



# Association of Ontario Land Surveyors

Interpretive Guide and Supplement to  
The Performance Standards for the  
Practice of Cadastral Surveying  
(Ontario Regulation 216/10)



March 15, 2015

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## Introduction

This guide is a compilation of the June 2011 revision of the Integration Guide and the April 2011 revision of the Interpretive Guide and Supplement to the Performance Standards for the Practice of Cadastral Surveying. We owe a great deal of gratitude to Phillip Swift for his work on the Integration Guide and to John Middleton for his work on the Interpretive Guide.

This compiled guide is to be read in conjunction with Ontario Regulation 216/10 Performance Standards for the Practice of Professional Land Surveying. The numbering corresponds with that of the regulation, not all sections are commented on. I strongly recommend you also read [Guidelines for RTK/RTN GNSS Surveying in Canada](#) a link which can be found near the top of page 5.

When editing any compilation of work by several authors there is always a problem of trying to mesh the various styles of writing. This compilation is no exception, so don't linger over the syntax but concentrate on the content.

If errors are found or additions need to be added, please contact me.

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# Part I

## General

### Definitions

1.

"coordinates"

The coordinates shall be expressed as grid coordinates as set out in Section 31. (b).

The Land Title system does not guarantee the extent of title. Similarly, integrated coordinates are not guaranteed positions for the public to use. Accurate georeferencing helps professional land surveyors to discharge their duty to the public.

There will always be differences of opinion and discrepancies to resolve between what is in the record and evidence on the ground. These differences can far exceed the accuracy to which surveyors are capable of measuring. The resolution of contradictory boundary evidence is the essence of professional cadastral surveying.

"coordinate system"

Sections 31(a) and (b) list the permitted reference frames and map projections; in particular, the reference frame must be NAD83(Original) or NAD83(CSRS+epoch) and the projections must be UTM or MTM.

"monument"

In addition to legal survey points, observed reference points must also be monumented. For example, a temporary point on ice in the middle of a frozen lake should not be cited as an observed reference point on the face of the plan.

"observed reference point"

The survey must be connected to monumented control, per Section 18 (1) (i) (v). There will be times when the surveyor will want to create one or more new control monuments. It is advisable to use permanent onsite points for observed reference points.

It is noted that GNS observations may have to be acquired on points which are not on the surveyed parcel. Section 6 of the Surveys Act, R.S.O, 1990, c S. 30 gives surveyors the right of entry; however every surveyor must be cognizant of the rights of adjacent land owners and should obtain permission before observing points that are not on the surveyed parcel. (See Right of Entry Bulletin 2005-01).

The following field surveying methods are available for creating an "observed reference point" connected to a coordinate system. They include, but are not limited to:

Ties with conventional total stations to "specified control points";

*(For GNSS methods see Guidelines for RTK/RTN GNSS Surveying in Canada)*

[http://www.nrcan.gc.ca/sites/www.nrcan.gc.ca/files/earthsciences/pdf/Canada-RTK-UserGuide-v1\\_1-EN.pdf](http://www.nrcan.gc.ca/sites/www.nrcan.gc.ca/files/earthsciences/pdf/Canada-RTK-UserGuide-v1_1-EN.pdf)

Ties with two or more Global Navigation Satellite System (GNSS) receivers to "specified control points" including:

*Static, Rapid Static or Real Time Kinematic (RTK) simultaneous phase differential vectors to "specified control points."*

Precise Point Positioning with two or more GNSS receivers:

*When using GNSS receivers, the surveyor can determine coordinates using the NRCAN PPP service.*

*(for PPP methods see the NRCAN publication: "[On-line Precise Point Positioning](#)");*

Observations with one GNSS receiver, including:

*Precise Point Positioning; and*

*Positioning with a single rover in a commercial RTK network (RTN, or GNSS precision wide area network).*

*When using a single GNSS receiver, it is mandatory to have redundant measurements, separated by time period of 1-2 hours to collect adequate data in order to satisfy the accuracy for the area you are working in.*

*Integration using only one GNSS receiver also requires current independent testing of the equipment and process over a specified control point, preferably in the general vicinity of the survey, as part of the field documentation.*

"specified control point"

Integrated surveys must be connected to monumented control, per Section 18 (1) (i) (v), with sufficient data to enable the location of the parcel of land surveyed to be ascertained in relation to the monumented points that are used to integrate the survey.

There are many field surveying methods for connecting an integrated survey to "specified control points", including:

Ties with conventional total stations.

Ties with two or more GNSS receivers including:

*Static, Rapid Static or Real Time Kinematic (RTK) simultaneous phase differential vectors; (for GNSS methods see [Guidelines for RTK/RTN GNSS Surveying in Canada](#)).*

Observations with one GNSS receiver, including:

*Field ties with a single rover in a commercial RTK network (RTN, or GNSS precision wide area network) to “specified control points”.*

### **Standards for projects**

2. This Regulation gives minimum standards. Certain projects may require higher standards, and therefore the standard of care should be elevated appropriately.

### **Report after Completion**

4. (1) If no obvious problems or contentious issues are found in the preparation of a survey, a letter or pre-printed form acknowledging the inclusion of copies of the plan of survey, if applicable, the return of documents, the rendering of accounts, etc., may constitute sufficient notice to the client of the completion of the survey.  
  
(2) If a plan is not prepared, the written communication provided to the client should state the scope of the survey work, the location of the monuments planted and that a plan was not prepared.  
  
(3) If obvious problems or contentious issues are found during the course of the survey the written communication provided to the client should draw his or her attention to all such problems or issues.

### **Quality assurance**

5. Measurements and calculations for integrating cadastral surveys shall be proven by independent redundant checks. Positioning methods using a single GNSS receiver require a time interval of 1-2 hours before making redundant checks to allow for the geometry of the satellites to change.

## **PART II CADASTRAL SURVEYING**

### **Field Survey Standards**

#### **Evidence used**

8.
  - 1) The documentary evidence, referred to in subsection 8(a) of the Performance Standards Regulation, that is to be referred to when undertaking a survey, includes documentary evidence obtained during,
    - (a) a land registry office search;
    - (b) a search of the member's own files for related field notes of surveys or plans thereof;
    - (c) a search of the files of other licensed members; and
    - (d) a search of any other sources that reasonably might be expected to contain applicable material.
    - (e) Survey records requested by a licensed member from the files of another licensed member may include field notes, reports and plans and should be,
      - (i) made available for delivery to the licensed member requesting same within five working days of such a request;
      - (ii) researched by a competent person;
      - (iii) should be drawn only from records owned by the member providing the records; and
      - (iv) complete and reflect the final decisions made during the survey.
  - 2) If a boundary of a parcel of land is found to be dependent on the position of a body of water, sufficient research should be undertaken, as required by subsections 8(a) and (b) of the Performance Standards Regulation, to determine if the water level of the body of water has been artificially altered and may include reference to:
    - (a) the agency responsible for land patents;
    - (b) the agencies responsible for administering structures on waterways;
    - (c) the instructions to the surveyor for the original survey;

- (d) the original plan, field notes and diary of the surveyor who did the original survey;
  - (e) subsequent surveys;
  - (f) historical atlases and books on local history; and
  - (g) a visual inspection of the outlet of the body of water and of the water boundary.
- 3) With respect to priority of evidence referred to in subsection 8 (c) and in accordance with common and statute law:

Where a monument is placed on an existing boundary, such monument will normally be placed on the boundary at a point established from existing evidence of the boundary on both sides of the monument so placed, if so intended.

### **Error of Closure of Field Data**

9.

The error of closure of field data on a survey, in respect to the perimeter of each parcel shall not exceed the parameters set out in section 9 of the Performance Standards Regulation.

### **Bearings**

10.

Where bearings are derived from a line of known bearing, where evidence of the line exists on the ground, the position of the line and the survey evidence of the line need be shown on a plan adopting such reference bearing.

If a survey has been integrated to a coordinate system in accordance with section 14, all bearings will be shown as Grid Bearings. Sections 31-35 allow only UTM and MTM projections, in which all bearings are grid by definition. A note shall be included on the plan indicating that the bearings are Grid Bearings, referenced to the stated projection, zone, datum and if applicable, adjustment epoch .

Bearings may be quadrantal or full-circle.

(a)

The surveyor's goal is to determine bearings to meet the accuracy requirements of the survey. (Note: a distance error of 1:5000 per Section 9(d) equates to a bearing error of about 40").

Special techniques to obtain good bearings for integrated surveys include:

*Astronomic or gyroscopic observations with Laplace correction and meridian convergence.*



*This method is useful when the integration coordinates are only accurate to the rural or remote standard;*

*Observations with two or more GNSS receivers including:  
Static, Rapid Static or Real Time Kinematic (RTK) simultaneous phase  
differential vectors;*

*The minimum baseline distance when determining bearings between  
azimuth stations occupied by GNSS receivers should be 150m;*

*Positioning with one GNSS receiver, including:*

*(a) A single GNSS receiver for Precise Point Positioning;  
Processing observations obtained at different times results in  
independent estimates of positions. The accuracy of the azimuth or  
bearing of the line defined by the two stations will be limited by the  
accuracy of both PPP solutions. Using a single GNSS receiver and  
PPP to determine bearings may not be adequate, but the error could  
be mitigated by longer observation times on longer baselines. The  
surveyor must provide strong evidence to support the reported  
accuracy.*

*(b) A single GNSS receiver in a commercial RTK network (RTN, or GNSS  
precision wide area network).*

*When using a single GNSS receiver in a real-time commercial  
network, it is mandatory to have redundant measurements, separated  
by a time interval of 1-2 hours to estimate positions of two points on a  
baseline with sufficient accuracy to produce a grid bearing exceeding  
the minimum accuracy of Section 9(d), namely, 1:5000 or 40" of arc.*

*Introducing a third monumented point and proving the angle with a  
direct total station observation or traverse is advised to test whether  
the bearing is adequate because this provides geometric redundancy.*

*(b) Grid bearings may be derived from a line on a previous survey, including one  
deposited or registered before the coming into force of 216/10, provided:  
The previous survey was connected to a georeferenced coordinate system  
(reference frame) by measurements; and  
The previous survey can reliably be transformed to NAD83(Original) or  
NAD83(CSRS+epoch) and its projection to UTM or MTM.*

*(c) Monuments in a coordinate system include "specified control points" and "observed  
reference points".*

*Boundary monuments from previous surveys, including those deposited or registered  
before the coming into force of 216/10 may be considered as a source of "observed  
reference points", provided*

The previous survey was connected to a coordinate system by measurements; and *the datum and projection of the previous survey can reliably be converted to NAD83(Original) or NAD83(CSRs+epoch) and its projection to UTM or MTM.*

## Topographic Information

11.

The position of topographic information, including topographic information required by section 24 of the Performance Standards Regulation, must be determined in accordance with the requirements of section 11 of the Regulation and may more particularly be determined by:

- (a) Periodic offset measurements from a survey traverse, such offset measurements to be of no greater length than 80 metres and at no greater intervals than 60 metres;
- (b) measurements using electronic distance and/or angle measuring devices from stations on a survey traverse, such measurements to be at no greater intervals than 60 metres along the topographic feature;
- (c) controlled photogrammetric methods; or
- (d) any other method that satisfies the requirements of section 11 of the Regulation.

## Integration

14.

Factors to consider when assessing whether an area is urban, rural or remote:

*An area is urban if "built-up" or if there is a "specified control point" within 2 kilometres of the survey.*

*"built-up area" means land that is primarily used or zoned for residential, commercial or industrial purposes; per O.Reg. 525/91;*

*An area is rural if there is a "specified control point" between 2 kilometres and 15 kilometres from the survey;*

*An area is remote if there is no "specified control point" within 15 kilometres of the survey.*

*When remote or rural land is being developed, surveyors should consider whether the area is becoming rural or urban.*

*Registered plans should usually be treated as "urban".*

Confidence Level:

*Accuracy of the listed coordinates shall be to the 95% confidence level.*

Accuracy:

*The regulation was intentionally silent on whether the accuracy standards were referring to “absolute (network) accuracy” or “relative (local)” accuracy. Although in the longer term surveyors will likely strive to meet “absolute (network) accuracy” for now most surveys will be striving to meet accuracy standards associated with “relative (local)” accuracy. This is particularly true where surveyors are integrating using existing control that in itself may not meet urban standards of “absolute (network)” accuracy.*

*By tying "observed reference points" from previous integrated surveys, the new survey accuracy is limited by the accuracy of the previous points.*

*Only the coordinates explicitly listed in the table are required to meet the accuracy standards of urban, rural or remote.*

## **Field Notes**

15.

Section 15 of the Performance Standards Regulation requires that “.... Field notes shall be prepared in the field and shall contain a clear and detailed account of everything found, observed and done in the field in the course of and relevant to the survey...”. More particularly, the field notes should include information that:

*(1) locates and identifies the property being surveyed including,*

*(a) the geographic designation of the land being surveyed and the land adjacent to the land being surveyed, and*

*(b) the names of adjoining streets;*

*(2) facilitates the interpretation and use of the field notes such as,*

*(a) a north arrow on each page,*

*(b) the date and the file number of the survey on each page,*

*(c) the page number and the total number of pages used on each page,*

*(d) the type and identification of all measuring equipment used e.g., electronic distance measuring equipment, GPS, steel tape etc.*

*(e) the identification of the party chief and assistants,*

- (f) *the weather conditions,*
      - (g) *reference to records of field calculations, and*
      - (h) *dimension arrows for distances and angle measurements where required to make the information clear;*
  - (3) *illustrates the field procedures and the method of survey including,*
    - (a) *offset lines and traverse lines identified as such,*
    - (b) *the annotation of instrument stations, interline points, points of intersection and site stations etc.,*
    - (c) *all observations or measurements, including slope, tension, temperature and tape correction, as required,*
    - (d) *whether angles and distances have been set or measured, and*
    - (e) *an adequate description of all evidence including the surveyor's identification marking, or if none this fact should be indicated, the condition of found monuments, all monuments set or restored and every permanent structure referencing monuments.*
  - (4) *in addition:*
    - (a) *Field notes should be recorded at the time of observation.*
    - (b) *Where it is deemed necessary to redraw field notes, the original field notes should be retained and attached to the copies.*
    - (c) *Data added to field notes on a date other than that recorded on the page should be so identified.*
    - (d) *After the field survey has been completed, incorrect measurements on field notes should not be erased but stroked out in such a manner that they remain legible but are obviously discarded.*
  - (5). *A field note report should include:*
    - (a) *a record of all oral evidence obtained,*
    - (b) *an explanation of any discrepancy and*
    - (c) *an assessment of any conflicting evidence.*
    - (d) See "[Guideline for the Preparation of Field Notes](#)" approved by Council, July 2007.

## Plans

### Use of the word “survey”

16.

The word “survey” is used in the title of a plan only when the plan has been prepared from a survey made for the purposes of establishing or defining a boundary or corner of a parcel of land.

- (1) *For the purposes of this section a survey may be deemed to be “current” if,*
  - (a) *the survey complies with the applicable requirements of the statutes and regulations of Ontario;*
  - (b) *upon a field inspection it can be determined that no changes have taken place to the property or to the monumentation since the survey was made that would necessitate a change in the survey; and*
  - (e) *an up-to-date search for documentary evidence has been made, as required by subsection 8(a) of the Performance Standards Regulation, and no changes have occurred that would necessitate a change in the survey.*
- (2) *A plan should only be prepared from a current survey. Where a plan is “updated” or revised to reflect conditions in (a), (b) and (c) above, it may only be “updated” by the licensed member that signed the plan or a licensed member of the firm that was originally responsible for the preparation of the plan.*
- (3) *A plan should not be compiled or partially compiled unless permitted by the statutes and regulations of Ontario.*
- (4) *Graphic illustrations prepared for retail leases, land severance applications, accidents, and similar purposes, and not prepared in accordance with the survey and plan requirements in the statutes and regulations of Ontario, should be entitled using the word “sketch”.*
- (5). *A licensed member should only use distances and directions which the member knows to be reliable in the preparation of:*
  - (a) *a sketch to illustrate a description written under subsection 50 (1) Ont. Reg 43/96*
  - (b) *a sketch prepared under subsection 81(2) of the Registry Act R.S.O. 1990.*
- (6). *A sketch should indicate the exact source of the dimensions shown on the sketch and note if they are not obtained from survey.*

- (6) *Sketches should not be prepared on the pre-printed forms, used for plans of survey, which contain the legends, certificates, etc. pertinent to plans of survey.*
- (8). *Sketches should indicate in their title blocks the purpose of the sketch, e.g. building permit application, severance application.*
- (9). *The geographic designation of the parcel should appear as part of the sketch and not in the title block.*
- (10). *The following caution note should appear prominently on the sketch:*

**CAUTION**

***This is not a plan of survey and shall not be used except for the purpose indicate in the title block.***

- (11) - (1) *A sketch should include a note indicating that the sketch is protected by copyright.*
  - (2) *Subsection (1) does not apply to sketches prepared under clause 24(b).*
- (12). *A sketch should contain a statement that a copy of the sketch is not a valid copy unless it is embossed with the surveyor's seal.*
- (13). *A sketch should not be signed unless required by an approving agency.*

**Contents**

18.

- (i)(i) *Plans should normally show three monumented points, per generally accepted verification of monuments.*
- (ii) *This section does not negate the use of a coordinate when it is the best evidence available. The phrase "in themselves" means that the coordinate is not used in isolation without the normal documentary and field research and application of the statute and common law. Additionally, this clause requires that a surveyor make independent checks when staking a point at a coordinate.*

*The accuracy (urban, rural or remote) and level should be in the table where the coordinates are listed.*
- (iv) *The reference frames and map projections permitted are listed in Sections 31 (a) and (b); the reference frames being: NAD83(Original) and NAD83(CSRS+epoch), and the projections being UTM and MTM.*

- (v) *The intention of this section is to require the surveyor to measure in the field and show resulting ties on the plan from monuments on the boundary of the survey to at least two control monuments. This applies to "specified control points" as well as "observed reference points".*

*The ties should be chosen to provide sufficient data to permit the calculation of the error of closure from a starting control monument, through the plan dimensions, to an ending monument, thereby proving the soundness of the connection to the reference system.*

*Boundary monuments may also serve as "observed reference points", removing the necessity to show ties.*

*No ties are required on the plan between "observed reference points" and "specified control points".*

- (l) *Subsection 18 (l) of the Performance Standards Regulation requires that the source of the distance or direction set in a survey be shown on a plan by:*

*reference to:*

- (a) the registration number of an instrument;*
- (b) a parcel number, where the land is registered under the Land Titles Act,*
- (c) the identifying number/letters of a plan of record in a land registry office, or*
- (d) the date of a plan or field notes, together with the name of the licensed member who prepared them or the name of the firm having custody of them.*

## **Location Information**

21.

- (1) *The data required by clause 21(1) (b) of the Performance Standards Regulation, to enable the location of the parcel of land surveyed to be ascertained in relation to the limits of the lot of which it is a part, is interpreted to include a distance and bearing from a corner of the parcel to,*
- (a) a corner of the lot,*
  - (b) any corner of a subdivision unit in the same lot,*
  - (c) the intersection of a limit of a highway with a limit of the lot provided that the highway is shown on a plan of survey registered or deposited in a land registry office.*
- (2) *A distance and bearing required under subsection (1) may be compiled from data shown on registered or deposited plans.*
- (3) *Where a distance and bearing have been compiled under subsection (2) the source of the data should be shown on the plan.*

Note:

*Integrated surveys still require a lot corner tie.*

## **Comparison information**

23.

*Subsection 23(a) (b) requires that comparisons be made where a measurement of distance or direction to be shown on a plan differs from that shown on a previously deposited or registered plan or description. If the measurement differs by an amount less than the linear error set out in section 9 of the Performance Standards Regulation, or its angular equivalent, from that shown on a previously registered or deposited plan or contained in a description in a previously registered instrument this subsection should normally be interpreted to require that the measurement shown on the plan be in agreement with the measurement shown on the previously registered or deposited plan or contained in the description in the previously registered instrument or parcel. In the case of integrated surveys, any adjustment of measured distances or directions to agree with values expressed on deposited plans or registered plans or documents must defer to the requirements of section 14(2) of the Performance Standards Regulation.*

*Since all integrated surveys under O.Reg. 216/10 have grid bearings and many pre-existing surveys used astronomic bearings, for the purposes of bearing comparisons a note may be included to indicate that the bearings on previous plans have been rotated to grid bearings. This note may be shown in a table to refer to multiple plans.*

*Rotation Note on the transformation of astronomic bearings:*

*For bearing comparison, a rotation of dd°mm'ss" (clockwise or counter clockwise) was applied to (identify plan) to convert to grid bearings.*

*Coordinate Comparison*

*Owing to incremental improvement in equipment and the surveyor's skill, accuracy is likely to improve with time. For these and other reasons, such as the recovery of superior monuments or adopting a newer reference frame epoch, a surveyor may have occasion to show comparisons to previous coordinates. This can be accomplished in the coordinate table or through a separate note.*

## **Topographic Information**

24.

*Subsection 24(1) of the Performance Standards Regulation specifies the topographic information that must and must not be shown on plans.*



*(a) Sub-clause (1) (a) (i) of section 24 is interpreted to require that topographic information, such as a natural boundary forming or controlling a boundary be illustrated on the plan with sufficient information to enable the relocation of the feature.*

*(b) Sub-clause (1) (a) (ii) of section 24 includes the requirement that topographic information found on the ground during the survey that indicates an easement or other interest in the title to the surveyed parcel may exist, such as overhead or buried utility lines, must be shown on the plan.*

*(c) Sub-clause (1) (a) (iii) of section 24 is interpreted to require that topographic information, such as a fence or hedge, that is near a limit of the land being surveyed, and which may represent a limit of occupation, must be shown on the plan.*

*(d) Sub-clause (2) indicates that topographic information that does not relate to the definition or re-establishment of the limits of subdivision units is not to be shown on a plan prepared for deposit or registration in a Land Registry Office, but topographic information adjoining the boundaries of the surveyed lands may be shown on the plan.*

*(e) In addition to the requirements of section 24, existing roads, streets, highways, lanes, commons, reserves, railways, canals, millponds, rivers, streams, lakes and ponds should be shown and identified on a plan insofar as is sufficient to illustrate the relationship of the survey to its surroundings.*

## **Surveyors Real Property Report**

### **Definition**

28. *“It is not mandatory to integrate an SRPR.*

### **Addendum**

*1. As a corollary to Section 4 (f) of the Performance Standards regulation, except where plans are to be deposited or registered, retention of ownership and copyright should be indicated if applicable.*

*2. Where the arc of a simple curve joins a line that is not tangent to the curve, the junction should be shown on a plan as “not tangential”.*

*3. Where any symbol or abbreviation is shown on a plan, its meaning should be clearly defined in a legend on the plan unless the symbol or abbreviation is defined in a regulation under the Surveyors Act, or Registry Act regarding surveys and plans.*

4.
  - (1) *In the preparation of a metes and bounds description, to be used in a document that purports to convey an interest in land, a licensed member should only use distances and directions which the member knows to be reliable and which express the member's opinion of the parcel limits.*
  - (2) *Subsection (1) does not apply to metes and bounds descriptions prepared by the Crown.*
  
5.
  - (1) *Section 28 of the Performance Standards Regulation is interpreted to permit a written certificate to be prepared certifying that there are buildings situate on a unit of land provided that:*
    - (a) *the land comprises five acres or more, and*
    - (b) *the buildings are substantially distant from the sidelines of the property.*
  - (2) *The form of the certificate should be substantially as follows:*

*"I hereby certify that there is totally situate within (...the property description...) a (...state buildings...), and that no (research or ) field survey has been undertaken to verify the existence of encroachments, easements, or other title qualifications or to verify if the parcel as occupied is in accordance with the herein described parcel."*
  
6.
  - (1) *A licensed member should only sign a certificate as shown on page 19 on a draft plan of subdivision, where the boundaries of the lands to be subdivided and their relationship to the adjacent lands are correctly shown.*
  - (2) *For the purposes of subsection (1) "correctly" means "of sufficient accuracy to satisfy the purposes of the draft plan of subdivision".*

I certify that:

The boundaries of the lands to be subdivided and their relationship to the adjacent lands are correctly shown.

-----

(Date)

-----

(Signature)

(name in print)

-----

Ontario Land Surveyor

# Sample Integration Statements under O.Reg. 216/10

## DISTANCE NOTES

### METRIC CONVERSION

19.(2) CALLS FOR THE BOLD METRIC CONVERSION NOTE.

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

AND COORDINATES PER 19. (2)

TO FEET BY DIVIDING BY 0.3048 PER 19(2)(a), OR TO METRES BY MULTIPLYING BY 0.3048 PER 19(2)(b)

### GRID SCALE CONVERSION

19.(3) CALLS FOR THE COMBINED SCALE FACTOR.

DISTANCES ARE GROUND AND CAN BE CONVERTED TO GRID BY MULTIPLYING BY THE COMBINED SCALE FACTOR OF 0.999725.

OR, DIVIDING PER 19 (3) (b)

## BEARING NOTE

20.(1) CALLS FOR THE ORIGIN OF THE BEARINGS

ALL INTEGRATED SURVEYS WILL SHOW GRID BEARINGS DERIVED FROM:

- 10.(a), 20.(2): OBSERVATIONS (CITE BEARING OF DIRECT TIE FROM A TO B)
  - ASTRONOMIC OBSERVATION FROM STATION A TO STATION B PLUS CONVERGENCE TO GRID, OR
  - SIMULTANEOUS PHASE DIFFERENTIAL BASELINE FROM STATION A TO STATION B;
- 10.(b), 20.(3): REFERENCE LINE OF KNOWN BEARING (CITE THE BEARING)
  - STATED LIMIT ON PREVIOUS PLAN, (WITH CONVERGENCE TO GRID IF APPLICABLE).
- 10.(c), 20.(4): POINTS LISTED IN INTEGRATION TABLE (DO NOT CITE INVERSED BEARING)
  - SPECIFIED CONTROL POINTS (SCPs) A & B (2 OR MORE), OR
  - OBSERVED REFERENCE POINTS (ORPs) A & B (2 OR MORE), OR
  - A COMBINATION OF 2 OR MORE SCPs AND ORPs.

QUADRANTAL OR FULL-CIRCLE PER SEC. 10.

OR, MTM PER 31(b)

OR, NAD83 (ORIGINAL), OR A FUTURE CSRS EPOCH

BEARINGS ARE UTM GRID, DERIVED FROM SIMULTANEOUS GPS OBSERVATIONS FROM MONUMENT A TO B, SHOWN HEREON, HAVING A BEARING OF N12°49'00"W REFERRED TO THE CENTRAL MERIDIAN OF UTM ZONE 16 (87° WEST LONGITUDE) OR MTM ZONE 10 (79° 30' WEST LONGITUDE)

CENTRAL MERIDIAN MAY APPLY FOR ASTRONOMIC OBSERVATIONS PER 20(2)(b)

OR, 347°11'00" PER SEC. 10.

PROJECTION, ZONE, DATUM, AND EPOCH (IF APPLICABLE) PER 20 (4)

OPTIONAL

FOR BEARING COMPARISONS, A ROTATION OF 1°05'30" COUNTER-CLOCKWISE WAS APPLIED TO BEARINGS ON PLAN 99M-123.

(GOOD PLACE TO STATE CONVERGENCE UNDER 10.(b) IF APPLICABLE)

## INTEGRATION DATA

18.(1)(i)(i) CALLS FOR THIS TABLE.

1. SPECIFIED CONTROL POINTS (SCPs) A & B, TIES FROM THE BOUNDARY TO SPCs SHOWN ON THE FACE OF THE PLAN;
  2. OBSERVED REFERENCE POINTS (ORPs) A & B TIES FROM THE BOUNDARY TO ORPs SHOWN ON THE FACE OF THE PLAN;
    - a) TIED TO SPCs BY CONVENTIONAL OR GPS VECTORS, E.G.:
      - TRANSIT AND CHAIN OR TOTAL STATION,
      - SIMULTANEOUS PHASE-DIFFERENTIAL BASELINES,
      - REAL TIME KINEMATIC (RTK) BASE AND ROVER BASELINES,
      - RTK BASE AND ROVER TRANSLATED COORDINATES;
    - b) COORDINATES DIRECTLY OBSERVED USING GPS
      - PRECISE POINT POSITIONING (PPP),
      - REAL TIME NETWORK (RTN) COORDINATES FROM PROVIDER,
      - RTN COORDINATES TRANSLATED TO OCCUPIED SPCs.
- NOTE: SINGLE GPS METHODS REQUIRE CALIBRATION ON A KNOWN POINT AND REDUNDANT VERIFICATION AFTER A TIME SHIFT.

ABBREVIATION

DEFINED IN SEC. 1, O.REG. 216/10

OBSERVED REFERENCE POINTS (ORPs) DERIVED FROM GPS OBSERVATIONS USING THE PRECISE POINT POSITIONING (PPP) SERVICE, UTM ZONE 16, NAD83 (CSRS) (1997.0).

SOURCE OF COORDINATES, PROJECTION, ZONE, DATUM AND EPOCH (IF APPLICABLE), PER 18 1.(i)(iv).

COORDINATES TO URBAN ACCURACY PER SEC. 14 (2) OF O.REG. 216/10 STATEMENT PER 18.(1)(i)(iii)

URBAN (AT LEAST 2 DECIMALS)  
RURAL (AT LEAST 1 DECIMAL)  
REMOTE (THE NEAREST METRE)  
(and something similar for feet)

GOOD PLACE TO LIST ADDITIONAL ORPs INTENDED FOR THE INTEGRATION OF FUTURE PHASES OF YOUR PROJECT.

POINT ID	NORTHING	EASTING
ORP A	5522311.25	397517.39
ORP B	5522374.13	397531.69
ORP C	5522354.89	397568.50

COORDINATES CANNOT, IN THEMSELVES, BE USED TO RE-ESTABLISH CORNERS OR BOUNDARIES SHOWN ON THIS PLAN.

STATEMENT PER 18(1)(i)(ii)

URBAN

Positions and bearings from ties to  
"Specified Control Points"

BEARINGS ARE UTM GRID, DERIVED FROM SPECIFIED CONTROL POINTS 10519980109 AND 10519980103, UTM ZONE 17, NAD83 (ORIGINAL).

FOR BEARING COMPARISONS, A ROTATION OF 1°05'30" COUNTER-CLOCKWISE WAS APPLIED TO BEARINGS ON PLAN 99M-123.

DISTANCES ARE GROUND AND CAN BE CONVERTED TO GRID BY MULTIPLYING BY THE COMBINED SCALE FACTOR OF 0.999737.

SPECIFIED CONTROL POINTS (SCPs): UTM ZONE 17, NAD83 (ORIGINAL). COORDINATES TO URBAN ACCURACY PER SEC. 14 (2) OF O.REG. 216/10		
POINT ID	NORTHING	EASTING
SCP 10519980103	4860956.05	618820.08
SCP 10519980109	4862790.76	617855.17
COORDINATES CANNOT, IN THEMSELVES, BE USED TO RE-ESTABLISH CORNERS OR BOUNDARIES SHOWN ON THIS PLAN.		

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

RURAL

Positions from ties to "Observed Reference Points" by Precise Point Positioning (PPP).  
Bearings from phase differential baseline.

BEARINGS ARE UTM GRID, DERIVED FROM SIMULTANEOUS GPS OBSERVATIONS FROM MONUMENT A TO B, HAVING A BEARING OF N12°49'00"W, UTM ZONE 16 (87° WEST LONGITUDE) NAD83 (CSRS) (1997.0).

FOR BEARING COMPARISONS, A ROTATION OF 1°05'30" COUNTER-CLOCKWISE WAS APPLIED TO BEARINGS ON PLAN 99M-123.

DISTANCES ARE GROUND AND CAN BE CONVERTED TO GRID BY MULTIPLYING BY THE COMBINED SCALE FACTOR OF 0.999725.

OBSERVED REFERENCE POINTS (ORPs) DERIVED FROM GPS OBSERVATIONS USING THE PRECISE POINT POSITIONING (PPP) SERVICE, UTM ZONE 16, NAD83 (CSRS) (1997.0).		
COORDINATES TO RURAL ACCURACY PER SEC. 14 (2) OF O.REG. 216/10		
POINT ID	NORTHING	EASTING
ORP A	5522311.3	397517.4
ORP B	5522374.1	397531.7
ORP C	5522354.9	397568.5
COORDINATES CANNOT, IN THEMSELVES, BE USED TO RE-ESTABLISH CORNERS OR BOUNDARIES SHOWN ON THIS PLAN.		

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

RURAL

Positions and bearings from ties to "Observed Reference Points" by Real Time Network.

BEARINGS ARE UTM GRID, DERIVED FROM OBSERVED REFERENCE POINTS A AND B, BY REAL TIME NETWORK (RTN) OBSERVATIONS, UTM ZONE 17, NAD83 (CSRS) (1997.0).

FOR BEARING COMPARISONS, A ROTATION OF 1°05'30" COUNTER-CLOCKWISE WAS APPLIED TO BEARINGS ON PLAN 99M-123.

DISTANCES ARE GROUND AND CAN BE CONVERTED TO GRID BY MULTIPLYING BY THE COMBINED SCALE FACTOR OF 0.999737.

OBSERVED REFERENCE POINTS (ORPs): UTM ZONE 17, NAD83 (CSRS) (1997.0). COORDINATES TO RURAL ACCURACY PER SEC. 14 (2) OF O.REG. 216/10		
POINT ID	NORTHING	EASTING
ORP A	4860956.1	618820.1
ORP B	4862790.8	617855.2
COORDINATES CANNOT, IN THEMSELVES, BE USED TO RE-ESTABLISH CORNERS OR BOUNDARIES SHOWN ON THIS PLAN.		

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

REMOTE

Positions from ties to "Observed Reference Points" by Precise Point Positioning (PPP).  
Bearings from Astronomic observations.

BEARINGS ARE UTM GRID, DERIVED FROM ASTRONOMIC OBSERVATIONS FROM MONUMENT A TO B, SHOWN HEREON, HAVING A BEARING OF N12°49'00"W REFERRED TO THE CENTRAL MERIDIAN OF UTM ZONE 16 (87° WEST LONGITUDE) NAD83 (CSRS) (1997.0).

FOR BEARING COMPARISONS, A ROTATION OF 1°05'30" COUNTER-CLOCKWISE WAS APPLIED TO BEARINGS ON PLAN 99M-123.

DISTANCES ARE GROUND AND CAN BE CONVERTED TO GRID BY MULTIPLYING BY THE COMBINED SCALE FACTOR OF 0.999725.

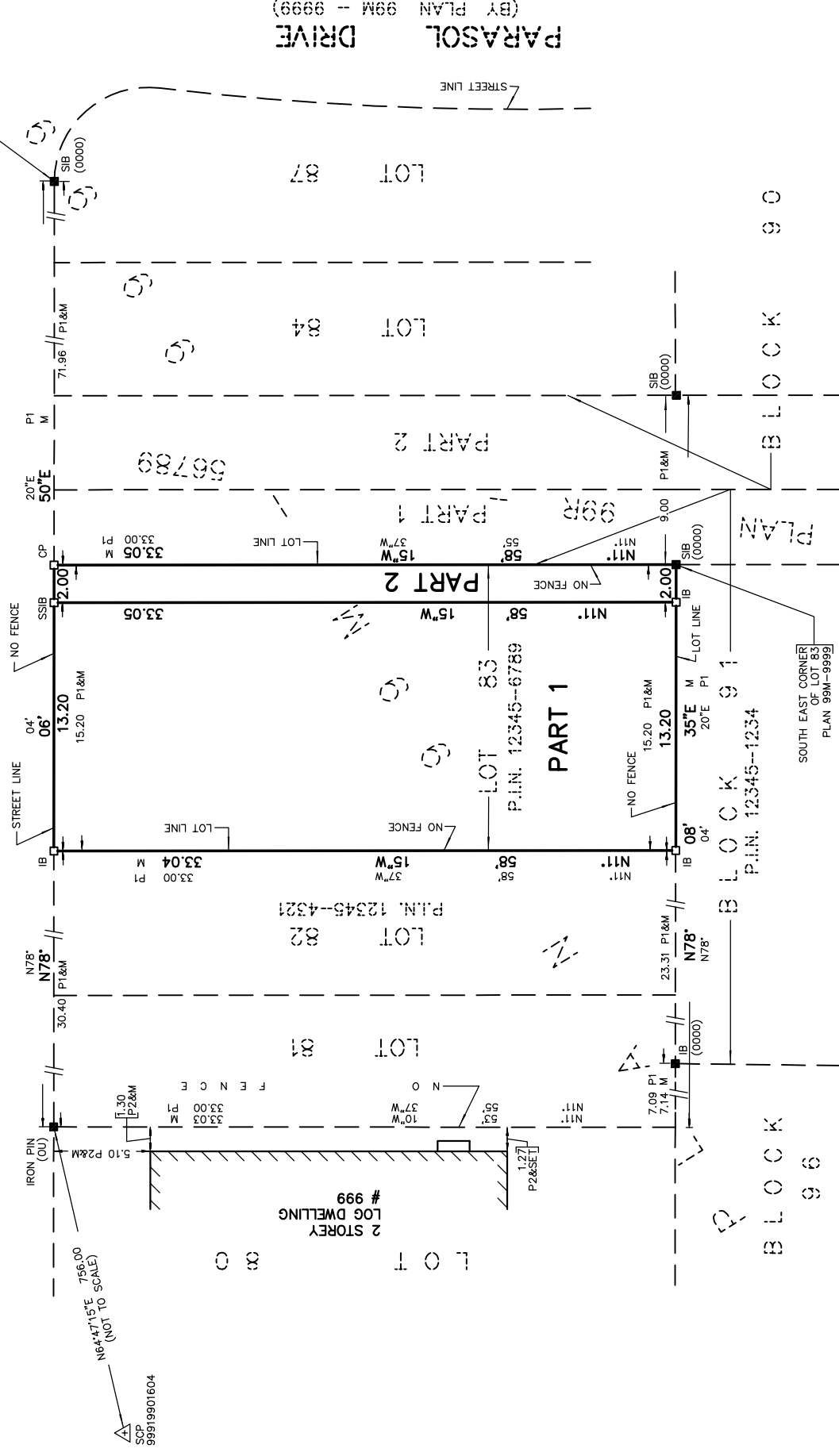
OBSERVED REFERENCE POINTS (ORPs) DERIVED FROM GPS OBSERVATIONS USING THE PRECISE POINT POSITIONING (PPP) SERVICE, UTM ZONE 16, NAD83 (CSRS) (1997.0).		
COORDINATES TO REMOTE ACCURACY PER SEC. 14 (2) OF O.REG. 216/10		
POINT ID	NORTHING	EASTING
ORP A	5522311	397517
ORP B	5522374	397532
ORP C	5522355	397569
COORDINATES CANNOT, IN THEMSELVES, BE USED TO RE-ESTABLISH CORNERS OR BOUNDARIES SHOWN ON THIS PLAN.		

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

**PLAN OF SURVEY OF  
LOT 83  
PLAN 99M-9999  
TOWN OF THEORY  
REGIONAL MUNICIPALITY OF FACT**



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



**NOTES**

- DENOTES MONUMENT SET
  - DENOTES MONUMENT FOUND
  - IB DENOTES IRON BAR
  - SIB DENOTES STANDARD IRON BAR
  - SSIB DENOTES SHORT STANDARD IRON BAR
  - CP DENOTES CONCRETE PIN
  - P.I.N. DENOTES PROPERTY IDENTIFIER NUMBER
  - SCP DENOTES SPECIFIED CONTROL POINT
  - M DENOTES MEASURED
  - (OU) DENOTES ORIGIN UNKNOWN
  - (0000) DENOTES I.B. FIRST LIMITED O.L.S.
  - P1 DENOTES PLAN 99M-9999
  - P2 DENOTES SURVEYOR'S REAL PROPERTY REPORT BY I.Z. SECOND LTD. O.L.S.
- (JOB No. 12345-67) DATED MAY 17, 2000.

BEARINGS ARE MTM GRID, DERIVED FROM SPECIFIED CONTROL POINTS 99919901604 AND 99919993004, MTM ZONE 10, NAD83 (ORIGINAL).  
COORDINATES ARE MTM ZONE 10, NAD83 (ORIGINAL), TO URBAN ACCURACY PER SEC. 14 (2) OF O.REG. 216/10, AND CANNOT, IN THEMSELVES, BE USED TO RE-ESTABLISH CORNERS OR BOUNDARIES SHOWN ON THIS PLAN.

POINT ID	NORTHING	EASTING
SCP 99919901604	5860225.15	320539.93
SCP 99919993004	5860763.51	321395.12

DISTANCES ARE GROUND AND CAN BE CONVERTED TO GRID BY MULTIPLYING BY THE COMBINED SCALE FACTOR OF 0.999910.

**SURVEYOR'S CERTIFICATE**

- I CERTIFY THAT:
- THIS SURVEY AND PLAN ARE CORRECT AND IN ACCORDANCE WITH THE SURVEYS ACT, THE SURVEYORS ACT AND THE LAND TITLES ACT AND REGULATIONS MADE UNDER THEM.
  - THE SURVEY WAS COMPLETED ON THE \_\_\_\_\_ DAY OF \_\_\_\_\_ 2010.

DATE \_\_\_\_\_ 2010

\_\_\_\_\_  
B.A. SURVEYOR  
ONTARIO LAND SURVEYOR

I REQUIRE THIS PLAN TO BE DEPOSITED UNDER THE LAND TITLES ACT.  
DATE \_\_\_\_\_, 2010  
B.A. SURVEYOR O.L.S.

**PLAN 99R-**  
RECEIVED AND DEPOSITED  
DATE \_\_\_\_\_, 2010

ASS'T DEP. LAND REGISTRAR FOR THE LAND TITLES DIVISION OF FACT REGION (No.99)

SCHEDULE		
PART	ALL OF LOT	ALL OF P.I.N.
1	83	99M-9999
2		12345-6789

**B.A. SURVEYOR LTD.**  
ONTARIO LAND SURVEYORS  
123 Main Street, Suite 1  
Theory, Ontario Z9Z 9Z9  
Tel:(999)999-9999 Fax (999)999-9998  
DRAWN: L.J.N. CHECKED: I.M.S.  
JOB No. 10-999 CAD FILE No.10999R02b

SCHEDULE						
PART	MINING CLAIM	LOT OR BLOCK	CON./PLAN	AREA (ha.)	PIN/PARCEL/INST./CROWN	RIGHTS AVAILABLE
1		PART OF THE BED OF LAKE FICTIONAL IN FRONT OF LOT 8, CONCESSION 1		0.030±	CROWN	
2				0.036±		
TOTAL AREA				0.066±		

TOWNSHIP OF BLANK

I REQUIRE THIS PLAN TO BE DEPOSITED UNDER THE LAND TITLES ACT.

DATE: MARCH 23, 2009

*[Signature]*  
I. M. SURVEYOR  
ONTARIO LAND SURVEYOR

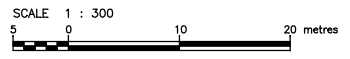
PLAN 99R -  
RECEIVED AND DEPOSITED

DATE

LAND REGISTRAR  
FOR THE LAND TITLES DIVISION OF EXAMPLE (No. 99)

PERMISSION TO DEPOSIT THIS PLAN OF SURVEY OF CROWN LAND WAS GIVEN BY THE SURVEYOR GENERAL OF ONTARIO ON THE 1st DAY OF APRIL, 2009.

PLAN OF SURVEY OF  
LOCATION CL 00000  
BEING  
PART OF THE BED OF LAKE FICTIONAL  
IN FRONT OF LOT 8, CONCESSION 1  
ALSO  
IN FRONT OF LOT 3,  
REGISTERED PLAN 99M-123  
GEOGRAPHIC TOWNSHIP OF BLANK  
MUNICIPALITY OF PLUMB-BOB  
TERRITORIAL DISTRICT OF EXAMPLE



- LEGEND AND NOTES**
- DENOTES FOUND MONUMENT
  - DENOTES PLANTED MONUMENT
  - SIB DENOTES STANDARD IRON BAR
  - IB DENOTES IRON BAR
  - P DENOTES REGISTERED PLAN 99M-123
  - (000) DENOTES I. M. SURVEYOR, O.L.S.
  - WIT DENOTES WITNESS

BEARINGS ARE UTM GRID, DERIVED FROM SIMULTANEOUS GPS OBSERVATIONS ON MONUMENTS A AND B, SHOWN HEREON, HAVING A GRID BEARING OF N12°49'00"W, NAD83 (CSRS) (1997.0) AND ARE REFERRED TO THE CENTRAL MERIDIAN OF UTM ZONE 16 (87 WEST LONGITUDE).

DISTANCES ON THIS PLAN ARE GROUND AND CAN BE CONVERTED TO GRID BY MULTIPLYING BY THE COMBINED SCALE FACTOR OF 0.999725.

FOR BEARING COMPARISONS, A ROTATION OF 1°05'30" COUNTER-CLOCKWISE WAS APPLIED TO BEARINGS ON PLAN 99M-123 TO CONVERT TO UTM BEARINGS.

THE LIMIT OF LAKE FICTIONAL AS SHOWN ON THIS PLAN HAS BEEN ESTABLISHED BY SURVEY AND BY IDENTIFYING THE WATER'S EDGE AS BEING THE BEST AVAILABLE EVIDENCE OF THIS LIMIT. ANY CHANGE IN THE POSITION OF THIS LIMIT AS SHOWN ON REGISTERED PLAN 99M-123 APPEARS TO BE THE RESULT OF NORMAL AND GRADUAL FLUCTUATIONS IN THIS LIMIT.

THE WATERSIDE LIMIT OF PARTS 1 AND 2 IS THE AMBULATORY LIMIT OF LAKE FICTIONAL.

**INTEGRATION DATA**

COORDINATES ARE DERIVED FROM GPS OBSERVATIONS USING THE PRECISE POINT POSITIONING (PPP) METHOD AND ARE REFERRED TO UTM ZONE 16 (87 WEST LONGITUDE) NAD83 (CSRS) (1997.0).

COORDINATE VALUES ARE TO A RURAL ACCURACY IN ACCORDANCE WITH SECTION 14 (2) OF O.REG 216/10

POINT ID	NORTHING	EASTING
A	5522311.25	397517.39
B	5522374.13	397531.69
C	5522354.89	397568.50

COORDINATES CANNOT, IN THEMSELVES, BE USED TO RE-ESTABLISH CORNERS OR BOUNDARIES SHOWN ON THIS PLAN.

- SURVEYOR'S CERTIFICATE**
- I CERTIFY THAT:
- THIS SURVEY AND PLAN ARE CORRECT AND IN ACCORDANCE WITH THE SURVEYS ACT, THE SURVEYORS ACT, THE LAND TITLES ACT AND THE REGULATIONS MADE UNDER THEM.
  - THE SURVEY WAS COMPLETED ON THE 29th DAY OF FEBRUARY, 2009.
  - THIS PLAN AND FIELD NOTES WAS PREPARED FROM AN ACTUAL SURVEY PERFORMED UNDER MY PERSONAL SUPERVISION AND I WAS PRESENT ON THE SITE DURING THE PROGRESS OF THIS SURVEY.

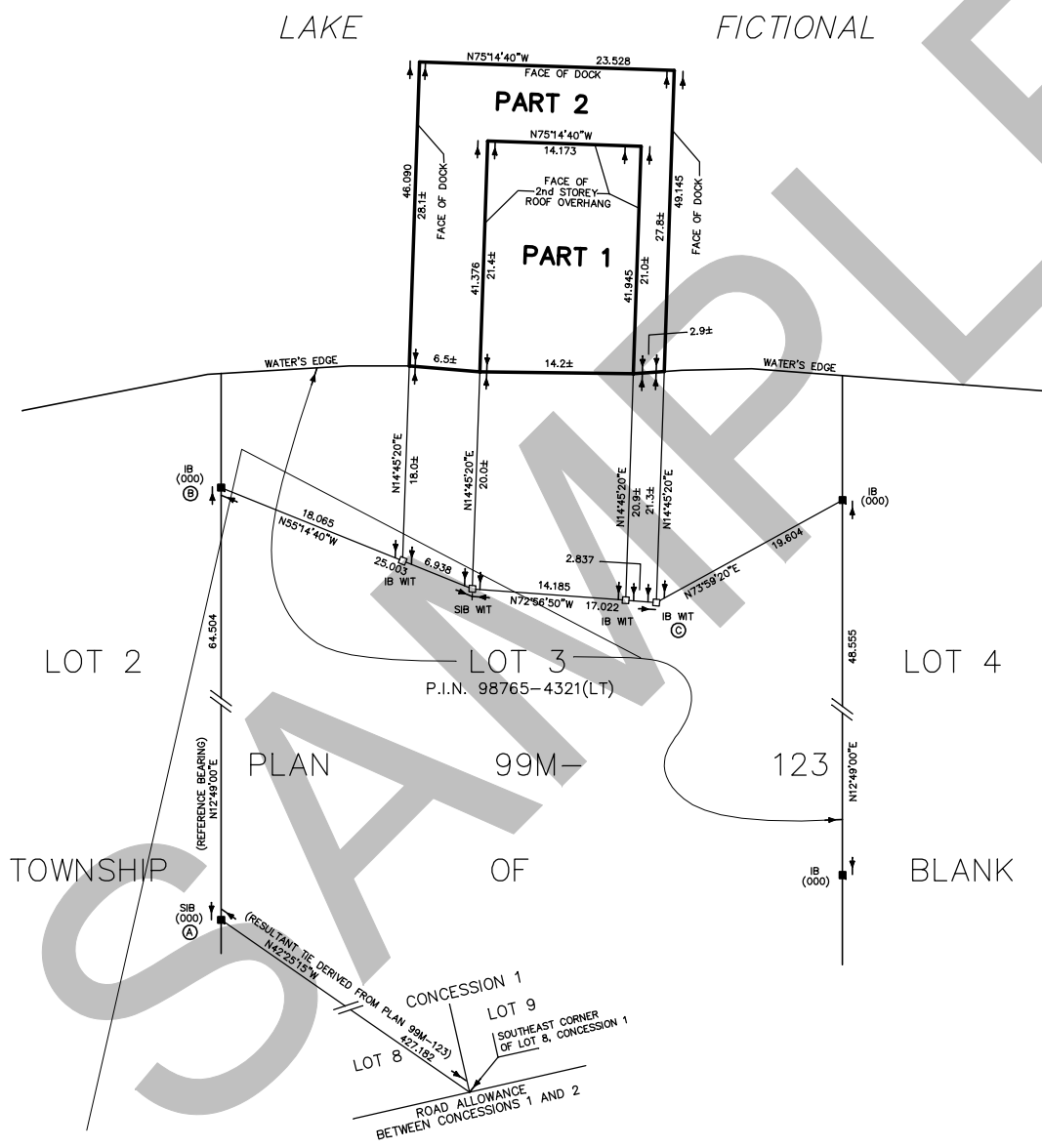
MARCH 23, 2009  
DATE

*[Signature]*  
I. M. SURVEYOR  
ONTARIO LAND SURVEYOR

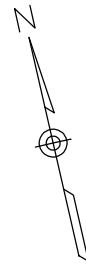
I. M. Surveyor  
Ontario Land Surveyor  
300 WATER STREET, PETERBOROUGH, ONTARIO, K9J 8M5  
TEL: (705) 755-2204 FAX: (705) 755-2149

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

FILE No: Integration Sample Plan V1.02    FIELD: OLS    DRAWN: CAD    CHECKED: OLS



LAKE FICTIONAL



OR:  
SMARTNET NETWORK  
CAN-NET NETWORK  
CONTROL MONUMENTS X & Y  
...ETC.

URBAN RURAL REKOTE

PLAN 99M-123

(REFERENCE BEARINGS)  
N12°49'00"E

CONCESSION 1

LOT 9  
SOUTHEAST CORNER OF LOT 8, CONCESSION 1

ROAD ALLOWANCE BETWEEN CONCESSIONS 1 AND 2