

USER INSTRUCTIONS FOR MEPDG SOFTWARE FLEXIBLE PAVEMENT DESIGN (Revision 1/28/09)

GETTING STARTED

Obtain MEPDG Software by downloading from the [MEPDG Software](#) link shown on the webpage, or obtain a copy from Office of Pavement Engineering.

Download the Traffic and Materials Properties tables from the INDOT Y drive or from INDOT Internet.

Make Indiana Design Manual Section 52-8.0, Pavement Design Procedural Guidelines, available. Section 52-8.0 is the primary source for all MEPDG input data.

Compile project-specific information, such as traffic data, road classification, number of lanes, geotechnical report, etc.

Each New project must start with all new data inputs, and not data saved from a previous project. You may not change the chosen weather station for an existing project. To change a weather station location, you must start a New project.

START THE MEPDG PROGRAM

Click on File, then select New.

The **CREATE NEW PROJECT** screen appears.

Choose and enter a name for trial design.

Example: SR 62, DES 9902940, HMA, 13 in. thickness

Select a project folder where you wish to save the file.

Unless working on a metric-units project, leave the Measure System as US Customary.

Click OK.

You should now see a Master screen with boxes for Project, Input, and Results.

Double click the General Information box to open the **GENERAL INFORMATION** screen.

Select the Type of Design from the options shown

Enter the Design Life, in years, value based on Section 52-8.0.

Complete the Date fields per Section 52-8.0.

Click OK.

Double click the Site/Project Identification box to open the **SITE/PROJECT IDENTIFICATION** screen.

In the Location field, input the Route number or name and County or City.

In the Project ID field, input the Des. No.

In the Section ID field, input the description of the location, i.e., From Route ____ to Route _____. This can be obtained from SPMS.

Leave the Date field as it is.

In the Section/Milepost field, select the option, normally miles.

In the Sta/MP field, input the beginning point of the project.

In the Sta/MP End field, input the end point of the project

In the Traffic Direction field, choose the applicable option.

Click OK.

Double click the Analysis Parameters box to open the **ANALYSIS PARAMETERS** screen.

In the Initial IRI field, enter the value per Section 52-8.0.

Under the Performance Criteria, the Flexible Pavement tab is highlighted.

Check and fill in the values for Terminal IRI, AC Bottom UP Cracking, AC Thermal Fracture, and Permanent Deformation – AC Only, as instructed in Section 52-8.0. These values depend on the road's classification which can be found in the SPMS data. Turn off the other boxes in the screen.

Click the Rigid Pavement tab to turn it green, no action required, then click back on the Flexible Pavement tab.

Click OK.

At this point, the Project stoplight and all three boxes associated with it should be green.

SAVE THE FILE.

Start the **INPUTS** portion of the process.

Double click the Traffic box to open the **TRAFFIC** screen.

Click the Import/Export button. You will now see an **IMPORT/EXPORT TRAFFIC** screen. On this screen, click the 3-dot button to open a **BROWSE FOR FOLDER** screen.

Select the INDOT_MEPDG (D:) option and from the Module 11B- Traffic Input Files. Choose the appropriate Input Traffic Group in accordance with Section 52-8.0. You should now be back to the **IMPORT/EXPORT TRAFFIC** screen.

Click OK.

Click Import.

Click Yes.

You should now be back to the **TRAFFIC** screen.

Click the Traffic Volume Adjustment Edit button. You will now see a **TRAFFIC VOLUME ADJUSTMENT FACTORS** screen. Click on each of the 4 tabs to turn them green.

Input the correct Growth Rate with the Compound Growth button selected.

Click OK.

Click the Axle Load Edit button. You will now see a screen showing the **AXLE DISTRIBUTION FACTORS**.

Click OK.

Click the General Traffic Inputs Edit button. The screen should now show **GENERAL TRAFFIC INPUTS**. Click the box on each of the three tabs to turn them green.

Click OK.

Input the Initial Two-Way AADTT, the Number of Lanes in Design Direction, the Percent of Trucks in Design Direction, the Percent of Trucks in the Design Lane, and the Operational Speed.

Click OK.

SAVE THE FILE.

Double click the Climate box. The **ENVIRONMENTAL/CLIMATIC** screen appears.

Select and click the Generate button.

Complete the Depth of Water Table with the information provided in the geotechnical report if available, or from Section 52-8.0.

Choose the Climatic Data for a Specific Weather Station option if the project is near one of Indiana's 11 weather stations. Scroll the highlighted area to view the weather station options. You may use the option to interpolate data from 3 Weather Stations by choosing that button and entering the latitude, longitude, and elevation of the project.

Click Select Station.

You will see a **SAVE GENERATED CLIMATIC DATA FILE** screen.

Assign the file a name, such as Terre Haute Weather Data.

Click Save.

You should now be back to the Master screen.

SAVE THE FILE.

Make the structural inputs.

Double click the Structure box and you should see a **STRUCTURE** screen.

Check to see that the value for surface short-wave absorptivity is per Section 52-8.0.

You will now build the cross section of the trial pavement cross section to be analyzed by MEPDG. Do not consider the thickness of Layer 1 at this time, as you will edit it later.

Click the Insert button and the **INSERT LAYER AFTER** screen appears. Choose the correct Material Type and Material options and input the design layer thickness.

Click OK.

Once again, click the Insert button and the **INSERT LAYER AFTER** screen appears, ready for the next layer of the cross section. Choose the correct Material Type and Material options and input the layer thickness for the third layer of the pavement cross section.

Click OK.

Again click the Insert button and enter the information for the fourth layer of the pavement cross section.

Click OK.

Again click the Insert button and enter the information for this layer. If this is the last layer to be considered in the design, e.g., the subsurface layer that will not be modified, click the Last Layer box instead of entering a thickness.

Click OK.

You should now be back to the **STRUCTURE** screen where you will see the various layers of the trial pavement's cross section. Next you will edit each of the layers shown starting from the lowest layer.

Highlight Layer 5, or lowest layer, and click the Edit button. You should now see an **UNBOUND LAYER – LAYER #5** screen.

Choose Input Level 2.

At this screen, with the Strength Properties tab highlighted, you should review the information shown for correctness. At the User Input Modulus option, choose the Representative Value (Design Value) and enter the correct Modulus value for the design per the Section 52-8.0 instructions.

Click OK.

You are returned to the **STRUCTURE** screen.

Highlight the next Layer upward and click the Edit button. The screen for this layer will now be shown. As previously instructed, choose Input Level 2, review the information shown, choose the Representative Value (Design Value) option, and enter the correct value in the Modulus window.

Click OK.

Next, choose Layer 3.

Click the Edit button.

You should now see the **ASPHALT MATERIAL PROPERTIES** screen.

The Asphalt Mix tab is green and you are currently at the Asphalt Binder tab.

Select Level 1.

Click on the Asphalt General tab.

In the General portion of this screen, edit the Reference Temperature.

In the Volumetric Properties as Built portion of the screen, edit the values for Effective Binder Content, Air Voids, and Total Unit Weight.

In the Poisson's Ratio portion of the screen, edit the value.

In the Thermal Properties portion of the screen, edit Thermal Conductivity and Heat Capacity.

All of these required values are shown in Section 52-8.0.

Click on the Asphalt Mix tab.

Click on the Import Button.

Go to INDOT_MEPDG (D:).
Go to Module 9A-HMA Material Input File.
Open the Dynamic Modulus folder.
Select the correct District.
Select the proposed PG Grade.
Select the appropriate Aggregate Size.

Click Open.

You are now back to the Asphalt Mix Tab. The table is now completed.

Observe the value in column 25 and in row 10. If this value is greater than 5000000, change the value to 5000000. If the value is less than 5000000, leave as computed by the program.

Click on the Asphalt Binder tab.

Click on the Superpave Binder Test Data option.

Click on the Import button.

Go to INDOT_MEPDG (D:).
Go to Module 9A-HMA Materials Input File.
Open the Superpave Binder folder.
Select the proper PG Grade.

Click Open.

Click OK.

An error message screen will appear. Click OK, then go back and change the number of Temperature Trials to the amount shown.

You are now back to the **STRUCTURE** screen.

Highlight Layer 2.

Click the Edit button.

Select Level 1.

Choose the Asphalt General tab and proceed as above.

Choose the Asphalt Mix tab and proceed as above.

Choose the Asphalt Binder tab and proceed as above.

Click OK.

Once again you are back to the **STRUCTURE** screen.

Highlight Layer 1.

Click the Edit button.

Select Level 3.

Edit the Layer Thickness to the trial design thickness chosen.

Choose the Asphalt General tab and proceed as above.

Choose the Asphalt Mix tab and fill in the Aggregate Gradations.

Choose the Asphalt Binder tab.

Choose the Superpave Binder Grade option.

Click in the correct PG Grade box.

Click OK.

At the warning, click OK.

Click OK.

You should now be back to the Master screen.

Click the Thermal Cracking box.

You should now see the **THERMAL CRACKING** screen.

Edit the Aggregate Coefficient of Thermal Contraction per Section 52-8.0.

Click OK.

You should now be back to the Master screen.

Select the Layer 1 – Asphalt Concrete box.

Select Level 1.

Proceed through the tabs in accordance with the instructions for Layers 2 and 3.

Now you should be back to the Master screen.

Click on the HMA Design Properties box.

Click OK.

If the Thermal Cracking box has returned to yellow in color, click the box, then select OK.

Now all of the boxes on the left side of the Master screen should be green.

SAVE THE FILE.

Click the Run Analysis button.

The status of the analysis run time will be displayed at the upper right portion of the screen. Run time will take several minutes.

Once the analysis is completed, you will have the option to review the Inputs, and the Results. Some of the Results can also be reviewed in a chart format.

SAVE THE FILE.