DIGITAL SURVEY PLAN STANDARDS

FOR MUNICIPAL APPLICATIONS

Version 1 - July 15, 1996

Crown Land Registry Services
Office of the Surveyor General
Ministry of Environment, Lands and Parks

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1. INTRODUCTION

The purpose of this publication is to provide a second version of digital plan standards for the receipt of digital survey information, from land surveyors, for municipal purposes.

The purpose of the standards is to provide a uniform format for digital survey information where required by municipalities in order that surveyors working in a number of municipalities will not have to maintain a different format for each municipality. Municipalities which adopt the standards will not, of course, have to receive different formats from different surveyors and will, therefore, be able to streamline their mapping update process. The format also reflects a structure which, in our view, will act as a component in the future development of digital survey returns for legal surveys, however, it is not intended that the standards outlined herein cover all of the information which will ultimately be required for the submission of digital survey returns for legal surveys.

It must be recognized that both surveyors and municipalities use a wide variety of software and plan/mapping formats and that some translation software may need to be developed in order to transmit and receive digital survey data in the formats required by the standards, however, having to do this for only one set of standards will, in our view, be cost effective for all parties.

2. BACKGROUND

In 1994, the Corporation of the District of Saanich (Saanich) recognized a need for digital plan standards for the exchange of survey information required by municipalities, from professional British Columbia land surveyors, for municipal mapping purposes. Saanich approached the Surveyor General for assistance with the development of standards and a project committee was formed with representatives from Saanich, the Corporation of Land Surveyors of the Province of British Columbia (corporation).

Prior to issuing Version 0 of the draft standards, the Office of the Surveyor General retained four different firms of land surveyors, using a variety of computer driven drafting systems, to prepare digital survey information in accordance with the standards for testing purposes by both the branch and Saanich. This led to further fine tuning of the draft standards which were issued in October of 1994.

Version 0 was distributed to all land surveyors by the corporation and Saanich forwarded the draft standards to the Union of British Columbia Municipalities for distribution to its member municipalities. Input was solicited by the Surveyor General throughout the testing period from October of 1994 until the present time. In response to comments received, minor amendments have been incorporated into Version 1.

3. FUTURE DEVELOPMENT OF STANDARDS

Version 1.0 of the standards can be considered phase 1 in the development of a more broadly based system for the preparation and use of digital survey plans in British Columbia. Version 1 serves as a starting point for streamlining the use of survey plan information within municipalities. The need for standards has been identified at the municipal level and this version have emerged as the result of leadership from Saanich.

It is expected that phase 2, which may occur over several years or more will include such things as:

- the standards for preparation;
- the process and requirements for deposit/storage/registration;
- integration into the spatial cadastral data base; and
- data sharing (through a digital repository or warehouse) of digital survey plan information.

The development of standards and procedures will have to address such issues as data models, geopositioning, security, data flows and other related items. Ultimately, the evolution to digital survey plans needs to be designed to support more effective integration into the business functions of local and provincial governments, the survey profession and the private sector. How these are to be developed and implemented will include the collaboration and coordination of a wide range of groups and interests. The goal is to build a model that supports the wide variety of interests.

4. CHANGE MANAGEMENT

The version 1.0 standards may need modification, enhancement or clarification while the longer term work is underway. In the short run, consultation between the Corporation, local government, and Crown Land Registry Services, Office of the Surveyor General will be utilized to manage change. In the longer term, a structure for change management that includes the variety of interests will need to be developed.

Organizations interested in participating in the change process or in the next phase of this work should make this interest known to the Office of the Surveyor General.

In addition, it would be appreciated if comments, suggestion, or issues on the version 1.0 standards could be forwarded to the Office of the Surveyor General.

Please send comments to: Office of the Surveyor General
Crown Land Registry Services
Ministry of Environment, Lands and Parks
3400 Davidson Avenue
Victoria BC V8V 1X4

5. DIGITAL SURVEY PLAN STANDARDS

5.1. DEFINITIONS

Coordinate System Means a system used to define positions on a grid composed of axes in the north and east directions.

DXF Means Drawing Interchange Format, a published file format in ASCII form which allows the exchange of drawing data between software packages capable of DXF support.

GPS Means Global Positioning System which is a satellite based positioning system.

Layer Means a class of data which can be viewed separately or combined with other data, similar in concept to the transparent overlays used for hard copy maps.

Polyline Means an entity comprising one or more connected line segments or curves, treated as a single entity.

Scenery A survey term used to describe the depiction of parcels and their descriptions (including rights of way, etc.) surrounding the area under survey.

UTM Means Universal Transverse Mercator--a mapping projection which depicts the earth's surface on a rectangular grid.

5.2. STANDARDS FOR RECORDING SURVEY PLANS INFORMATION

The following standards categorize the information contained in a survey plan into a variety of features. Each of these features is stored in a separate layer. Adherence to these standard layers allow users of the information to extract what is required in an efficient manner, prepare screen or hard copy plots in an efficient process, and exchange information.

The topic numbers below refer to layer names in the DXF file.

5.2.1. LINEAR FEATURES

LAYER NAME	DESCRIPTION
1	**Parcel Lines (new parcels being created by the plan including rights of way, easements, covenants, etc.)** This layer contains all boundaries of parcels being created by the plan, including boundaries which coincide with boundaries of the parent parcels. Lines and arcs must start and stop at each angle of a parcel and at intersections with traverse lines such as a traverse along a natural boundary. Natural boundaries shall be polylines which terminate at their intersections with parcel boundaries. In other words, all parcels must be closed shapes. In cases where a subdivision involves supplementary plans, individual files are required for each plan (e.g. a file for the subdivision plan, a separate file for a right of way plan and another separate file for a covenant plan--even though all may cover the same general area).
2	**Property Lines except District Lot or Section Boundaries (scenery)** This layer contains the boundaries of parcels which are shown for scenery purposes and the boundaries of new parcels as "truncated" for plotting purposes in order to leave the symbols clear of lines.
3	**Natural Boundary Traverse Lines and Offsets and other necessary tie lines which must be shown for survey reasons** Lines shall be fine broken lines (4 mm line, 2 mm space).
4	**Control Monument Ties** This layer shall show the actual ties made to the control monuments. Lines shall not be shortened or truncated for plotting purposes and shall be fine broken lines (4 mm line, 2 mm space).

5 **Heavy Outline**

The heavy outline shows the lands being dealt with by the plan. The heavy outline will be coincident with lines on layer 1, except that it will be clear of symbols.

6 **Rights of Way, Easements, Covenant Areas, etc. (scenery)**

This layer contains boundaries of rights of way and easements which are shown for scenery purposes. Lines will be fine broken lines (8 mm line, 2 mm space). Lines need not start and stop at each intersection with new parcel boundaries except where the intersection is posted.

Layers 1, 2 and 5 will, in the case of a plan of a right of way, easement, road or covenant area, contain the new boundaries. Layer 6 is meant to show existing rights of way, etc. for scenery purposes.

7 **Ghosted Boundaries**

Underlying boundaries of parent parcels shall be shown in fine broken lines (3 mm line, 2 mm space).

8 **District Lot or Section Boundaries (scenery)**

Solid where still in effect. Dashed where being cancelled or are no longer a parcel boundary (18 mm line, 2 mm space, 3 mm line, 2 mm space). These lines will also be clear of symbols.

NOTE: New district lot or section boundaries being established by a *Land Act* or *Mineral Tenure Act* survey are on layers 1, 2 and 5.

9 **Radial Lines of Curves**

Radial lines on this layer shall be to the actual curve centre and shall not be truncated. Lines shall be fine broken lines (6 mm line, 2 mm space).

5.2.2. POINT FEATURES

LAYER NAME	DESCRIPTION
10	This layer shall contain post and other symbols. The standard symbols shall be as found in Section 10(1) of the General Survey Instructions.

5.2.3. SURVEY ATTRIBUTES

LAYER NAME	DESCRIPTION
11	Attribute data shall be in default text and shall include, but not be limited to, the following example:

Coordinate System	*UTM (NAD 83)*	*(or LOCAL)*
UTM Zone	*10*	*(or N/A)*
Mean Combined UTM Scale Factor	*0.99960356*	*(or N/A)*
X coordinate of base scale point	*0.000*	
Y coordinate of base scale point	*0.000*	
Rotation Angle (ddd.mmss)	*045.0000*	
X coordinate of base rotation point	*457123.234*	
Y coordinate of base rotation point	*5385123.456*	
Surveyor's Commission Number	*2222*	

5.2.4. TEXT

LAYER NAME	DESCRIPTION
12	This layer shall contain: • Areas of new parcels. • Control monument identifiers. • Miscellaneous text (i.e. bearing trees, old evidence, etc.)
13	New parcel designations for parcels on layer 1.

14	This layer is to contain textual information for surrounding "scenery" parcels including: • Parcel designations. • Block designations (if any). • Plan numbers.
15	This layer shall contain all ghosted text of underlying parcels being cancelled.

5.3. GENERAL NOTES

5.3.1. COORDINATE SYSTEMS

- Within integrated survey areas or where a survey is controlled by approved differential GPS methods, UTM coordinates on the projection (not ground level) shall be used and shall be based on NAD 83. The scale factor given in the attribute data shall be the mean combined scale factor for the survey.

- Where a survey lies outside of an integrated survey area and GPS control is not used, a local astronomic meridian shall be adopted and assumed coordinates of not more than 100,000.000 and 100,000.00 shall be used. Coordinates need not be reduced to sea level, however, this shall be specified in the attribute data by placing "local" in the coordinate system block and "N/A" in the UTM zone and combined scale factor blocks.

5.3.2. MISCELLANEOUS

- All text on layers 13, 14 and 15 shall be centre middle justified.

- DXF files shall be two dimensional (2D) files and elevations/Z values shall always be "0".

- Layer numbers shall not be zero filled for layers less than 10 (i.e. layer one shall be "1" and not "01").

- Parcel designations on layers 13, 14 and 15 shall be as follows:

  - For a *Land Title Act* parcel - "A" or "1" (not "Lot A" or "Lot 1") or, if assigned, as assigned by the Registrar (i.e. "Parcel 1").

  - For a *Land Act* parcel - D.L. 1000 or Bk. A.