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Eagle Point Solution to a Frequently Asked Question

How to Use Surface Modeling

Summary:
This document explains how to create a 3D model of the site that you are creating or modeling.

Product: Eagle Point Software™ 2001
Release: 2001 and greater
Platform: All
Related documents:

As always, should you have any questions regarding any phase of installation, contact Eagle Point Technical Assistance at (800) 477-0909.

CAPABILITIES

- Visualize the site
- Create contours
- Compare volumes between topo's
- Create existing topo to process through RoadCalc

HOW

The Surface Modeling menu is a very important link between taking your existing data and modeling a proposed site. Once you understand the few basic steps of Surface Modeling, you will see that it is one of the easiest modules to conquer.

CREATING A MODEL

1. *What are you making a surface model of?*
   Have only the objects turned on that you want to be part of the surface model. It is safest to freeze all other layers, because when Surface Modeling makes a surface model, it triangulates to all objects you select.

2. *What are the parameters?*
   From the *Surface Modeling—Prepare* menu, select *Manage Surface Models*. Select the New (1st) icon. This is where you create your model name as well as set up properties. Select the Help icon for more details on values to enter for each option.

3. *Preparing the model for triangulation*
   A few parameters to keep in mind when making a surface model:

   a. You may need to use a boundary if it is an irregular shape. The boundary can be either a 2D or 3D polyline. A 3D boundary will create a more accurate surface model.
   b. Creating control lines. A breakline is a 3D line that controls triangulation of the model along breakpoints such as edges of pavement, ditches, and centerlines. In most all site work you will make use of breaklines by either drawing them in or having Data Collection draw them in automatically.
   c. Crossing breaklines are breaklines that are crossing over one another with the same northing and easting, but a different Z (elevation) value. When you are creating a surface model, it will prompt you if there are crossing breaklines. You can continue and ignore them, or cancel the triangulation process and repair them. You can repair them either graphically, or use the Surface Modeling Crossing Breakline command. Crossing breaklines can and will effect the outcome of the surface model. For more information on this use select the *Surface Modeling—Prepare* menu, and then select *Crossing Break Lines*. Select the Help icon for more information.

d. Masking objects is another option when creating a surface model. It is most often used when creating a surface model from existing contours or triangles. As a quick suggestion when making a surface model from existing contours, you can either select *Triangulate Surface Model from Contours*, or you can mask objects as Soft Break or No break from the *Surface Modeling—Construct—Mask Objects* menu. Both options should give you almost identical triangulation. But the second option can be quicker depending upon machine size. Masking as Soft Break is a recommended option when trying to make a surface model from existing contours. Once you mask them, select *Triangulate Surface Model,* not *Triangulate Surface Model from Contour.* For more information, select the *Surface Modeling—Construct—Mask Objects* menu and then the Help icon.

4. *Making of the surface model*
   To make the surface model, there are only a few things to remember.

   a. Select the *Triangulate—Triangulate Surface Model* menu.
   b. Set the Surface Model drop list to the desired Model.
   c. Set the boundary and void region drop lists accordingly.
   d. Select the Apply button on the dialog box.
   e. Your CAD command line will ask you to select objects. Window everything that is to part of the surface model and remember everything you select will be triangulated too unless it is outside the maximum or minimum elevations you specified earlier. So have only the objects you want to be part of the surface model turned on. Then press the Enter key at the command line to tell CAD you are done selecting objects. Surface Modeling will then begin the triangulation of the model.
   f. Select the Help icon for further details on different settings. If you followed the steps outlined above you should now have a surface model created. An important thing to remember is that a surface model is a data file. Once it's created it is permanent until you either overwrite it or delete it from the Surface Model Manager. It is not deleted if you erase the triangles, they are merely a graphical representation.

5. *Contour Creation and Output*
   The next step is to create your desired output.

   a. If you want to create contours select the *Contours—Make Intermediate and Index* menu. From there select the Help icon for further details.
   b. If you want to create a grid, spot elevations, or triangles to better visualize the surface model go to the *Surface Modeling—Output* menu and select the option you want. From there select the Help icon for further details.
   c. Another neat feature is the *Erase Existing Objects* routine under the *Output* menu. It allows you to automatically erase any previously created objects for your model such as triangles, contours, annotation, and grid. It works just like the CAD Erase command.

These quick steps should walk you through creating a model. For more information, refer to the Surface Modeling manual.