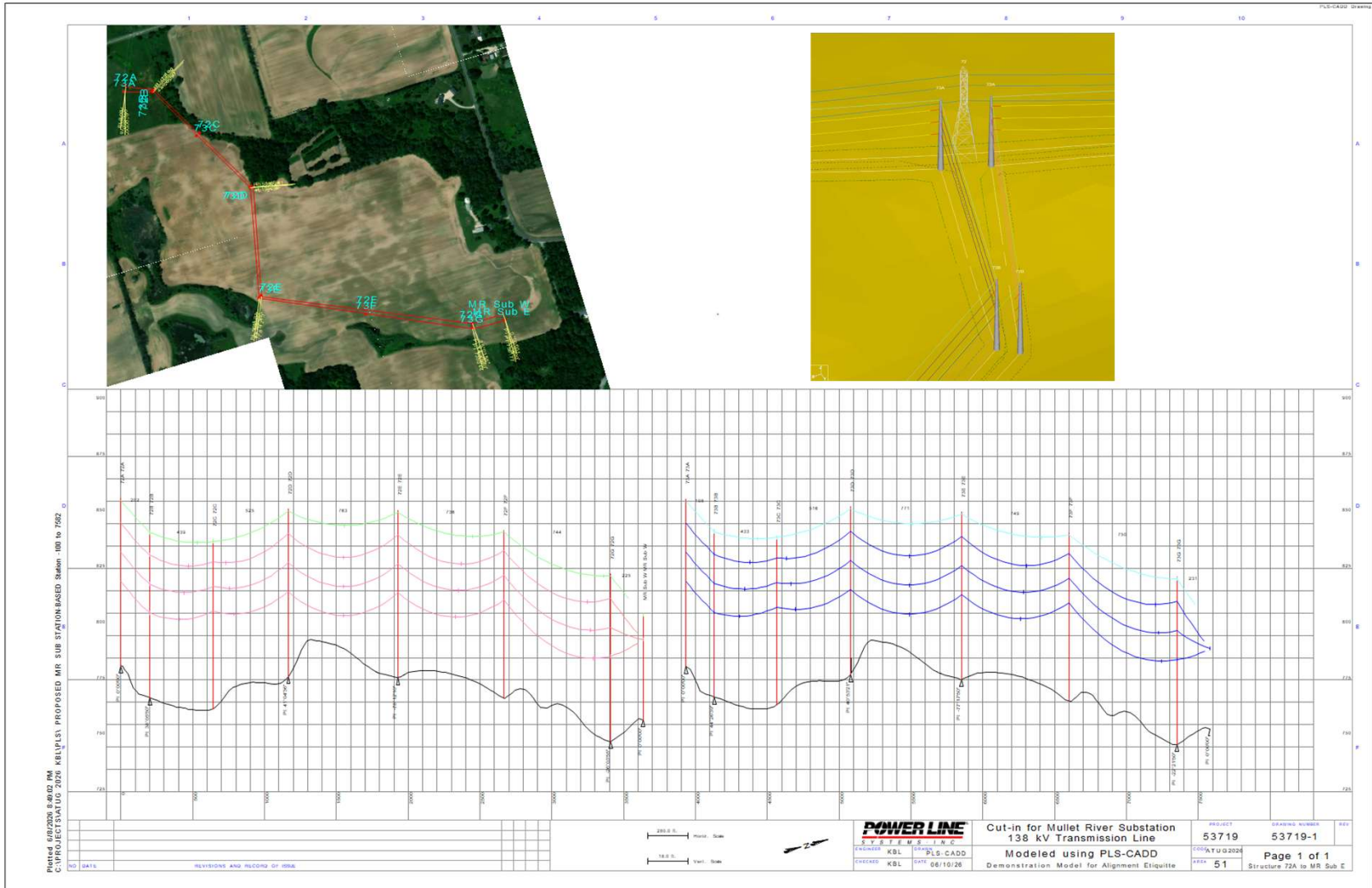


Alignment Etiquette



Kimberly Lowe & Dan McCormick, P.E.
June 10, 2026

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Agenda

- ⚡ **Example Using Proposed Line for a New Substation**
- ⚡ **Updating Design with New Terrain Data**
- ⚡ **Converting XY Based Structures to Station Based**
- ⚡ **Merging Projects**
- ⚡ **Merging Lines**
- ⚡ **Line-specific Alignments**

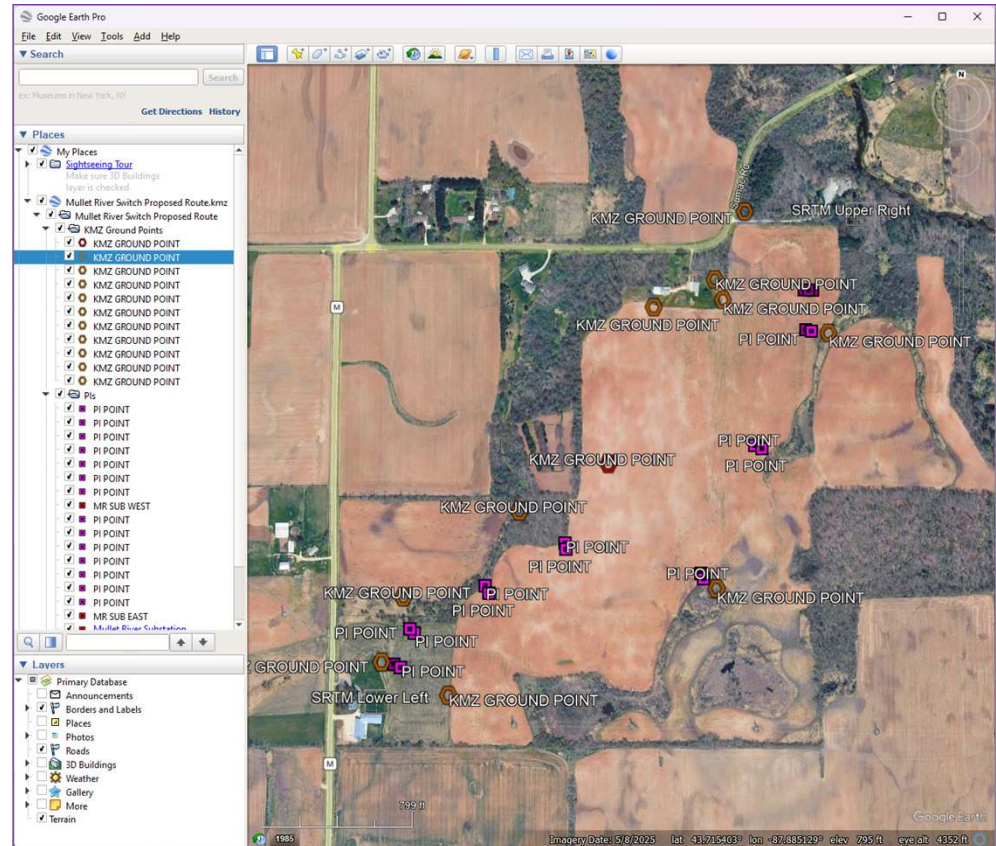
Proposed Design for Mullet River Substation*



Preliminary Design for Substation Cut-in

No Terrain Data? No Problem!

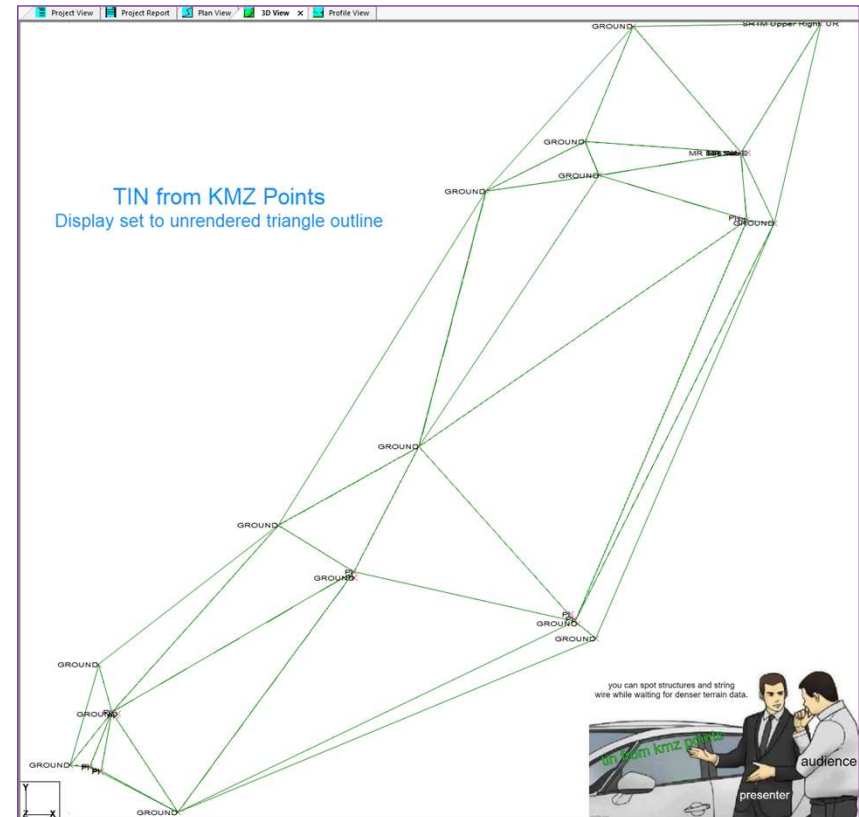
- ✦ Use **Terrain/Edit/Merge Points from External File/Merge Points from KML/KMZ Files...** to import an existing KML/KMZ.
- ✦ Elevation data can also be obtained from Google Earth which is helpful if topo maps are unavailable.
- ✦ This is not a substitute for survey-grade data, but KML/KMZ points can be helpful to build a preliminary design especially in the project scoping phase.
- ✦ Tip: If a KML/KMZ has an abundance of layers, it may be helpful to import a version of the KML/KMZ with only proposed centerline, PIs, structure locations. Additionally, it may be helpful to create a separate feature code in **Terrain/Feature Code Data/Edit...** specifically for the KML/KMZ points prior to importing.
- ✦ Imported points retain unique "Name" from Google Earth, but imported points will only be assigned to one feature code in PLS-CADD for each KMZ/KML file.



Preliminary Design for Substation Cut-in

Creating and Managing Ground TIN(s)

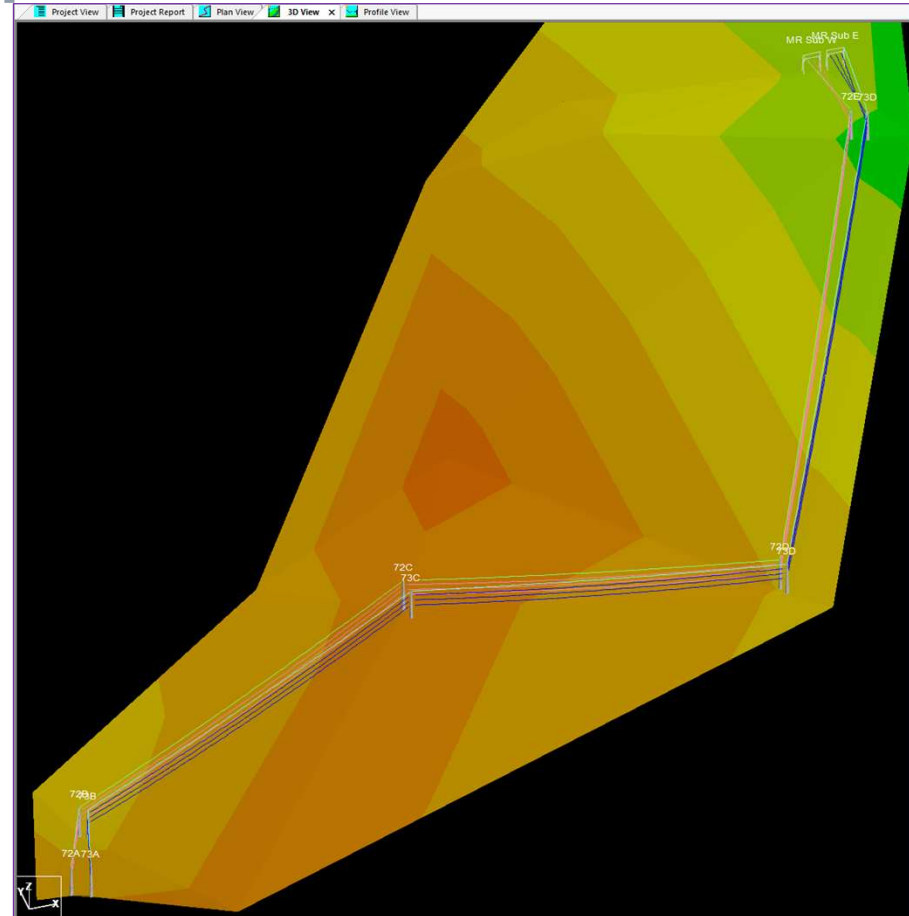
- Use **Terrain/TIN/Create Ground TIN...** to make a low density TIN from KMZ GROUND POINT(s). Increase default 300 ft triangle edge length as necessary.
- Use **Terrain/TIN/TIN Z Interpolation for Z=0 PIs, Survey Points, XY-based Structures, and/or Polygonal Constraints...** to calculate Z for KMZ PI POINTS or any other Z=0 points within the TIN boundary.
- Again, this is not a substitute for survey-grade data so it may be helpful to create a separate feature code specifically for points created from KMZ/KML data.
- The Ground TIN can be deleted and recreated using **Terrain/TIN/TIN Manager** which is helpful once survey-grade data is available and a denser TIN can be created.
- If you want to retain the TIN created from the KMZ/KML, save the TIN with a unique file name in the **Lines/Reference Manager** folder.
- We will demonstrate incorporating a new TIN using denser terrain data later in the presentation.



Preliminary Design for Substation Cut-in

XY Based Structures and Graphical Sections

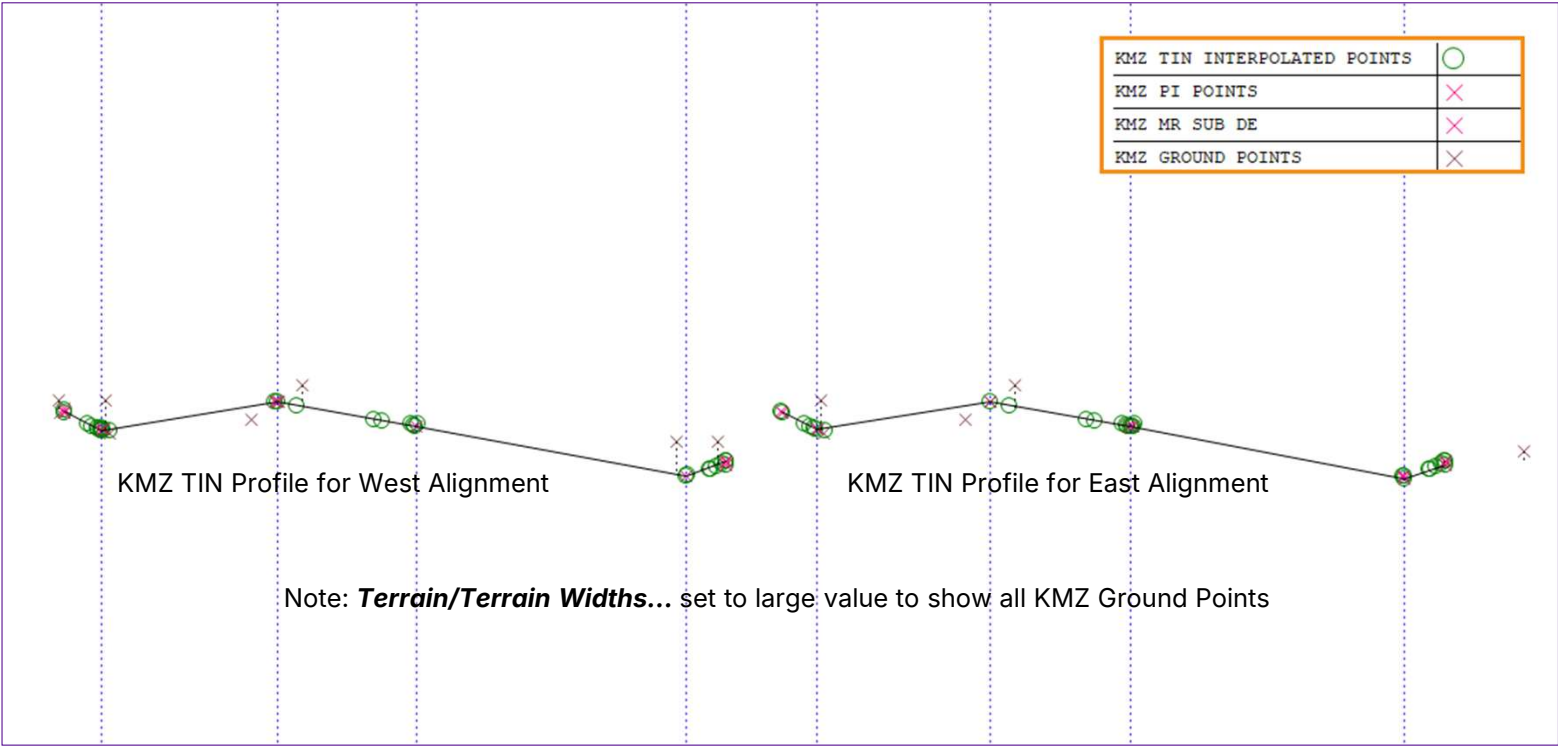
- ✎ Use **Structures/Add/XY Structure/At Survey Point** to spot structures at the KMZ PI POINTs. Use **Structures/Add/XY Structure/Along Line...** to spot additional structures as needed between the KMZ PI POINT(s).
- ✎ Use **Sections/Add...** or **Sections/Add Graphical...** to string wire along your XY Based Structures.
- ✎ Read more about XY Based Structures starting in Section 10.2.8 of the PLS-CADD User's Manual, or watch the video on our YouTube channel, [XY & Station Based Structure Conversion Commands & Advanced Alignment Modifications](#)
- ✎ Updated [XY Based Structures Tech note](#) will be available soon.
- ✎ Tip: it may be helpful to use **Criteria/Notes...** or the Project Notes field in **Lines/Edit...** to note uncertainties due to the source of terrain data.



Preliminary Design for Substation Cut-in

Creating Alignments from KMZ PI Points

✦ Alignments and interpolated points created from the KMZ TIN will give a very crude profile, but we will show how to refine it with new terrain data later in the presentation.



Multiple Alignments

- Use **Terrain/Alignment/Display Options for P.I., Alignment, Right of Way...** to adjust display as needed to differentiate the two alignments or toggle display in different Plan, Profile, 3D and Sheet Views.
- Right-of-Way lines can also be shown but these are not a substitute for boundaries established by a surveyor, deed or easement

	X	Y	Z	Station	Alignment Number	Line Angle	Closest Structure	Stationing to Closest Structure	Lines Alignment is Specific To	Label	PI Symbol/Leader Line Color	PI Leader Line Style	Ahead Segment Line Color	Ahead Segment Line Style	Right of Way Left Offset	Right of Way Right Offset	Right of Way Line Color	Right of Way Line Style
	(ft)	(ft)	(ft)	(ft)		(deg)		(ft)							(ft)	(ft)		
1	2557923.200	431152.840	779.200		1				2		Red	Solid	Blue	Solid	20.000		Green	Dot
2	2557993.249	431349.044	749.000	201.422	2	38.10			2		Red	Solid	Blue	Solid	30.000		Green	Dot
3	2558924.942	431523.473	783.000	1145.41	1	41.08			2		Red	Solid	Blue	Solid	40.000		Green	Dot
4	2558974.351	431479.189	771.532	1928.77	1	-78.20			2		Red	Solid	Blue	Solid	30.000		Green	Dot
5	2540136.274	433043.034	744.303	3408.94	1	-26.07			2		Red	Solid	Blue	Solid	20.000		Green	Dot
6	2540136.274	433267.489	752.624	3433.78	1				2		Red	Solid	Blue	Solid			Green	Dot
7	2557955.130	431137.230	789.000	3933.78	2				2		Red	Solid	Blue	Solid	20.000		Green	Dot
8	2558007.359	431327.459	769.826	4131.3	2	44.44			2		Red	Solid	Blue	Solid	30.000		Green	Dot
9	2558828.130	431304.369	794.780	5085.23	2	40.09			2		Red	Solid	Blue	Solid	40.000		Green	Dot
10	2558885.687	431660.761	771.142	5881.32	2	-77.30			2		Red	Solid	Blue	Solid	30.000		Green	Dot
11	2540182.949	433038.139	743.000	7350.44	2	-22.36			2		Red	Solid	Blue	Solid	20.000		Green	Dot
12	2540186.274	433267.489	750.448	7351.77	2				2		Red	Solid	Blue	Solid			Green	Dot

For the Sheet Plan View, PI and alignment settings in the table above are overridden by those in the dialog table. To change which settings should override, go to Drafting/Text/Line, Line Width, Style, Color and Layer.

Show Alignment Lines in: Plan View Sheet Plan View 3D View

Show Right of Way Lines in: Plan View Sheet Plan View 3D View

Show PI Symbol in: Sheet Profile View Profile View

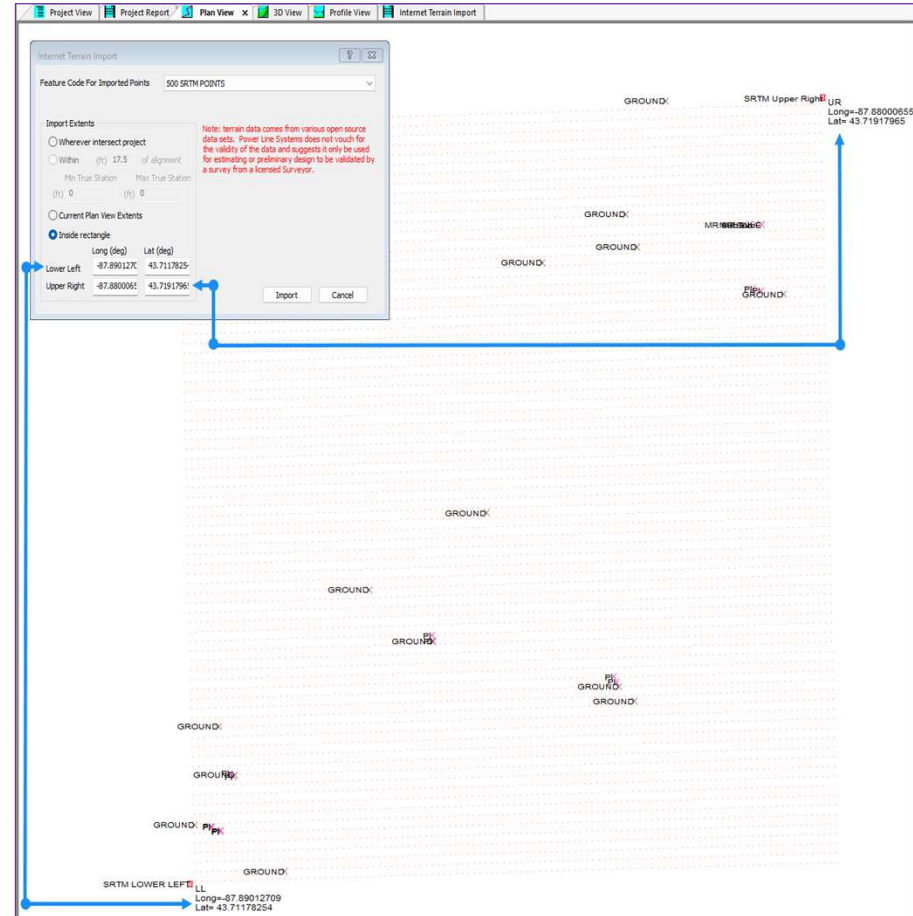
Add Above Label to PI Leader Text in: Plan View Sheet Plan View 3D View Profile View

Show Alignment Direction Arrows in: All Views (3D, Plan, Profile, Sheet)

Updating Design with New Terrain Data

Creating Separate Ground TIN with SRTM Points

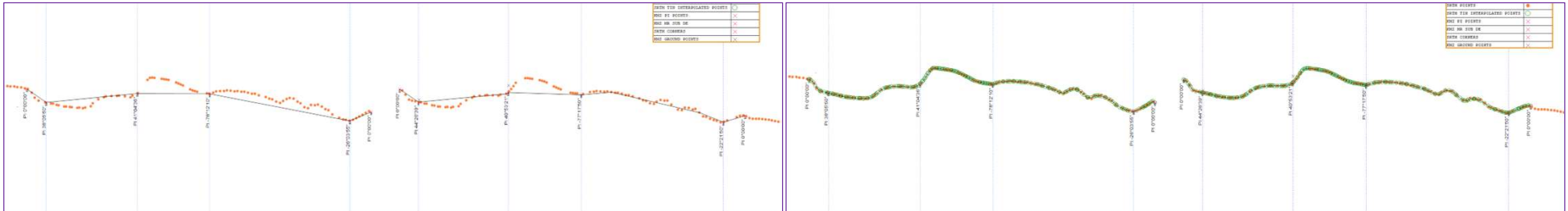
- ✦ Use **Terrain/Edit/Merge Points from External File/Merge Points from Internet...** to import XYZ points from the [Shuttle Radar Topography Mission \(SRTM\)](#)
- ✦ To import extents inside a rectangle, first use **Structures/Add/XY Structure/Freehand** for upper right and lower left corners. Then display structure Latitude and Longitude using **Drafting/Structure and Section Labeling/Plan View...**
- ✦ If you are getting new data later on, it may help to create a separate feature code specifically for imported SRTM points and use only that feature code for the SRTM TIN creation.
- ✦ Use **Terrain/TIN/TIN Manager** to detach the TIN created from KMZ points since TIN was saved in **Lines/Reference Manager**.
- ✦ Now use **Terrain/TIN/Create Ground TIN...** to make a new, separate TIN from the SRTM points.
- ✦ If desired, you can retain the TIN created from the SRTM points by saving the TIN with a unique file name in the **Lines/Reference Manager** folder.



Updating Design with New Terrain Data

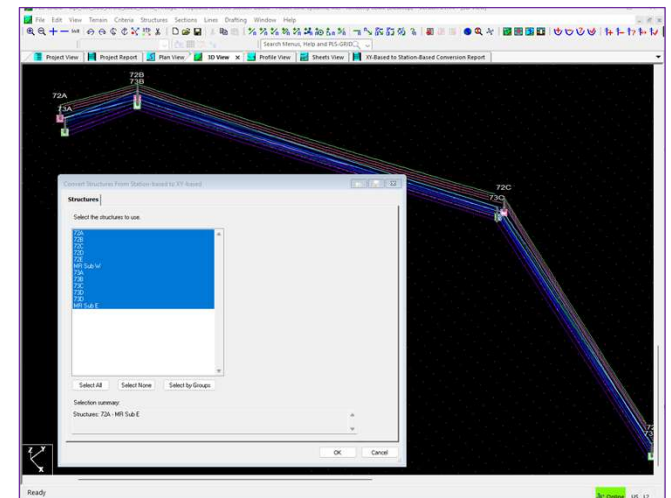
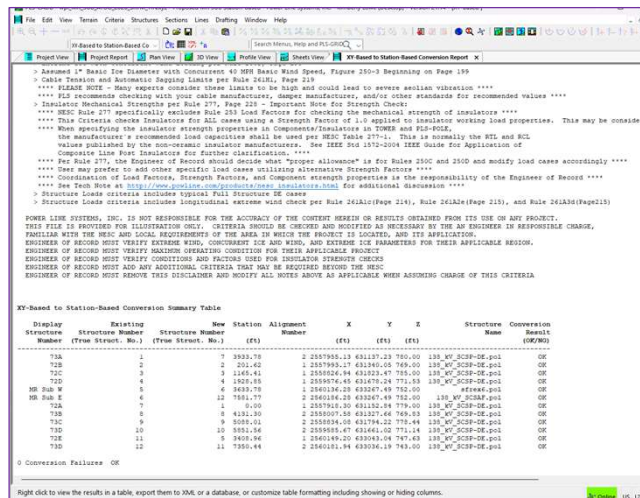
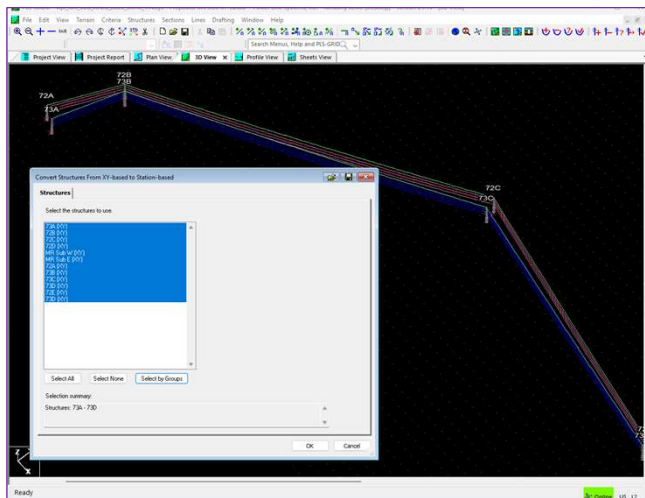
Refining KMZ Alignments with new SRTM TIN

- ✦ An alignment created from the KMZ TIN gives a very crude profile, but we can refine it with the SRTM TIN.
- ✦ Use **Terrain/TIN/Set Z of PIs, Survey Points, XY-based Structures, and/or Polygonal Constraints to 0...** to set Z to 0 for the PIs created from the KMZ.
- ✦ Then use **Terrain/TIN/TIN Z Interpolation for Z=0 PIs, Survey Points, XY-based Structures, and/or Polygonal Constraints...** to set Z to TIN elevation for PIs.
- ✦ Now you can use **Terrain/TIN/Create Interpolated Points** to refine your groundline profile.
- ✦ Once survey-grade terrain data arrives, a new TIN can be created. You can repeat the process of setting Z=0 for the PIs, then setting Z of PIs to the TIN elevation and creating interpolated points.



Converting XY Based Structures to Station Based

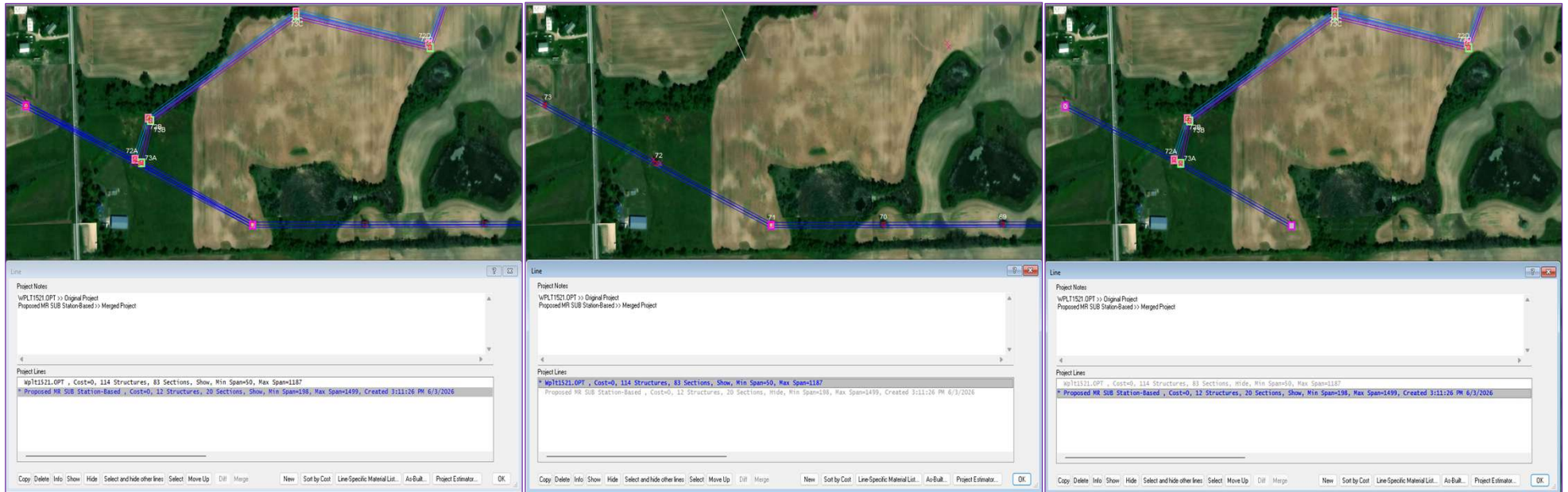
- Use **Structures/Alignment/Convert Structure(s) to Station-based...** to move one or multiple XY Based Structures onto an alignment.
- Depending on the number of structures to be moved, it may help to assign structure groups.
- Use the conversion report to check that structures were converted to the intended alignment(s)
- Review placement, orientation and height adjustments, make changes as needed
- You can convert back to XY Based Structures with **Structures/Alignment/Convert Structure(s) to XY-based...**



Merging Projects

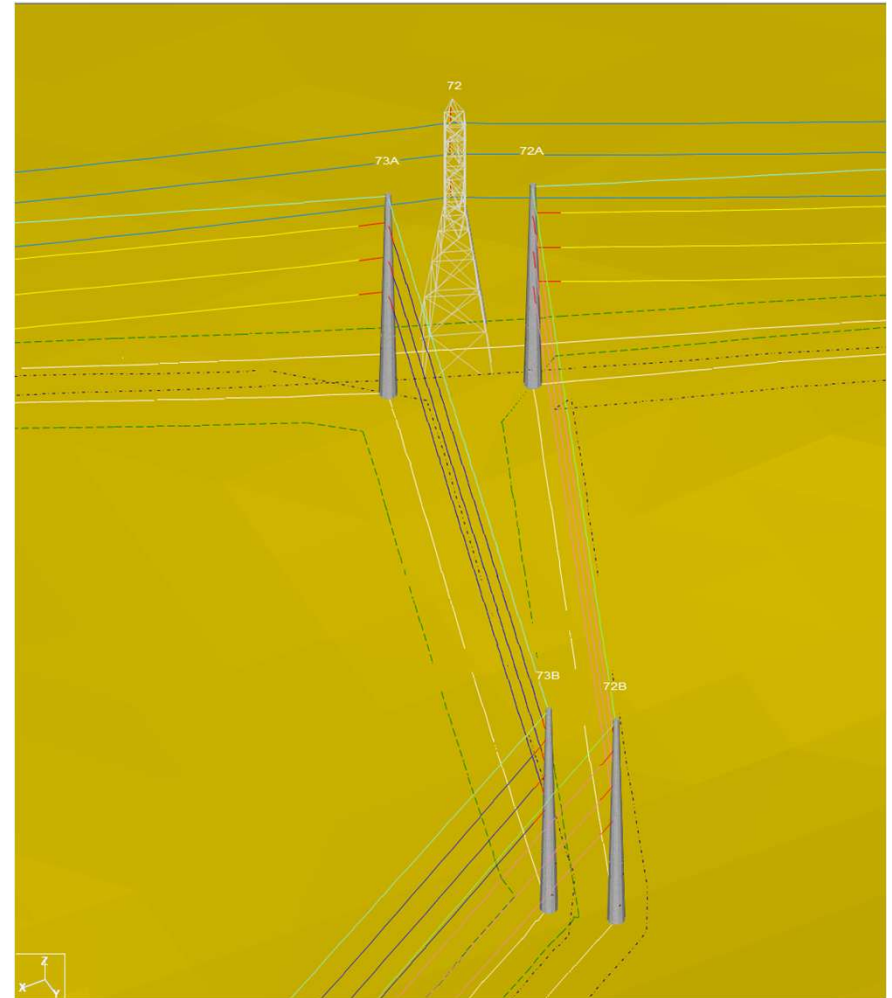
➤ Use **Lines/Merge Projects...** and a copy of the merged project will be placed into Lines/Edit...

➤ Read more in our [Merging Projects Together in PLS-CADD Tech Note](#)



A Brief Note on the Cut-in

- ✎ Refer to original main line for matching existing tensions at adjacent structures or performing load comparisons.
- ✎ Instead of restringing sections and copy-pasting rows of wire length data, change 72 to a site-specific structure and convert set 5 on 72 to an in-line deadend. Then use **Sections/Swap Attachments** to transfer wires to 72A and 73A.
- ✎ Use **Sections/Slip and Clip...** to match existing tensions at adjacent structures as shown in our [YouTube video](#)
- ✎ But wait there's more on **Sections/Slip and Clip...** [Advanced FE Modeling \(ATUG 2017 Presentation\)](#) and Graphical Sagging & FE Cable Adjustments (2020 Webinar). To access webinar, go to **Help/Register for Training Classes...** to select the webinar. You will need to be in the latest general release, previous general release or insider release version to access this webinar...and more!



Line-Specific Alignments

- To enable Line-Specific Alignments, go to **Terrain/Alignment/Line-Specific Alignment Configuration** and check the box.
- You can also go to **Terrain/Alignment/Table Edit Alignment** and double click on a PI to assign its alignment to specific line. Although the configuration menu is preferred for the initial assignments.
- To disable Line-Specific Alignments, go to **Terrain/Alignment/Line-Specific Alignment Configuration** and uncheck the box. All alignments will remain and will be viewable in all lines in the project.

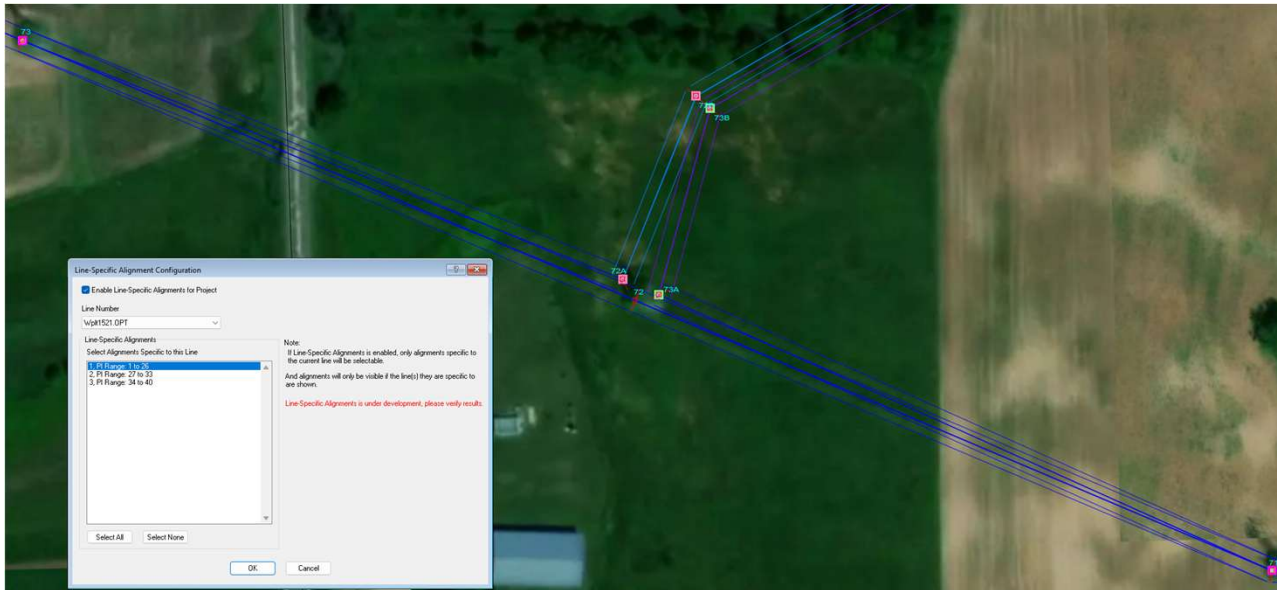


Table Edit Alignment

Double Click to edit PI. Automatically Interpolate Points
 Right Click PI for more options.
 Right Click and Drag to reorder PI.
 Shift Alignment will separate an alignment between the PI selected and one above it.
 Join Alignments will merge the alignment of the currently selected PI to the alignment below it.
 Note: This command is not undoable. It is recommended to save your work.

Original PI #	Original Station	X	Y	Z	Alignment #	Lines Alignment Specific To
1	0.0000	2523457.7030	640096.6666	835.1999	1	1,4
2	6156.8336	2529306.2087	638173.9196	814.0239	1	1,4
3	8046.4943	2545940.6837	627412.8960	793.2453	1	1,4
4	11286.2080	2544128.4685	636441.4966	809.5951	1	1,4
5	17887.6222	2550347.9085	634328.9799	810.9495	1	1,4
6	20298.9951	2550602.3084	632523.3387	800.4979	1	1,4
7	22743.9095	2554847.1382	632437.9196	802.4810	1	1,4
8	26790.9322	2558502.0282	630855.3799	798.1661	1	1,4
9	43523.7958	2573605.8776	630879.3199	714.7886	1	1,4
10	44779.3644	2576361.3176	630907.4199	700.9022	1	1,4
11	46963.3051	2578746.9173	629983.8896	690.2120	1	1,4
12						
13						
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Original PI: [PI #] 2557384.1231
 X: [PI #] 631396.8419
 Y: [PI #] 773.9837
 Z: [PI #] 773.9837

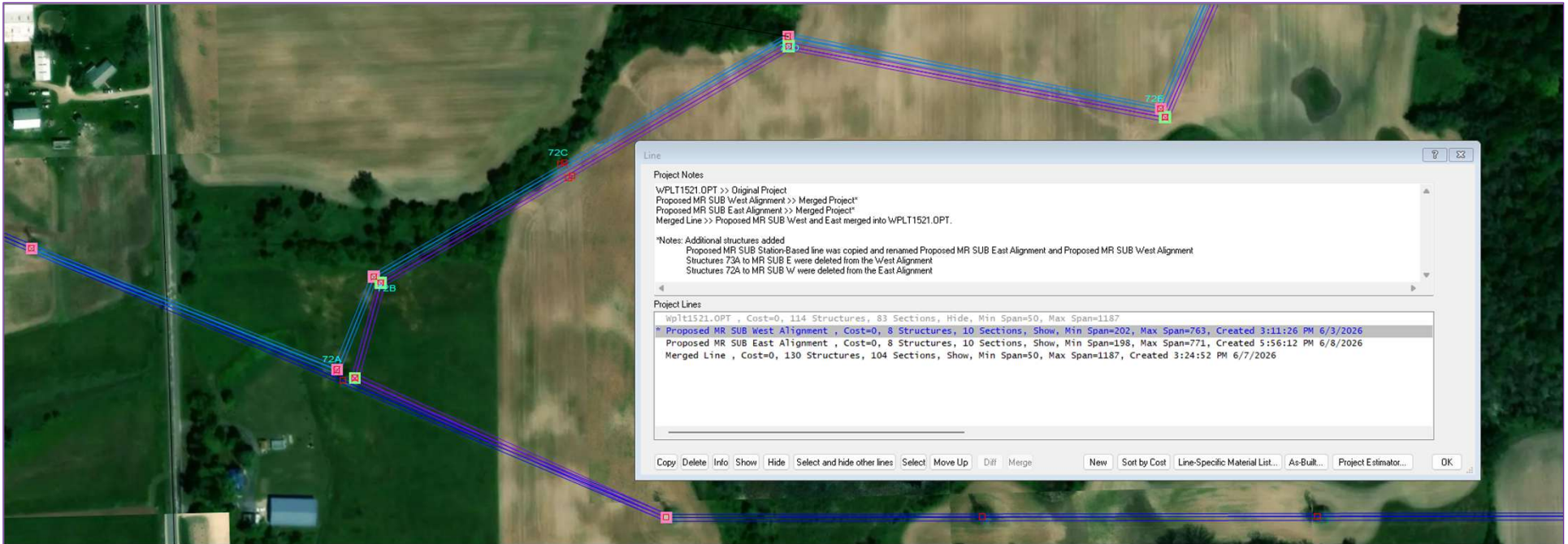
Lines Alignment Specific To: [Line #] 1,2,3,4,5,6,7,8,9,10,11,12,13,14,15,16,17,18,19,20,21,22,23,24,25,26,27,28,29,30,31,32,33,34,35,36,37,38,39,40

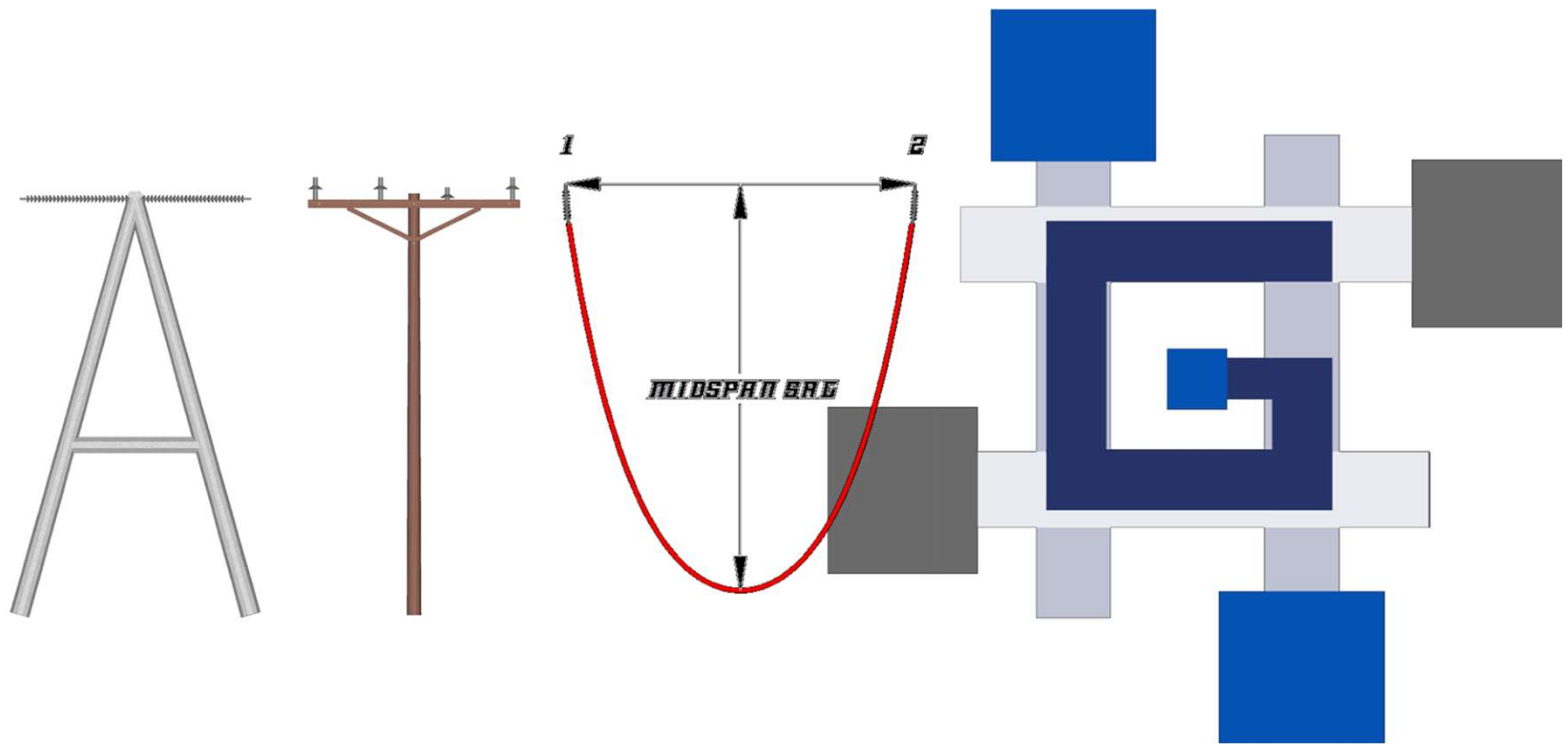
Note: To select lines this alignment is specific to, Line-Specific Alignments must be enabled. Enable this feature in Terrain/Alignment/Line-Specific Alignment Configuration.

Buttons: Add PI, Delete All, OK, Cancel

Line-Specific Alignments

- Alignments are still a global feature, this function is useful for toggling display when multiple alignments are present. Use **Lines/Edit...** to select, show, and hide line-specific alignments.
- To disable Line-Specific Alignments, go to **Terrain/Alignment/Line-Specific Alignment Configuration** and uncheck the box. All alignments will remain and will be viewable in all lines in the project.
- Useful for selecting and modifying PIs, inserting branches or inserting taps on overlapping alignments.





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