

Chapter 8: Surface Editing Tools (excerpt)

Authenticate:

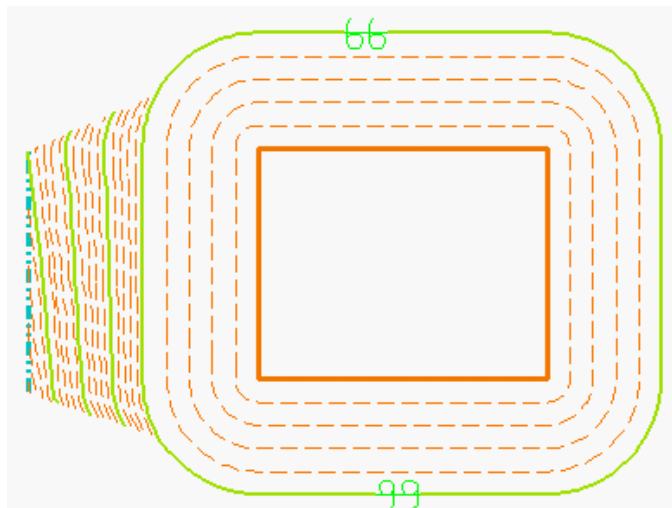
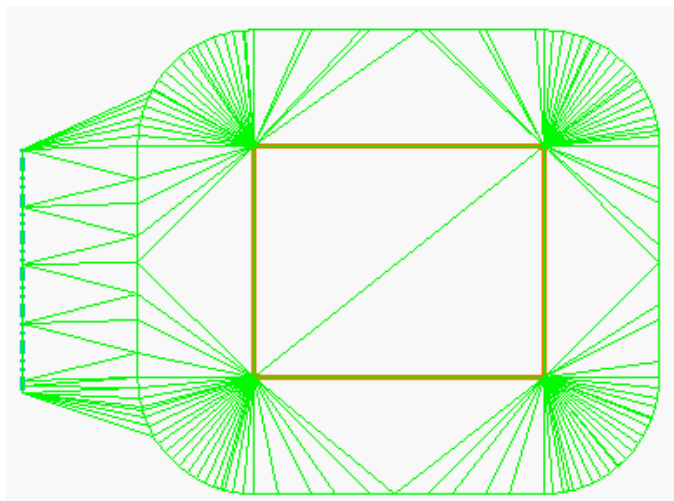
Use the **Edit Feature Point** command to verify the location of the ditch bottom..

Notice the Starting Elevation of **96** and the Ahead Slope of **-2%**.

59. Triangulate the **site** surface (InRoads>Surface>Triangulate Surface).

60. Display the triangles

61. Display the contours.



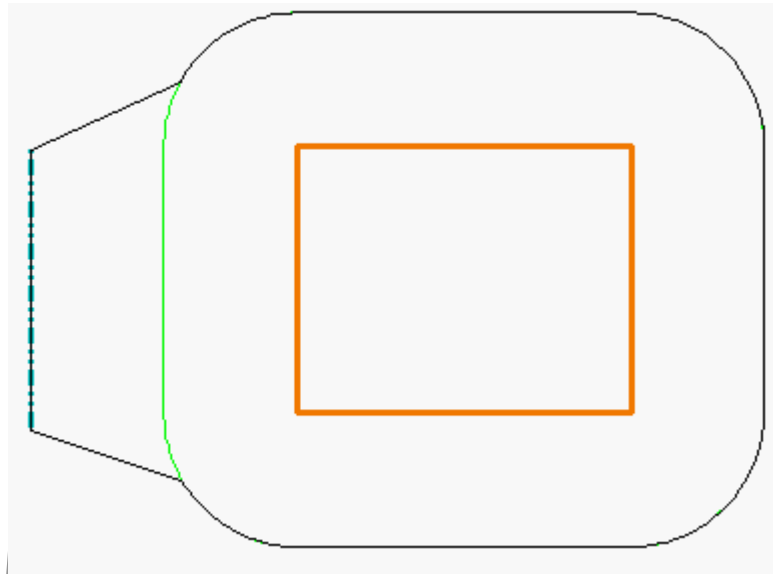
62. Save the Surface.

63. Display the Perimeter of Bob's **site** surface.

Building InRoads

We will use this perimeter in the next section for a quick-and-dirty starting point for tying into the existing surface.

We will use this shape as the starting point for the **Generate Sloped Surface** command. It will work along this graphic at a specified interval and look for a target surface via a Cut Slope or Fill slope as appropriate.



Generate Sloped Surface

Tying into the Existing Surface

At this point we have a Design Surface that does not tie into the existing surface. The “non-corridor” command that seeks and ties into a surface is the **Generate Sloped Surface** command.

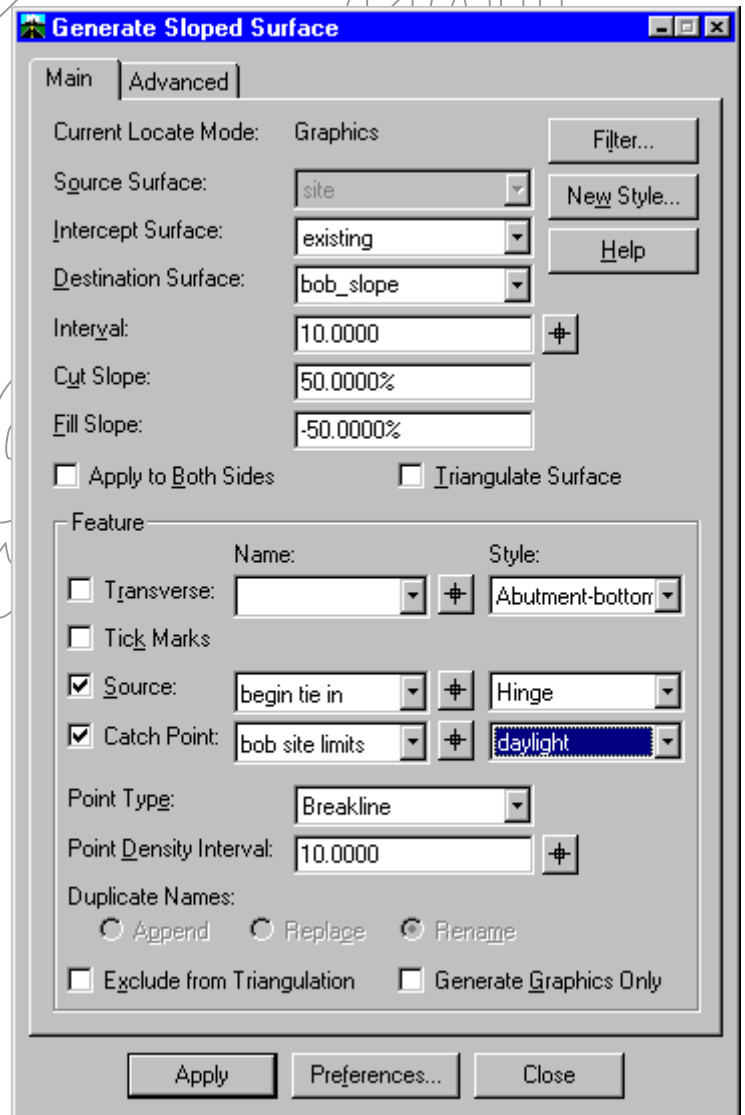
64. Select InRoads>Surface>Design Surface>Generate Sloped Surface.

There are many controls on this, most of which should be familiar to us.

The “Bigger One:” is the **Destination Surface**. Which surface do we want to put the resulting Features in? This is a good command to take advantage of the “encapsulation” or “quarantine” capability of the Destination Surface. Results should be thoroughly tested before integrating with the source surface.

The “Big Four” are positioned a bit differently in this form, primarily because this command can create three different types of resulting features.

You almost always want to have the **Catch Point** Features created and put into the Destination Surface. You also have the option of copying the Source graphic or feature into the Destination Surface. It can also create **Transverse** Features to clarify and further control the triangulation of the Destination (and subsequent) surfaces.



New controls are the **Cut Slope** and **Fill Slope** fields. When the source feature is in cut it will use the Cut Slope until it intercepts the Intercept Surface and use the Fill Slope when the source is in Fill. Make sure you have a positive slope in Cut and a negative slope in Fill.

The **Locate Mode** reads the **InRoads Locate** lock. If the **Locate Mode** is set to **Surface**, the **Source Surface** list is enabled. After hitting **Apply** **InRoads** will prompt you to “**Identify Feature.**” If it is set to **Graphics**, **InRoads** will prompt you to “**Identify element.**”

Anticipate:

We will be creating a new surface called “**bob_slope**” which will contain the perimeter of the site surface (it will be called “begin tie in” of the “Hinge” Feature Style. The daylight line tying into the existing surface will be called “bob site limits” and be of the “daylight” Feature Style. These graphics will be displayed to the screen.

65. Make sure the **Generate Graphics Only** toggle is **OFF**.

66. Set the controls as per the form above.

We are ready to Hit the **Apply** button.
Make sure you read and understand the Prompts.

67. Hit **Apply**.

The prompt reads “**Identify Element.**”

This is the element from which the **Generate Slope Surface** command will seek the existing surface. The graphic will become the “**Source**” feature in the **Destination** surface.

68. Select the perimeter of the **site** surface. Accept at the **Accept/Reject** prompt

The prompt reads “**Identify beginning/Reset for Entire**”.

The new feature can be generated from along the entire graphic by hitting the reset button. Otherwise, placing a data point will mark the beginning of where command starts looking for the surface. A subsequent prompt will ask to “**Identify ending/Reset for Entire.**” A reset will enable to the end of the graphics otherwise a data point will specify the end.

69. Reset, so that the entire perimeter will be used.

The prompt reads the overused “**Identify location.**”

This means “place a data point on the applicable side of the feature.” Often it means “left or right?” Here it means “inside or outside?”

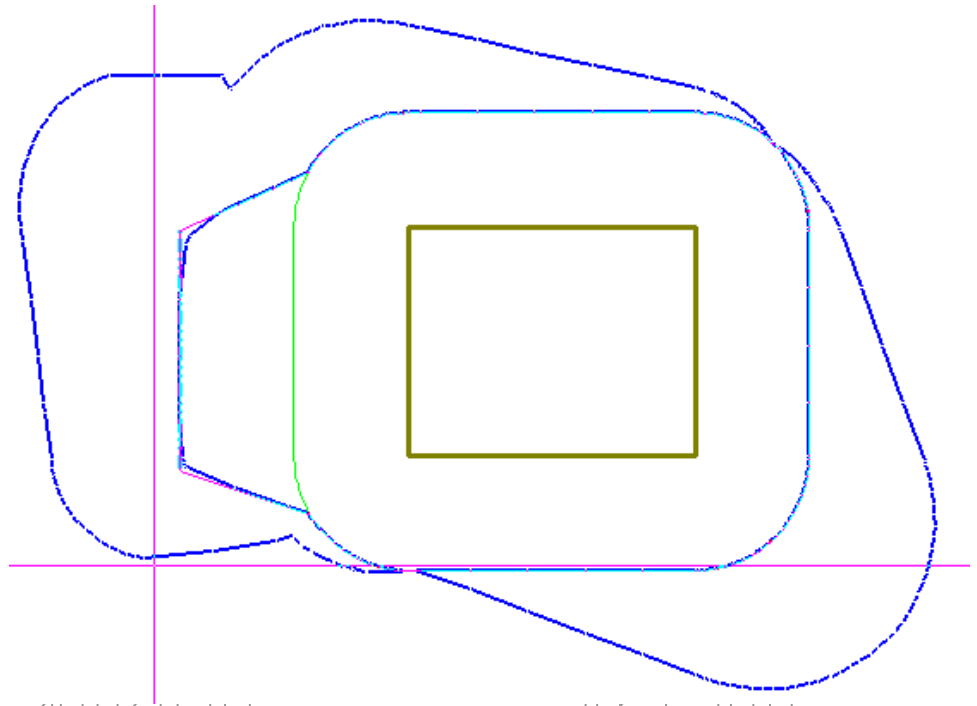
Notice that if you place the cursor inside the perimeter a technically valid solution is shown. It is not the engineering solution we want.

Building InRoads

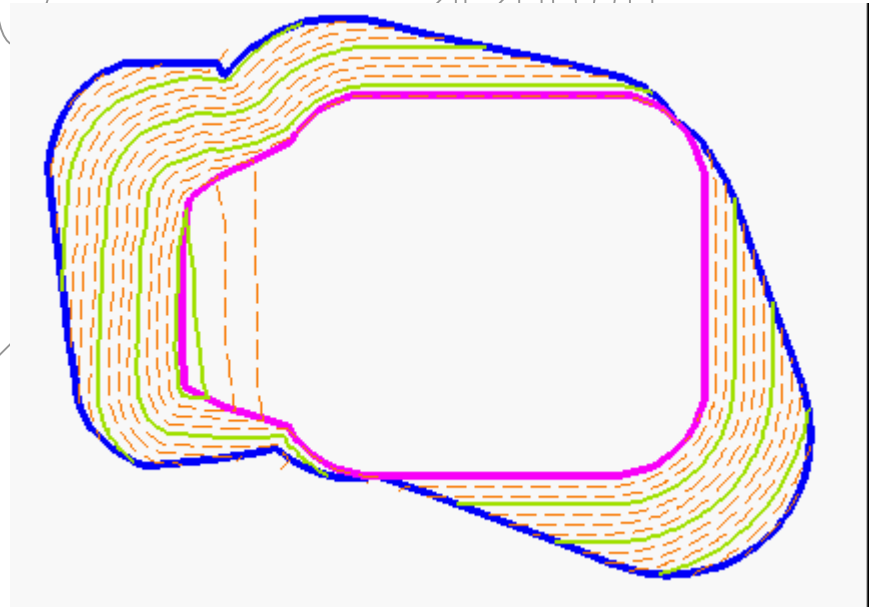
70. Drag the cursor outside the perimeter.

The “rubberbanding” solution should look something like.

71. If so, place a data point.



Authenticate:
Erase all the graphics and display the features in the **bob_slope** surface.
Triangulate the Surface and display the contours.
Tracking can be used to verify slopes.



Copy Portion of Surface

We can merge the **bob_slope** and **site** surfaces together or we can use the **Copy Portion of Surface** command to copy the **Daylight** feature to the site surface.

72. Select InRoads>Surface>Edit Surface>Copy Portion of Surface.

The Features list lists the Features in the Source Surface. The Destination Surface receives the copied feature(s).

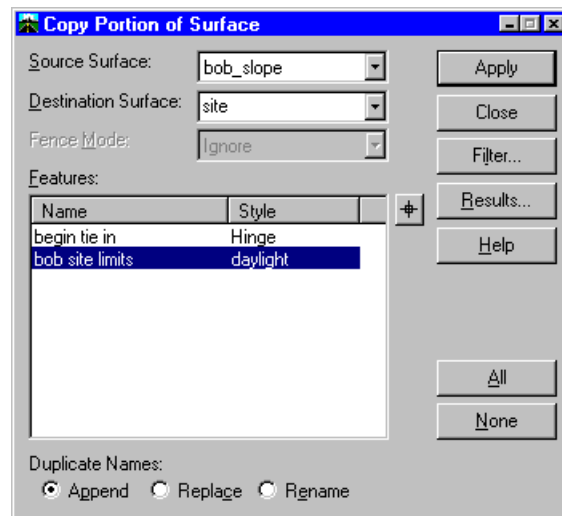
73. Select **bob_slope** for Source Surface.

74. Select **site** for Destination Surface.

75. Select the **Daylight** feature to copy.

76. Hit **Apply**.

Note: if either surface has no triangles in it, InRoads prompts “No triangle found” instead of “Successful completion” and the feature(s) are not copied!



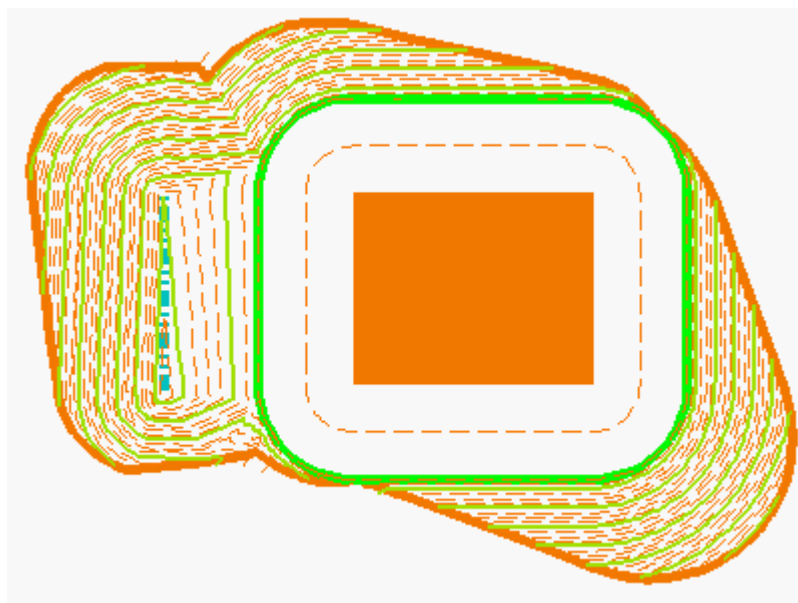
Authenticate:

Verify that the Daylight feature now exists in the site surface.

Triangulate.

Display the contours of the site surface.

The screenshot to the right shows the features and contours of the **site** surface (The View Fill attribute is ON).



Manage

We are at a point where we have completed an engineering process. We have confirmed that the engineering intention is accurately represented in the surface. Now is an appropriate time to manage the surfaces. This may include renaming the final surface (**bob_site** is more descriptive than **site**). Any intermediate surfaces should be deleted or named as such and archived.

The Project Line to Surface command

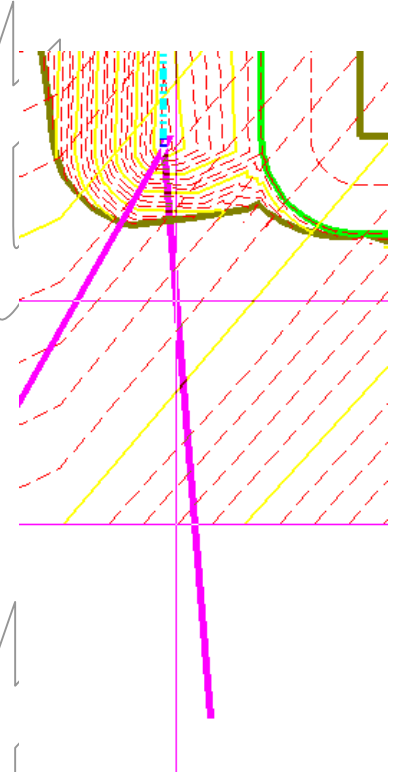
Now, some engineering purists might object that Bob's ditch is not really a ditch, it is a pond. They might also object that there might be some problems with the way the pond overflows.

How do we find some solution to keep Bob's house dry? How do we our ditch into the existing ground?

The Project Line to Surface command is used to intersect a line to a surface. The command needs a 3D starting point, a slope a direction, and an target surface.

In the screenshot to the right the Project Line to Surface command shows a line continuing from the ditch bottom at -2% until hit the surface. This requires a rather long extension to the "ditch" that Bob does not want to pay for.

Bob hires an engineer who suggests that he can just create a spillway with sufficient freeboard so that the foundation stays dry. The engineer says that a flat ditch at an elevation of 98 feet tying into the existing ground will be sufficient.



77. Select InRoads>Surface>Design Surface>Project Line to Surface.

78. The intercept Surface should be existing.

79. The Slope should be 0.0.

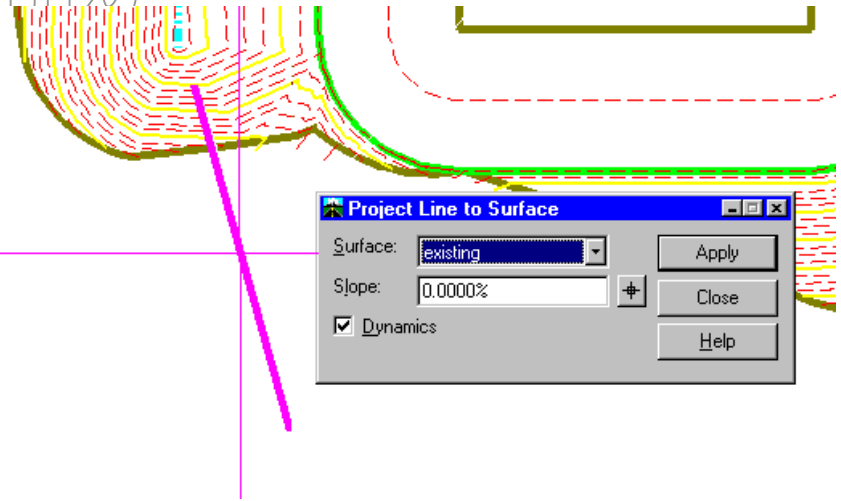
80. Turn Dynamics ON

81. Hit Apply.



82. Snap to the 98' contour near the center of the "pond."

83. Drag the cursor to the south.



Notice that a line is projected from the start point through the cursor. The line ends where the line intercepts the target Surface.

84. Move the cursor until a reasonably short line is found.

85. Place a data point.

