State of Florida

Department of Transportation

FDOT ORD Traffic Plans

Signing & Pavement Markings

Workshop Training Guide

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1 ORD SETUP 5

Objective 5

Introduction 5

FDOT WorkSpace 5

Setting WorkSet Location 6

Project Setup 7

2 SIGNING TOOLS 8

Objective 8

Introduction 8

FDOT Signs Application 9

Assembly Creation 9

Assembly Creation - Panel 10

Assembly Creation - Post 11

Assembly Creation – Placement 12

Labels 13

Labels – General Settings 13

Labels – Panel 13

Labels - Post 13

Labels – Save/Recall Label Settings 14

Tools & Settings 14

Tools & Settings – Connector 14

Tools & Settings – modification 14

User Settings 15

User Settings – general 15

User Settings – Files 16

User Settings – admin only 16

Exercise 2.1 Place Single Post Sign Assembly 17

Exercise 2.2 Saving the Sign Assembly 20

Exercise 2.3 Update Sign Post Location 20

Exercise 2.4 Place Multi-Panel Sign Assembly 21

Exercise 2.5 Creating and Placing a Sign Assembly using 2 methods (Part 1) 25

Exercise 2.6 Placing same sign assembly using a saved xml file (Part 2) 26

Exercise 2.7 Checking out the Sign Assembly Inventory in a File 26

3 PAVEMENT MARKING TOOL 29

Objective 29

Introduction 29

Drawing Pavement Marking 29

Striping 30

Stripe Pattern 30

Element Data 32

Separation Mode 32
Separation Pattern 32
Control Points 33
Chevron Diverge/Merge 33
Diverge Pattern 33
Control Points 33
Exercise 3.1 Draw Striping Patterns 34
Exercise 3.2 Placing a 24” Stop Bar 37
Exercise 3.3 Placing two different Patterns 38
Exercise 3.4 Placing and Editing a Crosswalk 39

1 ORD SETUP

OBJECTIVE

This chapter covers the initial setup required to start using this tutorial.

In this chapter, the following topics will be covered:

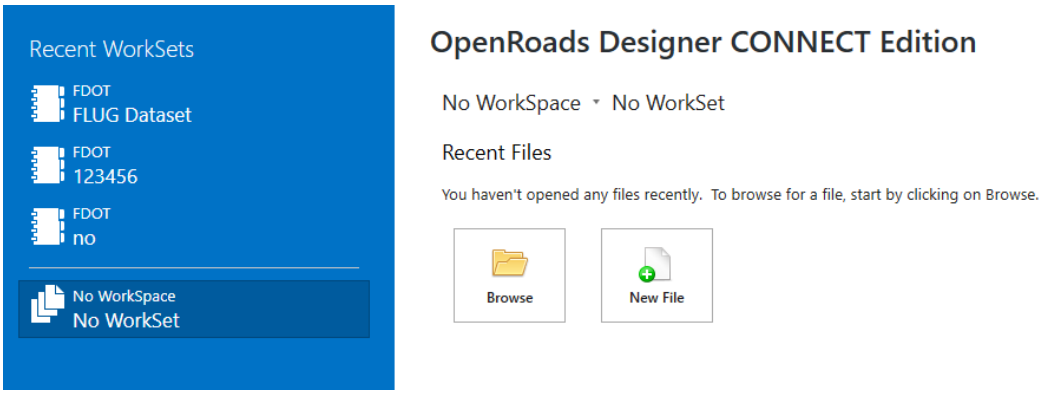
- FDOT Workspace
- FDOT Worksets
- Creating a New Project

INTRODUCTION

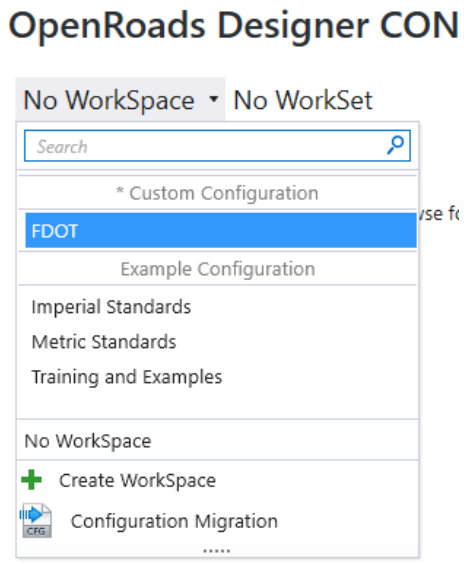
If this is your first-time opening FDOT ORD you will need to do some basic setup before you can begin your project design, this chapter will cover the basics.

FDOT WORKSPACE

When you launch FDOT ORD you are greeted with the following screen. ORD needs a starting point to begin, so you will need to point to a WorkSpace and WorkSet. The image below tells you that neither have been selected.



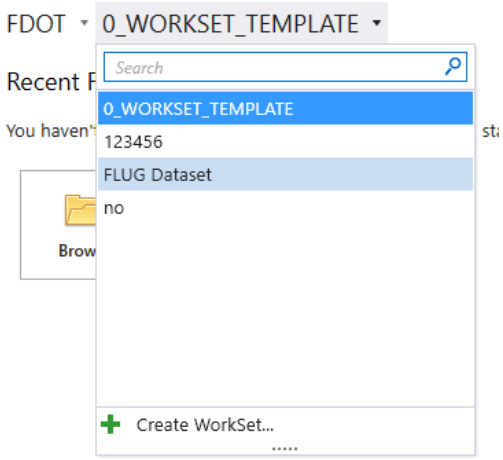
To set a Workspace select the pulldown to see the list of available workspaces and select FDOT as shown below.



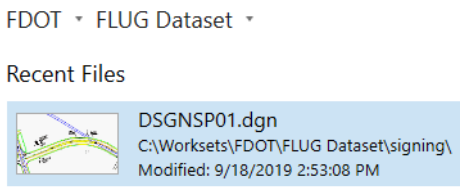
Not only can you select a workspace from this dialog, but you can create different WorkSpaces in case you are working for multiple DOT's

SETTING WORKSET LOCATION

Now that you have the WorkSpace and all the settings that are inclusive to that particular work space, you need to set the WorkSet, which represents your active project folder and drawings. Using the pull down to display the list select the FLUG Dataset workset, which is used for this workbook.

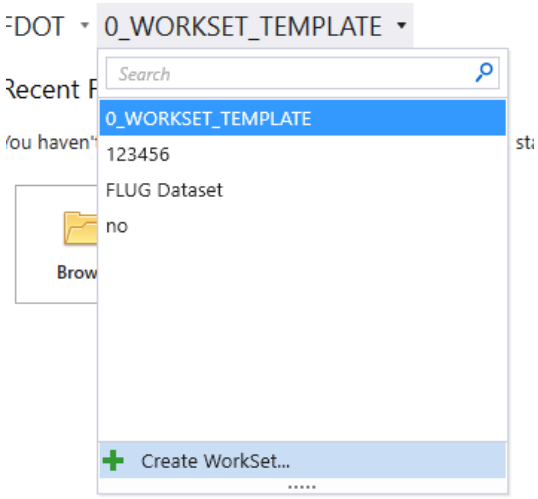


If you have worked in this workset before a list of recently opened files are visible and are ready to be opened. The Recent files list only applies for the current workset.



PROJECT SETUP

You do not need to do this for this workbook, but this topic is for future reference on starting a new project from scratch using the FDOT WorkSpace, with the work space set to FDOT pulldown the Work Set List and select **Create WorkSet**.



The Create WorkSet dialog box opens, which you will fill in the Name, Description, Template, Location, and other data. Make sure for template you select 0_WORKSET_TEMPLATE. Select OK when finished.

It's important to note that the first file you must open is the _BlankFile.dgn, this will allow you to start the design file creation process using the Create File application located on the FDOT Ribbon in ORD. The BlankFile has a notification letting you know to not start any design file usage from this file. Using the Create File app applies proper symbology to the new design files.

2 SIGNING TOOLS

OBJECTIVE

This chapter covers the sign applications available in the FDOT ORD Work Space. There are Cell drawing files included, containing all sign cells from the ***M.U.T.C.D***. and ***Standard Highway Sign*** book. These cells can be placed anywhere within the design file.

In this chapter, the following topics will be covered:

- FDOT Signs application
- Guide SIGN 7.0

INTRODUCTION

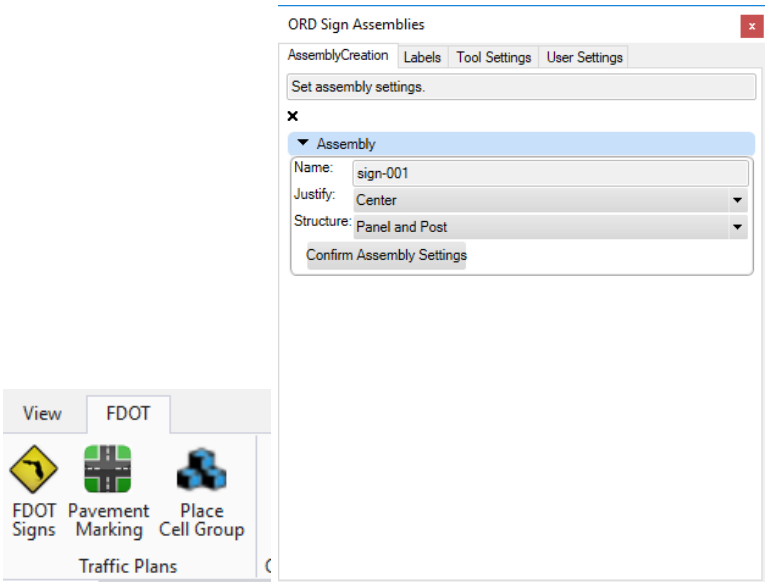
At this point, the designer may have an inventory of existing signs for their project. The designer must decide which signs need to be removed, relocated, or replaced. This work should be done in the proposed design file, *DSGNSP01.dgn*.

The FDOT Signs program is another source for placing proposed and existing sign cells. It allows the designer to build sign assemblies and place them in the design file. The sign post contains the pay item data required to be quantified., the panel contains no pay item data. The ORD version of the FDOT Signs application is very similar to the Civil 3D version.

GuidSIGN, is a sign design program available from Transoft Solutions, and is included in this section and briefly explained.

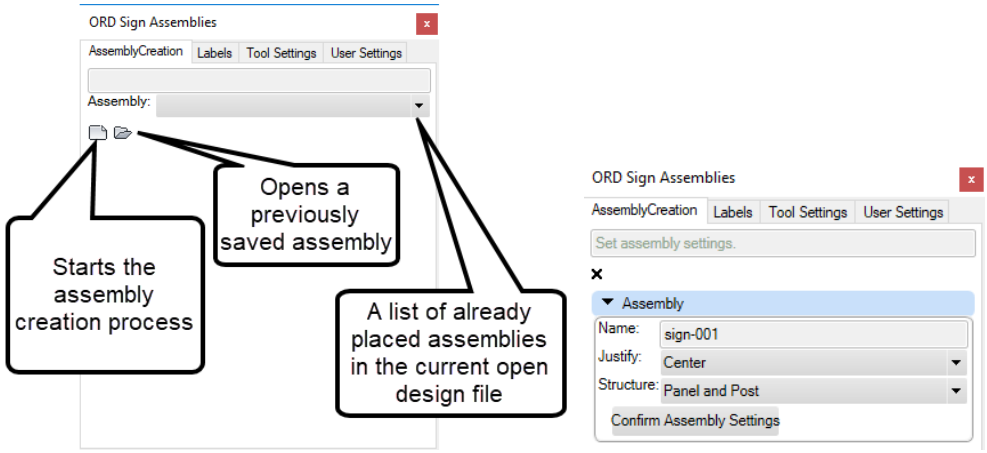
FDOT SIGNS APPLICATION

Accessible from the FDOT Ribbon on the Traffic Plans panel, the FDOT Signs Application is designed to assist in the placement of standard sign panels and posts in the signing and marking plans. This tool uses a separate xml file that contains all pay item data required to quantify correctly. All the signs that are in the *Standard Highway Sign Book* and the *Florida Roadway and Traffic Design Standards* have been included. The application is a palette based program.



The FDOT Signs App has four tabs: **Assembly Creation, Labels, Tools Settings, & User Settings**

ASSEMBLY CREATION



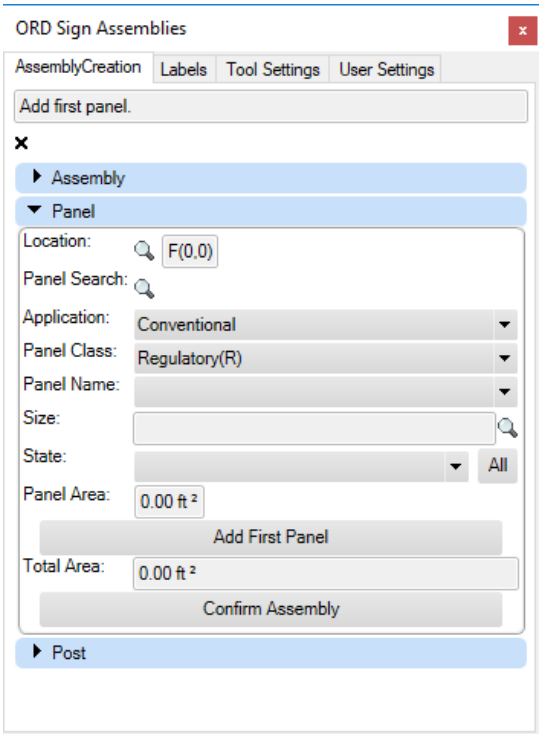
We will start when the start assembly button is selected. The dialog box shown above right opens.

- **Cancels Assembly Creation:** When selected it cancels the assembly creation process and returns to the default dialog as shown above left.
- **Name:** User can assign a name or an automatic default name will be used. A 3-digit counter is added at the end, this allows same named assemblies to exist in the design file without being over written.

- **Justify:** Allows the panel(s) to be set either Left, Center, or Right in the assembly.
- **Structure:** The user can designate the assembly structure as Panel and Post, Post Only, or Panel Only.
- **Confirm Assembly Settings:** This is selected when the assembly parameters are set and the designer is ready to move on to the next step.

ASSEMBLY CREATION - PANEL

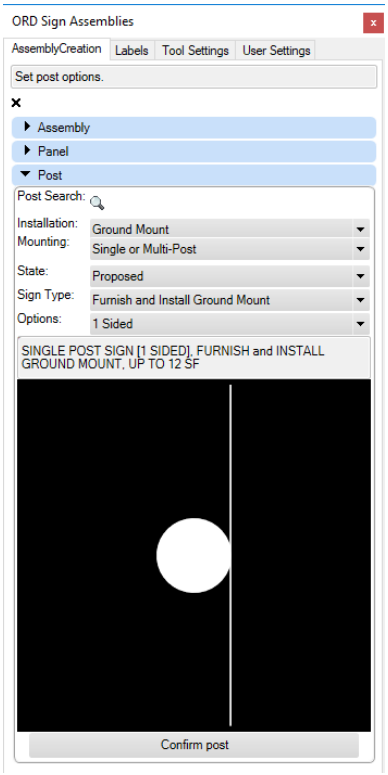
The panel assembly portion of the process is where you pick the panel(s) to add to the assembly and preview your work before moving on to the next step.



- **Location** – When selected a grid box opens showing where the panels are in relation to each other in the assembly. The user can also change locations from here by right clicking on the populated grid box for options. The grid box also contains the back side of the assembly if it is a double-sided assembly.
- **Panel Search** – Allows the user to search for a panel by name and bypasses the navigation to the desired panel.
- **Application** - This gives the designer the ability to select from the list of options including; Conventional, Expressway, Freeway, Minimum, or Oversized. The selections made upstream effect what's available downstream in the selection process of other options.
- **Panel Class** – Panel Class is another way to shrink down the panels to choose from, it contains a big list of classes; Regulatory (R), Route Markers (M) and more, the letters in parenthesis designate the panel name. Example being Route Markers (M) = M1-7 panel name.
- **Panel Name** – With the previous selections made the list is culled down to the available panels and will populate with the panel name.
- **Size** – The user can select the Search icon to select the available sizes that go with the panel selected, if a size is not preset you can enter in a custom size. An example entry being 24x36 which will equal 6 S.F. It is the designer's responsibility to know what size sign to use, do not assume this tool has the intelligence built in to determine the correct size to set for the sign panels of the project.
- **State** – The user has 4 states to choose from; Proposed, Existing to Remain, Remove, and Relocate. The **All** button will force the state chosen to all panels in the assembly.
- **Panel Area** – This displays the Square Footage of the current panel that is being added to the assembly.
- **Panel Preview** – When a panel is selected it displays a preview of how the panel(s) will look before placement.
- **Add First Panel** – The user must select this button to add it to the assembly, if another panel needs to be added the user will repeat the previous steps to add it.
- **Total Area** – This displays the total Square Footage of all panels that are part of an assembly.

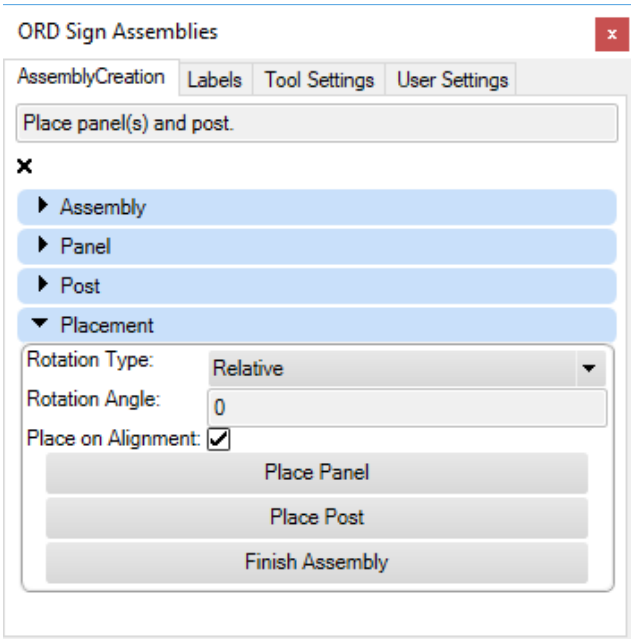
- **Confirm Assembly** – When all panels have been added to the assembly and the user is ready to move on to the post options click on Confirm Assembly.

ASSEMBLY CREATION - POST



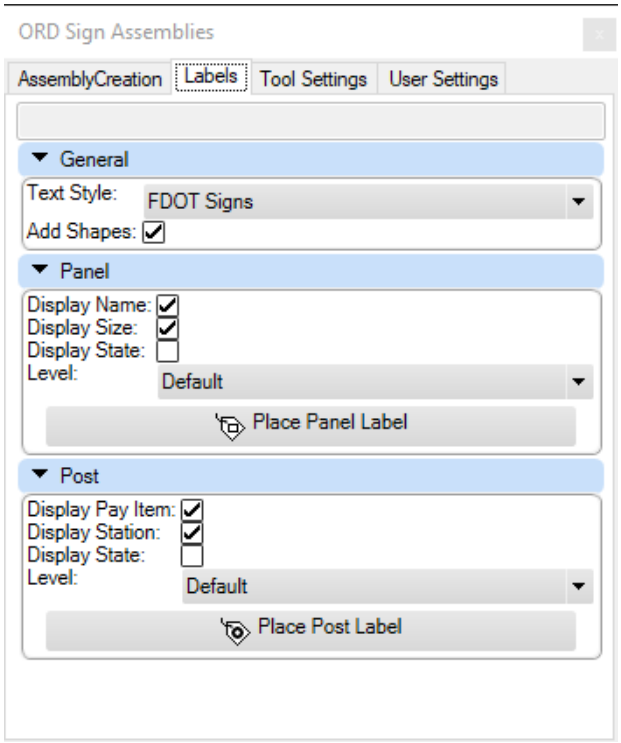
- **Post Search** – Allows user to search for a specific post which will avoid the pulldown navigation to choose the post.
- **Installation** – The user selects which installation method to use. The following are available; Ground Mount, Panel Only, and Overhead.
- **Mounting** – This allows the user to select the type of sign mounting, options being; Single or Multi-Post, Sign Beacon, Delineator, Highlighted Sign, Object Marker, Internally Illuminated Sign, Dynamic Message Sign Support Structure, or Electronic Display Sign.
- **State** – There are several states available; Proposed, Existing to Remain, Relocate, Remove, and Proposed/Remove.
- **Sign Type** – The options displayed to choose from is dependent on the type of State selected.
- **Options** – This pull down gives the user ability to pick whether the sign is one sided, two sided, or single post or multiple posts. The options available are based on the previous selections made.
- **Panel Custom Label Fields** – This is where to fill in any open fields on a sign panel. Example, the Speed Limit sign has one field that needs to be filled in. When the Speed Limit sign is selected Field 1 becomes active to enter the speed. This will change the preview display to show the new speed. If a sign is selected with more than one field in it the FDOT Signs tool will recognize this and the appropriate number of fields will become active.
- **Pay Item –** This will show a preview of the post cell used and the Pay Item information assigned.
- **Confirm Post –** When selected the assembly is ready for placement and the tool moves to the placement process.

ASSEMBLY CREATION – PLACEMENT



- **Rotation Type and Angle** – There are two options for Rotation, Relative and Absolute, Relative allows the assembly to be rotated parallel to the roadway alignment and the flow of traffic, for this reason it is the default. Absolute allows the user to enter in a fixed rotation angle.
- **Place on Alignment –** This toggle when on will place the assembly along an alignment with a Station, if toggled off it will be placed freely with no association to the alignment.
- **Place Panel –** Starts the process of placing the assembly starting with the panel first.
- **Place Post –** Starts the process of placing the post to go with the previously placed panel.
- **Finish Assembly –** Once the assembly is placed this should be selected before moving on to the Label options.

LABELS



LABELS – GENERAL SETTINGS

- **Text Style –** Controls which font is used for the labels, default is set to FDOT.
- **Add Shapes –** When toggled on, the Pay Item Number Label has a Rectangle shape and the Sign panel name has an Oval shape.

LABELS – PANEL

- **Display Name –** Controls if the Panel name is part of the label or not.
- **Display Size –** Controls if the Size of the panel is part of the label or not.
- **Display State –** Controls if the state is labeled, default is proposed. If toggled on the "Existing to Remain" or "To Be Relocated" state will be part of the label.
- **Level –** Provides a level override if needed, the default is TextLabel for Panel labels.
- **Place Panel Label –** Executes the place panel label command, user picks the panel to label and then the location of the label.

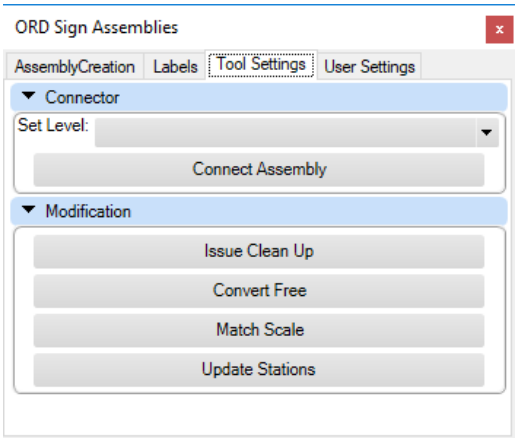
LABELS - POST

- **Display Pay Item –** Controls if the Post label contains the Pay Item Number.
- **Display Station –** Controls if the Station location is part of the label or not.
- **Display State -** Controls if the state is labeled, default is proposed. If toggled on the "Existing to Remain" or "To Be Relocated" state will be part of the label.
- **Level -** Provides a level override if needed, the default is PayItem_dp for Panel labels.
- **Place Post Label -** Executes the place post label command, user picks the post to label and then the location of the label.

LABELS – SAVE/RECALL LABEL SETTINGS

- **Recall or Save –** Allows users to save and recall their label settings for future sessions.

TOOLS & SETTINGS

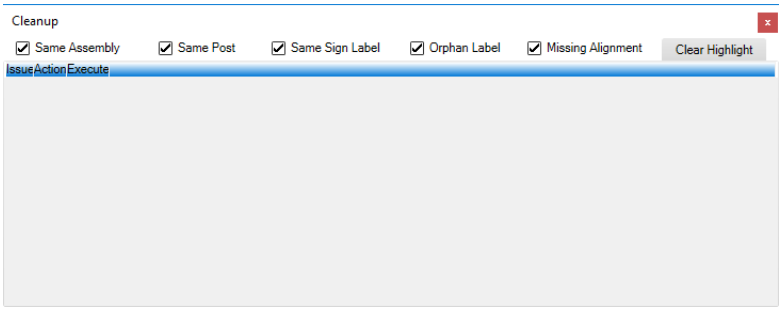


TOOLS & SETTINGS – CONNECTOR

- **Set Level –** The default level of the connector line is TextLabel, but can be changed by use of the pull-down menu.
- **Connect Assembly –** The connector line is the leader line between the post and panel and will dynamically stay connected if panel or post is moved. If the design file has assemblies that are not connected the user can use this command to add them after they are placed.

TOOLS & SETTINGS – MODIFICATION

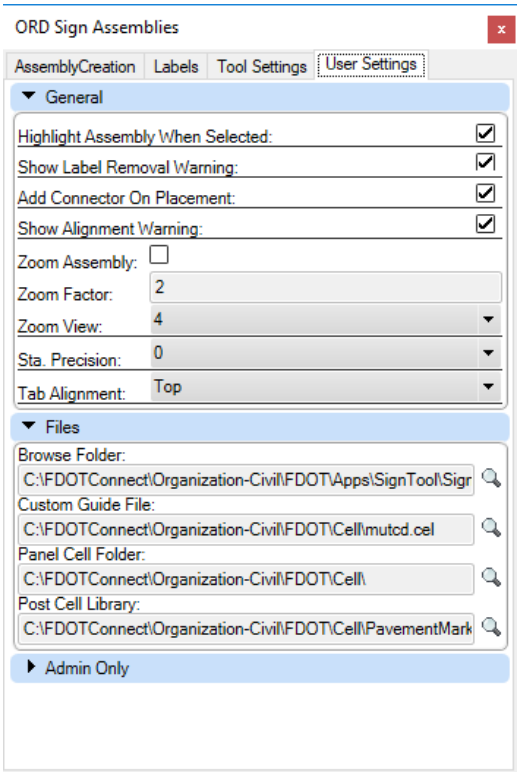
- **Issue Cleanup –** Allows user to delete unused sign assembly data from drawing file. Each cleanup option can be controlled with a check toggle.



- **Same Assembly** – Deletes duplicate named assemblies.
- **Same Post** – This will delete duplicate sign labels that are in the file.
- **Same Sign Label –** This will delete duplicate sign labels that are in the file.
- **Orphan Label –** If an assembly has been deleted and the label somehow remains, this will delete the label that is not associated to any assembly.
- **Missing Alignment –** If an alignment that has Sign Assemblies associated to it is deleted, this will delete all signs that are still associated to the deleted alignment.
- **Clear Highlight –** When the list is populated with scan results of selected criteria, this is used to clear the list which will remove the data from the file.

- **X –** This closes the Cleanup tool.
- **Convert Free –** Converts already placed assemblies to a free state which has no association to an alignment.
- **Match Scale –** Common scale for a FDOT design file is 1" =40', but in cases where the scale is very different Match Scale will adjust the assembly sizes in the file for better visibility.
- **Update Stations –** The user can update the station of the assembly if it has been moved or copied.

USER SETTINGS

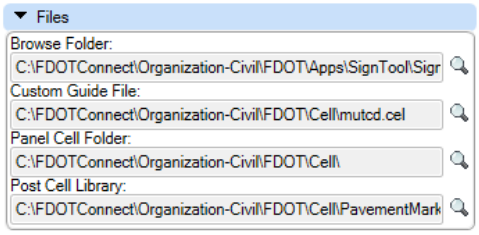


USER SETTINGS – GENERAL

- **Highlight Assembly When Selected –** Controls when an already placed assembly is selected from the assembly pull down list is highlighted or not.
- **Show Label Removal Warning –** When relabeling an already placed assembly, when toggled on a warning will display telling you that you are about to delete and relabel an assembly.
- **Add Connector on Placement –** When toggled on it will automatically place the connector line as the assemblies are placed.
- **Show Alignment Warning –** When toggled on it will warn the designer if they are about to change alignment association.
- **Zoom Assembly –** When toggled on it will zoom to the selected assembly from the list.
- **Zoom View –** Controls how far the selected assembly is zoomed in.
- **Station Precision –** Controls how many decimal places are displayed in the station label, default is set to 0 to match standards.

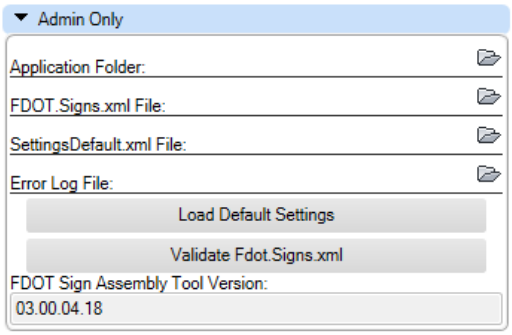
- **Tab Alignment –** The user can change the side of the dialog box that displays the tabs. The options are along the top or along the right side.

USER SETTINGS – FILES



- **Browse Folder** – The browse folder is where you save and/or recall sign assemblies. The user should change this location to point to the sign assembly folder within the ORD install which contains already created assemblies.
- **Custom Guide File** – This location is where your cells reside in the guide sign file you have created for your project, this location will constantly change as you work through a design. It is not important where the default location is pointing.
- **Panel Cell Folder** – This points to the root folder cell library location that contains all the required sign panels that you will use in your project design.
- **Post Cell Library** – This points to the cell library location that contains all the required post cells you will use in the design.

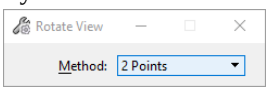
USER SETTINGS – ADMIN ONLY



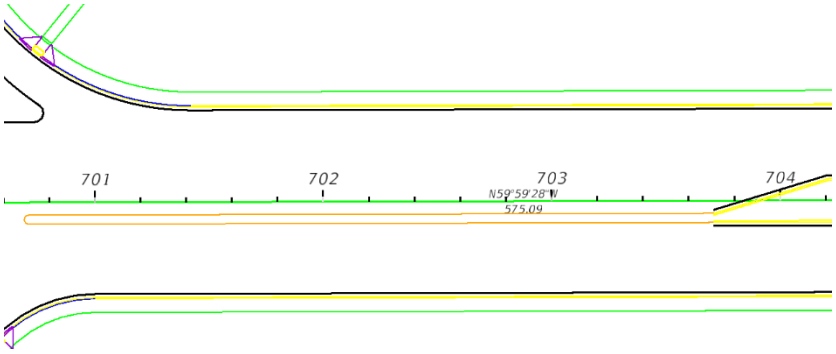
- **Application Folder -** Opens the location of the FDOT Signs folder within the ORD Installation location
- **FDOT.Signs.xml File –** Opens the FDOT.Signs.xml file for editing. It is recommended that that the user not edit this file, however if it is necessary use this command to access it.
- **Settings Default.xml File –** This file should already be set; however, the user can change this file and then Select the Load Default Settings to load settings into the application.
- **Error Log File –** When selected this will open the Error Log File to determine what error has occurred that can then be passed to the CADD office for the developer to evaluate.
- **Load Default Settings –** This loads the Settings.Default.xml File discussed above.
- **Validate FDOT.Signs.xml –** This will validate the cells and cell files that are necessary for the Sign Tool to function correctly. It will report what is missing.
- **FDOT Sign Assembly Tool Version –** Identifies the version of the sign application, this is useful when reporting bugs or issues with the program.

Exercise 2.1 Place Single Post Sign Assembly

In this exercise, the designer will build, place, and label a simple sign assembly. The Sign tool is designed so the user works top to bottom making selections.

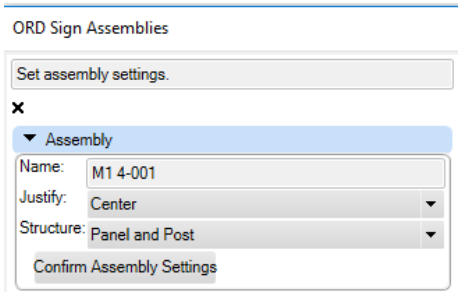
1. Open the *Dsgnsp01.dgn* file and zoom in near *Station* **702+20.**
2. Select the Rotate View button select the **2 Points** command and using the SR61Alignment as the object select anywhere near station 701+00 for the first point and anywhere neat station 702+00 for the second point. 

The drawing should look like below.



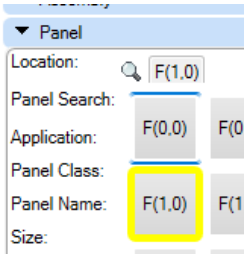
3. From the FDOT Ribbon, select the **FDOT Signs** icon to open the application.

4. From FDOT Signs, select the **Create New Assembly** icon.
5. For *Name* enter **M1 4**, notice the name has added -001 to the end.
6. Set *Justify* to **Center**.
7. Make sure **Panel** and **Post** is selected, then select **Confirm Assembly Settings**.

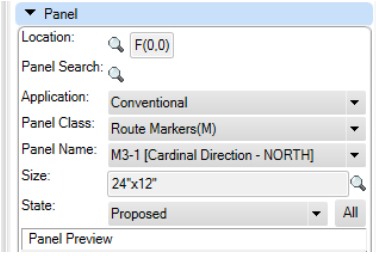


8. Click on the *Location* icon to change the location of the panel on the grid.
9. Click on **Cell F(1,0)**. This will be the *Route Marker Panel* location.

10. In the *Panel Section*:
    a. Set the *Application* to **Conventional**.
    b. Set *Panel Class* to **Route Markers(M)**
    c. For *Panel Name* Select the **M1-4 (3 Digits)**.
    d. *Size* is preset with one option, select **30”x24”**.
    e. Set *State* to **Proposed.**
    f. For *Field 1* type in **319** the panel preview shows the text, ignore the text not being centered in the panel it will be centered when the panel is placed in the file.
    g. Click **Add First Panel**,
11. On the *Location Grid* select the one above the panel already created, **F(0,0).**



12. Select another *Route Marker*, **M3-1** which is the *NORTH* panel.
13. For size select **24”x12”** from the available options.
14. Set State to **Proposed**.
15. Select **Add Next Panel,** then **Confirm Assembly.** You should see a preview of the 2-panel assembly.



16. For the *Post Parameters* enter the following.

a. Set the *Installation* to **Ground Mount**.

b. Set *Mounting* to **Single** or **Multi-Post.**

c. Set *State* to **Proposed**.

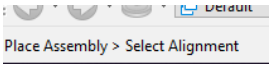
d. Set *Sign Type* to **Furnish and Install Ground Mount**.

e. Set *Options* to **1 Sided.**

f. Click on **Confirm Post** to continue to the *Placement* section.

17. Select **Place Panel** to start the *panel placement command*.

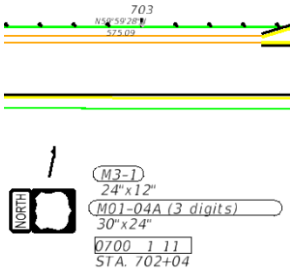
18. The command line asks to select the *Alignment*, select the **SR61 Alignment** and select an area in the drawing on the south side of the alignment away from the sidewalk to allow room for labels and connector line. Left click to place panel.



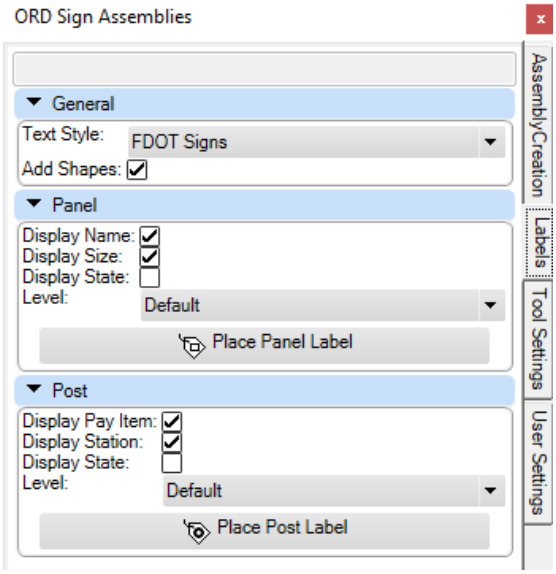
19. Select **Place Post**, Select the Alignment and left click to place the Post near Station 702+20

20. Select **Finish Assembly** to proceed to placing Labels.

    The drawing should look like below.

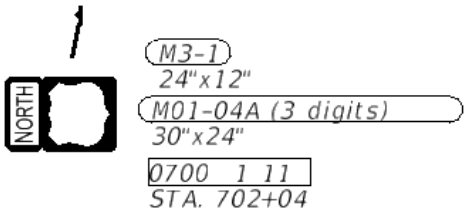


21. Select the **Labels** tab and make sure to match the following settings as shown below.



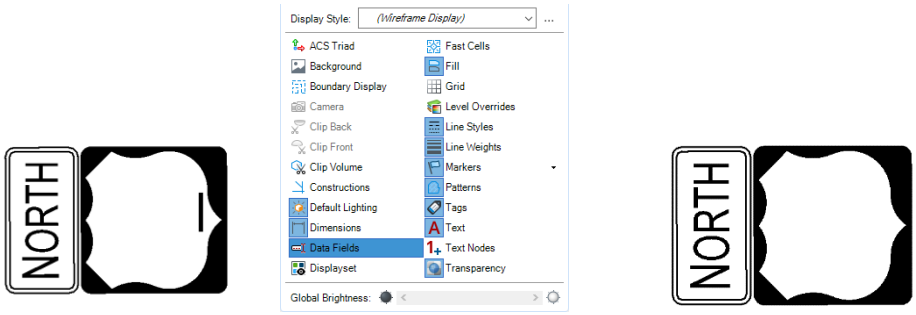
22. Click **Place Panel Label**, click the **NORTH** *panel*, select the *label location* to the right of the assembly, click on the **Route Marker** *panel* and place the label below the previous label.

23. Click **Place Post Label,** click the *post*, for *label location* pick below the previous labels. Your drawing should look like below.



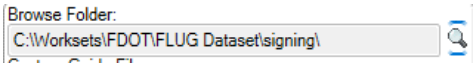
Note *Label placement is a personal preference. Be consistent with how you place sign labels so the plans look professional. Use MicroStation commands to move the* ***Sign Names*** *and* ***Sizes*** *so they are centered under the sign panels and are stacked from top to bottom.*

When the panels are placed you may see the data fields still be visible along with the desired text, to cut off the data fields use the view attribute pulldown and toggle off Data Fields 



Exercise 2.2 Saving the Sign Assembly

In this exercise, the designer will save the previously placed sign assembly as an xml file, so that it can be recalled, placed, and labeled in a future instance.

1. Switch to the User Settings tab on the Sign tool and change the folder used for saving and recalling assemblies as shown. 

2. Switch back to the Assembly Creation tab and select the Save Icon 

3. The save as dialog box opens already in the folder you just set, Name the assembly M1-4_M3-1.xml.

4. Press Ok to save and close the dialog.

5. Save your file before continuing.

Exercise 2.3 Update Sign Post Location

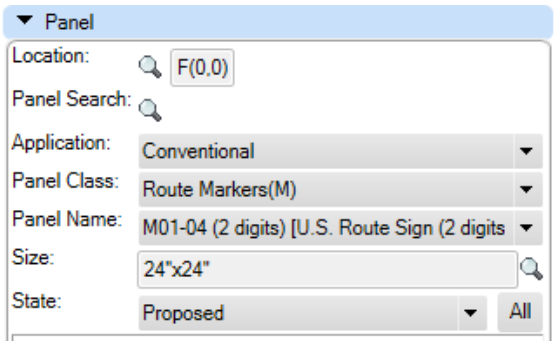
In this exercise, the student will move the post location of an already placed assembly.

1. Continuing in the *DSGNSP01.dgn.*
2. Zoom to the location of the previously placed assembly.
3. Move the post a few feet in either direction.
4. Notice that when you click to place the post the station value automatically updates along with the connector that keeps the attachment between the post and panel.
5. Save drawing before continuing.

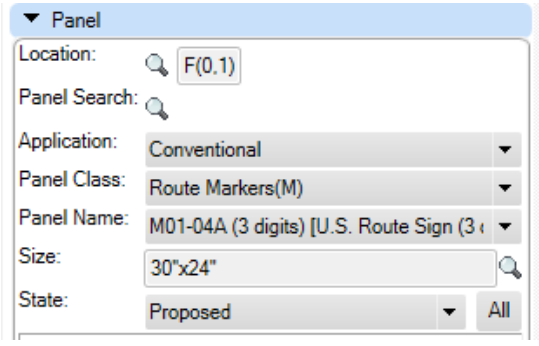
Exercise 2.4 Place Multi-Panel Sign Assembly

In this exercise, the student will use the same process as in the previous exercise to assemble and place a four-panel sign assembly.

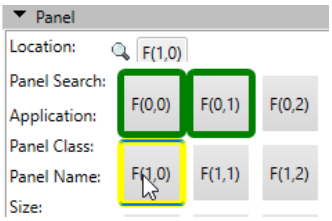
1. Continuing in *Dsgnsp01.dgn***,** zoom to the vicinity of *Station* **703+00**. This sign will be added on the North side.
2. Open the Sign tool, if closed, select **Start New Assembly**.
3. *Name* the new assembly **M1-4Panel** and select **Confirm Assembly Settings.**
4. In the *Panel Section*, make selections for **Panel 1 of 4** as shown below.



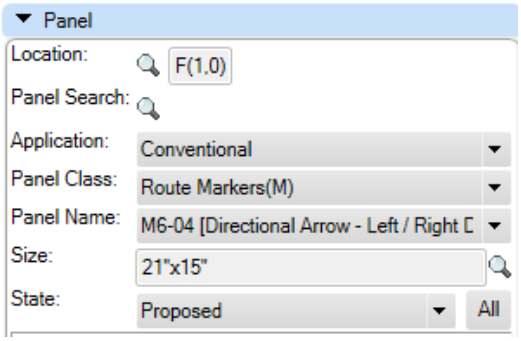
5. Select **Add Panel**.
6. Make the following selections for **Panel 2 of 4**.



7. Select **Add Next Panel**.
8. Click on the Location icon and select the location that is marked yellow in the diagram below, notice the used locations are green.

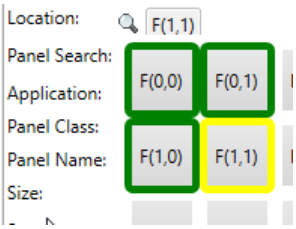


9. Make the following selections for **Panel 3 of 4**.

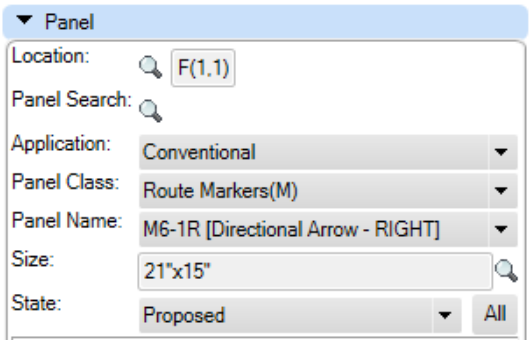


10. Select **Add Next Panel**.

11. Click on the Location icon and select the location that is marked yellow in the diagram below.

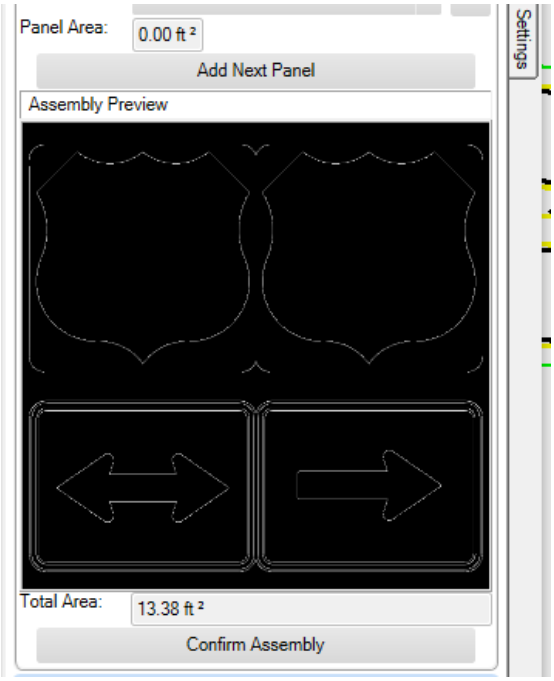


12. Make the following selections for Panel 4 of 4.

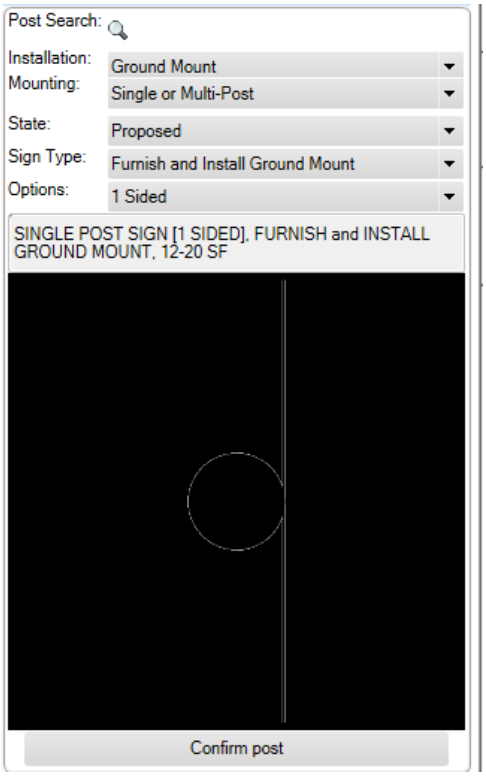


13. Select **Add Next Panel**.

14. Notice the preview of the assembly and how the Panel Area is at zero, but the Total Area is 13.38sf this is the total area of all four panels.

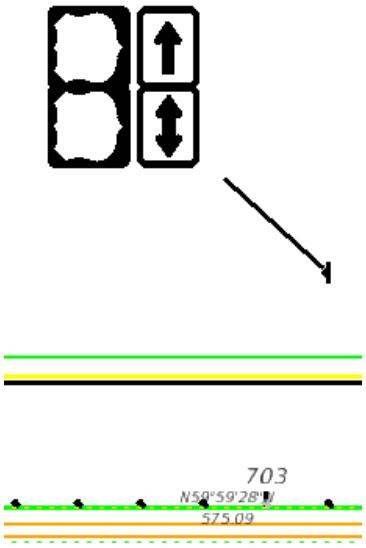


15. Select **Confirm Assembly**.
16. In the *Post* section make the following selections.

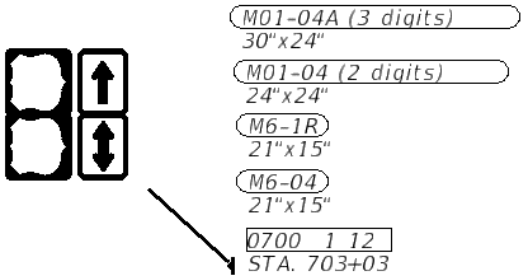


Notice the Pay Item information is different from the previous assembly you placed. This is because of the additional square footage of the panels. This is automatic and controlled by the signs.xml file, so the user will not have to make the selection. The data is placed on the post when placed.

17. Select **Confirm Post**.
18. Select **Place Panel**
19. Make sure *Rotation* is set to **Relative** and ***Place on Alignment*** is checked.
20. Select **Place Panel** and click near the *Station* 703 as shown below.



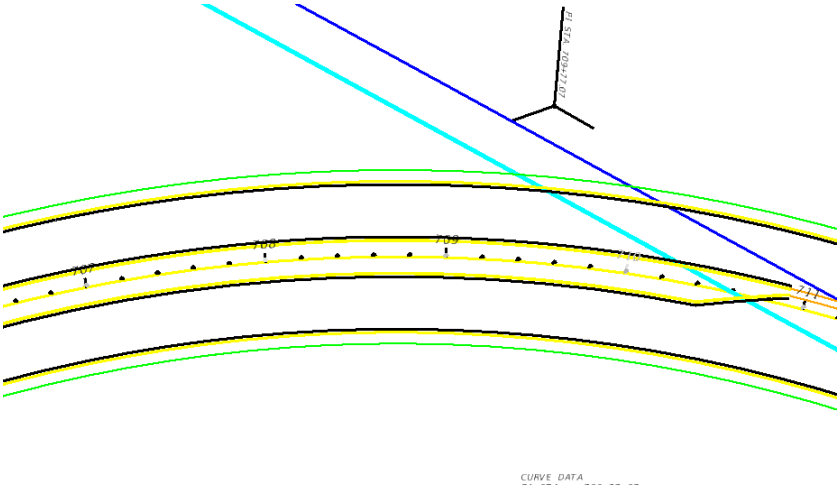
21. Select **Place Post** and Select close to Station 703+00 just outside the Sidewalk.
22. Click **Finish Assembly**, then select the **Labels** tab.
23. Select **Place Panel Label**, select one panel at a time and place the label. You don't need to select the Place Panel Label again, due to the command is always active until you change to the post.
24. Select **Place Post Label** and select below the previously placed labels. The completed assembly is shown below.
25. Save drawing before continuing.



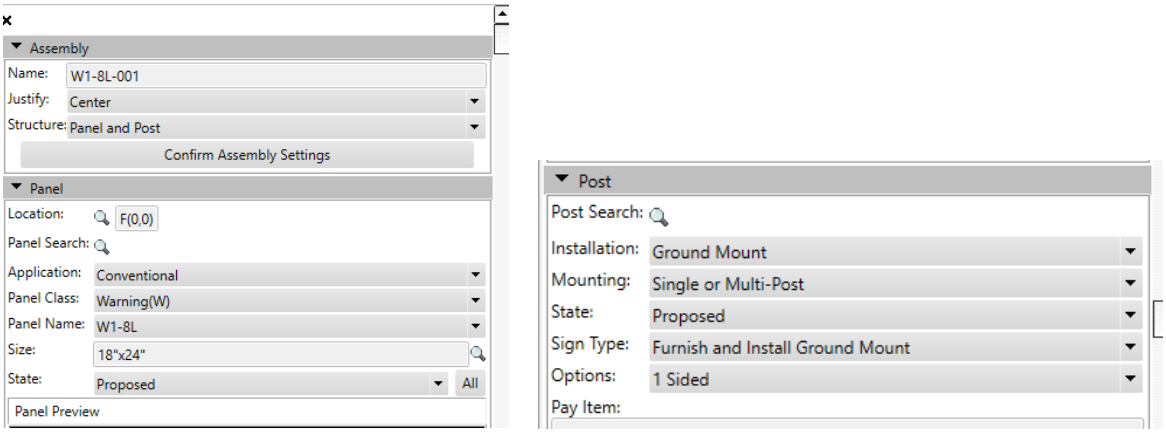
Exercise 2.5 Creating and Placing a Sign Assembly using 2 methods (Part 1)

In this exercise, the designer will create and place a warning arrow sign assembly two times using different techniques. The designer will first place it like previous steps, then the designer will recall a previously saved version of the assembly.

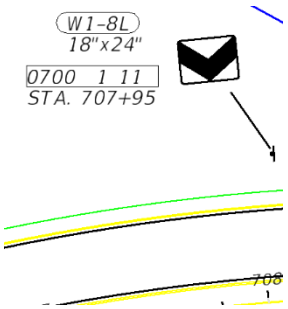
1. Continuing in the *DSGNSP01.dgn* switch to the FDOT Ribbon and select the **2 Point Twist** command.
2. Rotate and zoom to the area as shown below.



3. Open **FDOT Signs** if not already open. Create the following assembly using the steps from earlier exercises.



4. Place the panel and post around Station 708+00 and label the panel and post as shown below.
5. Save your file before continuing.

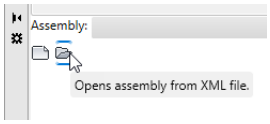


6. On the Sign Tool switch to the Assembly Creation tab.
7. Click on the save assembly button .
8. Name the assembly **W1-8L** & press OK.

Exercise 2.6 Placing same sign assembly using a saved xml file (Part 2)

In this exercise, the designer will open a saved sign assembly and place in the design file.

1. Continue working in the *DSGNSP01.dgn* file.
2. Close the Sign tool if open.
3. Re open the sign tool
4. Click on **Opens assembly from XML file** button in the FDOT Signs app.



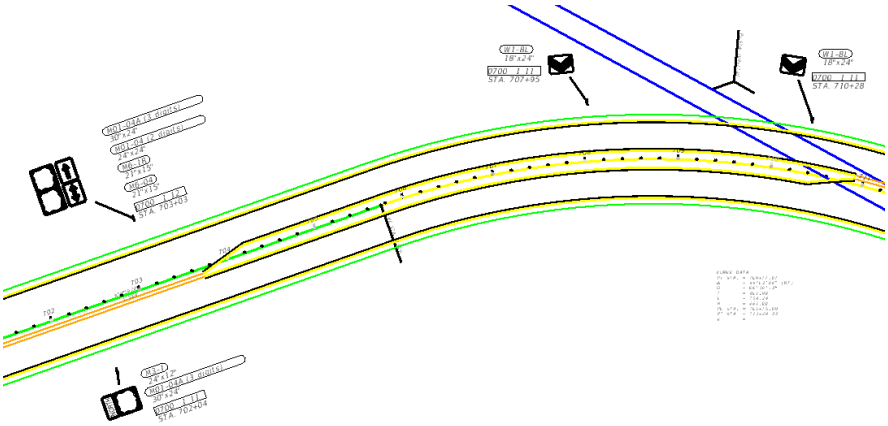
5. Using the list pulldown select the **W1 8L** assembly. A preview is shown to verify the selection.

6. Select **Load**.
7. To save you time, the sign tool pre-loads all settings based on how it was saved. If no changes are needed select **Confirm Assembly** and then **Confirm Post**.
8. Place the Panel & Post.
9. Select **Finish Assembly**
10. Switch to the Labels tab on the sign tool.
11. Label Panel and Post.
12. Save drawing before continuing.

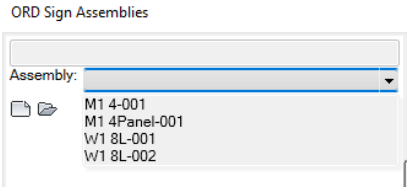
Exercise 2.7 Checking out the Sign Assembly Inventory in a File

In this exercise, the designer will open the sign tool while the dsgnsp01.dgn is open to get familiar with navigating around the already placed assemblies in the file. This exercise will show the importance of proper naming conventions of assemblies.

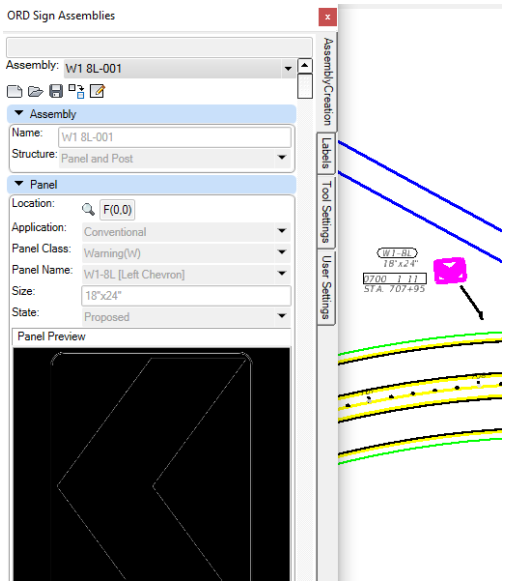
The drawing should contain 4 Sign assemblies if you have followed the previous exercises.



1. Continue working in the dsgnsp01.dgn file.
2. Close the Sign tool and Re open it.
3. Click on the Assembly pulldown list.



4. The list contains the 4 placed assemblies, naming is important due to the number of assemblies a project could contain. Notice the two W1 8L assemblies in the list. The difference in the name is the 3-digit number, this will allow you to have unlimited assemblies of the same name.
5. From the assembly list select the **W1 8L-001** sign.
6. Two things happened, the selected assembly is highlighted in the file and the sign tool dialog has populated with the settings of the assembly.



7. If desired you can edit the assembly by pressing the Edit Assembly button 
8. Save your drawing.

Editing an already placed assembly means you can change any setting in the controls or even change the panel or ass additional panels. Once the changes have been made you will need to confirm the assembly and place the panel and post like you did initially along with re labeling.

3 PAVEMENT MARKING TOOL

OBJECTIVE

The objective of this chapter is to create Proposed Pavement Marking Features using the Pavement Marking tool located on the FDOT Ribbon in ORD.

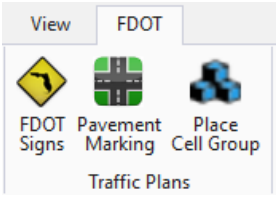
INTRODUCTION

This chapter demonstrates several applications that help to create a Pavement Marking set of plans:

- **Pavement Marking tool-** An application within the FDOT WorkSpace that is used to draw Pavement Marking in accordance with the FDOT (CADD) standards.

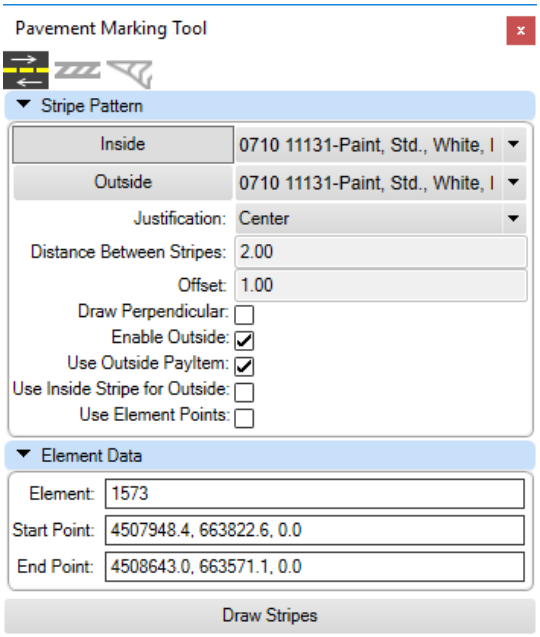
Refer to in the Plans Preparation Manual, Volume 2, Chapter 23 for more detail on developing the Signing and Marking set of plans. Refer to the Design Standards indexes and the *Plans Preparation Manual*, Volume I, chapter 7 for design criteria.

DRAWING PAVEMENT MARKING



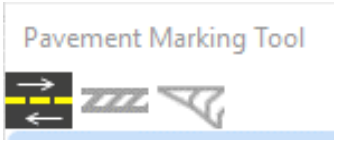
Many of the Traffic Plan items are simple 2d line styles drawn and have pay item information already placed for future Quantity Reports. To draw Pavement Markings with the tool, select the Pavement Marking icon on the Traffic Plans panel on the FDOT Ribbon.

> ***Note*** *As a best practice, start the pavement marking design by placing one of the solid edge lines and build from that. This will give the designer a solid starting point to create the entire remaining parallel pavement marking lines.*



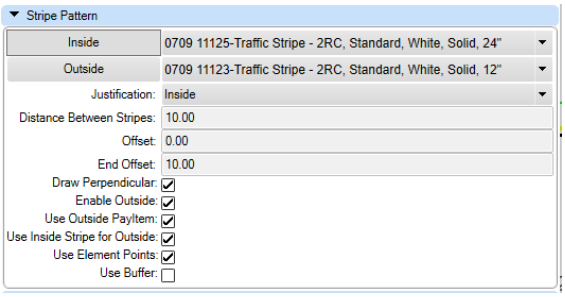
As discussed earlier there are three modes in the Pavement Marking tool to aid in the design and layout of Pavement Marking. *Striping, Separator, & Merge/Diverge Chevrons*.

STRIPING



The Pavement Marking tool places all solid or skip Pavement Marking. The striping tool can use an Alignment, or Line for length and offsets. The linear elements can be in the current source file or in a reference file.

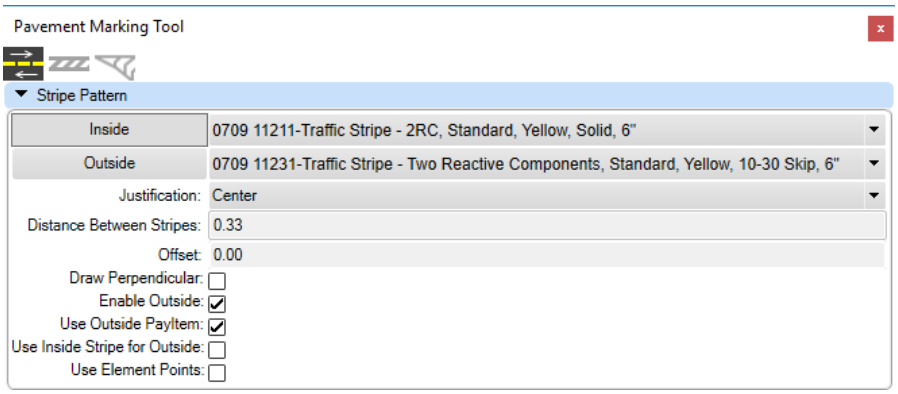
STRIPE PATTERN



There is an Inside pattern which by default is active draws a single stripe, if you toggle on Enable Outside a second stripe will be drawn along with the Inside pattern. The designer can enter in the distance between stripe patterns, the distance is measured from the center as a default, however the justification can be changed. There is a history list that the designer can quickly change

patterns, the history list contains the last 10 patterns the designer has selected, to access the history list click on the pulldown button in the pattern name.

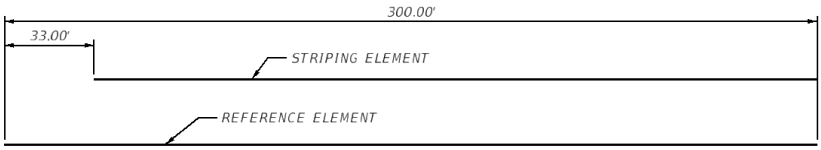
Enable Outside (Double Stripe) allows for four possible configurations set up with a combination of Solid/Solid, Skip/Skip, Solid/Skip and Skip/Solid markings. The figure shows the *Double Stripe* Pattern set up to draw a 6" solid yellow line on the Inside and a 6" 10/30 Skip line on the Outside with a 0.33' or 4" Distance Between Stripes.



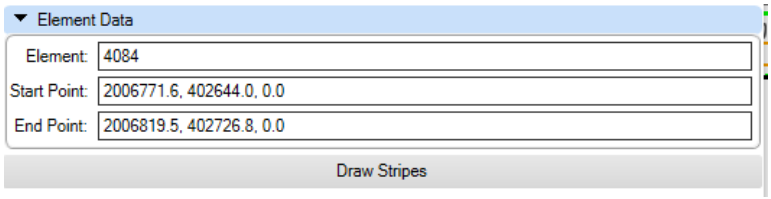
This is a typical set up for a two-lane roadway with a passing zone on one side, as depicted in the figure below.

- ***Justification*** – Justification is used to measure the distance from inside and outside patterns, Center splits the distance between patterns and adds on both sides, Left and Right designates either pattern as the entity to offset from.
- ***Distance Between Stripes*** – It is the space between two striping lines. This distance is expressed in terms of master units. There will be times when the designer will need to use a larger distance between lines than what the design standards call for. Example, if the signing and marking plans are at 100 scale a 4" separation between two 6" lines is not enough, the two lines appear like one thick line.
- ***Offset*** **–** The distance between the source or reference element and the beginning of the striping pattern(s)
- ***Draw Perpendicular*** **–** Allows the user to draw patterns perpendicular to a source line, an example of use is a Stop Bar or Cross Walk Striping.
- ***Enable Outside*** **–** Like discussed above, if toggled on you can add an additional pattern to place alongside the inside pattern
- ***Use Outside PayItem*** **–** This toggle identifies if the pay item data if different between the two patterns
- ***Use Inside Stripe for Outside*** **–** If toggled along with Enable Outside toggled it copies the inside pattern and uses the same for the outside pattern.
- ***Use Element Points-*** Must be toggled on to be able to select line work.
- ***Use Buffer*** **–** If toggled this allows user to select the begin and end point along the reference element selected to place patterns.

The figure below shows how the buffer function works. The reference line used which is 300' long along with the new line created 33' to the right of the beginning point. The reference line is, a reference, it does not have to control the length of the new striping pattern created.



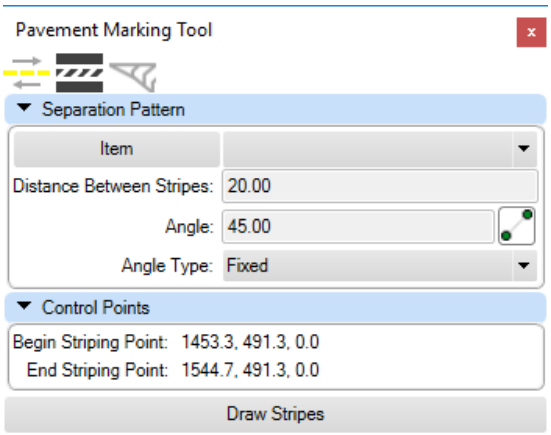
ELEMENT DATA



- ***Element –*** Lists the name of the reference pattern.
- ***Start Point*** – This lists the Coordinates or Station value of the Reference Pattern at the Starting Point.
- ***End Point*** – This lists the Coordinates or Station value of the Reference Pattern at the Ending Point.

SEPARATION MODE

Another Mode in the Pavement Marking tool is the Separation Mode. This mode allows you to draw stripes at an angle between elements such as a center turn lane where it approaches a left turn condition.



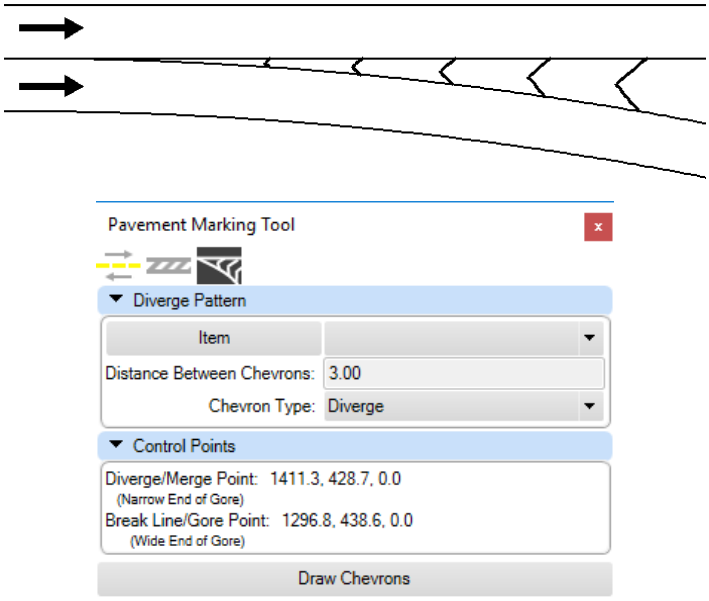
SEPARATION PATTERN

- **Item** – Select this button to open the Pay Item Database to select a striping pattern. The list to the right contains a pulldown that lists the history of previously placed patterns.
- **Distance Between Stripes** - Allows the user to input the distance between stripes.
- **Angle** – Allows the user to enter a known angle or to select the pick box to pick two points in the drawing to designate the angle used.
- **Angle Type** – Allows the user to select either a fixed or variable angle for the stripes.

CONTROL POINTS

- **Begin Striping Point** – List the coordinates of the beginning striping point.
- **End Striping Point** – List the coordinates of the end striping point.
- **Draw Stripes** – Places the stripes based on the criteria selected.

CHEVRON DIVERGE/MERGE



The Chevron Diverge/Merge Mode is used for traffic channelization at a gore when traffic flows in the same direction as seen in the figure below. Refer to Design Standards for specific design criteria.

DIVERGE PATTERN

- **Item** – Select this button to open the Pay Item Database to select a striping pattern. The list to the right contains a pulldown that lists the history of previously placed patterns.
- **Distance Between Chevrons** – Allows the user to input the distance between stripes.
- **Chevron Type** – Allows the user to select the Chevron type, which determines the direction of the pattern. The choices are Diverge and Merge.

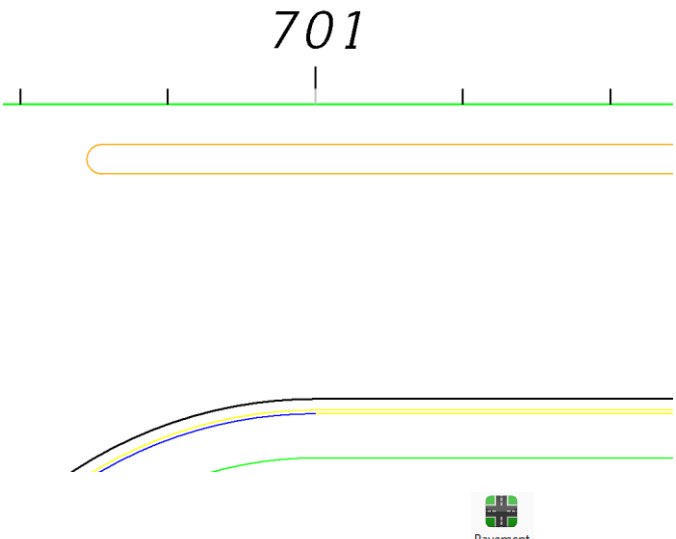
CONTROL POINTS

- **Diverge/Merge Point** – List the coordinates of the narrow end of gore.
- **Break Line/Gore Point** – List the coordinates of the wide end of gore.
- **Draw Chevrons** – Places the stripes based on the criteria selected.

Exercise 3.1 Draw Striping Patterns

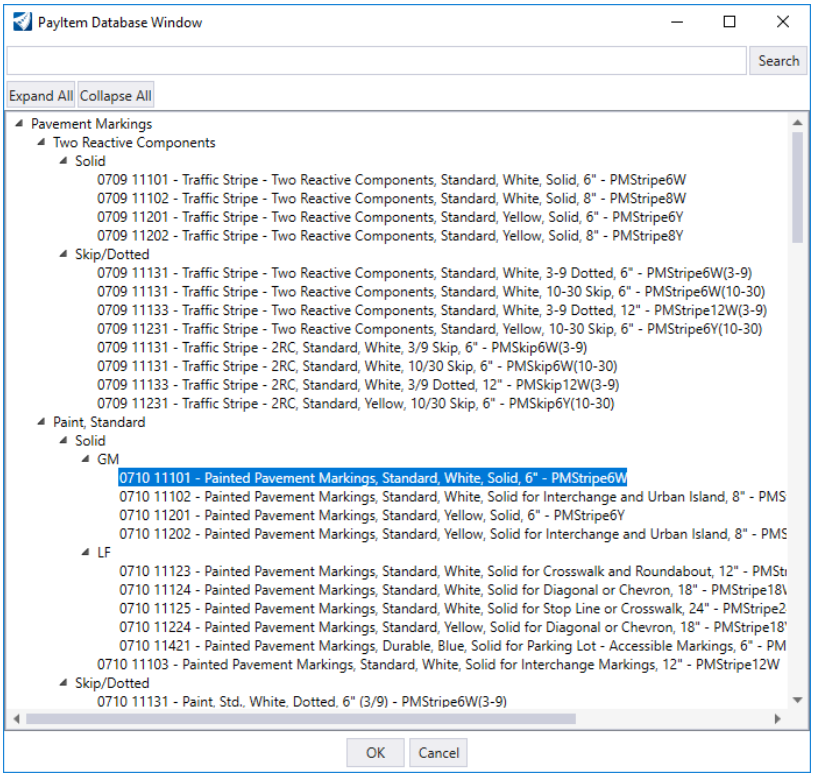
In this exercise, the user will place a 6” Solid White pattern representing the edge of pavement along the Curb & Gutter of the roadway, which is part of one side of a Bike Lane. The user will also add the other side to complete the Bike Lane designation.

1. Open or continue working in *DSGNSP01.dgn.*
2. Twist view and zoom to the area shown below.

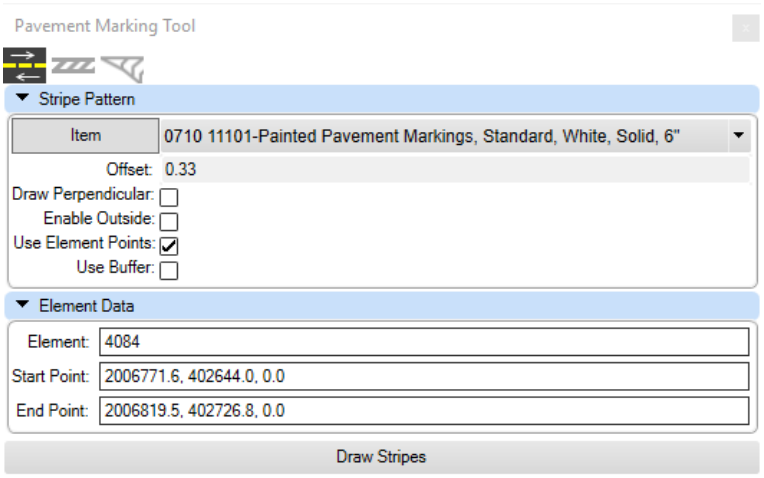


3. On the FDOT Ribbon select the Pavement Marking Tool

.
4. Select the Item button to open the Pay Item Database Window.

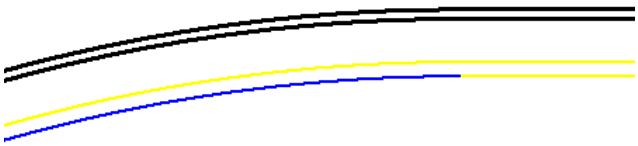


5. Select Pay Item 0710 11101 which is a 6” Solid White pattern.
6. Select **OK.**
7. For offset enter .33 which equals 4”.
8. Make sure **Use Element Points** is toggled. Make sure selections equals image below.

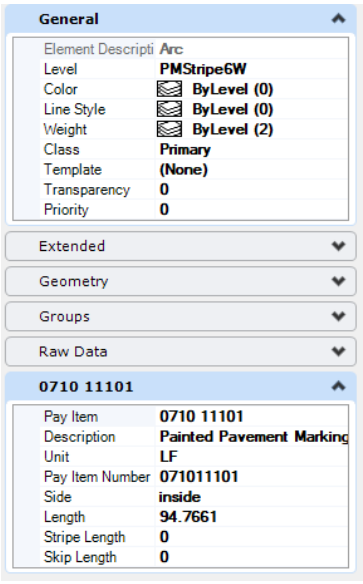


9. Select **Draw Stripes** and select the Edge of Pavement and left click to the outside.
10. Click **Draw Stripes** and select the EOP along the arc and left click to the outside.

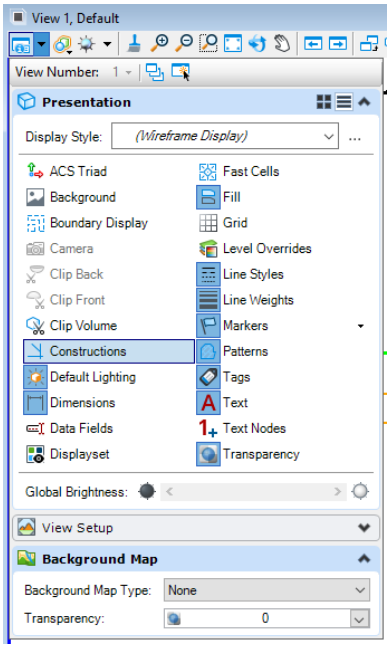
Your drawing should look like below.



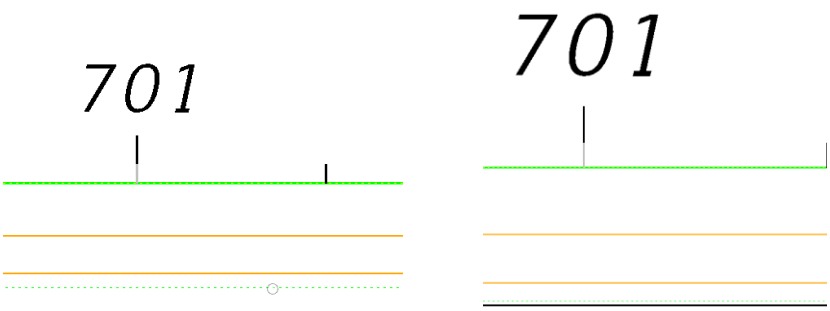
If you select the new pattern and look at the properties you will see the pay item information



11. Select the **View Attributes** button  and turn on constructions to see the construction linework in the drawing.



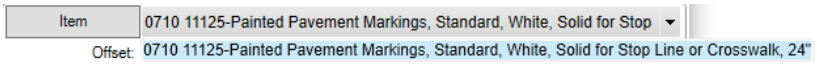
12. Using the same pattern and criteria as before select **Draw Stripes.**
13. Near the Traffic Median is a green line representing the EOP, select the line and left click below the line for placement.
14. The drawing should look like image below, save your file before continuing.



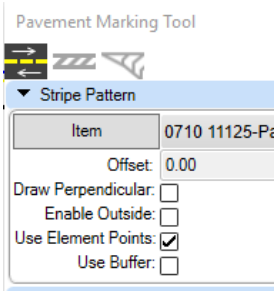
Exercise 3.2 Placing a 24" Stop Bar

In this exercise, the user will place a 24" stop bar at the intersection using a construction line as a reference. Make sure Construction Lines are turned on and zoom to the intersection around Station 701+00.

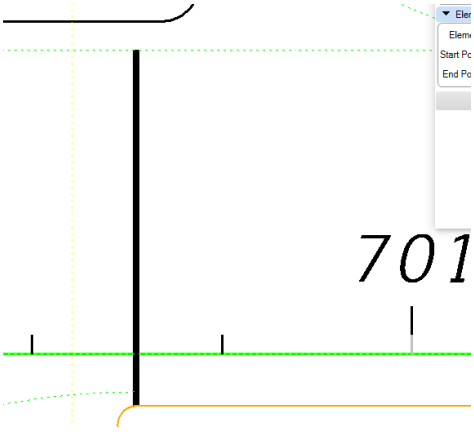
1. Continue working in the *DSGNSP01.dgn* drawing.
2. Open the Pavement Marking tool.
3. Select the Item button and browse to the following and select it.



4. For Offset enter 0. Match criteria as shown below.

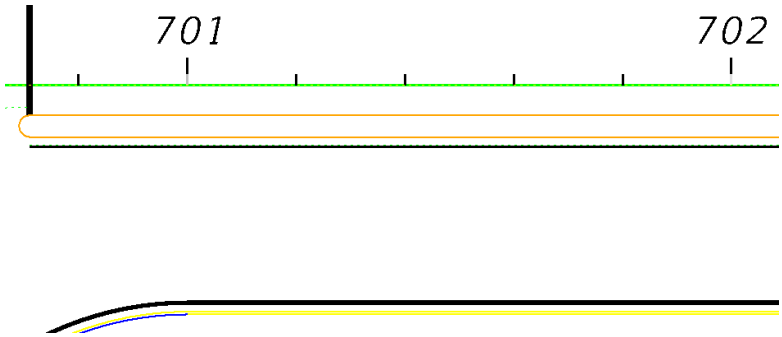


5. Select Draw Stripes and pick the Construction Line representing the Stop Bar and Left Click anywhere on the screen.
6. Drawing should look like image below.
7. Save your file before Continuing.

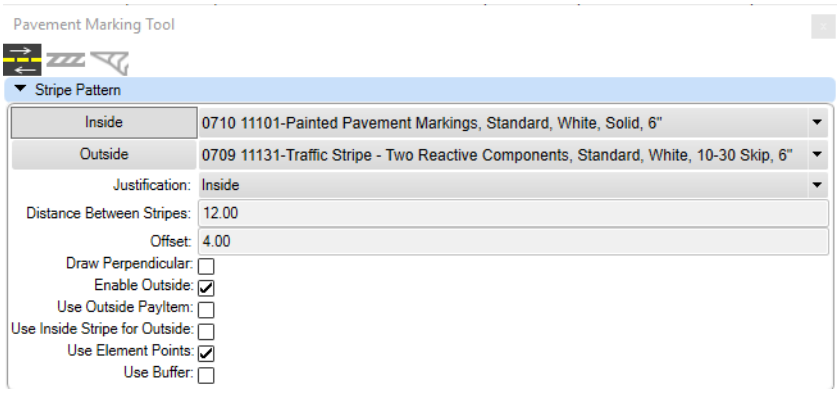


Exercise 3.3 Placing two different Patterns

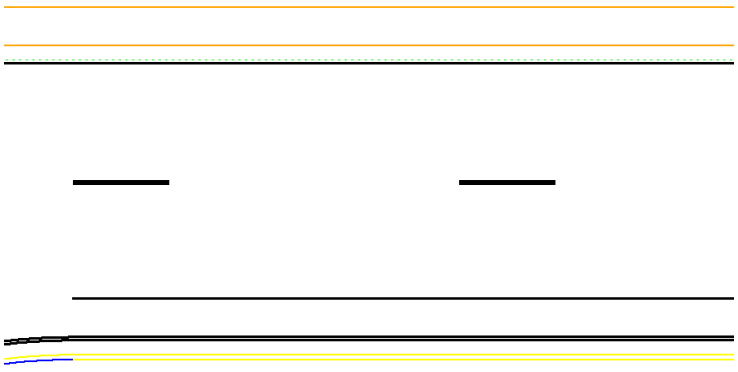
In this exercise, the user will place two patterns, one representing the Bike Lane and the other a 10/30 Skip pattern for a lane line. Zoom to the area shown below.



1. Continuing in the *DSGNSP01.dgn* file.
2. Open the Pavement Marking tool if not open.
3. Browse to the patterns for inside and outside as shown below.
4. Toggle on **Enable Outside**.
5. Match all criteria as shown.



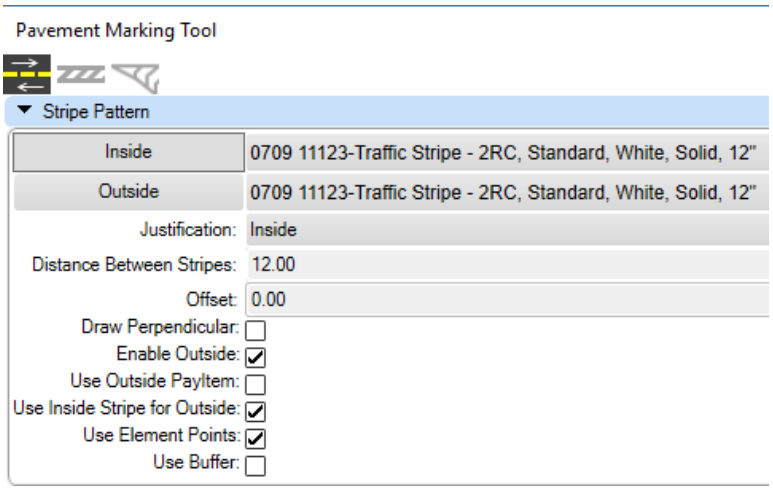
6. Select **Draw Stripes** and pick the EOP pattern that was placed in an earlier exercise.
7. Left Click in the Roadway side to place patterns.
8. Save your drawing before continuing. Your file should look like below.



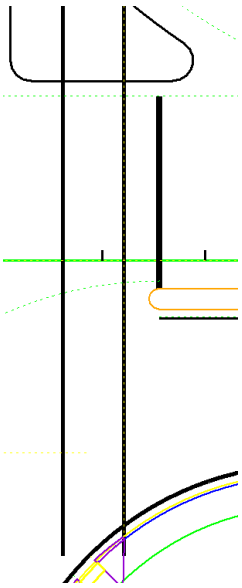
Exercise 3.4 Placing and Editing a Crosswalk

In this exercise, the user will place two crosswalk patterns at the intersection using construction lines as a reference. Zoom to the area near the intersection.

1. Continuing in the *DSGNSP01.dgn* file.
2. Open Pavement Marking tool if not already open.
3. Select the inside button and browse to the **0709 11123** Pay item, which is a 12” solid white pattern.
4. For Justification select **Inside**.
5. Distance between stripes should be **12**.
6. Toggle on **Enable Outside**.
7. Toggle on **Use Inside Stripe for Outside**, this copies the inside pattern and populates the Outside pattern with same.

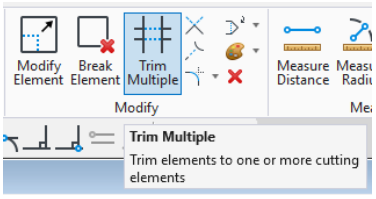


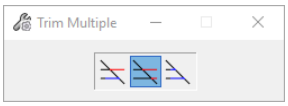
8. Select **Draw Stripes** and pick the yellow construction line representing the left side of the crosswalk.
9. Left Click anywhere on the screen. The drawing should look like below.



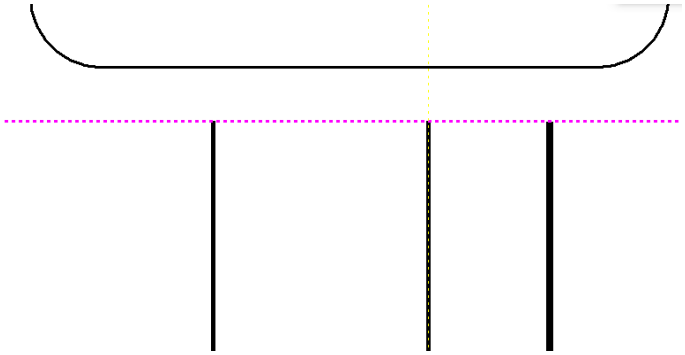
Now we have a little clean up to do Trimming and extending on both sides of the crosswalk pattern. First let's focus on the pedestrian median at the top of the intersection.

10. Switch to the **Drawing** Ribbon and select **Trim Multiple**

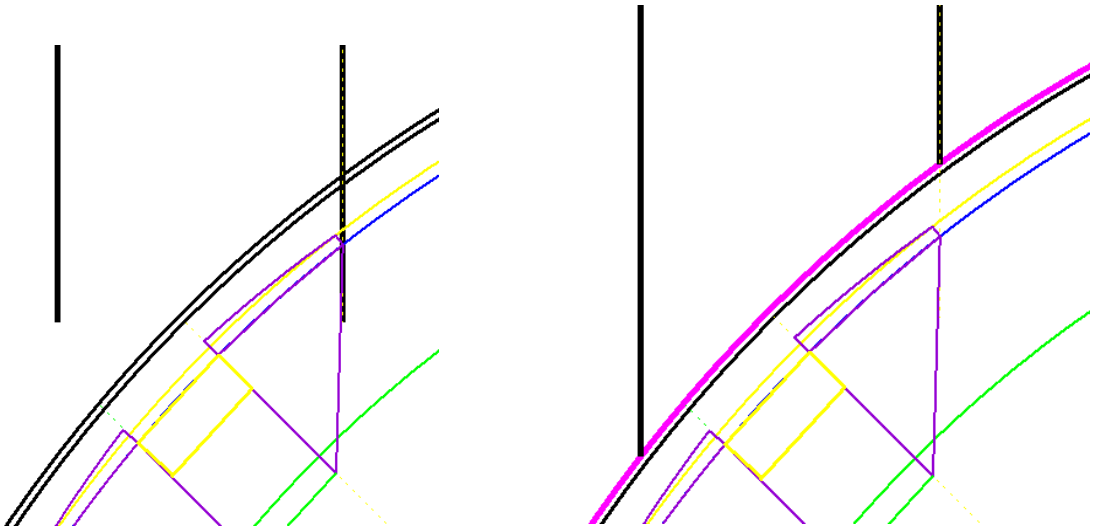




11. Select the construction line representing EOP and pick the two crosswalk lines.



12. Next pan to the HC Ramp on the other side. You will need to trim one side and extend the other side to the EOP that you placed earlier.



13. Using the Trim Multiple command trim and extend as per the above image.
14. Save and Exit out of ORD.