Government of Alberta ■

Geo-Referencing
Digital Plan Submissions

Revisions

December 18, 2009 Revisions	
FAQ 2 amended to reference the grandfather period.	
FAQ 15 – 35 added	
Sample plan added	
March 31, 2010 Revision	
Geo-referencing hierarchy (see page 4) added	
March 31, 2011 Revision	
Re-formatted and created two documents; Geo-referencing Specification document; and Frequently Asked Question (FAQ) document.	

Geo-Referencing Requirements for All Plans Submitted To the Land Titles Office and Sustainable Resource Development

In addition to current Land Titles Office (LTO) and Sustainable Resource Development (SRD) requirements for digital CAD file submissions, the practitioner must provide sufficient information such that the CAD file can be integrated into the NAD83 reference system. To meet this requirement, the CAD file must be geo-referenced. See the end of this document for LTO and SRD layer specification requirements.

Geo-referencing is the process of assigning a coordinate system to a set of data. This is accomplished by identifying a reference point on the plan and assigning geo-referenced coordinates to that point. The CAD file is then rotated to match the appropriate grid orientation. The CAD file **must** contain one point appropriately identified and geo-referenced to either the NAD83 Original or CSRS datum. The CAD file may be prepared using either ground or grid distances.

Geo-Referencing Methods

The preferred methods for determining the coordinates of the geo-reference point are as follows:

1. For a survey performed using Global Navigation Satellite System (GNSS) observations, the plan should be geo-referenced to the GNSS derived coordinates. It is preferred that the surveyor improve the accuracy of the GNSS derived coordinates by using the PPP (Precise Point Positioning) Service from Natural Resources Canada nrcan.gc.ca .

2. For a survey tied to one or more Alberta Survey Control Markers (ASCMs), the plan should be geo-referenced to the observed ASCM coordinates (i.e. GNSS derived), as they more accurately reflect the true location of the survey. If geo-referencing to the published ASCM coordinates, NAD83 (CSRS) are preferred as they are more accurate.

3. For all other surveys, including Descriptive Plans, the geo-referencing coordinates may be determined from either the Cadastral Mapping Database, the Alberta Township System (ATS) version 4.1 (March 2005) coordinates or an existing integrated plan.

The rotation from plan to grid orientation is only applied to the CAD file. The plan should still be prepared using traditional bearing derivation methods.

Geo-Referencing Plan Requirements

The plan requirements for geo-referencing are as follows:

Legend:

- The datum used; either NAD83(Original) or NAD83(CSRS)
- The projection used (3TM, UTM or 10TM) and the appropriate reference meridian
- The combined scale factor used to scale ground distances to the mapping plane
- The grid coordinates of the geo-reference point

- A statement regarding the method used for determining the coordinates of the geo-reference point
- A statement indicating how the grid bearings were determined. Examples of appropriate grid bearing statements are:
    o Bearings are grid, derived from GNSS observations
    o Bearings are grid, derived from the line between ASCM _____ and ASCM _____
    o Bearings are assumed from Plan _____

    > **Note**: If the bearings are assumed from a plan then the corresponding grid bearing for the reference line must be shown in the legend.

    o Bearings are assumed from the East Boundary of NE 1-49-7-5

    > **Note**: If the bearings are assumed from a Township Plan then the corresponding grid bearing for the reference line must be shown in the legend.

    o Bearings are grid, derived from published ATS coordinates

    > **Note:** The ATS points used must be listed, i.e. E ¼ 1-49-7-5 to NE 1-49-7-5.

Body of the Plan

- The geo-referenced point using the prescribed symbol (a solid line circle with a recommended plot radius of 2.2 mm and plot thickness of 0.25 mm accompanied by the unique text identifier "RP").

    > **Note**: The symbol and text must be shown in the main body of the plan and appear in the plot or PDF file which becomes the registered plan (plan of record) at LTO or SRD.

    > **Note:** The centre of the symbol in the CAD file must digitally match the grid coordinates of the geo-reference point shown on the plan.

- If a geo-referenced point is outside the main body of the plan the practitioner must:
    1. Place the symbol and text in the correct geo-referenced position and on the prescribed layer in the CAD file.
    2. Show a copy of the symbol on the main body of the plan with a broken line. This symbol must appear in the pdf or plot file, which becomes the registered plan (plan of record) at LTO or SRD.

Land Titles Submissions:

LTO Layer/Level Specification Description	Layer
Type Of Survey, Condominium Drawing Title(Floor Plan or Cross Section) and Location (Section, Township, Range, Meridian)	1
Scale Bar And Scale Text	2
Legend and North Arrow	3
ALS Affidavit, Surveyors name and Registration Number, (John Smith A.L.S. Registration Number 1234) and Owners Name	4
Map Sheet Border, Company Name And File Number	5
Linework and Text for Local Authority Approvals, LTO Approvals and Condominium Corporation Address	6
Subdivision/RW Plan Area (Area To be Registered)	7
Outline / Inline Area To Be Registered	8
Property And RW Linework **Outside Area To Be Registered**	9
Text For Linework **Outside Area To Be Registered** (bearings, distances, lot and block numbers, etc.)	10
Phantomized Linework For Superceded Plans and Phantomized Lot, Block and Plan Numbers	11
MASCOT Number and Symbol and ASCM tie linework and text; lines may be broken for plot purpose, not to scale	12
Symbols (IP Planted, IP Fd., Drill Holes, Etc.) and associated text	13
Dimension Arrows and Lines	14
Street Name, Lane, Road Allowance and WalkWay Text	15
Condominium Unit Factors Table, Individual Lot and Parcel Areas, Certificate of Title Number in Lot/Parcel	16
Section, Block Lines, Unbroken **Within Area To be Registered**	17
Section,Lot,Block Lines **up to** Survey Post **Within Area to be registered (trimmed linework)**	18
Lot/Condo Unit Numbers **Within Area To Be Registered**	19
Block Numbers **Within Area To Be Registered**	20
Registered Plan Number, (generally blank, number added after registration)	21
Line Bearings, Distances, Lot Dimensions, Arc, Radius, Chord Info B and E of Curve, Delta (Text) **within area to be Reg.** and associated lead lines, arrowheads and dimension linework	22
Street And Lane Widths **Within Area To Be Registered**	23
Lot Lines Unbroken **Within Area To Be Registered;** including Bareland Condominium Unit Boundary	24
ASCM Symbols and text identifier at true coordinates or to scale	25
Right-Of-Way Plan - Dimensions And Distances include assoc. lead lines, arrowheads and dimension linework **within area to be Reg.**	26
Right-Of-Way Dashed Line, (generally used on Subdivision plans) **for new R/W plans**	27
Right Of Way Linework, intersecting/unbroken At IP Symbols **for new R/W plans**	28
Right Of Way Descriptor (e.g. Utility R/W)	29
Lot Line And Text In Hydrology - Within Hydrology	30
Section,Block Line In Hydrology, Block Nos., Dimension Within Hydrology	31
Hydrographic Features Linework and Feature Names	32
Location/Place Name (City, Town, County, Municipal District)	33
Misc. Information	34
Geo-Reference Point (RP) Symbol and Text. The entire drawing should be moved to the georeferenced point. The point is to be **i**dentified by a symbol. The centre of the symbol must have the correct absolute coordinates. The symbol consists of a concentric circle around the appropriate (planted or found) IP symbol. Place the "RP" text next to RP symbol. See examples below: Planted IP: Found IP: *Updated June 2, 2009	35*

Public Land Dispositions

Layer Specification for Digital Disposition Submissions

Layer / Level	Feature
9	**Property, R/W and Adjacent Dispositions** Contains the linework of adjacent existing property, r/w and surface activities/dispositions as indicated per content requirements for that disposition. Typically outside area of interest. ATS (section) linework broken for plot purposes.
10	**Text** Contains the text for adjacent surface activities / dispositions, property and r/w. Leaders and arrows are acceptable.
17	**ATS (Section)** Linework not to be broken and must be topologically clean. ATS linework must be completed for the entirety of all 1/4 sections affected by the surface activity. There must not be any text element on this layer/level.
28	**Disposition boundary** This linework shows the limits/boundaries of the disposition. It must be bold enough to eliminate any possible confusion and not dashed. In the case of an MSL and LOC on the same plan, the linework is not to be duplicated. This linework must be topologically clean, no duplicated linework and no dangles or undershoots. There must not be any text element on this layer/level.
35*	**Geo-Reference Point** (RP) Symbol and Text. The point must be identified by a symbol. The centre of the symbol must have the correct absolute coordinates. The symbol consists of a concentric circle around the appropriate (planted or found) IP symbol. Place the "RP" text next to RP symbol. **Examples:** Planted IP: Found IP:
40	**Surface Activity Code Text** i.e: MSL, PLA (not required to display on plot or image file). Insertion point must fall within the limits of the disposition in each Crown parcel or ATS land. There must be text elements on this layer/level.

*Updated June 2, 2009