CEE 4020 - Computer Applications in CEE

Alignments

October 15, 2012

Adding Alignment From Polyline

From the end of P1 (the exit from the NS alignment) the directions are: $330 < S, 500 < N55dE, 600 < E$ with radii of 100 and 500 respectively.

- Draw PLINE (or draw multiple lines and convert to PLINE using POLYEDIT)
- Select PLINE to convert to alignment

Adding Alignment From Layout

Redo the first alignment with the following information:

- Create alignment from layout
- Do not fill in any design information
- Go to 'curve and spinal settings'
- Set curve radius to 100'
- Select 'cubic parabola' curve
- Select Tan-Tan (with curves)option
- Choose P1 and draw the first curve $330 < S, 500 < N55dE$
- Go back to 'curve and spinal settings'
- Set curve radius to 500'
- Select Tan-Tan (with curves)option
- Complete the curve with $600 < E$

Tabular Editing

- Open alignment grid view
- Check for curves.

Alignments As Objects

- Reverse alignment direction
  *Helps in station integrity
- Change alignment names in Properties Box
  *Right click on alignment
  *Select 'alignment properties'
- Set design speed
- Calculate super elevation

Editing Alignments

- Graphical:Grip Editing (NOT good for precise functions)
- At the beginning/end: The point can be moved at will
- In the middle: Allows only translation of element
- Indicates P1 relationship defining curve (Holds radius constant)
- Changes curve radius
- Changes curve length thus indirectly changing radius

Relevant Highway Horizontal Curve Design Formulae

The following formula may be useful:

- Length of curve: $L = \frac{R\Delta\pi}{180}$
- Length of tangent: $T = R.Tan(\Delta/2)$
- Chord length: $C = 2R.Sin(\Delta/2)$
- Design speed: $u^2 = (e + f).15.R$

where, u is design speed, e is superelevation, f is coefficient of side friction, R is radius of curve, Δ is the angle subtended by the curve.