# Overview

The ODOT criteria file **pavt_exist.x** is used to draw the existing pavement and shoulders for divided or undivided highways on the cross sections.

Version 09.01.16 is a major revision of the file. Changes were made to draw the existing pavement and shoulders using element symbology that facilitates computing earthwork quantities with GEOPAK.

The criteria can be configured to draw the existing pavement in one of three different configurations shown in the examples below"

Asphalt Pavement and Shoulders

Asphalt Pavement and shoulders
Over Concrete Pavement

Concrete Pavement with Asphalt Shoulders
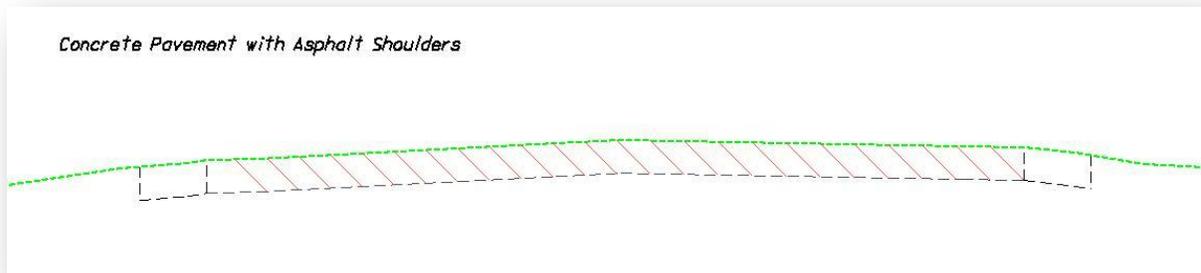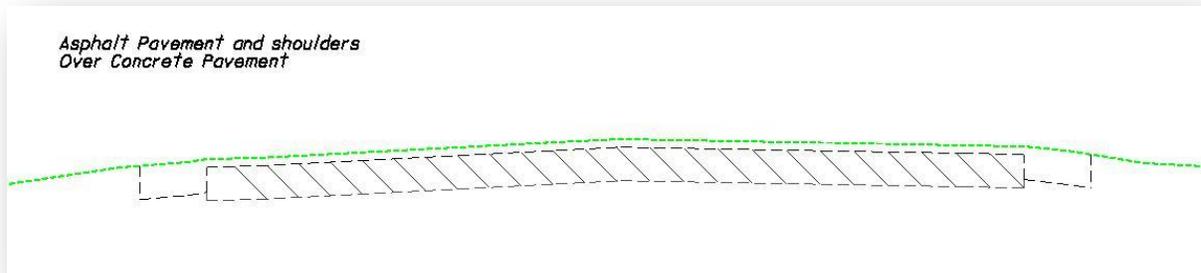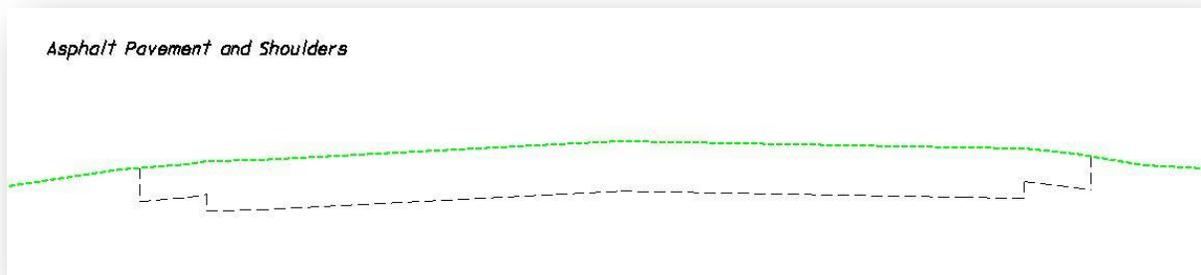
Inclusion Sequence

The ODOT Standard criteria file **define.x** contains default definitions for some of the Define Variables used by ODOT's criteria files. **define.x** must always be included first in any criteria run.

pavt_exist2.x does not rely on any previously stored marked points and can be run alone or with other criteria files. If it is included in a criteria run with other criteria, it can be included anywhere in the inclusion sequence, after **define.x**.

Define Variables

A summary of the variables defined in **pavt_exist.x** is included below. Each variable has been assigned a default value within the criteria. The user should review the variables below to ensure that the default values are acceptable for the project. The value of each variable can be changed by the user before processing the criteria. See the ODOT GEOPAK Road Training Guide, Part 2, Chapter 5 for more information on modifying the default value of the variables.

Design File Variables

"EXISTING DGN FILE NAME"
"XS DGN FILE NAME"
These variables are used by the DEFINE_DGN variables to identify the base map MicroStation design file that contains the existing, proposed, and cross section graphics. The default value for each variable has been defined using a relative path as follows:

> define "EXISTING DGN FILE NAME" ..\survey\basemaps\nnnnnBE###.dgn
> define "XS DGN FILE NAME" ..\roadway\basemaps\nnnnnXC###.dgn

By default GEOPAK will look for design files in the Working Directory assigned for the project. Using the directory structure defined in the ODOT CADD Engineering Standards Manual, Section 302, Project Directory Structure, the GEOPAK Working Directory should be defined as the geopak folder.

The ".." syntax will instruct GEOPAK to look for the proposed design file by starting in the Working Directory, and then go up the project folder path one directory. From there, go into the \survey\basemaps folder, or the \roadway\basemaps folder, to find the file.

The name of the design file must be edited to reflect the name of the plan view design file for your project. See the ODOT CADD Engineering Standards Manual, Section 304 File Naming Conventions for design file names.

Variables for Drawing the Pavement

"ex pavt type"
This variable is used to define the type of pavement buildup that will be drawn on the cross sections. The variable can be set to one of three values as defined below:

> **ex pavt type = 1**
> Set the variable to a value of 1 to draw asphalt pavement.

> **ex pavt type = 2**
> Set the variable to a value of 2 to draw asphalt over concrete pavement.

> **ex pavt type = 3**
> Set the variable to a value of 3 to draw concrete pavement.

The default value is 2.

"ex asphalt pavt thickness"
This variable is used to define the existing asphalt pavement thickness in Master Units. A default value of 0.25 has been assigned.

"ex asphalt shoulder thickness"
This variable is used to define the thickness for the existing asphalt shoulder in Master Units. A default value of 0.75 has been assigned.

"ex concrete thickness"
The variable is used to specify the thickness of the concrete removal. The default value is 1.0

" ex concrete shoulder"
This variable can be used to instruct the criteria to draw concrete removal for the existing shoulders. Set the value to 1 to instruct the criteria to draw concrete shoulders. Set the value to 0 if the existing shoulder buildup does not include concrete. The default value is 0.

The thickness of the concrete shoulder is determined by the variable "ex concrete thickness".

"hatch concrete removal"
The user may elect to have the criteria crosshatch the concrete removal area. Set the value of this variable to 1 if you would like to crosshatch the area. With a value of 0, the concrete removal area will not be crosshatched. The default value is 1

"ex shoulder max width"
This variable is used to specify the maximum width that the criteria will look to the left and right side of the existing pavement for the existing shoulder. The default value is 12.

An example of how this variable works is shown below.

Consider the pattern line at station 41+50 shown below. In this example, the criteria has found an existing shoulder to the left of EOP #2. Since the shoulder line does not fall within the limits of the variable "maximum ex shoulder width", no shoulder will be drawn on the cross section for the first pavement set.
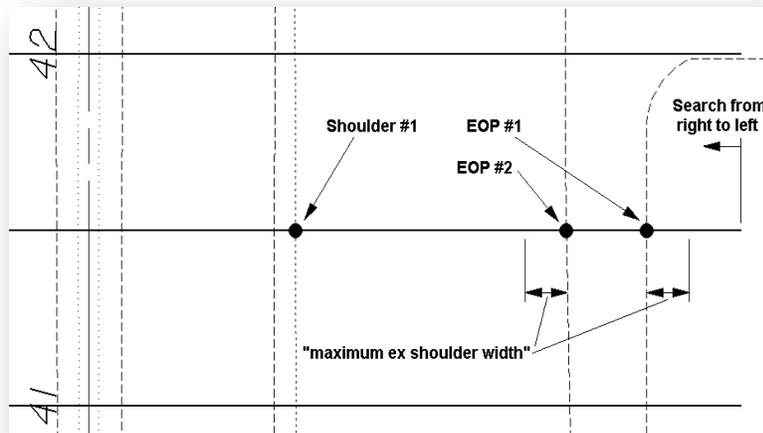
If no intersection with the existing shoulder is found during the criteria processing (as shown to the right of EOP #1 in Figure 3 above), the following message will be displayed in the GEOPAK Process Cross Sections Display dialog box:
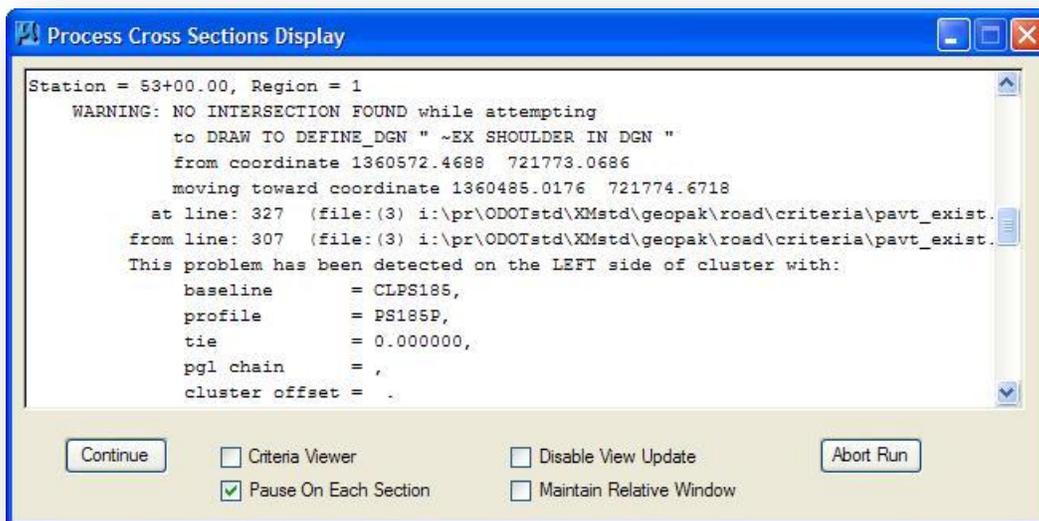
This message is not necessarily an indication that an error has occurred during processing and should be considered normal if a condition similar to the one shown in Figure 3 is encountered.

Define DGN Variables

The following DEFINE_DGN variables are used by the criteria to locate the MicroStation elements that **pavt_exist.x** will search for in order to draw the proposed pavement.

These variables have been defined with the values listed below in accordance with ODOT standards and should never be redefined by the user.

Additionally, these variables have been defined as hidden variables and will not show up in the DEFINE_DGN Variables portion of the Proposed Cross Sections dialog box when preparing a criteria run.

"~EDGE OF PAVEMENT EX"
This variable is used to find the plan view graphics representing the location of the existing edge of pavement. The variable has been defined as follows in the criteria:

```
define_dgn "~EDGE OF PAVEMENT EX" \
dgn = "EXISTING DGN FILE NAME" \
lvname = PV_X_EOP \
wt = 0,ByLevel \
co = 0,ByLevel \
lc = 3,ByLevel
```

"~EDGE OF SHOULDER EX"
Plan view graphics defining the location of the existing shoulder. The variable has been defined as follows in the criteria:

```
define_dgn "~EDGE OF SHOULDER EX" \
dgn = "EXISTING DGN FILE NAME" \
lvname = PV_X_Shoulder \
wt = 0,ByLevel \
co = 6,ByLevel \
lc = 5,ByLevel
```

"~EX GROUND IN XSDGN"
This variable defines the symbology of the elements that make up the existing ground line. The name of the cross section design file is defined by the "XS DGN FILE NAME" variable. The variable has been defined as follows in the criteria:

```
define_dgn "~EX GROUND IN XSDGN" \
dgn = "XS DGN FILE NAME" \
lvname = XS_X_Ground_Line \
wt = 1,ByLevel \
co = 0,2,ByLevel \
lc = 3,ByLevel
```
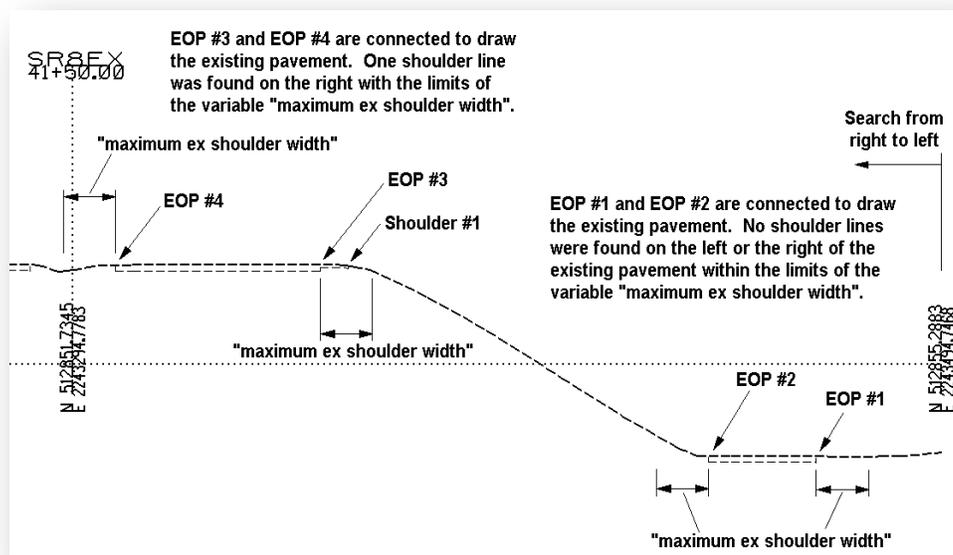
Processing Notes

Processing Multiple Roadways

pavt_exist.x has been configured to search for existing pavement lines in the specified plan view design file starting from the right side of the pattern line as shown below.
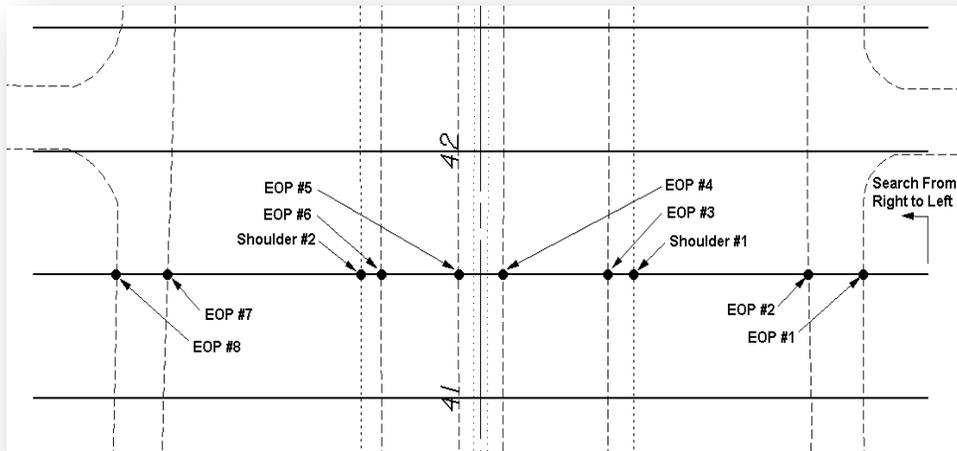

The graphic below shows the right half of the cross section for the pattern line at station 41+50 in the example above.


The first two existing edge of pavement lines that are found are considered to be one pavement set. Each subsequent pair of existing pavement lines encountered will be connected to draw the existing pavement.

Note: There were no shoulder lines drawn in the median in this example, only barrier lines. To draw shoulders to the median side of the pavement, the user would need to add shoulder lines to the plan view graphics

In the example below, the pattern line at station 42+00 does not intersect the first edge of existing pavement for the service road on the right side of the cross section because the pattern line falls within the service road intersection.
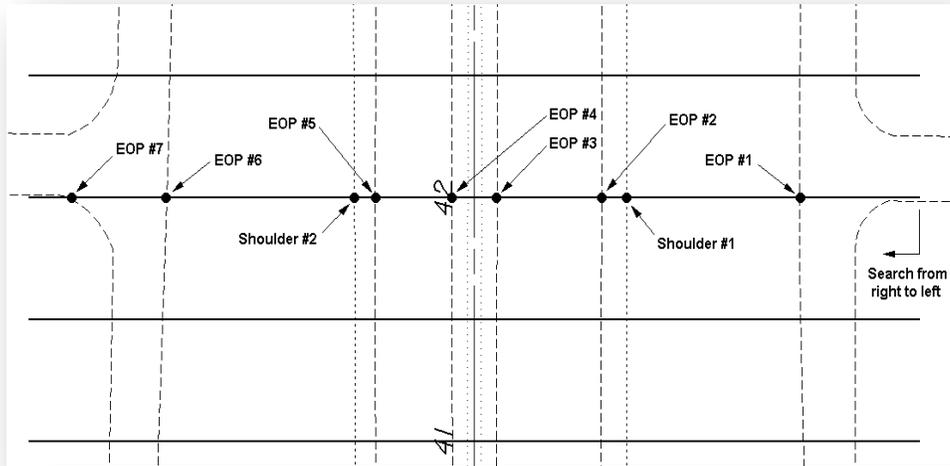
The criteria will connect the first two edge of pavement lines encountered as shown below. Each subsequent pair of existing pavement lines is connected as shown bellow.
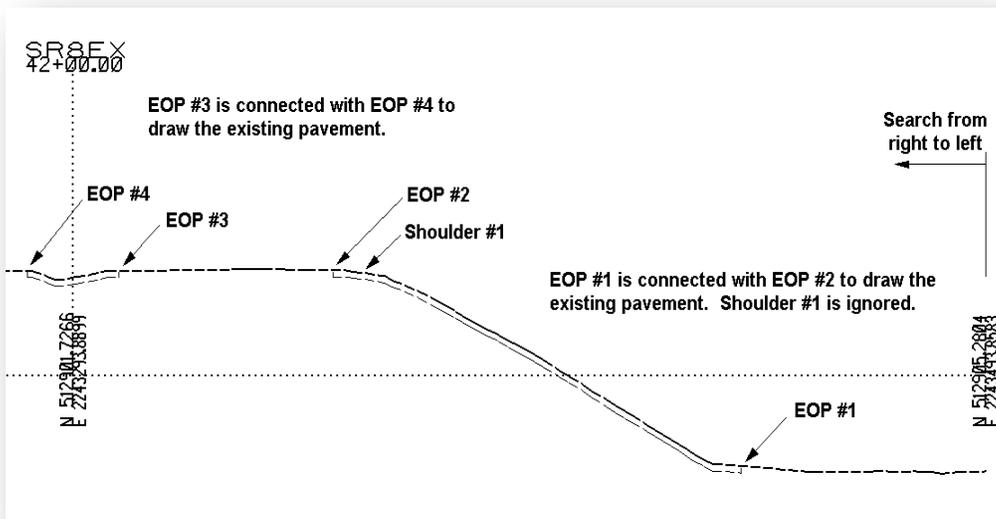
Care must be taken to review each pattern line to ensure that the pattern line intersects the edge of pavement lines in a manner that will ensure the existing pavement is drawn correctly on the cross sections.

Note that existing pavement buildup is drawn using the same settings for each successive pair of existing pavement lines found in the specified design file. In the examples above, the service road will be drawn with the same pavement buildup as the divided highway.

In the case that multiple existing roadways are encountered for a given pattern line and each roadway has a different pavement buildup, it will be necessary to run the criteria file multiple times for each different existing roadway.

For the first criteria run, change the color of the existing pavement lines for the service roads to CO=1. The color for the mainline will be left as CO=0. When the criteria is processed, only the mainline pavement is drawn on the cross sections.

For the second criteria run, the color of the existing pavement lines for the service roads should be changed back to CO=0 and the mainline is changed to CO=1. Change the values of the variables to reflect the proper values for the service roads.

After both criteria runs are processed, the color for all the existing pavement lines should be changed back to CO=0.

As an alternative to changing the symbology for the existing pavement lines, the user may elect to copy the existing pavement lines into a new file and delete the lines for the existing pavement that should not be processed. In this case, be sure to assign the value of the variable "existing dgn file name" to reflect the name of the new design file containing the existing pavement lines.

Level Symbology

The criteria is configured to draw the existing pavement with symbology that can be used by GEOPAK to generate earthwork quantities for the cross sections. The elements are drawn using the following symbology:

	Level	Color	Style	Weight
Bottom of Asphalt Pavement and Shoulders	XS_P_Pavt	0	3	0
Bottom of Concrete Pavement	XS_P_Pavt	36	3	0