Chapter 19

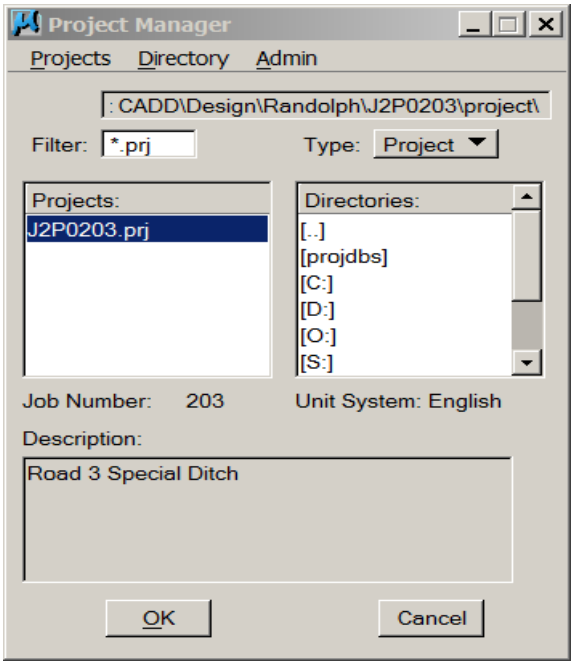
Special Ditch Profiles

19.1 Exercise: Special Ditch Profiles

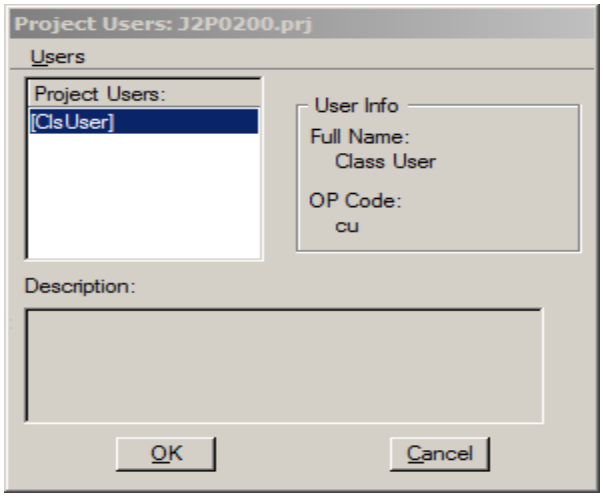
1) Open the **plan.dgn.**

2) Using Project Manager open the following project:

pw:\District CADD\Design\Randolph\J2P0203\project\J2P0203.prj

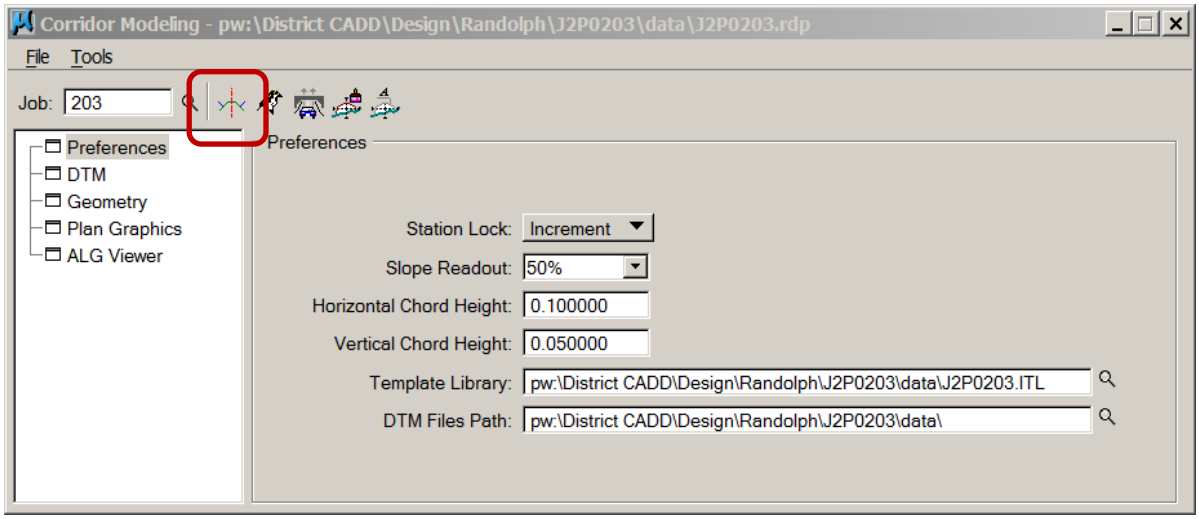


Select **ClsUser** as the project user.

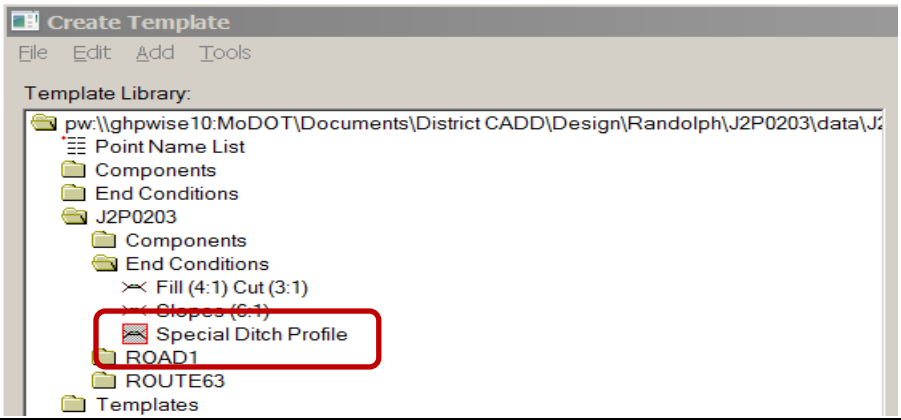


3) From the GeoPak Road Tool Palette, select **Corridor Modeling**:

4) Open Corridor Modeling, load the **J2P0203.rdp** and then select the **Open Create Template** icon.



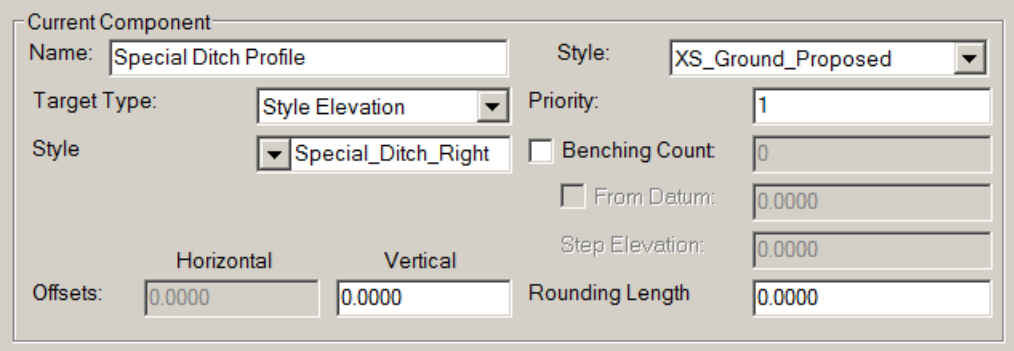
5) Navigate to the **J2P0203 > End Conditions** folder and right click to create a new template called "**Special Ditch Profile".**



6) To create the new slope component, right-click on the Template Window and select **Add New Component > End Condition**.

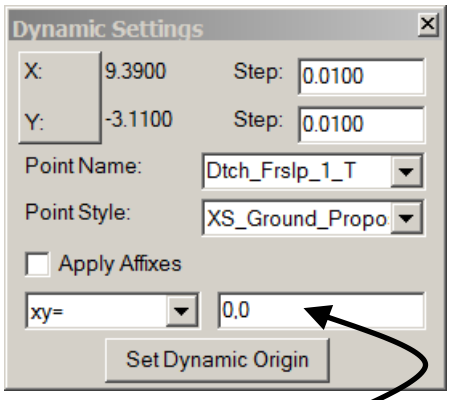
7) Setup the Current Component portion of the Create Template dialog as follows:

Name: **Special Ditch Profile**
Style: **XS Ground Proposed**
Target Type: **Style Elevation**
Style: **Special_Ditch_Right**
Priority: **1**
Surface: **<Active>**



8) For the first point setup the **Dynamic Settings** dialog as follows:

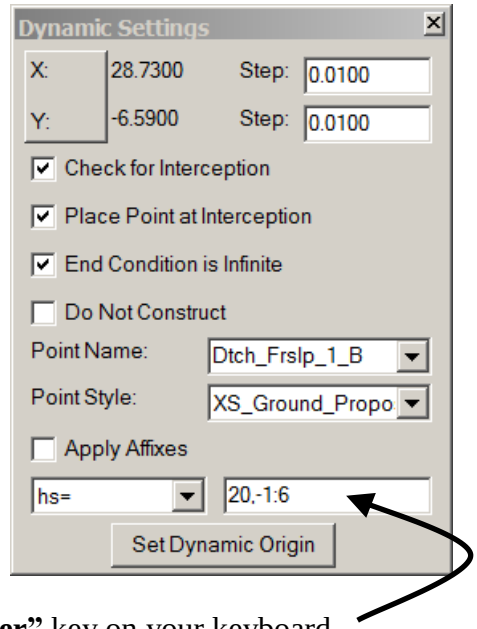
Point Name: **Ditch_Frslp_1_T (select from list)**
Point Style: **XS_Ground_Proposed**
Apply Afhxes: **Disabled**
Precision Input: **xy = 0,0**



With your cursor in the **xy=0,0 field**, press the "**Enter"** key on your keyboard.

9) For the second point setup the **Dynamic Settings** dialog as follows:

Check for Interception:	**Enable**
Place Point at interception:	**Enable**
End Condition is Infinite:	**Enable**
Do Not Construct:	**Disabled**
Point Name:	**Ditch_Frslp_1_B**
Point Style:	**XS Ground Proposed**
Apply Affixes:	**Disabled**
Precision Input:	**hs = 20,-1:6**



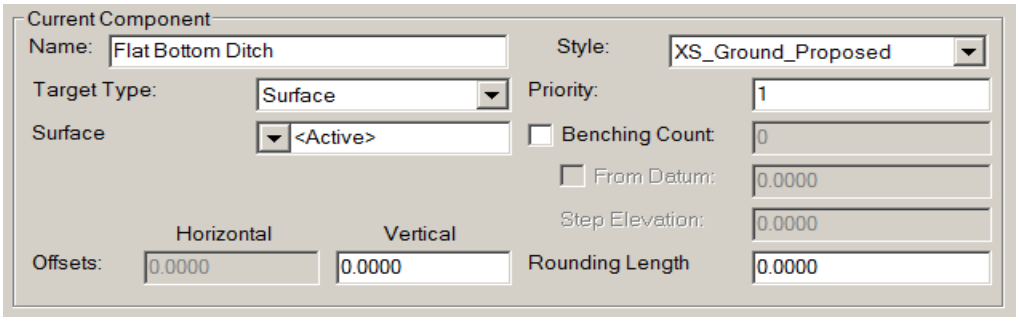
With your cursor in the **hs = 20,-1:6 field**, press the "**Enter"** key on your keyboard.

10) **Right-click** on the Current Template window and select **Finish**.

11) **Create the next Ditch Component** by Right-clicking in the Current Template window and select **Add New Component > End Condition**.

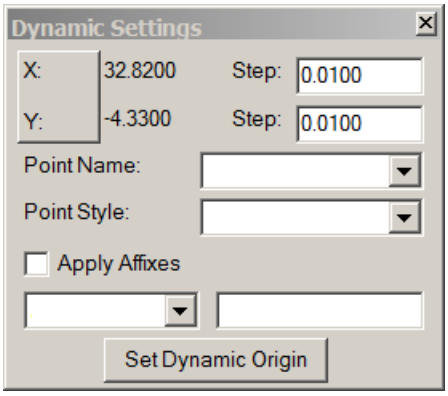
Setup the Current Component portion of the Create Template dialog as follows:

Name:	**Flat Bottom Ditch**
Style:	**XS Ground Proposed**
Target Type:	**Surface**
Priority:	**1**
Surface:	**<Active>**



12) For the first point setup the **Dynamic Settings** dialog as follows:

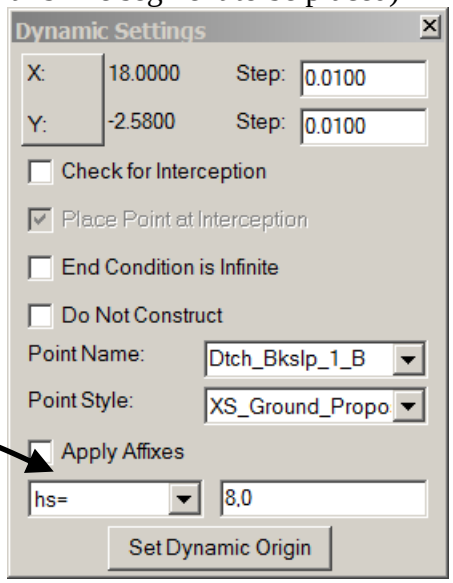
X Step: 0.10
Y Step: 0.10



Start the Flat Bottom Ditch by place it's first point on top of the **Dtch_Frslp_1_B** point.

13) To place the **Back of Ditch bottom** point, set the **Dynamic Settings** dialog as follows:

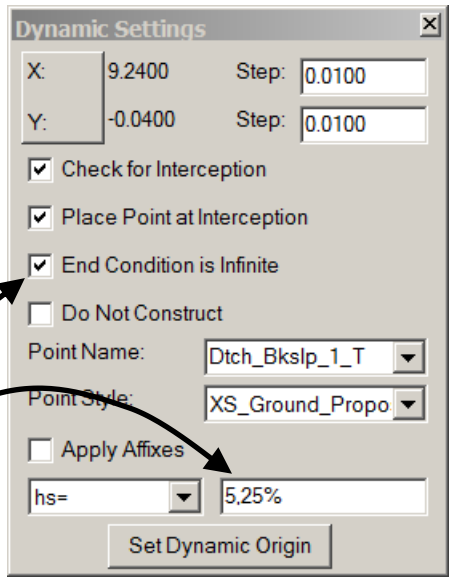
Point Name:	**Dtch_Bkslp_1_B** (select from list)
Check for Interception:	**Disabled** (This forces this line segment to be placed)
Place Point at Interception:	**Disable**
End Condition is Infinite:	**Disabled**
Do Not Construct:	**Disabled**
Apply Affixes:	**Disabled**
Precision Input:	**hs = 8,0**



With your cursor in the **hs = 8,0 field**,
Press the Enter key

14) To place **Slope-Stake point**, set up the **Dynamic Settings** dialog as follows:

Point Name:	**Dtch_Bkslp_1_T** (select from list)
Check for Interception:	**Enable**
Place Point at Interception:	**Enable**
End Condition is Infinite:	**Enable**
Do Not Construct:	**Disabled**
Apply Affixes:	**Disabled**
Precision Input:	**hs = 5 ,25%**



Toggle on **End Condition is Infinite**

With your cursor in the **hs = 5, 25.0%**, press the Enter key

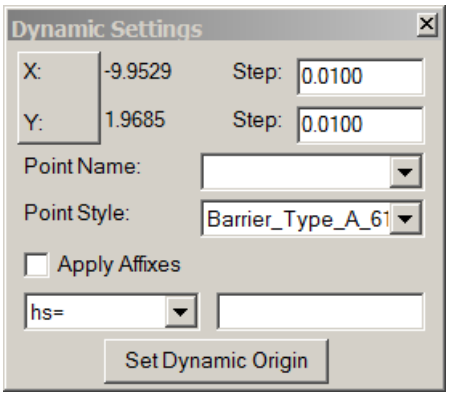
15) **Right-click** on the Current Template window and select **Finish**.

16) Select **File > Save** to save the template library.

17) Test the End Conditions by selecting the "**Test"** button located under the Current Template window.

Try and draw the **Active Surface** in the test window. You will notice the ditch does not draw until you introduce the **Special Ditch Profile Style Elevation**.

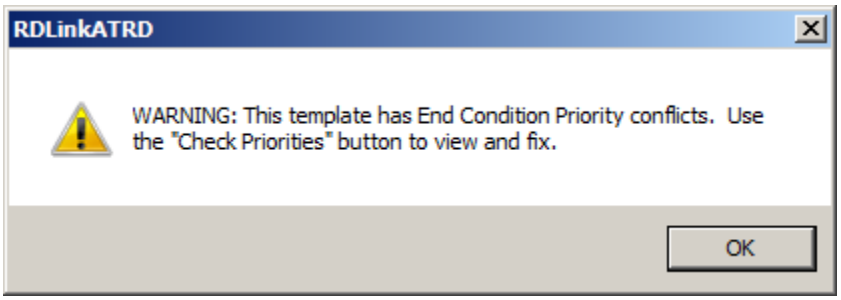
18) Next we need to account for cases where there will be not be Special Ditch Profile. To do this drag and drop the following **MoDOT** standard **End Conditions** into our new combined End Condition template. Be sure the **Dynamic Settings** are active and with a step increment set to 0.01



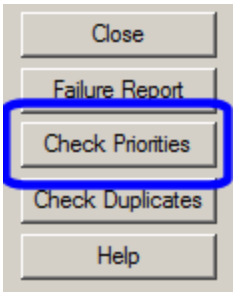
Right Side

Fill Slope 1 (6:1)
Ditch

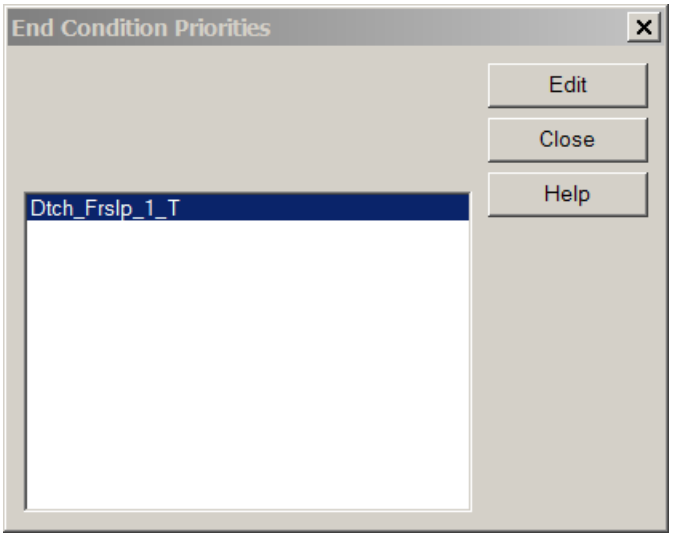
19) Once again test the End Conditions by selecting the "**Test"** button located under the Current Template window. A warning will be given about the template having end condition priority conflicts.



20) Select **Check Priorities** on the right side of the Test End Conditions window.

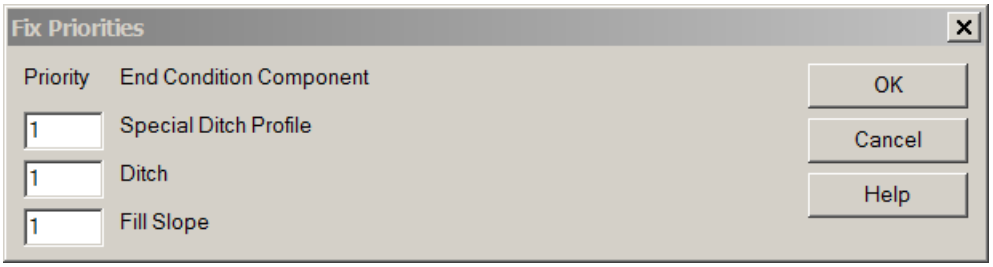


Notice the **Ditch_Frslp_1_T** point is the point that has the priority conflicts.



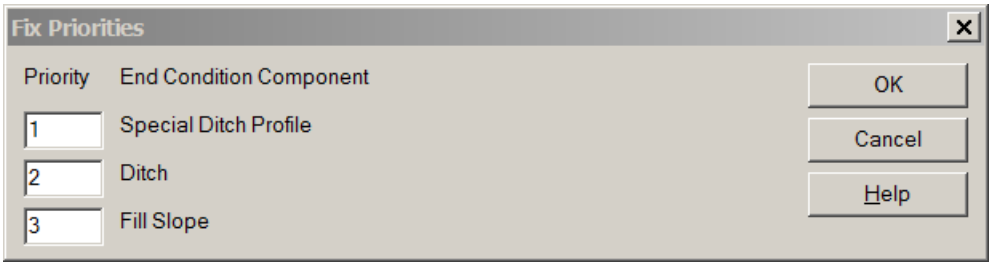
21) In the **End Condition Priorities** dialog select **Edit**.

Notice that all the end conditions have the same priority number.



Put your cursor in each of the fields and notice the segments highlighting.

The Special Ditch Profile is the most desirable condition, therefore set the priorities as follows:



Click OK, and then Close.

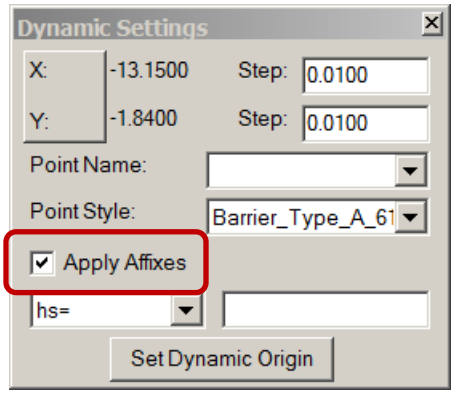
22) Select the active surface and click "**Draw"** on the right side of the **Test End Conditions** window. Move your cursor over the end conditions.

Next introduce the Special Ditch Profile by selecting the Special Ditch Profile style and click "**Draw**".

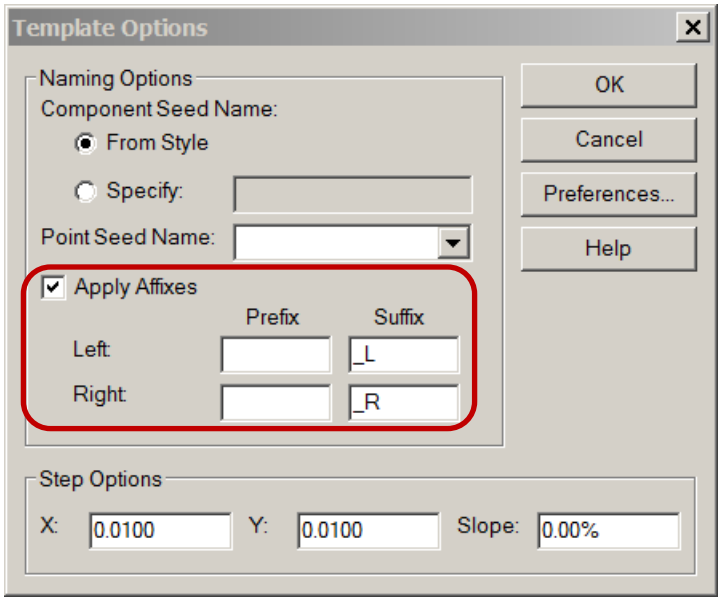
23) Close the **Test End Conditions** dialog. Save the Template Library by Selecting **File > Save**.

24) In **Create Template** navigate to the **J2P0203/Road1** folder and remove the End Conditions in the Road1 Two Lane Rural & Urban templates.

25) Set the following Dynamic Settings:



26) In **Create Template** go to **Tools > Options** and confirm the following Affixes are set:



27) In **Create Template** use the following components to modify the **Road1 Two Lane Rural & Urban Templates**:

End Conditions:

Left Side	**Right Side**
Special Ditch Profile	Special Ditch Profile

*Notes

a) In the **Special Ditch Profile_L** component of both templates change the Style Elevation to **Special Ditch Left.**
b) Save Template Library
c) Close out of Create Template and Corridor Modeler.

28) Store the following 4 Special Ditch Profiles using separate COGO input command for each:

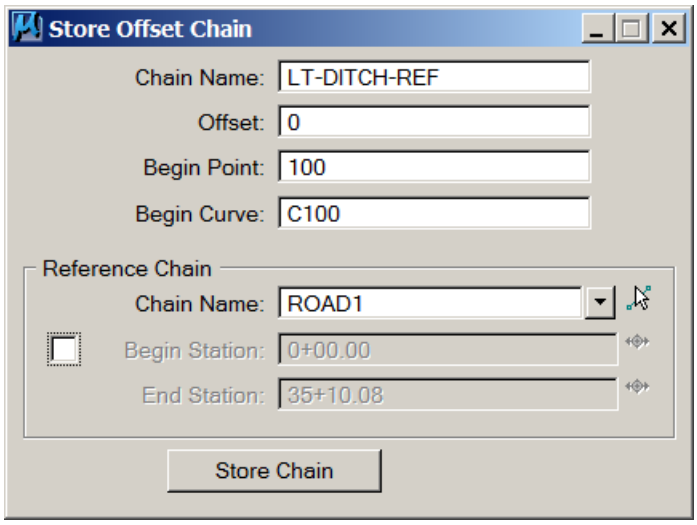
STORE PROfile **ROAD1-LT-1**
VPI 1 Station **0+50 E**levation **820.20**
VPI 2 Station **12+50 E**levation **820.00**
END PROFILE

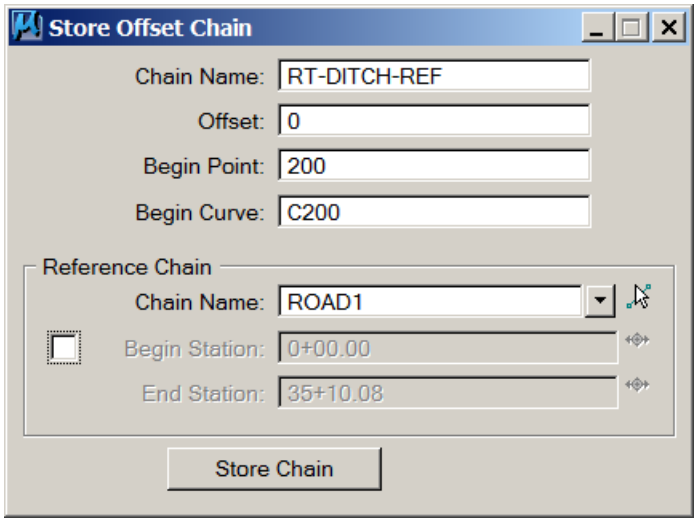
STORE PROfile **ROAD1-LT-2**
VPI 1 Station **16+00 E**levation **830.00**
VPI 2 Station **25+80 E**levation **848.20**
END PROFILE

STORE PROfile **ROAD1-RT-1**
VPI 1 Station **0+00 E**levation **821.00**
VPI 2 Station **11+00 E**levation **818.37**
END PROFILE

STORE PROfile **ROAD1-RT-2**
VPI 1 Station **31+30 E**levation **851.50**
VPI 2 Station **35+10 E**levation **855.06**
END PROFILE

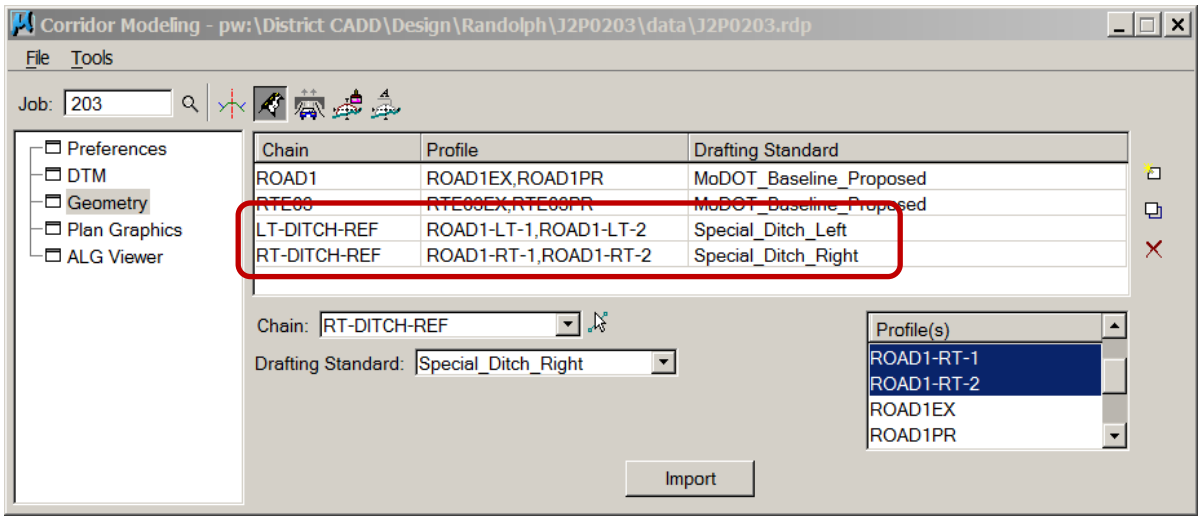
29) In order to target multiple profiles using a single style elevation the User will need to create a chain that incorporates the station range of the special ditch profiles. In this case we will offset (offset=0) the Road 1 baseline chain to create the reference chains for the left and right side of the roadway.





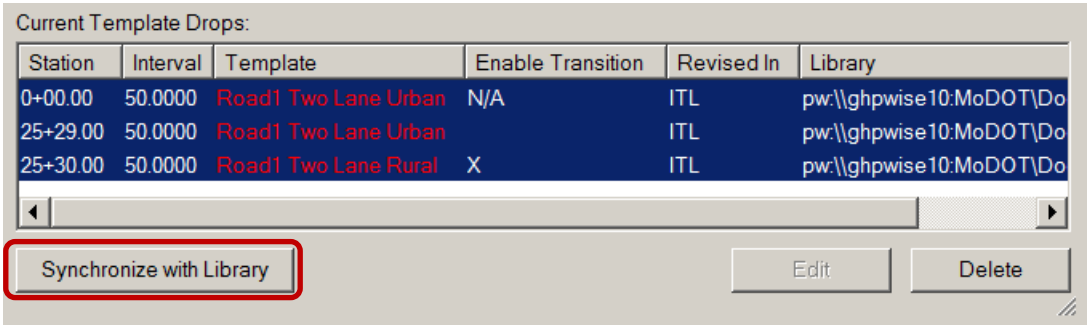
30) Back in Corridor modeling import the following Chain and Profiles:

Chain	Profiles	Drafting Standard
LT-DITCH-REF	ROAD1-LT-1, ROAD1-LT-2	Special_Ditch_Left
RT-DITCH-REF	ROAD1-RT-1, ROAD1-RT-2	Special_Ditch_Right



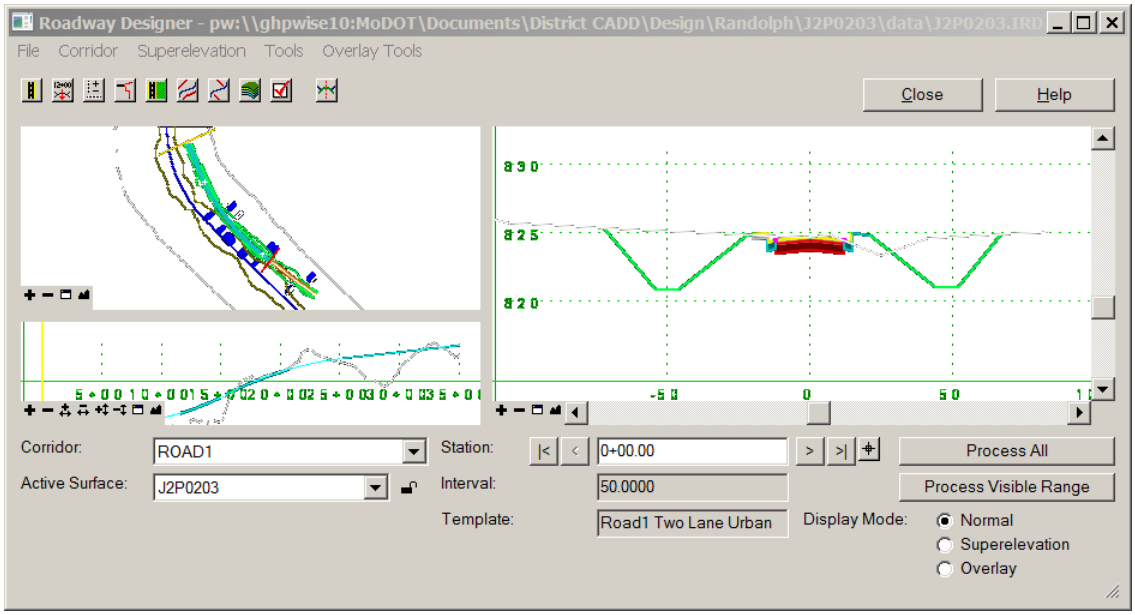
31) Open Roadway Designer (**J2P0203.ird**) and verify the active corridor is the **Road1** corridor. Next navigate to the template drop dialog (Corridor > Template Drops).

Update the Template Drops by selecting the drops first and then selecting "Synchronize with Library"



Close the Template Drop Dialog

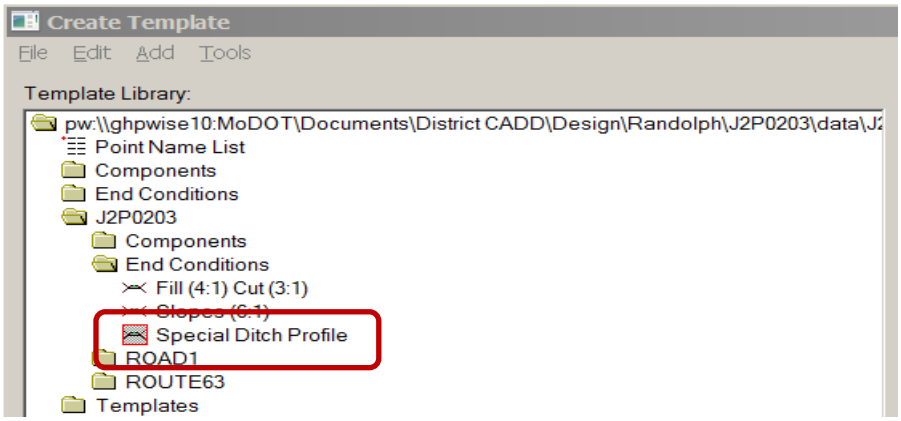
32) Back in Roadway Designer review the section with the special ditch profiles



One thing you will notice very quickly is that it is very hard to visually determine if the Special Ditch is properly drawing. To help with this we are going to make some addition changes to the Special Ditch Profile End Condition.

33) Open the Template Library from within Roadway Designer by selecting the last icon across the top.

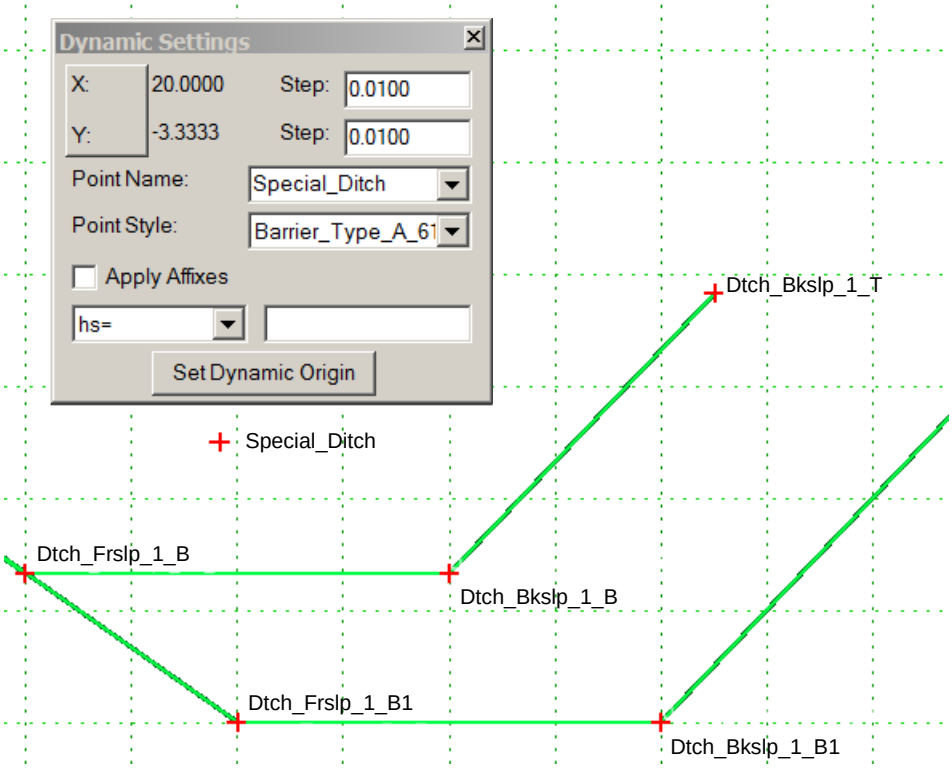
34) Navigate to the **J2P0203 > End Conditions** folder and double click on the End Condition called "**Special Ditch Profile"** to make it active.



35) Make active the Dynamic Setting dialog with a step increment set to 0.01 or greater.

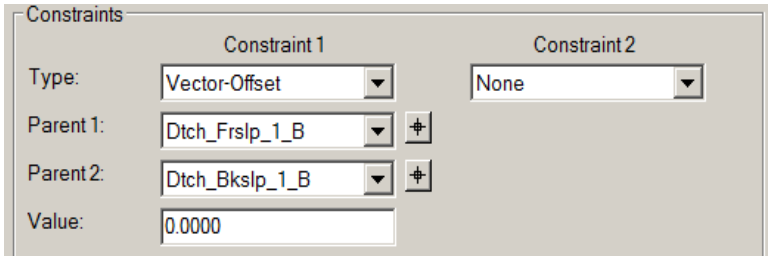
The first thing we are going to add to the end condition is a Special Ditch point.

Right Click and select **Add New Component > Null Point** and place a point called "**Special_Ditch**" just above the Flat Bottom Ditch.

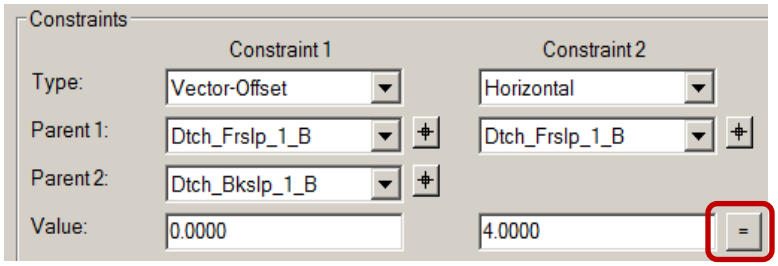


36) Within the Special_Ditch Point Properties modify the following constraints:

<u>Constraint 1</u>
Type: Vector-Offset
Parent 1: Dtch_Frslp_1_B
Parent 2: Dtch_Bkslp_1_B
Value: 0.0000

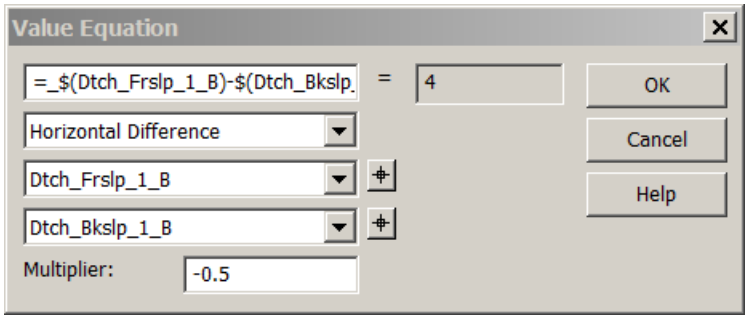


<u>Constraint 2</u>
Type: Horizontal
Parent 1: Dtch_Frslp_1_B
Value: 4.0000



To make sure that the Special_Ditch point is always in the middle of the flat bottom ditch we are going to introduce a Value Equation by clicking on the "=" sign just to the right of the horizontal value of 4.

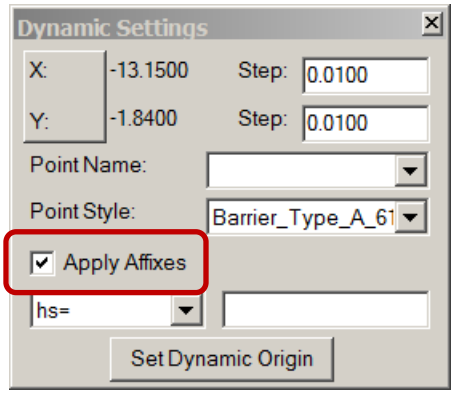
Equation: =_$(Dtch_Frslp_1_B)-$(Dtch_Bkslp_1_B)*-0.500
Type: Horizontal Difference
Parent 1: Dtch_Frslp_1_B
Parent 2: Dtch_Bkslp_1_B
Multiplier: -0.5



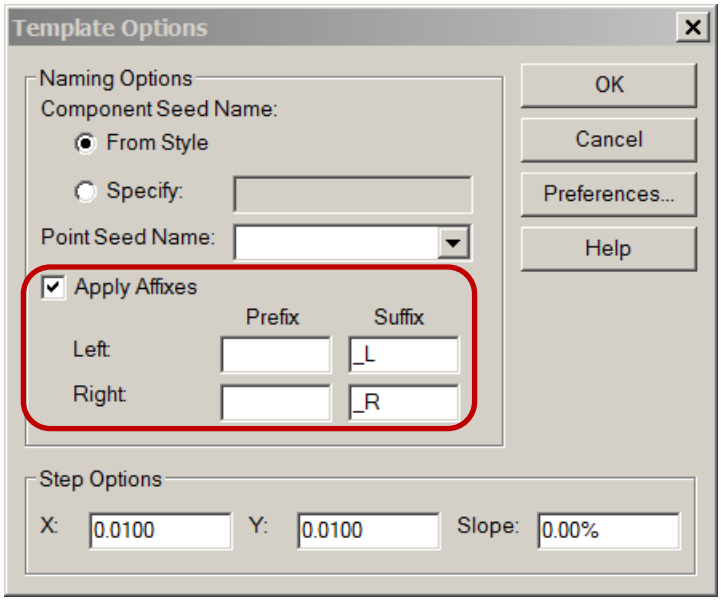
Now that we have added this point it will show up in all Cross Section where a special ditch is present.

37) Next navigate to the **J2P0203/Road1** folder and remove the End Conditions in the Road1 Two Lane Rural & Urban templates.

38) Set the following Dynamic Settings:



39) In **Create Template** go to **Tools > Options** and confirm the following Affixes are set:



40) In **Create Template** use the following components to modify the **Road1 Two Lane Rural & Urban Templates**:

End Conditions:

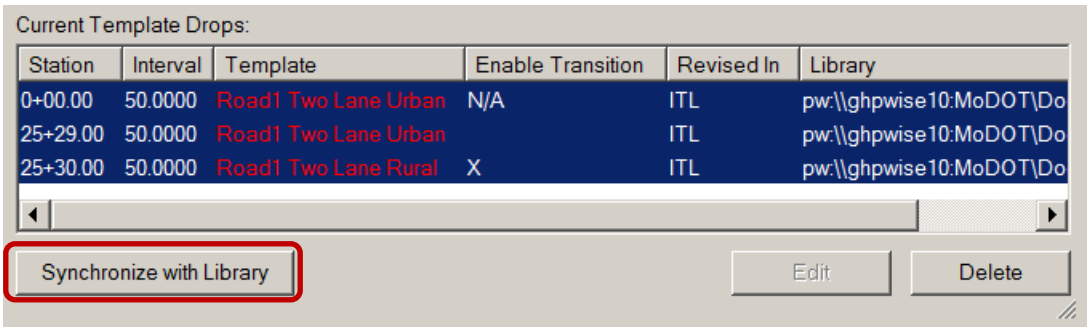
Left Side	**Right Side**
Special Ditch Profile	Special Ditch Profile

*Notes

d) In the **Special Ditch Profile_L** component of both templates change the Style Elevation to **Special Ditch Left.**
e) Save and close the Template Library

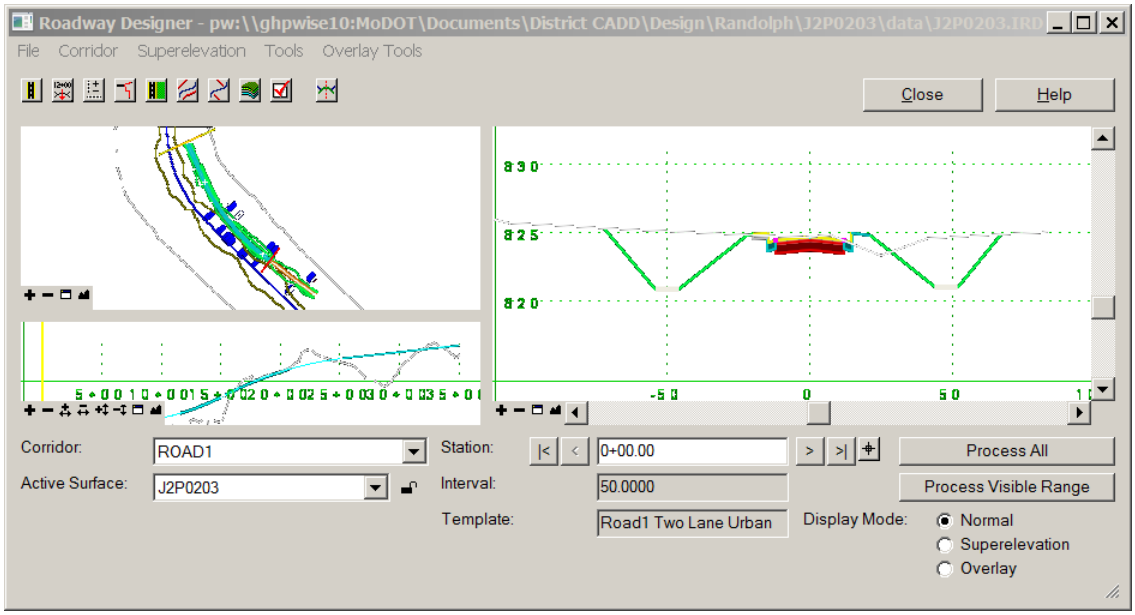
41) Open Roadway Designer (J2P0203.ird) and verify the active corridor is the Road1 corridor. Next navigate to the template drop dialog (Corridor > Template Drops).

Update the Template Drops by selecting the drops first and then selecting "Synchronize with Library"



Close the Template Drop Dialog

42) Back in Roadway Designer review the section with the special ditch profiles



When a special ditch profile is applied a point will be place at the Chain and Profile location. Therefore with this project the User should see a point at the mid point of our template when a special ditch profile is active for a particular station.