



**LAND
REGISTRY
SERVICES**

NSW LandXML Recipe

Specifications for preparation of Deposited Plans in LandXML format for lodgment at NSW Land Registry Services

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Amendment History

Version	Date	Author	Comments
4.0	15-10-2010	Mark Deal	Complete rewrite of NSW Recipe to align with ICSM ePlan Protocol LandXML Mapping .doc
4.01	3-11-2010	Mark Deal Feedback from: Mike Elfick and Landmark	<ul style="list-style-type: none"> • Removed Author element • Removed Amendment and AmendmentItem elements • Removed PlanFeatures and PlanFeature elements • Removed IrregularLine element • Removed PntList2D element • Removed PntList3D element • Removed PurposeOfSurvey element • Removed Personnel element • Removed SurveyHeader@surveyorReference attribute • Changed description column for CgPoint@state attribute • Changed description column for Parcel@state attribute • Changed ReducedObservation@azimuth attribute to “R” (required) • Changed wording of description for the following attributes:: <ul style="list-style-type: none"> ○ ReducedObservation@distanceType ○ ReducedObservation@azimuthType ○ ReducedArcObservation@arcType ○ ReducedObservation@adoptedDistanceSurvey ○ ReducedArcObservation@adoptedSurvey • Included easements in Parcel@name and Parcel@desc descriptions. • Added new Section 4 Complex Scenario Descriptions. Including Section 4.1 multipart lots • Changed Parcel@pclRef description
4.02	15-11-2010	Mark Deal (ICSM WG)	<ul style="list-style-type: none"> • Change to use of ReducedObservation@desc and ReducedArcObservation@desc attribute
4.03	16-11-2010	Mark Deal Landmark	<ul style="list-style-type: none"> • Removed following attributes <ul style="list-style-type: none"> ○ LandXML@xmlns:xsi ○ LandXML@xsi:schemaLocation • Added ReducedObservation@distanceAdoptionFactor • Changed wording of description of Parcel@state • Sample LXML for part lots (sec 4.1) Parcel@state changed to “proposed” • Added Section 1.2 – References

Version	Date	Author	Comments
4.04	December 2010	Mark Deal	<ul style="list-style-type: none"> • Added attributes Line@note and Curve@note • Amended description of <ul style="list-style-type: none"> ○ ReducedObservation@azimuth ○ ReducedObservation@azimuthType ○ ReducedArcObservation@arcType ○ ObservationGroup@id ○ InstrumentSetup@id • Added new links in Section 1.2 – References • Added attributes <ul style="list-style-type: none"> ○ LandXML@xmlns:xsi ○ LandXML@xsi:schemaLocation • Changed attribute LandXML@xmlns:xsi from CR to R (Required)
4.04.01	January 2011	Mark Deal	<ul style="list-style-type: none"> • Change to Note 2d on page 8 and description of Parcel@parcelType • SurveyHeader@jurisdiction value changed from NSW to New South Wales • DocFileRef@location amended file name in location address
4.04.02	February 2011	Mark Deal	<ul style="list-style-type: none"> • A number of elements and attributes that were previously omitted from the NSW recipe have now been included to accommodate some administrative data. The following is a list of the additional Elements@attributes that have been added: <ul style="list-style-type: none"> ○ PurposeOfSurvey ○ AdministrativeDate ○ Personnel ○ SurveyHeader@surveyorFirm ○ SurveyHeader@surveyorReference ○ Amended Child Element references in SurveyHeader ○ Amended element tree diagram ○ Added information in Section1.5 • Amended example LXML for Centre, Curve, Start and End elements • Change to Note 2d on page 8 all NSW enumeration now capital • Changed cardinality of ReducedObservation to 1-* • Changed element tree diagram to show ReducedObservation as required • Added FieldNote element and changed element tree diagram • Added ReducedObservation@coordGeomRefs and ReducedArcObservation@coordGeomRefs • Added Note 2g page 8
5.0	March 2011	ICSM ePlan WG	<ul style="list-style-type: none"> • CgPoint@pntSurv value for parcel and curve centre now "sideshot" for both
6.0	September 2011	Mark Deal	<ul style="list-style-type: none"> • Removed 'AdminArea' from description of Parcel@parcelType • Amended example LXML for multipart lots section 4.1 • Amended Administrative Date element to describe use for date of survey. "office use only" classification has been removed for this element.

			<ul style="list-style-type: none"> CoordinateSystem@datum attribute changed to "R" (required) Reinstated IrregularLine element Reinstated PntList2D element Reinstated PntList3D element Reinstated PlanFeatures and PlanFeature elements Changed Personnel@attributes to "optional" SurveyHeader@desc changed to "required" Amended description of Monument@desc CoordGeom@name changed to "optional" Added AdministrativeArea Element as optional element Added LocationAddress and its Child Elements as optional for future use
6.01	October 2011	Mark Deal	<ul style="list-style-type: none"> Added to complex scenarios. Change CgPoint@desc to R
6.02	November 2011	Mark Deal	<ul style="list-style-type: none"> Change CgPoint@desc to CR Changed cardinality for AdministrativeDate under SurveyHeader to 1-*. This is to mandate the date of survey. Changed Parcel@name description
6.03	Dec 2011	Mark Deal	<ul style="list-style-type: none"> Added additional LXML enumeration (i.e. "traverse") to the subset used in NSW for CgPoint@pntSurv Changed cardinality for FieldNote element Completed complex scenarios for Control Mark used as RM and boundary corner not marked.
6.04	Feb 2012	Mark Deal	<ul style="list-style-type: none"> Added complex scenario for recording "plans used" Update reference files addresses from LPMA to LPI Update description of CgPoint@pntSurv for "sideshot" Added irregular lines and occupations to complex scenarios section Change personnel element to mandatory Changed SurveyHeader@surveyorReference to required
6.05	April 2012	Mark Deal	<ul style="list-style-type: none"> Added occupations and irregular line definition to complex scenarios
6.06	May 2012	Mark Deal	<ul style="list-style-type: none"> Added to complex scenarios <ul style="list-style-type: none"> easements over track in use easement defined by centreline traverse Admin area boundaries
6.07	June 2012	Mark Deal	<ul style="list-style-type: none"> Added to complex scenarios for occupations Changed monumentType to CR
6.08	July 2012	MD	<ul style="list-style-type: none"> Added Subdivision Number to complex scenarios Change to SurveyHeader@name description
6.09	Nov 2012	MD	<ul style="list-style-type: none"> "desc" attribute info added to Line element and complex scenarios "Occupations" section Added details of User defined diagrams for rendering- complex scenario section
6.10	Feb 2013	MD	<ul style="list-style-type: none"> Added CoordGeom@desc Added more info on user defined diagrams

6.11	Mar 2013 Apr 2013 May 2013	MD MD MD	<ul style="list-style-type: none"> Amended definition for transmission line easements Sec 4.12 Re write of Irregular line section Changed ReducedObservation@azimuth to CR Added adminArea@adminAreaType "Terrain" to record terrain info name & note attributes removed from Line ,Curve and IrregularLine elements
7.0	July 2013	MD	<ul style="list-style-type: none"> added scenario for Boundary Mark found – RM gone on same corner minor rewording to Introduction, Sections 1.4 and 1.5 updated web numerous address hyperlinks
7.1	4 Sept2013	MD & Hwan Choi (HC)	<ul style="list-style-type: none"> reinstated Amendment and AmendmentItem elements fixed typos customise numerous element /attribute descriptions to NSW specific
7.2	12 Sep 2013	MD	<ul style="list-style-type: none"> added appendix A edit re Occupation use of Monument@state
7.3	22 Oct 2013	MD	<ul style="list-style-type: none"> added info on direction of flow arrow for water courses Sec 4.17 edited AnnotationType list in appendix A
7.4	20 Nov 2013	MD	<ul style="list-style-type: none"> edited Plan Feature@name description and Occupations scenarios to accommodate walls, buildings ,fences ,Kerbs and offsets from Kerbs and other plan feature types
7.5	31 Mar 2014	MD	changed horzOrderType list in Appendix A
7.5.1	30 Jun 2014	MD	edited section 4.13 transmission line easement definition
7.5.2	Oct 2014	MD	Added Parcel@class = "Reserved Road" and Section 4.18 Defining Reserved Roads
7.5.3	April 2015	MD	Amended description of how to define extremity boundary of easement for transmission line sec 4.13
8.0	Nov 2014	HC	<ul style="list-style-type: none"> Added "Reference" in the NSW enumerated list for purposeType – Not yet implemented Added Annotation@type = "Combined Scale Factor"
	Mar 2015	HC	<ul style="list-style-type: none"> Added "Unspecified" in the NSW enumerated list for monumentState Added 4.19 Defining Reference Mark (RM) and modified 4.6 Control marks used as reference marks – Not yet implemented Added ReducedObservation@distanceAccClass and changed its type from enum:horzClassType to enum:distanceAccType – Not yet implemented Removed ReducedObservation@adoptedAzimuthSurvey attribute
	Nov 2015	HC	<ul style="list-style-type: none"> Added Annotation@type = "LPI File Ref" Updated all the examples used Major review and updates on the Complex Scenario sections Added "Designated Area" in the NSW enumerated list for parcelClass
	Dec 2015	HC	<ul style="list-style-type: none"> Added 4.20 Defining the area 'Benefited to the Part' using Designated Area Added "BM" in the NSW enumerated list for monumentType

			<ul style="list-style-type: none"> Removed "Unspecified" in the NSW enumerated list for monumentState
	Feb 2016	HC	<ul style="list-style-type: none"> Added "Staged Strata Plan" and "Staged Strata Plan Of Subdivision" in the NSW enumerated list for PurposeOfSurvey@name
	Mar 2016	HC	<ul style="list-style-type: none"> Changed requirement of PlanFeature@desc from required to conditionally required and updated Section 4.13 Changed the NSW enumerated list for adminDateType and updated Section 3.33 AdministrativeDate <ul style="list-style-type: none"> Removed "Lodgment Date", "Registration Date" and "Image Date" Added "Date Of Compilation" Changed the Cardinality of ReducedObservation element from 1 - * to 0 - *
	Apr 2016	HC	<ul style="list-style-type: none"> Updated section 4.10.1 under 'Traverse': Changed ReducedObservation@desc="Boundary" to "Connection" Added 4.20 Defining the Line PEG NSW enumerated list for monumentState and distanceAccType have been modified Section 4.19 have been modified to include all Reference Marks
	May 2016	HC	<ul style="list-style-type: none"> Added "Boardwalk" and "Passage" in the NSW enumerated list for RoadName@ roadNameType to support the latest Rural and Urban addressing standard, AS/NZS 4819:2011
8.0.1	June 2016	HC	<ul style="list-style-type: none"> Amended section 4.11.1 Occupations Changed requirement of PlanFeature@desc back to required and updated Section 4.13 Reinstated "natural boundary" as a valid enumeration for CgPoint@pntSurv and updated Section 4.10.1
8.0.2	Feb 2017	MD/HC	<ul style="list-style-type: none"> Change to description of ReducedObservation and ReducedArcObservation@desc
	Mar 2017	HC	<ul style="list-style-type: none"> added "LPICalculated" to observationType for distanceType, azimuthType and arcType attributes in ReducedObservation and ReducedArcObservation
	July 2017	MD	<ul style="list-style-type: none"> Changed naming convention for Hydrographic Parcels see Section 3.14 and 4.10.3 Removed "GPS" and replaced with "Policy 3" horzFixType enumeration list

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1. INTRODUCTION

NSW Land Registry Services (NSW LRS) is developing a digital plan processing system that includes the preparation and lodgment of land title plans in LandXML format. LandXML has been ratified by the Intergovernmental Committee on Surveying and Mapping (ICSM) as the national standard for digital lodgment of land title plans.

The ICSM has published a document titled “*ePlan Protocol LandXML Mapping*” which fully defines every element within the national LandXML schema. However not every jurisdiction will use all of the elements within the schema. In the initial implementation of digital plan lodgment in NSW, digital plans lodged in NSW LRS will only include the survey component of the plan that is currently represented on the plan drawing sheet together with a subset of the information contained on the Administration Sheet. All of the administrative information (including the subset in the LXML), certification and signatures will continue to be contained in an Administration Sheet in TIFF format which must be lodged in conjunction with the LandXML file.

During the first stages of implementation, a TIFF file of the plan drawing sheet will also be lodged to support the LandXML. This will be the case until NSW LRS can satisfactorily produce a formal rendering of the LXML file onto the appropriate plan form, through an online rendering service being developed and enhanced for surveyors in the ePlan lodgment portal within SIX. Once the rendering service is in full production, the lodging surveyor will no longer need to prepare a TIFF of the plan drawing sheet. The rendering service will also be available for surveyors to render their plans for use with councils, clients etc. prior to lodgment. The version rendered by NSW LRS at lodgment will then form the legal representation of the plan.

This document specifies the elements that are required to be in the LandXML file for a plan submission to NSW LRS as part of the ePlan process. It is a subset of the ICSM LandXML specification.

For information on NSW LRS ePlan please refer to:

http://www.lpi.nsw.gov.au/land_titles/eplan/digital_eplan

1.1 Purpose

This document specifies the requirements for the construction of a digital plan for lodgment with NSW LRS. It is intended for use by survey software vendors and surveyors to assist them in the development of Land XML functionality within their software and practices that complies with the NSW specifications and ICSM national standard LandXML format.

1.2 References

Links to the following documents, schemas and reference data files are provided to assist in the creation of Land XML plan files that are compliant with the National (ICSM) and NSW specifications.

REF1 LandXML 1.2 Schema http://icsm.govspace.gov.au/files/2012/11/LandXML-1.2.xsd
REF2 ICSM ePlan Protocol – LandXML Mapping https://icsm.govspace.gov.au/files/2011/09/ePlan-Protocol-LandXML-Mapping-v2.1.pdf
REF3 ICSM ePlan Protocol – LandXML Structural Requirements https://icsm.govspace.gov.au/files/2010/11/ePlan_Protocol_-_LandXML_Structural_Requirements_v1.0.pdf
REF4 ICSM ePlan Protocol – Schema Architecture https://icsm.govspace.gov.au/files/2010/11/ePlan-Protocol-Schema-Architecture-v2.1.pdf
REF5 ICSM ePlan Protocol – Schema http://www.icsm.gov.au/eplan/schema/xml-gov-au-icsm-eplan-cif-protocol-2.0.xsd
REF6 NSW Enumerations List http://www.lpi.nsw.gov.au/__data/assets/file/0011/146981/xml-gov-au-nsw-icsm-eplan-cif-enumerated-types-1.0.xsd
REF7 NSW ePlan Protocol Schema http://www.lpi.nsw.gov.au/__data/assets/file/0014/142007/xml-gov-au-nsw-icsm-eplan-cif-protocol-1_1.xsd
Ref 8 NSW reference data context http://www.lpi.nsw.gov.au/__data/assets/xml_file/0010/137368/xml-gov-au-nsw-icsm-eplan-cif-referencedata-101013.xml

1.3 How the data will be used

The digital plan file known as a CIF (Cadastral Information File) which is in LandXML format, will only contain data for a single deposited plan.

This file can be used in two situations:

1. Data interchange from a surveyor to NSW LRS as part of an ePlan lodgment of a new plan.
2. Data interchange when receiving existing digital plan data from NSW LRS.

1.4 Exception

During initial implementation stage of digital lodgment in NSW, occupations such as walls, fences etc. are not required to form part of the LandXML file. Notwithstanding that, this document defines LandXML definition for occupations in Section 4.11. Initially they will only be required to be displayed on the accompanying TIFF file of the plan drawing sheet.

When the NSW LRS rendering service, described in the Introduction Section of this document, is available and the TIFF of the plan drawing sheet is no longer required the occupation information must be included in the LXML file.

1.5 Using this document

Section 1

This section contains background information on this document

Section 2

This section provides a list of the XML elements that are used for plans being prepared for lodgement in NSW. The elements appear in the order that they appear in the LandXML schema.

Section 3

This section describes each element and its attributes in detail. Elements are presented in the order that they appear in the LandXML schema, and each element's child and parent elements are provided along with an example of use.

In section 3, tables are used to assist formatting information. Most table sections are self-explanatory; however the following have special meaning:

Cardinality:

This specifies how many child elements of a particular type an element must have, e.g.:

- a. **0 - *** means zero or more (i.e. the child is optional)
- b. **1** means exactly one (i.e. if the parent element is used, it must have this element as a child)
- c. **1 - *** means at least one and possibly more

Type:

This specifies the data type of an attribute. The type can be an XML base type such as "string", or custom type that is defined in the schema. Types used by the Protocol are listed as follows:

- a. *Base* – a raw value type, e.g. "string".
- b. *LandXML Enumerations* – an enumerated type defined in the LandXML Schema, e.g. "stateType".
- c. *Jurisdictional Enumerations* – an enumerated type defined by the NSW enumerations schema, e.g. "parcelClass". These are defined as skeleton types in the LandXML schema that are extended by the jurisdictional enumerations.
- d. *Custom Jurisdictional Enumerations* – defined as a base type in LandXML but with a custom enumeration type specified by a jurisdictional enumerations schema, e.g. "horzDatumType" - 'horizontalDatum' in LandXML 1.2 is defined as *string* but in NSW jurisdictional schema, it is defined as a *horzDatumType*, which is the custom enumerated type specified by jurisdictional enumeration schemas. Only the enumerated values listed in the enumeration schemas can be used for these attributes.
- e. *Other Defined Types* – explicitly defined in as a type in LandXML but the underlying type is a base type. These are not extended in the jurisdictional schemas. The underlying LandXML base type is used.

For information on all the “type” definitions used by the ePlan Protocol, including LXML and NSW specific enumerated types, please refer to **Appendix A** in this document

Required:

This specifies whether an attribute is:

- a. Required (**R**): the attribute must be used when the element is used and must have a value that is not an empty string.

E.g. **Parcel** elements must have a **name** attribute.

- b. Conditionally Required (**CR**): the attribute must be used if some condition is met.

E.g. **CoordinateSystem** element must have a **desc**, if the plan is on MM orientation. The value will be the deposited plan to which the survey has been orientated

- c. Optional (**O**): the attribute may be used

E.g. **Amendment** elements have an optional **comments** attribute

NB: elements and attributes that are specified as optional in the national specification may be required in this NSW specification

Section 4

Complex scenarios section specifies LandXML structural requirements that are to be used in the construction of a CIF where necessary to handle scenarios that require LandXML to be structured in a certain way to correctly capture the data

All sections - XML examples

Throughout this document, XML examples use the following formatting:

```
<Parcel class="Road" ...>
  <CoordGeom>
    <Line>
      <Start pntRef="..." />
      <End pntRef="..." />
    </Line>
    <Line>
      ...
    </Line>
  </CoordGeom>
</Parcel>
```

Notes

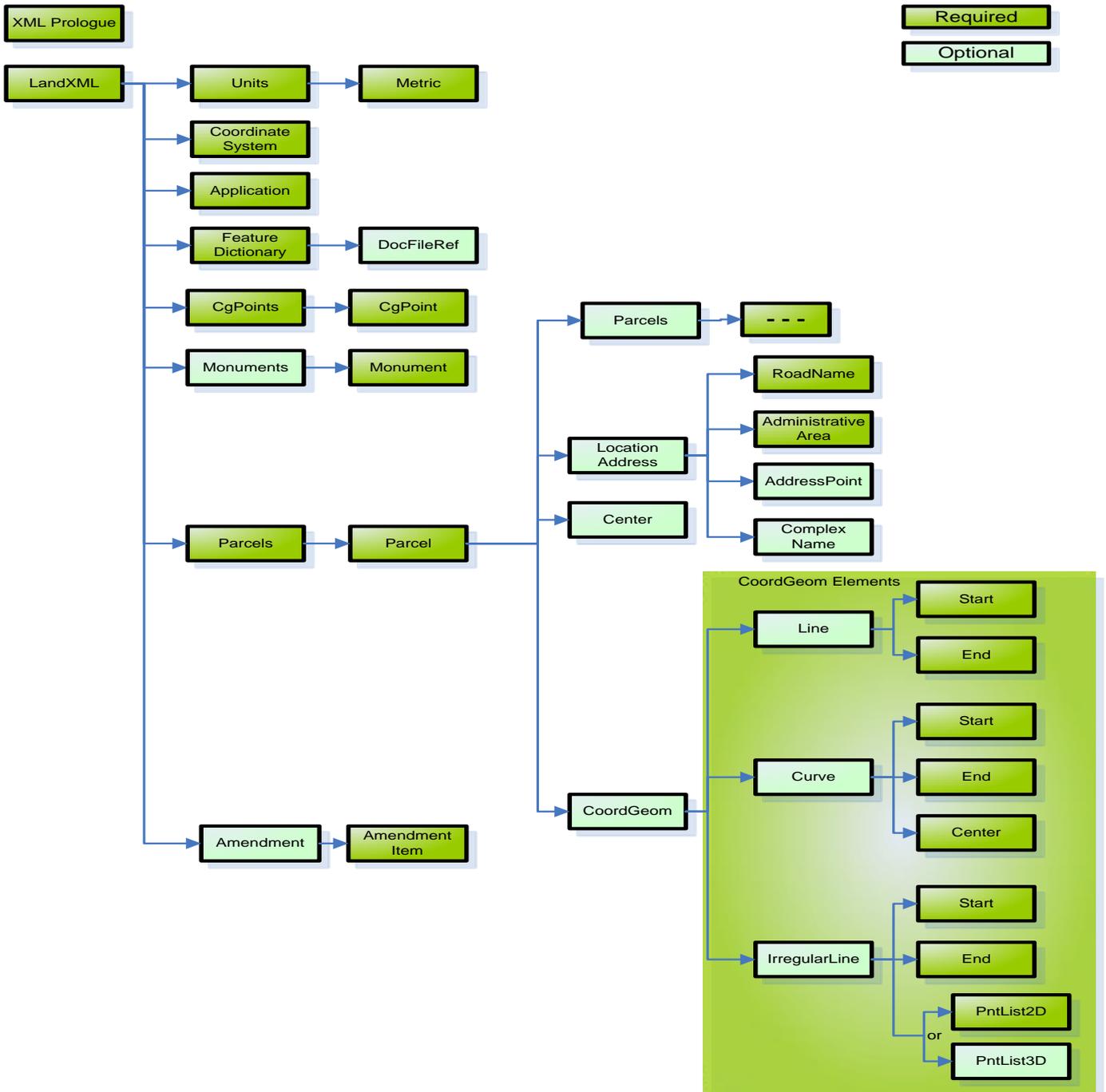
1. Sections of code that are not important to the XML examples are replaced by an ellipsis (...)
2. The following conventions apply to element and attribute names and values:
 - a. Element names start with a capital letter
 - b. All attribute values defined by a LXML enumeration start with lower case letter.

- c. All attribute values defined in the NSW jurisdictional specific enumerations start with upper case letter.
 - d. Where the attribute is a "string" the case is not sensitive.
 - e. In LandXML, names reflect the purpose of the element. Capitalisation is used to assist readability, e.g. **CoordinateSystem**.
 - f. All dates shown in the file must be in the format of yyyy-mm-dd (ISO 8601)
3. XPath notation is used to refer to elements in places.
- Full reference to Parcel elements: **/LandXML/Parcels/Parcel**
 - Partial reference to Line elements: **//Parcel/Line**
4. Where an attribute value says "set to..." the value in the CIF must be the stated value matching exactly.

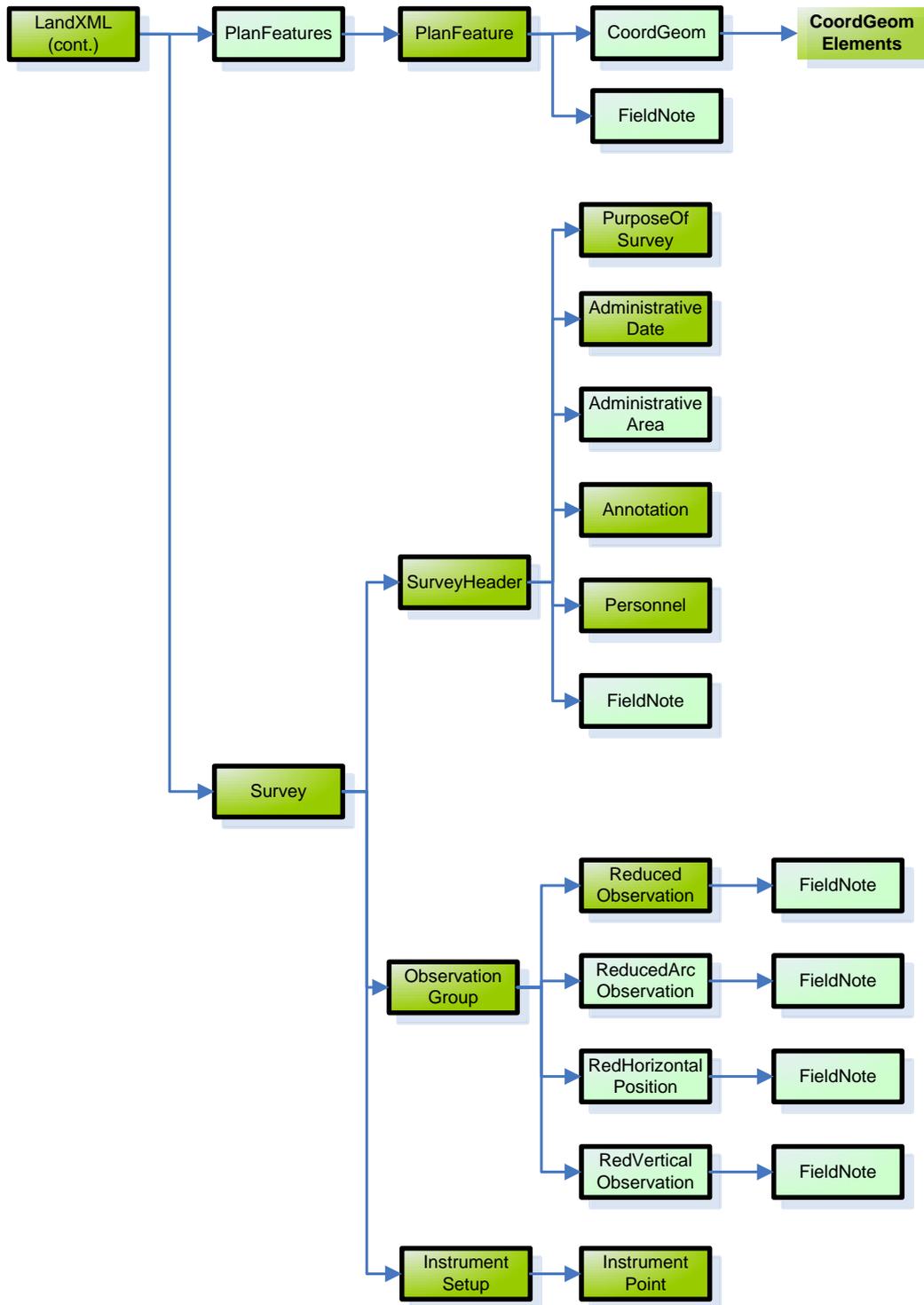
2. FILE DEFINITION – ELEMENT TREE

A LandXML file for use in the NSW ePlan process will contain the elements that are listed below in the order they appear in the LandXML schema:

LandXML Element Tree - Part 1



LandXML Element Tree - Part 2



3. ELEMENTS AND ATTRIBUTES

3.1 XML Prolog

Description	All XML files must start with a prologue that declares the version of XML being used and the character encoding. The XML prologue element is a requirement of the XML specification. (Note: there cannot be Byte Order Mark for it to work with validation service)		
Example	<code><?xml version="1.0" encoding="utf-8" ?></code>		
Parent Elements	None		
Child Elements	Cardinality		
None			
Attribute	Type	Required	Description
version	string	R	Set to: 1.0
encoding	string	R	Set to: utf-8

3.2 LandXML

Description	The first element in the CIF must be a LandXML root element. All other elements are contained inside this element. A CIF must contain one LandXML element.		
Example	<pre> <LandXML version="1.0" date="2014-06-13" time="05:43:04" xmlns="http://www.landxml.org/schema/LandXML-1.2" xmlns:xsi="http://www.w3.org/2001/XMLSchema-instance" xsi:schemaLocation="http://www.landxml.org/schema/LandXML-1.2 http://www.landxml.org/schema/LandXML-1.2/LandXML-1.2.xsd"> ... <Units> ... </Units> <CoordinateSystem ... ></CoordinateSystem> <Application ... ></Application> <FeatureDictionary ... > ... </FeatureDictionary> <CgPoints ... > ... </CgPoints> <Parcels ... > ... </Parcels> <PlanFeatures ... > ... </PlanFeatures> <Survey> ... </Survey> <Monuments> ... </Monuments> <Amendment ... > ... </Amendment> ... </LandXML> </pre>		
Parent Elements	None		
Child Elements	Cardinality		
<i>Units</i>	1		
<i>CoordinateSystem</i>	1		
<i>Application</i>	1		
<i>FeatureDictionary</i>	1		
<i>CgPoints</i>	1		
<i>Parcels</i>	1		
<i>PlanFeatures</i>	0 - *		
<i>Survey</i>	1		
<i>Monuments</i>	0 - 1		
<i>Amendment</i>	0 - *		
Attribute	Type	Required	Description
version	string	R	Version number of this CIF. e.g. "1.0"
date	date	R	Date that this version of the CIF was created in ISO 8601 format (yyyy-mm-dd). e.g. "2014-06-13"

time	time	R	Time that this version of the CIF was created. ISO 8601 format (hh:mm:ss). e.g. "05:43:04"
xmlns	string	R	XML namespace, set to: http://www.landxml.org/schema/LandXML-1.2
xmlns:xsi	string	R	XML schema instance, set to: http://www.w3.org/2001/XMLSchema-instance
xsi:schemaLocation	string	R	LandXML Schema Location for validation, set to: http://www.landxml.org/schema/LandXML-1.2 http://www.landxml.org/schema/LandXML-1.2/LandXML-1.2.xsd

3.3 Units

Description	This element defines the measurement units used by the CIF.		
Example	<pre> <LandXML ... > ... <Units> <Metric ... > </Metric> </Units> ... </LandXML> </pre>		
Parent Elements	<i>LandXML</i>		
Child Elements			Cardinality
<i>Metric</i>			1
Attribute	Type	Required	Description
			None

3.4 Metric

Description	This element specifies the metric units used in the file.		
Example	<pre> ... <Units> <Metric areaUnit="squareMeter" linearUnit="meter" volumeUnit="cubicMeter" angularUnit="decimal dd.mm.ss" temperatureUnit="celsius" pressureUnit="milliBars" directionUnit="decimal dd.mm.ss"> </Metric> </Units> ... </pre>		
Parent Elements	<i>Units</i>		
Child Elements			Cardinality
None			
Attribute	Type	Required	Description
areaUnit	metArea	R	Set to: squareMeter
linearUnit	metLinear	R	Set to: meter
volumeUnit	metVolume	R	Set to: cubicMeter
angularUnit	angularType	CR	Required if an angle is shown on the plan and set to: decimal dd.mm.ss
temperatureUnit	metTemperature	R	Set to: celsius
pressureUnit	metPressure	R	Set to: milliBars
directionUnit	angularType	R	Set to: decimal dd.mm.ss e.g. "45.3025" represent 45°30'25". Both the minutes and seconds must be two characters ranging between '00' to '60'.

3.5 CoordinateSystem

Description	The CoordinateSystem element defines the coordinate system used for CgPoint coordinates and the orientation information of the CIF.		
Example	<pre> <LandXML ... > ... <CoordinateSystem datum="MM" desc="Oriented to DP54565" horizontalDatum="Local" verticalDatum="AHD"> </CoordinateSystem> ... </LandXML> </pre>		
Parent Elements	<i>LandXML</i>		
Child Elements			Cardinality
None			
Attribute	Type	Required	Description
datum	<i>surveyBgDatumType</i>	R	This is the datum for the plan orientation e.g. "MGA", "MM", etc. If datum ="MM", then plan of orientation must be recorded in desc attribute. See <i>surveyBgDatumType</i> list in NSW enumerations schema for allowed values.
desc	string	CR	Required if the datum ="MM". Defines the plan of orientation of the survey. e.g. "Oriented to DP54565"
horizontalDatum	<i>horzDatumType</i>	R	Datum of CgPoint horizontal coordinates. Although <i>horzDatumType</i> is a list in NSW enumerations schema, it is set to: Local for NSW plans
verticalDatum	<i>vertDatumType</i>	CR	Required if 3D points are used. <i>The vertDatumType</i> is in NSW enumerations schema. This value should be set to: AHD for NSW plans

3.6 Application

Description	The Application element records information about the surveying software application used to create the CIF.		
Example	<pre> <LandXML ... > ... <Application name="AcmeCAD" version="1.1.11"> </Application> ... </LandXML> </pre>		
Parent Elements	<i>LandXML</i>		
Child Elements			Cardinality
None			
Attribute	Type	Required	Description
name	string	R	The name of the application that created the CIF. e.g. "AcmeCAD"
version	string	R	The version of the application e.g. "1.1.11"

3.7 FeatureDictionary

Description	The FeatureDictionary element specifies the version of the reference data and enumerations list used when building the CIF. Only one Feature dictionary is used to refer to the collection of jurisdictionally specific schemas, see “ePlan Protocol – Schema Architecture” Document. For example, LGA reference data lists may be changed more frequently than jurisdictional enumerations lists and therefore are versioned as a separate feature dictionary.		
Example	<pre> <LandXML> ... <FeatureDictionary name="ReferenceDataContext" version="NSW-101013"> <DocFileRef ... ></DocFileRef> </FeatureDictionary> ... </LandXML> </pre>		
Parent Elements	<i>LandXML</i>		
Child Elements	Cardinality		
<i>DocFileRef</i>	0 - *		
Attribute	Type	Required	Description
name	string	R	The name of the feature dictionary. Names are specified at the jurisdictional level based on the organisation of jurisdictional enumeration and reference data lists.
version	string	R	The version of the feature dictionary used for this CIF.

3.8 DocFileRef

Description	The DocFileRef element records the details about the FeatureDictionary including the names, locations and attributes of the files that comprise the feature dictionary.		
Example	<pre> ... <FeatureDictionary ... > <DocFileRef name="au-gov-nsw-icsm-cif-enumerated-types.xsd" location="http://www.lpi.nsw.gov.au/__data/assets/xml_file/0010/137368/xml-gov-au-nsw-icsm-eplan-cif-referencedata-101013.xml"> </DocFileRef> ... </FeatureDictionary> ... </pre>		
Parent	<i>FeatureDictionary</i>		
Child Elements	Cardinality		
None			
Attribute	Type	Required	Description
name	string	R	File name
location	Any URI	R	URL of the NSW reference data context. Refer to section 2.4 of the schema architecture implementation for details on use. Reference data context for NSW must be set to: http://www.lpi.nsw.gov.au/__data/assets/xml_file/0010/137368/xml-gov-au-nsw-icsm-eplan-cif-referencedata-101013.xml

3.9 CgPoints

Description	The CgPoints element is a container for all the points created as CgPoint in the file.		
Example	<pre> <LandXML ... > ... <CgPoints zoneNumber="56"> ... <CgPoint ... > ... </CgPoint> ... </CgPoints> ... </LandXML> </pre>		
Parent Elements	<i>LandXML</i>		
Child Elements			Cardinality
<i>CgPoint</i>			1 - *
Attribute	Type	Required	Description
zoneNumber	<i>zoneNumberType</i>	R	The MGA Zone No is mandatory for all plans, including plans on MM orientation

3.10 CgPoint

Description	A CgPoint represents a point in the CIF. They may represent boundary points, traverse points, reference marks, permanent survey marks and various administrative points. The datum for these points is specified by CoordinateSystem@horizontalDatum , which is set to Local for NSW plans.		
Example	<pre> ... <CgPoints ... > <CgPoint name="822" desc="A" state="existing" pntSurv="control" oID="22126"> 6257928.410000 333988.599000 78.7360 </CgPoint> </CgPoints> ... </pre>		
Element Content	Coordinate values for the point. Two dimensional coordinates are a coordinate pair of the Northing followed by Easting. Three dimensional coordinates are a coordinate triplet: Northing, Easting and Height. Coordinates are separated by a single space.		
Parent Elements	<i>CgPoints</i>		
Child Elements			Cardinality
None			
Attribute	Type	Required	Description
name	string	R	Unique ePlan identifier for the point.
oID	string	CR	Required for Survey Control points. Value is the mark number from SCIMS
desc	string	CR	This is mainly used for labelling the datum terminal points. Two points must have this attribute one must be labelled "A" and the other "B". Other alphanumeric starting from "C" can also be used to label specific points for other purposes.
state	<i>stateType</i>	R	The state of the CgPoint in the context of other CgPoints in the CIF. "proposed" or "existing" are the only state that can be used in NSW

pntSurv	survPntType	R	<p>This is to specify the point type and following types can be used in NSW.</p> <ul style="list-style-type: none"> • “boundary” for all boundary points of all parcels (regardless of Parcel@state) • “control” points for control marks • “reference” points for reference marks • “sideshot” points for parcel centre, curve centre, occupation points and diagram only points. • “traverse” for all other points
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3.11 Monuments

Description	The Monuments element is a container Monument element, which contains details for boundary, reference and control marks as well as offsets of occupations.		
Example	<pre> <LandXML ... > ... <Monuments> ... <Monument ... ></Monument> ... </Monuments> ... </LandXML> </pre>		
Parent Elements	<i>LandXML</i>		
Child Elements			Cardinality
<i>Monument</i>			1 - *
Attribute	Type	Required	Description
			None

3.12 Monument

Description	The Monument element defines the physical attributes of all survey marks on the plan including boundary, reference and control marks as well as offsets of occupations. A Monument must be linked to a CgPoint using the pntRef attribute. The CgPoint defines the survey mark's relational position against all other points and identification.		
Example	<pre> ... <Monuments> ... <Monument name="1" pntRef="5" type="Peg" state="Found" desc="Original lot peg" condition="Remains" originSurvey="DP654321" </Monument> ... </Monuments> ... </pre>		
Parent Elements	<i>Monuments</i>		
Child Elements			Cardinality
None			
Attribute	Type	Required	Description
name	string	R	Unique ePlan identifier for the point. Can be a sequence starting at “1”

pntRef	pointNameRef (string)	R	Reference to the name attribute of the linked CgPoint .
type	<i>monumentType</i>	CR	Jurisdictional list of monument types – see <i>monumentType</i> list in NSW enumerations schema e.g. "Peg", "GIP", "DH&W", etc. Required for all marks except for marks with a state of "Gone" or "Not Found"
state	<i>monumentState</i>	R	Jurisdictional list of monument states – see <i>monumentState</i> list in NSW enumerations schema This is the state of the mark itself and required for all marks e.g. "Found", "Placed", etc.
desc	string	CR	Surveyor's description of the monument. Required if the monumentType does not fully describe the monument. If the monument is a SCIMS mark and used as a reference mark as well, then desc should state "used as reference mark"
condition	<i>monumentCondition</i>	O	Jurisdictional list of monument condition – see <i>monumentCondition</i> list in NSW enumerations schema e.g. "Disturbed", "Destroyed", "Inaccessible", etc.
originSurvey	string	CR	This is the plan number that physically placed the mark and required for all found marks with exception of SCIMS marks. e.g. "DP1145678", "16.789", "Origin unknown", etc.

3.13 Parcels

Description	The Parcels element is a container for individual Parcel elements. Parcels containers can be nested within Parcel elements to capture parcel relationships.		
Example	<pre> <LandXML ... > ... <Parcels> ... <Parcel ... > ... </Parcel> ... </Parcels> ... </LandXML> </pre>		
Parent Elements	<i>LandXML</i>		
Child Elements		Cardinality	
<i>Parcel</i>		1 - *	
Attribute	Type	Required	Description
			None

3.14 Parcel

Description	The Parcel element provides a basic unit to describe a spatial area. A Parcel element can contain a nested Parcels element that has Parcel child elements. There are fewer required attributes for these "sub" parcels, generally only requiring a name and pclRef .		
Example	<pre> ... <Parcels> ... <Parcel name="1" area="3225.6" parcelType="Single" state="proposed" class="Lot" useOfParcel="Public Reserve" parcelFormat="Standard"> <Center ... /> <CoordGeom ... > ... </CoordGeom> <LocationAddress ... > ... </LocationAddress> </Parcel> <Parcel name="2" parcelType="Multipart" ... > <Parcels> <Parcel name="A" pclRef="2A"/> <Parcel name="B" pclRef="2B"/> </Parcels> </Parcel> <Parcel name="2A" parcelType="Part" ... > ... </Parcel> <Parcel name="2B" parcelType="Part" ... > ... </Parcel> <Parcel name="E1" class="Easement" desc="Right of Carriageway Variable Width" ... > <CoordGeom ... > ... </CoordGeom> </Parcel> <Parcel name="R1" class="Road" desc="NICHOLSONS LANE (20.115 WIDE)" ... > <Center ... /> <CoordGeom ... > ... </CoordGeom> </Parcel> ... </ Parcels> ... </pre>		
Parent Elements	<i>Parcels</i>		
Child Elements	Cardinality		
<i>Center</i>	0 - 1		
<i>CoordGeom</i>	0 - 1		
<i>Parcels</i>	0 - 1		
<i>LocationAddress</i>	0 - *		
Attribute	Type	Required	Description

name	string	R	<ul style="list-style-type: none"> Lot number for new lots e.g. "1", "2", etc. Lot/plan for adjoining lots. e.g. "1/DP123456", "A/DP235", etc. <p><i>Note: any string combination of alpha/numeric characters can be used for adjoining parcels</i></p> <ul style="list-style-type: none"> All Road ,Secondary Interest (including Easement) and Hydrography parcels must start with prefix 'R' , 'E' and "H" respectively followed by integers. i.e. "R1", "R2", etc. for Roads "E1", "E2", etc. for Secondary Interests "H1", "H2", etc. for Hydrography parcels For actual Road, Easement and water body names please refer to desc attribute
area	double	CR	The legal area. Required for new lots. Must be in units as specified in Units element. (<i>set to m² in NSW</i>)
parcelType	<i>parcelTypeType</i>	R	Jurisdictional list of the parcel construction type – see <i>parcelTypeType</i> list in NSW enumerations schema e.g. "Single", "Multipart", etc. <i>Note: First letter must be upper case.</i>
state	<i>parcelStateType</i>	R	The state of the parcel in the context of other parcels on the plan and only the following three states can be used. <ul style="list-style-type: none"> "proposed" - for all subject parcels "adjoining" - for all other parcels outside the subject parcels "existing" - for all existing parcels within the boundaries of subject parcels e.g. an existing easement within a new lot
class	<i>parcelClass</i>	R	In the context of the survey plan, the class that a parcel belongs to i.e. its grouping. See <i>parcelClass</i> list in NSW enumerations schema e.g. "Lot", "Road", "Easement", etc.
desc	string	CR	Required, if the parcel class="Road", "Easement" , any secondary interest or Hydrography parcels. For a Road, it should have Road name, type, width and/or alignment details For a new Easement, it should be easement name and/or width as per 88B instrument. e.g. "Easement to Drain Water 0.5 wide" For an existing Easement, it should also contain the creating instrument as well as easement name and/or width. e.g. "Easement for Drainage 1 wide - vide DP13" All Secondary Interest parcels should have appropriate description/name in this attribute <ul style="list-style-type: none"> For Hydrography parcels this attribute records the name of the water body e.g. "Pioneer River"

useOfParcel	<i>useOfParcelType</i>	O	Jurisdictional list of the use of a parcel that further defines the specific use – see <i>useOfParcelType</i> list in NSW enumerations schema e.g. "Public Reserve", etc.
parcelFormat	<i>parcelFormat</i>	R	Jurisdictional list of the physical format of a parcel – see <i>parcelFormat</i> list in NSW enumerations schema e.g. "Standard", "Stratum", etc.
pclRef	parcelNameRef (string)	CR	Reference identifier used to link the parts of multipart lots – see <i>section 4.1</i> of this document

3.15 LocationAddress

Description	The LocationAddress element contains street address information for its parent element.		
Example	<pre> ... <Parcel ... > ... <LocationAddress addressType=" ... " flatType=" ... " flatNumber=" ... " floorLevelType=" ... " floorLevelNumber=" ... " numberFirst=" ... " numberSuffixFirst=" ... " numberLast=" ... " numberSuffixLast=" ... "> <ComplexName ... ><ComplexName/> <RoadName ... ><RoadName/> <AdministrativeArea ... ><AdministrativeArea/> <AddressPoint ... ><AddressPoint > </LocationAddress> ... </Parcel> ... </pre>		
Parent Elements	<i>Parcel</i>		
Child Elements	Cardinality		
<i>ComplexName</i>	0 - *		
<i>RoadName</i>	1 - *		
<i>AdministrativeArea</i>	1 - *		
<i>AddressPoint</i>	0 - *		
Attribute	Type	Required	Description
addressType	<i>addressTypeType</i>	R	The type of the address. A Parcel could have many addresses as it could have several frontages and be used for different purposes. For example it may have a primary address and several aliases.
flatType	<i>flatTypeType</i>	O	Jurisdictional list of the flat type – see <i>flatTypeType</i> list in NSW enumerations schema e.g. "Unit", "Townhouse", etc.
flatNumber	string	O	The number of the flat
floorLevelType	<i>floorLevelTypeType</i>	O	Jurisdictional list of the floor level type – see <i>floorLevelTypeType</i> list in NSW enumerations schema e.g. "Basement", "Ground", etc.
floorLevelNumber	string	O	The number of the floor level
numberFirst	int	O	The street address number or the first street address number in a range of numbers
numberSuffixFirst	string	O	The alpha suffix of the first street address number e.g. "A"
numberLast	int	O	The last street address number in a range of numbers.

numberSuffixLast	string	O	The alpha suffix of the last street address number e.g. "B"
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3.16 ComplexName

Description	The ComplexName element is used to store the site name and building name.		
Example	<pre> ... <LocationAddress ... > ... <ComplexName desc="Riverview" priority="1"> <ComplexName/> ... </LocationAddress> ... </pre>		
Parent Elements	<i>LocationAddress</i>		
Child Elements	Cardinality		
None			
Attribute	Type	Required	Description
desc	string	R	The site name, building name or other name.
priority	int	R	The priority of the ComplexName is relation to other ComplexName being defined in the LocationAddress .

3.17 RoadName

Description	The RoadName element is used to store the details of the road fronted by the property.		
Example	<pre> ... <LocationAddress ... > ... <RoadName roadNameType="Street" roadName="Smith" roadNameSuffix=" ..." roadType="Public Highway" pclRef=" ..." > <RoadName/> ... </LocationAddress> ... </pre>		
Parent Elements	<i>LocationAddress</i>		
Child Elements	Cardinality		
None			
Attribute	Type	Required	Description
roadNameType	<i>roadNameTypeType</i>	R	Jurisdictional list of the road name type – see <i>roadNameTypeType</i> list in NSW enumerations schema e.g. "Street", "Lane", etc.
roadName	string	R	The name of the road (without Type or Suffix)
roadNameSuffix	<i>roadNameSuffixType</i>	O	Jurisdictional list of the suffix type of the road name – see <i>roadNameSuffixType</i> list in NSW enumerations schema e.g. "East", "West", etc. Any prefix is also recorded in this attribute
roadType	<i>roadTypeType</i>	R	Jurisdictional list of the road type – see <i>roadTypeType</i> list in NSW enumerations schema e.g. "Public" or "Private"
pclRef	parcelNameRefs (string)	O	Reference to physical road parcel.

3.18 AddressPoint

Description	The AddressPoint element describes the geographic location of an address using coordinates either contained in a linked CgPoint element or as a space delimited list inside the element.		
Example	<pre> ... <LocationAddress ... > ... <AddressPoint addressPointType="Access Point" pntRef="1004"> < /AddressPoint/> ... </LocationAddress> ... </pre>		
Parent Elements	<i>LocationAddress</i>		
Child Elements		Cardinality	
None			
Attribute	Type	Required	Description
addressPointType	<i>addressPointTypeType</i>	R	Jurisdictional list of address point type – see <i>addressPointTypeType</i> list in NSW enumerations schema e.g. "Access Point" or "Centroid of Parcel"
pntRef	pointNameRef (string)	R	The CgPoint representing the location of the address point. Value must be a CgPoint@name attribute in the CIF.

3.19 Center

Description	The Center element represents either: <ul style="list-style-type: none"> • A nominal centre point for a Parcel element, or • The centre point of the Curve element The pntRef attribute references the CgPoint@name attribute.		
Example	<pre> ... <Parcel ... > <Center pntRef="108"/> ... <CoordGeom ... > ... <Curve ... > ... <Center pntRef="23"/> ... </Curve> ... </CoordGeom> </Parcel> ... </pre>		
Parent Element	<i>Parcel, Curve</i>		
Child Elements		Cardinality	
None			
Attribute	Type	Required	Description
pntRef	pointNameRef (string)	R	Value must be a CgPoint@name attribute in the CIF.

3.20 CoordGeom

Description	<p>The CoordGeom element is a container for the spatial components of its parent element.</p> <p>This section defines the lines that form each parcel or a feature in a clockwise sequence.</p>		
Example	<pre> ... <Parcel ... > ... <CoordGeom name="189857-1-60" desc=" ..." > ... <Line ... > ... </Line> <Curve ... > ... </Curve> <IrregularLine ... > ... </IrregularLine> ... </CoordGeom> ... </Parcel> ... <PlanFeature ... > ... <CoordGeom name="Building-1" desc="DBL BK HOUSE" > ... <Line ... > ... </Line> <Curve ... > ... </Curve> <IrregularLine ... > ... </IrregularLine> ... </CoordGeom> ... </PlanFeature> ... </pre>		
Parent Elements	<i>Parcel, PlanFeature</i>		
Child Elements	Cardinality		
<i>Line</i>	0 - *		
<i>Curve</i>	0 - *		
<i>IrregularLine</i>	0 - *		
Attribute	Type	Required	Description
name	string	O	Unique ePlan identifier.
desc	string	O	Free text description of the CoordGeom element. e.g. description of occupation such as, "DBL BK HOUSE", etc.

3.21 Line

Description	The Line element represents a straight line between two points. The line may be used to construct a 2D or 3D object.		
Example	<pre> ... <CoordGeom ... > ... <Line desc=" ... "> <Start ... /> <End ... /> </Line> ... </CoordGeom> ... </pre>		
Parent Elements	<i>CoordGeom</i>		
Child Elements		Cardinality	
<i>Start</i>			1
<i>End</i>			1
Attribute	Type	Required	Description
desc	string	O	Free text description of the line.

3.22 Curve

Description	A Curve is a specific type of regular line between two points. It is defined by its start and end points, its radius, direction of rotation and centre point (i.e. radius point).		
Example	<pre> ... <CoordGeom ... > ... <Curve rot="ccw" radius="122.900"> <Start ... /> <Center ... /> <End ... /> </Curve> ... </CoordGeom> ... </pre>		
Parent Elements	<i>CoordGeom</i>		
Child Elements		Cardinality	
<i>Start</i>			1
<i>End</i>			1
<i>Center</i>			1
Attribute	Type	Required	Description
radius	double	R	The radius of the curve
rot	<i>clockwise</i>	R	Direction from Start to End Value will be either "cw" for clockwise or "ccw" for counter clockwise

3.23 IrregularLine

Description	Irregular lines are used to capture non-surveyed lines (e.g. river boundary). An IrregularLine must have a CgPoint as its start and end point and a point list to define the line between the start and end points.		
Example	<pre> ... <CoordGeom ... > ... <IrregularLine desc="Left Bank of Darling River" source="DP1234"> <Start ... /> <End ... /> <PntList2D> ... </PntList2D> </IrregularLine> ... <IrregularLine desc=" ... " > <Start ... /> <End ... /> <PntList3D> ... </PntList3D> </IrregularLine> ... </CoordGeom> ... </pre>		
Parent Elements	<i>CoordGeom</i>		
Child Elements	Cardinality		
<i>Start</i>	1		
<i>End</i>	1		
<i>PntList2D</i> or <i>PntList3D</i>	1		
Attribute	Type	Required	Description
desc	string	R	Free text description of the irregular line. e.g. "Left Bank of Darling River"
source	string	O	Required if the line has been adopted from another source. e.g. "DP1234"

3.24 Start

Description	The Start element represents the 'from' point of linear elements such as Curve , Line , IrregularLine (cf. <i>End</i>).		
Example	<pre> ... <Line ... > ... <Start pntRef="214"/> ... </Line> <Curve ... > ... <Start pntRef="224"/> ... </Curve> <IrregularLine ... > ... <Start pntRef="234"/> ... </IrregularLine> ... </pre>		
Parent Elements	<i>Line, Curve, IrregularLine</i>		
Child Elements		Cardinality	
None			
Attribute	Type	Required	Description
pntRef	pointNameRef (string)	R	Value must be a CgPoint@name attribute in the CIF.

3.25 End

Description	The End element represents the 'to' point of linear elements such as Curve , Line , IrregularLine (cf. <i>Start</i>).		
Example	<pre> ... <Line ... > ... <End pntRef=" 215"/> ... </Line> <Curve ... > ... <End pntRef="225"/> ... </Curve> <IrregularLine ... > ... <End pntRef="235"/> ... </IrregularLine> ... </pre>		
Parent Elements	<i>Line, Curve, IrregularLine</i>		
Child Elements		Cardinality	
None			
Attribute	Type	Required	Description
pntRef	pointNameRef (string)	R	Value must be a CgPoint@name attribute in the CIF.

3.26 PntList2D

Description	<p>The PntList2D element is used with associated Start and End elements to define a two dimensional line using a sequence of space separated (y, x) or (northing, easting) coordinate pairs that are the content of the element.</p> <p>The first and last coordinate pair must match the associated Start and End points coordinate pairs respectively (therefore the element must contain at least two coordinate pairs).</p>		
Example	<pre> ... <IrregularLine ... > ... <PntList2D> 6263281.740730 287046.916070 6263280.340620 287047.461040 ... 6263260.670370 287028.817030 6263257.385810 287025.211110 </PntList2D> </IrregularLine> ... </pre>		
Element Content	<p>A space delimited list of coordinate values in Northing Easting pairing.</p> <p><PntList2D>N₀ E₀ N₁ E₁ ... N_n E_n</PntList2D></p>		
Parent Elements	<i>IrregularLine</i>		
Child Elements	Cardinality		
None			
Attribute	Type	Required	Description
			None

3.27 PntList3D

Description	<p>The PntList3D element is used with associated Start and End elements to define a three dimensional line using a sequence of space separated (y, x, z) or (northing, easting, height) coordinate sets that are the content of the element.</p> <p>The first and last coordinate set must match the associated Start and End points coordinate sets respectively (therefore the element must contain at least two coordinate sets).</p>		
Example	<pre> ... <IrregularLine ... > ... <PntList3D> 6263281.740730 287046.916070 27.780 6263280.340620 287047.461040 26.880 ... 6263260.670370 287028.817030 28.489 6263257.385810 287025.211110 28.597 </PntList3D> </IrregularLine> ... </pre>		
Element Content	<p>A space delimited list of coordinate values in Northing Easting Height.</p> <p><PntList3D>N₀ E₀ H₀ N₁ E₁ H₁ ... N_n E_n H_n</PntList3D></p>		
Parent Elements	<i>IrregularLine</i>		
Child Elements	Cardinality		
None			
Attribute	Type	Required	Description
			None

3.28 PlanFeatures

Description	A container for PlanFeature elements. In NSW this element is used for occupations being walls, fences, buildings, etc. or extremity of transmission line easements.		
Example	<pre> <LandXML ... > ... <PlanFeatures name="Occupation"> ... <PlanFeature ... > ... </PlanFeature> ... </PlanFeatures> ... </LandXML> </pre>		
Parent Elements	<i>LandXML</i>		
Child Elements			Cardinality
<i>PlanFeature</i>			1 - *
Attribute	Type	Required	Description
name	string	R	Set to: Occupation

3.29 PlanFeature

Description	The PlanFeature element is used to define and facilitate rendering of occupations on the plan including walls, fences, buildings, kerbs, etc. as well as extremity of transmission line easements.		
Example	<pre> ... <PlanFeatures ... > ... <PlanFeature name="Wall-1" desc="Retaining Wall"> ... <CoordGeom ... > ... </CoordGeom> <FieldNote> ... </FieldNote> ... </PlanFeature> ... </PlanFeatures> ... </pre>		
Parent Elements	<i>PlanFeatures</i>		
Child Elements			Cardinality
<i>CoordGeom</i>			0-1
<i>FieldNote</i>			0 - *
Attribute	Type	Required	Description
name	string	R	Must have a prefix of "Building", "Wall", "Fence", "Kerb" or "Offset" to facilitate the correct line style for the rendering
desc	string	R	Free text description of the PlanFeature element is required. <i>Note: Where this element is used for the perimeter boundary of transmission line easements the "desc" attribute should have a prefix of "DNR"– see Section 4.13 of this document</i>

3.30 Survey

Description	The Survey element contains the survey components of the ePlan.		
Example	<pre> <LandXML ... > ... <Survey> ... <SurveyHeader ... > ... </SurveyHeader> <InstrumentSetup ... > ... </InstrumentSetup> <ObservationGroup ... > ... </ObservationGroup> ... </Survey> ... </LandXML> </pre>		
Parent Elements	<i>LandXML</i>		
Child Elements	Cardinality		
<i>SurveyHeader</i>	1		
<i>InstrumentSetup</i>	1 - *		
<i>ObservationGroup</i>	1		
Attribute	Type	Required	Description
			None

3.31 SurveyHeader

Description	The SurveyHeader element contains administrative information about the survey.		
Example	<pre> ... <Survey> ... <SurveyHeader name="1189857" desc="Plan of SUBDIVISION OF LOT 1343 DP1171493" jurisdiction="New South Wales" surveyFormat="Standard" type="surveyed" surveyorFirm="CRAIG & RHODES" surveyorReference="72-10-1343"> ... <Personnel ... /> <PurposeOfSurvey ... /> <Annotation ... /> <AdministrativeArea ... /> <AdministrativeDate ... /> <FieldNote> ... </FieldNote> ... </SurveyHeader> ... </Survey> ... </pre>		
Parent Elements	<i>Survey</i>		
Child Elements	Cardinality		
<i>Personnel</i>	1		
<i>PurposeOfSurvey</i>	1		
<i>Annotation</i>	1 - *		
<i>AdministrativeArea</i>	0 - *		
<i>AdministrativeDate</i>	1 - *		
<i>FieldNote</i>	0 - *		
Attribute	Type	Required	Description
name	string	R	Should be the DP No. without the DP" prefix. e.g. "DP12345" to be recorded as "12345"
desc	string	R	This is the plan heading e.g. "Plan of subdivision of ... "

jurisdiction	<i>jurisdictionType</i>	R	Set to: New South Wales
surveyorFirm	string	O	The name of the surveying firm
surveyorReference	string	R	Surveying firms internal reference ID
surveyFormat	<i>surveyFormatType</i>	R	Jurisdictional list of the survey format type – see <i>surveyFormatType</i> list in NSW enumerations schema e.g. "Standard", "Stratum", "Strata", etc.
type	<i>surveyType</i>	R	This is plan survey type, which is either "compiled" or "surveyed" for NSW plans. If the plan is partially surveyed then it should be "surveyed"

3.32 AdministrativeArea

Description	The AdministrativeArea element contains the administrative areas relevant to this survey. It defines a number of different types of administrative areas such as local government and locality. Each entry can link to a parcel element that defines the boundaries of the administrative area.		
Example	<pre> ... <SurveyHeader ... > ... <AdministrativeArea adminAreaType="Locality" adminAreaName="PENRITH" adminAreaCode="2750" pclRef="PENRITH"/> <AdministrativeArea adminAreaType="Local Government Area" adminAreaName="PENRITH"/> <AdministrativeArea adminAreaType="Parish" adminAreaName="CASTLEREAGH"/> <AdministrativeArea adminAreaType="County" adminAreaName="CUMBERLAND"/> <AdministrativeArea adminAreaType="Survey Region" adminAreaName="Urban"/> <AdministrativeArea adminAreaType="Terrain" adminAreaName="Level-Undulating"/> ... </SurveyHeader> ... </pre>		
Parent Elements	<i>SurveyHeader, LocationAddress</i>		
Child Elements	Cardinality		
None			
Attribute	Type	Required	Description
adminAreaType	<i>adminAreaTypeType</i>	R	Jurisdictional list of administrative area types – see <i>adminAreaTypeType</i> list in NSW enumerations schema e.g. "Locality", "Parish", "County", etc.
		CR	This will also be used;
		CR	<ul style="list-style-type: none"> to identify if the surveyed area is "Urban" or "Rural" area, adminAreaType is set to "Survey Region" – Not required for compiled plan to identify if the terrain type of surveyed area is "Level-Undulating" or "Steep-Mountainous", adminAreaType is set to "Terrain" – Required for partially compiled plan

adminAreaName	string	R CR CR	The full name of the administrative area (County, Parish, Locality, LGA). e.g. "PENRITH", "CUMBERLAND" or If adminAreaType ="Survey Region", it should be populated with either "Urban" or "Rural" or If adminAreaType ="Terrain", it should be populated with either "Level-Undulating" or "Steep-Mountainous"
adminAreaCode	string	O	The code or identifier of the administrative area. e.g. "2750" (Post Code for a Locality)
pclRef	parcelNameRefs (string)	O	A reference to the name of a parcel element representing the corresponding administrative area.

3.33 AdministrativeDate

Description	The AdministrativeDate element captures a list of relevant administrative dates used in the jurisdictions' plan lodgement process. This element is used to record the date of survey for lodged plans in NSW. Plans disseminated from LPI may have another instance of this element, such as recording the date of registration of the plan.		
Example	<pre> ... <SurveyHeader ... > ... <AdministrativeDate adminDateType="Date Of Survey" adminDate="2013-10-02"/> ... </SurveyHeader> ... </pre>		
Parent Elements	<i>SurveyHeader</i>		
Child Elements	Cardinality		
None			
Attribute	Type	Required	Description
adminDateType	<i>adminDateTypeType</i>	R	Jurisdictional list of the date types – see <i>adminDateTypeType</i> list in NSW enumerations schema "Date of Survey" is required for all surveyed plans "Date of Compilation" is required for all compiled plans
adminDate	date	R	Date according to the adminDateType in ISO 8601 format (yyyy-mm-dd). e.g. "2013-10-02"

3.34 PurposeOfSurvey

Description	The PurposeOfSurvey element describes the purpose of the survey.		
Example	<pre> ... <SurveyHeader ... > ... <PurposeOfSurvey name="Subdivision"/> ... </SurveyHeader> ... </pre>		
Parent Elements	<i>SurveyHeader</i>		
Child Elements		Cardinality	
None			
Attribute	Type	Required	Description
name	<i>purpSurvType</i>	R	Jurisdictional list of purpose of survey types – see <i>purpSurvType</i> list in NSW enumerations schema e.g. "Subdivision", "Easement", etc.

3.35 Personnel

Description	The Personnel element captures information about the personnel who participated in the survey and the surveyor who endorsed the survey.		
Example	<pre> ... <SurveyHeader ... > ... <Personnel name="JOHN DOE" role="Signing Surveyor" regType="Registered" regNumber="1004"/> ... </SurveyHeader> ... </pre>		
Parent Elements	<i>SurveyHeader</i>		
Child Elements		Cardinality	
None			
Attribute	Type	Required	Description
name	string	R	Full name of the surveyor as registered.
role	<i>surveyorRoleType</i>	O	Set to: "Signing Surveyor"
regType	<i>registrationType</i>	O	Set to: "Registered"
regNumber	string	O	Surveyor's board registration number

3.36 Annotation

Description	The Annotation element is used for rendering purposes in NSW and type of "Plans Used" is the only type that is compulsory.		
Example	<pre> ... <SurveyHeader ... > ... <Annotation type="Plans Used" name="1" desc="DP12345, DP378910, DP524789, C5697.2103"/> <Annotation type="Subdivision Number" name="s1" desc="015/14"/> <Annotation type="Plan Note" name="n1" desc="All areas shown are approximate"/> <Annotation type="Parcel Note" name="n2" desc="Limited to 20.195m in depth" pclRef="1, 2, 3"/> <Annotation type="Diagram Lots" name="d1" desc="25, 43, 62, 85"/> <Annotation type="Diagram Occupations " name="d2" desc="25, 43, 62, 85"/> <Annotation type="Direction of Flow Non Tidal" name="f1" desc="58, 69"/> <Annotation type="Combined Scale Factor" name="c1" desc="0.999978"/> <Annotation type="LPI File Ref" name="r1" desc="2015M7100 (1404)Comp"/> ... </SurveyHeader> ... </pre>		
Parent Elements	<i>SurveyHeader</i>		
Child Elements	Cardinality		
None			
Attribute	Type	Required	Description
type	<i>annotationType</i>	R	<p>This is a category of annotations that are used in NSW – see <i>annotationType</i> list in NSW enumerations schema for full list of types that can be used in NSW.</p> <p>An Annotation could be based on the plan as a general statement, or specific to a parcel or number of parcels.</p> <p>e.g.</p> <ol style="list-style-type: none"> AnnotationType "Plans Used" is used to record the plans used by the surveyor in preparing the plan and this is the only mandatory Annotation Type in NSW AnnotationType "Diagram", "Diagram Lots", "Diagram Secondary Interests", "Diagram Occupations" can be used to define the area to be in the sub-diagram on the rendering of the file AnnotationType "Subdivision Number" is used to record the subdivision certificate number for plan of subdivision, etc. AnnotationType "Plan Note" can be used to give information relating to whole of the plan, such as <code>desc="All areas shown are approximate"</code> AnnotationType "Parcel Note" can be used for specific parcel(s) to give information relating to particular parcel(s), such as <code>desc="Limited to 20.195m in depth"</code>

3.37 FieldNote

Description	Notes are added as content of the FieldNote element. Plain text or any valid XML structure may be placed inside this element.		
Example	<pre> ... <Survey> ... <SurveyHeader ... > ... <FieldNote> This is a field note </FieldNote> ... </SurveyHeader> ... <ObservationGroup ... > ... <ReducedObservation ... > <FieldNote>This is a field note</FieldNote> </ReducedObservation> <ReducedArcObservation ... > <FieldNote>This is a field note</FieldNote> </ReducedArcObservation> <RedHorizontalPosition ... > <FieldNote>This is a field note</FieldNote> </RedHorizontalPosition> <RedVerticalObservation ... > <FieldNote>This is a field note</FieldNote> </RedVerticalObservation> ... </ObservationGroup> ... </Survey> ... <PlanFeatures... > ... <PlanFeature ... > ... <FieldNote> This is a field note </FieldNote> ... </PlanFeature> ... </PlanFeatures> ... </pre>		
Element Content	Free text or any valid XML structure representing the field note information.		
Parent Elements	<i>SurveyHeader</i> <i>PlanFeature</i> <i>ReducedObservation</i> <i>ReducedArcObservation</i> <i>RedHorizontalPosition</i> <i>RedVerticalObservation</i>		
Child Elements	Cardinality		
None (If custom XML is used, child elements of the custom XML will be shown.)			
Attribute	Type	Required	Description
None			

3.38 ObservationGroup

Description	The ObservationGroup element is a container element for all types of observation elements.		
Example	<pre> ... <Survey> ... <ObservationGroup id="OG-1"> ... <ReducedObservation ... /> <ReducedArcObservation ... /> <RedHorizontalPosition ... /> <RedVerticalObservation ... /> </ObservationGroup> ... </Survey> ... </pre>		
Parent Elements	<i>Survey</i>		
Child Elements			Cardinality
<i>ReducedObservation</i>			0 - *
<i>ReducedArcObservation</i>			0 - *
<i>RedHorizontalPosition</i>			0 - *
<i>RedVerticalObservation</i>			0 - *
Attribute	Type	Required	Description
id	ID (string)	R	As LandXML allows multiple observation groups, each observation group has an "id". For ePlan there will be only one observation group per file. ID value should be unique within the file and must start with an alpha character and may not contain spaces.

3.39 ReducedObservation

Description	The ReducedObservation element contains a reduced horizontal measurement being the bearing and distance. The measurement is related to CgPoint elements using references to InstrumentSetup elements for the setupID and targetSetupID attributes. (See <i>InstrumentSetup</i> for details.)		
Example	<pre> ... <ObservationGroup ...> ... <ReducedObservation name="15" desc="Connection" setupID="IS14" targetSetupID="IS15" azimuth="59.3032" horizDistance="324.525" distanceType="Measured" azimuthType="Measured" distanceAdoptionFactor="1.00024000" coordGeomRefs="LOT-103"> <FieldNote> ... </FieldNote> </ReducedObservation /> ... </ObservationGroup> ... </pre>		
Parent Elements	<i>ObservationGroup</i>		
Child Elements			Cardinality
<i>FieldNote</i>			0 - *
Attribute	Type	Required	Description
name	string	R	Unique ePlan identifier.

desc	<i>purposeType</i>	R	<p>Jurisdictional list of the purpose types – see <i>purposeType</i> in NSW enumerations schema.</p> <p>This is the equivalent of a line type in NSW and values to be set as follows:</p> <p>Boundary: all boundaries of new parcels with the exception of boundaries of new lots that about a road and boundaries of new road parcels that about a lot parcel of any state.</p> <p>Road: boundaries of new lots that about a road and boundaries of new road that about a lot parcel of any state.</p> <p>Reference: Reference Mark connections from marks to the referencing corner – Not yet implemented</p> <p>Connection: all other measured lines in the plan</p>
coordGeomRefs	coordGeomNameRefs (string)	O	A space delimited list of the CoordGeom @ name values this measurement is used in
setupID	IDREF (string)	R	A reference to the InstrumentSetup @ id that this measurement is made from
targetSetupID	IDREF (string)	R	A reference to the InstrumentSetup @ id that this measurement is made to
azimuth	direction (double)	CR	This is the bearing of ReducedObservation and required for all observations with exception of compiled residue parcel boundaries where bearing is optional
horizDistance	double	CR	This is the horizontal distance of ReducedObservation and required for all observations with exception of connections to Trig. stations
distanceType	<i>observationType</i>	CR	<p>Jurisdictional list of the observation types – see <i>observationType</i> in NSW enumerations schema.</p> <p>It is required if the method of observation is other than measured.</p>
azimuthType	<i>observationType</i>	CR	<p>Jurisdictional list of the observation types – see <i>observationType</i> in NSW enumerations schema.</p> <p>It is required if the method of observation is other than measured.</p>

distanceAccClasss – Not yet implemented	<i>monumentState</i>	CR	Jurisdictional list of monument states – see <i>monumentState</i> in NSW enumerations schema. This is the state of the reference line and It is required if the desc="Reference"
adoptedDistanceSurvey – Not yet implemented	string	CR	Required if the observation is adopted from a previous survey or for found marks (reference lines). Value is the plan number it was adopted from. "Origin unknown" may be the value where applicable.
distanceAdoptionFactor	double	CR	This is the scale factor used for conversion between grid and ground distance. Ground distance should be given in the horizDistance . It is required for connections between survey control marks.

3.40 ReducedArcObservation

Description	The ReducedArcObservation element contains a horizontal arc measurement. There can be multiple ReducedArcObservation over same two points as long as radii are different.		
Example	<pre> ... <ObservationGroup ...> ... <ReducedArcObservation name="329" desc="Boundary" setupID="S-132" targetSetupID="S-130" chordAzimuth="124.3035" radius="930.570" length="47.145" rot="cw" arcType="Compiled" coordGeomRefs="XSTG12-1-1260"> <FieldNote> ... </FieldNote> </ReducedArcObservation /> ... </ObservationGroup> ... </pre>		
Parent Elements	<i>ObservationGroup</i>		
Child Elements			Cardinality
<i>FieldNote</i>			0 - *
Attribute	Type	Required	Description
name	string	R	Unique ePlan identifier

desc	<i>purposeType</i>	R	<p>Jurisdictional list of the purpose types – see <i>purposeType</i> in NSW enumerations schema.</p> <p>This is the equivalent of a line type in NSW and values to be set as follows:</p> <p>Boundary: all boundaries of new parcels with the exception of boundaries of new lots that abut a road and boundaries of new road parcels that abut a lot parcel of any state.</p> <p>Road: boundaries of new lots that abut a road and boundaries of new road that abut a lot parcel of any state.</p> <p>Connection: all other measured lines in the plan</p> <p>Reference: Not used for arcs</p>
coordGeomRefs	coordGeomNameRefs (string)	O	A space delimited list of the CoordGeom @ name values this measurement is used in
setupID	IDREF (string)	R	A reference to the InstrumentSetup @ id that this measurement is made from
targetSetupID	IDREF (string)	R	A reference to the InstrumentSetup @ id that this measurement is made to
chordAzimuth	direction (double)	R	The chord bearing of the arc and it is required for all observations including compiled parcels
radius	double	R	Radius of the arc and it is required for all observations including compiled parcels
length	double	R	Length of the arc and it is required for all observations including compiled parcels
rot	<i>clockwise</i>	R	Direction of the arc from the setupID to the targetSetupID . Value will be either "cw" for clockwise or "ccw" for counter clockwise
arcType	<i>observationType</i>	CR	<p>Jurisdictional list of the observation types – see <i>observationType</i> in NSW enumerations schema.</p> <p>It is required if the method of observation is other than measured.</p>
adoptedSurvey	string	CR	Required if the observation is adopted from a previous survey, this is the identity (e.g. plan number) of the survey it was adopted from

3.41 RedHorizontalPosition

Description	The RedHorizontalPosition element contains horizontal details of the survey control marks in the plan. For all established control marks (with class="C" or better & order="3" or better), details must match SCIMS database.		
Example	<pre> ... <ObservationGroup ...> ... <RedHorizontalPosition name="172475" setupID="S-31" latitude="6363006.080" longitude="373418.490" class="U" order="U" currencyDate="2015-07-27" horizontalFix="Traverse" horizontalDatum="MGA"> <FieldNote> ... </FieldNote> </RedHorizontalPosition/> ... </ObservationGroup> ... </pre>		
Parent Elements	<i>ObservationGroup</i>		
Child Elements			Cardinality
<i>FieldNote</i>			0 - *
Attribute	Type	Required	Description
name	string	R	Unique ePlan identifier.
setupID	IDREF (string)	R	A reference to the InstrumentSetup @ id where the point is a survey control point. There must be at least one ReducedObservation associated with same id.
horizontalDatum	<i>horzDatumType</i>	R	Jurisdictional list of the horizontal datum types – see <i>horzDatumType</i> in NSW enumerations schema.
latitude	string	R	SCIMS northing coordinate for the control mark
longitude	string	R	SCIMS easting coordinate for the control mark.
horizontalFix	<i>horzFixType</i>	R	Jurisdictional list of the horizontal fix types – see <i>horzDatumType</i> in NSW enumerations schema. This is the method used to determine the position of the mark and it should be "SCIMS" for all established marks. Different methods can be used for unestablished marks. Police 3 plans will record "Policy 3"
currencyDate	string	R	This is the date the survey control mark information was obtained from SCIMS or by other method in ISO 8601 format (yyyy-mm-dd). e.g. "2014-06-13"
class	<i>horzClassType</i>	R	Jurisdictional list of the horizontal class types – see <i>horzClassType</i> in NSW enumerations schema. This must match order in SCIMS database for found established marks.
order	<i>horzOrderType</i>	R	Jurisdictional list of the horizontal order types – see <i>horzOrderType</i> in NSW enumerations schema. This must match order in SCIMS database for found marks.

3.42 RedVerticalObservation

Description	<p>The RedVerticalObservation element contains vertical information of the survey control marks in the plan. For all established control marks, details must match SCIMS database.</p> <p>These are in additional information to the details provided for the control mark in the RedHorizontalPosition Section above.</p> <p>The additional information is only mandatory for plans defining stratum boundaries that use a survey control mark as one of the required bench marks</p>		
Example	<pre> ... <ObservationGroup ...> ... <RedVerticalObservation name="172475" setupID="S-31" height="20.200" verticalDatum="AHD" class="LC" order="L3"> <FieldNote> ... </FieldNote> </RedVerticalObservation/> ... </ObservationGroup> ... </pre>		
Parent	<i>ObservationGroup</i>		
Child elements		Cardinality	
<i>FieldNote</i>		0 - *	
Attribute	Type	Required	Description
name	string	R	Unique ePlan identifier
setupID	IDREF (string)	R	<p>A reference to the InstrumentSetup @ id where the point is a survey control point.</p> <p>There must be a RedHorizontalPosition with same setupID.</p>
height	double	R	This is the reduced level value for the control mark.
verticalDatum	<i>vertDatumType</i>	R	<p>Jurisdictional list of the vertical datum types – see <i>vertDatumType</i> in NSW enumerations schema.</p> <p>This is the vertical datum used for the height and it is set to: AHD in NSW.</p>
class	<i>vertClassType</i>	R	<p>Jurisdictional list of the vertical class types – see <i>vertClassType</i> in NSW enumerations schema.</p> <p>This must match class in SCIMS database for found established marks</p>
order	<i>vertOrderType</i>	R	<p>Jurisdictional list of the vertical order types – see <i>vertOrderType</i> in NSW enumerations schema.</p> <p>This must match order in SCIMS database for found marks.</p>

3.43 InstrumentSetup

Description	The InstrumentSetup element links observation setup points to a CgPoint . This is purely a structural requirement of LandXML to link observation start and end points to a physical location. See example below.		
Example	<pre> ... <Survey> ... <InstrumentSetup id="S-4" stationName="4" instrumentHeight="0"> <InstrumentPoint ... /> </InstrumentSetup> ... </Survey> ... </pre>		
Parent Elements	<i>Survey</i>		
Child Elements	Cardinality		
<i>InstrumentPoint</i>	1		
Attribute	Type	Required	Description
id	ID	R	ID value should be unique within the document. Must start with an alpha character and may not contain spaces.
stationName	string	R	Required by LandXML but optional for ePlan.
instrumentHeight	double	R	Required by LandXML but optional for ePlan. If not needed should be Set to: 0

3.44 InstrumentPoint

Description	The InstrumentPoint element contains the reference to the CgPoint for the InstrumentSetup .		
Example	<pre> ... <InstrumentSetup ... > <InstrumentPoint pntRef="4"/> </InstrumentSetup> ... </pre>		
Parent Elements	<i>InstrumentSetup</i>		
Child Elements			Cardinality
None			
Attribute	Type	Required	Description
pntRef	pointNameRef	R	Reference to the CgPoint for this InstrumentPoint .

3.45 Amendment

Description	The Amendment element is used to record amendments made to the file. This element would not normally be used by the surveyor creating the file, but by LPI to record a post registration amendment requested by the surveyor or required by LPI. The information recorded in this element will be shown on the rendering of the LXML done by LPI.		
Example	<pre> < LandXML ... > ... <Amendment dealingNumber="Amendment File 2013-1174" amendmentDate="2013-08-26" comments="Connections to easement E5 in lot 6 amended from 0.5 to 0.6"> <AmendmentItem ... /> </Amendment> ... </LandXML> </pre>		
Parent Elements	<i>LandXML</i>		
Child Elements			Cardinality
<i>AmendmentItem</i>		1 - *	
Attribute	Type	Required	Description
dealingNumber	string	CR	This is the LPI amendment file No
amendmentDate	date	R	The date that the amendment was made.
comments	string	R	Description of the amendment e.g. "Connections to easement E5 in lot 6 amended from 0.5 to 0.6"

3.46 AmendmentItem

Description	The AmendmentItem element contains name of each element that has been amended. It is only recorded in the LXML file and will not be shown on the plan when rendered.		
Example	<pre> ... <Amendment ... > <AmendmentItem elementName="ReducedObservation 244"/> ... </Amendment> ... </pre>		
Parent Elements	<i>Amendment</i>		
Child Elements	Cardinality		
None			
Attribute	Type	Required	Description
elementName	string	R	The name of the element being amended. e.g. If a ReducedObservation element is amended then the value of elementName is ReducedObservation @ name in the file.

4. COMPLEX SCENARIO DESCRIPTIONS

This section of the document specifies LandXML structural requirements that are to be used in the construction of a CIF where necessary to handle scenarios that require LandXML to be structured in a certain way to correctly capture the data. It also explains in NSW specific terms some of the scenarios described in the ICSM National level document titled – “*ePlan Protocol LandXML Structural Requirements*”

4.1 Multipart Lots

Multipart lots consist of multiple parts linked to form a single cadastral entity. This is achieved using one parcel with a **parcelType** of "multipart" with linkages to several parcels with a **parcelType** of "part".

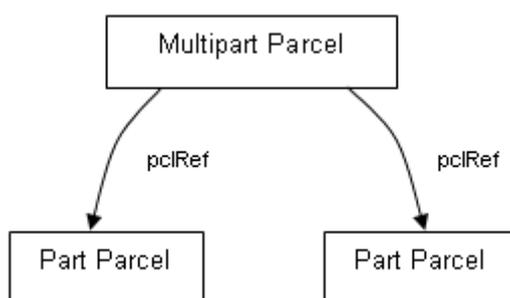


Figure 1 – Multipart parcel structure

A multipart lot has the following structural features:

- The "multipart" parcel contains parcel linkages to all the "part" parcels.
- The "multipart" parcel does not contain the **CoordGeom** and **Center** elements. Only the "part" parcels contain coordinate geometry.
- The "multipart" parcel specifies the total area in its **area** attribute. All part parcels must specify their respective area in their **area** attribute.
- For a lot with multiple parts, the “multipart” parcel name is the lot number and the “part” lot parcel name is the lot number followed by a an alpha suffix starting with “A”.

For example, if Lot 101 has two parts the parcel name of the multipart parcel is “101” and two part parcels are “101A” and “101B”.

NB: the suffix is required in LandXML file as each name should be unique, however the lot number is rendered as Pt 101.

The following is an example implementation of a multipart parcel in LandXML file. The element names are arbitrary and used for demonstration purposes only.

```
<Parcel name="101" class="Lot" state="proposed" parcelType="Multipart" parcelFormat="Standard" area="6685">
  <!-- Linkage to parts -->
  <Parcels>
    <Parcel name="A" pclRef="101A"/>
    <Parcel name="B" pclRef="101B"/>
  </Parcels>
</Parcel>
```

```

<Parcel name="101A" class="Lot" state="proposed" parcelType="Part" parcelFormat="Standard"
area="1206">
  <Center ... />
  <CoordGeom ... >
    ...
  </CoordGeom>
</Parcel>
<Parcel name="101B" class="Lot" state="proposed" parcelType="Part" parcelFormat="Standard"
area="5479">
  <Center ... />
  <CoordGeom ... >
    ...
  </CoordGeom>
</Parcel>

```

4.2 Subdivision Number

The Subdivision Number issued by the Council in the Subdivision Certificate is also recorded on the plan drawing sheet. This is recorded in the LXML file by the use of the Annotation element.

Surveyor: Date of Survey: Surveyor's Ref:	PLAN OF SUBDIVISION OF LOT IN DP	L.G.A.: Locality: Subdivision No: SC/14/2010/529/1 <small>Lengths are in metres. Reduction Ratio: 100</small>	Registered:	D.P.
---	-------------------------------------	--	-------------	------

```

<SurveyHeader ... >
  <Annotation type="Subdivision Number" name="s1" desc="SC/14/2010/529/1"/>
  ...
</SurveyHeader>

```

4.3 Plan Note

To apply a note (annotation) to a plan that is about the whole plan you use the **Annotation** Element as a child of the **SurveyHeader** element with **Annotation@type="Plan Note"**. See example below.

```

<SurveyHeader ... >
  <Annotation type="Plan Note" name="n1" desc="All areas are approximate"/>
  ...
</SurveyHeader>

```

4.4 Parcel Note

To apply a note (annotation) to a specific parcel or number of parcels you use the **Annotation** Element as a child of the **SurveyHeader** element with **Annotation@type="Parcel Note"**. See example below.

```

<SurveyHeader ... >
  <Annotation type="Parcel Note" name="n2" desc="Unformed Road" pclRef="R1, R2"/>
  ...
</SurveyHeader>

```

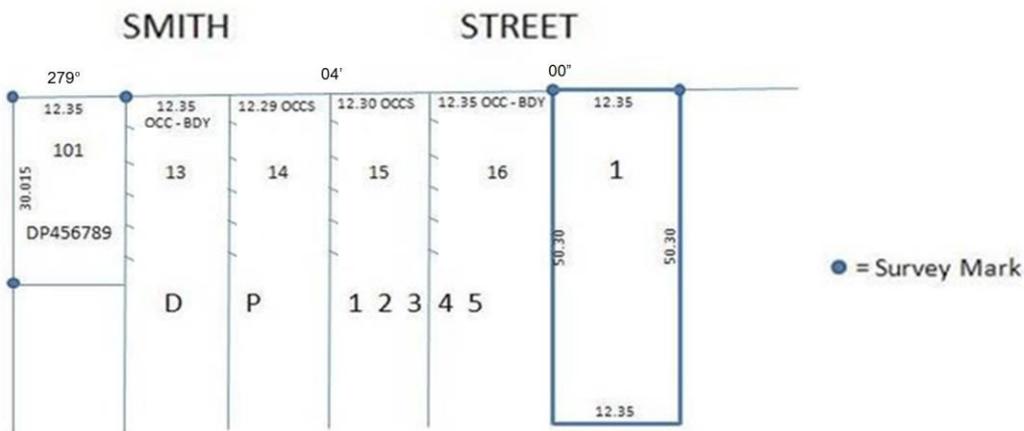
4.5 Line Note

To apply a note to a specific line you use the FieldNote element as a child of the ReducedObservation element. See following examples:

- Showing a dimension as “by me”

```
<ReducedObservation name="75" desc="Connection" setupID="IS84" targetSetupID="IS83"
azimuth="189.04" horizDistance="6.320">
  <FieldNote>by me</FieldNote>
</ReducedObservation>
```

- Showing measurements between occupations



```
...
<ReducedObservation name="75" desc="Connection" setupID="IS84" targetSetupID="IS83"
azimuth="279.04" horizDistance="12.35">
  <FieldNote>OCC-BDY</FieldNote>
</ReducedObservation>
<ReducedObservation name="76" desc="Connection" setupID="IS83" targetSetupID="IS82"
azimuth="279.04" horizDistance="12.30">
  <FieldNote>OCCS</FieldNote>
</ReducedObservation>
...
```

4.6 Control marks used as reference marks – Not yet implemented See V7.5.3 for current method

A Control Mark (PM, SSM, etc.) can also be used as a reference mark. This is recorded by using following convention in Land XML:

```
At CgPoint;
<CgPoint name="3" state="existing" pntSurv="control" oID="168718">6110668.110000
534471.312000</CgPoint>

At ReducedObservation;
<ReducedObservation name="30" desc="Reference" setupID="IS3" targetSetupID="IS2"
azimuth="265.3700" horizDistance="3.945" distanceAccClass="Placed"/>

At RedHorizontalPosition;
<RedHorizontalPosition name="61" setupID="IS3" latitude="6263432.521" longitude="287064.951"
class="C" order="3" currencyDate="2014-01-29" horizontalFix="SCIMS" horizontalDatum="MGA"/>
```

```
At Monument;  
<Monument name="10" pntRef="3" type="SSM" state="Found"/>
```

4.7 “Not Marked” boundary corners

Where a surveyor does not place a boundary mark (such as a peg) at the corner of a new lot, they are required to record the corner as "Not Marked" and place a reference mark in a suitable location remote from the corner.

In order to record a corner which is "Not Marked", **CgPoint** and **Monument** elements should be populated as per below example.

```
At CgPoint;  
<CgPoint state="proposed" pntSurv="boundary" name="79">6390231.696689  
741645.430913</CgPoint>  
  
At Monument;  
<Monument name="27" pntRef="79" type="Not Marked" state="Not Marked" condition="Inaccessible"/>
```

4.8 RM gone

4.8.1 with boundary mark

Where a surveyor finds or places a boundary mark (such as a peg) on a corner of an adjoining or proposed parcel and there was a RM that was connected to the same corner which is now gone, they are required to record boundary mark information as well as RM gone.

In order to record this information, **CgPoint** and **Monument** elements should be populated as per below example.

```
At CgPoint;  
<CgPoint state="existing" pntSurv="boundary" name="79">6390231.696689 741645.430913</CgPoint>  
  
At Monument;  
<Monument name="2" pntRef="16" type="Peg" state="Found" desc="RM Gone (DP220102)"/>
```

4.8.2 without boundary mark

New lot corners

Where surveyor cannot place a boundary mark on a new lot corner and there was a RM that was connected to the same corner which is now gone, they must record the corner as "Not Marked" and place a reference mark in a suitable location remote from the corner as per section 4.7 of this document. They must also record RM gone in the file.

In order to record this information, **CgPoint** and **Monument** elements should be populated as per below example.

```
At CgPoint;  
<CgPoint state="proposed" pntSurv="boundary" name="79">6390231.696689  
741645.430913</CgPoint>  
  
At Monument;  
<Monument name="2" pntRef="16" type="Not Marked" state="Not Marked" condition="Inaccessible"  
desc="RM Gone (DP220102)"/>
```

Adjoining lot corners

Where there is no boundary mark on an adjoining lot corner and there was a RM that was connected to the same corner which is now gone, they must record RM gone detail on the corner it was referencing.

In order to record this information, **CgPoint** and **Monument** elements should be populated as per below example.

At CgPoint;

```
<CgPoint state="existing" pntSurv="boundary" name="79">6390231.696689  
741645.430913</CgPoint>
```

At Monument;

```
<Monument name="2" pntRef="16" state="Gone" desc="RM Gone (DP220102)"/>
```

4.9 Plans Used

The list of plans used by the surveyor in the preparation of the plan is recorded using the **Annotation@type** of "Plans Used" in the NSW enumerations schema. Plan numbers or names are recorded in a comma delimited list in the **Annotation@desc** attribute. See example below.

```
<SurveyHeader ...>  
  <Annotation type="Plans Used" name="1" desc="DP378910, DP524789, 5697.2103"/>  
  ...  
</SurveyHeader>
```

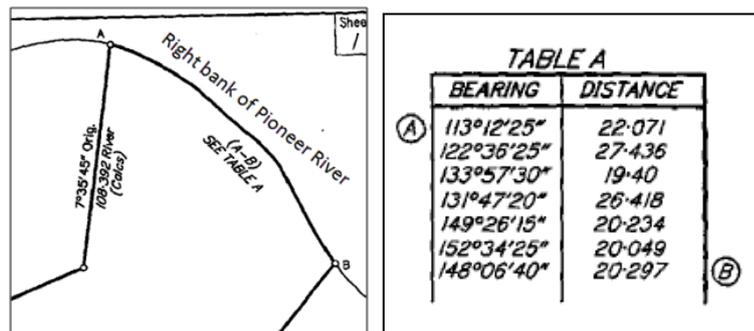
NB: This is a mandatory element required for all plans.

4.10 Irregular Lines

Irregular line boundaries such as creeks, etc. are defined differently depending on if the plan is surveyed or compiled.

4.10.1 Surveyed plans

For surveyed plans, the irregular line boundary (e.g. natural boundary) of a lot is to be defined using **IrregularLine** element and the traverse information in LandXML. The **IrregularLine** element is for the rendering of the legal boundary together with the description of the feature (e.g. Right bank of Pioneer River) and the traverse information is for mathematical closure of the lot and will be rendered separately in a short right lines table to represent a traverse along the boundary.



IrregularLine element

The shape of the irregular line is visualized using the **PntList2d** element under **IrregularLine** element in LandXML using a set of northing and easting coordinate pairs

The information used to render the irregular line and description of the boundary is as follows:

- IrregularLine@desc** records the location of the legal boundary (e.g. "Right bank of Pioneer Creek")
- The **Start** and **End** points (**pntRefs**) of the irregular line should be from **CgPoints**
- The coordinate pairs of the points representing the irregular line between the **Start** and **End** points. The first and last pairs of coordinates in the list must match the **CgPoint** coordinates of **Start** and **End** points.

NB: Some of the coordinate pairs in the list can be same as the **CgPoint** coordinates that are used in traverse

```
<IrregularLine desc="Right bank of Pioneer River" >
  <Start pntRef="217"/>
  <End pntRef="234"/>
  <PntList2D>1322.137070 897.047360 1315.916630 896.467670 1310.226980 897.991240
  1303.757680 903.401480 1294.458130 911.729520 1206.212380 967.435920 1195.584230
  974.819390 1188.710850 975.722460 1183.368710 976.036190 1177.116210 974.874520
  1170.836800 971.127850 1162.738330 965.201400 1157.406840 961.661120 1153.054100
  958.694270 1289.443320 915.970390 1274.394860 931.130970 1268.003170
  937.445250</PntList2D>
</IrregularLine>
```

Traverse

Bearings and distances of traverses are recorded using **ReducedObservation** element under the **ObservationGroup** element and all points used in the traverse must be in the **CgPoints** element and have corresponding **InstrumentSetup** elements. The start and end point of the traverse must match the **Start@pntRef** and **End@pntRef** of the corresponding **IrregularLine** and have **CgPoint@pntSurv** of "boundary". All other intermediate points in the traverse must have **CgPoint@pntSurv** of "natural boundary". See example below

```
At CgPoints;
<CgPoints zoneNumber="56">
  ...
  <CgPoint name="217" state="proposed" pntSurv="boundary">1322.137070 897.047360</CgPoint>
  <CgPoint name="234" state="proposed" pntSurv="boundary">1268.003170 937.445250</CgPoint>
  ...
  <CgPoint name="221" state="proposed" pntSurv="natural boundary">1310.226980
  897.991240</CgPoint>
  <CgPoint name="222" state="proposed" pntSurv="natural boundary">1188.710850
  975.722460</CgPoint>
  <CgPoint name="223" state="proposed" pntSurv="natural boundary">1183.368710
  976.036190</CgPoint>
  <CgPoint name="224" state="proposed" pntSurv="natural boundary">1177.116210
  974.874520</CgPoint>
  ...
</CgPoints>
```

At InstrumentSetup;

```
...
<InstrumentSetup id="S-217" stationName="217" instrumentHeight="0">
  <InstrumentPoint pntRef="217" />
</InstrumentSetup>
<InstrumentSetup id="S-221" stationName="221" instrumentHeight="0">
  <InstrumentPoint pntRef="221" />
</InstrumentSetup>
...
<InstrumentSetup id="S-224" stationName="226" instrumentHeight="0">
  <InstrumentPoint pntRef="226" />
</InstrumentSetup>
<InstrumentSetup id="S-234" stationName="234" instrumentHeight="0">
  <InstrumentPoint pntRef="234" />
</InstrumentSetup>
...
```

All traverse observations should have **ReducedObservation@desc** of "Connection"

At ObservationGroup;

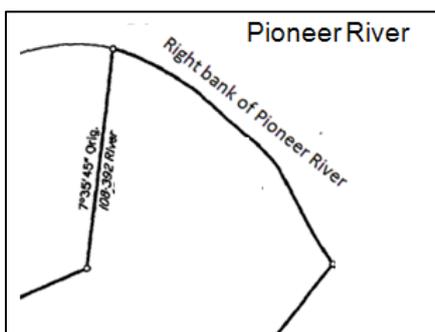
```
<ObservationGroup id="OG-1">
  ...
  <ReducedObservation name="11" setupID="S-217" targetSetupID="S-221" azimuth="234.5140"
  horizDistance="13.235" desc="Connection"></ReducedObservation>
  <ReducedObservation name="12" setupID="S-221" targetSetupID="S-222" azimuth="324.5120"
  horizDistance="12.320" desc="Connection"></ReducedObservation>
  ...
  <ReducedObservation name="13" setupID="S-223" targetSetupID="S-224" azimuth="54.5145"
  horizDistance="15.450" desc="Connection"></ReducedObservation>
  <ReducedObservation name="14" setupID="S-224" targetSetupID="S-234" azimuth="144.5115"
  horizDistance="21.105" desc="Connection"></ReducedObservation>
  ...
</ObservationGroup>
```

4.10.2 Compiled plans

For compiled plans, the irregular line boundary (e.g. natural boundary) of a lot is to be defined using **IrregularLine** element only. See IrregularLine element under section 4.10.1 for example.

4.10.3 Defining Adjoining Hydrographic Parcels

To create a river (or any other water feature) as an adjoining parcel, following attributes under Parcel element should be populated as per example below. This is applicable to both Surveyed and Compiled plans.



```
<Parcel name="H1" class="Hydrography"
desc="Pioneer Creek" state="adjoining"
parcelFormat="Standard" useOfParcel="River"
```

Diag. Compiled **IrregularLine** boundary with River as adjoining parcel

4.11 PlanFeatures

PlanFeatures element in LandXML is used for diagrammatic features of the plan such as occupations, offsets, other features, etc. Hence, the features can be exaggerated for better visual representation, if required. The points (**CgPoint**) used to create the feature should have **pntSurv** of “sideshot” unless it is an actual boundary or reference point.

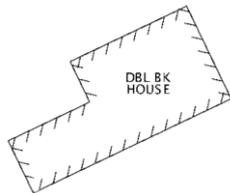
4.11.1 Occupations

Occupations generally have geometry (shape), description and offsets. Geometry and the description of an occupation are defined in **PlanFeature** element and all the points used in the geometry definition should have corresponding **CgPoint** elements. Offsets are generally defined using **Monument** element but it can also be defined using **PlanFeature** element in some cases.

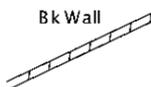
In a special case where the occupation is a wall on the boundary the **Line@desc** attribute is also need to be populated with “Face of Wall” of the corresponding parcel geometry line.

In NSW, only the following five types of features can be used and these are only to differentiate the rendering style.

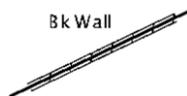
- Building : hatching inside a line



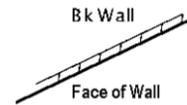
- Wall : hatching between a set of parallel lines



Wall only



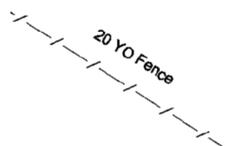
Boundary in Wall



Wall on Boundary

NB: Boundary in Wall must indicate where the boundary is at two end points using **Monuments** element

- Fence : hatching between the broken line



Off Boundary



On Boundary

NB: There is slight difference in hatching between on and off boundary Fence

- Kerb : broken line



- Offset : renders only desc attribute between given two points



See following example for how each elements/attributes are populated in LandXML for occupations.

All points (**CgPoint**) used to create occupations including the occupation of a point nature such as 'centre of a fence post' should be in the **CgPoints** element.

```

At CgPoints;
<CgPoints zoneNumber="56">
...
<CgPoint name="11" state="proposed" pntSurv="boundary">1322.137070 897.047360</CgPoint>
<CgPoint name="12" state="existing" pntSurv="boundary">1268.003170 937.445250</CgPoint>
...
<CgPoint name="35" state="existing" pntSurv="boundary">1310.226980 897.991240</CgPoint>
<CgPoint name="36" state="existing" pntSurv="boundary">1188.710850 975.722460</CgPoint>
...
<CgPoint name="3" state="existing" pntSurv="sideshot">1183.368710 976.036190</CgPoint>
<CgPoint name="4" state="existing" pntSurv="sideshot">1177.116210 974.874520</CgPoint>
<CgPoint name="5" state="existing" pntSurv="sideshot">1153.054100 958.694270</CgPoint>
<CgPoint name="6" state="existing" pntSurv="sideshot">1289.443320 915.970390</CgPoint>
<CgPoint name="7" state="existing" pntSurv="sideshot">1197.135371 977.322490</CgPoint>
<CgPoint name="8" state="existing" pntSurv="sideshot">1185.846230 964.612050</CgPoint>
<CgPoint name="9" state="proposed" pntSurv="boundary">1235.561320 944.719420</CgPoint>
...
</CgPoints>

```

Monuments element is generally used for mark details but it can also be used for occupation offset information. When it is used for this purpose, **type** attribute must be "Occupation".

```

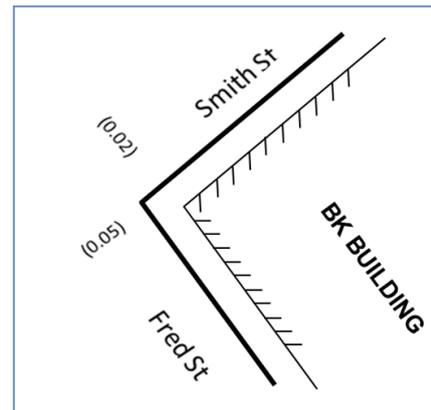
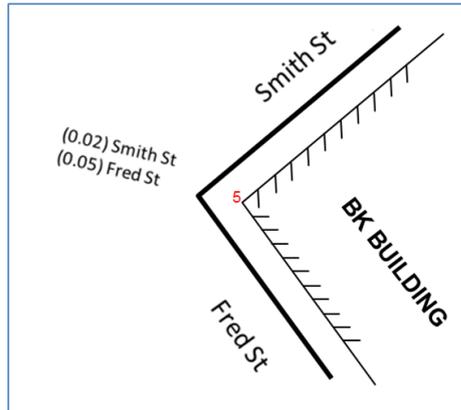
At Monuments;
<Monuments>
...
<!--one occupation with offsets to two roads near intersection (see diagrams on next page) -->
<Monument name="30" pntRef="5" type="Occupation" state="Existing" desc="1.00 Clear Smith Rd,
0.05 Clear Fred St"/>
...
<!--offsets from the occupation of a point nature (see diagrams on next page) -->
<Monument name="31" pntRef="9" type="Occupation" state="Existing" desc="Cen. Old SFP 0.24N
0.09E"/>
...
<!--offsets from the occupation of a point nature (see diagrams on page 60) -->
<Monument name="32" pntRef="3" type="Occupation" state="Existing" desc="(0.05)"/>
...
<!--offsets from the occupation of a point nature (see diagrams on page 60) -->
<Monument name="33" pntRef="6" type="Occupation" state="Existing" desc="0.04 OFF BDY"/>
...
</Monuments>

```

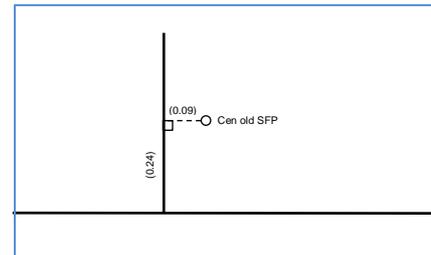
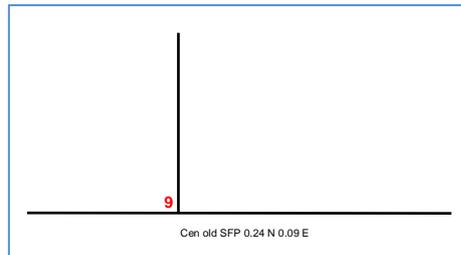
How it will be rendered

What it means

Offsets to two Roads near intersection



Occupation of point nature



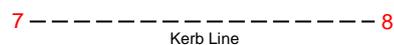
PlanFeatures element is where each occupation is defined as an individual **PlanFeature** element with its geometry definition and the description of what the feature (occupation) is. The **name** attribute of a **PlanFeature** determines the rendering style. If there are two or more of same type features, numeric suffix must be used to give them the unique identity.

At PlanFeatures;

```

<PlanFeatures name="Occupation">
  <PlanFeature name="Fence1" desc="20 YO FENCE ON BDY">
    <CoordGeom name="F1">
      <Line>
        <Start pntRef="11"/>
        <End pntRef="12"/>
      </Line>
    </CoordGeom>
  </PlanFeature>
  <PlanFeature name="Wall1" desc="Bk Wall">
    <CoordGeom name="W1">
      <Line>
        <Start pntRef="35"/>
        <End pntRef="36"/>
      </Line>
    </CoordGeom>
  </PlanFeature>
  <PlanFeature name="Kerb1" desc="Kerb Line">
    <CoordGeom name="K1">
      <Line>
        <Start pntRef="7"/>
        <End pntRef="8"/>
      </Line>
    </CoordGeom>
  </PlanFeature>

```



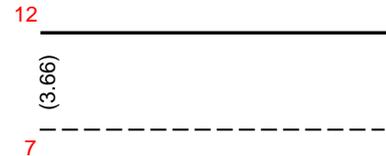
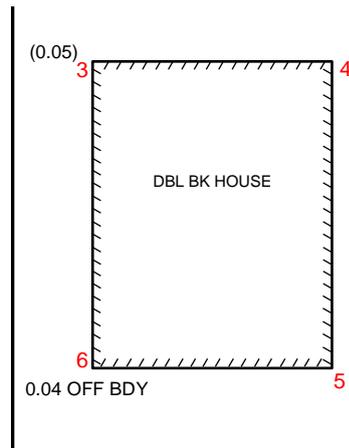
Cont'd to next page

Cont'd from last page

```

<PlanFeature name="Building1" desc="DBL BK HOUSE">
  <CoordGeom name="B1">
    <Line>
      <Start pntRef="3"/>
      <End pntRef="4"/>
    </Line>
    <Line>
      <Start pntRef="4"/>
      <End pntRef="5"/>
    </Line>
    <Line>
      <Start pntRef="5"/>
      <End pntRef="6"/>
    </Line>
    <Line>
      <Start pntRef="6"/>
      <End pntRef="3"/>
    </Line>
  </CoordGeom>
</PlanFeature>
<PlanFeature name="Offset1" desc="(3.66)">
<!--desc can also have (KL-BDY 3.66), (3.66 CNR Bk), etc. -->
  <CoordGeom name="O1">
    <Line>
      <Start pntRef="12"/>
      <End pntRef="7"/>
    </Line>
  </CoordGeom>
</PlanFeature>
</PlanFeatures>

```



NB: To facilitate rendering of occupations within LXML file the coordinate geometry must be sequenced as if walking along the occupation feature with the hatching representing the substance of the occupation always on the right hand side of the occupation line being defined

In a case where the occupation is a wall on the boundary **Line@desc** attribute under Parcel element must be populated as per below example.

At Parcel;

```

<Parcel name="12" area="495.0" class="Lot" state="proposed" parcelFormat="Standard"
parcelType="Single">
  <Center pntRef="LC-137"/>
  <CoordGeom name="XSTG12-1-1205">
    ...
    <Line>
      <Start pntRef="34"/>
      <End pntRef="35"/>
    </Line>
    <Line desc="Face of Wall">
      <Start pntRef="35"/>
      <End pntRef="36"/>
    </Line>
    <Line>
      <Start pntRef="36"/>
      <End pntRef="37"/>
    </Line>
    ...
  </CoordGeom>
</Parcel>

```

NB:

- When using the **PlanFeature@name** of "Wall" or "Fence" the **CoordGeom** will represent the center line of the wall/fence.
- When using the **PlanFeature@name** of "Building" or "Kerb" the **CoordGeom** will represent the outside face of the building's wall or face of Kerb

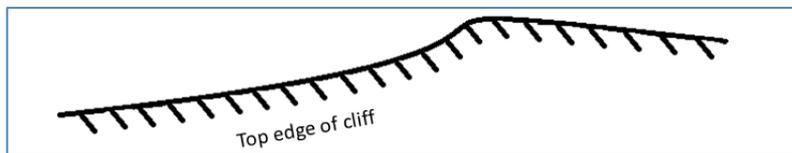
4.11.2 Other Types of Plan Features

Other types of plan features such as "Dam", "Cliff", "Watercourse" etc. can be created using one of the five feature types (**PlanFeature@name**) from previous section. Type should be selected to match the appropriate line style for rendering and for the description of the actual feature, **PlanFeature@desc** attribute should be used.

Examples

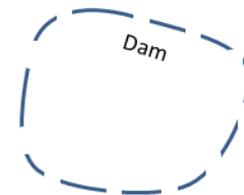
1. Use Building to render a Cliff

`<PlanFeature name="Building" desc="Top edge of cliff">`



2. Use Kerb to render a Dam

`<PlanFeature name="Kerb" desc="Dam">`



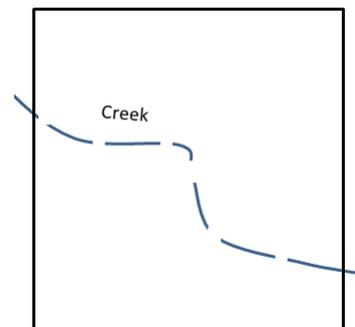
3. Use Kerb to render a Tree

`<PlanFeature name="Kerb" desc="Oak Tree">`



4. Use Kerb to render a Creek

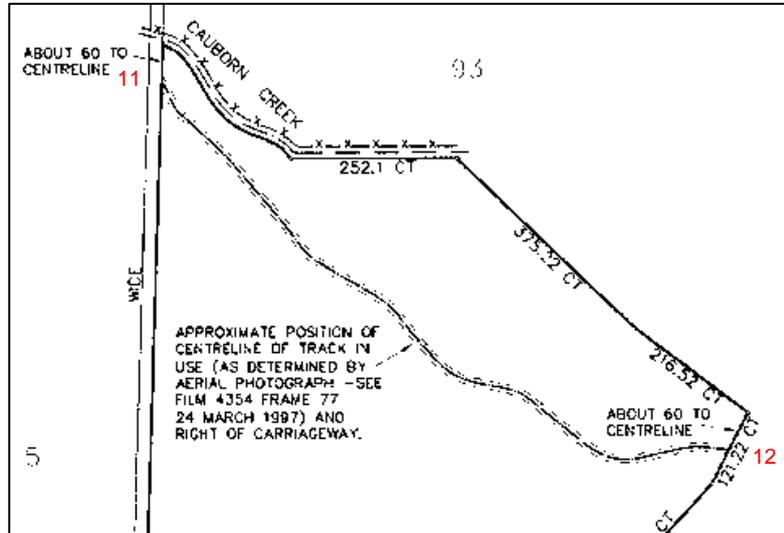
`<PlanFeature name="Kerb" desc="Creek">`



NB: If there is an irregular line in the shape of the watercourse the IrregularLine element should be used in the **CoordGeom** of the **PlanFeature**

4.12 Easements over track in use or line of pipes (Approx. position)

These easements are defined using **IrregularLine** element as per section 4.10 of this document. See following example for how each elements/attributes are populated in LandXML for the easement below.



At CgPoints;

```
<CgPoints zoneNumber="56">
...
<CgPoint name="11" state="proposed" pntSurv="boundary">1322.137070 897.047360</CgPoint>
<CgPoint name="12" state="proposed" pntSurv="boundary">1268.003170 937.445250</CgPoint>
...
</CgPoints>
```

At Parcel;

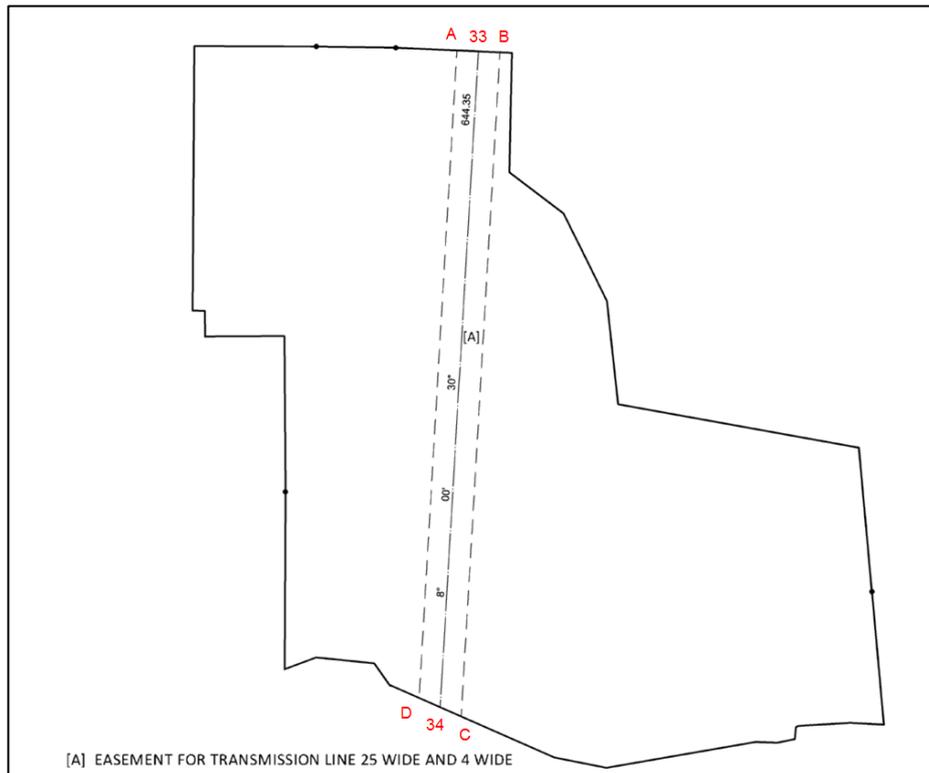
```
<Parcel name="E1" class="Easement" state="proposed" parcelFormat="Standard" parcelType="Single"
desc="Right of Carriageway over track in use">
<Center pntRef="LC-137"/>
<CoordGeom name="E1">
<IrregularLine desc="Approximate position of centreline of track in use" source="as determined by
Aerial photograph – see film 4354 frame 77, 24 March 1997">
<Start pntRef="11"/>
<End pntRef="12"/>
<PntList2D>1322.137070 897.047360 1315.916630 896.467670 1310.226980 897.991240
1303.757680 903.401480 1294.458130 911.729520 1206.212380 967.435920 1195.584230
974.819390 1188.710850 975.722460 1183.368710 976.036190 1177.116210 974.874520
1170.836800 971.127850 1162.738330 965.201400 1157.406840 961.661120 1153.054100
958.694270 1289.443320 915.970390</PntList2D>
</IrregularLine>
</CoordGeom>
</Parcel>
```

4.13 Transmission line easements defined by centre line traverse

These easements have two parts and they are defined separately in the LandXML.

- The centerline traverse : This is defined as an unclosed easement parcel.
- The extremity boundaries : This is defined as a plan feature.

See following example for how each elements/attributes are populated in LandXML for the easement below.



The centreline traverse

At CgPoints;

```
<CgPoints zoneNumber="56">
  ...
  <CgPoint name="33" state="proposed" pntSurv="boundary">1322.137070 897.047360</CgPoint>
  <CgPoint name="34" state="proposed" pntSurv="boundary">1268.003170 937.445250</CgPoint>
  ...
</CgPoints>
```

At Parcel;

```
<Parcel name="E3" class="Easement" state="proposed" parcelFormat="Standard" parcelType="Single"
desc="Easement for Transmission Line 25 Wide - Defined by traverse of centreline of poles ">
  <Center pntRef="LC-17"/>
  <CoordGeom name="E3">
    <Line>
      <Start pntRef="33"/>
      <End pntRef="34"/>
    </Line>
  </CoordGeom>
</Parcel>
```

At InstrumentSetup;

```
...
<InstrumentSetup id="S-33" stationName="33" instrumentHeight="0">
  <InstrumentPoint pntRef="33" />
</InstrumentSetup>
<InstrumentSetup id="S-34" stationName="34" instrumentHeight="0">
  <InstrumentPoint pntRef="34" />
</InstrumentSetup>
...
```

At ObservationGroup;

```
<ObservationGroup id="OG-1">
  ...
  <ReducedObservation name="21" setupID="S-34" targetSetupID="S-33" azimuth="8.0030"
    horizDistance="644.35" desc="Boundary"></ReducedObservation>
  ...
</ObservationGroup>
```

The extremity boundaries

At CgPoints;

```
<CgPoints zoneNumber="56">
  ...
  <CgPoint name="A" state="proposed" pntSurv="sideshot">1183.368710 976.036190</CgPoint>
  <CgPoint name="B" state="proposed" pntSurv="sideshot">1177.116210 974.874520</CgPoint>
  <CgPoint name="C" state="proposed" pntSurv="sideshot">1153.054100 958.694270</CgPoint>
  <CgPoint name="D" state="proposed" pntSurv="sideshot">1289.443320 915.970390</CgPoint>
  ...
</CgPoints>
```

At PlanFeatures;

```
<PlanFeatures name="Occupation">
  ...
  <PlanFeature name="Kerb E3" desc="DNR Transmission line easement boundary">
    <CoordGeom name="E3Bdy">
      <Line>
        <Start pntRef="A"/>
        <End pntRef="B"/>
      </Line>
      <Line>
        <Start pntRef="B"/>
        <End pntRef="C"/>
      </Line>
      <Line>
        <Start pntRef="C"/>
        <End pntRef="D"/>
      </Line>
      <Line>
        <Start pntRef="D"/>
        <End pntRef="A"/>
      </Line>
    </CoordGeom>
  </PlanFeature>
  ...
</PlanFeatures>
```

N.B.

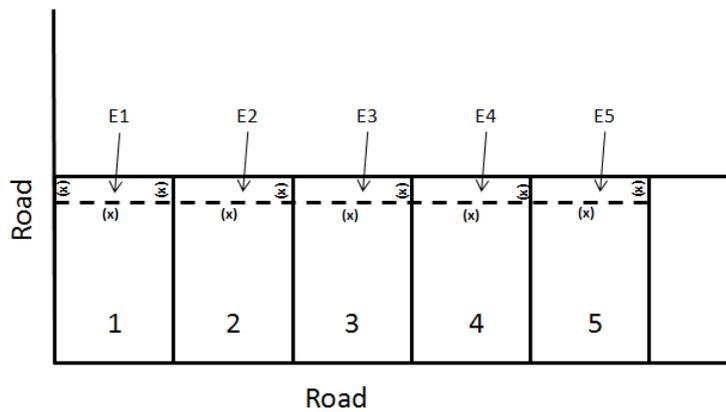
Any description with prefix 'DNR' will not be rendered from Rendering Service

4.14 Definition of easement segments

Where one easement extends over multiple lots, this easement must be segmented and defined as separate easement parcels, one for each lot that it affects.

The easement parcel names (**Parcel@name**) are to be E1, E2, E3, etc. but they must have same parcel description (**Parcel@desc**). This will ensure all the parts of the easement parcels with same descriptions to be combined within the one designation as per below diagram.

Full dimensions are required for all proposed easement parcels including all '(x)' marked easement boundaries.



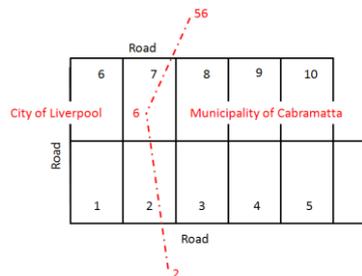
E1-E5 Easement to Drain Water 2 Wide

4.15 Administrative area boundaries

Where a plan crosses over multiple administrative areas such as LGA, Parish, etc., the administrative areas are defined as unclosed parcels. This method also applies to any partial parcel where the parcel cannot be shown in full either because of size or its extent is unknown.

Typically for administrative area boundaries there will be two Administrative Area parcels separated by a common boundary. These types of parcels need at least one line and a Center to identify on which side of the line the parcel is located.

The example shown below is where a plan covers 2 LGA's



Where there are multiple administrative area types that coincide with the same dividing boundary e.g. when both Locality and LGA are different on both sides, the parcel name can combine their names e.g. name = "City Of Hay - locality of Como". The useOfParcel will be set to "Administrative Area". However there will still be a separate Administrative Area element required for each one

At Parcels;

```

<Parcels>
...
<Parcel name="City of Liverpool" class="Administrative Area" state="existing" parcelType="Single"
parcelFormat="Standard" useOfParcel="Local Government Area">
  <Center pntRef="LC-13"/>
  <CoordGeom name="LGA-1">
    <Line>
      <Start pntRef="56"/>
      <End pntRef="6"/>
    </Line>
    <Line>
      <Start pntRef="6"/>
      <End pntRef="2"/>
    </Line>
  </CoordGeom>
</Parcel>
<Parcel name="Municipality of Cabramatta" class="Administrative Area" state="existing"
parcelType="Single" parcelFormat="Standard" useOfParcel="Local Government Area">
  <Center pntRef="LC-14"/>
  <CoordGeom name="LGA-2">
    <Line>
      <Start pntRef="2"/>
      <End pntRef="6"/>
    </Line>
    <Line>
      <Start pntRef="6"/>
      <End pntRef="56"/>
    </Line>
  </CoordGeom>
</Parcel>
...

```

4.16 Defining diagrams in LXML for LPI rendering

The rendering service will provide the ability to self-nominate diagrams, including diagrams that render only specific information in the specified area. If there are no self-nominated diagrams, diagrams will be auto generated by the service.

The **Annotation** elements are used to define the self-nominated diagrams. To define the area to be shown as diagram, **Annotation@desc** attribute is used with reference to **CgPoint@name** values. The **Annotation@type** defines the type of diagrams which include the following “*annotationType*” enumerations

- “Diagram”
: Render all information in the area defined by the **Annotation@desc**
- “Diagram Lots”
: Render all information relating to lots only
- “Diagram Occupations”
: Render all information relating to occupations and line work only for lots
- “Diagram Secondary Interests”
: Render all information relating to secondary interests (e.g. easements) and line work only for lots.

See following example for how each elements/attributes are populated in LandXML to define self-nominate diagrams.

```
At SurveyHeader;  
<SurveyHeader ...>  
...  
<Annotation type="Diagram" name="D1" desc="D-11, D-12, D-13, D-14"/>  
<Annotation type="Diagram Secondary Interests" name="D2" desc="D-21, D-22, D-23, D-24"/>  
<Annotation type="Diagram Occupations" name="D3" desc="D-31, D-32, D-33, D-34"/>  
<Annotation type="Diagram" name="D4" desc="D-41, D-42, D-43, D-44"/>  
<Annotation type="Diagram Lots" name="D5" desc="34, 33, 80, 83, 84, 69"/>  
<Annotation type="Diagram Occupations" name="D6" desc="34, 33, 80, 83, 84, 69"/>  
<Annotation type="Diagram Secondary Interests" name="D7" desc="34, 33, 80, 83, 84, 69"/>  
...  
</SurveyHeader>
```

NB: The **CgPoint** used to define the extent of the diagram can be any points that are already in the file or can be points that are created solely for the purpose of defining the diagram area. For all the **CgPoint** solely for extent of the diagram only should be defined as per below.

```
At CgPoints;  
<CgPoints ...>  
...  
<CgPoint name="D-11" state="proposed" pntSurv="sideshot">303.305400 980.661530</CgPoint>  
<CgPoint name="D-12" state="proposed" pntSurv="sideshot">303.305400 886.032160</CgPoint>  
<CgPoint name="D-13" state="proposed" pntSurv="sideshot">276.163110 886.032160</CgPoint>  
<CgPoint name="D-14" state="proposed" pntSurv="sideshot">276.163110 980.661530</CgPoint>  
<CgPoint name="D-21" state="proposed" pntSurv="sideshot">293.706738 991.056130</CgPoint>  
...  
</ CgPoints>
```

4.17 Adding Direction of Flow arrow in water course

The Direction of Flow arrow can be added in LandXML using the **Annotation@type** of “Direction Of Flow Tidal” or “Direction Of Flow Non Tidal”. This will allow the rendering service to render the appropriate type of arrow next to a water course. The reference (link) to the water course is done using the **desc** attribute, which is to be populated with the **Start** and **End** points of the corresponding **IrregularLine** element.

There are 2 relevant annotation types and the type of arrow will be as per below;

1. “Direction Of Flow Non Tidal” will produce a straight arrow.



2. “Direction Of Flow Tidal” will produce an “S” shaped arrow.



See following example for how each elements/attributes are populated in LandXML.

At IrregularLine;

```
...  
<IrregularLine desc="Right Bank of Hawkesbury River" >  
  <Start pntRef="11"/>  
  <End pntRef="14"/>  
  <PntList2D>.....</PntList2D>  
</IrregularLine>
```

```
...  
<IrregularLine desc=" Bank of Georges River" >  
  <Start pntRef="21"/>  
  <End pntRef="24"/>  
  <PntList2D>.....</PntList2D>  
</IrregularLine>
```

...

At SurveyHeader;

```
<SurveyHeader ...>
```

```
  ...  
  <Annotation type="Direction Of Flow Tidal" name="F1" desc="11, 14"/>  
  <Annotation type="Direction Of Flow Non Tidal" name="F2" desc="21, 24"/>  
  ...  
</SurveyHeader>
```

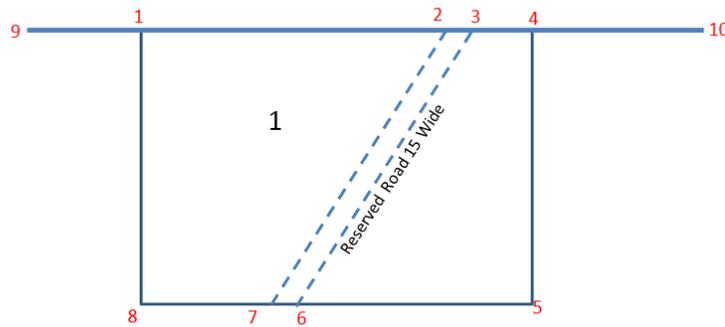
NB: The flow arrow will always render from first point to second point in the **desc** attribute regardless of **Start** and **End** of **IrregularLine**.

4.18 Defining Reserved Roads

When a reserved road is excluded from a lot, it should be created in the LXML file as a separate road parcel. It must have a **class** of “Reserved Road”

The boundaries of the Reserved Road do not require **ReducedObservation** and will be rendered as broken lines. If any boundary of the reserved road coincides with another parcel boundary of any other class, the line work of other parcel class will take precedence at the rendering.

See following example for how each elements/attributes should be populated in LandXML for given example.



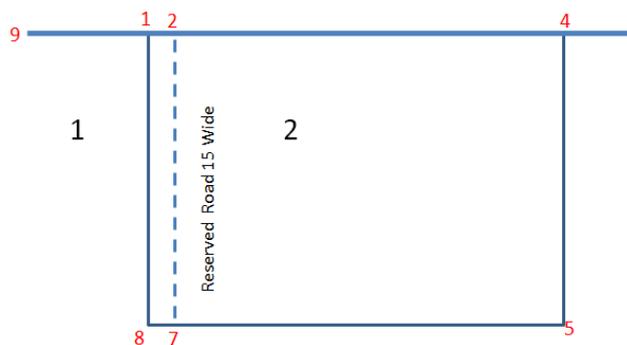
At Parcel;

```

<Parcel name="R11" desc="Reserved Road 15 Wide" class="Reserved Road" state="existing"
parcelFormat="Standard" parcelType="Single">
  <Center pntRef="LC-47"/>
  <CoordGeom name="R11-1">
    <Line>
      <Start pntRef="2"/>
      <End pntRef="3"/>
    </Line>
    <Line>
      <Start pntRef="3"/>
      <End pntRef="6"/>
    </Line>
    <Line>
      <Start pntRef="6"/>
      <End pntRef="7"/>
    </Line>
    <Line>
      <Start pntRef="7"/>
      <End pntRef="2"/>
    </Line>
  </CoordGeom>
</Parcel>

```

If any of the Reserved Road parcel boundaries coincide with a proposed lot boundary that has a **ReducedObservation** (boundary from point 8 to point 1 below), the **ReducedObservation@desc** should be "Boundary" and not "Road".



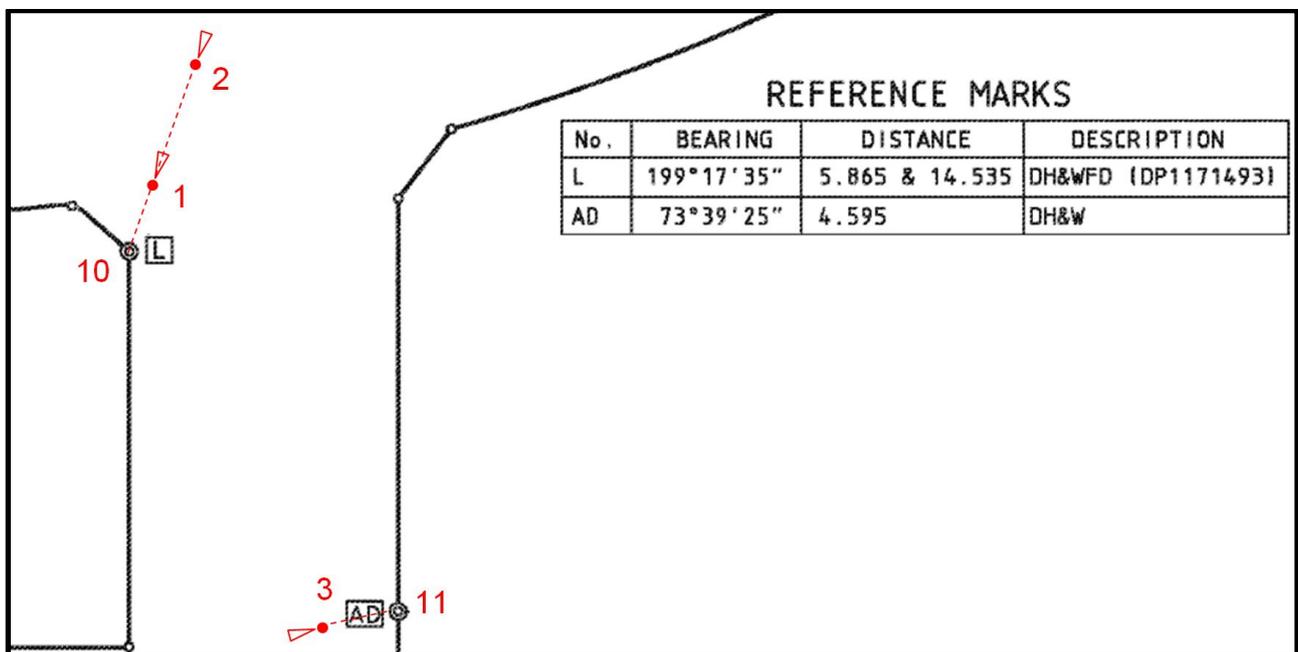
4.19 Defining Reference Mark (RM) – Not yet implemented

Reference marks in LandXML are defined in two levels. One is using Monument element to define physical mark information and the other is to define the information in regard actual observation to referencing corner.

4.19.1 RM(s) referencing single corner

In most situations, there will be a double up of information in Monument and ReducedObservation elements in regard to the state of the mark and the observation (see Example 1 below). There are also cases where this information does not agree between the two elements (see Example 2 below).

Example 1: Two reference marks (points 1 & 2) were found referencing a corner 'L' (point 10) and agree with DP1171493 which is also the origin of the mark. Another mark (point 3) was placed to reference corner 'AD' (point 11).



See following for how each elements/attributes should be populated in LandXML for given example.

At CgPoints;

```
<CgPoints zoneNumber="56">
```

```
...  
<CgPoint name="1" state="existing" pntSurv="reference">6110676.619 534466.481</CgPoint>  
<CgPoint name="2" state="existing" pntSurv="reference">6110676.317 534462.548</CgPoint>  
<CgPoint name="3" state="proposed" pntSurv="reference">6110668.110 534471.312</CgPoint>  
...  
<CgPoint name="10" state="proposed" pntSurv="boundary">6110671.235 534463.458</CgPoint>  
<CgPoint name="11" state="proposed" pntSurv="boundary">6110665.137 534452.181</CgPoint>
```

```
</CgPoints>
```

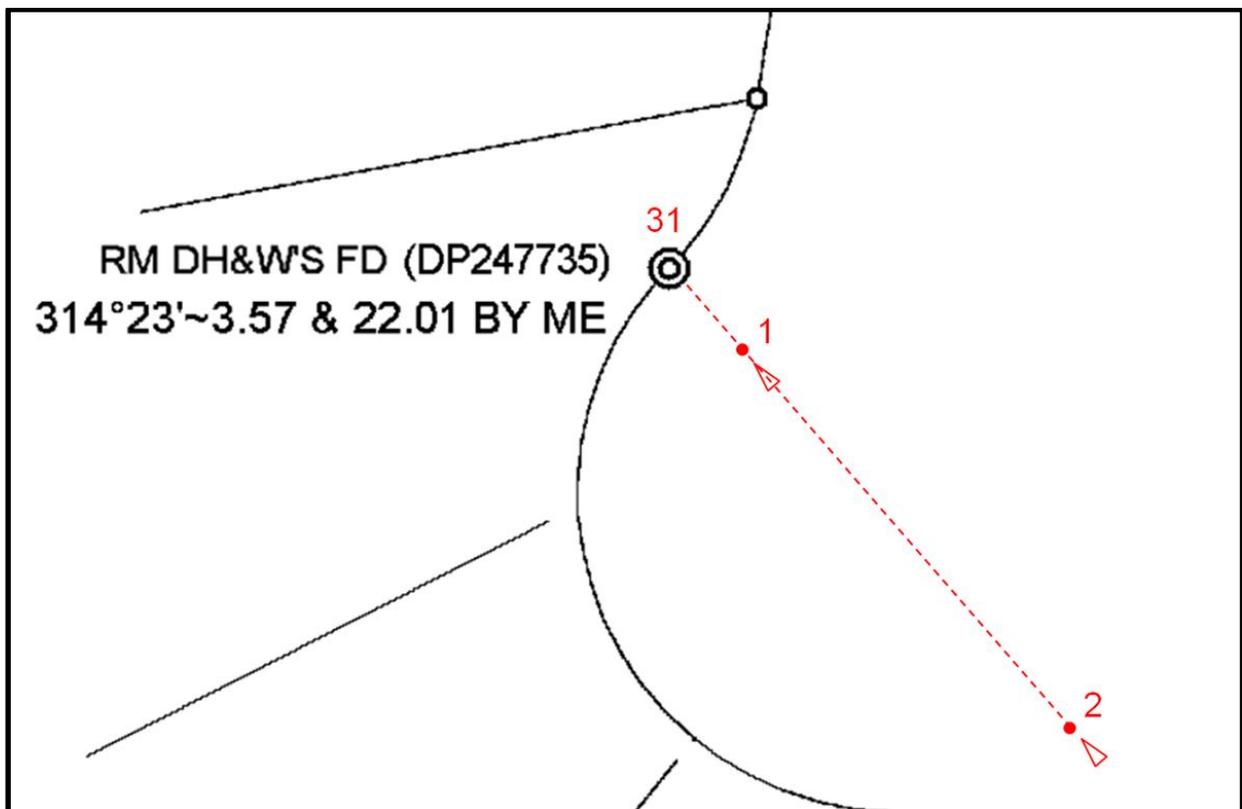
At ObservationGroup;

```
<ObservationGroup id="OG-1">
...
<ReducedObservation name="19" desc="Reference" setupID="IS1" targetSetupID="IS10"
azimuth="199.1735" horizDistance="5.865" distanceAccClass="Found"
adoptedDistanceSurvey="DP1171493"/>
<ReducedObservation name="20" desc="Reference" setupID="IS2" targetSetupID="IS10"
azimuth="199.1735" horizDistance="14.535" distanceAccClass="Found"
adoptedDistanceSurvey="DP1171493"/>
<ReducedObservation name="21" desc="Reference" setupID="IS3" targetSetupID="IS11"
azimuth="73.3925" horizDistance="4.595" distanceAccClass="Placed"/>
...
</ObservationGroup>
```

At Monuments;

```
<Monuments>
...
<Monument name="21" pntRef="1" type="DH&W" state="Found" originSurvey="DP1171493"/>
<Monument name="22" pntRef="2" type="DH&W" state="Found" originSurvey="DP1171493"/>
<Monument name="23" pntRef="3" type="DH&W" state="Placed"/>
...
</Monuments>
```

Example 2: There are two reference marks (points 1 & 2) were found referencing a corner at point 31 but has been re-referenced by the survey and does not agree with the origin (DP247735) of the mark.



See following for how each elements/attributes should be populated in LandXML for given example.

At CgPoints;

```
<CgPoints zoneNumber="56">
...
<CgPoint name="1" state="existing" pntSurv="reference">6110676.619 534466.481</CgPoint>
<CgPoint name="2" state="existing" pntSurv="reference">6110676.317 534462.548</CgPoint>
...
<CgPoint name="31" state="proposed" pntSurv="boundary">6110671.235 534463.458</CgPoint>
...
</CgPoints>
```

At Monuments;

```
<Monuments>
...
<Monument name="21" pntRef="1" type="DH&amp;W" state="Found" originSurvey ="DP247735"/>
<Monument name="22" pntRef="2" type="DH&amp;W" state="Found" originSurvey ="DP247735"/>
...
</Monuments>
```

At ObservationGroup;

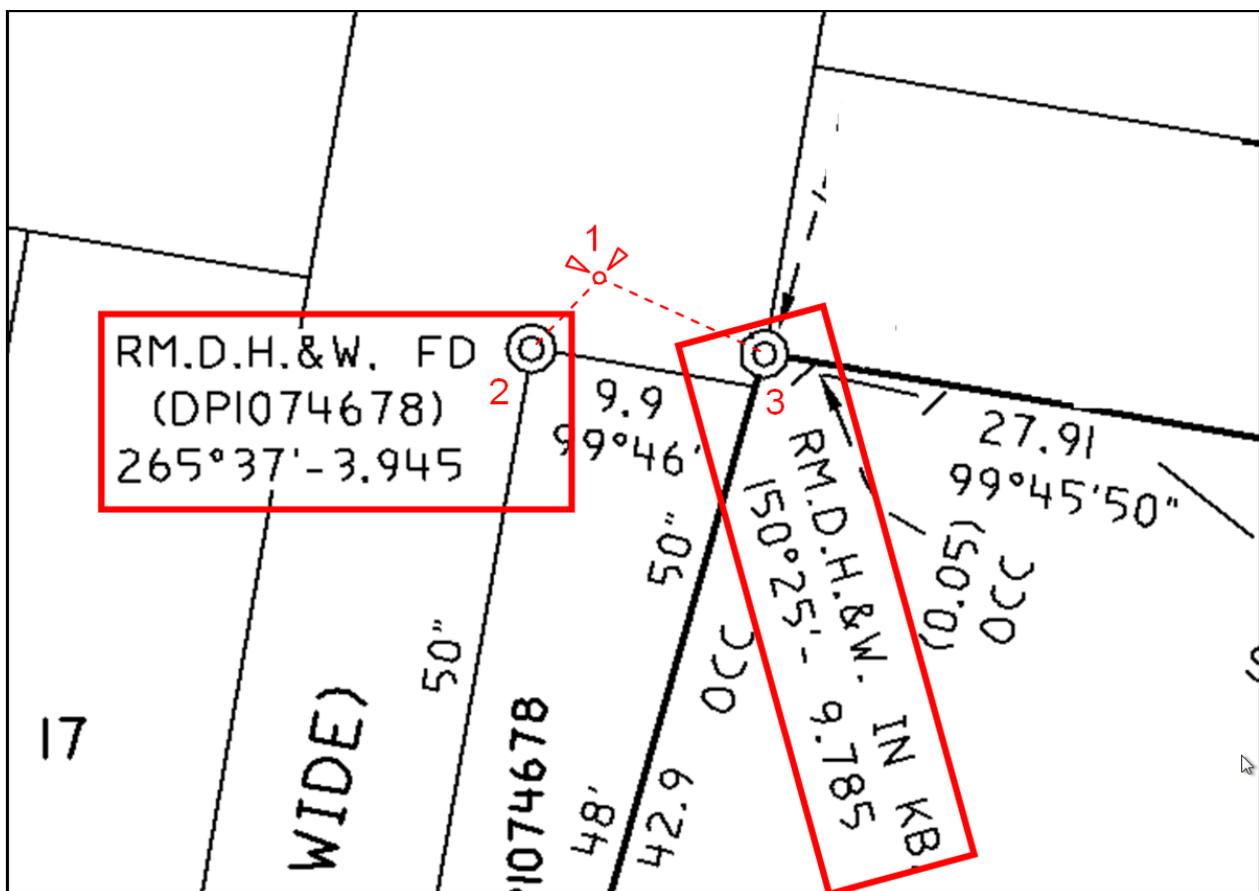
```
<ObservationGroup id="OG-1">
...
<ReducedObservation name="19" desc="Reference" setupID="IS1" targetSetupID="IS31"
azimuth="314.2000" horizDistance="3.570" distanceAccClass="Found By Me"
adoptedDistanceSurvey="DP247735"/>
<ReducedObservation name="20" desc="Reference" setupID="IS2" targetSetupID="IS31"
azimuth="314.2000" horizDistance="22.010" distanceAccClass="Found By Me"
adoptedDistanceSurvey="DP247735"/>
...
</ObservationGroup>
```

4.19.2 When one mark references multiple corners

There have been many occasions where one physical mark is used to reference multiple corners at different times of survey. When a single mark is used to define multiple corners with different attribute values, it must be defined as follow.

1. Attributes of the physical mark will be populated in the Monument element.
2. The reference information will be populated in the ReducedObservation of each reference lines

Example: Two reference lines shown in red box below are actually connected to same reference mark, which is shown as a circle with wings. Connection to the left corner was surveyed and agrees to the found origin (DP1074678), whereas connection to the right corner is new reference using same mark.



See following for how each elements/attributes should be populated in LandXML for given example.

```
At CgPoints;  
<CgPoints zoneNumber="56">  
...  
<CgPoint name="1" state="existing" pntSurv="reference">6110676.619 534466.481</CgPoint>  
<CgPoint name="2" state="existing" pntSurv="boundary">6110676.317 534462.548</CgPoint>  
<CgPoint name="3" state="proposed" pntSurv="boundary">6110668.110 534471.312</CgPoint>  
...  
</CgPoints>
```

At ObservationGroup;

```
<ObservationGroup id="OG-1">
  ...
  <ReducedObservation name="30" desc="Reference" setupID="IS1" targetSetupID="IS2"
  azimuth="265.3700" horizDistance="3.945" distanceAccClass="Found"
  adoptedDistanceSurvey="DP1074678"/>
  <ReducedObservation name="31" desc="Reference" setupID="IS1" targetSetupID="IS3"
  azimuth="150.2500" horizDistance="9.785" distanceAccClass="Placed"/>
  ...
</ObservationGroup>
```

At Monuments;

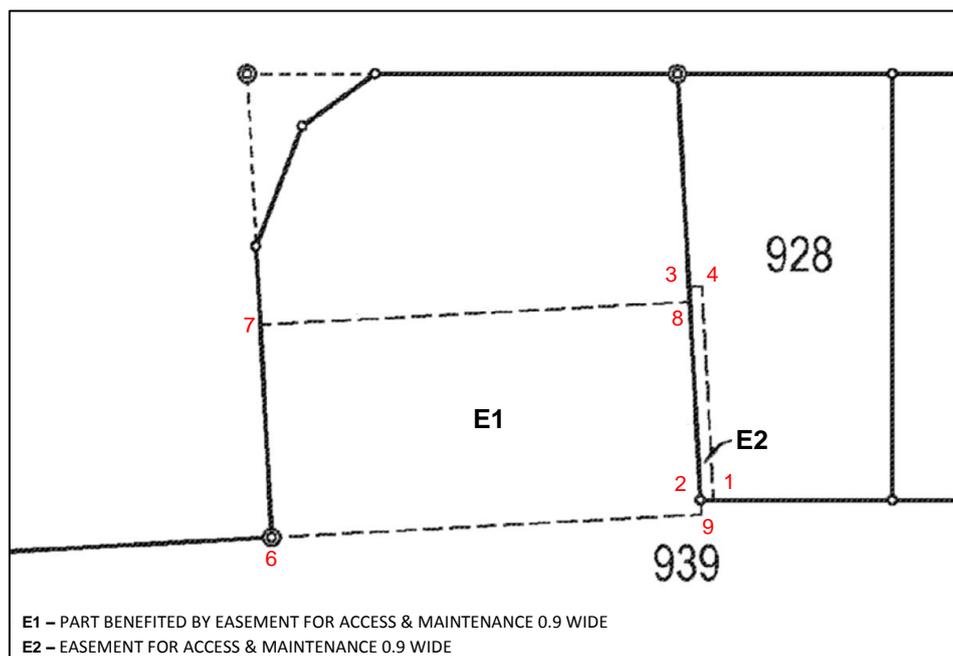
```
<Monuments>
  ...
  <Monument name="10" pntRef="1" type="DH&W" state="Found" originSurvey="DP1074678"/>
  ...
</Monuments>
```

NB: The state attribute under Monument element is the physical state of the mark and the distanceAccClass attribute under ReducedObservation element is the state of the individual reference line. When these attributes are either "Found" or "Found By Me", the Monument@originSurvey attribute and ReducedObservation@adoptedDistanceSurvey attributes should be populated accordingly.

4.20 Defining the area 'Benefited to the Part' using Designated Area

When only part of the lot is being benefited by a secondary interest such as an easement, it is required to designate the area being benefited. The area being designated must be created as a separate parcel with a Parcel@class="Designated Area".

See next page for how each elements/attributes should be populated in LandXML for example below.



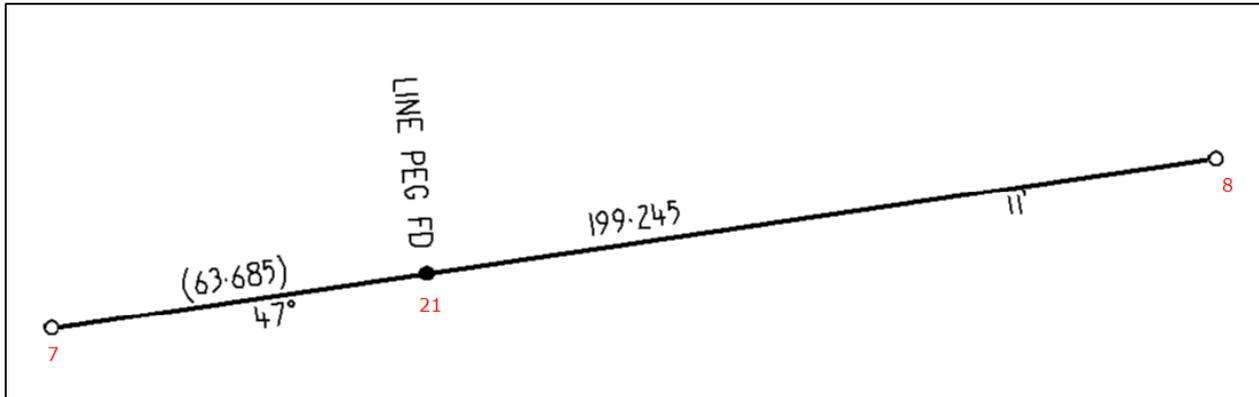
At Parcels;

```
<Parcels>
...
<Parcel name="E1" desc="Part Benefited by Easement for Access and Maintenance 0.9 Wide"
class="Designated Area" state="proposed" parcelType="Single" parcelFormat="Standard">
  <Center pntRef="LC-14"/>
  <CoordGeom name="LGA-2">
    <Line>
      <Start pntRef="6"/>
      <End pntRef="7"/>
    </Line>
    <Line>
      <Start pntRef="7"/>
      <End pntRef="8"/>
    </Line>
    <Line>
      <Start pntRef="8"/>
      <End pntRef="9"/>
    </Line>
    <Line>
      <Start pntRef="9"/>
      <End pntRef="6"/>
    </Line>
  </CoordGeom>
</Parcel>
<Parcel name="E2" desc="Easement for Access and Maintenance 0.9 Wide" class="Easement"
state="proposed" parcelType="Single" parcelFormat="Standard">
  <Center pntRef="LC-13"/>
  <CoordGeom name="LGA-1">
    <Line>
      <Start pntRef="1"/>
      <End pntRef="2"/>
    </Line>
    <Line>
      <Start pntRef="2"/>
      <End pntRef="3"/>
    </Line>
    <Line>
      <Start pntRef="3"/>
      <End pntRef="4"/>
    </Line>
    <Line>
      <Start pntRef="4"/>
      <End pntRef="1"/>
    </Line>
  </CoordGeom>
</Parcel>
...
</Parcels>
```

4.21 Defining the Line PEG

When there is a Line PEG on a boundary, this can be defined using **Monument** element as per the other types of boundary marks. The difference with the Line PEG is that this point will not be part of the Coordinate Geometry of a parcel and have a **CgPoint@pntSurv="traverse"**. Instead there should be a connection to the Line PEG in the **ReducedObservation** element.

See following for how each elements/attributes should be populated in LandXML for example below.



At CgPoints;

```
<CgPoints zoneNumber="56">
...
<CgPoint name="7" state="existing" pntSurv="boundary">6110676.619 534466.481</CgPoint>
<CgPoint name="8" state="existing" pntSurv="boundary">6110696.317 534659.548</CgPoint>
...
<CgPoint name="21" state="existing" pntSurv="traverse">6110683.110 534521.312</CgPoint>
...
</CgPoints>
```

At ObservationGroup;

```
<ObservationGroup id="OG-1">
...
<ReducedObservation name="3" desc="Boundary" setupID="IS7" targetSetupID="IS8"
azimuth="47.1100" horizDistance="199.245"/>
...
<ReducedObservation name="31" desc="Connection" setupID="IS7" targetSetupID="IS21"
azimuth="47.1100" horizDistance="63.685"/>
...
</ObservationGroup>
```

At Monuments;

```
<Monuments>
...
<Monument name="18" pntRef="21" type="PEG" desc="LINE PEG" state="Found"/>
...
</Monuments>
```

APPENDIX A – ENUMERATION LISTS

The following appendix outlines all the LandXML type definitions used by the ePlan Protocol in NSW implementation. This includes the enumerated types.

A1. Primitive Data Types

The following are primitive data type definitions used by the CIF. They are defined by the XML standard (see <http://www.w3.org/TR/xmlschema-0/#CreatDt>).

Type	Description
anySimpleType	Highest level of simple type and can store any simple type.
anyURI	Uniform Resource Identifier
boolean	True or False
date	ISO8601 date format: YYYY-MM-DD
double	A double precision floating point number
IDREF	A reference to the ID of another element
int	An integer
positiveInteger	A positive integer value
string	An extended sequence of characters
time	ISO8601 time format: hh:mm:ss

A2. LandXML Enumerated Types

The following types are defined in LandXML with an enumerated list of valid values. NSW will be using a subset of the LandXML values available.

See LandXML 1.2 schema for full list <http://www.landxml.org/schema/LandXML-1.2/LandXML-1.2.xsd>

The attributes are listed under the element to which they belong and are listed in the order, in which the elements appear in this document.

Attribute	Type	Description	Enumerations
Metric			
directionUnit	angularType	Angular values in numeric format. E.g. 45° 3' 5" should be entered as "45.0305". Minutes and seconds must be within the numeric range between 00 and 60.	Set to: decimal dd.mm.ss
areaUnit	metArea	Valid metric units of measure for area.	Set to: squareMeter
linearUnit	metLinear	Valid metric units of measure for length	Set to: meter
pressureUnit	metPressure	Valid metric units of measure for pressure	Set to: milliBars

Attribute	Type	Description	Enumerations
temperatureUnit	metTemperature	Valid metric units of measure for temperature.	Set to: celsius
volumeUnit	metVolume	Valid metric units of measure for area volume.	Set to: cubicMeter
CgPoint			
state	stateType	The state of the point. Either proposed (new) or existing	<ul style="list-style-type: none"> ▪ proposed ▪ existing
pntSurv	survPntType	The type/purpose of the point	<ul style="list-style-type: none"> ▪ boundary ▪ control ▪ natural boundary ▪ reference ▪ sideshot ▪ traverse
Parcel			
state	parcelStateType	The state of the parcel in context of other parcels in the plan	<ul style="list-style-type: none"> ▪ adjoining ▪ existing ▪ proposed
Curve			
rot	clockwise	The direction of the curve either clockwise (cc) or counter clockwise (ccw)	<ul style="list-style-type: none"> ▪ cw ▪ ccw
SurveyHeader			
type	surveyType	Whether the plan was surveyed or compiled	<ul style="list-style-type: none"> ▪ compiled ▪ surveyed
ReducedArcObservation			
rot	clockwise	The direction of the curve either clockwise (cc) or counter clockwise (ccw)	<ul style="list-style-type: none"> ▪ cw ▪ ccw

A3. NSW Enumerated Types

The following enumerated types in LandXML are defined as jurisdictional enumeration types to meet each jurisdictional requirement. NSW enumeration schema file is available at the following link: http://www.lpi.nsw.gov.au/_data/assets/file/0011/146981/xml-gov-au-nsw-icsm-eplan-cif-enumerated-types-1.0.xsd

The attributes are listed under the element to which they belong and are listed in the order, in which the elements appear in this document.

NB: Enumerations in red texts are not to be used.

Attribute	Type	Description	Enumerations
CoordinateSystem			
datum	surveyBgDatumType	Horizontal Datum of the plan	<ul style="list-style-type: none"> ▪ ISG ▪ Local ▪ MGA ▪ MM ▪ TM
horizontalDatum	horzDatumType	Datum of CgPoint coordinates	Set to: Local
verticalDatum	vertDatumType	Vertical datum for the plan	Set to: AHD
CgPoints			
zoneNumber	zoneNumberType	The MGA zone for the plan and NSW zones should be one of the following	<ul style="list-style-type: none"> ▪ 54 ▪ 55 ▪ 56 ▪ 57
Monument			
state	monumentState	This is a list of states for a monument (mark or occupation).	<ul style="list-style-type: none"> ▪ Existing ▪ Found ▪ Gone ▪ Not Found ▪ Found Now Gone ▪ Placed ▪ Not Marked ▪ Found By Me
Type	monumentType	This is a survey mark types, also includes “Not Marked” and “Occupation” to accommodate complex scenarios as described in Section 4 of this document.	<ul style="list-style-type: none"> ▪ DH&W ▪ GIP ▪ Wing ▪ Reference Tree ▪ Tree ▪ Approved Mark ▪ Broad Arrow ▪ Conc Block ▪ DH ▪ Bottle ▪ Lockspit

Attribute	Type	Description	Enumerations
		<p>N.B. “Approved Mark” together with desc attribute can be used if the used mark type is not in the list</p>	<ul style="list-style-type: none"> ▪ Metal Spike ▪ GIN ▪ Nail ▪ Peg ▪ PM ▪ Pipe ▪ Post ▪ PVC Pipe ▪ Rod ▪ Specified Point ▪ Spike ▪ Star Picket ▪ SSM ▪ Token ▪ TS ▪ Not Marked ▪ Occupation ▪ MM ▪ GB ▪ CP ▪ CR ▪ Witness Mark ▪ BM
condition	monumentCondition	This is a list of mark conditions that may be applied to a mark.	<ul style="list-style-type: none"> ▪ Destroyed ▪ Disturbed ▪ Original ▪ Replaced ▪ Remains ▪ Subsidence Area ▪ Uncertain ▪ Inaccessible ▪ Submerged
Parcel			
class	parcelClass	<p>This is a list of parcel classes in NSW.</p> <p>N.B. Classes that are in blue text are secondary interest parcels and require desc attribute to be populated.</p>	<ul style="list-style-type: none"> ▪ Administrative Area ▪ Association Property ▪ Building ▪ Caveat ▪ Common Property ▪ Covenant ▪ Designated Area ▪ Easement ▪ Exclusive Use Area ▪ Footprint ▪ Hydrography ▪ Lease ▪ License ▪ Lot ▪ Permit

Attribute	Type	Description	Enumerations
			<ul style="list-style-type: none"> ▪ Positive Covenant ▪ Profit A Prende ▪ Restriction On Use Of Land ▪ Restriction On User ▪ Railway ▪ Reserved Road ▪ Road
parcelFormat	parcelFormat	Parcel Format describes how the parcel is described	<ul style="list-style-type: none"> ▪ Standard ▪ Strata ▪ Stratum
parcelType	parcelTypeType	The parcel structure type	<ul style="list-style-type: none"> ▪ Single ▪ Multipart ▪ Part
UseOfParcel	useOfParcelType	Describes how the parcel is used for	<ul style="list-style-type: none"> ▪ Access Channel ▪ Administrative Area ▪ Artificial Water Way ▪ Association Property ▪ Balcony ▪ Bay ▪ Boat Ramps ▪ Canal ▪ Car Parking ▪ Car Space ▪ Carport ▪ Cemetery ▪ Coastal Management Zone ▪ Common Property ▪ County ▪ Courtyard ▪ Creek ▪ Deck ▪ Drainage Reserve ▪ Entry ▪ Garage ▪ Garbage ▪ Garden ▪ Garden Area ▪ Garden Space ▪ Landing ▪ Letter Box ▪ Lift ▪ Loading Bay ▪ Local Government Area ▪ Locality ▪ Main ▪ Ocean

Attribute	Type	Description	Enumerations
			<ul style="list-style-type: none"> ▪ Parish ▪ Parking ▪ Parking Area ▪ Patio ▪ Permit ▪ Permit To Occupy ▪ Planter ▪ Planter Box ▪ Plunge Pool ▪ Pool ▪ Porch ▪ Portico ▪ Private Yard ▪ Public Reserve ▪ Public Use Land ▪ Remainder ▪ River ▪ Roof Garden ▪ Stairs ▪ Storage ▪ Store ▪ Swimming Pool ▪ Temporary Road ▪ Terrace ▪ Travelling Stock Route ▪ Tree Clearing ▪ Unit ▪ Verandah ▪ Visitor Parking ▪ Void ▪ Water Feature ▪ Yard ▪ Yard Area
Location Address			
addressType	addressTypeType	This Type is to define a specific list of address types	<ul style="list-style-type: none"> ▪ Alias ▪ Historical ▪ Primary ▪ Secondary
flatType	flatTypeType	To define a specific list of living unit types for addressing	<ul style="list-style-type: none"> ▪ Apartment ▪ Berth ▪ Cottage ▪ Dock ▪ Duplex ▪ Factory ▪ Flat ▪ House ▪ Kiosk ▪ Office ▪ Penthouse ▪ Premises

Attribute	Type	Description	Enumerations
			<ul style="list-style-type: none"> ▪ Room ▪ Shed ▪ Shop ▪ Stall ▪ Studio ▪ Suite ▪ Townhouse ▪ Unit ▪ Villa ▪ Ward ▪ Warehouse
floorLevelType	floorLevelTypeType	To define a specific list of floor level types	<ul style="list-style-type: none"> ▪ Basement ▪ Floor ▪ Ground ▪ Level ▪ Lobby ▪ Lower Ground Floor ▪ Lower Level ▪ Mezzanine ▪ Observation Deck ▪ Parking ▪ Platform ▪ Podium ▪ Rooftop ▪ Sub-Basement ▪ Upper Ground Floor
RoadName			
roadName	roadNameTypeType	To define a specific list of Road name types	<ul style="list-style-type: none"> ▪ Access ▪ Accessway ▪ Alley ▪ Alleyway ▪ Amble ▪ Anchorage ▪ Approach ▪ Arcade ▪ Artery ▪ Avenue ▪ Basin ▪ Beach ▪ Bend ▪ Block ▪ Boardwalk ▪ Boulevard ▪ Boulevarde ▪ Brace ▪ Brae ▪ Branch ▪ Break ▪ Bridge

Attribute	Type	Description	Enumerations
			<ul style="list-style-type: none"> ▪ Broadway ▪ Brow ▪ Bypass ▪ Byway ▪ Causeway ▪ Centre ▪ Centreway ▪ Chase ▪ Circle ▪ Circlet ▪ Circuit ▪ Circus ▪ Close ▪ Colonnade ▪ Common ▪ Concourse ▪ Copse ▪ Corner ▪ Corso ▪ Court ▪ Courtyard ▪ Cove ▪ Crescent ▪ Crest ▪ Cross ▪ Crossing ▪ Crossroad ▪ Crossway ▪ Cruiseway ▪ Cul-de-Sac ▪ Cutting ▪ Dale ▪ Dell ▪ Deviation ▪ Dip ▪ Distributor ▪ Drive ▪ Driveway ▪ Edge ▪ Elbow ▪ End ▪ Entrance ▪ Esplanade ▪ Estate ▪ Expressway ▪ Extension ▪ Fairway ▪ Fire Track ▪ Firetrail ▪ Flat ▪ Follow ▪ Footway ▪ Foreshore

Attribute	Type	Description	Enumerations
			<ul style="list-style-type: none"> ▪ Formation ▪ Freeway ▪ Front ▪ Frontage ▪ Gap ▪ Garden(s) ▪ Gate(s) ▪ Glade ▪ Glen ▪ Grange ▪ Green ▪ Ground ▪ Grove ▪ Gully ▪ Heights ▪ Highroad ▪ Highway ▪ Hill ▪ Interchange ▪ Intersection ▪ Island ▪ Junction ▪ Key ▪ Landing ▪ Lane ▪ Laneway ▪ Lees ▪ Line ▪ Link ▪ Little ▪ Lookout ▪ Loop ▪ Lower ▪ Mall ▪ Meander ▪ Mew ▪ Mews ▪ Motorway ▪ Mount ▪ Nook ▪ Outlook ▪ Parade ▪ Park ▪ Parklands ▪ Parkway ▪ Part ▪ Pass ▪ Passage ▪ Path ▪ Pathway ▪ Piazza ▪ PKW ▪ Place

Attribute	Type	Description	Enumerations
			<ul style="list-style-type: none"> ▪ Plateau ▪ Plaza ▪ Pocket ▪ Point ▪ Port ▪ Promenade ▪ Quad ▪ Quadrangle ▪ Quadrant ▪ Quay(s) ▪ Ramble ▪ Ramp ▪ Range ▪ Reach ▪ Reserve ▪ Rest ▪ Retreat ▪ Ride ▪ Ridge ▪ Ridgeway ▪ Right Of Way ▪ Ring ▪ Rise ▪ River ▪ Riverway ▪ Riviera ▪ Road ▪ Roads ▪ Roadside ▪ Roadway ▪ Ronde ▪ Rosebowl ▪ Rotary ▪ Round ▪ Route ▪ Row ▪ Rue ▪ Run ▪ Service Way ▪ Siding ▪ Slope ▪ Sound ▪ Spur ▪ Square ▪ Stairs ▪ State Highway ▪ Steps ▪ Strait ▪ Strand ▪ Street ▪ Strip ▪ Subway ▪ Tarn

Attribute	Type	Description	Enumerations
			<ul style="list-style-type: none"> ▪ Terrace ▪ Thoroughfare ▪ Tollway ▪ Top ▪ Tor ▪ Towers ▪ Track ▪ Trail ▪ Trailer ▪ Triangle ▪ Trunkway ▪ Turn ▪ Underpass ▪ Upper ▪ Vale ▪ Viaduct ▪ View ▪ Villas ▪ Vista ▪ Wade ▪ Walk ▪ Walkway ▪ Way ▪ Wharf ▪ Wynd ▪ Yard
roadNameSuffix	roadNameSuffixType	To allow a list of specific road suffixes	<ul style="list-style-type: none"> ▪ Central ▪ East ▪ Extension ▪ Lower ▪ North ▪ North East ▪ North West ▪ South ▪ South East ▪ South West ▪ Upper ▪ West
roadType	roadTypeType	To define if the road is a public, private or temporary road	<ul style="list-style-type: none"> ▪ Public ▪ Private ▪ Temporary
AddressPoint			
addressPointType	addressPointTypeType	This is to define the type of Geocode what the address point is for.	<ul style="list-style-type: none"> ▪ Access Point ▪ Centroid of Parcel
Survey Header			
jurisdiction	jurisdictionType	This is the name of the jurisdiction (i.e. state) and	<ul style="list-style-type: none"> ▪ Australian Capital Territory

Attribute	Type	Description	Enumerations
		should be Set to: New South Wales for all plans lodged at LPI	<ul style="list-style-type: none"> ▪ New South Wales ▪ Northern Territory ▪ Queensland ▪ South Australia ▪ Tasmania ▪ Western Australia ▪ Victoria
surveyFormat	surveyFormatType	Describes the format of the survey	<ul style="list-style-type: none"> ▪ Community Schemes ▪ Examination Survey ▪ Standard ▪ Stratum ▪ Strata Schemes ▪ Survey Information Only
AdministrativeArea			
adminAreaType	adminAreaTypeType	Type of Admin Area	<ul style="list-style-type: none"> ▪ County ▪ Locality ▪ Local Government Area ▪ Parish ▪ Survey Region ▪ Terrain
PurposeOfSurvey			
purposeOfSurvey@name	purpSurvType	Purpose of the plan	<ul style="list-style-type: none"> ▪ Additional Sheet For Community Title Plan ▪ Boundary Adjustment Plan For Community Title Plan ▪ Building Alteration Plan ▪ Building Alteration Plan – Leasehold ▪ Building Stratum Subdivision ▪ Coal Definition ▪ Community Plan ▪ Community Plan Of Consolidation ▪ Community Plan Of Subdivision ▪ Consolidation ▪ Crown Folio Creation ▪ Delimitation

Attribute	Type	Description	Enumerations
			<ul style="list-style-type: none"> ▪ Departmental ▪ Easement ▪ Ex-Survey Plan ▪ Lease ▪ Limited Folio Creation ▪ Neighbourhood Plan ▪ Neighbourhood Plan Of Consolidation ▪ Neighbourhood Plan Of Subdivision ▪ Oyster Lease ▪ Part Strata ▪ Pipelines Act, 1967 ▪ Precinct Plan ▪ Precinct Plan Of Consolidation ▪ Precinct Plan Of Subdivision ▪ Primary Application ▪ Redefinition ▪ Replacement Sheet For Community Title Plan ▪ Resumption Or Acquisition ▪ Road Or Motorway ▪ Roads Act, 1993 ▪ Strata Plan ▪ Strata Plan – Leasehold ▪ Strata Plan Of Consolidation ▪ Strata Plan Of Consolidation – Leasehold ▪ Strata Plan Of Subdivision ▪ Strata Plan Of Subdivision – Leasehold ▪ Staged Strata Plan ▪ Staged Strata Plan Of Subdivision ▪ Subdivision ▪ Surrender ▪ Survey Information Only

AdministrativeDate			
adminDateType	adminDateTypeType	The administrative purpose of the date	<ul style="list-style-type: none"> ▪ Date Of Survey ▪ Date Of Compilation
Personnel			
regType	registrationType	Surveyor's registration state	Set to: Registered
role	surveyorRoleType	Surveyor's role	Set to: Signing Surveyor
Annotation			
type	annotationType	The type of annotation	<ul style="list-style-type: none"> • Parcel Note • Plan Note • Plans Used • Subdivision Number • Diagram • Diagram Lots • Diagram Occupations • Diagram Secondary Interests • Direction Of Flow Tidal • Direction Of Flow Non Tidal • Combined Scale Factor • LPI File Ref
ReducedObservation			
desc	purposeType	This is the equivalent of the line type	<ul style="list-style-type: none"> ▪ Boundary ▪ Road ▪ Connection ▪ Reference – Not yet implemented
distanceType/ azimuthType	observationType	This is a list of defined observation types.	<ul style="list-style-type: none"> ▪ Adopted ▪ Calculated ▪ Deducted ▪ Measured ▪ Scaled ▪ Compiled ▪ GNSS ▪ LPICalculated

distanceAccClass – Not yet implemented	monumentState	This is a list of states for a monument. NB: Enumerations in red texts are not to be used.	<ul style="list-style-type: none"> ▪ Found ▪ Found Now Gone ▪ Placed ▪ Found By Me ▪ <i>Gone</i> ▪ <i>Not Found</i> ▪ <i>Not Marked</i>
ReducedArcObservation			
desc	purposeType	This is the equivalent of the line type NB: Enumerations in red texts are not to be used.	<ul style="list-style-type: none"> ▪ Boundary ▪ Road ▪ Connection ▪ <i>Reference</i>
arcType	observationType	This is a list of defined observation types.	<ul style="list-style-type: none"> ▪ Adopted ▪ Calculated ▪ Deducted ▪ Measured ▪ Scaled ▪ Compiled ▪ GNSS ▪ LPICalculated
RedHorizontalPosition			
horizontalDatum	horzDatumType	Horizontal datum of SCIMS marks	<ul style="list-style-type: none"> ▪ ISG ▪ Local ▪ MGA ▪ MM ▪ TM
horizontalFix	horzFixType	Method used to determine the coordinates of the SCIMS marks	<ul style="list-style-type: none"> ▪ SCIMS ▪ Traverse ▪ Scaled From Map ▪ Astro ▪ Policy 3 ▪ GNSS
Class	horzClassType	SCIMS horizontal class	<ul style="list-style-type: none"> ▪ 3A ▪ 2A ▪ A ▪ B ▪ C ▪ D ▪ E ▪ U
order	horzOrderType	SCIMS horizontal order	<ul style="list-style-type: none"> ▪ 00 ▪ 0 ▪ 1 ▪ 2 ▪ 3 ▪ 4 ▪ 5 ▪ U

RedVerticalObservation			
verticalDatum	vertDatumType	Vertical datum of SCIMS marks	Set to: AHD
Class	vertClassType	SCIMS vertical class	<ul style="list-style-type: none"> ▪ L2A ▪ LA ▪ LB ▪ LC ▪ LD ▪ LE ▪ 2A ▪ A ▪ B ▪ C ▪ D ▪ E ▪ U
order	vertOrderType	SCIMS vertical order	<ul style="list-style-type: none"> ▪ L0 ▪ L1 ▪ L2 ▪ L3 ▪ L4 ▪ L5 ▪ 0 ▪ 1 ▪ 2 ▪ 3 ▪ 4 ▪ 5 ▪ U

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