Chapter-1 Libraries

Creating a Roundabout Library

As discussed earlier Bentley Civil Roundabouts (BCR) uses a library roundabout that is a preset configuration of the roundabout (RAB). A special toolset is available for setting up the RAB.
Before beginning, the user should familiarize themselves with the various parts of the RAB. The prior section outlined the description of these parts as defined by FWHA's manual on roundabout design. When working with BCR you will find this same terminology. Additionally BCR expands on this terminology in order to assign properties to other geometric constraints needed for roundabout design. Below is a list of additional terminology:

Circulatory Crown- Describes the location of crown element if desired in the circulatory area.
Overrun (Apron) - area allowed for overrun in turning radius of circulatory area.
Approach- Consists of the group of geometric features that make up the approaching lane to the RAB.
Deflection Area- The theoretical area used entry and exit to the RAB circulatory area.
Flare- Collection of geometric elements along the outer lane of the RAB used to join adjacent approaches.
The exercise below will guide the user through customizing a delivered library RAB. The customization will involve:

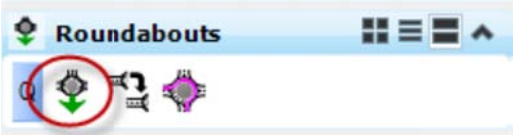
- Selecting a closely related RAB template
- Redefine the geometric components associated to the RAB
- Featurize the geometric components

NOTE: The current version of ProjectWise does not work with Roundabout Libraries. The examples in this manual assume the project is not in ProjectWise, however, it is important that the drawings are placed in ProjectWise when complete.

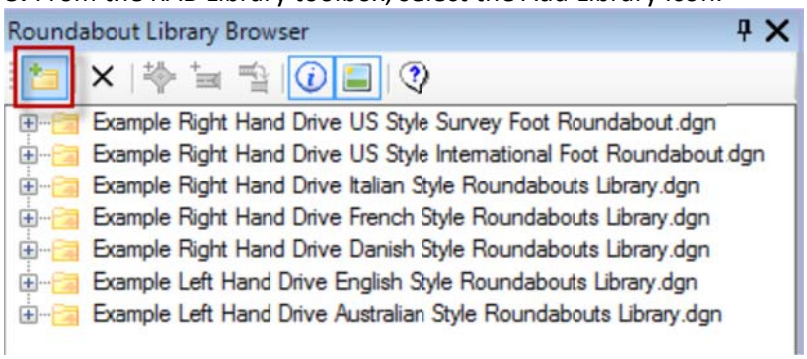
Set Up Roundabout Library

1. Open the File RAB-MODOT.dgn C*:\Data\CH-1Create Library*. (file cannot currently reside in ProjectWise)

2. Open the toolbox "Roundabouts- Library Browser" ... *Tools > Roundabouts>Roundabout Library Browser* or from the task menu



3. From the RAB Library toolbox, select the Add Library Icon.

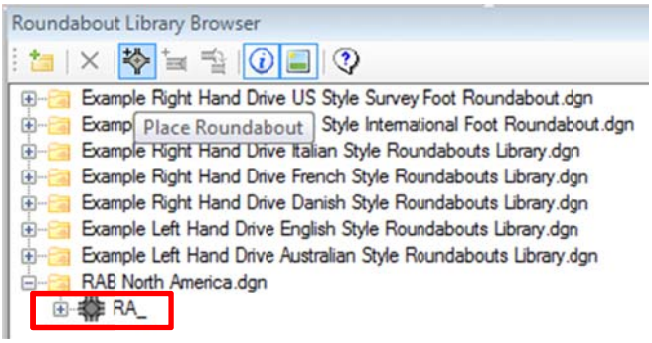


4. Select the RAB North America.dgn. C*:\Data\RoundaboutsII\CH-1Create Library*

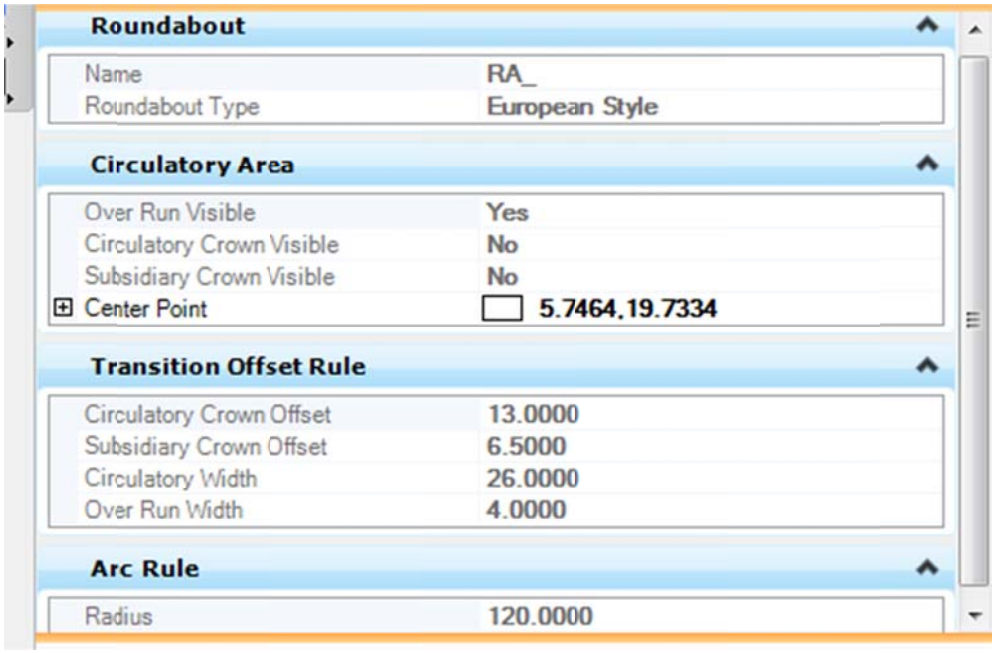
Note *An RAB North America,dgn will now appear in the Roundabout Library Browser*

5. Open the RAB North America Roundabout.

6. Select RA_.

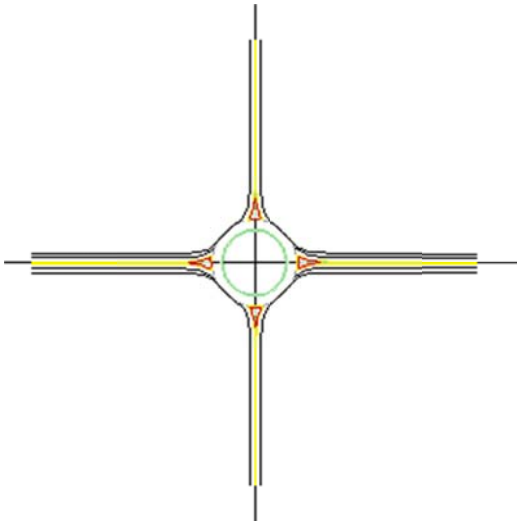


7. Setup the RAB properties.



8. Click the Place Roundabout Tool.

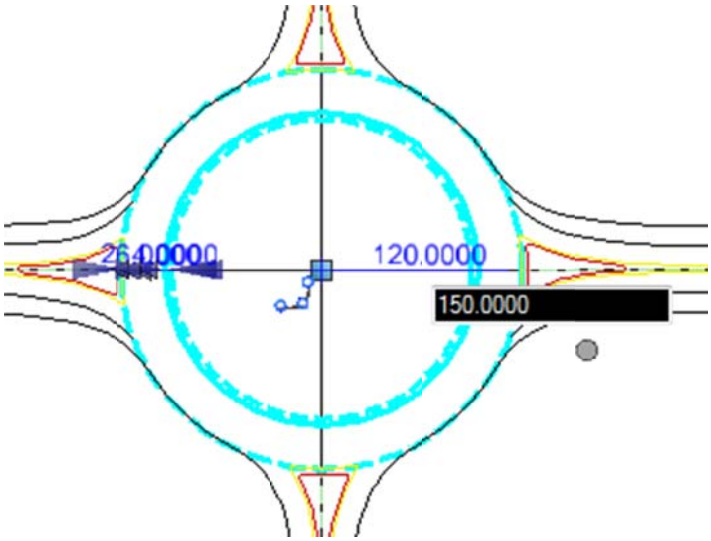
This will place the RAB based on 1 or more legs of the Roundabout. If you select only 1 leg, you will have a roundabout with a single approach created, based on the settings for the approach. An approach will be created for each leg selected. Follow the prompts and select the center point and a RAB will be created. Below a Roundabout has been created selecting 4 legs.



The Library RAB contains the geometric design for a typical RAB. This RAB can be modified by altering any of the features to include additional approaches, customize lanes, circulatory area, and geometry modifications.

Modify Circulatory Area

9. Change the diameter of the RAB circulatory area by selecting any portion of the circulatory area. Change the diameter to 150'. You will see selecting the radius will pull up the Heads Up Display.



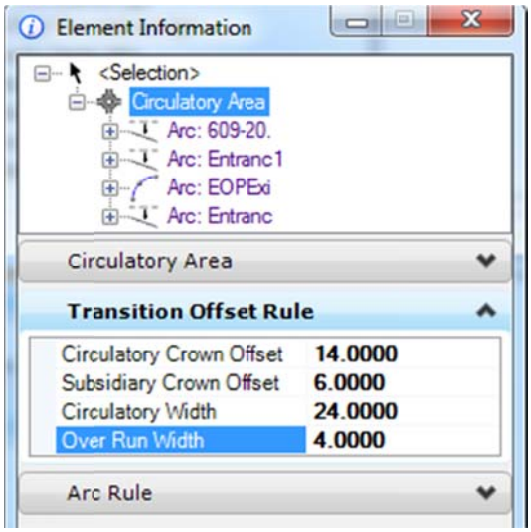
Note *Make the above modification done using the* ***On screen Editing (Heads Up Display)***

Use the MicroStation Element Information tool to change the following:

10. Select the circulatory area.

11. Open the Microstation Element Information dialog .

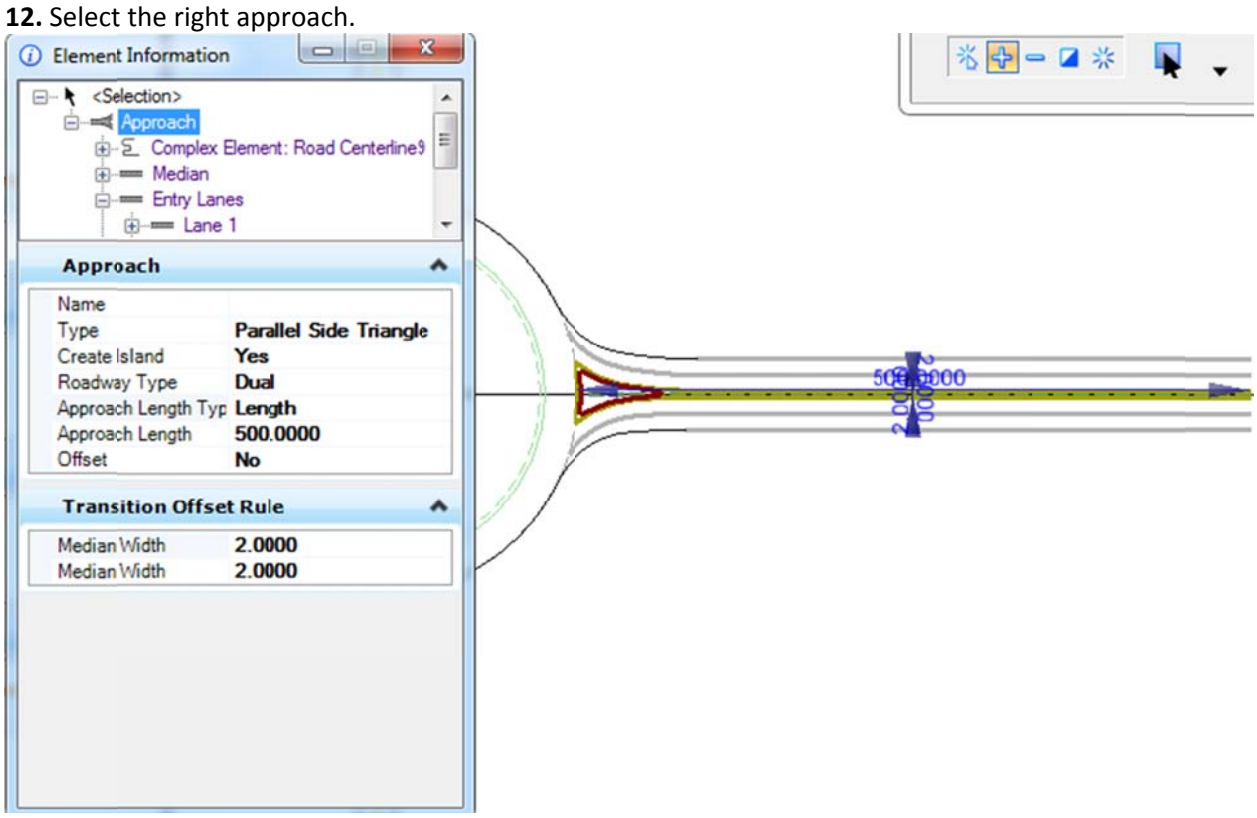
Under the Circulatory Area – Transition Offset Rule, set the following values:



Take time to review the Information available for the different features that make up the Roundabout

Modify Approaches

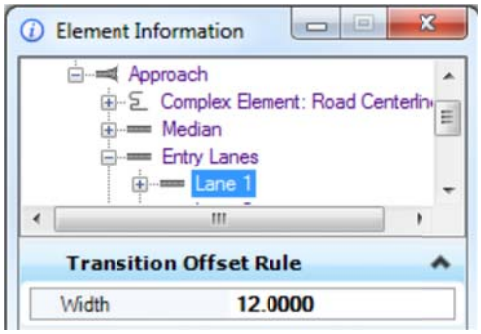
12. Select the right approach.



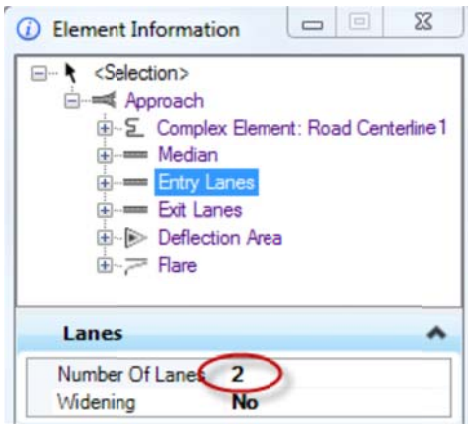
13. Expand the Approach in the element information dialog, expand “Entry Lanes”

14. Highlight Lane1.

15. Set the Lane width to 12'.

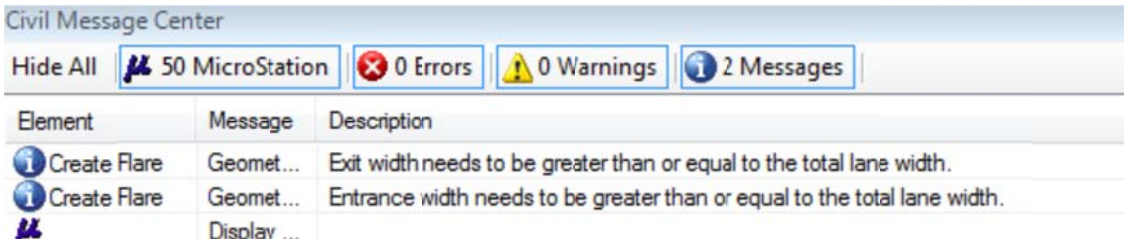


16. Add additional lanes. Set the Number of Entry Lanes to 2.

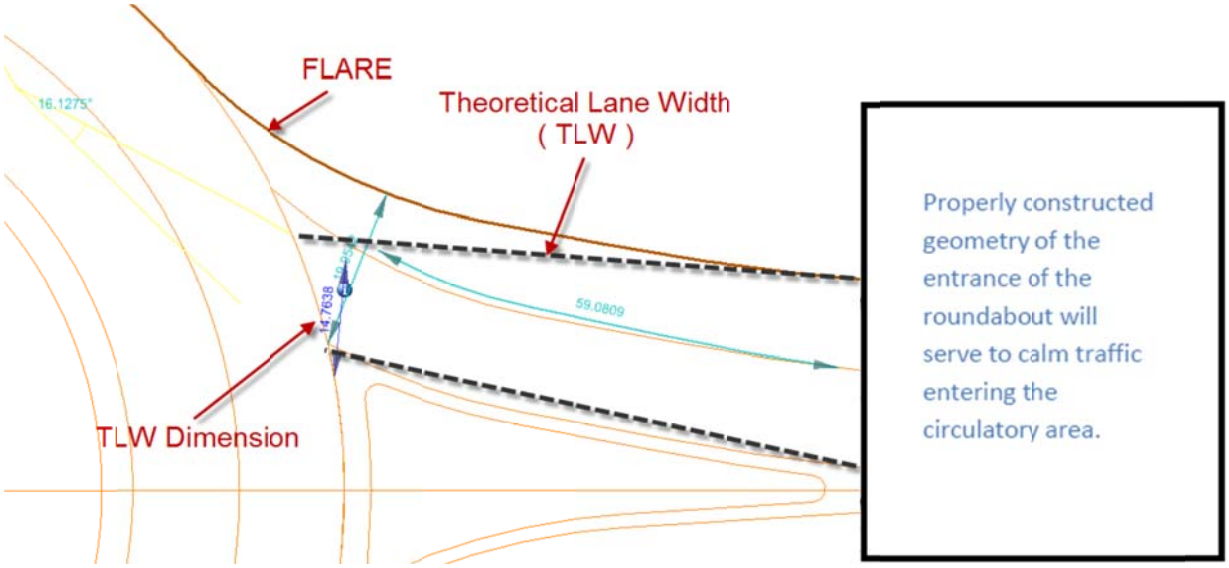


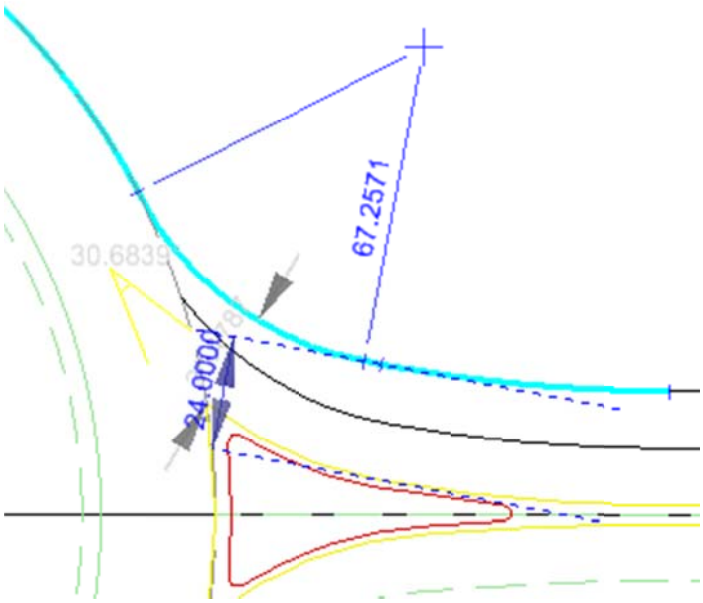
17. Repeat the process for the Exit Lanes, creating 2-12" wide lanes**.**
Experiment with 3 or more lanes.

18. From the Task Menu open the Message Center to view information on the new message alerts. *Tools > Civil Geometry > Message Center.*



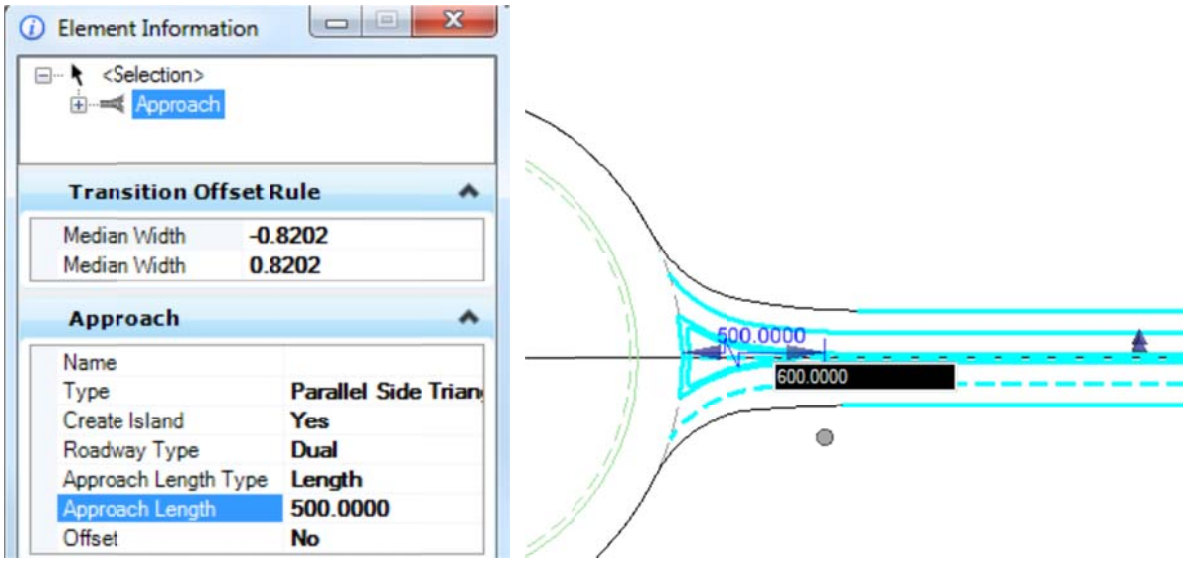
19. Select the entrance "Flare" and zoom to the intersection as shown below. Modify the theoretical lane width to be equal to the combined 2 lane width (12'). Repeat this on the exit lane.



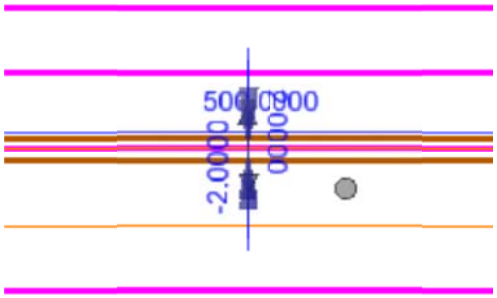


Note *The user will also need to modify the exit lane by selecting the exit flare and editing in the same manner as the entry. Once edited the alerts will disappear.*

20. Modify the length of the right approach by selecting the approach. Change the "**Approach Length Type**" in the element information dialog to "**Length**" this will add an Approach Length field to the information dialog. Enter 600' for the length.

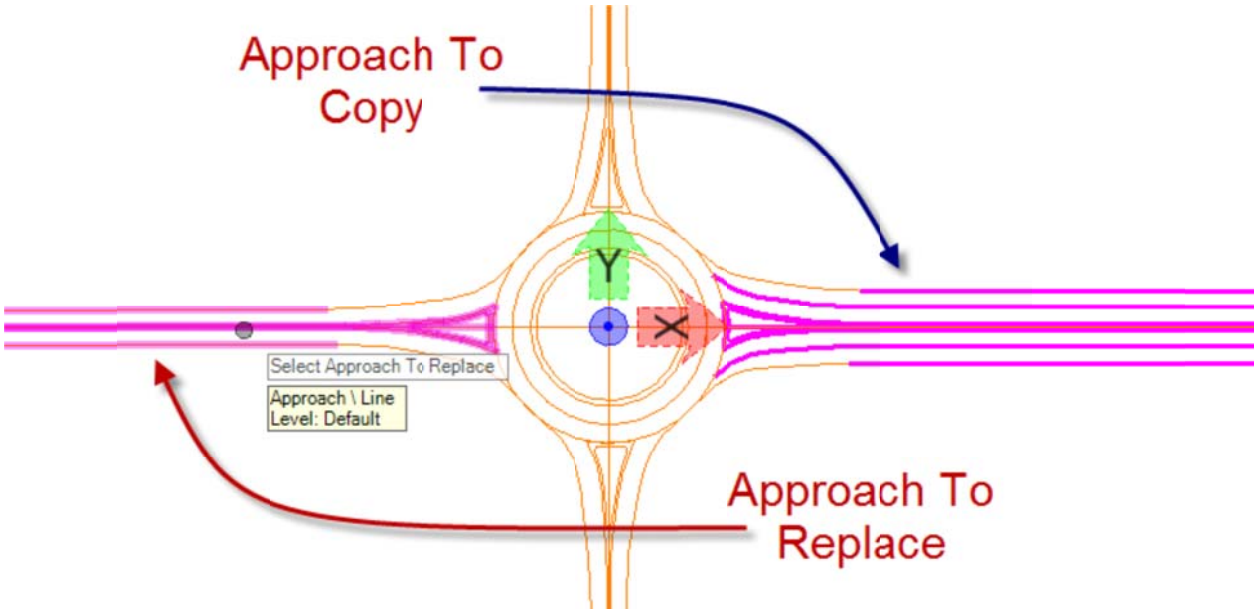


21. Last- Modify the central median Width to 2' by selecting the center of the approach and use the **Heads Up Display** enter 2' for both the entry reserve and exit reserve.



Modify Remaining approaches

22. Modify the "Left" approach using the Replace Approach command. THIS TOOL IS LOCATED UNDER TOOLS>ROUNDABOUTS, OR IN THE TASK MENU FOR ROUNDABOUTS. THIS IS NOT THE TOOL LOCATED IN THE ROUNDABOUTS LIBRARY.



23. Modify the Upper and lower approaches as follows.

a. Change the approach length to 400’.

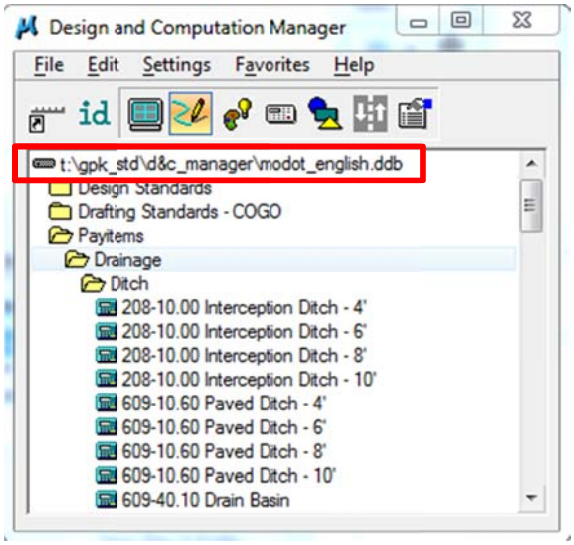
b. Change the Entry and Exit Lane width to 12’.

24. Save and Close your drawing file.

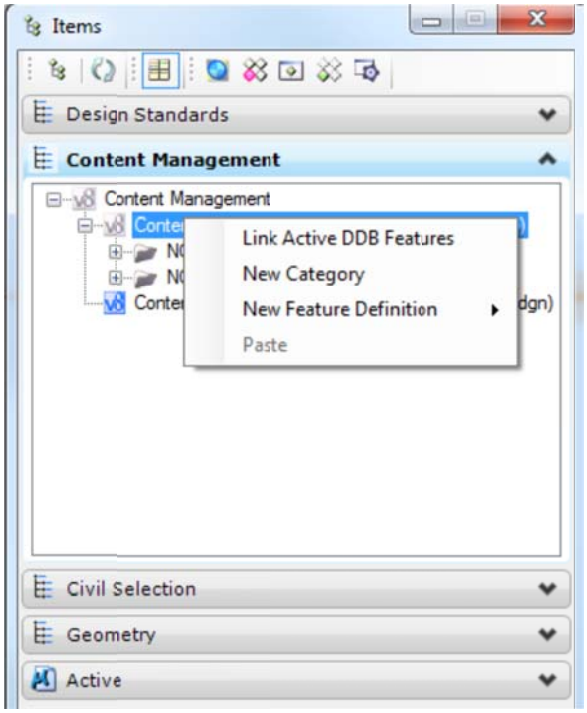
Linking Features Database

Prior to assigning features make sure the Design and Computation Manager has the “Modot_english.ddb” as the items database.

- Activate GEOPAK
- Open Design and Computations Manager



Open the Items Browser on the Primary Tool Bar.



Once imported features with annotation properties can be set to auto annotate. Features used in Hz geometry (IE alignments) can be set for geometry to persists or store in the native Coordinate Geometry database. These attributes are set using the Details panel, accessed through the Item Browser.

The user can assign features to each element comprising the roundabout. Using the now linked DDB, you can assign features to control symbology and assist in quantities calculations.

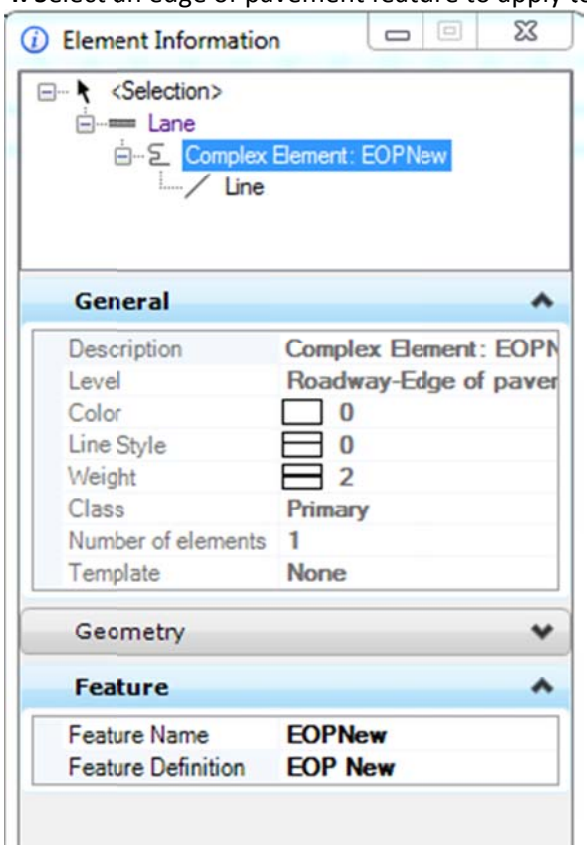
Assigning Features to the RAB

1. Select outer lane of any of the RAB approaches and open element information.

2. Expand the Lane down to the "complex element".

3. Use the Feature section, tag the feature Definition field to expose the list of active features.

4. Select an edge of pavement feature to apply to the outer lane edge.



Assigning features in the library is much more efficient as the features will be automatically passed into the RAB design project.

5. Repeat this process to the various geometric components as time permits.

A completed RAB library will be used in the subsequent sections based off the workflow used in this chapter.