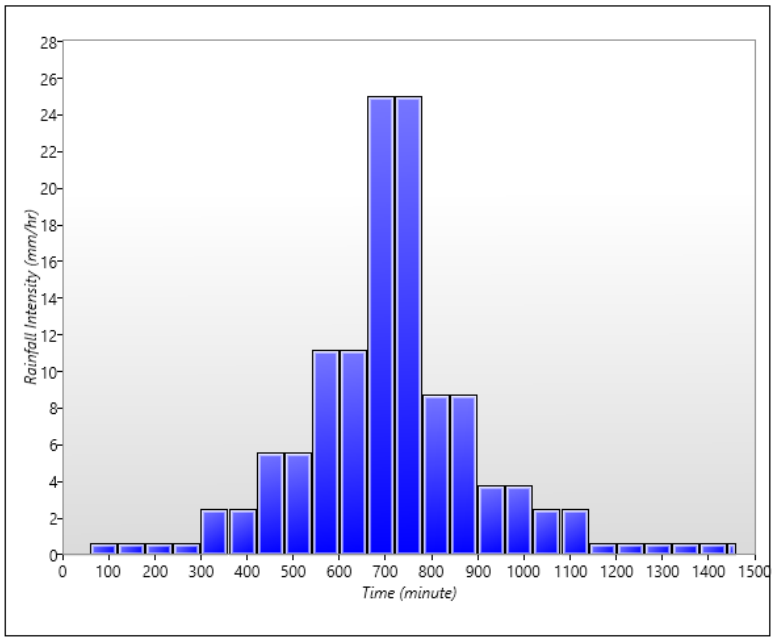
  -
  -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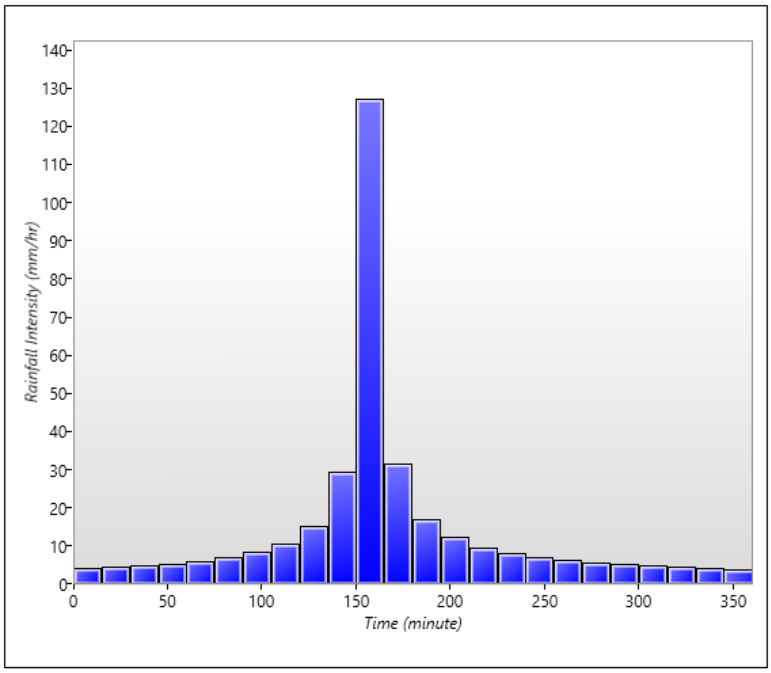
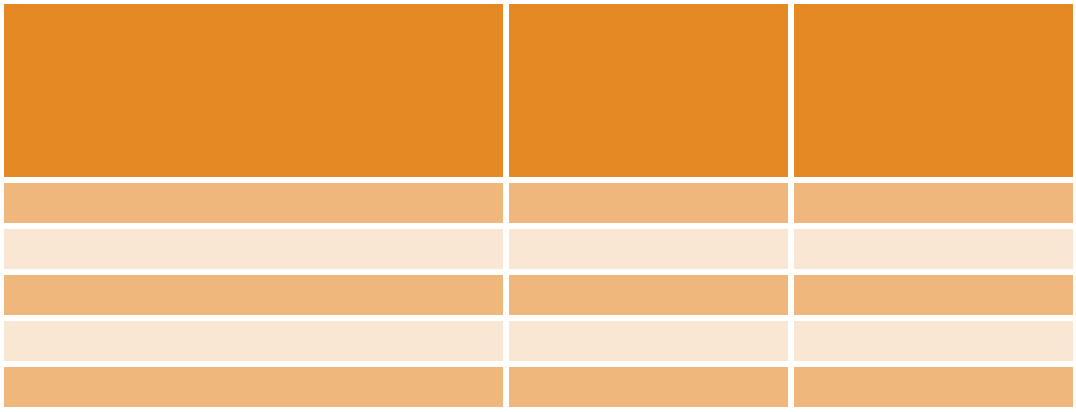
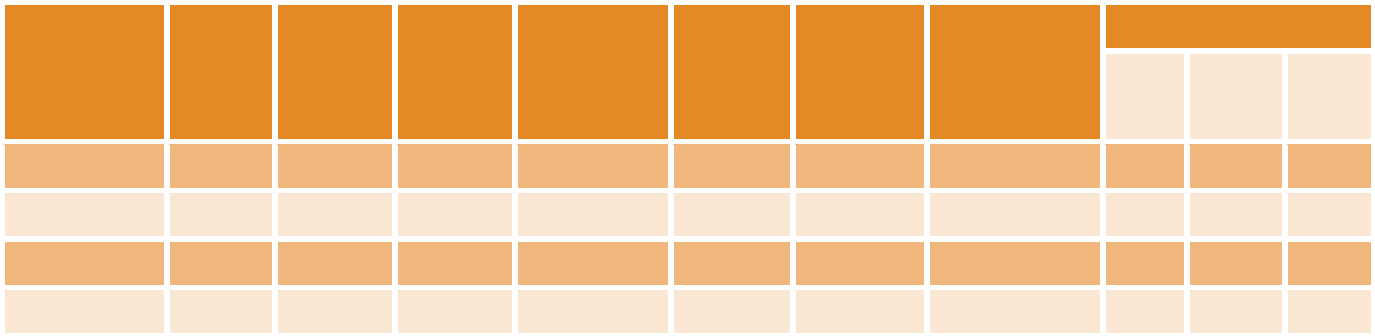
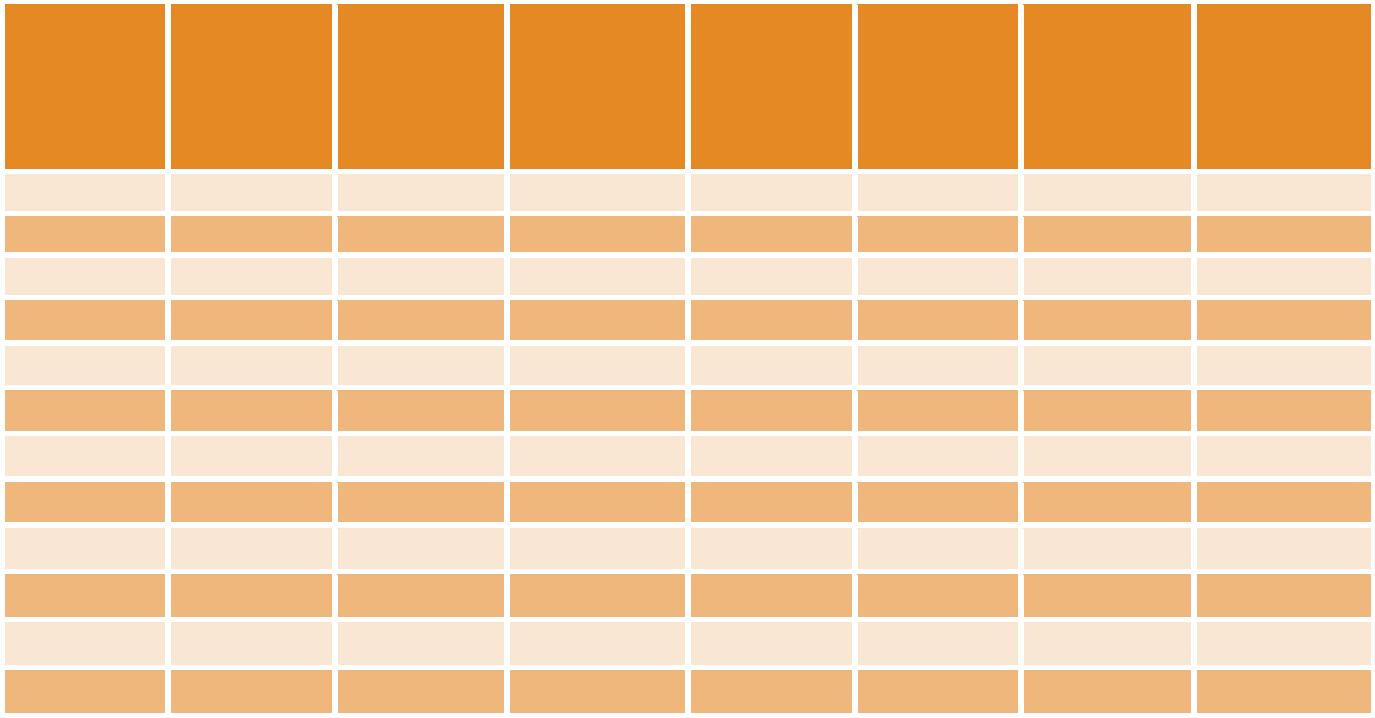
0
2
4
6
8
10
12
14
16
18
20
22
24
26
28
0
100
200
300
400
500
600
700
800
900
1000
1100
1200
1300
1400
1500
Time (minute)


Rainfall Intensity (mm/hr)
140
130
120
110
100
90
80
70
60
50
40
30
20
10
0
0
50
100
150
200
250
300
350
Time (minute)







	DISCH [m³/s]	STORAGE [ha.m]
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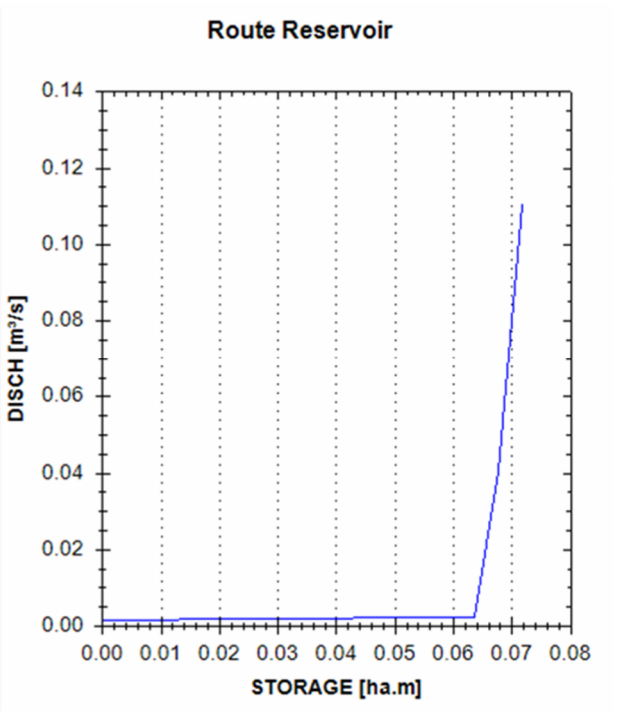
2	0.001	0.005
3	0.002	0.010
4	0.002	0.016
5	0.002	0.019
6	0.002	0.022
7	0.002	0.025
8	0.002	0.028
9	0.002	0.031
10	0.002	0.034
11	0.002	0.038
12	0.002	0.041
13	0.002	0.045
14	0.002	0.048
15	0.002	0.052
16	0.002	0.056
17	0.002	0.060
18	0.002	0.064
19	0.040	0.068
20	0.110	0.072



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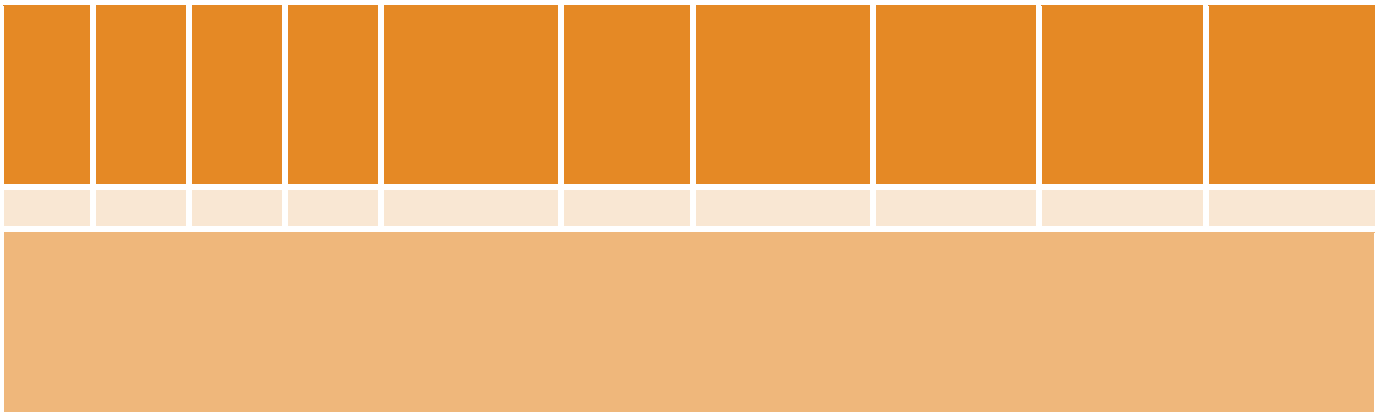
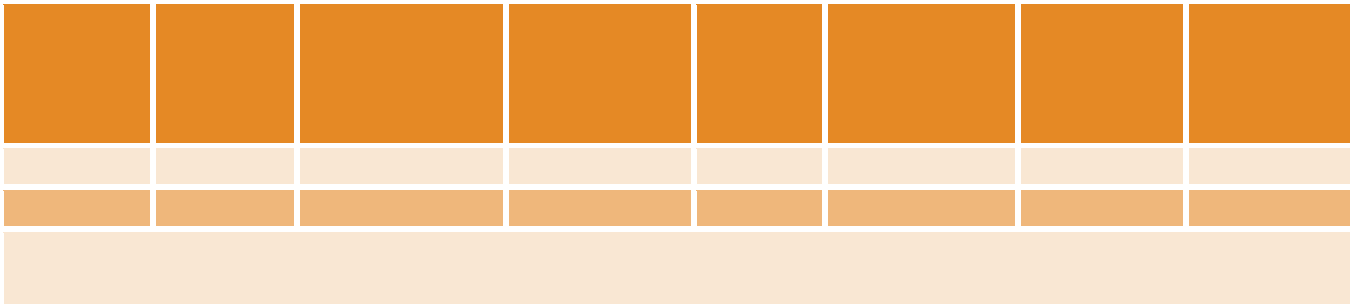
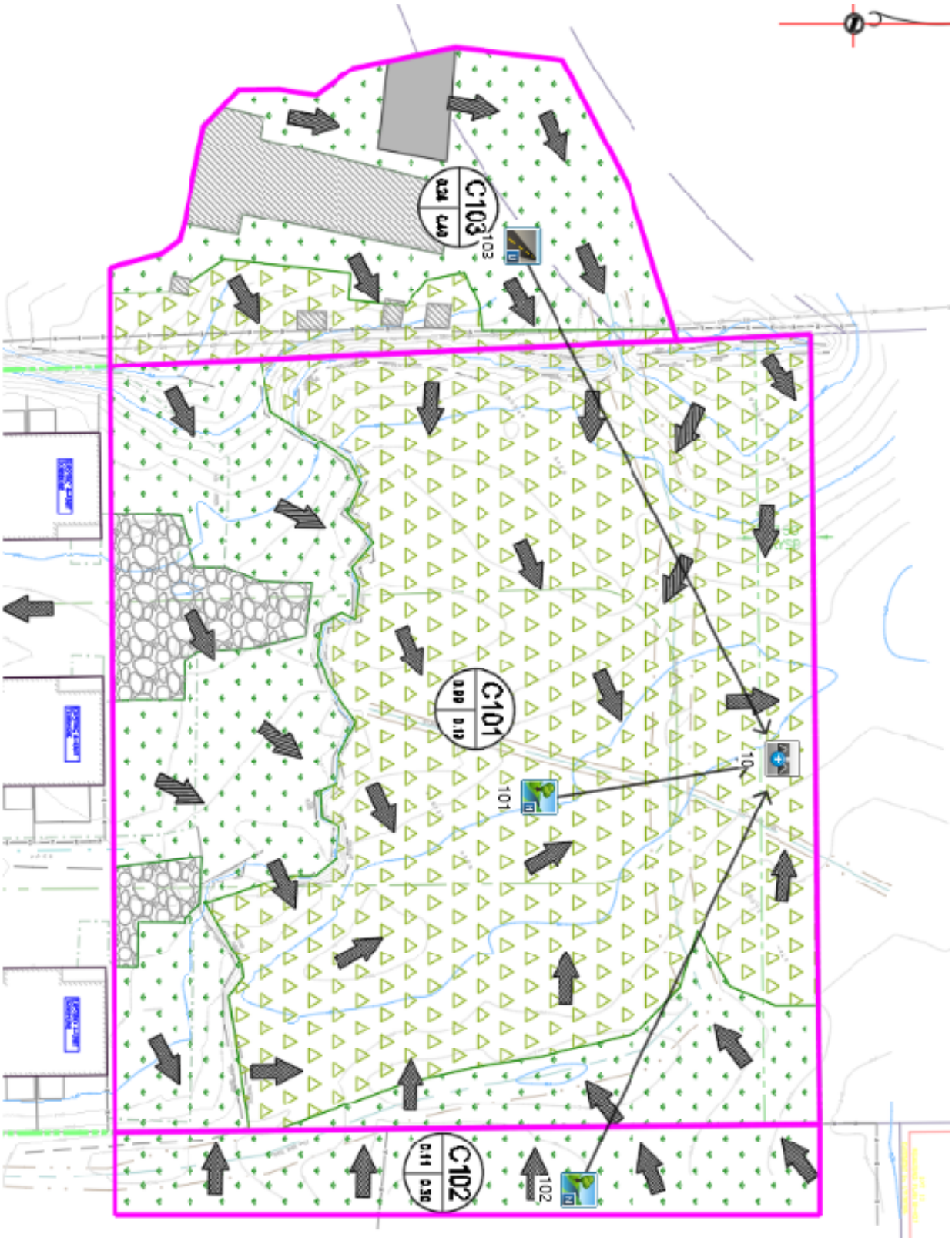
LICENSED PROFESSIONAL ENGINEER
J. S. STILLMAN
100550202
2025-07-08
PROVINCE OF ONTARIO

Peter Fiala



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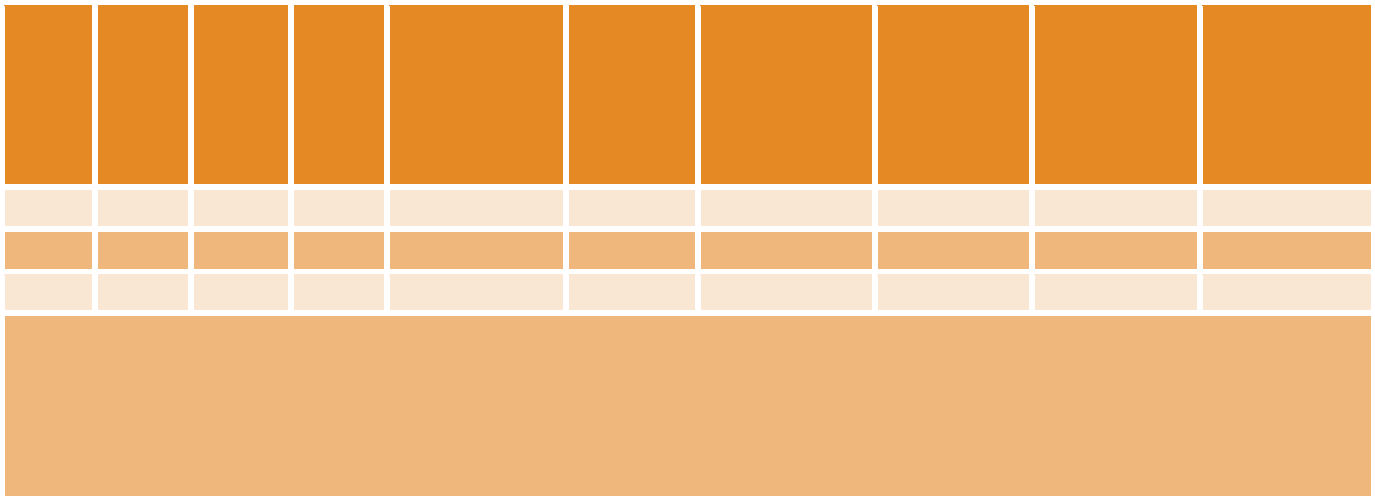
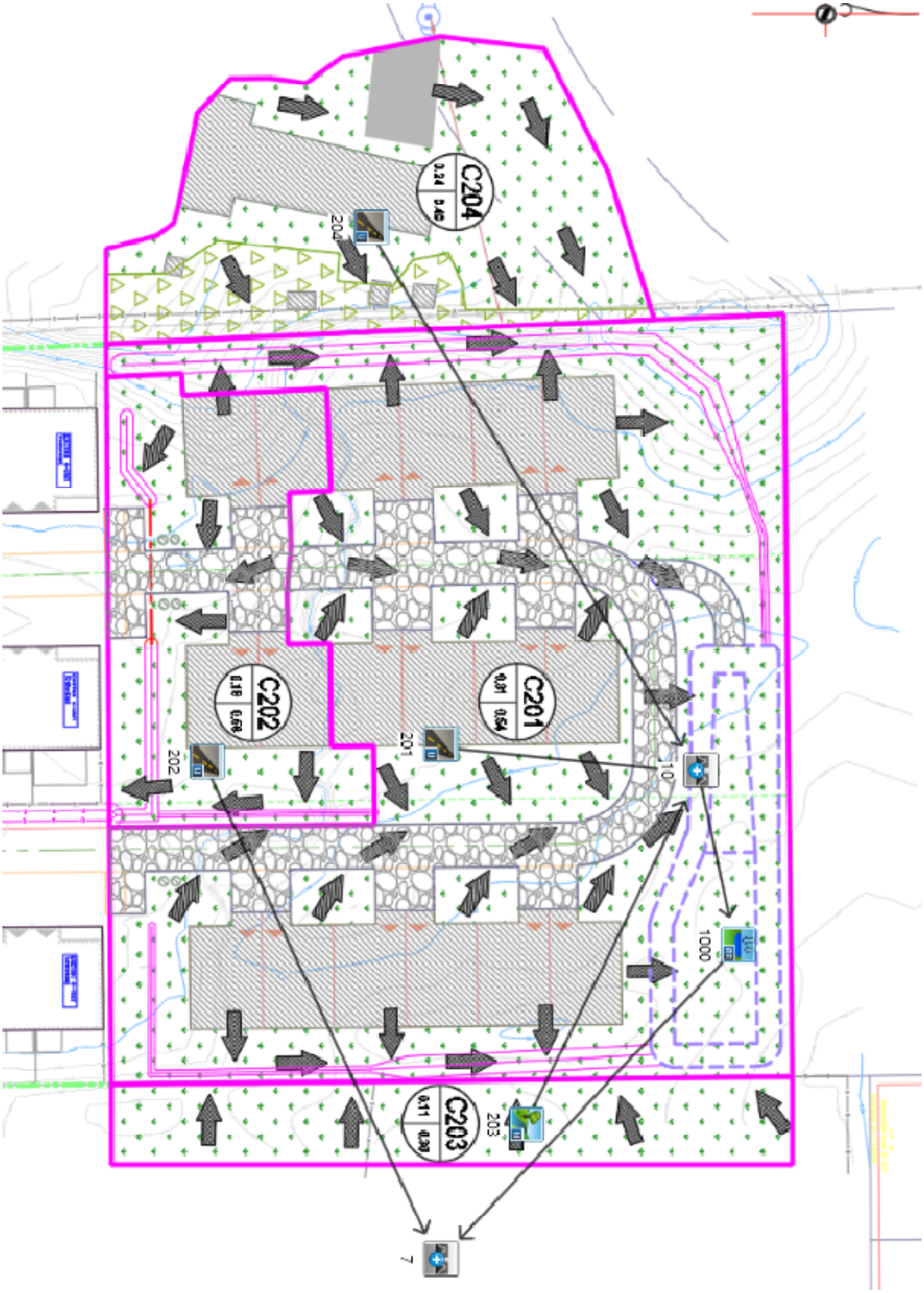
C101
C102
101
102
103



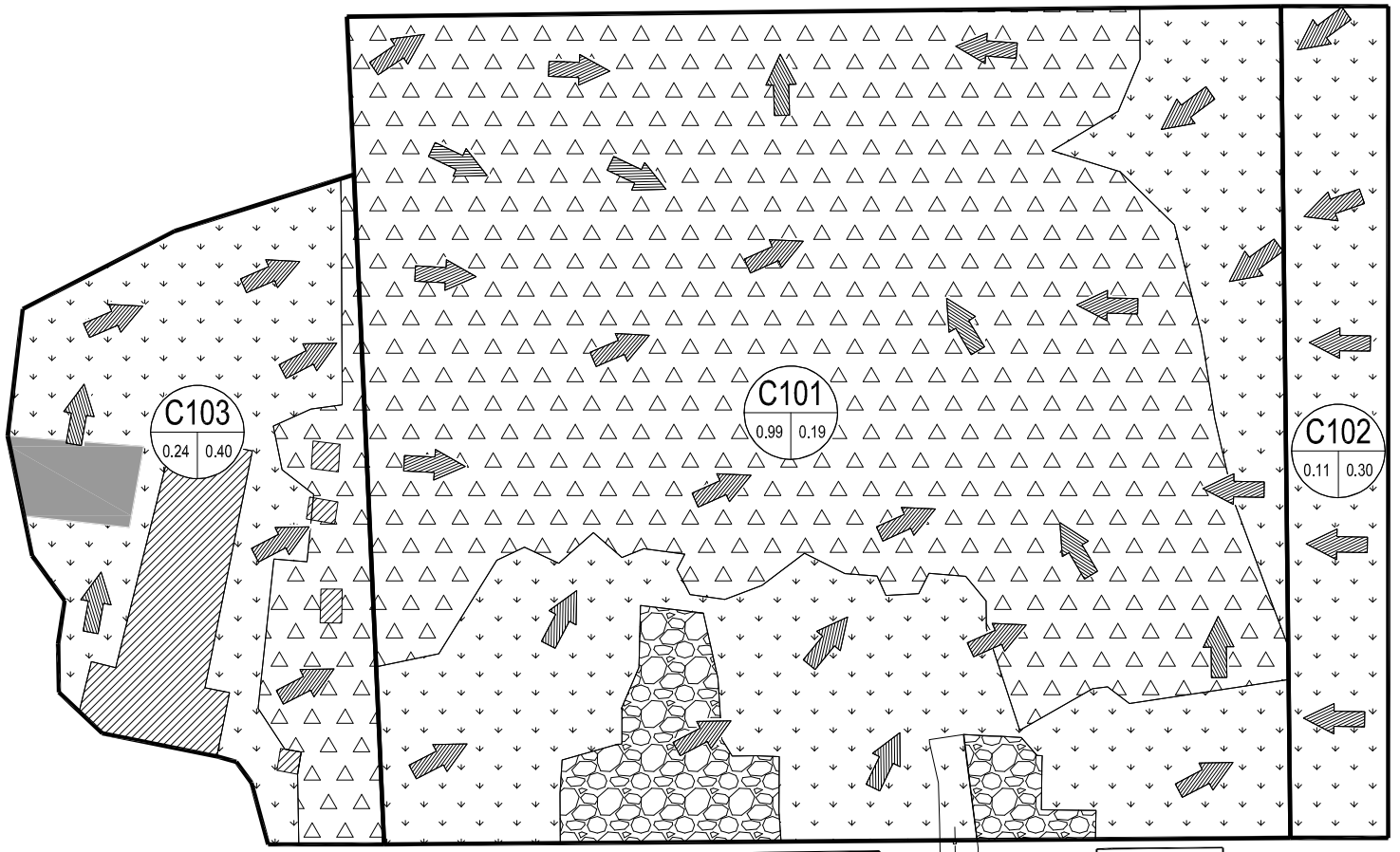

C204
C202
C201
C203
204
202
201
203
10
1000
7

Appendix B

Pre-Development Catchment Areas (SWM1)

PL-CON-2025-00040

LOT 13
REGISTERED PLAN M-453
EASEMENT No. LT136755



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Member of the exp Global Company
839 Regent Street, Suite 340
Sudbury, Ontario, Canada
P3E 5M8
Tel: 705 674 9681
Fax: 705 674 3583
www.exp.com

LEGEND

- LAWNS
- WOODS
- GRANULAR
- BUILDINGS
- ASPHALT
- OVERLAND FLOW ROUTE
- CATCHMENT AREA AREA (ha)
- RUNOFF COEFFICIENT

X-1 | 0.50 | 0.32

No.	Revision	By	Date
1	ISSUED FOR SWM	PT	2025-06-06

ISSUED FOR SWM

Professional Seal(s)

Drawn By: PT	Scale: 1:250
Checked By: AL	Dated: 2025-06-06
Approved By:	Dated:
Date Printed: 2025-06-10	

File Name: I:\24006124\6022 HANMER\SITEPLANS\1-20-06-2025.DWG

Project Title:
1916555 ONTARIO DEVELOPMENT
MR80 HANMER TOWNHOUSE DEVELOPMENT
6034, 6040 MUNICIPAL ROAD 80, HANMER, ONTARIO

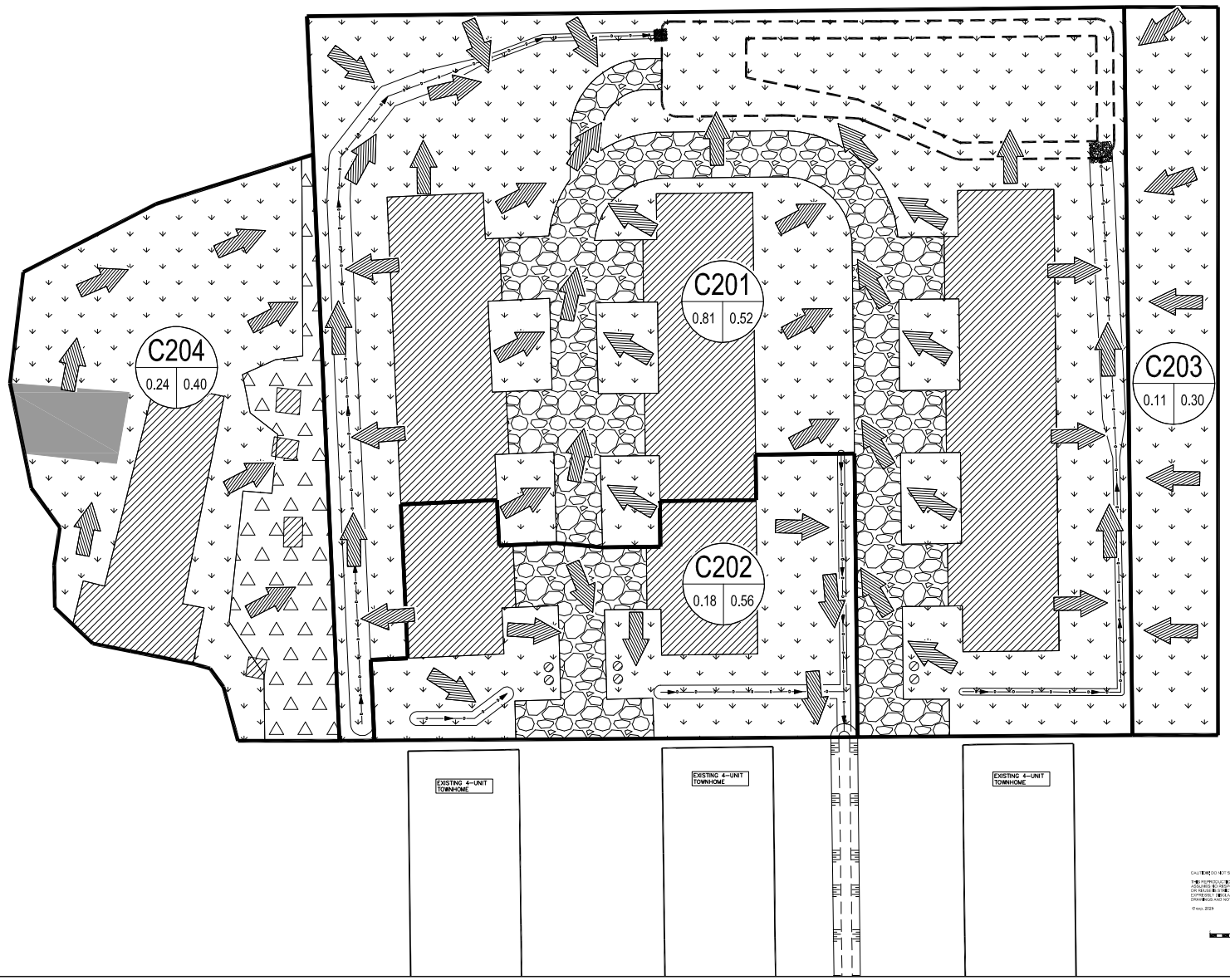
Dwg. Title:
STORM WATER MANAGEMENT DRAWING

Project No.: SUD-00024006124-A0

Dwg. No.: SWM1 | Rev. No.: 0

Appendix C

Post-Development Catchment Areas (SWM2)



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Environment Health & Safety
609 Regent Street, Suite 340
Sudbury, Ontario, Canada
P3E 5S9
Tel: 705 674 9681
Fax: 705 674 3361
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PL-CON-2025-00040

LEGEND

- LAWNS
- WOODS
- GRANULAR
- BUILDINGS
- ASPHALT
- OVERLAND FLOW ROUTE
- X-1 (0.50 / 0.32): CATCHMENT AREA / AREA (ha) / RUNOFF COEFFICIENT

No.	Revision	By	Date
1	ISSUED FOR SWM	PT	2025-06-06

ISSUED FOR SWM

Professional Seal(s)

Drawn By: PT	Scale: 1:250
Checked By: AL	Dated: 2025-06-06
Approved By:	Dated:
Date Printed: 2025-06-10	

File Name: I:\24006124\6022 HANMER\SITEPLAN\R1\20250620250606.DWG

Project Title:
1916555 ONTARIO DEVELOPMENT
MR80 HANMER TOWNHOUSE DEVELOPMENT
6034, 6040 MUNICIPAL ROAD 80, HANMER, ONTARIO

Dwg. Title:
STORM WATER MANAGEMENT DRAWING

Project No.: SUD-00024006124-A0

Dwg. No.: SWM2 | Rev. No.: 0

Appendix D

Pre-Development Visual OTTHYMO Model Output Sheets

```
*******************************************
** SIMULATION:01 - 2yr 6hr 15min Chicago **
*******************************************

--------------------
| ADD HYD  (  0010)|
|   1 +  2 =  3    |          AREA    QPEAK    TPEAK     R.V.
--------------------          (ha)    (cms)    (hrs)     (mm)
        ID1= 1 (  0101):     0.99   0.006     3.00     3.29
      + ID2= 2 (  0102):     0.11   0.002     2.75     4.40
        ==================================================
        ID = 3 (  0010):     1.10   0.007     3.00     3.40

     NOTE:  PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.
-------------------------------------------------------------------------------

--------------------
| ADD HYD  (  0010)|
|   3 +  2 =  1    |          AREA    QPEAK    TPEAK     R.V.
--------------------          (ha)    (cms)    (hrs)     (mm)
        ID1= 3 (  0010):     1.10   0.007     3.00     3.40
      + ID2= 2 (  0103):     0.24   0.005     2.75     9.61
        ==================================================
        ID = 1 (  0010):     1.34   0.011     3.00     4.50

     NOTE:  PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.
-------------------------------------------------------------------------------
*******************************************
** SIMULATION:02 - 5yr 6hr 15min Chicago **
*******************************************

--------------------
| ADD HYD  (  0010)|
|   1 +  2 =  3    |          AREA    QPEAK    TPEAK     R.V.
--------------------          (ha)    (cms)    (hrs)     (mm)
        ID1= 1 (  0101):     0.99   0.015     3.00     7.17
      + ID2= 2 (  0102):     0.11   0.004     2.75     8.87
        ==================================================
        ID = 3 (  0010):     1.10   0.017     3.00     7.34

     NOTE:  PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.
-------------------------------------------------------------------------------

--------------------
| ADD HYD  (  0010)|
|   3 +  2 =  1    |          AREA    QPEAK    TPEAK     R.V.
--------------------          (ha)    (cms)    (hrs)     (mm)
        ID1= 3 (  0010):     1.10   0.017     3.00     7.34
      + ID2= 2 (  0103):     0.24   0.011     2.75    16.70
        ==================================================
        ID = 1 (  0010):     1.34   0.026     2.92     9.00

     NOTE:  PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.
-------------------------------------------------------------------------------
*******************************************
** SIMULATION:03 - 10yr 6hr 15min Chicago **
*******************************************

--------------------
| ADD HYD  (  0010)|
|   1 +  2 =  3    |          AREA    QPEAK    TPEAK     R.V.
--------------------          (ha)    (cms)    (hrs)     (mm)
        ID1= 1 (  0101):     0.99   0.022     3.00     9.80
      + ID2= 2 (  0102):     0.11   0.005     2.75    11.81
        ==================================================
        ID = 3 (  0010):     1.10   0.024     2.92    10.00

     NOTE:  PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.
-------------------------------------------------------------------------------

--------------------
| ADD HYD  (  0010)|
|   3 +  2 =  1    |          AREA    QPEAK    TPEAK     R.V.
--------------------          (ha)    (cms)    (hrs)     (mm)
        ID1= 3 (  0010):     1.10   0.024     2.92    10.00
      + ID2= 2 (  0103):     0.24   0.014     2.75    21.08
        ==================================================
        ID = 1 (  0010):     1.34   0.036     2.92    11.97

     NOTE:  PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.
-------------------------------------------------------------------------------
*******************************************
** SIMULATION:04 - 25yr 6hr 15min Chicago **
*******************************************
```

```
--------------------
| ADD HYD  (  0010)|
|   1 +  2 =  3    |          AREA    QPEAK    TPEAK     R.V.
--------------------          (ha)    (cms)    (hrs)     (mm)
        ID1= 1 (  0101):     0.99   0.030     3.00    13.43
      + ID2= 2 (  0102):     0.11   0.007     2.75    15.83
        ================================================
        ID = 3 (  0010):     1.10   0.034     2.92    13.67

     NOTE:  PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.
--------------------------------------------------------------------------------


--------------------
| ADD HYD  (  0010)|
|   3 +  2 =  1    |          AREA    QPEAK    TPEAK     R.V.
--------------------          (ha)    (cms)    (hrs)     (mm)
        ID1= 3 (  0010):     1.10   0.034     2.92    13.67
      + ID2= 2 (  0103):     0.24   0.022     2.75    26.84
        ================================================
        ID = 1 (  0010):     1.34   0.049     2.83    16.01

     NOTE:  PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.
--------------------------------------------------------------------------------
****************************************
** SIMULATION:05 - 50yr 6hr 15min Chicago **
****************************************


--------------------
| ADD HYD  (  0010)|
|   1 +  2 =  3    |          AREA    QPEAK    TPEAK     R.V.
--------------------          (ha)    (cms)    (hrs)     (mm)
        ID1= 1 (  0101):     0.99   0.042     3.00    18.69
      + ID2= 2 (  0102):     0.11   0.009     2.75    21.55
        ================================================
        ID = 3 (  0010):     1.10   0.047     2.92    18.97

     NOTE:  PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.
--------------------------------------------------------------------------------


--------------------
| ADD HYD  (  0010)|
|   3 +  2 =  1    |          AREA    QPEAK    TPEAK     R.V.
--------------------          (ha)    (cms)    (hrs)     (mm)
        ID1= 3 (  0010):     1.10   0.047     2.92    18.97
      + ID2= 2 (  0103):     0.24   0.029     2.75    34.74
        ================================================
        ID = 1 (  0010):     1.34   0.069     2.83    21.77

     NOTE:  PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.
--------------------------------------------------------------------------------
****************************************
** SIMULATION:06 - 100yr 6hr 15min Chicago **
****************************************


--------------------
| ADD HYD  (  0010)|
|   1 +  2 =  3    |          AREA    QPEAK    TPEAK     R.V.
--------------------          (ha)    (cms)    (hrs)     (mm)
        ID1= 1 (  0101):     0.99   0.053     3.00    23.38
      + ID2= 2 (  0102):     0.11   0.011     2.75    26.61
        ================================================
        ID = 3 (  0010):     1.10   0.060     2.92    23.70

     NOTE:  PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.
--------------------------------------------------------------------------------


--------------------
| ADD HYD  (  0010)|
|   3 +  2 =  1    |          AREA    QPEAK    TPEAK     R.V.
--------------------          (ha)    (cms)    (hrs)     (mm)
        ID1= 3 (  0010):     1.10   0.060     2.92    23.70
      + ID2= 2 (  0103):     0.24   0.036     2.75    41.51
        ================================================
        ID = 1 (  0010):     1.34   0.086     2.83    26.86

     NOTE:  PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.
--------------------------------------------------------------------------------
************************************************
** SIMULATION:07 - 2Yr 24Hr 60Minute AES Type II **
************************************************


--------------------
| ADD HYD  (  0010)|
```

```
|   1 +  2 =  3    |          AREA    QPEAK    TPEAK     R.V.
------------------           (ha)    (cms)    (hrs)     (mm)
        ID1= 1 (  0101):     0.99   0.006    13.00     7.83
      + ID2= 2 (  0102):     0.11   0.001    13.00     9.61
        ================================================
        ID = 3 (  0010):     1.10   0.007    13.00     8.01

     NOTE:  PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.
--------------------------------------------------------------------------------

--------------------
| ADD HYD  (  0010)|
|   3 +  2 =  1    |          AREA    QPEAK    TPEAK     R.V.
------------------           (ha)    (cms)    (hrs)     (mm)
        ID1= 3 (  0010):     1.10   0.007    13.00     8.01
      + ID2= 2 (  0103):     0.24   0.003    13.00    17.15
        ================================================
        ID = 1 (  0010):     1.34   0.010    13.00     9.63

     NOTE:  PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.
--------------------------------------------------------------------------------
************************************************
** SIMULATION:08 - 5Yr 24Hr 60Minute AES Type II **
************************************************

--------------------
| ADD HYD  (  0010)|
|   1 +  2 =  3    |          AREA    QPEAK    TPEAK     R.V.
------------------           (ha)    (cms)    (hrs)     (mm)
        ID1= 1 (  0101):     0.99   0.012    13.00    15.70
      + ID2= 2 (  0102):     0.11   0.002    13.00    18.30
        ================================================
        ID = 3 (  0010):     1.10   0.014    13.00    15.96

     NOTE:  PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.
--------------------------------------------------------------------------------

--------------------
| ADD HYD  (  0010)|
|   3 +  2 =  1    |          AREA    QPEAK    TPEAK     R.V.
------------------           (ha)    (cms)    (hrs)     (mm)
        ID1= 3 (  0010):     1.10   0.014    13.00    15.96
      + ID2= 2 (  0103):     0.24   0.005    13.00    30.26
        ================================================
        ID = 1 (  0010):     1.34   0.019    13.00    18.49

     NOTE:  PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.
--------------------------------------------------------------------------------
************************************************
** SIMULATION:09 - 10Yr 24Hr 60Minute AES Type II **
************************************************

--------------------
| ADD HYD  (  0010)|
|   1 +  2 =  3    |          AREA    QPEAK    TPEAK     R.V.
------------------           (ha)    (cms)    (hrs)     (mm)
        ID1= 1 (  0101):     0.99   0.016    13.00    20.43
      + ID2= 2 (  0102):     0.11   0.002    13.00    23.44
        ================================================
        ID = 3 (  0010):     1.10   0.018    13.00    20.74

     NOTE:  PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.
--------------------------------------------------------------------------------

--------------------
| ADD HYD  (  0010)|
|   3 +  2 =  1    |          AREA    QPEAK    TPEAK     R.V.
------------------           (ha)    (cms)    (hrs)     (mm)
        ID1= 3 (  0010):     1.10   0.018    13.00    20.74
      + ID2= 2 (  0103):     0.24   0.006    13.00    37.27
        ================================================
        ID = 1 (  0010):     1.34   0.024    13.00    23.67

     NOTE:  PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.
--------------------------------------------------------------------------------
************************************************
** SIMULATION:10 - 25Yr 24Hr 60Minute AES Type II **
************************************************

--------------------
| ADD HYD  (  0010)|
|   1 +  2 =  3    |          AREA    QPEAK    TPEAK     R.V.
------------------           (ha)    (cms)    (hrs)     (mm)
        ID1= 1 (  0101):     0.99   0.021    13.00    27.21
```

```
      + ID2= 2 (  0102):     0.11   0.003    13.00    30.71
        ==============================================
        ID = 3 (  0010):     1.10   0.023    13.00    27.56

     NOTE:  PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.
--------------------------------------------------------------------------------

--------------------
| ADD HYD  (  0010)|
|   3 +  2 =  1    |          AREA    QPEAK    TPEAK     R.V.
--------------------          (ha)    (cms)    (hrs)     (mm)
        ID1= 3 (  0010):     1.10   0.023    13.00    27.56
      + ID2= 2 (  0103):     0.24   0.008    13.00    46.85
        ==============================================
        ID = 1 (  0010):     1.34   0.031    13.00    30.98

     NOTE:  PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.
--------------------------------------------------------------------------------
************************************************
** SIMULATION:11 - 50Yr 24Hr 60Minute AES Type II **
************************************************

--------------------
| ADD HYD  (  0010)|
|   1 +  2 =  3    |          AREA    QPEAK    TPEAK     R.V.
--------------------          (ha)    (cms)    (hrs)     (mm)
        ID1= 1 (  0101):     0.99   0.028    13.00    36.99
      + ID2= 2 (  0102):     0.11   0.004    13.00    41.09
        ==============================================
        ID = 3 (  0010):     1.10   0.031    13.00    37.40

     NOTE:  PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.
--------------------------------------------------------------------------------

--------------------
| ADD HYD  (  0010)|
|   3 +  2 =  1    |          AREA    QPEAK    TPEAK     R.V.
--------------------          (ha)    (cms)    (hrs)     (mm)
        ID1= 3 (  0010):     1.10   0.031    13.00    37.40
      + ID2= 2 (  0103):     0.24   0.010    13.00    60.12
        ==============================================
        ID = 1 (  0010):     1.34   0.041    13.00    41.43

     NOTE:  PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.
--------------------------------------------------------------------------------
************************************************
** SIMULATION:12 - 100Yr 24Hr 60Minute AES Type II **
************************************************

--------------------
| ADD HYD  (  0010)|
|   1 +  2 =  3    |          AREA    QPEAK    TPEAK     R.V.
--------------------          (ha)    (cms)    (hrs)     (mm)
        ID1= 1 (  0101):     0.99   0.034    13.00    45.49
      + ID2= 2 (  0102):     0.11   0.004    13.00    50.05
        ==============================================
        ID = 3 (  0010):     1.10   0.038    13.00    45.95

     NOTE:  PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.
--------------------------------------------------------------------------------

--------------------
| ADD HYD  (  0010)|
|   3 +  2 =  1    |          AREA    QPEAK    TPEAK     R.V.
--------------------          (ha)    (cms)    (hrs)     (mm)
        ID1= 3 (  0010):     1.10   0.038    13.00    45.95
      + ID2= 2 (  0103):     0.24   0.012    13.00    71.24
        ==============================================
        ID = 1 (  0010):     1.34   0.050    13.00    50.44

     NOTE:  PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.
--------------------------------------------------------------------------------
```

Appendix E

Post-Development Visual OTTHYMO Model Output Sheets - Uncontrolled

```
*****************************************
** SIMULATION:01 - 2yr 6hr 15min Chicago **
*****************************************

--------------------
| ADD HYD  (  0005)|
|   1 +  2 =  3    |          AREA    QPEAK    TPEAK     R.V.
--------------------          (ha)    (cms)    (hrs)     (mm)
        ID1= 1 (  0201):     0.81   0.030     2.75    15.56
      + ID2= 2 (  0202):     0.19   0.010     2.75    17.51
        ====================================================
        ID = 3 (  0005):     0.99   0.040     2.75    15.92

     NOTE:  PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.
-------------------------------------------------------------------------------

--------------------
| ADD HYD  (  0005)|
|   3 +  2 =  1    |          AREA    QPEAK    TPEAK     R.V.
--------------------          (ha)    (cms)    (hrs)     (mm)
        ID1= 3 (  0005):     0.99   0.040     2.75    15.92
      + ID2= 2 (  0203):     0.11   0.002     2.75     4.40
        ====================================================
        ID = 1 (  0005):     1.10   0.041     2.75    14.76

     NOTE:  PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.
-------------------------------------------------------------------------------

--------------------
| ADD HYD  (  0005)|
|   1 +  2 =  3    |          AREA    QPEAK    TPEAK     R.V.
--------------------          (ha)    (cms)    (hrs)     (mm)
        ID1= 1 (  0005):     1.10   0.041     2.75    14.76
      + ID2= 2 (  0204):     0.24   0.005     2.75     9.61
        ====================================================
        ID = 3 (  0005):     1.34   0.047     2.75    13.85

     NOTE:  PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.
-------------------------------------------------------------------------------
*****************************************
** SIMULATION:02 - 5yr 6hr 15min Chicago **
*****************************************

--------------------
| ADD HYD  (  0005)|
|   1 +  2 =  3    |          AREA    QPEAK    TPEAK     R.V.
--------------------          (ha)    (cms)    (hrs)     (mm)
        ID1= 1 (  0201):     0.81   0.051     2.75    25.17
      + ID2= 2 (  0202):     0.19   0.019     2.75    27.93
        ====================================================
        ID = 3 (  0005):     0.99   0.069     2.75    25.68

     NOTE:  PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.
-------------------------------------------------------------------------------

--------------------
| ADD HYD  (  0005)|
|   3 +  2 =  1    |          AREA    QPEAK    TPEAK     R.V.
--------------------          (ha)    (cms)    (hrs)     (mm)
        ID1= 3 (  0005):     0.99   0.069     2.75    25.68
      + ID2= 2 (  0203):     0.11   0.004     2.75     8.87
        ====================================================
        ID = 1 (  0005):     1.10   0.073     2.75    23.99

     NOTE:  PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.
-------------------------------------------------------------------------------

--------------------
| ADD HYD  (  0005)|
|   1 +  2 =  3    |          AREA    QPEAK    TPEAK     R.V.
--------------------          (ha)    (cms)    (hrs)     (mm)
        ID1= 1 (  0005):     1.10   0.073     2.75    23.99
      + ID2= 2 (  0204):     0.24   0.011     2.75    16.70
        ====================================================
        ID = 3 (  0005):     1.34   0.083     2.75    22.70

     NOTE:  PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.
-------------------------------------------------------------------------------
*****************************************
** SIMULATION:03 - 10yr 6hr 15min Chicago **
*****************************************

--------------------
| ADD HYD  (  0005)|
```

```
|   1 +  2 =  3    |          AREA    QPEAK    TPEAK     R.V.
------------------           (ha)    (cms)    (hrs)     (mm)
        ID1= 1 (  0201):     0.81   0.072     2.75    30.86
      + ID2= 2 (  0202):     0.19   0.024     2.75    34.01
        ================================================
        ID = 3 (  0005):     0.99   0.095     2.75    31.45

     NOTE:  PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.
--------------------------------------------------------------------------------


--------------------
| ADD HYD  (  0005)|
|   3 +  2 =  1    |          AREA    QPEAK    TPEAK     R.V.
------------------           (ha)    (cms)    (hrs)     (mm)
        ID1= 3 (  0005):     0.99   0.095     2.75    31.45
      + ID2= 2 (  0203):     0.11   0.005     2.75    11.81
        ================================================
        ID = 1 (  0005):     1.10   0.100     2.75    29.48

     NOTE:  PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.
--------------------------------------------------------------------------------


--------------------
| ADD HYD  (  0005)|
|   1 +  2 =  3    |          AREA    QPEAK    TPEAK     R.V.
------------------           (ha)    (cms)    (hrs)     (mm)
        ID1= 1 (  0005):     1.10   0.100     2.75    29.48
      + ID2= 2 (  0204):     0.24   0.014     2.75    21.08
        ================================================
        ID = 3 (  0005):     1.34   0.115     2.75    27.99

     NOTE:  PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.
--------------------------------------------------------------------------------
*******************************************
** SIMULATION:04 - 25yr 6hr 15min Chicago **
*******************************************


--------------------
| ADD HYD  (  0005)|
|   1 +  2 =  3    |          AREA    QPEAK    TPEAK     R.V.
------------------           (ha)    (cms)    (hrs)     (mm)
        ID1= 1 (  0201):     0.81   0.090     2.75    38.12
      + ID2= 2 (  0202):     0.19   0.030     2.75    41.71
        ================================================
        ID = 3 (  0005):     0.99   0.120     2.75    38.79

     NOTE:  PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.
--------------------------------------------------------------------------------


--------------------
| ADD HYD  (  0005)|
|   3 +  2 =  1    |          AREA    QPEAK    TPEAK     R.V.
------------------           (ha)    (cms)    (hrs)     (mm)
        ID1= 3 (  0005):     0.99   0.120     2.75    38.79
      + ID2= 2 (  0203):     0.11   0.007     2.75    15.83
        ================================================
        ID = 1 (  0005):     1.10   0.127     2.75    36.48

     NOTE:  PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.
--------------------------------------------------------------------------------


--------------------
| ADD HYD  (  0005)|
|   1 +  2 =  3    |          AREA    QPEAK    TPEAK     R.V.
------------------           (ha)    (cms)    (hrs)     (mm)
        ID1= 1 (  0005):     1.10   0.127     2.75    36.48
      + ID2= 2 (  0204):     0.24   0.022     2.75    26.84
        ================================================
        ID = 3 (  0005):     1.34   0.148     2.75    34.77

     NOTE:  PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.
--------------------------------------------------------------------------------
*******************************************
** SIMULATION:05 - 50yr 6hr 15min Chicago **
*******************************************


--------------------
| ADD HYD  (  0005)|
|   1 +  2 =  3    |          AREA    QPEAK    TPEAK     R.V.
------------------           (ha)    (cms)    (hrs)     (mm)
        ID1= 1 (  0201):     0.81   0.116     2.75    47.80
      + ID2= 2 (  0202):     0.19   0.038     2.75    51.89
        ================================================
        ID = 3 (  0005):     0.99   0.153     2.75    48.56
```

```
     NOTE:  PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.
--------------------------------------------------------------------------------

--------------------
| ADD HYD  (  0005)|
|   3 +  2 =  1    |          AREA    QPEAK    TPEAK     R.V.
--------------------          (ha)    (cms)    (hrs)     (mm)
        ID1= 3 (  0005):     0.99   0.153     2.75    48.56
      + ID2= 2 (  0203):     0.11   0.009     2.75    21.55
        ================================================
        ID = 1 (  0005):     1.10   0.163     2.75    45.85

     NOTE:  PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.
--------------------------------------------------------------------------------

--------------------
| ADD HYD  (  0005)|
|   1 +  2 =  3    |          AREA    QPEAK    TPEAK     R.V.
--------------------          (ha)    (cms)    (hrs)     (mm)
        ID1= 1 (  0005):     1.10   0.163     2.75    45.85
      + ID2= 2 (  0204):     0.24   0.029     2.75    34.74
        ================================================
        ID = 3 (  0005):     1.34   0.192     2.75    43.88

     NOTE:  PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.
--------------------------------------------------------------------------------
********************************************
** SIMULATION:06 - 100yr 6hr 15min Chicago **
********************************************

--------------------
| ADD HYD  (  0005)|
|   1 +  2 =  3    |          AREA    QPEAK    TPEAK     R.V.
--------------------          (ha)    (cms)    (hrs)     (mm)
        ID1= 1 (  0201):     0.81   0.138     2.75    55.90
      + ID2= 2 (  0202):     0.19   0.044     2.75    60.35
        ================================================
        ID = 3 (  0005):     0.99   0.183     2.75    56.73

     NOTE:  PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.
--------------------------------------------------------------------------------

--------------------
| ADD HYD  (  0005)|
|   3 +  2 =  1    |          AREA    QPEAK    TPEAK     R.V.
--------------------          (ha)    (cms)    (hrs)     (mm)
        ID1= 3 (  0005):     0.99   0.183     2.75    56.73
      + ID2= 2 (  0203):     0.11   0.011     2.75    26.61
        ================================================
        ID = 1 (  0005):     1.10   0.194     2.75    53.71

     NOTE:  PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.
--------------------------------------------------------------------------------

--------------------
| ADD HYD  (  0005)|
|   1 +  2 =  3    |          AREA    QPEAK    TPEAK     R.V.
--------------------          (ha)    (cms)    (hrs)     (mm)
        ID1= 1 (  0005):     1.10   0.194     2.75    53.71
      + ID2= 2 (  0204):     0.24   0.036     2.75    41.51
        ================================================
        ID = 3 (  0005):     1.34   0.229     2.75    51.54

     NOTE:  PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.
--------------------------------------------------------------------------------
************************************************
** SIMULATION:07 - 2Yr 24Hr 60Minute AES Type II **
************************************************

--------------------
| ADD HYD  (  0005)|
|   1 +  2 =  3    |          AREA    QPEAK    TPEAK     R.V.
--------------------          (ha)    (cms)    (hrs)     (mm)
        ID1= 1 (  0201):     0.81   0.013    13.00    26.63
      + ID2= 2 (  0202):     0.19   0.004    13.00    28.63
        ================================================
        ID = 3 (  0005):     0.99   0.017    13.00    27.00

     NOTE:  PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.
--------------------------------------------------------------------------------

--------------------
| ADD HYD  (  0005)|
```

```
|   3 +  2 =  1    |          AREA    QPEAK    TPEAK     R.V.
------------------           (ha)    (cms)    (hrs)     (mm)
        ID1= 3 (  0005):     0.99   0.017    13.00    27.00
      + ID2= 2 (  0203):     0.11   0.001    13.00     9.61
        ================================================
        ID = 1 (  0005):     1.10   0.018    13.00    25.25

     NOTE:  PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.
--------------------------------------------------------------------------------


--------------------
| ADD HYD  (  0005)|
|   1 +  2 =  3    |          AREA    QPEAK    TPEAK     R.V.
--------------------          (ha)    (cms)    (hrs)     (mm)
        ID1= 1 (  0005):     1.10   0.018    13.00    25.25
      + ID2= 2 (  0204):     0.24   0.003    13.00    17.15
        ================================================
        ID = 3 (  0005):     1.34   0.021    13.00    23.82

     NOTE:  PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.
--------------------------------------------------------------------------------
************************************************
** SIMULATION:08 - 5Yr 24Hr 60Minute AES Type II **
************************************************


--------------------
| ADD HYD  (  0005)|
|   1 +  2 =  3    |          AREA    QPEAK    TPEAK     R.V.
--------------------          (ha)    (cms)    (hrs)     (mm)
        ID1= 1 (  0201):     0.81   0.022    13.00    42.38
      + ID2= 2 (  0202):     0.19   0.006    13.00    46.16
        ================================================
        ID = 3 (  0005):     0.99   0.028    13.00    43.08

     NOTE:  PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.
--------------------------------------------------------------------------------


--------------------
| ADD HYD  (  0005)|
|   3 +  2 =  1    |          AREA    QPEAK    TPEAK     R.V.
--------------------          (ha)    (cms)    (hrs)     (mm)
        ID1= 3 (  0005):     0.99   0.028    13.00    43.08
      + ID2= 2 (  0203):     0.11   0.002    13.00    18.30
        ================================================
        ID = 1 (  0005):     1.10   0.029    13.00    40.59

     NOTE:  PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.
--------------------------------------------------------------------------------


--------------------
| ADD HYD  (  0005)|
|   1 +  2 =  3    |          AREA    QPEAK    TPEAK     R.V.
--------------------          (ha)    (cms)    (hrs)     (mm)
        ID1= 1 (  0005):     1.10   0.029    13.00    40.59
      + ID2= 2 (  0204):     0.24   0.005    13.00    30.26
        ================================================
        ID = 3 (  0005):     1.34   0.034    13.00    38.76

     NOTE:  PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.
--------------------------------------------------------------------------------
************************************************
** SIMULATION:08 - 5Yr 24Hr 60Minute AES Type II **
************************************************


--------------------
| ADD HYD  (  0005)|
|   1 +  2 =  3    |          AREA    QPEAK    TPEAK     R.V.
--------------------          (ha)    (cms)    (hrs)     (mm)
        ID1= 1 (  0201):     0.81   0.022    13.00    42.38
      + ID2= 2 (  0202):     0.19   0.006    13.00    46.16
        ================================================
        ID = 3 (  0005):     0.99   0.028    13.00    43.08

     NOTE:  PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.
--------------------------------------------------------------------------------


--------------------
| ADD HYD  (  0005)|
|   3 +  2 =  1    |          AREA    QPEAK    TPEAK     R.V.
--------------------          (ha)    (cms)    (hrs)     (mm)
        ID1= 3 (  0005):     0.99   0.028    13.00    43.08
      + ID2= 2 (  0203):     0.11   0.002    13.00    18.30
        ================================================
        ID = 1 (  0005):     1.10   0.029    13.00    40.59
```

NOTE: PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.

ADD HYD (0005)					
1 + 2 = 3		AREA (ha)	QPEAK (cms)	TPEAK (hrs)	R.V. (mm)
	ID1= 1 (0005):	1.10	0.029	13.00	40.59
+	ID2= 2 (0204):	0.24	0.005	13.00	30.26
	ID = 3 (0005):	1.34	0.034	13.00	38.76

NOTE: PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.

****
** SIMULATION:09 - 10Yr 24Hr 60Minute AES Type II **
****

ADD HYD (0005)					
1 + 2 = 3		AREA (ha)	QPEAK (cms)	TPEAK (hrs)	R.V. (mm)
	ID1= 1 (0201):	0.81	0.027	13.00	50.86
+	ID2= 2 (0202):	0.19	0.007	13.00	55.06
	ID = 3 (0005):	0.99	0.033	13.00	51.64

NOTE: PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.

ADD HYD (0005)					
3 + 2 = 1		AREA (ha)	QPEAK (cms)	TPEAK (hrs)	R.V. (mm)
	ID1= 3 (0005):	0.99	0.033	13.00	51.64
+	ID2= 2 (0203):	0.11	0.002	13.00	23.44
	ID = 1 (0005):	1.10	0.035	13.00	48.81

NOTE: PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.

ADD HYD (0005)					
1 + 2 = 3		AREA (ha)	QPEAK (cms)	TPEAK (hrs)	R.V. (mm)
	ID1= 1 (0005):	1.10	0.035	13.00	48.81
+	ID2= 2 (0204):	0.24	0.006	13.00	37.27
	ID = 3 (0005):	1.34	0.042	13.00	46.76

NOTE: PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.

****
** SIMULATION:11 - 50Yr 24Hr 60Minute AES Type II **
****

ADD HYD (0005)					
1 + 2 = 3		AREA (ha)	QPEAK (cms)	TPEAK (hrs)	R.V. (mm)
	ID1= 1 (0201):	0.81	0.041	13.00	77.54
+	ID2= 2 (0202):	0.19	0.010	13.00	82.74
	ID = 3 (0005):	0.99	0.051	13.00	78.51

NOTE: PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.

ADD HYD (0005)					
3 + 2 = 1		AREA (ha)	QPEAK (cms)	TPEAK (hrs)	R.V. (mm)
	ID1= 3 (0005):	0.99	0.051	13.00	78.51
+	ID2= 2 (0203):	0.11	0.004	13.00	41.09
	ID = 1 (0005):	1.10	0.054	13.00	74.75

NOTE: PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.

ADD HYD (0005)

```
|   1 +  2 =  3    |          AREA    QPEAK    TPEAK     R.V.
------------------           (ha)    (cms)    (hrs)     (mm)
        ID1= 1 (  0005):     1.10   0.054    13.00    74.75
      + ID2= 2 (  0204):     0.24   0.010    13.00    60.12
        ==========================================================
        ID = 3 (  0005):     1.34   0.064    13.00    72.16

     NOTE:  PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.
-------------------------------------------------------------------------------
*************************************************
** SIMULATION:12 - 100Yr 24Hr 60Minute AES Type II **
*************************************************


--------------------
| ADD HYD  (  0005)|
|   1 +  2 =  3    |          AREA    QPEAK    TPEAK     R.V.
------------------           (ha)    (cms)    (hrs)     (mm)
        ID1= 1 (  0201):     0.81   0.047    13.00    90.14
      + ID2= 2 (  0202):     0.19   0.011    13.00    95.73
        ==========================================================
        ID = 3 (  0005):     0.99   0.059    13.00    91.18

     NOTE:  PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.
-------------------------------------------------------------------------------


--------------------
| ADD HYD  (  0005)|
|   3 +  2 =  1    |          AREA    QPEAK    TPEAK     R.V.
------------------           (ha)    (cms)    (hrs)     (mm)
        ID1= 3 (  0005):     0.99   0.059    13.00    91.18
      + ID2= 2 (  0203):     0.11   0.004    13.00    50.05
        ==========================================================
        ID = 1 (  0005):     1.10   0.063    13.00    87.05

     NOTE:  PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.
-------------------------------------------------------------------------------


--------------------
| ADD HYD  (  0005)|
|   1 +  2 =  3    |          AREA    QPEAK    TPEAK     R.V.
------------------           (ha)    (cms)    (hrs)     (mm)
        ID1= 1 (  0005):     1.10   0.063    13.00    87.05
      + ID2= 2 (  0204):     0.24   0.012    13.00    71.24
        ==========================================================
        ID = 3 (  0005):     1.34   0.075    13.00    84.25

     NOTE:  PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.
-------------------------------------------------------------------------------
```

Appendix F

Storage Requirements Calculations

```
*****************************************
** SIMULATION:01 - 2yr 6hr 15min Chicago **
*****************************************

--------------------
| RESERVOIR(  1000)|     OVERFLOW IS OFF
| IN= 2---> OUT= 1 |
| DT=  5.0 min     |     OUTFLOW    STORAGE   |  OUTFLOW    STORAGE
--------------------      (cms)     (ha.m.)   |   (cms)     (ha.m.)
     **** WARNING : FIRST OUTFLOW IS NOT ZERO.
                       0.0013     0.0000   |   0.0019      0.0376
                       0.0014     0.0050   |   0.0019      0.0411
                       0.0015     0.0103   |   0.0020      0.0446
                       0.0016     0.0158   |   0.0020      0.0482
                       0.0016     0.0187   |   0.0021      0.0519
                       0.0017     0.0217   |   0.0021      0.0557
                       0.0017     0.0247   |   0.0022      0.0596
                       0.0018     0.0278   |   0.0022      0.0636
                       0.0018     0.0310   |   0.0404      0.0677
                       0.0018     0.0343   |   0.1102      0.0718

                                 AREA     QPEAK     TPEAK       R.V.
                                 (ha)     (cms)     (hrs)       (mm)
   INFLOW : ID= 2 (  0010)      1.160      0.034      2.75      12.57
   OUTFLOW: ID= 1 (  1000)      1.160      0.002      6.33      12.58

                  PEAK   FLOW   REDUCTION [Qout/Qin](%)=  4.44
                  TIME SHIFT OF PEAK FLOW         (min)=215.00
                  MAXIMUM  STORAGE   USED       (ha.m.)=  0.0115

-------------------------------------------------------------------------------
*****************************************
** SIMULATION:02 - 5yr 6hr 15min Chicago **
*****************************************

--------------------
| RESERVOIR(  1000)|     OVERFLOW IS OFF
| IN= 2---> OUT= 1 |
| DT=  5.0 min     |     OUTFLOW    STORAGE   |  OUTFLOW    STORAGE
--------------------      (cms)     (ha.m.)   |   (cms)     (ha.m.)
     **** WARNING : FIRST OUTFLOW IS NOT ZERO.
                       0.0013     0.0000   |   0.0019      0.0376
                       0.0014     0.0050   |   0.0019      0.0411
                       0.0015     0.0103   |   0.0020      0.0446
                       0.0016     0.0158   |   0.0020      0.0482
                       0.0016     0.0187   |   0.0021      0.0519
                       0.0017     0.0217   |   0.0021      0.0557
                       0.0017     0.0247   |   0.0022      0.0596
                       0.0018     0.0278   |   0.0022      0.0636
                       0.0018     0.0310   |   0.0404      0.0677
                       0.0018     0.0343   |   0.1102      0.0718

                                 AREA     QPEAK     TPEAK       R.V.
                                 (ha)     (cms)     (hrs)       (mm)
   INFLOW : ID= 2 (  0010)      1.160      0.061      2.75      20.88
   OUTFLOW: ID= 1 (  1000)      1.160      0.002      6.33      20.88

                  PEAK   FLOW   REDUCTION [Qout/Qin](%)=  2.76
                  TIME SHIFT OF PEAK FLOW         (min)=215.00
                  MAXIMUM  STORAGE   USED       (ha.m.)=  0.0209

-------------------------------------------------------------------------------
*****************************************
** SIMULATION:03 - 10yr 6hr 15min Chicago **
*****************************************

--------------------
| RESERVOIR(  1000)|     OVERFLOW IS OFF
| IN= 2---> OUT= 1 |
| DT=  5.0 min     |     OUTFLOW    STORAGE   |  OUTFLOW    STORAGE
--------------------      (cms)     (ha.m.)   |   (cms)     (ha.m.)
     **** WARNING : FIRST OUTFLOW IS NOT ZERO.
                       0.0013     0.0000   |   0.0019      0.0376
                       0.0014     0.0050   |   0.0019      0.0411
                       0.0015     0.0103   |   0.0020      0.0446
                       0.0016     0.0158   |   0.0020      0.0482
                       0.0016     0.0187   |   0.0021      0.0519
                       0.0017     0.0217   |   0.0021      0.0557
                       0.0017     0.0247   |   0.0022      0.0596
                       0.0018     0.0278   |   0.0022      0.0636
                       0.0018     0.0310   |   0.0404      0.0677
                       0.0018     0.0343   |   0.1102      0.0718

                                 AREA     QPEAK     TPEAK       R.V.
                                 (ha)     (cms)     (hrs)       (mm)
   INFLOW : ID= 2 (  0010)      1.160      0.078      2.75      25.89
   OUTFLOW: ID= 1 (  1000)      1.160      0.002      6.33      25.90
```

```
                    PEAK   FLOW   REDUCTION [Qout/Qin](%)=  2.25
                    TIME SHIFT OF PEAK FLOW         (min)=215.00
                    MAXIMUM  STORAGE   USED       (ha.m.)=  0.0266

--------------------------------------------------------------------------------
*****************************************
** SIMULATION:04 - 25yr 6hr 15min Chicago **
*****************************************
--------------------
| RESERVOIR(  1000)|     OVERFLOW IS OFF
| IN= 2---> OUT= 1 |
| DT=  5.0 min     |     OUTFLOW    STORAGE   |  OUTFLOW    STORAGE
--------------------      (cms)     (ha.m.)   |   (cms)     (ha.m.)
     **** WARNING : FIRST OUTFLOW IS NOT ZERO.
                          0.0013     0.0000   |   0.0019      0.0376
                          0.0014     0.0050   |   0.0019      0.0411
                          0.0015     0.0103   |   0.0020      0.0446
                          0.0016     0.0158   |   0.0020      0.0482
                          0.0016     0.0187   |   0.0021      0.0519
                          0.0017     0.0217   |   0.0021      0.0557
                          0.0017     0.0247   |   0.0022      0.0596
                          0.0018     0.0278   |   0.0022      0.0636
                          0.0018     0.0310   |   0.0404      0.0677
                          0.0018     0.0343   |   0.1102      0.0718

                                AREA     QPEAK     TPEAK       R.V.
                                (ha)     (cms)     (hrs)       (mm)
   INFLOW : ID= 2 (  0010)      1.160      0.113      2.75      32.37
   OUTFLOW: ID= 1 (  1000)      1.160      0.002      4.00      32.38

                    PEAK   FLOW   REDUCTION [Qout/Qin](%)=  1.60
                    TIME SHIFT OF PEAK FLOW         (min)= 75.00
                    MAXIMUM  STORAGE   USED       (ha.m.)=  0.0340

--------------------------------------------------------------------------------
*****************************************
** SIMULATION:05 - 50yr 6hr 15min Chicago **
*****************************************
--------------------
| RESERVOIR(  1000)|     OVERFLOW IS OFF
| IN= 2---> OUT= 1 |
| DT=  5.0 min     |     OUTFLOW    STORAGE   |  OUTFLOW    STORAGE
--------------------      (cms)     (ha.m.)   |   (cms)     (ha.m.)
     **** WARNING : FIRST OUTFLOW IS NOT ZERO.
                          0.0013     0.0000   |   0.0019      0.0376
                          0.0014     0.0050   |   0.0019      0.0411
                          0.0015     0.0103   |   0.0020      0.0446
                          0.0016     0.0158   |   0.0020      0.0482
                          0.0016     0.0187   |   0.0021      0.0519
                          0.0017     0.0217   |   0.0021      0.0557
                          0.0017     0.0247   |   0.0022      0.0596
                          0.0018     0.0278   |   0.0022      0.0636
                          0.0018     0.0310   |   0.0404      0.0677
                          0.0018     0.0343   |   0.1102      0.0718

                                AREA     QPEAK     TPEAK       R.V.
                                (ha)     (cms)     (hrs)       (mm)
   INFLOW : ID= 2 (  0010)      1.160      0.147      2.75      41.11
   OUTFLOW: ID= 1 (  1000)      1.160      0.002      6.33      41.12

                    PEAK   FLOW   REDUCTION [Qout/Qin](%)=  1.35
                    TIME SHIFT OF PEAK FLOW         (min)=215.00
                    MAXIMUM  STORAGE   USED       (ha.m.)=  0.0440

--------------------------------------------------------------------------------
*****************************************
** SIMULATION:06 - 100yr 6hr 15min Chicago **
*****************************************
--------------------
| RESERVOIR(  1000)|     OVERFLOW IS OFF
| IN= 2---> OUT= 1 |
| DT=  5.0 min     |     OUTFLOW    STORAGE   |  OUTFLOW    STORAGE
--------------------      (cms)     (ha.m.)   |   (cms)     (ha.m.)
     **** WARNING : FIRST OUTFLOW IS NOT ZERO.
                          0.0013     0.0000   |   0.0019      0.0376
                          0.0014     0.0050   |   0.0019      0.0411
                          0.0015     0.0103   |   0.0020      0.0446
                          0.0016     0.0158   |   0.0020      0.0482
                          0.0016     0.0187   |   0.0021      0.0519
                          0.0017     0.0217   |   0.0021      0.0557
                          0.0017     0.0247   |   0.0022      0.0596
                          0.0018     0.0278   |   0.0022      0.0636
                          0.0018     0.0310   |   0.0404      0.0677
```

```
                          0.0018     0.0343   |   0.1102      0.0718

                                AREA     QPEAK     TPEAK       R.V.
                                (ha)     (cms)     (hrs)       (mm)
   INFLOW : ID= 2 (  0010)      1.160     0.176      2.75      48.51
   OUTFLOW: ID= 1 (  1000)      1.160     0.002      6.00      48.52

                   PEAK   FLOW   REDUCTION [Qout/Qin](%)=  1.19
                   TIME SHIFT OF PEAK FLOW         (min)=195.00
                   MAXIMUM  STORAGE   USED       (ha.m.)=  0.0524

--------------------------------------------------------------------------------
**************************************************
** SIMULATION:07 - 2Yr 24Hr 60Minute AES Type II **
**************************************************
--------------------
| RESERVOIR(  1000)|     OVERFLOW IS OFF
| IN= 2---> OUT= 1 |
| DT=  5.0 min     |     OUTFLOW    STORAGE   |  OUTFLOW    STORAGE
--------------------      (cms)     (ha.m.)   |   (cms)     (ha.m.)
     **** WARNING : FIRST OUTFLOW IS NOT ZERO.
                          0.0013     0.0000   |   0.0019      0.0376
                          0.0014     0.0050   |   0.0019      0.0411
                          0.0015     0.0103   |   0.0020      0.0446
                          0.0016     0.0158   |   0.0020      0.0482
                          0.0016     0.0187   |   0.0021      0.0519
                          0.0017     0.0217   |   0.0021      0.0557
                          0.0017     0.0247   |   0.0022      0.0596
                          0.0018     0.0278   |   0.0022      0.0636
                          0.0018     0.0310   |   0.0404      0.0677
                          0.0018     0.0343   |   0.1102      0.0718

                                AREA     QPEAK     TPEAK       R.V.
                                (ha)     (cms)     (hrs)       (mm)
   INFLOW : ID= 2 (  0010)      1.160     0.017     13.00      22.02
   OUTFLOW: ID= 1 (  1000)      1.160     0.002     15.50      22.04

                   PEAK   FLOW   REDUCTION [Qout/Qin](%)=  9.69
                   TIME SHIFT OF PEAK FLOW         (min)=150.00
                   MAXIMUM  STORAGE   USED       (ha.m.)=  0.0176

--------------------------------------------------------------------------------
**************************************************
** SIMULATION:08 - 5Yr 24Hr 60Minute AES Type II **
**************************************************
--------------------
| RESERVOIR(  1000)|     OVERFLOW IS OFF
| IN= 2---> OUT= 1 |
| DT=  5.0 min     |     OUTFLOW    STORAGE   |  OUTFLOW    STORAGE
--------------------      (cms)     (ha.m.)   |   (cms)     (ha.m.)
     **** WARNING : FIRST OUTFLOW IS NOT ZERO.
                          0.0013     0.0000   |   0.0019      0.0376
                          0.0014     0.0050   |   0.0019      0.0411
                          0.0015     0.0103   |   0.0020      0.0446
                          0.0016     0.0158   |   0.0020      0.0482
                          0.0016     0.0187   |   0.0021      0.0519
                          0.0017     0.0217   |   0.0021      0.0557
                          0.0017     0.0247   |   0.0022      0.0596
                          0.0018     0.0278   |   0.0022      0.0636
                          0.0018     0.0310   |   0.0404      0.0677
                          0.0018     0.0343   |   0.1102      0.0718

                                AREA     QPEAK     TPEAK       R.V.
                                (ha)     (cms)     (hrs)       (mm)
   INFLOW : ID= 2 (  0010)      1.160     0.028     13.00      36.19
   OUTFLOW: ID= 1 (  1000)      1.160     0.002     15.08      36.20

                   PEAK   FLOW   REDUCTION [Qout/Qin](%)=  6.50
                   TIME SHIFT OF PEAK FLOW         (min)=125.00
                   MAXIMUM  STORAGE   USED       (ha.m.)=  0.0324

--------------------------------------------------------------------------------
**************************************************
** SIMULATION:09 - 10Yr 24Hr 60Minute AES Type II **
**************************************************
--------------------
| RESERVOIR(  1000)|     OVERFLOW IS OFF
| IN= 2---> OUT= 1 |
| DT=  5.0 min     |     OUTFLOW    STORAGE   |  OUTFLOW    STORAGE
--------------------      (cms)     (ha.m.)   |   (cms)     (ha.m.)
     **** WARNING : FIRST OUTFLOW IS NOT ZERO.
                          0.0013     0.0000   |   0.0019      0.0376
                          0.0014     0.0050   |   0.0019      0.0411
                          0.0015     0.0103   |   0.0020      0.0446
```

0.0016	0.0158	|	0.0020	0.0482
0.0016	0.0187	|	0.0021	0.0519
0.0017	0.0217	|	0.0021	0.0557
0.0017	0.0247	|	0.0022	0.0596
0.0018	0.0278	|	0.0022	0.0636
0.0018	0.0310	|	0.0404	0.0677
0.0018	0.0343	|	0.1102	0.0718

	AREA (ha)	QPEAK (cms)	TPEAK (hrs)	R.V. (mm)
INFLOW : ID= 2 (0010)	1.160	0.034	13.00	43.89
OUTFLOW: ID= 1 (1000)	1.160	0.002	16.33	43.90

PEAK FLOW REDUCTION [Qout/Qin](%)= 5.64
TIME SHIFT OF PEAK FLOW (min)=200.00
MAXIMUM STORAGE USED (ha.m.)= 0.0406

****
** SIMULATION:10 - 25Yr 24Hr 60Minute AES Type II **
****

RESERVOIR(1000)	OVERFLOW IS OFF
IN= 2---> OUT= 1	
DT= 5.0 min	OUTFLOW (cms) / STORAGE (ha.m.) / OUTFLOW (cms) / STORAGE (ha.m.)

**** WARNING : FIRST OUTFLOW IS NOT ZERO.

0.0013	0.0000	0.0019	0.0376
0.0014	0.0050	0.0019	0.0411
0.0015	0.0103	0.0020	0.0446
0.0016	0.0158	0.0020	0.0482
0.0016	0.0187	0.0021	0.0519
0.0017	0.0217	0.0021	0.0557
0.0017	0.0247	0.0022	0.0596
0.0018	0.0278	0.0022	0.0636
0.0018	0.0310	0.0404	0.0677
0.0018	0.0343	0.1102	0.0718

	AREA (ha)	QPEAK (cms)	TPEAK (hrs)	R.V. (mm)
INFLOW : ID= 2 (0010)	1.160	0.042	13.00	54.31
OUTFLOW: ID= 1 (1000)	1.160	0.002	19.58	54.32

PEAK FLOW REDUCTION [Qout/Qin](%)= 4.99
TIME SHIFT OF PEAK FLOW (min)=395.00
MAXIMUM STORAGE USED (ha.m.)= 0.0518

****
** SIMULATION:11 - 50Yr 24Hr 60Minute AES Type II **
****

RESERVOIR(1000)	OVERFLOW IS OFF
IN= 2---> OUT= 1	
DT= 5.0 min	OUTFLOW (cms) / STORAGE (ha.m.) / OUTFLOW (cms) / STORAGE (ha.m.)

**** WARNING : FIRST OUTFLOW IS NOT ZERO.

0.0013	0.0000	0.0019	0.0376
0.0014	0.0050	0.0019	0.0411
0.0015	0.0103	0.0020	0.0446
0.0016	0.0158	0.0020	0.0482
0.0016	0.0187	0.0021	0.0519
0.0017	0.0217	0.0021	0.0557
0.0017	0.0247	0.0022	0.0596
0.0018	0.0278	0.0022	0.0636
0.0018	0.0310	0.0404	0.0677
0.0018	0.0343	0.1102	0.0718

	AREA (ha)	QPEAK (cms)	TPEAK (hrs)	R.V. (mm)
INFLOW : ID= 2 (0010)	1.160	0.053	13.00	68.52
OUTFLOW: ID= 1 (1000)	1.160	0.007	17.58	68.53

PEAK FLOW REDUCTION [Qout/Qin](%)= 12.35
TIME SHIFT OF PEAK FLOW (min)=275.00
MAXIMUM STORAGE USED (ha.m.)= 0.0641

****
** SIMULATION:12 - 100Yr 24Hr 60Minute AES Type II **
****

RESERVOIR(1000)	OVERFLOW IS OFF
IN= 2---> OUT= 1	

DT= 5.0 min	OUTFLOW (cms)	STORAGE (ha.m.)	OUTFLOW (cms)	STORAGE (ha.m.)
**** WARNING : FIRST OUTFLOW IS NOT ZERO.				
	0.0013	0.0000	0.0019	0.0376
	0.0014	0.0050	0.0019	0.0411
	0.0015	0.0103	0.0020	0.0446
	0.0016	0.0158	0.0020	0.0482
	0.0016	0.0187	0.0021	0.0519
	0.0017	0.0217	0.0021	0.0557
	0.0017	0.0247	0.0022	0.0596
	0.0018	0.0278	0.0022	0.0636
	0.0018	0.0310	0.0404	0.0677
	0.0018	0.0343	0.1102	0.0718

	AREA (ha)	QPEAK (cms)	TPEAK (hrs)	R.V. (mm)
INFLOW : ID= 2 (0010)	1.160	0.062	13.00	80.32
OUTFLOW: ID= 1 (1000)	1.160	0.021	15.08	80.34

PEAK FLOW REDUCTION [Qout/Qin](%)= 33.89
TIME SHIFT OF PEAK FLOW (min)=125.00
MAXIMUM STORAGE USED (ha.m.)= 0.0656

Appendix G

Post-Development Visual OTTHYMO Model Output Sheets - Controlled

```
*******************************************
** SIMULATION:01 - 2yr 6hr 15min Chicago **
*******************************************

-------------------
| ADD HYD  (  0007)|
|   1 +  2 =  3    |          AREA    QPEAK    TPEAK     R.V.
-------------------           (ha)    (cms)    (hrs)     (mm)
        ID1= 1 (  1000):     1.16   0.002     6.33    12.58
      + ID2= 2 (  0202):     0.18   0.009     2.75    16.65
        ====================================================
        ID = 3 (  0007):     1.34   0.011     2.75    13.13

     NOTE:  PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.
--------------------------------------------------------------------------------
*******************************************
** SIMULATION:02 - 5yr 6hr 15min Chicago **
*******************************************

-------------------
| ADD HYD  (  0007)|
|   1 +  2 =  3    |          AREA    QPEAK    TPEAK     R.V.
-------------------           (ha)    (cms)    (hrs)     (mm)
        ID1= 1 (  1000):     1.16   0.002     6.33    20.88
      + ID2= 2 (  0202):     0.18   0.017     2.75    26.65
        ====================================================
        ID = 3 (  0007):     1.34   0.019     2.75    21.67

     NOTE:  PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.
--------------------------------------------------------------------------------
*******************************************
** SIMULATION:03 - 10yr 6hr 15min Chicago **
*******************************************

-------------------
| ADD HYD  (  0007)|
|   1 +  2 =  3    |          AREA    QPEAK    TPEAK     R.V.
-------------------           (ha)    (cms)    (hrs)     (mm)
        ID1= 1 (  1000):     1.16   0.002     6.33    25.90
      + ID2= 2 (  0202):     0.18   0.022     2.75    32.53
        ====================================================
        ID = 3 (  0007):     1.34   0.023     2.75    26.80

     NOTE:  PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.
--------------------------------------------------------------------------------
*******************************************
** SIMULATION:04 - 25yr 6hr 15min Chicago **
*******************************************

-------------------
| ADD HYD  (  0007)|
|   1 +  2 =  3    |          AREA    QPEAK    TPEAK     R.V.
-------------------           (ha)    (cms)    (hrs)     (mm)
        ID1= 1 (  1000):     1.16   0.002     4.00    32.38
      + ID2= 2 (  0202):     0.18   0.028     2.75    39.99
        ====================================================
        ID = 3 (  0007):     1.34   0.029     2.75    33.42

     NOTE:  PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.
--------------------------------------------------------------------------------
*******************************************
** SIMULATION:05 - 50yr 6hr 15min Chicago **
*******************************************

-------------------
| ADD HYD  (  0007)|
|   1 +  2 =  3    |          AREA    QPEAK    TPEAK     R.V.
-------------------           (ha)    (cms)    (hrs)     (mm)
        ID1= 1 (  1000):     1.16   0.002     6.33    41.12
      + ID2= 2 (  0202):     0.18   0.035     2.75    49.90
        ====================================================
        ID = 3 (  0007):     1.34   0.037     2.75    42.31

     NOTE:  PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.
--------------------------------------------------------------------------------
*******************************************
** SIMULATION:06 - 100yr 6hr 15min Chicago **
*******************************************

-------------------
| ADD HYD  (  0007)|
|   1 +  2 =  3    |          AREA    QPEAK    TPEAK     R.V.
-------------------           (ha)    (cms)    (hrs)     (mm)
        ID1= 1 (  1000):     1.16   0.002     6.00    48.52
```

```
      + ID2= 2 (  0202):     0.18   0.042     2.75    58.17
        ==================================================
        ID = 3 (  0007):     1.34   0.043     2.75    49.83

     NOTE:  PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.
--------------------------------------------------------------------------------
************************************************
** SIMULATION:07 - 2Yr 24Hr 60Minute AES Type II **
************************************************

--------------------
| ADD HYD  (  0007)|
|   1 +  2 =  3    |          AREA    QPEAK    TPEAK     R.V.
--------------------          (ha)    (cms)    (hrs)     (mm)
        ID1= 1 (  1000):     1.16   0.002    15.50    22.04
      + ID2= 2 (  0202):     0.18   0.003    13.00    27.26
        ==================================================
        ID = 3 (  0007):     1.34   0.005    13.00    22.75

     NOTE:  PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.
--------------------------------------------------------------------------------
************************************************
** SIMULATION:08 - 5Yr 24Hr 60Minute AES Type II **
************************************************

--------------------
| ADD HYD  (  0007)|
|   1 +  2 =  3    |          AREA    QPEAK    TPEAK     R.V.
--------------------          (ha)    (cms)    (hrs)     (mm)
        ID1= 1 (  1000):     1.16   0.002    15.08    36.20
      + ID2= 2 (  0202):     0.18   0.005    13.00    44.32
        ==================================================
        ID = 3 (  0007):     1.34   0.007    13.00    37.31

     NOTE:  PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.
--------------------------------------------------------------------------------
************************************************
** SIMULATION:09 - 10Yr 24Hr 60Minute AES Type II **
************************************************

--------------------
| ADD HYD  (  0007)|
|   1 +  2 =  3    |          AREA    QPEAK    TPEAK     R.V.
--------------------          (ha)    (cms)    (hrs)     (mm)
        ID1= 1 (  1000):     1.16   0.002    16.33    43.90
      + ID2= 2 (  0202):     0.18   0.006    13.00    53.01
        ==================================================
        ID = 3 (  0007):     1.34   0.008    13.00    45.13

     NOTE:  PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.
--------------------------------------------------------------------------------
************************************************
** SIMULATION:10 - 25Yr 24Hr 60Minute AES Type II **
************************************************

--------------------
| ADD HYD  (  0007)|
|   1 +  2 =  3    |          AREA    QPEAK    TPEAK     R.V.
--------------------          (ha)    (cms)    (hrs)     (mm)
        ID1= 1 (  1000):     1.16   0.002    19.58    54.32
      + ID2= 2 (  0202):     0.18   0.008    13.00    64.59
        ==================================================
        ID = 3 (  0007):     1.34   0.010    13.00    55.72

     NOTE:  PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.
--------------------------------------------------------------------------------
************************************************
** SIMULATION:11 - 50Yr 24Hr 60Minute AES Type II **
************************************************

--------------------
| ADD HYD  (  0007)|
|   1 +  2 =  3    |          AREA    QPEAK    TPEAK     R.V.
--------------------          (ha)    (cms)    (hrs)     (mm)
        ID1= 1 (  1000):     1.16   0.007    17.58    68.53
      + ID2= 2 (  0202):     0.18   0.010    13.00    80.14
        ==================================================
        ID = 3 (  0007):     1.34   0.011    13.00    70.10

     NOTE:  PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.
--------------------------------------------------------------------------------
************************************************
** SIMULATION:12 - 100Yr 24Hr 60Minute AES Type II **
************************************************
```

ADD HYD (0007)				
1 + 2 = 3	AREA (ha)	QPEAK (cms)	TPEAK (hrs)	R.V. (mm)
ID1= 1 (1000):	1.16	0.021	15.08	80.34
+ ID2= 2 (0202):	0.18	0.011	13.00	92.92
ID = 3 (0007):	1.34	0.025	15.00	82.05

NOTE: PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.

Geotechnical Investigation and Design Report

1916555 Ontario Limited

Type of Document:
Final Report

Project Name:
Proposed Development
6022 MR80
Hanmer, Ontario

Project Number:
SUD-24014195-A0

Prepared By:
Steven Kacan, P.Eng
Civil/Geotechnical Engineer,
Earth and Environmental Northeastern Ontario

EXP
885 Regent Street
Sudbury, Ontario, P3E 5M4
t: +1.705.674.9681
f: +1.705.674.5583

Date Submitted:
2025-02-20

Table of Contents

1. Introduction

Further to our Proposal No. 24-121-GP_rev.1, dated June 21, 2024, and your subsequent authorization to proceed, EXP Services Inc. (EXP) has completed the field investigation and the geotechnical engineering evaluation for the above noted project. Our comments and recommendations, based on the results of the field investigation and our understanding of the project scope are provided in this report.

It is understood by EXP that a residential development is to be constructed north of 6022 MR80, in Hanmer, Ontario. Details of the development were provided to the geotechnical representative prior to site investigation, locations of the boreholes are shown on the attached drawing, Dwg. No. A-1, included in Appendix A.

2. Field Investigation

The field investigation for this project consisted of the advancement of eleven (11) sampled boreholes within the proposed development site. The boreholes were advanced from January 16 to 17, 2025, with the borehole logs found in Appendix B, Figs. B-2 to B-12. The advancement of the boreholes was supervised on a full-time basis by a geotechnical representative from EXP.

The sampled boreholes were advanced using a truck mounted, CME 55 drill rig, equipped with a hollow stem auger and split spoon sampling equipment, in locations free of buried or overhead services. Soils samples were then obtained directly from the augers within the first 0.75 m intervals thereafter in conjunction with the Standard Penetration Test (SPT), at depths noted on the attached borehole logs in Appendix B. The SPT “N” values have been recorded at each sample interval to provide an assessment of the in-situ compactness condition of the subgrade soils. Monitoring wells were installed in boreholes BH-1 and BH-3.

Groundwater levels were measured within the open boreholes prior to backfilling. Boreholes were backfilled with auger cuttings and sealed with bentonite chips.

The retained soil samples were logged in the field and then carefully packaged and transported to our laboratory for detailed examination and testing.

The borehole locations and elevations were obtained by handheld GPS during the field investigation. The borehole locations and elevations should be considered accurate only to the degree implied by the methods used and should not be used for design purposes.

3. Laboratory Testing

A laboratory testing program was performed on representative soil samples and consisted of moisture content determinations and grain size distributions. The laboratory test results are summarized on the attached borehole logs in Appendix B, with more detailed results available in Appendix C.

4. Subsurface Conditions

Details of the soils encountered during the field investigation are summarized on the attached borehole logs in Appendix B. The logs include textural descriptions of the subsoil and indicate the soil boundaries inferred from non-continuous sampling and observations during the field investigation. These boundaries reflect approximate transition zones for the purpose of geotechnical design and should not be interpreted as exact planes of geological change. When reading this report, the explanatory notes and definitions provided in Figures B-1A, and B-1B in Appendix B should be referenced.

All boreholes except for BH-F4 encountered organics or topsoil. The organics/topsoil extended to depths ranging from 50 mm to 0.6 m. Underlying the organics in boreholes BH-F1, BH-F2, BH-F5, BH-F6, BH-P1, BH-P2, BH-R1 and BH-R2 and from surface in BH-F4 was a silt. The silt was light to dark brown, with some sand and moist. Uncorrected SPT "N" values within the material varied between 10 to 15 blows per 300 mm, classifying the soil as compact in compactness condition. The silt extended to depths between 0.3 to 0.8 m. The moisture content of the silt varied between 13 and 34%.

Underlying the organics in boreholes BH-F3, BH-F6 and BH-P3 and under the silt in boreholes BH-F1, BH-F2, BH-F4, BH-F5, BH-R1 and BH-R2 is a sand and silt. The sand and silt extended to the termination of all boreholes except for boreholes BH-F3, BH-F5, BH-P3. The sand and silt was brown to grey in colour and wet. Uncorrected SPT "N" values with the material varied between 1 to 15 blows per 300 mm, classifying the soil as very loose to compact in compactness condition. The moisture content of the sand and silt was between 9 and 28%.

Under the silt layer in boreholes BH-P1 and BH-P2 was a sand. The sand contained trace silt, trace gravel, and was brown to grey. The sand was brown to grey in colour and wet. This sand extended to the termination of the boreholes. Uncorrected SPT "N" values with the material varied between 4 to 11 blows per 300 mm, classifying the soil as very loose to compact in compactness condition. The moisture content of the sand was between 12 and 27%.

Under the sand and silt was a shale layer in boreholes BH-F3, BH-F5 and BH-P3. This shale extended to the termination depth of the boreholes.

Refusal was encountered in boreholes BH-F1, BH-F4 and BH-P2 and under the shale in BH-F3, BH-F5 and BH-P3. Refusal on suspected boulder or bedrock was inferred. Refusal depths are summarized in the table bellow.

Table 4-1: Refusal Depths

Borehole	Refusal Depth
BH-F1	2.7 m
BH-F3	3.3 m
BH-F4	4.7 m
BH-F5	2.4 m
BH-P2	3.2 m
BH-P3	2.7 m

Groundwater was encountered at boreholes BH-F2, BH-F6, and BH-P2, and ranged in depth from 2.0 to 4.0 m from surface. Caved conditions were encountered in borehole BH-F3, BH-F4, and BH-P1 and BH-P3 at depths ranging from 2.0 to 4.4 m below grade. Seasonal variations in the water table should be anticipated, with higher levels occurring during wet weather conditions (spring thaw and late fall) and lower levels occurring during dry weather conditions.

5. Foundation Recommendations

Based on the soil conditions encountered within the boreholes, it is recommended that the proposed building be founded conventional strip or spread footings bearing on the encountered native soils or engineered fill over native soils.

Note that foundations should be kept as high as possible to avoid excavations below the groundwater levels on site.

Note that the proposed foundation details and loading conditions have not been provided to EXP at the time of this report. EXP should be retained to review the final designs and specifications to confirm that they are in general agreement with the assumptions on which our recommendations are based. If not accorded the privilege of making this review, EXP will assume no responsibility for interpretation of the recommendations in this report.

5.1 Conventional Strip or Spread Footings on Native Soils or on Engineered Fill Overlying Native Soils

Prior to the placement of the footings, topsoil, organics, fill and any other deleterious material must be removed down to the undisturbed native soils. The exposed subgrade should be proof rolled to identify any soft or unstable areas. The exposed subgrade and proof rolling is to be inspected by a representative from EXP prior to placing fill material or concrete. Any soft or loose areas encountered below the footing locations or any areas that are subject to softening/loosening when exposed to water and construction activities should be excavated down to a firm subgrade and replaced with Granular “A” or Granular “B” Type II in accordance with Ontario Provincial Standards and Specifications (OPSS) 1010. If wet soil conditions are present during construction, a non-woven geotextile separator (Terrafix 270R or equivalent) is to be used between the subgrade soils and the Granular “A” or Granular “B” Type II to stabilize the native soils.

To protect the footing base from construction activity or inclement weather, a 150 mm thick layer of Granular “A” material (OPSS 1010) can be placed directly below the footings and extend a minimum of 300 mm on either side of the footing edge and then slope down at 1H:1V. In-lieu of the Granular “A”, a lean mix concrete base can be poured. The lean mix concrete should extend a minimum of 300 mm on either side of the footings. Note that the footing base should not be left exposed beyond the day of excavation.

Engineered fill can be placed between the native soils and footings to raise the base of footing elevation if necessary. The engineered fill is to consist of Granular “B” Type I or II (OPSS 1010). A final 150 mm thick layer of Granular “A” (OPSS) should be placed directly below the footing. The engineered fill below any footings is to extend horizontally a minimum of 300 mm from any footing edge and then slope down at 1H:1V to the underlying native soils.

All engineered fill is to be placed in maximum 150 mm thick lifts and is to be compacted to 100% of the Standard Proctor Maximum Dry Density (SPMDD) within 1.5% of optimum moisture content under full time supervision by an EXP representative.

Footings founded on the undisturbed native soils, or on engineered fill overlying undisturbed native soils, can be designed with a factored geotechnical resistance at Ultimate Limit States (ULS) of 112 kPa. This value was calculated using a geotechnical resistance factor of 0.5. A bearing pressure at Serviceability Limit States (SLS) of 75 kPa may be used. Footings designed with the recommendations contained herein are expected to settle less than 25 mm total and 20 mm differential.

Foundations which are to be placed at different elevations in soils or near service trenches should be located such that the footings are set below a line drawn up at 10 horizontals to 7 vertical from the near edge of a lower foundation or bottom of a service trench, as indicated on Figure 5-1 below.

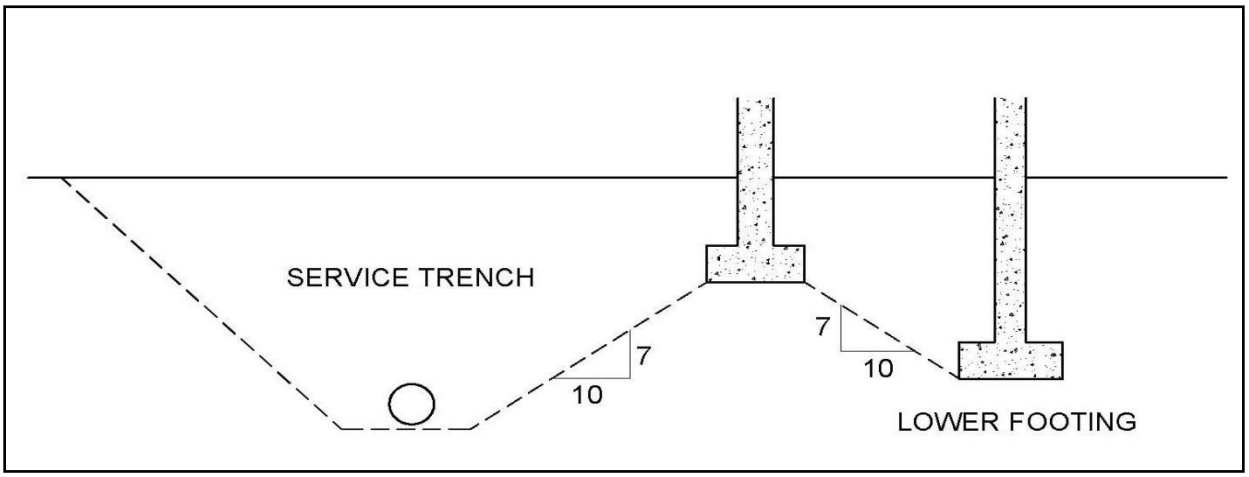


Figure 5-1: Footings near Service Trenches or at Different Elevations

These foundation recommendations assume the structures are lightly loaded. Strip and spread footing widths must comply with minimum Code requirements.

5.2 Frost Considerations

The freezing index in the Sudbury area is approximately 1330 C degree-days. There is potential for up to 2.1 m of frost penetration to occur over the winter months in unprotected, unheated areas and 1.7 m for heated structures.

As such, foundations for unheated structures should be provided with a minimum of 2.1 m of earth cover frost protection and heated structures should be provided with 1.7 m of earth cover frost protection. Note that to be considered a heated structure; the building must be maintained continuously at a minimum temperature of 18°C. If this will not occur, the building/structure shall be considered unheated.

Should sufficient earth cover not be provided, insulation will be required. Insulation should consist of rigid extruded polystyrene, have a minimum compressive strength of 275 kPa, and an R-Value of 5 for every 25.4 mm of thickness, (i.e., Styrofoam HI 40). Any exposed insulation is to be protected against sunlight and physical damage. A rough estimate for cost evaluation purposes can be made by assuming that 25.4 mm of rigid insulation designed for below grade installation is equivalent to 300 mm of soil cover. Note that insulation for heated structures should be placed both horizontally and vertically along the outside edge of the foundation. Insulation for unheated structures must extend below the entire foundation.

Detailed insulation recommendations can be provided by EXP, if necessary, once the final foundation designs have been determined.

5.3 Site Classification for Seismic Response

The Ontario Building Code (OBC) has adopted the National Building Code of Canada requirements for seismic design considerations. Based on the conditions encountered at the borehole locations, the Site Classification for Seismic Response has been estimated to be Site Class D as per the OBC clause 4.1.8.4, Site Properties and Table 4.1.8.4 A, Site Classification for Seismic Response.

These earthquake/seismic design parameters should be reviewed in detail by the structural engineer and incorporated into the design as required. If a Site Classification based on shear wave velocity testing is required, EXP can provide a quote to perform the necessary testing.

5.4 Backfill Recommendations

All imported backfill material used to backfill the foundation walls should consist of Granular "B" Type I or Granular "B" Type II (OPSS 1010) material, with a maximum aggregate size not exceeding 120 mm. The Granular "B" material used against the foundation walls should have no sizes greater than 75 mm and must be placed in lifts no greater than 150 mm in thickness and must be compacted to 98% of the SPMDD. Care must be taken to ensure damage to the foundation walls does not occur.

5.5 Lateral Earth Pressure

Any foundations and any retaining structures should be designed to resist lateral earth pressure. The expression for calculating lateral earth pressure "p" at any depth "h" is given by the following:

$p = K(\gamma h + q) + \gamma_w h_w$

where,
- p = Lateral earth pressure (kPa)
- K = Coefficient of earth pressure
- γ = Unit weight of backfill (kN/m^3)
- γ_w = Unit weight of water (kN/m^3)
- h = Depth to point of interest (m)
- h_w = Depth of water above point of interest (m)
- q = Surcharge load acting adjacent to the wall at the ground surface (kPa)

Table 5-1 lists various earth pressure properties for given materials.

Table 5-1: Material Types and Earth Pressure Parameters

Material	Friction Angle ø´ (unfactored)	Coefficient of Active Earth Pressure (k_a)	Coefficient of Passive Earth Pressure (k_p)	Coefficient of Earth Pressure at rest (k_o)	Unit Weight (kN/M^3)
Granular "A"	38°	0.24	4.2	0.38	22
Granular "B"	38°	0.24	4.2	0.38	21

Note: Values given for horizontal earth pressures are for horizontal backfill. For sloping backfill, the design requirements outlined in the Canadian Foundation Engineering Manual should be used.

The mobilization of full active or passive resistance requires a measurable and perhaps significant wall movement or rotation. Therefore, unless the structural element can tolerate these deflections, the at-rest earth pressure should be used in design.

The effects of compaction surcharge should be considered in the calculations of active and at rest earth pressures. The lateral pressure due to compaction should be taken as at least 12 kPa at the surface, and its magnitude should be assumed to diminish linearly with depth to zero at the depth where the active (or at rest) pressure is equal to 12 kPa. This pressure distribution should be added to the calculated active (or at rest) pressure. Notwithstanding, lighter compaction equipment and smaller lifts should be used adjacent to walls to prevent overstressing.

5.6 Surface Drainage

The exterior grade around the buildings should be sloped away from the walls to prevent surface runoff from entering the building. Permanent perimeter weeping tile should be installed where any floor is less than 150 mm above final grade and is required to be dry. The drainage tile should have a minimum diameter of 100 mm, and be surrounded by well-draining filter material (i.e. 20 mm Clear Stone gravel). The filter material should be surrounded with a non-woven geotextile. The perforated

drainage tile should drain to a suitable drainage area or interior sump. All subsurface walls should be adequately damp-proofed above the water table and waterproofed below the water table. The roof drains should discharge away from the building to appropriate drainage areas.

5.7 Dewatering

The ground water was encountered at the site approximately 2.0 m below grade. Excavations below 2.0 m will be difficult to achieve and will require extensive dewatering and as such should be avoided.

Dewatering requirements will be governed by the time of the year the construction is performed. It is the responsibility of the Contractor to propose a suitable dewatering system based on the time of construction and groundwater levels. The method used should not undermine any adjacent structures. The dewatering method is the responsibility of the Contractor, and the Contractor should submit his proposal to the Prime Consultant for review and approval prior to construction. It is recommended that the contractor conduct a test dig prior to construction to familiarize themselves with the groundwater conditions.

Should excavations extend below the groundwater levels, extensive dewatering will be required and it is recommended to have a hydrogeological study completed for the site to further understand dewatering volumes, environmental impacts on adjacent water bodies or structures, and if a permit to take water (PTTW) will be required to complete the dewatering program. Should a hydrogeological study be required, please contact EXP to further discuss additional field work and reporting.

5.8 Pavement Structure Design Recommandations

The recommended pavement structure designs for both light traffic and heavy traffic areas are provided below. The recommended pavement structures outlined below assume adequate provision for drainage. A conventional asphalt pavement structure as noted below will typically have a functional service life of 12 years. This represents the number of years to the first rehabilitation (via overlay or resurfacing), assuming that regular maintenance and crack sealing is completed. Subsequent resurfacing is typically expected to last at least 10 years.

Layer	Light Traffic or Parking Areas	Heavy Traffic or Loading Areas
Asphalt	50 mm SP 12.5 Surface Course	40 mm SP 12.5 Surface Course 50 mm SP 19.0 Binder Course 90 mm Total Thickness
Base	150 mm Granular “A”	150 mm Granular “A”
Subbase	300 mm Granular “B” Type II Or 450 mm Granular “B” Type I	450 mm Granular “B” Type II Or 600 mm Granular “B” Type I

Rigid pavement can be considered in areas of sharp truck turning or where heavy loads will be situated. The rigid pavement structure should include 200 mm of concrete over a 100 mm thick OGDL (Open Graded Drainage Layer) and a 200 mm thick base course, consisting of Granular “A” over the subbase material to improve the support and function as a drainage layer.

The roadway granular base and sub-base materials must be in accordance with OPSS 1010 and must be placed in maximum 150 mm lifts and compacted to 100% of the Standard Proctor Maximum Dry Density (SPMDD) at a moisture content within 2.0% of the optimum moisture content.

The long-term performance of pavement structures is highly dependent upon the sub-grade support conditions. Stringent construction control procedures should be maintained to ensure that uniform sub-grade moisture and density conditions are achieved. In addition, the need for adequate drainage cannot be overemphasized. The finished surface and underlying sub-grade must be sloped to provide effective drainage to catchbasins, ditching, and/or subdrains etc.

Surface water should not be allowed to pond along the outside edges of paved areas. Sub-drains should be installed to intercept excess subsurface moisture and prevent sub-grade softening.

Additional comments on the construction of the pavement structures are as follows:

- To ensure maximum service life of the pavement structures, all organics/peat and other deleterious materials should be removed to the native subgrade. An upfill required below the pavement structure can consist of Granular "B" Type I or II or a Select Subgrade Material (SSM) in accordance with OPSS 1010.
- Any subgrade soils should be proof-roll compacted prior to placing any engineered fill. Any soft areas encountered during proof-rolling should be excavated and replaced with a Granular "A" or Granular "B" Type II (OPSS 1010) material.
- If ditches are utilized, they should have inverts of at least 600 mm below the bottom of the sub-base.
- The most severe loading conditions on a soil pavement structure sub-grade usually occur during construction. Consequently, special provisions such as additional granular sub-base, may be required, especially if construction is completed during unfavorable weather conditions over native soils. Typically, the first lift of engineered fill is placed with a thickness of 300 mm prior to vibratory compaction to mitigate disturbance of the sub-grade soils.
- If wet soil conditions are present during construction, a non-woven geotextile separator (Terrafix 270R or equivalent) should be placed between the subgrade soils and any upfill/pavement structure material to stabilize the native soils.

6. Excavations

The in-situ native soils may be classified as Type 3 soils for excavations terminating above the groundwater level and Type 4 soils for excavations terminating below the groundwater level in conformance with the Ontario Occupational Health and Safety Act (OHSA). Excavation side slopes in Type 3 soils should remain stable at a slope of 1H:1V. Excavation side slopes in Type 4 soils should remain stable at a slope of 3H:1V.

Excavations below the groundwater level will require dewatering and will be difficult, and as such should be avoided.

The need to excavate flatter side slopes if excessively wet or soft/loose materials, or concentrated seepage zones are encountered, should not be overlooked

Water (i.e. surface water runoff) should not be permitted to enter and/or pond within the construction area. Stockpiles should be kept a sufficient distance from any soil excavation so as not to surcharge the excavation side slopes.

All excavations must be completed in accordance with the most recent regulations in the Ontario Occupational Health and Safety Act. The contractor should be aware that slope height, slope inclination, or excavation depths, should in no case, exceed those specified in local, provincial or federal safety regulations. Such regulations are strictly enforced and, if not followed, the owner, the contractor or earthwork or utility subcontractor could be liable for substantial penalties.

It is important to note that soils encountered in the construction excavations may vary significantly across the site. Our preliminary soil classifications are based solely on the materials encountered in widely spaced explorations. The contractor should verify that similar conditions exist throughout the proposed area of excavation. If different subsurface conditions are encountered at the time of construction, we recommend that EXP be contacted immediately to evaluate the conditions encountered.

6.1 Re-use of Excavated Material

The encountered soils are too poorly graded or fine grained to be re-used as free draining engineered fill. All in-situ materials may be used for general landscaping purposes away from structures/roads or in areas where non-free draining backfill may be required, provided it is environmentally safe to do so.

Any soils being removed from the site, must comply with the excess soil regulations (O.Reg. 406/19). While it is the responsibility of the source site to ensure soil exported off-site for reuse is suitable for the intended receiving site, it is highly recommended that the receiving site conduct an independent review of the analytical results to confirm the suitability of the soil to be reused at the specific receiving site.

7. Buried Service Recommendations

Recommendations for proposed buried services are included in the following sections.

7.1 Frost Protection

Protection against freezing is an integral part of a sewer and water system design. The standard solution calls for burying the top of the utility lines in the ground below the anticipated frost penetration depth (2.1 m in the Sudbury Area). Where this cannot be achieved, an alternate solution involves incorporating rigid polystyrene insulation (i.e. Styrofoam HIGHLOAD-40), which can be used to reduce the depth of trench required. The two design configurations frequently used are horizontal placement, and the inverted "U". Both of these methods require suitable design, as well as correct construction procedures. Installing insulation does not alter conventional utility line construction practice to an appreciable extent. However, in some cases, a wider trench may be required to accommodate the horizontal layer of insulation. Another option is to use pre-insulated pipe.

A rough estimate for cost evaluation can be made by assuming that 25 mm of rigid insulation designed for below grade installation is equivalent to 300 mm of soil cover. This and any other design values should, however, be confirmed with the insulation manufacturer.

Maintaining compatibility with adjacent subgrade conditions should minimize annual differential frost heaving. This is usually accomplished by backfilling the service trenches with materials matching the surrounding soils. Another approach to minimizing the annual differential heaving of subgrade soil is to construct frost tapers in conformance with OPSD 803.030 and/or 803.03. The same amount of heaving will occur whether a frost taper is installed, or the trench is backfilled with excavated material. However, the heaving of a frost taper is spread across the length of the taper causing the differential heaving to be less abrupt.

7.2 Pipe Embedment and Bedding

Any fill materials, organics, and other deleterious materials are to be removed down to competent native soils prior to placement of the bedding material. Pipe bedding requirements as outlined in the OPSD 802.010 for flexible pipes and OPSD 802.031 and 802.032 for rigid pipes will be sufficient for sanitary, storm and watermain pipes. The pipe bedding should consist of a Clear Stone gravel (OPSS 1004) or Granular "A" material (OPSS.MUNI 1010) with a minimum thickness of 150 mm beneath the pipe and raised to the pipe springline. The granular bedding should be placed in lifts not exceeding 150 mm and compacted to 98% of the material's SPMDD. Particular care should be taken when compacting beneath the pipe haunches. The cover material should consist of a compacted sand material with no sizes greater than 25 mm or a Granular "A" material.

Bedding thicknesses may be increased in areas where the native soil base supporting the bedding is wet, or subject to disturbance. Where soft or loose base conditions are encountered below the water table, base stabilization may be required.

This may include the placement of crushed stone sub-bedding, wrapped in a non-woven geotextile, to prevent base disturbance and to allow the removal of water through standard filtered sump and pump methods.

If construction proceeds during the winter months, the base and sides of the trench, as well as all fill materials, should not be allowed to freeze.

7.3 Excavated Soil and Trench Backfill

It is typical practice in Northern Ontario to re-use a portion of the in-situ excavated native material as fill within exterior (outside) trench utility services, especially where these trenches interrupt traveled sections of a roadway. This is to ensure compatibility with adjacent subgrade soils to minimize annual differential frost heaving.

Non-organic material from the service trench excavation may be re-used as random fill above the top of the pipe cover material to the underside of the pavement structure subbase materials. All re-used materials must be placed in lifts not exceeding 150 mm and be compacted to 98% of the SPMDD within 2% of the optimum moisture content. EXP cautions that any native material below the groundwater level may not meet the above compaction requirements without significant reworking and drying prior to placement. If stockpiling of trench excavated material for re-use is required, it is recommended that it be covered to prevent exposure to rain and it cannot be allowed to freeze. All unsuitable materials from the trench excavation not reused must be disposed of off-site.

Any excavated material contaminated with organics, construction debris, or other deleterious materials must not be re-used as backfill material. This material may be re-used for general landscaping purposes, provided it is environmentally safe to do so.

8. Soil Drainage Characteristics

It is understood that infiltration trenches are proposed to be constructed as part of this development. The size and depth of the trenches are unknown at this time, we have provided general soil properties for design considerations. Refer to appendix C for laboratory grain size analysis results.

Location	Soil Type	D_{10} (mm)	D_{60} (mm)	C_U	K (cm/s)	Percolation Rate T (min/cm)	Recommended T (min/cm)	Infiltration Rate I ($mm/hr/m^2$)
BH-P1 SS3	Sand, trace Silt, trace Gravel	0.048	0.52	10.8	0.0023	10-15	15	82.8
BH-P2 SS3	Sand, trace Silt	0.16	0.4	2.5	0.025	5-10	10	900
BH-P3 SS2	Sand and Silt	0.0082	0.067	8.2	0.000067	25-35	35	2.4

9. Construction Constraints Under Cold Weather Conditions

For all construction activities at this site, the following applies:

- During excavations, all subgrade soils must be maintained at a minimum temperature of 5° C.
- No granular material may be placed under frozen conditions, with all fill material maintained at a minimum temperature of 5° C prior to and during installation. If granular fill is to be placed in freezing conditions, the granular fill must be restricted to Granular "B" Type II material. Since Granular "B" Type II has a larger aggregate size, care should be taken to prevent point loading on the underside of the concrete.
- Soils and granular fill material that is in direct contact with fresh concrete must be at a minimum temperature of 5° C prior to pouring the concrete and must be free of snow and ice fragments.
- All granular fill, prior to placement of concrete, must be reviewed by this office to ensure it is free of frost, buried ice and snow.
- All reinforcing steel in the concrete forms must be free of ice and snow, and must be maintained at a minimum temperature of 5° C.
- During the placement of concrete in cold weather conditions, a field cured cylinder should be placed beside the heated form for a period of 6 days. The field cured cylinder should be returned to a designated laboratory on the sixth day for 7 day compressive strength testing.
- All heated and tarped areas should be monitored for temperature using a max/min thermometer.
- All concrete is to have a minimum of 6 to 8% air entrainment to prevent cracking and shall be maintained at a minimum temperature of 10° C for a period of 4 to 7 days.

The 6 to 8% air entrained concrete during cold weather placement is to prevent significant strength loss of concrete because of freezing and thawing. The air entrainment will provide the capacity to absorb stresses during freeze/thaw action.

10. Construction Quality Control

Construction quality control of the "earthworks" should be provided throughout the project by a representative of EXP to verify all design assumptions, recommendations, and confirmation of the subsurface soil conditions. This includes inspection of the excavation and subgrade prior to the placement of any structural fill and foundations, to ensure that all deleterious materials have been removed and to ensure that the actual conditions are not markedly different than those on which the recommendations made herein are based. Compaction control of structural fill is also recommended as standard practice, as is sampling and testing of aggregates and concrete.

11. Design Review

The recommendations made in this report are in accordance with our present understanding of the project and are provided solely for the design team responsible for the project. If there are any changes, such as relocation of any structures or other features which may affect our analysis, the information obtained during this investigation may be inadequate and additional field work and reporting may be required.

EXP Services Inc. should be retained to review the final design and specifications to confirm that it is in general agreement with the assumptions on which our recommendations are based. If not accorded the privilege of making this review, EXP Services Inc. will assume no responsibility for interpretation of the recommendations in this report.

12. Limitations

A subsurface investigation is a limited sampling of a site. Should any conditions at the site be encountered that differ from those reported at the test locations, we require that we be notified immediately to allow reassessment of our recommendations.

Whereas this investigation has estimated the groundwater level at the time of the fieldwork, and commented on general construction problems, the presence of conditions, which would be difficult to establish from our boreholes, may affect the type and nature of dewatering procedures which should be used in practice. These conditions include local and seasonal fluctuations in the groundwater table, erratic changes in the soil profile between the tests, and thin layers of soil with large or small permeabilities compared with the general soil mass, etc.

The comments given in this report are intended only for the guidance of the design team responsible for the project. The number of test holes required to determine the localized underground conditions between test holes affecting construction costs, techniques, sequencing, equipment, scheduling, etc. could be greater than has been carried out for design purposes. Contractors bidding on or undertaking the works should, in this light, decide on their own investigations, as well as their own interpretations of the factual test hole results, so that they may draw their own conclusions as to how the subsurface conditions may affect them.

The investigation and comments are necessarily ongoing as new information of underground conditions becomes available. For example, more specific information is available with respect to in-situ subsurface conditions between test locations once construction is underway. Subsurface soil interpretation between test holes, as well as the recommendations of this report, should be verified through field inspections provided by EXP to validate the current information for use during the construction stage.

Virtually no scope of work, no matter how exhaustive, can identify all contaminants or all conditions above or below ground. For example, conditions elsewhere on the property may differ from those encountered, and conditions may change with time. Therefore, no warranty is provided that the entire site condition is represented by those identified at specific locations.

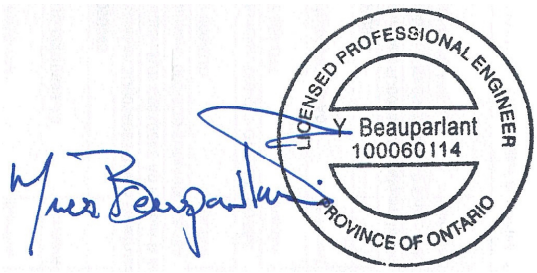
This report in no way reflects any on-site environmental considerations.

13. Closure

We trust that these comments provide you with sufficient information to proceed with design. Should you have any questions, please do not hesitate to contact this office.

Yours truly,

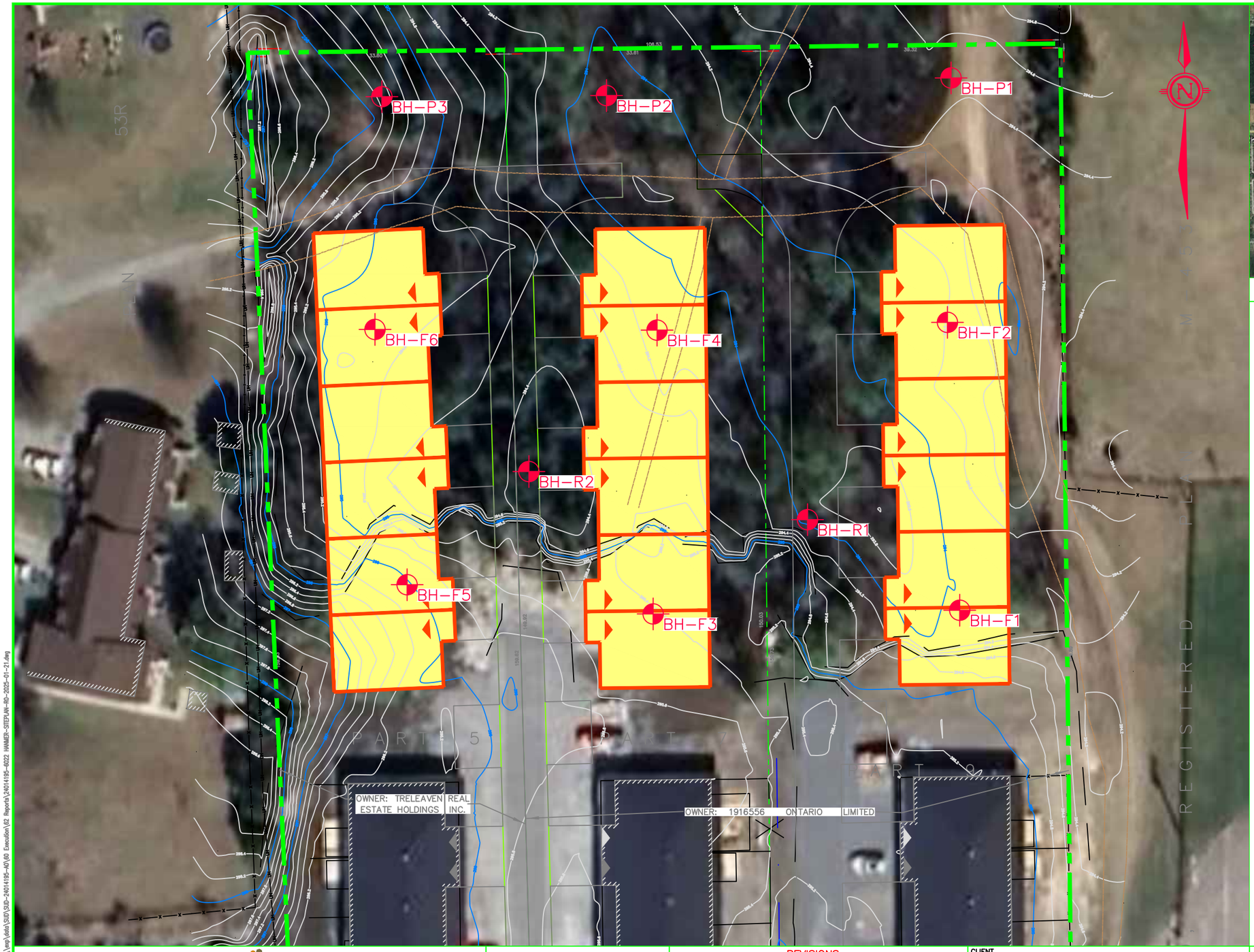
EXP Services Inc.



Steven Kacan, P.Eng
Civil/Geotechnical Engineer
Earth & Environmental Services
Northeastern Ontario

Yves Beauparlant, P.Eng.
Manager, Earth & Environmental Services
Northeastern Ontario

Appendix A – Drawings



KEYPLAN - N.T.S.

LEGEND

EXP BOREHOLE

– NOTES –

1) The boundaries and soil types have been established only at Test Hole locations. Between Test Holes, they are assumed and may be subject to considerable error.
2) Do not use Test Hole elevations for design purposes.
3) Soil samples will be retained in storage for 3 month and then destroyed unless client advises that an extended time period is required.
4) Quantities should not be established from the information provided at the Test Hole locations.
5) This drawing forms part of the report, project number as referenced, and should be used only in conjunction with this report.

EXP Services Inc.
Sudbury Branch
t: +1.705.674.4401 | f: +1.705.674.5583
885 Regent Street
Sudbury, ON P3E 5M4
Canada
www.exp.com

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REVISIONS

No.	DESCRIPTION	DATE

CLIENT: 1916555 ONTARIO LIMITED

PROJECT: MR80 PROPOSED DEVELOPMENT HANMER, ON

PROJECT NO.: SUD-24014195-A0

TITLE: BOREHOLE LOCATION PLAN

DATE: JAN 2025 | SCALE: NTS | DWG NO.: A-1

Appendix B – Borehole Logs

Notes on Sample Descriptions

1. All sample descriptions included in this report follow the International Society for Soil Mechanics and Foundation Engineering (ISSMFE), as outlined in the Canadian Foundation Engineering Manual. Note, however, that behavioral properties (i.e. plasticity, permeability) take precedence over particle gradation when classifying soil. Please note that, with the exception of those samples where a grain size analysis has been made, all samples are classified visually. Visual classification is not sufficiently accurate to provide exact grain sizing or precise differentiation between size classification systems.

UNIFIED SOIL CLASSIFICATION

CLAY (PLASTIC) TO	FINE	MEDIUM	CRS.	FINE	COARSE
SILT (NONPLASTIC)	SAND			GRAVEL	

0.002	0.006	0.02	0.06	0.2	0.6	2.0	6.0	20	60	200

EQUIVALENT GRAIN DIAMETER IN MILLIMETRES

ISSMFE SOIL CLASSIFICATION

CLAY	SILT			SAND			GRAVEL			COBBLES	BOULDERS
	FINE	MEDIUM	COARSE	FINE	MEDIUM	COARSE	FINE	MEDIUM	COARSE		

2. Fill: Where fill is designated on the borehole log it is defined as indicated by the sample recovered during the boring process. The reader is cautioned that fills are heterogeneous in nature and variable in density or degree of compaction. The borehole description may therefore not be applicable as a general description of site fill materials. All fills should be expected to contain obstruction such as wood, large concrete pieces or subsurface basements, floors, tanks, etc., none of these may have been encountered in the boreholes. Since boreholes cannot accurately define the contents of the fill, test pits are recommended to provide supplementary information. Despite the use of test pits, the heterogeneous nature of fill will leave some ambiguity as to the exact composition of the fill. Most fills contain pockets, seams, or layers of organically contaminated soil. This organic material can result in the generation of methane gas and/or significant ongoing and future settlements. Fill at this site may have been monitored for the presence of methane gas and, if so, the results are given on the borehole logs. The monitoring process does not indicate the volume of gas that can be potentially generated nor does it pinpoint the source of the gas. These readings are to advise of the presence of gas only, and a detailed study is recommended for sites where any explosive gas/methane is detected. Some fill material may be contaminated by toxic/hazardous waste that renders it unacceptable for deposition in any but designated land fill sites; unless specifically stated the fill on this site has not been tested for contaminants that may be considered toxic or hazardous. This testing and a potential hazard study can be undertaken if requested. In most residential/commercial areas undergoing reconstruction, buried oil tanks are common and are generally not detected in a conventional geotechnical site investigation.

3. Till: The term till on the borehole logs indicates that the material originates from a geological process associated with glaciation. Because of this geological process the till must be considered heterogeneous in composition and as such may contain pockets and/or seams of material such as sand, gravel, silt or clay. Till often contains cobbles (75 to 200 mm) or boulders (over 200 mm). Contractors may therefore encounter cobbles and boulders during excavation, even if they are not indicated by the borings. It should be appreciated that normal sampling equipment cannot differentiate the size or type of any obstruction. Because of the horizontal and vertical variability of till, the sample description may be applicable to a very limited zone; caution is therefore essential when dealing with sensitive excavations or dewatering programs in till materials.

Notes On Soil Descriptions

4. The following table gives a description of the soil based on particle sizes. With the exception of those samples where grain size analyses have been performed, all samples are classified visually. The accuracy of visual examination is not sufficient to differentiate between this classification system or exact grain size.

Soil Classification		Terminology	Proportion
Clay and Silt	<0.060 mm	“trace” (e.g. Trace sand)	1% to 10%
Sand	0.060 to 2.0 mm	“some” (e.g. Some sand)	10% to 20%
Gravel	2.0 to 75 mm	adjective (e.g. sandy, silty)	20% to 35%
Cobbles	75 to 200 mm	“and” (e.g. and sand)	35% to 50%
Boulders	>200 mm		

The compactness of Cohesionless soils and the consistency of the cohesive soils are defined by the following:

Cohesionless Soil		Cohesive Soil		
Compactness	**Standard Penetration Resistance “N” Blows / 0.3 m**	**Consistency**	**Undrained Shear Strength (kPa)**	**Standard Penetration Resistance “N” Blows / 0.3 m**
Very Loose	0 to 4	Very soft	<12	<2
Loose	4 to 10	Soft	12 to 25	2 to 4
Compact	10 to 30	Firm	25 to 50	4 to 8
Dense	30 to 50	Stiff	50 to 100	8 to 15
Very Dense	Over 50	Very Stiff	100 to 200	15 to 30
		Hard	>200	>30

5. **ROCK CORING**

Where rock drilling was carried out, the term RQD (Rock Quality Designation) is used. The RQD is an indirect measure of the number of fractures and soundless of the rock mass. It is obtained from the rock cores by summing the length of the core covered, counting only those pieces of sound core that are 100 mm or more length. The RQD value is expressed as a percentage and is the ratio of the summed core lengths to the total length of core run. The classification based on the RQD value is given below.

RQD Classification	RQD (%)
Very Poor Quality	<25
Poor Quality	25 to 50
Fair Quality	50 to 75
Good Quality	75 to 90
Excellent Quality	90 to 100

$$\text{Recovery Designation \% Recovery} = \frac{\text{Length of Core Per Run}}{\text{Total Length of Run}} \times 100$$

Log of Borehole BH-F1

Project No. SUD-24014195-A0 | Figure No. B-2

Project: MR80 Development | Sheet No. 1 of 1

Location: Hanmer, Ontario

503803 E, 5166710 N

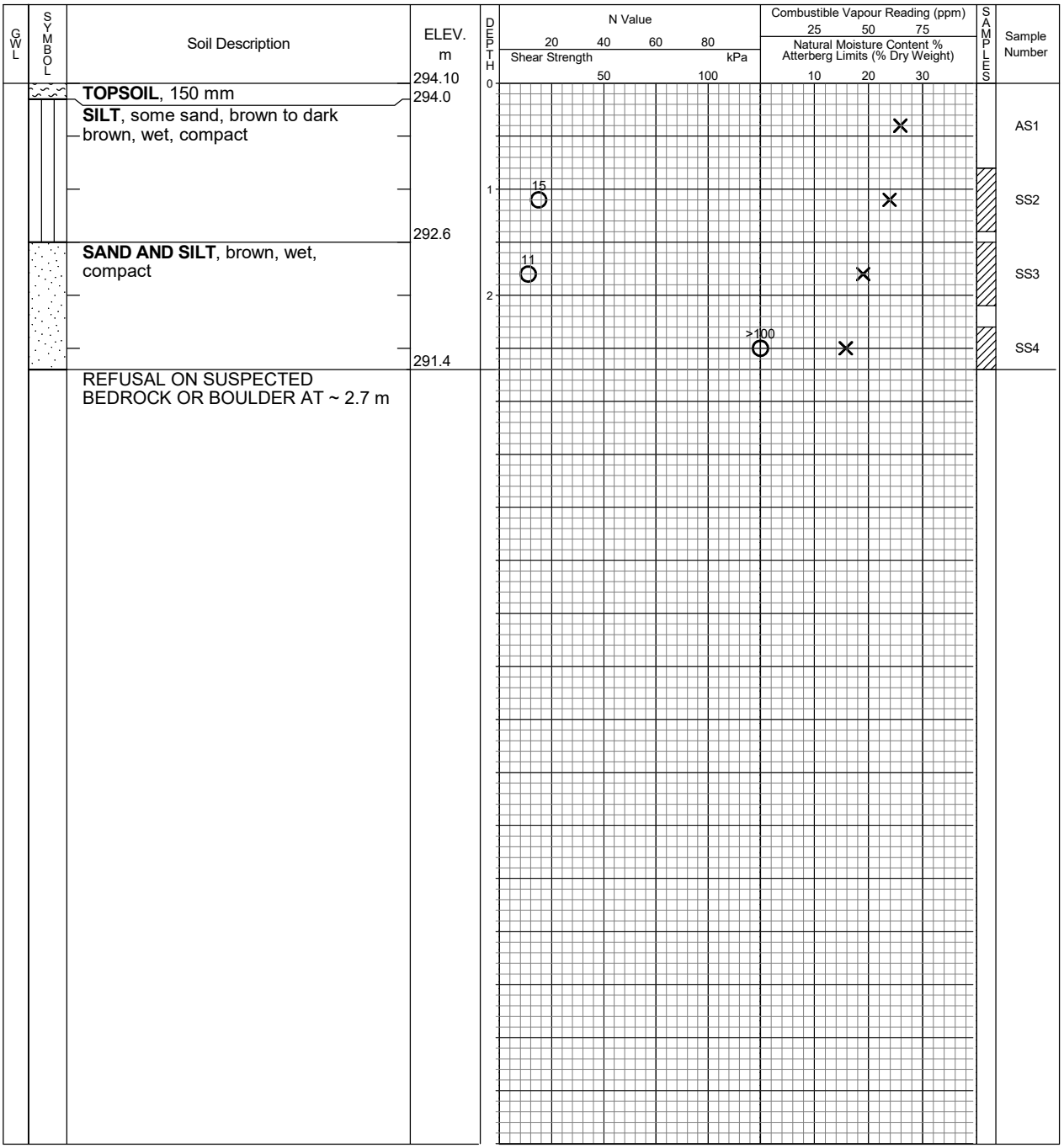
Date Drilled: Jan 16, 2025

Drill Type: CME 55 Track

Datum: Geodetic (hand-held GPS)

Auger Sample | SPT (N) Value | Dynamic Cone Test | Shelby Tube | Field Vane Test (S)

Combustible Vapour Reading | Natural Moisture | Plastic and Liquid Limit | Undrained Triaxial at % Strain at Failure | Penetrometer



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EXP Services Inc.
885 Regent Street
Sudbury, ON P3E 5M4
CANADA
t: +1.705.674.9681
f: +1.705.674.5583

Borehole data requires interpretation assistance from EXP before use by others.

See Figures B-1A and B-1B for Notes on Sample Description

Time	Water Level (m)	Depth to Cave (m)
upon completion	dry	no cave

Log of Borehole BH-F2

Project No. SUD-24014195-A0 | Figure No. B-3

Project: MR80 Development | Sheet No. 1 of 1

Location: Hanmer, Ontario

503797 E, 5166748 N

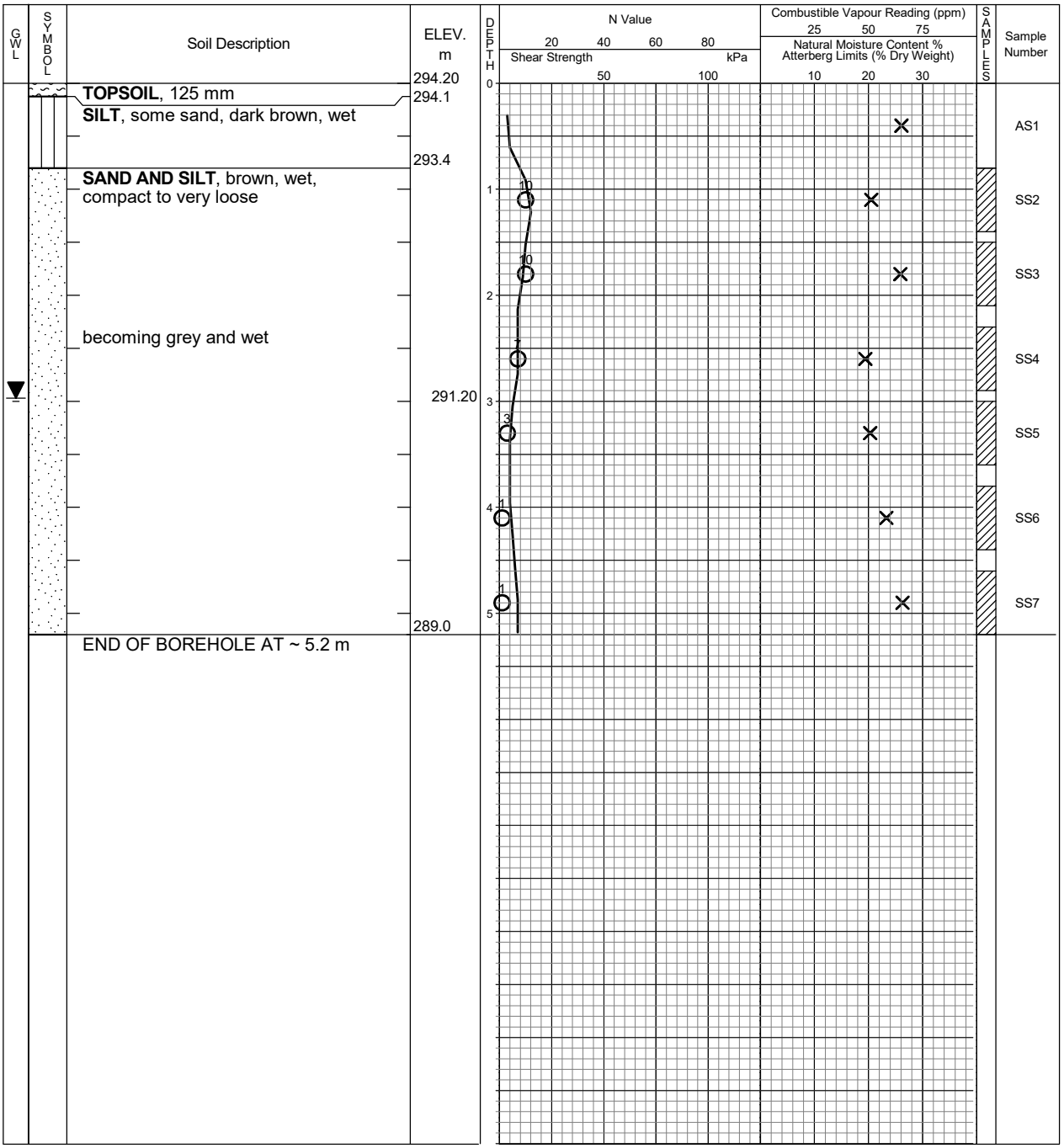
Date Drilled: Jan 16, 2025

Drill Type: CME 55 Track

Datum: Geodetic (hand-held GPS)

Auger Sample | SPT (N) Value | Dynamic Cone Test | Shelby Tube | Field Vane Test (S)

Combustible Vapour Reading | Natural Moisture | Plastic and Liquid Limit | Undrained Triaxial at % Strain at Failure | Penetrometer



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EXP Services Inc.
885 Regent Street
Sudbury, ON P3E 5M4
CANADA
t: +1.705.674.9681
f: +1.705.674.5583

Borehole data requires interpretation assistance from EXP before use by others.

See Figures B-1A and B-1B for Notes on Sample Description

Time	Water Level (m)	Depth to Cave (m)
upon completion	3.0	3.1

Log of Borehole BH-F3

Project No. SUD-24014195-A0 | Figure No. B-4

Project: MR80 Development | Sheet No. 1 of 1

Location: Hanmer, Ontario

503762 E, 5166711 N

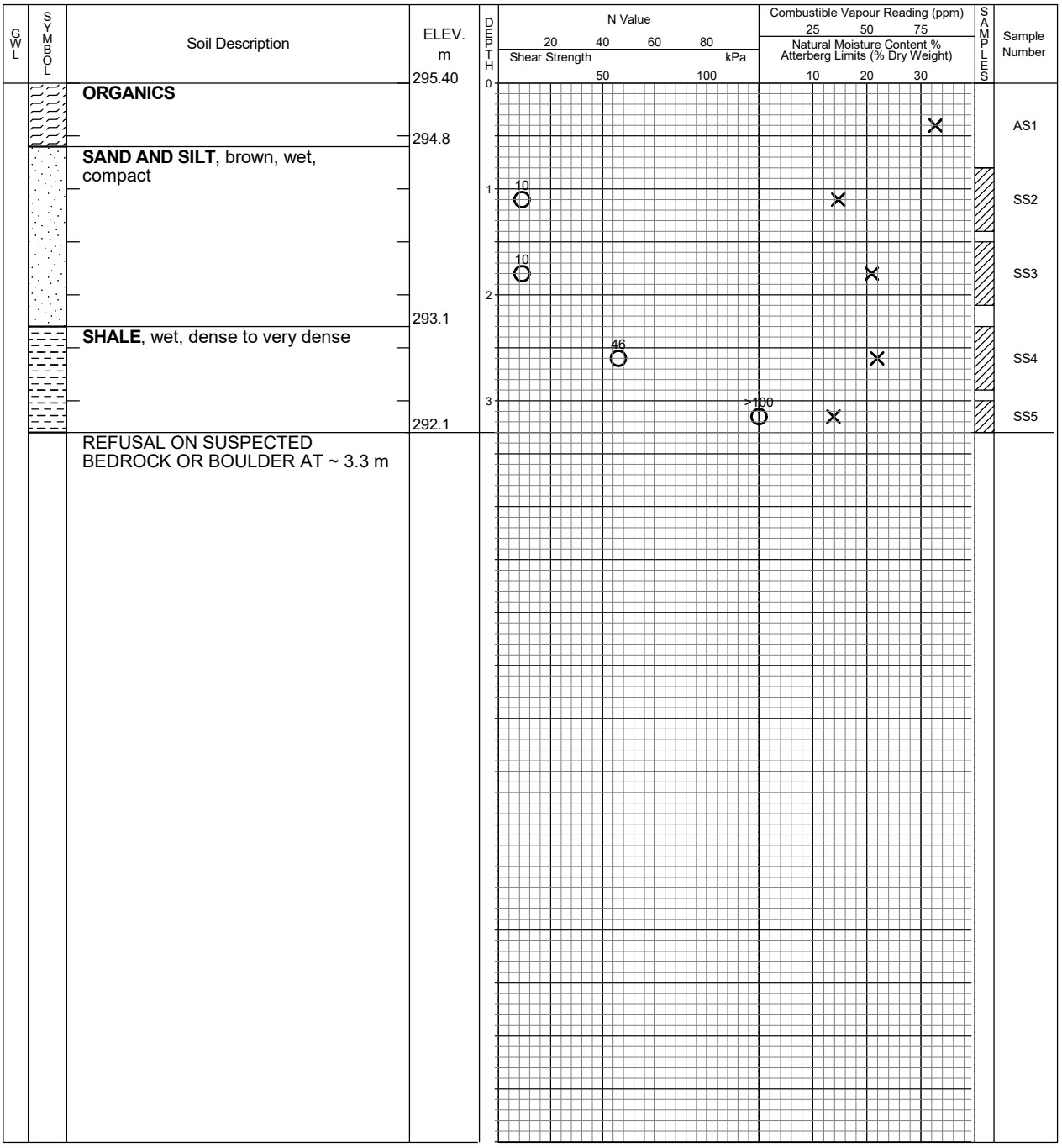
Date Drilled: Jan 17, 2025

Drill Type: CME 55 Track

Datum: Geodetic (hand-held GPS)

Auger Sample | SPT (N) Value | Dynamic Cone Test | Shelby Tube | Field Vane Test (S)

Combustible Vapour Reading | Natural Moisture | Plastic and Liquid Limit | Undrained Triaxial at % Strain at Failure | Penetrometer



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EXP Services Inc.
885 Regent Street
Sudbury, ON P3E 5M4
CANADA
t: +1.705.674.9681
f: +1.705.674.5583

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See Figures B-1A and B-1B for Notes on Sample Description

Time	Water Level (m)	Depth to Cave (m)
upon completion	dry	2.7

Log of Borehole BH-F4

Project No. SUD-24014195-A0 | Figure No. B-5

Project: MR80 Development | Sheet No. 1 of 1

Location: Hanmer, Ontario

503763 E, 5166741 N

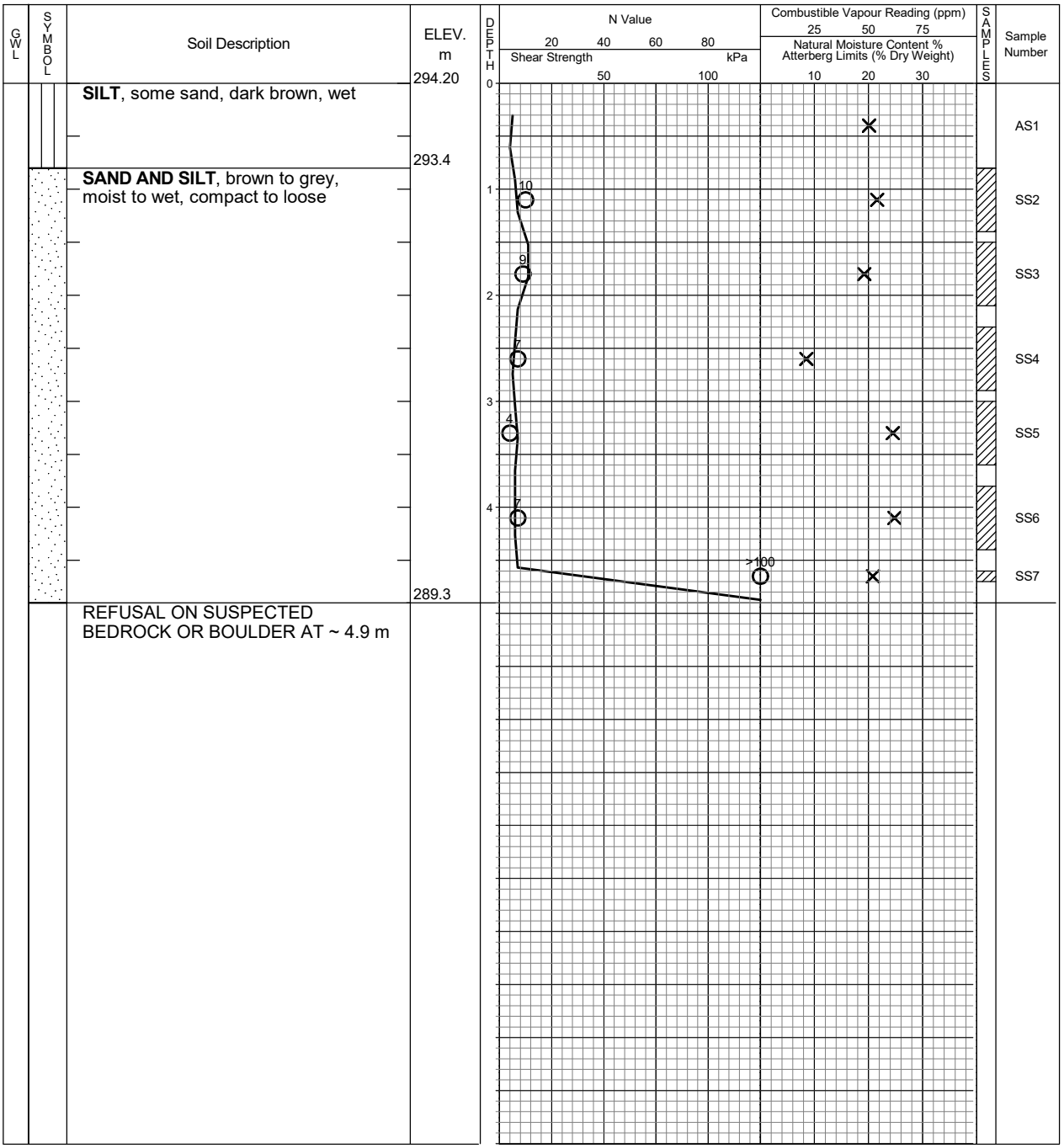
Date Drilled: Jan 17, 2025

Drill Type: CME 55 Track

Datum: Geodetic (hand-held GPS)

Auger Sample | SPT (N) Value | Dynamic Cone Test | Shelby Tube | Field Vane Test (S)

Combustible Vapour Reading | Natural Moisture | Plastic and Liquid Limit | Undrained Triaxial at % Strain at Failure | Penetrometer



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885 Regent Street
Sudbury, ON P3E 5M4
CANADA
t: +1.705.674.9681
f: +1.705.674.5583

Borehole data requires interpretation assistance from EXP before use by others.

See Figures B-1A and B-1B for Notes on Sample Description

Time	Water Level (m)	Depth to Cave (m)
upon completion	dry	3.3

Log of Borehole BH-F5

Project No. SUD-24014195-A0 | Figure No. B-6

Project: MR80 Development | Sheet No. 1 of 1

Location: Hanmer, Ontario

503737 E, 5166711 N

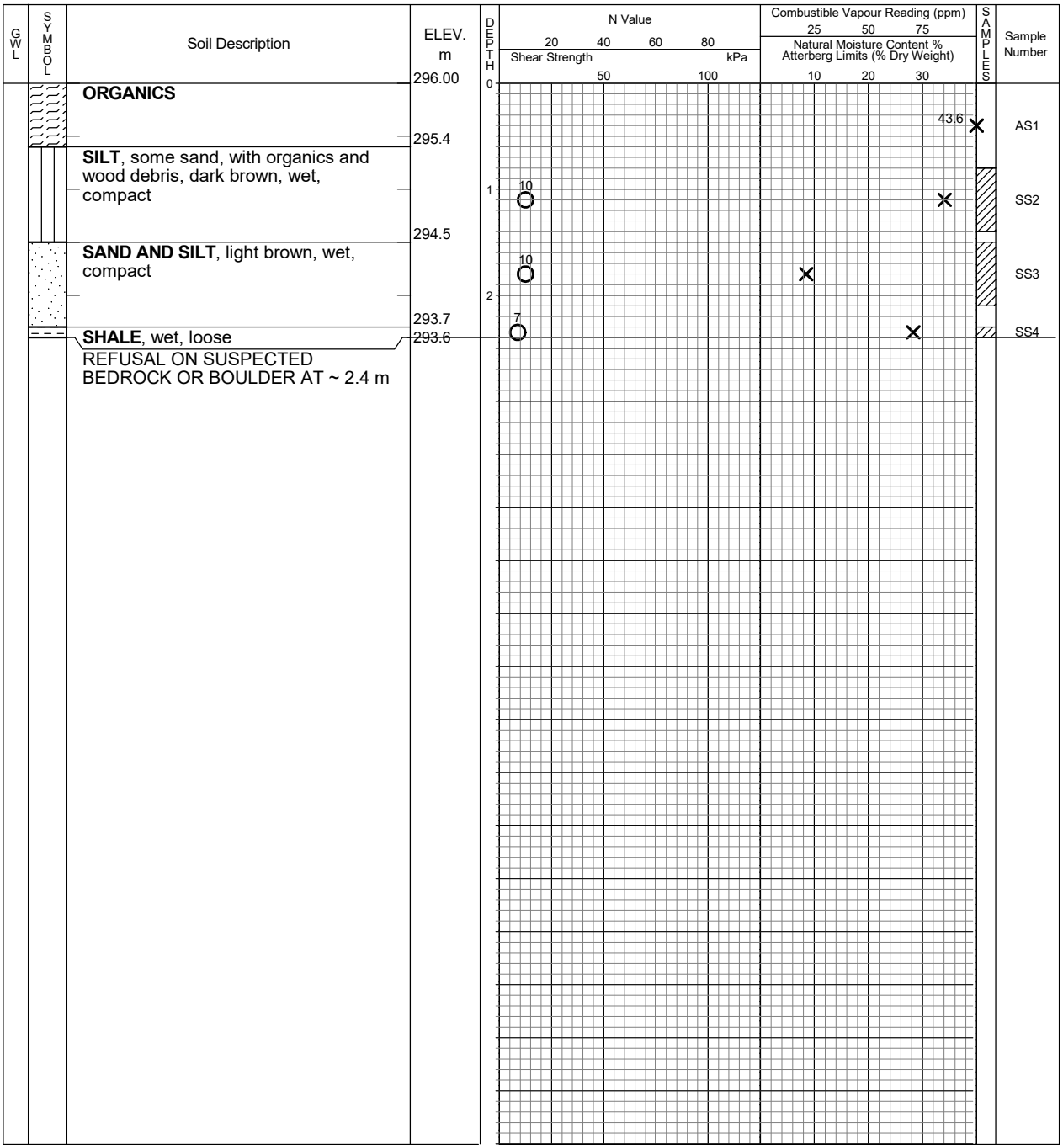
Date Drilled: Jan 17, 2025

Drill Type: CME 55 Track

Datum: Geodetic (hand-held GPS)

Auger Sample | SPT (N) Value | Dynamic Cone Test | Shelby Tube | Field Vane Test (S)

Combustible Vapour Reading | Natural Moisture | Plastic and Liquid Limit | Undrained Triaxial at % Strain at Failure | Penetrometer



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EXP Services Inc.
885 Regent Street
Sudbury, ON P3E 5M4
CANADA
t: +1.705.674.9681
f: +1.705.674.5583

Borehole data requires interpretation assistance from EXP before use by others.

See Figures B-1A and B-1B for Notes on Sample Description

Time	Water Level (m)	Depth to Cave (m)
upon completion	dry	no cave

Log of Borehole BH-F6

Project No. SUD-24014195-A0 | Figure No. B-7

Project: MR80 Development | Sheet No. 1 of 1

Location: Hanmer, Ontario

503730 E, 5166738 N

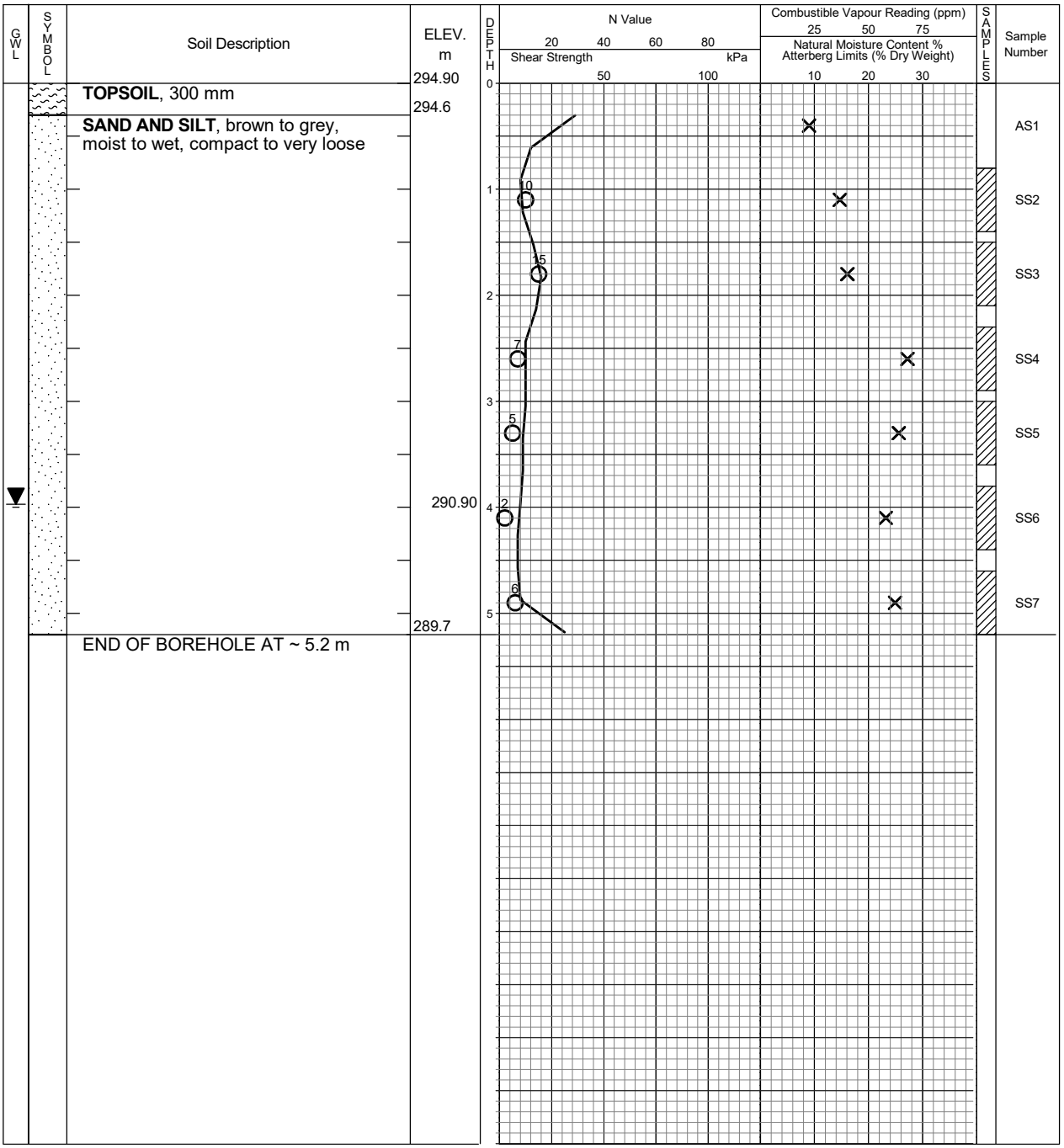
Date Drilled: Jan 16, 2025

Drill Type: CME 55 Track

Datum: Geodetic (hand-held GPS)

Auger Sample | SPT (N) Value | Dynamic Cone Test | Shelby Tube | Field Vane Test (S)

Combustible Vapour Reading | Natural Moisture | Plastic and Liquid Limit | Undrained Triaxial at % Strain at Failure | Penetrometer



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EXP Services Inc.
885 Regent Street
Sudbury, ON P3E 5M4
CANADA
t: +1.705.674.9681
f: +1.705.674.5583

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See Figures B-1A and B-1B for Notes on Sample Description

Time	Water Level (m)	Depth to Cave (m)
upon completion	4.0	4.4

Log of Borehole BH-P1

Project No. SUD-24014195-A0 | Figure No. B-8

Project: MR80 Development | Sheet No. 1 of 1

Location: Hanmer, Ontario

503795 E, 5166783 N

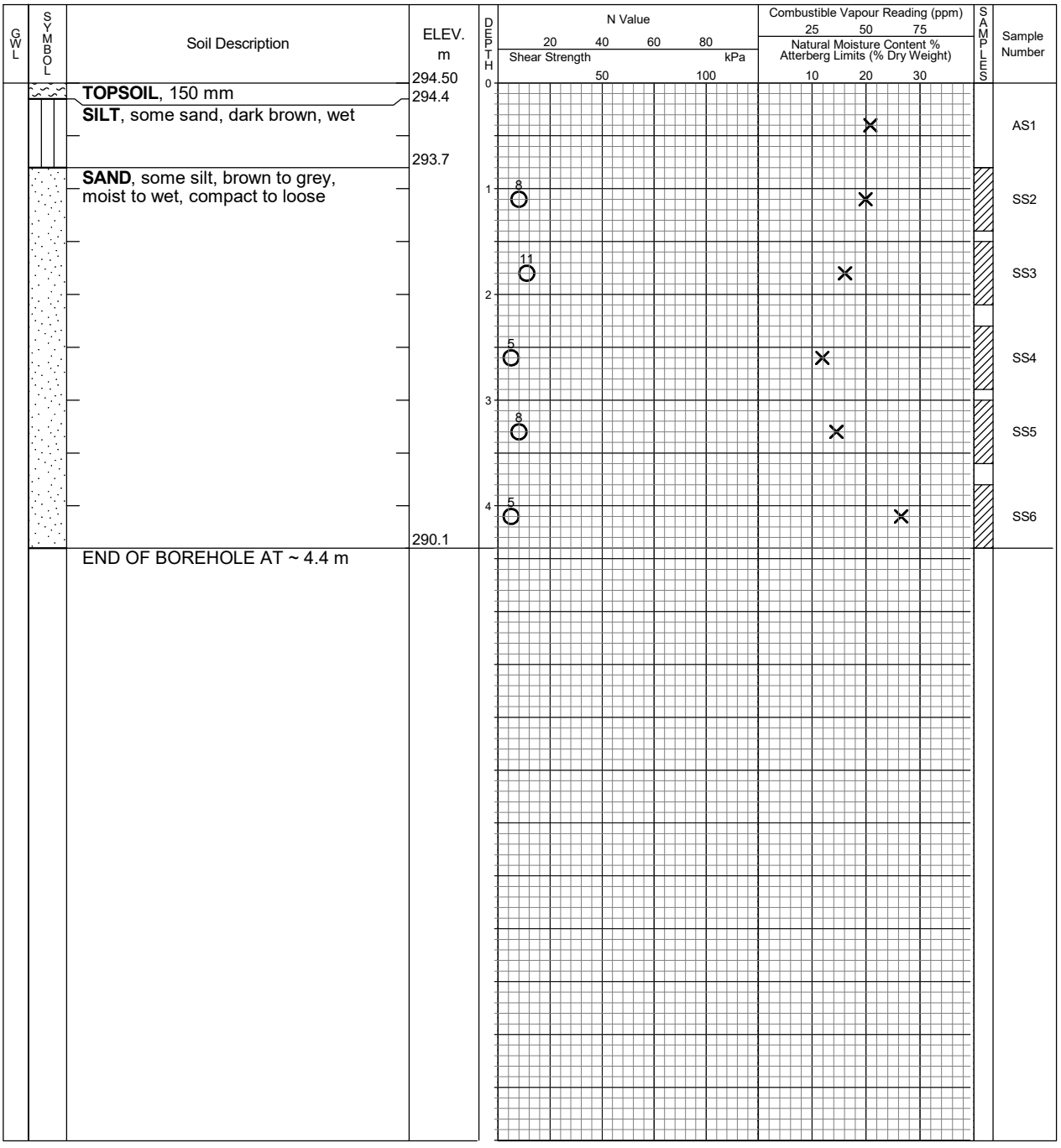
Date Drilled: Jan 16, 2025

Drill Type: CME 55 Track

Datum: Geodetic (hand-held GPS)

Auger Sample | SPT (N) Value | Dynamic Cone Test | Shelby Tube | Field Vane Test (S)

Combustible Vapour Reading | Natural Moisture | Plastic and Liquid Limit | Undrained Triaxial at % Strain at Failure | Penetrometer



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EXP Services Inc.
885 Regent Street
Sudbury, ON P3E 5M4
CANADA
t: +1.705.674.9681
f: +1.705.674.5583

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See Figures B-1A and B-1B for Notes on Sample Description

Time	Water Level (m)	Depth to Cave (m)
upon completion	dry	3.5

Log of Borehole BH-P2

Project No. SUD-24014195-A0 | Figure No. B-9

Project: MR80 Development | Sheet No. 1 of 1

Location: Hanmer, Ontario

503761 E, 5166777 N

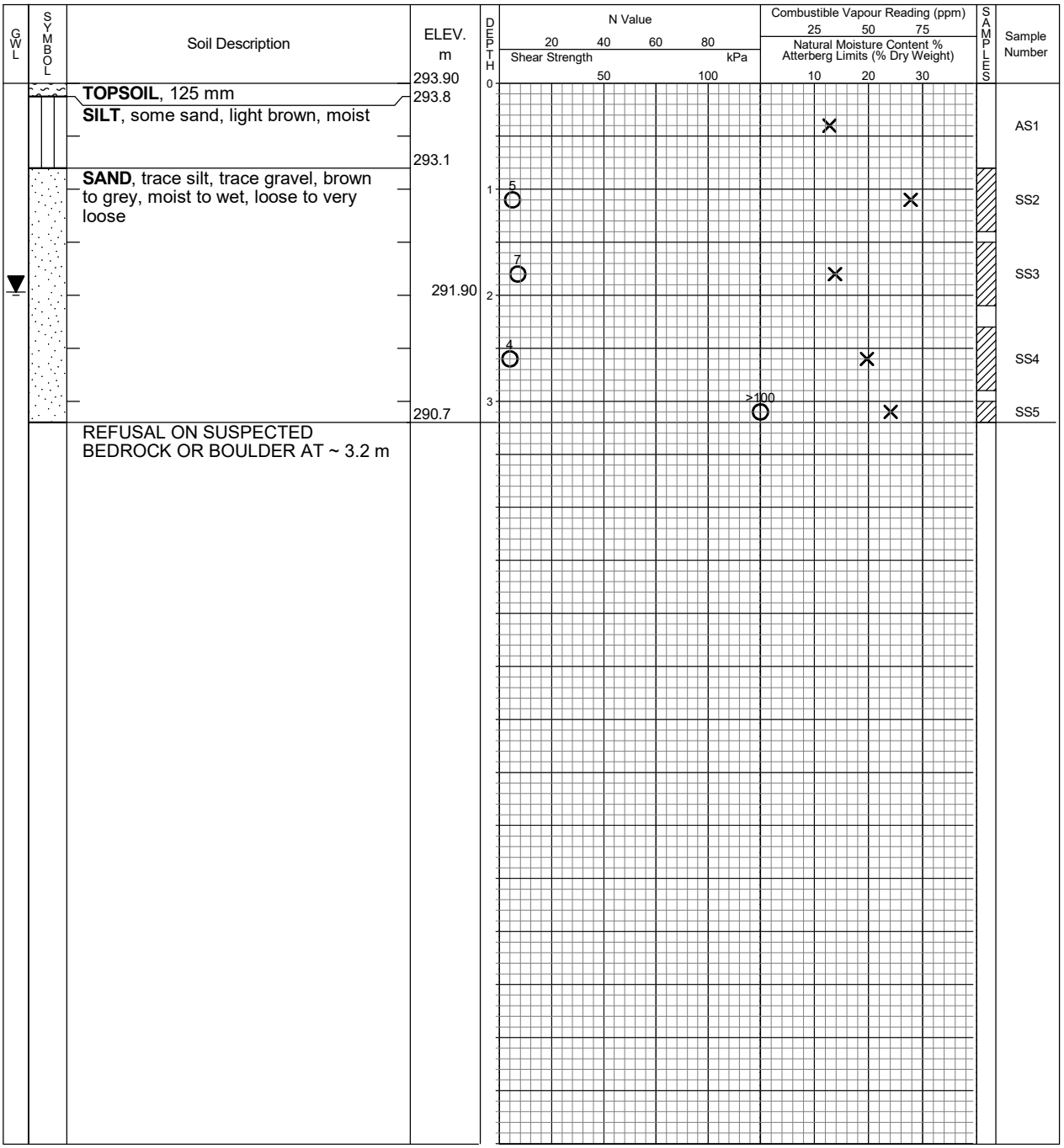
Date Drilled: Jan 16, 2025

Drill Type: CME 55 Track

Datum: Geodetic (hand-held GPS)

Auger Sample | SPT (N) Value | Dynamic Cone Test | Shelby Tube | Field Vane Test (S)

Combustible Vapour Reading | Natural Moisture | Plastic and Liquid Limit | Undrained Triaxial at % Strain at Failure | Penetrometer



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EXP Services Inc.
885 Regent Street
Sudbury, ON P3E 5M4
CANADA
t: +1.705.674.9681
f: +1.705.674.5583

Borehole data requires interpretation assistance from EXP before use by others.

See Figures B-1A and B-1B for Notes on Sample Description

Time	Water Level (m)	Depth to Cave (m)
upon completion	2.0	2.1

Log of Borehole BH-P3

Project No. SUD-24014195-A0 | Figure No. B-10

Project: MR80 Development | Sheet No. 1 of 1

Location: Hanmer, Ontario

503733 E, 5166771 N

Date Drilled: Jan 16, 2025

Drill Type: CME 55 Track

Datum: Geodetic (hand-held GPS)

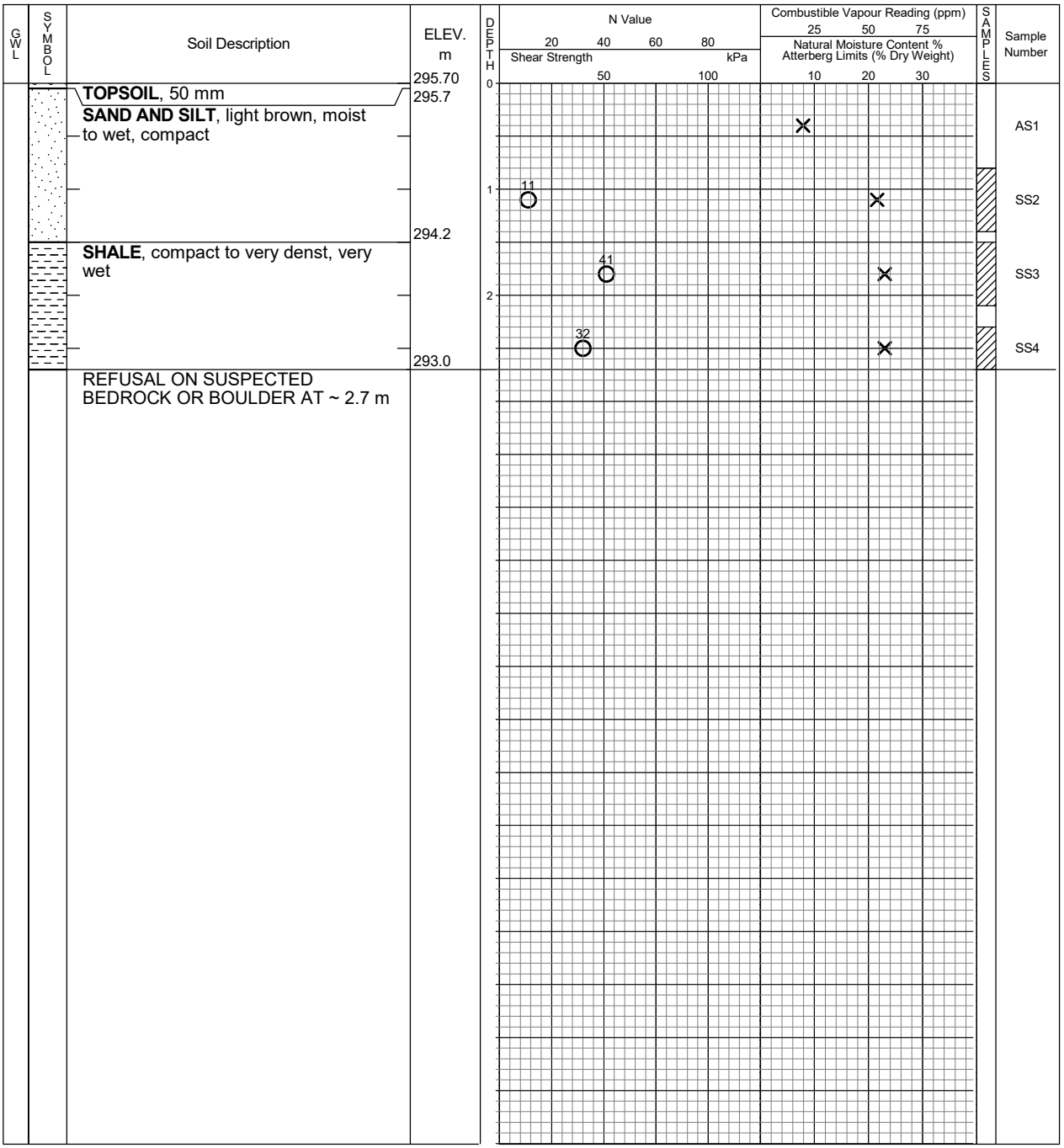
Auger Sample | Combustible Vapour Reading

SPT (N) Value | Natural Moisture

Dynamic Cone Test | Plastic and Liquid Limit

Shelby Tube | Undrained Triaxial at % Strain at Failure

Field Vane Test (S) | Penetrometer



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EXP Services Inc.
885 Regent Street
Sudbury, ON P3E 5M4
CANADA
t: +1.705.674.9681
f: +1.705.674.5583

Borehole data requires interpretation assistance from EXP before use by others.

See Figures B-1A and B-1B for Notes on Sample Description

Time	Water Level (m)	Depth to Cave (m)
upon completion	dry	2.0

Log of Borehole BH-R1

Project No. SUD-24014195-A0 | Figure No. B-11

Project: MR80 Development | Sheet No. 1 of 1

Location: Hanmer, Ontario

503784 E, 5166729 N

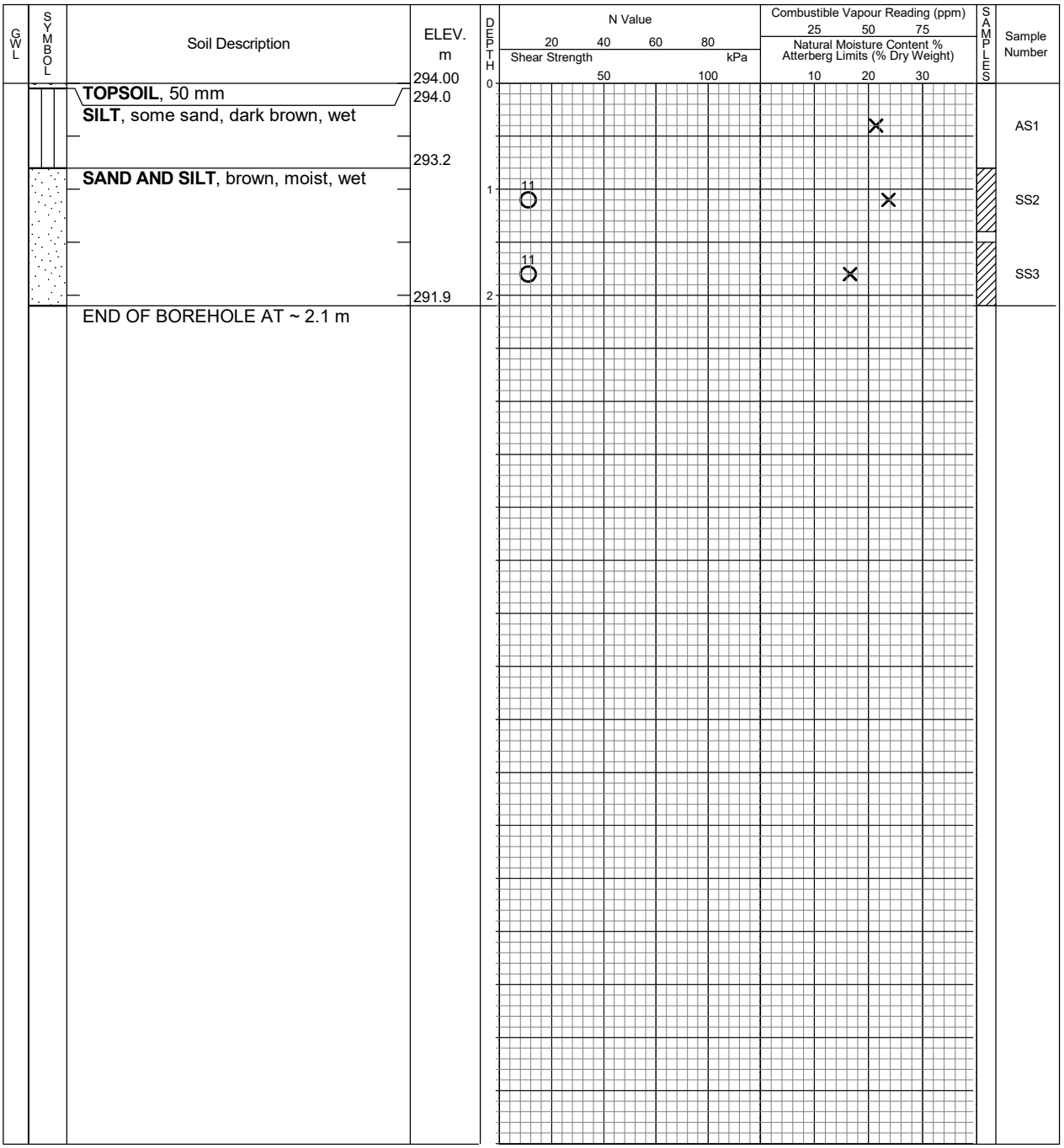
Date Drilled: Jan 17, 2025

Drill Type: CME 55 Track

Datum: Geodetic (hand-held GPS)

Auger Sample | SPT (N) Value | Dynamic Cone Test | Shelby Tube | Field Vane Test (S)

Combustible Vapour Reading | Natural Moisture | Plastic and Liquid Limit | Undrained Triaxial at % Strain at Failure | Penetrometer



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EXP Services Inc.
885 Regent Street
Sudbury, ON P3E 5M4
CANADA
t: +1.705.674.9681
f: +1.705.674.5583

Borehole data requires interpretation assistance from EXP before use by others.

See Figures B-1A and B-1B for Notes on Sample Description

Time	Water Level (m)	Depth to Cave (m)
upon completion	dry	no cave

Log of Borehole BH-R2

Project No. SUD-24014195-A0 | Figure No. B-12

Project: MR80 Development | Sheet No. 1 of 1

Location: Hanmer, Ontario

503744 E, 5166730 N

Date Drilled: Jan 16, 2025

Drill Type: CME 55 Track

Datum: Geodetic (hand-held GPS)

Auger Sample | SPT (N) Value | Dynamic Cone Test | Shelby Tube | Field Vane Test (S)

Combustible Vapour Reading | Natural Moisture | Plastic and Liquid Limit | Undrained Triaxial at % Strain at Failure | Penetrometer

GWL	SYMBOL	Soil Description	ELEV. m	DEPTH	N Value / Shear Strength (kPa)	Combustible Vapour Reading (ppm) / Natural Moisture Content % / Atterberg Limits (% Dry Weight)	SAMPLES	Sample Number
		TOPSOIL, 200 mm	294.30	0				
		SILT, some sand, dark brown, wet	294.1					AS1
		SAND AND SILT, brown, moist, compact, wet	293.5	1	11			SS2
				2	12			SS3
			292.2					
		END OF BOREHOLE AT ~ 2.1 m						

N Value: 20 40 60 80 | Shear Strength: 50 100 kPa

Combustible Vapour Reading (ppm): 25 50 75 | Natural Moisture Content % / Atterberg Limits (% Dry Weight): 10 20 30

SUDBURY GEO SUD-24014195-A0 - MR80 DEVEOLOPMENT.GPJ NEW.GDT 2/19/25

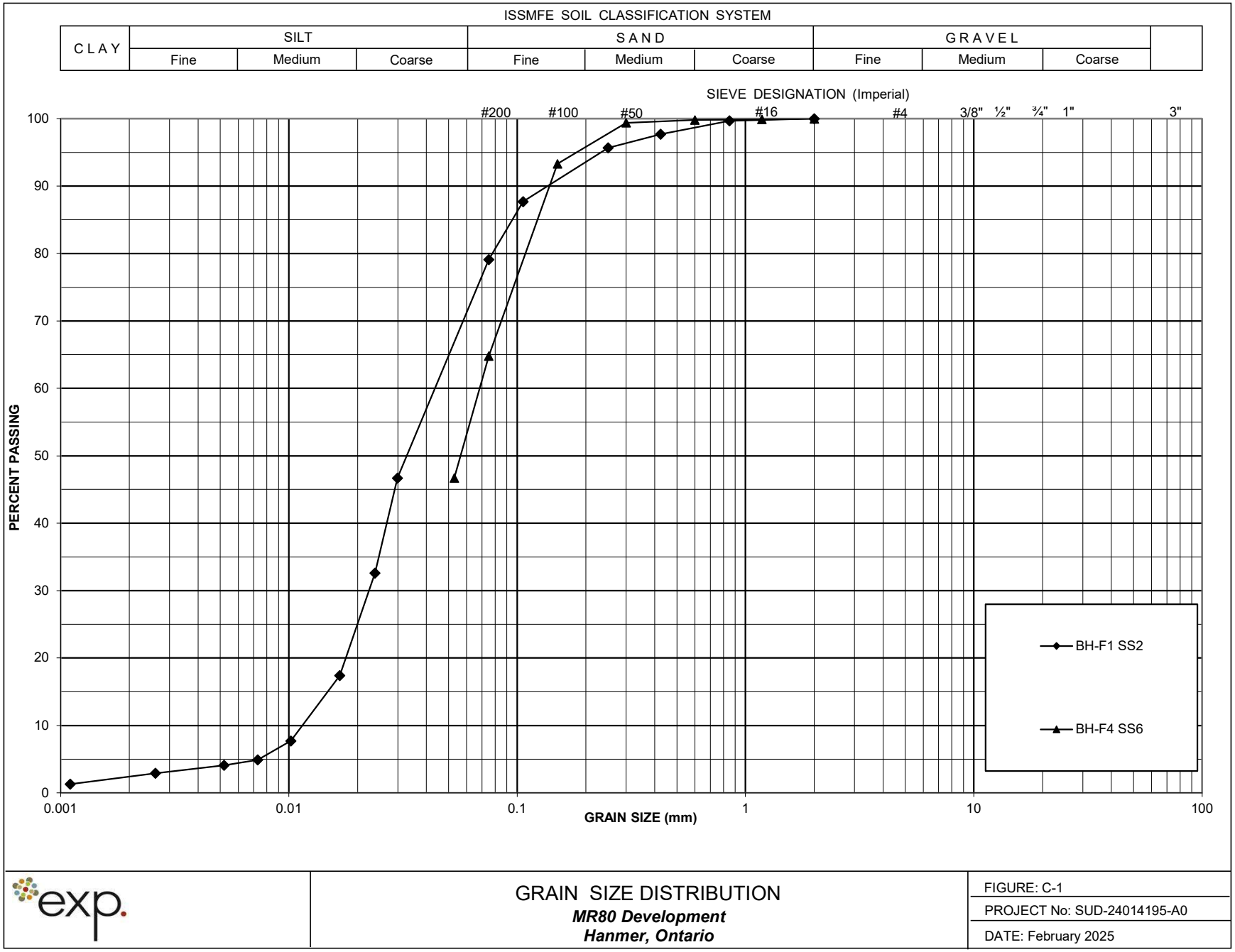
EXP Services Inc.
885 Regent Street
Sudbury, ON P3E 5M4
CANADA
t: +1.705.674.9681
f: +1.705.674.5583

Borehole data requires interpretation assistance from EXP before use by others.

See Figures B-1A and B-1B for Notes on Sample Description

Time	Water Level (m)	Depth to Cave (m)
upon completion	dry	no cave

Appendix C – Geotechnical Laboratory Testing



GRAIN SIZE DISTRIBUTION

MR80 Development

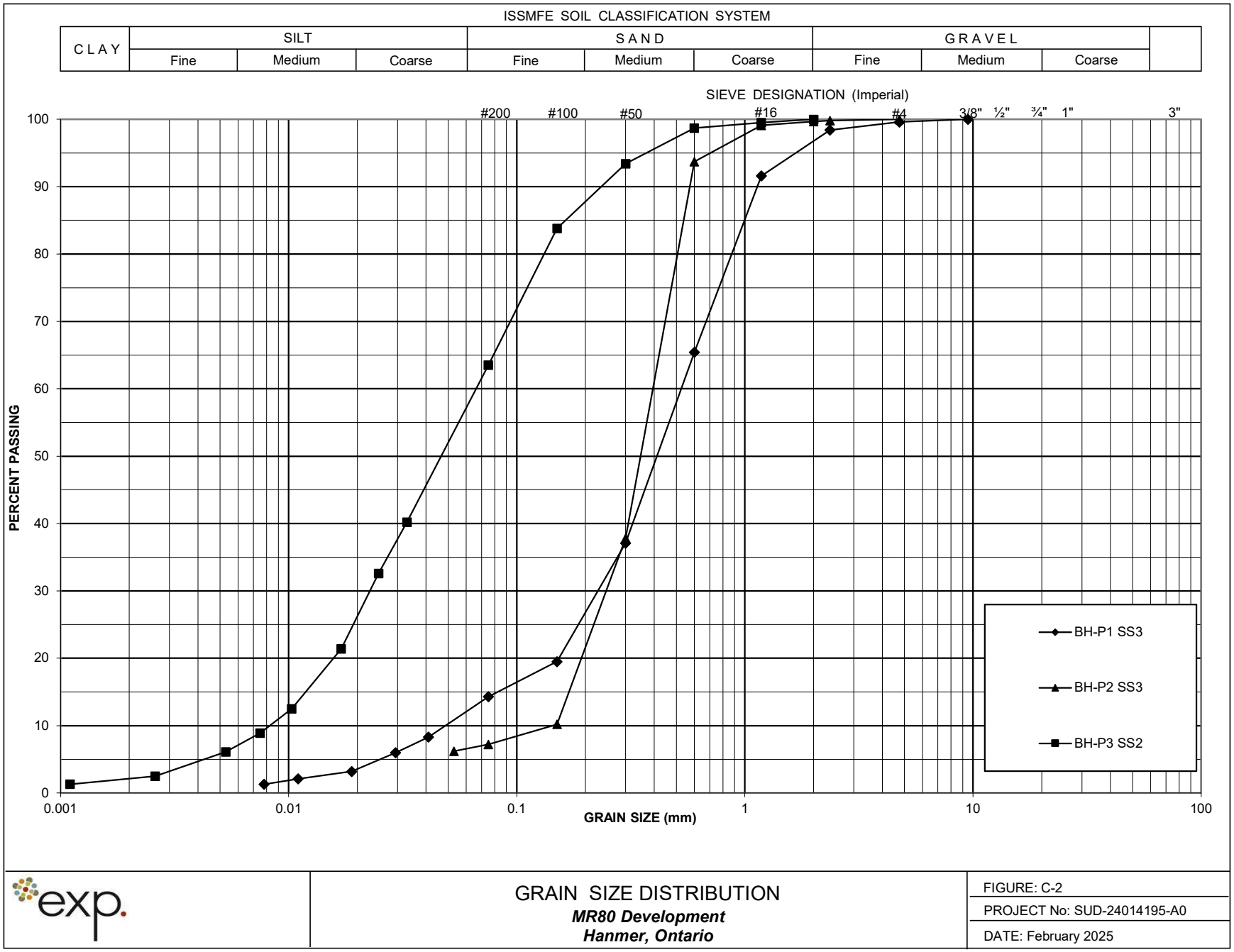
Hanmer, Ontario

FIGURE: C-1

PROJECT No: SUD-24014195-A0

DATE: February 2025

PL-CON-2025-00040



exp.

GRAIN SIZE DISTRIBUTION

MR80 Development

Hanmer, Ontario

FIGURE: C-2

PROJECT No: SUD-24014195-A0

DATE: February 2025

PL-CON-2025-00040

Box 5000, Station A
200 Brady Street
Sudbury, Ontario P3A 5P3
(705) 671-2489 ext 4376 or 4346
(705) 673-2200 FAX

Record #: PL-CON-2025-00043

APPLICATION SUMMARY

File Date: June 18, 2025

Application Type: Consent (Land Severance)

Address(es): 700 Grassy Lake Road, Whitefish P0M 3E0

Applicant(s): LARINA HANSEN

Owner(s): ERIC HANSEN AND SHERYL-ANN HANSEN

PLANNING APPLICATION
PURPOSE OF TRANSACTION

☐ **Addition to Lot**

Area	**Area (Second Additional Lot if Applicable)**
Depth	**Depth (Second Additional Lot if Applicable)**
Frontage	**Frontage (Second Additional Lot if Applicable)**

☒ **Creation of New Lot**

Area
69120.3

Depth
244.4

Frontage
290.8

☐ **Creation of Lot(s) for Semi-Detached or Row Housing**

Area

Depth

Frontage

☐ Cancellation of Prior Consent

File No. of Prior Consent

Type of Consent being cancelled

If you are cancelling a prior lot creation, is there a current driveway accessing the created lot?

☐ Easement/Right-of-Way

Area

Depth

Frontage

Area (Second Easement or Right-of-Way if Applicable)

Depth (Second Easement or Right-of-Way if Applicable)

Frontage (Second Easement or Right-of-Way if Applicable)

☐ Lease

Area

Depth

Frontage

☐ Other

Describe Other

Area

Depth

Frontage

GENERAL APPLICATION

Are there multiple properties associated with the application?
No

Please describe the additional properties associated with this application

Are you the registered owner or an authorized agent?
Authorized Agent

What is the date of acquisition of subject land?
June 30th 1999

What is the number of dwelling units on the property?
1

What is the number of proposed new buildings/structures on the property?

What is the number of existing buildings/structures on the property?
3

If this application is approved, would any existing dwelling units be legalized?
No

How many dwelling units will be legalized?

Is this property located within an area subject to the Greater Sudbury Source Protection Plan?
No

Provide details on how the property is designated in the Source Protection Plan

CONSENT

Name of person(s) to whom land or interest in land is intended to be conveyed, leased or mortgaged
Larina Hansen

Are there any easements or restrictive covenants affecting the subject land?
No

Please indicate a description of each easement or covenant and its effect

Has the land ever had any previous severances?
Yes

Name of transferee
B0299/1974 (OCT 21/74) - Transferee unknown

Date of transfer
Unknown

Use of severed land
Rural residential

Is property located with 1km (.6 miles) of a First Nation Reserve?
No

Has the parcel intended to be severed ever been, or is it now part of a Plan of Subdivision?

No

Please indicate the file number and status of the application

What is the current designation of the subject land in the applicable Official Plan?
Rural

Explain how the application conforms with the Official Plan
The proposed use of the new lot is residential which is permitted in rural areas. Existing lots in the area are mostly all residential, meaning the lot would be compatible with the character of the existing lots. No additional public services would be required. There is only intended to be one dwelling unit on the new lot and the new lot has plenty of space for both a sewage disposal system and a well. There are no restrictions on the land. Both the severed and retained lots would be over 5 acres with over 90m of road frontage.

Explain how the application is consistent with the Provincial Policy Statements
The creation of this lot will not impact public services or infrastructure. Lot is located within reasonable distance of public services and is located on a road that already receives public services.

Explain how the application conforms, or does not conflict with the Growth Plan for Northern Ontario
This application does not impact economic growth as it located in an area comprising of residential lots. There are already people living in the area meaning the province would not need to further extend services. Furthermore, the lot being severed is located in the rural part of Greater Sudbury so it does not conflict with the development of the economic and service hub of Sudbury.

CONCURRENT APPLICATIONS

☐ **Minor Variance**

File Number(s) - Minor Variance

Status - Minor Variance

☐ **Rezoning**

File Number(s) - Rezoning

Status - Rezoning

☐ **Official Plan Amendment**

File Number(s) - Official Plan Amendment

Status - Official Plan Amendment

LAND RETAINED

Area	Depth	Frontage
479228.74	703	535.8

Existing use of land

Rural

Proposed use of land

Rural

Proposed use of land

Will a certificate be required for the retained land?

No

WATER/SEWAGE - RETAINED

Municipally owned and operated piped water system	☐
Municipally owned and operated sanitary sewage system	☐
Lake	☐
Pit Privy	☐
Individual Well	☒
Communal Well	☐
Individual Septic System	☒
Communal Septic System	☐
Other	☐

Explain Other

PROPERTY ACCESS - RETAINED

Provincial highway	☐
Road maintained by the municipality	☒
Municipal road that is maintained seasonally	☐
Municipal road that is maintained yearly	☐
Water	☐

Indicate the parking and docking facilities to be used if via water

Estimate the distance of these facilities from the retained land and nearest public road by water

LAND SEVERED

Existing use of land

Rural

Proposed use of land

Rural

Parcel # and/or Lot and registered Plan of Subdivision # of property which will benefit

WATER/SEWAGE - SEVERED

Municipally owned and operated piped water system	☐
Municipally owned and operated sanitary sewage system	☐
Lake	☐
Pit Privy	☒
Individual Well	☒
Communal Well	☐
Individual Septic System	☒
Communal Septic System	☐
Other	☐

Explain Other

PROPERTY ACCESS - SEVERED

Provincial highway	☐
Road maintained by the municipality	☒
Municipal road that is maintained seasonally	☐
Municipal road that is maintained yearly	☐
Water	☐

Indicate the parking and docking facilities to be used via water

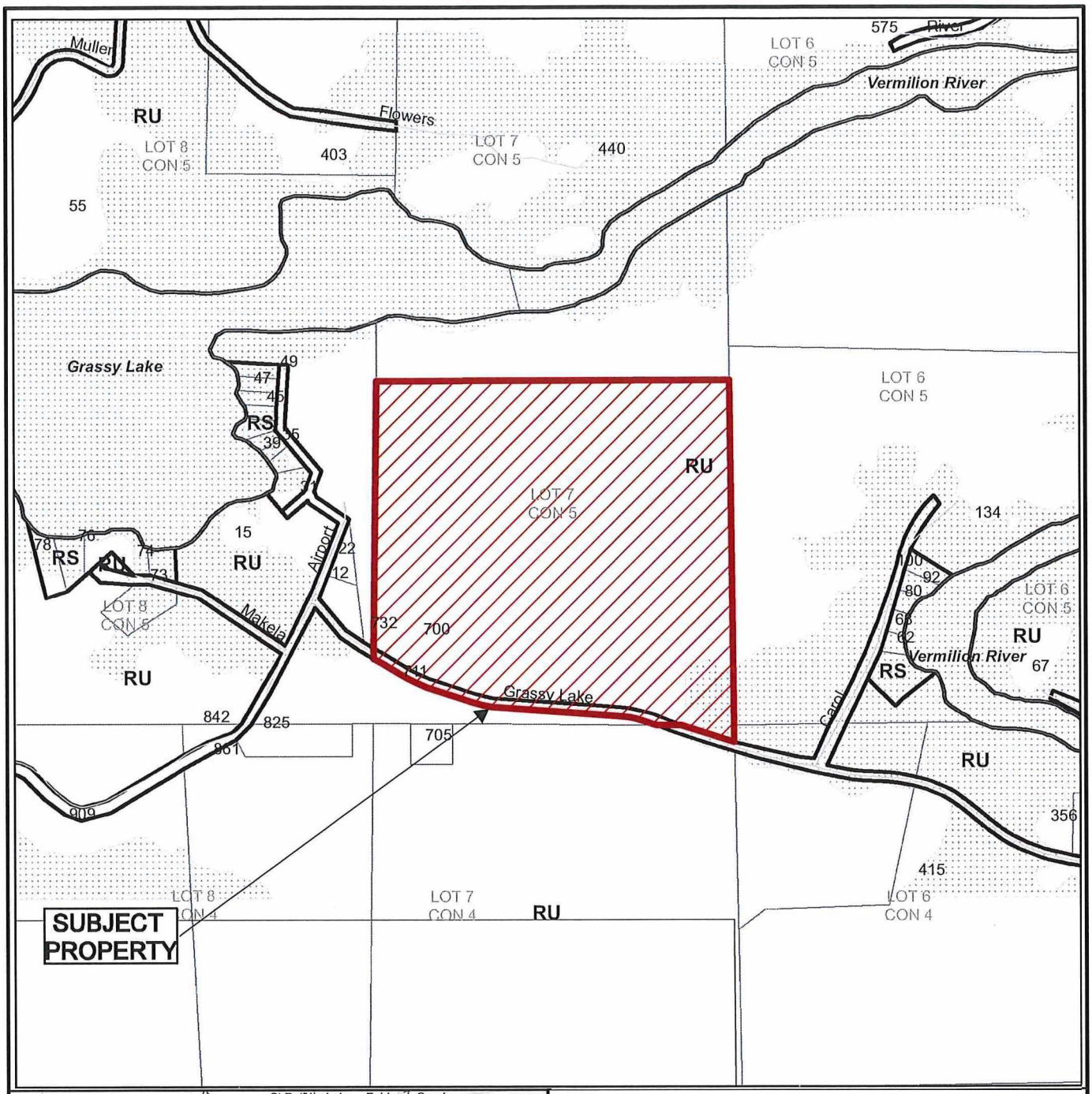
Estimate the distance of these facilities from the severed land and nearest public road by water

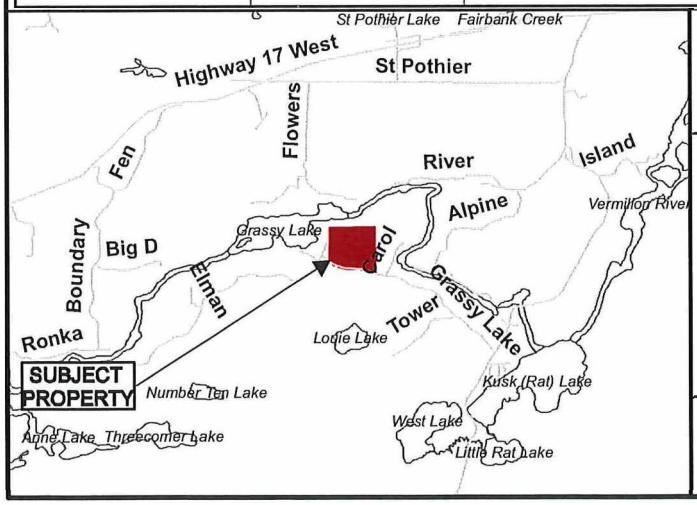
PROPOSED BUILDING/STRUCTURE

Building Description	Location	Same As Existing	Proposed Ground Floor Area (m2)	Proposed Gross Floor Area (m2)	Proposed Number of Storeys	Proposed Width (m)	Proposed Length (m)	Proposed Height (m)	Proposed Front Yard Setback (m)	Proposed Rear Yard Setback (m)	Proposed Side Yard Setback (m)	Proposed Side Yard Setback Other (m)

EXISTING BUILDING/STRUCTURE

Building Description	Location	To Be Demolished	Existing Ground Floor Area (m2)	Existing Gross Floor Area (m2)	Existing Number of Storeys	Existing Width (m)	Existing Length (m)	Existing Height (m)	Existing Front Yard Setback (m)	Existing Rear Yard Setback (m)	Existing Side Yard Setback (m)	Existing Side Yard Setback Other (m)
House (Single Unit Dwelling)	Retained Land	No	185.9	256.28	2	22.2	8.6	7	57	560	85	405
Shed	Retained Land	No	43.8	43.8	1	6	7.3	5.5	53	542	46	455
Pool	Retained Land	No	42.03	42.03	0	3.7	3.7	1.3	65.0	554.00	85	410.00





Application for Consent

N

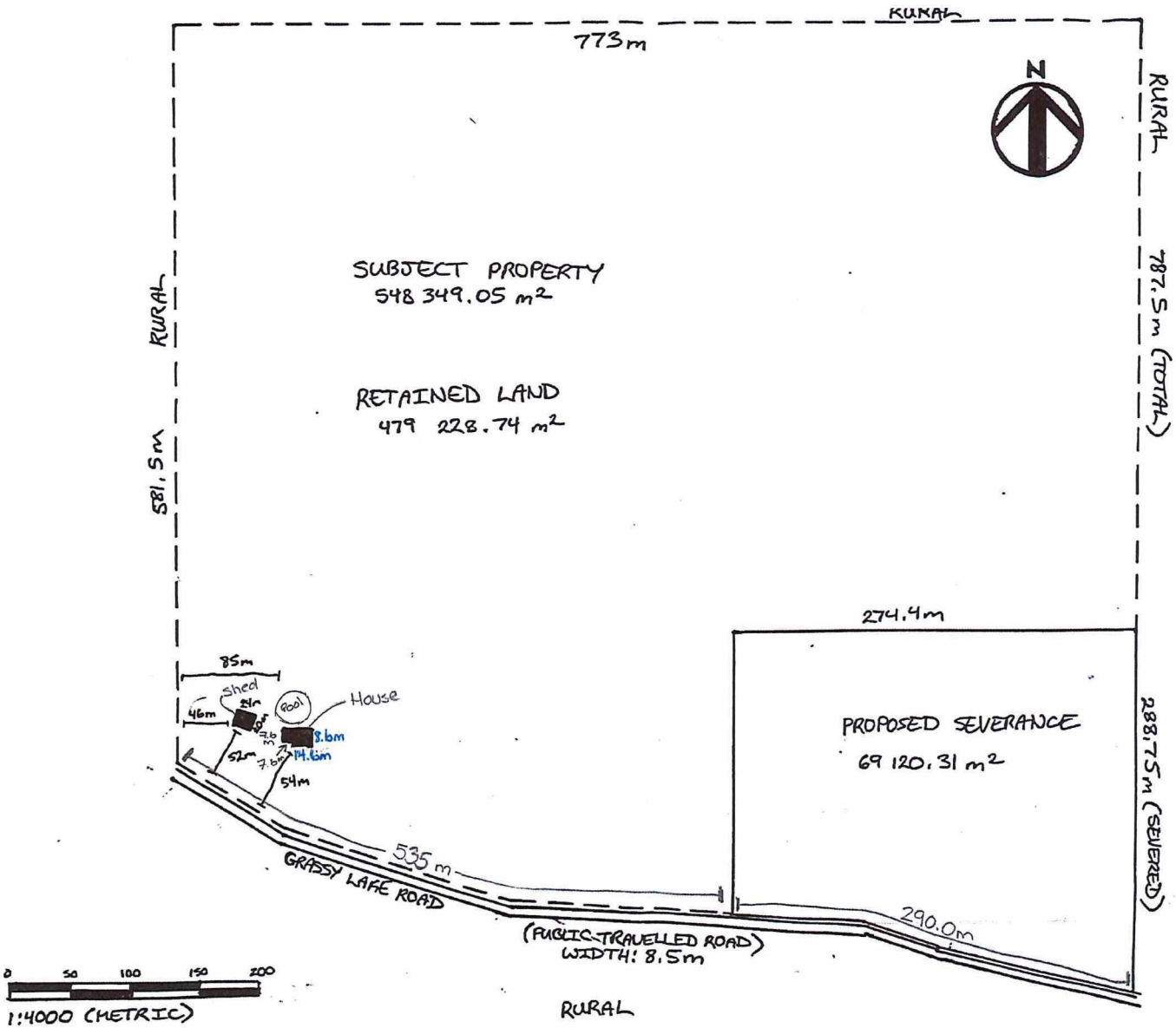
Subject Property being PIN 73396-0054,
Parcel 8166 SEC SWS,
Part Broken Lot 7, Concession 5 as in EP4430,
except LT64259; Part Lot 7, Concession 4,
being Location CL-3211, Part 1, Plan 53R-9778,
Township of Louise,
700 Grassy Lake Road, Whitefish,
City of Greater Sudbury

NTS
Sketch 1

PL-CON-2025-00043
Date: 2025 06 27

700 GRASSY LAKE ROAD

JUNE 2025



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Sketch 2