Preparing LISCAD data for Export to a Victorian ePlan

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Version	**Date**	**Changes Made**	**Author**
0.1	7 April 2011	Import of earlier documentation and restructuring content	LISTECH
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0.5	16 June 2011	Added Equipment Used Coding	LISTECH
0.6	5 Sep 2011	Plan features, Connections and Addressing content added	LISTECH

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1.0 Introduction

1.1. Purpose and Scope

This document explains how to prepare LISCAD SEE data for export to an ePlan CIF to meet Victorian jurisdictional requirements.

It is assumed that the reader is familiar with LISCAD, as well as the relevant ePlan documentation from ICSM and the relevant jurisdictional authority.

Enumeration tables and other sections of this document which are also applicable to all other jurisdictions are indicated with the phrase "*all jurisdictions*" in *italic*.

1.2. Preparing LISCAD data for Export to ePlan

The Projection used to create the SEE project must be either Plane or MGA.
- If the project is on some other projection it will be tagged as "local", as only "local" or "MGA" are acceptable in the CIF.

The SEE point, line and polygon objects need to be attributed according to this document to ensure a valid CIF is created.
- The codes, ids and descriptions of the SEE objects exported are used by the export process to tag the objects with data when they are placed in the CIF, based upon mappings described later in sections 2, 3 and 4 of this document.

Only DISPLAYED points, lines and polygons are exported.
- Hence ensure that appropriate groups are displayed via Display/Groups.

1.3. Accessing the LISCAD ePlan Export functionality

The LISCAD ePlan export command is located in the LISCAD SEE application and accessed via the command:

"Data Conversions / Export / ePlan"

If the "ePlan" option is not present in the Export menu, use "Export / Add Remove" to add it to the menu.

If the ePlan option is not present, or is present but cannot be used, the LISCAD licence needs to be upgraded to the latest version and the ePlan module needs to be added. Please contact LISTECH to arrange.

Ensure your SEE data is attributed according to this document before using the Export/ ePlan command.

2.0 Point Attributes

2.1. Point Coding

Points must be coded as $C_1C_2C_{34}C_{56}$ where:

C_1 - Point State
C_2 - Point Type
C_{34} - Monument Type   (Only needed if point is an ePlan monument)
C_{56} - Monument State (Only needed if point is an ePlan monument)

The CIF file mappings and required code characters are tabulated below.

C_1 - Point State
All Juristictions

Enumeration	LISCAD Point Code C_1	Additional information
abandoned	A	
destroyed	D	
existing	E	Default for Victoria
proposed	P	

C_2 - Point Type
All Juristictions

Enumeration	LISCAD Point Code C_2	Additional information
monument	M	
control	C or H or V	C = Horz and Vert, H = Horz only, V = Vert only
sideshot	S	
boundary	B	
natural boundary	N	
traverse	T	
reference	R	
administrative	A	

C_{34} - Monument Type   (Only needed if point is an ePlan monument)

Enumeration	LISCAD Point Code C_{34}	Additional information
Occupation	OC	
Bolt	BL	
Bottle	BT	
Chisel Cut	CC	
Cross Head Nail	CH	
Deep Driven Rod	DR	
Drill Hole	DH	
Drill Hole with Wings	DW	
Dumpy Peg	DP	
Etch	ET	
G.I. Nail	GI	
HSM	HS	
Nail	NL	
Nail in Peg	NP	

Nail in Rail	NR	
Not Marked	NM	
Offset Nail	ON	
Other	OT	
Peg	PG	
Peg and Trench	PT	
Pin	PN	
Pipe	PP	
Plaque	PL	
Plug	PU	
Rivet	RV	
Rod	RD	
Reference Tree	RT	
Screw	SW	
Spike	SK	
Star Picket	SP	
Star Picket with Collar	SC	
Star Steel Post	SS	
Steel Star Picket	ST	
Survey Nail	SN	
Survey Post	SO	
Unknown	UN	

C_{56} - **Monument State**   (Only needed if point is an ePlan monument)

Enumeration	LISCAD Point Code C_{56}	Additional information
Abandoned	AB	
Damaged	DM	
Destroyed	DS	
Disturbed	DB	
Found	F	
Leaning	LN	
Loose	LO	
Nipple Damaged	ND	
Not Found	NF	
Not Used	NU	
OK	OK	
Origin	OR	
Placed	PL	
Plaque Missing	PM	
Removed	RM	
Replaced	RP	
Suspect	SP	
Unknown	UN	
Unstable	US	

2.2. Point Description

Monuments may have a "description" attribute and an 'originSurvey' attribute. The values for both of these are held in the LISCAD point description, as 'description'|'originSurvey', separated by the '|' character.

E.g. a LISCAD point with description of **TARNEIT PM356 | PS523401** will export a monument to the CIF with the originSurvey = **PS523401** and description = **TARNEIT PM356**.

2.3. Point Identifier

The Point Identifier is used to hold oID (official survey mark) numbers (sometimes known as the "9 figure number").

Point Identifiers that start with O [capital character 'O'] get an official point identifier in the CIF. For example point identifier O123456789 will produce an official point identifier value in the CIF of 123456789, the 'O' being removed by the export process.

If the ID does not start with letter 'O', then the ID is not exported as it is not needed in the CIF unless it is an oID for an official survey mark.

2.4. Example of Point Attributing using Code and Description

This example details the required point code and description in LISCAD to produce the appropriate CIF output for a particular point.

The point is existing (point state), used for horizontal control (point type), is a rivet (monument type) and has been found (monument state).

It was originally placed in survey BP1532, and has a PCM number of **PCM112340524.**

Hence, this point would be stored in LISCAD with:
    Point Code: EHRVF
    Point Description: BP1532|PCM112340524

The CIF created from LISCAD using Export/ePlan would have the following 2 entries.

<CgPoint name="**CGPNT-xxx**" pntSurv="**control**" state="**existing**">

<Monument name="**MON-yyy**" desc="**PCM112340524**" type="**Rivet**" state="**Found**" pntRef="**CGPNT-xxx**" originSurvey="**BP1532**" />

2.5. Other Rules for Points

The following points are not exported even if they are displayed in SEE:
  • Points with a code of CENTRE.
    ○ This allows arc centre points to be used in the CIF to define the arc geometry without also being used as CIF points in their own right.
  • Points on group NATURAL.
    ○ This allows you to view data in SEE that is excluded from export to the CIF.

3.0 Line Attributes

3.1. Line Coding

Lines must be coded as C_1 C_2 where:

C_1 - Line Purpose Type
C_2 - Equipment Type (optional)

The CIF file mappings and required code characters are tabulated below.

C_1 - Line Purpose Type
All Jurisdictions

Enumeration	LISCAD Line Code C_1	Additional information
normal	N	Used in Vic
check	C	
backsight	B	
foresight	F	
traverse	T	Used in Vic
sideshot	S	Used in Vic
resection	R	
levelLoop	L	
digitalLevel	D	
remoteElevation	E	
reciprialObservation	O	
topo	P	
cutSheets	H	
asbuilt	A	

C_2 - Equipment Type

Enumeration	LISCAD Line Code C_2	Additional information
Total Station	T	
Theodolite and EDM	E	
Theodolite and Steel Band	S	
GNSS (inc. GPS)	G	
Level	L	
Tape	P	
Other	O	

3.2. Line Description

Irregular lines are lines that have more than one segment and are to be placed in a LISCAD group called "IRREGULARLINE", otherwise they are output as a series of Line elements in the CIF.

Irregular lines have a "description" attribute and a "source" attribute in the CIF. The values for both of these are held in the LISCAD line description, separated with a '|'.

E.g. a LISCAD line with description of **aaaaa|bbbbb** will export an irregular line to the CIF with the description = **aaaaa** and source = **bbbbb.**

3.3. Other Rules for Lines

Only the following LISCAD lines are exported.

- Parcel Lines: Lines that define polygons are exported as part of the Parcel object described later in this document (Section 4).

- Reduced Observations: Lines that are exported to the CIF as Reduced Observations include lines that are individual segments and have a bearing attribute and/or a distance attribute. (Any line that has more than one segment will be treated as an 'Irregular Line' in the CIF. Refer to section 3.2)
    - If a reduced azimuth is to be created in the CIF, the bearing attribute of the line in LISCAD must be set for that line.
    - If a reduced distance is to be created in the CIF, the distance attribute of the line in LISCAD must be set for that line.
    - Azimuths and distances are exported to the CIF at the precision set in the Utilities/Configure/Angles and Utilities/Configure/Distances commands.
    - Each line must have a code as defined in section 3.1.

Reduced Observations have an optional "description" attribute, "azimuthAccuracy" attribute, "distanceAccuracy" attribute , "adoptedAzimuthSurvey", "adoptedDistanceSurvey", "azimuthAdoptionFactor" and "distanceAdoptionFactor" attributes in the CIF. The values of these are held in the LISCAD line description, separated with a '|'.

E.g. a LISCAD line with description of **aaaaa|0.01|0.001|LP12345| |7.0128** will export a ReducedObservation to the CIF with the description = **aaaaa**, azimuthAccuracy = **0.01**, distanceAccuracy = **0.001**, adoptedAzimuthSurvey = **LP12345** and azimuthAdoptionFactor = **7.0128.** Note that in order to jump over the adoptedDistanceSurvey field, (or any field to be left blank), a space must be used between the '|' characters.

Reduced Arc Observations have an optional "description" attribute, "arcAzimuthAccuracy" attribute, "arcLengthAccuracy" attribute , "adoptedSurvey", "azimuthAdoptionFactor" and "lengthAdoptionFactor" attributes in the CIF. The values of these are held in the LISCAD line description, separated with a '|'.

E.g. a LISCAD arc with description of **aaaaa|0.01|0.001|LP12345|7.0128** will export an ReducedArcObservation to the CIF with the description = **aaaaa**, arcAzimuthAccuracy = **0.01**, arcLengthAccuracy = **0.001**, adoptedAzimuthSurvey = **LP12345** and azimuthAdoptionFactor = **7.0128.** Note that in order to jump over any field to be left blank, a space must be used between the '|' characters.

4.0 Polygon Attributes

4.1. Polygon Coding

Polygons must be coded as $C_1C_2C_{34}C_{567}$ where:

C_1 -   Parcel State
C_2 -   Parcel Type
C_{34} -   Parcel Class
C_{567} - Parcel Use

The CIF file mappings and required code characters are tabulated below.

C_1 - Parcel State
All Jurisdictions

Enumeration	LISCAD Polygon Code C_1	Additional Information
Affected	A	The parcel must be amalgamated with one or more parcels created by the survey when the survey is deposited.
Created	C	The parcel is being created by the survey.
Encroached	O	The parcel has been subject to natural erosion and/or accretion and the definition of the parcel has been/should be updated. Relevant where the parcel affected by the accretion/erosion is not extinguished by the survey.
Existing	E	The parcel is existing.
Extinguished	X	The parcel is being replaced by the parcels being created by the survey.
Referenced	R	The parcel is referenced by the survey.
Proposed	P	The parcel is introduced on the survey but has not actually been 'created'. This will generally only apply to parcels such as Future Development Units (FDU) on a Proposed Unit Development plan (PUD). The parcel will be created in a subsequent plan, eg Stage 1 of the Unit Development.
Adjoining	D	

C_2 - Parcel Type
All Jurisdictions

Enumeration	LISCAD Polygon Code C_2	Additional Information
Single	S	The parcel is made up of a single coordinate geometry.eg a standard house lot
Multipart	M	The parcel is made up of more than one part parcel, e.g. a building format lot. These part parcels are referenced in the parcels attribute
Part	P	The parcel is a part parcel, e.g. a balcony in a building format lot. Several part parcels make up a multipart parcel. A part parcel cannot be issued with a title
Administrative	A	The parcel represents an admin area e.g. a parish which may or may not have a coordinate geometry. These are used to allocate these admin areas to parcels.

C_{34} - Parcel Class

Parcel Class indicates what the parcel's intent is.

If the 4th character is not needed, but something must be inserted there (e.g. when a Parcel Use is required at the 5th character), use the 'Z' character for the 4th character.

Enumeration	LISCAD Polygon	Additional Information

	Code C_{34}	
Administrative Area	A	
Crown Allotment	CA	
Common Property	CM	
Crown Portion	CP	
Easement	E	
Lot	L	
Road	R	The parcel is used for road.
Reserve	RS	
Restriction	RT	
Owners Corporation	O	
Depth Limitation	D	

C_{567} - Parcel Use

Parcel Use indicates what the parcel's use is.

Enumeration	LISCAD Polygon Code C_{567}	Additional Information
LGA	LG	.
Locality	LC	
County	CO	
Parish	PA	
Township	TO	
Limited	LM	
Limited to Common Property	LMC	
Unlimited	UN	
Air Exhaust and Ventilation	AEV	
Air Exhaust, Ventilation and Access	AEA	
Air Supply	AS	
Bore, Windmill and Tank	BWT	
Carriageway	CA	
Carriageway (with Limitation and Obligation)	CAL	
Channel	CH	
Chimney	CM	
Data Transmission	DT	
Drainage	DR	
Drainage and Floodway	DF	
Drainage and Sewerage	DS	
Drainage and Waterway	DW	
Erosion	ER	
Fire Access	FAC	
Fire Egress	FEG	
Fire Escape	FES	
Flooding	FL	
Floodway	FW	

Flow of Air	FAR	
Flow of Light	FLT	
Flow of Light and Air	FLA	
Footway	FO	
Garbage Collection/Garbage	GC	
Gas Distribution Pipeline	GD	
Gas Transmission Pipeline	GT	
Ground Water Monitoring	GW	
Irrigation	IR	
Laying Water Pipes	LWP	
Loading and Unloading Heavy Equipment	LHE	
Mail Collection	MC	
Nuisance or Annoyance	NA	
Overhanging Balcony	OB	
Overhanging Eaves	OE	
Overhanging Projections	OP	
Overhanging Spouting	OS	
Party Wall	PW	
Passage of Air	PSA	
Passage of Light	PSL	
Passage of Light and Air	PSR	
Pipeline or Ancillary Purposes	PP	
Powerline	PO	
Public Conveniences	PC	
Public Highway	PH	
Quarrying and Blasting	QB	
Recreation and Garden	RG	
Right of Access	RA	
Right of Entry	RE	
Sanitary Convenience	SC	
Sewerage	SW	
Signboard, Signage	SS	
Soakage by Water	SO	
Submergence	SU	
Supply of Electricity	SE	
Supply of Gas	SG	
Supply of Recycled Water	SPR	
Supply of Water	SPW	
Support	SP	
Telecommunications	TC	
Transmission of Electricity	TE	
Tree Planting	TP	

Underground Effluent Disposal	UED	
Use of Stairway	US	
Vehicle Parking	VP	
Walkway	WK	
Walkway in the event of 'activity' in 'specific location'	WKE	
Waste Disposal	WD	
Waterway	WW	
Waterway Management	WWM	
Way	WY	
Wetland	WL	

4.2. Polygon Description

The polygon description is used to enter parcel names according to rules based upon the parcel class, state and type. These rules are explained below.

Parcel Naming Rules

Summary Table (* means any of the possible enumerations)

Category	Parcel State C_1	Parcel Type C_2	Parcel Class C_{34}	Description must contain	Description Example
Created Lot	C	*	L	Lot #	1
Non Created Lot	Not C	*	L	Lot #\Plan #	1\PSxxxxx
Common Property	*	*	CM	Common Prop #	1 or CM1
Road	*	*	R	Road Parcel # and Road Name	1 Smith Sreet or R1 Smith Street
Reserve	*	*	RS	Reserve #	1 or RES1
Easment	*	*	E	Easment #	1 or E1
Restriction	*	*	RT	Restriction #	1 or RST1
Owners Corp'n	*	*	O	Owner Corp parcel #	1 or OC1
Crown Allotments	*	*	CA or D	"Allotment" #, "Section" #	Allotment 3, Section 25
Crown Portions	*	*	CP	"Portion" #	Portion 31
Part Parcels	*	P	*	Part Parcel #	1

Explanatory notes to Parcel Naming Rules Summary table.

- **Created Lot**
  Created Lots have a class of "lot" and a state of "created", C3 = 'L' and C1 = 'C'. A typical code would be 'CSL'

  In this case, the description should just contain the number of the Lot on the Plan being created, e.g. '1', being Lot 1 on PS XXXXXX. The CIF parcel name for this parcel will be 1\PSXXXXX. (The plan of subdivision number is entered only once via the Export/ePlan/Details dialog).

- **Non created Lot**
  If a Lot is already existing, e.g. C3 = 'L' and C1 is not 'C', e.g. 'E' for existing, or 'X' for extinguished, then the description should also include the Plan Number the parcel came from, , e.g. 1\PSXXXXXX which will become parcel name in the CIF.

- **Common Property**
  For Parcels that have a class of "Common Property" C34 = 'CM', the description should just contain the number of the Common Property parcel on the Plan being created, e.g. '1', though 'CM1' is also acceptable. The code will then create a Parcel name for this of CM1\PSXXXXX. (The plan of subdivision number is entered only once via the Export/ePlan/Details dialog).

- **Road**
  For Parcels that have a class of "Road" C3 = 'R', the description should just contain the number of the Road Parcel on the Plan being created, e.g. '1', though 'R1' is also acceptable. The code will then create a Parcel name for this of R1\PSXXXXX. The description here should also have the Road Name, so if R1 is Smith Street, the description should be "R1 Smith Street", or "1 Smith Street".

- **Reserve**
  For Parcels that have a class of "Reserve" C34 = 'RS', the description should just contain the number of the Reserve parcel on the Plan being created, e.g. '1', though 'RES1' is also acceptable. The CIF will then have a parcel name for this of RES1\PSXXXXX. (The plan of subdivision number is entered only once via the Export/ePlan/Details dialog).

- **Easement**
  For Parcels that have a class of "Easement" C3 = 'E', the description should just contain the number of the Easement parcel on the Plan being created, e.g. '1', though 'E1' is also acceptable. The CIF will then have a parcel name for this of E1\PSXXXXX. (The plan of subdivision number is entered only once via the Export/ePlan/Details dialog).

- **Restriction**
  For Parcels that have a class of "Easement" C34 = 'RT', the description should just contain the number of the Restriction parcel on the Plan being created, e.g. '1', though 'RST1' is also acceptable. The code will then create a Parcel name for this of RST1\PSXXXXX. (The plan of subdivision number is entered only once via the Export/ePlan/Details dialog).

- **Owners Corporation**
  For Parcels that have a class of "Owners Corporation" C3 = 'O', the description should just contain the number of the Owners Corporation parcel on the Plan being created, e.g. '1', though 'OC1' is also acceptable. The code will then create a Parcel name for this of OC1\PSXXXXX. (The plan of subdivision number is entered only once via the Export/ePlan/Details dialog).

- **Crown Allotments and Depth Limitations**
  For Parcels that have a class of "Crown Allotment" C34 = 'CA', or "Depth Limitation" C3 = "D" the Parcel Name is derived from the Allotment and Section, the details of these must be in the Polygon Description. A comma must separate the Allotment and Section, e.g. the description could be "Allotment 3, Section 25". The Parish or Township code is also required, but this comes from the defined Administrative Area that the parcel is in, and is not required in the Polygon description. The code will create a Parcel Name of the form $A{\sim}S$\PP$PC$, where A is the allotment number, e.g. 3, S is the Section number, e.g. 25 and PC is the parish code, e.g. 3473B.

- **Crown Portions**
  For Parcels that have a class of "Crown Portion" C34 = 'CP', the Parcel Name is derived from the Portion number, the details of these must be in the Polygon Description. e.g. the description could be "Portion 31". The Parish or Township code is also required, but this comes from the defined Administrative Area that the parcel is in, and is not required in the Polygon description. The code will create a Parcel Name of the form P\PP$PC$, where P is the portion number, e.g. 31, and PC is the parish code, e.g. 3473B.

- **Part Parcels**
  For Parcels that have a type of "Part" C2 = 'P', they should have a numeric description, e.g. 1 The Multipart Parcel that is the parent parcel for the part parcel will define the Parcel Name of the child parcel, using the number in the description to say what number part parcel it is.

4.3. Example of Polygon Coding

A Polygon is to be exported as a Parcel in the CIF with the following attributes...

<Parcel class="**Lot**" parcelFormat="**Standard**" state="**existing**" parcelType="**single**" name="**2/SP177688**" desc="**27317/163**">

The code of that Polygon will need to be ESSL. This is because the first character of the Polygon code maps to the Parcel state, (E = existing), the second character of the Polygon code maps to the Parcel type, (S = single), the third character of the Polygon code maps to the Parcel format (S = standard), the fourth (and fifth) characters of the Polygon code maps to the Parcel class (L = Lot).

The name and description of the Parcel comes from the description of the Polygon in SEE, according to rules outlined in the Parcel Naming Rules section of this document.

5.0 Plan Features

Plan Features are defined in SEE as any displayed line object which resides on the PLANFEATURES group.

The ePlan User Interface dialog in SEE has a Tab which displays all objects to be output as a Plan Feature.

6.0 Connections

The ePlan User Interface has a Tab which allows the definition of Road, Crown Allotment or Crown Portion connections to be output to the CIF. The user needs to create a piece of LISCAD text which is the Connection Name, e.g. "PRYORS ROAD" and have line elements to define the connection , most likely being the edges of related polygons. The State is hardcoded to be "existing" for Road class connections, but can be either "existing" or "referenced" for Crown Allotments and Portions.

"Referenced" is used when the crown allotment no longer exists and was previously subdivided in another plan.

Existing is where the crown allotment is still current. Once these existing crown allotments eventually get subdivided, a surveyor would have to refer to them as "referenced" if they are used to re-establish any titles.

 The centroid of the connection is the coordinates of the Text object hot point selected.
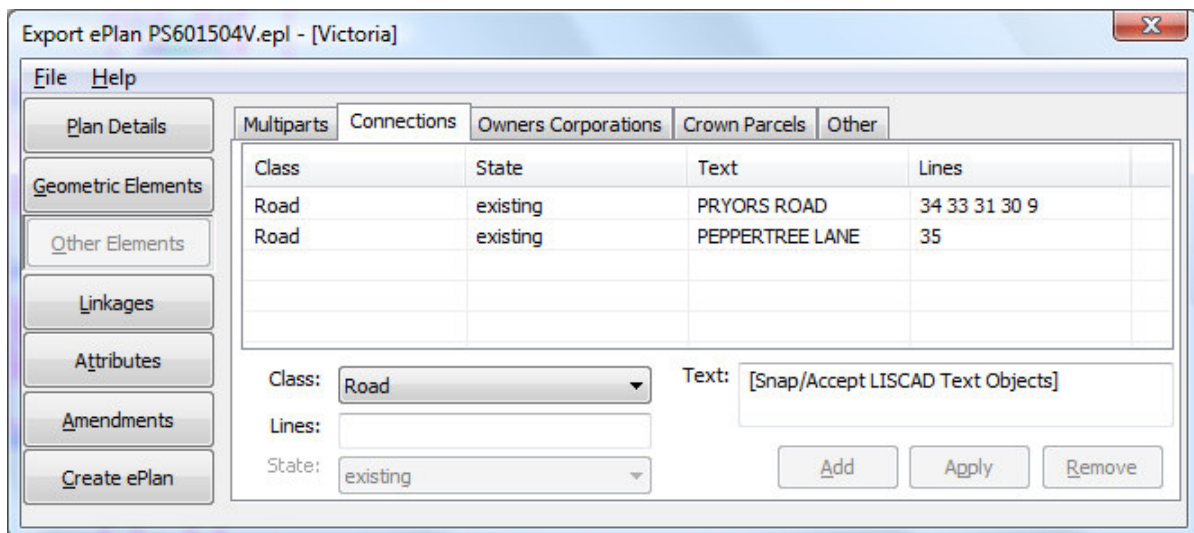
7.0 Tips for Preparing the Data

7.1. Code Table

You should create an appropriate code table and use it to set the required attributes for points, lines and polygons before creating the various objects. There may already be a sample code table available for your jurisdiction, which you could use as a start and then edit/modify it as you progress. Please contact LISTECH regarding availability of a sample code table.

7.2. Attribute Editing

LISCAD has numerous commands and powerful functionality available for editing object attributes. Please ensure you are familiar with this editing functionality.

8.0 Creating the CIF

8.1. Export / ePlan and associated Help

For assistance when using the Export/ePlan dialogs, please selecting the help option within the dialog or pressing F1.

9.0 Addressing Rules

9.1. The Address Name/Number Field

When entering an address into the ePlan dialog, it is important to know how the entered address is broken up into the required ePlan attributes in the CIF.

The relevant fields are
- Flat Type
- Flat Number
- Floor Level Type

- Floor Level Number
- Number First
- Number Suffix First
- Number Last
- Number Suffix Last

So given an address string...

1. Flat Type, if it exists must come first. E.g Unit 7. The word "unit" is recognised as a valid option of the VICMAP data type "flatType", but any valid word in that list could be used here, signalling that the number following is the flat Number.
2. Floor Type, if it exists must come next. E.g Floor 2 word "floor" is recognised as a valid option of the VICMAP data type "floorLevelType", but any valid word in that list could be used here, signalling that the number following is the floor Level Number
3. Whatever is left needs to be parsed into the number first/suffix, number last/suffix fields using the '-' as the separator.

   Example:

The following address entered into the Address Name/Number field in the ePlan functionality...

Unit 25 Floor 4 45A-49B

Will be separated out in the CIF to ...

```
-<LocationAddress numberSuffixFirst="A" numberFirst="45" addressType="Primary"
flatNumber="25 " flatType="Unit" numberLast="49" floorLevelNumber="4"
floorLevelType="Floor" numberSuffixLast="B">
```