SIGNING PLAN PREPARATION – SPECIFICATION SUMMARY

Contents

Overview

This guide provides details for working with the signing specifications summary ("spec sum") Excel workbook and how to link the spreadsheets into AutoCAD Civil 3D. Designers use the specification summary Excel spreadsheets to provide construction locations, quantities, and summaries for all road projects that require signing.

Process Provenance

- Date of development: *2/26/2025*

- Revision date: *3/19/2025*

- Application/Tool(s): *Civil 3D, Microsoft Excel*

- Version(s): *13.6.1986.0 Civil 3D 2024.4.2 Update*

- Environment(s): *MDT Civil 3D State Kit r2024 v2.1.0*

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Statement of Need

Most state transportation projects require signing updates to remain federally compliant, improve public safety, and communicate information to drivers. This document is a reference to help designers with preparing summary frames and sign specification and location sheets for standard projects.

Acronyms/Definitions Used in This Document

MUTCD – Manual on Uniform Traffic Control Devices (Federal Manual)

SHS – Standard Highway Signs Publication (Federal Sign Design Drawings/Layouts)

Main Sign Design References

MDT Traffic Engineering Manual (Ch 18 "Highway Signing")
https://www.mdt.mt.gov/other/webdata/external/traffic/manual/chapter_18.pdf

MUTCD https://mutcd.fhwa.dot.gov/kno_11th_Edition.htm

SHS https://mutcd.fhwa.dot.gov/kno-shs_2024.htm

Process Description and Examples

Section I. Getting Started

Procedure – Create new SpecSum DWG and Signing Spreadsheet

1. With MDT State Kit 2.1.0 or newer installed, start AutoCAD using the Civil 3D 2024 Montana icon.

2. Expand New, select Browse Templates, choose the Speed Sheet folder and select MDTSI_SpecSum.dwt. Save new .dwg in project folder.

3. Go to the MDT Tools toolbar. In the MDT EXCEL panel, click the MDT Excel Tools drop-down and choose Excel SISUM Template.

4. Click Enable Content on the yellow banner under the toolbar ribbon. Click OK to save file to the relevant project folder, replacing hash marks with Unique Project Number (UPN). Choose the file type Excel Workbook (.xlsx). Then on the pop-up, select "save and erase features".

Section II.   Excel Formatting Notes

Procedure – Familiarize Yourself With Formatting

1. *Do not change cell sizes, hide or change row or column widths and heights, or merge cells.* These spreadsheets will be used by construction to copy and paste relevant cells. If cells change size, copy and paste functionality can be compromised and linking to AutoCAD will require more work for the designer to scale properly.
   - If a project has multiple sites, one row may be merged to put a title in for a site change.

26.661	R	REPLACE	R2-1	36 X 48			10.0	5" Treated Wood Pole
26.685	L	REPLACE	R2-1	36 X 48			10.0	5" Treated Wood Pole
Site 2: North of Victor								
69.382	R	REPLACE	W1-2R	36 X 36	FY		10.0	4" Treated Wood Pole
69.441	L	REPLACE	RA-3 MT	12 X 18			20.0	2.0lb Steel U Post

2. *Font sizes, styles, and decimal places should not be changed.* If data is cutoff/unreadable after printing to PDF, text size can be changed in that cell.
   - The "breakaway type" column is ESRI Surveyor 24 pt font to show breakaway symbols.

3. Sheets are protected in the workbook. This prevents formatting and formula changes. Some cells that have formulas may be locked. To unprotect a sheet, go to the Review toolbar tab and select "Unprotect Sheet". Sheets can be protected again by selecting "Protect Sheet" in the same location.

Section III. Filling Out Sheets S2-S25

Procedure – Add Sign Information in The Table

1. Designers will notice many sheet tabs on the bottom of the Excel workbook. Begin inputting data in the S2 sheet and continue moving to the right across the tabs to S25.
    - In the tab S2, "S" is for signing. This is to differentiate the signing plan sheets from other parts of the plan package (road design, electrical, etc.). "2" is the start of the locations and specifications sheets. S1 consists of summary tables and notes (added later, see Section IV).

2. *Fill out sign specifications that require manual input* (further detail in table at the end of this section). Leave non-applicable cells blank (do not input 0s or n/a's).

3. *A gap should be left above and below all multi-sign assemblies* (an empty row). This gives a break for aesthetic purposes and room for checkers to put comments more easily. *Specs for multi-sign assembly supports/abbreviations should be added in the top row of that assembly group.*

4. *For all multi-sign assemblies (or with retro-reflective strips), add a vertical black line underneath the sign location information in column D.* There are vertical lines in the upper left of all spec sum sheets to use or modify for this purpose (can be lengthened as needed). For example, if there is a 3-sign assembly at the start of sheet S2, copy the middle line in the upper left, select cell D9, and paste the line so it extends down to the bottom of the cells used for the 3 signs.
    - This can also be done by making the left borders of column D thick.

TECH TIP!

Need to move a row of sign data?

Select all the cells across the table row > Copy > Paste Special > Formulas

This keeps formulas intact, so they still count summary quantities correctly.

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5. If the project requires more sheets (this is rare), right click and copy S25 from the sheet tab (when blank, or remove values in new sheet). Continue the S# naming.
    -   Total quantities from the new sheets will need to be added too. Add the new S# sheet names to the list on the QUANTITIES tab, below S25 (cell A33 down).
    -   Continue the formulas down to the end of the list from row 32 by dragging the lower right corner of the cell.
    -   Change the necessary project totals cells (row 8) to extend to the bottom of the newly added rows.
    -   Alternatively, you can start a new specification summary file and add totals together at the end.

Column Heading	Input required?	What to Input
Station / R.P.	Y	Stationing or reference post system to follow can be found in project scope of work (SOW).
LFT / MDN / RGT / OH	Y	Drop-down list for Left, Median, Right, or OverHead. This is where the sign is located. Right refers to the right side of the road when RPs / stationing is increasing.
Action	Y	Drop-down list for the action taken during project construction. "Guide" is used if there are multiple supports or if overhead. New is used only if entire row/assembly is new.
Sign No. (MUTCD)	Y, N	Drop-down list for standard MUTCD/MDT sign designations, manual entry for guide signs (type, highway # - milepost, # guide sign within that mile) (For example, G89-3a is the first guide sign on highway 89 after milepost 3, G89-3b would be the second guide sign within the same mile)
Panel Size (Inches)	Y	Width X Height of sign panel. "X" will autofill when width is input.
Fluorescent Yellow or Fluorescent Yellow Green, Back Bracing Req'd / Angle Iron Req'd, Mount Back to Back	Y	Drop-down abbreviations. BBR will autofill for all sheet aluminum increment signs (per MDT detailed drawings). AIR and all other abbreviations require manual entry.
Clearance/Offset	Y	Drop-down list
Type of Support	Y	Drop-down list
Support Spacing	N	
Mounting Height	Y	Drop-down list
Foundation Depth	N	
Support Length (X Y Z)	Y	Calculate estimated length(s)
Cantilever	Y	X to indicate cantilever
Breakaway Type	N	(symbols correspond to detailed drawings)
Behind Guardrail	Y	Drop-down abbreviation
Panel, Wood Pole, Steel Post quantities	N	
# of Breakaways	N	
Remove, Reset (sign/guide)	N	1 if sign is removed (when replacing panel or supports) or reset to other location. Guide is used if sign has 2+ supports or is overhead.
Sign Image	Y, N	Standard signs autofill, images that do not autofill need to be added manually (can be done via Snip & Sketch tool)
Remarks	Y	Additional notes. "Move to right side of approach", "Reuse panel on new supports" (would be with a reuse action), etc.

## Section IV. Summary Table and Delineation Table (S1)

Procedure – Input and Check Quantities

1. Go to the Delin_Table sheet and enter delineation totals. Hide unused rows.

2. Go to the Summary_Table sheet and check totals. Add/paste rows for infrequently used items to table if needed. Many of these bid items are in the list on the right side of the Excel sheet. Hide any unused rows in the table.
    - If multiple summary tables are necessary (e.g.: multiple sites or counties), copy table formatting (formatting paintbrush is helpful) and break up totals as needed. This will require unprotecting the quantities and S1 sheets to modify formulas (see Section II).
    - The Quantities sheet (tab to the right of S25) counts totals for the summary table. There are sheet totals to help with checking project quantities here.

Section V.   Finishing The Spec Sum

Procedure – Linking Spreadsheets To AutoCAD

1. Start Autodesk Civil 3D.

2. Open the file created in Section I, step 2.

3. Navigate to the S2 view frame in model view.

4. Go back to the Excel spreadsheet. Beginning with tab S2, select "Print_Area" from the Name Box in the upper left corner of the spreadsheet's formula bar. Copy selected table.
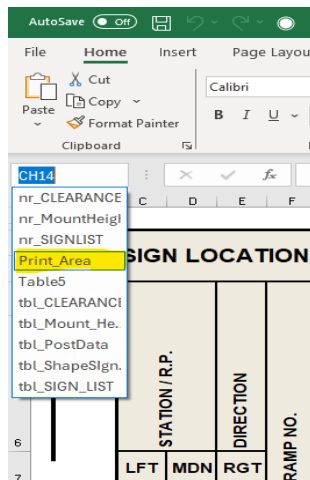
5. Next, in the AutoCAD file, go to the home tab, expand the drop-down arrow under paste, then paste special. In the paste special dialogue box, select Paste Link, As Microsoft Excel Worksheet, then confirm with OK.
   - After pasting as a link, when changes are made to the excel file, the changes will update automatically when starting a new session of AutoCAD.

6. Repeat steps 3 - 5 to paste the rest of the tables for the project in the corresponding box number in model space. They will be added to the same layout tab number using these view frame boxes.

7. Summary, delineation tables, and the project totals row do not use "Print_Area".
   - After hiding unused rows, highlight the table area needed, copy, then Paste Special as a Microsoft Excel Worksheet Link like the rest. The summary and delineation tables may need to be scaled by 2 after pasting in the summary frame area.

8. The following table is a written description of the sheet order and contents for a signing plan file:

Sheet Number	Sheet Description	Contents
S1 (Multiple sites may require many summary tables, if these summaries need to spill over onto S2, the sign location and specification sheets start on the next available sheet)	SIGNING NOTES AND SUMMARY FRAME(S) (These descriptions are used on the MDT sheet borders on Civil 3D layouts along with project and designer information, and page numbers)	Left half of sheet: standard notes (MDT_SI_NOTES block from same name block library) A vertical black line separates the two halves of sheet S1 Right half of sheet: summary and delineation tables
S2 and beyond (For example, if there are 15 pages of spec sum sheets after 1 page of summary tables, S2-S16 use this same format)	SIGN LOCATIONS AND SPECIFICATIONS	Spec sum tables, last page of tables also contains project totals after end of table (project totals row from the quantities tab of Excel spreadsheet)
After spec sum tables (Using same example above, S17-S19 could be details)	DETAIL	Project specific detailed drawings
After details (Using same example above, S20-S33 could be plan sheets)	PLAN SHEET	Visual map of project signing/pavement marking and delineation specifications