Carlson Civil 2010

Syllabus Outline

Overview

1. Windows File Structure
    a. Drive letters
    b. Folders
    c. Desktop icons (shortcuts)
2. Carslon/Autocad drawing format
3. Coordinates
    a. Drawing base point
    b. N,E,Z = Y,X,Z
    c. Quadrants, bearings and azimuths
4. External data files
5. Carlson modules
6. Layers
7. Mouse Action
    a. Right click
    b. Left click
    c. Middle button/scroll
    d. Mouse click settings
8. Entering dimensions and angles during drawing commands
    a. by picking
    b. by coordinates
    c. by relative dimensions (x,y,z)
9. Carlson Help menu

Settings

1. Drawing setup
    a. Setting the horizontal scale
    b. Set paper
2. Project
    a. Data folder setup
    b. Data type subfolders
3. Configure (setting the defaults)
    a. General settings
        i. Object linking
    b. Drawing setup
    c. Save/load settings
4. Mouse click settings
5. Units control

Part one – Surface Modeling

(Taught by instructional examples)

Surface

1. Draw boundary
    a. Shrink wrap entities
2. Triangulate and contour
    a. Draw faces
    b. Write .tin file
    c. Inclusion/exclusion
    d. Ignore 0 elevation
3. Contour
    a. Draw contours
    b. Contour layers/intervals
    c. Index layers/intervals
4. Labels
    a. Label layer
    b. Hide labels
    c. Label intervals
        i. Distance interval
    d. Selection options
5. Contour labels
    a. Manual labeling
    b. Move label along contour
6. Design pad template
    a. Closed polyline
    b. Select surface file
    c. Fill slopes
    d. Cut slopes
    e. Calculate earthwork

Part two – Road Design

Center line and Profile

1. Creating a centerline
    a. 2d polyline
    b. Polyline to centerline file
    c. Input/edit centerline
    d. Station centerline
2. Quick Profile
    a. Surface file
    b. Centerline file
    c. Save profile (.pro)
3. Design road profile
    a. New profile – proposed grades (.pro)
        i. Existing centerline(.cl)
        ii. Existing (.TIN)
    b. Create new profile (pvi, slopes)
4. Draw profile
    a. Multiple profiles
    b. Draw options

Road Design

1. Design Template
    a. Grades
        i. Slope
        ii. Dist
        iii. ID
    b. Curbs
    c. Cut/fill
    d. Subgrades
2. Road network
    a. Settings
        i. Existing surface
        ii. Triangulate and contour [setup]
            1. draw TIN faces
            2. contour
                a. interval
                b. layers
    b. Road name
        i. Add
            1. centerline(s)
            2. profile(s) - *proposed*
            3. template
    c. Edit intersections

        i. Front/back
        ii. Radii
    d. Cul-de-sac
        i. Add
            1. select road
                a. start/end position
                b. cul-de-sac radius
                c. fillet radii
                d. template ID [tied to radii]
    e. Process
    f. 3d viewer window

Special road design templates and commands

1. Create polyline for atypical section
2. Polyline to centerline file
3. Assign template pt centerline
    a. Add
        i. Create new template (.tpc)
        ii. Template point description (ID)
        iii. Specify centerline
        iv. Side (left or right)
    b. Road network
        i. Edit road
            1. add template (.tpc)
        ii. Process road design
4. 3d polyline
    a. Point elevation entry
    b. Distance entry
    c. Slope entry
    d. Offset 3d polyline
    e. Design pad template
5. Final TIN creation
6. Volumes by triangulation

Sewer Design

1. Input/Edit profile
    a. Type [sewer]
    b. Entering data
        i. Station
        ii. Elevation (invert)
        iii. Pipe size
        iv. Material
    c. Reference profile
2. Draw profile

a. Select sewer profile
b. Draw options
c. Drawing over existing profiles *(note starting station)*