CONNECT DOCUMENTATION

Connect Edition Introduction

MicroStation Connect Documentation

OpenRoads Designer Documentation (Survey)

OpenRoads Designer Documentation (Design)

Appendices

OpenRoads Designer

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OpenRoads Design – Contours

P-6-7: Contour Creation (CTR and PCN) for plans from Terrain

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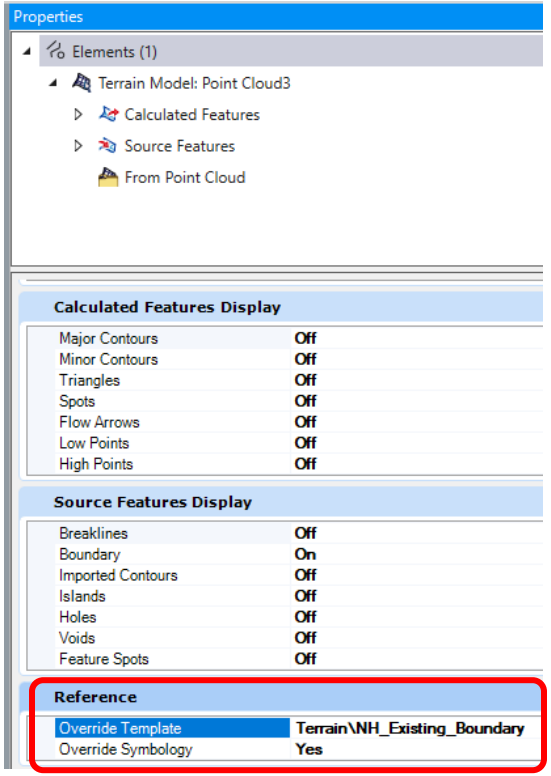
Introduction Whole - Video – P-6-7 CTR Creation

Contours can be extracted from a Scalable Terrain Model (STM) or a Terrain Model (TM). A STM can also be used to create HEC–RAS sections. The STM can be created from several different sources including files, points, breaklines or ORD Terrain Models. These combined STM can be exported to a TM, Contours Extracted or saved for future use.

https://communities.bentley.com/products/3d_imaging_and_point_cloud_software/w/wiki/10678/extract-contours

https://nhgov.sharepoint.com/:v:/r/sites/DOT-ProjectCentral-Home/CADD%20Document%20Library/nh-ord-microstation-contour-from-terrain.mp4?csf=1&web=1&e=AbbZ6d

Annotation scale issues with Major contour text means if you want them to look correct you need to save them as separate models based on the scale you want to show them. The gaps for the text are not scalable with annotation scale as changes to the text is.



Boundary for Clipping Terrain or Contours Video – Create STM.dgn and Boundary

A boundary needs to be created from the terrain model to clip the contours. When generated they become unclipped.

Create\Open *12345-E-STM.dgn* (existing) or *12345-P-STM.dgn* (proposed) in the \PRJ directory using the 3D Design seed file.

Attach the E-Terrain model's *Default-3D* model. Make sure the view is set to *Top* rotation and *Fit View* so the entire terrain is visible.

Select the terrain model. In *Element Properties*, change the display to only show the terrain's boundary by having all feature display settings to **Off** except the *Boundary* setting. It may be necessary to set the *Override Symbology* property to **Yes**.

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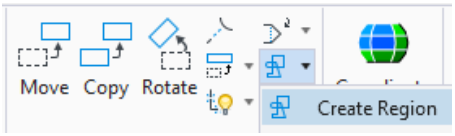
Set the level to *BDR-Clip-Boundary*. Make sure color, linestyle and weight are set to *ByLevel*.

Level Display – Shut off all levels except *BDR-Clip-Boundary*.

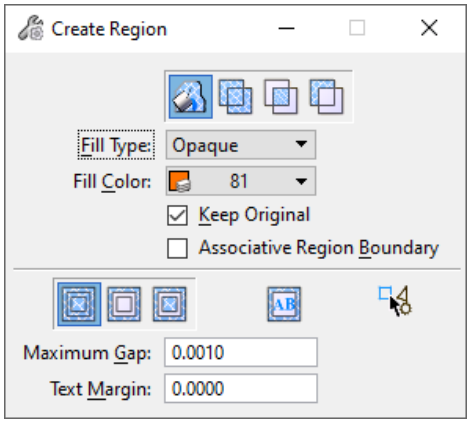
Select the *Create Region* tool. Set the method to **Flood** (left button in top row) and *Fill Type* to **Opaque**.



Click inside the terrain boundary and **Accept** the selection.

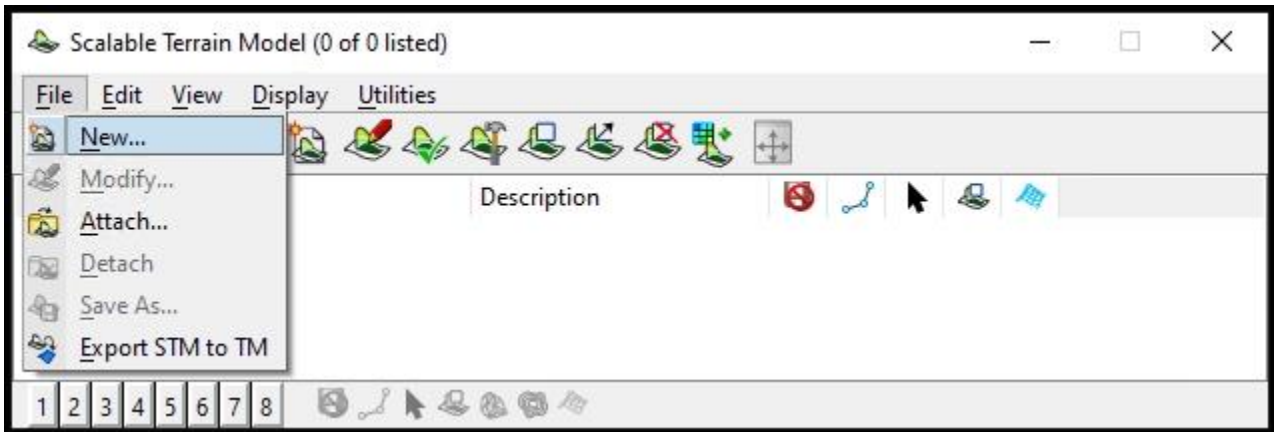
Turn on all levels

The closed shape can be selected and the fill turned off leaving only the Shapes out line on.



Create a Scalable Terrain Model including an ORD Terrain Model [Video – Create STM and Coutours]

Continuing in the *12345-E(P)-STM.dgn* the drawing should be opened into its *Default-3D* model. Attach the terrain dgn's *Default-3D* model. Switch the workflow to **Reality Modeling** > **Attach** tab and select the **Scalable Terrain Model** tool in the bottom right of the *Scalable Terrain Model* pane.



Select **File** > **New**… and name the STM with the name. **12345-E(P)-STM.stm**

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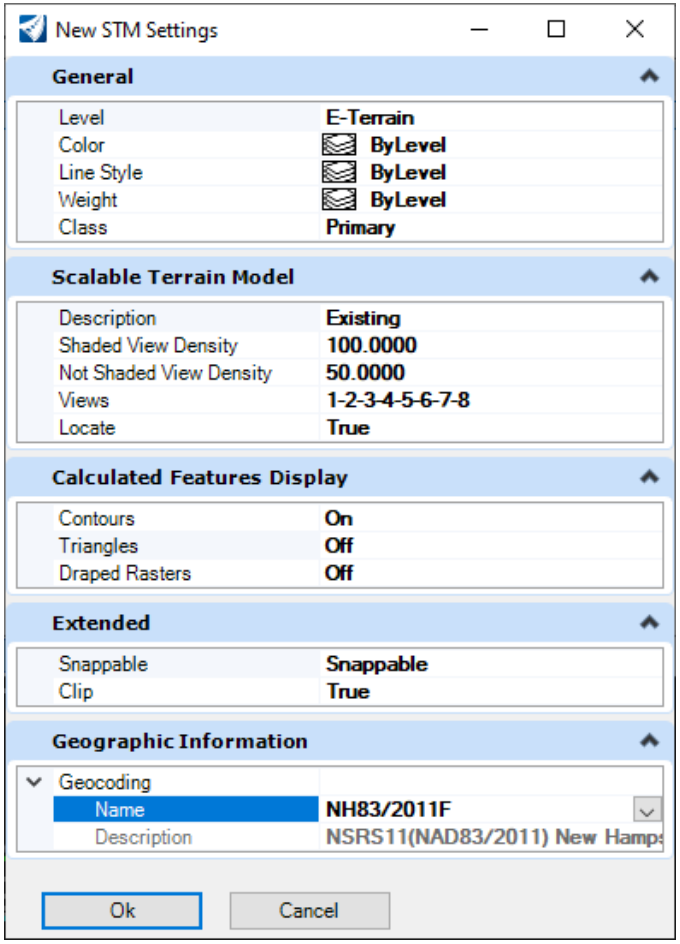
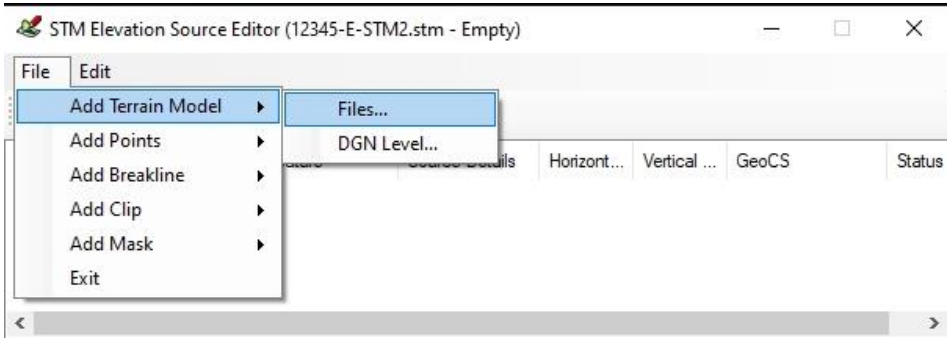
The *New STM Settings* box will be displayed. Set the Level, add a Description, contours-on, triangles-off and set the geographic coordinate system. Click **OK**. This will create the STM.



Next the Terrain model needs to be attached as an elevations source in the STM. Use *File* > *Modify* to Open the *STM Elevation Source Editor*. In the Editor use **File** > **Add Terrain Model** > **DGN Level…** Select the terrain model reference and the **E-Terrain** level then click **Select**. The Terrain will be added to the STM but not visible. This allows you to add additional terrains or other features to the STM if needed.

Use **Edit** > **Generate** or click the **Generate** icon to display the generated STM.

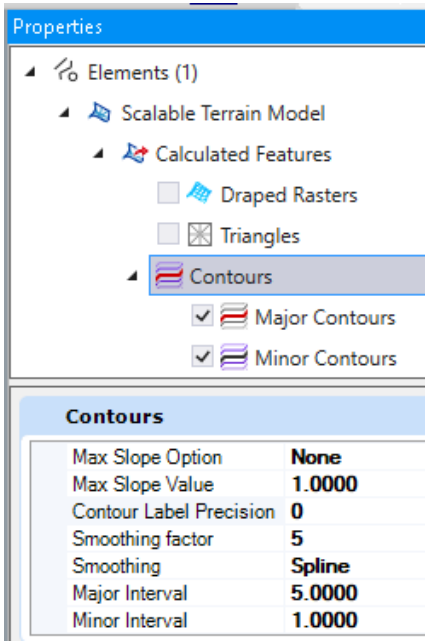
Close the *STM Elevation Source Editor*.

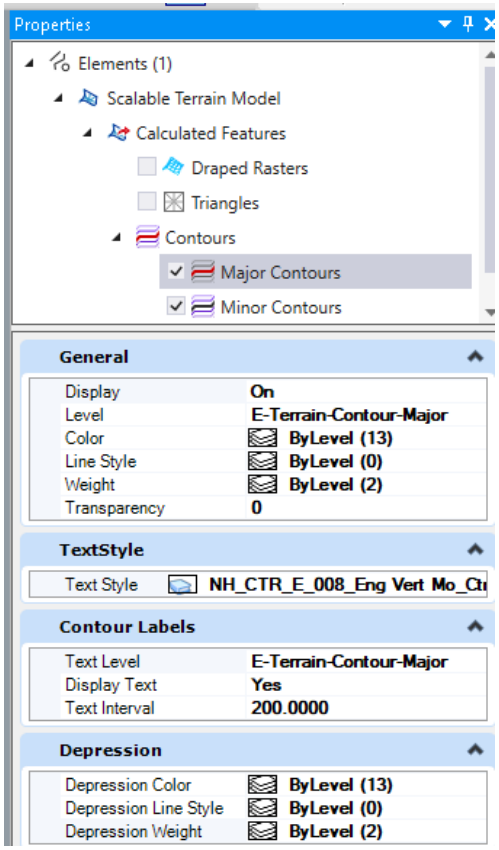


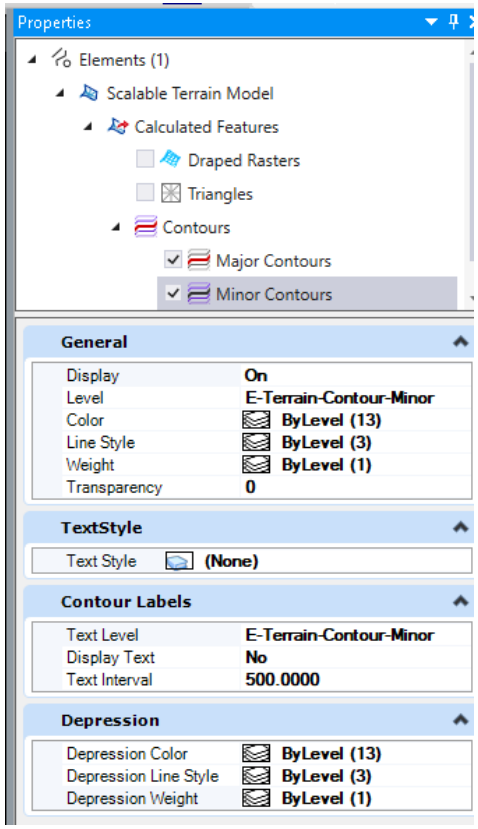
Create the Contours and Update the Symbology

Use *Element Selector* to select the STM. In the *Properties* box expand the *Scalable Terrain Model's* Calculated Features and select *Contours*. Change the contour interval as desired and set the precision to **0**. For existing contours set the smoothing to **Vertex - Smoothing factor 10** , for proposed set it to **none**. To remove the **'** symbol from the contours use *File* > *Settings* > *File* > *Working Units.* Click **Custom** to delete the Labels and save settings.

Expand the Contours dropdown and set the properties of the Major and Minor Contours as shown below. (P- for proposed) Use *ByLevel* settings and set *Text Interval* as needed. SET the Annotation Scale!







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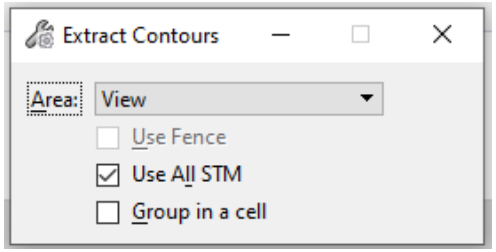
Fit view to ensure the whole terrain is displayed and In the *Scalable Terrain Model* box, select **Edit** > **Extract Contours**. The *Extract Contour* tool will display. Use the Area drop down to select mode **View**. Uncheck the *Group in a cell* box. Select the view to extract the contours.

NOTE: There seems to be an issue that no contours are generated if the **Element** option is used, so the clipping will need to be done when copying the contours into the ctr or pcn file. If generating clipped contours does work using an **Element**, do that and just copy the contours below with no fence.



Open the ctr.dgn in a Separate Session Video - Copy Contours to CTR.dgn

This file should have only a *Default-3D* model to start. Reference attach the STM.dgn's *Default-3D* model. Create a Fence from Element and select the Boundary created. Copy Fence Contents using the *Clip* option to copy the contours into the ctr dgn. Text justification of the labels may need to be changed. Use element selector and select all text in the drawing then use the *Change Text* attributes tool to change the justification only to *Right Top* or change the justification in the *Properties* box.

In the Models box Copy the *Default-3D* model and name it appropriately for the contours it contains, this will open that model. Detach the STM reference file and delete the Clip boundary. Reopen the *Default-3D* model and delete the contours. Save.

Open STM file and update for different Scale and or Different Intervals Video – Create Others

Delete only the contours leaving the clip boundary and the stm.

Change the Annotation scale to **1"=20'** or what is needed and Fit View.

If needed select the STM and update the major/minor increments.

From the STM toolbox select **Edit** > **Extract Contours** > **View**. and *Accept.*

Select all Text elements and change them to top right justification.

Save Settings and Save the DGN.

Return to the CTR dgn update the model then copy for next iteration – Repeat

In the ctr dgn open the *Default-3D* model. Delete any contours.

Open the reference file dialog box and reload the STM reference file to show the latest contours.

Change the Annotation scale to match the new contour's setting **1"=20'** and fit View.

Create a Fence from Element and select the Boundary created.

Copy Fence Contents Clip inside to copy the contours into the ctr dgn

If needed Select all Text elements and change them to top right justification.

Save Settings and Save the DGN.

Different models to create, ctr-50 1 foot minor, ctr-20 1 foot minor, ctr-50 2 foot minor, ctr-20 2 foot minor

FINISHING

When done creating the different models in the ctr dgn open the *Default-3D* model and fit view. Shut off the display of the STM and Delete every thing from the model. Use the *Place Text* command to place a large note "SELECT THE CORRECT MODEL TO DISPLAY THE CONTOURS" in the center of the view. Select the text and scale it up 50 times its size. This text will be seen when the file is attached as a reference letting users know that they need to open the reference file dialog box and select the appropriate model to display for the scale and needs of the plans it is being referenced into.

Save Settings, Save and close the ctr dgn

In the STM dgn Use the *Scalable Terrain* tool and save the STM file. Can delete the latest set of contours created.

Save Settings, Save and close the STM dgn