

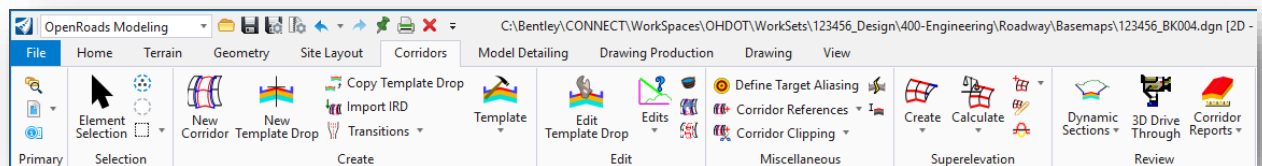


OpenRoads Designer Corridor Modeling Overview

Overview

OpenRoads Designer provides several corridor modeling and site design tools to facilitate generating 3D representations of a new roadway or other type of surface. Designers work primarily in 2D files. The OpenRoads tools automatically generate the 3D model.

Tools for the design, creation, modification, management, and report functions are provided. The tools are accessed by choosing the Corridors tab as shown below.



Reference files are used to federate the data on a typical design project. Very small projects may have much of the data in a few files while larger projects will use multiple files for the geometry, terrain, superelevation, etc., and the 3D model. All these files can reference one another to present a complete model of the project.

Each road within the project is used to define a 3D corridor model representing the proposed design. A corridor consists of an alignment, profile, and a template defining the initial roadway typical section. Multiple templates may be applied within a corridor to better define the roadway. Additionally, transitions and other modifications to the template can be defined using various modification tools. As changes are made, the 3D corridor model is automatically updated.

Corridor Modeling Workflow

The workflow for corridor modeling is summarized below.

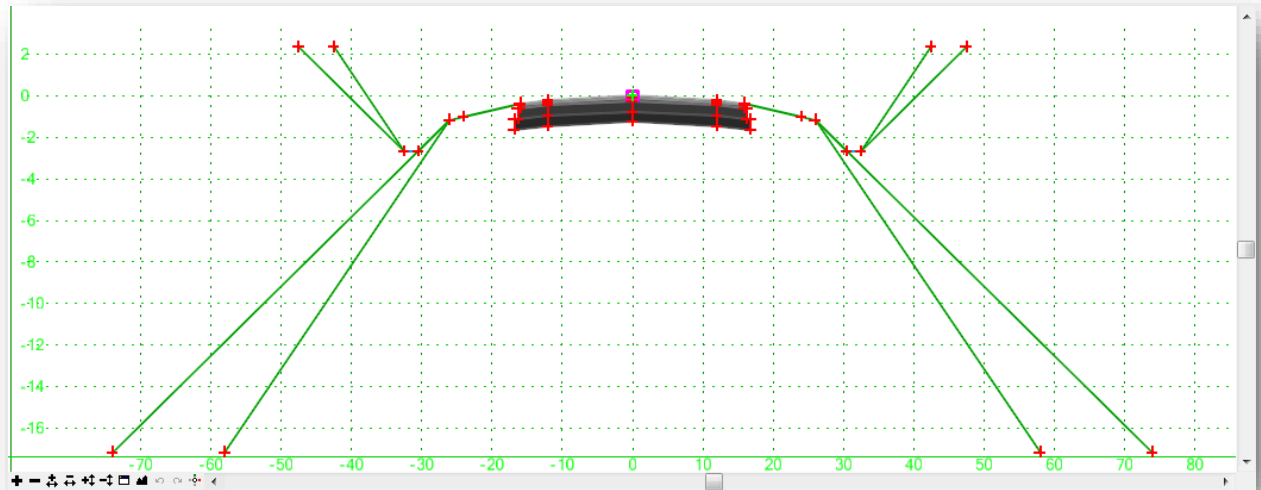
1. Create Civil horizontal and vertical geometry element(s)
2. Create a DGN file for the corridor model
3. Attach references for the existing ground terrain and the alignment data
4. Define templates for the project
5. Set the active terrain (existing ground) if the template ties to ground
6. Create a corridor based on the horizontal and vertical elements
7. Add template drop(s)
8. Add horizontal and/or vertical controls for template points (optional)
9. Define any transitions and connections
10. Associate superelevation information



11. Review the results and adjust as necessary using additional controls, such as end condition exceptions, secondary alignments, parametric constraints, or target aliasing
12. Continue the process/review/modify

Templates

In simple terms, the template is a “smart” typical section that you “push” along an alignment to create the proposed 3D model. An example of a template for a 2-Lane undivided highway, with cut and fill slope options, is shown below.



Templates are stored in a template library (*.itl).

Templates are defined by inserting **Points**, **Components**, and **End Conditions**. A component is a set of points that define an open or closed shape. There is no limit to the number of points or components in a template.

ODOT Template Library

ODOT provides a sample template library in the following folder:

```
..\Standards\Template Library\OHDOT_Templates.itl
```

The templates contained in the ODOT library can be used as a starting point to define templates for specific projects. Many of the templates represent individual components that can be combined to generate the full template for a specific typical section design. For example, a template representing a lane of pavement can be combined with another template representing curb and gutter.

The templates for each project are stored in their own project specific template library. When a new project is created in ProjectWise using the ODOT Project Creation application, the ODOT template library is copied into the **990-WorkSet Standards\Template Library** folder for the project and renamed as follows:

```
#####_Templates.itl
```

Where ##### = the 6-digit PID number for the project.



The template library is specified in the .cfg file for the WorkSet by the MicroStation configuration variable listed below:

**CIVIL_ROADWAY_TEMPLATE_LIBRARY = \$(_USTN_WORKSETSTANDARDS)Template
Library/\$(OHDOT_PID)_Templates.itl**

Template creation is a key component to the Corridor Modeling process.



Corridors

Corridor Modeling Basemap Design Files

For ODOT projects, the 3D model is generated in a “KM” basemap design file. For smaller projects with only one alignment, it is acceptable to generate the entire model in one KM design file. For projects with more than one alignment, it is recommended that users take a federated approach to store each corridor model in its own KM design file.

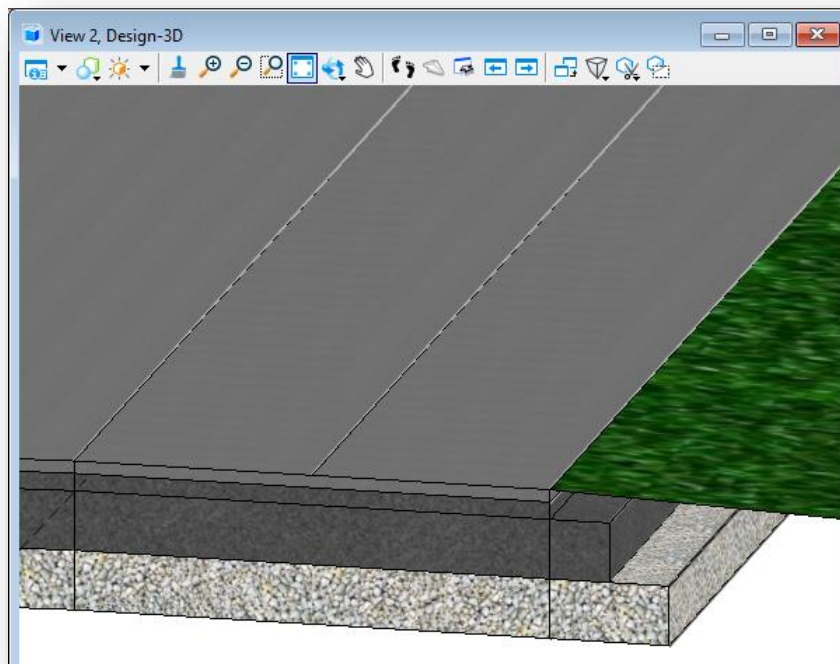
For projects with lengthy alignments, it may be desirable to create multiple KM files for a single alignment. When a corridor is defined, beginning and ending stations are specified. Using this workflow, multiple corridor design files are referenced together.

The **OHDOT Create Design Files** application is used to create the KM design files for the project.

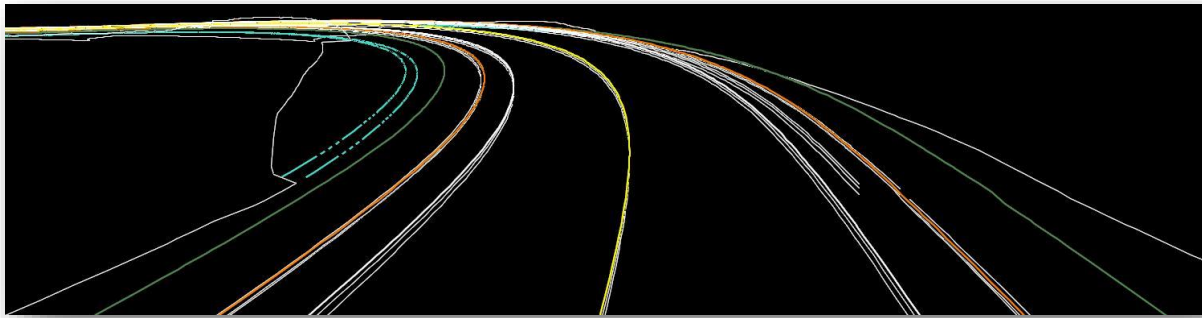
Corridor Model 3D Graphics

When a corridor is processed, the 3D model is generated in a separate MicroStation model named “Design-3D”. The corridor graphics consist of 3D line strings and 3D surfaces for each design component.

The example below shows a portion of the pavement for a corridor with the individual pavement layers that were generated for the 3D model as well as a portion of the side slope.



When the template is processed, the template points are connected between template “drop” locations to form the longitudinal break lines that are used to create the proposed surface. An example of the longitudinal break lines plotted from a 3-dimensional design surface is shown below.

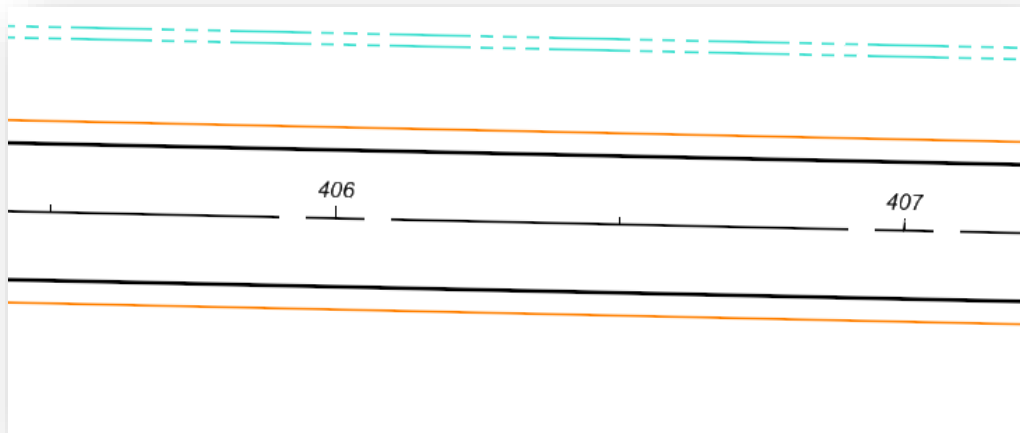


Only the top template points are used to create the proposed surface mesh. Points below the surface are excluded from the proposed design surface.

The sub-surfaces can be included in the proposed cross sections as “components” or alternate surfaces. These components can be used for volume calculations.

Corridor 2D Graphics

In addition to the 3D graphics, the corridor modeling process draws 2D plan view graphics. These graphics can be used to generate the plan sheets for the project. An example of the 2D plan-view graphics drawn as part of the corridor modeling process for the pavement, shoulders, and a ditch, is shown below.





OpenRoads Software Version

This document was prepared using the following software version:

OpenRoads Designer CONNECT Edition – 2021 Release 1 Update 10 – Version 10.10.01.03

Contacts

For any questions, suggestions, or problems with this document please contact the ODOT Office of CADD and Mapping Services by use of the following form on the ODOT website:

https://odot.formstack.com/forms/cadd_servicerequest
