

PLANS PRODUCTION FOR PAVEMENT PRESERVATION PROJECTS IN AUTODESK

Contents

CONTENTS	1
OVERVIEW	3
Process Provenance	3
STATEMENT OF NEED	3
ACRONYMS/DEFINITIONS USED IN THIS DOCUMENT	3
REFERENCES	3
PROCESS DESCRIPTION AND EXAMPLES	5
Section I. Title Sheet	5
Procedure – File Setup	5
Procedure – Title Block	7
Procedure – Project Location	9
Procedure – Project Design Data Blocks	10
Procedure – Engineer’s Stamp Block.....	11
Procedure – County Map	12
Procedure – RP Limits and Project Location Label	16
Example of Completed Title Sheet.....	17
Section II. Notes Sheets.....	18
Procedure – File Setup	18
Section III. Typical Sections	20
Procedure – File Setup	20
Procedure – Border Setup	23
Procedure – Create Typical Sections.....	35
Section IV. Summary Frames.....	42



MONTANA
Department of Transportation

- Procedure – Civil 3D File Setup 42
- Procedure – Excel Quantity Manager File Setup 46
- Procedure – Insert OLE Objects 47
- Section V. Sheet Set Manager (SSM) 51
 - Procedure – Create a Sheet Set 51
 - Procedure – Create a Subset..... 56
 - Procedure – Add Sheets to the SSM 57
 - Procedure – Edit Project Information in the SSM 60
 - Procedure – Edit Other Sheet Information 63
- Section VI. Plot Sheet Sets 65
 - Procedure – Plot a Sheet Set..... 65

Overview

This document contains the workflows necessary for producing a set of plans for pavement preservation projects, including the title sheet, notes sheets, summary sheets, and typical sections. This document also covers how to create and plot a sheet set.

Process Provenance

- Date of development: 3/21/2023
- Revision date: 8/29/2023
- Application/Tool(s): *Autodesk Civil 3D*
- Version(s): 13.4.2162.0 Civil 3D 2022.2.2
- Environment(s): *MDT Civil 3D State Kit r2022 v1.22*
- Author: [MDT Road Design Workflow Subcommittee](#)

Statement of Need

Pavement preservation plans do not require civil objects and thus were not covered in Civil 3D production training. Therefore, separate workflows were necessary to outline the process for creating plans for pavement preservation processes.

Disclaimer: One procedure in this document currently relies on Microstation for the county maps on the title sheet and is only intended as an interim workflow until a more efficient process using Civil 3D has been vetted for the maps. This document will be updated when the vetting and testing is complete. The update will be announced through the same channels that this workflow was announced.

Acronyms/Definitions Used in This Document

OLE – Object Linking and Embedding. OLEs are embedded copies of information from another document.

QMG – Excel Quantity Manager file

References

[Title and Notes Sheets in Autodesk](#)

[Summary Sheets in Autodesk](#)

[Tips for Summary Sheets in Autodesk](#)

203 – Civil 3D Plan Production Training

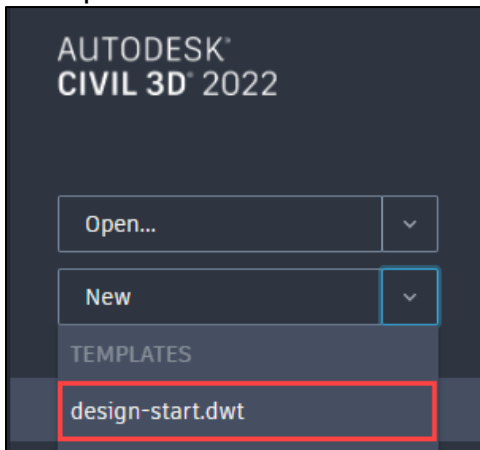
[Surfacing Calculation Spreadsheet](#)

Process Description and Examples

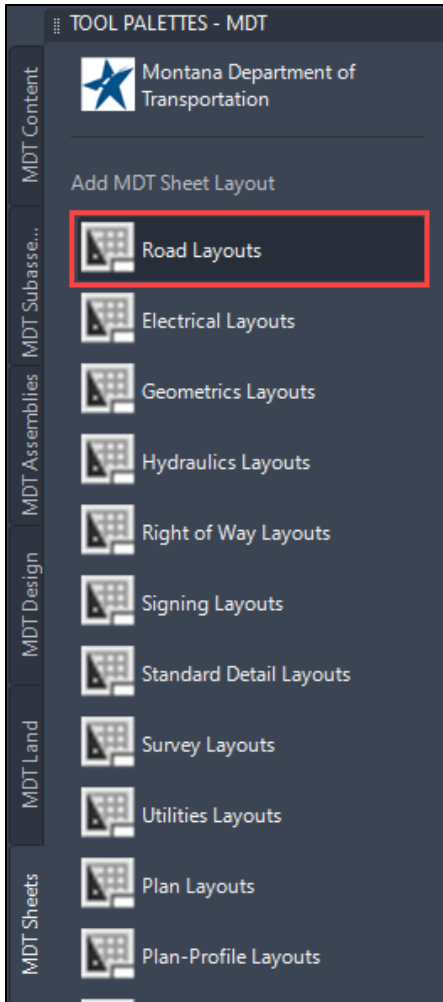
Section I. Title Sheet

Procedure – File Setup

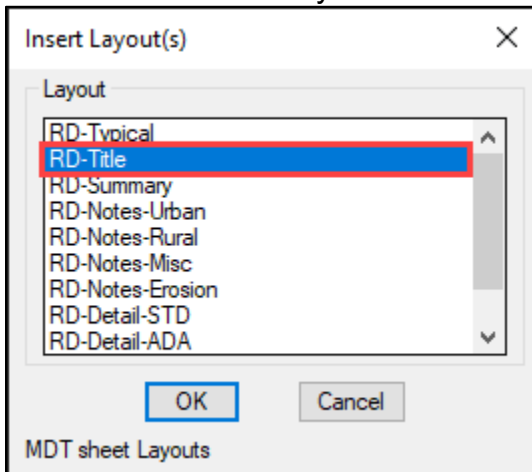
1. Create a new file using the **design-start.dwt** template. Save it as **[UPN#]RDTTL001.dwg** (for example, 9422000RDTTL001.dwg) in the RD directory of the project on BIM 360. Use **CTRL+S** or navigate to the C3D icon in the top left and save the file.



2. Create a new layout using the **Road Layouts** within the **MDT Sheets** tab of the **MDT Tool Palette**.



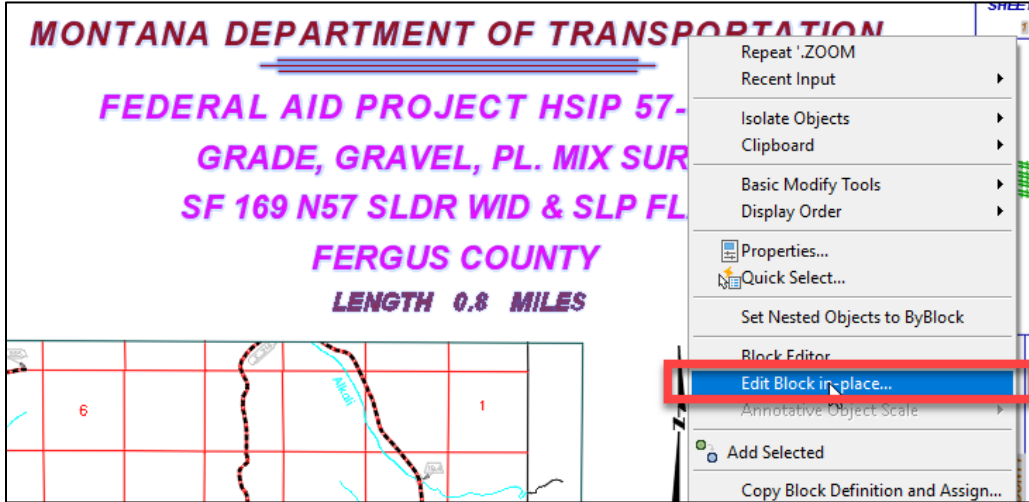
3. Select the **RD-Title** layout.



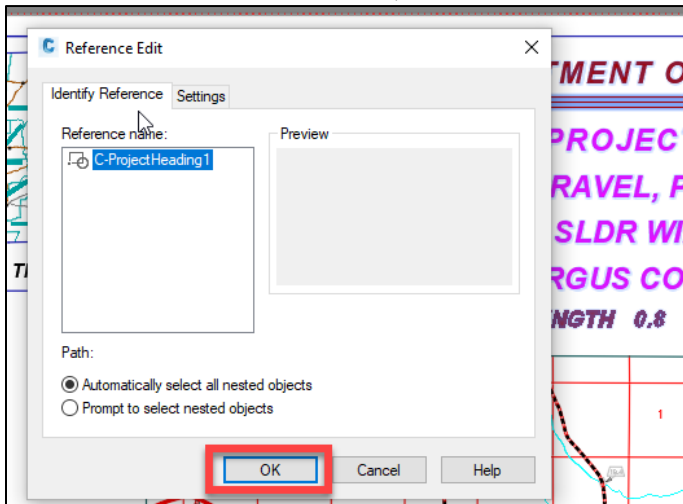
[Back to top](#)

Procedure – Title Block

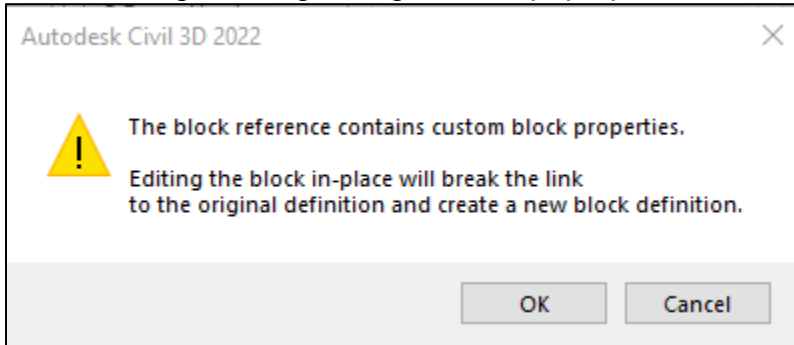
1. Select or highlight the title block, right click and select **Edit Block in-place...** to edit the title block.



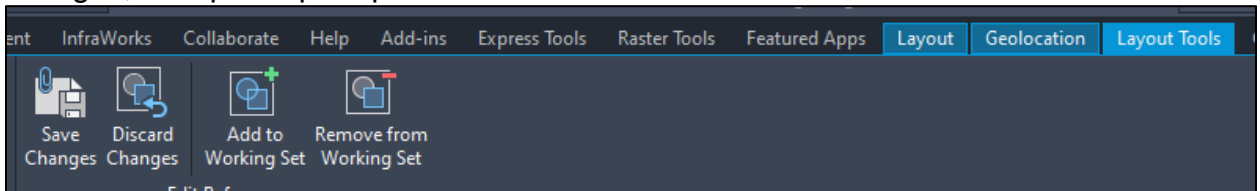
2. In the Reference Edit menu, click **OK**.



- The following warning dialog box will pop up. Click **OK**.



- Double click any of the text fields within the Title Block to change their attributes. When finished with the edits, select **Save Changes** within the **Layout Tools** contextual tab in the ribbon to close the block editor. If prompted to save the text changes, accept the prompt to save and close.

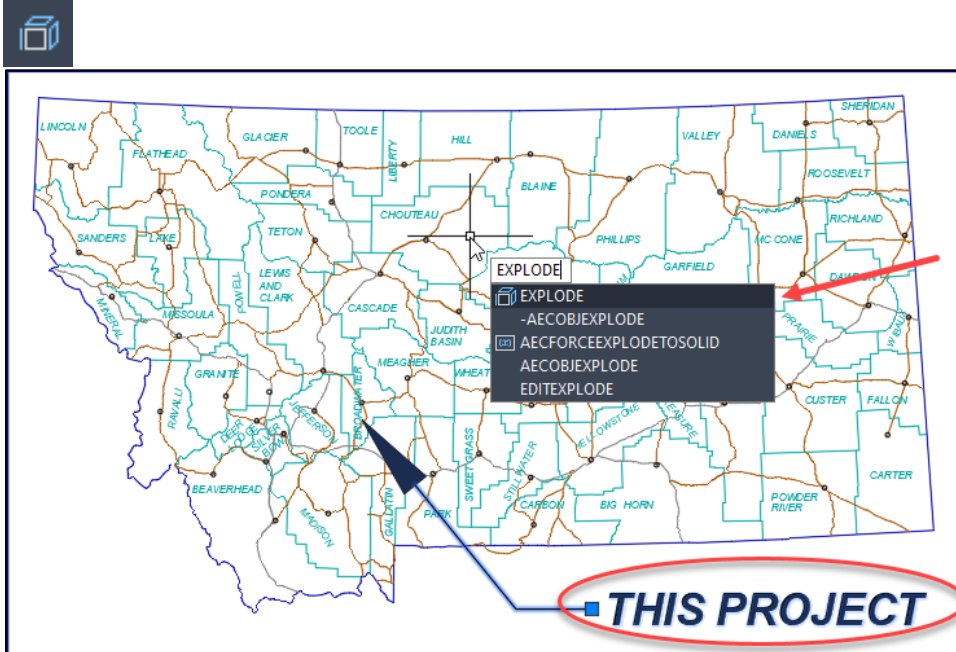


NOTE: Wait to edit the sheet border project information on all the sheets until the sheet set has been created for the project. When created, follow the steps covered in Section V of this document.

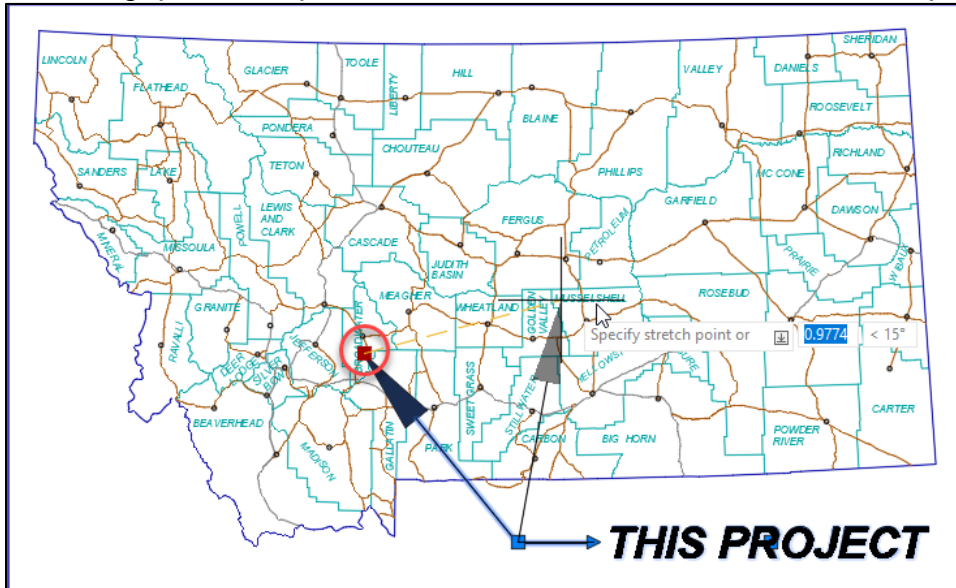
[Back to top](#)

Procedure – Project Location

1. **Explode** the "THIS PROJECT" callout once by typing **X**, or **Explode**, or by selecting the icon that looks like a cube in the **Modify** panel of the **Home** tab.



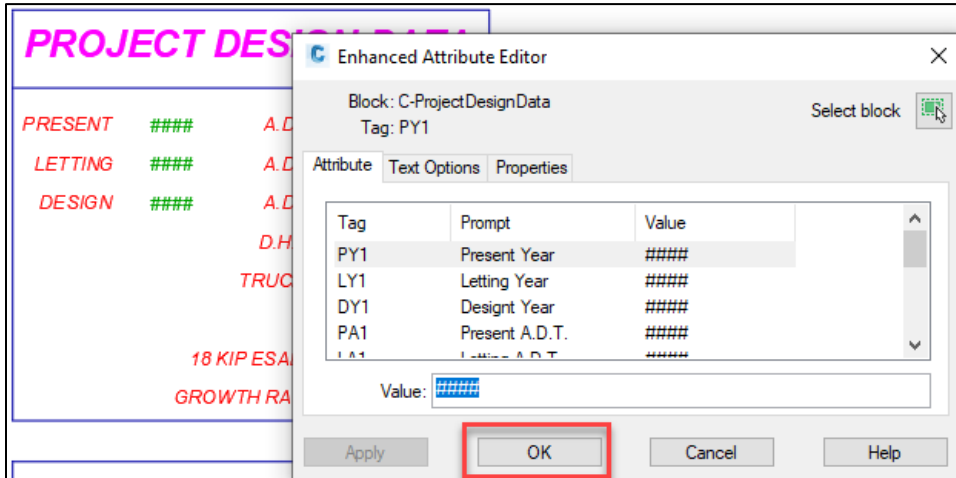
2. Use the grip on the tip of the arrowhead to move the arrow to the project location.



[Back to top](#)

Procedure – Project Design Data Blocks

1. Double click within the Project Design Data table to open the Enhanced Attributes Editor dialog box to edit each field. When done, click **OK** to save and exit the menu.



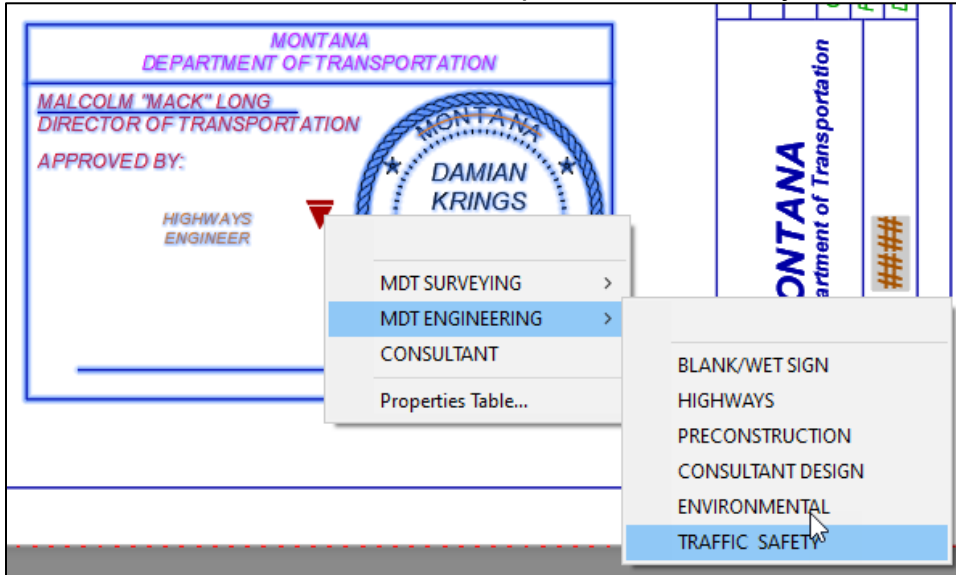
2. Repeat the process above to edit the Associated Project Agreement Numbers and Related Projects tables, if applicable.

[Back to top](#)

Procedure – Engineer’s Stamp Block

1. Click or highlight the Engineers Stamp Block and then use the visibility state dropdown arrow in the center of the block to change the format to the required department/engineer.

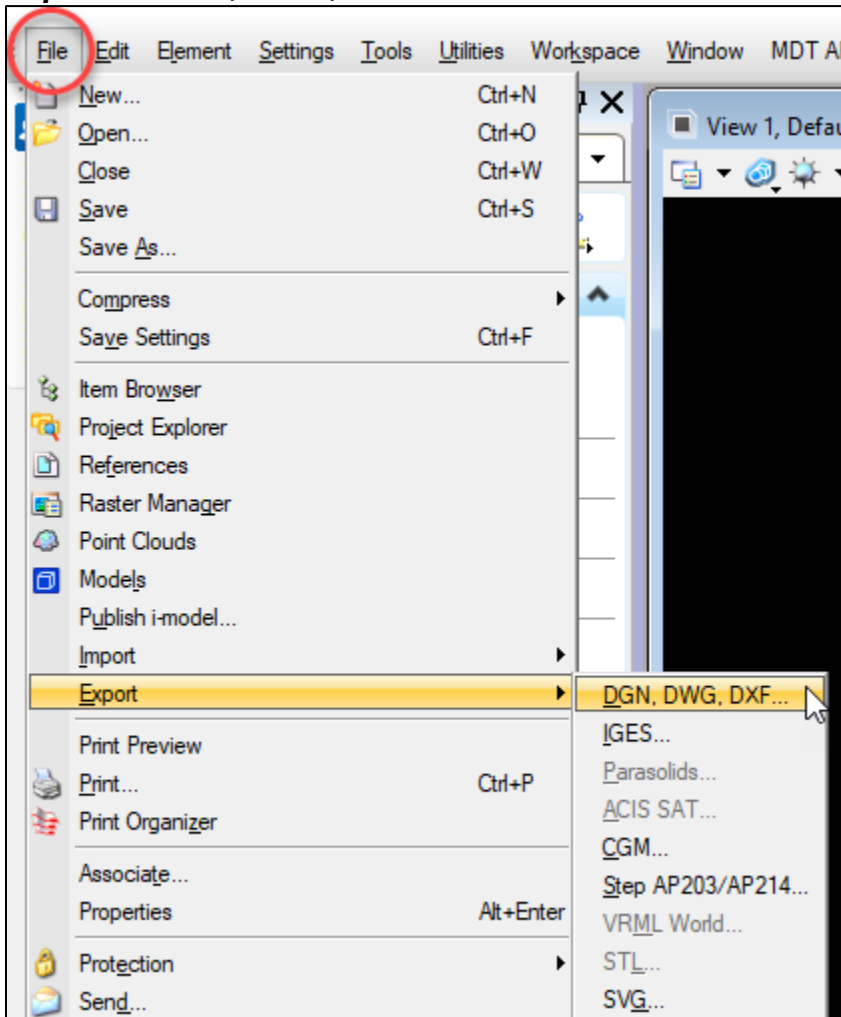
For example, to change the default block to Traffic & Safety, select the dropdown, then hover over the **MDT ENGINEERING** sub-menu and select **TRAFFIC SAFETY**. The block will update automatically.



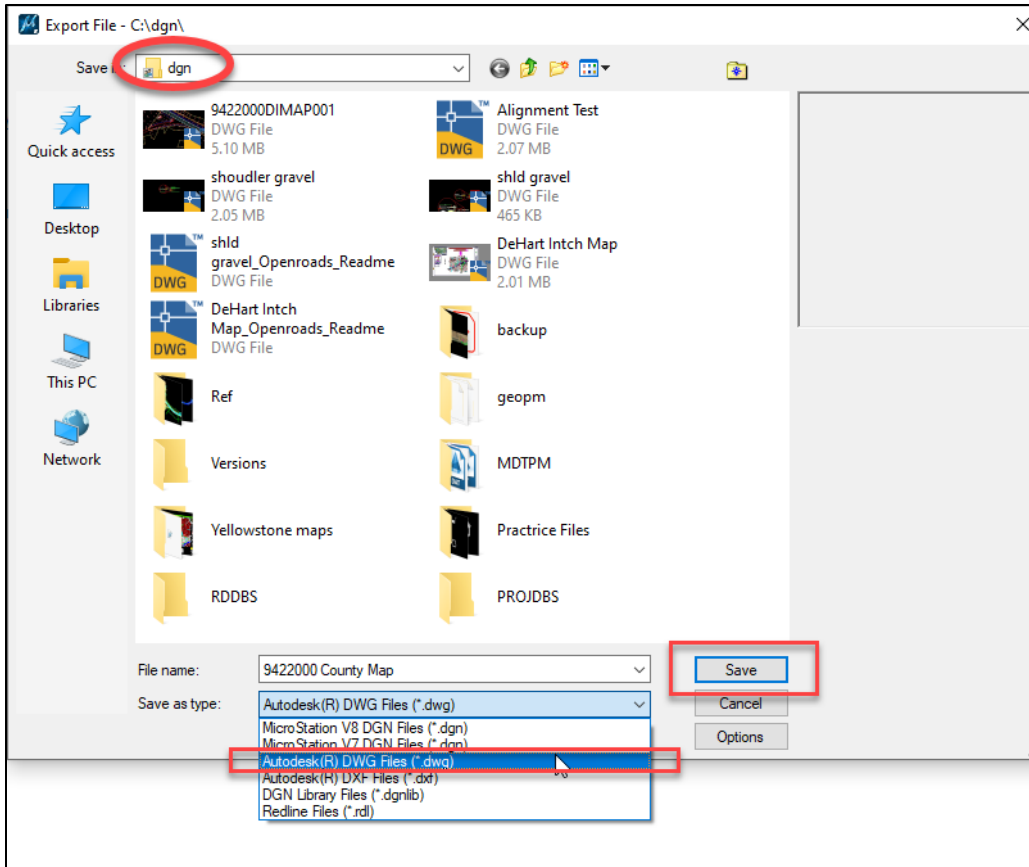
[Back to top](#)

Procedure – County Map

1. Download the county map corresponding to the project from the County Maps page under Resources on the Road Design page of the MDT Intranet. Save this file to your **C:\dgn** folder.
2. Open the file in Microstation. Delete unwanted objects.
3. Export this file as an Autodesk DWG file by navigating to the **File** tab, and select **Export -> DGN, DWG, DXF**.



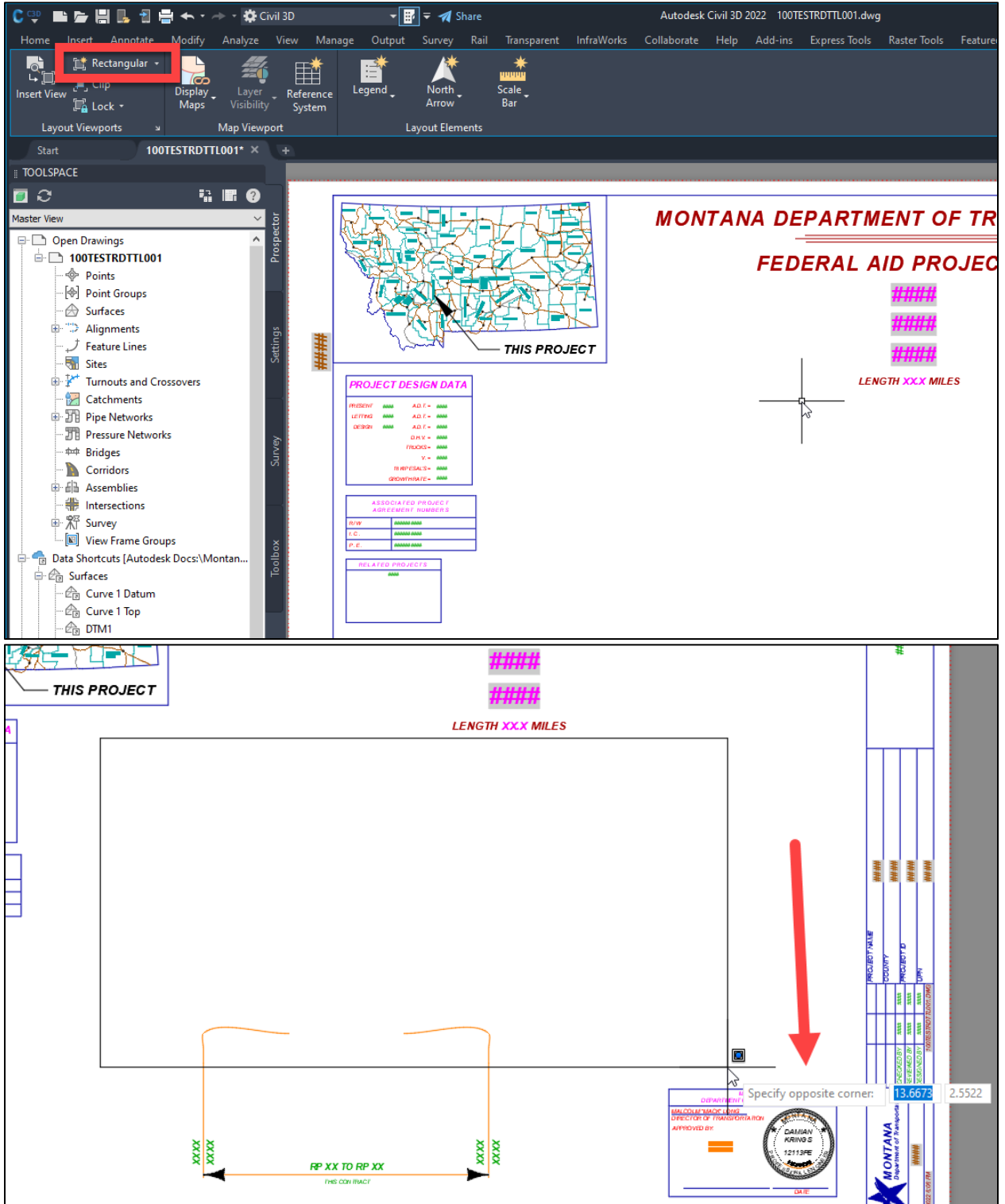
3. In the save menu, change the file type to a **DWG** file. Save this to your **C:\dgn** folder.



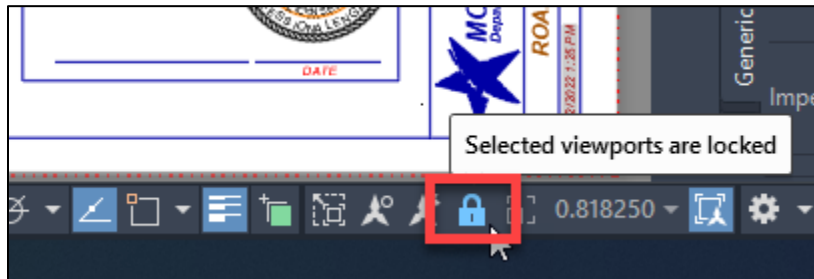
4. Return to Civil 3D. Using the C3D icon in the top left corner, open the exported county map file from the previous step.
5. In the county map file, highlight the linework desired to be shown in the title sheet and copy using **CTRL+C**. Navigate to the title sheet file and paste the linework into the model space using **CTRL+V**.

Montana Department of Transportation - Plans Production for Pavement Preservation Projects in Autodesk

6. Create a viewport to display the county map. Set the active layer to **GS-VPRT**. Select the **RD-Title** Layout, then in the **Layout** contextual tab in the ribbon, select **Rectangular** in the **Layout Viewports**. Specify the limits of the viewport in the paper space by clicking upper left and lower right corners of the rectangle as the extents.



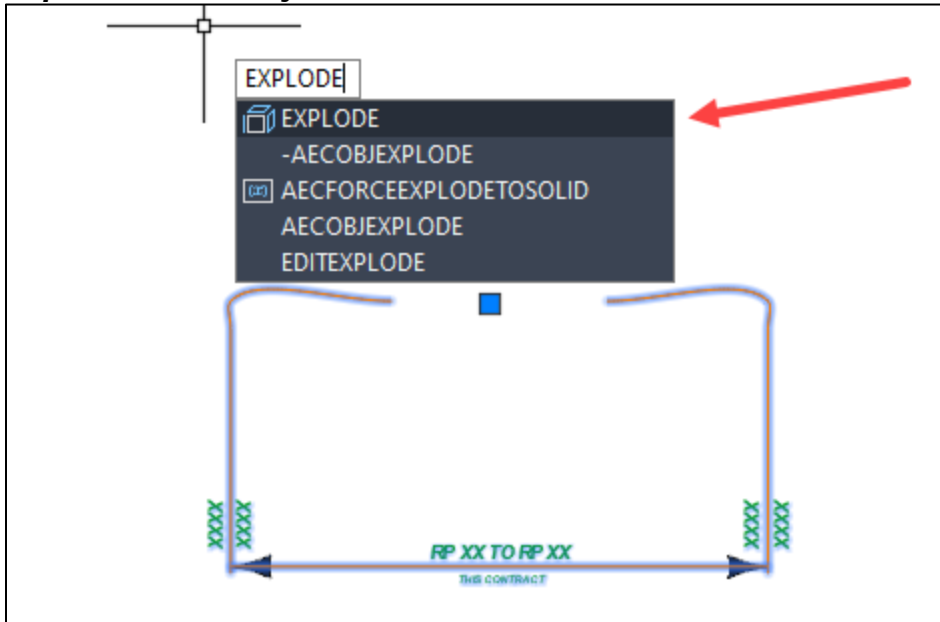
7. Double click within the viewport to enter model space. Use **Pan** and **Zoom** to capture the area of the county map. Adjust the limits of the viewport by clicking and dragging the corner grips. Once the limits and scale are set, lock the viewport by clicking the lock icon in the status bar on the bottom right of the screen.



[Back to top](#)

Procedure – RP Limits and Project Location Label

1. **Explode** the **C-ProjectLocationLabel** block to edit its contents.

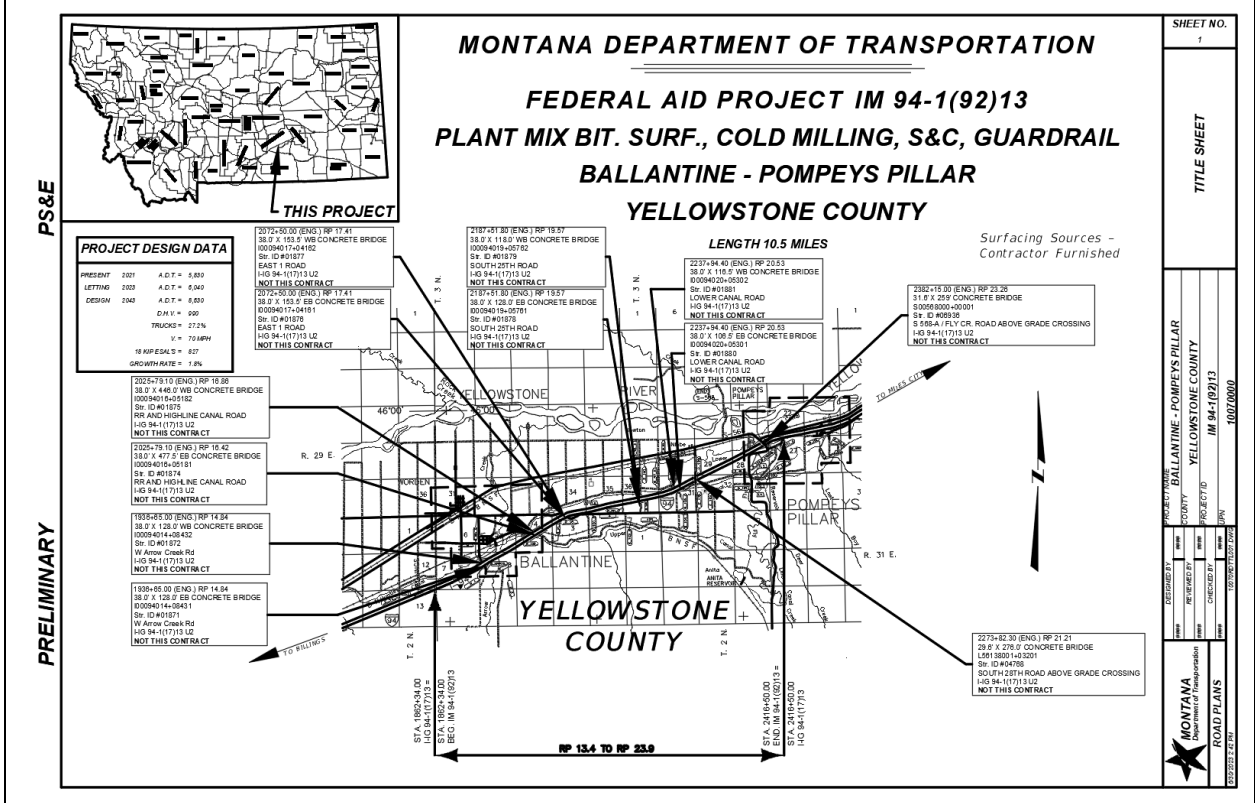
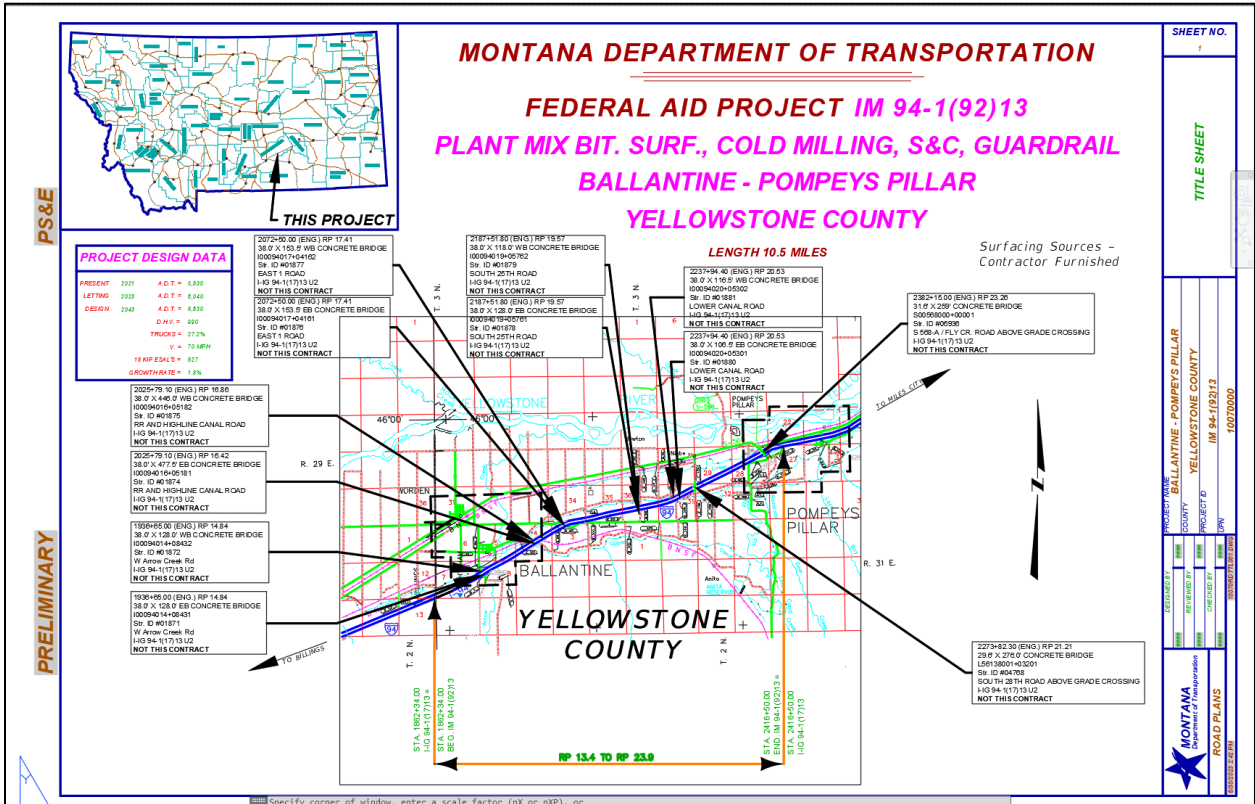


2. Use the grips and the **Move**, **Extend**, and **Trim** commands to adjust the project limits lines and labels to match the extents of the project on the county map. To edit the text fields, double click within them, type the appropriate text, and press **Esc** to exit after edits are complete.
3. Once the limits and labels are set, select them and type the command **CHSPACE**. Then hit **Enter**. This will swap all highlighted linework from the paper space to its corresponding location in the model space. To make further edits to the RP Limit or Project Location information, use the model space tab and edit the information there.

NOTE: MDT Right-Of-Way requested that Road Design place the RP Limit and Project Location information in the model space so that they can reference the model space into their drawings and make their appropriate edits.

[Back to top](#)

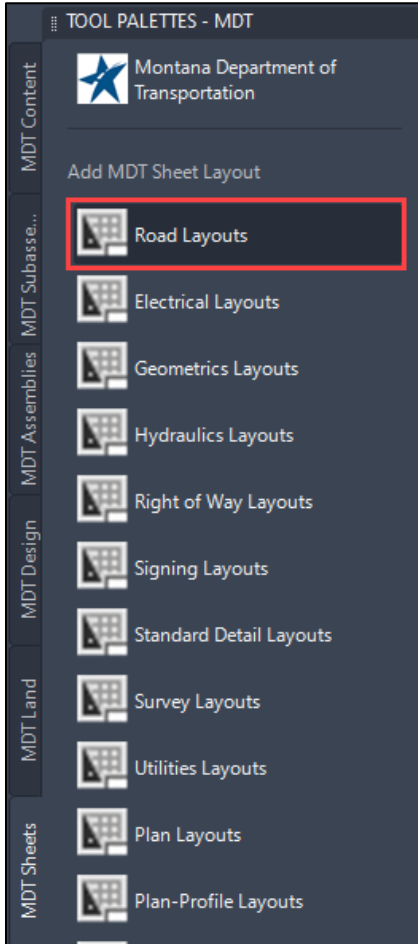
Example of Completed Title Sheet



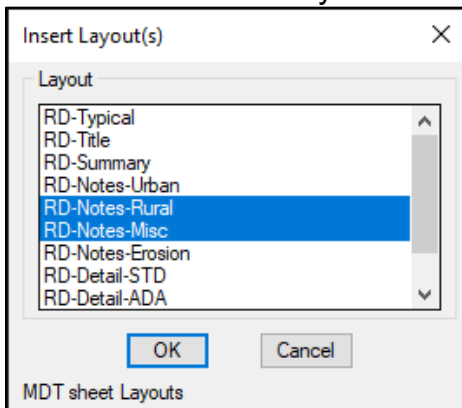
Section II. Notes Sheets

Procedure – File Setup

1. In the Title sheet file, create a new layout using the **Road Layouts** within the **MDT Sheets** tab of the **MDT Tool Palette**.



2. While holding **Ctrl**, select either the **RD-Notes-Rural** or **RD-Notes-Urban** and the **RD-Notes-Misc** layouts based on the scope of the project. Then select **OK**.



3. Explode blocks in the **RD-Notes-Rural** or **RD-Notes-Urban** layouts and edit as necessary.

TABLE OF CONTENTS		NOTES	
ROAD PLANS	SHEET NO.	BASIS OF PLAN QUANTITIES	SKREW DIAGRAM
TITLE SHEET	1	QUANTITIES FOR ESTIMATING PURPOSES ONLY: COMP. AGGREGATE WEIGHT = 1380 LBS. PER CUBIC YARD ASPHALT CEMENT - GRADE 2 - 5% AGG. = 0.47% OF PLANT MIX BY SURF. ASPHALT CEMENT - GRADE 3 - 10% AGG. = 0.94% OF PLANT MIX BY SURF. ASPHALT CEMENT - GRADE 3 - 3% AGG. = 0.10% OF PLANT MIX BY SURF. HYDRATED LIME = 0.35% OF RECYCLED FILL MIX (MFLMMP) BITUMINOUS BONDING AGENT = 0.51 LBS. PER GAL. ENHANCED ASPHALT - TACK (ALL OTHER SURFACES) = 0.18 GAL. PER SQ. YARD (UNDULATED) ENHANCED ASPHALT - TACK (CONCRETE SURFACES) = 0.18 GAL. PER SQ. YARD (UNDULATED) ENHANCED ASPHALT - FOG SEAL (A, C) = 0.18 GAL. PER SQ. YARD (UNDULATED) SEAL = 0.42 GAL. PER SQ. YARD COVER = 0.21 GAL. PER SQ. YARD CURING SEAL = 0.21 GAL. PER SQ. YARD CTF = 10.0 LBS. PER CUBIC YARD BLOTTER = 1.0 LBS. PER SQ. YARD PORTLAND CEMENT = 4% OF CTS DRY WT.	
TABLE OF CONTENTS	2	APPROACHES	LIMITED ACCESS CONTROL
NOTES	3	CONSTRUCT APPROACHES TO A 34" FINISHED TOP ON A 24" SUBGRADE UNLESS NOTED OTHERWISE IN THE PLANS. PROVIDE THE FOLLOWING SURFACING: 2 1/2" PLANT MIX BITUMINOUS SURF. 3/4" CRUSHED AGGREGATE COURSE PLANT MIX SURFACE ALL PUBLIC APPROACHES TO HIGHWAYS. QUANTITIES FOR ONE PUBLIC APPROACH: AVERAGE LENGTH = X 1000 YW PLANT MIX BITUMINOUS SURF. = X 2.00 GAL CRUSHED AGGREGATE COURSE = X 2.00 GAL ENHANCED ASPHALT - TACK = X 2.00 GAL AGG. TREATMENT = X 2.00 GAL PLANT MIX SURFACE ALL PRIVATE APPROACHES TO HIGHWAYS. QUANTITIES FOR ONE PRIVATE APPROACH: AVERAGE LENGTH = X 1000 YW 2 1/2" PLANT MIX BITUMINOUS SURF. = X 2.00 GAL 3/4" CRUSHED AGGREGATE COURSE = X 2.00 GAL ENHANCED ASPHALT - TACK = X 2.00 GAL AGG. TREATMENT = X 2.00 GAL GRAVEL SURFACE ALL FARM FIELD APPROACHES TO HIGHWAYS WITH A 1/2" WIDE PLANT MIX STRIP SUBJECT TO LOCAL ORDINANCES. QUANTITIES FOR ONE FARM FIELD APPROACH: AVERAGE LENGTH = X 1000 YW 2 1/2" PLANT MIX BITUMINOUS SURF. = X 2.00 GAL 3/4" CRUSHED AGGREGATE COURSE = X 2.00 GAL ENHANCED ASPHALT - TACK = X 2.00 GAL AGG. TREATMENT = X 2.00 GAL QUANTITIES FOR ONE FARM FIELD APPROACH: 34" FINISHED TOP ON A 24" SUBGRADE AVERAGE LENGTH = X 1000 YW PLANT MIX BITUMINOUS SURF. = X 2.00 GAL CRUSHED AGGREGATE COURSE = X 2.00 GAL ENHANCED ASPHALT - TACK = X 2.00 GAL AGG. TREATMENT = X 2.00 GAL	THIS PROJECT IS A LIMITED ACCESS CONTROL FACILITY. OBTAIN APPROVAL FROM THE CHIEF OF THE RIGHT-OF-WAY BUREAU PRIOR TO DESIGN, DELETING OR RELOCATING ANY APPROACHES. SOILS INFORMATION SEE SHEET PROVISIONS FOR ADDITIONAL INFORMATION. THE LOCATION OF GEOTECHNICAL BORINGS IS SHOWN ON THE PLAN VIEW WITH THE FOLLOWING SYMBOLS: BORING NUMBER (SEE TECHNICAL BORING) UTILITIES CALL THE UTILITIES UNDERGROUND LOCATION CENTER (B11) OR OTHER NOTIFICATION CENTER FOR THE BEARING AND LOCATION OF ALL LINES AND SERVICES BEFORE EXCAVATING. ALL CLEARANCES OR OFFSETS PROVIDED FOR UTILITIES ARE FROM EXISTING GROUND LINE. WETLANDS WETLANDS EXIST ADJACENT TO THE ROADWAY AND WAY EXIST BEYOND THE PROJECT LIMITS. WETLAND AREAS AND PROBABLY WETLAND IMPACT AREAS WITHIN THE PROJECT LIMITS HAVE BEEN DELINEATED AND ARE SHOWN ON THE PLANS. ANY ACTION IMPACTING WETLANDS ARE OUTSIDE OF THE PERMILLENT IMPACT AREAS SHOWN IS THE RESPONSIBILITY OF THE CONTRACTOR.
CENTERLINE COORDINATE TABLE	4	MAILBOXES & MAILBOX TURNSHOUTS	
CONTROL DIAGRAM & LEVEL DATA	4	CONSTRUCT MAILBOX TURNSHOUTS AT LOCATIONS SHOWN IN THE PLANS OR AS STATED BY THE PROJECT MANAGER. PROVIDE THE FOLLOWING SURFACING: "B" MAINLINE (2 1/2" PLANT MIX BITUMINOUS SURF.) "B" SIDE STREET (3/4" CRUSHED AGGREGATE COURSE) QUANTITIES FOR ONE MAILBOX TURNSHOUT FOR ESTIMATING PURPOSES ONLY: AVERAGE LENGTH = X 3000 YW PLANT MIX BITUMINOUS SURF. = X 2.00 GAL CRUSHED AGGREGATE COURSE = X 2.00 GAL ENHANCED ASPHALT - TACK = X 2.00 GAL AGG. TREATMENT = X 2.00 GAL	
TYPICAL SECTIONS	5-7		
SUMMARIES	8-10		
CLEANING & GRUBBING	8		
GRADING	8		
ADDITIONAL GRADING	8		
FINISH GRADE CONTROL	8		
CULVERTS	8		
CULVERT SUMMARY RECAP	8		
SURFACING	8		
ADDITIONAL SURFACING	8		
CUTLE DRAWDING	10		
GUARDRAIL	10		
PAVING	10		
MARKINGS	10		
TORUSL AND SEEDING	10		
PAVEMENT BORINGS	10		
HYDRAULIC DATA SUMMARY	11		
DETAILS	12-14		
RAMPS	12		
PLAN & PROFILE	15-17		
SIGNING PLANS			
SUMMARY	S1		
SPECIFICATIONS	S2		
DETAILS	S3		
PLANS	S4		
BRIDGE PLANS			
BRIDGE PLANS	B1-B7		
STANDARD DRAWINGS	B7		
AS-BUILT DRAWINGS	B7		
CROSS SECTIONS			
MAINLINE	1-7		
SIDE STREETS	1-7		

NOTE: Additional notes not found on the sheet can be found in the **RD-Notes.dwg** block library.

4. If applicable, add approach tables and wetland delineation tables to the **RD-Notes-Misc** layout, following the same methods outlined in the [Summary Frames](#) section of this document.

[Back to top](#)

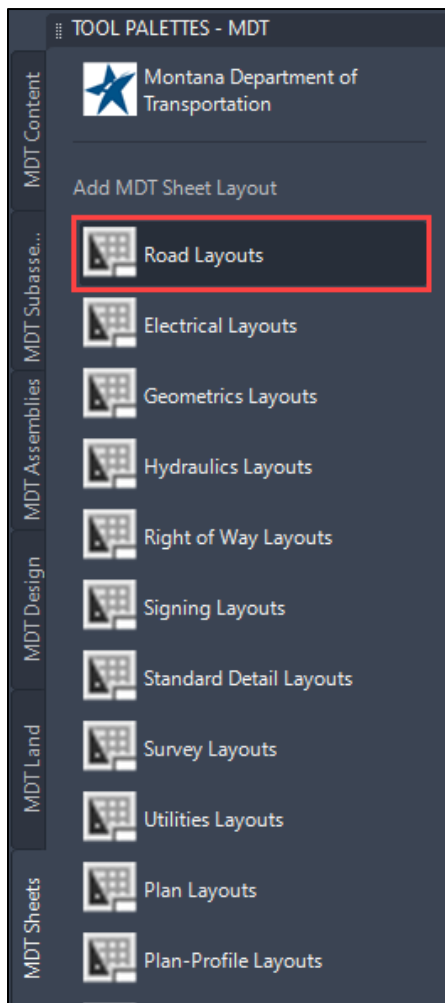
Section III. Typical Sections

Procedure – File Setup

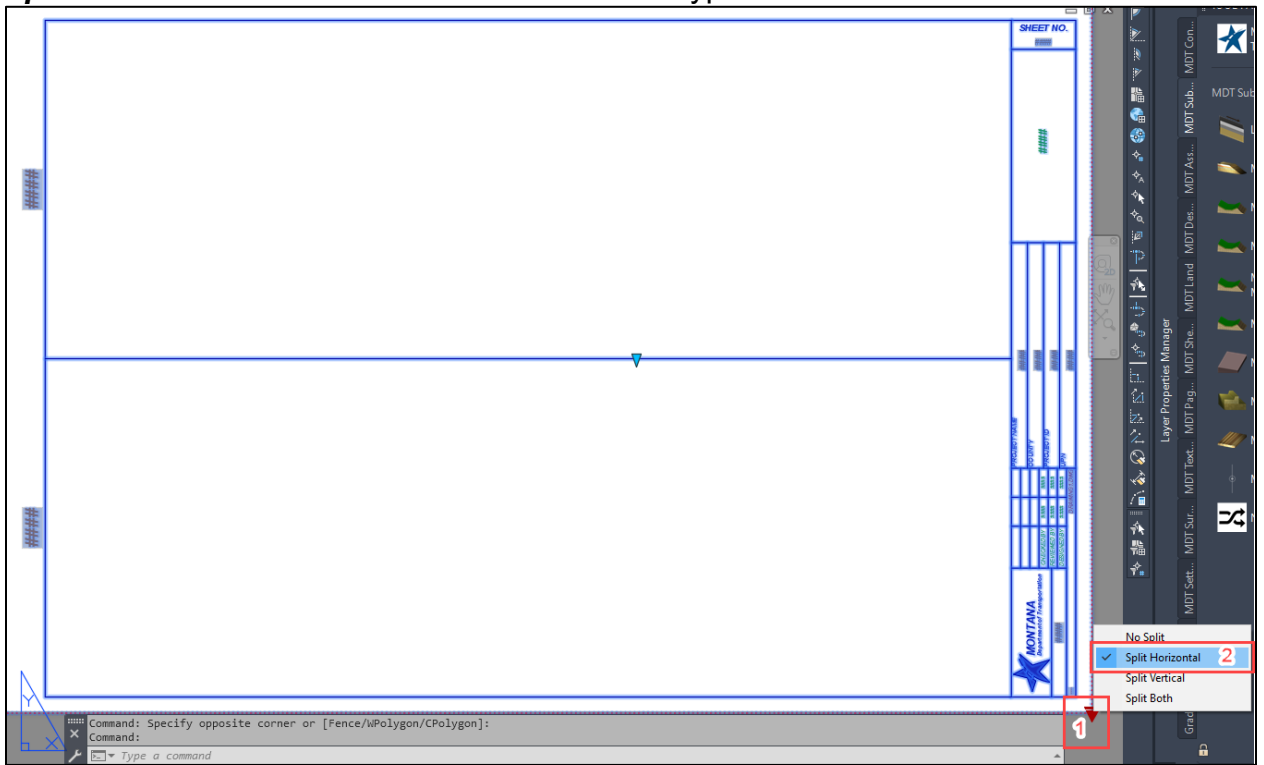
1. Create a new file called **[UPN#]RD TYP001.dwg** using the **design-start.dwt** template. Set the drawing scale to **1" = 10'** and set the working folder and data shortcuts appropriately.

NOTE: In future versions of the State Kit, a Typical Sections template file will be created with the view frames already built into them. In the meantime, follow the File Setup and Border Setup procedures.

2. Create a new layout using the **Road Layouts** within the **MDT Sheets** tab of the **MDT Tool Palette**.



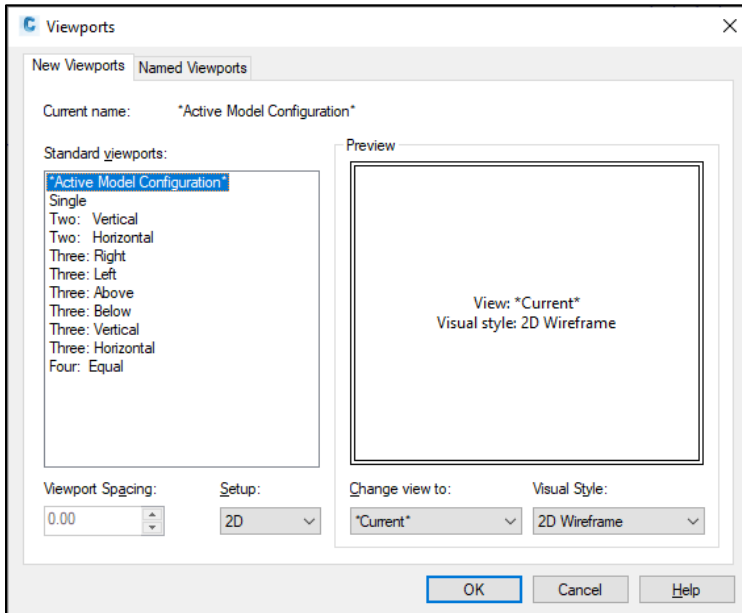
5. Select the border of the sheet and select the block visibility state dropdown arrow in the lower right corner of the border. Change the designation from **No Split** to **Split Horizontal** to divide the border in half for typical sections.



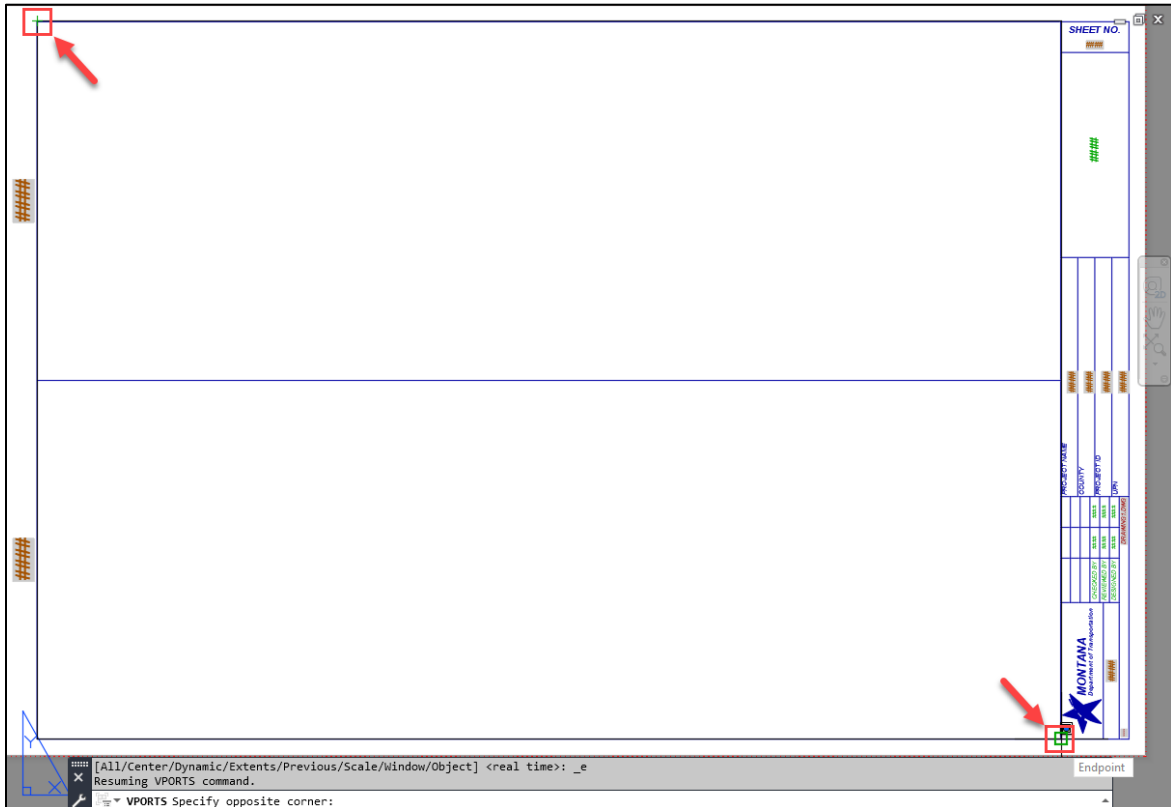
[Back to top](#)

Procedure – Border Setup

1. While in the **RD-Typical** layout, type the command **VPORTS**. Accept the defaults and select **OK**.



2. You will be prompted to specify the corners of the viewports. Select the corners of the border sheet as shown below:



- Return to the paper space by double clicking outside the extents of the viewport border. In the paper space, select the viewport border (turn on Selection Cycling [Command: **SELECTIONCYCLING**, variable **2**] to aid in selecting) and use the **Properties** palette set the both the **Annotation Scale** and the **Standard Scale** of the viewport to **1"=10'**.

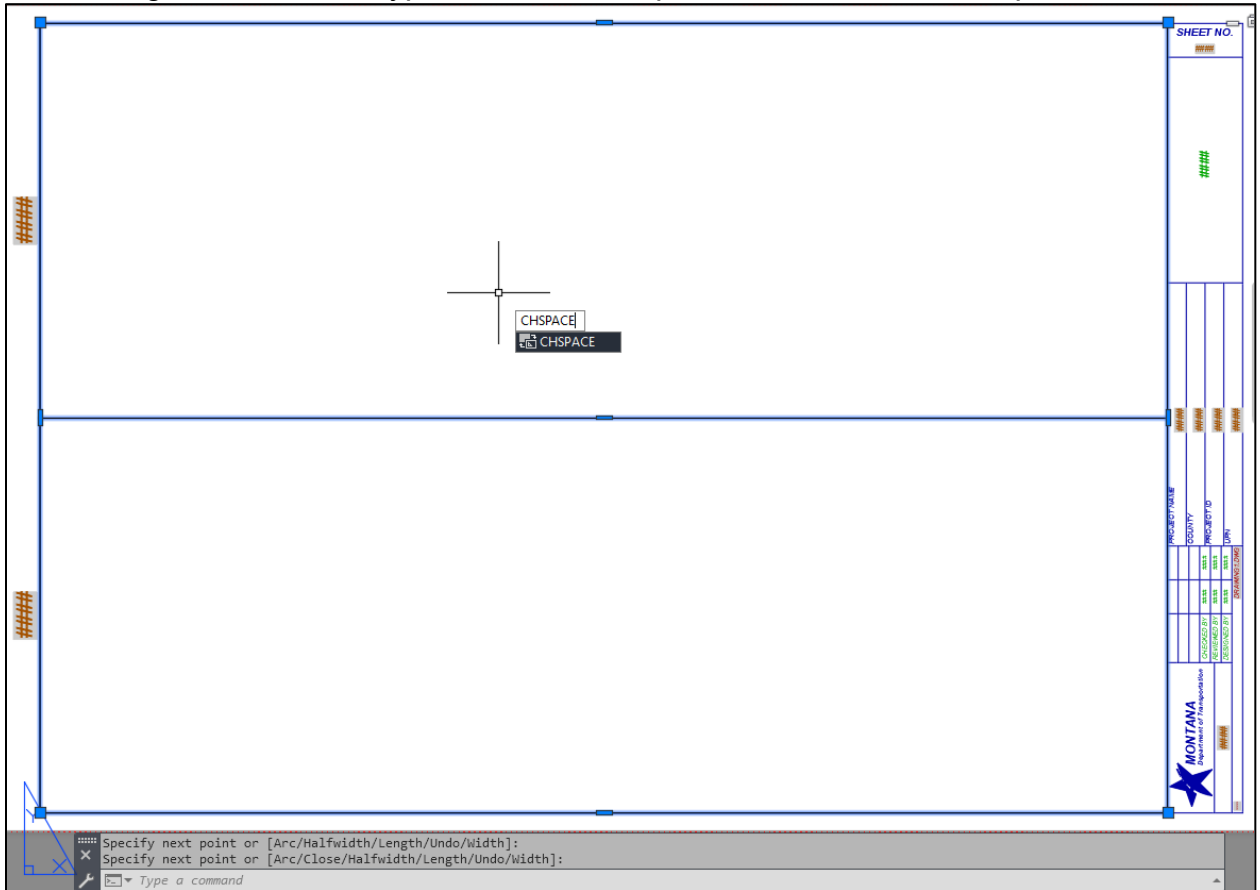
Selection Cycling icon on bottom bar:



Viewport settings:

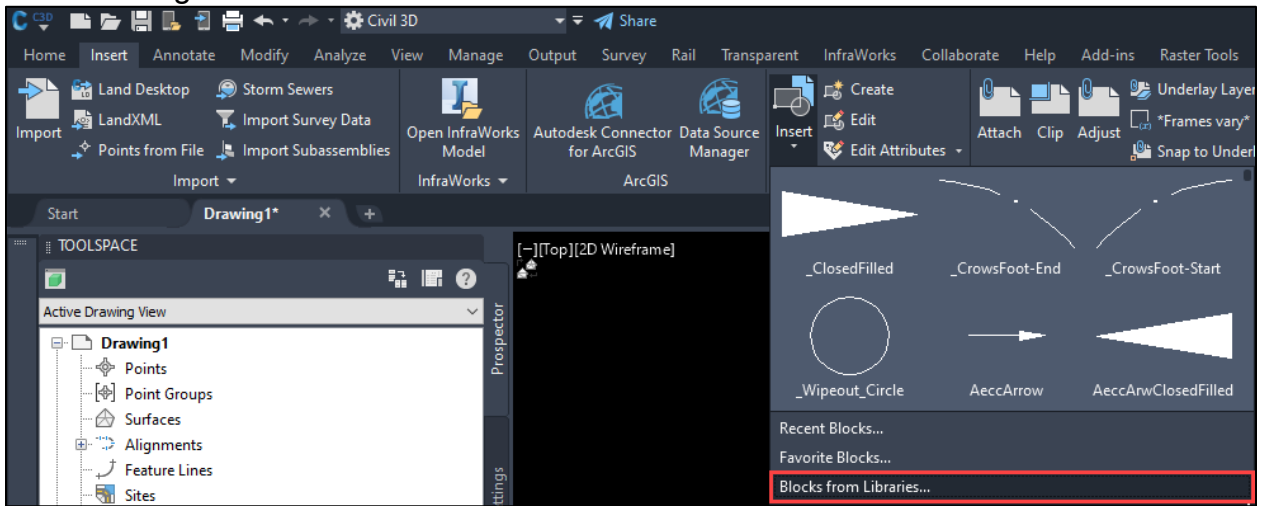
Property	Value
General	
Color	ByLayer
Layer	X-MISC
Linetype	ByLayer
Linetype scale	1.0000
Plot style	ByColor
Lineweight	ByLayer
Transparency	ByLayer
Hyperlink	
Geometry	
Center X	8.2500
Center Y	5.5000
Center Z	0.0000
Height	10.5000
Width	15.0000
Misc	
On	Yes
Clipped	No
Display locked	No
Annotation scale	1" = 10'
Standard scale	1" = 10'
Custom scale	0.1000
UCS per viewport	Yes
Layer property overrides	No
Visual style	2D Wireframe
Shade plot	As Displayed
Linked to Sheet View	No
Viewport	
Viewport Type	Undefined
Viewport Order	-1

- In the paper space, draw a rectangle around the viewport either using the **RECTANG** command or selecting the rectangle tool from the **Drawing** tools in the **Home** ribbon tab. Draw a horizontal line (Command: **L** for line or **PL** for polyline) on top of the **Split Horizontal** border line. Ensure your snaps are on so that the line snaps to the midpoint of the vertical line of the rectangle. Then select the rectangle and line and type **CHSPACE** to put them into the model space.



- Return to the model space via the **Model** tab and find the border using **Zoom Extents**.

6. In the model space, open the blocks palette by typing **BLOCKSPALETTE** or by going into the **Insert** tab and selecting the **Insert** dropdown of the **Block** section and selecting **Blocks from Libraries**.



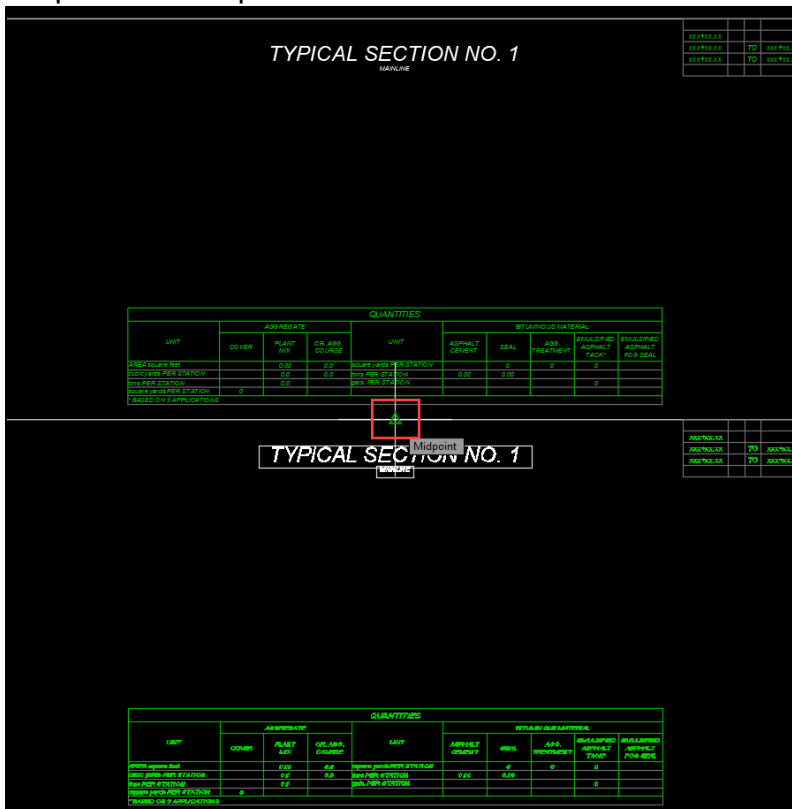
7. In the **Blocks** palette, select the **Libraries** tab and double click the **RD-Typicals.dwg** library.



- Within the library, select the **T-TablesQtyStaLabel** block so that it is attached to the cursor and ready to be inserted into the drawing. Using the midpoint snap, select the midpoint of the upper horizontal line of the border as the insertion point.

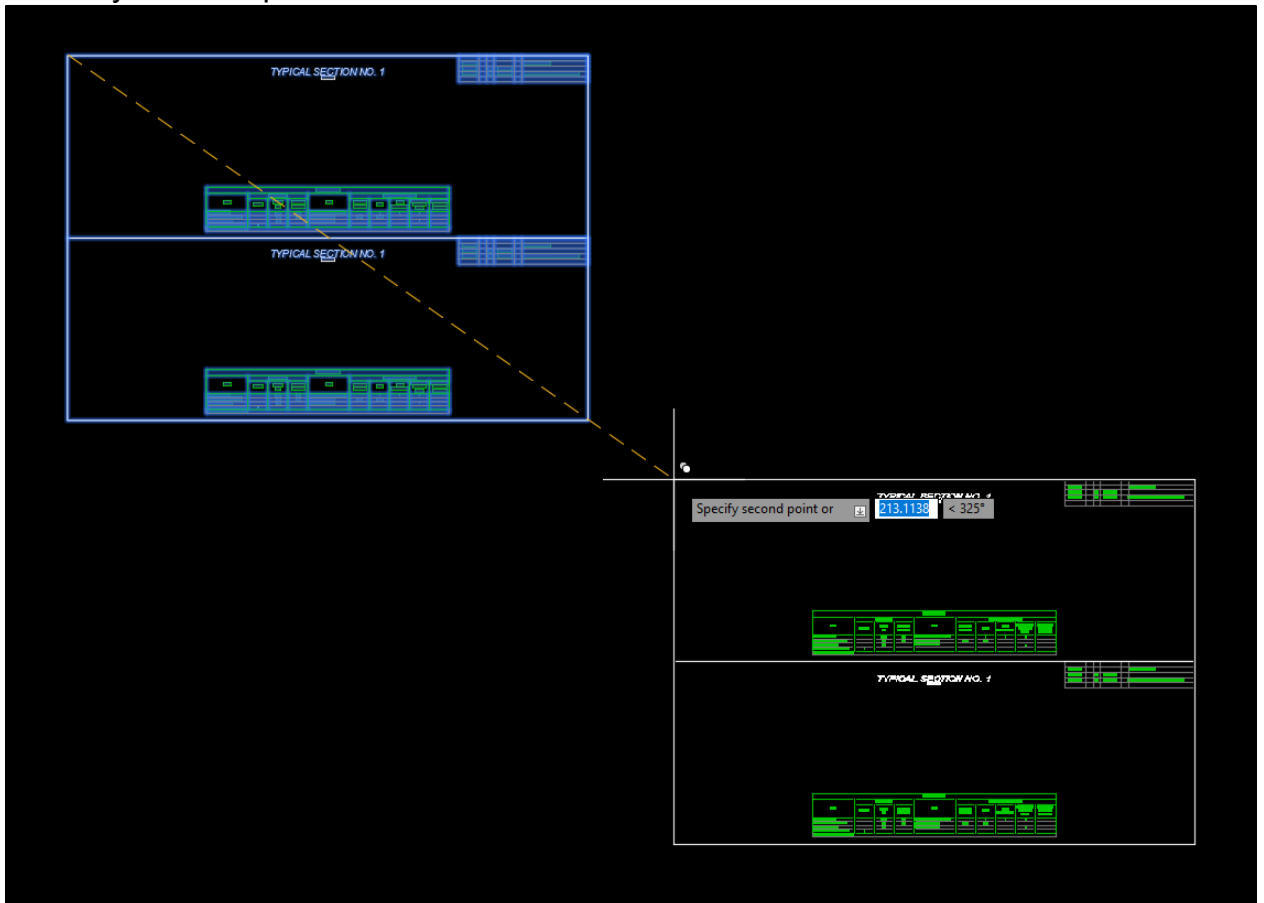


- Repeat the process above for the second typical section, except snap to the midpoint of the split horizontal line.

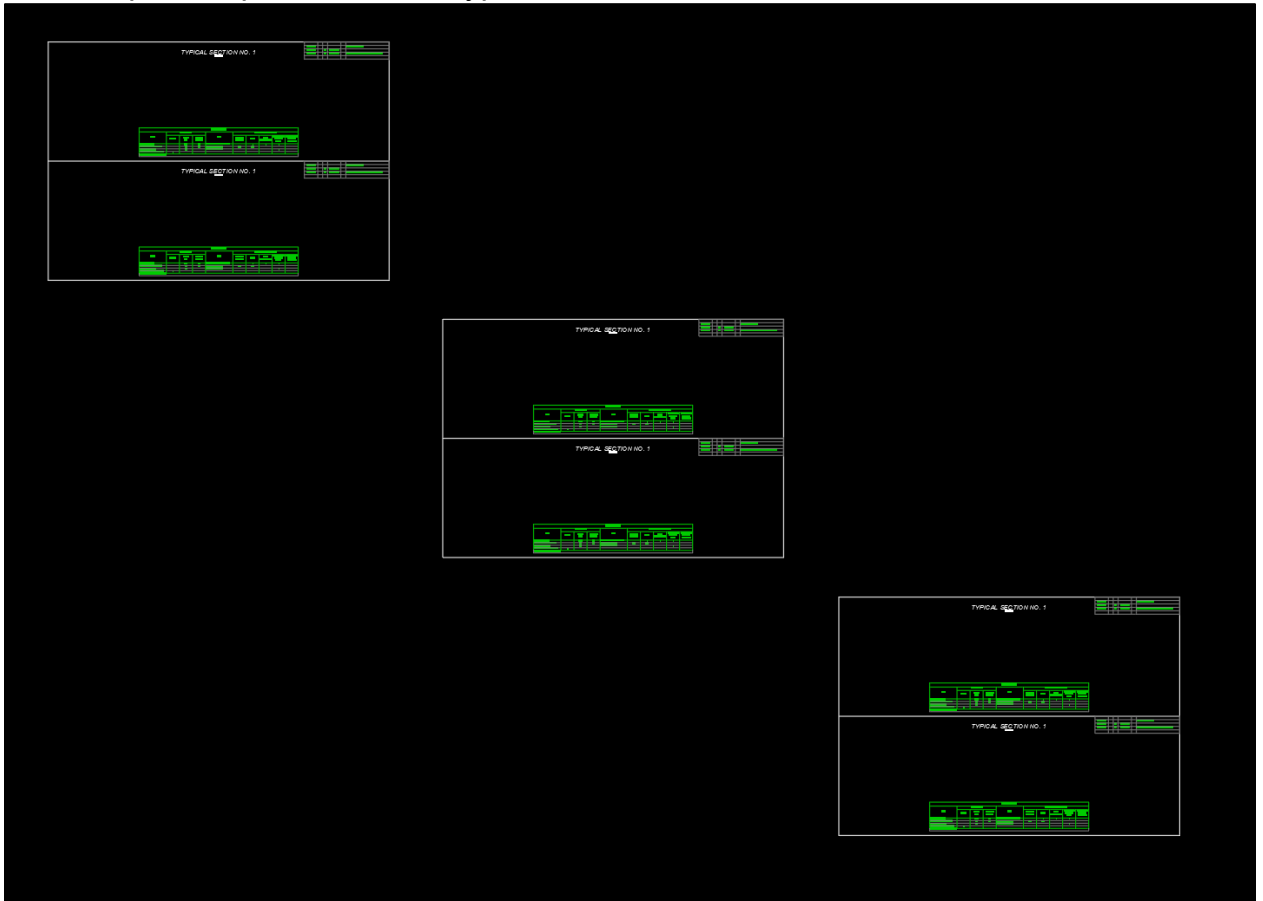


10. Select the border lines and blocks and copy the shapes diagonally until you have as many typical borders as you need sheets.

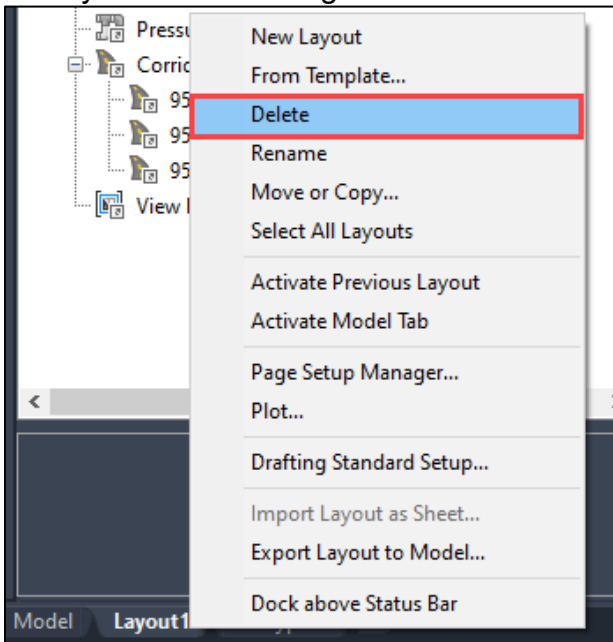
NOTE: Copying diagonally ensures that no more than two section view frames overlap. Overlapping section views can cause issues when adjusting dimensions on the typical sections, which arise when the view frame needs to be adjusted vertically to better position the section view within the sheet border.



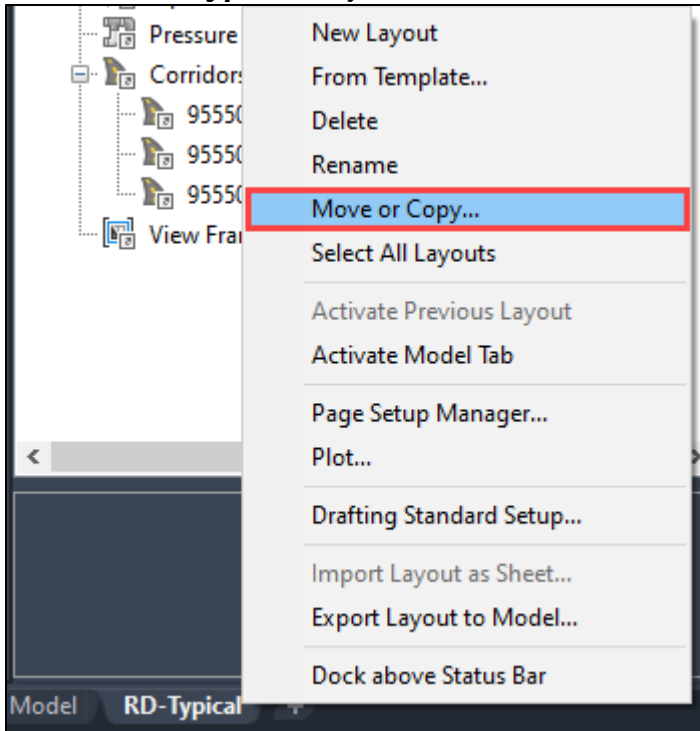
An example setup for five to six typical sections:



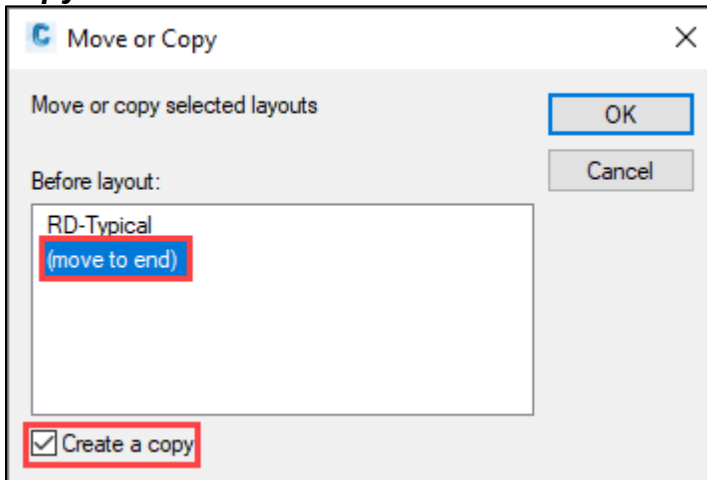
11. Delete the default **Layout1** from the drawing to clear up space by right clicking the layout and selecting **Delete**.



12. Copy Layouts: Copy the **RD-Typical** layout to create more layout sheets. Right click the **RD-Typical** Layout and select **Move or Copy...** from the list.



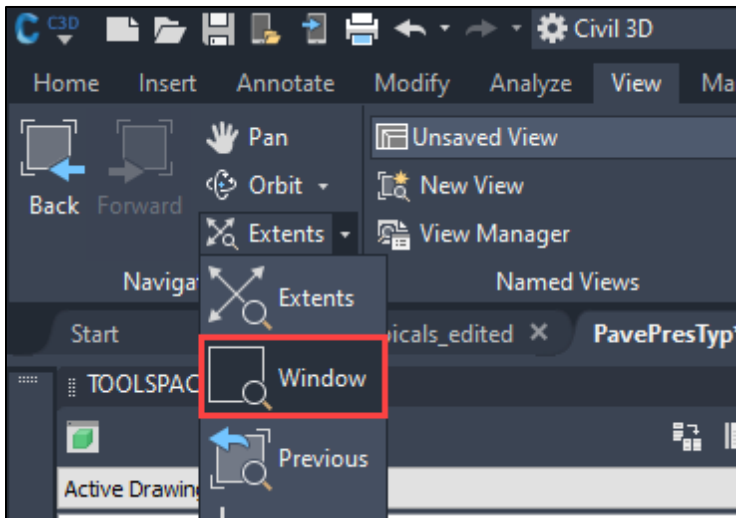
13. In the **Move or Copy** dialog, select (**move to end**), and check the **Create a copy** box. Then select **OK**.



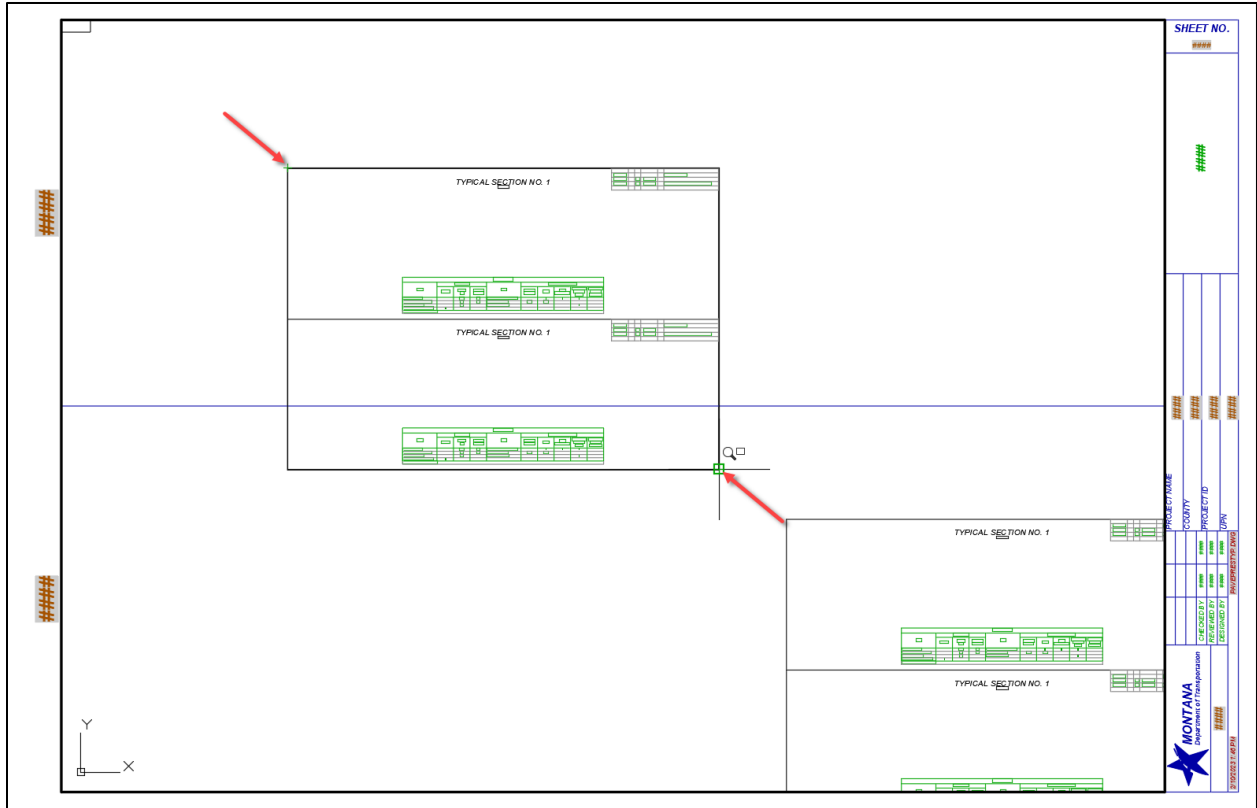
14. In the copied layout **RD-Typical (2)**, double click within the viewport and type **OSNAPCOORD** and change the variable to **0**.

NOTE: This step only needs to be completed once; however, if you update the State Kit, you will need to reset the variable.

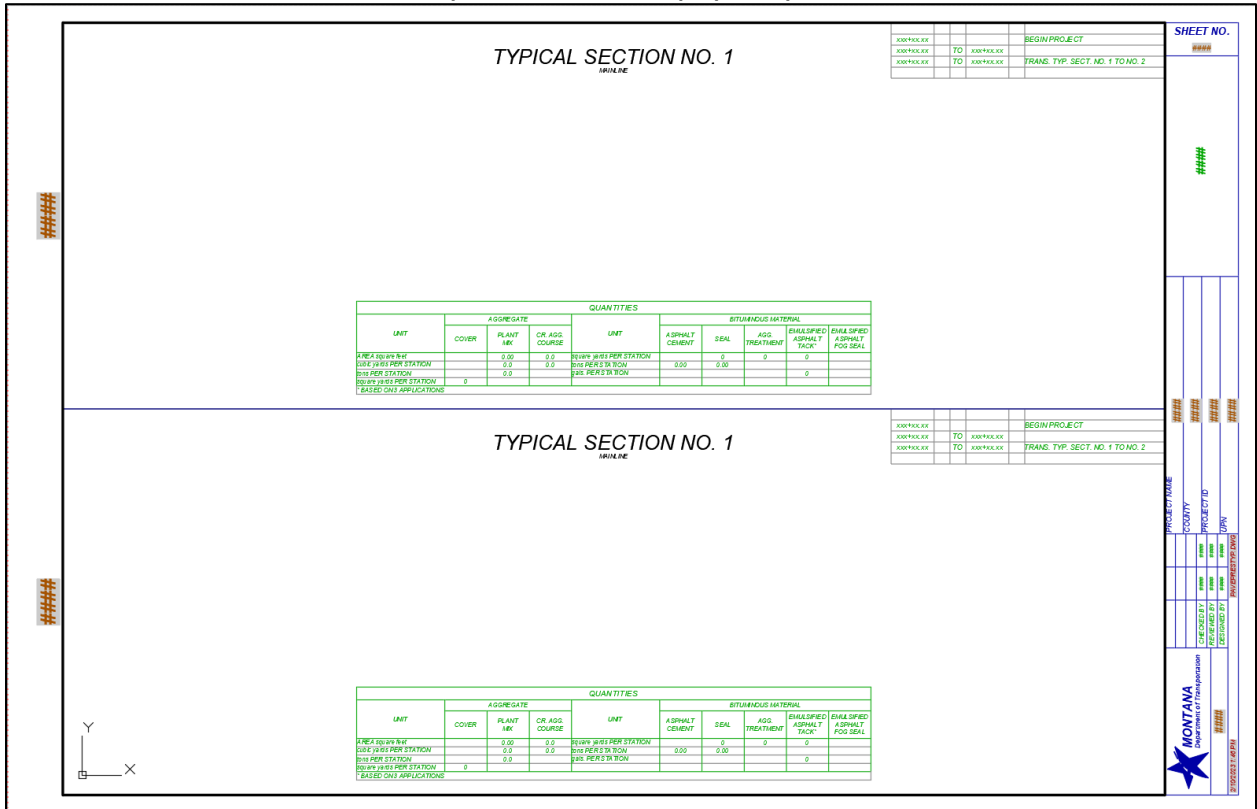
15. While in the viewport, select the dropdown next to **Extents** from within the **Navigate 2D** panel in the **View** tab and select **Window**. You can also type the command **ZOOM** and type or select **W** for window.



16. With endpoint snaps turned on, select the upper left and lower right corners of the rectangle border.

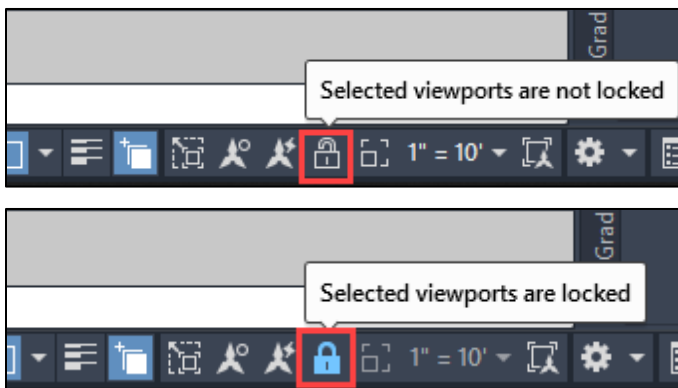


17. Double click outside of the viewport to return to paper space.



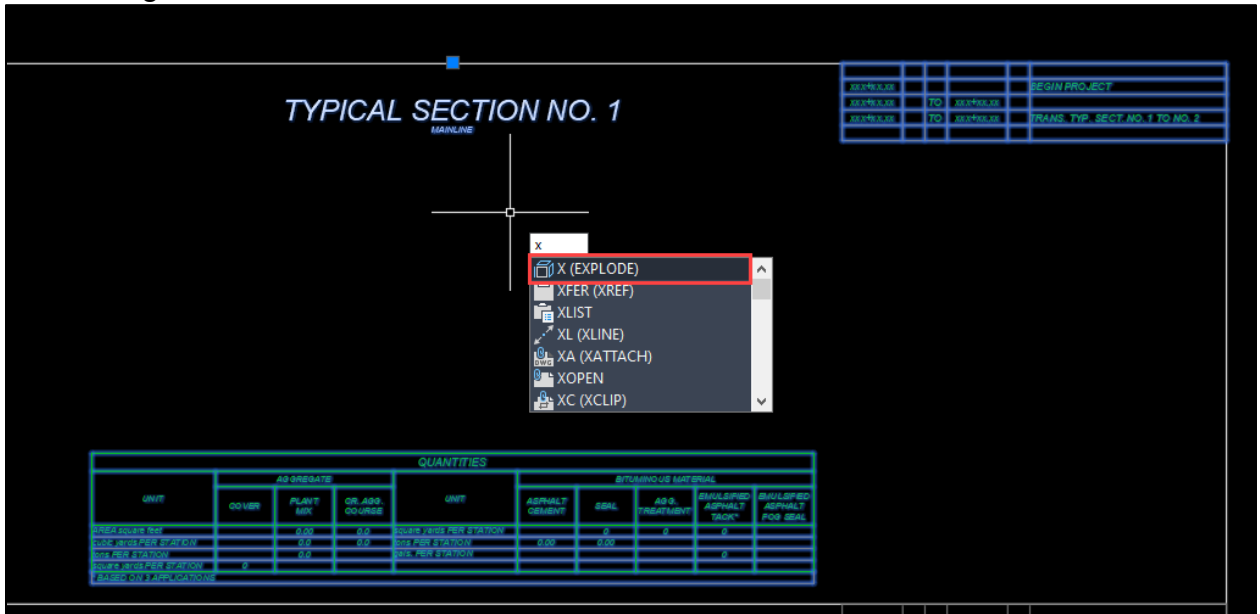
18. Repeat Steps 12 through 16 as necessary.

19. Once complete, **lock** the viewports in each layout to avoid any accidental changing of the viewport scale while switching between the model and paper space. Select the viewport then select the viewport lock button in the **Quick Access** toolbar on the bottom of the screen.



20. In the model space, select the title blocks and explode them by typing **X** then hitting **Enter**.

NOTE: *Explode* the Typical Section title and the Mainline subtitle to a single line text box after **exploding** the block to have it display in paper space. This issue will be fixed in a future version of the State Kit, which pertains to the annotative state being turned on for the font when it is not needed.



21. Double click within the text boxes to edit the text or the tables. If you need to add a new line to the station ranges, select a row of the table, right click, and select **Insert Row Below** or select it from the contextual tab for the table in the ribbon.

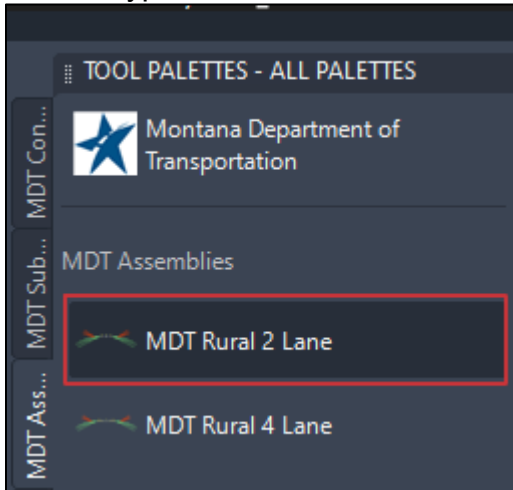


NOTE: A macro for calculating for the typical section surfacing quantities in Civil 3D does not exist, so the quantities must be calculated by hand and manually entered into the tables. The [surfacing calculation spreadsheet](#) on MDT's web page is intended to assist designers in calculating the quantities for pavement sections. [Back to top](#)

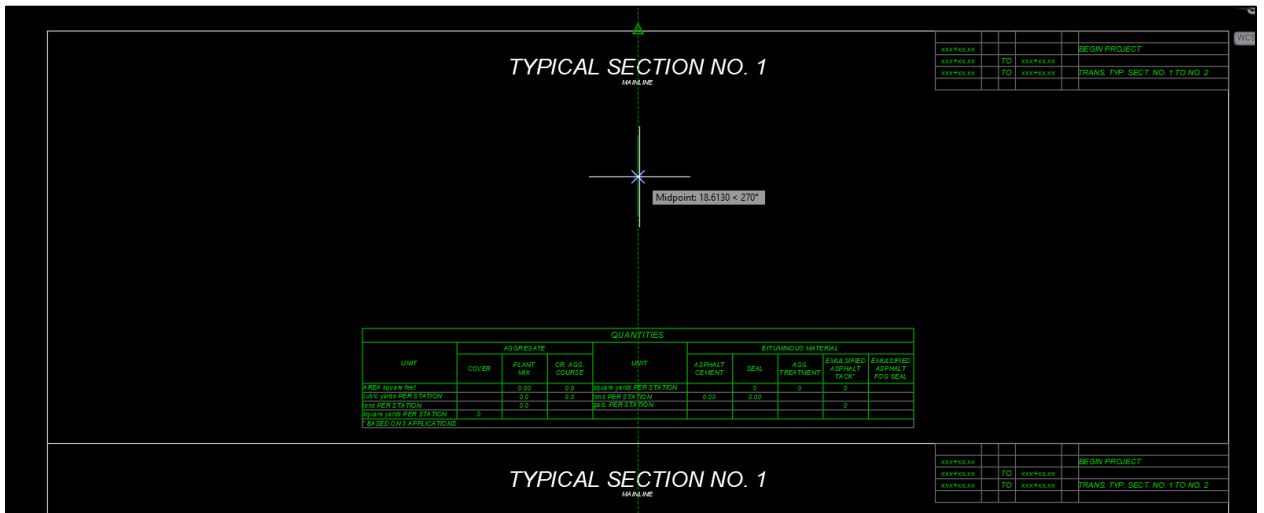
Procedure – Create Typical Sections

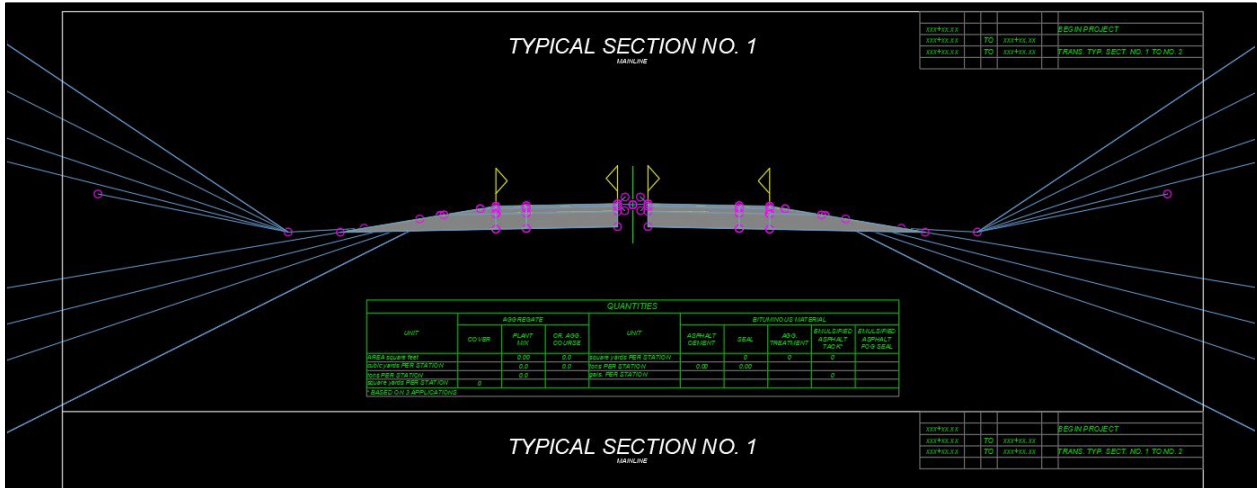
- Using the **MDT Assemblies** located in the State Kit, select the closest appropriate assembly for your needs. In this example, **MDT Rural 2 Lane** was used.

NOTE: Once the basic assembly has been inserted into the drawing, MDT Subassemblies (i.e., curb and gutter) can be added or removed to achieve the desired typical section.

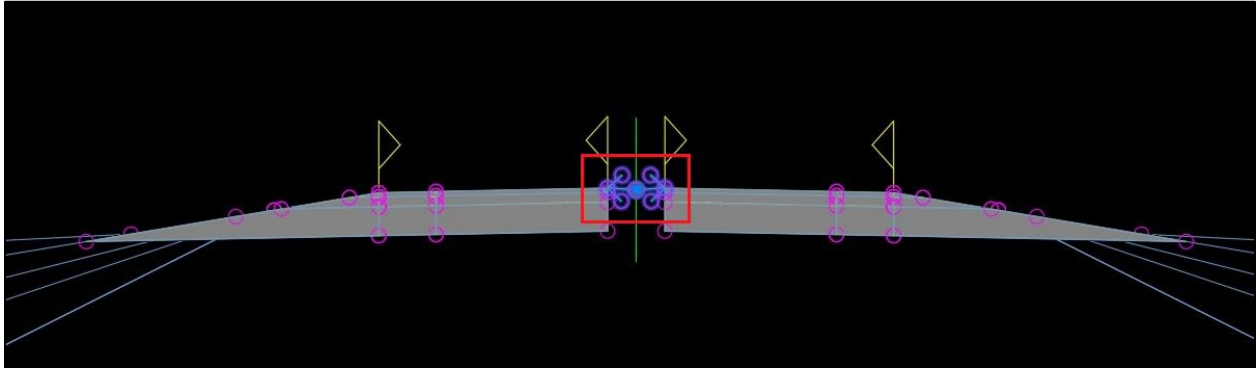


- When prompted for an insertion point, select a point in the approximate center of the top view area. Once the assembly has been placed, press **Esc** to exit the command.

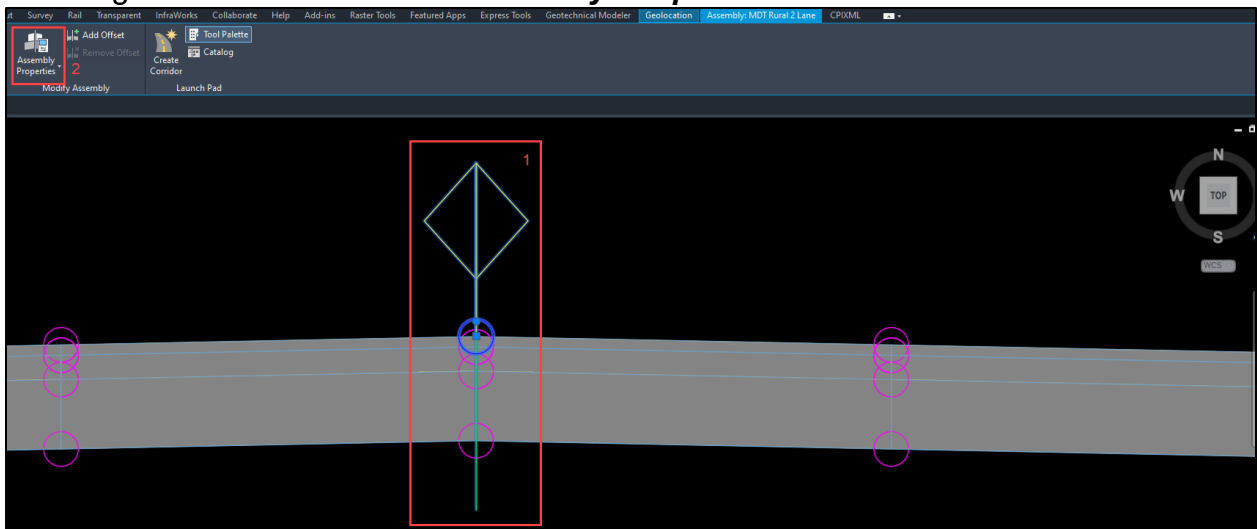




3. Select and delete the MDTPParameterReferences subassemblies at the center of the assembly.

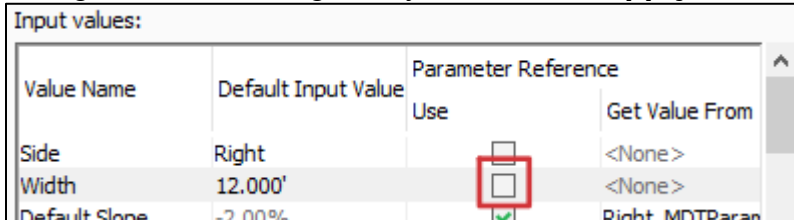


4. Select the center handle of the assembly to open the contextual tab in the ribbon for assemblies. Select **Assembly Properties**. You can also right click after selecting the handle and select **Assembly Properties** from the list.

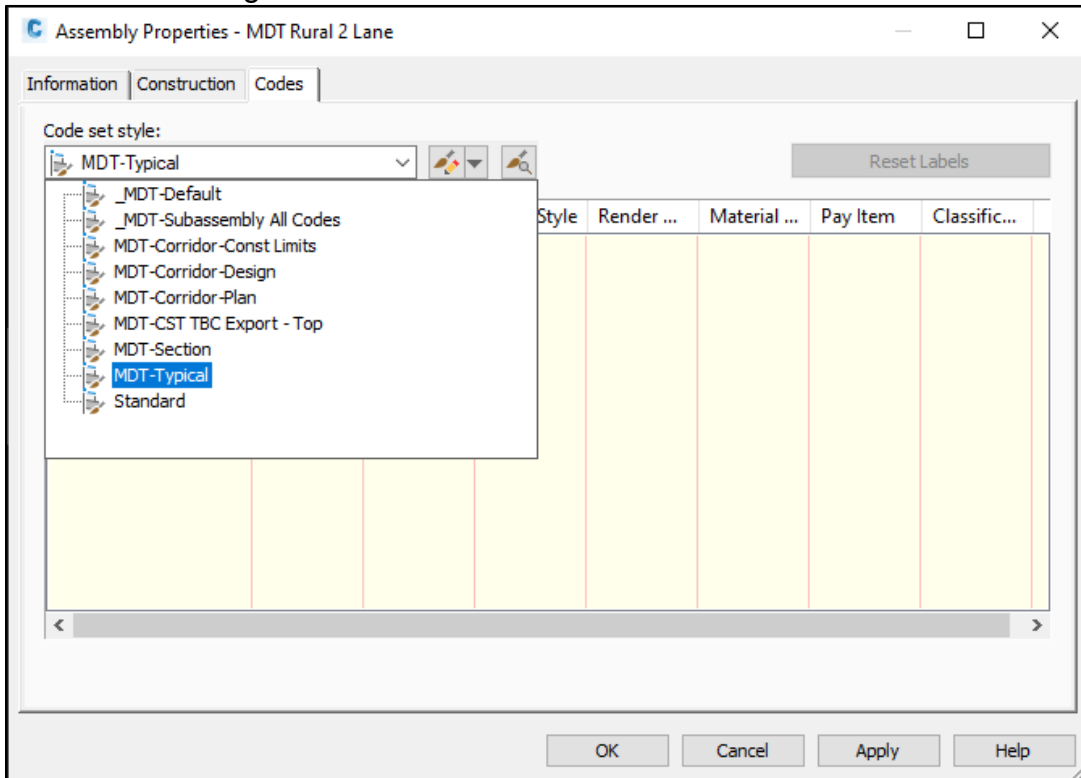


- In the **Assembly Properties** dialog box, select the **Construction** tab. Move through the **Item** list and use the **Input values** section to edit the lane widths and material depths to match the surfacing recommendation for the project. When finished with an item, select **Apply** to make the changes.

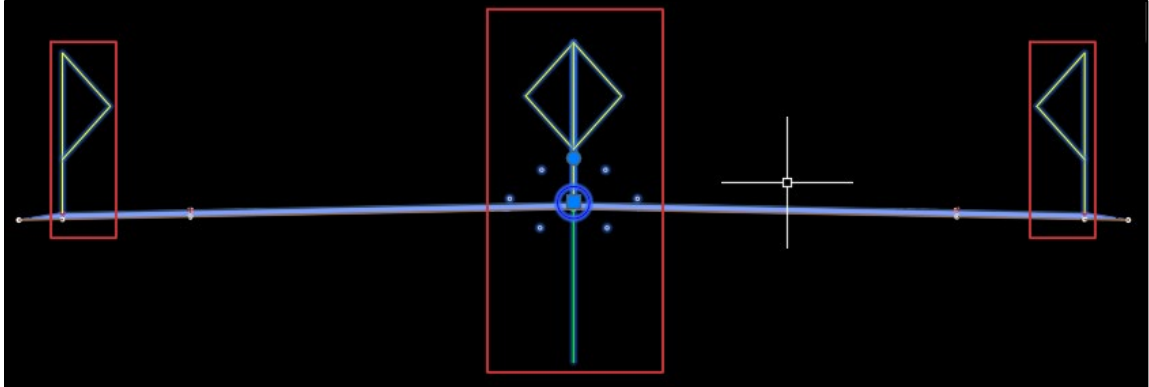
NOTE: To change a property from the default value, the **Use Parameter Reference** box must be unchecked. The value will not change on the **Input values** list until the **Apply** button is selected and the **Item** is changed. The change on the drawing will sync when the **Apply** button is selected.



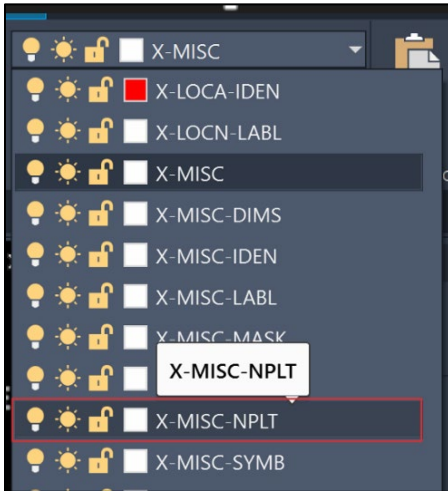
- Under the **Codes** tab of the **Assembly Properties** dialog box, select the drop-down menu for **Code set style**, and select **MDT-Typical**. Select **Apply** and **OK** to close the dialog box.



7. On the assembly in the model space, select the **handles**, **centerline markers**, and **CL point markers**.



8. While the items are selected, navigate to the **Home** tab, and select the drop-down arrow next to the active layer. Change the layer to **X-MISC-NPLT**.



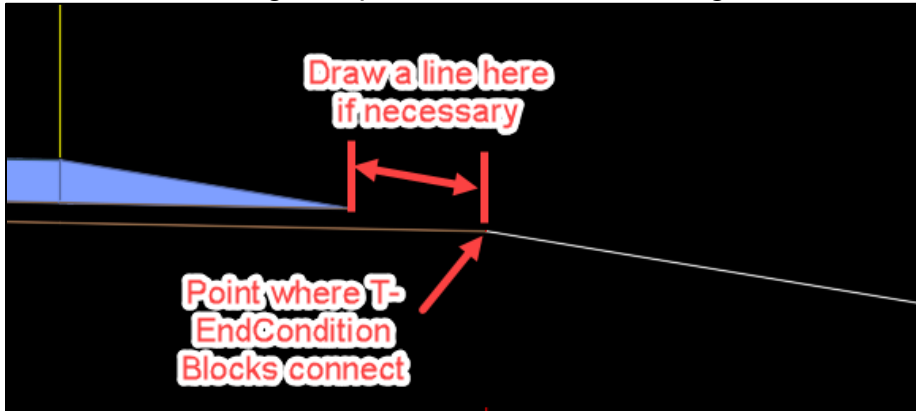
9. Select **Close** in the warning box. The handles may still show in the model space but should not show in the paper space. The resulting typical should look like the image below:



10. Use the **Blocks Palette** to insert the **T-Dimensions** block and attach it by snapping to the crown of the roadway. Insert the **T-EndCondition** blocks as appropriate for the situation.

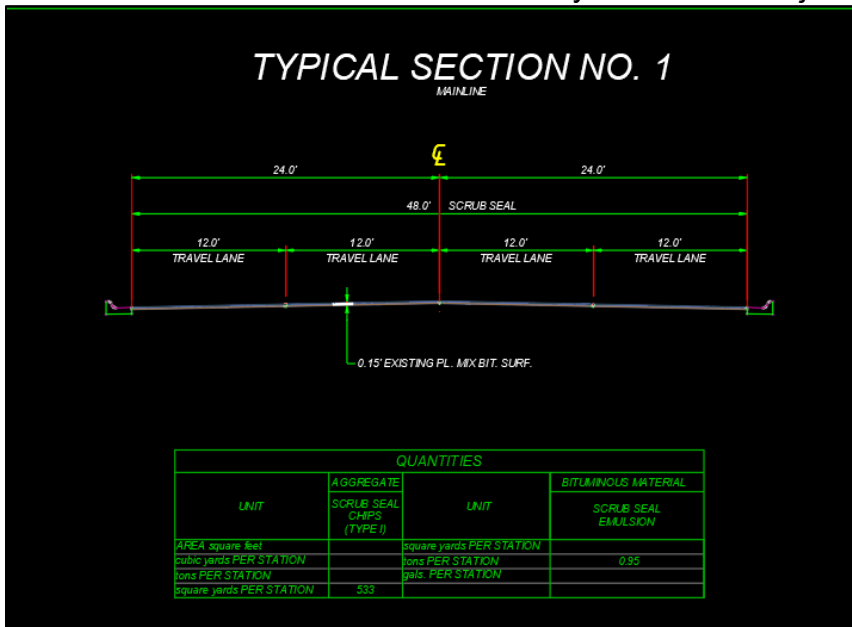


NOTE: The *T-EndCondition* blocks are set up to connect to the edge of the CAC on the inslope, so a line or polyline may need to be drawn to connect the rest of the surfacing inslope, like shown in the image below:



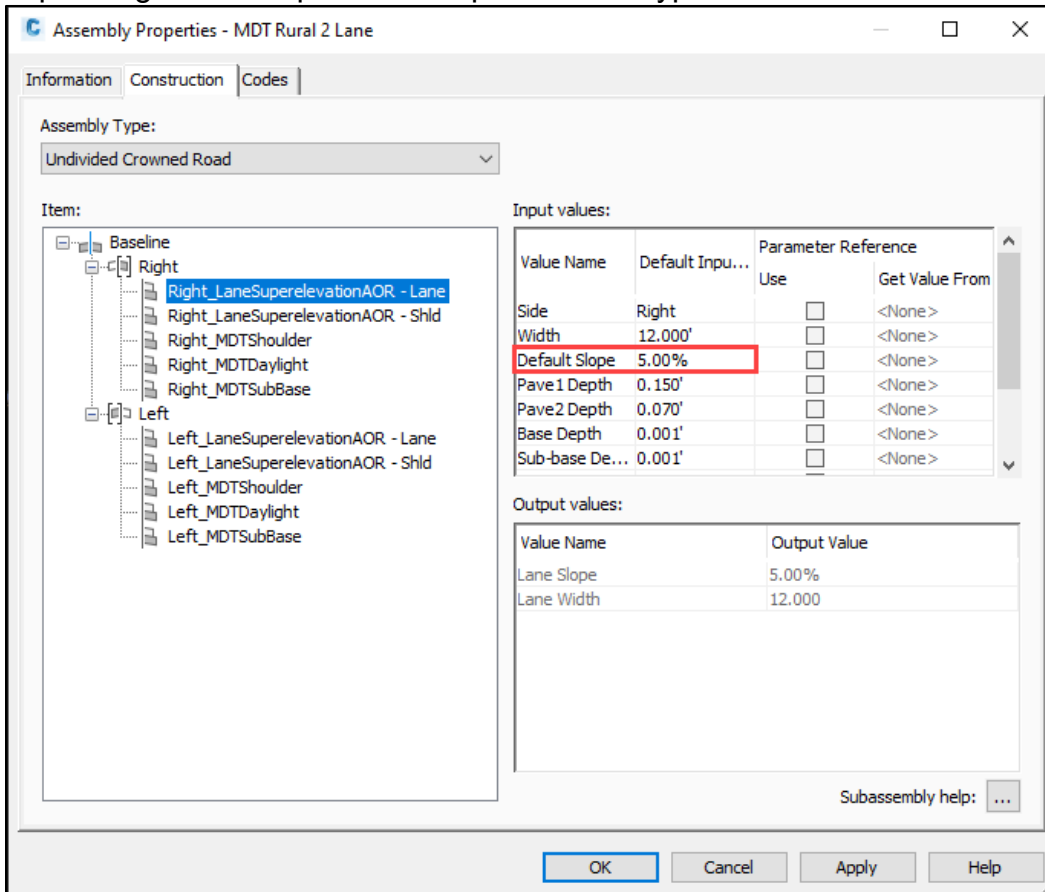
11. Use the *Explode*, *Copy*, and *Move* tools to label the typical sections to the appropriate standards. Snap dimensions to the top surface of the subassemblies to ensure that the leader lines are all the same distance from the surface. When completed the result should look similar to the image below.

NOTE: Each item within an exploded block must be individually adjusted and moved. If tables or dimensions are exploded down too many levels, each text and dimension will have to be individually moved and adjusted.



12. For superelevated sections, change the **Default Slope** input value of each subassembly to meet the desired superelevation slope.

For example, a left curve with a maximum superelevation of 5% would need to be changed to -5% on the left side slopes and +5% on the right side slopes. Delete the Quantities block and instead insert the **T-TableSuperelevation** block. Snap it to the midpoint of either the horizontal border or the bottom border, depending on which panel the superelevated typical is located.

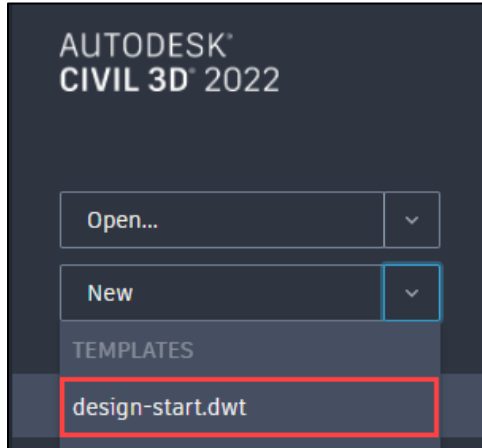


[Back to top](#)

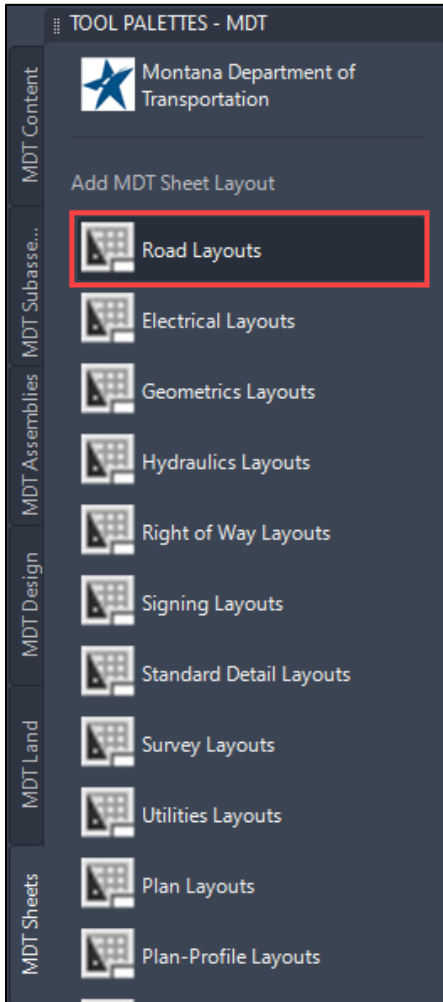
Section IV. Summary Frames

Procedure – Civil 3D File Setup

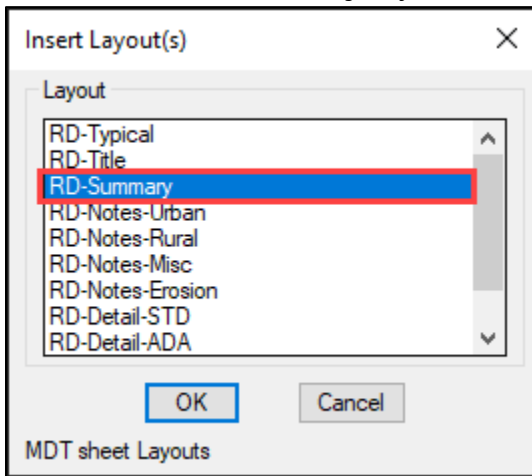
1. Create a new file using the **design-start.dwt** template. Save it as **[UPN#]RDSUM001.dwg** (for example, 9422000RDSUM001.dwg) in the RD directory of the project on BIM 360. Use **CTRL+S** or navigate to the C3D icon in the top left and save the file.



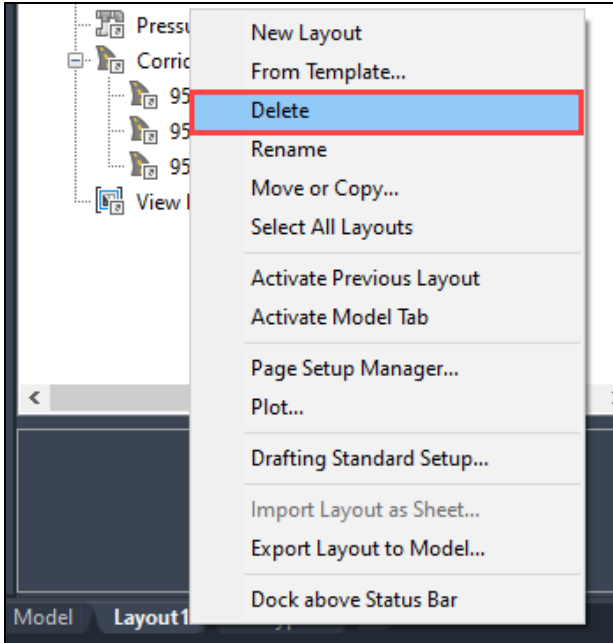
2. Create a new layout using the **Road Layouts** within the **MDT Sheets** tab of the **MDT Tool Palette**.



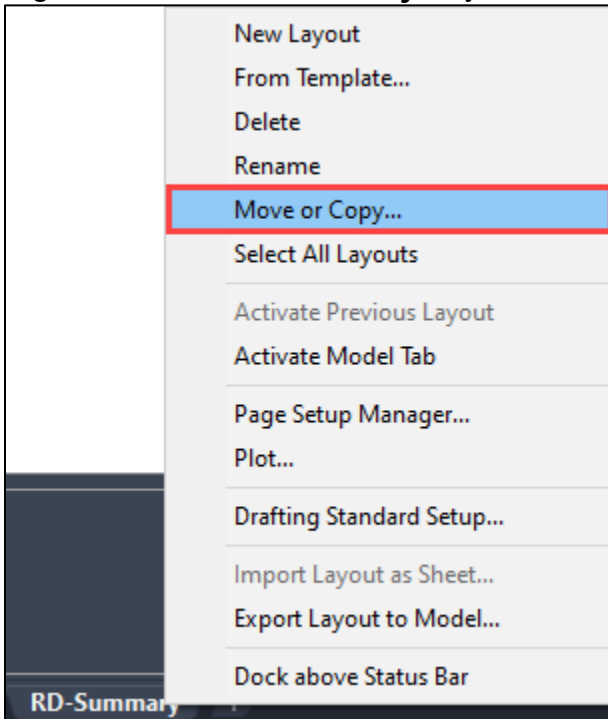
3. Select the **RD-Summary** layout.



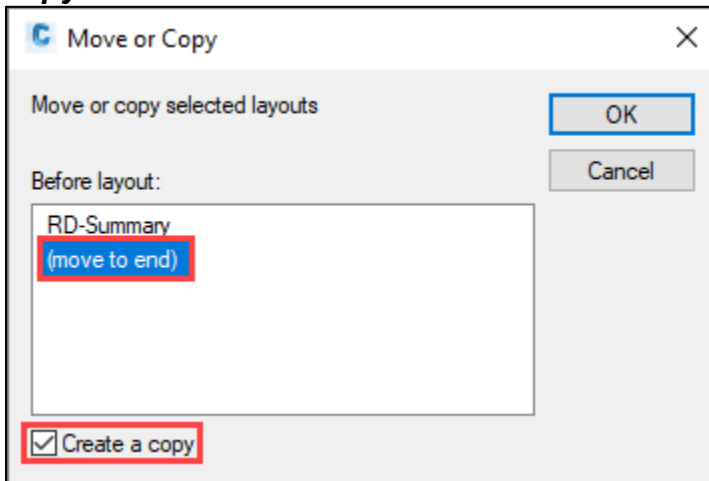
4. Delete the default **Layout1** from the drawing to clear up space by right clicking the layout and selecting **Delete**.



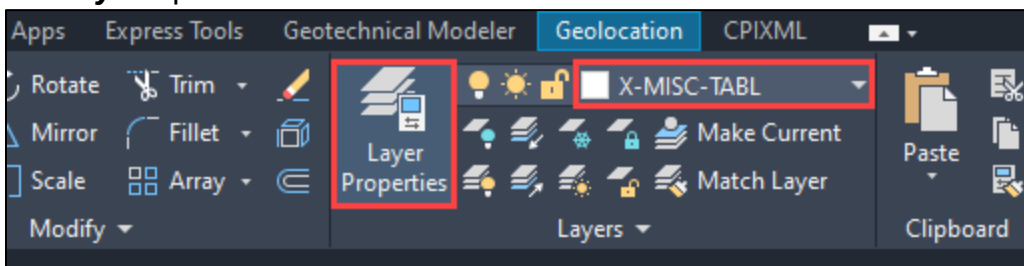
5. Copy Layouts: Copy the **RD-Summary** layout to create more layout sheets. Right click the **RD-Summary** Layout and select **Move or Copy...** from the list.



- In the **Move or Copy** dialog, select **(move to end)**, and check the **Create a copy** box. Then select **OK**.



- Right click the newly created layouts and select **Rename**. **Rename** the layout tabs as **RDSUM001**, **RDSUM002**, etc. as necessary.
- Set the active layer to **X-MISC-TABL** by selecting it from the layer dropdown in the **Layers** panel on the **Home** tab.



- Type the command **OLEFRAME**, press **Enter**, and change the variable to <2> by typing **2** then hitting **Enter**. This allows the frames to display grip handles but will not plot the border frame. Changing the value to 1 will plot the border frame.

NOTE: Because this process pertains to a system variable and not a file, it only needs to be completed once. It will also need to be completed each time after updating the State Kit.

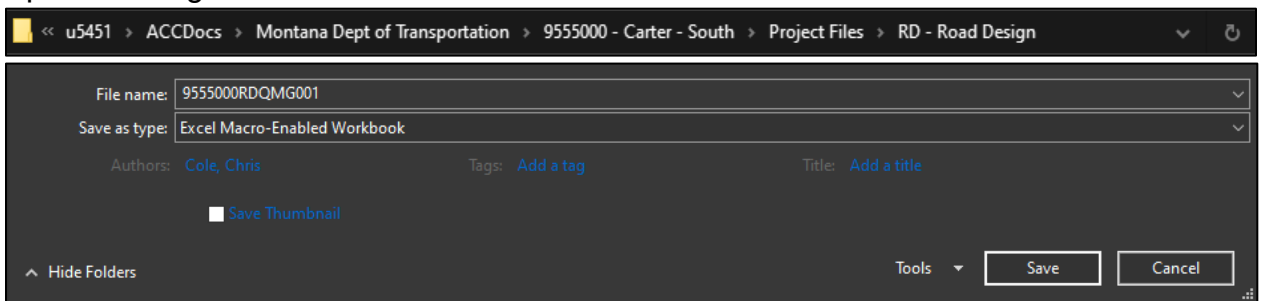
[Back to top](#)

Procedure – Excel Quantity Manager File Setup

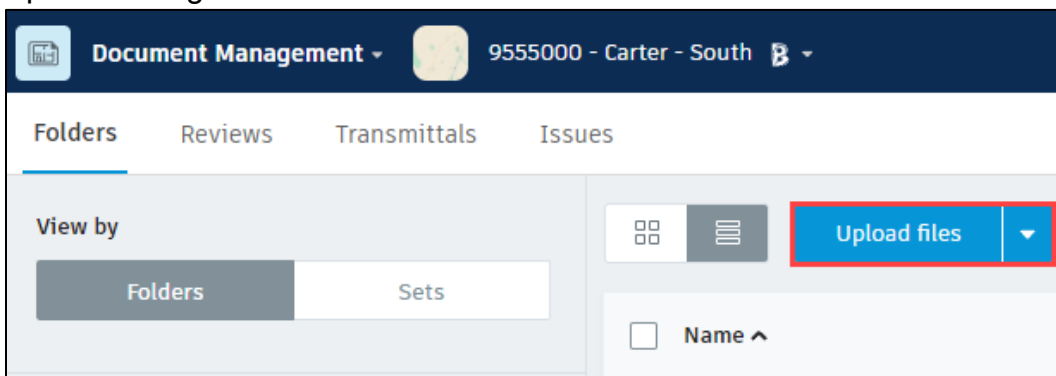
1. Create a new Excel Quantity Manager sheet by navigating to the **Road Design** page on the MDT Intranet and selecting the **Excel Quantity Manager** link under the **Estimating** header and follow the instructions on the page, or by opening Microstation and selecting **Road Tools > Summary Sheets > Create Excel QMG File**.
2. Save the file as **[UPN#]RDQMG001.xlsx** and browse to the RD directory within the project through ACCDocs or save the file locally and upload the file to BIM 360 via the web version.

NOTE: Saving the file to BIM 360 will allow dynamic updates in the summary sheets as information is edited in the Excel workbook.

Upload through Autodesk Docs:

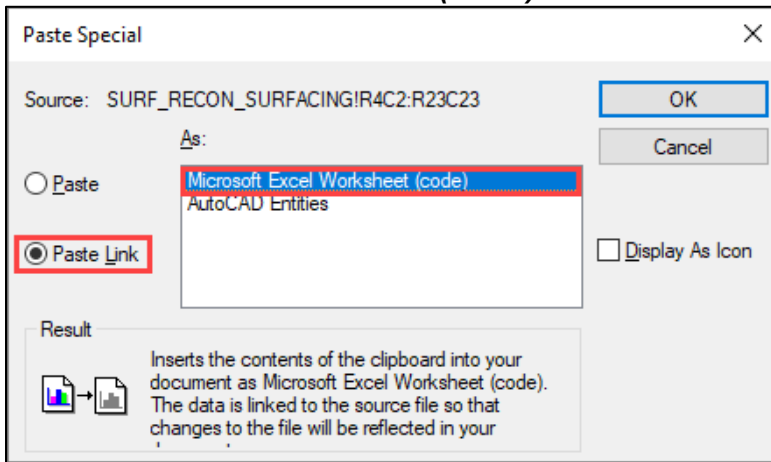


Upload through the web:

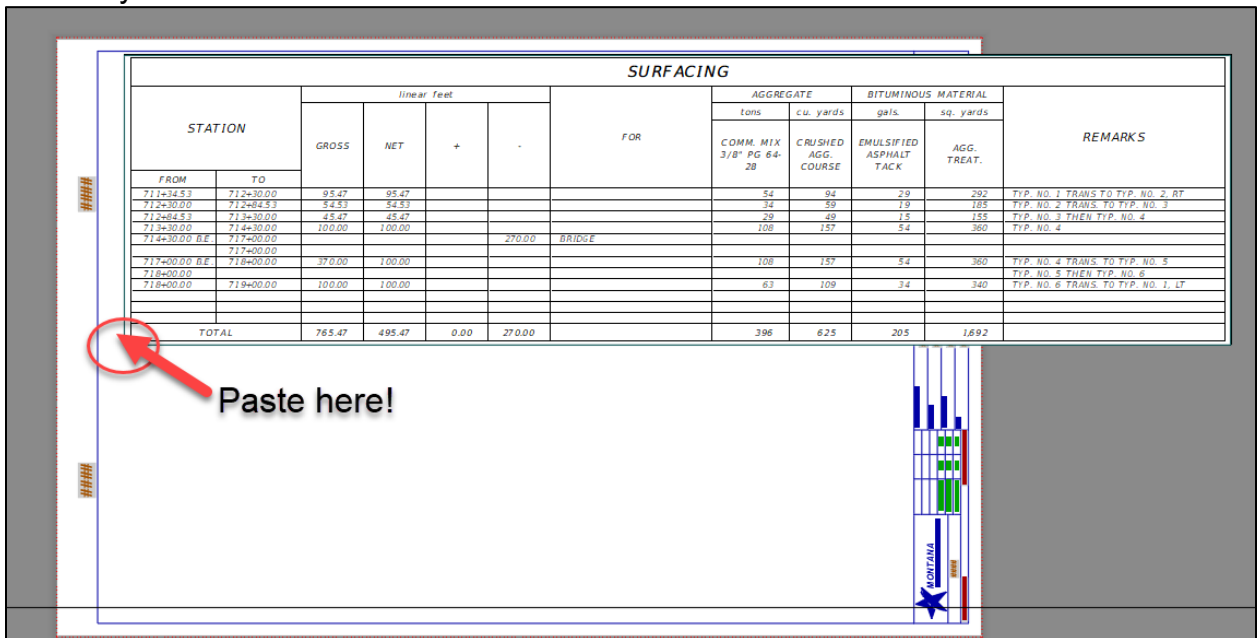


3. Fill out the summary frames in the Excel workbook to meet the project needs.
[Back to top](#)

- In the **Paste Special** dialog box, select **Paste Link** and set the source as **Microsoft Excel Worksheet (code)**. Then select **OK**.

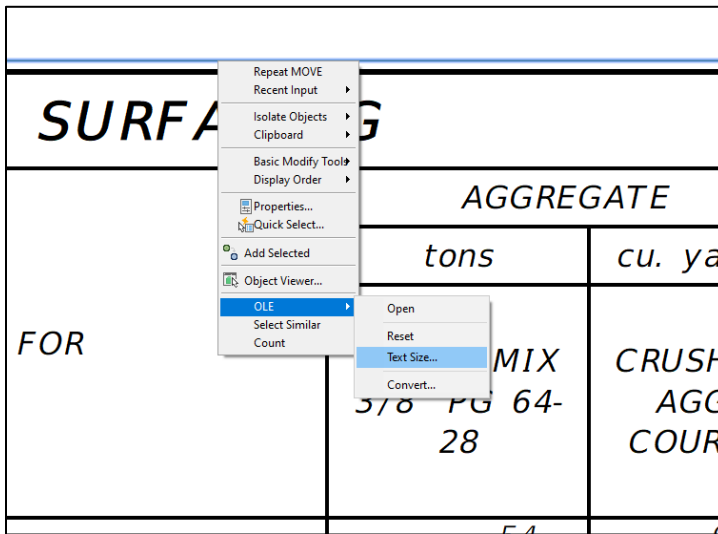


- Select a point in paper space on the **RDSUM001** layout tab to paste the linked summary frame.

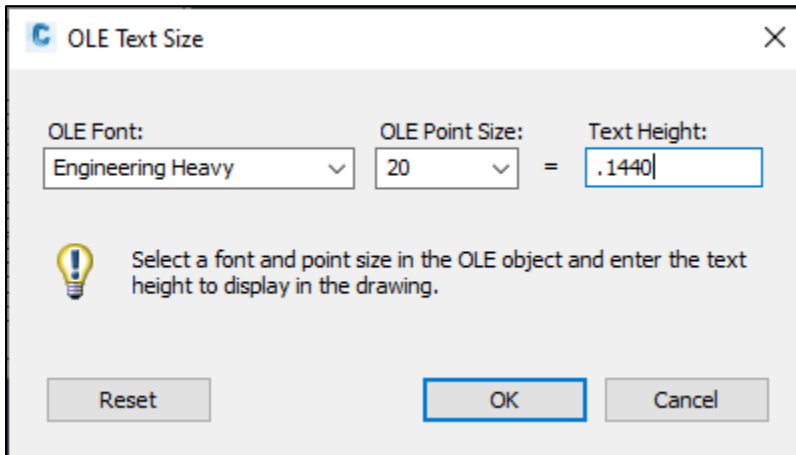


NOTE: The OLE will be too large for the summary sheet and must be scaled to fit.

8. Select the summary frame, right click, and hover over **OLE** and select **Text Size...**



9. Set the text size to **OLE 20 = Text Height 0.1440** for the Engineering Heavy font.



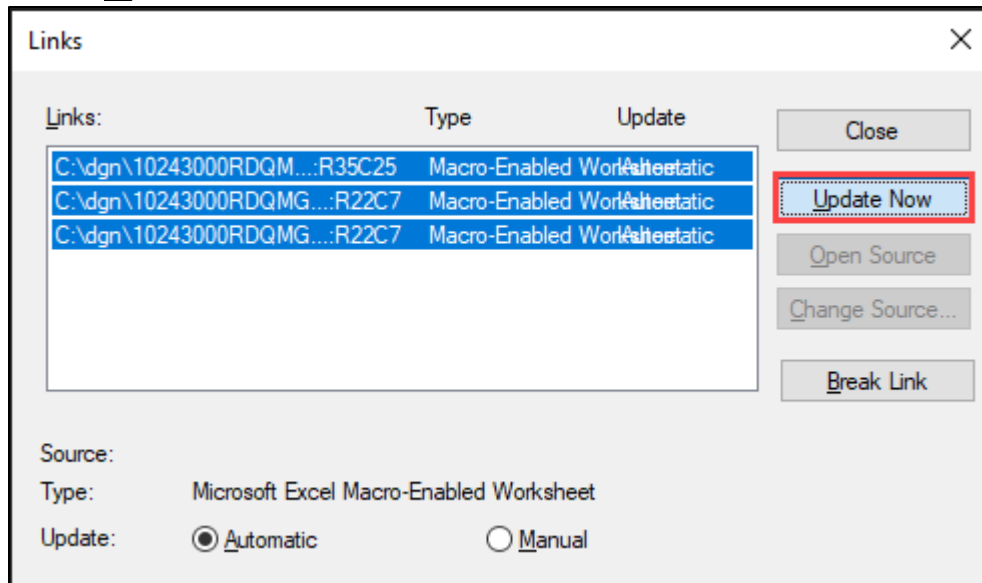
NOTE: The font displayed in the OLE Text Size window is the typically largest text size detected in the linked Excel spreadsheet. Updating any font text height will update all other font text heights in the OLE. Use the following table for converting text heights other than OLE Point Size 20:

OLE Point Size	OLE Text Size
12	0.0867
14	0.1011
16	0.1156
18	0.1300
20	0.1444
22	0.1589
24	0.1733

10. Repeat Steps 4-9 and paste into the additional layouts as necessary.
11. After the summary frames have been imported and scaled into the layout, arrange them by using the **Move** command under the **Modify** panel in the **Home** tab, typing **MOVE** then pressing **Enter**, or by holding a left click and dragging the linked summary frame to its desired location in the paper space.

NOTE: Linked OLEs should update automatically after saving changes in Excel. If the OLEs do not update, perform the following steps:

- a. Type the command **OLELINKS** and press **Enter**.
- b. In the popup box, select all the links using a shift select, or select a specific frame that needs to be updated.
- c. Select **Update Now**.

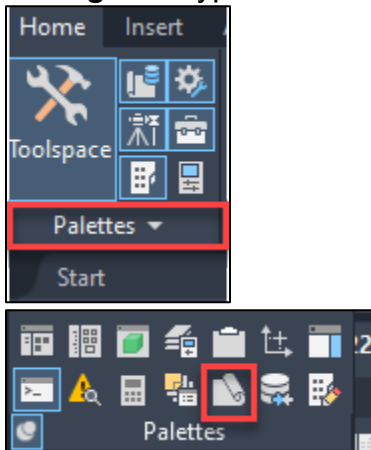


- d. When the update is complete, select **Close**.
[Back to top](#)

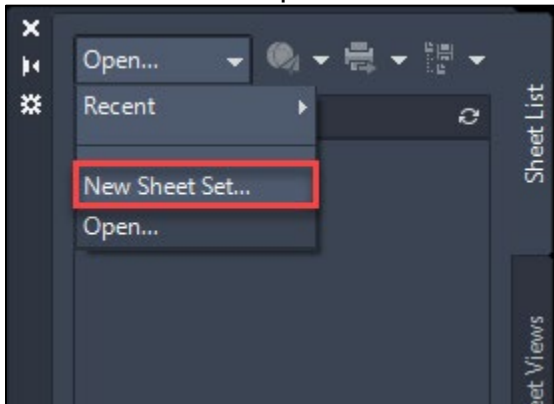
Section V. Sheet Set Manager (SSM)

Procedure – Create a Sheet Set

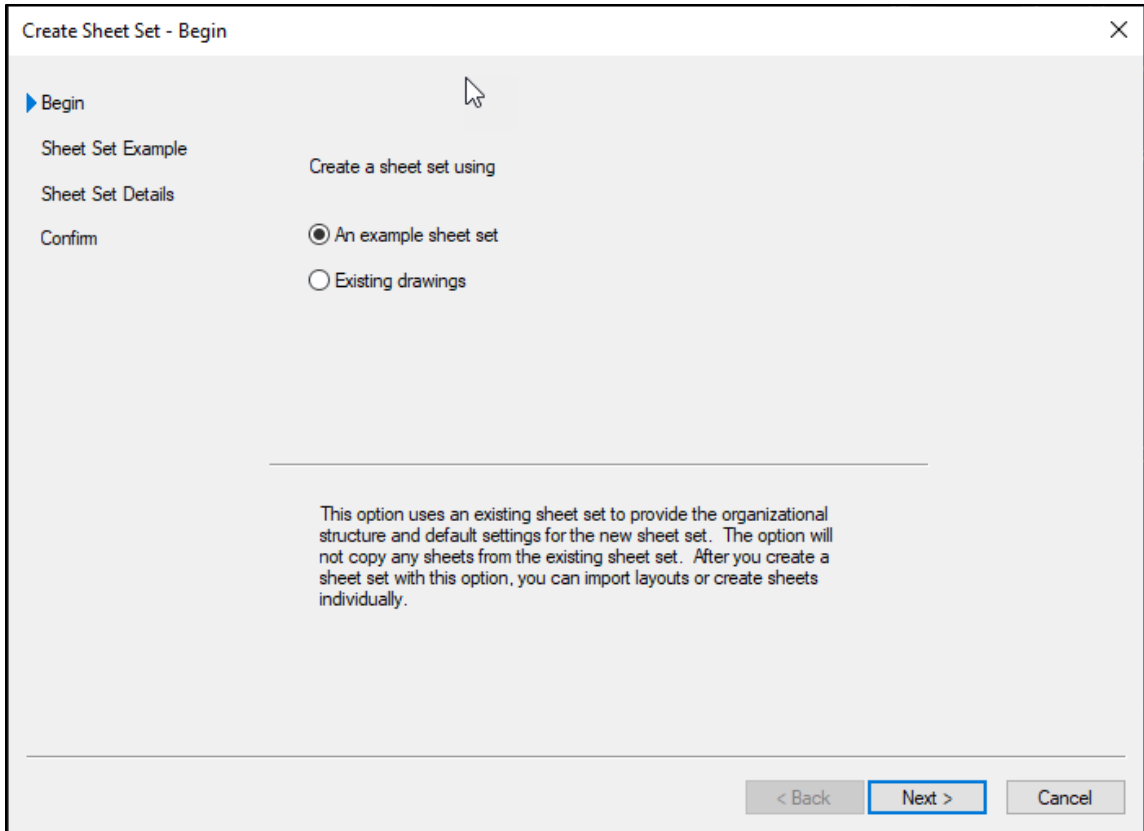
1. In the **Home** Tab select the **Palettes** drop down menu and open **Sheet Set Manager** or type the command **SSM**.



2. In the **Sheet Set Manager** select the **Open...** drop down menu and select **New Sheet Set...** This opens the **Create Sheet Set** wizard.

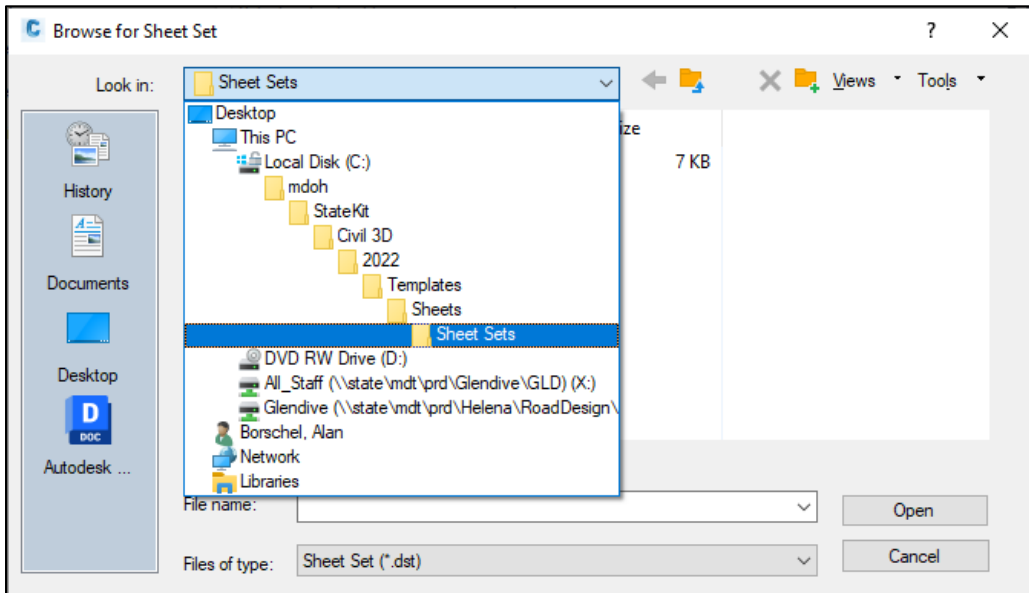
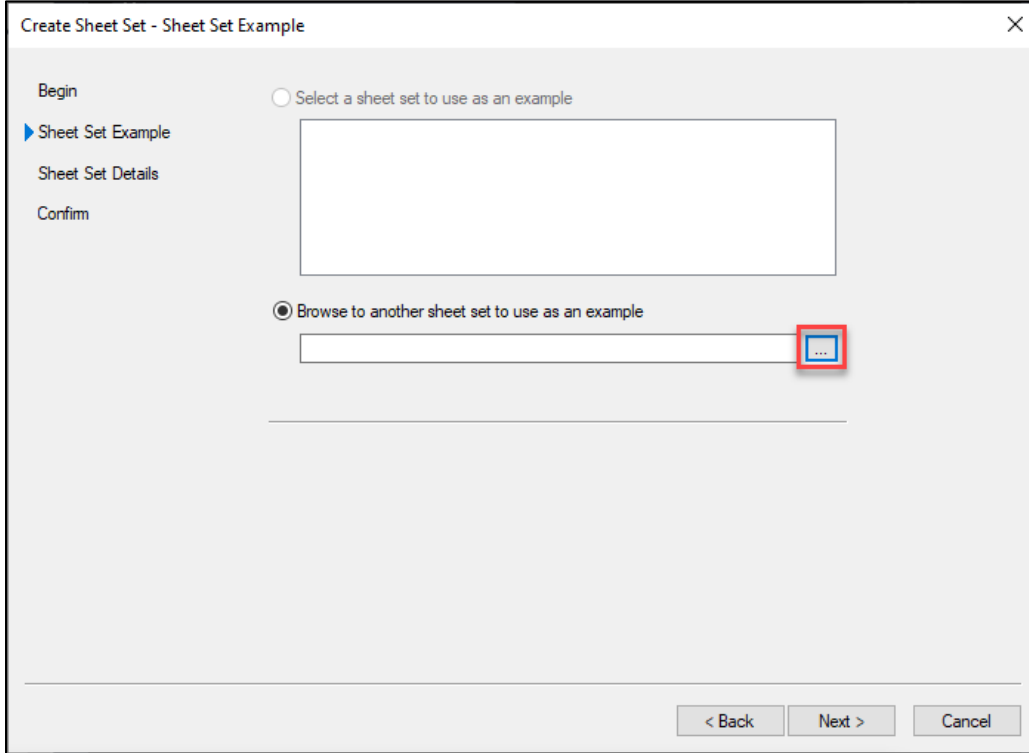


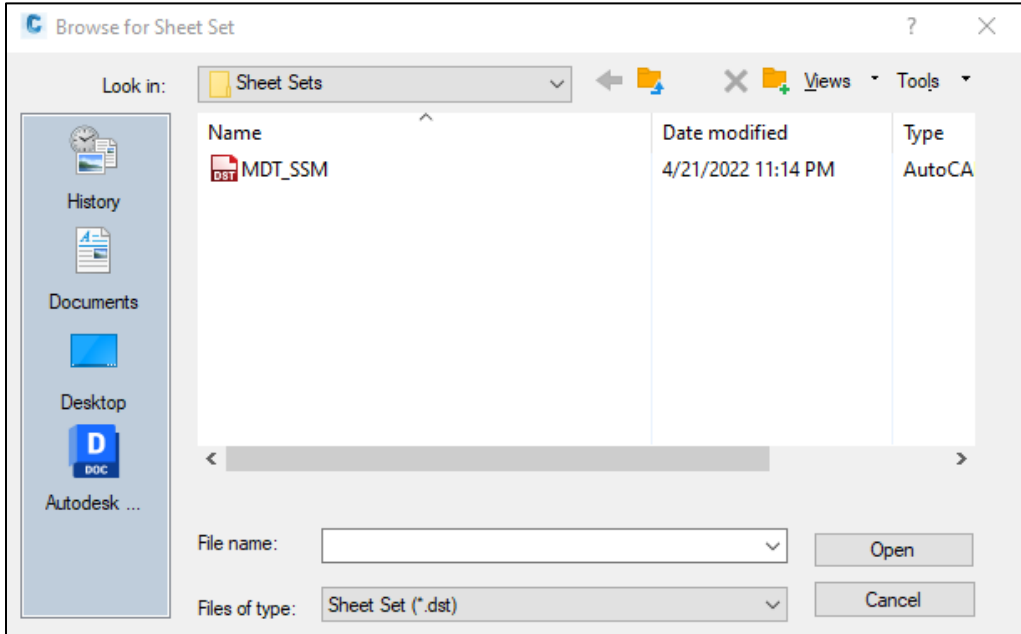
3. In the Begin tab of the wizard, select create a sheet set using **an example sheet set**. Then select **Next**.



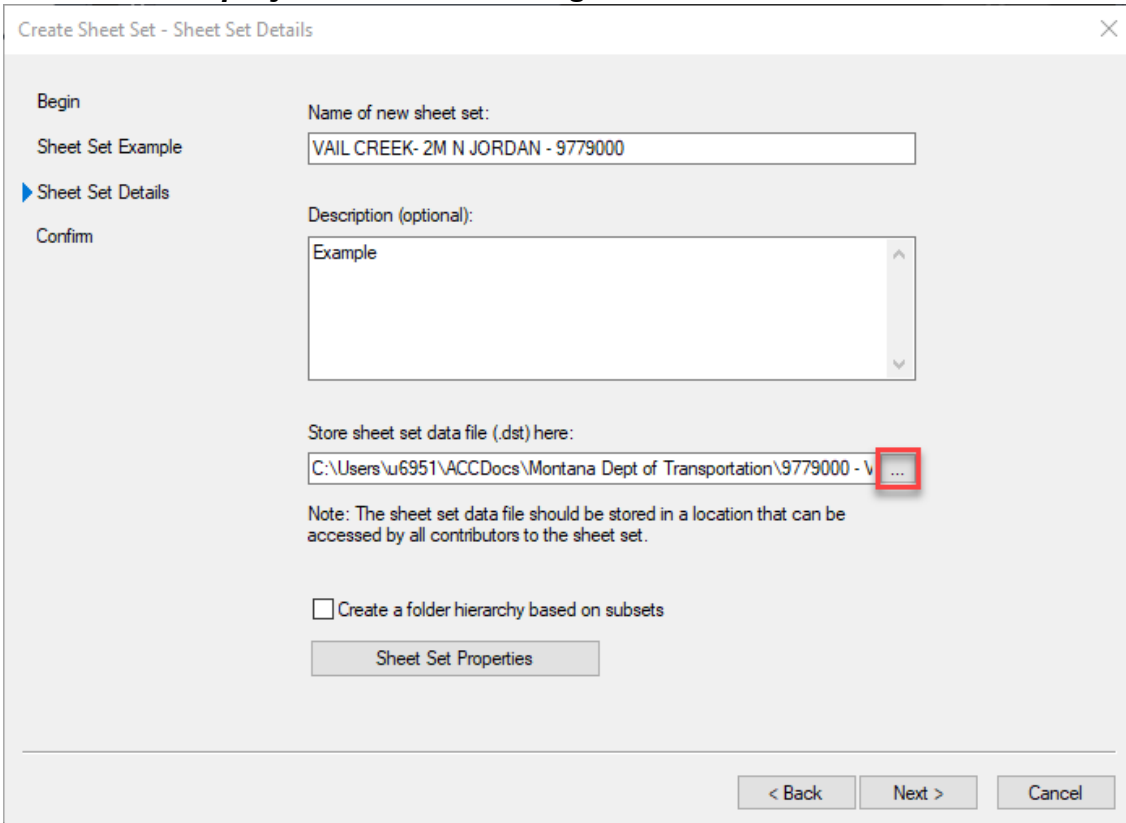
- In the **Sheet Set Example** tab, select the toggle next to **Browse to another sheet set to use as an example** and select **MDT_SSM** as the sheet set example. If it is not already set, select the ellipsis, and navigate to the following location:

C:\mdoh\StateKit\Civil 3D\2022\Templates\Sheets\Sheet Sets.

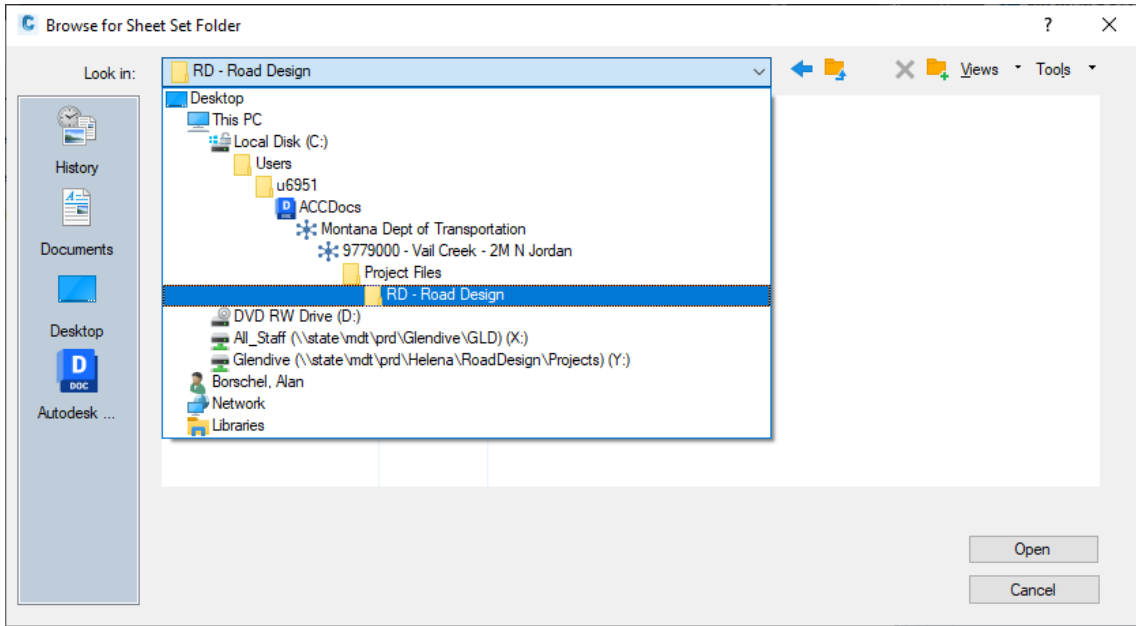




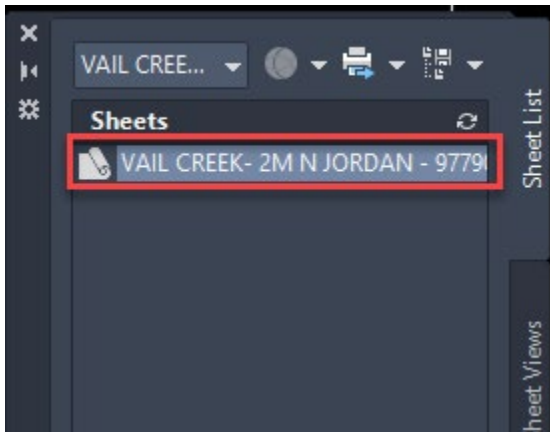
5. In the **Sheet Set Details** tab, name the sheet set and add a description if needed. Use the ellipsis to set the location for the sheet set data file and browse to the **BIM 360 project RD - Road Design folder**.



Montana Department of Transportation - Plans Production for Pavement Preservation Projects in Autodesk



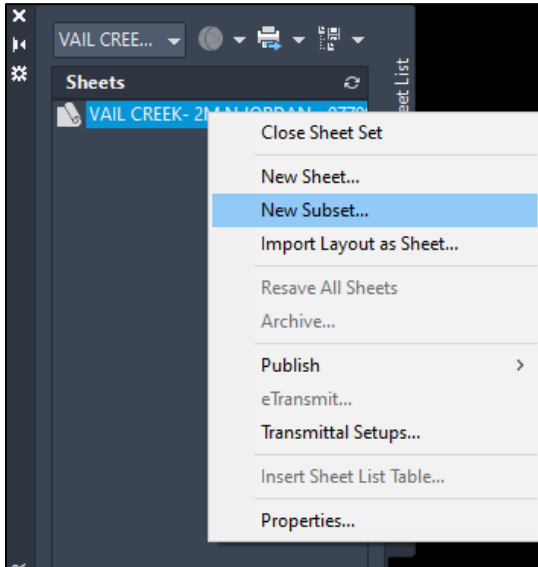
6. In the **Confirm** tab, verify that the settings are correct and click **Finish** to create the Sheet Set.



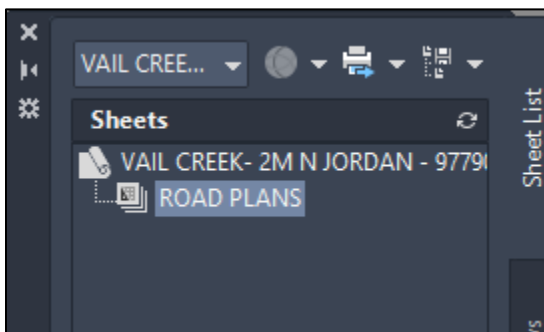
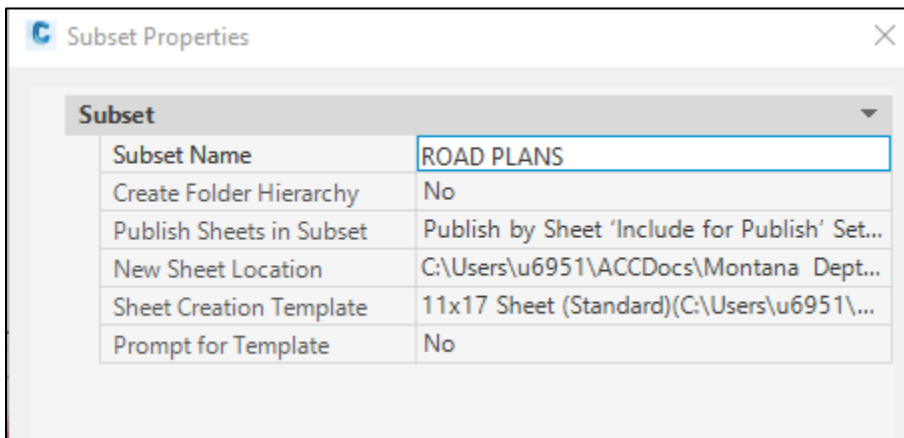
[Back to top](#)

Procedure – Create a Subset

1. Right click on the Sheet Set in the **Sheet Set Manager** and select **New Subset...**



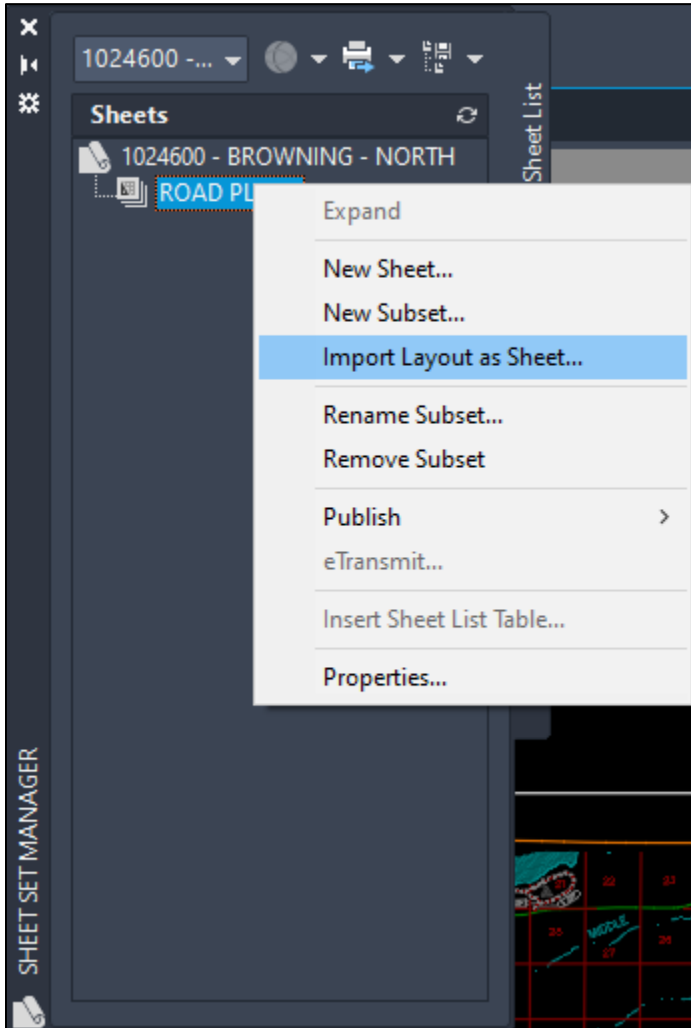
2. Set the Subset name as **ROAD PLANS** and select **OK** to create the Subset.



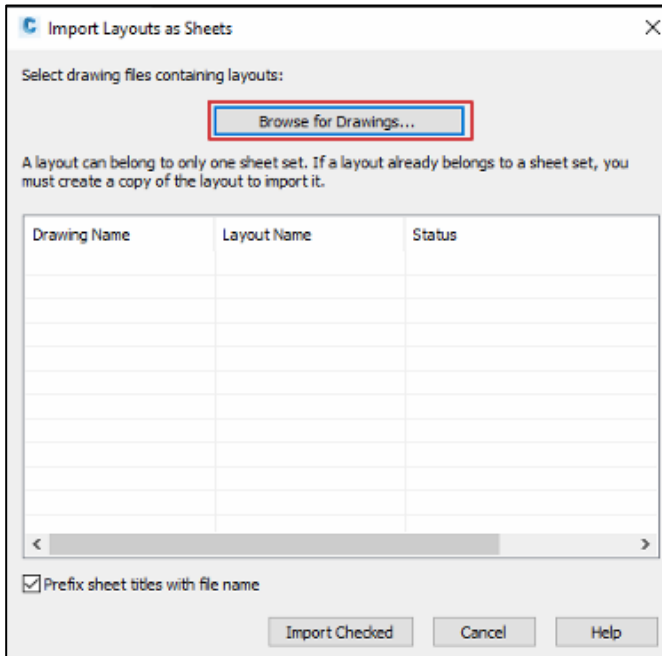
[Back to top](#)

Procedure – Add Sheets to the SSM

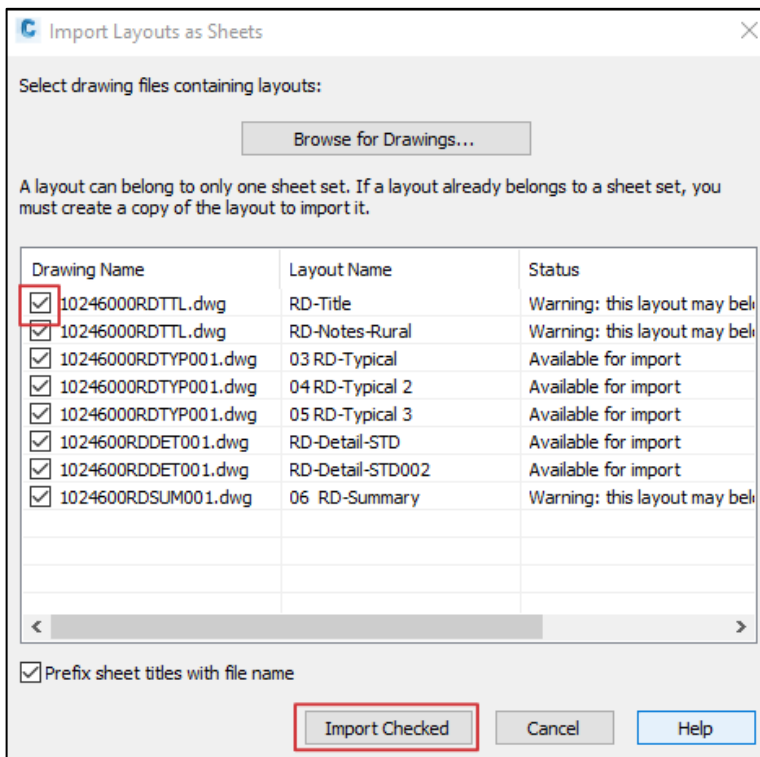
1. Right click on the Subset in the **Sheet Set Manager** and select **Import Layout as Sheet...**



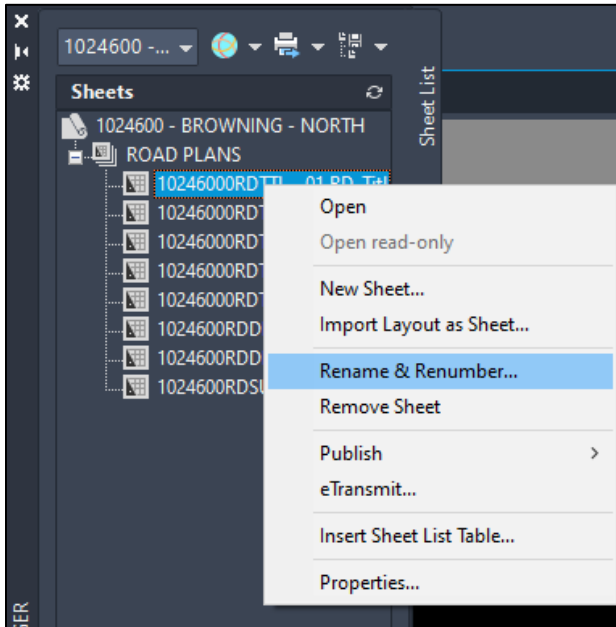
- In the **Import Layouts as Sheets** dialog box, select **Browse for Drawings....** Navigate to the location of the project drawings. Using shift or control, select all the drawings containing the desired layouts for plotting and select **Open**.



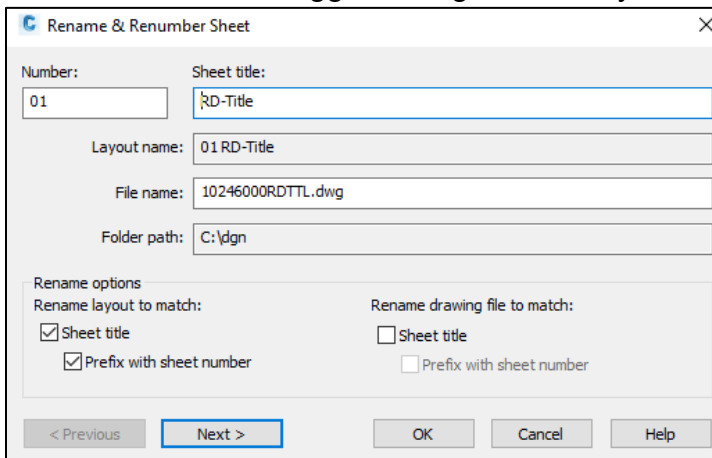
- Use the checkboxes to select the layouts necessary for plans. Then select **Import Checked**.



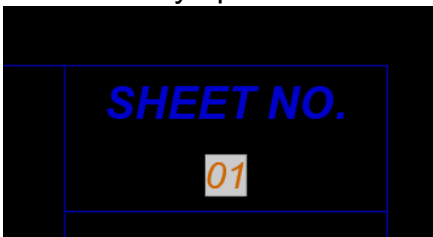
- Once the layouts are imported, the sheet order and numbers can be changed by right clicking on the sheet and selecting **Rename & Renumber...**



- In the **Rename & Renumber Sheet** dialog box, rename and renumber the sheets as desired. Toggle through sheets by selecting the **Next >** button.



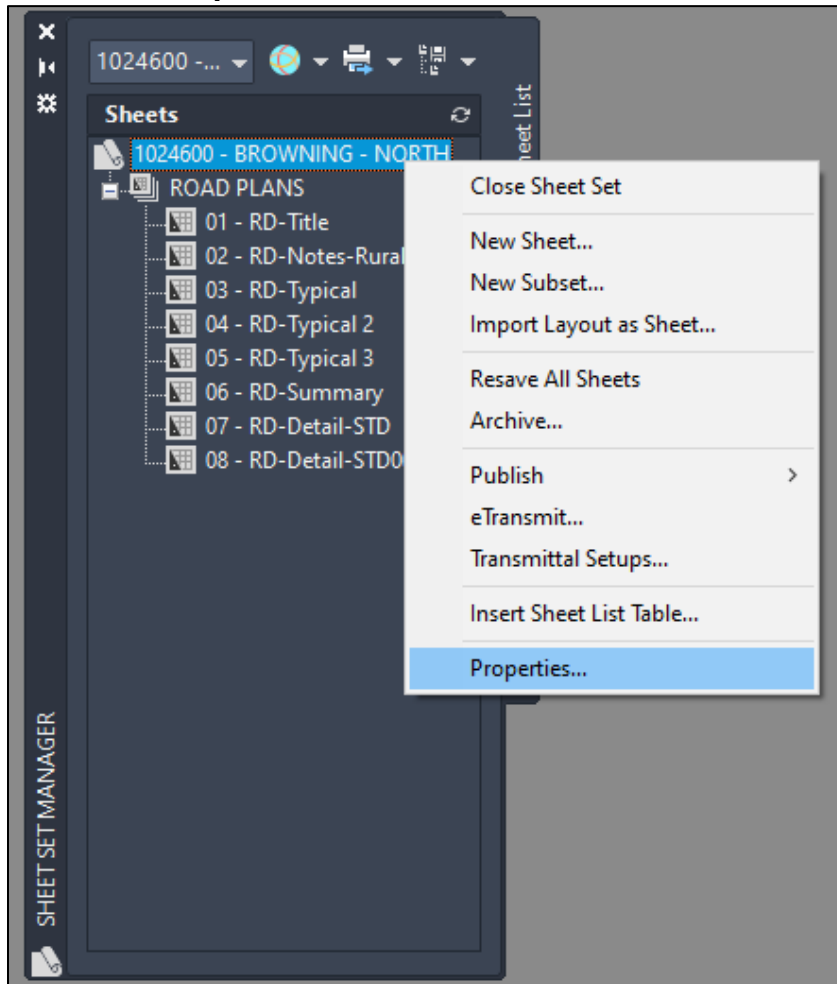
NOTE: The process of renaming and renumbering the sheet will automatically populate sheet numbers on the layouts as seen below. These numbers will automatically update if a sheet is moved within the sheet set.



[Back to top](#)

Procedure – Edit Project Information in the SSM

1. To edit project information, right click on the sheet set in the **Sheet Set Manager** and select **Properties....**



- Fill in project information by double clicking into fields to edit.

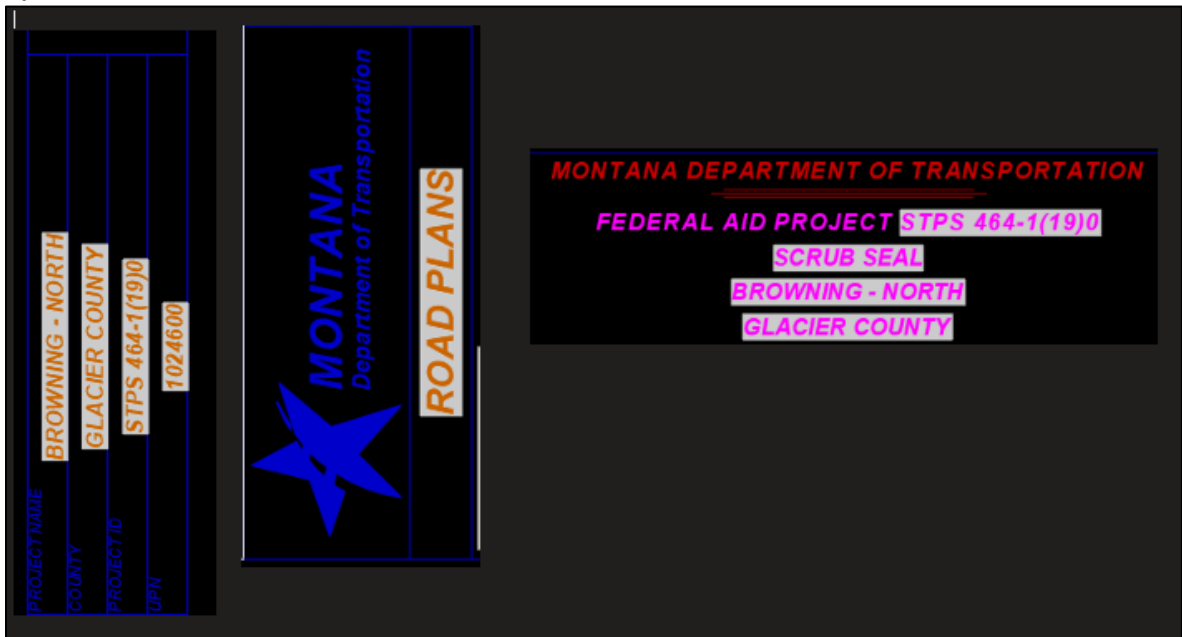
Sheet Set	
Name	BROWNING NORTH - 10246000
Sheet set data file	C:\Users\u5451\Documents\BROWNING NORTH -...
Description	
Model view	
Label block for views	
Callout blocks	
Page setup overrides file	C:\mdoh\StateKit\Civil 3D\2022\Templates\Sheets\...

Project Control	
Project number	10246000
Project name	BROWNING - NORTH
Project phase	PRELIMINARY
Project milestone	FPR

Sheet Creation	
Sheet storage location	C:\Users\u5451\Documents
Sheet creation template	MDT_PlanProfile_200(C:\mdoh\StateKit\Civil 3D\20...
Prompt for template	Yes

Sheet Set Custom Properties	
01_FED_AID_NO	STPS 464-1(19)0
02_PROJECT_DESC	BROWNING - NORTH
03_PROJECT_COUNTY	GLACIER COUNTY
04_DESIGNER_NAME	K. LABONDE
05_DESIGNER_DATE	08/2023
06_REVIEWER_NAME	FIRST INITIAL LAST NAME
07_REVIEWER_DATE	MM/YYYY
08_CHECKED_NAME	FIRST INITIAL LAST NAME
09_CHECKED_DATE	MM/YYYY

- Once all the appropriate project information has been entered, select **OK** to close the dialog box. This will auto-populate information on the blocks of every sheet including the project name, county, project ID, UPN, and work group. It will also update the title on the title sheet.

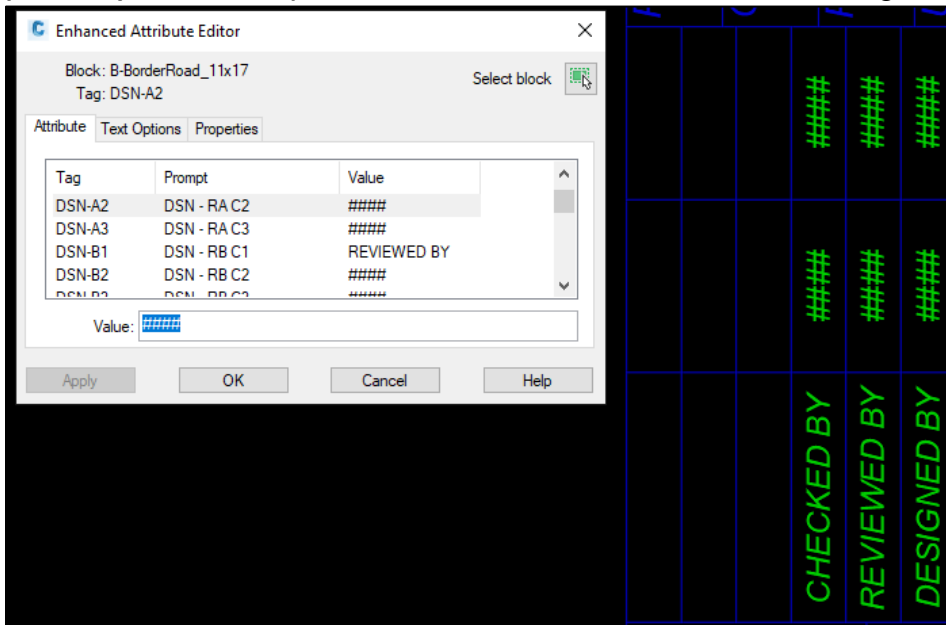


NOTE: It is important that you do not edit or delete the fields underneath the ***Project Control*** or ***Sheet Set Custom Properties*** within the borders, as the fields are tied to the ***Sheet Set Manager***. If the fields no longer have a box around them, the association has been lost and the border block will need to be replaced with the standard border block in the layout to bring the associated fields back.

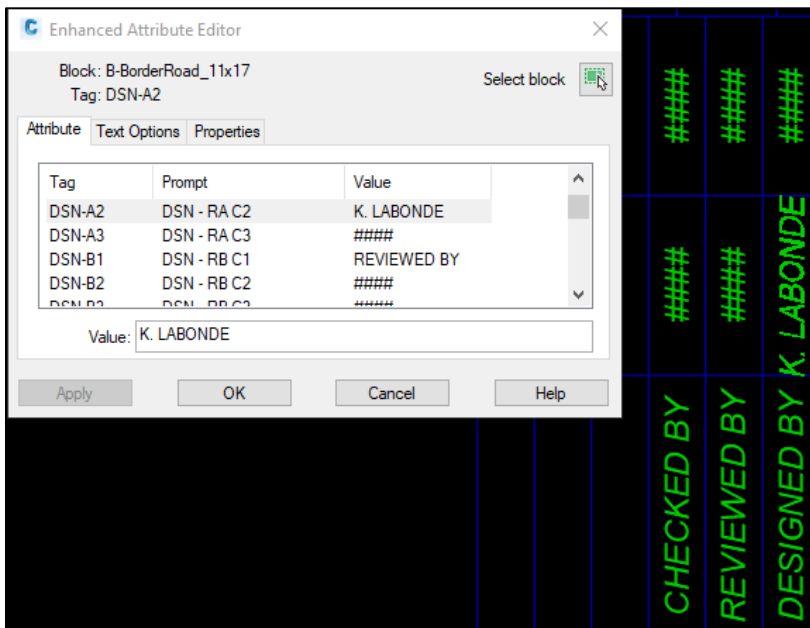
[Back to top](#)

Procedure – Edit Other Sheet Information

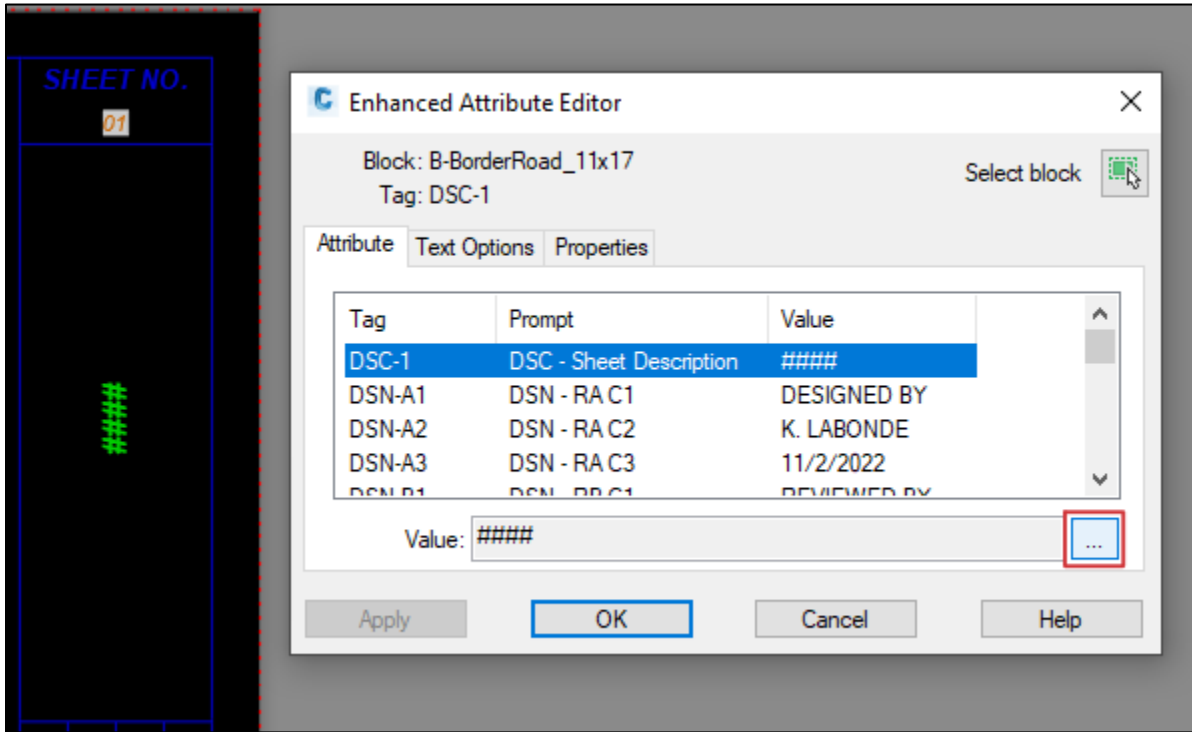
1. Each sheet will have information that will need to be hand-edited. This includes the *Checked by*, *Reviewed by*, *Designed by* name and date attributes, and the sheet description attribute. To edit these, double click on the place holders (#####). This will open the **Enhanced Attribute Editor** dialog box.



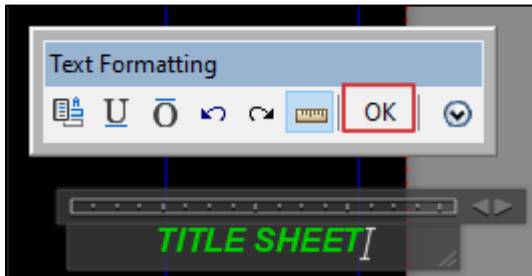
2. Select the desired tag or prompt and fill in the value with the desired content. Select **Apply** and the attribute in the drawing will populate. Once completed select **OK**.



- To edit the sheet description, double click on the attribute. This will open the same dialog box as before. Because this attribute has multiple text lines, select the button next to the value box to open the **Multiline Editor**.



- This will open a Text Formatting box. Make the changes to the sheet description and select **OK**. Then select **OK** in the **Enhance Attribute Editor** dialog box.

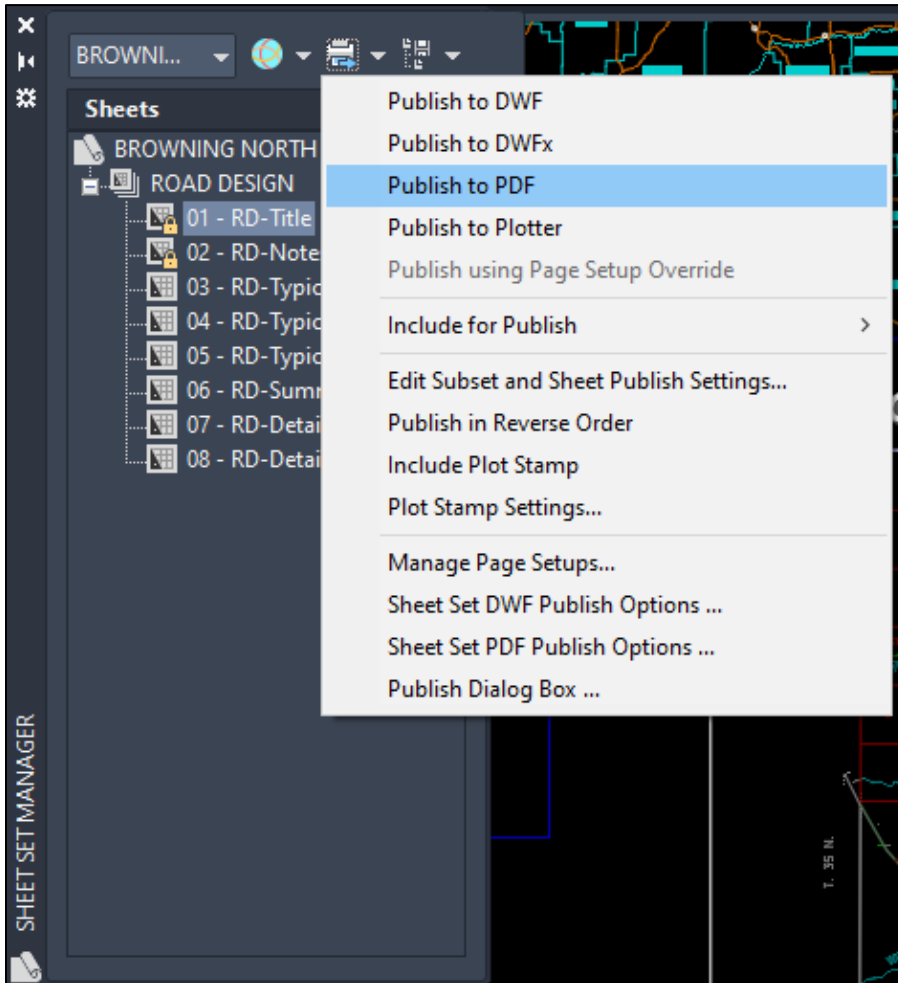


[Back to top](#)

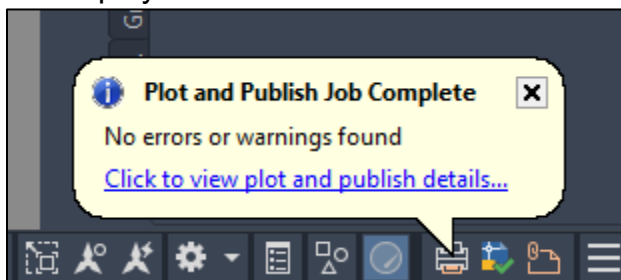
Section VI. Plot Sheet Sets

Procedure – Plot a Sheet Set

1. To publish a PDF of a plan sheet or entire subset, right click on the item in the *Sheet Set Manager* and select **Publish to PDF**.



2. Select where the PDF will be saved and select **Print**. A processing window will appear to display progress. Once the print job is complete, the following message will display on the lower bar of Civil 3D.



[Back to top](#)