ANNOTATION CORRIDOR

Workflow for creating Annotation Corridor for use in Road Cross Sections

NOTE: Screenshots and video demos throughout document reflect ProjectWise, however, instructions have been updated for use with the KDOT Delivered Workspace.

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Geology Annotation Corridor Overview

Background

With the move to CONNECT edition, many workflows have required adjustments. Files that were used downstream by other Bureaus no longer exist or do not have the needed data

This 3D geology workflow is a way to provide Road Design with the Geologic layers without a need to pass files back and forth, where previously Geology took a copy of the Road XS stack file and added those layers then sent it back to Road Design.

Prerequisites

Geology Terrains

Best practice for creating terrain files for the Geology Annotation Corridor is to keep each terrain in its own container/dgn or they can be placed in one file, but each should be in its own model. Geology Terrain files should be named kaXXXXXXgtm-XX.dgn
NOTE: KDOT Geology is using Bentley's LeapFrog software to generate a model of geological layers and exporting the mesh for use in OpenRoads to generate the terrain.

Template Library

Best practice is to copy the workspace template library and place this copy in the project folder. The 10.10 workspace template can be found in this location:

- KDOT_10.10\Standards_Civil\Template Library\
    - Right click on KDOT_Civil_Templates_10.10.itl and select copy
    - Paste into the applicable Project folder.
    - It is recommended that the ITL be renamed KDOT_Civil_Templates_10.10.itl to KAXXXXXX_Geo.itl
        - Adding the Geo suffix will differentiate it from any road template libraries

References

The following files are recommended references:
Survey – Terrain (stm)
Road – Alignment(s) (ral)
Geology – Terrain (gtm)

- There may be one gtm with multiple models or multiple gtm files with one terrain in each.

Video Demo

[Workflow for Creating Annotation Corridor for use in Cross Sections]

Creating the Geology Annotation Corridor

Create New DGN using 2D Seed File

- Create new DGN using the appropriate workspace seed file.
  - Seed files are in the workspace at this relative location: KDOT_10.10\Standards_Civil\Seed
  - 3D seed files are used for the creation of Terrains.
  - 2D seed files are used for everything else.
    - These 2D files let the software create & manage 3D models.
- The recommended name for this geology annotation corridor is:
  - kaXXXXXX**gco**.dgn
- Assign the Geographic Coordinate System for the project

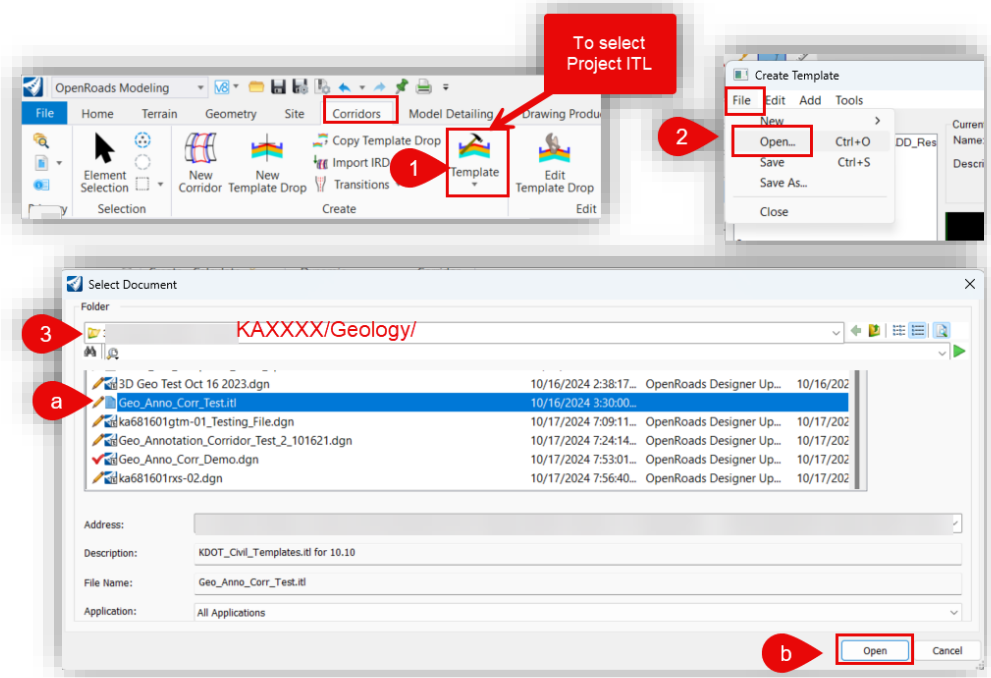
Attach References

- Attach References as noted above

Selecting Project ITL (Template Library)

Before creating the corridor, we need to set the template library to the project ITL (Template Library). It is defaulted to the Workspace ITL. These are the steps to point the file to the Project ITL.

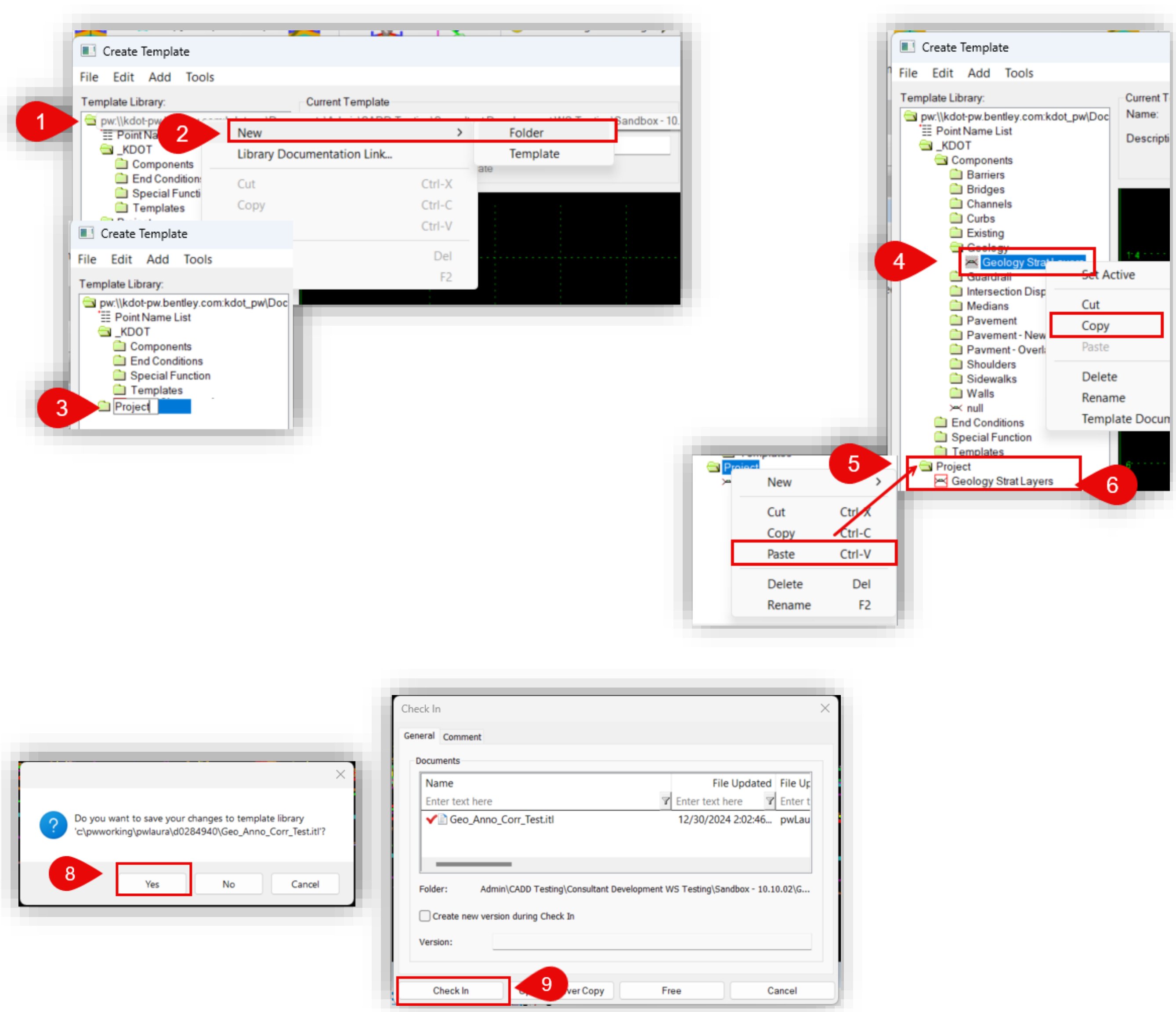
1. In the Corridors tab in the Create section, click on the Template Icon
2. In the Create Template dialog box, at the top, select File→Open
3. Navigate to location where Project ITL is saved
   a. Select Project ITL
   b. Click Open



Copy Geology Strat Layers Template to New Folder

To ensure that modifications made to the template are saved, a project folder should be created in the project template library as follows:

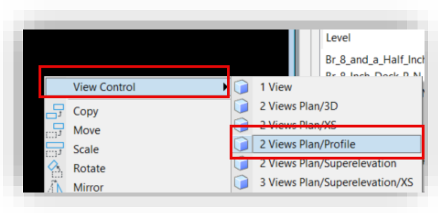
1. Select and right click the top-level folder (also shows the path to the project folder)
2. Select "New" and then "Folder"
3. Set a name for the folder
4. Navigate to _KDOT→Components→Geology then right click and copy the Geology Strat Layer template
5. Right click on the newly created folder and paste the template
6. Double click on the template under the new folder to set it as the active template
7. Close the Create Template dialog box
8. If asked to Save the ITL, Select "Yes"
9. On the Check-In dialog box, check in the project ITL (ProjectWise only)



Open Profile View

Before creating the corridor, hold down the right mouse button and select View→2 Views Plan/Profile

- Select the Alignment and then select a view (2-8) to put the profile view.



Create the Corridor

1. Navigate to the OpenRoads Modeling Workflow→Corridors Tab→Create Section and select "New Corridor" and follow the prompts
   a. Select Alignment
   b. Select Existing Ground in Profile View opened above

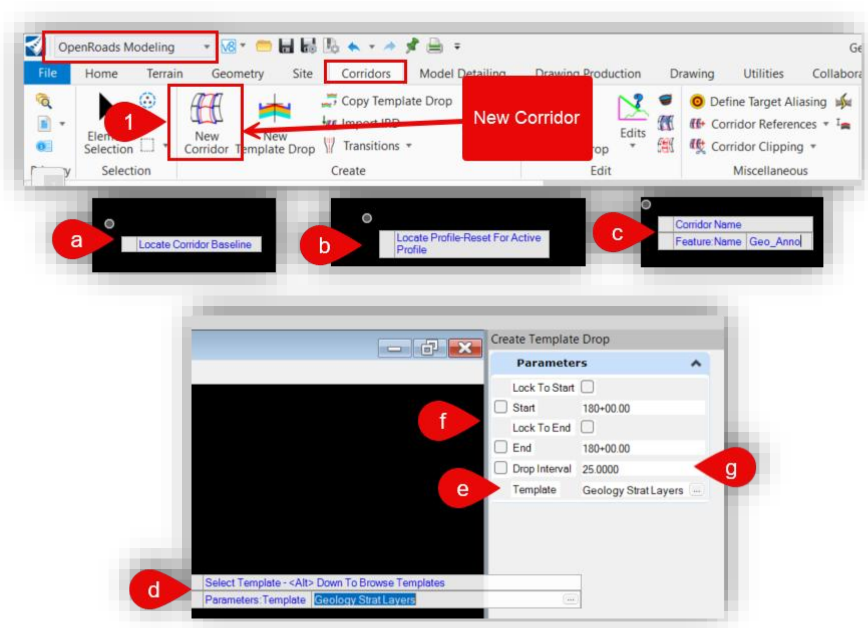
➢ **<u>DO NOT</u>** Right Click/Reset for Active Profile
   i. This is because the proposed profile may not run the entire length of the project which will result in annotations missing from some cross sections

   c. Give the Corridor a name (IE Geo_Anno)

Apply Template Drop

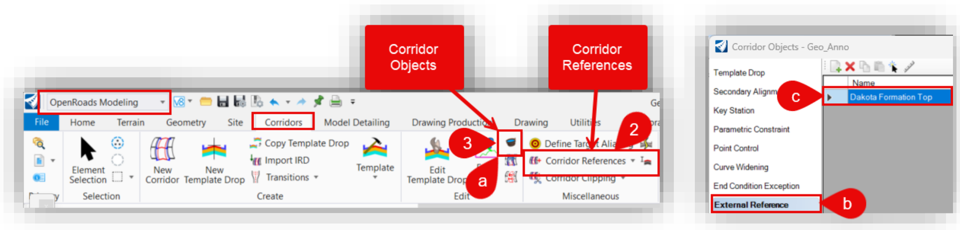
The remaining steps can be done from the floating prompt, or the Create Template Drop dialog box

   d. Select Template (Alt+down or ellipsis)
   e. Template (Geology Strat Layers) in the folder created earlier
   f. Hit Alt to lock to start, data point, and alt to lock to end and datapoint
   g. Use default interval (25') unless Road specifies something different



Add Geology Terrain(s) as Corridor Reference(s)

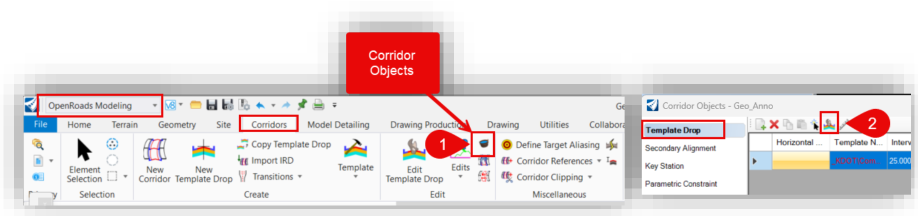
2. Remaining in the Corridors Tab, select Add Corridor Reference under Corridor References
    a. Select the terrain in the design file
    b. Repeat for each stratification terrain
        i. NOTE: You can select the terrain(s) from the 3D model
3. Verify Terrains show correctly via Corridor Objects
    a. Select the Corridor Objects ICON in the Edit section of the Corridor Tab
    b. Select External Reference from the left menu
    c. The terrain name should be listed (DTMEntity is ok too)



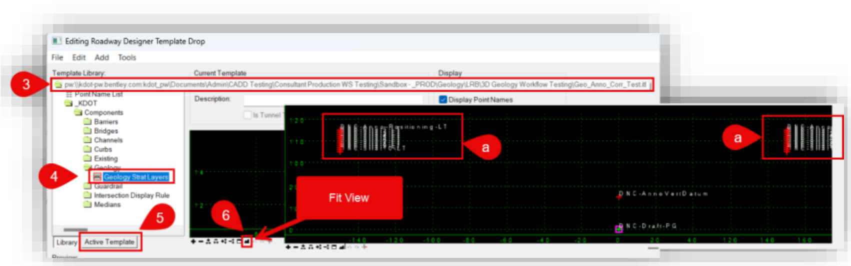
Edit Template Drop

Now that we have a corridor and are pointed to the Project ITL, we are ready to edit the template drop. These edits will ensure that when the Annotation Corridor is referenced into a Cross Section file, the annotation group can locate the terrain(s) and label in the Cross Section drawing and sheet models.

1. To edit the template drop, open the Corridor objects again
    a. Follow prompts to select the corridor
2. In the Corridor objects dialog, stay in the top section and select the "Edit Template Drop" icon



3. In the Editing Roadway Designer Template Drop dialog, first hover over the top lever folder on the left and verify it is pointing to the Project ITL
4. The Geology Strat Layer template should already be active in the folder tree
5. Below the folder tree, click on "Active Template"
6. Click the Fit View Icon to display all the components
    a. Note the columns in the upper right and left of the template

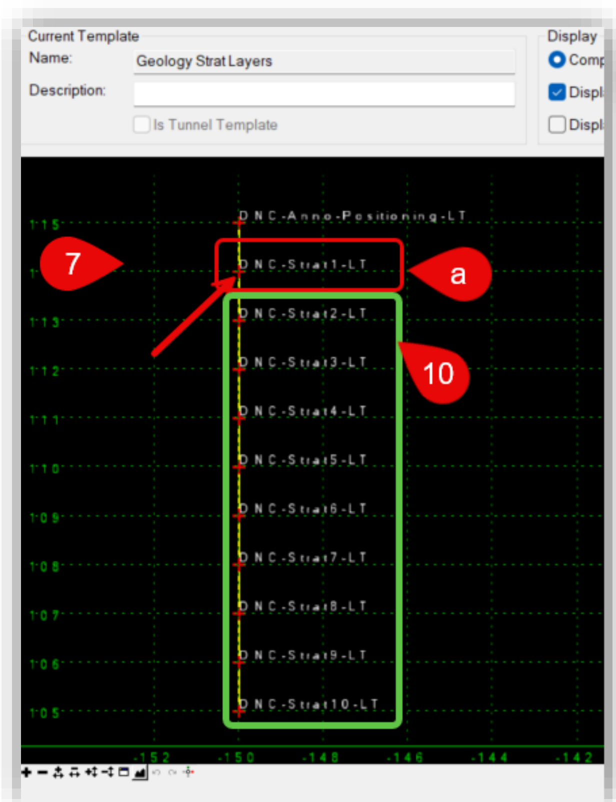


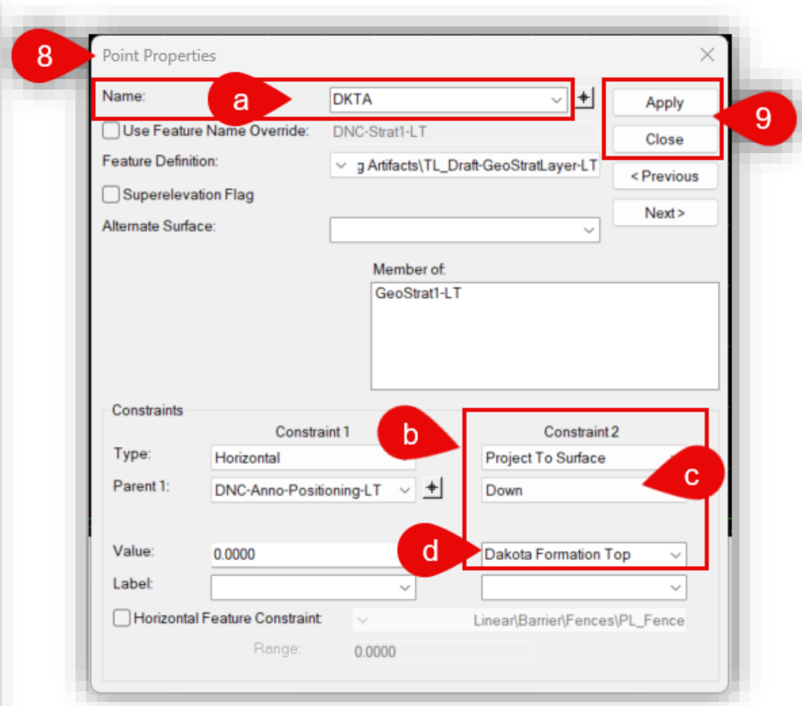
7. Zoom into the upper left line of points
    a. Double click on the first point (red plus) called DNC_Strat-LT. It should be the second one from the top
8. In the Point Properties dialog
    a. Change the name of the point (This will be the text displayed on the Cross Sections)
        i. For the left side add a space at the beginning of the point name
        ii. For the right side add a space after the point name

NOTE: It doesn't matter which side gets the space before or after as long as they are not both the same.

    b. Under Constraint 2 section, change Vertical to Project to Surface
    c. Change DNC-Anno-Positioning-LT to Down
    d. For the value, use the drop down to select the associated stratification layer terrain
9. Click Apply, then Close
10. Repeat steps 7-9 for each stratification layer/terrain in the project using the next point below

Once done with the left side, fit view, and zoom into the right side and repeat steps 7-9 for the right side using a space in a different location than the left side point names.





NOTES:

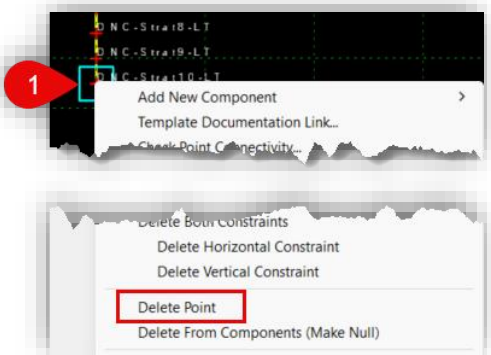
- If more than 10 stratification layers/terrains exist for the project, a new corridor and template drop will need to be done for each set of 10

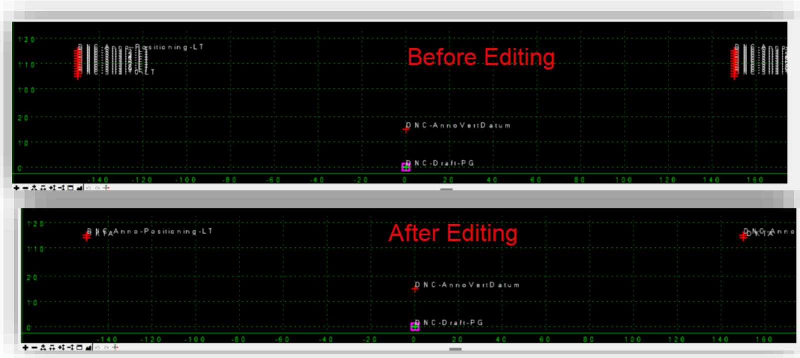
- The horizontal offset can be adjusted via the top point DNC-Anno-Positioning or can be varied along the corridor by editing the parametric constraint values of Annon_HorizOffset

Delete Unused Template Points from Template Drop

Once all the needed points have been edited, the remaining points can be deleted from the template drop.

1. Right click on each unused point (left and right) and select "Delete Point"
   a. Use "Undo" or Ctrl+Z if you accidently delete a point that is needed
2. Selecting "Fit View" should show only the remaining points
3. Hit OK at the top right of the Editing Template dialog box and close the corridor objects dialog box
4. If you get a dialog box to save changes and check-in your Project ITL, go ahead and do so.

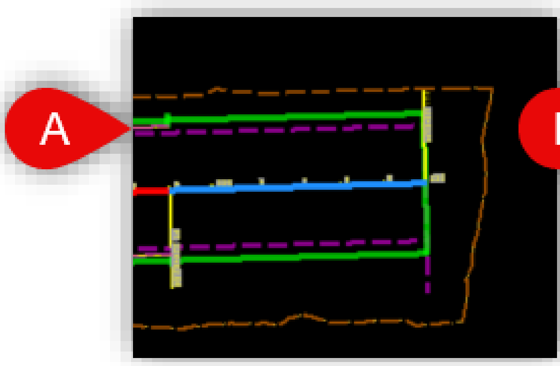


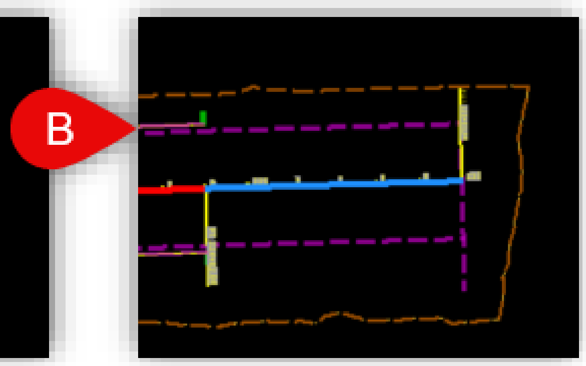


Verify Template Drop Applied

OpenRoads changes the corridor visually when a template drop has been applied. Before sending the file over to Road Design for use, verify the template has been applied.

a. A **green** outline indicates **no** template has been applied
b. A **purple** outline indicates the template has been applied





Review of Geology and Labels on Cross Sections

Copy Road RXS to working folder

Care should be taken when using an existing Cross Section Sheet file that the geology layers display in the cross sections appropriately. The following are steps to add the Geology Annotation corridor to an existing RXS file.

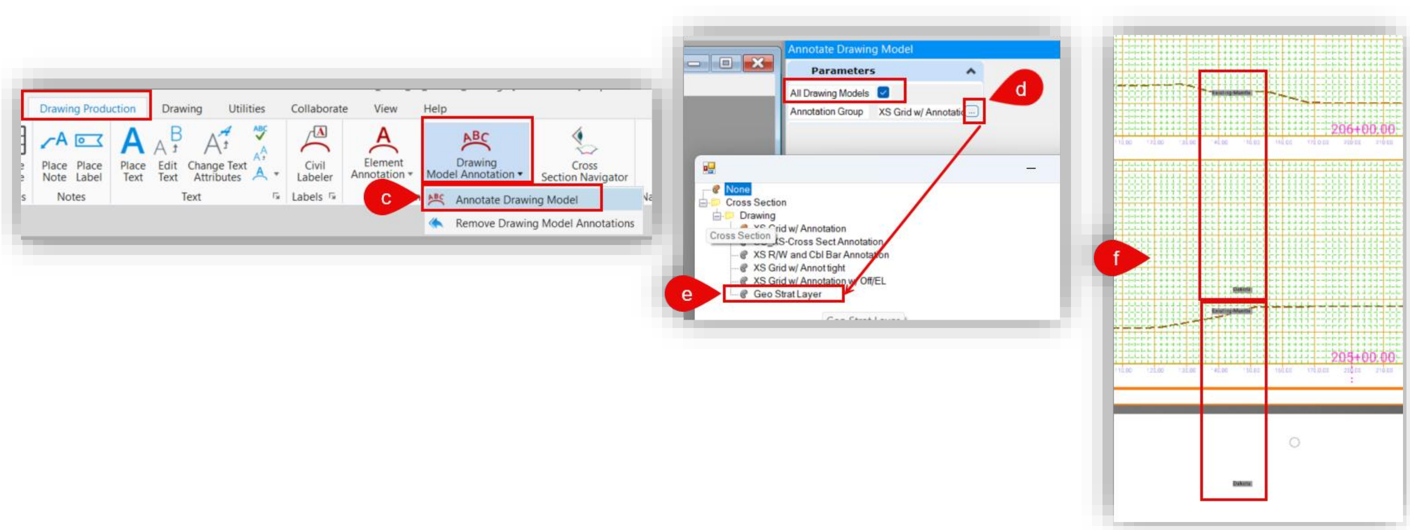
1. Obtain a copy of the RXS from Road design and add -geo at the end

Adding the Geology Annotation Corridor (GCO)

It is possible that some cross sections will need to be re-cut by Road Design after applying the Geology Annotation corridor.
This is because typical cross sections may not be cut deep enough to properly label the geological layers in some areas. This will depend on Road Design's need for that information in a given area.

   a. Attach as a reference the GCO file from geology with nesting to display the associated terrains (Depth of 1 should be enough).
   b. Nesting may need to be set in both 2D and 3D models.
   c. Navigate to any drawing model
   d. From the OpenRoads Modeling Workflow, Select Drawing Production→Drawing Model Annotation→Annotate Drawing Model
   e. In the Annotate Drawing Model dialog, check "All Drawing Models", and Click the ellipses next to Annotation Group
   f. In the Pop up, expand Cross Section and Drawing and select "Geo Strat Layer" and datapoint to accept
   g. Open a sheet model to verify annotation was successful
      i. In this case, the cross sections are not deep enough so the label appears off grid
         1. This sheet can either be re-cut to be deeper or the label can be deleted if geologic layer is not needed in this area.

2. Cross sections can now be plotted for review.

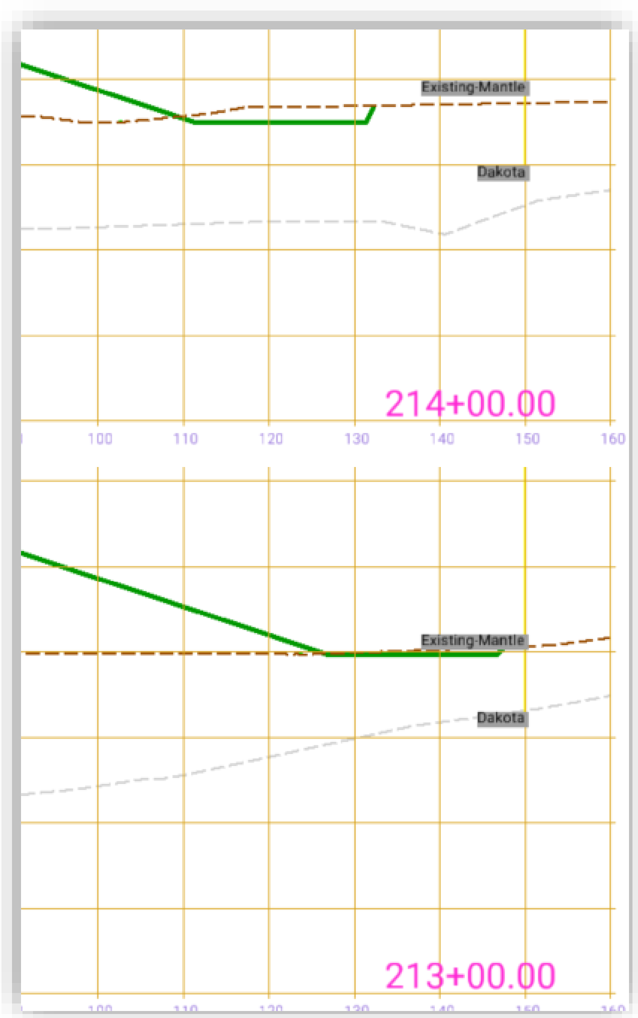


Geology Annotation Corridor Complete

Once the review is complete, send the GCO file, all GTM files, and any additional pertinent information to Road Design.

This is an example of what it will look like on the Road Design Cross Sections when the annotation is applied.

NOTE: The text displayed is the point name used in the template.



Support

If there are any questions or issues regarding this workflow while applying it to your project, please send an email to ebitsm@ks.gov and cc kdot#cadd.support@ks.gov

This document is a general guide for creating data in the OpenX software and doesn't include specific Geology workflows such as creating boreholes.

Appendix

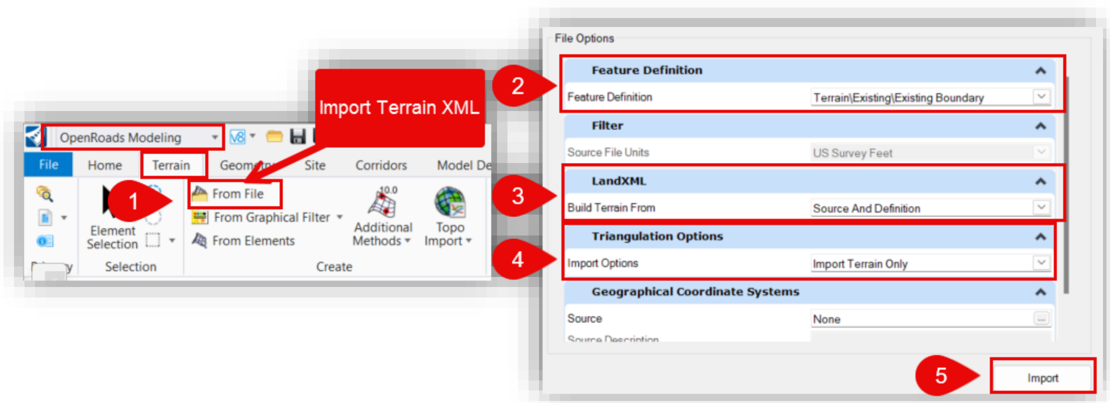
Import Geology Terrain XML's (if needed)

If there are issues referencing the terrains, you can import the terrain XMLs directly into the gco dgn (Geology Annotation Corridor).

NOTE: It is recommended the Terrain XML is imported into a separate model within the DGN.

These are the steps to import the terrain XML's:

1. Navigate to OpenRoads Modeling Workflow→Terrains Tab→Create Section and select "From File"
2. In pop up, set the feature definition
3. Set LandXML option to "Source and Definition"
4. Set Triangulation Options to "Import Terrain Only"
5. Click "Import"
6. Repeat, as needed, for each stratification layer terrain to be visualized in Cross Sections



Troubleshooting/FAQ's

Q: What happens if I create the corridor, but a template didn't get applied/selected?

A: See Apply Template Drop

Q: Road Design says there are no annotations showing up or annotations don't match linear elements when applying the annotation to the cross-section file?

A: Common causes are:

- Template Point edits were not applied
- Template points were edited but all fields were not set correctly
- Cross sections are not deep enough to display geologic layers
  - If Cross Sections are not deep enough, some annotations may appear off grid
    - Cross sections can be re-cut if geological information is needed
    - Labels can be deleted if not needed