

AutoCAD® Civil 3D® 2013 UK and Ireland Country Kit



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1 General

1.1 Introduction from the author and creator

The document is an overview of all settings that AutoCAD Civil 3D 2013 Country Kit for the UK and Ireland. Also this is an update to what was provided in 2012 with enhancements and changes based on learning from users over the past year.

As the UK and Ireland has no true drawing standards the styles provided should give results that are familiar to the users and to be similar to other civil design software in some cases.

The content is an example of what is possible and to what a user of AutoCAD Civil 3D should require to start using the product from out of the box.

For any organisation, the templates provided should be used as a base to adjust the content for their own needs where some changes to layer names, colours, linetypes and drawing border frames can be achieved with only AutoCAD knowledge.

The templates then could be located on a network location so to standardise that organisation with consistent results. Any styles created on the fly for specific needs can be always dragged and dropped back into the master template for reuse. In addition the style manager can compare changes and also purge out unnecessary styles and layers.

Last year I introduced a number of tool palettes to add standard road sections, features and links to web and blog sites to enhance your adoption of the product. This year I have renewed the British kerbs, channels and edging using the subassembly composer tool and supplied the source data for your own use and education.

The country kit is an on-going development and is based on user feedback, so please feel free to suggest additions, amendments as needed. These are assisted by an example drawing and user case.

Please email jack.strongitharm@autodesk.com

Keep up to date by reading the blog site and following the Youtube channel for updates and announcements.

www.autodesk.com/fromthegroundup and also the YouTube Channel www.youtube.co.uk/CivilFromtheGroundUp

Enjoy

Jack Strongitharm – Autodesk AEC Technical Sales
Infrastructure



Lead for

1.2 Overview

UKIE Country Kit contains folders mention below:

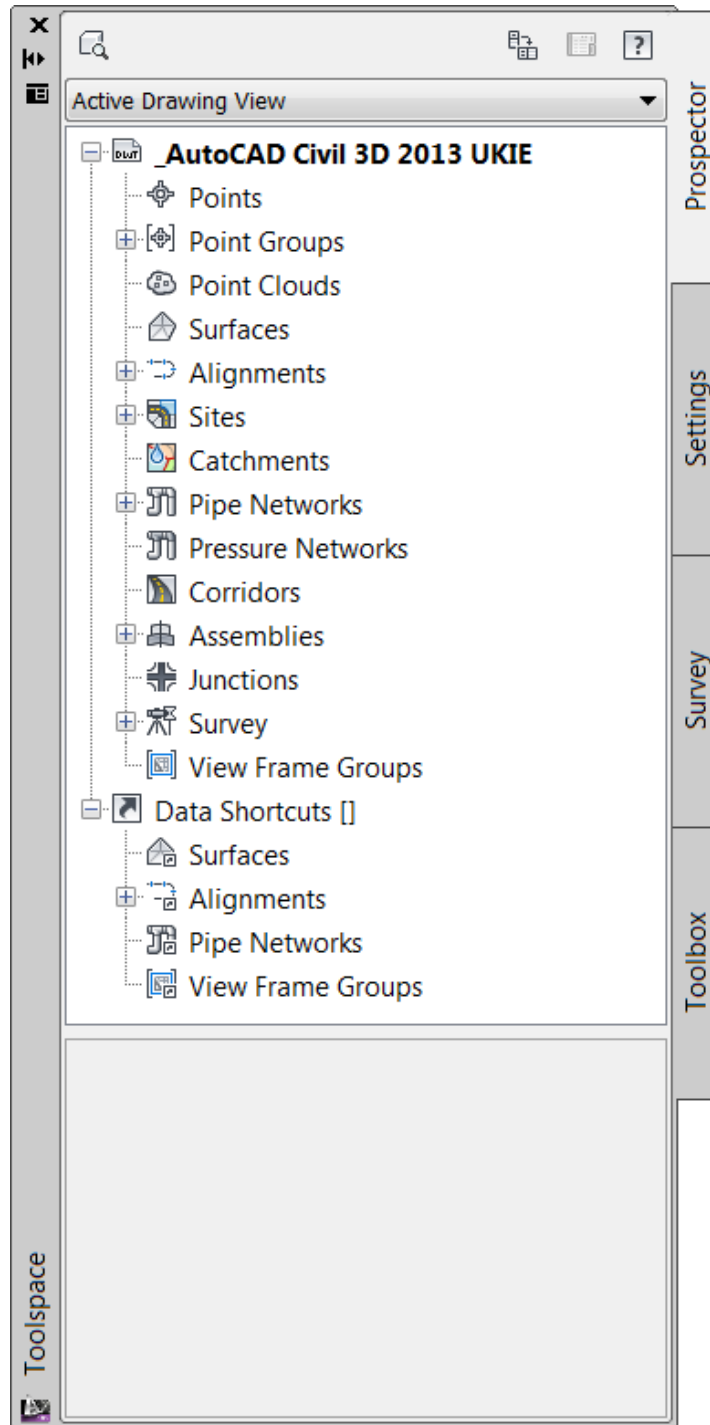
- **_Autodesk Civil 3D 2013 UKIE.dwt** template for UK and Ireland styles for Civil 3D objects and labels.
- **_Autodesk Civil 3D 2013 Section.dwt** template sample to produce automated cross section sheets
- **_Autodesk Civil 3D 2013 UK OS Mastermap** template for importing raw .gz and or .gml files from the Ordnance Survey to theme with suitable colours to create a dwg.
- **UK IE Pipes Catalog.** Folder with pipes files that correspond with Parts Lists (styles) in the template.
- **UK IE Structures Catalog**
- **Plan Production.** Folder with templates that contains settings for Plan Production
- **Corridor Design Standards.** A setup file for Design Criteria and Superelevation for Corridor models based on DMRB standards. Also a file for roundabout design with suggested values.
- **Quantities Reports.** Folder with files containing settings for generating reports of volume for Corridor models or dynamic tables in the current drawing.
- **Toolbox.** containing reports, which can be run from the Toolbox tab in the Toolspace.
- **Assemblies.** Folder containing drawings with predefined assemblies that can be used with the Junction functionality.
- **Rate Item Data.** An example file containing settings for reporting areas and length from objects in the current drawing.

Toolspace is the Primary Civil 3D property window. This window is used for handling Civil 3D objects and settings of all Civil 3D styles for Civil 3D objects and labels. The Toolspace has two important tabs:

- **Prospector.** Use this tab for handling properties and styles for Civil 3D objects and labels.
- **Settings.** Use this tab for general settings of Civil 3D styles.

1.2.1 Prospector

Any Civil 3D object contains its own style. This style controls the Civil 3D object appearance (object and label) in the drawing. The Prospector tab in the Toolspace is the Primary window for handling property, styles and commands for all Civil 3D objects.



From the Prospector tab in the Toolspace it is possible to create, copy or edit styles for Civil 3D objects. In addition to this labels are generated as dynamic data mostly annotative.

Note that new styles not automatically will be saved in the template for the CKD. This has to be done manually with Drag and Drop in the 'Master View' settings tab.

1.2.2 Settings

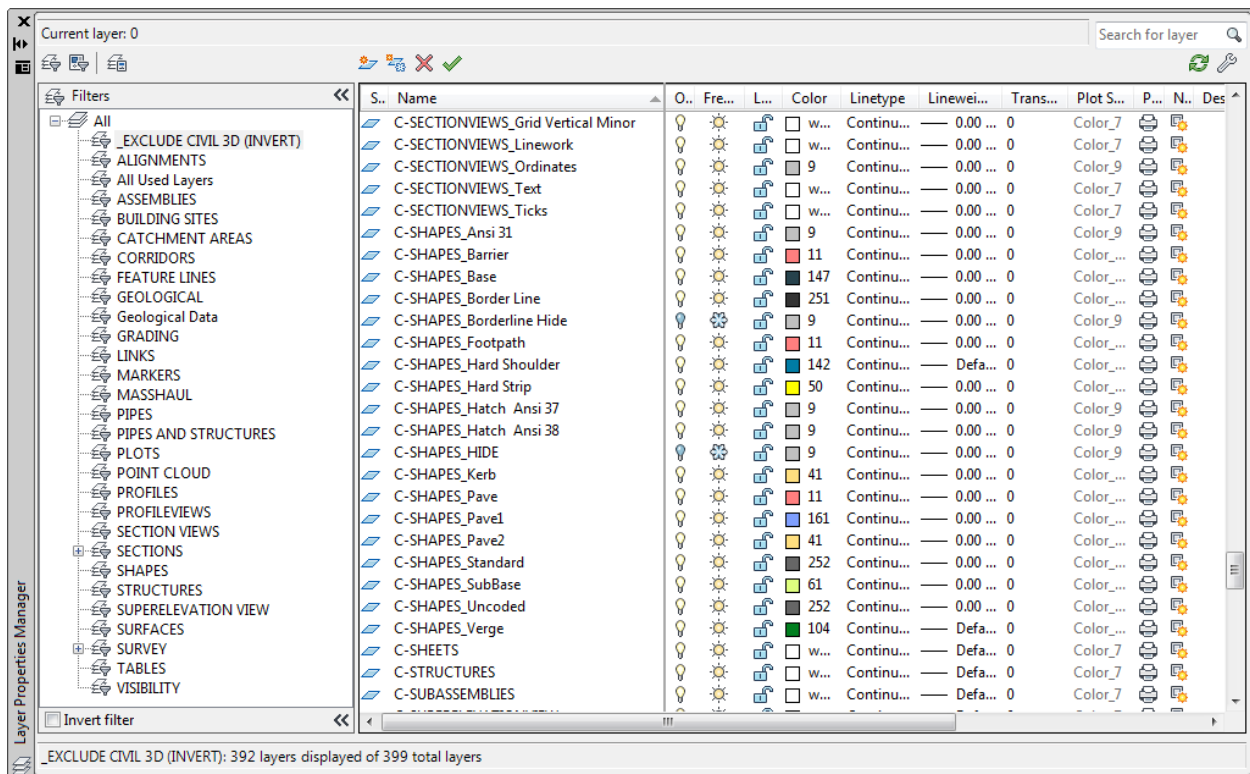
Civil 3D objects are generated with their own styles when created in the drawing with a Civil 3D command.

It is recommended to start from the UKIE / or IE template and bring data into that template

Here it is possible create, copy or edit Civil 3D styles. Note that new or edited styles not automatically will be saved in the template. This has to be done manually with Drag and Drop.

All styles are set to Bylayer so that control of colour, linetype, lineweight, on or off etc can be controlled through the layer manager and also enables the use of XREF into plain AutoCAD software.

As there are many layers, filters have been added to make it quick and easy to navigate the layers

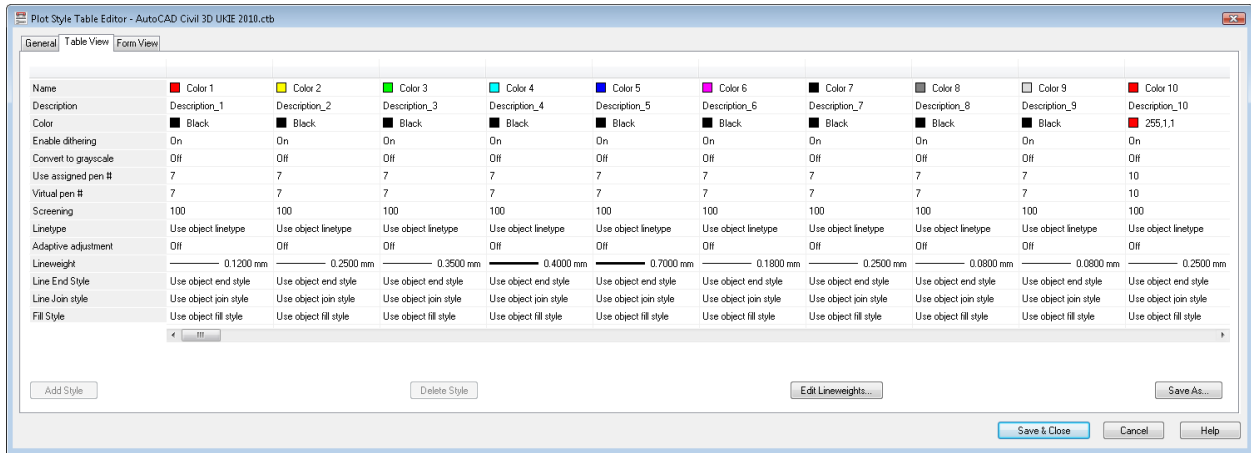


1.2.3 Colours

A suggested line colour scheme has been implemented to give suitable results from plotting. Plot styles have been created to accompany the printing from these templates

AutoCAD Civil 3D UKIE 2013.ctb
AutoCAD Civil 3D UKIE 2013 - No Colour.ctb

The primary AutoCAD colours have been reserved for black linework in varying thicknesses and colours from 10 are retained as colour in 2.5mm thickness



Black/white colour. Is primary used for labels and tables created in the drawingText
The table below lists used text styles.

Text Style	Description	Font
Civil 3D Standard Text		Arial
Civil 3D IE Section Text	Text for IE template for sections bands	Monotxt
Civil 3D IE Text	Text for IE template	Simplex

2 Layers

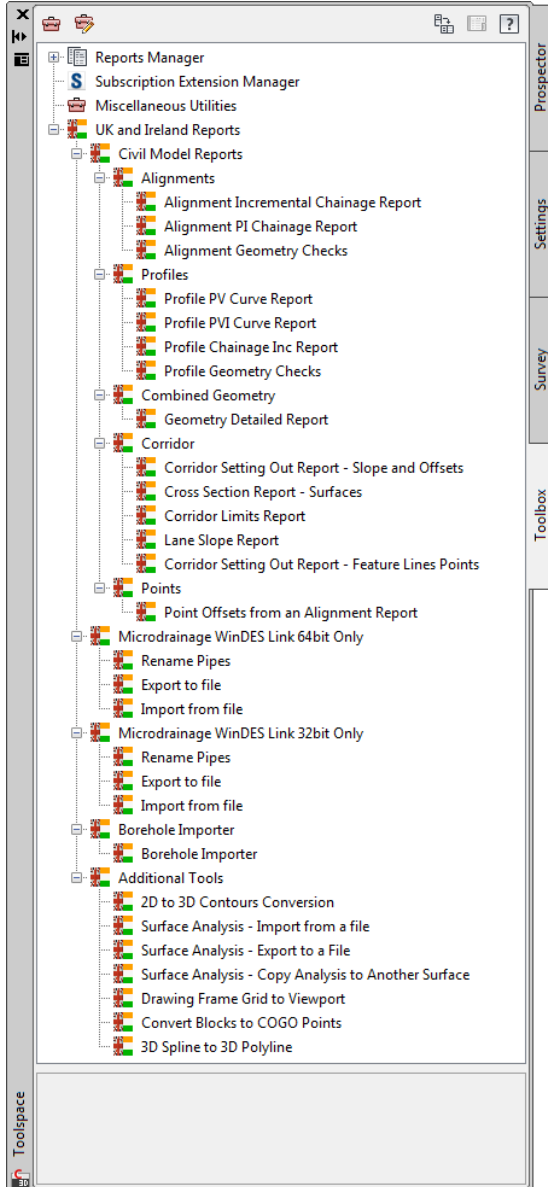
The table below lists the objects and layers. All sub layers are based on these core names.

Object	Layer
Alignment	C-ALIGNMENTS
Alignment-Labeling	C-LABELS
Alignment Table	C-TABLES
Assembly	C-ASSEMBLY
Building Site	C-BUILDINGSITES
Corridor	C-CORRIDORS
Corridor Section	C-CORRIDORSECTION
Feature Line	C-FEATURELINES
General Note Label	C-LABELS
General Segment Label	C-LABELS
Grading	C-GRADING
Grading-Labeling	C-TABLES
Grid Surface	C-SURFACES
Grid Surface-Labeling	C-LABELS
Interference	C-INTERFERENCES
Junction	C-JUNCTIONS
Junction-Labeling	C-LABELS
Mass Haul Line	C-MASSHAULLINE
Mass Haul View	C-MASSHAULVIEW
Match Line	C-MATCHLINES
Match Line-Labeling	C-LABELS
Material Section	C_MATERIALSECTION
Material Table	C-TABLES
Parcel	C-PLOTS
Parcel-Labeling	C-LABELS
Parcel Segment	C-LABELS
Parcel Segment-Labeling	C-LABELS
Parcel Table	C-TABLES
Pipe	C-PIPE
Pipe-Labeling	C-LABELS
Pipe and Structure Table	C-TABLES
Pipe Network Section	C_MATERIALSECTION
Pipe or Structure Profile	C-PROFILES
Point Table	C-TABLES
Profile	C-PROFILE
Profile-Labeling	C-LABELS

Profile View	C-PROFILEVIEWS
Profile View-Labeling	C-LABELS
Sample Line	C-SAMPLE_Lines
Sample Line-Labeling	C-SAMPLE_Labels
Section	C-SECTIONS
Section-Labeling	C-LABELS
Section View	C-SECTIONVIEW
Section View-Labeling	C-LABELS
Section View Quantity Takeoff Table	C-TABLES
Sheet	C-SHEET
Structure	C-STRUCTURES
Structure-Labeling	C-LABELS
Subassembly	C-SUBASSEMBLIES
Surface Legend Table	C-TABLES
Survey Figure	C-SURVEY_Figures
Survey Network	C-SURVEY_Networks
Tin Surface	C-SURFACES
Tin Surface-Labeling	C-LABELS
View Frame	C-VIEWFRAMES
View Frame-Labeling	C-LABELS

3 Reports

The table below lists all UK and Ireland reports (Toolspace > Toolbox > UK and Ireland Reports)



Report Name	Description
Civil Model Reports	
Alignment Incremental Chainage Report	Creates a report at chainages specified of the alignment and profile geometry with levels and bearings
Alignment PI Chainage Report	Reports the intersection points of alignments
Alignment Superelevation	Superelevation data from an alignment

Crossfall Report	
Alignment Geometry Checks	Reports the alignment based on the design criteria applied
Profile PV Curve Report	Reports the vertical profile point information
Profile PVI Curve Report	Reports the vertical profile point information
Profile Chainage Inc. Report	Reports the profile data at a chainage interval
Profile Geometry Checks	Reports the profile based on the design criteria applied
Geometry Detailed Report	Coordinates, levels, bearings and element types along an alignment and profile
Geometry Simple Report	Coordinates and levels along an alignment and profile
Corridor Setting Out Report	Reports a corridor for offset and slope
Points Offsets from an Alignment Report	Will report the offset and chainage value of COGO points from an Alignment
Surface Sampling along an Alignment Report	Require sample lines and will read a surface at 5m interval offsets
Microdrainage WinDES Link	
Rename Pipes to WinDES coding	Renames pipes to WinDES codes so to be accepted on import, convention looks like this 1.000, 1.001 for the main line and 2.000, 2.001.. for branches etc
Export Pipes to SWS File	Exports a SWS/FWS file which transfers coordinates, cover levels, pipes and structures
Import Pipes from SWS File	Imported the analysed file from WinDES and either can update pipes and or create new networks.
Additional Tools	
2D to 3D Contour Conversion	A tool which by specifying a fence line through contour polyline will convert the elevation of the line to the level specified
Surface Analysis – Import/Export to a file	Export and Import desired settings for reuse
Drawing Frame Grid to Viewport	Place a grid on a viewport
Convert Blocks to COGO Points	As described
3D Spline to 3D Polyline	As described

4 Drawing Settings

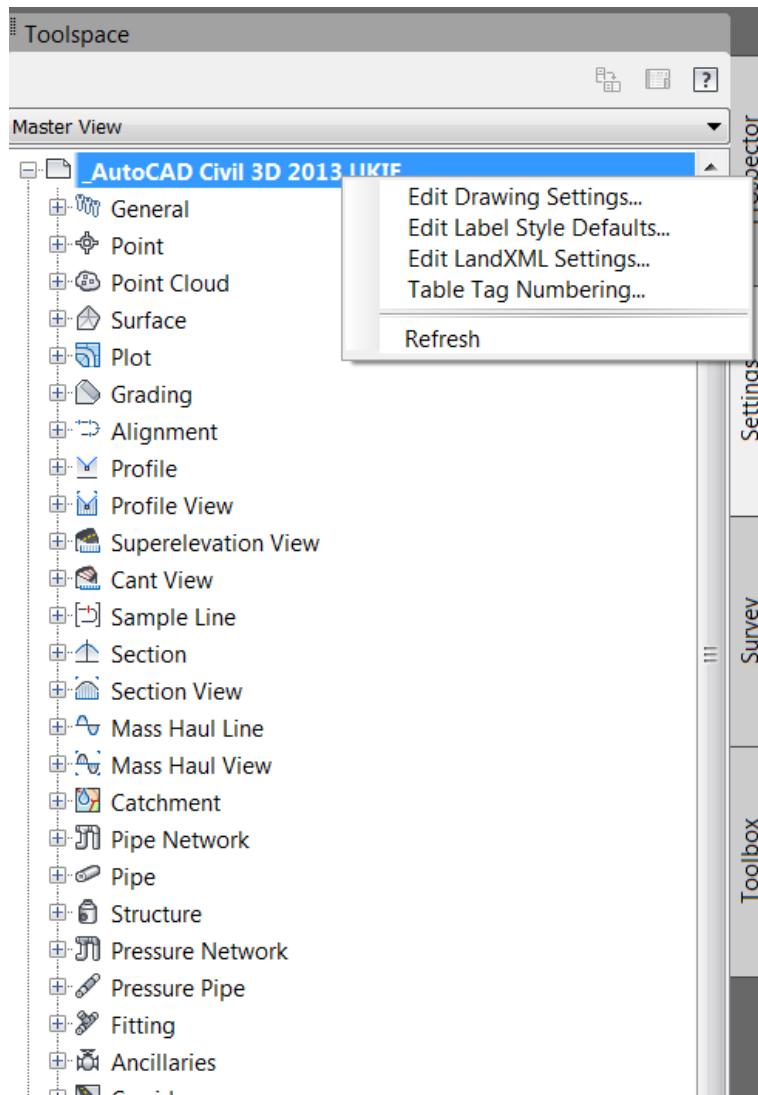
4.1 Object Layers

The as mentioned above all the Civil 3D objects are by default placed on layers automatically.

Once placed can be moved to alternative layers if required.

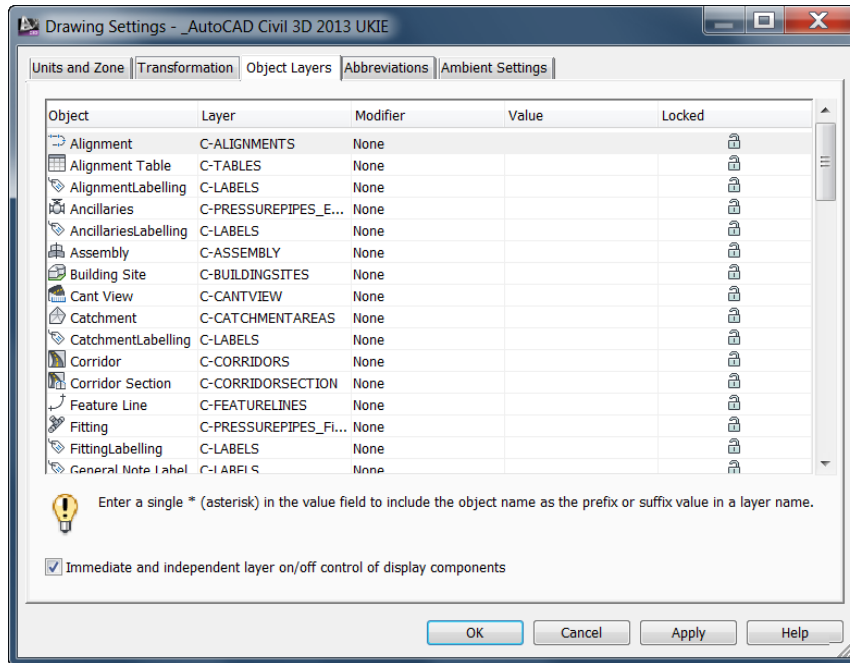
4.1.1 Edit Drawing Settings...

Civil 3D object layers are available from Edit Drawing Settings. The figure below shows from where the command is accessible.



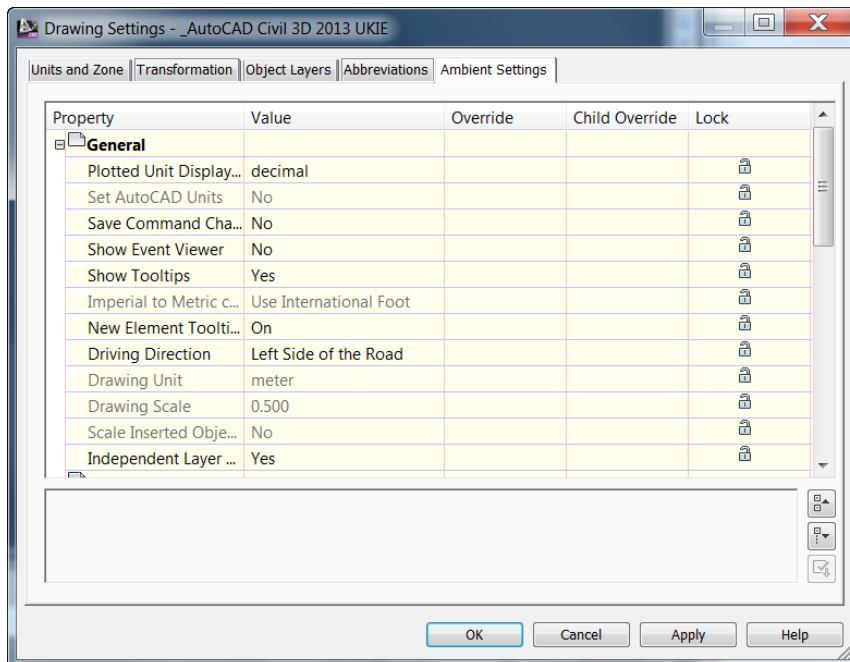
4.1.2 Object Layers...

Figure below show the window and tab with Object Layers.



4.2 Ambient Settings

Table below lists all values for Civil 3D units.




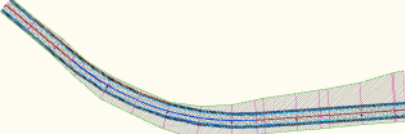
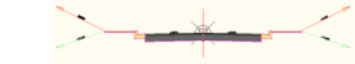

5 Object styles

All Civil 3D object styles in the UKIE and IE templates.

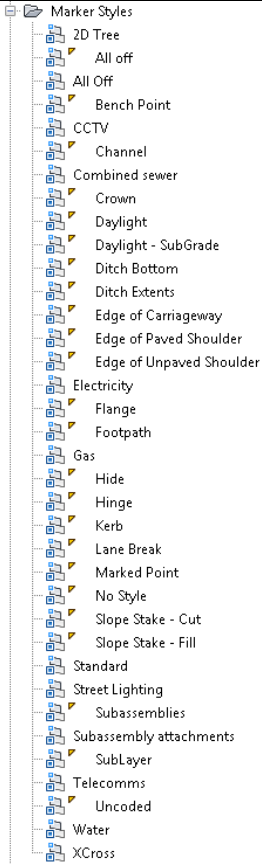
5.1 Multi-purpose Styles

Feature Line Styles	Description	Screen grab / DWF / DWG	Default
Various	An extensive list of line styles which will be created from corridor models and featureline design. Each style has its own layer for colour and linetype control		Yes

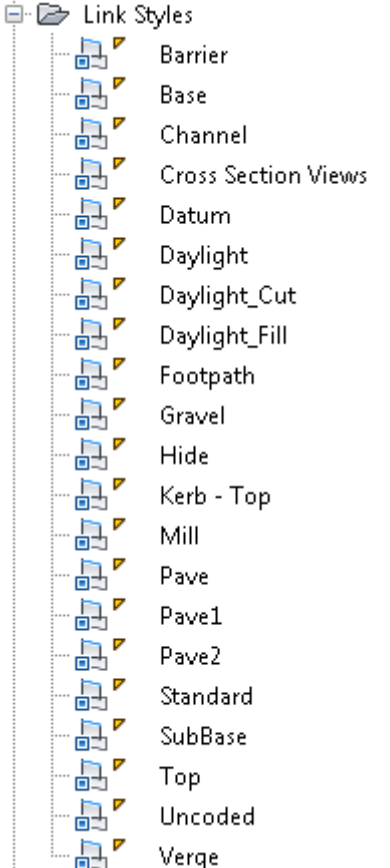
Code Set Styles	Description	Screen grab / DWF / DWG	Default
	All code set styles will render the links in the corridor with the realistic visual style		
Plan View	Style with the links and markers removed for a clean linework drawing		Yes

Plan View (with Links shown)	Simple plan with links shown to understand the model		
Plan View – Hatching	Style with AutoCAD hatch patterns		
Assembly Creation	Style to show the assembly while creating in assembly mode		
Cross Section – Hatching	Style to be used to show the corridor in cross sections		

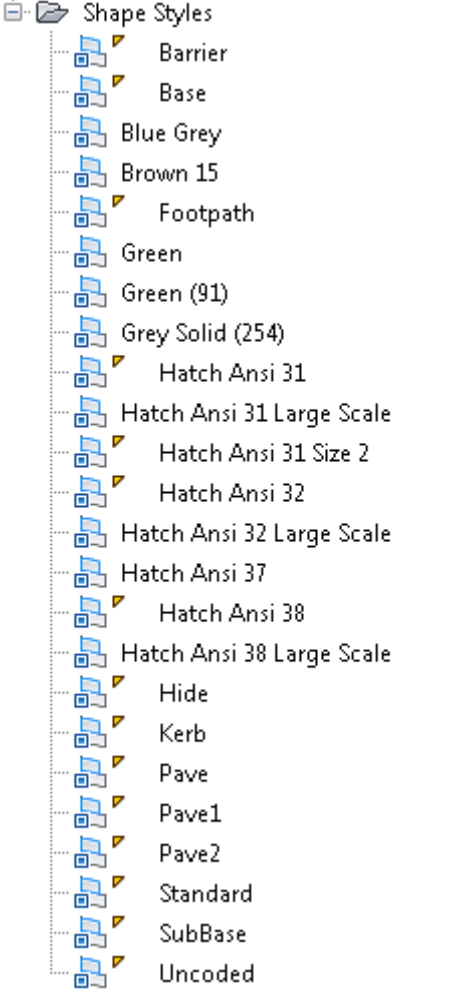
Marker Styles	Description	Screen grab / DWF / DWG	Default
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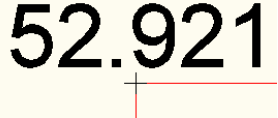
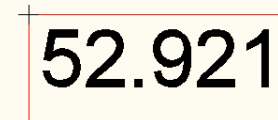
<p>Various</p>	<p>An extensive list of marker styles which will be created from corridor models and featureline design. All are stored in C-Markers layer</p>		<p>Yes</p>
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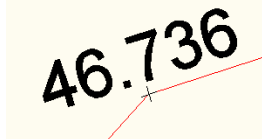
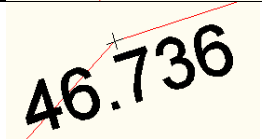
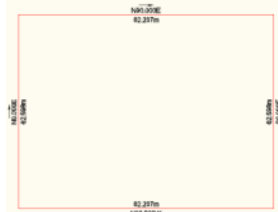
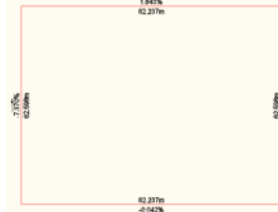

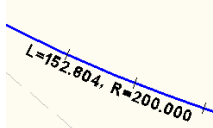
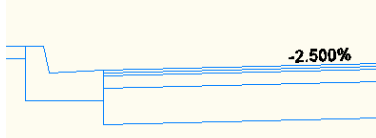
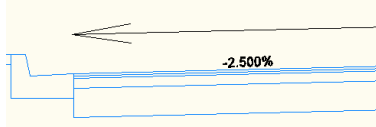
Link Styles	Description	Screen grab / DWF / DWG	Default
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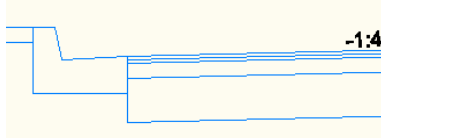
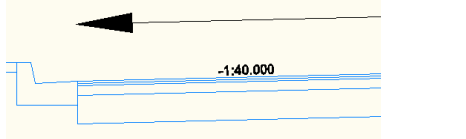
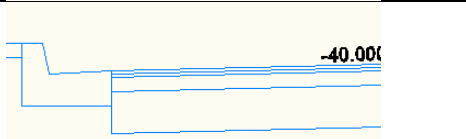
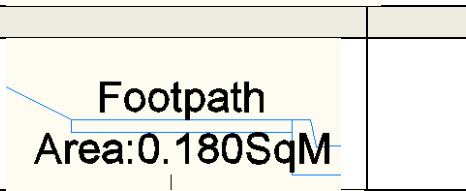
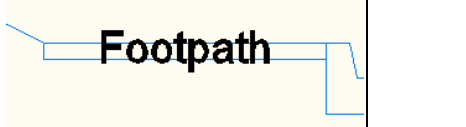
<p>Various</p>	<p>An extensive list of link styles which will be created from corridor models.</p>		
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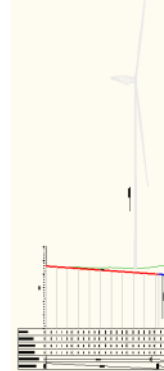

Shape Styles	Description	Screen grab / DWF / DWG	Default
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<p>Various</p>	<p>An extensive list of shape styles which will be created from corridor models and featureline design. Each create either a solid colour as specified or a AutoCAD hatch pattern. These are also used for profile hatching For 2013 a new additional set have been provided to support borehole import and AGS descriptions</p>		
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Multi-purpose Label Styles	Description	Screen grab / DWF / DWG	Default
<p>Note</p>			
<p>Simple MTEXT Label</p>	<p>A note label where any content can be written, but the label is plan readable and or dragged out with a leader</p>		
<p>General Line Labels</p>			
<p>Featureline Vertex Level – Above the line</p>			
<p>Featureline Vertex Level – Below the line</p>			





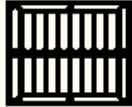


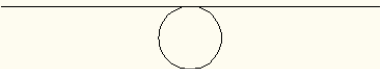

<p>Featureline Vertex Level Object Rotation – Above the line</p>		<p>x 356140.190 y 403425.227 z 52.921</p>	
<p>Featureline Vertex Level Object Rotation – Above the line</p>			
<p>Featureline Vertex Level Object Rotation – Below the line</p>			
<p>Length and Angle</p>			
<p>Length and Slope</p>			
<p>Line</p>			
<p>Straight Label</p>			
<p>Curve</p>			
<p>Curve Label</p>			
<p>Marker</p>			
<p>Level</p>			
<p>Offset</p>			
<p>Link</p>			
<p>Percent Slopes / IE Percent Slopes</p>			
<p>Percent Slopes with Direction Arrow</p>			

Rise:Run Slopes (1:x)		
Rise: Run Slopes (1:x) with Direction Arrow		
Run:Rise Slopes		
Shape		
Shape Area and Name		
Shape Code		


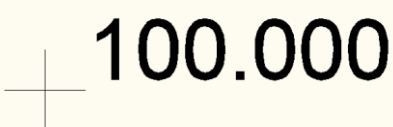
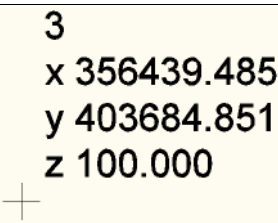

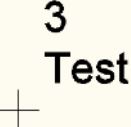
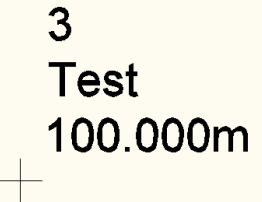
Projection Styles	Description	Screen grab / DWF / DWG	Default
Vertex Markers and Exaggeration to Blocks etc			
Vertex Markers and No Exaggeration to Blocks etc			Yes

5.2 Points

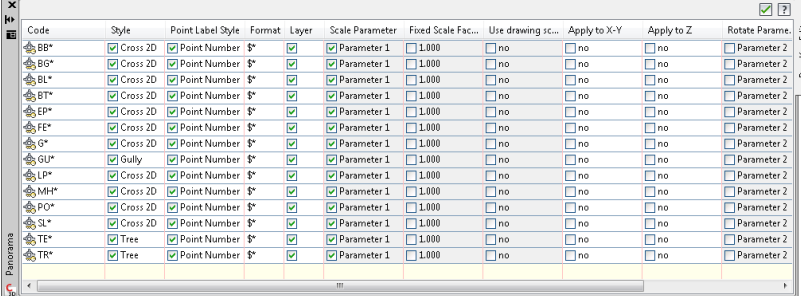
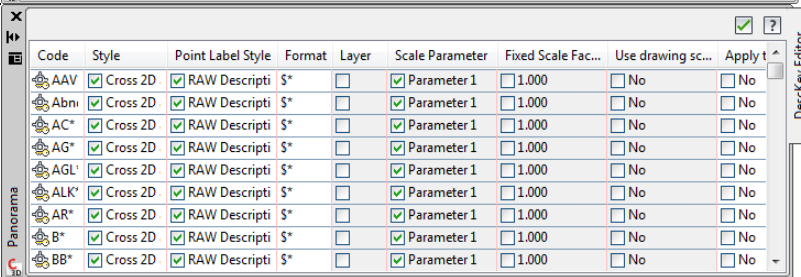
User Defined Attribute Classifications	Description	Screen grab / DWF / DWG	Default
<None>			

Point Styles	Description	Screen grab / DWF / DWG	Default
Benchmark			
Cross 2D and 3D			
Fence Post	Can be used in cross sections to show boundary fences		
Gas Valve		GV 	
Gully			
Pylon	Can be used in cross sections to show pylons		
Shrub			
Sign Single Pole			
Tree			

Water Valve			
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Point Label Styles	Description	Screen grab / DWF / DWG	Default
Description			
Level Only			
No Labels Point Coordinates and Level			
Point Number			
Point Number and Description			
Point Number Description and Level			

Description n Key Sets	Description	Screen grab / DWF / DWG	Default t
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<p>UK and Ireland Example</p>	<p>A set of survey raw point codes to be customised by the user for symbols</p>		
<p>DMRB Vol 5</p>	<p>A set of codes based on the appendix in the DMRB specification</p>		


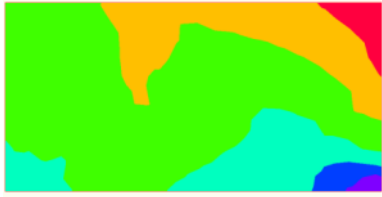
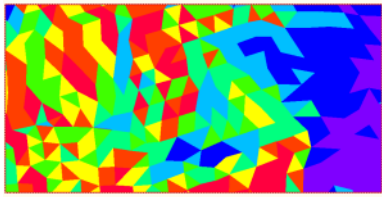
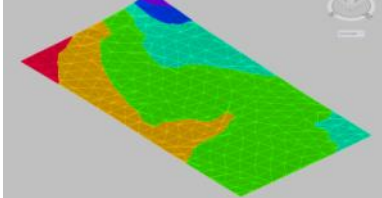
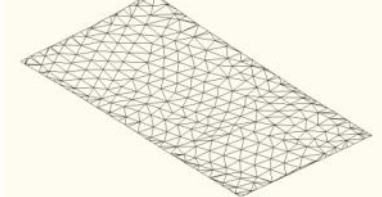
Point Table Styles	Description	Screen grab / DWF / DWG	Default																									
Point Table – Coordinates and Levels		<table border="1" style="border: 2px solid green;"> <thead> <tr> <th colspan="5">POINT DATA</th> </tr> <tr> <th>POINT NUMBER</th> <th>EASTING</th> <th>NORTHING</th> <th>LEVEL</th> <th>DESCRIPTION</th> </tr> </thead> <tbody> <tr> <td>1</td> <td>356130.638</td> <td>403776.309</td> <td>54.137</td> <td>GULLY</td> </tr> <tr> <td>2</td> <td>356231.229</td> <td>403714.304</td> <td>57.462</td> <td>TREE</td> </tr> <tr> <td>3</td> <td>356439.465</td> <td>403684.851</td> <td>100.000</td> <td>TEST</td> </tr> </tbody> </table>	POINT DATA					POINT NUMBER	EASTING	NORTHING	LEVEL	DESCRIPTION	1	356130.638	403776.309	54.137	GULLY	2	356231.229	403714.304	57.462	TREE	3	356439.465	403684.851	100.000	TEST	
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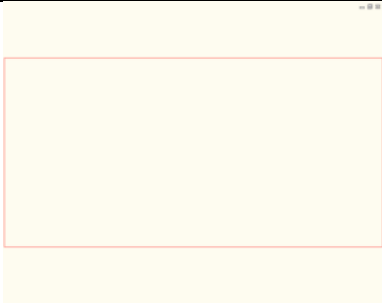
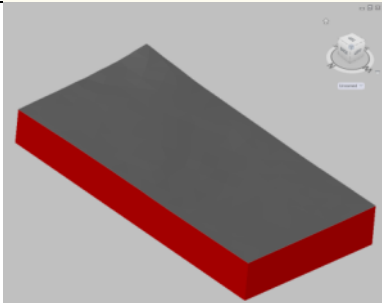
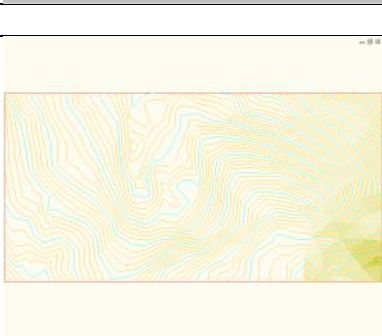

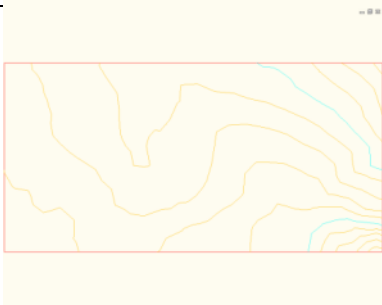
5.3 Point Cloud

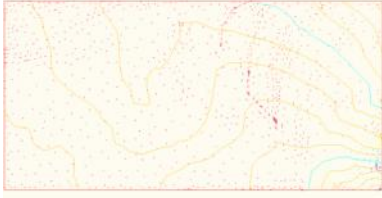

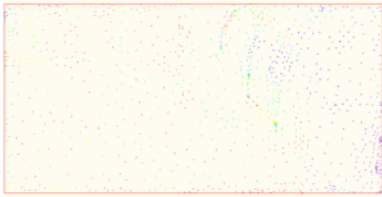
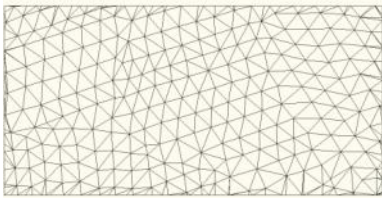
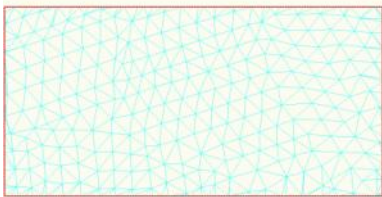
Point Cloud Styles	Description	Screen grab / DWF / DWG	Default
_No Display			
Greyscale Intensity			
Level Ranges			
Lidar Classification			
Scaled Colour Intensity			
Single Colour			
True Colour - RGB			

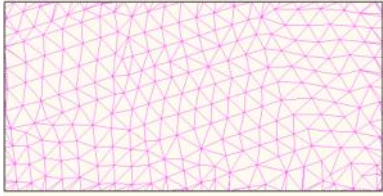
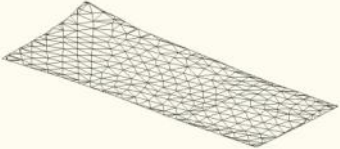
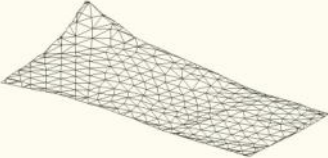
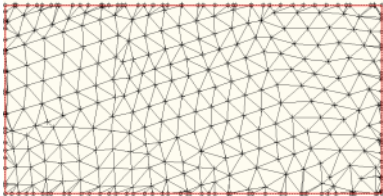

5.4 Surfaces

Surface Styles	Description	Screen grab / DWF / DWG	Default
2D Solid Cut and Fill	To be used with volume surfaces		


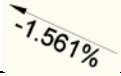

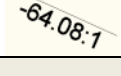
<p>2D Solid Fill - (Use analysis to change colour)</p>			
<p>2D Solid Level Banding</p>			
<p>2D Solid Slope Banding</p>			
<p>3D Face Level Banding</p>			
<p>3D Triangulation</p>			
<p>_No Display</p>	<p>As described</p>		






















Border			
Border Projected to 0			
Contours 0.1m and 0.5m			
Contours 0.1m and 0.5m - Arrows			
Contours 1m and 5m			











































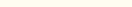
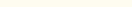

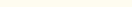

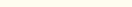
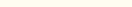
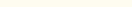

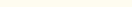

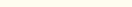
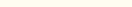
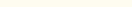

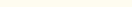

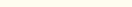
Contours 1m and 5m - Arrows			
Large Surface Contours 5m and 25m			
Slope Arrows and Border			
Triangulation			
Triangulation Cyan			

Triangulation – Magenta			
Triangulation 3D 2X Exaggerated			
Triangulation 3D 5X Exaggerated			
Triangulation and Points			
User Contours	Using analysis to set a contour/s at a specific surface level		
Watershed Areas			

Surface Label Styles Name/Type	Description	Screen grab / DWF / DWG	Default
--------------------------------	-------------	-------------------------	---------

Contour			
Major and Minor Contours			
Slope			
Percent Slope			
Rise : Run Slope (1:x)			
Run : Rise Slope (x:1)			
Spot Level			
Spot Level		× 51.553m	
Watershed			
ID - Type - Area		ID=75 TYPE=DEPRESSION AREA=57570.562m2	

Surface Table Styles Name/Type	Description	Screen grab / DWF / DWG	Default																									
Directions		<table border="1"> <thead> <tr> <th colspan="4">SURFACE DIRECTION DATA</th> </tr> <tr> <th>NUMBER</th> <th>MINIMUM DIRECTION</th> <th>MAXIMUM DIRECTION</th> <th>COLOUR</th> </tr> </thead> <tbody> <tr> <td>1</td> <td>N0° 00' 15.06"E</td> <td>N44° 59' 09.02"E</td> <td></td> </tr> <tr> <td>2</td> <td>N44° 59' 09.02"E</td> <td>N89° 58' 29.18"E</td> <td></td> </tr> <tr> <td>3</td> <td>N89° 58' 29.18"E</td> <td>S45° 00' 59.09"E</td> <td></td> </tr> <tr> <td>4</td> <td>S45° 00' 59.09"E</td> <td>S0° 01' 51.52"E</td> <td></td> </tr> </tbody> </table>	SURFACE DIRECTION DATA				NUMBER	MINIMUM DIRECTION	MAXIMUM DIRECTION	COLOUR	1	N0° 00' 15.06"E	N44° 59' 09.02"E		2	N44° 59' 09.02"E	N89° 58' 29.18"E		3	N89° 58' 29.18"E	S45° 00' 59.09"E		4	S45° 00' 59.09"E	S0° 01' 51.52"E			
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Cut and Fill Volumes		<table border="1"> <thead> <tr> <th colspan="6">SURFACE LEVEL DATA</th> </tr> <tr> <th>NUMBER</th> <th>MINIMUM LEVEL</th> <th>MAXIMUM LEVEL</th> <th>COLOUR</th> <th>AREA</th> <th>VOLUME</th> </tr> </thead> <tbody> <tr> <td>1</td> <td>46.62</td> <td>48.79</td> <td></td> <td>43572.269m2</td> <td>801161.388m3</td> </tr> <tr> <td>2</td> <td>48.79</td> <td>50.99</td> <td></td> <td>55880.203m2</td> <td>710502.450m3</td> </tr> </tbody> </table>	SURFACE LEVEL DATA						NUMBER	MINIMUM LEVEL	MAXIMUM LEVEL	COLOUR	AREA	VOLUME	1	46.62	48.79		43572.269m2	801161.388m3	2	48.79	50.99		55880.203m2	710502.450m3																									
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5.5 Parcels

User-Defined Attributes	Description	Screen grab / DWF / DWG	Default
<None>			

Parcel Styles	Description	Screen grab / DWF / DWG	Default
Council Owned Land			
Private			
Housing			
Proposed Housing			
Retail			
Proposed Retail			
Protected Ecology			
Leisure			
Roads			

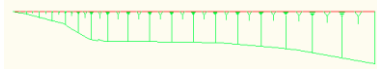

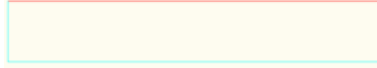
Proposed Roads			
Unknown			

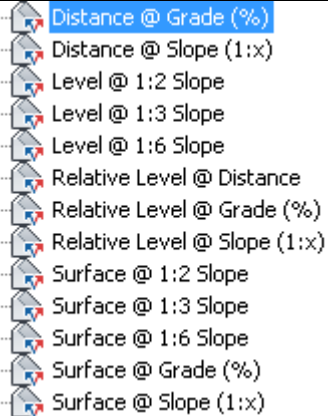
Parcel Label Styles	Description	Screen grab / DWF / DWG	Default
Number Area (m2 and acres) & Perimeter (m)		5 Area 16535.45m2 (4.086 acres) Perimeter 515.16m	
Number Area (m2 and hectares) & Perimeter (m)		5 Area 16535.45m2 (1.654 hectare) Perimeter 515.16m	
Number Area (m2) & Perimeter (m)		5 Area 16535.45m2 Perimeter 515.16m	
Number only			

Parcel Table Styles	Description	Screen grab / DWF / DWG	Default														
Area		<table border="1"> <thead> <tr> <th colspan="2">PARCELS/PLOTS</th> </tr> <tr> <th>PARCEL/PLOT</th> <th>AREA</th> </tr> </thead> <tbody> <tr> <td>1</td> <td>92419.66</td> </tr> <tr> <td>2</td> <td>110393.09</td> </tr> <tr> <td>3</td> <td>10183.66</td> </tr> <tr> <td>4</td> <td>10424.52</td> </tr> <tr> <td>5</td> <td>16535.45</td> </tr> </tbody> </table>	PARCELS/PLOTS		PARCEL/PLOT	AREA	1	92419.66	2	110393.09	3	10183.66	4	10424.52	5	16535.45	
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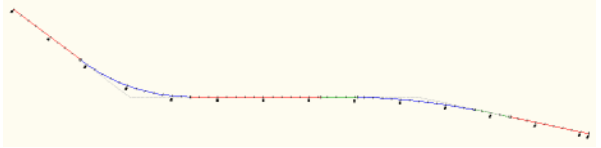
Full descriptions		PARCELPLOTS DATA			
		PARCELPLOTS	AREA	PERIMETER	SEGMENT LENGTH
		1	92419.88	1348.09	14.87 192.28 192.86 12.81 42.83 119.26 223.61 40.54 52.32 81.22 421.98 0.00
		2	112982.09	2480.60	18.41 107.22 411.82 288.64 379.88 184.72 49.27 14.86 0.00 41.78 108.04 62.32 72.97 227.89 107.72 32.28 0.00 -14.07

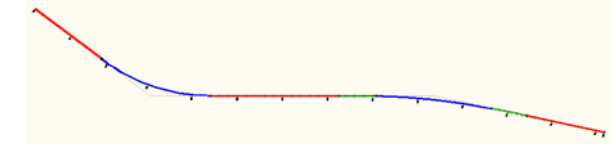
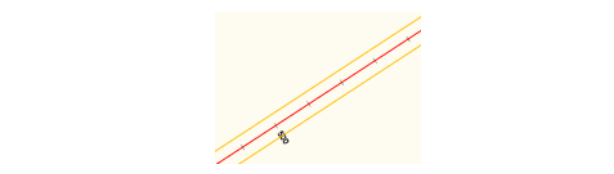
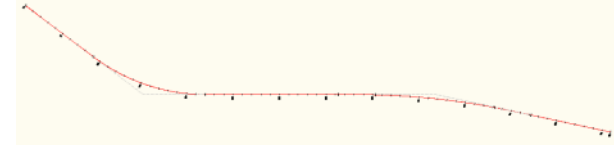
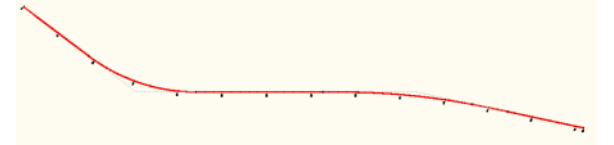

5.6 Grading

Grading Styles	Description	Screen grab / DWF / DWG	Default
Fill			Yes
Cut			Yes
Offset			Yes

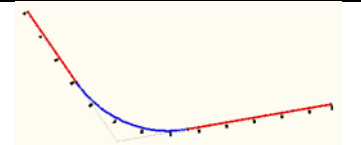
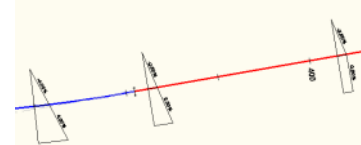


Grading Criteria Sets	Description	Screen grab / DWF / DWG	Default
Basic	Some examples of offsets and tie in to surfaces with some default values. All values are unlocked so they can be overridden when applied	 <ul style="list-style-type: none"> Distance @ Grade (%) Distance @ Slope (1:x) Level @ 1:2 Slope Level @ 1:3 Slope Level @ 1:6 Slope Relative Level @ Distance Relative Level @ Grade (%) Relative Level @ Slope (1:x) Surface @ 1:2 Slope Surface @ 1:3 Slope Surface @ 1:6 Slope Surface @ Grade (%) Surface @ Slope (1:x) 	


5.7 Alignments

Alignment Style	Description	Screen grab / DWF / DWG	Default
Design Style	Style to give the user and easy understanding of the elements in the alignment. Straights are shown as red, curves as blue and transition curves as green		

Design Style LWT	As above with lineweight applied to thicken the line		Yes
Offsets	Style to show alignments that are an offset from an alignment baseline		
Plotting Style	Style in one colour and linetype (centerline) for plotting purposes		
Plotting Style LWT	As above with lineweight		
IE Alignment	Yellow line colour and solid linetype		

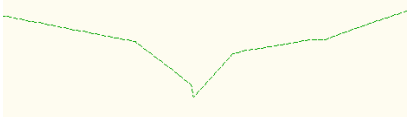


Alignment Design Checks	Description	Screen grab / DWF / DWG	Default
TD 93a standards check	Checks for the transition length		

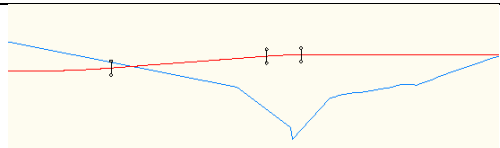

Alignment Label Type/Name	Description	Screen grab / DWF / DWG	Default
Major Minor and Geometry	Dumbbell type markers at change of element, pip markers at every 10m		Yes
Detailed alignment labelling	As above with super Level wedges		
Geometry Points Only	Dumbbell type markers at change of element		
IE Alignments	Text in blue colour		

IE Alignments with Corridors	As above but with the text offset to allow for a corridor model inside the text labels		
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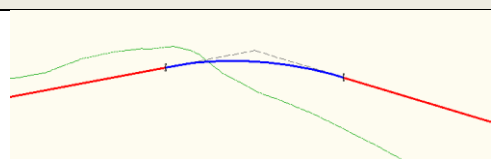
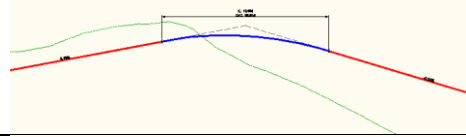
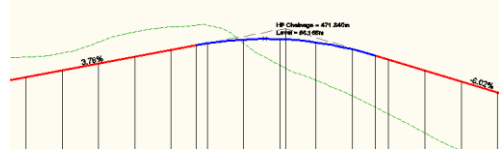
Alignment Table Type/Name	Description	Screen grab / DWF / DWG	Default																												
Line																															
Line # & Length & Bearing & Start & End		<table border="1"> <thead> <tr> <th colspan="5">ALIGNMENT LINE DATA</th> </tr> <tr> <th>LINE #</th> <th>LENGTH</th> <th>BEARING</th> <th>START POINT</th> <th>END POINT</th> </tr> </thead> <tbody> <tr> <td>L1</td> <td>192.654</td> <td>S62° 50' 16.72"E</td> <td>(355789.4048, 403867.5526)</td> <td>(355941.9359, 403751.1752)</td> </tr> <tr> <td>L2</td> <td>235.366</td> <td>N53° 03' 11.89"E</td> <td>(356182.9651, 403750.7217)</td> <td>(356371.5477, 403892.6540)</td> </tr> <tr> <td>L3</td> <td>227.570</td> <td>S73° 10' 39.85"E</td> <td>(356549.6428, 403924.1664)</td> <td>(356767.4748, 403868.2968)</td> </tr> </tbody> </table>	ALIGNMENT LINE DATA					LINE #	LENGTH	BEARING	START POINT	END POINT	L1	192.654	S62° 50' 16.72"E	(355789.4048, 403867.5526)	(355941.9359, 403751.1752)	L2	235.366	N53° 03' 11.89"E	(356182.9651, 403750.7217)	(356371.5477, 403892.6540)	L3	227.570	S73° 10' 39.85"E	(356549.6428, 403924.1664)	(356767.4748, 403868.2968)				
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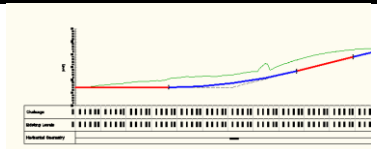
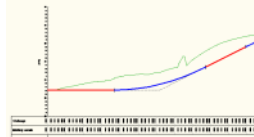
5.8 Profiles

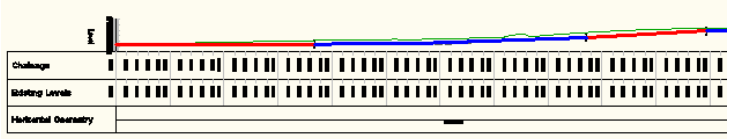
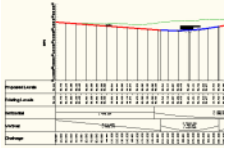
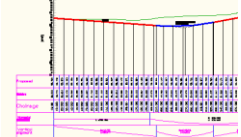
Profile Style	Description	Screen grab / DWF / DWG	Default
Existing Ground	Green dashed line for ground surface profiles		Yes
Additional Surface 1, 2, 3, 4	A profile style to show other surface profiles in a different colour		
Design Style/ LWT	Elements drawn in red for straights and blue for vertical parabolic		Yes

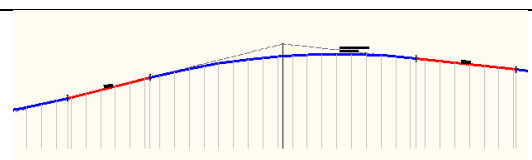
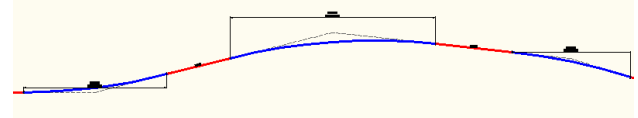
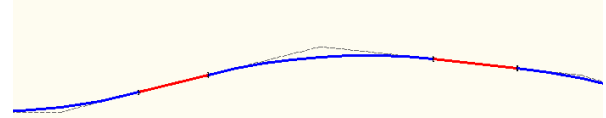
	curves		
Plotting Style	Style to use for plotting purposes		
IE Ground			
IE Plotting Style			

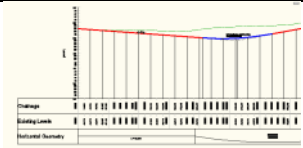
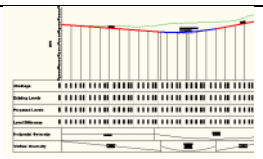
Profile Design Checks	Description	Screen grab / DWF / DWG	Default
Design Check Sets			
TD93a standards check	Checks for the transition length based on Q value		
CAP 168 Profile Checks	Checks for runway design by CAP 168 standards Checks to 3.3.1, 3.3.2, 3.3.4, 3.3.6, 3.5.1		

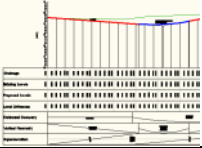
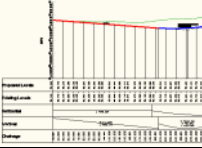

Profile Label Type/Name	Description	Screen grab / DWF / DWG	Default
Profile Label Sets			
Basic Label Set			
Annotated Label Set			
Detailed Annotated Label Set			Yes
No labels			

Profile View Type/Name	Description	Screen grab / DWF / DWG	Default
5x Exaggeration			Yes
10x Exaggeration			

Natural Scale	
Legacy UK Software Emulation	
IE Profile View / Legacy IE Local Authority Software Emulation	

Profile View Label Type/Name	Description	Screen grab / DWF / DWG	Default
Detailed Designed Profile Labels and Ordinates	Element dumbbells, high and low points and ordinates		Yes
Annotated Label Set	Style that adds curve information in a dimension style		
Basic label set	Element dumbbells only		


Profile Band Type/Name	Description	Screen grab / DWF / DWG	Default
Profile Band Set			
Chainage and Existing Ground Levels	Labels the existing ground levels, chainages and horizontal geometry		
Levels and Geometry Details	Labels the existing ground levels, proposed levels, chainages, horizontal and vertical geometry		Yes

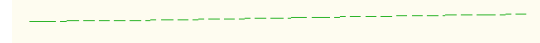
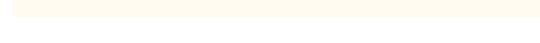
Levels Geometry and Super Level			
Pipe Network			
Legacy UK Software Emulation			
IE Profile Bands / Legacy IE Software Emulation			

5.9 Superelevation View


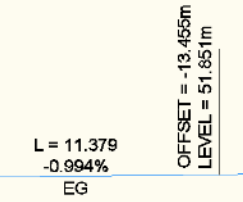
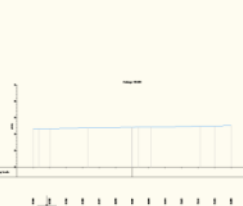
Superelevation View Styles	Description	Screen grab / DWF / DWG	Default
Design View			Yes

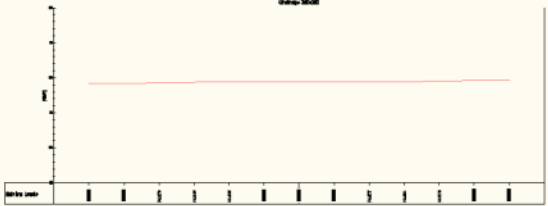
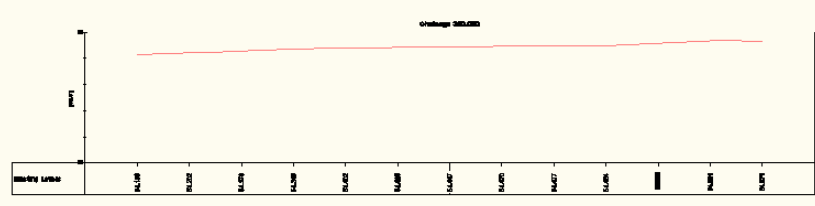
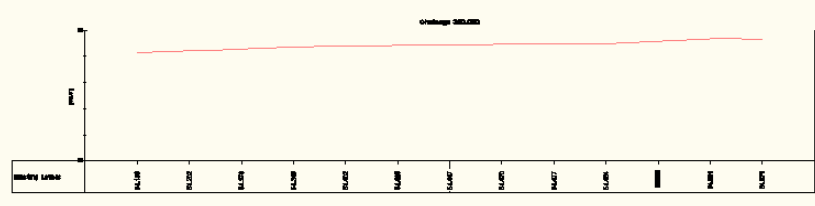
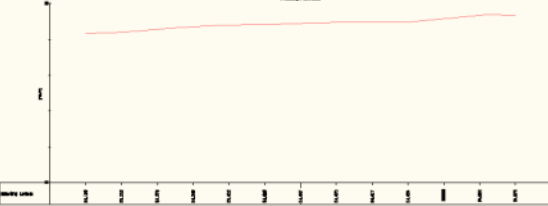
5.10 Sections

Sample Line Styles	Description	Screen grab / DWF / DWG	Default
Sample Lines	Sample line group number and chainage values		Yes

Section Styles	Description	Screen grab / DWF / DWG	Default
Existing Ground	Dashed green line		Yes
Proposed Ground	Solid red line		
Additional Surface 1, 2, 3 and 4	A section style to show other surface sections in a different colour		
Corridor Presentation	No visible line shown, but labels are determined from this line		

Section Label Styles	Description	Screen grab / DWF / DWG	Default
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EG Labels	Offset and level data		
FG Labels	Offset, level data, surface grade and name for finished ground surfaces		
Ordinates	Ordinate lines from the grade breaks to the top of the bands		

Section View Styles	Description	Screen grab / DWF / DWG	Default
X Section			Yes
X Section 2x Exaggeration			
X Section 2.5x Exaggeration			
X Section 2.5x Exaggeration			

Label Styles	Description	Screen grab / DWF / DWG	Default
Offset and Level	Specify a location and reports the offset from the baseline and level		
Grade	Ability to draw a grade freely		

Due to the new stagger functionality in 2010, this has been enabled as standard so to stop overlapping text labels at close proximity. The recommended method of creating cross sections for corridor design is to create a surface to the 'TOP' links and using the grade break band styles will annotate the corridor features.

Section Band Styles	Description	Screen grab / DWF / DWG	Default
Surface Levels at Major Intervals			
Surface Levels at Grade Intervals			
_Design and Existing Levels with Level Difference/Offsets	Choose Section 1 for proposed and Section 2 for existing		
IE Sections	Choose Section 1 for Existing and Section 2 for Proposed		
Section Table Styles	Description	Screen grab / DWF / DWG	Default
Total Volume			

Simple		<table border="1"> <thead> <tr> <th colspan="4">Volumes 350.000m</th> </tr> <tr> <th>Material Name</th> <th>Area (m2)</th> <th>Volume (m3)</th> <th>C.Vol (m3)</th> </tr> </thead> <tbody> <tr> <td>Surface</td> <td>0.15</td> <td>7.50</td> <td>52.50</td> </tr> <tr> <td>Binder</td> <td>0.15</td> <td>7.50</td> <td>52.50</td> </tr> <tr> <td>Base</td> <td>0.60</td> <td>30.00</td> <td>210.00</td> </tr> <tr> <td>Sub-Base</td> <td>1.80</td> <td>90.00</td> <td>630.00</td> </tr> <tr> <td>Footpath Surface</td> <td>0.36</td> <td>17.99</td> <td>125.93</td> </tr> </tbody> </table>	Volumes 350.000m				Material Name	Area (m2)	Volume (m3)	C.Vol (m3)	Surface	0.15	7.50	52.50	Binder	0.15	7.50	52.50	Base	0.60	30.00	210.00	Sub-Base	1.80	90.00	630.00	Footpath Surface	0.36	17.99	125.93	
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Footpath Surface	0.36	17.99	125.93																												
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Group Plot Styles	Description	Screen grab / DWF / DWG	Default
Sheet Grouping	Arrays the sections to fit the viewport		
Plot All			

Sheet Styles	Description	Screen grab / DWF / DWG	Default
Current Page Setup to Layout (Paperspace)	Reads the viewport		

5.11 Pipe Networks

Parts Lists	Description	Screen grab / DWF / DWG	Default
	A selection of lists for drainage and underground utilities		
Interference Styles	Description	Screen grab / DWF / DWG	Default
Simple Sphere Interference	Shows a green sphere in 3D view		

Pipe Styles	Description	Screen grab / DWF / DWG	Default
BT Openreach			
Cable			
CCTV			
Double Line			
Electric			
Foul			
Motorway Comms			
SFA Combined Sewer	From the sewers for adoption 6 th edition standards		
SFA FW Sewer			
SFA Rising Main - Combined			
SFA Rising Main - Foul			
SFA Rising Main - Surface Water			






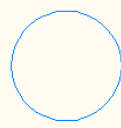




SFW SW Water			
SFA Watercourses			
Single Line			
Solid Centreline to Pipe Size	The width of the line is controlled by pipe size		
Solid Centreline to Pipe Schematic			
Solid Centreline to Pipe Size	The width of the line is controlled by pipe size		
Solid Dashed Line Schematic			
Solid Dashed Line to Pipe Size	The width of the line is controlled by pipe size		
Transco Gas			
Virgin Media			

Pipe Rule Set	Description	Screen grab / DWF / DWG	Default
Basic			Yes

Pipe Label Styles	Description	Screen grab / DWF / DWG	Default
Name Size and 2D Length (Centre to Centre)			
Name Only			
Pipe Length and Slope			

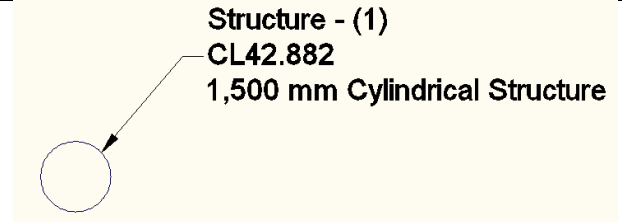
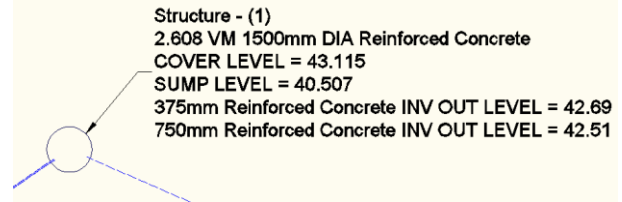
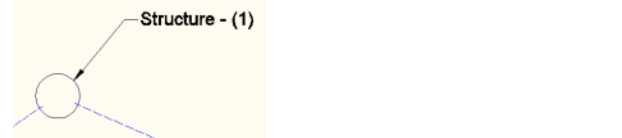
Pipe Table Styles	Description	Screen grab / DWF / DWG	Default																								
Pipe Setting Out		<table border="1"> <thead> <tr> <th colspan="6">Pipe Table</th> </tr> <tr> <th>Pipe Name</th> <th>Size (mm)</th> <th>Plan Length (m)</th> <th>Slope</th> <th>Start Invert Level</th> <th>End Invert Level</th> </tr> </thead> <tbody> <tr> <td>Pipe - (3)</td> <td>375</td> <td>140.352</td> <td>-1.10%</td> <td>34.825</td> <td>38.172</td> </tr> <tr> <td>Pipe - (4)</td> <td>375</td> <td>107.979</td> <td>2.24%</td> <td>36.152</td> <td>33.729</td> </tr> </tbody> </table>	Pipe Table						Pipe Name	Size (mm)	Plan Length (m)	Slope	Start Invert Level	End Invert Level	Pipe - (3)	375	140.352	-1.10%	34.825	38.172	Pipe - (4)	375	107.979	2.24%	36.152	33.729	
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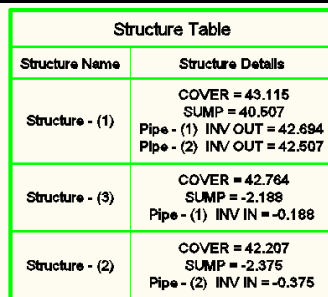
Simple Summary Pipe List	Pipe Table			
	Pipe Name	Size (mm)	Length (m)	Slope
	Pipe - (3)	375	140.352	-1.10%
	Pipe - (4)	375	107.979	2.24%

Structure Styles	Description	Screen grab / DWF / DWG	Default
Adoptable Foul Water Manhole			
Adoptable Surface Water Manhole			
BT Openreach			
CCTV			
Electric Manhole			
Generic Circle			
Gully Detailed			
Motorway Comm Box			
Sewer Manhole			
Sewer Manhole			

Transco Gas Manhole		GAS	
Virgin Manhole		CABLE	

Structure Rule Styles	Description	Screen grab / DWF / DWG	Default
Basic			

Structure Label Styles	Description	Screen grab / DWF / DWG	Default
Name Cover and Part Type			
Data with Connected Pipes			
Name Only			

Structure Table Styles	Description	Screen grab / DWF / DWG	Default										
Simple Summary List		 <table border="1" data-bbox="641 1354 966 1648"> <thead> <tr> <th colspan="2">Structure Table</th> </tr> <tr> <th>Structure Name</th> <th>Structure Details</th> </tr> </thead> <tbody> <tr> <td>Structure - (1)</td> <td>COVER = 43.115 SUMP = 40.507 Pipe - (1) INV OUT = 42.694 Pipe - (2) INV OUT = 42.807</td> </tr> <tr> <td>Structure - (3)</td> <td>COVER = 42.764 SUMP = -2.198 Pipe - (1) INV IN = -0.188</td> </tr> <tr> <td>Structure - (2)</td> <td>COVER = 42.207 SUMP = -2.375 Pipe - (2) INV IN = -0.375</td> </tr> </tbody> </table>	Structure Table		Structure Name	Structure Details	Structure - (1)	COVER = 43.115 SUMP = 40.507 Pipe - (1) INV OUT = 42.694 Pipe - (2) INV OUT = 42.807	Structure - (3)	COVER = 42.764 SUMP = -2.198 Pipe - (1) INV IN = -0.188	Structure - (2)	COVER = 42.207 SUMP = -2.375 Pipe - (2) INV IN = -0.375	
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Structure Setting Out	Structure Table			
	Structure Name	Easting	Northing	Cover Level
	Structure - (1)	358124.725	403493.936	43.115
	Structure - (3)	358101.857	403478.643	42.764
	Structure - (2)	358160.071	403478.584	42.207
				Connected Pipes
				Pipe - (1) Inv. 42.694 Pipe - (2) Inv. 42.507
				Pipe - (1) Inv. -0.188
				Pipe - (2) Inv. -0.375

5.12 Corridors

Corridor Styles	Description	Screen grab / DWF / DWG	Default
Edit Regions not Shown			Yes
Edit Style	Shows manual overrides to corridor section to the drawing		

Assembly Styles	Description	Screen grab / DWF / DWG	Default
Basic			

Mass Haul Line Styles	Description	Screen grab / DWF / DWG	Default
Diagonal Hatch			
Solid Hatch			

Mass Haul View Styles	Description	Screen grab / DWF / DWG	Default
Clipped Grid			Yes

Quantity Takeoff Criteria	Description	Screen grab / DWF / DWG	Default
Footways			
Road Construction			
Road Construction Complete			
Road Narrow Widening			
Road Overlay			
Road Planing			
Two Surfaces			

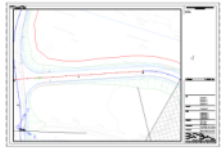
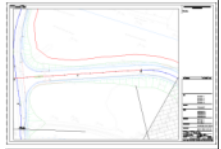
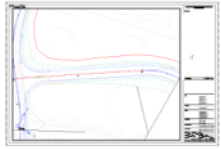
QTO Table Styles	Description	Screen grab / DWF / DWG	Default
Total Volume			

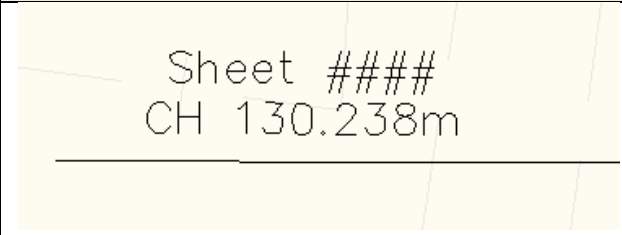
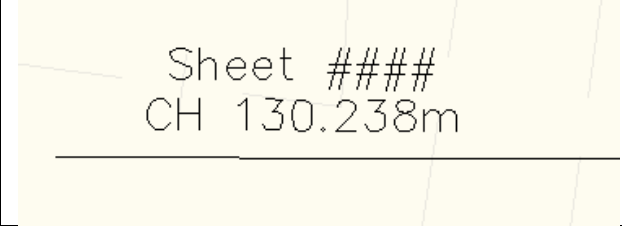
Total Volume Table		<table border="1"> <thead> <tr> <th colspan="8">Total Volume Table</th> </tr> <tr> <th>Chainage</th> <th>Cut Area</th> <th>Fill Area</th> <th>Cut Vol</th> <th>Fill Vol</th> <th>Cum Cut Vol</th> <th>Cum Fill Vol</th> <th>Net Vol</th> </tr> </thead> <tbody> <tr> <td>0.000</td> <td>0.419m2</td> <td>0.495m2</td> <td>0.000m3</td> <td>0.000m3</td> <td>0.000m3</td> <td>0.000m3</td> <td>0.000m3</td> </tr> <tr> <td>25.000</td> <td>1.045m2</td> <td>0.179m2</td> <td>18.299m3</td> <td>8.428m3</td> <td>18.299m3</td> <td>8.428m3</td> <td>9.872m3</td> </tr> <tr> <td>50.000</td> <td>2.950m2</td> <td>0.000m2</td> <td>49.942m3</td> <td>2.242m3</td> <td>68.242m3</td> <td>10.669m3</td> <td>57.572m3</td> </tr> <tr> <td>75.000</td> <td>6.399m2</td> <td>0.000m2</td> <td>116.869m3</td> <td>0.000m3</td> <td>185.110m3</td> <td>10.669m3</td> <td>174.441m3</td> </tr> <tr> <td>100.000</td> <td>11.475m2</td> <td>0.000m2</td> <td>223.429m3</td> <td>0.000m3</td> <td>408.539m3</td> <td>10.669m3</td> <td>397.870m3</td> </tr> </tbody> </table>	Total Volume Table								Chainage	Cut Area	Fill Area	Cut Vol	Fill Vol	Cum Cut Vol	Cum Fill Vol	Net Vol	0.000	0.419m2	0.495m2	0.000m3	0.000m3	0.000m3	0.000m3	0.000m3	25.000	1.045m2	0.179m2	18.299m3	8.428m3	18.299m3	8.428m3	9.872m3	50.000	2.950m2	0.000m2	49.942m3	2.242m3	68.242m3	10.669m3	57.572m3	75.000	6.399m2	0.000m2	116.869m3	0.000m3	185.110m3	10.669m3	174.441m3	100.000	11.475m2	0.000m2	223.429m3	0.000m3	408.539m3	10.669m3	397.870m3	
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5.13 Plan and Profile Sheets

View Frame Styles	Description	Screen grab / DWF / DWG	Default
Simple			

View Frame Label Styles	Description	Screen grab / DWF / DWG	Default
Simple			

Match Line Styles	Description	Screen grab / DWF / DWG	Default
Simple – ANSI 37 Hatched Masking	Applies a ANSI 37 fill to mask out the next sheet		
Simple – ANSI 38 Hatched Masking	Applies a ANSI 38 fill to mask out the next sheet		
Simple – No Masking	No fill		
Simple – Solid Masking	Applies a white solid fill to mask out the next sheet		

Match Line Label Styles	Description	Screen grab / DWF / DWG	Default
Match Line Left			
Simple			
Match Line Right			
Simple			

5.14 Survey

Network Styles	Description	Screen grab / DWF / DWG	Default
Simple			

Figure Styles	Description	Screen grab / DWF / DWG	Default
Various	An example of linework linked to the codes in the figure prefix library. Each line style has its own colour and layer		

5.15 Catchment Areas

Catchment Area Styles	Description	Screen grab / DWF / DWG	Default
Catchment Area			

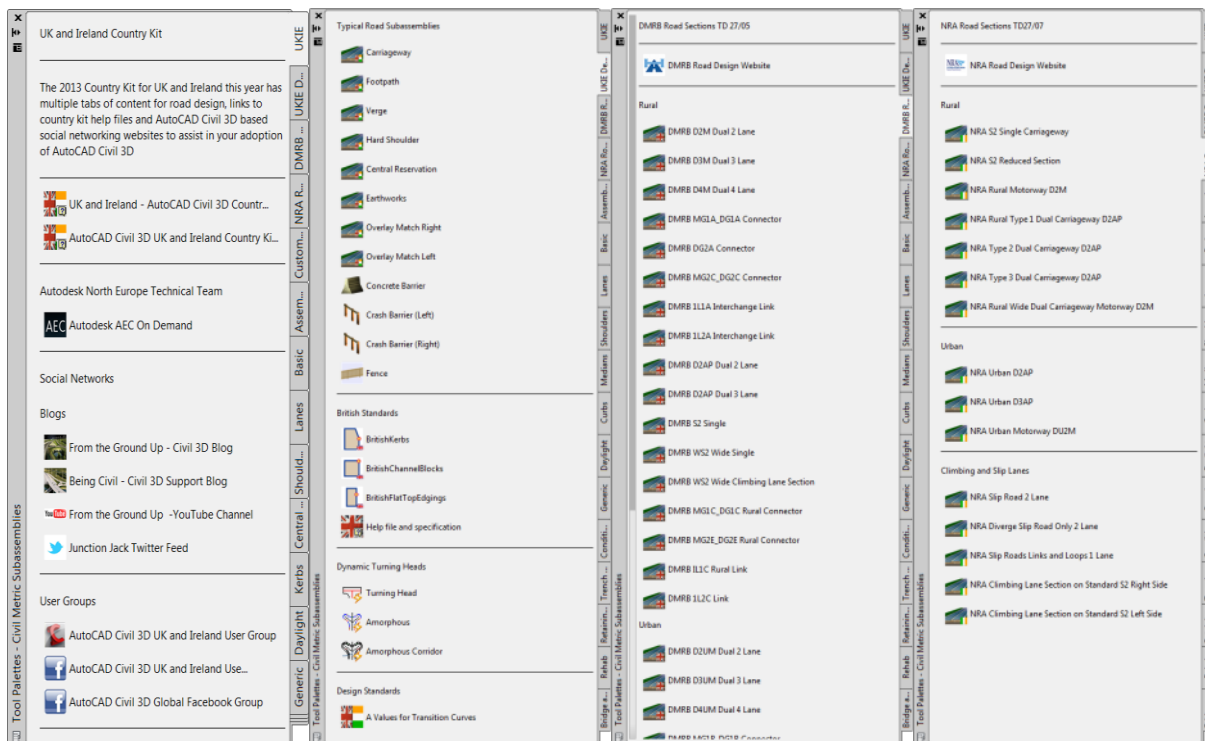
6 Tool palette(s)

6.1 Content

There are four tabs in the UKIE country kit.

The main UKIE tab has links to this help file, websites, blogs, YouTube, UKIE User Group and facebook.
NOTE: The User Group and Resource Centre are not Autodesk official sites.

The remaining tabs are for road creation with road sections based on the road standards in UK and Ireland including links to those official websites where the standards can be downloaded.



6.1.1 Subassemblies

Supplied is a simple extract of the subassembly catalogue for easy access to the most common subassemblies to use which have been preconfigured to suitable values for width and slope etc. Also supplied is a selection of kerb, channel and edging units to British Standards.

6.1.2 Dynamic Blocks

Some examples of how civil objects can be combined into AutoCAD dynamic blocks in this case turning heads with one that includes a corridor where you can change the profile to the designed profile in the project.

6.1.3 Transition Curve Design Tables

A table of A values has been provided so that the dynamic transition lengths can be utilised using UK and Ireland values.

q		0.3		
V	L	A		RL
40	11.42041		67.59	4568.17
50	22.3055		94.46	8922.20
60	38.5439		124.17	15417.56
70	61.20628		156.47	24482.51
80	91.36331		191.17	36545.32
90	130.0857		228.11	52034.26
100	178.444		267.17	71377.59
110	237.5089		308.23	95003.57
120	308.3512		351.20	123340.47

q		0.6		
V	L	A		RL
40	57.10207		47.79	2284.08
50	89.22198		66.79	4461.10
60	128.4797		87.80	7708.78
70	174.8751		110.64	12241.26
80	228.4083		135.18	18272.66
90	289.0792		161.30	26017.13

6.1.4 Assemblies

In addition as assemblies used for junction creation, the standards for UK and Ireland for Highway Link design have been created.

They have been set with a standard slope value and can react when used with superelevation on the alignment. The pavement depths are set to an overall construction depth of 0.5m which then can be modified to suit the site conditions.

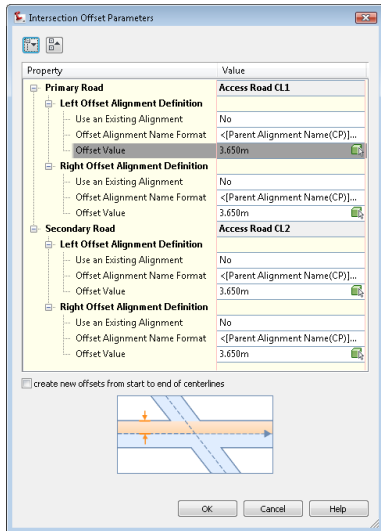
NOTE: If the standards change during the course of the release an updated set will be made available in due course. It is noted on the assemblies to which year of the standards that these assemblies were created from.

These assembly drawings are stored in the following locations

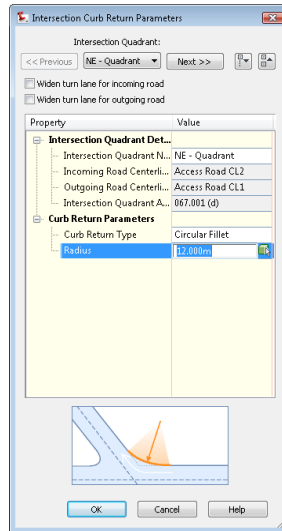
C:\Documents and Settings\USER NAME\Autodesk\C3D2013\enu\Assemblies\Metric\UKIE (XP)
C:\ProgramData\Autodesk\C3D2013\enu\Assemblies\Metric\UKIE (Windows 7 and Vista)

7 Junctions (also known as Intersections outside the UK and Ireland)

2D Geometry

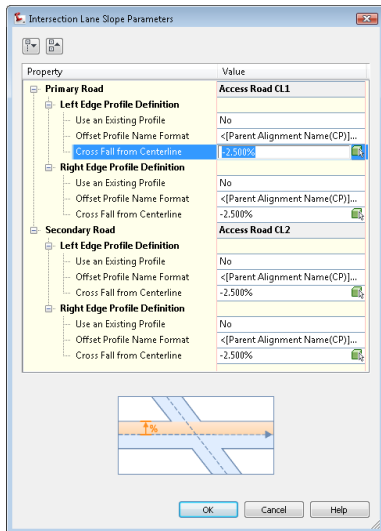


Lane offsets set to 3.65m

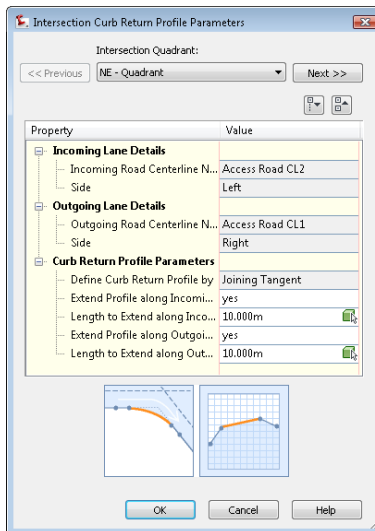


Kerb radius fillets set to 12m circular fillets

3D Geometry

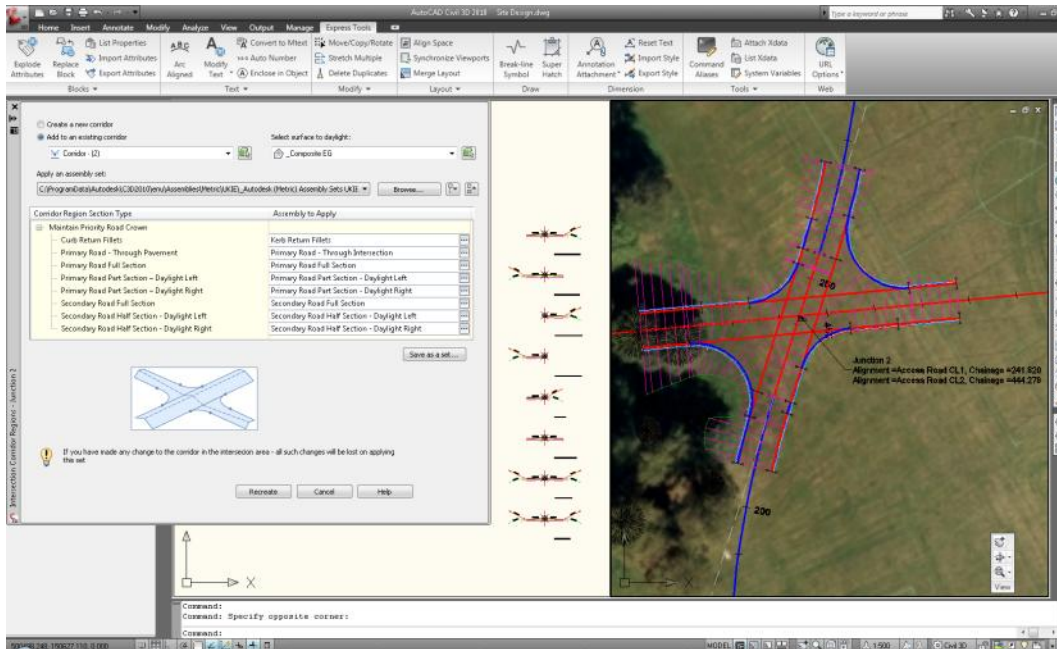


Lane crossfall set to -2.5% (-1:40)



In 2013 the vertical profiles are set to a straight grade, to give an initial vertical profile design. The kerb return radius fillets are extended 10m beyond the tangency with the connecting roads to allow for easy editing in plan but allow to visualise the grade in and out of the junction.

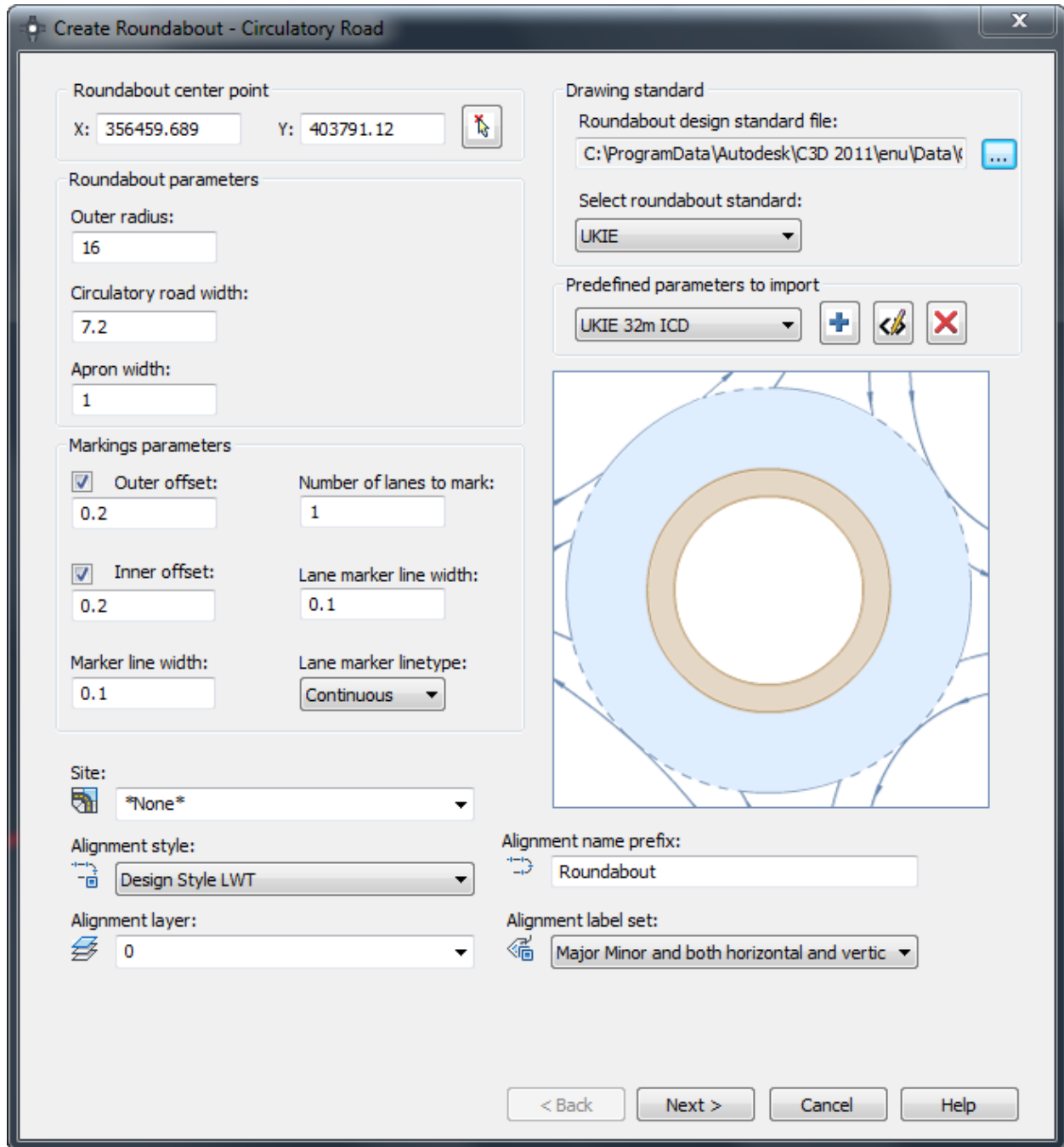
Using the assembly sets and or customised sets mentioned in the previous section these can be used to automatically build the junction corridor model

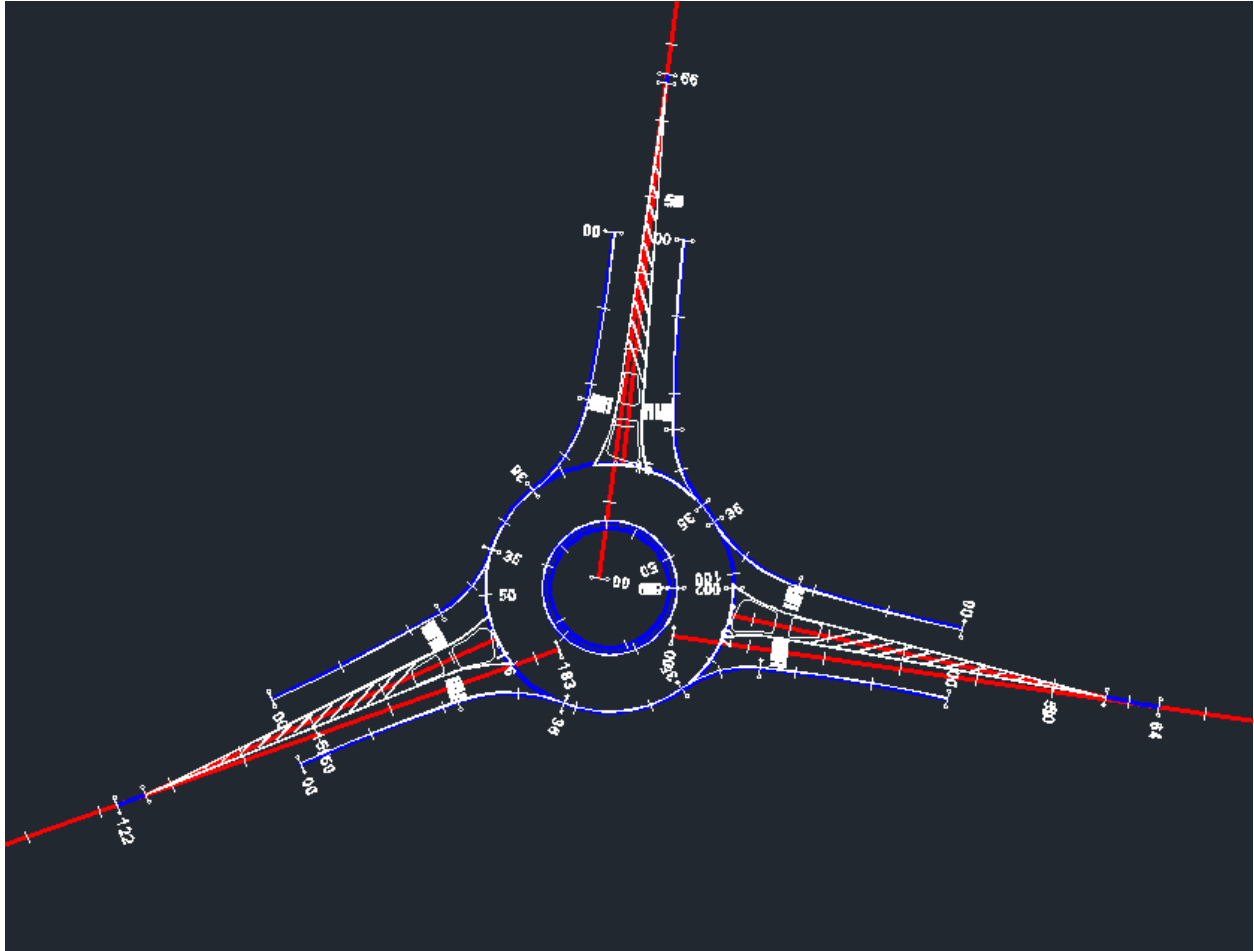


8 Roundabouts

A design standards file has been provided to give some suitable values to produce simple roundabout results. As there are no specific tables for all values these settings are to give an outline of a roundabouts to which can be edited depending on results from roundabout traffic analysis for capacity.

Autodesk Civil 3D 2013 Metric Roundabouts Presets UKIE.xml

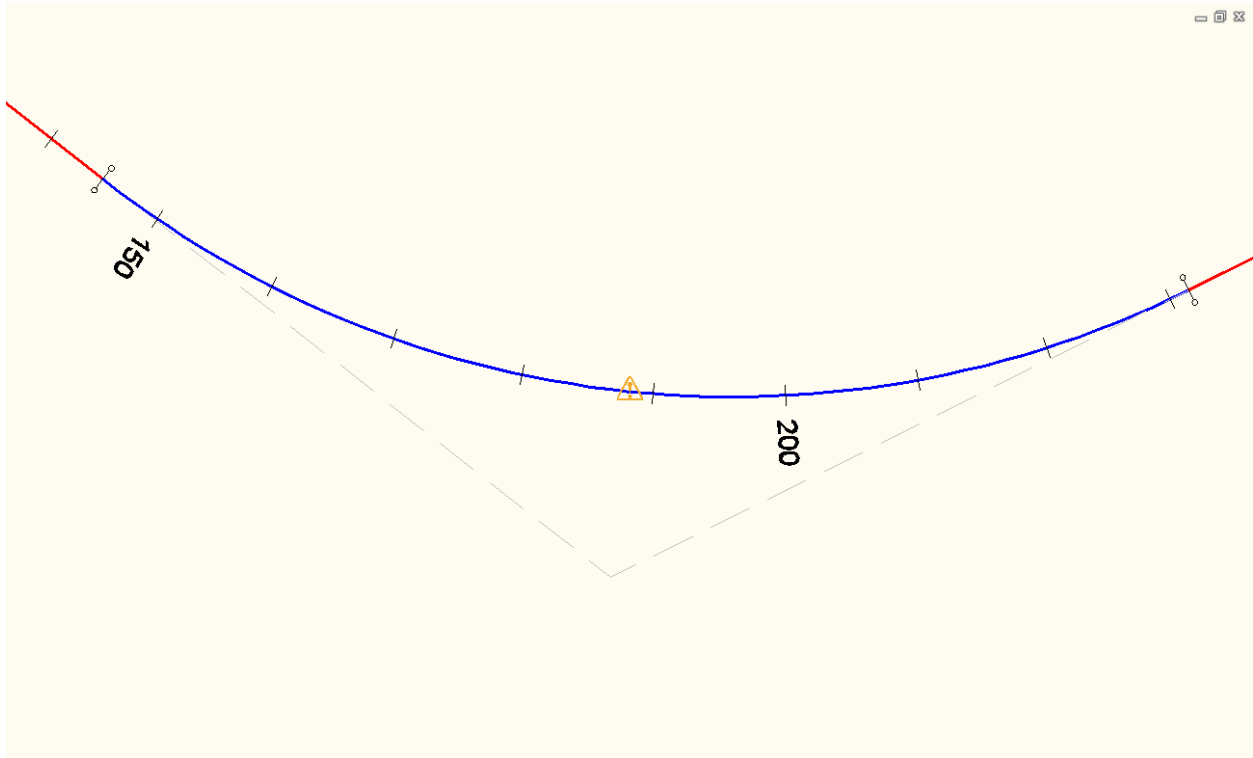




9 Design Criteria

Design Criteria is used for alignments and profiles used in corridor models for road design. The design will therefore follow the local standard for road design. The standards supplied in the UKIE Country Kit Content Pack is to the DMRB standards and TD9/93a.

If violate the design criteria Civil 3D gives you a warning in the drawing for curves that are violated. The figure below is an example of violating the design criteria.

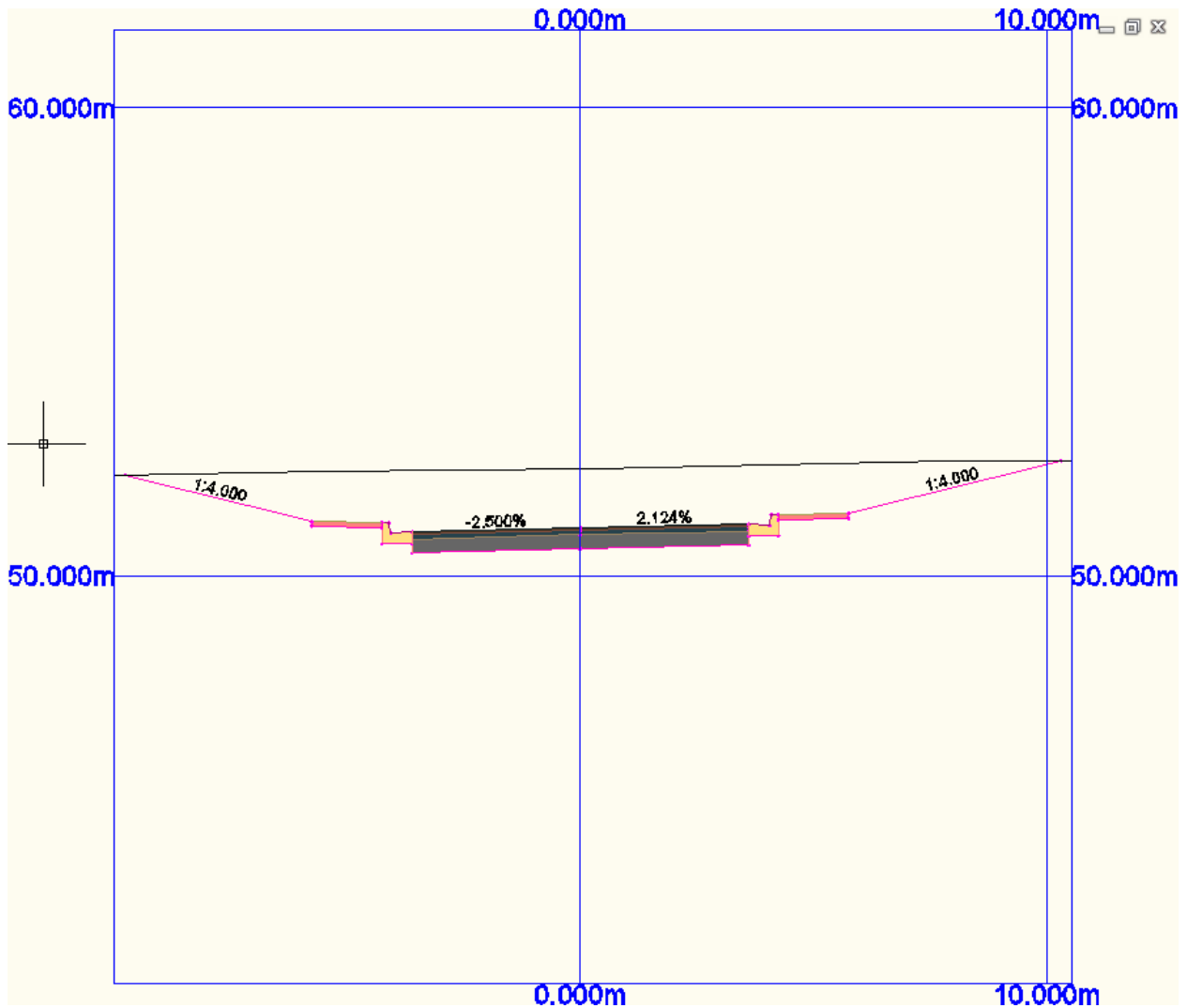


Where a departure in standards is required, this can be achieved by increasing the Superelevation rate within the Alignment Geometry Grid Editor.

No.	rough Point2	Minimum Radius	Minimum Radius Table	Transition Length Table	Attainment Method	Radius	Delta angle
1	.101m,403500.9...						
2		1020.000m	TD9/93a superelevation 2.5%		Standard	76.986m	064.483 (d)
3	.878m,403666.7...		TD9/93a superelevation 2.5%				
4		1020.000m	TD9/93a superelevation 3.5%		Standard	200.000m	036.918 (d)
5	.588m,403634.7...		TD9/93a desirable superelevation 5%				

One step below desirable Min R. at 7%
Two steps below desirable Min R. at 7%

Design Criteria is also used for calculating super Level for road design where the Superelevation is applied over the transitions curves. Figure below is an example for automatic calculation of super Level in a left hand curve.



The UKIE design criteria are saved in the _Autodesk Civil 3D 2013 Road Design Standards UKIE.xml

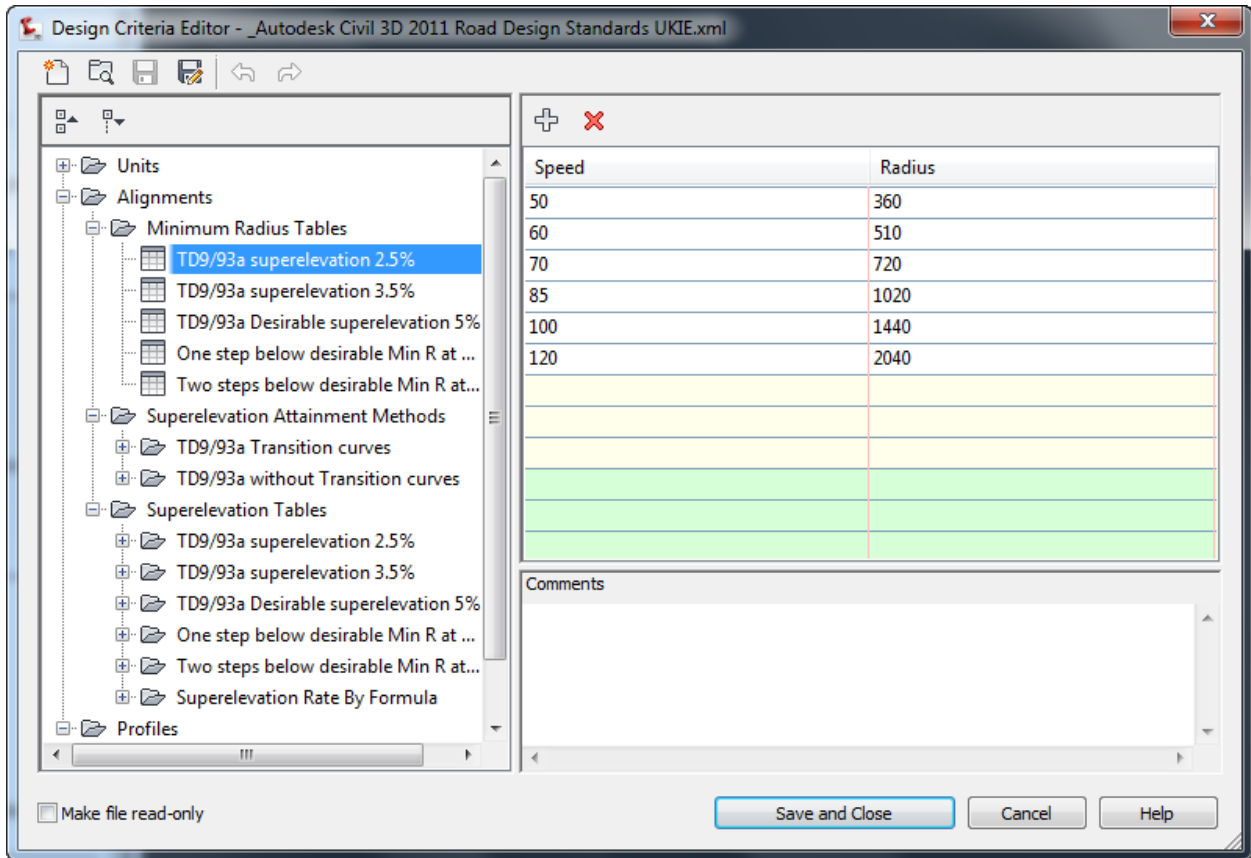
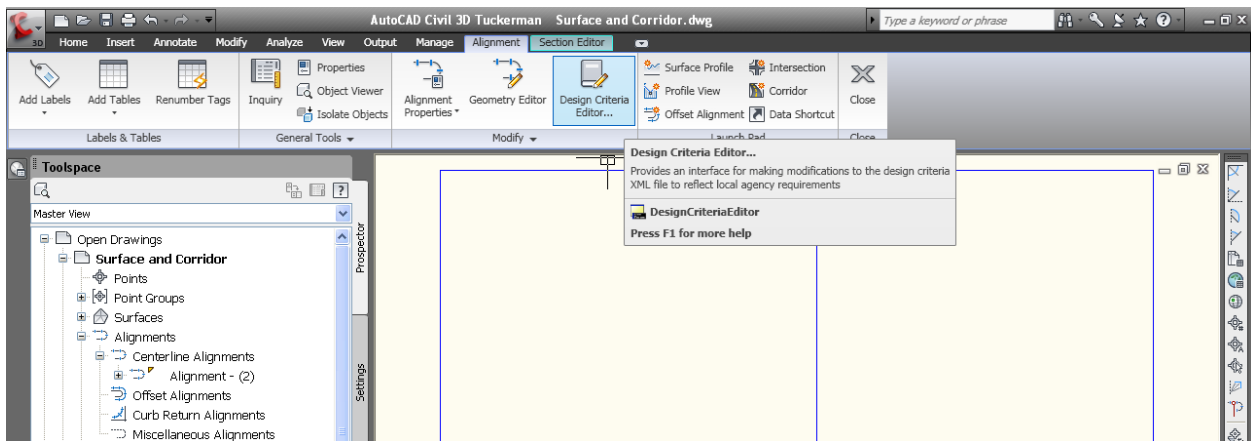


Figure below shows where the internal editor can be found.



10 Quantity Take Off

10.1 Introduction of QTO

In Civil 3D it is possible to create a link between a Rate Item list (also known as Pay Items outside UK and Ireland) of Civil 3D objects as well as AutoCAD objects. The link is on 2 levels:

1. **Settings in the template.** Corridor (Subassemblies), Pipes and Structures are automatically linked to the Pay Item list.
2. **Select objects.** Select polygon, polylines, lines or Feature Lines by manual select in the Pay item list.

If objects in the Civil 3D drawing are linked to the rate Item list, then it is possible to run a report that prints areas and length for objects, that are linked.

The potential is to link the drawing and object model data to methods of measurement such as MCHW, MHRW (Ireland) and CESSM.

Included is a UKIE Example.csv file which is based on the MCHW, but does only have the main rate item listing at this point

Figure below shows an example report with summary of rate Items.

Pay Item ID	Description	Quantity	Unit	Baseline	Station		Offset		Remarks
					Start	End	Start	End	
11001	Kerbs	21.978	m						Corridor Feature Line: EC
11001	Kerbs	13.974	m						Corridor Feature Line: EC
11001	Kerbs	21.977	m						Corridor Feature Line: EC
11001	Kerbs	13.896	m						Corridor Feature Line: EC
11001	Kerbs	10.001	m						Corridor Feature Line: EC
11001	Kerbs	13.364	m						Corridor Feature Line: EC
11001	Kerbs	23.204	m						Corridor Feature Line: EC
11001	Kerbs	10.001	m						Corridor Feature Line: EC
11001	Kerbs	9.675	m						Corridor Feature Line: EC
11001	Kerbs	11.171	m						Corridor Feature Line: EC
11001	Kerbs	22.515	m						Corridor Feature Line: EC
11001	Kerbs	65.961	m						Corridor Feature Line: EC
11001	Kerbs	32.417	m						Corridor Feature Line: EC

It is possible to summary different types based on count, area or length.

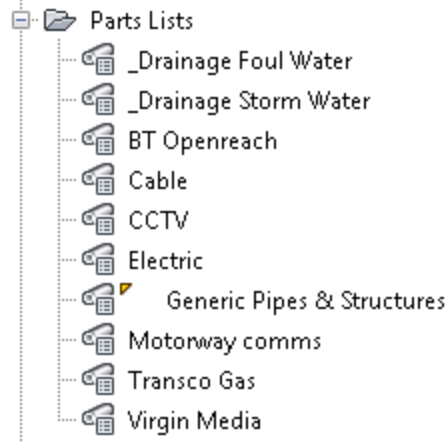
The rate Items can contain a formula that can multiply the summary with a price.

This can be a very easy way to calculate prices on kerbing etc.

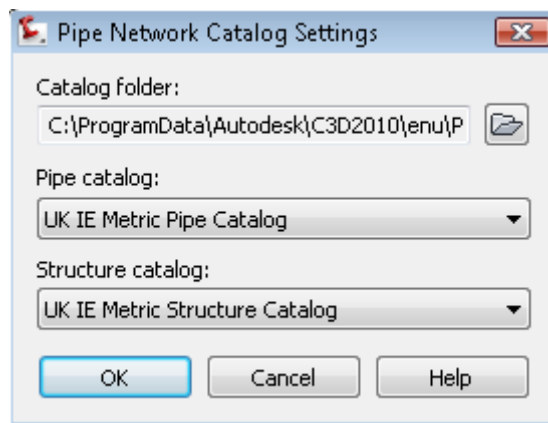
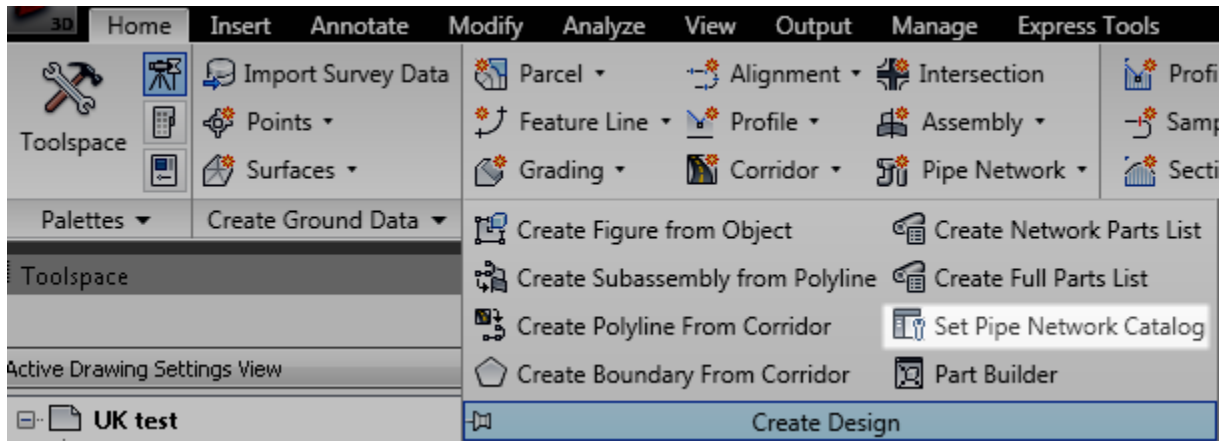
Information from QTO can be shown in reports (CSV, HTML or TXT) or be exported to use in third party Bills of Quantity/Estimation application.

11 Pipe and Structure Catalog

The UKIE Country Kit contains a number of parts for drainage and underground utilities.



These are accessed from the UKIE Metric Pipes and UKIE Metric Structures parts catalog, which must be set first to enable their use



11.1 Parts Appendix

Appendix

Pipes

PE Pipes are specified by external diameter instead of internal dia.
The Part Size Name takes account of this parameter.

PE Pipes

SDR11

Wall Thickness	Inner Pipe Diameter	Part Size Name
2.3000	11.4000	16 mm PE Pipe SDR11
2.3000	15.4000	20 mm PE Pipe SDR11
2.3000	20.4000	25 mm PE Pipe SDR11
3.0000	26.0000	32 mm PE Pipe SDR11
3.7000	32.6000	40 mm PE Pipe SDR11
4.6000	40.8000	50 mm PE Pipe SDR11
5.1000	44.8000	55 mm PE Pipe SDR11
5.8000	51.4000	63 mm PE Pipe SDR11
6.8000	61.4000	75 mm PE Pipe SDR11
8.2000	73.6000	90 mm PE Pipe SDR11
10.0000	90.0000	110 mm PE Pipe SDR11
11.4000	102.2000	125 mm PE Pipe SDR11
12.7000	114.6000	140 mm PE Pipe SDR11
16.4000	147.2000	180 mm PE Pipe SDR11
18.2000	163.6000	200 mm PE Pipe SDR11
22.7000	204.6000	250 mm PE Pipe SDR11
25.4000	229.2000	280 mm PE Pipe SDR11
28.6000	257.8000	315 mm PE Pipe SDR11
32.3000	290.4000	355 mm PE Pipe SDR11
36.4000	327.2000	400 mm PE Pipe SDR11
40.9000	368.2000	450 mm PE Pipe SDR11
45.5000	409.0000	500 mm PE Pipe SDR11
50.8000	458.4000	560 mm PE Pipe SDR11

Wall Thickness	Inner Pipe Diameter	Part Size Name
57.2000	515.6000	630 mm PE Pipe SDR11
63.6000	572.8000	700 mm PE Pipe SDR11
64.5000	581.0000	710 mm PE Pipe SDR11
72.7000	654.6000	800 mm PE Pipe SDR11
81.8000	736.4000	900 mm PE Pipe SDR11
90.0000	820.0000	1,000 mm PE Pipe SDR11

SDR17

Wall Thickness	Part Size Name	Inner Pipe Diameter
5.4000	90 mm PE Pipe SDR17	79.2000
6.6000	110 mm PE Pipe SDR17	96.8000
7.4000	125 mm PE Pipe SDR17	110.2000
9.5000	160 mm PE Pipe SDR17	141.0000
10.7000	180 mm PE Pipe SDR17	158.6000
13.4000	225 mm PE Pipe SDR17	198.2000
14.8000	250 mm PE Pipe SDR17	220.4000
16.6000	280 mm PE Pipe SDR17	246.8000
18.7000	315 mm PE Pipe SDR17	277.6000
21.1000	355 mm PE Pipe SDR17	312.8000
23.7000	400 mm PE Pipe SDR17	352.6000
26.7000	450 mm PE Pipe SDR17	396.6000
29.7000	500 mm PE Pipe SDR17	440.6000
32.2000	560 mm PE Pipe SDR17	495.6000
37.4000	630 mm PE Pipe SDR17	555.2000
39.8000	700 mm PE Pipe SDR17	620.4000
42.1000	710 mm PE Pipe SDR17	625.8000
47.4000	800 mm PE Pipe SDR17	705.2000
53.3000	900 mm PE Pipe SDR17	793.4000
59.3000	1000 mm PE Pipe SDR17	881.4000

SDR21

Wall Thickness	Part Size Name	Inner Pipe Diameter
7.6000	160 mm PE Pipe SDR21	144.8000
8.6000	180 mm PE Pipe SDR21	162.8000
10.7000	225 mm PE Pipe SDR21	203.6000
11.9000	250 mm PE Pipe SDR21	226.2000
13.3000	280 mm PE Pipe SDR21	253.4000
15.0000	315 mm PE Pipe SDR21	285.0000
16.9000	355 mm PE Pipe SDR21	321.2000
19.0000	400 mm PE Pipe SDR21	362.0000
21.4000	450 mm PE Pipe SDR21	407.2000
23.8000	500 mm PE Pipe SDR21	452.4000
26.6000	560 mm PE Pipe SDR21	506.8000
30.0000	630 mm PE Pipe SDR21	570.0000
33.8000	710 mm PE Pipe SDR21	642.4000

Wall Thickness	Part Size Name	Inner Pipe Diameter
38.0000	800 mm PE Pipe SDR21	724.0000
42.8000	900 mm PE Pipe SDR21	814.4000
47.6000	1000 mm PE Pipe SDR21	904.8000

SDR26

6.2000	147.6000	160 mm PE Pipe SDR26
6.9000	166.2000	180 mm PE Pipe SDR26
8.6000	207.8000	225 mm PE Pipe SDR26
9.6000	230.8000	250 mm PE Pipe SDR26
10.7000	258.6000	280 mm PE Pipe SDR26
12.1000	290.8000	315 mm PE Pipe SDR26
13.6000	327.8000	355 mm PE Pipe SDR26
15.3000	369.4000	400 mm PE Pipe SDR26
17.2000	415.6000	450 mm PE Pipe SDR26
19.1000	461.8000	500 mm PE Pipe SDR26
21.6000	516.8000	560 mm PE Pipe SDR26
24.3000	581.4000	630 mm PE Pipe SDR26
27.3000	655.4000	710 mm PE Pipe SDR26
30.8000	738.4000	800 mm PE Pipe SDR26
34.7000	830.6000	900 mm PE Pipe SDR26
38.5000	923.0000	1000 mm PE Pipe SDR26

PVC-O Pipes (Uponor Mondial)

Wall Thickness	Part Size Name	Pressure rating	Inner Pipe Diameter
3.0000	110 mm PVC-O Pipe 12.5 bar	12.5 bar	104.0000
5.1000	140 mm PVC-O Pipe 12.5 bar	12.5 bar	129.8000
3.7000	160 mm PVC-O Pipe 12.5 bar	12.5 bar	152.6000
4.6000	200 mm PVC-O Pipe 12.5 bar	12.5 bar	190.8000
5.7000	250 mm PVC-O Pipe 12.5 bar	12.5 bar	238.6000
7.2000	315 mm PVC-O Pipe 12.5 bar	12.5 bar	300.6000
9.1000	400 mm PVC-O Pipe 12.5 bar	12.5 bar	381.8000
3.2000	110 mm PVC-O Pipe 16 bar	16 bar	103.6000
5.1000	140 mm PVC-O Pipe 16 bar	16 bar	129.8000
4.7000	160 mm PVC-O Pipe 16 bar	16 bar	150.6000
5.8000	200 mm PVC-O Pipe 16 bar	16 bar	188.4000
7.3000	250 mm PVC-O Pipe 16 bar	16 bar	235.4000
9.2000	315 mm PVC-O Pipe 16 bar	16 bar	296.6000
11.6000	400 mm PVC-O Pipe 16 bar	16 bar	376.8000

PVC-u pipes

Wall Thickness	Inner Pipe Diameter	Part Size Name
1.7000	19.6000	23.00 PVC-u pipe
2.1000	20.8000	25.00 PVC-u pipe
2.7000	21.6000	27.00 PVC-u pipe
3.2000	23.6000	30.00 PVC-u pipe
4.0000	27.0000	35.00 PVC-u pipe
5.0000	30.0000	40.00 PVC-u pipe

Cast Iron Class AB

Inner Pipe Diameter Wall Thickness

40.0000	7.4500
50.0000	9.5500
65.0000	8.6500
80.0000	7.2500
100.0000	10.9500
125.0000	12.4500
150.0000	13.6500
175.0000	14.8500
200.0000	16.6000
225.0000	17.0500
250.0000	18.0000
300.0000	16.9000
350.0000	18.3000
375.0000	19.0000
400.0000	19.7000
450.0000	21.1500
500.0000	22.5500
525.0000	23.2500
550.0000	23.9500
600.0000	25.1000
650.0000	26.3000
675.0000	26.9500
700.0000	27.4500
750.0000	28.6000
800.0000	29.7500
825.0000	30.5000
850.0000	31.2000
900.0000	32.1000
1000.0000	34.1500
1050.0000	35.3000
1100.0000	36.2500
1200.0000	38.3000

Cast Iron Pipe Class CD

Inner Pipe Diameter Wall Thickness

40.0000	7.4500
50.0000	9.5500
65.0000	8.6500
80.0000	7.2500
100.0000	10.9500
125.0000	12.4500
150.0000	13.6500
175.0000	14.8500
200.0000	16.6000
225.0000	17.0500
250.0000	18.0000
300.0000	22.7000
350.0000	24.6500
375.0000	25.6000
400.0000	26.5500
450.0000	28.4500
500.0000	30.1500
525.0000	31.1000
550.0000	31.8500
600.0000	33.5000
650.0000	35.1500
675.0000	35.9000
700.0000	36.6000
750.0000	38.0000
800.0000	39.6500
825.0000	40.4000
900.0000	42.2500
1000.0000	45.1000
1050.0000	46.5000
1200.0000	50.2500

Clay pipes

plain end 100 mm Vitrified Clay Pipe 11 mm wall thickness
plain end 150 mm Vitrified Clay Pipe 14 mm wall thickness
plain end 225 mm Vitrified Clay Pipe 19 mm wall thickness
plain end 300 mm Vitrified Clay Pipe 29 mm wall thickness
socketed 225 mm Vitrified Clay Pipe 19 mm wall thickness
socketed 300 mm Vitrified Clay Pipe 29 mm wall thickness
rocker 150 mm Vitrified Clay Pipe 11 mm wall thickness
rocker 225 mm Vitrified Clay Pipe 19 mm wall thickness
rocker 300 mm Vitrified Clay Pipe 29 mm wall thickness
400 mm Vitrified Clay Pipe 46 mm wall thickness
450 mm Vitrified Clay Pipe 46 mm wall thickness
450 mm Vitrified Clay Pipe 51 mm wall thickness
500 mm Vitrified Clay Pipe 51 mm wall thickness
600 mm Vitrified Clay Pipe 58 mm wall thickness
Unjointed 100 mm Vitrified Clay Pipe 15 mm wall thickness
Unjointed 150 mm Vitrified Clay Pipe 21 mm wall thickness
Unjointed 225 mm Vitrified Clay Pipe 23 mm wall thickness
Unjointed 300 mm Vitrified Clay Pipe 36 mm wall thickness
300 mm Vitrified Clay Pipe 33 mm wall thickness
Socketed 400 mm Vitrified Clay Pipe 46 mm wall thickness
Socketed 450 mm Vitrified Clay Pipe 46 mm wall thickness

Concrete pipes

Inner Pipe Diameter Wall Thickness

225.0000	35.0000
300.0000	55.0000
375.0000	55.0000
450.0000	64.0000
525.0000	72.0000
600.0000	84.0000
675.0000	75.0000
750.0000	80.0000
825.0000	85.0000
900.0000	90.0000
1050.0000	105.0000
1200.0000	120.0000
1350.0000	150.0000
1500.0000	150.0000
1600.0000	115.0000
1800.0000	180.0000
2000.0000	200.0000
2100.0000	280.0000
2200.0000	220.0000
2400.0000	220.0000

Copper Pipes

Inner Pipe Diameter Wall Thickness

6.0000	0.8000
8.0000	0.8000
10.0000	0.8000
12.0000	0.8000
15.0000	1.0000
18.0000	1.0000
22.0000	1.2000
28.0000	1.2000
35.0000	1.5000
42.0000	1.5000
54.0000	2.0000
66.7000	2.0000

Inner Pipe Diameter Wall Thickness

76.1000	2.0000
108.0000	2.5000

Ductile Iron Pipes

Inner Pipe Diameter Wall Thickness

80.0000	9.0000
100.0000	9.0000
150.0000	10.0000
200.0000	11.0000
250.0000	12.5000
300.0000	12.5000
350.0000	13.5000
400.0000	14.0000
450.0000	14.5000
500.0000	15.5000
600.0000	17.0000
700.0000	18.5000
800.0000	20.5000
900.0000	22.5000
1000.0000	24.0000
1200.0000	27.5000
1400.0000	31.0000
1600.0000	34.0000
1800.0000	37.5000
2000.0000	41.0000

PVC Pipe

Inner Pipe Diameter Wall Thickness

75.0000	3.0000
90.0000	4.0000
100.0000	5.0000
150.0000	5.0000
175.0000	6.0000
225.0000	7.0000
300.0000	7.0000
375.0000	8.0000
450.0000	10.0000
475.0000	12.0000
500.0000	15.0000
630.0000	17.0000

Inner Pipe Diameter Wall Thickness

650.0000

20.0000

Spun Iron pipe

Inner Pipe Diameter Wall Thickness

80.0000	9.0000
100.0000	9.0000
150.0000	10.0000
200.0000	11.0000
250.0000	12.5000
300.0000	12.5000
350.0000	13.5000
400.0000	14.0000
450.0000	14.5000
500.0000	15.5000
600.0000	17.0000
700.0000	18.5000
800.0000	20.5000
900.0000	22.5000
1000.0000	24.0000
1200.0000	27.5000
1400.0000	31.0000
1600.0000	34.0000
1800.0000	37.5000
2000.0000	41.0000

Steel API SL pipes

Inner Pipe Diameter Wall Thickness

80.0000	4.4500
100.0000	7.1500
150.0000	9.1500
200.0000	9.5500
250.0000	11.5000
300.0000	11.9500
350.0000	2.8000
400.0000	3.2000
450.0000	3.5000
500.0000	4.0000
600.0000	5.0000
700.0000	5.5000
800.0000	6.5000
900.0000	7.0000
1000.0000	8.0000
1200.0000	10.0000
175.0000	9.3500
225.0000	9.7500
550.0000	4.5000
600.0000	5.0000
750.0000	6.0000
850.0000	7.0000
90.0000	5.8000

Steel BS1387 Pipes

Inner Pipe Diameter Wall Thickness

80.0000	4.4500
100.0000	7.1500
125.0000	7.3500
150.0000	7.5500

Steel BS3600 Pipes

Inner Pipe Diameter Wall Thickness

80.0000	4.4500
100.0000	7.1500
150.0000	9.1500
200.0000	9.5500
250.0000	11.5000
300.0000	11.9500
350.0000	2.8000
400.0000	3.2000
450.0000	3.5000
500.0000	4.0000
600.0000	5.0000
700.0000	5.5000
800.0000	6.5000
900.0000	7.0000
1000.0000	8.0000
1200.0000	10.0000
175.0000	9.3500
225.0000	9.7500
550.0000	4.5000
600.0000	5.0000
750.0000	6.0000
850.0000	7.0000
90.0000	5.8000

Steel ISO 4200 Pipes Series 1

Inner Pipe Diameter Wall Thickness

80.0000	4.5000
90.0000	5.8000
100.0000	7.1500
150.0000	9.1500
200.0000	9.5500
250.0000	11.5000
300.0000	11.9500
350.0000	2.8000
400.0000	3.2000
450.0000	3.5000
500.0000	4.0000
600.0000	5.0000
700.0000	5.5000
800.0000	6.5000
900.0000	7.0000
1000.0000	8.0000
1050.0000	8.5000
1100.0000	9.0000
1200.0000	9.5000

Steel ISO4200 Series 2

Inner Pipe Diameter Wall Thickness

90.0000	5.8000
100.0000	13.5000
125.0000	4.0000
750.0000	6.0000
1100.0000	34.0000

Steel ISO4200 Series 3

Inner Pipe Diameter Wall Thickness

80.0000	1.5000
100.0000	4.0000
125.0000	8.1500
175.0000	9.3500
225.0000	9.7500

Inner Pipe Diameter Wall Thickness

550.0000	4.5000
650.0000	5.0000
850.0000	7.0000

Comms ducting multiway

Inner Pipe Width	Inner Pipe Height	Part Size Name
210.0000	100.0000	2x1 way 100mm dia 210 x 100
100.0000	210.0000	1x2 way 100mm dia 100 x 210
320.0000	100.0000	3x1 way 100mm dia 320 x 100
100.0000	320.0000	1x3 way 100mm dia 100x320
210.0000	210.0000	2x2 way 100mm dia 210x210
210.0000	210.0000	2x2 way 100mm dia 210x210
430.0000	100.0000	4x1 way 100mm dia 430x100
100.0000	430.0000	1x4 way 100mm dia 100x430
320.0000	210.0000	3x2 way 100mm dia 320x210
210.0000	320.0000	2x3 way 100mm dia 210x320
430.0000	210.0000	4x2 way 100mm dia 430x210
210.0000	430.0000	2x4 way 100mm dia 210x430
320.0000	320.0000	3x3 way 100mm dia 320x320
430.0000	320.0000	4x3 way 100mm dia 430x320
320.0000	430.0000	3x4 way 100mm dia 320x430
430.0000	430.0000	4x4 way 100mm dia 430x430

Ovoid Concrete Pipe

Inner Pipe Width	Inner Pipe Height	Wall Thickness
600.0000	900.0000	150.0000
800.0000	1200.0000	150.0000
400.0000	600.0000	185.0000

Generic Circular pipe

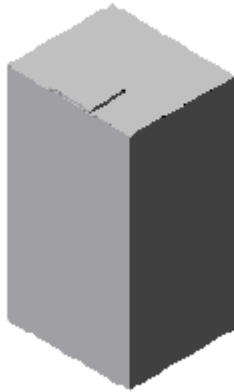
Inner Pipe Diameter	Wall Thickness
100.0000	11.0000
150.0000	14.0000
225.0000	19.0000
300.0000	29.0000
450.0000	46.0000
525.0000	51.0000
600.0000	58.0000
675.0000	75.0000
750.0000	21.0000
825.0000	85.0000
900.0000	90.0000
975.0000	95.0000
1050.0000	105.0000
1125.0000	110.0000
1200.0000	120.0000
1275.0000	130.0000
1350.0000	150.0000
1425.0000	160.0000
1500.0000	150.0000
1575.0000	115.0000
1650.0000	120.0000

Inner Pipe Diameter	Wall Thickness
1725.0000	180.0000
1800.0000	180.0000
1875.0000	180.0000
1950.0000	200.0000
2025.0000	200.0000
2100.0000	200.0000
2175.0000	220.0000
2250.0000	220.0000

Structures

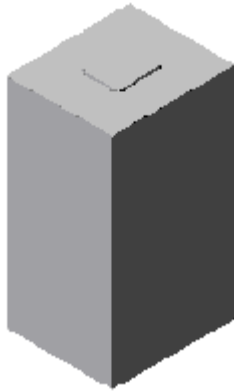
BT Manholes

BT Manhole MRX401



Inner Structure Width	1200.0000
Inner Structure Length	1800.0000
Rim to Sump Height	2000.0000

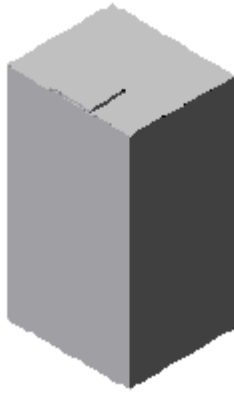
BT Manholes MRX402,405,410,411,412,413



Box Width	Box Length	Rim to Sump Height	Part Size Name
3500.0000	1200.0000	2000.0000	MRX402A 2000 height
3500.0000	1200.0000	2225.0000	MRX402B 2225 height
3500.0000	1200.0000	2450.0000	MRX402C 2450 height
4000.0000	1650.0000	2000.0000	MRX405A 2000 height
4000.0000	1650.0000	2225.0000	MRX405B 2225 height
4000.0000	1650.0000	2450.0000	MRX405C 2450 height
3100.0000	1700.0000	2100.0000	MRX410A 2100 height
3100.0000	1700.0000	2400.0000	MRX410B 2400 height
3100.0000	1700.0000	2700.0000	MRX410C 2700 height
4900.0000	2300.0000	2100.0000	MRX411A 2100 height
4900.0000	2300.0000	2400.0000	MRX411B 2400 height
4900.0000	2300.0000	2700.0000	MRX411C 2700 height
3700.0000	2800.0000	2100.0000	MRX412A 2100 height
3700.0000	2800.0000	2400.0000	MRX412B 2400 height
3700.0000	2800.0000	2700.0000	MRX412C 2700 height

Box Width	Box Length	Rim to Sump Height	Part Size Name
3700.0000	2000.0000	2100.0000	MRX413A 2100 height
3700.0000	2000.0000	2400.0000	MRX413B 2400 height
3700.0000	2000.0000	2700.0000	MRX413C 2700 height

BT Manhole MRX404 Rectangular edge access 2400x1200 2m height



BT Manholes MRX507,508,510,511,512,513



Rim to Sump Height	Part Size Name
2000.0000	MRX509 2000 height
2100.0000	MRX510A 2100 height
2400.0000	MRX510B 2400 height
2700.0000	MRX510C 2700 height
2100.0000	MRX511A 2100 height
2400.0000	MRX511B 2400 height
2700.0000	MRX511C 2700 height
2100.0000	MRX512A 2100 height
2400.0000	MRX512B 2400 height
2700.0000	MRX512C 2700 height
2100.0000	MRX513A 2100 height
2400.0000	MRX513B 2400 height
2700.0000	MRX513C 2700 height
2700.0000	MRX513C 2700 height

BT Manholes MRX509-MRX513



Rim to Sump Height	Part Size Name
2000.0000	MRX509 2000 height
2100.0000	MRX510A 2100 height
2400.0000	MRX510B 2400 height
2700.0000	MRX510C 2700 height
2100.0000	MRX511A 2100 height
2400.0000	MRX511B 2400 height
2700.0000	MRX511C 2700 height
2100.0000	MRX512A 2100 height
2400.0000	MRX512B 2400 height
2700.0000	MRX512C 2700 height
2100.0000	MRX513A 2100 height
2400.0000	MRX513B 2400 height
2700.0000	MRX513C 2700 height
2700.0000	MRX513C 2700 height

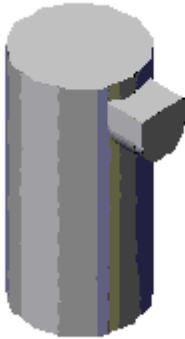
BT Manholes MRX810



Rim to Sump Height	Part Size Name
2100.0000	MRX810A 2000 height
2400.0000	MRX810B 2100 height
2700.0000	MRX810C 2700 height

Gullies

Road Gully 150mm trapped outlet



Structure Height	Structure Diameter
750.0000	375.0000
900.0000	375.0000
750.0000	450.0000
900.0000	450.0000
1050.0000	450.0000

Manholes (as per SFA 6th Edition)

Manhole Type A 1200mm access shaft (for ladders/irons)



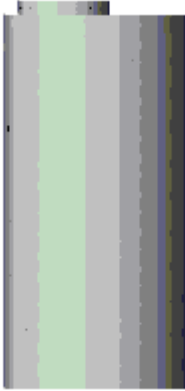
Inner Structure Diameter	1200.0000	1500.0000	1800.0000			
Cone Height	600.0000					
Wall Thickness	150.0000					
Floor Thickness	225.0000					
Frame Diameter	600.0000	675.0000				
Frame Height	230.0000	280.0000	295.0000	345.0000	360.0000	410.0000

Manhole Type A 900mm access shaft



Inner Structure Diameter	1200.0000	1500.0000	1800.0000			
Cone Height	600.0000					
Wall Thickness	150.0000					
Floor Thickness	225.0000					
Frame Diameter	600.0000	675.0000				
Frame Height	230.0000	280.0000	295.0000	345.0000	360.0000	410.0000

Manhole Type B



Inner Structure Diameter	1200.0000	1500.0000	1800.0000			
Wall Thickness	150.0000					
Floor Thickness	225.0000					
Frame Diameter	600.0000	675.0000				
Frame Height	230.0000	280.0000	295.0000	345.0000	360.0000	410.0000

Range Values [Min, Max, Default]

Rim to Sump Height	1150.0000	3000.0000	1150.0000
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Manhole Type C



Inner Structure Width	1240.0000					
Inner Structure Length	675.0000					
Frame Width	1220.0000					
Frame Length	685.0000					
Frame Height	100.0000	150.0000	180.0000	210.0000	240.0000	270.0000
Wall Thickness	200.0000					
Floor Thickness	225.0000					

Range Values [Min, Max, Default]

Rim to Sump Height	300.0000	2000.0000	500.0000
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Manhole Type D

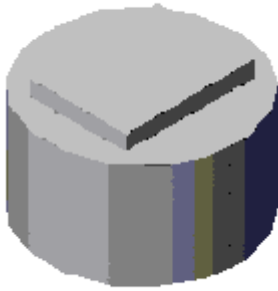


Inner Structure Width	900.0000					
Inner Structure Length	675.0000					
Frame Width	675.0000					
Frame Length	675.0000					
Frame Height	100.0000	150.0000	180.0000	210.0000	240.0000	270.0000
Wall Thickness	200.0000					
Floor Thickness	225.0000					

Range Values [Min, Max, Default]

Rim to Sump Height	100.0000	1800.0000	150.0000
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Manhole Type E

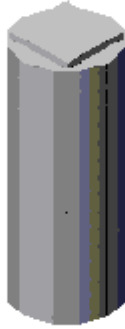


Frame Width	675.0000				
Frame Length	675.0000				
Frame Height	100.0000	150.0000	200.0000	250.0000	300.0000
Wall Thickness	150.0000				
Floor Thickness	225.0000				

Range Values [Min, Max, Default]

Rim to Sump Height	300.0000	2000.0000	500.0000
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Demarcation Chamber 350x350 max cover size

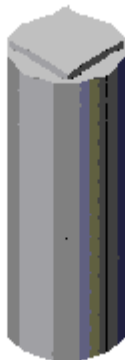


Frame Height	100.0000	150.0000								
Wall Thickness	75.0000	100.0000	125.0000	150.0000	175.0000	200.0000	225.0000	250.0000	300.0000	

Range Values [Min, Max, Default]

Barrel Pipe Clearance	850.0000	3000.0000	1200.0000
Rim to Sump Height	1200.0000	4000.0000	1400.0000

Demarcation Chamber 450x450 max cover size



Frame Height	100.0000	150.0000								
Wall Thickness	75.0000	100.0000	125.0000	150.0000	175.0000	200.0000	225.0000	250.0000	300.0000	3

Range Values [Min, Max, Default]

Barrel Pipe Clearance	850.0000	3000.0000	1200.0000
Rim to Sump Height	300.0000	1300.0000	1400.0000

Rectangular Manhole with Rectangular cover

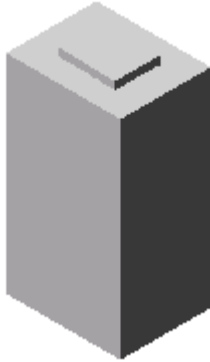


Table Values

Inner Structure Width	Inner Structure Length	Frame Width	Frame Length
675.0000	750.0000	675.0000	750.0000
600.0000	1200.0000	750.0000	1350.0000
675.0000	1200.0000	675.0000	1200.0000
750.0000	1200.0000	900.0000	1350.0000
900.0000	1200.0000	1050.0000	1350.0000
1000.0000	1200.0000	600.0000	600.0000
1075.0000	1200.0000	600.0000	600.0000
1225.0000	1350.0000	600.0000	600.0000
350.0000	1375.0000	600.0000	600.0000
600.0000	1500.0000	750.0000	1650.0000
750.0000	1500.0000	900.0000	1650.0000

Inner Structure Width	Inner Structure Length	Frame Width	Frame Length
900.0000	1500.0000	1050.0000	1650.0000
600.0000	1800.0000	750.0000	1950.0000
750.0000	1800.0000	900.0000	1950.0000
900.0000	1800.0000	1050.0000	1950.0000

Simple Cylinder



Table Values

Structure Diameter	1050.0000	1350.0000	1500.0000	1800.0000	1200.0000
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