

Land Surveys Session



Photo Courtesy of Tulloch Engineering





August 14 – morning Agenda:

- 1) **Part A** – Survey Plan Elements
- 2) **Part B** – Survey Report Elements
- 3) Using a **Plan Scale** Introduction & Exercises
- 4) **Part C** – **Plan Review** Exercises





PART A:

What are the to 2 basic parts/components

(not the types) of ANY survey plan?

- 1. Title Block**
- 2. Diagram**





1. Title Block

- National Standards for the Surveys of Canada Lands
(effective January 19, 2015)
- General Instructions for Surveys of Canada Lands,
e-Edition *(effective 2004 to 2015)*



National Standards Chapter 2: Survey Plans (Section 2.2.3)

CANADA LANDS SURVEYS RECORDS
ARCHIVES D'ARPENTAGE DES TERRES DU CANADA

106763

DATE: 2017-12-12

- Title of the Plan
- Purpose
- Location
- Name of Reserve
- District
- Province

PLAN OF SURVEY OF
LOT 30 (UTILITY ACCESS ROAD),
LOT 31 (UTILITY ACCESS ROAD),
LOT 32 (UTILITY ACCESS ROAD)
AND RIGHT OF WAY (UTILITY)
OVER PART OF LOT 30 (UTILITY ACCESS ROAD)
AND PART OF LOT 32 (UTILITY ACCESS ROAD)
AND PART OF 20.117m WIDE ROAD AS SHOWN
ON PLAN RD4410 (C.L.S.R.) AND PART OF THE
UNSURVEYED PORTION OF
THE HENVEY INLET INDIAN RESERVE No. 2
HENVEY INLET INDIAN RESERVE No. 2
DISTRICT OF PARRY SOUND
PROVINCE OF ONTARIO

SCALE 1:5000 metres



THIS SURVEY WAS EXECUTED DURING THE PERIOD OF OCTOBER 31, 2017
TO NOVEMBER 20, 2017 BY M. TRUCHON, OLS, CLS.

THE PLOT SIZE THAT WILL PROVIDE TRUE SCALE AT OPTIMUM READABILITY FOR THIS PLAN
IS 600 mm BY 953 mm.

- Date(s) of field survey
- Name of Surveyor

*Example for Plan prepared under the
National Standards*



Title Block (continued):

REGISTRATION PLAN — FULL SURVEY

CANADA LANDS SURVEY RECORDS
97106
DATE July 9, 2010

THE SURVEY REPORT FOR THIS
PLAN IS RECORDED UNDER
No. FB 38235 C.L.S.R.

- Title of the Plan
- Purpose
- Location:
 - Name of Reserve
 - District
 - Province

- Scale Bar

PLAN AND FIELD NOTES OF SURVEY OF

LOT 23

HENVEY INLET INDIAN RESERVE No. 2

DISTRICT OF PARRY SOUND
PROVINCE OF ONTARIO

SCALE RATIO 1 : 1000

0 10 20 30 40 50 60 70 80 90 100 METRES



THIS SURVEY WAS EXECUTED ON FEBRUARY 9th AND 11th, 2009
BY J. A. COLE, O.L.S., C.L.S

- Date(s) of field survey
- Name of Surveyor

No scale statement (plotting scale) required by the General Instructions (e-Edition)

Example for Plan prepared under the General Instructions (e-Edition)



Title Block (continued): Legend

- Bearing Statement

LEGEND

BEARINGS ARE NAD83 (CSRS) EPOCH V6 (2010.0) UTM GRID DERIVED FROM GNSS OBSERVATIONS ON THE LINE BETWEEN GCP1 AND GCP2 HAVING A BEARING OF 342°48'05" AND IS REFERRED TO THE CENTRAL MERIDIAN OF UTM ZONE 17, 81° WEST LONGITUDE.

UTM COORDINATES – NAD83 (CSRS) EPOCH V6 (2010.0) UTM ZONE 17					
STATION	NORTHING	EASTING	COMBINED SCALE FACTOR	ELLIPSOIDAL HEIGHT	ESTIMATED ABSOLUTE ACCURACY
GCP1	5076101.795	534469.023	0.99959109	149.908	0.020
GCP2	5076603.412	534313.762	0.99959024	154.417	0.030
GCP3	5078699.756	532210.844	0.99958594	170.871	0.020

COORDINATES ARE UTM ZONE 17, NAD83 (CSRS) EPOCH V6 (2010.0) DERIVED FROM PPP OBSERVATIONS ON GCP1, GCP2 AND GCP3

- Unit of measurement

DISTANCES SHOWN ARE HORIZONTAL AT GENERAL GROUND LEVEL AND ARE EXPRESSED IN METRES AND DECIMALS THEREOF.

TO COMPUTE UTM COORDINATES, DISTANCES SHOULD BE REDUCED TO SEA LEVEL AND THE PROJECTION PLANE BY MULTIPLYING A COMBINED SCALE FACTOR OF 0.99958991.

ALL MONUMENTS PLANTED DURING THE COURSE OF THIS SURVEY ARE MARKED WITH 1604. THEY ARE ALSO MARKED WITH UNIQUE POINT NUMBERS AS SHOWN ON THE PLAN.

ALL SET AND FOUND MONUMENTS ARE ACCOMPANIED BY A METAL POST OR WOOD MARKER SET NOT MORE THAN 0.3m AWAY UNLESS NOTED OTHERWISE.

AREAS ARE IN HECTARES, AND CAN BE CONVERTED TO ACRES BY MULTIPLYING BY 2.4711.

SUPPORT INFORMATION FOR THIS SURVEY IS CONTAINED IN A SURVEY REPORT RECORDED UNDER FIELD BOOK NUMBER FB **41791** (C.L.S.R.)

- Explanation of symbols used

SURVEY MONUMENT FOUND.....	■
SURVEY MONUMENT PLANTED.....	□
SHORT STANDARD IRON BAR (2.5cm x 2.5cm x 60cm long).....	SSIB
STANDARD IRON BAR (2.5cm x 2.5cm x 120cm long).....	SIB
IRON BAR (1.5cm x 1.5cm x 60cm long).....	IB
IRON BAR (2.5cm x 2.5cm x 15cm long).....	RB
CLS STANDARD POST IN CONCRETE MONUMENT (SHORT).....	P.CM
HORIZONTAL CONTROL MONUMENT.....	HCM
NO VISIBLE MARKINGS.....	NVM
NO MONUMENT MARKER SET.....	NM
FOUND NO EVIDENCE.....	FNE
LANDS DEALT WITH BY THIS PLAN BOUNDED THUS.....	
RIGHTS-OF-WAY (UTILITY) DEALT WITH BY THIS PLAN BOUNDED THUS.....	
PLANTED MONUMENT UNIQUE STAMPED NUMBER.....	①
SURVEY TIES SHOWN THUS.....	-----

- Explanation of abbreviations

THE POSITION OF SOME MONUMENTS HAVE BEEN EXAGGERATED FOR CLARITY
ALL FOUND MONUMENTS ARE NVM UNLESS OTHERWISE SPECIFIED.



Title Block (continued): Legend



- Bearing Statement

- Explanation of abbreviations

 - Explanation of symbols used

- Unit of measurement

LEGEND

ALL BEARINGS SHOWN HEREON ARE ASTRONOMIC AND ARE REFERRED TO THE MERIDIAN THROUGH THE SOUTHEAST CORNER OF THE TOWNSHIP OF HENVEY, DERIVED FROM THE SOUTHERLY LIMIT OF ROAD PLAN 60320 (CLSR) HAVING A BEARING OF 78°14'55"

STANDARD IRON BAR (25mm X 25mm X 1200mm) FOUND
STANDARD IRON BAR (25mm X 25mm X 1200mm) PLACED
IRON BAR (16mm X 16mm X 90mm) FOUND
ROUND IRON BAR (16mm Ø) FOUND

PLASTIC CAP
COORDINATED CONTROL MONUMENT
NOT TO SCALE

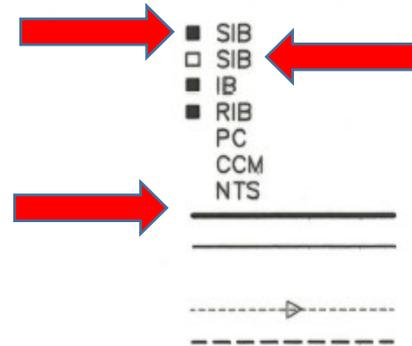
LANDS DEALT WITH BY THIS PLAN BORDERED THUS
~~LOTS OR PARCELS WITHIN THE LANDS DEALT WITH AND~~
OTHER MEASURED BOUNDARIES.
TRAVERSE LINES AND STATIONS
ADJACENT LOTS OR PARCELS

NOTES

COORDINATED CONTROL MONUMENTS SHOWN HEREON HAVE BEEN OBTAINED FROM THE MINISTRY OF NATURAL RESOURCES - COSINE NAD83(ORIG) AND TRANSLATED TO NAD83 (CSRS) USING NRCan ntv 2.0 WITH ON83CSv1.gsb GRID DATABASE

DISTANCES SHOWN ON THIS PLAN AND FIELD NOTES ARE HORIZONTAL AT GENERAL GROUND LEVEL AND ARE EXPRESSED IN METRES AND DECIMALS THEREOF AND MAY BE CONVERTED TO FEET BY DIVIDING BY 0.3048.

ALL MONUMENTS PLACED DURING THIS SURVEY ARE MARKED WITH A SURVEYOR'S No. 1604 (M. F. TULLOCH, O.L.S., C.L.S.) AND A PLASTIC CAP WITH LOT IDENTIFICATION



Title Block(continued): Statements



Re: Section 38, Canada Lands Surveyors Regulations CERTIFIED CORRECT	
Digitally signed by Truchon, Melissa Date: 2017.12.12 10:09:29 '-05'00	
Digitally signed by Lelievre, Sylvain Date: 2017.12.12 '12:33:13 -05'00	Department of Natural Resources Surveyor General Branch <i>Section 31, Canada Lands Surveys Act</i> APPROVED Manager, Cadastral Services East
Project : 2017-14-165 File : SM8206-06170 Checklist: 5254A	

Statement of
Responsibility

Approval of Surveyor
General Branch



Title Block (continued): Statements



Re: Section 38, Canada Lands Surveyors Regulations

CERTIFIED CORRECT

On the 17th day of JUNE 2009¹⁰

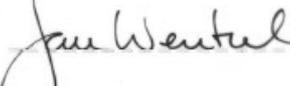


J. A. COLE O.L.S., C.L.S.
Tulloch Geomatics Inc.



~~Department of Natural Resources~~
RE: Section 31, Canada Lands Surveys Act
and Framework Accord (December 2003)

APPROVED



2010.06.30
Date

Jan Wentzel C.L.S.
Head Cadastral Services East.
Surveyor General Branch

Reviewed By: P.M. CROOKS
24 - JUNE - 2010

FILE : SM8206-06170
PROJECT : 2008-14-170
Sheet 1 of 1

Statement of Responsibility

Approval of Surveyor General Branch

←





2. Diagram

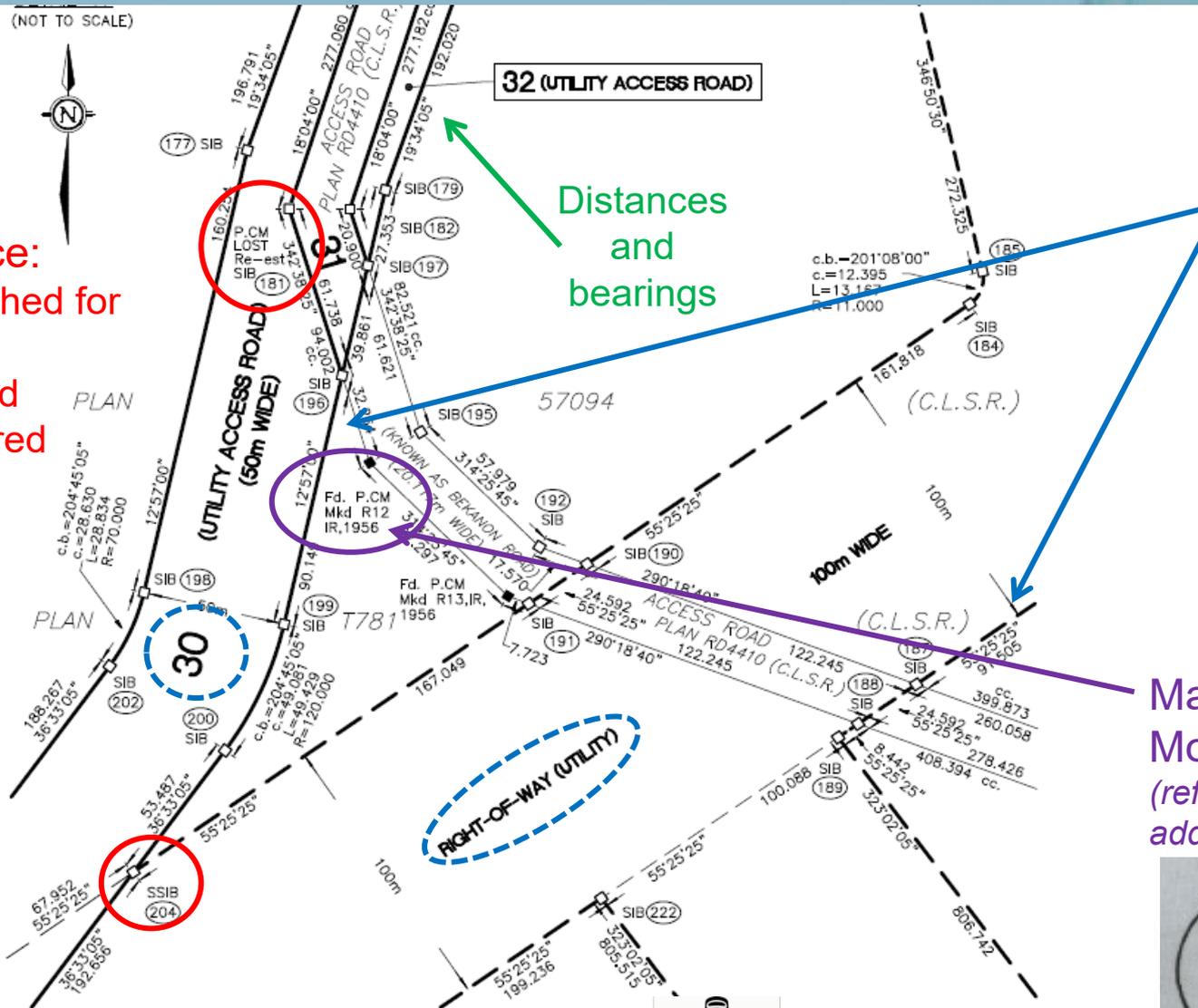
- National Standards for the Surveys of Canada
Lands



National Standards Chapter 2: Survey Plans (Section 2.2.4)

Evidence:

- searched for
- found
- placed
- restored



Heavy line
(lands dealt with
by survey – as
referenced in the
legend)

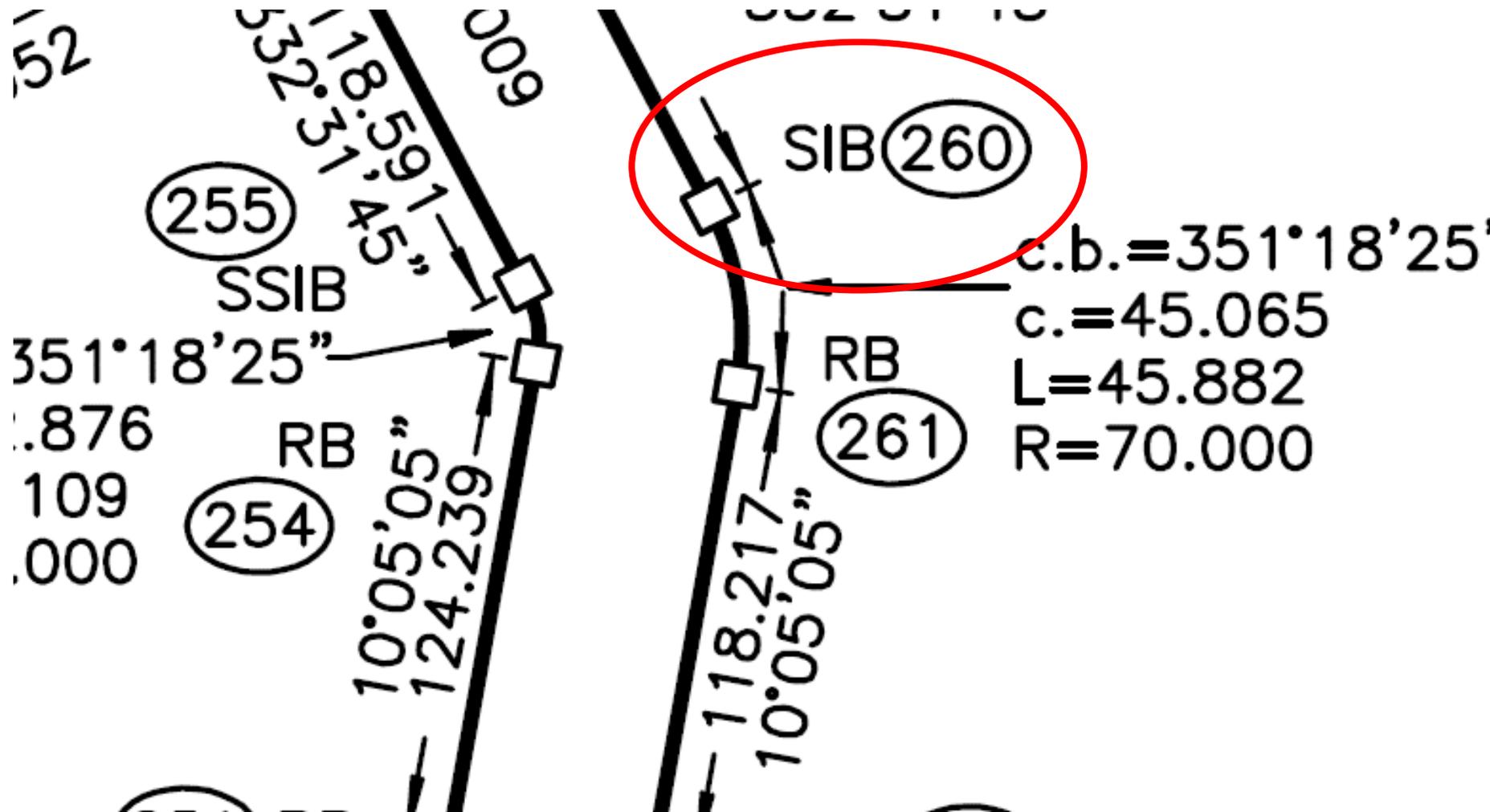
Markings on
Monuments
(refer to the legend for
additional information)



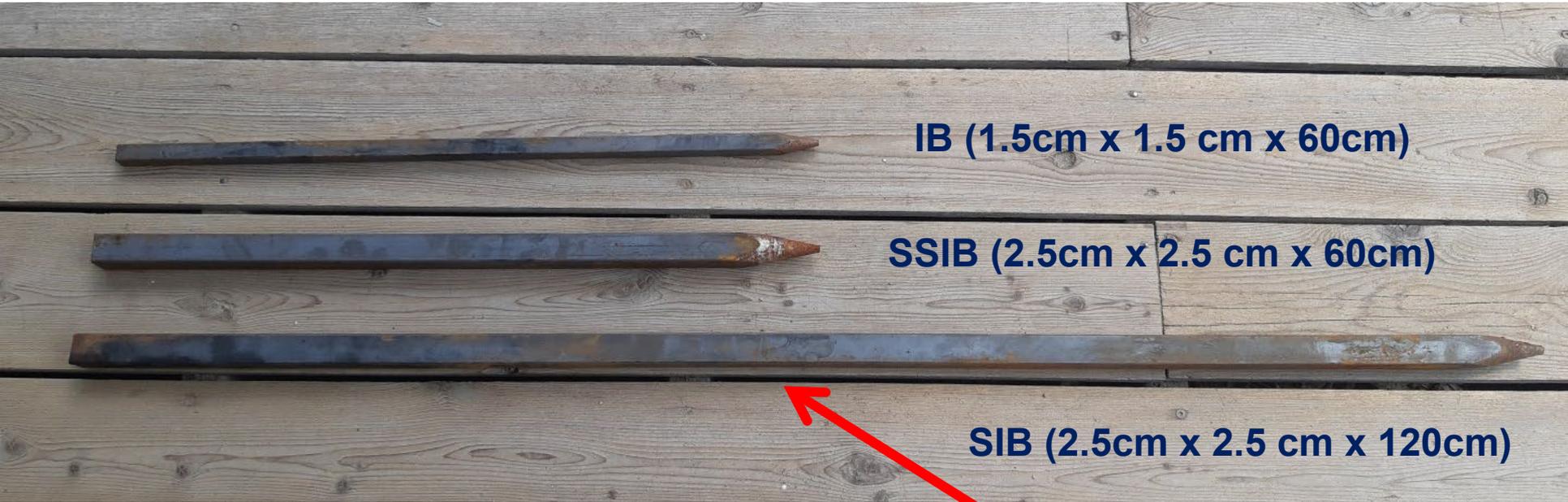
Example for Plan prepared under the
National Standards



National Standards Chapter 2: Survey Plans (Section 2.2.4)



National Standards Chapter 2: Survey Plans (Section 2.2.4)



IB (1.5cm x 1.5 cm x 60cm)

SSIB (2.5cm x 2.5 cm x 60cm)

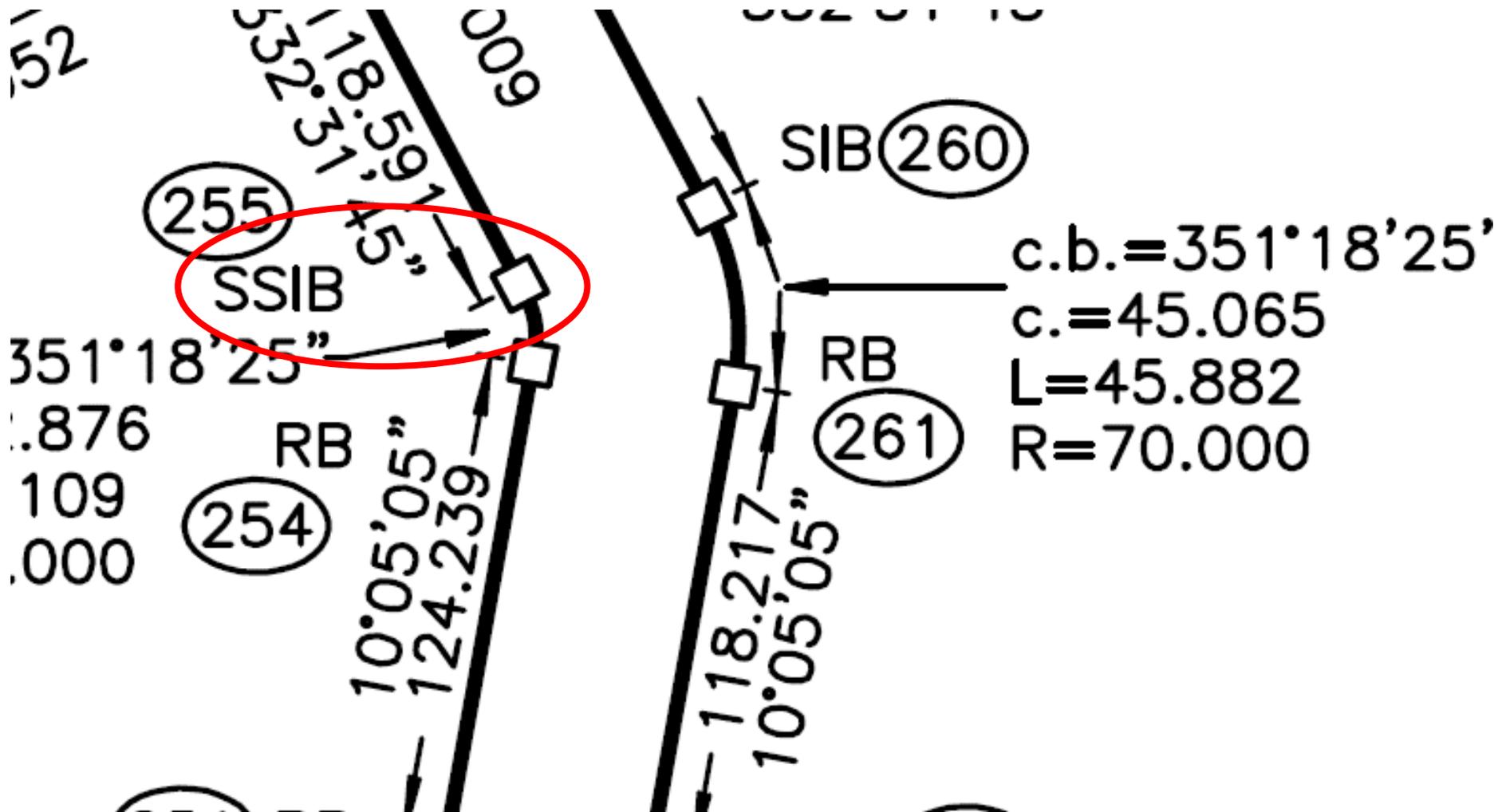
SIB (2.5cm x 2.5 cm x 120cm)

Type of monument
shown on plan

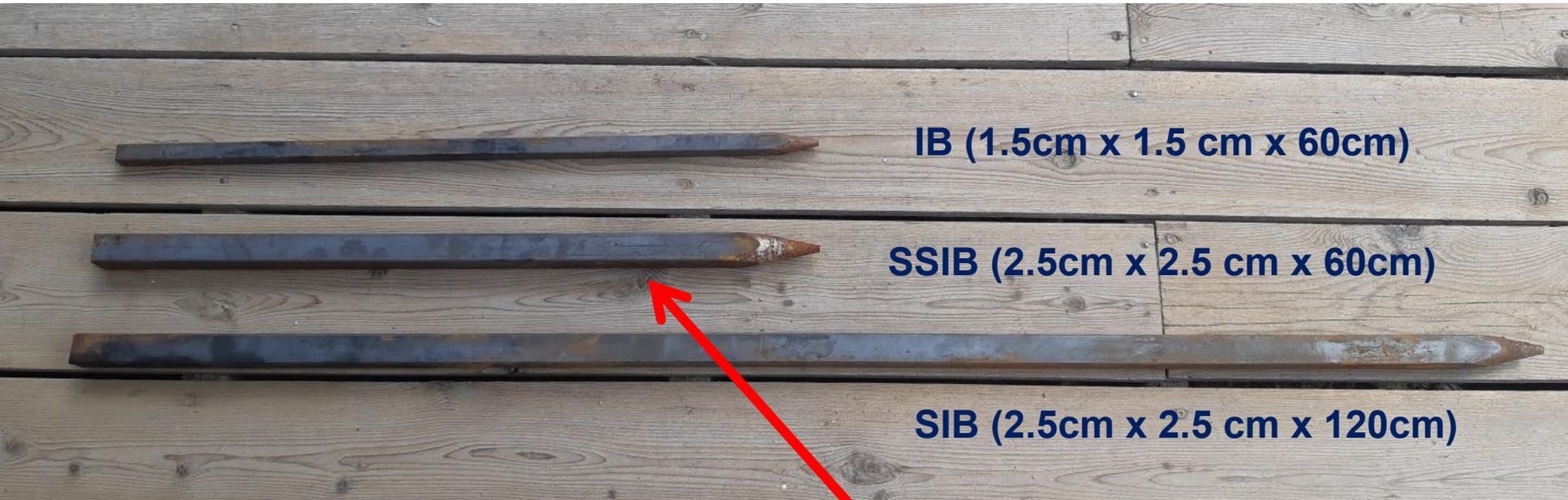
Photo curtesy of: T.A. Bunker Land Surveying Ltd.



National Standards Chapter 2: Survey Plans (Section 2.2.4)



National Standards Chapter 2: Survey Plans (Section 2.2.4)



IB (1.5cm x 1.5 cm x 60cm)

SSIB (2.5cm x 2.5 cm x 60cm)

SIB (2.5cm x 2.5 cm x 120cm)

Type of monument
shown on plan

Photo curtesy of: T.A. Bunker Land Surveying Ltd.



National Standards Chapter 2: Survey Plans (Section 2.2.4)



A “CLS Cap” is usually situated over the (*previously shown*) monuments “placed” to:

- aid in locating the monuments on the ground,
- identifying the survey company that placed the monument (in this case 1323 is for T.A. Bunker Surveying Ltd. in Gravenhurst)

<http://www.aols.org/directory/monument-id-numbers>

Photo curtesy of:
T.A. Bunker Land Surveying Ltd.



National Standards Chapter 2: Survey Plans (Section 2.2.4)



Unable to read the 4 digit Survey Company identification number
(from photo)

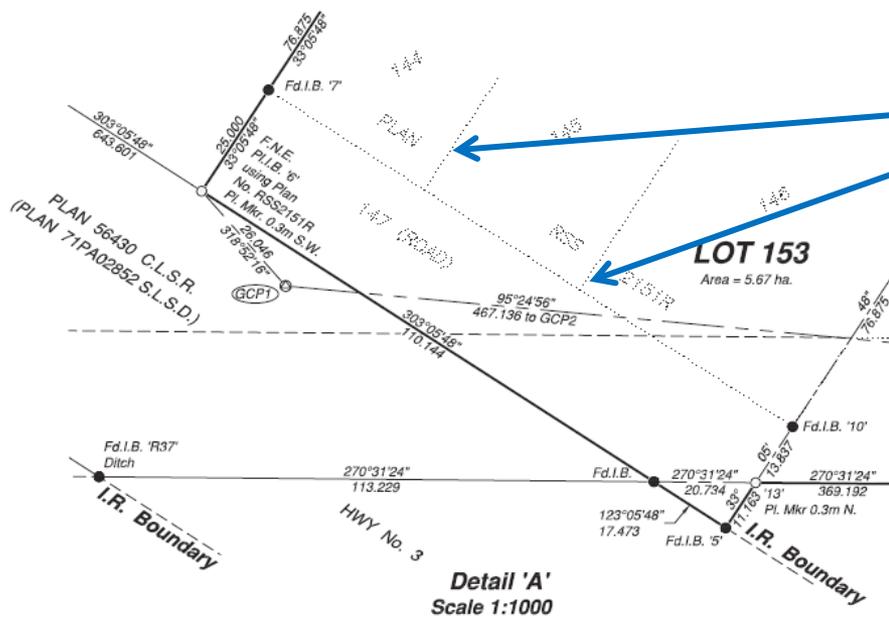
Monument stamped 24

Photo curtesy of: Tulloch Engineering

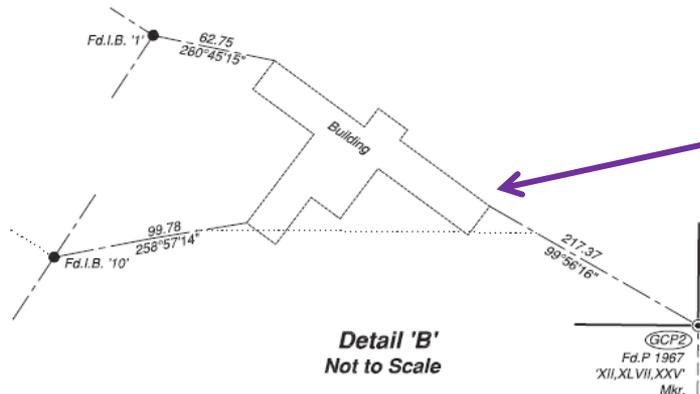


National Standards Chapter 2: Survey Plans (Section 2.2.4)

Phantom boundaries of parcels being subdivided or consolidated



Features (natural or man-made)



Example for Plan prepared under the National Standards





PART B:

What information does a
Survey Report contain?
Is it important?



National Standards Chapter 4: Survey Reports

- Circumstances and actions taken if the surveyor was unable to comply with the National Standards, Survey Instructions or other requirements of the survey
- Information that is not evident on the plan:
 - How monuments were restored or re-established
 - Access to the parcels
 - Discrepancies with previous surveys and how they were addressed
 - Any survey problems encountered and how they were dealt with
- Copies of plans or documents that are not of public record
- Imagery/photographs of water boundaries

A Survey Report is not required if there is nothing more to report (*than what is currently shown on the plan*), unless the Survey Instructions specifically require one or the survey includes a natural boundary.

- The Survey Report is certified and recorded in the CLSR as a field book.



Survey Reports *(prior to the National Standards)*:



- Similar requirements to the current National Standards, but also included:
 - Contacts with local officials and the reasons for the contacts
 - Name of the person requesting the survey, reason for the survey and the type of transaction
 - The type of terrain, access to the site, or weather conditions which affected the execution of the survey.
- The General Instructions (preceding the General Instructions e-Edition), did not require the survey report to be recorded in the CLSR.
 - As of 2008 – The survey report is to be signed and dated.
 - If they were intended to be recorded in the CLSR, they had to be certified and sealed.
- Required a survey report to be prepared, even if there was nothing to report on.

“If a surveyor believes there is nothing to report, then a report stating this should be submitted by the surveyor.”



National Standards Chapter 4: Survey Reports

TO COMPLETE UTM COORDINATES, DISTANCES SHOULD BE REDUCED TO SEA LEVEL AND THE PROJECTION PLANE BY MULTIPLYING A COMBINED SCALE FACTOR OF 0.99958991.

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SURVEY MONUMENT PLANTED	□
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STANDARD IRON BAR (2.5cm x 2.5cm x 120cm long)	SIB
IRON BAR (1.5cm x 1.5cm x 60cm long)	IB
IRON BAR (2.5cm x 2.5cm x 15cm long)	RB
CLS STANDARD POST IN CONCRETE MONUMENT (SHORT)	P.CM
HORIZONTAL CONTROL MONUMENT	HCM
NO VISIBLE MARKINGS	NVM
NO MONUMENT MARKER SET	NM
FOUND NO EVIDENCE	FNE
LANDS DEALT WITH BY THIS PLAN BOUNDED THUS	—————
RIGHTS-OF-WAY (UTILITY) DEALT WITH BY THIS PLAN BOUNDED THUS	——— ——— ———
PLANTED MONUMENT UNIQUE STAMPED NUMBER	①
SURVEY TIES SHOWN THUS	-----

Field book number
Assigned to the
Survey Report

*Example for Survey Report prepared under the
National Standards*



National Standards Chapter 4: Survey Reports

CANADA LANDS SURVEYS RECORDS ARCHIVES D'ARPENTAGE DES TERRES DU CANADA			
FB 41791			
DATE: 2017-12-11			
	SURVEY REPORT		
	<p>Description: Lot 30 (Utility Access Road), Lot 31 (Utility Access Road), Lot 32 (Utility Access Road) and Right of Way (Utility) over Part of Lot 30, Part of Lot 32, Part of 20.117m Wide Road as Shown on Plan RD4410 (C.L.S.R.) and Part of the Unsurveyed Portion of The Henvey Inlet Indian Reserve No. 2</p> <p>SGB Project Number: 201714165 SM Number: SM8206-06170 Region of Survey: Ontario Location of Survey: (06170) Henvey Inlet Indian Reserve No. 2 Type of Survey: Parcel Survey</p>		
<table border="1"><tr><td>Digitally signed by Truchon, Melissa Date: 2017.12.12 10:04:47 -05'00</td><td style="text-align: right;">Certified Correct </td></tr></table>		Digitally signed by Truchon, Melissa Date: 2017.12.12 10:04:47 -05'00	Certified Correct 
Digitally signed by Truchon, Melissa Date: 2017.12.12 10:04:47 -05'00	Certified Correct 		
December 2017 TULLOCH Project #: 17-3542-39			



National Standards Chapter 4: Survey Reports



Pattern Energy
Transmission Line and Access Road
Survey Report

TRANSMISSION LINE AND ACCESS ROAD SURVEY REPORT AND SUPPLEMENTARY FIELD NOTES

SGB Project Number: 201714165
SM Number: SMS206-06170
Description: Transmission Line and Access Road
Region of Survey: Ontario
Location of Survey: (06170) Henvey Inlet Indian Reserve No. 2
Type of Survey: Parcel Survey
Instructions Issued to: Mel Truchon OLS, CLS, Tulloch Geomatics Inc.

This plan was prepared to allow for the lease of lands by Henvey Inlet Wind LP within the Henvey Inlet Indian Reserve No. 2 for the purposes of a transmission line and access road.

Additional field notes of the survey have been prepared separately from the plan and are appended to this report in Appendix A. Included in the field notes is one page containing calculations pertaining to the re-establishment of 4 monuments from Plan 98696. There were some discrepancies with the underlying plans and the calculation sheets address the methods of re-establishment for these monuments.

Monuments S8 and S5 from Plan 98696 CLSR were found in good condition and measurements between them were found to agree very well with the underlying plan. Monument S7 was found bent and subsequently removed and re-established. Monument S6 was found leaning south east and was re-established as part of the survey. The five monuments that were found in the area for the access road (RD4410) appear to be located easterly of where the measurements on Plan 98696 CLSR indicate. These monuments are fairly consistent with one another in terms of their east-west location. There are discrepancies with the plan in this area; however, the overall distance between R11 and R15 (bent and restored) is consistent with the plan and R13 does in fact fall on the line between S8 and the re-established location of S6. Monuments R11, R13, R12, R15 and R10 were deemed to be in their original location and accepted. Being as the dimensions on the plan between S8 and R13 and between R12 and S6 appear to be incorrect, monument S7 was re-established by setting the distance from S8 and S6 was re-established by setting the bearing from S5 to intersect the re-established bearing from the south.

In re-tracing the boundaries of Access Road shown on Plan RD4410, many monuments were missing between monument R12 (RD4410) and R15 (98696 CLSR). The measurements shown on Plan 98696 CLSR were compiled from Plan R.S.O. 6664R. Plan R.S.O. 6664R did not find any evidence associated with the access road shown on RD4410. In calculating between the original monument R12 (RD4410) and monument R15 (98696 CLSR) a large discrepancy was found with a misclosure of 5.475 at 24°04'27". The bearings and distances throughout this area

Project # 17-3542-39
December 2017

Page 1

← The reason of the survey
← Where additional field notes can be found

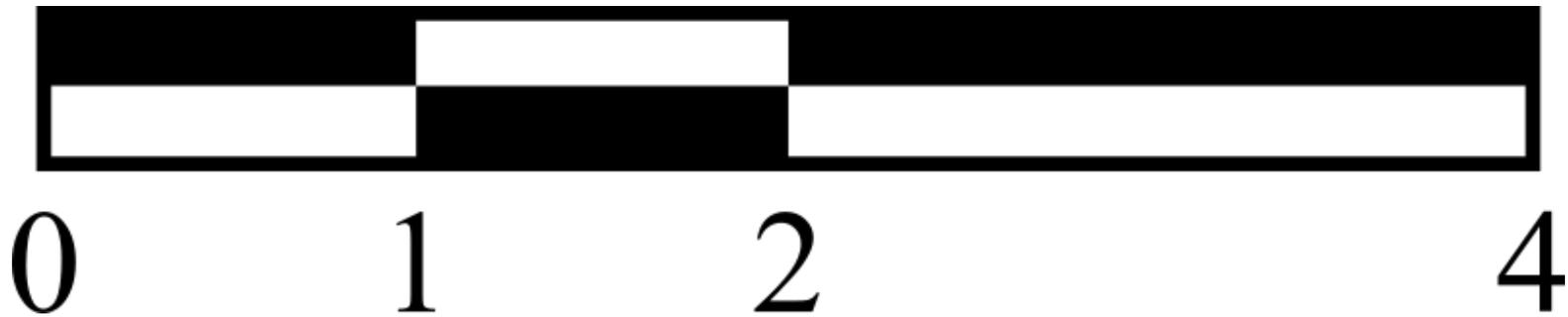
**Example for Survey Report prepared under the
National Standards**





Using a Plan Scale:

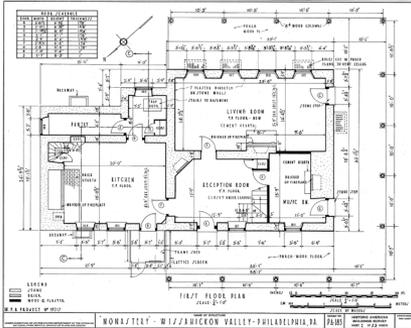
- Introduction
- Exercises



Plan Measurements and Scales:

Plan Scale:

Drawing Measurements



Compared to

Real World Measurements



1 drawing unit =
X real world units
1 : X

1 metre = 1 metre



Plan Measurements and Scales



A drawing scale of **1 : 100** means

1 equals **100**
drawing unit **real world units**

For survey plans, it can be units of metres

Whereby:

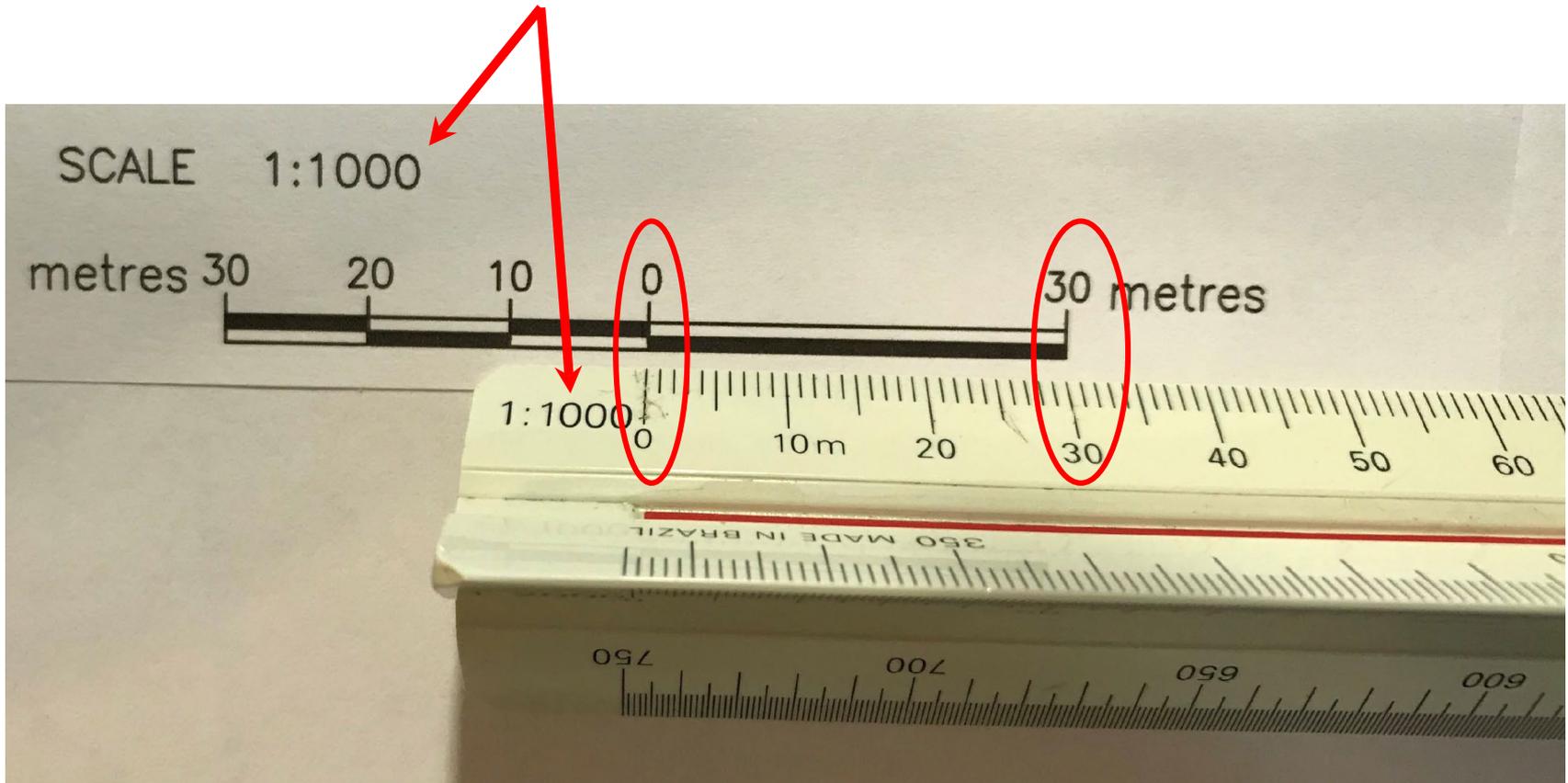
1 drawing unit equals **100 metres** on the
ground



Plan Measurements and Scales:



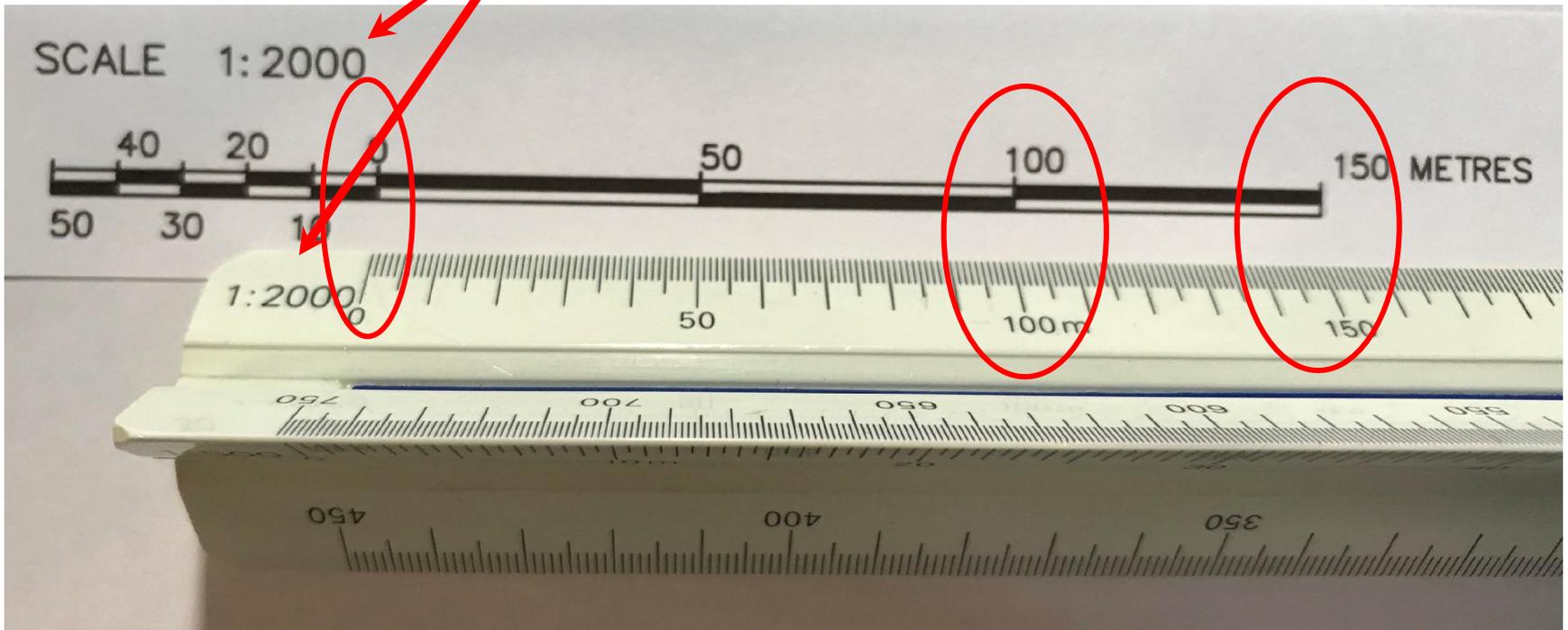
Examples: 1:1000



Plan Measurements and Scales:



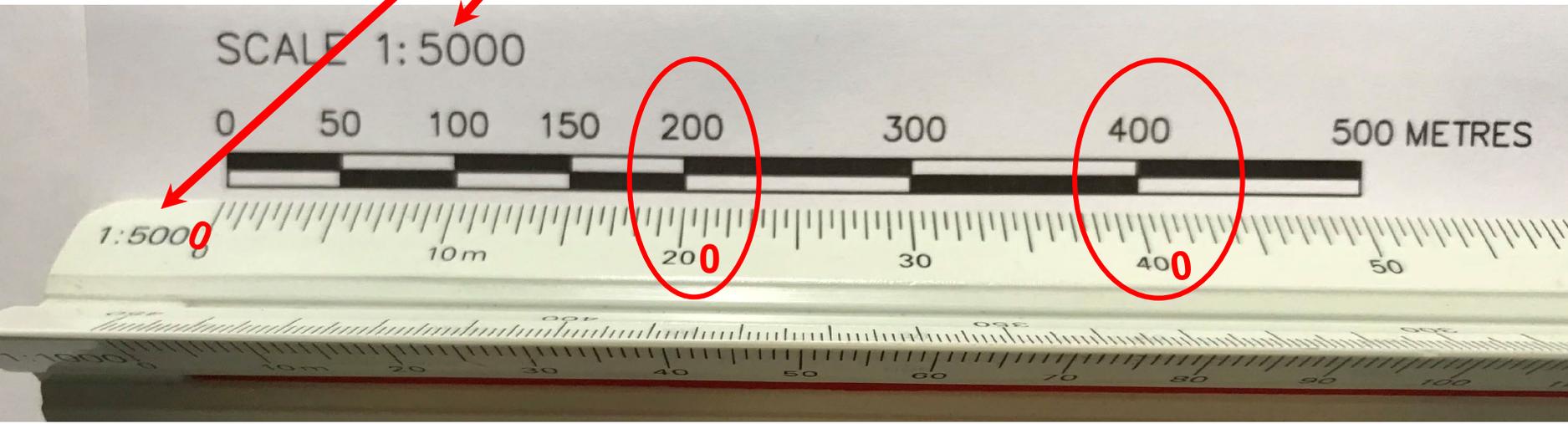
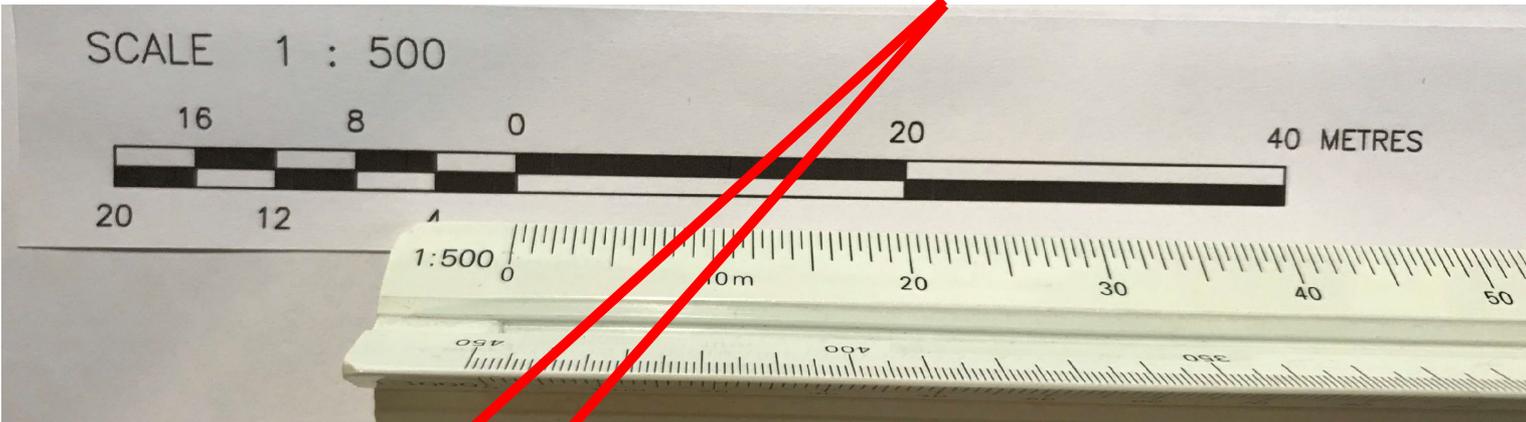
Examples: 1:2000



Plan Measurements and Scales:



Examples: 1:500 & 1:5000



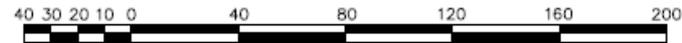
Plan Measurements and Scales:



SCALE : 1/1000 (METRIC)



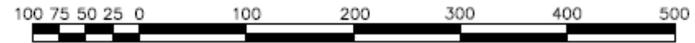
SCALE : 1/10000 (METRIC)



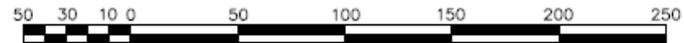
SCALE : 1/2000 (METRIC)



SCALE : 1/500 (METRIC)



SCALE : 1/5000 (METRIC)



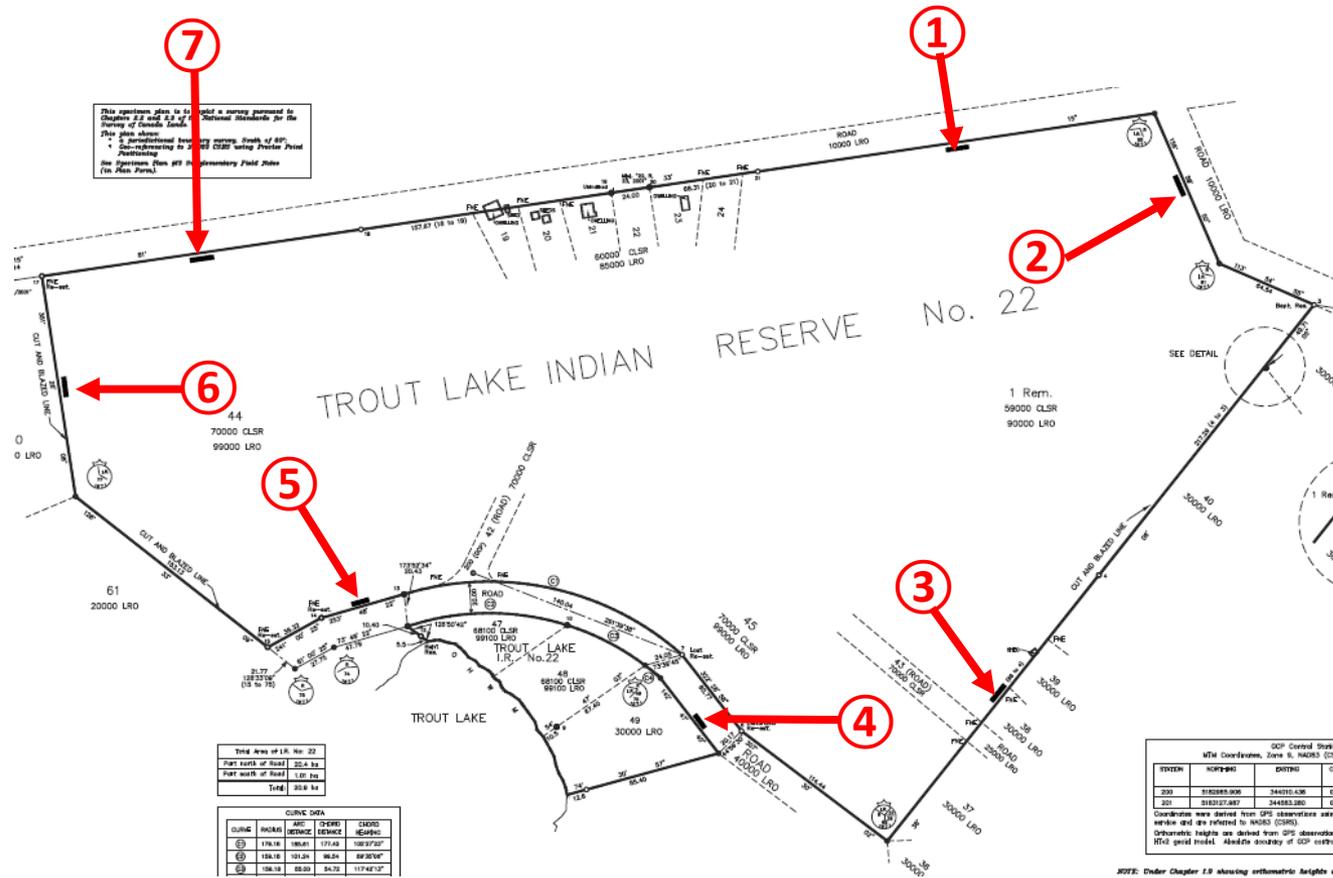
SCALE : 1/2500 (METRIC)



SCALE : 1/1250 (METRIC)



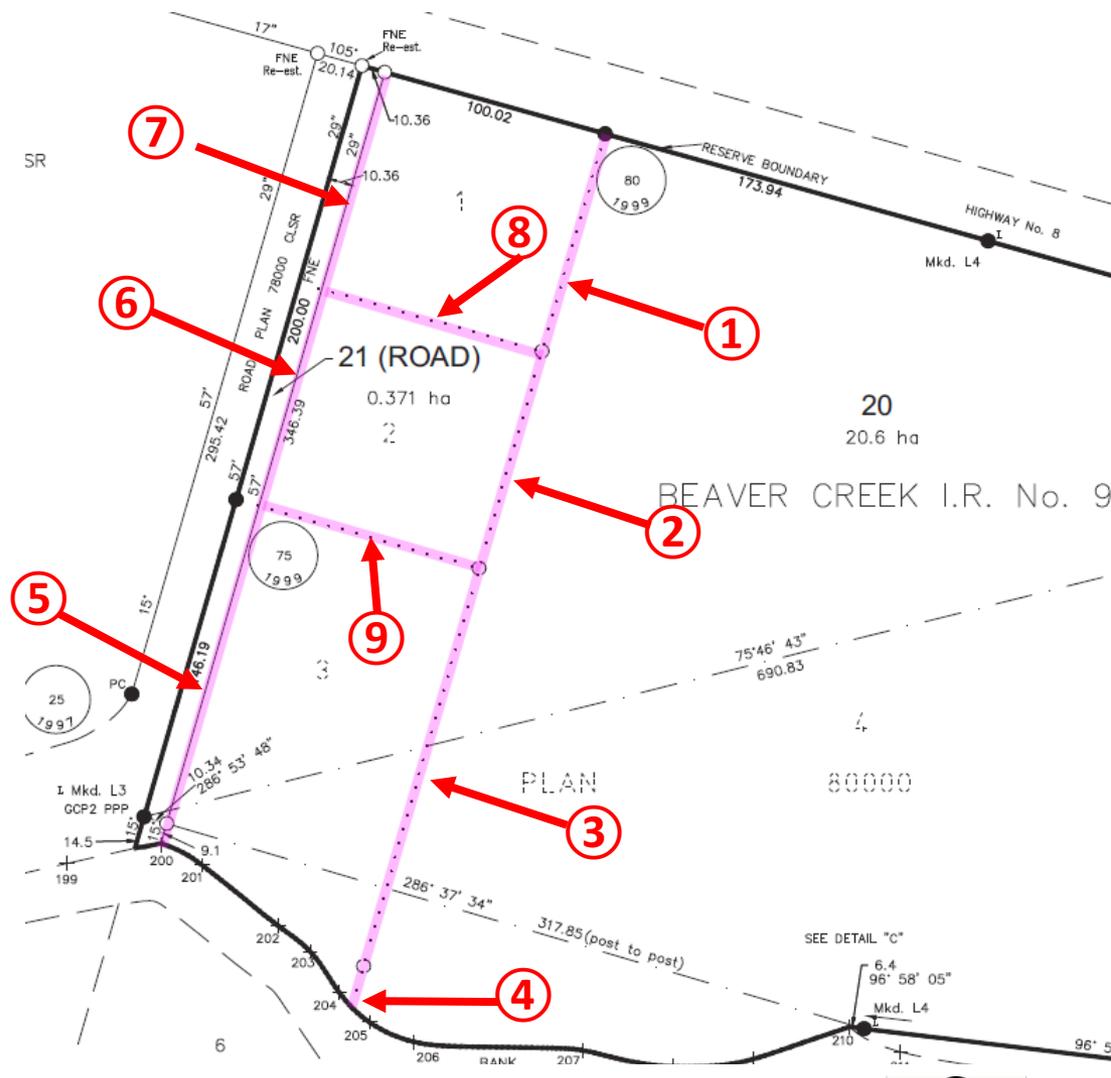
Scale Exercise 1:



- Using Plan 1:
 - Provide missing dimensions (to the nearest metre) for the boundaries of the plan
 - Check the plotting of the plan:
 - Scale bar
 - Measurement on the plan



Scale Exercise 2:



Using Plan 2:

- Provide dimensions *(to the nearest metre)* for the boundaries of Lots 1, 2 and 3 *(measurements are from/to the centre of each monument/line)*
- Don't forget to check the plotting of the plan first – is it to scale?





PART C:

Survey Plan Review Exercises





Review

Survey Plan 3



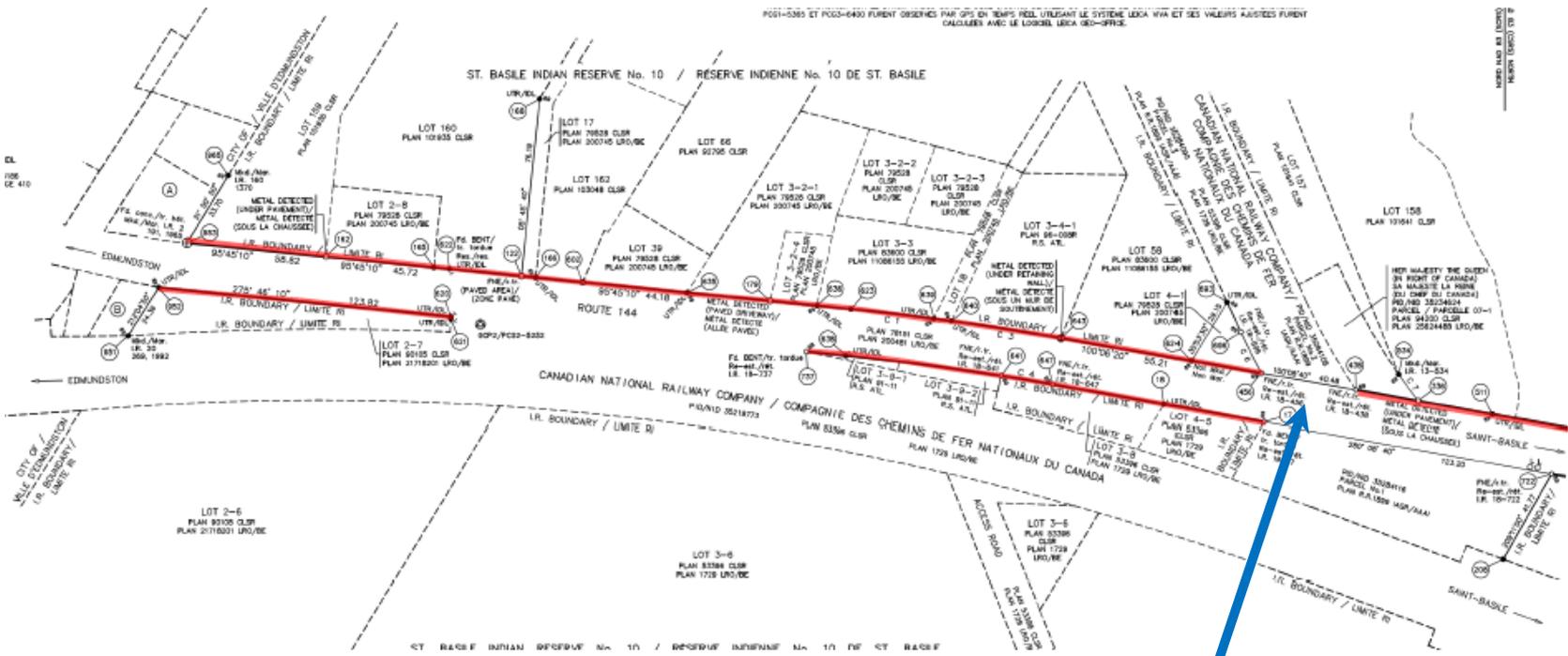


Review

Survey Plan 4



Review of Survey Plan 4: Sheet 1 of 3

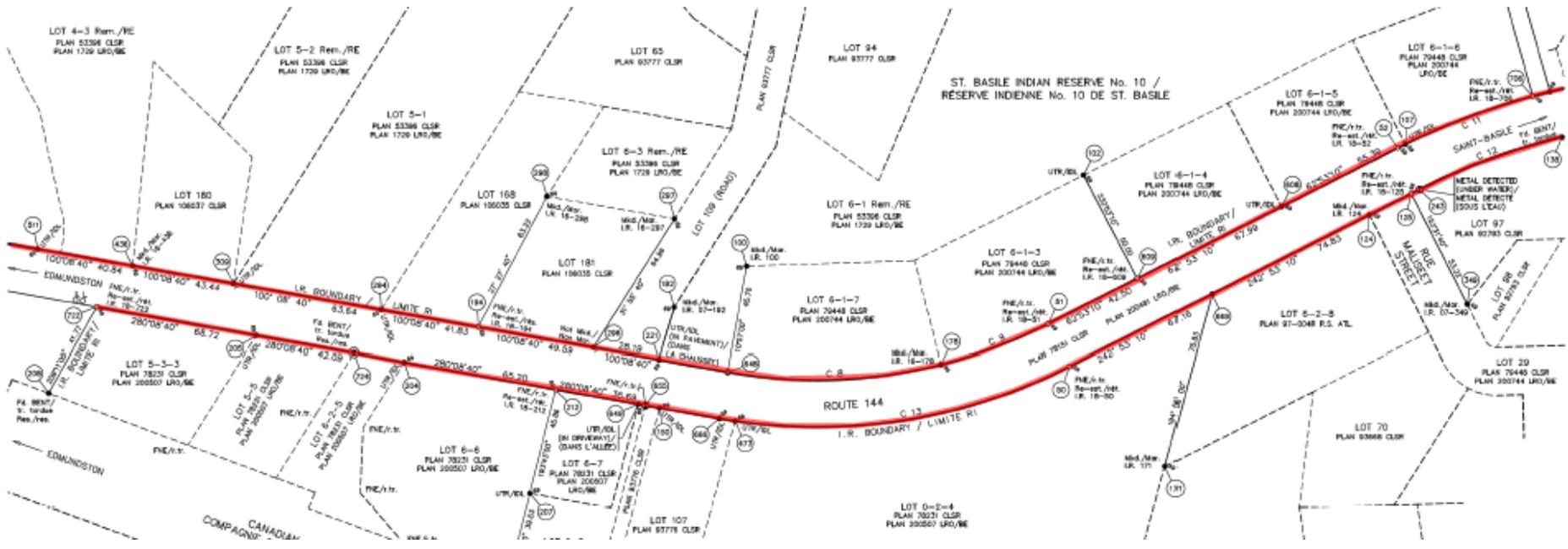


POSI-5385 ET POSI-6400 FURENT OBSERVÉS PAR GPS EN TEMPS RÉEL UTILISANT LE SYSTÈME LEICA VIA ET DES VALEURS AUGMENTÉES FURENT CALCULÉES AVEC LE LOGICIEL LEICA GEO-SPIRE.

MONTÉVIEUX 83 (SUD) / MONTÉVIEUX (SUD) 83



Review of Survey Plan 4: Sheet 2 of 3





ENCROACHMENTS AND EASEMENTS

There are two areas where there are encroachments onto the reserve.

West of the west boundary of the reserve, the City of Edmundston has a lagoon constructed. Along the shore of the Saint John River, there was rip-rap placed and just at the waters edge the rip-rap encroaches by 0.6 metres onto the reserve.

South of the east bound of Lot 6-2, Plan 53396 CLSR, between the south boundary of the Canadian Government Railway and the Saint John River there is an area that has been filled with large boulders. It is assumed the boulders were placed for erosion protection, for in this area the south boundary of the railway is within 2.3 metres of the OHWM. The boulders cover an area which is from the edge of the railway to the river and about 141 metres long.





Review

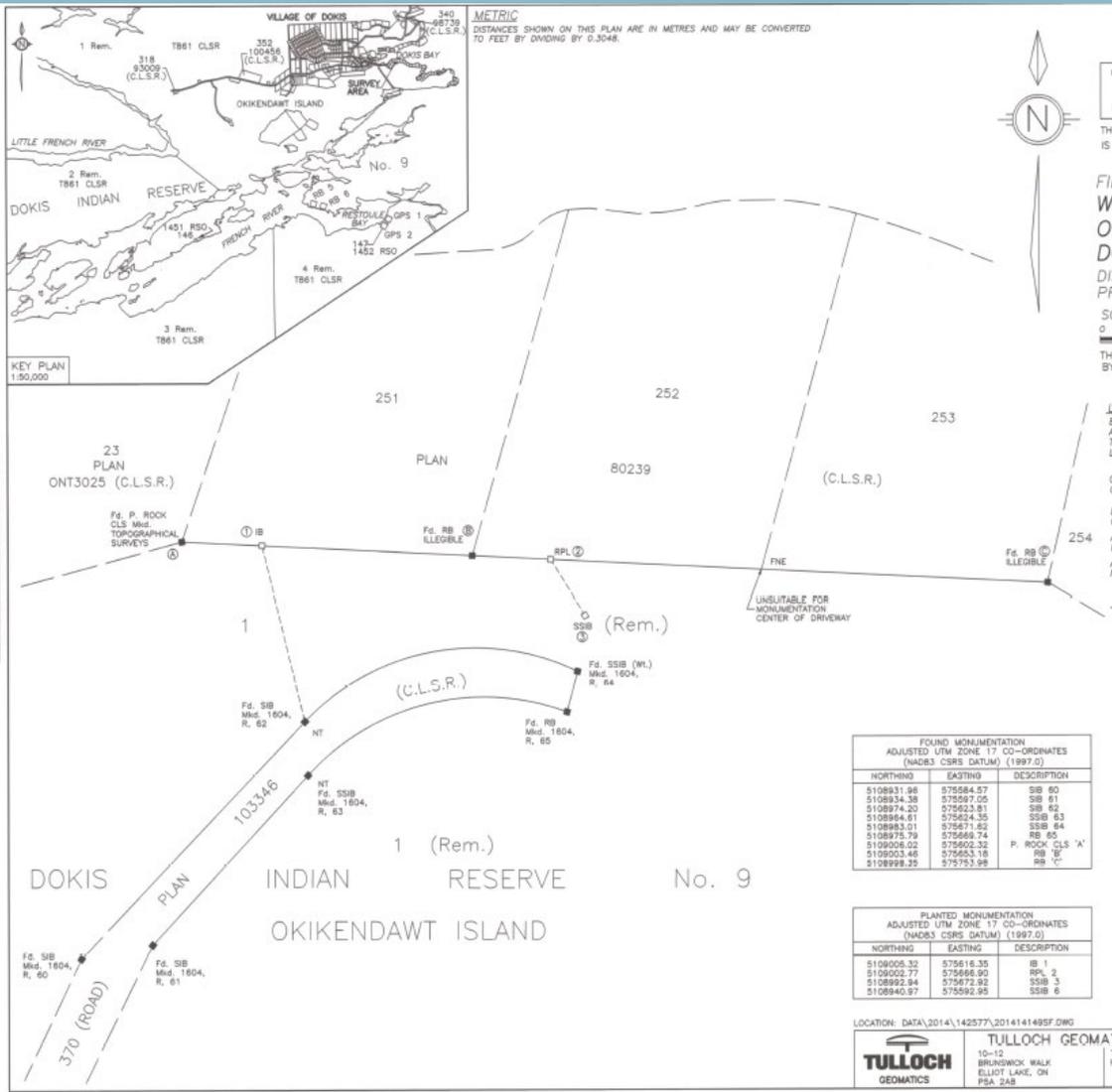
Survey Plan 5



Review of Survey Plan 5:



No "lands dealt with" depicted on field notes.





LUNCH

