

TxDOT User Manual

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# Introduction

TxCRCP-ME was developed under research project 0-5832, "Develop Mechanistic/Empirical Design for CRCP." This application determines CRCP performance (punch-outs per mile) based on user inputs such as location, traffic, concrete properties, and support layers.

# Installation

TxCRCP-ME can be downloaded at <https://github.com/iDataVisualizationLab/TxDOT/tree/main/dist>

Users can choose to use the portable version or the installation version. The current version is 2.6 and available at:

* [Portable ](https://github.com/iDataVisualizationLab/TxDOT/blob/main/dist/TxCRCPME%202.7.exe)
* [Installation ](https://github.com/iDataVisualizationLab/TxDOT/blob/main/dist/TxCRCPME%20Setup%202.7.exe)

The portable version can be clicked and run right after being downloaded without extra installation step, but it will be slow on start-up compared to the installed version.

For the installed version, when running the setup file, the “Windows protected your PC” dialog (as shown Figure 1) can appear. In this case, please click on the Graphical user interface, application

Description automatically generated to get the Graphical user interface, text, application

Description automatically generated button, as shown in Figure 2. After clicking on the “Run anyway” button, the Setup dialog will be automatically processed (Figure 3). Note that users don’t need to re-run the setup file in the next running time. Instead, the user can use the installed shortcut Logo

Description automatically generated with medium confidence on Desktop.

|  |  |
| --- | --- |
| Graphical user interface, application  Description automatically generated  Figure 1. Windows protected your PC dialog | Graphical user interface, text, application  Description automatically generated  Figure 2. Windows protected your PC dialog when click on More info. |

Graphical user interface, text, application, email

Description automatically generated

Figure 3. Setup dialog.

# Step 1

In the beginning, the user can fill the information manually or Load the input file (the excel exported from the previous session) by clicking on Graphical user interface, table

Description automatically generated button.

In Step 1, the user will be required to fill in general information about the project (Figure 4). The “District” field is required to calculate the temperature of the project area.

Graphical user interface, table

Description automatically generated

Figure 4. Step 1 interface

For District and County, users can select with the drop box or click on the Graphical user interface, table

Description automatically generated icon to open the map and choose its location (Figure 5, Figure 6).

|  |  |
| --- | --- |
| Map  Description automatically generated  Figure 5. District map. | Figure 6. County map |

After filling in all information, click on Graphical user interface, table

Description automatically generated to go to Step 2.

# Step 2

In Step 2, three input fields need to be filled in:

* Design life (years): need to be not less than 1
* Total number of lanes in one direction: between 1 and 10
* Total design traffic in one direction: between 1 and 500

Click or hover on the Graphical user interface, table

Description automatically generated button to learn more instructions on the associated input.

Table

Description automatically generated

Figure 7. Step 2 of our interface

After filling in all information, click on Graphical user interface, table

Description automatically generated to go to Step 3.

# Step 3

Step 3 requires the layer information: Subgrade and Treatment Information and Base Layer Information.

* Soil classification of subgrade: select one of 15 options (GW, GP, GM, etc. )
* Plasticity Index (PI): a measure of the plasticity of soil needs to be positive
* Subgrade treatment: select one of 7 options (please read the recommendation in Figure 8)
* Subgrade treatment thickness (in.): needs to be not less than 1 and recommended as shown in Figure 8.

**YES**

**NO**

1. Cement
2. Lime-fly ash (FS)

**YES**

**NO**

* Lime
* Lime-cement
* Lime-fly ash (FS)
* Cement
* Fly ash (CS)
* Lime
* Lime-cement
* Lime-fly ash (FS)

Recommended subgrade treatment thickness is greater than 8.0”.

Is the plasticity index <15

Is the plasticity index <35

Figure 8. Subgrade Treatment Guidelines

* Base type: choose between CRB, HMA, and ASB (please read the recommendation in Figure 9)
* Base layer thickness (inches): this field will automatically adjust based on the Base type input

Is the plasticity index of subgrade <15

**YES**

**NO**

* Bond Breaker (≥1.0”) + 6” Cement Treated Base
* 4” Hot Mix Asphalt Base

Is the soil type

: ML, CL, OL, MH, CH, OH

**YES**

**NO**

* Bond Breaker (≥1.0”) + Cement Treated Base (≥6.0”)
* Bond Breaker (≥1.0”) + Cement Treated Base (≥6.0”)
* Hot Mix Asphalt Base (≥4.0”)

The engineer can increase the base thickness, but TxCRCP-ME design input should always be

* No greater than 6” in cement-treated base
* No greater than 4” in HMA base

Figure 9. Base Type Selection Guidelines

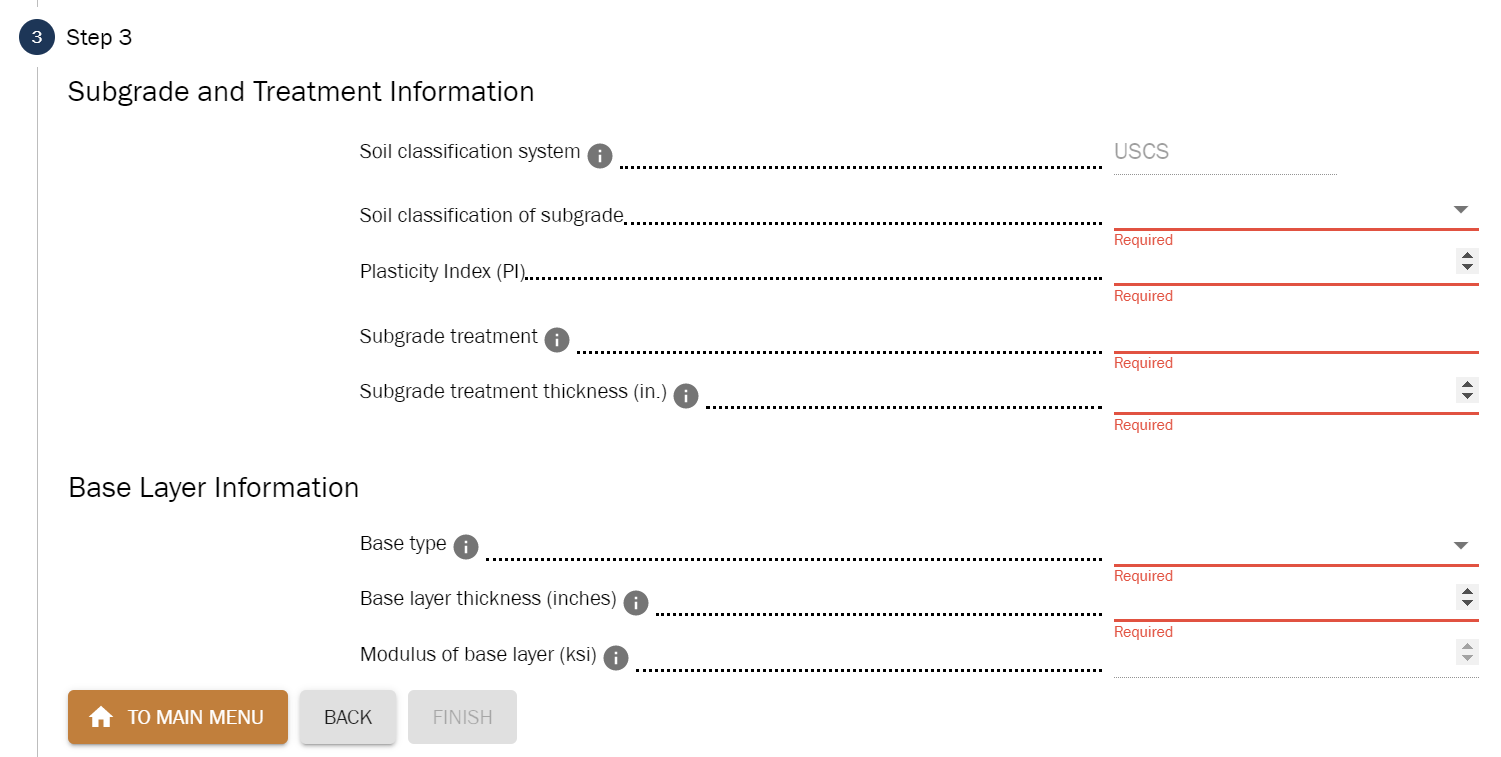


Figure 10. Step 3 of our interface

After filling in all information, click on Text

Description automatically generated to go to Result.

# Result

After finishing all the previous steps, the result will be displayed in this stage. The input data section on the left is the user input, and the analysis result section on the right is the application calculation.

If the user wants to modify the data input, use Graphical user interface

Description automatically generated button to go back to Step 3 or click on the Graphical user interface

Description automatically generated button to jump to Step 1 or Graphical user interface

Description automatically generated button to clear all input data and go back to Step 1.

To Print the result, click on Graphical user interface

Description automatically generated button.

To export the result to the excel file and reuse it when needed, click on Graphical user interface

Description automatically generated button.

For the detail of the analysis, the user can view the chart by clicking on the Text

Description automatically generated button.

Graphical user interface, text, application, email

Description automatically generated

Figure 11. Example results.

# General purpose button

On the bottom of the page, there are 3 button link to general information of the project.

Graphical user interface, application

Description automatically generated

Other general-purpose buttons are included in the table below.

Table 1. Button description list.

|  |  |
| --- | --- |
| Graphical user interface, application  Description automatically generated | Link to the [Pavement Manual](http://onlinemanuals.txdot.gov/txdotmanuals/pdm/pdm.pdf) about: The Pavement Manual was updated to include a new pavement structural design category, pavement preservation. Information was also added relating to soil k values. |
| Graphical user interface, application  Description automatically generated | Link to the [Standard TxDOT Specifications for Construction and Maintenance of Highways, Streets and Bridges](https://www.txdot.gov/inside-txdot/division/construction/txdot-specifications.html) |
| Graphical user interface, application  Description automatically generated | Link to the collection files of [Roadway Standards](https://www.txdot.gov/insdtdot/orgchart/cmd/cserve/standard/rdwylse.htm) |
|  | Go to the Main Menu |
|  | Go to the previous step |
| Graphical user interface, table  Description automatically generated | Go to the next step |
| Graphical user interface, table  Description automatically generated | Users can hover or click on the button to view the guideline or descriptions of the current field. |