

U.S. Department of Transportation (USDOT)
Federal Highway Administration (FHWA)
Federal Lands Highway (FLH)

OPENROADS DESIGNER TEMPLATE LIBRARY OVERVIEW

WorkSpace 10.10
September 2022

NOTE: CFL and EFL still use Workspace 10.9. Consultants should check with their COR prior to using Workspace 10.10.



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RECORD OF REVISIONS

The following record of revisions to the OpenRoads Designer Template Library Overview for Workspace 10.10.21 is offered as a “quick reference” to determine the latest changes. While we strive to keep this table current, the best practice is to refer to the document.

SECTION	REVISION DATE	REVISION DESCRIPTION
All	September 2022	Start of document

GENERAL NOTES

The following applies to the Template Library associated with OpenRoads Designer WorkSpace version 10.10+.

- Assembled templates – All templates have display rules built-in to control the display of the wedge component and end condition for each side.
- Parametric Constraints – When assembling a template from individual pieces, the Parametric Constraints will not honor the Apply Affixes setting. Instead, they will add a prefix minus "-" sign (i.e., Cut Slope will retain name on Right side, but left side will get named -Cut Slope). It is suggested to rename these without the minus sign and add "_L" and "_R" suffixes. Additionally, the relationship of points with other components will need to be established.
- End Condition Templates – The end condition templates have a ditch built in but can be set to zero "0" depth if one is not desired. If the ditch is to be set to a depth of zero 0, it is recommended to merge the points to reduce the amount of useless breaklines for final delivery.

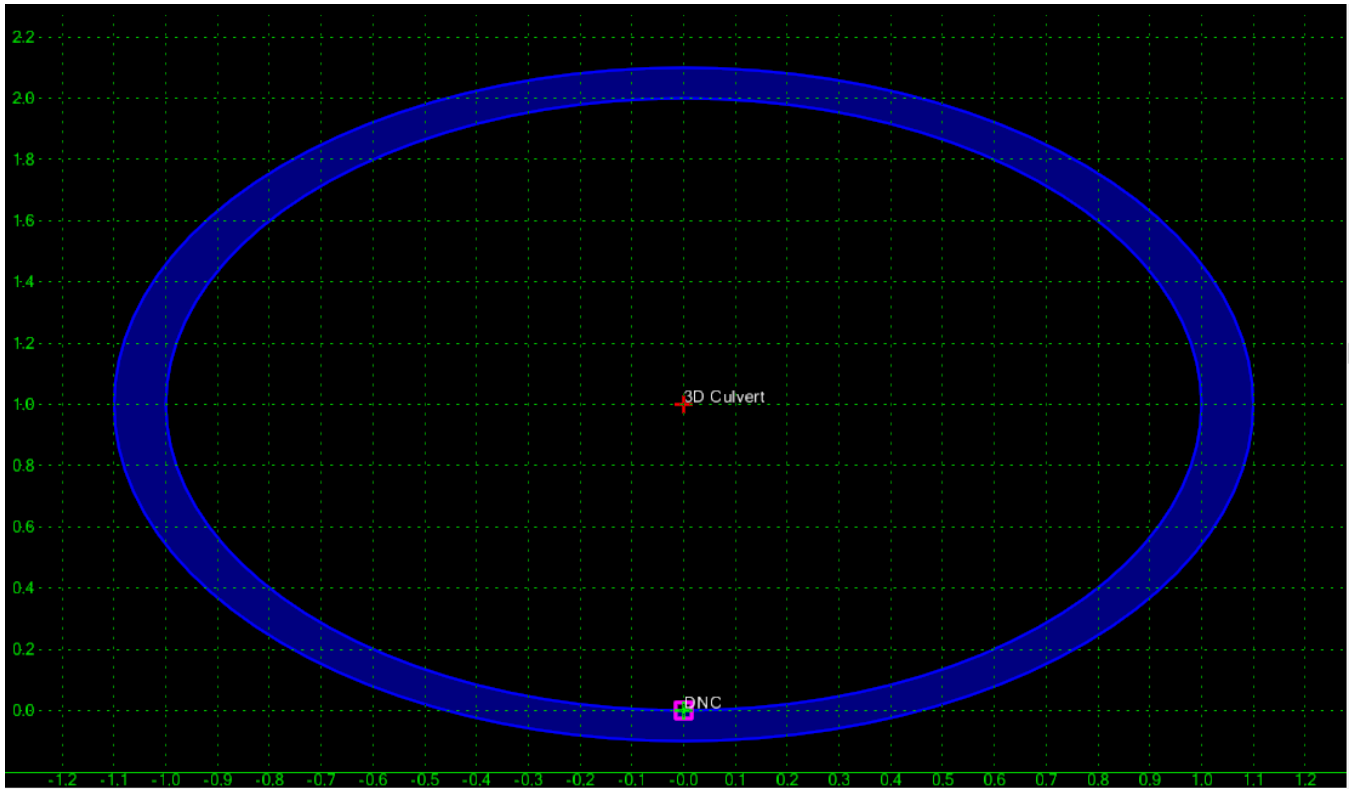
1. CULVERT

1.1. 3D_CULVERT

Location. <project template library>/ORD Templates/Culvert/3D_Culvert

Description. This template is to be applied for culverts.

Figure 1 – 3D Culvert Template



Parametric Constraints.

Table 1 – 3D_Culvert parametric constraints

Parametric Constraint	Setting	Use
Pipe_Exterior_Radius	1.1'	Adjust exterior pipe radius
Pipe_Interior_Radius	1.0'	Adjust interior pipe radius

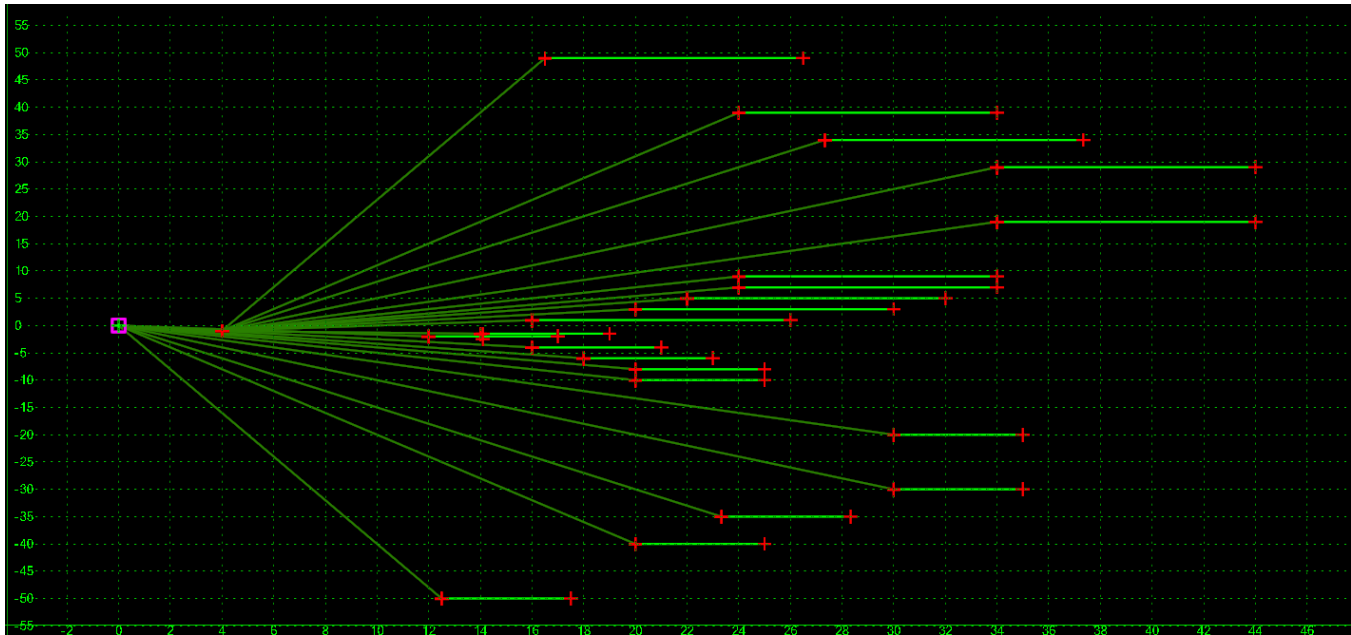
2. END CONDITIONS

2.1. CUT & FILL w/CONST

Location. <project template library>/ORD Templates/End Conditions/Cut & Fill w/Const

Description. This end condition has slope stake limit of 1:2 to 1:6 CUT priority over FILL with topsoil, ditch, and construction limit included.

Figure 2 – Cut & Fill w/Construction Limit Template



How to assemble with main template. Drag end condition onto the daylight point of subgrade, Hinge point will automatically merge with component point.

Parametric Constraints.

Table 2 – Cut priority and fill with ditch + construction limit end condition parametric constraints

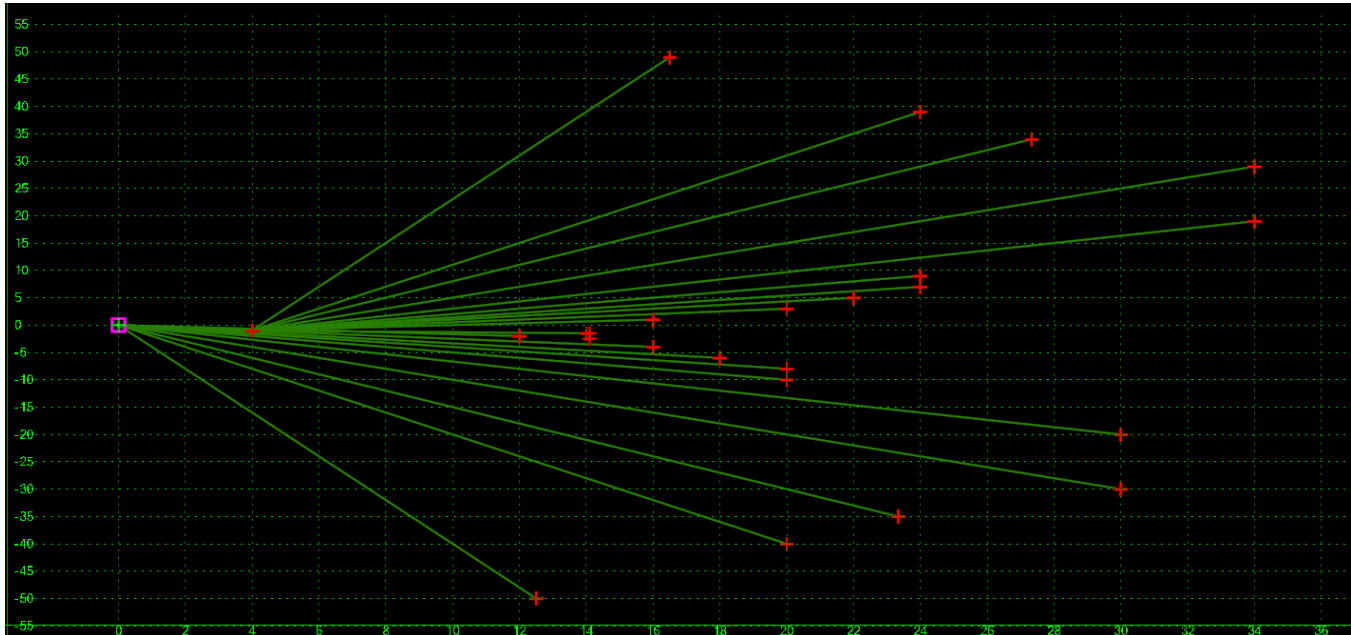
Parametric Constraints	Setting	Use
Cut Slope	Equal to slope	Adjust cut slopes
Construction Limit	10' on Cut, 5' on Fills	Adjust the offset of Const. Limits
Daylight Depth	1'	Adjust depth of Daylight Ditch
Daylight Ditch Width	0'	Adjust width of Daylight Ditch
Daylight Foreslope	1:4	Adjust foreslope of Daylight Ditch
Ditch Bot Slope	0%	Adjust slope of Daylight Ditch
Ditch Bot Width	0'	Adjust width of Ditch
Ditch Depth	1'	Adjust depth of Ditch
Ditch Foreslope	1:4	Adjust foreslope of Ditch
Fill Slope	Equal to Slope	Adjust fill slopes

2.2. CUT & FILL w/TABLES

Location. <project template library>/ORD Templates/ End Conditions/Cut & Fill w/Tables

Description. This end condition has slope stake limit of 1:2 to 1:6 CUT priority over FILL with topsoil and ditch included.

Figure 3 – Cut & Fill w/Tables Template



How to assemble with main template. Drag end condition onto the daylight point of subgrade, Hinge point will automatically merge with component point. If wanting to be controlled by a display rule, then all end condition branches will need to be made a child of the component it's attached to.

Parametric Constraints.

Table 3 – Cut priority and fill with ditch end condition parametric constraints

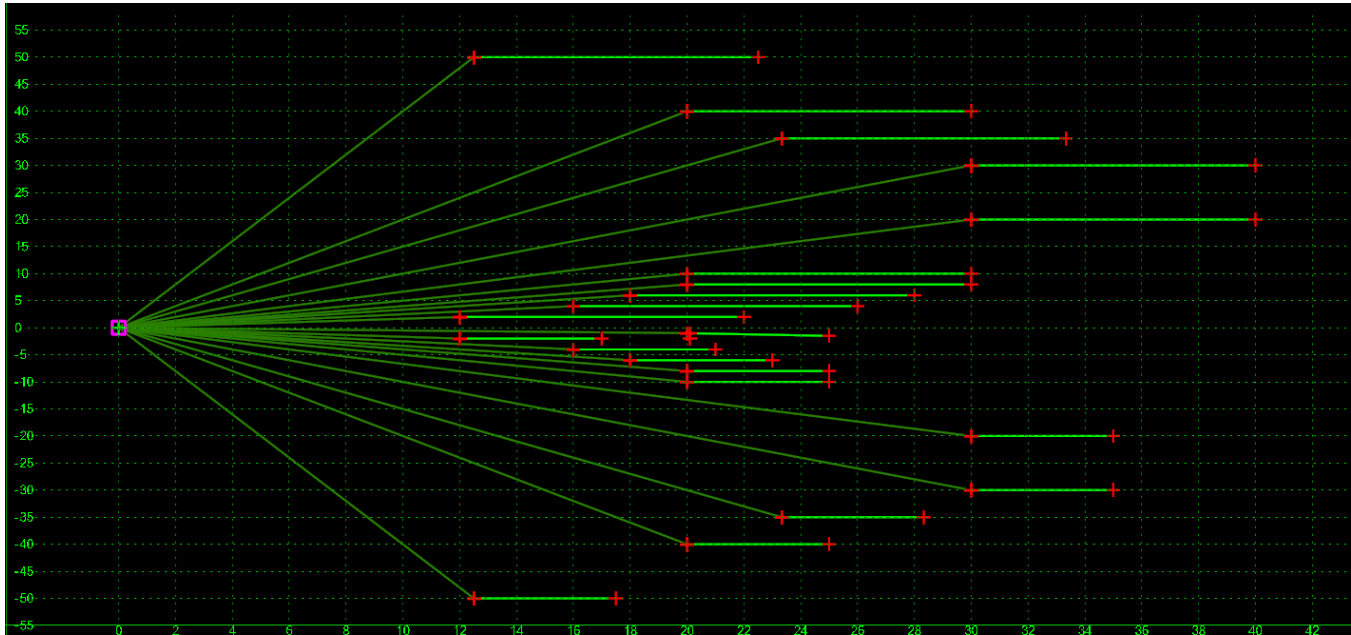
Parametric Constraints	Setting	Use
Cut Slope	Equal to slope	Adjust cut slopes
Daylight Depth	1'	Adjust depth of Daylight Ditch
Daylight Ditch Width	0'	Adjust width of Daylight Ditch
Daylight Foreslope	1:4	Adjust foreslope of Daylight Ditch
Ditch Bot Slope	0%	Adjust slope of Daylight Ditch
Ditch Bot Width	0'	Adjust width of Ditch
Ditch Depth	1'	Adjust depth of Ditch
Ditch Foreslope	1:4	Adjust foreslope of Ditch
Fill Slope	Equal to Slope	Adjust fill slopes

2.3. CUT & FILL w/o DITCH

Location. <project template library>/ORD Templates/ End Conditions/Cut & Fill w/o Ditch

Description. This end condition has slope stake limit of 1:2 to 1:6 CUT priority over FILL with topsoil and construction limit included.

Figure 4 – Cut & Fill w/o Ditch Template



How to assemble with main template. Drag end condition onto the daylight point of subgrade, Hinge point will automatically merge with component point. If wanting to be controlled by a display rule, then all end condition branches will need to be made a child of the component it's attached to.

Parametric Constraints.

Table 4– Cut priority and fill end condition parametric constraints

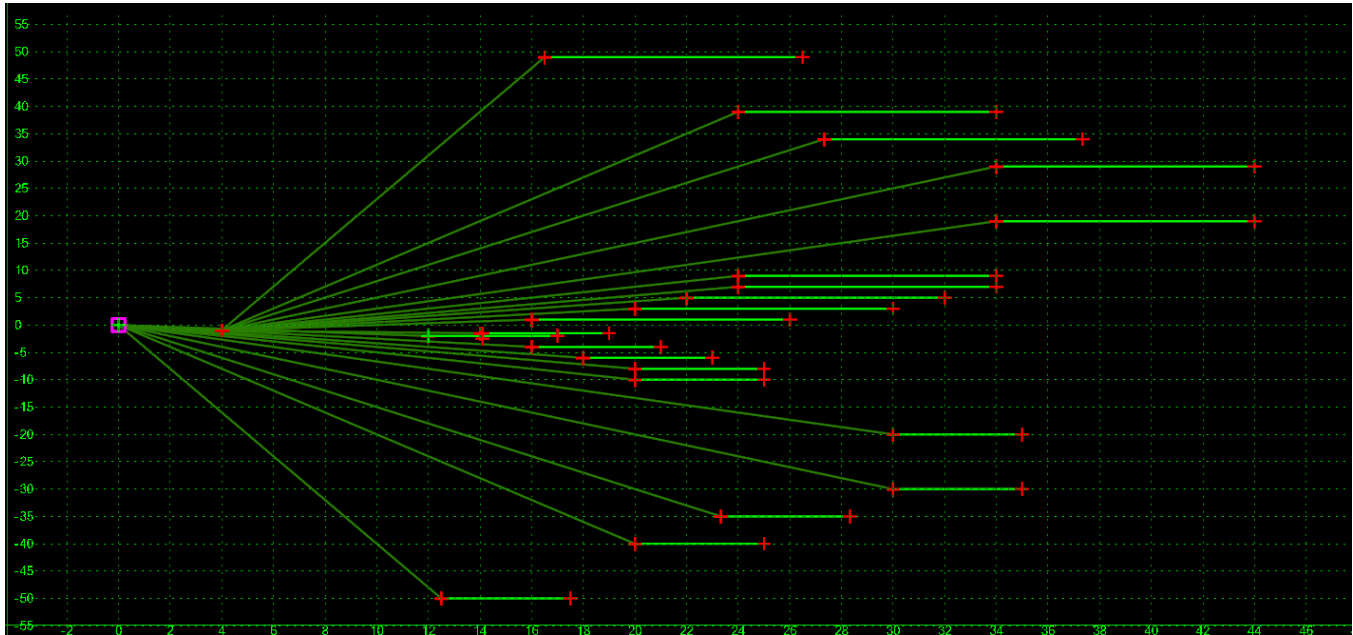
Parametric Constraints	Setting	Use
Cut Slope	Equal to slope	Adjust cut slopes
Construction Limit	10' on Cut, 5' on Fills	Adjust the offset of Const. Limits
Daylight Depth	1'	Adjust depth of Daylight Ditch
Daylight Ditch Width	0'	Adjust width of Daylight Ditch
Daylight Foreslope	1:4	Adjust foreslope of Daylight Ditch
Ditch Bot Slope	0%	Adjust slope of Daylight Ditch
Ditch Bot Width	0'	Adjust width of Ditch
Ditch Depth	1'	Adjust depth of Ditch
Ditch Foreslope	1:4	Adjust foreslope of Ditch
Fill Slope	Equal to Slope	Adjust fill slopes

2.4. FILL & CUT w/CONST

Location. <project template library>/ORD Templates/ End Conditions/Fill & Cut w/Const

Description. This end condition has slope stake limit of 1:2 to 1:6 FILL priority over CUT with topsoil, ditch, and construction limit included.

Figure 5 – Fill & Cut w/Const Template



How to assemble with main template. Drag end condition onto the daylight point of subgrade, Hinge point will automatically merge with component point.

Parametric Constraints.

Table 5– Cut and fill priority with ditch + construction limit end condition parametric constraints

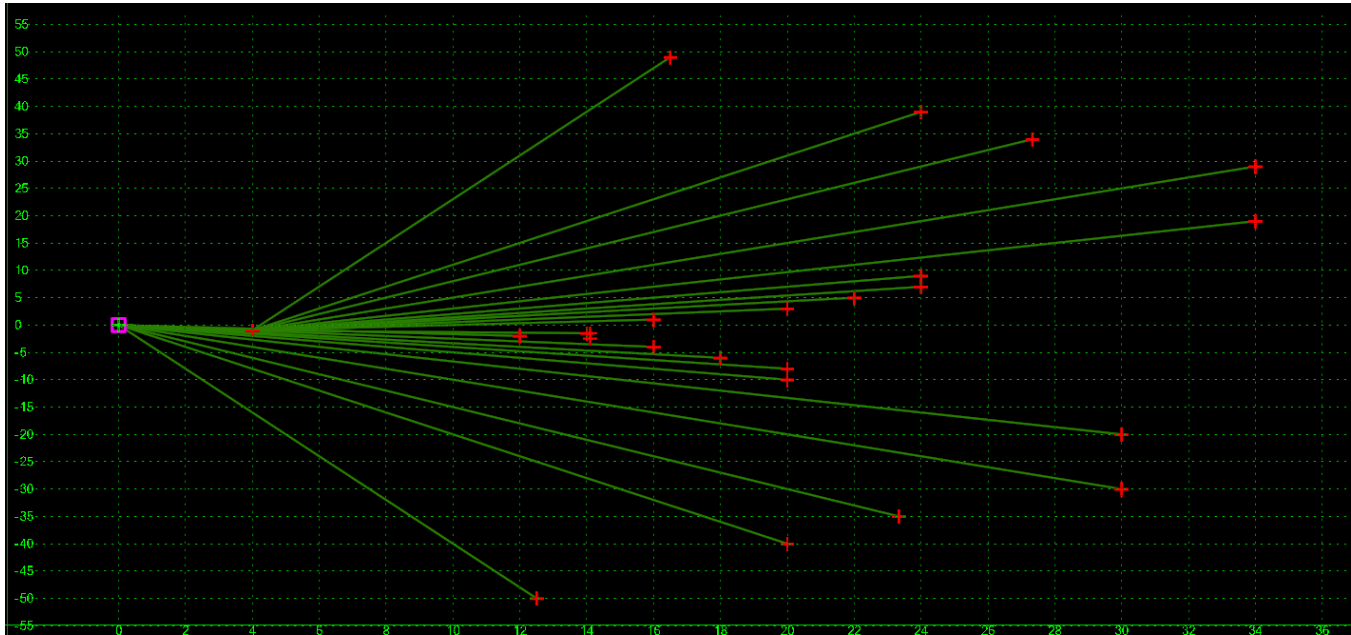
Parametric Constraints	Setting	Use
Cut Slope	Equal to slope	Adjust cut slopes
Construction Limit	10' on Cut, 5' on Fills	Adjust the offset of Const. Limits
Daylight Depth	1'	Adjust depth of Daylight Ditch
Daylight Ditch Width	0'	Adjust width of Daylight Ditch
Daylight Foreslope	1:4	Adjust foreslope of Daylight Ditch
Ditch Bot Slope	0%	Adjust slope of Daylight Ditch
Ditch Bot Width	0'	Adjust width of Ditch
Ditch Depth	1'	Adjust depth of Ditch
Ditch Foreslope	1:4	Adjust foreslope of Ditch
Fill Slope	Equal to Slope	Adjust fill slopes

2.5. FILL & CUT w/TABLES

Location. <project template library>/ORD Templates/ End Conditions/Fill & Cut w/Tables

Description. This end condition has slope stake limit of 1:2 to 1:6 FILL priority over CUT with topsoil and ditch included.

Figure 6 – Fill & Cut w/Tables Template



How to assemble with main template. Drag end condition onto the daylight point of subgrade, Hinge point will automatically merge with component point. If wanting to be controlled by a display rule, then all end condition branches will need to be made a child of the component it's attached to.

Parametric Constraints.

Table 6 – Cut and fill priority with ditch end condition parametric constraints

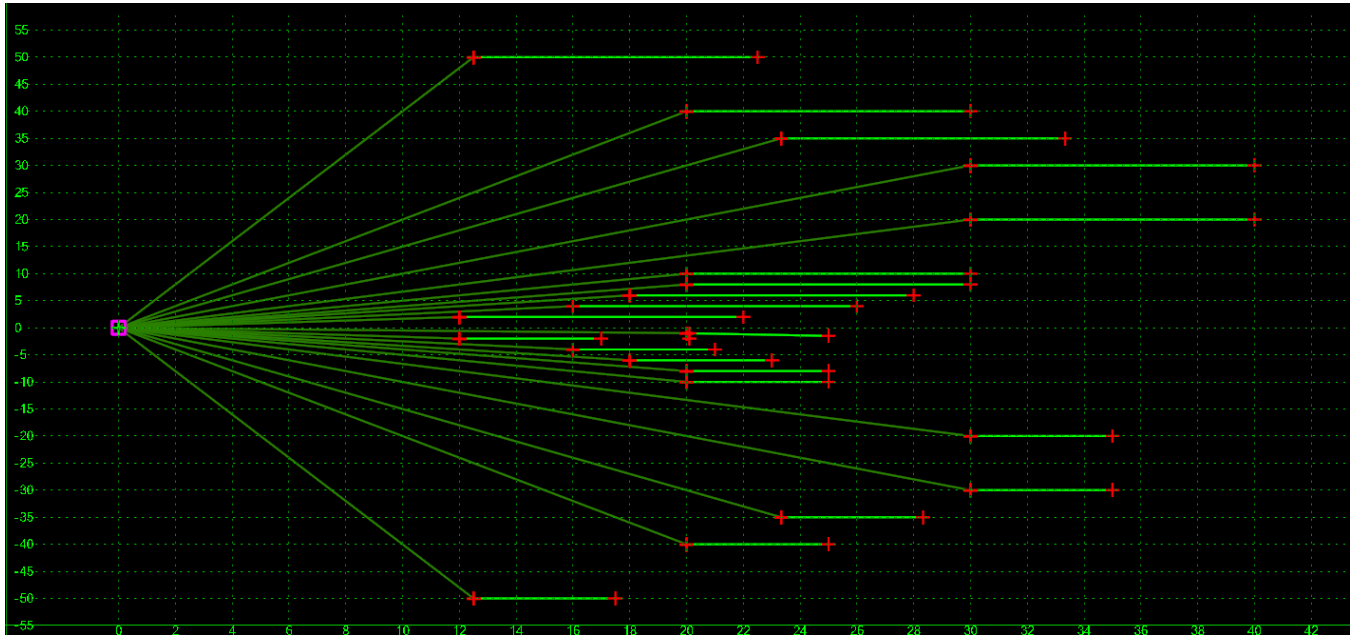
Parametric Constraints	Setting	Use
Cut Slope	Equal to slope	Adjust cut slopes
Daylight Depth	1'	Adjust depth of Daylight Ditch
Daylight Ditch Width	0'	Adjust width of Daylight Ditch
Daylight Foreslope	1:4	Adjust foreslope of Daylight Ditch
Ditch Bot Slope	0%	Adjust slope of Daylight Ditch
Ditch Bot Width	0'	Adjust width of Ditch
Ditch Depth	1'	Adjust depth of Ditch
Ditch Foreslope	1:4	Adjust foreslope of Ditch
Fill Slope	Equal to Slope	Adjust fill slopes

2.6. FILL & CUT w/o DITCH

Location. <project template library>/ORD Templates/ End Conditions/Fill & Cut w/o Ditch

Description. This end condition has slope stake limit of 1:2 to 1:6 FILL priority over CUT with topsoil and construction limit included.

Figure 7 – Fill & Cut w/o Ditch Template



How to assemble with main template. Drag end condition onto the daylight point of subgrade, Hinge point will automatically merge with component point. If wanting to be controlled by a display rule, then all end condition branches will need to be made a child of the component it's attached to.

Parametric Constraints.

Table 7– Cut and fill priority end condition parametric constraints

Parametric Constraints	Setting	Use
Cut Slope	Equal to slope	Adjust cut slopes
Construction Limit	10' on Cut, 5' on Fills	Adjust the offset of Const. Limits
Daylight Depth	1'	Adjust depth of Daylight Ditch
Daylight Ditch Width	0'	Adjust width of Daylight Ditch
Daylight Foreslope	1:4	Adjust foreslope of Daylight Ditch
Ditch Bot Slope	0%	Adjust slope of Daylight Ditch
Ditch Bot Width	0'	Adjust width of Ditch
Ditch Depth	1'	Adjust depth of Ditch
Ditch Foreslope	1:4	Adjust foreslope of Ditch
Fill Slope	Equal to Slope	Adjust fill slopes

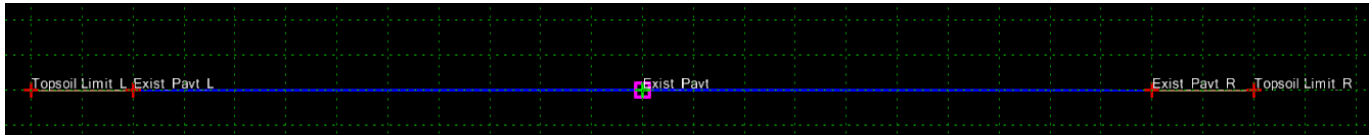
3. EXISTING

3.1. EXIST PAVT with TOPSOIL REMOVAL

Location. <project template library>/ORD Templates/Existing/Exist Pavt with Topsoil Removal

Description. This template seeks the edges of existing pavement feature definition, or a width can be assigned by Parametric Constraint. It also seeks the topsoil beyond the existing edges of pavement by using the Topsoil Limits features from the design corridor, both components use parametric constraint to set the depths.

Figure 8 – Exist Pavt with Topsoil Removal Template



How to assemble with main template. For best results this template should be ran in a separate Existing Pavement Corridor file. It also needs to follow within the existing edges of pavement, a new alignment following within the existing edge of pavement may need to be used. The design corridor is then referenced into Existing Pavement Corridor file and the Topsoil Limit_L & Topsoil Limit_R are made as Corridor References which will establish the limits of topsoil removal out to the staking limits. Once the Existing Pavement Corridor has been created, return to the Design corridor and reference the Existing Pavement file, run Cut/Fill Volumes, then get Corridor Quantities.

Parametric Constraints.

Table 8– Existing pavement with topsoil removal parametric constraints

Parametric Constraints	Setting	Use
Exist pavt Depth	1'	Set exist pavementt depth to be removed
Exist pavt Width_L	-10'	Adjust width of exist pavement left
Exist pavt Width_R	10'	Adjust width of exist pavement right
Exist Topsoil Depth	0.5'	Set topsoil depth to be removed
Exist Topsoil Width_L	2'	Width beyond exist pavement left
Exist Topsoil Width_R	2'	Width beyond exist pavement right

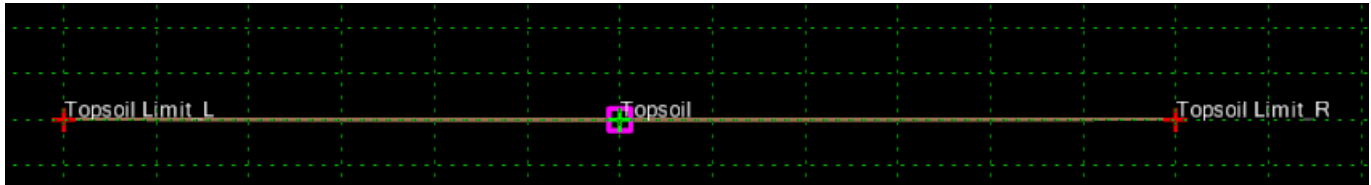
Notes. The width set in this template are merely place holders, the intended use is to seek features that define the widths.

3.2. TOPSOIL REMOVAL

Location. <project template library>/ORD Templates/ Existing/Topsoil Removal

Description. This template seeks the edges of design corridor Topsoil Limit feature definition and uses parametric constraint to set the depth.

Figure 9 – Topsoil Removal Template



How to assemble with main template. For best results this template should be ran in a separate Topsoil Corridor file, the design alignment can be used. With the design corridor referenced in, create Corridor References of the Topsoil Limit_L & Topsoil Limit_R elements from the design corridor. Then return to the Design corridor file and reference in the Topsoil file, run Cut/Fill Volumes, then get Corridor Quantities.

Parametric Constraints.

Table 9 – Topsoil removal parametric constraints

Parametric Constraints	Setting	Use
Exist Topsoil Depth	0.5'	Set topsoil depth to be removed

Notes. The width set in this template are merely place holders, the intended use is to seek features that define the widths.

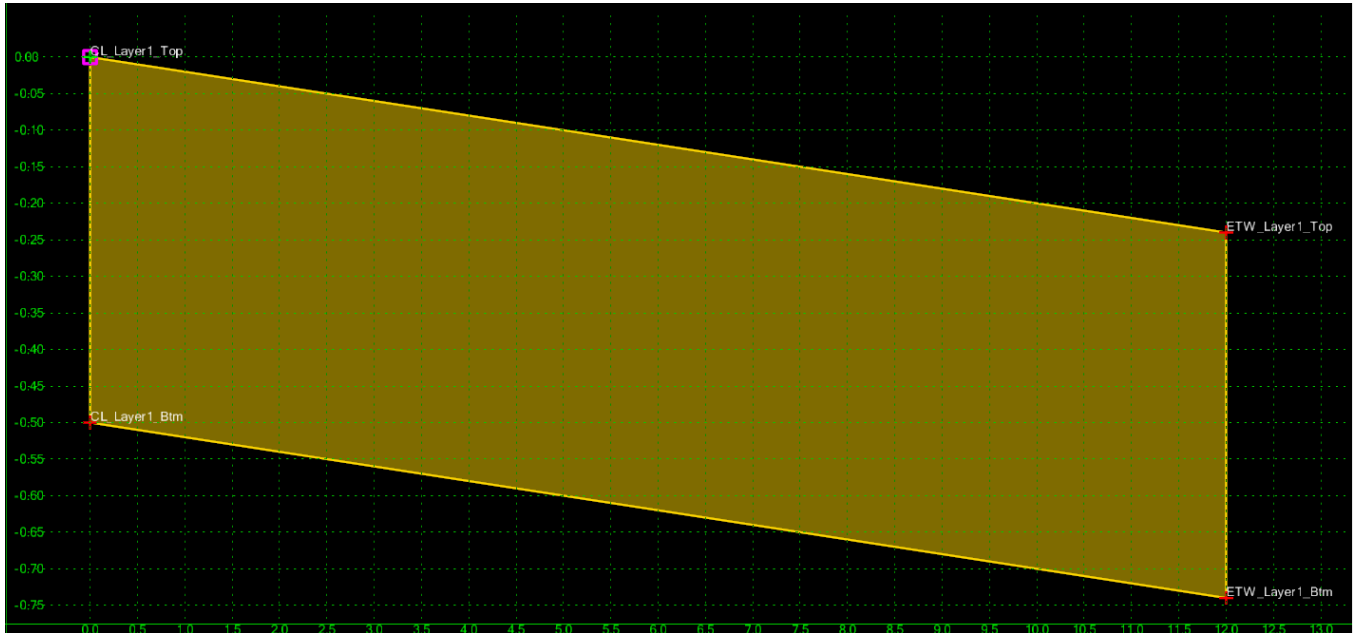
4. PAVEMENT COMPONENTS

4.1. LANE LAYER 1

Location. <project template library>/ORD Templates/Pavement Components/Lanes/Lane Layer 1

Description. This template is straight edge of component Layer 1.

Figure 10 – Lane Layer 1 Template



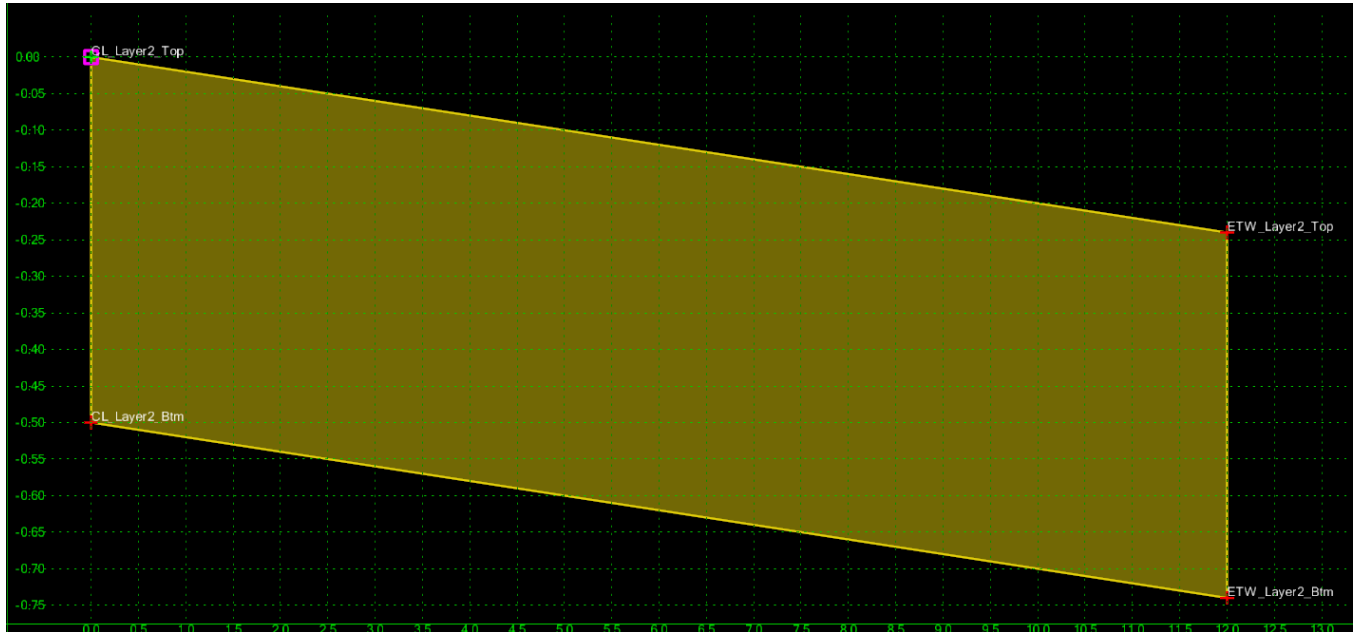
Note. The ExGrd null point is not included in this template. If this template is used to assemble a template, make sure to grab the ExGrd null point from the <project template library>/ORD Templates/Pavement Components/Lanes/Lane Layers Combined template. See ORD Manual Chapter 8 (<https://highways.dot.gov/federal-lands/cadd-support/ord-user-manual/8-template-library>).

4.2. LANE LAYER 2

Location. <project template library>/ORD Templates/Pavement Components/Lanes/Lane Layer 2

Description. This template is straight edge of component Layer 2.

Figure 11 – Lane Layer 2 Template



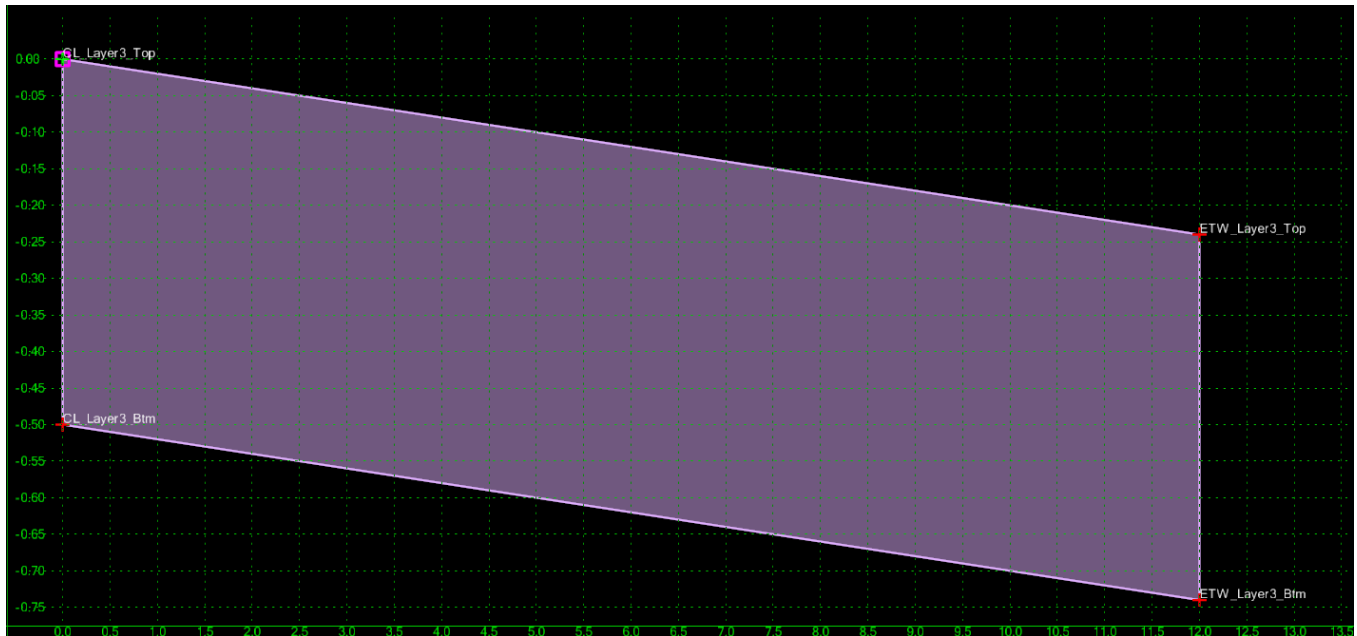
Note. The ExGrd null point is not included in this template. If this template is used to assemble a template, make sure to grab the ExGrd null point from the <project template library>/ORD Templates/Pavement Components/Lanes/Lane Layers Combined template. See ORD Manual Chapter 8 (<https://highways.dot.gov/federal-lands/cadd-support/ord-user-manual/8-template-library>).

4.3. LANE LAYER 3

Location. <project template library>/ORD Templates/Pavement Components/Lanes/Lane Layer 3

Description. This template is straight edge of component Layer 3.

Figure 12 – Lane Layer 3 Template



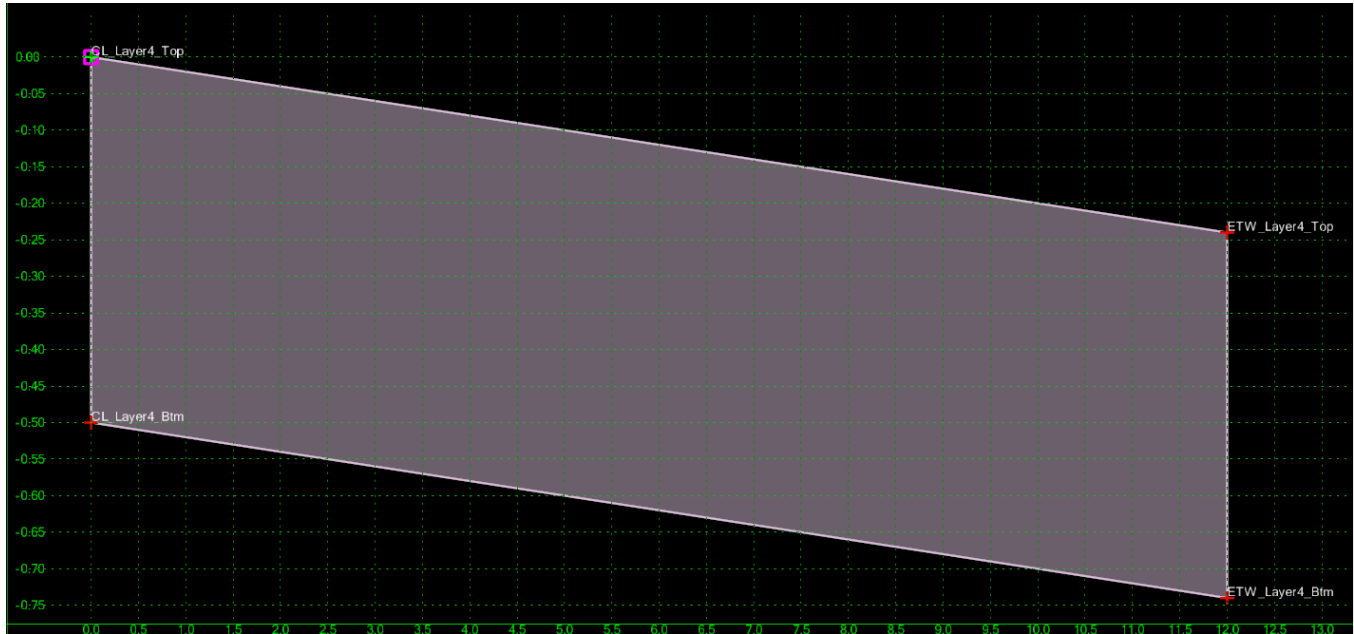
Note. The ExGrd null point is not included in this template. If this template is used to assemble a template, make sure to grab the ExGrd null point from the <project template library>/ORD Templates/Pavement Components/Lanes/Lane Layers Combined template. See ORD Manual Chapter 8 (<https://highways.dot.gov/federal-lands/cadd-support/ord-user-manual/8-template-library>).

4.4. LANE LAYER 4

Location. <project template library>/ORD Templates/Pavement Components/Lanes/Lane Layer 4

Description. This template is straight edge of component Layer 4.

Figure 13 – Lane Layer 4 Template



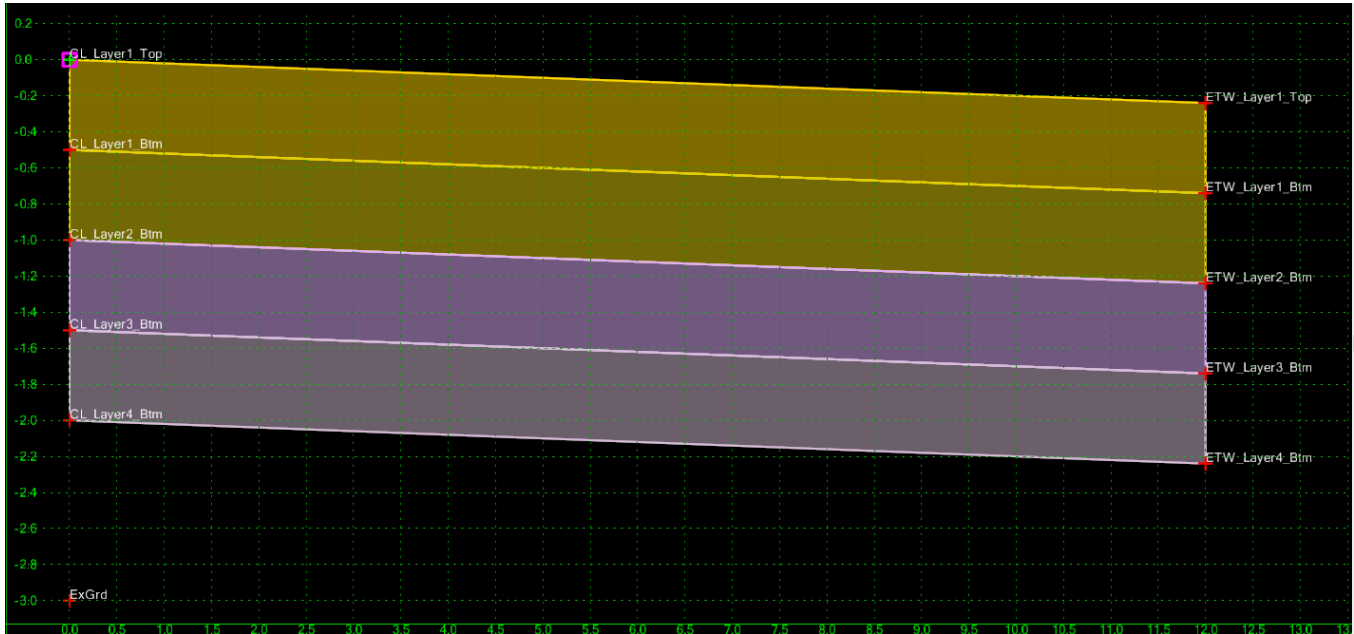
Note. The ExGrd null point is not included in this template. If this template is used to assemble a template, make sure to grab the ExGrd null point from the <project template library>/ORD Templates/Pavement Components/Lanes/Lane Layers Combined template. See ORD Manual Chapter 8 (<https://highways.dot.gov/federal-lands/cadd-support/ord-user-manual/8-template-library>).

4.5. LANE LAYERS COMBINED

Location. <project template library>/ORD Templates/Pavement Components/Lanes/Lane Layers Combined

Description. This template is straight edge of component Layer 1, Layer 2, Layer 3, and Layer 4.

Figure 14 – Lane Layers Combined Template

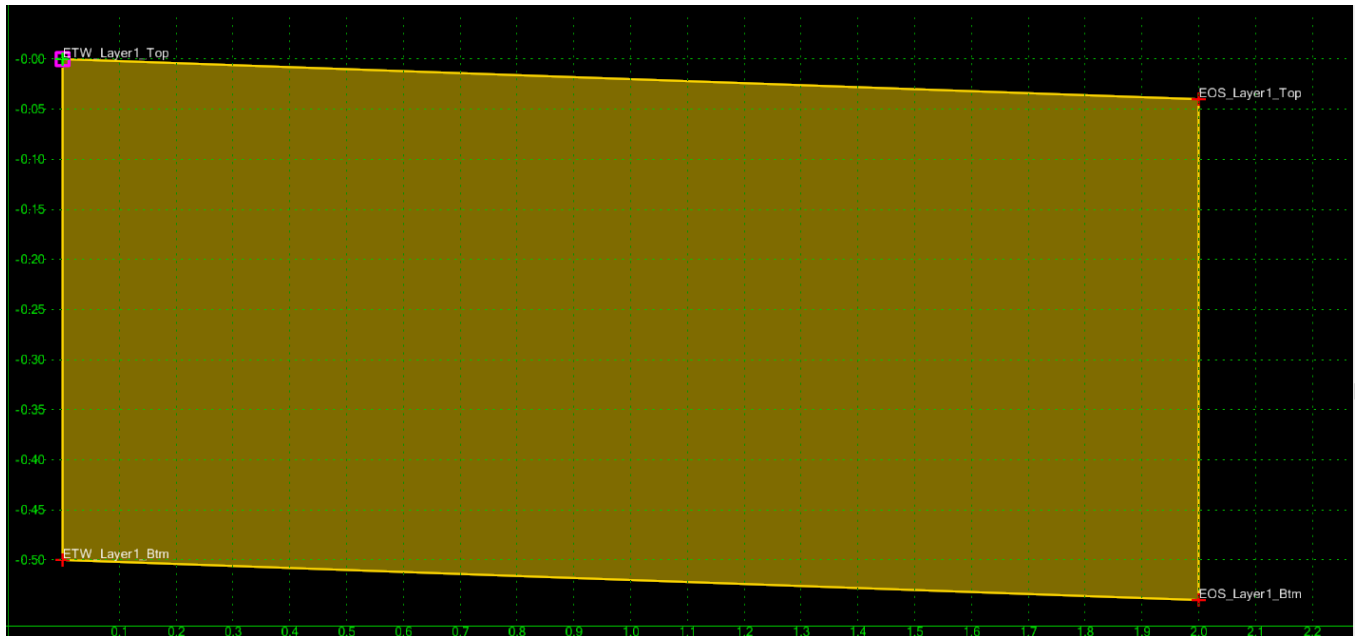


4.6. SHDR LAYER 1

Location. <project template library>/ORD Templates/Pavement Components/Shoulder/Shdr Layer 1

Description. This template is straight edge of component Shoulder Layer 1.

Figure 15 – Shdr Layer 1 Template

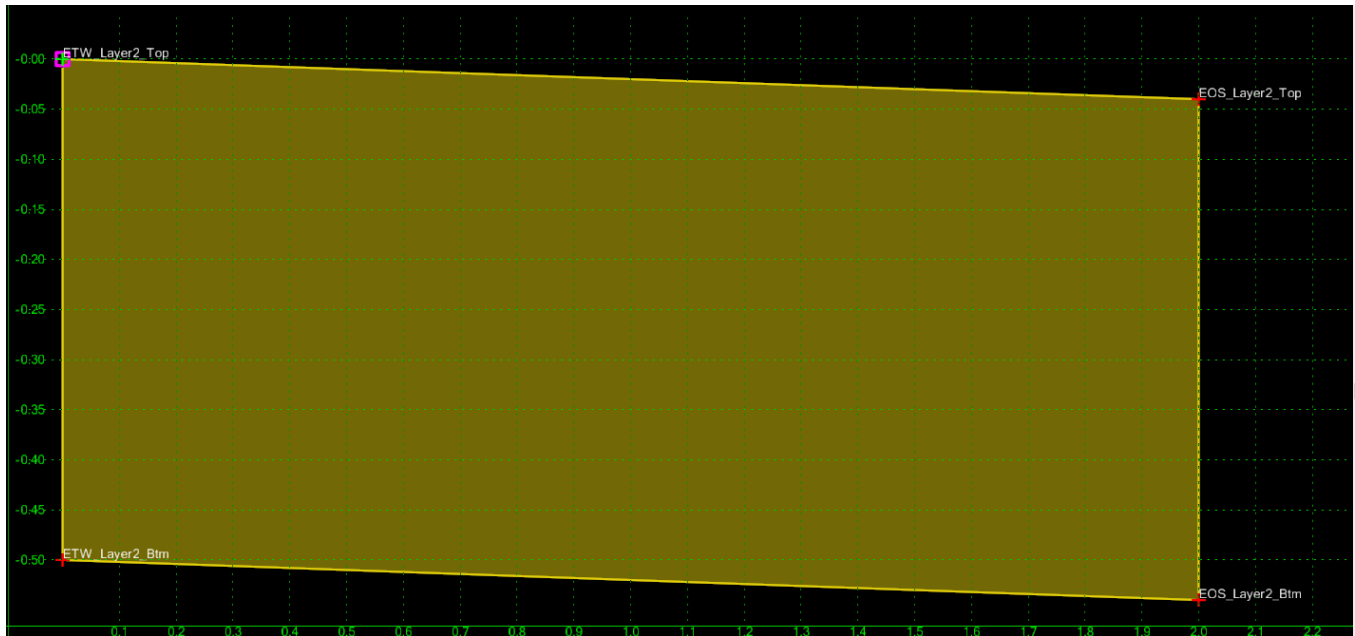


4.7. SHDR LAYER 2

Location. <project template library>/ORD Templates/Pavement Components/Shoulder/Shdr Layer 2

Description. This template is straight edge of component Shoulder Layer 2.

Figure 16 – Shdr Layer 2 Template

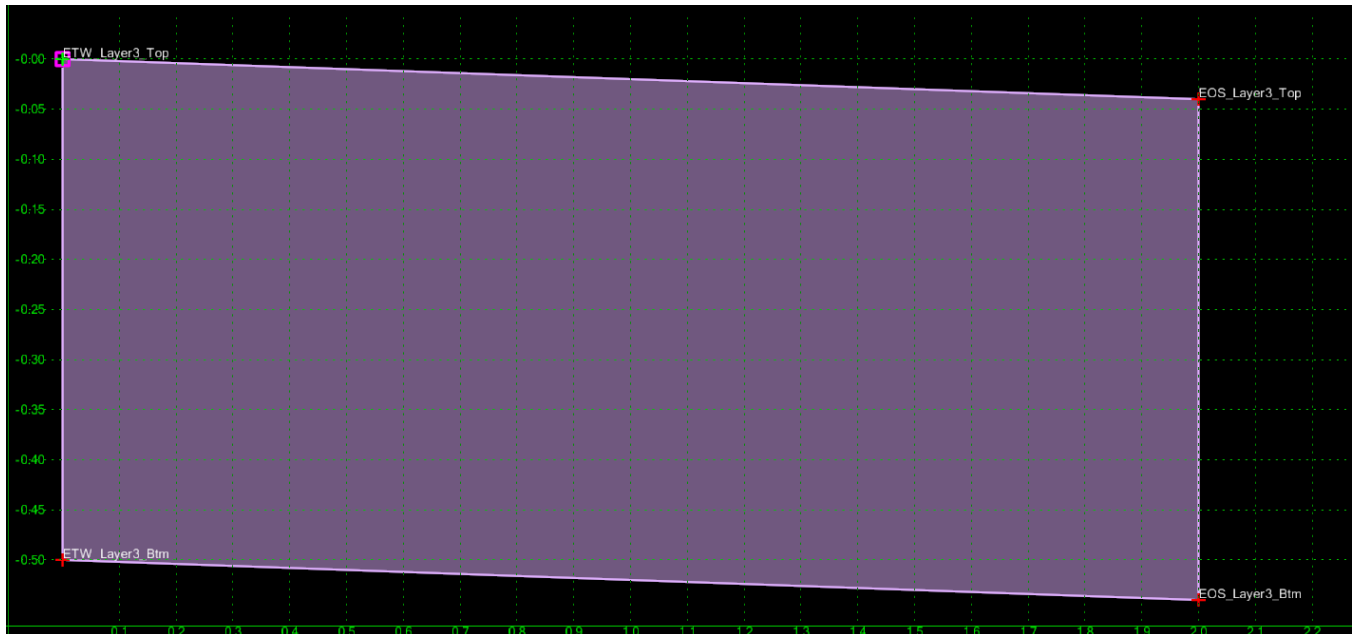


4.8. SHDR LAYER 3

Location. <project template library>/ORD Templates/Pavement Components/Shoulder/Shdr Layer 3

Description. This template is straight edge of component Shoulder Layer 3.

Figure 17 – Shdr Layer 3 Template

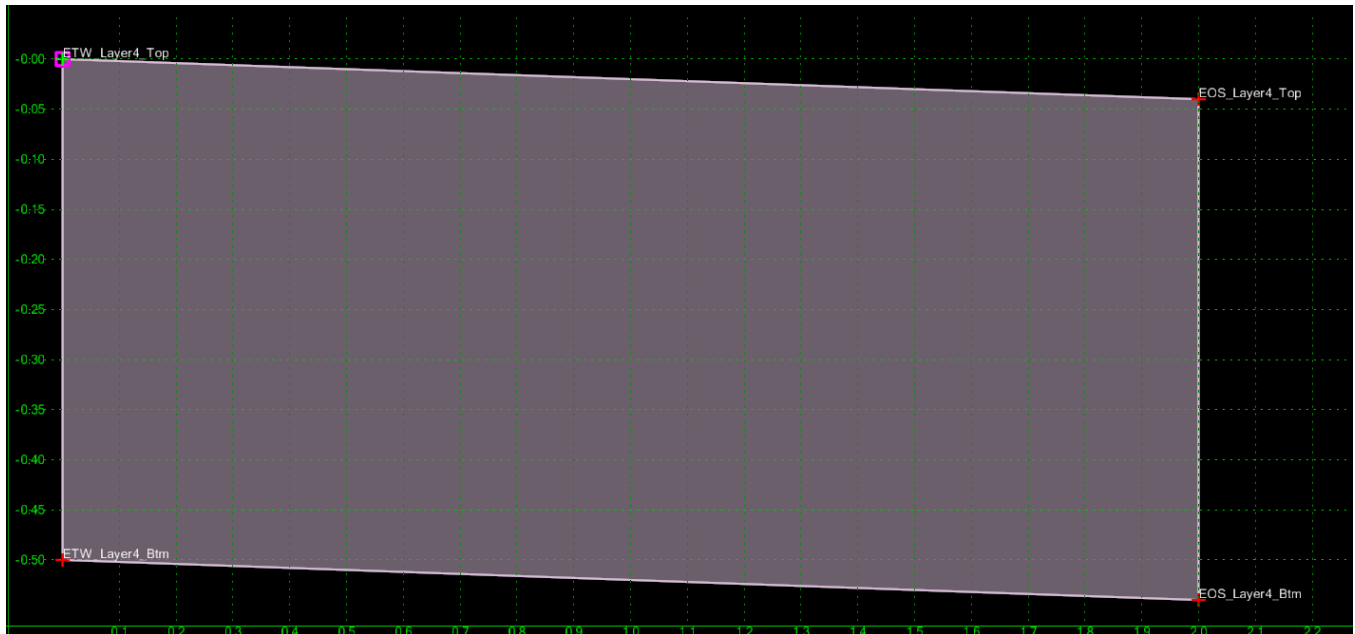


4.9. SHDR LAYER 4

Location. <project template library>/ORD Templates/Pavement Components/Shoulder/Shdr Layer 4

Description. This template is straight edge of component Shoulder Layer 4.

Figure 18 – Shdr Layer 4 Template

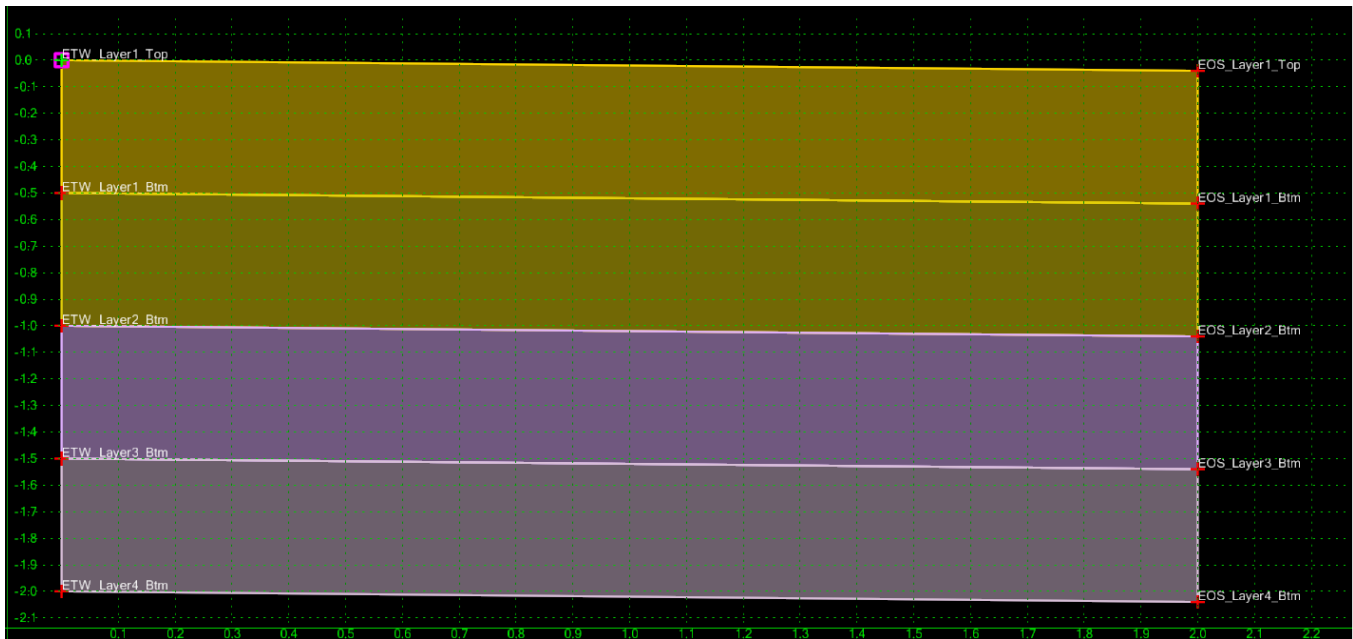


4.10. SHDR LAYERS COMBINED

Location. <project template library>/ORD Templates/Pavement Components/Shoulder/Shdr Layers Combined

Description. This template is straight edge of components Shoulder Layer 1, Shoulder Layer 2, Shoulder Layer 3, and Shoulder Layer 4.

Figure 19 – Shdr Layers Combined Template



4.11. WEDGE LAYER 1

Location. <project template library>/ORD Templates/Pavement Components/Wedge/Wedge Layer 1

Description. This template is a wedge edge of component Wedge Layer 1.

Figure 20 – Wedge Layer 1 Template

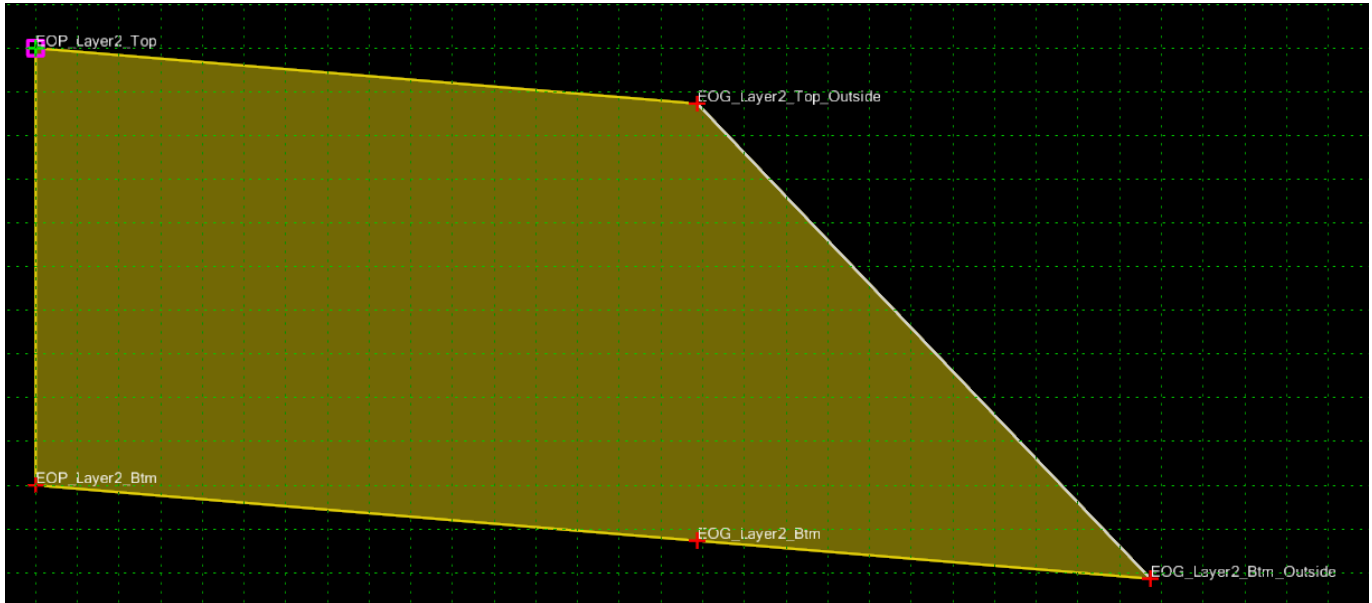


4.12. WEDGE LAYER 2

Location. <project template library>/ORD Templates/Pavement Components/Wedge/Wedge Layer 2

Description. This template is a wedge edge of component Wedge Layer 2.

Figure 21 – Wedge Layer 2 Template

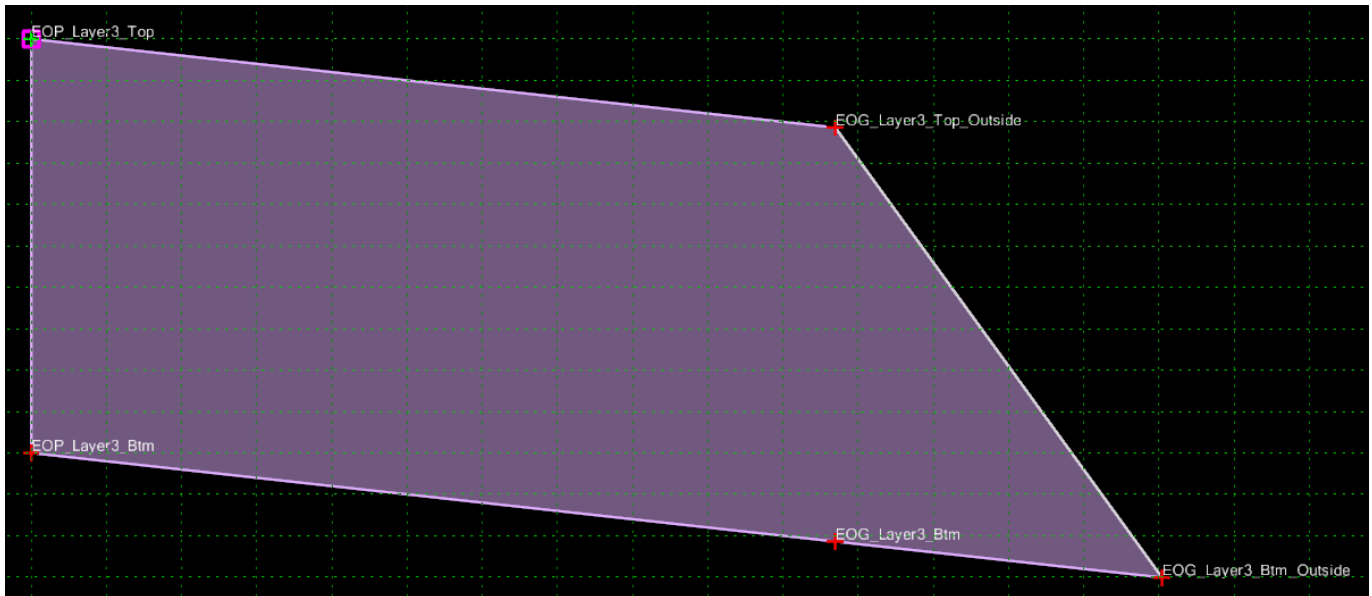


4.13. WEDGE LAYER 3

Location. <project template library>/ORD Templates/Pavement Components/Wedge/Wedge Layer 3

Description. This template is a wedge edge of component Wedge Layer 3.

Figure 22 – Wedge Layer 3 Template

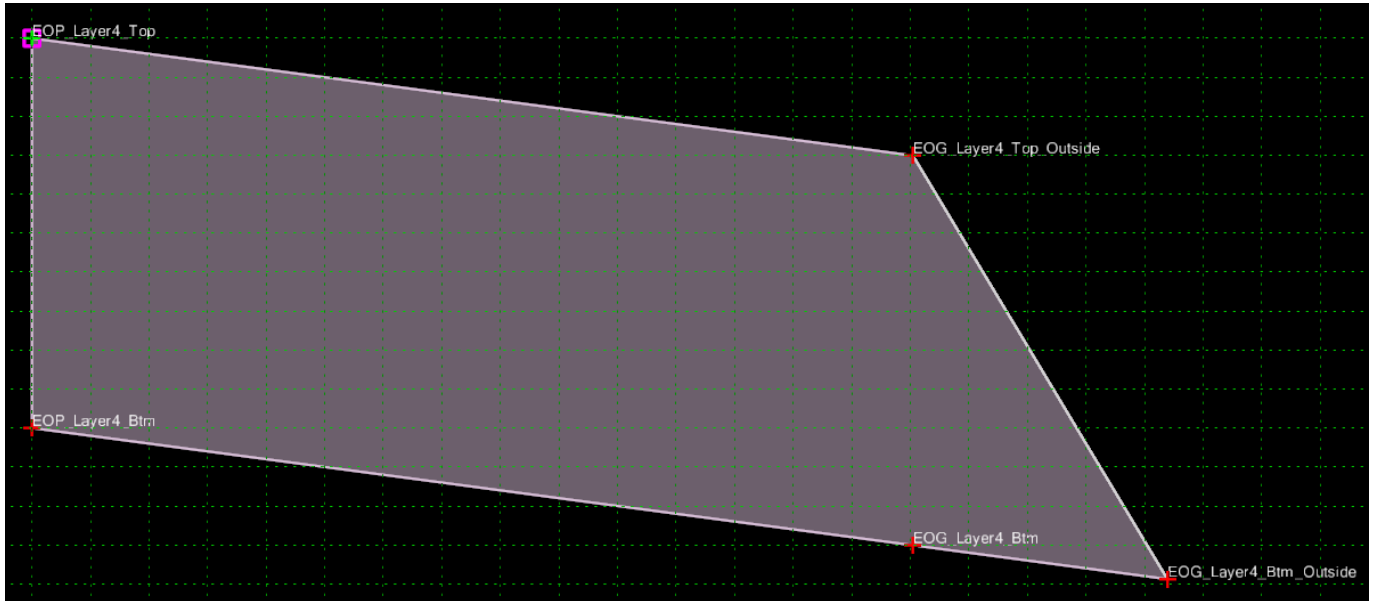


4.14. WEDGE LAYER 4

Location. <project template library>/ORD Templates/Pavement Components/Wedge/Wedge Layer 4

Description. This template is a wedge edge of component Wedge Layer 4.

Figure 23 – Wedge Layer 4 Template

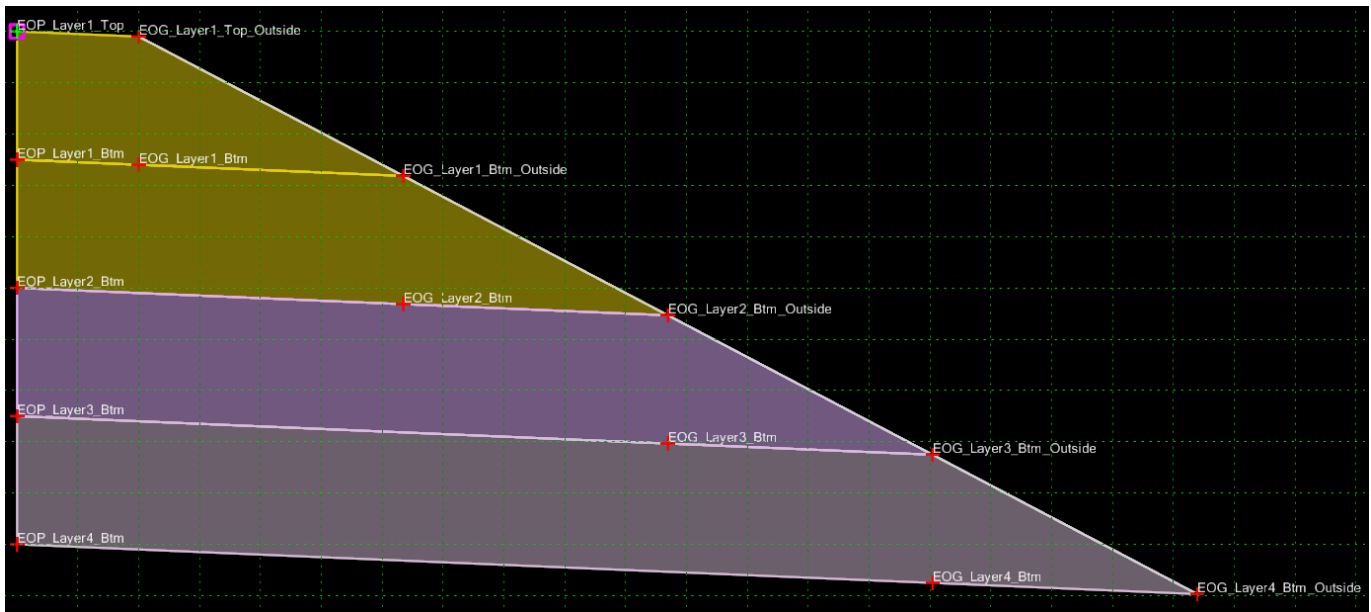


4.15. WEDGE LAYERS COMBINED

Location. <project template library>/ORD Templates/Pavement Components/Wedge/Wedge Layers Combined

Description. This template is a wedge edge of components Wedge Layer 1, Wedge Layer 2, Wedge Layer 3, and Wedge Layer 4.

Figure 24 – Wedge Layers Combined Template

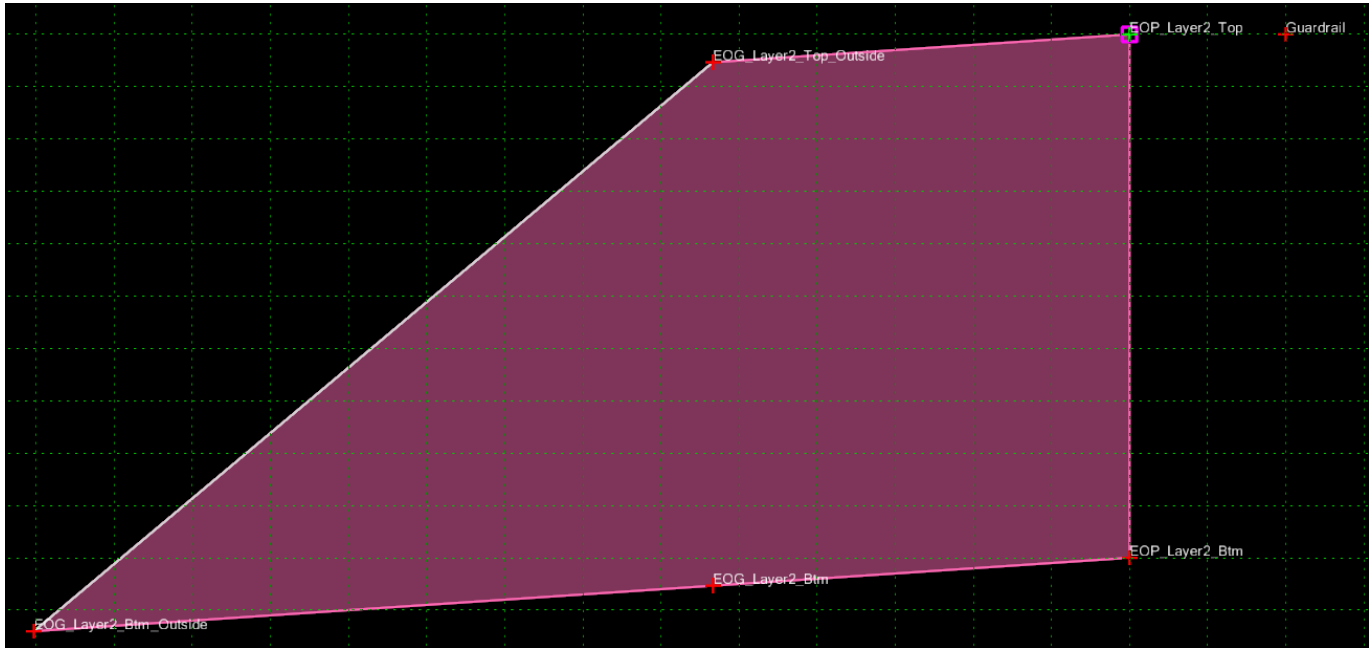


4.16. WEDGE GUARDRAIL_L

Location. <project template library>/ORD Templates/Pavement Components/Wedge Guardrail/Wedge Guardrail_L

Description. This template is a wedge edge of components for guardrail on the left.

Figure 25 – Wedge Guardrail_L Template



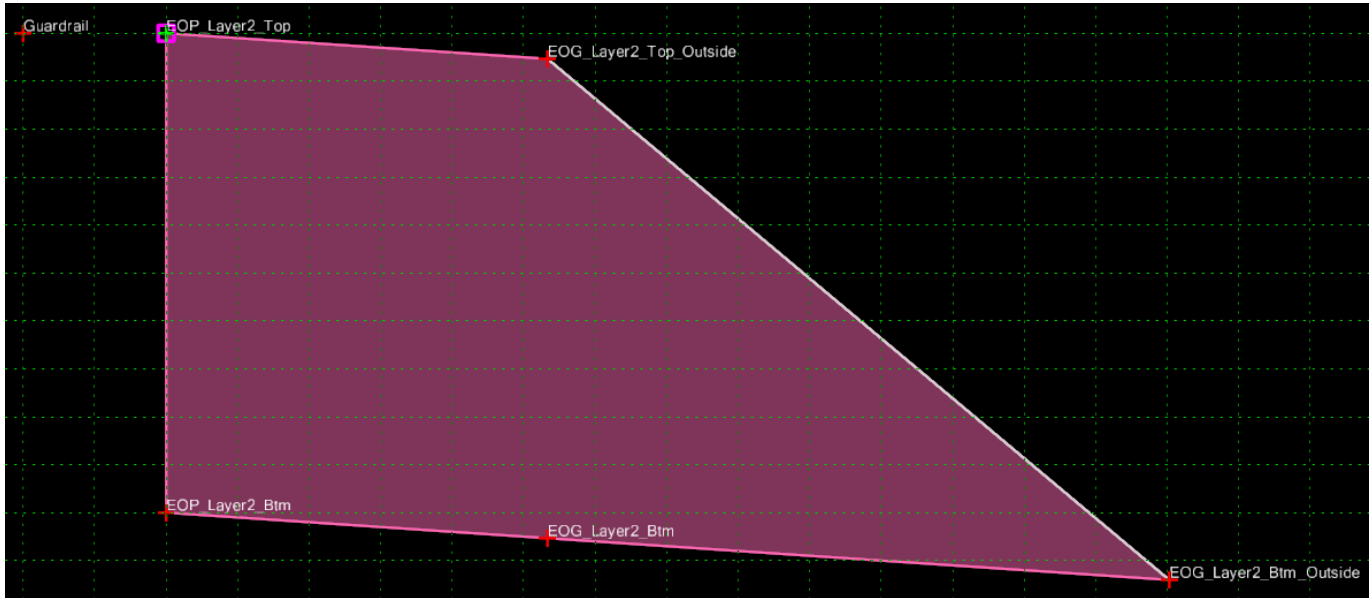
Note. The Affixes are not applied for this template.

4.17. WEDGE GUARDRAIL_R

Location. <project template library>/ORD Templates/Pavement Components/Wedge Guardrail/Wedge Guardrail_R

Description. This template is a wedge edge of components for guardrail on the right.

Figure 26 – Wedge Guardrail_R Template



Note. The Affixes are not applied for this template.

4.18. SAFETY WEDGE LAYER 1

Location. <project template library>/ORD Templates/Pavement Components/Wedge Safety/Safety Wedge Layer 1

Description. This template is of components for safety wedge for Layer 1.

Figure 27 – Safety Wedge Layer 1 Template

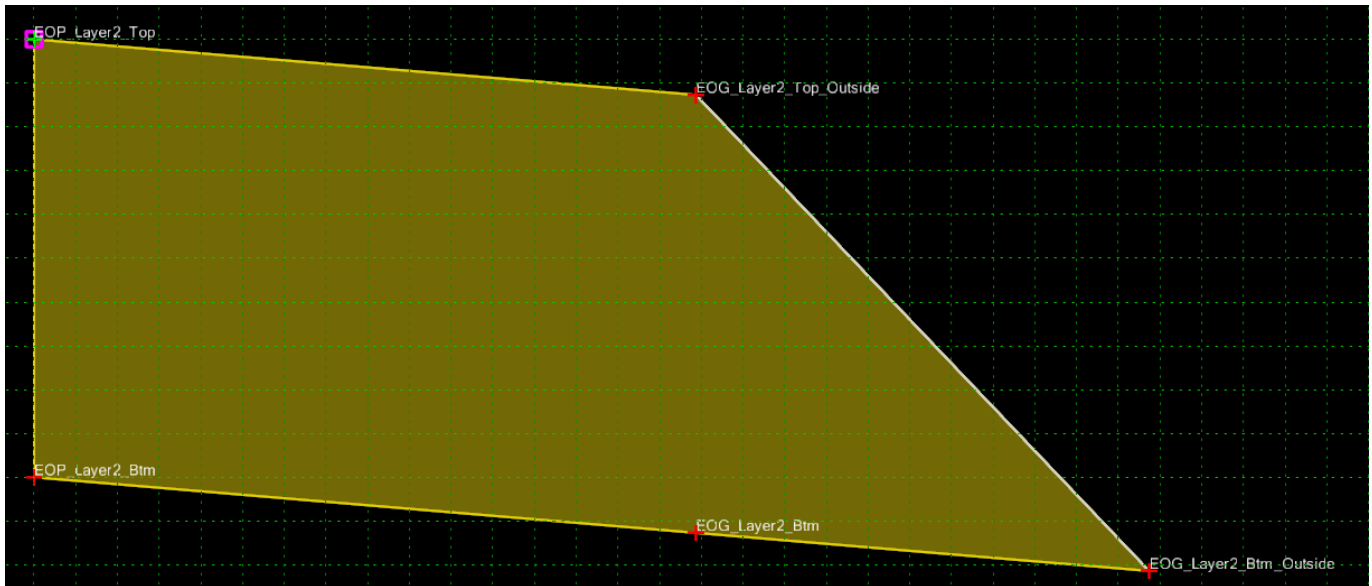


4.19. SAFETY WEDGE LAYER 2

Location. <project template library>/ORD Templates/Pavement Components/Wedge Safety/Safety Wedge Layer 2

Description. This template is of components for safety wedge for Layer 2.

Figure 28 – Safety Wedge Layer 2 Template

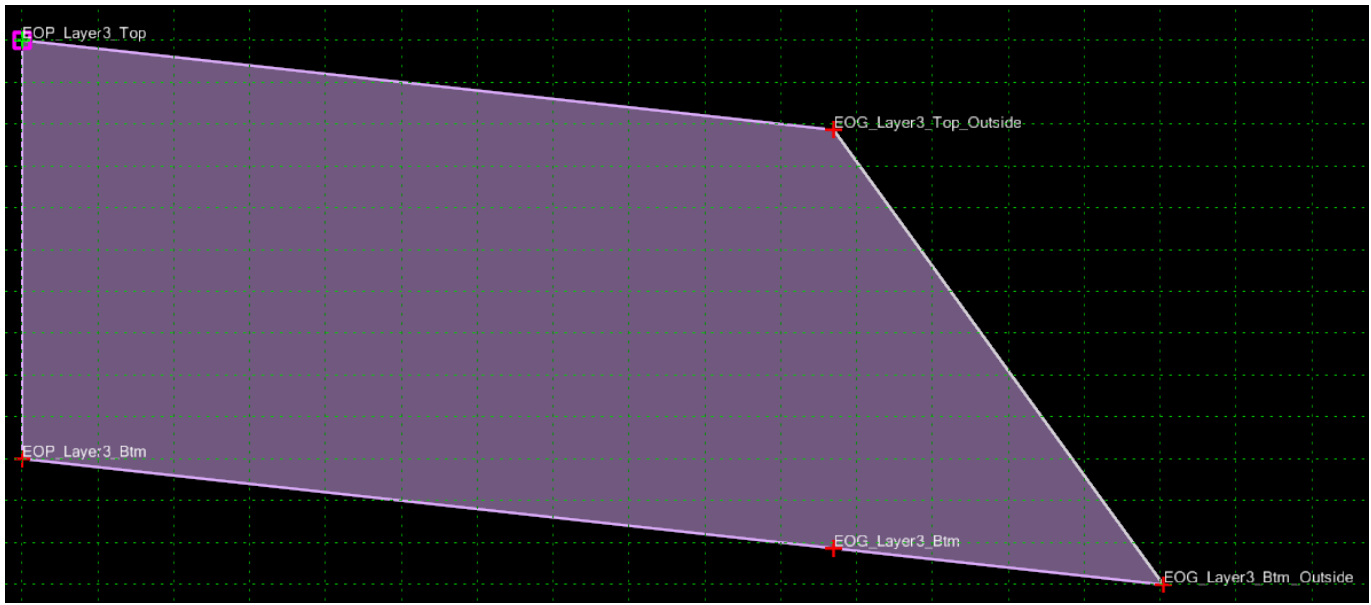


4.20. SAFETY WEDGE LAYER 3

Location. <project template library>/ORD Templates/Pavement Components/Wedge Safety/Safety Wedge Layer 3

Description. This template is of components for safety wedge for Layer 3.

Figure 29 – Safety Wedge Layer 3 Template

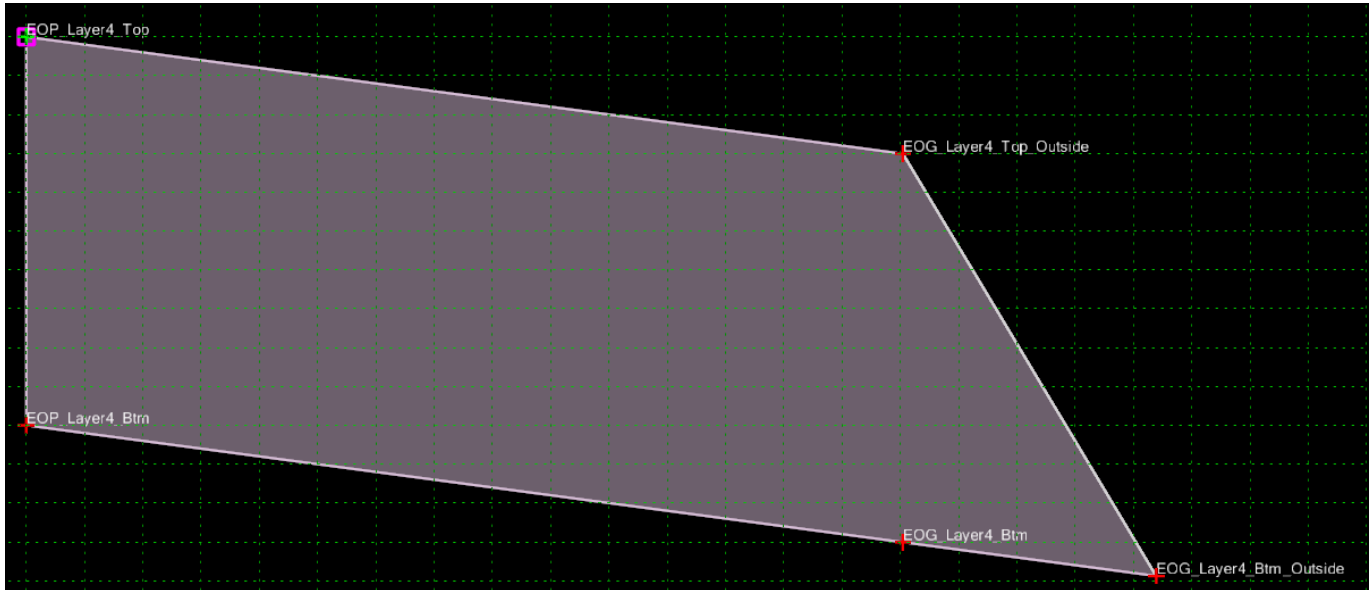


4.21. SAFETY WEDGE LAYER 4

Location. <project template library>/ORD Templates/Pavement Components/Wedge Safety/Safety Wedge Layer 4

Description. This template is of components for safety wedge for Layer 4.

Figure 30 – Safety Wedge Layer 4 Template

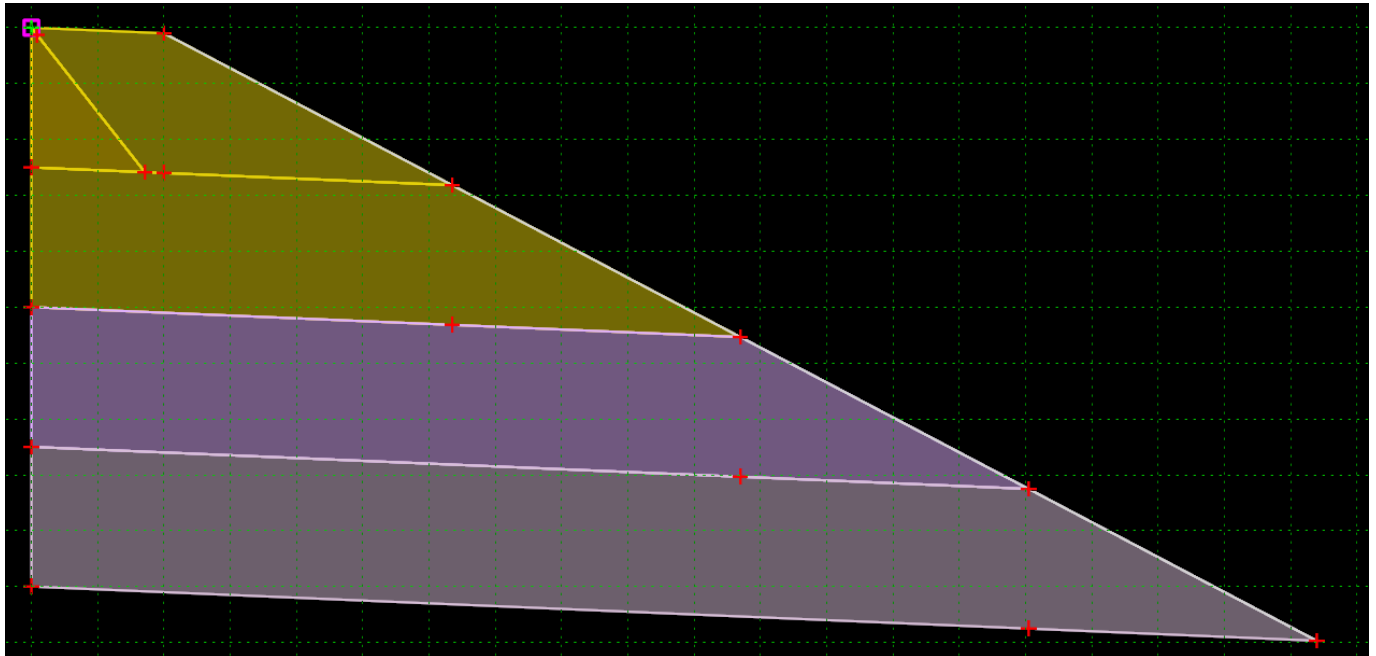


4.22. SAFETY WEDGE LAYERS COMBINED

Location. <project template library>/ORD Templates/Pavement Components/Wedge Safety/Safety Wedge Layers Combined

Description. This template is of components for safety wedge for Layer 1, Layer 2, Layer 3, and Layer 4.

Figure 31 – Safety Wedge Layers Combined Template



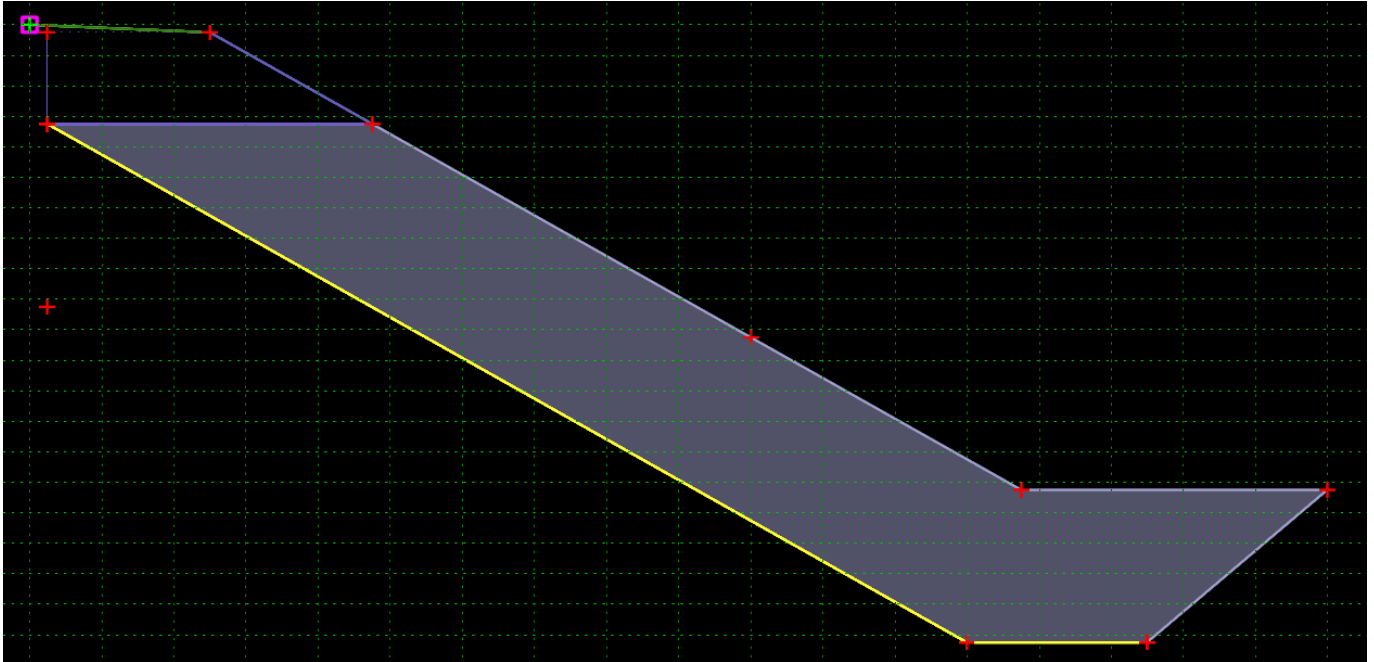
5. RIPRAP REVETMENT

5.1. RIPRAP_REVETMENT

Location. <project template library>/ORD Templates/Riprap Revetment/Riprap_Revetment

Description. This template is for riprap revetments.

Figure 32 – Riprap_Revetment Template



How to assemble with main template. Drag the Hinge onto the daylight point of subgrade, Hinge point will automatically merge with component point.

Parametric Constraints.

Figure 33 – Riprap revetment parametric constraints

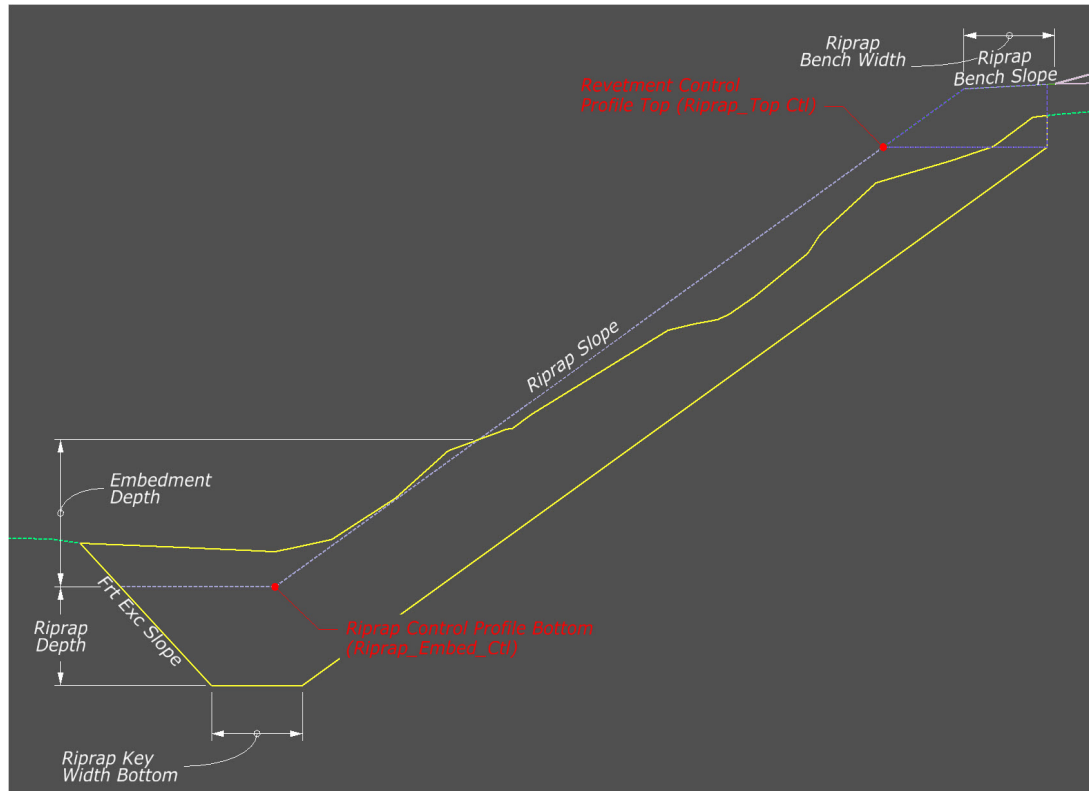


Table 10 – Riprap revetment parametric constraints

Parametric Constraint Label	Default Value	Parent Point
Embedment Depth	-5'	Riprap Embed_Ctl
Frt Exc Slope	100%	Riprap Key Frt
Riprap Bench Slope	5.00%	Riprap Bench
Riprap Bench Slope	5'	Riprap Bench
Riprap Depth	-5'	Riprap_Btm2
Riprap Slope	66.67%	Riprap Toe_OG
Riprap Key Width Btm	5'	Riprap_Btm_Frt

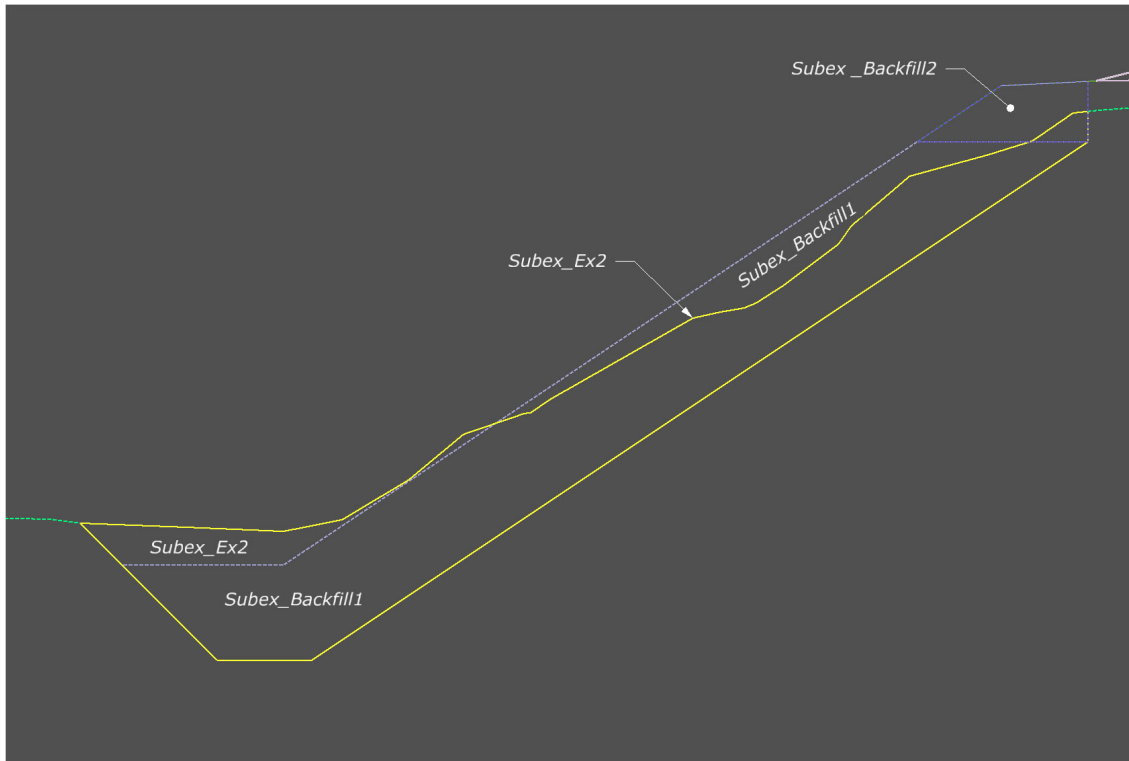
Point Controls.

Table 11 – Riprap revetment point controls

Point	Description
Riprap_Top_Ctl	Top Profile
Riprap Embed_Ctl	Bottom Profile

Feature Definition Volume Options.

Figure 34 – Riprap revetment feature definition volume options



The Feature Definition/Mesh/Volume options are by default set to "Design". Use the Mesh/Volume option in the table below to separate the subex quantity volumes from normal cut/fill volumes.

Edits can be made in the Your project(1)_cor.dgn at: Explorer/OpenRoads Standards/Your project(1)_Cor.dgn/Feature Definitions/Mesh/Subex

Table 12 – Riprap revetment feature definition volume options

Feature Definition	Mesh / Volume Option	Split Quantity
Subex_Backfill_1	Custom	FALSE
Subex_Backfill_1	Custom	FALSE
Subex_Ex2	Custom	FALSE

Make sure the below parameters are checked when using the Create Cut Fill Volumes tool.

Cut Fill Volume Parameters	
Compute Custom	Checked

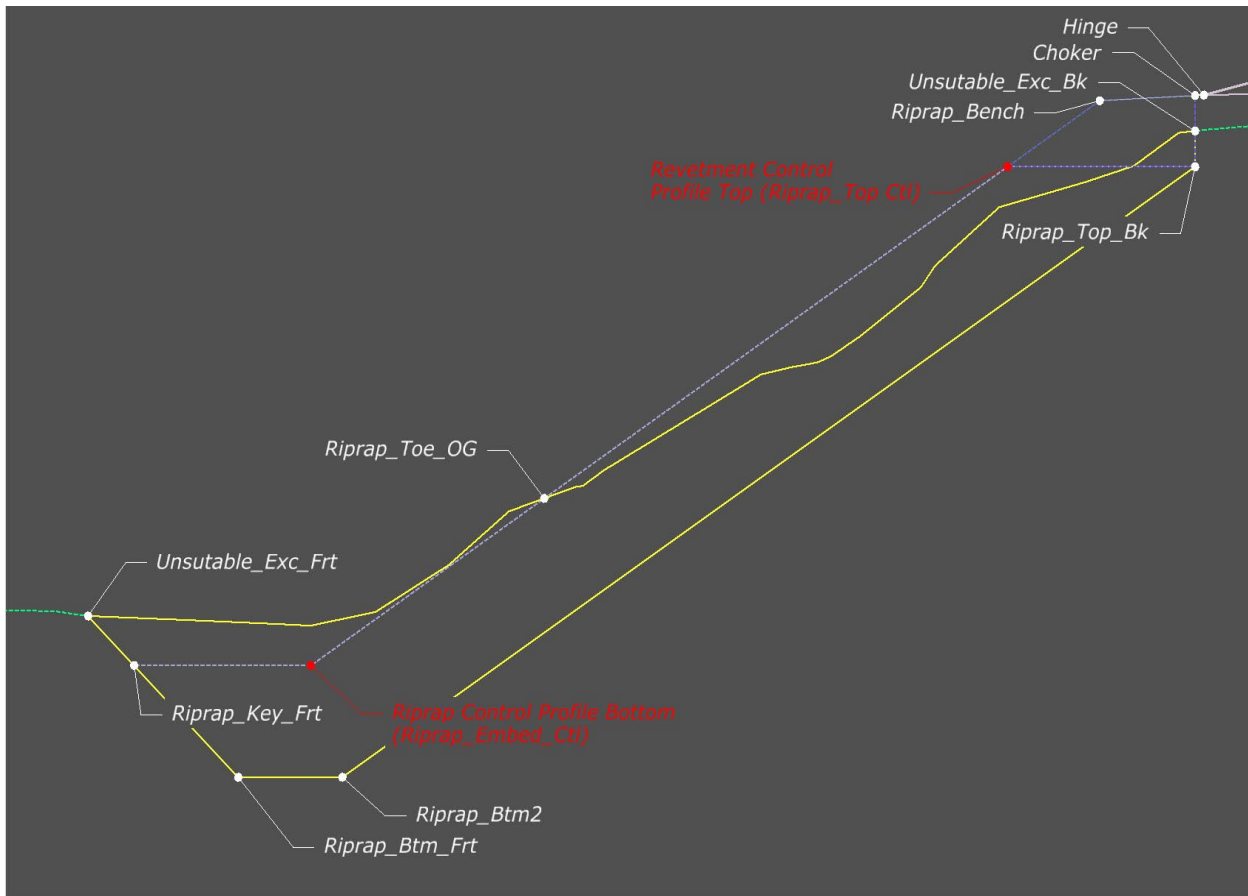
Display Rules.

Table 13 – Riprap revetment display rules

Display Rule	Description
Switch_Choker	Choker Intercept Riprap Slope
Switch_Choker1	Choker Intercept Bench Slope
Switch_Excavation	Excavation catch below Riprap

Points.

Figure 35 – Riprap revetment points

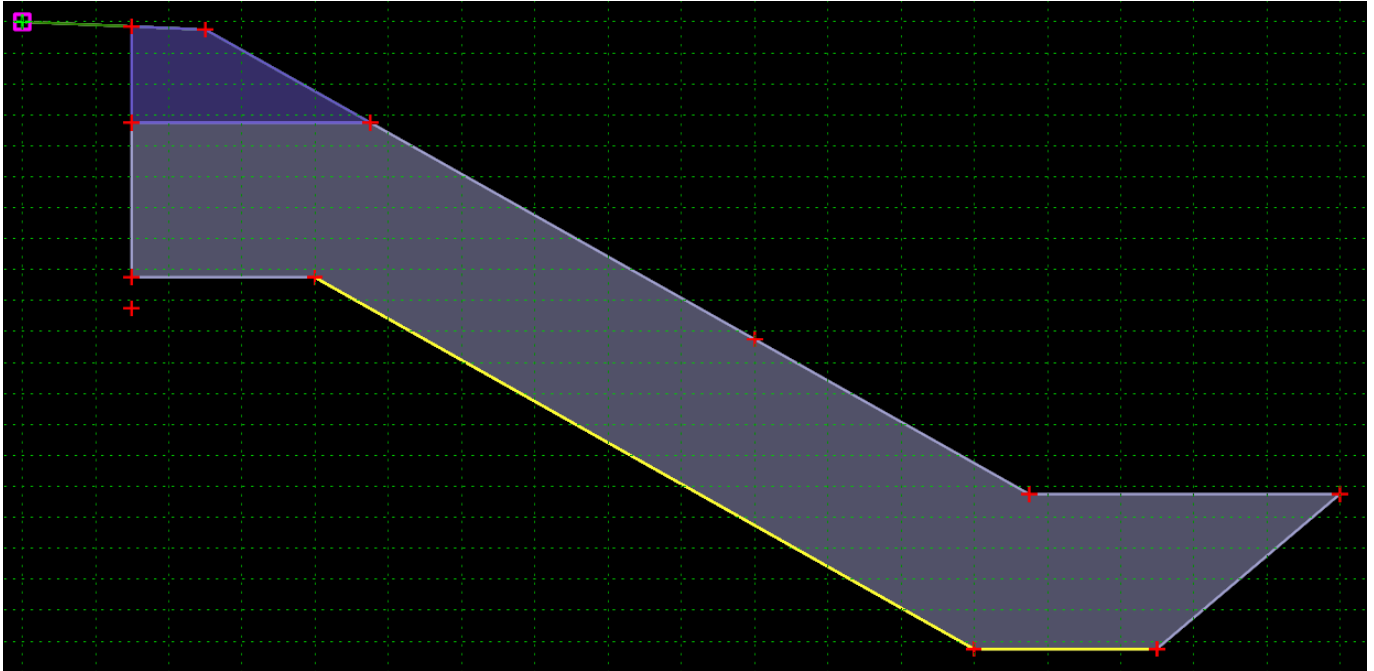


5.2. RIPRAP_REVETMENT_KEYED

Location. <project template library>/ORD Templates/ Riprap Revetment/Riprap_Revetment_Keyed

Description. This template is for keyed in riprap revetments.

Figure 36 – Riprap_Revetment_Keyed Template



How to assemble with main template. Drag the Hinge onto the daylight point of subgrade, Hinge point will automatically merge with component point.

Parametric Constraints.

Figure 37 – Keyed riprap revetment parametric constraints

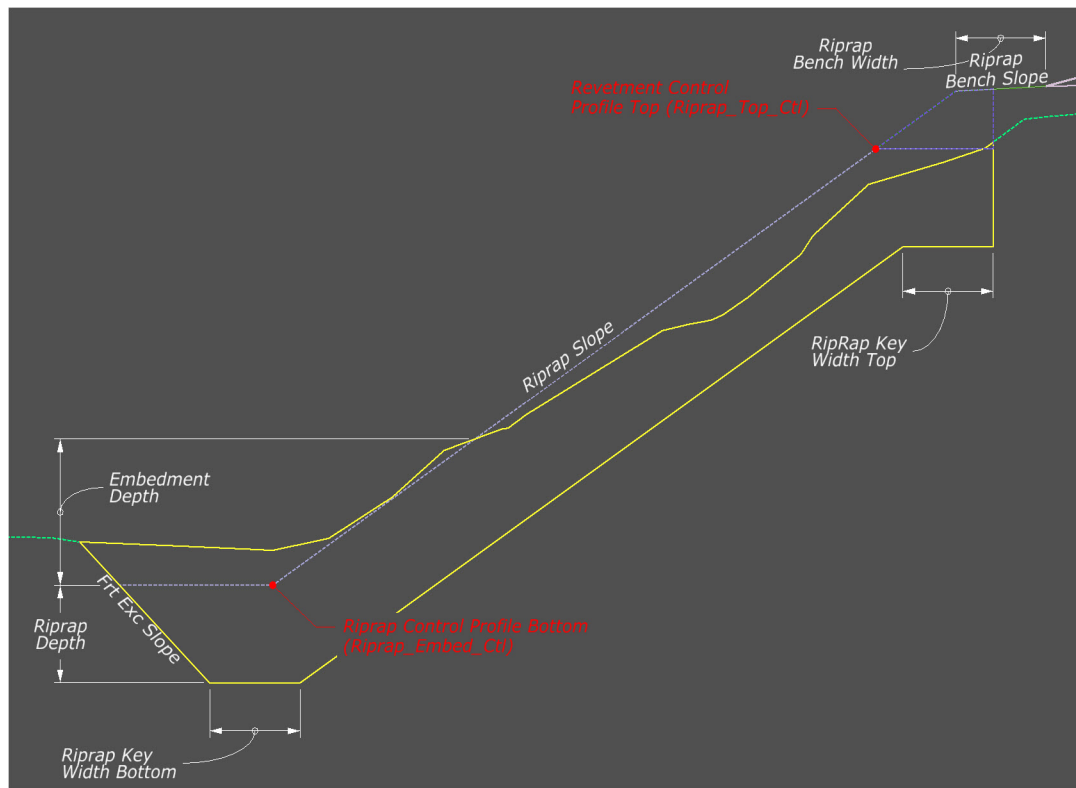


Table 14 – Keyed riprap revetment parametric constraints

Parametric Constraint Label	Default Value	Parent Point
Embedment Depth	-5'	Riprap Embed_Ctl
Frt Exc Slope	100%	Riprap Key Frt
Riprap Bench Slope	5.00%	Riprap Bench
Riprap Bench Slope	5'	Riprap Bench
Riprap Depth	-5'	Riprap_Btm2
Riprap Slope	66.67%	Riprap Toe_OG
Riprap Key Width Top	5'	Riprap_Btm_Bk
Riprap Key Width Btm	5'	Riprap_Btm_Frt

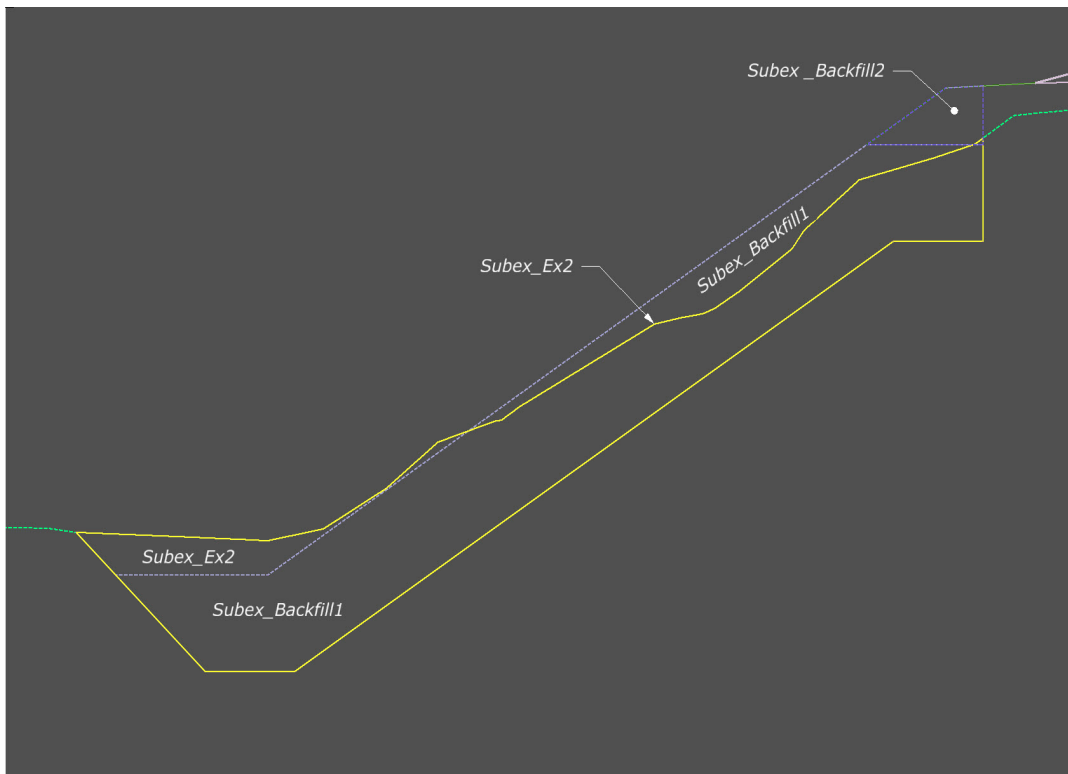
Point Controls.

Table 15 – Keyed riprap revetment point controls

Point	Description
Riprap_Top_Ctl	Top Profile
Riprap_Embed_Ctl	Bottom Profile

Feature Definition Volume Options.

Figure 38 – Keyed riprap revetment feature definition volume options



The Feature Definition/Mesh/Volume options are by default set to "Design". Use the Mesh/Volume option in the table below to separate the subex quantity volumes from normal cut/fill volumes.

Edits can be made in the Your project(1)_cor.dgn at: Explorer/OpenRoads Standards/Your project(1)_Cor.dgn/Feature Definitions/Mesh/Subex

Table 16 – Keyed riprap revetment feature definition volume options

Feature Definition	Mesh / Volume Option	Split Quantity
Subex_Backfill_1	Custom	FALSE
Subex_Backfill_1	Custom	FALSE
Subex_Ex2	Custom	FALSE

Make sure the below parameters are checked when using the Create Cut Fill Volumes tool.

Cut Fill Volume Parameters	
Compute Custom	Checked

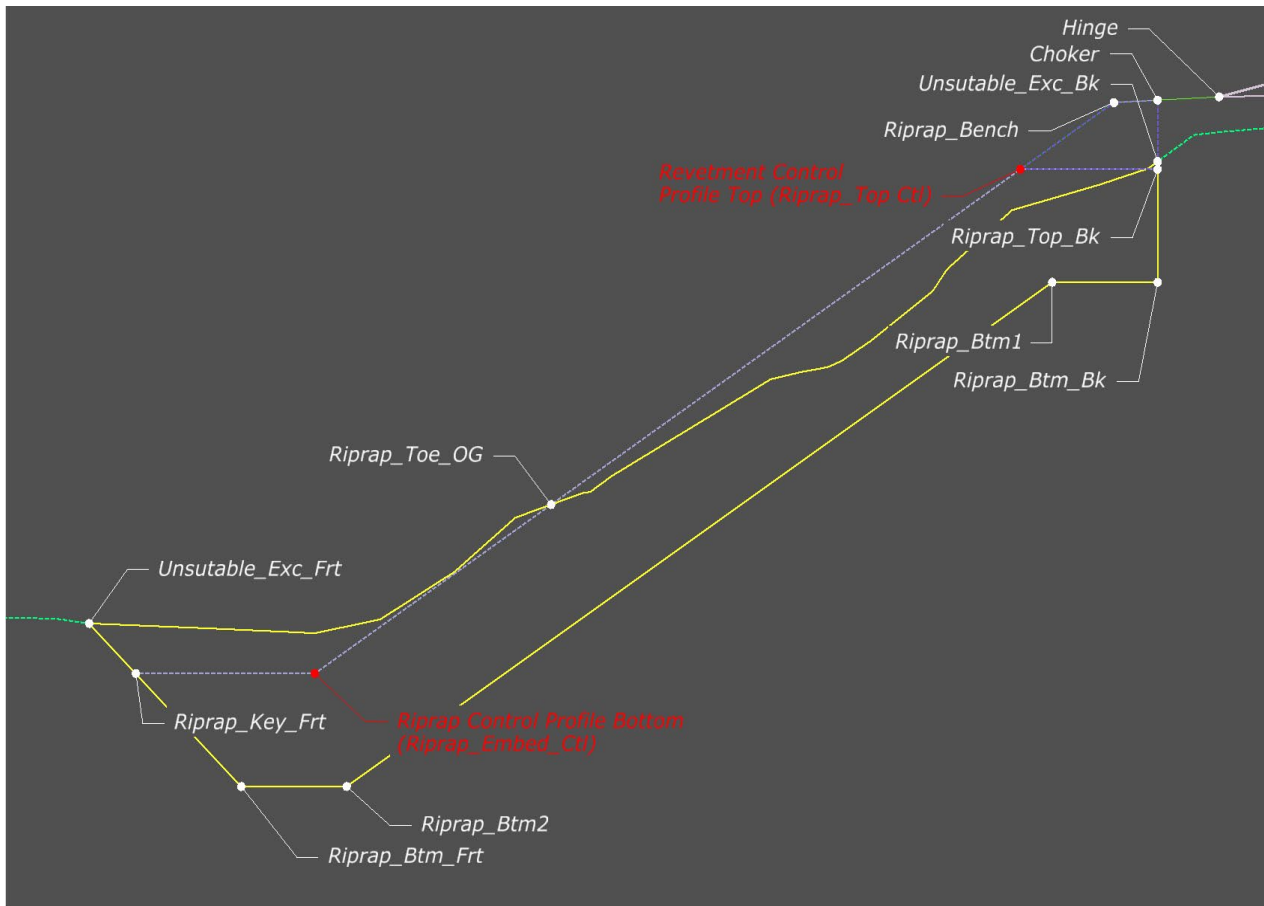
Display Rules.

Table 17 – Keyed riprap revetment display rules

Display Rule	Description
Switch_Choker	Choker Intercept Riprap Slope
Switch_Choker1	Choker Intercept Bench Slope
Switch_Excavation	Excavation catch below Riprap

Points.

Figure 39 – Keyed riprap revetment points



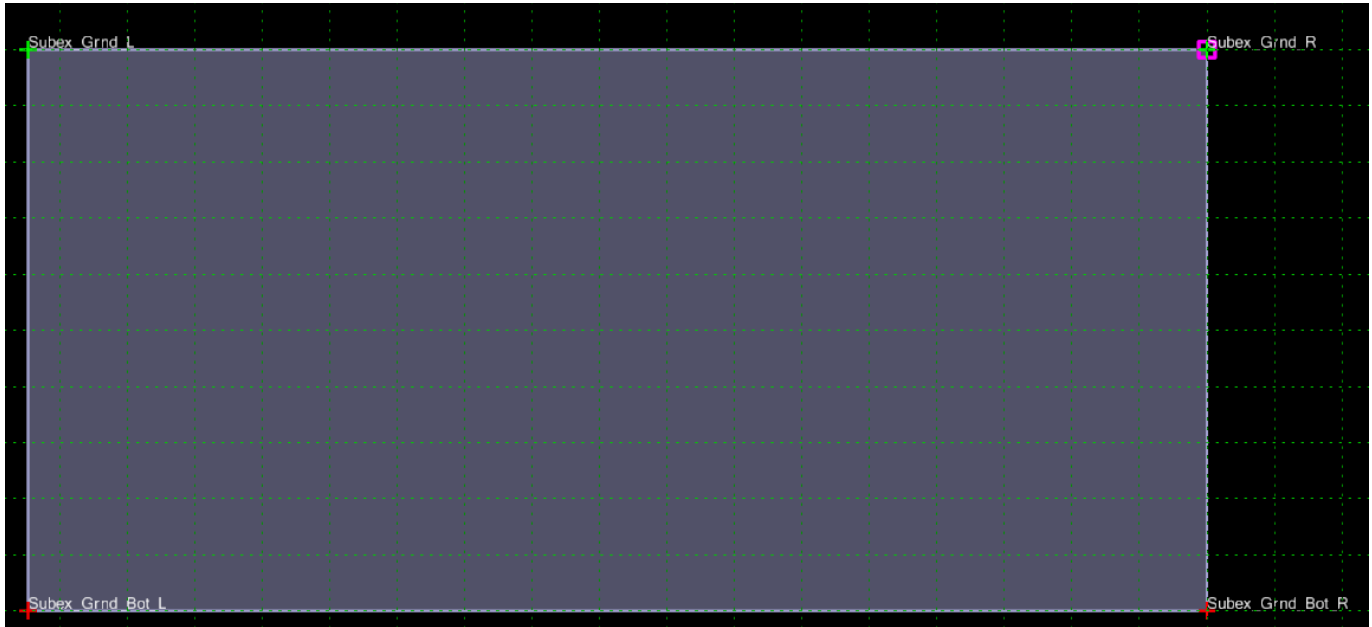
6. SUBEX

6.1. SUBEX FULL_1

Location. <project template library>/ORD Templates/Subex/Subex Full_1

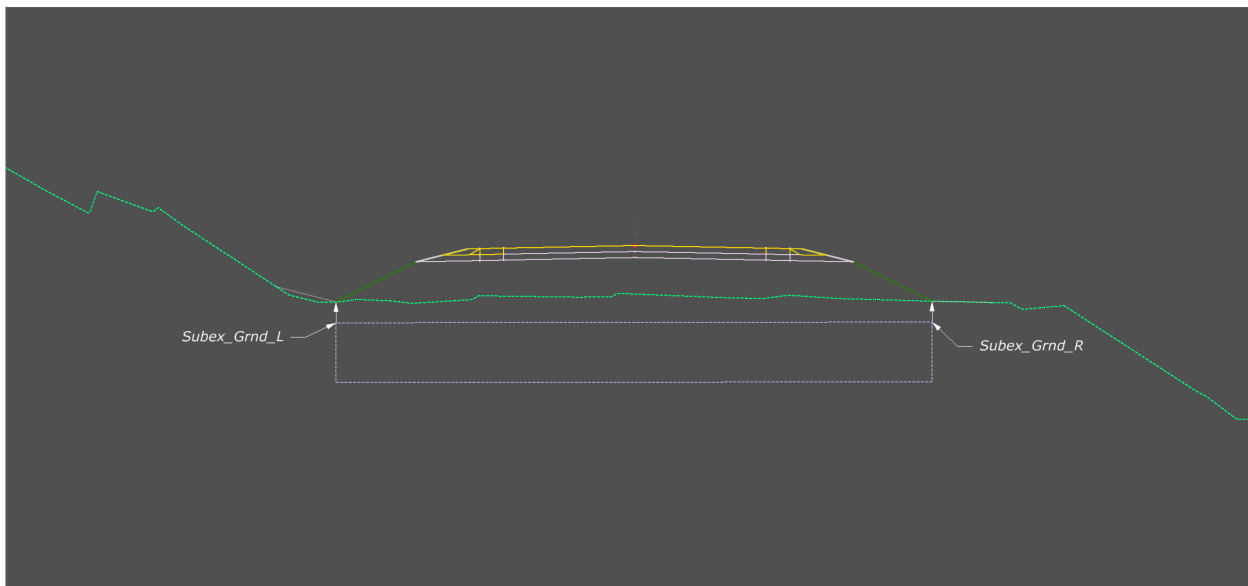
Description. This template is for subexcavation.

Figure 40 – Subex Full_1 Template



How to assemble with main template. Turn off **Apply Affixes**. Drag the **Subex_Grnd_R** point onto the Slopestake End Condition on the right side. Merge the **Subex_Grnd_L** with the slope stake end condition on the left.

Figure 41 – Full Subexcavation



Parametric Constraints.

Figure 42 – Full Subexcavation Parametric Constraints

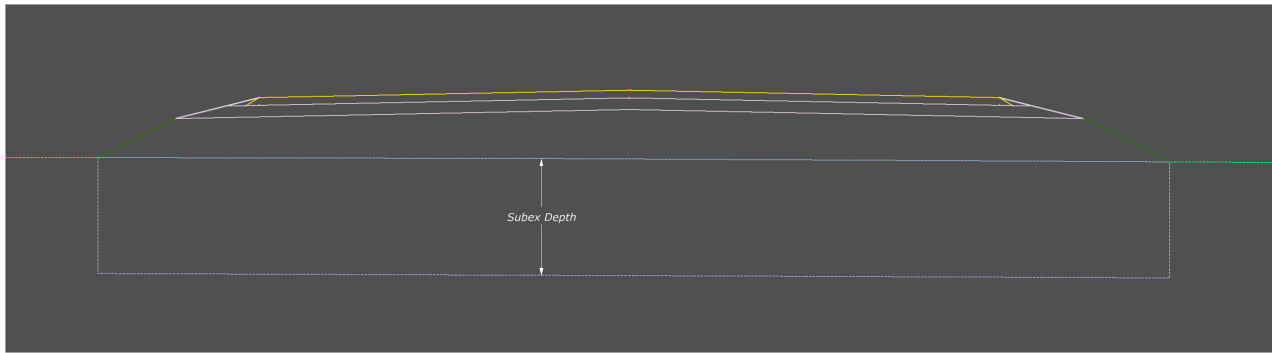
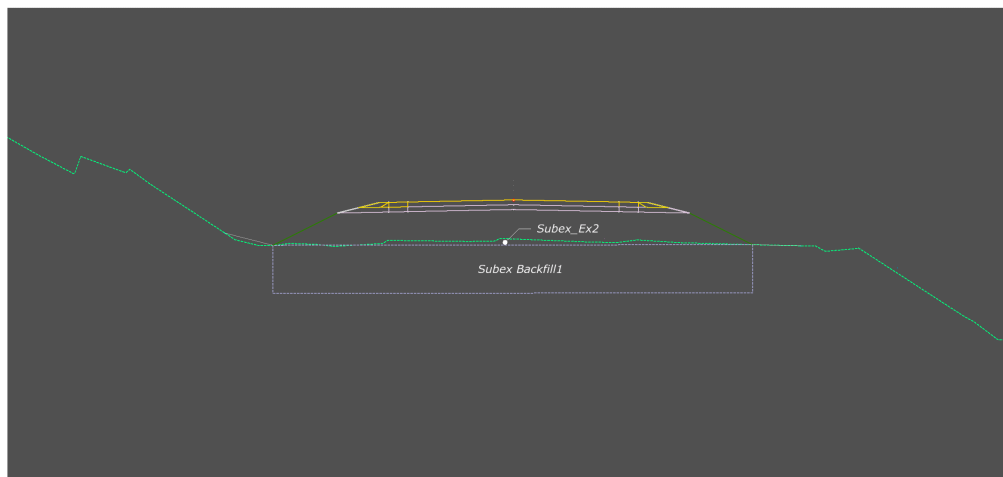


Table 18– Existing pavement with topsoil removal parametric constraints

Parametric Constraint Label	Default Value	Parent Point
Subex Depth	4'	Subex_Backfill_Bot_Out

Feature Definition Volume Options.

Figure 43 – Full Subexcavation Feature Definition Volume Options



The Feature Definition/Mesh/Volume options are by default set to "Design". Use the Mesh/Volume option in the table below to separate the subex quantity volumes from normal cut/fill volumes.

Edits can be made in the Your project(1)_cor.dgn at: Explorer/OpenRoads Standards/Your project(1)_Cor.dgn/Feature Definitions/Mesh/Subex

Table 19– Existing pavement with topsoil removal feature definitions

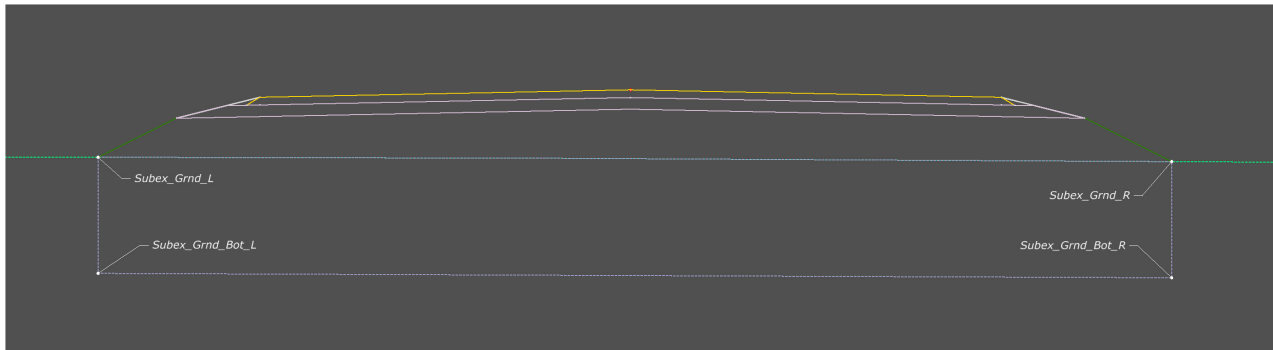
Feature Definition	Mesh / Volume Option	Split Quantity
Subex_Backfill1	None	NA
Subex_Ex2	None	NA

Make sure the below parameters are checked when using the Create Cut Fill Volumes tool.

Cut Fill Volume Parameters	
Compute Custom	Checked

Points.

Figure 44 – Full Subexcavation points

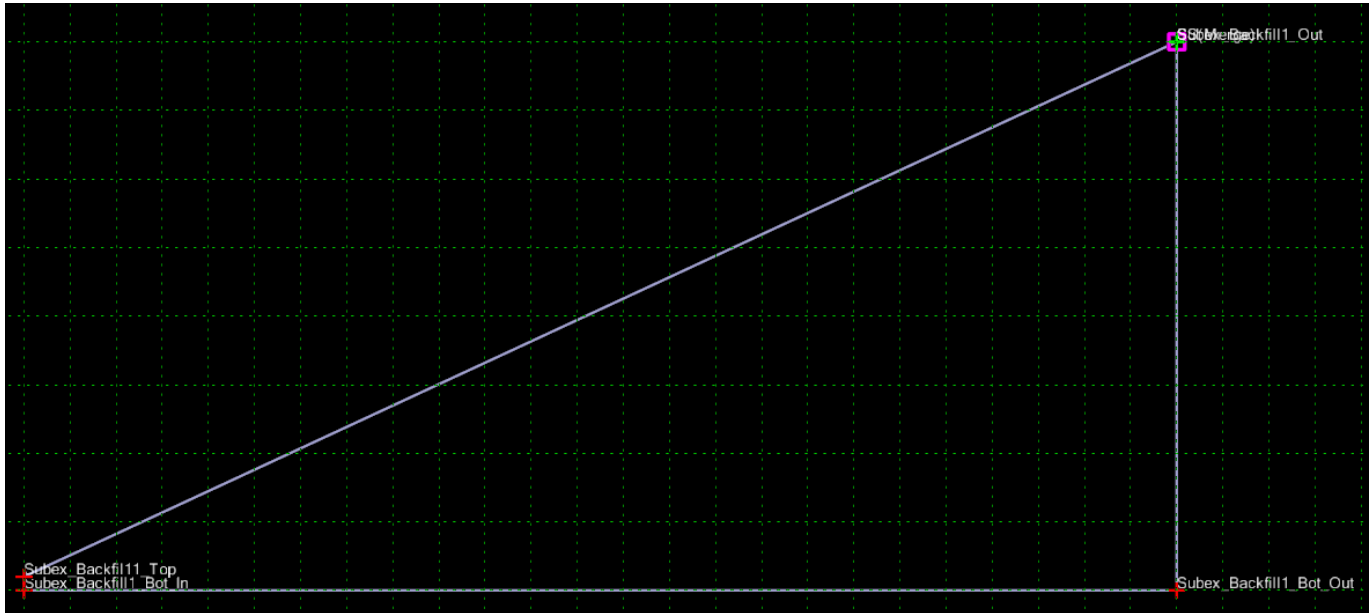


6.2. SUBEX TYPE 2

Location. <project template library>/ORD Templates/Subex/Subex Type 2

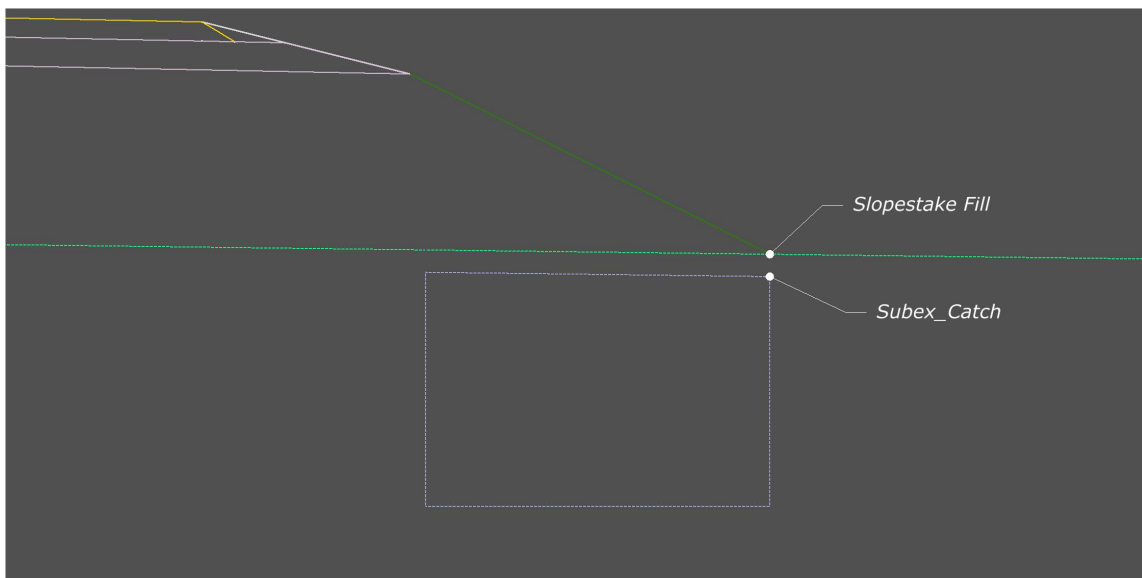
Description. This template is for wedge subexcavation.

Figure 45 – Subex Type 2 Template



How to assemble with main template. Drag the Subex_Catch point onto the Slopestake End Condition, Subex_Catch point will automatically merge with Slopestake end condition point.

Figure 46 – Subexcavation Type 2 Template



Parametric Constraints.

Figure 47 – Subexcavation Type 2 parametric constraints

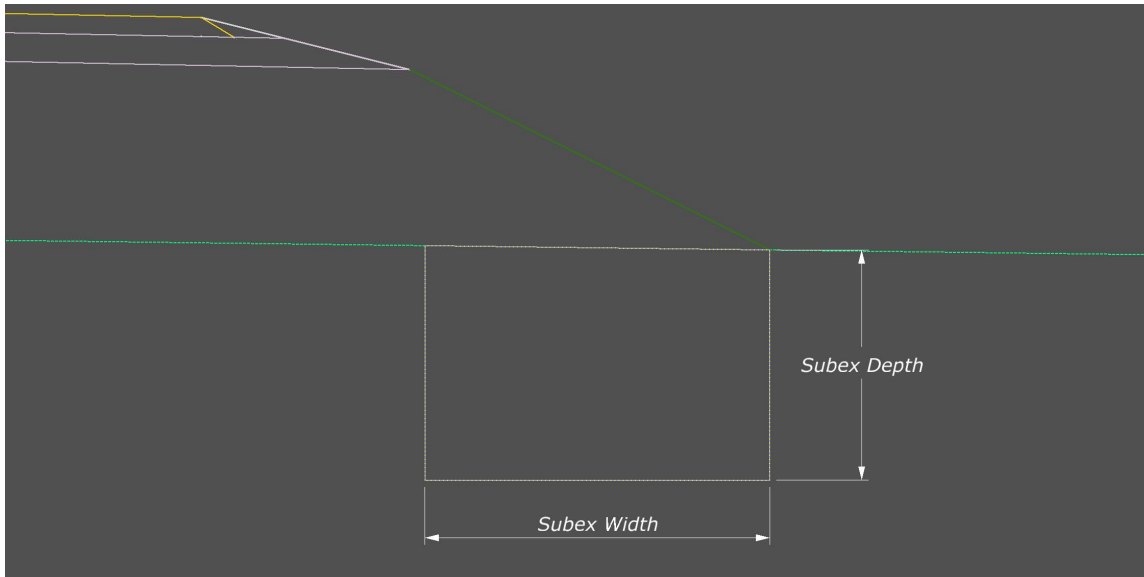
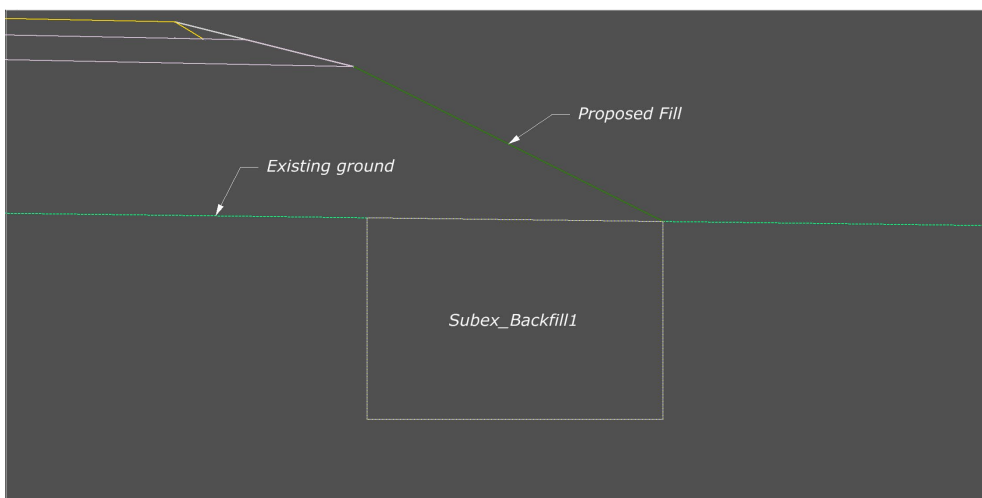


Table 20 – Subexcavation Type 2 parametric constraints

Parametric Constraint Label	Default Value	Parent Point
Subex Depth	4'	Subex_Backfill_Bot_Out
Subex Width	6'	Subex_Backfill_Bot_In

Feature Definition Volume Options.

Figure 48 – Subexcavation Type 2 feature definition volume options



The Feature Definition/Mesh/Volume options are by default set to "Design". Use the Mesh/Volume option setting in the table below to separate the subex volumes from normal cut/fill volumes.

Edits can be made in the Your project(1)_cor.dgn at:

Explorer/OpenRoads Standards/Your project(1)_Cor.dgn/Feature Definitions/Mesh/Subex

Table 21 – Subexcavation Type 2 feature definition volume options

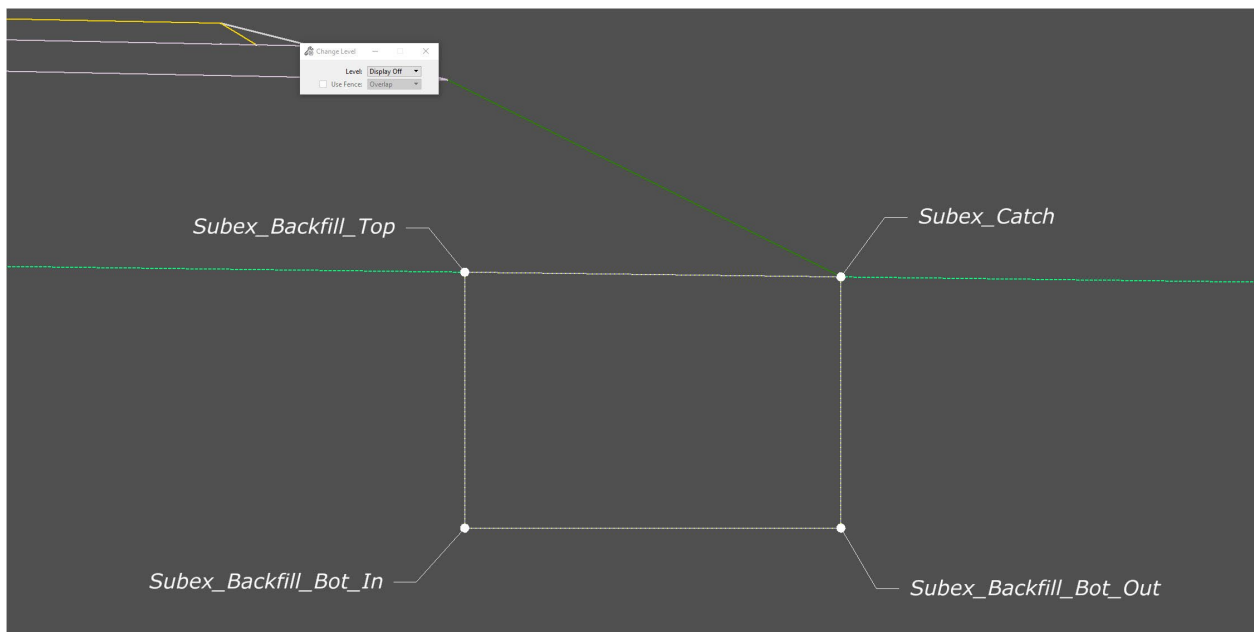
Feature Definition	Mesh / Volume Option	Split Quantity
Subex_Backfill1	Custom	FALSE
Subex_Ex2	Custom	FALSE

Make sure the below parameters are checked when using the Create Cut Fill Volumes tool.

Cut Fill Volume Parameters	
Compute Custom	Checked

Points.

Figure 49 – Subexcavation Type 2 points

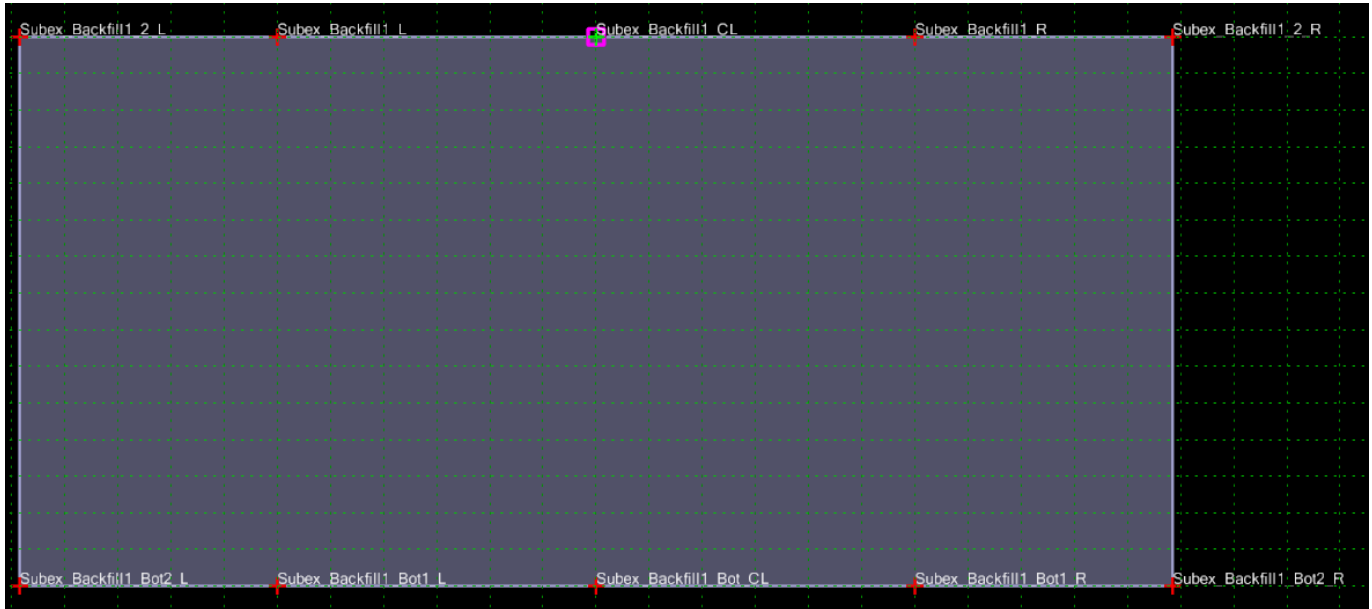


6.3. SUBGRADE_SUBEX_FULL

Location. <project template library>/ORD Templates/Subex/Subgrade_Subex_Full

Description. This template is for full width subgrade subexcavation.

Figure 50 – Subgrade_Subex_Full Template



6.4. SUBGRADE_SUBEX_HALF

Location. <project template library>/ORD Templates/Subex/Subgrade_Subex_Half

Description. This template is for half width subgrade subexcavation.

Figure 51 – Subgrade_Subex_Half Template

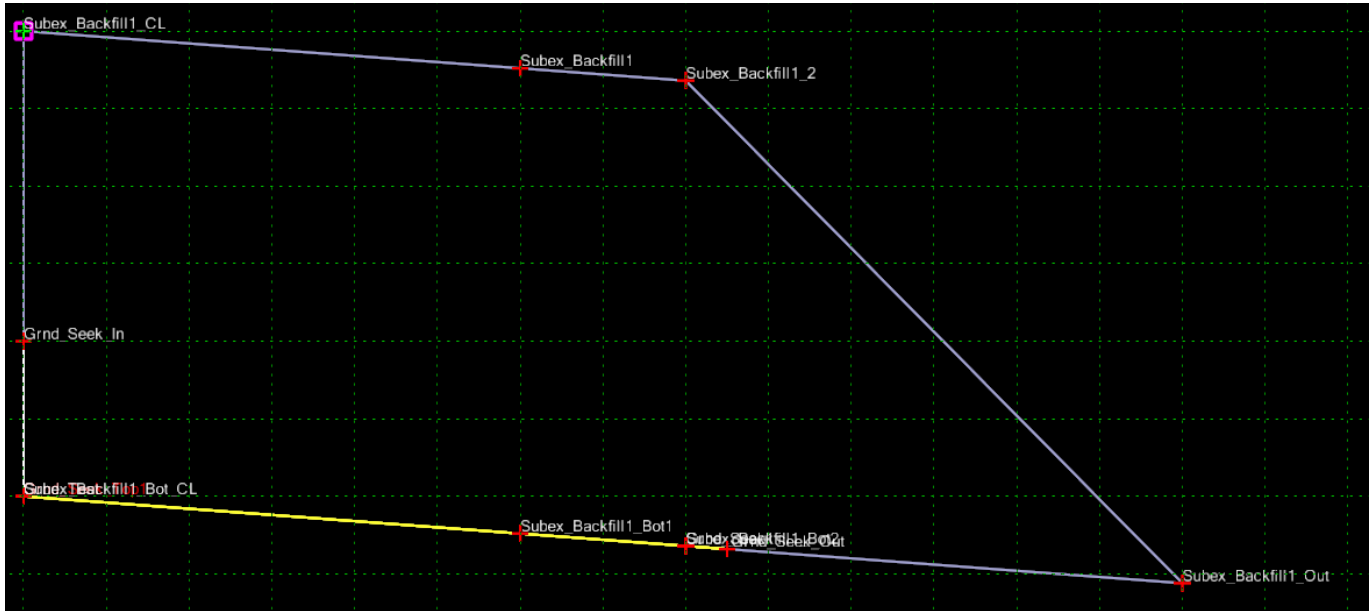


6.5. SUBGRADE_SUBEX_HALF_DAYLIGHT1

Location. <project template library>/ORD Templates/Subex/Subgrade_Subex_Half_Daylight1

Description. This template is for half width subgrade subexcavation.

Figure 52 – Subgrade_Subex_Half_Daylight1 Template



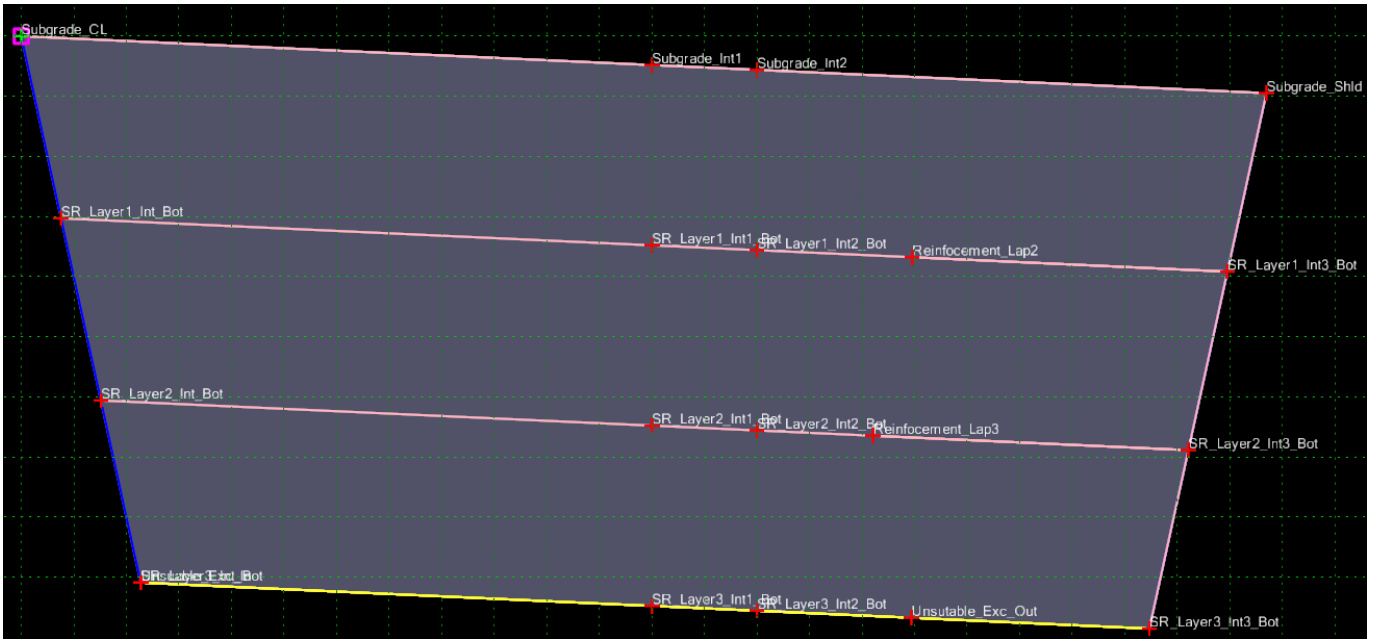
7. SUBGRADE REINFORCEMENT

7.1. SUBGRADE REINFORCEMENT 1/2 WIDTH

Location. <project template library>/ORD Templates/Subgrade Reinforcement/Subgrade Reinforcement 1/2 Width

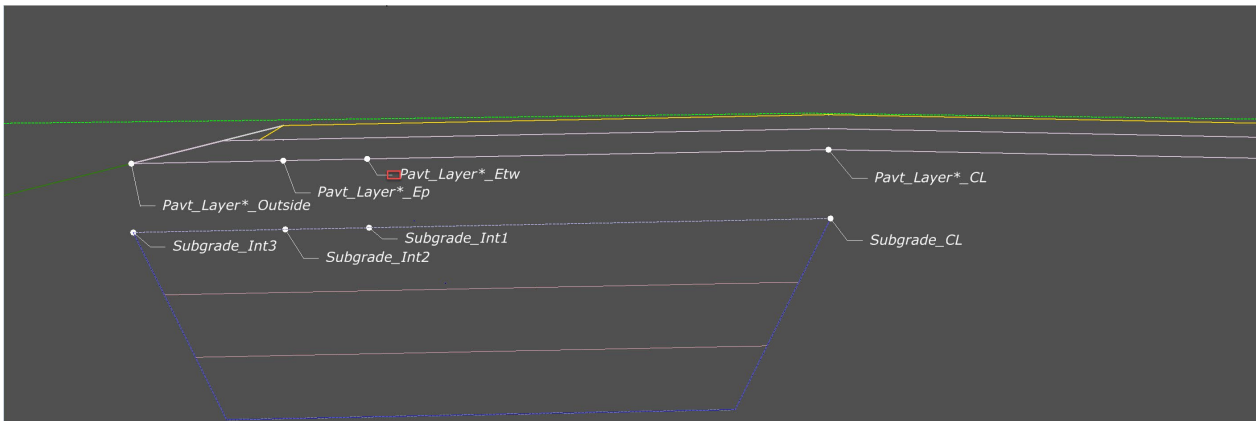
Description. This template is for subexcavation with reinforcement layers.

Figure 53 – Subgrade Reinforcement 1/2 Width Template



How to assemble with main template. Drag the Subgrade_CL onto the CL point of subgrade, Subgrade_CL point will automatically merge with component point. Merge the subgrade_Int1 with the ETW point of subgrade. Merge the subgrade_Int2 with the EOP point of subgrade. Merge the subgrade_Int3 with the Outside point of subgrade.

Figure 54 – Subgrade reinforcement – half width template



Parametric Constraints.

Figure 55 – Subgrade reinforcement – half width parametric constraints

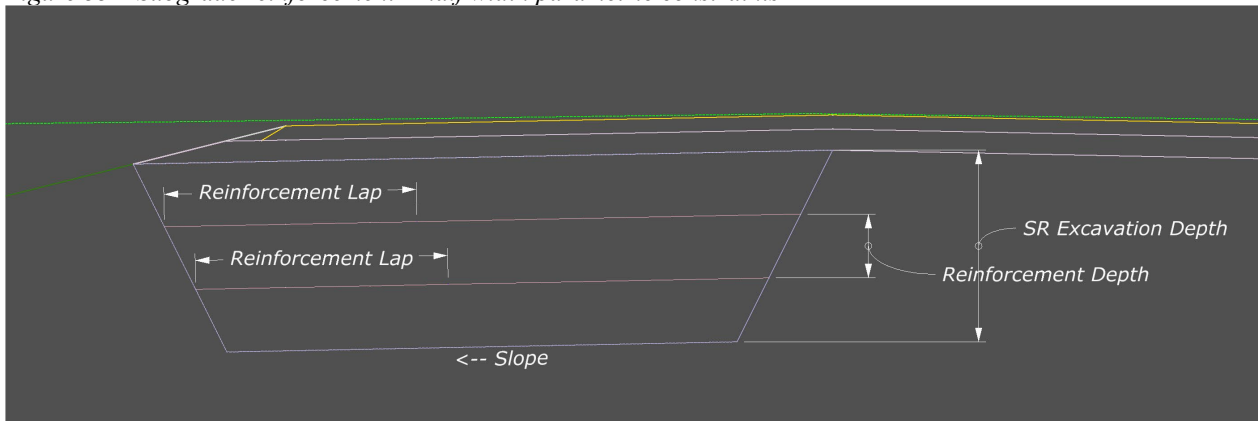
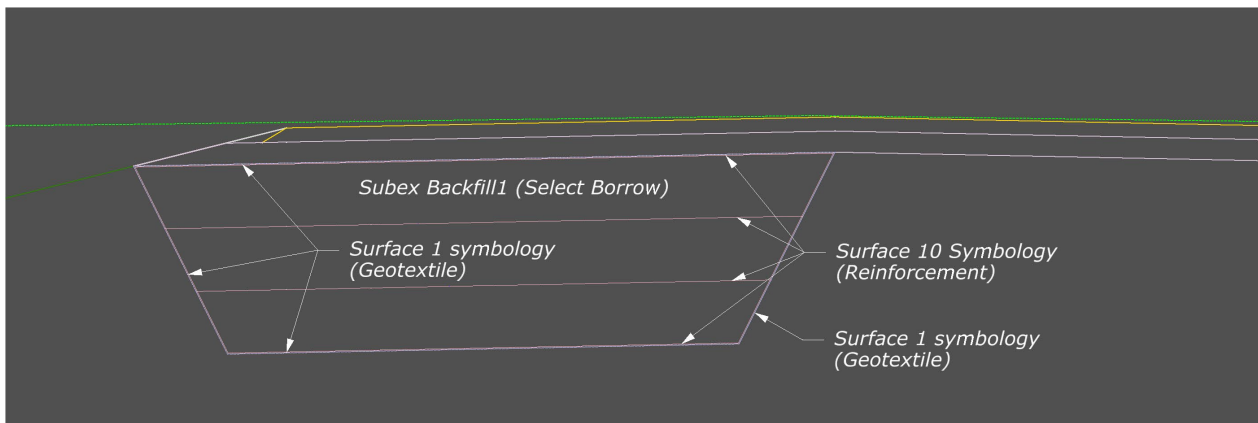


Table 22 – Subgrade reinforcement – half width parametric constraints

Parametric Constraint Label	Default Value	Parent Point	Note
Reinforcement Depth	-1.5'		
Reinforcement Lap	-6'		
SR Exc Depth	-4.5'	SR_Exc_Depth	Multiple of Reinf Depth
SR Slope	-2%		Follows Super

Feature Definition Volume Options.

Figure 56 – Subgrade reinforcement – half width feature definition volume options



The Feature Definition/Mesh/Volume options are by default set to "Design". Use the Mesh/Volume option in the table below to separate the subex quantity volumes from normal cut/fill volumes.

Edits can be made in the Your project(1)_cor.dgn at: Explorer/OpenRoads Standards/Your project(1)_Cor.dgn/Feature Definitions/Mesh/Subex

Table 23 – Subgrade reinforcement – half width feature definition volume options

Feature Definition	Mesh / Volume Option	Split Quantity
Subex_Backfill1	Custom	FALSE
Surface 1 Symbology	Custom	FALSE
Surface 10 Symbology	Custom	N/A

Make sure the below parameters are checked when using the Create Cut Fill Volumes tool.

Cut Fill Volume Parameters	
Compute Custom	Checked

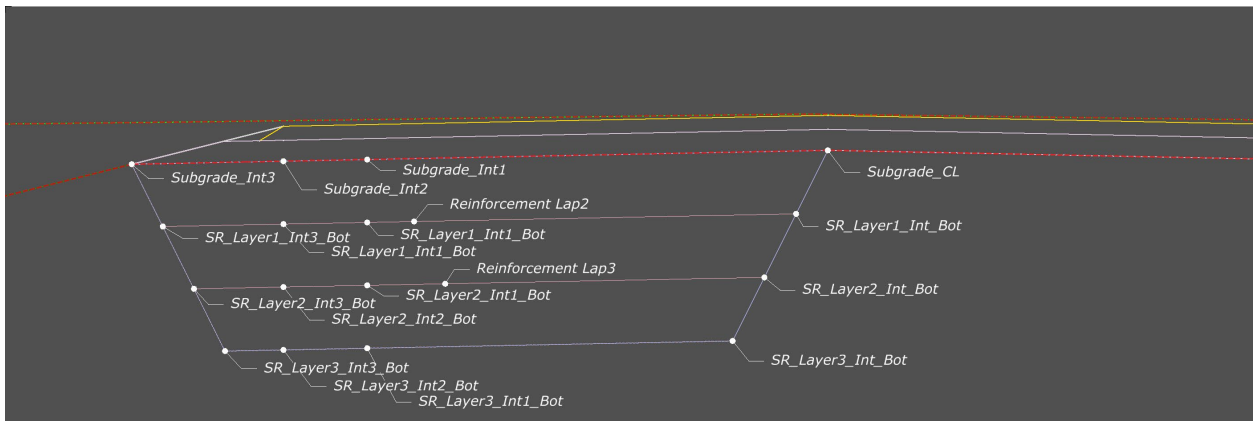
Display Rules.

Table 24 – Subgrade reinforcement – half width display rules

Display Rule	Description
Rule1	Layer 2 Reinforcement on
Rule2	Layer 3 Reinforcement on
Rule3	Top & Bottom Reinforcement on

Points.

Figure 57 – Subgrade reinforcement – half width points

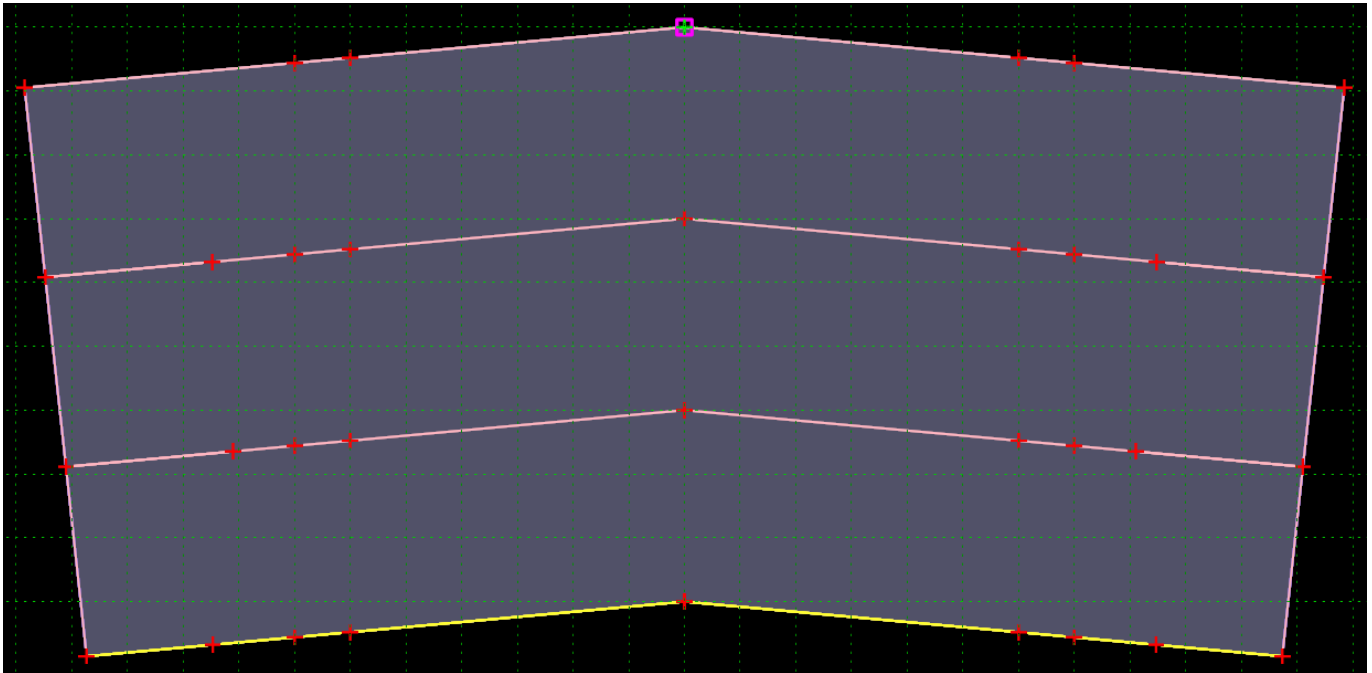


7.2. SUBGRADE REINFORCEMENT FULL WIDTH

Location. <project template library>/ORD Templates/Subgrade Reinforcement/Subgrade Reinforcement Full Width

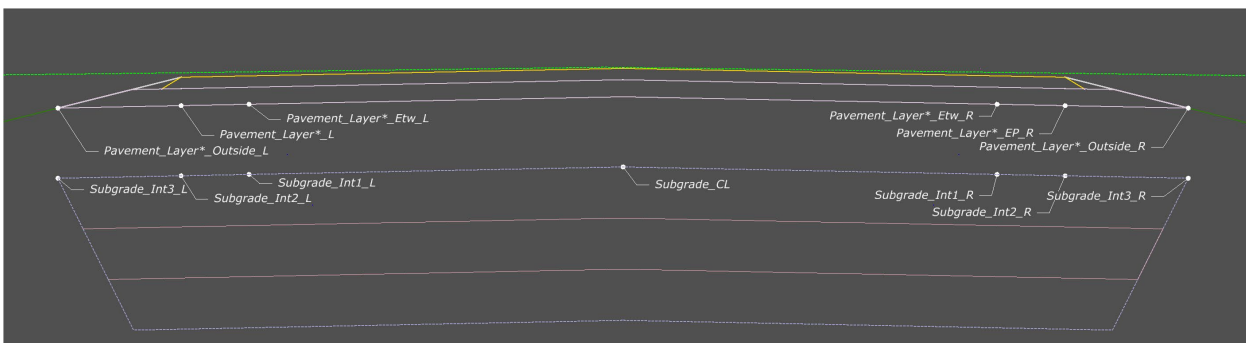
Description. This template is for subexcavation with reinforcement layers.

Figure 58 – Subgrade Reinforcement Full Width Template



How to assemble with main template. Drag the Subgrade_CL onto the CL point of subgrade, Subgrade_CL point will automatically merge with component point. Merge the subgrade_Int1 with the ETW point of subgrade. Merge the subgrade_Int2 with the EOP point of subgrade. Merge the subgrade_Int3 with the Outside point of subgrade.

Figure 59 – Subgrade reinforcement – full width template



Parametric Constraints.

Figure 60 – Subgrade reinforcement – full width parametric constraints

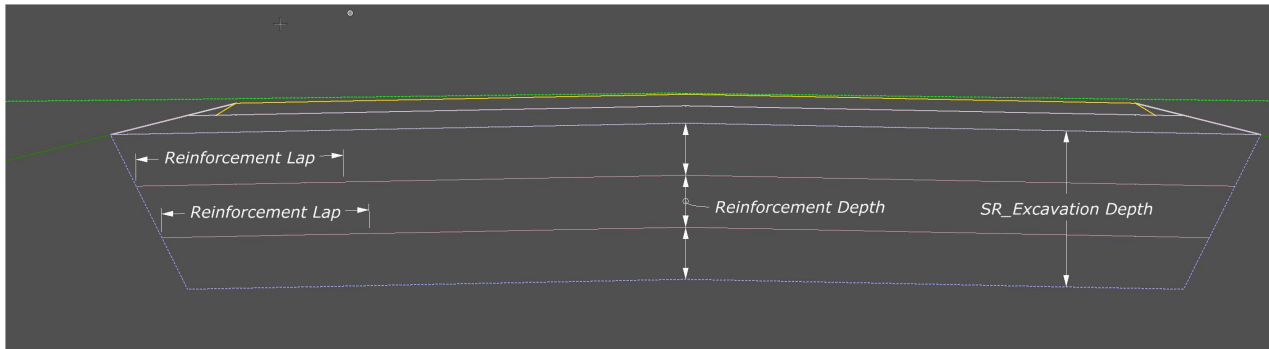
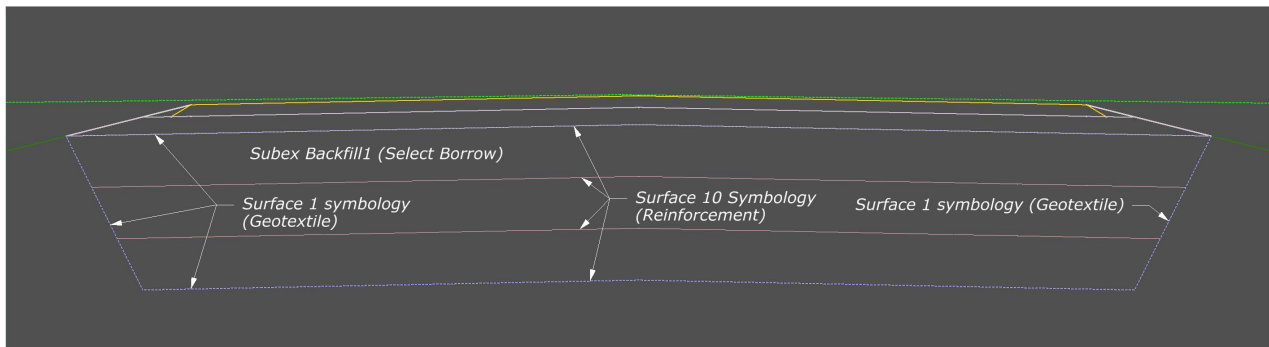


Table 25 – Subgrade reinforcement – full width parametric constraints

Parametric Constraint Label	Default Value	Parent Point	Note
Reinforcement Depth	-1.5'		
Reinforcement Lap	-6'		
SR Exc Depth	-4.5'	SR_Exc_Depth	Multiple of Reinf Depth
SR Slope	-2%		Follows Super

Feature Definition Volume Options.

Figure 61 – Subgrade reinforcement – full width feature definition volume options



The Feature Definition/Mesh/Volume options are by default set to "Design". Use the Mesh/Volume option in the table below to separate the subex quantity volumes from normal cut/fill volumes.

Edits can be made in the Your project(1)_cor.dgn at: Explorer/OpenRoads Standards/Your project(1)_Cor.dgn/Feature Definitions/Mesh/Subex

Table 26 – Subgrade reinforcement – full width feature definition volume options

Feature Definition	Mesh / Volume Option	Split Quantity
Subex_Backfill1	Custom	FALSE
Surface 1 Symbology	Custom	FALSE
Surface 10 Symbology	None	FALSE

Make sure the below parameters are checked when using the Create Cut Fill Volumes tool.

Cut Fill Volume Parameters	
Compute Custom	Checked

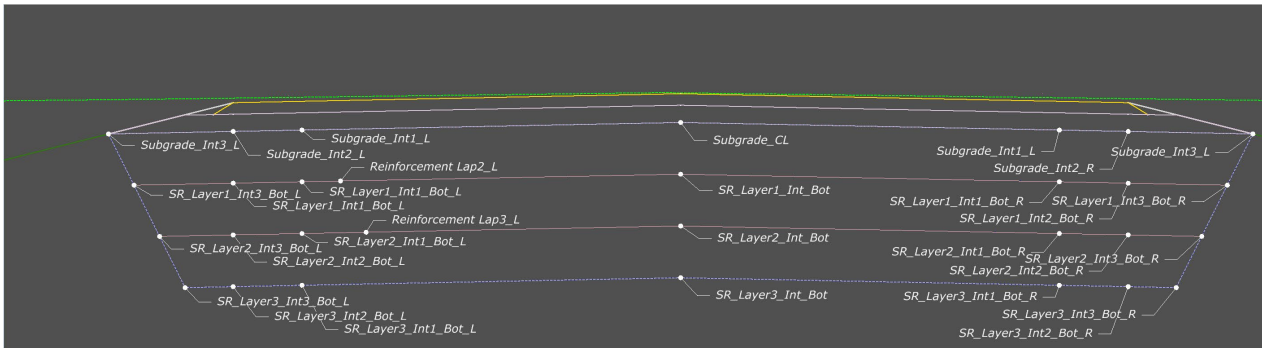
Display Rules.

Table 27 – Subgrade reinforcement – full width display rules

Display Rule	Description
Rule1	Layer 2 Reinforcement on
Rule2	Layer 3 Reinforcement on
Rule3	Top & Bottom Reinforcement on

Points.

Figure 62 – Subgrade reinforcement – full width points

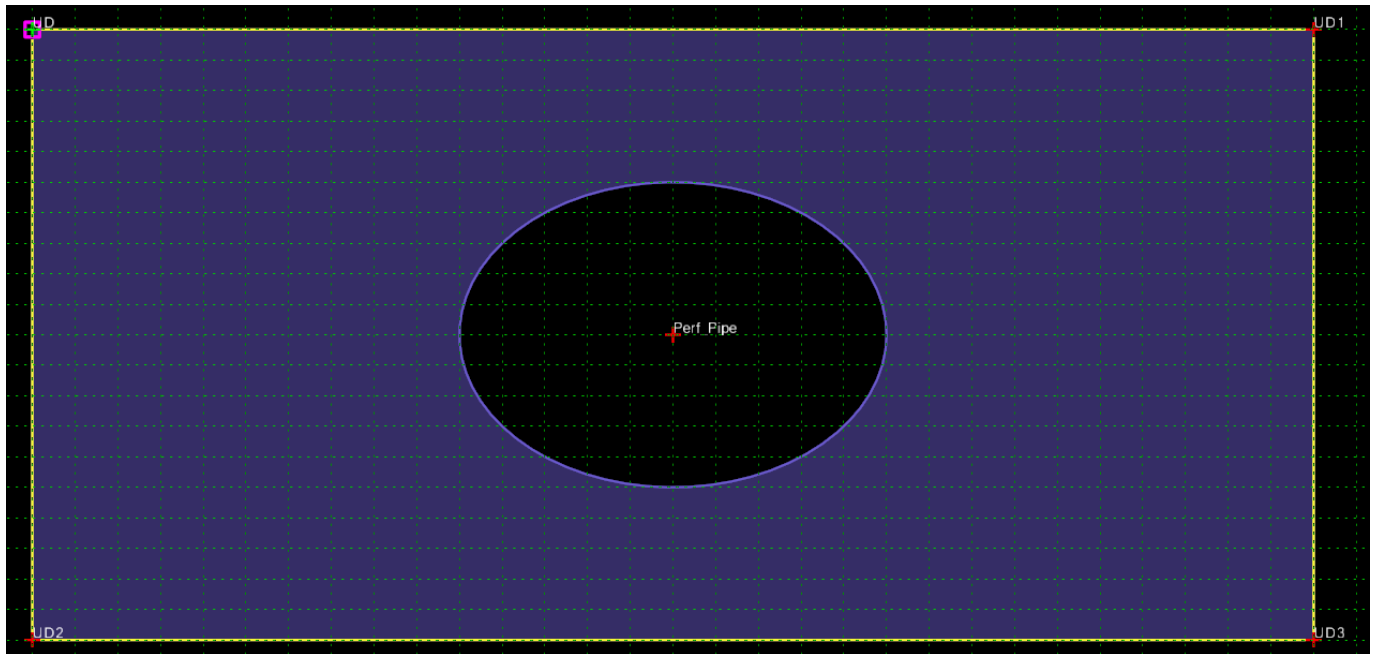


7.3. UNDERDRAIN

Location. <project template library>/ORD Templates/Subgrade Reinforcement/Underdrain

Description. This template is for Underdrain systems.

Figure 63 – Underdrain Template



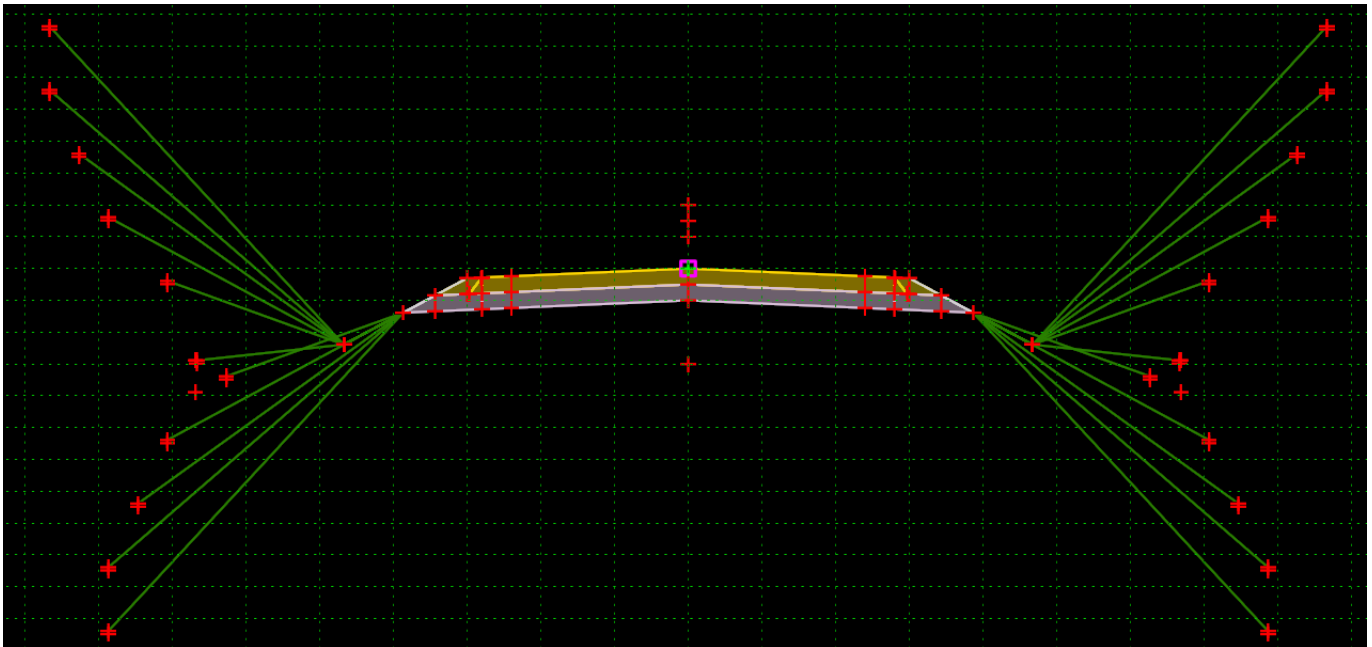
8. TEMPLATES

8.1. TWO-LANE 2 LAYER

Location. <project template library>/ORD Templates/Templates/Two-Lane 2 Layer

Description. This template is two-lane traveled way with shoulders using the Safety Wedge + Cut Priority and Fill End Condition with topsoil.

Figure 64 – Two-Lane 2 Layer Template



Parametric Constraints.

Table 28 – Simple Two-Lane Template Parametric Constraints

Parametric Constraints	Setting	Use
Cut Slope_L	Equal to slope	Adjust cut slopes
Cut Slope_R	Equal to slope	Adjust cut slopes
Daylight Depth_L	1'	Adjust depth of daylight ditch
Daylight Depth_R	1'	Adjust depth of daylight ditch
Daylight Ditch Width_L	0'	Extends daylight backslope distance
Daylight Ditch Width_R	0'	Extends daylight backslope distance
Daylight Foreslope_L	1:4 (25%)	Adjust foreslope of daylight ditch
Daylight Foreslope_R	1:4 (25%)	Adjust foreslope of daylight ditch
Display off_L	0'	Turns off display of Wedge & End condition
Display off_R	0'	Turns off display of Wedge & End condition
Ditch Bot Slope_L	0%	Controls slope of flat bottom ditch
Ditch Bot Slope_R	0%	Controls slope of flat bottom ditch

Parametric Constraints	Setting	Use
Ditch Bot Width_L	0'	Controls width of flat bottom ditch
Ditch Bot Width_R	0'	Controls width of flat bottom ditch
Ditch Depth_L	1'	Controls the depth of ditch
Ditch Depth_R	1'	Controls the depth of ditch
Ditch Foreslope_L	1:4 (25%)	Adjusts foreslope of ditch
Ditch Foreslope_R	1:4 (25%)	Adjusts Foreslope of ditch
Fill Slope_L	Equal to slope	Adjusts fill slopes
Fill Slope_R	Equal to slope	Adjusts fill slopes
Foreslope_L	Equal to slope	Adjusts foreslope of pavement section
Foreslope_R	Equal to slope	Adjusts foreslope of pavement section
Gravel Width_L	1'	Adjusts width of safety edge gravel cover (cannot be zero)
Gravel Width_R	1'	Adjusts width of safety edge gravel cover (cannot be zero)
Lane 1 Depth	-0.5'	Controls depth of lane layer 1
Lane 2 Depth	-0.5'	Controls depth of lane layer 2
Lane 3 Depth	-0.5'	Controls depth of lane layer 3
Lane 4 Depth	-0.5'	Controls depth of lane layer 4
Lane Slope_L	2%	Controls slope of lane
Lane Slope_R	2%	Controls slope of lane
Lane Width_L	12'	Controls width of lane
Lane Width_R	12'	Controls width of lane
Shldr 1 Depth	-0.5'	Controls depth of shoulder layer 1
Shldr 2 Depth	-0.5'	Controls depth of shoulder layer 2
Shldr Width_L	2'	Controls width of shoulder
Shldr Width_R	2'	Controls width of shoulder
Wedge 1 Depth	-0.5'	Controls depth of wedge layer 1
Wedge 2 Depth	-0.5'	Controls depth of wedge layer 2

Display Rules.

Table 29– Simple Two-Lane Template Display Rules

Display Rules	Setting	Use
Display off_L	0'	Turns off display of Wedge & End condition
Display off_R	0'	Turns off display of Wedge & End condition

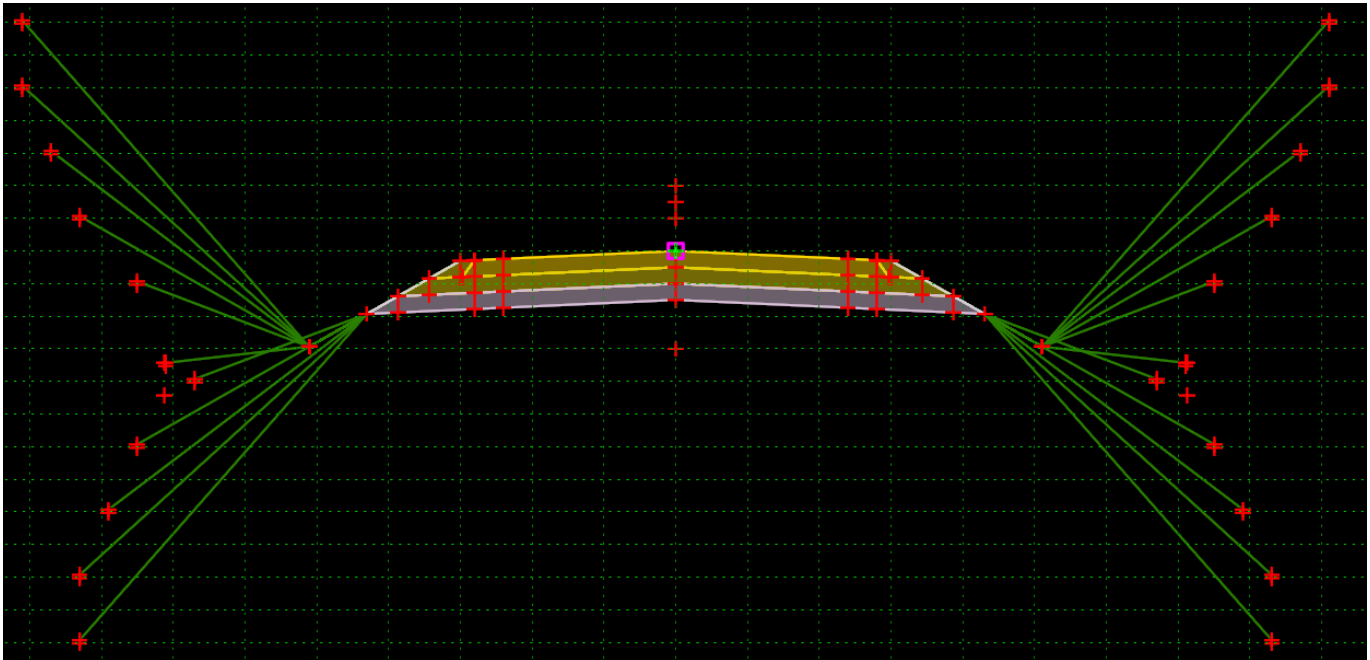
Alternately, if geometry using Feature Definition "Approach Road Match Line" is present, and made an External Reference to the Corridor, then the wedge and end condition will turn off on the side the feature is placed.

8.2. TWO-LANE 3 LAYER

Location. <project template library>/ORD Templates/Templates/Two-Lane 3 Layer

Description. This template is two-lane traveled way with shoulders using the Safety Wedge + Cut Priority and Fill End Condition with topsoil.

Figure 65 – Two-Lane 3 Layer Template



Parametric Constraints.

Table 30 – Simple Two-Lane Template Parametric Constraints

Parametric Constraints	Setting	Use
Cut Slope_L	Equal to slope	Adjust cut slopes
Cut Slope_R	Equal to slope	Adjust cut slopes
Daylight Depth_L	1'	Adjust depth of daylight ditch
Daylight Depth_R	1'	Adjust depth of daylight ditch
Daylight Ditch Width_L	0'	Extends daylight backslope distance
Daylight Ditch Width_R	0'	Extends daylight backslope distance
Daylight Foreslope_L	1:4 (25%)	Adjust foreslope of daylight ditch
Daylight Foreslope_R	1:4 (25%)	Adjust foreslope of daylight ditch
Display off_L	0'	Turns off display of Wedge & End condition
Display off_R	0'	Turns off display of Wedge & End condition
Ditch Bot Slope_L	0%	Controls slope of flat bottom ditch
Ditch Bot Slope_R	0%	Controls slope of flat bottom ditch
Ditch Bot Width_L	0'	Controls width of flat bottom ditch

Parametric Constraints	Setting	Use
Ditch Bot Width_R	0'	Controls width of flat bottom ditch
Ditch Depth_L	1'	Controls the depth of ditch
Ditch Depth_R	1'	Controls the depth of ditch
Ditch Foreslope_L	1:4 (25%)	Adjusts foreslope of ditch
Ditch Foreslope_R	1:4 (25%)	Adjusts Foreslope of ditch
Fill Slope_L	Equal to slope	Adjusts fill slopes
Fill Slope_R	Equal to slope	Adjusts fill slopes
Foreslope_L	Equal to slope	Adjusts foreslope of pavement section
Foreslope_R	Equal to slope	Adjusts foreslope of pavement section
Gravel Width_L	1'	Adjusts width of safety edge gravel cover (cannot be zero)
Gravel Width_R	1'	Adjusts width of safety edge gravel cover (cannot be zero)
Lane 1 Depth	-0.5'	Controls depth of lane layer 1
Lane 2 Depth	-0.5'	Controls depth of lane layer 2
Lane 3 Depth	-0.5'	Controls depth of lane layer 3
Lane Slope_L	2%	Controls slope of lane
Lane Slope_R	2%	Controls slope of lane
Lane Width_L	12'	Controls width of lane
Lane Width_R	12'	Controls width of lane
Shldr 1 Depth	-0.5'	Controls depth of shoulder layer 1
Shldr 2 Depth	-0.5'	Controls depth of shoulder layer 2
Shldr 3 Depth	-0.5'	Controls depth of shoulder layer 3
Shldr Width_L	2'	Controls width of shoulder
Shldr Width_R	2'	Controls width of shoulder
Wedge 1 Depth	-0.5'	Controls depth of wedge layer 1
Wedge 2 Depth	-0.5'	Controls depth of wedge layer 2
Wedge 3 Depth	-0.5'	Controls depth of wedge layer 3

Display Rules.

Table 31– Simple Two-Lane Template Display Rules

Display Rules	Setting	Use
Display off_L	0'	Turns off display of Wedge & End condition
Display off_R	0'	Turns off display of Wedge & End condition

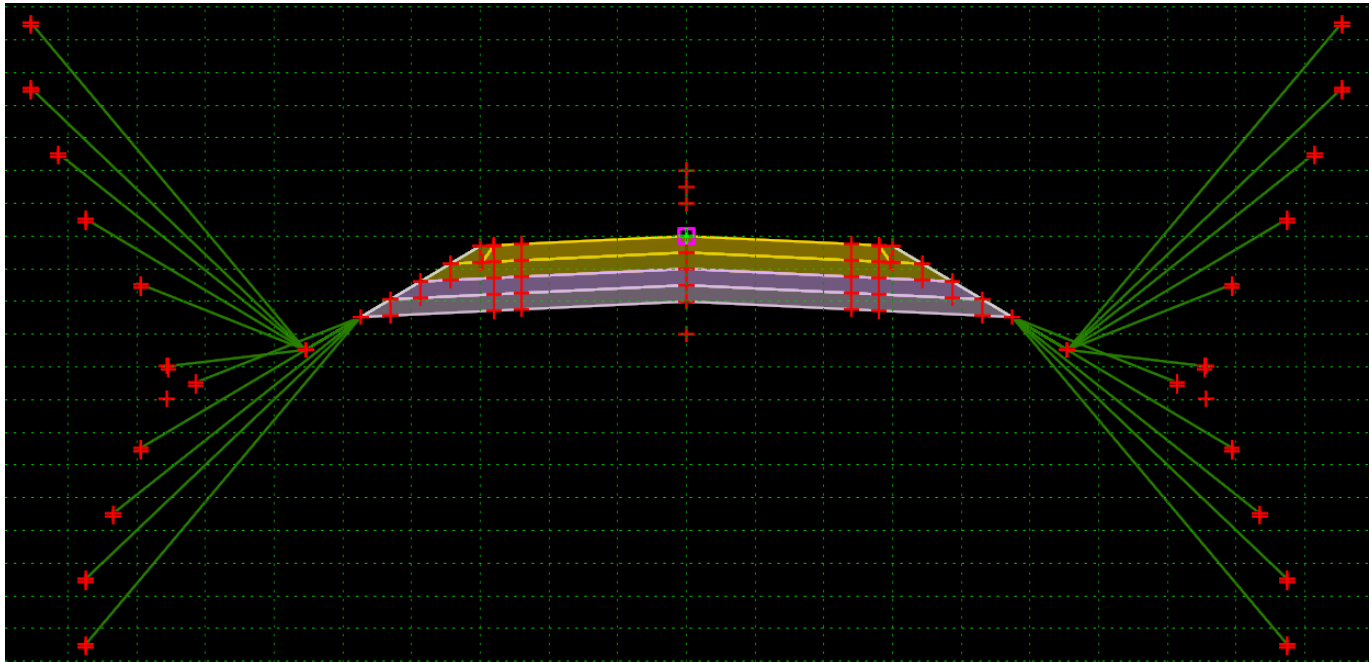
Alternately, if geometry using Feature Definition "Approach Road Match Line" is present, and made an External Reference to the Corridor, then the wedge and end condition will turn off on the side the feature is placed.

8.3. TWO-LANE 4 LAYER

Location. <project template library>/ORD Templates/Templates/Two-Lane 4 Layer

Description. This template is two-lane traveled way with shoulders using the Safety Wedge + Cut Priority and Fill End Condition with topsoil.

Figure 66 – Two-Lane 4 Layer Template



Parametric Constraints.

Table 32 – Simple Two-Lane Template Parametric Constraints

Parametric Constraints	Setting	Use
Cut Slope_L	Equal to slope	Adjust cut slopes
Cut Slope_R	Equal to slope	Adjust cut slopes
Daylight Depth_L	1'	Adjust depth of daylight ditch
Daylight Depth_R	1'	Adjust depth of daylight ditch
Daylight Ditch Width_L	0'	Extends daylight backslope distance
Daylight Ditch Width_R	0'	Extends daylight backslope distance
Daylight Foreslope_L	1:4 (25%)	Adjust foreslope of daylight ditch
Daylight Foreslope_R	1:4 (25%)	Adjust foreslope of daylight ditch
Display off_L	0'	Turns off display of Wedge & End condition
Display off_R	0'	Turns off display of Wedge & End condition
Ditch Bot Slope_L	0%	Controls slope of flat bottom ditch
Ditch Bot Slope_R	0%	Controls slope of flat bottom ditch
Ditch Bot Width_L	0'	Controls width of flat bottom ditch

Parametric Constraints	Setting	Use
Ditch Bot Width_R	0'	Controls width of flat bottom ditch
Ditch Depth_L	1'	Controls the depth of ditch
Ditch Depth_R	1'	Controls the depth of ditch
Ditch Foreslope_L	1:4 (25%)	Adjusts foreslope of ditch
Ditch Foreslope_R	1:4 (25%)	Adjusts Foreslope of ditch
Fill Slope_L	Equal to slope	Adjusts fill slopes
Fill Slope_R	Equal to slope	Adjusts fill slopes
Foreslope_L	Equal to slope	Adjusts foreslope of pavement section
Foreslope_R	Equal to slope	Adjusts foreslope of pavement section
Gravel Width_L	1'	Adjusts width of safety edge gravel cover (cannot be zero)
Gravel Width_R	1'	Adjusts width of safety edge gravel cover (cannot be zero)
Lane 1 Depth	-0.5'	Controls depth of lane layer 1
Lane 2 Depth	-0.5'	Controls depth of lane layer 2
Lane 3 Depth	-0.5'	Controls depth of lane layer 3
Lane 4 Depth	-0.5'	Controls depth of lane layer 4
Lane Slope_L	2%	Controls slope of lane
Lane Slope_R	2%	Controls slope of lane
Lane Width_L	12'	Controls width of lane
Lane Width_R	12'	Controls width of lane
Shldr 1 Depth	-0.5'	Controls depth of shoulder layer 1
Shldr 2 Depth	-0.5'	Controls depth of shoulder layer 2
Shldr 3 Depth	-0.5'	Controls depth of shoulder layer 3
Shldr 4 Depth	-0.5'	Controls depth of shoulder layer 4
Shldr Width_L	2'	Controls width of shoulder
Shldr Width_R	2'	Controls width of shoulder
Wedge 1 Depth	-0.5'	Controls depth of wedge layer 1
Wedge 2 Depth	-0.5'	Controls depth of wedge layer 2
Wedge 3 Depth	-0.5'	Controls depth of wedge layer 3
Wedge 4 Depth	-0.5'	Controls depth of wedge layer 4

Display Rules.

Table 33– Simple Two-Lane Template Display Rules

Display Rules	Setting	Use
Display off_L	0'	Turns off display of Wedge & End condition
Display off_R	0'	Turns off display of Wedge & End condition

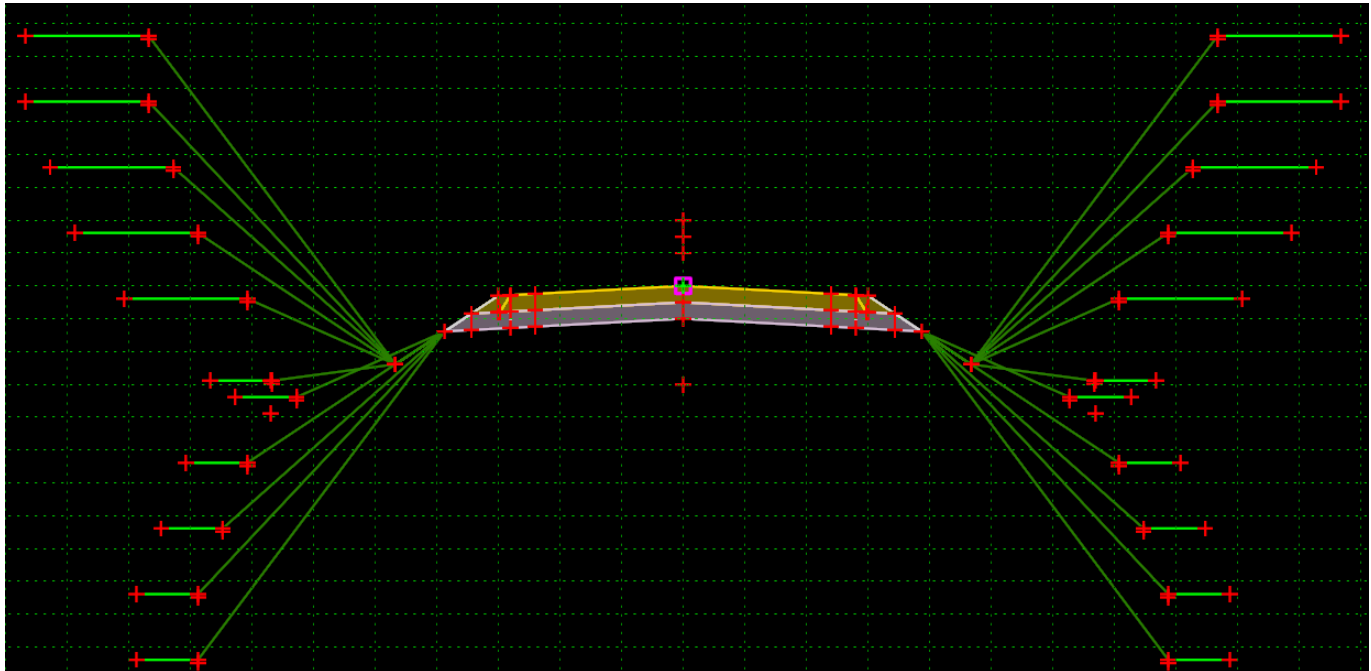
Alternately, if geometry using Feature Definition "Approach Road Match Line" is present, and made an External Reference to the Corridor, then the wedge and end condition will turn off on the side the feature is placed.

8.4. TWO-LANE CONST 2 LAYER

Location. <project template library>/ORD Templates/Templates/Two-Lane Const 2 Layer

Description. This is a two-lane with shoulders using the Safety Wedge and Cut & Fill w/ Const End Condition.

Figure 67 – Two-Lane Const 2 Layer Template



Parametric Constraints.

Table 34 – Two-lane with ditch + construction limit end condition template parametric constraint

Parametric Constraints	Setting	Use
Construction Limit_L	10' Cuts, 5' Fills	Adjust Construction limits
Construction Limit_R	10' Cuts, 5' Fills	Adjust Construction limits
Cut Slope_L	Equal to slope	Adjust cut slopes
Cut Slope_R	Equal to slope	Adjust cut slopes
Daylight Depth_L	1'	Adjust depth of daylight ditch
Daylight Depth_R	1'	Adjust depth of daylight ditch
Daylight Ditch Width_L	0'	Extends daylight backslope distance
Daylight Ditch Width_R	0'	Extends daylight backslope distance
Daylight Foreslope_L	1:4 (25%)	Adjust foreslope of daylight ditch
Daylight Foreslope_R	1:4 (25%)	Adjust foreslope of daylight ditch
Display off_L	0'	Turns off display of Wedge & End condition
Display off_R	0'	Turns off display of Wedge & End condition
Ditch Bot Slope_L	0%	Controls slope of flat bottom ditch

Parametric Constraints	Setting	Use
Ditch Bot Slope_R	0%	Controls slope of flat bottom ditch
Ditch Bot Width_L	0'	Controls width of flat bottom ditch
Ditch Bot Width_R	0'	Controls width of flat bottom ditch
Ditch Depth_L	1'	Controls the depth of ditch
Ditch Depth_R	1'	Controls the depth of ditch
Ditch Foreslope_L	1:4 (25%)	Adjusts foreslope of ditch
Ditch Foreslope_R	1:4 (25%)	Adjusts Foreslope of ditch
Fill Slope_L	Equal to slope	Adjusts fill slopes
Fill Slope_R	Equal to slope	Adjusts fill slopes
Foreslope_L	Equal to slope	Adjusts foreslope of pavement section
Foreslope_R	Equal to slope	Adjusts foreslope of pavement section
Gravel Width_L	1'	Adjusts width of safety edge gravel cover (cannot be zero)
Gravel Width_R	1'	Adjusts width of safety edge gravel cover (cannot be zero)
Lane 1 Depth	-0.5'	Controls depth of lane layer 1
Lane 2 Depth	-0.5'	Controls depth of lane layer 2
Lane Slope_L	2%	Controls slope of lane
Lane Slope_R	2%	Controls slope of lane
Lane Width_L	12'	Controls width of lane
Lane Width_R	12'	Controls width of lane
Shldr 1 Depth	-0.5'	Controls depth of shoulder layer 1
Shldr 2 Depth	-0.5'	Controls depth of shoulder layer 2
Shldr Width_L	2'	Controls width of shoulder
Shldr Width_R	2'	Controls width of shoulder
Wedge 1 Depth	-0.5'	Controls depth of wedge layer 1
Wedge 2 Depth	-0.5'	Controls depth of wedge layer 2

Display Rules.

Table 35– Two-lane with ditch + construction limit end condition Template Display Rules

Display Rules	Setting	Use
Display off_L	0'	Turns off display of Wedge & End condition
Display off_R	0'	Turns off display of Wedge & End condition

Alternately, if geometry using Feature Definition "Approach Road Match Line" is present, and made an External Reference to the Corridor, then the wedge and end condition will turn off on the side the feature is placed.

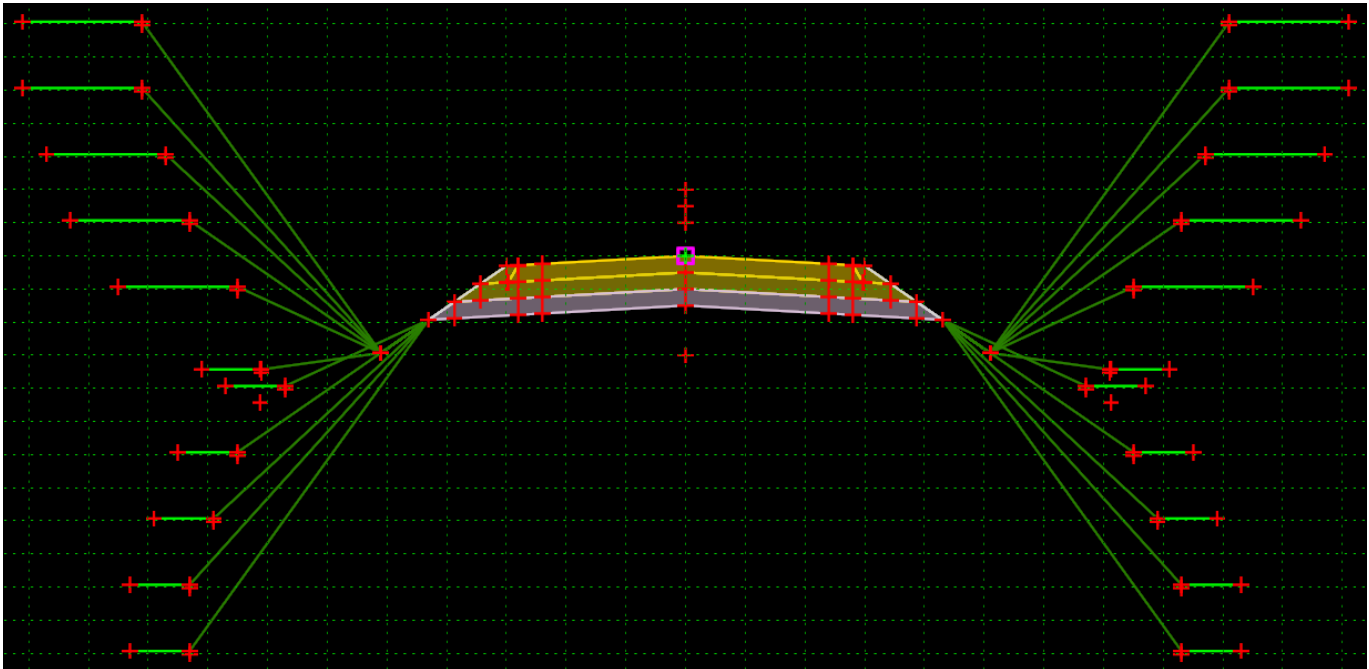
Display of layers (lane, shoulder, and wedge) is turned off when depth are set to zero.

8.5. TWO-LANE CONST 3 LAYER

Location. <project template library>/ORD Templates/Templates/Two-Lane Const 3 Layer

Description. This is a two-lane with shoulders using the Safety Wedge and Cut & Fill w/ Const End Condition.

Figure 68 – Two-Lane Const 3 Layer Template



Parametric Constraints.

Table 36 – Two-lane with ditch + construction limit end condition template parametric constraint

Parametric Constraints	Setting	Use
Construction Limit_L	10' Cuts, 5' Fills	Adjust Construction limits
Construction Limit_R	10' Cuts, 5' Fills	Adjust Construction limits
Cut Slope_L	Equal to slope	Adjust cut slopes
Cut Slope_R	Equal to slope	Adjust cut slopes
Daylight Depth_L	1'	Adjust depth of daylight ditch
Daylight Depth_R	1'	Adjust depth of daylight ditch
Daylight Ditch Width_L	0'	Extends daylight backslope distance
Daylight Ditch Width_R	0'	Extends daylight backslope distance
Daylight Foreslope_L	1:4 (25%)	Adjust foreslope of daylight ditch
Daylight Foreslope_R	1:4 (25%)	Adjust foreslope of daylight ditch
Display off_L	0'	Turns off display of Wedge & End condition
Display off_R	0'	Turns off display of Wedge & End condition
Ditch Bot Slope_L	0%	Controls slope of flat bottom ditch

Parametric Constraints	Setting	Use
Ditch Bot Slope_R	0%	Controls slope of flat bottom ditch
Ditch Bot Width_L	0'	Controls width of flat bottom ditch
Ditch Bot Width_R	0'	Controls width of flat bottom ditch
Ditch Depth_L	1'	Controls the depth of ditch
Ditch Depth_R	1'	Controls the depth of ditch
Ditch Foreslope_L	1:4 (25%)	Adjusts foreslope of ditch
Ditch Foreslope_R	1:4 (25%)	Adjusts Foreslope of ditch
Fill Slope_L	Equal to slope	Adjusts fill slopes
Fill Slope_R	Equal to slope	Adjusts fill slopes
Foreslope_L	Equal to slope	Adjusts foreslope of pavement section
Foreslope_R	Equal to slope	Adjusts foreslope of pavement section
Gravel Width_L	1'	Adjusts width of safety edge gravel cover (cannot be zero)
Gravel Width_R	1'	Adjusts width of safety edge gravel cover (cannot be zero)
Lane 1 Depth	-0.5'	Controls depth of lane layer 1
Lane 2 Depth	-0.5'	Controls depth of lane layer 2
Lane 3 Depth	-0.5'	Controls depth of lane layer 3
Lane Slope_L	2%	Controls slope of lane
Lane Slope_R	2%	Controls slope of lane
Lane Width_L	12'	Controls width of lane
Lane Width_R	12'	Controls width of lane
Shldr 1 Depth	-0.5'	Controls depth of shoulder layer 1
Shldr 2 Depth	-0.5'	Controls depth of shoulder layer 2
Shldr 3 Depth	-0.5'	Controls depth of shoulder layer 3
Shldr Width_L	2'	Controls width of shoulder
Shldr Width_R	2'	Controls width of shoulder
Wedge 1 Depth	-0.5'	Controls depth of wedge layer 1
Wedge 2 Depth	-0.5'	Controls depth of wedge layer 2
Wedge 3 Depth	-0.5'	Controls depth of wedge layer 3

Display Rules.

Table 37– Two-lane with ditch + construction limit end condition Template Display Rules

Display Rules	Setting	Use
Display off_L	0'	Turns off display of Wedge & End condition
Display off_R	0'	Turns off display of Wedge & End condition

Alternately, if geometry using Feature Definition "Approach Road Match Line" is present, and made an External Reference to the Corridor, then the wedge and end condition will turn off on the side the feature is placed.

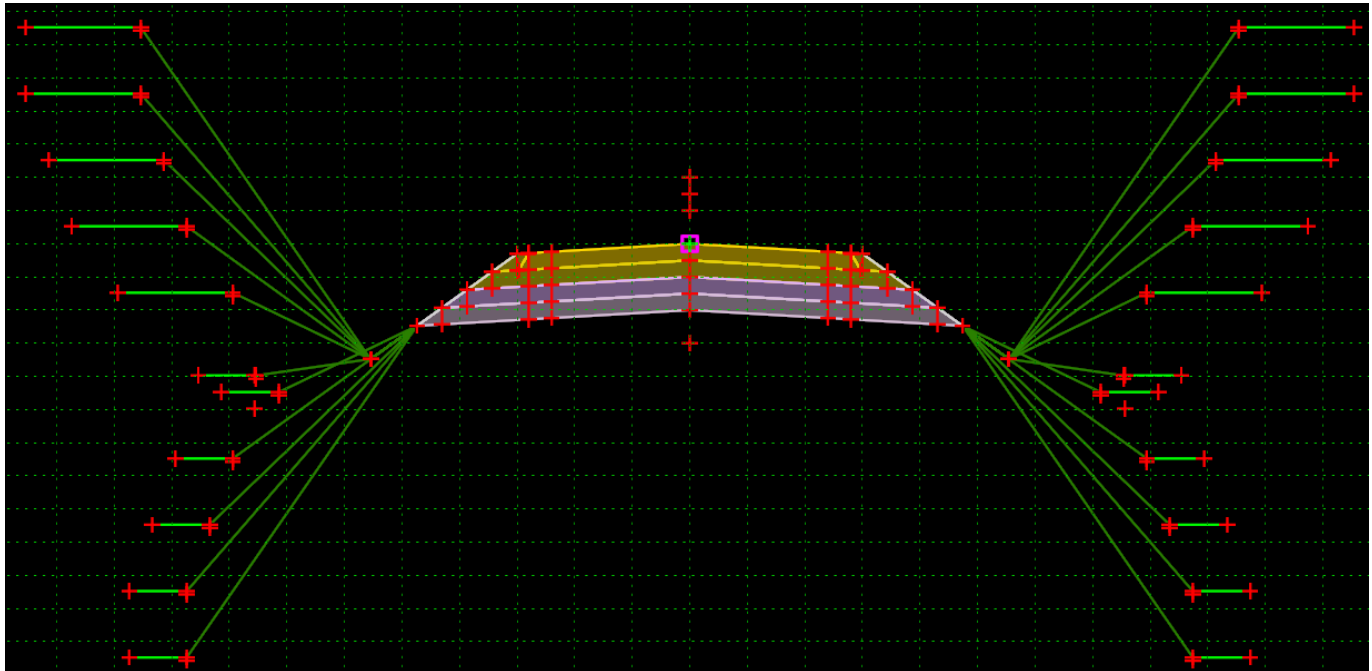
Display of layers (lane, shoulder, and wedge) is turned off when depth are set to zero.

8.6. TWO-LANE CONST 4 LAYER

Location. <project template library>/ORD Templates/Templates/Two-Lane Const 4 Layer

Description. This is a two-lane with shoulders using the Safety Wedge and Cut & Fill w/ Const End Condition.

Figure 69 – Two-Lane Const 4 Layer Template



Parametric Constraints.

Table 38 – Two-lane with ditch + construction limit end condition template parametric constraint

Parametric Constraints	Setting	Use
Construction Limit_L	10' Cuts, 5' Fills	Adjust Construction limits
Construction Limit_R	10' Cuts, 5' Fills	Adjust Construction limits
Cut Slope_L	Equal to slope	Adjust cut slopes
Cut Slope_R	Equal to slope	Adjust cut slopes
Daylight Depth_L	1'	Adjust depth of daylight ditch
Daylight Depth_R	1'	Adjust depth of daylight ditch
Daylight Ditch Width_L	0'	Extends daylight backslope distance
Daylight Ditch Width_R	0'	Extends daylight backslope distance
Daylight Foreslope_L	1:4 (25%)	Adjust foreslope of daylight ditch
Daylight Foreslope_R	1:4 (25%)	Adjust foreslope of daylight ditch
Display off_L	0'	Turns off display of Wedge & End condition
Display off_R	0'	Turns off display of Wedge & End condition
Ditch Bot Slope_L	0%	Controls slope of flat bottom ditch

Parametric Constraints	Setting	Use
Ditch Bot Slope_R	0%	Controls slope of flat bottom ditch
Ditch Bot Width_L	0'	Controls width of flat bottom ditch
Ditch Bot Width_R	0'	Controls width of flat bottom ditch
Ditch Depth_L	1'	Controls the depth of ditch
Ditch Depth_R	1'	Controls the depth of ditch
Ditch Foreslope_L	1:4 (25%)	Adjusts foreslope of ditch
Ditch Foreslope_R	1:4 (25%)	Adjusts Foreslope of ditch
Fill Slope_L	Equal to slope	Adjusts fill slopes
Fill Slope_R	Equal to slope	Adjusts fill slopes
Foreslope_L	Equal to slope	Adjusts foreslope of pavement section
Foreslope_R	Equal to slope	Adjusts foreslope of pavement section
Gravel Width_L	1'	Adjusts width of safety edge gravel cover (cannot be zero)
Gravel Width_R	1'	Adjusts width of safety edge gravel cover (cannot be zero)
Lane 1 Depth	-0.5'	Controls depth of lane layer 1
Lane 2 Depth	-0.5'	Controls depth of lane layer 2
Lane 3 Depth	-0.5'	Controls depth of lane layer 3
Lane 4 Depth	-0.5'	Controls depth of lane layer 4
Lane Slope_L	2%	Controls slope of lane
Lane Slope_R	2%	Controls slope of lane
Lane Width_L	12'	Controls width of lane
Lane Width_R	12'	Controls width of lane
Shldr 1 Depth	-0.5'	Controls depth of shoulder layer 1
Shldr 2 Depth	-0.5'	Controls depth of shoulder layer 2
Shldr 3 Depth	-0.5'	Controls depth of shoulder layer 3
Shldr 4 Depth	-0.5'	Controls depth of shoulder layer 4
Shldr Width_L	2'	Controls width of shoulder
Shldr Width_R	2'	Controls width of shoulder
Wedge 1 Depth	-0.5'	Controls depth of wedge layer 1
Wedge 2 Depth	-0.5'	Controls depth of wedge layer 2
Wedge 3 Depth	-0.5'	Controls depth of wedge layer 3
Wedge 4 Depth	-0.5'	Controls depth of wedge layer 4

Display Rules.

Table 39– Two-lane with ditch + construction limit end condition Template Display Rules

Display Rules	Setting	Use
Display off_L	0'	Turns off display of Wedge & End condition
Display off_R	0'	Turns off display of Wedge & End condition

Alternately, if geometry using Feature Definition "Approach Road Match Line" is present, and made an External Reference to the Corridor, then the wedge and end condition will turn off on the side the feature is placed.

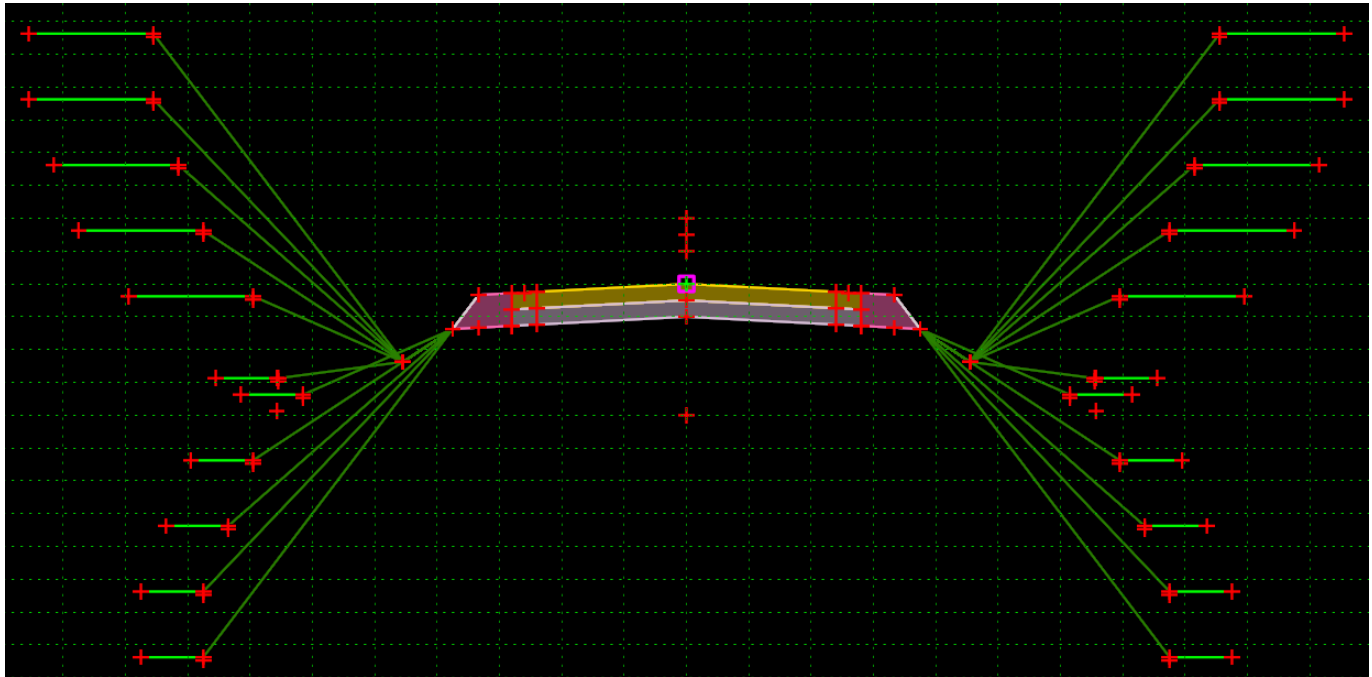
Display of layers (lane, shoulder, and wedge) is turned off when depth are set to zero.

8.7. TWO-LANE GR 2 LAYER

Location. <project template library>/ORD Templates/Templates/Two-Lane GR 2 Layer

Description. This is a two-lane with shoulders using the Guardrail Wedge and Cut & Fill End Condition.

Figure 70 – Two-Lane GR 2 Layer Template



Parametric Constraints.

Table 40– Two-Lane + Guardrail with Ditch + Construction Limit End Condition parametric constraints

Parametric Constraints	Setting	Use
Construction Limit_L	10' Cuts, 5' Fills	Adjust Construction limits
Construction Limit_R	10' Cuts, 5' Fills	Adjust Construction limits
Cut Slope_L	Equal to slope	Adjust cut slopes
Cut Slope_R	Equal to slope	Adjust cut slopes
Daylight Depth_L	1'	Adjust depth of daylight ditch
Daylight Depth_R	1'	Adjust depth of daylight ditch
Daylight Ditch Width_L	0'	Extends daylight backslope distance
Daylight Ditch Width_R	0'	Extends daylight backslope distance
Daylight Foreslope_L	1:4 (25%)	Adjust foreslope of daylight ditch
Daylight Foreslope_R	1:4 (25%)	Adjust foreslope of daylight ditch
Display off_L	0'	Turns off display of Wedge & End condition
Display off_R	0'	Turns off display of Wedge & End condition
Ditch Bot Slope_L	0%	Controls slope of flat bottom ditch
Ditch Bot Slope_R	0%	Controls slope of flat bottom ditch

Parametric Constraints	Setting	Use
Ditch Bot Width_L	0'	Controls width of flat bottom ditch
Ditch Bot Width_R	0'	Controls width of flat bottom ditch
Ditch Depth_L	1'	Controls the depth of ditch
Ditch Depth_R	1'	Controls the depth of ditch
Ditch Foreslope_L	1:4 (25%)	Adjusts foreslope of ditch
Ditch Foreslope_R	1:4 (25%)	Adjusts Foreslope of ditch
Fill Slope_L	Equal to slope	Adjusts fill slopes
Fill Slope_R	Equal to slope	Adjusts fill slopes
Foreslope_L	Equal to slope	Adjusts foreslope of pavement section
Foreslope_R	Equal to slope	Adjusts foreslope of pavement section
Front face of post to EOP_L	1'	Adjusts distance from face of guardrail to edge of pavement (8" block + 3 1/4" W-Beam ~ 12")
Front face of post to EOP_R	1'	Adjusts distance from face of guardrail to edge of pavement (8" block + 3 1/4" W-Beam ~ 12")
Front face of post to hinge dist_L	2.667'	Controls distance from face of post to hinge (8" post + 2' = 2.667')
Front face of post to hinge dist_R	2.667'	Controls distance from face of post to hinge (8" post + 2' = 2.667')
Lane Slope_L	2%	Controls slope of lane
Lane Slope_R	2%	Controls slope of lane
Lane Width_L	12'	Controls width of lane
Lane Width_R	12'	Controls width of lane
Layer 1 Depth	-0.5'	Controls depth of layer 1
Layer 4 Depth	-0.5'	Controls depth of layer 4
Shldr Width_L	-2'	Controls depth of wedge layer 1
Shldr Width_R	-2'	Controls depth of wedge layer 2

Display Rules.

Table 41 – Two-Lane + Guardrail with Ditch + Construction Limit End Condition Template Display Rules

Display Rules	Setting	Use
Display off_L	0'	Turns off display of Wedge & End condition
Display off_R	0'	Turns off display of Wedge & End condition

Alternately, if geometry using Feature Definition "Approach Road Match Line" is present, and made an External Reference to the Corridor, then the wedge and end condition will turn off on the side the feature is placed.

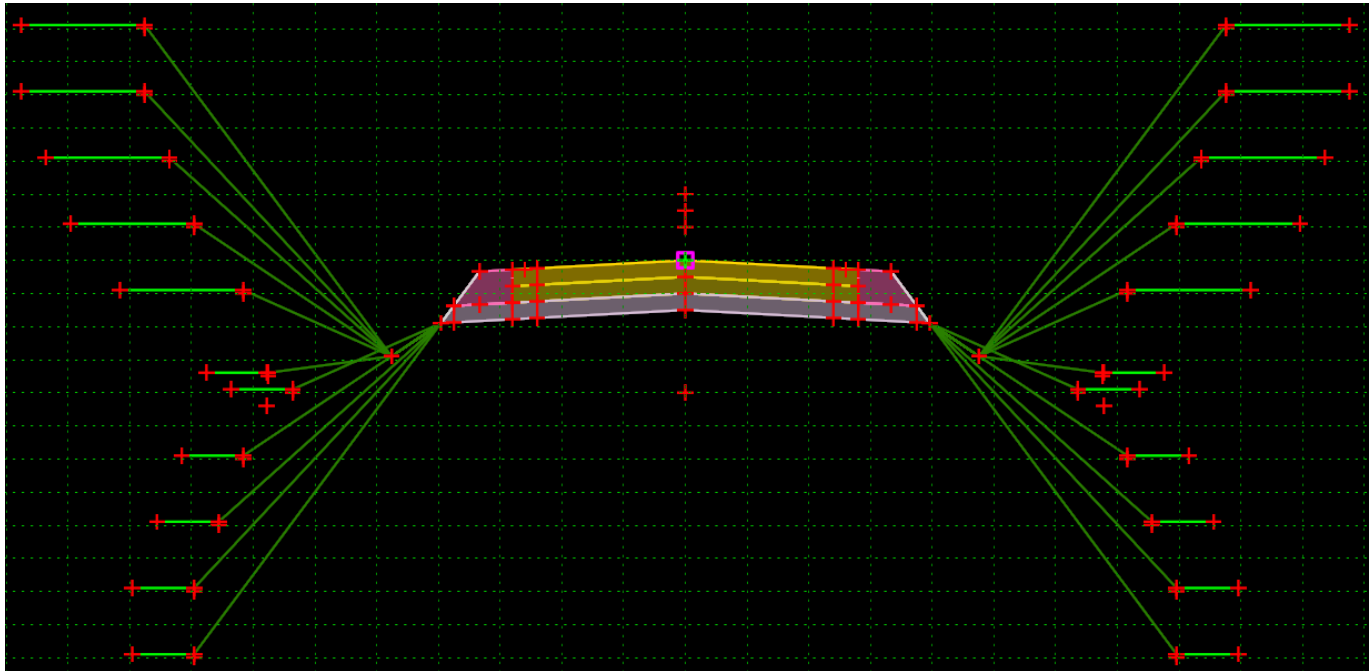
Display of layers (lane, shoulder, and wedge) is turned off when depth are set to zero.

8.8. TWO-LANE GR 3 LAYER

Location. <project template library>/ORD Templates/Templates/Two-Lane GR 3 Layer

Description. This is a two-lane with shoulders using the Guardrail Wedge and Cut & Fill End Condition.

Figure 71 – Two-Lane GR 3 Layer Template



Parametric Constraints.

Table 42– Two-Lane + Guardrail with Ditch + Construction Limit End Condition parametric constraints

Parametric Constraints	Setting	Use
Construction Limit_L	10' Cuts, 5' Fills	Adjust Construction limits
Construction Limit_R	10' Cuts, 5' Fills	Adjust Construction limits
Cut Slope_L	Equal to slope	Adjust cut slopes
Cut Slope_R	Equal to slope	Adjust cut slopes
Daylight Depth_L	1'	Adjust depth of daylight ditch
Daylight Depth_R	1'	Adjust depth of daylight ditch
Daylight Ditch Width_L	0'	Extends daylight backslope distance
Daylight Ditch Width_R	0'	Extends daylight backslope distance
Daylight Foreslope_L	1:4 (25%)	Adjust foreslope of daylight ditch
Daylight Foreslope_R	1:4 (25%)	Adjust foreslope of daylight ditch
Display off_L	0'	Turns off display of Wedge & End condition
Display off_R	0'	Turns off display of Wedge & End condition
Ditch Bot Slope_L	0%	Controls slope of flat bottom ditch
Ditch Bot Slope_R	0%	Controls slope of flat bottom ditch

Parametric Constraints	Setting	Use
Ditch Bot Width_L	0'	Controls width of flat bottom ditch
Ditch Bot Width_R	0'	Controls width of flat bottom ditch
Ditch Depth_L	1'	Controls the depth of ditch
Ditch Depth_R	1'	Controls the depth of ditch
Ditch Foreslope_L	1:4 (25%)	Adjusts foreslope of ditch
Ditch Foreslope_R	1:4 (25%)	Adjusts Foreslope of ditch
Fill Slope_L	Equal to slope	Adjusts fill slopes
Fill Slope_R	Equal to slope	Adjusts fill slopes
Foreslope_L	Equal to slope	Adjusts foreslope of pavement section
Foreslope_R	Equal to slope	Adjusts foreslope of pavement section
Front face of post to EOP_L	1'	Adjusts distance from face of guardrail to edge of pavement (8" block + 3 1/4" W-Beam ~ 12")
Front face of post to EOP_R	1'	Adjusts distance from face of guardrail to edge of pavement (8" block + 3 1/4" W-Beam ~ 12")
Front face of post to hinge dist_L	2.667'	Controls distance from face of post to hinge (8" post + 2' = 2.667')
Front face of post to hinge dist_R	2.667'	Controls distance from face of post to hinge (8" post + 2' = 2.667')
Lane Slope_L	2%	Controls slope of lane
Lane Slope_R	2%	Controls slope of lane
Lane Width_L	12'	Controls width of lane
Lane Width_R	12'	Controls width of lane
Layer 1 Depth	-0.5'	Controls depth of layer 1
Layer 2 Depth	-0.5'	Controls depth of layer 2
Layer 4 Depth	-0.5'	Controls depth of layer 4
Shldr Width_L	2'	Controls width of shoulder
Shldr Width_R	2'	Controls width of shoulder

Display Rules.

Table 43 – Two-Lane + Guardrail with Ditch + Construction Limit End Condition Template Display Rules

Display Rules	Setting	Use
Display off_L	0'	Turns off display of Wedge & End condition
Display off_R	0'	Turns off display of Wedge & End condition

Alternately, if geometry using Feature Definition "Approach Road Match Line" is present, and made an External Reference to the Corridor, then the wedge and end condition will turn off on the side the feature is placed.

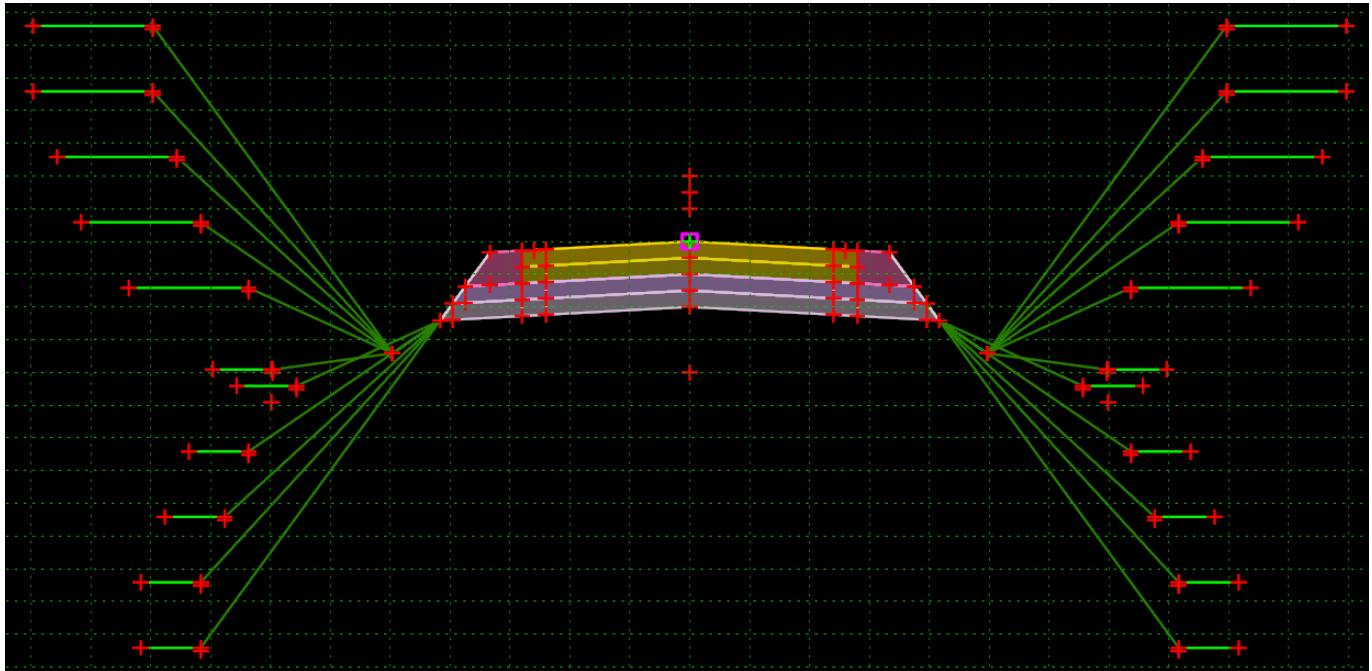
Display of layers (lane, shoulder, and wedge) is turned off when depth is set to zero.

8.9. TWO-LANE GR 4 LAYER

Location. <project template library>/ORD Templates/Templates/Two-Lane GR 4 Layer

Description. This is a two-lane with shoulders using the Guardrail Wedge and Cut & Fill End Condition.

Figure 72 – Two-Lane GR 4 Layer Template



Parametric Constraints.

Table 44– Two-Lane + Guardrail with Ditch + Construction Limit End Condition parametric constraints

Parametric Constraints	Setting	Use
Construction Limit_L	10' Cuts, 5' Fills	Adjust Construction limits
Construction Limit_R	10' Cuts, 5' Fills	Adjust Construction limits
Cut Slope_L	Equal to slope	Adjust cut slopes
Cut Slope_R	Equal to slope	Adjust cut slopes
Daylight Depth_L	1'	Adjust depth of daylight ditch
Daylight Depth_R	1'	Adjust depth of daylight ditch
Daylight Ditch Width_L	0'	Extends daylight backslope distance
Daylight Ditch Width_R	0'	Extends daylight backslope distance
Daylight Foreslope_L	1:4 (25%)	Adjust foreslope of daylight ditch
Daylight Foreslope_R	1:4 (25%)	Adjust foreslope of daylight ditch
Display off_L	0'	Turns off display of Wedge & End condition
Display off_R	0'	Turns off display of Wedge & End condition
Ditch Bot Slope_L	0%	Controls slope of flat bottom ditch
Ditch Bot Slope_R	0%	Controls slope of flat bottom ditch

Parametric Constraints	Setting	Use
Ditch Bot Width_L	0'	Controls width of flat bottom ditch
Ditch Bot Width_R	0'	Controls width of flat bottom ditch
Ditch Depth_L	1'	Controls the depth of ditch
Ditch Depth_R	1'	Controls the depth of ditch
Ditch Foreslope_L	1:4 (25%)	Adjusts foreslope of ditch
Ditch Foreslope_R	1:4 (25%)	Adjusts foreslope of ditch
Fill Slope_L	Equal to slope	Adjusts fill slopes
Fill Slope_R	Equal to slope	Adjusts fill slopes
Foreslope_L	Equal to slope	Adjusts foreslope of pavement section
Foreslope_R	Equal to slope	Adjusts foreslope of pavement section
Front face of post to EOP_L	1'	Adjusts distance from face of guardrail to edge of pavement (8" block + 3 1/4" W-Beam ~ 12")
Front face of post to EOP_R	1'	Adjusts distance from face of guardrail to edge of pavement (8" block + 3 1/4" W-Beam ~ 12")
Front face of post to hinge dist_L	2.667'	Controls distance from face of post to hinge (8" post + 2' = 2.667')
Front face of post to hinge dist_R	2.667'	Controls distance from face of post to hinge (8" post + 2' = 2.667')
GR Grading Slope_L	2%	Adjusts finished slope of guardrail grading
GR Grading Slope_R	2%	Adjusts finished slope of guardrail grading
Gravel Width_L	1'	Adjusts width of safety edge gravel cover (cannot be zero)
Gravel Width_R	1'	Adjusts width of safety edge gravel cover (cannot be zero)
Layer 1 Depth	-0.5'	Controls depth of layer 1
Layer 2 Depth	-0.5'	Controls depth of layer 2
Layer 3 Depth	-0.5'	Controls depth of layer 3
Layer 4 Depth	-0.5'	Controls depth of layer 4
Lane Slope_L	2%	Controls slope of lane
Lane Slope_R	2%	Controls slope of lane
Lane Width_L	12'	Controls width of lane
Lane Width_R	12'	Controls width of lane
Shldr Width_L	2'	Controls width of shoulder
Shldr Width_R	2'	Controls width of shoulder

Display Rules.

Table 45 – Two-Lane + Guardrail with Ditch + Construction Limit End Condition Template Display Rules

Display Rules	Setting	Use
Display off_L	0'	Turns off display of Wedge & End condition
Display off_R	0'	Turns off display of Wedge & End condition

Alternately, if geometry using Feature Definition "Approach Road Match Line" is present, and made an External Reference to the Corridor, then the wedge and end condition will turn off on the side the feature is placed.

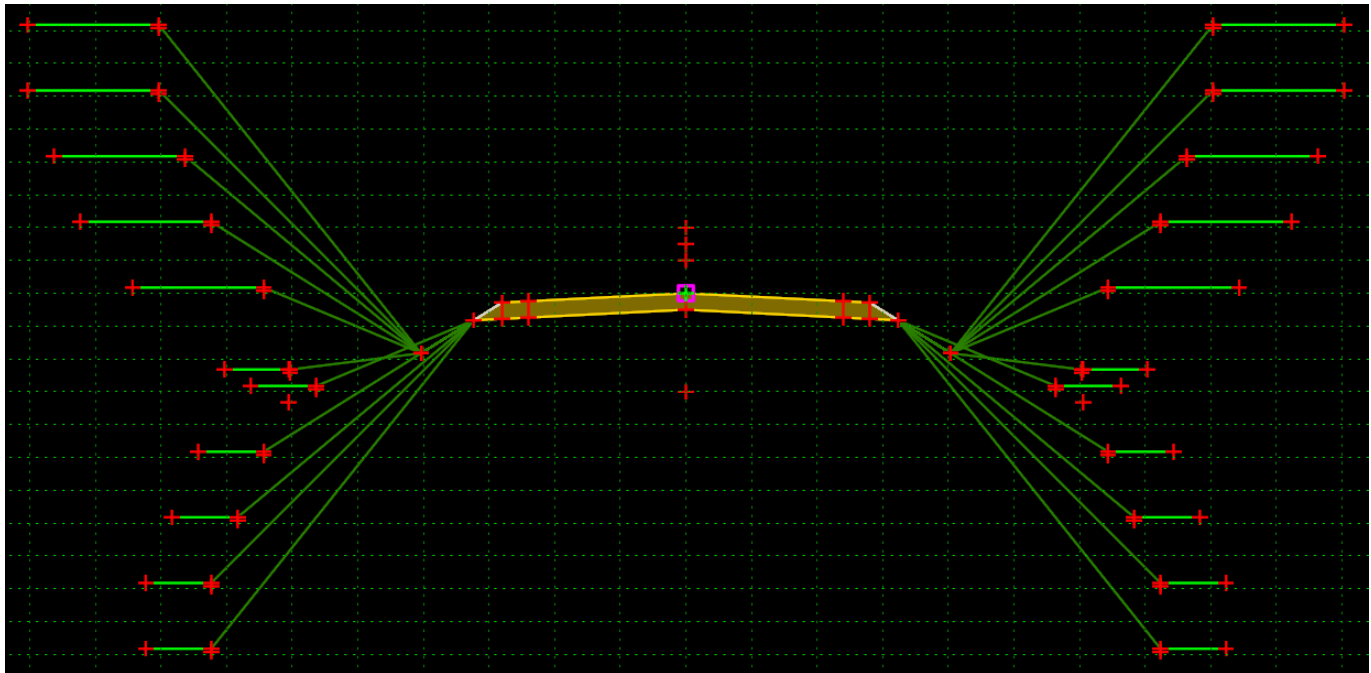
Display of layers (lane, shoulder, and wedge) is turned off when depth are set to zero.

8.10. TWO-LANE GRAVEL 1 LAYER

Location. <project template library>/ORD Templates/Templates/Two-Lane Gravel 1 Layer

Description.

Figure 73 – Two-Lane Gravel 1 Layer Template



Parametric Constraints.

Table 46– Two-Lane Gravel 1 Layer + Construction Limit End Condition parametric constraints

Parametric Constraints	Setting	Use
Construction Limit_L	10' Cuts, 5' Fills	Adjust Construction limits
Construction Limit_R	10' Cuts, 5' Fills	Adjust Construction limits
Cut Slope_L	Equal to slope	Adjust cut slopes
Cut Slope_R	Equal to slope	Adjust cut slopes
Daylight Depth_L	1'	Adjust depth of daylight ditch
Daylight Depth_R	1'	Adjust depth of daylight ditch
Daylight Ditch Width_L	0'	Extends daylight backslope distance
Daylight Ditch Width_R	0'	Extends daylight backslope distance
Daylight Foreslope_L	1:4 (25%)	Adjust foreslope of daylight ditch
Daylight Foreslope_R	1:4 (25%)	Adjust foreslope of daylight ditch
Display off_L	0'	Turns off display of Wedge & End condition
Display off_R	0'	Turns off display of Wedge & End condition
Ditch Bot Slope_L	0%	Controls slope of flat bottom ditch
Ditch Bot Slope_R	0%	Controls slope of flat bottom ditch

Parametric Constraints	Setting	Use
Ditch Bot Width_L	0'	Controls width of flat bottom ditch
Ditch Bot Width_R	0'	Controls width of flat bottom ditch
Ditch Depth_L	1'	Controls the depth of ditch
Ditch Depth_R	1'	Controls the depth of ditch
Ditch Foreslope_L	1:4 (25%)	Adjusts foreslope of ditch
Ditch Foreslope_R	1:4 (25%)	Adjusts foreslope of ditch
Fill Slope_L	Equal to slope	Adjusts fill slopes
Fill Slope_R	Equal to slope	Adjusts fill slopes
Foreslope_L	Equal to slope	Adjusts foreslope of pavement section
Foreslope_R	Equal to slope	Adjusts foreslope of pavement section
Lane Slope_L	2%	Controls slope of lane
Lane Slope_R	2%	Controls slope of lane
Lane Width_L	12'	Controls width of lane
Lane Width_R	12'	Controls width of lane
Layer 1 Depth	-0.5'	Controls depth of layer 1
Shldr Width_L	2'	Controls width of shoulder
Shldr Width_R	2'	Controls width of shoulder

Display Rules.

Table 47 – Two-Lane Gravel 1 Layer + Construction Limit End Condition Template Display Rules

Display Rules	Setting	Use
Display off_L	0'	Turns off display of Wedge & End condition
Display off_R	0'	Turns off display of Wedge & End condition

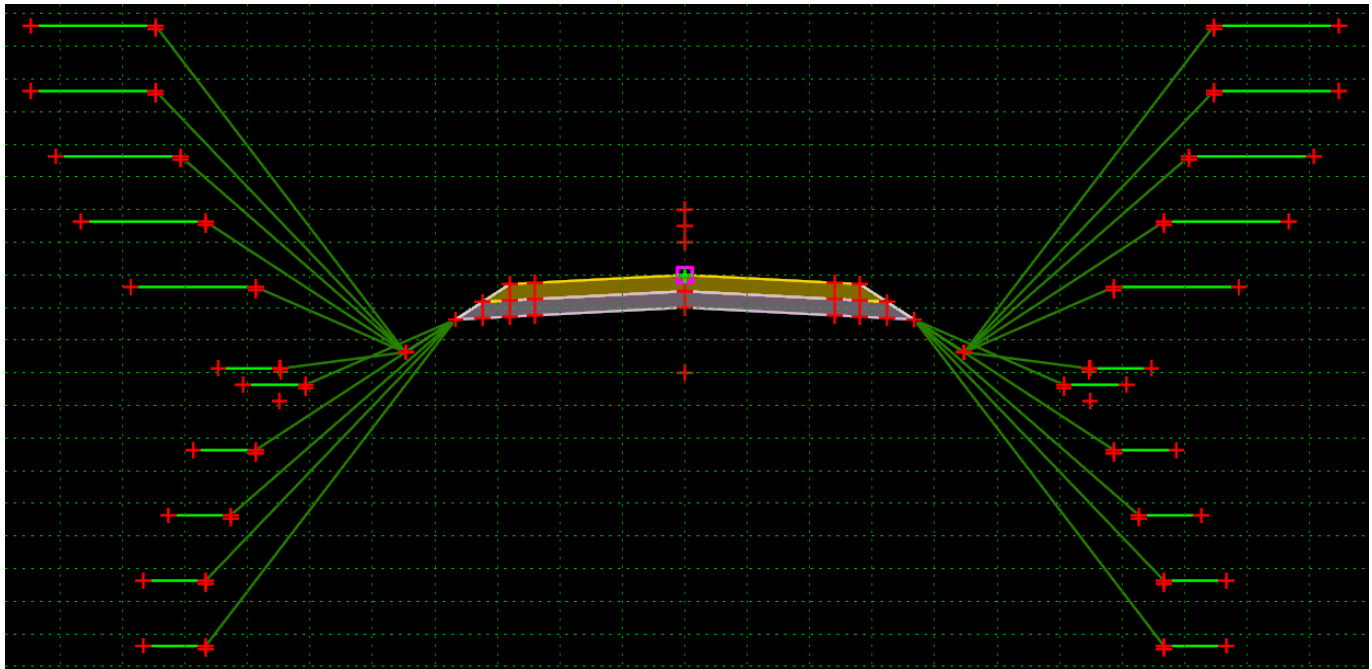
Alternately, if geometry using Feature Definition "Approach Road Match Line" is present, and made an External Reference to the Corridor, then the wedge and end condition will turn off on the side the feature is placed.

8.11. TWO-LANE GRAVEL 2 LAYER

Location. <project template library>/ORD Templates/Templates/Two-Lane Gravel 2 Layer

Description.

Figure 74 – Two-Lane Gravel 2 Layer Template



Parametric Constraints.

Table 48– Two-Lane Gravel 2 Layer + Construction Limit End Condition parametric constraints

Parametric Constraints	Setting	Use
Construction Limit_L	10' Cuts, 5' Fills	Adjust Construction limits
Construction Limit_R	10' Cuts, 5' Fills	Adjust Construction limits
Cut Slope_L	Equal to slope	Adjust cut slopes
Cut Slope_R	Equal to slope	Adjust cut slopes
Daylight Depth_L	1'	Adjust depth of daylight ditch
Daylight Depth_R	1'	Adjust depth of daylight ditch
Daylight Ditch Width_L	0'	Extends daylight backslope distance
Daylight Ditch Width_R	0'	Extends daylight backslope distance
Daylight Foreslope_L	1:4 (25%)	Adjust foreslope of daylight ditch
Daylight Foreslope_R	1:4 (25%)	Adjust foreslope of daylight ditch
Display off_L	0'	Turns off display of Wedge & End condition
Display off_R	0'	Turns off display of Wedge & End condition
Ditch Bot Slope_L	0%	Controls slope of flat bottom ditch
Ditch Bot Slope_R	0%	Controls slope of flat bottom ditch

Parametric Constraints	Setting	Use
Ditch Bot Width_L	0'	Controls width of flat bottom ditch
Ditch Bot Width_R	0'	Controls width of flat bottom ditch
Ditch Depth_L	1'	Controls the depth of ditch
Ditch Depth_R	1'	Controls the depth of ditch
Ditch Foreslope_L	1:4 (25%)	Adjusts foreslope of ditch
Ditch Foreslope_R	1:4 (25%)	Adjusts foreslope of ditch
Fill Slope_L	Equal to slope	Adjusts fill slopes
Fill Slope_R	Equal to slope	Adjusts fill slopes
Foreslope_L	Equal to slope	Adjusts foreslope of pavement section
Foreslope_R	Equal to slope	Adjusts foreslope of pavement section
Lane Slope_L	2%	Controls slope of lane
Lane Slope_R	2%	Controls slope of lane
Lane Width_L	12'	Controls width of lane
Lane Width_R	12'	Controls width of lane
Layer 1 Depth	-0.5'	Controls depth of layer 1
Layer 2 Depth	-0.5'	Controls depth of layer 2
Shldr Width_L	2'	Controls width of shoulder
Shldr Width_R	2'	Controls width of shoulder

Display Rules.

Table 49 – Two-Lane Gravel 2 Layer + Construction Limit End Condition Template Display Rules

Display Rules	Setting	Use
Display off_L	0'	Turns off display of Wedge & End condition
Display off_R	0'	Turns off display of Wedge & End condition

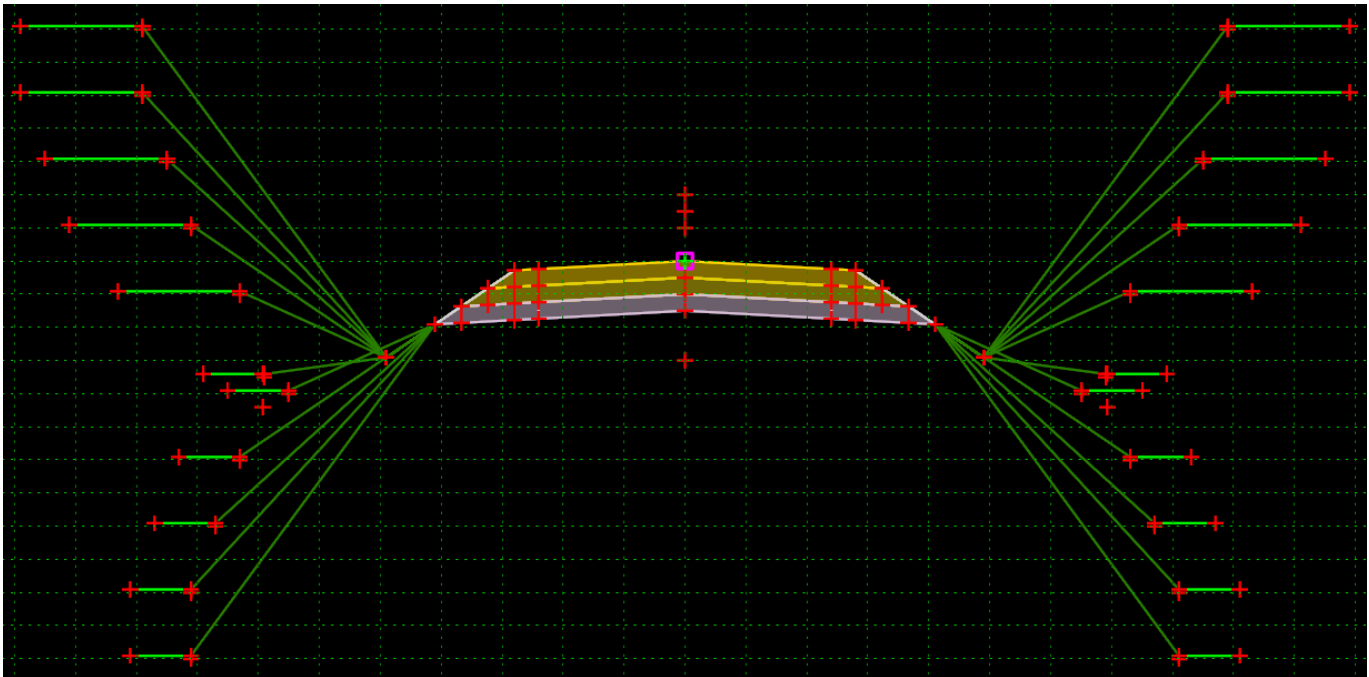
Alternately, if geometry using Feature Definition "Approach Road Match Line" is present, and made an External Reference to the Corridor, then the wedge and end condition will turn off on the side the feature is placed.

8.12. TWO-LANE GRAVEL 3 LAYER

Location. <project template library>/ORD Templates/Templates/Two-Lane Gravel 3 Layer

Description.

Figure 75 – Two-Lane Gravel 3 Layer Template



Parametric Constraints.

Table 50– Two-Lane Gravel 3 Layer + Construction Limit End Condition parametric constraints

Parametric Constraints	Setting	Use
Construction Limit_L	10' Cuts, 5' Fills	Adjust Construction limits
Construction Limit_R	10' Cuts, 5' Fills	Adjust Construction limits
Cut Slope_L	Equal to slope	Adjust cut slopes
Cut Slope_R	Equal to slope	Adjust cut slopes
Daylight Depth_L	1'	Adjust depth of daylight ditch
Daylight Depth_R	1'	Adjust depth of daylight ditch
Daylight Ditch Width_L	0'	Extends daylight backslope distance
Daylight Ditch Width_R	0'	Extends daylight backslope distance
Daylight Foreslope_L	1:4 (25%)	Adjust foreslope of daylight ditch
Daylight Foreslope_R	1:4 (25%)	Adjust foreslope of daylight ditch
Display off_L	0'	Turns off display of Wedge & End condition
Display off_R	0'	Turns off display of Wedge & End condition
Ditch Bot Slope_L	0%	Controls slope of flat bottom ditch
Ditch Bot Slope_R	0%	Controls slope of flat bottom ditch

Parametric Constraints	Setting	Use
Ditch Bot Width_L	0'	Controls width of flat bottom ditch
Ditch Bot Width_R	0'	Controls width of flat bottom ditch
Ditch Depth_L	1'	Controls the depth of ditch
Ditch Depth_R	1'	Controls the depth of ditch
Ditch Foreslope_L	1:4 (25%)	Adjusts foreslope of ditch
Ditch Foreslope_R	1:4 (25%)	Adjusts foreslope of ditch
Fill Slope_L	Equal to slope	Adjusts fill slopes
Fill Slope_R	Equal to slope	Adjusts fill slopes
Foreslope_L	Equal to slope	Adjusts foreslope of pavement section
Foreslope_R	Equal to slope	Adjusts foreslope of pavement section
Lane Slope_L	2%	Controls slope of lane
Lane Slope_R	2%	Controls slope of lane
Lane Width_L	12'	Controls width of lane
Lane Width_R	12'	Controls width of lane
Layer 1 Depth	-0.5'	Controls depth of layer 1
Layer 2 Depth	-0.5'	Controls depth of layer 2
Layer 3 Depth	-0.5'	Controls depth of layer 3
Shldr Width_L	2'	Controls width of shoulder
Shldr Width_R	2'	Controls width of shoulder

Display Rules.

Table 51 – Two-Lane Gravel 3 Layer + Construction Limit End Condition Display Rules

Display Rules	Setting	Use
Display off_L	0'	Turns off display of Wedge & End condition
Display off_R	0'	Turns off display of Wedge & End condition

Alternately, if geometry using Feature Definition "Approach Road Match Line" is present, and made an External Reference to the Corridor, then the wedge and end condition will turn off on the side the feature is placed.

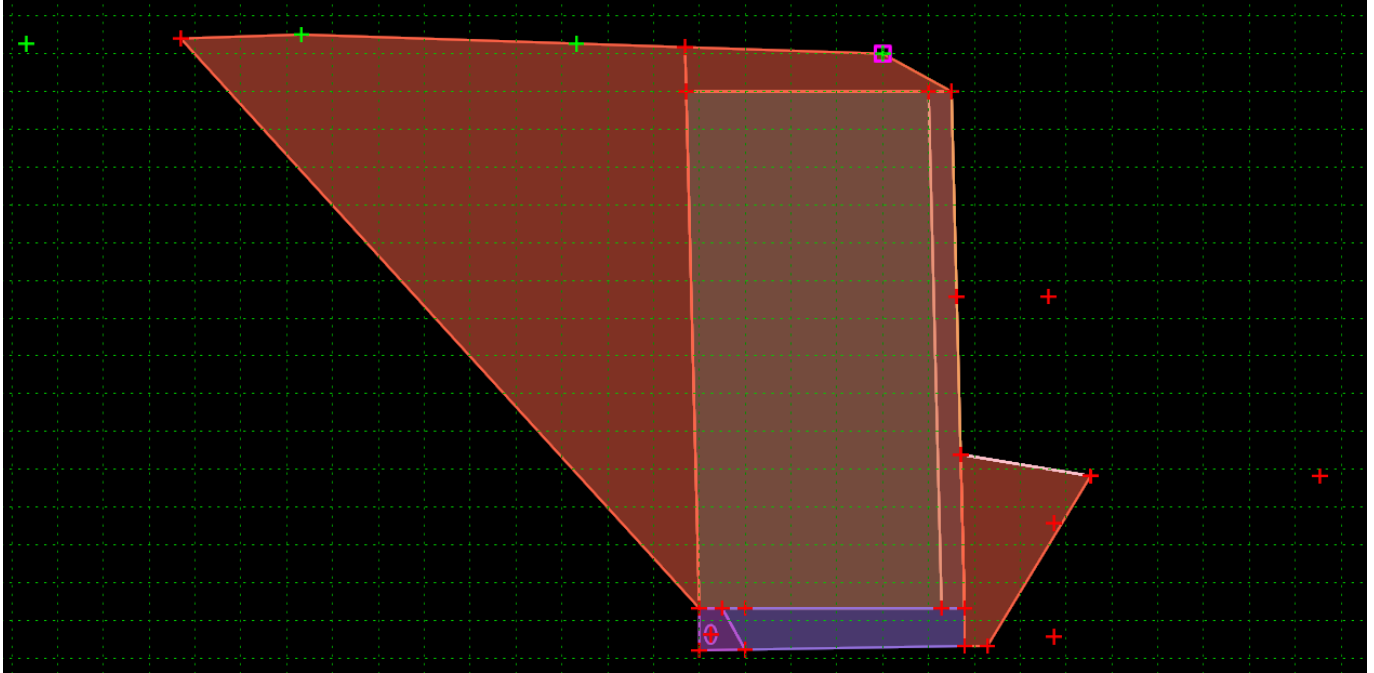
9. WALLS

9.1. MSE WALL

Location. <project template library>/ORD Templates/Walls/MSE/MSE Wall

Description.

Figure 76 – MSE Wall Template

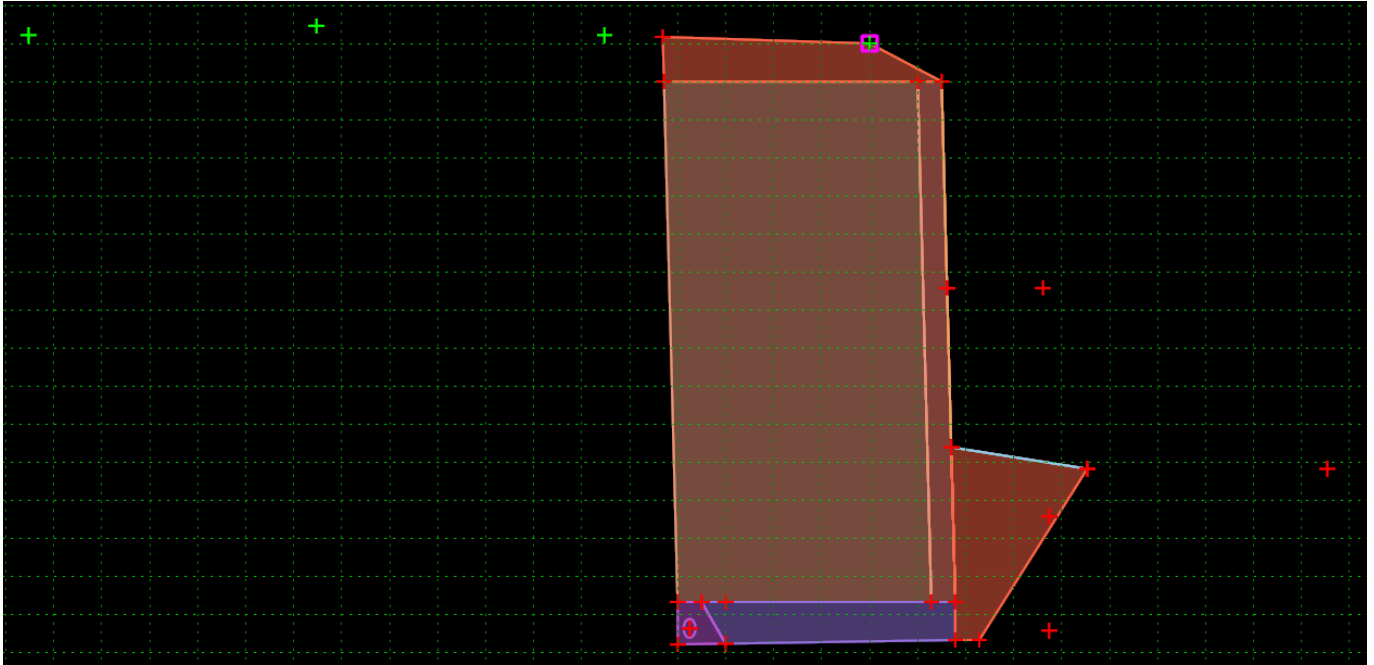


9.2. MSE WALL with EXC COMPONENT

Location. <project template library>/ORD Templates/Walls/MSE/MSE Wall w/ Exc Component

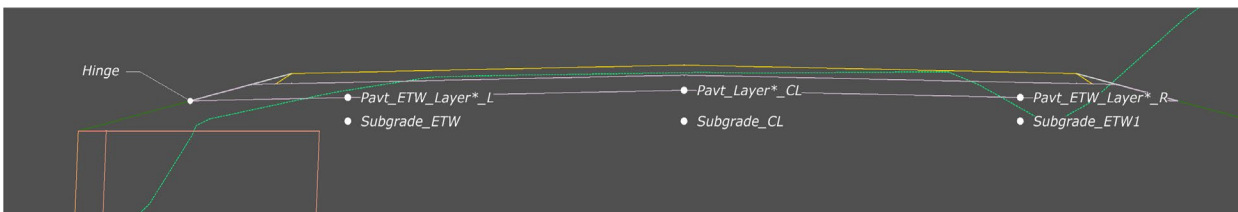
Description. This template is...

Figure 77 – MSE Wall w/ Exc Component Template



How to assemble with main template. Drag the Hinge onto the daylight point of subgrade, Hinge point will automatically merge with component point. Merge the Subgrade_ETW, Subgrade_CL and Subgrade ETW1 with the Main Template subgrade points. Ignore any merge warning.

Figure 78 – MSE Wall w/ Exc Component template



Parametric Constraints.

Figure 79 – MSE Wall w/ Exc Component parametric constraints

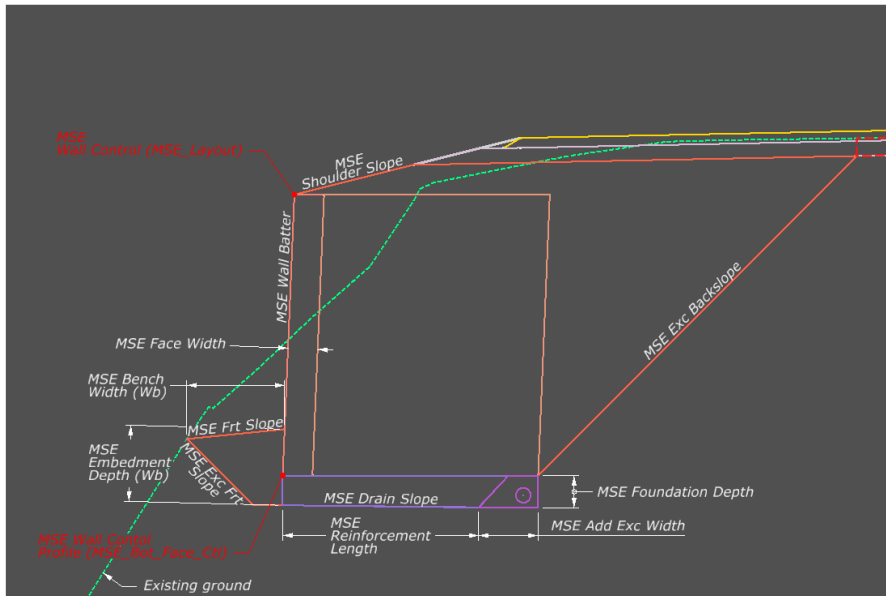


Table 52 – MSE Wall w/ Exc Component parametric constraints

Parametric Constraint Label	Default Value	Parent Point	Note
MSE Add Exc Width	-2'	MSE_Backfill12_Bot_Bk	
MSE Bench Width (Wb)	4'	MSE_Wb_Test	
MSE Drain Slope	1%	MSE_Fnd_Bk	
MSE Exc Backslope	100%	MSE_Backfill3_Subgrade	
MSE Exc Front Slope	100%	MSE_Backfill3_Frt	
MSE Foundation Depth	-1'	MSE_Fnd_Frt	
MSE Front Slope	10.00%	MSE_Backslope2	
MSE Reinforcement Length (L)	-7'	MSE_Reinforcement	Wall Width Factor = 0.7
MSE Shoulder Slope	25%	MSE_Layout	
MSE Shoulder Width	4'	MSE_Layout	
MSE Wall Batter	2400.0%	MSE_Frnt_Grnd	
MSE_Face_Width	1'	MSE_Top_Face_Bck	
UD_Pipe Radius	0.25'		

Point Controls.

Table 53 – MSE Wall w/ Exc Component point controls

Point	Description
MSE Layout	Horizontal wall chain
MSE Bot_Face_Ctl	Bottom of wall profile

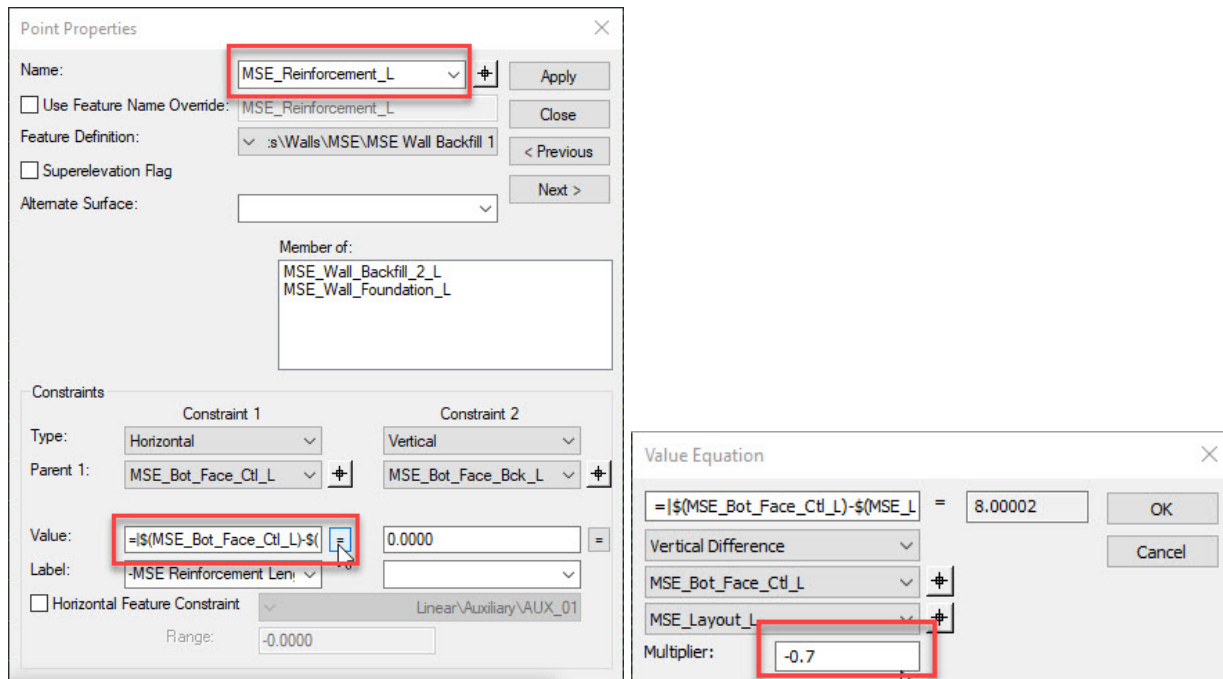
Other Points for Profile Views.

Table 54 – MSE Wall w/ Exc Component other points for profile views

Point	Description
MSE_Frt_Grnd	OG at Face of wall

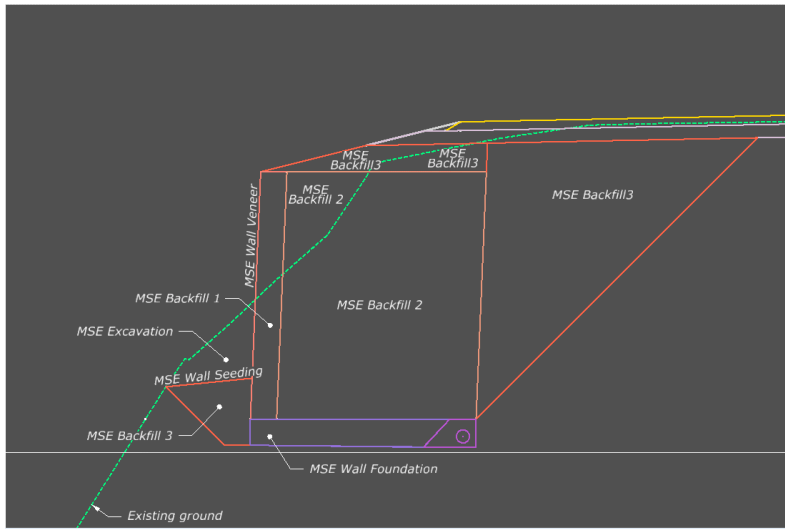
Wall Width Factor. The wall width factor can be edited by changing the multiplier in the value equation for the horizontal point properties of the MSE_Reinforcement point. The parametric constraint MSE Reinforcement Length will override this value if used.

Figure 80 – MSE Wall w/ Exc Component wall width factor



Feature Definition Volume Options.

Figure 81 – MSE Wall w/ Exc Component feature definition volume options



The Feature Definition/Mesh/Volume options are by default set to "Design". Use the Mesh/Volume option in the table below to separate the MSE quantity volumes from normal cut/fill volumes.

Edits can be made in the Your project(1)_cor.dgn at: Explorer/OpenRoads Standards/Your project(1)_Cor.dgn/Feature Definitions/Mesh/Walls/MSE

Table 55 – MSE Wall w/ Exc Component feature definition volume options

Feature Definition	Mesh / Volume Option	Split Quantity
MSE Wall Veneer	Custom	FALSE
MSE Wall Seeding	Custom	FALSE
MSE Wall Backfill1	Custom	FALSE
MSE Wall Backfill2	Custom	FALSE
MSE Wall Backfill3	Custom	FALSE
MSE Wall Excavation	Custom	FALSE
MSE Wall Foundation	Custom	FALSE

Make sure the below parameters are checked when using the Create Cut Fill Volumes tool.

Cut Fill Volume Parameters	
Compute Custom	Checked

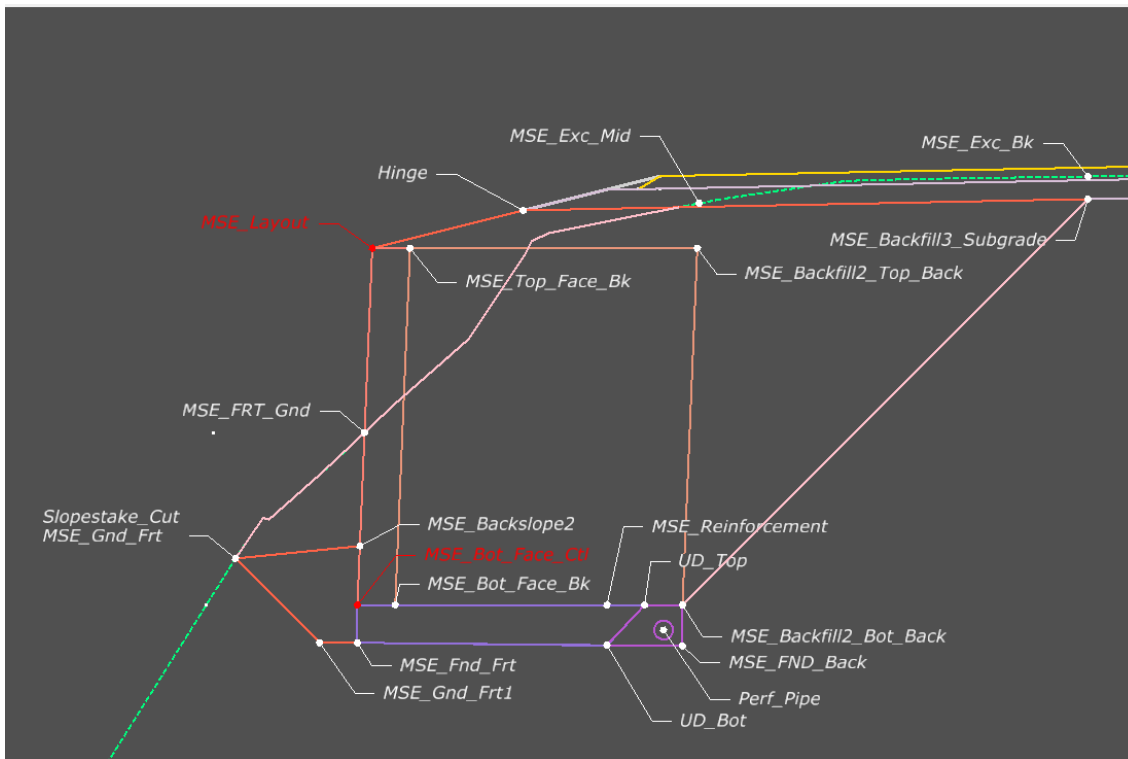
Component Display Rules.

Table 56 – MSE Wall w/ Exc Component display rules

Display Rule	Description
Backfill3_Intercept	Checks which side of CL MSE_Exc_Bk finds its target
Exc_above_subgrade_a	Checks if MSE_Exc_Bk finds its target above subgrade intercept
Exc_above_subgrade_a	Checks if MSE_Exc_Bk finds its target above subgrade intercept

Points.

Figure 82 – MSE Wall w/ Exc Component points

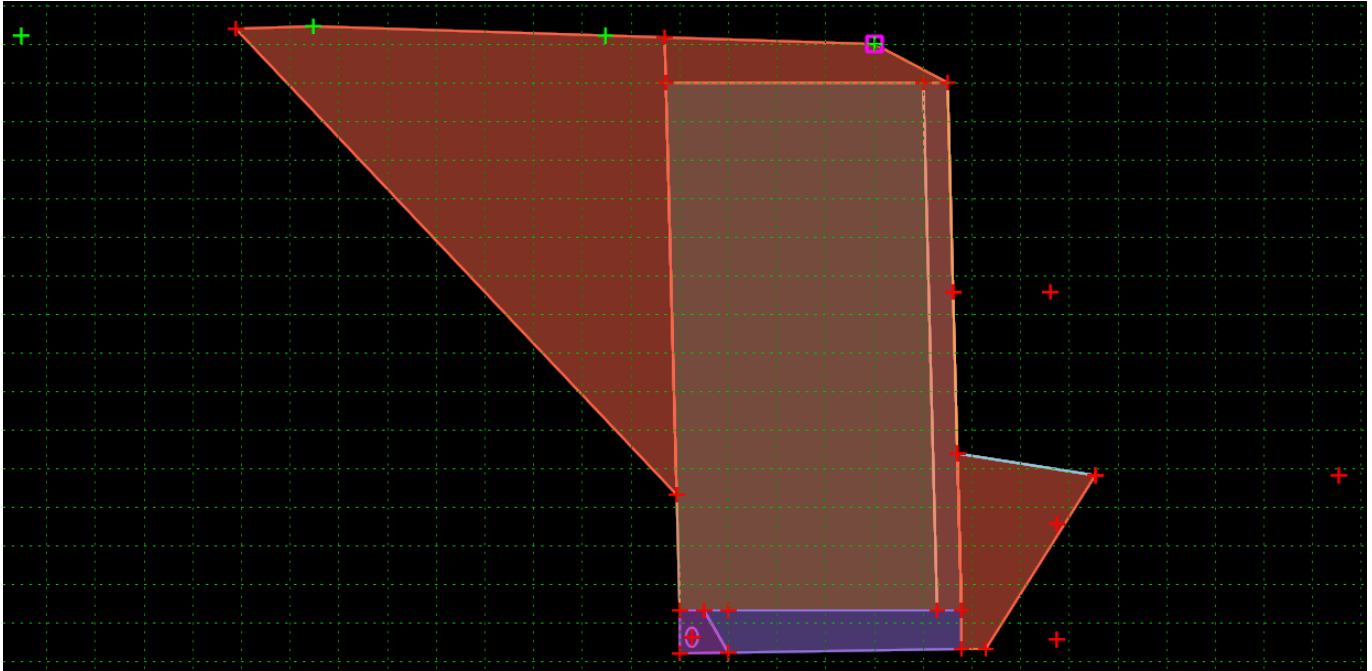


9.3. MSE WALL w/ ROCKSLOPE

Location. <project template library>/ORD Templates/Walls/MSE/MSE Wall w/Rockslope

Description. This template is...

Figure 83 – MSE Wall w/Rockslope Template

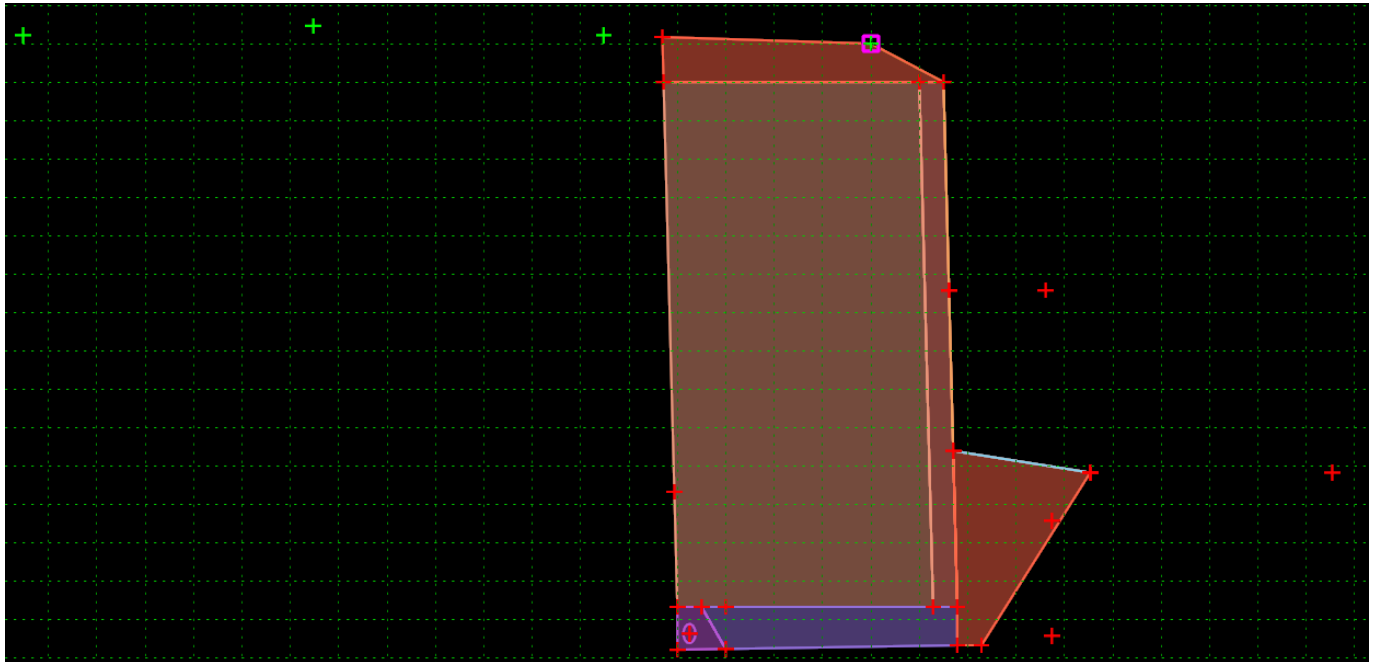


9.4. MSE WALL w/ ROCKSLOPE & EXC COMPONENT

Location. <project template library>/ORD Templates/Walls/MSE/MSE Wall w/Rockslope & Exc Component

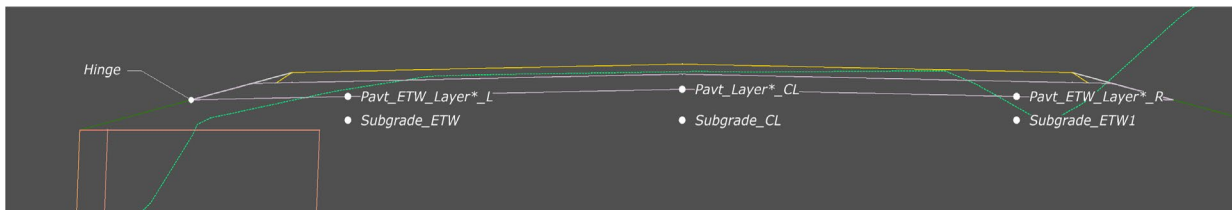
Description. This template is...

Figure 84 – MSE Wall w/Rockslope & Exc Component Template



How to assemble with main template. Drag the Hinge onto the daylight point of subgrade, Hinge point will automatically merge with component point. Merge the Subgrade_ETW, Subgrade_CL and Subgrade ETW1 with the Main Template subgrade points. Ignore any merge warning.

Figure 85 – MSE Wall w/Rockslope & Exc Component template



Parametric Constraints.

Figure 86 – MSE Wall w/Rockslope & Exc Component parametric constraints

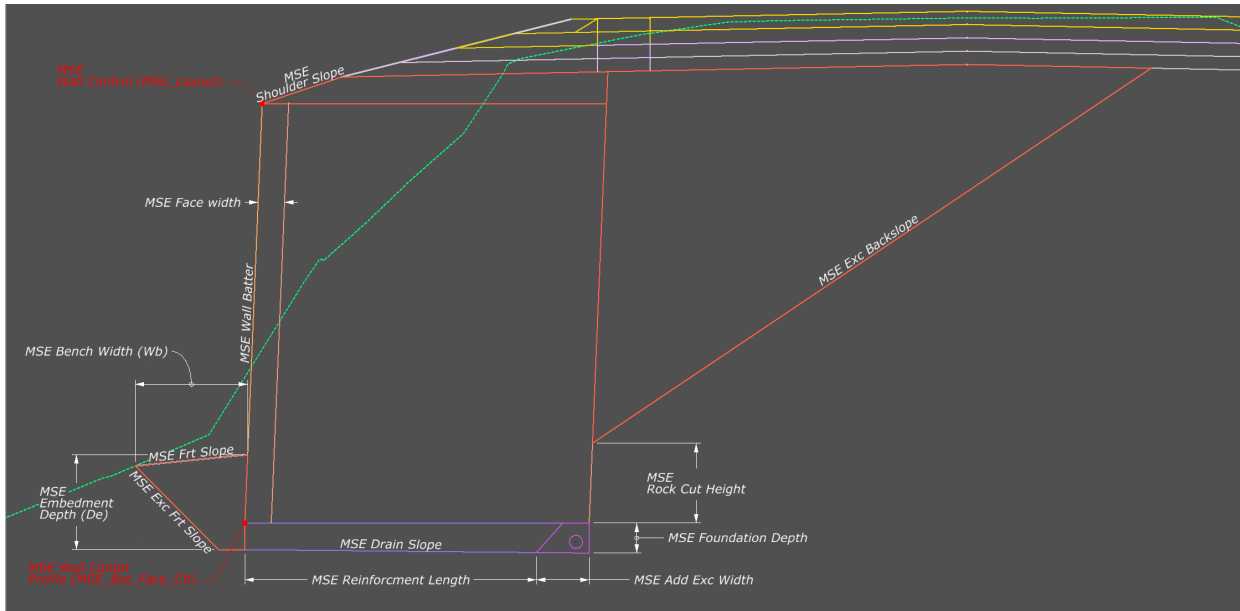


Table 57 – MSE Wall w/Rockslope & Exc Component parametric constraints

Parametric Constraint Label	Default Value	Parent Point	Note
MSE Add Exc Width	-2'	MSE_Backfilll2_Bot_Bk	
MSE Bench Width (Wb)	4'	MSE_Wb_Test	
MSE Drain Slope	1%	MSE_Fnd_Bk	
MSE Exc Backslope	100%	MSE_Backfill3_Subgrade	
MSE Exc Front Slope	100%	MSE_Backfill3_Frt	
MSE Foundation Depth	-1'	MSE_Fnd_Frt	
MSE Front Slope	10.00%	MSE_Backslope2	
MSE Reinforcement Length (L)	-7'	MSE_Reinforcement	Wall Width Factor = 0.7
MSE Shoulder Slope	25%	MSE_Layout	
MSE Shoulder Width	4'	MSE_Layout	
MSE Wall Batter	2400.0%	MSE_Frnt_Grnd	
MSE_Face_Width	1'	MSE_Top_Face_Bck	
UD_Pipe Radius	0.25'		

Point Controls.

Table 58 – MSE Wall w/Rockslope & Exc Component point controls

Point	Description
MSE_Layout	Horizontal wall chain
MSE_Bot_Face_Ctl	Bottom of wall profile

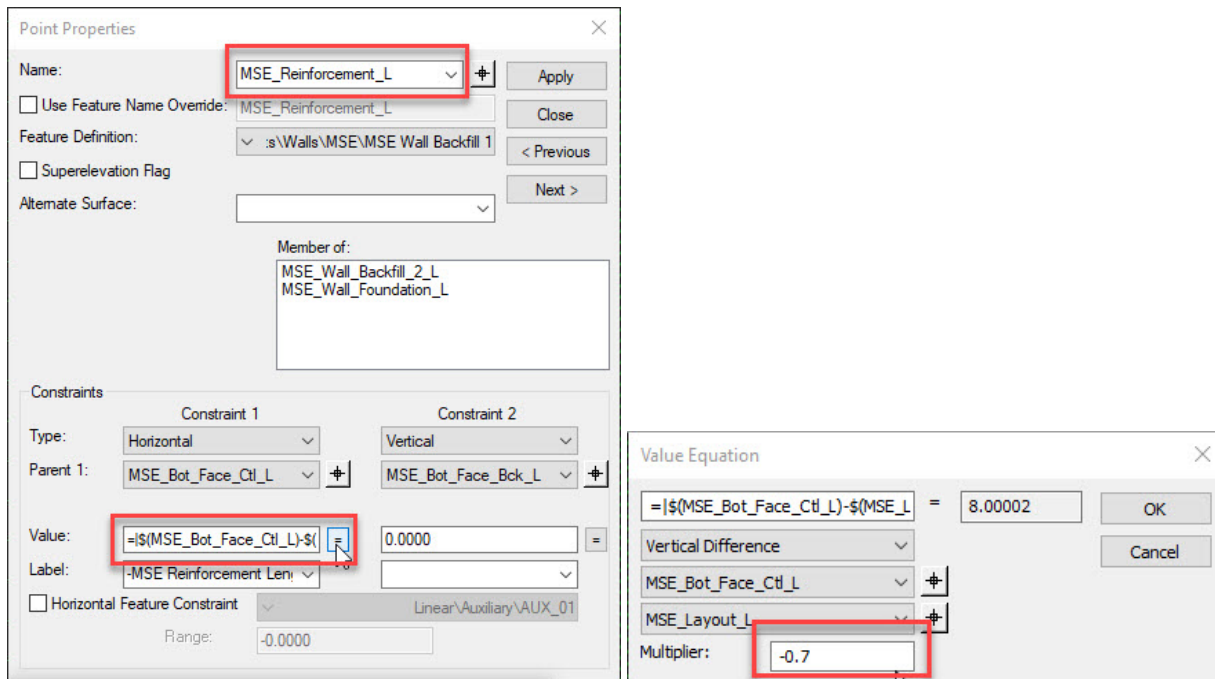
Other Points for Profile Views.

Table 59 – MSE Wall w/Rockslope & Exc Component other points for profile views

Point	Description
MSE_Frt_Grnd	OG at Face of wall

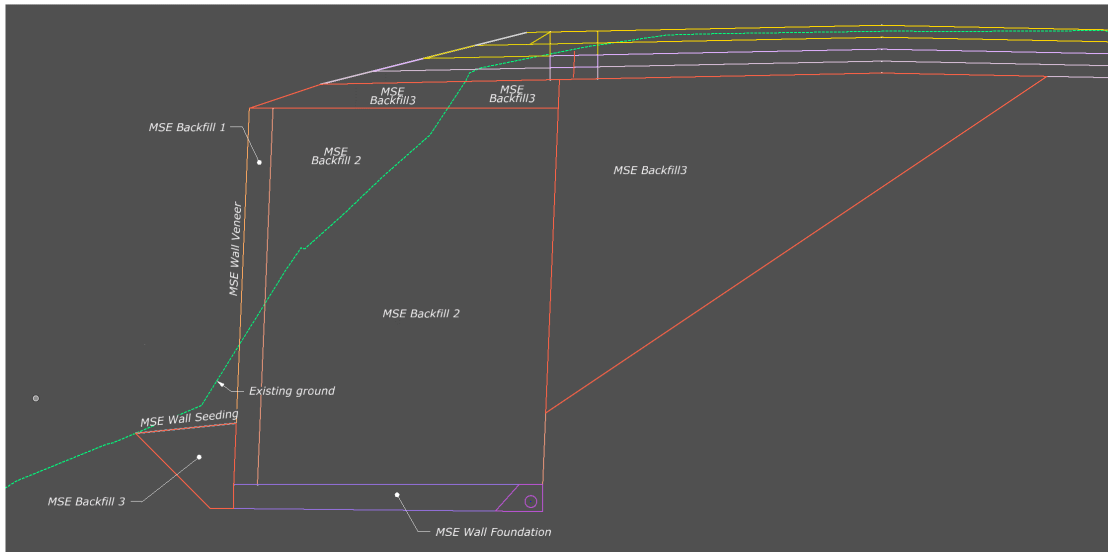
Wall Width Factor. The wall width factor can be edited by changing the multiplier in the value equation for the horizontal point properties of the MSE_Reinforcement point. The parametric constraint MSE Reinforcement Length will override this value if used.

Figure 87 – MSE Wall w/Rockslope & Exc Component wall width factor



Feature Definition Volume Options.

Figure 88 – MSE Wall w/Rockslope & Exc Component feature definition volume options



The Feature Definition/Mesh/Volume options are by default set to "Design". Use the Mesh/Volume option in the table below to separate the MSE quantity volumes from normal cut/fill volumes.

Edits can be made in the Your project(1)_cor.dgn at: Explorer/OpenRoads Standards/Your project(1)_Cor.dgn/Feature Definitions/Mesh/Walls/MSE

Table 60 – MSE Wall w/Rockslope & Exc Component feature definition volume options

Feature Definition	Mesh / Volume Option	Split Quantity
MSE Wall Veneer	Custom	FALSE
MSE Wall Seeding	Custom	FALSE
MSE Wall Backfill1	Custom	FALSE
MSE Wall Backfill2	Custom	FALSE
MSE Wall Backfill3	Custom	FALSE
MSE Wall Excavation	Custom	FALSE
MSE Wall Foundation	Custom	FALSE

Make sure the below parameters are checked when using the Create Cut Fill Volumes tool.

Cut Fill Volume Parameters	
Compute Custom	Checked

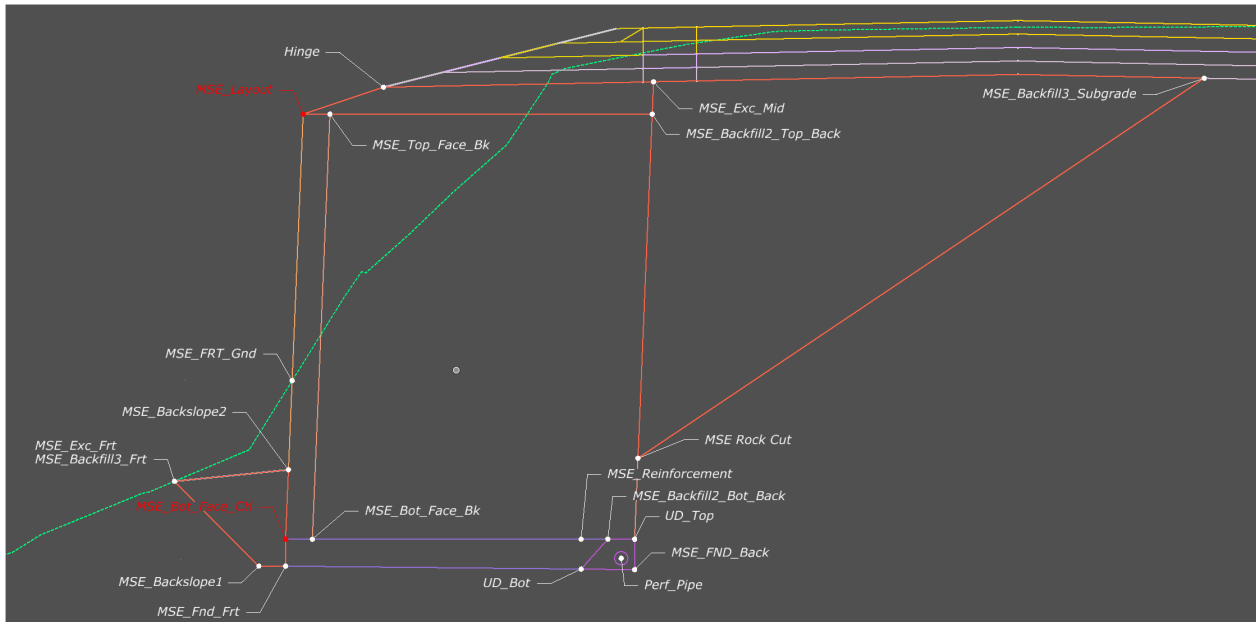
Component Display Rules.

Table 61 – MSE Wall w/Rockslope & Exc Component component display rules

Display Rule	Description
Backfill3_Intercept	Checks wich side of CL MSE_Exc_Bk finds its target
Exc_above_subgrade_a	Checks if MSE_Exc_Bk finds its target above subgrade intercept
Exc_above_subgrade_a	Checks if MSE_Exc_Bk finds its target above subgrade intercept

Points.

Figure 89 – MSE Wall w/Rockslope & Exc Component points

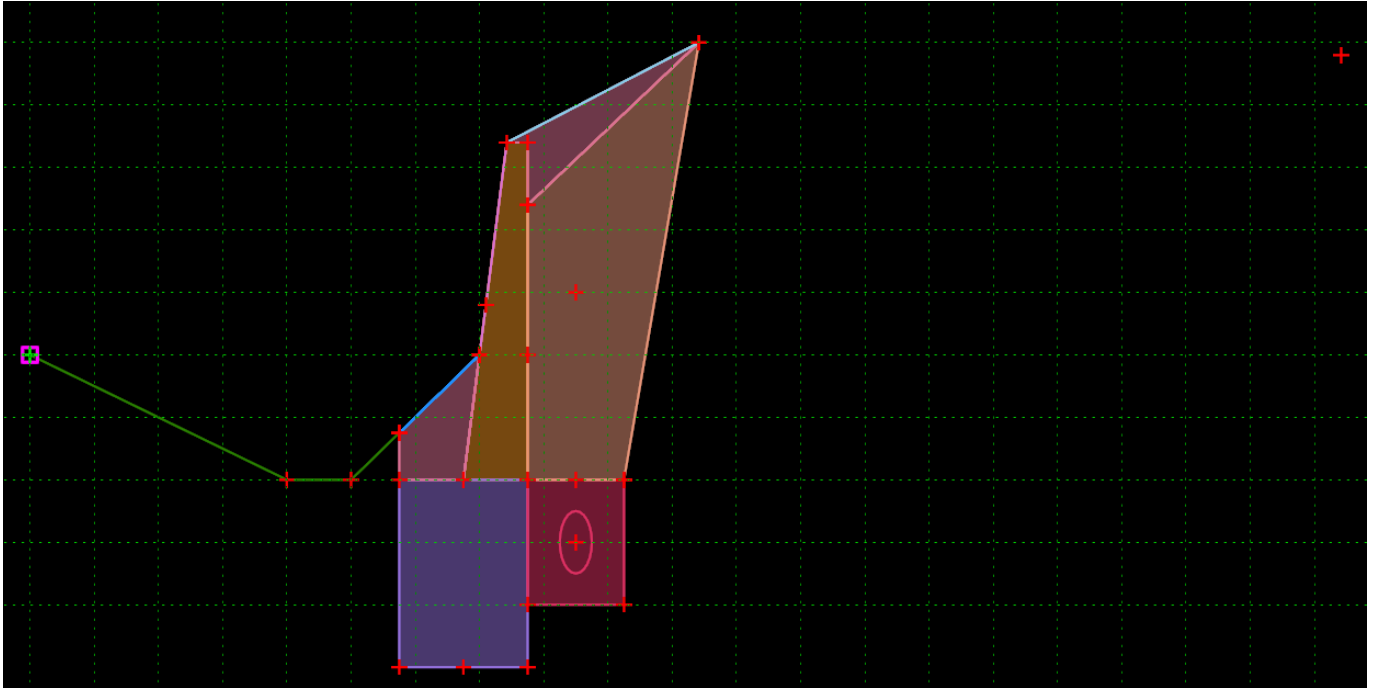


9.5. ROCKERY WALL w/DITCH

Location. <project template library>/ORD Templates/Walls/Rockery/Rockery Wall w/Ditch

Description. This template is...

Figure 90 – Rockery Wall w/Ditch Template

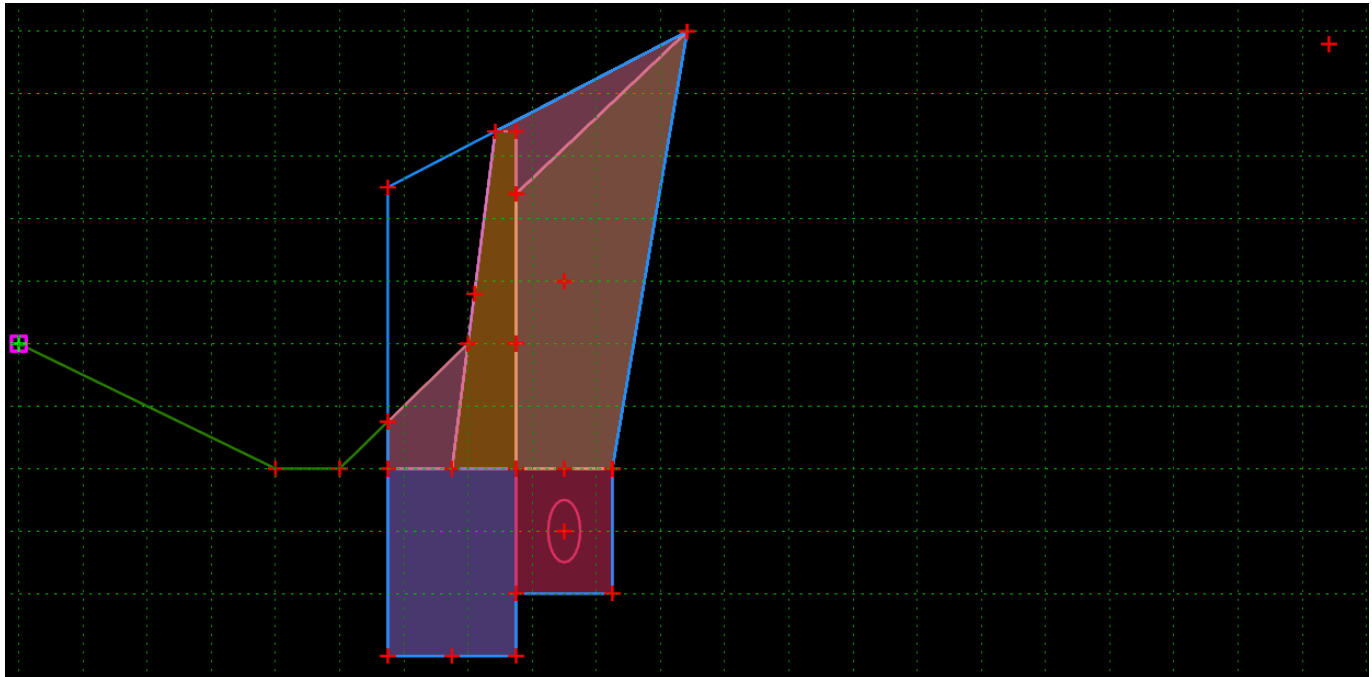


9.6. ROCKERY WALL w/DITCH w/EXC COMPONENT

Location. <project template library>/ORD Templates/Walls/Rockery/Rockery Wall w/Ditch w/Exc Component

Description. This template is...

Figure 91 – Rockery Wall w/Ditch w/Exc Component Template



How to assemble with main template. Drag the Hinge onto the daylight point of subgrade, Hinge point will automatically merge with component point.

Parametric Constraints.

Figure 92 – Rockery Wall w/Ditch w/Exc Component parametric constraints

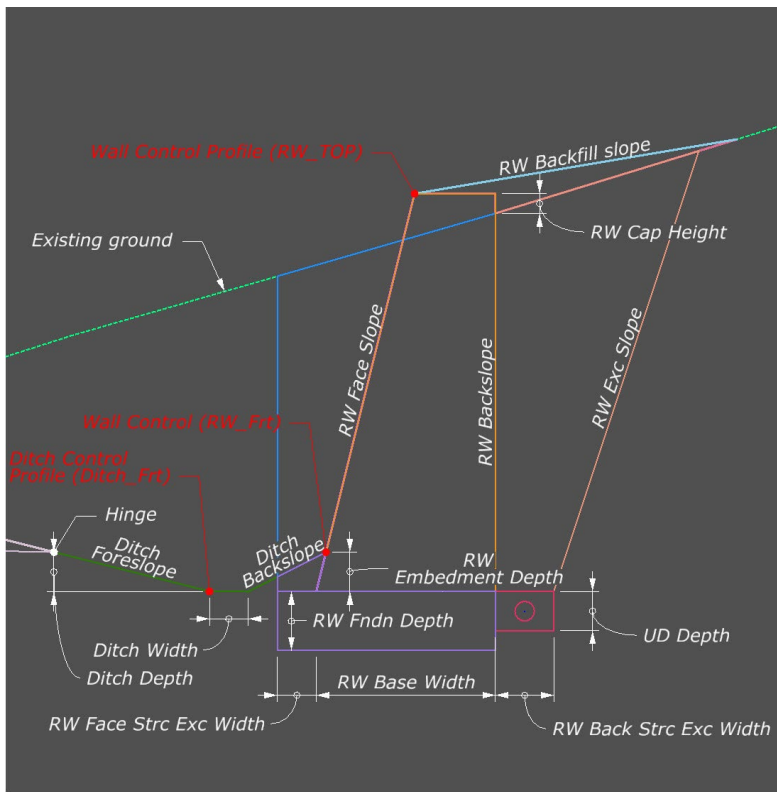


Table 62 – Rockery Wall w/Ditch w/Exc Component parametric constraints

Parametric Constraint Label	Default Value	Parent Point	Note
Ditch Backslope	50%	RW_Front	
Ditch Backslope Width	2'	RW_Front	
Ditch Depth	-1'	Ditch_Bot	
Ditch Foreslope	-25%	Ditch_Bot	
Ditch Slope	0%	Ditch_Bot_Back	
Ditch Width	1'	Ditch_Bot_Back	
RW Back Struc Exc Width	1.5'	RW_Exc_Bk	
RW Backslope	5000000000%	RW_Bk_Top_OG	Vertical
RW Base Width	0.75'	RW_Backfill_Bot_Bk	Wall height factor multiplier = 0.5
RW Cap Height	0.5'	RW_Top	
RW Embedment Depth	1'	RW Embedment Depth	
RW Exc Slope	300%	RW_Backfill2_Bk	
RW Face Slope	400%	RW_DNC_Ref_Batter	
RW Face Str Exc Width	-1'	RW_Fndn_Top_Frt	
RW Foundation Depth	-1'	RW_Fndn_Bot_Frt	

Parametric Constraint Label	Default Value	Parent Point	Note
UD Depth	-1'	RW_UD_Frt	
UD Pipe Radius	0.25'		

Point Controls.

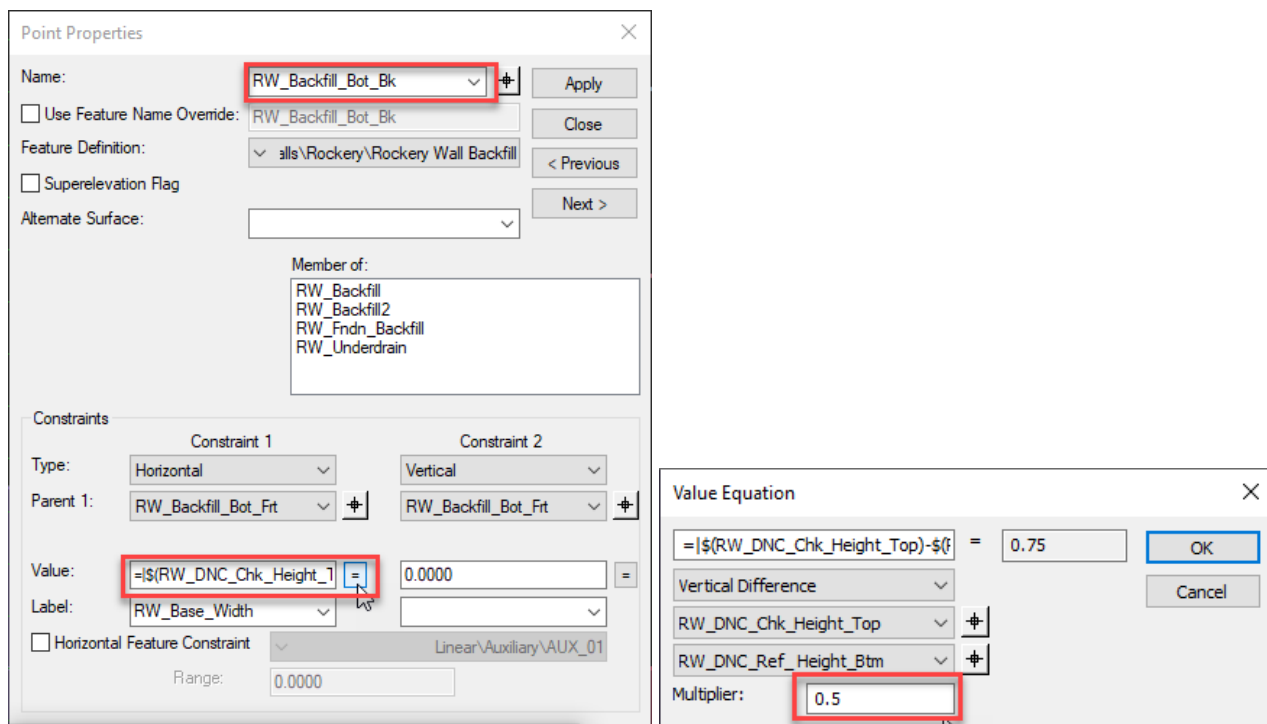
Table 63 – Rockery Wall w/Ditch w/Exc Component point controls

Point	Description
RW_Top	Top of wall profile
RW_Front	Horizontal wall chain
Ditch_Frt	Ditch Profile

Wall Width Factor.

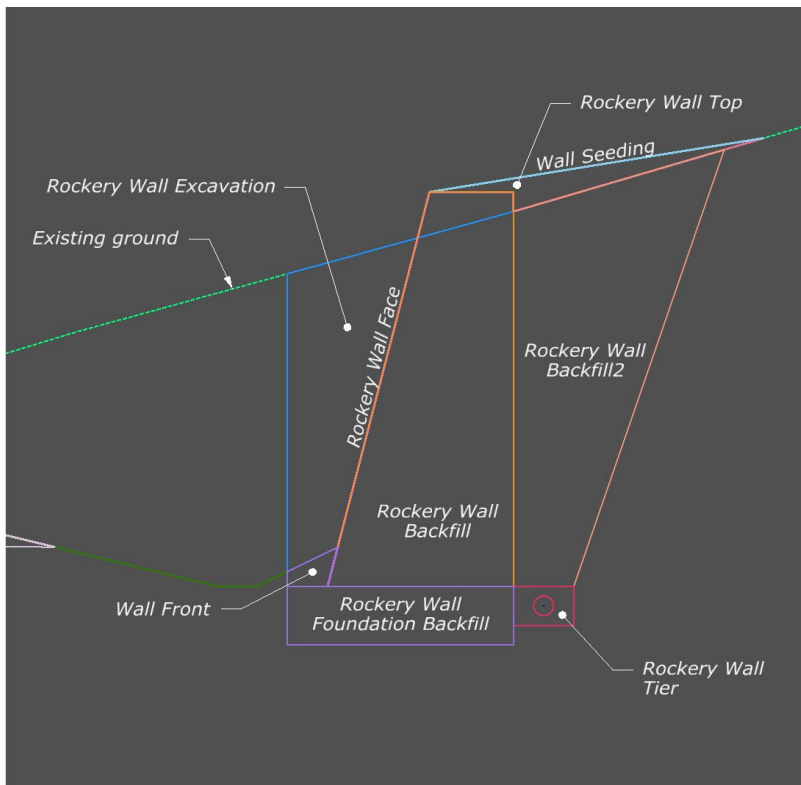
The wall width factor can be edited by changing the multiplier in the value equation for the horizontal point properties of the RW_Backfill_Bot_Bk point. The parametric constraint RW Base Width will override this value if used.

Figure 93 – Rockery Wall w/Ditch w/Exc Component wall width factor



Feature Definition Volume Options.

Figure 94 – Rockery Wall w/Ditch w/Exc Component feature definition volume options



The Feature Definition/Mesh/Volume options are by default set to "Design". Use the Mesh/Volume option in the table below to separate the rockery quantity volumes from normal cut/fill volumes.

Edits can be made in the Your project(1)_cor.dgn at: Explorer/OpenRoads Standards/Your project(1)_Cor.dgn/Feature Definitions/Mesh/Walls/Rockery

Table 64 – Rockery Wall w/Ditch w/Exc Component feature definition volume options

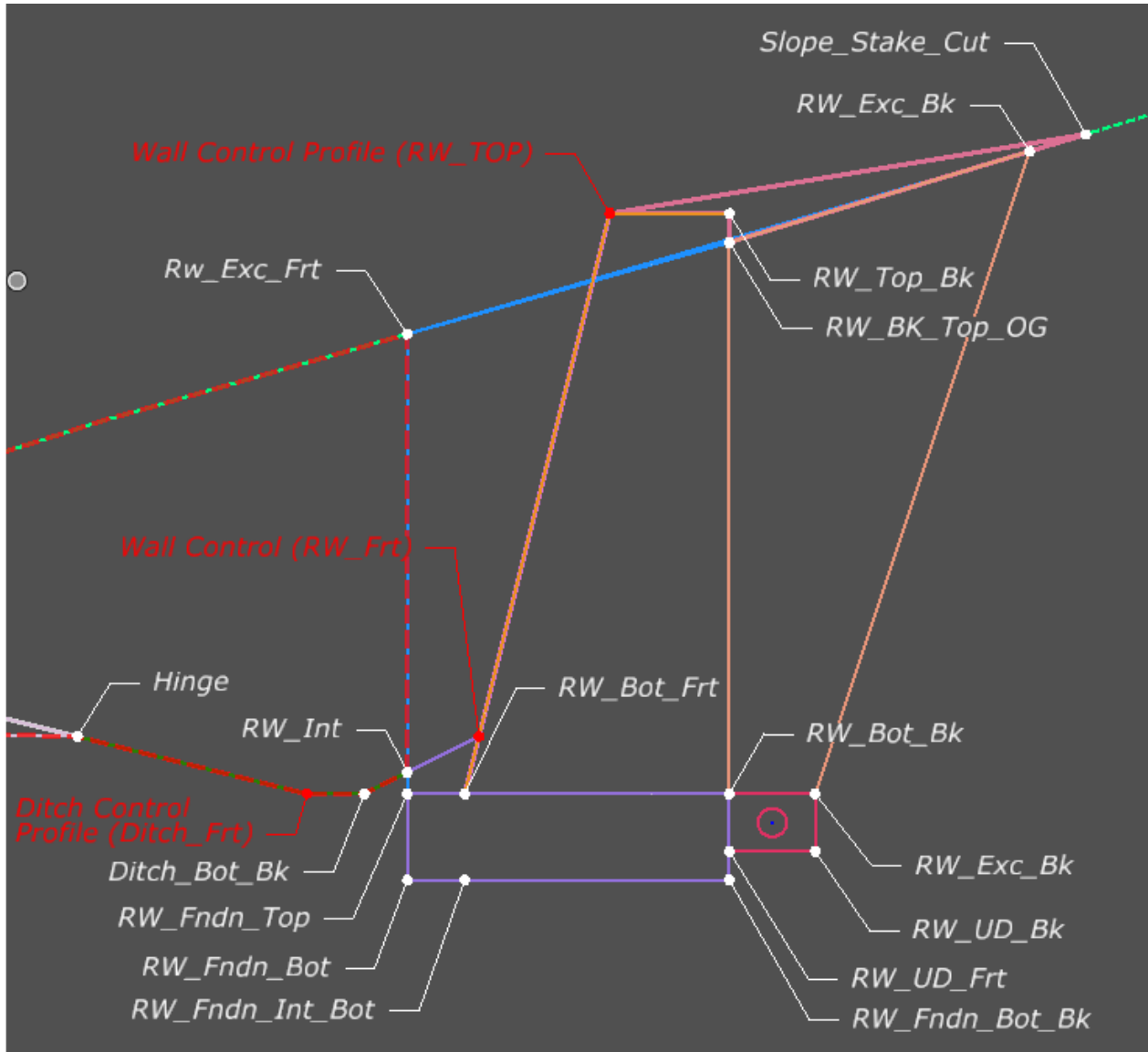
Feature Definition	Mesh / Volume Option	Split Quantity
Rockery Wall Backfill	Custom	FALSE
Rockery Wall Backfill 2	Custom	FALSE
Rockery Wall Excavation	Custom	FALSE
Rockery Wall Face	Custom	FALSE
Rockery Wall Foundation Backfill	Custom	FALSE
Rockery Wall Top	Custom	FALSE
Rockery Wall Tier	Custom	FALSE
Wall Gutter	Custom	FALSE
Wall Front	Custom	FALSE
Wall Seeding	Custom	FALSE

Make sure the below parameters are checked when using the Create Cut Fill Volumes tool.

Cut Fill Volume Parameters	
Compute Custom	Checked

Points.

Figure 95 – Rockery Wall w/Ditch w/Exc Component points



9.7. UNDERDRAIN

Location. <project template library>/ORD Templates/Walls/Underdrain

Description. This template is...

Figure 96 – Underdrain Template

