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Eagle Point Solution to a Frequently Asked Question

How to Use RoadCalc

Summary:
This document explains the basics of RoadCalc.

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.

GENERAL OVERVIEW

The layout of RoadCalc is designed to allow you to enter your supplied data in an orderly, easily accessible method. With that said Eagle Point's modular approach is set up to work from left to right across the toolbar. So if you start from scratch, the first thing you need to do is enter your alignment data. Once your alignment is established you can then cut cross-sections, etc. For new users of RoadCalc, there are 6 pull-down menus. Under each menu there is an *Edit Data* submenu. To process your design, each of the edit data menus should have data. Within each of the pull-down menus you can enter data numerically and/or graphically. When entering data or converting graphic information it should always be readable in the *Edit Data* menu.

GETTING STARTED

In this quick step through document the first thing that you have to realize is that RoadCalc has the capabilities of being very dynamic for multiple lane transition, and yet basic enough to do simple county road development. Take the data you have and enter it accordingly. An example of this is alignments. RoadCalc gives you the ability to convert an object from the graphics, all the way to entering in superelevation design. There are a lot of options, do not let all the different buttons scare you off.

Alignments

What is RoadCalc Looking For?

RoadCalc is looking for your horizontal alignment data. By default, RoadCalc lists three alignments in the Project Manager. Under the *Alignments–Manage* menu Centerline, ROWLeft, and ROWRight are listed. Centerline is the base alignment that your typical section will follow. For each separate centerline alignment, a separate subproject will need to be created. If you were creating a subdivision, each street would be a new RoadCalc subproject. The ROW alignments do not need to be defined at this time.

How Do You Enter Your Alignment Data?

Each subproject needs horizontal alignment data. This needs to be entered from either the *Edit Data* or the *Convert Objects to Alignment* menu. The vertical alignment information will be entered in *Profiles* menu later.

- **Graphic**

    1. If you have a CAD object that will be your centerline, select the *Alignments–Convert Objects to Alignment* menu.
    2. Your CAD program asks you to select objects. Select the segments from the graphic and right click to tell the program you are finished.
    3. CAD prompts you to select a point near the beginning. Select a point near the BOP of the alignment. (Anywhere near the endpoint of your starting station).

4. Select an alignment and stationing from the Alignment drop list. The software already has an alignment called Centerline, which is the desired alignment.

- **Numeric**

1. If numeric data is involved, select the *Alignments–Edit Data* menu.
2. Select the New icon and enter in your known information whether it's a Node ID, Northing and Easting, Deflection Angle, etc.
3. Once your horizontal alignment data is entered you can modify it graphically or through the Edit Data dialog box. If you make any changes you should receive a synchronization error. Update it accordingly. If you changed it graphically update the data, and vice versa.

Curve Data

What is RoadCalc Looking For?

RoadCalc is looking for your horizontal curve data. Whether it is automatically associated with a polyline that has curves already defined, or if the curve data will be entered through the Edit Data–Curve Data option. If there is no horizontal curve data, nothing needs to be entered in the dialog box.

How Do You Enter Your Curve Data?

1. Select the *Alignments–Edit Data* menu and click on the Curve Data button in the Edit Data dialog box. If you converted an object with arc data to an alignment from the graphic you will already see curve data. If you do not have curve data all the values will appear with a zero in the edit fields.
2. Enter in your curve data based on the information you know. If you know the radius enter it in the **R:** edit field. If you know the length, enter it in the **L:** edit field. After entering the known values press the Tab key to fill in the remaining edit fields.
3. There are two small Left/Right Arrows on the middle left hand side of the dialog box. Use these arrows to jump from PI to PI. Next to the arrows will be a warning message about curve data overlapping if the values you entered are impossible to design. This error would need to be resolved before continuing.

Superelevation Data

What is RoadCalc Looking For?

RoadCalc is looking for horizontal curve data based off AASHTO Method 5 Highway Design. Entering superelevation data here automatically superelevates your standard typical section based on the input data you enter. This input data can be calculated from known data or pulled from the speed tables. If you are not superelevating the design typical you will not need to enter superelevation data.

How Do You Enter Superelevation Data?

1. Select the *Alignments–Edit Data* menu and click on the Curve Data button in the Edit Data dialog box.
2. You now have two choices. You can either click on the Superelevation Data or Horizontal Speed Tables button. If you select the latter option you will need to follow the steps below. If you select the Superelevation Data button go to step 3.
    a. You first need to specify your speed table. What is the maximum super rate you will be using?
    b. Next, you need to specify your design speed.
    c. Finally, you need to select your Da (Arc Definition) or the radius for your curve.
    d. Once all three parameters are set select the Create Curve button.
    e. Select the desired curves you want to specify data for and click on the OK button. You should see your curve update in your CAD file as well.
3. If you selected the Superelevation Data button, click on the Superelevation Calculator button.
4. Enter in the required data Da, Maximum Super, Lane width, etc.
5. Once you enter your data select the Calculate button to calculate the superelevation runoff, tangent runout distance, etc.
6. Select the Create Curve button.
7. Highlight the selected curves you wish to apply the super information too and say yes to overwrite any existing curve information. If any of the curves vary just repeat and apply the steps listed here and be sure to select the correct PI.
8. Close the Superelevation Calculator dialog box to see your superelevation data. The Bs, Px, Py, Ms, and the corresponding station values display

There are two small Left/Right Arrows on the bottom left hand side of the dialog box. Use these arrows to jump from PI to PI. Next to the arrows will be a warning about superelevation data overlapping if the values you entered cause your ending superelevation data to overlap with another curve's beginning or ending superelevation station. Without going into too much detail it is possible to have overlapping superelevation data and still process your design.

Once you have entered the superelevation data, there are a couple of more specific features you may or may not want to use. On the Superelevation Data dialog box, there are two options: Superelevation Transition and Rollover. Superelevation Transition

allows you to maintain your max superelevation through a small tangent segment that may exist between two nearly compound curves. Rollover is applied to the shoulders of your typical section to auto-rotate the shoulder to match AASHTO safety specs. Each of these options is based off your design specs. Neither option has to be used to superelevate your typical section.

To utilize rollover parameters:

1. Toggle on Rollover and select the Parameters button.
2. Either select the current PI or select all PIs. Usually all PI's will be the option you want to select.
3. Toggle on High and/or Low side to rotate your shoulder on the typical section. Toggling both sides is the typical option.
4. Specify a PT Code. This will be snapped to the shoulder point on your typical section later. The default is 10, If you use 10 just remember to place 10 on your shoulder edge when you create your typical section later.
5. Specify the safety slope. Option of 7% or 8% is standard.

The rollover parameters help rotate the shoulder's of your typical section when you approach full superelevation. With a normal typical section at 2% grade and a 4% shoulder you will rotate with a max superelevation of say 6%. As the road rotates AASHTO deems it unsafe to not rotate your shoulder to fluctuate with the superelevated typical. So on the low side, RoadCalc will rotate your shoulder to match the grade of the road (per AASHTO) and on the high side, RoadCalc will maintain the difference based off you slope. So if you're at 6% the shoulder will be 2% because you specified an 8% slope.

At this point you should have your centerline data completed. You can now move on to cutting cross-sections.

Cross-Sections

What is RoadCalc Looking For?

RoadCalc is initially looking for your original ground data to establish existing conditions to apply your typical section to. Once your original ground is extracted, you can view sections either through the *Edit Cross-Section Data* menu or from the *View Cross-Section Graphics* menu. After creating original ground data you will later process a typical section on your alignment and be able edit the design data in the same way as your original ground.

How Do You Enter Cross-Section Data?

Here is a quick explanation of Eagle Point surfaces. The surfaces can be found under the *Cross-section–Manage Surfaces* menu. Eagle Point uses three types of surfaces: Original, Design, and Actual.

Original is anything that was there before you got there. Eagle Point creates a surface automatically because you need to have at least one original surface. This is where you would also create any subsurface models that you want to show, such as clay or rock.

Use the Design tab to enter your proposed surfaces. If you were going to process a rural road you add as many surfaces as you needed. Each surface will be defined on your typical section and give separate quantities as well. A design surface could also be pulled from a model. It all depends on your proposed data.

Actual surfaces or "Asbuilt" is for ongoing surveys. For example, the data you collected on a construction site you first surveyed in June would be your original data. You then survey the same site in July and build a tin of that information. You would add an actual surface to represent that model. You then survey the site in August and build another model. You would add a second actual surface to represent that model. Your quantities can then be compared on a total between your last actual and the original model or compared between actuals to find in situ quantities.

With that said, there are 5 ways to enter cross-section data. The first way, which is done 95% of the time, is to extract the original ground data from a surface model. (Refer to Surface Modeling to make your surface model). To do this follow the steps below.

1. Select the *Cross-Sections–Extract Cross-Sections* menu.
2. The station range should default to the length of your centerline from the A*lignments* menu. Under Station options, specify the interval or distance between each section. Usually 50' or 100' is normal. This value also affects your volumes because RoadCalc uses average end area calculations to compute your earthwork.

Other options that can be specified:

- Curve Station Interval allows you cut more sections when along a curve. It is used to show sections more closely to identify superelevated sections (also helping to give more accurate quantities).

  Curve stations will cut a section at the PC and PT along with already extracted sections. Equation Stations will extract a section at the Station ahead and the Station back if you entered station equations on your Centerline. Finally, the skew angle allows you to cut non-perpendicular sections to your alignment. Used to show culverts running along the alignment or any other objects (no typicals get processed at these stations because it would alter the earthwork quantities).

1. Mark stations that need to be checked so that you can extract data and if there are existing sections already cut you have the option to delete them.
2. Click on OK to continue.

3. On the Extract Cross-Section dialog box, check the surface that you want to extract data to along with the model that you will extract it from (the model should have been created in Eagle Point's Surface Modeling).
4. Specify a corridor edge or how far out from the centerline you want to extract data. Left of the centerline must be negative. If RoadCalc runs out of surface model data it will extract as far as the data exists. The other option is to toggle on User Defined Corridor. This allows you to select a boundary as your limits.

   The stationing list shows all the stations you will extract data to. An X should display under the marked station list. If there are individual stations you need to add, select the New icon and specify your station. If you wanted to cut sections at driveway or intersection stations this is where you would accomplish that.

Mark	If the station isn't already marked you can highlight and mark that section.
Unmark	If the station is already marked you can highlight and unmark that section.
Build List	Opens the previous dialog box allowing you to rebuild your stationing.
Settings	Allows you set a stretch factor when viewing cross-sections.

5. Click on the OK button to extract cross sections.

- Import Cross-Sections
  Importing an ASCII file directly into RoadCalc.
- Draw cross-sections in graphically
  Draw sections using CAD commands.
- Numerically enter the data
  Select the *Edit Cross-Sections* menu and add in each station and offsets.
- Extract cross-sections from objects
  Select the *Extract Cross-Sections* menu and select User-defined as the surface.

At this point you should have your original ground cross-section data available. To verify your information you can open the Edit Cross-Section Data dialog box and view the preview as well as look at the data. At this time you are ready to view your profile graphics and continue processing your design.

Profiles

What is RoadCalc Looking For?

RoadCalc is looking for your vertical alignment information. After extracting cross-sections you should have an original ground profile. By default, RoadCalc lists one profile in the Project Manager. The Centerline is listed under the *Profiles–Manage* menu. This is the profile you need to associate your design Centerline with. Your profile is also at an exaggerated vertical scale. Under the *Tools–Plot Scales* menu is the option where your horizontal divided by your vertical scale controls your exaggeration or stretch factor. When viewing the profile drawing (rcprf???.dwg) you are looking at your X (station) and Z (elevation) values.

How Do You Enter Your Profile Data?

Each subproject that has Plan & Profile sheets or road design involved needs vertical alignment or profile data. This data needs to be entered from either the *Edit Data* or *Convert Objects to Profile* menu. The horizontal alignment information was entered earlier using the A*lignments* menu.

- **Graphic**

  1. To accomplish this you first need to be in the profile drawing. To do this, select the *Profiles–View Profile Graphics* menu.
  2. After drawing your proposed profile CAD object, select the P*rofiles–Convert Objects to Profile* menu.
  3. Your CAD program will ask you to select objects. Select the segments from the graphic and right click to tell the program you are finished.
  4. Click on the Next button on the dialog box.
  5. The software already has a profile called Centerline, which is the desired profile. Click on OK.

- **Numeric**

  1. To accomplish this you first need to be in the profile drawing. To do this, select the *Profiles–View Profile Graphics* menu.
  2. Select the *Profiles–Edit Data* menu.
  3. Select the New icon and enter in your known information whether it's station and elevation or grade and distance.

4. Once your profile data is entered you can modify it graphically or through the Edit Data dialog box. If you make any changes, select the *Profiles–Synchronize Graphics and Data*. Update your profile accordingly. If you changed it graphically update the data and vice versa.

Vertical Curve Data

What is RoadCalc Looking For?

RoadCalc is looking for your vertical curve data here. Whether it is automatically associated from a CAD object with curves already defined, or if the curve data will be entered through the Curve Data option under the *Profiles–Edit Data* menu. If there is no vertical curve data, you do not need to enter anything here.

How Do You Enter Your Curve Data?

1. Select the *Profiles–Edit Data* menu.
2. Click on the Curve Data button. If you converted an object with arc data to a profile from the graphics you will already see curve data. If you do not have curve data all the values will appear with a zero in the edit fields.
3. Now you will enter your curve data based on the information you know. If you know the length, enter it in the **L:** edit field. If you know the K value enter it the **K:** edit field. After entering the known value hit the Tab key and to fill in the remaining edit fields.

The other option is to enter vertical curves based off AASHTO specifications.

1. Select the Vertical Speed Tables button on the Vertical Curve Data dialog box.
2. Select the desired speed table method and the corresponding speed.
3. Select the Create Vertical Curve button.
4. Highlight the desired curves and click on OK.

There are two small Left/Right Arrows on the middle left hand side of the dialog box. Use those arrows to jump from VPI to VPI. Below the arrows will be a warning message about curve data overlapping if the values you entered are impossible to design. This error needs to be resolved before continuing.

At this point your vertical data for centerline is complete and you can continue processing your design.

Typical Sections

What is RoadCalc Looking For?

Under the *Typical Section* menu you will build a prototype of what your typical section looks like. If your typical section varies in appearance you will want to create a typical for each occasion.

An example would be:

- Existing Curb and Gutter on both sides
- Intersection typical (no curb and gutter on either side)
- Driveway typical left side
- Driveway typical right side

If your section tapers or raise/lowers for an intersection, turning lane, or ditch, it should not require a new section, only a special alignment or profile. You will use special alignments and/or profiles to control that. This option will be discussed in detail in another document. You only need multiple sections to show multiple design surfaces. You will also want to take advantage of the Typical Section Library so you can store your template and not need to recreate it in every single project.

How Do I Create My Typical Section?

You will first need to add in the design surfaces as mentioned earlier under Cross-Sections. To do this, refer to the discussion about design surfaces under Cross-Sections.

The next step is to add a typical section name.

1. Select the *Typical Sections–Manage Typical Sections* menu.
2. Select the New icon.
3. Type in a name and description for your typical section.
4. Close the Manage dialog box.
5. Select the *Typical Sections–View Typical Section Graphics* menu.
6. This will load a Rct??***.dwg or dgn. At this point, you create your typical section drawing.

There are two ways to build your typical section. The first by using CAD functions and the second by using the Eagle Point tools found under the *Construct Typical Section* menu.

There are two views of a typical section, a cut view and a fill view. This allows you to draw different typical sections. This is used when your typical varies based on whether it is in cut vs. fill situation. However, 99% of the time the only variation that occurs is when a cut typical section will have a back ditch before it ties back to the original ground. If you use CAD functions just be sure to draw the section on the correct layer. Layer *Cut_Fill* draws in both views, layer *Cut* draws in the cut view only and layer *Fill* draws in the fill view only.

To use the Eagle Point tools:

1. Select the *Typical Sections–Construct Typical Sections* menu.
2. Verify the third icon in is depressed. This tells RoadCalc to draw in both cut and fill.
3. Select the second icon - Precision Input.
4. The bottom portion of the dialog box activates and asks for a start point. You have different choices available here. The crosshairs follow your Horizontal Alignment and Vertical Profile respectively, but in this drawing they are based off 0,0. The thing to remember is you know two things about the segment of the typical section you will draw, whether it's the dXdY, dXS, or any other choice listed. Type the capital letter of your choice. Each entry is a three-step process. If you make a mistake at any point in one step, finish the 3-step process and then type U for undo in the Prompt box. There is also an R option you use to reset the pen so you do not duplicate lines.
5. Type A when prompted for a start point. This is for absolute coordinates. You will use 0,0.
6. Type 0 and press Enter when asked for an X value.
7. Type 0 and press Enter when asked for a Y value.
8. Press Enter to accept the default of 0 when asked for a PT Code.
9. When prompted for Next Point, enter your known input type, which will be dXS for this example. Type XS and press Enter. This means you know the distance in the X direction as well as the slope of the line.
10. Type 12 and press Enter when asked for an X value. This will go to the right 12'. Left would be input as -12.
11. Type -2 and press Enter when asked for a slope value. This will go down at a 2%, up is a positive value.
12. Press Enter to accept the default of 0 when asked for a PT Code.
13. CAD should show a line drawn 12' at a -2% from the crosshairs. Enter your next known input. Remember that UP and RIGHT is positive, DOWN and LEFT is negative.

    If you make a mistake, finish the 3-step process and then type U for undo after the PT Code prompt. When finished drawing a line, use the Reset option so you do not draw duplicate lines. If you are at a certain point and want to snap to an intersection or endpoint in CAD, when prompted for next point you can use the Pick in CAD button and select the point. RoadCalc will still ask for a PT Code before it draws the line so make sure you press Enter at the PT Code prompt. You can use a combination of CAD tools along with Eagle Point tools to create a typical section.

    Listed below are the other icons available on the Construct Typical section dialog box.

Place PT Code	Snap PT Codes to endpoints of your typical section. This allows you to extrapolate information off those points upon running the design. Also plays a vital role in associating special alignments and profiles.
Mirror icons	Allow you to mirror your section from left to right or vice versa. Works great if your section is symmetrical about the centerline.
Define, Show and Clean icons	The key to your section. Whether you built your section through RoadCalc or through CAD you need to define the section.

How Do You Define Your Typical Section?

Once the Typical Section is drawn, select the Define Typical Section icon. This opens the Define dialog box, which lists all of the design surfaces you added earlier. Each surface represents a different portion of your section. You want to make sure you have at least 1 more surface in the list than you are actually going to hatch. The last surface defines the top of the earthwork quantities.

1. Highlight the first surface.
2. Select the Define button.
3. CAD prompts you to select a point. Pick a point inside the first surface.
4. It should display hatched in. If it is not hatched in, the surface is not closed.
5. Highlight the second surface.
6. CAD prompts you to select a point. Pick a point inside the second surface.
7. It should display hatched in. If it is not hatched in, the surface is not closed.

8. Continue this process until you have defined each of your surfaces.
9. Click on OK.
10. Select the Show icon. The typical section should hatch in completely without any errors. If so your typical section is defined correctly. If not consult Eagle Point Technical Support (1-800-477-0909) for more help.
11. To remove the hatching, select the Clean icon.

At this point your typical section is defined and you can continue processing your design.

Process

What is RoadCalc Looking For?

Under the *Process* menu are options that combine all the data you've entered so far. The entire goal is to be able to run the design. Before you can run the design there are few things you need to set up.

- **Associate alignments and profiles**
  This allows you to tag special PT Codes on the typical section to an alignment. An example would be when a lane tapers from 12 to 24' wide. Rather than creating multiple sections you create one typical section 12' wide and create an alignment that represents the taper as well as the 24' offset. This will be discussed more in another document.

- **Slopes Library**
  The Slopes Library is where you to create tie slopes back to your original ground. There are multiple types of tie slopes. To see what each one does select the ? (Help) icon on the Slopes Library dialog box. The slope types you create in this library will be available in every project. To apply them to this project, you will pull them from your library under the *Process–Manage Condition Table*s menu. RoadCalc has default slopes in the library so there is no need for you to create a new slope value for this example. So you continue processing your design without adding anything to your Slopes Library.

- **Manage Condition Tables**
  The Condition Tables option is where you apply your back slopes to tie back into the original ground. So from the outermost point on your typical, RoadCalc will tie back to your Original ground at the slope you specify in the Manage Condition Tables dialog box.

  1. Select the New icon.
  2. Enter a name for the condition, such as *apply 4:1 slopes*. You will apply 4:1 slopes.
  3. Highlight Cut on the left and then select the Modify icon to change the slope from 3:1 to 4:1. You can also double click the 0.00 under depth range.
  4. You want to tie from outermost point and you will not use the varying depth so the top half of the box can be left alone. On the bottom half, you will specify Single for the slope type and select Single 4:1 H/V for the slope. Leave PT Code set to Outermost Point.
  5. Select OK to apply the information to the cut typical.
  6. Highlight Fill on the left side and repeat steps 3-5 to setup a 4:1 slope in fill as well.

- **Edit Design Locations**
  Use Edit Design Locations to enter your starting station location based on the centerline. You will enter these locations for both your typical section as well as the conditions that you created. RoadCalc will process the condition you specify until the next condition or typical section is specified.

  1. Select the *Typical Sections–Edit Typical Sections* menu. You will first enter your typical section location.
  2. Select the New icon in the middle of the dialog box.
  3. Specify the station and typical that you want to process. The first station you enter should be the BOP of your alignment, or the first station where you want to process a typical section.
  4. Specify the transition type. Transitioning is used to stretch or transition from one typical to the next. In order to use this you will need at least two different typical sections as well as two station locations. An example would be if you created a 12' wide typical and also a 24' typical. You would enter station 0+00 as your 12' typical and station 1+000 as your 24' typical. If you specify Transition to Next Station, RoadCalc will gradually widen the 12' typical section so at station 5+00 your typical would be 18' wide. If you specify Do Not Transition, RoadCalc will process the 12' wide section up to station 9+99.99. Since you only have one section, leave it set to Do Not Transition.
  5. Select the OK button to accept your entry. If you click Apply it does the same thing but leaves the dialog box open. Select Cancel to close the box if this happened to you.
  6. You will now specify the condition table locations. Select the New icon at the bottom of the Edit design Location dialog box.
  7. Specify the station and slope type that you want to use. Again the starting station should match your typical section location. At this point if you had multiple conditions created you would enter those here.
  8. Select the OK button.

  As long as you have at least one Typical Section location specified and one Condition Table Location specified, you can process the design. The number of typical section locations and conditional table locations will vary on the amount of changes in your design from start to finish. If you are in a rural type location, you may only have one typical section, whereas

if you're in an urban reconstruction, you may have 15 different typical section locations. The reason the Slopes and Typical Sections are processed separately is because your typical may change but the tie slope doesn't. Usually your stationing will be the same in both criteria sections.

- **Run Design**
  This is where RoadCalc does all the work. It will take your typical section(s) and condition(s) and process them along the alignment. At this point, all the design criteria, alignment, cross-section, profile, and typical sections, should be entered. If you are missing any of this data you will have problems trying to run design. RoadCalc helps somewhat in that area because when you select the Run Design command, RoadCalc shows you the starting station for your alignment, profile, and cross-sections. If they do not look correct they need to be corrected.

  1. Select *Process–Run Design*.
  2. Enter the station range you want to process. The default is your alignment stationing so you will want to keep those values on the initial process.
  3. Select the Method. For this example, leave it set to Use Design Locations.
  4. Select Automatic.
  5. Click on Run.

  At this point, RoadCalc processes your design and displays a Process Warnings dialog box if there are any problems. If the Warnings dialog box does not display, RoadCalc had no problems with any of your design criteria.

  Other options on the Run Design dialog box are Step through Warnings and Step through All. These options allow you to tweak your base design from what you originally specified. If you choose Step through Warnings, RoadCalc only opens the Step Through dialog box on problem stations. Step through All allows you to alter any station you have processed. You can change the back slope value or condition type from station to station. Select the Help icon for more information on this. This should allow you to then continue your design into the *Output* menu where you can look at Cross-Sections, Plan & Profile sheets, and quantities.

Output

What is RoadCalc Looking For?

- **Cross-Section Sheets**
  RoadCalc is looking to generate your cross-section sheets with your own custom settings, all predefined so when the sheet is generated all the settings look just the way you want them too.
  1. Select the Output–Cross-Section Sheets menu.
  2. Customize your Sheet and CAD Settings.

     Using Sheet Settings, you can customize the drawing (Rcxplt.dwg) that RoadCalc is using. If you place a border in that drawing, every sheet you cut will automatically show that border.

     Use the CAD Settings drop list to adapt the sheets to your CAD standards.

  3. Once you have selected your settings, select the New icon.
  4. Specify the needed station range and click on OK. This will generate as many sheets as needed to fit all your sections.
  5. Once the sheets are generated, highlight the sheet you want to look at and click on the View icon.

- **Plan and Profile Sheets**
  RoadCalc is looking to generate your P&P sheets using your predefined custom settings. This way, when the sheet is generated all the settings look just the way you want them to. When RoadCalc cuts a sheet it is actually opening a paperspace drawing and creating two viewports. These viewports cross-reference the main drawing file as well as the profile dwg (rcprf???.dwg). You will want to make sure you've saved your changes in those two drawings.

  1. Select the *Output–Plan and Profile Sheets* menu.
  2. Customize your settings.

     Using Sheet Settings, you can customize the drawing (Rcplap.dwg) that RoadCalc is using. If you place a border in that drawing, every sheet you cut will automatically show your border. If you do insert a border in this drawing, make sure you place it in paperspace

     Use the CAD Settings drop list to adapt to your standards.

  3. Once you have selected your settings, select the New icon.
  4. Specify the needed station range and click on OK. This will generate as many P&P sheets as needed to show all your sheets.
  5. Once the sheets are generated, highlight the sheet you want to look at and click on the View icon.

If you make any changes to the plan or profile drawing they should automatically show up on any existing P&P sheets you have cut. If the location isn't quite right use the select the *Output–Adjust Plan and Profile Sheets* menu.

- **Breaklines from PT Codes**
  If you placed PT Codes on your typical section, RoadCalc will create a polyline in your plan drawing at the processed elevation or at zero depending on your settings when building your typical section. To do this, select the PT Code you placed to extract and select the correct surface.

- **Profiles from PT Codes**
  If you placed PT Codes on your typical section, RoadCalc will create a polyline in your profile drawing at the processed elevation when building your typical section. To do this, select the PT Code you placed to extract and select the correct surface.

- **Catchlines**
  RoadCalc will generate broken polylines that show where you tied back into the original ground. It will also show whether it's in cut or fill based on color (cyan is fill, yellow is cut).

- **3D Faces**
  RoadCalc will generate 3D faces of your top design surface out to your corridor edge. These faces can be shaded and used for presentation purposes. You can customize the colors by selecting the CAD Settings icon.

- **Inherit Elevation from Design**
  RoadCalc will raise any nodes to the elevation of the design. You select the nodes to be changed and RoadCalc will inherit your design elevation. Useful tool for exporting points for staking purposes.

- **Create Surface Model from Road**
  This will automatically create an Eagle Point surface model of your design.
  1. To do this, select the three yellow folders to the right of the Road Surface Model.
  2. Select the Mew icon on the Manage Surface Models dialog box.
  3. Type in a new name.
  4. Click on OK.
  5. Click on OK and Eagle Point will create a surface model.

  Tip: You might want to open Surface Modeling and select the Triangulate–Merge Surface Models menu. Merge the proposed surface model to the original for proposed contours of your entire site.

- **Printouts**

  RoadCalc will print out whatever data might be needed to your printer or file based on the printer settings you specified under the *File–Print Setup* menu.

- **Volumes**
  The biggest printout will be the volumes printout. This allows you to view your end area volumes for both the pavement surfaces and your earthwork quantities. There are multiple settings such as compaction factors and pay units that can be set. Refer to the Help icon for more information on this.