RESEARCH DIVISION

MDOT ProVAL Software User Guide

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Table of Contents

Preface i

How This Book Is Organized i

Acknowledgments i

Introduction 1

Installing Software 1

Starting Software 7

Software Help (User's Guide) 8

Options Tab 9

Importing Templates 11

Profile File Manipulation 13

New File (Project) 13

Open Existing (Project) 15

Zoom In on Profile 17

Zoom Out on Profile 18

Display X and Y Coordinates 18

Change Units on Profile 19

Using Editor 20

Cropping Profile 20

Save a Cropped File 22

Open Cropped File 23

View Cropped File 24

Smoothness Assurance 25

Open File for Analysis 25

Select Appropriate Template 26

Apply 250mm Filter & Histogram Settings 27

Short Continuous Analysis 29

Long Continuous Analysis 31

Reporting for Smoothness Assurance 33

Grinding Simulation 34

Long Continuous Grinding Comparison 36

Short Continuous Grinding Comparison 38

Quality Assurance Check 41

Processing Data 41
Reporting for Profiler Certification 45
Pay Incentive Calculation Procedure 46
Processing Data 46
Spreadsheet Inputs 47
Power Spectral Density 48
Processing Data 48
PSD Examples 51
Example 1 51
Example 2 52
Troubleshooting 53
Sending the log files 53
Remove potentially corrupted files 53

Preface

This manual provides a step by step process of operating and understanding the ProVAL (Profile Viewing and Analysis) software program. ProVAL is an engineering software application used to view and analyze pavement profiles. The analyses of interest to Mississippi DOT and paving contractor personnel are described in this manual. The ProVAL software is developed by the Transtec Group through a contract with the US FHWA, Western Federal Lands, and the LTPP. This software is free of charge and can be downloaded from the Transtec Group website (www.roadprofile.com). Refer to the ProVAL Installation section of the ProVAL 3.4 User's Guide for hardware and software requirements for this program. **This guide uses specific files in each example. However, the same principles apply to any files being used for that individual task within the ProVAL software.**

How This Book Is Organized

This book is divided into multiple sections that provide the user with a basic step by step guide to using ProVAL 3.4. Each section explains a function of the software and how it can be used.

The Introduction explains how to download and open the software. It also shows information about the User's Guide and various other options to help get familiar with ProVAL.

Profile File Manipulation shows how to open a file, zoom in and out on a profile, and change units.

The Using Editor section explains how to crop a profile and save a file.

Smoothness Assurance (SAM) is a ProVAL analysis function that produces graphs for the MRI of a profile. A grinding simulation function is also included in this section.

Quality Assurance Check is to ensure the contractor's profiler is accurate before it is used to collect on a project. This function compares the contractor's profile of a control section to MDOT's profile of that same section.

Power Spectral Density (PSD) is a function that displays a graph of a profile's wavelength. There are PSD examples of typical pavement irregularities included in this section.

Acknowledgments

Milady Howard, Jordan Whittington and Matthew Strickland authored, in cooperation with the FHWA, a Mean Roughness Index (MRI) specification study. This study included data collection and analysis recommendations for MRI.

Alex Middleton, Alex Collum and Alan Hatch collected and processed data for the MRI pilot project.

Brian Schleppi of the Ohio DOT provided ProVAL examples and other information relating to MRI.

The Transtec Group, Inc. provided the ProVAL software that is used for this project, which was funded by FHWA, Western Federal Lands, and LTPP.

Introduction

The International Roughness Index (IRI) is a statistic used to determine the amount of roughness in a measured longitudinal profile. IRI values are meant to represent the ride quality experiences by passengers sitting in the left and right back seat. IRI is highly correlated to vertical passenger acceleration. A mathematical model is used to calculate the total vertical movement by one wheel of a vehicle as it travels over the pavement. The IRI values represent the total vertical suspension travel divided by distance (in/mi or m/km). An IRI value is representative of a single longitudinal profile, usually a wheel path of a travel lane. Mean Roughness Index (MRI) is the average of the IRI values from both wheel path profiles of a travel lane, therefore producing one roughness value for the entire lane. Two base lengths are used to evaluate pavement smoothness. The long interval (528 feet) is used to determine the overall quality and the short interval (25 feet) is used to guard against any minor imperfections on the pavement.

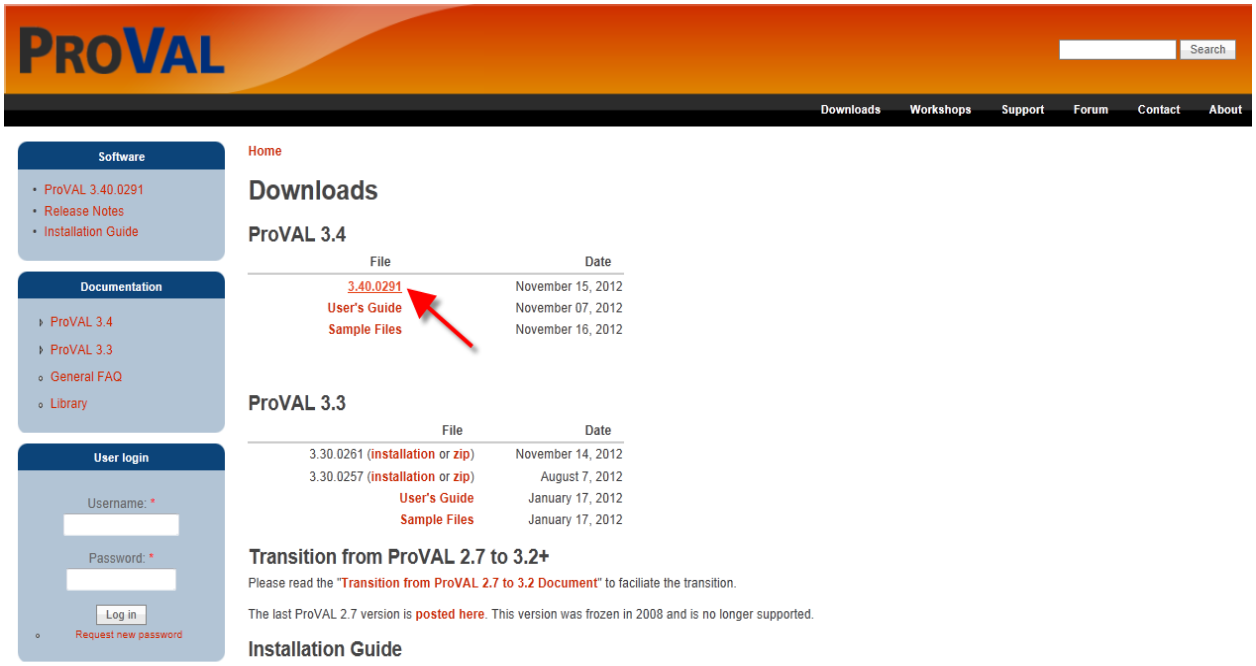
Installing Software

1.1 Go to the Transtec Group website (http://www.roadprofile.com/) and download the latest version of ProVAL.

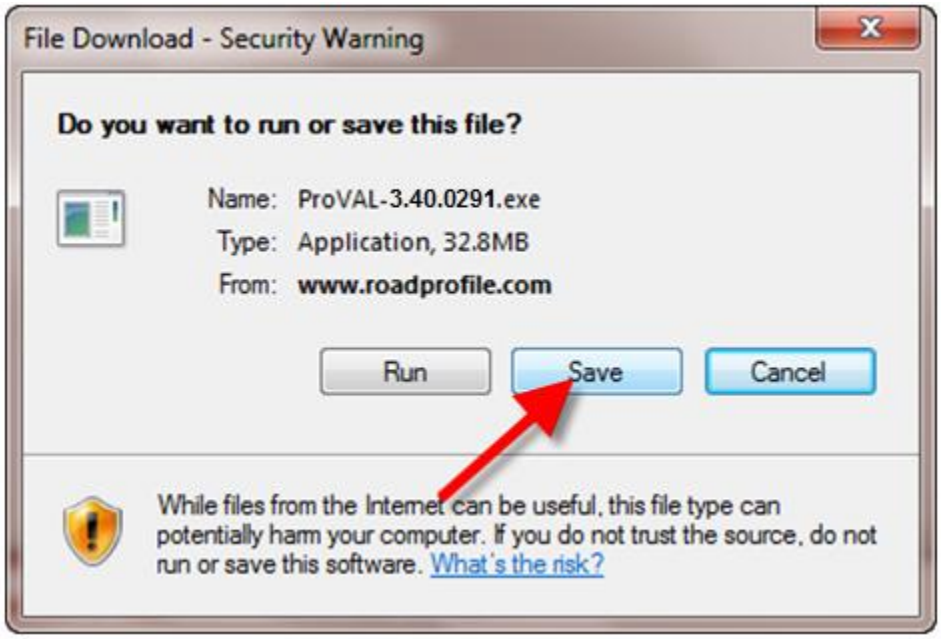
1.2 For hardware and software requirements, refer to page 2 of the Transtec Group User's Guide which can be downloaded as displayed in section 1.4 of this document.

1.3 Click **Downloads** as shown below.

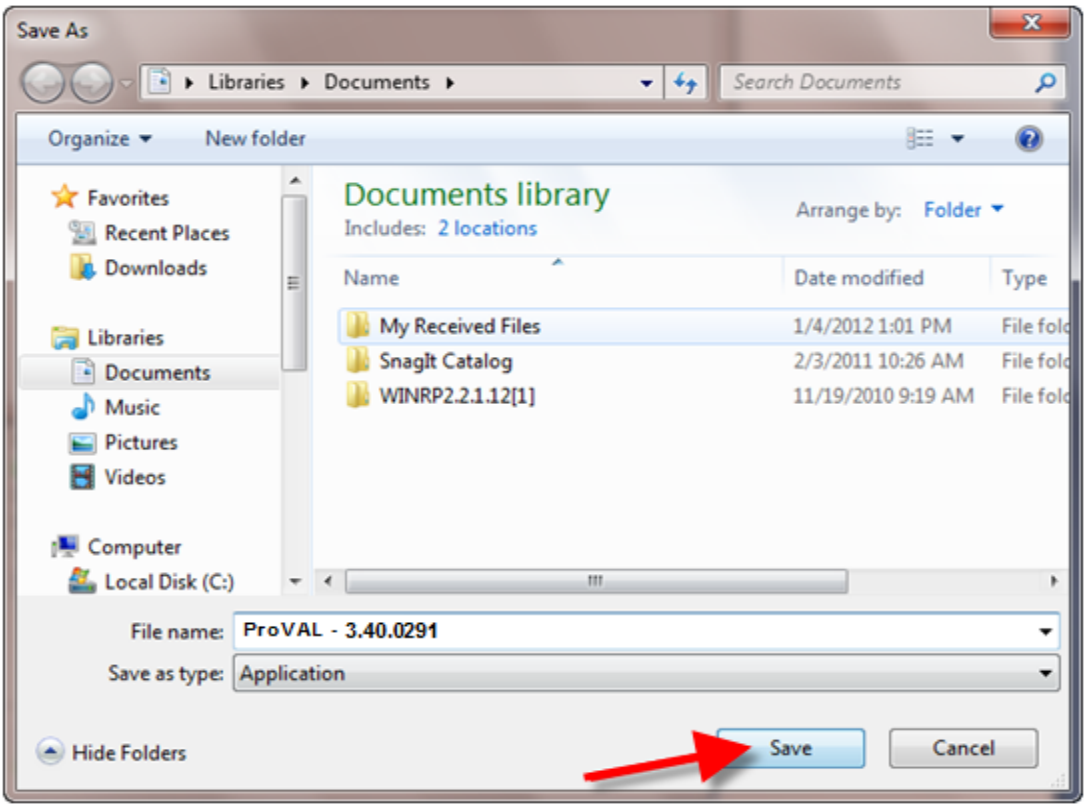
1.4 Click on the latest version of the ProVAL application for installation. The Transtec Group User's Guide can be downloaded by clicking on the link just below the latest version of the application.



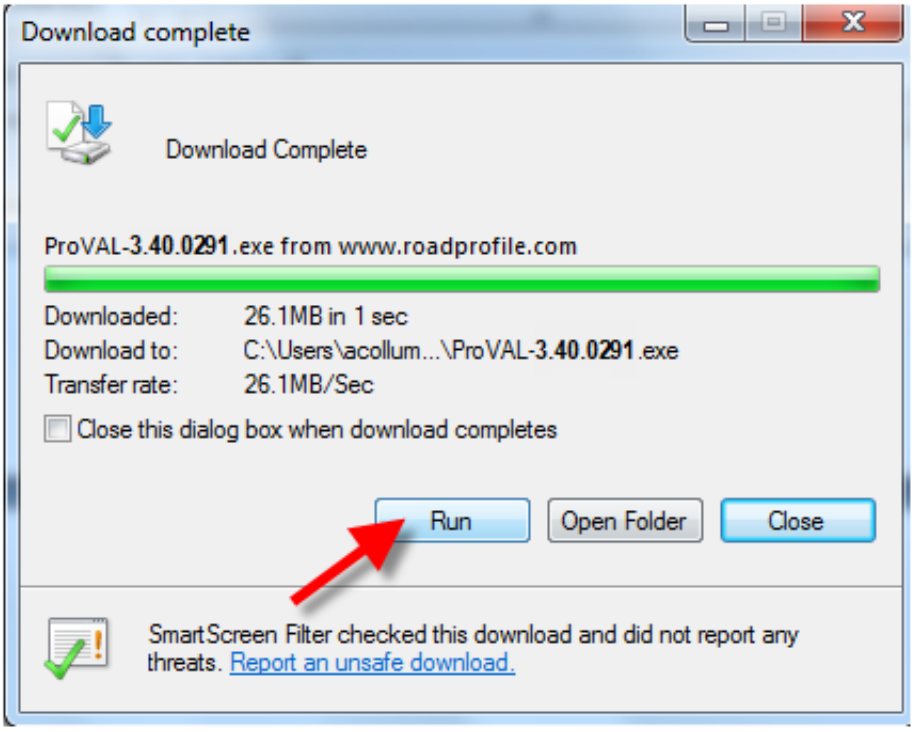
1.5 Click **Save**.



1.6 Click **Save**.

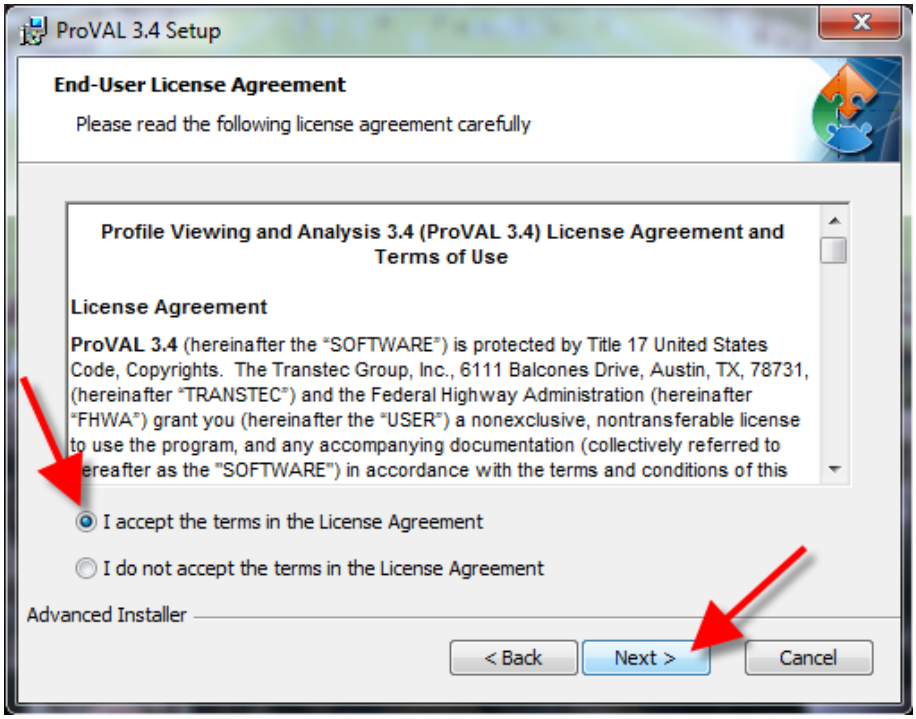


1.7 Once download has completed, click **Run**.

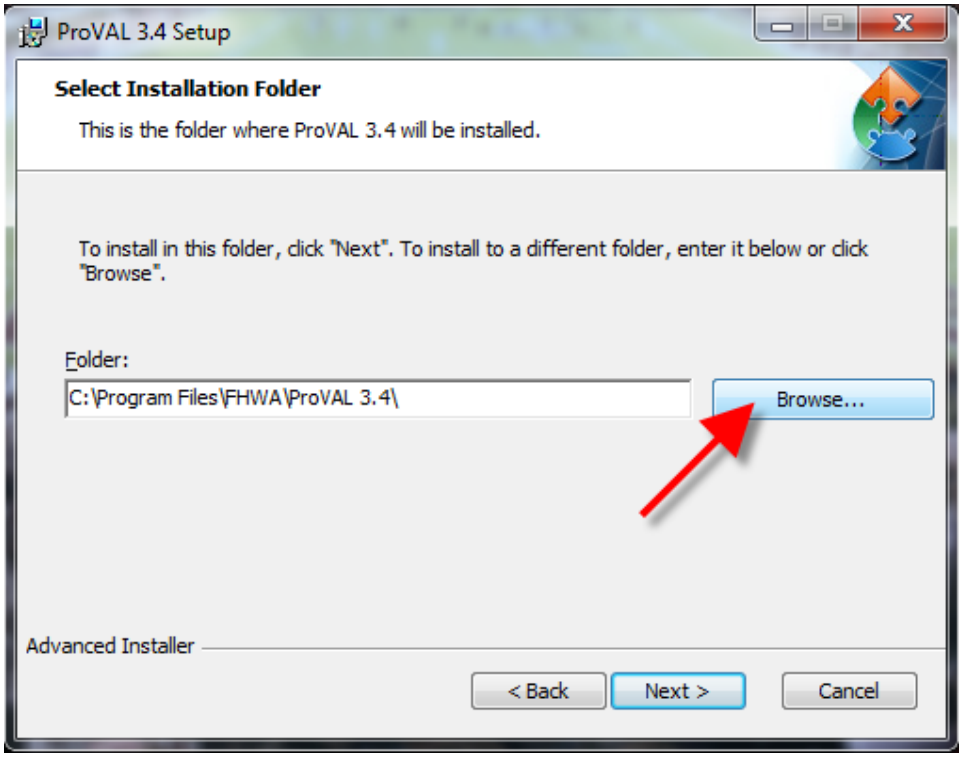


1.8 Click **Next**.

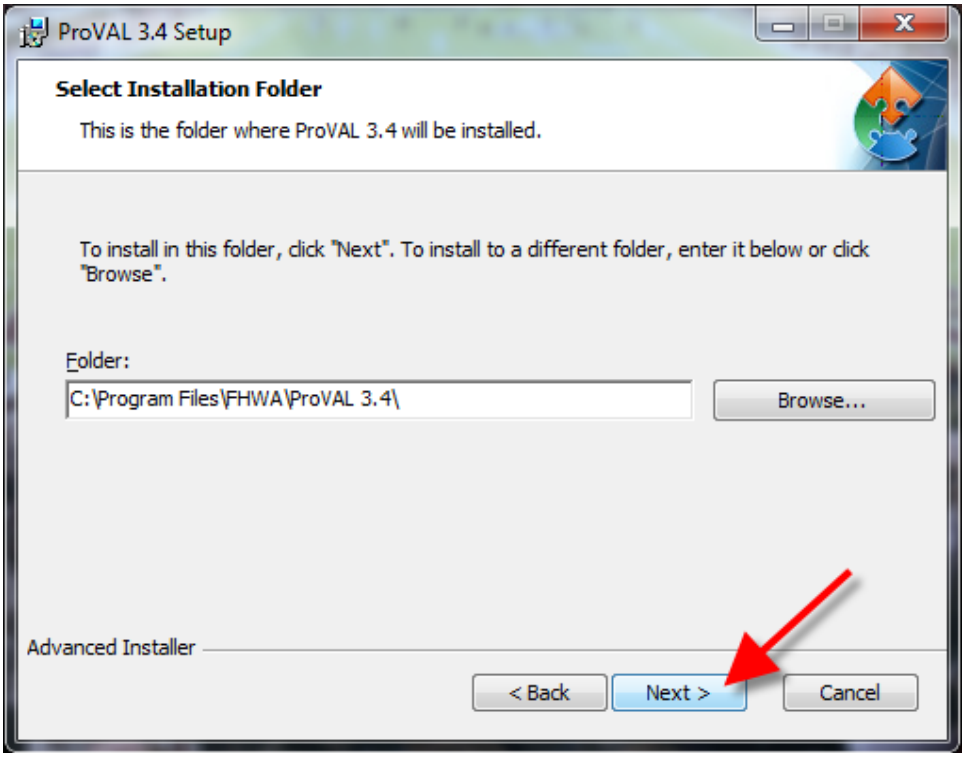
1.9 Read the license agreement. If you agree with it, select **I accept the terms in the License Agreement** then click **Next**.



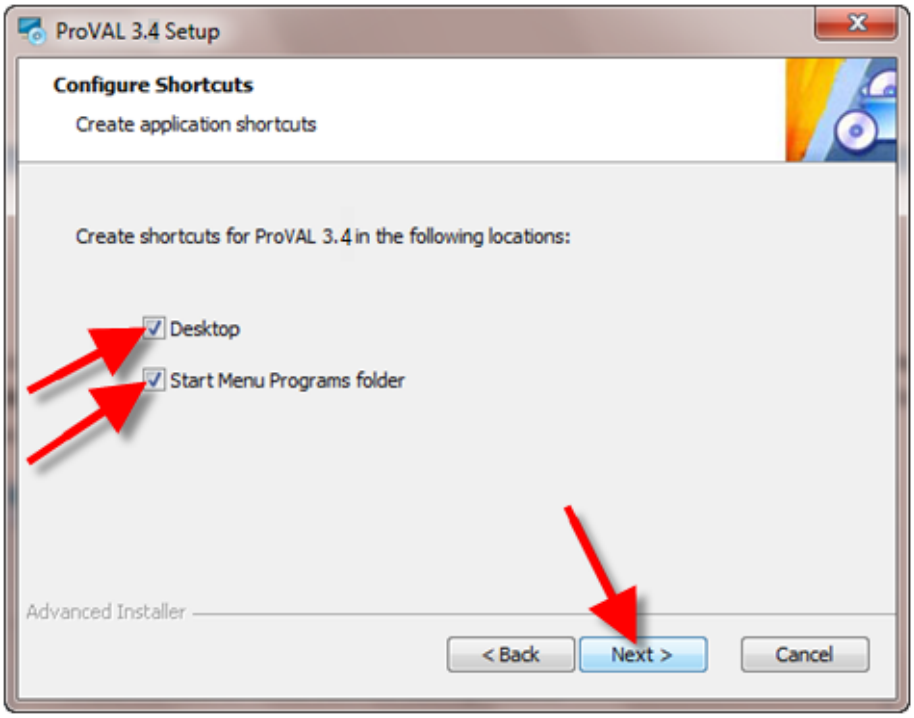
1.10 If you do not want to install the application in the default folder, click **Browse** to find a location to install the ProVAL application.



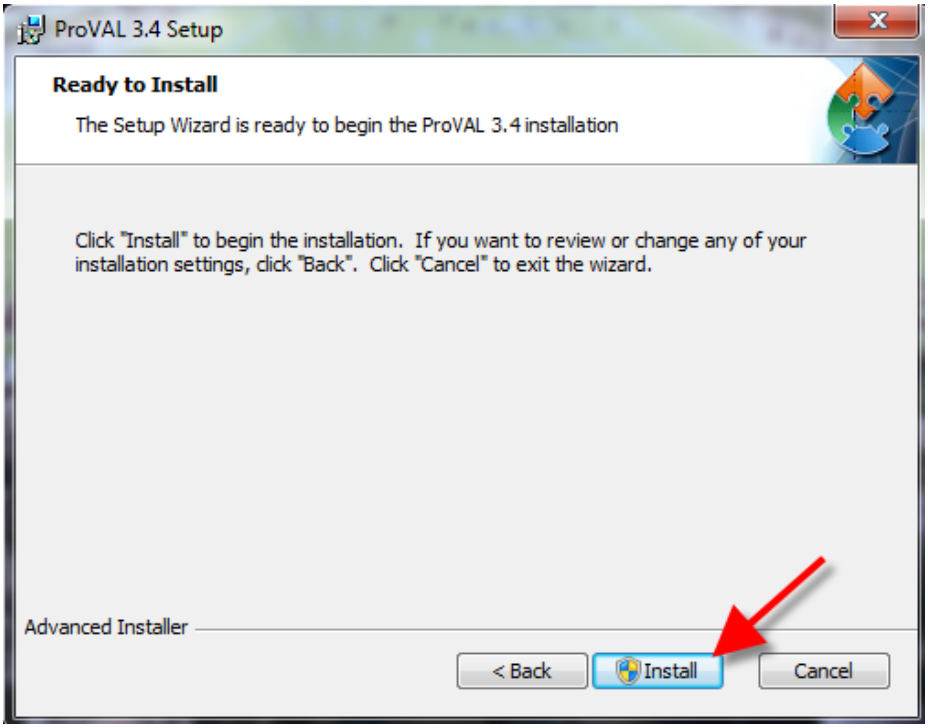
1.11 Once an installation folder is selected, click **Next**.



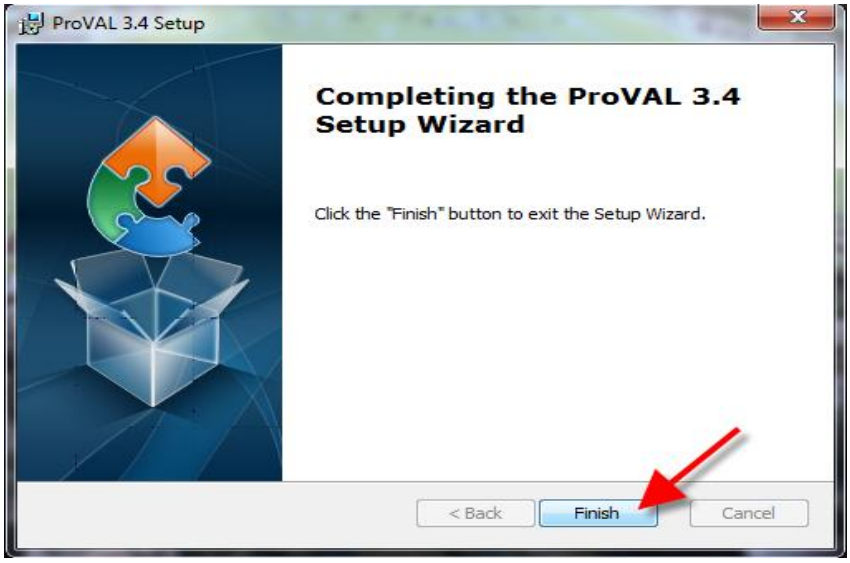
1.12 To create shortcuts for the ProVAL application, check the boxes next to **Desktop** and **Start Menu Programs folder**. This will create a ProVAL icon on the desktop screen and add a ProVAL folder to the start menu. Then click **Next**.



1.13 Click **Install** to begin installation process.



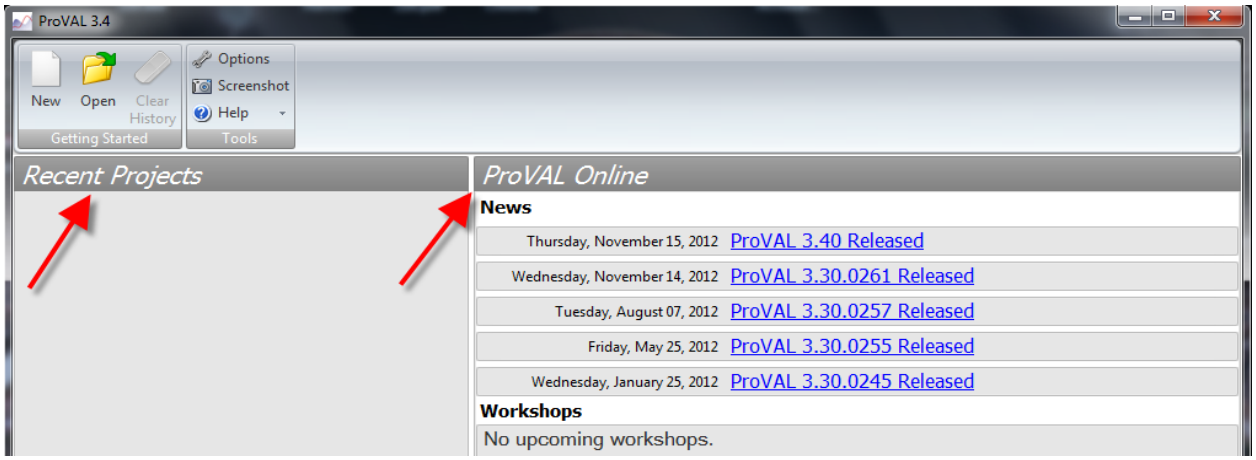
1.14 Click **Finish** to complete the installation process. If the Launch ProVAL 3.4 button is checked, the application will start after you click the finish button.



Starting Software

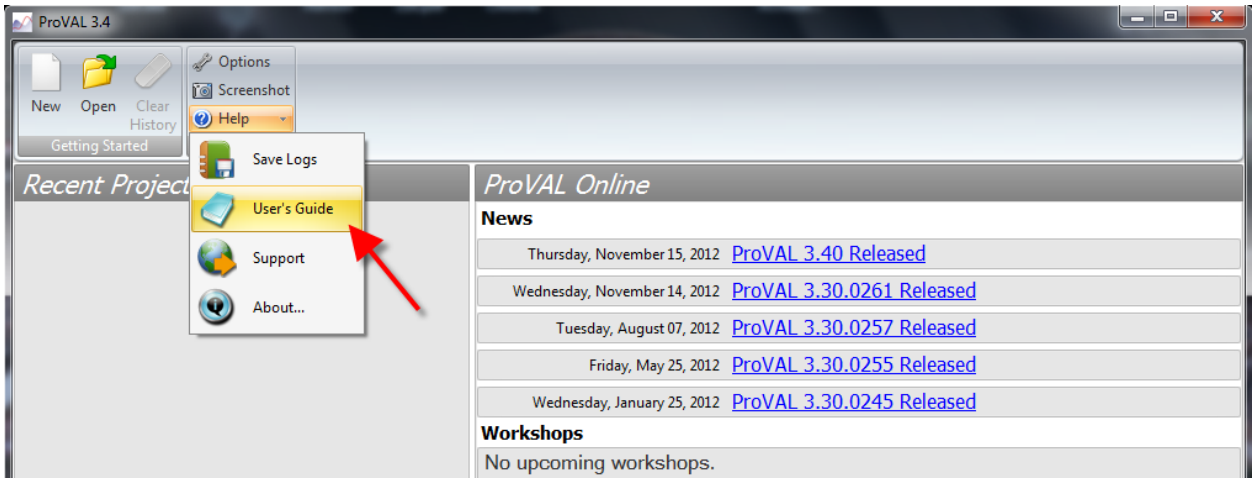
1.15 Once ProVAL is downloaded and installed, locate the ProVAL 3.4 icon on your desktop and double click it to open ProVAL 3.4.

1.16 ProVAL opens to the starting screen and is ready for a user to open a file. The two main sections on the screen are Recent Projects and ProVAL Online (if connected to web). ProVAL Online displays News (updated versions of the software) and Workshops (training classes scheduled).

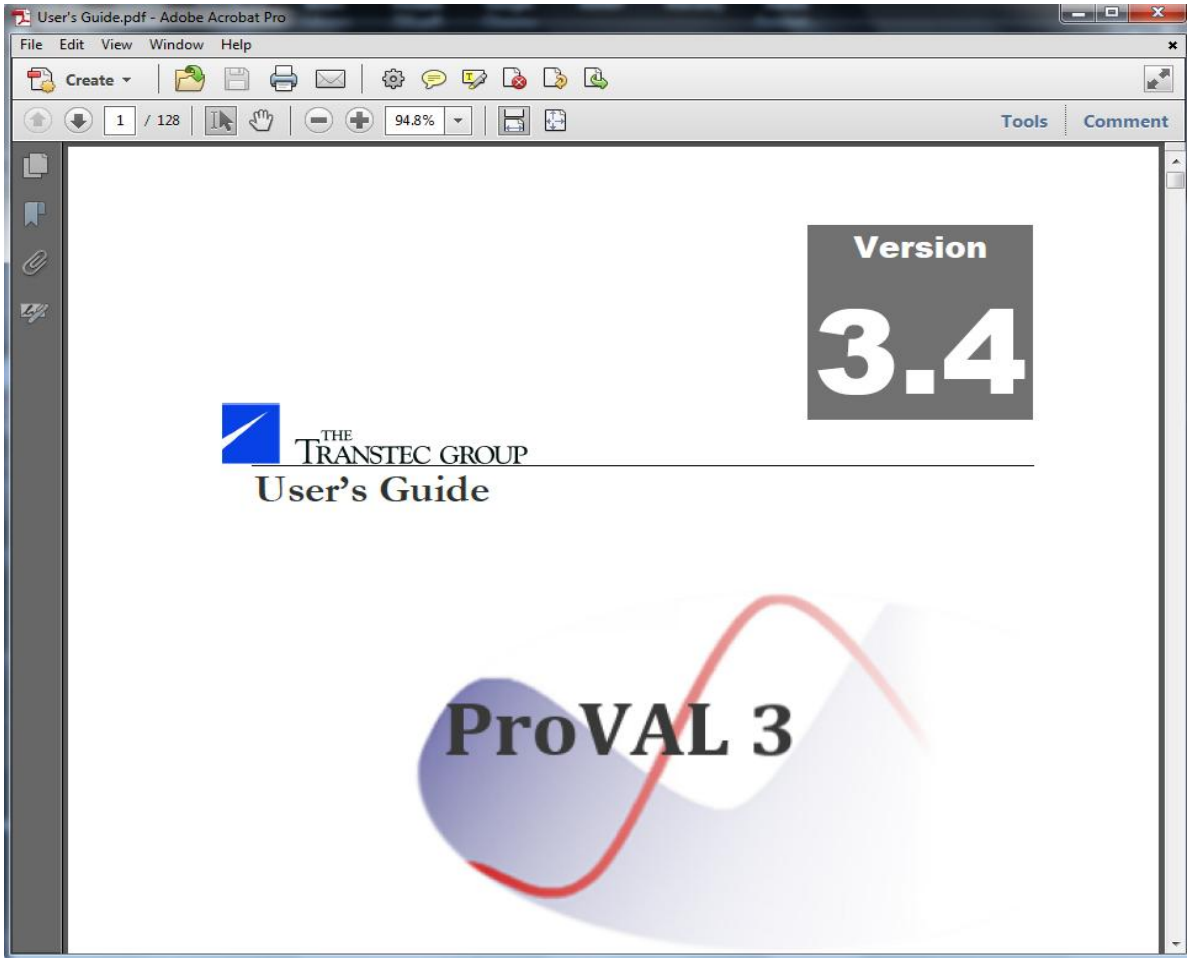


Software Help (User's Guide)

1.17 For a more in depth look into ProVAL 3.4, click the **Help** tab and select **User's Guide**. *Note: Refer to pages 13-42 in the Transtec Group User's Guide for help with getting started.*



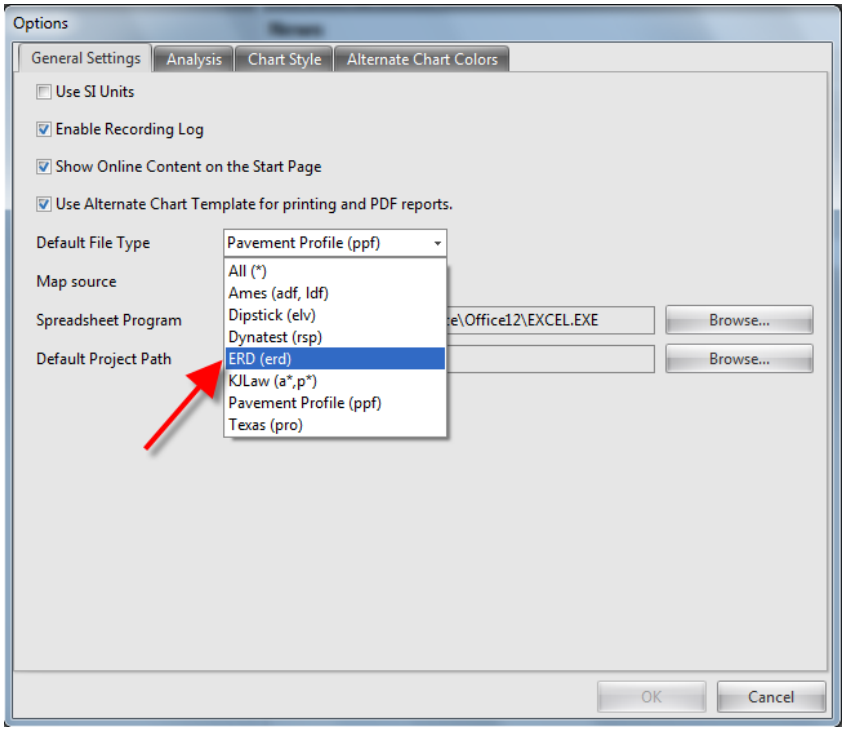
1.18 The User's Guide will appear on the screen in PDF format. *Note: The Transtec Group 'User's Guide' is not to be confused with this User's Guide that MDOT has provided all trainees.*



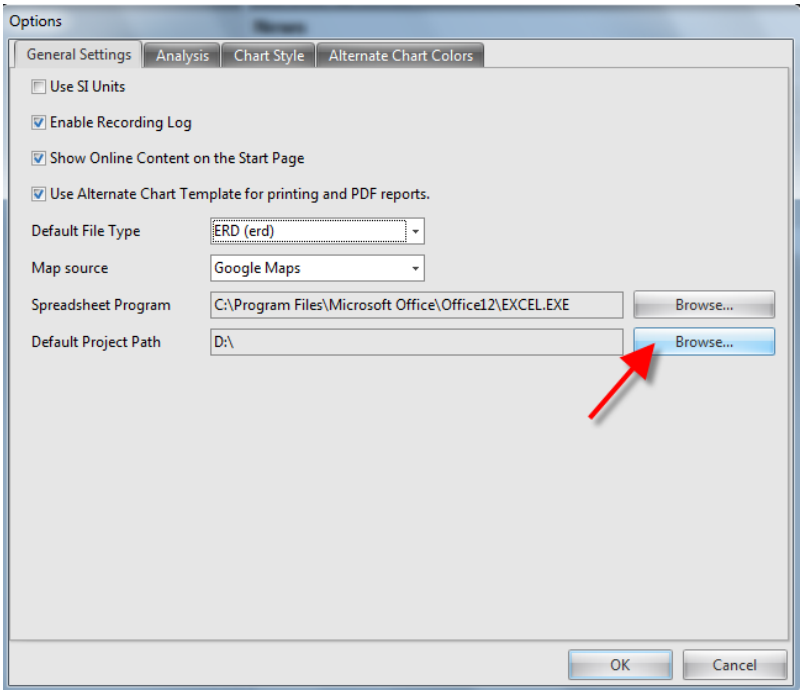
Options Tab

1.19 Click **Options** in the **Tools** group. This feature allows you to change default settings and import templates.

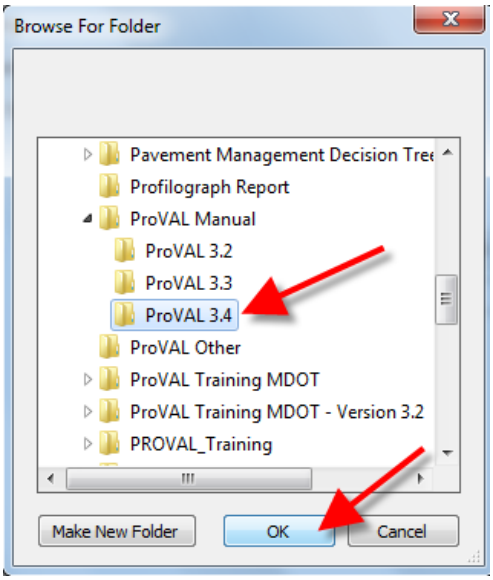
1.20 Select **ERD (.erd)** from the **Default File Type** dropdown menu. Contractors will submit .erd files to MDOT project engineers so this will be the primary file type imported into ProVAL.



1.21 Click **Browse** next to **Default Project Path** to create a default path for opening files. This will allow you to easily open files from a folder that contains the .erd files for all of your projects.

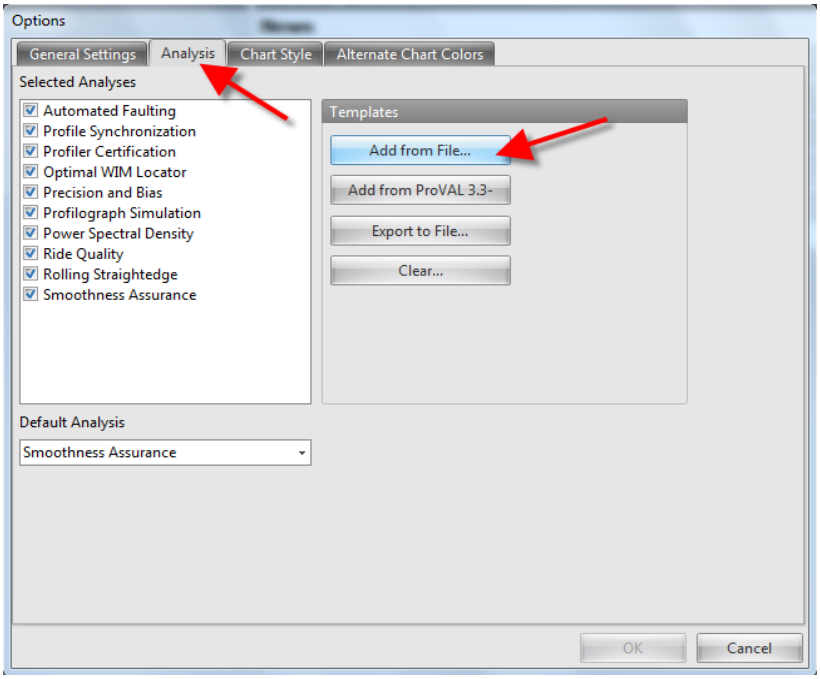


1.22 Select the desired project folder and click **OK**.

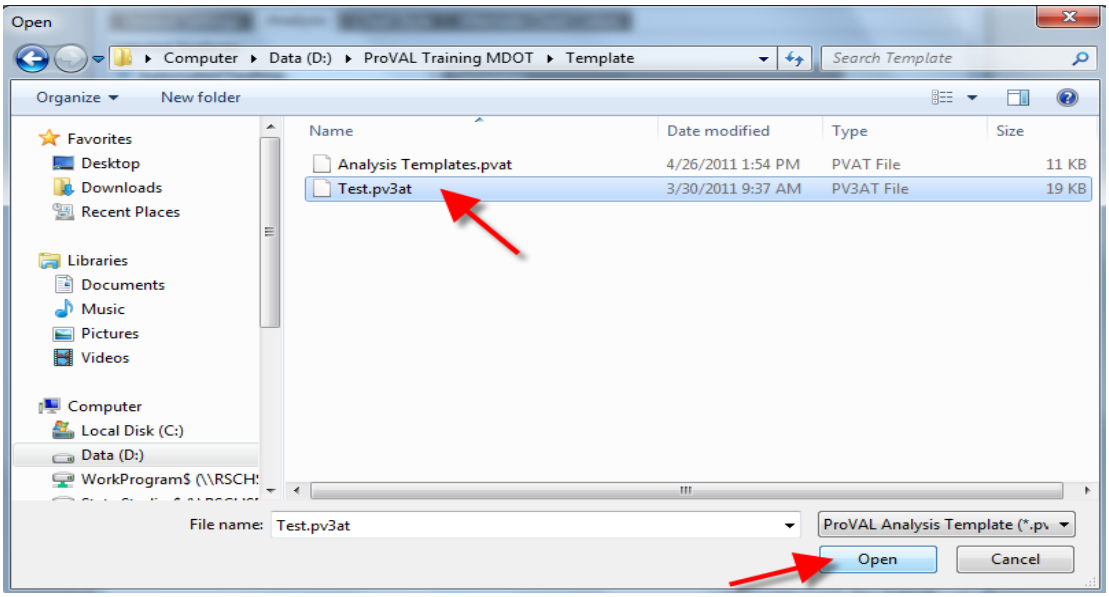


Importing Templates

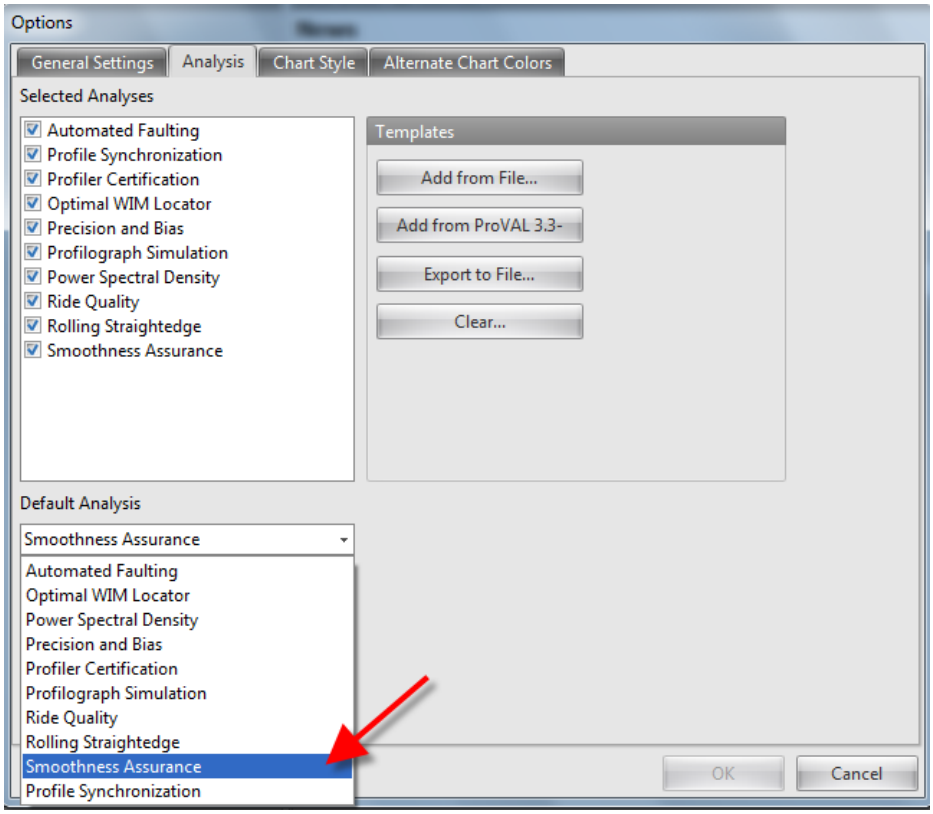
1.23 Click the **Analysis** tab and select **Add from File…** under the **Templates** heading. These templates are created based on the MDOT MRI specification. There are three categories of pavement construction. Each category has MRI values that the pavement's profile must meet. Once the template is imported, the user will select the correct category for the pavement being analyzed (see selecting template in section 4.3 on page 26). *Note: Refer to page 63 in the Transtec Group User's Guide for more information on templates.*



1.24 Locate the **Test.pv3at** template and click **Open**.



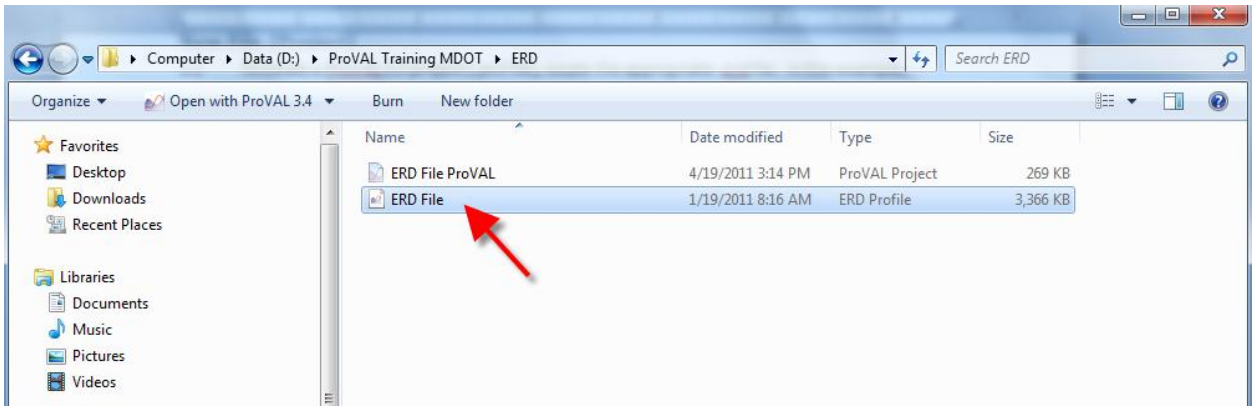
1.25 The template is imported and ready to be used when analyzing a project. Set the **Default Analysis** tab to **Smoothness Assurance** (this will be the most used ProVAL function).



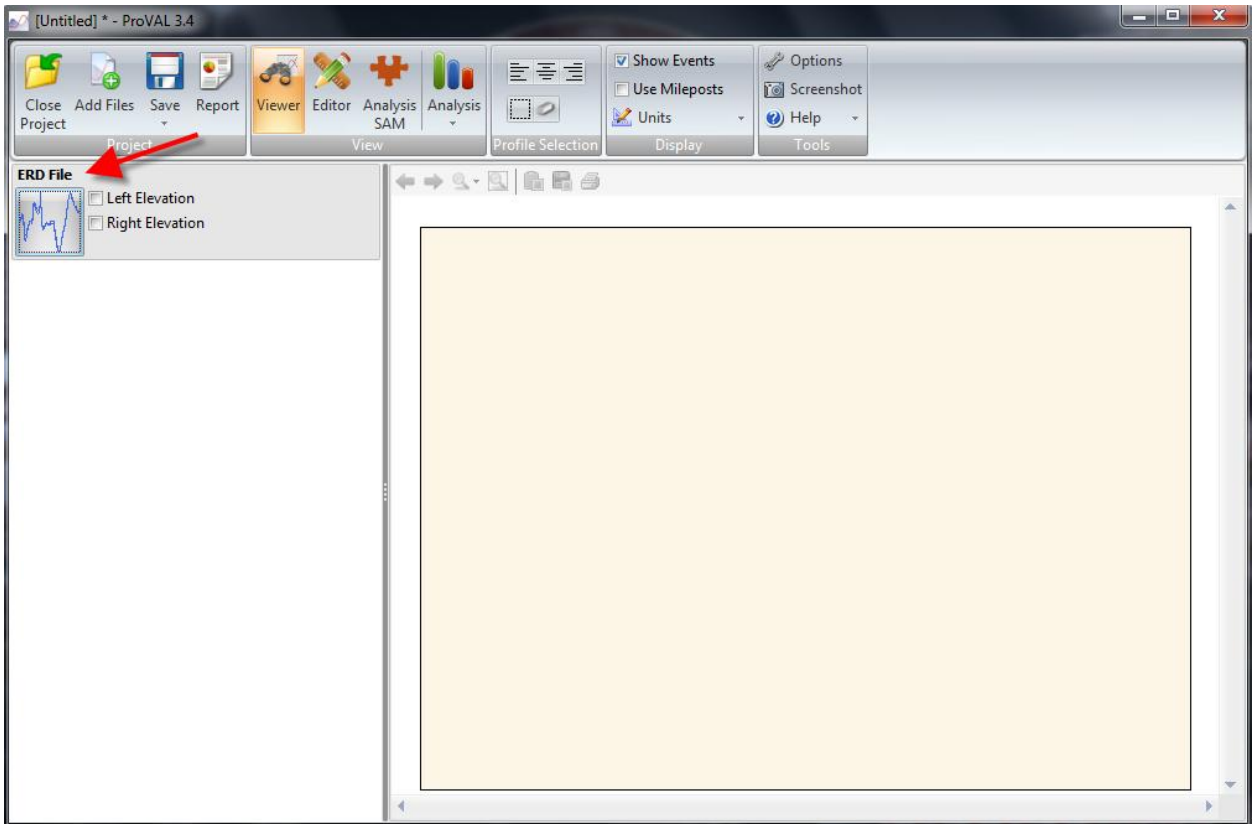
Profile File Manipulation

New File (Project)

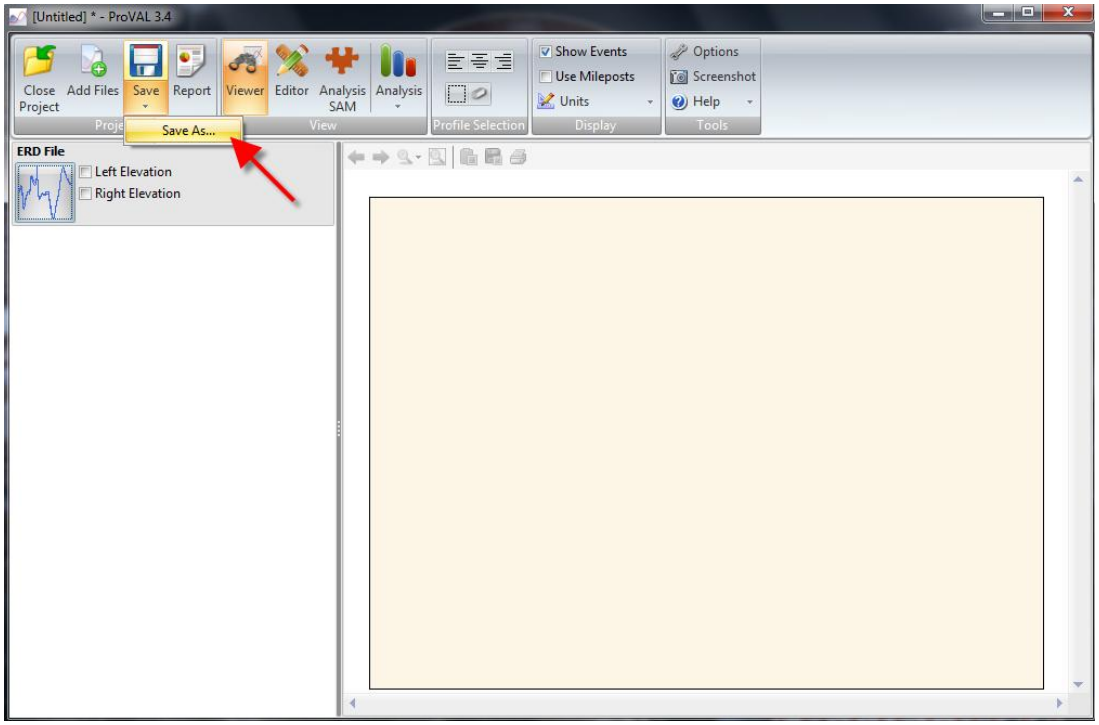
2.1 To create a ProVAL 3.4 project (.pvp file), import the appropriate .erd file. In this example, double click **ERD File** from the **ProVAL Training Folder**. The ERD File will automatically open in the latest version of ProVAL that is installed on your machine.



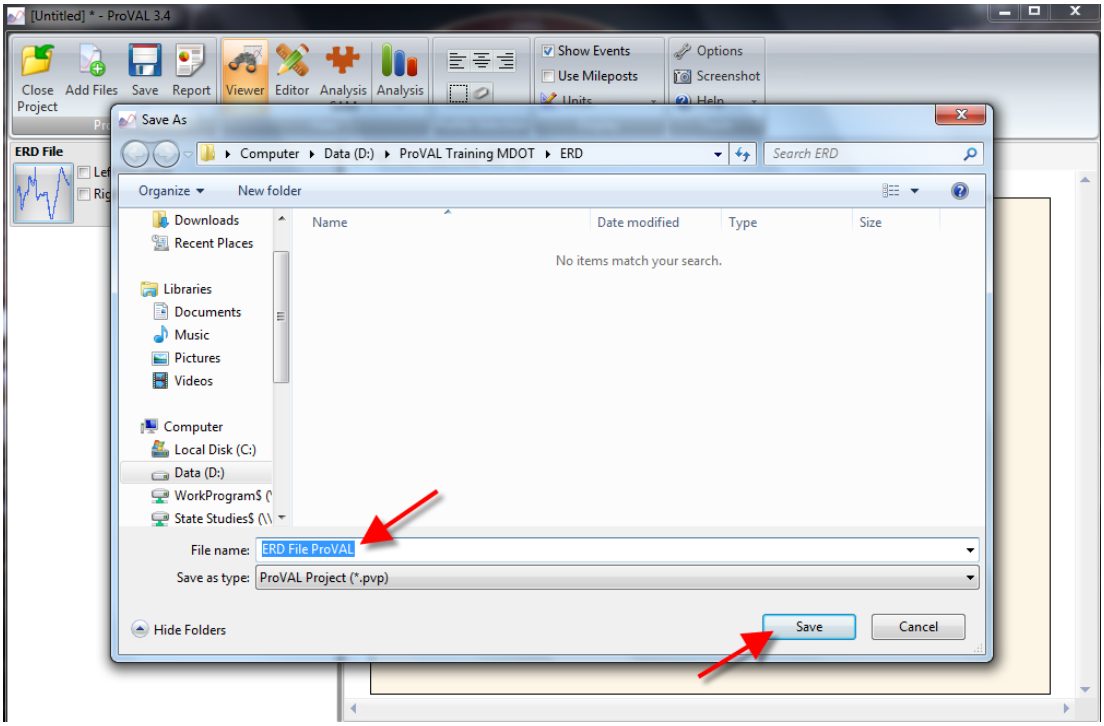
2.2 Shown below is the **ERD File** shown after it opens in ProVAL 3.4.



2.3 To save the file as a ProVAL 3.4 Project (.pvp file), select **Save As** from the **Save** dropdown menu.



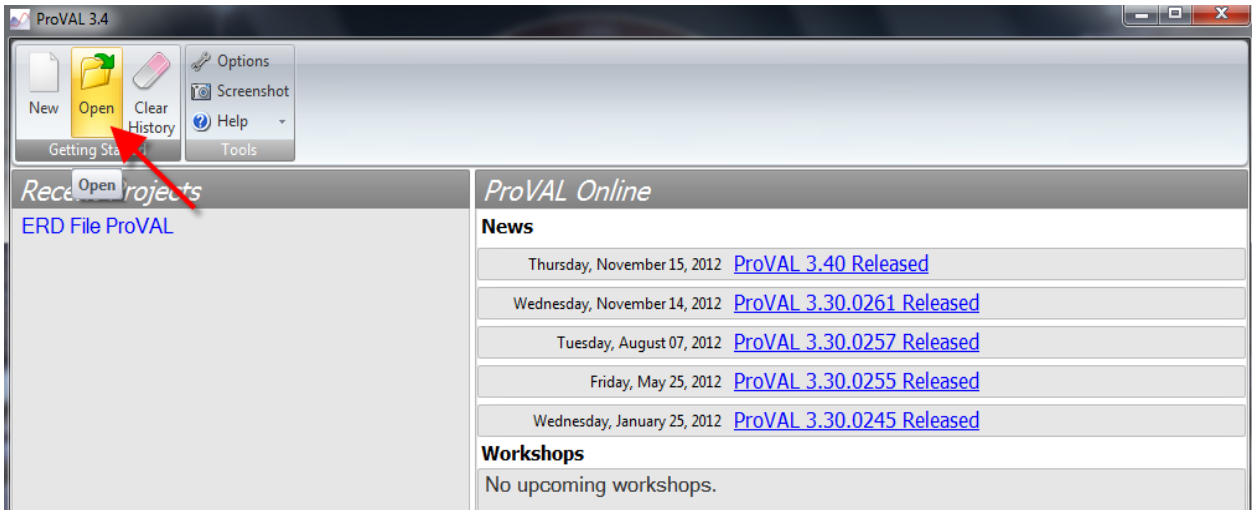
2.4 Choose a File name and folder to save the project, then click **Save**.



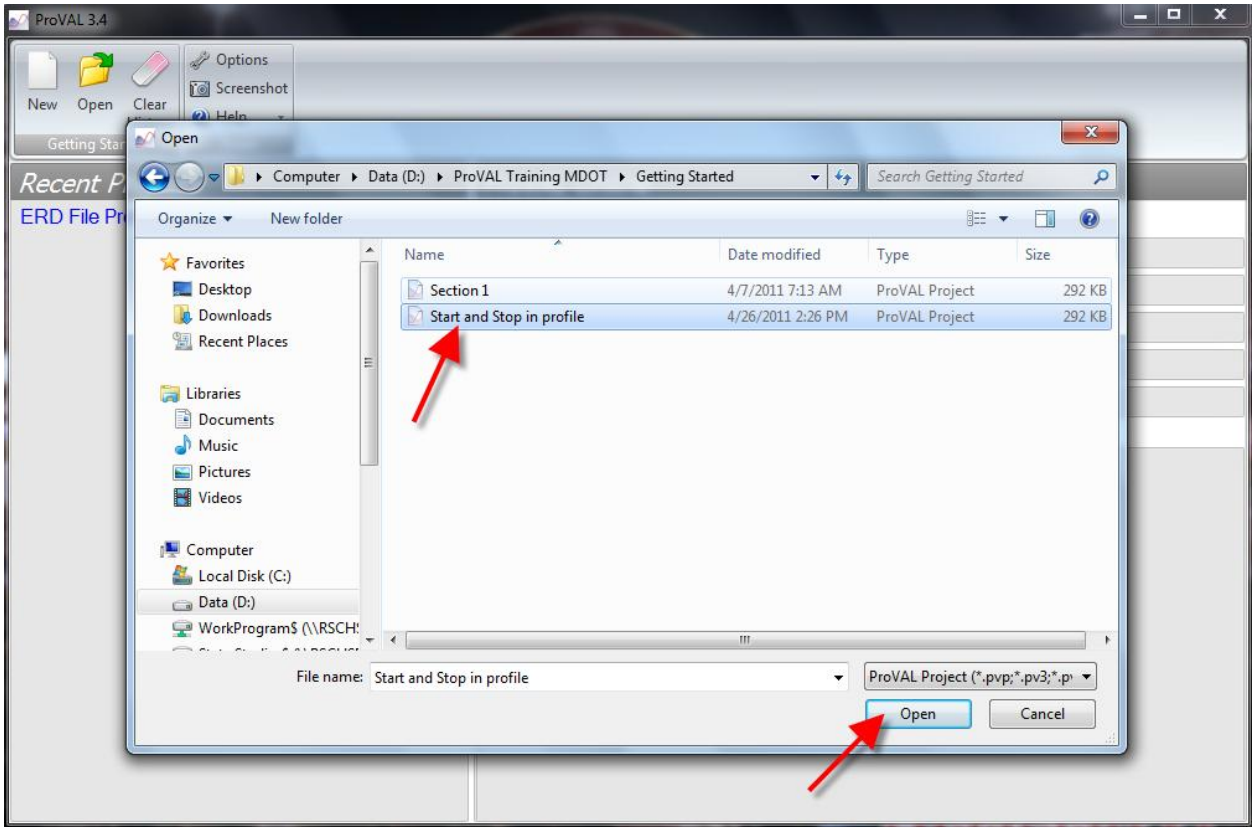
2.5 Project is saved as a .pvp file (ProVAL Project). Close the project (top left of screen) after saving.

Open Existing (Project)

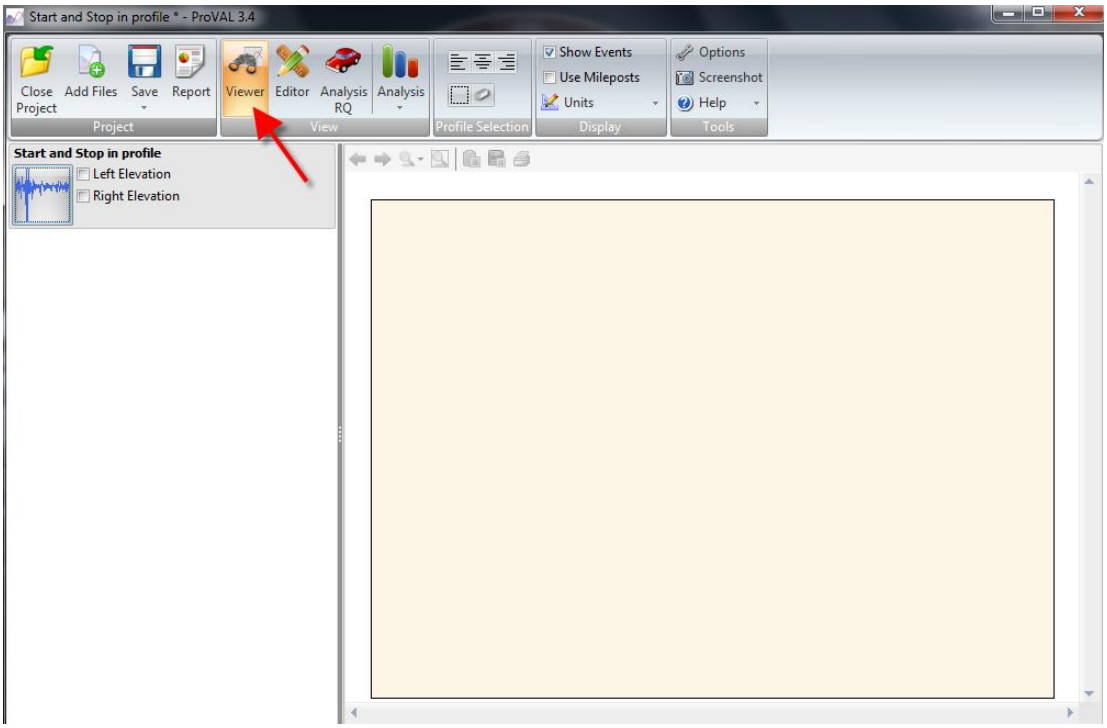
2.6 Click the **Open** button in the **Getting Started** group to open a file. *Note: Refer to pages 43-50 in the Transtec Group User's Guide for more information on this section.*



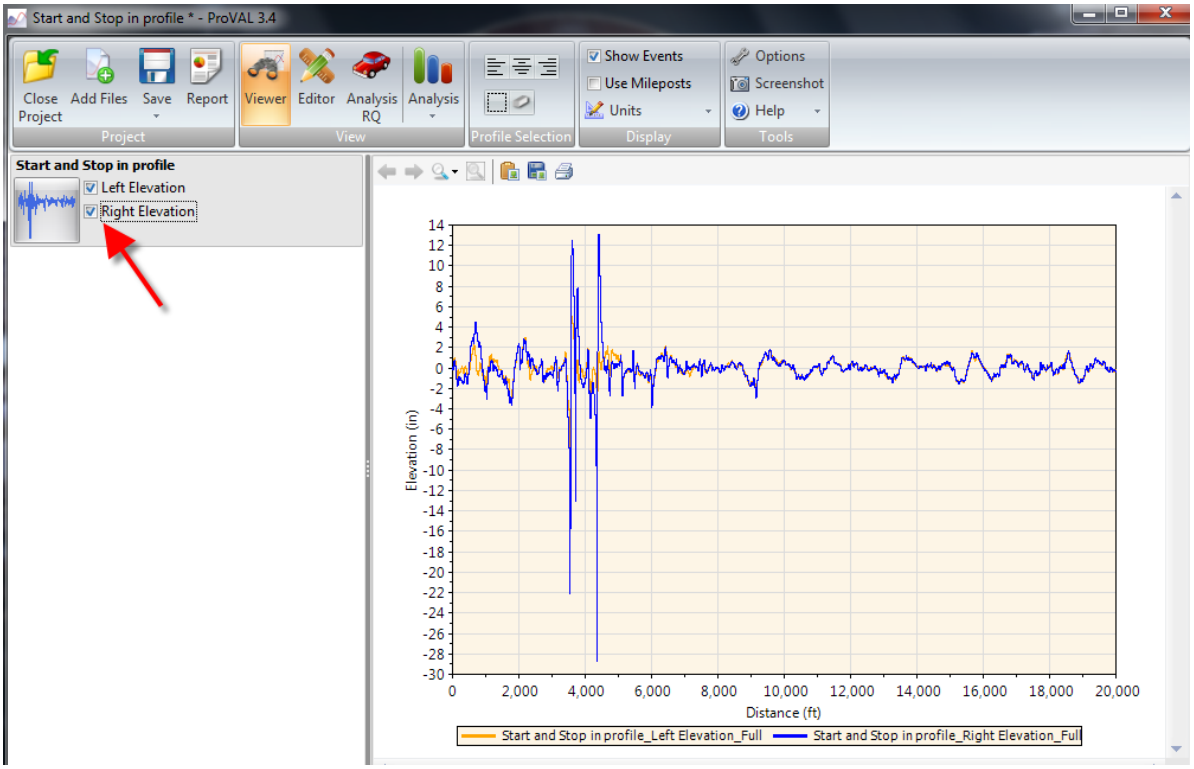
2.7 Select **Start and Stop in Profile** and click **Open**. *Note: ProVAL 2 Projects (.pv2 files) can be opened using ProVAL 3.4.*



2.8 File opens in default **Viewer** window. Review the functions on the ribbons at the top of the screen to become familiar with ProVAL. *Note: Refer to the Transtec Group User's Guide for more information on each icon.*



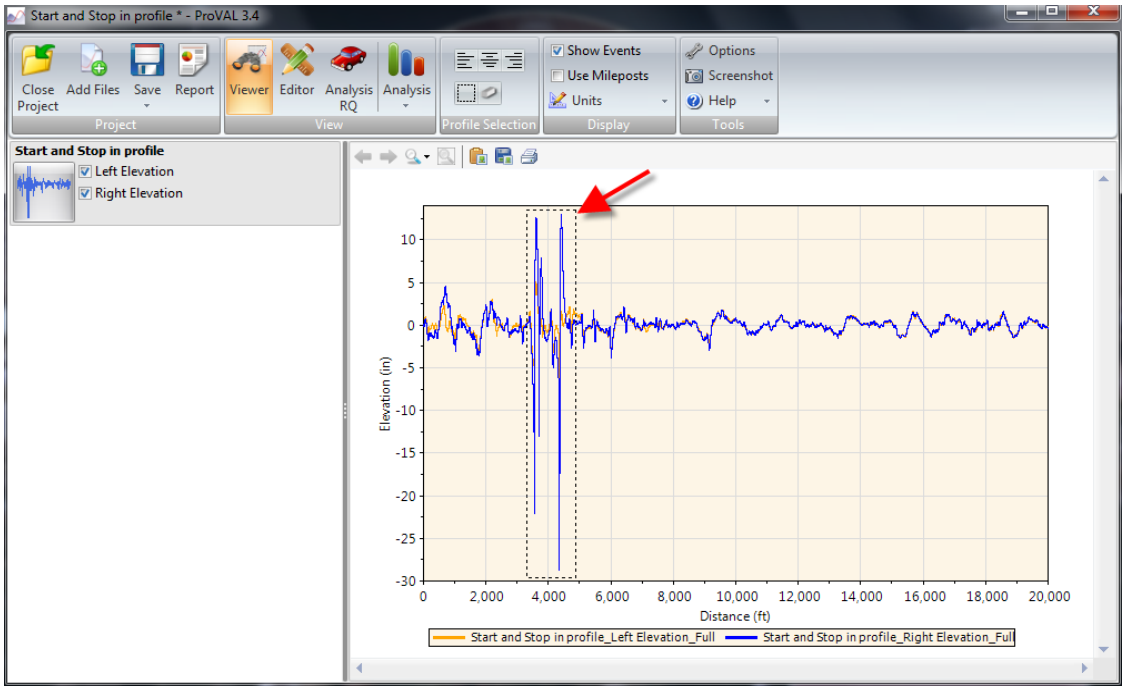
2.9 To view the raw profile of the data, check the boxes next to **Left Elevation** and **Right Elevation**.



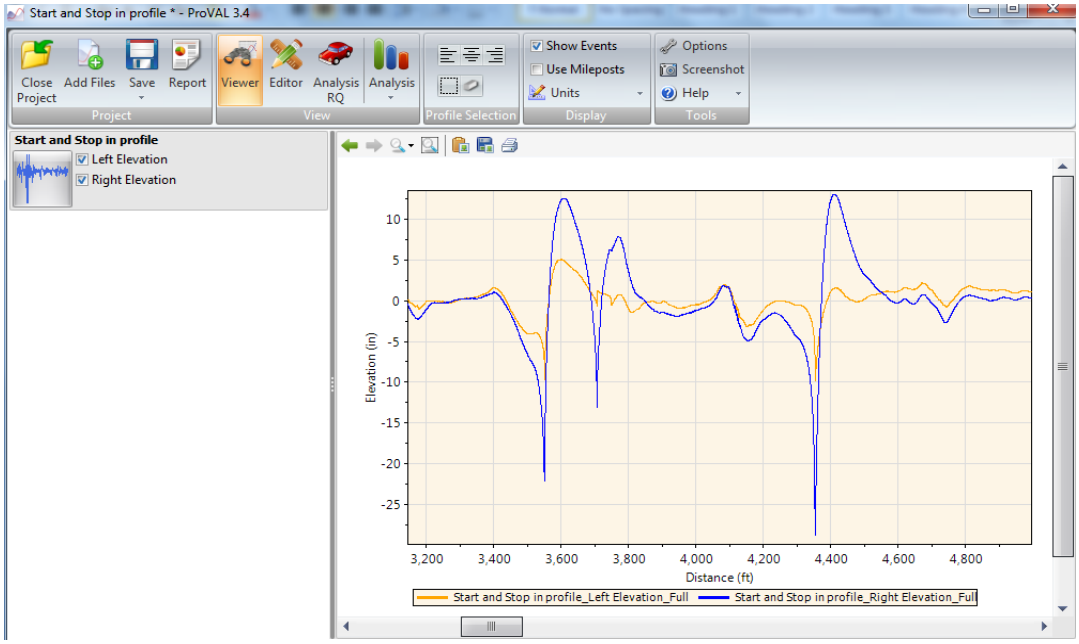
Zoom In on Profile

A profile can be taken over long distances. The user can use the zoom feature to look at a specific area of the profile to evaluate problems.

2.10 The pavement's profile will be displayed as shown below. To zoom in on a profile section, click and drag across a rectangular section of the profile. In this example, left and right elevations from longitudinal distance 3,300 ft to 4,900 ft.

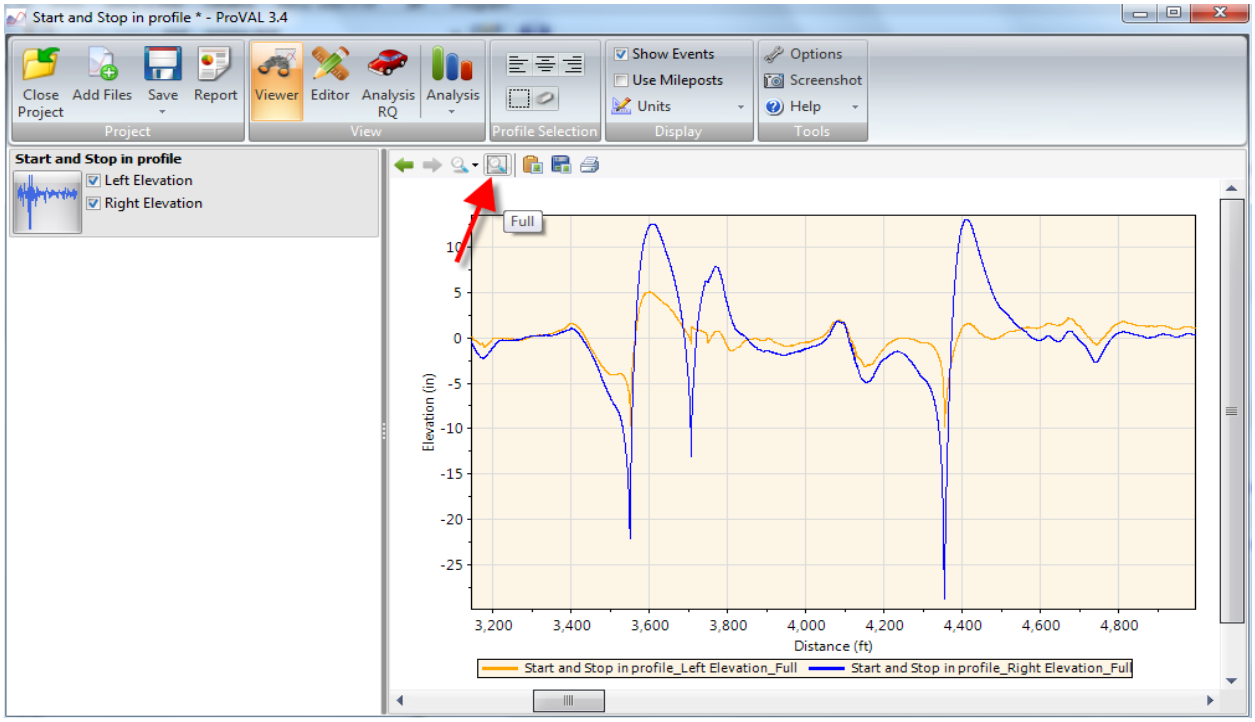


2.11 The profile should look similar to the picture below.



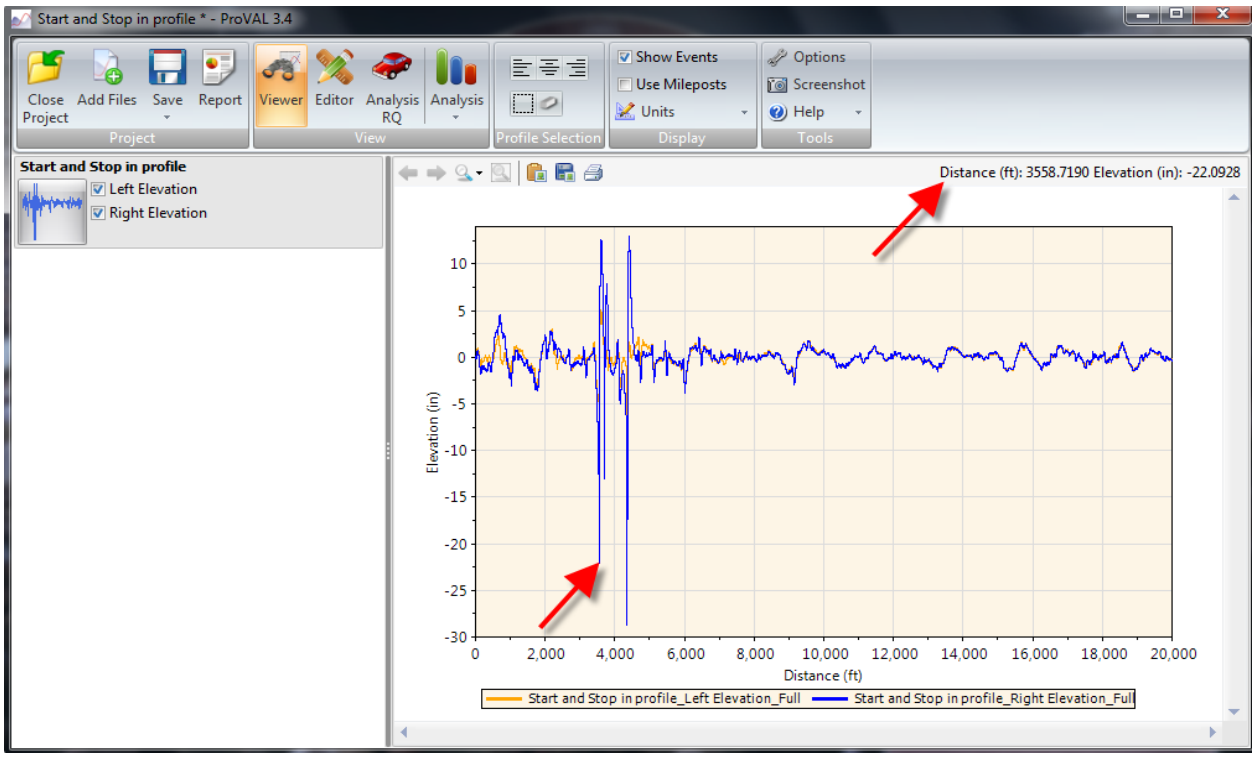
Zoom Out on Profile

2.12 Select the **Full** button to return to the complete profile.



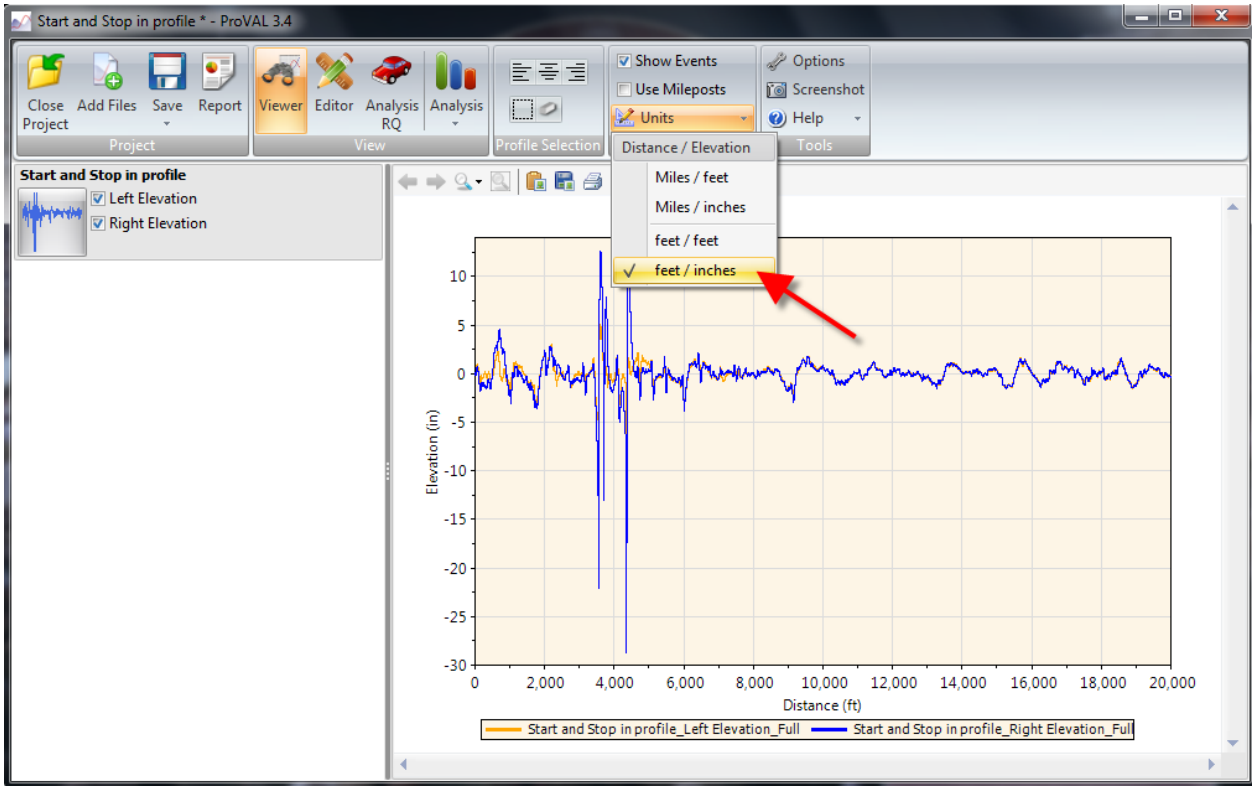
Display X and Y Coordinates

2.13 Place the cursor at a point on the graph to display its x-(distance) and y-(elevation) coordinates.



Change Units on Profile

2.14 Select **Units** in the **Display** group to view unit options and select desired units.

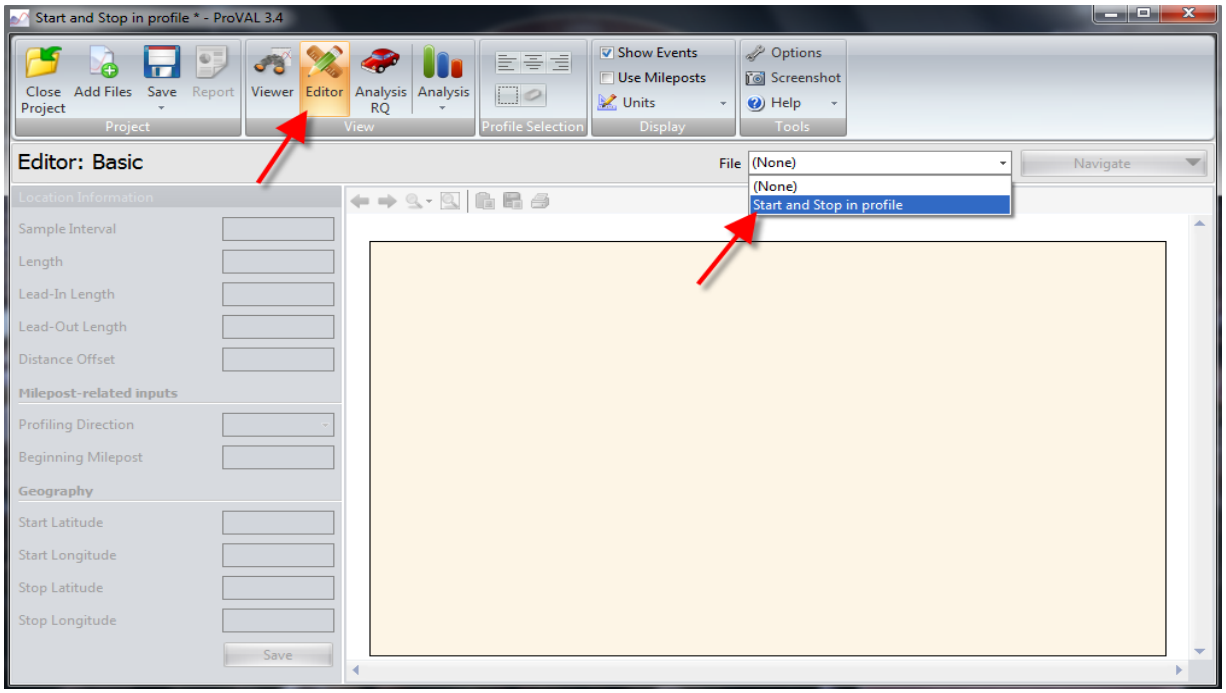


Using Editor

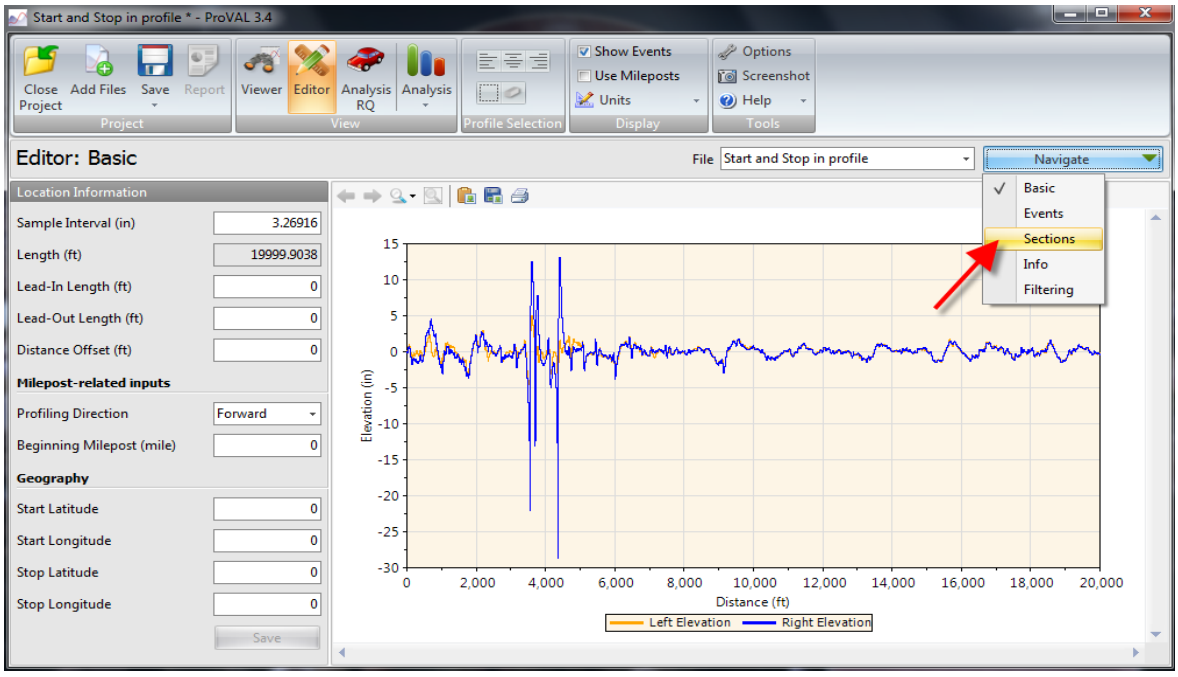
The Editor function is used to isolate a certain section of a pavement for roughness evaluation.

Cropping Profile

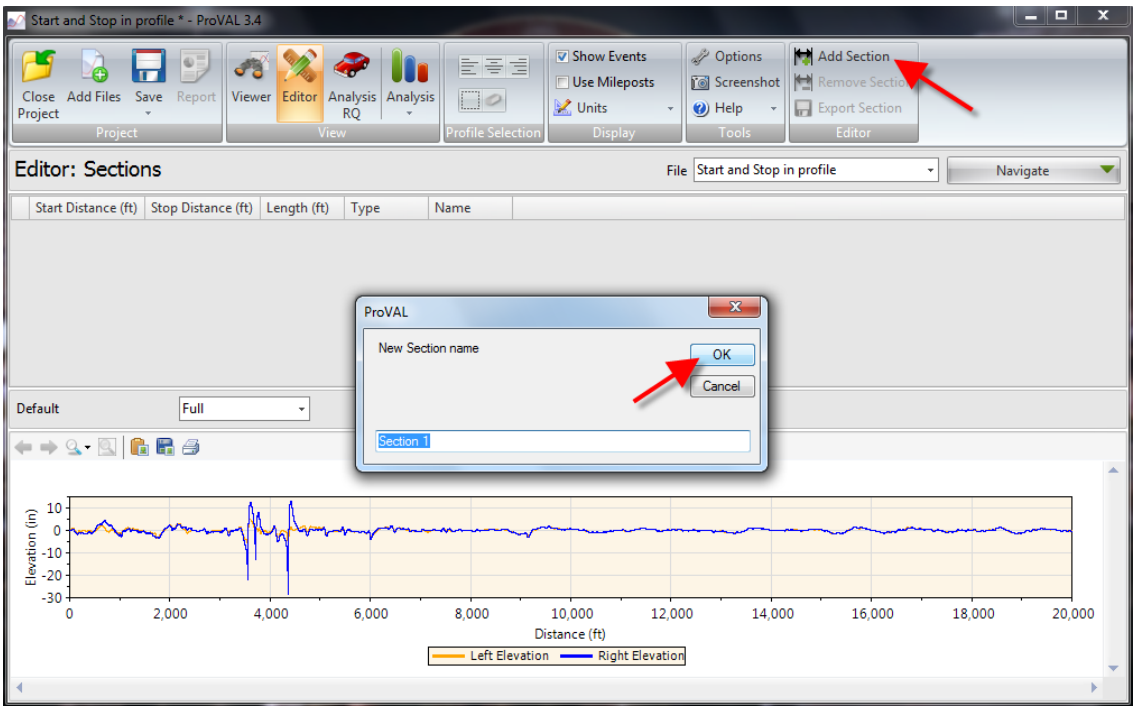
3.1 Select **Editor** in the **View** group. Then, choose the desired filename from the **File** dropdown menu. *Note: Refer to pages 52-61 in the User's Guide for more information on editing a file.*



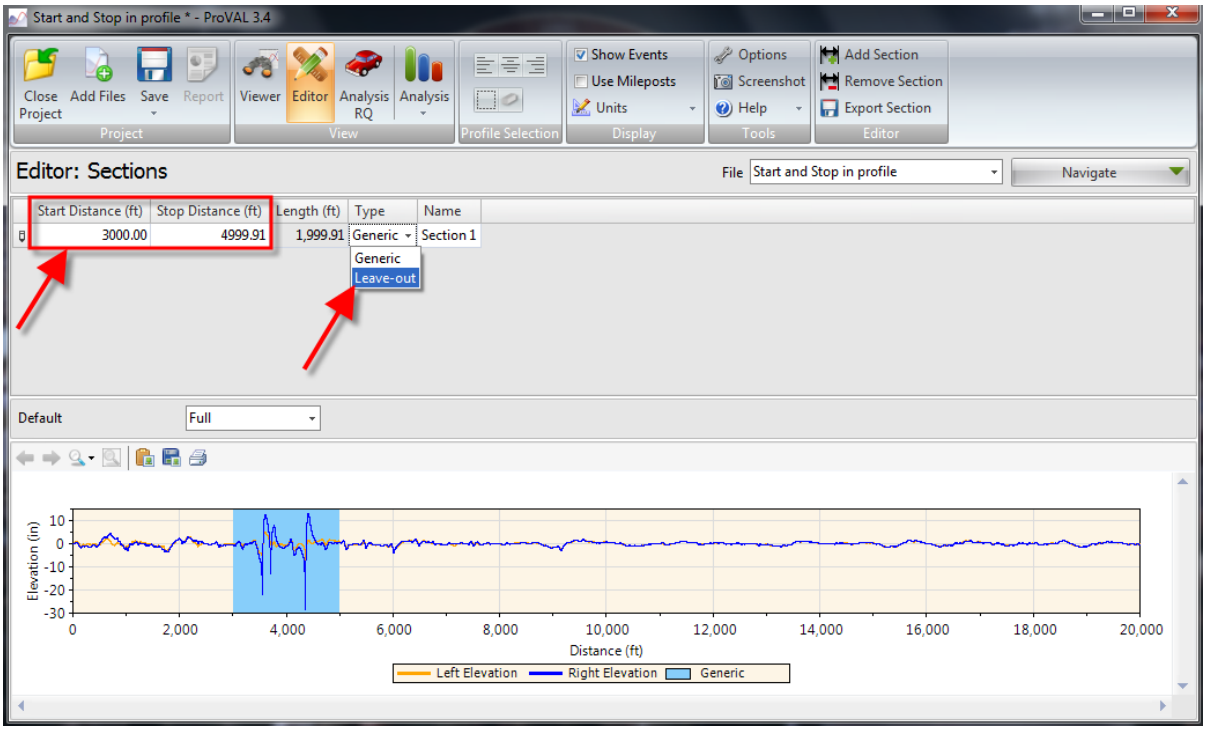
3.3 Select **Sections** in the **Navigate** dropdown menu.



3.3 Select **Add Section** in the **Editor** group as shown by the top arrow. Enter “Section 1” or a name that appropriately describes the section in the blank and click **OK**.

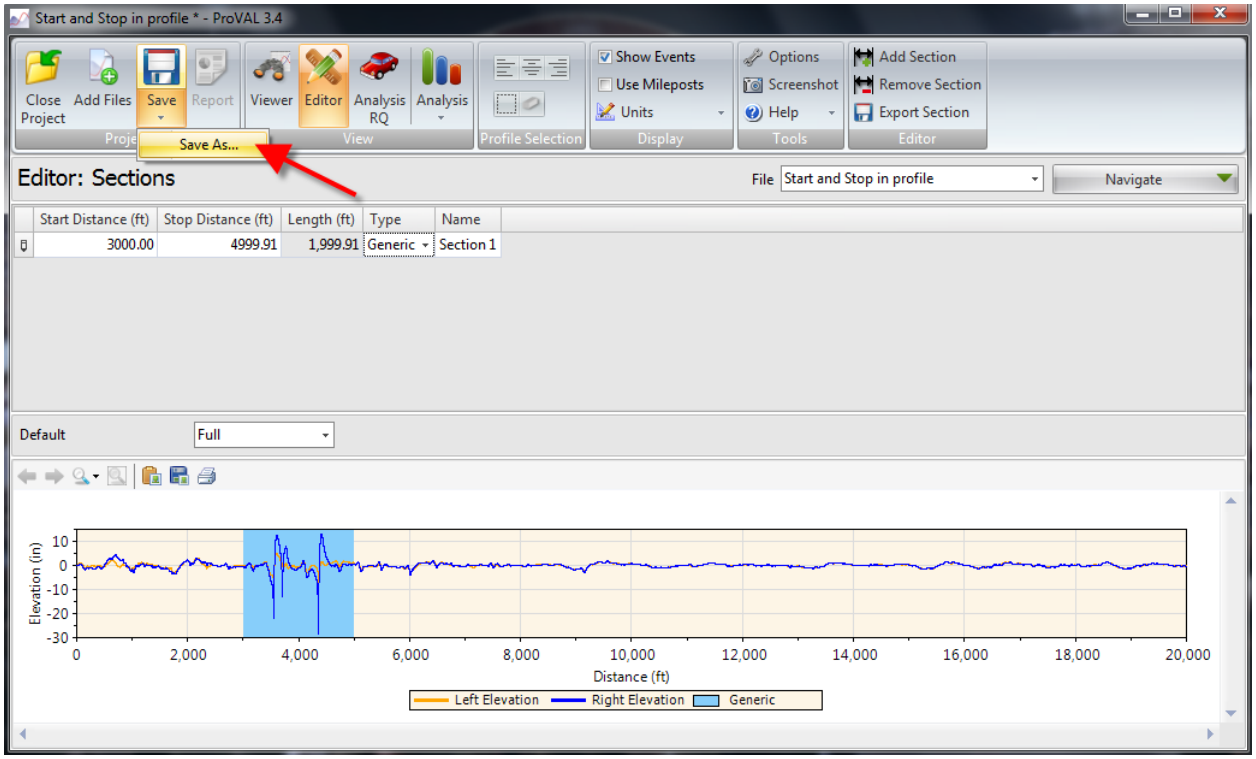


3.4 For Section 1, enter 3,000 ft as start distance and 5,000 ft as end distance. Select **Leave-Out** under the **Type** dropdown menu. This section is now ignored in all analysis modules. “**Leave-Out” sections are used for bridges so that portion of the profile is not included in the analysis.**

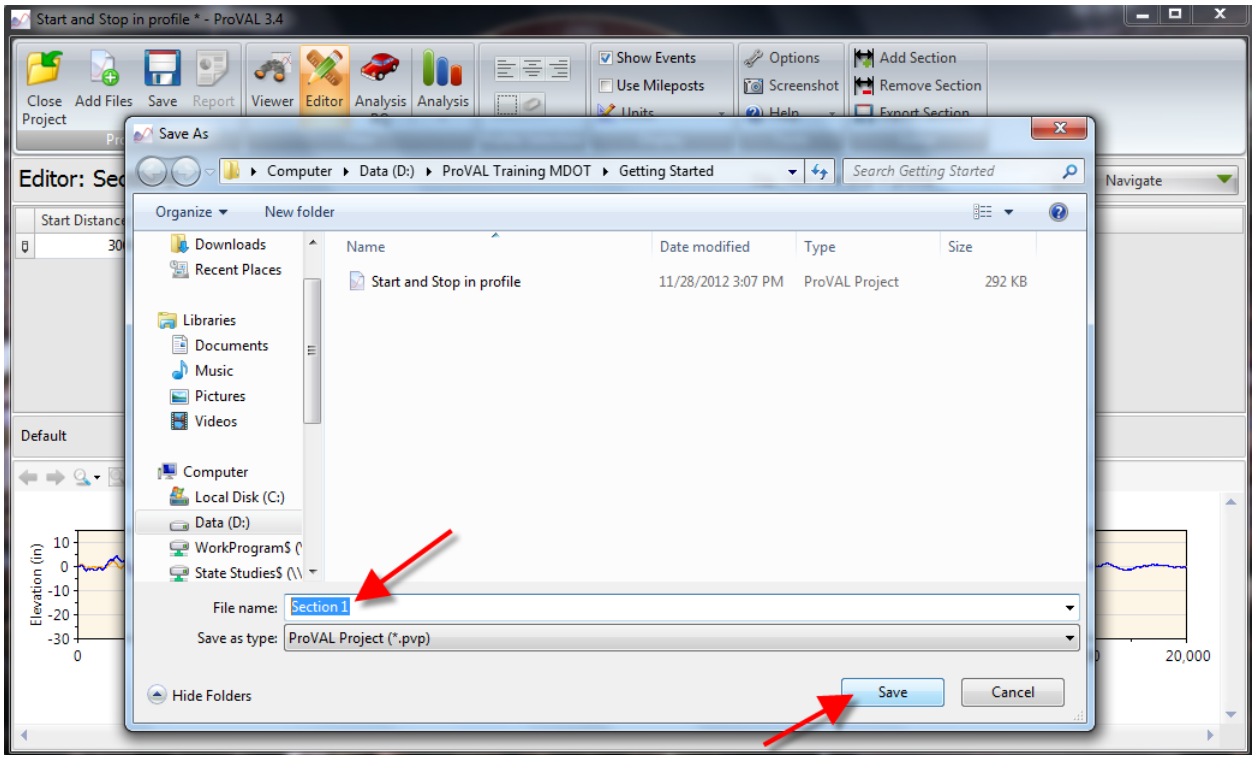


Save a Cropped File

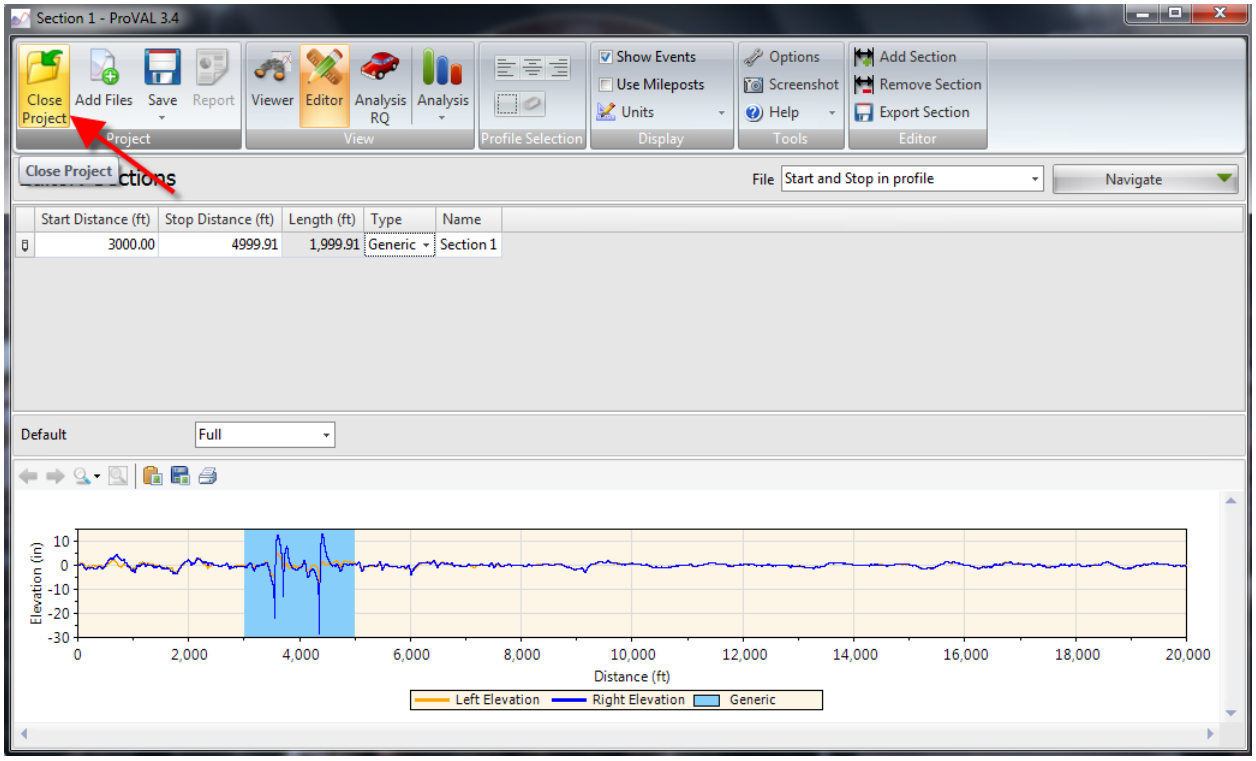
3.5 Select **Save As** on the **ProVAL icon** dropdown menu.



3.6 Name the file **Section 1** and select **ProVAL Project (*.pvp)** as the file type, then click **Save**.

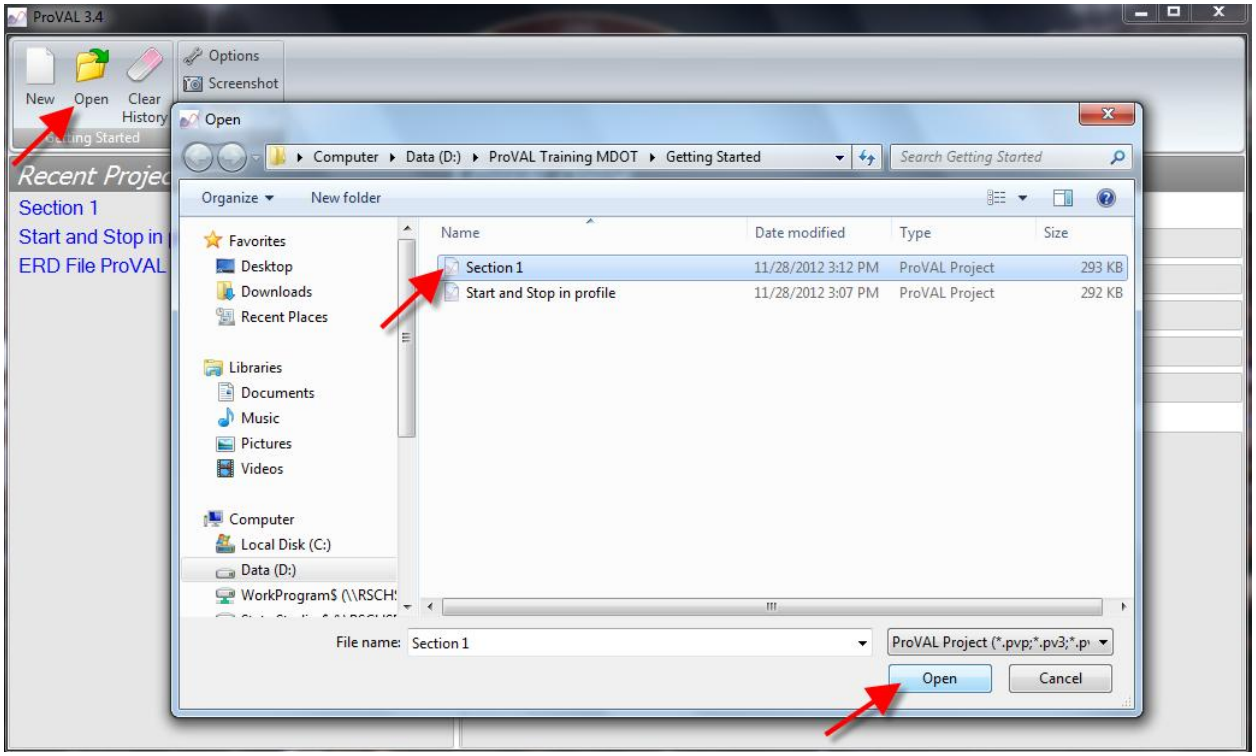


3.7 Select **Close Project** on the **ProVAL icon** dropdown menu.

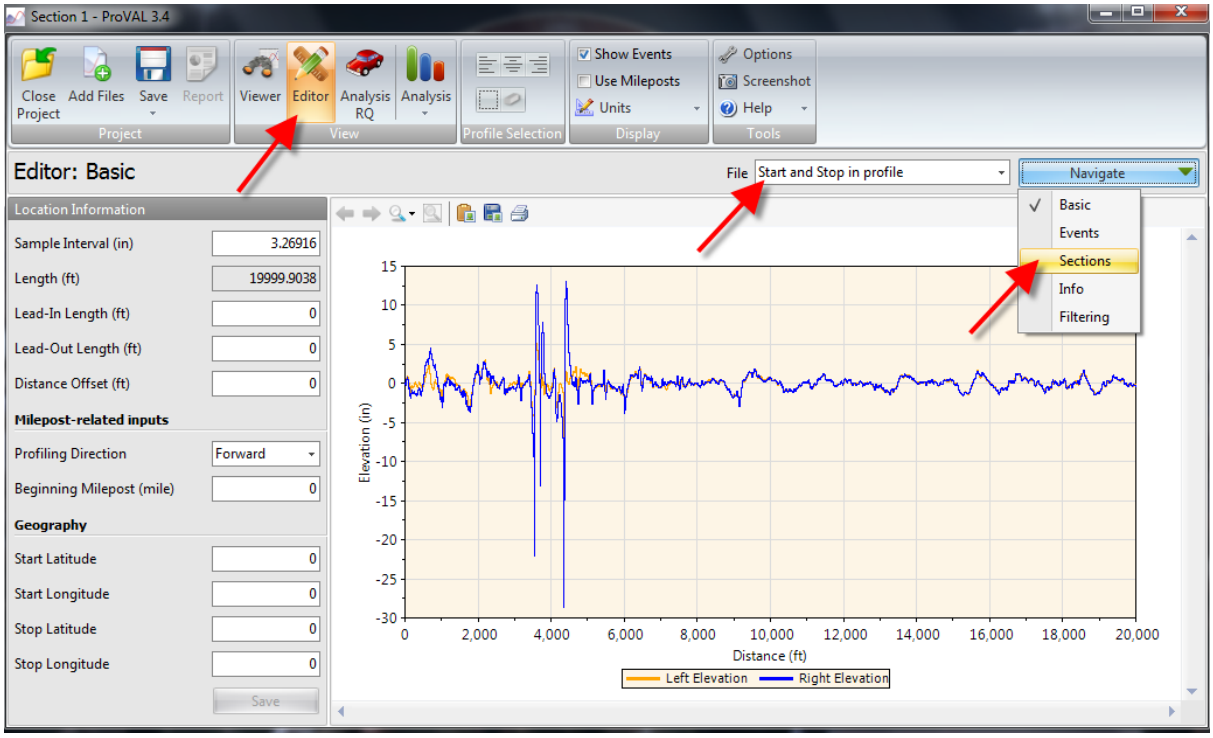


Open Cropped File

3.8 Select **Section 1** from its saved location then click **Open**.

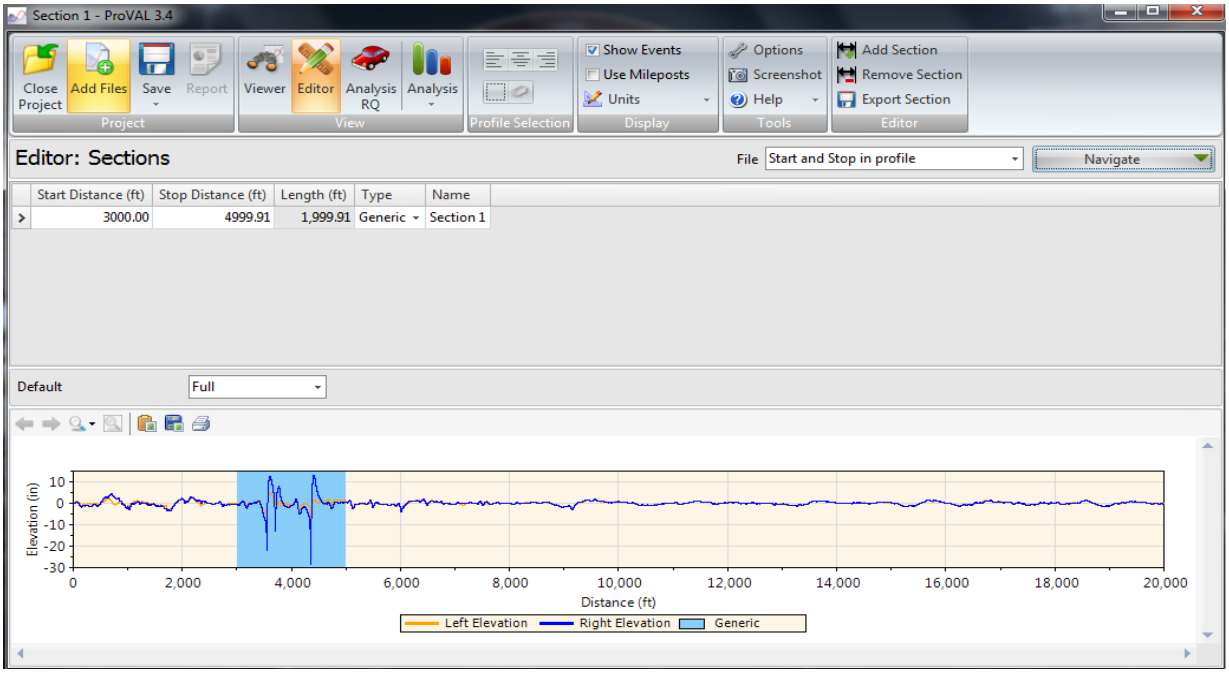


3.9 Select **Editor** from the **View** Group. Choose the file **Start and Stop in Profile**. Select **Sections** in the **Navigate** tab.



View Cropped File

3.10 View the previously created section.



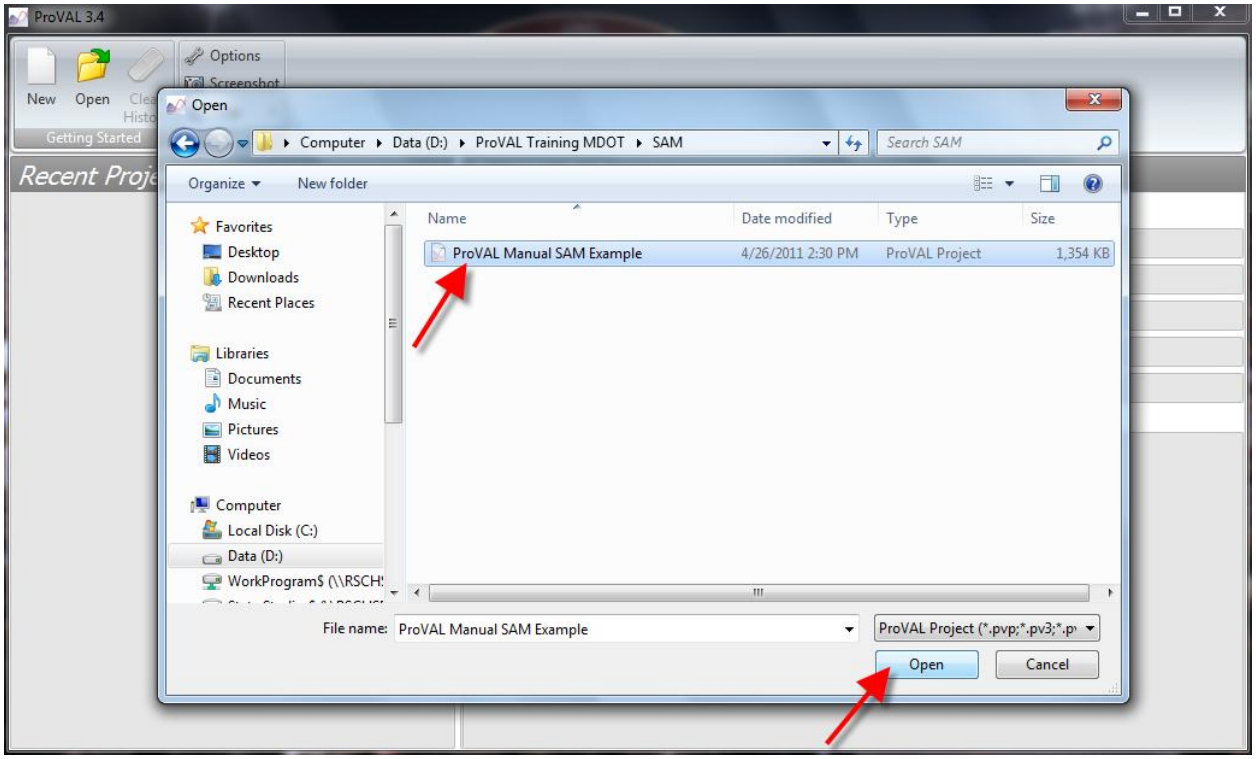
3.11 Close project and discard changes.

Smoothness Assurance

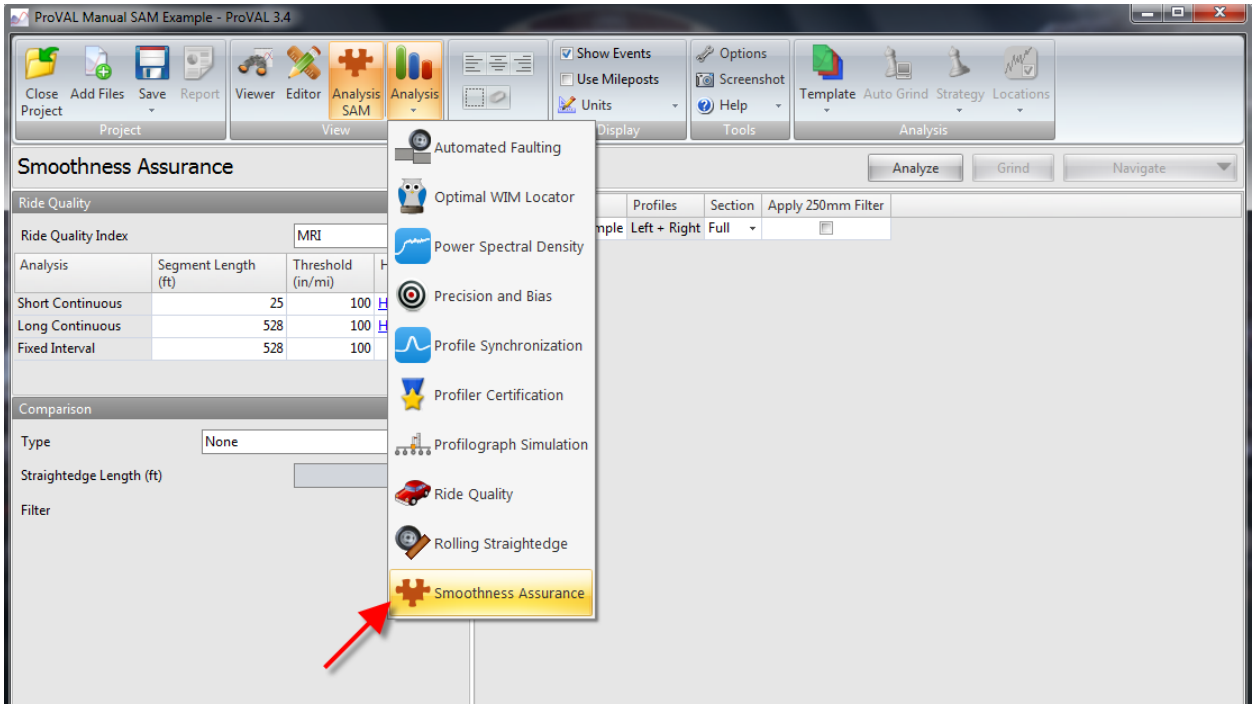
The Smoothness Assurance (SAM) function is used to calculate and graph the short continuous interval and long continuous interval MRI values.

Open File for Analysis

4.1 Open the **ProVAL Manual SAM Example** file in the **ProVAL Training MDOT** folder. *Note: Refer to pages 101-123 in the User's Guide for more information on Smoothness Assurance and grinding.*

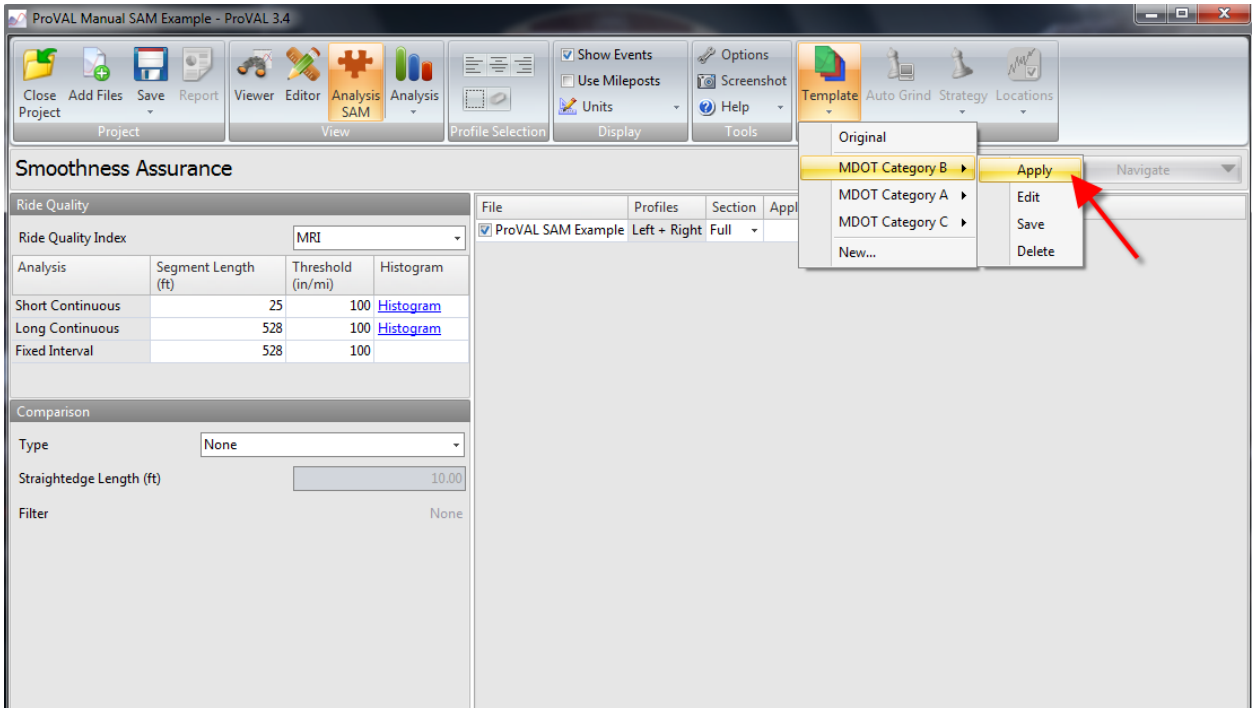


4.2 Select the **Analysis** dropdown in the **View** group. Then click on **Smoothness Assurance**.



Select Appropriate Template

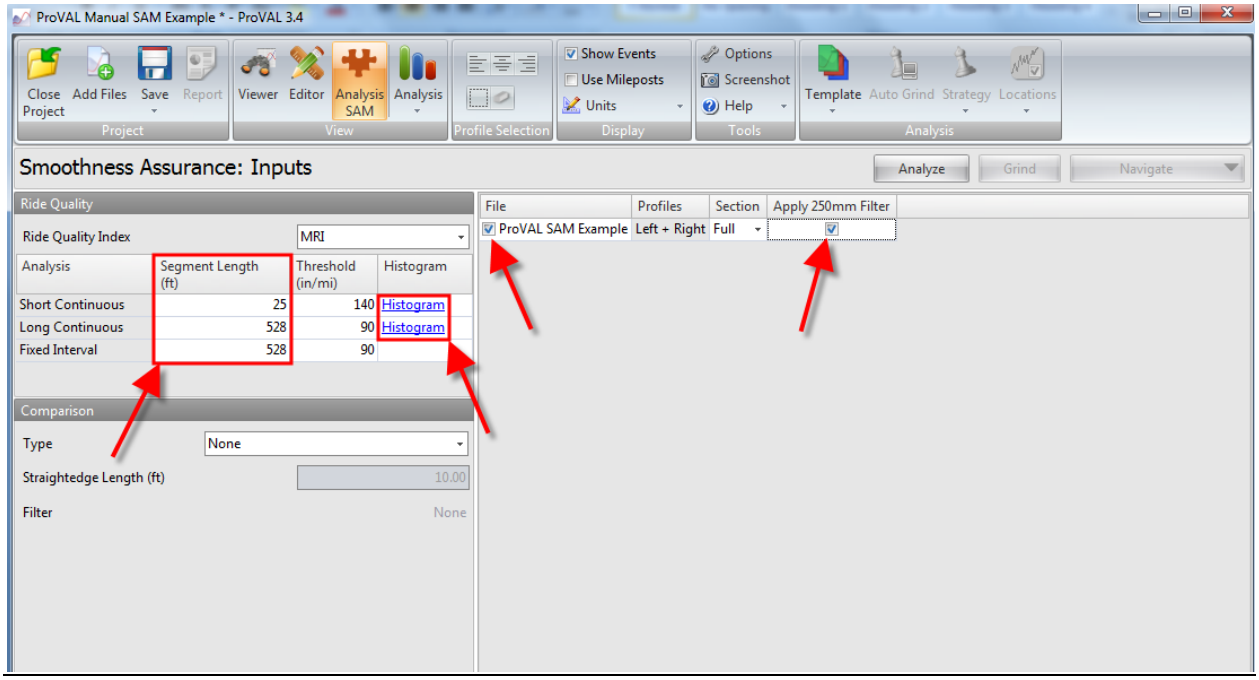
4.3 Click the **Template** button and select **Category B** and then click **Apply**. *Note: Refer to the MDOT MRI Specification for more information on pavement categories.*



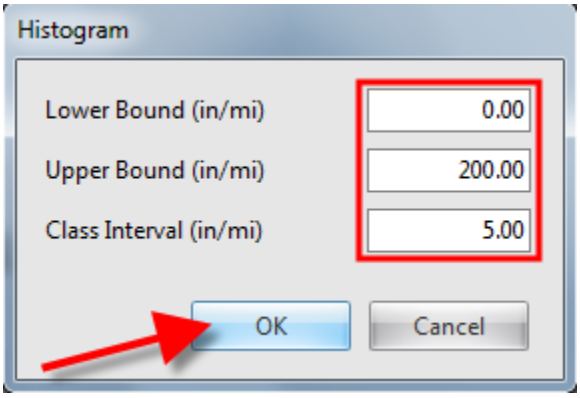
Apply 250mm Filter & Histogram Settings

Note: Filter & Histogram settings for each project category are included when importing templates as displayed in sections 1.23 & 1.24. Therefore, disregard sections 4.4 - 4.7 if template has been applied.

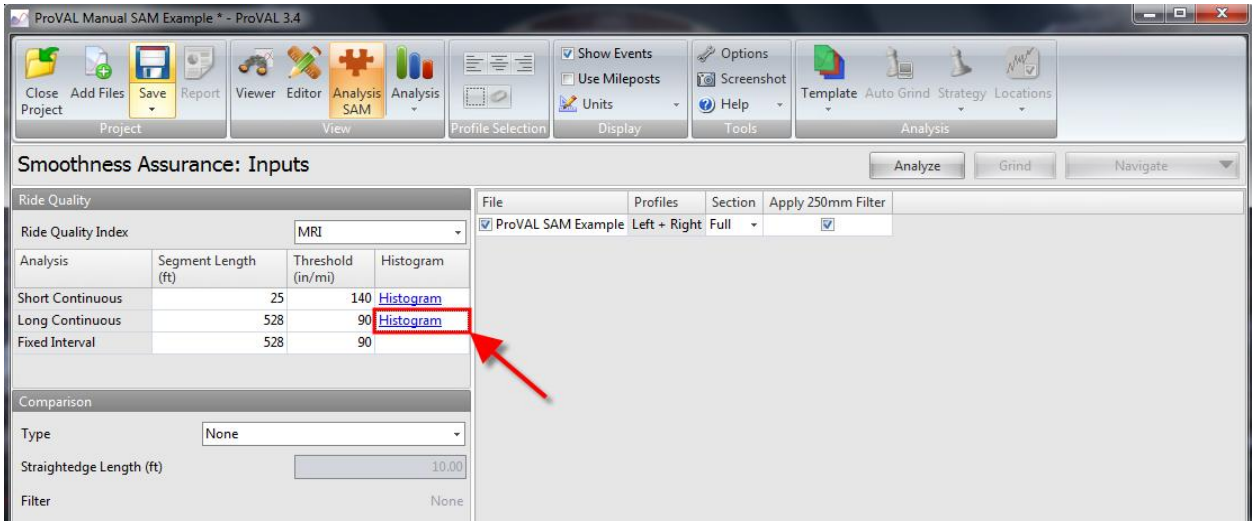
4.4 Check the **File** box and the **Apply 250mm Filter** box (if necessary based on type of profiler used to collect data). **Segment length** should always be 25' for short continuous, 528' for long continuous, and 528' for fixed interval. Next, click on Histogram next to **Short Continuous**. *Note: Refer to pages 59-61 in the User's Guide for more information on filtering.*



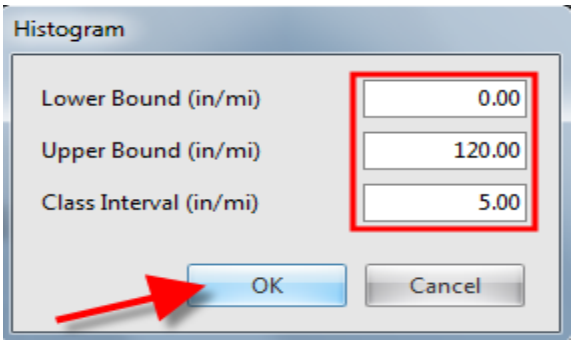
4.5 For the Short Continuous Histogram, change the **Lower Bound (in/mi)** to 0.00, the **Upper Bound (in/mi)** to 200.00, and the **Class Interval (in/mi)** to 5.00 then click **OK**. *Note: The default Class Interval setting is 10.00 in/mi, but it must be 5.00 in/mi to correctly perform the pay incentive calculations.*



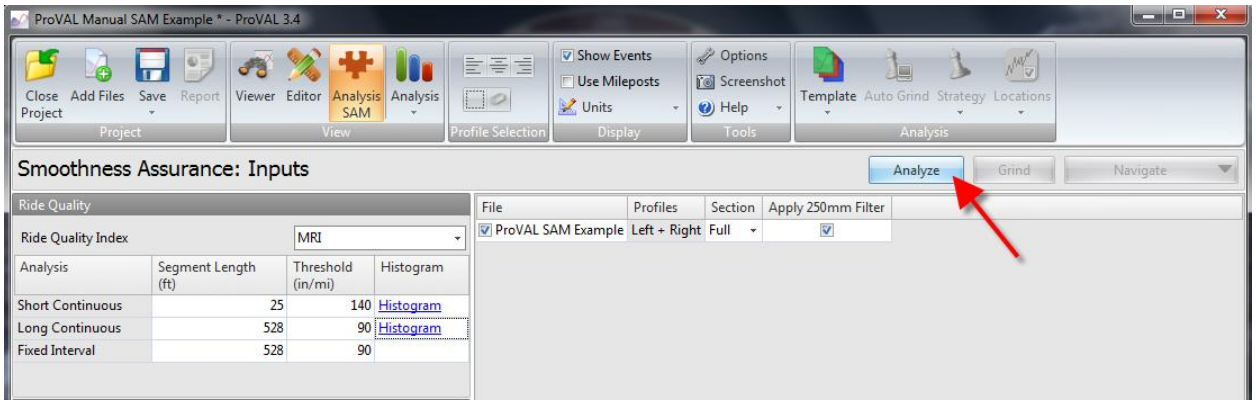
4.6 Click on Histogram next to **Long Continuous**.



4.7 For the Long Continuous Histogram, change the **Lower Bound (in/mi)** to 0.00, the **Upper Bound (in/mi)** to 120.00, and the **Class Interval (in/mi)** to 5.00 then click **OK**. *Note: The default Class Interval setting is 10.00 in/mi, but it must be 5.00 in/mi to correctly perform the pay incentive calculations.*



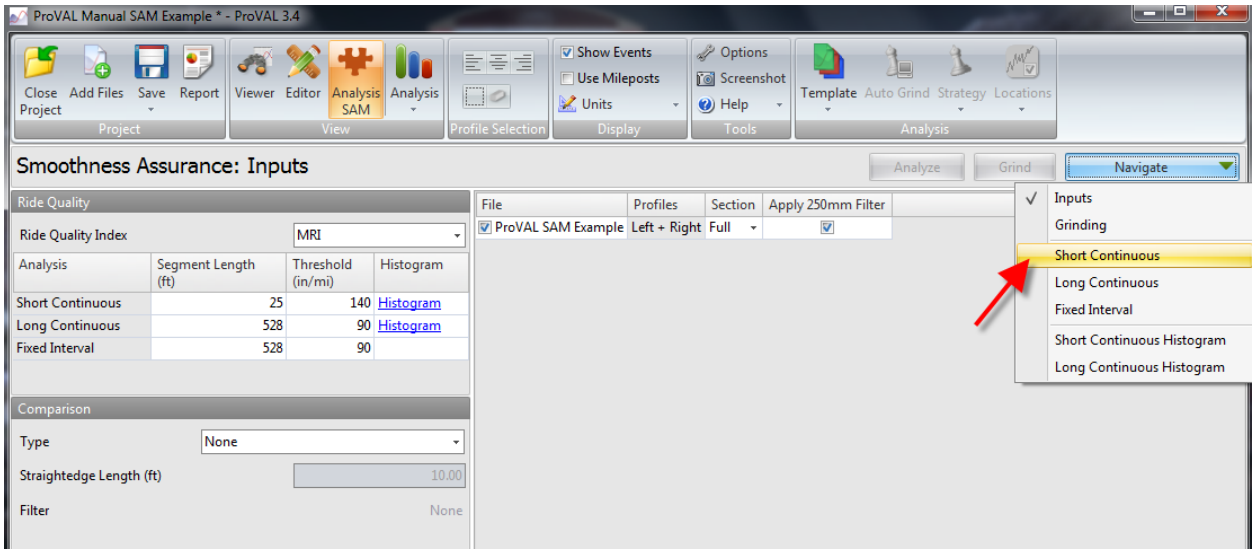
4.8 Once the desired boxes are checked (or correct template has been applied) and the histogram settings are correct, select **Analyze**.



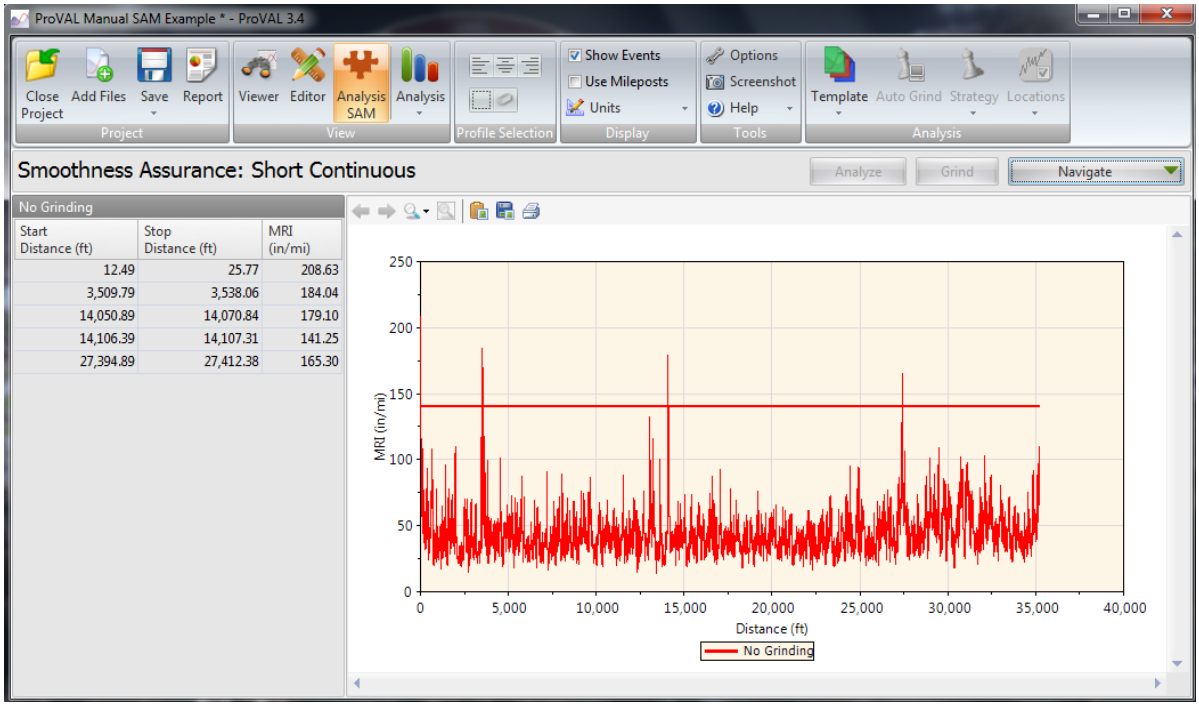
Short Continuous Analysis

The short continuous interval uses a base length of 25 feet to analyze a road profile and produce MRI values. This short interval is necessary to guard against any sudden surprises (bumps/dips) on the pavement.

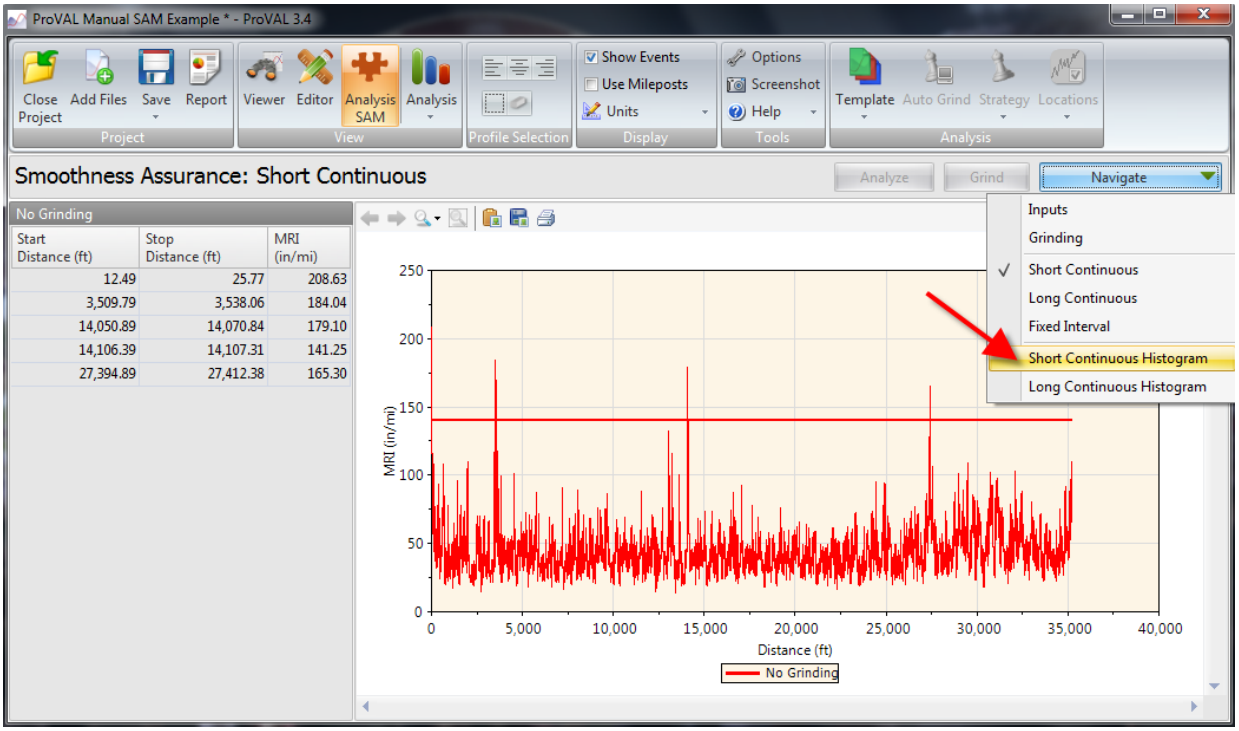
4.7 To view the short continuous graph, click **Short Continuous** under the **Navigate** tab.



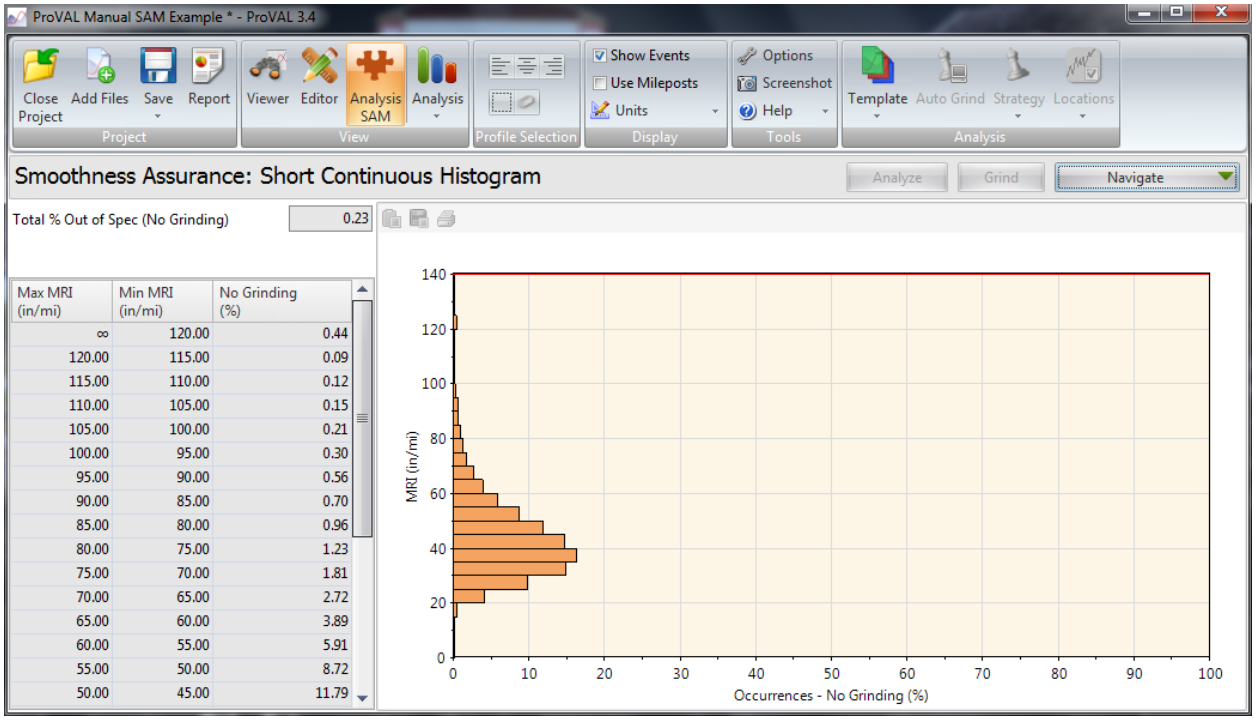
4.8 Short Continuous graph will appear. Areas above the allowable short continuous MRI threshold values are listed to the left of the graph.



4.9 Click on **Short Continuous Histogram** under the **Navigate** tab.



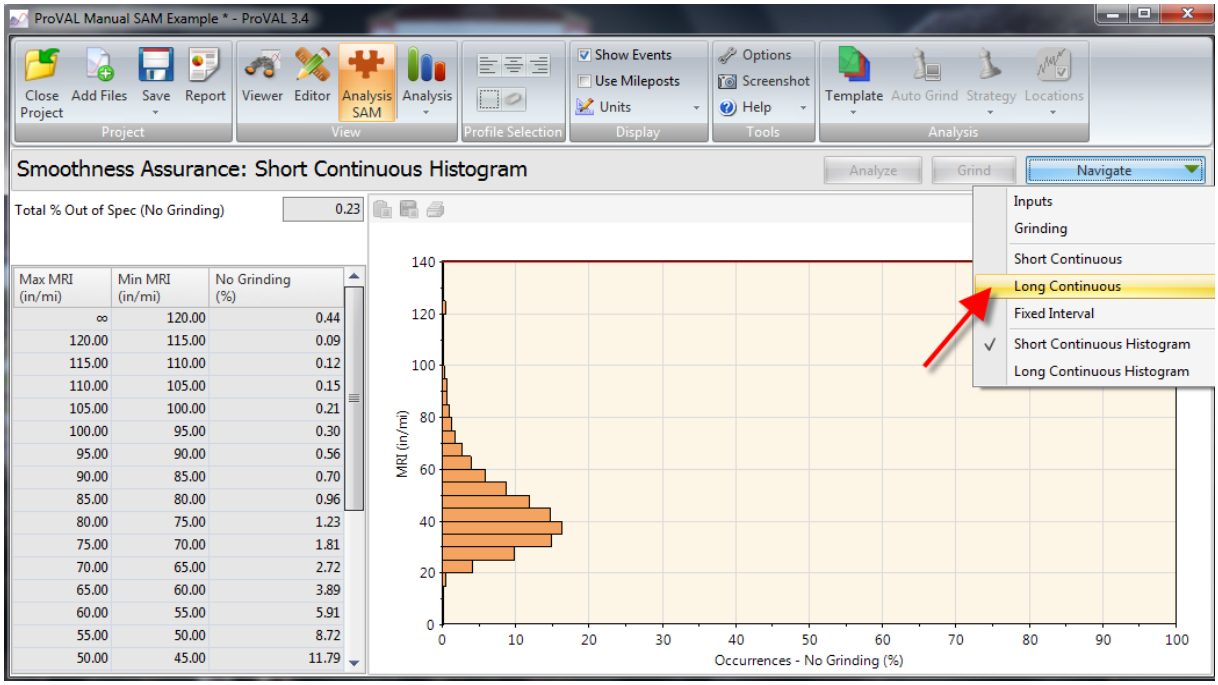
4.10 Short Continuous Histogram will appear. Numerical values are displayed to the left of the graph.



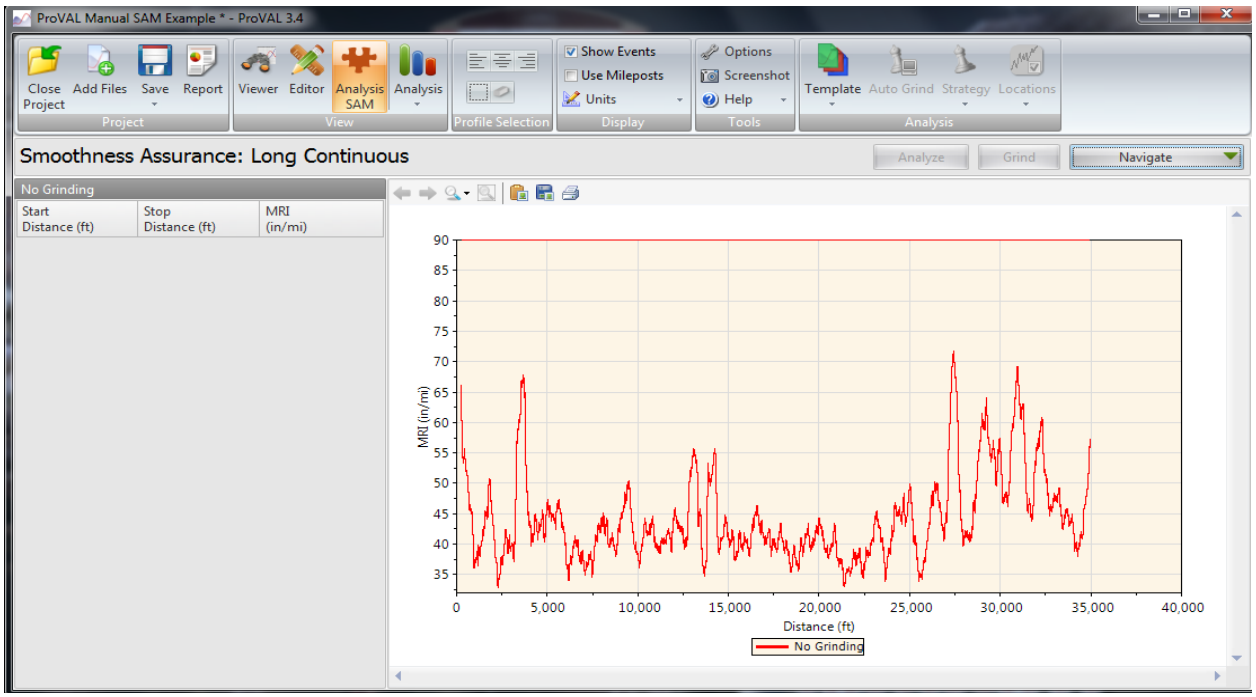
Long Continuous Analysis

The long continuous interval is uses a base length of 528 feet to analyze a road profile and produce MRI values. This long interval is used to set the overall quality of the pavement.

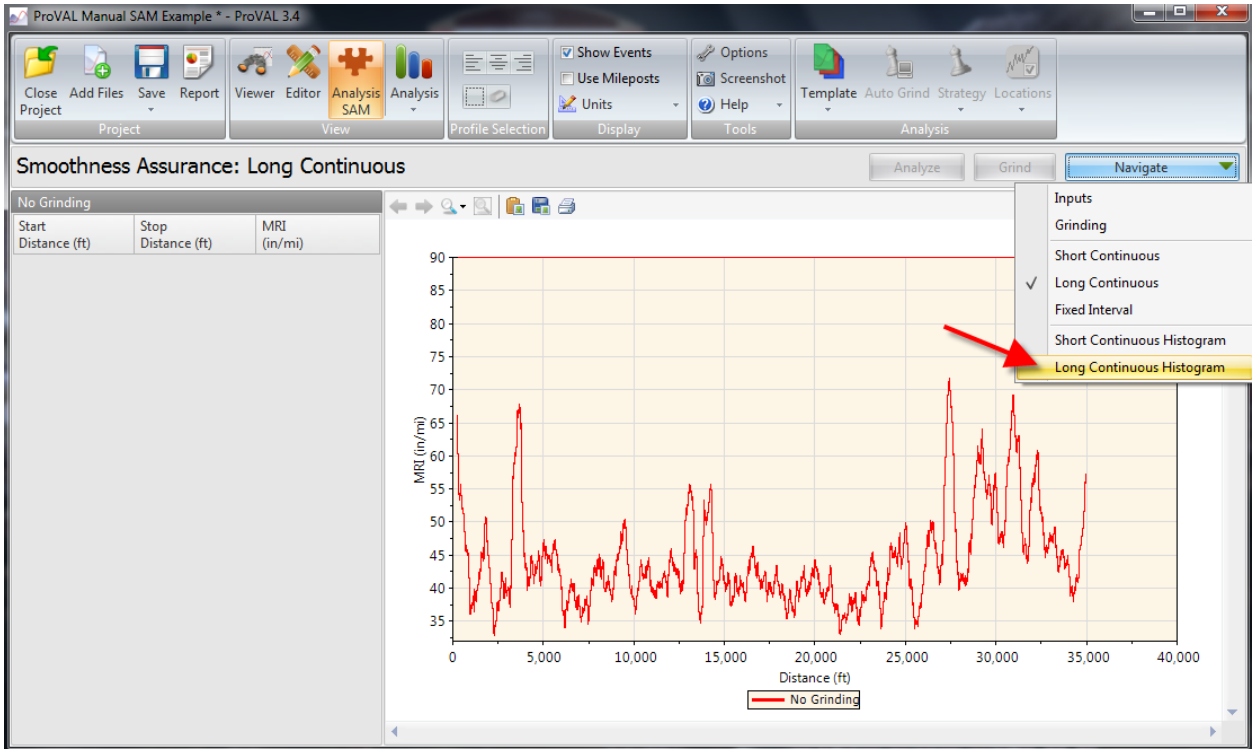
4.11 Click on **Long Continuous** under the **Navigate** tab.



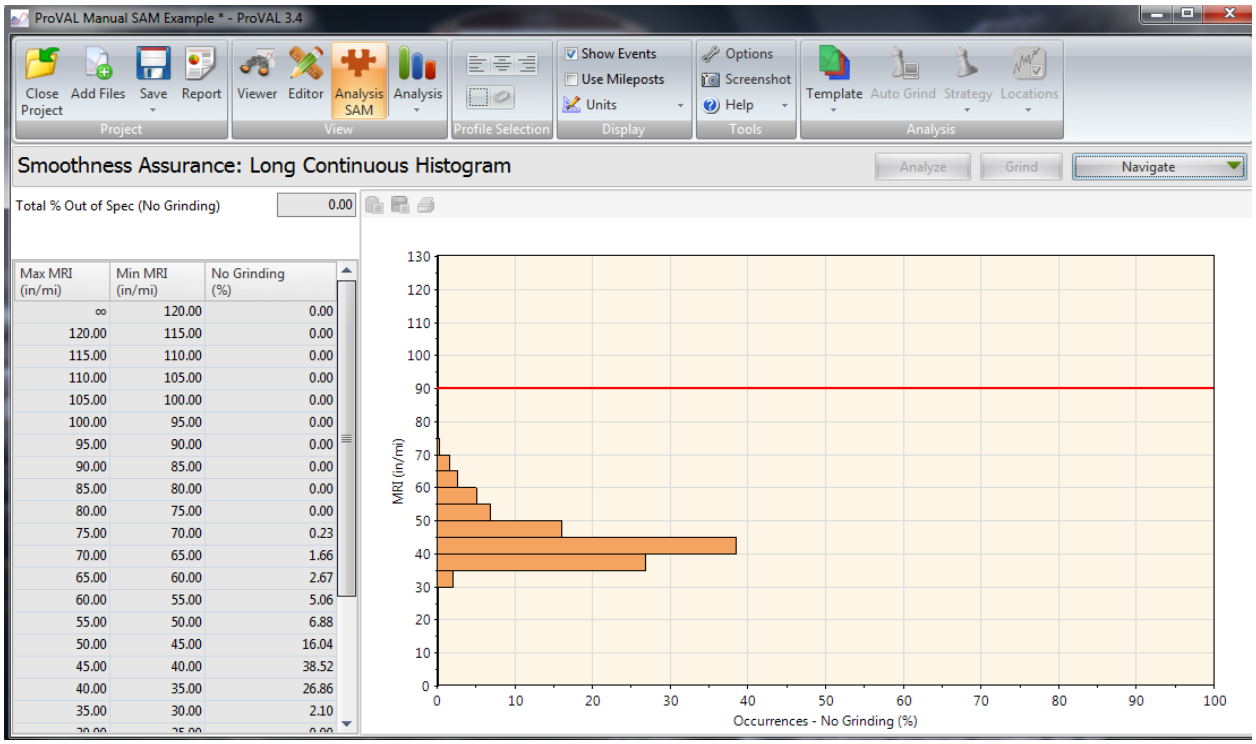
4.12 Long Continuous graph will appear. Areas above the allowable long continuous remove and replace MRI threshold values are listed to the left of the graph.



4.13 Click on **Long Continuous Histogram** under the **Navigate** tab.



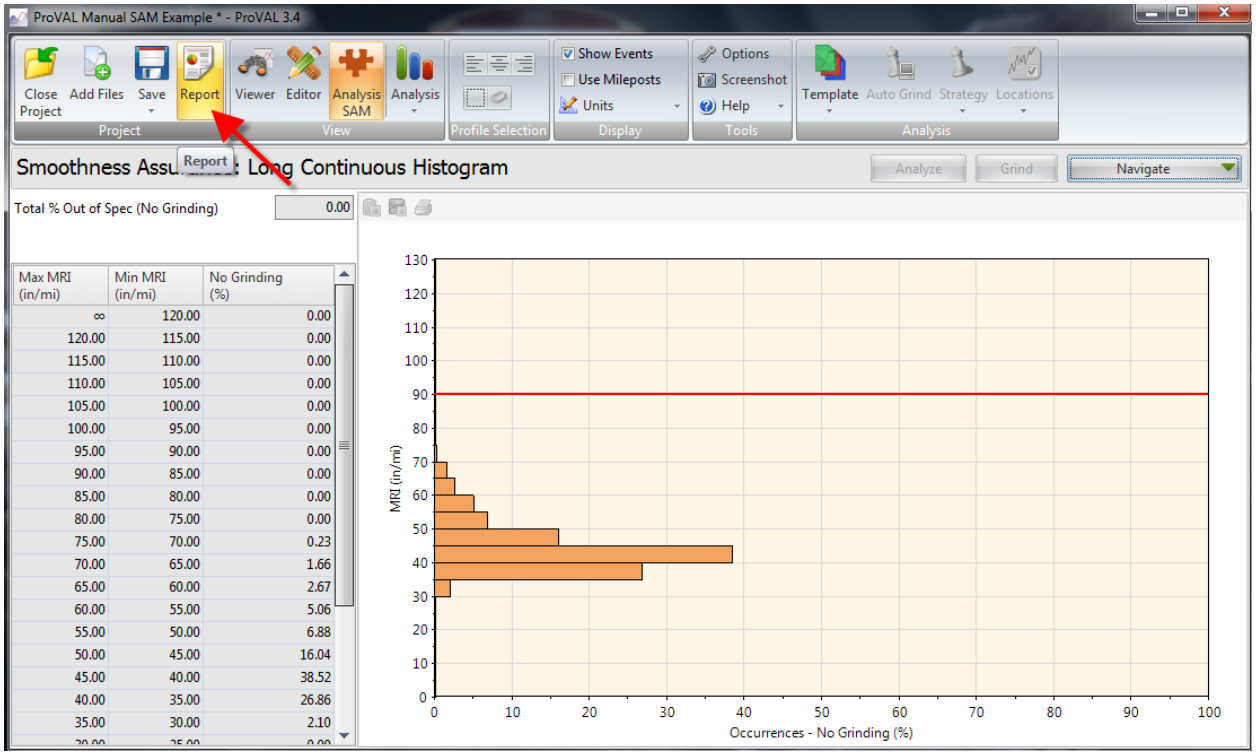
4.14 Long Continuous Histogram will appear. Numerical values are displayed to the left of the graph.



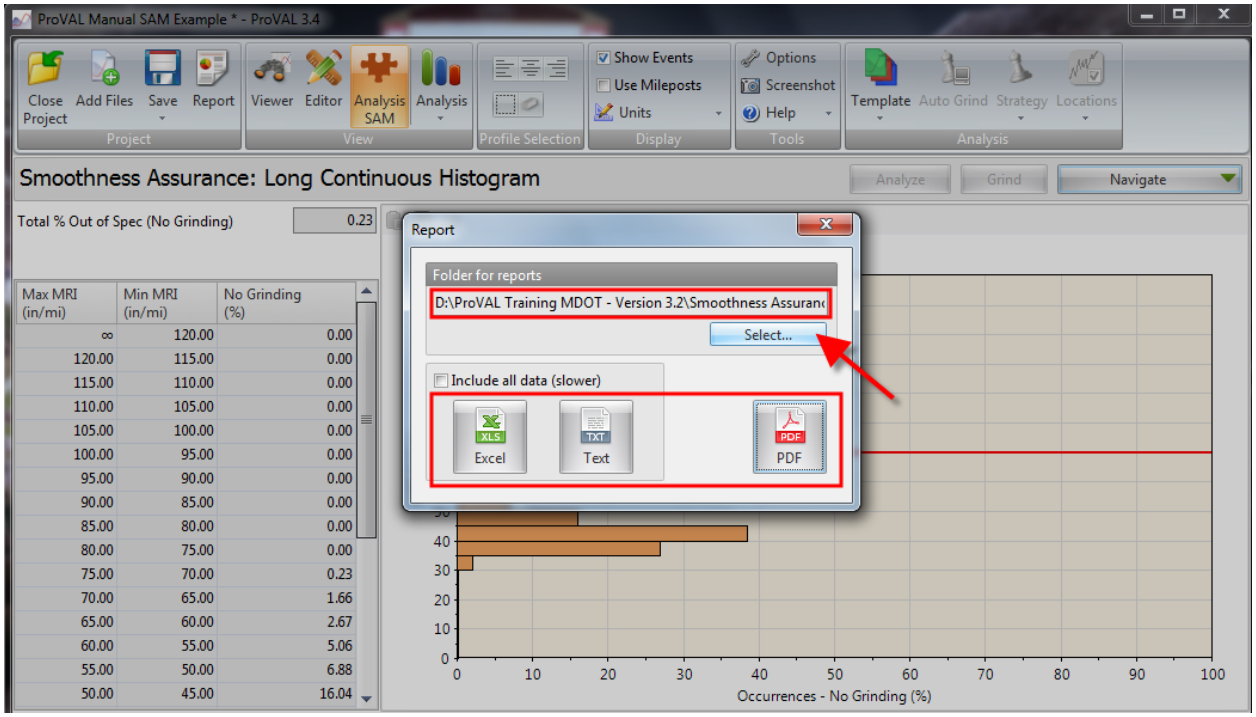
Max MRI (in/mi)	Min MRI (in/mi)	No Grinding (%)
∞	120.00	0.00
120.00	115.00	0.00
115.00	110.00	0.00
110.00	105.00	0.00
105.00	100.00	0.00
100.00	95.00	0.00
95.00	90.00	0.00
90.00	85.00	0.00
85.00	80.00	0.00
80.00	75.00	0.00
75.00	70.00	0.23
70.00	65.00	1.66
65.00	60.00	2.67
60.00	55.00	5.06
55.00	50.00	6.88
50.00	45.00	16.04
45.00	40.00	38.52
40.00	35.00	26.86
35.00	30.00	2.10

Reporting for Smoothness Assurance

4.15 To view data in a report format, click **Report** in the **View** group.



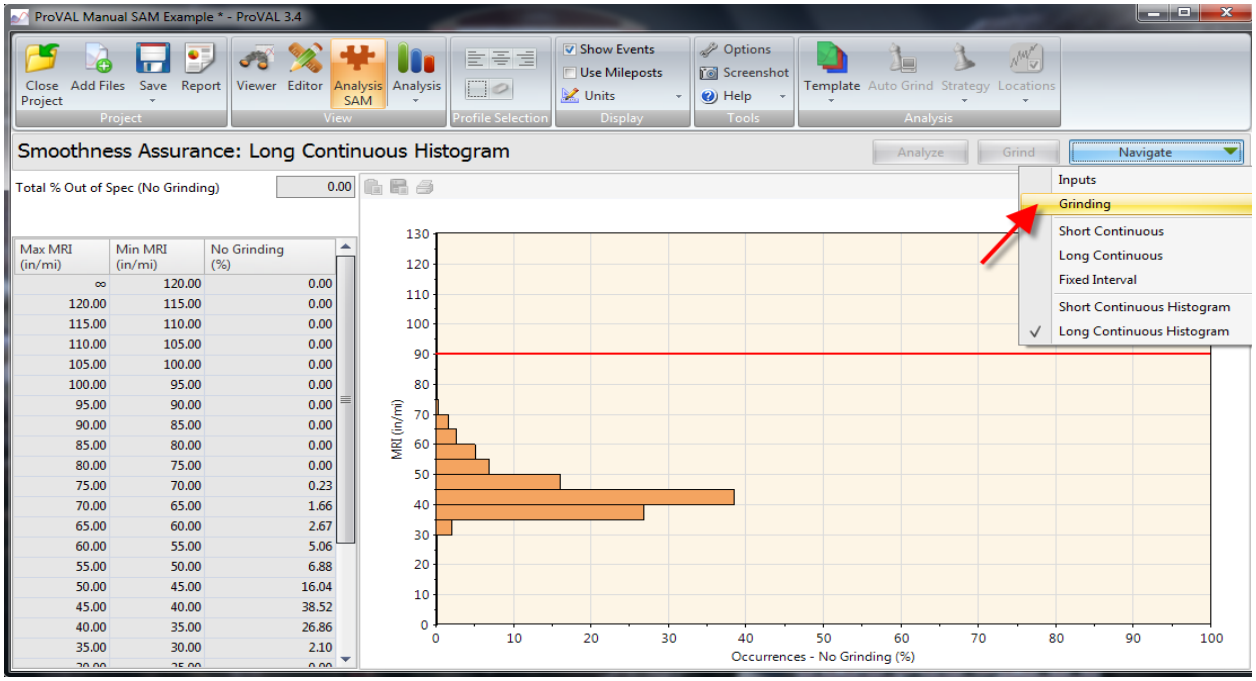
4.16 Select the desired file format (**PDF**, **Excel**, **or Text**), choose a filename/folder to save report, then click **Select**.



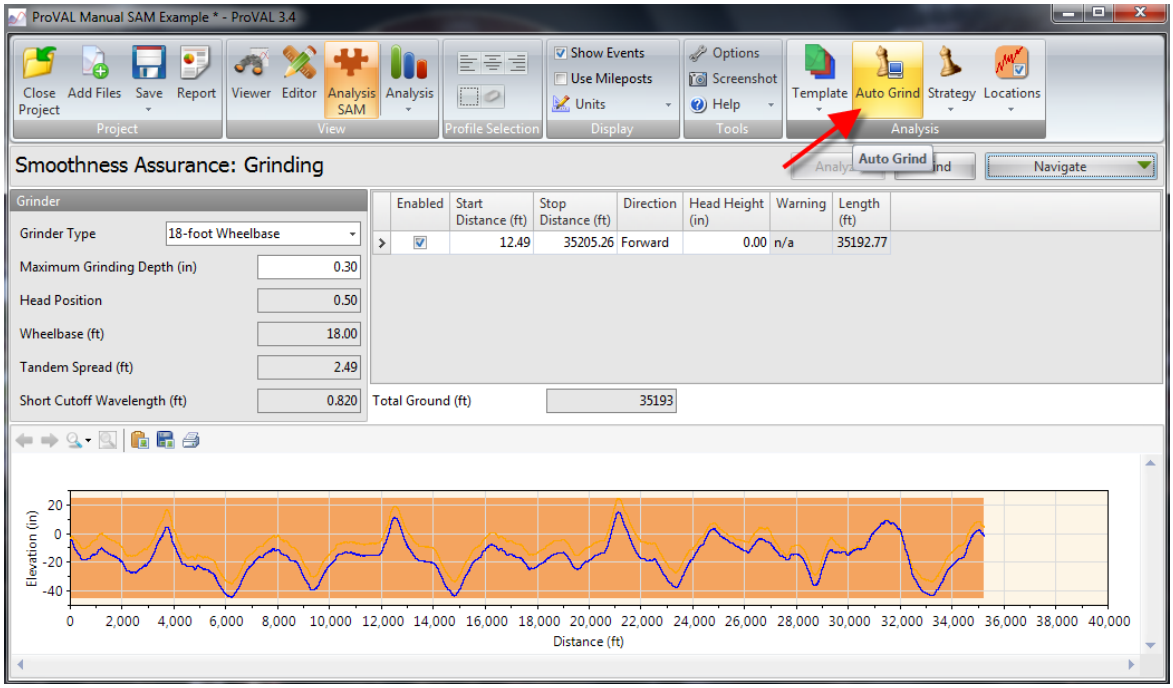
Grinding Simulation

ProVAL has the capability to perform a grinding simulation that will help predict the post-grinding MRI values.

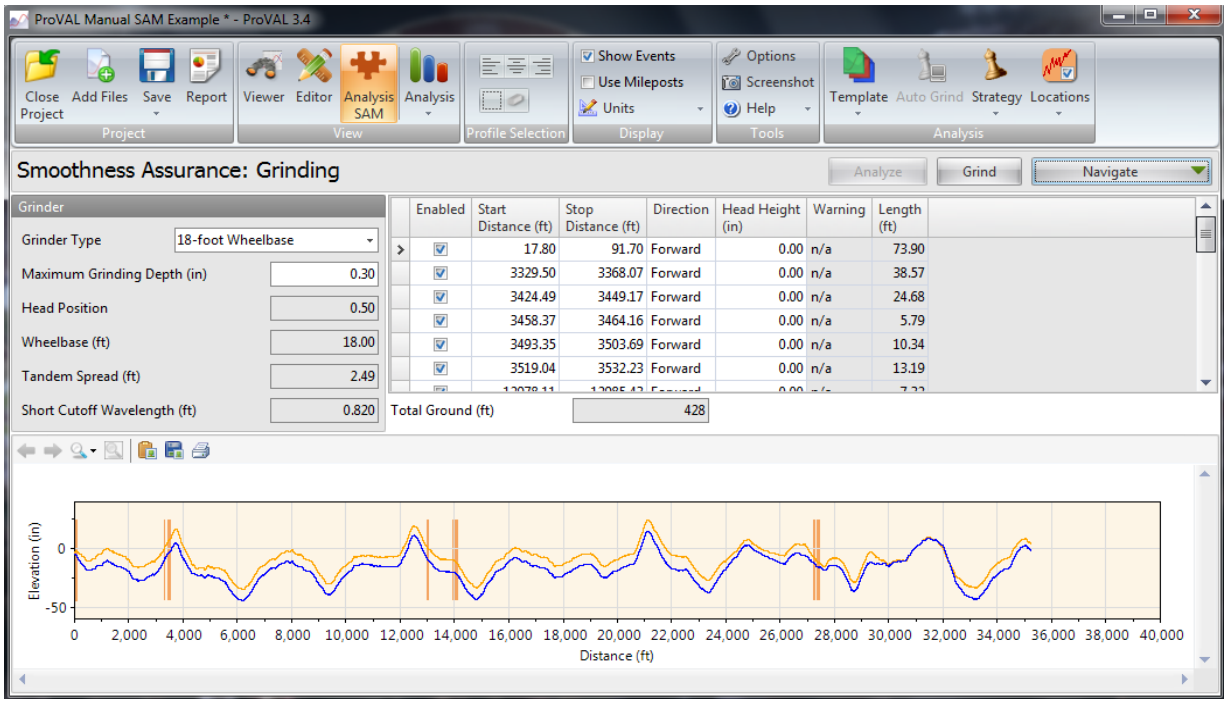
4.17 Select **Grinding** under the **Navigate** tab.



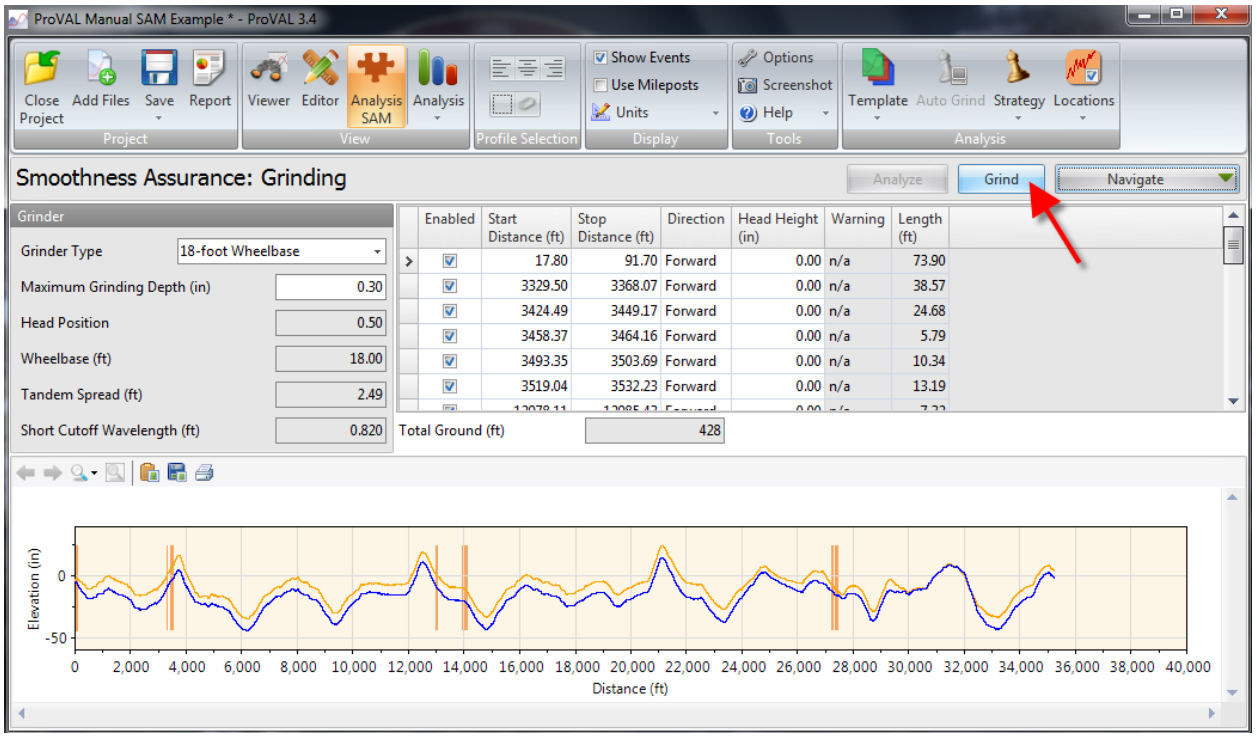
4.18 Select **Auto Grind** from the **Analysis** group. Note: The settings for the grinding simulation (left center of screen under **Grinder** heading) can be changed as needed.



4.19 The graph on the bottom of the screen highlights, in orange, the areas that grinding should occur. The numerical values of the locations for grinding are displayed in a chart in the center portion of the screen.

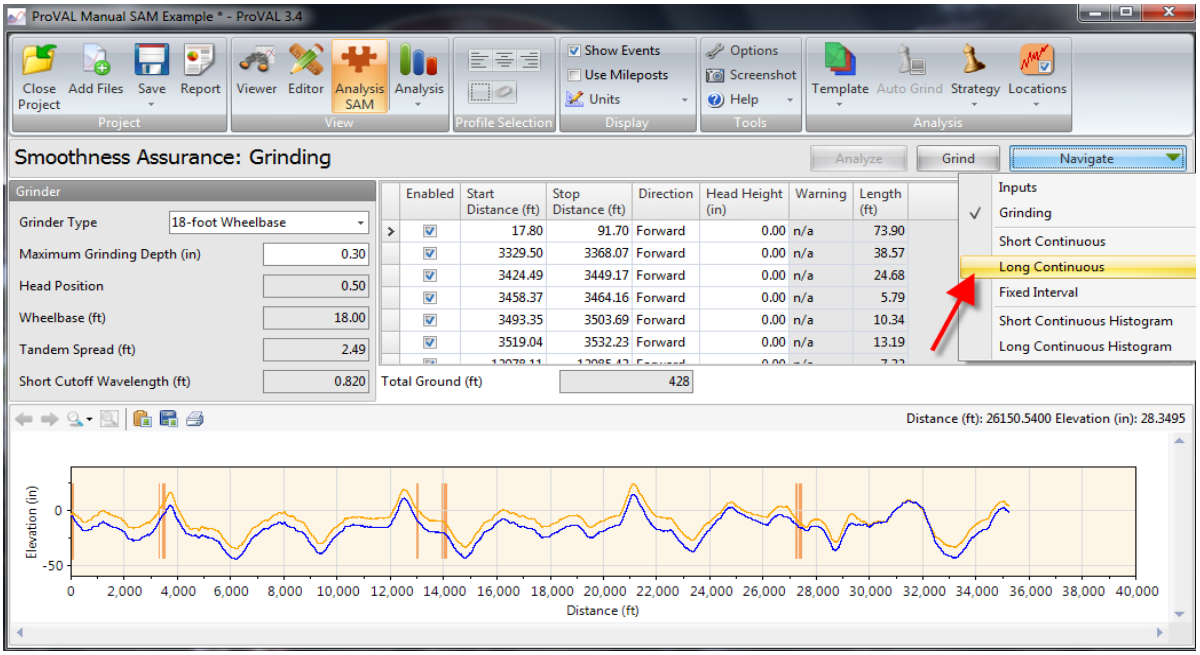


4.20 To apply the grinding simulation to the short continuous and long continuous MRI graphs, select **Grind** as shown below.

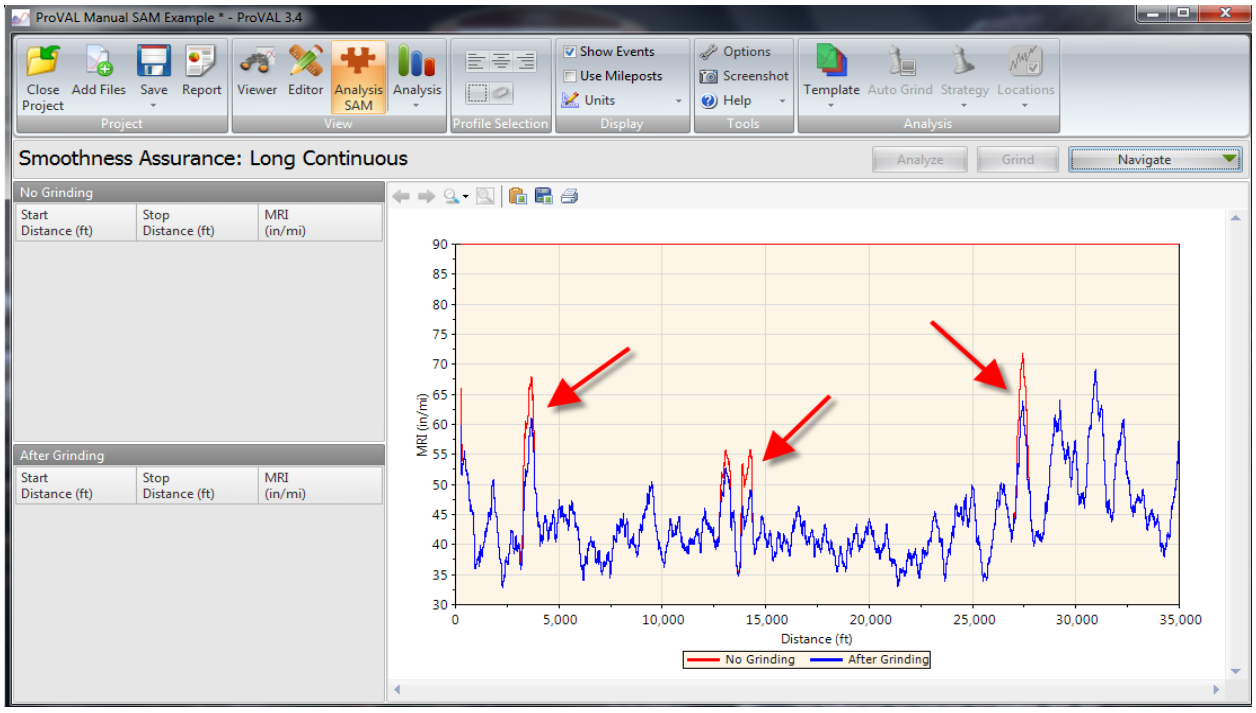


Long Continuous Grinding Comparison

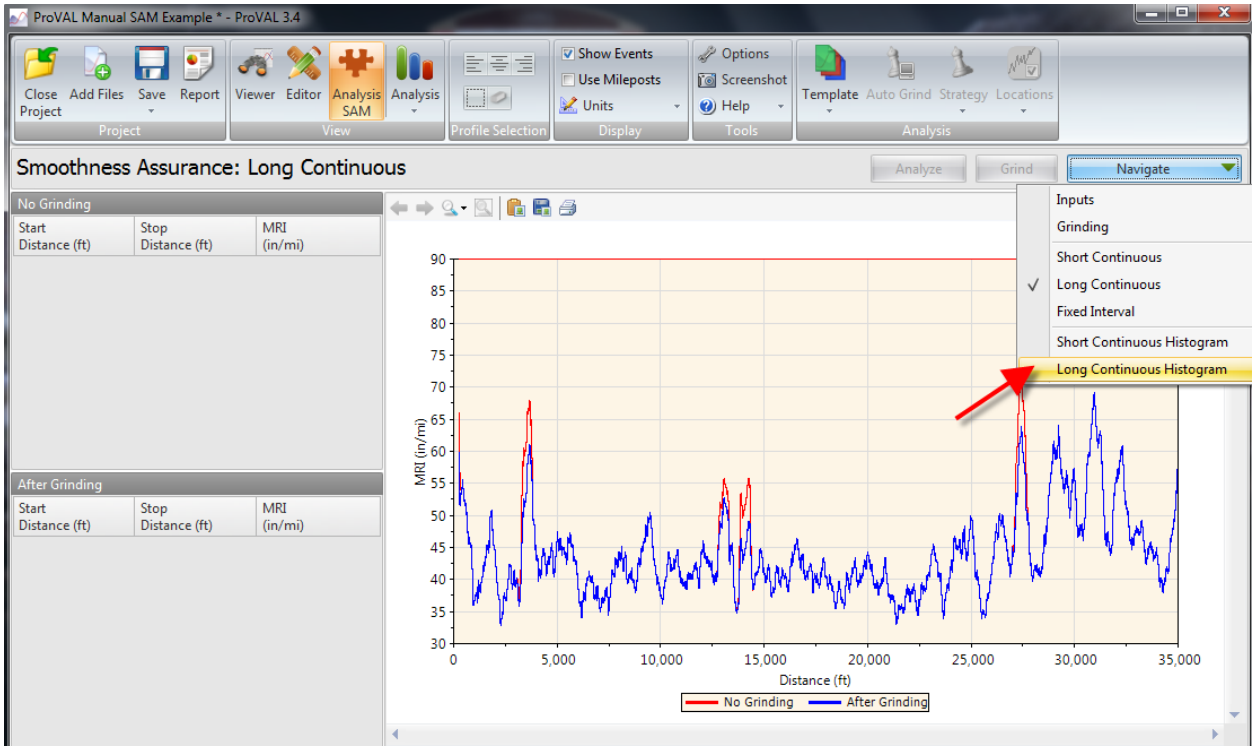
4.21 Select **Long Continuous** under the **Navigate** tab.



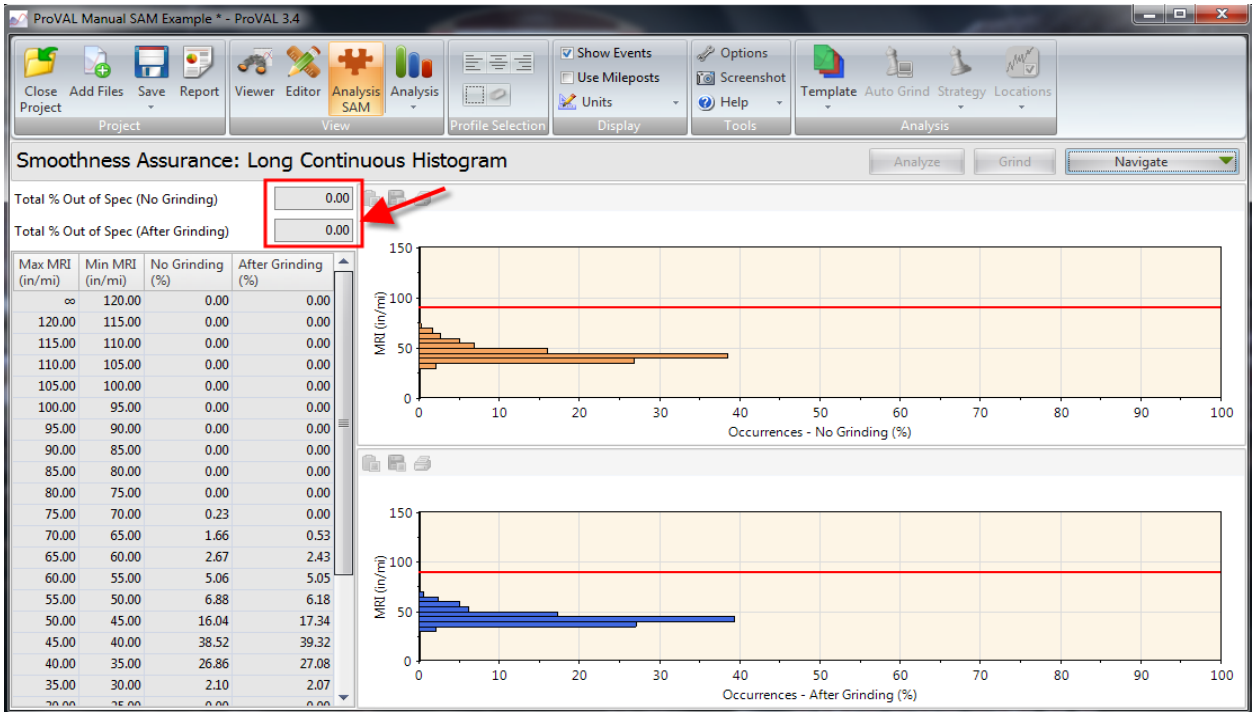
4.22 The red line represents the long continuous MRI **before grinding** and the blue line represents the long continuous MRI **after grinding**. Notice the improvement in roughness values after grinding. *Note: The reason that the grinding was simulated around in these three locations is because these areas had some bumps/dips that exceeded the short continuous threshold as seen in sections 4.26 - 4.29.*



4.23 Select **Long Continuous Histogram** under the **Navigate** tab.

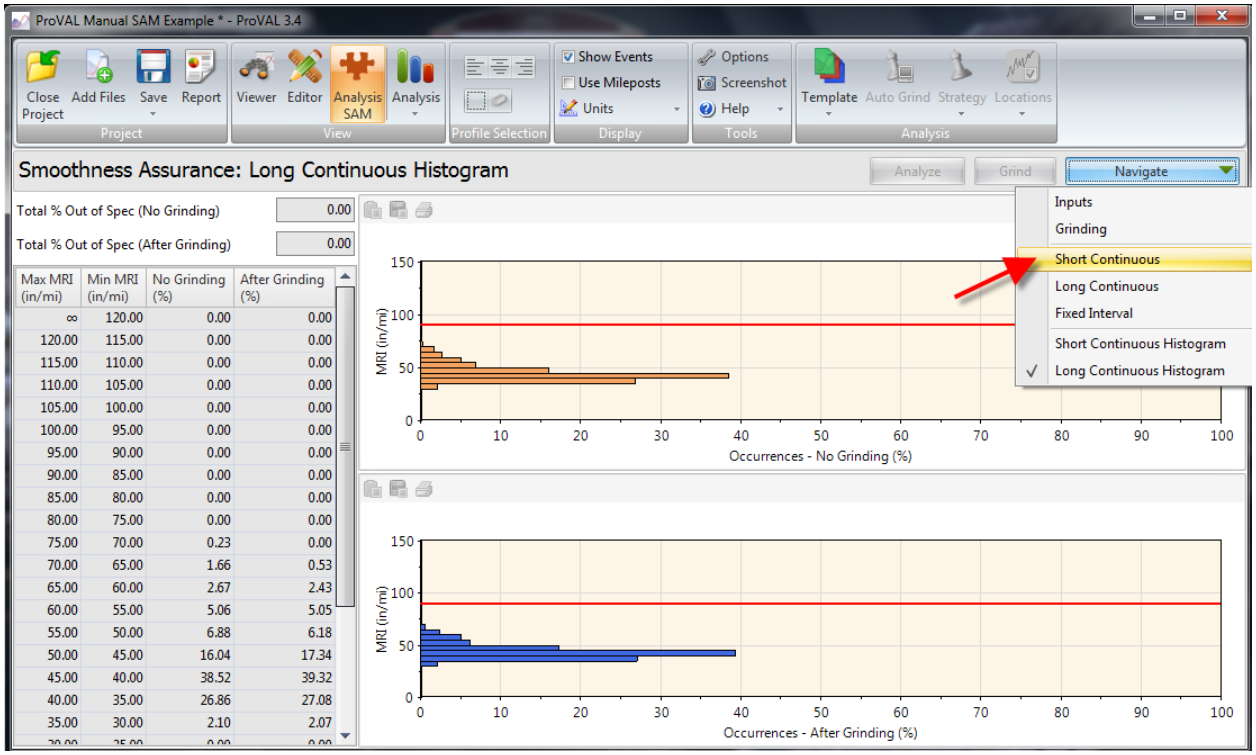


4.24 The values for **Total % Out of Spec** before and after grinding are displayed below. This shows the estimated values for the long continuous MRI before and after grinding the pavement's rough areas.

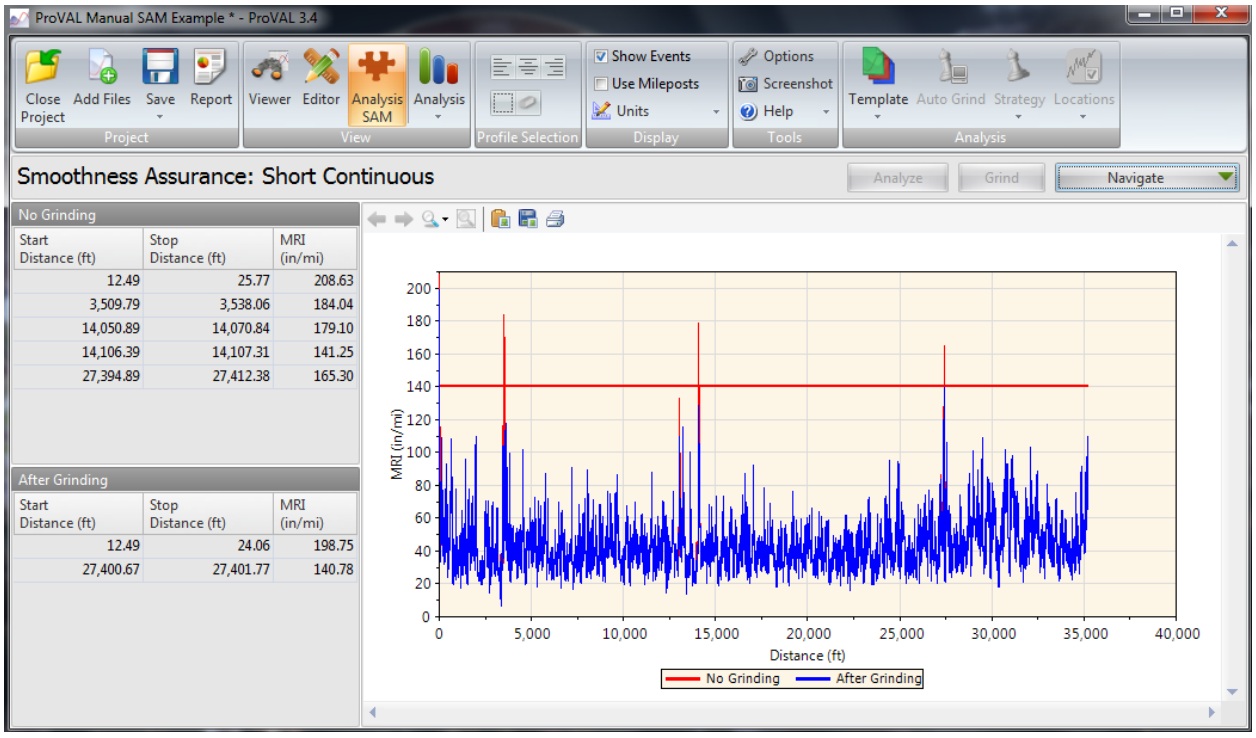


Short Continuous Grinding Comparison

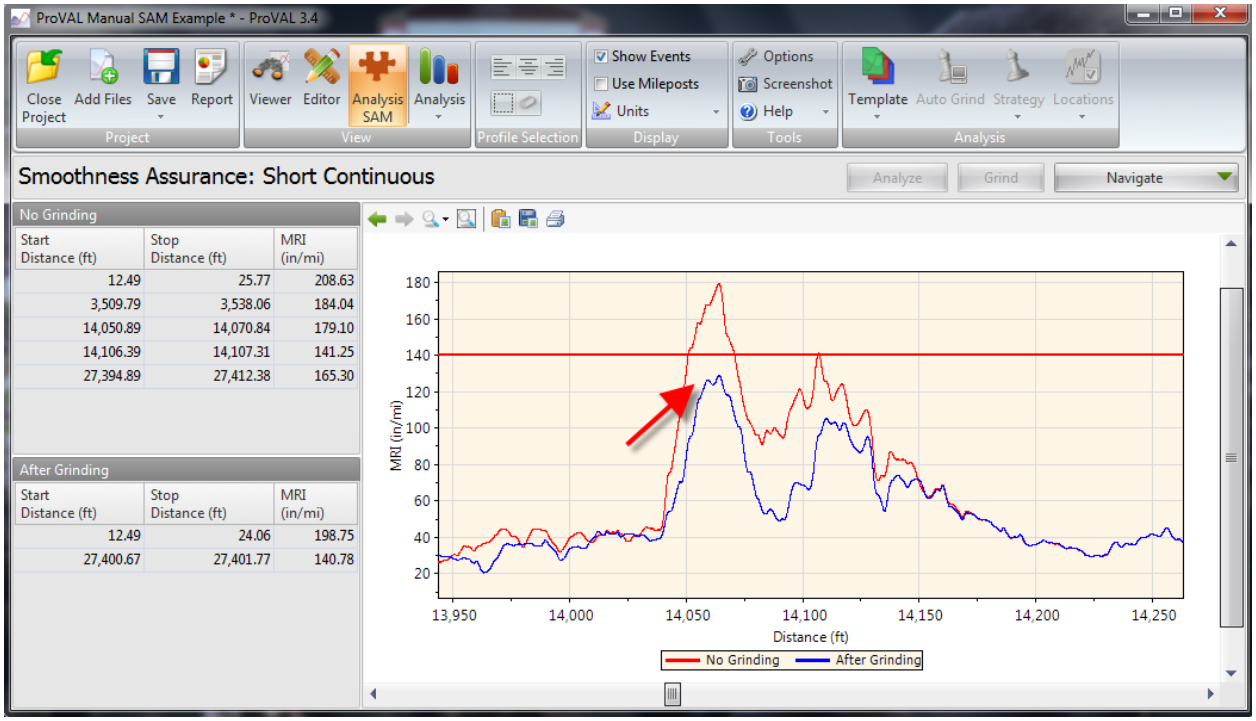
4.25 Select **Short Continuous** under the **Navigate** tab.



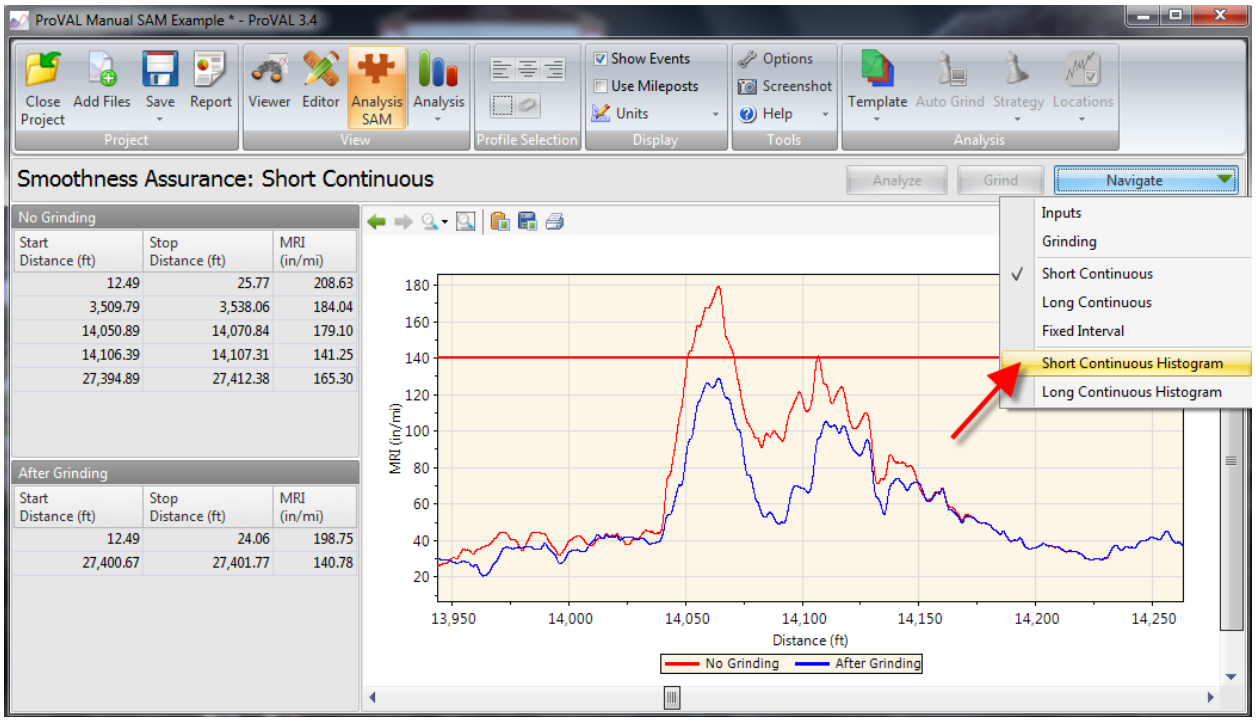
4.26 The red line represents the short continuous MRI **before grinding** and the blue line represents the short continuous MRI **after grinding**.



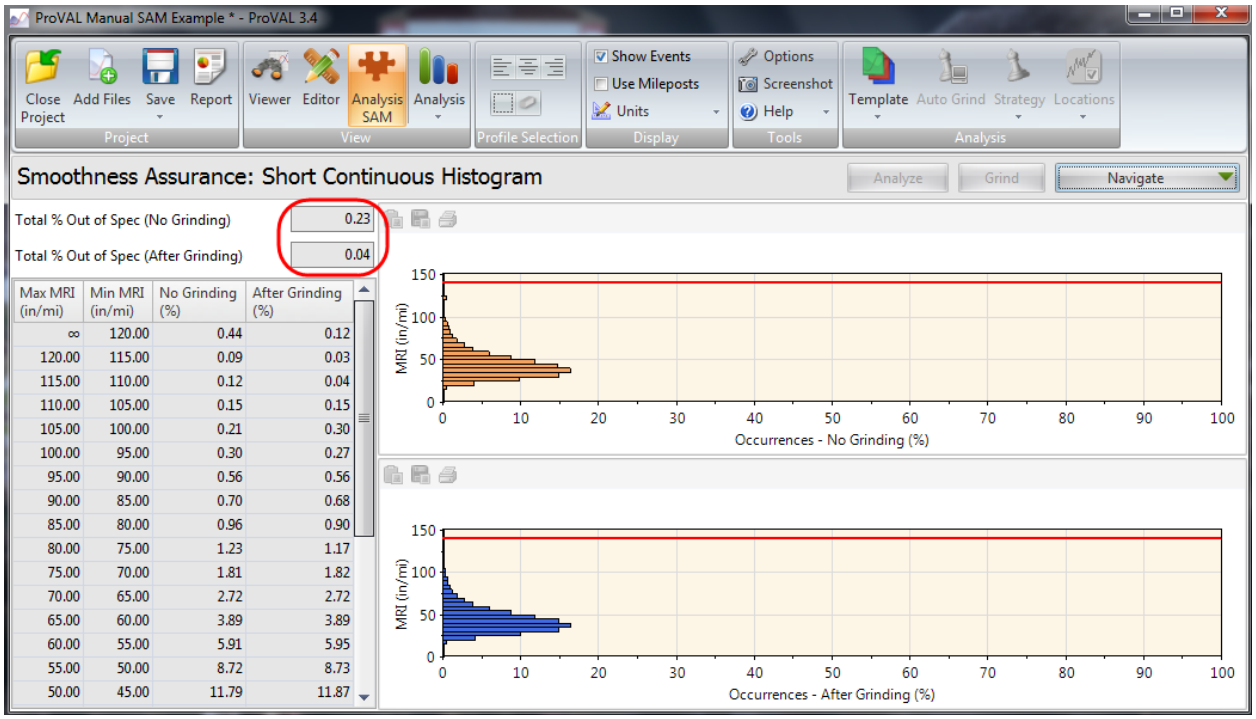
4.27 This is a zoomed in view of the 13,950 ft to 14,250 ft interval. Notice the MRI improvement after the grinding simulation. This bump/dip is now within the allowable MRI threshold.



4.28 Select **Short Continuous Histogram** from the **Navigate** tab.



4.29 The values for **Total % Out of Spec** before and after grinding are displayed below. This shows the estimated values for the short continuous MRI before and after grinding the pavement's rough areas.

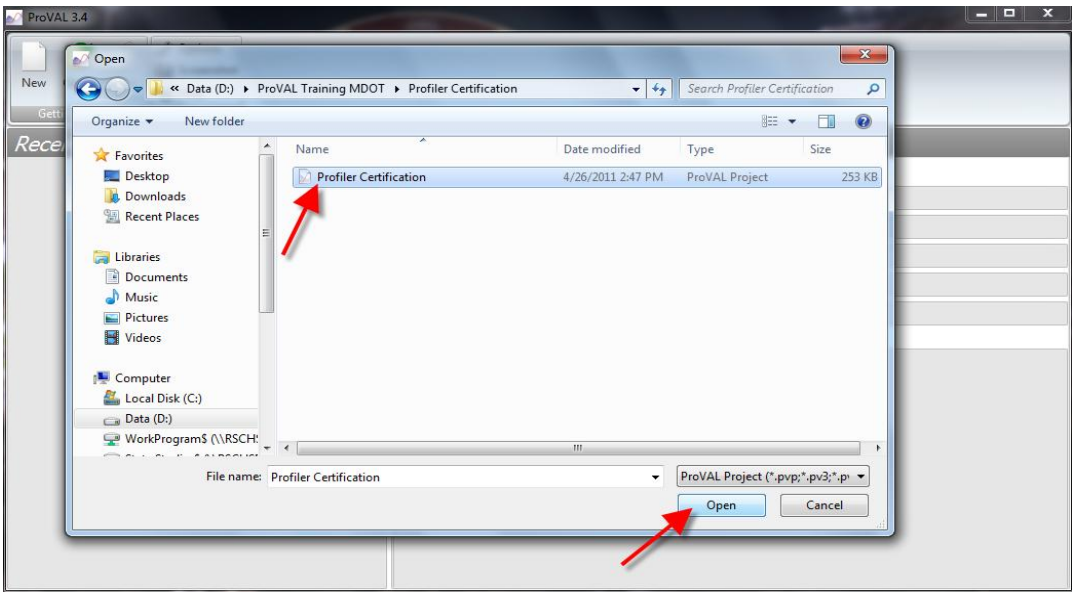


Quality Assurance Check

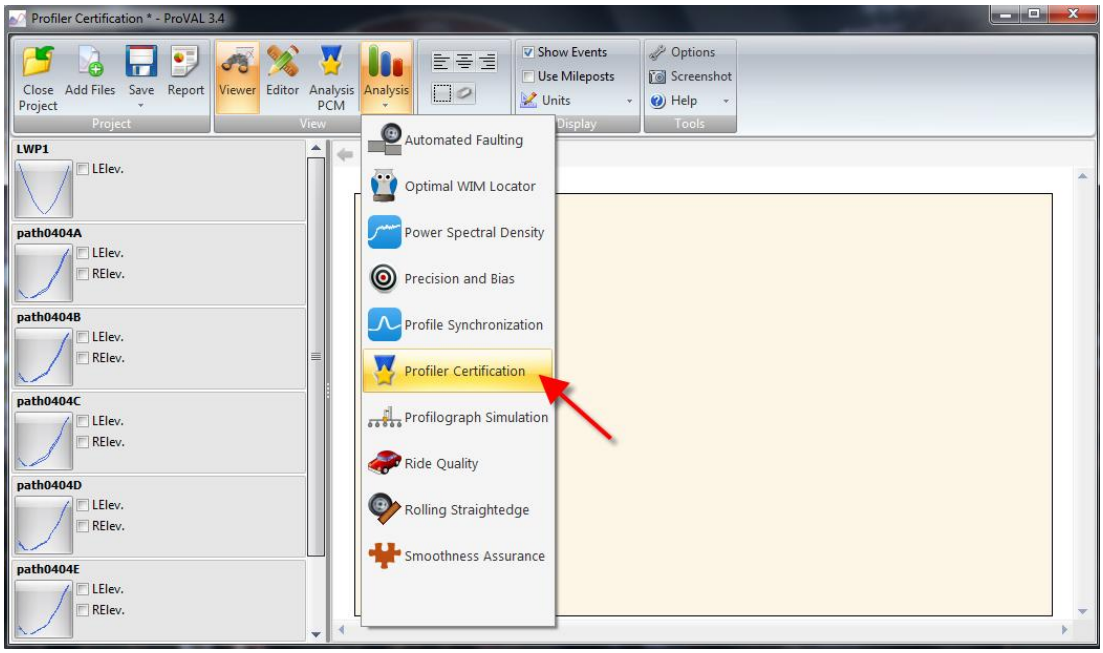
Before a contractor profiles on a jobsite, they are required to check the accuracy of their profiler at one of the MDOT control sections. The contractor must make five runs of the control section and their data will be compared to MDOT's data using the Profiler Certification feature in ProVAL. *Note: Refer to pages 85-88 in the User's Guide for more information on the Quality Assurance Check.*

Processing Data

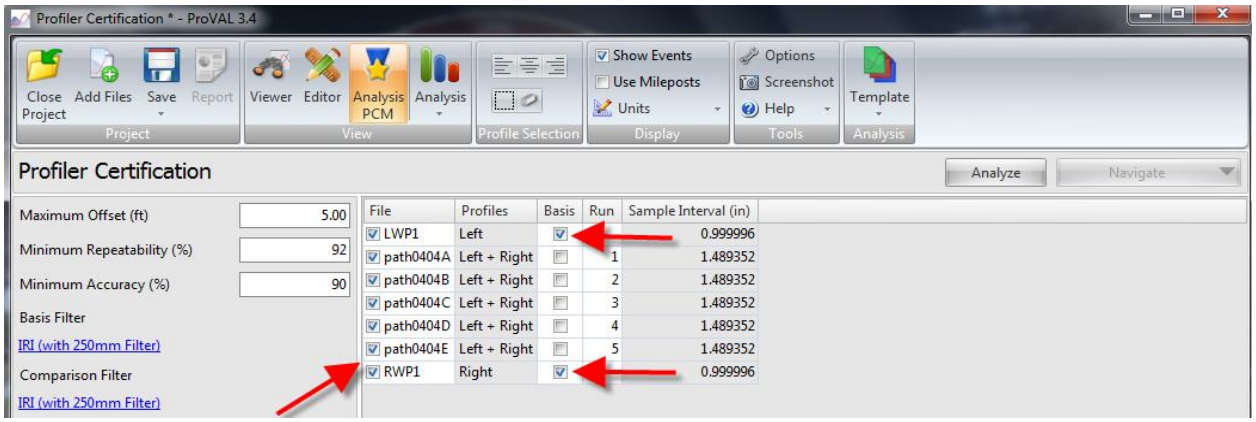
5.1



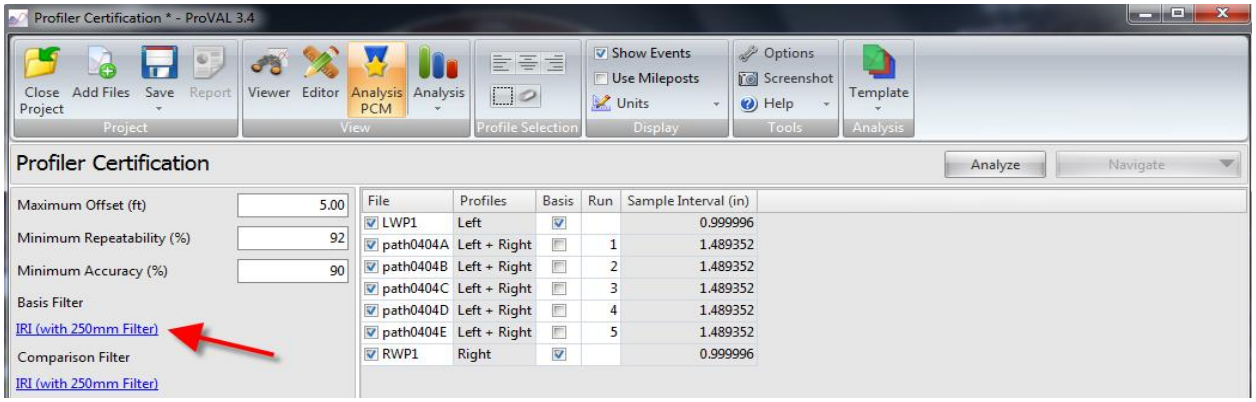
5.1 Click **Profiler Certification** under the **Analysis** tab in the **View** group. Contractor's profile runs of control sections will be compared to MDOT's profile runs by using Profiler Certification function.



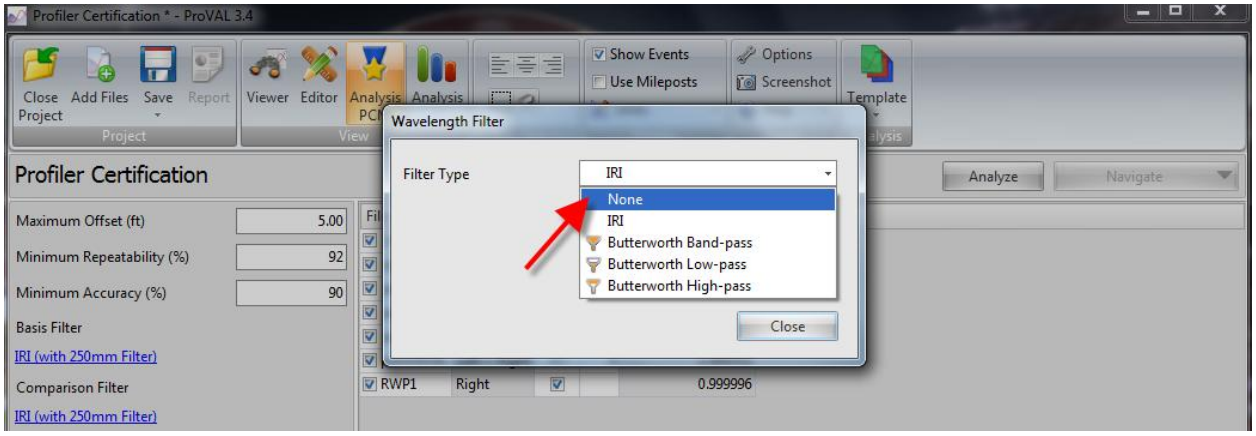
5.2 Check the box next to each run and select a basis for comparison. In this case, the basis runs are from the walking profiler which tests only one wheel path at a time. Therefore, check the **Basis** box next to each of the walking profiler runs.



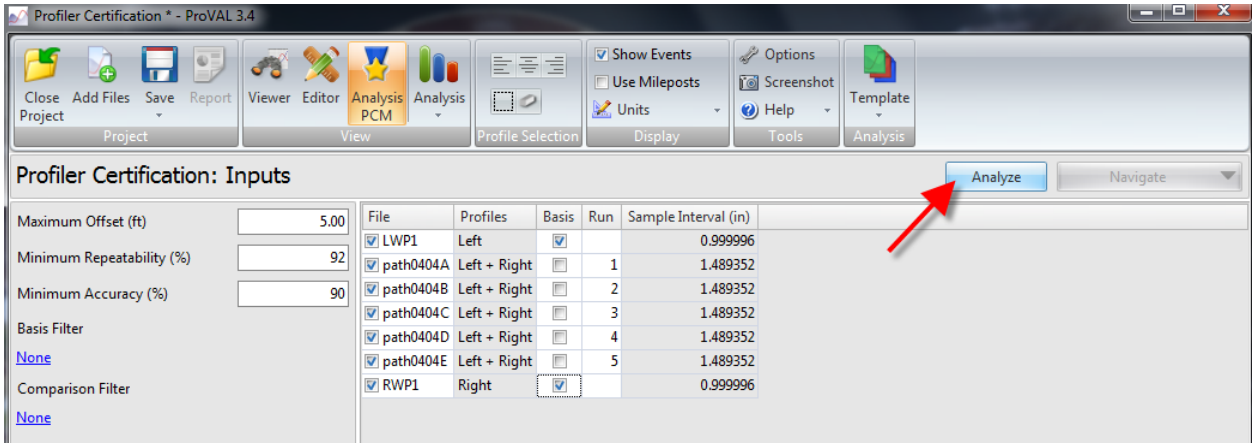
5.3 If data has already been filtered, the filters must be turned off. To turn off filter, first click **IRI (with 250mm filter)** next to Basis Filter. Note: Ensure that the profiler does not have a filter built into the device before using the 250mm filter.



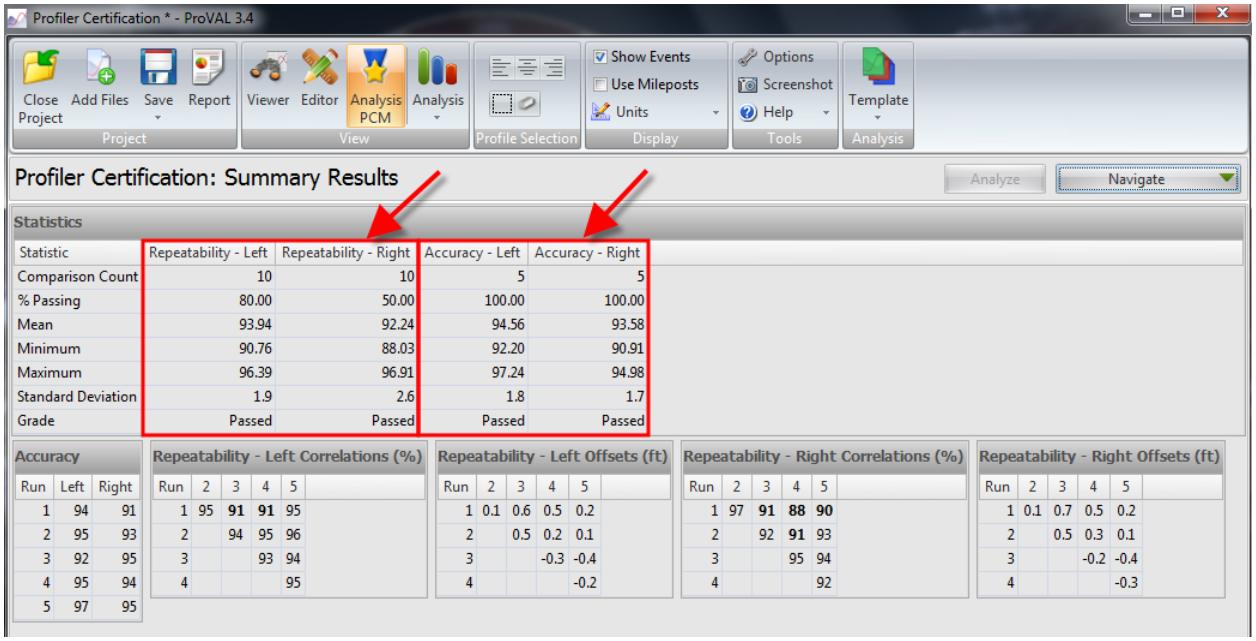
5.4 Select **None** under the **Filter Type** tab, and then click **Close**. Repeat the process for the **Comparison Filter.**



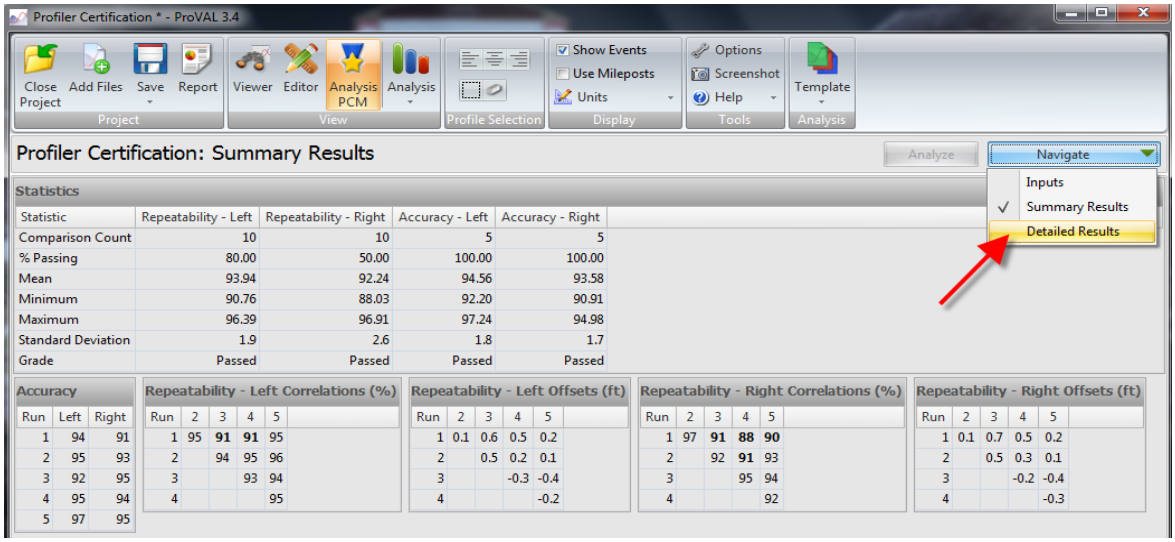
5.5 Once filters settings are set, click **Analyze**.



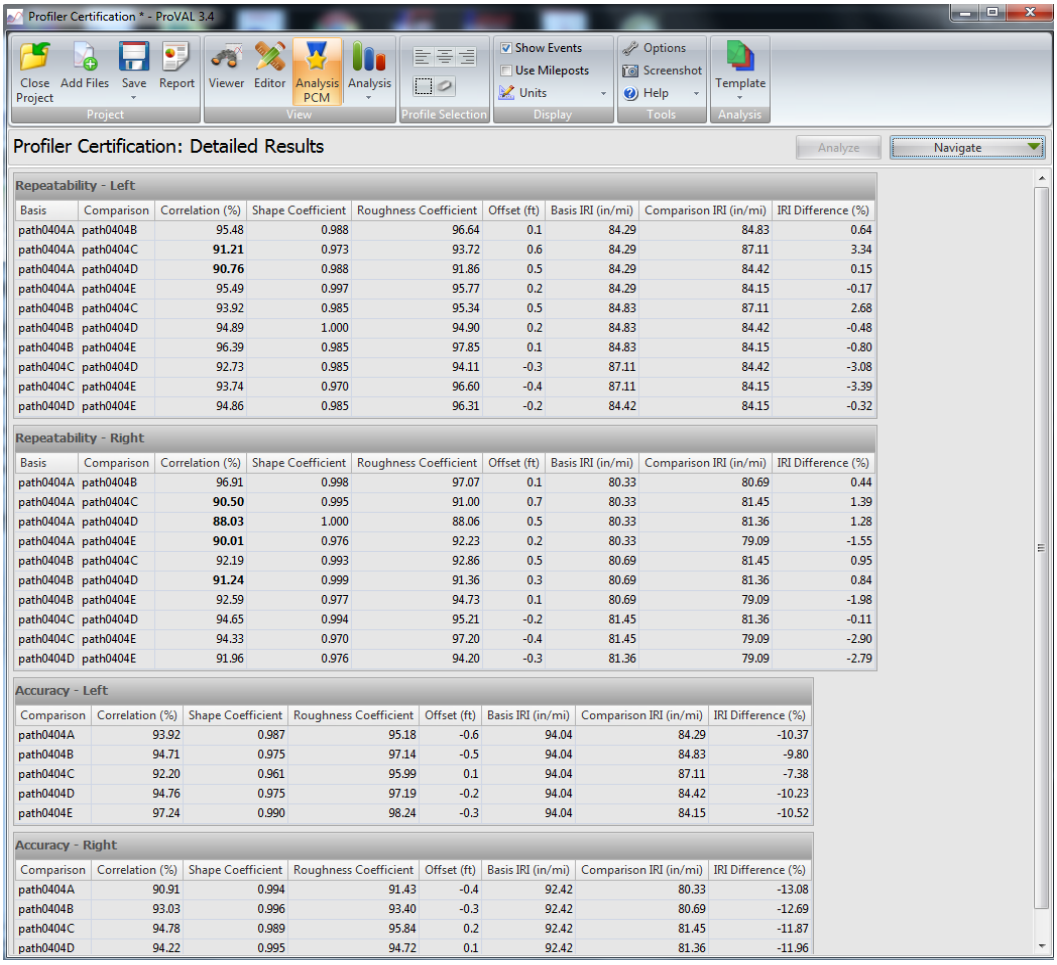
5.6 Certification data is displayed for left and right wheel paths. The grades (Pass or Fail) for each wheel path's repeatability and accuracy are displayed at the bottom of the area boxed in red. If the vendor does not pass in all columns at the bottom of the window, please contact Research Division and someone will investigate.



5.7 Select **Detailed Results** under the **Navigate** tab.

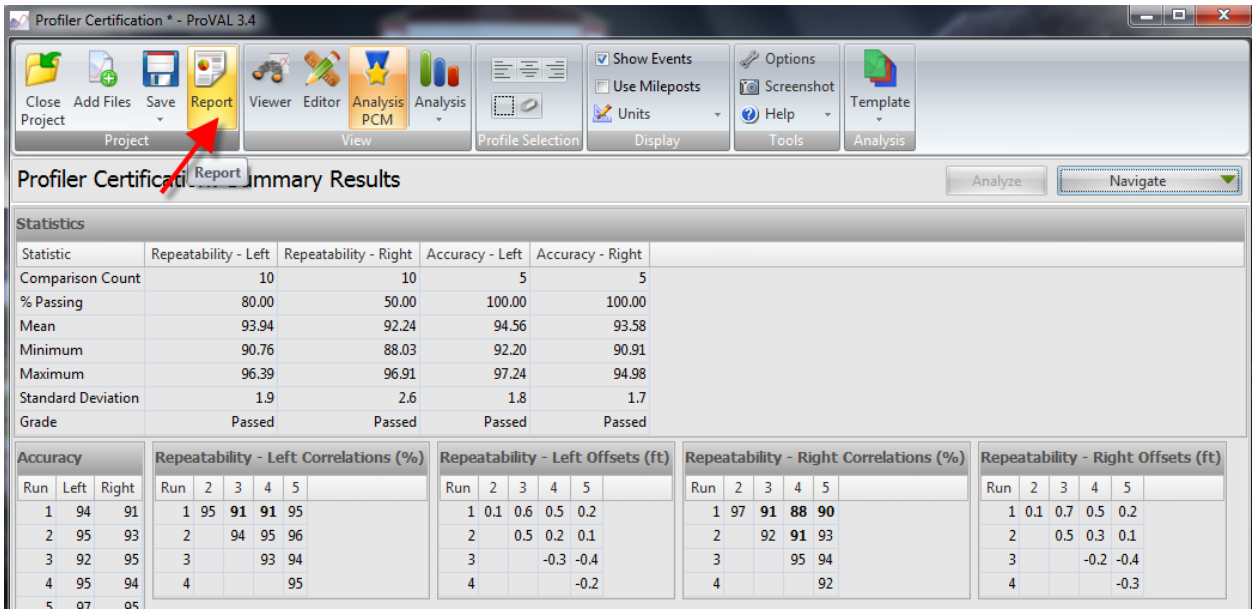


5.8 A detailed result summary is displayed.

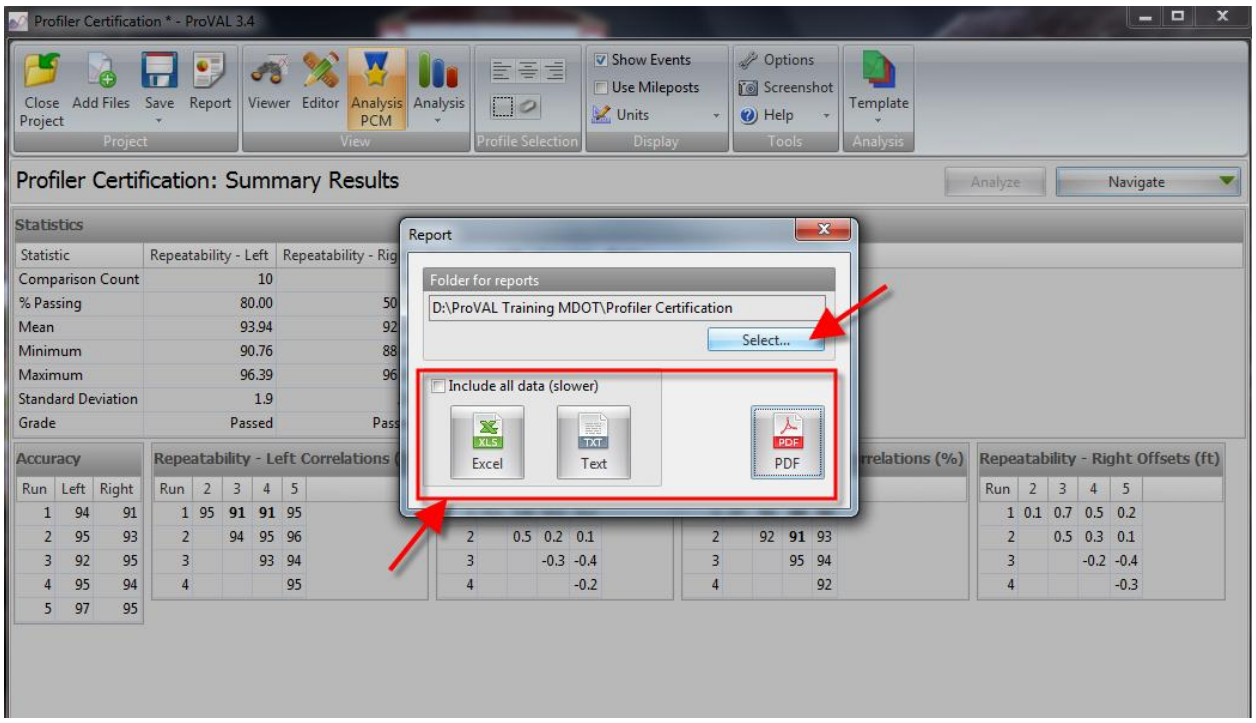


Reporting for Profiler Certification

5.8 To view data in a report format, click **Report** in the **View** group then choose the desired file type.



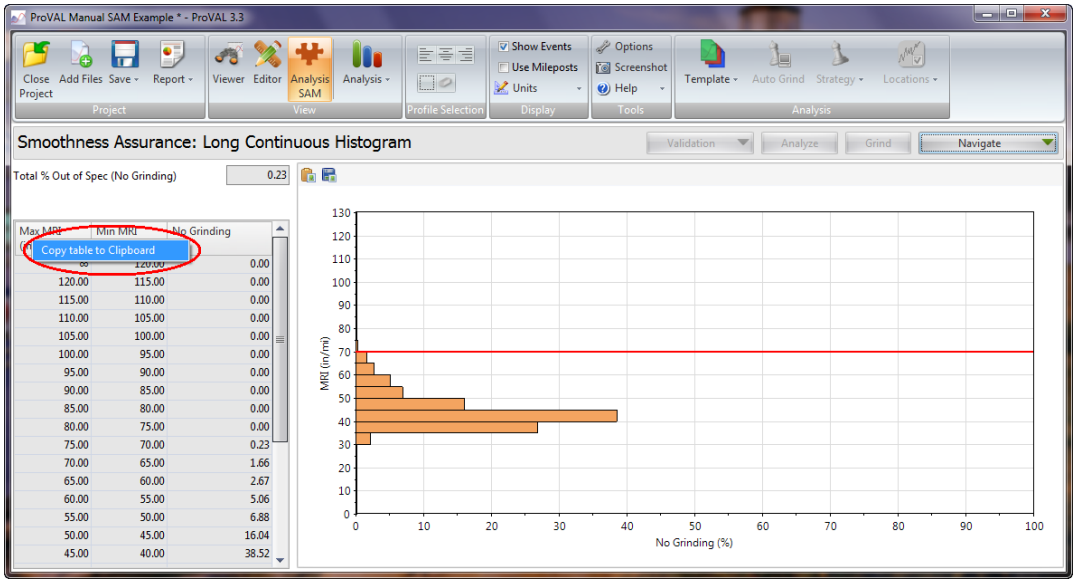
5.9 Choose the desired report format, provide a destination folder for the report to be saved, then choose **Select**.



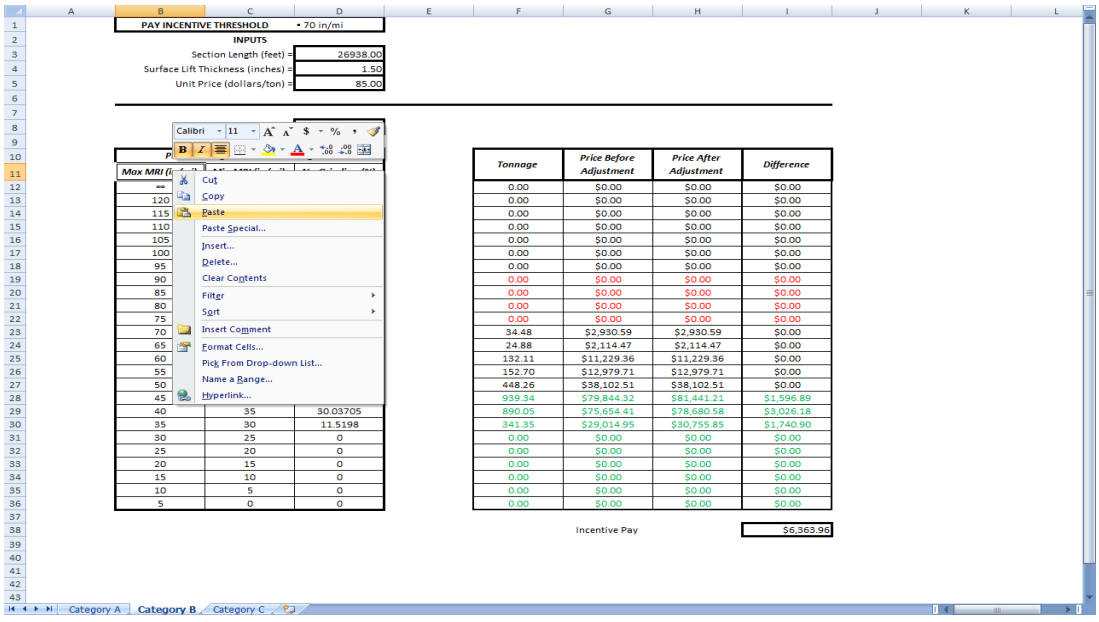
Pay Incentive Calculation Procedure

Processing Data

6.1 Enter the **Smoothness Assurance Module** and analyze the desired file as referenced on pages 25-32 (must re-analyze if you have already performed a grinding simulation). After processing, select the **Long Continuous Histogram** option under the **Navigate** tab as referenced in sections 4.11 to 4.14. Again, the Histogram Class Interval must be 5.00 in/mi as referenced in sections 4.4 to 4.6. Once the **Long Continuous Histogram** is open, **right click** on the top row of the table on the left hand side of the screen and select **Copy table to Clipboard**.

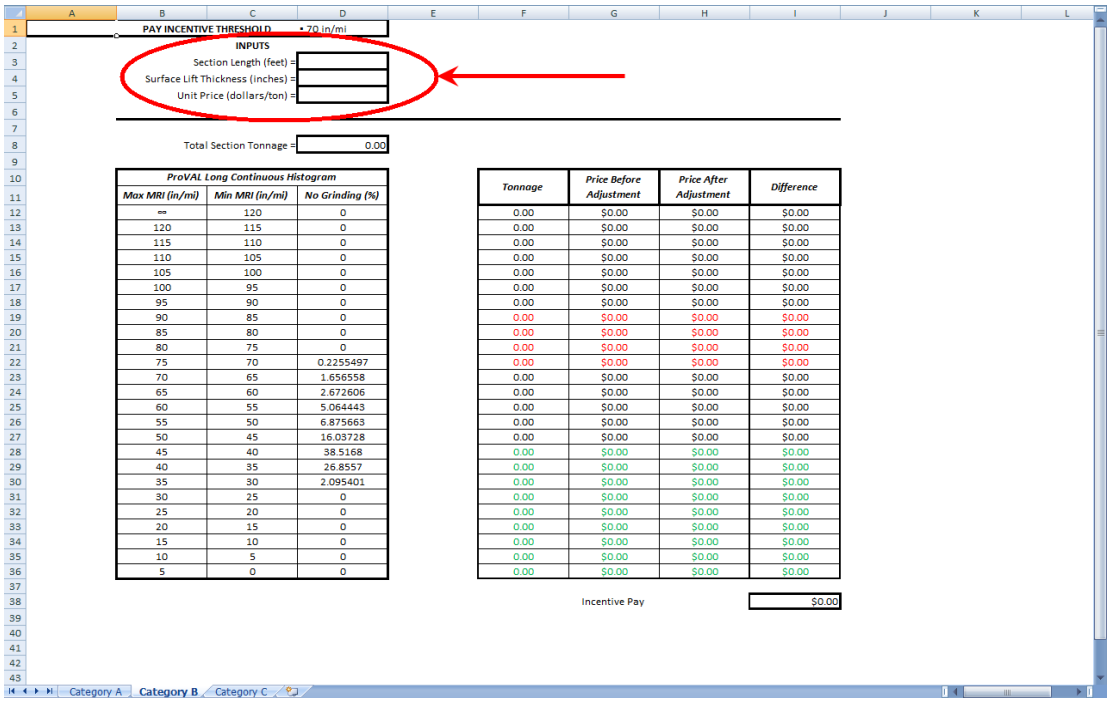


6.2 Open up the Excel spreadsheet entitled **MRI Pay Incentive Template Asphalt** and right click on the box **Max MRI** and select **Paste**.



Spreadsheet Inputs

6.3 Once the table is copied into the spreadsheet, input the proper values in the boxes for **Section Length, Surface Lift Thickness,** and **Unit Price**.



PAY INCENTIVE THRESHOLD • 70 in/mi

INPUTS

Section Length (feet) =

Surface Lift Thickness (inches) =

Unit Price (dollars/ton) =

Total Section Tonnage = 0.00

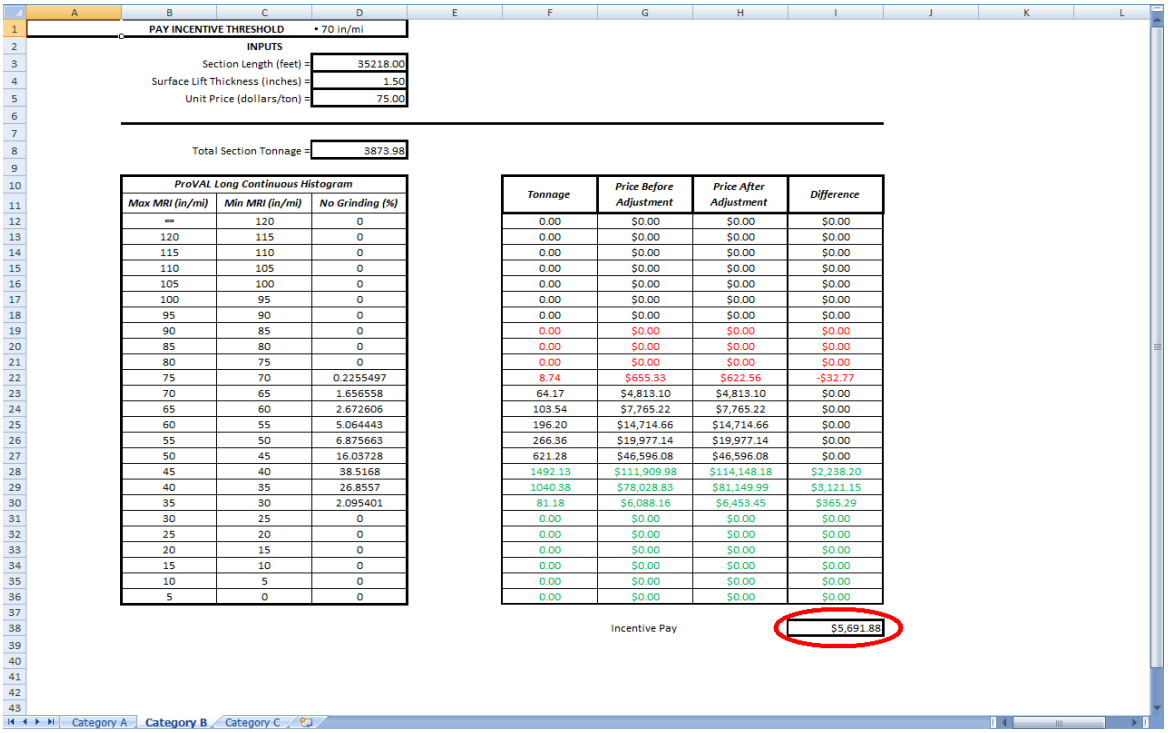
ProVAL Long Continuous Histogram		
Max MRI (in/mi)	Min MRI (in/mi)	No Grinding (%)
∞	120	0
120	115	0
115	110	0
110	105	0
105	100	0
100	95	0
95	90	0
90	85	0
85	80	0
80	75	0
75	70	0.2255497
70	65	1.656558
65	60	2.672606
60	55	5.064443
55	50	6.875663
50	45	16.03728
45	40	38.5168
40	35	26.8557
35	30	2.095401
30	25	0
25	20	0
20	15	0
15	10	0
10	5	0
5	0	0

Tonnage	Price Before Adjustment	Price After Adjustment	Difference
0.00	$0.00	$0.00	$0.00
0.00	$0.00	$0.00	$0.00
0.00	$0.00	$0.00	$0.00
0.00	$0.00	$0.00	$0.00
0.00	$0.00	$0.00	$0.00
0.00	$0.00	$0.00	$0.00
0.00	$0.00	$0.00	$0.00
0.00	$0.00	$0.00	$0.00
0.00	$0.00	$0.00	$0.00
0.00	$0.00	$0.00	$0.00
0.00	$0.00	$0.00	$0.00
0.00	$0.00	$0.00	$0.00
0.00	$0.00	$0.00	$0.00
0.00	$0.00	$0.00	$0.00
0.00	$0.00	$0.00	$0.00
0.00	$0.00	$0.00	$0.00
0.00	$0.00	$0.00	$0.00
0.00	$0.00	$0.00	$0.00
0.00	$0.00	$0.00	$0.00
0.00	$0.00	$0.00	$0.00
0.00	$0.00	$0.00	$0.00
0.00	$0.00	$0.00	$0.00
0.00	$0.00	$0.00	$0.00
0.00	$0.00	$0.00	$0.00
0.00	$0.00	$0.00	$0.00
0.00	$0.00	$0.00	$0.00
0.00	$0.00	$0.00	$0.00
0.00	$0.00	$0.00	$0.00
0.00	$0.00	$0.00	$0.00
0.00	$0.00	$0.00	$0.00
0.00	$0.00	$0.00	$0.00
0.00	$0.00	$0.00	$0.00

Incentive Pay $0.00

Category A | Category B | Category C

6.4 Once both of these values have been entered into the spreadsheet, you will find the section pay incentive value in the **Incentive Pay** box.



PAY INCENTIVE THRESHOLD • 70 in/mi

INPUTS

Section Length (feet) = 35218.00

Surface Lift Thickness (inches) = 1.50

Unit Price (dollars/ton) = 75.00

Total Section Tonnage = 3873.98

ProVAL Long Continuous Histogram		
Max MRI (in/mi)	Min MRI (in/mi)	No Grinding (%)
∞	120	0
120	115	0
115	110	0
110	105	0
105	100	0
100	95	0
95	90	0
90	85	0
85	80	0
80	75	0
75	70	0.2255497
70	65	1.656558
65	60	2.672606
60	55	5.064443
55	50	6.875663
50	45	16.03728
45	40	38.5168
40	35	26.8557
35	30	2.095401
30	25	0
25	20	0
20	15	0
15	10	0
10	5	0
5	0	0

Tonnage	Price Before Adjustment	Price After Adjustment	Difference
0.00	$0.00	$0.00	$0.00
0.00	$0.00	$0.00	$0.00
0.00	$0.00	$0.00	$0.00
0.00	$0.00	$0.00	$0.00
0.00	$0.00	$0.00	$0.00
0.00	$0.00	$0.00	$0.00
0.00	$0.00	$0.00	$0.00
0.00	$0.00	$0.00	$0.00
0.00	$0.00	$0.00	$0.00
0.00	$0.00	$0.00	$0.00
0.00	$0.00	$0.00	$0.00
8.74	$655.33	$622.56	-$32.77
64.17	$4,813.10	$4,813.10	$0.00
103.54	$7,765.22	$7,765.22	$0.00
196.20	$14,714.66	$14,714.66	$0.00
266.36	$19,977.14	$19,977.14	$0.00
621.28	$46,596.08	$46,596.08	$0.00
1492.13	$111,909.98	$114,148.18	$2,238.20
1040.38	$78,028.83	$81,149.99	$3,121.15
81.18	$6,088.16	$6,453.45	$365.29
0.00	$0.00	$0.00	$0.00
0.00	$0.00	$0.00	$0.00
0.00	$0.00	$0.00	$0.00
0.00	$0.00	$0.00	$0.00
0.00	$0.00	$0.00	$0.00
0.00	$0.00	$0.00	$0.00

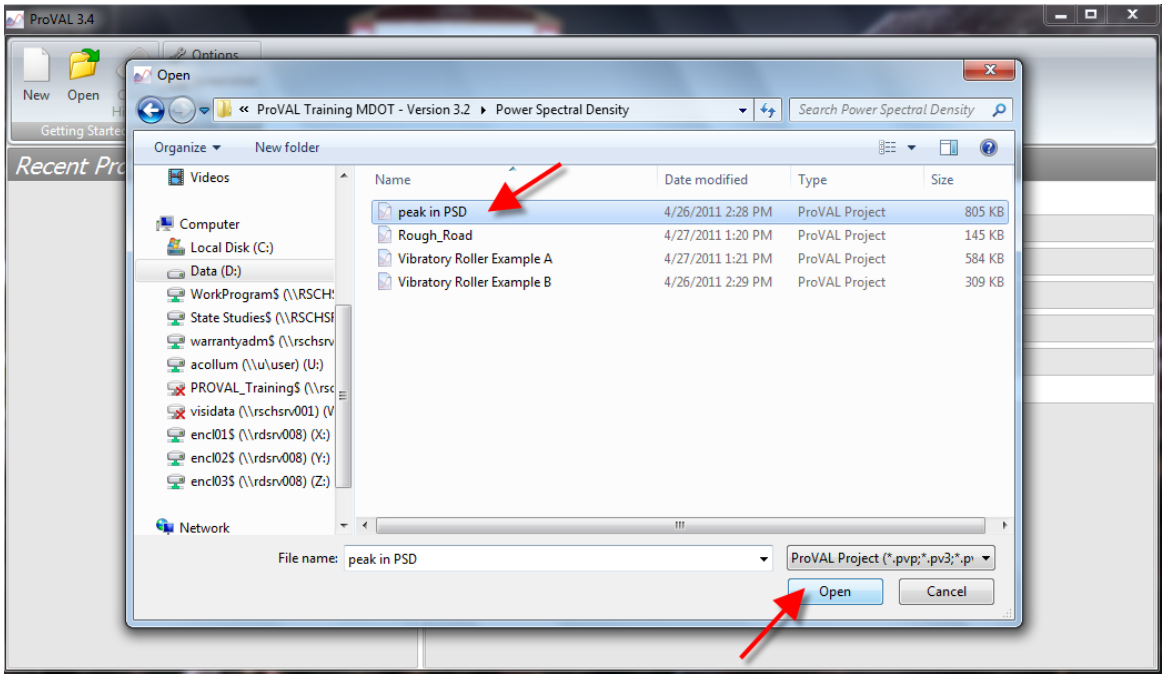
Incentive Pay $5,691.88

Category A | Category B | Category C

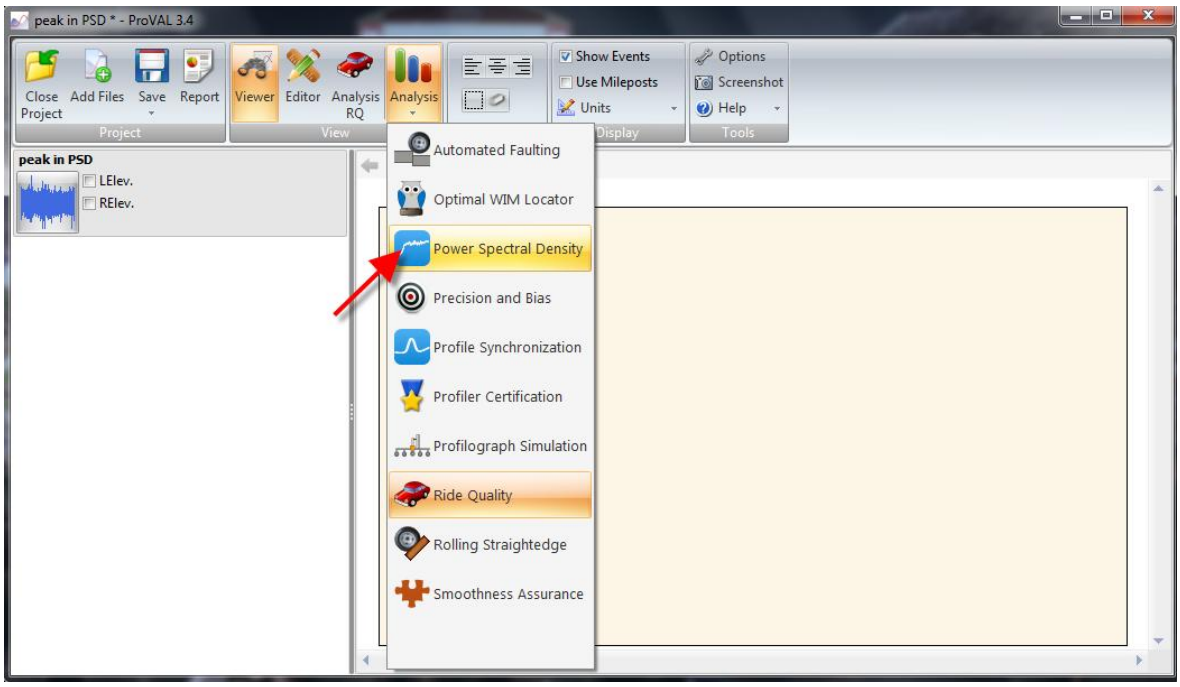
Power Spectral Density

Processing Data

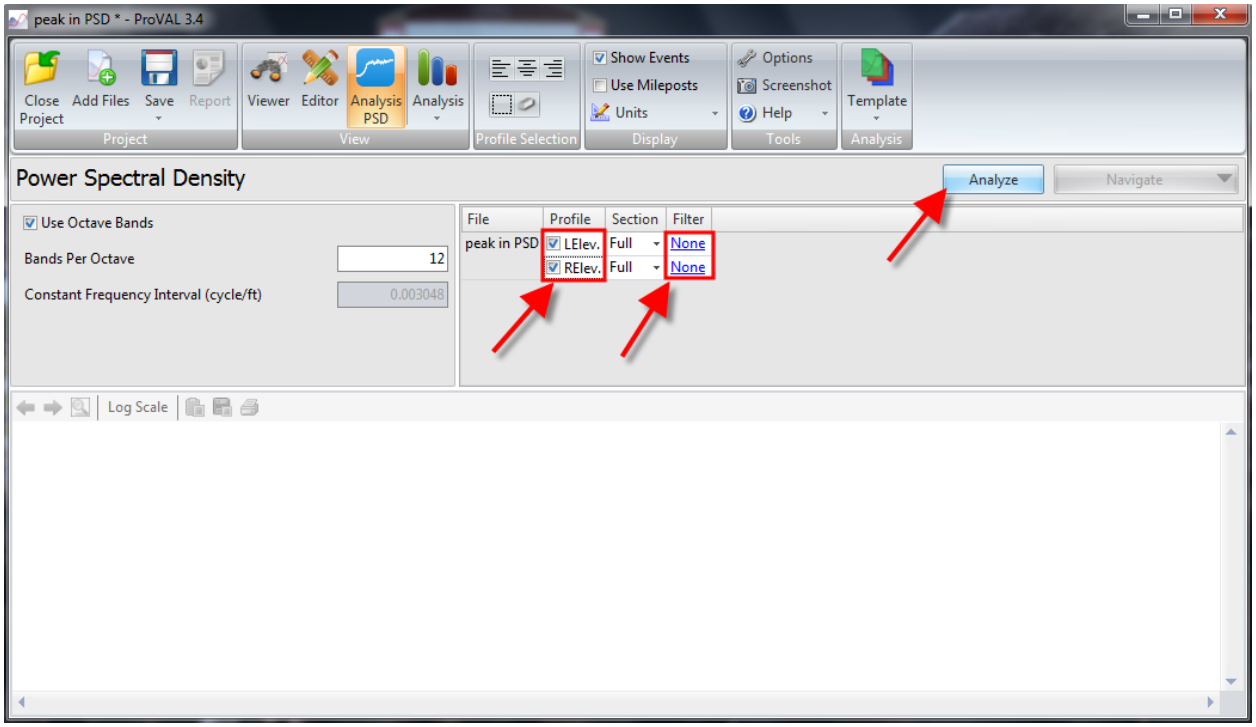
6.1 Select **peak in PSD** in the **ProVAL Training MDOT** folder and click **Open**. Note: Refer to pages 79-82 in the User's Guide for more information on PSD.



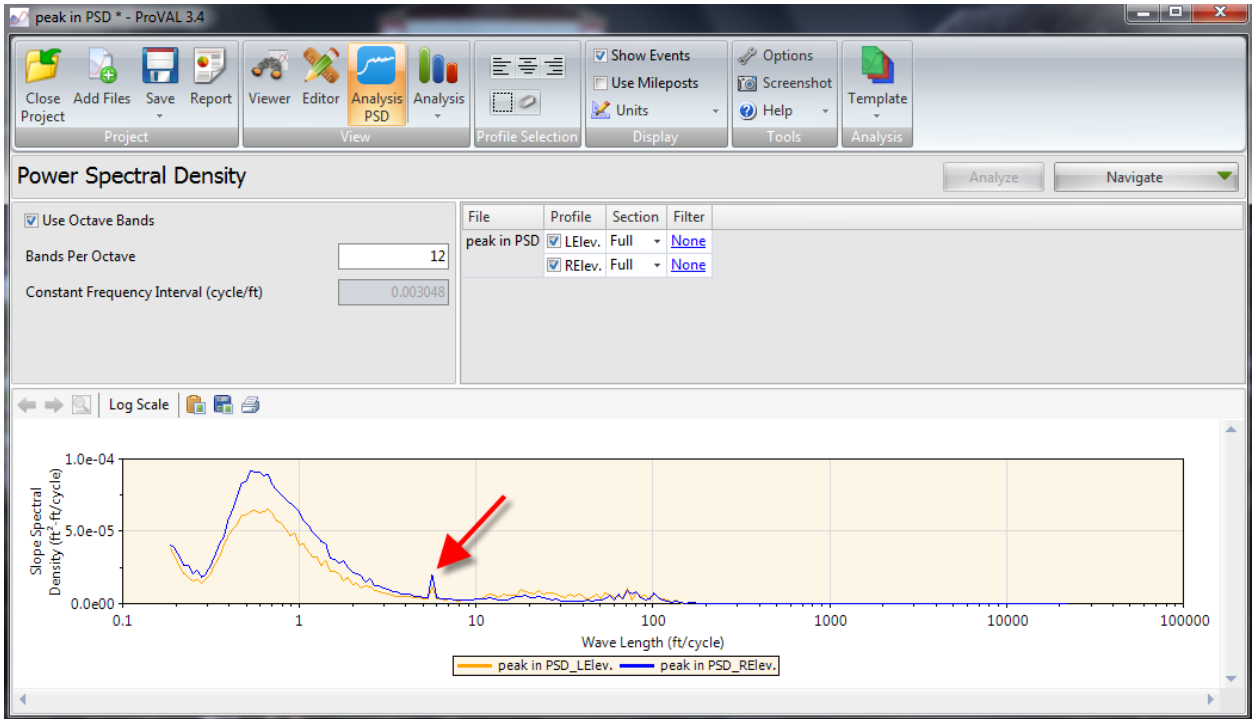
6.2 Select **Power Spectral Density** under the **Analysis** tab in the **View** group.



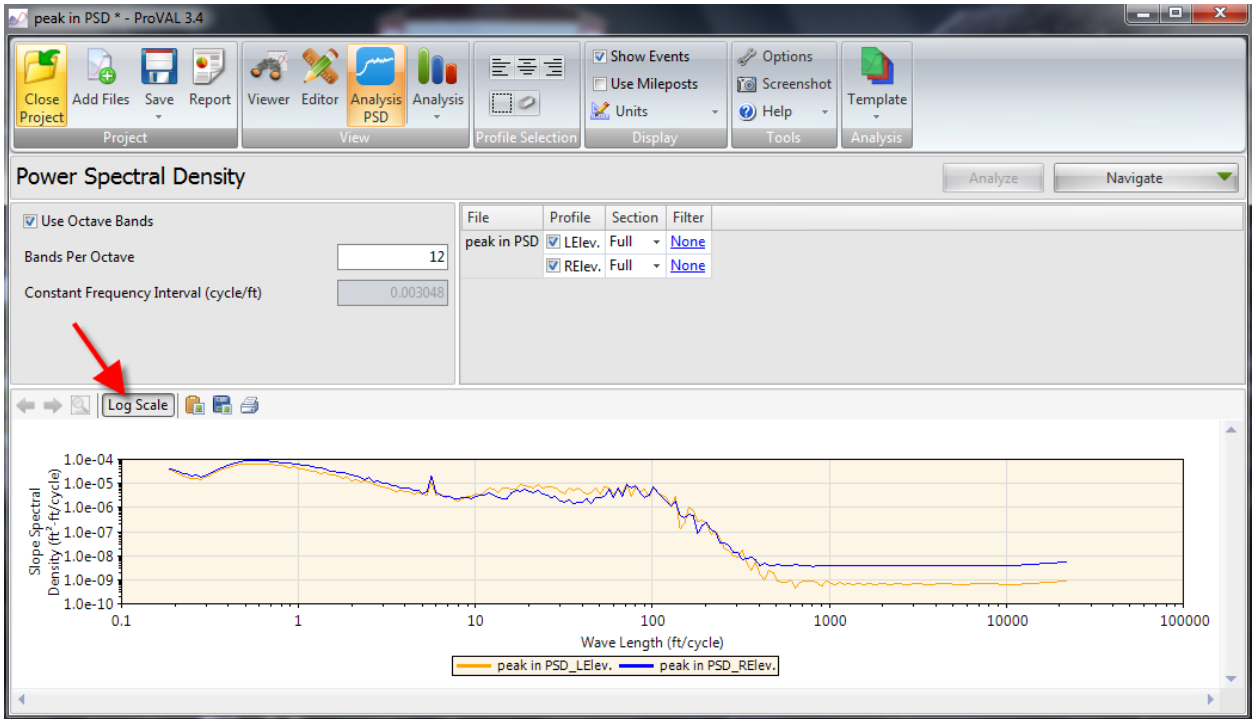
6.3 Check the box next to each wheel path and set filter to desired setting, then click **Analyze**.



6.4 Displayed below is the **Slope PSD (Wave Length)** graph. Notice the peak in PSD between the 5 to 6 foot wavelength bands.



6.5 Click the **Log Scale** button to display the graph on a log scale. Notice the same peak in PSD between the 5 and 6 foot wavelength band.

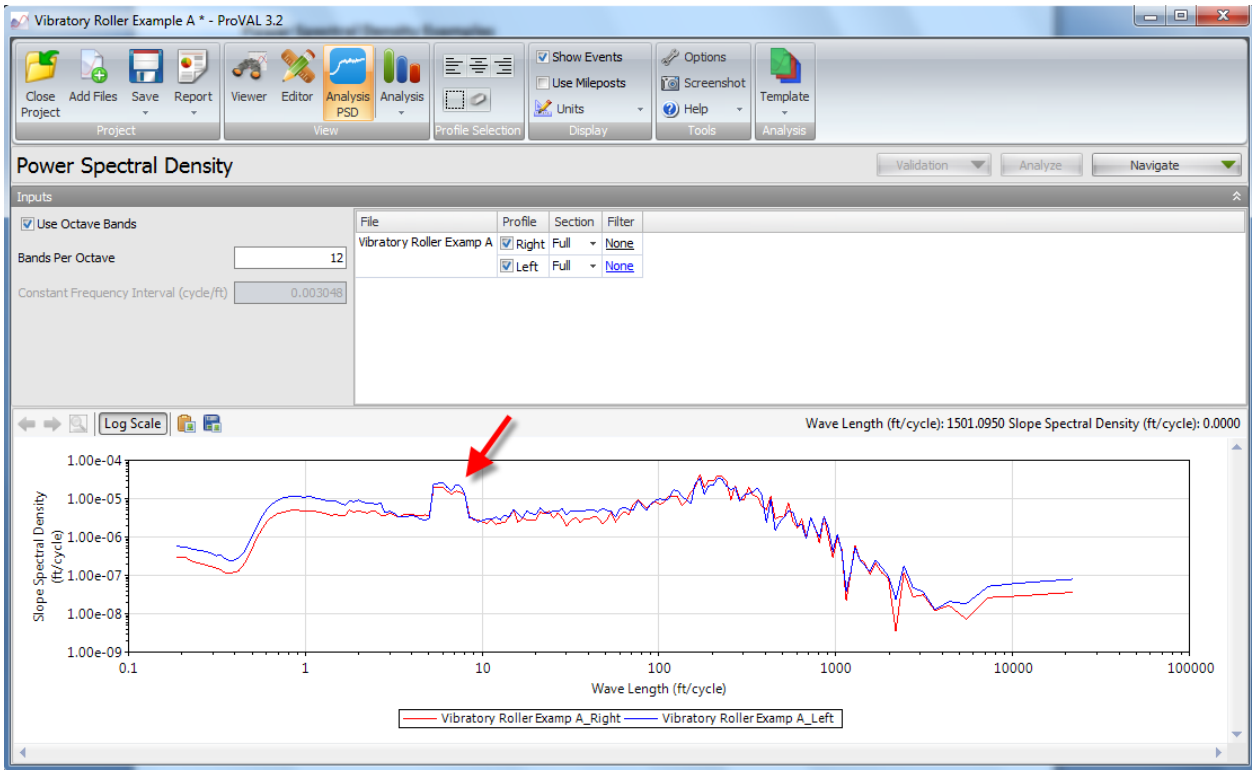


PSD Examples

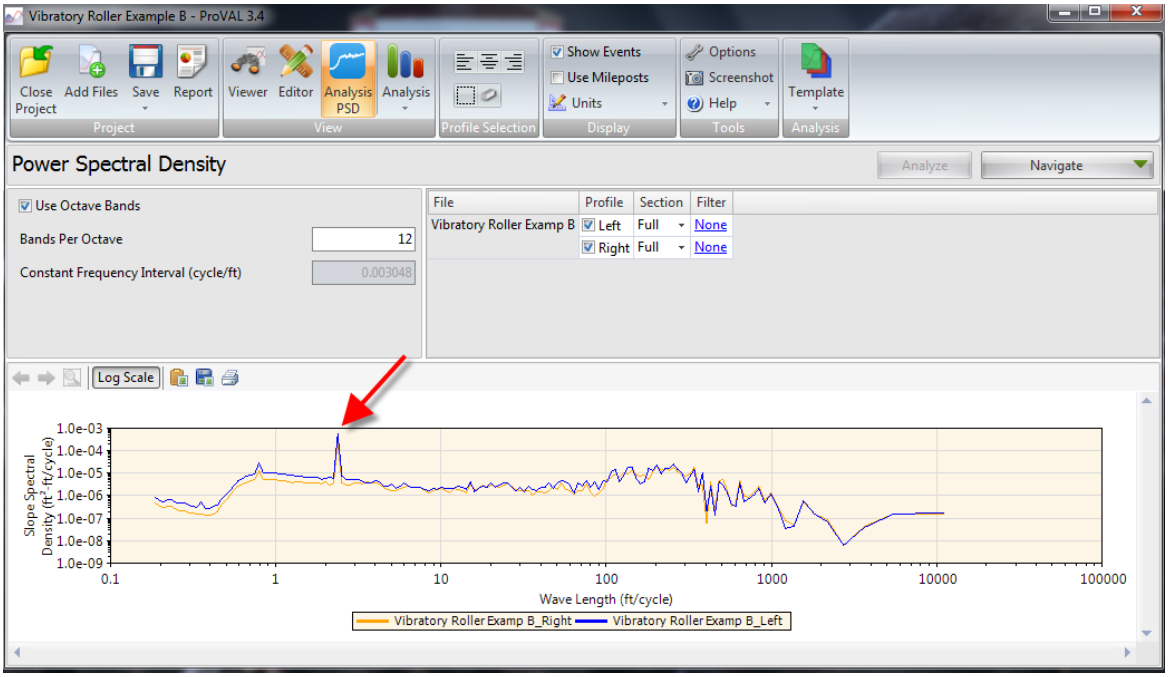
Example 1

The figures in 6.6 and 6.7 display the PSD for pavement profiles that were collected in different lanes and directions on the same project. The project consisted of an interstate mill and fill thin AC overlay. In figures 6.6 and 6.7, the vibratory roller induces content into the profile by the amplitude and frequency settings and the rate of roller travel speed. The bumps and dips cycle in and out of phase with each other between the left and right wheel paths. This is because one half lane was rolled then the other half lane was rolled with the roller traveling at slightly different speeds. This will cause a decrease in ride quality.

6.6 The graph below shows that the pavement peaks in the 5 to 8 foot wavelength band. This induced content is a wavelength band which affects vehicle suspensions, therefore increasing the MRI value.

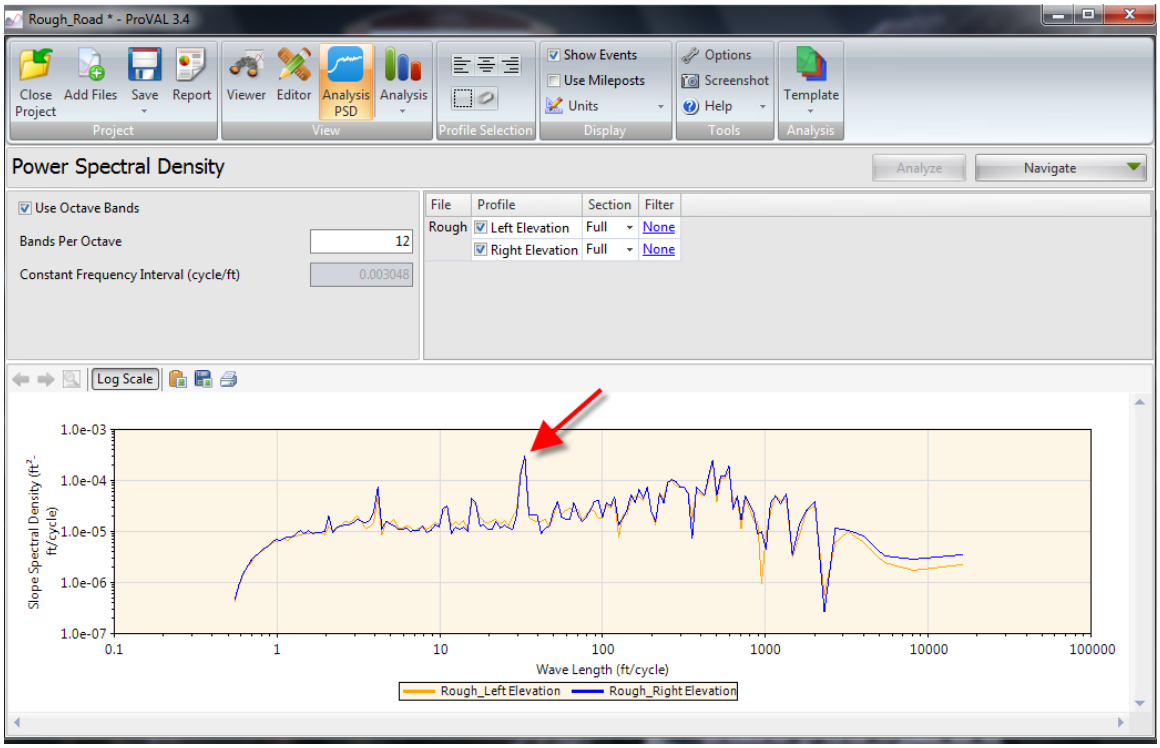


6.7 The graph below shows that the pavement peaks in the 2.2 to 2.5 foot wavelength band. This wavelength band is mostly outside what most effects vehicle suspensions and MRI.



Example 2

6.8 The PSD analysis shown below is for a rough road (avg. IRI = 122 in/mile). From the peak shown by the arrow below, there appears to be an issue occurring in approximately 32 ft intervals.



Troubleshooting

The ProVAL 3.4 program has a few known issues that can cause the software to not function properly. You can visit the ProVAL website (www.roadprofile.com) for help with correcting any issues. If there are any further issues with the ProVAL software, contact the Research Division.

The following two sections explain known fixes for ProVAL issues. This information was taken directly from the Transtec Group's website.

Sending the log files

For Windows XP (Vista may be different), your log files are located here:
C:\Documents and Settings\[USERNAME]\Local Settings\Application Data\The Transtec Group

For Windows 7, look here:
C:\Users\[USERNAME]\AppData\Local\The Transtec Group

This location is hidden so you will probably need to Show Hidden Files. Send us the *Recording Log.xml* and *Event Log.xml* files, preferably zipped first. It is possible these files will not exist. If this is the case, don't fret; just go to the next step.

Remove potentially corrupted files

For all files and folders listed below, we recommend moving them to a temporary location instead of just deleting them. If you find that one of these files is causing the problem, please send it to us so we can fix the problem.

Folder: C:\Documents and Settings\[USERNAME]\Local Settings\Application Data\The Transtec Group\ProVAL 3.1

Move the *AutoRecovery* folder (if it exists and contains files). If the software does not start, continue to the next step.

Folder: C:\Documents and Settings\[USERNAME]\Application Data\The Transtec Group\ProVAL 3.1

Move *Options.xml*. If PV3 does not start, then move *Analysis Templates.pvat*. If PV3 does not start, move *Analysis Templates.pv3at* again AND continue to the next step.

Folder: C:\Documents and Settings\[USERNAME]\Application Data\The Transtec Group\ProVAL 3.0

Move *Options.xml*. If PV3 does not start, then move *Analysis Templates.pv3at*. If PV3 does not start, move *Analysis Templates.pv3at* again AND continue to the next step.

Folder: C:\Documents and Settings\[USERNAME]\Local Settings\Application Data\The Transtec Group\ProVAL 2.7

Move *Input Sets.xml*. If PV3 does not start, contact us.