

MONTANA DEPARTMENT OF TRANSPORTATION



203 – Civil 3D Plan Production User Guide









Prepared by:



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DRAFT

Course Description

Course 203 – Civil 3D Plan Production is the third and final course in the three-part Civil 3D Fundamentals learning path. This course will complete the foundational knowledge needed to be proficient using Civil 3D. Building on the topics discussed in the 201 and 202 courses, 203 delivers insight into Sections, Section Views, Templates, Styles, Data Shortcuts, Printing, Sheet Setup, Sheet Set Manager and Quantities.

Course Length

4 hours

User Guide Notification Icons

This User Guide contains icons to help alert and assist the user with specific tasks and content. Each icon is identified and described in the table below.

ICON	DESCRIPTION
	The EXERCISE icon identifies tasks where users are guided through a hands-on review of the instructional topic using the software.
	The TIP icon identifies software best practices and useful tips.
	 The NOTE icon is used for identifying general information such as: To provide additional information that is not considered to be a warning or critical. To provide additional/alternative steps to workflow. To provide reminders of important information previously covered that may affect specific tasks throughout the workflow process.
CAUTION	The CAUTION icon is used to help identify and warn users of information and or workflow steps that should be followed or executed correctly.

User Guide Course Objectives

Course Objectives

- Learn to efficiently navigate paper space layouts and viewports
- Using a Production Plan Template
- How to create View Frames for a project
- Leverage OLE objects to display Excel data in Civil 3D
- Utilizing the Sheet Set Manager to produce construction documents

Topics Covered

- Layouts / Viewports
- MDT Plan Production Template(s)
- View Frames
- MDT Sheet Set Template MDT Borders and Sheets
- Working with Sheet Set Manager
- Attributes / Fields
- OLE objects

Pre-requisites

- A basic understanding of design/drafting procedures and terminology
- A working knowledge of your operating system
- 101 AutoCAD Fundamentals for Bentley Users
- 201 Civil 3D Fundamentals I
- 202 Civil 3D Fundamentals II

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User Guide Layouts and Viewports

Layouts and Viewports

A layout is a 2D working environment for creating drawing sheets. The area within a layout is called paper space, where you can add a title block, display scaled views of model space within layout viewports, and create tables, schedules, notes, north arrows and bar scales. You can access one or more layouts from the tabs located at the bottom-left corner of the drawing area to the right of the Model tab. You can use multiple layout tabs to display details of the various components of your model at several scales and on different sheet sizes.

Layout viewports are objects that display views of model space. You create, scale, and place them in paper space on a layout. On each layout, you can create one or more layout viewports. Each layout viewport is like a window view of the model space at a scale and orientation that you specify.

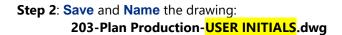
Working with and Creating Layouts

MDT uses Tool Palettes, MDT Sheets tab, to create layout tabs from an MDT template. The template contains the desired sheets sizes and title blocks creating uniformity and standardization through MDT.

Create a new drawing



Step 1: From the Start tab > Create a new drawing using the Standard: designstart.dwt





C:\mdtapps\Autodesk_Training\203-Civil 3D Plan production\Working

Step 3: Navigate to the Insert tab > Reference panel > Select Attach.





- a. Navigate to C:\mdtapps\Autodesk_Training\203-C3D Plan Production\References
- b. Select 8684000ROMAP001.dwg
- c. Click Open.

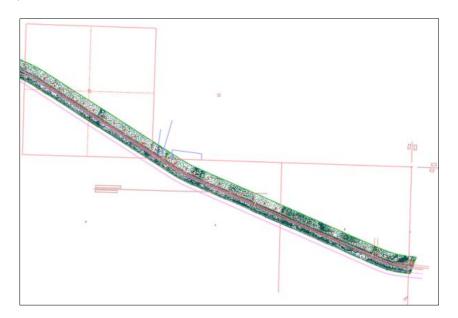
Step 4: From the Attach External Reference dialog box, verify the following parameters:

- Reference Type = Overlay
- Scale = Specify On-screen is unchecked
- Insertion point = Specify On-screen is unchecked
- Path type = Relative path
- Rotation = Specify On-screen is unchecked

Step 5: Click OK.



Step 6: Type ZE, to zoom extents.



User Guide Layouts and Viewports

Creating a new layout



Step 1: Select MDT Sheets tab from the tool palette, select Road Layouts.

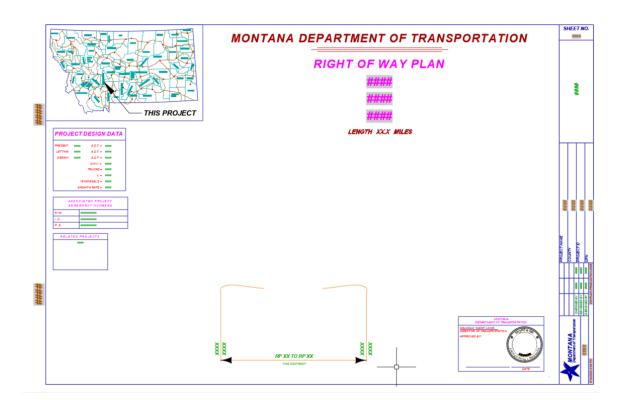
If the tool palette is not showing, select Ctrl+3 on the keyboard to turn the tool palette on.

Step 2: Select RD-Title from the Insert Layout(s) dialog box, click OK.

Step 3: Select RD-Title layout tab.







Working with and Creating Viewports



Step 2: Select General Sheet from the Layer Filters, double click GS-VPRT to set the layer current, close the Layer Properties.

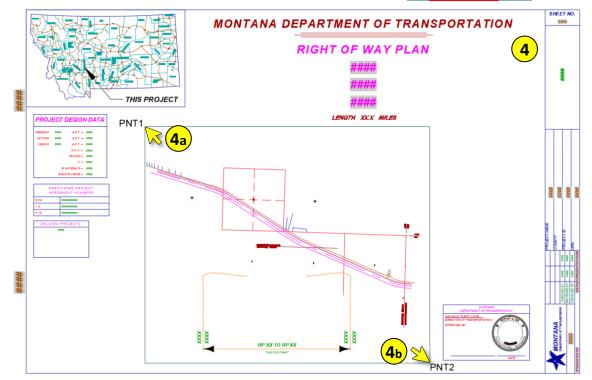




Step 3: Navigate to Layout Tools tab > Layout Viewports panel, select Rectangular.

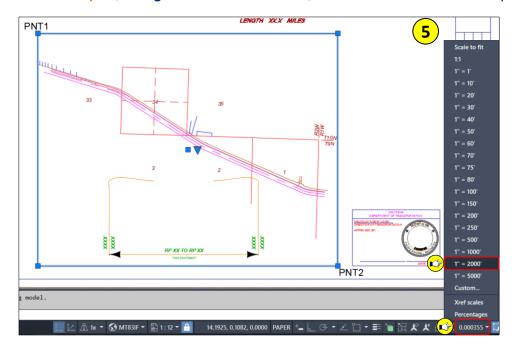
Step 4: Select near **PNT1** when prompted to Specify corner of viewport, **select** near **PT2** when prompted to Specify opposite corner.





User Guide Layouts and Viewports

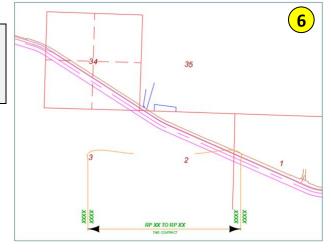
Step 5: Select the viewport, change the scale to 1" = 2000', select Esc to deselect the viewport.



Step 6: Double click in the viewport, pan to reposition the viewport as shown below. All of section 34 is visible.



To pan press down on the scroll wheel located on the mouse or type PAN at the command line. If PAN is typed, Esc will need to be used to end the command.





Use caution when panning within an unlocked viewport. If the scroll wheel is scrolled the viewport scale will change. It is good practice to lock the viewport after it is correctly positioned.

Step 7: Select the viewport, verify the scale is still 1" = 2000'.



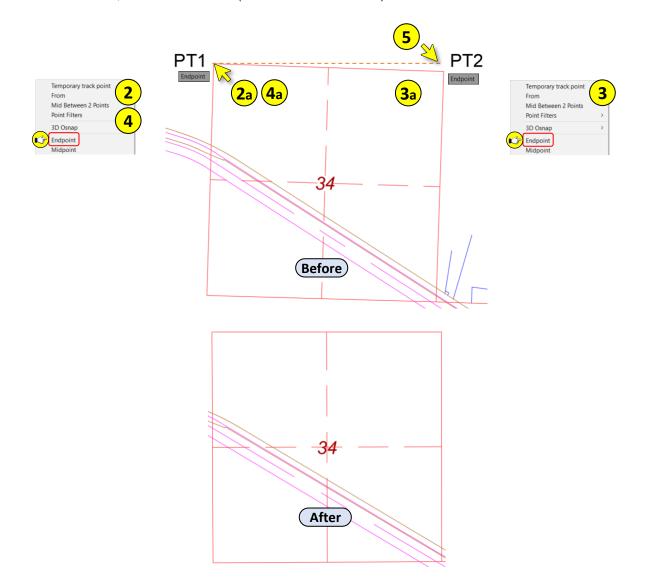
Rotating viewport to align with Model Space objects



- Step 1: Navigate to Express Tools tab > Layout panel, select Align Space.
- Step 2: When prompted for the first alignment point in MODEL space select Shift + right click, select endpoint, select PT1 (NW corner of section 34).



- Step 3: When prompted for the second point in MODEL space select Shift + right click, select endpoint, select PT2 (NE corner of section 34).
- Step 4: When prompted for the first alignment point in PAPER space select Shift + right click, select endpoint, select PT1 (NW corner of section 34).
- Step 5: When prompted for the second alignment point in PAPER space select F8 on the keyboard to turn ortho ON, select a near PT2 (NE corner of section 34).



Paper Space objects into Model Space



- Step 1: Type CHSPACE, select the Project Location Label block from Paper Space, select Enter.
- Step 2: Double click in Paper Space to exit the Paper Space viewport.
- Step 3: Select Model layout tab, verify that the Project Location Label block is shown.



MDT Plan Production Templates

The MDT State Kit has multiple plan production templates to choose from. There is a plan only, plan over plan, plan over profile, profile over profile and cross section template that can be used to create plan production sheets from.

Working with Templates

In some cases during the project lifecycle a single sheet may need to be produced for an exhibit. The MDT plan production templates can be leveraged for this scenario.

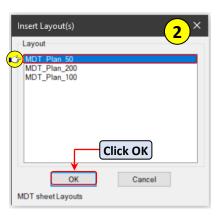
Creating a plan only layout



- Step 1: Navigate to TOOL PALETTES > MDT Sheets tab, select Plan Layouts.
- Step 2: Select MDT Plan 50 from the Inset Layout(s) dialog box, click OK.

Step 3: Select MDT_Plan_50 layout.





Step 4: Double click inside the title block to activate the viewport, **select** the pad lock to unlock the viewport.





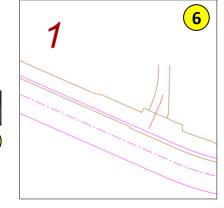
Step 5: **Type ZE**, **select Enter** to Zoom Extents. Alternatively, you can double click the center mouse button.

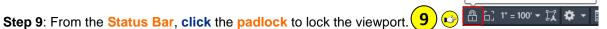
Step 6: Using the mouse, **pan** and **zoom** to the area shown.

Step 7: From the Status Bar, select MODEL to return to Paper Space. Alternatively, you can double click outside the viewport.

Step 8: Select the viewport, change the viewport scale to 1" = 100'.

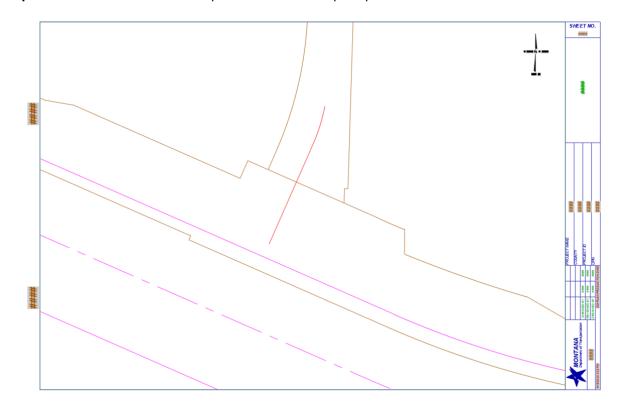






Selected viewports are not locked

Step 10: Press Esc to exit the viewport and return to Paper Space.



User Guide View Frames

View Frames

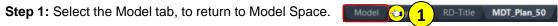
View frames are created based on an alignment in the drawing, and on a designated plan view or profile view viewport in a template. When creating sheets that will contain profile view data in addition to plan view data, there must be a profile in the drawing. Like other Autodesk Civil 3D objects, properties of a view frame can be edited. For example, a view frame's object name, description, object style, or the layer on which it is displayed can be edited. The properties of the view frame are saved in the drawing in which it was created the view frame.

A view frame group manages a group of view frames that are created while using the Create View Frames wizard. Each view frame group manages the view frames and match lines for a single alignment. View Frame Groups can be shared with other drawings through data shortcuts.

Working with View Frames

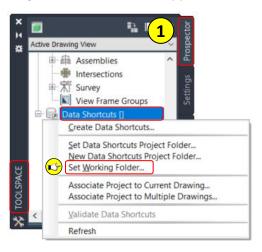
When multiple sheets need to be created for a project that contains an alignment, the Plan production tools should be used. The Plan Production tools are used to create view frames and sheets automatically for the project.

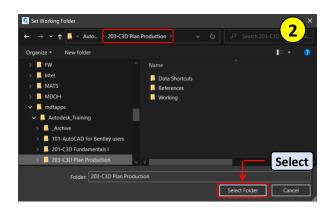
Setting up the drawing for Plan Production



Step 1: Navigate to TOOLSPACE > Prospector tab > Data Shortcuts, right click on Data Shortcuts, select Set Working Folder.

Step 2: Browse to C:\mdtapps\Autodesk_Training\203-C3D Plan Production, select Select Folder.





Step 3: Verify the Data Shortcuts path has been set.

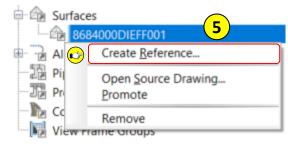
Data Shortcuts [C:\mdtapps\Autodesk_Training\203-C3D Plan Production\Data Shortcuts]

Step 4: Navigate to Data Shortcuts > Surfaces, expanded Surfaces.

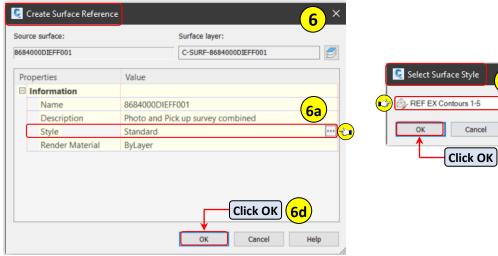


Step 5: Right click on 8684000DIEFF001, select Create Reference.

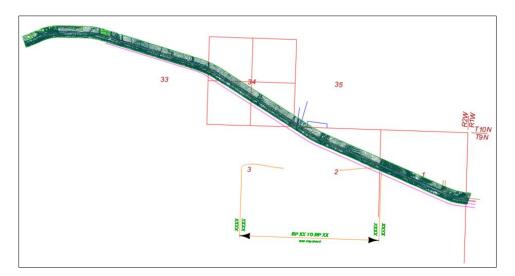
Step 6: In the Create Surface Reference dialog box, change the Style to REF Ex Contours 1-5, select OK in the Select Surface Style dialog box, select OK in the Create Surface Reference dialog box.



6c



Step 7: Type ZE, **select Enter** on the keyboard to Zoom Extents.

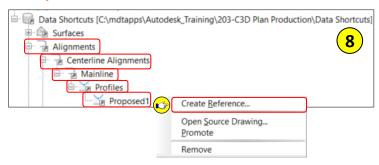


User Guide View Frames

Step 8: Navigate to Data Shortcuts > **Alignments**, **expanded** Alignments > Centerline Alignments > Mainline > **Profiles**, **right click** on **Proposed 1**.

Step 9: Accept the defaults, click OK.







By selecting the Profile, Proposed 1, for Alignment Mainline, the Alignment and Profile are Data Referenced. The Profile is dependent of the Alignment.

Creating View Frames

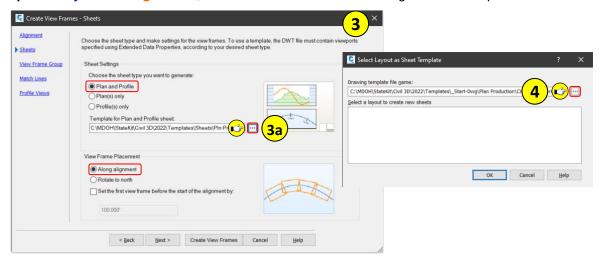


- Step 1: Navigate to Output tab > Plan Production panel, select Create View Frames.
- Step 2: Verify the following settings in the Create View Frames dialog box, select next to advance.



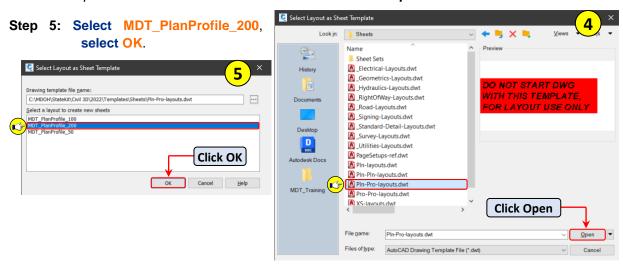


Step 3: Verify the settings below, select the browse button to navigate to the template location.

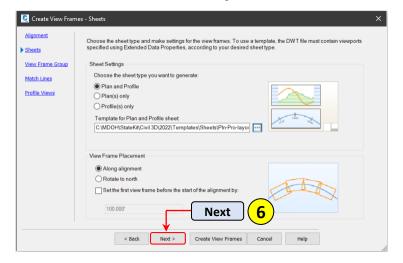


Step 4: Select the **browse** button in the Select Layout as Sheet Template dialog box, **navigate** to the **template** location, **select Pin-Pro-Layouts.dwt**, **click Open**.

Template location: C:\MDOH\StateKit\Civil 3D\2022\Templates\Sheets\



Step 6: Select Next in the Create View Frames dialog box.



User Guide View Frames

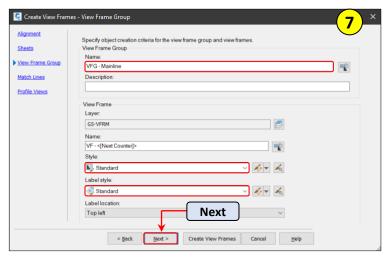
Step 7: Verify the settings below, select Next.

View Frame Group Name: VFG-Mainline

View Frame Name: VF-<[Next Counter]>

Style: Standard

Label Style: Standard



Step 8: Verify the settings below, select Next.

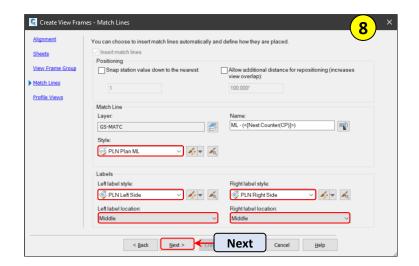
Style: PLN Plan ML

Left label style: PLN left Side

Right label style: PLN Right Side

Left label location: Middle

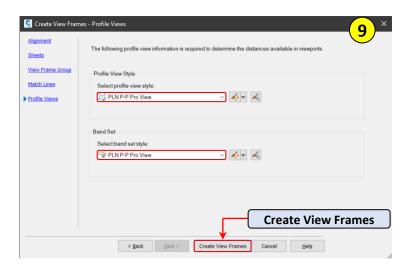
Right label location: Middle

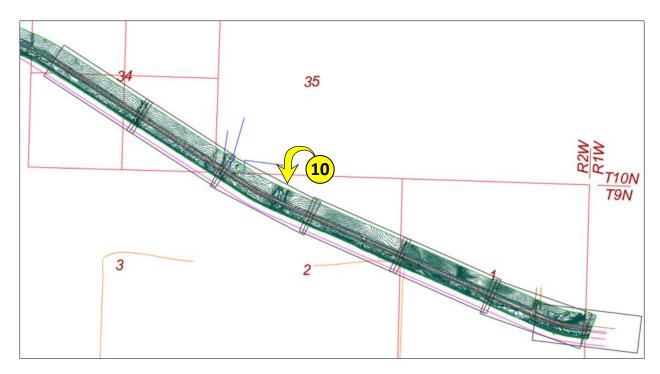


Step 9: Verify the settings below, select Create View Frames.

Profile View Style: PLN P-P Pro View

Band Set: PLN P-P Pro View





Step 10: From Model space > **See** the **View Frames** created along the alignment.

MDT Sheet Set Template – Creating Sheets

The Sheet Set Manager is a drawing organization tool. MDT has built a Sheet Set Template that can be leveraged when creating plan production sheets. It contains custom project data that can be populated and will display within the fields of the MDT title blocks.

Working with Sheet Set Manager

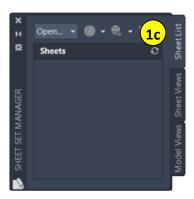
Accessing Sheet Set Manager

Step 1: Navigate to the Home tab > Palettes panel.

- a. Click Palettes drop-down.
- b. Select Sheet Set Manager icon.
- c. See the Sheet Set Manager palette.
 - Alternatively, Ctrl+4 opens and closes Sheet Set Manager.



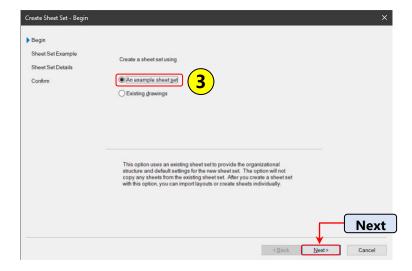




Step 2: Select the Open drop down, select New Sheet Set.

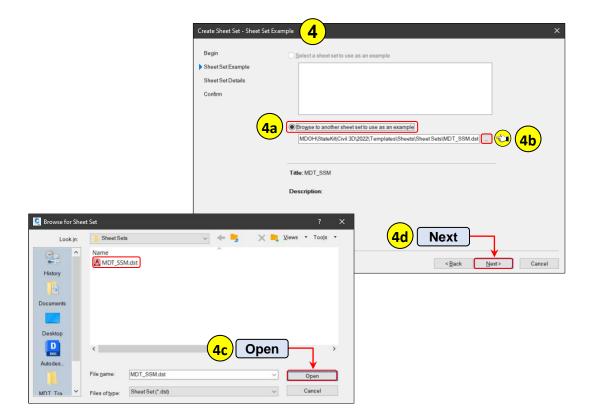
Step 3: From the Create Sheet Set dialog box, select An example sheet set, Click Next.





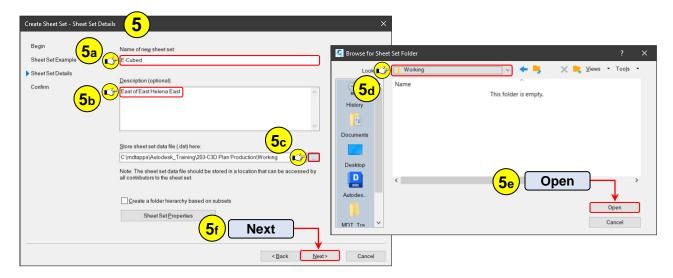
Step 4: From the Create Sheet Set - Sheet Set Example dialog box:

- a. Select Browse to another sheet set to use as an example.
- b. Navigate to: C:\MDOH\StateKit\Civil 3D\2022\Templates\Sheets\Sheet Sets
- c. From the Browse for Sheet Set dialog box > Select MDT_SSM.dst, select Open
- d. Click Next.

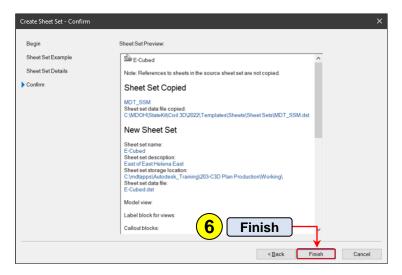


Step 5: From the **Create Sheet Set – Sheet Set Details** dialog box:

- a. Name the new sheet set E-Cubed.
- b. Enter a description of East of East Helena East.
- c. Browse to the sheet set storage location
 - C:\mdtapps\Autodesk_Training\203-C3D Plan Production\Working
- d. Click Open.
- e. Click Next.



Step 6: Click Finish.



Creating sheets



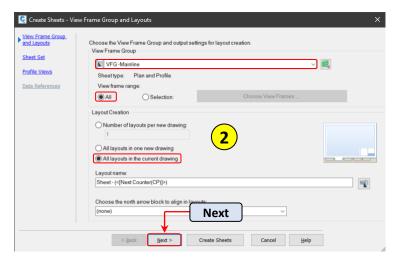
Step 1: Navigate to Output tab > Plan Production panel, select Create Sheets.

Step 2: Verify the settings below, click Next.

View Frame Group: VFG-Mainline

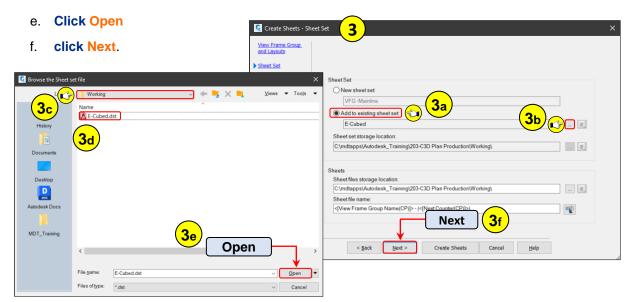
View Frame Range: All

Layout Creation: All Layouts in the current drawing



Step 3: From the Create Sheets - Sheet Set dialog box:

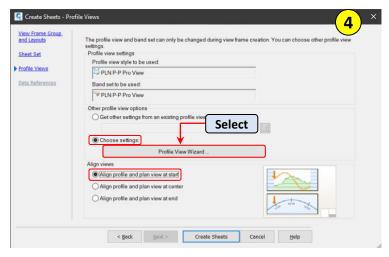
- a. Select Add to existing sheet set.
- b. Click the Browse to the folder button
- Navigate to the E-Cubed sheet set location
 C:\mdtapps\Autodesk_Training\203-C3D Plan Production\Working
- d. Select E-Cubed.dst



Step 4: Verify the settings below, select Profile View Wizard.

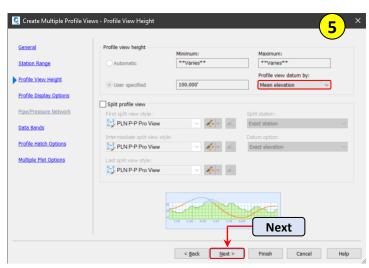
Choose settings: **Select Profile View**Wizard

Align Views: Align profile and plan view at start



Step 5: Verify the settings below, select Next.

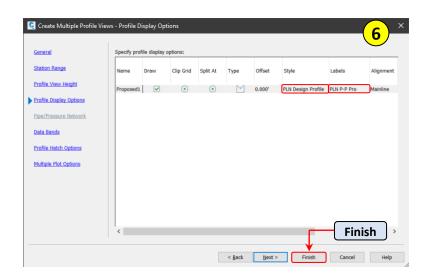
Profile view datum by: Mean elevation



Step 6: Verify the settings below, select Finish.

Style: PLN Design Profile

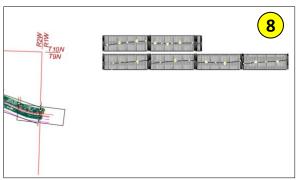
Labels: PLN P-P Pro

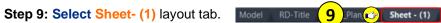


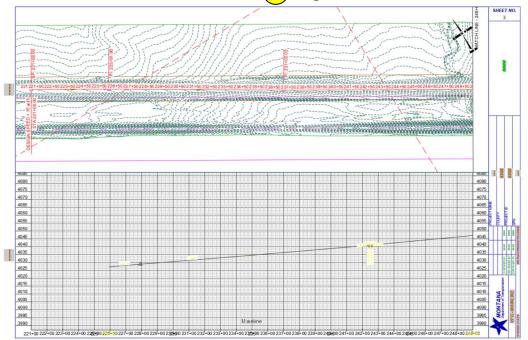
Step 7: Select Create Sheets in the Create Sheets dialog box, select OK on the warning box.



Step 8: Pick a **location** in Model Space to **place** the **profile views** when prompted to Select profile view origin, **close** the **PANORMA**, **type RE**, **select Enter**.







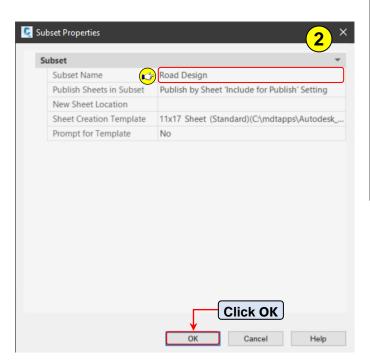
Adding Sheets

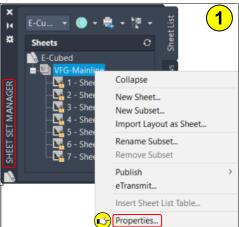


Adding, renaming and rearranging sheets.

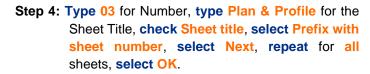
Step 1: Navigate to SHEET SET MANAGER, right click on VFG-Mainline, select Properties.

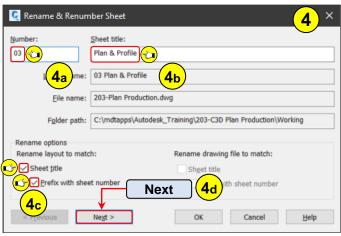
Step 2: Edit the Subset Name to Road Design, click OK.

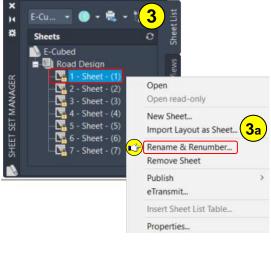


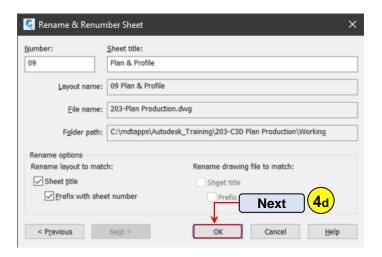


Step 3: Right click on 1-Sheet – (1), select Rename & Renumber.





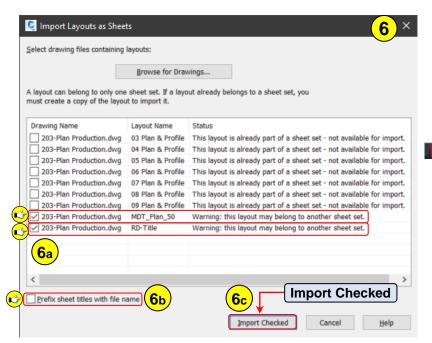


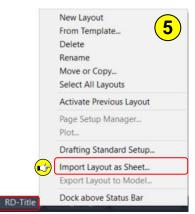




Step 5: Right click on RD-Title layout, select Import Layout as Sheet.

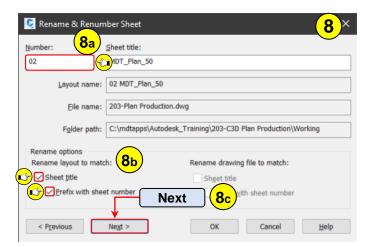
Step 6: Check MDT_Plan_50 and RD-Title, uncheck Prefix sheet titles with file names, select Import Checked.

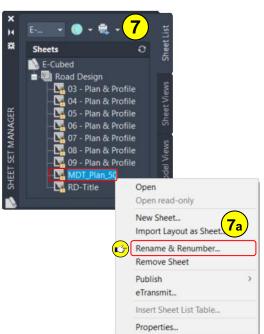




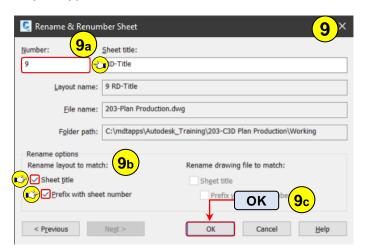


- Step 7: Right click on MDT_Plan_50 in the SHEET SET MANGER palette, select Rename & Renumber.
- Step 8: Type 02 for the Number, check Sheet title and Prefix with sheet number, select Next.





Step 9: Type 01 for the Number, check Sheet title and Prefix with sheet number, select OK.





Step 10: Select 02 – MDT_Plan 50, hold the left mouse button down, drag sheet to top of the sheet list, repeat for 01 – RD-Title.



Text Attributes and Text Fields

An attribute is a label or tag that attaches data to a block or drawing. Title blocks can contain attributed text that allow for typing in common project or drawing information. Fields contain instructions to display data that you expect to change during the life cycle of a drawing. When a field is updated, the latest data is displayed. For example, the value of the FileName field is the name of the file. If the file name changes, the new file name is displayed when the field is updated. Fields can be inserted in any kind of text, including text in table cells, attributes, and attribute definitions. When any text command is active, Insert Field is available on the shortcut menu. Some sheet set fields can be inserted as placeholders. For example, you can insert SheetNumberAndTitle as a placeholder. Later, when the layout is added to a sheet set, the placeholder field displays the correct sheet number and title.

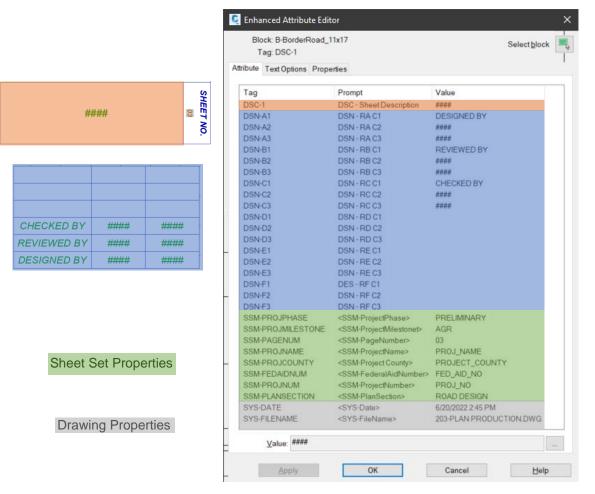
Working with Text Attributes



Step 1: Select 03 Plan & Profile layout tab.



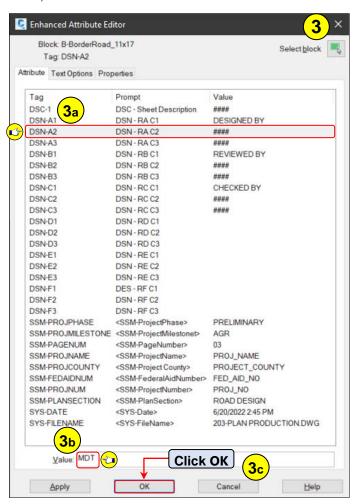
Step 2: Double click on the MDT border.



Step 3: Select DSN-A2, type MDT in the value field, select OK.

Step 4: Zoom to DESIGNED BY, verify MDT is displayed in the title block.

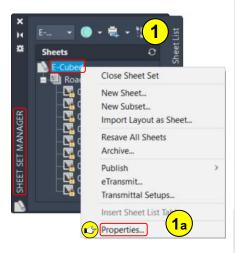
		(4)
CHECKED BY	####	####
REVIEWED BY	####	####
DESIGNED BY	MDT	####

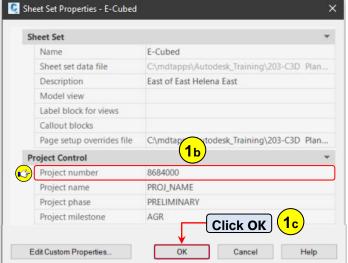


Working with Text Fields



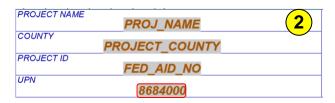
Step 1: Navigate to SHEET SET MANAGER, right click on E-Cubed, select Properties, edit project number to 8684000, click OK.





User Guide OLE Objects

Step 2: Type RE (Regen), verify the Project number has updated.



OLE Objects

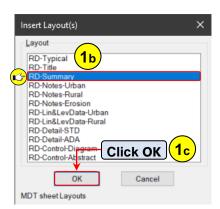
Object linking and embedding is a way to use information from one application in another application. To use OLE, you need both source and destination applications that support OLE. Both linking and embedding insert information from one document into another document. Also, both linked and embedded OLE objects can be edited from within the destination application. However, linking and embedding store information differently. The relationship between embedding and linking is similar to that between inserting a block and creating an external reference. For example, linking a Microsoft Excel spreadsheet in Civil 3D creates a dynamic link and if the data in Excel updates the data in Civil 3D will update as well.

Working with and Understanding OLE Objects



Linking an Excel Summary Sheet





Step 1: Navigate to TOOL PALETTES > MDT Sheets tab, select Road Layout, select RD-Summary, click OK.

Step 2: Select Model layout tab to return to model space.



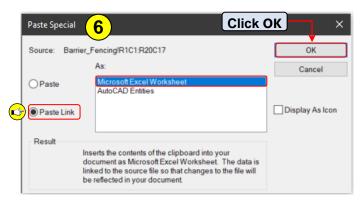
Step 3: Open Windows Explorer, **navigate** to C:\mdtapps\Autodesk_Training\203-C3D Plan Production\References\OLE, **open 8684000RDQMG001.xlsx**.

Step 4: Highlight the data, Ctrl+C to copy data, return to Civil 3D.

A B	FENCING																		
			linear feet FARM FENCE						each					4					
ST	ATION	TYPE	TYPE		WILDL					FARM FENCE PANEL		DEADMAN	FARM GATE		CATE		CATE		REMARKS
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225+91.90	252+53.00			2,661			6	-		-				LT.					
252+53.00	252+69.00			0.400			-	_		-			16	LT.					
252+69.00	273+99.19		229	2,130			5	-		-				LT.					
273+99.19	276+27.88		229				2	-		-		16		LT 440' LT NW CORNER PROPERTY					
276+27.88	276+97.85	_	70					-		-		10		LT 440 LT NW CORNER PROPERTY					
276+27.85	277+70.00	_	70		719		10			+		16		LT PLACE FENCE ALONG EASEMENT WEST SIDE OF COUNTY ROAL					
375+47.20	387+40.54	1,213	-		719		16	-		-		10		LT.					
313141.20	307140.34	1,210					10			1				LI.					
1	TOTAL		299	4,791	719	909	47	0	~	0	4	32	16						
TYPE 1 - WOOL) POSTS (WF4-SBE	SS-16)																	

Step 5: Navigate to Home tab > Clipboard panel > Paste, select Paste Special.

Step 6: Verify the following settings, click OK.





Step 7: Select a **point** in Model space when prompted to Specify insertion point, **zoom** to the **point** selected to view the Excel data.

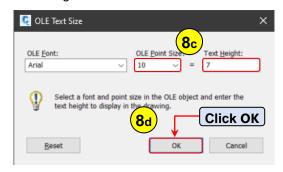
١				t				eac					
1		FARM			linear feet						linear feet		(7)
	1	FARM FENCE									FARM		•
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	_	+		DLT	_	-		E	\vdash		UZ	0.3	
53.00			2.661			6			-				LT.
69.00												16	LT.
99.19			2,130			5							LT.
27.88		229				4							LT.
						2					16		LT 440' LT NW CORNER PROPERTY
97.85		70				4			\perp				LT.
70.00				719					_		16		LT PLACE FENCE ALONG EASEMENT WEST SIDE OF COUNTY ROA
40.54	1,213					16			\vdash				LT.
	1,213	299	4,791	719	909	47	0	~	0	4	32	16	
5	99.00 99.19 27.88	99.00 19.19 177.88 170.00 10.54 1,213	19 00 199 199 199 229 27.7 88 229 77. 85 70 00 10.54 1,213	99.00 2,130 17.88 229 2,130 17.85 70 10.00 1,213	99.00 2,130 99.19 2,130 99.19 2,130 99.19 2,130 99.19 9.19 9.19 9.19 9.19 9.19 9.19 9.	53.00 2,661 19.00 2,130 19.19 2,130 17.88 229 17.85 70 10.00 719 1.213	53.00	33.00 2,661 6 199.00 2,130 5 17.88 229 4 17.85 70 4 10.00 719 10 10.54 1,213	33.00	33.00	33.00	33.00	33.00

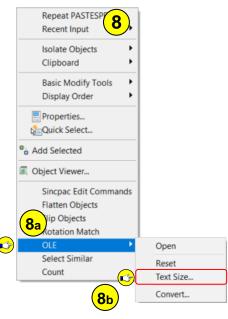
User Guide OLE Objects

Step 8: Select the OLE object and right click, select OLE, select Text Size, change the values as shown below, click OK.

OLE Point Size = 10

Text Height = 7





Step 9: Select RD-Summary layout

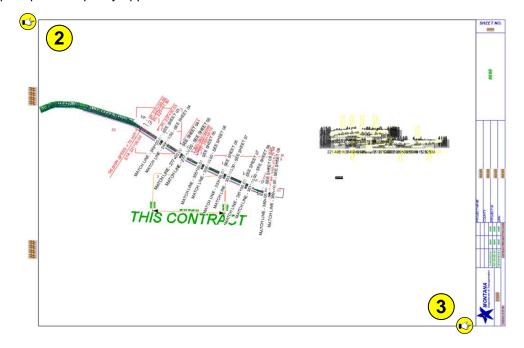


Creating a viewport

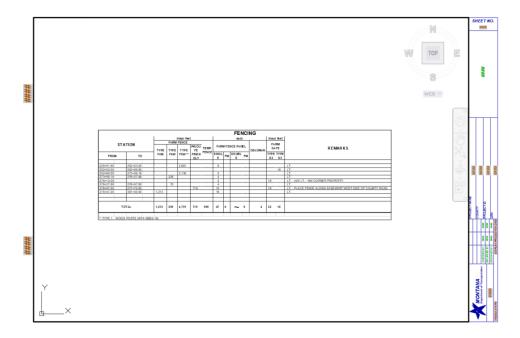


- Step 1: Navigate to Layout Viewports panel, select Rectangular.
- **Step 2: Type END**, **select** the **upper left corner** of the title block, when prompted to Specify corner of viewport.
- **Step 3: Type END**, **select** the **lower right corner** of the title block, when prompted to Specify opposite corner.





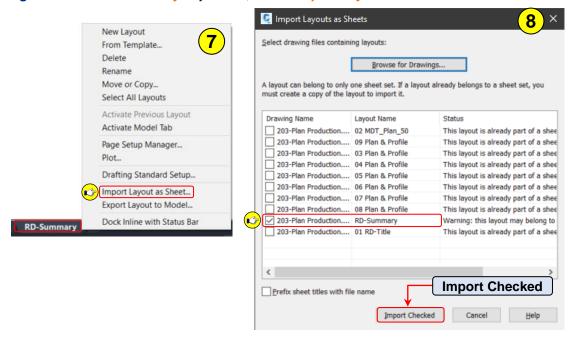
Step 4: Double click within the **viewport** to activate it, **zoom** to the **OLE object**, **type PS** to return to paper space.



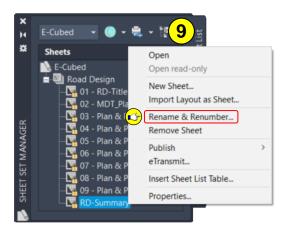
Step 5: Select the viewport, change the viewport scale to 1" = 100', select Esc to deselect the viewport.

Step 6: Save the drawing.

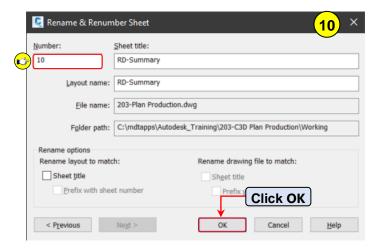
Step 7: Right click on RD-Summary Layout tab, select Import Layout as Sheet.



Step 8: Check RD-Summary, uncheck Prefix sheet titles with file names, select Import Checked.



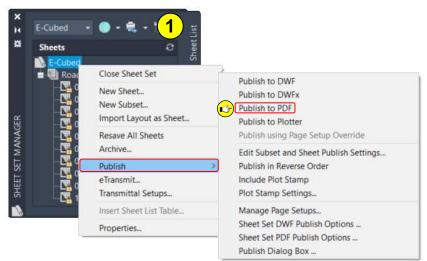
Step 9: Navigate to Sheet Set Manager, right click on RD-Summary, select Rename & Renumber.



Step 10: Type 10 for the Number, select OK.

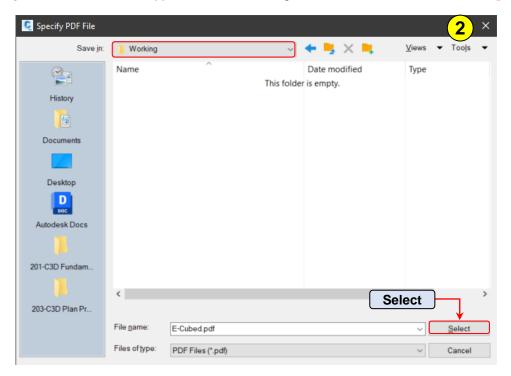
Step 11: Save the drawing.

Create a PDF set of plans 🗳



Step 1: Navigate to Sheet Set Manager, right click on E-Cubed, select Publish to PDF.

Step 2: Browse to C:\mdtapps\Autodesk_Training\203-C3D Plan Production\Working, select Select.



Review the created pdf.