



NHDOT CAD/D Connect Documentation

CONNECT DOCUMENTATION

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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

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

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

Create\Open 12345ctr.dgn (existing) or 12345pcn.dgn (proposed) in the \PRJ directory using the 3D Design seed file.

Attach the 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**.

Calculated Features Display	
Major Contours	Off
Minor Contours	Off
Triangles	Off
Spots	Off
Flow Arrows	Off
Low Points	Off
High Points	Off

Source Features Display	
Breaklines	Off
Boundary	On
Imported Contours	Off
Islands	Off
Holes	Off
Voids	Off
Feature Spots	Off

Reference	
Override Template	Terrain\NH_Existing_Boundary
Override Symbology	Yes



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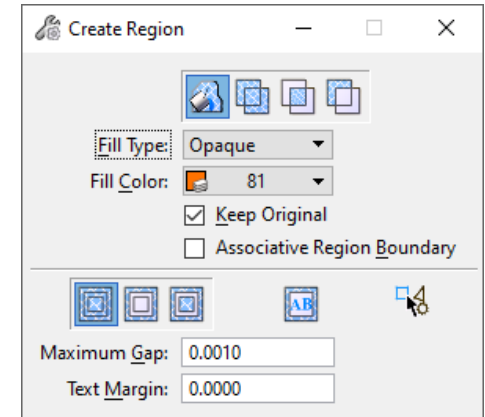
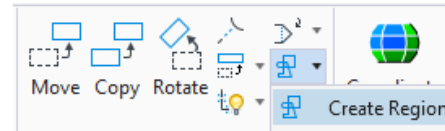
Set the level to *BDR-Clip-Boundary*. Make sure color, linestyle and weight are set to *ByLevel*.

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**.

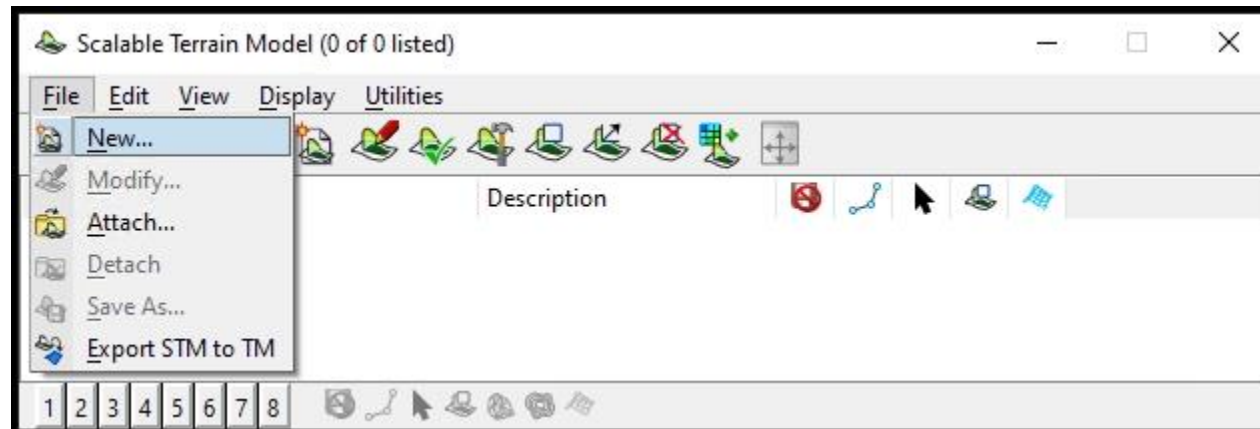
Click inside the terrain boundary and **Accept** the selection.

Turn on all levels



Create a Scalable Terrain Model including an ORD Terrain Model

Continuing in the *12345ctr* or *pcn* 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**



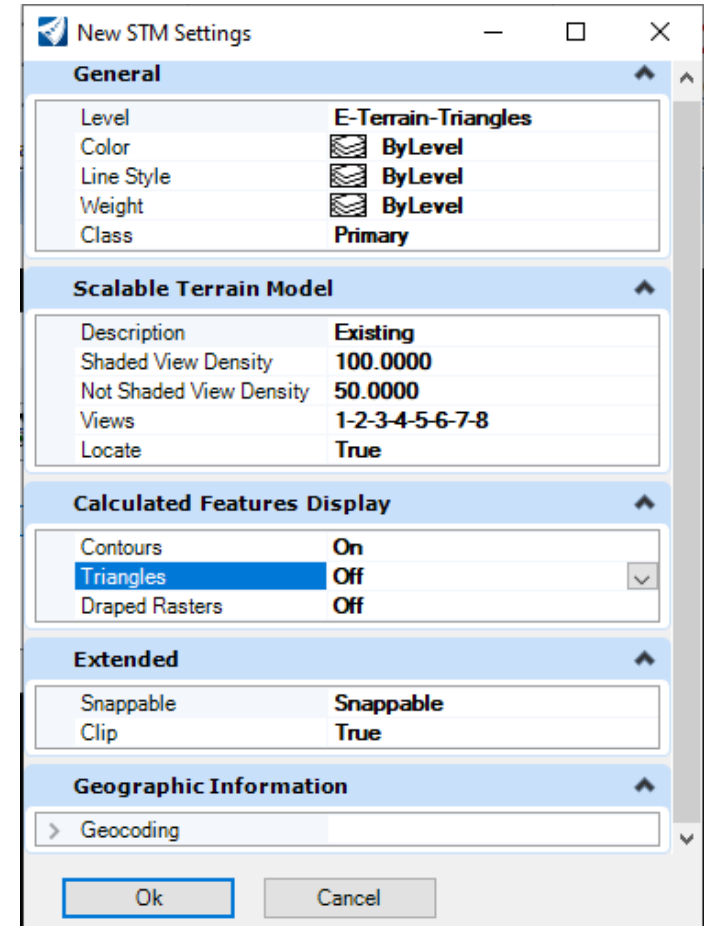
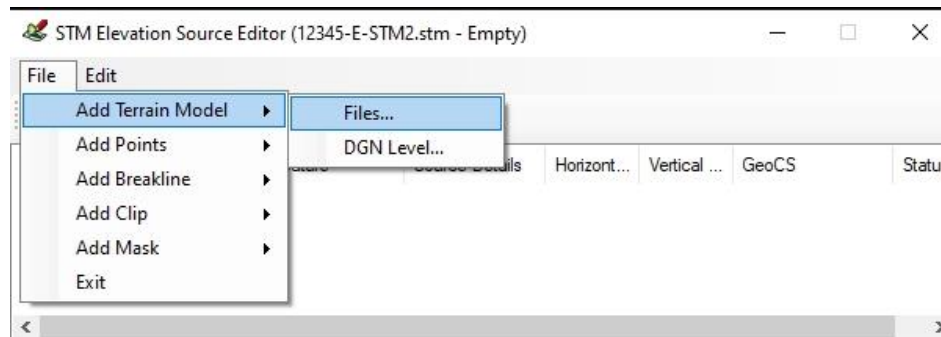
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The *New STM Settings* box will be displayed. Set the Level, add a Description, contours-on, triangles-off and set the geographic coordinate system. Click **OK**. This will create the STM.

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 current drawing 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*.





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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.

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!

Properties

- Elements (1)
 - Scalable Terrain Model
 - Calculated Features
 - Draped Rasters
 - Triangles
 - Contours
 - Major Contours
 - Minor Contours

General	
Display	On
Level	E-Terrain-Contour-Major
Color	ByLevel (13)
Line Style	ByLevel (0)
Weight	ByLevel (2)
Transparency	0

TextStyle	
Text Style	NH_CTR_E_008_Eng Vert Mo_Ct

Contour Labels	
Text Level	E-Terrain-Contour-Major
Display Text	Yes
Text Interval	200.0000

Depression	
Depression Color	ByLevel (13)
Depression Line Style	ByLevel (0)
Depression Weight	ByLevel (2)

Properties

- Elements (1)
 - Scalable Terrain Model
 - Calculated Features
 - Draped Rasters
 - Triangles
 - Contours
 - Major Contours
 - Minor Contours

General	
Display	On
Level	E-Terrain-Contour-Minor
Color	ByLevel (13)
Line Style	ByLevel (3)
Weight	ByLevel (1)
Transparency	0

TextStyle	
Text Style	(None)

Contour Labels	
Text Level	E-Terrain-Contour-Minor
Display Text	No
Text Interval	500.0000

Depression	
Depression Color	ByLevel (13)
Depression Line Style	ByLevel (3)
Depression Weight	ByLevel (1)

Properties

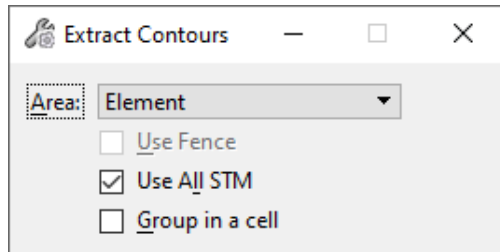
- Elements (1)
 - Scalable Terrain Model
 - Calculated Features
 - Draped Rasters
 - Triangles
 - Contours
 - Major Contours
 - Minor Contours

Contours	
Max Slope Option	None
Max Slope Value	1.0000
Contour Label Precision	0
Smoothing factor	5
Smoothing	Spline
Major Interval	5.0000
Minor Interval	1.0000



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In the *Scalable Terrain Model* box, select **Edit > Extract Contours**. The *Extract Contour* tool will display. Use the Area drop down to select mode **Element**. Uncheck the *Group in a cell* box. Select the Shaded Boundary to extract the contours and accept the extraction.



Using the *Scalable Terrain* tool, the STM can be saved. The text justification of the labels may need to be changed. Use element selector and select all text in the drawing and use the *Change Text* attributes tool to change the justification only to *Right Top* or change the justification in the *Properties* box.

Rename the model to *ctr50*. Set the logical name.

Create 20 Scale Contours

Copy the *ctr50* model to create a new 3D model *ctr20*

Delete the 50 scale contours.

Change the Annotation scale to **1"=20'**.

From the STM toolbox select **Edit > Extract Contours > Element**. Select the shaded *Clip Boundary* and *Accept*.

Save the STM and then *Detach* the STM.

Delete the terrain model and detach any other terrain models.

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

Delete the clip boundary and any other stuff from both models leaving only the contours.

Save Settings and Save the DGN.