CREATING GEOLOGY TERRAIN(S)

Leapfrog to OpenRoads Designer

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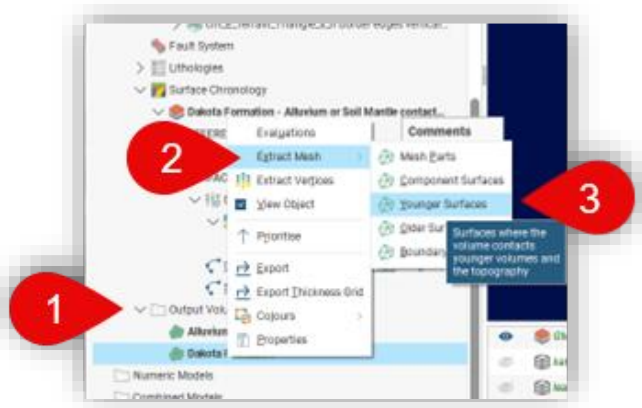
Table of Contents

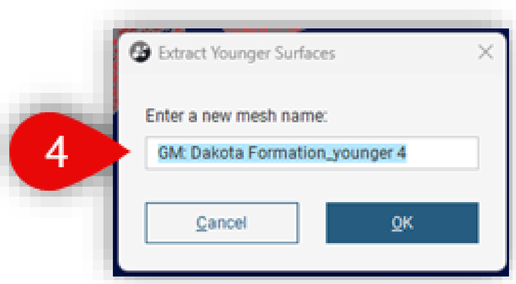
Leapfrog Export

Extract Mesh from Leapfrog Output Volumes

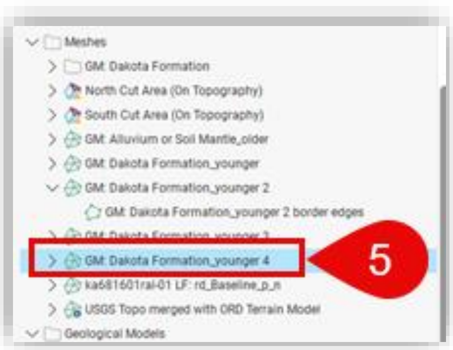
1. Locate Output Volumes section in the left menu tree.
    a. Right click on the oldest layer first, working your way to the youngest layer.
        i. Exclude Alluvium layer.
2. Select Extract Mesh
3. Then select Younger Surfaces



4. In the Extract Younger Surfaces dialog box, Name the layer for the mesh creation

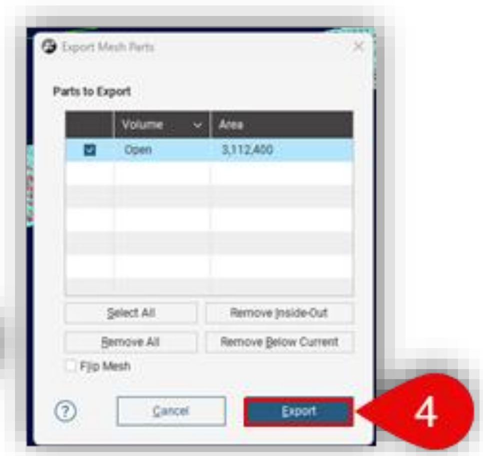


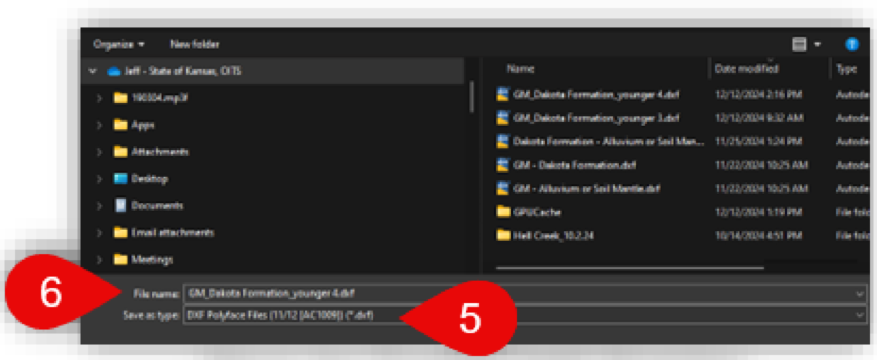
5. The new mesh will now appear in your Meshes menu



Export Mesh to DXF File

1. Navigate to Meshes in the Project Tree on the left
2. Right click on the new mesh name
3. Select Export
4. Click the Export Button
5. In the Save dialog box, choose type as "DXF Polyline"
   a. NOTE: There are two DXF file options. Pick the DXF Polyline option.
6. Name the file for the Geologic layer you are extracting and click Save
   a. IE) Dakota Formation Younger





Save As Type = DXF Polyline

- **IMPORTANT** – If working inside ProjectWise, these DXF files should be added to the Project folder in ProjectWise. The source files used to generate terrains is tied to the terrain and having them inside ProjectWise makes it easy to regenerate the terrain, if needed.

OpenRoads Designer Import

Create New DGN using 3D Seed File

- Create new DGN via Advanced Wizard and select the appropriate 3D workspace seed file.
  - 3D seed files are used for the creation of Terrains.
- The recommended name for this geology terrain is:
  - kaXXXXXXgtm.dgn
- Assign the Geographic Coordinate System

Geology Terrain (gtm) Best Practice

Because Terrains generally use the same level, it is recommended that each terrain reside in its own model or DGN. This is so if a terrain layer need turned off, it can be done by reference and not level.

- Multiple Terrrains should not be created in one model.
  - If all terrains are in the same model and on the same level, turning that level off will turn all terrains off.

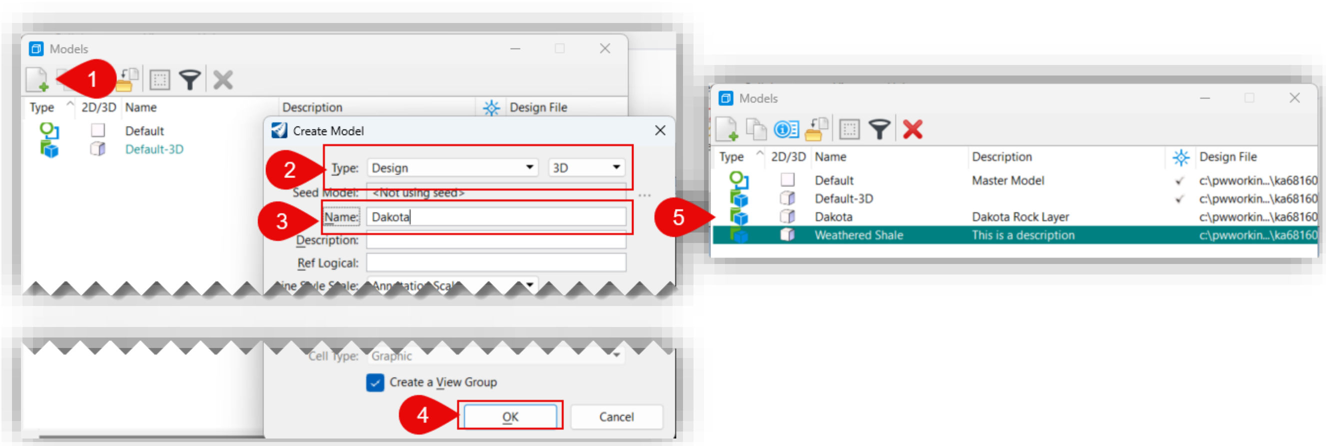
There are two options when the project has multiple stratification layers. With either method, the rock layer name should be in the description field for ease of identifying which file or model holds which rock layer.

NOTE: Whichever method is chosen, communication with the Road Design Staff is critical so they will know if they are referencing multiple GTM files or one with multiple models that will need to be selected during the attach reference process.

Option 1 – One GTM File – Multiple Models

This option involves creating one GTM file and within that GTM, create a new 3D model for each terrain/layer.

1. Open the models dialog and click the Create Model button (paper with green plus)
2. In the Create Model dialog, change type to Design and 3D
3. Input Name (Rock Layer) and description (pertinent information) for model
4. Hit OK
5. Continue adding models until all Rock Layers have a model



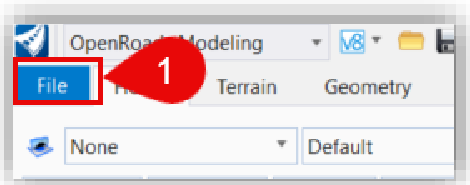
Option 2 – Multiple GTM Files – One for each Rock Layer

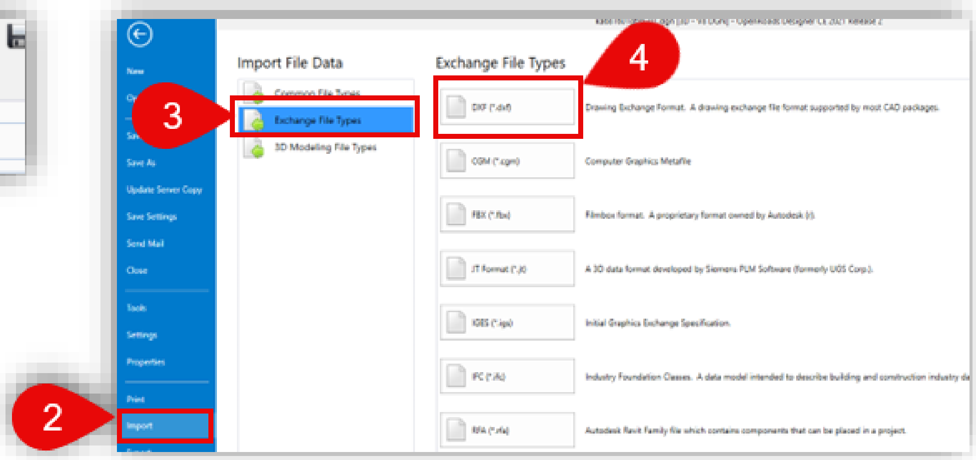
- Create a GTM file for each terrain/layer
    a. If choosing to create multiple GTM files, they should be incremented
        IE) If there are 5 rock layers, you would have GTM-01, GTM-02, … GTM-05

Import Mesh (Leapfrog DXF file) into OpenRoads

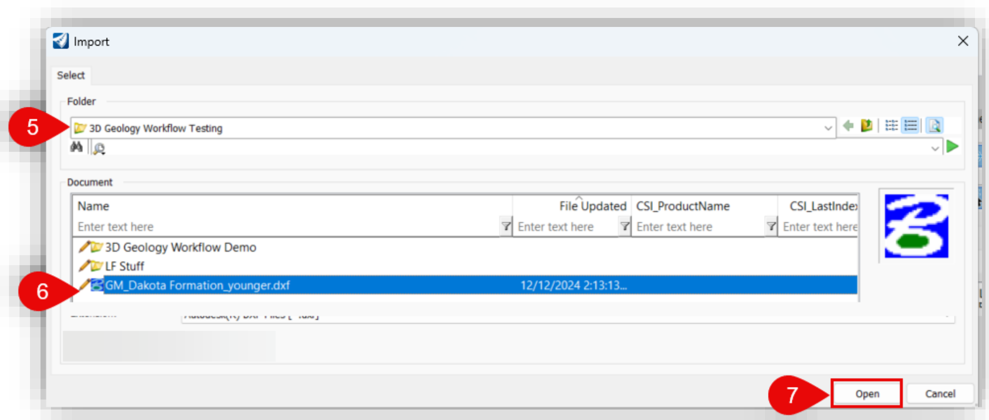
This process will be used for each rock layer that needs to be converted to a terrain whether it's in its own DGN or its own model.

1. In the GTM, go to the backstage using the File tab in any workflow.
2. Select Import
3. Select Exchange File Types
4. Select DXF (.dxf)





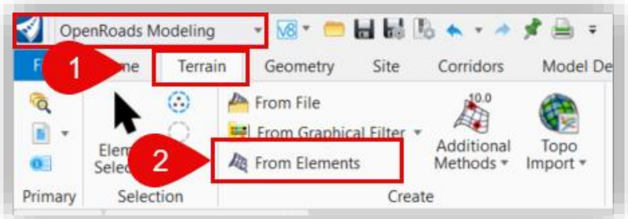
5. In the pop-up dialog box, navigate to the location of the DXF that was exported from Leapfrog
    a. ProjectWise users should have added this to the project folder.
6. Select the dxf file
7. Click Open

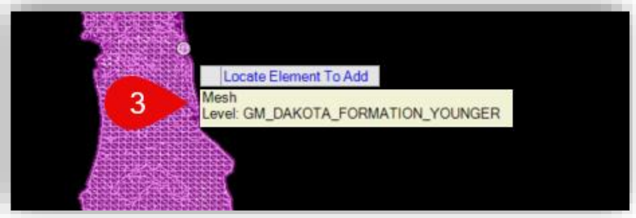


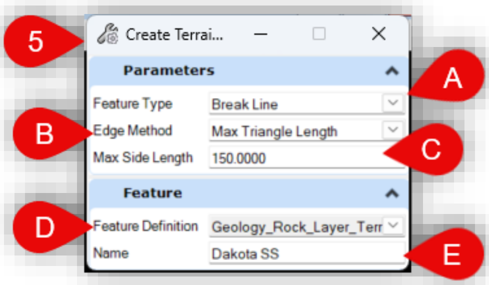
Create Terrain from Mesh

Now that we have the mesh imported into OpenRoads, we can create a terrain from elements.

1. In the OpenRoads Modeling Workflow→Select the Terrain Tab
2. Select From Elements
3. Select the Mesh
4. Right Click to reset
5. In the Create terrain Model by Elements dialog set the following:
    a. Feature Type = **Break Line**
    b. Edge Method = **Max Triangle Length**
    c. Max Side Length = **150.00**
    d. Feature Definition = **Geology_Rock_Layer_Terrain**
    e. Name should be the rock layer name

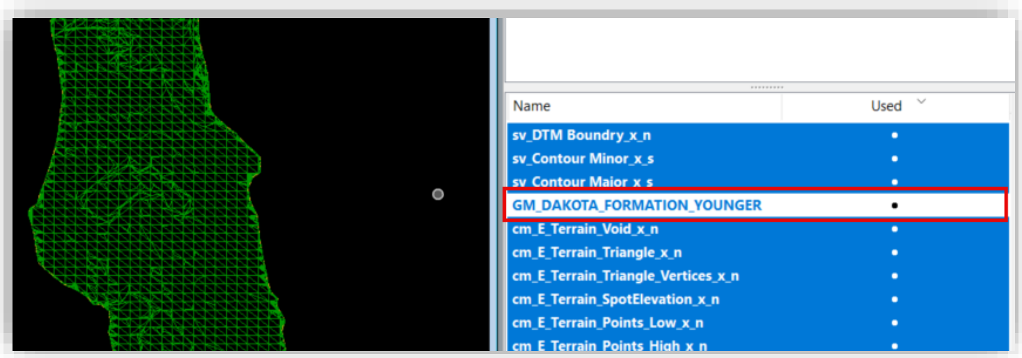






Optional – Turn off Mesh level

Leapfrog generates a new level name for the mesh that matches the rock layer name. At the moment, that level can be turned off, then save settings.

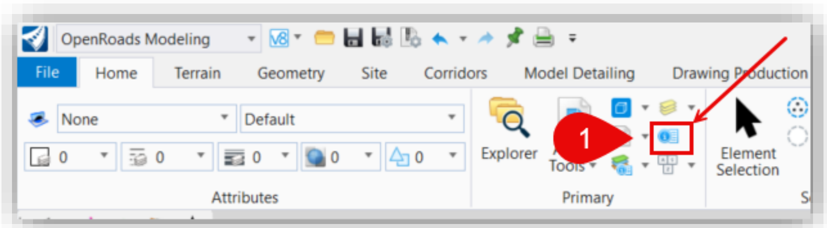


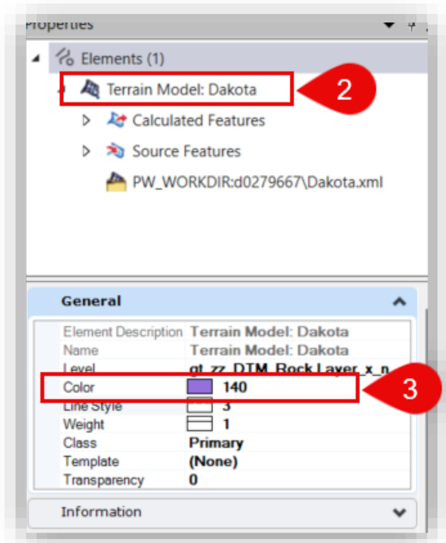
Change Color For Each Additional Terrain

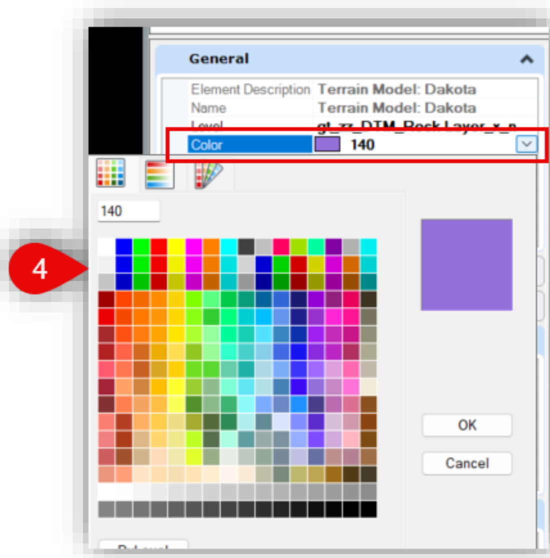
When working with multiple rock layers, it is recommended that the color of each terrain be different so when viewing them in the DGN, each layer can be visually identified in cross sections. KDOT CADD Support has identified colors that are easily viewed in all design, drawing, and sheet models.

Steps to change the color:

1. After initial creation of the terrain, select the terrain and open properties
2. In the properties dialog, verify the element shows "Terrain Model: XXXX"
3. Locate the color in the General section, click on the line, then use the drop down arrow to open the color table
4. Select new color
    a. It is recommended to use the colors in order so they are easily identified from the prior rock layer
    b. There are 9 colors listed including the default color. Any additional layers over 9 should start over in the list beginning with the default color.







The following colors should be used for visibility in the DGN design, drawing, and sheet models.
Default Color = 140
23 (teal)
#51 (orange)
#153 (pastel blue)
#112 (peach)
#124 (purple)
#72 (teal)
#83 (orange)
#187 (dark pastel blue)

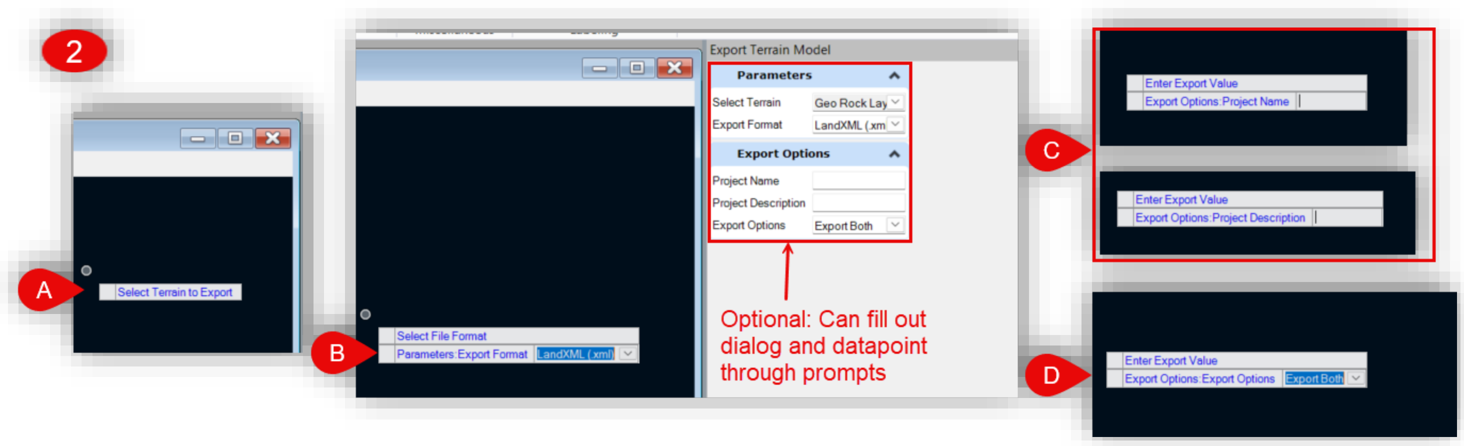
Then repeat starting with default color 140

Export Terrain to XML

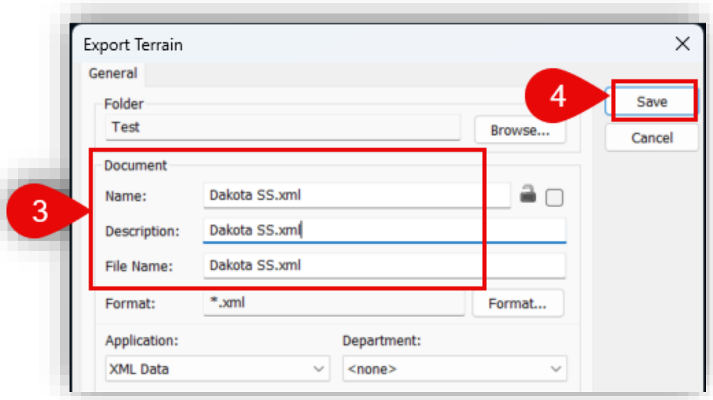
Now that the terrain has been created, it should be exported as an XML. This is done so that the terrain can be recreated, as needed. Do this for each terrain created.

Here are the steps to export the terrain to an XML:

1. Navigate to the OpenRoads Modeling Workflow→Terrain Tab→Miscellaneous Section and click "Export to File"
2. Following the prompts (This information can also be populated in the Export Terrain Model Dialog, then datapoint through the prompts).
    a. Select the Terrain
    b. Select the File Format (LandXML) and datapoint
    c. Datapoint to skip Project Name and Project Description
    d. Select Export Options (Both is fine)



3. In the save dialog, name the XML the rock layer being represented
4. Click Save
5. Check-In the file when prompted (if applicable)



Now that the terrain has been created and an XML has been generated, the annotation corridor can be created.

➢ See [KDOT Geology - Annotation Corridor for Geologic Layers in XS - Workflow]