KTF software
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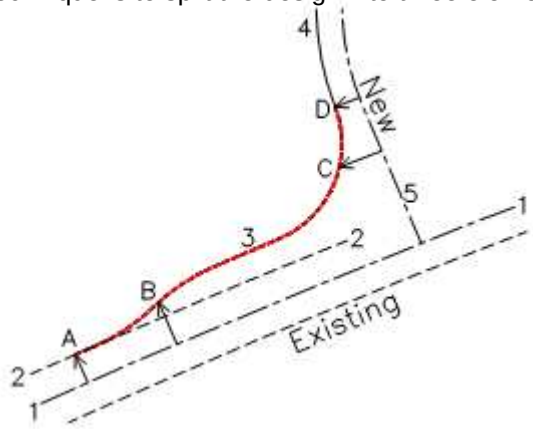
Ground Modelling, Road Design and Land Survey software for Civil Engineering, Environmental and Landscape applications working within CAD.

Existing road to new channel

This sequence combines a number of routines including the vertical design of a junction that exists as a 2D Polyline. The objective here is to achieve a smooth vertical design linking the existing channel in to a new channel line (from a Master String). The technique is to split the design into three elements. A to B, B to C and C to D.



The starting point for this tutorial is an existing road with 3D Polylines representing the channels and centre-line and 2D Polylines representing the centre-line of a new road and a "joining" or widening alignment (in red) that needs to be designed vertically.

1 3D Polyline representing centre-line of Existing road.
2 3D Polyline representing left channel of Existing road
3 2D Polyline (red) representing alignment of "widening channel".
4 3D Polyline from *Design, String* menu items representing new road left channel.
5 Horizontal alignment of New road.

A Start of "widening" on Existing left channel.

A to B "Widening" initially defined by menu item *Design, Strings, Existing Cross Fall to 2D Polyline*.

C to D "Widening" initially defined by menu item *Design, Strings, Assign by Gradient to 2D Polyline*.

D End of "widening" and start of New road left channel.

Step 1 New road alignment design

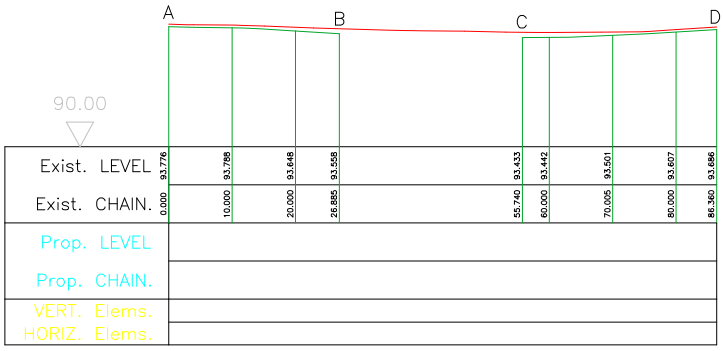
Horizontal and vertical alignment designs as described in the New Road design sequence. The Master String now potentially exists for the New road.

Step 2 New road left channel design

Use *Design, Strings* menu items *Draw* or *Single string defined by Offset and Gradient*. Only output required is Draw 3D Polyline.

Step 3 Project existing fall to widening (A - B)

Write a section defined by the Existing road cross fall “projected” through to the “widening” between A and B. Use menu item *Design, Strings, Assign by existing Cross Fall to 2D Polyline*. Chainage source needs to be the 2D Polyline. Draw this section with the end chainage extended to be at least the same as the length of the widening 2D Polyline (3).



A – B section and C - D section

Step 4 Design channel related to new road (C - D)

Write a section defined by cross fall from the New road Master String to the “widening” between C and D. Use menu item *Design, Strings, Assign by Gradient to 2D Polyline*. Chainage source needs to be the 2D Polyline as in stage 3 above. Superimpose this section on the section drawn by stage 3 above.

Step 5 Design widening vertical alignment

The vertical alignment of the “widening” may now be designed on this combined section. Use the tools in menu items *Sections* and *Design, Vertical* to produce a 2D Polyline representing the vertical alignment. Write the vertical geometry file (.vtg) from menu item *Design, Vertical, Extract geometry*. Alternatively join B to C on the section with a curve and a straight or reverse curves using menu item *Polyline utilities, Join by curves*.

Step 6 Draw widening channel as 3D Polyline

The *Design, Strings, 3D Draw*. Check all is smooth by looking at things in 3D and if low points/gully locations are of interest use menu item *3D Polylines, Highs and Lows (Gullies)*.

Note that problems may occur if B to C is a long length and the site is not very flat. A more suitable method may be to project the existing channel onto most of the widening using *Sections, Create Sections from Drawing entities, Levels along a 2D Polyline*, smooth this out on the section, draw (the Master String), and link this element to the 3D Polyline (from C to D) by the junction design method (*Design, Strings, 3D Junction*).