MDOT Survey Workflow

Produce Survey Deliverables for Design Engineers using OpenRoads Designer

Overview:
This document is intended as a "how to" guide to create required survey deliverable products for MDOT Design engineers using **OpenRoads Designer** with the **MDOT Connect configuration**.

Required file setup:

- A final mapping drawing in DGN format, built in OpenRoads Designer with the latest MDOT Connect configuration. All the Survey data edits (crossing breaklines, spikes, linking codes, etc.) have been completed.
- Mapping survey deliverables consist of a 3D and a 2D mapping file, a Terrain Model file containing all Terrain models including bridge decks in DGN format, individual Terrain Models in XML format, the alignment and ROW data in DGN & XML format, an ASCII text file of the control, and the survey information sheet in DOC format.

Summary of Required RID Deliverables

- **S-XXXXXX_Survey_3D_20YY-MM-DD.dgn** - 3D mapping file
- **S-XXXXXX_Survey_2D_20YY-MM-DD.dgn** - 2D DGN generated from the 3D DGN
- **S-XXXXXX_ExTerrain_20YY-MM-DD.dgn** – Terrain Model file
- **S-XXXXXX_ExTerrain_LandXML_20YY-MM-DD.xml** - Terrain in XML format
- **S-XXXXXX_ExTerrain_Deck_*structure designation*_20YY-MM-DD.xml –** Individual Deck Terrains in XML format(if required).
- **S-XXXXXX_Align_ROW_20YY-MM-DD.dgn** - Alignment & ROW data in DGN
- **S-XXXXXX_Align_LandXML_20YY-MM-DD.xml** - Alignment & ROW data in XML
- **S-XXXXXX_ControlPts_20YY-MM-DD.txt** - Control point data in ASCII text
- **S-XXXXXX_Survey_Info_Sheet_20YY-MM-DD.doc** - Survey information in Word

In the new file name format "XXXXXX" represents the project number.

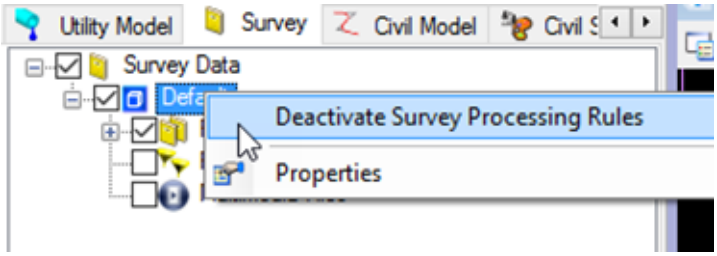
For more details, please refer to the MDOT Development Guide Wiki at http://mdotwiki.state.mi.us/design/index.php/Main_Page. Especially note chapter 3 of this document, the section titled "Survey Files," and the corresponding "Notes."

This workflow document will address creation of the first five files listed above.

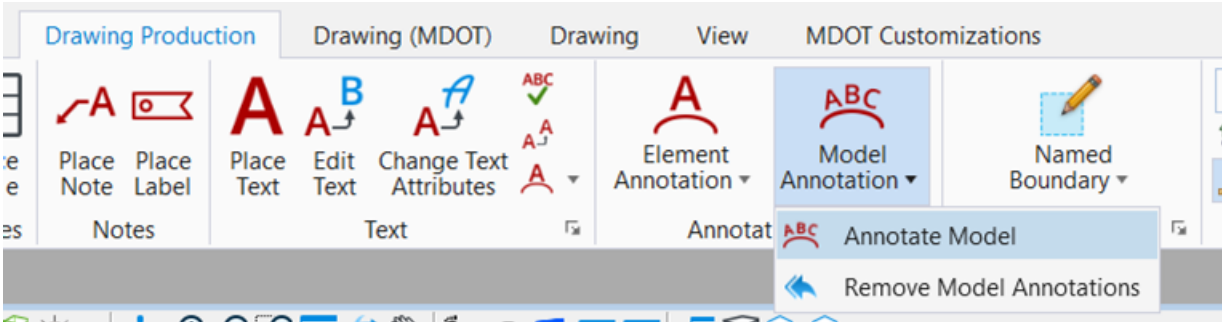
Step By Step:

I. 3D MAPPING file: S-XXXXXX_Survey_3D_20YY-MM-DD.dgn

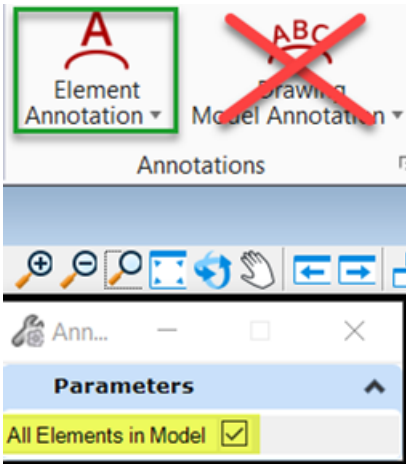
1. All Survey data edits have been completed. This is very important, as any edits found later will result in having to start over at section I. The workflow "ORD_Workflow-Editing a Terrain Model and Creating a CLIP Boundary" has been followed and a CLIP boundary has been created.
2. Deactivate the Survey Processing Rules in the 3D DGN to lock the database. Right click on **"DEFAULT"** then select **"Deactivate Survey Processing Rules"**.



3. Assign the proper contour Feature Definition to the terrain model(s).
4. Annotate the Model by:
    a) 10.09 and earlier: Select the Drawing Production tab under the Survey Workflow, then in Annotations select Annotate Model. Left click in the drawing view window to complete.



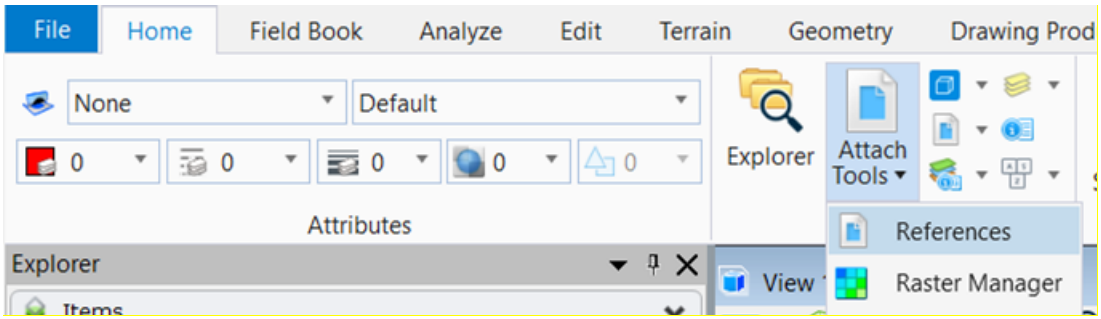
    b) 10.10 and newer: Select the Drawing Production tab under the Survey Workflow, then in Annotations select Annotate Element. A dialog box will open with the option to annotate All Elements in Model, check this box. The dialog may also be pinned to the side. Left click in the drawing view window to complete.



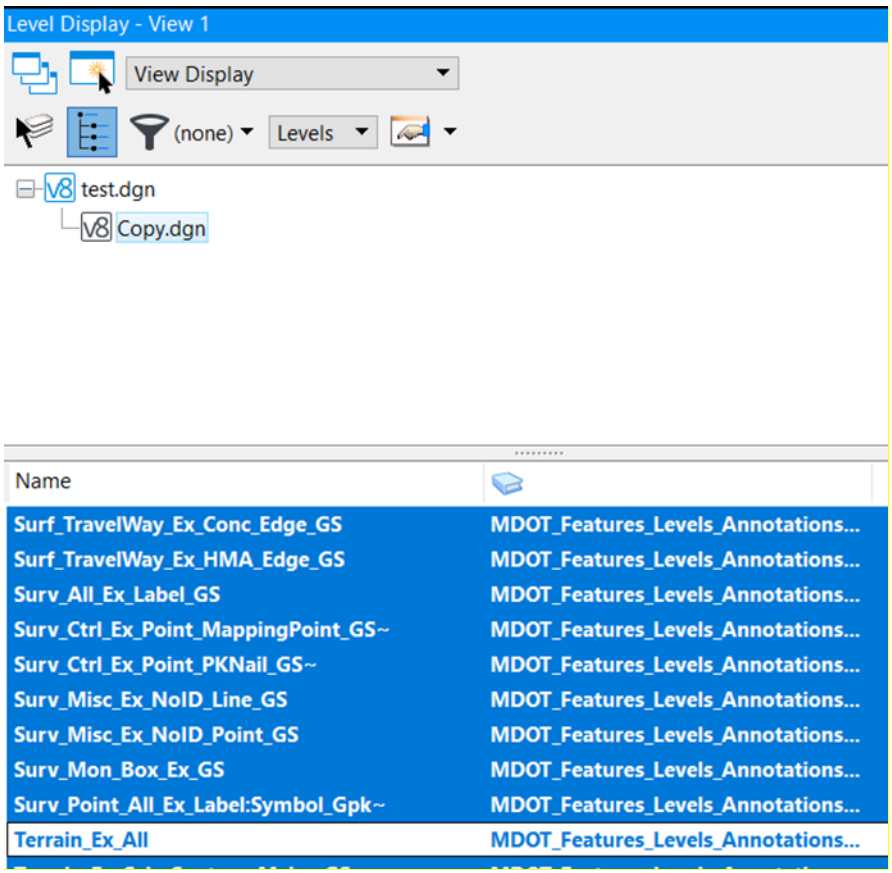
5. Compress the 3D file(File > Tools > Compress File).

II. **2D MAPPING file: S-XXXXXX_Survey_2D_20YY-MM-DD.dgn**

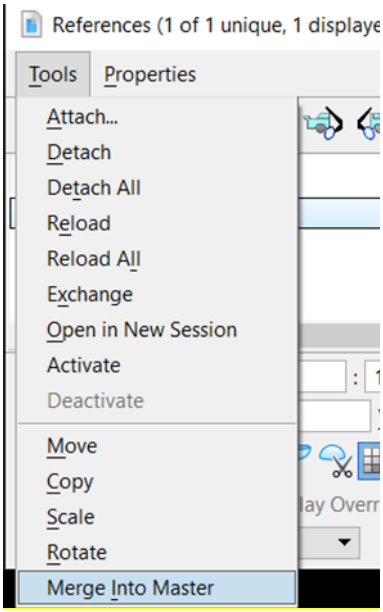
1. Open a new 2D file for the correct zone of the job. This will be the finished 2D file, so name it accordingly.
2. Reference the completed Survey 3D file into the 2D file using the “Coincident World” method.



3. Make sure all levels of the reference are turned on except for Terrain_Ex_All or they will not carry through! Turning off the Terrain_Ex_All level prevents the terrain model from coming through but still allows the features such as break lines and boundaries.



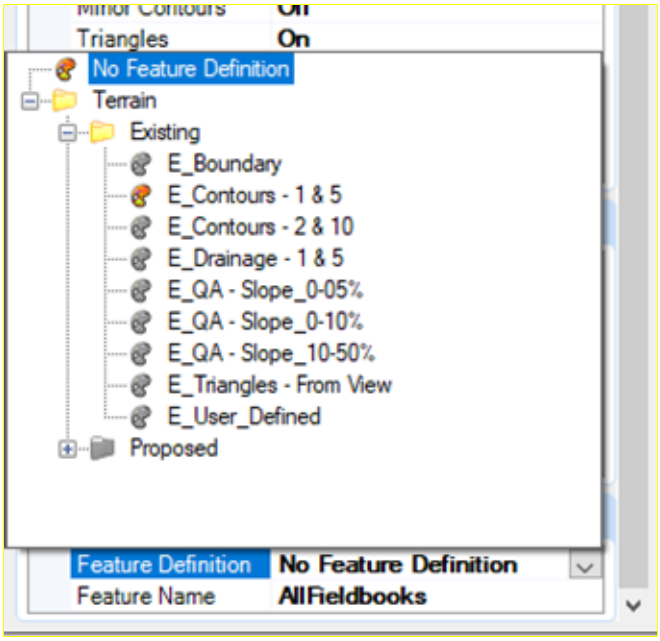
4. In the Reference dialog select the reference file and do a Merge Into Master.



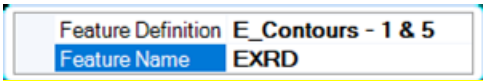
5. This will now be the Survey 2D file. Verify it does not contain any Field Book data.

III. Terrain Model file: S-XXXXXX_ExTerrain_20YY-MM-DD.dgn

1. In the 3D file, apply a **Feature Definition** to the Terrain Model if you have not done so already. Open "**Properties**", click on the **Terrain Model**, and then click on the "**Feature Definition**" field at the bottom. Select the requested E_Contours definition for the Survey 3D file.



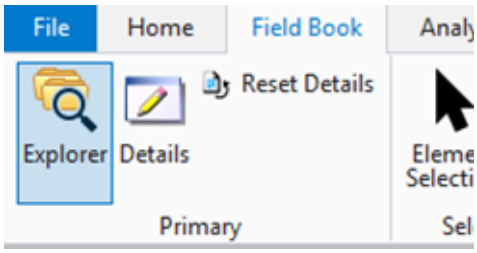
2. In the Feature Name field:



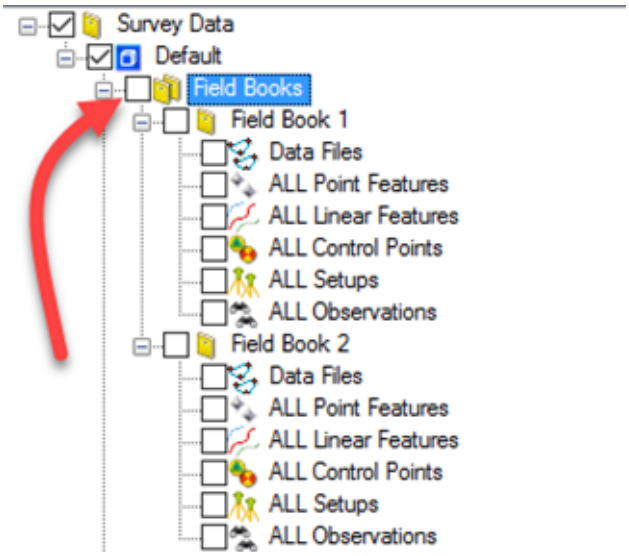
Set the Terrain Model name accordingly.

217		Terrain Model Road Project – EXRD, EXRD1, EXRD2, etc. for multiple model
218		Terrain Model Bridge Deck - structure designation, CS12345S01, CS12345B02NB, CS12345B02SB, CS12345X02 etc. for multiple deck models as discussed with the project manager.
219		Terrain Model Road & Bridge Deck Combined Project – EXRDDK, EXRDDK1, EXRDDK2, etc. for multiple models
220		Terrain Model Photo Mapping – EXPHO, EXPHO1, EXPHO2
221		Terrain Model Supplemental Photo Survey – EXSUP, EXSUP1, EXSUP2
222		Terrain Model Merged Photo / Supplemental Survey – EXMERG, EXMERG1, EXMERG2

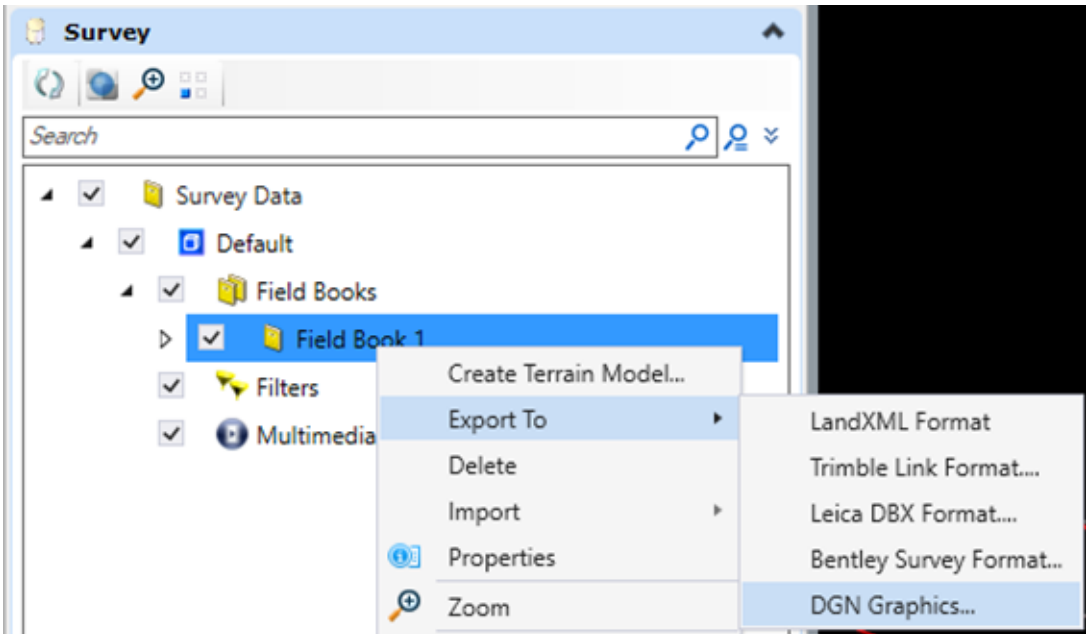
3. Open **Explorer** (if it isn't already open)



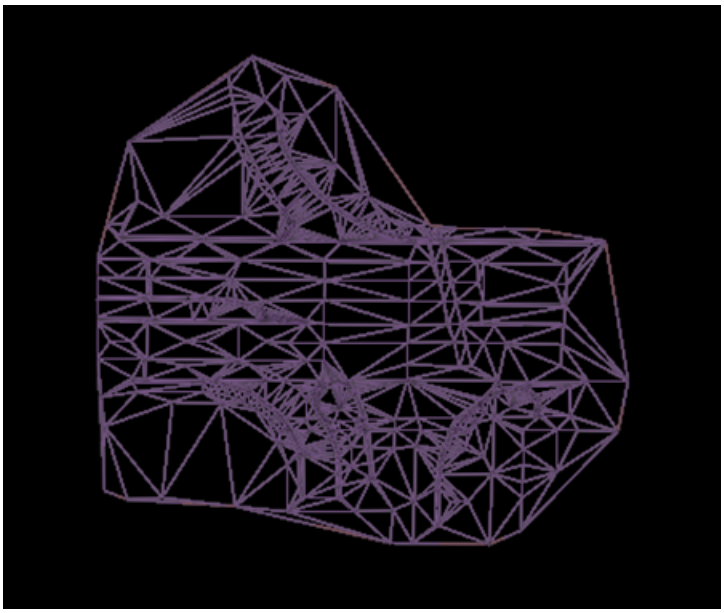
4. Click on the Survey heading to expand it.
5. UNCHECK “Field Books” so that none of their data is showing



6. Right-click on any one of the Field Books, then “**Export to**” and “**DGN Graphics…**”

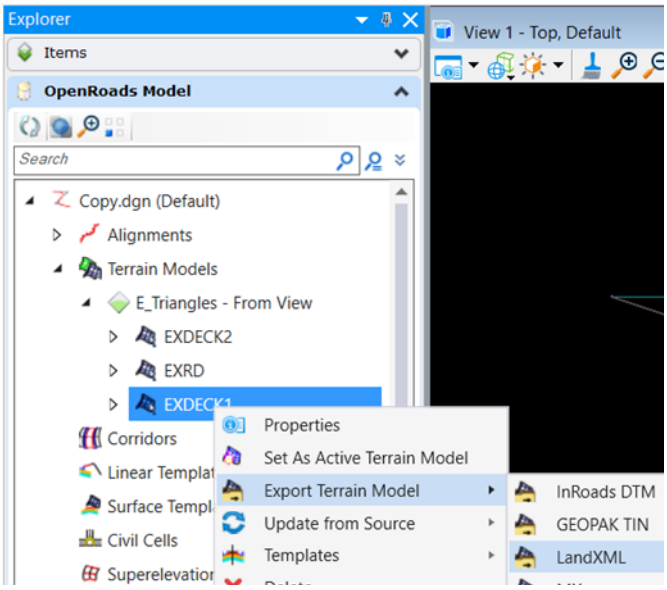


7. The new Terrain Model DGN will open automatically. Turn on all levels and verify that it contains only the Terrain Model data. Delete any extraneous detail (Graphic Elements not in the field book such as text, notes, etc.). Make sure to set the Feature Definition to E_Triangles – From View.

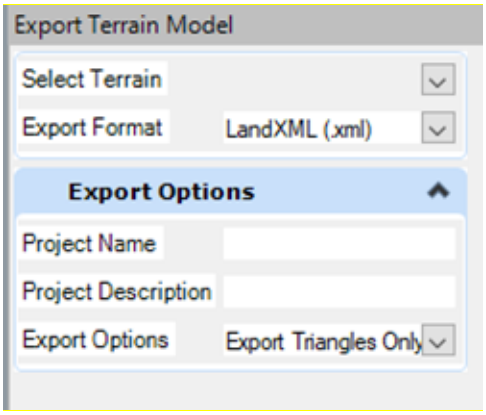


IV. Terrain Model file in Land XML format: S-XXXXXX_ExTerrain_XML_20YY-MM-DD.xml and/or S-XXXXXX_ExTerrain_Deck_*structure designation*_20YY-MM-DD.xml

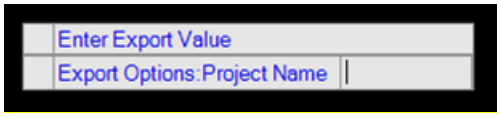
1. From the Terrain Model DGN file, click on the "**OpenRoads Model**" heading under Explorer, then expand the field under "**Terrain Models**" and then the Feature Definition you've applied. Right-click on each Terrain Model listed and select "**Export Terrain Model**" then "**LandXML**".



2. In the "**Export Terrain Model**" dialog box verify the format is set to **XML** and input the **Project Name and Description**. Even though the **Select Terrain** field is blank it will export whichever terrain you right clicked on in step 1 above.

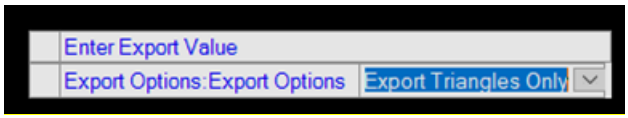


In the "**Export Options**" field make sure you have "**Export Triangles Only**" selected. With your cursor over the drawing view you will see a small dialog:



Left click and you get:

Left click again for:



Left click again for the Save dialog. Name the file accordingly and choose the save location. Hit Save. The dialog will close and you will see:

Right click to exit the command, the XML has already been saved. Repeat for any other models in the file.

V. COMPRESS all DGN files

1. Compress all the deliverable DGN files using the **Compress Options** menu: (**File** > **Tools** > **Compress Options**). Check all options ON, but not "Include References" or "Unused Nested Attachment Levels". Click "Compress" to do the compression.