
February 2, 2018

Ref No.: 17-048

Trinity Consultants Ontario Inc.
885 Don Mills Road, Suite 106
Toronto, ON. M3C 1V9

Attn: Brian J. Schuyler, C.E.T., Senior Consultant

**Subject: Slope Stability Evaluation and Determination of Location of Long Term Stable Top of Slope
233 to 245 Dunlop Street West, Barrie, Ontario**

Alston Associates (AA) was retained by Trinity Consultants Ontario Inc. (Trinity) to update the slope stability study undertaken for the site by Terraprobe Inc. in 2012. We understand that this update is required in support of development plan approval by the City of Barrie. A copy of the report titled "Slope Assessment, 233 to 241 Dunlop Street West, Barrie, Ontario, File No. 31-12-8129, dated December 3, 2012) prepared by Terraprobe Inc. was provided to **AA** by Trinity.

The site is located on the south side of Dunlop Street West, and consists of the properties with the Municipal addresses 233, 237, 241 and 245 Dunlop Street West. For the purpose of this report Dunlop Street West is considered to be oriented in an east-west direction.

A ravine slope is situated on the south section of the site. The location of the top of the staked bank (slope) is shown on the Site Plan dated October 27, 2017, prepared by ISM Architects and Topographic Plan dated August 15, 2017, prepared by Dino Astri Surveying Ltd., both of which are attached to this report. Based on elevations included on the Topographic Plan, the valley lands are situated 5 to 6 m below the tableland throughout the northern section of the site, and consist of a pond (wetland) referred to as Milligan's Pond; a tributary to Bunkers Creek. A narrow creek, less than 2 m in width runs within the ravine through the southwest corner of the site. The creek meanders and is situated within a minimum distance of 8 m from the base of the slope.

Based on information contained in the latest Site Plan prepared by ISM Architects, we understand that the proposed development will consist of an eight storey above grade residential building located in the north section of the site. The south section of the site north of the ravine lands will be developed with a parking lot. Within the western section of the site, the south curb of the parking lot will be situated along the line of top of bank. In the remaining area of the site, the parking lot will be situated within a minimum distance of 6 m from the top of the slope.

The assessment undertaken by Terraprobe was limited to the properties with the municipal addresses 233 to 241 Dunlop Street West; it did not include the property at 245 Dunlop Street West. The assessment was also based on a concept plan wherein, the proposed parking lot was to be situated a minimum of 10 from the top of slope. The assessment consisted of a visual examination of the site and slope conditions. Boreholes

were not drilled at the site and slope stability analyses were not completed. The assessment concluded that the undisturbed slope was considered to be stable against failure with a minimum slope of 2H:1V, and a stability setback allowance is not required; the existing top of slope is the stable top of slope line. Terraprobe also concluded that in the absence of active toe erosion, for clay soil, an erosion allowance of 1 to 4 m be used for the toe erosion allowance.

Terraprobe recommended that a minimum of 6 m of erosion access allowance be provided to provide access for long term maintenance of the slope in the event deemed necessary.

Based on the above considerations, Terraprobe opined that since the development limit (edge of proposed parking lot) was to be situated a minimum of 10 m from the top of slope, the existing slope is stable and will perform with an appropriate safety factor for the proposed construction.

A geotechnical investigation was carried out by **AA** in 2017 for the proposed development which was to consist of a 3 storey building with a single basement level. A total of 7 boreholes were advanced at the site extended to depths ranging from 2 m to 9.6 m. The investigation revealed that the site is underlain by surface cover of topsoil and fill material, followed by native sand soil. Groundwater was encountered below a depth of 4.5 m below grade.

The site was visited by the writer on January 26, 2018, to examine the condition of the slope. Based on observations made at the site, information obtained from the previous Terraprobe report and the findings of the geotechnical investigation report, we concur with the conclusion made by Terraprobe; that the slope is stable and will provide a minimum safety factor of 1.3 against failure.

The Ontario Ministry of Natural Resources (MNR) Natural Hazards Policies provide general guidelines for the determination of setback for new developments adjacent to the crest of natural slopes (shoreline bluffs, river valleys, ravines). The setback is determined from the following three (3) setback allowances, measured from the slope toe towards the slope crest:

1. Stable Slope Allowance (stability component of setback)
2. Erosion Access Allowance (access allowance of the setback)
3. Toe Erosion Allowance (erosion component of setback)

Stability Component

For land development and planning, MNR requires a minimum Safety Factor of 1.3 for engineering design of slopes for stability. This safety factor is used to determine the stability component of the Long Term Stable Top of Slope line (LTSTOSL). Based on the existing slope conditions, the slope is considered to be stable and therefore the stability component is not required; the setback is 0 m.

Erosion Access Allowance

Based on MNR's Technical Guide for River and Stream Systems, an erosion access allowance is typically required from the LTSTOSL line. The erosion access allowance is to ensure that there is enough safety zone along the top of a slope for people and vehicle to enter or exit an area during emergency and maintenance

work. This allowance may extend into development area provided that the area is not built upon. A minimum 6 m erosion access allowance is typically used.

Toe Erosion Allowance

The toe erosion allowance is applicable where the base of the slope is situated within a distance of 15 m from the water body. Accordingly a toe erosion allowance will be required. The toe erosion allowance is typically based on several factors, including type of soil, presence or absence of active erosion, and bankfull width.

The boreholes advanced at the site by **AA** in 2017 revealed that the soil within the depth of the slope consists of silty sand or sand with trace to some silt.

In the absence of active erosion, MNR recommends a toe erosion allowance of 1 to 2 m, for a bankfull creek width less than 5 m. Given that the creek is situated at least 8 m from the toe of slope, the stream flow in the creek is very slow and Milligan's pond would control velocity and erosion, an erosion allowance of 1 m should be adequate.

Based on the above, the total development setback would be 7 m; the sum of erosion access allowance of 6 m and the toe erosion allowance of 1. Sections of the parking lot extend to the top of slope.

Should you have any questions regarding this letter, please do not hesitate to contact our office.

Yours very truly,

alston associates

Division of Terrapex Environmental Ltd.



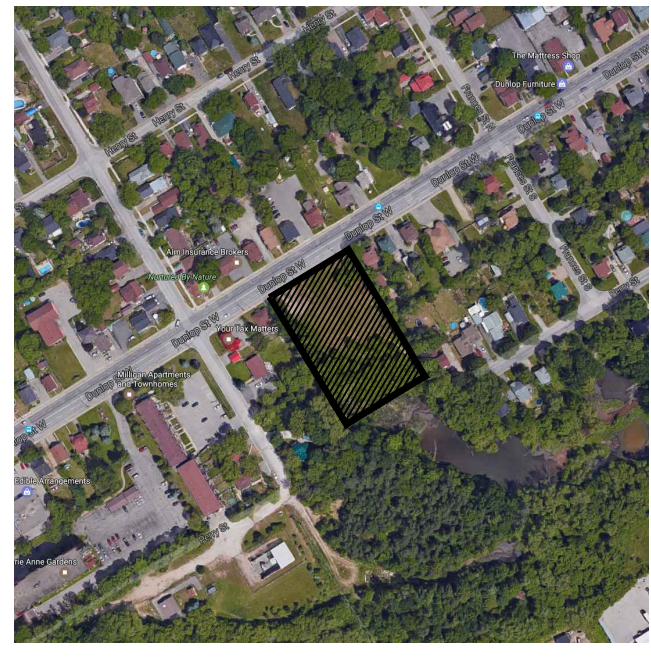
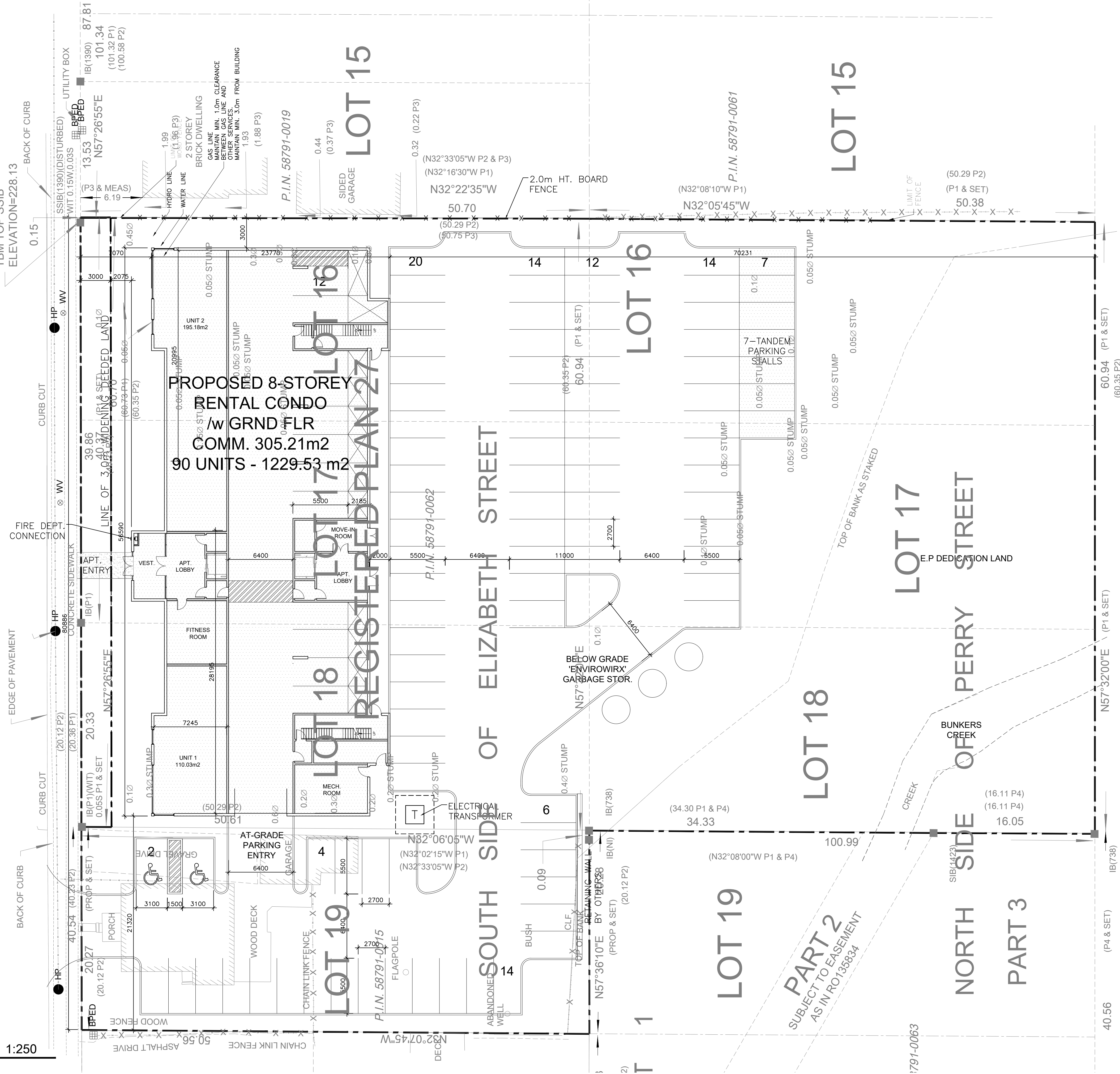
Vic Nersesian, P.Eng.

**Attachments: Site Plan dated October 27, 2017, prepared by ISM Architects.
Topographic Plan dated August 15, 2017, prepared by Dino Astri Surveying Ltd.
Terraprobe Slope Stability Assessment report dated December 3, 2012.**

DUNLOP STREET WEST
(ELIZABETH STREET BY REGISTERED PLAN 27)

P.I.N. 58790-0002

SITE PLAN 1:250



KEY PLAN

LEGAL DESCRIPTION

LOTS 16, 17 & 18, SOUTH SIDE OF ELIZABETH STREET,
LOTS 16, 17 & 18, NORTH SIDE OF PERRY STREET
REGISTERED PLAN 27, CITY OF BARRIE, COUNTY OF SIMCOE

COMBINED SITE INFORMATION

SITE ZONING	MUA--APARTMENTS (CURRENTLY RM2)		
SITE AREA	7178.62 m ² (1.77 ACRES)		
BUILDING AREA	1229.53 m ² (13,234.55 sq. ft.)		
GROSS FLOOR AREA	96,426.84 m ² (89,582.95 sq. ft.)		
COMMERCIAL AREA	305.21 m ²	(3,285.25 sq. ft.)	24.8%
COMMERCIAL AREA (LESS PARKING)	305.21 m ²	(3,285.25 sq. ft.)	51.5%
STANDARDS	MUA STANDARDS	RM2 STANDARDS	PROVIDED
LOT AREA (MIN.)	--	750 m ²	7178.62 m ²
LOT FRONTAGE (MIN.)	--	12.0 m	80.88 m
FRONT YARD, (NORTH)	5.0 m MAX.	7.0 m MIN.	5.07 m
SIDE YARD, (WEST)	3.0 m MAX.	1.8 m MIN.	21.32 m
SIDE YARD, (EAST)	3.0 m MAX.	1.8 m MIN.	3.00 m
REAR YARD (SOUTH)	7.0 m MIN.	7.0 m MIN.	70.23 m
LOT COVERAGE (MAX. % OF SITE AREA)	N/A	35.0%	17.12%
LANDSCAPED OPEN SPACE	N/A	35.0%	0.00m ² (00.00%)
HT. OF MAIN BUILDINGS	16.5 m MAX.	10.0 m MAX.	28.90 m
aisle WIDTH	6.4 m MIN.	6.4 m MIN.	6.4 m
AREA OF FRONT YARD	N/A	N/A	0.00m ² (00.00%)
AREA OF FRONT YARD LANDSCAPED	N/A	N/A	0.00m ² (00.00%)
NUMBER OF PARKING SPACES (RESIDENTIAL)	108 SPACES (Ø1 SPACE /UNIT)	108 SPACES (Ø1 SPACE /UNIT)	108 SPACES (Ø1 SPACE /UNIT)
TOTAL PARKING	108	108	96 (+7 TANDEM)
NUMBER OF APT. UNITS			108

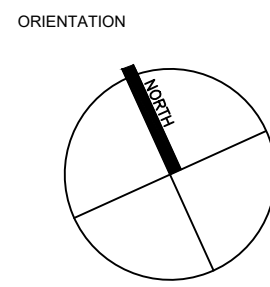
MINIMUM PARKING SIZES:
STANDARD 2.7m x 5.5m
BARRIER-FREE 3.1m x 5.5m /w 1.5 AISLE

ISM ARCHITECTS
174 Bayfield Street
Barrie, ON L4N 3B5
T: 705.726.2242
E: ian@ismarchitects.ca

No.	ISSUE/REVISION	DATE
1	CLIENT REVIEW	JUN 15/17
2	NEW TOPO	AUG 16/17
3	ISSUE FOR SUBMISSION	SEPT 01/17



DO NOT SCALE DRAWINGS
THE CONTRACTOR SHALL CHECK AND VERIFY ALL DIMENSIONS AND
PROCEEDING WITH THE WORK.



CLIENT
MUSKOKA D & M CORP.
190 HOTCHKISS ST.,
GRAVENHURST, ON.
DOUG GRAY
dgray@granitecondos.com

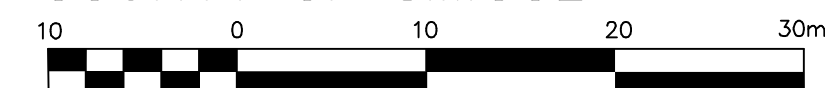
PROJECT
90 RENTAL CONDOMINIUMS
233 DUNLOP STREET WEST,
BARRIE, ON

PROJECT INFORMATION
PROJECT No.: 173941
DRAWN BY: MM JB
CHECKED BY: ISM
DATE: 27.10.2017
SCALE: AS NOTED

DRAWING
SITE PLAN

DRAWING No.
A100

TOPOGRAPHIC PLAN OF
OF ALL OF
LOTS 16, 17, 18, 19 AND 20
SOUTH SIDE OF ELIZABETH STREET
LOTS 16, 17 AND 18
NORTH SIDE OF PERRY STREET
REGISTERED PLAN 27
CITY OF BARRIE
COUNTY OF SIMCOE



SCALE = 1:400
DINO R.S. ASTRI, O.L.S.

LEGEND

■	DENOTES	FOUND SURVEY MONUMENT
□	DENOTES	PLANTED SURVEY MONUMENT
SIB	DENOTES	STANDARD IRON BAR
IBØ	DENOTES	ROUND IRON BAR
IB	DENOTES	IRON BAR
-OH-	DENOTES	OVERHEAD WIRES
✕✕	DENOTES	FENCING
BPED	DENOTES	BELL PEDESTAL
HP	DENOTES	HYDRO POLE
WV	DENOTES	WATER VALVE
⊙	DENOTES	DECIDUOUS TREE
⊙	DENOTES	CONIFEROUS TREE
(NI)	DENOTES	NOT IDENTIFIABLE
738	DENOTES	R.C. KIRKPATRICK, O.L.S.
1390	DENOTES	P. KITCHEN, O.L.S.
1423	DENOTES	R. KRUPOWICZ, O.L.S.
(P1)	DENOTES	TOPOGRAPHIC SURVEY BY RUDY MAK SURVEYING LTD. DATED SEPTEMBER 13, 1999.
(P2)	DENOTES	REGISTERED PLAN 27
(P3)	DENOTES	BUILDING LOCATION SURVEY BY PAUL R. KITCHEN SURVEYING LTD. DATED NOVEMBER 28, 1984.
(P4)	DENOTES	PLAN 51R-18316
(P5)	DENOTES	PLAN 51R-34538

ELEVATION NOTE

ELEVATIONS SHOWN HEREON ARE GEODETIC AND ARE DERIVED USING
GPS TECHNOLOGY AND THE CAN-NET VRS NETWORK.

LOCAL TBM IS TOP OF SSIB AT THE NORTH EAST CORNER OF PARCEL
HAVING AN ELEVATION OF 228.13m.

BEARING NOTE

BEARINGS SHOWN HEREON ARE UTM GRID BEARINGS AND ARE DERIVED FROM
OBSERVED REFERENCE POINTS A AND B BY REAL TIME NETWORK
OBSERVATIONS, AND ARE REFERRED TO THE CENTRAL MERIDIAN 81°W IN
ZONE 17, AND ARE BASED ON NAD 83(CSRs)(1997 EPOCH).

BEARING ROTATION NOTE

FOR BEARING COMPARISONS, A ROTATION OF 04°00'50" COUNTER CLOCKWISE
WAS APPLIED TO PLAN (P1) AND (P5) TO CONVERT TO UTM BEARINGS.

FOR BEARING COMPARISONS, A ROTATION OF 04°03'05" COUNTER CLOCKWISE
WAS APPLIED TO PLAN (P2) AND (P3) TO CONVERT TO UTM BEARINGS.

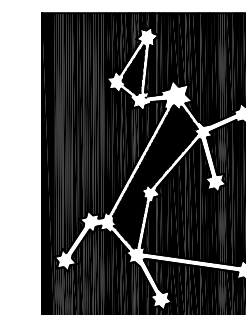
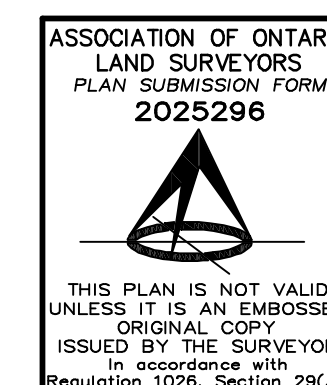
METRIC

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

THE FIELD WORK REPRESENTED BY THIS PLAN WAS COMPLETED ON 24TH DAY OF JULY, 2017.

AUGUST 15, 2017
DATE

DINO R. S. ASTRI
ONTARIO LAND SURVEYOR



DINO ASTRI
SURVEYING LTD.

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Copies available @ www.landsurveyrecords.com

PROJECT No. : 17166_TOPO

