



Lesson 3: Importing Base Surface Data

WELCOME!

This lesson is about getting surface data into PowerCivil. In many cases, the design process will commence when you receive a base map from the surveyor or cartographer. The most common form of surface data is contours - in this lesson you will learn how to extract the three dimensional data associated with contour lines from within a CAD file. Once extracted, the three dimensional data is used to create a triangulated irregular network file, or TIN. The TIN becomes the basis for terrain modeling in subsequent lessons.

LESSON OBJECTIVES

In this lesson, the topics covered include:

- Topic 1 PowerCivil DTM Extract Graphics Tool – import contour data
- Topic 2 PowerCivil Build Triangles Tool – build the TIN from 3D data
- Topic 3 Load DTM Features – display the surface model

Be sure to have a look at the context sensitive help for PowerCivil. Either while using the tutorial or in general practice with the software, you will find the help system not only includes program documentation but it also is equipped with links to online video clips (internet connection is required). Access the help from the menu bar under *Help>Civil Help*.

INTRODUCTION

This Lesson will show you how to extract surface contour data to build a digital terrain model. By extracting the contour data you can build the surface information used as the basis for terrain modeling. As grading objects are created, they will be merged into the base TIN which will be created in this lesson.

EXTRACT GRAPHICS

The first step in the effort to produce the existing TIN needed to model the site is the extraction of graphical contours.

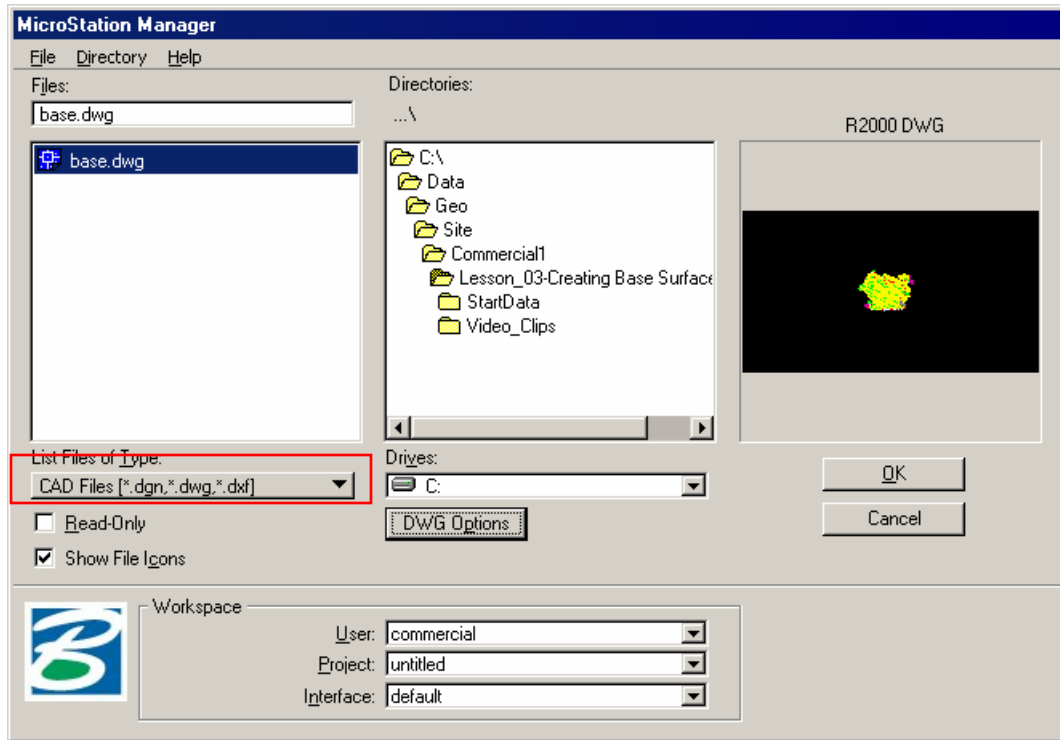
To view this portion of the lesson, press the play button.



From the desktop launch PowerCivil using the program icon, navigate to the folder for Lesson 3 and then open the file “BASE.DWG” – be sure to change the



”Files of Type” option box to “CAD Files”. This will recognize all DWG, DGN and DXF files.



Our base file is in DWG format, which is a fairly common format among surveyors. This presents no problem whatsoever as we will extract the contour data from the DWG and produce a DAT (or data) file of the 3D information. Upon entering the DWG file you will be prompted to select the units for the file; choose feet and press the OK button.

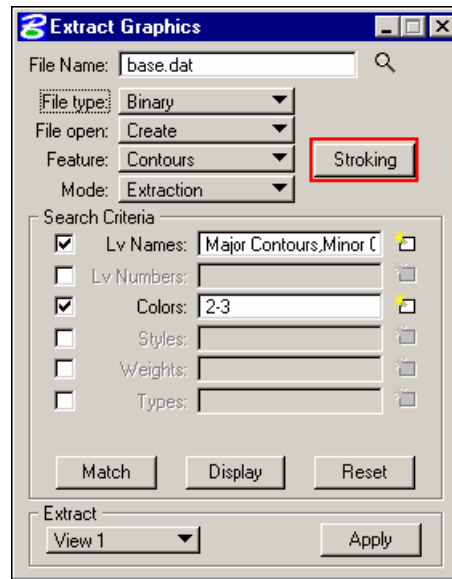
Once in the base file, you will want to follow these steps:

1. Activate the “Digital Terrain Model” tools from the “Civil” menu (*Civil>Digital Terrain Model*).
2. Invoke the “Extract Graphics” tool.

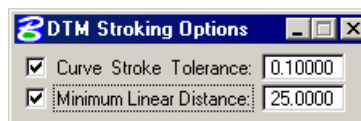


3. Key-in the filename for the DAT file – use “BASE.DAT”.

- Set the rest of the dialog as follows:



- Press the “Stroking” button and toggle both options and leave the default values.



- Press the “Match” button and then data point on a major contour and then a minor contour in the drawing.

Hint Click on a contour line and then click again to accept the selection.

- Press the “UnDisplay/Display” button and then press the button again to assure that the selection is correct.
- Ensure that the complete project is in view 1 and press the “Apply” button.

The PowerCivil status bar at the bottom of the screen should display that the extraction is complete. The contour information has been collected and stored in a 3D data file. This data will be triangulated into a surface in the next exercise. Close the Extract Graphics dialog.

BUILD TRIANGLES

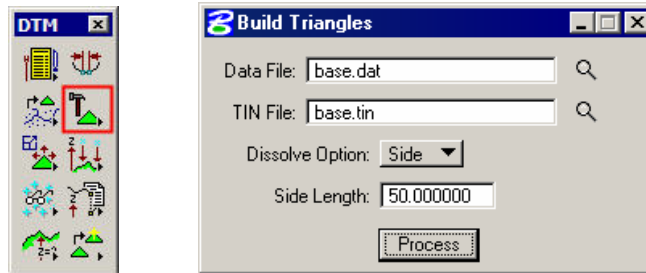
The final step required to produce the “TIN” is to triangulate the 3d data stored in the “DAT” file.

To view this portion of the lesson, press the play button.



Using the same “Digital Terrain Model” tools and staying in the “BASE.DWG” file, you will want to proceed with the following steps:

1. Invoke the “Build Triangles” tool from the DTM tool bar



2. Enter the “DAT” file name and provide a name for the new “TIN”, in our case use “BASE.TIN”.
3. Change the “Dissolve Option” to “Side” with a length of 50.
4. Press the “Process” button. The PowerCivil status bar at the bottom of the screen should display that build triangles is complete. The TIN has been created and will be used in the next lesson as the base object of the site model.
5. The “TIN” is now created.

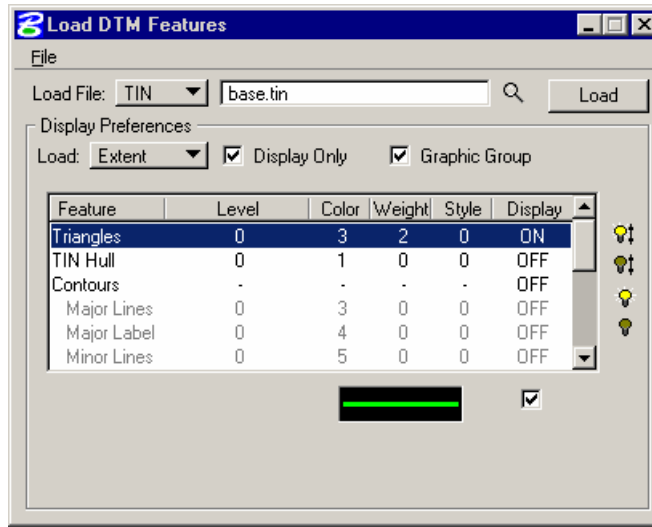
LOAD DTM FEATURE

1. To ensure that the “TIN” has been built properly, use the “Load DTM Feature” tool to display the surface.

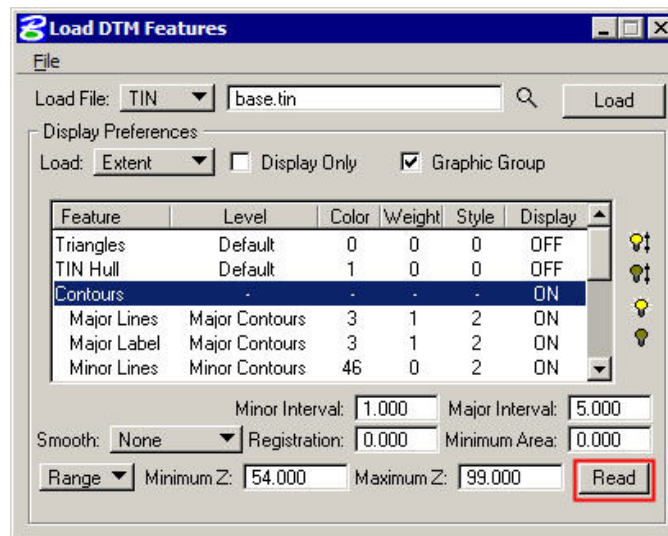


2. Change the File Type to “TIN”.
3. Choose the “BASE.TIN” file just created.
4. Select the “Display Only” option.
5. Choose the features that you would like to visualize by toggling each item “ON”.

- Set the symbology for each feature by double clicking on the sample graphic at the bottom of the dialog.



- Be sure to press the “Read” button on the Contours feature dialog. This will identify the min and max elevation of the TIN



- Press the “Load” button. The Contours should now be drawn in the file.

SUMMARY

The main points to remember are:

- PowerCivil can extract many data types to build a surface.
- You must first extract the information into DAT file.
- Build the triangles using the DAT file to create a TIN.
- Be sure to view the DTM features to be assured that you have a viable surface to use for modeling.

For more video instruction please visit the following web page...

<http://65.217.17.142/downloads/sitemodeler/GEOPAK%20Site%20Modeler%20Training%20Videos.htm>

