# OpenRoads Guide and Frequently Asked Questions

# Proposed File Organization

Create separate design files for sheet reference (***d######des***) and for OpenRoads model reference (***d######model***). The des file would be completely independent and would have no association with the model or OpenRoads. The model file's 2D model could be referenced to the des file and the line work within would contain the EPs and sidewalk across driveways and intersections.

- ***d######des*** – Plan sheet reference file will include all plan drafted items minus anything used to create the model.

- ***d######model*** – Master model file should contain the OpenRoads Alignment, Profiles, Super Elevation. Eps, Corridor References/Point Controls, and Corridor Models.

- ***d######model_rte622*** – Major connections may benefit from having their own model files. However, this may limit the functionality of having dynamic intersections. This would only be worth considering for very large projects.

- ***d######prof*** – Profile file to be referenced on the sheets. This file will look the same as we have formerly done. The OpenRoads profile must be exported to Geopak, then drawn in the *d######prof* file in order to be labeled properly and referenced on the sheets.

- ***######.itl*** – The template library used for the project. In-house VDOT users should save this file in the Geopak project folder.

A quick note on the various Microstation Models within a file:

Basically all work is done in **Seed2D** (line work and modeling work). When 3D elements are referenced/created, a **Seed2D-3D** model (actual 3D) is created. This model is automatically referenced to your **Seed2D** view. It can be turned off to reduce clutter.

## Setup and Outline of Work

1. ***d######model*** – Attach the file with the 3D terrain model (possibly sdt###### or scr######) and set as the active terrain model.  If only a .TIN file was provided, see "Creating a Terrain Model from a .TIN" below. See "Creating a Terrain Model from a .TIN" below.

2. ***d######model*** – Create baseline in OpenRoads. Station the baseline and name it. Export to Geopak. "Complex by PI" is recommended for creating the baseline. Using traditional methods and featurizing your line work to create a baseline is **not recommended**, but if needed it will work well but modifications will be easiest to do if you used "Complex by PI.

3. ***d######model*** – Create profile in OpenRoads. See section below on "Drawing Vertical Alignment". Name it and export to Geopak.

4. ***d######model*** – Draw and label baseline from geopak. You can create line work (E.P.s, etc.) by offsetting the baseline. Use OpenRoads tools to offset and create line work (from the OpenRoads baseline) if you want to be able to preserve design intent and take advantage of the dynamic features of OpenRoads. This works well but does tend to really slow down the processing time. From the issues seen it would be recommended that you use traditional methods of creating your line work and featurize it afterwards.

5. ***d######model*** – Create Corridor Model from baseline. Create Templates and Template Drops. See other sections in this document.

6. ***d######model*** – Add relevant line work as Corridor References for the Corridor, or use Point Controls (see below).

7. ***d######model*** – create superelevation shapes from the corridor. Can either be imported from .CSV or generated by OpenRoads.

8. ***d######model*** – Create connection baselines and profiles.

9. ***d######model*** – Use linear templates and surface templates to create radial returns and tie intersections together.

10. ***d######prof***/xsheet/etc – Export baselines and profiles to geopak, draw labeling, create annotated profile in prof file, prepare plan sheets. If corridor model is located in the des file, turn off all modeling elements in the plan sheets, including Construction class items, working lines, etc.

11. ***d######des*** – This file would be used to place all other items to be display on the plan sheets. Reference ***d######model*** to copy in linework needed for the plan sheets (EPs, curbing, shoulders, etc).

All of these steps would be done in the d######des file. If you use this option you can run the risk of file corruption.

# Terrain Model (Existing Terrain)

## Creating a Terrain Model from a .TIN

Some Projects have a terrain model already in the SDT file that could be used in OpenRoads. The CADD section is working with the Survey Section to get the terrain model incorporated into their deliverables. On most projects you will need to create a terrain model in its own file since one does not already exist. All you need is the TIN file.

- Create an empty file using a new seed3D call ***d######tin***
- In the Terrain Model toolbar, click "Create From File"
- Find the correct TIN file
- Set Source File Units to Feet or US Survey Feet (check project)
- Set Feature Definition to Terrain Display>Existing_Contours-1-5
- Set Import Options to "Import Terrain Only"
- Click Import
- Save file and reference to design file

Check if the contours match the TIN file. Sometimes it will not. In this case, use Load DTM Features in Geopak to draw triangles and the TIN hull, and then create a terrain model from elements using the mesh as soft break lines and hull as a boundary.


## Corridor Re-associate

There is now an option in OpenRoads that will allow users to change or re-associate horizontal and vertical alignments. At the MicroStation Key-in, key-in "Corridor Reattach" and follow the prompts:

- Locate Corridor
- Locate Corridor Baseline (your new alignment)
- Locate Profile Element You will then see your corridor modified in your plan view.

There is a YouTube video available on this issue.

http://communities.bentley.com/products/road___site_design/w/road_and_site_design__wiki/29671.re-associate-horizontal-and-vertical-alignment-in-an-existing-openroads-corridor

# Drawing Vertical Alignment

- Open new view for profile, use "Open Profile Model" tool. Must be done in the same file as the baseline and where the corridor will be.

- Existing ground should automatically appear, if not, check your Active Terrain Model, check references.

- The "Vertical Curve Parameter" may default to the R-value instead of the K-value. To fix it, go to Settings->Design File->Civil Formatting and change Vertical Curve Parameter to K value.

- For connections, use "Profile Intersection Point" tool to select EPs and CLs of mainline to start profile, or use "Quick Profile from Surface" and select the mainline corridor.

- For mainline, use "Profile Complex by VPI" tool to draw rough profile. The profile can be adjusted and optimized by moving the handles afterwards.

- To tie to existing at a vertical curve, you may want to determine the curve tie location beforehand, and then use "Parabola From Element" once you know K and L. This will preserve handles without drawing extraneous lines at the tie point.

- Otherwise, draw other lines as necessary using Complex by VPI, or else drawing individual lines and connecting with "Parabola Between Elements". If necessary, connect all with Complex by Elements.

- For an overlay/widening job, a trick to minimize the overlay depth is to draw a complex (horizontal baseline) for the existing roadway high point (crown or superelevated high side), set the active profile for this baseline as the existing ground, then use "Profile By Slope From Element" to project this point to your proposed baseline at your proposed cross slope. This line will show you how low your proposed profile can be (minimum overlay) without cutting the existing pavement.

# **Templates**

## **Set Up:**

Save the template library file (.itl) to the projects geopak project folder. That way, the template library will be archived with the project files at milestones.

To modify templates, use "Create Template" to modify the template library, and then use "Synchronize Template" to update a Template Drop.

If you use "Edit Template Drop". The template is only modified in the corridor and does not change in the template library. The templates can easily be copied to the library if desired; this ensures that templates can be easily referenced by other projects, and that inconsistencies can be avoided.

Template Library Organizer can be used to copy templates from you active file or from one library to another.

- Open your project specific template library.

- Go to Tools > Template Library Organizer.

- Click on the "..." button to the right to navigate to the location above and open the desired .itl file or from active file.

- Click and drag templates and components you need from the right to the left pane.

When designing templates, think about overrides you might use (point controls or end condition exceptions). If you might use point controls to define a ditch profile, use slope and vertical to constraint the ditch bottom, not slope and ditch width.

# Corridor Objects

## Point Controls:

- Point Controls - To control cross section points with line work this method uses the template point name which can be picked form a list or graphically selected from the dynamic cross section view. This option has the most power in that it can control a point in three ways, horizontally, vertically, or both. It also has options to offset from an element. The point name can be found in the point properties.
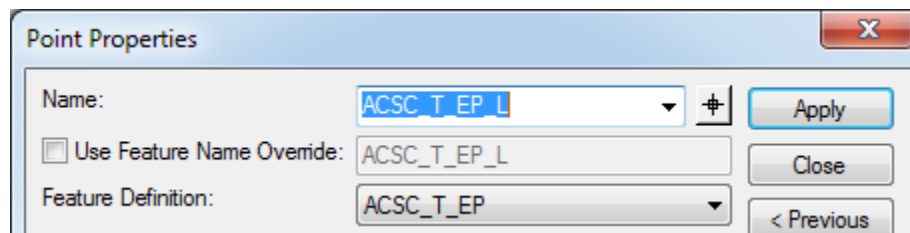


- **Use:** To force ditch elevations to follow a ditch profile, to draw median curb that crosses the centerline on crowned roads, for line work on divided highways or other projects with multiple lines of the same feature if corridor references won't work. Also, superelevation is automatically assigned as a point control. Works best if you create a complex chain from line work to make a single element if possible.

## Corridor External References:

- Corridor External References - Simpler and easier, but only can control horizontal constraints.

- To control cross section points with line work, this is based on an option on the template point properties. When checked on with a feature listed and a range distance set the software will look for the feature once added in the External References.  Use "Add Corridor External Reference" to add the featurized drawn line work to the model.

- **Use:** To vary shoulder slopes, side slopes, ditch slopes, recoverable slope widths, graded shoulder widths, etc. Generally variables that cannot be controlled by line work. It is also used to set the pavement depths. We can also use it to turn off or 0 out layers or other things like recoverable slopes or shoulders. If your shoulders are defined with corridor references, but disappear near the ends of the project, you can use a parametric constraint to set the width to zero. With this option the template could be modified without actually editing the template.

## End Conditions Exceptions:

- **Use:** To force ditches or other local side slope/tie-in conditions that varies from the main template(s). Parametric constraints are recommended if the modification is simple (see above).

**Superelevation**

When creating super elevation shapes it is recommend to do the in the ***d######model*** file:

- Create Superelevation Sections works best if a single section is setup rather than a section per curve. The only advantage we have setting up multiple sections or per curve are that we can set different speeds per section. Setting a single section for the length of the project makes backing up and restoring the super input much easier. This also allows for the user to use the .csv input file to create or modify the super. To create a single section use minimum tangent length that is longer that the alignment. For example 10000 works for most projects.

- Create Superelevation Lanes there is a tool on the superelevation editor that will create the lanes based off of the template or you can set them up manually through the prompts.
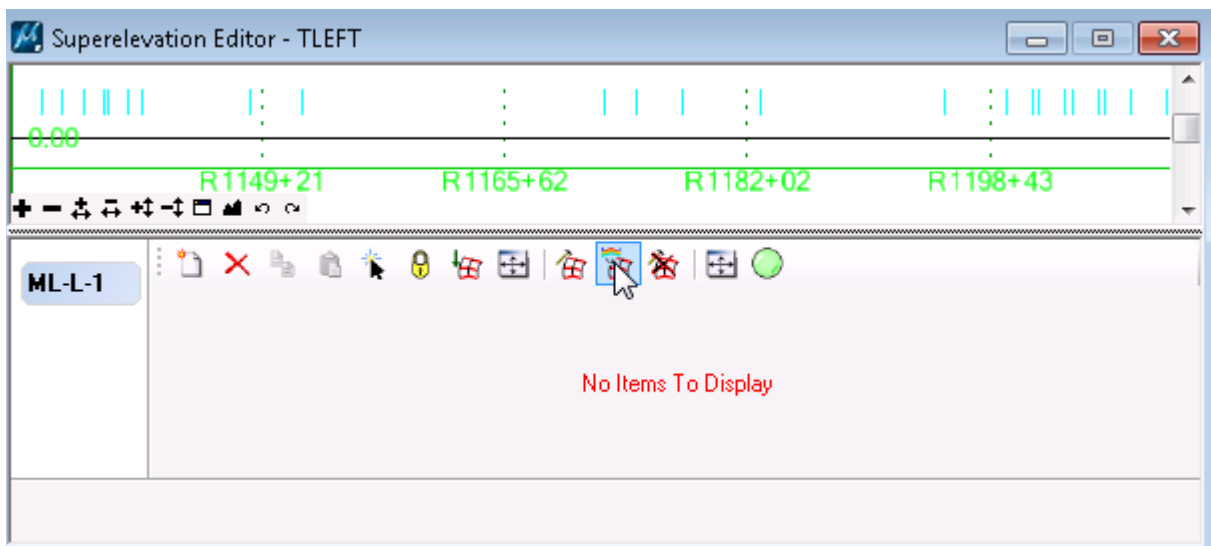


- Create Superelevation Shapes there are a couple of ways to accomplish this.

    o Calculate in OpenRoads

        ▪ Use Calculate Superelevation tool and pick the SEP file and choose the correct settings.

        ▪ Use Superelevation Editor to adjust as necessary

        ▪ Use the Superelevation Editor and modify items manually (Click the "Add New" button to add new super points

o Import from CSV file.

- This has several advantages over Calculate in OpenRoads:

  - Easier to modify than using the super elevation editor (especially for long alignments).
  - Using Calculate Superelevation will often not give you want you want, especially for compound and reverse curves and project termini transitions to existing
  - The super elevations are saved into a separate file that can be restored, even if the **d######model** file gets corrupted.

- It is recommended that a CSV file be created each alignment or super section in the corridor for backup.

- An initial CSV file can be created

  - Either: use the Calculate Super elevation tool, then use Super elevation Report and save the SuperelevationToCSV.xsl to a .CSV file and modify as desired in Microsoft Excel. Make sure you have the format options set to four places.

- Or: copy from another project if desired.

- If you are using the CSV file to edit the super. Once you have set it up to be what you want, you should stick to editing the CSV file, as it could get confusing trying to use the Superelevation Editor and the CSV file.

- When modifying your initial CSV file to be exactly what you want. **Make sure that the superelevation lanes match what you've created**.If it does not match you can change the name in the CSV file or you can use Element Info to rename the lanes. The LS and RS are the side that the lane is rotated around, not the side of the baseline it is on. The point type (FSIN, NC, etc) really does not matters other than clarity when reviewing. This is an example of the .csv file.

| | A | B | C | D | E | F | G |
|---|---|---|---|---|---|---|---|
| 1 | ML_L | 13+624.9422 R1 | -0.02 | RS | NC | L | 0 |
| 2 | ML_L | 13+650.9700 R1 | -0.02 | RS | NCIN | L | 0 |
| 3 | ML_L | 13+724.5170 R1 | 0 | RS | U | L | 0 |
| 4 | ML_L | 13+769.7600 R1 | 0.02 | RS | RCIN | L | 0 |
| 5 | ML_L | 13+862.5170 R1 | 0.0605 | RS | FSIN | L | 0 |
| 6 | ML_L | 13+884.6798 R1 | 0.0605 | RS | FSOUT | L | 0 |

- Use Import Superelevation to import your CSV file to your superelevation lanes. Open the Superelevation Editor. Select All or use (Ctrl+A) and hit the Delete button on the toolbar to clear all superelevation points. If you don't clear them out you will have conflicting points. Click the Import Superelevation Transitions button on the toolbar and select your CSV file. This will populate the Superelevation editor with your data.

o Apply the Superelevation to the Corridor

You might need to process the corridor, or even re-Assign the Superelevation to Corridor to get the new transitions to take effect if they do not automatically.

# Civil Cells Information

We have had user call with issues with placing the Civil Cells. Bentley has tested our Civil Cell and provided this table with the results. VDOT has Bentley working to fix the issues with the Civil Cells and to provide better instruction on the placement and modifications of them.

The following table shows the results of VDOT Civil Cell placement/editing testing meant to test stability of the cells.

| Category/Cell | Placement Valid | Edits Valid | Issues/Notes |
|---|---|---|---|
| Basic T | Yes | Yes | (1) All Cells |
| Right Turn Median onto Connection | Yes | Yes | |
| Right Turn Lane on ML | Yes | Yes | |
| Right Turn Median off Conn. | Yes | Yes | |
| Right Turn Lane on Mainline & Right Turn Median onto Connection | No | | Taper failed on testing geometry. All cells with Turn Lane onto Conn. seemed to fail. |
| Remainder of T's (with exception of Turn lane onto Conn.) | Yes | Yes | Didn't check all, but checked several and everything is holding up. |
| **ADA Ramps** | | | |
| ADA_A | No | | Partial failure on testing geometry |
| ADA_B | Not Tested | | |
| ADA_C | Not Tested | | |
| **Drives** | | | |
| VDOT Drive Rural | No | | Seam Line doesn't hold up. It would if it wasn't offset 0.5 from Drive CL. There is a parabolic profile on the EOP of Drive which isn't active but doesn't place well. |

| | | | |
|---|---|---|---|
| VDOT Drive Urban | No | | Didn't hold up on testing Geometry |
| **Median Openings** | | | |
| Xover | Yes | Yes | |
| Crossover | Yes | Yes | |
| Open End Median with Turn Lane | Yes | Yes | |
| Basic Median | Yes | Yes | |
| **Roundabouts** | | | |
| Circulatory-Large | Yes | Yes | |
| Approach Single Lane | Yes | Yes | |
| Other Roundabout Cells | Not Tested | | |

## <u>Intersection Modeling from Scratch (Surface Templates and Linear Templates)</u>

Some Civil Cells do not really work at this time as seen in the table above, but are basically composed of Surface Templates and Linear Templates. Below is a method to model an intersection from scratch using this method (not using Civil Cells). Three of the most common different types of intersections must be kept in mind to ensure they are modeled correctly: single plane (tabled) intersections, crowned intersections (with no modifications to the major road), and intersections with a right turn lane (on the major road). With a little creativity, the methods described below can be used to create more complex intersections, such as roundabouts. The basic approach is to define as much as you can with your corridors/template drops for design consistency, and use surface and linear templates to model warped areas.

## Complete Corridor Elements:

1. Create mainline (major road) corridor. Typically the major road should be designed with a standard typical section and the minor road will be warped (described below) to meet it. If the entire intersection is tabled (single plane) to provide free-flow design to the minor road as well, it is recommended that the mainline typical be constructed normally, but then superelevated (using superelevation shapes) to create this tabling, and the minor road warped (described below) to meet the tabled mainline. However, if there is not complete mainline reconstruction (the project is on the minor road and the major road is only a transition area of the project)) it may be better to model the entire intersection using a terrain model->surface template.

2. Create connection baseline.

3. Create connection profile. Use tools such as "Quick Profile from Surface" and "Profile Intersection Point" to get the location of your mainline EP and cross slope (CL to EP) to tie from. Profile must begin at or inside of the match line (the point at which the mainline will begin to warp; outside of the through lanes at least). See below for the match line creation.

4. Create connection corridor and/or line work. There are 3 main possibilities here:

   - Tie in at back of radius (or within the radius): no additional line work needed besides what is described in the next section.
   - Short connection: Create EP lines and set their profiles by using "Profile By Slope From Element" from the connection baseline, or else draw the EP profiles independently.
   - Long connection: Create line work, a corridor, template, template drop, etc, as you did for the mainline.

**Create Boundary and Profile Lines:**
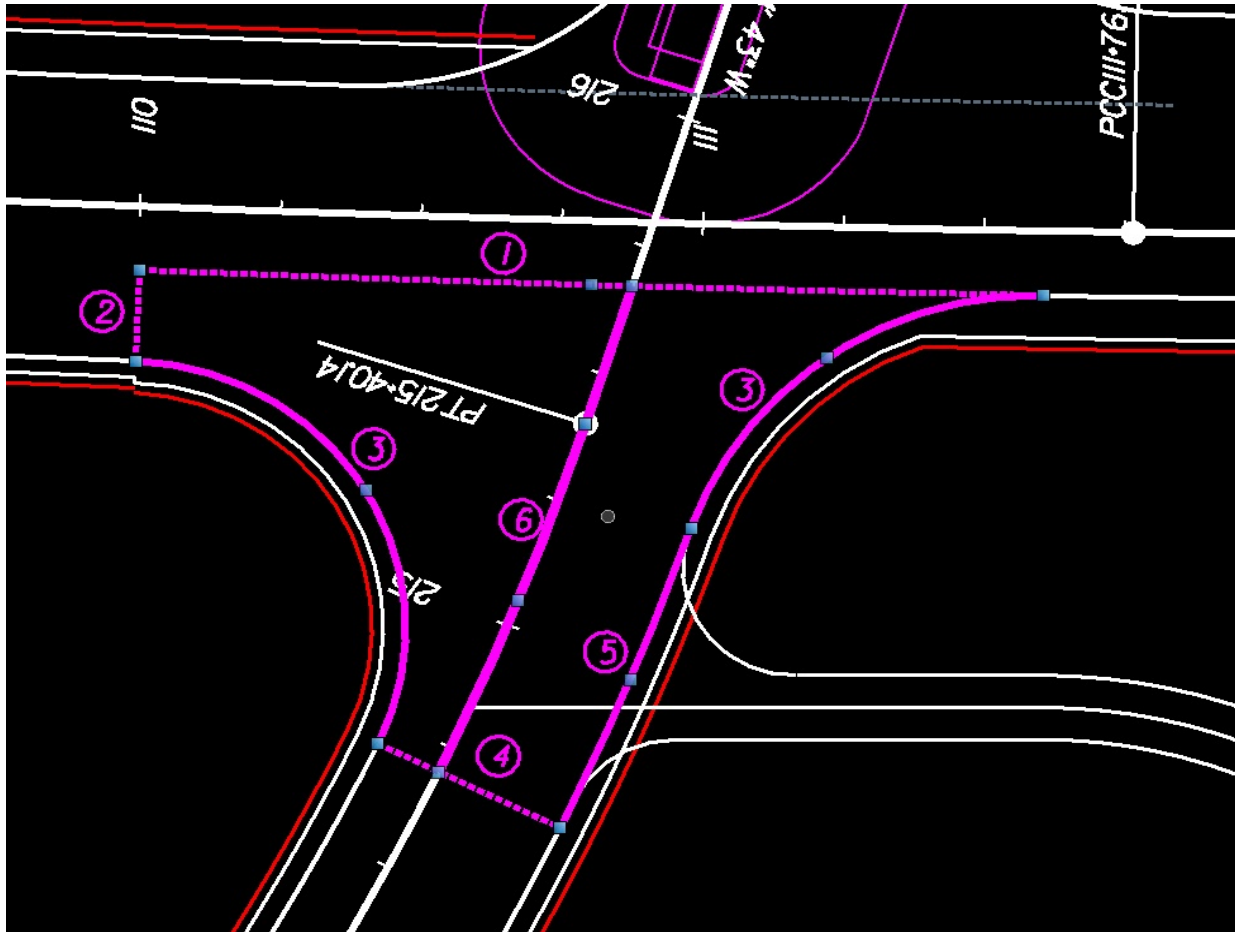


1.  **(1)** & **(2)** Matchlines on the major road:
    - Set Feature to Modeling-Seam_Line
    - In the above example, **(1)** is at the edge of the thru lane (offset from baseline), **(2)** is perpendicular across the end of the right turn lane at the radial return.
    - If **(1)** is drawn using "Single Offset Partial" from the baseline, it will be preserved if the baseline is modified (optional).
    - **(1)** will be drawn from radial return to radial return if there is no right turn lane, eliminating **(2)**.
    - **(2)** can also be pulled back further in the right turn lane, allowing the turn lane to be warped sooner as it approaches the intersection. This would require a **(5)** on the mainline.
    - **Profile:** Use "Quick Profile from Surface", selecting the mainline corridor as the surface. Set this as the active profile.
    - These matchlines are used as seam lines on the major road so that the major road corridor does not draw shoulder elements here (see cleanup below).

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2. **(4)** Matchline on the minor road:
   - Set Feature to Modeling-Seam_Line

   **Case 1: Tie to Connection Road Corridor**
   - Draw matchline **(4)** at the station (perpendicular to connection baseline) where you want to begin to warp for the intersection (at least back of radial return).
   - End your template drop on the connection at this station. The template drop may need to be slightly past this station to get a profile (next step). Zoom way in to see.
   - Generate profile using "Quick Profile from Surface", selecting the connection corridor, and set as active profile (same as **(1)** & **(2)** above).

   **Case 2: Tie to Existing**
   - Draw matchline **(4)** at your pavement tie point (end of construction). This does not really have to be perpendicular to the connection baseline.
   - Set existing ground (the Active Terrain Model) as the Active Profile.

3. **(6)** Connection Baseline:
   - Unfortunately, line **(6)** cannot be the actual connection baseline, but needs to be trimmed to just the intersection area (see figure above).
   - Use Single Offset Partial to copy the connection baseline. Set offset to zero, and snap to your matchlines **(1)** & **(4)** for your begin and end stations.
   - Use Project Profile to Element to project the connection baseline profile to the partial baseline you just created and set as the Active Profile.

4. **(3)** & **(5)** Radial Returns (EPs in intersection):
   - Radial returns (3) may be simple curves, compound curves, or tapered curves.
   - It may include linear sections (5) along the mainline (for warping when not adjacent to thru lanes) or along the connection (to avoid using a corridor, or tie into a corridor further down).
   - **Horizontal:**
     **Option 1:** Draw using traditional linework and featureize.
     **Option 2:** Use the Simple Arc, Taper Arc Taper, or 3 Center Arc tool to create the radial returns. This way, the returns will update automatically if the corridor changes.
     **Option 2B:** Use Arc to Element or Simple Arc to Element if the tie in is in the middle of the return.
   - Use "Complex by Elements" to add (3)s and (5)s to a single chain for each return.
   - Trim the mainline/connection EPs and roadside as necessary. Do not trim EPs for driveways.

- **Vertical:**
- If your return requires a curb return profile in the plans, make sure the horizontal and vertical are named properly for export to Geopak.
- You need to determine the tie elevations and grades at each end.

    **Method 1:** Use "Quick Profile from Surface". This will only work if your corridor has not been trimmed at all yet, and overlaps the radial section.
    **Method 2 (best):** Use "Profile By Slope from Element" from both baselines using the roadway cross slope. This should work very well unless you're in a super transition.
    **Method 3:** View the profiles of the immediate upstream and downstream EPs. Use Quick Profile from Surface from the corridor to get elevation and slope at your radial tie.
    If tying to existing ground, you can draw a temporary line beyond the tie and view its existing ground profile to get the slope of existing ground at the radial tie.
    **Method 4:** You can use the "Quick Profile Transition" tool, which will automatically tie. This usually does not give what you want, and does not work well if not set up well.

- Draw the proposed profile using normal means that ties smoothly at the ends with the right elevation and slope.
- You need to come off the tie slopes very slowly, since the radial return typically starts very close to the travelway (can get very steep easily).
    If Method 2 was used above (as recommended) you use can follow the baseline as long as possible to create a smooth transition.
- Vertical curves should be used, but only need to meet a low speed (15-25 mph). K= 3-12 for crests and K= 5-14 for sags, or less if very low volume (private).
- Of course, make sure to set your proposed profile as the active profile, once drawn.

## Create Surface Template:

The next step is to actually create the intersection pavement. Make sure you have all the required elements (see above). You need lines that define the horizontal and vertical (make sure there is an active profile) for the entire boundary of your warped intersection area. You will also want a crown line (**(6)** above) to warp out the crown smoothly and ensure that your through movement will be modeled as profiled.

1. In your project's template library, create a copy of a pavement structure template (like Asphalt Concrete w/ Aggr. Base - 1 Ln) and modify as necessary.
2. Use Terrain Model->Create from Elements. Set Feature Type to Boundary, Edge Method to None, Feature Definition to (Surface-Boundary?) and give it a logical name. Select all boundary elements (**(1)**, **(2)**, **(3)**, **(4)**, **(5)**) to create the terrain model.
3. Use Terrain Model->Add Features. Set Feature Type to Break Line and select the trimmed piece of connection centerline **(6)**.
4. In 3D Geometry, use the Apply Surface Template tool. Select the Terrain Model just created and choose No for "Apply External Clip Boundary". Choose the template just created.

5. Check that your pavement is modeled correctly. Look at the 3D view to verify triangles, and check the Dynamic Cross Sections.

Note that multiple surface templates can be applied to a single intersection terrain model by applying an external clip boundary when creating the surface template. This will be necessary if the pavement design changes in the intersection area, or if there is overlay and full depth widening.

## Create Linear Template:

The final step is to create the roadside along the intersection EPs (shoulder, curb/gutter, sidewalk, ditch, tie slopes, etc).

1. Create the template for your roadside.
   - The easiest thing to do is to take your mainline, or connection template, copy it, and delete the pavement and one side.
   - Typically the roadside will transition along your radial return, from your mainline design to connection design.
   - This transition will require the use of point controls, corridor references, and/or parametric constraints. See other sections for template creation tips.
2. Use 3D Geometry->Apply Linear Template to select each radial return. Choose the applicable template from the template library, and a station range. Description is recommended.
3. Use parametric constraints to smoothly transition the side slopes, widths, etc. Otherwise there will be breaks in your cross sections.

## Trim and Clean Up:

Clip Connection (only applies if you have a Corridor for the connection)
   - Just the change the end station of the template drop to coincide with your connection matchline.

Clip Mainline
   - If your mainline matchline is set to the right level, add your matchline as a Corridor Reference.
   - If it is still not working correctly, check parent-child relationships in the template, and check that seam-seek points are working properly.

Check Geometry
   - Use the dynamic cross section viewer to make sure all ties are clean (no gaps or overlaps). If there are unnecessary elements showing (like terrain models) turn off or change levels.
   - You can even view cross sections along the radial returns to see how the slopes are tying it, etc.

Modify Parameters
   - Adjust the template in your template library for your intersection to change pavement depths. If there is overlay and widening, an additional template may be necessary.
   - Use parametric constraints, point controls, and/or corridor references to smoothly transition your radial return roadside

## Showing Existing Pavement

Before you create static cross sections, incorporate the existing pavement into your model if you want it to show up.

Add a component representing existing pavement to your proposed roadway template:

- In the Template Editor, open your roadway template.
- Go to Components>Overlay>Layers>Existing Pavement
- Drag this element to your centerline
- Set the existing ground lines as Point Controls for the EXPVT_T_EP_L and EXPVT_T_EP_R point

This method works as well as Geopak did at drawing existing pavement, which means it may get confused by intersections, parking lots, etc, unless you modify the EP lines used as point controls. In the end, it would usually require some manual adjustments to be correct everywhere.

# Static Cross Sections (Cross Section Sheets)

See here for changes to make in cross section preference options. To generate static cross sections:

**Create Stack:**

1. Create a cross section file. (d######xs or likewise)
2. Reference the d######des file (or other file with corridor model). If the existing ground is not showing up, you may need to make it a direct attachment, or change the nesting depth in the Seed2D-3D model, and/or set it as the active terrain model. Same considerations for existing pavement if set up as a surface template.
3. Use the "Create Cross Section" tool under Corridor Modeling. Recommend generating the stack file, then Geopak to create XS Sheets referencing the stack. Then, changes and adjustments to the sheets will be independent of the cross sections themselves.
4. Select "Geopak Stack" under preferences. Make sure to check the interval (25' or 50'). Change the offsets to be as small as possible (75' or 150') for best results. 500' will cause large gaps between sections in the sheets.
5. If you don't want gridlines on your stack XS, go to Controls>Grid to uncheck.
6. Check the Model Name under General. If the model already exists, it will add _1. (So you have to delete the model if you want to overwrite old cross sections).
7. Hit apply.

**Annotate:**

8. Use the "Annotate Cross Section" tool under Corridor Modeling. Select 5_Sc or 10_Sc under preferences.
9. Make sure the correct surface is selected. Apply.

**Draw Right of Way:**

10. Use the old Geopak-Proposed Cross Sections to draw ROW. Make sure the XS model is open in the XS file, and that the Pattern-By Station matches exactly the stack cells.

**Create Sheets:**

11. Use Geopak to create sheets referencing the stack file. Be sure to set the Element Search Criteria to include relevant named levels. Again, make sure the right model is open in the stack file. If cross sections are being drawn too few on a sheet, "Maximum Vertical Size" may need to be modified.

## Extracting a Single Cross Section

To draw a cross section at an intermediate station, as necessary or requested by others:

1. In the d######des file: "Create Key Station" to insert a key station at the desired location. This step is not necessary, but insures that the cross section will be accurate and will tie to the existing ground.

2. In the d######xs file: "Create Cross Sections" tool. Select alignment.

3. Select VDOT XS 5 or 10 under Preferences. Choose "Single Station" and enter value.

4. Change model name to something unique (include station perhaps).

5. Annotate the created cross section sheet.


## Construction Limits

Option 1: Explode cross section pavement shapes in stack file. Run geopak construction limits.

Option 2: Make a copy of the file with the Corridor Model in it. Explode the Corridor Model outline into line strings. Manually change the line styles of the former corridor outline into cuts and fills.

VDOT is working on setting up a feature option so that this will be drawn the construction limits in plan view correctly based off of the catch points in the template, at the same time a VBA is being written to place the cut and fill symbol correctly on the plans.


### Tips

- Keep in mind: It is difficult to copy alignments and profiles between files, and even more difficult (perhaps impossible) to preserve handles (design intent/adjustability).


## Troubleshooting and Tips

### Templates not behaving as expected

- If modifying the template library, **did you synchronize the template drop?**

- Are linear features added as External References?

- When using template points, make sure the Range for the Horizontal feature constraint (Edit Point) is far enough out to be detected.

- Seam line not working right? Make sure every component in the template has a parent.

## Stray lines out in space in Dynamic Cross sections

In the 2D-3D model view, turn off all extra references that are not needed in the cross sections/model.

## Context Sensitive Menu

In Microstation SS4, to turn off the sometimes annoying toolbar that pops up when you hover your mouse over something (called the "Context Sensitive Menu"):

- Go to Settings -> Snaps -> AccuSnap
- Under the General tab, uncheck "Pop-up Info"
- It shouldn't show up anymore

You can also turn it back on, or even change the delay here (defaults to ½ second).

## Fixing Incorrect Survey Reference Scales

If an attached survey file or other reference file is showing line styles and cells at the wrong scale:

- Turn off the "Use Active Annotation Scale" toggle for the Reference (see Reference Dialog)

- Go to the Settings for the Reference and set the Global Line Style Scale to Reference

## Station Increment on Dynamic Cross Section Viewer is Inconsistent/Random

When setting up with "Open Cross Section View" tool, select an alignment instead of a corridor. This allows you to set an increment. Otherwise, it will often increment to transition points, etc.

## Chain created in OpenRoads does not show up in Geopak

If a single line (between two points) is used as a baseline, it can still be stationed and profiled. However, it will not be imported to geopak as a chain. Use Complex by PI to create a chain between two points or else convert a Line to a Complex by using Complex by Element and make sure it is set to "Automatic". **If you already drew a profile, make sure the profile is set to "Active Profile", or it won't show up in the new Complex profile.** The copied profile might only be a shadow of its former self, so you may want to re-trace it.

## Profiles

- Don't delete an active profile without first making it inactive.
- If vertical curves will not export to geopak, check to make sure that they are parabolic, not circular.

## Seam Lines are Not Read

Check the template. Make sure seamseeks are there, and that elements are set to turn off when the seamseek variable is activated.

## Civil Tools Taskbar Missing

From the VDOT Taskbar: Click the drop arrow to the right of "VDOT Tools", Select Civil Tools, Right click and Open Civil Tools in new Dialog. Go back to VDOT tools on the original Task pane.

## VDOT Frequently Asked Questions

**Question:** Why did VDOT choose not to use the auto annotate option in the alignment feature?

**Answer:** When turning on auto annotate option, you must also turn on auto update. After looking at this option, it was a consensus that this option had draw backs. If the items get deleted then they are deleted from the (GPK) database without prompting the user. As it is now this allows for users to create multiple alignments and profiles then decide which ones get sent to the (GPK). Also the (GPK) can be used as a backup tool and alignment and profiles can be restored in a file or used in other models.

**Question:** How do I annotate my alignments?

**Answer:** For OpenRoads, plans production is done by exporting the alignments to the native geometry database (GPK) and using the D&C manager to annotate the alignments. This is the same method VDOT has been using.

**Question:** How do I annotate my profiles?

**Answer:** For OpenRoads, plans production is done by exporting the profiles to the native geometry database (GPK) and using the annotation and sheeting tools available in the native toolset. This is the same method VDOT has been using.

**Question:** How I place sheet numbers and project numbers on cross section sheets produced by open roads?

**Answer:** After creating the sheets use these command to array the project number and place the sheet number at an increment. The 100 is the number of sheets that is a generic default number. If there are 25 sheets, this number would be 25.

Project Numbers

Array Text: Use this key in command for 10 Scale (Point Distance=230.0,90|100)

Array Text: Use this key in command for 5 Scale (Point Distance=115.0,90|100)

If a point increment box appears in Microstation, set that to **0.**

Sheet Numbers

Copy increment: Use this key in command (increment text;%d;Point Distance=230.0,90|100)

Copy increment: Use this key in command (increment text;%d;Point Distance=115.0,90|100)

Please note a point increment box appears in Microstation, set that to **1.**

**Question:** How do you generate a stack of cross section in OpenRoads that can be used in the old version of Geopak?

**Answer:** Use the create cross section option under the Corridor Modeling task menu. Choose preferences and pick the option for Geopak Stack.

**Question:** What's the best or easiest way to take the cross section from the model to another file?

**Answer:** In the cross section model use the place fence command then choose the option to Copy/Move contents to another file. Use the default settings of clip and copy to create the new file with the cross sections in it.