

Flow of Events for Use Case – Display Contour Lines

Change Log	
23/09/2004	Renamed from previous UC_DisplayContourLines.
05/10/2004	Update to reference use of qualified geometry
31/10/2004	Finalized for pre-integrated model

Overview

Displays a contour as a line of constant elevation on a map.

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In model development, the entities that satisfy this use case are generalised to being any line displaying a reference plane of constant value, not just elevation contours.

Process

Preconditions

- Map area is defined
- Survey data is available from which an application can interpolate positions to define the line that defines the contour.
 - Note that it is considered to be the role of the application to define and use an algorithm for interpolation of survey data to define the contour line. This use case assumes that this has been done and therefore considers only the display (or provision for the display) of the contour.

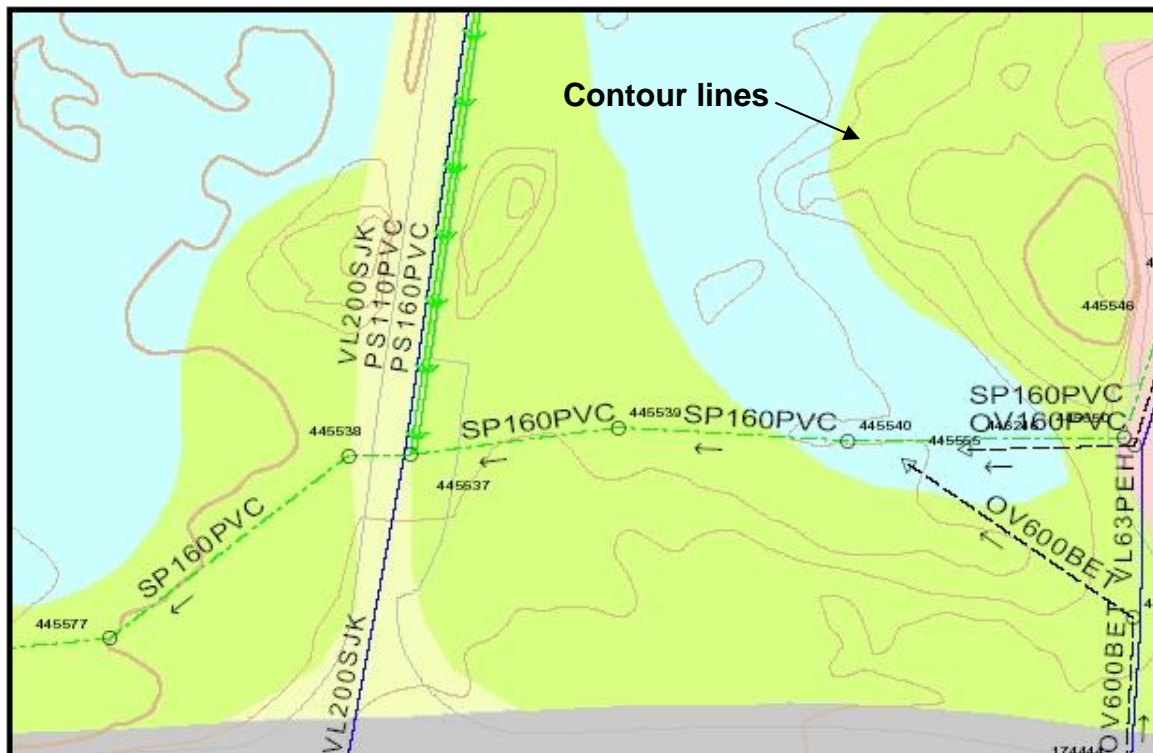


Figure 1: Contour lines on a map

Actors

Authority

Main Flow

Flow	Entity
1. Set the appropriate points along the length of a contour.	IfcPoint / IfcAnnotationPoint
2. Create an instance of an IfcAnnotationLine entity.	IfcAnnotationCurve
3. Use an IfcCompositeCurve as the geometric representation for IfcAnnotationLine.	IfcCompositeCurve
4. Identify the IfcAnnotationLine as an instance of a constant elevation contour	IfcAnnotationCurve
5. Set the value of the attribute that defines the contour elevation to the height above sea level	Pset_AnnotationCurveContour.ContourValue
6. Contour can be annotated, its line style and color set and its visibility determined using additional entities in the set of IfcPresentationXXX schemata.	

Post Conditions

Contour lines are defined and can be displayed
Elevation of each contour above sea level is set.

IFC Usage and Extension Requirements

Existing Entity/Class Usage

Entity Class Name	Usage
IfcCompositeCurve	Used to define the line of the contour. Note that composite curve is used rather than individual curve segments specifically so that transitions between segments can be handled.
IfcMeasureWithUnit	Used to determine the unit of measure and the value of the contour.

New Entity/Class Requirement

Entity Class Name	Usage
IfcAnnotationCurve	An IfcAnnotationCurve is a line that has a specific identity and purpose. As a contour, an IfcAnnotationCurve is a line drawn through all those points in a reference plane that have the same value of a given unit of measure.

Attribute	Cardinality	Datatype	Definition

#	Type (DER, U, WHERE)	Proposition

New Property Set Requirement

Name:	Pset_AnnotationCurveContour
Applicability:	IfcAnnotationCurve entities
Applicable Classes:	IfcAnnotationCurve

Applicable Type Value:	
IFC Version:	2x3
Definition:	Definition from IAI: Specifies parameters of a standard curve that has a single, consistent measure value.

Property	Type	Datatype	Unit	Definition
ContourValue	IfcPropertySingleValue	IfcLengthMeasure		Value of the elevation of the contour above or below a reference plane.

Issue List

Question	Answer
<p>[TL 17.08.04] I don't think that it is adequate to define an IfcContour – contour lines are not semantic objects, but representations (similar to TIN, Brep, footprint and others). Therefore I recommend not to use this approach.</p> <p>Define a representation identifier for the shape representation of site or area with the name “contour lines” and define the geometry (IfcCompositeCurve) to be used.</p>	<p>From meeting notes 01 Sept 2004</p> <p>Discussed whether there is a need to include a contour as an entity or whether this should be left to applications to determine from available data. It was agreed that both approaches could be achieved. However, users considered that contours are amongst the most important aspects of a map presentation and that they should be therefore included within the model. This could be particularly important where the map information is to be presented on a 2D plane surface.</p> <p>ACTION: JDW to ensure inclusion of Contour (or its generalisation) as an entity within the model.</p>
<p>[IFG. Oslo. 01.10.2004] Can a contour be referenced as a type of line within a qualified geometry, the qualification providing identity and purpose?</p>	<p>Include contour within a generalised qualified geometry section (schema to be determined).</p>