

# Surveyor's Manual for ePlan

LISCAD Version 12.0 with ePlan Add-on



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# 1 Introduction To ePlan

ePlan is a national initiative spearheaded by the Intergovernmental Committee on Surveying and Mapping (ICSM) to replace the existing paper and PDF plans of subdivision with a new electronic file format. This enables the computerisation and automation of many industry and government processes resulting in a more efficient land administration business and higher quality cadastral data.

The ePlan implementation project in Victoria consists of the following building blocks:

- A Victorian ePlan file format
- ePlan supported survey software packages
- Internal government computer systems to manage ePlan through the land administration process.

This document supports the first two building blocks. The following sections explain the basic requirements for compiling an ePlan and an overview of how to perform this in your chosen surveying software package.

## 1.1 ePlan File Format Overview

The ePlan File is a specialised data file for storing and transferring survey information. It is based on the national ICSM ePlan Protocol which defines a common format for all jurisdictions to capture and transfer survey information. Unlike conventional spatial file formats such as DXF, DGN, Shapefile and KML which are designed for GIS applications, ePlan is focused specifically on capturing cadastral information. The significance of this is that not only does ePlan capture conventional spatial data, it also captures the administrative and land interest information attached to spatial data. For example, land parcels are defined with their type (single, part and multipart), class (lot, road, etc.) and identifier (lot number) attached to the polygon. Because this information is built into the file format, the information is 'intelligent' and can be used by computer systems for a number of downstream land administration purposes.

## 1.2 Spatial Object, Interest, Relationship Concept

A subdivision is represented in ePlan by breaking down the land into 3 main components. The Spatial object defines the boundaries for the subject land. The interest defines what the land represents. Relationships between interests are common in capturing conditions on land eg: easement beneficiaries.

The Parcel element is the universal element used to capture these 3 components. It contains an array of attributes to define the interest, a geometry structure to define the spatial object and a parcel linkage mechanism to define relationships. It is important to understand the ePlan definition of Parcel is any interest defined on the plan including secondary interests such as easements and restrictions. This is different to the definition of a cadastral parcel.

## 1.3 Coordinates vs. Dimensions in ePlan

ePlan is primarily a dimension based file. However, coordinates are captured against all vertices for the purpose of visualisation. They are not used for validation or update of cadastral databases. Coordinates allow the surveyor to distort the diagram to produce a more appealing visualisation.

ePlan requires dimensions against every boundary, traverse and radiation. Dimensions form the basis of the survey information in ePlan and are used for survey validation and update of cadastral

databases. The only coordinates used for survey purposes in ePlan are the Permanent Mark and Primary Cadastral Mark coordinates that provide the connection to MGA.

**NOTE: All ePlans must be connected to MGA.**

## 1.4 Unsupported Plan Types and Components

The following are currently unsupported by either the ePlan file format, Validator, Visualiser or LISCAD:

- Building subdivisions – not supported by file format, Validator, Visualiser and LISCAD, however plans with boundaries defined by building are supported
- Boundary Plans - not supported by file format, LISCAD, Validator and Visualiser
- TLA Plans - not supported by file format, LISCAD, Validator and Visualiser
- Crown Plans - not supported by file format, LISCAD, Validator and Visualiser

These features will be rolled out progressively. Please contact the ePlan support team for information for options regarding these types of plans.

**The following sections provide a guide on elements and terminology of ePlan that differ in some way to the information captured on paper/PDF plans.**

This guide aims to be generic. Be aware that some of the terminology may be slightly different between software packages. The terminology used in this guide is directly from the ePlan specifications. Where necessary, explanations and translations are provided.

## 1.5 Administrative Data

### 1.5.1 Head Of Power (Legislation)

Although this is generally not annotated on plans, ePlan requires the surveyor to specify the Act or Acts that apply on the plan. Generally all plans use the *Subdivision Act 1988*. Plans with owners corporations must also use *Owners Corporations Act 2006*.

### 1.5.2 Survey Purpose

Survey purpose refers to the sections under the Subdivision Act 1988 that apply to this plan. Both primary and additional plan purposes must be included. For example, Section 22 is specified for subdivisions and consolidations. If an easement is created as an additional purpose, then Section 23 must also be specified.

### 1.5.3 Survey Type

Survey Type refers to whether the plan is based on survey, non-survey or partial survey. ePlan uses slightly different terminology. The translation is as follows:

- Surveyed = Survey
- Computed = Non-survey
- Compiled = Partial-survey

### 1.5.4 Administrative Areas (Location of Land)

The required administrative areas for ePlan are LGA, Parish and Townships (if applicable).

## 1.6 Parcel Topology

The following is a guide to the ePlan Parcel element and how to use it to capture various components of a plan diagram. Note that the term Parcel in ePlan refers to any type of land interest including easements and restrictions.

### 1.6.1 Introduction to the ePlan Parcel

The Parcel element captures information about an interest over land. It contains attributes that define the interest, and geometry to define the spatial extent of the interest.

The core attributes of a Parcel that define the interest are as follows:

Parcel Attribute	Usage
Name	The parcel's SPI or equivalent unique identifier
Type	eg single or multipart
State	eg extinguished, created or affected in this plan
Class	eg Lot, Road, Reserve, Easement, Restriction, etc
<i>Additional attributes are used for specific purposes such as:</i>	
Description	used for road names
Owner	used to capture authority beneficiaries for easements, or vesting authority for roads/reserves
Use of parcel	captures easement purposes

### 1.6.2 Created and Extinguished Primary Parcels

A primary parcel/interest is a parcel with a class of Lot, Stage Lot, Road, Reserve, Common Property, Crown Allotment and Crown Portion. These parcel classes form the base cadastral layer.

Extinguished parcels are the parcels to be subdivided in the plan. A full spatial definition of them is required in ePlan. Created parcels are the new subdivided parcels that sit over the extinguished parcels. The area covered by created parcels should fully 'consume' the area covered by extinguished parcels.

### 1.6.3 Secondary Interests (Easements and Restrictions)

Secondary interests are defined as parcels with a class of Easement, Restriction and Depth Limitation (a type of restriction). The method for capturing these types of parcels in ePlan is different to the way they are represented on paper plans. This is because ePlan is a data centric file, while paper plans are created to be easy to visually interpret.

Easements are captured in ePlan as their individual interests. An easement interest is defined by the purpose and beneficiary. For example, a pipeline easement owned by a water authority is one easement interest. Its full spatial extent is captured as a polygon which is assigned to the interest. The polygon is shared between easements that have different interests over the same area. For example, if the same area of pipeline easement is also a footpath for the benefit of the land in the plan, the polygon is only drawn once in the plan and linked to both interests. Where an easement overlaps, there is no manipulation of the overlapping section in ePlan. The overlapping easements will be automatically identified and represented by the Visualiser within SPEAR. Easement polygons can also be split using a multipart parcel to capture each easement segment.

Restrictions are captured as one single parcel per restriction condition. This condition is captured as the description of the parcel. If a spatial definition is required for the restriction, this is captured as either a single polygon or as a multipart parcel.

#### 1.6.4 Title Connections

A title connection is shown in ePlan as an adjoining existing road or crown allotment parcel. Only the abutting boundary of the parcel needs to be drawn (the parcel does not need to be a closed polygon). The centroid of the parcel (the label) needs to be placed on the correct side of the boundary indicating the position of the parcel.

### 1.7 Parcel Identifiers in ePlan

ePlan uses a standardised element identification system based on the Standard Parcel Identifier system used for titles in Victoria. Every interest type has a specific identifier format that must be used when creating new interests on a plan. The basis of the format is as follows:

[Parcel ID] \ [Plan Number]

For example, Lot 1 on plan PS123456 is represented as 1\PS123456.

**NOTE: For the ePlans that do not have Plan Number at the time of submission to SPEAR, the term 'LV-To-Supply' must be entered as the Plan Number. This value will be replaced with the relevant Dealing Number from the Victorian Online Titling System (VOTS) once the ePlan is registered at Land Victoria.**

Various software packages will provide different levels of functionality when it comes to generating and assigning identifiers. Ensure that you understand how parcel IDs are created in your specific package. Different interest types have different ID formats. The table below outlines the various formats used.

Parcel Type	Format	Example
Lot	[#] \ [Plan Number]	1\PS123456
	G [#] \ [Plan Number]	G101\PS123456
	B [#] \ [Plan Number]	B30\PS123456
* Balance Lot	BL [#] \ [Plan Number]	BL1\PS123456
* Consolidated Lot	1 \ [Plan Number]	1\PC123456
Common property	CM [#] \ [Plan Number]	CM1\PS123456
Road \ Road Abuttal	R [#] \ [Plan Number] or	R1\PS123456
* Road Abuttal	ROAD – [%]	ROAD-1
Reserve	RES [#] \ [Plan Number]	RES1\PS123456
Geometry Easement		
* Easement (Encumbering)	E [#]	E1
* Easement (Appurtenant)	A [#]	A1
* Encumbering Easement (Road)	R[#]	R1
Standard/2D Building Easement	EAS [#] \ [Plan Number]	EAS1\PS123456
Restriction	RST [#] \ [Plan Number]	RST1\PS123456
Owners Corporation	OC [#] \ [Plan Number]	OC1\PS123456



Crown Parcel	[Allot#] ~ [Sec#] \ [Parish Plan] [Portion#] \ [Parish Plan]	31~2\PP5509 or 1\PP4568
Depth Limitation	DL-[origin]	DL-24~2\PP1234
Staged Lot	S [%] \ [Plan Number]	S1\PS123456
Part Parcel	[Prefix] [#] – p [#] \ [Plan Number] Exception for Part Geometry Easements	1-p1\PS123456 E1-p2

## 1.8 Survey Data

The surveyor is required to capture the 'control traverse' in an ePlan. This consists of all the permanent marks, reference marks, instrument points and the traversing between them. Traversing, radiations and boundary dimensions are captured using the Reduced Observation element in ePlan. Most of the attribute information is self-explanatory however the following unconventional terminology is explained below.

### 1.8.1 Observation Purpose

Observation purpose is the equivalent of a line type. It defines broadly what the observation is used for. The values are built into LandXML resulting in strange names that are unrelated to their real purposes. In future releases of LandXML, ICSM is looking to change this to allow better naming conventions. The purpose types used in ePlan are as follows:

Observation Type	Usage
Normal	Parcel boundaries including lots, roads, common property, easements, restrictions etc.
Traverse	Traversing to/from marks
Sideshot	Radiations to/from marks
Topo	Connection lines for fixing floating easements and restriction footprints, and road splays

## 1.9 Interpreting Existing Plans for ePlan

The differences between paper plans and ePlan necessitate a degree of interpretation when carrying forward existing interests or conditions from paper plans to a new ePlan. The following sections outline some of the major areas of differences and explain how to correctly interpret and translate paper plan information to the ePlan format.

### 1.9.1 Easements

Easements in ePlan are captured using a slightly different method to paper plans. In ePlan, first a polygon (Geometry easement) is created in the diagram for each easement area, then the polygon is assigned to the easement interest (the combination of origin, purpose and beneficiary). If there are multiple interests over the same easement area, the polygon is not duplicated and will be simply assigned to all relevant interests.

The current paper plan method creates new easements where overlaps occur. In ePlan, the overlapping section is not a separate Parcel element and is automatically identified and visualised by the ePlan Visualiser within SPEAR. The following diagram taken from a paper plan illustrates this

concept. In ePlan, each coloured polygon is captured as a Geometry easement which will be assigned to an easement interest. The overlapping easements E-8 and E-9 which are captured separately in the paper plan will not be captured in ePlan.

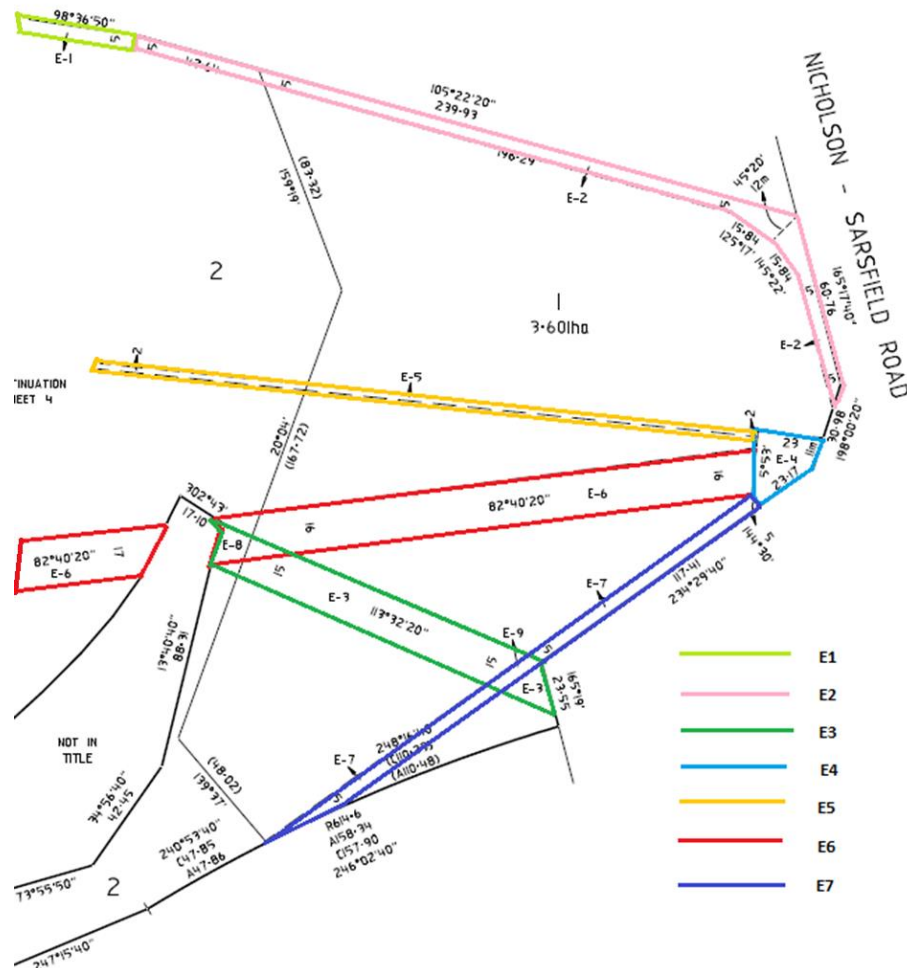


Diagram showing easements in ePlan

### 1.9.2 Restrictions

Restrictions are captured as Parcel elements in ePlan. Existing restrictions must be given a SPI code in ePlan. The process to do this, is very simple. Restriction 1 on PS123456X becomes RST1\PS123456. It is possible multiple surveyors will come across existing restrictions that require a derived SPI code for ePlan. Correctly using this rule to derive the SPI should result in consistency between ePlans. Any errors will be picked up at examination time.

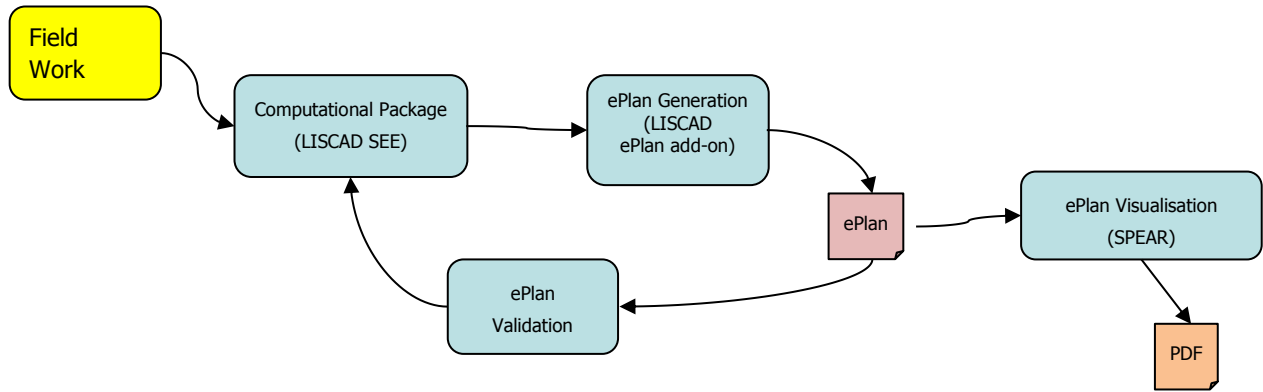
Restrictions frequently show footprints for the area affected. In many cases, a restriction applies to multiple footprints. To handle this, the restriction is captured as a multipart parcel with each footprint polygon as a part of the multipart.

## 1.10 ePlan Preparation Process

ePlan-enabled surveyors in SPEAR are able to lodge an ePlan as the Plan of Subdivision or Consolidation. Once the ePlan is uploaded successfully to SPEAR, the ePlan Validation Service checks for completeness and correctness to the ePlan Protocol and plan examination rules and provides the

surveyor with an 'ePlan Validation Report'. The ePlan Visualiser then generates a fully drafted PDF plan from the ePlan file.

The following figure illustrates the current process for the creation, validation and visualisation of ePlan.



### 1.10.1 Resolution of Bearings and Distances in ePlan

ePlan requires all bearings and distances to be shown to second-of-arc and millimetre resolution. Depending on the size of the plan, the drafted PDF may only be rounded to the nearest minute and centimetre (or lower). To maintain consistency between ePlan and PDF, ePlan bearings and distances, when rounded, should produce the same result as shown on the PDF.

### 1.10.2 Closure Rules

When preparing an ePlan, all closures on title, traversing and observations where there are discrepancies must be within the misclosure vector of 1.4mm. This is the maximum misclosure allowed for bearings and distances shown to the stated resulting in section 1.7.1 Surveying (Cadastral Surveys) Regulations 2005. If a title closes within survey tolerance specified by the Surveyor General but does not close within the 1.4mm misclosure vector, then an adjustment must be made to the title boundary dimensions. The preferred method to use in this situation is to maintain title bearings and adjust the misclosure out of the distances only. A Crandall adjustment (least squares on distance only) is suitable for this purpose. If there are survey differences causing misclosures, then existing Surveyor General's guidelines apply.

Any adjustment to title dimensions must be accompanied by a Surveyor's Report Annotation justifying the adjustment. If the adjustment purpose is to remove rounding errors, then only a simple statement is required eg: '*Title adjusted to close within millimetre tolerance.*'

## 2 Getting Started with ePlan in LISCAD

**NOTE: When referring to menu options, the bracketed menu indicates the LISCAD task mode that must be selected before going to the menu item e.g: (Task→Utilities) Configure→Units indicates to first select Task→Utilities and then Configure→Units.**

### 2.1 Units Configuration

Upon installing or upgrading LISCAD, units configuration should be performed to prepare the workstation for ePlan creation. Go to **(Task→Utilities) Configure→Units**.

**NOTE: You are not able to save the changes until you have an opened project.** Table on the right shows the recommended settings:

Configuration Item	Setting
Angular > Sexagesimal	North Azimuth
Co-ordinates	Grid
Azimuths	Plane Bearing
Distances	Ground
Linear	Metres
Area	Ha./Sq.Metres
Volume	Cubic Metres
Grade	Percent

#### 2.1.1 Unit Rounding/Precision

In **(Task→Utilities) Configure→Distances, Angles and Areas**. Set distance rounding to the millimetre (0.001), bearings to the second (1") and areas to the square centimetre (0.01).

### 2.2 Plan Details

The plan details can be entered through menu **(Task→Utilities) Edit→Details**. The 'Operator' name in Details window will be exported to ePlan as the author of ePlan file. If the 'Operator' name is not entered in this window, the author of the ePlan would be exported as 'LISTech Pty Ltd'.

## 2.3 ePlan Code Table

Import the ePlan code table for Victoria - .ctb file (a sample is available on SPEAR website) to the following directory:

in Windows XP→ C:\Documents and Settings\All Users\Application Data\LISCAD\11.3\uk

In Windows 7→ C:\ProgramData\LISCAD\11.3\uk

Select the ePlan code table through menu **(Task→Utilities) Configure→Code Table**.

### 2.3.1 Adding Codes to the Code Table

If a required code is not present in the code table, it will need to be added.

All the available codes are listed in the LISCAD Code Table Reference supplied by LISTECH. To add a code to the code table, go to **(Task→Utilities) Tables→Code Tables→Open**. Select the ePlan code table, tick 'Table View' and click 'OK' to open the table. Once the table is shown, go to View and select the feature type among point, line and polygon types. Add the code you require by typing into the bottom row of the table. Type in an appropriate group for the new code and any other preferences and the save and close the table.

## 2.4 Lookup Table

Surveyors usually create diagrams using their own defined codes. Mapping these codes to ePlan codes, required by LISCAD, may be very error prone and tedious for big and complex diagrams. Using Lookup Table in LISCAD, users are able to map their own specific codes to ePlan codes automatically.

To create a new Lookup Table, go to **(Task →Utilities) Tables→Lookup Table→New** and enter a name.

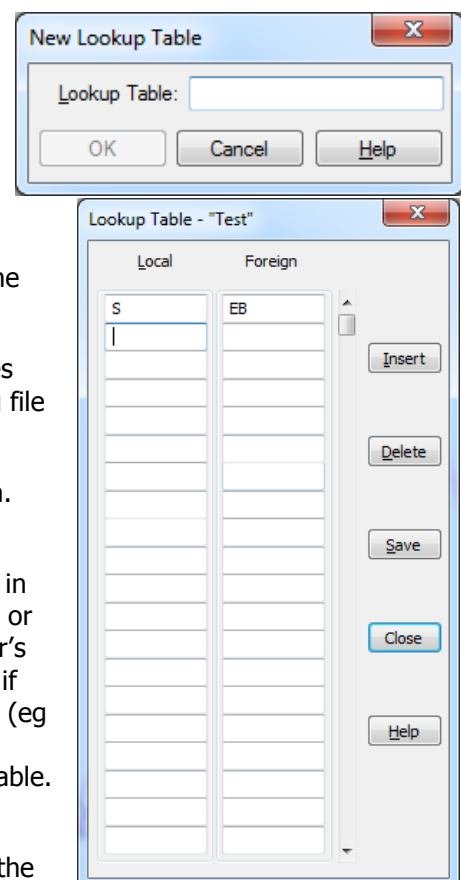
In the Lookup Table, you are able to add, change and delete the codes. The **'Local'** column is used for entering existing surveyor's codes in the diagram and **'Foreign'** column is used for entering the corresponding LISCAD ePlan codes.

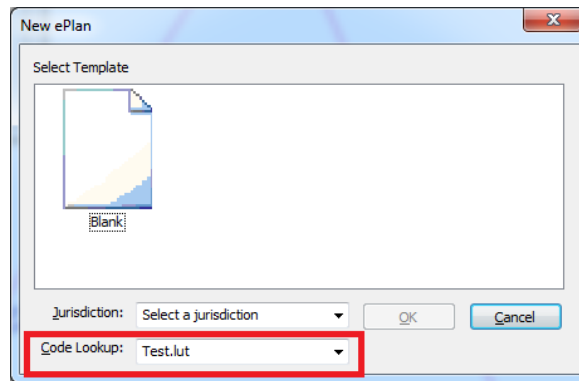
The figure on the right shows a Lookup Table which maps features with code 'S' to 'EB' (Existing Boundary) once the LISCAD drawing file is converted to ePlan.

**NOTE 1:** Lookup Table does not change the codes in the diagram.

**NOTE 2:** There must be a one-to-one relationship between the surveyor's codes and LISCAD ePlan codes. Also, each code stored in 'Local' column must only include a unique feature type (point, line or polygon). A combination of feature types under the same surveyor's code is not allowed when the Lookup Table is used. For example, if you have used the same code for capturing multiple feature types (eg you have used code 'S' for both boundary corners and boundary lines), you need to separate them before setting up the Lookup Table.


The Lookup Table should be selected within the ePlan Export Tool (below figure). Refer to the next section regarding how to set up the Export tool in LISCAD.





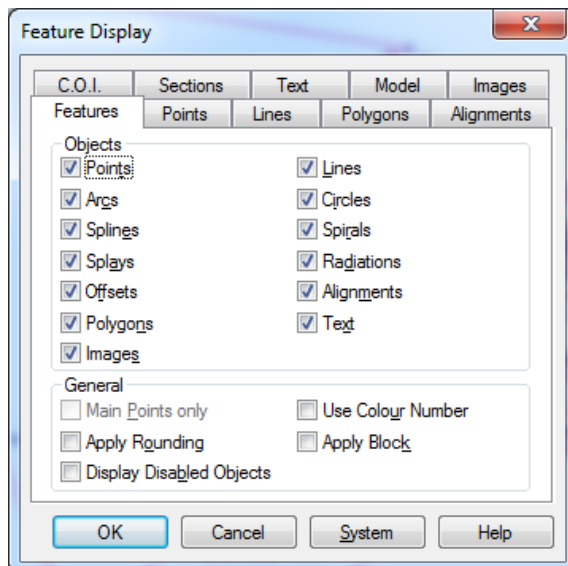
## 2.5 Set up ePlan Export Tool (ePlan Add-on)

The ePlan Export Tool is located in **(Task→Data Conversions) Export→ePlan**. To add the tool after a fresh installation, select **Export→ Add/Remove**, select 'ePlan' and click 'Add'.

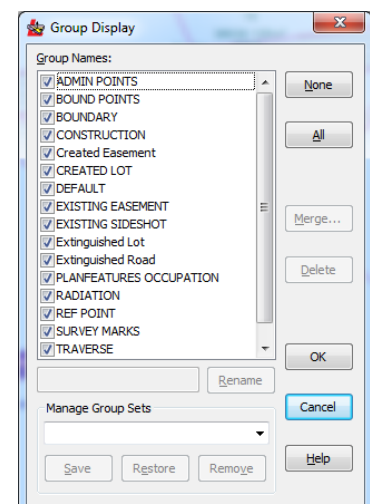
To add the ePlan Export Tool to the toolbar, go to **(Task→Utilities) Configure→Toolbars**. Click Customise, select the Data Conversions category and drag the icon  onto your preferred toolbar.

## 2.6 Display Features and Groups

To generate an ePlan from the ePlan Export Tool, all display features must be turned on. To ensure this is the case, go to **(Task→Utilities) Display→Features**. Click the Features tab and ensure everything in the **Objects** section is ticked. You are free to turn on anything you like in the other tabs without affecting the ePlan export.



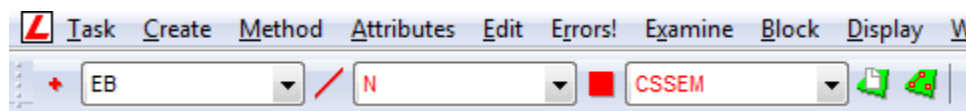
Similarly all viewing groups must be turned on before generating an ePlan (through the ePlan Export Tool). These are accessed through **(Task→Utilities) Display→Groups**.



## 3 Diagram Creation in LISCAD

Depending on your previous experience and work style, ePlan creation may be quite different to your usual LISCAD work. Because ePlan is a data file, a diagram that looks correct on the screen may not necessarily reflect the underlying created data. Data issues might result in validation errors so it is therefore important to pay attention to what is being created as you draw the diagram.

For drawing any points, lines and polygons the appropriate code must be selected using the code toolbar at the top of the screen.



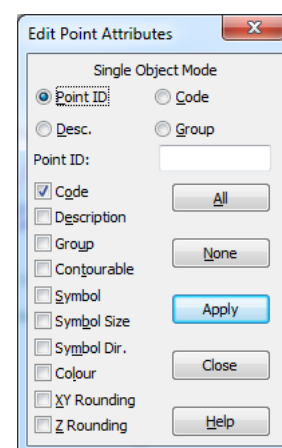
### 3.1 Points (Boundary Corners, Survey Marks)

Creating a diagram begins with plotting the traverse points and boundary corners. These can be drawn using your preferred method. Each point must be correctly coded to the ePlan coding conventions (see LISCAD's ePlan Code Table document<sup>1</sup>). If you forget to assign a correct code to a point, the code can be modified later through **(Task→Computations) Edit→Attributes→Point**.

Select the point on the diagram by clicking on it. Tick the **'Code'** box in the window (with **'Point ID'** selected) and then select a new point code from the toolbar and click **'Apply'**.

Every point in LISCAD will translate to a Coordinate Geometry Point (CgPoint) in the ePlan. Redundant points can sometimes be hard to find in large diagrams so be sure to keep track of all the points you create.

Every point must be used by a line or polygon, otherwise, the validation service will fail, flagging the redundant point. See *Section 3.4 Removal of Duplicated Points and Lines*.



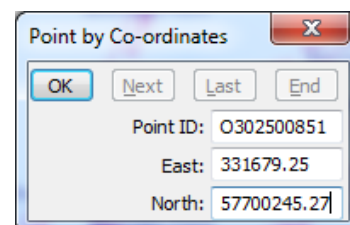
#### 3.1.1 Capturing Permanent Marks (PMs) and Primary Cadastral Marks (PCMs)

When capturing a PM or PCM, several pieces of information are required against the point attributes. First, choose the point code from the code table. For instance, code **'ECPLOK'** needs to be selected for a PCM of which its state is **Existing**, point type is **Control**, monument type is **Plaque**, and condition is **OK**. For the new survey marks that you aim to add to SMES along with your application, make sure that the point code starts with **'N'** for New point state (eg: **'NHPGPL'** for **New Horizontal Peg Placed**).

In the **Point by Co-ordinates** tool, be sure to enter the 9 figure number as the mark in the Point ID field (Diagram on the right).

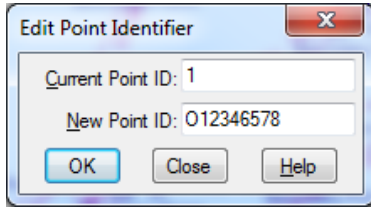
The mark identifier (9 figure number) must be preceded by the letter **'O'**.

If required, the Point ID can be modified by going to **Edit→Point Identifiers→By Point**, clicking on the point to select it and typing the 9 Figure Number into **New Point ID**.

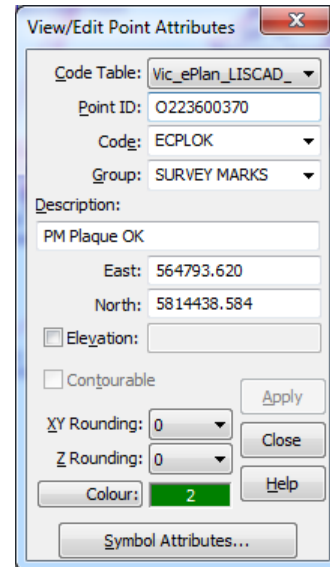


<sup>1</sup> Available for download on <http://www.spear.land.vic.gov.au/spear/pages/eplan/surveyors/liscad-pilot-resources.shtml>





Monument information can be added through **(Task→Computations) Edit→View/Edit→Points**. Select the mark on the diagram, type into the **Description** field and click **'Apply'**. The Description field is optional (Diagram on the right).



## 3.2 Lines (Parcel/Building boundary, Traverses, Connections)

Once points have been plotted, lines can be generated by joining the points. Use **(Task→Computations) Create→Line, Method→Existing Points**. Each line must be coded using the ePlan coding conventions (see LISCAD Code Table Reference<sup>1</sup>). If you forget to assign a correct code to a line, the code can be modified later through **(Task→Computations) Edit→Attributes→Line**.

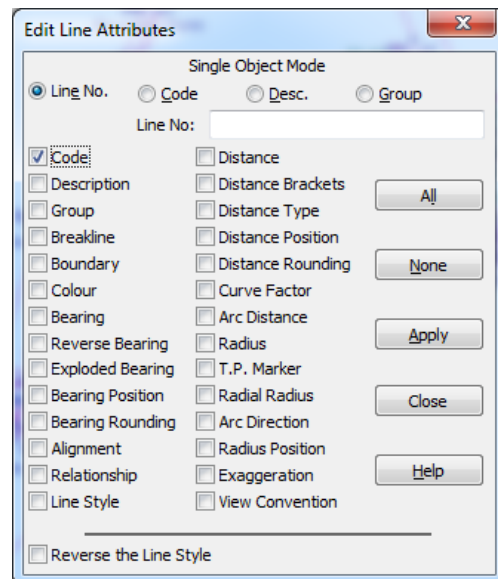
Select the line on the diagram by clicking on it. Tick the **'Code'** box in the window (make sure that **'Line No.'** is selected) and then select a new line code from the toolbar and click **'Apply'**.

Each line in LISCAD corresponds to an Observation in the ePlan file. When creating lines, it is possible to end up with overlapping and redundant lines. If extra lines are required for construction purposes, use a different code other than the ePlan codes.

It is important to remove any redundant lines as this will prevent validation errors when generating the ePlan. See *Section 3.4 Removal of Duplicated Points and Lines*.

If creating a regular boundary or traverse line, ensure that **(Task→Computations) Create→Line Segment** is ticked.

If creating a natural boundary or some other freehand irregular line, this option must be unticked.



### 3.2.1 Arc Lines

There are several methods available to create arcs. All are fine for ePlan purposes. An arc consists of the arc line and a centre point. Therefore when selecting the codes for an arc, both the point and line code must be selected. **Use 'ES' (Existing Sideshot) for centre point code**. The line will generally be **'N'** for normal boundary lines.

If deleting an arc line, be sure to also delete the centre point. Although it will not affect validation, maintaining a clean file is good practice.



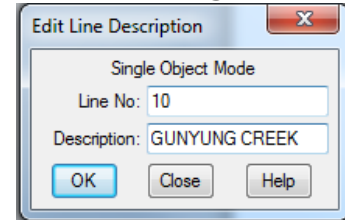
### 3.2.2 Irregular Lines (Natural Boundaries)

Natural boundaries and freehand lines are represented by an irregular line. To create an irregular line, ensure that **(Task→Computations) Create→Line Segment** is **unticked**.

Point code is **'EN'** (Existing **N**atural Boundary)

Line code is **'N'** (Normal) - if using the Land Victoria supplied code table, use code **'N\_irregu'**

ePlan requires the surveyor to textually describe all irregular lines. For instance, a river boundary could be described as 'edge of river'. Descriptions must be added after the line is created. To annotate an irregular line, select **(Task→Computations) Edit→Attributes→Line Description**. Then select the irregular line and enter the text into the dialog box.



### 3.2.3 Building Boundaries

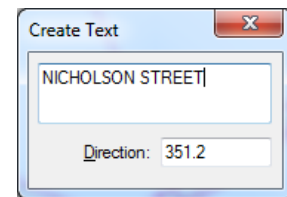
ePlan does not need the bearing and distance to be recorded for the lines representing building boundaries. Each building boundary line can be described in an ePlan as an 'Interior Face', 'Exterior Face', 'Median', or 'Other'. The combination of code **'N'** (for Normal boundary) with any of codes in **C<sub>2</sub>** is to be used to depict the building boundary lines.

By selecting any of the combined codes (eg: **'NI'**) from the code table the line would be drawn with no bearing and distance and the relevant description (eg: Interior Face) would be recorded for the line in ePlan.

### 3.2.4 Road Abutments and Connections

The necessary diagram elements for abutments and connections are:

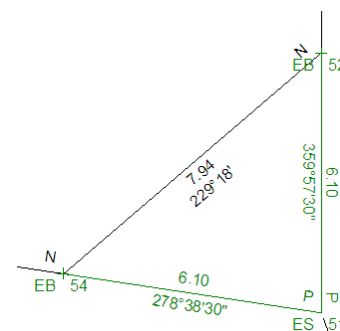
- Lines representing the abutting/connecting boundary (eg road, crown allotment, etc.)
- Text label identifying the abuttal, placed on the correct side of the boundary. This is created using **(Task→Computations) Create→Text**.



Abutments and connections are created through the ePlan Export Tool. Refer to *Section 4.3.2 Other Elements | Title Connections and Abutting Administrative Boundaries* for further details.

### 3.2.5 Road Splays

Road splays can be created using two topo lines (code **'P'**). The road splay corners on the title boundary are plotted using point code **'EB'** (Existing **B**oundary) and the external corner is plotted using point code **'ES'** (Existing **S**ideshot).



### 3.2.6 Plan Features

For capturing a Plan Feature in LISCAD, the following steps should be undertaken:

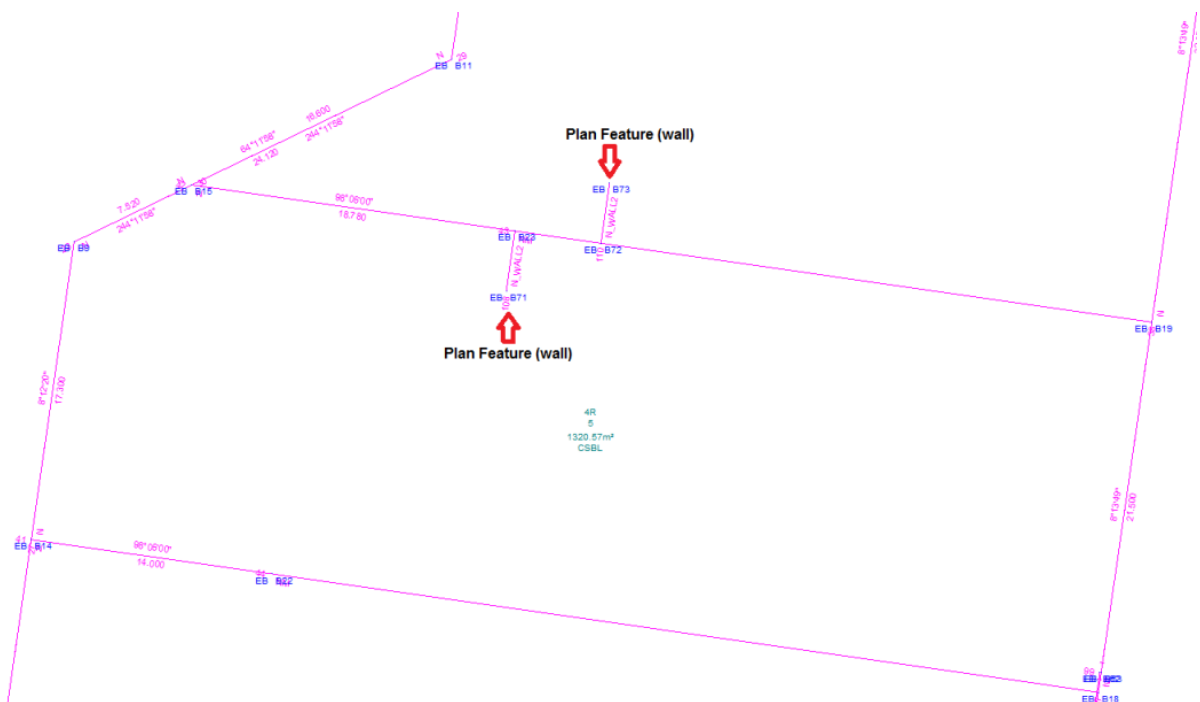
- 1) If the Plan Feature is a Line containing two points only, make sure that **(Task→Computations) Create→Line Segment** is ticked and then draw the line using the Codes in the following Table.

However, if the Plan Feature is a Line consisting of multiple points (eg a chainage), make sure that **(Task→Computations) Create→Line Segment** is unticked and then draw the line using the Codes in the following Table. Make sure that the bearing and distance for new line code are turned off and the Line Code has no description.

Occupation (PlanFeatures) type	Group Name	Code
Building Return (hatched walls on Plan of Subdivision)	PLANFEATURES BRT	N_BRT
Masonry Wall (to cover brick walls, buildings, etc.)	PLANFEATURES WALL	N_WALL
Timber Wall	PLANFEATURES TWALL	N_TWALL
Fence	PLANFEATURES FEN	N_FENCE
Offset	PLANFEATURES OFF	N_OFFSET
Chainage	PLANFEATURES CHAIN	N_CHAIN
Kerb	PLANFEATURES KERB	N_KERB
Gate	PLANFEATURES GATE	N_GATE </td
Centreline	PLANFEATURES CNTL	N_CNTL
No symbol (eg Not Fenced, Not Defined)	PLANFEATURES NSMB	N_NSMBL
Railway	PLANFEATURES RAIL	N_RWALL
Rockwall	PLANFEATURES RWALL	N_RWALL
Hedge	PLANFEATURES HDG	N_HEDGE
Other (eg verandah, roller door)	PLANFEATURES OTH	N_OTHER

- 2) If needed, describe the Plan Feature through **(Task→Computations)**  
**Edit→Attributes→Line Description.**

In the following diagram, two walls are plan features.



### 3.3 Polygons

There are 3 methods for creating polygons, 'existing points', 'element selection' and 'traced'. It is highly recommended that **you do not use 'existing points' to create polygons**. This method creates duplicate lines which will be hard to manage and will ultimately result in validation errors.

To generate the polygons, first choose the correct polygon code eg '**CSSL**' for **C**reated **S**ingle **S**tandard **L**ot, or '**CSBL**' for **C**reated **S**ingle **2D** **B**uilding **L**ot (lot including building boundary). Then use **(Task→Computations) Create→Polygon, Method→Element Selection** and in sequential order, click each line of the polygon and then click 'end' to create the polygon. Alternatively for simple polygons use Trace and select a starting point. LISCAD will trace the lines and calculate a closed polygon.

When capturing the Staged Plans, the following codes can be used:

- XSSSL (e**X**tinguished **S**tandard **S**ingle **S**taged **L**ot) for extinguished lot, and
- CSSSL (**C**reated **S**tandard **S**ingle **S**taged **L**ot) for created staged lot.

### 3.3.1 Parcel Identifier in Polygon Description

Parcel identifier needs to be set for each polygon in **Edit→Attributes→Polygon Description**.

#### Existing/Cancelled Parcels

The Survey Parcel Identifier (SPI) must be put in the polygon description, in the form of lot\plan number (eg: 1\PS123456). Created parcels only need the parcel (lot) number.

SPIs can be found using LASSI-SPEAR<sup>2</sup>. If the SPI is of a cancelled or referenced parcel eg old crown allotment, the SPI should be reconstructed using the guidelines in *Section 1.7 Parcel Identifiers in ePlan*.

#### Created Parcels

Created parcels only need the parcel (lot) number.

By entering only the parcel number of created parcels into the **Polygon Description** attribute of a polygon, LISCAD generates the SPI by combining this with the plan number entered in the ePlan Export Tool. Parcel numbers should be unique for each class of parcel. For example, lot number should not clash with other lots. When entering numbers for parcels other than lots, it is a good idea to maintain the same naming convention as for SPIs to make identification of these parcels easier eg: 'CM1' for common property, 'R1' for road, 'RES1' for reserve, 'E1' for easement and 'RST1' for restriction. See *Section 1.7 Parcel Identifiers in ePlan*.

\*\* A consolidated parcel only needs the plan number (starting with PC), if nothing is entered into the **Polygon Description** attribute of a consolidated polygon LISCAD generates the SPI using the plan number entered in the ePlan Export Tool.

#### Modify Parcel Codes

To modify the code of a polygon, go to **(Task→Computations) Edit→Attributes→Polygon**.

Click on the polygon you wish to change and then tick 'Code' box in the above window (make sure that '**Polygon No.**' is selected). Alternatively, type the polygon number. Select the correct code in the code toolbar and click '**Apply**'.

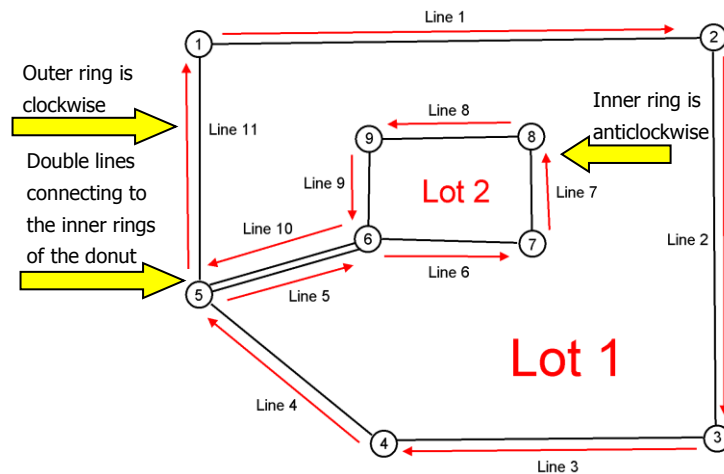
### 3.3.2 Donut Polygons

ePlan supports all types of donut polygons including donuts within donuts. Donut polygons consist of polygons with internal holes. They are captured in LISCAD as a single continuous simple polygon using an ordered continuous sequence of lines beginning and ending on the outer ring of the donut.

In order to connect the inner rings of the donut, '**double lines**' need to be drawn (diagram below). One line traces into the inner rings and the other line traces out. The connecting lines must have normal boundary code ('N'). It should be noted that the direction of inner rings reverses with each level of internal ring. If the outer ring is clockwise, then the first level internal ring will be

<sup>2</sup> <https://www.spear.land.vic.gov.au/lassi/SpearUI.jsp>

anticlockwise, then the second level internal ring will be clockwise, and so on. See Appendix A for more diagrammatic examples and different scenarios.

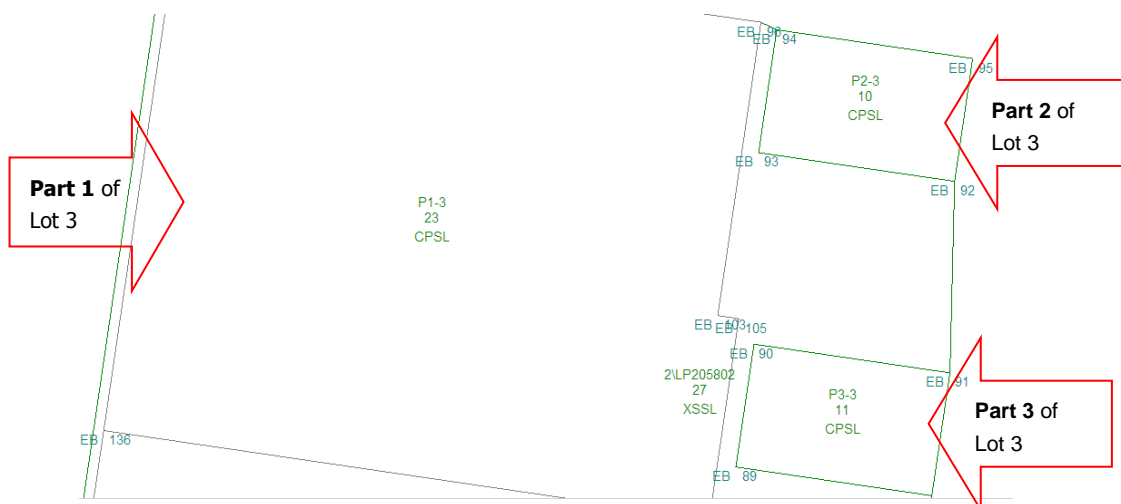


### 3.3.3 Multipart Parcels with Part Polygons

Creating multipart parcels on the diagram is the same process as any parcel (see *Section 3.3 Polygons*).

Each part lot is coded using the **P** code for part (eg: CPSL for Created **P**art Standard Lot). The part number is required in the polygon description. **LISCAD looks for the first number in the polygon description to use as the part number**. This allows you to enter extra text to help identify the polygon on screen. For example, a polygon description of '**P1-14**' equates to Part 1 of Lot 14. The 'P' and '-14' are stripped out by LISCAD. This is useful if you want to include the lot number in the description to help identify the polygon.

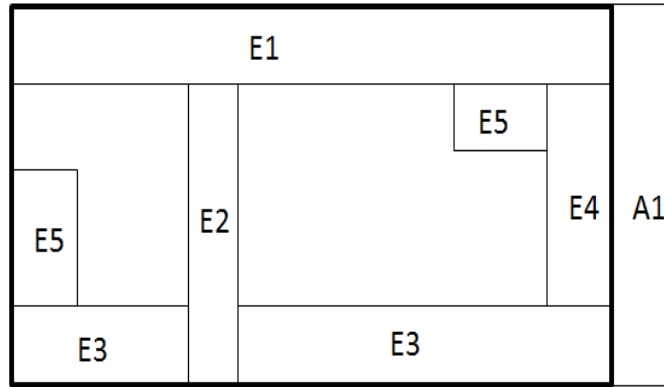
Part polygons are linked together using the ePlan Export Tool. See *Section 4.3 Other Elements* for details.



### 3.3.4 Easements

In LISCAD, there are two steps for capturing easements, as following:

**Step 1** – An individual polygon should be drawn on the diagram to include the geometry of each easement, similar to how easements are currently shown on PDF Plans (see below figure).



Depending on the state (existing, created, etc.) and type (single, part, etc.) of easements, a correct easement code (eg CSSEM, ESSEM, CPSEM, EPSEM, etc.) should be assigned to each polygon.

**NOTE: You should not draw the overlapping easement polygon as an individual easement. The overlapping easements will be identified and represented automatically by the ePlan visualiser within SPEAR.**

On the diagram, the easements should have a description of 'E#' (for encumbering easement), 'A#' (for appurtenant easement) or 'R#' (for encumbering easement (road)). Part easements should have a description of 'P#-E#', 'P#-A#', or P#-R#. No origin should be included within the description of easements drawn on the diagram.

**NOTE: For any Encumbering Easement (Road), there must be one created Road (with code CSSR) in the diagram with the same geometry and description ('R#').**

Follow the instructions in *Section 3.3 Polygons* to create geometry easements required in step 1.

**Step 2** – For each unique combination of **purpose/origin/land benefitted**, a Standard/2D Building easement should be created within the ePlan add-on. The Standard/2D Building easement should include the reference(s) to the geometry segment(s) created in step 1 as well as some information about that easement (eg purpose, origin, land benefitted).

The below table illustrates the information that needs to be assigned to Standard/2D Building easements in step 2.

XML Parcel Name (Standard/2D Building easement created in step 2)	Subject Land (geometry segment created in step 1)	Purpose	Width (m)	Origin	Land Benefited/In Favour Of
EAS1\PS700472	E1 & E4	Sewerage	See Diagram	This plan	City West Water Ltd
EAS2\PS630826		Carriage Way	See Diagram	PS630826H	Maribyrnong City Council
EAS3\PS630826		Transmission of Telecommunication Signals	See Diagram	PS630826H	Vol. 5489 Fol.726
EAS4\PS700472		Gas Pipeline	See Diagram	PS630826H - Section 146 of the Gas Industry Act	SPI Networks (Gas) Pty Ltd

				2001	
<b>EAS5\PS700472</b>	E2	Carriage Way	2	This plan	Maribyrnong City Council
<b>EAS6\PS700472</b>		Carriage Way	2	This plan	Lot 2 PS630826H
<b>EAS7\PS700472</b>		Carriage Way	2	This plan	Lot 1 & Lot A on this plan
<b>EAS8\PS700472</b>		Gas Pipeline	2	This plan - Section 146 of the Gas Industry Act 2001	SPI Networks (Gas) Pty Ltd
<b>EAS9\PS700472</b>	E3	Carriage Way	3	This plan	Lot 1 & Lot A on this plan
<b>EAS10\PS700472</b>	E4	Sewerage	3	This plan	City West Water Ltd
<b>EAS11\PS700472</b>	E5	Carriage Way	See Diagram	This plan	Lot 1 & Lot A on this plan
<b>EAS12\PS630826</b>	A1	Carriage Way	3	PS630826H	Maribyrnong City Council

This step is described in more details in Section *4.3.5 Other Elements / Easements*.

### 3.4 Removal of Duplicated Points and Lines

Three tools for removing duplicated (redundant) lines and points can be found under **(Task→Utilities) Maintenance→Filter Points / Filter Lines / Filter Points on Line and Grade**.

These tools allow you to remove all redundant points and lines in the diagram so that they are not exported into the ePlan. **NOTE: Be aware that it will not remove orphaned or stranded points that are not connected to the diagram by a line. These still need to be removed manually.**

## 4 ePlan Export Tool (ePlan Add-on)

The LISCAD ePlan Export Tool (ePlan add-on) is used to generate an ePlan compliant LandXML file from a LISCAD drawing file (.SEE). It saves all data to a working file called the EPL file (.EPL file extension). Each time you open the ePlan add-on, you will be prompted to either create a new EPL file or browse to a previously created EPL file. It is important to keep EPL and SEE files together, so they do not get mixed up with other plans.

Before starting up the ePlan add-on, all the diagram elements described in the previous section must be complete and correctly coded. In the add-on, you are also able to choose your defined Lookup Table to map your codes in the diagram file to ePlan codes.

Validation of the ePlan (.xml) file can be performed via the SPEAR website. Validation checks most components of the plan to ensure that the data entered conforms to the Victorian ePlan requirements.

The Export Tool includes the following windows:

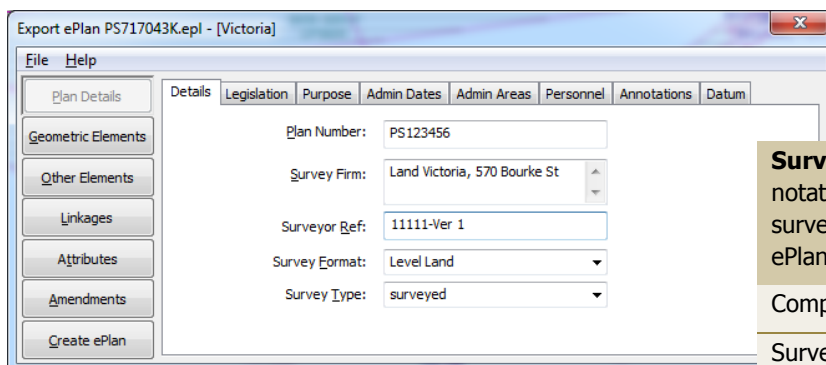
- Plan Details
- Geometric Elements
- Other Elements
- Linkages
- Attributes
- Amendments, and
- Create ePlan.

### 4.1 Plan Details

Plan details window captures most of the information traditionally found in the plan cover sheet, including plan number, surveying firm, location of land and notations.

#### 4.1.1 Plan Details | Details

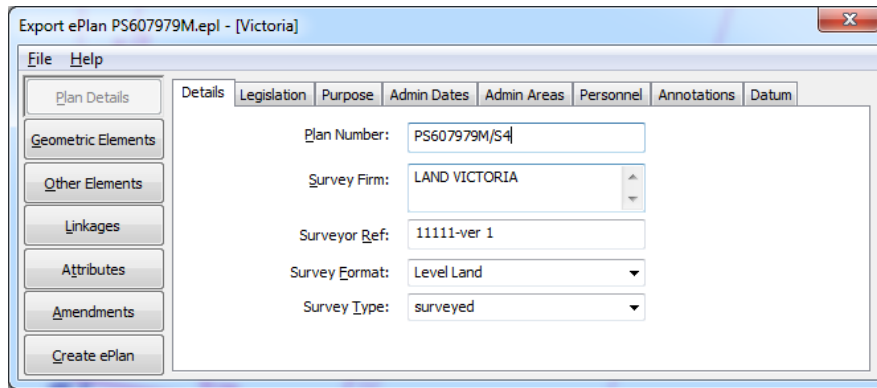
Add the relevant plan details as required. Be sure that you enter the 'surveyor version number' into the '**Surveyor Ref**' box. The version number should be entered right after the surveyor reference starting with '-Ver' (see figure below).



**Survey Type** corresponds to the notation, 'This plan is based on survey/non-survey'. The translation to ePlan values:

Computed	Non-Survey
Surveyed	Survey
Compiled	Partial Survey

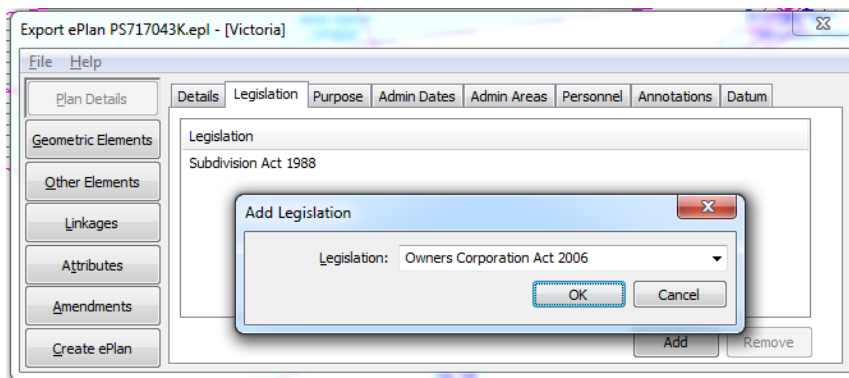
If it is a staged Plan, based on the naming convention, the plan number format must be: PSXXXXXXX/S#. S# is referred to stage number.



**Note: If you would like to submit an ePlan under Section 23, 24A or 32B that does not have any Plan Number, insert 'LV-To-Supply' into 'Plan Number' box. This value will be replaced with the relevant Dealing Number from the Victorian Online Titling System (VOTS) once your ePlan is registered at Land Victoria.**

#### 4.1.2 Plan Details | Legislation

Select the relevant legislation that applies to the plan.



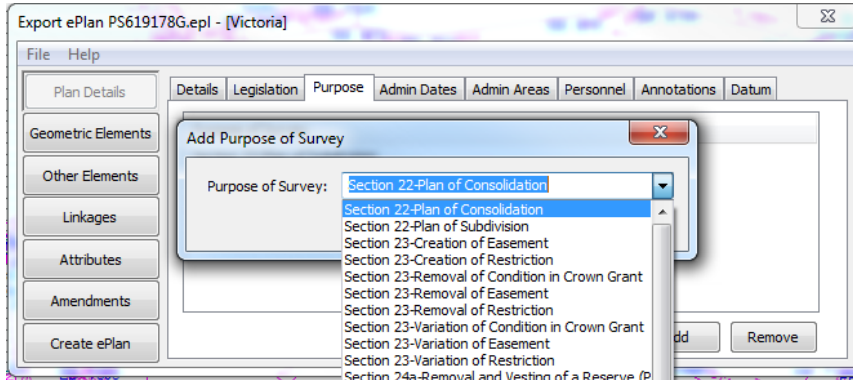
If there is any Owners Corporation in the plan, the Owners Corporation Act 2006 needs to be added.





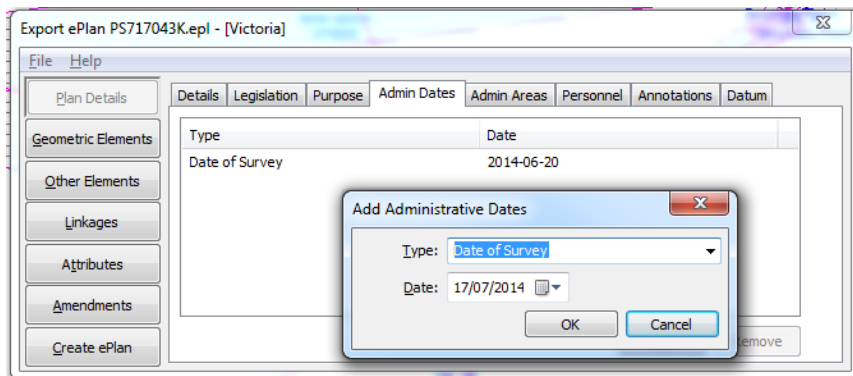
### 4.1.3 Plan Details | Purpose

**Purpose of Survey** corresponds to the section under the Act this plan is created under. Both the primary purpose and additional secondary purposes must be defined here. For example, if a Section 22 plan also creates easements as an additional purpose, Section 23 must be specified. If this plan removes a reserve vesting status, then specify Section 24A.



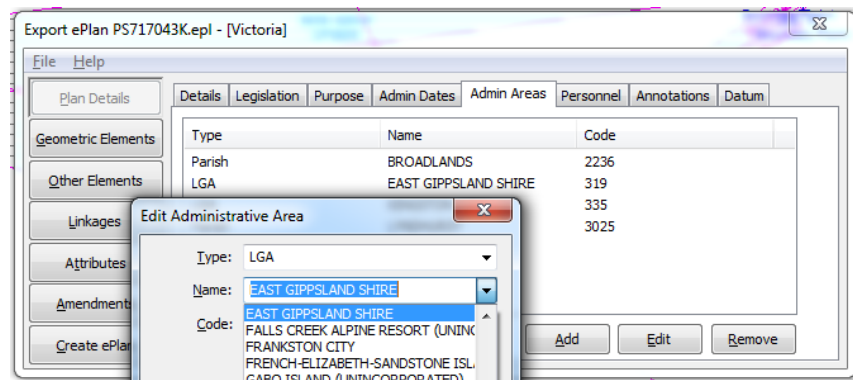
### 4.1.4 Plan Details | Administrative Dates

If a plan is based on survey, the 'Date of Survey' must be specified.



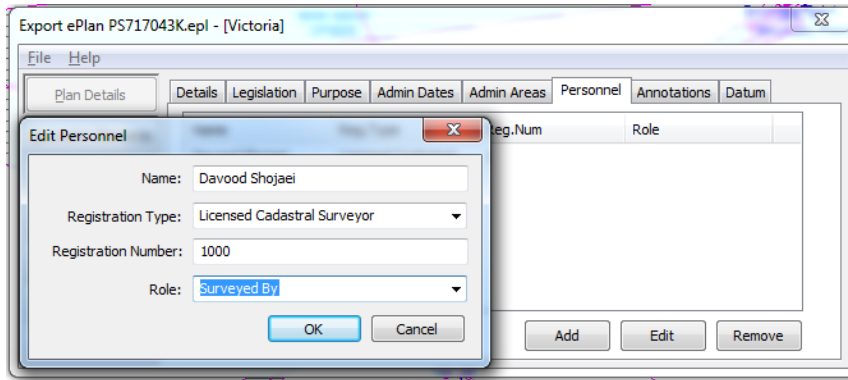
### 4.1.5 Plan Details | Administrative Areas

These values correspond to the Location of Land panel. Only LGA, Parish and Township are required. Codes are automatically populated when a Name is selected, or they can be obtained from LASSI-SPEAR (<https://maps.land.vic.gov.au/lassi/SpearUI.jsp>).



### 4.1.6 Plan Details | Personnel

Enter the details of the Licensed Surveyor signing the plan.

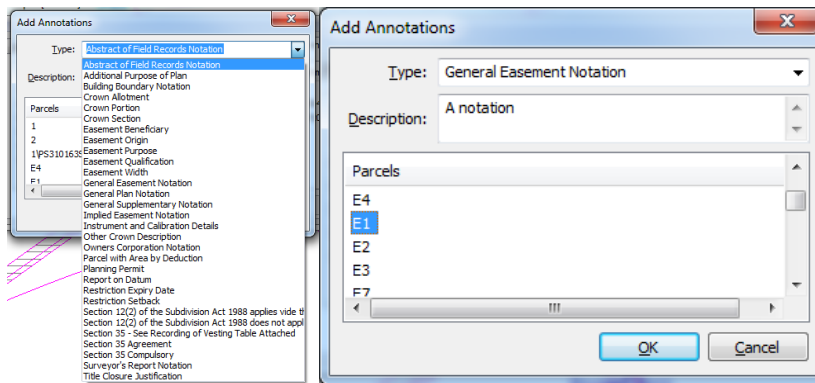


#### 4.1.7 Plan Details | Annotations

ePlan Annotations are used to capture miscellaneous information about the plan and survey. It includes some information that is traditionally shown in the notations panel, surveyors report and abstract of field records, as well as data specific to ePlan.

Annotations can be accompanied by a description and parcel references. A description is required for annotations where further information is necessary such as 'Planning Permit'. **Where a description is not required, copy the Type text in the description field so as to not leave the field blank.** For example, 'Parcel with Area by Deduction' requires no further description so copy the Type text into the Description box.

Certain annotations require parcel references such as 'Easement Width' or 'Restriction Expiry Date'. Select the parcel that the annotation applies to from the list box. To select multiple parcels, hold the keyboard CTRL key when selecting. Annotations that apply to the whole plan do not require a parcel reference.



The following table outlines the usage of all available annotations:

Annotation	Requires Description	Requires Parcel Reference
Planning Permit	Yes	No
Report on Datum	Yes	No
Instrument and Calibration Details	Yes	No
Crown Allotment	Yes	No
Crown Section	Yes	No
Crown Portion	Yes	No
Other Crown Description	Yes	No

Parcel with Area by Deduction	Optional	Yes
Restriction Expiry Date	Yes	Yes
General Plan Notation	Yes	Optional
General Easement Notation	Yes	Optional
Abstract of Field Records Notation	Yes	Optional
Surveyor's Report Notation	Yes	Optional
Title Closure Justification	Yes	No
Easement Qualification	Yes	Yes
Easement Width	Yes	Yes
Implied Easement Notation	Yes	Optional
Easement Purpose	Yes	Yes
Easement Origin	Yes	Yes
Easement Beneficiary	Yes	Yes
General Supplementary Notation	Yes	No
Owners Corporation Notation	Yes	Yes
Section 35 - See Recording of Vesting Table Attached	No	No
Building Boundary Notation	Yes	Yes
Section 35 Compulsory	Optional	Yes
Section 35 Agreement	Optional	Yes
Additional Purpose of Plan	Yes	No
Section 12(2) of the Subdivision Act 1988 applies vide this plan	Optional	No
Section 12(2) of the Subdivision Act 1988 does not apply vide this plan	Optional	No
Included Stages	Yes	No
Purpose Of The Owners Corporation	Yes	Yes
The Basis For Allocation Of Lot Entitlement And Liability	Yes	Yes
Details Of The Limitations Of The Owners Corporation	Yes	Yes
Functions Or Obligations Referred By The Limited Owners Corporation	Yes	Yes
Functions Or Obligations Referred To The Unlimited Owners Corporation	Yes	Yes
Purpose of Plan	Yes	No
Grounds for Removal	Yes	No
Grounds for Variation	Yes	No
Grounds for Vesting	Yes	No

**NOTE 1: 'Easement Width' annotation must be only linked to geometry easements drawn on the diagram (specified as 'E-#', 'A-#' or 'R-#') and not the Standard/2D Building easements created in the ePlan add-on (specified as 'EAS-#').**

**NOTE 2: 'Implied Easement Notation', 'Easement Purpose', 'Easement Origin' and 'Easement Beneficiary' must only be linked to Standard/2D Building easements created in the ePlan add-on (specified as 'EAS-#').**

**NOTE 3: If there is only one Crown Description in the plan, use a combination of the following three annotations to describe it:**

- **Crown Allotment**
- **Crown Section**
- **Crown Portion**

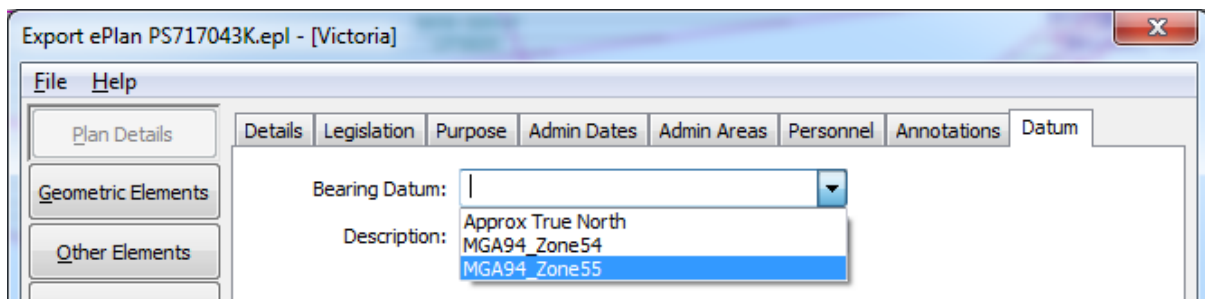
**However, if there is more than one Crown Description, only use 'Other Crown Description' annotation to describe multiple Crown Descriptions.**

**NOTE 4: The following traditional notations are not entered as annotations and are captured elsewhere in an ePlan:**

- **Survey / Non Survey**
- **Permanent Mark connections**
- **Staged plan notation**

#### **4.1.8 Plan Details | Datum**

Select the Bearing Datum of the plan and enter the description or leave blank.



## **4.2 Geometric Elements**

The **Geometric Elements** tabs display the ePlan elements generated from the diagram. These tabs are used to preview the created ePlan elements in tabular format. If an error is detected, the ePlan Export Tool must be closed and the error corrected on the diagram. Once the correction is made, the EPL file can be re-opened.

- Parcels

Export ePlan PS717043K.epl - [Victoria]

File Help

Plan Details

Geometric Elements

Other Elements

Linkages

Attributes

Amendments

Create ePlan

Poly No.	Description	State	Type	Format	Class	Use
18	1	created	Single	Standard	Lot	
19	2	created	Single	Standard	Lot	
20	1\PS3101...	extinguis...	Single	Standard	Lot	
24	E4	created	Single	Standard	Easement	
25	P1-E5	created	Part	Standard	Easement	
26	P2-E5	created	Part	Standard	Easement	
27	E1	existing	Single	Standard	Easement	
28	E2	existing	Single	Standard	Easement	
29	E3	existing	Single	Standard	Easement	
30	P1-E6	created	Part	Standard	Easement	

- Reduced Observations

Export ePlan PS717043K.epl - [Victoria]

File Help

Plan Details

Geometric Elements

Other Elements

Linkages

Attributes

Amendments

Create ePlan

Number	From	To	Purpose	Equipment
1	6	3	traverse	
3	3	4	traverse	
4	4	5	traverse	
5	5	7	traverse	
6	3	7	traverse	
7	7	8	traverse	
8	O223600370	7	traverse	
9	O113110318	3	sideshot	
10	8	12	sideshot	
13	11	12	normal	

- Points

Export ePlan PS717043K.epl - [Victoria]

File Help

Plan Details

Geometric Elements

Other Elements

Linkages

Attributes

Amendments

Create ePlan

Pt ID	OID	State	Type
10		existing	boundary
100		existing	boundary
104		existing	boundary
11		existing	boundary
111		existing	boundary
112		existing	boundary
113		existing	boundary
114		existing	boundary
115		existing	boundary
116		existing	boundary

- Monuments

Export ePlan PS717043K.epl - [Victoria]

File Help

Plan Details

Geometric Elements

Other Elements

Linkages

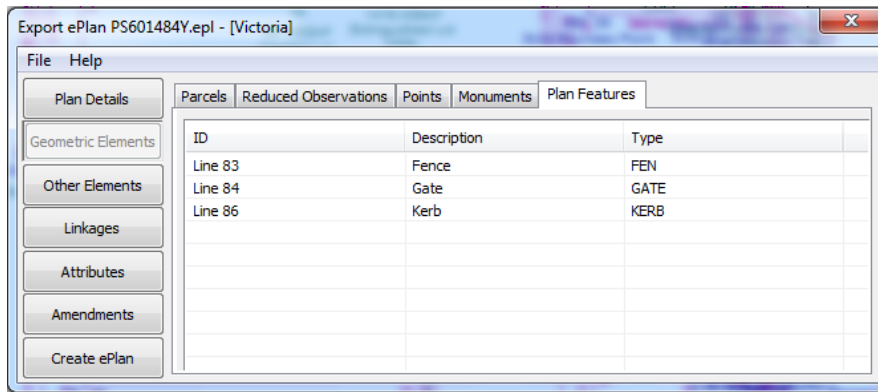
Attributes

Amendments

Create ePlan

Pt ID	Description	State	Type	Condition
3	Traverse Point	New	Spike	Placed
4	New RM Spike ...	New	Spike	Placed
5	New RM Spike ...	New	Spike	Placed
6	New RM Spike ...	New	Spike	Placed
7	New RM Spike ...	New	Spike	Placed
8	New RM Spike ...	New	Spike	Placed
O113110318	PM Plaque OK	Existing	Plaque	OK
O223600370	PM Plaque OK	Existing	Plaque	OK

- Plan Features



## 4.3 Other Elements

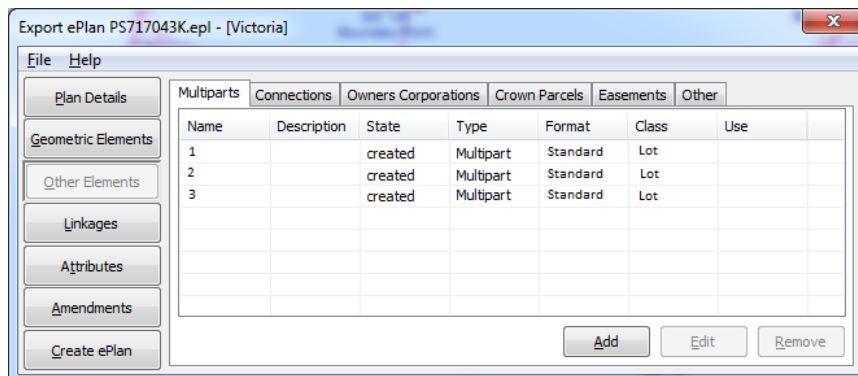
In this section, the components of the 'Other Elements' window are described.

### 4.3.1 Other Elements | Multipart Parcels

Multipart Parcels are created by linking 2 or more 'part' polygons together through a Multipart entity. Before performing the steps in this section, all the part polygons must be created, correctly coded and their part numbers assigned (see *Section 3.3.3 Multipart Parcels with Part Polygons*).

#### 4.3.1.1 Multipart Parcel Entity

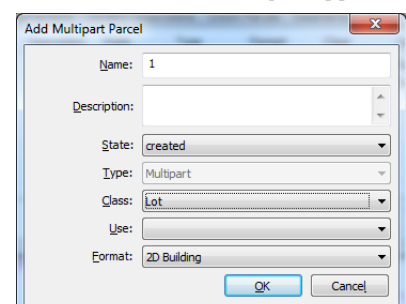
A multipart parcel entity is created in the **Multiparts** tab in **Other Elements** window. All types of multipart parcels are created here including lots, geometry easements, restrictions and depth limitations.



#### 4.3.1.2 Multipart Created Primary Parcels (Lots, Roads, Reserves and Common Property)

To create a multipart primary parcel, at least 2 'part' coded polygons must exist in the diagram eg: 'CPSL' for created **part** standard lot. The attributes entered into the 'Add' window should match the coding of the part polygons.

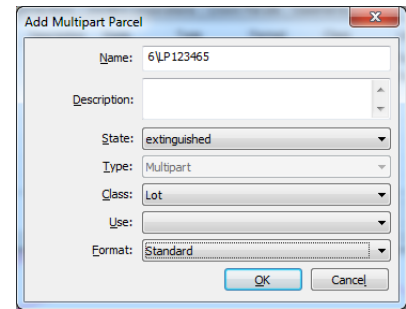
**Name** is the parcel ID that will form the new SPI. **Use** and **Description** should be left blank. **Format** should be selected from the drop-down list. If the multipart parcel contains one or more 2D Building part parcel(s), then '2D Building' should be selected, otherwise



select 'Standard'.

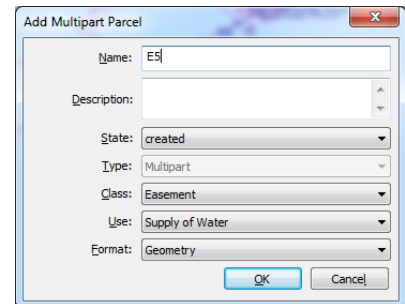
#### 4.3.1.3 Multipart Extinguished, Affected and Existing Primary Parcels

Multipart extinguished, affected or existing primary parcels are created the same way as above except that the name must contain the complete SPI retrieved from LASSI-SPEAR (<https://www.spear.land.vic.gov.au/lassi/SpearUI.jsp>).



#### 4.3.1.4 Multipart Easements

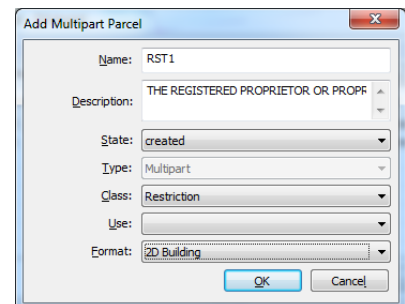
To create a multipart easement, at least 2 'part' coded easement polygons must exist in the diagram eg: 'CPSEM' for created part standard easement. The attributes entered into the 'Add' window should match the coding of the part polygon.



**Name** is the easement identifier. Only E or A and the easement number is necessary and it should not clash with any other easement IDs. Refer to *section 1.7 Parcel Identifiers in ePlan* for more information about easements' naming convention. **Note that the format of easements should be defined as Geometry.**

#### 4.3.1.5 Multipart Created Restrictions

Multipart restrictions are used to represent building envelopes and other spatial areas where the restriction applies. A minimum of 2 polygons coded as created part standard restriction ('CPSRT') are required for a multipart restriction.

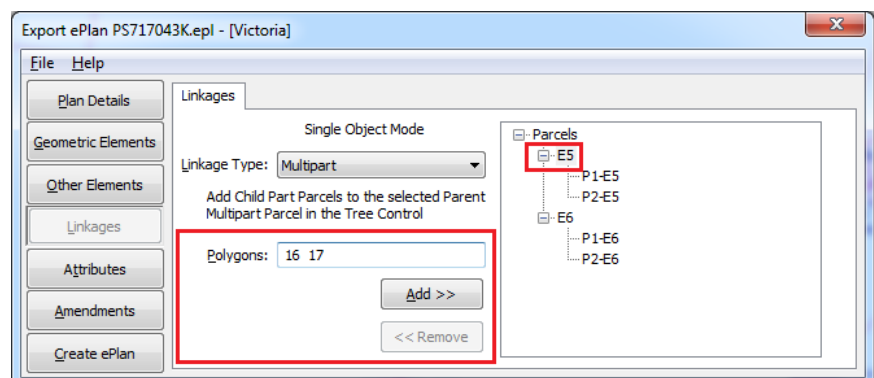


As with easements, the name field for restrictions only requires a number that does not clash with any other restrictions. Letters can be used to help identify it in the linkages window. In the example below 'RST1' has been used. The restriction description should be entered into the 'Description' field.

#### 4.3.1.6 Multipart Parcels Linkages

Once the necessary multipart parcels have been created, they must be linked to the associated part polygons from the diagram. LISCAD will attempt to automatically link part polygons where unambiguous situations exist. For more complex plans, manual linking will be required.

To link polygons to a multipart parcel, select the parcel name from the tree on the right, and enter the polygon numbers (separated by a space) that correspond to part polygons and click 'Add'. To find corresponding polygon numbers from parcel IDs, go to the **Parcels** tab in the **Geometric Elements** window.



### 4.3.2 Other Elements | Title Connections and Abutting Administrative Boundaries

The **Connections** tab under **Other Elements** window is used to establish the title connection of the plan eg: a road abuttal connecting to a road corner. Road, crown parcel, and administrative area boundaries can be specified for abuttal and connection purposes.

To correctly capture the abutments and title connections complete the following steps:

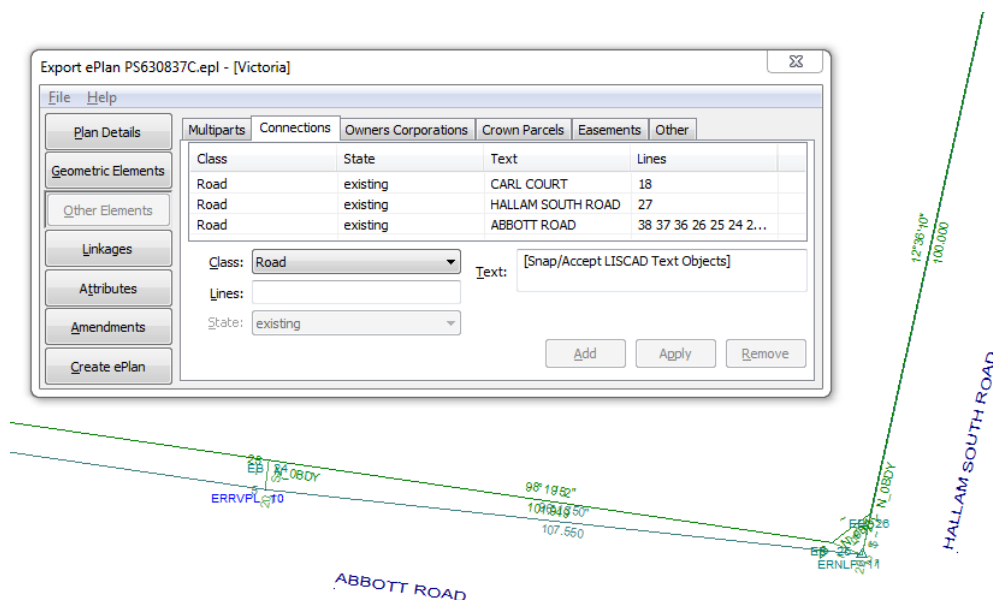
- Place the appropriate street name, crown allotment SPI or administrative area name on the diagram using the **Text by Freehand** tool in a location within what would be the (Vicmap) road/crown parcel/administrative area
- Open the EPL Tool and navigate to **Other Elements**→**Connections**
- Select the text element in the diagram by clicking on the point below the first character
- Select a **Class** of 'Road', 'Crown Allotment', 'Crown Portion' or 'Administrative Area'
- Select the lines that represent the boundary of the abuttal and connection by clicking each line on the diagram
- If Crown Allotment or Portion, select either 'Existing' or 'Referenced'. 'Referenced' is used when the original crown allotment has since been subdivided but the boundary is still intact
- If Administrative Area, select 'Existing'.
- Click **'Add'**.

See the next three sections for examples on capturing abutting Roads, Crown Parcels and Administrative Areas.

#### 4.3.2.1 Abutting Roads

In the example below, there are 2 entries created for the 2 roads that comprise the title connection. 'Abbott Road' was created using the abutting boundaries and an extended line to the road corner. 'Hallam South Road' was created using an arbitrary length line to represent the other side of the corner.

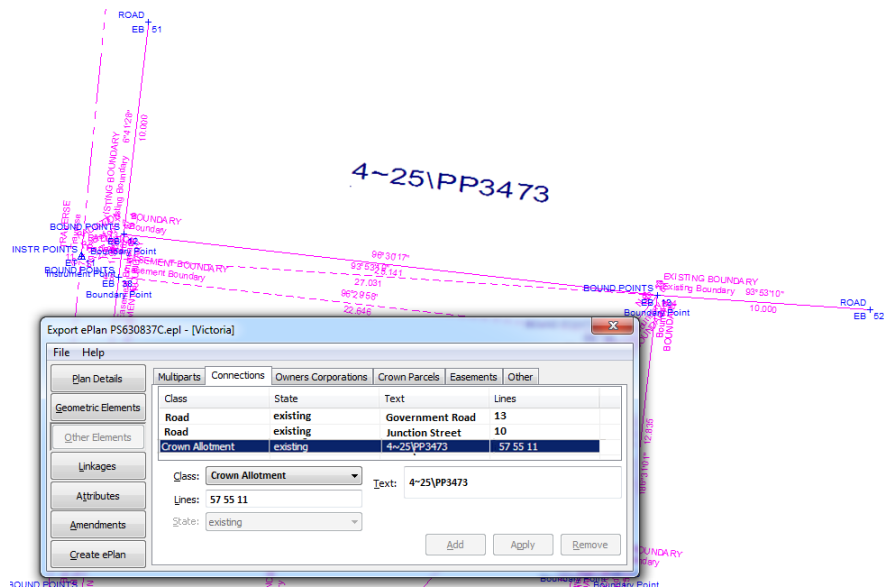
The length of the line used for the road corner is not important. However an appropriate length should be used for future visualisation purposes.





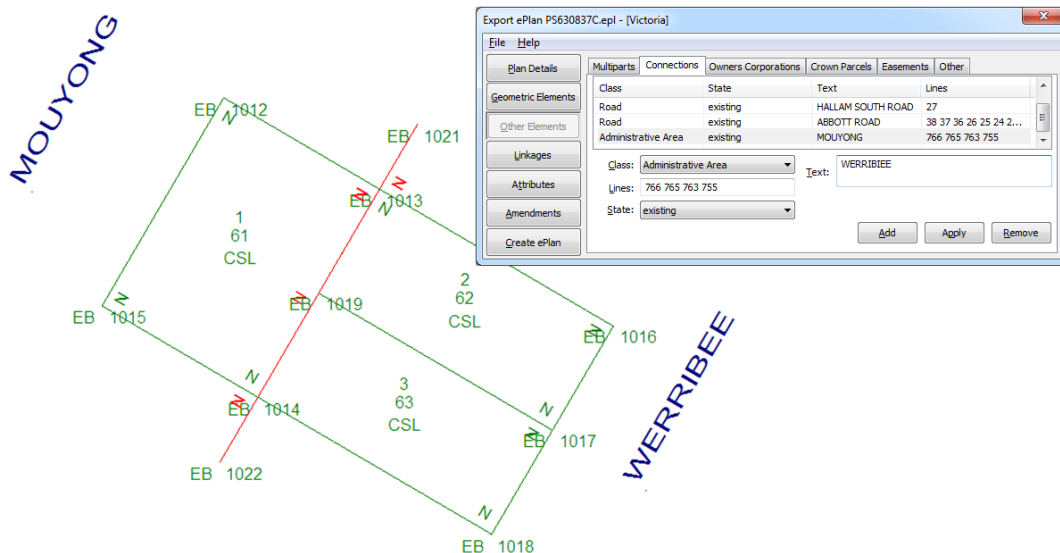
#### 4.3.2.2 Abutting Crown Parcels

In the example below, the abutting boundary of a crown allotment has been created using an arbitrary length line with normal boundary code ('N'). The crown allotment SPI has also been created on the diagram. In the **Connections** tab in **Other Elements** window, the Class of 'Crown Allotment' is selected and the abutting boundary lines of the crown allotment and the SPI are selected on the diagram.



#### 4.3.2.3 Abutting Administrative Boundary (Municipal Boundary)

If the lots on a plan are located in more than one municipality or very close to the municipal boundary, it is expected that the abutting administrative areas are defined. In the example below, lot 1 is located in Parish of MOUYONG and lots 2 and 3 are within Parish of WERRIBEE. The Parish names have been created on the diagram using **Text by Freehand** tool. In the **Connections** tab in **Other Elements** window, the Class of 'Administrative Area' is selected and the abutting boundary line(s) of the MOUYONG parish and its name are selected on the diagram. This is also done for WERRIBEE parish.



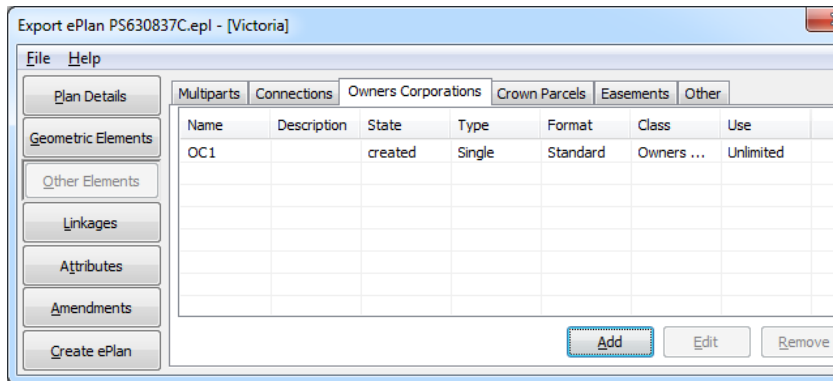
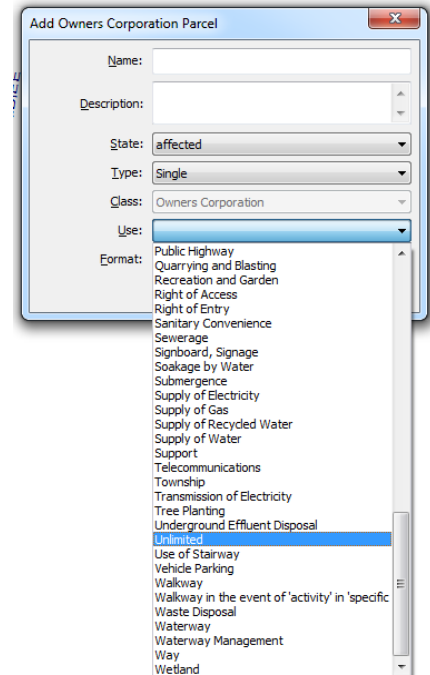
### 4.3.3 Other Elements | Owners Corporations

If the plan contains Common Property, an Owners Corporation Schedule should be created. There are 3 components to create the Owners Corporation Schedule.

#### 4.3.3.1 Create Owners Corporation Entity

The OC entity must first be created in the **Owners Corporation** tab (under **Other Elements** window). The OC name is the number of the OC. It can be prefixed with letters to help identify it in the linkages screen, eg: 'OC1' or 'Owners1'. Do not use spaces or symbols.

- **Description** (Optional) Used to enter a long name.
- **State** is always 'created'.
- **Type** is always 'Single'.
- There are 3 OC usages in the **Use** drop down. They are 'Unlimited', 'Limited' and 'Limited to Common Property'.
- **Format** is always 'Standard'.

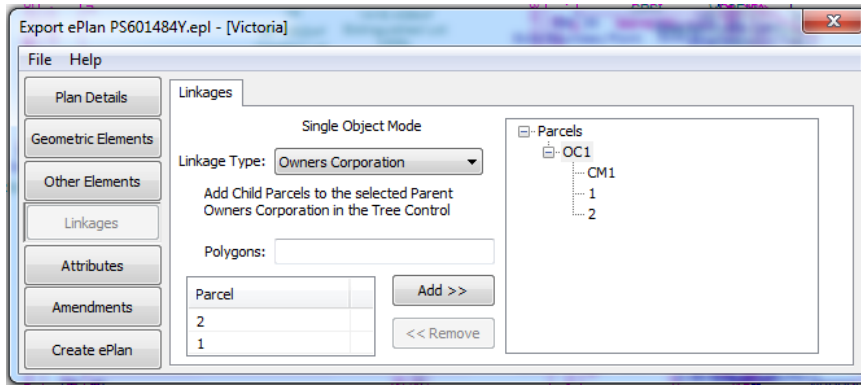


#### 4.3.3.2 Owners Corporation Linkages

Once the OC entity is created, it must be linked to the lots and common property that comprise the OC. This is performed in the **Linkages** tab under the **Owners Corporation Linkage** type. Simple plans with 1 OC will be automatically linked by LISCAD. However, you can manually add and remove parcels as required.

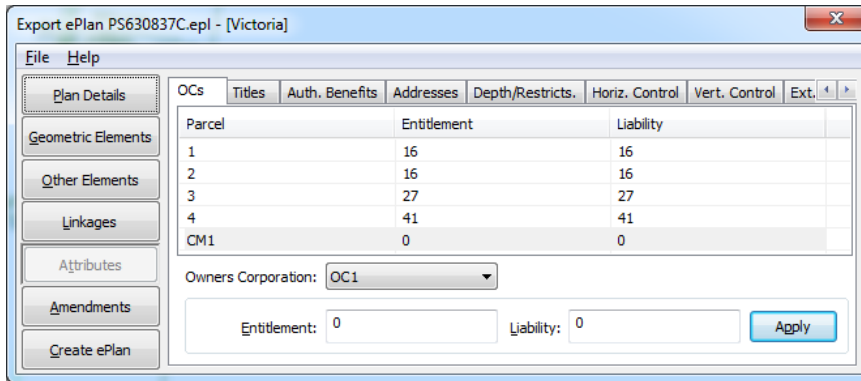
To add a list of parcels, enter their LISCAD polygon numbers into the **Polygons** field separated by a space. Then click '**Add**'. Polygon numbers and their corresponding parcel ID can be found in the **Geometric Elements** tab.

When adding a multipart parcel to an OC, enter the polygon number of 1 of the parts only. This will automatically assign the entire multipart to the OC.



#### 4.3.3.3 Entitlement and Liability Apportionment

The final step to creating an OC is to assign the entitlement and liability apportionment values to the member lots. This is done through the **Attributes** screen. Select the OC if there is more than 1, click on each parcel and set the values in the form below. The common property parcel **must** have its values set to 0.

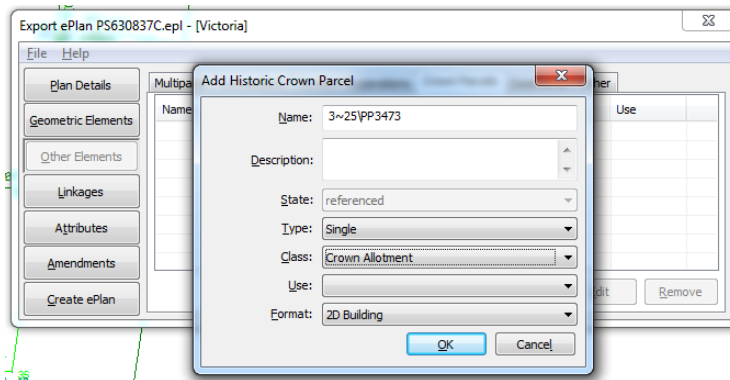


#### 4.3.4 Other Elements | Referenced Crown Parcels (Crown Description)

ePlan uses an intelligent way of recording the crown description of a plan. Crown parcels are captured as referenced parcels that can optionally have a polygon definition. Depending on the situation, one of three methods can be used.

##### 4.3.4.1 Non-Spatial Crown Parcel without Parcel Linkages

For simple scenarios where there is only 1 referenced crown parcel in the crown description, a non-spatial parcel is adequate. This is created in the **Crown Parcels** tab.



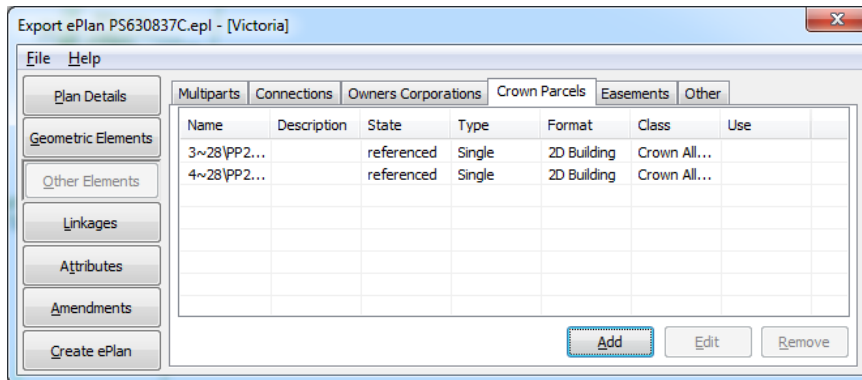
- **Name** must be formatted as per the rules in *Section 1.7 Parcel Identifiers in ePlan*.
- **Description** is optional but can be used for the keyword "Part", indicating that only part of the parcel is referenced.
- **Type** is always 'Single'.

- **Class** is either 'Crown Allotment' or 'Crown Portion'.
- **Use** is blank.
- **Format** is always 'Standard'.

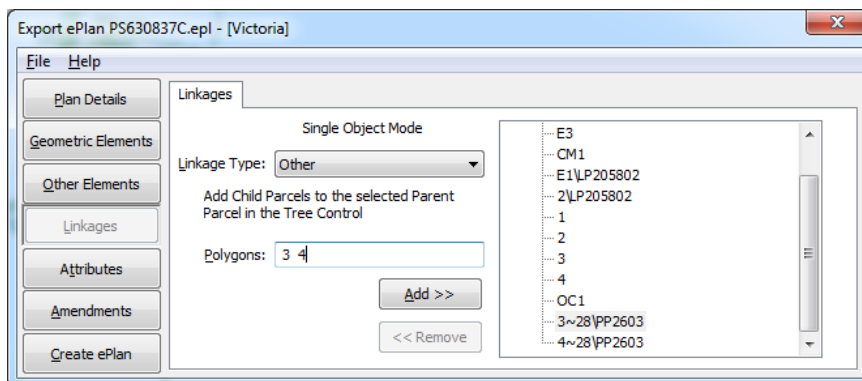
No further information is required. Because there are no linkages, it is assumed that this crown parcel reference applies to the entire subdivision area.

#### 4.3.4.2 Non-Spatial Crown Parcel with Parcel Linkages

In scenarios where the plan covers multiple crown parcels, it is necessary to specify the created parcels that reside over each referenced crown parcel. This is done by linking each crown parcel to the associated created parcels. First create the 2 parcel entries in the **Crown Parcels** tab.



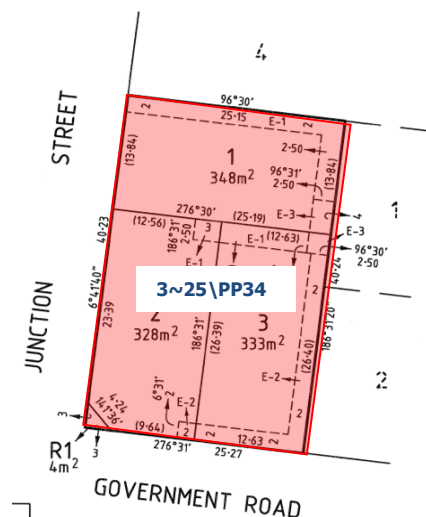
Once this is done, the 2 parcels will appear in **Linkages** in the 'other' category. Highlight each crown parcel SPI from the list and **add** the LISCAD polygon numbers for each associated created parcels. The polygon numbers can be found in **Parcels** tab under **Geometric Elements** window.



#### 4.3.4.3 Crown Parcel with Polygon

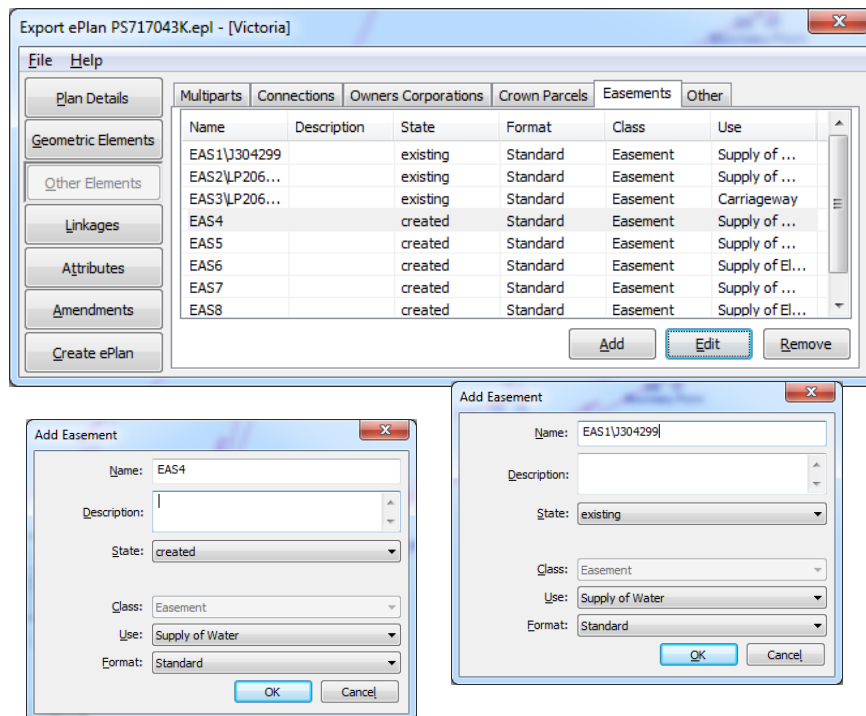
In scenarios where created parcels completely cover one or more crown parcels, each crown parcel should be created following the guidelines in *Section 3.3 Polygons* by selecting the proper code from the code toolbar (eg **ESSCA** for existing single standard crown allotment or **ESSCP** for crown portion). The SPI of the referenced parcel should be reconstructed using the guidelines in *Section 1.7 Parcel Identifiers in ePlan*.

For example, the following subdivision plan covers a crown allotment (No. 3 of Section 25 in Parish Plan 3473). For this plan of subdivision, in addition to creating an extinguished parcel, a crown allotment parcel should be created as a referenced parcel.



### 4.3.5 Other Elements | Easements

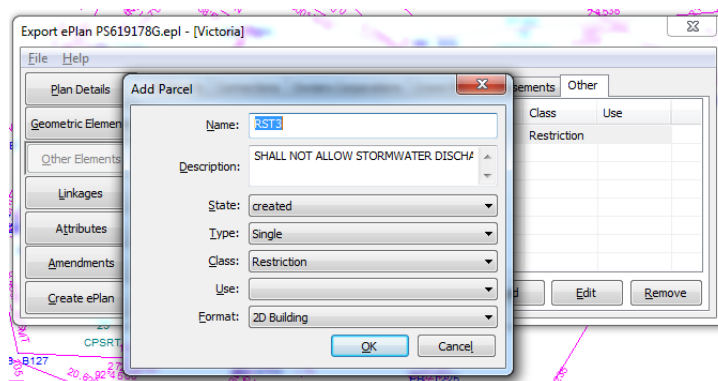
In this tab, for each unique combination of **purpose/origin/land benefitted** a Standard/2D Building easement should be defined. For existing, extinguished or affected Standard/2D Building easements, **Name** must contain the complete SPI of the easement (specified as 'EAS#\Origin Plan Number'). However, for created easements, **Name** is specified without any SPI ('EAS#'). The format of easements must be selected as 'Standard' or '2D Building'.



### 4.3.6 Other Elements | Other

#### 4.3.6.1 Text Only Restrictions

Text only restrictions can be created using the **Other** tab under **Other Elements** window. A **Type** of 'Single' should be used in all cases. Once created, these parcels must have their appropriate linkages created in the **Linkages** window.

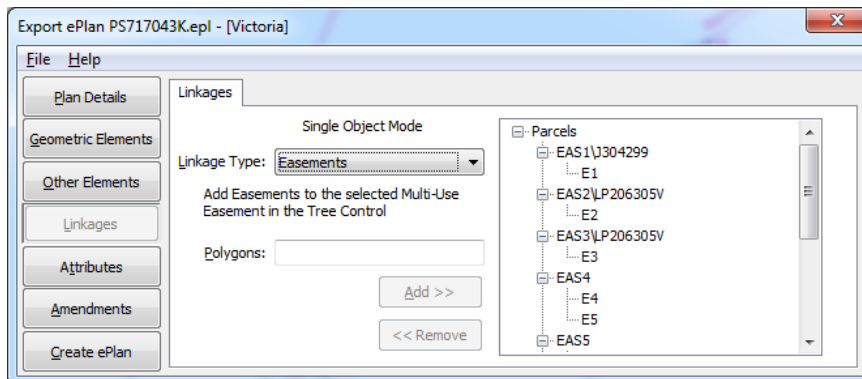


## 4.4 Linkages

In this Section, the method used for linking the geometry easements to a Standard/2D Building, beneficiaries to a Standard/2D Building easement and benefit/burden to a restriction is described.

#### 4.4.1 Linkages | Easements

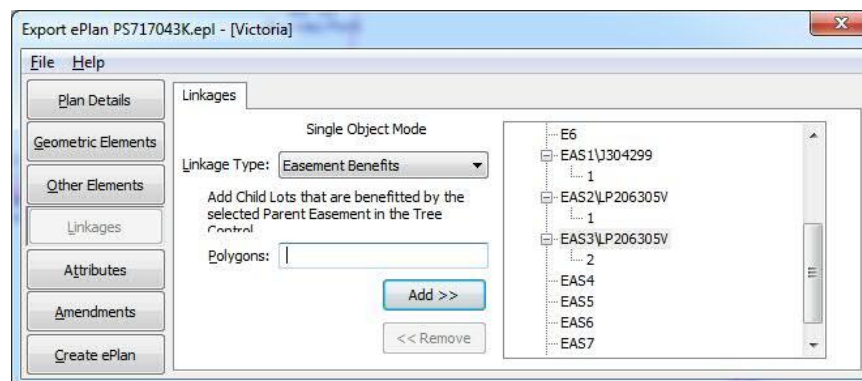
This tab is used to link the geometry easements drawn in the diagram to Standard/2D Building easements created in *Section 4.3.5 Other Elements / Easements*. The following figure shows an example of this.



#### 4.4.2 Linkages | Easement Beneficiary

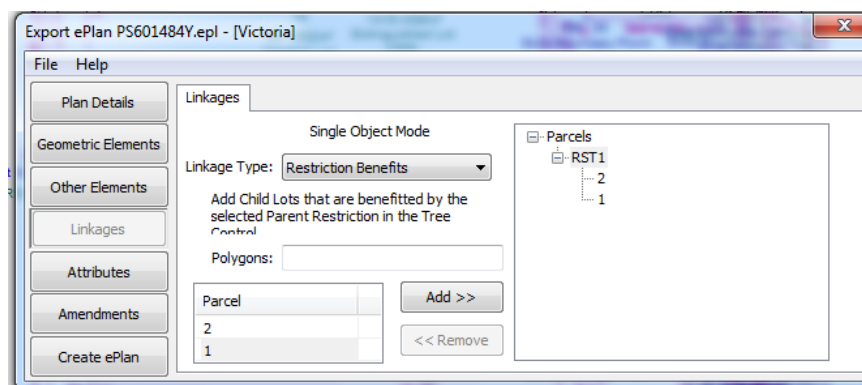
To define lots on the plan as beneficiaries to Standard/2D Building easements (specified as 'EAS-#'), they must be linked through the **Linkages** window. To define all land in the plan as benefiting, the polygon numbers of all parcels must be added as a linkage.

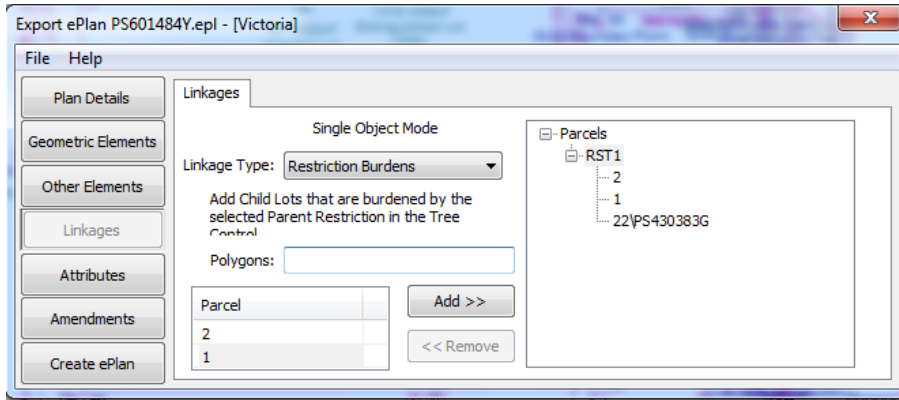
Multiple polygon numbers must be separated by a space. To find corresponding polygon numbers using parcel IDs, go to the **Parcels** tab under the **Geometric Elements** window.



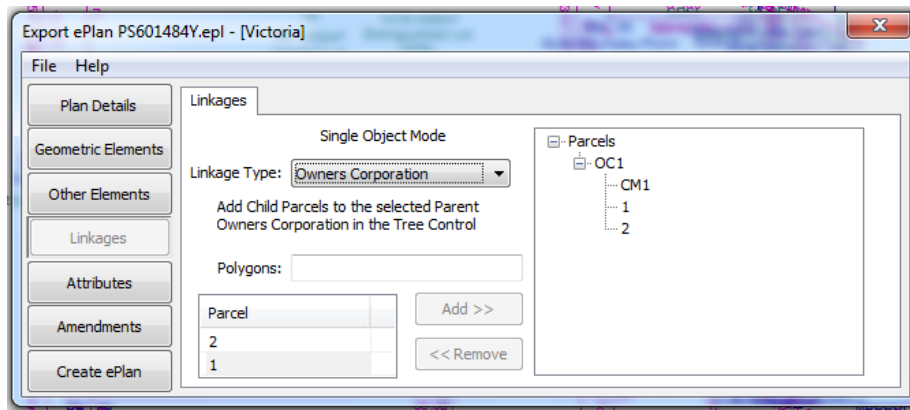
#### 4.4.3 Linkages | Restriction Benefit and Burden

Benefiting and burdened lots are defined by linking the associated parcels in the **Linkages** window. Multiple polygon numbers must be separated by a space. To find corresponding polygon numbers using parcel IDs, go to the **Parcels** tab under the **Geometric Elements** window.





If there is an Owners Corporation, you need to link the lots to the Owners Corporation (including spatial and non-spatial parcels).

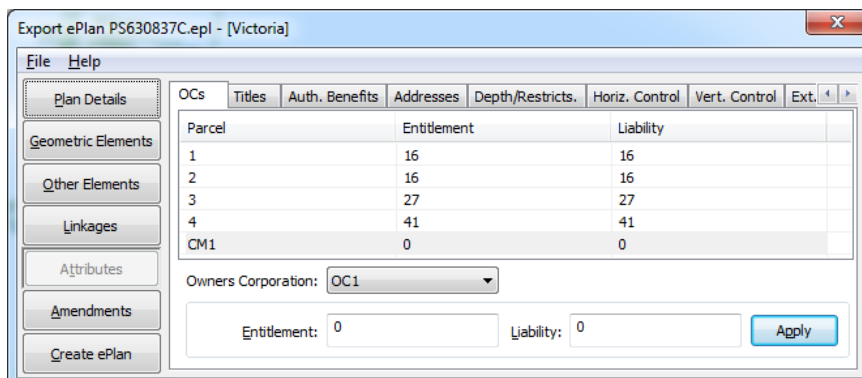


## 4.5 Attributes

The **Attributes** window allows additional information to be recorded against parcels. These should be filled in where applicable.

### 4.5.1 Attributes | OCs

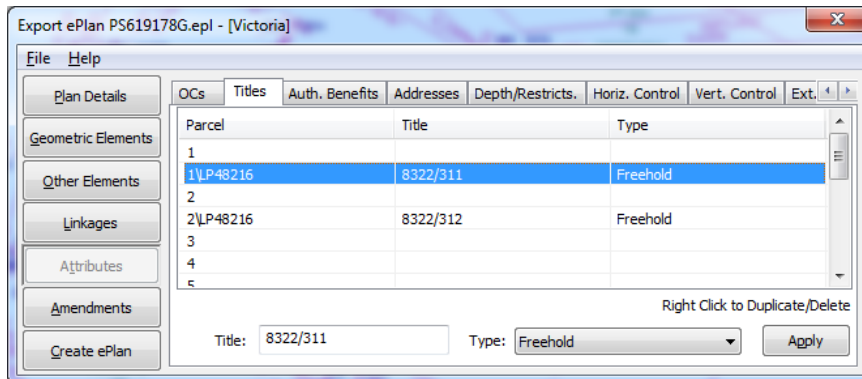
In the Owners Corporation tab, the entitlement and liability values are assigned to the member lots. Select the OC if there is more than 1, click on each parcel and set the values in the form below. The common property parcel **must** have its values set to 0.





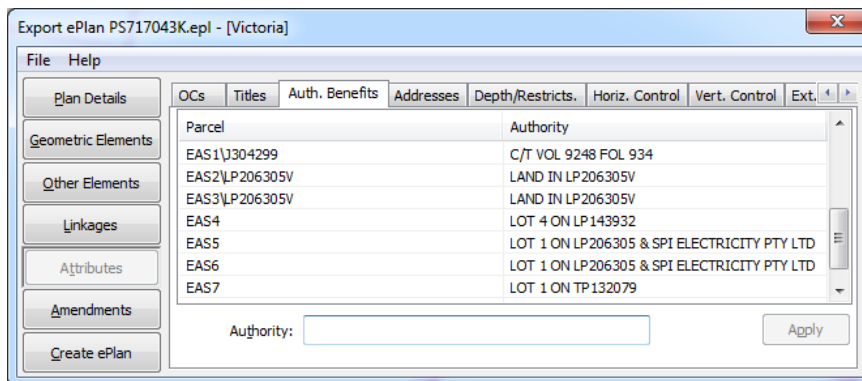
#### 4.5.2 Attributes | Title References

Title references are recorded against every extinguished parcel. To record title references, go to the **Titles** tab under the **Attributes** window and select a parcel entry from the list to add title information to. Enter the VOTS volume and folio number, select the title type and click **'Apply'**.



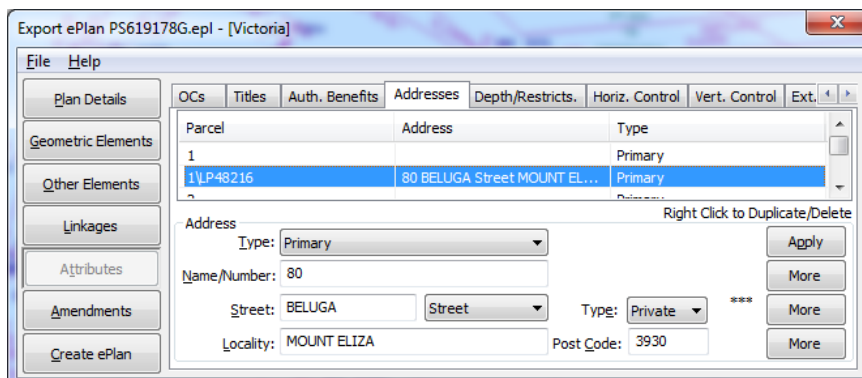
#### 4.5.3 Attributes | Authority Benefits

To add vesting authorities against roads and reserves, and to add authority beneficiaries against easements, use the **Authority Benefits** tab under **Attributes**. Select the parcel to add the authority to, type the authority name into the **Authority** field and click **'Apply'**. Any **Easements** or **Lots on a Plan** can be specified in the authority field.



#### 4.5.4 Attributes | Parcel Addresses

Street addresses for parcels are entered through the **Addresses** tab under the **Attributes** window. Select the parcel from the list to add an address to and fill in the form.



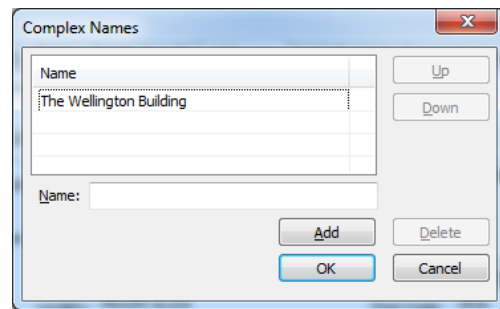


The **Name/Number** field is a multipurpose field that records unit number, flat number, street number or range and the number suffix. The following is an example of the complete usage of the field.

Unit 25 Floor 4 45A-49B

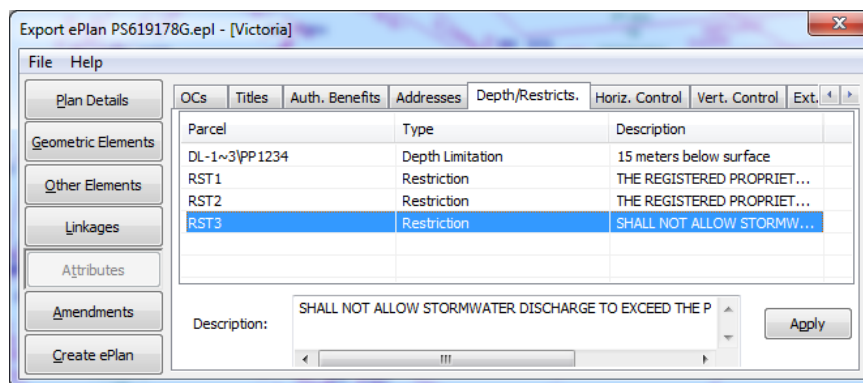
This equates to unit 25 on floor 4 for the building in street number range 45A to 49B. Simply omit the unneeded components when entering the name/number for your address.

If a building or complex name is required, click the first **More** button to reveal the **Complex Name** dialog. Type the name of the building and click '**Add**'.



#### 4.5.5 Attributes | Restriction and Depth Limitation Description

Restrictions and Depth Limitation parcels, created by drawing a polygon on the diagram, can have their description entered in the ePlan add-on under the **Attributes**→**Depth/Restrictions** tab. All restrictions and depth limitations drawn on the diagram will appear in the list where their descriptions can be edited.



##### 4.5.5.1 Depth Limitations

There are 3 options for recording depth limitations in ePlan:

1. Spatial parcel representation
2. Non-spatial parcel representation with linkages and/or
3. Plan Annotation.

##### 4.5.5.2 Naming Convention

Depth limitation parcels have a specific naming convention based on the original crown grant identifier. The format is:

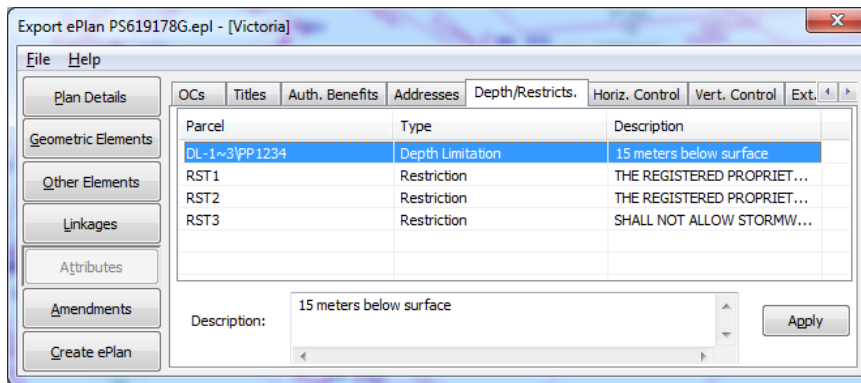
DL-[origin crown grant SPI]

For example a depth limitation on allotment 20, section 3 of parish plan PP2167 is represented as 'DL-20~3\PP2167'. The full name must be entered when creating a depth limitation as a parcel using the methods below.

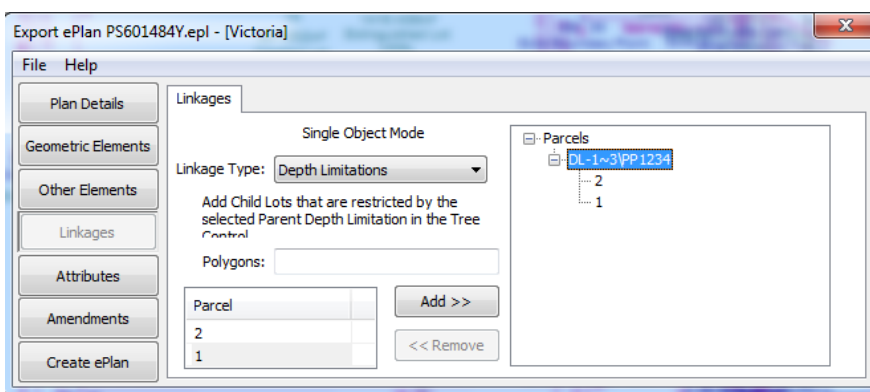
##### 4.5.5.3 Spatial Parcel Representation

A spatial parcel representation of a depth limitation can be used if you require showing the spatial extent of the depth limitation. It is created using the same method as all other parcel types described in *Section 3.3 Polygons*. The code for a depth limitation polygon is 'ESSD' for **Existing Single Standard Depth limitation**.

The description of the depth limitation (eg '15m below surface') is recorded in the **Depth/Restrictions** tab under the **Attributes** window. The depth limitation will be visible in the list once the polygon has been created and correctly coded.



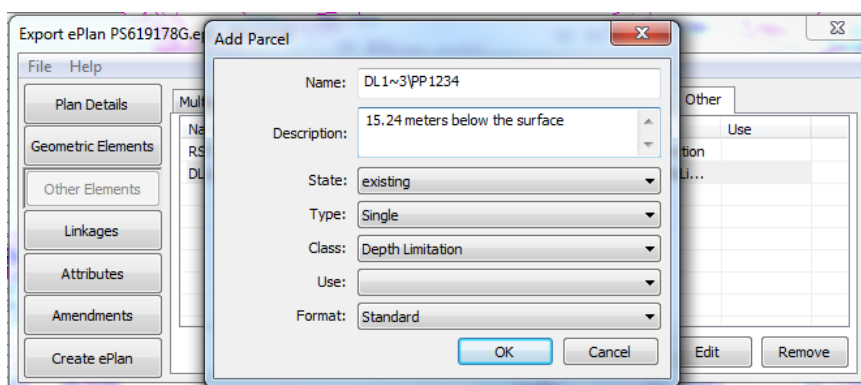
Once created, the parcels associated with the depth limitation need to be linked in the **Linkages** window. Select **Linkage Type** of 'Depth Limitation' and click on the depth limitation to link. Then type in the polygon numbers of parcels to link, leaving a space between each number. Polygon numbers can be found in the **Parcels** tab under the **Geometric Elements** window.



#### 4.5.5.4 Non-spatial Parcel Representation

A non-spatial parcel representation of a depth limitation is used if you do not have information about the spatial extent of the depth limitation but you require showing which specific parcels the depth limitation applies.

To create a non-spatial depth limitation, go to the **Other** tab under the **Other Elements** window of the ePlan Export Tool. Click **'Add'**, fill in the attributes and click **'OK'**.

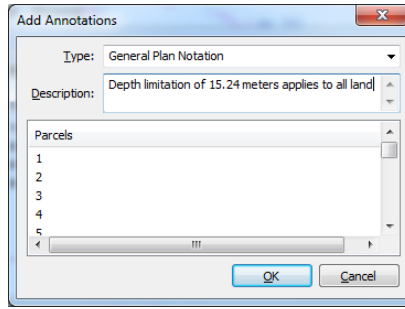


#### 4.5.5.5 Plan Annotation

If the depth limitation applies to the whole plan, a plan annotation can be used.

**NOTE: This method is the least preferred way of capturing a depth limitation and should only be used if the above methods are not suitable.**

To add a depth limitation annotation, go to the **Annotations** tab under **Plan Details** window and click **'Add'**. Select 'General Plan Notation' and type in the full text of the depth limitation as you would for a paper plan.

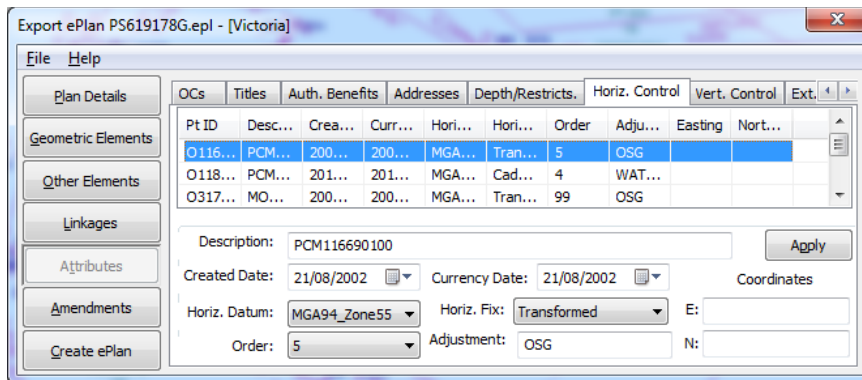


#### 4.5.6 Attributes | Horizontal and Vertical Control

The horizontal and vertical control tabs capture Permanent Mark and PCM attributes. All PM and PCM coded points will appear in the list. If your ePlan has not been prefilled from a digital data download, you will have to fill in the information manually from a SMES report. The table on the right translates the LISCAD field names to the SMES report field names.

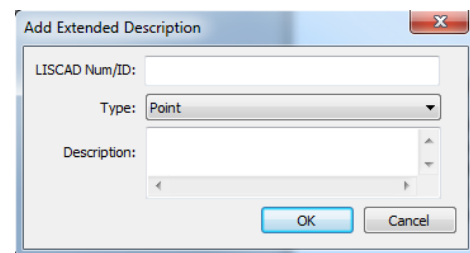
LISCAD	SMES Report
Description	Official Mark Name
Created Date	Coordinates Date
Currency Date	Date Last Used
Horiz. Fix/Vert. Fix	Technique
Adjustment	Source

The mark number and status are based on the code assigned to the point (see *Section 3.1.1 Capturing Permanent Marks (PMs) and Primary Cadastral Marks (PCMs)*).



#### 4.5.7 Attributes | Extended Description

A description attached to a LISCAD feature (point, line or polygon) can only be a maximum 32 characters long; sometimes, especially for Restrictions, this is not long enough to hold the required data. Therefore, if you need to add a longer description for ePlan purposes, this tab allows that to happen. The **Number** is the LISCAD number, the **Type** is either Polygon, Point or Line and the **Description** is what you want it to be.



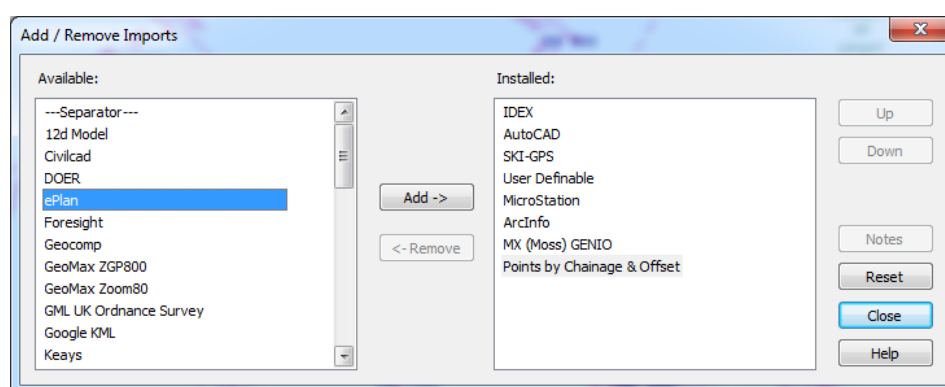
## 5 ePlan Import Tool

One of the key benefits of ePlan to the surveying industry is improved access to survey information in readily usable format. ePlan can facilitate the construction of surveys by pre-populating the previous surveys' information including parcellation and metadata (eg administrative areas, datum, location addresses, survey marks information, road abutments, etc.).

LISCAD includes an **ePlan Import Tool** which supports the import of both ePlan and Cadastral Infrastructure Search (CIS) file. CIS is the digital data file in ePlan format downloaded from LASSI – SPEAR. For more information about how to download digital data from LASSI – SPEAR, refer to User Guide 53 – Using LASSI - SPEAR available from SPEAR web site.

### 5.1 Setting up the ePlan Import Tool

The ePlan Import Tool is located in **(Task→Data Conversions) Import→ePlan**. To add the tool after a fresh installation, select **Import→Add/Remove Imports**, select 'ePlan' and click 'Add'.



The following sections explore the scenarios for importing ePlan/CIS files into LISCAD.

### 5.2 Starting a New Survey with Available Survey Information

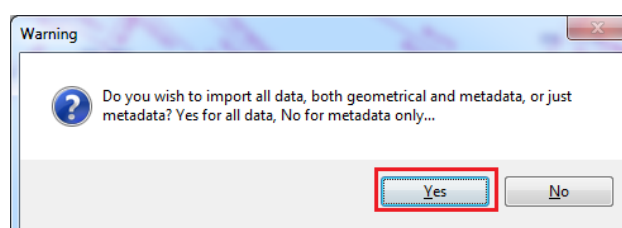
This scenario is recommended when you want to use the available ePlan files of the previous surveys or the CIS file downloaded from LASSI – SPEAR, to pre-populate the base information (including the parcellation and metadata) for constructing the survey.

To import an ePlan or a CIS file into LISCAD complete the following steps:

Step 1 – generate a new SEE file in LISCAD using **File→New** and set the File name and Projection (MGA94).

Step 2 – import the xml file using ePlan Import Tool **(Task→Data Conversions) Import→ePlan**.

Step 3 – click 'Yes' in the popup window shown by the system to import both parcellation and metadata.



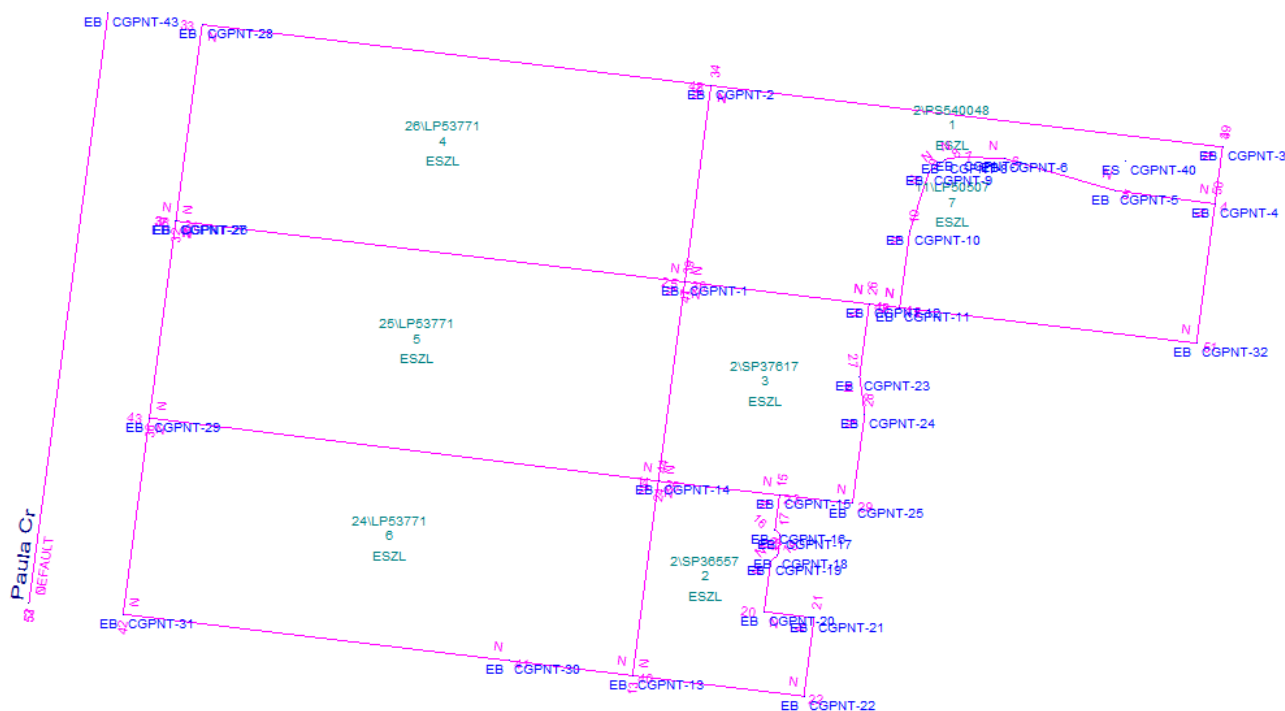
Once the file is imported successfully, the system shows another popup window to advise that an EPL file including metadata has been created for the SEE file.

**NOTE: The EPL file is created in the same folder that SEE file has been created in Step 1.**

Step 4 – display the required attributes of points, lines and polygons that need to be exported to ePlan according to *Section 2.6 Display Features and Groups*.

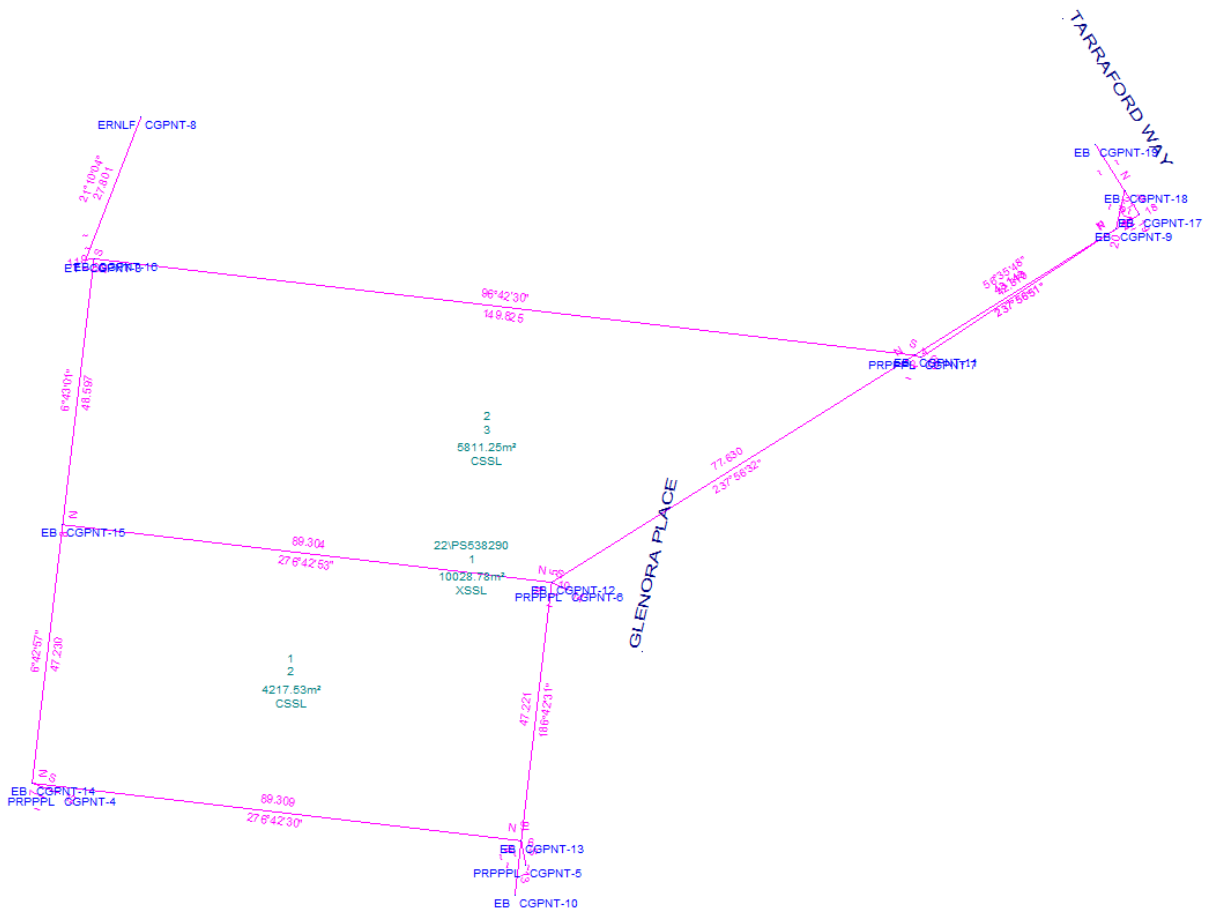
If a CIS file is imported, you would be able to see the following features in the diagram:

- Points with ePlan-LISCAD compliant coding and appropriate point identifier for PM/PCM
- Monuments
- Boundary lines with ePlan-LISCAD compliant coding
- Road abutments
- Parcellation (lots, common properties, roads, reserves and crown parcels) with ePlan-LISCAD compliant coding
- Descriptions (Standard Parcel Identifier (SPI))
- Road names

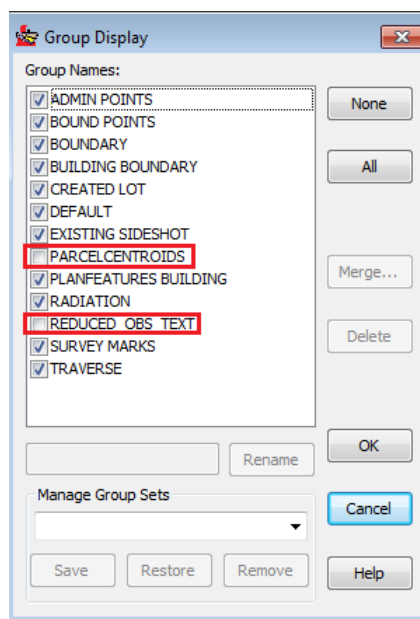


However, if an ePlan file is imported you would be able to see more information, as following:

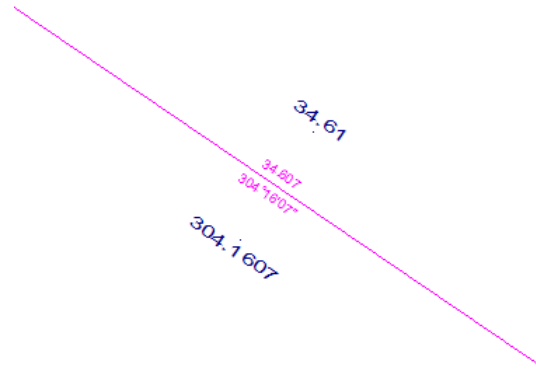
- Points with ePlan-LISCAD compliant coding and appropriate point identifier for PM/PCM
- Monuments with ePlan-LISCAD compliant coding
- Boundary lines with bearing, distance and ePlan-LISCAD compliant coding
- Traverses and radiations with bearing, distance and ePlan-LISCAD compliant coding
- Road abutments
- Parcellation (lots, roads, reserves, common properties, crown parcels, easements, restrictions and depth limitations) with ePlan-LISCAD compliant coding
- Descriptions (Standard Parcel Identifier (SPI))
- Road names



**NOTE:** When an ePlan is imported, two groups are created which are not visible by default. The first group is named 'PARCEL CENTROIDS' and includes the centroids of parcels in the original ePlan which has been imported. After import, a new centroid is generated automatically for each parcel by LISCAD. The second group namely 'REDUCED OBS TEXT' includes the bearings and distances of observations in the original ePlan which has been imported. These two groups have been provided for comparison.



By turning on the 'REDUCED OBS TEXT' group, you would be able to compare the bearings and distances of imported observations with the corresponding values in the original ePlan. Texts in blue show the original bearing and distance of an observation in figure below.

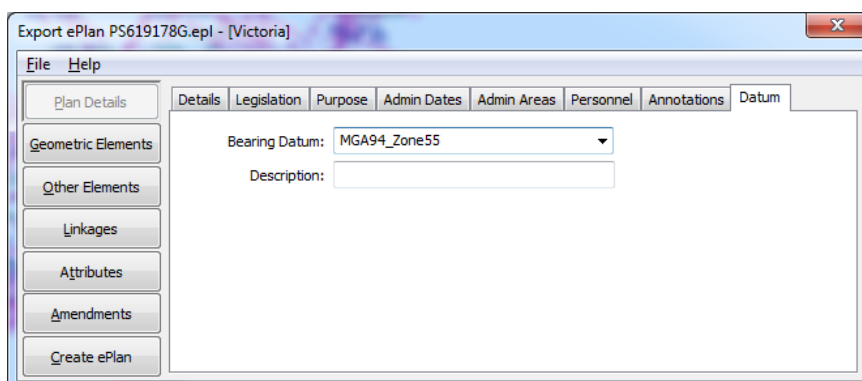
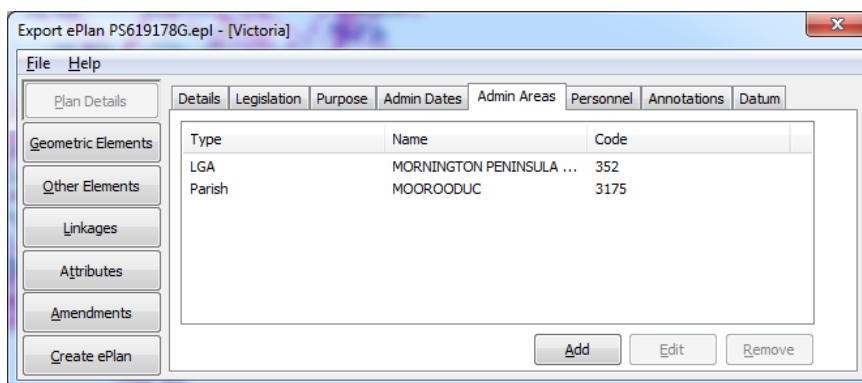


Step 5 – review the created EPL file using **(Task→Data Conversions) Export→ePlan**, in case you would like to use the pre-populated metadata in addition to the parcellation.

In this step, you would be able to see and review the metadata which are pre-populated from imported ePlan/CIS, as following:

Plan Details Window

- Details, Legislation, Purpose, Administrative Areas, Personnel, Annotations and Datum for imported ePlan
- Administrative Areas (LGA, Parish, etc.) and Datum for imported CIS



Geometric Elements Window

- Parcels information (for both imported ePlan and CIS)

Export ePlan PS619178G.epl - [Victoria]

File Help

Plan Details

Geometric Elements

Other Elements

Linkages

Attributes

Amendments

Create ePlan

Poly No.	Description	State	Type	Format	Class	Use
1	1	created	Single	Standard	Lot	
2	2	created	Single	Standard	Lot	
3	3	created	Single	Standard	Lot	
4	4	created	Single	Standard	Lot	
5	5	created	Single	Standard	Lot	
6	6	created	Single	Standard	Lot	
7	7	created	Single	Standard	Lot	
8	8	created	Single	Standard	Lot	
9	9	created	Single	Standard	Lot	
10	ROAD1	created	Single	Standard	Road	

- Reduced Observations (only for imported ePlan)

Export ePlan PS619178G.epl - [Victoria]

File Help

Plan Details

Geometric Elements

Other Elements

Linkages

Attributes

Amendments

Create ePlan

Number	From	To	Purpose	Equipment
1	O118210219	T1	traverse	
2	T1	T2	traverse	
3	T2	T3	traverse	
4	T3	T4	traverse	
5	T4	T5	traverse	
6	T3	B1	traverse	
8	T2	B2	traverse	
10	T5	B3	traverse	
11	T4	T6	traverse	
12	T6	T7	traverse	

- Points information (for both imported ePlan and CIS)

Export ePlan PS619178G.epl - [Victoria]

File Help

Plan Details

Geometric Elements

Other Elements

Linkages

Attributes

Amendments

Create ePlan

Pt ID	OID	State	Type
B1		existing	boundary
B10		existing	boundary
B100		existing	boundary
B107		existing	boundary
B11		existing	boundary
B12		existing	boundary
B126		existing	boundary
B127		existing	boundary
B128		existing	boundary
B13		existing	boundary

- Monuments information (for both imported ePlan and CIS)

Export ePlan PS619178G.epl - [Victoria]

File Help

Plan Details

Geometric Elements

Other Elements

Linkages

Attributes

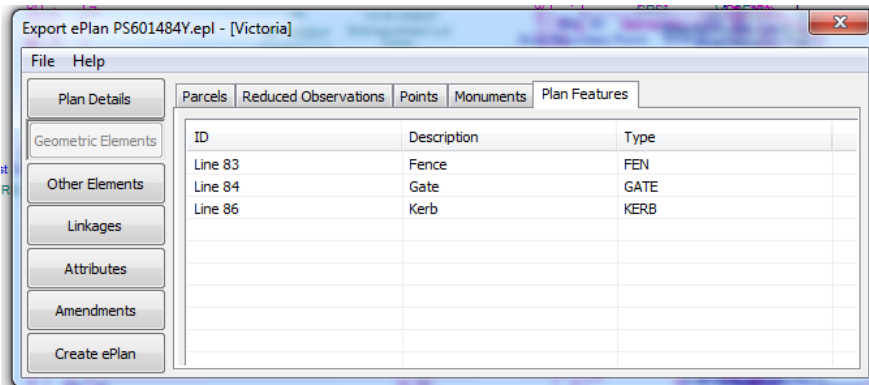
Amendments

Create ePlan

Pt ID	Description	State	Type	Condition
B3		Existing	Nail	Found
O116690100		Existing	Plaque	OK
O118210219		Existing	Plaque	OK
O317502010		Existing	Plaque	OK
O317502030		Existing	Plaque	OK
T11		Existing	Nail	Found

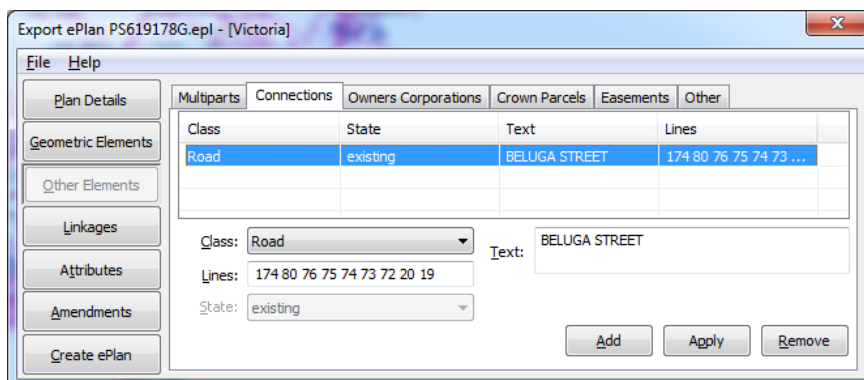
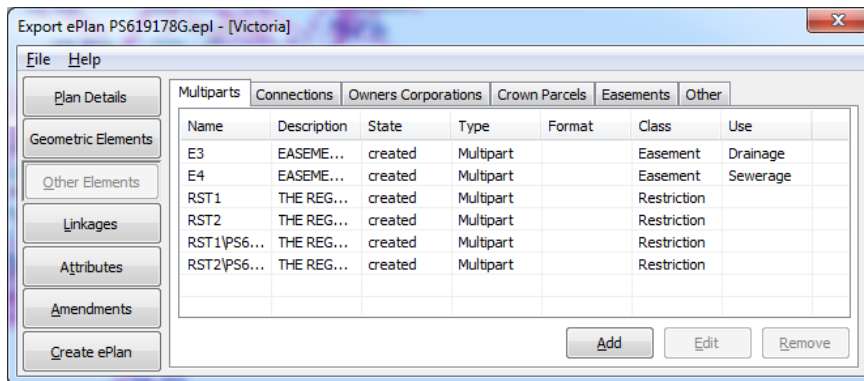


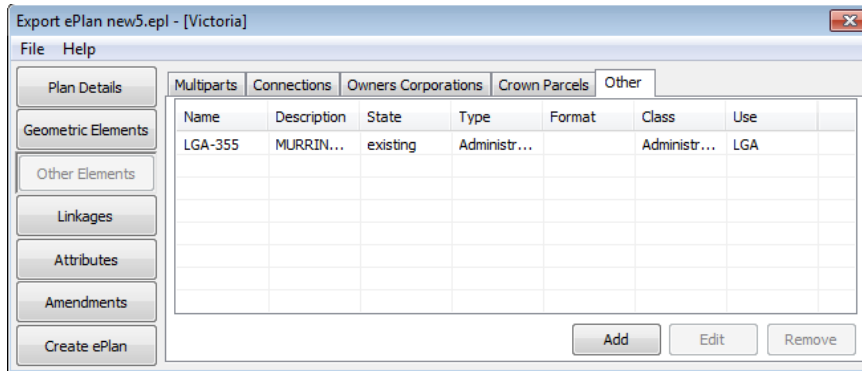
- Plan Features (only for imported ePlan)



### Other Elements Window

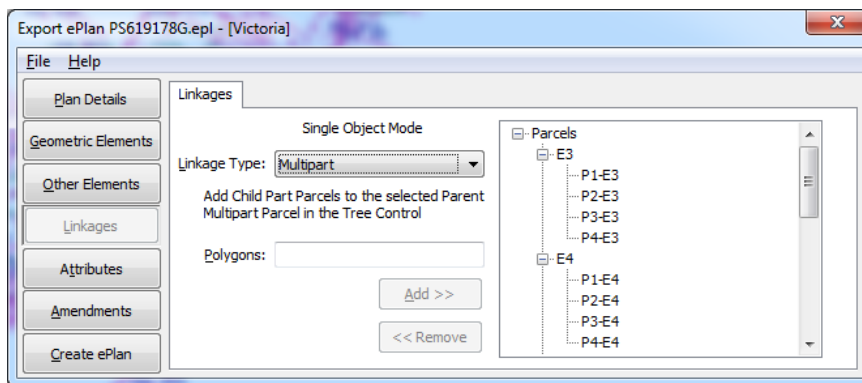
- Multiparts, Connections (abuttals), Owners Corporations, Crown Parcels, Easements and Other for imported ePlan
- Multiparts, Connections (abuttals) and Other for imported CIS





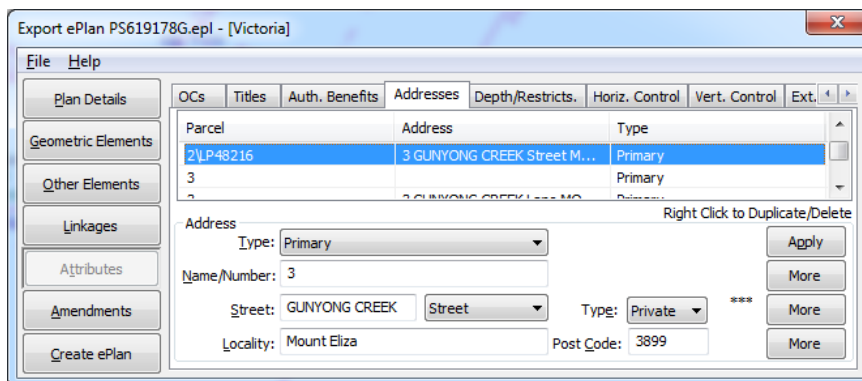
### Linkages Window

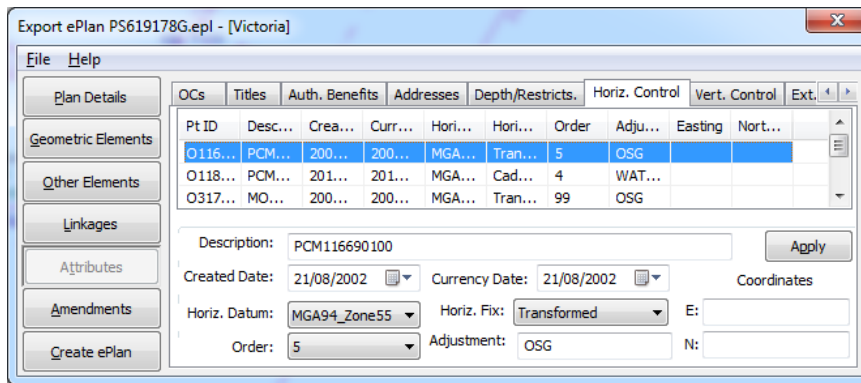
- Multipart, Owners Corporation, Easement, Restriction Benefit/Burden, etc. for imported ePlan
- Multipart for imported CIS



### Attributes Window

- Owners Corporations Schedule, Titles, Easements Authority Benefits, Location Addresses, Depth Limitation/Restriction Description, Horizontal and Vertical Survey Marks' information for imported ePlan
- Location Addresses, Horizontal and Vertical Survey Marks' information for imported CIS





Step 6 – construct your survey using the pre-populated data in both diagram and eplan Export Tool environments.

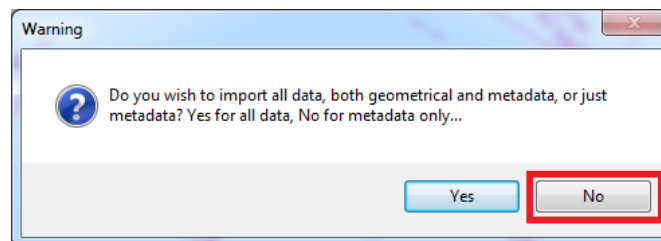
### 5.3 Pre-populate Known Metadata Based on Provided Survey Information

This scenario is recommended when you have drawn the diagram (SEE file) and want to add some of the required metadata from a CIS file and convert SEE file to an ePlan. To import a CIS file to your current SEE file, follow the steps below:

Step 1 – open the SEE file that you want to convert to ePlan.

Step 2 – import the CIS file (in xml) to LISCAD using ePlan Import Tool.

Step 3 – click 'No' in the popup window shown by the system to import metadata only.



Once the file is imported successfully, the system shows another popup window to advise that an EPL file including metadata has been created for the SEE file.

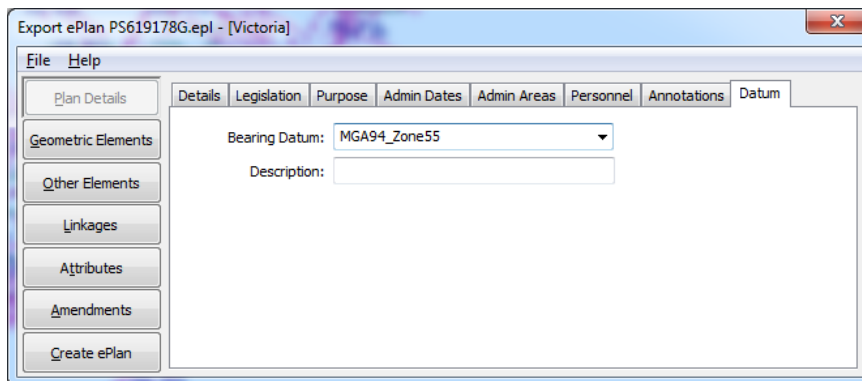
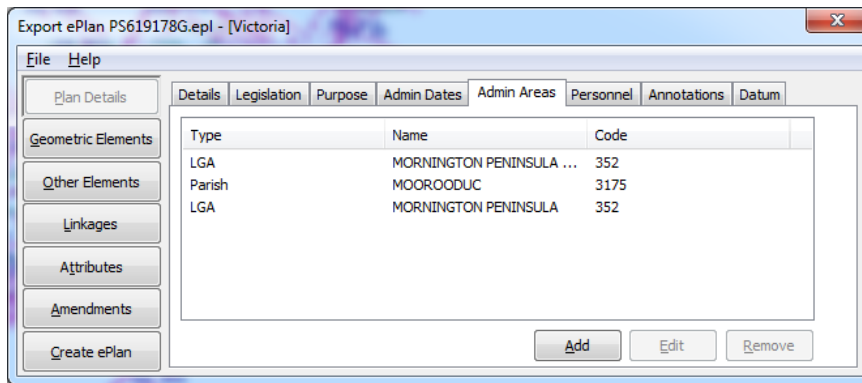
**NOTE: The EPL file is created in the same folder that SEE file exists.**

Step 4 – review the created EPL file using **(Task→Data Conversions) Export→ePlan**.

In this step, you would be able to see and review the metadata which are pre-populated from imported CIS, as following:

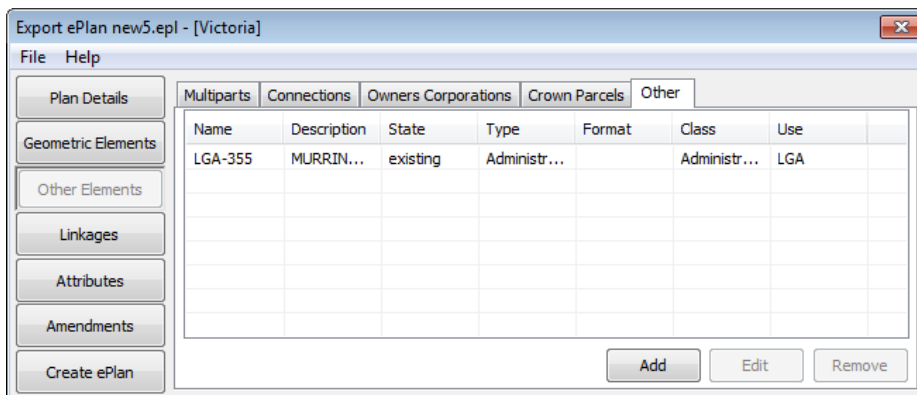
#### Plan Details Window

- Administrative Areas (LGA, Parish, etc.) and Datum



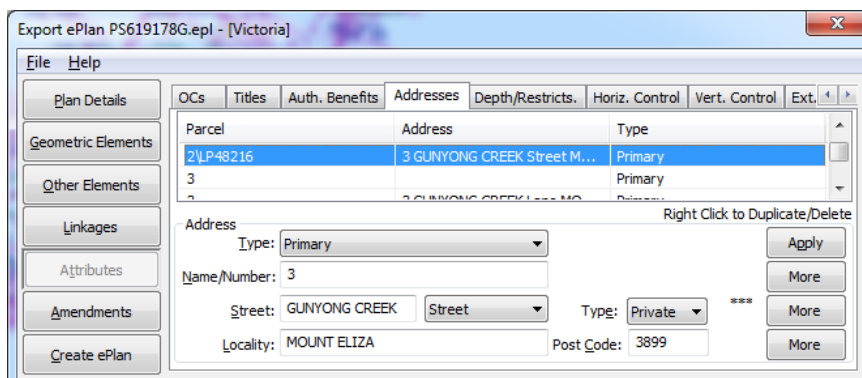
### Other Elements Window

- Other (non-spatial parcels for admin areas)

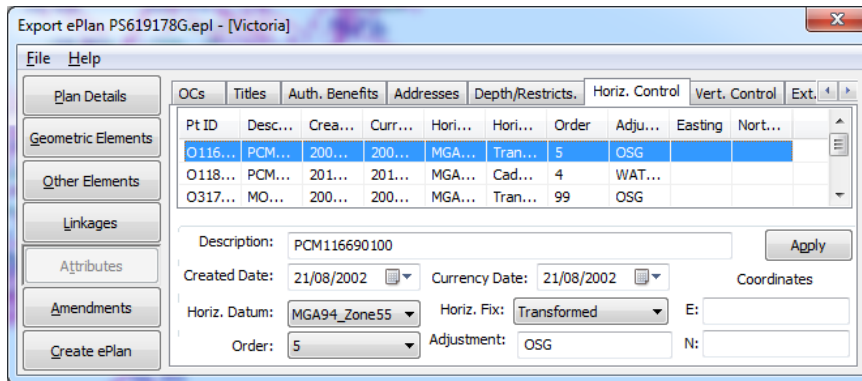


### Attributes Window

- Location Addresses (for any parcel in diagram of which its SPI matches the parcel SPI in imported CIS)



- Horizontal and Vertical Survey Marks' information (for any survey mark in diagram of which its oID matches the oID of survey marks in imported CIS)



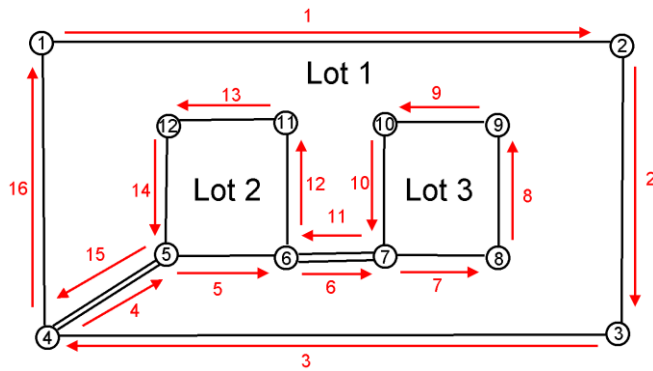
**NOTE:** The ePlan Import Tool compares the SPI of parcels and also the oID of PMs/PCMs in both diagram and imported CIS file and matches the consistent features to import and assign metadata.

# Appendices

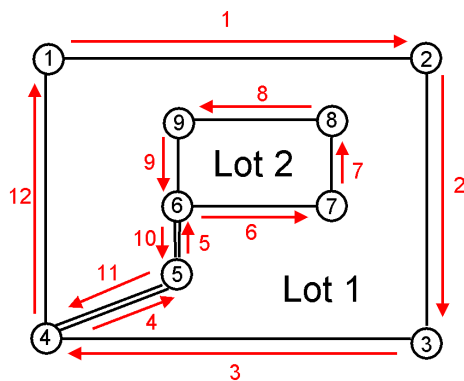
## Appendix A – DONUT POLYGONS EXAMPLES

Below are some examples showing different types of donut polygons. The red arrows illustrate the direction of the rings along with the order of line segments selection for polygon creation.

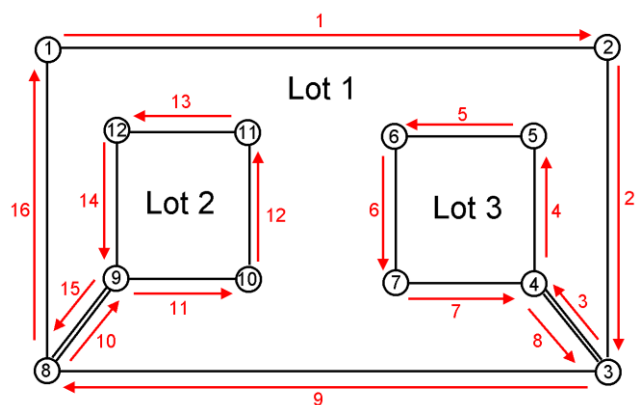
### Daisy Chained Donut



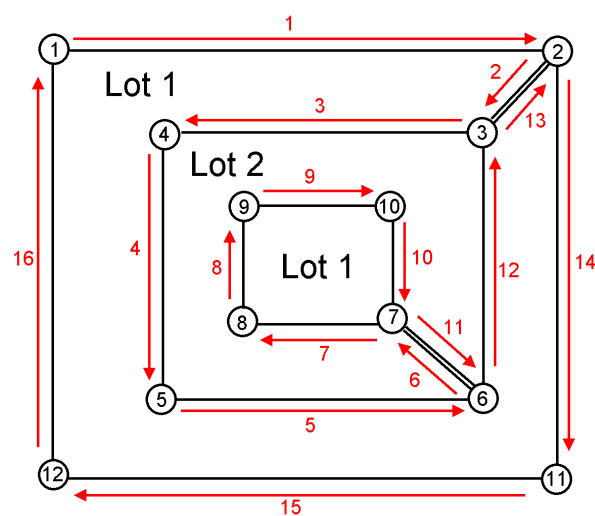
### Multiple connection lines



### Multiple connections from different points

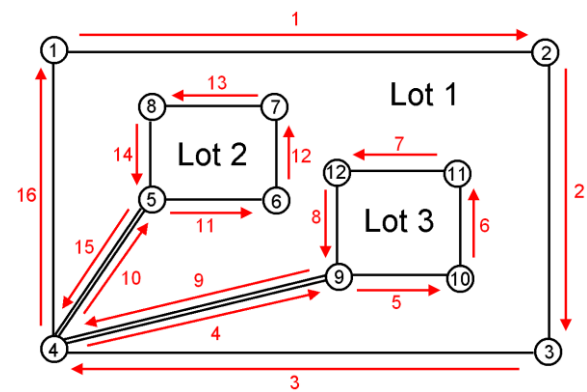


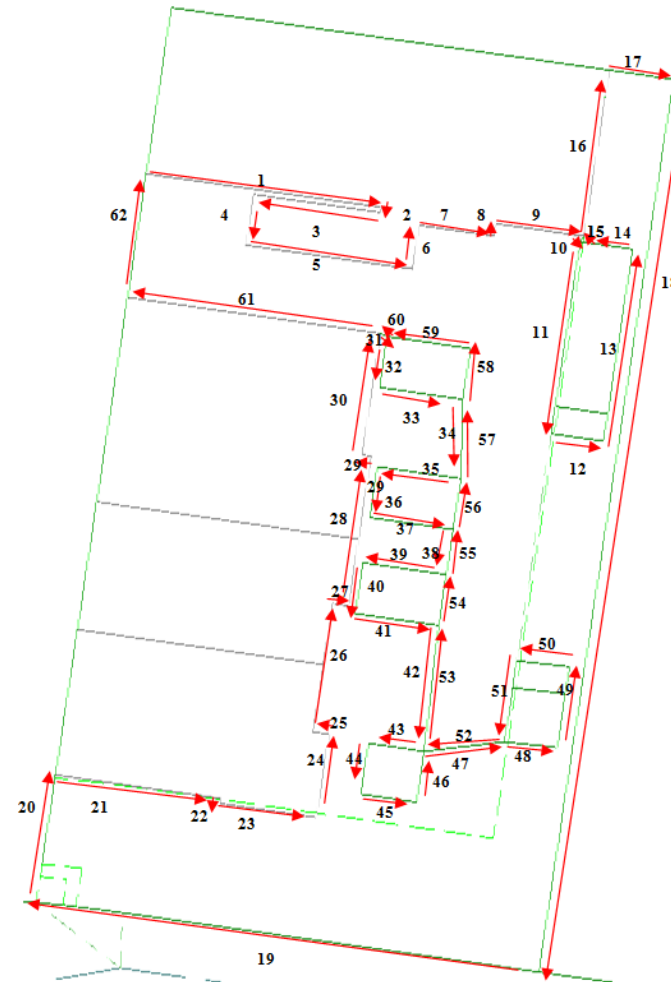
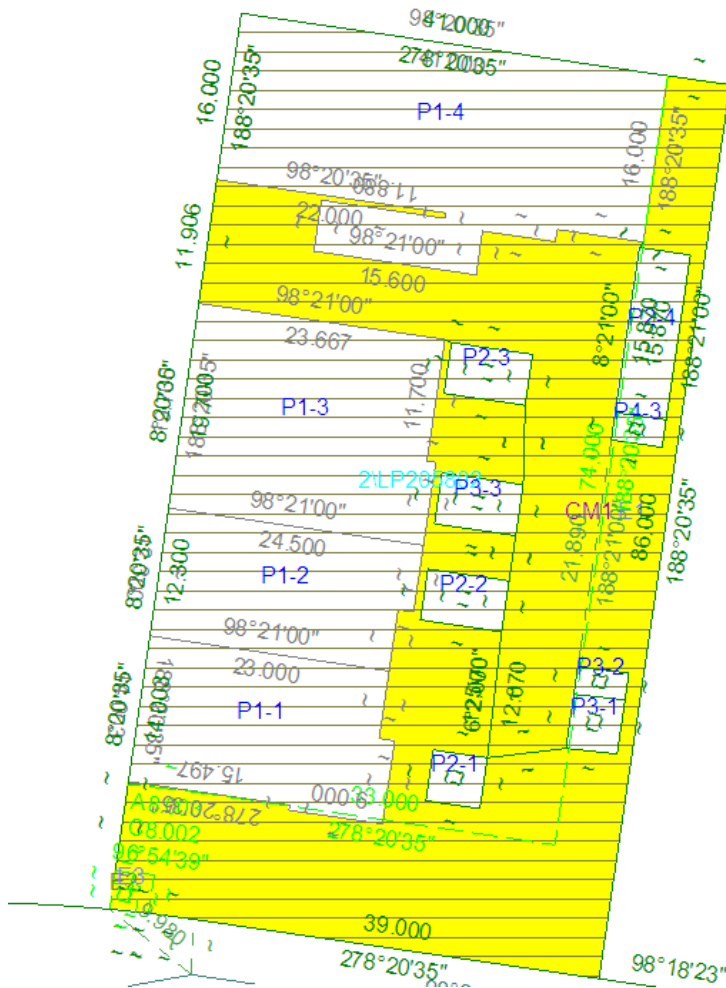
### Donut within donut



### Multiple connections from the same point

Multiple connections from the same point can be done in any order provided all the double lines are followed before the single line.





**NOTE:** It is highly recommended to plan the selection of line segments before creating the donut polygon. For instance, the selection of the line segments for creating the common property polygon in the above diagram has been planned as diagram on right.