

2 CREATING A KEY SHEET

OBJECTIVE

The objective of this chapter is to teach the student how to create a Key Sheet that meets the FDOT CADD standards and criteria defined in the Plans Preparation Manual.

INTRODUCTION

Once the student has completed this chapter, they will be able to create a Key Sheet and all of its components that follow the FDOT standards. The creation of this sheet will adhere to the FDOT CADD standards and the Plans Preparation manual.

GENERAL INFORMATION

The key sheet is the first sheet of a component set of the construction plans. The information shown on the key sheet varies depending on whether or not the component is the lead for the project. Traffic Plans components in most cases are not the lead and therefore do not require all of the information that a lead key sheet requires. Refer to Chapter 3 Volume 2 of the *Plans Preparation Manual* for more information.

The following list contains the requirements for a Key Sheet.

- Place the standard border cell for a key sheet.
- Fill in the Financial Project ID, Federal Funds (if applicable), County Name/Roadway Section Number, & State Road Number.
- Fill in the Construction Contract Number, Fiscal Year, & Sheet Number.
- Place the project location map & North arrow (Lead Key Sheet Only).
- Place the Florida map cell and label project location (optional for sub-components).
- List Contract Plans Components (Lead Key Sheet Only).
- Place an Index of Sheets.
- Include “Early Works” Note under Index (if applicable).
- Place the Engineer of Record (EOR) information cell & fill out.
- List the Project Manager.
- Place the Governing Standards & Specification Notes (Lead Key Sheet Only).
 - Place Design Standards Revision Note (if applicable).
- List Developmental Design Standards Note (if applicable).
- Complete Revision Box (if applicable).
- Complete Key Sheet Revision Box (if applicable).
- Place Goes-with Note for Strung Projects. (Lead Key Sheet Only).

PROJECT LOCATION MAP

Florida county maps are available for download from the FDOT Surveying & Mapping web page. <http://www.dot.state.fl.us/surveyingandmapping/countymap.shtm>. The county maps are available in DGN or PDF file format. Download the DGN file into the appropriate project directory. The Key Sheet Clipping tool uses this file to attach, scale and clip the map to the key sheet.

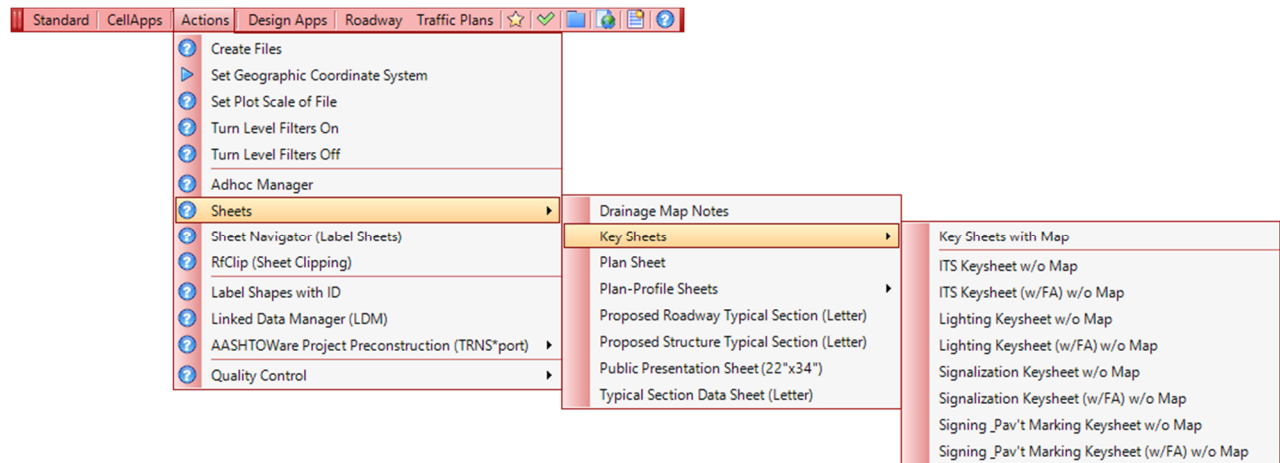
The tool places the Project Location Map in the center of the sheet and sized to ensure non-interference with other elements on the Key Sheet. Its purpose is to provide enough information to understand easily the project location. Township, Range, and County lines and numbers are shown to make the location clear.

The following list contains the requirements for the Location Map.

- Place the Section, Township and Range line labels.
- Label Begin & End Project Limits (Milepost - correct to three decimal places & Station - to 2 decimal places).
- Label Begin & End Bridge & Bridge Culvert Limits.
- Label Station Equations.
- Label Project Exception Limits.
- Label Rail Crossings within Construction Limits.

CREATE TRAFFIC DESIGN KEY SHEET

The FDOT Menu includes tools to aid in the creation of key sheets with location maps. The figure below shows the FDOT Menu options for creating a key sheet.



KEY SHEET WITHOUT MAP

There are multiple options to create a *Key Sheet with w/o Map*. These options are available for sub-component sets of plans that do not need a map. The Key Sheet design file is created first using the **Create File/Project** tool or some other acceptable method to create the design file using the correct seed file and design file name.

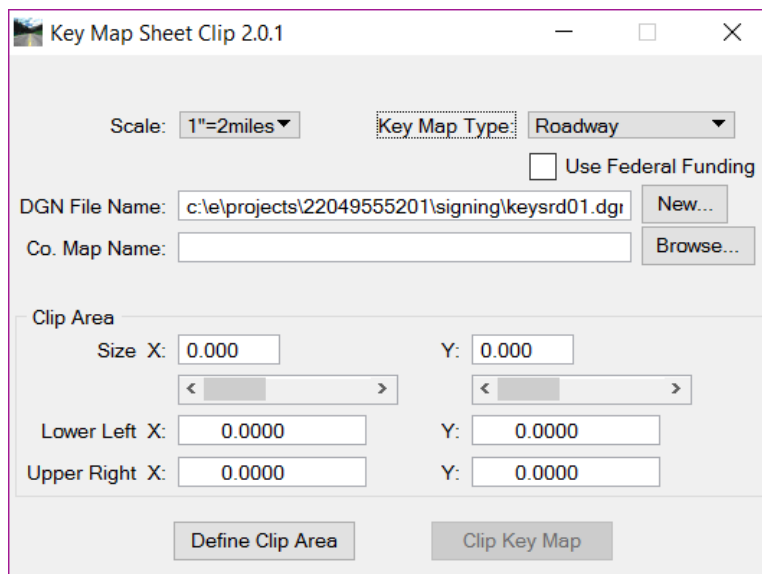
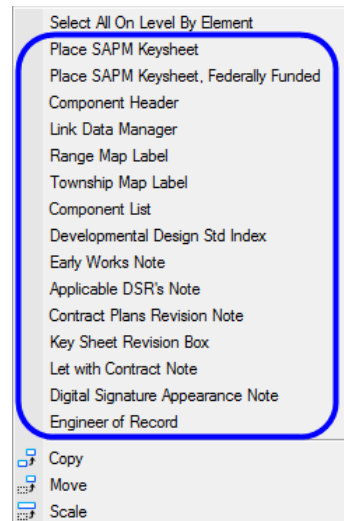
Right click menu options are available in standard Key Sheet file, KEYSXX. The exact options will change based on the discipline (XX) key sheet file. The options include placing the discipline specific key sheet cell for a sub-component discipline as well as all the options needed for a lead key sheet.

Once the Key Sheet cell is placed in the file, the sheet is filled out with the required information for a sub-component set of plans.

KEY SHEET WITH A MAP

If the project is the lead component, a Key Sheet with a map will need to be created. This option from FDOT Menu opens the **Key Map Sheet Clip** tool. This tool does not require a Key Sheet design file already created; this tool creates it.

Note *This tool by default is set to create the Roadway Key Sheet even if the tool is started in the Signing folder. It is important to set the Key Map Type first.*



- **Scale** - 1"=2miles (10,560), 1"=4miles (21120) or 1"=8miles (42240)
- **Key Map Type** – The list of disciplines for creating key sheets. As the component is selected, the DGN File Name will dynamically change accordingly.
- **Use Federal Funds** – If selected this places the (*FEDERAL FUNDS*) text on the Key Sheet.
- **DGN File Name** – Displays the working directory path and the design file name of the Key Sheet being created. The **New** button creates a new file for the sheet cell to be placed in. The file name will default to the next available file number in the standard naming convention for the key map type chosen.
- **Co. Map Name** – This is the county map file downloaded from FDOT's Surveying and Mapping web site. Browse to the file in either in the Roadway discipline folder or the data folder in the project directory.
- **Clip Area** – This portion of the dialog is for setting the clip limits of the map. Either key-in the coordinates, or dynamically select them with the Define Clip Area button.
- **Define Clip Area** - This opens the selected county map so the area to be clipped can be graphically selected. A square will be attached to the cursor. The size of the square is defined by the Scale or Size. Place the square around the area to be clipped and enter a Data Point. The *Clip Key Map* button will become active.
- **Clip Key Map** – This will clip the map, place the sheet cell, open the file, set the plot scale according to the scale selected, and then launch **Sheet Navigator**.

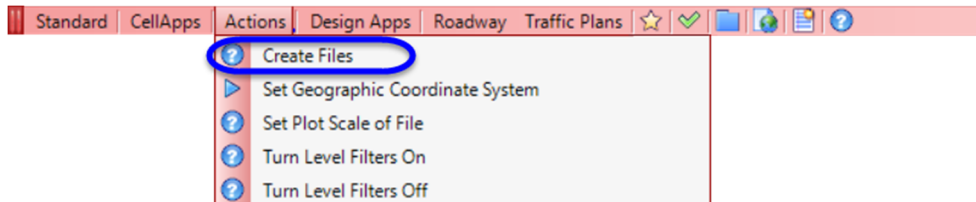
Note *Key Sheet without a Location Map*

Exercise 2.1 Create Key Sheet for Sub-component

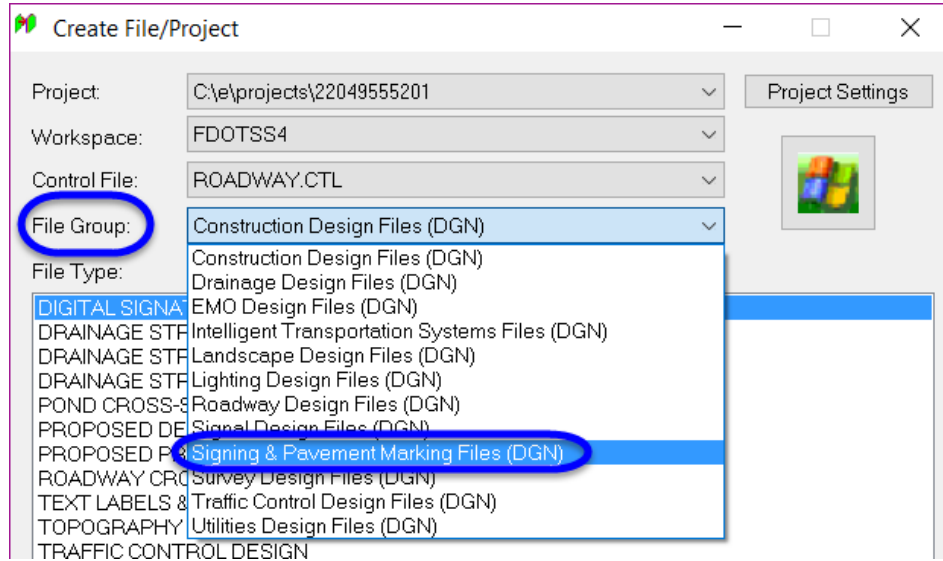
In this exercise, the recommended workflow will be used to create a Key Sheet for a sub-component set of plans.

➤ Create the Key Sheet DGN file

1. Open the file DSGNSP01.dgn located in the Signing folder.
2. From the FDOT Menu select Create Files from the Actions menu.

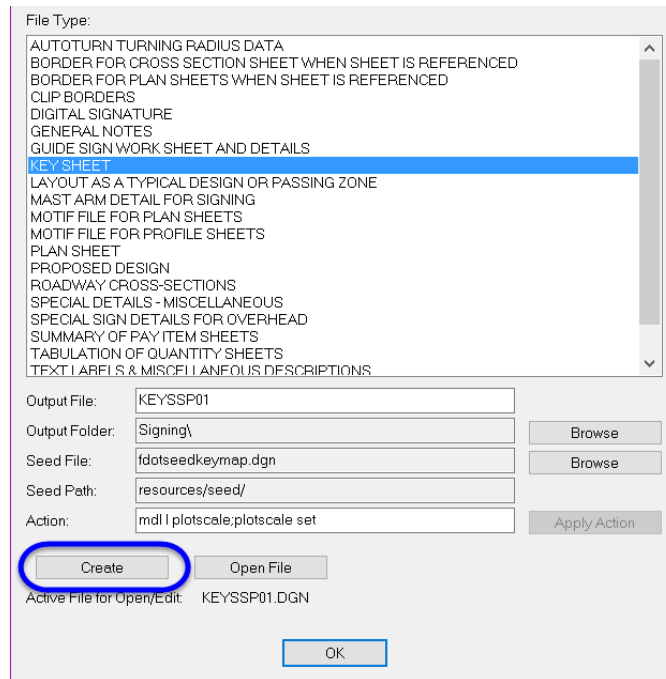


3. On the Create Files/Project dialog set the File Group to Signing & Pavement Marking Files (DGN).

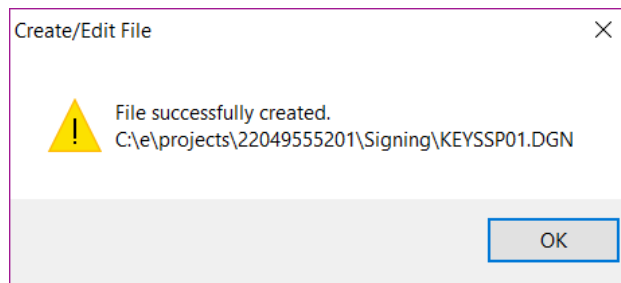


Note The Project, Workspace, and Control File options should be set correctly based on the last settings used. If not, these will need to be set before setting the File Group option. See Exercise 1.1 for further details.

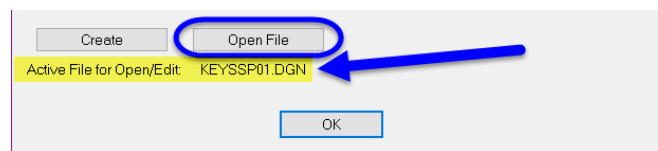
- Under File Type select Key Sheet and click the Create button at the bottom of the dialog.



- Click OK on the Create/Edit File pop up dialog box. The file has been successfully created.

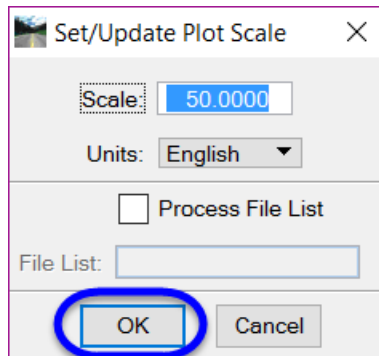


- Click on the Open File button next to Create. This will open the file and activate the Set Plotscale tool.



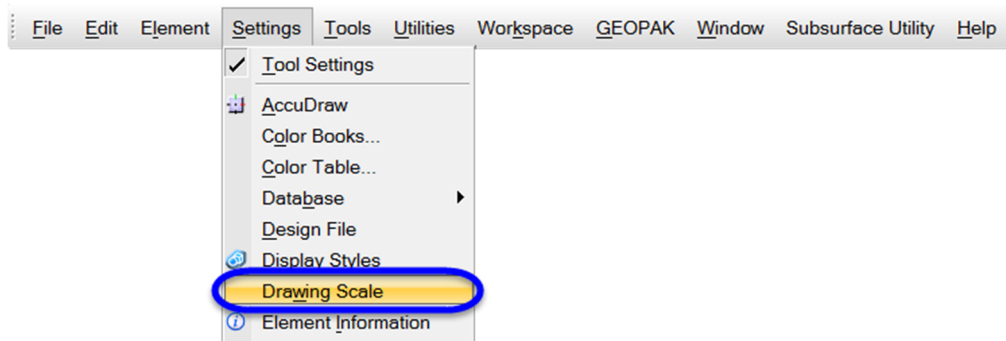
Note Pay attention to the file name defined next to the Active File for Open/Edit. Make sure this is the correct file to open before click on Open File.

7. In the KEYSSP01.dgn file, click Ok on the Set Plotscale dialog box.

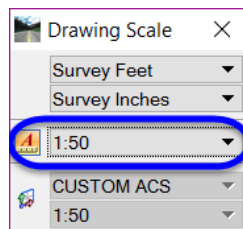


Note Since there is not a map on this Key Sheet, selecting the default plotscale of 50 will be fine.

8. Click OK to close the Create File/Project dialog box.
9. From the MicroStation menu select Settings > Drawing Scale.

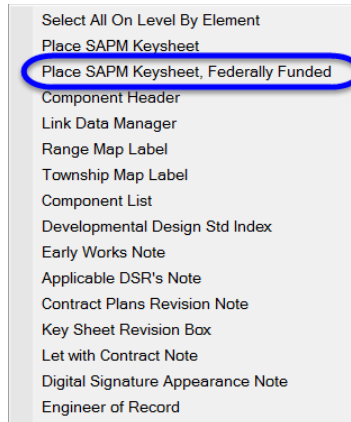


10. Turn On Annotation Scale and set to 1:50 to match the plotscale.



➤ **Place Key Sheet & Fill in Required Information**

1. Right-click and hold to get the context menu to pop-up. Select the option to Place SAPM Keysheet, Federally Funded.

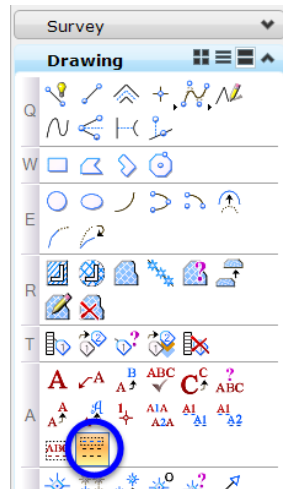


2. The Place Cell dialog will come up and the cell will be attached to the cursor for placement. Set the scale of the cell to 50 to match the plotscale and annotation scale set in the file.



3. Click anywhere on the screen to place the cell.

4. Select the Text tool, Auto Fill in Enter Data Fields from the Drawing task menu under the FDOT Plans Development Task menu.

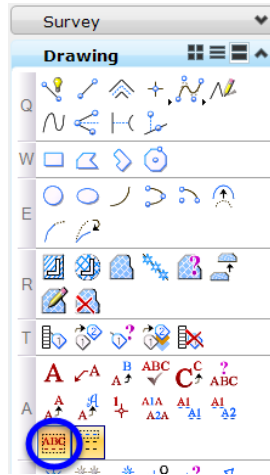


5. Click anywhere in the screen to start the tool.

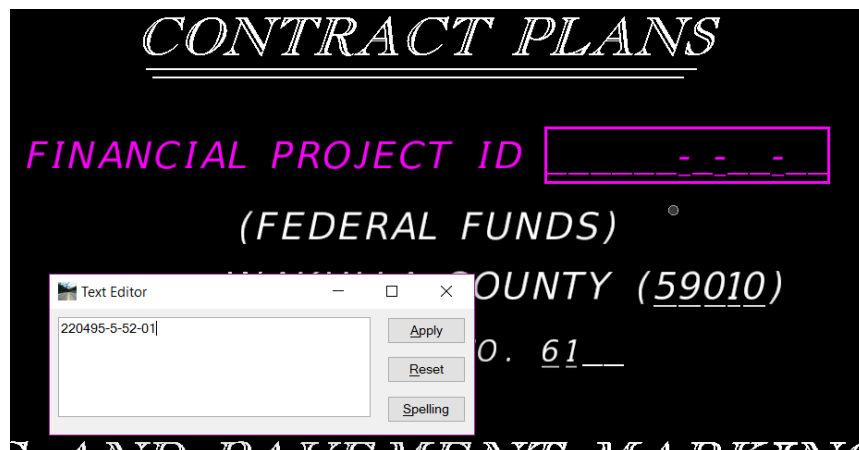


6. Type in the value for the County name, WAKULLA, and hit enter on the keyboard.
7. The tool selects the next empty data field in the file. Type in the values followed by enter to place all the information into the Key Sheet. Use the following values.
 - a. Roadway Section Number: 59010
 - b. State Road No.: 61
 - c. Sheet No.: S-1
 - d. Fiscal Year: 17
 - e. Contract No.: Note: Click on the screen to skip this data field.
 - f. Project Manager: Denise Broom (or use your own name)

8. Select the Text tool, Enter Data Fields from the Drawing task menu under the FDOT Plans Development Task menu.



9. Click on the enter data field for the Financial Project ID. The field will highlight and existing text is populated to the Edit Text dialog box.
10. Enter the value 220495-5-52-01 overwriting the dashes.

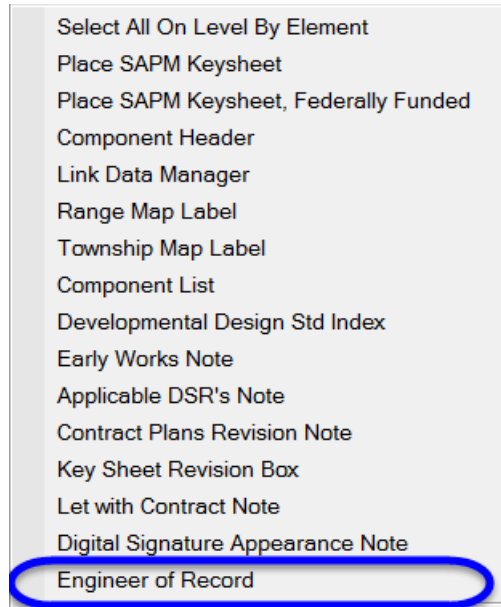


11. Click in the screen to update the data field value.

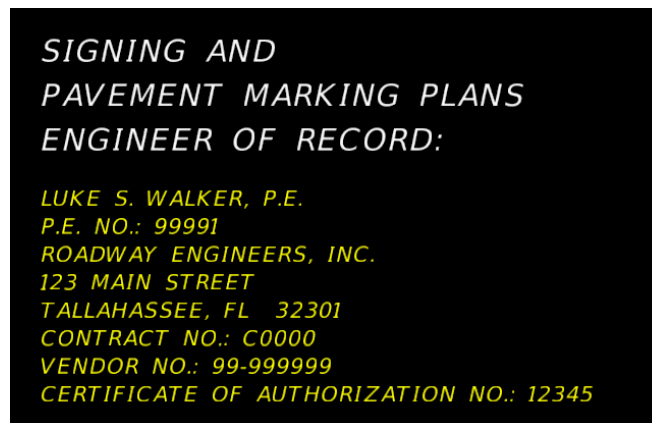
➤ **Place & Edit the Engineer of Record Information**

The Engineer of Record information is placed as cell that can be edited with the engineer's information.

1. Right click on the screen to open the context menu and select Engineer of Record.



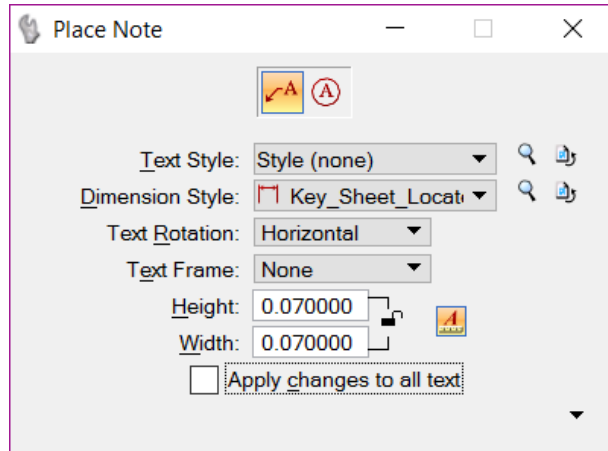
2. The cell is attached at the end of the cursor ready for placement. Click in the lower left corner of the Key Sheet cell to place the cell.
3. Using the Enter Data Field tool, modify the cell as shown below.



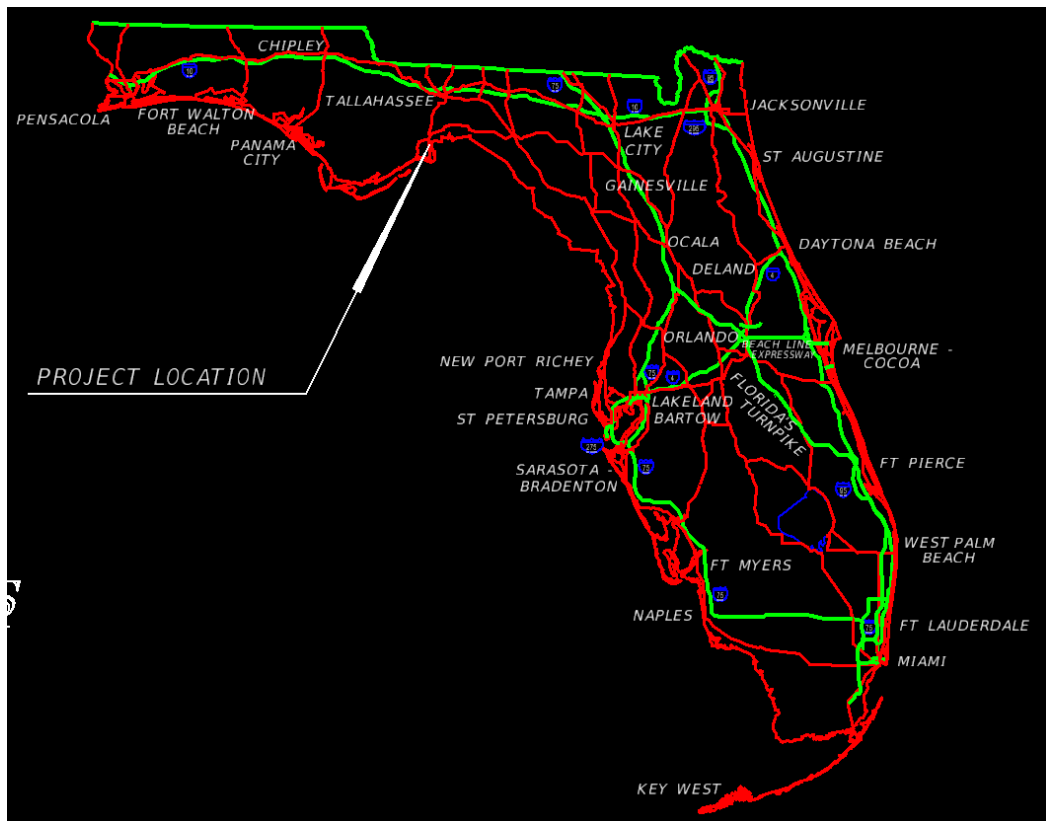
➤ **Label the Project Location on the Florida Map**

The Florida Map is optional for sub-component key sheets, however they are included on all key sheets cells.

1. The *Project Location* label that goes on a Key Sheet points to the project location on the Florida map. From the FDOT Plans Development Task Menu, select **Drawing > Place Note**.
2. Set the *Place Note Parameters* as shown below:



3. Type *PROJECT LOCATION* into the *Text Editor*, select the general project location on the Florida map, position the label, and data point again to place it. The label should display as shown below.



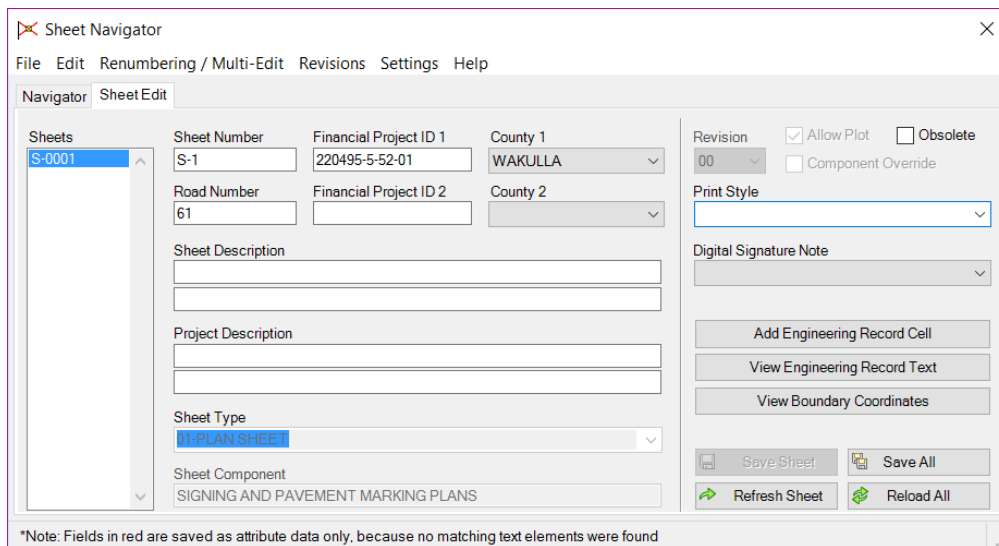
➤ **Creating and Placing the Key Sheet Index (Part 1)**

There are two options through LDM to link/create the index. The first option is to use the Create Link from template to create the text file KSIndexSPM.txt. This file can be linked to the Key Sheet and manually updated as needed to keep the index current. This method requires manual updates to the text file linked to the key sheet. This is not the recommended workflow.

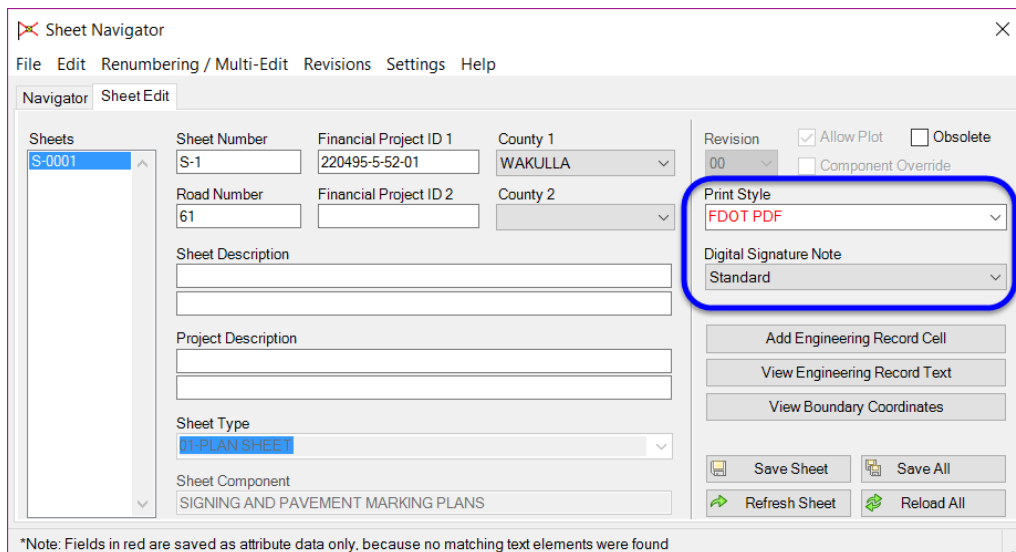
The second, recommended, option is to use Sheet Navigator to generate the index and then link this file to the key sheet using LDM. As sheets are added to the plans, update the index and then regenerate the component index. This process will help automate the sheet index list to keep it up to date.

This part of the exercise will go through the recommended workflow using Sheet Navigator and LDM.

1. On the FDOT Menu, select **Actions > Sheet Navigator (Label Sheets)** to launch the Sheet Navigator dialog.

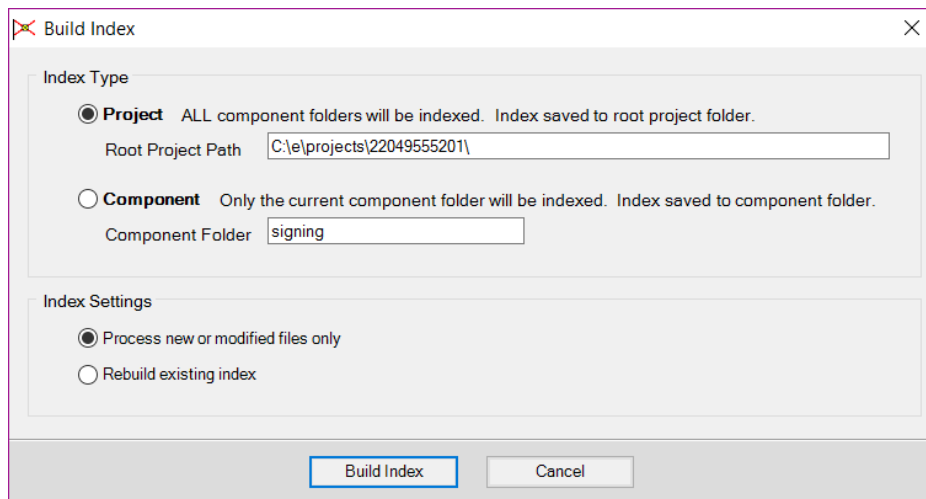
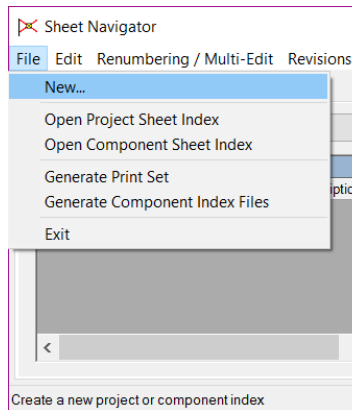


2. Set the Print Style to FDOT PDF and select Standard from the Digital Signature Note drop down list as shown below. Click Save Sheet.

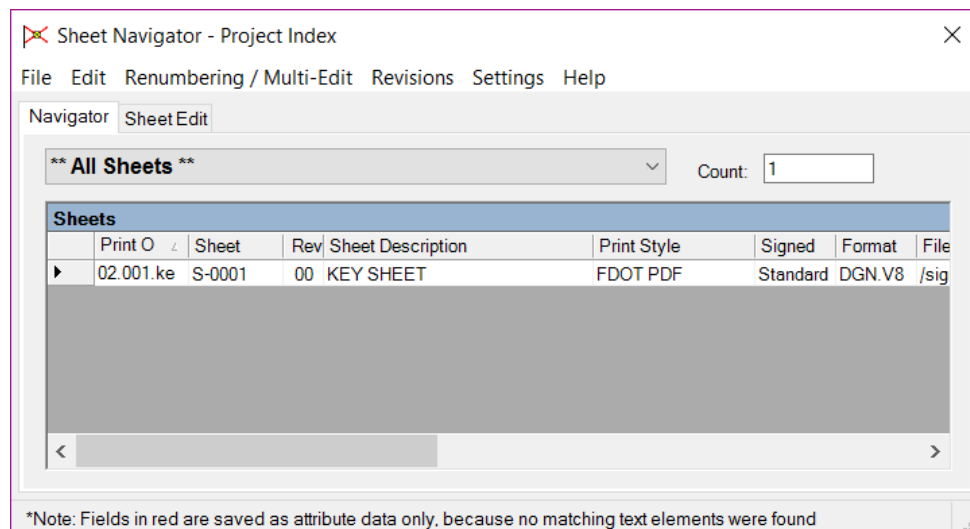


3. In Sheet Navigator, select the **Navigator** tab.

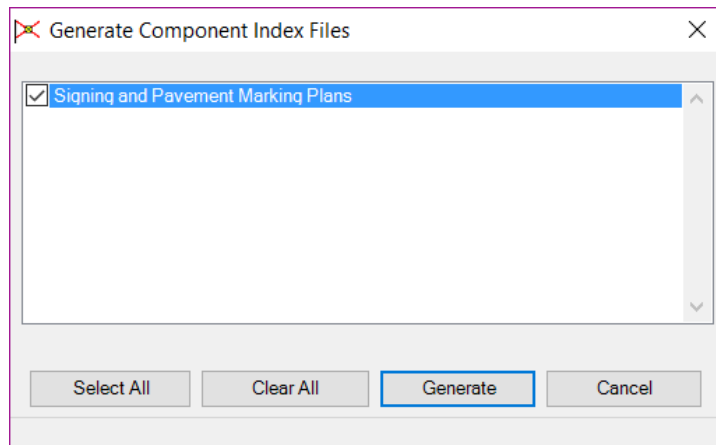
4. Select **File > New**. This opens the Build Index dialog.



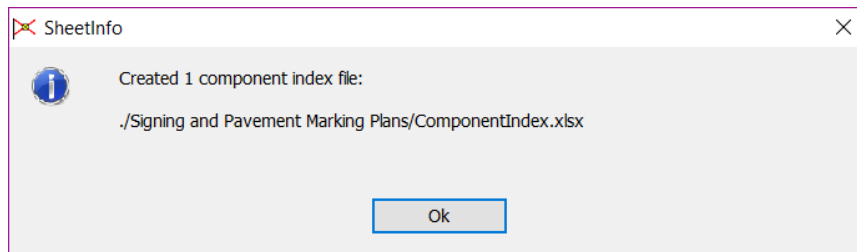
5. Select the **Project** option.
6. Click the **Build Index** button. This creates *sheetinfo.xml* in the *Project* folder.
7. MicroStation will close and the **CADmanage (CM.Batch)** process will run. When complete, MicroStation will re-open and Sheet Navigator will display the *Index* on the *Navigator* Tab.



- From Sheet Navigator select **File > Generate Component Index Files**. This opens the Generate Component Index Files dialog.



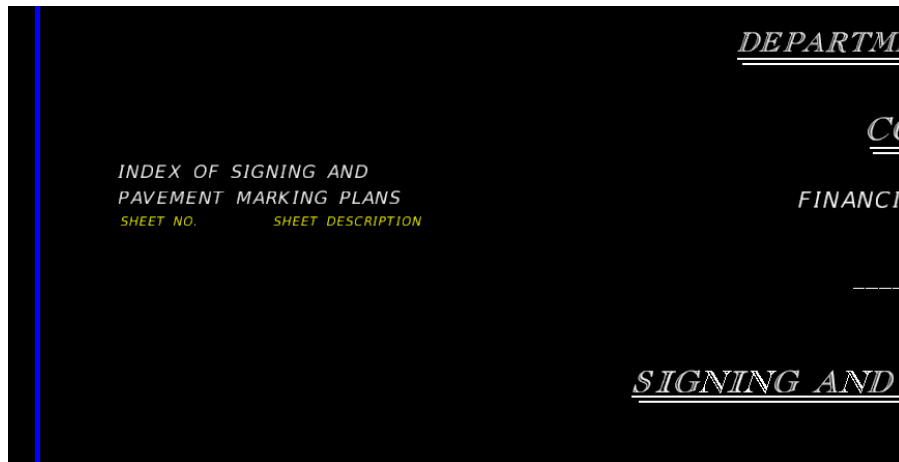
- Toggle **On** the check box for *Signing and Pavement Marking Plans*.
- Click the **Generate** button. Sheet Navigator will create 1 component index file saved to the discipline folder of the project directory.



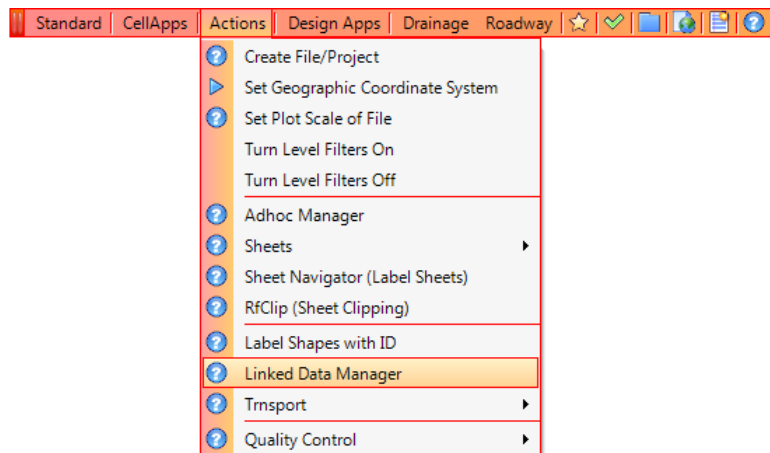
- Click the **Ok** button.
- Close Sheet Navigator.

➤ **Creating and Placing the Key Sheet Index (Part 2)**

1. Zoom in around the text “INDEX OF SIGNING AND PAVEMENT MARKING PLANS”. This is on the left hand side of the sheet.

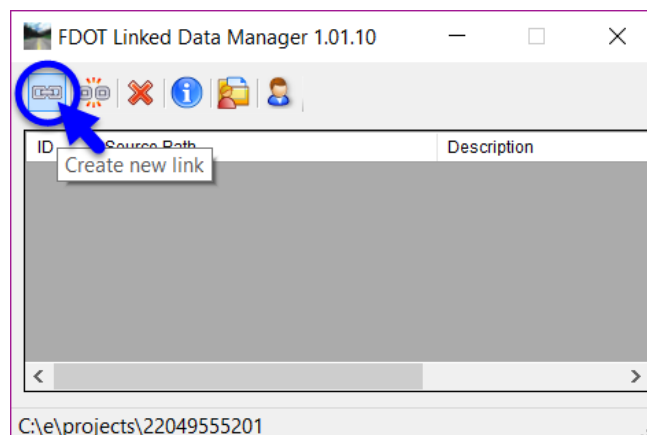


2. Navigate to the FDOTSS4 Menu **Actions > Linked Data Manager**.

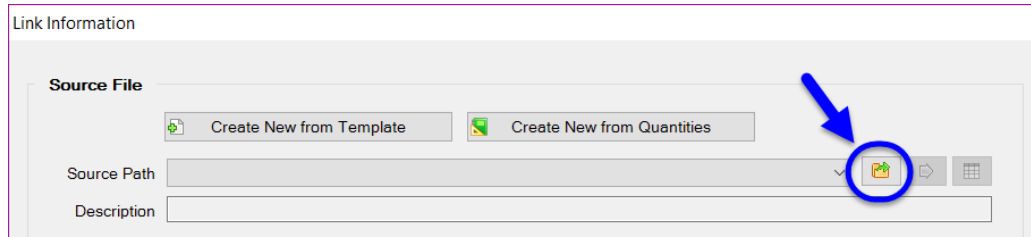


Note LDM can also be accessed from the Right Click Context menu.

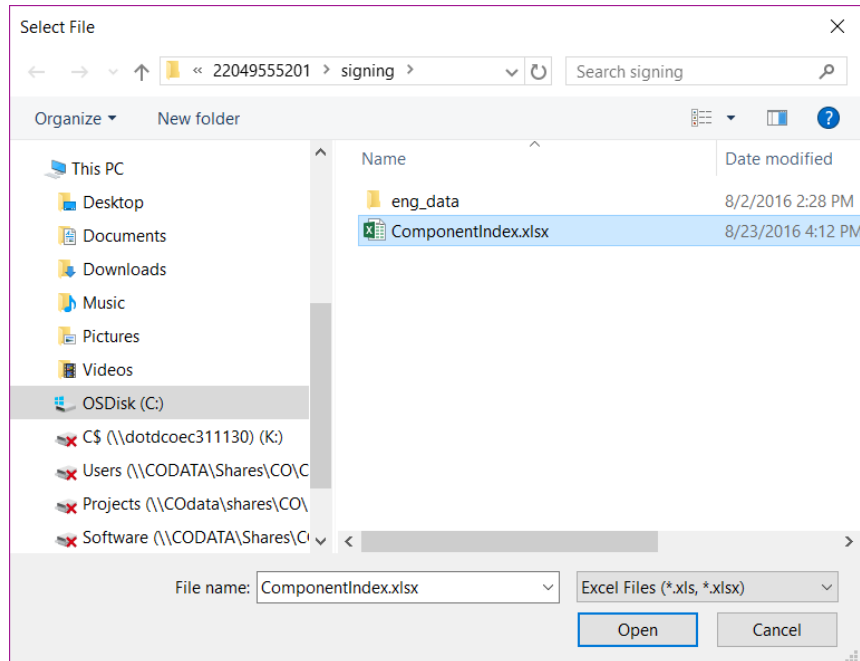
3. Click the **Create New Link** button.



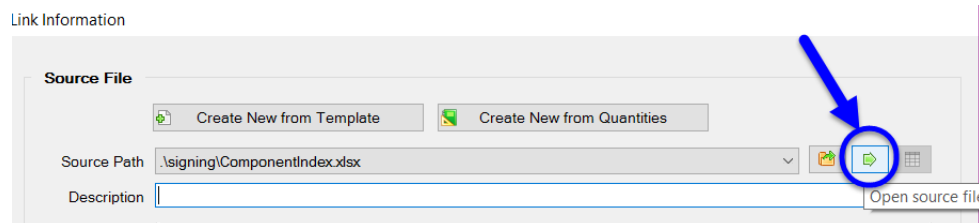
4. On the Link Information dialog box, click the **Select Existing File** button.



5. Select the *ComponentIndex.xlsx* and click the **Open** button.



6. Click on the Open Source button to open the Excel file.

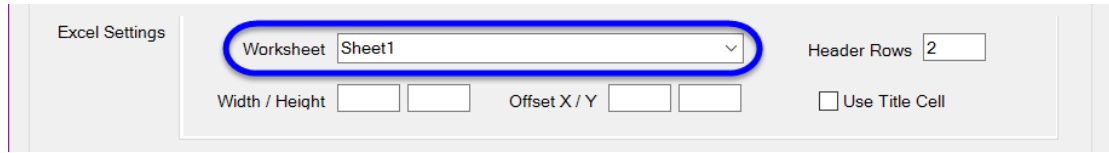


7. In the Excel file, add a second sheet to the list of sheets.

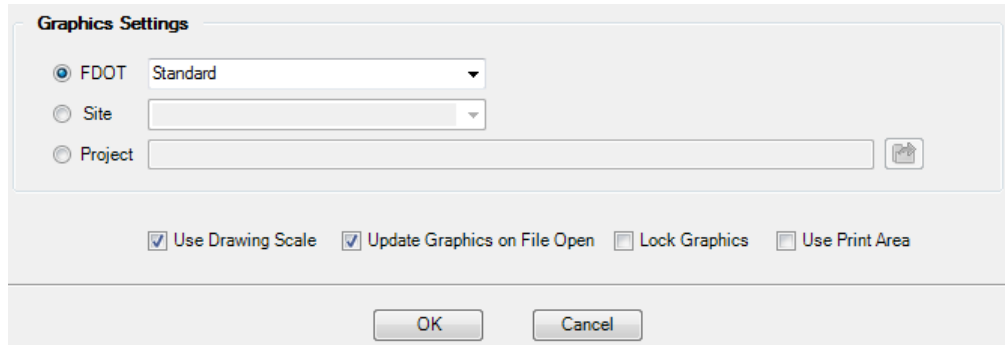
	A	B
1		
2	S-1	KEY SHEET
3	S-2	TABULATION OF QUANTITIES SHEET
4		
5		

Note At this point in the project only the key sheet has been created. LDM has a bug when trying to place this link with only one sheet. Adding a sheet will correct this.

8. Save and close the Excel file.
9. For the *Excel Settings*, set the *Worksheet* to **Sheet 1** as shown below.



10. Set the *Graphic Settings* as shown below.



11. Click the **OK** button.
12. Snap to the origin of the text label **SHEET**. This will line up the text properly.

INDEX OF
SHEET NO.

13. Data Point to place the text. Close Linked Data Manager.

➤ **Additional Key Sheet Information**

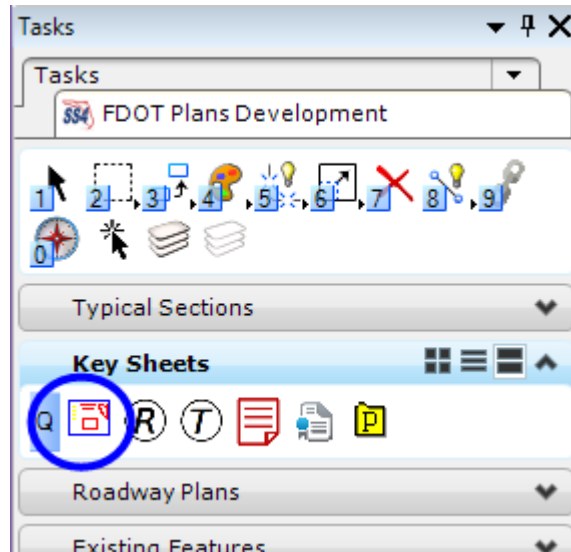
As the need arises, other items may be required on the Key Sheet. These include the Contract Plans Revision Note, the Key Sheet Revision Box, Developmental Design Standards list, Applicable DSR's Note, and Early Works Note. These item can be placed as cells on the Key Sheet in the same way the Engineer of Record cell from the right click context menu and modified as needed using the Edit Text or Enter Data Field tools.

Exercise 2.2 Key Sheet with a Location Map (Optional)

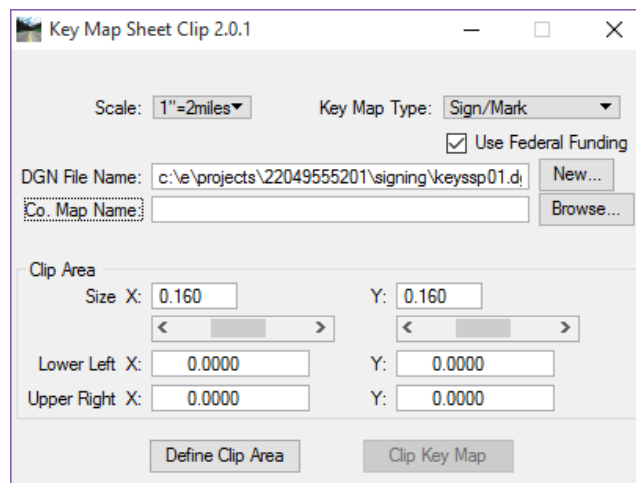
This optional exercise is provided to show how to use the FDOT Key Map Sheet Clip tool.

➤ Create the Key Sheet (Part 1)

1. Open *Dsgnsp01.dgn* in the *signing* folder.
2. Select **Create Key Sheets** from FDOT Plans Development Task Menu, Key Sheets. This opens the Key Map Sheet Clip dialog.

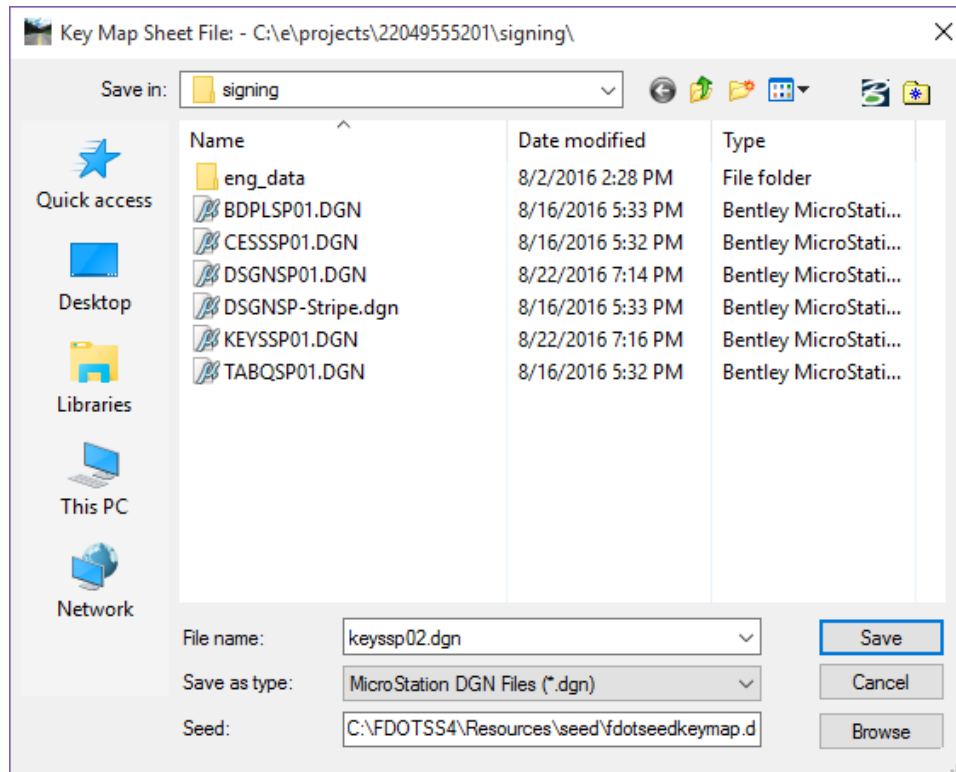


3. Set the top portion of the dialog as follows:
 - a. *Scale* – 1”=2miles
 - b. *Key Map Type* – Sign/Mark
 - c. Check to Use Federal Funding



Note The DGN File Name should be set to create the keyssp01.dgn file in the current working directory. If it is not, continue with steps 4 & 5. Otherwise go to step 6.

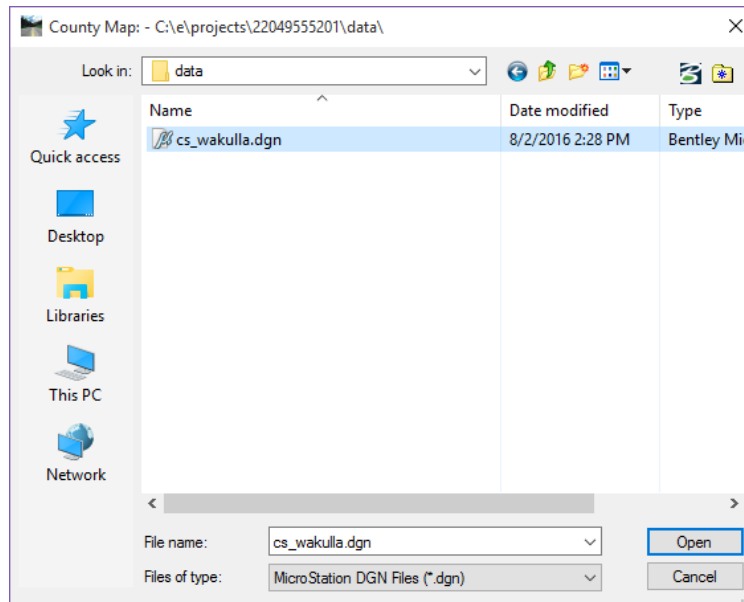
4. Modify the file name to keyssp02.dgn. (This is avoid issues with the key sheet created in Exercise 1.)
5. Click the **New** button next to the DGN File Name. This will open the Key Map Sheet File dialog. This dialog allows the designer to enter a different file name and select a different folder.



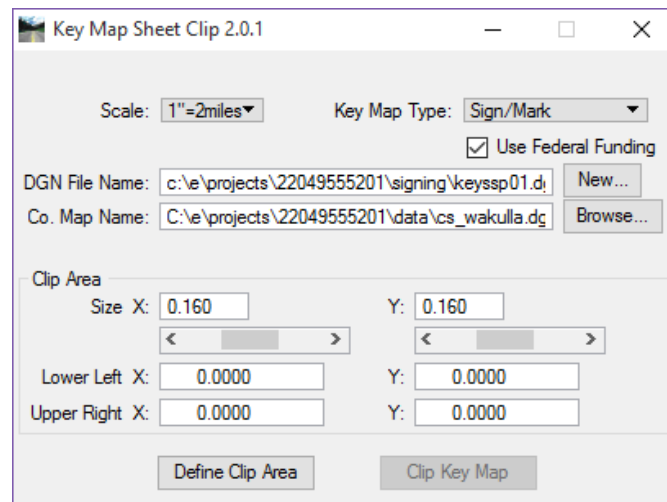
6. Click the **Save** button. This will create the Key Sheet File; however, it is an empty file.
7. Click the **Browse** button next to *Co. Map Name*. This is where the designer can select the full county map MicroStation file downloaded from the Survey and Mapping web site.
8. Navigate to the **data** folder in the project.

Note This folder location for the county map may vary at each individual's office. It may also be saved to the discipline directory of the lead component.

9. Select the *cs_wakulla.dgn* file and click **Open**. This will populate the *Co Map Name* field in the **Key Map Sheet Clip** dialog.



10. **Key Map Sheet Clip** dialog should display as shown below. Notice all of the fields are populated.



11. Click the **Define Clip Area** button. This opens the county map design file to allow the *Defined Clip Area* to be positioned around the area to be clipped.
12. Use any of the MicroStation **zoom** or **pan** tools to move to an area where the clip border will have maximum coverage. This area is not important for this exercise; it is a general location.
13. Place a **Data Point** to select the *clip area*. To redefine the clip area, click the **Define Clip Area** button to select a different clip area.
14. Click the **Clip Key Map** button. This will process for a moment and open the key sheet. **Sheet Navigator** will also open requiring user input.

➤ **Sheet Navigator (Part 2)**

1. Continuing in *keyssp01.dgn*, the *plot scale* should be set automatically to **10560**. This is equal to a 1"=2 mile scale.

Note *It is very important to set the plot scale before completing Sheet Navigator; the Digital Signature Note is dependent on the scale.*

2. From the FDOT Menu, select **Actions > Sheet Navigator** to launch Sheet Navigator. (Sheet Navigator should open automatically.)
3. From Sheet Navigator > Sheet Edit tab, fill in the *Sheet Number* with **S-1**.
4. For the *Financial Project ID 1*, click inside the blank field. This will populate the field with the correct **Financial Project ID**.
5. For the *County* select the drop down arrow and navigate to **Wakulla** County.
6. For the *Road Number* type in **61**. Do not include **SR** in the field; it is part of the sheet file.
7. For the *Digital Signature Note* select the drop down then select **Standard**.
8. Click the **Save Sheet** button. This will tag the file with all of the pertinent information and populates the fields in the key sheet.

The screenshot shows the 'Sheet Navigator' application window with the 'Sheet Edit' tab active. The interface includes a menu bar (File, Edit, Renumbering / Multi-Edit, Revisions, Settings, Help) and a 'Navigator' sidebar on the left. The main area contains several input fields and dropdown menus: 'Sheet Number' (S-1), 'Financial Project ID 1' (220495-5-52-01), 'County 1' (WAKULLA), 'Road Number' (61), 'Financial Project ID 2' (empty), 'County 2' (empty), 'Sheet Description' (empty), 'Project Description' (empty), 'Sheet Type' (01-PLAN SHEET), and 'Sheet Component' (SIGNING AND PAVEMENT MARKING PLANS). On the right side, there are checkboxes for 'Allow Plot' (checked) and 'Obsolete', a 'Revision' dropdown (00), a 'Print Style' dropdown (FDOT PDF), and a 'Digital Signature Note' dropdown (Standard). Below these are buttons for 'Add Engineering Record Cell', 'View Engineering Record Text', and 'View Boundary Coordinates'. At the bottom right are buttons for 'Save Sheet', 'Save All', 'Refresh Sheet', and 'Reload All'. A status bar at the bottom reads: '*Note: Fields in red are saved as attribute data only, because no matching text elements were found'.

9. Take a moment to review the key sheet.

Note *For more in depth details for creating a lead key sheet with a location map, see the FDOT Plan Development Workflows manual, Chapter 2.*