PAVT_OVERLAY1.X – version 07.04.10

Description

PAVT_OVERLAY1.X is used to draw pavement widening and resurfacing for a variety of projects. The criteria can be used in cases where:

- the existing pavement cross slope will be maintained for the overlay and for the widening.
- a fixed cross slope as specified by the user will be used for the overlay and widening.
- the existing pavement cross slope will be utilized for the overlay and a separate fixed cross slope will be utilized for the widening.

The criteria can be used for resurfacing projects with no widening, with resurfacing and widening on one side of the existing road, or for projects with resurfacing and widening on both sides of the existing road. An example showing widening drawn on both sides of the existing pavement is shown in Figure 1 below:

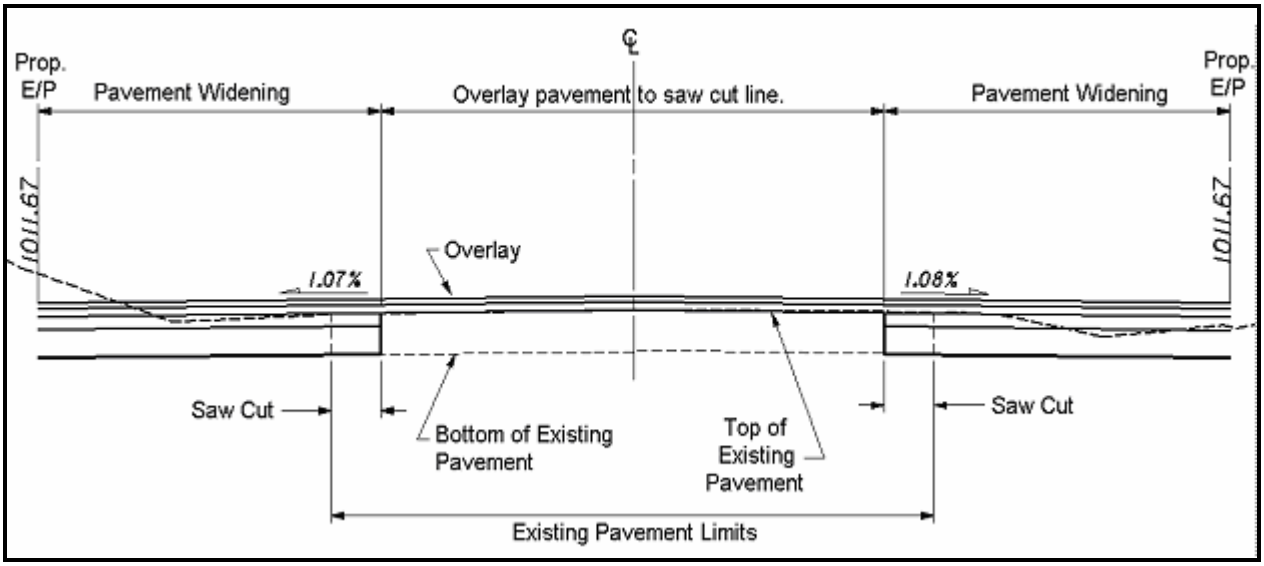

Figure 1

The top two pavement layers are always used to overlay the existing pavement, even if the pavement widening is only to one side.

The top two pavement layers do not have to be drawn on top of the existing pavement. The criteria also provides the capability to specify a pavement planing depth for projects where the surface courses will be removed and replaced.

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_OVERLAY1.X should always be the first criteria file included for processing, after **DEFINE.X**.

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Define Variables

A summary of the variables defined in **PAVT_OVERLAY.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, as needed. 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"
"PROPOSED 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 "PROPOSED DGN FILE NAME" ..\roadway\basemaps\nnnnnBP###.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 `\survey\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.

"number of layers"
The total number of pavement layers to be drawn for the pavement widening. The top two layers are always used to overlay the existing pavement. Up to six pavement layers can be defined for the widening. The default value is 4. ***Note***: This variable should never be set for less than two pavement layers. If only one layer is defined, the criteria will not process correctly.

"pavement planing"
This variable is used to define the thickness of the existing pavement that will be removed. The default value is 0.

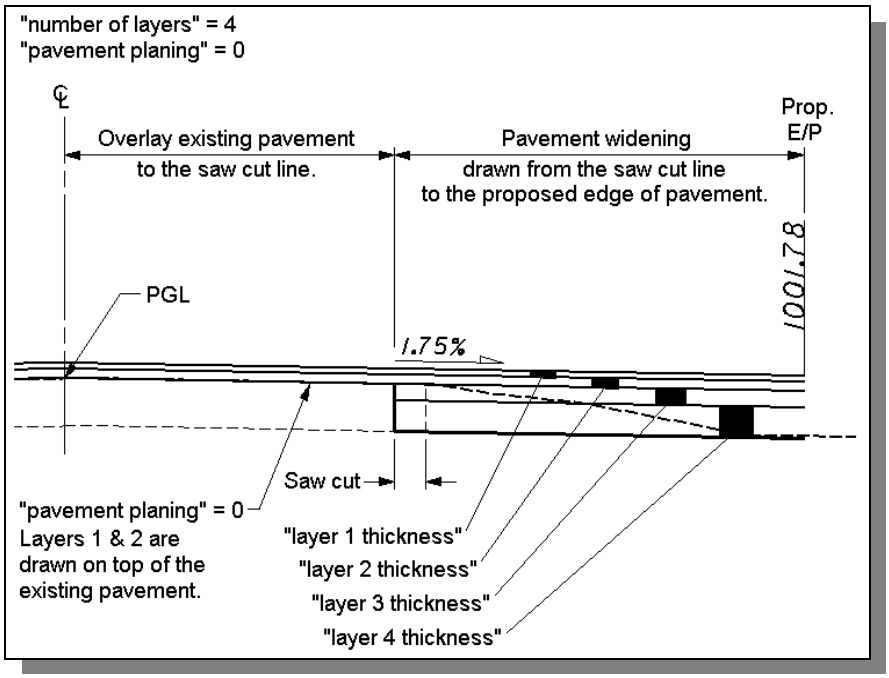


Figure 2

By defining a value for "pavement planing" equal to the thickness of pavement layer 1 and layer 2, the results shown in Figure 3 are obtained.

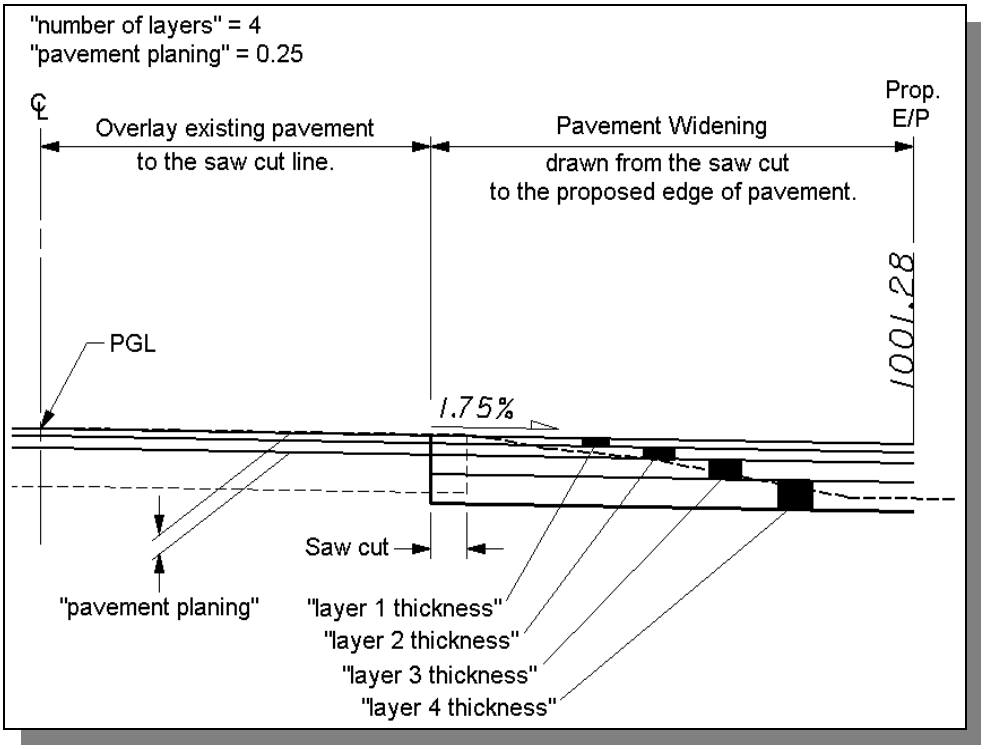


Figure 3

"layer 1 thickness"
The pavement thickness for layer 1 in Master Units. The default value has been defined as 0.1042 (1¼")

"layer 2 thickness"
The pavement thickness for layer 2 in Master Units. The default value has been defined as 0.1458 (1¾")

"layer 3 thickness"
The pavement thickness for layer 3 in Master Units. The default value has been defined as 0.3333 (4")

"layer 4 thickness"
The pavement thickness for layer 4 in Master Units. The default value has been defined as 0.500 (6")

"layer 5 thickness"
The pavement thickness for layer 5 in Master Units. The default value has been defined as 0.500 (6")

"layer 6 thickness"
The pavement thickness for layer 6 in Master Units. The default value has been defined as 0.500 (6")

"fixed pavement slope"
"fixed widening slope"
These variables work together to specify the cross slope for the overlay and the widening portions of the proposed pavement. The default value for each is 0 which will result in cross slopes that match the existing pavement. A non-zero value will be used as the cross slope for all of the cross sections.

Define DGN Variables

The following DEFINE_DGN variables are used by the criteria to locate the MicroStation elements that **PAVT_OVERLAY1.X** will search for in order to draw the pavement widening and resurfacing.

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

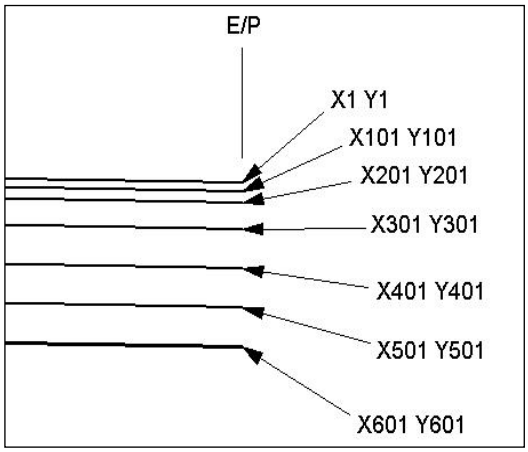
Additionally, these variables have been defined as "hidden" variables and will not show up in the DEFINE_DGN Variables portion of the *Proposed Cross Sections* dialog box when preparing a criteria run.

```
define_dgn "~edge of pavement ex" \
        dgn = "existing dgn file name" \
        lvname = PV_X_EOP \
        wt = 0, ByLevel \
        co = 0, ByLevel \
        lc = 3, ByLevel

define_dgn "~edge of pavement pr" \
        dgn = "proposed dgn file name" \
        lvname = PV_X_EOP\
        wt = 2, ByLevel \
        co = 0, ByLevel \
        lc = 0, ByLevel

define_dgn "~saw cut in dgn" \
        dgn = "proposed dgn file name" \
        lvname = PV_P_Saw_Cut_line \
        wt = 1, ByLevel \
        co = 10, ByLevel \
        lc = 0, ByLevel

define_dgn "xs exist ground line" \
        dgn = "xs dgn file name" \
        lvname = XS_X_Ground_line \
        wt = 1 , ByLevel\
        co = 0,2, ByLevel \
        lc = 3, ByLevel
```

Marked Points

GEOPAK has a simple, yet very important way of "remembering" where the location of various points are during the drawing process. This is accomplished with marked points.

Some marked points are stored during the criteria processing that are only used temporarily and do not need to be "remembered" as processing continues. These points can be subsequently redefined by another criteria file. There are, however, certain key locations that must be referred to by multiple criteria files. **PAVT_OVERLAY1.X** will store the following marked points during processing that should never be redefined by another criteria file:



Edge of pavement at the pavement surface	x1 y1
Bottom of pavement layer 1	x101 y101
Bottom of pavement layer 2	x201 y201
Bottom of pavement layer 3	x301 y301
Bottom of pavement layer 4	x401 y401
Bottom of pavement layer 5	x501 y501
Bottom of pavement layer 6	x601 y601

On divided highways the criteria will mark two additional points on the median side of the pavement:

Inside edge of pavement, median to the right	x18 y18
Inside edge of pavement, median to the left	x19 y19

Figure 4

Text and Symbology

The final cross section cut and fill lines representing the proposed subbase, grading, etc... are drawn on level XS_Finished_Grade_P. This level should always be shown on the final cross sections.

The individual pavement layers are drawn on level XS_P_Pavt_layers and should not normally be shown on the final cross sections.

The pavement slope and edge of pavement elevations are drawn on level XS_P_Text_Info by the criteria. This annotation is drawn for information only and should not normally be shown on the final cross sections.

Examples

PROCESSING EXAMPLE 1

In this example, we'll add a new 12' lane to the right side of the existing pavement, overlay the existing pavement and add new shoulders to both sides of the road. The plan view graphics are drawn as shown in Figure 5 below:

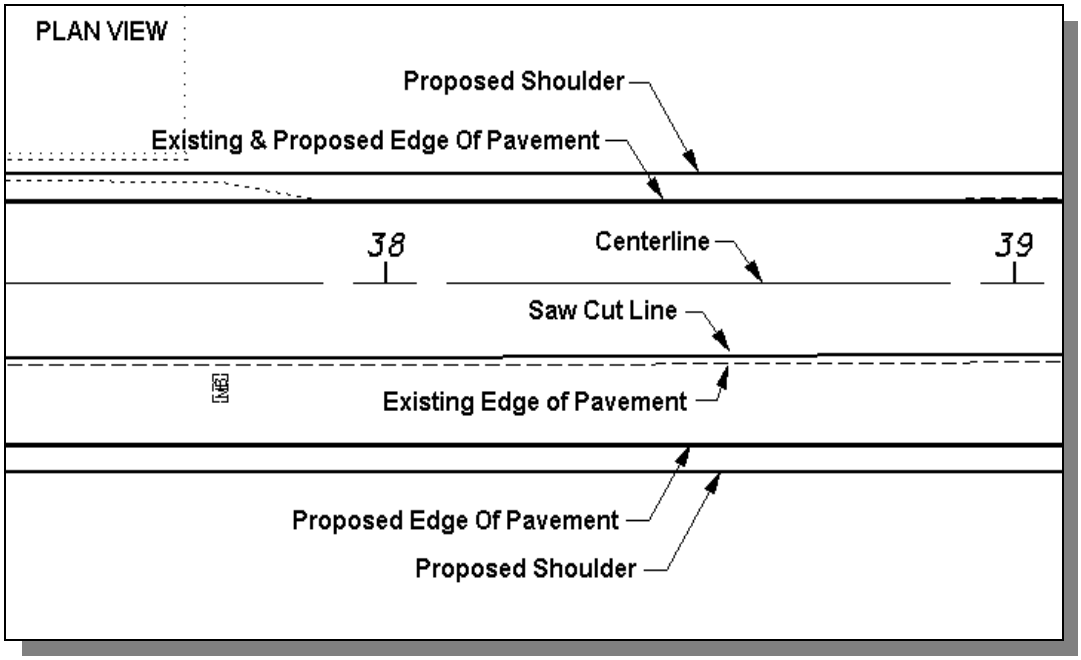


Figure 5

The following criteria files are included for processing:

```
side slope LT
    include define.x
    include pavt_overlay1.x
    include sh301-8.x
    include ss307-4.x
```

```
side slope RT
    include define.x
    include pavt_overlay1.x
    include sh301-8.x
    include ss307-4.x
```

An example of the finished cross section is shown below:

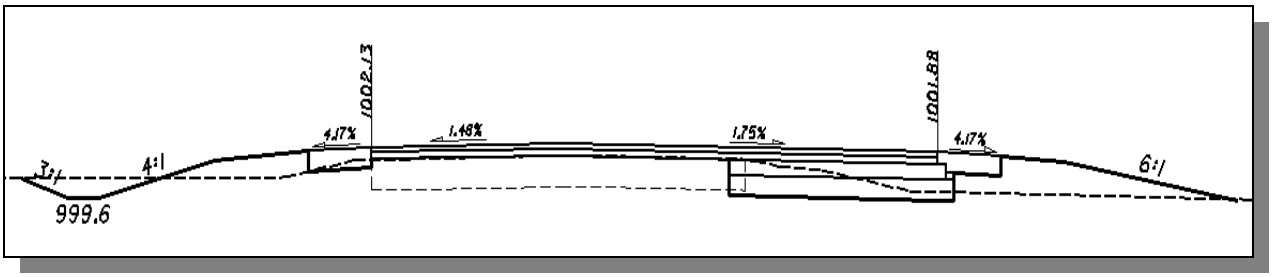


Figure 6

PROCESSING EXAMPLE 2

In this example, we'll resurface the existing pavement and add curb and gutter on each side of the road. The plan view graphics are drawn as shown in Figure 7 below:

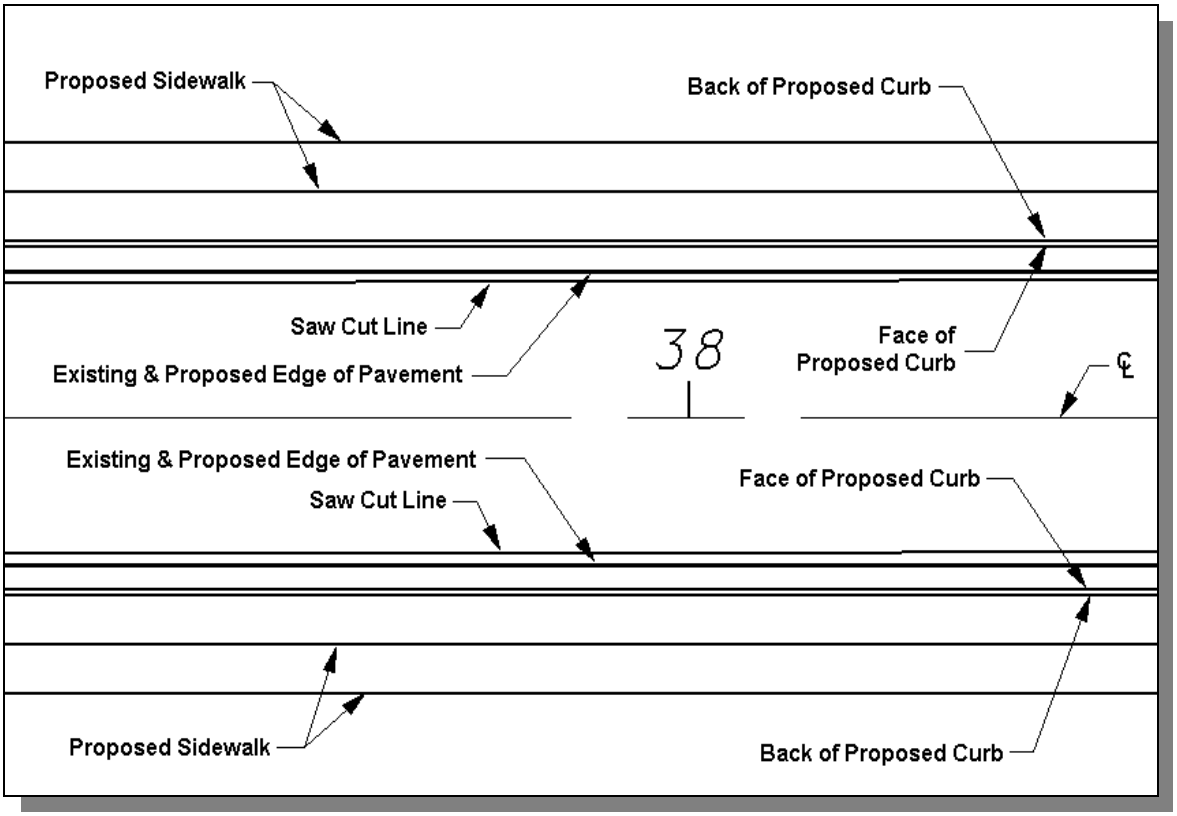


Figure 7

The following criteria files are included for processing:

```
side slope LT
    include define.x
    include pavt_overlay1.x
    include crb2_p.x
    include curb_gr.x
```

```
side slope RT
    include define.x
    include pavt_overlay1.x
    include crb2_p.x
    include curb_gr.x
```

An example of the finished cross section is shown below.

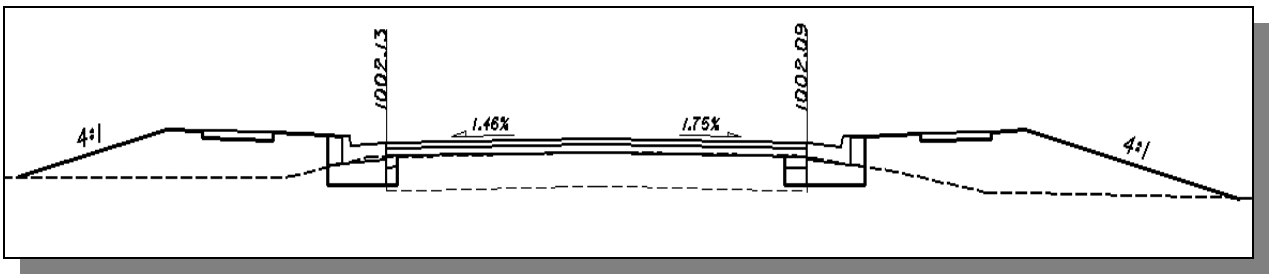


Figure 8

PROCESSING EXAMPLE 3 - Matching the existing cross slope.

In this example, the variables **"fixed pavement slope**" and **"fixed widening slope"** are both set to 0 as shown below. The existing pavement slope is maintained for both the overlay and the widening.

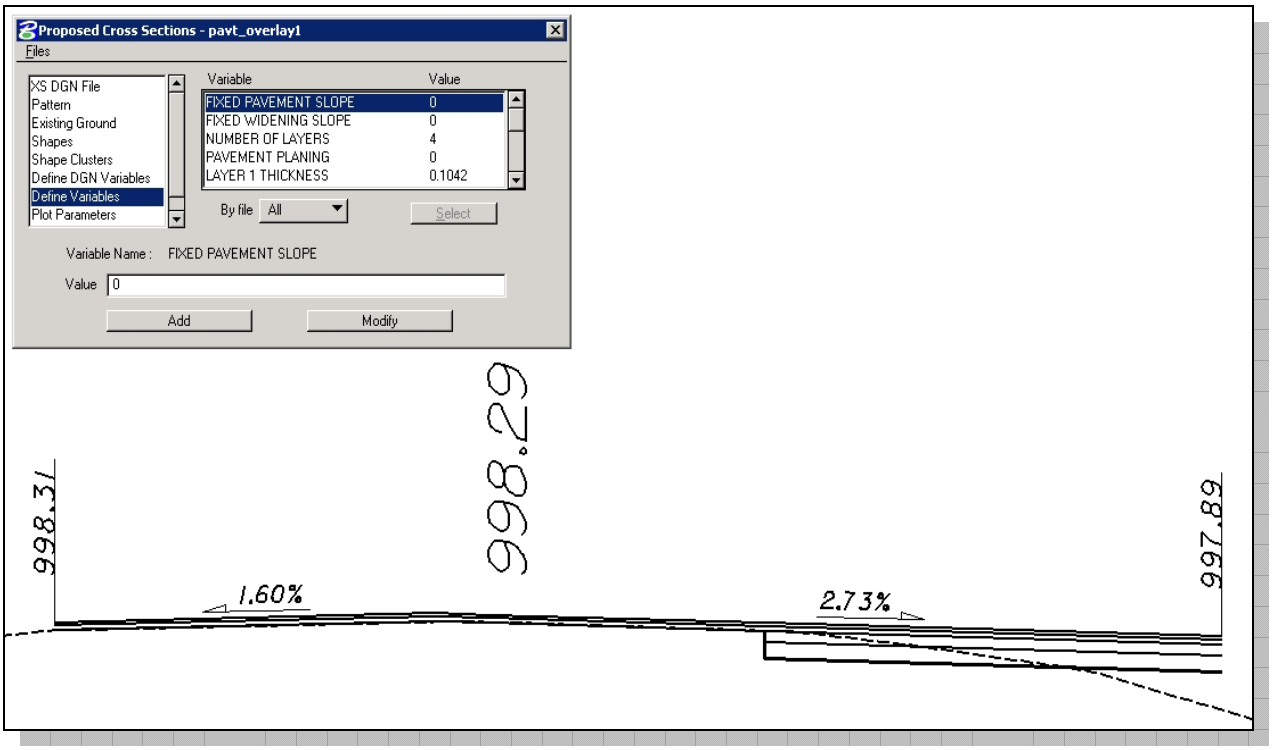


Figure 9

PROCESSING EXAMPLE 4 - Setting a fixed cross slope.

In this example, the variables **"fixed pavement slope**" and **"fixed widening slope"** are both set to -1.56 as shown below. The overlay and the widening portions are both drawn using the specified slope as shown in Figure 10 below.

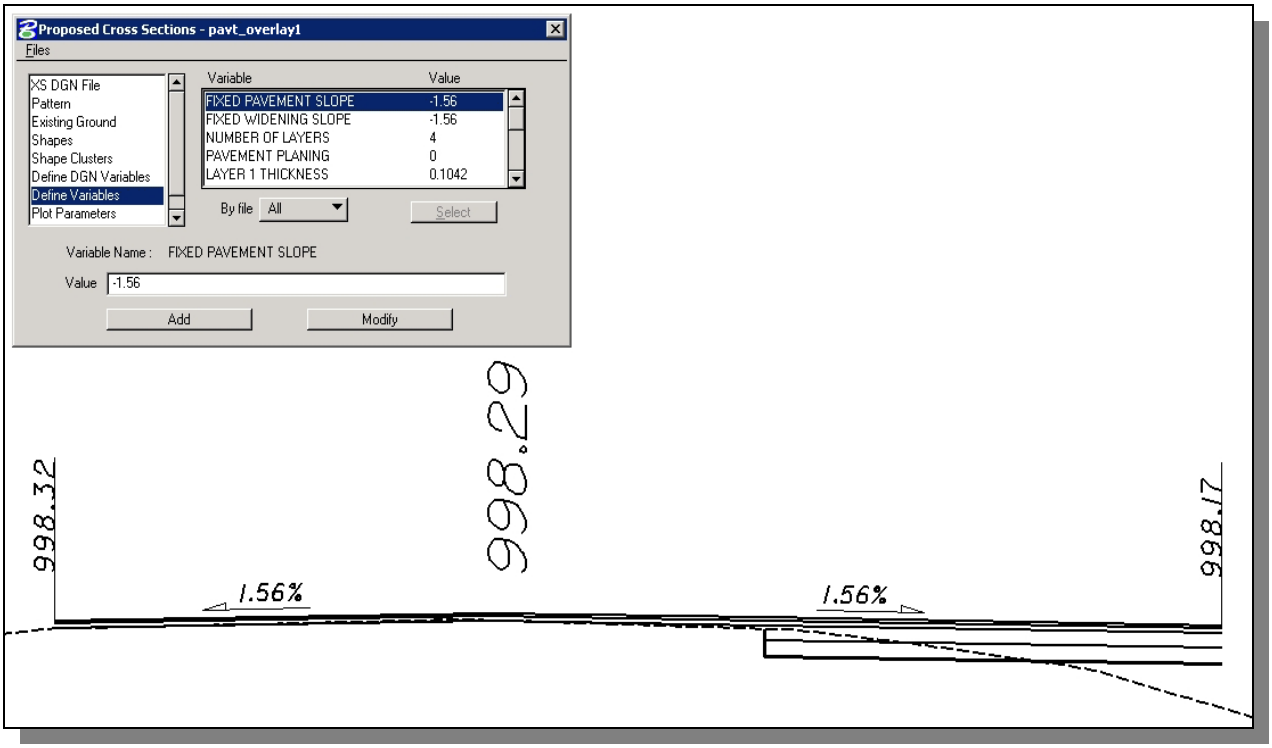


Figure 10

PROCESSING EXAMPLE 5 - Specifying a fixed cross slope for the widening.

In this example, the variable **"fixed pavement slope**" is set to 0 and the variable **"fixed widening slope"** is set to -1.56 as shown below. The overlay is drawn by matching the existing pavement slope. The widening is drawn using the value of **"fixed widening slope**".

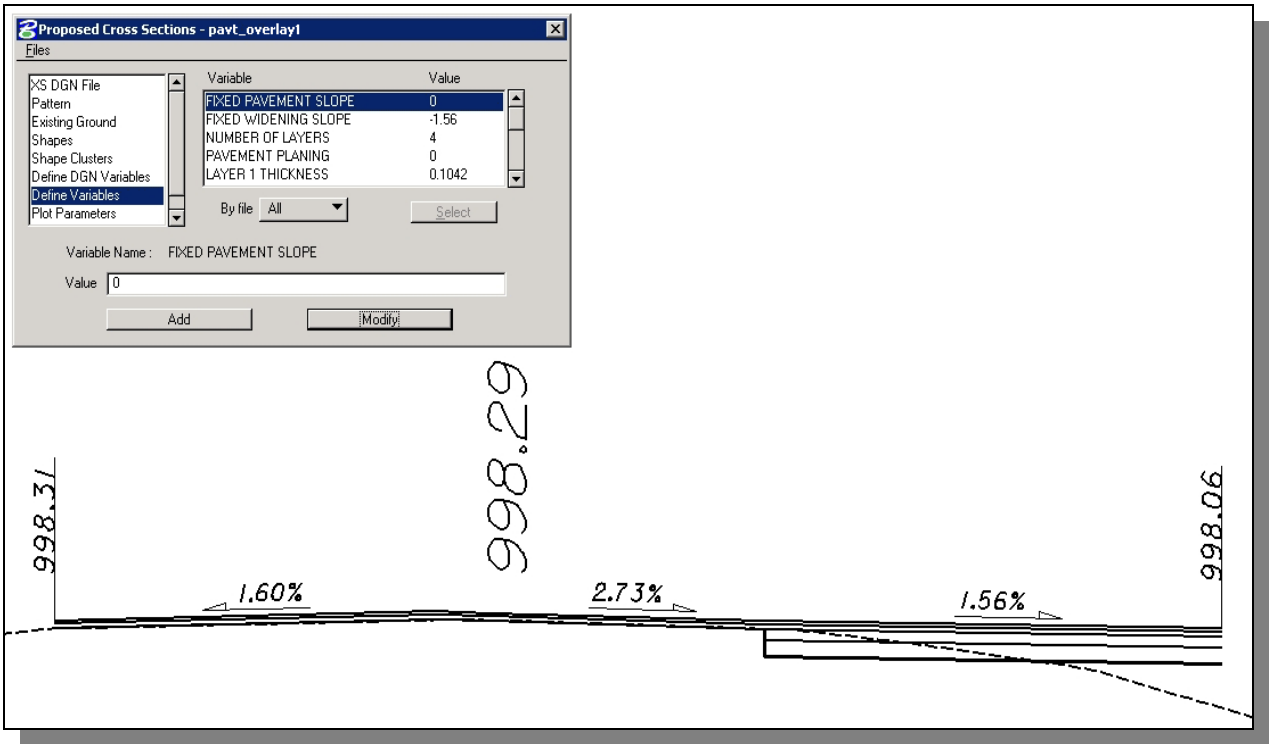


Figure 11